Town of Surfside

ITB 2024-01

Abbott Avenue Stormwater Improvements Project

Addendum No. 2

Date Issued: May 13, 2024

To All Proposers:

Proposers for the above-referenced ITB shall take note of the following changes, additions, deletions or clarifications to ITB No. 2024-01, which in accordance with the ITB Documents shall become a part of and have precedence over anything shown or described otherwise in the ITB.

THE FOLLOWING CHANGES, ADDITIONS, DELETIONS, RESPONSES AND CLARIFICATIONS TO ITB NO. 2024-01 ARE PROVIDED BY THE TOWN BELOW:

1. The following dates have been changed:

Event	Date*	Time* (EST)
Deadline to Submit Questions / Requests for Clarification	**May 24, 2024**	**5:00 PM**
Deadline to Submit Sealed Bids – Submission Deadline	**June 4, 2024**	**2:00 PM**
Bid Opening & Evaluation of Bids	**June 4, 2024**	**2:00 PM**

Bid submission deadline is now June 4, 2024 at 2:00 PM.

2. The Town is hereby submitting revised technical specifications with drawings/plans. Please take note that this replaces the technical specifications and drawings/plans found in Attachment B of this ITB.

3. The Town is hereby submitting a revised Bid Form. Please take note that this replaces the bid form within the ITB.

4. **Question/Comment Received: Please provide the Geotechnical Report.**
   Town Response: The Geotechnical Report is attached with this revised Attachment B.

5. **Question/Comment Received: The Electrical Drawings for the Pump Stations are missing. Please advise.**
   Town Response: The MEP drawings are attached with this revised Attachment B.

6. **Question/Comment Received: Reviewing the specifications and the site plans do not show any electrical distribution or any electrical schematics for the pump station control panel. Also, do not see in the writing specs any mentioning of the electrical gear or control panel gear.**
   Town Response: The MEP drawings are attached with this revised Attachment B

7. **Question/Comment Received: Is there a Pump Specification section other than what is on plan pages CP-401 & CP-404?**
   Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

8. **Question/Comment Received: Will the city approve an equal for the Lead and Lag pumps as long as the GPM and TDH are met?**
   Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

9. **Question/Comment Received: Please clarify the Pump Can/Tube material? Stainless?**
   Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

10. **Question/Comment Received: The Pump station valves call out on the plans CP-401 & CP-404 to be 24" Flanges Gate valves but are likely to be 24" Flanged Check Valves? Weight & Lever Type, No Spring tensioner or cushion? Or could a Flapper type check valve be utilized. I have attached a PDF for review, these types are more common in Storm Water Check valves.**
    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

11. **Question/Comment Received: Asbestos: Are there any existing Asbestos pipes within the work area of this project besides the AC lines to grouted?**
    Town Response: Unknown to the Town.

12. **Question/Comment Received: Contamination: Are there any known existing contamination within the vicinity of the work on this project?**
    Town Response: Unknown to the Town.

13. **Question/Comment Received: What is the anticipated award date for this project?**
    Town Response: Sometime summer 2024.

14. **Question/Comment Received: What is the anticipated start date for construction?**
    Town Response: Before the end of 2024.

15. **Question/Comment Received: Will you be providing payment of stored materials?**

Town Response: No.

16. **Question/Comment Received: Is there any known construction with other contractors within this project that may impact the work on this contract? If so:**
    1. **Where is the work involved?**
    2. **What type of work is it?**
    3. **What are the dates anticipated?**

    Town Response: Unknown to the Town.

17. **Question/Comment Received: Is there any tree removal required in this project?**
    Town Response: No.

18. **Question/Comment Received: Is there any Owner or Utility companies work planned in the project boundaries.**
    Town Response: Unknown to the Town.

19. **Question/Comment Received: PDF 142, 193, 263 and 266 mention Contractor's field office. Is a Field Office a mandatory requirement?**
    Town Response: No.

20. **Question/Comment Received: PDF 151, 1.2 TEMPORARY CONNECTIONS. B, states: "The cost of any temporary facilities and night, weekend, or holiday activity and overtime payments required during process interruptions shall be included in the WORK." In order to include this cost in the bid, please provide a quantity and sizes.**
    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

21. **Question/Comment Received: Please confirm that this project requires Build America, Buy America.**
    Town Response: The Town will clarify at a later date.

22. **Question/Comment Received: PDF 18, 3.2. GENERAL SCOPE OF WORK REQUIREMENTS. No. 6 States:" Replacement of damaged concrete sidewalks, driveways, curb and gutter, concrete pavers, asphalt pavement and sod." Please provide pay items for replacement of these items or at least quantities, so proper costs can be included in bid.**
    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

23. **Question/Comment Received: Pay Item 11. 4700 sy.1st how can "joint restraints" be paid by square yards? This is a quantity with a unit of "each". 2nd bedding, temporary pavement, limerock base, and asphaltic concrete have very dissimilar widths. How can they all be lumped together? To properly provide actual costs in the bid, please provide proper pay items for each of these items.**
    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

24. **Question/Comment Received: PDF 94 (Plan notes), note 3.2 states: "UNLESS OTHERWISE INDICATED ON THE PLANS, ALL EXISTING MANHOLES, CATCH BASINS, METERS AND OTHER STRUCTURES, WHETHER INDICATED ON THE PLANS OR NOT SHALL BE ADJUSTED TO MATCH THE NEW GRADE, BY THE CONTRACTOR." In order**

to include this cost if they are not indicated on the plans a price can not be included, unless a quantity is provided. We assume 1 MH, 2 CB, and 4 meters unless a quantity id provided.

Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

25. **Question/Comment Received: PDF 94 (Plan notes), #4 & 4.1 states: "4. PRECONSTRUCTION RESPONSIBILITIES 4.1. ALL UTILITY / ACCESS EASEMENTS TO BE SECURED PRIOR TO CONSTRUCTION", We assume easements are already secured since no:**
    1. **Locations**
    2. **Quantities**
    3. **Or Details are provided to include in bid.**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

26. **Question/Comment Received: What are the governing agencies having jurisdiction within the limits of this project?**

    Town Response: Town of Surfside

27. **Question/Comment Received: ITB, PDF 117 Plan Notes, #4 states: "SOIL BEARING PRESSURE UNDER STRUCTURE ASSUMED TO BE AT MINIMUM 2000 PSF. PRIOR TO INSTALLATION OF DRAINAGE STRUCTURE THE SOIL BEARING CAPACITY OF THE FOUNDATION MUST BE CONFIRMED BY THE CONTRACTOR, THROUGH A CERTIFIED GEOTECHNICAL LABORATORY." This is not a typical test, please confirm this test will be required for all seven (7) manholes and Control Structure.**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

28. **Question/Comment Received: Insurance requirements shown in the "sample contract section 6.1" has a requirement for builder's risk coverage as opposed to the insurance requirement of the ITB which does NOT show any requirement for builder's risk. Please clarify this discrepancy.**

    Town Response: The Town will clarify at a later date.

29. **Question/Comment Received: ITB, PDF 125, Detail #11, please confirm note 2 regarding "Locking Grates to be provided".**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

30. **Question/Comment Received: ITB, PDF 156, B, STATES: "Furnish and Install 16"/24" Piping / LF…shall include the cost of providing…obtaining approval and providing maintenance of traffic (MOT) and traffic control;… the cost of placing, maintain and removing the necessary barricades…" There is already a pay item (#15 MOT) in the proposal for "maintenance of traffic", how are we to include it in the footage price for pipes? 1. Also, at the end of this section it states: "…If the Contractor does not improve cleanliness to the satisfaction of the OWNER, the payment for this pay item may be denied and a separate contractor may be hired to complete Dust Control and Clean-up operations. Denied payments and cost of independent contractor will be subtracted from the lump-sum amount for this pay item through a change order and**

from the retainage amount if necessary." This item is Lineal Feet item, how can Lump Sum be applied? 2. In C, "Furnish and Install 16"/24" Gate Valves with Valve Boxes / EA:" There is no pay item for valves and this same illogical wording for valves in the description for pipe#8 & #9, how do you pay for valves by the foot?

Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

31. **Question/Comment Received: Where is pay item**
    1. **D, 8" Concrete Slab for Ground?**
    2. **E. 24"x16" Reducer / EA:**
    3. **F. As-Built Drawings / LS:**
    4. **G. Restoration of 4" and 6" Concrete Sidewalk and Driveways / SF:**
    5. **H. Sod / SY:**
    6. **I. Erosion and Sedimentation Control / LS:**
    7. **J. 1" Asphalt Pavement / SY:**
    8. **K. Installation of New Crosswalk Concrete and/or Pavers / SF:**
    9. **L. Curbing Installation / LF:**
    10. **M. Striping and Pavement Markings / LS:**
    11. **Etcetera, etcetera, etcetera**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

32. **Question/Comment Received: PDF 185, "M. Design calculations, drawings, and materials specifications shall be supplied as specified herein and by the individual specification sections." Where is this applicable?**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

33. **Question/Comment Received: PDF 186: "B. It is considered reasonable that the CONTRACTOR shall make a complete and acceptable submittal to the ENGINEER by the first resubmittal on an item. AND C. The OWNER reserves the right to withhold monies due to the CONTRACTOR to cover additional costs of the ENGINEER's review beyond the first resubmittal." What is the value for each additional review for such submittals?**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

34. **Question/Comment Received: PDF 193, "E. The CONTRACTOR shall schedule sample submittals such that: 1. Sample submittals for color and texture selection are complete so the ENGINEER has 45 Days to assemble color panels and select color- and texture-dependent products and materials without delay to the construction schedule; and," Where is this applicable, the completion time provided of 365 days with 120 days for permits and now another 45 days for engineer to assemble panels will require a minimum of 165 additional contract days. Please revise.**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

35. **Question/Comment Received: PDF 201 states: 1, "Unless indicated otherwise by the Technical Specifications, the OWNER will appoint, employ, and pay for services of an independent firm to perform inspection and testing or will perform inspection and testing itself." 2, "The OWNER or independent firm will perform inspections, testing,**

and other services as required by the ENGINEER under Paragraph 1.3C above." On PDF 202 it states: D. "The Contractor shall employ and pay for the services of an independent testing laboratory for specified testing as indicated in the Contract Document or specified by the ENGINEER, OWNER or Engineering Inspector or Building Department Inspector." Please clarify. Since this is not a measurable quantity, please provide an allowance account for testing with an approximate value, like many municipalities provide.

Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

36. **Question/Comment Received: PDF 205, "D. Salvage: The OWNER may desire to salvage certain items of existing equipment which are to be dismantled and removed during the course of construction. Prior to removal of any existing equipment or piping from the site of work, the Contractor shall ascertain from the OWNER whether or not the particular item or items are to be salvaged. Items to be salvaged shall be stockpiled at a location as designated by the OWNER." In order to include the salvage costs in the bid proposal, with the exception of removed meters, please:**
    1. **Identify the type of materials to be salvaged?**
    2. **The quantity to salvage?**
    3. **Location (how far from project materials are to be transported)?**
    4. **Whether materials are to be transported as found or at bidder's convenience?**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

37. **Question/Comment Received: PDF 206, "1.12 OBSTRUCTIONS A. All water pipes, storm drains, sanitary sewers, force mains, gas or other pipe, telephone or power cables or conduits and all other obstructions, whether or not shown, shall be temporarily supported across utility line excavations or relocated at the Contractor's expense." In order to include such unknowns in the bid, the following "not shown" obstacles information are necessary.**
    1. **Quantity of obstructions?**
    2. **Size of obstructions?**
    3. **Length of obstructions?**
    4. **Depth of obstructions?**
    5. **Quantity of relocations?**
    6. **We assume; 1-6" to 8" WM10' long and 1-18" culvert 10 ft long to support in our bid.**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

38. **Question/Comment Received: PDF 210, 1.2 EXISTING UTILITIES AND IMPROVEMENTS, "The CONTRACTOR shall protect underground Utilities and other improvements which may be impaired during construction operations, regardless of whether or not the Utilities are indicated on the Drawings." If not indicated and no marked, it is possible to impair utilities. If this is to be included in bid then a quantity of possible utilities to protect/deal with is required. We assume 1 utility in bid.**

    Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

39. **Question/Comment Received: PDF 245, 1.3 PERMIT FEES, B states: "The CONTRACTOR shall be responsible for posting the required security deposit with the**

TOWN prior to initiating work within TOWN Right of Way." In order to include in the bid, what is the value of the security deposit?
Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

40. **Question/Comment Received: PDF 348, 3.1 CLEANING states: "Thorough pigging will be required, and operations shall be sufficient to remove all deleterious materials left in the pipe by construction and shall meet the Engineer's approval.**
Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

41. **Question/Comment Received: Several concerns have been brought up with the latest plans issued in this solicitation that are dated February 3, 2023, Please confirm these are indeed the plans to be used for bidding this job.**
Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

42. **Question/Comment Received: Is bid bond required?**
Town Response: Please refer to the bid bond section of the ITB.

43. **Question/Comment Received: What are the LD's specially on this project?**
Town Response: To be determined at contract.

44. **Question/Comment Received: The Town may consider an extension for the bid opening due to the Town has not issued the Electrical Drawings so far.**
Town Response: Please see revised deadline.

45. **Question/Comment Received: Can the Town add an item for Furnish & Install Air Release Valve?**
Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

46. **Question/Comment Received: Can the Town add and item for Striping?**
Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

47. **Question/Comment Received: Please provide the detail for Trench Restoration.**
Town Response: Please find attached revised Attachment B and Bid Form. If question remains, please submit to the Town by the revised question submission deadline.

PROPOSER:

NAME: _____

TITLE: _____

DATE: _____

INVITATION TO BID

(ITB) BID # 2024-01

REVISED 2024-05-07

EXHIBIT B
TECHNICAL SPECIFICATIONS

Abbott Avenue Drainage Improvements

PREPARED FOR:

TOWN OF SURFSIDE
DEPARTMENT OF PUBLIC WORKS
AND PROCUREMENT DEPARTMENT

Prepared by:

KEITH

Engineering Inspired Design.

Table of Contents

DIVISION 00 – BIDDING AND CONTRACTING REQUIREMENTS

DIVISION 01 – GENERAL REQUIREMENTS

01 10 00 SUMMARY OF WORK

PART 1 - GENERAL

1.1 THE REQUIREMENTS

A. The WORK to be performed under this Contract includes, but is not limited to, furnishing and installing new stormwater piping, manholes, valves, etc.; connecting to existing stormwater management system; abandoning/relocating/upsizing existing piping; and all ancillaries associated with completion of this work. The CONTRACTOR is responsible for the proper handling and disposal of any existing piping being demolished and/or connected to. The WORK shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents which may be necessary for the complete and proper construction of the WORK in good faith shall be provided by the CONTRACTOR as though originally so indicated, at no increase in cost to the TOWN (OWNER).

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The WORK of this Contract comprises furnishing, installation, and construction of the following:

1. Two (2) stormwater pump stations and the associated control structures, electrical control panels, electrical power drops, electrical disconnects, downstream defenders, and trash rack structures.

2. Six (6) Drainage Injection Well(s)

3. 12-inch, stormwater forcemain pipe, valves and fittings; PVC (C900), minimum pressure rating 80 psi.

4. 18-inch stormwater forcemain pipe, valves and fittings; PVC (C900), minimum pressure rating 80 psi.

5. 24-inch stormwater forcemain pipe, valves and fittings; PVC (C900), minimum pressure rating 80 psi.

6. 24-inch HDPE Gravity stormwater pipe

7. Air release valves.

8. Replacement of any construction damaged concrete sidewalks, driveways, curb and gutter, concrete pavers, asphalt pavement and sod.

9. Milling and Overlaying the WORK area.

B. The WORK shall include furnishing and installing all piping, and appurtenances complete in place, including all cut-in connections to existing piping; surveying for both horizontal and vertical control for construction of the pipeline and appurtenances, all earthwork, trench excavation, transporting excess material to the OWNER's onsite storage area, removal and disposal of unsuitable material, dewatering, furnishing and installing pipe bedding material, all backfill, and compaction; furnishing and installing pipe restraint; including the temporary and permanent restoration of pavement and pavement markings; construction of supports for existing utilities, repair of damaged existing utilities indicated on the drawings; temporary and final restoration of all improvements incidental to the pipeline construction including restoration of sodding, landscaping, fences, driveways, and other existing features removed or damaged during pipeline construction; flushing, pressure testing of pipelines; disposal of existing asbestos concrete pipe in conformance with regulatory requirements; training, monitoring, and safety gear for handling asbestos concrete pipe; restoration and cleanup; providing maintenance of traffic; coordination with the OWNER, permitting agencies, and private lot owners; including required surveying for the preparation of record drawings and completion of record drawings, and all other work required a complete installation, all in accordance with the requirements of the Contract Documents.

C. The WORK is located within the TOWN OF SURFSIDE in Miami-Dade County, Florida. The project area extends from Abbott Avenue (to the east) to Bay Road (to the west).

D. The CONTRACTOR's attention is directed to the project milestones as follows:

1. Milestone 1 – Apply for all required permits and submit all required information for permits within 45 days of Notice to Proceed (NTP) as required by Specification 01 77 40 Permits.

2. Milestone 2 – Obtain all required permits within 120 days of NTP as required by Specification 01 77 40 Permits.

3. Milestone 3 – Substantial Completion within 365 days of Notice of Commencement (NOC). Substantial completion shall consist of completion and acceptance of the following:

    a. All stormwater forcemains, pressure tested, and cleared by the Miami Dade County DERM, and placed into service.

4. Milestone 4 – Final Completion within 395 days of Notice to Proceed.

1.3 CONTRACT METHOD

A. The WORK hereunder will be constructed under a lump sum contract.

1.4 WORK BY OTHERS

A. Where two (2) or more contracts are being performed at one time on the same Site or adjacent land in such manner that work under one contract may interfere with work under another, the OWNER will determine the sequence and order of the Work in either or both contracts. When the Site of one contract is the necessary or convenient means of access for performance of work under another, the OWNER may grant privilege of access or other reasonable privilege to the contractor so desiring, to the extent, amount, and in manner and at time that the OWNER may determine. No OWNER determination of method or time or sequence or order of the work or access privilege shall be the basis for a claim for delay or damage except under provisions of the General Conditions for temporary suspensions of the work. The CONTRACTOR shall conduct its operations to cause a minimum of interference with the work of such other contractors and shall cooperate fully with such contractors to allow continued safe access to their respective portions of the Site, as required to perform work under their respective contracts.

B. **Interference With Work on Utilities:** The CONTRACTOR shall cooperate fully with all utility forces of the OWNER or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the WORK, and shall schedule the WORK so as to minimize interference with said relocation, altering, or other rearranging of facilities.

1.5 CONTRACTOR USE OF SITE AND OR PUBLIC RIGHT OF WAY

A. The CONTRACTOR shall be responsible obtaining the necessary storage/staging areas for materials and equipment within the public Right of Way or any available vacant/empty lot adjacent to the Right of Way. Excavated materials and/or backfill materials shall not be stored in the roadway Right of Way for more than 48 hours. If suitable for backfill elsewhere, excavated material must be stockpiled within the staging area. Materials unsuitable for backfill must be removed and disposed of immediately.

1. Wherever possible, open trenches must be backfilled/plated, and barricades removed while maintaining adequate safety measures.

2. Streets must be graded/leveled to provide reasonable assurance against personal injury, vehicle damage, etc.

3. Streets temporarily restored, as described above, must be regularly maintained. For example, streets must be watered, new potholes filled and disturbed, and adjacent paved streets swept.

B. The CONTRACTOR's use of the Site shall be limited to its construction operations, including on-Site storage of materials, on-Site fabrication facilities, and field offices.

C. The CONTRACTOR shall not store or leave any equipment or materials within the Right-of-Way or on private property during non-construction hours, other than equipment that cannot be reasonably moved daily.

D. The CONTRACTOR shall regularly remove construction debris, unsuitable excavated material/rocks, and refuse from the Staging Area and shall remove it within 48 hours when directed to do so by the OWNER. All removed corrugated metal pipe, storm drain structures, and other demolished items shall be removed from the site or placed in dumpster within 24 hours of removal.

E. The CONTRACTOR shall obtain all required municipal or other governmental permits for any offsite storage yards, processing areas, or other operations. Refer to Specification 01 77 40 Permits.

1.6 OUTAGE PLANS

A. The CONTRACTOR shall not remove from service any existing operating potable water pipeline, fire hydrant, or close any valves without permission from the OWNER. The CONTRACTOR shall coordinate with the OWNER and ENGINEER for when the WORK requires removing any potable water, from service to conduct tie-ins.

B. The CONTRACTOR shall develop an Outage Plan detailing the identifying the existing pipelines to be isolated and removed from service, the valves to be closed, lots that will be affected by the outage, the tasks to be performed, the anticipated duration of each task, and the total anticipated time to complete the work and return the pipelines back into service. The CONTRACTOR shall submit the Outage Plan to the OWNER and ENGINEER for review and approval a minimum of two weeks before the outage.

    1. The OWNER shall operate all existing valves as required by the Outage Plan. Under no circumstances shall the contractor operate any existing valves.

    2. The CONTRACTOR shall be responsible for providing written notification to the lot owners indicating the date, time, and duration of the outage at no additional cost to the OWNER. The notification shall be provided to the lot owner a minimum of one week in advance.

    3. The CONTRACTOR shall provide written confirmation of the shutdown date and time two working days prior to the actual shutdown.

1.7 PROJECT MEETINGS

A. A Project Kickoff and a Pre-Construction Meeting shall be held in accordance with Specification 01 32 20 – Project Meetings

B. Permitting Meetings with permitting agencies shall be held in accordance with Specification 01 32 20 – Project Meetings

C. Progress Meetings shall be held in accordance with Specification 01 32 20 – Project Meetings

1.8 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project Superintendent, provide a dedicated Project Manager specific to this project as a supervisor to oversee proper performance of the WORK. Project Manager shall attend all meetings and have the authority to make decisions on behalf of the CONTRACTOR. Project Manager shall attend the site at a minimum once a day to evaluate the construction and to prepare a daily job report. Project Manager shall be responsible for all coordination, document handling, submittals review and processing, quality control, and project scheduling. The Project Manager, once approved, shall not be replaced without prior consent of the Owner and Engineer.

B. Project Superintendent shall be a direct employee of the CONTRACTOR.

C. Project Superintendent shall fluently speak, read and write in English.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 10 10 ABBREVIATIONS OF INSTITUTIONS

PART 1 - GENERAL

1.1 GENERAL

A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of the Specifications, the following acronyms or abbreviations which may appear shall have the meanings indicated herein.

1.2 ABBREVIATIONS

AA	Aluminum Association
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABMA	American Bearing Manufacturer's Association
ACGIH	American Conference of Governmental Industrial Hygienists
ACI	American Concrete Institute
ACOE	Army Corps of Engineers
ACPA	American Concrete Pipe Association
AF&PA	American Forest and Paper Association
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AHGDA	American Hot Dip Galvanizers Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AIHA	American Industrial Hygiene Association
AIIM	Association for Information and Image Management
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMA	Acoustical Material Association
AMCA	Air Movement and Control Association International, Inc
ANS	American Nuclear Society
ANSI	American National Standards Institute, Inc.
APA	The Engineered Wood Association
APHA	American Public Health Association
API	American Petroleum Institute APWA American Public Works Association
ARI	Air-Conditioning and Refrigeration Institute
ASA	Acoustical Society of America
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASLE	American Society of Lubricating Engineers

ASME	American Society of Mechanical Engineers
ASMM	Architectural Sheet Metal Manual
ASNT	American Society of Nondestructive Testing
ASQ	American Society for Quality
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWCI	American Wire Cloth Institute
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials, and Code Administrators International
BHMA	Builders Hardware Manufacturer's Association
CABO	Council of American Building Officials
CDA	Copper Development Association
CEMA	Conveyors Equipment Manufacturer's Association
CGA	Compressed Gas Association
CLFMI	Chain Link Fence Manufacturer's Institute
CLPCA	California Lathing and Plastering Contractors Association
CMA	Concrete Masonry Association
CMAA	A division/section of the Material Handling Industry of America
CRSI	Concrete Reinforcing Steel Institute
DCDMA	Diamond Core Drilling Manufacturer's Association
DERM	Department of Environmental Resource Management
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
DTPW	Department of Transportation and Public Works
EI	Energy Institute
EIA	Electronic Industries Alliance
EPA	Environmental Protection Agency
ETL	Electrical Test Laboratories
FBC	Florida Building Code, 2007 Edition with 2009 Supplement
FCC	Federal Communications Commission
FCI	Fluid Controls Institute
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Association
FHWA	Federal Highway Administration
FM	Factory Mutual System
FPL	Forest Products Laboratory
FS	Federal Specifications
HI	Hydronics Institute, Hydraulic Institute
HSWA	Federal Hazardous and Solid Waste Amendments
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
IBC	International Building Code
ICC	International Code Council
ICEA	Insulated Cable Engineers Association
ICCEC	Electrical Code
ICC-ES	International Code Council Evaluation Service

IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IESNA	Illuminating Engineering Society of North America
IFC	International Fire Code
IFGC	International Fuel Gas Code
IMC	International Mechanical Code
IME	Institute of Makers of Explosives
IPC	International Plumbing Code, Association Connecting Electronic Industries
IPCEA	Insulated Power Cable Engineers Association
IRC	International Residential Code
ISA	Instrument Society of America
ISDI	Insulated Steel Door Institute
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
ITU-T	Telecommunications Standardization Sector of the International Telecommunications Union
LPI	Lightning Protection Institute
LRQA	Lloyd's Register Quality Assurance
MBMA	Metal Building Manufacturer's Association
MDCHD	Miami-Dade County Health Department
MIL	Military Standards (DoD)
MPTA	Mechanical Power Transmission Association
MSS	Manufacturers Standardization Society
MTI	Marine Testing Institute
NAAMM	National Association of Architectural Metal Manufacturer's
NACE	National Association of Corrosion Engineers
DASMA	Door and Access Systems Manufacturers Association International
NAPF	National Association of Pipe Fabricators
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors
NBS	National Bureau of Standards
NCCLS	National Committee for Clinical Laboratory Standards
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association or National Fluid Power Association
NISO	National Information Standards Organization
NIST	National Institute of Standards and Technology
NLGI	National Lubricating Grease Institute
NRCA	National Roofing Contractors Association
NSF	National Sanitation Foundation
NWWDA	National Wood Window and Door Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Precast/Prestressed Concrete Institute
PPI	Plastic Pipe Institute
RCRA	Resource Conservation and Recovery Act
RIS	Redwood Inspection Service, a division of the California Redwood Association, CRA
RMA	Rubber Manufacturers Association
RVIA	Recreational Vehicle Industry Association
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers
SDI	Steel Door Institute, Steel Deck Institute

SFWMD	South Florida Water Management District
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPFA	Steel Plate Fabricator's Association
SPIB	Southern Pine Inspection Bureau
SSBC	Southern Standard Building Code, Southern Building Code Congress
SSPC	Society for Protective Coating
SSPWC	Standard Specifications for Public Works Construction
STLE	Society of Tribologists and Lubricating Engineers
TAPPI	Technical Association of the Worldwide Pulp, Paper, and Converting Industry
TFI	The Fertilizer Institute
TIA	Telecommunications Industries Association
TPI	Truss Plate Institute
UBC	Uniform Building Code
UL	Underwriters Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WDMA	National Window and Door Manufacturers Association
WEF	Water Environment Federation
WI	Woodwork Institute
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 10 15 INDEX OF DRAWINGS

PART 1 - GENERAL

1.1 CONTRACT DRAWINGS

A. Plans labeled **ISSUED FOR BID DATED 05/07/2024** and any subsequent revision thereto introduced by Addenda prior to Bid, showing the work of the Contract are hereby made a part of the Contract Documents and are listed as follows:

SURVEY

1 of 6	TOPOGRAPHIC SURVEY ABBOTT AVENUE DRAINAGE IMPROVEMENTS PHASE-2
2 of 6	TOPOGRAPHIC SURVEY ABBOTT AVENUE DRAINAGE IMPROVEMENTS PHASE-2
3 of 6	TOPOGRAPHIC SURVEY ABBOTT AVENUE DRAINAGE IMPROVEMENTS PHASE-2
4 of 6	TOPOGRAPHIC SURVEY ABBOTT AVENUE DRAINAGE IMPROVEMENTS PHASE-2
5 of 6	TOPOGRAPHIC SURVEY ABBOTT AVENUE DRAINAGE IMPROVEMENTS PHASE-2
6 of 6	TOPOGRAPHIC SURVEY ABBOTT AVENUE DRAINAGE IMPROVEMENTS PHASE-2

GENERAL

GI-000	COVER SHEET
GI-001	LEGEND AND ABBREVIATIONS
GI-002	GENERAL CONSTRUCTION NOTES
GI-003	GENERAL CONSTRUCTION SPECIFICATIONS
GI-004	KEY MAP

CIVIL

CG-101 - 106	EROSION CONTROL PLANS
CG-501	EROSION CONTROL DETAILS
CP-101 - 106	DRAINAGE PLANS
CP-401 - 404	PUMP STATION PLAN AND DETAILS
CP-501 - 502	DRAINAGE DETAILS
CM-101 - 106	PAVEMENT SIGNING AND MARKING PLANS

B. Due to the possibility of typing errors or omissions, the above list shall not be considered as necessarily complete, nor shall the Standard Details which may be included elsewhere herein be considered as forming a complete listing of all Standard Details which may apply to this Project. Perform all work shown on all sheets of the Plans, as specified herein or necessary for a complete functional installation and no extra compensation will be made

due to the omission or incorrect listing of a Drawing in this Section. The CONTRACTOR shall field investigate and verify as necessary for this work prior the construction.

C. APPENDICES

1. Boundary and Topographic Survey
2. Stormwater Management Report
3. Geotechnical Investigation Report

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTIONS

01 14 00 CONSTRUCTION CONSTRAINTS

PART 1 - GENERAL

1.1 THE SUMMARY

A. WORK shall be scheduled, sequenced, and performed in a manner which minimizes disruption to the public and to the operation and maintenance of existing facilities along the pipeline alignment.

B. The CONTRACTOR shall incorporate the construction and schedule constraints of this Section in preparing the construction schedules required under Specifications 01 32 16 – CPM Construction Schedule.

1.2 TEMPORARY CONNECTIONS

A. Making connections to existing facilities or other operations that interfere with the operation of the existing equipment shall be thoroughly planned in advance, and required equipment, materials, and labor shall be on hand at the time of undertaking the connections. WORK shall be completed as quickly as possible and with as little delay as possible and shall proceed continuously (24 hours a day and seven days a week) if necessary, to complete modifications and/or connections in the minimum time.

B. The cost of any temporary facilities and night, weekend, or holiday activity and overtime payments required during process interruptions shall be included in the WORK.

C. Temporary facilities and piping shall be located to minimize interference with CONTRACTOR's construction facilities and OWNER's operation and maintenance of the distribution water system. Piping materials shall be suitable for the material being conveyed and be as required in the Contract Specifications.

1.3 CONSTRUCTION SEQUENCING

A. Construction activities shall be scheduled and sequenced to ensure continuous operation of the existing distribution water system. The CONTRACTOR shall be responsible for development of the construction sequencing. In implementing the construction sequencing, the CONTRACTOR shall maintain the existing facilities in service until new facilities are constructed and are operational to supplement the existing capaTOWN. When new facilities are operational, the existing facilities may be taken out of service. The following general guidelines shall be used by the CONTRACTOR in planning the sequence of construction.

1. Safe working conditions for personnel shall be maintained during installation, modification, and demolition WORK. The foregoing includes at least proper trench excavation, the provision of temporary equipment guards, supports, warning signs, sidewalk, and covers over openings.

2. Valves to be temporarily shut off during the WORK shall be operated by the owner.

1.4 SCHEDULE CONSTRAINTS

A. General: It is the CONTRACTOR's responsibility to coordinate and plan the construction activities to integrate each schedule constraint into performance of the overall WORK.

B. The listing of schedule constraints below does not mean that every constraint or special condition has been identified. The list does not substitute for the CONTRACTOR's coordination and planning for completion of the WORK within the Contract Times.

C. The work will be performed in residential neighborhood. The CONTRACTOR shall reasonable minimize the inconvenience to the residents and property owners, and reasonably maximize the safety of residents.

1. Approximately one week prior to the start of work in a particular (section of a street) the Contractor shall distribute flyers to all addresses in that location explaining the work that will be done, explaining the measures to be taken to protect the safety and the property of the residents, explaining how the Contractor will minimize inconvenience and to inform the residents of the contact information (cellphone number and emails) of key personnel: Contractor's Public Relations' Officer, Contractor's on-site Superintendent, OWNER's Project Manager, TOWN's on-site Representative. Contractor must also distribute flyers to all residents affected by water main shutdown to facilitate the connection to existing water mains.

2. Prior to start of work in a particular (section of) street, the Contractor must field verify the actual size and type of existing mains and fittings prior to ordering fittings and tapping sleeves and valves required for connecting into existing water mains.

3. At any given time, the length of the continuous, open trench shall not exceed 2,000 LF.

4. Open trench, outside the direct area that workers and equipment require, shall barricaded on both sides.

5. H-20 traffic rated steel plates shall cover open trenches across driveways.

6. At the end of each workday, backfill of trenches, compaction, placement of temporary pavement, removal of barricades and other temporary construction and clean up shall not lag more than 200 LF behind pipe installation.

7. Restoration to original or better condition of landscaping, private driveways, private fences, and all other types of private or public property, even if it is placed in the public right of way, and that has been affected by the construction activities, shall not lag more than 500 LF behind pipe installation.

8. Full lane width pavement overlay shall not commence until installed stormwater distribution piping in that location has been accepted by the OWNER.

D. No construction activities shall take place between the hours of 5:00 PM to 7:00 AM. No deliveries shall be allowed between the hours of 5:00 PM and 7:00 AM.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 29 00 MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 THE SUMMARY

A. Payment for the various items of the Bid Schedule, as further specified herein, shall include all compensation to be received by the CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefor shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.

B. The following explanation of the Measurement and Payment for the Bid Schedule items is provided; however, the omission of reference to any item shall not alter the intent of the Bid Schedule or relieve the CONTRACTOR of the necessity of constructing a complete project under this Contract.

C. The quantities set forth in the Bid Schedule are approximate and are given to establish a uniform basis for the comparison of bids. The OWNER reserves the right to increase or decrease the quantity of any item or portion of the work during the progress of construction in accordance with the terms of the Contract.

D. Unit prices are used as a means for computing bid, for Contract purposed, for periodic payments, and for determining the value of additions or deletions.

E. Payments shall be made for the items listed on the Bid Forms on the basis of the work actually performed and completed. No payment to be made for materials stored on site or elsewhere. Payment for completed work is including but not limited to, the furnishing of all necessary labor, materials, equipment, tools, transportation, delivery, disposal of waste and surplus material, backfilling and site restoration as shown in the plans, and all other appurtenances to complete the construction and installation of the work as shown on the drawings and described in the specifications. If any time of work, process, equipment or material is not specifically listed in the unit price bid item schedule of values, the CONTRACTOR shall include as provide said work, process, equipment or material of the best quality workmanship appropriate for the intended use at no additional cost.

1.2 ESTIMATED QUANTITIES

A. Where quantities are shown, they are approximate and are given only as a basis of calculation upon which the award of the contract is to be made. OWNER or ENGINEER do not assume any responsibility for the final quantities, nor shall CONTRACTOR claim

misunderstanding because of such estimate of quantities. Final payment will be made only for the satisfactorily completed quantity of each item.

B. The ENGINEER'S estimated quantities for unit bid prices, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. OWNER does not expressly or by implication agree that the nature of the materials encountered below the surface-of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as OWNER may deem necessary. The CONTRACTOR will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work ordered by the OWNER, and for use in computation of the value of the Work performed for progress payments.

1.3 MEASUREMENT STANDARDS

A. All work completed under the Contract shall be measured according to the United States Standards Methods.

1.4 METHOD OF MEASUREMENT AND PAYMENT

A. **Lump Sum Items:** Where the payment is to be made on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum item.

B. **Unit Price Items:** Where payment is to be made on a unit price basis, separate payment will be made for the items of work described herein and listed on the Bid Schedule. Any related work not specifically listed, but required for satisfactory completion of the Work, shall be considered to be included in the scope of the appropriate listed work items.

C. **Measurement of Length:** Unless otherwise specified for the particular items involved, all measurements of distance for items to be paid for on the basis of length shall be taken horizontally or vertically.

D. **Measurement of Area:** In the measurement of items paid for on the basis of area of finished work, the lengths and/or widths to be used in the calculations shall be the actual dimensions measured along the surface of the completed work within the neat lines shown or designated. At intersections, the measurement used for length of side area will be measured from the outside edge of the width allowed along the main trench.

E. **Failed Testing:** No additional payment will be allowed due to failed tests, generation additional work from the Contractor. Contractor shall correct the substandard condition and restore area to final condition at his own expense. The OWNER may back charge the contractor, via change order, for re-inspection expenses due to failed tests due to the negligence of the contractor.

1.5 BASIS OF PAYMENTS

A. The various items of Work will be paid for in the unit-amounts per work item times units completed and accepted by Owner of work items listed in the Bid Form. The sum of all separate payments shall not exceed the contract price.

Item No.1, **Cost per EACH** For furnishing selling delivering and, installing all necessary materials, equipment and supplies for construction of pump station(s) No. 1 and No. 2 (including all valves, piping, inverted baffle, sluice gate, floats, valve vault(s) (including all pump station and bypass piping, access hatch, and 24-inch check valve and check valve vault) Pressure transducers, access hatch, control panel and all electrical equipment / wiring / conduits / FPL Power drop / Control Panels and disconnects needed for the pump station) and appurtenances complete, will be paid for at the unit price bid times the number of pump station installed and accepted by the Engineer. The price bid shall be full compensation for furnishing all necessary material, equipment and supplies to each complete installation of Pump Station ready for service and shall include but not limited to, furnishing specified pumps and related equipment; furnish concrete top slab with traffic loading manhole cover for new pump station as shown on plan; furnish pump station ballast; furnish pedestal for pumps as per manufacture recommendation; furnish piping (suction and discharge), valves and box valves as required, fittings and accessories; additional backfill if required; furnish wet well sensing devices and related equipment; furnish electrical control panel, motor disconnect switch, wiring, conduits, channel support system; furnish materials, equipment and supplies necessary for switches and receptacles; furnish all materials, equipment and supplies necessary for pump station start-up and testing; furnish materials and equipment for relocation of conduit/wiring existing underground utilities in conflict with proposed work; including sheeting, shoring, bracing, dewatering, and any measures associated with dewatering; suitable backfill compaction and testing; the cost of temporary pavement furnish suitable backfill material; furnish materials for temporary and permanent pavement; replacement of any sod, sidewalk, pavement and/or paver required and damaged during construction and all appurtenant and miscellaneous items and materials required for a complete, satisfactory and functional installation, making the connection, cleaning and testing including water for test the new pumps, coordination with TOWN and other appurtenant and miscellaneous items and work for a complete satisfactory and functional installation.

The Contractor shall perform this work complete as specified. Payment includes mobilization and demobilization and any necessary repair, including pavement restoration to return the site to its condition prior the construction.

Item No. 2, Cost per EACH For furnishing and installing Downstream Defender(s): The unit price for this item shall include the cost of labor, equipment, the structure, the manhole cover, and Downstream Defender, transportation to the site, storage and protection on-site, bi-directional testing prior to installation, mechanical restraints, structure and manhole cover, excavation [including sheeting, shoring, bracing, dewatering, and any measures associated with dewatering; suitable backfill compaction and testing; the cost of temporary pavement (permanent pavement if the valve is located outside the limits of repaving); sodding and/or landscaping, the cost of placing, maintaining

and removing the necessary barricades and fencing for public safety, the cost of providing the measures called for in the MOT. White Reflective Pavement Markers, as directed by the OWNER; painting of box cover as described in these specifications and as directed by the OWNER; disposal of debris, waste and refuse, and all other necessary items for a complete, installed, and operable sluice gate, and all items shown in the Plans Details.

Item No. 3, Cost per EACH For furnishing and installing control structure(s): The unit price for this item shall include the cost of labor, equipment, the structure, the manhole cover, the S.S. Flap Gate and inline Tideflex Valve, transportation to the site, storage and protection on-site, bi-directional testing prior to installation, mechanical restraints, structure and manhole cover, excavation [including sheeting, shoring, bracing, dewatering, and any measures associated with dewatering; suitable backfill compaction and testing; the cost of temporary pavement (permanent pavement if the valve is located outside the limits of repaving); sodding and/or landscaping, the cost of placing, maintaining and removing the necessary barricades and fencing for public safety, the cost of providing the measures called for in the MOT. White Reflective Pavement Markers, as directed by the OWNER; painting of box cover as described in these specifications and as directed by the OWNER; disposal of debris, waste and refuse, and all other necessary items for a complete, installed, and operable sluice gate, and all items shown in the Plans Details.

Item No. 4, Cost per EACH For furnishing and installing trash rack structure(s): The unit price for this item shall include the cost of labor, equipment, the structure, the access hatch, the aluminum bar grating, and thew 24” sluice gate, transportation to the site, storage and protection on-site, bi-directional testing prior to installation, mechanical restraints, structure and manhole cover, excavation [including sheeting, shoring, bracing, dewatering, and any measures associated with dewatering; suitable backfill compaction and testing; the cost of temporary pavement (permanent pavement if the valve is located outside the limits of repaving); sodding and/or landscaping, the cost of placing, maintaining and removing the necessary barricades and fencing for public safety, the cost of providing the measures called for in the MOT. White Reflective Pavement Markers, as directed by the OWNER; painting of box cover as described in these specifications and as directed by the OWNER; disposal of debris, waste and refuse, and all other necessary items for a complete, installed, and operable sluice gate, and all items shown in the Plans Details.

Item No. 5, Cost per EACH For furnishing and installing drainage injection well structure(s): The unit price for this item shall include the cost of labor, equipment, the structure, the drainage injection well, the manhole cover, and the air release valve, transportation to the site, storage and protection on-site, bi-directional testing prior to installation, mechanical restraints, structure and manhole cover, excavation [including sheeting, shoring, bracing, dewatering, and any measures associated with dewatering; suitable backfill compaction and testing; the cost of temporary pavement (permanent pavement if the valve is located outside the limits of repaving); sodding and/or landscaping, the cost of placing, maintaining and removing the necessary barricades and fencing for public safety, the cost of providing the measures called for in the MOT. White Reflective Pavement Markers, as directed by the OWNER; painting of box cover as described in these specifications and as directed by the OWNER; disposal of debris, waste

and refuse, and all other necessary items for a complete, installed, and operable sluice gate, and all items shown in the Plans Details.

Item No. 6, Cost per EACH For furnishing and installing Manhole(s)/Catch Basin(s) (s): The unit price for this item shall include the cost of labor, equipment, the structure, the manhole cover, and/or the catch basin inlet top, transportation to the site, storage and protection on-site, bi-directional testing prior to installation, mechanical restraints, structure and manhole cover, excavation [including sheeting, shoring, bracing, dewatering, and any measures associated with dewatering; suitable backfill compaction and testing; the cost of temporary pavement (permanent pavement if the valve is located outside the limits of repaving); sodding and/or landscaping, the cost of placing, maintaining and removing the necessary barricades and fencing for public safety, the cost of providing the measures called for in the MOT. White Reflective Pavement Markers, as directed by the OWNER; painting of box cover as described in these specifications and as directed by the OWNER; disposal of debris, waste and refuse, and all other necessary items for a complete, installed, and operable sluice gate, and all items shown in the Plans Details.

Item No. 7,8,9 , Cost per Foot For furnishing and installing 12-inch/18-inch/24-inch/ PVC (C900 - Minimum pressure rating 80 psi) stormwater forcemain Pipe(s): This item shall be measured as LF of the horizontal projection along the center line of the pipe of pipe installed, and shall include the cost of providing the pipe on site, proper storage and protection on site, all pipe fittings, (bends, Wyes, tees, plugs) and installation of all pipes and fittings; including all pipe bedding; joint restraints; disposal of debris, waste and refuse; preparing, obtaining approval and providing maintenance of traffic (MOT) and traffic control; furnishing, installation and removal of fill and flush connections for filling mains; hydrostatic testing, pressure testing, cleaning, flushing, disinfection, identification tape; the cost of trenching including:

1) Sheeting, shoring, bracing, dewatering, and any measures associated with dewatering, such as turbidity barrier and sediment control
2) Excavation necessary for installation of the pipe including **cost of asphalt pavement material and limerock base material** per trench pavement restoration detail; backfill (including flowable fill if so directed by the OWNER), Type B Bedding per Trenching restoration Detail, removal hauling or additional suitable backfill material if required, compaction and density testing;, compacted in-place, in the pipe trench, according to the depths specified in the utility trench detail, the cost of temporary pavement over the trench, including removal of existing asphalt and temporary asphalt; the cost of placing, maintain and removing the necessary barricades and fencing for public safety.

As-builts, soft digs, test pits, exploratory digging and restoration for existing utilities, repairs to damaged existing utilities, repaints to irrigation systems, and driveway and sidewalk restoration shall be included in these pay items. Silt fence, erosion control measures, pipe lubricant, gaskets, joint restraints; all other consumables, and incidentals as shown on the plans and specifications and/or necessary for a complete and operational pressure system shall be included in the unit price for this pay item. This item also includes the cost for site clean-up during the execution of the work and final clean-up after completion of pipe installation and/or other construction activities as called for in the plans and specifications. This payment item includes the cost of labor, sweeping, consumables,

equipment and all other necessary items and components to maintain a condition commensurate with a residential neighborhood: free of dust, waste and debris, no stock piles of construction materials other than in the designated locations; street sweeping and clean-up immediately following installation of temporary pavement; general clean-up at the end of each work day; watering site or other measures of dust control to minimize dust impact in the neighborhood. The Contractor shall apply good 'housekeeping' practices during the execution of the work. If the OWNER is dissatisfied with the cleanliness of the site, it may issue to the Contractor a written notice to improve cleanliness with specific instructions for improvement. If the Contractor does not improve cleanliness to the satisfaction of the OWNER, the payment for this pay item may be denied and a separate contractor may be hired to complete Dust Control and Clean-up operations. Denied payments and cost of independent contractor will be subtracted from the lump-sum amount for this pay item through a change order and from the retainage amount if necessary.

Item No. 10, Cost per Foot For furnishing and installing 24-inch HDPE Gravity stormwater Pipe(s): This item shall be measured as linear feet of the horizontal projection along the center line of the pipe of pipe installed, and shall include the cost of providing the pipe on site, proper storage and protection on site, installation; disposal of debris, waste and refuse; preparing, obtaining approval and providing maintenance of traffic (MOT) and traffic control; furnishing, hydrostatic testing, lamping testing, cleaning, identification tape; the cost of trenching including:

1) Sheeting, shoring, bracing, dewatering, and any measures associated with dewatering, such as turbidity barrier and sediment control
2) Additional excavation necessary for crossing under existing utilities]; backfill (including flowable fill if so directed by the OWNER), Type B Bedding per Trenching restoration Detail, removal hauling or additional suitable backfill material if required, compaction and density testing; the cost of temporary pavement over the trench, including removal of existing asphalt and temporary asphalt; the cost of placing, maintain and removing the necessary barricades and fencing for public safety.

As-builts, soft digs, test pits, exploratory digging and restoration for existing utilities, repairs to damaged existing utilities, repaints to irrigation systems, and driveway and sidewalk restoration shall be included in these pay items. Silt fence, erosion control measures, pipe lubricant, gaskets; all other consumables, and incidentals as shown on the plans and specifications and/or necessary for a complete and operational pressure system shall be included in the unit price for this pay item. This item also includes the cost for site clean-up during the execution of the work and final clean-up after completion of pipe installation and/or other construction activities as called for in the plans and specifications. This payment item includes the cost of labor, sweeping, consumables, equipment and all other necessary items and components to maintain a condition commensurate with a residential neighborhood: free of dust, waste and debris, no stock piles of construction materials other than in the designated locations; street sweeping and clean-up immediately following installation of temporary pavement; general clean-up at the end of each work day; watering site or other measures of dust control to minimize dust impact in the neighborhood. The Contractor shall apply good 'housekeeping' practices during the execution of the work. If the OWNER is dissatisfied with the cleanliness of the

site, it may issue to the Contractor a written notice to improve cleanliness with specific instructions for improvement. If the Contractor does not improve cleanliness to the satisfaction of the OWNER, the payment for this pay item may be denied and a separate contractor may be hired to complete Dust Control and Clean-up operations. Denied payments and cost of independent contractor will be subtracted from the lump-sum amount for this pay item through a change order and from the retainage amount if necessary.

Item No. 11, Cost per Square Yard For asphalt, milling and resurfacing (Including all areas of trench restoration and as indicated on the plans or disturbed by the construction operation. Mill 1" of Asphalt paving and resurface with 1" of new asphalt paving): The cost for this pay item shall include all labor, equipment and materials necessary to provide a 1 ½" thick (after compaction) asphaltic concrete on the trench restoration and 1" thick asphalt overlay of rest of the pavement width at all work areas and as shown in the plans. Also included are disposal of debris, tack and prime coats, compaction, asphaltic concrete, paving of asphalt driveways damaged by constriction activities; protection of newly laid asphalt, and any other related activities required for providing a new asphalt pavement surface for all affected areas in this contract. This activity shall only take place after all work has been completed, after approval of the OWNER, and after clearance from the department of health has been obtained. Measurement for payment shall be based on the tons (TN) installed as approved by the Engineer.

Item No. 12, Lump Sum Price, For pavement marking(s): This pay item shall include all the necessary pavement markings needed to be restored after pavement overlay, including any initial stripping of paint to provide a proper finished product. Striping shall be with thermoplastic paint and as required to restore original conditions, to meet requirements of the Manual on Uniform Traffic Control Devices, FDOT and as shown in the drawing notes and specifications. Also included is maintenance of traffic and paint protection and reflective pavement markers (RPM's – yellow, white, blue and green), disposal of debris, and any other related activities required to provide thermoplastic striping at all resurfaced streets in this contract.

Item No. 14, For Mobilization / Demobilization / Bonds / Insurance: This item shall cover the costs for all necessary insurance, and bonds the Contractor must secure; the costs for making available on the work site the necessary temporary facilities and the necessary personnel, supplies, tools and equipment to perform the work (heavy construction equipment, hand tools, storage, lay- down yards, temporary and/or portable power supply, barricades, fence and safety equipment, and all other items necessary to start the work); submittal of all required documentation, such as insurance certificates and bonds; posting OSHA required notices and establishment of safety programs; notifications to the affected public; Contractor's superintendent on site full-time. Demobilization shall be included in this item and shall be part of 'substantial completion' and includes the removal of all tools and equipment from site, the removal of all temporary facilities, the restoration of those areas to original or better conditions that were used for temporary facilities. No additional payments will be made for mobilization and demobilization activities due to shutdowns, suspension of work, or other mobilization requirements.

Measurement for payment shall be based on the completion of the mobilization items, as described, to the satisfaction of the OWNER and shall not be more than 5% of the Total Bid. The lump sum amount for this bid item shall be distributed as follows: 60% at the completion of the mobilization requirements and 40% at substantial completion of the work.

Item No. 15, For Maintenance of Traffic: Measurement of payment shall include the preparation and processing of Maintenance of Traffic Plans to respective divisions and installation, thereafter, including a Florida Licensed Professional Traffic Engineer preparing the MOT plans to the satisfaction of the OWNER and shall not be more than 5% of the Total Bid. No lane closures during Holiday periods. Any additional costs including but not limited to barricades, lights, off duty police officers and other duties associated with nighttime work shall be incorporated into the cost for this item. The lump sum amount for this bid item shall be distributed as follows: equal monthly amounts during the duration of the contract time.

Item No. 16, Lump Sum Price, For Erosion Control/BMPs/SWPPP Measures: This pay item includes all necessary operations to prevent contamination or disturbing of the environment of the properties adjacent to the work. This includes but is not limited to; confining all runoff from disturbed surfaces and contaminated waters and utilizing barriers to prevent erosion and contamination and all de equipment and materials for sodding, grading, topsoil, the preparation of the surface prior to placement of sod, close placement of sod, fertilizing, watering and other maintenance as specified herein and not included under other pay items. The total pay requests for this pay item shall not exceed the contractual amount for this pay item without prior written approval from the OWNER. Sod restoration included in this pay item is necessary to restore original conditions damaged due to construction operations. Sod damaged by the contractor due to failure to exercise care at the construction site, shall be responsible for watering the shrub/ sod daily, for a minimum of twelve (12) weeks after installation. Measurement for payment shall be based on a lump sum installed as approved by the Engineer.

Item No. 17, Lump Sum Price For Construction Surveying / Stake Out / As-Built Drawings: This pays item shall include all costs associated with construction surveying, stake out and the production of final As-built drawings including all survey work and necessary requested revisions. As-built drawings shall be provided by the Contractor to the Engineer three weeks prior to final inspection. All As-built data shall be provided by a Florida licensed surveyor, signed, and sealed and dated by the responsible party. At the completion of the work, deliver the drawings documenting As-built information, measured by a licensed surveyor, to the engineer, in good condition and free from any extraneous notation. Contractor shall provide three (3) hard copies 11”x17” of as-builts, one (1) AutoCAD file and one (1) PDF file. The As-built information on the system is to include, but not be limited to locations of all valves, fittings, Pump Station and drainage well locations and top-of-pipe elevation on 100-foot intervals at a minimum. Measurement for payment shall be based on the completion of this pay item.

Item No. 18, Lump Sum Price For Construction Material Testing: This pays item shall include all costs associated with construction Material testing. Measurement for payment shall be based on the completion of this pay item.

Item No. 19, Dedicate Allowance For providing a certified industrial hygienist or State of Florida licensed engineer in environmental discipline to develop health and safety plan: Dedicated Allowance. Providing a Certified Industrial Hygienist, certified by the American Board of Industrial hygiene or a State of Florida licensed Engineer in Environmental Discipline to develop site-specific health and safety plan, will be paid at the Aggregate sum bid. The price bid will be full compensation for the Certified Industrial Hygienist or a State of Florida licensed Engineer in Environmental Discipline provide monitored testing and evaluation of test for duration of contract and have his representative on site at all times during construction in area of contamination for testing of soils, following up on results and developing a protocols consistent with findings; meeting with Contractor, subcontractors and government agencies, preparation of reports, submittals of reports to the Engineer and the TOWN and all other appurtenant and miscellaneous items and work for a complete, satisfactory, and functional installation to prevent deterioration of the structural, the pipe and /or the environment.

Item No. 20, Dedicate Allowance For all costs of required permit fees, inspections, impact fees, if authorized by the Engineer: Dedicated Allowance; for costs of required permits, fees, inspections, impact fees, and other direct cost of this nature, if authorized by the Engineer. Payment shall reimburse the Contractor for only the cost of the construction permit or fee. Any question of whether a construction permit or fee is required shall be decided by the Engineer whose word shall be final. Any portion of this fund remaining after all authorized payments have been made will be withheld from contract payments and will remain with the County.

Item No. 21, Lump Sum Price For unforeseen improvements, for minor construction changes and quantities adjustments, if ordered by the Town: Contingency Allowance, for Unforeseeable improvements, Minor Construction Changes and Quantity Adjustments at other intersections along Abbott Avenue and 92nd Street, additional work not covered by other items, if ordered by the Engineer: This account is for all labor, materials, equipment and services necessary or modification or extra work required to complete the Project because of unforeseen conditions, unforeseen conflicts between existing elements of work and the proposed work; for minor changes required to resolve any unforeseen conditions, Revised Regulations, Technological and Products Development, Operational Changes, Schedule Requirements, Program Interface, Emergencies and Other Miscellaneous Costs; and for adjustments to estimated quantities shown on the unit prices of the Quotation to conform to actual quantities installed; and associated time related to this work only if ordered in writing by the Engineer, in accordance with the Section 13 of the General Covenants and Conditions entitled "Extra Work and Payment Therefore" of the Special Conditions. Any portion of these accounts remaining after all authorized payments have been made will be withheld from Contract payments and will remain with the County.

<u>Item No. 22</u>, Lump Sum Price For unforeseen conditions, for minor construction changes and for quantity adjustments, if ordered by the Engineer: Contingency Allowance, for Unforeseeable Conditions, Minor Construction Changes and Quantity Adjustments, additional work not covered by other items, if ordered by the Engineer: This account is for all labor, materials, equipment and services necessary or modification or extra work required to complete the Project because of unforeseen conditions, unforeseen conflicts between existing elements of work and the proposed work; for minor changes required to resolve any unforeseen conditions, Revised Regulations, Technological and Products Development, Operational Changes, Schedule Requirements, Program Interface, Emergencies and Other Miscellaneous Costs; and for adjustments to estimated quantities shown on the unit prices of the Quotation to conform to actual quantities installed; and associated time related to this work only if ordered in writing by the Engineer, in accordance with the Section 13 of the General Covenants and Conditions entitled "Extra Work and Payment Therefore" of the Special Conditions. Any portion of these accounts remaining after all authorized payments have been made will be withheld from Contract payments and will remain with the County.

1.6 PAYMENTS

A. Shall be accordance with the provisions of the GENERAL CONDITIONS. Invoices for the work completed for each payment period shall include construction photographs per Specification 01 32 00.

1.7 NON-PAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:
   1. Loading, hauling, and disposing of rejected material.
   2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
   3. Rejected loads of material, including material rejected after it has been placed by reason of failure of CONTRACTOR to conform to provisions of Contract Documents.
   4. 4Material not unloaded from transporting vehicle.
   5. Defective Work not accepted by TOWN.
   6. Material remaining on hand after completion of Work.

1.8 NON-PAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Partial Payment: Partial payments will be made in accordance with the General.

B. Covenants and Conditions.

C. Final Payment: Will be made only for materials incorporated in Work; remaining materials, for which partial payments have been made, shall revert to Contractor unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

1.9 FINAL APPLICATION FOR PAYMENT

A. Prior to submitting final application makes acceptable delivery of required documents, and other requirements as specified in Section 01700, Contract Closeout.

B. Final payment shall be subject to the conditions and requirements included in the General Covenants and Conditions and all others included in the Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 29 73 SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 THE SUMMARY

A. This Section defines the process whereby the Schedule of Values (unit price breakdown) shall be developed and incorporated into the cost loading function of the CPM Schedule in accordance with the requirements of Specification 01 32 16 – CPM Construction Schedule.

B. Monthly progress payment amounts will be determined from the monthly progress updates of the CPM Schedule activities.

C. Develop the Schedule of Values independent of but simultaneous with the development of the CPM Schedule activities and logic.

1.2 DETAILED SCHEDULE OF VALUES

A. Prepare and submit a detailed Schedule of Values to the ENGINEER within ten (10) Days from the date of the Notice to Proceed (NTP).

B. The Schedule of Values shall begin with the Bid Summary Form included in the Bid Package and further break down work activities in sufficient detail such that the ENGINEER is able to determine monthly progress payment amounts through cost loading of the CPM Schedule activities.

C. Because the ultimate requirement is to develop a detailed Schedule of Values sufficient to determine appropriate monthly progress payment amounts through cost loading of the CPM Schedule activities, furnish a sufficiently detailed breakdown in order to meet this requirement.

D. The ENGINEER will be the sole judge of acceptable numbers, details and description of values established.

E. If, in the opinion of the ENGINEER, a greater number of Schedule of Values items than proposed are necessary, add the additional items so identified by the ENGINEER.

F. Adjustments and Acceptance

1. The CONTRACTOR and ENGINEER shall meet and jointly review the detailed Schedule of Values within 30 Days the date of the ENGINEER receiving the Schedule of Values from the CONTRACTOR, at which time the value allocations and extent of detail shall be reviewed in order to determine if necessary adjustments to the values are required, and to determine if sufficient detail has been proposed in order to allow acceptable cost loading of the CPM Schedule activities.

2. Make necessary adjustments to the value allocation or level of detail and submit a revised detailed Schedule of Values within ten (10) Days from the review meeting.

3. Following acceptance of the detailed Schedule of Values, incorporate the values into the cost loading portion of the CPM Schedule.

4. Concurrently develop the CPM activities and logic with the development of the detailed Schedule of Values; however, it shall be necessary to adjust the detailed Schedule of Values to correlate to individual Schedule activities.

5. It is anticipated that instances will occur, due to the independent but simultaneous development of the Schedule of Values and the CPM Schedule activities, where interfacing these 2 documents will require changes to each document.

6. Schedule activities may need to be added to accommodate the detail of the Schedule of Values, and Schedule of Value items may need to be added to accommodate the detail of the CPM Schedule activities.

7. Where such instances arise, propose changes to the Schedule of Values and to the CPM Schedule activities in order to satisfy the CPM Schedule cost loading requirements.

1.3 CROSS-REFERENCE LISTING

A. To assist in the correlation of the Schedule of Values and the CPM Schedule, provide a cross-reference listing to be furnished in 2 parts:

   1. In the first part, list each scheduled activity with the breakdown of the respective valued items making up the total cost of the activity; and,

   2. In the second part, list the valued item with the respective schedule activity or activities that make up the total indicated cost.

B. In the case where a number of schedule items make up the total cost for a valued item (shown in the Schedule of Values), indicate the total cost for each Schedule of Value item.

C. Incorporate approved Change Orders reflected in the CPM Schedule into the Schedule of Values as a single unit identified by the Change Order number.

1.4 CHANGES TO SCHEDULE OF VALUES

A. Changes to the CPM Schedule which additional activities not included in the original schedule but included in the original WORK (schedule omissions) shall have values assigned as approved by the ENGINEER.
B. Reduce other activity values in order to provide equal value adjustment increases for added activities, as approved by the ENGINEER.

C. In the event that the CONTRACTOR and ENGINEER agree to make adjustments to the original Schedule of Values because of inequities discovered in the original accepted detailed Schedule of Values, increases and equal decreases to values for activities may be made.

1.5 LIQUIDATED DAMAGES

A. The schedule of Values information is an integral part of the scheduling and reporting under the Construction Schedule and the progress payment information.

B. As such, it is critical information to evaluating progress and the proper planning of the OWNER's and ENGINEER's WORK-related effort as well as their financial obligations associated with the Project.

C. If a submittal required by this Section is found to be incomplete or is submitted later than required, the OWNER will suffer financial loss and, accordingly, liquidated damages will be assessed against the CONTRACTOR in accordance with the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 32 00 CONSTRUCTION PHOTOGRAPHS

GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall conduct pre-construction, construction progress, and post construction photographs and videos of the construction project as specified herein.

B. The CONTRACTOR shall engage the services of a professional videographer for pre-construction video recording. The color audio-video DVD shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-video documentation. Videographer shall furnish to ENGINEER the names and addresses of two (2) references that the videographer has performed color audio-video recording for projects of a similar nature within the last twelve (12) months. The videographer shall be approved by the ENGINEER prior to any video recording of the project site.

1.2 SUBMITTALS

A. Videos and photographs shall be submitted as specified herein and in accordance with Specification 01 33 00 - Contractor Submittals.

1.3 PRECONSTRUCTION PHOTOGRAPHS AND VIDEOS

A. Prior to commencing the WORK, the CONTRACTOR shall provide a continuous color digital audio-video recording (DVD) of the entire area of the project to serve as a record of the site pre-construction conditions. The CONTRACTOR will provide one copy of the pre-construction video to the OWNER, one copy to the ENGINEER, and maintain one copy free from damage or defect that shall become the property of the OWNER at Project Close Out. The CONTRACTOR shall review the video recordings for clarity and accuracy and shall make supplemental records of existing conditions if they are not clearly indicated.

B. No construction shall begin prior to review of the preconstruction video of the construction area by the OWNER, ENGINEER and the CONTRACTOR. The ENGINEER or OWNER shall have the authority to reject all or any portion of the video not conforming to specifications and order that it be redone at no additional charge to the OWNER. The CONTRACTOR shall reschedule unacceptable coverage within five (5) calendar days after being notified. The ENGINEER shall designate those areas, if any, to be omitted from or added to audio-video coverage.

C. Video recording shall be made not more than 60 days prior to commencement of construction.

D. The CONTRACTOR shall video the entire project area including the project site, and any other areas which may be affected or impacted by the WORK including staging and storage areas.

E. The CONTRACTOR shall supplement video recordings with photographs. A minimum of twenty (20) pre-construction photographs shall be provided.

F. The CONTRACTOR'S attention is directed to the deteriorating condition of the existing roadways, seawalls, and some of the private property. The CONTRACTOR shall take the necessary steps during preconstruction videotaping to ensure the existing conditions of roadway, seawalls, private property and all other areas within the area of WORK and areas that may be affected by the WORK are adequately documented to protect the CONTRACTOR and the OWNER from unsubstantiated claims.

1.4 CONSTRUCTION PROGRESS PHOTOGRAPHS

A. A minimum of six (6) photographs shall be taken each week until completion of the Work.

B. The number of photographs required shall be at the sole discretion of the ENGINEER whose decision shall be final. An increase in the number of photographs above the minimum shall not be cause for an increase in cost and no extra compensation will be allowed.

C. For all photograph the CONTRACTOR shall coordinate with the ENGINEER as to the actual number and location of views to be photographed and the day and time of photographing.

D. Progress photographs shall be submitted with monthly Applications for Payment in accordance with the Contract Documents.

1.5 POST-CONSTRUCTION PHOTOGRPAHS AND VIDEO

A. At project closeout, the CONTRACTOR shall provide a continuous color digital audio-video recording (DVD) of the entire area of the project to serve as a record of the post-construction conditions. The completed pump station project and adjacent properties shall be captured.

B. The post-construction video recording shall be supplemented with a minimum of forty (40) photographs documenting the completion of the project construction and adjacent properties.

PRODUCTS

2.1 VIDEO MEDIA

A. The video portion of the recording shall produce bright, sharp, and clear pictures with accurate colors and shall be free from distortion, tearing, rolls, and any other form of picture imperfection.

B. All video recordings shall contain coverage of all surface features located within the construction zone of influence. Of particular concern shall be the existence of any faults, fractures, defects, etc. of existing features, particularly those located at private properties and homes immediately adjacent to and across the street from the project site. Panning, zoom-in and zoom-out rates shall be sufficiently controlled to maintain a clear view of the object.

C. All video recordings shall, by electronic means, display continuously and simultaneously, the date and time of recording. The video recording shall be generated with the actual taping date and time as transparent digital information. The date information shall contain the month, day and year.

D. Video media shall be standard Digital Video Disc (DVD) format.

E. Accompanying the video recording shall be a corresponding and simultaneously recorded audio recording. Each tape shall begin with the recorded date, project name and be followed by the general location, i.e., viewing side and direction of progress. The audio track shall consist of an original live recording. The recording shall contain exclusively the narrative commentary of the electrographer, recorded simultaneously with the fixed elevation video record of the zone of influence of construction. The recording shall assist in viewer orientation and in any needed identification, differentiation, clarification, or objective description of the features being shown in the video portion of the recording, including location relative to construction stations. The audio recording shall be free from any conversations between the camera operator and any other production technicians. The audio portion of the recording shall produce the commentary of the camera operator with proper volume, clarity, and be free from distortion and interruptions.

2.2 VIDEO MEDIA INDEXING

A. Video Identification: All video media shall be permanently labeled and shall be properly identified by number and project name and location.

B. Video Logs: Each video shall have a log of that video's contents. The log shall describe the various segments of coverage contained on the video in terms of the names of the streets or easements, coverage beginning and end, directions of coverage, video unit counter numbers, and date.

C. Video Index: The electrographer shall provide an index listing, in order by video number, each video number and a brief description of coverage contained on that video, including

engineering station numbers and/or street address at every building abutting roadway and canal.

2.3 PHOTOGRAPHS

A. Furnish one (1) color hard copy (3-½ by 5 inch) of each photograph and one (1) CD containing all pictures in electronic JPG format.

B. Photographs shall have a minimum clarity of 5 megapixels.

C. Hard copy prints: commercial quality prints, color, 3-½-inches by 5-inches, single weight on glossy paper. Enclose each print in a protector punched to fit a standard three ring binder.

D. Number photographs in sequence beginning with the numeral one. Each print shall be stamped with the following information stamped or typed on the back of the print:

TOWN OF SURFSIDE

CONTRACT NO. _____
Contractor: _____
Photograph No.: _____Date: _____Time: _____
Description: _____

EXECUTION

1.1 GENERAL

A. The ENGINEER and the OWNER may request to be present during the pre-construction video recording and photographing.

1.2 VISIBILITY

A. All video recordings and photographs shall be performed during times of good visibility: none shall be done during period of significant precipitation, mist, or fog. The video recordings and photographs shall only be done when sufficient sunlight is present to properly illuminate the subject, and to produce bright, sharp replications of those subjects.

B. No video recordings and photographs shall be performed when more than 10% of the area to be taped contains debris or obstructions unless otherwise authorized by the OWNER.

1.3 COVERAGE

A. The CONTRACTOR shall sufficiently capture the existing pre-construction conditions within the project site, but not limited to: staging areas, WORK areas, roadways, light poles, trees, landscaping, storm drainage structures, walls, and any other areas which may be affected or impacted by the WORK to protect the OWNER, the ENGINEER, and the CONTRACTOR from unsubstantiated claims. The CONTRACTOR shall capture

existing deterioration of landscaping and other fixtures and features in or adjacent to the area of WORK, whether impacted or not.

1.4 CAMERA OPERATION

A. Camera Control: Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during video playback. In addition, all other camera and recording system controls such as lens focus and aperture, video level, pedestal, chroma, white balance, and electrical focus shall be properly controlled or adjusted to maximize picture quality.

B. Viewer Orientation Techniques: The audio and video portions of the recording shall maintain viewer orientation. Visual displays of all visible building addresses shall be utilized. In easements where the proposed construction location will not be readily apparent to the video viewer, the OWNER shall indicate the proposed centerline of construction.

END OF SECTION

01 32 16 CPM CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 GENERAL

A. The CONTRACTOR shall schedule the WORK in accordance with this Section.

B. Development of the schedule, the cost loading of the schedule, monthly payment requisitions and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling. The CPM Schedule shall be cost loaded based on the schedule of values as approved by the ENGINEER.

C. The CPM schedule and related reports should be prepared with the current version of Primavera Project Planner (P3) or SureTrak software.

1.2 DEFINITIONS

A. CPM Scheduling: The term shall be interpreted to be generally as outlined in the Association of General Contractors (AGC) publication, "The Use of CPM in Construction." except that either "i-j" arrow diagrams or precedence diagramming format may be utilized. In the case of conflicts between this Section and the AGC document, this Section shall govern.

B. Float: Unless otherwise indicated herein, float and total float are synonymous. Total float is the period of time measured by the number of Days each non-critical path activity may be delayed before it and its succeeding activities become part of the critical path. If a non-critical path activity is delayed beyond its float period, then that activity becomes part of the critical path and controls the end date of the WORK. Thus, delay of a noncritical path activity beyond its float period will cause delay to the project itself.

1.3 SCHEDULING QUALIFICAITON SUBMITTALS

A. CONTRACTOR shall submit a statement of computerized CPM capability within fifteen (15) Days after Notice to Proceed to verify that either: (1) the CONTRACTOR has inhouse capability qualified to use CPM techniques and the Primavera P3 or SureTrak software or (2) that the CONTRACTOR will arrange for the services of a CPM consultant so qualified. In either event the statement shall identify the individual who will perform the CPM scheduling and shall describe the construction projects required below. The statement shall also identify the contact persons for the referenced projects with current telephone and address information.

B. Criteria: The individual performing scheduling shall have successfully applied computerized CPM technique to at least 2 projects of similar nature, scope, and value not less than one half the Total Bid Price of this project.

1.4 INITIAL SCHEDULE SUBMITTALS

A. Where submittals are required hereunder, the CONTRACTOR shall submit five (5) copies of each submittal item.

B. The CONTRACTOR shall submit a 60 Day Plan of Operation and a Project Overview Bar Chart at the Project Kickoff Meeting which will serve as the CONTRACTOR's plan of operation for the initial 60 Day period of the Contract Times and identify the manner in which the CONTRACTOR intends to complete the WORK within the Contract Times.

   1. 60 Day Plan of Operation: During the initial 60 Days of the Contract Times, the CONTRACTOR shall conduct operations in accordance with a 60 Day bar chart type schedule. The chart so prepared shall show accomplishment of the CONTRACTOR's early activities (mobilization, permit acquisition, submittals necessary for early material and equipment procurement, submittals necessary for long lead equipment procurement, CPM submittals, initial sitework and other submittals and activities required in the first 60 Days).

   2. Project Overview Bar Chart: The overview bar chart shall indicate the major components of the WORK and the sequence relations between major components and subdivisions of major components. The overview bar chart shall indicate the relationships and time frames in which the various components of the WORK will be made substantially complete and placed into service in order to meet the required milestones. Sufficient detail shall be included to subdivide major components in such activities as (1) excavation, (2) foundation subgrade preparation, (3) foundation concrete, (4) completion of structural concrete, (5) major mechanical WORK, (6) major electrical WORK, (7) instrumentation and control WORK, and (8) other important WORK for each major facility within the overall project scope. Planned durations and start dates shall be indicated for each WORK item subdivision. Each major component and subdivision component shall be accurately plotted on time scale sheets not to exceed 36-inches by 60-inches in size. No more than 4 sheets shall be employed to present this overview information.

C. The ENGINEER, OWNER, and the CONTRACTOR shall meet to review and discuss the 60 Day plan of operation and project overview bar chart within 5 Days after submittal. The ENGINEER's review and comment on the schedules will be limited to conformance with the sequencing and milestone requirements in the Contract Documents. The CONTRACTOR shall make corrections to the schedules necessary to comply with the requirements and shall adjust the schedules to incorporate any missing information requested by the ENGINEER.

1.5 CPM SCHEDULE SUBMITTALS

A. Original CPM Schedule Submittal: Within fifteen (15) Days after the commencement date stated in the Notice to Commencement, the CONTRACTOR shall submit for review by the ENGINEER a hard copy of the CPM schedule and the computerized schedule report tabulations. The CONTRACTOR shall also submit a CD that contains the schedule

submittal information. The data shall be compatible with Primavera P3 or SureTrak to generate network diagrams and schedule reports identical to the hard copies submitted. This submittal shall have already been reviewed and approved by the CONTRACTOR's Project Manager, superintendent, and estimator prior to submission. The CPM schedule shall be a time-scaled network diagram of the "i-j" activity-on-arrow or precedence type. The network diagram shall describe the activities to be accomplished and their logical relationships and shall show the critical path. The CONTRACTOR's attention is directed to the requirement that the schedule shall contain sufficient detail and information to cost load the CPM schedule in accordance with the approved schedule of values. Each installation and sitework activity shall be cost loaded as indicated.

B. The computerized schedule report tabulations shall include the following:

1. Report of activities sorted by activity number: Activity numbers, where practical, shall correlate to the area numbers designated on the Contract Drawings.

2. Report of activities sorted by early start date.

3. Report of activities sorted by total float.

4. Report of activities sorted by responsibility code. Responsibility codes shall be established for the CONTRACTOR, ENGINEER, OWNER, Subcontractors, Suppliers, etc. These codes shall be identified in the Network Diagram.

5. A successor-predecessor report which shall identify the successor and predecessor activities for each activity and ties between schedule activities.

C. Analysis

1. Early Completion

a. The CONTRACTOR may show early completion on the original CPM submittal if that is its plan.

b. An original CPM submittal showing early completion shall either be accompanied by:

1) Request for change of Contract Times at zero change of Contract Price, accompanied by documentation demonstrating that the Bid was based on early completion, or

2) Demonstration in the submittal that the time difference between early completion and the original Contract Time is total float.

c. An early completion schedule unaccompanied by one of these will not be accepted.

d. The ENGINEER will analyze a request for Change Order in accordance with the General Conditions.

2. Float Ownership: Neither the OWNER nor the CONTRACTOR owns the float time. The project owns the float time. Liability for delay to the project completion date rests with the party causing the delay. For example, if Party A is responsible for consuming a portion of the float time and Party B later consumes the remainder of the float time plus additional time beyond the float time, Party B is responsible for the time that is a delay past the completion date. Party A would not be responsible for any delay since it did not consume all the float time, additional float time remained after its delay, and the completion date was unaffected by its tardiness.

D. Original CPM Schedule Review Meeting: The CONTRACTOR shall, within 25 Days from the commencement date stated in the Notice to Commencement, meet with the ENGINEER to review the original CPM schedule submittal. The CONTRACTOR shall have the Project Manager, superintendent, and the scheduler in attendance. The meeting will take place over a half day period. The ENGINEER's review will be limited to conformance with the Contract Documents. However, the review may also include:

1. Clarifications of the design intent.

2. Directions to include activities and information missing from the submittal.

3. Requests to the CONTRACTOR to clarify and revise the schedule.

E. Revisions to the Original CPM Schedule: Within 35 Days after the commencement date stated in the Notice to Commencement, the CONTRACTOR shall revise the original CPM schedule submittal to address review comments from the original CPM schedule review meeting and resubmit the network diagrams and reports for the ENGINEER's review. The ENGINEER, within 14 Days from the date that the CONTRACTOR submitted the revised schedule will either (1) accept the schedule and cost loaded activities as submitted, or (2) advise the CONTRACTOR in writing to review any part or parts of the schedule which either do not meet the requirements or are unsatisfactory for the ENGINEER to monitor the progress and status of WORK or evaluate monthly payment requests by the CONTRACTOR. The ENGINEER may accept the schedule conditional upon the first monthly CPM schedule update correcting deficiencies identified. When the schedule is accepted, it shall be considered as the "Original CPM Construction Schedule" until an updated schedule has been submitted. The ENGINEER reserves the right to require that the CONTRACTOR adjust, add to, or clarify any portion of the schedule which may later be discovered to be insufficient for the monitoring of WORK or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.

F. Acceptance

1. Acceptance of the CONTRACTOR's schedule by the ENGINEER and OWNER will be based solely upon compliance with the requirements. By way of the CONTRACTOR

assigning activity durations and proposing the sequence of the WORK, the CONTRACTOR agrees to utilize sufficient and necessary management and other resources to perform WORK in accordance with the schedule. Upon submittal of a schedule update, the updated schedule shall be considered the "current" project schedule.

2. Submission of the CONTRACTOR's progress schedule to the ENGINEER shall not relieve the CONTRACTOR of total responsibility for scheduling, sequencing, and pursuing the WORK to comply with the requirements of the Contract Documents, including adverse effects such as delays resulting from ill-timed WORK.

G. Monthly Updates and Periodic CPM Schedule Submittals

1. Following acceptance of the CONTRACTOR's original CPM schedule, the CONTRACTOR shall monitor the progress of the WORK and adjust the schedule each month to reflect actual progress and any changes in planned future activities. Each schedule update submittal shall be complete including information requested in the original schedule submittal and be in the schedule report format indicated below. Each update shall continue to show WORK activities including those already completed. Completed activities shall accurately depict "as built" information by indicating when the WORK was actually started and completed.

2. Neither the submission nor the updating of the CONTRACTOR's original schedule submittal nor the submission, updating, change, or revision of any other report, curve, schedule, or narrative submitted by the CONTRACTOR, nor the ENGINEER's review or acceptance of any such report, curve, schedule, or narrative shall have the effect of amending or modifying in any way the Contract Times or obligations under the Contract. Only a signed, fully executed Change Order can modify contractual obligations.

3. The monthly schedule update submittal will be reviewed with the CONTRACTOR during a monthly construction progress meeting held on the 20th Day of each month. The goal of these meetings is to enable the CONTRACTOR and the ENGINEER to initiate appropriate remedial action to minimize any known or foreseen delay in completion of the WORK and to determine the amount of WORK completed since the last schedule update. The status of the WORK will be determined by the percent complete of each activity in the updated CPM schedule. These meetings are considered a critical component of the overall monthly schedule update submittal, and the CONTRACTOR shall have appropriate personnel attend. As a minimum, the CONTRACTOR's Project Manager and superintendent shall attend these meetings. The CONTRACTOR shall plan on the meeting taking no less than 6 hours. Within 7 Days after the monthly progress meeting, the CONTRACTOR shall submit the revised CPM schedule, the revised CPM computerized tabulations, the revised successor/predecessor report, the project status reports as defined below and the CONTRACTOR's

4. Application for Payment. Within 5 Days of receipt of the revised submittals, the ENGINEER will either accept or reject the monthly schedule update submittal. If accepted, the percent complete in the monthly update shall be the basis for the Application for Payment to be submitted by the CONTRACTOR. If rejected, the update shall be corrected and resubmitted by the CONTRACTOR before the Application for Payment for the update period will be processed.

5. Schedule Revisions: The CONTRACTOR shall highlight or otherwise identify changes to the schedule logic or activity durations made from the previous schedule. The CONTRACTOR shall modify any portions of the CPM schedule which become infeasible because activities are behind schedule or for any other valid reason.

1.6 CHANGE ORDERS

A. Upon approval of a Change Order, the change shall be reflected in the next submittal of the CPM Schedule. The CONTRACTOR shall utilize a sub-network in the schedule depicting the changed WORK and its effect on other activities. This sub-network shall be tied to the main network with appropriate logic so that a true analysis of the critical path can be made. Whenever the CONTRACTOR believes that a Change Order will extend the Contract Times, the sub-network analysis herein shall be submitted with the price proposal for the change. If the CONTRACTOR does not submit the sub-network demonstrating that the change affects the Contract Times, then no subsequent claim for additional time due to the change will be accepted.

1.7 CPM STANDARDS

A. Construction Schedule: Construction schedules shall include a graphic network diagram and computerized schedule reports as required below for status reporting.

B. Networks: The CPM network shall be in a form of a time scaled "i-j" activity-on-arrow or precedence type diagram and may be divided into a number of separate sheets with suitable match lines relating the interface points among the sheets. Individual sheets shall not exceed 36-inches by 60-inches.

C. Construction and procurement activities shall be presented in a time-scaled format with a calendar timeline along the entire sheet length. Each activity arrow or node shall be plotted so that the beginning and completion dates of each activity are accurately represented along the calendar timeline. Every activity shall use symbols that clearly distinguish between critical path activities, non-critical activities, and free float for each non-critical activity. Activity items shall be identified by their activity number, responsibility code, duration, and dollar value. Non-critical path activities shall show total float time in scale form by utilizing a dotted line or some other graphical means.

D. Duration Estimates: The duration estimate for each activity shall be computed in Days and shall represent the single best estimate considering the scope of the WORK and resources planned for the activity. Except for certain non-labor activities such as curing of concrete

or delivery of materials, activity duration shall not exceed 10 Days nor be less than one Day, unless otherwise accepted by the ENGINEER.

1.8 SCHEDULE REPORT FORMAT

A. Schedule Reports: Schedule reports shall be prepared based on the CPM schedule, shall be submitted on paper and CD, depending on file size, and shall include the following minimum data for each activity:

1. Activity numbers and responsibility codes.
2. Work Order No.
3. CIP No.
4. Estimated activity duration.
5. Activity description.
6. Activity percent completion.
7. Early start date (calendar dated).
8. Early finish date (calendar dated).
9. Late start date (calendar dated).
10. Late finish date (calendar dated).
11. Status (whether critical).
12. Total float for each activity.
13. Free float for each activity.
14. Cost value for each activity.

B. Project Information: Each Schedule Report shall be prefaced with the following summary data:

1. Project name.
2. CONTRACTOR name.
3. Type of tabulation.
4. Project duration.

5. Contract Times (as revised by Change Orders).

6. The commencement date stated in the Notice to Proceed.

7. The data date and plot date of the CPM Schedule.

8. If an update, cite the new schedule completion date.

1.9 PROJECT STATUS REPORTING

A. The CONTRACTOR shall furnish monthly project status reports (overview bar chart and a written narrative report) in conjunction with the revised CPM schedules as indicated above. Status reporting shall be in the form below.

B. The CONTRACTOR shall prepare and submit monthly an overview bar chart schedule of the major project components. The overview bar chart schedule shall be a summary of the current CPM schedule (original and as updated and adjusted throughout the entire construction period). The major project components shall be represented as time bars which shall be subdivided into various types of WORK including demolition, excavation and earthwork, yard piping, concrete construction, and mechanical, electrical and instrumentation installations. Major components shall include each new structure by area designation, sitework, modifications to existing structures, tie-ins to existing facilities, and plant startups.

C. Each major component and subdivision shall be accurately plotted consistent with the project overview bar chart above. It shall represent the same status indicated by early start and finish activity information contained in the latest update of the CPM schedule. In addition, a percent completion shall be indicated for each major component and subdivision. The initial submittal of the overview bar chart schedule shall be made at the time that the revised original CPM schedule is submitted to the ENGINEER. The CONTRACTOR shall amend the overview schedule to include any additional detail required by the ENGINEER. The CONTRACTOR shall include any additional information requested by the ENGINEER at any time during the construction of the WORK.

D. The CONTRACTOR shall prepare monthly written narrative reports of the status of the project for submission to the ENGINEER. Status reports shall include:

1. The status of major project components (percent complete, amount of time ahead or behind schedule) and an explanation of how the project will be brought back on schedule if delays have occurred.

2. The progress made on critical activities indicated on the CPM schedule.

3. Explanations for any lack of WORK on critical path activities planned for the last month.

4. Explanations for any schedule changes, including changes to the logic and to activity durations.

5. A list of the critical activities scheduled to be performed in the next 2 months.

6. The status of major material and equipment procurement.

7. The value of materials and equipment properly stored at the Site but not yet incorporated into the WORK.

8. Any delays encountered during the reporting period.

9. An assessment of inclement weather delays and impacts to the progress of the WORK.

E. The CONTRACTOR may include any other information pertinent to the status of the WORK. The CONTRACTOR shall include additional status information requested by the ENGINEER.

1.10 INCLEMENT WEATHER PROVISIONS OF THE SCHEDULE

A. The Contractor's schedule shall include at least the number of Days of delay due to unusually severe weather.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END SECTION

01 32 20 PROJECT MEETINGS

PART 1 - GENERAL

1.1 PROJECT KICKOFF MEETING

A. A Notice to Proceed (NTP) will be issued to the CONTRACTOR within ten (10) calendar days of the execution of the Construction Contract. The NTP shall authorize the CONTRACTOR to apply for all required permits and initiate the shop drawing and other CONTRACTOR submittals required by the Contract Documents.

B. A project kickoff meeting will be held within ten (10) calendar days of issuing the NTP.

C. The following entities shall attend the Project Kickoff Meeting:

1. OWNER
2. ENGINEER
3. CONTRACTOR
4. Others as requested by the OWNER, ENGINEER or CONTRACTOR

D. The minimum agenda for the Project Kickoff Meeting shall address the following items:

1. Introductions
2. Roles and Responsibilities – Designation of Responsible Personnel
3. Communication Protocols
4. Contractor Submittal Procedures and Forms
5. Status of Insurance and Bonds
6. Subcontractors and Suppliers
7. Contract Milestones and Tentative Construction Schedule
8. Permits
9. Requests for Information and Proposals
10. Field Decisions and Change Orders Procedures
11. Payment Applications

12. Use of Owner's Allowance

13. Community Relations

14. Project Meetings

E. The ENGINEER shall prepare and distribute the meeting agenda and shall preside at the meeting. The CONTRACTOR shall record and distribute minutes of the proceedings and decisions.

F. At the Project Kickoff Meeting, the CONTRACTOR shall furnish a list of all permits and licenses the CONTRACTOR shall obtain, indicating the agency to grant the permit, the expected date of submittal, and the expected date for receipt of the permit.

1. Within 30 calendar days of the date of the NTP, the CONTRACTOR shall apply for and submit required documentation including shop drawings and calculations, in full and complete, to obtain all permits required by Laws and Regulation from the agencies having jurisdiction.

G. Within seven (7) days of receipt of permits, copies shall be submitted to the ENGINEER.

1.2 PRE-CONSTRUCTION MEETING

A. A Notice of Commencement (NOC) shall be issued to a CONTRACTOR once all required permits have been obtained and required shop drawings have been approved. The NOC shall authorize the CONTRACTOR to begin construction. The NOC will initiate the start of the contract time as defined by the Contract Documents.

B. A Pre-construction Meeting will be held within ten (10) calendar days of issuing the NOC. The CONTACTOR shall not initiate construction until after the Pre- Construction Meeting.

C. The following entities shall attend the Pre-Construction Meeting:

1. OWNER

2. ENGINEER

3. CONTRACTOR

4. Major SUBCONTRACTORS

5. Others as requested by the TOWN, ENGINEER or CONTRACTOR

D. The minimum agenda for the Pre-Construction Meeting shall address the following items:

1. Introductions

2. Roles and Responsibilities – Designation of Responsible Personnel
3. Request for Information and Proposals
4. Procedures when Field Conditions differ from Design Drawings
5. Field Decisions and Change Orders Procedures
6. Permit Requirements
7. Community Relations
8. Deliveries and Storage
9. Security Procedures
10. Safety Procedures
11. Maintenance of Traffic
12. Construction Schedule and Sequencing
13. Inspections
14. Sampling and Testing Procedures
15. Shutdowns for Tie-Ins to Existing Mains
16. Hurricane Preparedness
17. Housekeeping Procedures
18. Project Meetings

E. The CONTRACTOR shall prepare and distribute the meeting agenda and shall preside at the meeting. The CONTRACTOR shall record and distribute minutes of the proceedings and decisions.

1.3 PROGRESS MEETINGS AND DAILY LOGS

A. The CONTRACTOR will conduct project meetings in accordance with Article 7.9.1 of the Contract for Construction.

B. The CONTRACTOR'S Project Meetings shall be conducted no less than biweekly and shall include the CONTRACTOR'S administrative, managerial, supervisory personnel, and representatives of each SUBCONTRACTOR working on the site. The ENGINEER

and OWNER shall have the right, but not the obligation to attend such weekly Project Meetings.

C. The CONTRACTOR shall maintain detailed meeting notes from each such weekly Project Meeting. Meeting notes from each project meeting shall be submitted to the ENGINEER and OWNER within two (2) working days of each Project Meeting.

D. The CONTRACTOR's Superintendent shall maintain a daily job diary which shall include for each work day the daily weather conditions at the Site, the identify of each SUBCONTRACTOR working on the Site, the manpower of each SUBCONTRACTOR working on the site, the identify of all visitors to the Site, and any and all other information reflecting any delays, hindrances, interferences, or other problems encountered or incurred at the Site.

E. The Superintendent shall be on the Project Site during all working hours; speak, read, and write in Fluent English; and be a direct employee of the CONTRACTOR (not a SUBCONTRACTOR).

F. Each week the CONTRACTOR shall furnish to the ENGINEER one (1) full and complete PDF copy of the daily job diary.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 33 00 CONTRACTOR SUBMITTAL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Submit to the ENGINEER for review and approval, such shop drawings, test reports and data on materials, equipment, and material samples as are required for the proper control of work, and as specified in the Specification sections.

B. Submit to the ENGINEER a complete list of preliminary data on items for which shop drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the ENGINEER shall in no way expressed or implied relieve the CONTRACTOR from submitting complete shop drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of shop drawings.

C. Maintain an accurate updated shop drawing submittal log which shall include the following items:

1. Submittal-Description and Number assigned.

2. Specification Section.

3. Drawings Sheet Number.

4. Date to Engineer.

5. Date returned to CONTRACTOR (from ENGINEER).

6. Status of Submittal (Reviewed, Reviewed as Noted, Rejected/Resubmit).

7. Date of Resubmittal and Return (as applicable).

8. Date material release (for fabrication).

9. Projected date of fabrication.

10. Projected date of delivery to site.

1.2 CONTRACTOR'S RESPONSIBILITY

A. The CONTRACTOR shall submit shop drawings to the ENGINEER for approval with the exception that no less than one (1) hard copy and one (1) electronic PDF copy shall be submitted. The ENGINEER will retain one (1) set and one (1) will be returned to the CONTRACTOR.

B. Shop drawings shall be submitted for all materials and equipment to be furnished, in addition, the submission shall include the motor efficiency, and motor torque speed curves from zero to full load speed for motors over 10 hp.

C. Shop drawings shall be submitted prior to any project construction activity. In a timely fashion, well before the contemplated ordering for fabrication of special order or long lead time items or construction use of any standard element of the work, the CONTRACTOR shall furnish shop drawings for the review and approval of the ENGINEER.

D. Furnish the ENGINEER with a schedule of shop drawings submittals fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.

E. Submit to the ENGINEER all drawings and schedules sufficiently in advance of construction requirements to provide maximum time for checking and appropriate action from the time the ENGINEER receives them.

F. Prior to submission, the CONTRACTOR shall thoroughly check such drawings, satisfying himself that they meet the requirements of the Contract Documents and that they are coordinated with the arrangements set forth on other shop drawings, and shall place on them the project's name, ER number, address, the date and his stamp of approval. Where items for which shop drawings are submitted are to meet special conditions listed in the detailed Specifications, the conditions shall be so noted on the drawing. Where there is a deviation from the Specifications, the CONTRACTOR shall note it and state the reason why a deviation is required.

G. Each and every copy of the Drawings and data shall bear CONTRACTOR's stamp showing that they have been so checked and approved. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents and the CONTRACTOR shall state the reason why a deviation is required, and the deviation noted on the transmittal sheet. If the CONTRACTOR fails to notify the ENGINEER of a deviation and that deviation mistakenly gets approved by the ENGINEER, the CONTRACTOR shall be required to provide the contract specified material and/or equipment to the satisfaction of the ENGINEER.

H. Furnish a Certificate of Unit Responsibility, as specified in equipment specification section. Form is attached to this Section.

I. Shop drawings submitted without the required approval as specified above shall be returned without review and no extension of time will be granted for any delays caused by such improper submission.

J. All submittals shall be accompanied by a transmittal letter prepared in duplicate containing the following information:

    1. Date.

2. Project Title and Number.

3. CONTRACTOR's name and address.

4. The number of each shop drawings, data, and sample submitted.

5. Notification of deviations from Contract Documents.

6. Submittal Log Number conforming to and referring to Specification Section Numbers.

7. Certification the submittal conforms to the specifications or contains deviations to the specifications.

K. Any delays or costs caused, either directly or indirectly, by non-timely submissions; submission of items differing significantly from the intent of the Plans and/or Specifications; repeated submission of or argument over, rejected elements or changes required for acceptance; arguments with the criteria or requirements of the Plans or Specifications; or any other such similar activities shall be at the sole expense of the CONTRACTOR.

L. For major equipment submittals, as defined by the ENGINEER, the CONTRACTOR shall include in the submittal a copy of the specification with each and every paragraph initialed be the CONTRACTOR indication compliance, or indication a deviation is requested followed by a request for deviation listing/form.

M. Design calculations, drawings, and materials specifications shall be supplied as specified herein and by the individual specification sections.

N. Do not begin any of the work covered by a drawing, data, or a sample returned as “REJECTED; REVISE AND RESUBMIT” or “NOT REVIEWED” until a revision or correction thereof has been reviewed and returned to him, by the ENGINEER, with approval as “REVIEWED, NO COMMENTS” or "REVIEWED, COMMENTS AS NOTED”. Be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to receiving ENGINEER's approval or approval “As Noted” of the necessary shop drawings.

O. Shop drawings shall be of such character that they may be used as fabrication drawings. Prior to submission, the CONTRACTOR shall thoroughly check such drawings, satisfying himself that they meet the requirements of the Plans and Specifications and that they are coordinated with the arrangements set forth on other shop drawings, and shall place on them the Contract Number, the date and his stamp of approval. One (1) copy will be returned to the CONTRACTOR with the ENGINEER's mark of approval thereon or will be marked to indicate changes necessary to effect compliance with the Specifications and the remaining copies will be retained by the OWNER. When drawings are approved by the ENGINEER, they shall be as binding as any of the Contract Documents. Any errors or omissions on the shop drawings shall not relieve the CONTRACTOR of his responsibility.

He shall correct such errors, or omissions, including any necessary additions or alterations to construction, at his expense upon notification by the ENGINEER.

P. Be fully responsible for observing the need for and for making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment he proposes to supply, both as they pertain to his own work, work of others, or of other Divisions herein or Trades and clearly show such changes on the shop drawings. All changes shall be clearly called out.

Q. Determine and verify:

1. Field measurements.

2. Field construction criteria.

3. Catalog numbers and similar data.

4. Conformance with Specifications.

5. Installation and Maintenance clearances.

1.3 ENGINEER’S REVIEW OF SHOP DRAWINGS

A. Except as otherwise indicated, the ENGINEER will return prints of each submittal to the CONTRACTOR with comments noted thereon, within 20 Days following receipt by the ENGINEER.

B. It is considered reasonable that the CONTRACTOR shall make a complete and acceptable submittal to the ENGINEER by the first resubmittal on an item.

C. The OWNER reserves the right to withhold monies due to the CONTRACTOR to cover additional costs of the ENGINEER's review beyond the first resubmittal.

D. The ENGINEER'S maximum review period for each submittal or resubmittal will be 20 Days; thus, for a submittal that requires 2 resubmittals before it is complete, the maximum review period could be 60 Days.

E. If a submittal is returned to the CONTRACTOR marked "NO EXCEPTIONS TAKEN," formal revision and resubmission will not be required.

F. If a submittal is returned marked "MAKE CORRECTIONS NOTED," the CONTRACTOR shall make the corrections on the submittal, but formal revision and resubmission will not be required. If the CONTRACTOR does not agree to abide in full of the corrections, the CONTRACTOR must notify the ENGINEER within in 5 days and the status will be revised to “AMEND-RESUBMIT”.

G. Resubmittals

1. If a submittal is returned marked "AMEND-RESUBMIT," the CONTRACTOR shall revise the submittal and resubmit the required number of copies.

2. Resubmittal of portions of multi-page or multi-drawing submittals will not be accepted: For example, if a Shop Drawing submittal consisting of 10 drawings contains one drawing noted as "AMEND-RESUBMIT," the submittal as a whole is deemed "AMEND- RESUBMIT," and 10 drawings are required to be resubmitted.

3. Every change from a submittal to a resubmittal or from a resubmittal to a subsequent resubmittal shall be identified and flagged on the resubmittal. Submittal review comments shall be addressed as numbered in the review comments and all review comments addressed.

H. Rejected Submittals

1. If a submittal is returned marked "REJECTED-RESUBMIT," it shall mean either that the proposed material or product does not satisfy the specification, the submittal is so incomplete that it cannot be reviewed, or is a substitution request not submitted in accordance with the requirements of this section.

2. In the first 2 cases, the CONTRACTOR shall prepare a new submittal and shall submit the required number of copies.

3. In the latter case, the CONTRACTOR shall submit the substitution request according to the requirements of this section.

4. The resubmittal of rejected portions of a previous submittal will not be accepted.

I. The fabrication of an item may commence only after the ENGINEER has reviewed the pertinent submittals and returned copies to the CONTRACTOR marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

J. Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as changes to the contract requirements.

K. The CONTRACTOR shall be responsible for confirming and correlating quantities and dimensions, fabrication processes and techniques, coordinating WORK with the trades, and satisfactory and safe performance of the WORK.

L. Conformance:

1. Corrections or comments made on the CONTRACTOR's Shop Drawings during review shall not relieve the CONTRACTOR from compliance with Contract Drawings and Specifications.

2. Review is for conformance to the design concept and general compliance with the Contract Documents only.

3. The ENGINEER's review will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown. The review of drawings and schedules will be general, and shall not be construed:

    a. As permitting any departure from the Contract requirements;

    b. As relieving the CONTRACTOR of responsibility for any errors, including details, dimensions, and materials;

    c. As approving departures from details furnished by the ENGINEER, except as otherwise provided herein.

4. The CONTRACTOR shall be responsible for confirming and correlating quantities and dimensions, fabrication processes and techniques, coordinating WORK with the trades, and satisfactory and safe performance of the WORK.

M. Variations:

1. If the drawings or schedules as submitted describe variations and show a departure from the Contract requirements which ENGINEER finds to be in the interest of the OWNER and to be so minor as not to involve a change in Contract Price or time for performance, the ENGINEER may return the reviewed drawings without noting an exception.

2. If the drawings or schedules, as submitted, describe variations and show a departure from the Contract requirements which the ENGINEER finds to be minor enough to be corrected by redlining the submittal, he shall do so and return the submittal marked "approved as noted." The redlined corrections shall be as binding on the CONTRACTOR as would be a resubmission embodying the same corrections.

N. Resubmittals will be handled in the same manner as first submittals. On resubmittals the CONTRACTOR shall direct specific attention, in writing or on resubmitted shop drawings, to revisions other than the corrections requested by the ENGINEER on previous submissions. The CONTRACTOR shall make any corrections required by the ENGINEER.

O. If the CONTRACTOR considers any correction indicated on the shop drawings to constitute a change to the Contract Drawings or Specifications, the CONTRACTOR shall give written notice thereof to the ENGINEER.

P. When the shop drawings have been approved by the ENGINEER, the CONTRACTOR shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the ENGINEER.

Q. No partial submittals will be reviewed. Submittals not complete will be returned to the CONTRACTOR for resubmittal. Unless otherwise specifically permitted by the ENGINEER, all submittals shall be made in groups containing all associated items for systems, processes or as indicated in specific specifications sections. All drawings, schematics, manufacturer's product data, certifications and other shop drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interface checking.

R. The approval of shop drawings and data will be general, and shall mean that upon examination of the drawings, no variations from the Contract requirements have been discovered, and approval will not relieve the CONTRACTOR of his responsibilities as defined under the Contract. The OWNER’s review will not constitute an approval of dimensions, quantities and details of the material, equipment, device or item shown.

1.4 SHOP DRAWINGS

A. When used in the Contract Documents, the term "shop drawings" shall be considered to mean CONTRACTOR's plans for materials and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data shall be considered only as supportive to required shop drawings as defined above.

B. Manufacturer's catalog sheets, brochures, diagrams, illustrations, and other standard descriptive data shall be clearly marked to identify pertinent materials, product, or models. Delete information which is not applicable to the Work by striking or cross-hatching.

C. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, describe such variations in the letter of transmittal. If the CONTRACTOR fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed and approved.

D. For all mechanical and electrical equipment furnished, provide a list including the equipment name, address of and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

E. All manufacturers or equipment suppliers who propose to furnish equipment or products shall submit an installation list to the ENGINEER along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least five years, unless otherwise specified. Manufacturers and/or equipment which fails to meet the specified experience period will be considered if the manufacturer or supplier provides a bond or cash deposit which will guarantee replacement of the equipment or process in the event of failure or unsatisfactory service.

F. Only the ENGINEER will utilize the color "red" in marking shop drawing submittals.

1.5 REQUIRED INFORMATION

A. Transmittal Form

1. Shop Drawing submittals shall be accompanied by the ENGINEER's standard submittal transmittal form, a reproducible copy of which is available from the ENGINEER.

2. A submittal without the form, or where applicable items on the form have not been completed, will be returned for resubmittal.

B. Organization

1. Use a single submittal transmittal form for each technical specification Section or item or class of material or equipment for which a submittal is required.

2. A single submittal covering multiple Sections will not be accepted, unless the primary specification references other Sections for components: For example, if a pump Section references other Sections for the motor, shop-applied protective coating, anchor bolts, local control panel, and variable frequency drive, a single submittal would be accepted, whereas a single submittal covering vertical turbine pumps and horizontal split-case pumps would not be accepted.

3. On the transmittal form, index the components of the submittal and insert tabs in the submittal to match the components.

4. Relate the submittal components to specification paragraph and subparagraph, drawing number, detail number, schedule title, room number, or building name, as applicable.

5. Unless otherwise indicated, match terminology and equipment names and numbers used in the submittals with those used in the Contract Documents.

C. Format

1. Minimum sheet size shall be 8-1/2 inches by 11 inches, and maximum sheet size shall be 24 inches by 36 inches. The CONTRACTOR shall submit to the OWNER a paper hard copy and electronically in PDF format.

2. Where product data from a manufacturer is submitted, clearly mark which model is proposed, with complete pertinent data capacities, dimensions, clearances, diagrams, controls, connections, anchorage, and supports.

3. Present a sufficient level of detail for assessment of compliance with the Contract Documents.

4. Numbering

    a. Assign to each submittal a unique number.

    b. Number the submittals sequentially, with the submittal numbers clearly noted on the transmittal.

    c. Assign original submittals a numeric submittal number followed by a decimal point and a numeric digit in order to distinguish between the original submittal and each resubmittal: For example, if submittal "25.1" requires a resubmittal, the first resubmittal will bear the designation "25.2" and the second resubmittal will bear the designation "25.3," and so on.

D. Disorganized submittals that do not meet the requirements of the Contract Documents will be returned without review.

E. Submit, as applicable, the following for all prefabricated or manufactured structural, mechanical, electrical, plumbing, process system, and equipment:

1. Shop drawings or equipment drawings, including dimensions, size and location of connections to other work, and weight of equipment.

2. Catalog information and cuts.

3. Installation or placing drawings for equipment, drives, and bases.

4. Supporting calculations, signed and sealed by a Florida Registered Engineer when required, for equipment and associated supports, or hangers required or specified to be designed by equipment manufacturers.

5. Signed and sealed calculations and drawings by in-house Florida Registered Professional Engineer for structural systems, indicating compliance to the structural design criteria specified in the Drawings.

6. Complete manufacturer's specifications, including materials description and paint system.

7. Performance data and pump curves.

8. Suggested spare parts with current price information.

9. List of special tools required for testing, checking, parts replacement, and maintenance. (Special tools are those which have been specially designed or adapted for use on parts of the equipment and are not customarily and routinely carried by maintenance mechanics).

10. List of special tools furnished with the equipment.

11. List of materials and supplies required for the equipment prior to, and during startup.

12. List of materials or supplies furnished with the equipment.

13. Special handling instructions.

14. Requirements for storage and protection prior to installation.

15. Requirements for routine maintenance required prior to equipment startup.

16. List of all requested exceptions to the Contract Documents.

1.6 SAMPLES

A. Furnish, for the approval of the ENGINEER, samples required by the Specifications or requested by the ENGINEER. Samples shall be delivered to the ENGINEER as specified or directed. The CONTRACTOR shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the ENGINEER.

B. Quantity

1. The CONTRACTOR shall submit the number of samples indicated by the Specifications.

2. If the number is not indicated, submit not less than 3 samples.

3. Where the quantity of each sample is not indicated, submit such quantity as necessary for proper examination and testing by the methods indicated.

C. Identification and Distribution

1. Individually and indelibly label or tag each sample, indicating the salient physical characteristics and the manufacturer's name.

2. Each sample shall have a label indicating:

a. Name of Project.

b. Material or Equipment Represented.

c. Name of Producer and Brand (if any).

d. Location in Project

3. Upon acceptance by the ENGINEER, one set of the samples will be stamped and dated by the ENGINEER and returned to the CONTRACTOR, one set of samples will be retained by the ENGINEER, and one set shall remain at the Site in the ENGINEER's field office until completion of the WORK.

D. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.

2. Full range of color, texture and pattern.

3. A minimum of two samples of each item shall be submitted.

E. The CONTRACTOR shall schedule sample submittals such that:

1. Sample submittals for color and texture selection are complete so the ENGINEER has 45 Days to assemble color panels and select color- and texture-dependent products and materials without delay to the construction schedule; and,

2. After the ENGINEER selects colors and textures, the CONTRACTOR has sufficient time to provide the products or materials without delay to the construction schedule.

3. The Contract Times will not be extended for the CONTRACTOR's failure to allow enough review and approval or selection time, failure to submit complete samples requiring color or texture selection, or failure to submit complete or approvable samples.

F. Selection

1. Unless otherwise indicated, the ENGINEER will select colors and textures from the manufacturer's standard colors and standard materials, products, or equipment lines.

2. If certain samples represent non-standard colors, materials, products, or equipment lines that will require an increase in Contract Times or Price, the CONTRACTOR shall clearly state so on the transmittal page of the submittal.

G. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

H. Approved samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the approved samples. Samples which failed testing or were not approved will be returned to the CONTRACTOR at his expense, if so, requested at time of submission

1.7 MANUFACTURER'S EXPERIENCE RECORD

A. When a manufacturer's experience record is required by these specifications, the following may be provided in lieu of the specified record:

   1. Manufacturers and/or equipment which does not meet the specified experience period will be considered if the manufacturer or supplier provides a bond or cash deposit valid for five years less his years of experience, which will guarantee replacement of the equipment or process in the event of failure or unsatisfactory performance or service

1.8 PROPOSED SUBSTITUTIONS OR "OR APPROVED EQUAL" ITEMS

A. The CONTRACTOR'S bid price shall include materials or equipment meeting the specifications. Proposed substitutions will only be considered following award of the Contract as described herein

B. Changes in products, materials, equipment, and methods of construction required by the Contract Documents which are proposed by the CONTRACTOR after award of the Contract are considered to be requests for substitutions. Where the Plans and/or Specifications designate the products of a particular manufacturer, the product specified has been found suitable for the intended use. Articles or products of similar characteristics may be offered for the approval of the ENGINEER if sufficient information is submitted by the CONTRACTOR to allow the ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named, subject to the following requirements:

   1. The burden of proof as to the type, function, and quality of any such substitution product, material or equipment shall be upon the CONTRACTOR.

   2. The ENGINEER will be the sole judge as to the type, function, and quality of any such substitution and the ENGINEER's decision shall be final.

   3. The ENGINEER may require the CONTRACTOR to furnish additional data about the proposed substitution.

   4. The OWNER may require the CONTRACTOR to furnish a special performance guarantee or other surety with respect to any substitution.

   5. Acceptance by the ENGINEER of a substitution item proposed by the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitution.

   6. The CONTRACTOR shall pay all costs of implementing accepted substitutions, including redesign and changes to WORK necessary to accommodate the substitution.

C. The procedure for review by the ENGINEER will include the following:

1. Prior to proposing any substitute item, CONTRACTOR shall satisfy itself that the item proposed is: equal or better to that specified; that such item will fit into the space allocated; that such item affords comparable ease of operation, maintenance and service; that the appearance, longevity and suitability for the climate are comparable; that by reason of costs savings, reduced construction time or similar demonstrable benefit, the substitution of such item will be in OWNER’s interest and will in no way detrimentally impact the project schedule. The burden of proof that such an item offered is equal in all respects to that specified shall be CONTRACTOR’S.

2. If the CONTRACTOR wishes to provide a substitution item, the CONTRACTOR shall make written application to the ENGINEER on the "Substitution Request Form." A copy of this form is attached to the end of this Specification. Following award of contract, an electronic copy of the Substitution Request Form will be provided to the CONTRACTOR.

3. The CONTRACTOR shall certify by signing the form that the list of paragraphs on the form are correct for the proposed substitution.

4. The ENGINEER will evaluate each proposed substitution within a reasonable period of time, not to exceed 30 days.

5. As applicable, no shop drawing submittals shall be made for a substitution item nor shall any substitution item be ordered, installed, or utilized without the ENGINEER'S prior written acceptance of the CONTRACTOR'S "Substitution Request Form."

6. The ENGINEER will record the time required by the ENGINEER in evaluating substitutions proposed by the CONTRACTOR and in making changes by the CONTRACTOR in the Contract Documents occasioned thereby.

D. The CONTRACTOR's application shall address the following factors which will be considered by the ENGINEER in evaluating the proposed substitution:

1. Complete data substantiating compliance of proposed substitution with the requirements of the Contract Documents, including:

    a. Product identification, including manufacturer’s name and address and model number of products

    b. Manufacturer’s literature, identifying

        1) Product description

        2) Reference Standards

        3) Performance, testing, and relevant engineering data

c. Samples, if applicable

d. List two similar projects where substitution was utilized. Provide the following information for each project:

1) Contact person name and phone number. Contact should be able to provide information on the use of the product.

2) Location of installation

3) Date of installation

4) Quantity installed

5) Scope and description of project

2. Whether the evaluation and acceptance of the proposed substitution will prejudice the CONTRACTOR's achievement of Substantial Completion on time.

3. Whether acceptance of the substitution for use in the WORK will require a change in any of the Contract Documents to adapt the design to the proposed substitution.

4. Whether incorporation or use of the substitution in connection with the WORK is subject to payment of any license fee or royalty.

5. Whether all variations of the proposed substitution from the items originally specified are identified.

6. Whether available maintenance, repair, and replacement service are indicated. The manufacturer shall have a local service agency (within 50 miles of the site) which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.

7. Whether an itemized estimate is included of all additional costs and cost savings that will result directly or indirectly from acceptance of such substitution, including cost of redesign; claims of other contractors affected by the resulting change; and any licensing fee or royalties.

8. Whether the proposed substitute item meets or exceeds the experience and/or equivalency requirements listed in the appropriate technical specifications.

E. In making the formal request for substitution, the CONTRACTOR represents that:

1. The substitution has been investigated and it has been determined that is equal to or superior in all respects to the specified product.

2. The CONTRACTOR will provide the same warranties and bonds for the substitution as the product specified

3. The substitution will be coordinated into the installation of the WORK and any required changes to complete the WORK in all respects as a result of the substitution will be made by the CONTRACTOR at no additional cost to the OWNER.

4. The CONTRACTOR waives claims for additional cost caused by the substitution, which may subsequently become apparent.

5. All cost data provided is complete and accurate.

F. Without any increase in cost to the OWNER, the CONTRACTOR shall be responsible for and pay all costs in connection with proposed substitutions and of inspections and testing of equipment or materials submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK, whether or not the ENGINEER accepts the proposed substitution or proposed equipment or material. The CONTRACTOR shall reimburse the OWNER for the charges of the ENGINEER for evaluating each proposed substitution. In some instances, a credit may be due the OWNER. Unless specifically authorized by the ENGINEER in writing, no additional contract time will be allowed, and a decrease in time may be appropriate.

1.9 UNIT RESPONSIBILITY

A. Where unit responsibility for a system is required by the Contract Documents, the CONTRACTOR’s vendor shall provide a notarized “Unit Responsibility Certification Form” as part of the Submittal process. A copy of this form is attached to the end of this Specification. Following award of contract, an electronic copy of the form will be provided to the CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 42 19 REFERENCE STANDARDS

PART 1 - GENERAL

1.1 THE SUMMARY

A. Titles of Sections and Paragraphs: Titles and subtitles accompanying specification sections and paragraphs are for convenience and reference only and do not form a part of the Specifications.

B. Applicable Publications: Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is indicated, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Contract is advertised for Bids shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth in the Specifications or shown on the Drawings will be waived because of any provision of or omission from said standards or requirements.

C. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific WORK is to be assigned to specialists or expert entities who must be engaged to perform that WORK. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also, they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of WORK is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the CONTRACTOR.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. The CONTRACTOR shall construct the WORK in accordance with the Contract Documents and the referenced portions of those referenced codes, standards, and specifications.

B. References herein to “Building Code” or “Standard Building Code” shall mean the Florida Building Code (FBC), 2007 Edition with 2009 Supplement. Similarly, references to "Mechanical Code" or "Uniform Mechanical Code," "Plumbing Code" or "Uniform Plumbing Code," "Fire Code" or "Uniform Fire Code," shall mean Florida Building Code. “Florida Hurricane Code” shall mean the Florida Building Code. "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). “Roadway and Traffic Design Standards” and “Standard Specifications for Road and Bridge Construction, latest edition” (Green Book)" shall mean the Design Standards and Specifications of the Florida Department of Transportation. “Land Use and Development Regulations” shall mean the land use and development regulations of the TOWN Public Works Department. The latest edition of the codes as

approved by the Municipal Code and used by the local agency as of the date that the WORK is advertised for Bids shall apply to the WORK herein, including all addenda, modifications, amendments, or other lawful changes thereto.

C. Municipal Code and used by the local agency as of the date that the WORK is advertised for Bids shall apply to the WORK herein, including all addenda, modifications, amendments, or other lawful changes thereto.

D. In case of conflict between codes, reference standards, drawings, and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ENGINEER for clarification and direction prior to ordering or providing any materials or furnishing labor. The CONTRACTOR shall bid for the most stringent requirements.

E. References to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

F. Applicable Standard Specifications: References in the Contract Documents to "Standard Specifications" or SSPWC shall mean the Standard Specifications for Public Works Construction.

1.3 REGULATIONS RELATED TO HAZARDOUS MATERIALS

A. The CONTRACTOR shall be responsible that all WORK included in the Contract Documents, regardless if indicated or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other federal, state, and local regulations governing the storage and conveyance of hazardous materials, including petroleum products.

B. Where no specific regulations exist and the OWNER has not waived the requirement in writing, chemical, hazardous, and petroleum product piping and storage in underground locations shall be double containment piping and tanks or be installed in separate concrete trenches and vaults with an approved lining that cannot be penetrated by the chemicals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 45 00 QUALITY CONTROL

PART 1 - GENERAL

1.1 DEFINITION

A. Specific quality control requirements for the WORK are indicated throughout the Contract Documents. The requirements of this Section are primarily related to performance of the WORK beyond furnishing of manufactured products. The term "Quality Control" includes inspection, sampling and testing, and associated requirements.

1.2 INSPECTION AT PLACE OF MANUFACTURE

A. Unless otherwise indicated, all products, materials, and equipment shall be subject to inspection by the ENGINEER at the place of manufacture.

B. The presence of the ENGINEER at the place of manufacturer, however, shall not relieve the CONTRACTOR of the responsibility for providing products, materials, and equipment which comply with all requirements of the Contract Documents. Compliance is a duty of the CONTRACTOR and said duty shall not be avoided by any act or omission on the part of the ENGINEER.

1.3 SAMPLING AND TESTING

A. Unless otherwise indicated, all sampling and testing will be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered; however, the OWNER reserves the right to use any generally-accepted system of sampling and testing which, in the opinion of the ENGINEER will assure the OWNER that the quality of the workmanship is in full accord with the Contract Documents.

B. Any waiver by the OWNER of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the testing or other quality assurance requirements originally indicated, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial WORK, shall not be construed as a waiver of any requirements of the Contract Documents.

C. Notwithstanding the existence of such waiver, the ENGINEER reserves the right to make independent investigations and tests, and failure of any portion of the WORK to meet any of the requirements of the Contract Documents, shall be reasonable cause for the ENGINEER to require the removal or correction and reconstruction of any such WORK in accordance with the General Conditions.

1.4 INSPECTION AND TESTING SERVICE

A. Inspection and testing laboratory service shall comply with the following:

1. Unless indicated otherwise by the Technical Specifications, the OWNER will appoint, employ, and pay for services of an independent firm to perform inspection and testing or will perform inspection and testing itself.

2. The OWNER or independent firm will perform inspections, testing, and other services as required by the ENGINEER under Paragraph 1.3C above.

3. Reports of testing, regardless of whether the testing was the OWNER'S or the CONTRACTOR'S responsibility, will be submitted to the ENGINEER in [duplicate] indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

4. The CONTRACTOR shall cooperate with the OWNER or independent firm and furnish samples of materials, design mix, equipment, tools, storage, and assistance as requested.

5. The CONTRACTOR shall notify ENGINEER 24 hours prior to the expected time for operations requiring inspection and laboratory testing services.

6. Retesting required because of non-conformance to requirements shall be performed by the same independent firm on instructions by the [ENGINEER]. The CONTRACTOR shall bear all costs from such retesting.

7. For samples and tests required for CONTRACTOR'S use, the CONTRACTOR shall make arrangements with an independent firm for payment and scheduling of testing. The cost of sampling and testing for the CONTRACTOR'S use shall be the CONTRACTOR'S responsibility.

1.5 EVALUATION OF THE WORK

A. The Work shall be conducted under the general observation of the ENGINEER and shall be subject to evaluation by representatives of the ENGINEER acting on behalf of the OWNER to ensure strict compliance with the requirements of the Contract Documents. Such evaluation may include mill, plant, and shop or field evaluation, as required. The ENGINEER and OWNER shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.

B. The presence of the ENGINEER or any evaluator; however, shall not relieve the Contractor of the responsibility for the proper execution of the Work in accordance with the Contract Documents. Compliance is a duty of the Contractor and is not be relieved by any act or omission on the part of the ENGINEER.

C. Materials and articles furnished by the Contractor shall be subject to evaluation, and acceptance by the ENGINEER prior to use for the Work. No Work shall be backfilled, buried, cast in concrete, hidden or otherwise covered until the ENGINEER, has completed his inspection or evaluation. Any Work so covered in the absence of evaluation shall be subject to uncovering. Where unevaluated Work cannot be uncovered, such as in concrete cast over reinforcing steel, all such Work shall be subject to demolition, removal, and reconstruction under proper evaluation, and no additional payment will be allowed, therefore. If any portion of asphalt work is not accepted by the ENGINEER, OWNER or Engineering Inspector, the Contractor shall remove and reconstruct across the width of the lane and for the length of the lane. In the asphalt pavement area; no splicing, cut-in sections or patchwork will be accepted.

1.6 MATERIALS SAMPLING AND TESTING

A. Unless otherwise indicated, all sampling and testing will be in accordance with the methods prescribed in the current standards of the ASTM as applicable to the class and nature of the article or materials considered; however, the OWNER reserves the right to use any generally-accepted system of sampling and testing which, in the opinion of the ENGINEER will assure the OWNER that the quality of the workmanship is in full compliance with the Contract Documents.

B. Any waiver by the ENGINEER of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the testing or other quality assurance requirements originally indicated, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial WORK, shall not be construed as a waiver of any requirements of the Contract Documents.

C. The ENGINEER reserves the right to make independent investigations and tests, and failure of any portion of the WORK to meet any of the requirements of the Contract Documents

D. The Contractor shall employ and pay for the services of an independent testing laboratory for specified testing as indicated in the Contract Document or specified by the ENGINEER, OWNER or Engineering Inspector or Building Department Inspector.

E. The actions of the testing laboratory shall in no way relieve the Contractor of his obligations under the Contract. The laboratory testing work will include such evaluations and testing required by the Contract Documents, existing laws, codes, ordinances, etc. The testing laboratory will have no authority to change the requirements of the Contract Documents, nor perform, accept or approve any of the Contractor's Work.

F. The CONTRACTOR shall include the time required for testing of materials and equipment in his published schedule and the cost for testing of materials and equipment in its bid. The ENGINEER and OWNER will rely on this schedule to plan visits to manufacturing facilities and fabrication facilities for the purpose of inspecting workmanship and witness performance testing. Cost to the ENGINEER and OWNER for unscheduled or repeat

inspections will be borne by the CONTRACTOR. The CONTRACTOR shall provide the services of representatives of the manufacturers of certain equipment, as specified in other sections of these Contract Documents. The CONTRACTOR shall, after the equipment has been field tested and prior to final acceptance certify in writing statements that the equipment has been installed to manufacturer requirements and is ready for functional operation.

G. Reports of testing, regardless of whether the testing was the OWNER'S or the CONTRACTOR'S responsibility, will be submitted to the ENGINEER in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

H. The CONTRACTOR shall cooperate with the OWNER or independent firm and furnish samples of materials, design mix, equipment, tools, storage, and assistance as requested.

I. The CONTRACTOR shall furnish, all materials required by the ENGINEER, for testing, and is responsible for providing testing equipment, water, electric power, or fuel for the various evaluations and tests ordered. The CONTRACTOR will bear the cost of all tests, evaluations or investigations undertaken by the order of the ENGINEER for the purpose of determining conformance with the Contract Documents.

J. The CONTRACTOR shall notify the ENGINEER at least 5 working days in advance of asphalt work. CONTRACTOR shall provide certified testing of the temperature of each load as it is placed into the paver. Asphalt not meeting the temperature specification shall be rejected and returned to the plant.

K. The CONTRACTOR shall notify ENGINEER [32] hours prior to the expected time for operations requiring inspection and laboratory testing services.

L. For samples and tests required for CONTRACTOR'S use, the CONTRACTOR shall make arrangements with an independent firm for payment and scheduling of testing. The cost of sampling and testing for the CONTRACTOR'S use shall be the CONTRACTOR'S responsibility.

1.7 SITE INVESTIGATION AND CONTROL

A. The Contractor shall verify and control all dimensions for the WORK. The Contractor shall be solely responsible for any inaccuracies built in the Work due to its failure to comply with this requirement.

B. The Contractor shall evaluate ongoing related and appurtenant Work by others that conflicts with the CONTRACTOR’s ability to perform its WORK and report in writing to the ENGINEER the particular conditions that will prevent proper completion of the WORK. Failure to report any such changed conditions shall constitute acceptance of all site conditions.

1.8 RIGHT OF REJECTION

A. The ENGINEER and OWNER shall have the right, to reject any articles or materials that fail to meet the requirements of the Contract Documents or standards. If the ENGINEER through an oversight or otherwise, has accepted materials or Work which is defective or which fails to comply with to the Contract Documents, such materials, or WORK may be subsequently rejected by the ENGINEER.

B. The Contractor shall promptly remove rejected articles or materials from the site of the Work after notification of rejection. All costs of removal and replacement of rejected articles or materials as specified herein shall be borne by the Contractor.

C. Asphalt work rejected by the ENGINEER or OWNER shall be removed and reconstructed across the width of the lane and for the length of the lane. Cut-in sections or patchwork will not be accepted.

1.9 IMPERFECT WORK, EQUIPMENT, OR MATERIALS

A. Any defective or imperfect work, equipment, or materials furnished by the Contractor which is discovered before the final acceptance of the work, as established by the Certificate of Substantial Completion, or during the subsequent guarantee period, shall be removed and replaced

B. The ENGINEER may order tests of imperfect or damaged work, equipment, or materials to determine its functional capability. The cost of such tests shall be borne by the Contractor, and the nature, tester, extent and supervision of the tests will be as determined by the ENGINEER. If the results of the tests indicate that the required functional capability of the work, equipment, or material is not impaired, consistent with the final general appearance of same, the work, or materials may be deemed acceptable. If the results of such tests reveal that the required functional capability is uncertain, or materials have been impaired, then such work or materials shall be deemed imperfect and shall be replaced.

1.10 ABANDONMENT AND SALVAGE OF EXISTING FACILITIES

A. General: The scope of work may require the Contractor to interface with existing structures, and piping which will be abandoned or otherwise removed and/or relocated as part of the work. The contractor shall submit a written plan of the intended operation to the ENGINEER a minimum of ten (10) days prior to a shut-down, disconnection or tie-in. The contractor’s plan of operation shall limit interruption of service to no more than a four (4) hour per occurrence. The Contractor shall not proceed without authorization from the ENGINEER, prior to performing the work. Prior to any shut-downs, tie-ins or disconnections to existing utilities the Contractor shall submit a plan of operation that include contingencies for spare materials and equipment to perform the work.

B. The Contractor shall abandon, salvage or otherwise remove existing pipelines or segments of existing pipelines shown to be abandoned in place, salvaged, or removed as

part of the WORK. Pipe shown to be abandoned need only be removed a minimum three feet clear of new utilities. Abandon-in-place shall be defined as installing plugs, or other permanent closure, and grouting where indicated. The abandon-in-place pipe will remain buried unless otherwise noted.

C. Piping indicated on the Drawings as being removed, or any piping to be abandoned that interferes with new structures or piping, shall be excavated and removed using methods which will not disturb adjacent piping or other facilities. All pipe materials shall be subject to salvage by the OWNER as defined below.

D. Salvage: The OWNER may desire to salvage certain items of existing equipment which are to be dismantled and removed during the course of construction. Prior to removal of any existing equipment or piping from the site of work, the Contractor shall ascertain from the OWNER whether or not the particular item or items are to be salvaged. Items to be salvaged shall be stockpiled at a location as designated by the OWNER. All other items of equipment shall be disposed of off-site by the Contractor at his own expense, in accordance with applicable laws, ordinances and regulations. All existing meters removed must be salvaged.

1.11 SUBSURFACE INVESTIGATIONS

A. The Contractor shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater condition, the character of equipment and facilities required preliminary to and during the performance of the work, the general and local conditions and all other matters which can in any way affect the work under this Contract. The prices established for the work to be done shall reflect all costs pertaining to the work. Any claims for extras based on the substrata or ground water table conditions will be disallowed.

B. The Contractor further acknowledges that he assumes all risk contingent upon the nature of the subsurface conditions actually encountered by him in performing the work covered by the Contract, even though such actual conditions may result in the Contractor performing more or less work than he originally anticipated.

C. The OWNER as part Report of Geotechnical Engineering Services to this Contract Document is providing subsurface and water table data as part of the information to bidders but makes no guarantee, either expressed or implied, as to their accuracy or to the accuracy of any interpretation thereof.

1.12 OBSTRUCTIONS

A. All water pipes, storm drains, sanitary sewers, force mains, gas or other pipe, telephone or power cables or conduits and all other obstructions, whether or not shown, shall be temporarily supported across utility line excavations or relocated at the Contractor’s expense. The Contractor shall be responsible for any damage to any such pipes, conduits,

or structures. Approximate locations of known water, sanitary, drainage, power and telephone installations along route of new pipelines or in the vicinity of new work are shown but must be verified in the field by the Contractor. Any discrepancies or differences found shall be brought to the attention of the ENGINEER.

1.13 PROTECTION OF PROPERTY AND EXISTING FACILITIES

A. The CONTRACTOR shall protect all property that may be affected by his work or operations. The location and extent of underground and covered facilities are not guaranteed, and the CONTRACTOR is cautioned to proceed with care in order to prevent the undermining or damage to existing structures, piping, or facilities.

B. When potable water is being used, the supply source shall be protected against contamination in accordance with existing codes and regulations. The CONTRACTOR shall contact and coordinate water use connections with the OWNER.

C. If the CONTRACTOR's work disrupts or endangers any existing facilities or systems, the CONTRACTOR shall at its own expense make all necessary repairs or replacements necessary to correct the situation to the satisfaction of the ENGINEER and OWNER. Such corrective work shall progress CONTINUOUSLY to completion. The CONTRACTOR shall be responsible for the services of repair crews on call 24 hours per day for emergencies that arise involving WORK under this Contract.

D. Land Monuments - The CONTRACTOR shall notify the ENGINEER of any Federal, State, County, or private land monuments encountered. When government monuments are encountered, the CONTRACTOR shall notify the ENGINEER.

1.14 PROMPT REPAIR OF DAMAGES

A. Damages to any utilities are the responsibility of the CONTRACTOR and shall be promptly repaired at no cost to the OWNER. The CONTRACTOR will not be eligible for any delay claims ensuing from this damage.

B. WEATHER CONDITIONS

C. Work that may be adversely affected by inclement weather shall be suspended until proper conditions prevail. In the event of impending named storms, the CONTRACTOR shall take necessary precautions to protect all work, materials and equipment from exposure. The OWNER reserves the right, to order that additional protection measures over and beyond those proposed by the CONTRACTOR, be taken to safeguard all components of the project. The CONTRACTOR shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the OWNER for damage to the work from the elements of weather.

1.15 FIRE PROTECTION

A. The CONTRACTOR shall take all necessary precautions to prevent fires at or adjacent to the work, including his own buildings and trailers. Adequate fire extinguisher and hose line stations shall be provided throughout the work area.

B. No new Fire Hydrants shall be installed on water lines until the lines can be pressurized and made operational.

C. The CONTRACTOR shall notify the TOWN Fire Marshall before any existing fire hydrant can be rendered inactive by the WORK. Inactive hydrants shall be clearly marked as prescribed by the TOWN's Fire Marshall.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Inspection: The CONTRACTOR shall inspect materials or equipment upon the arrival on the job site and immediately prior to installation and reject damaged and defective items.

B. Measurements: The CONTRACTOR shall verify measurements and dimensions of the WORK, as an integral step of starting each installation.

C. Manufacturer's Instructions: Where installations include manufactured products, the CONTRACTOR shall comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in Contract Documents.

END OF SECTION

01 50 00 MOBILIZATION

PART 1 - GENERAL

1.1 THE SUMMARY

A. CONTRACTOR shall mobilize as required for the proper performance and completion of the WORK and in accordance with the Contract Documents.

B. Mobilization includes, but is not limited to, the following items:

1. Providing final Certificates of Insurance and Payment and Performance Bonds

2. Applying for submitting all required information for necessary permits.

3. Completing preconstruction videos and photographs

4. Arranging for and erection of CONTRACTOR's Staging Area.

5. Moving equipment and materials necessary for the first month of operations onto the Work Site.

6. Having OSHA required notices and establishing safety programs.

7. Having the CONTRACTOR's superintendent at the Site full time.

8. Submitting initial submittals.

9. Project coordination with the OWNER, ENGINEER, and Permitting Agencies

1.2 PAYMENT FOR MOBILIZATION

A. Payment for mobilization shall not exceed 5% of the contract price.

B. Payment for mobilization will be made at the lump sum bid price named on the Bid Summary form.

C. Partial payments for mobilization will be made as follows:

Construction % Complete	Allowable % of Lump Sum For Mobilization
5	25
10	50
25	75
100	100

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 50 10 PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.1 GENERAL

A. The CONTRACTOR shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than prior to such damage or temporary relocation, all in accordance with the Contract Documents.

1.2 EXISTING UTILITIES AND IMPROVEMENTS

A. General: Existing utilities have been shown on the Drawings insofar as information was reasonable available; however, it is the CONTRACTOR'S responsibility to preserve all existing utilities whether shown on the plans or not. The CONTRACTOR shall protect underground Utilities and other improvements which may be impaired during construction operations, regardless of whether or not the Utilities are indicated on the Drawings. The CONTRACTOR shall take all possible precautions for the protection of unforeseen Utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

B. The CONTRACTOR shall be responsible for exploratory excavations as it deems necessary to determine the exact locations and depths of Utilities which may interfere with its work. All such exploratory excavations shall be performed as soon as practicable after Notice to Proceed and, in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR's progress. When such exploratory excavations show the Utility location as shown on the Drawings to be in error, the CONTRACTOR shall so notify the ENGINEER.

C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the Utility.

D. Damages to any utilities shall be promptly be repaired at the CONTRACTOR'S expense and at no additional cost to the OWNER. At the sole discretion of the OWNER, such repairs shall be repaired by the CONTRACTOR or another contractor retained by the CONTRACTOR. All repairs to existing utilities shall be in accordance with the utility owner's current standards and the repairs shall be inspected and approved by the utility owner prior to acceptance by the OWNER. Any delays ensuing from repairing damage utilities will be considered inexcusable and the OWNER will have the right to hire a contractor to repair the damage and charge the CONTRACTOR for the costs associated.

E. Utilities to be Moved: In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the CONTRACTOR, be notified by the OWNER to move such property within a specified reasonable time. When utility lines are to be removed are encountered within the area of

operations the CONTRACTOR shall notify the ENGINEER a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

F. Utilities to be Removed: Where the proper completion of the WORK requires the temporary or permanent removal and/or relocation of an existing Utility or other improvement which is indicated, the CONTRACTOR shall remove and, without unnecessary delay, temporarily replace or relocate such Utility or improvement in a manner satisfactory to the ENGINEER and the owner of the facility. In all cases of such temporary removal or relocation, restoration to the former location shall be accomplished by the CONTRACTOR in a manner that will restore or replace the Utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.

G. OWNER's Right of Access: The right is reserved to the OWNER and to the owners of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the WORK of this Contract.

H. Underground Utilities Indicated: Existing Utility lines that are indicated or the locations of which are made known to the CONTRACTOR prior to excavation and that are to be retained, and all Utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the CONTRACTOR, unless otherwise repaired by the owner of the damaged Utility. If the owner of the damaged facility performs its own repairs, the CONTRACTOR shall reimburse said owner for the costs of repair.

I. Underground Utilities Not Indicated: In the event that the CONTRACTOR damages existing Utility lines that are not indicated or the locations of which are not made known to the CONTRACTOR prior to excavation, a verbal report of such damage shall be made immediately to the ENGINEER and a written report thereof shall be made promptly thereafter. The ENGINEER will immediately notify the owner of the damaged Utility. If the ENGINEER is not immediately available, the CONTRACTOR shall notify the Utility owner of the damage.

J. Approval of Repairs: All repairs to a damaged Utility or improvement are subject to inspection and approval by an authorized representative of the Utility or improvement owner before being concealed by backfill or other work.

K. Maintaining in Service: Unless indicated otherwise, oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the WORK shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the ENGINEER are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The CONTRACTOR shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be

abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

1.3 TREES OR SHRUBS WITHIN PROJECT LIMITS

A. General: Except where trees or shrubs are indicated to be removed, the CONTRACTOR shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or OWNER. Existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the CONTRACTOR or a certified tree company under permit from the jurisdictional agency and/or the OWNER. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs.

B. Trimming: Symmetry of the tree shall be preserved; no stubs or splits or torn branches left; clean cuts shall be made close to the trunk or large branch. Spikes shall not be used for climbing live trees. Cuts over 1-1/2 inches in diameter shall be coated with a tree paint product that is waterproof, adhesive, and elastic, and free from kerosene, coal tar, creosote, or other material injurious to the life of the tree.

C. Replacement: The CONTRACTOR shall immediately notify the jurisdictional agency and/or the OWNER if any tree or shrub is damaged by the CONTRACTOR's operations. If, in the opinion of said agency or the OWNER, the damage is such that replacement is necessary, the CONTRACTOR shall replace the tree or shrub at its own expense. The tree or shrub shall be of a like size and variety as the one damaged, or, if of a smaller size, the CONTRACTOR shall pay to the owner of said tree a compensatory payment acceptable to the tree or shrub owner, subject to the approval of the jurisdictional agency or OWNER. The size of the tree or shrub shall be not less than 1-inch diameter nor less than 6 feet in height.

1.4 LANDSCAPED AREAS

A. Landscaped or sodded areas damaged during construction shall be repaired to match the pre-construction condition to the satisfaction of the OWNER.

1.5 NOTIFICATION BY CONTRACTOR LANDSCAPED AREAS

A. The CONTRACTOR shall contact all existing utility companies and owners to determine the location of all existing utility lines and services not less than 3 days nor more than 7 days prior to excavation so that a representative of said owners or agencies can be present during such work if they so desire.

1. The CONTRACTOR shall contact “Sunshine State One-Call” a minimum of 48 hours in advance of any excavation. The CONTRACTOR shall provide the ENGINEER and OWNER with a copy of the ticket.

2. The CONTRACTOR shall provide written notification to owners of utilities that are not a member of Sunshine State One-Call or when utilities are located on private property a minimum of 72 hours prior to excavation.

1.6 PROTECTION OF STREET OR ROADWAY MARKERS

A. The CONTRACTOR shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced. Survey markers or points disturbed by the CONTRACTOR shall be accurately restored after street or roadway resurfacing has been completed.

1.7 RESTORATION OF PAVEMENT

A. General: All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. The pavement restoration requirement to match existing sections shall apply to all components of existing sections, including sub-base, base, and pavement. Temporary and permanent pavement shall conform to the requirements of the affected pavement owner. Pavements which are subject to partial removal shall be neatly saw cut in straight lines.

B. Temporary Resurfacing: Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.

C. Permanent Resurfacing: In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

D. Restoration of Sidewalks or Private Driveways: Wherever sidewalks or private roads have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks or roadways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions. If no such period of time is so fixed, the CONTRACTOR shall maintain said temporary sidewalks or roadways until the final restoration thereof has been made.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 52 50 MAINTENANCE OF TRAFFIC PLAN

PART 1 - GENERAL

1.1 GENERAL

A. The CONTRACTOR shall maintain traffic within the limits of the project for the duration of the construction period, including any temporary suspensions of the work, construct and maintain detours, provide facilities for access to residences, clubhouse, businesses, etc., along the project, furnish, install and maintain traffic control and safety devices during construction, furnish and install work zone pavement markings for maintenance of traffic in construction areas and provide any other special requirements for safe and expeditious movement of traffic specified on the plans. Maintenance of Traffic includes all facilities, devices and operations as required for safety and convenience of the public within the work zone and shall include provisions for pedestrian and school student traffic as well as vehicular traffic.

B. The CONTRACTOR shall not maintain traffic over those portions of the project where no work is to be accomplished or where construction operations will not affect existing roads. Do not obstruct or create a hazard to any traffic during the performance of the work and repair any damage to existing pavement open to traffic.

C. **Beginning Date of Contractor's Responsibility:** Maintain traffic starting the day work begins on the project or on the first day Contract time is charged, whichever is earlier. No work shall commence without approved and constructed Traffic Control Plans in place.

D. **Worksite Traffic Supervisor:** The CONTRACTOR shall provide a Certified Worksite Traffic Supervisor. Requirements are as follows:

1. Ensure that the Worksite Traffic Supervisor is available on a 24-hour per day basis, participates in all changes to traffic control and reviews the project on a day-to-day basis.

2. Ensure that the Worksite Traffic Supervisor is present to direct the initial setup of the traffic control plan and any changes. Provide the Worksite Traffic Supervisor with all equipment and materials needed to set up and maintain traffic control and handle traffic-related situations.

3. Ensure that the Worksite Traffic Supervisor immediately corrects all safety deficiencies. Do not allow minor deficiencies that are not immediate safety hazards to remain uncorrected for more than 24 hours.

4. Ensure that the Worksite Traffic Supervisor is available within 45 minutes after notification of an emergency situation and is prepared to positively respond to repair the work zone traffic control or to provide alternate traffic arrangements.

5. The TOWN may disqualify and remove from the project a Worksite Traffic Supervisor that fails to comply with the provisions of this specification. The OWNER may suspend all activities, except traffic and erosion control and such other activities that are necessary for project maintenance and safety, for failure to comply with these provisions.

6. Ensure that the Worksite Traffic Supervisor performs a drive-through inspection and observes traffic flow as soon as the work zone is activated and in each subsequent phase of work as they are opened to traffic. Provide to the ENGINEER a report listing any deficiencies and proposed corrective measures.

7. Ensure that the Worksite Traffic Supervisor conducts within the limits of the project, daily daytime and weekly night time inspections within the limits of the project for projects with predominate daytime work activities and daily nighttime and weekly daytime inspections for projects with predominate nighttime work, of all traffic control devices, traffic flow, pedestrian, bicyclist, and business accommodations.

8. Advise the project personnel of the schedule of these inspections and give them the opportunity to join in the inspection as is deemed necessary. Submit a comprehensive weekly report to the ENGINEER and include condition of all traffic control devices (including pavement markings) being used. The inspection report shall also include assurances that pedestrians are accommodated with a safe travel path around work sites and safely separated from mainline traffic, that existing or detoured bicyclist paths and bus routes and stops are being maintained satisfactorily throughout the project limits, and that existing businesses in work areas are being provided with adequate entrances for vehicular and pedestrian traffic during business hours. The Worksite Traffic Supervisor shall sign the report and certify that all of the above issues are being handled in accordance with the Contract Documents. If deficiencies are noted, the Worksite Traffic Supervisor shall note such deficiencies and include the proposed corrective actions.

E. Traffic Control Plan:

1. The CONTRACTOR is responsible for preparing a Traffic Control Plan (TCP) to be signed and sealed by a licensed Florida ENGINEER competent and trained in the preparation of a TCP. The TCP shall meet the requirements of the MUTCD Part VI, the ENGINEER, and the following jurisdictional agencies.

   a. Town of Surfside

   b. Miami-Dade County Department of Transportation and Public Works

2. The CONTRACTOR shall be responsible for contacting and coordinating with all emergency services from the TOWN and Miami-Dade County and notifying them of road closures, detours, and other elements of the TCP and WORK that may impact emergency services from access.

F. **Standards:** FDOT Design Standards (DS) are the minimum standards for the use in the development of all traffic control plans. The MUTCD Part VI is the minimum national standard for traffic control for highway construction, maintenance, and utility operations. Follow the basic principles and minimum standards contained in these documents for the design, application, installation, maintenance, and removal of all traffic control devices, warning devices and barriers which are necessary to protect the public and workers from hazards within the project limits.

G. The CONTRACTOR shall provide sufficient time in the construction schedule to develop and obtain approval for each TCP.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXECUTION

A. **Maintenance of Roadway Surfaces:** Maintain all lanes that are being used for the maintenance of traffic, including those on detours and temporary facilities, under all weather conditions. Keep the lanes free of dust, dirt, muck, potholes and rutting. Provide the lanes with the drainage facilities necessary to maintain a smooth riding surface under all weather conditions.

B. Traffic Lanes:

1. The CONTRACTOR shall provide continuous access for all residents to and from their homes.

2. If required to complete the WORK, the CONTRACTOR may close a roadway to thru traffic. However, access to residents and emergency vehicles shall be maintained at all times.

3. During all non-construction hours, the CONTRACTOR shall adequately mark and secure the WORK area to ensure the safety of residents and vehicular traffic.

C. **Crossings and Intersections:** Provide and maintain adequate accommodations for intersecting and crossing traffic. Do not block or unduly restrict any road or street crossing the project unless approved by the ENGINEER. Maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the Contract. Restore any loss of detection within 12 hours. Use only detection technology approved by the ENGINEER to restore detection capabilities. Before beginning any construction, provide the ENGINEER a plan for maintaining detection devices for each intersection and the name(s) and phone numbers of persons that can be contacted when signal operation malfunctions.

D. **Access for Residences and Businesses:** Provide continuous access to all residences and all places of business, residences and clubhouses.

E. **Protection of the Work from Injury by Traffic:** Where traffic would be injurious to a base, surface course, or structure constructed as a part of the work, maintain all traffic outside the limits of such areas until the potential for injury no longer exists.

F. **Use of High Visibility Safety:** Provide personnel with appropriate high visibility safety garments. Ensure that these garments be worn whenever the workers are within 15 feet of the edge of the travel way and during nighttime operations. Workers operating machinery or equipment in which loose clothing could become entangled during operation shall be required to wear appropriate high visibility clothing that will not be subject to entanglement such as orange shirts or jackets. Require CONTRACTOR personnel to wear reflective orange vest/garment during nighttime operations.

G. **Existing Pavement Markings:** Where a detour changes the lane use or where normal vehicle paths are altered during construction, remove all existing pavement markings that will conflict with the adjusted vehicle paths. Do not overpaint. Remove existing pavement markings using a method that will not damage the surface texture of the pavement and which will eliminate the previous marking pattern regardless of weather and light conditions. Remove all pavement markings that will be in conflict with “next phase of operation” vehicle paths as described above, before opening to traffic.

H. Detours:

1. General: Construct and maintain detour facilities wherever it becomes necessary to divert traffic from any existing roadway or bridge, or wherever construction operations block the flow of traffic.

2. Construction: Plan, construct, and maintain detours for the safe passage of traffic in all conditions of weather. Provide the detour with all facilities necessary to meet this requirement.

3. Construction Methods: Select and use construction methods and materials that provide a stable and safe detour facility. Construct the detour facility to have sufficient durability to remain in good condition, supplemented by maintenance, for the entire period that the detour is required.

4. Removal of Detours: Remove detours when they are no longer needed and before the Contract is completed. Restore the area used for detours to a condition equal to or better than existed before beginning of construction. Take ownership of all materials from the detour and remove them.

5. Detours Over Existing Roads and Streets: When the TCP specifies that traffic be detoured over roads or streets outside the project area, do not maintain such roads or streets. However, maintain all signs and other devices placed for the purpose of the detour.

I. Traffic Control Officer:

1. Provide uniformed law enforcement officers, including marked law enforcement vehicles, to assist in controlling and directing traffic in the work zone when traffic control in a signalized intersection is necessary when signals are not in use.

J. Driveway Maintenance:

1. General: Ensure that each residence and or business has safe, stable, and reasonable access.

2. Construction Methods: Place, level, manipulate, compact, and maintain the material, to the extent appropriate for the intended use. As permanent driveway construction is accomplished at a particular location, the CONTRACTOR may salvage and reuse previously placed materials that are suitable for reuse on other driveways.

K. Temporary Traffic Control Devices:

1. Installation and Maintenance: Install and maintain adequate traffic control devices, warning devices and barriers to protect the traveling public and workers, and to safeguard the work area. Erect the required traffic control devices, warning devices and barriers to prevent any hazardous conditions and in conjunction with any necessary traffic re-routing. Immediately remove, turn or cover any devices or barriers that do not apply to existing conditions.

2. Notify the ENGINEER of any scheduled operation, which will affect traffic patterns or safety, sufficiently in advance of commencing such operation to permit his review of the plan for the proposed installation of traffic control devices, warning devices or barriers.

3. Ensure an employee is assigned the responsibility of maintaining the position and condition of all traffic control devices, warning devices and barriers throughout the duration of the Contract. Keep the ENGINEER advised at all times of the identification and means of contacting this employee on a 24-hour basis.

4. Keep traffic control devices, warning devices, safety devices and barriers in the correct position, properly directed, clearly visible and clean, at all times. Immediately repair, replace or clean damaged, defaced or dirty devices or barriers.

L. **Work Zone Signs:** Provide signs in accordance with the approved TCPs and Design Standards.

M. **Warning/Channelizing Devices:** Furnish warning/channelizing devices in accordance with the approved TCPs and Design Standards.

N. **Reflective Collars for Traffic Cones:** At night use cone collars, designed to properly fit the taper of the cone when installed. Place the upper 6 inches collar a uniform 3 1/2-inch distance from the top of the cone and the lower 4-inch collar a uniform 2-inch distance below the bottom of the upper 6 inch collar. Ensure that the collars are capable of being

removed for temporary use or attached permanently to the cone in accordance with the manufacturer's recommendations. Provide white sheeting having a smooth outer surface and that essentially has the property of a retroreflector over its entire surface.

O. **Barrier Wall (Temporary):** Furnish, install, maintain, remove and relocate a temporary barrier wall in accordance with the approved TCPs.

P. **Glare Screen (Temporary):** Furnish, install, maintain, remove and relocate glare screen systems in conjunction with temporary barrier wall at locations identified in the approved TCPs. Ensure the anchorage of the glare screen to the barrier is capable of safely resisting an equivalent tensile load of 600 lb/ft of glare screen, with a requirement to use a minimum of three fasteners per barrier section. When glare screen is utilized on temporary barrier wall, warning lights will not be required.

Q. **Advance Warning Arrow Panel:** Furnish advance warning panel in accordance with the plans and Design Standards approved TCPs

R. **Temporary Traffic Control Signals:** Furnish, install and operate temporary traffic control signals as indicated in approved TCPs. Temporary traffic control signals will consist of either portable or fixed traffic signals. Provide certification that the portable traffic signals meet the requirements of the Design Standards. The ENGINEER may approve used signal equipment if it is in acceptable condition.

S. Work Zone Pavement Marking:

1. Description: Furnish and install Work Zone Pavement Markings for maintenance of traffic in construction areas as required. Measure the reflectivity of white and yellow stripes in accordance with Florida Method FM 5-541. Re-stripe anytime the reflectivity falls below the final values shown in FM 5-541. Use only pavement marking materials that do not contain any lead or chromium compounds.

2. Where the existing roadway has pavement markings, centerlines, lane lines, edge lines, stop bars and turn arrows in work zones will be required in accordance with the MUTCD with the following additions:

    a. Apply Work Zone Pavement Markings, including arrows and messages as determined by the ENGINEER or permitting agencies to be required for the safe operation of traffic. Channelizing devices may be used to direct traffic during the day before placing the Work Zone Pavement Markings.

    b. Work Zone Pavement Markings shall be designated in the approved TCPs as removable or non-removable.

END OF SECTION

01 53 00 HURRICANE PREPAREDNESS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR is responsible for having plans for protection of the WORK site during hurricanes and shall prepare and submit a Hurricane Preparedness Plan prior to any construction activity and mobilization.

B. The Hurricane Preparedness Plan shall be submitted to the ENGINEER and the OWNER at the Preconstruction Meeting for approval and shall include the following:

1. Items and equipment that must be removed from the WORK site.

2. Methods and materials that will be utilized to secure the materials and WORK site.

3. Methods and materials that will be utilized to protect uncompleted WORK items.

4. Plan for maximizing traffic lanes for evacuation.

5. Items that must commence at the time of hurricane watch in order to be completed prior to evacuation.

C. When the National Weather Service issues a Hurricane Watch for Broward, Miami-Dade, or Palm Beach County, the CONTRACTOR shall begin preparations to implement the Hurricane Preparedness Plan. When the National Weather Service issues a Hurricane Warning for Miami-Dade County, the CONTRACTOR shall immediately implement the Hurricane Preparedness Plan.

D. The cost of preparing and implementing the Hurricane Preparedness Plan shall be the responsibility of the CONTRACTOR. Hurricane watch and warning will be grounds for contract time extensions.

1.2 CONTRACTOR SUBMITTALS

A. Submittals of the Hurricane Preparedness Plan shall be in accordance with Section 01300 Contractor Submittals

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 55 00 SITE ACCESS AND STORAGE

PART 1 - GENERAL

1.1 ROADWAY LIMITATIONS

A. The CONTRACTOR shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the WORK.

B. It shall be the CONTRACTOR's responsibility to determine the maximum loads, height, and size of trucks on the existing access roads to the Site for delivery of equipment and parts.

1.2 TEMPORARY ACCESS

A. General: Continuous, unobstructed, safe, and adequate pedestrian and vehicular access shall be provided to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, fire and police stations, and hospitals. Safe and adequate public transportation stops and pedestrian crossings at intervals not exceeding 300-feet shall be provided. The CONTRACTOR shall cooperate with parties involved in the delivery of mail and removal of trash and garbage so as to maintain existing schedules for such services. Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time.

B. Temporary Bridges: Wherever necessary, to maintain vehicular crossings, the CONTRACTOR shall provide suitable temporary bridges or steel plates over unfilled excavations, except in such cases as the CONTRACTOR shall secure the written consent of the responsible individuals or authorities to omit such temporary bridges or steel plates, which written consent shall be delivered to the ENGINEER prior to excavation. Such bridges or steel plates shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges or steel plates for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the CONTRACTOR shall adopt designs furnished by said authority for such bridges or steel plates, or shall submit designs to said authority for approval, as may be required.

C. Street Use: Nothing herein shall be construed to entitle the CONTRACTOR to the exclusive use of any public street, alleyway, or parking area during the performance of the WORK hereunder, and it shall conduct its operations to not interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed to the public without first obtaining permission of the ENGINEER and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise indicated. Toe boards shall be provided to retain excavated material if required by the ENGINEER or the agency having jurisdiction over the street or

highway. Fire hydrants on or adjacent to the WORK shall be kept accessible to fire-fighting equipment. Temporary provisions shall be made by the CONTRACTOR to assure the use of sidewalks and the proper functioning of gutters, storm drain inlets, and other drainage facilities.

D. Traffic Control: Traffic control shall be provided by CONTRACTOR as specified in Specification 01 52 50 – Maintenance of Traffic Plan

E. Temporary Driveway Closure: The CONTRACTOR shall notify the owner or occupant (if not owner-occupied) of the closure of the driveways to be closed at least 3 working days prior to the closure. The CONTRACTOR shall minimize the inconvenience and minimize the time period that the driveways will be closed. The CONTRACTOR shall fully explain to the owner/occupant how long the closure will take and when closure will start.

1.3 CONTRACTOR'S WORK AND STORAGE AREA

A. The CONTRACTOR shall make its own arrangements for any necessary off-Site storage or shop areas necessary for the proper execution of the WORK.

B. The CONTRACTOR'S staging areas shall be kept in a clean and orderly fashion at all times. The areas will be sloped to drain off all storm runoff. The entrance to the storage areas shall be constructed in accordance with the drawings with a drainage pipe to protect the swale and an entrance driveway of 6 inches of crushed stone road base laid on suitable geotextile (filter fabric). Sediment control traps shall be positioned so as to ensure that downstream catch basins and drains are protected from runoff containing silt from the temporary areas. A sedimentation trap can be constructed by either excavating below grade or building an embankment across a swale and an open-channel spillway provided. Silt fence shall be provided around all central storage areas, limerock and central soil stockpiles.

C. The CONTRACTOR shall construct and use a separate storage area for hazardous materials used in constructing the WORK.

D. For the purpose of this paragraph, hazardous materials to be stored in the separate area are products labeled with any of the following terms: Warning, Caution, Poisonous, Toxic, Flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, 2 part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.

1. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.

2. The CONTRACTOR shall develop and submit to the ENGINEER a plan for storing and disposing of the materials above.

3. The CONTRACTOR shall obtain and submit to the ENGINEER a single EPA number for wastes generated at the Site.

4. The separate storage area shall meet the requirements of authorities having jurisdiction over the storage of hazardous materials. Such authorities include the TOWN, Florida Department of Environmental Protection, and DERM.

5. Hazardous materials that are delivered in containers shall be stored in the original containers until use. Hazardous materials delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 EXPLOSIVES AND BLASTING

A. The use of explosives to accomplish any of the Work will not be permitted.

1.2 DUST ABATEMENT

A. The CONTRACTOR shall furnish all labor, equipment, and means required and shall carry out effective measures wherever and as often as necessary to prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor shall be responsible for any damage resulting from any dust originating from its operations. The dust abatement measures shall be continued until the Contractor is relieved of further responsibility by the ENGINEER, and the TOWN. No separate payment will be allowed for dust abatement measures and all costs thereof shall be included in the Contractor's bid price. The Contractor shall control dust and sedimentation and provide abatements measures in accordance with rules, regulations and TOWN Ordinances.

B. All disturbed areas, unpaved streets, roads, parking areas, detours, or haul-roads used in the construction or storage areas must utilize approved dust-preventive treatment or periodically apply water to prevent dust as practical, and as directed by the ENGINEER or TOWN. Applicable environmental regulations for dust prevention shall be strictly enforced.

1.3 RUBBISH CONTROL

A. During the progress of the WORK, the Contractor shall keep the site of the WORK and other areas used by it in a neat and clean condition, and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Work site and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads and storage areas free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the site of construction in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

B. The Contractor shall furnish and pay for disposal of waste to include garbage and construction and demolition debris in accordance with applicable TOWN codes and exclusive solid waste franchise agreements. All solid waste containers and roll-offs shall be provided in accordance with the TOWN of Surfside requirements and exclusive solid waste franchise agreements. All solid waste containers and roll-offs within the TOWN of

Surfside for garbage shall be provided by Waste Management or in accordance with subsequent agreements; construction and demolition debris in the TOWN shall be provided by any of the following four (4) haulers: All Service Refuge, Waste Management, Choice Environmental or Southern Waste Systems or in accordance with subsequent agreements.

1.4 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, paint, fuel, solvent or reactant of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. The handling, storage, use and disposal of all such chemicals and disposal of residues shall be in strict accordance with all applicable rules and regulations of Federal, State and local jurisdictional agencies and the printed instructions of the manufacturer and all regulatory requirements. Copies of antidote literature and a supply of antidotes shall be kept at the storage site and at the Contractor's job site office.

1.5 NOISE CONTROL

A. Noise resulting from the Contractor's work shall not exceed the noise levels and other requirements stated in local ordinances. The Contractor shall be responsible for curtailing noise resulting from its operation. He shall, upon written notification from the ENGINEER, TOWN or the TOWN noise control officers, make any repairs, replacements, adjustments, additions and furnish mufflers when necessary to fulfill requirements.

1.6 PRECAUTIONS DURING ADVERSE WEATHER

A. During adverse weather, and against the possibility thereof, the Contractor shall take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, wood and building paper shelters, or other acceptable means. The Contractor shall be responsible for all changes caused by adverse weather.

B. The ENGINEER or TOWN may suspend construction operations at any time when, in its judgment, the conditions are unsuitable or the proper precautions are not being taken, whatever the weather conditions may be, in any season.

1.7 HURRICANE AND STORM WARNINGS

A. The Contractor shall take all precautions necessary to protect the job site during hurricane and storm watches and warnings as outlined in Specification 01 53 00 - Hurricane Preparedness.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 60 00 PRODUCTS, MATERIAL, EQUIPMENT, AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 DEFINITIONS

A. The word "Products," as used in the Contract Documents, is defined to include purchased items for incorporation into the WORK, regardless of whether specifically purchased for the project or taken from CONTRACTOR's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form WORK. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.

B. Neither "Products" nor "Materials" nor "Equipment" includes machinery and equipment used for preparation, fabrication, conveying, and erection of the WORK.

1.2 QUALITY ASSURANCE

A. **Source Limitations:** To the greatest extent possible for each unit of WORK, the CONTRACTOR shall provide products, materials, and equipment of a singular generic kind from a single source.

B. **Compatibility of Options:** Where more than one choice is available as options for CONTRACTOR's selection of a product, material, or equipment, the CONTRACTOR shall select an option which is compatible with other products, materials, or equipment. Compatibility is a basic general requirement of product, material and equipment selections.

1.3 PRODUCT DELIVERY AND STORAGE

A. The CONTRACTOR shall deliver and store the WORK in accordance with manufacturer's written recommendations and by methods and means which will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at the Site and overcrowding of construction spaces. In particular, the CONTRACTOR shall ensure coordination to ensure minimum holding or storage times for flammable, hazardous, easily damaged, or sensitive materials to deterioration, theft, and other sources of loss.

1.4 TRANSPORTATION AND HANDLING

A. Products shall be transported by methods to avoid damage and shall be delivered in undamaged condition in manufacturer's unopened containers and packaging.

B. The CONTRACTOR shall provide equipment and personnel to handle products, materials, and equipment [including those furnished by OWNER,] by methods to prevent soiling and damage.

C. The CONTRACTOR shall provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

1.5 STORAGE AND PROTECTION

A. Products shall be stored in accordance with manufacturer's written instructions and with seals and labels intact and legible. Sensitive products shall be stored in weather-tight climate-controlled enclosures and temperature and humidity ranges shall be maintained within tolerances required by manufacturer's recommendations.

B. For exterior storage of fabricated products, products shall be placed on sloped supports above ground. Products subject to deterioration shall be covered with impervious sheet covering and ventilation shall be provided to avoid condensation.

C. Loose granular materials shall be stored on solid flat surfaces in a well-drained area and shall be prevented from mixing with foreign matter.

D. Storage shall be arranged to provide access for inspection. The CONTRACTOR shall periodically inspect to assure products are undamaged and are maintained under required conditions.

E. Storage shall be arranged in a manner to provide access for maintenance of stored items and for inspection.

1.6 MAINTENANCE OF PRODUCTS IN STORAGE

A. Stored products shall be periodically inspected on a scheduled basis. The CONTRACTOR shall maintain a log of inspections and shall make the log available on request.

B. The CONTRACTOR shall comply with manufacturer's product storage requirements and recommendations.

C. The CONTRACTOR shall maintain manufacturer-required environmental conditions continuously.

D. The CONTRACTOR shall ensure that surfaces of products exposed to the elements are not adversely affected and that weathering of finishes does not occur.

E. For mechanical and electrical equipment, the CONTRACTOR shall provide a copy of the manufacturer's service instructions with each item and the exterior of the package shall contain notice that instructions are included.

F. Products shall be serviced on a regularly scheduled basis, and a log of services shall be maintained and submitted as a record document prior to final acceptance by the OWNER in accordance with the Contract Documents.

1.7 PROPOSED SUBSTITUTIONS OR "OR-EQUAL" ITEM

A. The CONTRACTOR'S bid price shall include materials or equipment meeting the specifications. Proposed substitutions will only be considered following award of the Contract as described herein.

B. Whenever materials or equipment are indicated in the Contract Documents by using the name of a proprietary item or the name of a particular manufacturer, the naming of the item is intended to establish the type, function, and quality required. If the name is followed by the words "or equal" indicating that a substitution is permitted, materials or equipment of other manufacturers may be accepted if sufficient information is submitted by the CONTRACTOR to allow the ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named, subject to the following requirements:

1. The burden of proof as to the type, function, and quality of any such substitution product, material or equipment shall be upon the CONTRACTOR.

2. The ENGINEER will be the sole judge as to the type, function, and quality of any such substitution and the ENGINEER's decision shall be final.

3. The ENGINEER may require the CONTRACTOR to furnish additional data about the proposed substitution.

4. The OWNER may require the CONTRACTOR to furnish a special performance guarantee or other surety with respect to any substitution.

5. Acceptance by the ENGINEER of a substitution item proposed by the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitution.

6. The CONTRACTOR shall pay all costs of implementing accepted substitutions, including redesign and changes to WORK necessary to accommodate the substitution.

C. The procedure for review by the ENGINEER will include the following:

1. Prior to proposing any substitute item, CONTRACTOR shall satisfy itself that the item proposed is: equal or better to that specified; that such item will fit into the space allocated; that such item affords comparable ease of operation, maintenance and

service; that the appearance, longevity and suitability for the climate are comparable; that by reason of costs savings, reduced construction time or similar demonstrable benefit, the substitution of such item will be in OWNER'S interest and will in no way detrimentally impact the project schedule. The burden of proof that such an item offered is equal in all respects to that specified shall be CONTRACTOR'S.

2. If the CONTRACTOR wishes to provide a substitution item, the CONTRACTOR shall make written application to the ENGINEER on the "Substitution Request Form." A copy of this form is attached to the end of this Specification. Following award of contract, an electronic copy of the Substitution Request Form will be provided to the CONTRACTOR.

3. Unless otherwise provided by law or authorized in writing by the ENGINEER, the "Substitution Request Form(s)" shall be submitted within the 20-day period after award of the Contract. After the end of the 20-day period, substitutions will only be considered in the case of the product being unavailable.

4. Wherever a proposed substitution item has not been submitted within said 20-day period, or wherever the submission of a proposed substitution material or equipment has been judged to be unacceptable by the ENGINEER, the CONTRACTOR shall provide the material or equipment indicated in the Contract Documents.

5. The CONTRACTOR shall certify by signing the form that the list of paragraphs on the form are correct for the proposed substitution.

6. The ENGINEER will evaluate each proposed substitution within a reasonable period of time, not to exceed 14 days.

7. As applicable, no shop drawing submittals shall be made for a substitution item nor shall any substitution item be ordered, installed, or utilized without the ENGINEER'S prior written acceptance of the CONTRACTOR'S "Substitution Request Form."

8. The ENGINEER will record the time required by the ENGINEER in evaluating substitutions proposed by the CONTRACTOR and in making changes by the CONTRACTOR in the Contract Documents occasioned thereby.

D. The CONTRACTOR's application shall address the following factors which will be considered by the ENGINEER in evaluating the proposed substitution:

1. Complete data substantiating compliance of proposed substitution with the requirements of the Contract Documents, including:

   a. Product identification, including manufacturer's name and address and model number of products

   b. Manufacturer's literature, identifying

1) Product description

2) Reference Standards

3) Performance, testing, and relevant engineering data

c. Samples, if applicable

d. List two similar projects where substitution was utilized. Provide the following information for each project:

1) Contact person name and phone number. Contact should be able to provide information on the use of the product.

2) Location of installation

3) Date of installation

4) Quantity installed

5) Scope and description of project

2. Whether the evaluation and acceptance of the proposed substitution will prejudice the CONTRACTOR's achievement of Substantial Completion on time.

3. Whether acceptance of the substitution for use in the WORK will require a change in any of the Contract Documents to adapt the design to the proposed substitution.

4. Whether incorporation or use of the substitution in connection with the WORK is subject to payment of any license fee or royalty.

5. Whether all variations of the proposed substitution from the items originally specified are identified.

6. Whether available maintenance, repair, and replacement service are indicated. The manufacturer shall have a local service agency (within 50 miles of the site) which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.

7. Whether an itemized estimate is included of all additional costs and cost savings that will result directly or indirectly from acceptance of such substitution, including cost of redesign; claims of other contractors affected by the resulting change; and any licensing fee or royalties.

8. Whether the proposed substitute item meets or exceeds the experience and/or equivalency requirements listed in the appropriate technical specifications.

E. In the making the formal request for substitution, the CONTRACTOR represents that:

1. The substitution has been investigated and it has been determined that is equal to or superior in all respects to the specified product.

2. The CONTRACTOR will provide the same warranties and bonds for the substitution as the product specified

3. The substitution will be coordinated into the installation of the WORK and any required changes to complete the WORK in all respects as a result of the substitution will be made by the CONTRACTOR at no additional cost to the OWNER.

4. The CONTRACTOR waives claims for additional cost caused by the substitution, which may subsequently become apparent.

5. All cost data provided is complete and accurate.

F. Without any increase in cost to the OWNER, the CONTRACTOR shall be responsible for and pay all costs in connection with proposed substitutions and of inspections and testing of equipment or materials submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK, whether or not the ENGINEER accepts the proposed substitution or proposed equipment or material. The CONTRACTOR shall reimburse the OWNER for the charges of the ENGINEER for evaluating each proposed substitution.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 77 00 PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 REQUIREMENT's INCLUDED

A. Comply with requirements stated in the Contract Documents and in the Specifications for administrative procedures in closing out the Work.

B. The CONTRACTOR shall promptly remove from the vicinity of the completed WORK, all rubbish, unused materials, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the WORK by the OWNER will be withheld until the CONTRACTOR has satisfactorily performed the final cleanup of the Site.

1.2 SUBSTANTIAL COMPLETION

A. Approximately two (2) weeks before CONTRACTOR considers the Work will be Substantially Complete, the CONTRACTOR shall submit to the ENGINEER:

1. A written notice that the Work, or designated portion thereof, is substantially complete.

2. A list of items to be completed or corrected.

B. Within a reasonable time after receipt of such notice, the ENGINEER will make an inspection to determine the status of completion.

C. Should the ENGINEER determine that the Work is not Substantially Complete:

1. The ENGINEER will promptly notify the CONTRACTOR in writing, giving the reasons therefor.

2. CONTRACTOR shall remedy the deficiencies in the Work and send a second written notice of substantial completion to the ENGINEER.

3. The ENGINEER will re-inspect the Work.

D. When the ENGINEER finds that the Work is Substantially Complete, the ENGINEER will:

1. After consideration of any objections made by the OWNER as provided in Conditions of the Contract, and when the ENGINEER considers the Work substantially complete, the ENGINEER will execute and deliver to the OWNER and the CONTRACTOR a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

2. Request the CONTRACTOR to initiate closeout submittals.

1.3 FINAL CLEANUP

A. When CONTRACTOR considers the Work is complete, the CONTRACTOR shall submit written certification that:

   1. Contract Documents have been reviewed.

   2. Work has been inspected for compliance with Contract Documents.

   3. Work has been completed in accordance with Contract Documents.

   4. Equipment and systems have been tested in the presence of the OWNER'S representative and are operational.

   5. Work is completed and ready for final inspection.

B. The ENGINEER will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should the ENGINEER consider that the Work is incomplete or defective:

   1. The ENGINEER will promptly notify the CONTRACTOR in writing, listing the incomplete or defective work.

   2. CONTRACTOR shall take immediate steps to remedy the stated deficiencies and send a second written certification to the ENGINEER that the Work is complete.

   3. The ENGINEER will re-inspect the Work.

D. When the ENGINEER finds that the Work is acceptable under the Contract Documents, the ENGINEER shall request the CONTRACTOR to complete any remaining closeout submittals.

E. The CONTRACTOR shall promptly remove from the vicinity of the completed WORK, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the WORK by the OWNER will be withheld until the CONTRACTOR has satisfactorily performed the final cleanup of the Site.

1.4 RE-INSPECTION FEES

A. Should he ENGINEER perform re-inspections due to failure of the Work to comply with the claims of status of completion made by the CONTRACTOR:

   1. OWNER will compensate the ENGINEER for such additional services.

   2. OWNER will deduct the amount of such compensation from the final payment to the CONTRACTOR.

1.5 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

A. Evidence of compliance with requirements of governing authorities.

B. Maintenance stock items; spare parts; special tools.

C. Certificate of Insurance for Products and Completed Operations.

1.6 CLOSEOUT TIMETABLE

A. The CONTRACTOR shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established not less than one week prior to beginning any of the foregoing items, to allow the OWNER, the ENGINEER, and their authorized representatives sufficient time to schedule attendance at such activities.

1.7 FINAL ADJUSTMENTS OF ACCOUNTS

A. Submit a final statement of accounting to the ENGINEER.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum

2. Additions and deductions resulting from:

a. Previous Change Orders.

b. Allowances

c. Unit Prices

d. Deductions for uncorrected Work

e. Penalties and Bonuses

f. Deductions for re-inspection payments

g. Deductions for liquidated damages

h. Other adjustments

3. Total Contract Sum, as adjusted

4. Previous payments

5. Sum remaining due

C. ENGINEER will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.8 FINAL SUBMITTALS

A. The CONTRACTOR, prior to requesting final payment, shall obtain and submit the following items to the ENGINEER for transmittal to the OWNER:

1. Written guarantees, where required.

2. Technical Manuals and instructions.

3. New permanent cylinders and key blanks for all locks.

4. Maintenance stock items; spare parts; special tools.

5. Completed record drawings.

6. Bonds for maintenance, as required.

7. Certificates of inspection and acceptance by local governing agencies having jurisdiction.

8. Releases from all parties who are entitled to claims against the subject project, property, or improvement pursuant to the provisions of law.

1.9 MAINTENANCE AND GUARANTEE

A. The CONTRACTOR shall comply with the maintenance and guarantee requirements contained in the Contract Documents.

B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the CONTRACTOR which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the CONTRACTOR shall have obtained a statement in writing from the affected private owner or public agency releasing the OWNER from further responsibility in connection with such repair or resurfacing.

C. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order from the OWNER. If the CONTRACTOR fails to make such repairs or replacements promptly, the OWNER reserves the right to do the WORK and the CONTRACTOR and its surety shall be liable to the OWNER for the cost thereof.

1.10 BOND

A. The CONTRACTOR shall provide a bond to guarantee performance of the provisions contained in the Contract Documents.

1.11 FINAL APPLICATION FOR PAYMENT

A. CONTRACTOR shall submit the final Application for Payment in accordance with procedures and requirements stated in the Contract for Construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 77 10 CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Perform cleaning, during progress of Work, and at completion of Work, as required by General Conditions.

1.2 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

1.3 GOOD “HOUSEKEEPING" PRACTICES

A. Contractor shall maintain good housekeeping practices throughout the duration of the project.

B. If the TOWN is dissatisfied with the cleanliness of the site, a written notice to improve cleanliness with specific instructions for improvement may be issued. If the Contractor does not improve cleanliness to the satisfaction of the TOWN, payment may be denied and a separate contractor may be hired to complete Dust Control and Clean-up operations. Denied payments and cost of independent contractor will be subtracted from the lump- sum amount for this pay item and from the retainage amount if necessary, through a change order.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use only those cleaning materials which do not create hazards to health or property and which do not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 DURING CONSTRUCTION

A. Perform periodic cleaning to keep Work, site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.

B. Provide on-site containers for collection of waste materials, debris, and rubbish.

C. Remove waste materials, debris, and rubbish from site daily and dispose of at legal disposal areas away from site.

3.2 DURING CONSTRUCTION

A. Employ skilled personnel for final cleaning.

B. Broom clean exterior paves surfaces and rake clean other surfaces of grounds.

C. Wash and shine glazing and mirrors.

D. Polish glossy surfaces to clear shine

E. Ventilating Systems:

1. Clean permanent filters and replace disposable filters if units were operated during construction.

2. Clean ducts, blowers, and coils if units were operated without filters during construction.

3. Upon completion, provide two spare sets of filters to the OWNER.

F. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.

G. Before Final Completion, or OWNER occupancy, conduct inspection of sight-exposed interior and exterior surfaces, and all Work areas, to verify Work is clean.

H. Remove paving materials and clean all castings, exiting and new after final paving is completed.

I. Clean all drainage structures and drainage components which may have received construction runoff, debris, and contaminants during construction operations.

J. Maintain cleaning until acceptance and occupation by the OWNER.

END OF SECTION

01 77 20 AS-BUILT DOCUMENTS

PART 1 - GENERAL

1.1 THE SUMMARY

A. CONTRACTOR shall maintain and provide the ENGINEER with record documents as specified below, except where otherwise specified.

1.2 MAINTENANCE OF DOCUMENTS

A. Maintain in CONTRACTOR'S field office in clean, dry, legible condition complete sets of the following: Drawings, Specifications, Addenda, approved Shop Drawings, Samples, photographs, Change Orders, other modifications of Contract Documents, test records, survey data, Field Orders, and all other documents pertinent to CONTRACTOR'S Work.

B. Provide files and racks for proper storage and easy access. File in accordance with filing format of Construction Specification Institute (CSI), unless otherwise approved by ENGINEER.

C. Make documents available at all times for inspection by ENGINEER and OWNER.

D. As-built documents shall not be used for any other purpose and shall not be removed from the CONTRACTOR'S office without ENGINEER'S approval.

1.3 MARKING SYSTEM:

A. Provide colored pencils or felt tipped pens for marking changes, revisions, additions and deletions, to the record set of Drawings. Use following color code unless otherwise approved by the ENGINEER:

1. Process and Mechanical: Red

2. Other Printer Notations: Black

1.4 RECORDING

A. Label each document "PROJECT AS-BUILTS" in 2-inch high printed letters.

B. Keep record documents current.

C. Do not permanently conceal any Work until required information has been recorded.

D. Drawings: Mark-up actual installations, which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing the as-built condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at the corresponding location on the contract drawings. Mark-up new

information, which is recognized to be of importance to the OWNER, but was not shown on either the contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize as-built drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, date and other identification of the cover of each set. The following minimum information shall be included, as applicable:.

1. Depths of various elements of foundation in relation to datum.

2. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

3. Location of internal utilities and appurtenances Concealed in construction referenced to visible and accessible features of structure.

4. Field changes of dimensions and details.

5. Changes made by Change Order or Field Order.

6. Details not on original Drawings.

7. Information to be shown for potable water mains, reuse water mains, and sanitary force mains shall include the location of valves, tees, bends and crosses dimensioned to the baseline survey or monument, including the station and offset. Elevations at top of pipe shall be provided every 50' and at locations where design elevations were shown on the plans. For situations where the pipeline is being adjusted to avoid conflicts with other utilities (less than 50' in total length), then elevations shall be provided at the beginning of the deflection (i.e. the first bend), middle of the deflection (i.e. the point where the conflict would have occurred with the utility), and the end of the deflection (i.e. the last bend).

8. Information to be shown for gravity sanitary sewer mains shall include invert elevations at manholes.

9. Information regarding all trenchless technologies horizontal and vertical location including bore/jacking, micro tunneling, and directional drilling. All as-built drawings shall show the geometry, horizontal, and vertical location of the directional drill path including the starting point, end point, and resulting curvatures.

E. Specifications and Addenda: Legibly mark up each Section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

2. Changes made by Change Order or Field Order.

3. Other matters not originally specified.

1.5 SUBMITTAL

A. Upon Substantial Completion of the Work, deliver record drawings to ENGINEER. Final payment will not be made until satisfactory "as-built' drawings are received by ENGINEER.

B. Accompany submittal with transmittal letter containing:

1. Date

2. Project Title and Number

3. CONTRACTOR’s name and address

4. Title and number of each record drawings

5. Certification that each document as submitted is complete and accurate

6. Signature of CONTRACTOR, or his/her authorized representative

C. Final Surveys - The CONTRACTOR shall provide the ENGINEER with two signed and sealed copies by a registered land surveyor and a CD of the final survey in a digital format compatible with Auto CAD 2019 software.

D. CADD Files -The CONTRACTOR shall provide a CD of the "as-built" drawings in a digital format compatible with AutoCAD 2019 software.

E. The CONTRACTOR must submit partial plot files or hard copies of As-Built drawings showing completed work with each partial payment requisition.

F. The CONTRACTOR shall be held responsible for the accuracy of such data and shall bear any costs incurred in finding utilities as a result of incorrect data furnished by the CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

01 77 40 PERMITS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Where permits have been obtained for this Project, copies will be appended at the rear of the Specifications.

B. The Contractor shall be familiar with, and comply with, all requirements of these permits.

C. The Contractor's particular attention is called to any Special Conditions of the permits relating to construction procedures, excavation and backfill requirements, open trench restrictions, turbidity control and all other general and special conditions, including flowable fill and pavement details. In the event any of the conditions of the permits are in conflict with the requirements of these Specifications, the more stringent conditions shall take precedence. The Contractor is to conform to all regulations of the governmental agencies having jurisdiction over this work, whether or not included in the permit.

D. Any deviations from the Plans, Specifications or permits appended thereto, must first be approved by the Engineer even if approval for the change has been given by the permitting agency.

E. The Contractor shall assume throughout the life of the Contract all obligations and responsibilities imposed on TOWN or other AHJ as permittee of the above-mentioned permits. All expenses necessary for compliance with the regulations and requirements of each permitting agency and its permit shall be borne by the Contractor and shall be included in the overall bid price.

F. All surveying required by the Project permits shall be done by the Contractor's Florida Registered Surveyors and Mapper. This includes staking out limits of construction, maintaining baselines and preparing monthly as-builts.

1.2 PERMITS BY TOWN

A. The ENGINEER will obtain permits on behalf of the TOWN from the following agencies:

1. Class II Water Control Permit – Miami-Dade County Water Control Division
2. Drainage Well Permit – Florida Department of Environmental Protection

B. The CONTRACTOR will obtain permits on behalf of the TOWN from the following agencies:

1. Class V Dewatering Permit - Miami-Dade County Water Control Division

C. Copies of these permits will be provided to the CONTRACTOR following award. The CONTRACTOR shall keep copies of these permits on the project site at all times.

D. The CONTRACTOR shall identify and make sure all the necessary permits and licenses are in place prior to the commencement of the WORK. The following table presents a list of state and local organizations and some of the permits that they administer. This list is for reference only and it shall be the CONTRACTOR'S responsibility to identify an obtain all required permits.

AGENCY	PERMIT
Miami-Dade County Department of Environmental Resources (DERM) 111 NW 1st Street Miami, FL 33128 (305)-375-2877	• Class II • Class V
Town of Surfside 9293 Harding Avenue Surfside, FL 33154 (954)-457-1607	• Public Works Permit
South Florida Water Management District 3301 Gun Club Road West Palm Beach, FL 33406 (561)-686-8800	• Form 0445 Mining/Dewatering Permit
Florida Department of Environmental Protection 3900 Commonwealth Boulevard Tallahassee, Florida 32399 (850)-245-2118	• Drainage Well Permit

1.3 PERMIT FEES

A. The OWNER shall be responsible for all permitting fees except for the permits obtained by the ENGINEER as identified in Part 1.2.A.

B. The CONTRACTOR shall be responsible for posting the required security deposit with the TOWN prior to initiating work within TOWN Right of Way.

C. The cost of any fees such as impact fees, inspection fees, etc. and the cost of all required permits shall be borne by the OWNER. The CONTRACTOR shall pay the required fees, obtain the permit(s) and then upon submission of proof of cost to the OWNER, be reimbursed for said cost out of the Approved Permit Fee Reimbursement Item. This shall apply only to required permits and fees. Permits obtained or fees paid for the advantage of the CONTRACTOR or non-required permits obtained for whatever reason shall not be reimbursed. The necessity or non-necessity of a permit or fee shall be determined by the ENGINEER whose word shall be final. As specified in Part 1.1.E, all costs of compliance with the permit(s) shall be borne by the CONTRACTOR and included in the bid price.

1.4 PERMITTING MEETINGS

A. The CONTRACTOR shall schedule, coordinate and attend all meetings as required for applying for and obtaining all required permits.

1.5 PERMITTING SUBMITTALS

A. Within 45 days of the date of the NTP, the CONTRACTOR shall apply for and submit all required documentation including shop drawings and calculations, in full and complete, to obtain all permits required by Laws and Regulation from the agencies having jurisdiction.

B. The CONTRACTOR shall apply for permits and respond to permitting agencies questions and requests for additional information and respond to comments within ten (10) days of receipt from permitting agencies. Within seven (7) days of receipt of permits, the CONTRACTOR shall submit one (1) copy to the ENGINEER and one (1) copy to the OWNER.

C. The CONTRACTOR shall obtain all required permits with 120 calendar days of the NTP.

1.6 PERMIT REQUIREMENTS

A. The CONTRACTOR shall obtain proof of satisfaction of conditions of permit from each agency prior to acceptance of WORK by the TOWN. The CONTRACTOR shall furnish one (1) copy of proof to the ENGINEER and one (1) copy to the OWNER.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

DIVISION 02 – EXISTING CONDITIONS (NOT USED)

DIVISION 03 – CONCRETE

03 60 00 GROUTING

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide grout, complete and in place, in accordance with the Contract Documents

B. The following types of grout are covered in this Section:

1. Cement Grout
2. Non-Shrink Grout - Class I (cement-based)
3. Non-Shrink Grout - Class II (cement-based)
4. Non-Shrink Epoxy Grout
5. Epoxy Anchor Grout for Post Installed Adhesive Anchors
6. Topping Grout and Concrete/Grout Fill
7. Structural Repair Grout

1.2 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with Specification 01 33 00 - Contractor Submittals.

1. Certified testing lab reports for tests indicated herein.
2. Test results and service report from the field tests and the demonstration and training session verifying the requirements indicated herein.
3. Certifications that grouts used on the project contain no chlorides or other chemicals that cause corrosion.
4. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement, curing, and appropriate uses for each type of grout used in the

WORK, and location of use. The current ICC-ES or IAPMO-UES report shall be submitted for all epoxy anchor grouts for adhesive anchors.

5. Manufacturer’s certification that its non-shrink grout does not contain aluminum, zinc, or magnesium powders as a method of expansion.

6. Submit manufacturer's written warranty as indicated herein.

7. Name and telephone number of grout manufacturer's representative who will give on-Site service. The representative shall have at least one year of experience with the indicated grouts.

1.3 QUALITY ASSURANCE

A. Field Tests

1. Compression test specimens will be taken from the first placement of each type of grout, and at intervals thereafter selected by the ENGINEER. The specimens will be made by the ENGINEER or its representative

2. Compression tests and fabrication of specimens for cement grout and cement based non-shrink grout will be performed in accordance with ASTM C 1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink), at intervals during construction selected by the ENGINEER. As a minimum, a set of 3 specimens will be made for testing at 7 Days, 28 Days, and each additional time period as appropriate.

3. Compression tests and fabrication of specimens for epoxy grouts will be performed in accordance with ASTM C 579 – Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes, Method B, at intervals during construction selected by the ENGINEER. A set of 3 specimens will be made for testing at 7 Days and each earlier time period as appropriate.

4. The cost of laboratory tests on grout will be paid by the OWNER except where test results show the grout to be defective. In such case, the CONTRACTOR shall pay for the tests, removal and replacement of Defective Work, and re-testing, all as part of the WORK.

5. The CONTRACTOR shall assist the ENGINEER in obtaining specimens for testing and shall furnish materials necessary for fabricating the test specimens.

B. Pre-Installation Demonstration and Training

1. Cement and Epoxy-Based Non-Shrink Grouts

a. The grout manufacturer shall give a demonstration and training session for the cement based non-shrink and epoxy grouts to be used on the project, before any installation of grout is allowed.

b. Training session shall use a minimum of 5 bags of cement-based non-shrink class I grout mixed to fluid consistency. Tests shall be conducted for flow cone and bleed tests. Six cubes for testing at 1, 3, and 28 Days shall be made. The remaining grout shall be placed, and curing may be initiated on actual project placements such as baseplates and tie holes to provide on-the-job training for the CONTRACTOR and ENGINEER. The CONTRACTOR employees who will be doing the grouting shall participate in this training and demonstration session. The training session shall include methods for curing the grout.

c. The manufacturer shall mix enough cement-based non-shrink class II grout for a minimum of 15 tie holes and shall train the CONTRACTOR'S employees in how to perform the WORK and cure the grout. The CONTRACTOR shall have the employees assisting in the mixing and sealing of the tie holes.

d. If the project includes patching, through bolt holes, epoxy anchors, and/or block outs, the manufacturer shall also train the CONTRACTOR's employees in the mixing and curing of the epoxy grouts for each of these applications.

e. The CONTRACTOR shall transport the test cubes to an independent test laboratory, obtain the test reports, and report these demonstration and training test cube strengths to the ENGINEER.

2. Epoxy Anchor Grout for Adhesive Anchors

a. Special inspection for all adhesive anchor installations shall be provided:

1) As recommended or required by the ICC-ES or IAPMO-UES report.

2) As required by the enforceable building code.

3) As otherwise indicated in the Contract Documents.

b. The most stringent of the above requirements shall be used. The cost of special inspection of adhesive anchors shall be paid for by the OWNER.

c. Before installing adhesive anchors in the WORK, adhesive anchor installers shall be trained and qualified at the Site by the manufacturer's representative. Training and qualification for each installer shall include at least:

1) Hole drilling procedure, hole preparation and cleaning techniques, adhesive injection technique and dispenser training/maintenance, rebar dowel preparation and installation, and proof loading/torqueing.

2) Anchors installed in both the vertical and horizontal positions in a mock-up concrete panel of adequate size and thickness. Anchors shall be tested in tension. A minimum of 3 anchors shall be tested for each installation position.

3) Anchors shall be tested at 2 times the published allowable tension load or 1-1/4 times the maximum design strength of the anchors in tension as indicated in the ICC-ES or IAPMO-UES report. The test load need not exceed 80 percent of the nominal yield strength of the anchor, based on steel strength, as determined by ACI 318 Appendix D.

4) If any of the 3 test bolts in any installation position fail to reach the test loads, the installer shall be re-tested with the same procedure. Re-testing is required only for the failed installation position.

5) An installer who has 3 consecutive successful bolt tests in the first or second trial is considered qualified for adhesive anchor installation for this project. The manufacturer's representative shall issue a certificate to the qualified installer, and a copy of the certificate shall be filed with the CONTRACTOR and be submitted to the ENGINEER.

6) The test anchor size shall be the largest size adhesive anchor used on the project. The anchor embedment length and edge distances shall be adequate to resist the test loads listed above.

7) Each installer shall be re-qualified every 6 months for the duration of the project by the same qualifying procedure.

8) The certification of each qualified installer shall be available for verification at the Special Inspector's request.

9) Defective anchors noted by the Special Inspector shall be replaced and re-installed by the CONTRACTOR without any additional compensation.

1.4 SPECIAL CORRECTION OF DEFECTS PROVISIONS

A. Manufacturer's Warranty

1. Furnish one-year warranty for WORK provided under this section.

2. Manufacturer's warranty shall not contain a disclaimer limiting responsibility to the purchase price of products or materials.

PART 2 - PRODUCTS

2.1 APPLICATION

A. Unless indicated otherwise, grouts shall be provided as listed below whether indicated on the Drawings or not.

Application	Type of Grout
Anchor bolts, anchor rods and reinforcing steel required to be set in grout in which the average working or operating temperature will be over 100 degrees F or in high fire risk areas.	Non-Shrink - Class I
Anchor bolts, anchor rods and reinforcing steel required to be set in grout that is not in high temperature or high fire risk areas.	Epoxy Anchor Grout
Beam and column (1 or 2 story) base plates less than 16-inches in the least dimension.	Non-Shrink - Class I
Column base plates (greater than 2 story or larger than 16-inches in the least dimension)	Non-Shrink - Class II
Storage tanks and other non-motorized equipment and machinery under 30 horsepower	Non-Shrink - Class I
Pumps over 1000 horsepower, unless indicated otherwise	Non-Shrink Epoxy
Filling block out spaces for embedded items such as railing posts, gate guide frames, etc.	Non-Shrink - Class I (Class II where placement time exceeds 20 min.)
Under precast concrete elements	Non-Shrink - Class II
Toppings and concrete/grout fill less than 3-inches thick	Topping Grout
Toppings and concrete/grout fill greater than 3-inches thick	Structural Concrete per 03 31 00
Surface repairs	Cement Grout
Repair of small (largest dimension less than 12 inches) holes and defects in concrete members which are not water bearing and not in contact with soil or another fill material	Non-Shrink - Class I or Non-Shrink - Class II or Structural Repair Grout
Repair of small (largest dimension less than 12 inches) holes and defects in concrete members which are water bearing or in contact with soil or other fill materials	Non-Shrink - Class II or Structural Repair Grout
Repair of large (largest dimension greater than 12 inches) holes and defects in concrete members.	Structural Repair Grout
Any application not listed above, where grout is indicated	Non-Shrink Class I, unless specifically indicated otherwise

2.2 CEMENT GROUT

A. Cement grout shall be composed of one-part cement, 3 parts sand, and the minimum amount of water necessary to obtain the desired consistency. Where needed to match the color of adjacent concrete, white portland cement shall be blended with regular cement as needed. The minimum compressive strength at 28 Days shall be 4000 psi.

2.3 NON-SHRINK GROUTS (cement-based)

A. General

1. Cement-based non-shrink grout shall be a prepackaged, inorganic, fluid, non-gas liberating, non-metallic, cement type grout requiring only the addition of water. Cement from kilns burning metal-rich hazardous waste fuel shall not be used.

2. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of non-shrink grout shall be as recommended by the manufacturer for the particular application.

3. Grout shall not contain chlorides or additives that may contribute to corrosion.

4. Grout shall be formulated to be used at any consistency from fluid to plastic.

5. Cement-based non-shrink grout shall have the following minimum properties when tested at a fluid consistency, at 28 Days:

   a. Minimum tensile splitting strength of 500 psi per ASTM C 496 - Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.

   b. Minimum flexural strength of 1000 psi per ASTM C 580 - Standard Test Method for Flexural Strength and Modulus of ElastiTOWN of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.

   c. Minimum bond strength (concrete to grout) of 1900 psi per modified ASTM C 882 - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.

   d. Grout shall be certified for use in a marine environment.

B. Non-Shrink Grout – Class I

1. Non-Shrink Grout – Class I shall have a minimum 28 Day compressive strength of 5000 psi when mixed at a fluid consistency.

2. Non-Shrink Grout – Class I shall meet the requirements of ASTM C 1107, Grade B or C, when mixed to fluid, flowable, and plastic consistencies.

3. Non-Shrink Grout – Class I shall have a maximum early age height change of 4.0 percent expansion and shall have no shrinkage (0.0 percent) in accordance with ASTM C 827 – Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures. The grout when tested shall not bleed or segregate at maximum allowed water.

4. Non-Shrink Grout – Class I shall have no shrinkage (0.0 percent) and a maximum of 0.3 percent expansion in the hardened state when tested in accordance with ASTM C 1090 – Standard Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout.

5. Furnish certification that the non-shrink property of grout is not based on gas production or gypsum expansion.

6. Non-Shrink Grout – Class I shall be Five Star Grout by Five Star Products, Sikagrout 212 by Sika Corporation, Duragrout by L&M Construction Chemicals; High-Flow Grout by Euclid Chemical Company, CG 200 PC by Hilti, or equal.

C. Non-Shrink Grout – Class II

1. Non-Shrink Grout – Class II shall be a high precision, fluid, extended working time, grout. The minimum 28-Day compressive strength shall be 7500 psi, when mixed at a fluid consistency.

2. Non-Shrink Grout – Class II shall have a maximum early age height change of 4.0 percent expansion and shall have no shrinkage (0.0 percent) in accordance with ASTM C 827.

3. Non-Shrink Grout – Class II shall have no shrinkage (0.0 percent) and a maximum of 0.3 percent expansion in the hardened state when tested in accordance with ASTM C 1090.

4. Non-Shrink Grout – Class II shall have an extended working time of 30 minutes minimum when mixed to a fluid consistency as defined in ASTM C 827 at temperature extremes of 45 to 90 degrees F in accordance with ASTM C 1107.

5. Non-Shrink Grout – Class II shall meet the requirements of ASTM C 1107, Grade B or C when tested using the amount of water needed to achieve fluid consistency per ASTM C 939.

6. The grout when tested shall not bleed or segregate at maximum allowed water content.

7. Provide certification that its non-shrink property is not based on gas production or gypsum expansion.

8. Non-Shrink Grout – Class II shall be Masterflow 928 by BASF, Five Star Fluid Grout 100 by Five Star Products, Crystex by L&M Construction Chemicals, or equal.

2.4 NON-SHRINK EPOXY GROUT

A. Non-shrink epoxy grout shall be a flowable, non-shrink, 100 percent solids system. The epoxy grout system shall have 3 components: resin, hardener, and specially blended aggregate, each premeasured and prepackaged. The resin component shall not contain any non-reactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.

B. Epoxy grout shall have a maximum early age height change of 4.0 percent expansion and shall have no shrinkage (0.0 percent) in accordance with ASTM C 827, (modified for epoxy grouts by using an indicator ball with a specific gravity between 0.9 and 1.1).

C. Epoxy grout shall have a negligible (less than 0.0006 in/in) length change after hardening, and a coefficient of thermal expansion less than 0.00003 in/in F when tested according to ASTM C 531 – Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.

D. The epoxy grout shall develop a minimum compressive strength of 9000 psi in 24 hours and 13,000 psi in seven days when tested in accordance with ASTM C 579, method B.

E. The mixed epoxy grout shall have a minimum working life of 90 to 120 minutes at 70 degrees F.

F. The effective bearing area shall be a minimum of 95 percent EBA in accordance with ASTM C 1339 – Standard Test Method for Flowability and Bearing Area of Chemical-Resistant Polymer Machinery Grouts, for bearing area and flow.

G. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application. Do not reduce aggregate loading or add solvents to increase flowability.

H. Non-shrink epoxy grout shall have the following minimum properties when tested at 7 Days:

   1. Minimum bond strength to concrete of 3000 psi per ASTM C 882 modified.

   2. Minimum bond strength to steel of 1700 psi per ASTM C 882 modified.

   3. Minimum flexural strength of 2500 psi per ASTM C 580.

   4. Minimum tensile strength of 2000 psi per ASTM C 307 -- Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.

I. Non-shrink epoxy grout shall be Five Star DP Epoxy Grout by Five Star Products, Inc., Masterflow 648 CP Plus by BASF, Sikadur 42 Grout-Pak by Sika Corporation, or equal.

2.5 EPOXY ANCHOR GROUT

A. Epoxy anchor grout for use in concrete shall be certified for use in accordance with ICC-ES AC 308.

B. Epoxy anchor grout shall conform to ASTM C 881 – Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete, Type IV, Class B & C, Grade 3 with the exception of gel time.

C. Heat deflection temperature per ASTM D 648 – Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position shall be a minimum 120 degrees F.

D. Manufacturer shall certify that the epoxy anchor grout will maintain 100 percent of its capaTOWN up to a short-term temperature of 110 degrees F and 50 percent of its capaTOWN up to a short-term temperature of 150 degrees F.

E. Grout shall come in a 2 chambered cartridge with a metering system that provides the proper ratio of hardener and resin. The grout shall also come with a static mixer nozzle to thoroughly mix the hardener and resin together.

F. Epoxy anchor grout shall be capable of being used in submerged applications once cured.

G. Compressive strength per ASTM D 695 – Standard Test Method for Compressive Properties of Rigid Plastics shall be 10,000 psi minimum.

H. Whenever possible, overhead anchors subject to vibration, anchors in fire-resistive construction or high fire risk areas, and anchors subject to working or operating temperatures above 100 degrees F shall be cast-in-place anchors. Whenever cast-in-place anchors cannot be used in these applications, use cement based non-shrink grout and oversized holes.

I. Embedment of adhesive anchors/rebar shall be deep enough to develop the anchor/rebar unless otherwise noted on the Contract Documents. Embedment shall not exceed 67 percent of the member depth.

J. Epoxy anchor grout shall be **Pure110+** by **Powers Fasteners; HIT-RE 500-SD** by **Hilti, SET-XP** by **Simpson Strong-Tie**, or equal.

2.6 TOPPING GROUT AND CONCRETE/GROUT FILL

A. Where fill thickness is 3-inches or greater, structural concrete as indicated in Section 03 31 00 - CAST-IN-PLACE CONCRETE, may be used when accepted by the ENGINEER. Fiber reinforcing shall be as indicated below.

B. Grout for topping of slabs and concrete/grout fill for built-up surfaces of tank, channel, and basin bottoms shall be composed of cement, fine aggregate, coarse aggregate, water, and admixtures proportioned and be mixed as indicated. Materials and procedures indicated for structural concrete in Section 03 31 00 - CAST-IN-PLACE CONCRETE, shall apply unless indicated otherwise.

C. Topping grout and concrete/grout fill shall contain a minimum of 564 pounds of cement per cubic yard with a maximum water cement ratio of 0.45.

D. Coarse aggregate shall be graded as follows:

U.S. Standard Sieve Size	Percent By Weight Passing
1/2 in	100
3/8 in	90-100
No. 4	20-55
No. 8	5-30
No. 16	0-10
No. 30	0

E. Strength: Minimum compressive strength of topping grout and concrete/grout fill at 28 Days shall be 4000 psi.

F. Topping grout used in clarifiers or where the fill thickness is 3 inches or greater shall contain fiber reinforcing, unless otherwise shown on the Contract Documents. Fiber shall be 100 percent virgin polypropylene fibrillated fibers specifically manufactured in a blended gradation for use as concrete secondary reinforcement. Fibers shall be added at a rate of 1.5 pounds per cubic yard of concrete. Fibers shall conform to ASTM C 1116 – Standard Specification for Fiber-Reinforced Concrete, Type III.

2.7 STRUCTURAL REPAIR GROUT

A. Structural repair grout shall be an extended set, pre-packaged cement-based mortar requiring only the addition of potable water. The material shall not contain any chlorides or lime other than the amounts contained within the hydraulic cement composition.

B. Structural repair grout shall have a minimum compressive strength per ASTM C 109 of 6,000 psi at 7 days.

C. Structural repair grout shall have a minimum bond strength per ASTM C 882 of 2,000 psi at 1 day.

D. For repairs larger than 2 cubic feet in volume, the structural repair grout may be extended by the addition of clean, damp, coarse aggregate per the manufacturer's written recommendations.

E. Structural repair grout shall be Structural Concrete ES by Five Star Products, or equal.

2.8 CONSISTENCY

A. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency is defined such that the grout is plastic and moldable but will not flow. Where "dry pack" is called for in the Contract Documents, it shall mean a grout of that consistency; the type of grout to be used shall be as indicated herein for the particular application.

B. The slump for topping grout and concrete/grout fill shall be adjusted to match placement and finishing conditions but shall not exceed 4-inches.

2.9 MEASUREMENT OF INGREDIENTS

A. Measurements for cement grout shall be made accurately by volume using containers. Shovel measurements shall not be allowed.

B. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

PART 3 - EXECUTION

3.1 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Grout shall be stored in accordance with manufacturer's recommendations.

3.2 GENERAL

A. CONTRACTOR shall arrange for the manufacturer of prepackaged grouts to provide on-Site technical assistance within 72 hours of request, as part of the WORK.

B. Grout shall not be placed until base concrete or masonry has attained its design strength, unless authorized otherwise by the ENGINEER.

C. When cementitious grouts are used on concrete surfaces, the concrete surface shall be saturated with water for 24 hours prior to placement. Upon completion of the saturation period, excess water shall be removed with clean, oil free compressed air prior to grouting. Concrete substrate shall not be wet prior to placement of epoxy grouts.

D. Surfaces that will be in contact with grout shall be free of dirt, loose rust, oil, wax, grease, curing compounds, laitance, loose concrete, and other deleterious materials.

E. Shade the WORK from sunlight for at least 24 hours before and 48 hours after grouting.

F. Contact the grout manufacturer's representative for assistance on hot and cold weather grouting techniques and precautions if applicable.

3.3 GROUTING PROCEDURES

A. General: Mixing, surface preparation, handling, placing, consolidation, curing, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

B. Structural, equipment, tank, and piping support bases shall be grouted, unless indicated otherwise.

1. The original concrete shall be blocked out or finished off a sufficient distance below the plate to provide for a minimum one-inch thickness of grout or other thickness if indicated.

2. After the base plate has been set in position at the proper elevation by steel wedges or double nuts on the anchor bolts, the space between the bottom of the plate and the original pour of concrete shall be filled with non-shrink-type grout through a headbox of appropriate size. The mixture shall be of a fluid consistency and poured continuously into the space between the plate and the base concrete. Forms for grout shall be tight against retaining surfaces, and joints shall be sealed as recommended by the grout manufacturer to be liquid-tight. Forms shall be coated as recommended by the grout manufacturer for easy form release. Where this method of placement is not practical or where required by the ENGINEER, alternate grouting methods shall be submitted by the CONTRACTOR for acceptance by the ENGINEER.

3. Concrete equipment pads for equipment bases that will be epoxy-grouted shall be sized so that, when the equipment base is fully grouted, the epoxy grout is stopped not less than 4-inches from the edge of the pad.

C. Drilled Anchors and Reinforcing Bars

1. General

a. Drilled anchors and reinforcing bars shall be installed in strict accordance with the manufacturer's instructions and applicable ICC-ES or IAPMO-UES report requirements. Holes shall be drilled, brushed and cleaned in accordance with the manufacturer’s instructions. Drilled anchors shall be installed in concrete having a minimum age of 21 days at the time of anchor installation. Anchors shall not be loaded until the grout has cured for the full cure time indicated by the manufacturer and reached its indicated strength in accordance with the manufacturer's instructions.

b. The CONTRACTOR shall identify the position of reinforcing steel and other embedded items prior to drilling holes. Care shall be exercised in drilling to avoid damaging existing reinforcing or embedded items. The location of drilled holes shall be adjusted to avoid drilling through or cutting any existing reinforcing bars or embedded items. Notify the ENGINEER if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and communications conduit, and piping.

2. The following requirements apply to adhesive anchors installed using cement based non-shrink grout and epoxy anchor grout:

   a. Unless otherwise indicated, when adhesive anchors are used to resist tensile forces in structural applications, the minimum depth of embedment shall be greater than or equal to the development length (ld) determined in accordance with ACI 318 for a cast in place reinforcing bar of the same diameter and grade, unless it can be shown by calculation that the anchor spacing and edge distance is sufficient to develop the tensile strength of the anchor in a lesser depth of embedment. Calculations shall be submitted in accordance with Specification 01 33 00 - Contractor Submittals.

   b. Core drilling of holes is not allowed.

   c. Relocation of drilled holes and adjustments or modifications to anchored or fastened items shall be considered part of the WORK and shall be provided at no additional cost to the OWNER.

   d. All abandoned drilled holes shall be filled with Epoxy Anchor Grout.

3. Epoxy Adhesive Anchors

   a. Grout shall be proportioned and mixed per the manufacturer’s instructions.

   b. Holes shall be dry.

4. Cement Based Non-Shrink Grout used for Anchorage

   a. In places of high temperature or fire hazard, anchor bolts and anchor rods shall be grouted in using cement based non-shrink grout, Class I.

   b. When the anchor bolt or anchor rod diameter is one-inch or less, the hole diameter shall be a minimum of 2-inches. When the anchor bolt/rod diameter is greater than one-inch, the hole diameter shall be at least twice the anchor bolt/rod diameter.

   c. Drilled holes shall be saturated with water for not less than 24 hours before installation of anchor/rod/rebar.

d. The non-shrink grout shall be placed in the holes in a non-sag (trowelable) consistency. The grout shall be placed in the holes before the anchor bolt/rod and then the anchor bolt/rod inserted and vibrated to ensure proper coverage.

D. Topping Grout and Concrete/Grout Fill

1. Mechanical, electrical, and finish WORK shall be completed prior to placement of topping or concrete/grout fill. To ensure bonding to the base slab, the base slab shall be given an exposed aggregate finish. Alternatively, where accepted by the ENGINEER, the base slab shall be given a roughened textured surface by a close-spaced rake while the surface is green. After curing, high pressure washing shall expose the aggregates and produce not less than a 3/16-inch amplitude roughness. Jackhammers or chipping hammers shall not be used.

2. The minimum thickness of grout topping, and concrete/grout fill shall be one inch. Where the finished surface of concrete/grout fill is to form an intersecting angle of less than 45 degrees with the concrete surface it is to be placed against, a key shall be formed in the concrete surface at the intersection point. The key shall be a minimum of 3-1/2 inches wide by 1-1/2 inches deep.

3. The base slab shall be thoroughly cleaned and wetted to saturated surface dry (SSD) condition per the International Concrete Repair Institute (ICRI) -- Technical Guide for Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays, prior to placing topping and fill. No topping concrete shall be placed until the slab is completely free from standing pools or ponds of water. A thin coat of neat cement grout shall be broomed into the surface of the slab just before topping or fill placement. The neat cement grout shall not be allowed to dry before topping placement. If it does dry, it must be immediately removed using wet stiff brooms and reapplied. The topping and fill shall be compacted by rolling or thorough tamping, brought to established grade, and floated. Grouted fill for tank and basin bottoms where scraping mechanisms are to be installed shall be screeded by blades attached to the revolving mechanism of the equipment in accordance with the procedures outlined by the equipment manufacturer after the grout is brought to the established grade. Coat surface with evaporation retardant as needed to prevent plastic shrinkage cracks.

4. Topping grout placed on sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the placement.

5. The surface shall be tested with a straight edge to detect high and low spots which shall be immediately eliminated. When the topping or fill has hardened sufficiently, it shall be steel troweled to a smooth surface free from pinholes and other imperfections. An approved type of mechanical trowel may be used as an assist in this operation, but the last pass over the surface shall be by hand-troweling. During finishing, no water, dry cement, or mixture of dry cement and sand shall be applied to the surface.

6. As soon as topping or fill finishing is completed, coat surface with curing compound. After the topping is set and sufficiently hard in clarifiers and where required by the ENGINEER, the tank shall be filled with sufficient water to cover the entire floor for 14 days.

3.4 CONSOLIDATION

A. Grout shall be placed in such a manner, for the consistency necessary for each application, to assure that the space to be grouted is completely filled.

END OF SECTION

DIVISION 04 – MASONRY (NOT USED)

DIVISION 05 – METALS

05 50 00 MISCELLANEOUS METALWORK

PART 1 - GENERAL

1.1 THE SUMMARY

A. Provide miscellaneous metalwork and appurtenances, complete and in place, as indicated in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards

AA-M32C22A41	Aluminum Association.
AASHTO HS-20	Truck Loading
AISC	Manual of Steel Construction
AISI	Design of Light Gauge, Cold-Formed Steel Structural Members
ASTM A 36	Carbon Structural Steel
ASTM A 48	Gray Iron Castings
ASTM A 123	Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153	Zinc Coating (Hot Dip) on Iron and Steel Hardwar
ASTM A 193	Alloy Steel and Stainless-Steel Bolting Materials for High Temperature Service
ASTM A 194	Carbon and Alloy Steel Nuts for Bolts for High Pressure and High Temperature
ASTM A 307	Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
ASTM A 325	Structural Bolts, Steel, Heat Treated, 120/105 ksi minimum Tensile

ASTM A 500	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A 992	Steel for Structural Shapes for Use in Building Framing
ASTM F 1554	Standard Specification for Anchor Bolts, Steel 36,55, and 105-k Yield Strength
ANSI/AWS D1.1	Structural Welding Code – Steel
ANSI/AWS D1.2	Structural Welding Code – Aluminum
ANSI/AWS QC1	Qualification and Certification of Welding Inspectors

1.3 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with the requirements of Specification 01 33 00 – Contractor Submittals

B. Shop Drawings

1. Shop Drawings shall conform to AISC recommendations and specifications, and shall show holes, and the like, as may be required for other parts of the WORK.

1.4 QUALITY ASSURANCE

A. Weld procedures and welder qualifications shall be available in the CONTRACTOR's field office for review.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Steel

Wide Flange Shapes	ASTM A 992
Shapes, Plates, Bars	ASTM A 36
Pipe, Pipe Columns, Bollards	ASTM A 53, Type E or S, Grade B standard weight unless indicated otherwise
HSS	ASTM A 500 Grade B

B. Corrosion Protection

1. Unless otherwise indicated, fabricated steel metalwork which will be used in a corrosive environment and/or will be submerged in water or wastewater shall be coated in accordance with the requirements of Section 09 96 00 – Protective Coating and shall not be galvanized prior to coating.

2. Other miscellaneous steel metalwork shall be hot-dip galvanized after fabrication.

C. Stainless Steel

1. Unless otherwise indicated, stainless steel metalwork and bolts shall be fabricated from Type 316 Stainless Steel

D. Aluminum

1. Unless otherwise indicated, aluminum metalwork shall be fabricated from Alloy 6061-T6.

2. Aluminum in contact with concrete, masonry, wood, porous materials, or dissimilar metals shall have contact surfaces coated in accordance with the requirements of Section 09 96 00 – Protective Coating.

E. Cast Iron

1. Unless otherwise indicated, iron castings shall conform to the requirements of ASTM A 48, Class 50B, or better.

2.2 IRON CASTINGS

A. General:

1. Iron castings shall be of uniform quality, free from blowholes, porosity, hard spots, shrinkage, distortion, or other defects.

2. The castings shall be smooth and well cleaned by shot blasting.

3. Covers and grates shall fit together evenly, such that the cover fits flush with the surrounding finished surface and such that the cover does not rock or rattle when a loading is applied.

4. Round covers and frames shall be provided with machined bearing surfaces.

B. Covers and grates with matching frames shall be provided with machined bearing surfaces.

1. Where located within a structure, the design loading shall match that required for the adjacent floor area, or, if no floor loading is indicated, a minimum of 300 pounds per square foot.
2. Exterior covers and grates shall be designed for AASHTO HS-20 loading unless indicated otherwise.

2.3 BOLTS AND ANCHORS

A. Standard Service (Non-Corrosive Application)

1. Unless otherwise indicated, bolts, anchor bolts, washers, and nuts shall be fabricated from steel as indicated.

2. Threads on galvanized bolts and nuts shall be formed with suitable taps and dies such that they retain their normal clearance after hot-dip galvanizing.

3. Except as otherwise indicated, steel for bolt material, and cap screws shall be in accordance with the following requirements:

4. Pipe and Equipment Flange Bolts: ASTM A 193, Grade B-7

B. Corrosive Service

1. Bolts, nuts, and washers in locations listed below shall be fabricated from stainless steel as indicated.

   a. Buried locations

   b. Inside buried vaults, manholes, and structures that do not drain through a gravity sewer or to a sump with a pump.

   c. Locations indicated or designated by the ENGINEER to be provided with stainless steel bolts.

2. Unless otherwise indicated, stainless steel bolts, anchor bolts, nuts, and washers shall be fabricated from Type 316 stainless steel, Class 2, conforming to ASTM A 193 for bolts and to ASTM A 194 for nuts. Buried pipe flange bolts and nuts on pipe of Class 275 and greater shall be in accordance with ASTM A193/A194, Grade B7.

3. Coating

   a. Threads on stainless steel bolts shall be protected with an anti-seize lubricant suitable for submerged stainless-steel bolts, meeting government specification MIL-A-907E.

   b. Buried bolts in poorly drained soil shall be coated the same as the buried pipe.

c. Anti-seize lubricant shall be classified as acceptable for potable water use by the NSF.

d. Anti-seize lubricant shall be "PURE WHITE" by Anti-Seize Technology, Franklin Park, IL, 60131, AS-470 by Dixon Ticonderoga Company, Lakehurst, NJ, 08733, or equal.

4. Bolt Requirements

a. The bolt and nut material shall be free-cutting steel.

b. The nuts shall be capable of developing the full strength of the bolts.

c. Threads shall be Coarse Thread Series conforming to the requirements of the American Standard for Screw Threads.

d. Bolts and cap screws shall have hexagon heads and nuts shall be Heavy Hexagon Series.

e. Bolts and nuts shall be installed with washers fabricated from material matching the base material of bolts, except that hardened washers for high-strength bolts shall conform to the requirements of the AISC Specification.

f. Lock washers fabricated from material matching the bolts shall be installed where indicated.

g. The length of each bolt shall be such that the bolt extends at least 1/8 inch beyond the outside face of the nut before tightening, except for anchor bolts which shall be flush with the face of the nut before tightening.

2.4 CONTRACTOR SUBMITTALS

A. Shop Drawings

1. Shop Drawings shall conform to AISC recommendations and specifications, and shall show holes, and the like, as may be required for other parts of the WORK.

2. Shop Drawings shall include complete details of members and connections, anchor bolt layouts, schedules for fabrication procedures, and diagrams for the sequence of erection.

2.5 QUALITY ASSURANCE

A. Weld procedures and welder qualifications shall be available in the CONTRACTOR's field office for review.

PART 3 - EXECUTION

3.1 FABRICATION AND INSTALLATION REQUIREMENTS

A. Fabrication and Erection: Except as otherwise indicated, the fabrication and erection of structural steel shall conform to the requirements of the American Institute of Steel Construction "Manual of Steel Construction."

3.2 WELDING

A. Method

1. Welding shall be performed by the metal-arc method or gas-shielded arc method as described in the American Welding Society "Welding Handbook" as supplemented by other pertinent standards of the AWS.

2. The qualification of the welders shall be in accordance with the AWS Standards.

B. Quality

1. In assembly and during welding, the component parts shall be adequately clamped, supported, and restrained in order to minimize distortion and for control of dimensions.

2. Weld reinforcement shall be as indicated by the AWS Code.

3. Upon completion of welding, remove weld splatter, flux, slag, and burrs left by attachments.

4. Welds shall be repaired in order to produce a workmanlike appearance, with uniform weld contours and dimensions.

5. Sharp corners of material that is to be painted or coated shall be ground to a minimum of 1/32 inch on the flat.

3.3 GALVANIZING

A. Structural steel plates shapes, bars, and fabricated assemblies required to be galvanized shall, after the steel has been thoroughly cleaned of rust and scale, be galvanized in accordance with the requirements of ASTM A 123.

B. Any galvanized part that becomes warped during the galvanizing operation shall be straightened.

C. Bolts, anchor rods, anchor bolts, nuts, and similar threaded fasteners, after being properly cleaned, shall be galvanized in accordance with the requirements of ASTM A 153.

D. Field Repairs

1. Field repairs to damaged galvanizing shall be performed by preparing the surface and applying a coating.
2. Surface preparation shall consist of removing oil, grease, soil, and soluble material by cleaning with water and detergent (SSPC SP1) followed by brush-off blast cleaning (SSPC SP7) over an area extending at least 4 inches into the undamaged area.

3. The coating shall be applied to at least 3 mils dry film thickness, and shall be **Zinc-Clad XI** by **Sherwin-Williams**, **Galvax** by **Alvin Products**, **Galvite** by **ZRC Worldwide**, or equal.

END OF SECTION

DIVISION 06 – WOOD AND PLASTICS (NOT USED)

DIVISION 07 – THERMAL AND MOISTURE PROTECTION (NOT USED)

DIVISION 08 – OPENINGS (NOT USED)

DIVISION 09 – FINISHES

09 96 00 PROTECTIVE COATING

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide protective coatings, complete and in place, in accordance with the Contract Documents.

B. Definitions

1. The term "paint," "coatings," or "finishes" as used herein, shall include surface treatments, emulsions, enamels, paints, epoxy resins, and other protective coatings, excepting galvanizing or anodizing, whether used as a pretreatment, primer, intermediate coat, or finish coat.

2. The term "DFT" means minimum dry film thickness, without any negative tolerance.

C. The following surfaces shall not be coated:

1. Concrete, unless required by items on the concrete coating schedule below or the Drawings.

2. Stainless steel

3. Machined surfaces

4. Grease fittings

5. Glass

6. Equipment nameplates

7. Platform gratings, stair treads, door thresholds, and other walk surfaces, unless specifically indicated to be coated.

8. Platform gratings, stair treads, door thresholds, and other walk surfaces, unless specifically indicated to be coated.

D. The coating system schedules summarize the surfaces to be coated, the required surface preparation, and the coating systems to be applied. Coating notes on the Drawings are used to show or extend the limits of coating schedules, to show exceptions to the schedules, or to clarify or show details for application of the coating systems.

1.2 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with Specification 01 33 00 – Contractor Submittals.

B. Submittals shall include the following information and be submitted at least 30 Days prior to commencing protective coating WORK:

1. Materials List: Eight copies of a coating materials list showing the manufacturer and the product number, keyed to the coating systems herein. The list shall be submitted prior to or at the time of submitting samples.

2. Manufacturer's Information: For each coating system to be used, the following data:

a. Manufacturer's data sheet for each product proposed, including statements on the suitability of the material for the intended use.

b. Technical and performance information that demonstrates compliance with the system performance and material requirements.

c. Paint manufacturer's instructions and recommendations on surface preparation and application.

d. Colors available for each product (where applicable).

e. Compatibility of shop and field applied coatings (where applicable).

f. Material Safety Data Sheet for each product proposed.

C. Samples

1. Samples of paint, finishes, and other coating materials shall be submitted on 8-1/2 inch by 11-inch sheet metal. Each sheet shall be completely coated over its entire surface with one protective coating material, type, and color.

2. Two sets of color samples to match each color selected by the ENGINEER from the manufacturer's standard color sheets. If custom mixed colors are indicated, the color

samples shall be made using color formulations prepared to match the color samples furnished by the ENGINEER. The color formula shall be shown on the back of each color sample.

3. One 5-pound sample of each abrasive proposed to be used for surface preparation for submerged and severe service coating systems.

4. The manufacturer shall state whether or not it has verified that the CONTRACTOR is going to use the proper mixing, coating application, heating, and environmental control equipment for the specified coating products. Only heated plural component equipment shall be used for the 100% solids coating application. Equipment shall be capable of performing a ratio test.

5. The Shop Coating Applicator shall provide SSPC QP 3 Certification or the coating manufacturer's certification of the applicator for selected coating system.

PART 2 - PRODUCTS

2.1 GENERAL

A. Suitability: The CONTRACTOR shall use suitable coating materials as recommended by the manufacturer. Materials shall comply with Volatile Organic Compound (VOC) limits applicable at the Site.

B. Material Sources: Where manufacturers and product numbers are listed, it is to show the type and quality of coatings that are required. If a named product does not comply with VOC limits in effect at the time of Bid opening, that product will not be accepted, and the CONTRACTOR shall propose a substitution product of equal quality that does comply. Proposed substitute materials will be considered as indicated below.

C. Compatibility: In any coating system only compatible materials from a single manufacturer shall be used in the WORK. Particular attention shall be directed to compatibility of primers and finish coats. If necessary, a barrier coat shall be applied between existing prime coat and subsequent field coats to ensure compatibility.

D. Containers: Coating materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, and name of manufacturer, all of which shall be plainly legible at the time of use.

E. Colors: Colors and shades of colors of coatings shall be as indicated or selected by the ENGINEER.

F. Substitute or "Or-Equal" Products

1. To establish equality under Specification 01 60 00 - Products, Materials, Equipment and Substitutions, the CONTRACTOR shall furnish satisfactory documentation from

the manufacturer of the proposed substitute or "or-equal" product that the material meets the indicated requirements and is equivalent or better in the following properties:

a. Minimum and maximum recoat times

b. Minimum and maximum cure time for immersion

c. Abrasion resistance per ASTM D4060 using CS17 Wheel

d. Maximum and minimum dry film thickness per coat

e. Compatibility with other coatings

f. Suitability for the intended service

g. Resistance to chemical attack

h. Temperature limitations during application and in service

i. Type and quality of recommended undercoats and topcoats

j. Ease of application

k. Ease of repairing damaged areas

l. Stability of colors

2. Protective coating materials shall be standard products produced by recognized manufacturers who are regularly engaged in production of such materials for essentially identical service conditions. When requested, the CONTRACTOR shall provide the ENGINEER with the names of not less than 10 successful applications of the proposed manufacturer's products that comply with these requirements.

3. If a proposed substitution requires changes in the WORK, the CONTRACTOR shall bear such costs involved as part of the WORK.

2.2 COATING SYSTEMS

A. Above ground piping and piping with manholes shall be painted with Tnemec.

B. System 106 – Fusion Bond Epoxy

1. Material

Type	100 Percent Solids Fusion Bond Epoxy
Demonstrated suitable for	Fluidized bed or electrostatic spray application, recommended for pumps, valves, pipe appurtenances, tanks, pipe hangers, flow meters, and hydrants
Certification requirement	NSF 61

2. Application in accordance with AWWA C213 and the following:

Type	100 Percent Solids Fusion Bond Epoxy
Demonstrated suitable for	Fluidized bed or electrostatic spray application, recommended for pumps, valves, pipe appurtenances, tanks, pipe hangers, flow meters, and hydrants
Certification requirement	NSF 61

PART 3 - EXECUTION

3.1 MANUFACTURER'S SERVICES

A. The CONTRACTOR shall require the protective coating manufacturer to furnish a qualified technical representative to visit the Site for technical support as may be necessary to resolve field problems.

3.2 WORKMANSHIP

A. Skilled craftsmen and experienced supervision shall be used on coating WORK.

B. Coating shall be done in a workmanlike manner so as to produce an even film of uniform thickness. Edges, corners, crevices, and joints shall receive special attention to insure thorough surface preparation. The finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks, and variations in color, texture, and finish. The hiding shall be so complete that the addition of another coat would not increase the hiding. Special attention shall be given so that edges, corners, crevices, welds, and similar areas receive a film thickness equivalent to adjacent areas, and installations shall be protected by the use of drop cloths or other precautionary measures.

C. Damage to other surfaces resulting from the WORK shall be cleaned, repaired, and refinished to original condition.

3.3 STORAGE, MIXING, AND THINNING OF MATERIALS

A. Manufacturer's Recommendations: Unless otherwise indicated, the coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protecting its coating materials, for preparation of surfaces for coating, and for other procedures relative to coating shall be strictly observed.

B. Coating materials shall be used within the manufacturer's recommended shelf life.

C. Storage and Mixing: Coating materials shall be stored under the conditions recommended by the Product Data Sheets, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Coatings from different manufacturers shall not be mixed together.

3.4 PREPARATION FOR COATING

A. General: Surfaces to receive protective coatings shall be prepared as indicated prior to application of coatings. The CONTRACTOR shall examine surfaces to be coated and shall correct surface defects before application of any coating material. Marred or abraded spots on shop-primed and on factory-finished surfaces shall receive touch-up restoration prior to any field coating application. Surfaces to be coated shall be dry and free of visible dust.

B. Protection of Surfaces Not to be Coated: Surfaces that are not to receive protective coatings shall be protected during surface preparation, cleaning, and coating operations.

C. Hardware, lighting fixtures, switch plates, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not to be painted shall be removed, masked, or otherwise protected. Drop cloths shall be provided to prevent coating materials from falling on or marring adjacent surfaces. The working parts of mechanical and electrical equipment shall be protected from damage during surface preparation and coating operations. Openings in motors shall be masked to prevent entry of coating or other materials.

D. Care shall be exercised not to damage adjacent WORK during blasting operations. Spraying shall be conducted under carefully controlled conditions. The CONTRACTOR shall be fully responsible for and shall promptly repair any and all damage to adjacent WORK or adjoining property occurring from blasting or coating operations.

E. Protection of Painted Surfaces: Cleaning and coating shall be coordinated so that dust and other contaminants from the preparation process will not fall on wet, newly coated surfaces.

3.5 SURFACE PREPARATION STANDARDS

A. The following referenced surface preparation specifications of the Steel Structures Painting Council shall form a part of this specification:

1. Solvent Cleaning (SSPC SP1): Removal of oil, grease, soil, salts, and other soluble contaminants by cleaning with solvent, vapor, alkali, emulsion, or steam.

2. White Metal Blast Cleaning (SSPC SP5): Removal of all visible rust, oil, grease, soil, dust, mill scale, paint, oxides, corrosion products and foreign matter by blast cleaning.

3. Near-White Blast Cleaning (SSPC SP10): Removal of all visible oil, grease, soil, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except that staining shall be limited to no more than 5 percent of each square inch of surface area.

3.6 FERROUS METAL SURFACED PREPARATION (UNGALVANIZED)

A. The minimum abrasive blasting surface preparation shall be as indicated in the coating system schedules included at the end of this Section. Where there is a conflict between these requirements and the coating manufacturer's printed recommendations for the intended service, the higher degree of cleaning shall apply.

B. Workmanship for metal surface preparation shall be in conformance with the current SSPC Standards and this Section. Blast-cleaned surfaces shall match the standard samples available from the National Association of Corrosion Engineers, NACE Standard TM-01-70 - Visual Standard for Surfaces of New Steel Air Blast Cleaned with Sand Abrasive and TM-01-75 - Visual Standard for Surfaces of New Steel Centrifugally Blast Cleaned with Steel Grit.

C. Oil, grease, welding fluxes, and other surface contaminants shall be removed by solvent cleaning per SSPC SP1 - Solvent Cleaning prior to blast cleaning.

D. Sharp edges shall be rounded or chamfered, and burrs and surface defects and weld splatter shall be ground smooth prior to blast cleaning.

E. The type and size of abrasive shall be selected to produce a surface profile that meets the coating manufacturer's recommendation for the particular product and service conditions. Abrasives for submerged and severe service coating systems shall be clean, hard, sharp cutting crushed slag. Automated blasting systems shall not be used for surfaces that will be in submerged service. Metal shot or grit shall not be used for surfaces that will be in submerged service, even if subsequent abrasive blasting will use hard, sharp cutting crushed slag.

F. Abrasive shall not be reused unless an automated blasting system is used for surfaces that will be in non-submerged service. For automated blasting systems, clean oil-free abrasives shall be maintained. The abrasive mix shall include at least 50 percent grit.

G. The CONTRACTOR shall comply with the applicable federal, state, and local air pollution control regulations for blast cleaning.

H. Compressed air for air blast cleaning shall be supplied at adequate pressure from well-maintained compressors equipped with oil and moisture separators that remove at least 95 percent of the contaminants.

I. Surfaces shall be cleaned of dust and residual particles of the cleaning operation by dry air blast cleaning, vacuuming, or another approved method prior to painting.

J. Enclosed areas and other areas where dust settling is a problem shall be vacuum cleaned and wiped with a tack cloth.

K. Damaged or defective coating shall be removed by the blast cleaning to meet the clean surface requirements before recoating.

L. If the required abrasive blast cleaning will damage adjacent WORK, the area to be cleaned is less than 100 square feet, and the coated surface will not be submerged in service, then SSPC SP2 or SSPC SP3 may be used.

M. Shop-applied coatings of unknown composition shall be completely removed before the indicated coatings are applied. Valves, castings, ductile or cast-iron pipe, and fabricated pipe or equipment shall be examined for the presence of shop-applied temporary coatings. Temporary coatings shall be completely removed by solvent cleaning per SSPC SP1 before the abrasive blast cleaning has been started.

N. Shop primed equipment shall be solvent cleaned in the field before finish coats are applied.

3.7 FERROUS METAL SURFACE PREPARATION (GALVANIZED)

A. Galvanized ferrous metal shall be alkaline cleaned per SSPC SP1 to remove oil, grease, and other contaminants detrimental to adhesion of the protective coating system, followed by brush off blast cleaning per SSPC SP7.

B. Pretreatment coatings of surfaces shall be in accordance with the printed recommendations of the coating manufacturer.

3.8 SURFACE PREPARATION OF FERROUS SURFACES WITH EXISTING COATINGS

A. General: Grease, oil, heavy chalk, dirt, or other contaminants shall be removed by solvent or detergent cleaning prior to abrasive blast cleaning. The generic type of the existing coatings shall be determined by laboratory testing.

B. Abrasive Blast Cleaning: The CONTRACTOR shall provide the degree of cleaning indicated in the coating system schedule for the entire surface to be coated. If the degree of cleaning is not indicated in the schedule, deteriorated coatings shall be removed by abrasive blast cleaning to SSPC SP6. Areas of tightly adhering coatings shall be cleaned to SSPC SP7, with the remaining thickness of existing coating not to exceed 3-mils.

C. Incompatible Coatings: If coatings to be applied are not compatible with existing coatings the CONTRACTOR shall apply intermediate coatings per the manufacturer's recommendation for the indicated coating system or shall completely remove the existing coating prior to abrasive blast cleaning. A small trial application shall be conducted for compatibility prior to painting large areas.

D. Unknown Coatings: Coatings of unknown composition shall be completely removed prior to application of new coatings.

E. Water Abrasive or Wet Abrasive Blast Cleaning: Where indicated or where Site conditions do not permit dry abrasive blasting for industrial coating systems due to dust or air pollution considerations, water abrasive blasting or wet abrasive blasting may be used. In both methods, paint-compatible corrosion inhibitors shall be used, and coating application shall begin as soon as the surfaces are dry. Water abrasive blasting shall be done using high pressure water with sand injection. In both methods, the equipment used shall be commercially produced equipment with a successful service record. Wet blasting methods shall not be used for submerged or severe service coating systems unless indicated.

3.9 SHOP COATING REQUIREMENTS

A. Unless otherwise indicated, items of equipment or parts of equipment which are not submerged in service shall be shop-primed and then finish-coated in the field after installation with the indicated or selected color. The methods, materials, application equipment, and other details of shop painting shall comply with this Section. If the shop primer requires top coating within a specific period of time, the equipment shall be finish-coated in the shop and then be touched up after installation.

B. Items of equipment or parts and surfaces of equipment which are submerged or inside an enclosed hydraulic structure when in service, with the exception of pumps and valves, shall have surface preparation and coating performed in the field.

C. The interior surfaces of steel water reservoirs, except for Part A surfaces, shall have surface preparation and coating WORK performed in the field.

D. For certain pieces of equipment, it may be undesirable or impractical to apply finish coatings in the field. Such equipment may include engine generator sets, equipment such as electrical control panels, switchgear or main control boards, submerged parts of pumps, ferrous metal passages in valves, or other items where it is not possible to obtain the indicated quality in the field. Such equipment shall be primed and finish-coated in the shop and touched up in the field with the identical material after installation. The CONTRACTOR shall require the manufacturer of each such piece of equipment to certify as part of its Shop Drawings that the surface preparation is in accordance with these specifications. The coating material data sheet shall be submitted with the Shop Drawings for the equipment.

E. For certain small pieces of equipment, the manufacturer may have a standard coating system that is suitable for the intended service conditions. In such cases, the final

determination of suitability will be made during review of the Shop Drawing submittals. Equipment of this type generally includes only indoor equipment such as instruments, small compressors, and chemical metering pumps.

F. Shop-painted surfaces shall be protected during shipment and handling by suitable provisions including padding, blocking, and the use of canvas or nylon slings. Primed surfaces shall not be exposed to the weather for more than 2 months before being top coated or less time if recommended by the coating manufacturer.

G. Damage to shop-applied coatings shall be repaired in accordance with this Section and the coating manufacturer's printed instructions.

H. The CONTRACTOR shall make certain that the shop primers and field topcoats are compatible and meet the requirements of this Section. Copies of applicable coating manufacturer's data sheets shall be submitted with equipment Shop Drawings.

3.10 APPLICATION OF COATINGS

A. The application of protective coatings to steel substrates shall be in accordance with SSPC PA1 - Paint Application Specification No. 1.

B. Cleaned surfaces and each coat shall be inspected prior to applying each succeeding coat. The CONTRACTOR shall schedule such inspection with the ENGINEER in advance.

C. Blast cleaned ferrous metal surfaces shall be painted before any rusting or other deterioration of the surface occurs. Blast cleaning shall be limited to only those surfaces that can be coated in the same day.

D. Coatings shall be applied in accordance with the manufacturer's instructions and recommendations and this Section, whichever has the most stringent requirements.

E. Special attention shall be given to edges, angles, weld seams, flanges, nuts and bolts, and other places where insufficient film thicknesses are likely to occur. Use stripe painting with a brush in these areas.

F. Special attention shall be given to materials that will be joined so closely that proper surface preparation and application are not possible. Such contact surfaces shall be coated prior to assembly or installation.

G. Finish coats, including touch-up and damage repair coats shall be applied in a manner that will present a uniform texture and color matched appearance.

H. Coatings shall not be applied under the following conditions:

1. Temperatures exceeding the manufacturer's recommended maximum and minimum allowable.
2. Dust or smoke laden atmosphere.

3. Damp or humid weather.

4. Substrate or air temperature is less than 5 degrees F above the dew point

5. Air temperature is expected to drop below 40 degrees F or less than 5 degrees F above the dew point within 8 hours after application of coating.

6. Wind conditions are not calm.

I. Dew point shall be determined by use of a sling psychrometer in conjunction with U.S. Dept. of Commerce, Weather Bureau psychometric tables.

J. Finish coats shall be applied after concrete, masonry, and equipment installation is complete, and the working areas are clean and dust free.

3.11 CURING OF COATINGS

A. The CONTRACTOR shall maintain curing conditions in accordance with the conditions recommended by the coating material manufacturer or by this Section; whichever is the most stringent, prior to placing the completed coating system into service.

B. In the case of enclosed areas, forced air ventilation, using heated air if necessary, may be required until the coatings have fully cured.

3.12 IDENTIFICATION OF PIPING

A. Identification of above ground piping shall be in accordance with the table provided below and with additional requirements set forth in Section 15000 – Mechanical, General.

B. **Tnemec** Safety Paint colors shall be used for this project as indicated below.

C. All above-ground pipe and fittings, Polyvinyl Chloride (PVC) pipe and fittings, metallic and non-metallic marking tapes, and any other marking device, will be color coded in accordance with the APWA Uniform Color Guide, which is as follows:

Color	Paint Color Number	Application
Red	Candy Apple Red/Safety - 06SF	Potable Water Hydrant Bonnet
Yellow	Lemon Yellow/Safety - 02SF	Potable Water Hydrant Body
Green	Spearmint Green/Safety - 09SF	Sewer Force main, Sewer
Blue	True Blue/Safety - 11SF	Potable Water Main

D. **Surface Preparation:** The exterior surfaces of pipes, valves, hydrants, and other above ground items that will be exposed to the atmosphere inside structures or above ground

will be abrasive blasted to a maximum commercial Grade SSPC-SP-6, NACE 3 and given a high solids epoxy primer coat of Tnemec Series 66 Hi-Build Epoxoline, 4.0 mils DFT at the factory. A finish coat will be applied after installation according the color schedule specified in this Section or as listed in Section 15000 – Mechanical, General. Evaluation of blast cleaned surface preparation WORK will be based upon comparison of the blasted surfaces with the standard samples available from the NACE, using NACE standards TM-01-70 and TM-01-75.

E. Finish coat shall have a DFT of 2 to 4 mils.

3.13 COATING SYSTEM SCHEDULE, FERROUS METAL

	Item	Surface Preparation	System No.
FM-7	Ferrous surfaces in water passages of all valves 2-inch size and larger, exterior surfaces of submerged valves.	White metal blast cleaning SSPC SP5	(106) fusion bond epoxy
FM-9	Ferrous surfaces of sleeve couplings.	Solvent cleaning SSPC SP1, followed by white metal blast cleaning SSPC-SP10	(106) fusion bond epoxy

3.14 ENVIRONMENTAL REQUIREMENTS

A. No coating work shall be performed under the following conditions:

1. Surface or ambient temperatures exceed the manufacturer's recommended maximum or minimum allowable.

2. Dust or smoke laden atmosphere.

3. Damp or humid conditions, where the relative humidity is above the manufacturer's maximum allowable.

4. Substrate and ambient temperatures are less than 5°F above the dew point and are decreasing. Dew point shall be measured by use of an instrument such as a Sling Psychrometer in conjunction with U.S. Department of Commerce, Weather Bureau psychrometric tables. Elcometer 319 Dew Point meter or equal may also be used.

5. Ambient temperature that is expected to drop below 50°F or less than 5°F above the dew point within 8 hours after application of coating.

END OF SECTION

DIVISION 10 – SPECIALTIES (NOT USED)

DIVISION 11 – EQUIPMENT (NOT USED)

DIVISION12 – FURNISHING (NOT USED)

DIVISION 13 – SPECIAL CONSTRUCTION (NOT USED)

DIVISION 21 – FIRE SUPPRESSION (NOT USED)

DIVISION 22 – PLUMBING (NOT USED)

DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING (NOT USED)

DIVISION 26 – ELECTRICAL

26 10 00 GENERAL

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. The work includes also all supervision, labor, materials, equipment, facilities and installation required for the complete electrical systems as indicated on the drawing and called for in these specifications, or as may be reasonably implied by either. When drawings, notes and/or specifications are in conflict, the most stringent requirements shall apply.

B. The provisions of this Section applies to all electrical items specified in the various Sections of Division 26 of these Specifications, except where otherwise specified of shown in Contract Documents.

C. Provide complete and operating electrical systems consisting of the following:

1. Power, lighting, control, instrumentation, grounding and lightning as shown on drawings, including switchgears, feeders, subfeeders, grounding, switchboard, transformers, motor control centers, safety switches and starters, panelboards, branch circuits, control wiring, control panels and receptacles and all other equipment shown on drawings or called for in the specifications.
2. Electrical connections to equipment furnished by other trades.
3. Power and control wiring of all motors and electrically operated equipment, including startup and testing.
4. Conduits, sleeves, pull, junction and terminal boxes, manholes, etc. required for all exposed, concealed and underground systems.
5. Properly maintained temporary electrical power and lighting as required for all trades.
6. Miscellaneous item obviously required for a complete and operating system (nuts and bolts, masonry anchors, conduit and equipment supports, drilling, welding, scaffolding, crane service, etc.) but not specifically called for on the drawings or specifications.

D. Visit the project site before submitting a bid. Verify all dimensions shown on the Contract drawings and determine the characteristics of existing facilities which will affect performance of the work, but which are not shown on the drawings or described within these specifications.

1.2 CODES AND STANDARDS

A. Reference within these Specifications to standards and codes implies that any item, product, or material so identified must comply with the minimum requirements as stated therein. Only the latest revised editions are applicable.

B. The Specifications, codes and standards listed below form a part of these specifications:

1. National Electrical Code (NEC)
2. National Electrical Contractor's Association (NECA)
3. National Fire Protection Association (NFPA)
4. Underwriters' Laboratories (UL)
5. National Electrical Manufacturers Association (NEMA)
6. American National Standards Institute (ANSI)
7. Federal Specifications (Fed. Spec.)
8. Insulated Power Cable Engineers Association (IPCEA)
9. South Florida Building Code (SFBC)
10. American Concrete Institute (ACI)
11. Institute of Electrical and Electronic Engineers (IEEE)
12. American Society for Testing and Materials (ASTM)
13. American Society of Mechanical Engineers (ASME)

C. Furnish equipment listed and bearing the label of Underwriters' Laboratories Inc. (UL) or of an independent testing laboratory acceptable to the Engineer and the local Code enforcement agency having jurisdiction.

D. Install equipment and materials in compliance with applicable provisions of the OSHA Safety and Health Standards (29CFR1910 and 29CFR1926, as applicable), State Building Standards and applicable local codes and regulations.

1.3 DRAWINGS

A. The drawings indicate the extent and general arrangements of equipment and wiring systems. If any departures from the drawings are deemed necessary by the Contractor, details of such departures and reasons therefor shall be submitted to the TOWN for approval within thirty days after award of the Contract. No such departures shall be made without the prior written approval of the TOWN. All items not specifically mentioned in the specifications or noted on the drawings but obviously necessary to make a complete working installation shall be included.

B. Mechanical equipment shown on the electrical drawings is included solely as a convenience to the Contractor and is not to be regarded as necessarily final or complete nor superseding in any way the work outlined in the mechanical specifications and drawings. Where electrical plans differ from the mechanical plans in regard to horsepower, voltage, phases, load rating or equipment location, the information shown on the mechanical drawings prevails and the required power shall be provided.

C. Wiring as shown on drawings are for a typical installation and based on the requirement for similar jobs but might not show all conductors required for this particular Contract. Coordinate with the manufacturers of proposed equipments the power and control wiring requirement and bid the job accordingly.

1.4 SHOP DRAWINGS

A. Within 30 days after the date of the award of the Contract, and before any material or equipment is purchased, submit to the Engineer for approval, a complete list in quintuplicate of electrical materials, fixtures and equipment to be incorporated in the work. Include catalog number, diagrams, drawings, material, finish, dimensions, fabrication details, installation and maintenance instructions books, interconnecting wiring diagrams, compliance with standards, UL approval and any other descriptive data as may be required by the Engineer. No material shall be delivered or installed previous shop drawings approval.

B. Provide detailed operational information of control systems, particularly those related to wiring, ladder and logical diagrams as well as a detailed sequence of operations of every component such as relays, lamps, timer, counter, etc. that makes up the proposed system.

C. Prepare a detailed system interconnection diagram, including the coordination of drawings and equipment from the various suppliers. This submittal shall be considered a shop drawing and shall include block and step by step process diagrams if needed for clarification or requested by the Engineer.

D. When submitting alternated items, provide a complete price breakdown for both, the original item and the proposed alternate item. This breakdown shall be in identical form for both items in NECA form or similar. Specify the net change in Contract price for each item and for the total price. Provide also complete information on every proposed alternate items for comparison and technical evaluation. Alternate proposals will not be considered prior to Bid opening.

E. Approval of material will be based on the manufacturer's compliance with the specifications, published ratings, or on test results where specified.

F. Any deviation from the specifications or drawings shall be listed separately and submitted with shop drawings. Failure to list all deviations shall be grounds for requiring removal of such items and installation of items in accord with the specifications at no extra cost to the TOWN.

G. Where installation procedures or part of the installation procedures are required to be in accordance with manufacturers' instructions, submit printed copies of those instructions. Do not proceed with the installation until the instructions are processed and authorized. Failure to submit the installation instructions shall be cause for rejection of the equipment or material.

H. Decision on acceptance or rejection of any and/or all proposed alternate items shall be made by the Engineer only and such decision is final and binding.

1.5 QUALITY ASSURANCE

A. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for two years prior to bid opening.

B. Equipment, materials, installation and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70.

C. Equipment shall have a nameplate bearing the manufacturer's name, address, model number and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.6 COORDINATION WITH OTHER UTILITIES AND TRADES

A. The drawings are generally diagrammatic, coordinate the electrical work with the work of other trades and furnish all necessary offsets in raceways, fittings, etc. so that architectural and structural interferences or conflict with conduits, piping, equipment, etc. are prevented.

B. Where failure to coordinate the work with other trades results that equipment have to be removed and relocated, the Engineer shall determine which one has to be moved regardless of which equipment was installed first. Cutting and patching required for relocation shall exactly match original finish. All relocation work has to be done at no cost to the TOWN.

C. Coordinated installation of underground ducts and conduits with other utilities on the site. Details of routing, burial depth, size of bends and termination at each end of service shall be verified on the job site.

1.7 CUTTING AND PATCHING

A. Make openings through walls, ceilings, roadways, slabs, etc. as required for the installation of electrical equipment. The Contractor is responsible for any damage done when providing such openings and shall patch and refinish to match the existing surface after making such openings.

B. Any work in new or existing structures that could affect its structural integrity are not permitted without the prior approval of the Engineer. Examples of those works are but not limited to:

1. Conduits, pipes, sleeves or any other item embedded in concrete along or through any beam, column, footing, grade beam, slab, wall or any other structural member.
2. Penetration of existing concrete walls and any other structural members with conduits or bus ducts.
3. Installation of groups of conduits or pipes bundled together or spread affecting the structural integrity of the structural frames, foundations or equipment bases.

C. On those cases, submit detailed installation shop drawings and do not proceed with the work until approval is granted. When approved, installation shall comply with ACI-318 Section 6.3, Conduits and Pipes Embedded in Concrete.

1.8 STORAGE

A. Store equipment and material furnished by the Contractor or the TOWN in a safe and orderly manner. Materials shall not be stored directly on the ground or floor and shall be kept clean, dry and free from damage or deteriorating elements. Damaged or rusted materials shall not be installed until replaced of refinished by the manufacturer. Manufacturer's recommendations for storage of equipment shall be strictly adhered to, including energizing of motor and equipment space heaters.

B. TOWN furnished equipment deteriorated while being in the Contractor custody shall be repaired or replaced at the satisfaction of the TOWN.

1.9 OPERATIONAL MANUALS AND AS BUILT DRAWINGS

A. Upon completion of the work, prepare and deliver to the Engineer the following:

1. Operation and maintenance manuals for each power, control and special system installed. Manuals shall consist of detailed drawings or catalog sheets for each component, control diagrams and sequence of operation, replacement parts lists, maintenance instructions and possible breakdowns and repairs, description of system operation. Include also complete parts list and name, address and phone number of the supplier and nearest manufacturer's representative of the equipment.

B. As-built drawings with exact location of underground equipment like conduits, duct banks, grounding, etc. Point to point wiring diagram indicating terminal and wire numbers, color coding and routing.

1. In addition, frame under glass single line "As built" drawings and mount them on wall near respective switchgears, switchboard, MCC's, etc.

1.10 TRAINING

A. Provide equipment manufacturer instructors for a minimum of forty hours to train designated TOWN personnel in the operation and maintenance of the different systems of the Contract.

26 10 20 PRODUCTS

1.1 MATERIALS

A. Furnish equipment, materials and components new, standard current products and latest design of manufacturers regularly engaged in the production of such equipment.

B. All materials shall bear the label of Underwriter's Laboratory (UL) for the intended use in all cases where this labeling is available or shall be materials reviewed by the code enforcing authorities and Engineer. All components shall be mechanically and electrically compatible with rating of apparatus in which installed.

C. Equipment of a similar nature shall be identical. Example: All switchboards (i.e., switchgear, motor control centers) and panelboards shall be of the same manufacturer and of the same style.

D. Coordinate shipping lengths of switchgears, motor control centers, etc. Those equipment’s shall be able to be removed and replaced in the future if necessary with the access and openings provided in the structure.

E. Furnish panelboards, terminal cabinets and other equipment requiring wire and cable terminations, with wiring gutter sized as required by NEC Tables 373-6(a) and 373-6(b).

F. For the control system provide all required relays, timers, control switches, push buttons, indicating lights, wire, conduit and fittings.

G. When reference is made to one manufacturer's name and catalog number, it does not necessarily mean that the equipment is an "off the shelf" item. Variances may be required for finish, material or other modifications. The Contractor shall assure that all such required modifications are made.

H. Provide single phase protection devices for circuit breaker combination starters with current limiting fuses to ensure that the circuit breaker trips if any fuse blows.

I. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected starting or release of stored energy in accordance with

29 CFR 1910.147. Mechanical isolation of machines and other equipment shall be in accordance with the requirements of Division 15, Mechanical.

1.2 ACCESSORIES

A. Use hardware and accessory fittings that are:

1. Corrosion protected and suitable for the atmosphere in which they are installed.
2. Designed, intended and appropriated for the use, and at the same time, complement the items with which they are used.
3. U.S. standard sizes.

1.3 SPARE PARTS

A. Submit a list of manufacturers recommended spare parts for all major equipment including descriptions of each part, part number and cost.

B. Furnish lighting fixtures with lamps. Where size is not specified or shown on the drawings, furnish the largest lamp for which the fixture is rated. Supply at least ten percent, but not less than two spare lamps for each type of lighting fixture specified.

C. Furnish fusible equipment with fuses, and ten percent (three minimum) of spare fuses of each type.

D. Furnish control equipment with spare parts, ten percent (three minimum) of relays, fuses, pilot lights, etc. and one spare of each different fully assembled electronic board.

E. Turn over to an authorized person spare parts provided with any equipment. Obtain signed and dated receipt for them.

PART 1. EXECUTION

3.01 INSTALLATION

A. All materials shall be installed at the locations shown on the drawings and in accordance with the specific manufacturer's recommended installation methods.

B. External control circuits or interlock circuits between motors and other equipment such as pressure or temperature switches, thermostats, etc., shown or not in the electrical drawings, have to be wired in compliance with the provisions of Division 26, Electrical.

C. All equipment shall be set level, at the correct heights, properly aligned and bolted together where delivered in sections. Install surface mounted equipment, including panelboards, automatic transfer switches, safety switches, individually mounted enclosed circuit

breakers, motor starters, etc., on a metal framing support system (continuous slot metal channel system).

D. Install conduit and equipment in such a manner as to avoid obstructions, preserve head room and keep openings and passageways clear.

E. Secure all materials and equipment firmly in place. All screws, bolts, nuts, clamps, fittings or other fastening devices shall be made up tight. Do not weld electrical materials for attachment and/or support.

F. Effectively ground all equipment in accordance with the NEC and as specified hereinafter. Use thermoweld process for taps to grounding grid and ground rods and appropriate two holes bolted tongue type connectors for above ground connections.

G. Provide minimum four inches high concrete pad with steel reinforcing and necessary bolts, anchors, inserts and conduit sleeves for floor mounted self-supported equipment such as transformers, switchgears, switchboards, control panels, and motor control centers and extend the pad in front of equipment to facilitate removal of breakers and starters that have to be rolled out.

H. Cutting, welding, or other weakening of building structure to facilitate equipment and materials installation are not be permitted.

I. Light fixtures are intended to be supported by the ceiling support system, however, where additional supports are required they shall be provided by the Contractor.

J. Where dimensions are given, the equipment is to be placed accordingly. Where equipment is not located by dimension, it shall be located in the area shown, exercising coordination with other trades and providing appropriate maintenance space around the equipment and working clearance that meet or exceed code requirements as per NEC Tables 110-16(a) and 110-34(a).

K. In areas designated as hazardous locations, all electrical equipment has to be certified for use in those areas and the installation must meet the related NEC for the class selected.

L. Use PVC coated rigid steel conduits and fittings in areas with corrosive ambient such as those exposed to primary and secondary sewage.

3.02 IDENTIFICATION

A. Clearly and permanently label electrical equipment such as switchgears, disconnects switches, starters, panelboards, transformers, control and alarm panels, etc., with securely fastened nameplates made of 1/16 inch thick black laminated plastic with 1/4 inch high white letters indicating electrical characteristics and identification.

B. Include in the nameplate whatever information applies, such as: voltage, current rating, number of phases, the panel and circuit number from which the equipment is fed, and the item it controls

C. Use red nameplates for emergency equipment, including disconnect ahead of main panel, and all electrical equipment related to the fire alarm system.

D. Identify panelboards circuits with a door mounted, plastic protected, typewritten directory.

E. Use color coding, flame and abrasion resistant vinyl plastic tape equal to Scotch No. 35 to identify conductor's phases. Colors as indicated in standards, drawing packages.

F. Identify control conductors with permanent, non-conductive tags at panels, terminal boxes and control stations to indicate their control function and feeders at every accessible point.

G. Feeder conduits shall be identified at wireways, panels, pull boxes, cabinets and similar locations to assist in future circuit tracing. Use adhesive markers, Dymo Labels or other approved methods.

H. Identify every conduit stub up with stamped nonferrous tags attached with stainless steel wire.

I. For identification of conduits and conductors, use the ID number as shown in the Wiring and Conduit Schedule.

3.03 EQUIPMENT CONNECTIONS

A. Make all connections and install and connect starters, contactors, and controls, including wiring requirements as determined in accordance with control wiring diagrams furnished for the equipment.

B. Examine other discipline drawings and make connections to equipment furnished by other contractors even if not shown in the electrical drawings.

C. Changes required by the Contractor furnished equipment shall be the Contractor's responsibility.

3.04 TESTING

A. General:

1. No existing electrical service shall be interrupted, test will be with a temporary power supply by the Contractor.
2. Notify the Engineer 30 days prior to commencement of all tests so they can be witnessed and submit the following:

a. Schedule for performing inspections and tests.
b. List of the testing equipment to be used.
c. Sample copy of equipment and material test forms.

3. Test equipment to have accuracy and been calibrated in accordance with the International Electrical Testing Association.
4. Correct at no cost to the TOWN, any defects or variances from standard or specified conditions found during these tests.
5. Tighten with calibrated torque wrench and to manufactures' recommendations, all accessible bolted connections, including the wiring connections.
6. Prior to the final test, perform continuity, insulation, and resistance tests to assure there are no shorts or unintentional ground in the entire electrical system.
7. Energize, start-up and test operate all the systems and equipment in the presence of the Engineer.
8. Energize the main service and all feeders and branch circuits from the normal power source. Take and record readings of phase to phase and phase to ground voltage, and each phase current at the service entrance, panelboards, transformers (primary and secondary) and at each three phase motors.
9. Check motors and starters to verify correct operation and inspect panelboards prior cover installation to verify correct conductor sizing and color coding
10. Test electrical equipment following manufacturers' start-up test procedures and other requirements set up in this and other sections under Division 26.
11. Conduct high potential tests before and after installation, on each medium voltage feeder conductor applying alternating or direct current voltage. Prior to making the after installation tests, disconnect cables from the equipment. The method, voltage, length of time and other characteristics of the tests shall be in accordance with the standards of IPCEA and as recommended by the cable manufacturer for the type of wire or cable involved.
12. Make insulation resistance test on each 480 volt and 240 volt feeder conductor before and after installation.
13. Test insulation of motors 200 HP or less in accordance with IEEE 43 and test voltages of NETA ATS, Table 10.2 for 1-minute duration with resistances tabulated at 30 and 60 seconds. Insulation values to be equal or greater than ohmic values established by the manufacturer. For larger motors, follow manufacturers' insulation test instructions.
14. Test all lighting fixtures, receptacles and switches and verify they are properly installed. Relamp lighting fixtures with new lamps.
15. Conduct a complete operating test of the fire alarm system.

B. Personnel and Equipment:

1. Provide instruments and equipment required to test the different systems.
2. Use safety devices such as rubber gloves and blankets, protective screens and barriers, danger signs, etc., to adequately protect and warn all personnel in the vicinity of the tests.
3. Provide qualified personnel, temporary power, lighting, wiring and all materials required to conduct the testing.

4. When specified or required, provide equipment manufacturer's representative to assist in testing their equipment.
5. In the event that equipment fails to pass the tests, provide the services of the equipment manufacturer's representative to assist the Contractor in repairing or troubleshooting their equipment.

C. Quality Assurance

1. Corporately and financially independent organization functioning as an unbiased testing authority with no professional or business association with the manufacturers, suppliers and installers of the tested equipment.

2. Engineers and technicians certified by the International Electrical Testing Association.

3. Registered Professional Engineer in the State of Florida to provide comprehensive project report outlining services performed, test results, recommendations, actions taken and comments.

D. Test Reports

1. Maintain a written record of all tests showing dates, personnel making test, equipment or materials tested, tests performed, and results. Have reports signed by the TOWN Engineer that witnessed the test.

2. Furnish tabulated and certified test reports.

3.05 TOOLS

A. Use only tools designed for the particular operation. Keep tools in good condition and do not use worn or broken tools.

B. Turn over to an authorized person, special tools provided with any equipment. Obtain signed and dated receipt for them.

3.06 CLEAN-UP AND PAINTING

A. After completion of the installation, clean inside and outside equipment enclosures removing foreign material, grease, dust, rust and chipped plaster and concrete until left in brand new condition.

B. Clean lighting fixtures, lenses and reflectors.

C. Remove corrosion found on metal surfaces and repair to prevent future corrosion.

D. Touch-up painting where finished surfaces have received minor scratches during installation. When damage cannot be corrected with minor touch-up, equipment shall be refinished at the factory at no cost to the TOWN.

3.07 FINAL INSPECTION

A. On completion of the final inspection, deliver to the TOWN the Certificate of Final Inspection from the local authority having jurisdiction.

END OF SECTION

DIVISION 27 – COMMUNICATIONS (NOT USED)

DIVISION 28 – ELECTRONIC SAFETY & SECURITY (NOT USED)

DIVISION 31 – EARTHWORK

31 10 00 SITE PREPARATION

PART 1 - GENERAL

1.1 THE SUMMARY

A. In its initial move onto the Site, the CONTRACTOR shall protect existing fences, houses and associated improvements, streets, and utilities downslope of construction areas from damage due to boulders, trees, or other objects dislodged during the construction process and clear, grub, strip; and regrade certain areas, in accordance with the Contract Documents.

1.2 SITE INSPECTION

A. Prior to moving onto the Site, the CONTRACTOR shall inspect the Site conditions and review maps of the Site.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CLEARING, GRUBBING, AND STRIPPING

A. Construction areas shall be cleared of grass and weeds to at least a depth of 6-inches and cleared of structures, pavement, sidewalks, concrete or masonry debris, trees, logs, upturned stumps, loose boulders, and any other objectionable material of any kind which would interfere with the performance or completion of the WORK, create a hazard to safety, or impair the subsequent usefulness of the WORK, or obstruct its operation. Loose boulders within 10-feet of the top of cut lines shall be incorporated in landscaping or removed from the Site. Trees and other natural vegetation outside the actual lines of construction shall be protected from damage during construction.

B. Within the limits of clearing, the areas below the natural ground surface shall be grubbed to a depth necessary to remove stumps, roots, buried logs, and other objectionable material. Septic tanks, drain fields, and connection lines and any other underground structures, debris or waste shall be removed if found on the Site. Objectionable material from the clearing and grubbing process shall be removed from the Site and wasted in approved safe locations.

C. Unless otherwise indicated, native trees larger than 3-inches in diameter at the base shall not be removed without the ENGINEER's approval. The removal of any trees, shrubs, fences, or other improvements outside of rights-of-way, if necessary, for the CONTRACTOR's choice of means and methods, shall be arranged with the owner of the property, and shall be removed and replaced, as part of the WORK.

3.2 OVEREXCAVATION, REGRADING, AND BACKFILL UNDER FILL AREAS

A. After the fill areas have been cleared, grubbed, and excavated, the areas to receive fill will require over excavation, regrading, and backfill, consisting of the removal and/or stockpiling of undesirable soils. The ground surface shall be recontoured for keying the fill and removing severe or abrupt changes in the topography of the Site.

    1. Topsoil: This soil mantles the siltstone/claystone which comprises much of the hillslope on the southern, approximately two-thirds of the plant site.

    2. Colluvium: This material is also present on the hillsides and covers the valley floor of the Site.

    3. Artificial Fill (Quarry Waste): Most of this material is present on the west side of the plant site near Rosalind Lane.

B. Any undesirable topsoil and colluvium shall be removed to the level designated by the ENGINEER and stockpiled for subsequent use as the first material to be placed in the compacted fill.

END OF SECTION

31 23 19 DEWATERING

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall dewater trench and structure excavations, in accordance with the Contract Documents and applicable regulatory agencies with jurisdiction. The CONTRACTOR shall secure all necessary permits from DERM, and other regulatory agencies as required to complete the requirements of this Section of the Specifications.

B. All dewatering operations shall discharge to existing storm drainage systems or canals, unless otherwise directed by regulatory agencies. The CONTRACTOR shall flush clean all existing storm drainage structures and piping utilized for dewatering operations to remove sediment that may have been deposited during dewatering operations.

C. The CONTRACTOR shall furnish an install all turbidity barriers, settling tanks, and other equipment as required by DERM, South Florida Water Management District, TOWN, and any other regulatory agency.

1.2 CONTRACTOR SUBMITTALS

A. Prior to commencement of excavation, the CONTRACTOR shall submit a detailed plan and operation schedule for dewatering of excavations. The detailed plan shall include mitigation measures to prevent settlement of nearby structures and a contingency plan for restoring nearby structures if settlement is observed as a result of the CONTRACTOR’s dewatering operations. The CONTRACTOR may be required to demonstrate the system proposed and to verify that adequate equipment, personnel, and materials are provided to dewater the excavations at all locations and times. The CONTRACTOR's dewatering plan is subject to review by the ENGINEER.

B. All dewatering shall comply with the regulations of the South Florida Water Management District and DERM.

1.3 QUALITY CONTROL

A. It shall be the sole responsibility of the CONTRACTOR to control the rate and effect of the dewatering in such a manner as to avoid all objectionable settlement and subsidence.

B. All dewatering operations shall be adequate to assure the integrity of the finished project and shall be the responsibility of the CONTRACTOR.

C. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at frequent intervals to detect any settlement which may develop. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with

the CONTRACTOR. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the CONTRACTOR.

D. CONTRACTOR shall survey, record and report the reference points on a daily basis, and submit the written log to the ENGINEER at the completion of construction. The ENGINEER shall be immediately notified should any sign of settlement is observed. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the CONTRACTOR.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Dewatering, where required, may include the use of well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, and other means. Standby pumping equipment shall be maintained on the Site.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. The CONTRACTOR shall provide all equipment necessary for dewatering. It shall have on hand, at all times, sufficient pumping equipment and machinery in good working condition and shall have available, at all times, competent workmen for the operation of the pumping equipment. Adequate standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.

B. Dewatering for structures and pipelines shall commence when groundwater is first encountered and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this Section or other requirements.

C. At all times, site grading shall promote drainage. Surface runoff shall be diverted from excavations. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and be pumped or drained by gravity from the excavation to maintain a bottom free from standing water.

D. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capaTOWN of the subgrade soils at proposed bottom of excavation.

E. The CONTRACTOR shall maintain the water level below the bottom of excavation in all work areas where groundwater occurs during excavation construction, backfilling, and up to acceptance.

F. Flotation shall be prevented by the CONTRACTOR by maintaining a positive and continuous removal of water. The CONTRACTOR shall be fully responsible and liable for all damages which may result from failure to adequately keep excavations dewatered.

G. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock.

H. The CONTRACTOR shall maintain the water level below the bottom of excavation in all work areas where groundwater occurs during excavation construction, backfilling, and up to acceptance.

I. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sandpacked and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check by the CONTRACTOR shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.

J. The CONTRACTOR shall dispose of water from the WORK in a suitable manner without damage to adjacent property. CONTRACTOR shall be responsible for obtaining any permits that may be necessary to dispose of water. No water shall be drained into work built or under construction without prior consent of the ENGINEER. Water shall be filtered using an approved method to remove sand and fine-sized soil particles before disposal into any drainage system.

K. Dewatering of trenches and other excavations shall be considered as incidental to the construction of the WORK and all costs thereof shall be included in the various contract prices in the Bid Forms, unless a separate bid item has been established for dewatering.

L. The CONTRACTOR'S attention is directed to the geotechnical reports included in Appendix of the technical specifications.

M. Discharge directly or indirectly through existing storm drains into canals shall meet the requirements of the DERM, South Florida Water Management District, TOWN, and all other applicable regulatory agencies.

N. The CONTRACTOR shall flush clean all existing storm drainage and structures and piping utilized for dewatering operations to remove sediment that may have been deposited during dewatering operations.

END OF SECTION

31 30 00 EARTHWORK

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall perform earthwork as indicated and required for construction of the WORK, complete and in place, in accordance with the Contract Documents.

B. The work included under this Section includes excavating, backfilling and compaction as required for the construction of the piping system specified herin.

C. Sheeting and Bracing: The CONTRACTOR'S attention is directed to the provisions of 29 C.F.Rs. 1926.650 Subpart of the OSHA excavation safety standards which require that all banks and trenches over 5 feet high shall be shored or sloped to the angle of repose. Trench excavation in excess of 5 feet shall conform to the Florida Trench Safety Act (F.S. Ch. 553). Excavations shall be sloped or otherwise supported in a safe manner in accordance with the Florida Trench Safety Act (F.S. Ch. 553) and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).

D. See Section 31 30 20 for Shoring specifications.

1.2 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall submit samples of materials proposed for the WORK in conformance with the requirements of Section 01300 – Contractor Submittals.

B. Sample sizes shall be as determined by the testing laboratory.

C. Submittals shall be in accordance with Specification 01 33 00 – Contractor Submittals.

1.3 UNIFIED SOIL CLASSIFICATION SYSTEM

A. References in this Section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D 2487.

B. The CONTRACTOR shall be bound by applicable provisions of ASTM D 2487 in the interpretation of soil classifications.

PART 2 - PRODUCTS

2.1 FILL AND BACKFILL MATERIAL REQUIREMENTS

A. General

1. Fill, backfill, and embankment materials shall be selected or shall be processed and clean fine earth, rock, gravel, or sand, free from grass, roots, brush, other vegetation and organic matter.

2. Fill and backfill materials that are to be placed within 6 inches of any structure or pipe shall be free of rocks or unbroken masses of earth materials having a maximum dimension larger than 3 inches.

B. The following types of materials are defined:

1. Common Fill: Common fill material shall be non-cohesive (PI ≤ 10) and shall consist of mineral soil substantially free of clay, organic material, loam, wood, trash and other objectionable material which may be compressible, or which cannot be properly compacted. Common fill shall not contain stones larger than 6 inches in any dimension, asphalt, broken concrete, masonry, rubble or other similar materials. The common fill shall have physical properties such that it can be readily spread and compacted during filling. Additionally, common fill shall be no more than 35 percent by weight finer than the No. 200 mesh sieve unless finer material is approved for use in a specific location by the ENGINEER.

2. Select Common Fill: Select common fill material shall be as specified above with the exception that the material shall contain no stones more than 1-1/2 inches in largest dimension and shall be no more than 5 percent by weight finer than the No. 200 mesh sieve. Select backfill for copper tubing shall be limerock screenings or sand. Sand shall be graded sand with 100 percent passing a 3/8-inch sieve and not more than 5 percent passing a No. 200 sieve. Select backfill material may be material resulting from excavation, if suitable in the opinion of the OWNER, carefully selected to comply with these requirements.

3. Bedding Rock: Bedding rock material used in pipe trench within pipe zone, under abutments, and under concrete structures shall be crushed stone or gravel meeting the gradation and durability requirements of FDOT No. 89 and FDOT No. 57 stone, as indicated on the Drawings. Number 131 and 132 Screenings may be substituted for FDOT No. 89. Only FDOT No. 57 and FDOT No. 89 stone can be used in excavations below the transitional water table. Onsite materials proposed by the CONTRACTOR for bedding materials will be considered by the ENGINEER on a case-by-case basis.

4. Structural Fill: Materials for structural fill shall be bedding rock or select common fill as specified herein or suitable material as approved by the ENGINEER.

5. Suitable Material: Materials classified by AASHTO as A-1-a, A-1-b, A-3, or A-2-4 shall be considered suitable material.

6. Mixing or blending of materials to obtain a suitable composite is the CONTRACTOR's option but is subject to the approval of the ENGINEER.

7. Suitable materials may be obtained from on-Site excavations, may be processed on-Site materials, or may be imported.

8. If imported materials are required by this Section or are required in order to meet the quantity requirements of the WORK, the CONTRACTOR shall provide the imported materials as part of the WORK.

9. Unsuitable Material: Materials deemed not suitable for use on the project by the ENGINEER. Unsuitable materials are defined as follows:

10. Soils that have more than 35% by weight finer than the #200 mesh sieve or a PI of 10 or greater.

11. Soils with highly organic materials with 5% or greater organic content by weight.

12. Soils which, when classified under ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System), fall in the classifications of Pt, OH, CH, MH, or OL.

C. Piping Backfill: Piping backfill shall be as indicated on the drawings. Backfill materials shall be used as indicated in the Table below.

Piping Backfill – Refer to Miami-Dade County Standard Details	
Pipe Bedding	Bedding Rock
Pipe Zone Backfill	Common Fill
Trench zone backfill	Common Fill
Final backfill under unpaved areas	Common Fill
Final backfill under paved areas	As specified in detailed on the Drawings
Replace pipeline trench over excavation	Bedding rock to the grade of the bottom of the pipe
Underneath manholes and vaults	Structural fill or as indicated on the drawings. See Item 1 below.
Where pipes pass through structure walls, manholes, or catch basin inlets	Structural fill shall be placed for a distance of 3 feet on either side of the vertical center line of the pipe and the CONTRACTOR shall make special efforts to compact the fill up to the horizontal centerline of the pipe.

D. Suitable Materials

1. Suitable backfill material shall be clean, shall not be expansive nor have high organic content, shall be free of clay, marl, unstable materials, debris, lumps and clods, and shall meet the following requirements:

   a. Maximum Liquid Limit shall not exceed 12 as determined by ASTM D 423.

   b. Maximum PlastiTOWN Index shall not exceed 35 as determined by ASTM D 424.

   c. Not more than 10 percent of weight shall be finer than 74-micron (No. 200) U.S. Standard Sieve.

2. Materials not defined below as unsuitable will be considered as suitable materials and may be used in fills, backfilling, and embankment construction, subject to the indicated requirements.

3. If acceptable to the ENGINEER, some of the material listed as unsuitable may be used when thoroughly mixed with suitable material to form a stable composite.

4. Mixing or blending of materials to obtain a suitable composite is the CONTRACTOR's option but is subject to the approval of the ENGINEER.

5. The CONTRACTOR shall submit certification to the ENGINEER that the chloride concentration in imported materials within the pipe zone does not exceed 100 ppm, when tested in accordance with the requirements of AASHTO T291-94 – Standard Method of Test for determining Water-Soluble Chloride Ion Content in Soil.

6. Suitable materials may be obtained from on-Site excavations, may be processed on-Site materials, or may be imported.

2.2 MATERIALS TESTING

A. Samples

1. The CONTRACTOR shall be responsible for material sampling testing.

2. The CONTRACTOR shall provide test trenches and excavations as required for materials sampling and testing.

3. The CONTRACTOR shall obtain the services of a certified testing company for all materials testing. The CONTRACTOR shall submit the name and contact information of the testing company to the ENGINEER for approval prior to initiating construction.

4. The CONTRACTOR shall submit all material testing results to the ENGINEER within one (1) week of receipt.

5. The ENGINEER may direct the CONTRACTOR to supply samples for testing of any material used in the WORK.

B. Particle size analysis of soils and aggregates will be performed using ASTM D 422 - Standard Test Method for Particle-Size Analysis of Soils.

C. Determination of sand equivalent value will be performed using ASTM D 2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

2.3 IDENTIFICATION TAPE

A. Unless otherwise indicated, identification tape shall be placed above buried pipelines that are not comprised of magnetic components at least in part.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILLING – GENERAL

A. General

1. Except when specifically provided to the contrary, excavation shall include the removal of materials, including obstructions, that would interfere with the proper execution and completion of the WORK.

2. The removal of such materials shall conform to the lines and grades indicated or ordered.

3. Unless otherwise indicated, the entire Site shall be stripped of vegetation and debris and shall be grubbed, and such material shall be removed from the Site prior to performing any excavation or placing any fill.

4. Sheeting and Shoring: The CONTRACTOR shall furnish, place, and maintain supports and shoring that may be required for the sides of excavations. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable state safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926) and the Florida Trench Safety Act (F.S. Ch. 553).

    a. The CONTRACTOR shall construct, brace, and maintain the excavation as required to support the sides of excavations and to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction and to protect adjacent structures, existing piping and/or foundation material from disturbance, undermining or other damage.

    b. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and compacted to the degree required for the material to be placed in the area inside of the sheeting excavation.

5. The CONTRACTOR shall provide quantity surveys where so required to verify quantities for Unit Price Contracts.

6. Surveys shall be performed prior to beginning WORK and upon completion by a surveyor licensed in the state where the Site is located.

B. Removal and Exclusion of Water (Dewatering)

1. The CONTRACTOR shall complete dewatering in accordance to Specifications 23 19 – Dewatering

2. The CONTRACTOR shall remove and exclude water, including stormwater, groundwater, irrigation water, and wastewater, from excavations.

3. Dewatering wells, wellpoints, sump pumps, or other means shall be used to remove water and continuously maintain groundwater at a level at least 2 feet below the bottom of excavations before the excavation WORK begins at each location.

4. Water shall be removed and excluded until backfilling is complete and field soils testing has been completed.

3.2 OVER-EXCAVATION

A. Indicated

1. Where areas are indicated to be over-excavated, excavation shall be to the depth indicated, and backfill shall be installed to the grade indicated.

B. Not Indicated

1. When ordered to over-excavate areas deeper and/or wider than required by the Contract Documents, the CONTRACTOR shall over-excavate to the dimensions ordered and backfill to the indicated grade.

C. Neither Indicated nor Ordered

1. Any over-excavation carried below the grade that is neither ordered or nor indicated shall be backfilled and compacted to the required grade with the indicated material as part of the WORK

3.3 EXCAVATION IN LAWN AREAS

A. Where excavation occurs in lawn areas, the sod shall be carefully removed, dampened, and stockpiled in order to preserve it for replacement.

B. Excavated material may be placed on the lawn, provided that a drop cloth or other suitable method is employed to protect the lawn from damage, but the lawn shall not remain covered for more than 72 hours.

C. Immediately after completion of backfilling and testing of the pipeline, the sod shall be replaced and lightly rolled in a manner as to restore the lawn as near as possible to its original condition.

D. The CONTRACTOR shall provide new sod if the stockpiled sod has not been replaced within 72 hours.

3.4 EXCAVATION IN VICINITY OF TREES

A. Except where trees are indicated to be removed, trees shall be protected from injury during construction operations.

B. No tree roots larger than 2 inches in diameter shall be cut without the express permission of the ENGINEER.

C. Trees shall be supported during excavation by any means previously reviewed and accepted by the ENGINEER.

3.5 ROCK EXCAVATION

A. Rock excavation and disposal shall be performed by the CONTRACTOR where rock is encountered in the installation of the WORK at his own expense.

B. Blasting will not be permitted.

3.6 BLASTING

A. Explosives and Blasting: Blasting will not be permitted.

3.7 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. The CONTRACTOR shall be responsible for the removal and disposal of all excess excavated material.

B. No excess material shall be stored within the ROW during non-working hours. Excess excavated material can be stored temporarily at the Contractor’s laydown area at the Park TOWN WTP until such time that it can be removed from the site for disposal.

C. Material shall be disposed of at an approved on-Site disposal area or off-Site at a location arranged by the CONTRACTOR in accordance with laws and regulations regarding the disposal of such material.

3.8 BACKFILL

A. General

1. Backfill shall not be dropped directly upon any structure or pipe.

2. Backfill shall not be placed around or upon any structure until the concrete has attained sufficient strength to withstand the loads imposed.

3. Backfill over and around pies shall begin as soon as practical after the pipe has been laid, jointed, and inspected.

4. Except for drainrock materials being placed in over-excavated areas or trenches, backfill shall be placed after water is removed from the excavation and the trench sidewalls and bottom have been dried to moisture content suitable for compaction.

B. Pre-Placement Conditions

1. Immediately prior to placement of backfill materials, the bottoms and sidewalls of trenches and structure excavations shall have any loose, sloughing, or caving soil and rock materials removed.

2. Trench sidewalls shall consist of excavated surfaces that are in a relatively undisturbed condition before placement of backfill materials.

C. Layering

1. Backfill materials shall be placed and spread evenly in layers.

2. When compaction is achieved using mechanical equipment, the layers shall be evenly spread such that when compacted, each layer shall not exceed 12 inches in thickness.

D. During spreading, each layer shall be thoroughly mixed as necessary in order to promote uniformity of material in each layer. Backfill around pipes shall be manually spread around the pipe so that when compacted, the backfill will provide uniform bearing and side support.

E. Moisture Content

1. Where the backfill material moisture content is below the optimum moisture content, water shall be added before or during spreading until the proper moisture content is achieved.

2. Where the backfill material moisture content is too high to permit the indicated degree of compaction, the material shall be dried until the moisture content is satisfactory.

F. The surface of filled areas shall be graded to smooth true lines, strictly conforming to the grades shown on the Drawings. Neither soft spots nor un-compacted areas will be permitted in the WORK.

3.9 PIPELINE AND UTILITY TRENCH EXCAVATION AND BACKFILL

A. General:

1. Unless otherwise indicated or ordered, excavation for pipelines and utilities shall be open-cut trenches with minimum widths as indicated.

2. Where pavements or sidewalks are cut, they shall be cut by means of a mechanical pavement saw to form true and straight edges which shall in general be either parallel or at right angles with the centerline of the pipe.

B. Trench Bottom

1. Except where pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe. Excavate pipe trenches to a minimum of 6-inches below the outside bottom of the proposed pipe barrel to provide for the installation of bedding material.

2. Excavations for pipe bells and welding shall be made as required.

3. Where pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe bedding.

C. Open Trenches

1. The maximum amount of open trench permitted in any one location shall be 500 feet or the length necessary to accommodate the amount of pipe installed in a single Day, whichever is greater.

2. Trenches shall be fully backfilled at the end of each Day or, in lieu thereof, shall be covered by heavy steel plates adequately braced and capable of supporting vehicular traffic in those locations where it is impractical to backfill at the end of each Day.

3. These requirements for backfilling or use of steel plate will be waived in cases where the trench is located further than 100 feet from any traveled roadway or occupied structure; in such cases, however, barricades and warning lights meeting appropriate safety requirements shall be provided and maintained.

D. Embankments, Fills, and Structural Backfills

1. Where pipelines are to be installed in embankments, fills, or structure backfills, the fill shall be constructed to a level at least one foot above the top of the pipe before the trench is excavated.

2. Upon completion of the embankment or structural backfill, a trench conforming to the appropriate detail may be excavated and the pipe may be installed.

E. Trench Shield

1. If a moveable trench shield is used during excavation operations, the trench width shall be wider than the shield such that the shield is free to be lifted and then moved horizontally without binding against the trench sidewalls and causing sloughing or caving of the trench walls.

2. If the trench walls cave or slough, the trench shall be excavated as an open excavation with sloped sidewalls or with trench shoring, as indicated and as required by the pipe structural design.

3. If a moveable trench shield is used during excavation, pipe installation, and backfill operations, the shield shall be moved by lifting the shield free of the trench bottom or backfill and then moving the shield horizontally.

4. The CONTRACTOR shall not drag trench shields along the trench causing damage or displacement to the trench sidewalls, the pipe, or the bedding and backfill.

F. Placing and Spreading of Backfill Materials

1. Each layer of coarse granular shall be compacted by means of at least 2 passes from a vibratory compactor that is capable of achieving the required density in 2 passes and that is acceptable to the ENGINEER.

2. Where such materials are used for pipe zone backfill, vibratory compaction shall be used at vertical intervals of the lesser of:

   a. One-half the diameter of the pipe; or

   b. 24 inches measured in the un-compacted state.

3. In addition, these materials shall be subjected to vibratory compaction at the springline of the pipe and the top of the pipe zone backfill, regardless of whether that dimension is less than 24 inches or not.

4. The material shall be placed and compacted under the haunch of the pipe and up each side evenly so as not to move the pipe during the placement of the backfill.

5. The material shall be placed in lifts that will not exceed 12 inches when compacted to the required density.

G. Mechanical Compaction

1. Backfill around and over pipelines that is mechanically compacted shall be compacted using light, hand-operated vibratory compactors and rollers that do not damage the pipe.

2. After completion of at least 2 feet of compacted backfill over the top of pipeline, compaction equipment weighing no more than 8,000 pounds may be used to complete the trench backfill.

H. Pipe and Utility Trench Backfill

1. Backfilling of pipe trenches will not be allowed until the work has been approved by the OWNER, pressure tested if required, and the OWNER indicates that backfilling may proceed. Any work which is covered or concealed without the knowledge and consent of the OWNER shall be uncovered or exposed for inspection. Partial backfill may be made to help restrain the pipe during pressure testing, if previously authorized by the OWNER.

2. The Contractor shall backfill all trenches and other excavations made in the process of installing the pipe. He shall maintain the surface of the backfill free from major irregularities and potholes.

3. Select backfill material shall be placed under and around the pipe to one foot above the crown (or to two feet above crown for PVC) in 6-inch layers. Each layer shall be thoroughly compacted to at least 100 percent of maximum density as defined by AASHTO Standard No. T-180, "Moisture-Density Relations of Soils using a 10-lb. (4.54 kg.) Rammer and an 18-in. (457 mm) Drop". The material in the ditch may be compacted by either hand tamper or a mechanized power tamper, provided the results obtained meet the continued approval of the OWNER. Particular attention and care shall be exercised in obtaining thorough support for the branch of all service connection fittings. Care shall be taken to preserve the alignment and gradient of the installed pipe.

4. Backfilling and compacting of material lying above a point one foot (or two feet for PVC pipe), above the crown of the pipe and below the pavement base or the surface of the ground, if out of pavement, shall be accomplished in layers not exceeding 9 inches in thickness. Each layer shall be thoroughly compacted with a powered hand tamper or a mechanized power tamper to at least 100 percent of maximum density as determined by AASHTO Specification T-180 or such greater density as may be required by the governing authority over the area in which the work is performed. A testing laboratory will make periodic field tests to determine the density being obtained in each lift, or layer, or the backfill. When compacted backfill fails to meet the specified percentage of maximum density as shown by test results, it shall be reworked and recompacted, and then retested. The reworking, recompacting and retesting of the backfill shall be repeated as many times as may be necessary to obtain compacted backfill with density meeting or exceeding the specified percentage as indicated by test results.

5. The Contractor shall exercise proper care to ensure that no pipe will be broken or displaced through the use of the type of mechanical compacting equipment he selects. Water shall be added as required to obtain optimum moisture to facilitate compaction but ponding or inundation of backfill will not be permitted. These ponding limitations shall not prohibit backfill in a wet trench up to the level of the natural water table if the "Alternate Method of Construction" is utilized.

6. Backfill shall in general be kept up with the rate of pipe laying. The backfill up to the springline of the pipe shall be placed as soon as practical after the laying of the pipe. On parts of the line where ground water level may be high enough to float the pipe, the placing of the backfill and the rate of pumping the trench shall be so controlled as to prevent the pipe from floating or moving from the line and grade shown on the Plans.

7. In the event that sufficient suitable material is not available at any point to properly backfill the trench, the Contractor shall transport suitable material from points of the line where such material is available or shall otherwise furnish suitable material.

8. Suitable material in excess of all backfill requirements and all unsuitable material shall be removed from the work and disposed by the Contractor.

9. Where cuts have been made through unpaved, stabilized rock roadways, driveways and parkways, surface restoration shall consist of 3 inches of compacted limerock overlaid by inches of gravel or graded and washed rock with a maximum diameter of ½-inch, except as otherwise directed by the OWNER. The rock shall be installed over the entire width of the disturbed area and shall closely match the existing rock at each location. Several grades of rock may be required to attain this end, but it is not anticipated that more than one grade will have to be used at any one location.

10. As described above, all pipe trenches shall be excavated to a level 6-inches below the outside bottom of the proposed pipe barrel. The resulting excavation shall be backfilled with approved pipe bedding material, up to the level of the outside bottom of the proposed pipe barrel. This material shall be tamped and compacted to provide a proper bedding for the pipe and shall then be shaped to receive the pipe, including recesses for the pipe bells and couplings. Placing and compacting bedding up to the level of the lower one-third of the pipe barrel shall immediately follow the installation of the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.

11. Select backfill material may be utilized where the excavated trench bottom is above water.

12. Any excavation below the levels required for installation of the pipe bedding shall be backfilled with approved bedding material, tamped, compacted and shaped to provide proper support for the proposed pipe.

I. Trench Shield

1. If a moveable trench shield is used during backfill operations, the shield shall be lifted to a location above each layer of backfill material prior to compaction of the layer.

2. The CONTRACTOR shall not displace the pipe or backfill while the shield is being moved.

J. Compaction Requirements

1. Maximum density of backfill materials within road base or sub-base shall be determined by AASHTO T-99C, latest revision (ASTM D698). Maximum density of backfill materials not located within road base or sub-base shall be determined by AASHTO T- 99, latest revision (ASTM D698).

Location	**Percentage of Maximum Dry Density**
Pipe embedment backfill	100
Over-excavated zones under bedding	100
Pipe zone backfill portion above embedment	100
Final backfill, beneath paved areas or structures. See Specification 02510 for Roadway Base requirements.	100
Final backfill, not beneath paved areas or structures.	95
Trench zone backfill, beneath paved areas and structures	100
Trench zone backfill, not beneath paved areas or structures	95

3.10 FIELD TESTING

A. General:

1. The CONTRACTOR shall be responsible for all compaction and material testing. The CONTRACTOR shall provide test trenches and excavations as required.

2. All costs for compaction and material testing shall be the responsibility of the CONTRACTOR.

3. The CONTRACTOR shall obtain the services of a certified testing company for all proctors and compaction testing. The CONTRACTOR shall submit the name and contact information of the testing company to the ENGINEER for approval prior to initiating construction.

4. The CONTRACTOR shall notify the ENGINEER a minimum of 48 hours in advance of all proctor, compaction, and material testing. The ENGINEER or TOWN INSPECTOR shall be present for all sampling and testing.

5. The CONTRACTOR shall submit all proctor, compaction, and material testing results to the ENGINEER within one (1) week of receipt.

6. The CONTRACTOR shall provide compaction testing at a minimum frequency of 50 feet on center for all new pipelines installations. The CONTRACTOR shall provide additional compaction testing at all pipeline bends, deflections, and offsets; at roadway intersections; and as required by the ENGINEER or TOWN to verify conformance with the Contract Documents.

B. Density:

1. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content will be determined in accordance with Method C of ASTM D 1557.

2. Where cohesionless, free draining soil material is required to be compacted to a percentage of relative density, the calculation of relative density will be determined in accordance with ASTM D 4253 and D 4254.

3. Field density in-place tests will be performed in accordance with ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method, ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth), or by such other means acceptable to the ENGINEER.

4. Density tests shall be made at every 100 linear feet at each lift, with test locations staggered at 25 feet each lift.

5. First test shall be made on the backfill layer 12-inches above the top of the pipe or at the water table, whichever is lower, and on 6-inch lifts thereafter.

C. Remediation

1. In case the test of the fill or backfill shows non-compliance with the required density, the CONTRACTOR shall accomplish such remedy as may be required to ensure compliance.

2. Subsequent testing to show compliance shall be by a testing laboratory selected by the OWNER and paid by the CONTRACTOR.

D. CONTRACTOR'S Responsibilities

1. The CONTRACTOR shall provide test trenches and excavations, including excavation, trench support and groundwater removal for the OWNER's field soils testing operations.

2. The trenches and excavations shall be provided at the locations and to the depths as required by the OWNER.

3. Lawn areas destroyed by test trenching and excavation shall be re-graded and re-landscaped with sod.

3.11 EXPLORATORY EXCAVATIONS

A. The CONTRACTOR shall excavate and expose buried points of connection to existing utilities as indicated.

B. Excavation shall be performed prior to the preparation of Shop Drawings for connections and before the fabrication of the pipe

C. The data obtained from exploratory excavations shall be used in preparing the Shop Drawings.

D. Data, including dates, locations excavated, and dimensioned sketches, shall be submitted to the ENGINEER within one week of excavation.

E. Unless otherwise indicated or ordered, excavation for pipelines and utilities shall be open-cut trenches with minimum widths as indicated.

F. Trench Bottom

1. Except where pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe.

2. Excavations for pipe bells and welding shall be made as required.

3. Where pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe bedding.

END OF SECTION

31 30 20 SHORING

PART 1 - GENERAL

1.1 GENERAL

A. Sheeting and shoring shall be installed where necessary to control trench width, protect the workmen and the general public, and prevent damage to this or adjacent work, or structures.

B. For excavations five (5) feet deep or less, sheeting and shoring shall be installed where necessary to control trench width, protect the workmen and the general public, and prevent damage to this or adjacent work, or structures. When an excavation is in excess of five (5) feet deep, the Contractor shall comply with the provisions of the "Trench Safety Act," Florida Statute 553, Part 3. Method(s) of compliance used shall protect the workmen and the general public, prevent damage to this or adjacent work, structures, utilities, pavements, sidewalks, curbs, gutters and similar improvements both public and private, and provide for proper maintenance of traffic. The trench width may vary to accomplish this and to comply with the "Trench Safety Act," Florida Statute 553, Part 3, but only from a point one (1) foot above the top of the pipe.

C. Trench widths, when measured at a point 12 inches above the top of the pipe, shall provide a 12-inch maximum clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheeting if used. Minimum trench width shall provide at least 6-inches clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheeting if used.

D. Where wood sheeting or certain designs of steel sheeting are used, the OWNER may require that the sheeting be cut of at a level two (2) feet above the top of the installed pipe and that portion below that level be left in place. If ordered left in place, sheeting and shoring shall be paid for under the appropriate Quotation Item.

E. If interlocking steel sheeting is used, the OWNER may permit its complete removal in lieu of the cut-off, providing removal can be accomplished without disturbing the bedding, pipe or pipe alignment. Any damage to the pipe bedding, pipe or pipe alignment shall be cause for rejection of the affected portion of the work.

F. In areas where trench widths are not limited by right-of-way and/or easement widths, property line restrictions, existing adjacent improvements, including pavements, structures and other utilities, and maintenance of traffic, the trench sides may be sloped to a suitable angle of repose of the excavated material, but only from a point one foot above the crown of the pipe.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END SECTION

31 35 26 EROSION CONTROL BARRIER

PART 1 - GENERAL

1.1 THE REQUIREMENTS

A. The CONTRACTOR shall provide effective temporary erosion control and sediment control measures during construction or until permanent erosion controls become effective so as to prevent pollution of water, detrimental effects to public or private property adjacent to the project and damage to WORK on the project.

B. The CONTRACTOR'S attention is called to comply with all necessary NPDES and SFWMD dewatering permit requirements (e.g. erosion control measures) during the execution of the WORK.

1.2 CONTRACTOR SUBMITTALS

A. Submittals shall be in accordance with Specification 01 33 00 – Contractor Submittals.

B. Product Data: Manufacturer's catalog sheets on geotextile fabrics.

PART 2 - PRODUCTS

2.1 GENERAL

A. Temporary erosion and water pollution control features consist of, but are not limited to temporary grassing, temporary sodding, temporary mulching, baled hay, silt fences, and rock dikes.

2.2 SODDING

A. Sodding material will be in accordance with Specification 32 92 00 – Seeding and Sodding

2.3 HAY BALES

A. Baled hay or straw dams shall be constructed in accordance with the FDOT Standards Section 104-6.4.9

2.4 ROCK DIKES

A. Rock dikes shall be constructed in accordance with the FDOT Standards Section 104-6.4.12 using FDOT No. 57 stone with ½" x ½" wire mesh.

B. All temporary erosion control facilities shall be removed upon completion of the project.

2.5 FABRIC

A. Fabric shall be woven or non-woven consisting of long-chain polymeric filaments or yarns such as polypropylene, polyethylene, polyester or polyamide. The base plastic shall contain stabilizers and/or inhibitors to make the filaments resistant to deterioration due to ultra-violet light, heat exposure and chemicals. The fabric shall be free of any treatment that may significantly alter its physical properties. The edges of the fabric shall be salvaged or otherwise finished to prevent the outer yarn from pulling away from the fabric.

B. Fabric shall have the following properties:

Parameter	Standard Method	Value
Grab tensile strength	ASTM D 4632	100 lb
Burst strength	ASTM D 3786	200 psi
Apparent opening size	ASTM D 4751	Between 200 and 70 sieve size

C. Fabric Manufacturer, or equal

1. Mirafi

2.6 FENCING

A. Woven wire fabric fencing shall be galvanized, mesh spacing of 6-inches, maximum 14-gauge, at least 30-inches tall.

2.7 FASTENERS

A. Fasteners to wood posts shall be steel, at least 1-1/2 inches long. Fasteners to steel posts shall be galvanized clips.

PART 3 - EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall prevent pollution of streams, canals, lakes, reservoirs, and other water impoundments by fuels, oils, bitumens, calcium chloride, silt or other disturbing materials. The CONTRACTOR shall conduct and schedule operations to avoid or otherwise minimize pollution by siltation.

B. The CONTRACTOR shall provide and maintain, for the duration of the project, erosion control barriers as required to prevent erosion and silt loss from the Site. Erosion control

measures shall remain in place until an adequate stand of grass has been established, per FDOT and NPDES standards.

C. The CONTRACTOR shall not commence clearing, grubbing, earthwork, or other activities that may cause erosion until barriers are in place.

D. The CONTRACTOR shall provide silt fences around the perimeter of all dirt stockpiles storage or processing areas. The CONTRACTOR shall provide silt fences along the canal side of any waterfront properties used for any construction purposes.

E. The CONTRACTOR flush and clean existing storm drainage system from deposits caused by the WORK. This will be identified by the OWNER.

3.2 BALED HAY AND BARRIERS

A. Baled ay and barriers when used shall be constructed in accordance with the details shown in the Drawings and in accordance with Section 104 of the FDOT Standards, 2000 edition. The CONTRACTOR shall construct baled hay or straw dams across water flow paths and place baled hay or straw barriers around drainage structures during the construction to protect against downstream or lateral accumulations of silt and debris. Baled hay or straw dams shall be constructed in accordance with the FDOT Standards, Section 104-6.4.9. The dams shall be placed so as to effectively control silt and debris dispersion under the conditions present on the project, or any conditions created during construction activities, which might tend to produce erosion or the accumulation of silt and debris. Top of bales shall also be placed below the edge of pavement to prevent flooding of the roadway.

B. The CONTRACTOR shall re-establish, at no increase in the Contract Price, all baled hay or straw dams, or sections thereof, which may become damaged, destroyed, or otherwise rendered unsuitable for their intended function during the construction of the project. All such temporary erosion control facilities shall be removed upon completion of the project.

3.3 ROCK DIKES

A. Rock dikes shall be constructed in accordance with the FDOT Standards Section 104-6.4.12 using FDOT No. 57 stone with ½" x ½" wire mesh. The CONTRACTOR shall construct rock dikes across water flow paths and place rock dikes around drainage structures during the construction to protect against downstream or lateral accumulations of silt and debris. The dikes shall be placed so as to effectively control silt and debris dispersion under the conditions present on the project, or any conditions created during construction activities, which might tend to produce erosion or the accumulation of silt and debris. Rock dikes shall also be placed below the edge of pavement to prevent flooding of the roadway.

B. The CONTRACTOR shall re-establish, at no increase in the Contract Price, all rock dikes, or sections thereof, which may become damaged, destroyed, or otherwise rendered

unsuitable for their intended function during the construction of the project. All such temporary erosion control facilities shall be removed upon completion of the project.

3.4 INSTALLATION

A. Barrier systems shall be installed in such a manner that surface runoff will percolate through the system in sheet flow fashion and allow sediment to be retained and accumulated.

B. Drop Inlets shall have a ½" x ½" wire mesh screen over the throat (existing inlets) or grate (for new inlets). A #57 stone barrier shall be provided in front of the throat (existing inlets) or around the inlet structure (new inlets) approximately 4" above the grate/throat. This will allow for water to be filter in moderate rain events and to overflow unobstructed into the inlet in major rain events.

C. Attach the woven wire fencing to the posts that are spaced a maximum of 6 feet apart and embedded a minimum of 12-inches. Install posts at a slight angle toward the source of the anticipated runoff.

D. Trench in the toe of the filter fabric barrier with a spade or mechanical trencher so that the downward face of the trench is flat and perpendicular to the direction of flow. Lay fabric along the edges of the trench. Backfill and compact.

E. Securely fasten the fabric materials to the woven wire fencing with tie wires.

F. Reinforced fabric barrier shall have a height of 18-inches.

G. Provide the filter fabric in continuous rolls and cut to the length of the fence to minimize the use of joints. When joints are necessary, splice the fabric together only at a support post with a minimum 6-inch overlap and seal securely.

3.5 HANDLING AND STORAGE

A. The geotextile fabric shall be wrapped in a protective covering, which is sufficient to protect it from sunlight, dirt and other debris during shipment and storage.

3.6 MAINTENANCE

A. Weekly inspection and repair or replacement of damaged components of the barrier, and within 24 hours of a 1/2 inch or greater rain event. Maintenance includes removing debris from wire mesh and #57 stone at all protected inlets. Unless otherwise directed, maintain the erosion control system until final acceptance; then remove erosion and sediment control systems promptly.

B. Remove sediment deposits when silt reaches a depth of 6-inches or 1/2 the height of the barrier, whichever is less. Dispose of sediments on the Site, if a location is indicated on

the Contract Drawings, or at a site arranged by the CONTRACTOR which is not in or adjacent to a stream or floodplain.

C. During periods of heavy rain (1” or greater as reported by the National Weather Service), the CONTRACTOR shall monitor the temporary erosion control measures to ensure that they are not causing localized flooding. The CONTRACTOR may be required to cut slits in the fabric to drain flooded areas. Fabric shall be replaced after heavy rain events.

END OF SECTION

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 11 13 AC PAVEMENT AND BASE

GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide A.C. pavement and base, complete and in place, in accordance with the Contract Documents.

B. The work specified in this Section consists of the application of bituminous material on previously prepared base in accordance with these specifications and in conformity with the line, grades, dimensions and notes shown on the Drawings.

C. The CONTRACTOR shall restore asphaltic concrete pavement over the top of new pipe installation as detailed on the Drawings and as specified herein.

1. Following successful pressure testing, the CONTRACTOR shall mill the existing pavement to a depth of 1-inch and provide a new 1-inch asphalt overlay for the entire width of the roadway to the limits indicated. The CONTRACTOR shall mill, saw cut, remove and/or replace the existing asphalt as needed so the final lift of asphalt matches existing grades of driveways and storm drains.

D. The CONTRACTOR shall construct asphaltic concrete pavement in accordance typical sections as indicated on the Drawings, and as specified herein. The CONTRACTOR shall provide leveling courses and taper asphalt thicknesses to accommodate varying grades, slopes, side slopes and asphalt thicknesses on the existing roadway or adjacent structures.

E. The CONTRACTOR shall possess an asphalt contractor license issued by Miami-Dade County, Florida or provide an asphalt SUBCONTRACTOR with an asphalt contractor license issued by Miami-Dade County, Florida. The CONTRACTOR or SUBCONTRACTOR shall have a minimum of three (3) satisfactory asphalt projects in Miami-Dade County, Florida where the projects were of equivalent scope, area, and type to this Work. The references shall be submitted to the ENGINEER for review and approval.

F. The CONTRACTOR shall provide adequate supervision, labor, equipment, materials, testing equipment and hot asphalt meeting the specifications and shall place asphalt to provide a smooth driving surface free of ponding. The CONTRACTOR shall flood the existing asphalt prior to the Work and shall flood the new asphalt at the request of the ENGINEER, OWNER, or TOWN to test and assure that the new asphalt drains properly without ponding.

G. The CONTRACTOR shall re-grade, add, remove and recompact the lime rock base as needed or as requested by the ENGINEER or OWNER or as required to provide a finished roadway surface that is smooth, provides a smooth ride and drains without ponding. Any asphalt not meeting the Contract Documents and not providing a smooth, level and comfortable driving surface shall be removed in its entirety and replaced by the CONTRACTOR at the CONTRACTOR's expense and with no additional cost to the OWNER.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards

AASHTO M 82	Cut-Back Asphalt (Medium Curing Type)
AASHTO M 140	Emulsified Asphalt
AASHTO M 208	Cationic Emulsified Asphalt
AASHTO M 226	Viscosity Graded Asphalt Cement
ASTM D 242	Mineral Filler for Bituminous Paving Mixtures
ASTM D 692	Coarse Aggregate for Bituminous Paving Mixtures
ASTM D 977	Emulsified Asphalt
ASTM D 1073	Fine Aggregate for Bituminous Paving Mixtures
ASTM D 1188	Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens
ASTM D 1557	Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf per cu ft)
ASTM D 2027	Cutback Asphalt (Medium Curing Type)
ASTM D 2397	Cationic Emulsified Asphalt
ASTM D 2726	Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
ASTM D 3381	Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D 3515	Hot-Mixed, Hot-Laid Bituminous Paving Mixtures

B. DOT Specifications: he phrases, "DOT Specifications" or “FDOT Specifications”, shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications are referred to herein and are hereby made a part of this Contract to the extent of such references and shall be as binding upon the Contract as though reproduced herein in their entirety.

DOT 160	Stabilizing
DOT 200	Lime rock Base
DOT 300	Prime and Tack Coats for Base Courses
DOT 320	Hot Bituminous Mixtures - Plant Methods and Equipment
DOT 330	Hot Bituminous Mixtures - General Construction Requirements
DOT 331	Type S Asphaltic Concrete
DOT 337	Asphaltic Concrete Friction Courses
DOT 902	Fine Aggregate
DOT 911	Lime rock Material for Base and Stabilized Base
DOT 916	Bituminous Materials

1.3 CONTRACTOR SUBMITTALS

A. The CONTRACTOR shall submit, in writing, materials testing reports, job-mix formulas, notarized certificates of compliance signed by material producer and CONTRACTOR, certifying that each material item complies with, or exceeds, requirements, and other pertinent information satisfactory to the ENGINEER and OWNER demonstrating that proposed materials and methods will comply with the provisions of this Section. The CONTRACTOR shall submit his proposed job-mix formula for the asphaltic concrete paving and required information for review along with the FDOT requirements for the type of asphalt to be used a minimum of ten (10) days prior to the placement of asphalt.

B. The CONTRACTOR shall submit a location map, travel route and travel time calculation from the asphalt mix supplier. The CONTRACTOR shall provide documentation that indicates the number and capacities of vehicles that will be provided for the transport and placement of the asphalt.

C. The CONTRACTOR shall provide documentation of the number and type of equipment, testing equipment and qualified supervisory and labor personnel to be provided to ensure that the asphalt is placed hot and smooth.

D. Suitability Tests of Proposed Materials: Tests for conformance with the Specifications shall be performed prior to start of the WORK. The samples shall be identified to show the name of the material, aggregate source, name of the supplier, contract number, and the segment of the WORK where the material represented by the sample is to be used. Results of all tests shall be submitted to the ENGINEER for approval. Materials to be tested shall include aggregate base, coarse and fine aggregate for paving mixtures, mineral filler, and asphalt cement.

E. Trial Batch: Before placing any paving material, a testing laboratory acceptable to the ENGINEER shall prepare a trial batch of asphalt concrete for each job-mix formula to be used by the CONTRACTOR for the work. The trial batch shall be prepared using the aggregates and asphalt cement proposed by the CONTRACTOR and approved by the ENGINEER. The compacted trial batch shall provide a basis for computing the voids ratio, provide an indication of the optimum asphalt content, and establish a basis for controlling compaction during construction. The cost of not more than 2 laboratory trial batch tests will be paid by the OWNER but the CONTRACTOR shall be responsible for the materials. Performing and paying for any additional trial batch testing shall be the CONTRACTOR's responsibility.

PRODUCTS

2.1 MATERIALS

A. **Limerock Base:** The lime rock base shall consist of either one (1) or two (2) courses of Miami Oolite lime rock conforming to DOT Sections 200 and 911.

B. **Prime Coat:** The material used for the prime coat shall be cut-back Asphalt Grade RC-70 conforming to DOT Sections 300 and 916 for prime to be used on Miami Oolite formation lime rock.

C. **Tack Coat:** The material used for the tack coat shall be Emulsified Asphalt Grade RS-2 conforming to DOT Sections 300 and 916.

D. **Asphaltic Concrete:** The materials and construction of the asphaltic concrete patch and surface courses shall be Type S-III and S-I Asphaltic Concrete conforming to DOT Sections 330, 331, 337 and 916. Final wearing surface shall be Type S-III. Asphaltic concrete mixtures shall be obtained only from plants which comply with the requirements of DOT Section 320 as applicable, using materials specified herein, and producing the specified mixture. General construction requirements for all hot bituminous mixtures specified herein shall conform to DOT Section 330, as applicable.

E. **Reclaimed asphalt shall not be used.**

F. Liquid Asphalt for Prime Coat shall be Asphalt Emulsion Prime (AEP) meeting the requirements of D.O.T. Specifications Section 916-4 and Section 300.

G. Liquid Asphalt for Tack Coat shall be Asphalt Emulsion Prime (AEP), conforming to the requirements of D.O.T. Specification Section 916-4 and Section 300.

2.2 AGGREGATE BASE

A. Materials for aggregate base shall be Type G material in accordance with Specification 31 30 00 - Earthwork.

2.3 PRIME COAT

A. Prime coat shall be Grade SC-250 liquid asphalt complying with the requirements of AASHTO M 82 (ASTM D 2027). Grade SC-70 liquid asphalt may be used when acceptable to the ENGINEER.

2.4 TACK COAT

A. Tack coat shall be emulsified asphalt Grade SS-1 or SS-1h, CSS-1 or CSS-1h diluted with one-part water to one-part emulsified asphalt, undiluted asphalt Grade RS-1 or CRS-1, or paving asphalt Grade AR-1000. Emulsified asphalt shall comply with the requirements of AASHTO M 140 (ASTM D 977) or M 208 (ASTM D 2397); paving asphalt shall comply with the requirements of AASHTO M 226 (ASTM D 3381).

2.5 PAVEMENT MARKING PAINT

A. Pavement marking paint shall be a product specifically formulated for use on asphalt concrete pavement and shall have a proven record of performance and durability.

2.6 EQUIPMENT

A. The pressure distributor used for placing the tack or prime coat shall be equipped with pneumatic tires having sufficient width of rubber in contact with the road surface to avoid breaking the bond of or forming a rut in the surface. The distance between the centers of openings of the outside nozzles of the spray bar shall be equal to the width of the application required, within an allowable variation of 2-inches. The outside nozzle at each end of the spray bar shall have an area of opening of not less than 25 percent, nor more than 75 percent in excess of the other nozzles which shall have uniform openings. When the application covers less than the full width, the normal opening of the end nozzle at the junction line may remain the same as those of the interior nozzle.

B. Application of prime or tack coat shall be done with a distributor approved by the Engineer of Record.

EXECUTION

3.1 PAVEMENT REMOVAL AND REPLACEMENT

A. General: All existing utility castings, including valves boxes, junction boxes, manholes, hand holes, pull boxes, inlets and similar structures in the areas of trench restoration and pavement replacement shall be adjusted by the CONTRACTOR to bring them flush with the surface of the finished work, at no additional cost to the OWNER. The CONTRACTOR shall install concrete collars and identification tags on all existing and new water and wastewater valves within the limits of construction.

B. The CONTRACTOR shall be responsible for the protection from damage from his construction operations, all pavements, including all lime rock base courses and asphaltic surface courses, within the work area. Any base course or surface course, damaged as a result of the CONTRACTOR's operation, shall be restored in accordance with the applicable requirements of these Contract Documents, to the satisfaction of the ENGINEER and TOWN, and to the satisfaction of the governing authority having jurisdiction over the work area at no additional cost to the OWNER. In order to protect himself from being held liable for any existing damaged pavement, including detour routes, the CONTRACTOR is advised to notify the TOWN, in writing, the street where such defective pavement exists prior to proceeding with any work in the vicinity. A copy of all such notices shall be forwarded to the ENGINEER and OWNER.

C. Wherever the line of the nominal repaving for trenches extends to within a travel lane, the CONTRACTOR shall repave the entire roadway width.

D. Permanent pavement repair shall be in accordance with the details shown on the Drawings, with edges straight and parallel and patches rectangular in plan. Any paving replacement required beyond the limits shown in the details, and as called for in the Specifications, shall be at the CONTRACTOR's expense.

E. No mixture shall be spread when the air temperature is less than 40 degrees F.

F. Any mixture caught in transit by a sudden rain may be laid at the CONTRACTOR's risk, if the base is in suitable condition. Under no circumstances shall asphalt material be placed while rain is falling or when there is water on the area to be covered.

3.2 PREPARATION

A. Before applying any bituminous material, all loose material, dust, dirt, and foreign material, which might prevent proper bond with the existing surface, shall be removed. Particular care shall be taken to clean the outer edges of the strip to be treated in order to ensure that the prime or tack coat will adhere.

B. When the prime or tack coat is applied adjacent to curb and gutter, or any other concrete surface (except where they are to be covered with a bituminous wearing course) such concrete surfaces shall be protected by heavy paper or other protective material while the

prime or tack coat is being applied. Any bituminous material deposited on such concrete surfaces shall be removed immediately.

3.3 WEATHER LIMITATIONS

A. No bituminous material shall be applied when the air temperature is less than 50EF in the shade, or when the weather conditions or the condition of the existing surface is unsuitable. In no case shall bituminous material be applied while rain is falling or when there is water on the surface to be covered.

3.4 APPLICATION OF PRIME COAT

A. After the base has been finished, the full width of surface shall be swept with a power broom supplemented with hand brooms and mechanical blowers prior to the application of the prime coat. Care shall be taken to remove all loose dust, dirt and objectionable matter. If deemed necessary, the base shall be lightly sprinkled with water immediately in advance of the prime coat. The prime coat shall be applied to the full width of the base.

B. The temperature of the prime material shall be such as to insure uniform distribution. The material shall be applied with a pressure distributor as specified above. The amount to be applied shall be sufficient to coat the surface thoroughly and uniformly without any excess to form pools or to flow off the base. For limerock base, the rate of application shall not be less than 0.10 gallons per square yard.

C. If the roadway is to be opened for use following the application of the prime material, a light uniform application of clean sand shall be applied and rolled. The sand shall be non-plastic, shall be free from silt and rock particles and shall not contain any sticks, vegetation, grass, roots or organic matter. After the sand covering has been applied, the surface may be opened to traffic.

3.5 APPLICATION OF TACK COAT

A. In general, a tack coat will not be used on primed bases except in areas which have become excessively dirty and cannot be cleaned or where the prime has cured and lost all of its bonding effect.

B. No tack coat shall be applied until the primed base or leveling course or new or existing asphaltic concrete has been cleaned and is free from sand, dust or other objectionable material.

C. The tack coat shall be applied with a pressure distributor as specified above. It shall be heated to a suitable consistency and applied in a thin uniform layer at the rate of between 0.05 gallons and 0.15 gallons per square yard.

D. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying but shall not be applied so far in advance or over such an area as to lose its adhesiveness as a result of being covered with dust or other foreign material. The tack

coat shall not advance ahead of the paving by more than 300 feet in business or residential areas unless otherwise approved by the Engineer. Suitable precautions shall be taken by the Contractor to protect the surface while the tack coat is drying and until the wearing surface is applied.

3.6 AGGREGATE BASE

A. Aggregate base shall be provided where indicated to the thickness indicated. Imported aggregate bases shall be delivered to the Site as uniform mixtures and each layer shall be spread in one operation. Segregation shall be avoided, and the base shall be free of pockets of coarse or fine material. Where the required thickness is 6-inches or less, the base materials may be spread and compacted in one layer. Where the required thickness is more than 6-inches; the base material shall be spread and compacted in two or more layers of approximately equal thickness, and the maximum compacted thickness of any one layer shall not exceed 6-inches. The relative compaction of each layer of aggregate base shall be not less than 95 percent of maximum density when measured in accordance with ASTM D 1557. The compacted surface of the finished aggregate shall be hard, uniform, smooth and at any point shall not vary more than 0.02 foot from the indicated grade or cross-section.

3.7 PRIME COAT

A. Prior to placing of pavement, a prime coat of cutback asphalt shall be applied to the compacted base or subgrade at a rate between 0.10 and 0.25 gal/sq yd.

3.8 TACK COAT

A. A tack coat shall be applied to existing paved surfaces where new asphalt concrete is to be placed on existing pavement. It shall also be applied to the contact surfaces of all cold pavement joints, curbs, gutters, manholes and the like immediately before the adjoining asphalt pavement is placed. Care shall be taken to prevent the application of tack coat material to surfaces that will not be in contact with the new asphalt concrete pavement. Diluted emulsified asphalt shall be applied at the rate of 0.05 to 0.15 gal/sq yd. Undiluted emulsified asphalt shall be applied at the rate of 0.025 to 0.075 gal/sq yd. Paving asphalt shall be applied at the rate of approximately 0.05 gal/sq yd.

3.9 PAVEMENT REPAIR

A. All damage to pavement as a result of work under this Contract shall be repaired in a manner satisfactory to the ENGINEER and TOWN and at no additional cost to the OWNER. The repair shall include the preparation of the subgrade, the placing and compacting of the lime rock base, the priming of the base, the placing and maintaining of the surface treatment, all as specified herein.

B. The width of all repairs shall extend at least twelve (12) inches beyond the limit of the damage. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other method acceptable to the ENGINEER so as to provide a clean edge to abut

the repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

C. When a pipeline is installed in the middle of the road or the trench is partially on two traffic lanes, pavement shall be milled, saw-cut along the edges and asphalt shall be placed for the width of the two traffic lanes that have been disturbed unless otherwise shown on the Drawings.

3.10 PAVING

A. Final paving cannot be installed until all pipelines are satisfactorily pressure tested. Any pipeline defects identified during the testing process must be repaired prior to the placement of asphalt concrete.

B. The asphaltic concrete surface required is one lift of ¾ inches FDOT Type S-III overlay, 1-inch FDOT Type SI structural course (over the trench and replacement lime rock base (over the trench) as shown on the drawings.

C. Lime rock of the Miami formation shall be used, having a minimum carbonate content of 60% and a minimum Load Bearing Ration (LBR) of 100. All lime rock bases must be constructed in lifts with a maximum thickness of 6-inches. The base material shall be compacted to a minimum density of 98% of maximum dry density as determined by AASHTO-180.

D. The maximum paving application tolerance is ¼-inch.

E. Prior to placement of asphalt a design mix for the asphalt gradation of all material, content of mix, Marshall Stability and laboratory density shall be provided to the ENGINEER, and TOWN. The design mix shall be subject to review and approval by the TOWN ENGINEER. Density testing shall be in compliance with FDOT Standard Specification for Road and Bridge Construction (latest edition).

F. After asphalt is placed, the CONTRACTOR shall obtain from an independent testing laboratory at minimum intervals of 300 feet, core borings of the asphalt to determine: thickness and density, Marshall Stability, Sieve Analysis of Aggregate and Bitumen content of Asphalt.

G. The graded aggregate base material shall be of uniform quality throughout, substantially free from vegetative matter, shale, lumps and clay balls and shall have an LBR of not less than 100. The material retained on the No. 10 sieve shall be composed of aggregate meeting the following requirements:

1. Soundness Loss, Sodium, Sulfate: AASHTO T 104-15%

2. Percent Wear: AASHTO T 96 (Grading A)

H. All lime rock shall be primed and compacted to 98% of the modified proctor density, AASHTO T-180, and be installed on a stabilized subgrade. In addition, a minimum LBR of 100 is required.

I. Certification from a testing laboratory shall be submitted to the ENGINEER and TOWN and will be subject to review and approval by the TOWN. The certification shall indicate that the material used for the base meets the specified criteria and contains less than 1% by weight asbestos and a minimum of 60% of calcium and magnesium.

J. After the base is completed, the CONTRACTOR shall obtain from an independent testing laboratory at minimum intervals of 300 feet, cores to determine base thickness and density. The tests shall be submitted to the ENGINEER and TOWN ENGINEER approval.

K. All sub-grades shall meet or exceed 98% modified proctor density AASHTO Y-180. In addition, a minimum L.B.R. of 40 will be required of all roadway and sub-grades.

L. All sub-grades are to be a minimum of six (6) inches beyond the base course layer where curbing is omitted. All rock bases shall be a minimum of six (6) inches beyond the asphalt concrete layer where curbing is omitted.

M. After the sub-grade is complete the CONTRACTOR shall obtain from an independent testing laboratory at minimum intervals of 300 feet, density and L.B.R. ratio tests on the sub-grade. The tests shall be submitted to the ENGINEER and the TOWN approval.

3.11 ASPHALT CONCRETE

A. At the time of delivery to the Site, the temperature of mixture shall not be lower than 260 degrees F or higher than 320 degrees F, the lower limit to be approached in warm weather and the higher in cold weather.

B. Asphalt concrete shall not be placed when the atmospheric temperature is below 40 degrees F or during unsuitable weather.

C. The asphalt concrete shall be evenly spread upon the subgrade or base to such a depth that, after rolling, it will be of the required cross section and grade of the course being constructed.

D. The depositing, distributing, and spreading of the asphalt concrete shall be accomplished in a single, continuous operation by means of a self-propelled mechanical spreading and finishing machine designed especially for that purpose. The machine shall be equipped with a screed or strike-off assembly capable of being accurately regulated and adjusted to distribute a layer of the material to a definite pre-determined thickness. When paving is of a size or in a location that use of a self-propelled machine is impractical, the ENGINEER may waive the self-propelled requirement.

E. Spreading, once commenced, shall be continued without interruption.

F. The mix shall be compacted immediately after placing. Initial rolling with a steel-wheeled tandem roller, steel three-wheeled roller, vibratory roller, or a pneumatic-tired roller shall follow the paver as closely as possible. If needed, intermediate rolling with a pneumatic-tired roller shall be done immediately behind the initial rolling. Final rolling shall eliminate marks from previous rolling. In areas too small for the roller, a vibrating plate compactor or a hand tamper shall be used to achieve thorough compaction.

G. Upon completion the pavement shall be true to grade and cross-section. When a 10-ft straightedge is laid on the finished surface parallel to the center of the roadway, the surface shall not vary from the edge of the straightedge more than 1/8-in except at intersections or changes of grade. In the transverse direction, the surface shall not vary from the edge of the straightedge more than 1/4-in.

H. The relative density after compaction shall be 95 percent of the density obtained by using ASTM D 1188 or D 2726. A properly calibrated nuclear asphalt testing device shall be used for determining the field density of compacted asphalt concrete, or slabs or cores may be laboratory tested in accordance with ASTM D 1188.

3.12 PAVEMENT MARKING

A. Pavement marking paint shall be applied where indicated only when the pavement surface is dry and clean, and when the air temperature is above 40 degrees F. All equipment used in the application of pavement marking shall produce stripes and markings of uniform quality with clean and well-defined edges that conform to the details and dimensions indicated. Drips, overspray, improper markings, and paint material tracked by traffic shall be immediately removed from the pavement surface by methods previously reviewed by the ENGINEER.

END OF SECTION

32 17 23 PAVEMENT MARKING AND SIGNS

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide pavement marking and striping, complete and in place, in accordance with the Contract Documents.

B. This Section consists of reflective pavement markers, traffic stripes and markings and traffic signs as specified herein, and as required for a complete installation.

C. The Contractor shall replace any existing reflective pavement markers, traffic stripes and markings damaged during construction to match the existing conditions.

1.2 QUALITY ASSURANCE

A. Perform WORK in accordance with the requirements of local agencies.

B. The phrase “DOT Specifications” shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications are referred to herein and are hereby made a part of this Contract to the extent of such references and shall be as binding upon the Contract as though reproduced herein in their entirety.

1.3 CERTIFICATION

A. The Contractor shall furnish the manufacturer’s certification that all signs furnished conform to these specifications and shall replace or repair at his expense all signs that fail to meet this requirement.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chlorinated Rubber-alkyd Type: Per Fed Spec. No. TT-P-115, Type III, or Code T-1, conforming to Section 971-12.2 of the Florida Department of Transportation Standard Specifications.

B. Paint shall be factory mixed, quick drying and non-bleeding type.

C. Color shall be as per D.O.T. requirements.

D. Striping, arrows, lane markers and stop bars shall be provided with paint containing reflective additive.

E. Thermoplastic Paint: Conform to the applicable Technical Specifications (Section 711) of the Florida Department of Transportation and Miami-Dade County DTPW Standards.

F. Traffic Paint: Conform to the applicable Technical Specifications (Section 710) of the Florida Department of Transportation and Miami-Dade County DTPW Standards.

2.2 PAVEMENT MARKING

A. Paint or traffic stripes and markings shall be in conformance with DOT specification “Thermoplastic Traffic Stripes and Markings Paint” 711-12. The colors of the paint shall be yellow or white as existed before the repair.

B. Temporary pavement markings shall be used for the phase between final overlay and when final thermoplastic markings can be placed. Temporary markings shall consist of paint or traffic tape. All such markings shall be fully retro-reflectorized.

C. Reflective pavement markers shall be in conformance with DOT specification Section 706-2.

2.3 TRAFFIC SIGNS

A. General: The Contractor shall replace signs damaged during construction. Traffic regulating signs shall conform to the colors, dimensions and requirements of the Manual on Uniform Traffic Control Devices (ANSI).

B. Sign Panels and Support Members: Sign panels and support members shall conform to Aluminum Association Alloy 6061-T6.

C. Bolts: Bolts shall conform to Aluminum Association Alloy 2024-T4 with an anodic coating 0.0002-inches thick minimum and chromate sealed.

D. Nuts: Nuts shall conform to Aluminum Association Alloy 6269-T9.

E. Reflective Sheeting: Reflective sheeting shall conform to DOT Type A requirements.

F. Construction Warning Signs: The Contractor shall install traffic and warning signs during construction in accordance with OSHA, DOT and County requirements.

G. All signage shall be in accordance with Miami-Dade County DTPW standards and the FHWA issued “Manual on Uniform Traffic Control Devices”, current edition.

PART 3 - EXECUTION

3.1 TRAFFIC AND LANE MARKINGS

A. Sweep dust and loose material from the sealed surface.

B. Apply paint striping as indicated with suitable mechanical equipment to produce uniform straight edges. Apply not less than 2 coats at manufacturer's recommended rates of application.

C. Protect pavement markings until completely dry in accordance with manufacturer's recommendations.

3.2 PAVEMENT MARKINGS

A. Temporary pavement markings shall be installed as soon as practical following paving. Pavement markings are required on all new asphalt, prior to night fall. All pavement markings shall be visible at night and shall be retro-reflective. In the event of inclement weather, the project shall be striped as soon as practical once the weather has improved.

B. Permanent thermoplastic markings shall not be placed until new asphalt has cured for a minimum of four (4) weeks.

C. The surface, which is to be painted shall be cleaned, by compressed air or other effective means, immediately before the start of painting, and shall be clean and dry when the paint is applied. Any vegetation or soil shall be removed from the pavement before edge striping is begun.

D. The traffic stripe shall be of the specified width, with clean, true edges and without sharp breaks in the alignment. A uniform coating of paint shall be obtained, and the finished stripe shall contain no light spots or paint skips. Any stripes which do not have a uniform, satisfactory appearance, both day and night, shall be corrected.

E. All newly painted stripes, including edge stripes, shall be protected until the paint is sufficiently dry to permit vehicles to cross the stripe without damage from the tires. While the center line stripes are being painted, all traffic shall be routed away from the painting operations and the newly painted stripe. When necessary, a pilot car shall be used to protect the painting operations from traffic interference.

F. Any portions of the stripes damaged during construction shall be repainted at the Contractor’s expense.

G. Thermoplastic Traffic Stripes and Markings: The thermoplastic compound shall be extruded or sprayed onto the pavement surface in a molten state by mechanical means, with surface application of glass spheres, when required, and upon cooling to ambient pavement temperature shall produce an adherent pavement marking of specified thickness and width and capable of resisting deformation.

H. The portion of the pavement surface or thermoplastic marking to which the marker is attached by the adhesive shall be cleaned of dirt, curing compound, grease, oil, moisture, loose or unsound pavement and any other material which would adversely affect the adhesive. Reflective markers shall be installed in such a manner that the reflective face of the marker is perpendicular to a line parallel to the roadway centerline. No markers shall

be installed over longitudinal or transverse joints of the pavement surface. The adhesive shall be spread on the bonding surface (not the marker) so that 100 percent of the bonding area of the marker will be covered. The adhesive application shall be of sufficient thickness so that when the marker is pressed into the adhesive, excess adhesive shall be forced out around the entire perimeter of the marker. All excessive adhesive shall be removed from in front of the reflective faces, if any adhesive or foreign matter adheres to the reflective face of the marker, the marker shall be replaced. The Engineer shall determine the minimum time necessary to cure the adhesive for sufficient set to bear traffic.

I. Reflective pavement markings shall be placed at locations of fire hydrants and watermain valves as required by TOWN standards.

3.3 SIGN FABRICATION

A. Preparation f sign blanks and fabrication of reflectorized faces shall conform to the applicable requirements of DOT Section 700-4 and 700-5.

3.4 INSTALLATION

A. Sign and supports shall be erected in conformance to DOT requirements and as specified herein.

B. All damaged signs and reflective pavement markers and traffic stripes and markings shall be replaced in conformance with this Section and DOT requirements.

END OF SECTION

32 92 00 SODDING

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall apply grass sodding, complete and in place, in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Federal Specifications:

FS O-F-241D Fertilizer, Mixed, Commercial.

B. Commercial Standards:

ANSI/ASTM D 422 Method for Particle-Size Analysis of Soils.

1.3 CONTRACTOR SUBMITTALS

A. Materials List: A list of all materials to be used in the turfing and seeding operations together with the source of those materials. The list shall include mulches, soil amendments, sod species, and erosion control blanketing. Manufacturer's literature showing physical characteristics, applications, and installation instrumentation shall be included.

B. Schedules: The following work plans, before work is started.

1. Delivery schedule at least 10 days prior to the intended date of the first delivery.

2. Pesticide Treatment Plan, giving proposed sequence of pesticide treatment work, before work is started. The pesticide trade name, chemical composition, formulation, concentration, application rate of active ingredients and methods of application for all materials furnished, and the name and state license number of the state-certified applicator shall be included.

3. Turfing Operation. A list of seeding and mulching equipment to be used in performance of turfing operation, descriptive data, and calibration tests.

4. Plant Establishment Period. Written calendar time period for the beginning of the plant and turf establishment period. When there is more than one establishment period, the boundaries of the planted and turf areas covered for each period shall be described.

1.4 CLEANUP

A. Upon completion of all seeding/sodding operations, the portion of the Site used for a work or storage area by the CONTRACTOR shall be cleaned of all debris, superfluous materials, equipment, and garbage.

B. Walks and pavement shall be swept or washed clean upon completion of the WORK of this Section.

1.5 MAINTENANCE PRIOR TO ACCEPTANCE OF PROJECT

A. General: The CONTRACTOR shall be responsible for protecting, watering, fertilizing, and maintaining turf and seeded areas until final acceptance of the WORK.

B. Maintain sod by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regarding and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

C. Maintain lawns for not less than a minimum of 30 days after substantial completion, until final acceptance.

D. Upon completion of seeding/sodding, the entire planted area shall be soaked to saturation by a fine spray. The new planting shall be kept watered by the sprinkling system on the Site during dry weather or whenever necessary for proper establishment of the turf. Care shall be taken to avoid excessive washing or puddling on the surface and any such damage caused thereby shall be repaired by the CONTRACTOR.

E. Protection: The CONTRACTOR shall provide adequate protection to all newly sodded areas including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until the end of the one-year correction period.

F. The CONTRACTOR shall replace any materials or equipment it has damaged, or which has been damaged by its employees or subcontractors.

G. Partial utilization of the project shall not relieve the CONTRACTOR of any of the requirements of this Section

H. Mowing of Turf Areas: First mowing of turf areas shall begin as soon as the grass has reached a height of 3 inches and subsequent mowing shall be at least once a week, or as often as necessary to maintain turf areas at a uniform height of 1-1/2 to 2 inches.

I. Maintenance shall include, in addition to the foregoing, cleaning, edging, the repair of erosion, and other maintenance work. Sidewalks and other paved areas shall be kept clean while planting and maintenance are in progress.

J. Turf areas shall be fertilized with percentage of nitrogen required to provide not less than 1 pound of actual nitrogen per 1,000 sq. ft. of lawn area and not less than 4 percent

phosphoric acid and 2 percent potassium. Provide nitrogen in a form that will be available to sod during initial period of growth; at least 50 percent of nitrogen to be in organic form. The chemical designation shall be 8-8-8.

1.6 FINAL INSPECTION AND GUARANTEE

A. Inspection of sodded areas will be made at final acceptance.

B. Written notice requesting inspection shall be submitted to the ENGINEER at least 10 days prior to the anticipated inspection date.

C. Any delay in completing the WORK of this Section beyond a single season will be cause for extending the correction of defects period an equal time.

D. The CONTRACTOR shall, without additional expense to the OWNER, replace sodding which develops defects or dies during the correction period.

PART 2 - PRODUCTS

2.1 GENERAL

A. Materials for soil conditioning and weed abatement shall be first-grade, commercial quality and shall have certificates indicating the source of material, analysis, quantity, or weight attached to each sack or container or furnished with each delivery. Delivery certificates shall be given to the ENGINEER as each shipment of material is delivered. A list of the materials used, together with typical certificates of each material, shall be submitted to the ENGINEER prior to final acceptance.

2.2 TOPSOIL

A. Topsoil shall be the existing soil stripped to the depth indicated and stockpiled at a location directed by the ENGINEER in accordance with Section 31 30 00 - Earthwork.

B. Additional topsoil, if needed, shall comply with the following:

1. Topsoil shall be obtained from naturally drained areas and shall be fertile, friable loam suitable for plant growth. Topsoil shall be subject to inspection and approval at the source of supply and upon delivery.

2. Topsoil shall be of uniform quality, free from subsoil, stiff or lumpy clay, hard clods, hardpan, rocks, disintegrated debris, plants, roots, seeds, and any other materials that would be toxic or harmful to plant growth. Topsoil shall contain no noxious weeds or noxious weed seeds.

3. Topsoil shall be 4% to 12% organic matter of the total dry weight.

4. pH and nutrient content shall be adjusted as necessary to conform with recommendations made by testing laboratory.

5. Mechanical analysis shall be performed and shall conform to ASTM D 422.

2.3 FERTILIZER AND ADDITIVES

A. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.

B. Chemical fertilizers shall be a mixed commercial fertilizer conforming to FS O-F-24c(1), Grade A or B, with percentages of nitrogen, phosphoric acid, and potash at 8-8-8. The combined N-P-K content shall be the following percentages of total weight: 50 percent nitrogen, 4 percent phosphoric acid and 2 percent potash. Fertilizers shall be uniform in composition, dry, and free flowing.

2.4 SOD

A. Provide sod to restore any damage caused by construction operations, lay-down area, or bypassing to the existing grass areas at the project site.

B. Sod shall match the existing grass type.

C. The sod shall be deeply rooted, not less than 2 years old, relatively free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 1-inch in any dimension, woody plant roots and other material detrimental to a healthy stand of turf. Sod that has become dry, moldy, or yellow from heating, or has irregularly shaped pieces of sod and torn or uneven ends shall be rejected.

D. Provide sod uniform pad sizes with maximum 5 percent deviation in either length or width. Broken pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically with a firm grasp on upper 10 percent of pad will be rejected.

E. Sod shall be nursery grown on cultivated mineral agricultural soils. Sod shall have been mowed regularly and carefully maintained from planting to harvest.

F. American Sod Producers Association (ASPA) Grade: Nursery grown or Approved. Field grown sod not acceptable.

G. The sod shall be nursery grown. It shall be uniformly cut in pads at a length of 24 inches, plus or minus 5% and a width of 18 inches, plus or minus 5%. Thickness shall be 1-1/2 inches excluding top growth and thatch. Pads shall not be stretched, broken or torn.

H. Sod shall be inspected and found free of disease, nematodes, pests and pest larvae, by entomologist of State Department of Agriculture.

I. Sod shall be uniform in color, leaf texture, and density.

2.5 MULCH

A. Wood Cellulose Fiber: Mulch shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to aid visual monitoring during application. Composition on air-dry weight basis: 9 to 15 percent moisture and pH range from 4.5 to 6.0.

B. Straw mulch or native hay for a soil/seed stabilizer shall be clean hay or straw applied at a rate of 3 tons per acre. Mulch shall be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6-inches minimum and 9-inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3-inches.

2.6 EROSION CONTROL MATERIAL

A. Soil Erosion Control Blanket: Blanket shall be machine-produced mat of wood excelsior formed from a web of interlocking wood fibers, covered on one side with either knitted straw blanket-like mat-construction, covered with biodegradable plastic mesh, or interwoven with biodegradable thread, plastic netting or twisted kraft paper cord netting.

B. Soil Erosion Control Fabric: Control fabric shall be knitted construction of polypropylene yarn with uniform mesh openings of 314 per 1-inch square with strips of biodegradable paper. Filler paper strips shall last 6 to 8 months.

C. Soil Erosion Control Net: Control net shall be heavy, twisted jute mesh weighing approximately 1.22 pounds per linear yard and 4-feet wide with mesh openings of approximately 1-inch square.

D. Anchors: Erosion control anchors shall be as recommended by the manufacturer.

2.7 PESTICIDE

A. Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide, and miticide. Pesticide material shall be labeled for use and applied only as registered by EPA and approved.

B. Herbicide shall contain maximum 54 percent alyphosate as an active ingredient. The herbicide shall not contain a surfactant. The herbicide shall allow seeding/sodding to take place 3 days after application of the herbicide.

PART 3 - EXECUTION

3.1 PREPARATION OF GROUND SURFACE

A. For sod, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.

3.2 SODDING

A. Lay sod within 24 hours from time of stripping.

B. Lay sod to form solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. WORK from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. WORK sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering of adjacent grass.

C. Water sod thoroughly with a fine spray immediately after planting.

3.3 APPLICATION OF PESTICIDE MATERIAL

A. When pesticide becomes necessary to remove a disease or pest, a state-certified applicator shall apply required pesticide in accordance with State EPA label restrictions and recommendations. Hydraulic equipment for the liquid application of pesticides shall consist of a leak-proof tank, positive agitation methods, controlled application pressure, and metering gauges. A pesticide treatment plan shall be furnished to the ENGINEER as indicated above.

3.4 SOD PLACEMENT

A. Areas shall be sodded as indicated. Adequate soil moisture shall be ensured prior to sodding by spraying water on the area to be sodded and wetting the soil to a minimum depth of 1 inch.

B. Placing Sod: Rows of sod shall be placed parallel to and tightly against each other. joints shall be staggered laterally. The sod strips shall not be stretched or overlapped. All joints shall be butted tight. Voids and air drying of roots shall be prevented. On long slopes, sod shall be laid at right angles to slopes. In ditches, sod shall be laid at right angles to the flow of water. When required, the sod shall be anchored by placing anchors a minimum distance of 2-feet on center with a minimum of 2 anchors per sod section.

C. Finishing: All air pockets shall be eliminated, and a true and even surface shall be provided by tamping or rolling the sod in place. Displacement of the sod shall be assured by knitting of sod to the soil. Frayed edges shall be trimmed, and holes or missing corners shall be patched in the sod.

D. Water Sod: Watering shall be started immediately after completing each day of sodding. Water shall be applied at a rate of 1-1/2 inches of water per week and at sufficient intervals to ensure moist soil conditions to a minimum depth of 1-inch. Run-off and puddling shall be prevented

3.5 EROSION CONTROL INSTALLATION

A. Erosion control material is required on slopes greater than 4 to 1. Erosion control material shall be installed in accordance with manufacturer's instructions. Placement of the erosion control material shall be accomplished without damage to installed material or without deviation to finished grade.

3.6 INSPECTION AND ACCEPTANCE

A. Sod areas will be accepted when in compliance with all the following conditions:

1. The roots are thoroughly attached to the soil.

2. Absence of visible joints.

3. All areas show a uniform stand of specified grass in healthy condition.

4. At least 60 days have elapsed since the completion of the WORK in this section.

B. When inspected sod WORK does not comply with requirements, replace rejected WORK and continue specified maintenance until re-inspected by ENGINEER and found to be acceptable.

C. Procedure:

1. The CONTRACTOR shall submit a request for acceptance in writing to the ENGINEER. Request must be received not less than 10 days before the anticipated date for final inspection.

2. Upon completion of all repairs and/or renewals required by ENGINEER at the inspection, the ENGINEER will verify the completeness of the WORK and then notify the OWNER in writing that the WORK is accepted.

3. Upon completeness, the OWNER will assume maintenance of all sod areas.

END OF SECTION

32 92 10 CURBS, GUTTERS, SIDEWALKS AND DRIVEWAYS

PART 1 - GENERAL

1.1 GENERAL

A. Work covered under this Section covers the furnishing of all labor, equipment and material required for cutting, removing, protecting and replacing all existing concrete driveways, sidewalks, and curb and gutter of the various types encountered, removed or damaged under this Contract.

B. The Contractor shall be responsible for the protection from damage from his construction operations, all concrete driveways, sidewalk, and curb and gutter within the work area. If payment items are established in the Quotation for the removal and replacement of concrete driveway, sidewalk, and curb and gutter, payment will be made only if such items are encountered within the limits of the trench width plus 2 feet (shoulders). Any concrete driveway, sidewalk, or curb and gutter beyond those limits, damaged as a result of the Contractor's operation, shall be restored in accordance with the applicable requirements of these Specifications, and to the satisfaction of the Engineer, at no additional cost to the OWNER. In order to protect himself from being held liable for any existing damaged concrete driveways, sidewalks or curb and gutter, the Contractor is advised to notify in writing the authority having jurisdiction over the street where such damage exists prior to proceeding with any work in the vicinity. A copy of all such notices shall be forwarded to the Engineer.

C. No payment will be made for removal and replacement of concrete driveway, sidewalk, or curb and gutter necessitated by the installation of thrust blocks or other appurtenant items which fall outside the above described limits. The cost for said removal and replacement shall be included in the price bid for the applicable item.

D. If payment items have not been established in the Quotation for the removal and replacement of concrete driveways, sidewalks, and curb and gutter, the cost for such work shall be included in the overall Project cost bid. No other compensation will be provided.

E. No form shall be set higher than the elevation of the adjacent concrete surface.

F. As used herein, "driveway" shall mean concrete driveway, and "curb and gutter" shall mean free standing curb, gutter, or combination curb and gutter.

G. All concrete shall be treated with a liquid curing compound, and in some cases, concrete colorant shall be required in order to match the color of the existing concrete being replaced. In each such case the curing compound, the colorant, and the color, shall meet with the approval of the Engineer and the municipality having jurisdiction over the work area. All additives to the concrete shall be applied in strict conformance with the recommendations of the manufacturer.

H. The Contractor shall provide adequate means to protect each driveway, sidewalk, and curb and gutter installation from damage from vandals, animals, weather or other causes, until the concrete is hard. Should damage occur from such causes, the Contractor shall remove and replace the damaged item at his own expense.

1.2 CONCRETE DRIVEWAYS

A. Concrete driveways, and sidewalks crossing driveways, shall be restored in full sections or blocks rather than trench width plus 2 feet (shoulders), if the original construction was divided into such sections or blocks. The existing driveway (or sidewalk) shall be cut with an abrasive disc saw to trim the edges to straight and true lines, with edges parallel and rectangular in plan. The interior concrete shall then be broken up and removed from the site.

B. Driveways, and sidewalks crossing driveways, shall be replaced with a concrete slab having a minimum thickness of 6 inches. Steel reinforcement is not required unless the existing driveway (or sidewalk) is so reinforced, in which case the replaced driveway shall also be reinforced to match the existing.

C. Such forms as are necessary shall be set up and the subgrade regraded for a slab 6 inches thick. The subgrade shall be thoroughly compacted and wet down prior to placing the concrete. The surface shall be given a surface and edging to match, as nearly as possible, that of the existing driveway (or sidewalk). The finish and edging shall be obtained through the use of screeds, trowels, edges and any other tool normally required by the trade in performing this kind of work.

D. All forms for driveways (or sidewalks) including those for expansion joints, shall be metal and shall be clean and well-oiled prior to placing concrete. The forms shall be set in place far enough in advance of concrete placing for the Engineer to check line and grade. Abrupt changes in line and grade will not be permitted, and forms shall be set to ensure smooth curvature and alignment both vertically and horizontally. Forms shall be left in place for a minimum of 24 hours after concrete has been placed.

E. Replacement driveways (and sidewalks) shall match the elevation and alignment of existing driveways (and sidewalk) wherever a connection is made.

1.3 SIDEWALKS

A. Sidewalks shall be restored in full section rather than trench width plus 2 feet (shoulder).

B. Removal of existing sidewalk, installation of forms, preparation of subgrade, and the final finish shall be performed as specified hereinabove for driveways, except that the minimum thickness of the sidewalk shall be 4 inches thick.

1.4 CURB AND GUTTER

A. Curb and gutter shall be restored in lengths equal to trench width plus 2 feet (shoulders) or 10 feet, whichever is greater, unless otherwise permitted or ordered by the Engineer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

DIVISION 33 – UTILITIES

33 01 10 CLEANING OF STORMWATER UTILITY PIPING

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall furnish and install all material, labor and equipment necessary to clean and test the force main and/or water main.

B. Pipelines for Stormwater Forcemains shall be pressure tested at 155 psi for a minimum of two (2) hours.

C. The Contractor is advised that he is solely responsible for any damage caused to the main or its lining by cleaning operations and he shall be required to repair or replace, as required by the OWNER, any damaged pipe or lining.

1.2 SUBMITTALS

A. Prior to cleaning operations, submit in writing to the Engineer, the make, model and characteristics of the pig to be used in cleaning operations.

B. If the pig has not been previously approved for this use by the OWNER, the submittal shall be a formal shop drawing submittal for approval and accompanied by a letter signed by a responsible officer of the manufacturing firm specifically stating that the submitted item will not damage the lining or pipe and that it is suitable for cleaning pipe of the diameter and lining type utilized in the project.

C. Single submittals may be made to qualify different types of pigs for different linings or sizes of pipe but only one manufacturer's products shall be included in a particular submittal.

1.3 QUALITY ASSURANCE

A. Testing hall be in accordance with ANSI/AWWA Standard C-600, latest edition. Cleaning and testing shall be performed in strict accordance with these specifications.

B. The Contractor is cautioned that Miami Dade County or other governing body having jurisdiction over the work location may have regulatory rules and ordinances prohibiting or limiting the discharge of water from any excavation into sanitary and storm sewer systems, or to canals and drainage ditches. The Contractor shall comply with all regulations of all governing agencies.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pig or cleaning lines: Bare Swab No. 5B; density, 1 lb./ft.3; Knapp Polly Pig, Inc., 1209 Hardy Street, Houston, Texas 77020, 1-800-231-7205, or approved equal.

PART 3 - EXECUTION

3.1 CLEANING

A. As soon as the installation of each run of force main and/or water main is completed, and prior to installation of valves on the main in positions which would interfere with the cleaning operation, the line shall be cleaned by use of a pig with characteristics as specified above. The pig shall be driven through the line by water pressure and no cables, push rods or other mechanisms that might damage the pipe or lining shall be utilized in this operation.

B. Thorough pigging will be required, and operations shall be sufficient to remove all deleterious materials left in the pipe by construction and shall meet the Engineer's approval. If required by the OWNER, pigging operations shall be scheduled to allow observation by the OWNER and no extra compensation will be allowed for such scheduling.

C. The Contractor shall furnish and install all piping necessary to carry out pigging operations, dispose of water and debris from the operation, and shall exercise care to prevent any damage to the surrounding area and adjoining or adjacent properties. The Contractor shall furnish either a new or in new condition pig for cleaning operations and the OWNER reserves the right to reject the pig and require provision by the Contractor of a new replacement at no additional cost to the OWNER.

D. The Contractor is required to install nightcaps, plugs or other devices acceptable to the Engineer at the open ends of the pipe installation at the end the workday. This requirement shall apply to installations both above and below the water table.

END OF SECTION

33 01 11 PRESSURE PIPE TESTING AND DISINFECTION

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The CONTRACTOR shall test pipelines and appurtenant piping, in accordance with the Contract Documents.

B. The CONTRACTOR shall be responsible for obtaining permits for discharging excess testing water if required to satisfy permit limits.

C. The CONTRACTOR shall coordinate all disinfection with the OWNER a minimum of 48 hours before starting the work. The 48 hours' notice shall apply to normal working days only; weekends and holidays exempted.

1.2 CONTRACTOR SUBMITTALS

A. Furnish: A testing plan and schedule, including method for conveyance, control, and disposal, shall be submitted in writing to the ENGINEER for review and approval. The plan shall be submitted a minimum of ten (10) working days prior to the scheduled date of testing.

PART 2 - PRODUCTS

2.1 MATERIAL REQUIREMENTS

A. All test equipment, temporary valves, bulkheads, and other water control equipment shall be as determined by the CONTRACTOR. No materials shall be used which would be injurious to the WORK for future conveyance.

PART 3 - EXECUTION

3.1 GENERAL

A. All pressure pipelines shall be tested. All testing operations shall be performed in the presence of the ENGINEER or OWNER.

B. Disposal of flushing water in the testing plan and meet the requirements of South Florida Water Control and DERM and all other applicable permitting agencies.

3.2 HYDROSTATIC TESTING OF PIPELINES

A. Prior to hydrostatic testing, pipelines shall be flushed or blown out as appropriate.

B. The CONTRACTOR shall test pipelines in sections. Sections to be tested shall be defined by isolation valves in the pipeline. Where such valves are not present, the CONTRACTOR

shall install temporary bulkheads or plugs for the purpose of testing. Sections that do not have isolation valves shall be tested in lengths not to exceed 2,000 feet. Sections that have a zero-leakage allowance may be tested as a unit.

C. No section of the pipeline shall be tested until field-placed concrete or mortar has attained an age of 14 Days.

D. The test shall be made by closing valves when available or by placing bulkheads and filling the line slowly with water. The CONTRACTOR shall be responsible for ascertaining that test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to or movement of the adjacent pipe. Unharnessed sleeve-type couplings, expansion joints, or other sliding joints shall be restrained or suitably anchored prior to the test to avoid movement and damage to piping and equipment.

E. Remove or protect any pipeline-mounted devices that may be damaged by the test pressure.

F. The pipeline shall be filled at a rate which will not cause any surges or exceed the rate at which the air can be released through the release valves at a reasonable veloTOWN. All the air within the pipeline shall be allowed to escape completely. The CONTRACTOR shall provide sufficient temporary tappings in the pipelines to allow for trapped air to exit. After completion of the tests, such taps shall be permanently plugged. The differential pressure across the orifices in the air release valves shall not be allowed to exceed 5 psi at any time during filling.

G. The CONTRACTOR shall furnish the pressure gauge to be used for pressure testing. The pressure gauge must be in 2 psi increments with a minimum of 200 psi total reading.

H. The OWNER'S procedures for Official Pressure Testing is as follows:

1. Pipeline segment to be pressure tested must be in a backfilled and compacted trench. If beneath a roadway, finished limerock must be installed unless prior approval from the OWNER has been granted.

2. Fill pipeline segment to be pressure tested.

    a. If the pipeline segment under test is tied into an existing main with the required double valves, then there must always be attest one fill and flush with a vent to atmosphere with all required ports for testing between the double valves and a single vent to atmosphere between all other double valve connections. All vents to atmosphere must always be open while the pipeline section under test is pressurized and all double valves must be closed.

    b. If the pipeline segment under test is not tied into the existing live main, then a fill and flush with a vent to atmosphere must be installed with all required ports for testing. This vent to atmosphere must always be open while the pipeline section is pressurized.

3. After the pipeline or section thereof has been filled, it shall be allowed to stand under a slight pressure for at least 24 hours to allow the concrete or mortar lining, as applicable, to absorb water and to allow the escape of air from air pockets. All air shall be expelled from the pipeline segment. During this period, bulkheads, valves, and connections shall be examined for leaks. If leaks are found, corrective measures satisfactory to the ENGINEER shall be taken.

4. The pipeline segment shall be pressurized to the test pressure of 155 psi. The official pressure test shall not begin until the pipeline segment has held the pressure to the allowable leakage for a minimum of 48 hours.

5. The official hydrostatic pressure test shall consist of holding the indicated test pressure on the pipeline segment for a period of two (2) hours. The test pressure shall be 155 psi, measured at the lowest point of the pipeline section being tested. At no point during the official pressure test shall the total pressure loss be more than 5 psi (pressure drop below 150 psi).

6. Pressure testing requirements and allowable leakage are summarized in the following table:

Pipe Type	Testing Standard	Test Pressure (P)	Test Duration	Allowed Leakage
Ductile iron, all joint types	AWWA C600	155 psi	2 hours	See Equation A
PVC	AWWA C605	155 psi	2 hours	See Equation A

Equation A: $$Q = \frac{(L * D * \sqrt{P})}{148{,}000}$$

Where: Q = allowable leakage (make-up water), gallons per hour

L = length tested or maximum test length allowed (2,000 feet), whichever is smaller, feet

D = nominal pipe diameter, inches

P = test pressure, psi

7. There shall be no intermediate pumping during the official pressure test. The CONTRACTOR may pump the allowable makeup water at the end of the two-hour test. The amount of allowable makeup water shall be based on the total footage of the pipeline segment under test, with a maximum of 2,000 feet. There shall be no allowable makeup water for valves, fittings, short lines less than 10 linear feet and any line less than 4-inches in diameter.

8. All sections of the pipeline under test must vent water and show a pressure loss on the pressure gauge at the end of the test. The gauge must read zero after all water pressure is expelled at the end of the test.

I. In the case of pipelines that fail to pass the leakage test, the CONTRACTOR shall determine the cause of the leakage, shall take corrective measures necessary to repair the leaks, and shall again test the pipelines; repeating as necessary until the pipeline passes the pressure test.

END OF SECTION

33 05 16 PRECAST CONCRETE MANHOLES AND VAULTS

GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide precast concrete manholes and vaults, complete and in place, in accordance with the Contract Documents.

1.2 SPECIFICATIONS, CODES AND STANDARDS

ASTM A 48 Gray Iron Castings

ASTM C 150 Portland Cement

ASTM C 443 Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets

ASTM C 478 Precast Reinforced Concrete Manhole Sections

ASTM C 913 Standard Specification for Precast Concrete Water and Wastewater Structures

ASTM C 923 Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals

1.3 CONTRACTOR SUBMITTALS

A. Shop Drawings

1. Show dimensions, locations, lifting inserts, reinforcement, and joints.

2. Structural design calculations for vaults, signed by a registered engineer.

B. Manufacturer’s Certification for Vaults: Written certification that the vault complies with the requirements of this Section.

1.4 QUALITY ASSURANCE

A. Inspection: After installation, the CONTRACTOR shall demonstrate that manholes and vaults have been properly installed, level, with tight joints, at the correct elevations and orientations, and that the backfilling has been carried out in accordance with the Contract Documents.

PRODUCTS

2.1 MANHOLES

A. The CONTRACTOR shall provide precast manhole sections and conical sections conforming to ASTM C 478 and the requirements of this Section. Adjusting rings shall be standard items from the manufacturer of the manhole sections. Minimum wall thickness of rings shall be 4-inches if steel reinforced and 6-inches if not reinforced.

B. Axial length of sections shall be selected to provide the correct total height with the fewest joints.

C. Conical sections shall be designed to support cast iron frames and covers under an H-20 loading, unless indicated otherwise.

D. Where the manhole barrel diameter is greater than 48-inches, a flat slab-transition, either concentric or eccentric, shall be used to transition to 48-inch diameter riser sections. Underside of the transition shall be at least 7-feet above the top of the bench.

E. Where indicated on the Drawings, manholes supplied for 48_inch and larger pipes shall be of a ”T” Base-style fabrication. The pipeline portion of the “Base T” section shall conform to ASTM C-76 and be of the same pipe class as the deepest connected sewer. The riser section shall conform to ASTM C-478.

F. Design Criteria: Manhole walls, transitions, conical sections, and base shall be designed per ASTM C 478 for the depths indicated and the following:

   1. AASHTO H-20 loading applied to the cover.

   2. Internal fluid pressure based on unit weight of 63 pcf with manhole filled from invert to cover with no balancing external soil pressure.

   3. Dead load of manhole sections fully supported by the base and transition.

   4. Additional reinforcing steel in walls to transfer stresses at openings.

   5. The minimum clear distance between the edges of any 2 wall penetrations shall be 12-inches or one-half of the diameter of the smaller penetration, whichever is greater.

G. Joints shall be sealed with o-ring gaskets conforming to ASTM C 443.

H. Concrete for base and channel formation shall be 4000 psi concrete.

I. Except were otherwise indicated on the Drawings, manholes shall have a precast concrete base and a factory installed bench.

J. Barrel section to sewer pipe connections shall be sealed with resilient connectors complying with ASTM C 923. Mechanical devices shall be stainless steel.

K. Manhole Manufacturers, or Equal

1. Oldcastle Precast

2. TJ Precast

3. Landmark Precast Concrete Products of the Palm Beacher

4. United Concrete Products

5. US Concrete Products Corporation

2.2 FRAMES AND COVERS

A. Castings: Castings for manhole frames and covers shall be non-rocking and shall conform to the requirements of ASTM A 48, Class 30. Unless otherwise indicated, cast iron covers and frames shall be heavy traffic type, with embossed lettering saying "Sewer" to meet the requirements of the TOWN Frame and cover shall be designed for H-20 traffic loading.

B. Castings Manufacturers, or Equal

1. Alhambra Foundry Co., Ltd.

2. Neenah Foundry Co.

3. Vulcan Foundry, Inc

EXECUTION

3.1 GENERAL

A. Pre-cast concrete sections shall be transported and handled with care in accordance with the manufacturer’s written recommendations. Where lifting devices are provided in pre-cast sections, such lifting devices shall be used as intended. Where no lifting devices are provided, the CONTRACTOR shall follow the manufacturer’s recommendations for lifting procedures to provide proper support during lifting.

B. Buried pre-cast concrete vaults shall be assembled and placed in excavations on properly compacted soil foundations as indicated. Pre-cast concrete vaults shall be set to grade and oriented to provide the required dimensions and clearances from pipes and other structures.

C. Prior to backfilling, all cracks and voids in pre-cast concrete vaults shall be filled with non-shrink grout or polyurethane sealant, or both. Around pipe and conduit penetrations, openings shall be sealed with polyurethane sealant. With the authorization of the ENGINEER, grout or a closed-cell flexible insulation may be used as filler material prior to placing a final bed of polyurethane sealant.

END OF SECTION

33 95 50 PVC PRESSURE PIPING (AWWA C900, MODIFIED)

PART 1 - GENERAL

1.1 THE SUMMARY

A. Provide polyvinyl chloride (PVC) pressure pipe, complete in place, as indicated in accordance with the Contract Documents.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards

AWWA C104/A21.5	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C110/A21.10	Ductile-Iron and Gray-Iron Fittings 3-in Through 48-in for Water and Other Liquids
AWWA C111/A21.11	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C600	Installation of Ductile-Iron Water Mains and Appurtenances
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe 4-in Through 12-in for Water Distribution
ASTM D 2584	Test Method for Ignition Loss of Cured Reinforced Resins
PPI Technical Report TR 3/4	Policies and Procedures for Developing Recommended Hydrostatic Design Stresses for Thermoplastic Pipe Materials
AWWA Manual M23	PVC Pipe - Design and Installation

1.3 CONTRACTOR SUBMITTALS

A. Shop Drawings

1. Submit drawings of pipe, fittings, and appurtenances.

2. Submit design calculations in order to demonstrate compliance of pipe and fittings with the requirements of this Section.

3. Furnish manufacturer's literature for metallic locating tape.

B. Certifications

1. Furnish a certified affidavit of compliance for pipe and other products or materials under this Section and the following supplemental requirements:

a. hydrostatic proof test reports;

b. sustained pressure test reports; and,

c. burst strength test reports.

C. Perform and pay for sampling and testing as necessary for the certifications.

1.4 QUALITY ASSURANCE

A. Inspection

1. Pipe shall be subject to inspection at the place of manufacture.

2. Notify the ENGINEER in writing of the manufacturing starting date, not less than 14 Days prior to the start of any phase of the pipe manufacture.

3. During the manufacture of the pipe, give the ENGINEER access to areas where manufacturing is in process, and permit the ENGINEER to make inspections as necessary to confirm compliance with the indicated requirements.

B. Testing

1. Test the materials used in the manufacture of the pipe in accordance with the requirements of this Section and the referenced standards, as applicable.

2. The ENGINEER shall have the right to witness testing, provided that the CONTRACTOR'S schedule is not delayed for the convenience of the ENGINEER.

3. Additional Samples

a. In addition to those tests specifically required, the ENGINEER may request additional samples of any material for testing by the OWNER.

b. Furnish the additional samples as a part of the WORK.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide PVC pressure pipe (4-inch through 24-inch) conforming to the applicable requirements of AWWA C900, and the requirements indicated in this Section.

B. PVC pipe shall have the following minimum thickness:

Pipe Nominal Diameter	Minimum DR
4” to 6”	DR 14
8” to 12”	DR 18
14” to 24”	DR 21

2.2 PIPE DESIGN CRITERIA

A. General

1. Design PVC pressure pipe wall thickness for internal pressure in accordance with the requirements of AWWA M23, as applicable, and the requirements indicated in this Section.

B. Determination of External Loads

1. Compute the dead (earth) loads using the following 2 equations for trench or embankment conditions, as applicable:

a. Trench Condition:

$$W_d = HwB_c$$

Where: W_d = earth load in pounds per linear foot

H = height of soil cover, feet

w = 130 lb/cu ft

B_c = outside diameter of pipe, feet

b. Positive Project Embankment Condition:

$$W_c = C_c w B_c^2$$

Where: W_c = earth load in pounds per linear foot

C_c	=	Calculation coefficient (based on $r_{sd}P$ of 0.75)
Ku	=	0.19
w	=	130 lb/ft^3
B_c	=	Outside diameter of pipe, feet

C. Truck Live Loads

1. Determine the truck live loads using the method recommended by AASHTO in "Standard Specifications for Highway Bridges."

2. For depths of cover less than 10 feet, add HS-20 live loads to the earth loads in order to determine the total load.

3. For depths of cover 3 feet or less, include HS-20 live load plus impact.

D. Deflection Control

1. The deflection of the pipe after installation, as determined from the Modified Iowa Formula outlined in AWWA M23, shall not exceed 0.03 times the outside diameter.

2. If the calculated deflection exceeds 0.03 times the outside diameter, increase the pipe class or improve the quality of the pipe zone backfill in order to achieve a higher modulus of soil reaction, E'.

3. For purposes of calculation, values of E' shall be 1100 psi at 90 percent Standard Proctor; 1500 psi at 95 percent Standard Proctor; and 2500 psi at 100 percent Standard Proctor, and the deflection lag factor shall be 1.5.

2.3 PIPE

A. Provide pipe of the indicated diameter and pressure class, complete with rubber gaskets.

B. Provide specials and fittings as indicated.

C. Potable water PVC pipe shall be solid wall blue pipe.

D. Pipe shall be continuously and permanently marked with the manufacturer’s name, pipe, size, and DR rating or pressure rating.

E. The dimensions and pressure classes for Dimension Ratios for large PVC pressure pipe with Cast-Iron Pipe Equivalent O.D.s shall conform to the requirements of AWWA C900.

F. Dimension Ratio (DR):

1. Minimum dimension ration series shall be as follows:

Nominal Diameter	Service	Minimum Dimension Ratio
4”, 6”	Water/Sewer	14
8”, 10”, 12”	Water/Sewer	18

G. The dimensions and pressure classes for Dimension Ratios for large PVC pressure pipe with Cast-Iron Pipe Equivalent O.D.s shall conform to the requirements of AWWA C900 and C905.

H. Additives and Fillers

1. Unless otherwise allowed in alternate qualification procedures of PPI-TR3, compounds which have a Hydrostatic Design Basis (HDB) of 4000 psi at 73.4 degrees F and for water shall not contain additives and fillers that exceed the recommended values in Table 1, Part Y of PPI-TR3 (e.g., allowable content range for calcium carbonate is 0.0-5.0 parts per hundred of resin).

2. If requested by the ENGINEER, determine the additive and filler content using the pyrolysis method as specified in ASTM D 2584.

I. The hall be marked with the extrusion or manufacturing code on the pipe. This coding shall be done in conjunction with records to be held by the manufacturer for 2 years, which indicates the date of manufacture, quality control tests, raw material batch number and other information deemed necessary by the manufacturer.

J. Joints

1. Joints for the buried PVC pipe shall be either an integral bell manufactured on the pipe or a separate coupling both employing a rubber ring joint.

2. Provide the bell and coupling of the same thickness as of the pipe barrel, or greater thickness.

3. Provide the sealing ring groove in the coupling of the same design as the groove in cast iron fittings and valves available from local water works supply distributors.

4. Where indicated, provide ductile iron restrained joint pipe.

5. No restrained joint PVC pipe will be accepted.

K. Joint Deflection

1. Deflection at the joint shall not exceed 75% of the maximum deflection recommended by the manufacturer.

2. No deflection of the joint will be accepted for joints that are over-belled or not belled to the stop mark.

L. Restrained joints for PVC pipe shall properly fit the pipe being installed and shall be manufactured by:

1. EBAA Iron, Inc., Series 2000PV

2. Romac Industries, Grip Ring

3. Ford, Uni-Flange

4. Stargrip series 4000

5. Sigma One Lok SLC Series

M. Bell restrained harnesses shall be used where in-line PVC restrained joints is required. Bell restrained harnesses for PVC pipe shall be manufactured by:

1. EBBA Iron, Inc., Series 1600

2. Stargrip Series 1100C

3. Sigma PVP Series

4. Ford, Uni-Flange series 1390

N. PVC Pipe Manufacturers or Equal:

1. J-M Pipe, Model Blue Brute for water service and Model Ring-tite for sewer/force main service.

2. Diamond Plastic Corporation

3. Certain Teed

2.4 FITTINGS

A. Provide ductile iron fittings conforming to the requirements of AWWA C110, Class 350.

B. PVC pipe fittings shall be mechanical joint.

C. Fittings shall be cement lined and seal coated per ANSI/AWWA C104 in accordance with the requirements of Specification 09 96 00 – Protective Coating.

D. Clearly label each fitting in order to identify its size and pressure class.

2.5 IDENTIFICATION AND LOCATING DEVICES

A. All PVC pipes shall be provided with “early warning” protection tape, 3-inches wide installed continuously along the pipeline alignment. Tape shall be installed during backfilling 12-inches to 18-inches directly above the centerline of the pipe.

1. Tape shall be color coded and marked based on the type of service as follows:

Service	Color	Marking
Storm sewer	Green	“Caution Buried Sewer Line Below”

2. The tape shall be as manufactured by Terra Tape, Pro-Line Safety Products or approved equal.

B. Markers shall be installed at all fittings (horizontal and vertical) and valves, as detailed in the Drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Perform laying, jointing, and testing for defects and leakage in the presence of the ENGINEER and obtain the ENGINEER's approval before acceptance.

B. Material found to have defects will be rejected, and the CONTRACTOR shall promptly remove such defective materials from the Site.

C. Installation shall conform to the requirements of AWWA M23, instructions furnished by the pipe manufacturer, and to the supplementary requirements indicated herein.

D. Wherever the provisions of this Section and the aforementioned requirements are in conflict, the more stringent provision shall apply.

3.2 HANDLING AND STORAGE

A. Handling

1. Carefully inspect pipe, fittings, and accessories before and after installation, and reject those found to be defective.

2. Pipe and fittings shall be free from fins and burrs.

3. Before being placed in position, clean the pipe, fittings, and accessories and maintain them in a clean condition.

4. Provide proper facilities for lowering sections of pipe into trenches.

5. Under no circumstances drop or dump pipe, fittings, or any other material into trenches.

B. Storage

1. Store pipe, if possible, at the Site in unit packages provided by the manufacturer.

2. Exercise caution to avoid compression damage or deformation to bell ends of the pipe.

3. Store pipe in such a way as to prevent sagging or bending and protect pipe from exposure to direct sunlight by covering with an opaque material while permitting adequate air circulation above and around the pipe.

4. Store gaskets in a cool, dark place out of the direct rays of the sun, preferably in original cartons.

3.3 TRENCHING AND BACKFILL

A. Trench excavation and backfill shall conform to the requirements of Specification 31 30 00 – Earthwork.

3.4 INSTALLATION

A. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying.

B. Grade the pipe in straight lines, taking care to avoid the formation of any dips or low points.

C. Do not lay pipe when the conditions of trench or weather are unsuitable.

D. At the end of each day's WORK, temporarily close the open ends of pipe with wood blocks or bulkheads.

E. Supports

1. Support pipe at its proper elevation and grade, taking care to provide firm and uniform support.

2. Wood support blocking will not be accepted.

3. The full length of each section of pipe and fittings shall rest solidly on the pipe bed, with a recessed excavation in order to accommodate bells, joints, and couplings.

4. Provide anchors and supports where indicated and where necessary for fastening WORK into place.

5. Independently support fittings.

F. Use short lengths of pipe in and out of each rigid joint or rigid structure.

G. Replace piping that does not allow sufficient space for proper installation of jointing material with piping of proper dimensions.

H. Blocking or wedging between bells and spigots will not be accepted.

I. Install joints in accordance with the manufacturer's recommendations.

J. Keep trenches free of water until joints have been properly made.

K. The maximum combined deflection at couplings shall be in accordance with the manufacturer's recommendations.

L. Rubber Gasketed Joints: Immediately before jointing pipe, the bell end of the pipe shall be thoroughly cleaned, and a clean rubber gasket lubricated with a lubricant recommended by the pipe manufacturer shall be placed in the bell groove. The spigot end of the pipe shall be carefully cleaned and lubricated with the same lubricant. The spigot end of the pipe shall then be inserted into the bell of the previously laid joint and pushed into its proper position. The spigot and bell end of rubber gasketed joints shall not be forced together by the use of excessive mechanical force. Tilting of the pipe to insert the spigot into the bell will not be permitted.

M. Cutting

1. Cut the pipe by means of saws, power-driven abrasive wheels, or pipe cutters, which will produce a square cut.

2. Cuts by wedge-type roller cutters will not be accepted.

3. After cutting, bevel the end of the pipe using a beveling tool, portable type sander, or abrasive disc.

3.5 INSTALLATION OF TRACER WIRE

A. Provide polyvinyl chloride pipelines with 14-gauge multi strand copper wire, laid along the top of the pipe and held in place with ties or hitches of the same kind of wire and spaced not more than 13 feet apart.

B. Tracer wire shall be brought up to grade and a minimum of four (4) feet of excess wire shall be coiled at each valve. A blue wire shall be used for water mains.

C. Furnish manufacturer's literature, completely describing the tape proposed to be furnished.

D. No tape shall be used prior to receipt of written approval of the ENGINEER.

3.6 INSTALLATION OF PIPE APPURTENANCES

A. Installation of Valves: Valves shall be handled in a manner to prevent any injury or damage to any part of the valve. Joints shall be thoroughly cleaned and prepared prior to installation. The CONTRACTOR shall adjust all stem packing and operate each valve prior to installation to insure proper operation.

B. Valves shall be installed so that the valve stems are plumb and, in the location, indicated.

3.7 FIELD TESTING AND DISINFECTION

A. Field testing and disinfection of water mains shall conform to the requirements of Specification 33 01 11 – Pressure Pipe Testing and Disinfection.

END OF SECTION

DIVISION 34 – TRANSPORTATIONS (NOT USED)

DIVISION 35 – WATERWAY AND MARINE CONSTRUCTION (NOT USED)

DIVISION 40 – PROCESS INTERCONNECTIONS

40 05 00 PIPING GENERAL

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide piping systems indicated, complete and operable, in accordance with the Contract Documents.

B. The provisions of this Section shall apply to piping in Divisions 33 and 40, and on the Drawings and as indicated in the Piping Schedule.

C. The Drawings define the general layout, configuration, routing, method of support, pipe size, and pipe type. The Drawings are not pipe construction or fabrication drawings. The CONTRACTOR shall prepare pipe spooling and fabrication drawings and shall submit them to the ENGINEER for review. The drawings are not detailed pipe construction or fabrication drawings.

D. Where pipe supports, fittings, specials, and spacing are indicated on the drawings and are reference to Standard Details, CONTRACTOR to use the Detail.

E. Where pipe supports, fittings, specials, details, and spacers are not indicated on the Drawings, it is the CONTRACTOR'S responsibility to develop the details necessary to construct piping systems to accommodate the specific piping needs and equipment provided, and to provide spacers, adapters, and connectors for a complete and functional system.

1.2 SUBMITTALS

A. Shop Drawings: Shop Drawings shall contain the following information:

1. Drawings: Layout drawings including necessary dimensions, details, pipe joints, fittings, specials, bolts and nuts, gaskets, valves, appurtenances, anchors, guides, and material lists. Fabrication drawings shall indicate spacers, adapters, connectors, fittings, and pipe supports to accommodate the equipment and valves in a complete and functional system.

2. Gasket Material: Submit gasket manufacturer's catalogindicating that the recommended product is suitable for each fluid service application.

3. Modular Seals for Pipe: Manufacturer's catalog sheet showing materials and installation procedures.

B. Samples

1. Performing and paying for sampling and testing as necessary for certifications are the CONTRACTOR'S responsibility.

C. Certifications

1. Necessary certificates, test reports, and affidavits of compliance shall be obtained by the CONTRACTOR.

2. A certification from the pipe fabricator that each pipe will be manufactured subject to the fabricator’s or a recognized Quality Control Program. An outline of the program shall be submitted to the ENGINEER for review prior to the manufacture of any pipe.

1.3 DEFINITIONS

A. Pipe, piping, pipe work, pipe system, piping system, or similar words, singular or plural shall mean and include, any type of pipes, tubes, fittings, valves, piping specialties, appurtenances, supports, restraints, anchors, coatings and linings and items related to piping.

B. Submerged piping, underwater piping or similar words, shall include any piping located two feet above water surface in basins or tanks.

C. Potable water or similar words, shall mean and include any type of potable water or process water that be deemed potable after treatment processes.

D. Corrosive service shall mean and include in locations listed below:

1. Buried locations

2. Submerged locations or submerged piping.

3. Inside buried vaults, manholes, and structures that do not drain through a gravity sewer or to a sump with a pump.

4. Chemical handling areas

5. Inside trenches, containment walls, and curbed areas

6. Locations indicated or designated in the contract documents.

1.4 MATERIAL DELIVERY, STORAGE, AND PROTECTION

A. Piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged condition and stored off the ground for protection against oxidation caused by ground contact.

B. Defective or damaged materials shall be replaced with new materials.

PART 2 - PRODUCTS

2.1 GENERAL

A. Extent of Work

1. Pipes, fittings, and appurtenances shall be provided in accordance with the requirements of the applicable Sections of Divisions 33 and 40 and as indicated.

2. Materials in contact with potable water shall be listed as compliant with NSF Standard 61 and FDEP.

B. Lining

1. Application, thickness, and curing of pipe lining shall be in accordance with the applicable Sections of Division 33, unless otherwise indicated.

C. Coating

1. Application , thickness, and curing of coating on buried pipe shall be in accordance with the applicable Sections of Division 2, unless otherwise indicated.

2. Pipes above ground or in structures shall be coated in accordance with Specification 09 96 00 – Protective Coating.

D. Pressure Rating

1. Piping systems shall be designed for the maximum expected pressure as defined in Specification 33 01 11 – Pressure Pipe Testing and Disinfection, or as indicated on the individual pipe material sections.

E. Inspections

1. Pipe shall be subject to inspection at the place of manufacture.

2. During the manufacture, the ENGINEER shall be given access to areas where manufacturing is in progress and shall be permitted to make inspections necessary to confirm compliance with requirements.

F. Tests

1. Except where otherwise indicated, materials used in the manufacture of the pipe shall be tested in accordance with the applicable specifications and standards.

2. Welds shall be tested as indicated.

3. The CONTRACTOR shall be responsible for performing material tests.

G. Welding Requirements

1. Qualification of welding procedures used to fabricate pipe shall be in accordance with the provisions of AWS D1.1 - Structural Welding Code or the ASME Boiler and Pressure Vessel Code, Section 9, whichever is applicable.

2. Welding procedures shall be submitted for the ENGINEER's review

H. Welder Qualification.

1. Welding shall be performed by skilled welders and welding operators who have adequate experience in the methods and materials to be used.

2. Welders shall be qualified under the provisions of AWS D1.1 or the ASME Boiler and Pressure Vessel Code, Section 9, by an independent local, approved testing agency not more than 6 months prior to commencing WORK on the piping whichever is applicable.

3. Machines and electrodes similar to those used in the WORK shall be used in qualification tests.

4. Qualification testing of welders and materials used during testing is part of the WORK.

2.2 PIPE FLANGES

A. General

1. Flanges shall be provided with flat faces and shall be attached with bolt holes straddling the vertical axis of the pipe unless otherwise indicated.

2. Attachment of the flanges to the pipe shall conform to the applicable requirements of AWWA C207.

3. Flange faces shall be perpendicular to the axis of the adjoining pipe.

4. Flanges for miscellaneous small diameter pipes shall be in accordance with the standards indicated for these pipes.

B. Pressure Ratings

1. 150 psig or less: Flanges shall conform to either AWWA C207 - Steel Pipe Flanges for Waterworks Service--Sizes 4 In. Through 144 In., Class D, or ASME B16.5 - Pipe Flanges and Flanged Fittings, 150 lb class.

2. 150 psig to 275 psig: Flanges shall conform to either AWWA C207 Class E or Class F, or ASME B16.5 150 lb class.

3. 275 psig to 700 psig: Flanges shall conform to ASME B16.5, 300 lb class.

4. Selection Based on Test Pressure

    a. Do not expose AWWA flanges to test pressures greater than 125 percent of rated capaTOWN.

    b. For higher test pressures, the next higher rated AWWA flange or an ANSI-rated flange shall be selected.

C. Blind Flanges

1. Provide blind flanges in accordance with AWWA C207, or as indicated for miscellaneous small pipes.

2. Blind flanges for pipe sizes 12-inches and greater shall be provided with lifting eyes in the form of welded or screwed eye bolts.

D. Flange Coating

1. Machined faces of metal blind flanges and pipe flanges shall be coated with a temporary rust-inhibitive coating to protect the metal until the installation is completed.

E. Flange Bolts

1. Bolts and nuts shall conform to the requirements of Section 05500 – Miscellaneous Metalwork.

2. Use all-thread studs on valve flange connections where space restrictions preclude the use of regular bolts.

F. Insulating Flanges

1. Insulated flanges shall be provided with bolt holes 1-4-inch diameter greater than the bolt diameter.

G. Insulating Flange Sets

1. Provide insulating flange sets where indicated.

2. Each insulating flange set shall consist of an insulating gasket, insulating sleeves and washers, and a steel washer.

3. Insulating sleeves and washers shall be one piece when flange bolt diameter is 1-1/2 inch or smaller and shall be made of acetal resin.

4. For bolt diameters larger than 1-1/2 inches, insulating sleeves and washers shall be 2- piece and shall be made of polyethylene or phenolic material.

5. Steel washers shall be in conformance with ASTM A 325 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

6. Insulating gaskets shall be full-face.

H. Insulating Flange Manufacturer, or Equal

1. JM red Devil, Type E

2. Maloney Pipeline Products Co.

3. PSI Products Inc

I. Flange Gaskets

1. Gaskets or flanged joints used in general water and wastewater service shall be full-faced type, with material and thickness in accordance with AWWA C207, suitable for temperatures to 700 degrees F, a pH of one to 11, and pressures to 1000 psig.

2. Blind flanges shall be provided with gaskets covering the entire inside face of the blind flange and shall be cemented to the blind flange.

3. Ring gaskets will not be accepted unless otherwise indicated.

4. Flange gaskets shall be: John Crane, Style 2160; Garlock, Style 3000 American DIP Toruseal; or equal.

5. Gaskets for flanged joints used in water with chloramines shall be: Gylon, Style 3500 as manufactured by Garlockor equal.

6. Gaskets for flanges for PVC and CPVC piping used in general water and wastewater service shall be full-faced, 1/8-inch thick, and made of ethylene propylene rubber (EPR) having a Type A durometer hardness of 50 to 70 when tested in accordance with ASTM D 2240.

7. When the mating flange has a raised face, provide a flat ring gasket filler between the PVC flange and gasket and the adjacent flange.

8. Gaskets for flanged joints used in chemicals, air, solvents, hydrocarbons, steam, chlorine and other fluids shall be made of materials compatible with the service, pressure, and temperature.

2.3 THREADED INSULATING CONNECTIONS

A. General:

1. Threaded insulating bushings, unions, or couplings, as appropriate, shall be used for joining threaded pipes of dissimilar metals and for piping systems where corrosion control and cathodic protection are involved.

B. Materials

1. Threaded insulating connections shall be constructed of nylon, Teflon, polycarbonate, polyethylene, or other non-conductive materials, and shall have ratings and properties to suit the service and loading conditions.

2.4 SLEEVE-TYPE COUPLINGS

A. General:

1. Provide sleeve-type couplings where indicated.

2. The CONTRACTOR will not be allowed to substitute a sleeve-split coupling or any other type in lieu of sleeve coupling unless approved by the ENGINEER.

B. Construction

1. Sleeve couplings shall be in accordance with AWWA C219 - Standard for Bolted Sleeve-Type Couplings for Plain-End Pipe.

2. Couplings shall be constructed of steel with steel bolts, without pipe stop.

3. Couplings shall be of sizes to fit the indicated pipe and fittings.

4. The middle ring shall be not less than 1/4-inch thick or at least the same wall thickness as the pipe to which the coupling is connected.

5. If the strength of the middle ring material is less than the strength of the pipe material, the thickness of the middle ring shall be increased to have the same strength as the pipe.

6. The coupling shall be either 5 or 7 inches long for sizes up to and including 30-inch and 10 inches long for sizes greater than 30-inch, for standard steel couplings, and 16 inches long for long-sleeve couplings.

7. The followers shall be single-piece contoured mill sections welded and cold-expanded as required for the middle rings and of sufficient strength to accommodate the number of bolts necessary to obtain adequate gasket pressures without excessive rolling.

8. The shape of the follower shall be of such design as to provide positive confinement of the gasket.

9. Bolts and nuts shall be in accordance with the requirements of Section 05 50 00 – Miscellaneous Metalwork.

10. Buried sleeve-type couplings shall be epoxy-coated at the factory as indicated.

C. Pipe Preparation

1. Where indicated, prepare the ends of the pipe for flexible steel couplings.

2. Plain ends for use with couplings shall be smooth and round for a distance of 12 inches from the ends of the pipe, with an outside diameter not more than 1/64 inch smaller than the nominal outside diameter of the pipe.

3. The middle ring shall be tested by cold-expanding a minimum of one percent beyond the yield point, in order to proof-test the weld to the strength of the parent metal.

4. The weld of the middle ring shall be subjected to air test for porosity.

D. Gaskets

1. Gaskets or sleeve-type couplings shall be rubber-compound material that will not deteriorate from age or exposure to air under normal storage or use conditions.

2. Gaskets for wastewater and sewerage applications shall be composed of Buna N, Grade 60, or equivalent suitable elastomer.

3. The rubber in the gasket shall meet the following specifications:

   a. Color: jet black

   b. Surface: non-blooming

   c. Durometer Hardness: 74, plus and minus 5

   d. Tensile Strength: 1000 psi minimum

e. Elongation: 175 percent minimum

4. The gaskets shall be immune to attack by impurities normally found in water or wastewater.

5. Gaskets shall meet the requirements of ASTM D 2000 - Classification System for Rubber Products in Automotive Applications, AA709Z, meeting Suffix B13 Grade 3, except as indicated above.

6. Where sleeve couplings are used in water containing chloramines or other fluids which attack rubber materials, gasket material shall be compatible with the piping service and fluid utilized.

7. Gasket materials used in water with chloramines shall be: Gylon Style 3500 by Garlockor equal.

E. Insulating Sleeve Couplings

1. Where insulating couplings are required, both ends of the coupling shall be provided with a wedge-shaped gasket which assembles over a sleeve of an insulating compound material compatible with the fluid service in order to obtain insulation of coupling metal parts from the pipe.

F. Restrained Joints

1. Sleeve-type couplings on pressure lines shall be harnessed unless thrust restraint is provided by other means.

2. Harnesses shall be designed by the pipe manufacturer in accordance with AWWA Manual M11, or as indicated.

3. Harness sets shall be designed for the maximum test pressure of the pipe in which they are installed.

4. Where harness sets are installed near the suction and discharge of the pump, harness bolts shall have zero elongation in order to prevent misalignment of the pump imparted by the thrust within the piping system.

G. Sleeve-Type Couplings Manufacturer, or Equal

1. Dresser, Style 38

2. Ford Meter Box Co., Inc., Style FC1 or FC3

3. Smith-Blair, Style 411

2.5 FLANGED COUPLING ADAPTERS

A. Provide flanged coupling adapters where indicated.

B. The CONTRACTOR will not be allowed to substitute any other type in lieu of flange coupling adapter unless approved by the ENGINEER.

C. The coupling shall be rated as indicated.

D. Construction

1. Flanged coupling adapter bodies shall be fabricated from steel, ASTM A 512 - Cold-Drawn Buttweld Carbon Steel Mechanical Tubing or A 513 - Electric-Resistance Welded Carbon and Alloy Steel Mechanical Tubing with steel bolts, without pipe stop.

2. Provide flanges in conformance with AWWA C207.

3. Couplings shall be of sizes to fit the indicated pipe and fittings.

4. The body shall be not less than 1/4 inch thick or at least the same wall thickness as the pipe to which the coupling is connected.

5. If the strength of the body material is less than the strength of the pipe material, the thickness of the middle ring shall be increased to have the same strength as the pipe.

6. The follower flange shall be fabricated from steel, ASTM A 576 - Steel Bars, Carbon, Hot Wrought, Special Quality or AISI C1012.

7. The shape of the follower shall be of such design as to provide positive confinement of the gasket.

8. Restraint

   a. For flanged coupling adapters installed in piping system rated for positive pressure, the coupling shall be restrained with harness bolts or tie rods.

   b. Other means of restraining the coupling such as set screws will not be accepted.

9. Bolts and nuts shall be in accordance with the requirements of Section 05500 – Miscellaneous Metalwork.

10. Buried couplings shall be epoxy-coated at the factory as indicated.

E. Gaskets

1. Gaskets for flange coupling adapters shall be composed of a rubber-compound material that will not deteriorate from age or exposure to air under normal storage or use conditions.

2. Gaskets for wastewater and sewerage applications shall be composed of Buna N, Grade 60, NSF-approved, or equivalent suitable elastomer.

3. The rubber in the gasket shall meet the following specifications:

   a. Color: jet black

   b. Surface: non-blooming

   c. Durometer Hardness: 74, plus and minus 5

   d. Tensile Strength: 1000 psi minimum

   e. Elongation: 175 percent minimum

4. The gaskets shall be immune to attack by impurities normally found in water or wastewater.

5. Gaskets shall meet the requirements of ASTM D 2000 - Classification System for Rubber Products in Automotive Applications, AA709Z, meeting Suffix B13 Grade 3, except as noted above.

6. Where flanged coupling adapters are used in water containing chloramines or other fluids which attack rubber materials, the gasket material shall be compatible with the piping service and fluid utilized.

7. Gasket materials used in water with chloramines shall be: **Gylon Style 3500** by Garlock or equal.

F. Piping Connections to Equipment

1. Where piping connects to mechanical equipment such as pumps, compressors, and blowers, bring the piping to the equipment connection aligned and perpendicular to the axis of the flange or fitting for which the piping is to be connected.

2. The piping shall not impose excessive stress to the equipment connection to cause misalignment of the equipment.

3. The CONTRACTOR shall assign the responsibility to the equipment manufacturer to review the piping connection to the equipment and submit any modifications to the ENGINEER for review.

G. Restrained Joints

1. Flange coupling adapters on pressure lines shall be harnessed unless thrust restraint is provided by other means.

2. Harnesses shall be designed by the pipe manufacturer in accordance with AWWA Manual M11, or as indicated.

3. Harness sets shall be designed for the maximum test pressure of the pipe in which they are installed.

4. Where harness sets are installed near the suction and discharge of the pump, harness bolts shall have zero elongation in order to prevent misalignment of the pump imparted by the thrust within the piping system.

H. Flanged Couplings Adapter Manufacturer, or Equal

1. Smith-Blair, Model 975

2. JCM, Model 309

2.6 PIPE THREADS

A. Pipe threads shall be in conformance with ASME B1.20.1 - Pipe Threads, General Purpose (inch), and be made up with Teflon tape unless otherwise indicated.

PART 3 - EXECUTION

3.1 GENERAL

A. This section specifies the general installation requirements for piping, valves, and related items and shall be installed in accordance with the manufacturer's technical data and printed instructions. Specific piping materials, systems, appurtenances, and related installation and testing requirements are specified in related sections of Divisions 01, 33, and 40, and as noted on the Drawings, Pipe and Valve Schedules.

B. Piping shall be installed in a neat and workmanlike manner, properly aligned and cut from measurements taken at the Site to avoid interferences with structural members, architectural features, openings, and equipment. Exposed pipe shall afford maximum headroom and access to equipment, and where necessary piping shall be installed with sufficient slopes for venting or drainage of liquids and condensate to low points.

C. CONTRACTOR shall obtain the assistance of the pipe manufacturer to instruct the pipe fitters in the correct installation and support of the piping system. Valves and flanges attached to the pipe shall be provided with adequate supports.

D. Lined Piping Systems

1. The lining manufacturer shall take full responsibility for the complete, final product and its application.

2. Pipe ends and joints of lined pipes at threaded flanges shall be epoxy-coated in order to assure continuous protection.

E. Proprietary manufactured couplings shall be installed in accordance with the coupling manufacturer's recommendation.

F. Care shall hall be taken to insure that piping flanges, mechanical-type couplings, sleeve-type couplings, flexible connectors, and expansion joints are properly installed as follows:

1. Gasket surfaces shall be carefully cleaned and inspected prior to making up the connection.

2. Each gasket shall be centered properly on the contact surfaces.

3. Connections shall be installed to prevent inducing stress to the piping system or the equipment to which the piping is connected.

4. Contact surfaces for flanges, couplings, and piping ends shall be aligned parallel, concentric, and square to each axis at the piping connections.

5. Flange Bolts

a. Flange bolts shall be initially hand-tightened with the piping connections properly aligned.

b. Bolts shall be tightened with a torque wrench in a staggered sequence to the AISC-recommended torque for the bolt material.

6. Harness, Thrust Restraint, and Tie Rod Bolts

a. Harness, thrust restraint, and tie rod bolts used for sleeve couplings, flange coupling adapters, or flexible joints shall be tightened gradually and equally at diametrically opposite sides until snug, in order to prevent misalignment and to ensure that all studs carry equal loads.

b. In order to prevent induced stress or misalignment, do not over-torque connections to adjoining pump or equipment.

7. Groove ends shall be clean and free from indentations, projections, and roll marks in the area from the pipe end to the groove.

8. After installation, joints shall not have any leakage that exceeds the allowable leakage rates.

9. Flanges shall not be deformed nor cracked.

G. Core Drilling

1. Where ore drilling is required for pipes passing through existing concrete, core drilling locations shall be determined by radiograph of concrete construction in order to avoid damage to embedded raceways and reinforcing bars.

H. Cleanup

1. After completion of the WORK, cuttings, joining and wrapping materials, and other scattered debris shall be removed from the Site.

2. The entire piping system shall be handed over in a clean and functional condition.

3.2 INSTALLATION

A. Installation shall be free from defects. Prior to installation, each pipe length shall be carefully inspected, be flushed clean of any debris or dust, and be straightened if not true straight. Ends of threaded pipes shall be reamed and filed smooth. Groove ends shall be clean and free from indentations, projections, and roll marks in the area from the pipe end to the groove. Fittings shall be equally cleaned before assembly.

B. Building gravity flow plumbing pipes shall be installed in a neat and workmanlike manner, in accordance with the prevailing plumbing and building codes. Pipes shall have the required slopes for proper drainage. Pipe locations inside buildings shall be coordinated with the rest of the WORK to avoid interferences and to provide sufficient headroom. Installations shall be acceptable to the local plumbing inspector.

C. Piping Joints: Pipe joints requirements shall conform to the applicable piping sections of Division 33 and Division 40.

1. Threaded Joints: Pipe threads shall be full and cleanly cut with sharp dies. Not more than 3 threads shall remain exposed after installation.

2. Welded Joints: Welded joints shall conform to the specifications and recommendations of ASME B 31.1 - Power Piping. Welding shall be done by skilled and qualified welders. Pipe surface residues, oxides, and heat stains are to be removed from a field weld and the affected areas adjacent by the use of stainless steel wire brushes. For alloy and stainless steel pipe, the post welding surfaces shall be cleaned with a pickle agent such as nitric/hydrofluoric acid solutions or pickle paste or equal, then complete removal of the agent by wash the surface thoroughly with clean water.

3. Flange Joints: Flanged joints shall be made with gaskets with bolts and nuts as specified. Care shall be taken not to over-torque the bolts, in accordance with the manufacturer's written recommendations.

4. Fusion-Welded Joints: Fusion-welded joints shall be made with the manufacturer's recommended equipment on clean, dry pipe ends. The joints shall be made up at the recommended ambient temperatures, to the pipe manufacturer's written recommendations. The pipe supplier shall be consulted to obtain machinery and expertise for the joining by fusion welded of pipe and fittings. No pipe or fittings shall be joined by fusion by any of the Contractor's personnel unless they are adequately trained and qualified in the techniques involved. Butt fusion joining shall yield a joint strength equal to or greater than the tensile strength of the pipe. Socket fusion, extrusion welding and hot gas welding shall not be used for field connections.

5. Brazed and Soldered Joints: Brazed and soldered joints shall conform to the manufacturer’s recommendations and to the specifications and recommendations of ASME B 31.1 - Power Piping. Brazing shall be done by skilled and qualified welders. Prior to the application of flux, the ends of tubes shall be thoroughly dried and cleaned.

6. Grooved Joints: Grooves for grooved couplings and fittings shall be made with specially designed grooving tools to the manufacturer's recommendations and conform to AWWA C 606 – Joints, Grooved and Shouldered Type. Grooves shall be clean and sharp without flaws, and the pipe ends shall be accurately cut at 90 degrees to the pipe axis.

7. Push On Joints: Push on joints and gasket installation shall be in accordance with the manufacturer's recommendations and lubricants. Pipe ends shall be beveled to facilitate assembly. Lubricants shall be suitable for potable water service and shall be kept clean in closed containers.

8. Solvent-Welded Joints: Solvent-welded joints shall be made with fresh primer and solvent cement on clean, dry pipe ends. The primer and cement cans shall be kept closed at all times and the joints shall be made up at the recommended ambient temperatures, to the pipe or cement manufacturer's written recommendations. PVC socket connections shall be joined with PVC cement conforming to ASTM D2564 Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC). CPVC socket connections shall be joined with CPVC solvent cement conforming to ASTM F493. For chemical service applications, solvent cement shall be formulated and labeled for use on that chemical.

9. Adhesive Joints: Adhesive joints shall be made with freshly-mixed 2-part epoxy on clean, dry pipe ends per pipe manufacturer recommendations. The joints shall be made up at the recommended ambient temperatures, to the pipe or adhesive manufacturer's written recommendations. Pipe ends shall be inserted to the full depth of the socket.

D. Valves and Unions: Unless otherwise indicated, connections to fixtures, groups of fixtures and equipment shall be provided with a shutoff valve and union, unless the valve has flanged ends. Unions shall be provided at threaded valves, equipment, and other devices requiring occasional removal or disconnection.

E. Branch Connections: Branch connections in horizontal runs of air and gas piping shall be made from the top of the pipe, to avoid drainage of condensate into the equipment. Unless otherwise indicated for threaded pipe connections between metal and plastic pipes, use metal FNPT and plastic MNPT.

    1. Pipe ends and joints of lined pipes at threaded flanges shall be epoxy-coated in order to assure continuous protection.

F. Isolation Joints / Dielectric Protection: Provide electrically isolate connections between dissimilar metal piping connections. Electrical checks shall be made to assure no contact is made between dissimilar metal piping elements.

    1. Use dielectric couplings specially designed for the prevention of galvanic reaction between dissimilar metals.

    2. For flanged connections, use stainless steel bolts with isolation bushings, washers, and full-face flange gaskets.

G. Core Drilling: Where core drilling is required for pipes passing through existing concrete, core drilling locations shall be determined by radiograph of concrete construction in order to avoid damage to embedded raceways and reinforcing bars.

H. Coating: Exposed pipes shall be coated with a finish coat to the pipe manufacturer's standard protective coating, with the manufacturer's recommended prime coat and a finish coat in accordance with Section 09 96 00 - Protective Coating.

I. Low points in piping systems and driplegs in steam, gas, and air systems shall have drainage valves.

J. Care shall be taken to insure that piping flanges, mechanical-type couplings, sleeve-type couplings, flexible connectors, and expansion joints are properly installed as follows:

    1. Gasket surfaces shall be carefully cleaned and inspected prior to making up the connection. Gasket shall be centered properly on the contact surfaces.

    2. Connections shall be installed to prevent inducing stress to the piping system or the equipment to which the piping is connected.

    3. Contact surfaces for flanges, couplings, and piping ends shall be aligned parallel, concentric, and square to each axis at the piping connections.

4. Flange Bolts

    a. Flange bolts shall be initially hand-tightened with the piping connections properly aligned.

    b. Bolts shall be tightened with a torque wrench in a staggered sequence to the recommended torque for the applicable piping material per AWWA or manufacturer's recommendation. Care shall be taken to avoid over-torqueing the bolts especially on plastic flanged joints.

    c. Harness, thrust restraint, and tie rod bolts used for sleeve couplings, flange coupling adapters, or flexible joints shall be tightened gradually and equally at diametrically opposite sides until snug, in order to prevent misalignment and to insure that all studs carry equal loads.

    d. In order to prevent induced stress or misalignment, do not over-torque connections to adjoining pump or equipment. Flanges shall not be deformed nor cracked.

3.3 INSPECTION

A. After completion of the WORK, cuttings, joining and wrapping materials, and other scattered debris shall be removed from the Site. The entire piping system shall be in a clean and functional condition.

B. Inspection: Finished installations shall be carefully inspected for proper joints and supports, interferences, and damage to pipe, fittings, and coating. Temporary plugs and covers shall be removed from openings and floor drains. Defective WORK shall be repaired to the satisfaction of the field engineer or plumbing inspector.

3.4 FIELD TESTING FOR PRESSURE PIPING

A. Prior to enclosure or burying, piping systems shall be pressure tested as required in the Piping Schedule for a period of not less than two hours without exceeding the tolerances listed in the Piping Schedule. Where no pressures are indicated, the pipes shall be subject to 1-1/2 times the maximum working pressure. The CONTRACTOR shall furnish test equipment, labor, materials, and devices as part of the WORK. For additional testing requirements, refer to Section 33 01 11 - Pressure Pipe Testing and Disinfection.

B. Leakage may be determined by loss of pressure, soap solution, chemical indicator, or other positive and accurate method. Fixtures, devices, or other accessories which are to be connected to the lines and which would be damaged if subjected to the test pressure shall be disconnected and ends of the branch lines plugged or capped as required during the testing procedures.

C. Leaks shall be repaired, and the system shall be re-tested until no leaks are found.

3.5 MATERIAL DELIVERY, STORAGE, AND PROTECTION

A. All piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged condition and stored off the ground for protection against oxidation caused by ground contact. All defective or damaged materials shall be replaced with new materials.

END OF SECTION

40 05 06 REPAIR CLAMPS AND TRANSITION COUPLINGS

PART 1 - GENERAL

1.1 THE REQUIREMENT

A. The WORK includes abandoning existing 2-inch galvanized potable water piping and potable water service connections connected to existing 6-inch, 8-inch, and 10-inch asbestos concrete (AC) pipe. The CONTRACTOR shall remove the existing tapping saddles on the existing asbestos concrete pipe and furnish and install full circle repair clamps to repair the taps and abandon the existing piping as shown on the Drawings, in accordance with the Contract Documents.

B. The WORK includes connecting new PVC and ductile iron piping to existing 6-inch, 8-inch, and 10-inch AC pipe as part of the new potable water and force main installation. The CONTRACTOR shall furnish and install PVC to AC pipe and DIP to AC pipe transition couplings as required to complete the designed connections of new piping to the existing AC pipe as shown on the Drawings, in accordance with the Contract Documents.

C. It is the CONTRACTOR's responsibility to develop the details necessary to construct the connections and to provide and install all spools, spacers, adapters, and connectors for a complete and functional system.

D. The provisions of this Section shall apply to all piping sections in Divisions 33 and 40.

1.2 CONTRACTOR SUBMITTALS

A. Shop Drawings: Submit manufacturer’s catalog sheets providing information on materials and installation procedures.

PART 2 - PRODUCTS

2.1 REPAIR CLAMPS

A. Repair clamps shall be full circle clamps sized for asbestos concrete outside diameter.

B. Repair clamps shall be constructed of 18-8 Type 304 stainless steel. Gaskets shall be Buna-N. Bolts and nuts shall be 18-8 Type 304 stainless steel.

C. Manufacturers or Equal:

1. Cascade Waterworks Manufacturing

2. Ford Meter Box Company

3. JCM Industries

4. Smith Blair

2.2 TRANSITION COUPLINGS

A. Transition couplings shall be designed and sized for PVC to asbestos concrete pipe and ductile iron to asbestos concrete pipe transitions.

B. Transition couplings shall be constructed of ductile iron pipe in accordance with ASTM A 536. Gaskets shall be Buna-N. Bolts and nuts shall be Type 18-8 type 304 stainless steel.

C. Manufacturers or Equal:

1. Cascade Waterworks Manufacturing

2. Ford Meter Box Company

3. Romac Industries

4. Smith Blair

PART 3 - EXECUTION

3.1 MATERIAL DELIVERY, STORAGE, AND PROTECTION

A. Piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged condition and stored off the ground for protection against oxidation caused by ground contact.

B. Defective or damaged materials shall be replaced with new materials.

3.2 INSTALLATION

A. Repair clamps, transition couplings, and accessories shall be installed in accordance with the requirements of the applicable Sections of Divisions 2 and 15, and in accordance with the manufacturer's instructions.

B. Piping and gaskets shall be carefully cleaned and inspected prior to making connections.

END OF SECTION

DIVISION 41 – PROCESS EQUIPMENT (NOT USED)

DIVISION 42 – PROCESS HEATING, COOLING AND DRYING EQUIPMENT (NOT USED)

DIVISION 43 – MATERIAL HANDLING EQUIPMENT

43 30 00 VALVES, GENERAL

PART 1 - GENERAL

1.1 THE SUMMARY

A. Provide valves, actuators, and appurtenances, complete and operable, as indicated in accordance with the Contract Documents.

B. The provisions of this Section shall apply to all valves and valve actuators except where otherwise indicated.

C. Valves and actuators in particular locations may require a combination of units, sensors, limit switches, and controls, as indicated.

D. Unit Responsibility

1. A single manufacturer shall be responsible for the coordination of design, assembly, testing, and furnishing of each valve; however, the CONTRACTOR shall be responsible to the OWNER for compliance with the requirements of each valve Section.

2. Unless indicated otherwise, the responsible manufacturer shall be the manufacturer of the valve.

E. Single Manufacturer

1. Where 2 or more valves of the same type and size are required, the valves shall be furnished by the same manufacturer.

1.2 CONTRACTOR SUBMITTALS

A. Furnish the following information on Shop Drawings:

1. Valve name, size, Cv factor, pressure rating, identification number (if any), and specification section number;

2. Complete information on the valve actuator, including size, manufacturer, model number, limit switches, and mounting;

3. Assembly drawings showing part nomenclature, materials, dimensions, weights, and relationships of valve handles, hand wheels, position indicators, limit switches, integral control systems, needle valves, and control systems;

B. Furnish a technical manual containing the required information for each valve, as indicated.

C. Furnish a spare parts list, containing the required information for each valve assembly, as indicated.

D. Factory Test Data

1. Where indicated, submit signed, dated, and certified factory test data for each valve requiring certification, before shipping the valve.

2. Furnish a certification of quality and test results for factory-applied coatings.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. General

1. Provide valves and gates of new and current manufacture.

2. Provide buried valves with valve boxes and covers containing position indicators and valve extensions.

B. Protective Coating

1. Coat the exterior surfaces of valves and the wet interior surfaces of ferrous valves of sizes 4-inch and larger in accordance with the requirements of Specification 09 96 00 – Protective Coating.

2. The valve manufacturer shall certify in writing that the required coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with the indicated requirements.

3. Do not epoxy-coat the flange faces of valves.

C. Valve Labeling

1. Buried valves shall be equipped with a valve tag indicating size and type of valve located at the valve box in accordance with the detail on the Drawings.

D. Valve Testing

1. As a minimum, unless otherwise indicated or recommended by the reference standards, test valves 3 inches in diameter and smaller in accordance with the manufacturer's standard procedure.

2. Factory-test valves 4 inches in diameter and larger as follows:

   a. Hydrostatic Testing

      1) Subject valve bodies to an internal hydrostatic pressure equivalent to twice the water-rated pressure of the valve.

      2) Metallic valves rating pressures shall be based at 100 degrees F.

      3) Plastic valves rating pressures shall be based at 73 degrees F, or at a higher temperature according to material type.

      4) During the hydrostatic test, there shall be no visible leakage through the valve body, end joints, or shaft seals, nor shall parts of the valve be permanently deformed.

      5) Allow test duration of at least 10 minutes, in order to allow visual examination for leakage.

   b. Seat Testing

      1) Test the valves for leaks in the closed position, with the pressure differential across the seat equal to the water rated pressure of the valve.

      2) Provide test duration of at least 10 minutes, in order to allow visual examination for leakage.

      3) The leakage rate shall be the more stringent of the following:

         a). As recommended by the reference standard for that type of valve; or

         b). Leakage past the closed valve not to exceed one fluid ounce per hour per inch diameter for metal seated valves, and drop-tight for resilient seated valves.

   c. Performance Testing

      1) Shop-operate the valves from the fully-closed to the fully-open position, and reverse under no-flow conditions in order to demonstrate that the valve assembly operates properly.

E. Certification

1. Prior to shipment of valves with sizes larger than 12-inches in diameter, submit certified, notarized copies of the hydrostatic factory tests, showing compliance with the applicable standards of AWWA, ANSI, or ASTM.

F. Valve Markings

1. Permanently mark valve bodies in accordance with MSS SP25 - Standard Marking Systems for Valves, Fittings, Flanges, and Unions.

2.2 MATERIALS

A. General

1. Provide materials suitable for the intended application.

2. Provide materials in contact with potable water listed as compliant with NSF Standard 61.

3. Ensure that materials not indicated are of high-grade standard commercial quality, free from defects and imperfections that might affect the serviceability of the product for the purpose for which it is intended.

4. Unless otherwise indicated, provide valve and actuator bodies conforming to the following requirements:

a. Cast Iron: Close-grained gray cast iron, conforming to ASTM A 48 - Gray Iron Castings, Class 30, or to ASTM A 126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings

b. Ductile Iron: ASTM A 536 - Ductile Iron Castings, or to ASTM A 395 - Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures

c. Steel: ASTM A 216 - Steel Castings, Carbon Suitable for Fusion Welding for High-Temperature Service, or to ASTM A 515 - Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service

d. Bronze: ASTM B 62 - Composition Bronze or Ounce Metal Castings, and valve stems not subject to dezincification shall conform to ASTM B 584 - Copper Alloy Sand Castings for General Applications. Bronze materials in contact with potable water service shall be free of lead content meeting the Lead Reduction Act.

e. Stainless Steel: Stainless steel valve and operator bodies and trim shall conform to ASTM A 351 - Steel Castings, Austenitic, for High-Temperature Service, Grade CF8M, or shall be Type 316 stainless steel

f. PVC: Polyvinyl chloride materials for valve body, flanges, and cover shall conform to Cell Classification 12454

g. CPVC: Chlorinated Poly Vinyl Chloride materials for valve body, flanges, and cover shall conform to Cell Classification 23447

h. NSF Standard 61: Materials shall be listed for use in contact with potable water.

2.3 VALVE CONSTRUCTION

A. Bodies

1. Provide valve bodies that are cast, molded (in the case of plastic valves), forged, or welded, of the materials indicated, and with smooth interior passages.

2. Provide wall thicknesses uniform and in agreement with the applicable standards for each type of valve, without casting defects, pinholes, and other defects that could weaken the body.

3. Perform welds on welded bodies by certified welders and ground welds smooth.

4. Provide valve ends as indicated, and rated for the maximum temperature and pressure to which the valve will be subjected.

B. Valve End Connections

1. Unless otherwise indicated, valves 2-1/2 inches in diameter and smaller may be provided with threaded end connections.

2. Provide valves 3 inches in diameter and larger with flanged end connections.

3. Flanges, bolts and gaskets shall be as specified in Section 40 05 00 - Piping, General.

C. Bonnets

1. Connect valve bonnets to the body by clamping, screwing, or flanging.

2. Provide bonnets of the same material, temperature, and pressure rating as the body.

3. Make provisions for the stem seal with the necessary glands, packing nuts, and yokes.

D. Stems

1. Provide valve stems of the materials indicated, or, if not indicated, of the best commercially-available material for the specific service, with adjustable stem packing, O-rings, chevron V-type packing, or other suitable seal. Bronze materials in contact

with potable water shall be NSF 61 approved and free of lead. Elastomeric materials shall be compatible with fluid service.

2. Where subject to dezincification, ensure that bronze valve stems conform to ASTM B 62, containing not more than 5 percent of zinc or more than 2 percent of aluminum, with a minimum tensile strength of 30,000 psi, a minimum yield strength of 14,000 psi, and an elongation of at least 10 percent in 2 inches.

3. Where dezincification is not a problem, bronze conforming to ASTM B 584 may be used, except that the zinc content shall not exceed 16 percent.

E. Stem Guides

1. Provide stem guides paced 10 feet on centers, unless the manufacturer can demonstrate by calculation that a different spacing is acceptable.

F. Internal Parts

1. Provide internal parts and valve trim as indicated for each individual valve.

G. Nuts and Bolts

1. Unless otherwise indicated, provide nuts and bolts on valve flanges and supports in accordance with the requirements of Section 05 50 00 – Miscellaneous Metalwork and Section 40 05 00 – Piping, General.

2.4 VALVE ACTUATORS

A. Valve actuators shall be as indicated and as specified in Section 43 30 12 – Valve and Gate Actuators

2.5 VALVE ACCESSORIES

A. Provide valves complete with the accessories required to provide a functional system.

2.6 SPARE PARTS

A. Furnish the required spare parts, suitably packaged and labeled with the valve name, location, and identification number.

B. Furnish the name, address, and telephone number of the nearest distributor for the spare parts of each valve.

C. Spare parts are intended for use by the OWNER, after expiration of the correction of defects period.

2.7 MANUFACTURERS

A. Valve manufacturers shall have a successful record of not less than 5 years in the manufacture of the indicated valves.

PART 3 - EXECUTION

3.1 VALVE INSTALLATION AND TRIAL OPERATION

A. General

1. Install valves, actuating units, stem extensions, valve boxes, and accessories in accordance with the manufacturer's written instructions and as indicated.

2. Adequately brace gates in order to prevent warpage and bending under the intended use.

3. Firmly support valves in order to avoid undue stresses on the pipe.

B. Access

1. Install valves in a manner to provide easy access for actuation, removal, and maintenance, and to avoid interference between valve actuators and structural members, handrails, and other equipment.

C. Valve Accessories

1. Where combinations of valves, sensors, switches, and controls are indicated, properly assemble and install such items such that systems are compatible and operating properly.

2. Clearly note the relationship between interrelated items on Shop Drawing submittals.

END OF SECTION

43 30 12 VALVES AND GATE ACTUATORS

PART 1 - GENERAL

1.1 THE SUMMARY

A. Provide valve and gate actuators and appurtenances, complete and operable, as indicated in accordance with the Contract Documents.

B. The provisions of this Section apply to valves and gates except where otherwise indicated in the Contract Documents.

C. Unit Responsibility

1. Make the valve or gate manufacturer responsible for the coordination of design, assembly, testing, and installation of actuators on the valves and gates; however, the CONTRACTOR shall be responsible to the OWNER for compliance of the valves, gates, and actuators with the Contract Documents.

D. Where 2 or more valve or gate actuators of the same type or size are required, the actuators shall be produced by the same manufacturer.

1.2 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with the requirements of Specification 43 30 00 – Valves, General.

B. Submit Shop Drawing information for actuators with the valve and gate submittals as a complete package.

C. Submit calculations showing dynamic seating and unseating torques versus the output torque of the actuator.

PART 2 - PRODUCTS

2.1 GENERAL

A. Provide actuators complete and operable with mounting hardware, gears, nuts, and extensions, as applicable.

B. Provide actuators with torque ratings equal to or greater than required for valve seating and dynamic torques, whichever is greater, and capable of holding the valve in any intermediate position between fully-open and fully-closed without creeping or fluttering.

C. Actuator torque ratings for butterfly valves shall be determined in accordance with AWWA C504 - Rubber-Seated Butterfly Valves.

D. Manufacturers

1. Where indicated, certain valves and gates may be provided with actuators manufactured by the valve or gate manufacturer.

2. Where actuators are furnished by different manufacturers, coordinate the selection to result in the fewest number of manufacturers possible.

E. Materials

1. Provide actuators of current models, of the best commercial quality materials, and liberally sized for the required torque.

2. Provide materials suitable for the environment in which the valve or gate is to be installed.

F. Actuator Mounting and Position Indicators

1. Securely mount actuators by means of brackets or hardware specially designed and sized for this purpose and of ample strength.

2. Cast the word "OPEN" on each valve or actuator, with an arrow indicating the direction to open in the counter-clockwise direction.

3. Equip gear and power actuators with position indicators.

G. Standards

1. Provide fasteners in accordance with the requirements of Section 05 50 00 – Miscellaneous Metalwork.

2. Provide coatings in accordance with the requirements of Section 09 96 00 – Protective Coating.

2.2 MANUAL ACTUATORS

A. General

1. Unless otherwise indicated, provide valves and gates with manual actuators.

2. Provide valves in sizes up to and including 4 inches with direct-acting lever or hand wheel actuators of the manufacturer's best standard design.

3. Provide valves and gates larger than 4-inch with gear-assisted manual actuators, with an operating pull of maximum 60 pounds on the rim of the hand wheel.

4. Provide buried valves with worm gear actuators, hermetically-sealed water-tight and grease-packed.

B. Buried Valves

1. Buried valves with extension stems to grade, with square nuts, position indicators, and cast-iron or steel pipe extensions with valve boxes, covers, and operating keys as detailed on the Drawings.

2. Provide wrench-nuts in compliance with AWWA C 500 - Metal-Seated Gate Valves for Water Supply Service.

C. Manual Worm Gear Actuator

1. Provide an actuator consisting of a single- or double-reduction gear unit contained in a weatherproof cast iron or steel body with cover, and a minimum 12-inch diameter hand wheel.

2. Provide the actuator to be capable of a 90-degree rotation, and equip the actuator with travel stops capable of limiting the valve opening and closing.

3. Provide the actuator with spur or helical gears and worm gearing.

4. Provide a self-locking gear ratio in order to prevent "back-driving."

5. Construct the spur or helical gears of hardened alloy steel, and the worm gear of alloy bronze.

6. Construct the worm gear shaft and the hand wheel shaft from 17-4 PH or similar stainless steel.

7. Accurately cut gearing with hobbing machines.

8. Use ball or roller bearings throughout.

9. Provide the output shaft end with a spline in order to allow adjustable alignment.

10. Actuator output gear changes shall be mechanically possible by simply changing the exposed or helical gear set ratio without further disassembly of the actuator.

11. Design gearing for a 100 percent overload.

12. The entire gear assembly shall be sealed weatherproof.

13. Design and rate buried gear actuators for buried service, provide with a stainless steel input shaft, and double-seal on shaft and top cap.

D. Traveling-Nut Actuator

1. Provide the actuator with a traveling-nut and screw (Scotch yoke), contained in a weatherproof cast iron or steel housing with a spur gear and a minimum 12-inch diameter hand wheel.

2. The screw shall run in 2 end bearings, and provide a self-locking actuator in order to maintain the valve position under any flow condition.

3. Construct the screw and gear from hardened alloy steel or stainless steel, and the construct the nut and bushings from alloy bronze.

4. The bearings and gear shall be grease-lubricated by means of nipples.

5. Design gearing for a 100 percent overload.

2.3 VALVE BOXES

A. Cast iron valve boxes shall be provided for all valves that are below finished grade elevations. Valve boxes shall be a two-piece screw type consisting of a cast iron base and adjustable cast iron top section with cover that shall be marked “WATER” or “SEWER” as appropriate.

B. Manufacturers of Valve Boxes for Water, or equal:

1. Tyler

2. U.S. Foundry

3. Wager Company

PART 3 - EXECUTION

3.1 MATERIAL DELIVERY, STORAGE, AND PROTECTION

A. All valves, valve boxes, and accessories shall be delivered in a clean and undamaged condition and stored off the ground for protection against oxidation caused by ground contact. All defective or damaged materials shall be replaced with new materials.

3.2 SERVICES OF MANUFACTURER

A. The adjustment of actuator controls and limit switches in the field for the required function shall be performed by field representatives of the manufacturers of valves or gates with pneumatic, hydraulic, or electric actuators.

3.3 INSTALLATION

A. Install valve and gate actuators and accessories in accordance with the requirements of Section 43 30 00 – Valves, General. Install valves and valve boxes as detailed on the Drawings and in accordance with the manufacturer's recommendations.

END OF SECTION

43 30 22 GATE VALVES

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide gate valves and appurtenances, complete and operable, in accordance with the Contract Documents.

B. The requirements of Section 43 30 00 - Valves, General apply to this Section.

C. The requirements of Section 43 30 12 - Valve and Gate Actuators apply to this Section.

1.2 CONTRACTOR SUBMITTALS

A. Furnish submittals in accordance with Section 43 30 00 – Valves, General.

PART 2 - PRODUCTS

2.1 GENERAL

A. Buried valves shall be of the inside screw, non-rising stem type. The valve actuators shall be as indicated, with counter-clockwise opening stems, in accordance with Section 43 30 12 – Valve and Gate Actuators.

B. All gate valves shall be resilient-seated gate valves as specified below.

2.2 RESILIENT-SEATED GATE VALVES

A. Construction: Resilient-seated gate valves shall conform to AWWA C509 - Resilient-Seated Gate Valves for Water and Sewerage Systems. The valves shall be suitable for a minimum design working water pressure of 200 psig, with flanged, bell and spigot, or mechanical joint ends as indicated. The valve body, bonnet, and disc shall be of cast iron or ductile iron and the disc or body shall be rubber-coated. Body and bonnet wall thickness shall be equal to or greater than the minimum wall thickness as listed in Table 1 of AWWA C509. The stem, stem nuts, glands, and bushings shall be bronze, with the stem seal per AWWA C509.

B. Pressure Ratings: AWWA C509 valves that are 3, 4, 6, 8, and 12 inches in size shall be rated for 200 psig minimum design working water pressure, and 16-, 20-, 24-, and 30-inch valves shall be rated for 150 psig minimum design working water pressure.

C. Protective Coating: Valve interior and exterior of body and bonnet shall be coated with a fusion bonded epoxy coating in accordance with Section 09800 - Protective Coating.

D. Actuators: Unless otherwise indicated, resilient-seated gate valves shall have manual actuators in accordance with Section 43 30 12.

E. Manufacturers, or Equal

1. Mueller Company

2. Clow, F-6100

3. Kennedy Valve, Ken-Seal

4. American Flow Products, 500/2500 Series

5. U.S. Pipe, Metroseal

2.3 GATE VALVES (SMALLER THAN 3-INCHES)

A. Construction: Gate valves smaller than 3-inches, for general purpose use, shall be non-rising stem, heavy-duty type for industrial service, with screwed or soldered ends to match the piping. The bodies shall have union bonnets of bronze conforming to ASTM B 62 - Composition Bronze or Ounce Metal Castings. The stems shall be of bronze conforming to ASTM B 62, or ASTM B 371 - Copper-Zinc-Silicon Alloy Rod. The solid wedges shall be of bronze conforming to ASTM B 62. The valves shall have malleable iron handwheels unless otherwise indicated, and stem seals shall be of Teflon-impregnated or other acceptable non-asbestos packing. Valves shall have a pressure rating of minimum 125 psi steam and 200 psi coldwater, unless otherwise indicated.

B. Manufacturers, or Equal

1. Crane Company

2. Milwaukee Valve Company

3. Wm. Powell Company

4. Stockham Valves and Fittings

5. Walworth Company

PART 3 - EXECUTION

3.1 GENERAL

A. Gate valves shall be installed in accordance with the provisions of Section 43 30 00 – Valves, General. Care shall be taken that valves in plastic lines are well supported at each end of the valve.

END OF SECTION

43 30 52 MISCELLANEOUS VALVES GENERAL

PART 1 - GENERAL

1.1 THE SUMMARY

A. The CONTRACTOR shall provide miscellaneous valves and appurtenances, complete and operable, in accordance with the Contract Documents.

B. The requirements of Section 43 30 00 - Valves, General, apply to this Section. CONTRACTOR SUBMITTALS

C. Furnish submittals in accordance with Section 43 30 00 - Valves, General.

PART 2 - PRODUCTS

2.1 AIR-VACUUM AND AIR-RELEASE VALVES

A. Air and Vacuum Valves: Air and vacuum valves shall be capable of venting large quantities of air while pipelines are being filled, and allowing air to re-enter while pipelines are being drained. They shall be of the size indicated, with flanged or screwed ends to match piping. Bodies shall be of high-strength cast iron. The float, seat, and moving parts shall be constructed of Type 316 stainless steel. Seat washers and gaskets shall be of a material insuring water tightness with a minimum of maintenance. Valves shall be designed for minimum 150 psi water-working pressure, unless otherwise indicated.

B. Air-Release Valves: Air-release valves shall vent accumulating air while system is in service under pressure and be of the size indicated. Valves shall meet the same general requirements as indicated for air and vacuum valves except that the vacuum feature will not be required. Valves shall be designed for a minimum water-working pressure of 150 psi, unless otherwise indicated.

C. Combination Air Valves: Combination air valves shall combine the characteristics of air and vacuum valves and air release valves by exhausting accumulated air in systems under pressure and releasing or re-admitting large quantities of air while a system is being filled or drained, respectively. Valves shall have the same general requirements as indicated for air and vacuum valves.

2.2 METAL BALL VALVES (4-INCH AND SMALLER)

A. General: Unless otherwise indicated, general purpose metal ball valves in sizes up to 4-inches shall have actuators in accordance with Section 15201 - Valve and Gate Actuators.

B. Body: Ball valves up to and including 1-1/2 inches in size shall have bronze or carbon steel 2 or 3 piece bodies with screwed ends for a pressure rating of not less than 600 psi WOG. Valves 2-inches to 4-inches in size shall have bronze or carbon steel 2 or 3 piece

bodies with flanged ends for a pressure rating of ANSI 125 psi or 150 psi unless otherwise indicated.

C. Balls: The balls shall be solid chrome-plated brass or bronze, or stainless steel, with standard port (single reduction) or full port openings.

D. Stems: The valve stems shall be of the blow-out proof design, of bronze, stainless steel, or other acceptable construction, with reinforced teflon seal.

E. Seats: The valve seats shall be of teflon or Buna-N, for bi-directional service and easy replacement.

F. Manufacturers, or Equal

1. Conbraco Industries, Inc. (Apollo)

2. ITT Engineered Valves

3. Neles-Jamesbury, Inc.

4. Watts Regulator

5. Worcester Controls

PART 3 - EXECUTION

3.1 INSTALLATION

A. Backflow preventers shall be installed in potable water lines where required by applicable codes or regulations, wherever there is any danger of contamination, and where indicated.

B. Valves shall be installed in accordance with the manufacturer's printed recommendations, and with Section 43 30 52 - Miscellaneous Valves.

C. Backflow preventers, as well as air and vacuum release valves, shall have piped outlets to the nearest acceptable drain, firmly-supported, and installed in such a way as to avoid splashing and wetting of floors and obstruction of traffic.

END OF SECTION

KEITH
Engineering Inspired Design.

ENGINEER'S OPINION OF PROBABLE COST

PROJECT TITLE			KEITH PROJECT NO.	DATE
Abbott Avenue Drainage Improvements			11494.01	5/7/2024
LOCATION			ESTIMATED BY:	DS
91st and 92nd Street Improvements			CHECKED BY:	SW
SUBMITTAL	OVERALL COST ESTIMATE		APPROVED BY:	SW

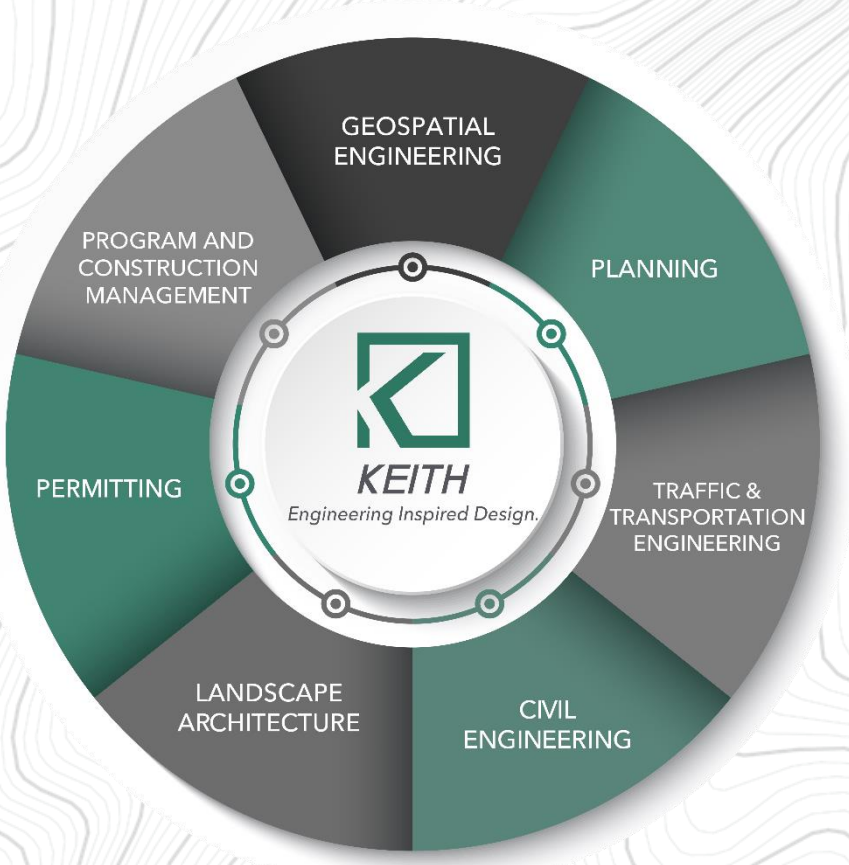
NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	F&I Pump Station & Valve Vault	2	LS	$ 950,000.00	$ 1,900,000.00
2	F&I Downstream Defender	2	EA	$ 175,000.00	$ 350,000.00
3	F&I Control Structure	1	EA	$ 50,000.00	$ 50,000.00
4	F&I Trash Rack Structure	2	EA	$ 20,000.00	$ 40,000.00
5	F&I Drainage Injection Wells	6	EA	$ 105,000.00	$ 630,000.00
6	F&I Drainage Manhole/Catch Basin	13	EA	$ 10,588.26	$ 137,647.38
7	F&I 12-inch PVC (C-900) Forcemain Pipe	1,622	LF	$ 320.00	$ 519,040.00
8	F&I 18-inch PVC (C-900) Forcemain Pipe	207	LF	$ 400.00	$ 82,800.00
9	F&I 24-inch PVC (C-900) Forcemain Pipe	714	LF	$ 510.00	$ 364,140.00
10	F&I 24-inch HDPE Pipe	531	LF	$ 325.00	$ 172,575.00
11	F&I Asphalt, Milling and Resurfacing	8,200	SY	$ 25.39	$ 208,198.00
12	F&I Pavement Markings	1	LS	$ 55,000.00	$ 55,000.00
13			Subtotal (Bid Items 1 through 21)		$4,454,400.38
14	Mobilization (6%)	6	%	$ 267,264.02	$ 267,264.02
15	Maintenance of Traffic (3%)	3	%	$ 133,632.01	$ 133,632.01
16	Erosion Control/SWPPP Measures	1	LS	$ 25,000.00	$ 25,000.00
17	Construction Surveying / Stake-out / As-Built (1%)	1.5	%	$ 66,816.01	$ 66,816.01
18	Construction Material Testing (0.75%)	1.5	%	$ 66,816.01	$ 66,816.01
19	Dedicated Allowance - Certified Industrial Hygienist or State of Florida Licensed Engineer in Environmental Discipline to Develop Health and Safety Plan	1	LS	$ 25,000.00	$ 25,000.00
20	Dedicated Allowance - Permit Fees, Inspections, Impact Fees (0.05) X (Subtotal, Item 13)	5	%	$ 222,720.02	$ 222,720.02
21	Contingency Allowance - For unforeseen improvements, for minor construction changes and quantities adjustments at other intersections along 91st & 92nd Street	1	LS	$ 200,000.00	$ 200,000.00
22	Contingency Allowance - For unforeseen conditions, for minor construction changes and for quantity adjustments, if ordered by the Engineer, the sum of 10% of the Subtotal, Item 13, (.10) X (Subtotal, Item 22)	10	%	$ 445,440.04	$ 445,440.04
23			TOTAL PROJECT COST =		$5,907,088.48

NOTES:

1. Quantities were calculated based on Construction Documents dated May 2024
2. The locations and sizes of the existing utilities are based on best available information and cannot be guaranteed for their accuracy.

STORMWATER MANAGEMENT REPORT

Project No. 11494.01
May, 2024



Abbott Avenue Drainage Improvements
Town of Surfside

91st Street and 92nd Street
Surfside, FL

Stephen D. Williams, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

KEITH
Engineering Inspired Design.

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
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1. Project Description

I. Background

The Town of Surfside is located between Indian Creek Village to the west and the Atlantic Ocean, and comprises of approximately 330 acres of land. The Town of Surfside was constructed in the 1920's and incorporated into a Town on May 18, 1935. The Town was completely developed by the 1980's. The original drainage system discharged directly into the tidal waters of Biscayne Bay. In 2010 there was a Florida Department of Environmental Protection (FDEP) program to implement water quality enhancements for Biscayne Bay and its tributaries. As part of that program, overflow weirs were installed on the Town of Surfside and FDOT outfalls with some diversion to drainage wells, with overflow to the Biscayne Bay, rather than direct uncontrolled discharge. See ***Figure 1*** below.

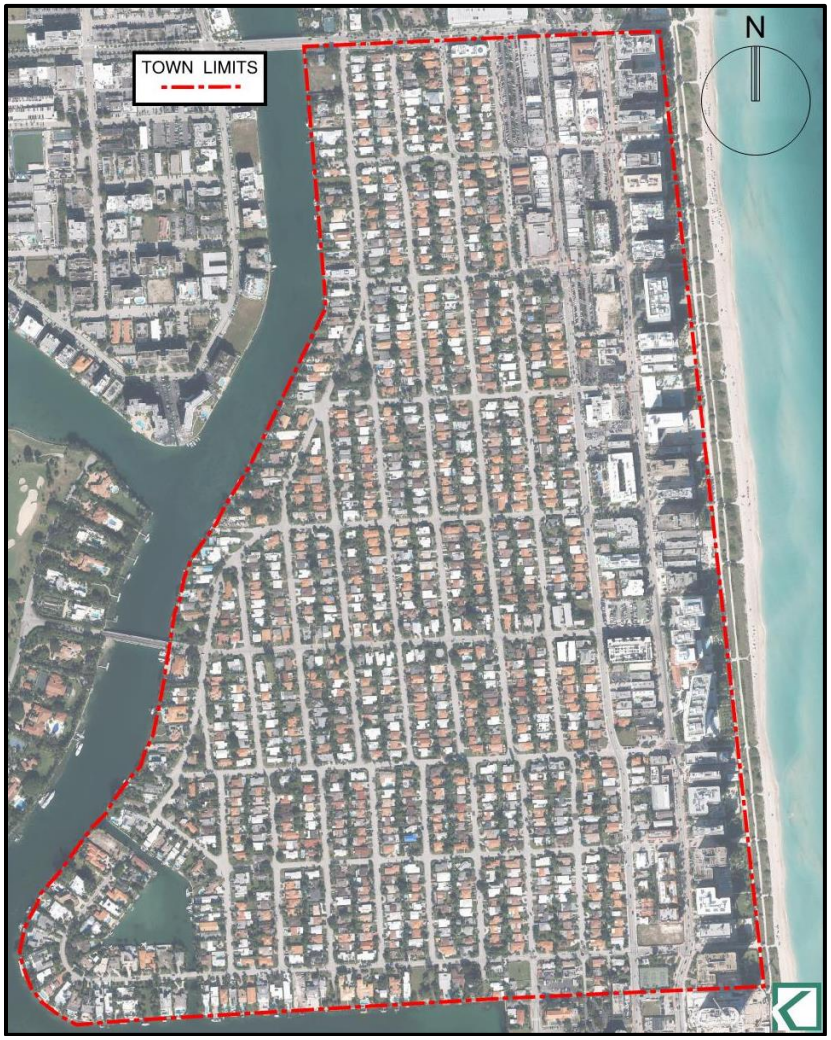


Figure 1 – Town of Surfside City Limits

II. Project Location

The proposed project is located along 92nd Street (in between Bay Road and Abbott Avenue) and Abbott Avenue (in between 92nd Street and 91st Street. These segments of roadway are ± 1,800 LF and contain approximately 50 single family residences. These roadways are located entirely within the Town of Surfside (Town), Miami-Dade County (MDC), Florida (Section 34 & 35, Township 52S and Range 42E). See ***Figure 2*** below.

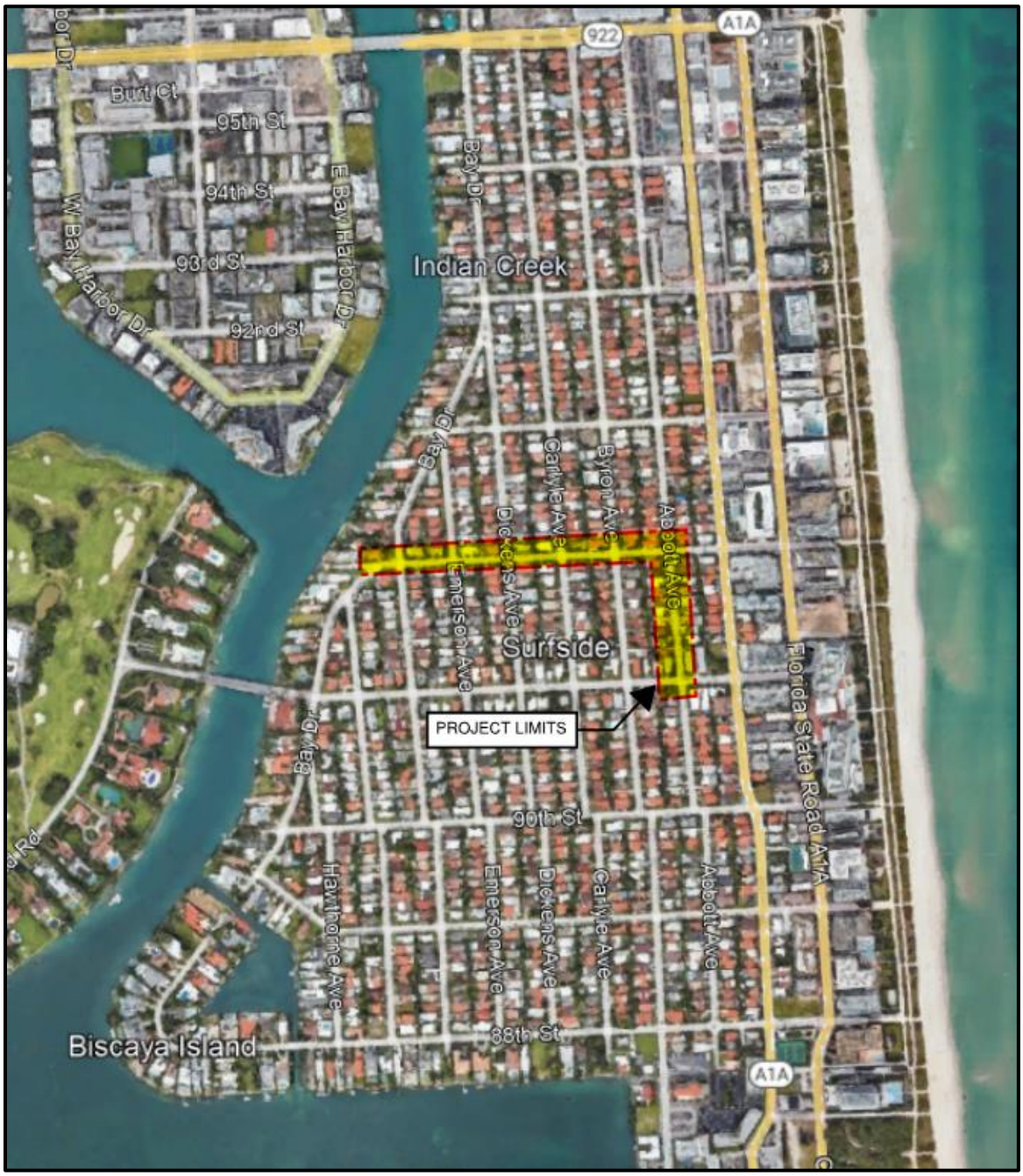


Figure 2 – Project Location

III. Existing Conditions:

The existing stormwater management system consists of an interconnected series of pipes throughout the Town which ultimately connect into four (4) pump stations which connect into a series of drainage injection wells. The Town does not have any conventional dry-detention areas (ponds, swales, exfiltration trench, underground storage, etc.). The stormwater runoff is also handled through eight (8) existing outfalls which discharge into Biscayne Bay. Refer to **Appendix C** for an overview of the pipe network. The roadway elevations throughout the Town (west of SR-A1A) are very low compared to the seasonal high water table. This contributes to frequent roadway flooding throughout the Town, particularly within Abbott Avenue. Abbott Avenue is specifically located west of Harding Avenue and east of Byron Avenue and is the most hydraulically remote point from the outfalls to the west. In addition to its location, Abbott Avenue has a lower elevation compared to the adjacent roadways, and therefore, cause more frequent flooding.

Figure 3 – Existing Stormwater Management System

IV. Proposed Improvements

This project proposes one (1) stormwater management system which will consist of a proposed stormwater pump station; located at the intersection of 92nd Street and Abbott Avenue. The station will have two (2) pumps which will collect and discharge water through 24-inch PVC (C-900) pressurized pipe. This will connects into six (6) pressurized drainage injection wells set in series, three (3) per pump. The injection wells will alleviate the flooding condition within Abbott Avenue. Water quality will be provided via a downstream defender, which will be placed prior to stormwater runoff entering the pump station (and drainage wells). The 24-inch PVC pressurized pipe will ultimately discharge into a bolted down dissipation "relief" structure and then a control structure which is at atmospheric pressure. This is critical for the major storm events, where the proposed wells cannot handle the stormwater flow rates. The excess stormwater will be able to discharge back into the existing Town of Surfside Stormwater Management System via the control structure, while providing the required head for the proposed wells.

2. STORMWATER MANAGEMENT CRITERIA

I. Basis of Assessment

The project's stormwater management (SWM) system design is based on the Town of Surfside and Miami-Dade County Department of Environmental Resource Management (DERM) Water Control criteria.

II. Miami-Dade County DERM Criteria Requirements

A. Vertical Datum Reference

All elevation information provided in this stormwater report, the proposed plans and the boundary and topographic survey references the National Geodetic Vertical Datum of 1929 (NGVD29) as required by Miami-Dade County Regulatory & Economic Resources (RER).

B. Finish Floor Elevation

The finish floor elevation (FFE) shall be designed based on the 100year-72 hour storm event (with zero discharge). In addition to the design storm, the FFE should take into account the FEMA Flood Zone criteria. The project limits are located within FEMA Flood Zone AE (and VE towards the east side of Collins Avenue); therefore, the FFE should meet the required FEMA Base Flood Elevation + 1.00-ft (per Florida Building Code). FEMA FIRM #12086C0144L dated 09/11/09 identifies a minimum base flood elevation of 8-feet. Therefore, the FFE is required to be **9.00-ft NGVD.** Refer to ***Appendix D*** for details. However, based on the best available information, none of the existing houses are at (or above) this design elevation. The existing Finished Floor Elevations (FFE) were evaluated based on the data below, on a site-by-site basis:

1. Specific Use Survey
   KEITH performed a Topographic Survey on 2/2/22 to accurately determine the finish floor elevations throughout Abbott Avenue. The FFE within Abbott ranges from 5.90-ft to 8.30-ft NGVD. The average FFE within Abbott Avenue is approximately 7.00-ft (with some homes having attached garages 1.0 to 1.5-ft lower than the existing FFE).

2. 8" above the adjacent crown of road
   KEITH obtained LiDAR information from the Florida International University (FIU) database which identified the roadway grades throughout the Town of Surfside. KEITH used this information to establish the finish floor elevations throughout areas which were not specifically surveyed. The

highest crown of road varies from an average elevation of 7.00, which requires the minimum FFE to be designed at 7.67-ft NGVD.

C. Roadway Level of Service (LOS):

The crown of road elevation for Abbott Avenue shall be designed based on the peak stage for the 5Yr-24Hr storm event. Additionally, the existing roadway crown should be a minimum of 2-ft over the control elevation. These requirements are identified within the South Florida Water Management District (SFWMD) Environmental Resource Permit (ERP) Applicant's Handbook Volume II (May 22, 2016)).

D. Water Quantity

The stormwater runoff from the Town of Surfside is routed into eight (8) control structures shown on ***Table 1*** below. These control structures are located along the west side of Surfside. Additionally, there are nine (9) drainage wells which help accommodate the surface runoff from the town roadways. There are no other means of available storage (ponds, exfiltration trench, underground storage, etc.). The ICPR Model reflects the routing of the stormwater runoff generated by the design rainfall events into the existing controls structures

Table 1 – Existing Control Structure Data

ID	Jurisdiction	Location	Weir Shape	Weir Opening Size	Invert Elevation (ft - NGVD)
*CS-01	Surfside	94th St.	Rectangle	84" x 9"	2.00
*CS-02	Surfside	89th St.	Rectangle	84" x 9"	2.00
*CS-03	Surfside	Carlyle Ave.	Rectangle	84" x 9"	2.00
CS-04	Surfside	95th St.	Rectangle	84" x 9"	2.00
CS-05	Surfside	92nd St.	Rectangle	84" x 9"	2.00
CS-06(R3)	Surfside	91st St.	Rectangle	84" x 9"	2.00
CS-07	Surfside	91st St.	Rectangle	84" x 9"	2.00
CS-08	Surfside	88th St.	Rectangle	84" x 9"	2.00
**S-77	FDOT	94th St.	Rectangle	72" x 18"	8.00
**S-101	FDOT	Carlyle Ave.	Rectangle	72" x 18"	8.00

*Control Structure is connected to three drainage wells, each capable of impounding 500 GPM/ft-head.
**Control Structure is connected to four drainage wells, each capable of impounding 600 GPM/ft-head.

1. Design Rainfall

The design rainfalls are based on the greater of the two criteria:

1. South Florida Water Management District (SFWMD) Environmental resource permit (ERP) Applicant's Handbook Volume II (May 22, 2016) "***Appendix C***: Isohyetal Maps (October 1990)".
2. National Oceanic and Atmospheric Administration (NOAA) National Weather Service Precipitation Frequency Estimates (NOAA Atlas 14 – Vol. 9, Version 2).

Table 2 below summarizes the design rainfalls for the Project. Both the SFWMD/MDC and NOAA Rainfall Distribution Maps are depicted in ***Appendix G***.

Table 2 – Design Rainfall

Design Storm	Rainfall – MDC (Inches)	Rainfall – NOAA (Inches)	Applied Highest for Analysis (Inches)
5-Year, 24-Hour	6.20	7.02	7.02
10-Year, 24-Hour	7.40	8.52	8.52
25-Year, 72-Hour	11.70	13.10	13.10
100-Year, 72-Hour	14.80	17.60	17.60

E. Water Quality

The water quality required for commercial developments is the greater of the following:

1. 1-inch times the total area
2. 2.5-inches times the percentage of impervious area

The proposed project will include a downstream defender prior to discharging into the newly proposed pump station. The downstream defenders will be designed to handle the flow from the 5-Year 24-Hour storm event for the roadway level of service.

The purpose of this report is not to evaluate the existing conditions for water quality; it is assumed that the existing conditions within Abbott Avenue meet the required water quality. In 2010, the Town of Surfside performed improvements to the overall stormwater system by providing 18-inch RCP pipe throughout Bay Drive to help improve the conveyance of the stormwater system. Additionally, eight (8) control structures (one at each outfall) and nine (9) drainage wells were constructed throughout the Town to help provide the water quality requirements.

3. ASSESSMENT

The design will use Interconnected Pond Routing Software (ICPR) Version 4 to analyze a pre-development vs post-development analysis for the Town of Surfside, specifically considering Abbott Avenue and the Town's existing outfalls.

The software will model the following scenarios:

- 5 year - 1 hour storm events.
- 5 year - 24 hour storm events.
- 10 year - 24 hour storm events.
- 25 year - 72 hour storm events.
- 100 year - 72 hour storm events.

I. Approach

The ICPR software utilizes three elements to model 1-D Hydraulics: **Nodes**, **Basins**, and **Links**.

Nodes are used to represent catchment areas (ponds, lakes, canals, inlets, etc.). Most Nodes are modeled as a stage-area (or stage volume) and are used to model areas of storage for stormwater runoff. Nodes can also be modeled as a time-stage element (typically used for outlets or boundary conditions).

In this model, nodes were modeled as the following:

1. Inlet/Manhole Storage – from the water table elevation to the rim of the structure

2. Roadway Storage – from the rim of the inlet to the roadway crown
3. Off-Road Storage – from the crown of road to the assumed elevation of the houses

Basins are used to describe the watershed area attached to the associated node. Information such as acreage size, percent impervious (inputted as Curve Numbers or Directly Connected Impervious Area), soil characteristics, land use coverage, time of concentration, and unit hydrographs can all be included within the Basin element. This model placed basins at the specific nodes (inlets) which were collecting the flow from the contributing area. LiDAR and survey information was used to determine the individual basin breakdown.

Links are used to model how the nodes interact, specifically how the stormwater runoff gets routed. Links can be pipes, weirs, drop structures, french drains, rating curves, and channels. The link elements were placed in the model based on the available information.

Each element was used to accurately model the flood conditions within Abbott Avenue. It is important to note that Abbott Avenue is connected through a series of pipes and weirs throughout the Town of Surfside Water Management System. Therefore, all interconnected portions are included in this model order to analyze Abbott Avenue. Please refer to **Appendix B** and **Appendix C** to see a breakdown of the individual Basins and the pipe network, respectively.

II. Design Parameters

A. Surface Waters/Wetland Impacts

The Town of Surfside is adjacent to Biscayne Bay, FDEP Water Body ID No. 3226H (Group 4, Class 3M), which is an impaired intercoastal waterbody within Miami Dade County (MDC). The stormwater runoff from this project will be routed into drainage injection wells which discharge directly into the aquifer. This will create a positive impact on Biscayne Bay by reducing the offsite discharge rate into the Bay.

B. Site Contamination

No known existing contaminants are within or adjacent to this project.

C. Time of Concentration/Unit Hydrograph

The pre and post design will both utilize a time of concentration (T_C) of 30 minutes and the Unit Hydrograph of 256.

D. Curve Number/Ground Soil Storage

The ICPR model will use an estimated Curve Number (CN) of 85 for both the pre-development and the post-development. This value was determined based on the TR-55 for Residential districts by average of lot size of 1/8 acres or less and assuming a NRCS Hydrologic Soil Group B for this project.

E. Tailwater

The tailwater for the design was assumed to be at the seasonal high water table elevation of Biscayne Bay. This information was determined from the Miami-Dade Groundwater Level Map (Refer to ***Appendix F***). The map depicts an elevation to be 1.60-ft NGVD

F. Saline Intrusion

The existing site is within the 1995 saline intrusion limits defined by the Miami-Dade County GIS 2022 data for Land Development. Therefore, drainage wells are an acceptable method for handling the stormwater runoff within the Town of Surfside.

G. Hydraulic Conductivity (Drainage Injection Well)

The proposed pressurized drainage injection wells are designed to handle a flow of 500 gpm per ft of head. This flow was determined based on the previously constructed drainage wells within the Town of Surfside. The Well Certifications (see ***Appendix H***) range from 500 to 800 gpm per ft of head.

H. Seasonal High Water Table Elevation

Based on the "Miami-Dade County Average 1999 October Water Table Map" the seasonal high water table elevation are approximately 1.60-ft NGVD 1929. However, in this area, ground water, and the tidal receiving water, is influenced by tidal action and subject to fluctuations with storm surges. Hence, when Hurricane Michael made landfall in Florida throughout August 30, 2017 – September 14, 2017, the town experienced an extreme storm elevation starting at 2.57-ft. Compared to the rainy season in 2021 from April 12, 2021 to May 12,2021, the storm elevations were at 2.17-ft high and (-)1.18-ft low.

4. PROPOSED IMPROVEMENTS

I. Improvement Description:

The newly provided pump station(s) and six (6) drainage well(s) were incorporated into the model as a rating curve with a total discharge rate of 6.7 cfs per ft/head for the wells and the corresponding pump curve for the selected pump. A stage/area node was added to the model as the pump stations wet well which connect the rating curve into a downstream stage/area node which modeled the force main. The drainage wells are represented by stage/area nodes along the force main connected with a rating curve to the aquifer (discharge point) which is represented with a time/stage node. The bypass system was not included in the model. The flap gate to be installed at the end of the force main is the overflow mechanism and is arbitrarily modeled as a weir set at elevation 8.00-ft NGVD. ***Table 3*** below outlines the newly proposed improvements which were added to the model. All other elements (links, nodes, basins) not listed in ***Table 3*** match the predevelopment model. Refer to the stormwater calculations for additional details.

Table 3 – Proposed Improvements

Element ID	Prop. Connection	Prop. Pipe Size (in)	Prop. Pipe Length (ft)	Prop. Improvement
NZA-0186	91st: MH Node	N/A	N/A	New Manhole
NZA-0187	91st: MH Node	N/A	N/A	Upstream Trash Rack
NZA-0188	91st: MH Node	N/A	N/A	Downstream Trash Rack
NZA-0189	91st: MH Node	N/A	N/A	Downstream Defender
NZA-0190	91st: Pump Station Node	N/A	N/A	Manhole
NZA-0191	91st: Force Main Node	N/A	N/A	Pump Station Outlet
NZA-0208	91st: Drainage Well Node	N/A	N/A	Drainage Well
NZA-0197	Abbott Ave: Drainage Well Node	N/A	N/A	Drainage Well
NZA-0200	Abbott Ave: Drainage Well Node	N/A	N/A	Drainage Well
NZA-0174	Abbott Ave: Drainage Well Node	N/A	N/A	Drainage Well

NZA-0162	Abbott Ave: MH Node	N/A	N/A	Upstream Trash Rack
NZA-0163	Abbott Ave: MH Node	N/A	N/A	Downstream Trash Rack
NZA-D8	Abbott Ave: MH Node	N/A	N/A	Manhole
NZA-PS-8	Abbott Ave: MH Node	N/A	N/A	Downstream Defender
NZA-0176	Abbott Ave: Pump Station Node	N/A	N/A	Manhole
NZA-0172	Abbott Ave: Force Main Node	N/A	N/A	Pump Station Outlet
NZA-0164	92nd: Force Main Node	N/A	N/A	Tee
NZA-0165	92nd: Drainage Well Node	N/A	N/A	Drainage Well
NZA-0167	92nd: Drainage Well Node	N/A	N/A	Drainage Well
NZA-0207	92nd: Force Main outlet	N/A	N/A	Upstream Flap Gate
P-E9-E8	Abbott Avenue & 91st: to new MH	24	300	New Pipe Connection
L-0345P	91st: MH to Trash Rack Structure	24	10	New Pipe Connection
L-0355W	91st: Trash Rack as weir	N/A	N/A	New Weir
L-0346P	91st: Trash Rack Structure to Defender	24	10	New Pipe Connection
L-0347P	91st: Defender to Pump Station Wet Well	24	11	New Pipe Connection
PS-2	91st: Pump Station rating curve	N/A	N/A	New Rating Curve
L-0354P	Abbott Ave: Force Main	24	36	New Pipe Connection
DW-10	Abbott Ave: Drainage Well	N/A	N/A	New Rating Curve
L-0349P	Abbott Ave: Force Main	24	313	New Pipe Connection
DW-11	Abbott Ave: Drainage Well	N/A	N/A	New Rating Curve
L-0351P	Abbott Ave: Force Main	24	194	New Pipe Connection
DW-12	Abbott Ave: Drainage Well	N/A	N/A	New Rating Curve
L-0360P	Abbott Ave: Force Main	24	194	New Pipe Connection
DW-13	Abbott Ave: Drainage Well	N/A	N/A	New Rating Curve
L-0328P	Abbott Ave: Force Main	24	77	New Pipe Connection
P-D7-D8	Abbott Avenue & 92nd: to new MH	24	10	New Pipe Connection
L-0338W	92nd: Trash Rack as weir	N/A	N/A	New Weir
L-0322P	92nd: Trash Rack Structure to MH	24	9	New Pipe Connection
P-PS-8-D8	92nd: MH to Defender	24	15	New Pipe Connection
P-CS-11-PS-8	92nd: Defender to Pump Station Wet Well	24	10	New Pipe Connection
PS-1	92nd: Pump Station rating curve	N/A	N/A	New Rating Curve
L-0339P	92nd: Force Main	24	88	New Pipe Connection
DW-14	92nd: Drainage Well	N/A	N/A	New Rating Curve
L-0331P	92nd: Force Main	24	95	New Pipe Connection
DW-15	92nd: Drainage Well	N/A	N/A	New Rating Curve
P-CS-11-D1	92nd: Force Main	24	1584	New Pipe Connection
L-0361W	92nd: Flap Gate as weir	N/A	N/A	New Weir
P-D7-E9	Abbott Avenue & 92nd: to new MH	24	300	New Pipe Connection
P-E9-PS-7	Abbott Avenue: CS to new PS	24	10	New Pipe Connection
CS-10	Abbott Avenue: CS to bypass MH	24	20	New Pipe Connection
P-CS-10-PS-7	Abbott Avenue: PS to bypass MH	24	10	New Pipe Connection
P-CS-10-E1	Abbott Avenue: bypass MH to Bay Drive	24	2,223	New Pipe Connection
DW-10-15	Abbott Avenue: PS to Aquifer	N/A	N/A	New Rating Curve

5. CONCLUSION

I. Results

The proposed improvements reduce the peak stages at Basin D7 and E8 (intersection at Abbott Avenue and 92nd Street/91st Street) by 11 to 7 inches during the 5-year – 24 hour storm event. However, either intersection meets the desired LOS. The proposed pump stations allow for water to be routed directly away from Abbott and to the outfall on the western side of the Town along Bay Drive. The proposed pump stations have no impact to the Abbott Avenue basins south of 91st Street (F9, G9, and I8), reducing the 5-year 24-hour storm by only 0.02-ft. The existing outfalls are also impacted by the proposed development. The outfall structures on 91st and 95th Street see the biggest reduction in outflow discharge into Biscayne Bay. Although the outfall structures within 96th Street and Carlyle Avenue are slightly increased, the overall discharge from the Town's stormwater management system is reduced by 48.33 cfs. Refer to ***Table 4*** and ***Table 5*** for an overview of the off-site discharge rates for the 25 Year – 72 Hour storm and peak stages within Abbott Avenue for the 5 Year – 24 Hour storm, respectively.

Table 4 – Peak Offsite Discharge

ID	Outfall Location	Outfall Size (in)	Existing Conditions Discharge (cfs)	Proposed Improvements Discharge (cfs)	Change in Flow/Discharge Rate (Δ cfs)
CS-00	96th St.	36	19.99	24.34	**4.35**
CS-01	94th St.	30	11.99	2.70	**(-)9.29**
CS-02	89th St.	24	2.51	3.44	**0.93**
CS-03	Carlyle Ave.	36	36.92	37.30	**0.38**
CS-04	95th St.	18	34.71	9.31	**(-)25.40**
CS-05	92nd St.	24	14.20	26.09	**11.89**
CS-06(R3)	91st St.	30	38.42	22.13	**(-)16.29**
CS-07	91st St.	24	27.08	11.44	**(-)15.64**
CS-08	88th St.	24	28.92	29.66	**0.74**
				TOTAL OFFSITE ADDITIONAL FLOW	**(-)48.33**

Table 5 – Summary of Proposed Abbott Avenue (Maximum Stages)

Basin ID	Estimated Roadway Centerline Elevation (ft - NGVD)	Existing Conditions Max Stage (ft - NGVD)	Proposed Improvements Max Stage (ft - NGVD)	Stage Difference (ft)	Difference between Crown of Road & Max Stage (ft)	LOS Achieved
AA4	4.00	3.37	3.68	**0.31**	**0.32**	**Yes**
A4	4.80	5.08	4.40	**(-)0.68**	**0.40**	**Yes**
B4	4.80	4.01	3.44	**(-)0.57**	**1.36**	**Yes**
C2	5.78	5.95	5.95	**-**	**(-)0.17**	**No**
D7	3.90	5.27	4.33	**(-)0.94**	**(-)0.43**	**No**
E8	4.00	4.92	4.32	**(-)0.60**	**(-)0.32**	**No**
F9	4.27	4.87	4.86	**(-)0.01**	**(-)0.59**	**No**
G9	4.84	4.85	4.83	**(-)0.02**	**0.01**	**Yes**
I8	4.51	4.78	4.75	**(-)0.03**	**(-)0.24**	**No**

II. Summary

The predevelopment model confirms the assessment that Abbott Avenue experiences major flooding (16-inches above the LOS), specifically at 91st and 92nd Street. As previously stated, this is due to the topography and location of the roadway; it is the most remote point from the existing outfalls and has lower elevations compared to the adjacent roadways. The proposed pump stations/drainage injection wells will have a positive long-term impact on the Town's flooding problems by allowing Abbott Avenue to be one of the first points of alleviating the stormwater runoff within the Town of Surfside. Primarily, the proposed improvements will also have a positive impact on the water quality. The peak discharge into Biscayne Bay is reduced by 9.20 cfs due to the proposed drainage injection wells. A downstream defender will be placed to ensure the aquifer remains unaffected. In addition to the water quality, the overall peak stages will be greatly reduced (14-inches at the Abbott Avenue and 92nd Street Basin). The proposed improvements will not bring both Basins D7 and E8 into compliance. The LOS for the 5-year 24-hour storm event is exceeded by approximately 3.5-inches.

CALCULATIONS

Pre-development Calculations

Background Image: NETWORK DIAGRAM

---Unable to Generate Chart---

Simulation: 005Yr-024Hr

Scenario: Ex. Conditions
Run Date/Time: 6/27/2023 8:33:38 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSIII-24
		Rainfall Amount:	6.50 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 010Yr-024Hr

Scenario: Ex. Conditions
Run Date/Time: 6/27/2023 8:36:11 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources		Lookup Tables	
Rainfall Folder:		Boundary Stage Set:	
		Extern Hydrograph Set:	
Unit Hydrograph Folder:		Curve Number Set:	
		Green-Ampt Set:	
		Vertical Layers Set:	
		Impervious Set:	

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SCSIII-24
		Rainfall Amount:	8.52 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 025Yr-072Hr

Scenario: Ex. Conditions
Run Date/Time: 6/27/2023 8:38:27 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000

End Time:	0	0	0	72.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: ~SFWMD-72
Rainfall Amount: 13.10 in
Storm Duration: 72.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100Yr-072Hr

Scenario: Ex. Conditions
Run Date/Time: 6/27/2023 8:43:21 PM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0010 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0001 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	17.60 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simple Basin: A1

Scenario:	Ex. Conditions
Node:	NZA-A1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.7600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: A2

Scenario:	Ex. Conditions
Node:	NZA-A2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.5500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: A3

Scenario:	Ex. Conditions
Node:	NZA-A3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	6.1200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: A4

Scenario:	Ex. Conditions
Node:	NZA-A4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.5600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA1

Scenario:	Ex. Conditions
Node:	NZA-AA1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.2700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA2

Scenario:	Ex. Conditions
Node:	NZA-AA2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.1900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA3

Scenario:	Ex. Conditions
Node:	NZA-AA3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.0800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA4

Scenario:	Ex. Conditions
Node:	NZA-AA4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.1300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA5

Scenario:	Ex. Conditions
Node:	NZA-AA5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.3000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B1

Scenario:	Ex. Conditions
Node:	NZA-B1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.4300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B2

Scenario:	Ex. Conditions
Node:	NZA-B2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.2700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B3

Scenario:	Ex. Conditions
Node:	NZA-B3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.7700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B4

Scenario:	Ex. Conditions
Node:	NZA-B4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.6400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: C1

Scenario:	Ex. Conditions
Node:	NZA-C1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: C2

Scenario:	Ex. Conditions
Node:	NZA-C2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.4800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D1

Scenario:	Ex. Conditions
Node:	NZA-D1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.2400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D2

Scenario:	Ex. Conditions
Node:	NZA-D2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D3

Scenario:	Ex. Conditions
Node:	NZA-D3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.3000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D4

Scenario:	Ex. Conditions
Node:	NZA-D4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	6.9900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D5

Scenario:	Ex. Conditions
Node:	NZA-D5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	8.8200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D6

Scenario:	Ex. Conditions
Node:	NZA-D6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	9.0700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D7

Scenario:	Ex. Conditions
Node:	NZA-D7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.5500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E1

Scenario:	Ex. Conditions
Node:	NZA-E1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.8300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E2

Scenario:	Ex. Conditions
Node:	NZA-E2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.8900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E3

Scenario:	Ex. Conditions
Node:	NZA-E3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E4

Scenario:	Ex. Conditions
Node:	NZA-E4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E5

Scenario:	Ex. Conditions
Node:	NZA-E5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E6

Scenario:	Ex. Conditions
Node:	NZA-E6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E7

Scenario:	Ex. Conditions
Node:	NZA-E7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.9700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E8

Scenario:	Ex. Conditions
Node:	NZA-E8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F1

Scenario:	Ex. Conditions
Node:	NZA-F1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.6300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F2

Scenario:	Ex. Conditions
Node:	NZA-F2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.5700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F3

Scenario:	Ex. Conditions
Node:	NZA-F3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.7800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F4

Scenario:	Ex. Conditions
Node:	NZA-F4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.9900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F5

Scenario:	Ex. Conditions
Node:	NZA-F5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.7800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F6

Scenario:	Ex. Conditions
Node:	NZA-F6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.8800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F7

Scenario:	Ex. Conditions
Node:	NZA-F7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.8800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F8

Scenario:	Ex. Conditions
Node:	NZA-F8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.9000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F9

Scenario:	Ex. Conditions
Node:	NZA-F9
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.8800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-1A

Scenario:	Ex. Conditions
Node:	FDOT-1A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.0500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-1B

Scenario:	Ex. Conditions
Node:	FDOT-1B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.9700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-2A

Scenario:	Ex. Conditions
Node:	FDOT-2A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.8100 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-2B

Scenario:	Ex. Conditions
Node:	FDOT-2B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-3A

Scenario:	Ex. Conditions
Node:	FDOT-3A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.5900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-3B

Scenario:	Ex. Conditions
Node:	FDOT-3B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-4A

Scenario:	Ex. Conditions
Node:	FDOT-4A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.3400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-4B

Scenario:	Ex. Conditions
Node:	FDOT-4B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.3000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-5B

Scenario:	Ex. Conditions
Node:	FDOT-5B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.9600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G1

Scenario:	Ex. Conditions
Node:	NZA-G1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.1000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G2

Scenario:	Ex. Conditions
Node:	NZA-G2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.2600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G3

Scenario:	Ex. Conditions
Node:	NZA-G3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.4300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G4

Scenario:	Ex. Conditions
Node:	NZA-G4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.0800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G5

Scenario:	Ex. Conditions
Node:	NZA-G5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.1900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G6

Scenario:	Ex. Conditions
Node:	NZA-G6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.7900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G7

Scenario:	Ex. Conditions
Node:	NZA-G7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G8

Scenario:	Ex. Conditions
Node:	NZA-G8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.4400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G9

Scenario:	Ex. Conditions
Node:	NZA-G9
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.4900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I1

Scenario:	Ex. Conditions
Node:	NZA-I1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.3600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I2

Scenario:	Ex. Conditions
Node:	NZA-I2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.1800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I3

Scenario:	Ex. Conditions
Node:	NZA-I3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.3800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I4

Scenario:	Ex. Conditions
Node:	NZA-I4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.4500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I5

Scenario:	Ex. Conditions
Node:	NZA-I5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.8100 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I6

Scenario:	Ex. Conditions
Node:	NZA-I6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.2100 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I7

Scenario:	Ex. Conditions
Node:	NZA-I7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I8

Scenario:	Ex. Conditions
Node:	NZA-I8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 3.9500 ac
Curve Number: 85.0
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Node: AQUIFER (89th)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: -60.00 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	-60.00
0	0	0	99999.0000	-60.00

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
AQUIFER (89th)	005Yr-024Hr	8.00	-60.00	0.0000	33.00	0.00	0
AQUIFER (89th)	010Yr-024Hr	8.00	-60.00	0.0000	33.00	0.00	0
AQUIFER (89th)	025Yr-072Hr	8.00	-60.00	0.0000	33.00	0.00	0
AQUIFER (89th)	100Yr-072Hr	8.00	-60.00	0.0000	33.00	0.00	0

Node: AQUIFER (94th)

Scenario: Ex. Conditions
Type: Time/Stage

Base Flow: 0.00 cfs
Initial Stage: -60.00 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	-60.00
0	0	0	99999.0000	-60.00

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
AQUIFER (94th)	005Yr-024Hr	8.00	-60.00	0.0000	39.60	0.00	0
AQUIFER (94th)	010Yr-024Hr	8.00	-60.00	0.0000	39.60	0.00	0
AQUIFER (94th)	025Yr-072Hr	8.00	-60.00	0.0000	39.60	0.00	0
AQUIFER (94th)	100Yr-072Hr	8.00	-60.00	0.0000	39.60	0.00	0

Node: AQUIFER (CARLYLE)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: -60.00 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	-60.00
0	0	0	99999.0000	-60.00

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
AQUIFER (CARLYLE)	005Yr-024Hr	8.00	-60.00	0.0000	0.00	0.00	0
AQUIFER (CARLYLE)	010Yr-024Hr	8.00	-60.00	0.0000	0.00	0.00	0
AQUIFER (CARLYLE)	025Yr-072Hr	8.00	-60.00	0.0000	0.00	0.00	0
AQUIFER (CARLYLE)	100Yr-072Hr	8.00	-60.00	0.0000	0.00	0.00	0

Node: FDOT AQUIFER (94TH)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: -60.00 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	-60.00
0	0	0	99999.0000	-60.00

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT AQUIFER (94TH)	005Yr-024Hr	8.00	-60.00	0.0000	42.88	0.00	0
FDOT AQUIFER (94TH)	010Yr-024Hr	8.00	-60.00	0.0000	42.88	0.00	0
FDOT AQUIFER (94TH)	025Yr-072Hr	8.00	-60.00	0.0000	42.88	0.00	0
FDOT AQUIFER (94TH)	100Yr-072Hr	8.00	-60.00	0.0000	42.88	0.00	0

Node: FDOT AQUIFER (CARLYLE)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: -60.00 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	-60.00
0	0	0	99999.0000	-60.00

Comment: FDOT AQUIFER

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT AQUIFER (CARLYLE)	005Yr-024Hr	8.00	-60.00	0.0000	42.88	0.00	0
FDOT AQUIFER (CARLYLE)	010Yr-024Hr	8.00	-60.00	0.0000	42.88	0.00	0
FDOT AQUIFER (CARLYLE)	025Yr-072Hr	8.00	-60.00	0.0000	42.88	0.00	0
FDOT AQUIFER (CARLYLE)	100Yr-072Hr	8.00	-60.00	0.0000	42.88	0.00	0

Node: FDOT OUTFALL (94th)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT OUTFALL (94th)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (94th)	010Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (94th)	025Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (94th)	100Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0

Node: FDOT OUTFALL (CARLYLE)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT OUTFALL (CARLYLE)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (CARLYLE)	010Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (CARLYLE)	025Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT	100Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (CARLYLE)							

Node: FDOT-1A

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 4.86 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.36	0.0001	4
4.86	0.6200	27007
8.00	1.8900	82328

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-1A	005Yr-024Hr	4.86	4.86	0.0028	7.25	5.85	26952
FDOT-1A	010Yr-024Hr	4.86	5.14	0.0028	9.62	6.34	32022
FDOT-1A	025Yr-072Hr	4.86	5.39	0.0028	8.41	3.71	36393
FDOT-1A	100Yr-072Hr	4.86	5.80	0.0028	12.40	5.17	43630

Node: FDOT-1B

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 5.22 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.72	0.0001	4
5.22	0.4700	20473
8.00	0.8300	36155

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-1B	005Yr-024Hr	5.22	4.56	0.0016	12.75	12.75	267
FDOT-1B	010Yr-024Hr	5.22	5.05	-0.0018	17.46	17.42	13655
FDOT-1B	025Yr-072Hr	5.22	5.46	-0.0026	20.83	18.89	21829
FDOT-1B	100Yr-072Hr	5.22	5.83	0.0020	28.40	20.00	23925

Node: FDOT-2A

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 3.91 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
3.44	0.0001	4
3.94	0.5100	22216
8.00	1.5000	65340

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-2A	005Yr-024Hr	3.91	4.84	0.0077	12.34	8.50	31795
FDOT-2A	010Yr-024Hr	3.91	5.12	0.0077	16.59	11.58	34807
FDOT-2A	025Yr-072Hr	3.91	5.36	0.0077	20.63	14.74	37325
FDOT-2A	100Yr-072Hr	3.91	5.75	0.0077	27.64	14.92	41499

Node: FDOT-2B

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs

Initial Stage: 1.40 ft
Warning Stage: 5.21 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.71	0.0001	4
5.21	0.6200	27007
8.00	1.2300	53579

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-2B	005Yr-024Hr	5.21	2.85	0.0176	39.43	39.45	196
FDOT-2B	010Yr-024Hr	5.21	3.70	0.0176	47.98	47.93	196
FDOT-2B	025Yr-072Hr	5.21	4.27	0.0176	50.78	50.67	196
FDOT-2B	100Yr-072Hr	5.21	4.89	0.0176	53.92	53.74	9547

Node: FDOT-3A

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 4.88 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.38	0.0001	4
4.88	0.5500	23958
8.00	1.3500	58806

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-3A	005Yr-024Hr	4.88	4.81	0.0225	28.26	12.35	20839
FDOT-3A	010Yr-024Hr	4.88	5.09	0.0225	28.26	14.89	26359
FDOT-3A	025Yr-072Hr	4.88	5.31	0.0225	28.26	16.23	28799

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-3A	100Yr-072Hr	4.88	5.66	0.0225	28.26	22.02	32680

Node: FDOT-3B

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 4.40 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
3.99	0.0001	4
4.40	0.6200	27007
8.00	2.7300	118919

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-3B	005Yr-024Hr	4.40	2.89	0.0098	9.82	8.53	100
FDOT-3B	010Yr-024Hr	4.40	3.76	0.0098	11.85	11.80	100
FDOT-3B	025Yr-072Hr	4.40	4.33	0.0098	14.48	14.28	22570
FDOT-3B	100Yr-072Hr	4.40	4.96	0.0098	19.74	16.28	41210

Node: FDOT-4A

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.18 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.81	0.0001	4
4.31	0.3100	13504
8.00	1.2000	52272

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-4A	005Yr-024Hr	4.18	4.79	-0.0275	14.38	28.26	19011
FDOT-4A	010Yr-024Hr	4.18	5.06	-0.0275	21.21	28.26	21850
FDOT-4A	025Yr-072Hr	4.18	5.26	-0.0275	25.75	28.26	23869
FDOT-4A	100Yr-072Hr	4.18	5.55	-0.0275	33.17	28.99	26911

Node: FDOT-4B

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 3.90 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
3.40	0.0001	4
3.90	0.6300	27443
8.00	1.7500	76230

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-4B	005Yr-024Hr	3.90	4.94	0.0002	9.95	3.77	39802
FDOT-4B	010Yr-024Hr	3.90	5.27	0.0002	12.27	5.35	43787
FDOT-4B	025Yr-072Hr	3.90	5.60	0.0002	15.00	4.97	47698
FDOT-4B	100Yr-072Hr	3.90	6.15	0.0002	20.45	5.46	54170

Node: FDOT-5B

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft

Warning Stage: 4.86 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.36	0.0001	4
4.86	0.6600	28750
8.00	2.2300	97139

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-5B	005Yr-024Hr	4.86	4.92	0.0002	7.11	6.10	30152
FDOT-5B	010Yr-024Hr	4.86	5.25	0.0002	10.93	9.43	37353
FDOT-5B	025Yr-072Hr	4.86	5.58	0.0002	10.54	9.79	44437
FDOT-5B	100Yr-072Hr	4.86	6.12	0.0002	13.51	9.87	56113

Node: NZA-A1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.60 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.10	0.0001	4
3.60	0.5200	22651
7.50	1.3600	59242

Comment: As-built Structure D-195

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A1	005Yr-024Hr	3.60	3.74	-0.0024	16.63	14.92	23938
NZA-A1	010Yr-024Hr	3.60	4.19	-0.0029	28.24	27.29	28168
NZA-A1	025Yr-072Hr	3.60	4.35	-0.0032	38.26	37.17	29673
NZA-A1	100Yr-072Hr	3.60	4.66	-0.0022	53.28	51.78	32650

Node: NZA-A2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.24 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.74	0.0001	4
4.24	0.4800	20909
7.50	1.6200	70567

Comment: AS-BUILT INLET CA-95

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A2	005Yr-024Hr	4.24	4.87	0.0008	13.63	12.53	30437
NZA-A2	010Yr-024Hr	4.24	5.04	0.0008	23.09	21.03	33043
NZA-A2	025Yr-072Hr	4.24	5.14	0.0008	30.59	28.56	34649
NZA-A2	100Yr-072Hr	4.24	5.40	0.0008	43.71	42.40	38542

Node: NZA-A3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.45 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.95	0.0001	4
4.45	0.6200	27007
7.50	2.2100	96268

Comment: AS-BUILT STRUCTURE BY95

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A3	005Yr-024Hr	4.45	4.95	-0.0007	12.57	7.95	38327
NZA-A3	010Yr-024Hr	4.45	5.07	-0.0006	17.47	12.82	41130
NZA-A3	025Yr-072Hr	4.45	5.18	-0.0006	21.92	17.28	43482
NZA-A3	100Yr-072Hr	4.45	5.70	-0.0006	36.53	31.24	55299

Node: NZA-A4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.80 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.30	0.0001	4
4.80	0.6400	27878
7.24	2.2900	99752

Comment: As-built Structrure AB95

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A4	005Yr-024Hr	4.80	5.08	-0.0007	12.26	10.89	36101
NZA-A4	010Yr-024Hr	4.80	5.21	-0.0007	16.74	9.76	39966
NZA-A4	025Yr-072Hr	4.80	5.45	-0.0007	23.51	15.81	47139
NZA-A4	100Yr-072Hr	4.80	5.81	-0.0007	35.88	23.23	57680

Node: NZA-AA1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.1000	4356
7.50	0.4000	17424

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA1	005Yr-024Hr	4.00	3.21	0.0010	13.26	13.26	308
NZA-AA1	010Yr-024Hr	4.00	3.45	0.0010	17.50	17.50	308
NZA-AA1	025Yr-072Hr	4.00	3.58	0.0010	20.00	19.99	977
NZA-AA1	100Yr-072Hr	4.00	3.79	0.0010	24.33	24.30	2782

Node: NZA-AA2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.0900	3920
7.50	0.4000	17424

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA2	005Yr-024Hr	4.00	3.30	0.0010	10.67	10.66	381
NZA-AA2	010Yr-024Hr	4.00	3.55	0.0010	14.00	14.01	753
NZA-AA2	025Yr-072Hr	4.00	3.69	0.0010	15.95	15.99	1804
NZA-AA2	100Yr-072Hr	4.00	3.91	0.0010	19.30	19.38	3523

Node: NZA-AA3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.5200	22651
7.50	1.0800	47045

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA3	005Yr-024Hr	4.00	3.35	0.0015	8.23	8.23	468
NZA-AA3	010Yr-024Hr	4.00	3.60	0.0015	10.81	10.80	4891
NZA-AA3	025Yr-072Hr	4.00	3.74	0.0015	12.56	12.38	11216
NZA-AA3	100Yr-072Hr	4.00	3.97	0.0015	15.85	15.06	21679

Node: NZA-AA4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.1300	5663
7.50	0.7900	34412

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA4	005Yr-024Hr	4.00	3.37	0.0033	18.47	6.02	535
NZA-AA4	010Yr-024Hr	4.00	3.63	0.0033	18.47	7.76	1658
NZA-AA4	025Yr-072Hr	4.00	3.78	0.0033	18.47	8.87	3318
NZA-AA4	100Yr-072Hr	4.00	4.02	0.0033	18.47	10.88	6003

Node: NZA-AA5

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 3.50 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.1200	5227
7.50	0.4300	18731

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA5	005Yr-024Hr	4.00	3.50	-0.0066	3.71	19.35	400
NZA-AA5	010Yr-024Hr	4.00	3.64	-0.0066	4.75	19.35	1629
NZA-AA5	025Yr-072Hr	4.00	3.79	-0.0066	5.62	19.35	3166
NZA-AA5	100Yr-072Hr	4.00	4.03	-0.0066	7.33	19.35	5501

Node: NZA-AA7

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.4700	20473
7.23	0.8800	38333

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA7	005Yr-024Hr	8.00	5.08	-0.0020	10.80	3.23	26439
NZA-AA7	010Yr-024Hr	8.00	5.21	-0.0017	8.94	2.96	27163
NZA-AA7	025Yr-072Hr	8.00	5.45	-0.0015	9.47	2.81	28509
NZA-AA7	100Yr-072Hr	8.00	5.81	-0.0002	12.81	4.25	30487

Node: NZA-B1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.17 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.67	0.0001	4
4.17	0.7000	30492
7.50	1.9500	84942

Comment: As-built Structure EX-280

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B1	005Yr-024Hr	4.17	3.14	-0.0061	36.89	37.44	100
NZA-B1	010Yr-024Hr	4.17	3.79	-0.0061	40.91	40.54	7086
NZA-B1	025Yr-072Hr	4.17	4.18	-0.0106	52.51	51.43	30678
NZA-B1	100Yr-072Hr	4.17	4.66	-0.0075	82.70	81.08	38581

Node: NZA-B2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.73 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.23	0.0001	4
4.73	0.5200	22651
7.50	1.6900	73616

Comment: As-built Structure EX-283

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B2	005Yr-024Hr	4.73	3.64	-0.0049	19.57	19.91	100
NZA-B2	010Yr-024Hr	4.73	4.54	-0.0049	25.19	23.71	14027
NZA-B2	025Yr-072Hr	4.73	4.78	-0.0049	31.64	29.94	23578
NZA-B2	100Yr-072Hr	4.73	5.06	-0.0114	43.31	41.97	28672

Node: NZA-B3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.83 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.33	0.0001	4
4.83	0.5500	23958
7.50	1.0800	47045

Comment: As-built Structure EX-291

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B3	005Yr-024Hr	4.83	3.97	-0.0035	8.75	8.89	100
NZA-B3	010Yr-024Hr	4.83	4.76	-0.0039	13.52	14.18	20656
NZA-B3	025Yr-072Hr	4.83	4.90	-0.0090	17.54	17.04	24551
NZA-B3	100Yr-072Hr	4.83	5.24	-0.0091	27.97	27.00	27515

Node: NZA-B4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.80 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.30	0.0001	4
4.80	0.3400	14810
7.64	1.4300	62291

Comment: AS-BUILT STRUCTURE EX-295

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B4	005Yr-024Hr	4.80	4.01	-0.0081	25.82	25.94	100
NZA-B4	010Yr-024Hr	4.80	5.00	-0.0083	35.52	33.90	18132
NZA-B4	025Yr-072Hr	4.80	5.44	-0.0081	37.40	39.46	25581
NZA-B4	100Yr-072Hr	4.80	5.80	-0.0081	43.75	40.48	31561

Node: NZA-C1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.44 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.94	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.44	0.6800	29621
7.50	2.1100	91912

Comment: As-built Structure EX-280

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-C1	005Yr-024Hr	4.44	4.33	-0.0010	8.34	7.58	22992
NZA-C1	010Yr-024Hr	4.44	4.91	-0.0018	12.19	7.88	39129
NZA-C1	025Yr-072Hr	4.44	5.17	-0.0020	17.92	16.60	44529
NZA-C1	100Yr-072Hr	4.44	5.40	-0.0018	31.34	29.57	49144

Node: NZA-C2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 5.78 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
5.28	0.0001	4
5.78	0.5000	21780
6.45	1.3900	60548

Comment: AS-BUILT STRUCTURE EX-404.

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-C2	005Yr-024Hr	5.78	5.95	-0.0007	11.25	9.75	31843
NZA-C2	010Yr-024Hr	5.78	6.04	-0.0008	15.64	13.82	36897
NZA-C2	025Yr-072Hr	5.78	6.10	-0.0007	19.12	16.98	40222
NZA-C2	100Yr-072Hr	5.78	6.20	-0.0005	26.07	23.36	46026

Node: NZA-CS-01

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.13	0.0010	44

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-01	005Yr-024Hr	8.00	2.02	0.0190	37.44	38.52	100
NZA-CS-01	010Yr-024Hr	8.00	2.12	0.0199	40.54	40.58	100
NZA-CS-01	025Yr-072Hr	8.00	2.29	0.0198	43.16	43.19	100
NZA-CS-01	100Yr-072Hr	8.00	2.46	0.0198	46.62	46.66	100

Node: NZA-CS-02

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.83	0.0010	44

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-02	005Yr-024Hr	8.00	2.01	-0.0148	26.67	29.82	100
NZA-CS-02	010Yr-024Hr	8.00	2.02	0.0170	33.01	33.07	100
NZA-CS-02	025Yr-072Hr	8.00	2.22	0.0170	35.36	35.43	100
NZA-CS-02	100Yr-072Hr	8.00	2.35	0.0170	37.63	37.70	100

Node: NZA-CS-03

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.13	0.0010	44

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-03	005Yr-024Hr	8.00	3.90	0.0009	31.17	31.17	100
NZA-CS-03	010Yr-024Hr	8.00	4.38	0.0009	35.80	35.80	100
NZA-CS-03	025Yr-072Hr	8.00	4.51	-0.0010	36.90	36.90	100
NZA-CS-03	100Yr-072Hr	8.00	4.79	0.0009	39.23	39.23	100

Node: NZA-CS-04

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.00	0.0010	44

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-04	005Yr-024Hr	8.00	2.70	-0.0007	8.20	8.20	100
NZA-CS-04	010Yr-024Hr	8.00	2.90	-0.0007	9.14	9.14	100
NZA-CS-04	025Yr-072Hr	8.00	2.98	-0.0008	9.42	9.42	100

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-04	100Yr-072Hr	8.00	3.14	-0.0007	9.94	9.94	100

Node: NZA-CS-05

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.50	0.0010	44

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-05	005Yr-024Hr	8.00	4.46	-0.0013	15.25	15.21	100
NZA-CS-05	010Yr-024Hr	8.00	4.63	-0.0014	15.49	15.42	100
NZA-CS-05	025Yr-072Hr	8.00	4.85	-0.0015	15.68	15.59	100
NZA-CS-05	100Yr-072Hr	8.00	5.13	-0.0014	14.99	14.96	100

Node: NZA-CS-TOWN

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.15	0.0010	44

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-TOWN	005Yr-024Hr	8.00	3.05	0.0010	13.26	13.26	343
NZA-CS-TOWN	010Yr-024Hr	8.00	3.27	0.0010	17.50	17.50	344
NZA-CS-TOWN	025Yr-072Hr	8.00	3.38	0.0010	19.99	19.99	344
NZA-CS-TOWN	100Yr-072Hr	8.00	3.57	0.0010	24.30	24.30	344

Node: NZA-D1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.56 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.06	0.0001	4
3.56	0.4400	19166
7.50	1.1600	50530

Comment: AS-BUILT STRUCTURE EX-271

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D1	005Yr-024Hr	3.56	4.51	-0.0018	30.73	27.68	26765
NZA-D1	010Yr-024Hr	3.56	4.68	-0.0021	43.77	34.95	28074
NZA-D1	025Yr-072Hr	3.56	4.90	-0.0020	49.77	40.64	29822
NZA-D1	100Yr-072Hr	3.56	5.18	-0.0020	48.08	43.39	32114

Node: NZA-D2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft

Warning Stage: 3.62 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.12	0.0001	4
3.62	0.4900	21344
7.50	1.4700	64033

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D2	005Yr-024Hr	3.62	4.64	0.0010	33.10	30.63	32546
NZA-D2	010Yr-024Hr	3.62	4.93	0.0010	46.12	40.34	35785
NZA-D2	025Yr-072Hr	3.62	5.18	0.0010	54.50	45.24	38562
NZA-D2	100Yr-072Hr	3.62	5.53	0.0010	59.74	59.81	42426

Node: NZA-D3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.98 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.48	0.0001	4
3.98	0.4700	20473
7.50	1.5100	65776

Comment: AS-BUILT STRUCTURE EX-263

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D3	005Yr-024Hr	3.98	4.83	-0.0017	27.83	26.51	31391
NZA-D3	010Yr-024Hr	3.98	5.21	-0.0015	39.63	32.09	36300
NZA-D3	025Yr-072Hr	3.98	5.56	-0.0015	45.97	37.31	40776
NZA-D3	100Yr-072Hr	3.98	6.03	-0.0009	47.70	43.58	46858

Node: NZA-D4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.16 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.66	0.0001	4
4.16	0.9400	40946
7.50	2.5700	111949

Comment: AS-BUILT STRUCTURE EX-258

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D4	005Yr-024Hr	4.16	5.05	0.0004	25.90	23.64	59857
NZA-D4	010Yr-024Hr	4.16	5.46	0.0001	41.56	28.98	68616
NZA-D4	025Yr-072Hr	4.16	5.89	-0.0001	50.65	32.58	77823
NZA-D4	100Yr-072Hr	4.16	6.47	0.0001	58.91	37.78	90101

Node: NZA-D5

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.46 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.96	0.0001	4
4.46	0.9400	40946
7.50	1.5200	66211

Comment: AS-BUILT STRUCTURE EX-253

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D5	005Yr-024Hr	4.46	5.16	0.0002	20.27	18.39	46751
NZA-D5	010Yr-024Hr	4.46	5.61	0.0002	36.20	23.66	50496
NZA-D5	025Yr-072Hr	4.46	6.09	0.0002	49.35	26.40	54505
NZA-D5	100Yr-072Hr	4.46	6.73	0.0002	49.95	28.02	59788

Node: NZA-D6

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.48 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.98	0.0001	4
4.48	1.0400	45302
7.50	1.9600	85378

Comment: AS-BUILT STRUCTURE EX-249

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D6	005Yr-024Hr	4.48	5.26	0.0002	18.95	11.91	55664
NZA-D6	010Yr-024Hr	4.48	5.66	0.0002	25.89	17.21	61021
NZA-D6	025Yr-072Hr	4.48	6.16	0.0002	33.93	19.49	67659
NZA-D6	100Yr-072Hr	4.48	6.82	0.0002	43.14	19.07	76356

Node: NZA-D7

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.90 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.40	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
3.90	0.5900	25700
6.24	1.9200	83635

Comment: AS-BUILT STRUCTURE EX-HG92

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D7	005Yr-024Hr	3.90	5.27	0.0001	17.11	4.58	59548
NZA-D7	010Yr-024Hr	3.90	5.67	0.0002	19.59	8.06	69575
NZA-D7	025Yr-072Hr	3.90	6.17	0.0001	21.63	9.00	82019
NZA-D7	100Yr-072Hr	3.90	6.83	0.0001	32.74	9.47	83638

Node: NZA-DS1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.20	0.0080	348

Comment: DISCHARGE STRUCTURE

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-DS1	005Yr-024Hr	8.00	1.60	0.0001	0.06	0.00	100
NZA-DS1	010Yr-024Hr	8.00	1.60	-0.0001	0.94	1.06	100
NZA-DS1	025Yr-072Hr	8.00	1.60	0.0002	3.56	3.76	100
NZA-DS1	100Yr-072Hr	8.00	1.60	0.0002	7.02	7.15	100

Node: NZA-DS2

Scenario: Ex. Conditions
Type: Stage/Area

Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.86	0.0080	348

Comment: DISCHARGE STRUCTURE

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-DS2	005Yr-024Hr	8.00	1.60	0.0000	0.03	0.00	100
NZA-DS2	010Yr-024Hr	8.00	1.60	0.0001	0.06	0.01	100
NZA-DS2	025Yr-072Hr	8.00	1.60	-0.0001	2.36	2.51	100
NZA-DS2	100Yr-072Hr	8.00	1.60	0.0002	4.63	4.73	100

Node: NZA-DS3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.90	0.0080	348

Comment: DISCHARGE STRUCTURE

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-DS3	005Yr-024Hr	8.00	1.62	-0.0019	31.17	31.20	100
NZA-DS3	010Yr-024Hr	8.00	1.62	-0.0020	35.80	35.82	100
NZA-DS3	025Yr-072Hr	8.00	1.62	-0.0020	36.90	36.92	100
NZA-DS3	100Yr-072Hr	8.00	1.63	-0.0019	39.23	39.25	100

Node: NZA-E1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.18 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.68	0.0001	4
4.18	0.5100	22216
7.50	1.8400	80150

Comment: AS-BUILT STRUCTURE BA91

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E1	005Yr-024Hr	4.18	3.33	-0.0007	44.22	44.22	100
NZA-E1	010Yr-024Hr	4.18	4.25	-0.0007	59.60	58.68	23425
NZA-E1	025Yr-072Hr	4.18	4.74	-0.0007	73.96	68.43	31946
NZA-E1	100Yr-072Hr	4.18	5.02	-0.0007	90.92	90.82	36854

Node: NZA-E2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.24 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.74	0.0001	4
4.24	0.4500	19602
7.50	1.4400	62726

Comment: AS-BUILT STRUCTURE EX-180

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E2	005Yr-024Hr	4.24	4.51	-0.0009	27.66	27.36	23226
NZA-E2	010Yr-024Hr	4.24	4.73	-0.0011	36.50	34.83	26128
NZA-E2	025Yr-072Hr	4.24	4.99	-0.0014	42.94	41.39	29539
NZA-E2	100Yr-072Hr	4.24	5.34	-0.0010	51.08	44.78	34197

Node: NZA-E3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.65 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.15	0.0001	4
4.65	0.4600	20038
7.50	1.4500	63162

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E3	005Yr-024Hr	4.65	4.63	0.0008	26.53	25.59	19445
NZA-E3	010Yr-024Hr	4.65	4.93	0.0008	38.48	34.66	24292
NZA-E3	025Yr-072Hr	4.65	5.19	0.0008	42.87	35.21	28170
NZA-E3	100Yr-072Hr	4.65	5.56	0.0008	47.18	42.03	33817

Node: NZA-E4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.46 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.96	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.46	0.4600	20038
8.00	1.4900	64904

Comment: AS-BUILT STRUCTURE EX-191

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E4	005Yr-024Hr	4.46	4.82	-0.0042	22.51	22.27	24601
NZA-E4	010Yr-024Hr	4.46	5.10	-0.0049	32.15	29.32	28179
NZA-E4	025Yr-072Hr	4.46	5.40	-0.0044	35.99	28.88	31905
NZA-E4	100Yr-072Hr	4.46	5.87	-0.0044	39.21	35.55	37882

Node: NZA-E5

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.59 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.09	0.0001	4
4.59	0.4600	20038
7.50	1.5100	65776

Comment: AS-BUILT STRUCTURE DI91

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E5	005Yr-024Hr	4.59	4.83	0.0043	18.63	18.58	23895
NZA-E5	010Yr-024Hr	4.59	5.11	0.0051	25.87	23.22	28238
NZA-E5	025Yr-072Hr	4.59	5.41	0.0045	28.79	25.72	32929
NZA-E5	100Yr-072Hr	4.59	5.89	0.0045	31.51	29.83	40435

Node: NZA-E6

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.22 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.72	0.0001	4
4.22	0.4700	20473
7.50	1.4700	64033

Comment: AS-BUILT STRUCTURE EX-CA91

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E6	005Yr-024Hr	4.22	4.86	-0.0018	14.96	15.02	28999
NZA-E6	010Yr-024Hr	4.22	5.17	-0.0017	20.20	19.84	33043
NZA-E6	025Yr-072Hr	4.22	5.48	-0.0014	22.52	20.82	37151
NZA-E6	100Yr-072Hr	4.22	5.98	-0.0012	25.61	24.91	43810

Node: NZA-E7

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.06 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.56	0.0001	4
4.06	0.4500	19602
7.50	1.3500	58806

Comment: AS-BUILT STRUCTURE EX-215

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E7	005Yr-024Hr	4.06	4.90	-0.0023	15.58	11.92	29161
NZA-E7	010Yr-024Hr	4.06	5.21	-0.0023	21.57	15.47	32757
NZA-E7	025Yr-072Hr	4.06	5.53	-0.0018	20.25	16.81	36383
NZA-E7	100Yr-072Hr	4.06	6.05	-0.0013	19.89	20.12	42314

Node: NZA-E8

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.4500	19602
5.94	1.3300	57935

Comment: AS-BUILT STRUCTURE EX-AB91

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E8	005Yr-024Hr	4.00	4.92	-0.0014	18.86	9.84	37795
NZA-E8	010Yr-024Hr	4.00	5.24	-0.0012	25.52	11.63	44157
NZA-E8	025Yr-072Hr	4.00	5.57	-0.0002	18.09	12.96	50544
NZA-E8	100Yr-072Hr	4.00	6.10	0.0002	19.45	15.59	57938

Node: NZA-F1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 2.91 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
2.41	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
2.91	0.4700	20473
7.50	1.3100	57064

Comment: AS-BUILT STRUCTURE EX-114

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F1	005Yr-024Hr	2.91	3.45	0.0007	9.43	6.05	24811
NZA-F1	010Yr-024Hr	2.91	4.32	0.0007	12.83	7.17	31709
NZA-F1	025Yr-072Hr	2.91	4.74	0.0007	19.33	14.39	35066
NZA-F1	100Yr-072Hr	2.91	5.18	0.0007	39.76	23.06	38559

Node: NZA-F2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.08 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.58	0.0001	4
4.08	0.3100	13504
7.50	0.9800	42689

Comment: AS-BUILT STRUCTURE EX-119

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F2	005Yr-024Hr	4.08	4.18	-0.0011	8.70	8.37	14348
NZA-F2	010Yr-024Hr	4.08	4.34	-0.0008	15.99	15.88	15730
NZA-F2	025Yr-072Hr	4.08	4.77	-0.0007	26.74	24.80	19405
NZA-F2	100Yr-072Hr	4.08	5.25	0.0005	39.44	35.44	23538

Node: NZA-F3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.96 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.46	0.0001	4
3.96	0.4200	18295
7.50	1.4100	61420

Comment: EX.AS-BUILT STRUCTURE 123

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F3	005Yr-024Hr	3.96	4.40	-0.0015	7.76	5.06	23665
NZA-F3	010Yr-024Hr	3.96	4.57	-0.0016	13.13	12.95	25762
NZA-F3	025Yr-072Hr	3.96	4.89	-0.0014	22.51	21.78	29606
NZA-F3	100Yr-072Hr	3.96	5.48	-0.0013	39.57	28.05	36787

Node: NZA-F4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.61 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.11	0.0001	4
3.61	0.4500	19602
7.50	1.4500	63162

Comment: EX.AS-BUILT STRUCTURE 126

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F4	005Yr-024Hr	3.61	4.86	0.0001	9.13	2.69	33578
NZA-F4	010Yr-024Hr	3.61	5.04	0.0001	12.29	9.00	35615
NZA-F4	025Yr-072Hr	3.61	5.17	0.0001	18.48	18.22	37066
NZA-F4	100Yr-072Hr	3.61	5.61	0.0001	35.91	29.89	42035

Node: NZA-F5

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.88 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.38	0.0001	4
3.88	0.4500	19602
7.50	1.4100	61420

Comment: EX.AS-BUILT STRUCTURE 131

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F5	005Yr-024Hr	3.88	4.90	0.0001	8.27	2.62	31359
NZA-F5	010Yr-024Hr	3.88	5.19	0.0001	13.48	4.53	34731
NZA-F5	025Yr-072Hr	3.88	5.35	0.0001	14.27	11.81	36597
NZA-F5	100Yr-072Hr	3.88	5.72	0.0001	26.27	22.78	40898

Node: NZA-F6

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.65 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.15	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
3.65	0.4500	19602
7.50	1.4100	61420

Comment: EX.AS-BUILT STRUCTURE 135

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F6	005Yr-024Hr	3.65	4.89	0.0001	9.07	5.11	33033
NZA-F6	010Yr-024Hr	3.65	5.19	0.0001	17.89	7.43	36335
NZA-F6	025Yr-072Hr	3.65	5.36	-0.0002	15.99	7.87	38193
NZA-F6	100Yr-072Hr	3.65	5.76	0.0001	22.80	14.45	42518

Node: NZA-F7

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.29 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.79	0.0001	4
4.29	0.4400	19166
7.50	1.4700	64033

Comment: EX.AS-BUILT STRUCTURE 141

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F7	005Yr-024Hr	4.29	4.88	-0.0003	7.97	7.86	27426
NZA-F7	010Yr-024Hr	4.29	5.18	-0.0002	14.60	11.90	31663
NZA-F7	025Yr-072Hr	4.29	5.36	0.0002	15.28	12.45	34159
NZA-F7	100Yr-072Hr	4.29	5.77	0.0001	27.59	16.27	39807

Node: NZA-F8

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.44 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.94	0.0001	4
4.44	0.4400	19166
7.50	1.4600	63598

Comment: EX.AS-BUILT STRUCTURE 142

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F8	005Yr-024Hr	4.44	4.87	0.0001	12.64	12.81	25360
NZA-F8	010Yr-024Hr	4.44	5.16	0.0001	18.08	16.77	29613
NZA-F8	025Yr-072Hr	4.44	5.35	0.0001	21.36	17.52	32435
NZA-F8	100Yr-072Hr	4.44	5.76	0.0001	34.67	18.10	38403

Node: NZA-F9

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.27 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.77	0.0001	4
4.27	0.3600	15682
6.52	1.1200	48787

Comment: EX.AS-BUILT STRUCTURE 148

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F9	005Yr-024Hr	4.27	4.87	-0.0018	5.91	2.70	24512
NZA-F9	010Yr-024Hr	4.27	5.16	-0.0018	11.21	6.27	28786
NZA-F9	025Yr-072Hr	4.27	5.36	-0.0016	16.51	7.12	31717
NZA-F9	100Yr-072Hr	4.27	5.77	-0.0015	19.32	7.35	37778

Node: NZA-G1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.81 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.31	0.0001	4
3.81	0.3100	13504
7.50	0.9800	42689

Comment: AS-BUILT STRUCTURE EX-166

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G1	005Yr-024Hr	3.81	3.43	-0.0009	4.65	4.74	3273
NZA-G1	010Yr-024Hr	3.81	4.29	-0.0009	5.99	6.24	17338
NZA-G1	025Yr-072Hr	3.81	4.73	-0.0009	13.33	12.13	20826
NZA-G1	100Yr-072Hr	3.81	5.18	-0.0009	22.35	12.81	24350

Node: NZA-G2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.6800	29621
7.50	2.2400	97574

Comment: EX.AS-BUILT STRUCTURE 108

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G2	005Yr-024Hr	4.00	3.09	-0.0043	28.31	29.30	100
NZA-G2	010Yr-024Hr	4.00	3.92	-0.0043	39.22	38.13	24755
NZA-G2	025Yr-072Hr	4.00	4.72	-0.0076	57.63	54.62	43650
NZA-G2	100Yr-072Hr	4.00	5.18	-0.0071	74.06	59.47	52527

Node: NZA-G3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.20 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.70	0.0001	4
4.20	0.4000	17424
7.50	1.2500	54450

Comment: EX.AS-BUILT STRUCTURE 105

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G3	005Yr-024Hr	4.20	3.95	-0.0028	15.92	15.34	8581
NZA-G3	010Yr-024Hr	4.20	4.40	-0.0028	19.99	19.64	19682
NZA-G3	025Yr-072Hr	4.20	4.89	-0.0036	31.00	28.53	25164
NZA-G3	100Yr-072Hr	4.20	5.43	-0.0044	49.44	36.50	31237

Node: NZA-G4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.80 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.30	0.0001	4
4.80	0.3800	16553
7.50	0.9600	41818

Comment: EX.AS-BUILT STRUCTURE 101

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G4	005Yr-024Hr	4.80	4.33	-0.0008	10.14	10.20	854
NZA-G4	010Yr-024Hr	4.80	4.91	-0.0010	15.44	15.30	17585
NZA-G4	025Yr-072Hr	4.80	5.15	-0.0012	25.50	24.83	19843
NZA-G4	100Yr-072Hr	4.80	5.60	-0.0013	38.70	36.06	24070

Node: NZA-G5

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.46 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.96	0.0001	4
4.46	0.3900	16988
7.50	1.1100	48352

Comment: EX.AS-BUILT STRUCTURE 95

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G5	005Yr-024Hr	4.46	4.84	-0.0041	9.11	7.84	20915
NZA-G5	010Yr-024Hr	4.46	5.10	-0.0041	12.64	11.11	23577
NZA-G5	025Yr-072Hr	4.46	5.24	-0.0043	17.85	17.60	25030
NZA-G5	100Yr-072Hr	4.46	5.68	-0.0040	26.42	22.40	29611

Node: NZA-G6

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.42 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.92	0.0001	4
4.42	0.3600	15682
7.50	1.1400	49658

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G6	005Yr-024Hr	4.42	4.84	-0.0007	7.56	5.19	20359
NZA-G6	010Yr-024Hr	4.42	5.12	-0.0008	11.15	7.42	23366
NZA-G6	025Yr-072Hr	4.42	5.29	-0.0008	12.97	12.79	25312
NZA-G6	100Yr-072Hr	4.42	5.73	-0.0006	19.43	14.11	30096

Node: NZA-G7

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.19 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.69	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.19	0.4600	20038
7.50	1.5200	66211

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G7	005Yr-024Hr	4.19	4.85	0.0003	8.50	7.97	29183
NZA-G7	010Yr-024Hr	4.19	5.12	0.0003	14.26	10.85	33025
NZA-G7	025Yr-072Hr	4.19	5.31	0.0002	16.24	11.92	35715
NZA-G7	100Yr-072Hr	4.19	5.74	0.0002	23.50	11.13	41643

Node: NZA-G8

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.18 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.68	0.0001	4
4.18	0.3300	14375
7.50	0.9800	42689

Comment: EX.AS-BUILT STRUCTURE 80

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G8	005Yr-024Hr	4.18	4.84	0.0001	22.27	17.58	20073
NZA-G8	010Yr-024Hr	4.18	5.12	0.0001	27.39	25.03	22428
NZA-G8	025Yr-072Hr	4.18	5.32	0.0001	32.30	29.95	24114
NZA-G8	100Yr-072Hr	4.18	5.74	0.0001	40.35	32.26	27694

Node: NZA-G9

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.84 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.34	0.0001	4
4.84	0.4100	17860
7.00	1.3500	58806

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G9	005Yr-024Hr	4.84	4.85	-0.0002	8.38	7.03	17972
NZA-G9	010Yr-024Hr	4.84	5.12	0.0002	12.88	10.82	23196
NZA-G9	025Yr-072Hr	4.84	5.32	0.0002	16.80	13.10	27025
NZA-G9	100Yr-072Hr	4.84	5.75	-0.0001	19.90	13.31	35030

Node: NZA-I1

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.72 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.22	0.0001	4
3.72	0.2300	10019
7.50	2.0000	87120

Comment: As-built Structure EX-2011

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I1	005Yr-024Hr	3.72	2.74	-0.0013	14.38	14.33	100
NZA-I1	010Yr-024Hr	3.72	3.22	-0.0013	22.08	22.08	100
NZA-I1	025Yr-072Hr	3.72	4.66	-0.0087	35.02	28.92	29244
NZA-I1	100Yr-072Hr	3.72	5.13	-0.0098	46.77	33.51	38688

Node: NZA-I2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.95 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.40	0.0001	4
3.95	0.2900	12632
7.50	0.9600	41818

Comment: As-built Structure EX-2013

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I2	005Yr-024Hr	3.95	4.28	-0.0012	9.96	9.68	15378
NZA-I2	010Yr-024Hr	3.95	4.41	-0.0012	16.18	15.77	16381
NZA-I2	025Yr-072Hr	3.95	4.70	-0.0011	20.89	20.41	18824
NZA-I2	100Yr-072Hr	3.95	5.23	-0.0009	29.58	29.16	23194

Node: NZA-I3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.49 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.99	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.49	0.3300	14375
7.50	1.0900	47480

Comment: As-built Structure EX-2071

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I3	005Yr-024Hr	4.49	4.78	-0.0006	6.97	6.77	17562
NZA-I3	010Yr-024Hr	4.49	4.87	-0.0006	11.39	11.01	18529
NZA-I3	025Yr-072Hr	4.49	4.93	-0.0005	14.67	14.19	19172
NZA-I3	100Yr-072Hr	4.49	5.31	-0.0004	23.04	21.73	23386

Node: NZA-I4

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.43 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.93	0.0001	4
4.43	0.3000	13068
7.50	1.0800	47045

Comment: As-built Structure EX-2021

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I4	005Yr-024Hr	4.43	4.78	-0.0009	5.11	3.50	16982
NZA-I4	010Yr-024Hr	4.43	4.87	-0.0008	6.99	5.59	17960
NZA-I4	025Yr-072Hr	4.43	4.93	-0.0007	8.55	7.83	18611
NZA-I4	100Yr-072Hr	4.43	5.34	-0.0006	17.21	14.88	23154

Node: NZA-I5

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.41 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.91	0.0001	4
4.41	0.3300	14375
7.50	1.3300	57935

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I5	005Yr-024Hr	4.41	4.79	0.0006	6.57	3.71	19705
NZA-I5	010Yr-024Hr	4.41	4.87	0.0006	8.61	6.22	20904
NZA-I5	025Yr-072Hr	4.41	5.00	0.0006	10.47	8.41	22729
NZA-I5	100Yr-072Hr	4.41	5.34	0.0006	14.02	12.54	27546

Node: NZA-I6

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.24 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.74	0.0001	4
4.24	1.0300	44867
7.50	2.2800	99317

Comment: EX.AS-BUILT STRUCTURE 2025

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I6	005Yr-024Hr	4.24	4.25	-0.0014	33.14	31.17	45070
NZA-I6	010Yr-024Hr	4.24	4.85	-0.0014	46.72	35.80	55060
NZA-I6	025Yr-072Hr	4.24	5.00	0.0015	56.72	37.18	57633
NZA-I6	100Yr-072Hr	4.24	5.35	0.0014	69.90	42.26	63376

Node: NZA-I7

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.56 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.06	0.0001	4
3.56	0.4700	20473
7.50	1.4300	62291

Comment: EX.AS-BUILT STRUCTURE 36

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I7	005Yr-024Hr	3.56	4.62	-0.0009	31.97	28.19	31761
NZA-I7	010Yr-024Hr	3.56	5.06	0.0008	44.13	37.09	36394
NZA-I7	025Yr-072Hr	3.56	5.24	0.0010	54.87	42.97	38387
NZA-I7	100Yr-072Hr	3.56	5.65	0.0010	69.35	47.38	42665

Node: NZA-I8

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.51 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.01	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.51	0.4200	18295
6.38	1.3600	59242

Comment: EX.AS-BUILT STRUCTURE 42

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I8	005Yr-024Hr	4.51	4.78	-0.0004	11.00	9.00	24198
NZA-I8	010Yr-024Hr	4.51	5.06	-0.0005	15.61	13.96	30338
NZA-I8	025Yr-072Hr	4.51	5.26	-0.0004	20.39	17.28	34622
NZA-I8	100Yr-072Hr	4.51	5.66	-0.0002	28.64	20.53	43492

Node: NZA-PS0

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.50	0.0050	218

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS0	005Yr-024Hr	8.00	4.08	-0.0142	15.21	14.20	218
NZA-PS0	010Yr-024Hr	8.00	4.24	-0.0142	15.42	14.20	218
NZA-PS0	025Yr-072Hr	8.00	4.46	-0.0142	15.59	14.20	218
NZA-PS0	100Yr-072Hr	8.00	4.75	-0.0142	14.96	14.20	218

Node: NZA-PS1

Scenario: Ex. Conditions
Type: Stage/Area

Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.00	0.0050	218

Comment: PUMP STATION

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS1	005Yr-024Hr	8.00	2.00	0.0243	38.52	39.60	100
NZA-PS1	010Yr-024Hr	8.00	2.09	0.0247	39.68	39.60	100
NZA-PS1	025Yr-072Hr	8.00	2.26	0.0245	39.70	39.60	100
NZA-PS1	100Yr-072Hr	8.00	2.43	0.0246	39.72	39.60	104

Node: NZA-PS2

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
2.50	0.0050	218

Comment: PUMP STATION

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS2	005Yr-024Hr	8.00	2.00	0.0162	29.82	33.00	122
NZA-PS2	010Yr-024Hr	8.00	2.00	0.0203	33.07	33.00	122
NZA-PS2	025Yr-072Hr	8.00	2.20	0.0195	33.09	33.00	160
NZA-PS2	100Yr-072Hr	8.00	2.33	0.0195	33.10	33.00	185

Node: NZA-PS3

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
2.50	0.0050	218

Comment: PUMP STATION

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS3	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	100
NZA-PS3	010Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	100
NZA-PS3	025Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	100
NZA-PS3	100Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	100

Node: NZA-S-106

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0070	305
4.49	0.0070	305

Comment: FDOT PUMP STATION

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S-106	005Yr-024Hr	8.00	2.00	-0.0117	21.20	42.88	768
NZA-S-106	010Yr-024Hr	8.00	2.00	-0.0117	24.99	46.10	768
NZA-S-106	025Yr-072Hr	8.00	2.00	-0.0118	28.20	47.66	768

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S-106	100Yr-072Hr	8.00	2.00	-0.0118	33.92	51.62	768

Node: NZA-S-77

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0040	174
10.17	0.0040	174

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S-77	005Yr-024Hr	8.00	2.00	0.0001	0.26	0.28	1692
NZA-S-77	010Yr-024Hr	8.00	3.38	0.0002	3.14	1.01	1918
NZA-S-77	025Yr-072Hr	8.00	3.99	0.0003	4.84	1.65	1881
NZA-S-77	100Yr-072Hr	8.00	4.60	0.0004	6.62	3.13	1967

Node: NZA-S-82

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0070	305
0.00	0.0070	305

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S-82	005Yr-024Hr	8.00	2.00	-0.0030	39.47	43.14	1779
NZA-S-82	010Yr-024Hr	8.00	3.38	-0.0030	47.93	46.02	1887
NZA-S-82	025Yr-072Hr	8.00	3.99	-0.0030	50.67	47.72	1887
NZA-S-82	100Yr-072Hr	8.00	4.60	-0.0030	53.74	49.50	1892

Node: NZA-S101

Scenario: Ex. Conditions
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0040	174
10.17	0.0040	174

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S101	005Yr-024Hr	8.00	2.00	-0.0081	4.11	14.73	181
NZA-S101	010Yr-024Hr	8.00	2.00	-0.0081	5.42	14.74	181
NZA-S101	025Yr-072Hr	8.00	2.00	-0.0082	7.10	14.76	181
NZA-S101	100Yr-072Hr	8.00	2.00	-0.0082	10.14	14.76	181

Node: OUTFALL (88th)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.20 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.20
0	0	0	99999.0000	1.20

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (88th)	005Yr-024Hr	8.00	1.20	0.0000	14.32	0.00	0
OUTFALL (88th)	010Yr-024Hr	8.00	1.20	0.0000	22.08	0.00	0
OUTFALL (88th)	025Yr-072Hr	8.00	1.20	0.0000	28.92	0.00	0
OUTFALL (88th)	100Yr-072Hr	8.00	1.20	0.0000	33.51	0.00	0

Node: OUTFALL (89th)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (89th)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
OUTFALL (89th)	010Yr-024Hr	8.00	1.60	0.0000	0.01	0.00	0
OUTFALL (89th)	025Yr-072Hr	8.00	1.60	0.0000	2.51	0.00	0
OUTFALL (89th)	100Yr-072Hr	8.00	1.60	0.0000	9.37	0.00	0

Node: OUTFALL (91st) - A

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (91st) - A	005Yr-024Hr	8.00	1.60	0.0000	24.71	0.00	0
OUTFALL (91st) - A	010Yr-024Hr	8.00	1.60	0.0000	34.55	0.00	0
OUTFALL (91st) - A	025Yr-072Hr	8.00	1.60	0.0000	38.42	0.00	0
OUTFALL (91st) - A	100Yr-072Hr	8.00	1.60	0.0000	51.33	0.00	0

Node: OUTFALL (91st) - B

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (91st) - B	005Yr-024Hr	8.00	1.60	0.0000	19.51	0.00	0
OUTFALL (91st) - B	010Yr-024Hr	8.00	1.60	0.0000	24.13	0.00	0
OUTFALL (91st) - B	025Yr-072Hr	8.00	1.60	0.0000	27.08	0.00	0
OUTFALL (91st) - B	100Yr-072Hr	8.00	1.60	0.0000	39.49	0.00	0

Node: OUTFALL (92nd)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (92nd)	005Yr-024Hr	8.00	1.60	0.0000	14.20	0.00	0
OUTFALL (92nd)	010Yr-024Hr	8.00	1.60	0.0000	14.20	0.00	0
OUTFALL (92nd)	025Yr-072Hr	8.00	1.60	0.0000	14.20	0.00	0
OUTFALL (92nd)	100Yr-072Hr	8.00	1.60	0.0000	19.09	0.00	0

Node: OUTFALL (94th)

Scenario: Ex. Conditions
Type: Time/Stage

Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (94th)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
OUTFALL (94th)	010Yr-024Hr	8.00	1.60	0.0000	1.06	0.00	0
OUTFALL (94th)	025Yr-072Hr	8.00	1.60	0.0000	11.99	0.00	0
OUTFALL (94th)	100Yr-072Hr	8.00	1.60	0.0000	41.61	0.00	0

Node: OUTFALL (95th)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (95th)	005Yr-024Hr	8.00	1.60	0.0000	8.20	0.00	0
OUTFALL (95th)	010Yr-024Hr	8.00	1.60	0.0000	23.37	0.00	0
OUTFALL (95th)	025Yr-072Hr	8.00	1.60	0.0000	34.71	0.00	0
OUTFALL (95th)	100Yr-072Hr	8.00	1.60	0.0000	51.09	0.00	0

Node: OUTFALL (96th)

Scenario: Ex. Conditions
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (96th)	005Yr-024Hr	8.00	1.60	0.0000	13.26	0.00	0
OUTFALL (96th)	010Yr-024Hr	8.00	1.60	0.0000	17.50	0.00	0
OUTFALL (96th)	025Yr-072Hr	8.00	1.60	0.0000	19.99	0.00	0
OUTFALL (96th)	100Yr-072Hr	8.00	1.60	0.0000	24.30	0.00	0

Node: OUTFALL (CARLYLE)

Scenario: Ex. Conditions
Type: Time/Stage

Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [Ex. Conditions]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (CARLYLE)	005Yr-024Hr	8.00	1.60	0.0000	31.20	0.00	0
OUTFALL (CARLYLE)	010Yr-024Hr	8.00	1.60	0.0000	35.82	0.00	0
OUTFALL (CARLYLE)	025Yr-072Hr	8.00	1.60	0.0000	36.92	0.00	0
OUTFALL (CARLYLE)	100Yr-072Hr	8.00	1.60	0.0000	39.25	0.00	0

Drop Structure Link: CS-01		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-1.83 ft	Invert:	-1.20 ft
From Node:	NZA-CS-01	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-DS1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	175.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip
Weir:	1	

Weir Count:	1
Weir Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	2.00 ft
Control Elevation:	2.00 ft
Max Depth:	0.75 ft
Max Width:	7.00 ft
Fillet:	0.00 ft

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-01 - Pipe	005Yr-024Hr	0.06	0.00	0.05	0.00	0.00	0.00
CS-01 - Weir: 1	005Yr-024Hr	0.06	0.00	0.05	0.00	0.00	0.00
CS-01 - Pipe	010Yr-024Hr	0.94	0.00	0.06	0.00	0.00	0.00
CS-01 - Weir: 1	010Yr-024Hr	0.94	0.00	0.05	1.11	1.11	1.11
CS-01 - Pipe	025Yr-072Hr	3.56	0.00	0.05	0.00	0.00	0.00
CS-01 - Weir: 1	025Yr-072Hr	3.56	0.00	0.05	1.73	1.73	1.73
CS-01 - Pipe	100Yr-072Hr	7.02	0.00	0.04	0.00	0.00	0.00
CS-01 - Weir: 1	100Yr-072Hr	7.02	0.00	0.04	2.17	2.17	2.17

Drop Structure Link: CS-02

Scenario:	Ex. Conditions
From Node:	NZA-CS-02
To Node:	NZA-DS2
Link Count:	1
Flow Direction:	Both
Solution:	Combine
Increments:	0
Pipe Count:	1
Damping:	0.0000 ft
Length:	80.00 ft

Upstream Pipe

Invert:	-2.30 ft
Manning's N:	0.0110

Geometry: Circular

Max Depth:	2.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

Downstream Pipe

Invert:	-1.20 ft
Manning's N:	0.0110

Geometry: Circular

Max Depth:	2.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	2.00 ft
Control Elevation:	2.00 ft
Max Depth:	0.75 ft
Max Width:	7.00 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-02 - Pipe	005Yr-024Hr	0.03	0.00	0.03	0.00	0.00	0.00
CS-02 - Weir: 1	005Yr-024Hr	0.03	0.00	0.03	0.00	0.00	0.00
CS-02 - Pipe	010Yr-024Hr	0.06	0.00	0.04	0.00	0.00	0.00
CS-02 - Weir: 1	010Yr-024Hr	0.06	0.00	0.04	0.00	0.00	0.00
CS-02 - Pipe	025Yr-072Hr	2.36	0.00	0.04	0.00	0.00	0.00
CS-02 - Weir: 1	025Yr-072Hr	2.36	0.00	0.04	1.51	1.51	1.51
CS-02 - Pipe	100Yr-072Hr	4.63	0.00	0.04	0.00	0.00	0.00
CS-02 - Weir: 1	100Yr-072Hr	4.63	0.00	0.04	1.89	1.89	1.89

Drop Structure Link: CS-03		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-4.50 ft	Invert:	-4.70 ft

From Node:	NZA-CS-03	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-DS3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	60.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Positive	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	2.00 ft	Op Table:	
Control Elevation:	2.00 ft	Ref Node:	
Max Depth:	0.75 ft	Discharge Coefficients	
Max Width:	7.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-03 - Pipe	005Yr-024Hr	31.17	0.00	0.02	0.00	0.00	0.00
CS-03 - Weir: 1	005Yr-024Hr	31.17	0.00	-0.03	5.94	5.94	5.94
CS-03 - Pipe	010Yr-024Hr	35.80	0.00	-0.02	0.00	0.00	0.00
CS-03 - Weir: 1	010Yr-024Hr	35.80	0.00	-0.03	6.82	6.82	6.82
CS-03 - Pipe	025Yr-072Hr	36.90	0.00	-0.02	0.00	0.00	0.00
CS-03 - Weir:	025Yr-072Hr	36.90	0.00	-0.03	7.03	7.03	7.03

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
1							
CS-03 - Pipe	100Yr-072Hr	39.23	0.00	0.02	0.00	0.00	0.00
CS-03 - Weir: 1	100Yr-072Hr	39.23	0.00	0.03	7.47	7.47	7.47

Drop Structure Link: CS-04		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-2.00 ft	Invert:	-2.00 ft
From Node:	NZA-CS-04	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	OUTFALL (95th)	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Positive	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	181.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Positive	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	2.00 ft	Ref Node:	
Control Elevation:	2.00 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	3.200
Max Width:	7.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-04 - Pipe	005Yr-024Hr	8.20	0.00	-0.01	0.00	0.00	0.00
CS-04 - Weir: 1	005Yr-024Hr	8.20	0.00	0.00	2.00	2.00	2.00
CS-04 - Pipe	010Yr-024Hr	9.14	0.00	0.02	0.00	0.00	0.00
CS-04 - Weir: 1	010Yr-024Hr	9.14	0.00	-0.04	2.00	2.00	2.00
CS-04 - Pipe	025Yr-072Hr	9.41	0.00	0.02	0.00	0.00	0.00
CS-04 - Weir: 1	025Yr-072Hr	9.42	0.00	-0.04	2.00	2.00	2.00
CS-04 - Pipe	100Yr-072Hr	9.94	0.00	0.02	0.00	0.00	0.00
CS-04 - Weir: 1	100Yr-072Hr	9.94	0.00	-0.04	2.00	2.00	2.00

Drop Structure Link: CS-05		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-2.33 ft	Invert:	1.21 ft
From Node:	NZA-CS-05	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-PS0	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	20.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Positive	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	2.10 ft	Ref Node:	
Control Elevation:	2.10 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	3.200
Max Width:	7.00 ft		

Fillet: 0.00 ft

Weir Table:
Orifice Default: 0.600
Orifice Table:

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-05 - Pipe	005Yr-024Hr	15.21	0.00	-0.02	0.00	0.00	0.00
CS-05 - Weir: 1	005Yr-024Hr	15.21	0.00	-0.02	2.90	2.90	2.90
CS-05 - Pipe	010Yr-024Hr	15.42	0.00	-0.03	0.00	0.00	0.00
CS-05 - Weir: 1	010Yr-024Hr	15.42	0.00	-0.02	2.94	2.94	2.94
CS-05 - Pipe	025Yr-072Hr	15.59	0.00	-0.03	0.00	0.00	0.00
CS-05 - Weir: 1	025Yr-072Hr	15.59	0.00	-0.02	2.97	2.97	2.97
CS-05 - Pipe	100Yr-072Hr	14.96	0.00	-0.03	0.00	0.00	0.00
CS-05 - Weir: 1	100Yr-072Hr	14.96	0.00	-0.02	2.85	2.85	2.85

Drop Structure Link: CS-06(R3)		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-1.88 ft	Invert:	-2.30 ft
From Node:	NZA-E1	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	OUTFALL (91st) - A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	153.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	2.00 ft
Control Elevation:	2.00 ft
Max Depth:	0.75 ft
Max Width:	7.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-06(R3) - Pipe	005Yr-024Hr	24.71	0.00	-0.01	0.00	0.00	0.00
CS-06(R3) - Weir: 1	005Yr-024Hr	24.71	0.00	0.00	4.71	4.71	4.71
CS-06(R3) - Pipe	010Yr-024Hr	34.55	0.00	-0.01	0.00	0.00	0.00
CS-06(R3) - Weir: 1	010Yr-024Hr	34.55	0.00	-0.01	6.58	6.58	6.58
CS-06(R3) - Pipe	025Yr-072Hr	37.60	0.00	0.01	0.00	0.00	0.00
CS-06(R3) - Weir: 1	025Yr-072Hr	37.60	0.00	-0.01	7.16	7.16	7.16
CS-06(R3) - Pipe	100Yr-072Hr	39.25	0.00	0.01	0.00	0.00	0.00
CS-06(R3) - Weir: 1	100Yr-072Hr	39.25	0.00	0.00	7.48	7.48	7.48

Drop Structure Link: CS-07		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-2.19 ft	Invert:	-2.90 ft
From Node:	NZA-E1	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	OUTFALL (91st) - B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			

Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	213.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	2.00 ft	Op Table:	
Control Elevation:	2.00 ft	Ref Node:	
Max Depth:	0.75 ft	Discharge Coefficients	
Max Width:	7.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-07 - Pipe	005Yr-024Hr	19.51	0.00	-0.01	0.00	0.00	0.00
CS-07 - Weir: 1	005Yr-024Hr	19.51	0.00	0.00	3.72	3.72	3.72
CS-07 - Pipe	010Yr-024Hr	24.13	0.00	-0.01	0.00	0.00	0.00
CS-07 - Weir: 1	010Yr-024Hr	24.13	0.00	0.00	4.60	4.60	4.60
CS-07 - Pipe	025Yr-072Hr	26.26	0.00	-0.01	0.00	0.00	0.00
CS-07 - Weir: 1	025Yr-072Hr	26.26	0.00	-0.01	5.00	5.00	5.00
CS-07 - Pipe	100Yr-072Hr	27.41	0.00	-0.01	0.00	0.00	0.00
CS-07 - Weir: 1	100Yr-072Hr	27.42	0.00	0.00	5.22	5.22	5.22

Drop Structure Link: CS-08		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-1.58 ft	Invert:	-1.58 ft
From Node:	NZA-I1	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	OUTFALL (88th)	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Flow Direction:	Both	Bottom Clip			
Solution:	Combine	Default:	0.00 ft	Default:	0.00 ft
Increments:	0	Op Table:		Op Table:	
Pipe Count:	1	Ref Node:		Ref Node:	
Damping:	0.0000 ft	Manning's N:	0.0000	Manning's N:	0.0000
Length:	15.00 ft	Top Clip			
FHWA Code:	0	Default:	0.00 ft	Default:	0.00 ft
Entr Loss Coef:	0.00	Op Table:		Op Table:	
Exit Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Positive	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	2.00 ft	Ref Node:	
Control Elevation:	2.00 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	3.200
Max Width:	7.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-08 - Pipe	005Yr-024Hr	14.32	0.00	-0.02	0.00	0.00	0.00
CS-08 - Weir: 1	005Yr-024Hr	14.33	0.00	-0.02	2.76	2.76	2.76
CS-08 - Pipe	010Yr-024Hr	22.08	0.00	-0.02	0.00	0.00	0.00
CS-08 - Weir: 1	010Yr-024Hr	22.08	0.00	-0.02	4.21	4.21	4.21

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-08 - Pipe	025Yr-072Hr	28.92	0.00	-0.11	0.00	0.00	0.00
CS-08 - Weir: 1	025Yr-072Hr	28.92	0.00	-0.11	5.51	5.51	5.51
CS-08 - Pipe	100Yr-072Hr	30.79	0.00	-0.12	0.00	0.00	0.00
CS-08 - Weir: 1	100Yr-072Hr	30.79	0.00	-0.13	5.86	5.86	5.86

Rating Curve Link: D-00

Scenario: Ex. Conditions
From Node: NZA-PS0
To Node: OUTFALL (92nd)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0004	1.70		1.60	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
D-00	005Yr-024Hr	14.20	0.00	-13.98	0.00	0.00	0.00
D-00	010Yr-024Hr	14.20	0.00	13.98	0.00	0.00	0.00
D-00	025Yr-072Hr	14.20	0.00	-13.98	0.00	0.00	0.00
D-00	100Yr-072Hr	14.20	0.00	13.98	0.00	0.00	0.00

Rating Curve Link: DW 1-3

Scenario: Ex. Conditions
From Node: NZA-PS1
To Node: AQUIFER (94th)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0001	2.00		1.60	

Comment: 500 GPM/FT

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DW 1-3	005Yr-024Hr	39.60	0.00	39.60	0.00	0.00	0.00
DW 1-3	010Yr-024Hr	39.60	0.00	39.60	0.00	0.00	0.00
DW 1-3	025Yr-072Hr	39.60	0.00	39.60	0.00	0.00	0.00
DW 1-3	100Yr-072Hr	39.60	0.00	39.60	0.00	0.00	0.00

Rating Curve Link: DW 4-6

Scenario: Ex. Conditions
From Node: NZA-PS2
To Node: AQUIFER (89th)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0002	2.00		1.60	

Comment: 500 GPM/FT

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DW 4-6	005Yr-024Hr	33.00	0.00	33.00	0.00	0.00	0.00
DW 4-6	010Yr-024Hr	33.00	0.00	33.00	0.00	0.00	0.00
DW 4-6	025Yr-072Hr	33.00	0.00	33.00	0.00	0.00	0.00
DW 4-6	100Yr-072Hr	33.00	0.00	33.00	0.00	0.00	0.00

Rating Curve Link: DW 7-9

Scenario: Ex. Conditions
From Node: NZA-PS3
To Node: AQUIFER (CARLYLE)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0003	2.00		1.60	

Comment: 500 GPM/FT

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DW 7-9	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
DW 7-9	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
DW 7-9	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
DW 7-9	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Rating Curve Link: FDOT DW- S102-S105

Scenario: Ex. Conditions
From Node: NZA-S-82
To Node: FDOT AQUIFER (94TH)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0005	2.00		1.60	

Comment: S-102, S-103, S-104, S-105

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FDOT DW-S102-S105	005Yr-024Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S102-S105	010Yr-024Hr	42.88	0.00	-42.88	0.00	0.00	0.00
FDOT DW-S102-S105	025Yr-072Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S102-S105	100Yr-072Hr	42.88	0.00	41.54	0.00	0.00	0.00

Rating Curve Link: FDOT DW- S96-S99

Scenario: Ex. Conditions
From Node: NZA-S-106
To Node: FDOT AQUIFER (CARLYLE)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0005	2.00		1.60	

Comment: S-96, S-97, S-98, S-99

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FDOT DW-S96-S99	005Yr-024Hr	42.88	0.00	-42.21	0.00	0.00	0.00
FDOT DW-S96-S99	010Yr-024Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S96-S99	025Yr-072Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S96-S99	100Yr-072Hr	42.88	0.00	-42.21	0.00	0.00	0.00

Pipe Link: P-A1-A2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.61 ft	Invert:	-1.81 ft
From Node:	NZA-A2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-A1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	276.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A1-A2	005Yr-024Hr	6.21	-0.07	-0.10	5.06	5.06	5.06
P-A1-A2	010Yr-024Hr	6.18	-0.07	-0.10	5.03	5.03	5.03
P-A1-A2	025Yr-072Hr	6.17	-0.07	-0.10	5.03	5.03	5.03
P-A1-A2	100Yr-072Hr	6.16	-0.07	-0.10	5.02	5.02	5.02

Pipe Link: P-A1-B1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-4.90 ft	Invert:	-2.00 ft
From Node:	NZA-A1	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	NZA-B1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	490.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A1-B1	005Yr-024Hr	6.79	-0.10	0.26	3.84	3.84	3.84
P-A1-B1	010Yr-024Hr	7.05	-0.08	0.26	3.99	3.99	3.99
P-A1-B1	025Yr-072Hr	6.85	-1.38	0.28	3.88	3.88	3.88
P-A1-B1	100Yr-072Hr	6.01	-1.79	0.32	3.40	3.40	3.40

Pipe Link: P-A1-CS-04		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.81 ft	Invert:	-2.00 ft
From Node:	NZA-A1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-CS-04	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	200.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A1-CS-04	005Yr-024Hr	8.20	-0.73	-0.08	4.64	4.64	4.64
P-A1-CS-04	010Yr-024Hr	9.14	-0.73	-0.08	5.17	5.17	5.17
P-A1-CS-04	025Yr-072Hr	9.42	-0.75	-0.09	5.33	5.33	5.33
P-A1-CS-04	100Yr-072Hr	9.94	-0.74	-0.08	5.63	5.63	5.63

Pipe Link: P-A2-A3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.54 ft	Invert:	-1.61 ft
From Node:	NZA-A3	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-A2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	274.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A2-A3	005Yr-024Hr	4.25	-0.18	-0.09	3.47	3.47	3.47
P-A2-A3	010Yr-024Hr	4.23	-0.18	-0.09	3.45	3.45	3.45
P-A2-A3	025Yr-072Hr	4.12	-0.18	-0.09	3.36	3.36	3.36
P-A2-A3	100Yr-072Hr	4.01	-0.18	-0.09	3.27	3.27	3.27

Pipe Link: P-A3-A4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.08 ft	Invert:	-1.54 ft
From Node:	NZA-A4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-A3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft

Length:	229.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A3-A4	005Yr-024Hr	3.01	-0.82	-0.08	2.45	2.45	2.45
P-A3-A4	010Yr-024Hr	2.91	-0.89	-0.08	2.37	2.37	2.37
P-A3-A4	025Yr-072Hr	2.75	-0.82	-0.08	2.24	2.24	2.24
P-A3-A4	100Yr-072Hr	2.52	-0.37	-0.08	2.05	2.05	2.05

Pipe Link: P-A4-FDOT1B		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-0.82 ft	Invert:	-1.08 ft
From Node:	FDOT-1B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-A4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	229.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A4-FDOT1B	005Yr-024Hr	0.82	-1.32	0.02	-2.42	-2.42	-2.42
P-A4-FDOT1B	010Yr-024Hr	0.78	-1.35	0.02	-2.47	-2.47	-2.47

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A4-FDOT1B	025Yr-072Hr	0.67	-1.39	0.02	-2.55	-2.55	-2.55
P-A4-FDOT1B	100Yr-072Hr	0.68	-1.43	0.02	-2.62	-2.62	-2.62

Pipe Link: P-AA1-AA2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-AA2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-AA1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	117.80 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA1-AA2	005Yr-024Hr	10.66	0.00	0.00	2.58	2.75	2.66
P-AA1-AA2	010Yr-024Hr	14.01	0.00	0.01	2.89	3.07	2.98
P-AA1-AA2	025Yr-072Hr	15.99	0.00	0.01	3.06	3.25	3.16
P-AA1-AA2	100Yr-072Hr	19.38	0.00	0.01	3.34	3.54	3.44

Pipe Link: P-AA2-AA3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-AA3	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-AA2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	133.29 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000

Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA2-AA3	005Yr-024Hr	8.23	0.00	-0.01	1.92	2.26	1.95
P-AA2-AA3	010Yr-024Hr	10.80	0.00	0.01	2.17	2.26	2.20
P-AA2-AA3	025Yr-072Hr	12.38	0.00	0.02	2.32	2.40	2.36
P-AA2-AA3	100Yr-072Hr	15.06	0.00	0.02	2.55	2.64	2.59

Pipe Link: P-AA3-AA4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.00 ft	Invert:	0.00 ft
From Node:	NZA-AA4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-AA3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	229.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA3-AA4	005Yr-024Hr	6.02	0.00	0.73	1.42	1.46	1.44
P-AA3-AA4	010Yr-024Hr	7.76	0.00	0.73	1.42	1.46	1.44
P-AA3-AA4	025Yr-072Hr	8.87	0.00	0.73	1.42	1.46	1.44
P-AA3-AA4	100Yr-072Hr	10.86	0.00	0.73	1.54	1.54	1.54

Pipe Link: P-AA4-AA5		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-AA4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-AA5	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	126.10 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA4-AA5	005Yr-024Hr	0.01	-18.47	0.12	-3.92	-5.84	-4.88
P-AA4-AA5	010Yr-024Hr	0.01	-18.47	0.12	-3.92	-5.84	-4.88
P-AA4-AA5	025Yr-072Hr	0.01	-18.47	0.12	-3.92	-5.84	-4.88
P-AA4-AA5	100Yr-072Hr	0.01	-18.47	0.12	-3.92	-5.84	-4.88

Pipe Link: P-AA7-A4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-AA7	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-A4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	190.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA7-A4	005Yr-024Hr	2.72	-2.11	-0.01	2.22	2.22	2.22
P-AA7-A4	010Yr-024Hr	2.43	-1.87	-0.01	1.98	1.98	1.98
P-AA7-A4	025Yr-072Hr	2.20	-1.13	-0.01	1.79	1.79	1.79
P-AA7-A4	100Yr-072Hr	1.63	-1.19	0.02	1.32	1.32	1.32

Pipe Link: P-B1-B2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-4.86 ft	Invert:	-4.90 ft
From Node:	NZA-B2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-B1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	275.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B1-B2	005Yr-024Hr	19.91	-4.84	2.00	4.06	4.06	4.06
P-B1-B2	010Yr-024Hr	23.61	-4.89	1.99	4.81	4.81	4.81
P-B1-B2	025Yr-072Hr	23.34	-4.97	2.00	4.75	4.75	4.75
P-B1-B2	100Yr-072Hr	23.21	-4.81	2.03	4.73	4.73	4.73

Pipe Link: P-B1-CS-01		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.75 ft	Invert:	-2.83 ft
From Node:	NZA-B1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-CS-01	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft

Length:	200.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B1-CS-01	005Yr-024Hr	37.44	-0.59	2.31	7.63	7.63	7.63
P-B1-CS-01	010Yr-024Hr	40.54	-0.59	2.43	8.26	8.26	8.26
P-B1-CS-01	025Yr-072Hr	43.16	-0.59	2.37	8.79	8.79	8.79
P-B1-CS-01	100Yr-072Hr	46.62	-0.59	2.34	9.50	9.50	9.50

Pipe Link: P-B2-B3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-4.54 ft	Invert:	-4.86 ft
From Node:	NZA-B3	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-B2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	275.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B2-B3	005Yr-024Hr	8.89	-4.83	0.96	2.83	2.83	2.83
P-B2-B3	010Yr-024Hr	13.23	-4.82	0.94	4.21	4.21	4.21

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B2-B3	025Yr-072Hr	9.50	-4.84	0.94	3.02	3.02	3.02
P-B2-B3	100Yr-072Hr	9.51	-5.44	-1.18	3.03	3.03	3.03

Pipe Link: P-B3-B4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-3.77 ft	Invert:	-4.54 ft
From Node:	NZA-B4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-B3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	275.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B3-B4	005Yr-024Hr	3.31	-5.02	-0.76	-1.60	-1.60	-1.60
P-B3-B4	010Yr-024Hr	7.19	-5.06	-0.78	2.29	2.29	2.29
P-B3-B4	025Yr-072Hr	11.02	-5.07	-0.82	3.51	3.51	3.51
P-B3-B4	100Yr-072Hr	11.71	-9.31	-0.82	3.73	3.73	3.73

Pipe Link: P-B4-C2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.58 ft	Invert:	-0.46 ft
From Node:	NZA-C2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-B4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	628.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000

Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B4-C2	005Yr-024Hr	1.85	-0.02	0.05	3.40	3.40	3.40
P-B4-C2	010Yr-024Hr	1.85	-0.02	0.05	3.39	3.39	3.39
P-B4-C2	025Yr-072Hr	1.85	-0.02	0.05	3.39	3.39	3.39
P-B4-C2	100Yr-072Hr	1.85	-0.02	0.05	3.39	3.39	3.39

Pipe Link: P-C1-B1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.88 ft	Invert:	-2.60 ft
From Node:	NZA-C1	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	NZA-B1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	674.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-C1-B1	005Yr-024Hr	6.83	-0.12	0.20	3.86	3.86	3.86
P-C1-B1	010Yr-024Hr	7.71	-0.12	0.21	4.36	4.36	4.36
P-C1-B1	025Yr-072Hr	8.11	-0.12	0.25	4.59	4.59	4.59
P-C1-B1	100Yr-072Hr	8.21	-0.12	0.23	4.65	4.65	4.65

Pipe Link: P-C1-D2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.60 ft	Invert:	-2.05 ft
From Node:	NZA-C1	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	NZA-D2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	715.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-C1-D2	005Yr-024Hr	2.48	-4.65	0.08	-2.63	-2.63	-2.63
P-C1-D2	010Yr-024Hr	2.71	-4.80	0.08	-2.71	-2.71	-2.71
P-C1-D2	025Yr-072Hr	2.30	-5.01	0.08	-2.83	-2.83	-2.83
P-C1-D2	100Yr-072Hr	0.09	-4.96	0.08	-2.81	-2.81	-2.81

Pipe Link: P-CS-TOWN-AA1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-AA1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-CS-TOWN	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	85.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-CS-TOWN-AA1	005Yr-024Hr	13.26	0.00	0.00	3.42	3.91	3.66
P-CS-TOWN-AA1	010Yr-024Hr	17.50	0.00	0.00	3.83	4.34	4.08
P-CS-TOWN-AA1	025Yr-072Hr	19.99	0.00	0.00	4.04	4.57	4.31
P-CS-TOWN-AA1	100Yr-072Hr	24.30	0.00	-0.01	4.40	4.94	4.67

Pipe Link: P-CS3-S3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	8.00 ft	Invert:	8.00 ft
From Node:	NZA-CS-03	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-PS3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	12.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-CS3-S3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-CS3-S3	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-CS3-S3	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-CS3-S3	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-D1-CS-05		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.50 ft	Invert:	-2.70 ft
From Node:	NZA-D1	Manning's N:	0.0120	Manning's N:	0.0120

To Node:	NZA-CS-05	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	15.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D1-CS-05	005Yr-024Hr	15.25	-0.12	0.32	4.85	4.85	4.85
P-D1-CS-05	010Yr-024Hr	15.49	-0.10	-0.33	4.93	4.93	4.93
P-D1-CS-05	025Yr-072Hr	15.68	-0.13	0.34	4.99	4.99	4.99
P-D1-CS-05	100Yr-072Hr	14.99	-0.13	0.34	4.77	4.77	4.77

Pipe Link: P-D1-D2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.05 ft	Invert:	-2.35 ft
From Node:	NZA-D2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-D1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.75 ft	Max Depth:	1.75 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	217.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow	Min Flow [cfs]	Min/Max	Max Us	Max Ds	Max Avg

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D1-D2	005Yr-024Hr	12.45	-0.13	-0.06	5.18	5.18	5.18
P-D1-D2	010Yr-024Hr	12.36	-0.14	-0.07	5.14	5.14	5.14
P-D1-D2	025Yr-072Hr	12.33	-0.21	-0.15	5.13	5.13	5.13
P-D1-D2	100Yr-072Hr	12.43	-0.18	0.07	5.17	5.17	5.17

Pipe Link: P-D1-E1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.35 ft	Invert:	-2.90 ft
From Node:	NZA-D1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E1	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	694.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D1-E1	005Yr-024Hr	5.35	-0.06	-0.05	3.03	3.03	3.03
P-D1-E1	010Yr-024Hr	5.36	-0.06	-0.05	3.03	3.03	3.03
P-D1-E1	025Yr-072Hr	5.40	-0.09	0.06	3.05	3.05	3.05
P-D1-E1	100Yr-072Hr	5.43	-0.07	-0.05	3.07	3.07	3.07

Pipe Link: P-D2-D3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.70 ft	Invert:	-2.05 ft
From Node:	NZA-D3	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	NZA-D2	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	276.00 ft	Op Table:		Op Table:	

FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D2-D3	005Yr-024Hr	8.11	-0.02	0.04	4.59	4.59	4.59
P-D2-D3	010Yr-024Hr	8.11	-0.02	-0.03	4.59	4.59	4.59
P-D2-D3	025Yr-072Hr	8.09	-0.02	0.12	4.58	4.58	4.58
P-D2-D3	100Yr-072Hr	8.07	-0.02	0.04	4.57	4.57	4.57

Pipe Link: P-D2-E3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.70 ft	Invert:	-2.10 ft
From Node:	NZA-D2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.75 ft	Max Depth:	1.75 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	304.83 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D2-E3	005Yr-024Hr	1.49	-5.38	0.06	-2.24	-2.24	-2.24
P-D2-E3	010Yr-024Hr	2.02	-5.95	0.06	-2.47	-2.47	-2.47
P-D2-E3	025Yr-072Hr	2.44	-5.86	0.16	-2.44	-2.44	-2.44

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D2-E3	100Yr-072Hr	2.37	-2.20	0.09	0.99	0.99	0.99

Pipe Link: P-D3-D4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.33 ft	Invert:	-2.70 ft
From Node:	NZA-D4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-D3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	284.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D3-D4	005Yr-024Hr	3.29	-0.01	0.01	4.19	4.19	4.19
P-D3-D4	010Yr-024Hr	3.28	-0.01	0.01	4.17	4.17	4.17
P-D3-D4	025Yr-072Hr	3.13	-0.01	0.01	3.98	3.98	3.98
P-D3-D4	100Yr-072Hr	2.79	-0.01	0.01	3.56	3.56	3.56

Pipe Link: P-D4-D5		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.43 ft	Invert:	-2.33 ft
From Node:	NZA-D5	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-D4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	262.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			

Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D4-D5	005Yr-024Hr	1.49	-0.01	0.00	1.90	1.90	1.90
P-D4-D5	010Yr-024Hr	1.48	-0.01	0.00	1.89	1.89	1.89
P-D4-D5	025Yr-072Hr	1.70	-0.01	0.01	2.16	2.16	2.16
P-D4-D5	100Yr-072Hr	1.88	-0.01	0.01	2.40	2.40	2.40

Pipe Link: P-D5-D6		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.42 ft	Invert:	-2.43 ft
From Node:	NZA-D6	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-D5	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	301.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D5-D6	005Yr-024Hr	1.26	-0.47	-0.01	1.60	1.60	1.60
P-D5-D6	010Yr-024Hr	1.25	0.00	0.00	1.60	1.60	1.60
P-D5-D6	025Yr-072Hr	1.25	0.00	-0.01	1.59	1.59	1.59
P-D5-D6	100Yr-072Hr	1.24	0.00	-0.01	1.58	1.58	1.58

Pipe Link: P-D6-D7		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.42 ft	Invert:	-2.42 ft
From Node:	NZA-D7	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-D6	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	292.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D6-D7	005Yr-024Hr	0.32	-0.93	0.01	-1.18	-1.18	-1.18
P-D6-D7	010Yr-024Hr	0.33	-0.95	0.01	-1.21	-1.21	-1.21
P-D6-D7	025Yr-072Hr	0.37	-0.09	0.01	0.47	0.47	0.47
P-D6-D7	100Yr-072Hr	0.39	-0.27	-0.01	0.50	0.50	0.50

Pipe Link: P-DS1-OUTFALL (94TH)		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.20 ft	Invert:	-3.12 ft
From Node:	NZA-DS1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	OUTFALL (94th)	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	10.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-DS1-OUTFALL (94TH)	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-DS1-OUTFALL (94TH)	010Yr-024Hr	1.06	0.00	0.15	0.22	0.22	0.22
P-DS1-OUTFALL (94TH)	025Yr-072Hr	3.76	0.00	-0.37	0.77	0.77	0.77
P-DS1-OUTFALL (94TH)	100Yr-072Hr	7.15	0.00	-0.52	1.46	1.46	1.46

Pipe Link: P-DS2-OUTFALL		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.20 ft	Invert:	-2.47 ft
From Node:	NZA-DS2	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	OUTFALL (89th)	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	10.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-DS2-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-DS2-OUTFALL	010Yr-024Hr	0.01	0.00	0.01	0.00	0.00	0.00
P-DS2-OUTFALL	025Yr-072Hr	2.51	0.00	0.21	0.80	0.80	0.80
P-DS2-OUTFALL	100Yr-072Hr	4.73	0.00	0.36	1.50	1.50	1.50

Pipe Link: P-DS3-OUTFALL(CARLYLE)		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-4.70 ft	Invert:	-4.00 ft
From Node:	NZA-DS3	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	OUTFALL (CARLYLE)	Geometry: Circular		Geometry: Circular	
		Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	11.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-DS3-OUTFALL(CARLYLE)	005Yr-024Hr	31.20	0.00	10.55	4.41	4.41	4.41
P-DS3-OUTFALL(CARLYLE)	010Yr-024Hr	35.82	0.00	10.54	5.07	5.07	5.07
P-DS3-OUTFALL(CARLYLE)	025Yr-072Hr	36.92	0.00	10.55	5.22	5.22	5.22
P-DS3-OUTFALL(CARLYLE)	100Yr-072Hr	39.25	0.00	10.54	5.55	5.55	5.55

Pipe Link: P-E1-E2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.57 ft	Invert:	-2.18 ft
From Node:	NZA-E2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	230.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E1-E2	005Yr-024Hr	19.76	-0.02	-0.17	6.29	6.29	6.29
P-E1-E2	010Yr-024Hr	19.58	-0.02	-0.17	6.23	6.23	6.23
P-E1-E2	025Yr-072Hr	19.68	-0.02	0.23	6.27	6.27	6.27
P-E1-E2	100Yr-072Hr	19.81	-0.02	0.24	6.31	6.31	6.31

Pipe Link: P-E1-F1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.90 ft	Invert:	-2.71 ft
From Node:	NZA-F1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	692.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E1-F1	005Yr-024Hr	3.42	-1.81	-0.03	1.94	1.94	1.94
P-E1-F1	010Yr-024Hr	3.31	-1.79	-0.03	1.88	1.88	1.88
P-E1-F1	025Yr-072Hr	2.73	-1.77	0.05	1.55	1.55	1.55
P-E1-F1	100Yr-072Hr	1.96	-2.37	0.04	-1.34	-1.34	-1.34

Pipe Link: P-E2-E3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-0.45 ft	Invert:	-1.57 ft
From Node:	NZA-E3	Manning's N:	0.0120	Manning's N:	0.0120

To Node:	NZA-E2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	260.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E2-E3	005Yr-024Hr	13.61	-0.04	-0.23	4.33	4.33	4.33
P-E2-E3	010Yr-024Hr	13.67	-0.04	-0.21	4.35	4.35	4.35
P-E2-E3	025Yr-072Hr	13.73	-0.08	0.26	4.37	4.37	4.37
P-E2-E3	100Yr-072Hr	13.68	-0.06	0.25	4.36	4.36	4.36

Pipe Link: P-E3-E4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.57 ft	Invert:	-0.45 ft
From Node:	NZA-E4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	283.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow	Min Flow [cfs]	Min/Max	Max Us	Max Ds	Max Avg

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E3-E4	005Yr-024Hr	10.49	-0.02	-0.21	3.34	5.94	4.64
P-E3-E4	010Yr-024Hr	10.55	-0.02	0.26	3.36	5.97	4.66
P-E3-E4	025Yr-072Hr	10.37	-0.02	0.27	3.30	5.87	4.59
P-E3-E4	100Yr-072Hr	10.39	-0.02	0.27	3.31	5.88	4.59

Pipe Link: P-E4-E5		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.57 ft	Invert:	-1.57 ft
From Node:	NZA-E5	Manning's N:	0.0012	Manning's N:	0.0012
To Node:	NZA-E4	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	277.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E4-E5	005Yr-024Hr	18.34	-0.21	-12.60	5.84	5.84	5.84
P-E4-E5	010Yr-024Hr	19.91	-0.49	-14.59	6.34	6.34	6.34
P-E4-E5	025Yr-072Hr	19.94	-0.42	-13.09	6.35	6.35	6.35
P-E4-E5	100Yr-072Hr	21.94	-0.33	-13.28	6.99	6.99	6.99

Pipe Link: P-E5-E6		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.79 ft	Invert:	-1.57 ft
From Node:	NZA-E6	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E5	Geometry:	Circular	Geometry:	Circular
Link Count:	1	Max Depth:	2.25 ft	Max Depth:	2.25 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	275.00 ft	Op Table:		Op Table:	

FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E5-E6	005Yr-024Hr	8.56	-3.06	0.85	2.15	2.15	2.15
P-E5-E6	010Yr-024Hr	8.52	-2.70	0.82	2.14	2.14	2.14
P-E5-E6	025Yr-072Hr	8.25	-0.01	0.78	2.07	2.07	2.07
P-E5-E6	100Yr-072Hr	8.10	-0.01	0.73	2.04	2.04	2.04

Pipe Link: P-E6-E7		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.89 ft	Invert:	-1.79 ft
From Node:	NZA-E7	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E6	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	275.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E6-E7	005Yr-024Hr	5.61	-1.58	-0.06	3.17	3.17	3.17
P-E6-E7	010Yr-024Hr	5.52	-1.06	-0.05	3.12	3.12	3.12
P-E6-E7	025Yr-072Hr	5.37	0.00	-0.05	3.04	3.04	3.04

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E6-E7	100Yr-072Hr	5.18	0.00	0.05	2.93	2.93	2.93

Pipe Link: P-E7-E8		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-0.69 ft	Invert:	-1.89 ft
From Node:	NZA-E8	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-E7	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	280.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E7-E8	005Yr-024Hr	2.77	-0.70	-0.02	3.52	3.52	3.52
P-E7-E8	010Yr-024Hr	2.75	-0.41	0.02	3.50	3.50	3.50
P-E7-E8	025Yr-072Hr	2.68	0.00	0.02	3.41	3.41	3.41
P-E7-E8	100Yr-072Hr	2.54	0.00	-0.01	3.23	3.23	3.23

Pipe Link: P-F1-F2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.66 ft	Invert:	-1.36 ft
From Node:	NZA-F2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	217.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			

Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F1-F2	005Yr-024Hr	2.43	-0.24	-0.01	3.09	3.09	3.09
P-F1-F2	010Yr-024Hr	2.43	-0.24	-0.01	3.10	3.10	3.10
P-F1-F2	025Yr-072Hr	2.44	-0.55	0.02	3.10	3.10	3.10
P-F1-F2	100Yr-072Hr	2.36	-0.73	-0.02	3.01	3.01	3.01

Pipe Link: P-F1-G1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.71 ft	Invert:	-2.80 ft
From Node:	NZA-G1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	119.25 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F1-G1	005Yr-024Hr	1.71	-3.75	-0.09	-2.12	-2.12	-2.12
P-F1-G1	010Yr-024Hr	3.12	-4.69	-0.09	-2.65	-2.65	-2.65
P-F1-G1	025Yr-072Hr	3.78	-4.97	-0.10	-2.81	-2.81	-2.81
P-F1-G1	100Yr-072Hr	3.88	-5.31	-0.09	-3.01	-3.01	-3.01

Pipe Link: P-F2-F3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.36 ft	Invert:	-1.66 ft
From Node:	NZA-F3	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	276.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F2-F3	005Yr-024Hr	2.52	-0.09	-0.03	3.21	3.21	3.21
P-F2-F3	010Yr-024Hr	2.48	-0.09	0.03	3.16	3.16	3.16
P-F2-F3	025Yr-072Hr	2.39	-0.09	-0.03	3.04	3.04	3.04
P-F2-F3	100Yr-072Hr	2.28	-0.09	0.03	2.90	2.90	2.90

Pipe Link: P-F2-G2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.65 ft	Invert:	-1.65 ft
From Node:	NZA-F2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	495.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F2-G2	005Yr-024Hr	2.18	0.00	0.06	2.78	2.78	2.78
P-F2-G2	010Yr-024Hr	2.17	0.00	0.06	2.76	2.76	2.76
P-F2-G2	025Yr-072Hr	2.17	-0.01	0.08	2.76	2.76	2.76
P-F2-G2	100Yr-072Hr	2.17	-0.01	0.08	2.77	2.77	2.77

Pipe Link: P-F4-F5		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.51 ft	Invert:	1.47 ft
From Node:	NZA-F5	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	262.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F4-F5	005Yr-024Hr	0.59	-0.01	0.00	1.09	1.09	1.09
P-F4-F5	010Yr-024Hr	0.62	-0.01	0.01	1.13	1.13	1.13
P-F4-F5	025Yr-072Hr	0.63	0.00	0.00	1.16	1.16	1.16
P-F4-F5	100Yr-072Hr	0.60	-0.01	0.01	1.11	1.11	1.11

Pipe Link: P-F4-G4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.47 ft	Invert:	1.47 ft
From Node:	NZA-F4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft

Length:	510.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F4-G4	005Yr-024Hr	1.67	-0.45	0.00	3.07	3.20	3.11
P-F4-G4	010Yr-024Hr	1.67	-0.48	0.00	3.07	3.17	3.10
P-F4-G4	025Yr-072Hr	1.64	-0.16	0.01	3.01	3.12	3.05
P-F4-G4	100Yr-072Hr	1.65	-0.02	0.00	3.02	3.05	3.03

Pipe Link: P-F5-F6		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.00 ft	Invert:	-2.00 ft
From Node:	NZA-F6	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	NZA-F5	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	292.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F5-F6	005Yr-024Hr	1.36	-1.48	0.02	-0.84	-0.84	-0.84
P-F5-F6	010Yr-024Hr	1.94	-1.44	0.02	1.10	1.10	1.10

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F5-F6	025Yr-072Hr	0.75	-1.43	0.02	-0.81	-0.81	-0.81
P-F5-F6	100Yr-072Hr	1.74	-1.43	-0.02	0.99	0.99	0.99

Pipe Link: P-F6-F7		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.25 ft	Invert:	-2.00 ft
From Node:	NZA-F7	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F6	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	271.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F6-F7	005Yr-024Hr	1.14	-2.13	0.00	-2.71	-2.71	-2.71
P-F6-F7	010Yr-024Hr	0.93	-2.05	0.01	-2.61	-2.61	-2.61
P-F6-F7	025Yr-072Hr	0.51	-1.99	-0.01	-2.53	-2.53	-2.53
P-F6-F7	100Yr-072Hr	0.30	-1.59	-0.01	-2.02	-2.02	-2.02

Pipe Link: P-F7-F8		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.17 ft	Invert:	0.25 ft
From Node:	NZA-F8	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F7	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	303.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000

Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F7-F8	005Yr-024Hr	0.01	-2.99	0.01	-3.81	-3.81	-3.81
P-F7-F8	010Yr-024Hr	0.14	-2.97	0.00	-3.79	-3.79	-3.79
P-F7-F8	025Yr-072Hr	0.01	-2.92	0.01	-3.71	-3.71	-3.71
P-F7-F8	100Yr-072Hr	0.00	-2.95	0.01	-3.76	-3.76	-3.76

Pipe Link: P-F8-F9		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.83 ft	Invert:	-2.17 ft
From Node:	NZA-F9	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F8	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	321.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F8-F9	005Yr-024Hr	2.55	0.00	0.00	3.24	3.24	3.24
P-F8-F9	010Yr-024Hr	2.58	-0.16	0.00	3.28	3.28	3.28
P-F8-F9	025Yr-072Hr	2.54	-0.30	0.01	3.23	3.23	3.23
P-F8-F9	100Yr-072Hr	2.38	-0.31	-0.01	3.03	3.03	3.03

Pipe Link: P-F8-G8		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.88 ft	Invert:	0.61 ft
From Node:	NZA-G8	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-F8	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	525.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F8-G8	005Yr-024Hr	0.01	-4.78	-0.01	-0.68	-0.68	-0.68
P-F8-G8	010Yr-024Hr	0.01	-6.26	0.01	-0.89	-0.89	-0.89
P-F8-G8	025Yr-072Hr	0.00	-6.54	0.01	-0.93	-0.93	-0.93
P-F8-G8	100Yr-072Hr	0.00	-6.59	-0.01	-0.93	-0.93	-0.93

Pipe Link: P-FDOT-1A-2A		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-4.86 ft	Invert:	-3.43 ft
From Node:	FDOT-1A	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT-2A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	275.42 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-1A-2A	005Yr-024Hr	2.91	-3.39	-0.76	-1.08	-1.08	-1.08
P-FDOT-1A-2A	010Yr-024Hr	2.80	-3.82	-0.76	-1.21	-1.21	-1.21
P-FDOT-1A-2A	025Yr-072Hr	3.71	-2.85	-0.76	1.18	1.18	1.18
P-FDOT-1A-2A	100Yr-072Hr	5.17	-2.85	-0.76	1.65	1.65	1.65

Pipe Link: P-FDOT-2A-3A		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-3.43 ft	Invert:	-2.16 ft
From Node:	FDOT-2A	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT-3A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	235.86 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-2A-3A	005Yr-024Hr	8.32	-9.60	-4.15	-1.36	-1.36	-1.36
P-FDOT-2A-3A	010Yr-024Hr	9.83	-9.60	-4.15	1.39	1.39	1.39
P-FDOT-2A-3A	025Yr-072Hr	10.47	-9.60	-4.15	1.48	1.48	1.48
P-FDOT-2A-3A	100Yr-072Hr	14.83	-9.60	-4.15	2.10	2.10	2.10

Pipe Link: P-FDOT-2B-3B		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.97 ft	Invert:	-4.38 ft
From Node:	FDOT-2B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT-3B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	657.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-2B-3B	005Yr-024Hr	9.82	-8.53	3.06	1.02	1.02	1.02
P-FDOT-2B-3B	010Yr-024Hr	9.82	-11.80	3.06	-1.23	-1.23	-1.23
P-FDOT-2B-3B	025Yr-072Hr	9.82	-14.28	3.06	-1.48	-1.48	-1.48
P-FDOT-2B-3B	100Yr-072Hr	9.82	-16.28	3.06	-1.69	-1.69	-1.69

Pipe Link: P-FDOT-2B-B4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.97 ft	Invert:	-3.77 ft
From Node:	FDOT-2B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-B4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	135.04 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-2B-B4	005Yr-024Hr	2.78	-22.75	1.19	-7.24	-7.24	-7.24
P-FDOT-2B-B4	010Yr-024Hr	2.77	-28.31	-1.26	-9.01	-9.01	-9.01
P-FDOT-2B-B4	025Yr-072Hr	2.86	-30.55	-1.30	-9.72	-9.72	-9.72
P-FDOT-2B-B4	100Yr-072Hr	2.81	-31.55	1.22	-10.04	-10.04	-10.04

Pipe Link: P-FDOT-3A-4A		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.16 ft	Invert:	-7.00 ft
From Node:	FDOT-3A	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT-4A	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	264.74 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-3A-4A	005Yr-024Hr	11.07	-28.26	4.31	-2.94	-2.94	-2.94
P-FDOT-3A-4A	010Yr-024Hr	14.89	-28.26	4.31	-2.94	-2.94	-2.94
P-FDOT-3A-4A	025Yr-072Hr	16.23	-28.26	4.31	-2.94	-2.94	-2.94

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-3A-4A	100Yr-072Hr	22.02	-28.26	4.31	-2.94	-2.94	-2.94

Pipe Link: P-FDOT-3B-4B		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-4.38 ft	Invert:	-5.00 ft
From Node:	FDOT-5B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT-5B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	304.53 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-3B-4B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-FDOT-3B-4B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-FDOT-3B-4B	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-FDOT-3B-4B	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-FDOT-4B-5B		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-5.00 ft	Invert:	-4.16 ft
From Node:	FDOT-4B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT-5B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Flow Direction:	Both	Bottom Clip			

Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	246.31 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-4B-5B	005Yr-024Hr	3.77	-2.97	0.06	0.77	0.77	0.77
P-FDOT-4B-5B	010Yr-024Hr	5.35	-1.17	0.06	1.09	1.09	1.09
P-FDOT-4B-5B	025Yr-072Hr	4.97	-0.14	-0.05	1.01	1.01	1.01
P-FDOT-4B-5B	100Yr-072Hr	5.46	-0.19	0.07	1.11	1.11	1.11

Pipe Link: P-FDOT-AA5-2B		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-AA5	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT-1B	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	626.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-AA5-2B	005Yr-024Hr	0.87	-1.33	0.00	-2.44	3.23	-2.45
P-FDOT-AA5-2B	010Yr-024Hr	0.87	-1.32	0.00	-2.42	3.23	-2.43
P-FDOT-AA5-2B	025Yr-072Hr	0.87	-1.41	0.00	-2.59	3.23	-2.59
P-FDOT-AA5-2B	100Yr-072Hr	0.87	-1.48	0.00	-2.71	3.23	-2.71

Pipe Link: P-FDOT-S106-S101		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-6.18 ft	Invert:	-9.20 ft
From Node:	NZA-S-106	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-S101	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	223.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-S106-S101	005Yr-024Hr	4.11	-14.73	-6.95	-2.08	-2.08	-2.08
P-FDOT-S106-S101	010Yr-024Hr	5.42	-14.74	-6.75	-2.08	-2.08	-2.08
P-FDOT-S106-S101	025Yr-072Hr	7.10	-14.76	-7.06	-2.09	-2.09	-2.09
P-FDOT-S106-S101	100Yr-072Hr	10.14	-14.76	-6.85	-2.09	-2.09	-2.09

Pipe Link: P-FDOT2B - S-82		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-3.45 ft	Invert:	0.00 ft
From Node:	FDOT-2B	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-S-82	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	378.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT2B - S-82	005Yr-024Hr	39.45	-29.10	2.24	-6.21	6.82	4.98
P-FDOT2B - S-82	010Yr-024Hr	47.93	-29.10	2.24	-6.21	7.19	5.43
P-FDOT2B - S-82	025Yr-072Hr	50.67	-29.10	2.24	-6.21	7.25	5.50
P-FDOT2B - S-82	100Yr-072Hr	53.74	-29.10	2.24	-6.21	7.27	5.54

Pipe Link: P-FDOT4A-S106		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	3.81 ft	Invert:	-6.18 ft
From Node:	FDOT-4A	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-S-106	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	823.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT4A-S106	005Yr-024Hr	9.55	0.00	0.00	4.78	1.35	3.07
P-FDOT4A-S106	010Yr-024Hr	15.37	0.00	0.00	5.51	2.17	3.84
P-FDOT4A-S106	025Yr-072Hr	20.31	0.00	0.00	6.02	2.87	4.44
P-FDOT4A-S106	100Yr-072Hr	28.99	0.00	0.00	6.80	4.10	5.45

Pipe Link: P-G1-G2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.80 ft	Invert:	-3.19 ft
From Node:	NZA-G1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	400.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G1-G2	005Yr-024Hr	4.74	-0.03	0.19	2.68	2.68	2.68
P-G1-G2	010Yr-024Hr	6.24	-0.03	0.19	3.53	3.53	3.53
P-G1-G2	025Yr-072Hr	6.67	-0.61	0.31	3.78	3.78	3.78
P-G1-G2	100Yr-072Hr	6.88	-1.67	0.24	3.89	3.89	3.89

Pipe Link: P-G2-CS-02		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.22 ft	Invert:	-2.30 ft
From Node:	NZA-G2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-CS-02	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	120.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G2-CS-02	005Yr-024Hr	26.67	-0.01	1.69	8.49	8.49	8.49
P-G2-CS-02	010Yr-024Hr	33.01	-0.01	1.84	10.51	10.51	10.51
P-G2-CS-02	025Yr-072Hr	35.36	-0.01	1.79	11.26	11.26	11.26
P-G2-CS-02	100Yr-072Hr	37.63	-0.01	1.73	11.98	11.98	11.98

Pipe Link: P-G2-G3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-3.38 ft	Invert:	-2.22 ft
From Node:	NZA-G3	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	262.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G2-G3	005Yr-024Hr	15.34	-0.15	0.76	4.88	4.88	4.88
P-G2-G3	010Yr-024Hr	15.20	-0.17	0.59	4.84	4.84	4.84
P-G2-G3	025Yr-072Hr	15.83	-0.09	0.52	5.04	5.04	5.04
P-G2-G3	100Yr-072Hr	15.66	-0.11	0.83	4.98	4.98	4.98

Pipe Link: P-G2-I1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-3.19 ft	Invert:	-2.93 ft
From Node:	NZA-G2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-I1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	563.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G2-I1	005Yr-024Hr	3.18	-1.59	-0.38	1.80	1.80	1.80
P-G2-I1	010Yr-024Hr	5.14	-1.59	-0.34	2.91	2.91	2.91
P-G2-I1	025Yr-072Hr	6.20	-1.59	-0.35	3.51	3.51	3.51
P-G2-I1	100Yr-072Hr	6.23	-1.59	-0.39	3.53	3.53	3.53

Pipe Link: P-G3-G4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.48 ft	Invert:	-3.38 ft
From Node:	NZA-G4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft

Length:	270.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G3-G4	005Yr-024Hr	10.20	-0.15	0.11	3.57	3.25	3.26
P-G3-G4	010Yr-024Hr	11.31	-0.18	0.10	3.60	3.60	3.60
P-G3-G4	025Yr-072Hr	10.37	-0.08	0.09	3.52	3.30	3.30
P-G3-G4	100Yr-072Hr	10.32	-0.11	0.09	3.52	3.28	3.28

Pipe Link: P-G4-G5		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.28 ft	Invert:	1.48 ft
From Node:	NZA-G5	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	267.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G4-G5	005Yr-024Hr	7.84	-0.09	-0.01	4.44	4.44	4.44
P-G4-G5	010Yr-024Hr	7.98	-0.10	-0.01	4.52	4.52	4.52

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G4-G5	025Yr-072Hr	7.96	-0.05	-0.01	4.51	4.51	4.51
P-G4-G5	100Yr-072Hr	7.87	-0.06	0.01	4.45	4.45	4.45

Pipe Link: P-G5-G6		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.19 ft	Invert:	0.28 ft
From Node:	NZA-G6	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G5	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	279.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G5-G6	005Yr-024Hr	2.85	-0.09	0.01	3.63	3.63	3.63
P-G5-G6	010Yr-024Hr	2.85	-0.11	0.01	3.63	3.63	3.63
P-G5-G6	025Yr-072Hr	2.88	-0.05	0.01	3.66	3.66	3.66
P-G5-G6	100Yr-072Hr	2.83	-0.07	0.01	3.60	3.60	3.60

Pipe Link: P-G6-G8		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-0.37 ft	Invert:	0.19 ft
From Node:	NZA-G8	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G6	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	550.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000

Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G6-G8	005Yr-024Hr	1.76	-2.18	0.02	-1.24	-1.24	-1.24
P-G6-G8	010Yr-024Hr	1.83	-1.83	0.04	-1.04	-1.04	-1.04
P-G6-G8	025Yr-072Hr	1.82	-1.56	-0.03	1.03	1.03	1.03
P-G6-G8	100Yr-072Hr	1.65	-0.99	0.03	0.93	0.93	0.93

Pipe Link: P-G6-I7		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.97 ft	Invert:	-3.42 ft
From Node:	NZA-I7	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-I6	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	280.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G6-I7	005Yr-024Hr	26.98	-0.10	-1.74	3.82	3.82	3.82
P-G6-I7	010Yr-024Hr	29.47	-0.08	-1.64	4.17	4.17	4.17
P-G6-I7	025Yr-072Hr	30.96	-0.09	-2.25	4.38	4.38	4.38
P-G6-I7	100Yr-072Hr	32.28	-0.09	-2.24	4.57	4.57	4.57

Pipe Link: P-G8-G9		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	0.81 ft	Invert:	-0.37 ft
From Node:	NZA-G9	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G8	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.75 ft	Max Depth:	1.75 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	262.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G8-G9	005Yr-024Hr	6.48	0.00	-0.03	2.69	2.69	2.69
P-G8-G9	010Yr-024Hr	6.40	0.00	0.03	2.66	2.66	2.66
P-G8-G9	025Yr-072Hr	6.50	0.00	-0.04	2.70	2.70	2.70
P-G8-G9	100Yr-072Hr	6.27	0.00	-0.04	2.61	2.61	2.61

Pipe Link: P-G8-I7		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.30 ft	Invert:	-1.83 ft
From Node:	NZA-I7	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-G8	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	570.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G8-I7	005Yr-024Hr	0.16	-16.78	-0.63	-2.37	-2.37	-2.37
P-G8-I7	010Yr-024Hr	0.16	-16.92	0.65	-2.39	-2.39	-2.39
P-G8-I7	025Yr-072Hr	0.16	-17.14	-0.86	-2.43	-2.43	-2.43
P-G8-I7	100Yr-072Hr	0.14	-17.62	0.76	-2.49	-2.49	-2.49

Pipe Link: P-I1-I2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.17 ft	Invert:	-2.32 ft
From Node:	NZA-I2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-I1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	267.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I1-I2	005Yr-024Hr	1.97	-0.18	0.04	3.61	3.61	3.61
P-I1-I2	010Yr-024Hr	1.95	-0.18	0.04	3.57	3.57	3.57
P-I1-I2	025Yr-072Hr	1.92	-0.19	0.04	3.53	3.53	3.53
P-I1-I2	100Yr-072Hr	1.91	-0.19	0.04	3.50	3.50	3.50

Pipe Link: P-I3-I4		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-1.54 ft	Invert:	1.02 ft
From Node:	NZA-I4	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-I3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft

Length:	275.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I3-I4	005Yr-024Hr	0.36	-1.01	0.02	-0.57	-0.57	-0.57
P-I3-I4	010Yr-024Hr	0.41	-1.00	-0.02	-0.56	-0.56	-0.56
P-I3-I4	025Yr-072Hr	0.60	-0.94	-0.04	-0.53	-0.53	-0.53
P-I3-I4	100Yr-072Hr	1.55	-0.96	-0.04	0.88	0.88	0.88

Pipe Link: P-I4-I5		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-0.68 ft	Invert:	-1.54 ft
From Node:	NZA-I5	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-I4	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	279.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I4-I5	005Yr-024Hr	0.27	-2.02	0.01	-2.57	-2.57	-2.57
P-I4-I5	010Yr-024Hr	0.72	-2.00	-0.01	-2.55	-2.55	-2.55

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I4-I5	025Yr-072Hr	0.89	-1.90	0.02	-2.42	-2.42	-2.42
P-I4-I5	100Yr-072Hr	0.83	-1.91	-0.01	-2.43	-2.43	-2.43

Pipe Link: P-I5-I6		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.97 ft	Invert:	-0.74 ft
From Node:	NZA-I6	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-I5	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	275.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I5-I6	005Yr-024Hr	0.01	-2.71	0.02	-3.45	-3.45	-3.45
P-I5-I6	010Yr-024Hr	0.01	-2.72	-0.02	-3.46	-3.46	-3.46
P-I5-I6	025Yr-072Hr	0.01	-2.69	0.03	-3.42	-3.42	-3.42
P-I5-I6	100Yr-072Hr	0.13	-2.61	0.03	-3.32	-3.32	-3.32

Pipe Link: P-I6-CS-03		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-3.46 ft	Invert:	-4.50 ft
From Node:	NZA-I6	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-CS-03	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	190.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000

Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I6-CS-03	005Yr-024Hr	31.17	0.00	-2.57	4.41	4.41	4.41
P-I6-CS-03	010Yr-024Hr	35.80	0.00	-2.24	5.06	5.06	5.06
P-I6-CS-03	025Yr-072Hr	36.90	0.00	-2.69	5.22	5.22	5.22
P-I6-CS-03	100Yr-072Hr	39.23	0.00	-2.76	5.55	5.55	5.55

Pipe Link: P-I7-I8		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.67 ft	Invert:	-2.97 ft
From Node:	NZA-I8	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-I7	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	280.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I7-I8	005Yr-024Hr	6.60	0.00	-0.17	3.74	3.74	3.74
P-I7-I8	010Yr-024Hr	6.67	0.00	-0.15	3.78	3.78	3.78
P-I7-I8	025Yr-072Hr	6.64	0.00	0.15	3.76	3.76	3.76
P-I7-I8	100Yr-072Hr	6.45	0.00	0.16	3.65	3.65	3.65

Pipe Link: P-OUTFALL(96th)-CS-TOWN		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-CS-TOWN	Manning's N:	0.0110	Manning's N:	0.0110
To Node:	OUTFALL (96th)	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	58.09 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-OUTFALL(96th)-CS-TOWN	005Yr-024Hr	13.26	0.00	0.00	3.91	5.27	4.59
P-OUTFALL(96th)-CS-TOWN	010Yr-024Hr	17.50	0.00	0.00	4.34	5.74	5.04
P-OUTFALL(96th)-CS-TOWN	025Yr-072Hr	19.99	0.00	0.00	4.57	5.99	5.28
P-OUTFALL(96th)-CS-TOWN	100Yr-072Hr	24.30	0.00	-0.01	4.94	6.39	5.67

Pipe Link: P-PS1-CS1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.78 ft	Invert:	-2.75 ft
From Node:	NZA-PS1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-CS-01	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	11.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			

Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS1-CS1	005Yr-024Hr	0.30	-38.52	-25.28	-5.45	-5.45	-5.45
P-PS1-CS1	010Yr-024Hr	0.30	-39.68	-24.90	-5.61	-5.61	-5.61
P-PS1-CS1	025Yr-072Hr	0.30	-39.70	-27.22	-5.62	-5.62	-5.62
P-PS1-CS1	100Yr-072Hr	0.30	-39.72	-28.70	-5.62	-5.62	-5.62

Pipe Link: P-PS1-DS1		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	8.00 ft	Invert:	8.00 ft
From Node:	NZA-PS1	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-DS1	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.33 ft	Max Depth:	1.33 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	63.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS1-DS1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS1-DS1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS1-DS1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS1-DS1	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-PS2-CS-02		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	-2.50 ft	Invert:	-2.30 ft
From Node:	NZA-PS2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-CS-02	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	11.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS2-CS-02	005Yr-024Hr	0.02	-29.82	23.00	-4.22	-4.22	-4.22
P-PS2-CS-02	010Yr-024Hr	0.04	-33.07	23.05	-4.68	-4.68	-4.68
P-PS2-CS-02	025Yr-072Hr	0.25	-33.09	23.46	-4.68	-4.68	-4.68
P-PS2-CS-02	100Yr-072Hr	0.22	-33.10	-25.24	-4.68	-4.68	-4.68

Pipe Link: P-PS2-DS2		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	8.00 ft	Invert:	8.00 ft
From Node:	NZA-PS2	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-DS2	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.33 ft	Max Depth:	1.33 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	38.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS2-DS2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS2-DS2	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS2-DS2	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS2-DS2	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-PS3-DS3		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	8.00 ft	Invert:	8.00 ft
From Node:	NZA-PS3	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-DS3	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	1.33 ft	Max Depth:	1.33 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	11.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS3-DS3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS3-DS3	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS3-DS3	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS3-DS3	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-S-82 - S-77		Upstream		Downstream	
Scenario:	Ex. Conditions	Invert:	1.60 ft	Invert:	1.60 ft
From Node:	NZA-S-82	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	NZA-S-77	Geometry: Circular		Geometry: Circular	
Link Count:	1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Flow Direction:	Both	Bottom Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft

Length:	888.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00	Top Clip			
Bend Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Location:	0.00 dec	Op Table:		Op Table:	
Energy Switch:	Energy	Ref Node:		Ref Node:	
		Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-S-82 - S-77	005Yr-024Hr	0.26	-0.28	-0.03	-0.50	-1.87	-1.19
P-S-82 - S-77	010Yr-024Hr	3.14	-1.01	-0.04	1.26	2.67	1.87
P-S-82 - S-77	025Yr-072Hr	4.84	-1.65	0.04	1.50	3.32	2.28
P-S-82 - S-77	100Yr-072Hr	6.62	-3.13	-0.03	1.69	3.66	2.54

Drop Structure Link: S-101		Upstream Pipe		Downstream Pipe	
Scenario:	Ex. Conditions	Invert:	-4.00 ft	Invert:	-4.00 ft
From Node:	NZA-S101	Manning's N:	0.0120	Manning's N:	0.0120
To Node:	FDOT OUTFALL (CARLYLE)	Geometry: Circular		Geometry: Circular	
		Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	12.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Both	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	

Geometry Type:	Rectangular
Invert:	8.00 ft
Control Elevation:	8.00 ft
Max Depth:	1.50 ft
Max Width:	6.00 ft
Fillet:	0.00 ft

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
S-101 - Pipe	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Pipe	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Pipe	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Pipe	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Drop Structure Link: S-77

Scenario:	Ex. Conditions
From Node:	NZA-S-77
To Node:	FDOT OUTFALL (94th)
Link Count:	1
Flow Direction:	Both
Solution:	Combine
Increments:	0
Pipe Count:	1
Damping:	0.0000 ft
Length:	12.00 ft
FHWA Code:	0
Entr Loss Coef:	0.00
Exit Loss Coef:	0.00

Upstream Pipe

Invert:	-4.00 ft
Manning's N:	0.0120

Geometry: Circular

Max Depth:	3.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Downstream Pipe

Invert:	-4.00 ft
Manning's N:	0.0120

Geometry: Circular

Max Depth:	3.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	
Manning's N:	0.0000

Bend Loss Coef: 0.00
Bend Location: 0.00 dec
Energy Switch: Energy

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Paved Road Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	8.00 ft	Ref Node:	
Control Elevation:	8.00 ft	Discharge Coefficients	
Max Depth:	1.50 ft	Weir Default:	3.200
Max Width:	6.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
S-77 - Pipe	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Pipe	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Pipe	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Pipe	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-A1-A2		Bottom Clip	
Scenario:	Ex. Conditions	Default:	0.00 ft
From Node:	NZA-A1	Op Table:	
To Node:	NZA-A2	Ref Node:	
Link Count:	1	Top Clip	
Flow Direction:	Both	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:	
Weir Type:	Paved Road Vertical	Ref Node:	
Geometry Type:	Rectangular		

Invert:	4.61 ft
Control Elevation:	4.61 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A1-A2	005Yr-024Hr	0.00	-7.94	0.00	0.00	0.00	0.00
W-A1-A2	010Yr-024Hr	0.00	-17.14	0.00	0.00	0.00	0.00
W-A1-A2	025Yr-072Hr	0.00	-24.79	0.00	0.00	0.00	0.00
W-A1-A2	100Yr-072Hr	0.00	-38.79	-0.01	-3.53	-3.53	-3.53

Weir Link: W-A1-B1

Scenario:	Ex. Conditions
From Node:	NZA-A1
To Node:	NZA-B1
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.38 ft
Control Elevation:	4.38 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A1-B1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-B1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-B1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-B1	100Yr-072Hr	3.60	0.00	0.00	1.08	1.08	1.08

Weir Link: W-A1-OUTFALL			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-A1	Default:	0.00 ft
To Node:	OUTFALL (95th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.81 ft	Discharge Coefficients	
Control Elevation:	3.81 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-OUTFALL	010Yr-024Hr	14.23	0.00	0.00	1.72	1.72	1.72
W-A1-OUTFALL	025Yr-072Hr	25.30	0.00	0.00	2.30	2.30	2.30
W-A1-OUTFALL	100Yr-072Hr	41.14	0.00	0.01	3.74	3.74	3.74

Weir Link: W-A2-A3			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-A2	Default:	0.00 ft
To Node:	NZA-A3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.72 ft	Discharge Coefficients	
Control Elevation:	4.72 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A2-A3	005Yr-024Hr	0.00	-6.71	0.00	-1.34	-1.34	-1.34
W-A2-A3	010Yr-024Hr	0.00	-12.01	0.00	-1.59	-1.59	-1.59
W-A2-A3	025Yr-072Hr	0.00	-16.50	0.00	-1.72	-1.72	-1.72
W-A2-A3	100Yr-072Hr	0.00	-28.93	-0.17	-2.63	-2.63	-2.63

Weir Link: W-A3-A4

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-A4	Default:	0.00 ft
To Node:	NZA-A3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.41 ft	Discharge Coefficients	
Control Elevation:	5.41 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A3-A4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A3-A4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A3-A4	025Yr-072Hr	0.56	0.00	0.00	0.00	0.00	0.00
W-A3-A4	100Yr-072Hr	15.67	0.00	0.00	1.77	1.77	1.77

Weir Link: W-A4-B4

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-A4	Default:	0.00 ft
To Node:	NZA-B4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	

Geometry Type:	Rectangular		
Invert:	5.02 ft	Ref Node:	
Control Elevation:	5.02 ft	Discharge Coefficients	
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A4-B4	005Yr-024Hr	0.88	0.00	0.00	0.68	0.68	0.68
W-A4-B4	010Yr-024Hr	5.11	0.00	0.00	1.22	1.22	1.22
W-A4-B4	025Yr-072Hr	13.19	0.00	0.00	1.62	1.62	1.62
W-A4-B4	100Yr-072Hr	15.57	-1.39	-1.98	1.69	1.69	1.69

Weir Link: W-A4-FDOT1B

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	FDOT-1B	Default:	0.00 ft
To Node:	NZA-A4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.22 ft	Discharge Coefficients	
Control Elevation:	4.22 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A4-FDOT1B	005Yr-024Hr	3.65	0.00	0.01	1.08	1.08	1.08
W-A4-FDOT1B	010Yr-024Hr	1.59	0.00	0.00	0.81	0.81	0.81

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A4-FDOT1 B	025Yr-072Hr	5.59	0.00	0.01	0.51	0.51	0.51
W-A4-FDOT1 B	100Yr-072Hr	9.03	0.00	0.03	0.82	0.82	0.82

Weir Link: W-AA1-AA2

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-AA1	Default:	0.00 ft
To Node:	NZA-AA2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	**Discharge Coefficients**	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA1-AA2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-AA2	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-AA2	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-AA2	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-AA1-OUTFALL(96th)

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-AA1	Default:	0.00 ft
To Node:	OUTFALL (96th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.00 ft
Control Elevation:	4.00 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA1-OUTFALL(96th)	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-OUTFALL(96th)	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-OUTFALL(96th)	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-OUTFALL(96th)	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-AA2-AA3

Scenario:	Ex. Conditions
From Node:	NZA-AA3
To Node:	NZA-AA2
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Rectangular
Invert:	4.00 ft
Control Elevation:	4.00 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA2-AA3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA2-AA3	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA2-AA3	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA2-AA3	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-AA3-AA4

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-AA4	Default:	0.00 ft
To Node:	NZA-AA3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	**Discharge Coefficients**	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA3-AA4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA3-AA4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA3-AA4	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA3-AA4	100Yr-072Hr	0.21	0.00	0.00	0.00	0.00	0.00

Weir Link: W-AA4-AA5

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-AA5	Default:	0.00 ft
To Node:	NZA-AA4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	**Discharge Coefficients**	

Control Elevation:	4.00 ft		
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA4-AA5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA4-AA5	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA4-AA5	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA4-AA5	100Yr-072Hr	0.34	0.00	0.00	0.00	0.00	0.00

Weir Link: W-AA7-A4

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-AA7	Default:	0.00 ft
To Node:	NZA-A4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	Discharge Coefficients	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA7-A4	005Yr-024Hr	2.68	-9.63	-3.64	-1.46	-1.46	-1.46
W-AA7-A4	010Yr-024Hr	2.44	-8.15	-2.08	-0.96	-0.96	-0.96
W-AA7-A4	025Yr-072Hr	2.57	-8.64	-3.09	0.84	0.84	0.84
W-AA7-A4	100Yr-072Hr	3.88	-11.69	-1.70	-1.06	-1.06	-1.06

Weir Link: W-B1-B2			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-B1	Default:	0.00 ft
To Node:	NZA-B2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.50 ft	Discharge Coefficients	
Control Elevation:	4.50 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	20.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B1-B2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B1-B2	010Yr-024Hr	0.00	-0.44	0.00	0.00	0.00	0.00
W-B1-B2	025Yr-072Hr	0.00	-8.28	0.00	0.00	0.00	0.00
W-B1-B2	100Yr-072Hr	0.00	-24.70	0.00	-2.47	-2.47	-2.47

Weir Link: W-B1-OUTFALL			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-B1	Default:	0.00 ft
To Node:	OUTFALL (94th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.90 ft	Discharge Coefficients	
Control Elevation:	3.90 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	20.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B1-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B1-OUTFALL	025Yr-072Hr	8.28	0.00	0.00	1.48	1.48	1.48
W-B1-OUTFALL	100Yr-072Hr	34.46	0.00	0.00	3.45	3.45	3.45

Weir Link: W-B2-B3

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-B2	Default:	0.00 ft
To Node:	NZA-B3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.54 ft	**Discharge Coefficients**	
Control Elevation:	4.54 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	20.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B2-B3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B2-B3	010Yr-024Hr	0.00	-5.81	0.00	0.00	0.00	0.00
W-B2-B3	025Yr-072Hr	0.00	-11.96	0.00	-1.67	-1.67	-1.67
W-B2-B3	100Yr-072Hr	0.00	-20.66	0.00	-2.07	-2.07	-2.07

Weir Link: W-B3-B4

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-B4	Default:	0.00 ft
To Node:	NZA-B3	Op Table:	
Link Count:	1	Ref Node:	

Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	5.52 ft
Control Elevation:	5.52 ft
Max Depth:	0.50 ft
Max Width:	20.00 ft
Fillet:	0.00 ft

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B3-B4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B3-B4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B3-B4	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B3-B4	100Yr-072Hr	8.35	0.00	0.00	1.48	1.48	1.48

Weir Link: W-B4-C2

Scenario:	Ex. Conditions
From Node:	NZA-B4
To Node:	NZA-C2
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	5.69 ft
Control Elevation:	5.69 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B4-C2	005Yr-024Hr	0.00	-8.35	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B4-C2	010Yr-024Hr	0.00	-12.82	0.00	0.00	0.00	0.00
W-B4-C2	025Yr-072Hr	0.00	-16.09	0.00	0.00	0.00	0.00
W-B4-C2	100Yr-072Hr	0.00	-22.63	0.00	-1.97	-1.97	-1.97

Weir Link: W-B4-FDOT2B

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	FDOT-1B	Default:	0.00 ft
To Node:	NZA-B4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.21 ft	Discharge Coefficients	
Control Elevation:	4.21 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	20.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B4-FDOT2B	005Yr-024Hr	11.71	0.00	0.00	1.66	1.66	1.66
W-B4-FDOT2B	010Yr-024Hr	16.42	0.00	-1.83	1.84	1.84	1.84
W-B4-FDOT2B	025Yr-072Hr	17.90	0.00	-2.07	1.88	1.88	1.88
W-B4-FDOT2B	100Yr-072Hr	19.01	0.00	-1.45	1.92	1.92	1.92

Weir Link: W-C1-B1

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-B1	Default:	0.00 ft
To Node:	NZA-C1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	

Damping:	0.0000 ft		
Weir Type:	Paved Road Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	4.86 ft	Ref Node:	
Control Elevation:	4.86 ft	**Discharge Coefficients**	
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C1-B1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C1-B1	010Yr-024Hr	0.00	-0.61	0.00	0.00	0.00	0.00
W-C1-B1	025Yr-072Hr	0.00	-10.70	0.00	0.00	0.00	0.00
W-C1-B1	100Yr-072Hr	0.00	-25.41	0.00	0.00	0.00	0.00

Weir Link: W-C1-D2

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-C1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.80 ft	**Discharge Coefficients**	
Control Elevation:	4.80 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C1-D2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C1-D2	010Yr-024Hr	2.89	0.00	0.00	1.01	1.01	1.01

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C1-D2	025Yr-072Hr	10.28	0.00	0.00	1.34	1.34	1.34
W-C1-D2	100Yr-072Hr	19.88	0.00	1.89	1.81	1.81	1.81

Weir Link: W-C2-FDOT3B

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	FDOT-3B	Default:	0.00 ft
To Node:	NZA-C2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.95 ft	**Discharge Coefficients**	
Control Elevation:	3.95 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C2-FDOT3B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C2-FDOT3B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C2-FDOT3B	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C2-FDOT3B	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-D1-D2

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-D1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft

Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.10 ft
Control Elevation:	4.10 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-D2	005Yr-024Hr	22.40	0.00	0.00	2.04	2.04	2.04
W-D1-D2	010Yr-024Hr	31.87	0.00	0.00	2.90	2.90	2.90
W-D1-D2	025Yr-072Hr	34.55	0.00	0.01	3.14	3.14	3.14
W-D1-D2	100Yr-072Hr	32.36	0.00	0.00	2.94	2.94	2.94

Weir Link: W-D1-E1

Scenario:	Ex. Conditions
From Node:	NZA-D1
To Node:	NZA-E1
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.24 ft
Control Elevation:	4.24 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-E1	005Yr-024Hr	8.78	0.00	0.00	1.46	1.46	1.46
W-D1-E1	010Yr-024Hr	17.81	0.00	0.00	1.85	1.85	1.85
W-D1-E1	025Yr-072Hr	24.26	0.00	0.01	2.21	2.21	2.21

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-E1	100Yr-072Hr	26.77	0.00	0.01	2.43	2.43	2.43

Weir Link: W-D1-OUTFALL

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-D1	Default:	0.00 ft
To Node:	OUTFALL (92nd)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.00 ft	Discharge Coefficients	
Control Elevation:	5.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D1-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D1-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D1-OUTFALL	100Yr-072Hr	4.89	0.00	0.00	1.20	1.20	1.20

Weir Link: W-D2-D3

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-D3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	

Geometry Type:	Rectangular		
Invert:	4.18 ft	Ref Node:	
Control Elevation:	4.18 ft	Discharge Coefficients	
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D2-D3	005Yr-024Hr	0.00	-23.23	0.00	-2.11	-2.11	-2.11
W-D2-D3	010Yr-024Hr	0.00	-28.12	0.00	-2.56	-2.56	-2.56
W-D2-D3	025Yr-072Hr	0.00	-32.70	-0.01	-2.97	-2.97	-2.97
W-D2-D3	100Yr-072Hr	0.00	-38.19	0.00	-3.47	-3.47	-3.47

Weir Link: W-D2-E3

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-E3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.17 ft	Discharge Coefficients	
Control Elevation:	4.17 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D2-E3	005Yr-024Hr	0.89	-6.65	0.00	-1.32	-1.32	-1.32
W-D2-E3	010Yr-024Hr	4.49	-10.18	-1.77	-1.52	-1.52	-1.52
W-D2-E3	025Yr-072Hr	5.68	-7.47	-2.34	-1.37	-1.37	-1.37
W-D2-E3	100Yr-072Hr	5.83	-8.49	-1.61	-0.77	-0.77	-0.77

Weir Link: W-D3-D4			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-D4	Default:	0.00 ft
To Node:	NZA-D3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.54 ft	Discharge Coefficients	
Control Elevation:	4.54 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D3-D4	005Yr-024Hr	22.54	0.00	0.00	2.05	2.05	2.05
W-D3-D4	010Yr-024Hr	27.71	0.00	0.00	2.52	2.52	2.52
W-D3-D4	025Yr-072Hr	31.23	0.00	0.00	2.84	2.84	2.84
W-D3-D4	100Yr-072Hr	36.21	0.00	0.00	3.29	3.29	3.29

Weir Link: W-D4-D5			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-D5	Default:	0.00 ft
To Node:	NZA-D4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.56 ft	Discharge Coefficients	
Control Elevation:	4.56 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D4-D5	005Yr-024Hr	17.98	0.00	0.00	1.68	1.68	1.68
W-D4-D5	010Yr-024Hr	22.64	0.00	0.39	2.06	2.06	2.06
W-D4-D5	025Yr-072Hr	25.26	0.00	0.40	2.30	2.30	2.30
W-D4-D5	100Yr-072Hr	26.81	0.00	0.61	2.44	2.44	2.44

Weir Link: W-D5-D6

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-D6	Default:	0.00 ft
To Node:	NZA-D5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.94 ft	**Discharge Coefficients**	
Control Elevation:	4.94 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D5-D6	005Yr-024Hr	11.17	0.00	0.00	1.58	1.58	1.58
W-D5-D6	010Yr-024Hr	16.88	0.00	2.03	1.70	1.70	1.70
W-D5-D6	025Yr-072Hr	18.99	0.00	2.08	1.86	1.86	1.86
W-D5-D6	100Yr-072Hr	18.66	0.00	1.96	1.80	1.80	1.80

Weir Link: W-D6-D7

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-D7	Default:	0.00 ft
To Node:	NZA-D6	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.40 ft
Control Elevation:	4.40 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D6-D7	005Yr-024Hr	4.40	-6.45	-0.67	-1.29	-1.29	-1.29
W-D6-D7	010Yr-024Hr	7.73	-4.09	-0.82	-0.84	-0.84	-0.84
W-D6-D7	025Yr-072Hr	8.63	-2.18	-0.04	0.78	0.78	0.78
W-D6-D7	100Yr-072Hr	9.08	-6.32	0.04	0.83	0.83	0.83

Weir Link: W-D7-FDOT4B

Scenario:	Ex. Conditions
From Node:	FDOT-4B
To Node:	NZA-D7
Link Count:	1
Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.48 ft
Control Elevation:	4.48 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D7-FDOT4B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D7-FDOT4B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D7-FDOT4	025Yr-072Hr	0.48	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
B							
W-D7-FDOT4 B	100Yr-072Hr	0.18	0.00	0.00	0.00	0.00	0.00

Weir Link: W-E1-E2

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-E2	Default:	0.00 ft
To Node:	NZA-E1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.22 ft	**Discharge Coefficients**	
Control Elevation:	4.22 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-E2	005Yr-024Hr	9.78	0.00	0.00	1.52	1.52	1.52
W-E1-E2	010Yr-024Hr	22.98	0.00	0.00	2.09	2.09	2.09
W-E1-E2	025Yr-072Hr	31.70	0.00	0.00	2.88	2.88	2.88
W-E1-E2	100Yr-072Hr	34.30	0.00	0.00	3.12	3.12	3.12

Weir Link: W-E1-F1

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-E1	Default:	0.00 ft
To Node:	NZA-F1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.26 ft	**Discharge Coefficients**	

Control Elevation:	0.00 ft		
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-F1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-F1	010Yr-024Hr	0.00	-0.85	0.00	0.00	0.00	0.00
W-E1-F1	025Yr-072Hr	6.43	-4.55	-0.04	1.29	1.29	1.29
W-E1-F1	100Yr-072Hr	12.48	-21.32	1.55	-1.94	-1.94	-1.94

Weir Link: W-E1-OUTFALL A

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-E1	Default:	0.00 ft
To Node:	OUTFALL (91st) - A	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.68 ft	Discharge Coefficients	
Control Elevation:	4.68 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-OUTFALL A	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL A	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL A	025Yr-072Hr	0.82	0.00	0.00	0.66	0.66	0.66

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-OUTFALL A	100Yr-072Hr	12.07	0.00	0.00	1.63	1.63	1.63

Weir Link: W-E1-OUTFALL B

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-E1	Default:	0.00 ft
To Node:	OUTFALL (91st) - B	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.68 ft	Discharge Coefficients	
Control Elevation:	4.68 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-OUTFALL B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL B	025Yr-072Hr	0.82	0.00	0.00	0.66	0.66	0.66
W-E1-OUTFALL B	100Yr-072Hr	12.07	0.00	0.00	1.63	1.63	1.63

Weir Link: W-E2-E3

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-E3	Default:	0.00 ft
To Node:	NZA-E2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft

Weir Type:	Broad Crested Vertical
Geometry Type:	Rectangular
Invert:	4.17 ft
Control Elevation:	4.17 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E2-E3	005Yr-024Hr	19.35	0.00	0.00	1.89	1.89	1.89
W-E2-E3	010Yr-024Hr	23.53	0.00	0.00	2.14	2.14	2.14
W-E2-E3	025Yr-072Hr	26.47	0.00	0.01	2.41	2.41	2.41
W-E2-E3	100Yr-072Hr	26.70	0.00	0.00	2.43	2.43	2.43

Weir Link: W-E3-E4

Scenario:	Ex. Conditions
From Node:	NZA-E4
To Node:	NZA-E3
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.38 ft
Control Elevation:	4.38 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E3-E4	005Yr-024Hr	17.93	0.00	0.00	1.86	1.86	1.86
W-E3-E4	010Yr-024Hr	24.87	0.00	0.00	2.26	2.26	2.26
W-E3-E4	025Yr-072Hr	24.50	0.00	0.00	2.23	2.23	2.23

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E3-E4	100Yr-072Hr	30.15	0.00	0.00	2.74	2.74	2.74

Weir Link: W-E4-E5

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-E5	Default:	0.00 ft
To Node:	NZA-E4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.81 ft	Discharge Coefficients	
Control Elevation:	4.81 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E4-E5	005Yr-024Hr	0.24	0.00	0.00	0.00	0.00	0.00
W-E4-E5	010Yr-024Hr	7.21	0.00	0.00	1.09	1.09	1.09
W-E4-E5	025Yr-072Hr	12.11	0.00	-1.98	1.16	1.16	1.16
W-E4-E5	100Yr-072Hr	13.26	0.00	-2.06	1.21	1.21	1.21

Weir Link: W-E5-E6

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-E6	Default:	0.00 ft
To Node:	NZA-E5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.50 ft	Discharge Coefficients	
Control Elevation:	4.50 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	

Max Width:	22.00 ft		
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E5-E6	005Yr-024Hr	11.68	0.00	0.00	1.49	1.49	1.49
W-E5-E6	010Yr-024Hr	16.82	0.00	1.87	1.57	1.57	1.57
W-E5-E6	025Yr-072Hr	17.42	0.00	-2.58	1.59	1.59	1.59
W-E5-E6	100Yr-072Hr	18.02	0.00	1.94	1.64	1.64	1.64

Weir Link: W-E6-E7

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-E7	Default:	0.00 ft
To Node:	NZA-E6	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.03 ft	**Discharge Coefficients**	
Control Elevation:	4.03 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E6-E7	005Yr-024Hr	10.56	-3.34	-2.53	1.09	1.09	1.09
W-E6-E7	010Yr-024Hr	13.69	-2.49	-1.67	1.24	1.24	1.24
W-E6-E7	025Yr-072Hr	14.88	0.00	-3.09	1.35	1.35	1.35
W-E6-E7	100Yr-072Hr	17.81	0.00	3.46	1.62	1.62	1.62

Weir Link: W-E7-E8

Scenario:	Ex. Conditions
From Node:	NZA-E8
To Node:	NZA-E7
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.36 ft
Control Elevation:	4.36 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E7-E8	005Yr-024Hr	9.67	-2.05	-3.65	1.21	1.21	1.21
W-E7-E8	010Yr-024Hr	11.14	-0.01	-3.11	1.39	1.39	1.39
W-E7-E8	025Yr-072Hr	12.42	0.00	-2.06	1.51	1.51	1.51
W-E7-E8	100Yr-072Hr	14.94	0.00	-2.07	1.36	1.36	1.36

Weir Link: W-E8-FDOT1A

Scenario:	Ex. Conditions
From Node:	FDOT-1A
To Node:	NZA-E8
Link Count:	1
Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.46 ft
Control Elevation:	4.46 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E8-FDOT1A	005Yr-024Hr	5.85	0.00	0.00	1.28	1.28	1.28
W-E8-FDOT1A	010Yr-024Hr	6.34	0.00	-0.01	1.30	1.30	1.30
W-E8-FDOT1A	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E8-FDOT1A	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-E8-FDOT5B

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	FDOT-5B	Default:	0.00 ft
To Node:	NZA-E8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.46 ft	**Discharge Coefficients**	
Control Elevation:	4.46 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E8-FDOT5B	005Yr-024Hr	6.10	0.00	-0.04	1.22	1.22	1.22
W-E8-FDOT5B	010Yr-024Hr	9.43	0.00	-3.54	1.41	1.41	1.41
W-E8-FDOT5B	025Yr-072Hr	9.79	0.00	-3.58	1.33	1.33	1.33
W-E8-FDOT5B	100Yr-072Hr	9.87	0.00	-3.97	1.10	1.10	1.10

Weir Link: W-F1-F2

Scenario:	Ex. Conditions
From Node:	NZA-F1
To Node:	NZA-F2
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.23 ft
Control Elevation:	4.23 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F1-F2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F1-F2	010Yr-024Hr	0.00	-2.24	0.00	-0.92	-0.92	-0.92
W-F1-F2	025Yr-072Hr	5.44	-11.37	2.09	-1.30	-1.30	-1.30
W-F1-F2	100Yr-072Hr	7.76	-15.81	3.72	-1.70	-1.70	-1.70

Weir Link: W-F1-G1

Scenario:	Ex. Conditions
From Node:	NZA-F1
To Node:	NZA-G1
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.28 ft
Control Elevation:	4.28 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F1-G1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F1-G1	010Yr-024Hr	0.45	0.00	0.00	0.00	0.00	0.00
W-F1-G1	025Yr-072Hr	8.98	-0.60	0.02	1.13	1.13	1.13
W-F1-G1	100Yr-072Hr	11.32	-2.65	-1.90	1.46	1.46	1.46

Weir Link: W-F2-F3

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-F3	Default:	0.00 ft
To Node:	NZA-F2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.24 ft	**Discharge Coefficients**	
Control Elevation:	4.24 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F2-F3	005Yr-024Hr	3.96	0.00	0.00	1.12	1.12	1.12
W-F2-F3	010Yr-024Hr	11.82	0.00	0.00	1.62	1.62	1.62
W-F2-F3	025Yr-072Hr	21.06	0.00	0.00	1.96	1.96	1.96
W-F2-F3	100Yr-072Hr	26.87	0.00	-1.35	2.44	2.44	2.44

Weir Link: W-F2-G2

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-F2	Default:	0.00 ft
To Node:	NZA-G2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.01 ft
Control Elevation:	4.01 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F2-G2	005Yr-024Hr	4.23	0.00	0.00	1.15	1.15	1.15
W-F2-G2	010Yr-024Hr	11.67	0.00	0.00	1.61	1.61	1.61
W-F2-G2	025Yr-072Hr	18.89	0.00	-2.43	1.84	1.84	1.84
W-F2-G2	100Yr-072Hr	23.06	0.00	-1.12	2.10	2.10	2.10

Weir Link: W-F3-F4

Scenario:	Ex. Conditions
From Node:	NZA-F3
To Node:	NZA-F4
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Gravel Road Vertical
Geometry Type:	Rectangular
Invert:	4.77 ft
Control Elevation:	4.77 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F3-F4	005Yr-024Hr	0.00	-1.59	0.00	0.00	0.00	0.00
W-F3-F4	010Yr-024Hr	0.00	-8.61	0.00	0.00	0.00	0.00
W-F3-F4	025Yr-072Hr	0.00	-15.53	0.00	-1.76	-1.76	-1.76
W-F3-F4	100Yr-072Hr	0.00	-25.21	0.00	-2.29	-2.29	-2.29

Weir Link: W-F4-F5			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-F5	Default:	0.00 ft
To Node:	NZA-F4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.03 ft	Discharge Coefficients	
Control Elevation:	5.03 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F4-F5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F4-F5	010Yr-024Hr	3.91	0.00	0.00	1.12	1.12	1.12
W-F4-F5	025Yr-072Hr	11.18	0.00	0.00	1.59	1.59	1.59
W-F4-F5	100Yr-072Hr	22.26	0.00	0.00	2.02	2.02	2.02

Weir Link: W-F4-G4			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-F4	Default:	0.00 ft
To Node:	NZA-G4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.05 ft	Discharge Coefficients	
Control Elevation:	0.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F4-G4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F4-G4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F4-G4	025Yr-072Hr	2.53	0.00	0.00	0.97	0.97	0.97
W-F4-G4	100Yr-072Hr	7.86	0.00	2.00	1.10	1.10	1.10

Weir Link: W-F5-F6

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-F6	Default:	0.00 ft
To Node:	NZA-F5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.81 ft	Discharge Coefficients	
Control Elevation:	4.81 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F5-F6	005Yr-024Hr	0.06	-1.53	0.00	-0.80	-0.80	-0.80
W-F5-F6	010Yr-024Hr	4.13	-2.49	0.02	1.12	1.12	1.12
W-F5-F6	025Yr-072Hr	5.39	-2.67	1.67	-0.76	-0.76	-0.76
W-F5-F6	100Yr-072Hr	12.71	-4.60	-1.63	1.16	1.16	1.16

Weir Link: W-F6-F7

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-F7	Default:	0.00 ft
To Node:	NZA-F6	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.63 ft
Control Elevation:	4.63 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F6-F7	005Yr-024Hr	3.01	-4.93	-0.01	1.02	1.02	1.02
W-F6-F7	010Yr-024Hr	8.09	-7.31	2.95	1.40	1.40	1.40
W-F6-F7	025Yr-072Hr	2.37	-7.74	2.49	-0.94	-0.94	-0.94
W-F6-F7	100Yr-072Hr	6.74	-9.77	1.65	-1.10	-1.10	-1.10

Weir Link: W-F7-F8

Scenario:	Ex. Conditions
From Node:	NZA-F8
To Node:	NZA-F7
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.60 ft
Control Elevation:	4.60 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F7-F8	005Yr-024Hr	0.34	-7.57	0.00	-1.33	-1.33	-1.33
W-F7-F8	010Yr-024Hr	5.09	-11.71	2.09	-1.30	-1.30	-1.30
W-F7-F8	025Yr-072Hr	0.47	-12.25	2.09	-1.29	-1.29	-1.29
W-F7-F8	100Yr-072Hr	0.09	-15.81	2.09	-1.75	-1.75	-1.75

Weir Link: W-F8-F9			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-F9	Default:	0.00 ft
To Node:	NZA-F8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.75 ft	Discharge Coefficients	
Control Elevation:	4.75 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F8-F9	005Yr-024Hr	2.33	0.00	0.00	0.94	0.94	0.94
W-F8-F9	010Yr-024Hr	5.95	0.00	0.04	1.26	1.26	1.26
W-F8-F9	025Yr-072Hr	6.88	-0.71	-3.11	1.18	1.18	1.18
W-F8-F9	100Yr-072Hr	7.21	-2.04	-1.60	-0.84	-0.84	-0.84

Weir Link: W-F8-G8			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-F8	Default:	0.00 ft
To Node:	NZA-G8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	0.00 ft	Discharge Coefficients	
Control Elevation:	0.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F8-G8	005Yr-024Hr	8.03	-0.03	0.04	0.73	0.73	0.73
W-F8-G8	010Yr-024Hr	10.51	-0.03	0.05	0.96	0.96	0.96
W-F8-G8	025Yr-072Hr	10.98	-0.01	0.05	1.00	1.00	1.00
W-F8-G8	100Yr-072Hr	11.05	-0.02	0.04	1.00	1.00	1.00

Weir Link: W-F9-FDOT2A

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	FDOT-2A	Default:	0.00 ft
To Node:	NZA-F9	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.77 ft	Discharge Coefficients	
Control Elevation:	4.77 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F9-FDOT2A	005Yr-024Hr	0.82	0.00	0.00	0.66	0.66	0.66
W-F9-FDOT2A	010Yr-024Hr	4.10	0.00	0.00	1.12	1.12	1.12
W-F9-FDOT2A	025Yr-072Hr	6.83	0.00	-0.24	1.33	1.33	1.33
W-F9-FDOT2A	100Yr-072Hr	6.43	0.00	0.11	1.30	1.30	1.30

Weir Link: W-G1-G2

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-G2	Default:	0.00 ft
To Node:	NZA-G1	Op Table:	
Link Count:	1	Ref Node:	

Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.36 ft
Control Elevation:	4.36 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G1-G2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G1-G2	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G1-G2	025Yr-072Hr	0.00	-11.27	0.00	-1.50	-1.50	-1.50
W-G1-G2	100Yr-072Hr	3.35	-11.73	1.77	-1.55	-1.55	-1.55

Weir Link: W-G2-G3

Scenario:	Ex. Conditions
From Node:	NZA-G2
To Node:	NZA-G3
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.13 ft
Control Elevation:	4.13 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-G3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-G3	010Yr-024Hr	0.00	-8.66	0.00	0.00	0.00	0.00
W-G2-G3	025Yr-072Hr	0.00	-22.44	0.39	-2.04	-2.04	-2.04
W-G2-G3	100Yr-072Hr	0.00	-28.38	2.15	-2.58	-2.58	-2.58

Weir Link: W-G2-I1

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-G2	Default:	0.00 ft
To Node:	NZA-I1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.29 ft	**Discharge Coefficients**	
Control Elevation:	4.29 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-I1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-I1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-I1	025Yr-072Hr	17.44	0.00	0.00	1.84	1.84	1.84
W-G2-I1	100Yr-072Hr	22.06	0.00	-3.53	2.01	2.01	2.01

Weir Link: W-G2-OUTFALL

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-G2	Default:	0.00 ft
To Node:	OUTFALL (89th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.00 ft	**Discharge Coefficients**	

Control Elevation:	5.00 ft		
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-OUTFALL	100Yr-072Hr	4.64	0.00	0.00	1.18	1.18	1.18

Weir Link: W-G3-G4

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-G3	Default:	0.00 ft
To Node:	NZA-G4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.73 ft	Discharge Coefficients	
Control Elevation:	4.73 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G3-G4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G3-G4	010Yr-024Hr	0.00	-4.66	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G3-G4	025Yr-072Hr	0.00	-16.77	0.00	-1.81	-1.81	-1.81
W-G3-G4	100Yr-072Hr	0.00	-27.73	0.00	-2.52	-2.52	-2.52

Weir Link: W-G4-G5

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-G4	Default:	0.00 ft
To Node:	NZA-G5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.84 ft	Discharge Coefficients	
Control Elevation:	4.84 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G4-G5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G4-G5	010Yr-024Hr	0.00	-8.07	0.00	-1.42	-1.42	-1.42
W-G4-G5	025Yr-072Hr	0.00	-15.51	0.00	-1.77	-1.77	-1.77
W-G4-G5	100Yr-072Hr	0.00	-20.72	1.23	-1.88	-1.88	-1.88

Weir Link: W-G5-G6

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-G6	Default:	0.00 ft
To Node:	NZA-G5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.48 ft	Discharge Coefficients	
Control Elevation:	4.48 ft	Weir Default:	2.800

Max Depth:	0.50 ft		
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G5-G6	005Yr-024Hr	5.05	0.00	0.00	1.10	1.10	1.10
W-G5-G6	010Yr-024Hr	7.11	-0.72	-2.57	1.11	1.11	1.11
W-G5-G6	025Yr-072Hr	12.25	-0.62	-1.60	1.11	1.11	1.11
W-G5-G6	100Yr-072Hr	13.52	0.00	-2.70	1.23	1.23	1.23

Weir Link: W-G6-G8

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-G6	Default:	0.00 ft
To Node:	NZA-G7	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.55 ft	Discharge Coefficients	
Control Elevation:	4.55 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G6-G8	005Yr-024Hr	0.82	-2.96	0.01	-0.89	-0.89	-0.89
W-G6-G8	010Yr-024Hr	2.55	-4.02	1.38	-1.04	-1.04	-1.04
W-G6-G8	025Yr-072Hr	2.00	-7.88	2.36	-1.09	-1.09	-1.09
W-G6-G8	100Yr-072Hr	0.00	-8.23	1.30	-1.15	-1.15	-1.15

Weir Link: W-G7-G8			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-G7	Default:	0.00 ft
To Node:	NZA-G8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.44 ft	Discharge Coefficients	
Control Elevation:	0.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G7-G8	005Yr-024Hr	5.98	0.00	0.00	1.29	1.29	1.29
W-G7-G8	010Yr-024Hr	7.73	-0.53	1.97	1.40	1.40	1.40
W-G7-G8	025Yr-072Hr	8.29	-2.18	1.42	1.43	1.43	1.43
W-G7-G8	100Yr-072Hr	7.79	-4.91	-1.72	1.40	1.40	1.40

Weir Link: W-G8-G9			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-G8	Default:	0.00 ft
To Node:	NZA-G9	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.63 ft	Discharge Coefficients	
Control Elevation:	4.63 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G8-G9	005Yr-024Hr	0.00	-4.45	0.00	-1.17	-1.17	-1.17
W-G8-G9	010Yr-024Hr	0.00	-8.59	0.03	-1.44	-1.44	-1.44
W-G8-G9	025Yr-072Hr	0.00	-10.87	-1.61	-1.55	-1.55	-1.55
W-G8-G9	100Yr-072Hr	0.00	-11.21	1.65	-1.56	-1.56	-1.56

Weir Link: W-G8-I7

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I7	Default:	0.00 ft
To Node:	NZA-G8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.70 ft	Discharge Coefficients	
Control Elevation:	4.70 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G8-I7	005Yr-024Hr	0.00	-3.32	0.00	0.00	0.00	0.00
W-G8-I7	010Yr-024Hr	0.00	-16.47	0.00	-1.80	-1.80	-1.80
W-G8-I7	025Yr-072Hr	0.00	-21.44	1.25	-1.95	-1.95	-1.95
W-G8-I7	100Yr-072Hr	0.00	-22.04	1.45	-2.00	-2.00	-2.00

Weir Link: W-G9-FDOT3A

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	FDOT-3A	Default:	0.00 ft
To Node:	NZA-G9	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.31 ft
Control Elevation:	4.31 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G9-FDOT3 A	005Yr-024Hr	2.59	0.00	0.48	0.91	0.91	0.91
W-G9-FDOT3 A	010Yr-024Hr	3.77	0.00	1.12	0.90	0.90	0.90
W-G9-FDOT3 A	025Yr-072Hr	4.78	0.00	1.07	0.94	0.94	0.94
W-G9-FDOT3 A	100Yr-072Hr	4.38	0.00	0.76	1.10	1.10	1.10

Weir Link: W-I1-I2

Scenario:	Ex. Conditions
From Node:	NZA-I2
To Node:	NZA-I1
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.03 ft
Control Elevation:	4.03 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I1-I2	005Yr-024Hr	7.87	0.00	0.00	1.41	1.41	1.41

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I1-I2	010Yr-024Hr	14.19	0.00	0.00	1.72	1.72	1.72
W-I1-I2	025Yr-072Hr	19.11	0.00	-2.00	1.90	1.90	1.90
W-I1-I2	100Yr-072Hr	28.34	0.00	-3.09	2.58	2.58	2.58

Weir Link: W-I1-OUTFALL

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I1	Default:	0.00 ft
To Node:	OUTFALL (88th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.00 ft	Discharge Coefficients	
Control Elevation:	5.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I1-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I1-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I1-OUTFALL	100Yr-072Hr	2.72	0.00	0.00	0.99	0.99	0.99

Weir Link: W-I2-I3

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I2	Default:	0.00 ft
To Node:	NZA-I3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	

Damping:	0.0000 ft		
Weir Type:	Paved Road Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	4.55 ft	Ref Node:	
Control Elevation:	4.55 ft	**Discharge Coefficients**	
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I2-I3	005Yr-024Hr	0.00	-6.77	0.00	0.00	0.00	0.00
W-I2-I3	010Yr-024Hr	0.00	-11.01	0.00	0.00	0.00	0.00
W-I2-I3	025Yr-072Hr	0.00	-14.19	0.00	-1.57	-1.57	-1.57
W-I2-I3	100Yr-072Hr	0.00	-21.73	1.57	-1.98	-1.98	-1.98

Weir Link: W-I3-I4

Scenario:	Ex. Conditions	**Bottom Clip**	
From Node:	NZA-I3	Default:	0.00 ft
To Node:	NZA-I4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.56 ft	**Discharge Coefficients**	
Control Elevation:	4.56 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I3-I4	005Yr-024Hr	0.10	-3.15	0.00	-0.64	-0.64	-0.64
W-I3-I4	010Yr-024Hr	0.09	-5.18	0.00	-0.76	-0.76	-0.76

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I3-I4	025Yr-072Hr	0.12	-7.24	0.00	-1.01	-1.01	-1.01
W-I3-I4	100Yr-072Hr	0.16	-14.12	2.07	-1.28	-1.28	-1.28

Weir Link: W-I4-I5

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I5	Default:	0.00 ft
To Node:	NZA-I4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.86 ft	Discharge Coefficients	
Control Elevation:	4.86 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I4-I5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I4-I5	010Yr-024Hr	0.05	-0.02	0.00	0.00	0.00	0.00
W-I4-I5	025Yr-072Hr	3.30	-0.62	0.00	1.06	1.06	1.06
W-I4-I5	100Yr-072Hr	8.80	-0.73	0.01	1.44	1.44	1.44

Weir Link: W-I5-I6

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I6	Default:	0.00 ft
To Node:	NZA-I5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.70 ft	Discharge Coefficients	
Control Elevation:	4.70 ft	Weir Default:	2.800

Max Depth:	0.50 ft		
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I5-I6	005Yr-024Hr	0.00	-1.60	0.00	0.00	0.00	0.00
W-I5-I6	010Yr-024Hr	0.00	-4.42	0.00	-1.04	-1.04	-1.04
W-I5-I6	025Yr-072Hr	0.29	-6.75	0.01	-1.31	-1.31	-1.31
W-I5-I6	100Yr-072Hr	3.89	-11.43	-1.10	-1.60	-1.60	-1.60

Weir Link: W-I6-I7

Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I6	Default:	0.00 ft
To Node:	NZA-I7	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.48 ft	Discharge Coefficients	
Control Elevation:	4.48 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	11.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I6-I7	005Yr-024Hr	0.00	-1.63	0.00	0.00	0.00	0.00
W-I6-I7	010Yr-024Hr	0.00	-12.83	0.00	-2.33	-2.33	-2.33
W-I6-I7	025Yr-072Hr	0.00	-15.98	0.00	-2.91	-2.91	-2.91
W-I6-I7	100Yr-072Hr	0.00	-17.74	-0.01	-3.23	-3.23	-3.23

Weir Link: W-I6-OUTFALL			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I6	Default:	0.00 ft
To Node:	OUTFALL (CARLYLE)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	7.30 ft	Discharge Coefficients	
Control Elevation:	7.30 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I6-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I6-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I6-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I6-OUTFALL	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-I7-I8			
Scenario:	Ex. Conditions	Bottom Clip	
From Node:	NZA-I7	Default:	0.00 ft
To Node:	NZA-I8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.58 ft	Discharge Coefficients	
Control Elevation:	0.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I7-I8	005Yr-024Hr	0.00	-5.48	0.00	0.00	0.00	0.00
W-I7-I8	010Yr-024Hr	0.00	-12.20	0.00	-1.63	-1.63	-1.63
W-I7-I8	025Yr-072Hr	0.00	-15.47	-2.02	-1.76	-1.76	-1.76
W-I7-I8	100Yr-072Hr	0.00	-18.77	-2.06	-1.87	-1.87	-1.87

Weir Link: W-I8-FDOT4A

Scenario:	Ex. Conditions
From Node:	FDOT-4A
To Node:	NZA-I8
Link Count:	1
Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	3.87 ft
Control Elevation:	3.87 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip

Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients

Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [Ex. Conditions]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I8-FDOT4A	005Yr-024Hr	5.54	0.00	-1.71	1.25	1.25	1.25
W-I8-FDOT4A	010Yr-024Hr	7.33	0.00	1.42	1.26	1.26	1.26
W-I8-FDOT4A	025Yr-072Hr	8.51	0.00	2.37	1.25	1.25	1.25
W-I8-FDOT4A	100Yr-072Hr	9.87	0.00	2.03	1.23	1.23	1.23

Rating Curve: RC-0001

Scenario: Ex. Conditions
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	39.60
9.90	39.60

Comment: Surfside Drainage Wells:
DW 1: 620 GPM/FT
DW 2: 800 GPM/FT
DW 3: 800 GPM/FT

Rating Curve: RC-0002

Scenario: Ex. Conditions
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	33.00
9.90	33.00

Comment: Surfside Drainage Wells:
DW 4: 500 GPM/FT
DW 5: 800 GPM/FT
DW 6: 550 GPM/FT

Rating Curve: RC-0003

Scenario: Ex. Conditions
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	27.67
9.90	27.67

Comment: Surfside Drainage Wells:
DW 7: 500 GPM/FT
DW 8: 400 GPM/FT
DW 9: 650 GPM/FT

Rating Curve: RC-0004

Scenario: Ex. Conditions
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
2.00	14.20
8.00	14.20

Comment: Existing Surfside Pump Station (92nd)

Rating Curve: RC-0005

Scenario: Ex. Conditions
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	42.88
9.90	42.88

Comment: FDOT Drainage Wells:
600 GPM/FT

CALCULATIONS

Post-development Calculations

Background Image: NETWORK DIAGRAM

---Unable to Generate Chart---

Simulation: 005Yr-024Hr

Scenario: COMBINED SOLUTIONS
Run Date/Time: 5/7/2024 11:18:39 AM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0001 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0000 ft	Rainfall Name:	~SCSIII-24
		Rainfall Amount:	6.50 in
Edge Length Option:	Automatic	Storm Duration:	24.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simulation: 010Yr-024Hr

Scenario: COMBINED SOLUTIONS
Run Date/Time: 5/7/2024 11:19:29 AM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	24.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: ~SCSIII-24
Rainfall Amount: 8.52 in
Storm Duration: 24.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 025Yr-072Hr

Scenario: COMBINED SOLUTIONS
Run Date/Time: 5/7/2024 11:20:12 AM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000

End Time:	0	0	0	72.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:

Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching: SAOR
Max Iterations: 6
Over-Relax Weight Fact: 0.5 dec
dZ Tolerance: 0.0010 ft
Max dZ: 1.0000 ft
Link Optimizer Tol: 0.0001 ft
Edge Length Option: Automatic

IA Recovery Time: 24.0000 hr
Smp/Man Basin Rain Opt: Global
Rainfall Name: ~SFWMD-72
Rainfall Amount: 13.10 in
Storm Duration: 72.0000 hr
Dflt Damping (1D): 0.0050 ft
Min Node Srf Area (1D): 100 ft2
Energy Switch (1D): Energy

Comment:

Simulation: 100Yr-072Hr

Scenario: COMBINED SOLUTIONS
Run Date/Time: 5/7/2024 11:22:10 AM
Program Version: ICPR4 4.07.08

General

Run Mode: Normal

	Year	Month	Day	Hour [hr]
Start Time:	0	0	0	0.0000
End Time:	0	0	0	72.0000

	Hydrology [sec]	Surface Hydraulics [sec]
Min Calculation Time:	60.0000	0.1000
Max Calculation Time:		30.0000

Output Time Increments

Hydrology

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Surface Hydraulics

Year	Month	Day	Hour [hr]	Time Increment [min]
0	0	0	0.0000	15.0000

Restart File

Save Restart: False

Resources & Lookup Tables

Resources

Rainfall Folder:
Unit Hydrograph Folder:

Lookup Tables

Boundary Stage Set:
Extern Hydrograph Set:
Curve Number Set:
Green-Ampt Set:
Vertical Layers Set:
Impervious Set:

Tolerances & Options

Time Marching:	SAOR	IA Recovery Time:	24.0000 hr
Max Iterations:	6		
Over-Relax Weight Fact:	0.5 dec		
dZ Tolerance:	0.0001 ft	Smp/Man Basin Rain Opt:	Global
Max dZ:	1.0000 ft		
Link Optimizer Tol:	0.0000 ft	Rainfall Name:	~SFWMD-72
		Rainfall Amount:	17.60 in
Edge Length Option:	Automatic	Storm Duration:	72.0000 hr
		Dflt Damping (1D):	0.0050 ft
		Min Node Srf Area (1D):	100 ft2
		Energy Switch (1D):	Energy

Comment:

Simple Basin: A1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-A1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.7600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: A2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-A2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.5500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: A3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-A3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	6.1200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: A4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-A4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.5600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-AA1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.2700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-AA2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.1900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-AA3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.0800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-AA4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.1300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: AA5

Scenario:	COMBINED SOLUTIONS
Node:	NZA-AA5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.3000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-B1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.4300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-B2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.2700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-B3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.7700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: B4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-B4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.6400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: C1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-C1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: C2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-C2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.4800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-D1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.2400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-D2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-D3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.3000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-D4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	6.9900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D5

Scenario:	COMBINED SOLUTIONS
Node:	NZA-D5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	8.8200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D6

Scenario:	COMBINED SOLUTIONS
Node:	NZA-D6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	9.0700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: D7

Scenario:	COMBINED SOLUTIONS
Node:	NZA-D7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.5500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.8300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.8900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E5

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E6

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E7

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.9700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: E8

Scenario:	COMBINED SOLUTIONS
Node:	NZA-E8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.6300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.5700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.7800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.9900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F5

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.7800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F6

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.8800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F7

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.8800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F8

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.9000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: F9

Scenario:	COMBINED SOLUTIONS
Node:	NZA-F9
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.8800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-1A

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-1A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.0500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-1B

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-1B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.9700 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-2A

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-2A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	5.8100 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-2B

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-2B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.0500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-3A

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-3A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.5900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-3B

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-3B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-4A

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-4A
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.3400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-4B

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-4B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.3000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: FDOT-5B

Scenario:	COMBINED SOLUTIONS
Node:	FDOT-5B
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.9600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.1000 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.2600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.4300 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.0800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G5

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.1900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G6

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.7900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G7

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G8

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.4400 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: G9

Scenario:	COMBINED SOLUTIONS
Node:	NZA-G9
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	3.4900 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I1

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I1
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	1.3600 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I2

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I2
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.1800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I3

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I3
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.3800 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00

% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I4

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I4
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.4500 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I5

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I5
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.8100 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I6

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I6
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	2.2100 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I7

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I7
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs
Time Shift:	0.0000 hr
Unit Hydrograph:	UH256
Peaking Factor:	256.0
Area:	4.1200 ac
Curve Number:	85.0
% Impervious:	0.00
% DCIA:	0.00
% Direct:	0.00
Rainfall Name:	

Comment:

Simple Basin: I8

Scenario:	COMBINED SOLUTIONS
Node:	NZA-I8
Hydrograph Method:	NRCS Unit Hydrograph
Infiltration Method:	Curve Number
Time of Concentration:	30.0000 min
Max Allowable Q:	0.00 cfs

Time Shift: 0.0000 hr
Unit Hydrograph: UH256
Peaking Factor: 256.0
Area: 3.9500 ac
Curve Number: 85.0
% Impervious: 0.00
% DCIA: 0.00
% Direct: 0.00
Rainfall Name:

Comment:

Node: AQUIFER (89th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
AQUIFER (89th)	005Yr-024Hr	8.00	1.60	0.0000	33.00	0.00	0
AQUIFER (89th)	010Yr-024Hr	8.00	1.60	0.0000	33.00	0.00	0
AQUIFER (89th)	025Yr-072Hr	8.00	1.60	0.0000	33.00	0.00	0
AQUIFER (89th)	100Yr-072Hr	8.00	1.60	0.0000	33.00	0.00	0

Node: AQUIFER (94th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage

Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
AQUIFER (94th)	005Yr-024Hr	8.00	1.60	0.0000	39.60	0.00	0
AQUIFER (94th)	010Yr-024Hr	8.00	1.60	0.0000	39.60	0.00	0
AQUIFER (94th)	025Yr-072Hr	8.00	1.60	0.0000	39.60	0.00	0
AQUIFER (94th)	100Yr-072Hr	8.00	1.60	0.0000	39.60	0.00	0

Node: AQUIFER (CARLYLE)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
AQUIFER (CARLYLE)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
AQUIFER (CARLYLE)	010Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
AQUIFER (CARLYLE)	025Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0
AQUIFER (CARLYLE)	100Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0

Node: FDOT AQUIFER (94TH)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT AQUIFER (94TH)	005Yr-024Hr	8.00	1.60	0.0000	42.88	0.00	0
FDOT AQUIFER (94TH)	010Yr-024Hr	8.00	1.60	0.0000	42.88	0.00	0
FDOT AQUIFER (94TH)	025Yr-072Hr	8.00	1.60	0.0000	42.88	0.00	0
FDOT AQUIFER (94TH)	100Yr-072Hr	8.00	1.60	0.0000	42.88	0.00	0

Node: FDOT AQUIFER (CARLYLE)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment: FDOT AQUIFER

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT AQUIFER (CARLYLE)	005Yr-024Hr	8.00	1.60	0.0000	42.88	0.00	0
FDOT AQUIFER (CARLYLE)	010Yr-024Hr	8.00	1.60	0.0000	42.88	0.00	0
FDOT AQUIFER (CARLYLE)	025Yr-072Hr	8.00	1.60	0.0000	42.88	0.00	0
FDOT AQUIFER (CARLYLE)	100Yr-072Hr	8.00	1.60	0.0000	42.88	0.00	0

Node: FDOT OUTFALL (94th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT OUTFALL (94th)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (94th)	010Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (94th)	025Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (94th)	100Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0

Node: FDOT OUTFALL (CARLYLE)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT OUTFALL (CARLYLE)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (CARLYLE)	010Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT OUTFALL (CARLYLE)	025Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0
FDOT	100Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	0

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (CARLYLE)							

Node: FDOT-1A

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 4.86 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.36	0.0001	4
4.86	0.6200	27007
8.00	1.8900	82328

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-1A	005Yr-024Hr	4.86	4.70	0.0027	7.42	7.22	18350
FDOT-1A	010Yr-024Hr	4.86	4.77	0.0028	10.79	10.58	22096
FDOT-1A	025Yr-072Hr	4.86	5.01	0.0028	13.37	12.82	29667
FDOT-1A	100Yr-072Hr	4.86	5.39	0.0027	18.13	15.27	36321

Node: FDOT-1B

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 5.22 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.72	0.0001	4
5.22	0.4700	20473
8.00	0.8300	36155

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-1B	005Yr-024Hr	5.22	4.12	0.0136	18.83	18.85	1285
FDOT-1B	010Yr-024Hr	5.22	4.74	0.0137	21.02	21.05	1285
FDOT-1B	025Yr-072Hr	5.22	5.08	0.0137	20.95	22.75	14889
FDOT-1B	100Yr-072Hr	5.22	5.59	0.0136	28.40	25.89	22579

Node: FDOT-2A

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 3.91 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
3.44	0.0001	4
3.94	0.5100	22216
8.00	1.5000	65340

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-2A	005Yr-024Hr	3.91	4.78	0.0069	12.34	8.25	31175
FDOT-2A	010Yr-024Hr	3.91	4.96	0.0074	16.59	12.62	33025
FDOT-2A	025Yr-072Hr	3.91	5.16	0.0074	20.27	14.92	35139
FDOT-2A	100Yr-072Hr	3.91	5.55	0.0069	27.64	16.54	39350

Node: FDOT-2B

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs

Initial Stage: 1.40 ft
Warning Stage: 5.21 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.71	0.0001	4
5.21	0.6200	27007
8.00	1.2300	53579

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-2B	005Yr-024Hr	5.21	2.98	0.0052	42.26	42.32	802
FDOT-2B	010Yr-024Hr	5.21	4.14	0.0052	50.95	50.84	802
FDOT-2B	025Yr-072Hr	5.21	4.49	0.0052	52.32	52.19	804
FDOT-2B	100Yr-072Hr	5.21	5.07	0.0052	54.16	54.02	19501

Node: FDOT-3A

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 4.88 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.38	0.0001	4
4.88	0.5500	23958
8.00	1.3500	58806

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-3A	005Yr-024Hr	4.88	4.78	0.0201	27.95	9.16	18989
FDOT-3A	010Yr-024Hr	4.88	4.95	0.0207	27.97	11.64	24716
FDOT-3A	025Yr-072Hr	4.88	5.15	0.0207	27.97	14.15	26958

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-3A	100Yr-072Hr	4.88	5.52	0.0201	27.95	17.42	31136

Node: FDOT-3B

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 4.40 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
3.99	0.0001	4
4.40	0.6200	27007
8.00	2.7300	118919

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-3B	005Yr-024Hr	4.40	3.02	0.0043	8.52	8.53	100
FDOT-3B	010Yr-024Hr	4.40	4.19	0.0044	11.85	11.73	13010
FDOT-3B	025Yr-072Hr	4.40	4.54	0.0044	14.48	13.46	30585
FDOT-3B	100Yr-072Hr	4.40	5.12	-0.0067	19.74	15.74	45522

Node: FDOT-4A

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.18 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.81	0.0001	4
4.31	0.3100	13504
8.00	1.2000	52272

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-4A	005Yr-024Hr	4.18	4.76	-0.0260	13.28	27.95	18760
FDOT-4A	010Yr-024Hr	4.18	4.93	-0.0265	18.63	27.97	20490
FDOT-4A	025Yr-072Hr	4.18	5.12	-0.0265	23.63	27.97	22473
FDOT-4A	100Yr-072Hr	4.18	5.45	-0.0260	32.21	27.95	25897

Node: FDOT-4B

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft
Warning Stage: 3.90 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
3.40	0.0001	4
3.90	0.6300	27443
8.00	1.7500	76230

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-4B	005Yr-024Hr	3.90	4.66	0.0001	9.95	6.82	36485
FDOT-4B	010Yr-024Hr	3.90	4.73	0.0002	12.27	10.86	37363
FDOT-4B	025Yr-072Hr	3.90	5.00	0.0001	15.00	13.58	40503
FDOT-4B	100Yr-072Hr	3.90	5.38	0.0001	20.45	17.44	45011

Node: FDOT-5B

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.40 ft

Warning Stage: 4.86 ft

Stage [ft]	Area [ac]	Area [ft2]
1.40	0.0001	4
4.36	0.0001	4
4.86	0.6600	28750
8.00	2.2300	97139

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
FDOT-5B	005Yr-024Hr	4.86	4.65	0.0001	5.57	5.25	16908
FDOT-5B	010Yr-024Hr	4.86	4.73	0.0002	8.52	8.08	21364
FDOT-5B	025Yr-072Hr	4.86	4.99	0.0001	10.45	9.93	31686
FDOT-5B	100Yr-072Hr	4.86	5.37	0.0001	13.99	12.13	39846

Node: NZA-A1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.60 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.10	0.0001	4
3.60	0.5200	22651
7.50	1.3600	59242

Comment: As-built Structure D-195

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A1	005Yr-024Hr	3.60	3.36	-0.0010	12.60	12.70	11946
NZA-A1	010Yr-024Hr	3.60	4.10	-0.0042	24.40	23.98	27328
NZA-A1	025Yr-072Hr	3.60	4.29	-0.0047	33.29	32.48	29109
NZA-A1	100Yr-072Hr	3.60	4.49	-0.0044	50.25	47.92	31053

Node: NZA-A2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.24 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.74	0.0001	4
4.24	0.4800	20909
7.50	1.6200	70567

Comment: AS-BUILT INLET CA-95

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A2	005Yr-024Hr	4.24	4.76	-0.0057	11.15	8.53	28817
NZA-A2	010Yr-024Hr	4.24	4.97	-0.0053	19.41	17.51	32103
NZA-A2	025Yr-072Hr	4.24	5.09	-0.0053	26.31	24.50	33919
NZA-A2	100Yr-072Hr	4.24	5.24	-0.0052	39.37	36.33	36167

Node: NZA-A3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.45 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.95	0.0001	4
4.45	0.6200	27007
7.50	2.2100	96268

Comment: AS-BUILT STRUCTURE BY95

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A3	005Yr-024Hr	4.45	4.84	-0.0024	12.57	6.96	35981
NZA-A3	010Yr-024Hr	4.45	5.01	-0.0023	17.47	11.18	39624
NZA-A3	025Yr-072Hr	4.45	5.12	-0.0023	21.35	14.43	42296
NZA-A3	100Yr-072Hr	4.45	5.41	-0.0023	29.11	23.83	48859

Node: NZA-A4

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.80 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.30	0.0001	4
4.80	0.6400	27878
7.24	2.2900	99752

Comment: As-built Structrure AB95

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-A4	005Yr-024Hr	4.80	4.40	-0.0066	13.76	13.76	5760
NZA-A4	010Yr-024Hr	4.80	4.92	-0.0068	18.06	16.89	31504
NZA-A4	025Yr-072Hr	4.80	5.18	-0.0068	26.30	20.37	39055
NZA-A4	100Yr-072Hr	4.80	5.61	-0.0066	35.62	24.10	51792

Node: NZA-AA1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.1000	4356
7.50	0.4000	17424

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA1	005Yr-024Hr	4.00	3.46	0.0006	17.70	17.70	308
NZA-AA1	010Yr-024Hr	4.00	3.66	0.0006	21.68	21.67	1696
NZA-AA1	025Yr-072Hr	4.00	3.79	0.0006	24.36	24.34	2800
NZA-AA1	100Yr-072Hr	4.00	4.06	0.0006	31.18	31.15	4816

Node: NZA-AA2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.0900	3920
7.50	0.4000	17424

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA2	005Yr-024Hr	4.00	3.58	0.0008	15.24	15.25	976
NZA-AA2	010Yr-024Hr	4.00	3.80	0.0008	18.82	18.86	2671
NZA-AA2	025Yr-072Hr	4.00	3.94	0.0008	21.14	21.18	3747
NZA-AA2	100Yr-072Hr	4.00	4.18	0.0008	26.77	26.79	4882

Node: NZA-AA3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.5200	22651
7.50	1.0800	47045

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA3	005Yr-024Hr	4.00	3.66	0.0027	13.15	13.05	7222
NZA-AA3	010Yr-024Hr	4.00	3.89	0.0027	16.68	16.39	17829
NZA-AA3	025Yr-072Hr	4.00	4.03	0.0027	19.02	18.39	23052
NZA-AA3	100Yr-072Hr	4.00	4.24	0.0027	23.47	22.83	24465

Node: NZA-AA4

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.1300	5663
7.50	0.7900	34412

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA4	005Yr-024Hr	4.00	3.68	0.0043	18.42	10.95	2254
NZA-AA4	010Yr-024Hr	4.00	3.93	0.0044	18.42	13.95	5086
NZA-AA4	025Yr-072Hr	4.00	4.08	0.0044	18.42	15.73	6477
NZA-AA4	100Yr-072Hr	4.00	4.28	0.0043	19.81	19.13	8051

Node: NZA-AA5

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 3.50 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.1200	5227
7.50	0.4300	18731

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA5	005Yr-024Hr	4.00	3.71	-0.0037	9.04	25.13	2395
NZA-AA5	010Yr-024Hr	4.00	3.97	-0.0037	11.75	25.13	5097
NZA-AA5	025Yr-072Hr	4.00	4.11	-0.0037	13.22	25.13	5803
NZA-AA5	100Yr-072Hr	4.00	4.30	-0.0037	15.69	25.13	6505

Node: NZA-AA7

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.00	0.4700	20473
7.50	0.8800	38333

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-AA7	005Yr-024Hr	8.00	4.40	-0.0017	8.45	3.74	22525
NZA-AA7	010Yr-024Hr	8.00	4.92	-0.0022	15.44	6.61	25180
NZA-AA7	025Yr-072Hr	8.00	5.18	-0.0024	20.37	8.23	26488
NZA-AA7	100Yr-072Hr	8.00	5.61	-0.0021	24.10	8.82	28695

Node: NZA-B1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.17 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.67	0.0001	4
4.17	0.7000	30492
7.50	1.9500	84942

Comment: As-built Structure EX-280

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B1	005Yr-024Hr	4.17	2.99	-0.0059	34.66	35.53	100
NZA-B1	010Yr-024Hr	4.17	3.65	-0.0059	40.00	39.87	100
NZA-B1	025Yr-072Hr	4.17	4.03	-0.0059	45.75	44.70	21904
NZA-B1	100Yr-072Hr	4.17	4.48	-0.0121	72.85	72.16	35612

Node: NZA-B2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.73 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.23	0.0001	4
4.73	0.5200	22651
7.50	1.6900	73616

Comment: As-built Structure EX-283

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B2	005Yr-024Hr	4.73	3.32	-0.0038	16.36	16.78	100
NZA-B2	010Yr-024Hr	4.73	4.35	-0.0039	22.70	22.32	5292
NZA-B2	025Yr-072Hr	4.73	4.70	-0.0038	28.58	27.05	21334
NZA-B2	100Yr-072Hr	4.73	4.97	-0.0040	40.46	37.83	27078

Node: NZA-B3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.83 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.33	0.0001	4
4.83	0.5500	23958
7.50	1.0800	47045

Comment: As-built Structure EX-291

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B3	005Yr-024Hr	4.83	3.45	-0.0030	5.69	5.84	100
NZA-B3	010Yr-024Hr	4.83	4.65	-0.0031	10.95	12.06	15381
NZA-B3	025Yr-072Hr	4.83	4.83	-0.0048	14.61	14.01	23887
NZA-B3	100Yr-072Hr	4.83	5.02	-0.0051	20.68	20.78	25592

Node: NZA-B4

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.80 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.30	0.0001	4
4.80	0.3400	14810
7.64	1.4300	62291

Comment: AS-BUILT STRUCTURE EX-295

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-B4	005Yr-024Hr	4.80	3.44	-0.0079	14.59	14.75	100
NZA-B4	010Yr-024Hr	4.80	4.73	-0.0080	23.43	24.15	12844
NZA-B4	025Yr-072Hr	4.80	5.08	-0.0081	26.64	24.97	19531
NZA-B4	100Yr-072Hr	4.80	5.61	-0.0091	34.92	28.24	28290

Node: NZA-C1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.44 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.94	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
4.44	0.6800	29621
7.50	2.1100	91912

Comment: As-built Structure EX-280

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-C1	005Yr-024Hr	4.44	4.25	-0.0022	8.34	7.24	18662
NZA-C1	010Yr-024Hr	4.44	4.69	-0.0025	11.59	7.47	34675
NZA-C1	025Yr-072Hr	4.44	4.97	-0.0028	14.20	9.05	40471
NZA-C1	100Yr-072Hr	4.44	5.30	-0.0027	24.90	22.15	47074

Node: NZA-C2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 5.78 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
5.28	0.0001	4
5.78	0.5000	21780
6.45	1.3900	60548

Comment: AS-BUILT STRUCTURE EX-404.

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-C2	005Yr-024Hr	5.78	5.95	-0.0008	11.25	9.75	31681
NZA-C2	010Yr-024Hr	5.78	6.04	-0.0008	15.64	13.82	36792
NZA-C2	025Yr-072Hr	5.78	6.10	-0.0007	19.12	16.99	40111
NZA-C2	100Yr-072Hr	5.78	6.20	-0.0004	26.07	23.35	45923

Node: NZA-CS-01

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.13	0.0010	44

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-01	005Yr-024Hr	8.00	2.02	0.0177	35.53	37.56	100
NZA-CS-01	010Yr-024Hr	8.00	2.05	0.0199	39.87	39.86	100
NZA-CS-01	025Yr-072Hr	8.00	2.23	0.0199	42.11	42.15	100
NZA-CS-01	100Yr-072Hr	8.00	2.40	0.0193	45.31	45.31	100

Node: NZA-CS-02

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.83	0.0010	44

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-02	005Yr-024Hr	8.00	2.01	0.0142	27.50	30.24	100
NZA-CS-02	010Yr-024Hr	8.00	2.17	0.0170	34.57	34.65	100
NZA-CS-02	025Yr-072Hr	8.00	2.28	0.0170	36.27	36.35	100
NZA-CS-02	100Yr-072Hr	8.00	2.37	0.0166	38.09	38.09	100

Node: NZA-CS-03

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.13	0.0010	44

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-03	005Yr-024Hr	8.00	3.86	0.0000	30.78	30.78	100
NZA-CS-03	010Yr-024Hr	8.00	4.42	0.0002	36.17	36.17	100
NZA-CS-03	025Yr-072Hr	8.00	4.55	0.0002	37.26	37.26	100
NZA-CS-03	100Yr-072Hr	8.00	4.87	0.0001	39.91	39.91	100

Node: NZA-CS-04

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.00	0.0010	44

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-04	005Yr-024Hr	8.00	2.56	-0.0006	7.23	7.23	100
NZA-CS-04	010Yr-024Hr	8.00	2.86	-0.0007	8.94	8.94	100
NZA-CS-04	025Yr-072Hr	8.00	2.95	-0.0008	9.31	9.31	100

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-04	100Yr-072Hr	8.00	3.05	-0.0008	9.66	9.66	100

Node: NZA-CS-05

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.50	0.0010	44

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-05	005Yr-024Hr	8.00	4.11	0.0058	27.38	27.38	100
NZA-CS-05	010Yr-024Hr	8.00	4.48	0.0068	29.62	29.64	100
NZA-CS-05	025Yr-072Hr	8.00	4.73	0.0070	31.00	31.03	100
NZA-CS-05	100Yr-072Hr	8.00	5.06	0.0058	32.69	32.69	100

Node: NZA-CS-TOWN

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.15	0.0010	44

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-CS-TOWN	005Yr-024Hr	8.00	3.28	0.0004	17.70	17.70	344
NZA-CS-TOWN	010Yr-024Hr	8.00	3.46	0.0004	21.67	21.67	344
NZA-CS-TOWN	025Yr-072Hr	8.00	3.57	0.0004	24.34	24.34	344
NZA-CS-TOWN	100Yr-072Hr	8.00	3.81	0.0004	30.24	30.24	344

Node: NZA-D1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.56 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.06	0.0001	4
3.56	0.4400	19166
7.50	1.1600	50530

Comment: AS-BUILT STRUCTURE EX-271

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D1	005Yr-024Hr	3.56	4.30	0.0044	39.80	29.22	25054
NZA-D1	010Yr-024Hr	3.56	4.70	-0.0089	49.91	45.76	28221
NZA-D1	025Yr-072Hr	3.56	4.97	-0.0100	55.09	48.25	30392
NZA-D1	100Yr-072Hr	3.56	5.33	-0.0099	63.25	59.87	33256

Node: NZA-D2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft

Warning Stage: 3.62 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.12	0.0001	4
3.62	0.4900	21344
7.50	1.4700	64033

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D2	005Yr-024Hr	3.62	4.31	-0.0082	40.27	35.59	28972
NZA-D2	010Yr-024Hr	3.62	4.71	-0.0120	54.33	43.51	33361
NZA-D2	025Yr-072Hr	3.62	4.97	-0.0129	61.52	48.72	36274
NZA-D2	100Yr-072Hr	3.62	5.34	-0.0137	72.91	69.91	40251

Node: NZA-D3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.98 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.48	0.0001	4
3.98	0.4700	20473
7.50	1.5100	65776

Comment: AS-BUILT STRUCTURE EX-263

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D3	005Yr-024Hr	3.98	4.32	-0.0028	34.41	31.11	24879
NZA-D3	010Yr-024Hr	3.98	4.72	-0.0020	45.13	36.90	29959
NZA-D3	025Yr-072Hr	3.98	4.98	-0.0022	50.18	40.54	33357
NZA-D3	100Yr-072Hr	3.98	5.35	-0.0023	64.89	61.57	38051

Node: NZA-D4

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.16 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.66	0.0001	4
4.16	0.9400	40946
7.50	2.5700	111949

Comment: AS-BUILT STRUCTURE EX-258

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D4	005Yr-024Hr	4.16	4.33	-0.0006	32.83	26.57	44508
NZA-D4	010Yr-024Hr	4.16	4.72	-0.0006	46.18	32.88	52892
NZA-D4	025Yr-072Hr	4.16	4.99	-0.0007	53.25	35.41	58498
NZA-D4	100Yr-072Hr	4.16	5.35	-0.0008	66.52	52.55	66313

Node: NZA-D5

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.46 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.96	0.0001	4
4.46	0.9400	40946
7.50	1.5200	66211

Comment: AS-BUILT STRUCTURE EX-253

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D5	005Yr-024Hr	4.46	4.33	-0.0013	22.14	19.12	30358
NZA-D5	010Yr-024Hr	4.46	4.73	-0.0015	35.10	26.26	43158
NZA-D5	025Yr-072Hr	4.46	4.99	-0.0019	42.32	29.12	45349
NZA-D5	100Yr-072Hr	4.46	5.36	-0.0013	55.32	38.20	48419

Node: NZA-D6

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.48 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.98	0.0001	4
4.48	1.0400	45302
7.50	1.9600	85378

Comment: AS-BUILT STRUCTURE EX-249

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D6	005Yr-024Hr	4.48	4.33	-0.0061	24.62	23.60	31936
NZA-D6	010Yr-024Hr	4.48	4.73	-0.0061	26.54	24.80	48602
NZA-D6	025Yr-072Hr	4.48	4.99	-0.0061	31.64	24.36	52098
NZA-D6	100Yr-072Hr	4.48	5.36	-0.0061	43.14	21.55	57014

Node: NZA-D7

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.90 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.40	0.0001	4

Stage [ft]	Area [ac]	Area [ft2]
3.90	0.5900	25700
6.24	1.9200	83635

Comment: AS-BUILT STRUCTURE EX-HG92

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D7	005Yr-024Hr	3.90	4.33	-0.0087	34.11	31.03	36341
NZA-D7	010Yr-024Hr	3.90	4.73	-0.0087	39.17	31.98	46148
NZA-D7	025Yr-072Hr	3.90	4.99	-0.0087	40.35	31.76	52671
NZA-D7	100Yr-072Hr	3.90	5.36	-0.0087	44.02	28.09	61874

Node: NZA-D8

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
-5.45	0.0003	12
3.74	0.0003	12

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-D8	005Yr-024Hr	8.00	4.23	-0.0156	32.46	42.74	100
NZA-D8	010Yr-024Hr	8.00	4.62	-0.0161	32.64	42.91	100
NZA-D8	025Yr-072Hr	8.00	4.89	-0.0161	32.64	42.91	100
NZA-D8	100Yr-072Hr	8.00	5.26	-0.0156	32.46	42.74	100

Node: NZA-DS1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area

Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.20	0.0080	348

Comment: DISCHARGE STRUCTURE

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-DS1	005Yr-024Hr	8.00	1.60	0.0000	0.05	0.00	100
NZA-DS1	010Yr-024Hr	8.00	1.60	0.0001	0.22	0.26	100
NZA-DS1	025Yr-072Hr	8.00	1.60	-0.0002	2.51	2.70	100
NZA-DS1	100Yr-072Hr	8.00	1.60	0.0001	5.71	5.72	100

Node: NZA-DS2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.86	0.0080	348

Comment: DISCHARGE STRUCTURE

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-DS2	005Yr-024Hr	8.00	1.60	0.0000	0.03	0.00	100
NZA-DS2	010Yr-024Hr	8.00	1.60	-0.0001	1.57	1.67	100
NZA-DS2	025Yr-072Hr	8.00	1.60	0.0002	3.28	3.44	100
NZA-DS2	100Yr-072Hr	8.00	1.60	0.0000	5.09	5.09	100

Node: NZA-DS3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.90	0.0080	348

Comment: DISCHARGE STRUCTURE

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-DS3	005Yr-024Hr	8.00	1.62	-0.0002	30.78	30.78	100
NZA-DS3	010Yr-024Hr	8.00	1.62	-0.0019	36.17	36.19	100
NZA-DS3	025Yr-072Hr	8.00	1.62	-0.0019	37.26	37.30	100
NZA-DS3	100Yr-072Hr	8.00	1.63	0.0002	39.91	39.92	100

Node: NZA-E1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.18 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.68	0.0001	4
4.18	0.5100	22216
7.50	1.8400	80150

Comment: AS-BUILT STRUCTURE BA91

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E1	005Yr-024Hr	4.18	4.25	-0.0009	36.37	32.22	23389

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E1	010Yr-024Hr	4.18	4.67	-0.0020	50.36	49.72	30803
NZA-E1	025Yr-072Hr	4.18	4.93	-0.0024	64.50	60.72	35394
NZA-E1	100Yr-072Hr	4.18	5.25	-0.0025	93.04	92.87	40988

Node: NZA-E2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.24 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.74	0.0001	4
4.24	0.4500	19602
7.50	1.4400	62726

Comment: AS-BUILT STRUCTURE EX-180

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E2	005Yr-024Hr	4.24	4.26	-0.0011	33.12	30.78	19902
NZA-E2	010Yr-024Hr	4.24	4.68	-0.0014	41.91	35.37	25379
NZA-E2	025Yr-072Hr	4.24	4.94	-0.0015	46.41	43.32	28856
NZA-E2	100Yr-072Hr	4.24	5.26	-0.0015	61.63	60.04	33150

Node: NZA-E3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.65 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.15	0.0001	4
4.65	0.4600	20038

Stage [ft]	Area [ac]	Area [ft2]
7.50	1.4500	63162

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E3	005Yr-024Hr	4.65	4.31	-0.0030	26.86	26.80	6372
NZA-E3	010Yr-024Hr	4.65	4.71	-0.0038	38.15	35.88	21025
NZA-E3	025Yr-072Hr	4.65	4.98	-0.0039	44.39	40.31	24985
NZA-E3	100Yr-072Hr	4.65	5.33	-0.0039	53.93	51.82	30402

Node: NZA-E4

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.46 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.96	0.0001	4
4.46	0.4600	20038
7.50	1.4900	64904

Comment: AS-BUILT STRUCTURE EX-191

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E4	005Yr-024Hr	4.46	4.31	-0.0009	20.81	19.45	14142
NZA-E4	010Yr-024Hr	4.46	4.72	-0.0061	31.47	26.69	23864
NZA-E4	025Yr-072Hr	4.46	4.98	-0.0067	37.62	30.22	27722
NZA-E4	100Yr-072Hr	4.46	5.34	-0.0013	47.15	41.95	33038

Node: NZA-E5

Scenario: COMBINED SOLUTIONS

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.59 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.09	0.0001	4
4.59	0.4600	20038
7.50	1.5100	65776

Comment: AS-BUILT STRUCTURE DI91

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E5	005Yr-024Hr	4.59	4.32	-0.0008	14.02	13.43	9047
NZA-E5	010Yr-024Hr	4.59	4.72	0.0076	23.42	20.43	22118
NZA-E5	025Yr-072Hr	4.59	4.98	0.0072	30.26	23.98	26224
NZA-E5	100Yr-072Hr	4.59	5.34	-0.0011	39.21	33.34	31902

Node: NZA-E6

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.22 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.72	0.0001	4
4.22	0.4700	20473
7.50	1.4700	64033

Comment: AS-BUILT STRUCTURE EX-CA91

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E6	005Yr-024Hr	4.22	4.32	-0.0007	15.91	13.22	21787

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E6	010Yr-024Hr	4.22	4.72	0.0025	23.01	14.82	27184
NZA-E6	025Yr-072Hr	4.22	4.99	-0.0012	25.16	17.37	30651
NZA-E6	100Yr-072Hr	4.22	5.35	-0.0010	33.88	24.68	35464

Node: NZA-E7

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.06 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.56	0.0001	4
4.06	0.4500	19602
7.50	1.3500	58806

Comment: AS-BUILT STRUCTURE EX-215

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E7	005Yr-024Hr	4.06	4.32	-0.0008	21.22	18.08	22574
NZA-E7	010Yr-024Hr	4.06	4.73	-0.0008	24.06	18.58	27210
NZA-E7	025Yr-072Hr	4.06	4.99	-0.0008	24.07	17.57	30183
NZA-E7	100Yr-072Hr	4.06	5.35	-0.0008	29.04	16.27	34324

Node: NZA-E8

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.4500	19602

Stage [ft]	Area [ac]	Area [ft2]
5.94	1.3300	57935

Comment: AS-BUILT STRUCTURE EX-AB91

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-E8	005Yr-024Hr	4.00	4.32	-0.0076	29.80	23.42	25902
NZA-E8	010Yr-024Hr	4.00	4.73	-0.0077	33.82	25.58	33991
NZA-E8	025Yr-072Hr	4.00	4.99	-0.0077	35.33	25.41	39133
NZA-E8	100Yr-072Hr	4.00	5.35	-0.0076	46.51	27.72	46351

Node: NZA-F1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 2.91 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
2.41	0.0001	4
2.91	0.4700	20473
7.50	1.3100	57064

Comment: AS-BUILT STRUCTURE EX-114

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F1	005Yr-024Hr	2.91	4.04	-0.0020	11.40	9.38	29508
NZA-F1	010Yr-024Hr	2.91	4.66	-0.0022	21.32	18.88	34401
NZA-F1	025Yr-072Hr	2.91	4.94	-0.0027	30.80	20.38	36672
NZA-F1	100Yr-072Hr	2.91	5.30	-0.0021	46.21	19.71	39541

Node: NZA-F2

Scenario: COMBINED SOLUTIONS

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.08 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.58	0.0001	4
4.08	0.3100	13504
7.50	0.9800	42689

Comment: AS-BUILT STRUCTURE EX-119

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F2	005Yr-024Hr	4.08	4.20	-0.0013	8.70	8.31	14513
NZA-F2	010Yr-024Hr	4.08	4.65	-0.0010	26.31	24.72	18405
NZA-F2	025Yr-072Hr	4.08	4.96	-0.0010	31.67	26.21	21059
NZA-F2	100Yr-072Hr	4.08	5.35	-0.0010	37.72	32.95	24382

Node: NZA-F3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.96 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.46	0.0001	4
3.96	0.4200	18295
7.50	1.4100	61420

Comment: EX.AS-BUILT STRUCTURE 123

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F3	005Yr-024Hr	3.96	4.40	-0.0017	7.76	5.06	23680

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F3	010Yr-024Hr	3.96	4.67	-0.0018	12.78	12.35	26897
NZA-F3	025Yr-072Hr	3.96	5.08	-0.0017	22.16	19.00	31937
NZA-F3	100Yr-072Hr	3.96	5.54	-0.0014	38.29	25.90	37560

Node: NZA-F4

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.61 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.11	0.0001	4
3.61	0.4500	19602
7.50	1.4500	63162

Comment: EX.AS-BUILT STRUCTURE 126

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F4	005Yr-024Hr	3.61	4.86	0.0000	9.14	2.69	33589
NZA-F4	010Yr-024Hr	3.61	5.03	0.0001	12.30	8.60	35529
NZA-F4	025Yr-072Hr	3.61	5.16	0.0001	17.85	17.38	36981
NZA-F4	100Yr-072Hr	3.61	5.65	0.0000	35.36	27.37	42413

Node: NZA-F5

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.88 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.38	0.0001	4
3.88	0.4500	19602

Stage [ft]	Area [ac]	Area [ft2]
7.50	1.4100	61420

Comment: EX.AS-BUILT STRUCTURE 131

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F5	005Yr-024Hr	3.88	4.89	0.0000	8.27	2.62	31287
NZA-F5	010Yr-024Hr	3.88	5.18	0.0001	12.99	5.11	34605
NZA-F5	025Yr-072Hr	3.88	5.33	0.0001	13.85	10.87	36391
NZA-F5	100Yr-072Hr	3.88	5.73	0.0000	25.34	22.17	41011

Node: NZA-F6

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.65 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.15	0.0001	4
3.65	0.4500	19602
7.50	1.4100	61420

Comment: EX.AS-BUILT STRUCTURE 135

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F6	005Yr-024Hr	3.65	4.88	0.0000	9.07	5.20	32915
NZA-F6	010Yr-024Hr	3.65	5.18	0.0001	17.68	7.83	36196
NZA-F6	025Yr-072Hr	3.65	5.34	-0.0001	16.00	8.90	37964
NZA-F6	100Yr-072Hr	3.65	5.76	0.0001	22.97	13.22	42506

Node: NZA-F7

Scenario: COMBINED SOLUTIONS

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.29 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.79	0.0001	4
4.29	0.4400	19166
7.50	1.4700	64033

Comment: EX.AS-BUILT STRUCTURE 141

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F7	005Yr-024Hr	4.29	4.87	-0.0003	7.97	8.00	27262
NZA-F7	010Yr-024Hr	4.29	5.17	-0.0002	13.99	12.33	31463
NZA-F7	025Yr-072Hr	4.29	5.34	-0.0001	15.56	12.85	33818
NZA-F7	100Yr-072Hr	4.29	5.76	0.0001	28.18	16.71	39745

Node: NZA-F8

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.44 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.94	0.0001	4
4.44	0.4400	19166
7.50	1.4600	63598

Comment: EX.AS-BUILT STRUCTURE 142

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F8	005Yr-024Hr	4.44	4.85	0.0001	12.84	13.11	25126

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F8	010Yr-024Hr	4.44	5.14	0.0001	18.81	17.66	29357
NZA-F8	025Yr-072Hr	4.44	5.32	0.0001	22.07	18.85	32011
NZA-F8	100Yr-072Hr	4.44	5.76	0.0001	34.49	18.95	38319

Node: NZA-F9

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.27 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.77	0.0001	4
4.27	0.3600	15682
6.52	1.1200	48787

Comment: EX.AS-BUILT STRUCTURE 148

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-F9	005Yr-024Hr	4.27	4.86	-0.0018	5.91	2.62	24359
NZA-F9	010Yr-024Hr	4.27	5.14	-0.0018	10.20	4.44	28527
NZA-F9	025Yr-072Hr	4.27	5.33	-0.0016	14.60	5.93	31269
NZA-F9	100Yr-072Hr	4.27	5.77	-0.0015	19.57	7.75	37684

Node: NZA-G1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.81 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.31	0.0001	4
3.81	0.3100	13504

Stage [ft]	Area [ac]	Area [ft2]
7.50	0.9800	42689

Comment: AS-BUILT STRUCTURE EX-166

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G1	005Yr-024Hr	3.81	3.89	-0.0014	5.87	6.02	14126
NZA-G1	010Yr-024Hr	3.81	4.65	-0.0014	11.88	11.31	20144
NZA-G1	025Yr-072Hr	3.81	4.93	-0.0014	20.45	17.67	22366
NZA-G1	100Yr-072Hr	3.81	5.29	-0.0014	28.70	17.80	25246

Node: NZA-G2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.50	0.0001	4
4.00	0.6800	29621
7.50	2.2400	97574

Comment: EX.AS-BUILT STRUCTURE 108

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G2	005Yr-024Hr	4.00	3.19	-0.0042	29.56	30.46	100
NZA-G2	010Yr-024Hr	4.00	4.56	-0.0050	55.04	48.01	40475
NZA-G2	025Yr-072Hr	4.00	4.91	-0.0073	65.55	60.87	47246
NZA-G2	100Yr-072Hr	4.00	5.27	-0.0062	80.89	62.75	54308

Node: NZA-G3

Scenario: COMBINED SOLUTIONS

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.20 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.70	0.0001	4
4.20	0.4000	17424
7.50	1.2500	54450

Comment: EX.AS-BUILT STRUCTURE 105

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G3	005Yr-024Hr	4.20	3.99	-0.0025	15.86	15.10	9982
NZA-G3	010Yr-024Hr	4.20	4.58	-0.0032	19.36	17.75	21696
NZA-G3	025Yr-072Hr	4.20	5.04	-0.0040	29.27	26.49	26910
NZA-G3	100Yr-072Hr	4.20	5.49	-0.0041	48.06	33.49	31914

Node: NZA-G4

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.80 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.30	0.0001	4
4.80	0.3800	16553
7.50	0.9600	41818

Comment: EX.AS-BUILT STRUCTURE 101

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G4	005Yr-024Hr	4.80	4.35	-0.0008	9.88	9.95	1610

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G4	010Yr-024Hr	4.80	4.92	-0.0011	14.83	14.32	17680
NZA-G4	025Yr-072Hr	4.80	5.15	-0.0014	23.92	23.16	19885
NZA-G4	100Yr-072Hr	4.80	5.64	-0.0014	37.67	34.35	24381

Node: NZA-G5

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.46 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.96	0.0001	4
4.46	0.3900	16988
7.50	1.1100	48352

Comment: EX.AS-BUILT STRUCTURE 95

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G5	005Yr-024Hr	4.46	4.82	-0.0040	9.07	7.64	20756
NZA-G5	010Yr-024Hr	4.46	5.08	-0.0041	12.60	10.26	23427
NZA-G5	025Yr-072Hr	4.46	5.22	-0.0044	16.54	16.29	24864
NZA-G5	100Yr-072Hr	4.46	5.70	-0.0042	25.70	21.93	29740

Node: NZA-G6

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.42 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.92	0.0001	4
4.42	0.3600	15682

Stage [ft]	Area [ac]	Area [ft2]
7.50	1.1400	49658

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G6	005Yr-024Hr	4.42	4.83	-0.0006	7.56	4.71	20188
NZA-G6	010Yr-024Hr	4.42	5.10	-0.0007	11.15	6.42	23158
NZA-G6	025Yr-072Hr	4.42	5.27	-0.0008	12.97	11.51	25024
NZA-G6	100Yr-072Hr	4.42	5.72	-0.0006	18.58	13.43	30071

Node: NZA-G7

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.19 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.69	0.0001	4
4.19	0.4600	20038
7.50	1.5200	66211

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G7	005Yr-024Hr	4.19	4.83	0.0001	8.50	7.97	28964
NZA-G7	010Yr-024Hr	4.19	5.10	0.0002	14.32	10.85	32741
NZA-G7	025Yr-072Hr	4.19	5.28	0.0002	16.56	11.93	35270
NZA-G7	100Yr-072Hr	4.19	5.73	0.0001	22.46	11.21	41524

Node: NZA-G8

Scenario: COMBINED SOLUTIONS

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.18 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.68	0.0001	4
4.18	0.3300	14375
7.50	0.9800	42689

Comment: EX.AS-BUILT STRUCTURE 80

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G8	005Yr-024Hr	4.18	4.83	0.0001	22.27	18.69	19929
NZA-G8	010Yr-024Hr	4.18	5.10	0.0001	27.59	26.82	22247
NZA-G8	025Yr-072Hr	4.18	5.28	0.0001	33.80	31.98	23833
NZA-G8	100Yr-072Hr	4.18	5.73	0.0001	42.16	34.88	27612

Node: NZA-G9

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.84 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.34	0.0001	4
4.84	0.4100	17860
7.00	1.3500	58806

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G9	005Yr-024Hr	4.84	4.83	0.0002	8.38	6.95	17474

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-G9	010Yr-024Hr	4.84	5.10	0.0002	12.59	10.29	22797
NZA-G9	025Yr-072Hr	4.84	5.29	0.0002	15.53	12.02	26401
NZA-G9	100Yr-072Hr	4.84	5.74	0.0001	18.60	12.32	34834

Node: NZA-I1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.72 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.22	0.0001	4
3.72	0.2300	10019
7.50	2.0000	87120

Comment: As-built Structure EX-2011

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I1	005Yr-024Hr	3.72	2.75	-0.0013	14.69	14.64	100
NZA-I1	010Yr-024Hr	3.72	3.52	-0.0013	24.17	23.65	5954
NZA-I1	025Yr-072Hr	3.72	4.84	-0.0107	41.02	29.66	32918
NZA-I1	100Yr-072Hr	3.72	5.20	-0.0111	49.29	36.42	40138

Node: NZA-I2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.95 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.40	0.0001	4
3.95	0.2900	12632

Stage [ft]	Area [ac]	Area [ft2]
7.50	0.9600	41818

Comment: As-built Structure EX-2013

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I2	005Yr-024Hr	3.95	4.28	-0.0012	9.96	9.68	15379
NZA-I2	010Yr-024Hr	3.95	4.41	-0.0012	16.18	15.77	16383
NZA-I2	025Yr-072Hr	3.95	4.90	-0.0012	20.89	20.41	20484
NZA-I2	100Yr-072Hr	3.95	5.31	-0.0009	30.00	29.16	23837

Node: NZA-I3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.49 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.99	0.0001	4
4.49	0.3300	14375
7.50	1.0900	47480

Comment: As-built Structure EX-2071

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I3	005Yr-024Hr	4.49	4.78	-0.0006	6.97	6.77	17562
NZA-I3	010Yr-024Hr	4.49	4.87	-0.0006	11.39	11.01	18529
NZA-I3	025Yr-072Hr	4.49	4.93	-0.0005	14.68	14.20	19174
NZA-I3	100Yr-072Hr	4.49	5.39	-0.0004	24.12	22.00	24313

Node: NZA-I4

Scenario: COMBINED SOLUTIONS

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.43 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.93	0.0001	4
4.43	0.3000	13068
7.50	1.0800	47045

Comment: As-built Structure EX-2021

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I4	005Yr-024Hr	4.43	4.78	-0.0009	5.11	3.50	16982
NZA-I4	010Yr-024Hr	4.43	4.87	-0.0008	6.99	5.60	17960
NZA-I4	025Yr-072Hr	4.43	4.93	-0.0007	9.76	9.79	18612
NZA-I4	100Yr-072Hr	4.43	5.43	-0.0006	19.27	15.88	24129

Node: NZA-I5

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.41 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.91	0.0001	4
4.41	0.3300	14375
7.50	1.3300	57935

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I5	005Yr-024Hr	4.41	4.79	-0.0004	6.57	3.71	19704

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I5	010Yr-024Hr	4.41	4.90	-0.0004	8.61	6.21	21330
NZA-I5	025Yr-072Hr	4.41	5.05	-0.0002	10.47	8.38	23450
NZA-I5	100Yr-072Hr	4.41	5.45	-0.0002	14.65	12.38	29000

Node: NZA-I6

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.24 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.74	0.0001	4
4.24	1.0300	44867
7.50	2.2800	99317

Comment: EX.AS-BUILT STRUCTURE 2025

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I6	005Yr-024Hr	4.24	4.20	0.0001	33.00	30.78	41627
NZA-I6	010Yr-024Hr	4.24	4.90	0.0003	48.75	36.17	55918
NZA-I6	025Yr-072Hr	4.24	5.06	-0.0003	61.21	39.37	58505
NZA-I6	100Yr-072Hr	4.24	5.45	0.0001	80.09	44.44	65111

Node: NZA-I7

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 3.56 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
3.06	0.0001	4
3.56	0.4700	20473

Stage [ft]	Area [ac]	Area [ft2]
7.50	1.4300	62291

Comment: EX.AS-BUILT STRUCTURE 36

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I7	005Yr-024Hr	3.56	4.56	0.0001	31.96	27.17	31072
NZA-I7	010Yr-024Hr	3.56	4.98	0.0001	44.47	39.38	35543
NZA-I7	025Yr-072Hr	3.56	5.20	-0.0003	56.17	47.74	37885
NZA-I7	100Yr-072Hr	3.56	5.62	0.0001	73.06	57.60	42387

Node: NZA-I8

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 4.51 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0001	4
4.01	0.0001	4
4.51	0.4200	18295
6.38	1.3600	59242

Comment: EX.AS-BUILT STRUCTURE 42

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-I8	005Yr-024Hr	4.51	4.76	-0.0004	11.00	8.69	23756
NZA-I8	010Yr-024Hr	4.51	4.98	-0.0004	15.44	13.45	28586
NZA-I8	025Yr-072Hr	4.51	5.21	-0.0004	19.62	17.21	33571
NZA-I8	100Yr-072Hr	4.51	5.63	-0.0002	28.51	21.39	42892

Node: NZA-PS-8

Scenario: COMBINED SOLUTIONS

Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
-13.18	0.0025	109
3.33	0.0025	109

Comment: downstream defender node. exit losses should be accounted for in the downstream pipe to simulate the in-line pollution control device

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS-8	005Yr-024Hr	8.00	4.16	-0.0596	42.74	81.36	129
NZA-PS-8	010Yr-024Hr	8.00	4.55	-0.0606	42.91	81.37	129
NZA-PS-8	025Yr-072Hr	8.00	4.81	-0.0606	42.91	81.37	129
NZA-PS-8	100Yr-072Hr	8.00	5.18	-0.0596	42.74	81.36	129

Node: NZA-PS0

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
3.50	0.0050	218

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS0	005Yr-024Hr	8.00	4.09	0.0107	14.57	14.20	218
NZA-PS0	010Yr-024Hr	8.00	4.45	0.0116	14.56	14.20	218
NZA-PS0	025Yr-072Hr	8.00	4.71	0.0117	14.59	14.20	218
NZA-PS0	100Yr-072Hr	8.00	5.04	0.0108	14.47	14.20	218

Node: NZA-PS1

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
4.00	0.0050	218

Comment: PUMP STATION

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS1	005Yr-024Hr	8.00	2.00	0.0234	37.56	39.60	100
NZA-PS1	010Yr-024Hr	8.00	2.01	0.0249	39.73	39.60	100
NZA-PS1	025Yr-072Hr	8.00	2.20	0.0247	39.77	39.60	100
NZA-PS1	100Yr-072Hr	8.00	2.37	0.0254	39.78	39.60	100

Node: NZA-PS2

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
2.50	0.0050	218

Comment: PUMP STATION

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS2	005Yr-024Hr	8.00	2.00	0.0171	30.24	33.00	122
NZA-PS2	010Yr-024Hr	8.00	2.15	0.0195	33.09	33.00	150
NZA-PS2	025Yr-072Hr	8.00	2.25	0.0196	33.09	33.00	171

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS2	100Yr-072Hr	8.00	2.35	0.0206	33.10	33.00	189

Node: NZA-PS3

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0010	44
2.50	0.0050	218

Comment: PUMP STATION

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-PS3	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	100
NZA-PS3	010Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	100
NZA-PS3	025Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	100
NZA-PS3	100Yr-072Hr	8.00	1.60	0.0000	0.00	0.00	100

Node: NZA-S-106

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0070	305
4.49	0.0070	305

Comment: FDOT PUMP STATION

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S-106	005Yr-024Hr	8.00	2.00	-0.0118	20.90	42.88	768
NZA-S-106	010Yr-024Hr	8.00	2.00	-0.0117	23.07	43.41	768
NZA-S-106	025Yr-072Hr	8.00	2.00	-0.0118	25.94	46.08	768
NZA-S-106	100Yr-072Hr	8.00	2.00	-0.0118	31.85	50.63	768

Node: NZA-S-77

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0040	174
10.17	0.0040	174

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S-77	005Yr-024Hr	8.00	1.98	0.0000	0.27	0.24	1584
NZA-S-77	010Yr-024Hr	8.00	3.87	0.0003	4.86	2.57	2093
NZA-S-77	025Yr-072Hr	8.00	4.20	0.0004	5.99	3.98	2225
NZA-S-77	100Yr-072Hr	8.00	4.78	0.0005	7.48	5.49	1673

Node: NZA-S-82

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0070	305
0.00	0.0070	305

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S-82	005Yr-024Hr	8.00	2.00	0.0033	42.32	43.15	1774
NZA-S-82	010Yr-024Hr	8.00	3.87	0.0031	50.84	47.74	1899
NZA-S-82	025Yr-072Hr	8.00	4.20	0.0030	52.19	48.87	1912
NZA-S-82	100Yr-072Hr	8.00	4.78	-0.0030	54.02	50.36	1934

Node: NZA-S101

Scenario: COMBINED SOLUTIONS
Type: Stage/Area
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft

Stage [ft]	Area [ac]	Area [ft2]
1.60	0.0040	174
10.17	0.0040	174

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
NZA-S101	005Yr-024Hr	8.00	2.00	-0.0081	3.54	14.69	181
NZA-S101	010Yr-024Hr	8.00	2.00	-0.0081	4.67	14.73	181
NZA-S101	025Yr-072Hr	8.00	2.00	-0.0082	5.88	14.77	181
NZA-S101	100Yr-072Hr	8.00	2.00	-0.0081	9.07	14.70	181

Node: OUTFALL (88th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.20 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.20
0	0	0	99999.0000	1.20

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (88th)	005Yr-024Hr	8.00	1.20	0.0000	14.64	0.00	0
OUTFALL (88th)	010Yr-024Hr	8.00	1.20	0.0000	23.65	0.00	0
OUTFALL (88th)	025Yr-072Hr	8.00	1.20	0.0000	29.66	0.00	0
OUTFALL (88th)	100Yr-072Hr	8.00	1.20	0.0000	36.42	0.00	0

Node: OUTFALL (89th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (89th)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
OUTFALL (89th)	010Yr-024Hr	8.00	1.60	0.0000	1.67	0.00	0

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (89th)	025Yr-072Hr	8.00	1.60	0.0000	3.44	0.00	0
OUTFALL (89th)	100Yr-072Hr	8.00	1.60	0.0000	13.74	0.00	0

Node: OUTFALL (91st) - A

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (91st) - A	005Yr-024Hr	8.00	1.60	0.0000	19.50	0.00	0
OUTFALL (91st) - A	010Yr-024Hr	8.00	1.60	0.0000	21.24	0.00	0
OUTFALL (91st) - A	025Yr-072Hr	8.00	1.60	0.0000	30.00	0.00	0
OUTFALL (91st) - A	100Yr-072Hr	8.00	1.60	0.0000	52.03	0.00	0

Node: OUTFALL (91st) - B

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (91st) - B	005Yr-024Hr	8.00	1.60	0.0000	10.19	0.00	0
OUTFALL (91st) - B	010Yr-024Hr	8.00	1.60	0.0000	10.98	0.00	0
OUTFALL (91st) - B	025Yr-072Hr	8.00	1.60	0.0000	19.31	0.00	0
OUTFALL (91st) - B	100Yr-072Hr	8.00	1.60	0.0000	40.84	0.00	0

Node: OUTFALL (92nd)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (92nd)	005Yr-024Hr	8.00	1.60	0.0000	14.20	0.00	0
OUTFALL (92nd)	010Yr-024Hr	8.00	1.60	0.0000	14.20	0.00	0

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (92nd)	025Yr-072Hr	8.00	1.60	0.0000	14.20	0.00	0
OUTFALL (92nd)	100Yr-072Hr	8.00	1.60	0.0000	25.78	0.00	0

Node: OUTFALL (94th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (94th)	005Yr-024Hr	8.00	1.60	0.0000	0.00	0.00	0
OUTFALL (94th)	010Yr-024Hr	8.00	1.60	0.0000	0.26	0.00	0
OUTFALL (94th)	025Yr-072Hr	8.00	1.60	0.0000	5.27	0.00	0
OUTFALL (94th)	100Yr-072Hr	8.00	1.60	0.0000	32.57	0.00	0

Node: OUTFALL (95th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (95th)	005Yr-024Hr	8.00	1.60	0.0000	7.23	0.00	0
OUTFALL (95th)	010Yr-024Hr	8.00	1.60	0.0000	18.41	0.00	0
OUTFALL (95th)	025Yr-072Hr	8.00	1.60	0.0000	29.60	0.00	0
OUTFALL (95th)	100Yr-072Hr	8.00	1.60	0.0000	44.54	0.00	0

Node: OUTFALL (96th)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (96th)	005Yr-024Hr	8.00	1.60	0.0000	17.70	0.00	0
OUTFALL (96th)	010Yr-024Hr	8.00	1.60	0.0000	21.67	0.00	0

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (96th)	025Yr-072Hr	8.00	1.60	0.0000	24.34	0.00	0
OUTFALL (96th)	100Yr-072Hr	8.00	1.60	0.0000	31.15	0.00	0

Node: OUTFALL (CARLYLE)

Scenario: COMBINED SOLUTIONS
Type: Time/Stage
Base Flow: 0.00 cfs
Initial Stage: 1.60 ft
Warning Stage: 8.00 ft
Boundary Stage:

Year	Month	Day	Hour	Stage [ft]
0	0	0	0.0000	1.60
0	0	0	99999.0000	1.60

Comment:

Node Max Conditions [COMBINED SOLUTIONS]

Node Name	Sim Name	Warning Stage [ft]	Max Stage [ft]	Min/Max Delta Stage [ft]	Max Total Inflow [cfs]	Max Total Outflow [cfs]	Max Surface Area [ft2]
OUTFALL (CARLYLE)	005Yr-024Hr	8.00	1.60	0.0000	30.78	0.00	0
OUTFALL (CARLYLE)	010Yr-024Hr	8.00	1.60	0.0000	36.19	0.00	0
OUTFALL (CARLYLE)	025Yr-072Hr	8.00	1.60	0.0000	37.30	0.00	0
OUTFALL (CARLYLE)	100Yr-072Hr	8.00	1.60	0.0000	39.92	0.00	0

Drop Structure Link: CS-01

Scenario: COMBINED SOLUTIONS
From Node: NZA-CS-01
To Node: NZA-DS1
Link Count: 1
Flow Direction: Both

Upstream Pipe
Invert: -1.83 ft
Manning's N: 0.0120
Geometry: Circular
Max Depth: 2.50 ft
Bottom Clip
Default: 0.00 ft

Downstream Pipe
Invert: -1.20 ft
Manning's N: 0.0120
Geometry: Circular
Max Depth: 2.50 ft
Bottom Clip
Default: 0.00 ft

Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	175.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Positive	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	2.00 ft	Op Table:	
Control Elevation:	2.00 ft	Ref Node:	
Max Depth:	0.75 ft	Discharge Coefficients	
Max Width:	7.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-01 - Pipe	005Yr-024Hr	0.05	0.00	0.04	0.00	0.00	0.00
CS-01 - Weir: 1	005Yr-024Hr	0.04	0.00	0.04	0.00	0.00	0.00
CS-01 - Pipe	010Yr-024Hr	0.22	0.00	0.06	0.00	0.00	0.00
CS-01 - Weir: 1	010Yr-024Hr	0.23	0.00	0.05	0.00	0.00	0.00
CS-01 - Pipe	025Yr-072Hr	2.51	0.00	0.05	0.00	0.00	0.00
CS-01 - Weir: 1	025Yr-072Hr	2.51	0.00	0.05	1.54	1.54	1.54
CS-01 - Pipe	100Yr-072Hr	5.71	0.00	0.05	0.00	0.00	0.00
CS-01 - Weir: 1	100Yr-072Hr	5.71	0.00	0.04	2.03	2.03	2.03

Drop Structure Link: CS-02		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-2.30 ft	Invert:	-1.20 ft
		Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-CS-02	Geometry: Circular		Geometry: Circular	
To Node:	NZA-DS2	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	80.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Positive	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	2.00 ft	Ref Node:	
Control Elevation:	2.00 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	3.200
Max Width:	7.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-02 - Pipe	005Yr-024Hr	0.03	0.00	0.03	0.00	0.00	0.00
CS-02 - Weir: 1	005Yr-024Hr	0.03	0.00	0.02	0.00	0.00	0.00
CS-02 - Pipe	010Yr-024Hr	1.57	0.00	0.04	0.00	0.00	0.00
CS-02 - Weir:	010Yr-024Hr	1.57	0.00	0.04	1.32	1.32	1.32

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
1							
CS-02 - Pipe	025Yr-072Hr	3.28	0.00	0.04	0.00	0.00	0.00
CS-02 - Weir: 1	025Yr-072Hr	3.28	0.00	0.04	1.69	1.69	1.69
CS-02 - Pipe	100Yr-072Hr	5.09	0.00	0.04	0.00	0.00	0.00
CS-02 - Weir: 1	100Yr-072Hr	5.09	0.00	0.03	1.95	1.95	1.95

Drop Structure Link: CS-03		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-4.50 ft	Invert:	-4.70 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-CS-03	Geometry: Circular		Geometry: Circular	
To Node:	NZA-DS3	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	60.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Positive	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	2.00 ft	Op Table:	
Control Elevation:	2.00 ft	Ref Node:	
Max Depth:	0.75 ft	Discharge Coefficients	
Max Width:	7.00 ft	Weir Default:	3.200
Fillet:	0.00 ft	Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-03 - Pipe	005Yr-024Hr	30.78	0.00	0.00	0.00	0.00	0.00
CS-03 - Weir: 1	005Yr-024Hr	30.78	0.00	0.00	5.86	5.86	5.86
CS-03 - Pipe	010Yr-024Hr	36.17	0.00	0.00	0.00	0.00	0.00
CS-03 - Weir: 1	010Yr-024Hr	36.17	0.00	-0.01	6.89	6.89	6.89
CS-03 - Pipe	025Yr-072Hr	37.26	0.00	0.00	0.00	0.00	0.00
CS-03 - Weir: 1	025Yr-072Hr	37.26	0.00	0.01	7.10	7.10	7.10
CS-03 - Pipe	100Yr-072Hr	39.91	0.00	0.00	0.00	0.00	0.00
CS-03 - Weir: 1	100Yr-072Hr	39.91	0.00	0.00	7.60	7.60	7.60

Drop Structure Link: CS-04		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-2.00 ft	Invert:	-2.00 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-CS-04	Geometry: Circular		Geometry: Circular	
To Node:	OUTFALL (95th)	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Positive	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	181.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Positive	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical		

Geometry Type:	Rectangular		
Invert:	2.00 ft	Default:	0.00 ft
Control Elevation:	2.00 ft	Op Table:	
Max Depth:	0.75 ft	Ref Node:	
Max Width:	7.00 ft	Discharge Coefficients	
Fillet:	0.00 ft	Weir Default:	3.200
		Weir Table:	
		Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-04 - Pipe	005Yr-024Hr	7.23	0.00	0.00	0.00	0.00	0.00
CS-04 - Weir: 1	005Yr-024Hr	7.23	0.00	0.00	2.00	2.00	2.00
CS-04 - Pipe	010Yr-024Hr	8.94	0.00	-0.01	0.00	0.00	0.00
CS-04 - Weir: 1	010Yr-024Hr	8.94	0.00	-0.01	2.00	2.00	2.00
CS-04 - Pipe	025Yr-072Hr	9.31	0.00	0.02	0.00	0.00	0.00
CS-04 - Weir: 1	025Yr-072Hr	9.31	0.00	-0.04	2.00	2.00	2.00
CS-04 - Pipe	100Yr-072Hr	9.66	0.00	0.03	0.00	0.00	0.00
CS-04 - Weir: 1	100Yr-072Hr	9.66	0.00	-0.04	2.00	2.00	2.00

Drop Structure Link: CS-05		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-2.33 ft	Invert:	1.21 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-CS-05	Geometry: Circular		Geometry: Circular	
To Node:	NZA-0178	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	20.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000

Bend Loss Coef: 0.00
Bend Location: 0.00 dec
Energy Switch: Energy

Pipe Comment:

Weir Component	
Weir:	1
Weir Count:	1
Weir Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	2.10 ft
Control Elevation:	2.10 ft
Max Depth:	0.75 ft
Max Width:	7.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-05 - Pipe	005Yr-024Hr	13.17	0.00	1.37	0.00	0.00	0.00
CS-05 - Weir: 1	005Yr-024Hr	13.17	0.00	1.55	2.51	2.51	2.51
CS-05 - Pipe	010Yr-024Hr	15.41	0.00	-1.46	0.00	0.00	0.00
CS-05 - Weir: 1	010Yr-024Hr	15.41	0.00	-1.62	2.94	2.94	2.94
CS-05 - Pipe	025Yr-072Hr	16.80	0.00	-0.82	0.00	0.00	0.00
CS-05 - Weir: 1	025Yr-072Hr	16.80	0.00	1.62	3.20	3.20	3.20
CS-05 - Pipe	100Yr-072Hr	18.49	0.00	1.58	0.00	0.00	0.00
CS-05 - Weir: 1	100Yr-072Hr	18.49	0.00	1.60	3.52	3.52	3.52

Drop Structure Link: CS-06(R3)		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-1.88 ft	Invert:	-2.30 ft
		Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-0202	Geometry: Circular		Geometry: Circular	
To Node:	NZA-0203	Max Depth:	2.50 ft	Max Depth:	2.50 ft

Link Count:	1
Flow Direction:	Both
Solution:	Combine
Increments:	0
Pipe Count:	1
Damping:	0.0000 ft
Length:	153.00 ft
FHWA Code:	0
Entr Loss Coef:	0.00
Exit Loss Coef:	0.00
Bend Loss Coef:	0.00
Bend Location:	0.00 dec
Energy Switch:	Energy

Bottom Clip			
Default:	0.00 ft	Default:	0.00 ft
Op Table:		Op Table:	
Ref Node:		Ref Node:	
Manning's N:	0.0000	Manning's N:	0.0000
Top Clip			
Default:	0.00 ft	Default:	0.00 ft
Op Table:		Op Table:	
Ref Node:		Ref Node:	
Manning's N:	0.0000	Manning's N:	0.0000

Pipe Comment:

Weir Component

Weir:	1
Weir Count:	1
Weir Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Sharp Crested Vertical
Geometry Type:	Rectangular
Invert:	2.00 ft
Control Elevation:	2.00 ft
Max Depth:	0.75 ft
Max Width:	7.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	
Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-06(R3) - Pipe	005Yr-024Hr	19.50	0.00	0.00	0.00	0.00	0.00
CS-06(R3) - Weir: 1	005Yr-024Hr	19.50	0.00	-0.01	3.71	3.71	3.71
CS-06(R3) - Pipe	010Yr-024Hr	21.24	0.00	-0.01	0.00	0.00	0.00
CS-06(R3) - Weir: 1	010Yr-024Hr	21.24	0.00	-0.01	4.05	4.05	4.05
CS-06(R3) - Pipe	025Yr-072Hr	22.13	0.00	-0.01	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-06(R3) - Weir: 1	025Yr-072Hr	22.13	0.00	-0.01	4.22	4.22	4.22
CS-06(R3) - Pipe	100Yr-072Hr	23.17	0.00	-0.01	0.00	0.00	0.00
CS-06(R3) - Weir: 1	100Yr-072Hr	23.17	0.00	-0.01	4.41	4.41	4.41

Drop Structure Link: CS-07		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED	Invert:	-2.19 ft	Invert:	-2.90 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-E1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-0204	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	213.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	2.00 ft	Ref Node:	
Control Elevation:	2.00 ft	Discharge Coefficients	
Max Depth:	0.75 ft	Weir Default:	3.200
Max Width:	7.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-07 - Pipe	005Yr-024Hr	10.19	0.00	-0.49	0.00	0.00	0.00
CS-07 - Weir: 1	005Yr-024Hr	10.19	0.00	-0.56	1.94	1.94	1.94
CS-07 - Pipe	010Yr-024Hr	10.98	0.00	-0.43	0.00	0.00	0.00
CS-07 - Weir: 1	010Yr-024Hr	10.98	0.00	-0.57	2.09	2.09	2.09
CS-07 - Pipe	025Yr-072Hr	11.44	0.00	0.30	0.00	0.00	0.00
CS-07 - Weir: 1	025Yr-072Hr	11.44	0.00	-0.57	2.18	2.18	2.18
CS-07 - Pipe	100Yr-072Hr	11.98	0.00	-0.37	0.00	0.00	0.00
CS-07 - Weir: 1	100Yr-072Hr	11.98	0.00	-0.54	2.28	2.28	2.28

Drop Structure Link: CS-08		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-1.58 ft	Invert:	-1.58 ft
		Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-I1	Geometry: Circular		Geometry: Circular	
To Node:	OUTFALL (88th)	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Solution:	Combine	Op Table:		Op Table:	
Increments:	0	Ref Node:		Ref Node:	
Pipe Count:	1	Manning's N:	0.0000	Manning's N:	0.0000
Damping:	0.0000 ft	Top Clip			
Length:	15.00 ft	Default:	0.00 ft	Default:	0.00 ft
FHWA Code:	0	Op Table:		Op Table:	
Entr Loss Coef:	0.00	Ref Node:		Ref Node:	
Exit Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component			
Weir:	1	Bottom Clip	
Weir Count:	1	Default:	0.00 ft
Weir Flow Direction:	Positive	Op Table:	
Damping:	0.0000 ft	Ref Node:	
Weir Type:	Sharp Crested Vertical	Top Clip	
Geometry Type:	Rectangular	Default:	0.00 ft
Invert:	2.00 ft	Op Table:	
Control Elevation:	2.00 ft	Ref Node:	
Max Depth:	0.75 ft	Discharge Coefficients	

Max Width: 7.00 ft
Fillet: 0.00 ft

Weir Default: 3.200
Weir Table:
Orifice Default: 0.600
Orifice Table:

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
CS-08 - Pipe	005Yr-024Hr	14.64	0.00	0.02	0.00	0.00	0.00
CS-08 - Weir: 1	005Yr-024Hr	14.64	0.00	-0.02	2.79	2.79	2.79
CS-08 - Pipe	010Yr-024Hr	23.65	0.00	-0.02	0.00	0.00	0.00
CS-08 - Weir: 1	010Yr-024Hr	23.65	0.00	-0.02	4.51	4.51	4.51
CS-08 - Pipe	025Yr-072Hr	29.66	0.00	-0.14	0.00	0.00	0.00
CS-08 - Weir: 1	025Yr-072Hr	29.66	0.00	-0.16	5.65	5.65	5.65
CS-08 - Pipe	100Yr-072Hr	31.07	0.00	-0.19	0.00	0.00	0.00
CS-08 - Weir: 1	100Yr-072Hr	31.07	0.00	-0.16	5.92	5.92	5.92

Rating Curve Link: D-00

Scenario: COMBINED SOLUTIONS
From Node: NZA-PS0
To Node: OUTFALL (92nd)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0004	1.70		1.60	

Comment: Existing Town of Surfside pump station at 92nd Street

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
D-00	005Yr-024Hr	14.20	0.00	14.20	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
D-00	010Yr-024Hr	14.20	0.00	14.20	0.00	0.00	0.00
D-00	025Yr-072Hr	14.20	0.00	14.20	0.00	0.00	0.00
D-00	100Yr-072Hr	14.20	0.00	14.20	0.00	0.00	0.00

Rating Curve Link: DW 1-3

Scenario: COMBINED SOLUTIONS
From Node: NZA-PS1
To Node: AQUIFER (94th)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0001	2.00		1.60	

Comment: 500 GPM/FT

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DW 1-3	005Yr-024Hr	39.60	0.00	39.60	0.00	0.00	0.00
DW 1-3	010Yr-024Hr	39.60	0.00	39.60	0.00	0.00	0.00
DW 1-3	025Yr-072Hr	39.60	0.00	39.60	0.00	0.00	0.00
DW 1-3	100Yr-072Hr	39.60	0.00	39.60	0.00	0.00	0.00

Rating Curve Link: DW 4-6

Scenario: COMBINED SOLUTIONS
From Node: NZA-PS2
To Node: AQUIFER (89th)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0002	2.00		1.60	

Comment: 500 GPM/FT

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow	Min Flow [cfs]	Min/Max	Max Us	Max Ds	Max Avg

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DW 4-6	005Yr-024Hr	33.00	0.00	33.00	0.00	0.00	0.00
DW 4-6	010Yr-024Hr	33.00	0.00	33.00	0.00	0.00	0.00
DW 4-6	025Yr-072Hr	33.00	0.00	33.00	0.00	0.00	0.00
DW 4-6	100Yr-072Hr	33.00	0.00	33.00	0.00	0.00	0.00

Rating Curve Link: DW 7-9

Scenario: COMBINED SOLUTIONS
From Node: NZA-PS3
To Node: AQUIFER (CARLYLE)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0003	2.00		1.60	

Comment: 500 GPM/FT

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
DW 7-9	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
DW 7-9	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
DW 7-9	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
DW 7-9	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Rating Curve Link: FDOT DW- S102-S105

Scenario: COMBINED SOLUTIONS
From Node: NZA-S-82
To Node: FDOT AQUIFER (94TH)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0005	2.00		1.60	

Comment: S-102, S-103, S-104, S-105

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FDOT DW-S102-S105	005Yr-024Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S102-S105	010Yr-024Hr	42.88	0.00	-42.88	0.00	0.00	0.00
FDOT DW-S102-S105	025Yr-072Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S102-S105	100Yr-072Hr	42.88	0.00	42.21	0.00	0.00	0.00

Rating Curve Link: FDOT DW- S96-S99

Scenario: COMBINED SOLUTIONS
From Node: NZA-S-106
To Node: FDOT AQUIFER (CARLYLE)
Link Count: 1
Flow Direction: Both

Table	Elev On [ft]	Elev On Node	Elev Off [ft]	Elev Off Node
RC-0005	2.00		1.60	

Comment: S-96, S-97, S-98, S-99

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FDOT DW-S96-S99	005Yr-024Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S96-S99	010Yr-024Hr	42.88	0.00	41.54	0.00	0.00	0.00
FDOT DW-S96-S99	025Yr-072Hr	42.88	0.00	42.21	0.00	0.00	0.00
FDOT DW-S96-S99	100Yr-072Hr	42.88	0.00	42.21	0.00	0.00	0.00

Pipe Link: FDOT-P-2A-3A		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	-3.43 ft	Invert:	-2.16 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-2A	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-3A	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			

Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	235.86 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
FDOT-P-2A-3 A	005Yr-024Hr	4.19	-8.84	-4.66	-1.25	-1.25	-1.25
FDOT-P-2A-3 A	010Yr-024Hr	4.79	-9.36	-4.72	-1.32	-1.32	-1.32
FDOT-P-2A-3 A	025Yr-072Hr	6.09	-9.36	-4.72	-1.32	-1.32	-1.32
FDOT-P-2A-3 A	100Yr-072Hr	8.37	-8.84	-4.66	-1.25	-1.25	-1.25

Pipe Link: P-A1-A2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.61 ft	Invert:	-1.81 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-A2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-A1	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	276.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A1-A2	005Yr-024Hr	5.97	-0.07	0.03	4.86	4.86	4.86
P-A1-A2	010Yr-024Hr	6.05	-0.08	-0.09	4.93	4.93	4.93
P-A1-A2	025Yr-072Hr	6.09	-0.08	-0.09	4.96	4.96	4.96
P-A1-A2	100Yr-072Hr	6.06	-0.07	0.03	4.94	4.94	4.94

Pipe Link: P-A1-B1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-4.90 ft	Invert:	-2.00 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-A1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-B1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	490.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A1-B1	005Yr-024Hr	5.57	0.00	0.09	3.15	3.15	3.15
P-A1-B1	010Yr-024Hr	6.84	0.00	0.16	3.87	3.87	3.87
P-A1-B1	025Yr-072Hr	6.96	-1.19	0.16	3.94	3.94	3.94
P-A1-B1	100Yr-072Hr	6.95	-1.88	0.09	3.93	3.93	3.93

Pipe Link: P-A1-CS-04		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.81 ft	Invert:	-2.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-A1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-04	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	

Length:	200.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A1-CS-04	005Yr-024Hr	7.23	-0.62	-0.09	4.09	4.09	4.09
P-A1-CS-04	010Yr-024Hr	8.94	-0.59	-0.08	5.06	5.06	5.06
P-A1-CS-04	025Yr-072Hr	9.31	-0.62	-0.09	5.27	5.27	5.27
P-A1-CS-04	100Yr-072Hr	9.66	-0.61	-0.09	5.47	5.47	5.47

Pipe Link: P-A2-A3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.54 ft	Invert:	-1.61 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-A3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-A2	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	274.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A2-A3	005Yr-024Hr	1.82	-2.27	0.16	-1.85	-1.85	-1.85
P-A2-A3	010Yr-024Hr	1.84	-2.11	0.14	-1.72	-1.72	-1.72
P-A2-A3	025Yr-072Hr	1.85	-2.10	0.13	-1.71	-1.71	-1.71

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A2-A3	100Yr-072Hr	1.82	-2.05	0.13	-1.67	-1.67	-1.67

Pipe Link: P-A3-A4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.08 ft	Invert:	-1.54 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-A4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-A3	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	274.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A3-A4	005Yr-024Hr	1.01	-5.08	-0.22	-4.14	-4.14	-4.14
P-A3-A4	010Yr-024Hr	1.01	-5.12	-0.28	-4.17	-4.17	-4.17
P-A3-A4	025Yr-072Hr	1.17	-5.10	-0.28	-4.16	-4.16	-4.16
P-A3-A4	100Yr-072Hr	2.21	-4.96	-0.22	-4.05	-4.05	-4.05

Pipe Link: P-A4-FDOT1B		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-0.82 ft	Invert:	-1.08 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-1B	Geometry: Circular		Geometry: Circular	
To Node:	NZA-A4	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	229.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			

Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-A4-FDOT1B	005Yr-024Hr	2.45	-12.07	1.51	-3.84	-3.84	-3.84
P-A4-FDOT1B	010Yr-024Hr	2.55	-14.13	1.26	-4.50	-4.50	-4.50
P-A4-FDOT1B	025Yr-072Hr	2.55	-15.11	1.26	-4.81	-4.81	-4.81
P-A4-FDOT1B	100Yr-072Hr	2.45	-16.20	1.51	-5.16	-5.16	-5.16

Pipe Link: P-AA1-AA2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	1.60 ft	Invert:	1.60 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-AA2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-AA1	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	117.80 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA1-AA2	005Yr-024Hr	15.25	0.00	0.00	3.09	3.33	3.21
P-AA1-AA2	010Yr-024Hr	18.86	0.00	0.01	3.41	3.66	3.54
P-AA1-AA2	025Yr-072Hr	21.18	0.00	0.01	3.59	3.85	3.72
P-AA1-AA2	100Yr-072Hr	22.91	0.00	0.00	3.74	4.02	3.88

Pipe Link: P-AA2-AA3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	1.60 ft	Invert:	1.60 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-AA3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-AA2	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	133.29 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA2-AA3	005Yr-024Hr	13.05	0.00	0.01	2.55	3.29	2.60
P-AA2-AA3	010Yr-024Hr	16.39	0.00	0.01	2.85	3.29	2.92
P-AA2-AA3	025Yr-072Hr	18.31	0.00	0.01	3.02	3.29	3.09
P-AA2-AA3	100Yr-072Hr	18.92	0.00	-0.01	3.11	3.29	3.19

Pipe Link: P-AA3-AA4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.00 ft	Invert:	0.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-AA4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-AA3	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	122.03 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA3-AA4	005Yr-024Hr	10.95	0.00	1.63	1.60	1.63	1.62
P-AA3-AA4	010Yr-024Hr	13.95	0.00	1.40	1.97	1.97	1.97
P-AA3-AA4	025Yr-072Hr	15.26	0.00	1.40	2.16	2.16	2.16
P-AA3-AA4	100Yr-072Hr	16.06	0.00	1.63	2.27	2.27	2.27

Pipe Link: P-AA5-FDOT1B		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	1.60 ft	Invert:	1.60 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-AA5	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-1B	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	626.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA5-FDOT1B	005Yr-024Hr	6.72	-6.42	-0.02	2.18	4.77	3.47
P-AA5-FDOT1B	010Yr-024Hr	6.72	-8.56	-0.02	-2.73	4.77	3.47
P-AA5-FDOT1B	025Yr-072Hr	6.72	-9.70	-0.02	-3.09	4.77	3.47
P-AA5-FDOT1B	100Yr-072Hr	6.72	-11.25	-0.02	-3.58	4.77	-3.58

Pipe Link: P-AA7-A4		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	1.60 ft	Invert:	1.60 ft
		Manning's N:	0.0120	Manning's N:	0.0120

From Node:	NZA-AA7	Geometry: Circular		Geometry: Circular	
To Node:	NZA-A4	Max Depth:	1.25 ft	Max Depth:	1.25 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	190.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-AA7-A4	005Yr-024Hr	2.49	-2.88	-0.01	-2.35	-2.35	-2.35
P-AA7-A4	010Yr-024Hr	3.16	-3.03	-0.01	2.58	2.58	2.58
P-AA7-A4	025Yr-072Hr	3.52	-3.11	-0.01	2.87	2.87	2.87
P-AA7-A4	100Yr-072Hr	3.44	-3.10	-0.01	2.80	2.80	2.80

Pipe Link: P-B1-B2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-4.86 ft	Invert:	-4.90 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-B2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-B1	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	275.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow	Min Flow [cfs]	Min/Max	Max Us	Max Ds	Max Avg

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B1-B2	005Yr-024Hr	16.78	-2.46	2.07	3.42	3.42	3.42
P-B1-B2	010Yr-024Hr	22.32	-2.93	2.12	4.55	4.55	4.55
P-B1-B2	025Yr-072Hr	22.86	-3.22	2.15	4.66	4.66	4.66
P-B1-B2	100Yr-072Hr	22.95	-3.40	2.12	4.68	4.68	4.68

Pipe Link: P-B1-CS-01		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.75 ft	Invert:	-2.83 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-B1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-01	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	200.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B1-CS-01	005Yr-024Hr	35.53	-0.95	2.33	7.24	7.24	7.24
P-B1-CS-01	010Yr-024Hr	39.87	-0.96	2.34	8.12	8.12	8.12
P-B1-CS-01	025Yr-072Hr	42.11	-0.98	4.16	8.58	8.58	8.58
P-B1-CS-01	100Yr-072Hr	45.31	-0.99	2.31	9.23	9.23	9.23

Pipe Link: P-B2-B3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-4.54 ft	Invert:	-4.86 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-B3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-B2	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	

Length:	275.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B2-B3	005Yr-024Hr	5.84	-3.41	0.72	1.86	1.86	1.86
P-B2-B3	010Yr-024Hr	12.06	-3.47	0.92	3.84	3.84	3.84
P-B2-B3	025Yr-072Hr	12.91	-3.40	0.91	4.11	4.11	4.11
P-B2-B3	100Yr-072Hr	9.09	-3.50	0.84	2.89	2.89	2.89

Pipe Link: P-B3-B4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-3.77 ft	Invert:	-4.54 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-B4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-B3	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	275.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B3-B4	005Yr-024Hr	3.34	-3.99	-0.82	-1.27	-1.27	-1.27
P-B3-B4	010Yr-024Hr	6.31	-4.03	-0.84	2.01	2.01	2.01
P-B3-B4	025Yr-072Hr	7.48	-3.97	-0.84	2.38	2.38	2.38

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B3-B4	100Yr-072Hr	11.46	-4.02	-0.92	3.65	3.65	3.65

Pipe Link: P-B4-C2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.58 ft	Invert:	-0.46 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-C2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-B4	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	628.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-B4-C2	005Yr-024Hr	1.85	-0.01	0.06	3.40	3.40	3.40
P-B4-C2	010Yr-024Hr	1.85	-0.01	0.06	3.40	3.40	3.40
P-B4-C2	025Yr-072Hr	1.85	-0.01	0.06	3.39	3.39	3.39
P-B4-C2	100Yr-072Hr	1.85	-0.01	0.06	3.39	3.39	3.39

Pipe Link: P-C1-B1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.88 ft	Invert:	-2.60 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-C1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-B1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	674.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			

Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-C1-B1	005Yr-024Hr	6.51	-1.71	0.45	3.69	3.69	3.69
P-C1-B1	010Yr-024Hr	7.14	-1.70	0.44	4.04	4.04	4.04
P-C1-B1	025Yr-072Hr	7.64	-1.70	0.45	4.32	4.32	4.32
P-C1-B1	100Yr-072Hr	7.88	-1.70	0.46	4.46	4.46	4.46

Pipe Link: P-C1-D2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.60 ft	Invert:	-2.05 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-C1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-D2	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	715.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-C1-D2	005Yr-024Hr	2.01	-3.39	-0.13	-1.92	-1.92	-1.92
P-C1-D2	010Yr-024Hr	2.14	-4.10	0.10	-2.32	-2.32	-2.32
P-C1-D2	025Yr-072Hr	2.26	-4.31	0.10	-2.44	-2.44	-2.44
P-C1-D2	100Yr-072Hr	1.99	-4.36	-0.13	-2.47	-2.47	-2.47

Pipe Link: P-CS-11-D1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-0.50 ft	Invert:	-2.00 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-0167	Geometry: Circular		Geometry: Circular	
To Node:	NZA-0207	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	1584.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.50	Top Clip			
Exit Loss Coef:	1.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment: add exit loss coefficient due to flap gate					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-CS-11-D1	005Yr-024Hr	8.80	-2.64	0.12	2.80	2.80	2.80
P-CS-11-D1	010Yr-024Hr	9.10	-2.51	0.09	2.90	2.90	2.90
P-CS-11-D1	025Yr-072Hr	9.28	-2.51	0.09	2.96	2.96	2.96
P-CS-11-D1	100Yr-072Hr	9.55	-2.60	0.13	3.04	3.04	3.04

Pipe Link: P-CS-11-PS-8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.00 ft	Invert:	-1.70 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-PS-8	Geometry: Circular		Geometry: Circular	
To Node:	NZA-0176	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	10.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-CS-11-PS-8	005Yr-024Hr	81.36	0.00	5.95	25.90	26.55	26.22
P-CS-11-PS-8	010Yr-024Hr	81.37	-0.01	5.74	25.90	26.55	26.22
P-CS-11-PS-8	025Yr-072Hr	81.37	-0.01	5.92	25.90	26.55	26.22
P-CS-11-PS-8	100Yr-072Hr	81.36	0.00	5.75	25.90	26.55	26.22

Pipe Link: P-CS-TOWN-AA1		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	1.60 ft	Invert:	1.60 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-AA1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-TOWN	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	85.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-CS-TOWN-AA1	005Yr-024Hr	17.70	0.00	0.00	3.84	4.36	4.10
P-CS-TOWN-AA1	010Yr-024Hr	21.67	0.00	0.00	4.18	4.72	4.45
P-CS-TOWN-AA1	025Yr-072Hr	24.34	0.00	0.00	4.40	4.95	4.67
P-CS-TOWN-AA1	100Yr-072Hr	30.24	0.00	0.00	4.87	5.43	5.15

Pipe Link: P-CS3-S3		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	8.00 ft	Invert:	8.00 ft
		Manning's N:	0.0120	Manning's N:	0.0120

From Node:	NZA-CS-03	Geometry: Circular		Geometry: Circular	
To Node:	NZA-PS3	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	12.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-CS3-S3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-CS3-S3	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-CS3-S3	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-CS3-S3	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-D1-CS-05		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.50 ft	Invert:	-2.70 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-05	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	15.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow	Min Flow [cfs]	Min/Max	Max Us	Max Ds	Max Avg

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D1-CS-05	005Yr-024Hr	27.38	-0.30	3.14	8.71	8.71	8.71
P-D1-CS-05	010Yr-024Hr	29.62	-0.30	3.31	9.43	9.43	9.43
P-D1-CS-05	025Yr-072Hr	31.00	-0.30	3.42	9.87	9.87	9.87
P-D1-CS-05	100Yr-072Hr	32.69	-0.30	3.16	10.41	10.41	10.41

Pipe Link: P-D1-D2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.05 ft	Invert:	-2.35 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-D1	Max Depth:	1.75 ft	Max Depth:	1.75 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	217.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D1-D2	005Yr-024Hr	11.71	-0.52	0.50	4.87	4.87	4.87
P-D1-D2	010Yr-024Hr	12.30	-0.52	0.43	5.11	5.11	5.11
P-D1-D2	025Yr-072Hr	12.26	-0.52	0.45	5.10	5.10	5.10
P-D1-D2	100Yr-072Hr	12.39	-0.52	0.51	5.15	5.15	5.15

Pipe Link: P-D1-E1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.35 ft	Invert:	-2.90 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	

Length:	694.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D1-E1	005Yr-024Hr	3.18	-3.43	-0.29	-1.94	-1.94	-1.94
P-D1-E1	010Yr-024Hr	3.56	-3.40	-0.19	2.02	2.02	2.02
P-D1-E1	025Yr-072Hr	3.69	-3.38	-0.19	2.09	2.09	2.09
P-D1-E1	100Yr-072Hr	3.75	-3.36	-0.29	2.12	2.12	2.12

Pipe Link: P-D2-D3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.70 ft	Invert:	-2.05 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-D3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-D2	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	276.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D2-D3	005Yr-024Hr	6.72	-1.76	0.09	3.80	3.80	3.80
P-D2-D3	010Yr-024Hr	6.39	-1.82	0.12	3.62	3.62	3.62
P-D2-D3	025Yr-072Hr	6.33	-1.89	0.12	3.58	3.58	3.58

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D2-D3	100Yr-072Hr	6.27	-1.88	0.12	3.55	3.55	3.55

Pipe Link: P-D2-E3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.70 ft	Invert:	-2.10 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E3	Max Depth:	1.75 ft	Max Depth:	1.75 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	304.83 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D2-E3	005Yr-024Hr	3.76	-4.55	-0.87	-1.89	-1.89	-1.89
P-D2-E3	010Yr-024Hr	4.78	-4.67	-0.79	1.99	1.99	1.99
P-D2-E3	025Yr-072Hr	5.23	-4.62	-0.61	2.17	2.17	2.17
P-D2-E3	100Yr-072Hr	5.58	-4.10	-0.78	2.32	2.32	2.32

Pipe Link: P-D3-D4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.33 ft	Invert:	-2.70 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-D3	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	284.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			

Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D3-D4	005Yr-024Hr	2.35	-1.73	-0.03	2.99	2.99	2.99
P-D3-D4	010Yr-024Hr	2.39	-1.77	0.03	3.05	3.05	3.05
P-D3-D4	025Yr-072Hr	2.41	-1.81	0.03	3.07	3.07	3.07
P-D3-D4	100Yr-072Hr	2.40	-1.80	-0.04	3.05	3.05	3.05

Pipe Link: P-D4-D5		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.43 ft	Invert:	-2.33 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D5	Geometry: Circular		Geometry: Circular	
To Node:	NZA-D4	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	262.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D4-D5	005Yr-024Hr	0.62	-2.01	-0.02	-2.55	-2.55	-2.55
P-D4-D5	010Yr-024Hr	0.63	-2.01	0.06	-2.57	-2.57	-2.57
P-D4-D5	025Yr-072Hr	0.62	-2.03	-0.07	-2.58	-2.58	-2.58
P-D4-D5	100Yr-072Hr	0.63	-2.02	-0.02	-2.57	-2.57	-2.57

Pipe Link: P-D5-D6		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.42 ft	Invert:	-2.43 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D6	Geometry: Circular		Geometry: Circular	
To Node:	NZA-D5	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	301.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D5-D6	005Yr-024Hr	0.35	-3.98	-0.09	-5.06	-5.06	-5.06
P-D5-D6	010Yr-024Hr	0.37	-4.01	-0.15	-5.10	-5.10	-5.10
P-D5-D6	025Yr-072Hr	0.39	-4.00	-0.15	-5.09	-5.09	-5.09
P-D5-D6	100Yr-072Hr	0.39	-4.00	-0.10	-5.10	-5.10	-5.10

Pipe Link: P-D6-D7		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.42 ft	Invert:	-2.42 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-D7	Geometry: Circular		Geometry: Circular	
To Node:	NZA-D6	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	292.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D6-D7	005Yr-024Hr	0.08	-17.85	-0.47	-5.68	-5.68	-5.68
P-D6-D7	010Yr-024Hr	0.11	-18.43	-0.60	-5.87	-5.87	-5.87
P-D6-D7	025Yr-072Hr	0.16	-16.48	-0.65	-5.25	-5.25	-5.25
P-D6-D7	100Yr-072Hr	0.14	-14.68	-0.47	-4.67	-4.67	-4.67

Pipe Link: P-D7-D8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.00 ft	Invert:	-1.86 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-D7	Geometry: Circular		Geometry: Circular	
To Node:	NZA-0162	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	10.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-D7-D8	005Yr-024Hr	31.03	0.00	3.40	9.88	9.88	9.88
P-D7-D8	010Yr-024Hr	31.98	-0.11	3.79	10.18	10.18	10.18
P-D7-D8	025Yr-072Hr	31.76	-0.11	3.81	10.11	10.11	10.11
P-D7-D8	100Yr-072Hr	28.09	-0.01	3.42	8.94	8.94	8.94

Pipe Link: P-DS1-OUTFALL (94TH)		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.20 ft	Invert:	-3.12 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-DS1	Geometry: Circular		Geometry: Circular	
To Node:	OUTFALL (94th)	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft

Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	10.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-DS1-OUTFALL (94TH)	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-DS1-OUTFALL (94TH)	010Yr-024Hr	0.26	0.00	0.05	0.05	0.05	0.05
P-DS1-OUTFALL (94TH)	025Yr-072Hr	2.70	0.00	0.36	0.55	0.55	0.55
P-DS1-OUTFALL (94TH)	100Yr-072Hr	5.72	0.00	0.05	1.17	1.17	1.17

Pipe Link: P-DS2-OUTFALL		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	-1.20 ft	Invert:	-2.47 ft
		Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-DS2	Geometry: Circular		Geometry: Circular	
To Node:	OUTFALL (89th)	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	10.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow	Min Flow [cfs]	Min/Max	Max Us	Max Ds	Max Avg

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-DS2-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-DS2-OUTFALL	010Yr-024Hr	1.67	0.00	-0.20	0.53	0.53	0.53
P-DS2-OUTFALL	025Yr-072Hr	3.44	0.00	-0.22	1.09	1.09	1.09
P-DS2-OUTFALL	100Yr-072Hr	5.09	0.00	0.04	1.62	1.62	1.62

Pipe Link: P-DS3-OUTFALL(CARLYLE)		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	-4.70 ft	Invert:	-4.00 ft
		Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-DS3	Geometry: Circular		Geometry: Circular	
To Node:	OUTFALL (CARLYLE)	Max Depth:	3.00 ft	Max Depth:	3.00 ft
		Bottom Clip			
Link Count:	1	Default:	0.00 ft	Default:	0.00 ft
Flow Direction:	Both	Op Table:		Op Table:	
Damping:	0.0000 ft	Ref Node:		Ref Node:	
Length:	11.00 ft	Manning's N:	0.0000	Manning's N:	0.0000
FHWA Code:	0	Top Clip			
Entr Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Exit Loss Coef:	0.00	Op Table:		Op Table:	
Bend Loss Coef:	0.00	Ref Node:		Ref Node:	
Bend Location:	0.00 dec	Manning's N:	0.0000	Manning's N:	0.0000
Energy Switch:	Energy				
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-DS3-OUTFALL(CARLYLE)	005Yr-024Hr	30.78	0.00	-1.92	4.35	4.35	4.35
P-DS3-OUTFALL(CARLYLE)	010Yr-024Hr	36.19	0.00	10.56	5.12	5.12	5.12
P-DS3-OUTFALL(CARLYLE)	025Yr-072Hr	37.30	0.00	10.55	5.28	5.28	5.28
P-DS3-OUTFALL(CARLYLE)	100Yr-072Hr	39.92	0.00	1.91	5.65	5.65	5.65

Pipe Link: P-E1-E2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.57 ft	Invert:	-2.18 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-E2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E1	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	230.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E1-E2	005Yr-024Hr	14.12	-1.39	0.07	4.50	4.50	4.50
P-E1-E2	010Yr-024Hr	14.20	-1.32	0.11	4.52	4.52	4.52
P-E1-E2	025Yr-072Hr	14.13	-1.40	0.11	4.50	4.50	4.50
P-E1-E2	100Yr-072Hr	13.55	-1.30	0.07	4.31	4.31	4.31

Pipe Link: P-E1-F1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.90 ft	Invert:	-2.71 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	692.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E1-F1	005Yr-024Hr	5.05	-2.99	0.03	2.86	2.86	2.86
P-E1-F1	010Yr-024Hr	5.48	-3.28	-0.10	3.10	3.10	3.10
P-E1-F1	025Yr-072Hr	5.52	-3.39	-0.10	3.12	3.12	3.12
P-E1-F1	100Yr-072Hr	5.59	-3.37	0.04	3.16	3.16	3.16

Pipe Link: P-E2-E3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-0.45 ft	Invert:	-1.57 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-E3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E2	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	260.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E2-E3	005Yr-024Hr	8.36	-1.78	-0.06	2.66	2.66	2.66
P-E2-E3	010Yr-024Hr	8.32	-1.69	-0.12	2.65	2.65	2.65
P-E2-E3	025Yr-072Hr	8.14	-2.12	-0.12	2.59	2.59	2.59
P-E2-E3	100Yr-072Hr	8.23	-1.68	-0.09	2.62	2.62	2.62

Pipe Link: P-E3-E4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.57 ft	Invert:	-0.45 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-E4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E3	Max Depth:	2.00 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft

Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	283.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E3-E4	005Yr-024Hr	6.69	-1.86	0.08	2.13	3.79	2.96
P-E3-E4	010Yr-024Hr	6.84	-1.87	-0.55	2.18	3.87	3.03
P-E3-E4	025Yr-072Hr	7.03	-1.87	-0.57	2.24	3.98	3.11
P-E3-E4	100Yr-072Hr	6.91	-1.86	0.10	2.20	3.91	3.06

Pipe Link: P-E4-E5		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.57 ft	Invert:	-1.57 ft
	SOLUTIONS	Manning's N:	0.0012	Manning's N:	0.0012
From Node:	NZA-E5	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E4	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	277.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E4-E5	005Yr-024Hr	5.35	-2.23	-2.38	1.70	1.70	1.70
P-E4-E5	010Yr-024Hr	9.67	-5.84	-9.66	3.08	3.08	3.08

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E4-E5	025Yr-072Hr	10.93	-5.84	-10.93	3.48	3.48	3.48
P-E4-E5	100Yr-072Hr	8.60	-2.23	2.95	2.74	2.74	2.74

Pipe Link: P-E5-E6		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.79 ft	Invert:	-1.57 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-E6	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E5	Max Depth:	2.25 ft	Max Depth:	2.25 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	275.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E5-E6	005Yr-024Hr	1.72	-2.15	0.22	-0.54	-0.54	-0.54
P-E5-E6	010Yr-024Hr	1.94	-2.17	1.78	-0.55	-0.55	-0.55
P-E5-E6	025Yr-072Hr	2.12	-2.19	1.93	-0.55	-0.55	-0.55
P-E5-E6	100Yr-072Hr	1.99	-2.15	-0.26	-0.54	-0.54	-0.54

Pipe Link: P-E6-E7		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.89 ft	Invert:	-1.79 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-E7	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E6	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	275.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000

Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E6-E7	005Yr-024Hr	1.05	-2.40	-0.07	-1.36	-1.36	-1.36
P-E6-E7	010Yr-024Hr	1.02	-2.83	0.22	-1.60	-1.60	-1.60
P-E6-E7	025Yr-072Hr	1.05	-2.92	0.09	-1.65	-1.65	-1.65
P-E6-E7	100Yr-072Hr	1.03	-2.98	-0.07	-1.69	-1.69	-1.69

Pipe Link: P-E7-E8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-0.69 ft	Invert:	-1.89 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-E8	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E7	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	280.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E7-E8	005Yr-024Hr	0.74	-4.18	-0.15	-5.32	-5.67	-5.45
P-E7-E8	010Yr-024Hr	0.69	-4.14	-0.17	-5.27	-5.67	-5.42
P-E7-E8	025Yr-072Hr	0.72	-4.16	-0.17	-5.30	-5.55	-5.39
P-E7-E8	100Yr-072Hr	0.65	-4.13	-0.16	-5.26	-5.63	-5.38

Pipe Link: P-E9-E8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.78 ft	Invert:	-1.78 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-0186	Geometry: Circular		Geometry: Circular	
To Node:	NZA-E8	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	10.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-E9-E8	005Yr-024Hr	0.09	-23.42	-1.53	-7.45	-7.45	-7.45
P-E9-E8	010Yr-024Hr	0.11	-25.58	-4.66	-8.14	-8.14	-8.14
P-E9-E8	025Yr-072Hr	0.14	-25.23	-4.67	-8.03	-8.03	-8.03
P-E9-E8	100Yr-072Hr	0.14	-24.81	-1.53	-7.90	-7.90	-7.90

Pipe Link: P-F1-F2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.66 ft	Invert:	-1.36 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F1	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	217.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F1-F2	005Yr-024Hr	2.40	-0.02	0.01	3.05	3.05	3.05
P-F1-F2	010Yr-024Hr	2.40	-0.48	0.02	3.06	3.06	3.06
P-F1-F2	025Yr-072Hr	2.40	-0.62	0.02	3.05	3.05	3.05
P-F1-F2	100Yr-072Hr	2.29	-0.58	0.01	2.91	2.91	2.91

Pipe Link: P-F1-G1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.71 ft	Invert:	-2.80 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	119.25 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F1-G1	005Yr-024Hr	1.43	-4.52	-0.21	-2.56	-2.56	-2.56
P-F1-G1	010Yr-024Hr	2.19	-4.66	-0.15	-2.64	-2.64	-2.64
P-F1-G1	025Yr-072Hr	2.77	-4.84	-0.19	-2.74	-2.74	-2.74
P-F1-G1	100Yr-072Hr	2.85	-4.78	-0.21	-2.70	-2.70	-2.70

Pipe Link: P-F2-F3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.36 ft	Invert:	-1.66 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F2	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft

Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	276.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F2-F3	005Yr-024Hr	2.77	-0.01	0.02	3.53	3.53	3.53
P-F2-F3	010Yr-024Hr	2.77	-0.01	0.01	3.53	3.53	3.53
P-F2-F3	025Yr-072Hr	2.77	-0.01	0.02	3.52	3.52	3.52
P-F2-F3	100Yr-072Hr	2.72	-0.01	0.01	3.46	3.46	3.46

Pipe Link: P-F2-G2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.65 ft	Invert:	-1.65 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G2	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	495.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F2-G2	005Yr-024Hr	2.19	-0.37	0.16	2.79	2.79	2.79
P-F2-G2	010Yr-024Hr	2.17	-0.35	0.10	2.76	2.76	2.76

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F2-G2	025Yr-072Hr	2.17	-0.29	0.15	2.76	2.76	2.76
P-F2-G2	100Yr-072Hr	2.17	-0.28	0.15	2.76	2.76	2.76

Pipe Link: P-F4-F5		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.51 ft	Invert:	1.47 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F5	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F4	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	262.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F4-F5	005Yr-024Hr	0.60	0.00	0.00	1.09	1.09	1.09
P-F4-F5	010Yr-024Hr	0.62	0.00	0.00	1.13	1.13	1.13
P-F4-F5	025Yr-072Hr	0.61	0.00	0.00	1.11	1.11	1.11
P-F4-F5	100Yr-072Hr	0.59	0.00	0.00	1.09	1.09	1.09

Pipe Link: P-F4-G4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	1.47 ft	Invert:	1.47 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G4	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	510.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000

Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F4-G4	005Yr-024Hr	1.69	-0.46	0.00	3.09	3.23	3.14
P-F4-G4	010Yr-024Hr	1.69	-0.49	0.00	3.09	3.20	3.13
P-F4-G4	025Yr-072Hr	1.67	-0.18	0.00	3.06	3.16	3.08
P-F4-G4	100Yr-072Hr	1.67	0.00	0.00	3.06	3.12	3.09

Pipe Link: P-F5-F6		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.00 ft	Invert:	-2.00 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-F6	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F5	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	292.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F5-F6	005Yr-024Hr	1.30	-1.50	0.00	-0.85	-0.85	-0.85
P-F5-F6	010Yr-024Hr	1.92	-1.45	0.01	1.09	1.09	1.09
P-F5-F6	025Yr-072Hr	0.75	-1.44	0.02	-0.82	-0.82	-0.82
P-F5-F6	100Yr-072Hr	1.59	-1.43	0.00	0.90	0.90	0.90

Pipe Link: P-F6-F7		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.25 ft	Invert:	-2.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F7	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F6	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	271.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F6-F7	005Yr-024Hr	1.14	-2.12	0.00	-2.71	-2.71	-2.71
P-F6-F7	010Yr-024Hr	0.93	-2.05	0.00	-2.61	-2.61	-2.61
P-F6-F7	025Yr-072Hr	0.51	-1.99	0.01	-2.53	-2.53	-2.53
P-F6-F7	100Yr-072Hr	0.25	-1.60	0.00	-2.03	-2.03	-2.03

Pipe Link: P-F7-F8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.17 ft	Invert:	0.25 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F8	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F7	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	303.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F7-F8	005Yr-024Hr	0.00	-3.00	0.00	-3.82	-3.82	-3.82
P-F7-F8	010Yr-024Hr	0.12	-2.98	0.00	-3.79	-3.79	-3.79
P-F7-F8	025Yr-072Hr	0.00	-2.92	0.00	-3.72	-3.72	-3.72
P-F7-F8	100Yr-072Hr	0.00	-2.95	0.00	-3.76	-3.76	-3.76

Pipe Link: P-F8-F9		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.83 ft	Invert:	-2.17 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-F9	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F8	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	321.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F8-F9	005Yr-024Hr	2.53	0.00	0.00	3.22	3.22	3.22
P-F8-F9	010Yr-024Hr	2.58	-0.17	0.00	3.29	3.29	3.29
P-F8-F9	025Yr-072Hr	2.56	-0.33	0.01	3.25	3.25	3.25
P-F8-F9	100Yr-072Hr	2.40	-0.33	0.00	3.05	3.05	3.05

Pipe Link: P-F8-G8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.88 ft	Invert:	0.61 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G8	Geometry: Circular		Geometry: Circular	
To Node:	NZA-F8	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft

Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	525.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-F8-G8	005Yr-024Hr	0.00	-4.89	0.00	-0.69	-0.69	-0.69
P-F8-G8	010Yr-024Hr	0.00	-6.59	0.01	-0.93	-0.93	-0.93
P-F8-G8	025Yr-072Hr	0.00	-7.04	0.01	-1.00	-1.00	-1.00
P-F8-G8	100Yr-072Hr	0.00	-6.89	0.00	-0.98	-0.98	-0.98

Pipe Link: P-FDOT-1A-2A		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-4.86 ft	Invert:	-3.43 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-1A	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-2A	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	275.42 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-1A-2A	005Yr-024Hr	2.91	-4.28	-0.99	-1.36	-1.36	-1.36

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-1A-2 A	010Yr-024Hr	2.68	-6.43	-0.97	-2.05	-2.05	-2.05
P-FDOT-1A-2 A	025Yr-072Hr	2.08	-7.52	-0.97	-2.39	-2.39	-2.39
P-FDOT-1A-2 A	100Yr-072Hr	1.46	-8.67	-0.99	-2.76	-2.76	-2.76

Pipe Link: P-FDOT-2B-3B		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	-2.97 ft	Invert:	-4.38 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-2B	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-3B	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	657.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-2B-3 B	005Yr-024Hr	4.26	-8.53	2.28	-0.89	-0.89	-0.89
P-FDOT-2B-3 B	010Yr-024Hr	4.40	-11.73	2.10	-1.22	-1.22	-1.22
P-FDOT-2B-3 B	025Yr-072Hr	4.40	-13.46	2.10	-1.40	-1.40	-1.40
P-FDOT-2B-3 B	100Yr-072Hr	4.26	-15.74	2.28	-1.64	-1.64	-1.64

Pipe Link: P-FDOT-2B-B4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.97 ft	Invert:	-3.77 ft

	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-2B	Geometry: Circular		Geometry: Circular	
To Node:	NZA-B4	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	135.04 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-2B-B4	005Yr-024Hr	2.68	-14.50	0.40	-4.62	-4.62	-4.62
P-FDOT-2B-B4	010Yr-024Hr	2.61	-19.05	-0.58	-6.06	-6.06	-6.06
P-FDOT-2B-B4	025Yr-072Hr	2.63	-19.28	0.39	-6.14	-6.14	-6.14
P-FDOT-2B-B4	100Yr-072Hr	2.62	-19.53	0.41	-6.22	-6.22	-6.22

Pipe Link: P-FDOT-3A-4A		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.16 ft	Invert:	-7.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-3A	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-4A	Max Depth:	3.50 ft	Max Depth:	3.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	264.74 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-3A-4A	005Yr-024Hr	7.66	-27.95	3.97	-2.91	-2.91	-2.91
P-FDOT-3A-4A	010Yr-024Hr	11.60	-27.97	4.05	-2.91	-2.91	-2.91
P-FDOT-3A-4A	025Yr-072Hr	14.15	-27.97	4.05	-2.91	-2.91	-2.91
P-FDOT-3A-4A	100Yr-072Hr	17.42	-27.95	3.97	-2.91	-2.91	-2.91

Pipe Link: P-FDOT-3B-4B		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	-4.38 ft	Invert:	-5.00 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-5B	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-5B	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	304.53 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-3B-4B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-FDOT-3B-4B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-FDOT-3B-4B	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-FDOT-3B-4B	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-FDOT-4B-5B		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-5.00 ft	Invert:	-4.16 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-4B	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-5B	Max Depth:	2.50 ft	Max Depth:	2.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	246.31 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-4B-5B	005Yr-024Hr	2.14	-2.97	0.00	-0.60	-0.60	-0.60
P-FDOT-4B-5B	010Yr-024Hr	3.14	-1.17	0.06	0.64	0.64	0.64
P-FDOT-4B-5B	025Yr-072Hr	3.77	-0.17	0.09	0.77	0.77	0.77
P-FDOT-4B-5B	100Yr-072Hr	4.67	-0.90	0.01	0.95	0.95	0.95

Pipe Link: P-FDOT-S106-S101		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-6.18 ft	Invert:	-9.20 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-S-106	Geometry: Circular		Geometry: Circular	
To Node:	NZA-S101	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	223.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT-S106 -S101	005Yr-024Hr	3.54	-14.69	-6.75	-2.08	-2.08	-2.08
P-FDOT-S106 -S101	010Yr-024Hr	4.67	-14.73	-7.06	-2.08	-2.08	-2.08
P-FDOT-S106 -S101	025Yr-072Hr	5.88	-14.77	-6.98	-2.09	-2.09	-2.09
P-FDOT-S106 -S101	100Yr-072Hr	9.07	-14.70	-6.75	-2.08	-2.08	-2.08

Pipe Link: P-FDOT1B-2B		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	1.60 ft	Invert:	0.66 ft
		Manning's N:	0.0110	Manning's N:	0.0110
From Node:	FDOT-1B	Geometry: Circular		Geometry: Circular	
To Node:	FDOT-2B	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	652.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT1B-2B	005Yr-024Hr	12.49	0.00	0.00	3.98	4.36	4.07
P-FDOT1B-2B	010Yr-024Hr	13.50	0.00	-0.01	4.30	4.59	4.33
P-FDOT1B-2B	025Yr-072Hr	13.87	0.00	0.01	4.42	4.74	4.46
P-FDOT1B-2B	100Yr-072Hr	13.58	0.00	0.02	4.32	4.83	4.48

Pipe Link: P-FDOT2B - S-82		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-3.45 ft	Invert:	0.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-2B	Geometry: Circular		Geometry: Circular	
To Node:	NZA-S-82	Max Depth:	4.00 ft	Max Depth:	4.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	378.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT2B - S-82	005Yr-024Hr	42.32	-29.09	1.64	-6.20	6.98	5.17
P-FDOT2B - S-82	010Yr-024Hr	50.84	-29.11	1.51	-6.21	7.13	5.36
P-FDOT2B - S-82	025Yr-072Hr	52.19	-29.11	1.51	-6.21	7.20	5.45
P-FDOT2B - S-82	100Yr-072Hr	54.02	-29.09	1.97	-6.20	7.35	5.64

Pipe Link: P-FDOT4A-S106		Upstream		Downstream	
Scenario:	COMBINED	Invert:	3.81 ft	Invert:	-6.18 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	FDOT-4A	Geometry: Circular		Geometry: Circular	
To Node:	NZA-S-106	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	823.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-FDOT4A-S106	005Yr-024Hr	9.11	0.00	0.00	4.72	1.29	3.00
P-FDOT4A-S106	010Yr-024Hr	12.42	0.00	0.00	5.16	1.76	3.46
P-FDOT4A-S106	025Yr-072Hr	16.82	0.00	0.00	5.66	2.38	4.02
P-FDOT4A-S106	100Yr-072Hr	25.92	0.00	0.00	6.54	3.67	5.10

Pipe Link: P-G1-G2		Upstream		Downstream	
Scenario:	COMBINED SOLUTIONS	Invert:	-2.80 ft	Invert:	-3.19 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G2	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	400.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G1-G2	005Yr-024Hr	6.02	-1.48	0.46	3.41	3.41	3.41
P-G1-G2	010Yr-024Hr	6.62	-1.46	0.42	3.74	3.74	3.74
P-G1-G2	025Yr-072Hr	6.79	-1.40	0.43	3.84	3.84	3.84
P-G1-G2	100Yr-072Hr	6.79	-1.32	0.46	3.84	3.84	3.84

Pipe Link: P-G2-CS-02		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.22 ft	Invert:	-2.30 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-02	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	120.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G2-CS-02	005Yr-024Hr	27.50	-0.19	1.41	8.75	8.75	8.75
P-G2-CS-02	010Yr-024Hr	34.57	-0.19	1.82	11.00	11.00	11.00
P-G2-CS-02	025Yr-072Hr	36.27	-0.19	1.84	11.55	11.55	11.55
P-G2-CS-02	100Yr-072Hr	38.09	-0.19	1.50	12.12	12.12	12.12

Pipe Link: P-G2-G3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-3.38 ft	Invert:	-2.22 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G2	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	262.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G2-G3	005Yr-024Hr	15.10	-0.02	0.21	4.81	4.81	4.81
P-G2-G3	010Yr-024Hr	15.65	-0.18	0.20	4.98	4.98	4.98
P-G2-G3	025Yr-072Hr	15.82	-0.03	0.22	5.04	5.04	5.04
P-G2-G3	100Yr-072Hr	15.90	-0.02	0.22	5.06	5.06	5.06

Pipe Link: P-G2-I1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-3.19 ft	Invert:	-2.93 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-I1	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	563.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G2-I1	005Yr-024Hr	3.31	-1.70	-0.38	1.87	1.87	1.87
P-G2-I1	010Yr-024Hr	6.14	-1.73	-0.38	3.47	3.47	3.47
P-G2-I1	025Yr-072Hr	6.19	-1.69	-0.37	3.50	3.50	3.50
P-G2-I1	100Yr-072Hr	6.13	-1.62	-0.36	3.47	3.47	3.47

Pipe Link: P-G3-G4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	1.48 ft	Invert:	-3.38 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G3	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft

Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	270.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G3-G4	005Yr-024Hr	9.95	-0.03	0.03	3.78	3.17	3.19
P-G3-G4	010Yr-024Hr	10.32	-0.03	0.03	3.79	3.29	3.29
P-G3-G4	025Yr-072Hr	10.15	-0.03	0.04	3.78	3.23	3.23
P-G3-G4	100Yr-072Hr	10.22	-0.03	0.05	3.77	3.25	3.25

Pipe Link: P-G4-G5		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.28 ft	Invert:	1.48 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G5	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G4	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	267.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G4-G5	005Yr-024Hr	7.64	0.00	-0.01	4.32	4.32	4.32
P-G4-G5	010Yr-024Hr	7.90	0.00	-0.01	4.47	4.47	4.47

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G4-G5	025Yr-072Hr	7.89	-0.01	-0.01	4.46	4.46	4.46
P-G4-G5	100Yr-072Hr	7.95	0.00	-0.02	4.50	4.50	4.50

Pipe Link: P-G5-G6		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.19 ft	Invert:	0.28 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G6	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G5	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	279.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G5-G6	005Yr-024Hr	2.83	-0.01	0.01	3.60	3.60	3.60
P-G5-G6	010Yr-024Hr	2.85	-0.02	0.01	3.62	3.62	3.62
P-G5-G6	025Yr-072Hr	2.87	-0.02	0.01	3.66	3.66	3.66
P-G5-G6	100Yr-072Hr	2.85	-0.01	0.01	3.63	3.63	3.63

Pipe Link: P-G6-G8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-0.37 ft	Invert:	0.19 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G8	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G6	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	550.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000

Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G6-G8	005Yr-024Hr	1.75	-2.18	0.01	-1.24	-1.24	-1.24
P-G6-G8	010Yr-024Hr	1.82	-1.83	0.01	-1.04	-1.04	-1.04
P-G6-G8	025Yr-072Hr	1.83	-1.56	-0.01	1.04	1.04	1.04
P-G6-G8	100Yr-072Hr	1.69	-1.00	0.01	0.96	0.96	0.96

Pipe Link: P-G6-I7		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.97 ft	Invert:	-3.42 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I7	Geometry: Circular		Geometry: Circular	
To Node:	NZA-I6	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	280.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G6-I7	005Yr-024Hr	26.55	-0.15	-0.07	3.76	3.76	3.76
P-G6-I7	010Yr-024Hr	28.59	-0.17	-0.63	4.04	4.04	4.04
P-G6-I7	025Yr-072Hr	29.48	-0.20	0.38	4.17	4.17	4.17
P-G6-I7	100Yr-072Hr	30.19	-0.14	-0.07	4.27	4.27	4.27

Pipe Link: P-G8-G9		Upstream		Downstream	
Scenario:	COMBINED	Invert:	0.81 ft	Invert:	-0.37 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-G9	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G8	Max Depth:	1.75 ft	Max Depth:	1.75 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	262.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G8-G9	005Yr-024Hr	6.48	0.00	0.00	2.69	2.69	2.69
P-G8-G9	010Yr-024Hr	6.40	0.00	0.03	2.66	2.66	2.66
P-G8-G9	025Yr-072Hr	6.50	0.00	0.03	2.70	2.70	2.70
P-G8-G9	100Yr-072Hr	6.27	0.00	0.01	2.61	2.61	2.61

Pipe Link: P-G8-I7		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.30 ft	Invert:	-1.83 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I7	Geometry: Circular		Geometry: Circular	
To Node:	NZA-G8	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	570.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-G8-I7	005Yr-024Hr	0.28	-17.52	-0.02	-2.48	-2.48	-2.48
P-G8-I7	010Yr-024Hr	0.30	-16.92	-0.18	-2.39	-2.39	-2.39
P-G8-I7	025Yr-072Hr	0.29	-17.15	0.14	-2.43	-2.43	-2.43
P-G8-I7	100Yr-072Hr	0.27	-17.63	-0.01	-2.49	-2.49	-2.49

Pipe Link: P-I1-I2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.17 ft	Invert:	-2.32 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-I1	Max Depth:	0.83 ft	Max Depth:	0.83 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	267.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I1-I2	005Yr-024Hr	1.97	-0.12	0.04	3.61	3.61	3.61
P-I1-I2	010Yr-024Hr	1.96	-0.11	0.03	3.59	3.59	3.59
P-I1-I2	025Yr-072Hr	1.94	-0.04	0.02	3.56	3.56	3.56
P-I1-I2	100Yr-072Hr	1.94	-0.05	0.04	3.56	3.56	3.56

Pipe Link: P-I3-I4		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-1.54 ft	Invert:	1.02 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I4	Geometry: Circular		Geometry: Circular	
To Node:	NZA-I3	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft

Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	275.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I3-I4	005Yr-024Hr	0.36	-1.01	-0.02	-0.57	-0.57	-0.57
P-I3-I4	010Yr-024Hr	0.42	-1.00	-0.03	-0.56	-0.56	-0.56
P-I3-I4	025Yr-072Hr	0.69	-0.95	0.03	-0.54	-0.54	-0.54
P-I3-I4	100Yr-072Hr	1.82	-0.96	-0.01	1.03	1.03	1.03

Pipe Link: P-I4-I5		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-0.68 ft	Invert:	-1.54 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I5	Geometry: Circular		Geometry: Circular	
To Node:	NZA-I4	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	279.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I4-I5	005Yr-024Hr	0.26	-2.01	0.00	-2.57	-2.57	-2.57
P-I4-I5	010Yr-024Hr	0.84	-2.00	0.00	-2.55	-2.55	-2.55

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I4-I5	025Yr-072Hr	0.91	-1.90	0.01	-2.42	-2.42	-2.42
P-I4-I5	100Yr-072Hr	0.91	-1.91	0.00	-2.43	-2.43	-2.43

Pipe Link: P-I5-I6		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.97 ft	Invert:	-0.74 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I6	Geometry: Circular		Geometry: Circular	
To Node:	NZA-I5	Max Depth:	1.00 ft	Max Depth:	1.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	275.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I5-I6	005Yr-024Hr	0.00	-2.70	0.00	-3.44	-3.44	-3.44
P-I5-I6	010Yr-024Hr	0.00	-2.73	0.00	-3.47	-3.47	-3.47
P-I5-I6	025Yr-072Hr	0.04	-2.71	-0.01	-3.45	-3.45	-3.45
P-I5-I6	100Yr-072Hr	0.21	-2.62	0.00	-3.34	-3.34	-3.34

Pipe Link: P-I6-CS-03		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-3.46 ft	Invert:	-4.50 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I6	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-03	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	190.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000

Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I6-CS-03	005Yr-024Hr	30.78	0.00	-0.08	4.35	4.35	4.35
P-I6-CS-03	010Yr-024Hr	36.17	0.00	0.71	5.12	5.12	5.12
P-I6-CS-03	025Yr-072Hr	37.26	0.00	0.50	5.27	5.27	5.27
P-I6-CS-03	100Yr-072Hr	39.91	0.00	0.08	5.65	5.65	5.65

Pipe Link: P-I7-I8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.67 ft	Invert:	-2.97 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-I8	Geometry: Circular		Geometry: Circular	
To Node:	NZA-I7	Max Depth:	1.50 ft	Max Depth:	1.50 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	280.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-I7-I8	005Yr-024Hr	6.52	0.00	0.00	3.69	3.69	3.69
P-I7-I8	010Yr-024Hr	6.56	0.00	0.04	3.71	3.71	3.71
P-I7-I8	025Yr-072Hr	6.52	0.00	0.03	3.69	3.69	3.69
P-I7-I8	100Yr-072Hr	6.40	0.00	0.00	3.62	3.62	3.62

Pipe Link: P-OUTFALL(96th)-CS-TOWN		Upstream		Downstream	
Scenario:	COMBINED	Invert:	1.60 ft	Invert:	1.60 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-CS-TOWN	Geometry: Circular		Geometry: Circular	
To Node:	OUTFALL (96th)	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	58.09 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-OUTFALL(96th)-CS-TOWN	005Yr-024Hr	17.70	0.00	0.00	4.36	5.76	5.06
P-OUTFALL(96th)-CS-TOWN	010Yr-024Hr	21.67	0.00	0.00	4.72	6.15	5.43
P-OUTFALL(96th)-CS-TOWN	025Yr-072Hr	24.34	0.00	0.01	4.95	6.39	5.67
P-OUTFALL(96th)-CS-TOWN	100Yr-072Hr	30.24	0.00	0.00	5.43	6.91	6.17

Pipe Link: P-PS-8-D8		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-3.45 ft	Invert:	-4.00 ft
	SOLUTIONS	Manning's N:	0.0110	Manning's N:	0.0110
From Node:	NZA-D8	Geometry: Circular		Geometry: Circular	
To Node:	NZA-PS-8	Max Depth:	2.00 ft	Max Depth:	2.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	15.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			

Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS-8-D8	005Yr-024Hr	42.74	0.00	11.55	13.61	13.61	13.61
P-PS-8-D8	010Yr-024Hr	42.91	0.00	11.40	13.66	13.66	13.66
P-PS-8-D8	025Yr-072Hr	42.91	0.00	11.40	13.66	13.66	13.66
P-PS-8-D8	100Yr-072Hr	42.74	0.00	11.55	13.61	13.61	13.61

Pipe Link: P-PS1-CS1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.78 ft	Invert:	-2.75 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-PS1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-01	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	11.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS1-CS1	005Yr-024Hr	0.48	-37.56	-16.65	-5.31	-5.31	-5.31
P-PS1-CS1	010Yr-024Hr	0.48	-39.73	-24.61	-5.62	-5.62	-5.62
P-PS1-CS1	025Yr-072Hr	0.49	-39.77	-25.84	-5.63	-5.63	-5.63
P-PS1-CS1	100Yr-072Hr	0.50	-39.78	-16.94	-5.63	-5.63	-5.63

Pipe Link: P-PS1-DS1		Upstream		Downstream	
Scenario:	COMBINED	Invert:	8.00 ft	Invert:	8.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-PS1	Geometry: Circular		Geometry: Circular	
To Node:	NZA-DS1	Max Depth:	1.33 ft	Max Depth:	1.33 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	63.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS1-DS1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS1-DS1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS1-DS1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS1-DS1	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-PS2-CS-02		Upstream		Downstream	
Scenario:	COMBINED	Invert:	-2.50 ft	Invert:	-2.30 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-PS2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-CS-02	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	11.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS2-CS-02	005Yr-024Hr	0.09	-30.24	-13.48	-4.28	-4.28	-4.28
P-PS2-CS-02	010Yr-024Hr	0.10	-33.09	23.48	-4.68	-4.68	-4.68
P-PS2-CS-02	025Yr-072Hr	0.10	-33.09	23.70	-4.68	-4.68	-4.68
P-PS2-CS-02	100Yr-072Hr	0.09	-33.10	-13.46	-4.68	-4.68	-4.68

Pipe Link: P-PS2-DS2		Upstream		Downstream	
Scenario:	COMBINED	Invert:	8.00 ft	Invert:	8.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-PS2	Geometry: Circular		Geometry: Circular	
To Node:	NZA-DS2	Max Depth:	1.33 ft	Max Depth:	1.33 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	38.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS2-DS2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS2-DS2	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS2-DS2	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS2-DS2	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-PS3-DS3		Upstream		Downstream	
Scenario:	COMBINED	Invert:	8.00 ft	Invert:	8.00 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-PS3	Geometry: Circular		Geometry: Circular	
To Node:	NZA-DS3	Max Depth:	1.33 ft	Max Depth:	1.33 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft

Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	11.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-PS3-DS3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS3-DS3	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS3-DS3	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
P-PS3-DS3	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Pipe Link: P-S-82 - S-77		Upstream		Downstream	
Scenario:	COMBINED	Invert:	1.60 ft	Invert:	1.60 ft
	SOLUTIONS	Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-S-82	Geometry: Circular		Geometry: Circular	
To Node:	NZA-S-77	Max Depth:	3.00 ft	Max Depth:	3.00 ft
Link Count:	1	Bottom Clip			
Flow Direction:	Both	Default:	0.00 ft	Default:	0.00 ft
Damping:	0.0000 ft	Op Table:		Op Table:	
Length:	888.00 ft	Ref Node:		Ref Node:	
FHWA Code:	0	Manning's N:	0.0000	Manning's N:	0.0000
Entr Loss Coef:	0.00	Top Clip			
Exit Loss Coef:	0.00	Default:	0.00 ft	Default:	0.00 ft
Bend Loss Coef:	0.00	Op Table:		Op Table:	
Bend Location:	0.00 dec	Ref Node:		Ref Node:	
Energy Switch:	Energy	Manning's N:	0.0000	Manning's N:	0.0000
Comment:					

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-S-82 - S-77	005Yr-024Hr	0.27	-0.24	-0.03	0.48	-1.81	-1.14
P-S-82 - S-77	010Yr-024Hr	4.86	-2.57	-0.03	1.49	2.80	2.05

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
P-S-82 - S-77	025Yr-072Hr	5.99	-3.98	0.03	1.66	3.44	2.44
P-S-82 - S-77	100Yr-072Hr	7.48	-5.49	-0.06	1.83	4.08	2.88

Drop Structure Link: S-101		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-4.00 ft	Invert:	-4.00 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-S101	Geometry: Circular		Geometry: Circular	
To Node:	FDOT OUTFALL (CARLYLE)	Max Depth:	3.00 ft	Max Depth:	3.00 ft
		Bottom Clip			
Link Count:	1	Default:	0.00 ft	Default:	0.00 ft
Flow Direction:	Both	Op Table:		Op Table:	
Solution:	Combine	Ref Node:		Ref Node:	
Increments:	0	Manning's N:	0.0000	Manning's N:	0.0000
Pipe Count:	1	Top Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	12.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				

Pipe Comment:

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Sharp Crested Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	8.00 ft	Ref Node:	
Control Elevation:	8.00 ft	Discharge Coefficients	
Max Depth:	1.50 ft	Weir Default:	3.200
Max Width:	6.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
S-101 - Pipe	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Pipe	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Pipe	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Pipe	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-101 - Weir: 1	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Drop Structure Link: S-77		Upstream Pipe		Downstream Pipe	
Scenario:	COMBINED SOLUTIONS	Invert:	-4.00 ft	Invert:	-4.00 ft
		Manning's N:	0.0120	Manning's N:	0.0120
From Node:	NZA-S-77	Geometry: Circular		Geometry: Circular	
To Node:	FDOT OUTFALL (94th)	Max Depth:	3.00 ft	Max Depth:	3.00 ft
		Bottom Clip			
Link Count:	1	Default:	0.00 ft	Default:	0.00 ft
Flow Direction:	Both	Op Table:		Op Table:	
Solution:	Combine	Ref Node:		Ref Node:	
Increments:	0	Manning's N:	0.0000	Manning's N:	0.0000
Pipe Count:	1	Top Clip			
Damping:	0.0000 ft	Default:	0.00 ft	Default:	0.00 ft
Length:	12.00 ft	Op Table:		Op Table:	
FHWA Code:	0	Ref Node:		Ref Node:	
Entr Loss Coef:	0.00	Manning's N:	0.0000	Manning's N:	0.0000
Exit Loss Coef:	0.00				
Bend Loss Coef:	0.00				
Bend Location:	0.00 dec				
Energy Switch:	Energy				
Pipe Comment:					

Weir Component		Bottom Clip	
Weir:	1	Default:	0.00 ft
Weir Count:	1	Op Table:	
Weir Flow Direction:	Both	Ref Node:	
Damping:	0.0000 ft	Top Clip	
Weir Type:	Paved Road Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	8.00 ft	Ref Node:	
Control Elevation:	8.00 ft		

Max Depth:	1.50 ft
Max Width:	6.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	3.200
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Weir Comment:

Drop Structure Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
S-77 - Pipe	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Pipe	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Pipe	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Pipe	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
S-77 - Weir: 1	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-A1-A2

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-A1
To Node:	NZA-A2
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.61 ft
Control Elevation:	4.61 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A1-A2	005Yr-024Hr	0.00	-3.53	0.00	0.00	0.00	0.00
W-A1-A2	010Yr-024Hr	0.00	-13.55	0.00	0.00	0.00	0.00
W-A1-A2	025Yr-072Hr	0.00	-20.72	0.00	0.00	0.00	0.00
W-A1-A2	100Yr-072Hr	0.00	-32.68	0.00	0.00	0.00	0.00

Weir Link: W-A1-B1

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-A1	Default:	0.00 ft
To Node:	NZA-B1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.38 ft	**Discharge Coefficients**	
Control Elevation:	4.38 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A1-B1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-B1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-B1	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-B1	100Yr-072Hr	2.37	0.00	0.00	0.95	0.95	0.95

Weir Link: W-A1-OUTFALL

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-A1	Default:	0.00 ft
To Node:	OUTFALL (95th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	3.81 ft
Control Elevation:	3.81 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A1-OUTFALL	010Yr-024Hr	9.47	0.00	0.00	1.50	1.50	1.50
W-A1-OUTFALL	025Yr-072Hr	20.28	0.00	0.00	1.93	1.93	1.93
W-A1-OUTFALL	100Yr-072Hr	34.87	0.00	0.01	3.17	3.17	3.17

Weir Link: W-A2-A3

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-A2
To Node:	NZA-A3
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.72 ft
Control Elevation:	4.72 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A2-A3	005Yr-024Hr	0.00	-2.72	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A2-A3	010Yr-024Hr	0.00	-8.88	0.00	-1.45	-1.45	-1.45
W-A2-A3	025Yr-072Hr	0.00	-13.70	0.00	-1.59	-1.59	-1.59
W-A2-A3	100Yr-072Hr	0.00	-22.07	0.00	-2.01	-2.01	-2.01

Weir Link: W-A3-A4

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-A4	Default:	0.00 ft
To Node:	NZA-A3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.41 ft	Discharge Coefficients	
Control Elevation:	5.41 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A3-A4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A3-A4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A3-A4	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A3-A4	100Yr-072Hr	5.57	0.00	0.00	1.26	1.26	1.26

Weir Link: W-A4-B4

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-A4	Default:	0.00 ft
To Node:	NZA-B4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.02 ft	Discharge Coefficients	

Control Elevation:	5.02 ft		
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A4-B4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A4-B4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A4-B4	025Yr-072Hr	3.91	0.00	0.00	1.12	1.12	1.12
W-A4-B4	100Yr-072Hr	9.87	-5.08	-2.04	1.45	1.45	1.45

Weir Link: W-A4-FDOT1B

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	FDOT-1B	Default:	0.00 ft
To Node:	NZA-A4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.22 ft	Discharge Coefficients	
Control Elevation:	4.22 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A4-FDOT1B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A4-FDOT1B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-A4-FDOT1B	025Yr-072Hr	4.44	0.00	1.45	0.59	0.59	0.59

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-A4-FDOT1 B	100Yr-072Hr	9.05	0.00	2.04	0.90	0.90	0.90

Weir Link: W-AA1-AA2

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-AA1	Default:	0.00 ft
To Node:	NZA-AA2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	**Discharge Coefficients**	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA1-AA2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-AA2	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-AA2	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-AA2	100Yr-072Hr	0.00	-4.75	0.00	-1.19	-1.19	-1.19

Weir Link: W-AA1-OUTFALL(96th)

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-AA1	Default:	0.00 ft
To Node:	OUTFALL (96th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	**Discharge Coefficients**	
Control Elevation:	4.00 ft	Weir Default:	2.800

Max Depth:	0.50 ft		
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA1-OUTFALL(96th)	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-OUTFALL(96th)	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-OUTFALL(96th)	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA1-OUTFALL(96th)	100Yr-072Hr	0.91	0.00	0.00	0.69	0.69	0.69

Weir Link: W-AA2-AA3

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-AA3	Default:	0.00 ft
To Node:	NZA-AA2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	Discharge Coefficients	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA2-AA3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA2-AA3	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA2-AA3	025Yr-072Hr	0.39	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA2-AA3	100Yr-072Hr	7.17	0.00	0.00	1.35	1.35	1.35

Weir Link: W-AA3-AA4

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-AA4	Default:	0.00 ft
To Node:	NZA-AA3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	Discharge Coefficients	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA3-AA4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA3-AA4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA3-AA4	025Yr-072Hr	1.42	0.00	0.00	0.80	0.80	0.80
W-AA3-AA4	100Yr-072Hr	6.86	0.00	0.00	1.19	1.19	1.19

Weir Link: W-AA4-AA5

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-AA5	Default:	0.00 ft
To Node:	NZA-AA4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	Discharge Coefficients	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	

Max Width:	22.00 ft		
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA4-AA5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA4-AA5	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-AA4-AA5	025Yr-072Hr	2.19	0.00	0.00	0.91	0.91	0.91
W-AA4-AA5	100Yr-072Hr	5.33	0.00	0.00	1.00	1.00	1.00

Weir Link: W-AA7-A4

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-AA7	Default:	0.00 ft
To Node:	NZA-A4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.00 ft	**Discharge Coefficients**	
Control Elevation:	4.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-AA7-A4	005Yr-024Hr	2.96	-6.76	0.00	-1.34	-1.34	-1.34
W-AA7-A4	010Yr-024Hr	5.84	-13.98	-1.80	-1.69	-1.69	-1.69
W-AA7-A4	025Yr-072Hr	7.35	-18.70	-1.81	-1.87	-1.87	-1.87
W-AA7-A4	100Yr-072Hr	7.89	-22.14	-1.92	-2.01	-2.01	-2.01

Weir Link: W-B1-B2

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-B1
To Node:	NZA-B2
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.50 ft
Control Elevation:	4.50 ft
Max Depth:	0.50 ft
Max Width:	20.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B1-B2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B1-B2	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B1-B2	025Yr-072Hr	0.00	-5.03	0.00	0.00	0.00	0.00
W-B1-B2	100Yr-072Hr	0.00	-18.04	0.00	0.00	0.00	0.00

Weir Link: W-B1-OUTFALL

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-B1
To Node:	OUTFALL (94th)
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Broad Crested Vertical
Geometry Type:	Rectangular
Invert:	3.90 ft
Control Elevation:	3.90 ft
Max Depth:	0.50 ft
Max Width:	20.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B1-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B1-OUTFALL	025Yr-072Hr	2.58	0.00	0.00	1.00	1.00	1.00
W-B1-OUTFALL	100Yr-072Hr	26.85	0.00	0.00	2.69	2.69	2.69

Weir Link: W-B2-B3

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-B2	Default:	0.00 ft
To Node:	NZA-B3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.54 ft	**Discharge Coefficients**	
Control Elevation:	4.54 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	20.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B2-B3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B2-B3	010Yr-024Hr	0.00	-2.06	0.00	0.00	0.00	0.00
W-B2-B3	025Yr-072Hr	0.00	-8.67	0.00	-1.50	-1.50	-1.50
W-B2-B3	100Yr-072Hr	0.00	-17.38	0.00	-1.83	-1.83	-1.83

Weir Link: W-B3-B4

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-B4	Default:	0.00 ft
To Node:	NZA-B3	Op Table:	
Link Count:	1	Ref Node:	

Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	5.52 ft
Control Elevation:	5.52 ft
Max Depth:	0.50 ft
Max Width:	20.00 ft
Fillet:	0.00 ft

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B3-B4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B3-B4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B3-B4	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B3-B4	100Yr-072Hr	1.40	0.00	0.00	0.82	0.82	0.82

Weir Link: W-B4-C2

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-B4
To Node:	NZA-C2
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	5.69 ft
Control Elevation:	5.69 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B4-C2	005Yr-024Hr	0.00	-8.21	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B4-C2	010Yr-024Hr	0.00	-12.72	0.00	0.00	0.00	0.00
W-B4-C2	025Yr-072Hr	0.00	-15.98	0.00	0.00	0.00	0.00
W-B4-C2	100Yr-072Hr	0.00	-22.46	0.00	0.00	0.00	0.00

Weir Link: W-B4-FDOT2B

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	FDOT-1B	Default:	0.00 ft
To Node:	NZA-B4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.21 ft	Discharge Coefficients	
Control Elevation:	4.21 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	20.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-B4-FDOT2B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-B4-FDOT2B	010Yr-024Hr	4.93	0.00	2.14	1.24	1.24	1.24
W-B4-FDOT2B	025Yr-072Hr	4.29	0.00	-0.70	1.19	1.19	1.19
W-B4-FDOT2B	100Yr-072Hr	2.57	0.00	0.01	1.00	1.00	1.00

Weir Link: W-C1-B1

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-B1	Default:	0.00 ft
To Node:	NZA-C1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	

Damping:	0.0000 ft		
Weir Type:	Paved Road Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	4.86 ft	Ref Node:	
Control Elevation:	4.86 ft	Discharge Coefficients	
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C1-B1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C1-B1	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C1-B1	025Yr-072Hr	0.00	-2.31	0.00	0.00	0.00	0.00
W-C1-B1	100Yr-072Hr	0.00	-17.75	0.00	0.00	0.00	0.00

Weir Link: W-C1-D2

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-C1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.80 ft	Discharge Coefficients	
Control Elevation:	4.80 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C1-D2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C1-D2	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C1-D2	025Yr-072Hr	2.92	-0.27	0.00	0.83	0.83	0.83
W-C1-D2	100Yr-072Hr	14.40	0.00	0.00	1.31	1.31	1.31

Weir Link: W-C2-FDOT3B

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	FDOT-3B	Default:	0.00 ft
To Node:	NZA-C2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.95 ft	**Discharge Coefficients**	
Control Elevation:	3.95 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-C2-FDOT3B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C2-FDOT3B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C2-FDOT3B	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-C2-FDOT3B	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-D1-D2

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-D1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft

Weir Type:	Paved Road Vertical		
Geometry Type:	Rectangular	Op Table:	
Invert:	3.50 ft	Ref Node:	
Control Elevation:	3.50 ft	Discharge Coefficients	
Max Depth:	10.00 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-D2	005Yr-024Hr	31.85	0.00	0.00	2.24	2.24	2.24
W-D1-D2	010Yr-024Hr	41.42	0.00	-0.01	2.38	2.38	2.38
W-D1-D2	025Yr-072Hr	46.50	0.00	-0.09	2.45	2.45	2.45
W-D1-D2	100Yr-072Hr	54.22	0.00	-0.05	2.49	2.49	2.49

Weir Link: W-D1-E1

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-D1	Default:	0.00 ft
To Node:	NZA-E1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.24 ft	Discharge Coefficients	
Control Elevation:	4.24 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-E1	005Yr-024Hr	0.86	0.00	0.00	0.67	0.67	0.67
W-D1-E1	010Yr-024Hr	15.46	0.00	0.00	1.54	1.54	1.54
W-D1-E1	025Yr-072Hr	17.61	-0.21	-3.12	1.60	1.60	1.60

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-E1	100Yr-072Hr	17.76	-1.09	1.94	1.62	1.62	1.62

Weir Link: W-D1-OUTFALL

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-D1	Default:	0.00 ft
To Node:	OUTFALL (92nd)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.00 ft	Discharge Coefficients	
Control Elevation:	5.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D1-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D1-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-D1-OUTFALL	100Yr-072Hr	11.58	0.00	0.00	1.60	1.60	1.60

Weir Link: W-D2-D3

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-D3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	

Geometry Type:	Rectangular		
Invert:	3.50 ft	Ref Node:	
Control Elevation:	3.50 ft	Discharge Coefficients	
Max Depth:	10.00 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D2-D3	005Yr-024Hr	0.00	-29.61	0.00	-1.97	-1.97	-1.97
W-D2-D3	010Yr-024Hr	0.00	-35.40	-0.06	-2.06	-2.06	-2.06
W-D2-D3	025Yr-072Hr	0.00	-39.92	-0.07	-2.10	-2.10	-2.10
W-D2-D3	100Yr-072Hr	0.00	-60.83	-0.07	-2.12	-2.12	-2.12

Weir Link: W-D2-E3

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-D2	Default:	0.00 ft
To Node:	NZA-E3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.17 ft	Discharge Coefficients	
Control Elevation:	4.17 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D2-E3	005Yr-024Hr	1.56	-0.07	0.00	0.74	0.74	0.74
W-D2-E3	010Yr-024Hr	1.81	-9.13	1.71	-1.09	-1.09	-1.09
W-D2-E3	025Yr-072Hr	2.69	-9.96	1.68	-1.28	-1.28	-1.28
W-D2-E3	100Yr-072Hr	4.73	-10.50	1.69	-1.41	-1.41	-1.41

Weir Link: W-D3-D4			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-D4	Default:	0.00 ft
To Node:	NZA-D3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	Discharge Coefficients	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D3-D4	005Yr-024Hr	26.24	0.00	0.00	1.72	1.72	1.72
W-D3-D4	010Yr-024Hr	32.52	0.00	0.02	1.83	1.83	1.83
W-D3-D4	025Yr-072Hr	35.04	0.00	-0.02	1.89	1.89	1.89
W-D3-D4	100Yr-072Hr	52.35	0.00	0.02	1.92	1.92	1.92

Weir Link: W-D4-D5			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-D5	Default:	0.00 ft
To Node:	NZA-D4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	Discharge Coefficients	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D4-D5	005Yr-024Hr	18.89	-1.01	-0.58	1.29	1.29	1.29
W-D4-D5	010Yr-024Hr	25.99	-2.86	2.85	1.54	1.54	1.54
W-D4-D5	025Yr-072Hr	28.84	-3.62	3.62	1.65	1.65	1.65
W-D4-D5	100Yr-072Hr	38.02	-2.44	-0.90	1.69	1.69	1.69

Weir Link: W-D5-D6

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-D6	Default:	0.00 ft
To Node:	NZA-D5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	**Discharge Coefficients**	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D5-D6	005Yr-024Hr	5.59	-8.33	2.26	-1.44	-1.44	-1.44
W-D5-D6	010Yr-024Hr	9.90	-8.95	-7.97	-1.45	-1.45	-1.45
W-D5-D6	025Yr-072Hr	11.75	-8.69	-8.20	-1.40	-1.40	-1.40
W-D5-D6	100Yr-072Hr	18.42	-6.69	2.11	-1.33	-1.33	-1.33

Weir Link: W-D6-D7

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-D7	Default:	0.00 ft
To Node:	NZA-D6	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	3.50 ft
Control Elevation:	3.50 ft
Max Depth:	10.00 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D6-D7	005Yr-024Hr	0.00	-19.86	-0.49	-1.90	-1.90	-1.90
W-D6-D7	010Yr-024Hr	0.00	-20.99	-4.56	-1.93	-1.93	-1.93
W-D6-D7	025Yr-072Hr	0.00	-20.71	-5.18	-1.92	-1.92	-1.92
W-D6-D7	100Yr-072Hr	0.02	-18.55	-0.66	-1.81	-1.81	-1.81

Weir Link: W-D7-FDOT4B

Scenario:	COMBINED SOLUTIONS
From Node:	FDOT-4B
To Node:	NZA-D7
Link Count:	1
Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.48 ft
Control Elevation:	4.48 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-D7-FDOT4B	005Yr-024Hr	4.68	0.00	0.00	1.19	1.19	1.19
W-D7-FDOT4B	010Yr-024Hr	7.72	0.00	0.00	1.40	1.40	1.40
W-D7-FDOT4	025Yr-072Hr	9.81	0.00	-1.75	1.52	1.52	1.52

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
B							
W-D7-FDOT4 B	100Yr-072Hr	12.77	0.00	-1.87	1.66	1.66	1.66

Weir Link: W-E1-E2

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-E2	Default:	0.00 ft
To Node:	NZA-E1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	**Discharge Coefficients**	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-E2	005Yr-024Hr	26.74	0.00	0.00	2.08	2.08	2.08
W-E1-E2	010Yr-024Hr	31.83	0.00	-0.01	2.17	2.17	2.17
W-E1-E2	025Yr-072Hr	41.62	0.00	0.11	2.20	2.20	2.20
W-E1-E2	100Yr-072Hr	58.46	0.00	0.05	2.22	2.22	2.22

Weir Link: W-E1-F1

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-E1	Default:	0.00 ft
To Node:	NZA-F1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.26 ft	**Discharge Coefficients**	

Control Elevation:	0.00 ft		
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-F1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-F1	010Yr-024Hr	16.21	-1.75	0.00	1.79	1.79	1.79
W-E1-F1	025Yr-072Hr	22.31	-6.23	0.81	2.03	2.03	2.03
W-E1-F1	100Yr-072Hr	24.46	-18.32	1.02	2.22	2.22	2.22

Weir Link: W-E1-OUTFALL A

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-E1	Default:	0.00 ft
To Node:	OUTFALL (91st) - A	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Sharp Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.68 ft	Discharge Coefficients	
Control Elevation:	4.68 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-OUTFALL A	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL A	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL A	025Yr-072Hr	7.87	0.00	0.00	1.41	1.41	1.41

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-OUTFALL A	100Yr-072Hr	28.86	0.00	0.00	2.62	2.62	2.62

Weir Link: W-E1-OUTFALL B

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-E1	Default:	0.00 ft
To Node:	OUTFALL (91st) - B	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.68 ft	Discharge Coefficients	
Control Elevation:	4.68 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E1-OUTFALL B	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL B	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-E1-OUTFALL B	025Yr-072Hr	7.87	0.00	0.00	1.41	1.41	1.41
W-E1-OUTFALL B	100Yr-072Hr	28.86	0.00	0.00	2.62	2.62	2.62

Weir Link: W-E2-E3

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-E3	Default:	0.00 ft
To Node:	NZA-E2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft

Weir Type:	Broad Crested Vertical		
Geometry Type:	Rectangular	Op Table:	
Invert:	3.50 ft	Ref Node:	
Control Elevation:	3.50 ft	Discharge Coefficients	
Max Depth:	10.00 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E2-E3	005Yr-024Hr	22.01	0.00	-0.01	1.56	1.56	1.56
W-E2-E3	010Yr-024Hr	26.80	0.00	-0.64	1.63	1.63	1.63
W-E2-E3	025Yr-072Hr	33.50	0.00	-0.56	1.65	1.65	1.65
W-E2-E3	100Yr-072Hr	47.78	0.00	-0.02	1.67	1.67	1.67

Weir Link: W-E3-E4

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-E4	Default:	0.00 ft
To Node:	NZA-E3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	Discharge Coefficients	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E3-E4	005Yr-024Hr	18.52	0.00	-0.18	1.40	1.40	1.40
W-E3-E4	010Yr-024Hr	25.67	0.00	-6.06	1.41	1.41	1.41
W-E3-E4	025Yr-072Hr	29.25	0.00	-5.64	1.47	1.47	1.47

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E3-E4	100Yr-072Hr	41.21	0.00	-0.83	1.53	1.53	1.53

Weir Link: W-E4-E5

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-E5	Default:	0.00 ft
To Node:	NZA-E4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	Discharge Coefficients	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E4-E5	005Yr-024Hr	8.08	0.00	1.99	0.54	0.54	0.54
W-E4-E5	010Yr-024Hr	13.79	0.00	-6.58	0.82	0.82	0.82
W-E4-E5	025Yr-072Hr	16.46	0.00	-8.06	0.83	0.83	0.83
W-E4-E5	100Yr-072Hr	24.74	0.00	2.90	0.83	0.83	0.83

Weir Link: W-E5-E6

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-E6	Default:	0.00 ft
To Node:	NZA-E5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	Discharge Coefficients	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	

Max Width:	22.00 ft		
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E5-E6	005Yr-024Hr	7.33	-6.68	-1.96	-0.65	-0.65	-0.65
W-E5-E6	010Yr-024Hr	13.75	-11.38	-8.83	1.00	1.00	1.00
W-E5-E6	025Yr-072Hr	16.34	-11.56	9.84	1.07	1.07	1.07
W-E5-E6	100Yr-072Hr	23.54	-8.83	1.96	-0.82	-0.82	-0.82

Weir Link: W-E6-E7

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-E7	Default:	0.00 ft
To Node:	NZA-E6	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.50 ft	**Discharge Coefficients**	
Control Elevation:	3.50 ft	Weir Default:	2.800
Max Depth:	10.00 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E6-E7	005Yr-024Hr	3.34	-12.46	-0.08	-1.26	-1.26	-1.26
W-E6-E7	010Yr-024Hr	9.42	-14.00	-1.73	-1.36	-1.36	-1.36
W-E6-E7	025Yr-072Hr	12.22	-13.76	0.56	-1.36	-1.36	-1.36
W-E6-E7	100Yr-072Hr	15.87	-13.36	0.03	-1.36	-1.36	-1.36

Weir Link: W-E7-E8

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-E8
To Node:	NZA-E7
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	3.50 ft
Control Elevation:	3.50 ft
Max Depth:	10.00 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E7-E8	005Yr-024Hr	0.00	-17.49	0.01	-1.84	-1.84	-1.84
W-E7-E8	010Yr-024Hr	4.91	-17.99	0.01	-1.85	-1.85	-1.85
W-E7-E8	025Yr-072Hr	7.97	-17.00	0.11	-1.81	-1.81	-1.81
W-E7-E8	100Yr-072Hr	10.08	-15.71	-0.09	-1.76	-1.76	-1.76

Weir Link: W-E8-FDOT1A

Scenario:	COMBINED SOLUTIONS
From Node:	FDOT-1A
To Node:	NZA-E8
Link Count:	1
Flow Direction:	Positive
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.46 ft
Control Elevation:	4.46 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E8-FDOT1A	005Yr-024Hr	7.22	0.00	0.00	1.37	1.37	1.37
W-E8-FDOT1A	010Yr-024Hr	10.58	0.00	0.00	1.56	1.56	1.56
W-E8-FDOT1A	025Yr-072Hr	12.82	0.00	2.08	1.66	1.66	1.66
W-E8-FDOT1A	100Yr-072Hr	15.27	0.00	-2.58	1.76	1.76	1.76

Weir Link: W-E8-FDOT5B

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	FDOT-5B	Default:	0.00 ft
To Node:	NZA-E8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.46 ft	Discharge Coefficients	
Control Elevation:	4.46 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-E8-FDOT5B	005Yr-024Hr	5.25	0.00	0.00	1.23	1.23	1.23
W-E8-FDOT5B	010Yr-024Hr	8.08	0.00	0.00	1.42	1.42	1.42
W-E8-FDOT5B	025Yr-072Hr	9.93	0.00	1.82	1.52	1.52	1.52
W-E8-FDOT5B	100Yr-072Hr	12.13	0.00	-2.01	1.63	1.63	1.63

Weir Link: W-F1-F2

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-F1
To Node:	NZA-F2
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.23 ft
Control Elevation:	4.23 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F1-F2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F1-F2	010Yr-024Hr	11.34	-1.51	-0.02	1.50	1.50	1.50
W-F1-F2	025Yr-072Hr	7.86	-8.35	1.50	1.17	1.17	1.17
W-F1-F2	100Yr-072Hr	5.52	-14.63	2.05	-1.49	-1.49	-1.49

Weir Link: W-F1-G1

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-F1
To Node:	NZA-G1
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.28 ft
Control Elevation:	4.28 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F1-G1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F1-G1	010Yr-024Hr	8.50	-0.57	0.00	1.30	1.30	1.30
W-F1-G1	025Yr-072Hr	14.79	-0.77	-3.12	1.51	1.51	1.51
W-F1-G1	100Yr-072Hr	17.95	-1.54	1.74	1.79	1.79	1.79

Weir Link: W-F2-F3

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-F3	Default:	0.00 ft
To Node:	NZA-F2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.24 ft	**Discharge Coefficients**	
Control Elevation:	4.24 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F2-F3	005Yr-024Hr	4.01	0.00	0.00	1.13	1.13	1.13
W-F2-F3	010Yr-024Hr	12.08	0.00	0.00	1.50	1.50	1.50
W-F2-F3	025Yr-072Hr	18.20	0.00	-2.96	1.80	1.80	1.80
W-F2-F3	100Yr-072Hr	24.78	0.00	-1.08	2.25	2.25	2.25

Weir Link: W-F2-G2

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-F2	Default:	0.00 ft
To Node:	NZA-G2	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.01 ft
Control Elevation:	4.01 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F2-G2	005Yr-024Hr	4.99	0.00	0.00	1.21	1.21	1.21
W-F2-G2	010Yr-024Hr	23.88	0.00	-0.59	2.17	2.17	2.17
W-F2-G2	025Yr-072Hr	25.36	0.00	-1.96	2.31	2.31	2.31
W-F2-G2	100Yr-072Hr	23.81	0.00	-1.65	2.16	2.16	2.16

Weir Link: W-F3-F4

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-F3
To Node:	NZA-F4
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Gravel Road Vertical
Geometry Type:	Rectangular
Invert:	4.77 ft
Control Elevation:	4.77 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F3-F4	005Yr-024Hr	0.00	-1.62	0.00	0.00	0.00	0.00
W-F3-F4	010Yr-024Hr	0.00	-8.25	0.00	0.00	0.00	0.00
W-F3-F4	025Yr-072Hr	0.00	-15.08	0.00	-1.75	-1.75	-1.75
W-F3-F4	100Yr-072Hr	0.00	-23.69	0.11	-2.15	-2.15	-2.15

Weir Link: W-F4-F5			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-F5	Default:	0.00 ft
To Node:	NZA-F4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.03 ft	Discharge Coefficients	
Control Elevation:	5.03 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F4-F5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F4-F5	010Yr-024Hr	3.51	0.00	0.00	1.08	1.08	1.08
W-F4-F5	025Yr-072Hr	10.26	0.00	0.00	1.54	1.54	1.54
W-F4-F5	100Yr-072Hr	21.72	0.00	0.92	1.98	1.98	1.98

Weir Link: W-F4-G4			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-F4	Default:	0.00 ft
To Node:	NZA-G4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.05 ft	Discharge Coefficients	
Control Elevation:	0.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F4-G4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F4-G4	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-F4-G4	025Yr-072Hr	2.22	0.00	0.00	0.93	0.93	0.93
W-F4-G4	100Yr-072Hr	8.20	0.00	1.90	1.10	1.10	1.10

Weir Link: W-F5-F6

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-F6	Default:	0.00 ft
To Node:	NZA-F5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.81 ft	**Discharge Coefficients**	
Control Elevation:	4.81 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F5-F6	005Yr-024Hr	0.00	-1.42	0.00	-0.80	-0.80	-0.80
W-F5-F6	010Yr-024Hr	3.53	-2.63	0.02	1.07	1.07	1.07
W-F5-F6	025Yr-072Hr	5.19	-2.79	1.79	-0.75	-0.75	-0.75
W-F5-F6	100Yr-072Hr	11.62	-4.69	1.72	1.06	1.06	1.06

Weir Link: W-F6-F7

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-F7	Default:	0.00 ft
To Node:	NZA-F6	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.63 ft
Control Elevation:	4.63 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F6-F7	005Yr-024Hr	2.77	-5.00	-0.01	0.99	0.99	0.99
W-F6-F7	010Yr-024Hr	7.82	-7.66	-1.78	1.39	1.39	1.39
W-F6-F7	025Yr-072Hr	2.37	-7.99	2.98	-0.95	-0.95	-0.95
W-F6-F7	100Yr-072Hr	5.63	-10.12	1.69	-1.11	-1.11	-1.11

Weir Link: W-F7-F8

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-F8
To Node:	NZA-F7
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.60 ft
Control Elevation:	4.60 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F7-F8	005Yr-024Hr	0.00	-7.65	0.00	-1.36	-1.36	-1.36
W-F7-F8	010Yr-024Hr	4.37	-12.13	-2.08	-1.31	-1.31	-1.31
W-F7-F8	025Yr-072Hr	0.00	-12.64	3.12	-1.30	-1.30	-1.30
W-F7-F8	100Yr-072Hr	0.00	-16.27	3.12	-1.76	-1.76	-1.76

Weir Link: W-F8-F9			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-F9	Default:	0.00 ft
To Node:	NZA-F8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.75 ft	Discharge Coefficients	
Control Elevation:	4.75 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F8-F9	005Yr-024Hr	2.23	0.00	0.00	0.93	0.93	0.93
W-F8-F9	010Yr-024Hr	4.35	0.00	0.04	1.10	1.10	1.10
W-F8-F9	025Yr-072Hr	5.78	-1.05	-1.56	0.95	0.95	0.95
W-F8-F9	100Yr-072Hr	7.61	-2.61	-2.44	-0.91	-0.91	-0.91

Weir Link: W-F8-G8			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-F8	Default:	0.00 ft
To Node:	NZA-G8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	0.00 ft	Discharge Coefficients	
Control Elevation:	0.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F8-G8	005Yr-024Hr	8.22	0.00	0.00	0.75	0.75	0.75
W-F8-G8	010Yr-024Hr	11.07	0.00	0.01	1.01	1.01	1.01
W-F8-G8	025Yr-072Hr	11.81	0.00	-0.01	1.07	1.07	1.07
W-F8-G8	100Yr-072Hr	11.57	0.00	0.00	1.05	1.05	1.05

Weir Link: W-F9-FDOT2A

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	FDOT-2A	Default:	0.00 ft
To Node:	NZA-F9	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.77 ft	Discharge Coefficients	
Control Elevation:	4.77 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-F9-FDOT2A	005Yr-024Hr	0.08	0.00	0.00	0.00	0.00	0.00
W-F9-FDOT2A	010Yr-024Hr	2.88	0.00	-0.01	1.01	1.01	1.01
W-F9-FDOT2A	025Yr-072Hr	4.64	0.00	-0.01	1.17	1.17	1.17
W-F9-FDOT2A	100Yr-072Hr	4.80	0.00	-0.04	1.18	1.18	1.18

Weir Link: W-G1-G2

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G2	Default:	0.00 ft
To Node:	NZA-G1	Op Table:	
Link Count:	1	Ref Node:	

Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.36 ft
Control Elevation:	4.36 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G1-G2	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G1-G2	010Yr-024Hr	0.00	-9.55	0.00	-1.50	-1.50	-1.50
W-G1-G2	025Yr-072Hr	0.00	-16.14	3.12	-1.79	-1.79	-1.79
W-G1-G2	100Yr-072Hr	0.00	-16.82	2.17	-1.78	-1.78	-1.78

Weir Link: W-G2-G3

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-G2
To Node:	NZA-G3
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.13 ft
Control Elevation:	4.13 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-G3	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-G3	010Yr-024Hr	0.00	-14.82	0.00	-1.66	-1.66	-1.66
W-G2-G3	025Yr-072Hr	0.00	-20.60	1.60	-1.92	-1.92	-1.92
W-G2-G3	100Yr-072Hr	0.00	-26.04	1.21	-2.37	-2.37	-2.37

Weir Link: W-G2-I1

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G2	Default:	0.00 ft
To Node:	NZA-I1	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.29 ft	Discharge Coefficients	
Control Elevation:	4.29 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-I1	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-I1	010Yr-024Hr	8.53	0.00	0.00	1.45	1.45	1.45
W-G2-I1	025Yr-072Hr	23.00	0.00	-1.60	2.09	2.09	2.09
W-G2-I1	100Yr-072Hr	23.74	0.00	-2.08	2.16	2.16	2.16

Weir Link: W-G2-OUTFALL

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G2	Default:	0.00 ft
To Node:	OUTFALL (89th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.00 ft	Discharge Coefficients	

Control Elevation:	5.00 ft		
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G2-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G2-OUTFALL	100Yr-072Hr	8.65	0.00	0.00	1.46	1.46	1.46

Weir Link: W-G3-G4

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G3	Default:	0.00 ft
To Node:	NZA-G4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.73 ft	Discharge Coefficients	
Control Elevation:	4.73 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G3-G4	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G3-G4	010Yr-024Hr	0.00	-5.06	0.00	0.00	0.00	0.00

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G3-G4	025Yr-072Hr	0.00	-17.05	0.00	-1.82	-1.82	-1.82
W-G3-G4	100Yr-072Hr	0.00	-26.26	0.00	-2.39	-2.39	-2.39

Weir Link: W-G4-G5

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G4	Default:	0.00 ft
To Node:	NZA-G5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.84 ft	Discharge Coefficients	
Control Elevation:	4.84 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G4-G5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-G4-G5	010Yr-024Hr	0.00	-7.40	0.00	-1.38	-1.38	-1.38
W-G4-G5	025Yr-072Hr	0.00	-14.47	0.00	-1.72	-1.72	-1.72
W-G4-G5	100Yr-072Hr	0.00	-20.36	2.82	-1.85	-1.85	-1.85

Weir Link: W-G5-G6

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G6	Default:	0.00 ft
To Node:	NZA-G5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.48 ft	Discharge Coefficients	
Control Elevation:	4.48 ft	Weir Default:	2.800

Max Depth:	0.50 ft		
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G5-G6	005Yr-024Hr	4.56	0.00	0.00	1.07	1.07	1.07
W-G5-G6	010Yr-024Hr	6.15	-0.77	-1.53	1.10	1.10	1.10
W-G5-G6	025Yr-072Hr	11.03	-0.83	-1.50	1.10	1.10	1.10
W-G5-G6	100Yr-072Hr	12.87	0.00	-1.52	1.17	1.17	1.17

Weir Link: W-G6-G8

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G6	Default:	0.00 ft
To Node:	NZA-G7	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.55 ft	Discharge Coefficients	
Control Elevation:	4.55 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G6-G8	005Yr-024Hr	0.97	-2.35	0.01	-0.89	-0.89	-0.89
W-G6-G8	010Yr-024Hr	2.60	-3.54	1.24	-1.04	-1.04	-1.04
W-G6-G8	025Yr-072Hr	2.32	-6.71	1.23	-1.09	-1.09	-1.09
W-G6-G8	100Yr-072Hr	0.00	-7.43	2.35	-1.14	-1.14	-1.14

Weir Link: W-G7-G8			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G7	Default:	0.00 ft
To Node:	NZA-G8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.44 ft	Discharge Coefficients	
Control Elevation:	0.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G7-G8	005Yr-024Hr	5.98	0.00	0.00	1.29	1.29	1.29
W-G7-G8	010Yr-024Hr	7.73	0.00	2.06	1.40	1.40	1.40
W-G7-G8	025Yr-072Hr	8.31	-0.57	1.72	1.44	1.44	1.44
W-G7-G8	100Yr-072Hr	7.83	-3.84	-1.47	1.41	1.41	1.41

Weir Link: W-G8-G9			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-G8	Default:	0.00 ft
To Node:	NZA-G9	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.63 ft	Discharge Coefficients	
Control Elevation:	4.63 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G8-G9	005Yr-024Hr	0.00	-3.38	0.00	-1.06	-1.06	-1.06
W-G8-G9	010Yr-024Hr	0.00	-7.99	0.03	-1.41	-1.41	-1.41
W-G8-G9	025Yr-072Hr	0.00	-9.80	-1.68	-1.50	-1.50	-1.50
W-G8-G9	100Yr-072Hr	0.00	-10.28	1.69	-1.51	-1.51	-1.51

Weir Link: W-G8-I7

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-I7	Default:	0.00 ft
To Node:	NZA-G8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.70 ft	Discharge Coefficients	
Control Elevation:	4.70 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G8-I7	005Yr-024Hr	0.00	-2.75	0.00	0.00	0.00	0.00
W-G8-I7	010Yr-024Hr	0.00	-15.45	0.00	-1.77	-1.77	-1.77
W-G8-I7	025Yr-072Hr	0.00	-21.90	0.00	-1.99	-1.99	-1.99
W-G8-I7	100Yr-072Hr	0.00	-22.92	1.22	-2.08	-2.08	-2.08

Weir Link: W-G9-FDOT3A

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	FDOT-3A	Default:	0.00 ft
To Node:	NZA-G9	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	

Invert:	4.31 ft
Control Elevation:	4.31 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-G9-FDOT3 A	005Yr-024Hr	1.90	0.00	0.00	0.82	0.82	0.82
W-G9-FDOT3 A	010Yr-024Hr	2.88	0.00	1.07	0.83	0.83	0.83
W-G9-FDOT3 A	025Yr-072Hr	3.43	0.00	0.84	0.94	0.94	0.94
W-G9-FDOT3 A	100Yr-072Hr	3.71	0.00	0.54	1.09	1.09	1.09

Weir Link: W-I1-I2

Scenario:	COMBINED SOLUTIONS
From Node:	NZA-I2
To Node:	NZA-I1
Link Count:	1
Flow Direction:	Both
Damping:	0.0000 ft
Weir Type:	Paved Road Vertical
Geometry Type:	Rectangular
Invert:	4.03 ft
Control Elevation:	4.03 ft
Max Depth:	0.50 ft
Max Width:	22.00 ft
Fillet:	0.00 ft

Bottom Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Top Clip	
Default:	0.00 ft
Op Table:	
Ref Node:	

Discharge Coefficients	
Weir Default:	2.800
Weir Table:	
Orifice Default:	0.600
Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I1-I2	005Yr-024Hr	7.88	0.00	0.00	1.41	1.41	1.41

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I1-I2	010Yr-024Hr	14.20	0.00	0.00	1.72	1.72	1.72
W-I1-I2	025Yr-072Hr	19.12	0.00	2.08	1.90	1.90	1.90
W-I1-I2	100Yr-072Hr	28.34	0.00	-1.95	2.58	2.58	2.58

Weir Link: W-I1-OUTFALL

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-I1	Default:	0.00 ft
To Node:	OUTFALL (88th)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	5.00 ft	Discharge Coefficients	
Control Elevation:	5.00 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I1-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I1-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I1-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I1-OUTFALL	100Yr-072Hr	5.35	0.00	0.00	1.24	1.24	1.24

Weir Link: W-I2-I3

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-I2	Default:	0.00 ft
To Node:	NZA-I3	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	

Damping:	0.0000 ft		
Weir Type:	Paved Road Vertical	Default:	0.00 ft
Geometry Type:	Rectangular	Op Table:	
Invert:	4.55 ft	Ref Node:	
Control Elevation:	4.55 ft	**Discharge Coefficients**	
Max Depth:	0.50 ft	Weir Default:	2.800
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I2-I3	005Yr-024Hr	0.00	-6.77	0.00	0.00	0.00	0.00
W-I2-I3	010Yr-024Hr	0.00	-11.01	0.00	0.00	0.00	0.00
W-I2-I3	025Yr-072Hr	0.00	-14.20	0.00	-1.69	-1.69	-1.69
W-I2-I3	100Yr-072Hr	0.00	-22.00	1.37	-2.00	-2.00	-2.00

Weir Link: W-I3-I4

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-I3	Default:	0.00 ft
To Node:	NZA-I4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.56 ft	**Discharge Coefficients**	
Control Elevation:	4.56 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I3-I4	005Yr-024Hr	0.11	-3.15	0.00	-0.64	-0.64	-0.64
W-I3-I4	010Yr-024Hr	0.10	-5.19	0.00	-0.76	-0.76	-0.76

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I3-I4	025Yr-072Hr	0.12	-9.10	0.00	-1.14	-1.14	-1.14
W-I3-I4	100Yr-072Hr	0.16	-14.05	3.02	-1.28	-1.28	-1.28

Weir Link: W-I4-I5

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-I5	Default:	0.00 ft
To Node:	NZA-I4	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.86 ft	**Discharge Coefficients**	
Control Elevation:	4.86 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I4-I5	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I4-I5	010Yr-024Hr	0.55	-0.02	0.00	0.00	0.00	0.00
W-I4-I5	025Yr-072Hr	5.24	-0.62	0.00	1.23	1.23	1.23
W-I4-I5	100Yr-072Hr	10.66	-0.73	2.07	1.49	1.49	1.49

Weir Link: W-I5-I6

Scenario:	COMBINED SOLUTIONS	**Bottom Clip**	
From Node:	NZA-I6	Default:	0.00 ft
To Node:	NZA-I5	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	**Top Clip**	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.70 ft	**Discharge Coefficients**	
Control Elevation:	4.70 ft	Weir Default:	2.800

Max Depth:	0.50 ft		
Max Width:	22.00 ft	Weir Table:	
Fillet:	0.00 ft	Orifice Default:	0.600
		Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I5-I6	005Yr-024Hr	0.00	-1.60	0.00	0.00	0.00	0.00
W-I5-I6	010Yr-024Hr	0.00	-4.43	0.00	-1.07	-1.07	-1.07
W-I5-I6	025Yr-072Hr	2.07	-6.76	0.01	-1.32	-1.32	-1.32
W-I5-I6	100Yr-072Hr	5.22	-11.51	1.67	-1.60	-1.60	-1.60

Weir Link: W-I6-I7

Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-I6	Default:	0.00 ft
To Node:	NZA-I7	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	4.48 ft	Discharge Coefficients	
Control Elevation:	4.48 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	

Comment:

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I6-I7	005Yr-024Hr	0.00	-1.29	0.00	0.00	0.00	0.00
W-I6-I7	010Yr-024Hr	0.00	-21.30	0.00	-1.96	-1.96	-1.96
W-I6-I7	025Yr-072Hr	0.00	-25.25	0.00	-2.30	-2.30	-2.30
W-I6-I7	100Yr-072Hr	0.00	-31.52	-0.01	-2.87	-2.87	-2.87

Weir Link: W-I6-OUTFALL			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	NZA-I6	Default:	0.00 ft
To Node:	OUTFALL (CARLYLE)	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Both	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Broad Crested Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	7.30 ft	Discharge Coefficients	
Control Elevation:	7.30 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I6-OUTFALL	005Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I6-OUTFALL	010Yr-024Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I6-OUTFALL	025Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00
W-I6-OUTFALL	100Yr-072Hr	0.00	0.00	0.00	0.00	0.00	0.00

Weir Link: W-I8-FDOT4A			
Scenario:	COMBINED SOLUTIONS	Bottom Clip	
From Node:	FDOT-4A	Default:	0.00 ft
To Node:	NZA-I8	Op Table:	
Link Count:	1	Ref Node:	
Flow Direction:	Positive	Top Clip	
Damping:	0.0000 ft	Default:	0.00 ft
Weir Type:	Paved Road Vertical	Op Table:	
Geometry Type:	Rectangular	Ref Node:	
Invert:	3.87 ft	Discharge Coefficients	
Control Elevation:	3.87 ft	Weir Default:	2.800
Max Depth:	0.50 ft	Weir Table:	
Max Width:	22.00 ft	Orifice Default:	0.600
Fillet:	0.00 ft	Orifice Table:	
Comment:			

Link Min/Max Conditions [COMBINED SOLUTIONS]

Link Name	Sim Name	Max Flow [cfs]	Min Flow [cfs]	Min/Max Delta Flow [cfs]	Max Us Velocity [fps]	Max Ds Velocity [fps]	Max Avg Velocity [fps]
W-I8-FDOT4A	005Yr-024Hr	5.46	0.00	1.41	1.24	1.24	1.24
W-I8-FDOT4A	010Yr-024Hr	5.91	0.00	2.47	1.25	1.25	1.25
W-I8-FDOT4A	025Yr-072Hr	7.87	0.00	2.36	1.25	1.25	1.25
W-I8-FDOT4A	100Yr-072Hr	9.88	0.00	3.05	1.23	1.23	1.23

Rating Curve: RC-0001

Scenario: COMBINED SOLUTIONS
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	39.60
9.90	39.60

Comment: Surfside Drainage Wells:
DW 1: 620 GPM/FT
DW 2: 800 GPM/FT
DW 3: 800 GPM/FT

Rating Curve: RC-0002

Scenario: COMBINED SOLUTIONS
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	33.00
9.90	33.00

Comment: Surfside Drainage Wells:
DW 4: 500 GPM/FT
DW 5: 800 GPM/FT
DW 6: 550 GPM/FT

Rating Curve: RC-0003

Scenario: COMBINED SOLUTIONS
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	27.67
9.90	27.67

Comment: Surfside Drainage Wells:
DW 7: 500 GPM/FT
DW 8: 400 GPM/FT
DW 9: 650 GPM/FT

Rating Curve: RC-0004

Scenario: COMBINED SOLUTIONS
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
2.00	14.20
8.00	14.20

Comment: Existing Surfside Pump Station (92nd)

Rating Curve: RC-0005

Scenario: COMBINED SOLUTIONS
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
1.90	42.88
9.90	42.88

Comment: FDOT Drainage Wells:
600 GPM/FT

Rating Curve: RC-PROPOSED-92ND

Scenario: COMBINED SOLUTIONS
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
2.00	26.78
8.00	26.78

Comment: DW-14, DW-15, DW-16
@ 500 MGP

Rating Curve: RC-PROPOSED-TEST

Scenario: COMBINED SOLUTIONS

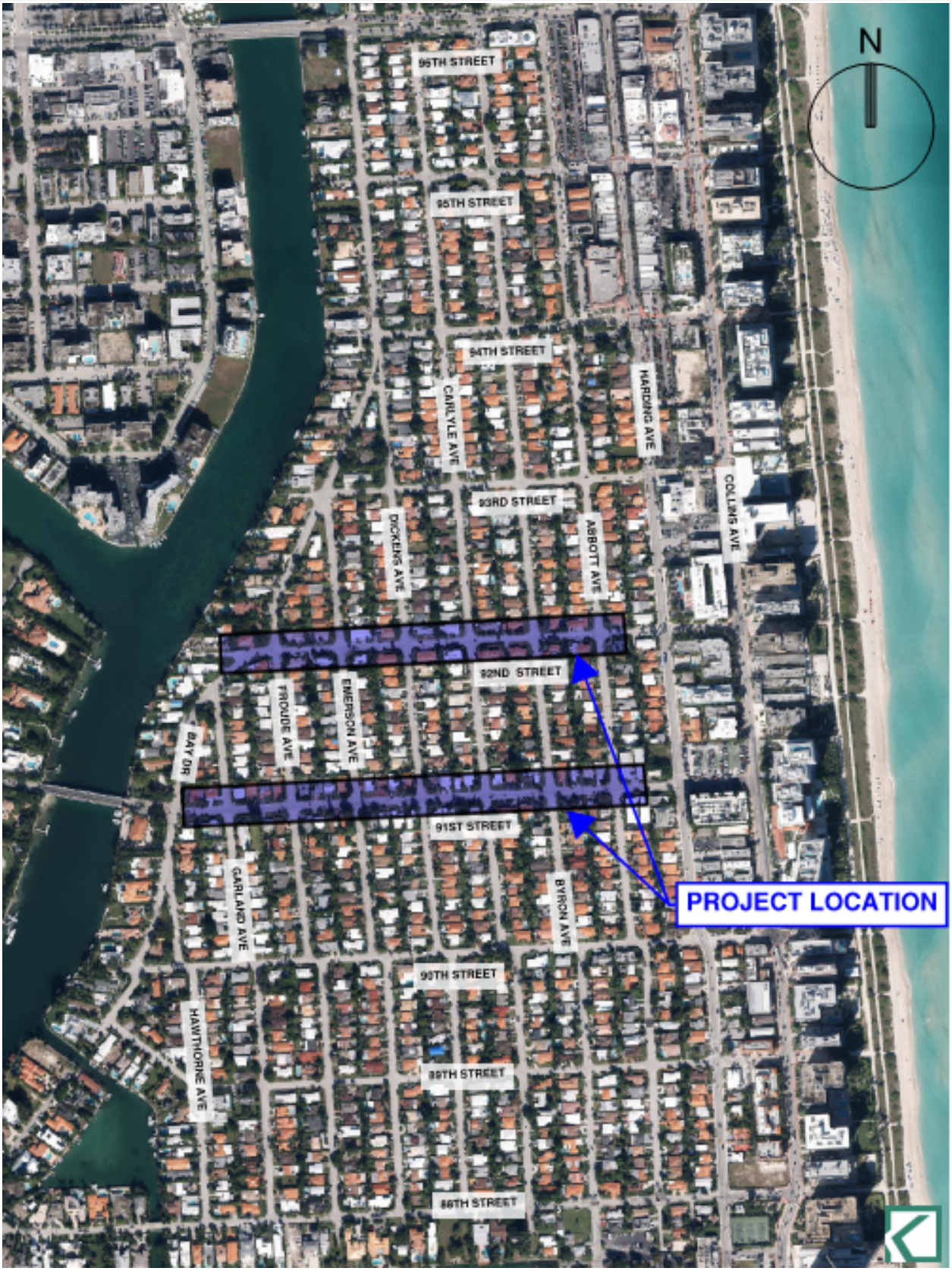
Type: Upstream Stage

Upstream Stage [ft]	Discharge [cfs]
2.00	26.78
8.00	26.78

Comment: DW-10, DW-11, DW-12 AT 500 GMP

Appendix A

Site Location Map



PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SITE LOCATION MAP

KEITH

5808 Blue Lagoon Drive, Suite 218
Miami, Florida 33126
PH: (954) 788-3400
Florida Certificate of Authorization: 7928
Licensed Business Number: 6860

APPENDIX A

DATE APRIL 2022

SCALE NOT TO SCALE

DSGN. BY CM

DWNG. BY VC

CHK. BY SW

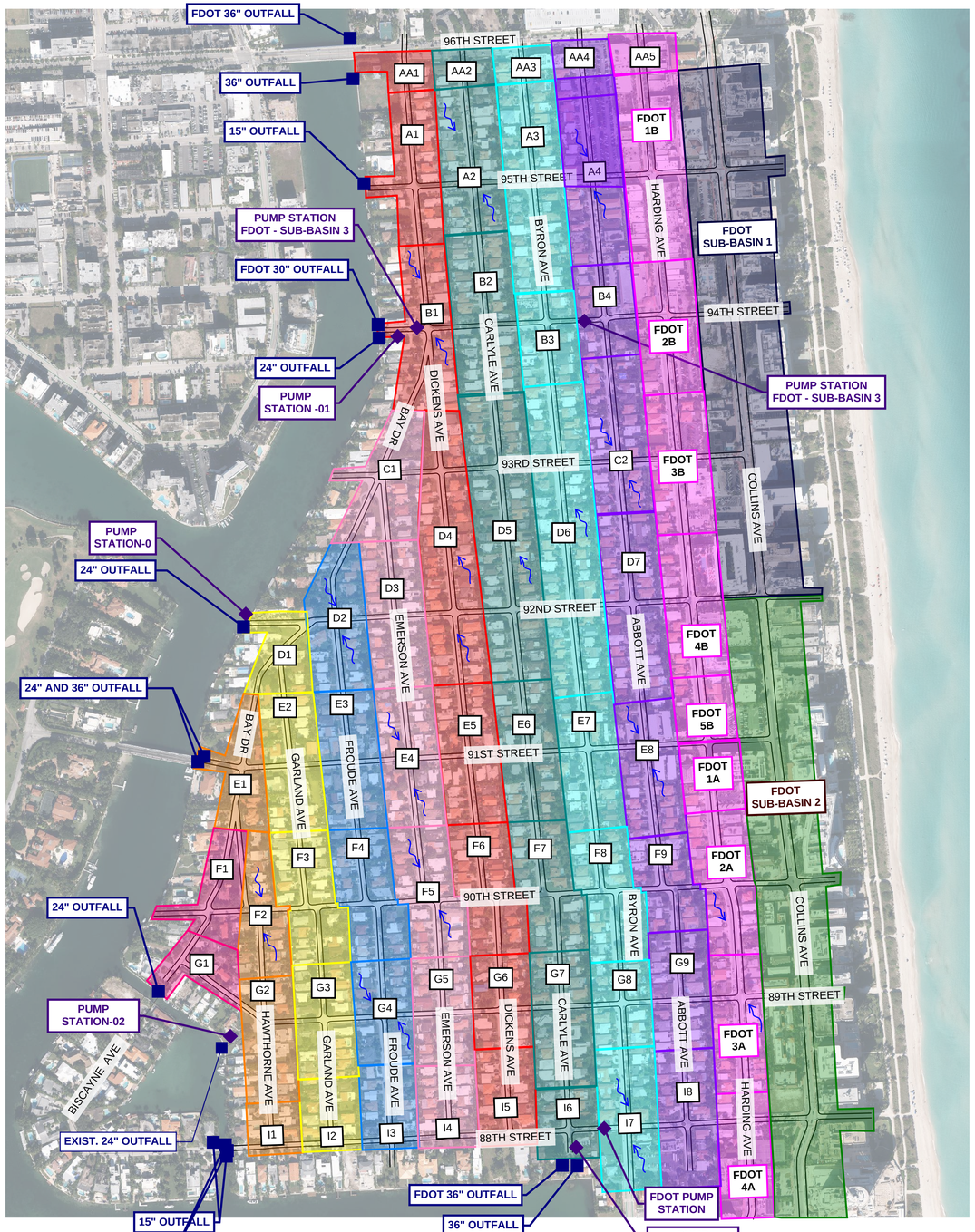
DATE	REVISIONS

Appendix B

Basin Map

LEGEND

OUTFALL | BASIN (A1) | PUMP STATION | FLOW ARROW



BASIN AREAS

Road Name	Basin	Acrea
Harding Road	AA5	1.30
	FDOT 1B	5.97
	FDOT 2B	4.05
	FDOT 3B	4.15
	FDOT 4B	4.30
	FDOT 5B	1.96
	FDOT 1A	2.05
	FDOT 2A	3.92
	FDOT 3A	3.59
	FDOT 4A	3.34
Abbot Road	AA4	1.13
	A4	5.56
	B4	2.64
	C2	5.48
	D7	5.55
	E8	4.09
	F9	2.88
	G9	3.49
	I8	3.95
Byron Road	AA3	1.08
	A3	6.12
	B3	2.77
	D6	9.07
	E7	3.96
	F8	3.89
	G8	2.44
	I7	4.12
Carlyle Road	AA2	1.19
	A2	4.55
	B2	5.27
	D5	8.82
	E6	4.09
	F7	3.88
	G7	4.14
	I6	2.21
Dickens Road	AA1	1.27
	A1	3.76
	B1	4.43
	D4	6.99
	E5	4.16
	F6	3.88
	G6	2.79
	I5	2.81
Emerson Road	C1	4.06
	D3	4.30
	E4	4.12
	F5	3.78
	G5	3.19
	I4	2.45
Froude Road	D2	4.06
	E3	4.07
	F4	3.99
	G4	3.08
	I3	2.38
Garland Road	D1	2.24
	E2	3.89
	F3	3.78
	G3	3.43
	I2	2.18
Hawthorne Road	E1	2.83
	F2	2.66
	G2	3.26
	I1	1.36
Bay Road	F1	2.63
	G1	2.10

NOTE:
FDOT SUB BASIN AREAS DETERMINED FROM FINAL AS-BUILT PLANS. DATED 08/14/2008 (FINANCIAL PROJECT ID:249561-2-52-01)

N

GRAPHIC SCALE
0 300 600
SCALE: 1" = 300
NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.

KEITH
301 East Atlantic Blvd. Pompano Beach, FL 33060
PH: (954) 788-3400
Florida Certificate of Authorization: 7928
Licensed Business Number: 6860

NO.	DESCRIPTION	DATE

PRELIMINARY PLAN NOT FOR CONSTRUCTION

THESE PLANS ARE NOT FULLY PERMITTED AND ARE SUBJECT TO REVISIONS MADE DURING THE PERMITTING PROCESS.

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	
DESIGNED BY:	MB
DRAWN BY:	VC
CHECKED BY:	CMP
BID-CONTRACT:	

CLIENT

TOWN OF SURFSIDE

PROJECT

TOWN OF SURFSIDE - ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

EXIST. DRAINAGE BASIN MAP

SHEET NUMBER	11494.M0
PROJECT NUMBER	EX-101

Appendix C

Stormwater Conveyance Pipe Network Map

N

GRAPHIC SCALE
0 300 600
SCALE: 1" = 300
NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.

LEGEND

- CATCH BASIN
- CURB INLET
- MANHOLE
- OUTFALL
- PUMP STATION

STORMWATER PIPE DIAMETER

TBD	24"
10"	30"
12"	36"
15"	42"
16"	48"
18"	

KEITH
301 East Atlantic Blvd. Pompano Beach, FL 33060
PH: (954) 788-3400
Florida Certificate of Authorization: 7928
Licensed Business Number: 6860

NO.	DESCRIPTION	DATE

PRELIMINARY PLAN NOT FOR CONSTRUCTION

THESE PLANS ARE NOT FULLY PERMITTED AND ARE SUBJECT TO REVISIONS MADE DURING THE PERMITTING PROCESS.

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	
DESIGNED BY:	MB
DRAWN BY:	VC
CHECKED BY:	CMP
BID-CONTRACT:	

CLIENT

TOWN OF SURFSIDE

PROJECT

TOWN OF SURFSIDE - ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PIPE NETWORK MAP

SHEET NUMBER	11494.M0
PROJECT NUMBER	EX-102

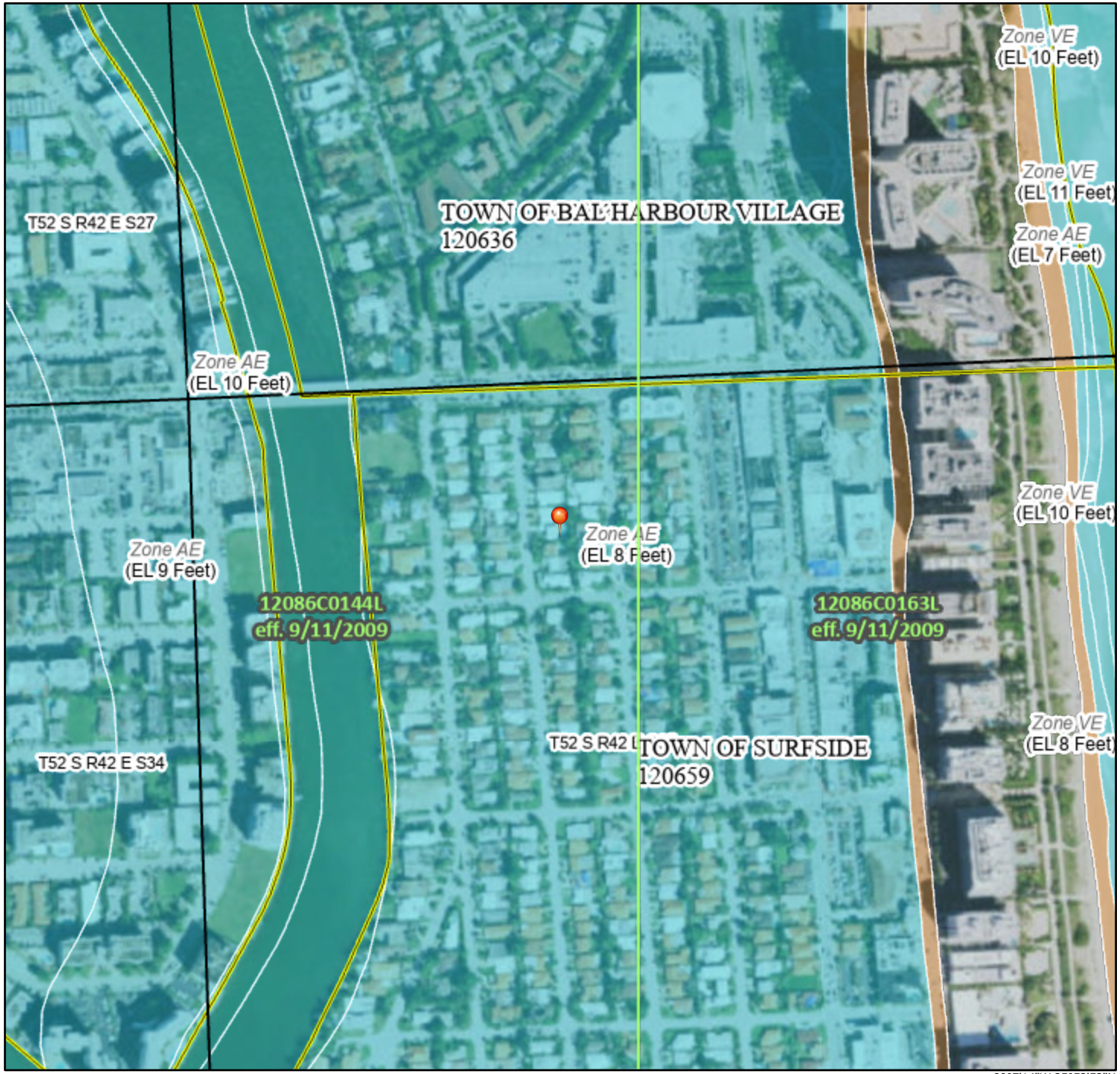
Appendix D

FEMA Flood Map

National Flood Hazard Layer FIRMette

FEMA

80°7'51"W 25°53'25"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

80°7'14"W 25°52'52"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/11/2021 at 3:15 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

80°7'31"W 25°53'22"N

80°6'53"W 25°52'50"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
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- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

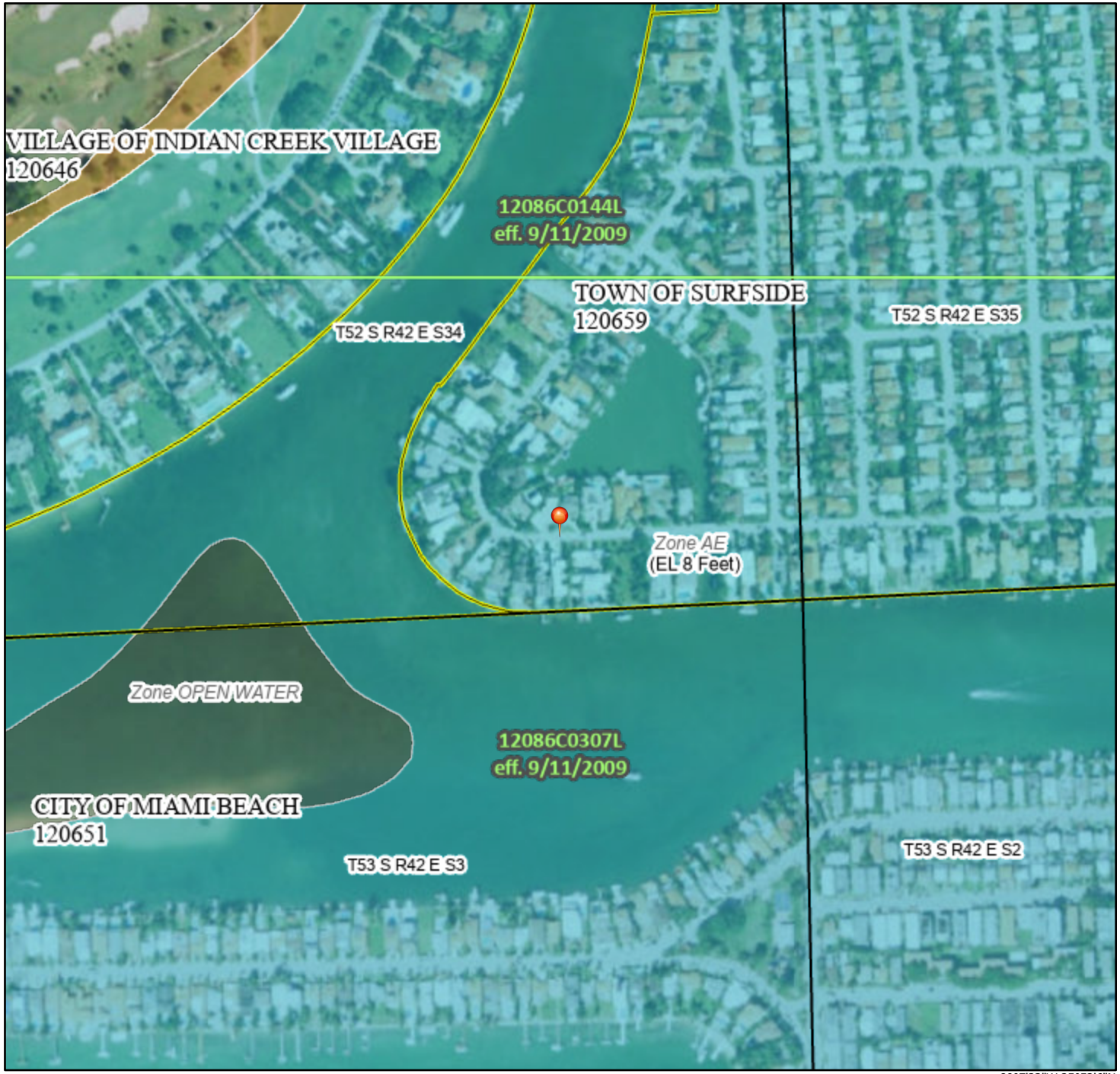
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/11/2021 at 3:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

80°8'10"W 25°52'38"N



80°7'33"W 25°52'6"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
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- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

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- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

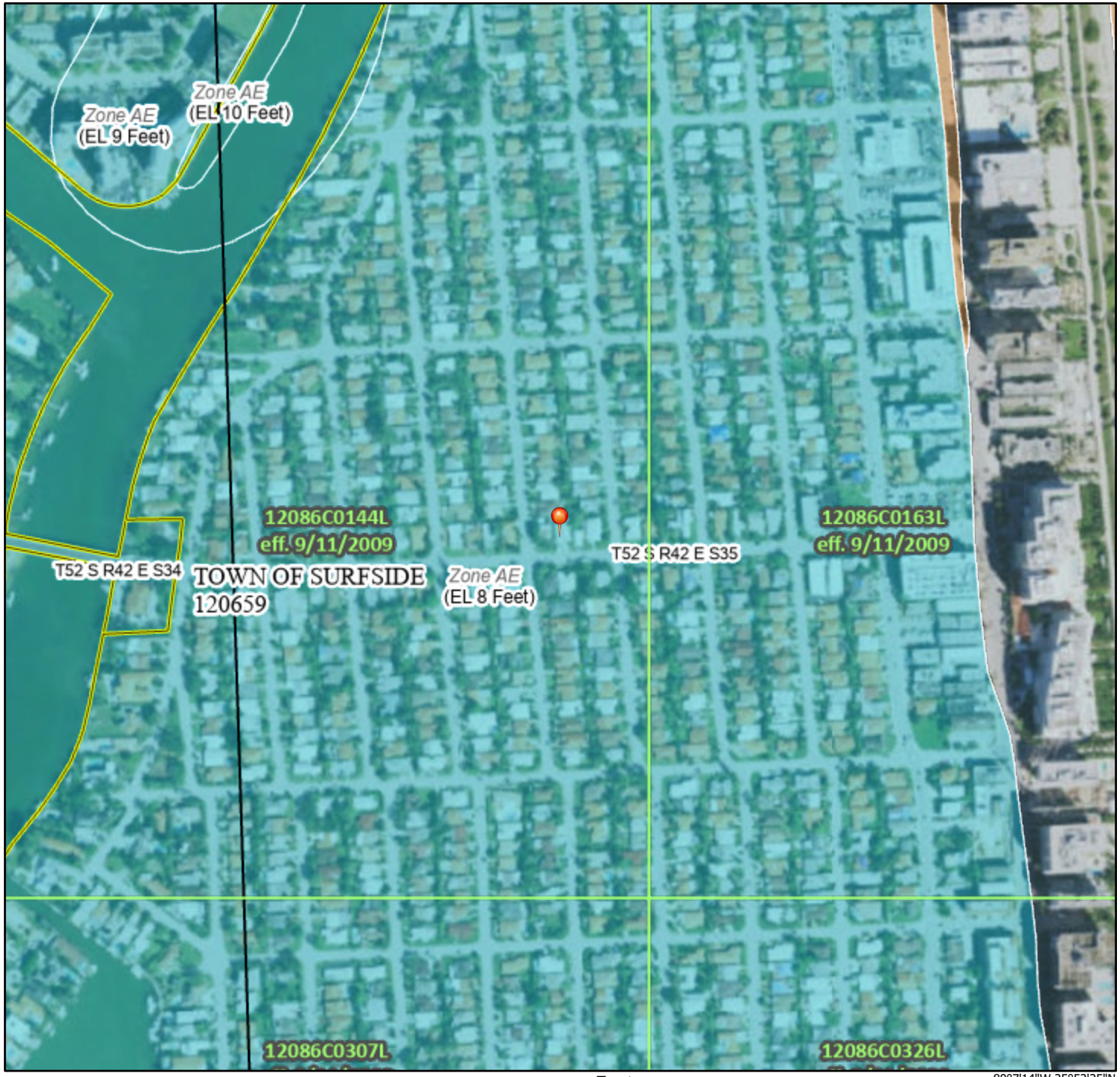
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/11/2021 at 3:12 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

80°7'52"W 25°52'57"N



80°7'14"W 25°52'25"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

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- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

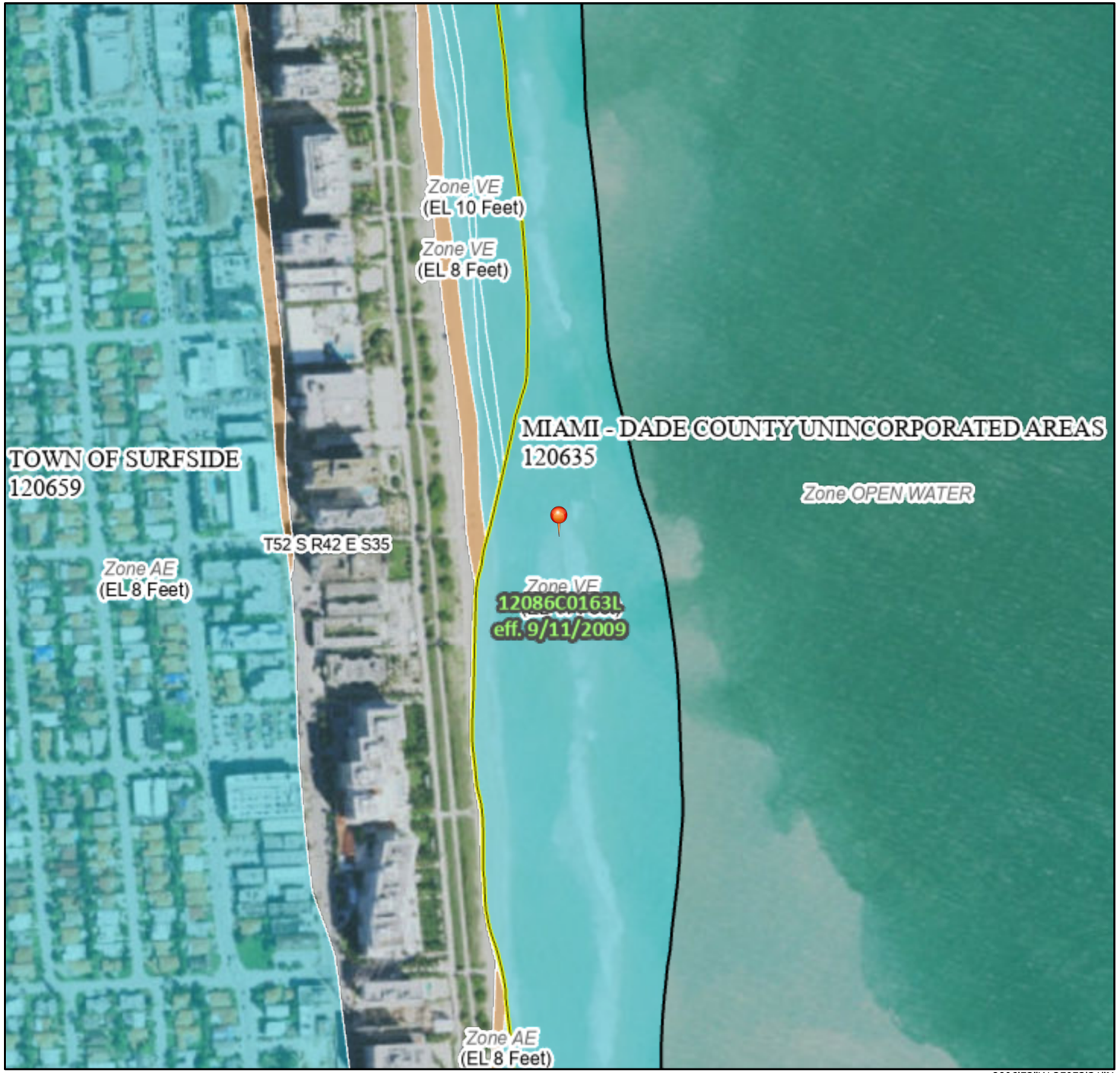
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/6/2021 at 10:44 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

80°7'29"W 25°53'4"N



80°6'52"W 25°52'31"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

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GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

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- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

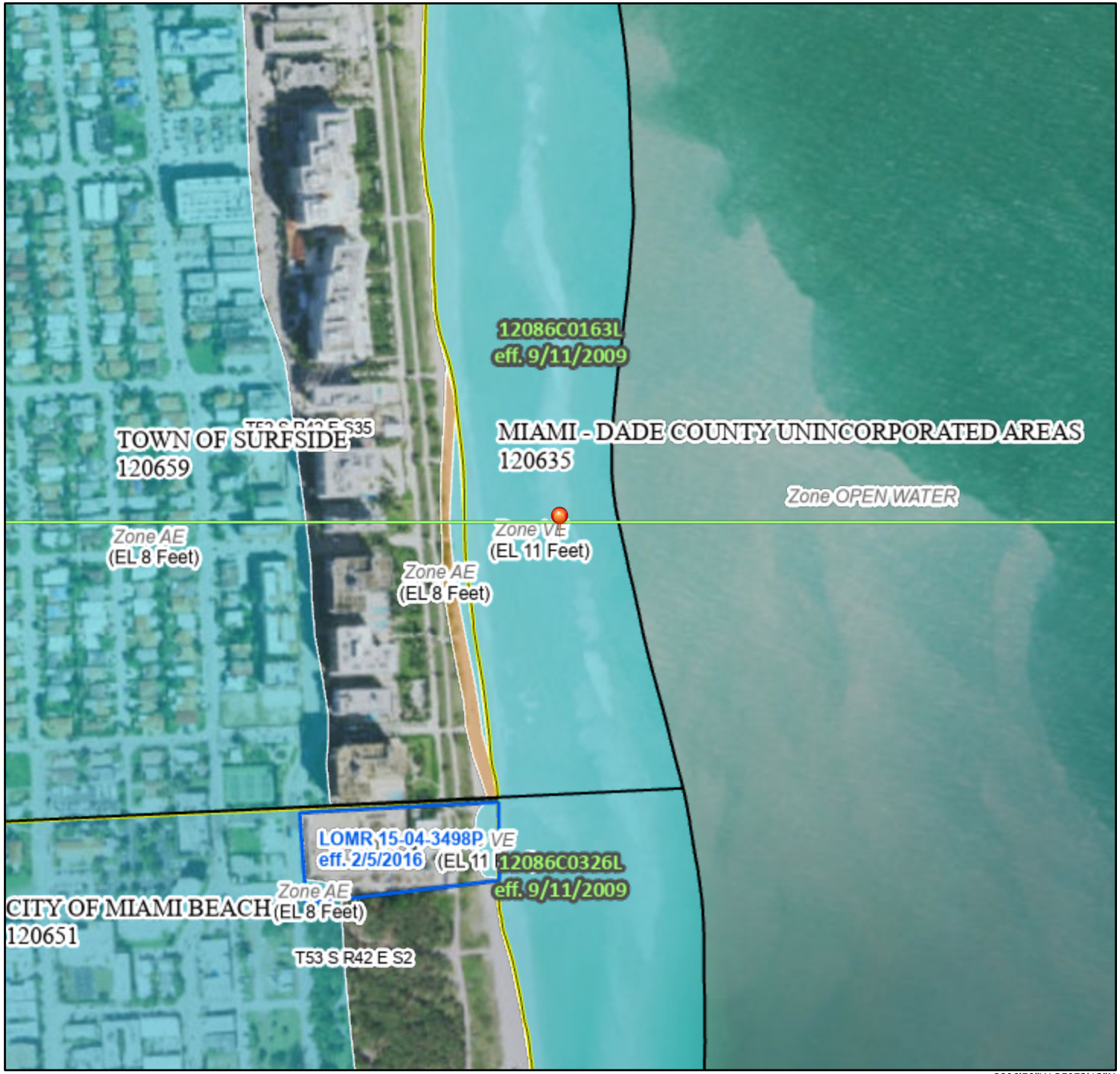
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/11/2021 at 3:18 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette

FEMA

80°7'27"W 25°52'46"N



80°6'50"W 25°52'13"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

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- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/11/2021 at 3:19 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Appendix E

USGA Soils Map

Map Scale: 1:10,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 12, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 6, 2019—Mar 24, 2020

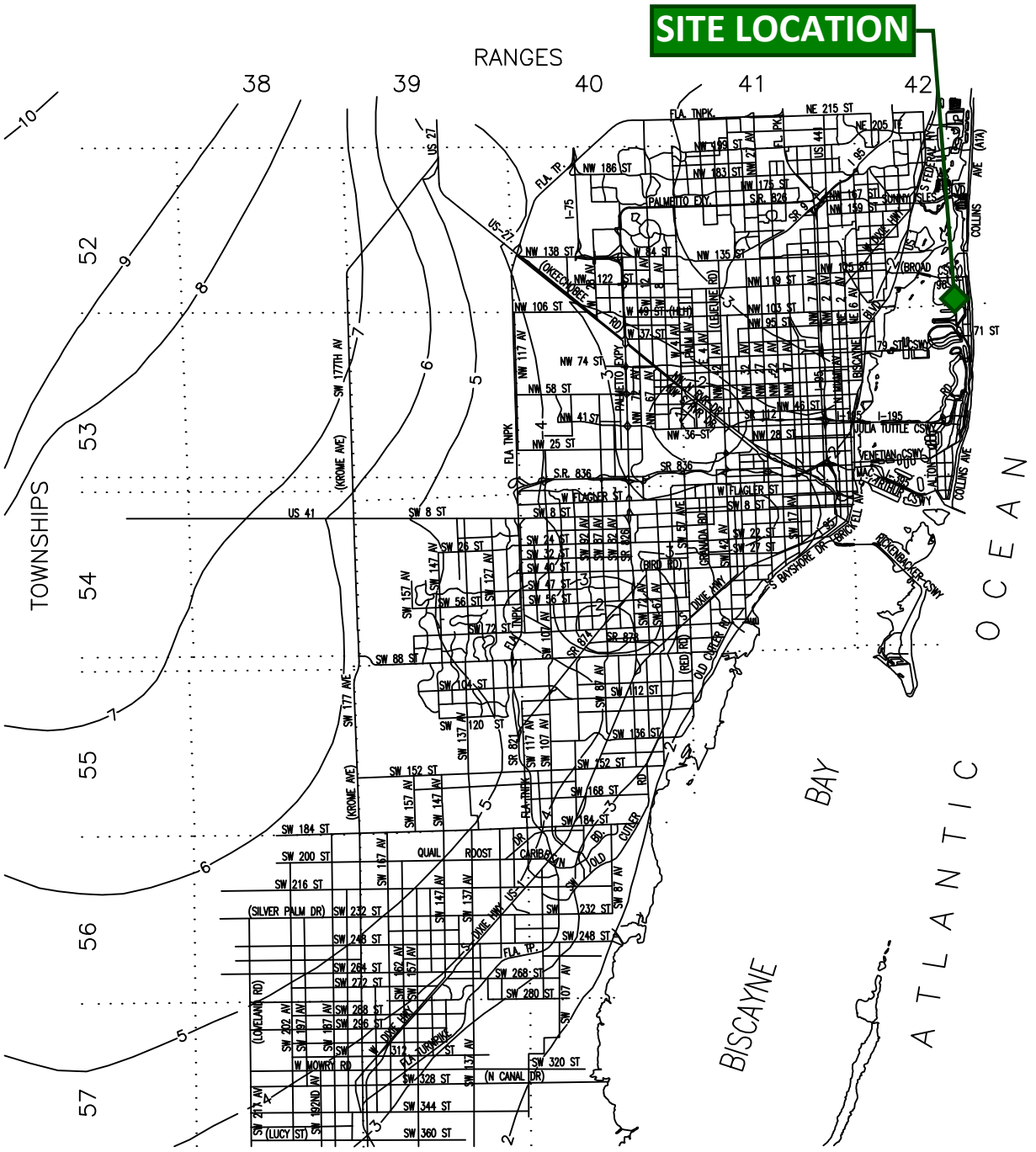
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
15	Urban land, 0 to 2 percent slopes	316.0	85.9%
39	Beaches	12.1	3.3%
99	Water	31.9	8.7%
100	Waters of the Atlantic Ocean	7.7	2.1%
Totals for Area of Interest		**367.7**	**100.0%**

Appendix F

Miami-Dade County Ground Water Level Map



NOTES:

1. CONTOUR INTERVAL 0.5 FOOT OR AS NOTED.
2. DATUM IS MEAN SEA LEVEL.
3. PREPARED FROM MIAMI–DADE FLOOD CRITERIA MAPS

1"=30,000'

0 1 2 3 4 5 6 7 8 9 10

SCALE IN MILES

KEITH
Engineering Inspired Design.
5805 BLUE LAGOON DRIVE, SUITE 218
MIAMI, FL 33126
(305) 667-5474

AVERAGE OCTOBER GROUND WATER LEVEL 1960-75

SECTION 29 , TOWNSHIP 52 , RANGE 42

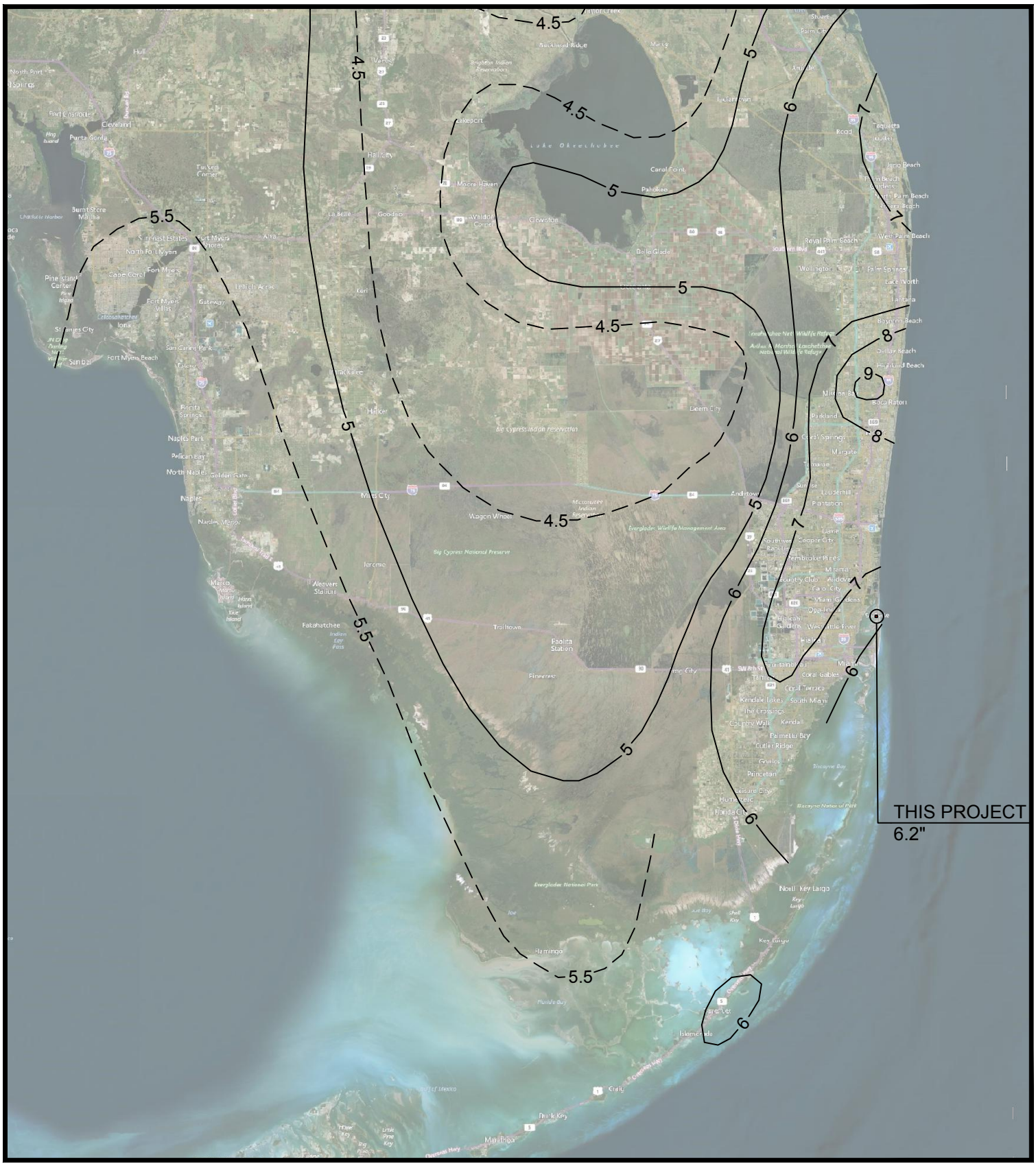
MIAMI-DADE COUNTY, FLORIDA

SHEET

C

Appendix G

Rainfall Distribution Maps



SHEET TITLE

5-YEAR, 24 HOUR ISOHYETAL MAP

KEITH

301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

DATE 3/31/22

SCALE 1" = 20 mi.

N

Drawing name: S:\11494.01 - Abbott Avenue Stormwater Drainage Design Phase II – Town of Surfside\Engineering\Design Calculations & Reports\Stormwater\Exhibits\Rainfall Maps\11494.01 Rainfall Maps.dwg

Plotted by: mbrooks On 3/31/2022 11:38 AM

SHEET TITLE

10-YEAR, 24 HOUR ISOHYETAL MAP

KEITH

301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

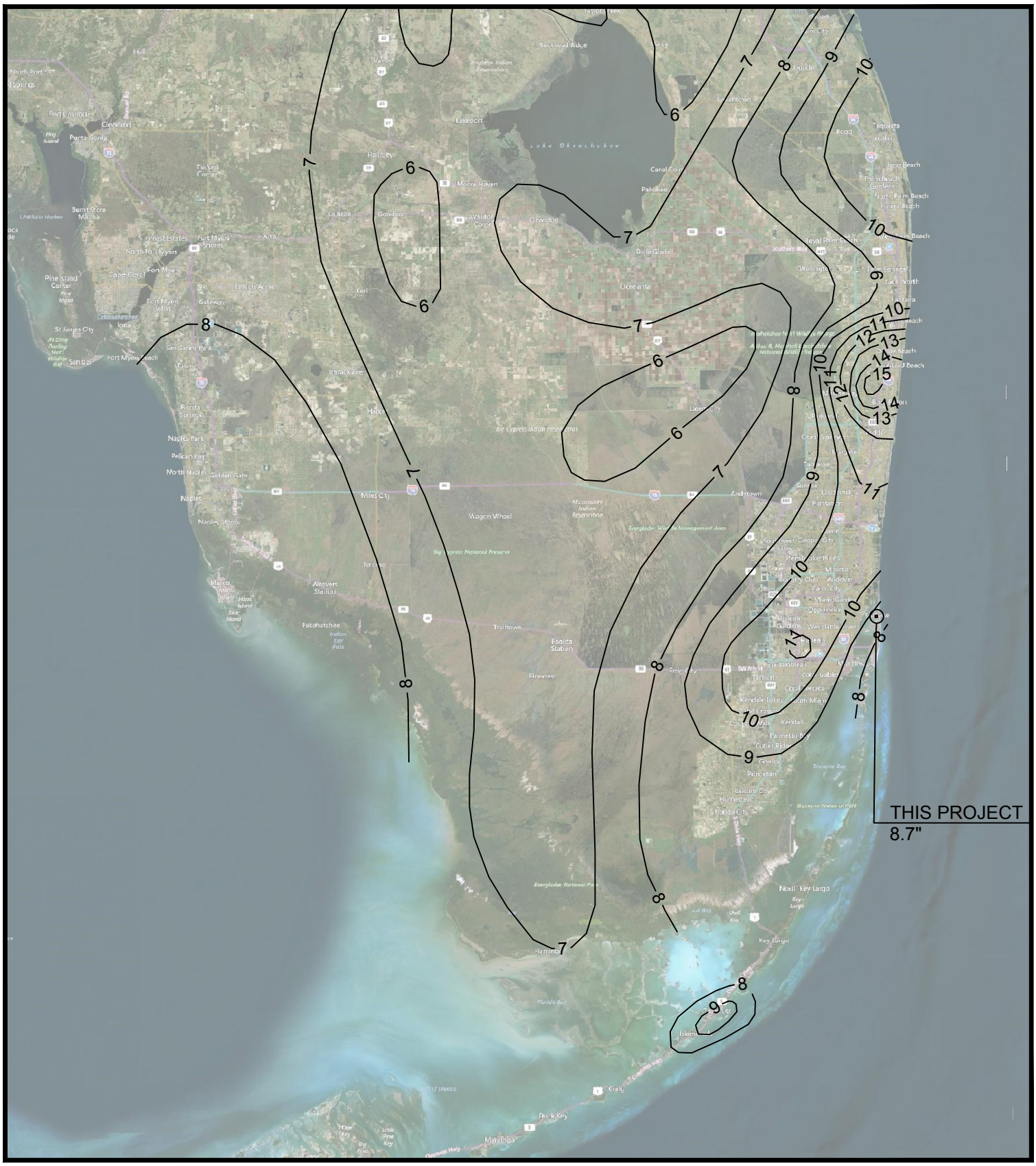
DATE 3/31/22

SCALE 1" = 20 mi.

N

Drawing name: S:\11494.01 - Abbott Avenue Stormwater Drainage Design Phase II – Town of Surfside\Engineering\Design Calculations & Reports\Stormwater\Exhibits\Rainfall Maps\11494.01 Rainfall Maps.dwg

Plotted by: mbrooks On 3/31/2022 11:38 AM



SHEET TITLE

25-YEAR, 24 HOUR ISOHYETAL MAP

KEITH

301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

DATE 3/31/22

SCALE 1" = 20 mi.

N

Drawing name: S:\11494.01 - Abbott Avenue Stormwater Drainage Design Phase II – Town of Surfside\Engineering\Design Calculations & Reports\Stormwater\Exhibits\Rainfall Maps\11494.01 Rainfall Maps.dwg

Plotted by: mbrooks On 3/31/2022 11:38 AM

SHEET TITLE

25-YEAR, 72 HOUR ISOHYETAL MAP

KEITH

301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

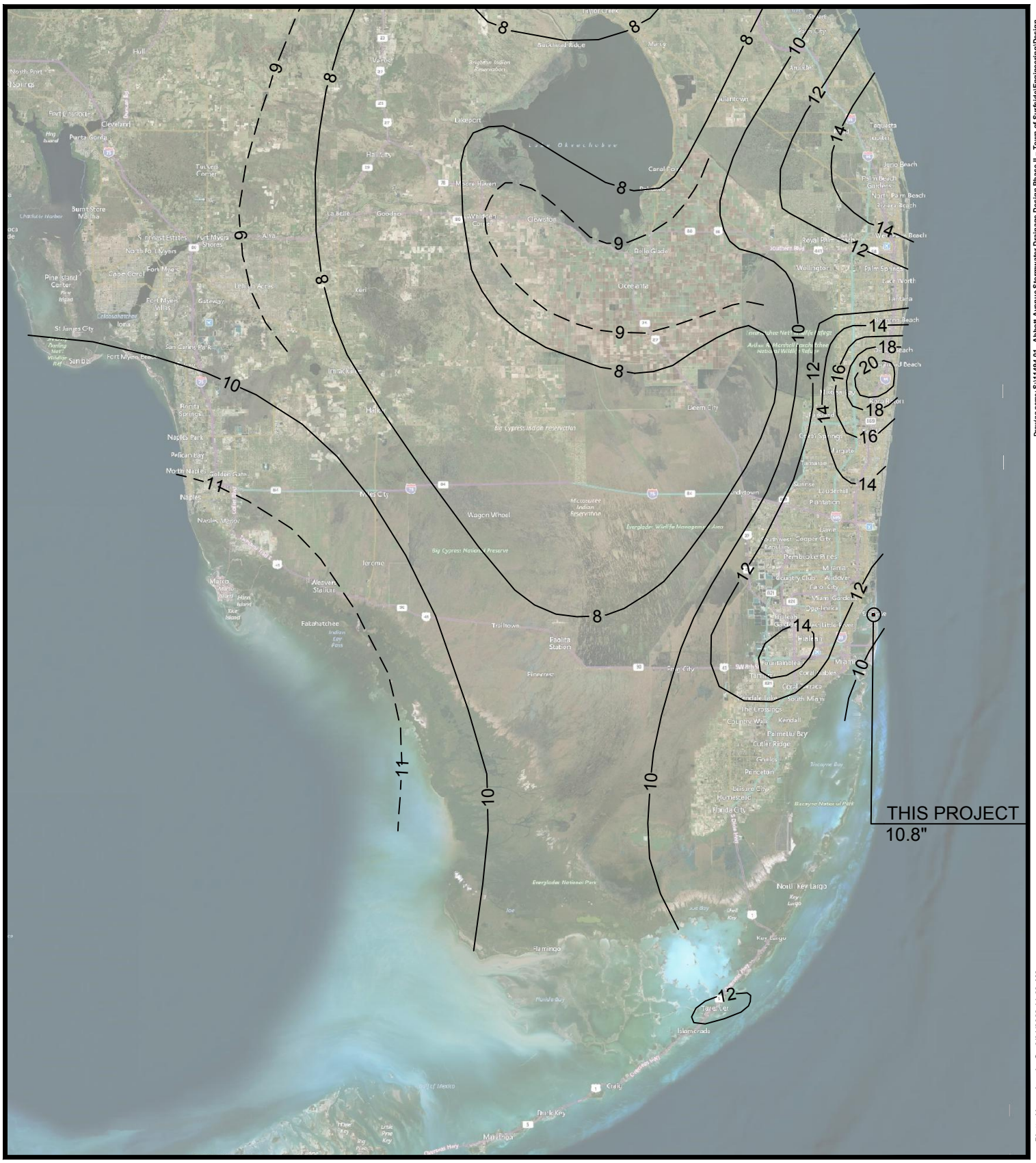
DATE 3/31/22

SCALE 1" = 20 mi.

N

Drawing name: S:\11494.01 - Abbott Avenue Stormwater Drainage Design Phase II – Town of Surfside\Engineering\Design Calculations & Reports\Stormwater\Exhibits\Rainfall Maps\11494.01 Rainfall Maps.dwg

Plotted by: mbrooks On 3/31/2022 11:38 AM



SHEET TITLE

100-YEAR, 24 HOUR ISOHYETAL MAP

KEITH

301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

DATE 3/31/22

SCALE 1" = 20 mi.

N

Drawing name: S:\11494.01 - Abbott Avenue Stormwater Drainage Design Phase II – Town of Surfside\Engineering\Design Calculations & Reports\Stormwater\Exhibits\Rainfall Maps\11494.01 Rainfall Maps.dwg

Plotted by: mbrooks On 3/31/2022 11:38 AM

SHEET TITLE

100-YEAR, 72 HOUR ISOHYETAL MAP

KEITH

301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400

Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

DATE 3/31/22

SCALE 1" = 20 mi.

N

Drawing name: S:\11494.01 - Abbott Avenue Stormwater Drainage Design Phase II – Town of Surfside\Engineering\Design Calculations & Reports\Stormwater\Exhibits\Rainfall Maps\11494.01 Rainfall Maps.dwg

Plotted by: mbrooks On 3/31/2022 11:38 AM

NOAA Atlas 14, Volume 9, Version 2
Location name: Miami Beach, Florida, USA*
Latitude: 25.8782°, Longitude: -80.1238°
Elevation: 2.67 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.572 (0.465-0.701)	0.656 (0.534-0.806)	0.797 (0.646-0.981)	0.915 (0.737-1.13)	1.08 (0.841-1.38)	1.21 (0.919-1.57)	1.34 (0.984-1.78)	1.47 (1.04-2.01)	1.65 (1.12-2.32)	1.79 (1.18-2.56)
10-min	0.837 (0.682-1.03)	0.961 (0.782-1.18)	1.17 (0.946-1.44)	1.34 (1.08-1.66)	1.58 (1.23-2.02)	1.77 (1.35-2.29)	1.96 (1.44-2.60)	2.15 (1.52-2.95)	2.42 (1.64-3.40)	2.62 (1.73-3.74)
15-min	1.02 (0.831-1.25)	1.17 (0.954-1.44)	1.42 (1.15-1.75)	1.63 (1.32-2.02)	1.93 (1.50-2.46)	2.16 (1.64-2.80)	2.39 (1.76-3.18)	2.63 (1.85-3.59)	2.95 (2.00-4.14)	3.19 (2.11-4.56)
30-min	1.56 (1.27-1.91)	1.80 (1.46-2.21)	2.20 (1.78-2.71)	2.53 (2.04-3.14)	3.00 (2.34-3.83)	3.37 (2.56-4.36)	3.73 (2.74-4.96)	4.11 (2.90-5.62)	4.61 (3.13-6.49)	5.00 (3.30-7.15)
60-min	2.10 (1.71-2.57)	2.40 (1.96-2.95)	2.94 (2.38-3.62)	3.42 (2.76-4.23)	4.13 (3.24-5.33)	4.71 (3.60-6.16)	5.33 (3.94-7.14)	5.99 (4.24-8.25)	6.92 (4.71-9.79)	7.66 (5.06-11.0)
2-hr	2.64 (2.16-3.21)	3.01 (2.46-3.67)	3.69 (3.00-4.51)	4.31 (3.49-5.30)	5.26 (4.16-6.78)	6.06 (4.67-7.90)	6.93 (5.16-9.26)	7.88 (5.62-10.8)	9.22 (6.32-13.0)	10.3 (6.86-14.7)
3-hr	2.94 (2.42-3.57)	3.35 (2.75-4.08)	4.13 (3.37-5.03)	4.86 (3.95-5.96)	6.02 (4.80-7.79)	7.03 (5.45-9.17)	8.13 (6.09-10.9)	9.36 (6.71-12.8)	11.1 (7.67-15.7)	12.6 (8.39-17.8)
6-hr	3.44 (2.84-4.15)	3.97 (3.27-4.79)	4.98 (4.09-6.03)	5.95 (4.86-7.24)	7.50 (6.03-9.67)	8.85 (6.91-11.5)	10.4 (7.80-13.8)	12.0 (8.68-16.4)	14.4 (10.0-20.2)	16.4 (11.0-23.1)
12-hr	3.92 (3.25-4.69)	4.64 (3.84-5.57)	5.98 (4.94-7.20)	7.24 (5.94-8.75)	9.18 (7.40-11.7)	10.9 (8.49-14.0)	12.7 (9.58-16.7)	14.7 (10.6-19.9)	17.5 (12.2-24.4)	19.9 (13.4-27.8)
24-hr	4.48 (3.73-5.33)	5.38 (4.48-6.42)	7.02 (5.82-8.39)	8.52 (7.03-10.2)	10.8 (8.72-13.7)	12.7 (10.0-16.2)	14.8 (11.2-19.4)	17.1 (12.4-22.9)	20.3 (14.2-28.0)	22.9 (15.6-31.8)
2-day	5.27 (4.41-6.23)	6.26 (5.24-7.41)	8.05 (6.71-9.56)	9.70 (8.04-11.6)	12.2 (9.90-15.3)	14.3 (11.3-18.1)	16.6 (12.7-21.5)	19.1 (14.0-25.4)	22.6 (15.9-30.9)	25.4 (17.4-35.1)
3-day	5.91 (4.96-6.96)	6.94 (5.82-8.18)	8.80 (7.36-10.4)	10.5 (8.73-12.5)	13.1 (10.6-16.3)	15.2 (12.1-19.2)	17.6 (13.5-22.7)	20.1 (14.8-26.7)	23.7 (16.8-32.3)	26.6 (18.3-36.5)
4-day	6.49 (5.46-7.62)	7.52 (6.33-8.84)	9.38 (7.86-11.1)	11.1 (9.24-13.1)	13.7 (11.1-17.0)	15.8 (12.6-19.9)	18.2 (14.0-23.4)	20.7 (15.3-27.4)	24.3 (17.3-33.1)	27.2 (18.8-37.3)
7-day	7.97 (6.73-9.31)	8.94 (7.55-10.5)	10.7 (9.02-12.6)	12.4 (10.4-14.6)	14.9 (12.2-18.4)	17.0 (13.6-21.3)	19.4 (15.0-24.8)	21.9 (16.3-28.8)	25.6 (18.3-34.6)	28.5 (19.8-38.9)
10-day	9.14 (7.75-10.6)	10.2 (8.60-11.8)	12.0 (10.1-14.0)	13.7 (11.5-16.1)	16.3 (13.4-20.0)	18.5 (14.8-22.9)	20.8 (16.1-26.5)	23.4 (17.4-30.6)	27.0 (19.4-36.4)	30.0 (20.9-40.7)
20-day	12.0 (10.3-13.9)	13.6 (11.5-15.7)	16.1 (13.7-18.7)	18.3 (15.5-21.4)	21.4 (17.6-25.8)	23.9 (19.1-29.2)	26.4 (20.5-33.2)	29.1 (21.7-37.5)	32.7 (23.5-43.4)	35.4 (24.8-47.8)
30-day	14.4 (12.3-16.6)	16.4 (14.0-18.9)	19.6 (16.6-22.6)	22.2 (18.8-25.7)	25.7 (21.0-30.7)	28.4 (22.8-34.4)	31.1 (24.1-38.6)	33.7 (25.2-43.2)	37.2 (26.8-49.0)	39.8 (28.0-53.4)
45-day	17.5 (15.0-20.0)	19.9 (17.0-22.8)	23.7 (20.2-27.3)	26.7 (22.7-30.9)	30.7 (25.1-36.3)	33.6 (26.9-40.4)	36.3 (28.2-44.8)	39.0 (29.1-49.5)	42.2 (30.5-55.2)	44.6 (31.5-59.6)
60-day	20.2 (17.3-23.1)	22.9 (19.6-26.2)	27.1 (23.1-31.1)	30.3 (25.8-35.0)	34.5 (28.3-40.6)	37.5 (30.1-44.9)	40.3 (31.3-49.4)	42.8 (32.1-54.1)	45.9 (33.2-59.8)	48.0 (34.0-64.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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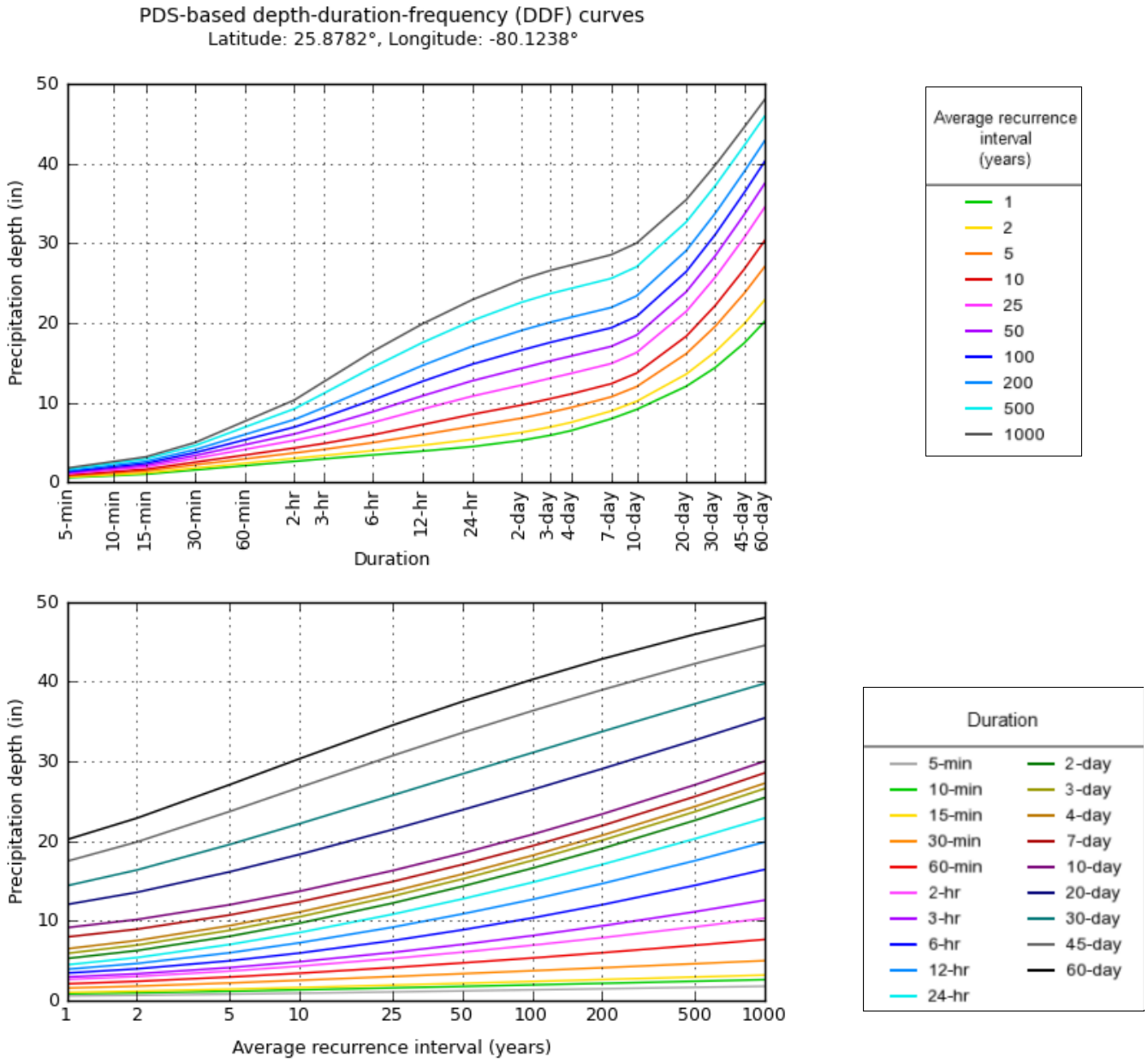
PF graphical



NOAA Atlas 14, Volume 9, Version 2

Created (GMT): Wed Mar 30 01:59:11 2022

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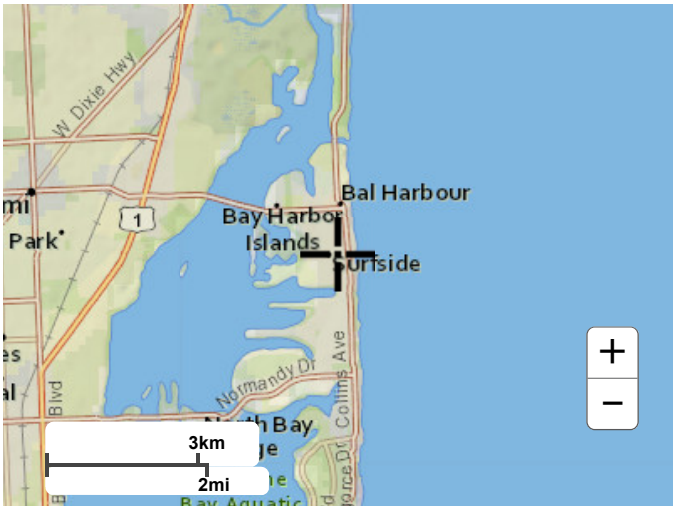
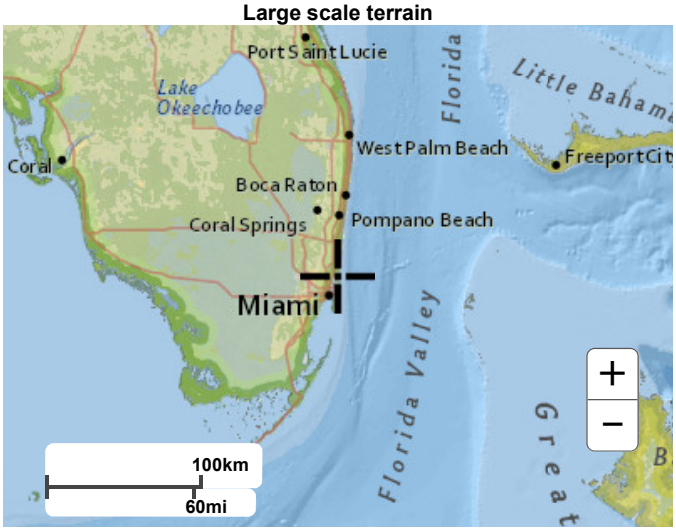
Maps & aerials

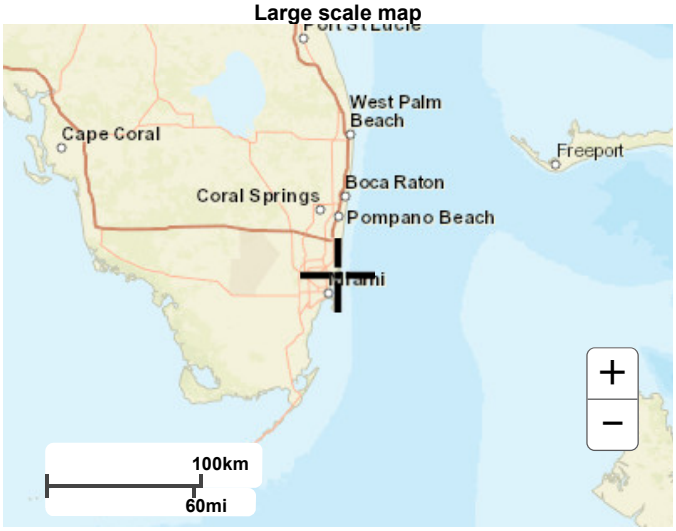
Small scale terrain



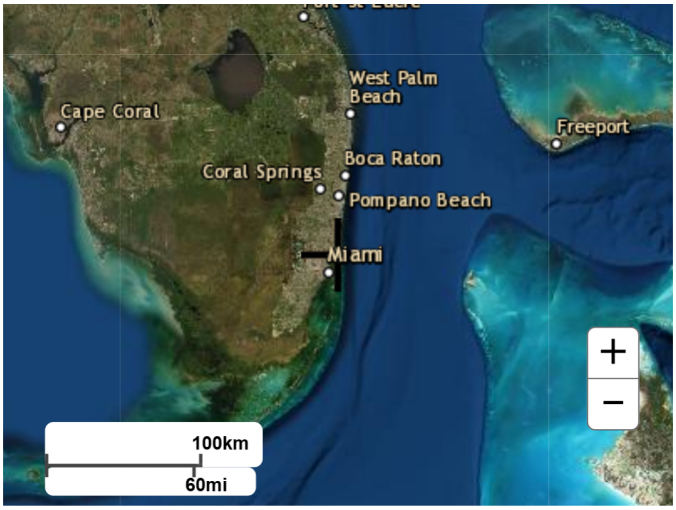
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix H

Town of Surfside Drainage Well Certification

Jaffer Well Drilling, a Division
of A.C. Schultes of Florida, Inc.
1451 SE 9th Court
Hialeah, Fl 33010
Dade: 305/576-7363
Broward: 954/523-6669

October 17, 2012

Department of Environmental Protection
400 North Congress Avenue
West Palm Beach, 33401

Attn: Gardner Strasser

RE: Town of Surfside Drainage Improvements
Permit # 0302036-003-UC

Gardner,

Enclosed are the requisite well completion reports, certificates of completion and water quality analyses.
The wells were capped awaiting use authorization. A Reasonable Assurance Report was approved within the permit.

"I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUTE THE INFORMATION SUBMITTED BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE AND COMPLETE.
I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS"

Greg Schultes
Jaffer Well Drilling
A Division of A.C Schultes of Florida

Cc: John O'Brien
William McCluskey

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No: 62-528.900(4)
Form Title: Certification of Class V Well construction Completion
Effective Date:
DEP Application No.: (Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside · Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Teffer Well Drilling

Title Production Supervisor State License No. 2377

Well Contractor's Address 1951 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

none

Actual Dimensions:

Diameter 24 inches

Well depth 97 feet

Casing depth 55 feet

P.S. # 1

DW-01

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

Permit issued 10-17-11
WACS 99864

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STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

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WEST PALM BEACH

Delegated Authority (If Applicable) _____

Date Stamp

Official Use Only

1.*Permit Number 0302036-003-vECUP/WUP Number _____ *DID Number _____ 62-524 Delineation No. _____

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 7/10/12 5. Florida Unique ID _____

6. Surfside : Pump Station #1 at 94 Street ; Well DW-1
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section _____ Land Grant _____ *Township _____ *Range _____

8. Latitude 25° 52' 59.89" Longitude 80° 07' 37.88"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: ____ NAD 27 ____ NAD 83 ____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)

- ☐ Domestic
- ☐ Bottled Water Supply
- ☐ Public Water Supply (Limited Use/DOH)
- ☐ Public Water Supply (Community or Non-Community/DEP)
- ☐ Class I Injection
- ☐ Landscape Irrigation
- ☐ Recreation Area Irrigation
- ☐ Agricultural Irrigation
- ☐ Livestock
- ☐ Nursery Irrigation
- ☐ Commercial/Industrial
- ☐ Golf Course Irrigation
- ☐ Site Investigations
- ☐ Monitoring
- ☐ Test
- ☐ Earth-Coupled Geothermal
- ☐ HVAC Supply
- ☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage

Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____

☐ Other (Describe) _____

12. *Drill Method: ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic ☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After -5 Hours at 820 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other _____

16.*Total Well Depth 97 ft. Cased Depth 55 ft. *Open Hole: From 55 To 97 ft. *Screen: From N.A To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) _____

From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____

18.*Surface Casing Diameter and Depth:

Dia 24 in. From 0 ft. To 55 ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☑ Other Driven

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

19.*Primary Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

20.*Liner Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

21.*Telescope Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower _____ Pump Capacity (GPM) _____
Pump Depth _____ ft. Intake Depth _____ ft.

23. Chemical Analysis (When Required):
Iron _____ ppm Sulfate _____ ppm Chloride 28,600 ppm
☑ Laboratory Test ☐ Field Test Kit TDS

24. Water Well Contractor:
*Contractor Name Greg Schultes *License Number 9377 E-mail Address greg.acsfl@verizon.net

*Contractor's Signature _____ *Driller's Name (Print or Type) _____
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

DW-01

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse).

From (ft.)	To (ft.)	Color	Grain Size (F, M, C)	Material
0	20			Sand, silt, shell
20	35			Limestone & sandstone
35	45			Sandstone
45	97			limestone & coquina

Comments:

***Detailed Site Map of Well Location**

N

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Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

July 30, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: Surf Side
Pace Project No.: 3563129

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on July 24, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: Surf Side
Pace Project No.: 3563129

Sample: DW-01 **Lab ID: 3563129001** Collected: 07/11/12 00:00 Received: 07/24/12 17:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**28600**	mg/L	250	250	1		07/26/12 18:49		

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REPORT OF LABORATORY ANALYSIS

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No: 62-528.900(4)
Form Title: Certification of Class V Well construction Completion
Effective Date:
DEP Application No.: (Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside · Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Teffer Well Drilling

Title Production Supervisor State License No. 9377

Well Contractor's Address 1951 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

None

Actual Dimensions:

Diameter 24 inches

Well depth 98 feet

Casing depth 52.5 feet

P.S. #1

DW-02

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

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FL DEP
WEST PALM BEACH

STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) _____

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

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FL DEP
WEST PALM BEACH

Date Stamp

Official Use Only

1.*Permit Number D302036-003-WC CUP/WUP Number _____ *DID Number _____ 62-524 Delineation No. _____

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 7/16/12 5. Florida Unique ID _____

6. Surfside : Pump Station #1 @ 94 St ; Well DW-2
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section _____ Land Grant _____ *Township _____ *Range _____

8. Latitude 25° 52' 59.73" Longitude 80° 07' 37.25"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: _____ NAD 27 _____ NAD 83 _____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)

☐ Domestic
☐ Bottled Water Supply
☐ Public Water Supply (Limited Use/DOH)
☐ Public Water Supply (Community or Non-Community/DEP)
☐ Class I Injection
☐ Landscape Irrigation
☐ Recreation Area Irrigation
☐ Agricultural Irrigation
☐ Livestock
☐ Nursery Irrigation
☐ Commercial/Industrial
☐ Golf Course Irrigation
☐ Site Investigations
☐ Monitoring
☐ Test
☐ Earth-Coupled Geothermal
☐ HVAC Supply
☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage

Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____

☐ Other (Describe) _____

12. *Drill Method: ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic ☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After .5 Hours at 800 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other _____

16.*Total Well Depth 98 ft. Cased Depth 52.5 ft. *Open Hole: From 52.5 To 98 ft. *Screen: From N.A To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) _____

From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____

18.*Surface Casing Diameter and Depth:

Dia 24 in. From 0 ft. To 52.5 ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☑ Other Driven
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

19.*Primary Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

20.*Liner Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

21. *Telescope Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower _____ Pump Capacity (GPM) _____
Pump Depth _____ ft. Intake Depth _____ ft.

23. Chemical Analysis (When Required):
Iron _____ ppm Sulfate _____ ppm Chloride 36,000 ppm
☑ Laboratory Test ☐ Field Test Kit TDS

24. Water Well Contractor:
*Contractor Name Greg Schultes *License Number 9377 E-mail Address greg.acsfl@verizon.net

*Contractor's Signature _____ *Driller's Name (Print or Type) _____
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

DW-02

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From (ft.)	To (ft.)	Color	Grain Size (F, M, C)	Material
0	20			Sand, silt, shell
20	35			limestone & sandstone
35	45			sandstone
45	97			limestone & coquina

Comments:

***Detailed Site Map of Well Location**

N

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OCT 19 2012
FL DEP
WEST PALM BEACH

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

July 30, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: Surf Side
Pace Project No.: 3563129

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on July 24, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: Surf Side
Pace Project No.: 3563129

Sample: DW-02 **Lab ID: 3563129002** Collected: 07/16/12 00:00 Received: 07/24/12 17:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**36000**	mg/L	250	250	1		07/26/12 18:50		

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No:	62-528.900(4)
Form Title:	Certification of Class V Well construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside, Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Telter Well Drilling

Title Production Supervisor State License No. 9377

Well Contractor's Address 1951 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

none

Actual Dimensions:

Diameter 24 inches

Well depth 98 feet

Casing depth 52.5 feet

P.S. #1

DW-03

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

RECEIVED

OCT 19 2012

FL DEP
WEST PALM BEACH

STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) ____________

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

Date Stamp

RECEIVED
OCT 1 9 2012
FL DEP
WEST PALM BEACH

Official Use Only

1.*Permit Number 0302036-063-UC CUP/WUP Number ______ *DID Number ______ 62-524 Delineation No. ______

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 7/20/12 ~~5. Florida Unique ID~~ ______

6. Surfside : Pump Station #1 at 94 st ; Well DW-03
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section ______ Land Grant ______ *Township ______ *Range ______

8. Latitude 25° 52' 59.76" Longitude 80° 07' 36.60"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: ____NAD 27 ____NAD 83 ____WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)
☐ Domestic ☐ Landscape Irrigation ☐ Agricultural Irrigation ☐ Site Investigations
☐ Bottled Water Supply ☐ Recreation Area Irrigation ☐ Livestock ☐ Monitoring
☐ Public Water Supply (Limited Use/DOH) ☐ Nursery Irrigation ☐ Test
☐ Public Water Supply (Community or Non-Community/DEP) ☐ Commercial/Industrial ☐ Earth-Coupled Geothermal
☐ Class I Injection ☐ Golf Course Irrigation ☐ HVAC Supply ☐ HVAC Return
Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage
Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) ______
☐ Other (Describe) ______

12. *Drill Method ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic
☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After .5 Hours at 800 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other ______

16.*Total Well Depth 98 ft. Cased Depth 52.5 ft. *Open Hole: From 52.5 To 98' ft. *Screen: From N.A. To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) ______

From	To	No. of Bags	Seal Material (Check One):
____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite Other ____
____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite Other ____
____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite Other ____
____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite Other ____
____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite Other ____

18.*Surface Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):
24 in.	0 ft.	52.5 ft.	____	☐ Neat Cement ☐ Bentonite ☑ Other Driven
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other

19.*Primary Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____

20.*Liner Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____

21. *Telescope Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement ☐ Bentonite ☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower ______ Pump Capacity (GPM) ______
Pump Depth ______ ft. Intake Depth ______ ft.

23. Chemical Analysis (When Required):
Iron ______ ppm Sulfate ______ ppm ~~Chloride~~ 35,000 ppm
☑ Laboratory Test ☐ Field Test Kit TDS

24. Water Well Contractor:
*Contractor Name Greg Schultes *License Number 9377 E-mail Address greg.acsfl@verizon.net
*Contractor's Signature [signature] *Driller's Name (Print or Type) ______
(I certify that the information provided in this report is accurate and true.)

DEP Form 62-532.900(2) Incorporated in 62-532.410, F.A.C. Effective Date: October 7, 2010

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

OW-03

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse).

From (ft.)	To (ft.)	Color	Grain Size (F, M, C)	Material
0	20			Sand, silt, shell
20	35			Limestone & sandstone
35	45			sandstone
45	98			limestone & coquina

Comments:

***Detailed Site Map of Well Location**

N

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

July 30, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: Surf Side
Pace Project No.: 3563129

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on July 24, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: Surf Side
Pace Project No.: 3563129

Sample: DW-03 **Lab ID: 3563129003** Collected: 07/19/12 00:00 Received: 07/24/12 17:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**35000**	mg/L	250	250	1		07/26/12 18:51		

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No:	62-528.900(4)
Form Title:	Certification of Class V Well construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside · Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Telter Well Drilling

Title Production Supervisor State License No. 2377

Well Contractor's Address 1951 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

none

Actual Dimensions:

Diameter 24 inches

Well depth 96 feet

Casing depth 56.5 feet

P.S. #2

DW-04

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/11.

Date: 10/17/12

(Contractor's Signature)

RECEIVED

OCT 19 2012

FL DEP
WEST PALM BEACH

STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) _____

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

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OCT 19 2012
FL DEP
WEST PALM BEACH

Date Stamp

Official Use Only

1.*Permit Number 0302036-003-UC CUP/WUP Number _____ *DID Number _____ 62-524 Delineation No. _____

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 4/25/12 5. Florida Unique ID _____

6. Surfside : Pump Station #2 at 895 t ; Well DW-04
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section _____ Land Grant _____ *Township _____ *Range _____

8. Latitude 25° 52' 27.66" Longitude 80° 07' 45.89"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: _____ NAD 27 _____ NAD 83 _____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)

- ☐ Domestic
- ☐ Bottled Water Supply
- ☐ Public Water Supply (Limited Use/DOH)
- ☐ Public Water Supply (Community or Non-Community/DEP)
- ☐ Class I Injection
- ☐ Landscape Irrigation
- ☐ Recreation Area Irrigation
- ☐ Agricultural Irrigation
- ☐ Livestock
- ☐ Nursery Irrigation
- ☐ Commercial/Industrial
- ☐ Golf Course Irrigation
- ☐ Site Investigations
- ☐ Monitoring
- ☐ Test
- ☐ Earth-Coupled Geothermal
- ☐ HVAC Supply
- ☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage

Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____

☐ Other (Describe) _____

12. *Drill Method: ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic ☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After .5 Hours at 500 GPM

14.*Measuring Point (Describe) grade Which is _____ ft. _____ Above _____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other _____

16.*Total Well Depth 96 ft. Cased Depth 56.5 ft. *Open Hole: From 56.5' To 96 ft. *Screen: From N/A To _____ ft. Slot Size _____

17.*Abandonment: ☐ Other (Explain) _____

From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____

18.*Surface Casing Diameter and Depth:

Dia 24 in. From 0 ft. To 56.5 ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☑ Other Driven
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____

19.*Primary Casing Diameter and Depth:

Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____

20.*Liner Casing Diameter and Depth:

Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____

21.*Telescope Casing Diameter and Depth:

Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____
Dia _____ in. From _____ ft. To _____ ft. No. of Bags _____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other _____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower _____ Pump Capacity (GPM) _____
Pump Depth _____ ft. Intake Depth _____ ft.

23. Chemical Analysis (When Required):
Iron _____ ppm Sulfate _____ ppm ~~Chloride~~ TDS 31,100 ppm
☑ Laboratory Test ☐ Field Test Kit

24. Water Well Contractor:
*Contractor Name Greg Schultes *License Number 9377 E-mail Address greg.acsfl@verizon.net

*Contractor's Signature _____ *Driller's Name (Print or Type) _____
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

DW-04

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From	To	Color	Grain Size (F, M, C)	Material
0 ft.	20 ft.			Sand, silt, shell
20 ft.	35 ft.			Limestone & Sandstone
35 ft.	40 ft.			Sand.
40 ft.	60 ft.			Sandstone
60 ft.	96 ft.			Limestone & Coquina
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
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Comments:

***Detailed Site Map of Well Location**

N

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Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

May 15, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: STORM DRAINAGE WELLS
Pace Project No.: 3556858

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on May 11, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: STORM DRAINAGE WELLS
Pace Project No.: 3556858

Sample: SURFSIDE PS # 04 **Lab ID: 3556858001** Collected: 04/25/12 00:00 Received: 05/11/12 15:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**31100**	mg/L	250	250	1		05/14/12 12:48		

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No:	62-528.900(4)
Form Title:	Certification of Class V Well construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside: Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Jetter Well Drilling

Title Production Supervisor State License No. 9377

Well Contractor's Address 1951 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

none

Actual Dimensions:

Diameter	24	inches
Well depth	94	feet
Casing depth	56	feet

P.S. #2

DW-05

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

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STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) ____________

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

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WEST PALM BEACH

Date Stamp

Official Use Only

1.*Permit Number 0302036-003-UC CUP/WUP Number ____ *DID Number ____ 62-524 Delineation No. ____

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 4/27/12 5. Florida Unique ID ____

6. Surfside : Pump Station #2 at 89st ; DW-05
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section ____ Land Grant ____ *Township ____ *Range ____

8. Latitude 25° 52' 27.91" Longitude 80° 07' 45.27"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: ____ NAD 27 ____ NAD 83 ____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)
☐ Domestic ☐ Landscape Irrigation ☐ Agricultural Irrigation ☐ Site Investigations
☐ Bottled Water Supply ☐ Recreation Area Irrigation ☐ Livestock ☐ Monitoring
☐ Public Water Supply (Limited Use/DOH) ☐ Nursery Irrigation ☐ Test
☐ Public Water Supply (Community or Non-Community/DEP) ☐ Commercial/Industrial ☐ Earth-Coupled Geothermal
☐ Class I Injection ☐ Golf Course Irrigation ☐ HVAC Supply ☐ HVAC Return
Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage
Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) ____
☐ Other (Describe) ____

12. *Drill Method ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic
☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After -5 Hours at 800 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other ____

16.*Total Well Depth 94 ft. Cased Depth 56 ft. *Open Hole: From 56 To 94 ft. *Screen: From N/A To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) ____

From	To	No. of Bags	Seal Material (Check One):			
____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	Other ____
____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	Other ____
____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	Other ____
____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	Other ____
____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	Other ____

18.*Surface Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):		
24 in.	0 ft.	56 ft.	____	☐ Neat Cement	☐ Bentonite	☑ Other Driven
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____

19.*Primary Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):		
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____

20.*Liner Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):		
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____

21.*Telescope Casing Diameter and Depth:

Dia	From	To	No. of Bags	Seal Material (Check One):		
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____
____ in.	____ ft.	____ ft.	____	☐ Neat Cement	☐ Bentonite	☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower ____ Pump Capacity (GPM) ____
Pump Depth ____ ft. Intake Depth ____ ft.

23. Chemical Analysis (When Required):
Iron ____ ppm Sulfate ____ ppm ~~Chloride~~ 29,800 ppm TDS
☑ Laboratory Test ☐ Field Test Kit

24. Water Well Contractor:
*Contractor Name Greg Schultes *License Number 9377 E-mail Address greg.acsfl@verizon.net
*Contractor's Signature [signature] *Driller's Name (Print or Type) ____
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV DW-05

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From	To	Color	Grain Size (F, M, C)	Material
0 ft.	20 ft.			Sand, silt, shell
20 ft.	35 ft.			Limestone & sandstone
35 ft.	40 ft.			sand
40 ft.	60 ft.			Sandstone
60 ft.	94 ft.			limestone & coquina
ft.	ft.			
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Comments:

***Detailed Site Map of Well Location**

N

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3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

May 15, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: STORM DRAINAGE WELLS
Pace Project No.: 3556858

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on May 11, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

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www.pacelabs.com

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3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: STORM DRAINAGE WELLS
Pace Project No.: 3556858

Sample: SURFSIDE PS # 05 **Lab ID: 3556858002** Collected: 04/25/12 00:00 Received: 05/11/12 15:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**29800**	mg/L	250	250	1		05/14/12 12:48		

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OCT 19 2012
FL DEP
WEST PALM BEACH

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No:	62-528.900(4)
Form Title:	Certification of Class V Well construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside · Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Teffer Well Drilling

Title Production Supervisor State License No. 9377

Well Contractor's Address 1451 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

None

Actual Dimensions:

Diameter 24 inches

Well depth 93 feet

Casing depth 57 feet

P.S. #2

DW-06

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

RECEIVED

OCT 19 2012

FL DEP
WEST PALM BEACH

STATE OF FLORIDA WELL COMPLETION REPORT

RECEIVED
[illegible] 2012
FL DEP
WEST PALM BEACH

Date Stamp

Official Use Only

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) ______

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

1.*Permit Number 0302036-003-UC CUP/WUP Number ______ *DID Number ______ 62-524 Delineation No. ______

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 5/1/12 5. Florida Unique ID ______

6. Surfside : Pump Station #2 at 89 St Well DW-06
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section ______ Land Grant ______ *Township ______ *Range ______

8. Latitude 25° 52' 27.31" Longitude 80° 07' 46.38"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: ____ NAD 27 ____ NAD 83 ____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)

☐ Domestic
☐ Bottled Water Supply
☐ Public Water Supply (Limited Use/DOH)
☐ Public Water Supply (Community or Non-Community/DEP)
☐ Class I Injection
☐ Landscape Irrigation
☐ Recreation Area Irrigation
☐ Agricultural Irrigation
☐ Livestock
☐ Nursery Irrigation
☐ Commercial/Industrial
☐ Golf Course Irrigation
☐ Site Investigations
☐ Monitoring
☐ Test
☐ Earth-Coupled Geothermal
☐ HVAC Supply
☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage

Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) ______

☐ Other (Describe) ______

12. *Drill Method ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic
☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After .5 Hours at 550 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other

16.*Total Well Depth 93 ft. Cased Depth 57 ft. *Open Hole: From 57 To 93 ft. *Screen: From N/A To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) ______

From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	Other ____
From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	Other ____
From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	Other ____
From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	Other ____
From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	Other ____

18.*Surface Casing Diameter and Depth:

Dia 24 in. From 0 ft. To 57 ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☑ Other Driven
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____

19.*Primary Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____

20.*Liner Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____

21.*Telescope Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____
Dia ____ in. From ____ ft. To ____ ft.	No. of Bags ____	Seal Material (Check One):	☐ Neat Cement	☐ Bentonite	☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower ______ Pump Capacity (GPM) ______
Pump Depth ______ ft. Intake Depth ______ ft.

23. Chemical Analysis (When Required):
Iron ______ ppm Sulfate ______ ppm ~~Chloride~~ 29,900 ppm TDS
☑ Laboratory Test ☐ Field Test Kit

24. Water Well Contractor:
*Contractor Name Greg Schultes License Number 9377 E-mail Address greg.acsfl@verizon.net
*Contractor's Signature [signature] *Driller's Name (Print or Type) ______
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

DW-06

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From	To	Color	Grain Size (F, M, C)	Material
0 ft.	20 ft.			Sand, silty, shell
20 ft.	35 ft.			Limestone & sandstone
35 ft.	40 ft.			Sand
40 ft.	60 ft.			Sandstone
60 ft.	93 ft.			Limestone & Coquina
ft.	ft.			
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Comments:

***Detailed Site Map of Well Location**

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Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

May 15, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: STORM DRAINAGE WELLS
Pace Project No.: 3556858

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on May 11, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: STORM DRAINAGE WELLS
Pace Project No.: 3556858

Sample: SURFSIDE PS # 06 **Lab ID: 3556858003** Collected: 05/01/12 00:00 Received: 05/11/12 15:10 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**29900**	mg/L	250	250	1		05/14/12 12:48		

REPORT OF LABORATORY ANALYSIS

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No: 62-528.900(4)
Form Title: Certification of Class V Well construction Completion
Effective Date:
DEP Application No.: (Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside: Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Telter Well Drilling

Title Production Supervisor State License No. 9377

Well Contractor's Address 1451 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

none

Actual Dimensions:

Diameter 24 inches

Well depth 955 feet

Casing depth 65 feet

P.S. #3

DW-07

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

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STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) _____

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

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OCT 19 2012
FL DEP
WEST PALM BEACH

Date Stamp

Official Use Only

1.*Permit Number D302036-003-WC CUP/WUP Number _____ *DID Number _____ 62-524 Delineation No. _____

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 8/24/12 5. Florida Unique ID _____

6. Surfside : Pump Station #3 at Carlyle Avenue DW-07
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section _____ Land Grant _____ *Township _____ *Range _____

8. Latitude 25° 52' 21.30" Longitude 80° 07' 28.99"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: ____ NAD 27 ____ NAD 83 ____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)

- ☐ Domestic
- ☐ Bottled Water Supply
- ☐ Public Water Supply (Limited Use/DOH)
- ☐ Public Water Supply (Community or Non-Community/DEP)
- ☐ Class I Injection
- ☐ Landscape Irrigation
- ☐ Recreation Area Irrigation
- ☐ Agricultural Irrigation
- ☐ Livestock
- ☐ Nursery Irrigation
- ☐ Commercial/Industrial
- ☐ Golf Course Irrigation
- ☐ Site Investigations
- ☐ Monitoring
- ☐ Test
- ☐ Earth-Coupled Geothermal
- ☐ HVAC Supply
- ☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage

Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____

☐ Other (Describe) _____

12. *Drill Method: ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic ☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After .5 Hours at 500 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other _____

16.*Total Well Depth 95.5 ft. Cased Depth 65 ft. *Open Hole: From 65 To 95.5 ft. *Screen: From N.A To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) _____

From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____

18.*Surface Casing Diameter and Depth:

Dia 24 in. From 0 ft. To 65 ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☑ Other Driven
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

19.*Primary Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

20.*Liner Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

21.*Telescope Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower ____ Pump Capacity (GPM) ____
Pump Depth ____ ft. Intake Depth ____ ft.

23. Chemical Analysis (When Required):
Iron ____ ppm Sulfate ____ ppm Chloride 31,500 ppm
☑ Laboratory Test ☐ Field Test Kit TDS

24. Water Well Contractor:
*Contractor Name Greg Schultes *License Number 9377 E-mail Address greg.acsfl@verizon.net

*Contractor's Signature _____ *Driller's Name (Print or Type) _____
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

OW-07

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From	0	To	20	Color		Grain Size (F, M, C)	Material	Sand, silty, shell
From	20	To	35	Color		Grain Size (F, M, C)	Material	Limestone & sandstone
From	35	To	40	Color		Grain Size (F, M, C)	Material	limestone
From	40	To	45	Color		Grain Size (F, M, C)	Material	sand
From	45	To	55	Color		Grain Size (F, M, C)	Material	Sandstone
From	55	To	60	Color		Grain Size (F, M, C)	Material	Sand
From	60	To	95.5	Color		Grain Size (F, M, C)	Material	limestone & coquina
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	
From		To		Color		Grain Size (F, M, C)	Material	

Comments: _____

***Detailed Site Map of Well Location**

N

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

September 10, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: SURFSIDE
Pace Project No.: 3566962

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on September 05, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

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www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: SURFSIDE
Pace Project No.: 3566962

Sample: DW-07 **Lab ID: 3566962001** Collected: 08/22/12 00:00 Received: 09/05/12 15:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**31500**	mg/L	250	250	1		09/06/12 15:47		

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WEST PALM BEACH

REPORT OF LABORATORY ANALYSIS

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No:	62-528.900(4)
Form Title:	Certification of Class V Well construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside: Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Telter Well Drilling

Title Production Supervisor State License No. 9377

Well Contractor's Address 1451 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

none

Actual Dimensions:

Diameter 24 inches

Well depth 94 feet

Casing depth 65 feet

P.S. #3

DW-08

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

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OCT 19 2012

FL DEP
WEST PALM BEACH

STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) _____

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

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OCT 19 2012
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WEST PALM BEACH

Date Stamp

Official Use Only

1.*Permit Number D302036-063-uCCUP/WUP Number _____ *DID Number _____ 62-524 Delineation No. _____

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 9/17/12 5. Florida Unique ID _____

6. Surfside : Pump Station #3 at Carlyle Avenue DW-08
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section _____ Land Grant _____ *Township _____ *Range _____

8. Latitude 25° 52' 22.44" Longitude 80° 07' 29.35"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: _____ NAD 27 _____ NAD 83 _____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)

- ☐ Domestic
- ☐ Bottled Water Supply
- ☐ Public Water Supply (Limited Use/DOH)
- ☐ Public Water Supply (Community or Non-Community/DEP)
- ☐ Class I Injection
- ☐ Landscape Irrigation
- ☐ Recreation Area Irrigation
- ☐ Agricultural Irrigation
- ☐ Livestock
- ☐ Nursery Irrigation
- ☐ Commercial/Industrial
- ☐ Golf Course Irrigation
- ☐ Site Investigations
- ☐ Monitoring
- ☐ Test
- ☐ Earth-Coupled Geothermal
- ☐ HVAC Supply
- ☐ HVAC Return

Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage

Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) _____

☐ Other (Describe) _____

12. *Drill Method: ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic ☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After -5 Hours at 400 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing? ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other _____

16.*Total Well Depth 94 ft. Cased Depth 65 ft. *Open Hole: From 65 To 94 ft. *Screen: From N/A To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) _____

From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other _____

18.*Surface Casing Diameter and Depth:

Dia 24 in. From 0 ft. To 65 ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☑ Other Driven
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

19.*Primary Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

20.*Liner Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

21.*Telescope Casing Diameter and Depth:

Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower _____ Pump Capacity (GPM) _____
Pump Depth _____ ft. Intake Depth _____ ft.

23. Chemical Analysis (When Required):
Iron _____ ppm Sulfate _____ ppm ~~Chloride~~ _____ ppm
☑ Laboratory Test ☐ Field Test Kit TDS

24. Water Well Contractor:
*Contractor Name Greg Schultes *License Number 9377 E-mail Address greg.acsfl@verizon.net

*Contractor's Signature _____ *Driller's Name (Print or Type) _____
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

DW-08

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From	To	Color	Grain Size (F, M, C)	Material
0 ft.	20 ft.			Sand, silt, shell
20 ft.	35 ft.			Limestone & Sandstone
35 ft.	40 ft.			Limestone
40 ft.	45 ft.			Sand
45 ft.	55 ft.			Sandstone
55 ft.	60 ft.			Sand
60 ft.	94 ft.			Limestone w/ Cogunas
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
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ft.	ft.			
ft.	ft.			

Comments:

***Detailed Site Map of Well Location**

N

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www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

October 15, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: Storm Dr Well
Pace Project No.: 3570308

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on October 05, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: Storm Dr Well
Pace Project No.: 3570308

Sample: Surfside DW-08 **Lab ID: 3570308001** Collected: 09/17/12 08:00 Received: 10/05/12 14:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**30300**	mg/L	250	250	1		10/08/12 22:23		

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FL DEP
WEST PALM BEACH

REPORT OF LABORATORY ANALYSIS

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No:	62-528.900(4)
Form Title:	Certification of Class V Well construction Completion
Effective Date:	
DEP Application No.:	(Filled in by DEP)

Town of Surfside

CERTIFICATION OF CLASS V WELL CONSTRUCTION COMPLETION

INSTRUCTIONS: Submit this certification to the Department along with a signed copy of the Well Completion Report from the appropriate Water Managemant District.

DEP Construction Permit No. 0302036-003-UC issued on 10/17/11 (Date). County Dade

Owner's Name Town of Surfside · Bill Evans, Public Works Director

Owner's Address 9293 Harding Avenue

City Surfside State FL Zip 33154

Well Contractor's Name Greg Schultes, Jetter Well Drilling

Title Production Supervisor State License No. 2377

Well Contractor's Address 1951 SE 9 Ct

City Hialeah State FL Zip 33010

Well Location as per plan

Deviations from the application and plans approved by the Department:

none

Actual Dimensions:

Diameter 24 inches

Well depth 105 feet

Casing depth 65 feet

P.S. #3

DW-09

This is to certify that, with the exception of the deviations noted above, the construction of this well has been completed in accordance with the plans authorized by Construction Permit No. 0302036-003-UC, dated 10/17/12.

Date: 10/17/12

(Contractor's Signature)

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FL DEP
WEST PALM BEACH

STATE OF FLORIDA WELL COMPLETION REPORT

Southwest
Northwest
St. Johns River
South Florida
Suwannee River
DEP
Delegated Authority (If Applicable) ____________

PLEASE, FILL OUT ALL APPLICABLE FIELDS
(*Denotes Required Fields Where Applicable)

Date Stamp
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FL DEP
WEST PALM BEACH
Official Use Only

1.*Permit Number 0302036-063-UC CUP/WUP Number ____ *DID Number ____ 62-524 Delineation No. ____

2.*Number of permitted wells constructed, repaired, or abandoned 9 *Number of permitted wells not constructed, repaired, or abandoned 0

3.*Owner's Name Town of Surfside ; Bill Evans. 4.*Completion Date 9/11/12 5. Florida Unique ID ____

6. Surfside : Pump Station #3 at Carlyle Avenue ; DW-09
*Well Location - Address, Road Name or Number, City, ZIP

7.*County Dade *Section ____ Land Grant ____ *Township ____ *Range ____

8. Latitude 25° 52' 21.82" Longitude 80° 07' 29.31"

9. Data Obtained From: ☐ GPS ☐ Map ☑ Survey Datum: ____ NAD 27 ____ NAD 83 ____ WGS 84

10.*Type of Work: ☑ Construction ☐ Repair ☐ Modification ☐ Abandonment

11.*Specify Intended Use(s) of Well(s)
☐ Domestic ☐ Landscape Irrigation ☐ Agricultural Irrigation ☐ Site Investigations
☐ Bottled Water Supply ☐ Recreation Area Irrigation ☐ Livestock ☐ Monitoring
☐ Public Water Supply (Limited Use/DOH) ☐ Nursery Irrigation ☐ Test
☐ Public Water Supply (Community or Non-Community/DEP) ☐ Commercial/Industrial ☐ Earth-Coupled Geothermal
☐ Class I Injection ☐ Golf Course Irrigation ☐ HVAC Supply ☐ HVAC Return
Class V Injection: ☐ Recharge ☐ Commercial/Industrial Disposal ☐ Aquifer Storage and Recovery ☑ Drainage
Remediation: ☐ Recovery ☐ Air Sparge ☐ Other (Describe) ____
☐ Other (Describe) ____

12. *Drill Method ☐ Auger ☐ Cable Tool ☑ Rotary ☐ Combination (Two or More Methods) ☐ Jetted ☐ Sonic
☐ Horizontal Drilling ☐ Hydraulic Point (Direct Push) ☑ Other Casing driven.

13.*Measured Static Water Level 4 ft. Measured Pumping Water Level 5' ft. After .5 Hours at 650 GPM

14.*Measuring Point (Describe) grade Which is ____ ft. ____ Above ____ Below Land Surface *Flowing: ☐ Yes ☑ No

15.*Casing Material: ☑ Black Steel ☐ Galvanized ☐ PVC ☐ Stainless Steel ☐ Not Cased ☐ Other ____

16.*Total Well Depth 105 ft. Cased Depth 65 ft. *Open Hole: From 65 To 105 ft. *Screen: From N/A To ____ ft. Slot Size ____

17.*Abandonment: ☐ Other (Explain) ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other ____
From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite Other ____

18.*Surface Casing Diameter and Depth:
Dia 24 in. From 0 ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☑ Other Driven
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

19.*Primary Casing Diameter and Depth:
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

20.*Liner Casing Diameter and Depth:
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

21.*Telescope Casing Diameter and Depth:
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____
Dia ____ in. From ____ ft. To ____ ft. No. of Bags ____ Seal Material (Check One): ☐ Neat Cement ☐ Bentonite ☐ Other ____

22. Pump Type (If Known):
☐ Centrifugal ☐ Jet ☐ Submersible ☐ Turbine
Horsepower ____ Pump Capacity (GPM) ____
Pump Depth ____ ft. Intake Depth ____ ft.

23. Chemical Analysis (When Required):
Iron ____ ppm Sulfate ____ ppm ~~Chloride~~ ____ ppm
☑ Laboratory Test ☐ Field Test Kit TDS

24. Water Well Contractor:
*Contractor Name Greg Schultes License Number 9377 E-mail Address greg.acsfl@verizon.net
*Contractor's Signature [signature] *Driller's Name (Print or Type) ____
(I certify that the information provided in this report is accurate and true.)

*Permit No. 0302036-003-UC

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET, BROOKSVILLE, FL 34604-6899
PHONE: (352) 796-7211 or (800) 423-1476
WWW.SWFWMD.STATE.FL.US

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
4049 REID STREET, PALATKA, FL 32178-1429
PHONE: (386) 329-4500
WWW.SJRWMD.COM

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
152 WATER MANAGEMENT DR., HAVANA, FL 32333-4712
(U.S. Highway 90, 10 miles west of Tallahassee)
PHONE: (850) 539-5999
WWW.NWFWMD.STATE.FL.US

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
P.O. BOX 24680
3301 GUN CLUB ROAD
WEST PALM BEACH, FL 33416-4680
PHONE: (561) 686-8800
WWW.SFWMD.GOV

DW-09

SUWANNEE RIVER WATER MANAGEMENT DISTRICT
9225 CR 49
LIVE OAK, FL 32060
PHONE: (386) 362-1001 or (800) 226-1066 (Florida only)
WWW.MYSUWANNEERIVER.COM

***DRILL CUTTINGS LOG** (Examine cuttings every 20 ft. or at formation changes. Note cavities and depth to producing zone. Grain Size: F=Fine, M=Medium, and C=Coarse)

From	To	Color	Grain Size (F, M, C)	Material
0 ft.	20 ft.			Sand, silt, shell
20 ft.	35 ft.			Limestone & sandstone
35 ft.	40 ft.			limestone
40 ft.	45 ft.			Sand
45 ft.	55 ft.			sandstone
55 ft.	60 ft.			Sand
60 ft.	105 ft.			limestone & coquina
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			
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ft.	ft.			
ft.	ft.			
ft.	ft.			
ft.	ft.			

Comments:

***Detailed Site Map of Well Location**

N

RECEIVED
OCT 19 2012
FL DEP
WEST PALM BEACH

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

October 15, 2012

Bill McCluskey
Jaffer Well Drilling - a div of A.C. Schultes of FL, Inc
1451 SE 9th Court
Hialeah, FL 33010

RE: Project: Storm Dr Well
Pace Project No.: 3570308

Dear Bill McCluskey:
Enclosed are the analytical results for sample(s) received by the laboratory on October 05, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Terrence Anderson

terrence.anderson@pacelabs.com
Project Manager

Enclosures

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

ANALYTICAL RESULTS

Project: Storm Dr Well
Pace Project No.: 3570308

Sample: Surfside DW-09 **Lab ID: 3570308002** Collected: 09/11/12 08:00 Received: 10/05/12 14:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**28400**	mg/L	250	250	1		10/08/12 22:22		

RECEIVED
OCT 19 2012
FL DEP
WEST PALM BEACH

Vandor, Heidi

From: Osborne, Vanessa
Sent: Tuesday, May 28, 2013 1:58 PM
To: bevans@townofsurfsidefl.gov
Cc: Strasser, Gardner; Vandor, Heidi; McCarty, Cathleen; twaterho@sfwmd.gov; ehopkins@sfwmd.gov; tobonm@miamidade.gov; 'Calil, Iraida (RER)'; hallm@miamidade.gov; gregschultes@yahoo.com; jobrien@jafferwells.com; 'Jerome Wentz'; jmesserian@calvingiordano.com
Subject: 0302036-001 Surfside drainage improvements Authhorization May 2013
Attachments: 0302036-001 - Surfside Drainage Improvements AU May 2013 (2).pdf

Vanessa Osborne
Dept. of Environmental Protection
400 N. Congress Ave.3rd Floor
West Palm Beach, FL. 33401
Phone: 561-681-6745
Fax: 561-681-6760

Please take a few minutes to share your comments on the service you received from the department by clicking on this link. DEP Customer Survey.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHEAST DISTRICT
400 NORTH CONGRESS AVENUE, 3rd FLOOR
WEST PALM BEACH, FL 33401
561-681-6600

RICK SCOTT
GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

ELECTRONIC CORRESPONDENCE

May 28, 2013

Town of Surfside
Attention: Bill Evans
Public Works Director
9293 Harding Avenue
Surfside , Florida 33154
bevans@townofsurfsidefl.gov

County: Miami-Dade
Project: Town of Surfside Drainage Improvements
Authorization Number: 0302036-003-UC
WACS ID Number: SED13M00099864
Date Issued: May 28, 2013
Expiration Date: None

Reference: Letter of Authorization to Use Nine (9) Stormwater Drainage Wells

Dear Mr. Evans:

This letter acknowledges receipt of the required Certification of Class V Well Construction Completion, Well Completion Report and Reasonable Assurance Report for Nine (9) wells, constructed under DEP Permit Number 0302036-003-UC, issued October 17, 2011. The drilling contractor was Jaffer Well Drilling, a Division of A.C. Schultes of Florida, Inc. The wells are located Pump Station No. 1 at 94th Street, Pump Station No. 2 at 89th Street, and Pump Station No. 3 at Carlyle Avenue, Surfside, Florida 33154, and are identified as Well Numbers DW-01 through DW-09. The geographical locations are:

Well No.	Latitude/Longitude
Pump Station No. 1	
DW-01	25° 52' 59.89"N/80° 07' 37.88"W
DW-02	25° 52' 59.73"N/80° 07' 37.25"W
DW-03	25° 52' 59.76"N/80° 07' 36.60"W
Pump Station No. 2	
DW-04	25° 52' 27.66"N/80° 07' 45.89"W
DW-05	25° 52' 27.91"N/80° 07' 45.27"W
DW-06	25° 52' 27.31"N/80° 07' 46.38"W
Pump Station No. 3	
DW-07	25° 52' 21.30"N/80° 07' 28.99"W
DW-08	25° 52' 22.44"N/80° 07' 29.35"W
DW-09	25° 52' 21.82"N/80° 07' 29.31"W

Based upon a review of this information, the placing of the wells into service is hereby authorized. Pursuant to Chapter 403, Florida Statutes, this authorization may be rescinded if the disposal wells should, at any time, contaminate or otherwise adversely affect other water in the vicinity, or it may be rescinded for any other condition contained in Rule 62-4.100 or 62-528.630(4) and (5), Florida Administrative Code (F.A.C.). Pursuant to Rule 62-528.635(4), (F.A.C.), this authorization to use is non-renewable and non-expiring.

Upon sale or legal transfer of the wells, the new owner must notify the Department within thirty (30) days on DEP Form No. 62-528.900(8) with appropriate fee. Until such time as the notice of change in ownership is submitted, you will be responsible for the operation of the wells and for damages resulting from improper operation of the wells in accordance with Rule 62-528.630(9), (F.A.C.).

The use of the wells is subject to the following Specific Conditions 10-16 as were stated in the Construction Permit:

SPECIFIC CONDITIONS:

10. The use of Class V, Group 6 Wells are authorized for disposal of stormwater only.

11. Allowing fluids other than those permitted into the disposal well will be considered a violation of this permit and shall constitute cause for permit revocation and possible enforcement action for water quality violations.

12. The permittee or designated operator of the Class V drainage system shall at all times properly maintain the system, methods of treatment and control in such a manner that efficient operation of the system is maintained at all times.

13. The permittee or designated operator shall make an inspection on a regular basis to insure free flow capability through basins, drains and wells. All debris e.g. leaves, sand, branches and oil found should be removed and disposed of in a proper manner. The Department must be notified of any repair that requires the replacement or alteration of any part of the system.

14. If for any reason, the owner or operator does not comply, or will be unable to comply, with any condition or limitation specified in this authorization, he or she shall notify the Department.

15. When required by the Department, the owner shall within a reasonable time furnish any information required by law that is needed to determine compliance with this authorization.

16. In accordance with F.A.C. Rule 62-528.645(1) the owner of the Class V wells shall apply for a Plugging and Abandonment permit, FDEP Form 62-528.900(6) with appropriate fee when the wells are no longer usable for its intended purpose. The application shall include the justification for abandonment and the proposed plugging plan.

17. Should ownership of the wells change in the future the Department requires the completion of the Notification Form, FDEP Form 62-528.900(8) along with appropriate fee, to be submitted within thirty (30) days of transfer of ownership.

If you have any questions about this letter of Authorization to Use, please call Underground Injection Control, Heidi Vandor, PG, at (561) 681-6687, or the undersigned.

Sincerely,

Linda A. Brien, P.G.
Water Facilities Program Administrator
Southeast District

LAB/HV

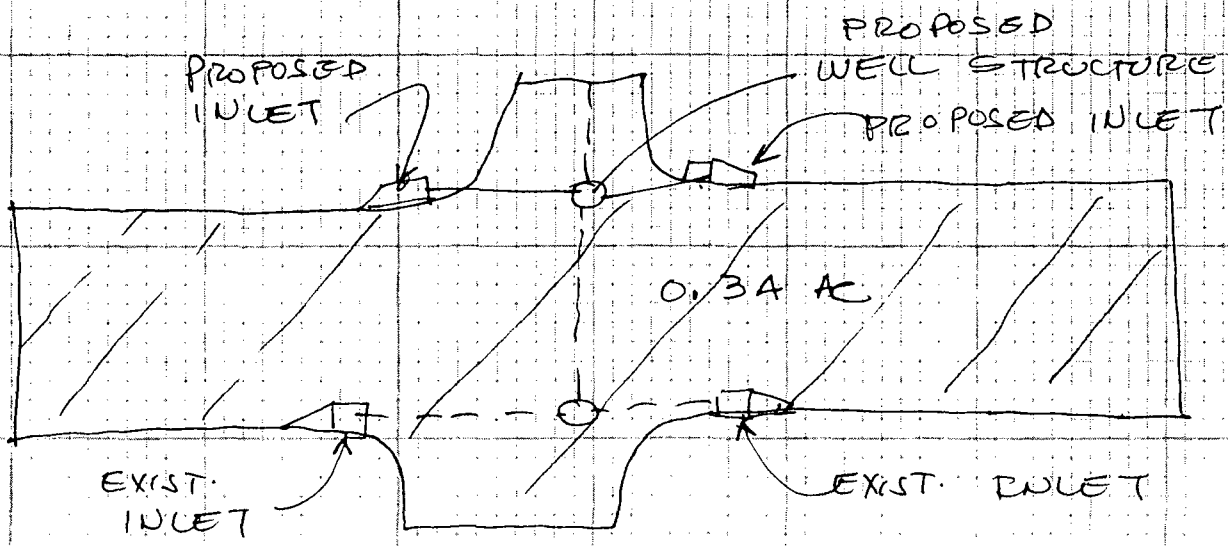
cc: Cathy McCarty, FDEP/TLH
Anthony M. Waterhouse, SFWMD – twaterho@sfwmd.gov
Emily Richardson, SFWMD - ehopkins@sfwmd.gov
Manny Tobon, RER – tobonm@miamidade.gov
Iraida Calili, RER - calili@miamidade.gov
Marie K, Hall, MD RER – hallm@miamidade.gov
John Messerian, PE, Calvin, Giordano & Associates, Inc. – jmesserian@calvingiordano.com
Gregory Schultes, Jaffer Well Drilling - gregschultes@yahoo.com
John O'Brien, Jaffer Well Drilling– jobrien@jafferwells.com
Jerome Wentz, P.G. - jeromewentz@yahoo.com

Appendix I

FDOT Drainage Well Calculations

Subject: HARDING AVE COLLINS AVE INJECTION WELLS CALCULATIONS	WPI No. 6113738	Sheet 1 of 1
	Project No. 87060-3555	
	Prepared by GAL	Date 12-17-92
	Checked by	Date

COLLINS AVE WELLS CALCULATION



TYPICAL COLLINS AVE INTERSECTION

Runoff calculation

Area = 0.34 Ac ±

i = 6.8 in/hour

Coeff = 0.9

$Q = CiA$

$Q = 0.9 \times 6.8 \times 0.34$

$Q = 2.08$ cfs

$Q = 2.08 \times 448.83 = 933.9$ GAL/min

Head used: 2.5 D.H.W.
5.5 Weir elev.

TOTAL HEAD = 5.5 − 2.5 = 3 FT.

Q per ft. head required: $\frac{934}{3} = 311$ GAL MIN

REQUIRED Q for COLLINS AVE WELLS
400 GAL MIN per FT. head

Subject: HARDING AVE / COLLINS AVE INJECTION WELLS CALCULATIONS	WPI No. 611 3738		Sheet 1 of 1
	Project No. 87060-3555		
	Prepared by GAC	Date 12-17-92	
	Checked by	Date	

HARDING AVE WELLS CALCULATION

MAXIMUM Q 3 YEAR STORM 41.6 cfs

$41.6 \text{ cfs} \times 448.83 \frac{\text{GAL/MIN}}{\text{cfs}} = 18672 \text{ GAL/MIN}$

WELL INTAKE 600 GAL/MIN per ft head

Pressure maintained at manifold = 8 ft head

TOTAL INTAKE by each Well = $8 \text{ ft/head} \times 600 \frac{\text{GAL/MIN}}{\text{ft/head}}$

= 4800 GAL/MIN

TOTAL INTAKE 4 wells = $4 \times 4800 = 19{,}200 \text{ GAL/min}$

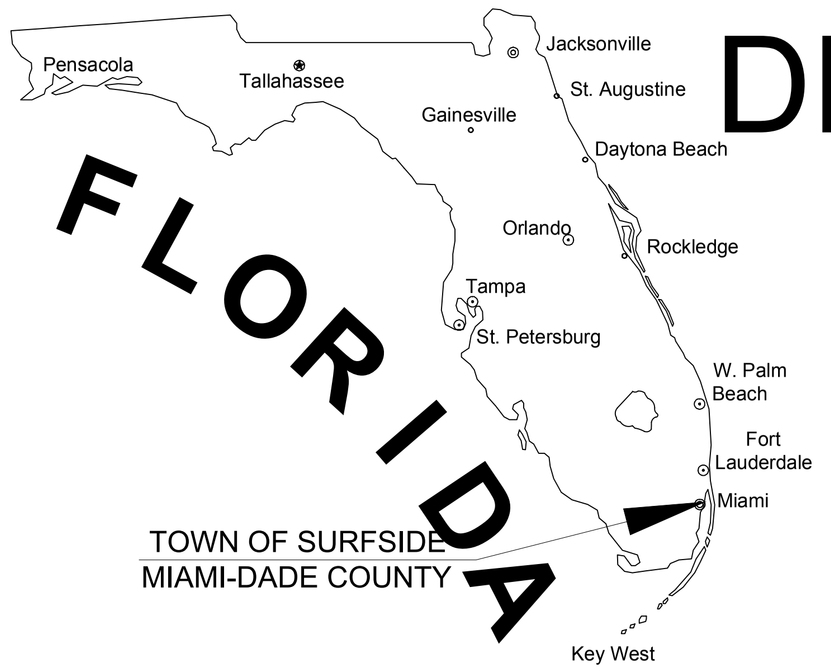
19200 GAL/MIN > 18672 GAL/MIN

∴ Wells will take runoff for 3 year storm

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

(100% CONSTRUCTION DOCUMENTS)

91ST AND 92ND STREET
TOWN OF SURFSIDE, FLORIDA

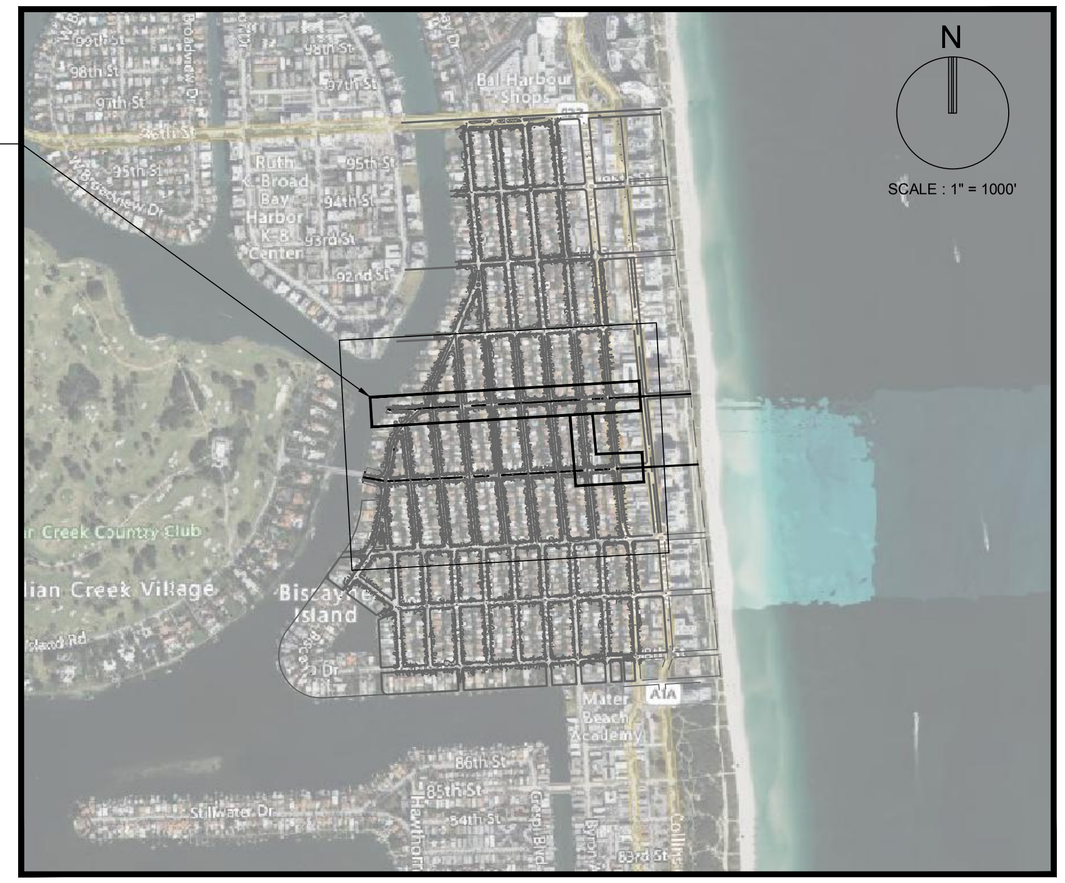


RELATIONSHIP BETWEEN
NGVD 1929 AND NAVD 1988

DATUM	DIFFERENCE	ELEV.
NGVD 1929	0.00	4.75'
NAVD 1988	-1.56 FEET	3.19'

ALL ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON NGVD 1929 DATUM

SITE LOCATION



LOCATION MAP
SECTION 35, TOWNSHIP 52 S, RANGE 42 E

INDEX OF SHEETS	
SHEET IDENTIFICATON	SHEET TITLE
-	COVER SHEET
1 - 6	TOPOGRAPHIC SURVEY
GI-001	LEGEND AND ABBREVIATIONS
GI-002	GENERAL CONSTRUCTION NOTES
GI-003	GENERAL SPECIFICATIONS
GI-004	KEY MAP
CG-101 - CG-106	EROSION CONTROL PLAN
CG-501	EROSION CONTROL DETAILS
CP-101 - CP-106	DRAINAGE PLAN
CP-401 & CP-404	PUMP STATION PLAN AND PROFILE
CP-402 - CP-408	PUMP STATION DETAILS
CP-501 - CP-502	DRAINAGE DETAILS
CM-101 - CM-109	PAVING MARKINGS AND SIGNAGE PLAN

FEMA FLOOD ZONE:

THE PROJECT LIMITS ARE LOCATED WITHIN FLOOD ZONE AE WITH A BASE FLOOD ELEVATION OF 8 FEET NAVD, AS SHOWN ON F.I.R.M. NUM. 12086C0144L AND 12086C0163L BEARING A MAP EFFECTIVE DATE OF 9/11/2009.

THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

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PREPARED FOR:
TOWN OF SURFSIDE
9293 HARDING AVENUE
SURFSIDE, FL 33154

KEITH
301 East Atlantic Boulevard
Pompano Beach, Florida 33060-6643
(954) 788-3400
Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

PROJECT No. 11494.01 MAY 2024

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

SURVEY REPORT:

SURVEY REPORT
TOPOGRAPHIC SURVEY
ABBOTT AVENUE DRAINAGE IMPORVEMENTS-PHASE 2
SURFSIDE, FLORIDA 33154.
MIAMI-DADE COUNTY, FLORIDA

SURVEY PURPOSE AND PROCEDURES:

TOPOGRAPHIC INFORMATION WAS COLLECTED TO SUPPLEMENT AND UPDATE THE EXISTING SURVEY. THE TOWN OF SURFSIDE PROVIDED AN EXISTING SURVEY THAT INCLUDED RIGHT OF WAY LINES AND 2D SURFACE FEATURES. KEITH LOCATED SIGNIFICANT CHANGES IN THE TOPOGRAPHY AND SURFACE FEATURES WITHIN 10 FEET OF THE RIGHT OF WAY LINES. ELEVATIONS WERE OBTAINED AT 25 FOOT INTERVALS. FINISHED FLOOR ELEVATIONS ALONG ABBOTT AVE. ARE INCLUDED.

FOR THE PROJECT SITES USING A COMBINATION OF GPS AND CONVENTIONAL SURVEYING METHODOLOGIES. REAL-TIME KINEMATIC (RTK) GPS WAS PRIMARILY USED TO ESTABLISH COORDINATES ON PRIMARY HORIZONTAL CONTROL POINTS. DIFFERENTIAL LEVELING WAS PERFORMED TO ESTABLISH ELEVATIONS ON EACH OF THE PRIMARY CONTROL POINTS, CONVENTIONAL TOTAL STATIONS WERE USED TO COLLECT THE TOPOGRAPHIC FEATURES, CROSS SECTIONS, AND SPOT ELEVATIONS. UPON COMPLETION OF THE DATA COLLECTION, A TOPOGRAPHIC SURVEY DWG FILE. DTM WAS CREATED AT THE FOLLOWING LOCATIONS, AT PUMP STATION (WEST END 92ND ST.) AT SURFSIDE BLVD. WEST OF BAY DR. UP TO THE SUBDIVISION ENTRANCE'S GATE, AT THE INTERSECTIONS OF ABBOTT AVE. & 91ST ST, AND AT THE INTERSECTION OF ABBOTT AVE. & 92ND ST.

SURVEY NOTES:

FIELD WORK WAS COMPLETED ON JANUARY 26, 2022.

THE DRAINAGE STRUCTURES SHOWN HEREON WERE FIELD MEASURED USING CONVENTIONAL MEASUREMENT TOOLS TO ASCERTAIN PIPE SIZES AND DEPTHS TO THE BEST OF PRACTICAL ABILITY. THE DIRECTION OF FLOW WAS OBSERVED IN THE FIELD WHEN A STRUCTURE WAS NOT FLOODED AND ASSUMPTIONS WERE MADE AS TO THE ULTIMATE DRAINAGE SYSTEM OUTFLOW.

BEARINGS AS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN DATUM 1983/2011 ADJUSTMENT (NAD83/11) TRAVERSE MERCATOR, FLORIDA EAST ZONE (901).

THE BASELINE OF SURVEY FOR 92ND STREET, SERVES AS THE REFERENCE BEARING LINE OF N 86°55'05"E.

UNITS OF MEASURE: US SURVEY FEET.

THE INTENDED DISPLAY SCALE FOR THIS SURVEY IS 1"=30' OR SMALLER.

ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 1929). SAID ELEVATIONS ARE BASED ON FOLLOWING MIAMI-DADE COUNTY BENCHMARKS.

T-243 - ADJUSTED
NAME: T-243
ELEVATION: (NGVD29): 13.03 FT
NORTHING: 562,256.63 EASTING: 942,206.32
LOCATION: SURFSIDE BLVD & BAY DRIVE 3:21' WEST OF WEST WALL OF GUARD HOUSE.
DESCRIPTION: US C & G BRASS DISC IN EAST END OF NORTH CONC GUARD RAIL OF BRIDGE OVER INDIAN CREEK.

AND

NAME: S-243
ELEVATION: (NGVD29): 11.77 FT
NORTHING: 565,499.53 EASTING: 942,976.63
LOCATION: 96 ST, 5.5' SOUTH OF SOUTH CURB BAY DRIVE, 225'+- WEST OF INTERSECTION
DESCRIPTION1: US C & G BRASS DISC IN SIDEWALK AT SE COR OF BRIDGE OVER INDIAN CREEK.

THE HORIZONTAL FEATURES SHOWN HEREON ARE PLOTTED TO WITHIN 1/30 OF THE MAP SCALE. HORIZONTAL FEATURE LOCATION IS TO THE CENTER OF THE SYMBOL AND MAY BE ALTERED FOR CLARITY. DISTANCES AND ELEVATIONS SHOWN HEREON ARE U.S. SURVEY FEET UNLESS OTHERWISE NOTED. THE EXPECTED HORIZONTAL ACCURACY OF THE INFORMATION SHOWN HEREON IS ± 1/10 FOOT.

THE ELEVATIONS OF AN ESTIMATED VERTICAL POSITIONAL ACCURACY OF 1/10 FOOT FOR NATURAL GROUND AND 1/100 FOOT FOR HARDSCAPE SURFACES.

HORIZONTAL LOCATION OF FINISH FLOOR & GARAGE ELEVATIONS ALONG ABBOTT AVENUE ARE APPROXIMATE, THESE ELEVATION WERE COLLECTED UTILIZING DIFFERENTIAL LEVELING.

IT IS A VIOLATION OF THE STANDARDS OF PRACTICE RULE 5J-17 OF THE FLORIDA ADMINISTRATIVE CODE TO ALTER THIS SURVEY WITHOUT THE EXPRESS PRIOR WRITTEN CONSENT OF THE SURVEYOR. ADDITIONS AND/OR DELETIONS MADE TO THE FACE OF THIS SURVEY WILL MAKE THIS SURVEY INVALID.

THIS PRODUCT DOES NOT REPRESENT A BOUNDARY, RIGHT-OF-WAY, OR ANY OTHER TYPE OF SURVEY OTHER THAN SPECIFIED.

THE OWNERSHIP OF FENCES, PERIMETER WALLS AND/OR HEDGES SHOWN HEREON ARE NOT KNOWN AND THUS ARE NOT LISTED AS ENCROACHMENTS. FENCES, HEDGES AND/OR PERIMETER WALLS ARE SHOWN IN THEIR RELATIVE POSITION TO THE BOUNDARY.

THIS SURVEY MUST BEAR THE SIGNATURE AND ORIGINAL RAISED SEAL OR THE ELECTRONIC SIGNATURE OF A FLORIDA LICENSED SURVEYOR AND MAPPER IN RESPONSIBLE CHARGE OF ITS PREPARATION, OTHERWISE THE SURVEY IS NOT VALID AND IS FOR INFORMATION PURPOSES ONLY.

CONTROL POINTS TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
200	565555.75	943992.62	4.75	SET NL
201	565117.11	944046.01	5.16	SET NL
202	564698.21	944084.29	4.93	SET NL
203	564262.74	944112.80	4.99	SET NL
204	563791.35	944161.96	5.06	SET NL
205	563416.52	944197.07	4.62	SET NL
206	562872.86	944239.44	3.73	SET NL
207	562401.90	944317.19	3.85	SET NL
208	562066.25	944341.71	3.83	SET NL
209	561734.48	944356.04	3.64	SET NL
210	561654.33	944431.34	3.85	SET NL
211	561306.22	944462.27	4.51	SET NL
212	561034.47	944476.90	4.59	SET NL
213	560719.62	944473.96	4.10	SET NL
214	560330.51	944504.32	4.78	SET NL
215	562213.60	942476.43	3.46	SET NL
216	562207.74	942818.12	4.29	SET NL
217	562255.04	943244.60	4.07	SET NL
218	562237.89	943451.09	4.07	SET NL

CONTROL POINTS TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
219	562289.80	943778.54	3.35	SET NL
220	562272.48	944073.69	3.46	SET NL
221	562314.43	944358.57	3.29	SET NL
222	562296.10	944613.83	4.56	SET NL
223	562875.90	942461.62	4.90	SET NL
224	562859.37	942702.05	3.28	SET NL
225	562877.13	943007.15	3.45	SET NL
226	562924.98	943449.75	4.03	SET NL
227	562923.51	943853.90	4.37	SET NL
228	562970.43	944270.33	3.43	SET NL
229	562951.39	944547.44	3.78	SET NL

CONTROL POINTS ELEVATION IS NGVD29

LEGEND:

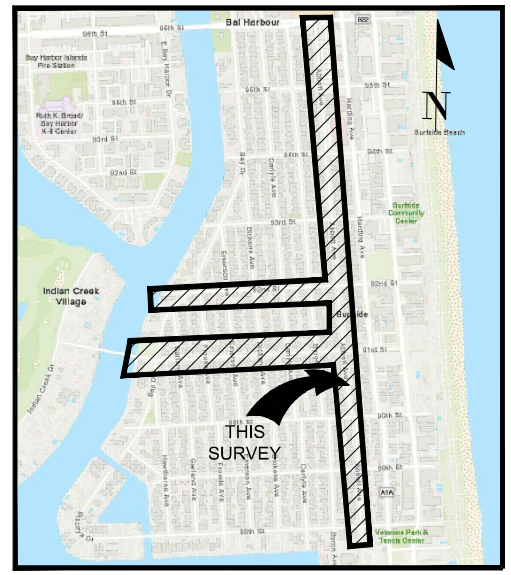
B.C.R.	BROWARD COUNTY RECORDS
BFP	BACK FLOW PREVENTER
BM	BENCHMARK
B.O.	BLACK OLIVE TREE
CATV	CABLE TELEVISION
CB	CATCH BASIN
C.M.	CREPE MYRTLE TREE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC.	CONCRETE
CPP	CORRUGATED PLASTIC PIPE
CPVC	CORRUGATED POLYVINYL CHLORIDE PIPE
EHH	ELECTRIC HAND HOLE
ELEV.	ELEVATION
EM	ELECTRIC METER
FHH	FIBER OPTIC HAND HOLE
FOC	FIBER OPTIC CABLE
G.L.	GUMBO LIMBO TREE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
ICV	IRRIGATION CONTROL VALVE
INV.	INVERT
LB	FLORIDA LICENSED BUSINESS NUMBER
MAH.	MAHOGANY TREE
M.D.C.R.	MIAMI-DADE COUNTY RECORDS
MW	MONITORING WELL
O.R.B.	OFFICIAL RECORDS BOOK
RCP	REINFORCED CONCRETE PIPE
R.P.	ROYAL POINCIANA TREE
R/W	RIGHT OF WAY
P.B.	PLAT BOOK
PG.	PAGE
PVC	POLYVINYL CHLORIDE PIPE
SCH.	SCHEFFLERA TREE
S.F.	STRANGLER FIG TREE
S.G.	SEA GRAPE TREE
TAB.	TABULIA TREE
THH	TELEPHONE HAND HOLE
T.O.B.	TOP OF BAFFLE
TSHH	TRAFFIC SIGNAL HAND HOLE
TYP.	TYPICAL
UNK.	UNKNOWN TREE

LEGEND:

GATE MOTOR
TRAFFIC MAST ARM
BENCHMARK
BOLLARD
CABLE TELEVISION
CATCH BASIN
CONCRETE LIGHT POLE
BUILDING COLUMN
CONCRETE UTILITY POLE
DECORATIVE LIGHT POLE
TWO SIDED SIGN
DOUBLE POST SIGN
ELECTRICAL BOX
ELECTRIC HAND HOLE
ELECTRIC METER
ELECTRIC OUTLET
FLAG POLE
GREASE TRAP MANHOLE
GUY ANCHOR
IRRIGATION CONTROL VALVE
TRAFFIC DIRECTION ARROWS
FLOOD LIGHT
MAILBOX
MANHOLE UNKNOWN
METAL LIGHT POLE
METAL POST
PALM TREE
KEY PAD
PAY PHONE
POST

LEGEND:

CURB INLET
STORM DRAIN MANHOLE
FIRE DEPARTMENT CONNECTION
SHADE TREE
SINGLE POST SIGN
SANITARY SEWER CLEANOUT
SANITARY SEWER VALVE
SANITARY SEWER MANHOLE
TRASH CAN
TRAFFIC SIGNAL CABINET
TRAFFIC SIGNAL HANDHOLE
CROSS WALK LIGHT POLE
WOOD UTILITY POLE
VAULT
BACK FLOW PREVENTER
DOUBLE DETECTOR CHECK VALVE
FIRE HYDRANT
WATER VALVE
WOOD LIGHT POLE
WATER METER
PINE TREE
SHRUB
GUARD RAIL
CHAIN LINK FENCE
WOOD FENCE
METAL FENCE
OVERHEAD LINES
RIGHT OF WAY LINE



LOCATION SKETCH
NOT TO SCALE

CERTIFICATION:

I HEREBY CERTIFY: THAT THIS TOPOGRAPHIC SURVEY WAS PERFORMED UNDER MY DIRECTION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND FURTHER, THAT SAID SURVEY MEETS THE INTENT OF THE APPLICABLE PROVISIONS OF THE "STANDARDS OF PRACTICE FOR LAND SURVEYING IN THE STATE OF FLORIDA," PURSUANT TO CHAPTER 472.027, FLORIDA STATUTES AND RULE 5J-17 OF THE FLORIDA ADMINISTRATIVE CODE.

KEITH & ASSOCIATES, INC.
CONSULTING ENGINEERS

Digitally signed by ALVIN SANTIAGO
DN: C=US, E=ASANTIAGO@KEITHTEAMS.COM, O=KEITH, CN=ALVIN SANTIAGO
Reason: I am the author of this document
Date: 2022.11.16 14:15:39-05'00'

BY: _____
ALVIN SANTIAGO, PSM
PROFESSIONAL SURVEYOR & MAPPERS NO. 7160
STATE OF FLORIDA
DATE OF CERTIFICATION: FEBRUARY 2, 2022.

THIS DOCUMENT CONSISTS OF 6 SHEETS AND EACH SHEET NOT BE CONSIDERED FULL, VALID AND COMPLETE UNLESS ATTACHED TO THE OTHERS.
NOT A BOUNDARY SURVEY

KEITH
301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400
Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

REVISIONS

NO.	DESCRIPTION	DATE

DATE:	02/02/2021
DRAWN BY:	C.M.
CHECKED BY:	A.S.
FIELD BOOK:	FB991, FB1018
	FB1022, FB1023, FB1026 & FB1028

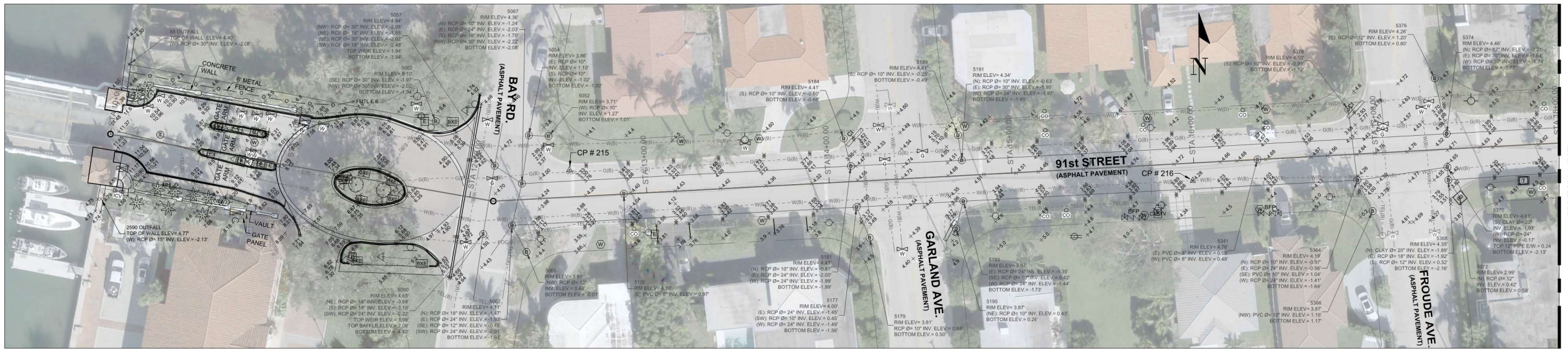
N

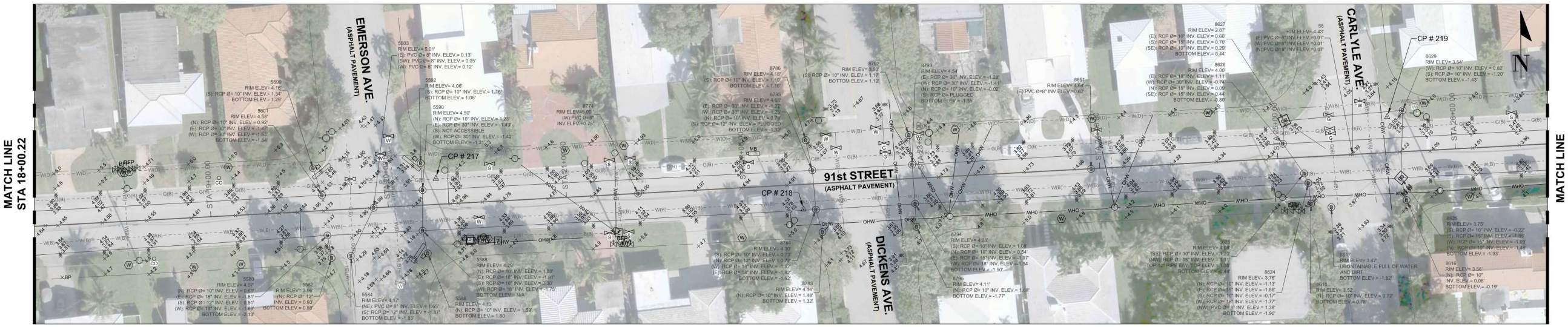
GRAPHIC SCALE
0 30 60
SCALE: 1" = 30 '
NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL, VERIFY SCALE USING BAR SCALE ABOVE.

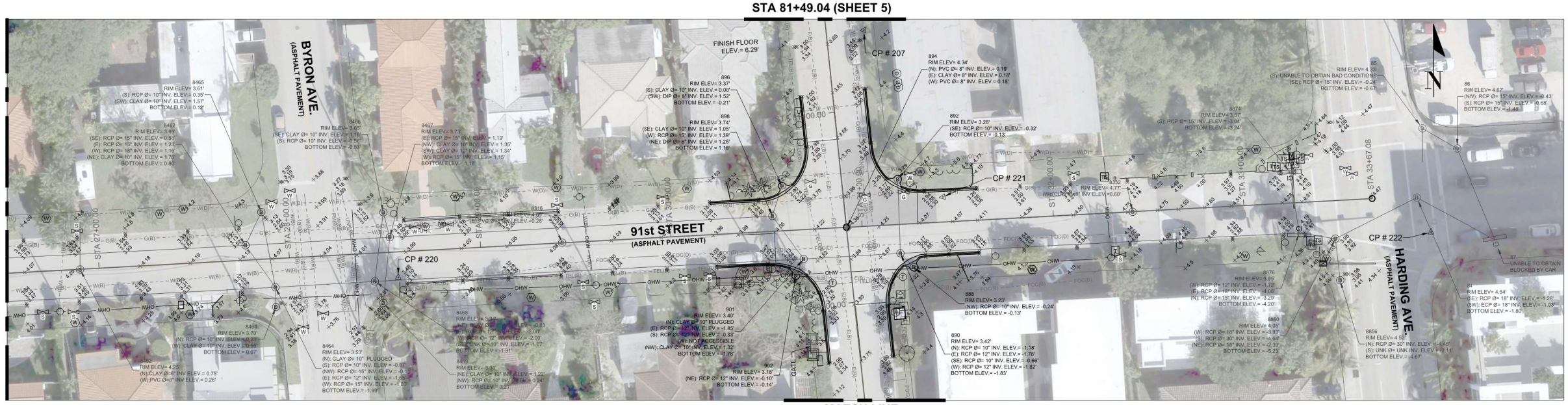
TOWN OF SURFSIDE
9293 HARDING AVE.
SURFSIDE, FL, 33154

SHEET TITLE
TOPOGRAPHIC SURVEY
ABBOTT AVENUE
DRAINAGE IMPROVEMENTS
PHASE-2
SURFSIDE, FLORIDA, 33154
MIAMI-DADE COUNTY, FLORIDA

SHEET NUMBER	1
PROJECT NUMBER	11494.01







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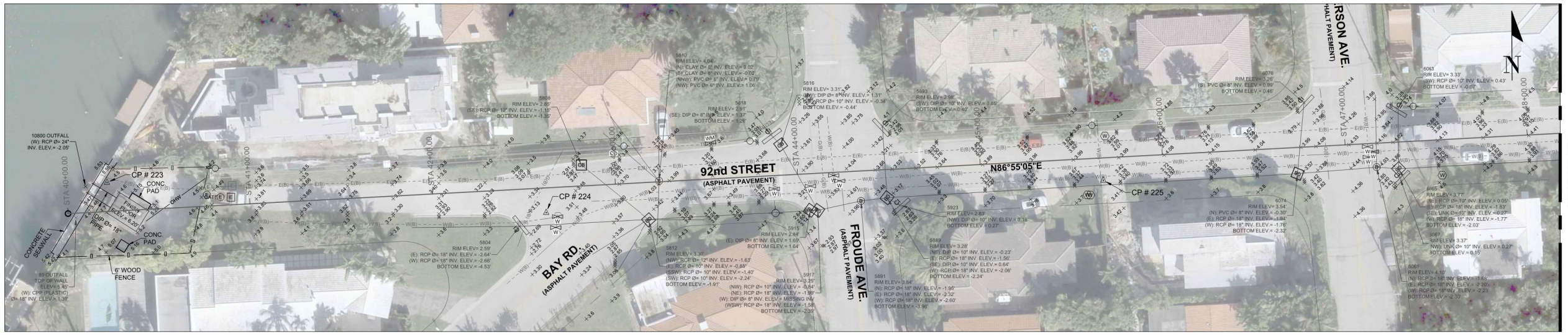
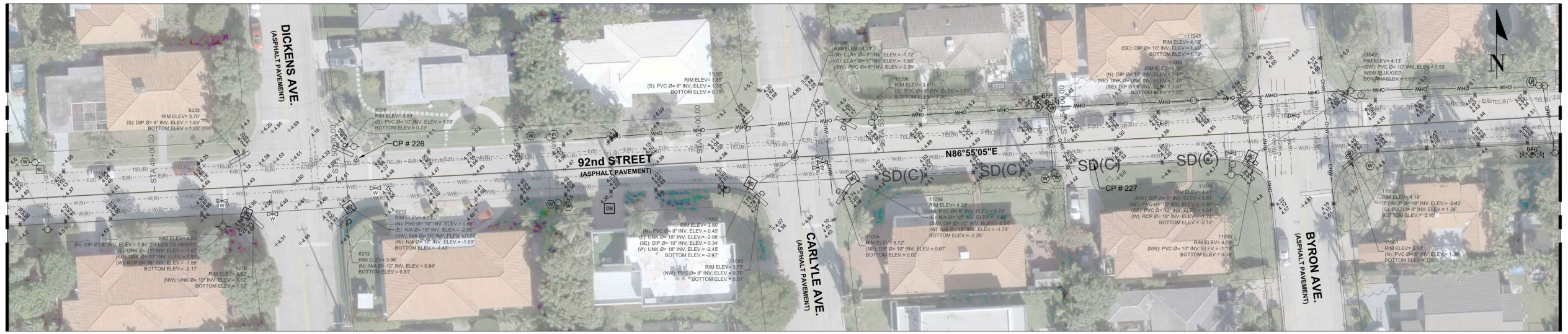
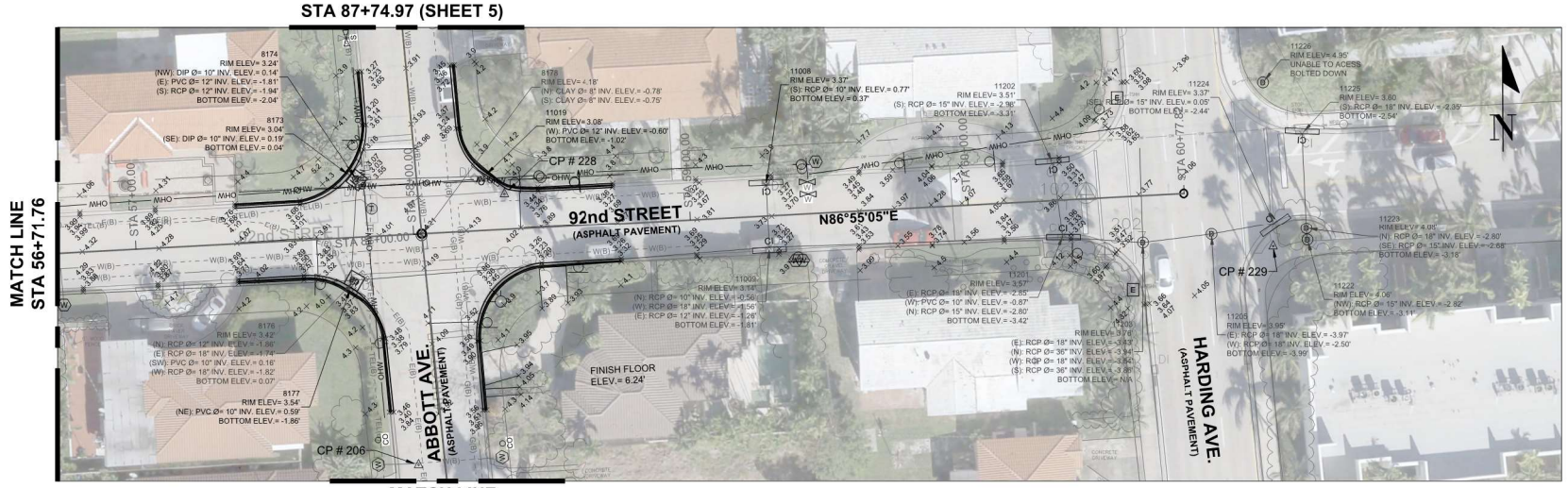
SHEET TITLE
TOPOGRAPHIC SURVEY
ABBOTT AVENUE
DRAINAGE IMPROVEMENTS
PHASE-2
SURFSIDE, FLORIDA, 33154
MIAMI-DADE COUNTY, FLORIDA

SHEET NUMBER	2
PROJECT NUMBER	11494.01

Plotted by: cmartinez On ----







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SHEET TITLE

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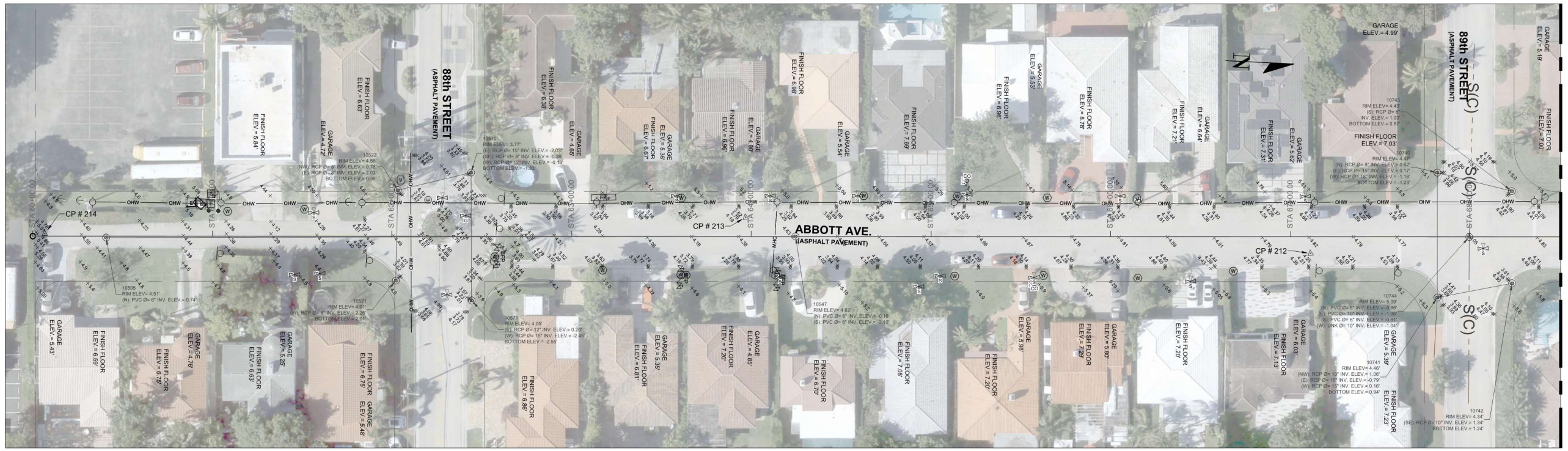
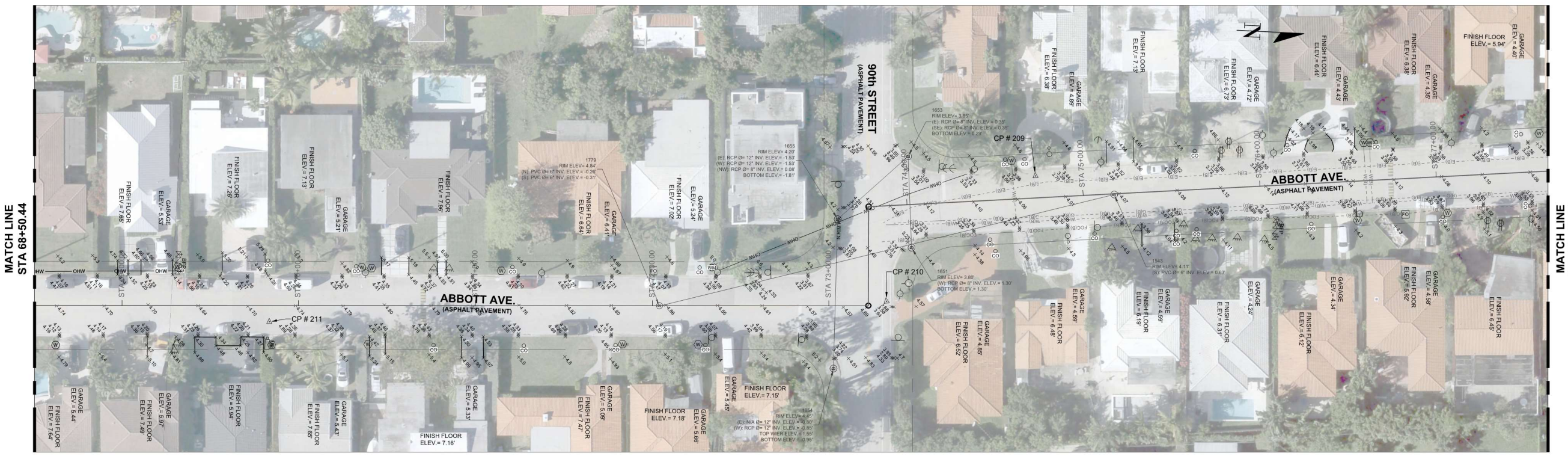
ABBOTT AVENUE
DRAINAGE IMPROVEMENTS
PHASE-2

SURFSIDE, FLORIDA, 33154
MIAMI-DADE COUNTY, FLORIDA

SHEET NUMBER	3
PROJECT NUMBER	11494.01

Plotted by: cmartinez On ----





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SURFSIDE, FL, 33154

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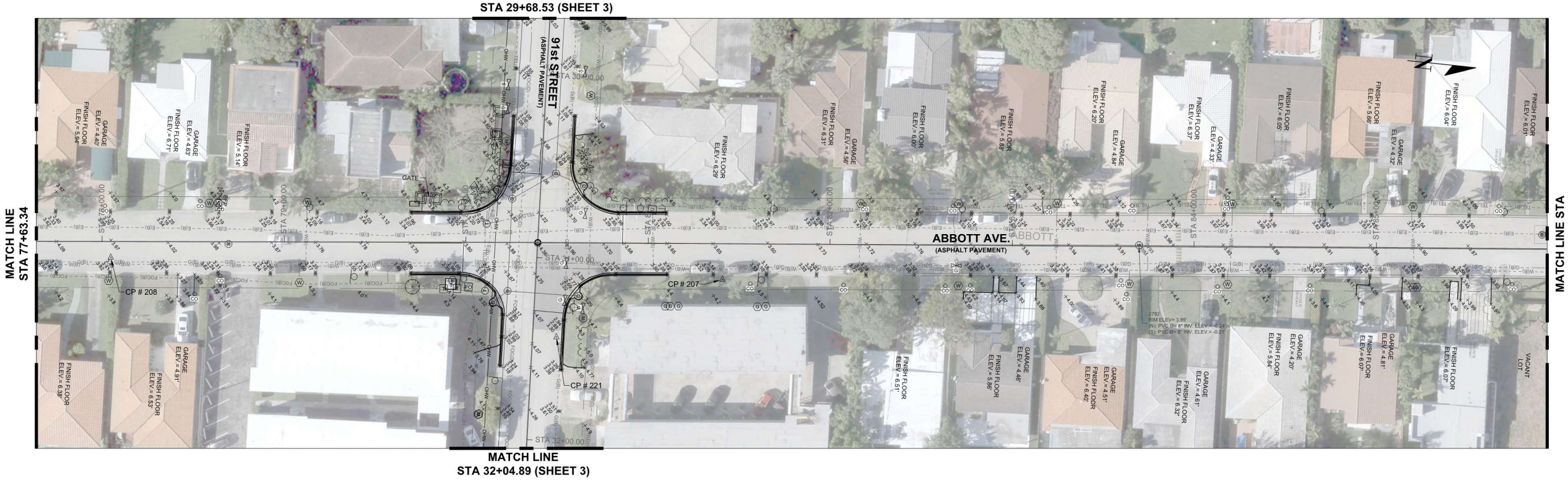
TOPOGRAPHIC SURVEY
ABBOTT AVENUE
DRAINAGE IMPROVEMENTS
PHASE-2
SURFSIDE, FLORIDA, 33154
MIAMI-DADE COUNTY, FLORIDA

SHEET NUMBER	4
PROJECT NUMBER	11494.01



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SURFSIDE, FL, 33154

SHEET TITLE

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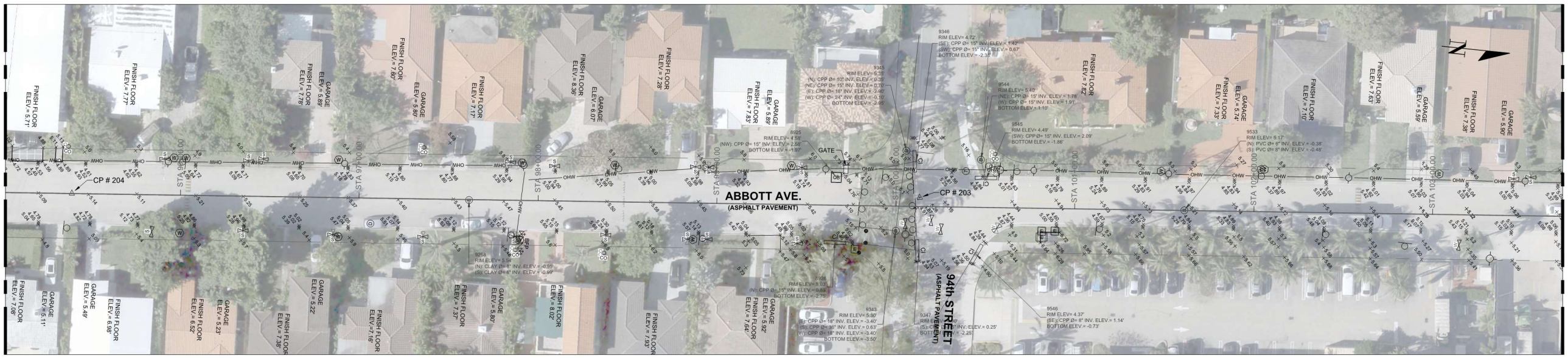
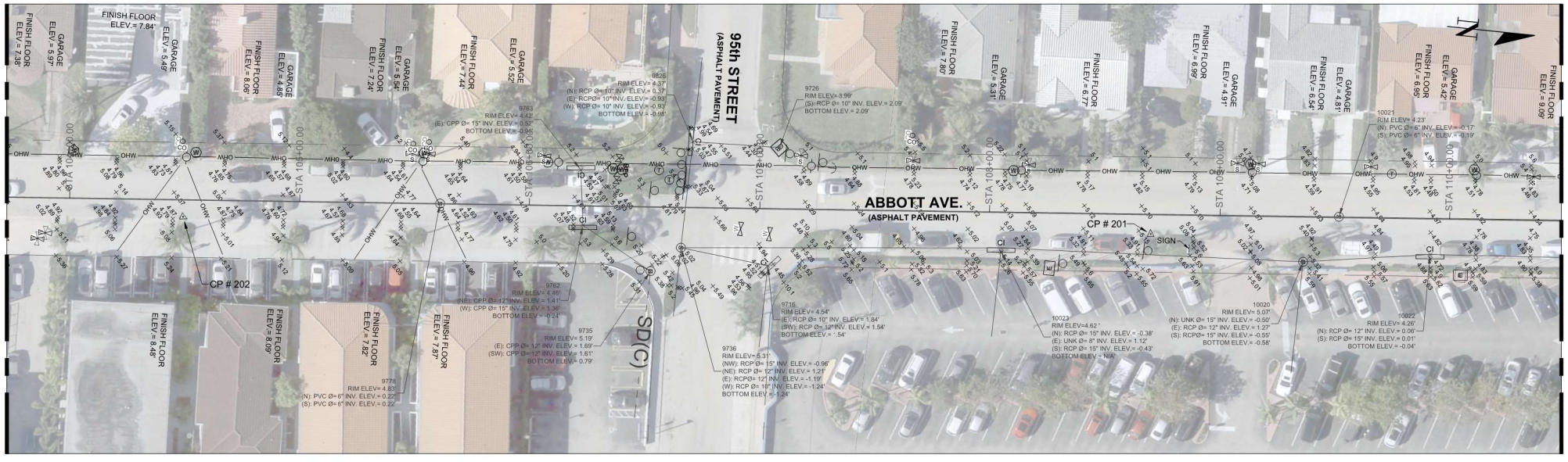
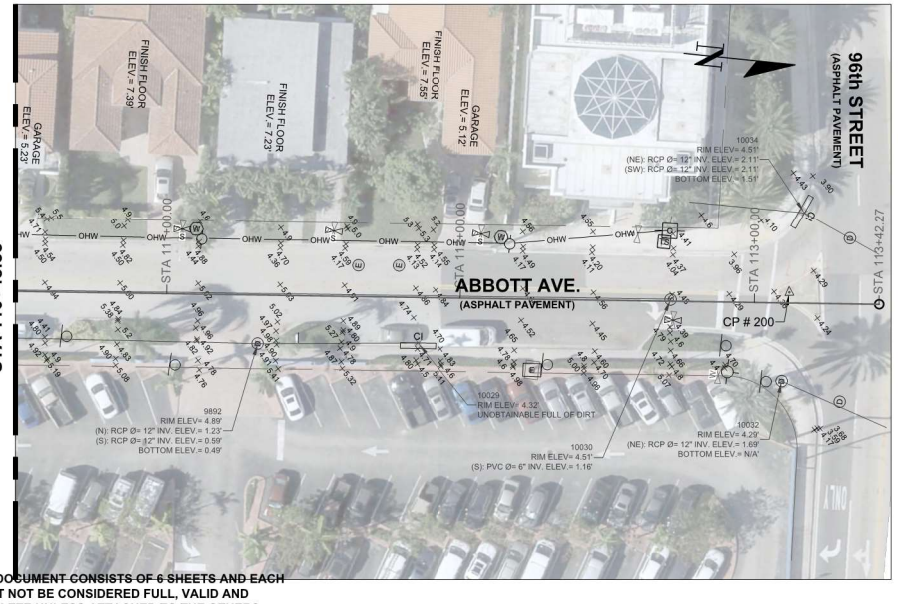
ABBOTT AVENUE
DRAINAGE IMPROVEMENTS
PHASE-2

SURFSIDE, FLORIDA, 33154
MIAMI-DADE COUNTY, FLORIDA

SHEET NUMBER	5
PROJECT NUMBER	11494.01







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SHEET TITLE

TOPOGRAPHIC SURVEY
ABBOTT AVENUE
DRAINAGE IMPROVEMENTS
PHASE-2

SURFSIDE, FLORIDA, 33154
MIAMI-DADE COUNTY, FLORIDA

SHEET NUMBER	6
PROJECT NUMBER	11494.01

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
A / CP-301	PROPOSED SECTION MARKER INDICATING THE SECTION LETTER AND THE SHEET ON WHICH THE SECTION VIEW APPEARS.
22 / C-05	DETAIL REFERENCE CALL OUT INDICATING THE DETAIL NUMBER AND THE SHEET ON WHICH THE DETAIL VIEW APPEARS.
1	REVISION TRIANGLE NUMBER
	MISC BREAK LINES
PIC#	PHOTO LOCATION AND CORRESPONDING PICTURE NUMBER.
N: 623025.4322 E: 850262.1786	COORDINATE VALUES SHOWN ON PROPOSED IMPROVEMENTS ARE RELATIVE TO THE COORDINATE VALUES INDICATED ON THE RIGHT-OF-WAY, PROPERTY CORNERS OR REFERENCE MONUMENT

GEN SITE & PMS

SYMBOL	DESCRIPTION
	PAVEMENT MARKING ARROWS
	STOP BAR
	ADA PARKING
	CONCRETE CAR STOP
	BICYCLE
	BICYCLE RACK
	AUTOMOBILE
	POST MOUNTED SIGNS 1,2, DOUBLE POST & 4 WAY
33	PARKING SPACE NUMBER
BL CL PL EL ML	BASELINE, CENTER, PROPERTY, FLOW & MONUMENT LINE
	BUILDING ACCESS (ADA) / (NON-ADA)

PAVING & GRADING

SYMBOL	DESCRIPTION
0.04% 0.04%	FLOW DIRECTIONAL ARROW
6"	ELEVATION CHANGE
5.00 5.00	MAJOR / MINOR CONTOUR ELEVATION
13.56	GRADE ELEVATION
13.56 / 22.00	TOP OF CURB / PAVEMENT ELEVATION
MEG	MATCH EXISTING GRADE
	SLOPE BANK
A-1 24'	DRIVEWAY TURNOUT IDENTIFICATION (FDOT INDEX 515) W/ DRIVE WIDTH
CR-7	SIDEWALK CURB RAMP (PER FDOT INDEX 304)
	SEAWALL

UTILITY PIPES

SYMBOL	DESCRIPTION
	PIPE FITTINGS: TEE, 90, 45, 22.5, 11.2, CAP,
	CAP W/FVO, REDUCER, VERTICAL, PLUG
	VALVES: GATE, BUTTERFLY, DOUBLE BTRFLY, BFP, DDCV, VACUUM BREAKER
MBO ABO ARV	MAN/AUTO BLOWOFF, ARV, PIV, FLUSH VLV, CORP STOP
SP# HYD FDC WW	SAMPLE PNT, HYDRANT, FDC, WATER WELL
	TAPPING SADDLE
SD	EXFILTRATION TRENCH
W	PIPE CASING
V	VENT PIPE BOX
22	UTILITY CROSSING TABLE REFERENCE
22	UTILITY CROSSING

HATCH PATTERNS

SYM	DESCRIPTION	SYM	DESCRIPTION
	CONCRETE AREA		BRICK PAVERS
	JOGGING PATH		SOIL TRACKING PREVENTION DEVICE
	PAVEMENT AREA		SAND (DETAIL / ELEVATION)
	BUILDING HATCH		EARTH (DETAIL / ELEVATION)
	MILLING AND RESURFACING		GRAVEL (DETAIL / ELEVATION)
	DETECTABLE WARNING PER FLORIDA CODE		GRASS AREA
	DEMOLITION AREA		ADA STRIPING

UTILITY STRUCTURES

SYMBOL	DESCRIPTION
CB	FDOT C,D,E,F,G & FABRIC CATCH BASIN
CB MH SS	NON-FDOT ROUND CB'S & MANHOLES, MDC STRUCTURE
	FDOT CURB INLETS TYPE1-TYPE10
	TRENCH DRAIN
	PIPE CULVERT - MITERED END SECTION
	STRAIGHT ENDWALL
PS#	PUMP STATION LOCATION AND NUMBER
	GREASE TRAP SINGLE AND DOUBLE
	SEPTIC TANK
	SEPTIC DRAIN FIELD
	DRAINAGE WELL, DRAIN C.B., CONTROL STRUCTURE
MW	MONITORING WELL
WELL	WATER WELL
M	METER BOX WATER AND IRRIGATION
YD DD DD	YARD DRAIN / 9" DECK DRAIN ROUND & SQUARE
CO CO CO	CLEAN OUT 6", 4" & BOX
22	STORM STRUCTURE TABLE REFERENCE NUMBER
22	SEWER STRUCTURE TABLE REFERENCE NUMBER

XX CONST. 5' Ø CB
RIM EL. = 12.88
N INV. ELEV. = 4.50' - XX" DIP
E INV. ELEV. = 4.50' - XX" DIP
S INV. ELEV. = 4.50' - XX" DIP
W INV. ELEV. = 4.50' - XX" DIP

SEWER STRUCTURE CALLOUT (SHOWN AS A CIRCLE CIRCUMSCRIBING THE STRUCTURE NUMBER.)

XX CONST. 5' Ø CB
RIM EL. = 12.88
N INV. ELEV. = 4.50' - XX" DIP
E INV. ELEV. = 4.50' - XX" DIP
S INV. ELEV. = 4.50' - XX" DIP
W INV. ELEV. = 4.50' - XX" DIP

STORM STRUCTURE CALLOUT (SHOWN AS A HEXAGON CIRCUMSCRIBING THE STRUCTURE NUMBER.)

INDICATES STRUCTURE NUMBER, STATION & OFFSET, STRUCTURE SIZE & TYPE, RIM/GRATE ELEVATION, PIPE INVERT ELEVATIONS & DIRECTION, PIPE SIZE & MATERIAL AS WELL AS ANY SPECIAL NOTES.

LINE TYPES

PROPOSED UTILITIES

W	WATER LINE
SAN	SANITARY SEWER
FM	FORCE MAIN
LFM	LOW PRESSURE FM
SD	STORM DRAIN
PSD	PRESSURE STORM
IRR	IRRIGATION
RAW	RAW WATER
RCW	RECLAIMED WATER
G	GAS LINE

TOPO

	BREAKLINE
	MAJOR CONTOUR
	MINOR CONTOUR
	TOP OF BANK
	TOE OF SLOPE
	EDGE OF WATER
CLS CLS	CENTERLINE OF SWALE

PAVEMENT MARKING

	STRIPE SKIP 2-4
	STRIPE SKIP 3-9
	STRIPE SKIP 6-10
	STRIPE SKIP 10-30
	STRIPE SKIP 10-10-20
	STRIPE SKIP 2-2-2

GENERAL SITE

	DEMOLITION
	TURBIDITY BARRIER
	PARKING STRIPING (SINGLE)
	BUILDING SETBACK
	FIRE TRUCK PATH
	SIGHT TRIANGLE
	BUILDING FOOTPRINT
	VEHICLE OVERHANG
O	CONSTRUCTION LIMITS
SF SF	SILT FENCE
SSF	SUPER SILT FENCE
	PARKING STRIPING (DOUBLE)

ABBREVIATIONS

ABBRV	DESCRIPTION
AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL
BIT.	BITUMINOUS
BC	BACK OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DWY	DRIVEWAY
ELEV (OR EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (OR EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MEG	MATCH EXISTING GRADE
MH	MANHOLE
MIN	MINIMUM
NIC	NOT IN CONTRACT

ABBREVIATIONS CONTINUED

ABBRV	DESCRIPTION
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
RT	RIGHT
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TSV	TAPPING SLEEVE AND VALVE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

LINE WEIGHTS

EXISTING	SHADED LINES & TEXT DENOTE EXISTING EQUIPMENT AND STRUCTURES.
FUTURE	NON-SHADED DASHED LINES & TEXT DENOTE FUTURE EQUIPMENT, STRUCTURES AND WORK.
PROPOSED / CONSTRUCT	NON-SHADED, BOLD, SOLID LINES & TEXT DENOTE PROPOSED EQUIPMENT, STRUCTURES AND WORK.

NOTE: THIS IS A STANDARD LEGEND SHEET. NOT ALL ITEMS ARE PERTINENT TO THIS SET OF DRAWINGS

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REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER	GI-001
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS

GENERAL NOTES

THIS CONSTRUCTION PROJECT MAY OR MAY NOT INCLUDE ALL ITEMS COVERED BY THESE NOTES AND SPECIFICATIONS, I.E. PAVING, GRADING, DRAINAGE LINES, WATER LINES, OR SANITARY SEWER LINES. SEE PLANS FOR DETAILED PROJECT SCOPE. NOTES AND SPECIFICATIONS ON THIS SHEET REFER TO PAVING, GRADING, DRAINAGE, WATER, AND SANITARY SEWER, AND ARE INTENDED FOR THIS PROJECTS SCOPE OF WORK AND FOR REFERENCE PURPOSES FOR OTHER WORK ITEMS THAT MAY BE REQUIRED DUE TO UNFORESEEN EXISTING CONDITIONS OR REQUIRED REMEDIAL WORK.

1. SPECIFIC SITE NOTES
1.1. COUNTY AND "CITY" IN THESE NOTES REFERS TO COUNTY AND CITY IN WHICH PROJECT RESIDES.
1.2. STATE IN THESE NOTES REFERS TO THE STATE OF FLORIDA.
1.3. EXISTING TOPOGRAPHIC INFORMATION IN THE PLANS IS BASED ON SURVEY DATA AND BEST AVAILABLE INFORMATION. SEE PROJECT SURVEY AND NOTES ON PLAN SHEETS REGARDING THE SOURCE OF THE TOPOGRAPHIC INFORMATION.

2. APPLICABLE CODES
2.1. ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY, COUNTY, AND ALL OTHER JURISDICTIONAL, STATE AND NATIONAL CODES WHERE APPLICABLE.
2.2. IN THE EVENT OF A CONFLICT BETWEEN THE GENERAL NOTES AND CONSTRUCTION SPECIFICATIONS IN THESE PLANS, AND THE CONTRACT DOCUMENTS AND SPECIFICATIONS IN THE SPECIFICATION BOOKLET, THE CONTRACTOR SHALL SUBMIT WRITTEN REQUEST FOR CLARIFICATION.
2.3. ALL CONSTRUCTION SHALL BE DONE IN A SAFE MANNER AND IN STRICT COMPLIANCE WITH ALL THE REQUIREMENTS OF THE FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, AND ALL STATE AND JURISDICTIONAL SAFETY AND HEALTH REGULATIONS.
2.4. THE CONTRACTOR SHALL BE REQUIRED TO COMPLY WITH FEDERAL, STATE, COUNTY, AND CITY LAWS, CODES, AND REGULATIONS.
2.5. ALL HANDICAP ACCESSIBLE AREAS TO CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), STATE ADA CODES, AND FLORIDA BUILDING CODE ADA CODES LATEST EDITION.
2.6. TRENCH SAFETY ACT
2.6.1. ALL TRENCH EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH CHAPTER 90-96 OF THE LAWS OF FLORIDA (THE TRENCH SAFETY ACT).
2.6.2. ALL TRENCH EXCAVATION IN EXCESS OF 5 FEET IN DEPTH SHALL BE UNDERTAKEN IN ACCORDANCE WITH O.S.H.A. STANDARD 29 CFR. SECTION 1926.650 SUBPART P.
2.6.3. THE CONTRACTOR SHALL SUBMIT WITH HIS CONTRACT A COMPLETED, SIGNED, AND NOTARIZED COPY OF THE TRENCH SAFETY ACT COMPLIANCE STATEMENT. THE CONTRACTOR SHALL ALSO SUBMIT A SEPARATE COST ITEM IDENTIFYING THE COST OF COMPLIANCE WITH THE APPLICABLE TRENCH SAFETY CODES.
2.6.4. A TRENCH SAFETY SYSTEM, IF REQUIRED, SHALL BE DESIGNED BY THE EXCAVATION CONTRACTOR UTILIZING A SPECIALTY ENGINEER AS REQUIRED.

3. CONSTRUCTION NOTES:
3.1. CONTRACTOR SHALL TIE TO EXISTING GRADE BY EVENLY SLOPING FROM CLOSEST PROPOSED GRADE PROVIDED TO EXISTING GRADE AT LIMITS OF CONSTRUCTION, UNLESS OTHERWISE NOTED ON THE PLANS. IF NO LIMIT OF WORK LINE IS INDICATED, SLOPE TO ADJACENT PROPERTY LINE OR RIGHT-OF-WAY LINE, AS APPLICABLE.
3.2. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL EXISTING MANHOLES, CATCH BASINS, METERS AND OTHER STRUCTURES, WHETHER INDICATED ON THE PLANS OR NOT SHALL BE ADJUSTED TO MATCH THE NEW GRADE, BY THE CONTRACTOR.
3.3. THE CURB SHALL BE SLOPED TO ACCOMMODATE THE NEW PAVEMENT, CATCH BASIN AND GRATE, AND THE SURFACE FLOW PATTERN.
3.4. THE CONTRACTOR SHALL USE CARE WHEN CUTTING THE EXISTING ASPHALT PAVEMENT AND DURING EXCAVATIONS, SO THAT THE EXISTING CATCH BASINS AND GRATES THAT ARE TO REMAIN WILL NOT BE DAMAGED.
3.5. THE CONTRACTOR SHALL MAINTAIN THE ROADWAY SLOPE WHEN RESURFACING THE ROADWAY. THE EDGE OF PAVEMENT SHALL MATCH THE NEW GUTTER LIP PER FDOT INDEX 300.
3.6. THE NEW SIDEWALK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE GIVEN ELEVATIONS AND AT THE PROPER SLOPES DEPICTED IN THE SPECIFICATIONS, DETAILS AND STANDARDS. EXISTING DRIVEWAYS AND OTHER FEATURES SHALL BE MATCHED WHEN POSSIBLE AS DIRECTED BY THE ENGINEER.
3.7. RADII SHOWN ARE TO THE EDGE OF PAVEMENT.
3.8. ALL BENCH MARK MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE PROTECTED AND REFERENCED BY THE CONTRACTOR IN THE SAME WAY AS PUBLIC LAND CORNERS.
3.9. ALL EXCESS MATERIAL IS TO BE DISPOSED BY THE CONTRACTOR WITHIN 72 HOURS.
3.10. IN AREAS WHERE THE BASE IS EXPOSED BY THE MILLING OPERATION, THE CONTRACTOR SHALL RESTORE THE BASE TO ITS ORIGINAL THICKNESS AND STRUCTURAL CAPACITY BEFORE PAVING OVER SUCH AREAS. THIS INCLUDES BUT IS NOT LIMITED TO RESTORING ORIGINAL DEGREE OF COMPACTION, MOISTURE CONTENT, COMPOSITION, STABILITY, AND INTENDED SLOPE. IF PAVING WILL NOT TAKE PLACE THE SAME DAY THE BASE IS EXPOSED AND REWORKED, THE BASE SHALL BE SEALED ACCORDING TO THE GOVERNING STANDARDS AND SPECIFICATIONS. ANY ADDITIONAL WORK RESULTING FROM THE CONTRACTOR'S FAILURE TO PROTECT THE EXPOSED BASE AS STATED ABOVE IN ORDER TO RESTORE THE ORIGINAL STRUCTURAL CAPACITY SHALL BE THE CONTRACTOR'S COST.
3.11. THE CONTRACTOR IS TO MAINTAIN EXISTING SIGNAGE DURING CONSTRUCTION OPERATIONS, IN ORDER TO FACILITATE EMERGENCY VEHICLE TRAFFIC.
3.12. THE TOPOGRAPHIC SURVEY INCLUDED WITH THIS SET OF PLANS REFLECTS PRE-DEMOLITION CONDITIONS AND DOES NOT REFLECT THE SITE CONDITIONS AFTER DEMOLITION. THE CONTRACTOR IS FULLY AND SOLELY RESPONSIBLE IN DETERMINING THE REQUIRED EARTHWORK FOR THE PROPOSED DEVELOPMENT OF THE SITE. THIS INCLUDES, BUT IS NOT LIMITED TO, ANY EXCAVATION/DREDGE AND FILL ACTIVITIES REQUIRED AT ANY PHASE OF THE PROJECT. THE CONTRACTOR SHALL USE THE FINAL APPROVED (RELEASED FOR CONSTRUCTION) PLANS, SURVEYS, GEOTECHNICAL REPORTS, AND ANY OTHER AVAILABLE INFORMATION FOR DETERMINING THE AMOUNT OF EXCAVATION/DREDGING AND FILLING REQUIRED. ANY QUANTITIES INCLUDED IN THE APPROVED PERMITS WERE ESTIMATED BY THE ENGINEER FOR PURPOSES OF OBTAINING THE PERMIT AND UNDER NO CIRCUMSTANCES SHALL BE USED BY THE CONTRACTOR IN LIEU OF PERFORMING THEIR OWN EARTHWORK CALCULATIONS REQUIRED FOR COST ESTIMATING AND BIDDING THE PROJECT.
3.13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND FAMILIARIZING THEMSELVES WITH ANY AND ALL AVAILABLE GEOTECHNICAL REPORTS PREPARED BY OTHERS AND/OR ANY RECOMMENDATIONS WRITTEN OR IMPLIED BY THE GEOTECHNICAL ENGINEER FOR THIS PROJECT. THE GEOTECHNICAL CONDITIONS AND RECOMMENDATIONS OUTLINED IN THESE REPORTS ARE IN FORCE AND IN FULL EFFECT AS PART OF THE PROPOSED IMPROVEMENTS. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL THE WORK ASSOCIATED WITH THIS PROJECT IS IN COMPLIANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. KEITH AND ASSOCIATES, INC. IS NOT RESPONSIBLE FOR THE SUITABILITY OR UNSUITABILITY OF THE SOILS ENCOUNTERED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE MEANS AND METHODS OF CONSTRUCTION USED CAN AND WILL ALLOW FOR THE SUCCESSFUL COMPLETION OF THE REQUIRED SITE IMPROVEMENTS.
3.14. THE CONTRACTOR SHALL ENSURE THAT THE AVAILABLE GEOTECHNICAL INFORMATION IS SUFFICIENT FOR HIS COMPLETE UNDERSTANDING OF THE SOIL CONDITIONS FOR THE SITE. IF ADDITIONAL GEOTECHNICAL INVESTIGATION IS REQUIRED BY THE CONTRACTOR, THIS ADDITIONAL WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.
3.15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND RESTORATION OF EXISTING PAVEMENT, PIPES, CONDUITS, SPRINKLER HEADS, CABLES, ETC., AND LANDSCAPED AREAS DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS AND/OR THOSE OF HIS SUBCONTRACTORS AND SHALL RESTORE AT NO ADDITIONAL COST.
3.16. THE CONTRACTOR SHALL NOT BRING ANY HAZARDOUS MATERIALS ONTO THE PROJECT. SHOULD THE CONTRACTOR REQUIRE SUCH FOR PERFORMING THE CONTRACTED WORK, THE CONTRACTOR SHALL REQUEST, IN WRITING, PERMISSION FROM THE OWNER, CITY AND ENGINEER. THE CONTRACTOR SHALL PROVIDE THE OWNER, CITY AND ENGINEER WITH A COPY OF THE MATERIAL SAFETY DATA SHEET (MSDS) FOR EACH HAZARDOUS MATERIAL PROPOSED FOR USE. THE PROJECT ENGINEER SHALL COORDINATE WITH THE OWNER AND CITY PRIOR TO ISSUING WRITTEN APPROVAL TO THE CONTRACTOR.
3.17. ANY KNOWN OR SUSPECTED HAZARDOUS MATERIAL FOUND ON THE PROJECT BY THE CONTRACTOR SHALL BE IMMEDIATELY REPORTED TO THE CITY AND/OR ENGINEER, WHO SHALL DIRECT THE CONTRACTOR TO PROTECT THE AREA OF KNOWN OR SUSPECTED CONTAMINATION FROM FURTHER ACCESS. THE CITY AND/OR ENGINEER ARE TO NOTIFY THE OWNER/ENGINEER OF THE DISCOVERY. THE OWNER/ENGINEER WILL ARRANGE FOR INVESTIGATION, IDENTIFICATION, AND REMEDIATION OF THE HAZARDOUS MATERIAL. THE CONTRACTOR SHALL NOT RETURN TO THE AREA OF CONTAMINATION UNTIL APPROVAL IS PROVIDED BY THE ENGINEER.
3.18. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE CITY ENGINEERING INSPECTOR AND ENGINEER 48 HOURS IN ADVANCE OF THE EVENT TO NOTIFY THE CITY OF CONSTRUCTION START UP, OR TO SCHEDULE ALL REQUIRED TESTS AND INSPECTIONS INCLUDING FINAL WALK-THROUGHS.

4. PRECONSTRUCTION RESPONSIBILITIES
4.1. ALL UTILITY / ACCESS EASEMENTS TO BE SECURED PRIOR TO CONSTRUCTION.
4.2. NO CONSTRUCTION MAY COMMENCE UNTIL THE APPROPRIATE PERMITS HAVE BEEN OBTAINED FROM ALL MUNICIPAL, STATE, COUNTY, AND FEDERAL AGENCIES AND A PRE-CONSTRUCTION MEETING HAS BEEN CONDUCTED.
4.3. ALL REQUIRED GOVERNMENTAL AGENCY BUILDING PERMITS TO BE OBTAINED BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION ACTIVITY.
4.4. CONTRACTOR TO COORDINATE CONSTRUCTION SCHEDULING FOR CONNECTION TO THE EXISTING WATER AND SEWER LINES WITH THE UTILITY DEPARTMENT THAT OWNS AND/OR MAINTAINS THE WATER AND SEWER LINES.
4.5. PRIOR TO THE START OF CONSTRUCTION, THE OWNER SHALL SUBMIT AN NPDES CONSTRUCTION GENERAL PERMIT (CGP) "NOTICE OF INTENT (N.O.I.) TO USE GENERIC PERMIT FOR STORM WATER DISCHARGE FROM CONSTRUCTION ACTIVITIES FORM (DEP FORM 62-621.300(4)(B)) TO FDEP NOTICES CENTER. THE CONTRACTOR WILL BE RESPONSIBLE FOR (1) IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) THAT WAS REQUIRED TO BE DEVELOPED PRIOR TO NOI SUBMITTAL, AND (2) RETENTION OF RECORDS REQUIRED BY THE PERMIT, INCLUDING RETENTION OF A COPY OF THE SWPPP AT THE CONSTRUCTION SITE FROM THE DATE OF PROJECT INITIATION TO THE DATE OF FINAL SITE STABILIZATION. A "NOTICE OF TERMINATION (N.O.T.) OF GENERIC PERMIT COVERAGE" FORM (DEP FORM 62-621.300(6)) MUST BE SUBMITTED TO FDEP TO DISCONTINUE PERMIT COVERAGE, SUBSEQUENT TO COMPLETION OF CONSTRUCTION. FOR ADDITIONAL INFORMATION SEE FDEP WEBSITE: HTTP://WWW.DEP.STATE.FL.US/WATER/ STORM WATER/NPDES.
4.6. PRIOR TO CONSTRUCTION OR INSTALLATION, 5 SETS OF SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW AS REQUIRED FOR THE FOLLOWING ITEMS LISTED BELOW, BUT NOT LIMITED TO:
- DRAINAGE: CATCH BASINS, MANHOLES, HEADWALLS, GRATES/TOPS, YARD DRAINS.
- WATER: FIRE HYDRANTS, VALVES, BACKFLOW PREVENTER, DDCV, METER BOX.
- SEWER: MANHOLES, LIFT STATIONS (WETWELL, HATCHES, VALVES, PUMP DATA, ELECTRICAL PANEL)

4.0.1. CATALOGUE LITERATURE SHALL BE SUBMITTED FOR DRAINAGE, WATER AND SEWER PIPES, FITTINGS, AND APPURTENANCES.
4.0.2. PRIOR TO SUBMITTING SHOP DRAWINGS TO THE ENGINEER, THE CONTRACTOR SHALL REVIEW AND APPROVE THE DRAWINGS, AND SHALL NOTE IN RED ANY DEVIATIONS FROM THE ENGINEER'S PLANS OR SPECIFICATIONS.
4.0.3. INDIVIDUAL SHOP DRAWINGS FOR ALL PRECAST STRUCTURES ARE REQUIRED. CATALOGUE LITERATURE WILL NOT BE ACCEPTED FOR PRECAST STRUCTURES.
4.7CONTRACTOR TO SUBMIT MAINTENANCE OF TRAFFIC PLAN(S) IN ACCORDANCE WITH FDOT AND COUNTY REQUIREMENTS, AND SUBMIT FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION.

5. INSPECTIONS / TESTING:
5.1. THE CONTRACTOR SHALL NOTIFY IN WRITING THE OWNER, CITY, COUNTY, ENGINEER OF RECORD, AND ANY OTHER GOVERNMENTAL AGENCIES HAVING JURISDICTION AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION AND PRIOR TO REQUIRED INSPECTIONS OF THE FOLLOWING ITEMS, WHERE APPLICABLE:
- CLEARING AND EARTHWORK
- STORM DRAINAGE SYSTEMS
- SANITARY SEWER SYSTEMS
- WATER DISTRIBUTION SYSTEMS
- SUBGRADE
- LIMEROCK BASE
- ASPHALT OR CONCRETE PAVEMENT
- SIDEWALKS, CONCRETE FLATWORK/CURBING
- LANDSCAPING
- PAVEMENT MARKING AND SIGNAGE
- SIGNALIZATION
- SITE LIGHTING
- ELECTRICAL AND COMMUNICATION LINES
- UTILITY CONDUITS
- IRRIGATION
- FINAL

5.1. THE OWNER, ENGINEER, AND JURISDICTIONAL PERMITTING AGENCIES MAY MAKE INSPECTIONS OF THE WORK AT ANY TIME. THE CONTRACTOR SHALL COOPERATE FULLY WITH ALL INSPECTIONS.
5.3. TESTING - ALL TESTING REQUIRED BY THE PLANS AND SPECIFICATIONS SHALL BE PERFORMED BY A LICENSED / FDOT QUALIFIED TESTING COMPANY. REQUIRED TEST FOR ASPHALT AND LIMEROCK SHALL BE TAKEN AT THE DIRECTION OF THE ENGINEER OR THE JURISDICTIONAL GOVERNMENTAL AGENCY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

6. TEMPORARY FACILITIES
6.1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR OR SUPPLY TEMPORARY WATER SERVICE, SANITARY FACILITIES, COMMUNICATIONS, AND ELECTRICITY, FOR HIS OPERATIONS AND WORKS, COST INCLUDED UNDER MOBILIZATION.
6.2. CONTRACTOR SHALL CONSTRUCT TEMPORARY FENCING TO SECURE CONSTRUCTION AREAS AT ALL TIMES, COST INCLUDED IN MOBILIZATION.
6.3. CONTRACTOR TO OBTAIN A SECURE STAGING AREA AND OBTAIN ALL NECESSARY APPROVALS FROM THE OWNER.
6.4. CONTRACTOR SHALL CONSTRUCT AND MAINTAIN TEMPORARY LIGHTING AS REQUIRED TO LIGHT THE CONSTRUCTION PROJECT LIMITS AT ALL TIMES, TO AT LEAST THE SAME LIGHTING INTENSITY LEVELS AS THE EXISTING CONDITIONS.
6.5. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ADJACENT PROPERTIES AT ALL TIMES.

7. PROJECT PROGRESS AND CLOSEOUT
7.1. DURING CONSTRUCTION, THE PROJECT SITE AND ALL ADJACENT AREAS SHALL BE MAINTAINED IN A NEAT AND CLEAN MANNER, AND UPON FINAL CLEAN-UP, THE PROJECT SITE SHALL BE LEFT CLEAR OF ALL SURPLUS MATERIAL OR TRASH. THE PAVED AREAS SHALL BE BROOM SWEPT CLEAN.
7.2. THE CONTRACTOR SHALL RESTORE OR REPLACE ANY PUBLIC OR PRIVATE PROPERTY (SUCH AS HIGHWAY, DRIVEWAY, WALKWAY, AND LANDSCAPING), DAMAGED BY HIS WORK, EQUIPMENT, OR EMPLOYEES, TO A CONDITION AT LEAST EQUAL TO THAT EXISTING IMMEDIATELY PRIOR TO THE BEGINNING OF CONSTRUCTION. SUITABLE MATERIALS AND METHODS SHALL BE USED FOR SUCH RESTORATION.
7.3. MATERIAL OR DEBRIS SHALL BE HAULED IN ACCORDANCE WITH NPDES PERMIT AND JURISDICTIONAL LAWS.
7.4. ALL LAND SURVEY PROPERTY MONUMENTS OR PERMANENT REFERENCE MARKERS, REMOVED OR DESTROYED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE RESTORED BY A STATE OF FLORIDA REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
7.5. ALL UNPAVED SURFACES DISTURBED AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE GRADED, SODDED, & RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED BEFORE THE CONSTRUCTION.

8. PROJECT RECORD DOCUMENTS:
8.1. DURING THE DAILY PROGRESS OF THE JOB, THE CONTRACTOR SHALL RECORD ON HIS SET OF CONSTRUCTION DRAWINGS THE LOCATION, LENGTH, MATERIAL AND ELEVATION OF ANY FACILITY NOT BUILT ACCORDING TO PLANS. THIS COPY OF THE "AS-BUILT" SHALL BE SUBMITTED TO ENGINEER FOR PROJECT RECORD.
8.2. UPON COMPLETION OF DRAINAGE IMPROVEMENTS AND LIMEROCK BASE CONSTRUCTION (AT LEAST 48 HOURS BEFORE PLACING ASPHALT PAVEMENT) THE CONTRACTOR SHALL FURNISH THE ENGINEER OF RECORD "AS-BUILT" PLANS FOR THESE IMPROVEMENTS, SHOWING THE LOCATIONS AND PERTINENT GRADES OF ALL DRAINAGE INSTALLATIONS AND THE FINISHED ROCK GRADES OF THE ROAD CROWN AND EDGES OF PAVEMENT AT 50 FOOT INTERVALS, INCLUDING LOCATIONS AND ELEVATIONS OF ALL HIGH AND LOW POINTS.
8.3. UPON COMPLETION OF CONSTRUCTION, AND PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD ONE COMPLETE SET OF ALL "AS-BUILT" CONTRACT DRAWINGS. THESE DRAWINGS SHALL BE MARKED TO SHOW "AS-BUILT" CONSTRUCTION CHANGES, DIMENSIONS, LOCATIONS, AND ELEVATIONS OF ALL IMPROVEMENTS.
8.4. "AS-BUILT" DRAWINGS OF WATER LINES AND FORCE MAINS SHALL INCLUDE THE FOLLOWING INFORMATION:
8.4.1. TOP OF PIPE ELEVATIONS EVERY 100 LF.
8.4.2. LOCATIONS AND ELEVATIONS OF ALL FITTINGS INCLUDING BENDS, TEES, GATE VALVES, DOUBLE DETECTOR CHECK VALVES, FIRE HYDRANTS, AND APPURTENANCES.
8.4.3. ALL CONNECTIONS TO EXISTING LINES.
8.4.4. ENDS OF ALL WATER SERVICES AT THE BUILDINGS WHERE THE WATER SERVICE TERMINATES.
8.5. "AS-BUILT" DRAWINGS OF GRAVITY SANITARY SEWER LINES SHALL INCLUDE THE FOLLOWING INFORMATION:
8.5.1. RIM ELEVATIONS, INVERT ELEVATIONS, LENGTH OF PIPING BETWEEN STRUCTURES, AND SLOPES.
8.5.2. THE STUB ENDS AND CLEANOUTS OF ALL SEWER LATERALS SHALL BE LOCATED HORIZONTALLY AND VERTICALLY.
8.6. "AS-BUILT" DRAWINGS OF ALL DRAINAGE LINES SHALL INCLUDE THE FOLLOWING INFORMATION:
8.6.1. RIM ELEVATION, INVERT ELEVATION, LENGTH OF PIPING BETWEEN STRUCTURES, AND CONTROL STRUCTURE ELEVATIONS IF APPLICABLE.
8.6.2. THE SIZE OF THE LINES.
8.6.3. DRAINAGE WELL STRUCTURE SHALL INCLUDE, BUT NOT BE LIMITED TO, TOP OF CASING ELEVATION, TOP AND BOTTOM ELEVATIONS OF THE STRUCTURE AND BAFFLE WALLS, RIM ELEVATIONS AND PIPE INVERTS.
8.7. "AS-BUILT" DRAWINGS OF CONSTRUCTION AREAS SHALL INCLUDE THE FOLLOWING:
8.7.1. ROCK ELEVATIONS AT ALL HIGH, AND LOW POINTS, AND AT ENOUGH INTERMEDIATE POINTS TO CONFIRM SLOPE CONSISTENCY.
8.7.2. ROCK ELEVATIONS AND CONCRETE BASE ELEVATIONS SHALL BE TAKEN AT ALL LOCATIONS WHERE THERE IS A FINISH GRADE ELEVATION SHOWN ON THE DESIGN PLANS.
8.7.3. ALL CATCH BASIN AND MANHOLE RIM ELEVATIONS.
8.7.4. FINISH GRADE ELEVATIONS IN ISLAND AREAS.
8.7.5. "AS-BUILT" ELEVATIONS SHALL BE TAKEN ON ALL PAVED AND UNPAVED SWALES, AT ENOUGH INTERMEDIATE POINTS TO CONFIRM SLOPE CONSISTENCY AND CONFORMANCE TO THE PLAN DETAILS.
8.7.6. LAKE AND CANAL BANK "AS-BUILT" DRAWINGS SHALL INCLUDE A KEY SHEET OF THE LAKE FOR THE LOCATION OF CROSS SECTIONS. LAKE AND CANAL BANK CROSS SECTIONS SHALL BE PLOTTED AT A MINIMUM OF EVERY 100 LF, UNLESS OTHERWISE SPECIFIED. "AS-BUILT" DRAWINGS SHALL CONSIST OF THE LOCATION AND ELEVATION OF THE TOP OF BANK, EDGE OF WATER, AND THE DEEP CUT LINE, WITH THE DISTANCE BETWEEN EACH SHOWN ON THE DRAWING.
8.7.7. RETENTION AREA "AS-BUILT" ELEVATIONS SHALL BE TAKEN AT THE BOTTOM OF THE RETENTION AREA AND AT THE TOP OF BANK. IF THERE ARE CONTOURS INDICATED ON THE DESIGN PLANS, THEN THEY SHALL BE INCLUDED IN "AS-BUILT" DRAWINGS AS WELL.
8.8. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL PREPARE "AS-BUILT" DRAWINGS ON FULL SIZE, 24" X 36" SHEETS. ALL "AS-BUILT" INFORMATION SHALL BE PUT ON THE LATEST ENGINEERING DRAWINGS. EIGHT (8) SETS OF BLUE OR BLACK LINE DRAWINGS SHALL BE SUBMITTED. THESE DRAWINGS SHALL BE SIGNED AND SEALED BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER OR LAND SURVEYOR.
8.9. AN ELECTRONIC COPY OF THESE "AS-BUILT" DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD IN AUTOCAD, VERSION 2008 OR LATER.

9. UTILITY NOTES
9.1. CONTRACTOR IS RESPONSIBLE FOR UTILITY VERIFICATION PRIOR TO FABRICATION.
9.2. THE CONTRACTOR IS ADVISED THAT PROPERTIES ADJACENT TO THE PROJECT HAVE ELECTRIC, TELEPHONE, GAS, WATER AND/OR SEWER SERVICE LATERALS WHICH MAY NOT BE SHOWN IN PLANS. THE CONTRACTOR MUST REQUEST THE LOCATION OF THESE LATERAL SERVICES FROM THE UTILITY COMPANIES.
9.3. THE CONTRACTOR SHALL USE HAND DIGGING WHEN EXCAVATING NEAR EXISTING UTILITIES. EXTREME CAUTION SHALL BE EXERCISED BY THE CONTRACTOR WHILE EXCAVATING, INSTALLING, BACKFILLING OR COMPACTING AROUND THE UTILITIES.
9.4. THE CONTRACTOR SHALL NOTIFY AND OBTAIN AN UNDERGROUND CLEARANCE FROM ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES AT LEAST 48 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN A SUNSHINE811.COM CERTIFICATION CLEARANCE NUMBER AND FIELD MARKINGS AT LEAST 48 HOURS PRIOR TO BEGINNING ANY EXCAVATION.
- PRIOR TO COMMENCEMENT OF ANY EXCAVATION, THE CONTRACTOR SHALL COMPLY WITH FLORIDA STATUTE 553.851 FOR THE PROTECTION OF UNDERGROUND GAS PIPELINES.

9.1. FOR STREET EXCAVATION OR CLOSING OR FOR ALTERATION OF ACCESS TO PUBLIC OR PRIVATE PROPERTY, THE CONTRACTOR SHALL NOTIFY:
- ROADWAY JURISDICTIONAL ENGINEERING / PUBLIC WORKS AUTHORITY.
- COUNTY TRANSIT AUTHORITY
- SCHOOL BOARD TRANSPORTATION AUTHORITY
- JURISDICTIONAL FIRE DEPARTMENT DISPATCH
- JURISDICTIONAL POLICE DEPARTMENT(S)

9.1. THE CONTRACTOR SHALL USE EXTREME CAUTION WORKING UNDER, OVER, AND AROUND EXISTING ELECTRIC LINES. THE CONTRACTOR SHALL CONTACT THE ELECTRIC PROVIDER COMPANY TO VERIFY LOCATIONS, VOLTAGE, AND REQUIRED CLEARANCES, ONSITE, IN RIGHT-OF-WAYS, AND IN EASEMENTS, PRIOR TO ANY CONSTRUCTION IN THE VICINITY OF EXISTING LINES.
9.2. LOCATION AND SIZE OF ALL EXISTING UTILITIES AND TOPOGRAPHY (FACILITIES) AS SHOWN ON CONSTRUCTION DRAWINGS ARE DRAWN FROM AVAILABLE RECORDS. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE FACILITIES SHOWN OR FOR ANY FACILITY NOT SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION (VERTICAL & HORIZONTAL) OF ANY EXISTING UTILITIES AND TOPOGRAPHY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE ELEVATIONS AND LOCATIONS OF ALL EXISTING FACILITIES, IN COORDINATION WITH ALL UTILITY COMPANIES, PRIOR TO BEGINNING ANY CONSTRUCTION OPERATIONS. IF AN EXISTING FACILITY IS FOUND TO CONFLICT WITH THE PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SO THAT APPROPRIATE MEASURES CAN BE TAKEN TO RESOLVE THE CONFLICT.
9.3. THE CONTRACTOR SHALL COORDINATE THE WORK WITH OTHER CONTRACTORS IN THE AREA AND ANY OTHER UNDERGROUND UTILITY COMPANIES REQUIRED. THE CONTRACTOR SHALL COORDINATE RELOCATION OF ALL EXISTING UTILITIES WITH APPLICABLE UTILITY COMPANIES.

10. SIGNING AND PAVEMENT MARKINGS
10.1.ALL SIGNING AND PAVEMENT MARKINGS INSTALLED AS PART OF THESE PLANS SHALL CONFORM TO THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), COUNTY TRAFFIC DESIGN STANDARDS AND FDOT DESIGN STANDARDS AS A MINIMUM CRITERIA.
10.2.MATCH EXISTING PAVEMENT MARKINGS AT THE LIMITS OF CONSTRUCTION.
10.3.REMOVAL OF THE EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY WATER BLASTING OR OTHER APPROVED METHODS DETERMINED BY THE ENGINEER.
10.4.INCORRECTLY PLACED PAINT OR THERMOPLASTIC PAVEMENT MARKINGS OVER FRICTION COURSE WILL BE REMOVED BY MILLING AND REPLACING THE FRICTION COURSE A MINIMUM WIDTH OF 18 IN AT THE CONTRACTOR'S EXPENSE. THE ENGINEER MAY APPROVE AN ALTERNATIVE METHOD IF IT CAN BE DEMONSTRATED TO COMPLETELY REMOVE THE MARKINGS WITHOUT DAMAGING THE ASPHALT.
10.5.PLACE ALL RETRO-REFLECTIVE PAVEMENT MARKERS IN ACCORDANCE WITH STANDARD INDEX 17352 AND / OR AS SHOWN IN THE PLANS.
10.6.CAUTION SHOULD BE EXERCISED WHILE RELOCATING EXISTING SIGNS TO PREVENT UNNECESSARY DAMAGE TO SIGNS. IF THE SIGN IS DAMAGED BEYOND USE, AS DETERMINED BY THE ENGINEER, SIGNS SHALL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
10.7.ALL EXISTING SIGNS THAT CONFLICT WITH CONSTRUCTION OPERATIONS SHALL BE REMOVED, STOCKPILED, AND RELOCATED BY THE CONTRACTOR. SIGN REMOVAL SHALL BE DIRECTED BY THE ENGINEER.
10.8.RELOCATED SIGN SUPPORT SYSTEM MUST MEET THE CURRENT DESIGN STANDARD.
10.9.THE CONTRACTOR SHALL PROVIDE AN INVENTORY OF EXISTING SIGNS TO REMAIN OR TO BE RELOCATED PRIOR TO STARTING THE JOB AND FORWARD THIS LIST TO THE ENGINEER. CONTRACTOR SHALL NOTIFY IF THERE ARE ANY MISSING OR DAMAGE SIGNS THAT THE PLANS SHOW TO REMAIN OR TO BE RELOCATED.
10.10. ALL ROADWAY PAVEMENT MARKINGS SHALL BE THERMOPLASTIC IN ACCORDANCE WITH FDOT SPECIFICATIONS SECTION 711.
10.11. HAND DIG THE FIRST FOUR FEET OF SIGN FOUNDATION.
10.12. ALL SIGNS SHALL MEET ALL OF THE FOLLOWING:
- MEET THE CRITERIA OUTLINED IN SECTION 2A.08 OF THE 2009 MUTCD
- MEET THE SPECIFICATIONS OUTLINED IN SECTION 700 AND 994 OF THE LATEST FDOT STANDARD SPECIFICATIONS.
- CONSIST OF MATERIALS CERTIFIED TO MEET THE RETROREFLECTIVE SHEETING REQUIREMENTS OUTLINED IN THE CURRENT VERSION OF ASTM D4956 FOR TYPE-XI RETROREFLECTIVE SHEETING MATERIALS MADE WITH PRISIMS, EXCEPT FOR SCHOOL ZONE AND PEDESTRIAN SIGNS WHICH SHALL BE COMPRISED OF RETROREFLECTIVE FLUORESCENT YELLOW-GREEN SHEETING CERTIFIED TO MEET ASTM D4956 TYPE IV RETROREFLECTIVE SHEETING MATERIALS.
- CONSIST OF RETROREFLECTIVE SHEETING MATERIALS THAT HAVE A VALID FDOT APPROVED PRODUCT LIST (APL) CERTIFICATION FOR SPECIFICATION 700 HIGHWAY SIGNING FOR FDOT SHEETING TYPE XI (OR TYPE IV FOR SCHOOL AND PEDESTRIAN SIGNS).

10.13.PATCH ATTACHMENT HARDWARE, SUCH AS COUNTERSUNK SCREWS OR RIVET HEADS, WITH RETRO REFLECTIVE BUTTONS THAT MATCH THE COLOR AND SHEETING MATERIAL OF THE FINISHED SIGN PANEL INCLUDING THE BACKGROUND, LEGEND OR BORDER.
10.14.ENSURE THE OUTSIDE CORNER OF SIGN IS CONCENTRIC WITH BORDER. ENSURE WHITE BORDERS ARE MOUNTED PARALLEL TO THE EDGE OF THE SIGN. ENSURE BLACK BORDERS ARE RECESSED FROM THE EDGE OF THE SIGN.
10.15.LAYOUT PERMANENT FINAL STRIPING THAT LEAVES NO VISIBLE MARKS AT TIME OF FINAL ACCEPTANCE.

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REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

GENERAL CONSTRUCTION NOTES

SHEET NUMBER GI-002

PROJECT NUMBER 11494.01

STATUS: CONSTRUCTION DOCUMENTS

CONSTRUCTION SPECIFICATIONS

SECTION 20 - GENERAL SPECIFICATIONS PAVING GRADING DRAINAGE AND EARTHWORK

20.GENERAL

20.1. IT IS THE INTENT OF THESE SPECIFICATIONS TO DESCRIBE THE MINIMUM ACCEPTABLE TECHNICAL REQUIREMENTS FOR THE MATERIALS AND WORKMANSHIP FOR CONSTRUCTION OF SITE IMPROVEMENTS FOR THIS PROJECT. SUCH IMPROVEMENTS MAY GENERALLY INCLUDE, BUT NOT TO BE LIMITED TO, CLEARING, GRADING, PAVING, REMOVAL OF EXISTING PAVEMENT STORM DRAINAGE, WATER LINES AND SANITARY SEWERS.

20.2. IT IS THE INTENT THAT THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION: (CURRENT EDITION) TOGETHER WITH "SUPPLEMENTAL SPECIFICATIONS TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" (CURRENT EDITION), AND THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS (CURRENT EDITION) BE USED WHERE APPLICABLE FOR THE VARIOUS WORK, AND THAT WHERE SUCH WORDING THEREIN REFERS TO THE STATE OF FLORIDA AND ITS DEPARTMENT OF TRANSPORTATION AND PERSONNEL, SUCH WORDING IS INTENDED TO BE REPLACED WITH THE WORDING WHICH WOULD PROVIDE PROPER TERMINOLOGY; THEREBY MAKING SUCH "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" TOGETHER WITH THE "FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS" AS THE "STANDARD SPECIFICATIONS" FOR THIS PROJECT. IF WITHIN A PARTICULAR SECTION, ANOTHER SECTION, ARTICLE OR PARAGRAPH IS REFERRED TO, IT SHALL BE PART OF THE STANDARD SPECIFICATIONS ALSO. THE CONTRACTOR SHALL ABIDE BY ALL LOCAL AND STATE LAWS, REGULATIONS AND BUILDING CODES WHICH HAVE JURISDICTION IN THE AREA.

20.3. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT AND PERFORM ALL OPERATIONS REQUIRED TO COMPLETE THE CONSTRUCTION OF A PAVING AND DRAINAGE SYSTEM AS SHOWN ON THE PLANS, SPECIFIED HEREIN, OR BOTH. IT IS THE INTENT TO PROVIDE A COMPLETE AND OPERATING FACILITY IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE CONSTRUCTION DRAWINGS. THE MATERIAL AND EQUIPMENT SHOWN OR SPECIFIED SHALL NOT BE TAKEN TO EXCLUDE ANY OTHER INCIDENTALS NECESSARY TO COMPLETE THE WORK.

20.4. ALL LABOR, MATERIALS, AND METHODS OF CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH THE PLANS AND CONSTRUCTION SPECIFICATIONS AND THE MINIMUM ENGINEERING AND CONSTRUCTION STANDARDS ADOPTED BY THE UNIT OF GOVERNMENT WHICH HAS JURISDICTION AND RESPONSIBILITY FOR THE CONSTRUCTION. WHERE CONFLICTS OR OMISSIONS EXIST, THE JURISDICTIONAL GOVERNMENT ENGINEERING DEPARTMENT'S STANDARDS SHALL GOVERN. SUBSTITUTIONS AND DEVIATIONS FROM PLANS AND SPECIFICATIONS SHALL BE PERMITTED ONLY WHEN WRITTEN APPROVAL HAS BEEN ISSUED BY THE ENGINEER.

20.5. GUARANTEE - ALL MATERIALS AND EQUIPMENT TO BE FURNISHED AND/OR INSTALLED BY THE CONTRACTOR UNDER THIS CONTRACT, SHALL BE GUARANTEED FOR A PERIOD OF (L) ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE THEREOF, AGAINST DEFECTIVE MATERIALS, DESIGN AND WORKMANSHIP. UPON RECEIPT OF NOTICE FROM THE OWNER OF FAILURE OF ANY PART OF THE GUARANTEED EQUIPMENT OR MATERIALS, DURING THE GUARANTEE PERIOD, THE AFFECTED PART OR MATERIALS SHALL BE REPLACED PROMPTLY WITH NEW PARTS OR MATERIALS BY THE CONTRACTOR, AT NO EXPENSE TO THE OWNER. IN THE EVENT THE CONTRACTOR FAILS TO MAKE NECESSARY REPLACEMENT OR REPAIRS WITHIN (7) SEVEN DAYS AFTER NOTIFICATION BY THE OWNER, THE OWNER MAY ACCOMPLISH THE WORK AT THE EXPENSE OF THE CONTRACTOR.

21. EARTHWORK

21.1. ALL AREAS WITHIN THE PROJECT LIMITS SHALL BE CLEARED AND GRUBBED PRIOR TO CONSTRUCTION. THIS SHALL CONSIST OF THE COMPLETE REMOVAL AND DISPOSAL OF ALL TREES, BRUSH, STUMPS, ROOTS, GRASS, WEEDS, RUBBISH AND ALL OTHER OBSTRUCTIONS RESTING ON OR PROTRUDING THROUGH THE SURFACE OF THE EXISTING GROUND TO A DEPTH OF 1'. ALL WORK SHALL BE IN ACCORDANCE WITH SECTION 110 OF THE STANDARD SPECIFICATIONS.

21.2. NONE OF THE EXISTING LIMEROCK MATERIAL FROM DEMOLISHED PAVEMENT IS TO BE INCORPORATED IN THE NEW LIMEROCK BASE, UNLESS NOTED IN PLANS. THE EXISTING LIMEROCK MATERIAL FROM DEMOLISHED PAVEMENT MAY BE INCORPORATED INTO THE STABILIZED SUBGRADE / SUBBASE, OR STABILIZED SHOULDER.

21.3. FILL MATERIAL SHALL BE CLASSIFIED AS A-L, A-3, OR A-2-4 IN ACCORDANCE WITH AASHTO M-145 AND SHALL BE FREE FROM VEGETATION AND ORGANIC MATERIAL. NOT MORE THAN 12% BY WEIGHT OF FILL MATERIAL SHALL PASS THE NO. 200 SIEVE.

21.4. ALL FILL MATERIAL IN AREAS NOT TO BE PAVED SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99.

21.5. ALL MATERIAL OF CONSTRUCTION SHALL BE SUBJECT TO INSPECTION AND TESTING TO ESTABLISH CONFORMANCE WITH THE SPECIFICATIONS AND SUITABLY FOR THE USES INTENDED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 24 HOURS PRIOR TO THE TIME HE WILL BE READY FOR AN INSPECTION OR TEST. THE CONTRACTOR SHALL FOLLOW CITY AND COUNTY INSPECTION PROCEDURES. THE CONTRACTOR SHALL NOT PROCEED WITH ANY PHASE OF WORK DEPENDENT ON AN INSPECTION OR TEST OF AN EARLIER PHASE OF WORK, PRIOR TO THAT TEST OR INSPECTION PASSING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING CERTIFIED MATERIAL TEST RESULTS TO THE ENGINEER OF RECORD PRIOR TO THE RELEASE OF FINAL CERTIFICATION BY THE ENGINEER. TEST RESULTS MUST INCLUDE, BUT MAY NOT BE LIMITED TO, DENSITIES FOR SUBGRADE AND LIMEROCK, UTILITIES, EXCAVATION, ASPHALT GRADATION REPORTS, CONCRETE CYLINDERS, ETC.

21.6. WHEN MUCK, CLAY, ROCK, OR ANY OTHER MATERIAL THAT IS UNSUITABLE IN ITS ORIGINAL POSITION ARE ENCOUNTERED BENEATH PROPOSED PAVEMENT AND SIDEWALK AREAS, THE UNSUITABLE MATERIALS SHALL BE COMPLETELY REMOVED FROM BENEATH THE PAVEMENT AND SIDEWALK AREAS AND (10) TEN FEET BEYOND THE EDGE OF PAVEMENT. ALL SUCH UNSUITABLE MATERIAL REMOVED BY THE SUBSOIL EXCAVATION, SHALL BE REPLACED WITH ACCEPTABLE EMBANKMENT MATERIAL, AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

21.7. WHEN MUCK, CLAY,HARDPAN OR ANY OTHER MATERIAL THAT IS UNSUITABLE IN ITS ORIGINAL POSITION, ARE ENCOUNTERED BENEATH PROPOSED DRAINAGE SWALES OR DRY RETENTION AREAS, THE UNSUITABLE MATERIALS SHALL BE COMPLETELY REMOVED FROM BENEATH THE DRAINAGE SWALES AND DRY RETENTION AREAS. ALL SUCH UNSUITABLE MATERIAL REMOVED BY THE SUBSOIL EXCAVATION, SHALL BE REPLACED WITH COARSE SAND, OR OTHER SUITABLE GRANULAR MATERIAL, AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

21.8. ALL UNDERGROUND UTILITIES AND DRAINAGE INSTALLATIONS SHALL BE IN PLACE PRIOR TO SUBGRADE COMPACTION AND PAVEMENT CONSTRUCTION.

21.9. GROUND ADJACENT TO ROADWAY/PAVEMENT HAVING RUNOFF SHALL BE GRADED (2) TWO INCHES LOWER THAN THE EDGE OF PAVEMENT TO ALLOW FOR THE PLACEMENT OF SOD.

21.10.SITE GRADING ELEVATIONS SHALL BE WITHIN 0.1' OF THE REQUIRED ELEVATION FOR NON PAVED AREAS AND ALL AREAS SHALL BE GRADED TO DRAIN WITHOUT PONDING.

21.11.THE CONTRACTOR SHALL PERFORM ALL EXCAVATION, FILL, EMBANKMENT AND GRADING TO ACHIEVE THE PROPOSED PLAN GRADES INCLUDING TYPICAL ROAD SECTIONS, SIDE SLOPES AND CANAL SECTIONS. ALL WORK SHALL BE IN ACCORDANCE WITH SECTION 120 OF THE STANDARD SPECIFICATIONS. IF FILL MATERIAL IS REQUIRED IN EXCESS OF THAT GENERATED BY THE EXCAVATION, THE CONTRACTOR SHALL SUPPLY THIS MATERIAL AS REQUIRED FROM OFF-SITE.

21.12.A 2" BLANKET OF TOP SOIL SHALL BE PLACED OVER ALL AREAS TO BE SODDED OR SEEDED AND MULCHED WITHIN THE PROJECT LIMITS UNLESS OTHERWISE INDICATED ON THE PLANS.

21.13.SOD SHALL BE ST. AUGUSTINE UNLESS OTHERWISE INDICATED ON THE PLANS, AND SHALL BE PLACED ON THE GRADED TOP SOIL AND WATERED TO INSURE SATISFACTORY CONDITION UPON FINAL ACCEPTANCE OF THE PROJECT.

22.DRAINAGE

22.1. INLETS - ALL INLETS SHALL BE THE TYPE DESIGNATED ON THE PLANS, AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 425 OF THE STANDARD SPECIFICATIONS. ALL INLETS AND PIPE SHALL BE PROTECTED DURING CONSTRUCTION TO PREVENT SILTATION IN THE DRAINAGE SYSTEMS BY WAY OF TEMPORARY PLUGS AND PLYWOOD OR PLASTIC COVERS OVER THE INLETS. THE ENTIRE DRAINAGE SYSTEM SHALL BE CLEANED OF ALL DEBRIS PRIOR TO FINAL ACCEPTANCE.

22.2. PIPE SPECIFICATIONS: THE MATERIAL TYPE IS SHOWN ON THE DRAWINGS BY ONE OF THE FOLLOWING DESIGNATIONS:

- RCP = REINFORCED CONCRETE PIPE, ASTM DESIGNATION C-76, SECTION 941 OF THE STANDARD SPECIFICATIONS.
- CMP = CORRUGATED METAL (ALUMINUM) PIPE, ASTM DESIGNATION M-196.
- CMP (SMOOTH LINED) = CORRUGATED METAL ALUMINUM PIPE, (SMOOTH LINED) ASTM DESIGNATION M-196.
- SCP = SLOTTED CONCRETE PIPE, SECTIONS 941 AND 942, OF THE STANDARD SPECIFICATIONS.
- PVC = POLYVINYL CHLORIDE PIPE.
- PCMP = PERFORATED CMP, SECTION 945, OF THE STANDARD SPECIFICATIONS
- CORRUGATED HIGH DENSITY POLYETHYLENE PIPE (HDPE) (12 INCHES TO 60 INCHES), SHALL MEET THE REQUIREMENTS OF FDOT SPECIFICATION SECTION 948-2.3.

22.3. PIPE BACKFILL - REQUIREMENTS FOR PIPE BACKFILL CROSSING ROADS OR PARKING AREAS SHALL BE AS DEFINED IN THE SECTION 125-8, OF THE STANDARD SPECIFICATIONS. PIPELINE BACKFILL SHALL BE PLACED IN 6 INCH LIFTS AND COMPACTED TO 100% OF THE STANDARD PROCTOR (AASHTO T-99 SPECIFICATIONS)

22.4. LOCATION OF DRAINAGE STRUCTURES SHALL GOVERN, AND PIPE LENGTH MAY HAVE TO BE ADJUSTED TO ACCOMPLISH CONSTRUCTION AS SHOWN ON THESE PLANS.

22.5. DISTANCE AND LENGTHS SHOWN ON PLANS AND PROFILE DRAWINGS ARE REFERENCED TO THE INNER WALLS OF STRUCTURES.

22.6. FILTER FABRIC SHALL BE MIRAFI, TYPAR OR EQUAL CONFORMING TO SECTION 985 OF THE STANDARD SPECIFICATIONS.

23.ASPHALT PAVING

23.1. WHERE NEW ASPHALT MEETS EXISTING ASPHALT, THE EXISTING ASPHALT SHALL BE SAW CUT TO PROVIDE A STRAIGHT EVEN LINE. PRIOR TO REMOVING CURB OR GUTTER, THE ADJACENT ASPHALT SHALL BE SAW CUT TO PROVIDE A STRAIGHT EVEN LINE.

23.2. INTERNAL ASPHALT PAVING CONSTRUCTED ON EXISTING SANDY SOILS SHALL BE CONSTRUCTED WITH A 12" SUBGRADE, COMPACTED TO A MINIMUM DENSITY OF 100% MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99. THE COMPACTED SUBGRADE SHALL BE CONSTRUCTED IN THE LIMITS SHOWN ON THE PLANS. ALL SUBGRADE SHALL HAVE AN LBR OF 40 UNLESS OTHERWISE NOTED.

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23.3. ASPHALTIC CONCRETE SURFACE COURSE SHALL BE CONSTRUCTED TO THE LIMITS SHOWN ON THE PLANS. THE SURFACE COURSE SHALL CONSIST OF THE THICKNESS AND TYPE ASPHALTIC CONCRETE AS SPECIFIED IN THE PLANS. ALL ASPHALTIC CONCRETE SHALL BE IN ACCORDANCE WITH SECTIONS 320, 327, 330, 334, 337, 338, 339 AND 341 OF THE STANDARD SPECIFICATIONS.

23.4. LIMEROCK BASE SHALL BE PREPARED, COMPACTED AND GRADED AND SHALL BE IN ACCORDANCE WITH SECTION 200 OF THE STANDARD SPECIFICATIONS. ALL LIMEROCK SHALL BE COMPACTED TO 98% PER AASHTO T-180 AND HAVE NOT LESS THAN 70% OF CARBONATES OF CALCIUM AND MAGNESIUM UNLESS OTHERWISE DESIGNATED. THE ENGINEER SHALL INSPECT THE COMPLETED BASE COURSE AND THE CONTRACTOR SHALL CORRECT ANY DEFICIENCIES AND CLEAN THE BASE COURSE PRIOR TO THE PLACEMENT OF THE PRIME COAT. A TACK COAT WILL ALSO BE REQUIRED IF THE ENGINEER FINDS THAT THE PRIMED BASE HAS BECOME EXCESSIVELY DIRTY OR THE PRIME COAT HAS CURED TO THE EXTENT OF LOSING BOUNDING EFFECT PRIOR TO PLACEMENT OF THE ASPHALTIC CONCRETE SURFACE COURSE. THE PRIME AND TACK COATS SHALL BE IN ACCORDANCE WITH SECTION 300 OF THE STANDARD SPECIFICATIONS.

23.5. LIMEROCK BASE MATERIAL SHALL BE PLACED IN MAXIMUM 6" LIFTS. BASES GREATER THAN 6" SHALL BE PLACED IN TWO EQUAL LIFTS. IF, THROUGH FIELD TESTS, THE CONTRACTOR CAN DEMONSTRATE THAT THE COMPACTION EQUIPMENT CAN ACHIEVE DENSITY FOR THE FULL DEPTH OF A THICKER LIFT, AND IF APPROVED BY THE ENGINEER, THE BASE MAY BE CONSTRUCTED IN SUCCESSIVE COURSES OF NOT MORE THAN 8 INCHES (200 MM) COMPACTED THICKNESS.

23.6. ASPHALT EDGES THAT ARE NOT CURBED SHALL BE SAW CUT TO PROVIDE A STRAIGHT EVEN LINE TO THE DIMENSIONS SHOWN ON PLANS.

24.CONCRETE CONSTRUCTION

24.1. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH SECTION 522 OF THE STANDARD SPECIFICATIONS AND IN ACCORDANCE WITH F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS, INDEX NO. 522-001. CONCRETE SIDEWALK SHALL BE 4" THICK, UNLESS OTHERWISE NOT AND CONSTRUCTED ON COMPACTED SUBGRADE, WITH 1/2" EXPANSION JOINTS PLACED AT A MAXIMUM OF 75', UNLESS OTHERWISE NOTED ON PLANS. CRACK CONTROL JOINTS SHALL BE 5' ON CENTER. ALL CONCRETE SIDEWALKS THAT CROSS DRIVEWAYS SHALL BE 6" THICK, UNLESS OTHERWISE NOTED ON PLANS.

24.2. SIDEWALK CURB RAMPS HALL BE IN ACCORDANCE WITH F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS, INDEX NO. 522-002.

24.3. CONCRETE CURB SHALL BE CONSTRUCTED TO THE LIMITS SHOWN ON THE PLANS. THE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI AT 28 DAYS AND SHALL BE IN ACCORDANCE WITH SECTION 520 OF THE STANDARD SPECIFICATIONS. CONCRETE CURBING SHALL BE IN ACCORDANCE WITH F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS, INDEX NO. 520-001.

SECTION 30 - WATER DISTRIBUTION AND SANITARY SEWER FORCE MAINS.

30. MATERIALS:

NOTE: IF MATERIALS LIST HERE ON ARE IN CONFLICT WITH UTILITY OWNER, MATERIAL OWNER REQUIREMENTS SHALL GOVERN.

30.1. ALL WATER MAIN PIPE, INCLUDING FITTINGS, SHALL BE COLOR CODED OR MARKED USING BLUE AS A PREDOMINANT COLOR TO DIFFERENTIATE DRINKING WATER FROM RECLAIMED OR OTHER WATER. UNDERGROUND PLASTIC PIPE SHALL BE SOLID-WALL BLUE PIPE, SHALL HAVE A CO-EXTRUDED BLUE EXTERNAL SKIN, OR SHALL BE WHITE OR BLACK PIPE WITH BLUE STRIPES INCORPORATED INTO, OR APPLIED TO, THE PIPE WALL; AND UNDERGROUND METAL OR CONCRETE PIPE SHALL HAVE BLUE STRIPES APPLIED TO THE PIPE WALL. PIPE STRIPED DURING MANUFACTURING OF THE PIPE SHALL HAVE CONTINUOUS STRIPES THAT RUN PARALLEL TO THE AXIS OF THE PIPE, THAT ARE LOCATED AT NO GREATER THAN 90-DEGREE INTERVALS AROUND THE PIPE, AND THAT WILL REMAIN INTACT DURING AND AFTER INSTALLATION OF THE PIPE. IF TAPE OR PAINT IS USED TO STRIPE PIPE DURING INSTALLATION OF THE PIPE, THE TAPE OR PAINT SHALL BE APPLIED IN A CONTINUOUS LINE THAT RUNS PARALLEL TO THE AXIS OF THE PIPE AND THAT IS LOCATED ALONG THE TOP OF THE PIPE; FOR PIPES WITH AN INTERNAL DIAMETER OF 24 INCHES OR GREATER, TAPE OR PAINT SHALL BE APPLIED IN CONTINUOUS LINES ALONG EACH SIDE OF THE PIPE AS WELL AS ALONG THE TOP OF THE PIPE.

30.2. DUCTILE IRON PIPE FOR WATER DISTRIBUTION MAINS SHALL CONFORM TO ANSI/AWWA STANDARD C151/A21.51 LATEST REVISION, "DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS" WITH A MINIMUM WALL THICKNESS OF CLASS 51 (PRESSURE CLASS 350) UNLESS OTHERWISE NOTED IN THE PLANS. DUCTILE IRON PIPE SHALL BE CEMENT LINED AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA STANDARD C104/A21.4 LATEST REVISION. THE PIPE SHALL BE ADAPTED FOR USE WITH CLASS 250 FITTINGS FOR ALL SIZES. WATER MAIN SHALL BE COLORED BLUE IN ACCORDANCE WITH FLORIDA STATE STATUTES.

30.3. DUCTILE IRON PIPE FOR SEWAGE FORCE MAINS SHALL CONFORM TO ANSI/AWWA STANDARD C151/A21.51 LATEST REVISION, "DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND- LINED MOLDS" WITH A MINIMUM WALL THICKNESS OF CLASS 51 (PRESSURE CLASS 350) UNLESS OTHERWISE NOTED IN THE PLANS. DUCTILE IRON PIPE SHALL BE INTERIOR CERAMIC EPOXY LINED AND EXTERIOR COATED WITH THE MANUFACTURER'S COATING SYSTEM (PROTECTO 401 CERAMIC EPOXY WITH A MINIMUM DRY FILM THICKNESS OF 40 MILS AND AN OUTSIDE COATING OF EITHER COAL TAR EPOXY OR ASPHALT). CEMENT MORTARED LININGS ARE NOT APPROPRIATE FOR THIS APPLICATION.

30.4. ALL PIPE & FITTINGS ON THE LIFT STATION SITES SHALL BE DUCTILE IRON CONFORMING TO THE SAME SPECIFICATIONS AS ABOVE FOR SEWAGE FORCE MAINS EXCEPT THAT FLANGED DUCTILE IRON PIPE & FITTINGS SHALL BE USED INSIDE VALVE PITS AND WET WELLS. FLANGED PIPE AND FITTINGS SHALL CONFORM TO ANSI/AWWA C115/A21.15 LATEST REVISION AND ANSI/AWWA C110/A21.10 LATEST REVISION. THE FOLLOWING THICKNESS CLASSES SHALL BE ADHERED TO: 4" - 12" - CLASS 52, 14" & LARGER - CLASS 51.

30.5. PVC PRESSURE PIPE FOR SIZES 4" THROUGH 12" AND SHALL CONFORM TO ANSI/AWWA STANDARD C900 LATEST REVISION. PVC PRESSURE PIPE SHALL BE MADE FROM CLASS 12454-A OR CLASS 12454-B VIRGIN MATERIAL AND CONFORM WITH THE OUTSIDE DIAMETER OF CAST IRON PIPE WITH A MINIMUM WALL THICKNESS OF DR SERIES 18. ULTRA VIOLET DEGRADATION OR SUN BLEACHED PIPE WILL BE CAUSE FOR REJECTION. WATER MAIN SHALL BE COLORED BLUE IN ACCORDANCE WITH FLORIDA STATE STATUTES. FORCE MAIN SHALL BE IMPREGNATED WITH GREEN PIGMENT. REUSE MAIN SHALL BE IMPREGNATED WITH PURPLE PIGMENT.

30.6. DUCTILE IRON FITTINGS FOR WATER DISTRIBUTION MAINS SHALL CONFORM TO ANSI/AWWA STANDARD C110/A21.10 LATEST REVISION. FITTINGS 4" AND LARGER SHALL BE CEMENT LINED AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA STANDARD C104/A21.4 LATEST REVISION. WATER MAIN FITTING SHALL BE COLORED BLUE IN ACCORDANCE WITH FLORIDA STATE STATUTES.

30.7. CAST IRON AND DUCTILE IRON FITTINGS FOR SEWAGE FORCE MAINS SHALL CONFORM TO ANSI/AWWA STANDARD C110/A21.10 LATEST REVISION. FITTINGS 4" AND LARGER SHALL BE COATED IN ACCORDANCE WITH THE REQUIREMENTS OF DUCTILE IRON PIPE FOR SEWAGE FORCE MAINS.

30.8. JOINTS FOR BELL AND SPIGOT DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO ANSI/AWWA STANDARD C111/A21.11 LATEST REVISION. MECHANICAL JOINT OR PUSH-ON JOINT TO BE RUBBER GASKET COMPRESSION-TYPE. SPECIAL FITTINGS AND JOINTS SHALL BE CONSIDERED FOR SPECIFIC INSTALLATION SUBJECT TO THE APPROVAL OF THE ENGINEER.

30.9. JOINTS FOR PVC PRESSURE PIPE SHALL BE BELL AND SPIGOT PUSH-ON RUBBER GASKET TYPE ONLY. NO SOLVENT WELD OR THREADED JOINTS WILL BE PERMITTED.

30.10. WATER DISTRIBUTION SYSTEM RESTRAINT: ALL FITTINGS AND SPECIFIC PIPE JOINTS SHALL BE RESTRAINED AS OUTLINED BELOW:

- JOINT RESTRAINT
- PUSH-ON P.V.C. EBAA IRON SERIES 1600
- PUSH-ON DIP EBAA IRON SERIES 1700
- TR-FLEX BY U.S. PIPE OR
- FLEX RING BY AMERICAN
- FITTINGS W/ DIP EBAA IRON SERIES 1100 MEGALUG
- FITTINGS W/ P.V.C. EBAA IRON SERIES 2000 MEGALUG
- LENGTH OF RESTRAINED PIPE SHALL BE AS INDICATED ON RESTRAINED JOINT PIPE DETAIL. (SEE WATER & SEWER DETAIL SHEET)

30.11. SEWAGE FORCE MAIN SYSTEM RESTRAINT: ALL FITTINGS AND SPECIFIC PIPE JOINTS SHALL BE RESTRAINED AS OUTLINED BELOW

- JOINT RESTRAINT
- PUSH-ON P.V.C. EBAA IRON SERIES 1600
- PUSH-ON DIP EBAA IRON SERIES 1700
- TR-FLEX BY U.S. PIPE OR
- FLEX RING BY AMERICAN
- FITTINGS W/ DIP EBAA IRON SERIES 1100 MEGALUG
- FITTINGS W/ P.V.C. EBAA IRON SERIES 2000 MEGALUG
- LENGTH OF RESTRAINED PIPE SHALL BE AS INDICATED ON RESTRAINED JOINT PIPE DETAIL. (SEE WATER & SEWER DETAIL SHEET)

30.12. WATER DISTRIBUTION VALVES SHALL BE GATE VALVES, IRON BODY, FULLY RESILIENT SEAT BRONZED MOUNTED NON-RISING STEM, RATED AT 200 PSI AND CONFORMING TO ANSI/AWWA C509 LATEST REVISION, AND SHALL HAVE MECHANICAL JOINTS.

30.12.1.1. GATE VALVES 4" AND LARGER SHALL BE MUELLER A-2361/2362, AMERICAN 250 LINE OR CLOW F-6100, CONFORMING TO ANSI/AWWA C500 LATEST REVISION OR APPROVED EQUAL.

30.12.1.2. TAPPING VALVES SHALL BE MUELLER T-2361/2362 OR APPROVED EQUAL.

30.12.1.3. GATE VALVES 3" OR LESS SHALL BE NIBCO T-133 OR T-136 WITH MALLEABLE HAND WHEELS OR APPROVED EQUAL.

30.13.TAPPING SLEEVES SHALL BE MUELLER H615, CLOW F- 2505 OR APPROVED EQUAL.

30.14.VALVE BOXES SHALL BE U.S. FOUNDRY 7500 OR APPROVED EQUAL PAINTED BLUE WITH THE DESIGNATION "WATER".

30.15.RETAINER GLANDS FOR DIP SHALL CONFORM TO ANSI/AWWA C111/A21.11 LATEST REVISION. ALL GLANDS SHALL BE MANUFACTURED FROM DUCTILE IRON AS LISTED BY UNDERWRITERS LABORATORIES FOR 250 PSI MINIMUM WATER PRESSURE RATING. CLOW CORPORATION MODEL F-1058, STANDARD FIRE PROTECTION EQUIPMENT COMPANY OR APPROVED EQUAL.

30.16.DRESSER COUPLINGS SHALL BE REGULAR BLACK COUPLINGS WITH PLAIN GASKETS FOR GALVANIZED STEEL PIPE. THEY SHALL BE DRESSER STYLE 90. NO SUBSTITUTIONS ALLOWED.

30.17.FIRE HYDRANTS SHALL BE MUELLER CENTURION TRAFFIC TYPE A-423 WITH 5 1/4" INTERNAL VALVE OPENING OR APPROVED EQUAL. PUMPER NOZZLE TO BE 18" FROM FINISHED GRADE. ALL HYDRANTS TO BE INSTALLED WITH CONTROL VALVE. RETAINER GLANDS ARE PREFERRED FOR RESTRAINING. FIRE HYDRANT SHALL COMPLY WITH ANSI/AWWA C502 LATEST REVISION. FIRE HYDRANTS SHALL BE PAINTED IN ACCORDANCE WITH NFPA #291 OR PER AGENCY STANDARDS HAVING JURISDICTION. BLUE RAISED REFLECTIVE PAVEMENT MARKER (RPM) SHALL BE USED TO IDENTIFY FIRE HYDRANT LOCATION. THE PLACEMENT OF THE RPM TO BE AT THE CENTERLINE OF THE OUTSIDE ROADWAY LANE.

30.18.SEWAGE FORCE MAIN VALVES SHALL BE PLUG VALVES WHICH SHALL BE OF THE NON-LUBRICATED, ECCENTRIC TYPE WITH RESILIENT FACED PLUGS, PORT AREAS FOR VALVES 20 INCHES AND SMALLER SHALL BE AT LEAST 80% OF FULL PIPE AREA. PORT AREA OF VALVES 24 INCHES AND LARGER SHALL BE AT LEAST 70% OF FULL PIPE AREA. THE BODY SHALL BE OF SEMI-STEEL (ASTM A-126 C1.B) AND SHALL HAVE BOLTED BONNET WHICH GIVES ACCESS TO THE INTERNALS OF THE VALVE. SEATS SHALL BE WELDED OVERLAY OF HIGH NICKEL CONTENT OR A STAINLESS STEEL PLATE LOCKED IN THE BODY CAVITY. IF A PLATE IS USED, IT SHALL BE REPLACEABLE THROUGH THE BONNET ACCESS. BEARINGS SHALL BE PERMANENTLY LUBRICATED OF STAINLESS STEEL, BRONZE OR TEFLON LINED, FIBER GLASS BACKED DURALON. BEARING AREAS SHALL BE ISOLATED FROM THE FLOW WITH GRIT SEALS. VALVES SHALL HAVE PACKING BONNETS WHERE THE SHAFT PROTRUDES FROM THE VALVE AND THE PACKING SHALL BE SELF-ADJUSTING CHEVRON TYPE WHICH CAN BE REPLACED WITHOUT REMOVING THE BONNET. ALL NUTS, BOLTS, SPRINGS AND WASHERS SHALL BE STAINLESS STEEL.

30.19.PLUG VALVES SHALL BE DESIGNED FOR A WORKING PRESSURE OF 150 PSI THE VALVE AND ACTUATOR SHALL BE CAPABLE OF SATISFACTORY OPERATION IN EITHER DIRECTION OF FLOW AGAINST PRESSURE DROPS UP TO AND INCLUDING 100 PSI (FOR PLUG VALVES OVER 12" IN DIAMETER). VALVES SHALL BE BUBBLE TIGHT IN BOTH DIRECTIONS AT 100 PSI DIFFERENTIAL. PLUG VALVES OVER 12" IN DIAMETER SHALL HAVE WORM GEAR OPERATORS. THE OPERATING MECHANISM SHALL BE FOR BURIED SERVICE WITH A 2 INCH SQUARE OPERATING NUT.

30.20.PLUG VALVES ARE TO BE INSTALLED WITH THE SEAT POINTED TOWARDS THE UPSTREAM FLOW, WHEN SPECIFIED.

30.21.SWING CHECK VALVES FOR WATER, SEWAGE, SLUDGE, AND GENERAL SERVICE SHALL BE OF THE OUTSIDE LEVER AND SPRING OR WEIGHT TYPE, IN ACCORDANCE WITH ANSI/AWWA C 508 LATEST REVISION SWING-CHECK VALVES FOR WATERWORKS SERVICE, 2" THROUGH 24" NPS, UNLESS OTHERWISE INDICATED, WITH FULL-OPENING PASSAGES, DESIGNED FOR A WATER-WORKING PRESSURE OF 150 PSI THEY SHALL HAVE A FLANGED COVER PIECE TO PROVIDE ACCESS TO THE DISC.

30.22.HIGH DENSITY POLYETHYLENE PIPE (HDPE) FOR WATER DISTRIBUTION MAINS SHALL CONFORM TO AWWA C906 STANDARD, LATEST REVISION. PIPES SHALL BE COLOR-CODED BLUE, MINIMUM 40 FEET STANDARD LENGTHS.

31.SERVICE CONNECTION:

31.1. SERVICE SADDLES SHALL BE FUSION BONDED PLASTIC COATED DUCTILE IRON (ASTM A536) WITH STAINLESS STEEL STRAPS, SADDLES SHALL BE DOUBLE STRAP TYPE.

31.2. SERVICE LINES SHALL BE POLYETHYLENE (PE 3408), 200 P.S.I RATED, DR9. PIPE JOINTS SHALL BE OF THE COMPRESSION TYPE TOTALLY CONFINED GRIP SEAL AND COUPLING NUT.

31.3. CORPORATION STOPS SHALL BE MANUFACTURED OF BRASS ALLOY IN ACCORDANCE WITH ASTM B-62 WITH THREADED ENDS, AS MANUFACTURED BY FORD BALLCORP, CATALOG # 1100 OR APPROVED EQUAL.

31.4. CURB STOPS SHALL BE FORD V63-44W-X" LATEST REVISION OR APPROVED EQUAL.

31.5. METER STOPS SHALL BE 90 DEGREE LOCKWING TYPE AND SHALL BE OF BRONZE CONSTRUCTION IN ACCORDANCE FV63-777W" LATEST REVISION WITH ASTM B-62. METER STOPS SHALL BE CLOSED BOTTOM DESIGN AND RESILIENT "0" RING SEALED AGAINST EXTERNAL LEAKAGE AT THE TOP. STOPS SHALL BE EQUIPPED WITH A METER COUPLING NUT ON THE OUTLET SIDES, AS MANUFACTURED BY FORD OR APPROVED EQUAL.

32. INSTALLATION:

32.1. WHERE RESTRAINED PIPE JOINTS ARE REQUIRED DUE TO FITTINGS, APPURTENANCES, ETC., PIPE MATERIAL SHALL BE DIP

32.2. ALL PVC PIPE SHALL BE INSTALLED IN ACCORDANCE WITH THE UNI-BELL PLASTIC PIPE ASSOCIATION "GUIDE FOR INSTALLATION OF PVC PRESSURE PIPE FOR MUNICIPAL WATER DISTRIBUTION SYSTEM," AND ANSI/AWWA C605-XX LATEST REVISION STANDARD.

32.3. ALL DIP SHALL BE INSTALLED IN ACCORDANCE WITH ANSI/ C600-XX LATEST REVISION.

32.4. ALL WATER MAINS SHALL TYPICALLY BE LAID WITH A MINIMUM 36" COVER FOR PVC AND 30" COVER FOR DIP.

32.5. DETECTOR TAPE SHALL BE LAID 18 INCHES ABOVE ALL WATER AND SEWER LINES. A 14 GAUGE MULTI-STRAND WIRE SHALL BE ATTACHED TO ALL NONCONDUCTIVE WATER MAINS TO FACILITATE LOCATION. AN EXTRA 4 FEET OF WIRE SHALL BE PROVIDED AT ALL VALVES, BLOW-OFFS, HYDRANTS, ETC. THE WIRE SHALL BE TESTED FOR CONTINUITY AT THE PRESSURE TEST.

32.6. PIPE DEFLECTION SHALL NOT EXCEED 50% OF THE MAXIMUM DEFLECTION RECOMMENDED BY THE MANUFACTURER.

32.7. A CONTINUOUS AND UNIFORM BEDDING SHALL BE PROVIDED. BACKFILL MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

32.8. ALL VALVES SHALL BE INSTALLED WITH ADJUSTABLE CAST IRON VALVE BOXES WITH THE WORD "WATER" OR "SEWER", AS APPLICABLE, CAST IN THE COVER. U.S. FOUNDRY OR APPROVED EQUAL.

33.TESTING:

33.1. BEFORE ANY PHYSICAL CONNECTIONS AND ACCEPTANCE FOR OPERATION TO THE EXISTING WATER MAINS ARE MADE, THE COMPLETE WATER SYSTEM SHALL BE FLUSHED, PRESSURE TESTED AND DISINFECTED. COPIES OF PASSING BACTERIOLOGICAL RESULTS AND PRESSURE TEST RESULTS MUST BE SUBMITTED TO, AND APPROVED BY, THE ENGINEER, UTILITY OWNER, AND HEALTH DEPARTMENT. HYDROSTATIC TESTING OF NEW MAINS SHALL BE PERFORMED AT A MINIMUM STARTING PRESSURE OF 150 PSI FOR TWO HOURS IN ACCORDANCE WITH ANSI/AWWA C600-05 (HYDROSTATIC TEST). THE PRESSURE TEST SHALL NOT VARY MORE THAN 5 PSI DURING THE TEST. THE ALLOWABLE LEAKAGE DURING THE PRESSURE TEST SHALL BE LESS THAN THE NUMBER OF GALLONS PER HOUR AS DETERMINED BY THE FORMULA:

L = (SD(P)1/2)/148,000.

IN WHICH L EQUALS THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR. S EQUALS LENGTH OF PIPE (LINEAR FEET), D EQUALS NOMINAL DIAMETER OF PIPE (INCHES) AND P EQUALS THE AVERAGE TEST PRESSURE (POUNDS PER SQUARE INCH GAUGE). MAXIMUM LENGTH OF TEST PIPE SECTION SHOULD BE 2000 FEET. THE WATER SYSTEM SHALL BE DISINFECTED IN ACCORDANCE WITH THE ANSI/AWWA C651-05 (WATER MAIN BACTERIOLOGICAL TESTS).

33.2. THE PRESSURE TEST SHALL BE WITNESSED BY A REPRESENTATIVE OF THE UTILITY OWNER AND THE ENGINEER OF RECORD.

33.3. FOR WATER DISTRIBUTION PIPES, SAMPLING POINTS SHALL BE PROVIDED BY THE CONTRACTOR AT THE LOCATIONS SHOWN ON THE PLANS.

33.4. FOR WATER DISTRIBUTION PIPES, DISINFECTION AND BACTERIOLOGICAL TESTING SHALL BE IN ACCORDANCE WITH ANSI/AWWA C651-14 (WATER MAIN BACTERIOLOGICAL TESTS). MAXIMUM DISTANCE BETWEEN SAMPLING POINTS SHALL BE AS FOLLOWS:

- TRANSMISSION MAINS: EVERY 1200 FEET
- BRANCH MAINS: EVERY 1000 FEET
- ISOLATED MAINS < 1000 FEET: 2 SAMPLE POINTS
- ISOLATED MAINS > 1000 FEET: 3 SAMPLE POINTS

SECTION 40 - GRAVITY SANITARY SEWER COLLECTION SYSTEM

40.GENERAL:

40.1. MANHOLE, VALVE BOX, METER BOX AND OTHER STRUCTURE RIM ELEVATIONS WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE ADJUSTED TO CONFORM TO PLAN GRADES PROPOSED IN THESE PLANS. IF NO OTHER INDIVIDUAL COST ITEM IS INCLUDED IN THE CONTRACT SCHEDULE FOR A PARTICULAR STRUCTURE ADJUSTMENT.

40.2. DISTANCE AND LENGTHS SHOWN ON PLANS AND PROFILE DRAWINGS ARE REFERENCED TO THE CENTER OF STRUCTURES.

41. MATERIALS:

NOTE: IF MATERIALS LIST HERE ON ARE IN CONFLICT WITH UTILITY OWNER, MATERIAL OWNER REQUIREMENTS SHALL GOVERN.

41.1. ALL PVC SEWER PIPE AND FITTINGS SHALL BE NON-PRESSURE POLYVINYL CHLORIDE (PVC) PIPE CONFORMING TO ASTM D 3034, SDR 26, WITH PUSH-ON RUBBER GASKET JOINTS.

41.2. DUCTILE IRON PIPE SHALL CONFORM TO ANSI/AWWA C151/A21.51-XX LATEST REVISION, "DUCTILE IRON PIPE CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS" WITH WALL THICKNESS CLASS 51 FOR 8" AND ABOVE, CLASS 52 FOR 4" AND 6", UNLESS OTHERWISE DIRECTED BY THE ENGINEER. DUCTILE IRON PIPE SHALL BE EPOXY LINED OR COATED WITH THE MANUFACTURER'S COATING SYSTEM AS APPROVED BY THE ENGINEER OF RECORD AND THE LOCAL MUNICIPALITY OR UTILITY OWNER. IN EITHER CASE, THE ENGINEER'S REVIEW AND APPROVAL IS REQUIRED FOR EITHER ALTERNATIVE PRIOR TO CONSTRUCTION. CEMENT MORTARED LININGS ARE NOT APPROPRIATE FOR THIS APPLICATION.

41.3. ALL DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI/AWWA STANDARD C110/A21.10-XX LATEST REVISION. ALL FITTINGS AND ACCESSORIES SHALL BE EPOXY LINED AND AS MANUFACTURED OR SUPPLIED BY THE PIPE MANUFACTURER OR APPROVED EQUAL.

41.4. MANHOLES SHALL BE PRECAST PER ASTM C 478 AND IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

41.5. MANHOLES ARE TO BE SEALED WITH TYPE II SULPHATE RESISTANT CEMENT OR APPROVED EQUAL - NO MOLDING PLASTER.

41.6. JOINTS FOR BELL AND SPIGOT DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO ANSI/AWWA STANDARD C111/A21.11-XX LATEST REVISION. MECHANICAL JOINT OR PUSH-ON JOINT TO BE RUBBER GASKET COMPRESSION- TYPE.

41.7. PVC CLEAN-OUTS TO HAVE SCREW TYPE ACCESS PLUG. LONG RADIUS WYE CONNECTIONS AND FITTINGS SHALL BE USED IN ORDER TO ACCESS CLEAN-OUT OPERATIONS.

41.8. CLEANOUTS SHALL BE INSTALLED AT ALL SEWER SERVICES EXCEEDING 75' IN LENGTH (EVERY 75') WITH A CLEAN OUT AT THE PROPERTY LINE, EASEMENT LINE, OR 5' FROM A BUILDING. THE CONTRACTOR SHALL COORDINATE THE LOCATION OF THE BUILDING CLEANOUT (5' FROM THE BUILDING) AND ELEVATION OF THE END OF THE SEWER SERVICE WITH THE BUILDING PLUMBING CONTRACTOR. CLEANOUTS SHALL BE THE SAME SIZE AS THE SERVICE LATERAL IN WHICH THEY ARE INSTALLED.

42. INSTALLATION:

42.1. PVC SEWER PIPE SHALL BE LAID IN ACCORDANCE WITH ASTM D 2321 AND THE UNI-BELL PLASTIC PIPE ASSOCIATION'S "RECOMMENDED PRACTICE FOR THE INSTALLATION OF PVC SEWER PIPE."

42.2. DIP SHALL BE INSTALLED IN ACCORDANCE WITH ANSI/AWWA C-600-XX LATEST REVISION.

42.3. PIPE TO MANHOLE CONNECTION TO BE FERNCO NEOPRENE BOOT COUPLINGS WITH STAINLESS STEEL ACCESSORIES OR APPROVED EQUAL.

42.4. MANHOLES SHALL BE SET PLUMB TO LINE AND GRADE ON FIRM SUBGRADE PROVIDING UNIFORM BEARING UNDER THE BASE.

42.5. ALL OPENINGS AND JOINTS SHALL BE SEALED WATERTIGHT.

42.6. TWO COATS OF KOPPERS 300-M, FIRST RED, SECOND ONE BLACK, SHALL BE APPLIED TO THE INSIDE OF ALL MANHOLES AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS (16 MILS PER COAT). COATING AS REQUIRED BY UTILITY OWNER OR ENGINEER SHALL BE APPLIED TO THE OUTSIDE OF THE MANHOLE. THE INTERIOR COATS SHALL BE APPLIED AFTER SEWER LAMPING OF LINES. AFTER THE APPLICATION OF EACH COAT, THE UTILITY OWNER AND ENGINEER SHALL INSPECT THE MANHOLES. THE INSPECTION SHALL BE SCHEDULED A MINIMUM OF 48 HOURS PRIOR TO INSPECTION.

43.TESTING: TESTING OF GRAVITY SEWER MAINS AND LATERALS SHALL BE IN ACCORDANCE WITH THE UTILITY OWNER'S MINIMUM DESIGN AND CONSTRUCTION STANDARDS LATEST REVISION.

43.1. AFTER CONSTRUCTION OF THE SEWER SYSTEM, THE ENGINEER MAY REQUIRE A VISUAL INFILTRATION AND/OR EXFILTRATION TEST TO BE PERFORMED ON THE ENTIRE SYSTEM OR ANY PART THEREOF.

43.2. AN AIR TEST MAY BE SUBSTITUTED FOR THE WATER EXFILTRATION TEST, UPON APPROVAL OF THE ENGINEER.

43.3. THE ALLOWABLE LIMITS OF SEWER PIPE LEAKAGE FOR GRAVITY SEWER MAINS SHALL NOT EXCEED 100 GALLONS PER INCH OF INSIDE PIPE DIAMETER PER MILE PER DAY FOR ANY SECTION TESTED. NO VISIBLE LEAKAGE SHALL BE ALLOWED.

43.4. THE INSTALLED SEWERS MAY REQUIRE VIDEO INSPECTIONS.

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(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

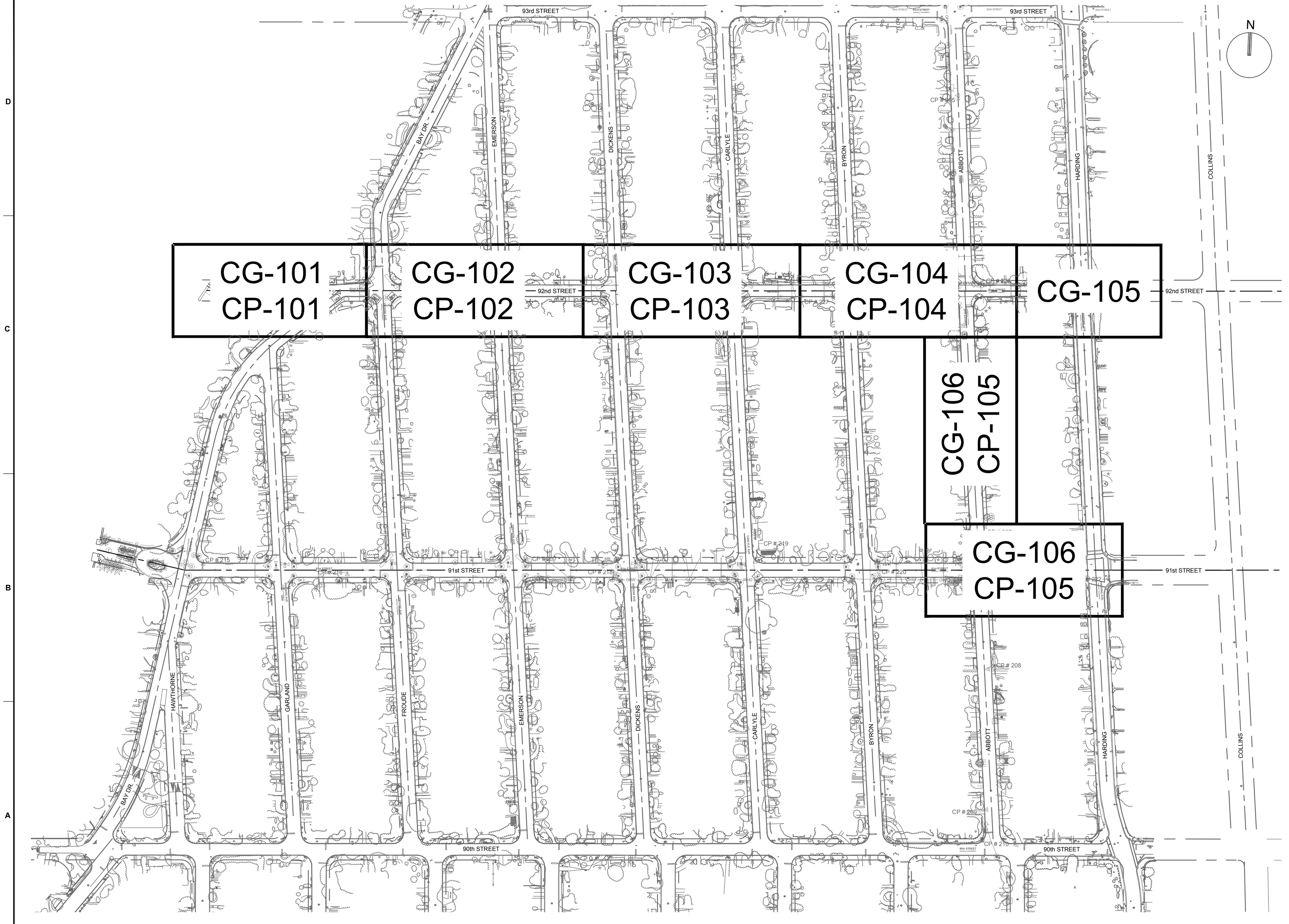
SHEET TITLE

GENERAL SPECIFICATIONS

SHEET NUMBER GI-003

PROJECT NUMBER 11494.01

STATUS: CONSTRUCTION DOCUMENTS



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KEY MAP

SHEET NUMBER	GI-004
PROJECT NUMBER	11494.01

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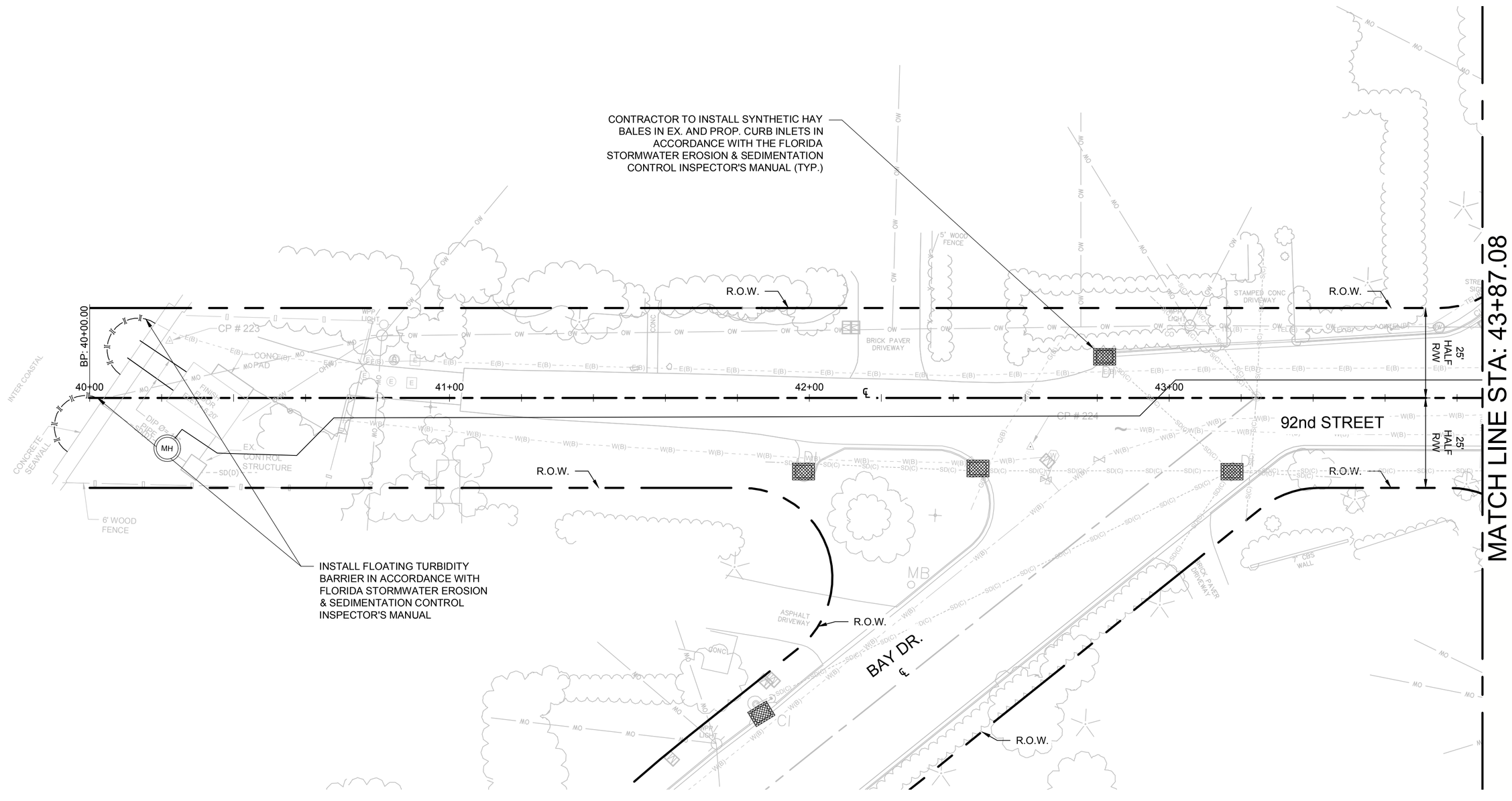

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GRAPHIC SCALE
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EROSION CONTROL PLAN - 92ND STREET

SHEET NUMBER	CG-101
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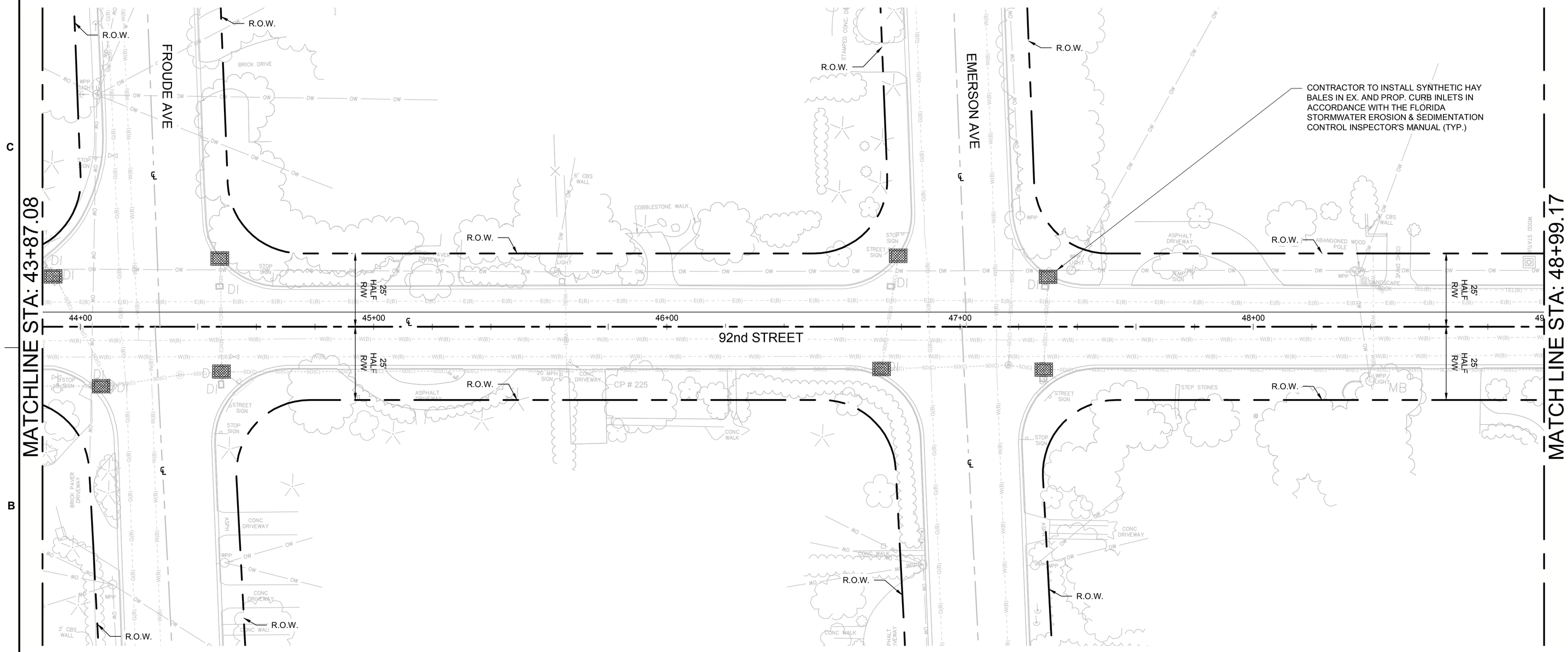

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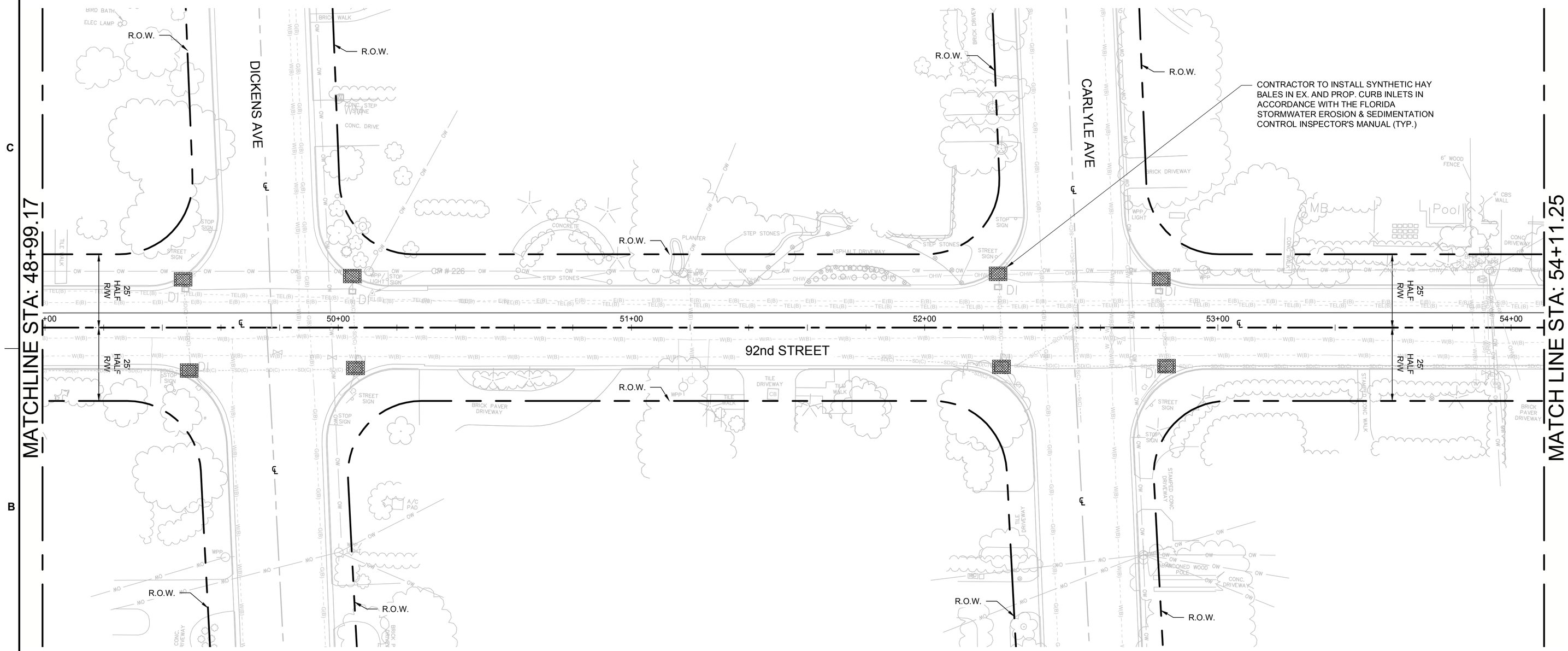

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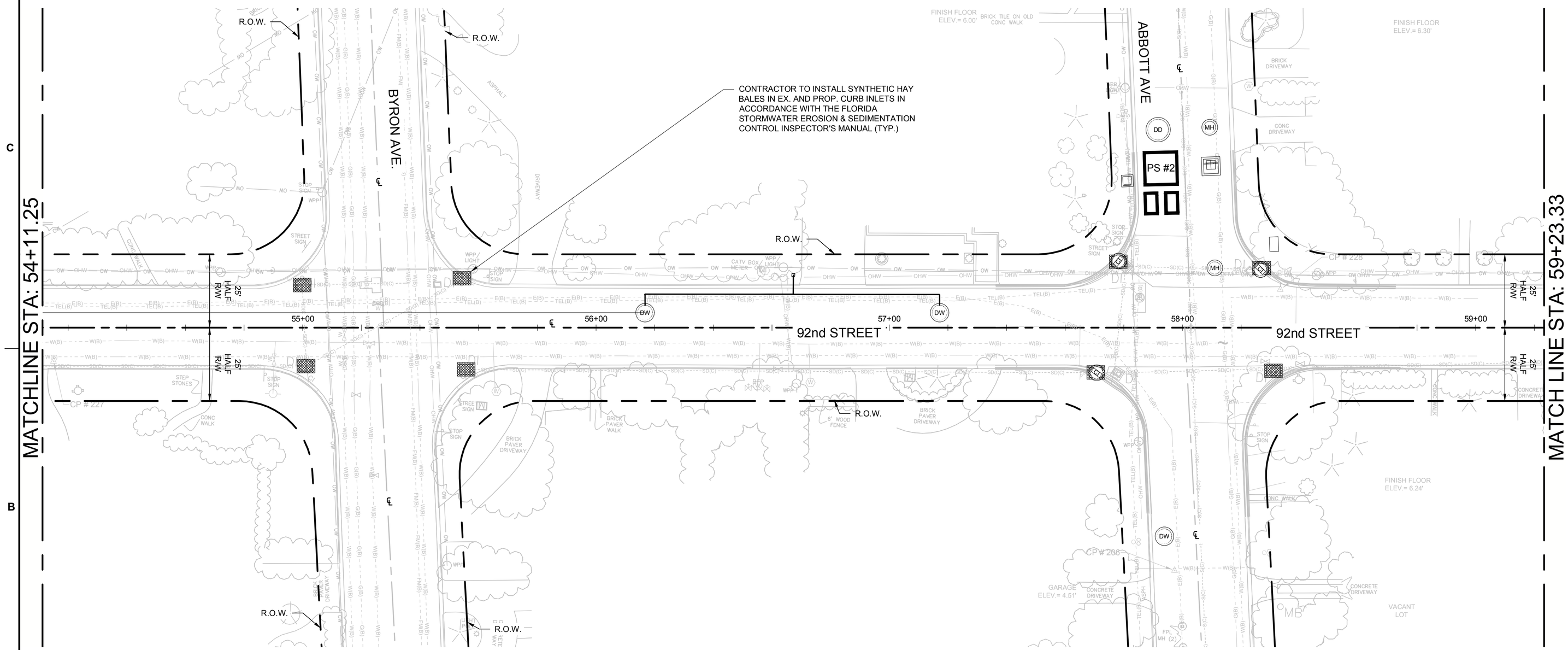

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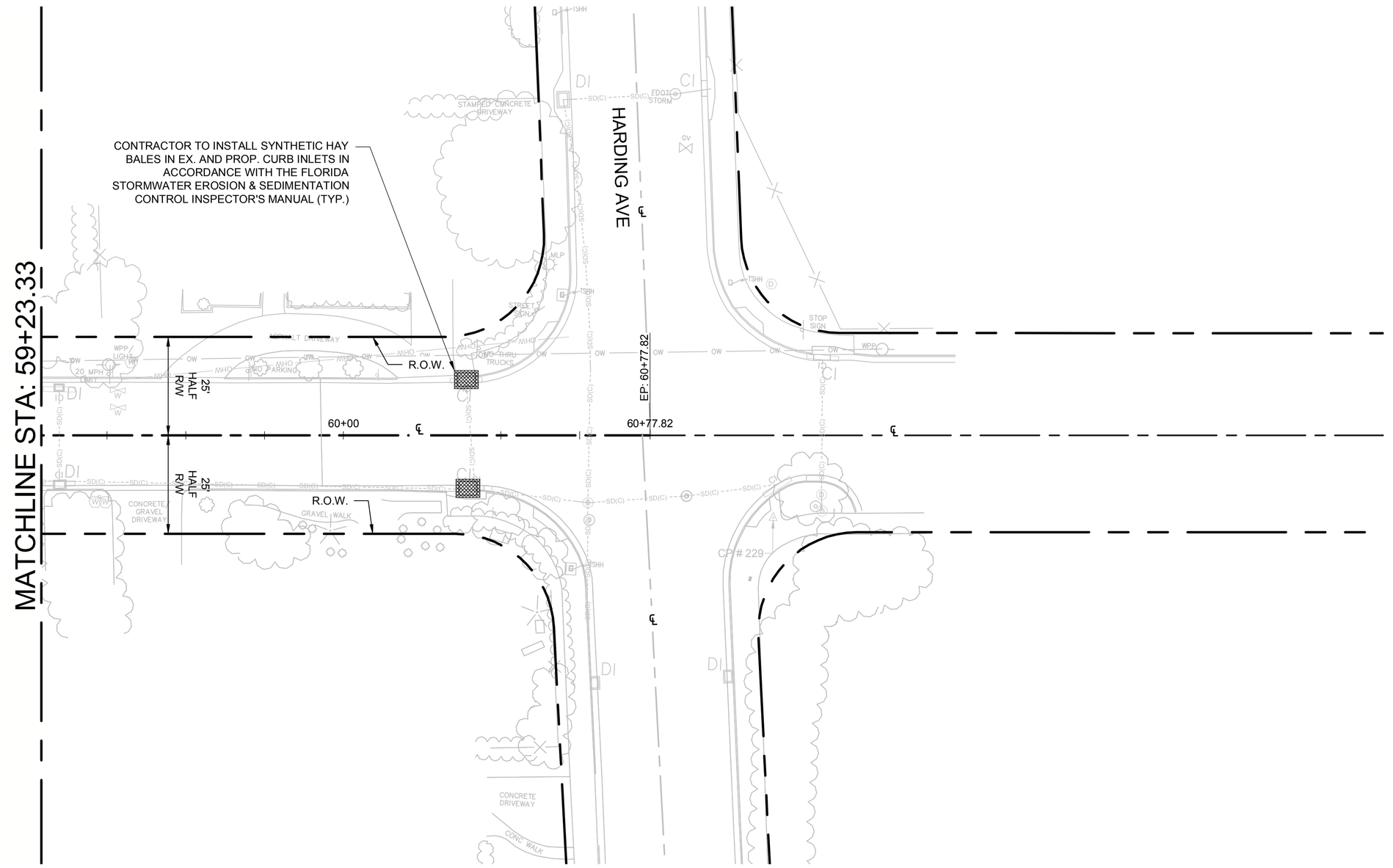

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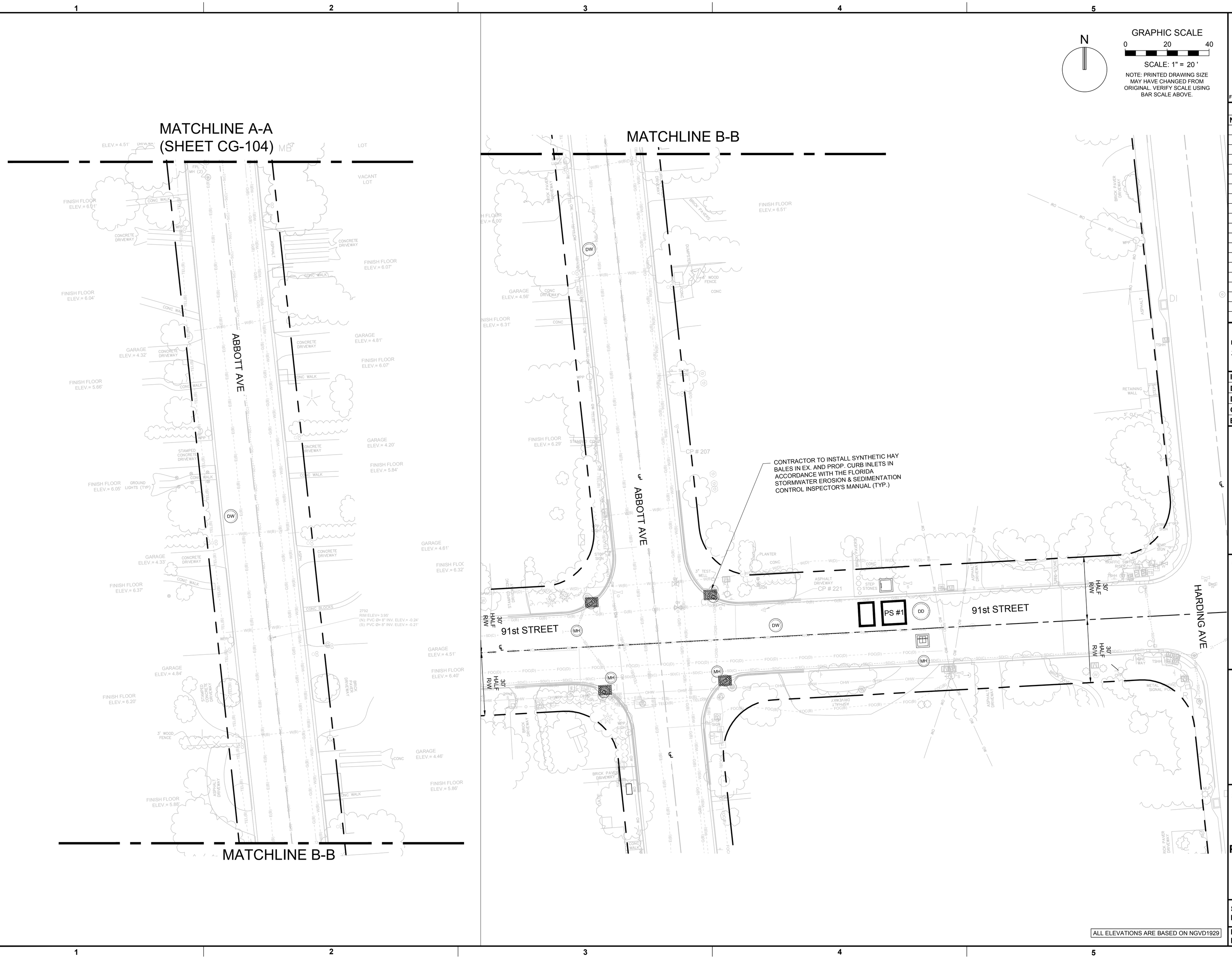
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



N

GRAPHIC SCALE
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SCALE: 1" = 20 '

NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.

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Florida Landscape Architecture Business License: LC26000457

REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

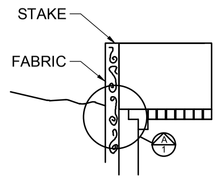
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

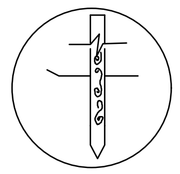
EROSION CONTROL PLAN - ABBOTT AVENUE

SHEET NUMBER	CG-106
PROJECT NUMBER	11494.01

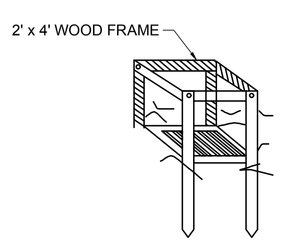
STATUS: CONSTRUCTION DOCUMENTS



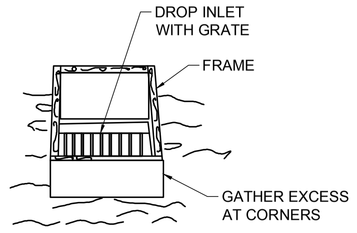
ELEVATION OF STAKE AND FABRIC ORIENTATION



DETAIL A



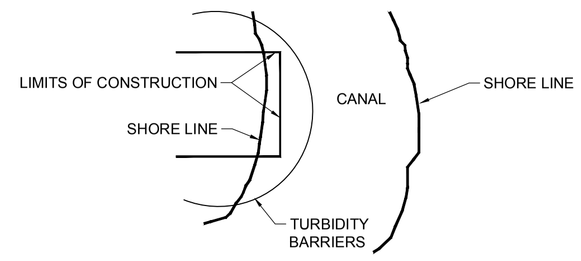
PERSPECTIVE VIEW



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS

FILTER FABRIC DROP INLET SEDIMENT FILTER



NOTES:
1. TURBIDITY BARRIERS ARE TO BE USED IN ALL PERMANENT WATERBODIES REGARDLESS OF DEPTH.
2. TURBIDITY BARRIERS FOR FLOATING STREAMS AND TIDAL CREEKS MAY BE EITHER FLOATING, OR STAKED TYPES OR ANY COMBINATIONS OF TYPES THAT WILL SUIT SITE CONDITIONS AND MEET EROSION CONTROL AND WATER QUALITY REQUIREMENTS. THE BARRIER TYPE(S) WILL BE AT THE CONTRACTORS OPTION UNLESS OTHERWISE SPECIFIED IN THE PLANS. POSTS IN STAKED TURBIDITY BARRIER TO BE INSTALLED IN VERTICAL POSITION UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CITY AND/OR DRAINAGE DISTRICT.

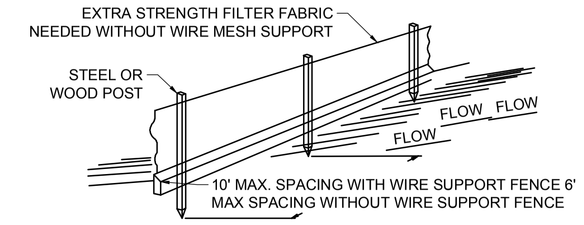
FLOATING TURBIDITY BARRIERS

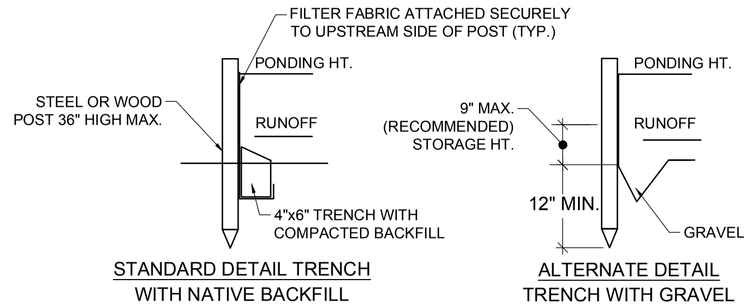
EROSION CONTROL GENERAL NOTES

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR ACQUIRING A VALID NPDES PERMIT. UNLESS SUCH PERMIT IS DETERMINED TO BE NON-APPLICABLE BY REGULATORY AGENCY HAVING PROPER JURISDICTION REGARDING THIS MATTER.
2. SILT FENCE AND TURBIDITY BARRIERS MUST REMAIN IN PLACE AND BE MAINTAINED AT ALL LOCATIONS SHOWN IN THE DRAWING UNTIL CONSTRUCTION ID COMPLETED AND SOILS ARE STABILIZED AND VEGETATION HAS BEEN.
3. CONTRACTOR SHALL SUBMIT SCHEDULE FOR THE INSTALLATION, INSPECTION AND MAINTENANCE THE EROSION CONTROLS FEATURES AS SHOWN IN THE DRAWINGS OR AS DIRECTED BY THE DESIGN ENGINEER. THE SCHEDULE SHALL SPECIFICALLY INDICATE THE SEQUENCE OF CLEARING, EARTH WORK OPERATIONS, AND WHEN THE EROSION CONTROL FEATURE WILL BE INSTALLED, INSPECTED, AND MAINTAINED. IT SHALL ALSO INCLUDE METHODS TO PREVENT POLLUTION OF STREAM, LAKES, TIDAL WATERS, CANALS, AND IMPOUNDMENTS. ESTABLISHED.

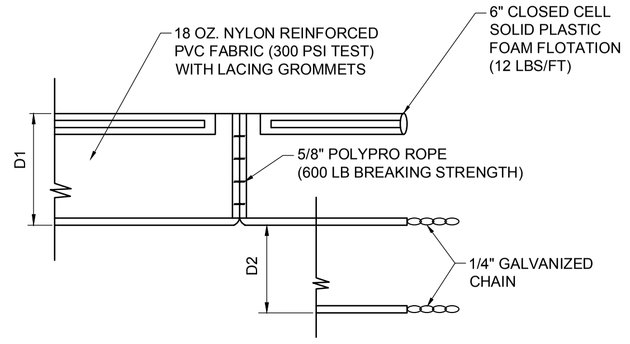
00 EROSION CONTROL DETAILS

NOT TO SCALE



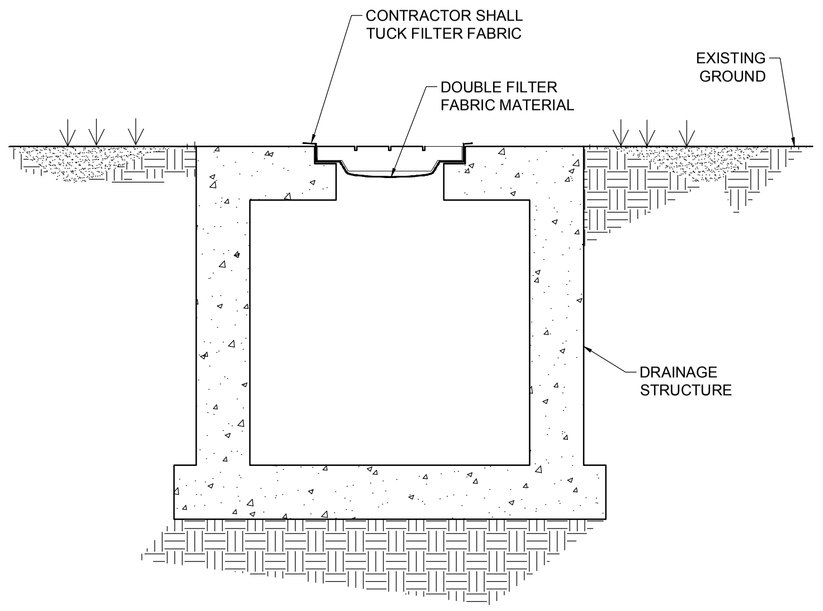


SILT FENCE

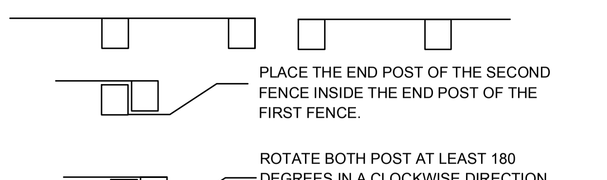


NOTE:
D1 = 5' STD. (SINGLE PANEL FOR DEPTHS 5' OR LESS)
D2 = 5' STD. (ADDITIONAL PANEL FOR DEPTHS > 5')
CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10'.
TWO (2) PANELS TO BE USED FOR DEPTHS GREATER THAN 10' UNLESS SPECIAL DEPTH CURTAINS SPECIFICALLY CALLED FOR IN THE PLANS OR AS DETERMINED BY THE ENGINEER, CITY OF TAMARAC OR BCDPEP.

FLOATING TURBIDITY BARRIERS TYP. SECTION

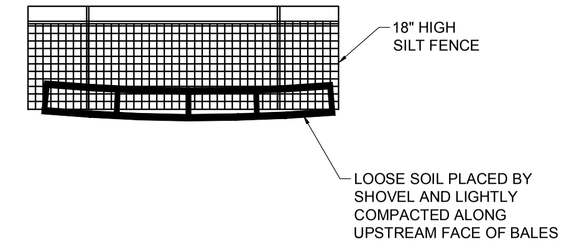


INLET / MANHOLE PROTECTION DETAIL



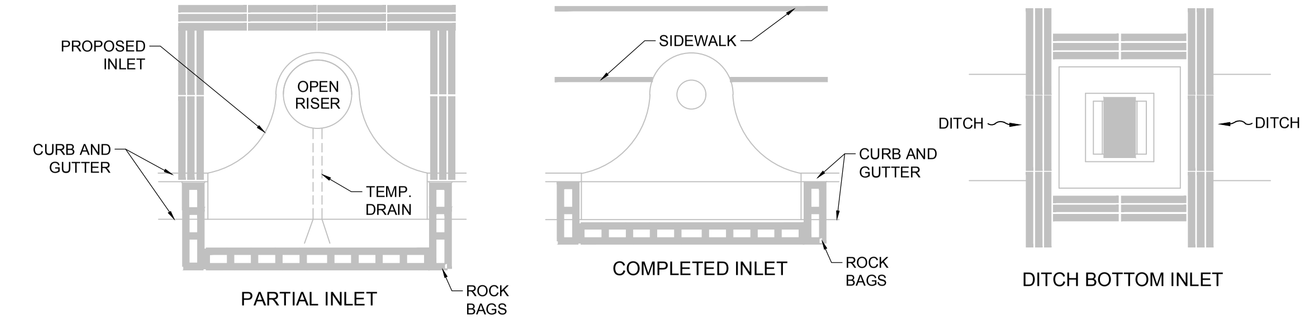
NOTES:
1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

ATTACHING TWO SILT FENCES



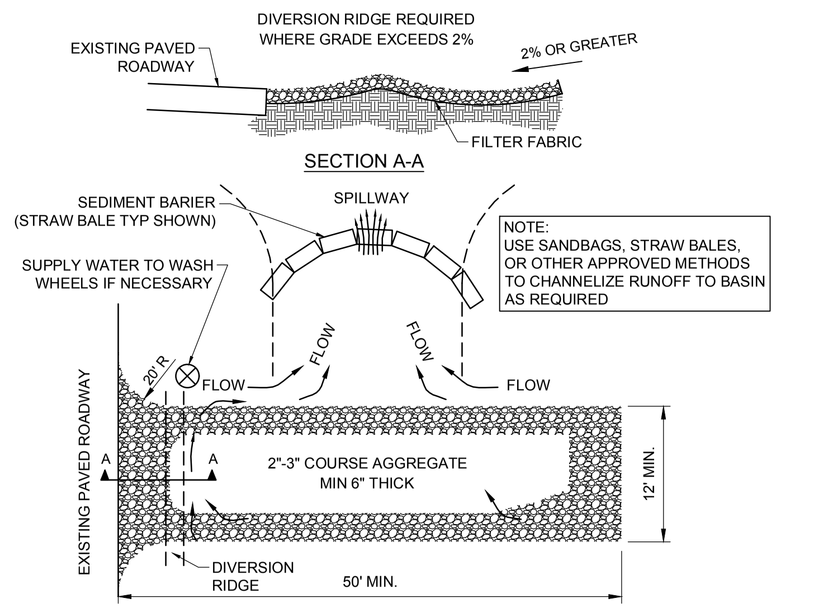
NOTES:
1. DO NOT CONSTRUCT SILT FENCES ACROSS PERMANENT FLOWING COURSES. SILT FENCES ARE TO BE PLACED AT UPLAND LOCATIONS.
2. BALES TO BE STAKED AT THE DIRECTION OF THE ENGINEER, CITY, NSID OR SFWMD.
3. WHERE THE SILT FENCE IS USED AS SLOPE PROTECTION, IT IS TO BE CONSTRUCTED ON 0% LONGITUDINAL GRADE TO AVOID CHANNELIZING RUNOFF ALONG THE LENGTH OF THE FENCE.

BALES BACKED BY SILT FENCE



NOTE:
1. ANCHOR BALES WITH 2 STAKES PER BALE.
2. WHEN USED IN CONJUNCTION WITH A SILT FENCE, BALES SHALL BE PLACED ON THE UPSTREAM SIDE OF THE FENCE.

PROTECTION AROUND INLETS OR SIMILAR STRUCTURES



NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

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REVISIONS

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CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

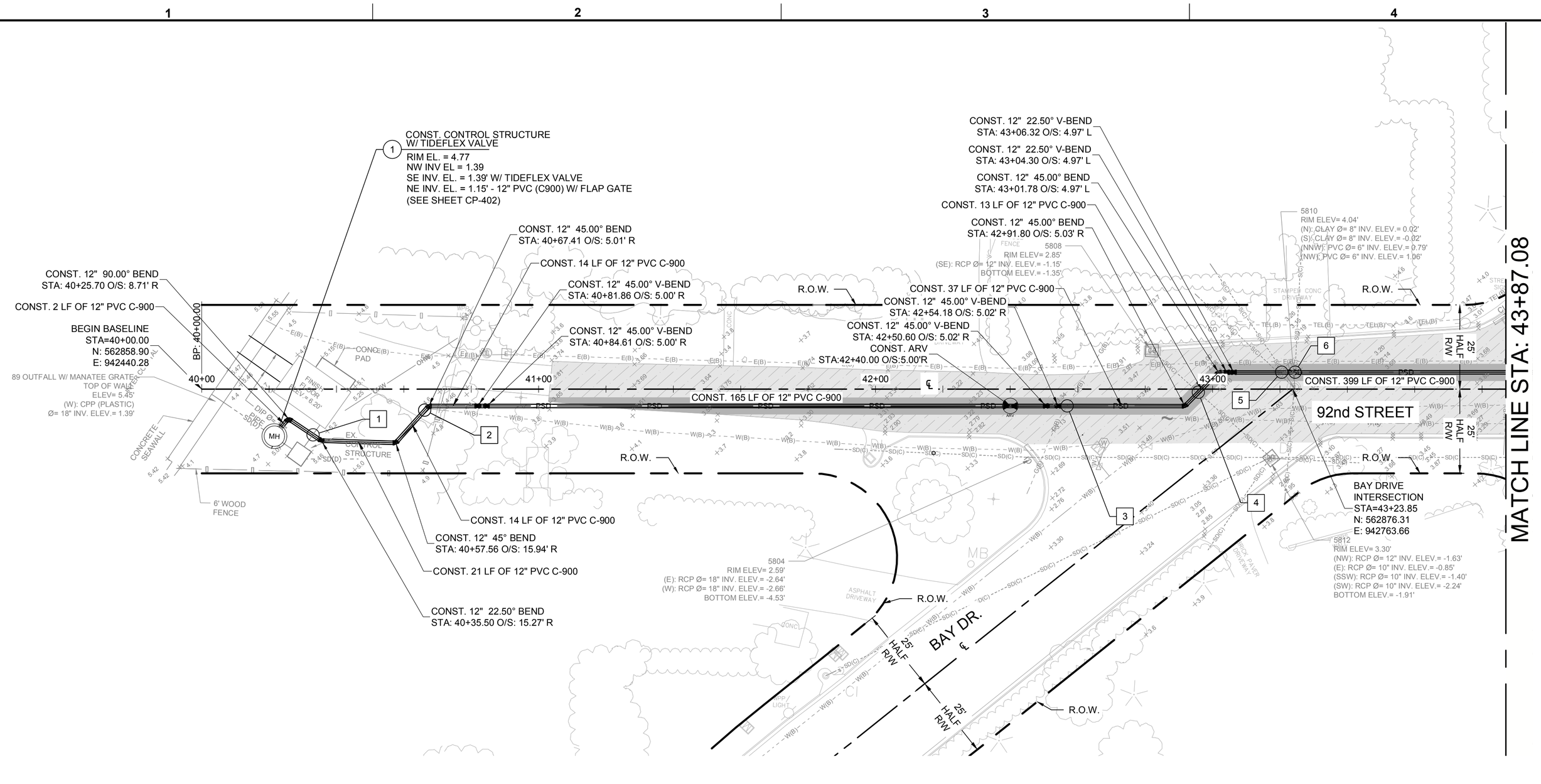
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

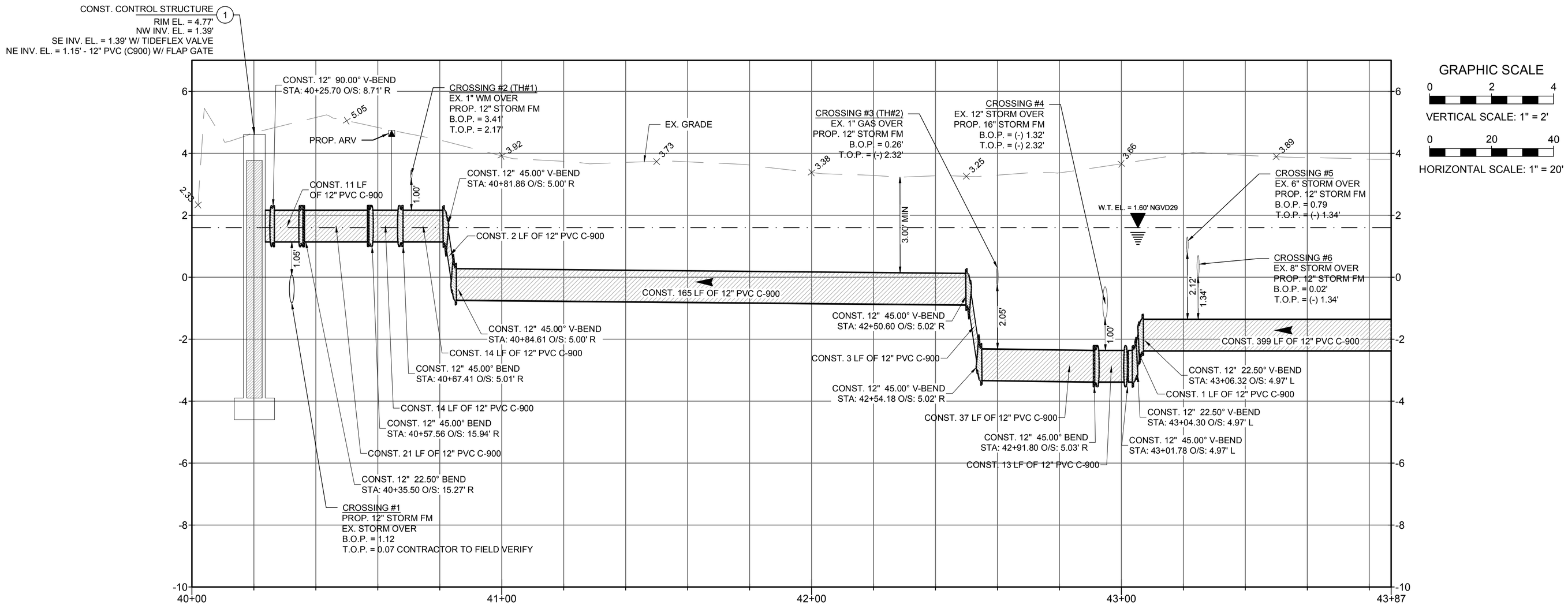
SHEET TITLE

EROSION CONTROL DETAILS

SHEET NUMBER	CG-501
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS





GRAPHIC SCALE
0 2 4
VERTICAL SCALE: 1" = 2'
0 20 40
HORIZONTAL SCALE: 1" = 20'

ALL ELEVATIONS ARE BASED ON NGVD1929

N

GRAPHIC SCALE
0 20 40
SCALE: 1" = 20 '
NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.

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TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

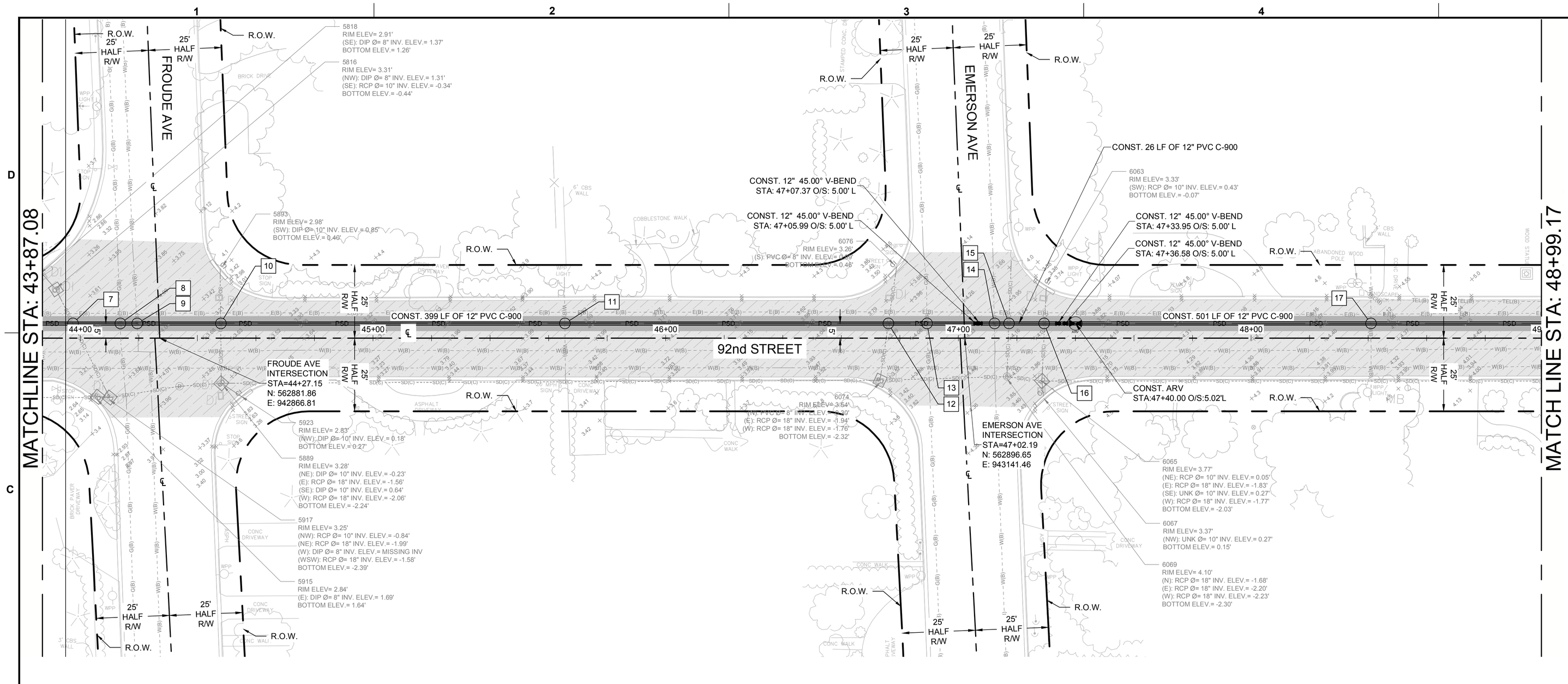
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

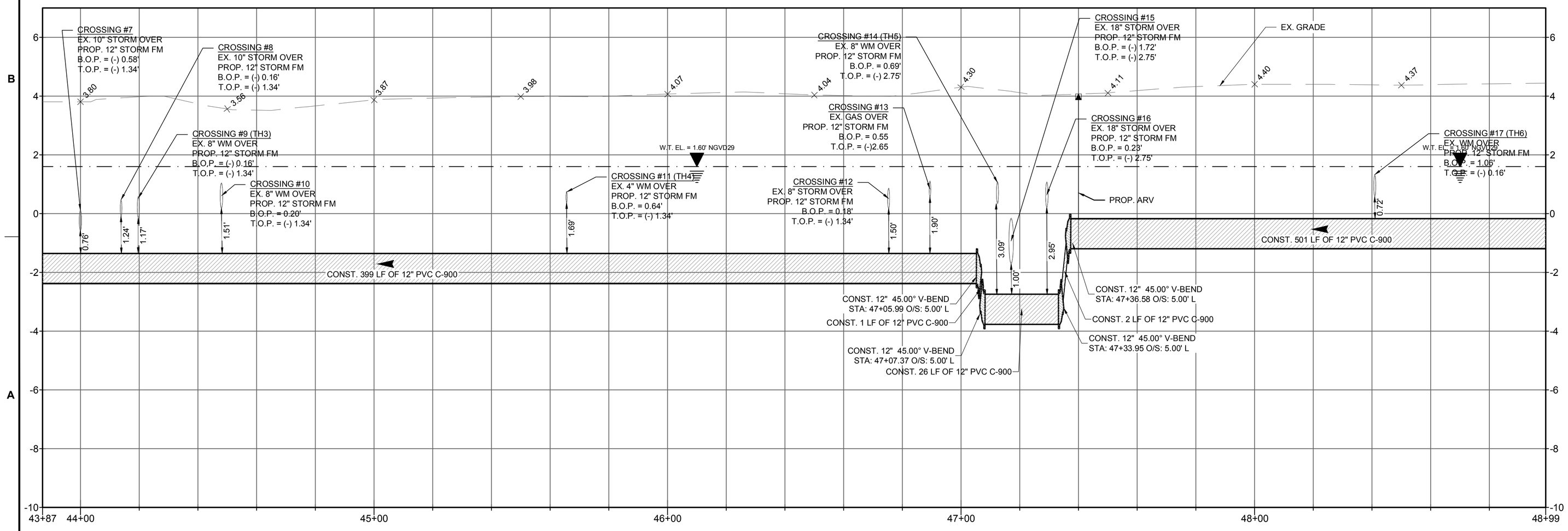
SHEET TITLE

DRAINAGE PLAN - 92ND STREET

SHEET NUMBER	CP-101
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS





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VERTICAL SCALE: 1" = 2'
0 20 40
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PROJECT

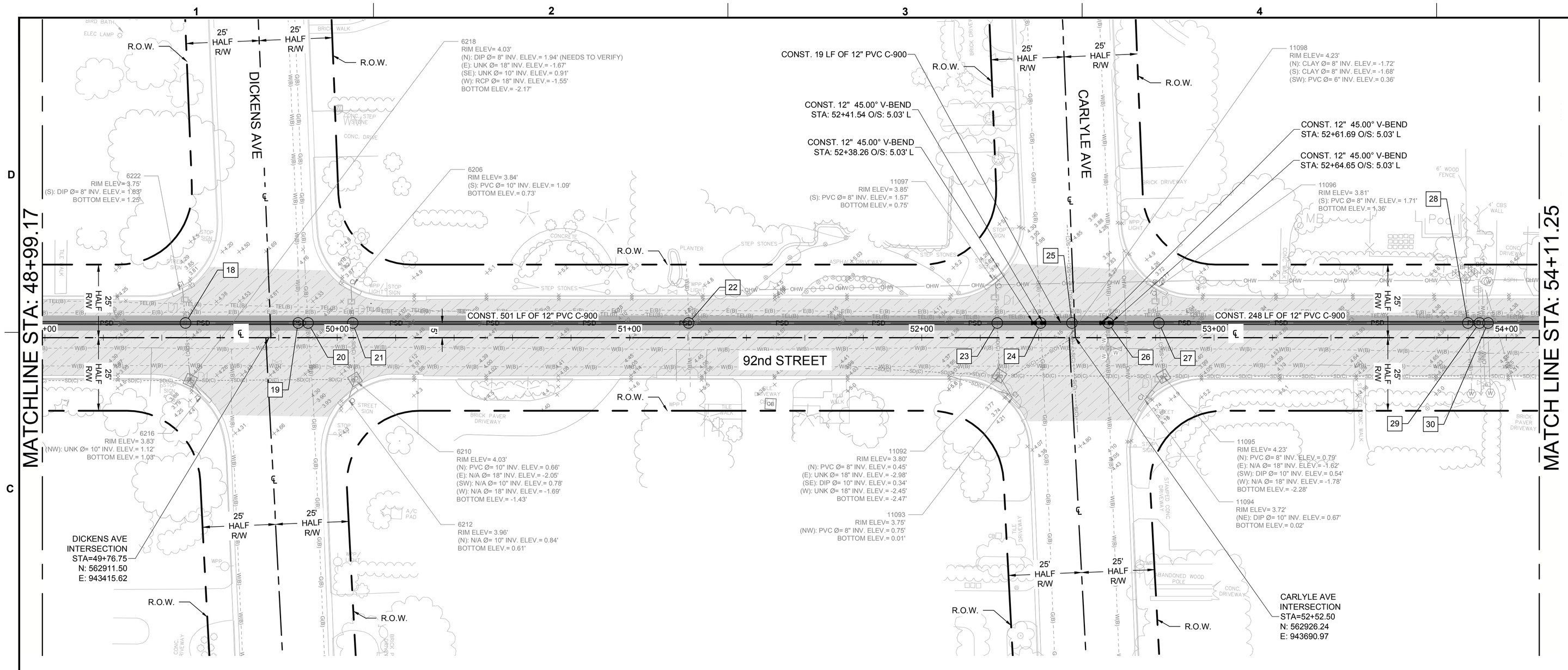
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

DRAINAGE PLAN - 92ND STREET

SHEET NUMBER	CP-102
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



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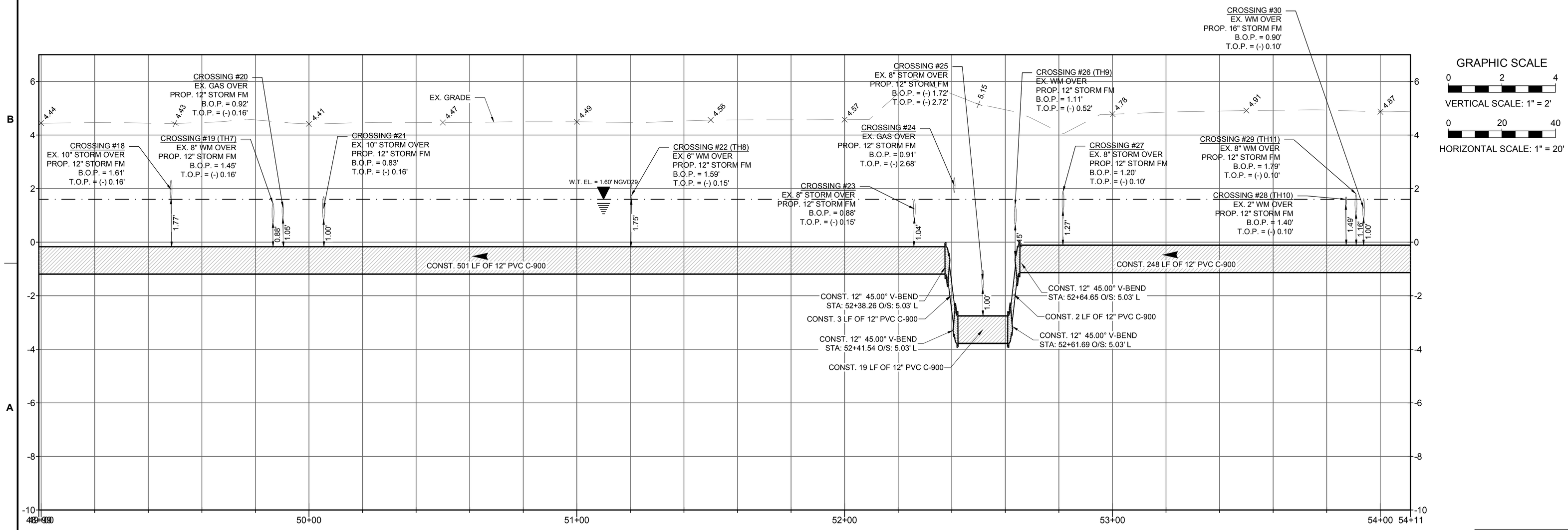

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HORIZONTAL SCALE: 1" = 20'

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SHEET TITLE

DRAINAGE PLAN - 92ND STREET

SHEET NUMBER	CP-103
PROJECT NUMBER	11494.01

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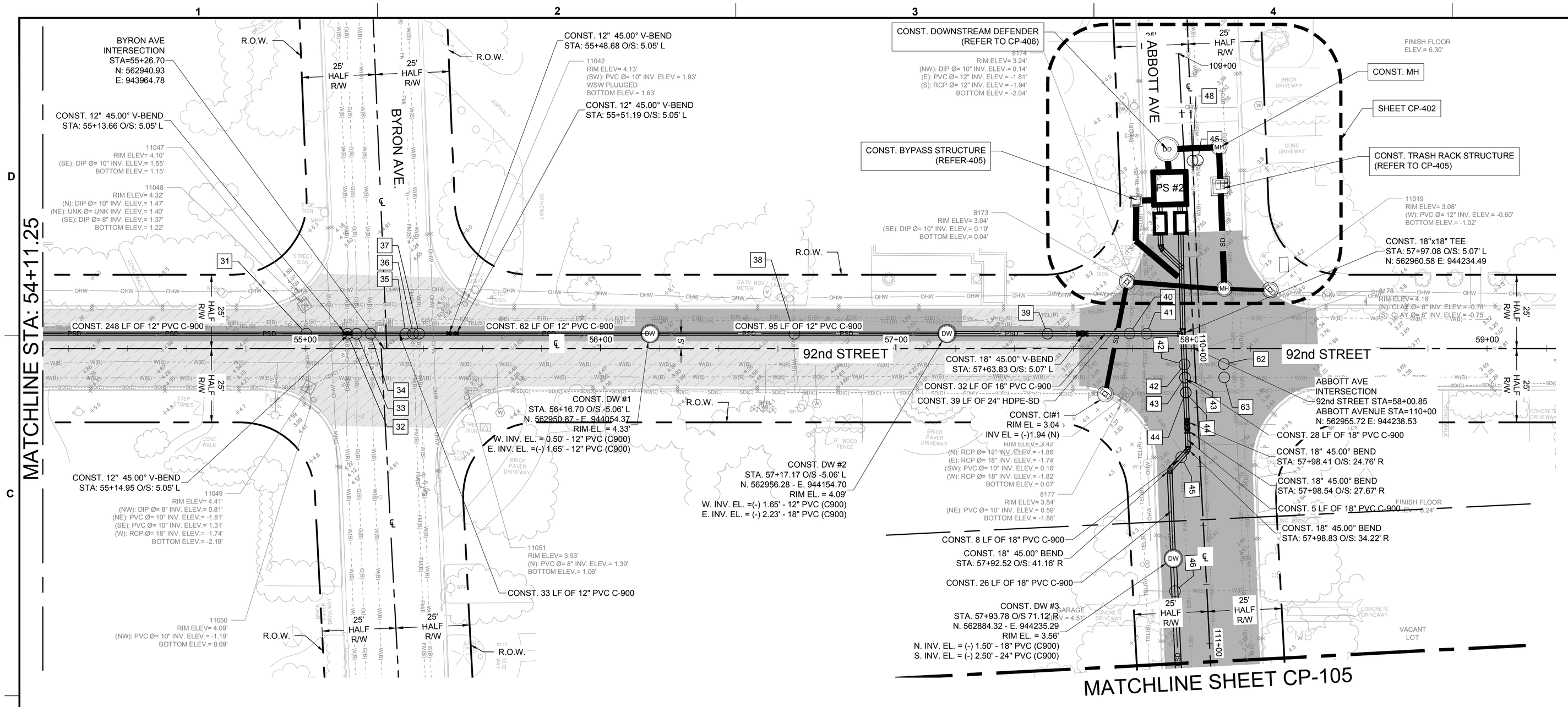

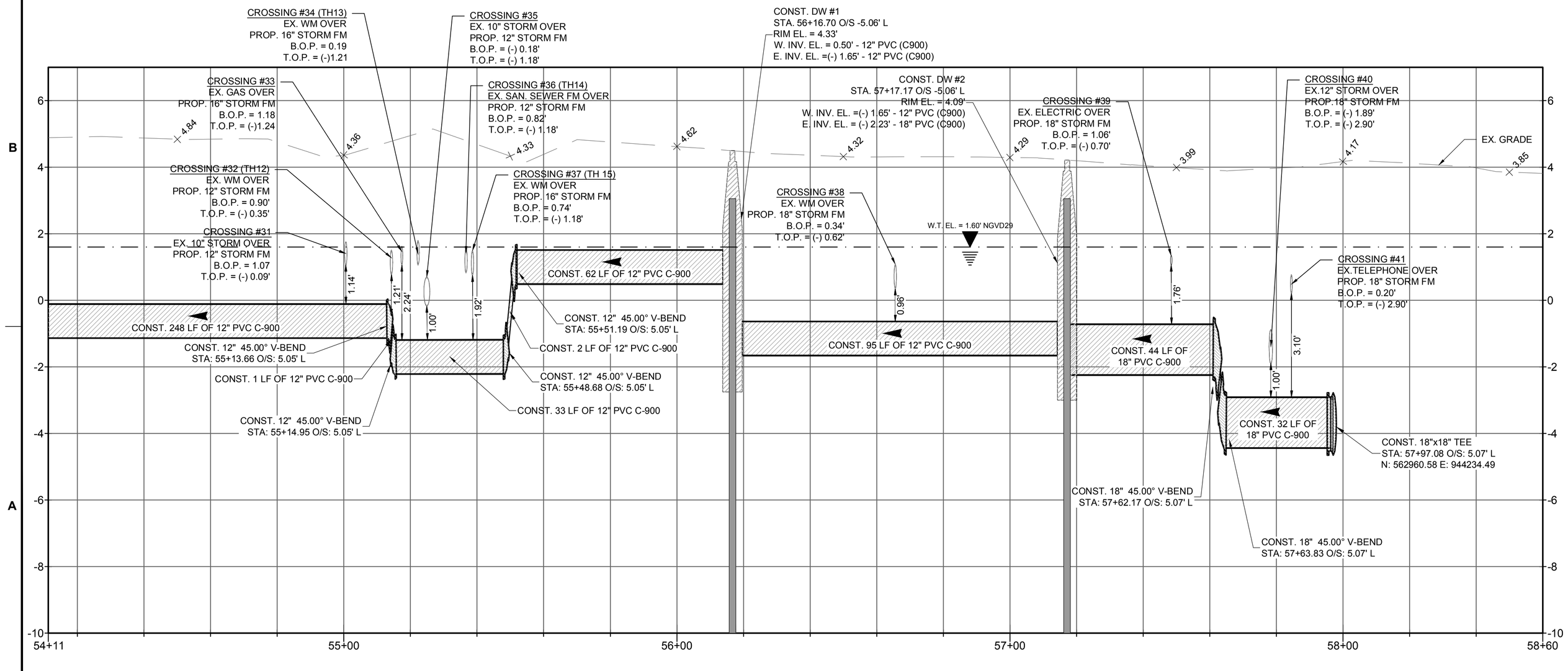

PIPE CROSSINGS:

62 EX. 8" WATER OVER PROP. 24" STORM (TH19)
B.O.P. EL. = 0.30' - (8" PVC)
T.O.P. EL. = (-)0.70' - (24" HDPE-SD)
CLEARANCE = 1' MINIMUM

63 EX. 6" WATER OVER PROP. 24" STORM (TH20)
B.O.P. EL. = 1.54' - (6" CIP)
T.O.P. EL. = (-)0.70' - (24" HDPE-SD)
CLEARANCE = 1' MINIMUM

N

GRAPHIC SCALE
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SCALE: 1" = 20 '
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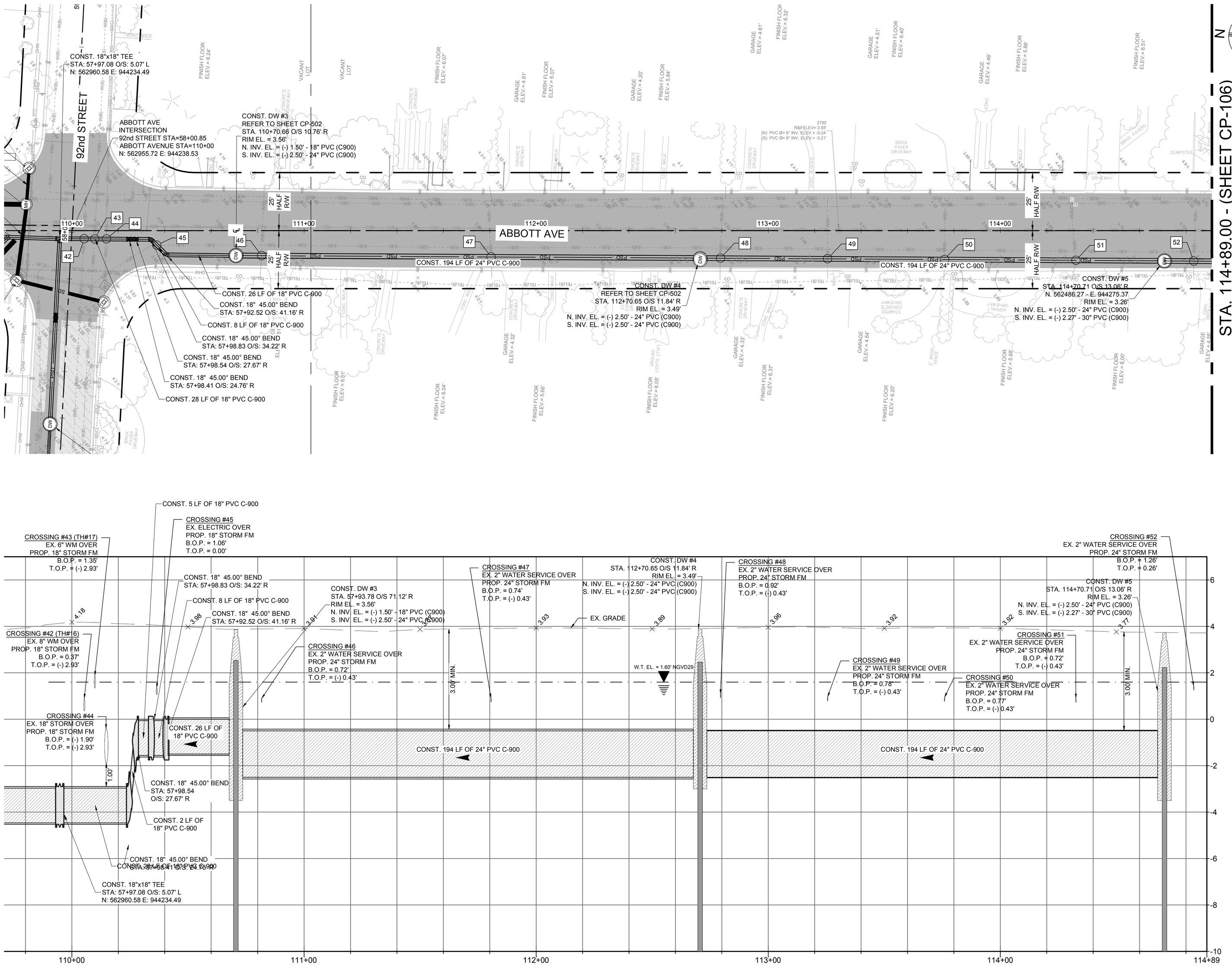

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DRAINAGE PLAN - ABBOTT AVENUE

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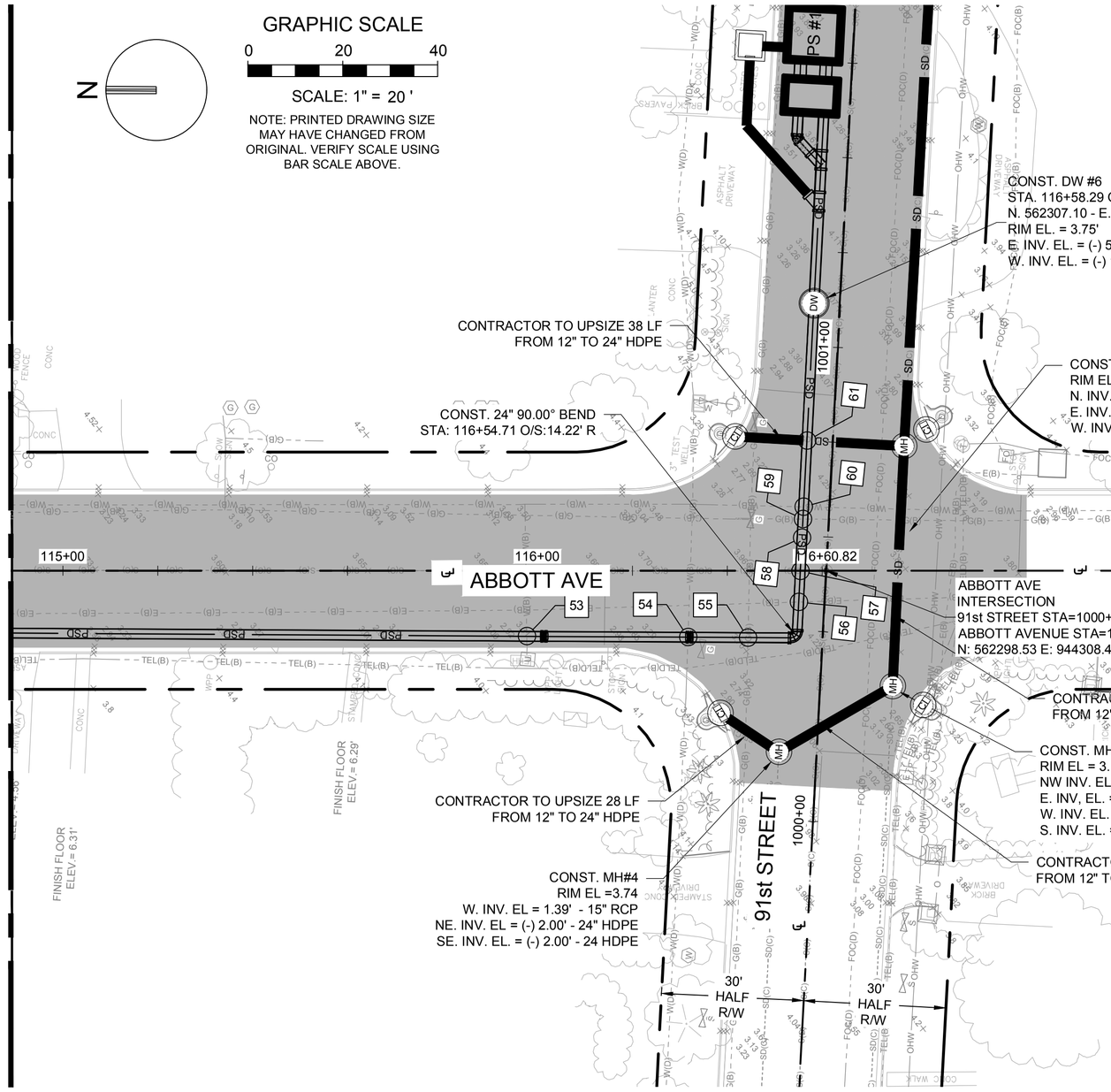
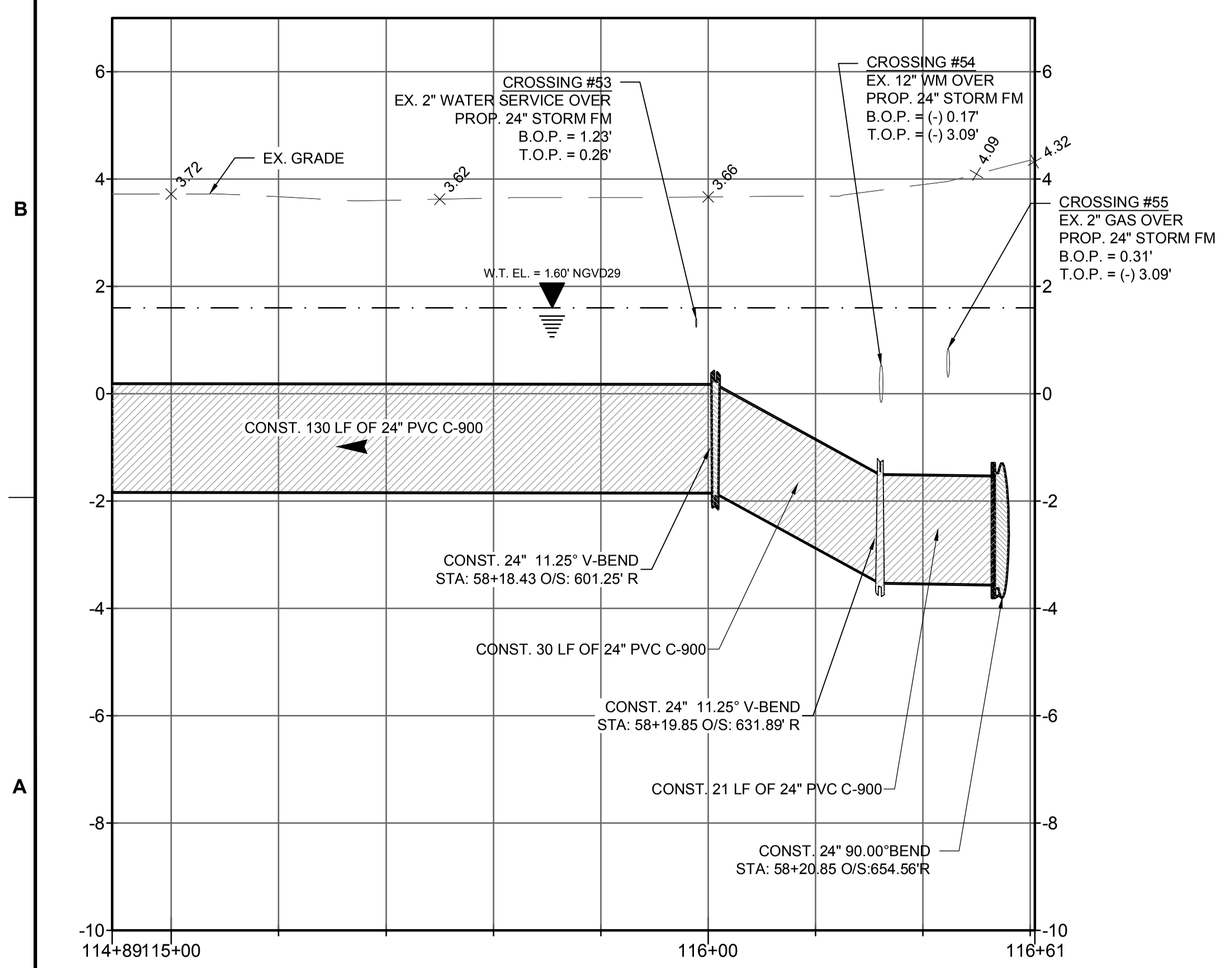
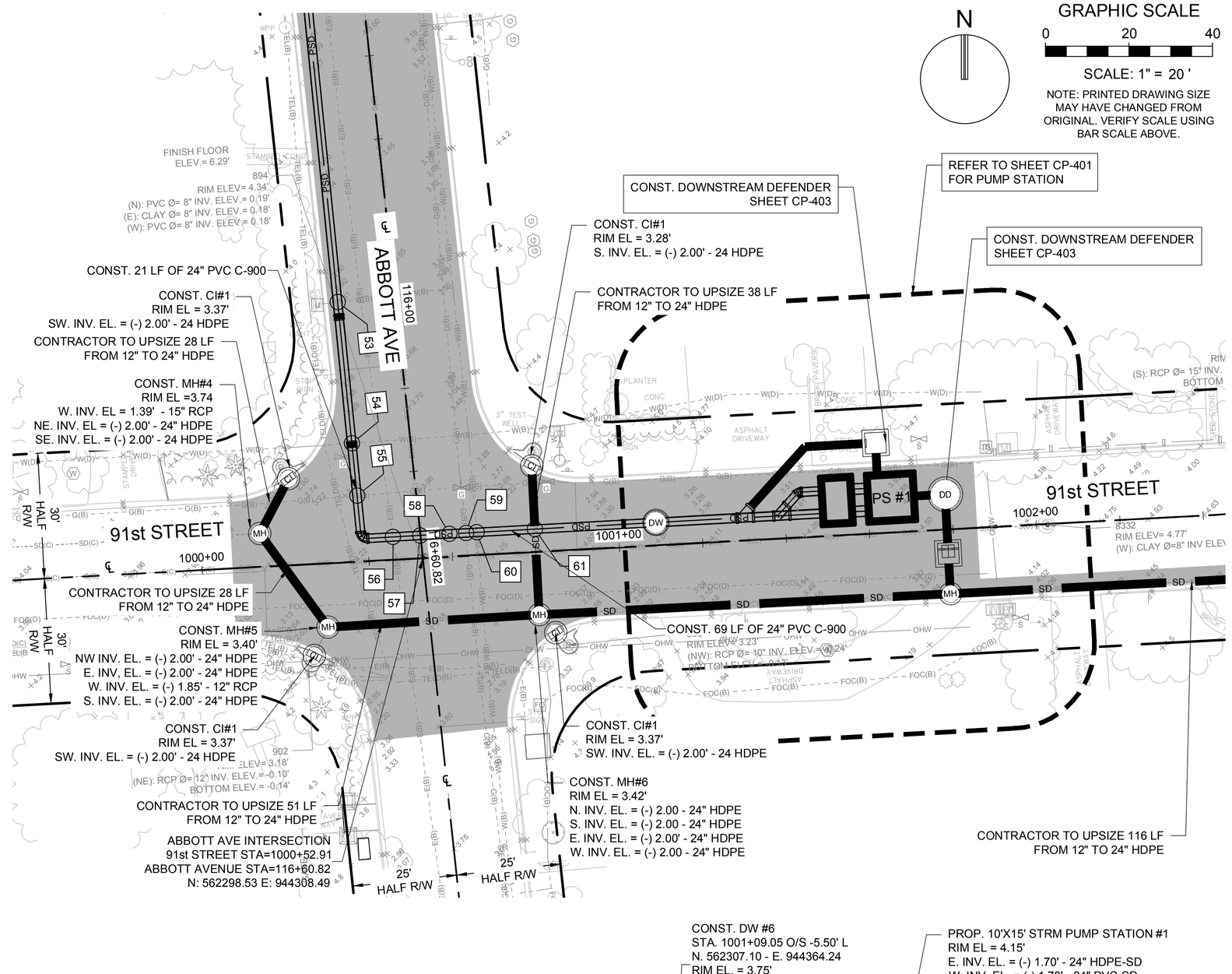
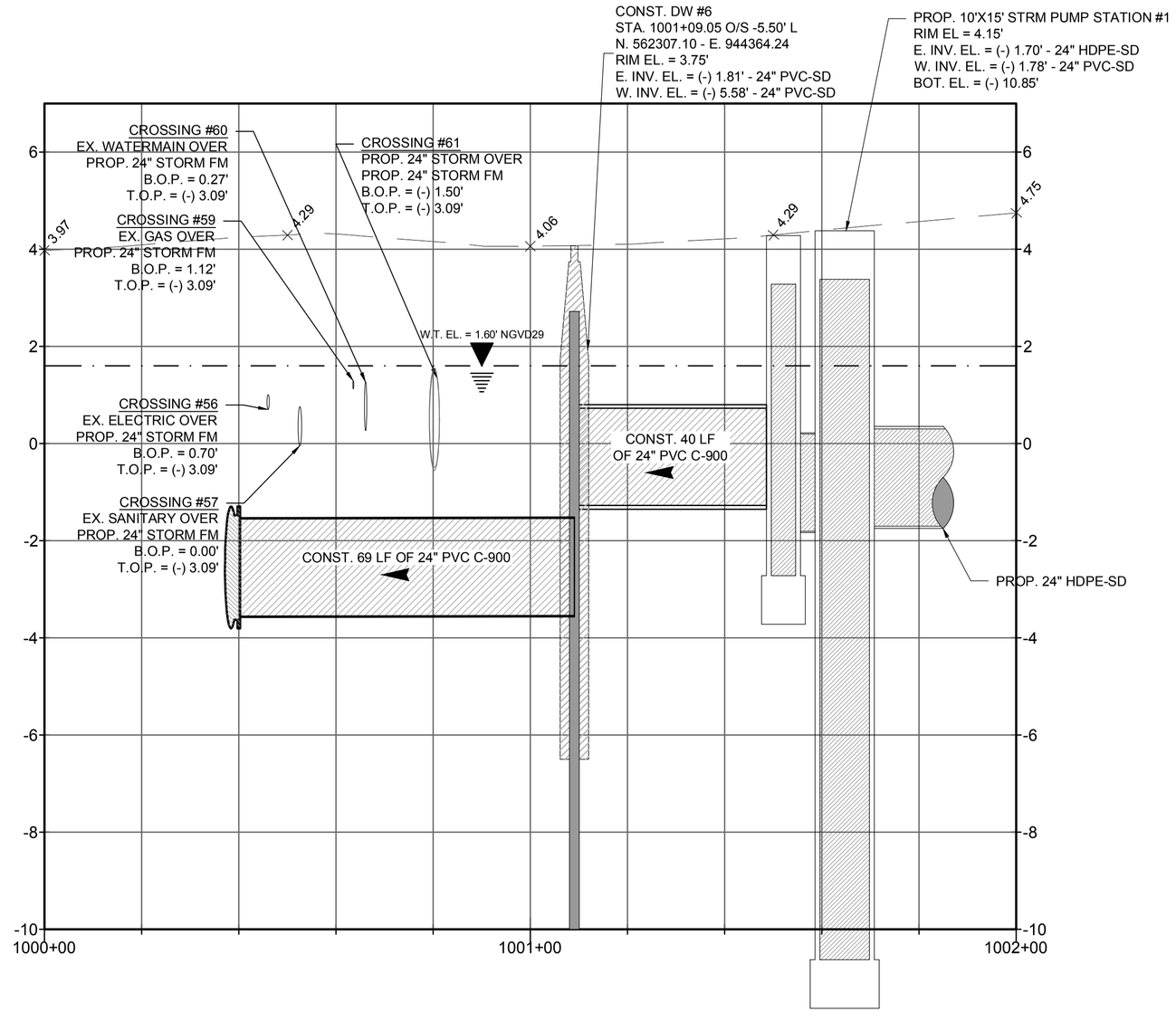
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS









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PROJECT

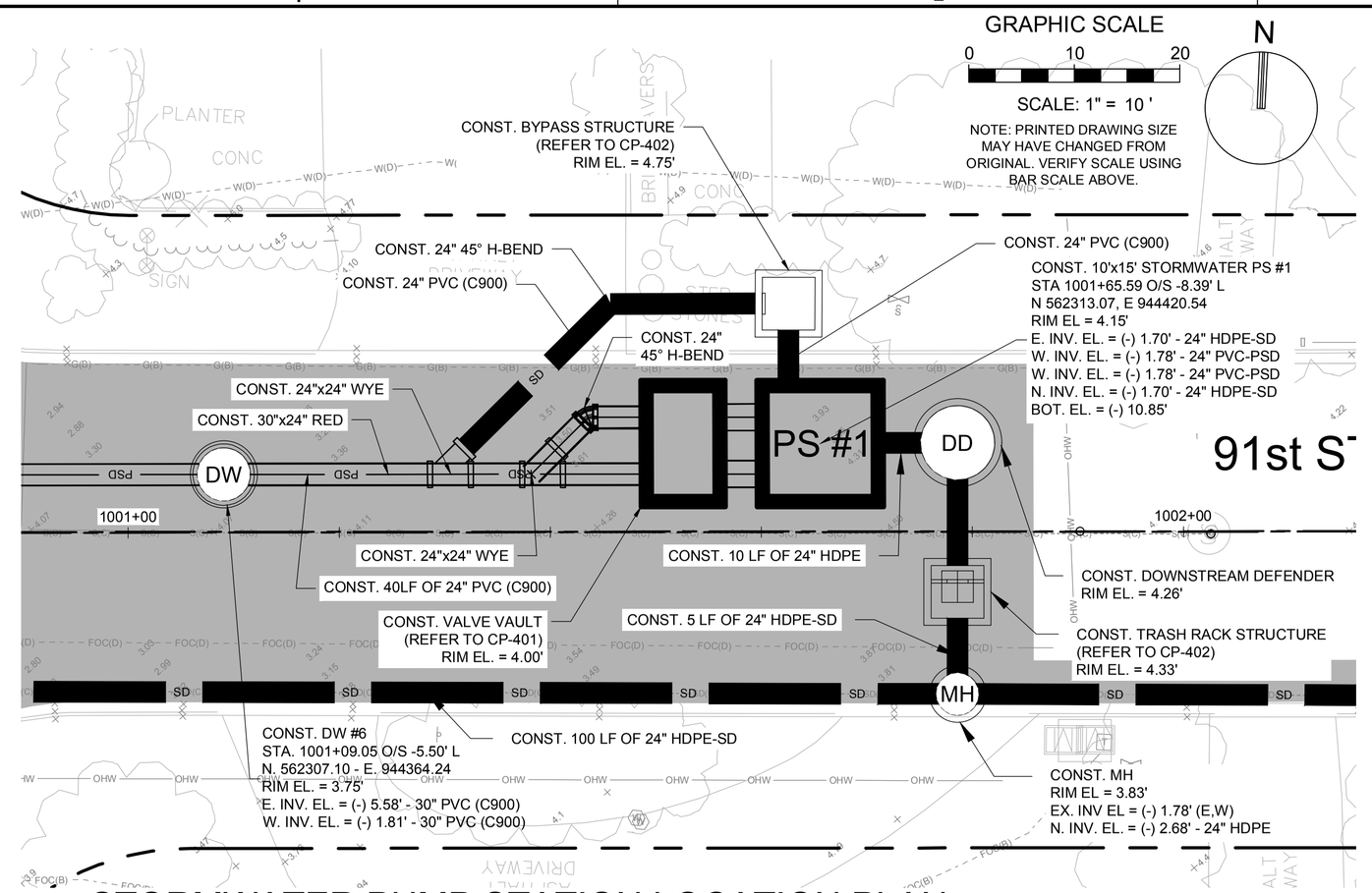
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

DRAINAGE PLAN - 91ST STREET

SHEET NUMBER	CP-106
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



1 STORMWATER PUMP STATION LOCATION PLAN

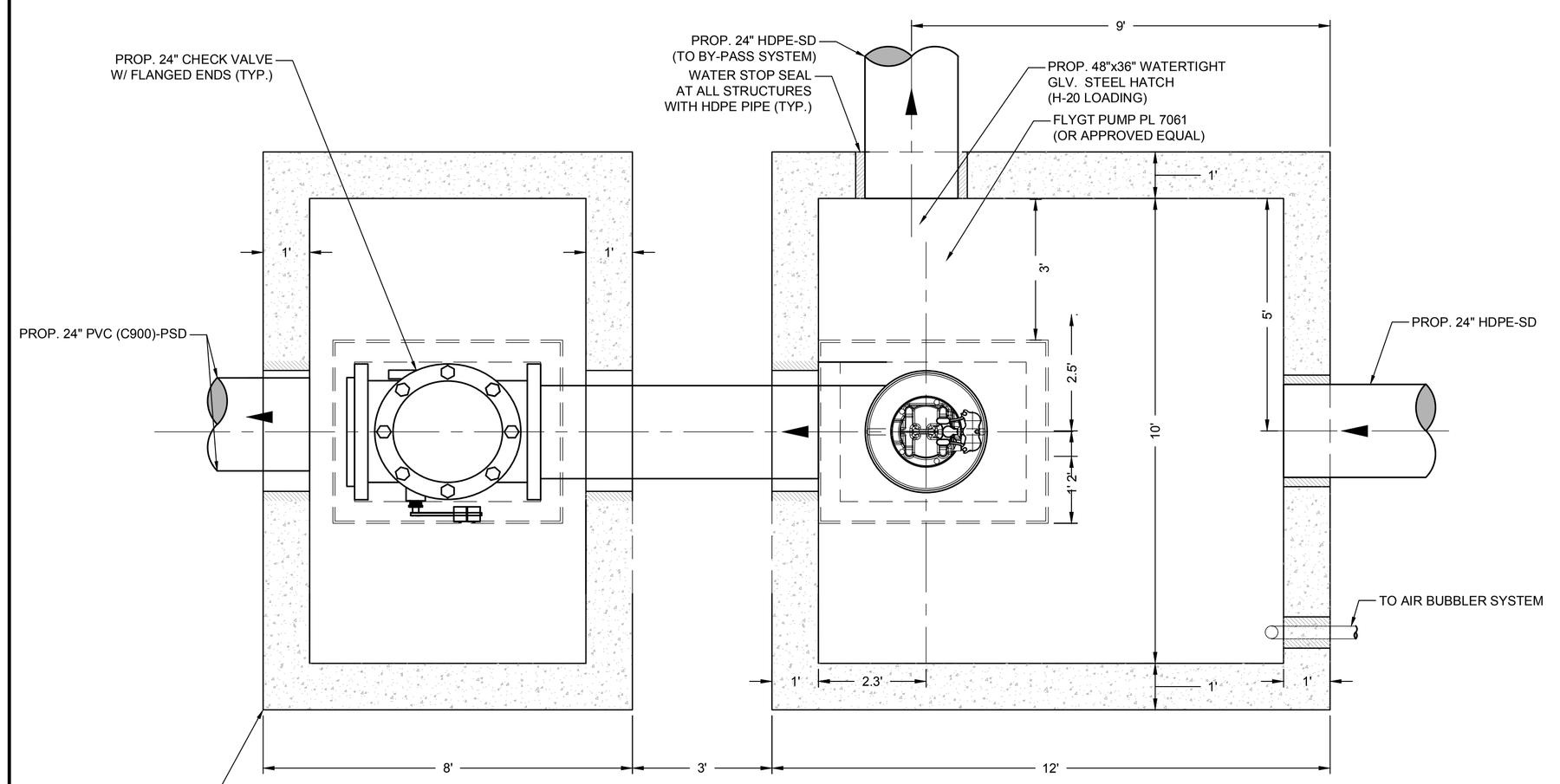
SCALE: 1"=10'

NOTES:

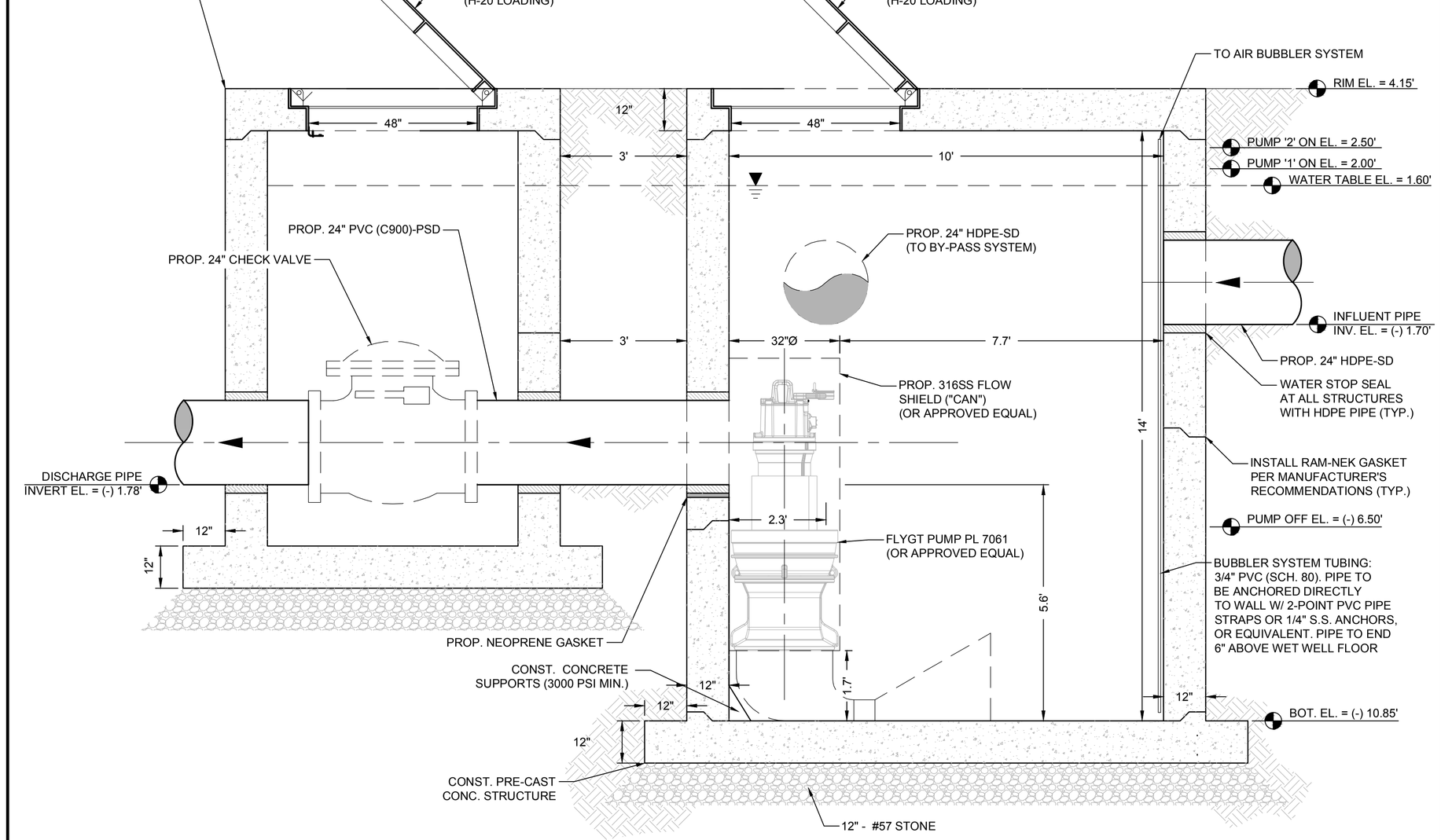
1. ALL ELEVATIONS ARE REFERENCING THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD).
2. ALL CONSTRUCTION SHALL CONFORM TO THE TOWN OF SURFSIDE AND MIAMI-DADE COUNTY WATER & SEWER UTILITY DEPARTMENT STANDARDS AND FLORIDA BUILDING CODE, LATEST REVISION.
3. CONCRETE SHALL HAVE NOT LESS THAN 3000 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS. PRE-CAST CONCRETE SHALL BE 4000 P.S.I. CLASS II MINIMUM.
4. REINFORCING STEEL SHALL CONFORM TO A.S.T.M. SPEC. A-615 AND SHALL BE DEFORMED ACCORDING TO A.S.T.M. SPEC. 305.
5. ALL PIPING SHALL BE DUCTILE IRON PER AWWA C151, 40 MIL, EPOXY LINED, FLANGED JOINTS UNLESS OTHERWISE NOTED. ALL FITTING SHALL BE DUCTILE IRON OR CAST IRON PER AWWA C110, FLANGED JOINTS UNLESS OTHERWISE NOTED.
6. ALL PIPE OPENINGS SHALL BE CAST AT TIME OF FABRICATION.
7. STORMWATER PUMPS SHALL BE THE FOLLOWING (OR APPROVED EQUIVALENT):
   PUMP: FLYGT SUBMERSIBLE, MODEL PL 7061/675 WITH P0675.000 35-45-6AA-W 140 HP MOTORS, 460 VOLTS, 3 PHASE, CAPABLE OF DELIVERING 11,100 GALLONS PER MINUTE AT A TOTAL DYNAMIC HEAD OF 33.3 FEET TDH.
8. OPENINGS AROUND PIPES SHALL BE SEALED WITH EMBECO MORTAR.
9. ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM WITHIN THE LIMITS OF CONSTRUCTION.
10. SHOP DRAWING FOR COMPLETE LIFT STATION SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL AND THEN SUBMITTED TO THE TOWN OF SURFSIDE UTILITY DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO DELIVERY TO SITE.
11. CONTRACTOR SHALL ENSURE NO FLOATATION OF WET WELL DURING CONSTRUCTION.
12. CHECK VALVE SHALL BE KENNEDY, IRON BODY, BRONZE MOUNTED, SWING CHECK, LEVER & WEIGHT, OR APPROVED EQUAL.
13. PIPE COUPLING SHALL BE CAST IRON, DRESSER STYLE 127 OR APPROVED EQUAL.
14. SIX (6) COPIES OF THE OPERATIONAL AND MAINTENANCE MANUAL AND COPIES OF ELECTRICAL CONTROL PANEL SCHEMATIC, IN 24"X36" FORMAT TOGETHER WITH A PDF DOCUMENT, SHALL BE SUBMITTED TO THE TOWN OF SURFSIDE.
15. ALL FITTINGS INSIDE WETWELL AND VALVE PIT SHALL BE FLANGED, AND ALL HARDWARE INSIDE WETWELL SHALL BE STAINLESS STEEL # 316.
16. ELECTRICAL CONTROL PANEL SHALL BE PROVIDED WITH A UL LABEL, AND BE MANUFACTURED BY A UL 508 MANUFACTURER.
17. A BAKELITE PLAQUE SHALL BE PROVIDED, NOT SMALLER THAN 60 SQUARE INCHES, WITH WHITE ENGRAVED LETTERS ON A RED BACKGROUND, WITH THE FOLLOWING NOTATIONS:
    TOWN OF SURFSIDE, FLORIDA
    STORMWATER PUMP STATION
    PLEASE REPORT RED FLASHING ALARM LIGHT
    CALL TELEPHONE NO. 305-861-4863
    TO REPORT POLLUTION CALL MDC-DERM
18. MOTOR STARTERS, CIRCUIT BREAKERS AND ELECTRICAL CONTROL DEVICES SHALL BE SQUARE-D #8536 AND SHALL BE SIZED PER N.E.C. CODE (2002).
19. ELECTRICAL PANEL MUST HAVE A STORAGE COMPARTMENT INSIDE PANEL DOOR FOR OPERATIONAL AND MAINTENANCE MANUAL.
20. ELECTRICAL SYSTEM SHALL BE PROTECTED BY A LIGHTNING ARRESTOR AND SURGE CAPACITOR.
21. POWER TOOL OUTLET TO BE MOUNTED IN DEAD FRONT AND MUST BE A G.F.I. RECEPTACLE.
22. HIGH-LEVEL ALARM LIGHT TO BE WIRED SEPARATE FROM CONTROL WIRING AND BE CIRCUIT BREAKER PROTECTED. THE THREE (3) FLASHING ALARM LIGHTS SHALL BE MANUFACTURED BY INGRAM PRODUCTS PART NO. LX40F WITH LEXAN ALARM GLOBE (RED - HIGH WATER ALARM, YELLOW/AMBER - AUXILARY POWER, GREEN - FP&L POWER) WITH L.E.D. LAMP OF EQUIVALENT WATTAGE.
23. SEAL OFFS TO BE PROVIDED ON ALL ELECTRICAL CONDUITS ENTERING CONTROL PANEL FROM WET WELL TYPE ES SEALING HUBS.
24. PROVIDE TWO (2) HOUR METERS.
25. SELECTOR SWITCHES SHALL BE SQARE-D 9001-KS43BH1 TO BE PROVIDED. ROUND TYPE 120V CRAMER 635G TO BE PROVIDED.
26. PILOT LIGHTS SHALL BE SQUARE-D 9001-KP38R9.
27. LIGHTNING ARRESTOR SHALL BE GENERAL ELECTRIC.
28. SURGE ARRESTOR SHALL BE GENERAL ELECTRIC.
29. CUT OFF LIFTING HOOKS BELOW SLABS AND GROUT HOLES FLUSH.
30. BY AIR FLOW ROTAMETER SHALL BE SCHURTLE AND KOERTING MODEL 20-7010V, OR EQUIVALENT.
31. ACCESS HATCH, FRAMES, AND COVERS SHALL BE HEAVY-DUTY ALUMINUM W. STAINLESS STEEL HINGES AND BOLTS, CAPABLE TO RESIST AASHTO H-20-44 WHEEL LOAD PER AASHOTO M306. HATCHES SHALL BE WATERTIGHT AND EQUIPPED WITH SPRING LOADED COVERS FOR EASY OPENING.

NOTES:

1. ALL UNPROTECTED STEEL SHALL BE FACTORY COATED WITH ACRYLIC DISPERSION ZINC PHOSPHATE PRIMER AND NOT LESS THAN TWO (2) 5-MIL COATS OF POLYESTER RESIN PAINT.
2. DESIGN, FABRICATION AND ERECTION OF PRECAST CONCRETE SHALL BE IN ACCORDANCE WITH ACI 318-99 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE AND PCI DESIGN NOTEBOOK. DESIGN OF CAST-IN-PLACE CONCRETE SHALL BE IN ACCORDANCE WITH ACI 319-99
3. THE TOP SLAB OF STRUCTURE SHALL BE DESIGNED TO CARRY TRAFFIC LOADS (IS 20 LOADING)
4. SOIL BEARING PRESSURE UNDER STRUCTURE ASSUMED TO BE AT MINIMUM 2000 PSF. PRIOR TO INSTALLATION OF DRAINAGE STRUCTURE THE SOIL BEARING CAPACITY OF THE FOUNDATION MUST BE CONFIRMED BY THE CONTRACTOR, THROUGH A CERTIFIED GEOTECHNICAL LABORATORY.
5. CONCRETE SHALL BE NORMAL WEIGHT, AND SHALL ATTAIN A 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI AND SHALL MEET THE REQUIREMENT OF ASTM C478. CONCRETE COVER FOR REINFORCEMENTS SHALL BE 2-IN EXCEPT FOOTING BOTTOM BARS SHALL HAVE 3" COVER.
6. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, AND SHALL BE U.S. MANUFACTURE.
7. GROUT TO SEAL THE PIPE, TOP SLABS, AND LEVELING COURSE SHALL BE EPOXY TYPE AND OF SUCH MIX THAT SHRINKAGE WILL NOT CAUSE LEAKAGE INTO OR OUT OF THE UNIT. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR GROUT FOR ENGINEER REVIEW AND APPROVAL.
8. ALL PVC PIPE CONNECTIONS TO BE MADE USING FLEXIBLE BOOT ADAPTER AND EPOXY GROUT SEAL. ALL RCP PIPE CONNECTIONS TO BE MADE USING EPOXY GROUT SEAL ONLY. (TYPICAL FOR ALL STRUCTURES)
9. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, SIGNED AND SEALED BY A FLORIDA LICENSED ENGINEER, FOR PRECAST STRUCTURES TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE CONSTRUCTION OF STRUCTURE.
10. ALL MANHOLE RING AND COVERS SHALL HAVE THE WORD "STORM SEWER" CAST ON COVER.
11. CONTRACTOR TO PROVIDE 18" SUMP MIN. WITHIN ALL STRUCTURE.



PLAN VIEW



PROFILE VIEW

ALL ELEVATIONS ARE BASED ON NGVD1929

KEITH
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PH: (305) 667-5474
Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

PROJECT

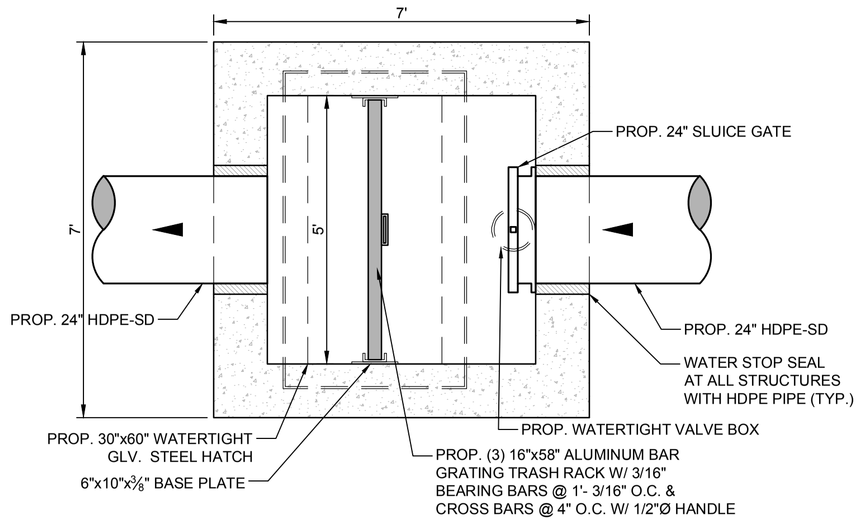
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

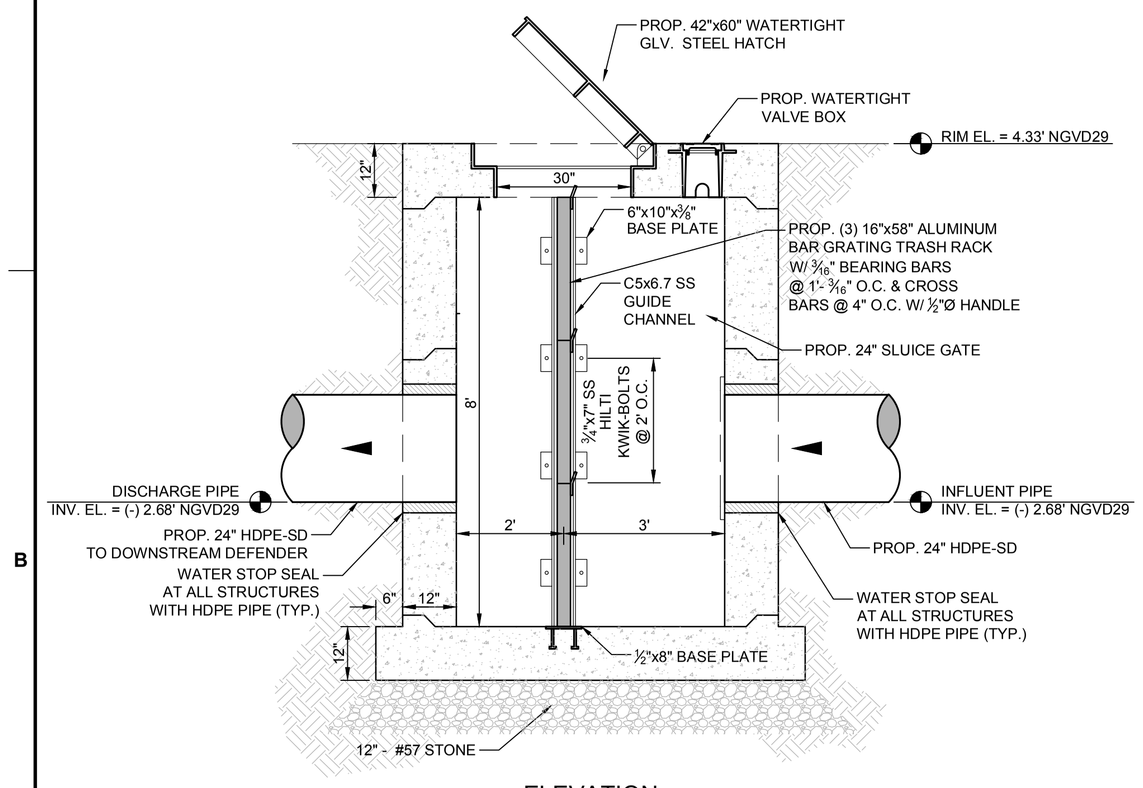
PUMP STATION PLAN - 91ST STREET

SHEET NUMBER	CP-401
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



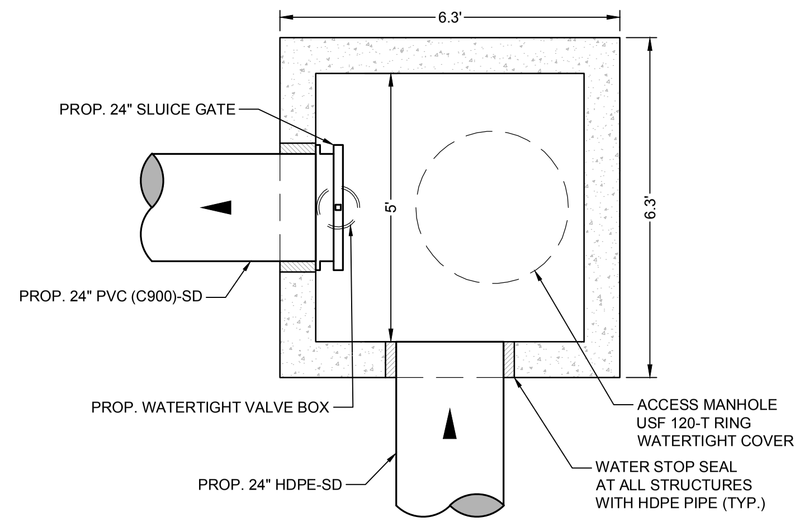
PLAN



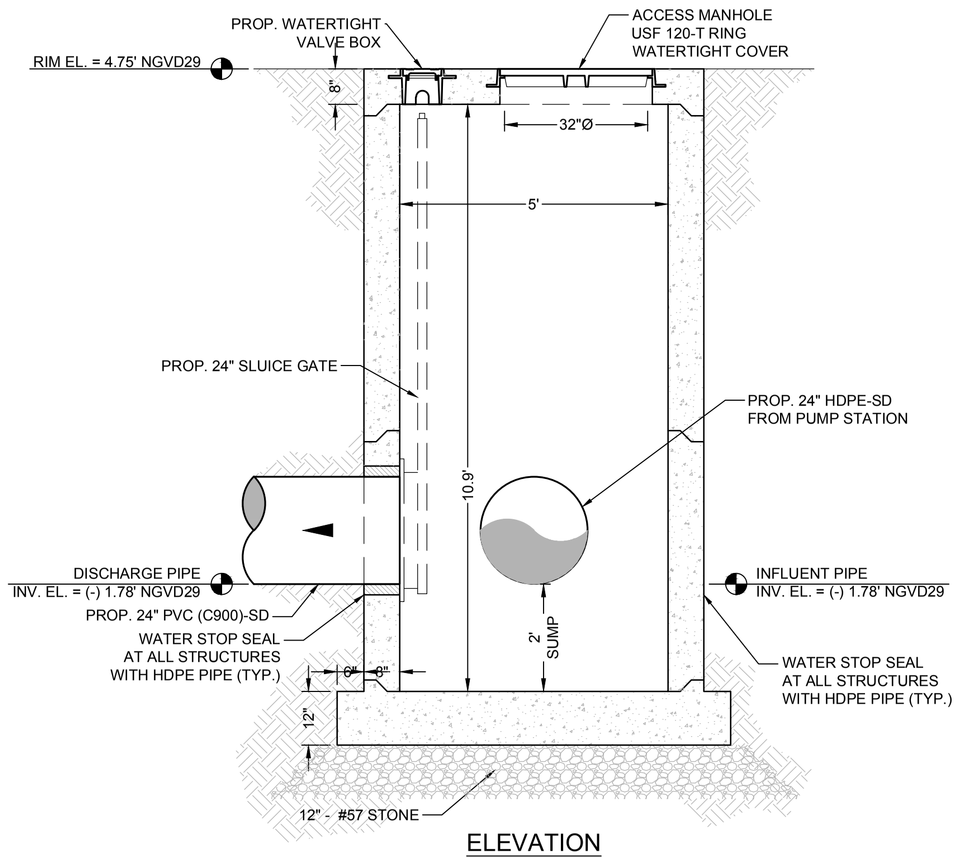
ELEVATION

1 TRASH RACK STRUCTURE DETAIL (91ST STREET)

NOT TO SCALE



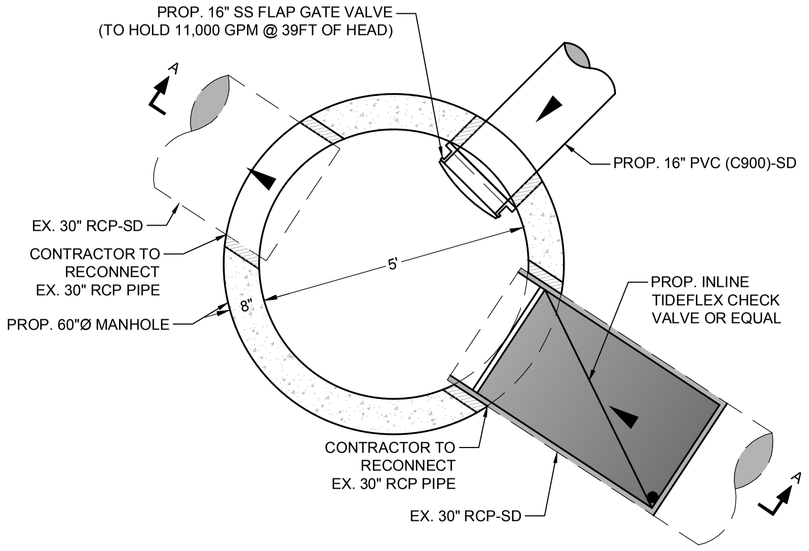
PLAN



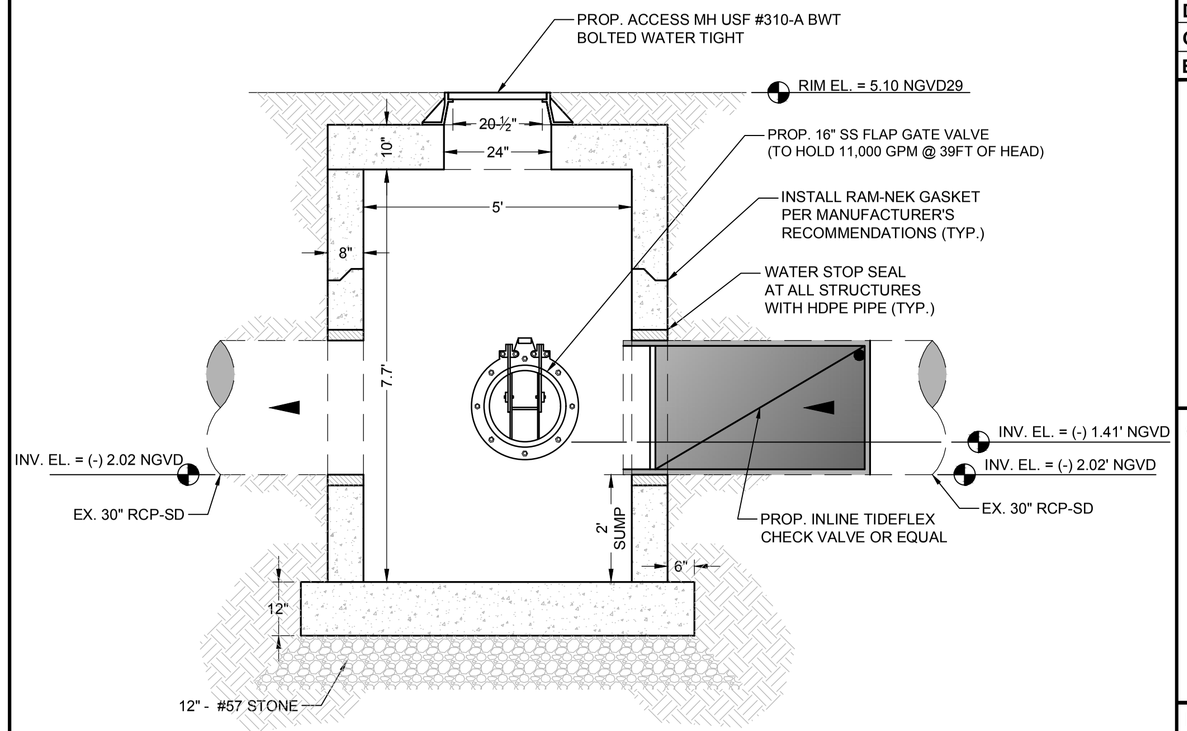
ELEVATION

2 BY-PASS STRUCTURE #1 DETAIL (91ST STREET)

NOT TO SCALE



PLAN VIEW



ELEVATION

3 CONTROL STRUCTURE #2 (91st STREET)

NOT TO SCALE

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REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

PROJECT

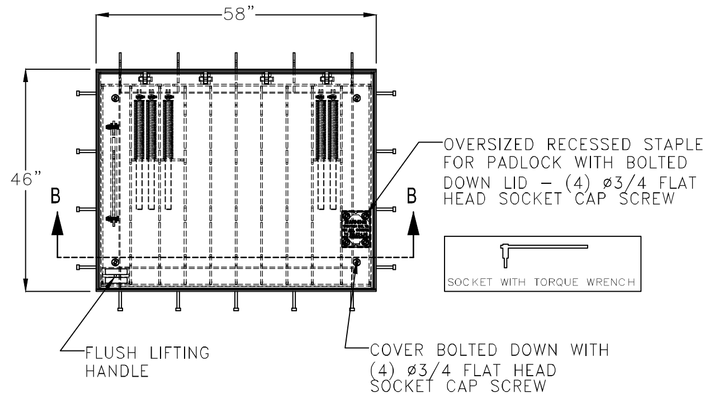
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

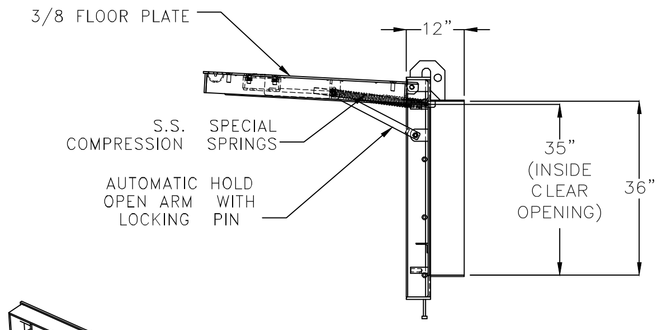
SHEET TITLE

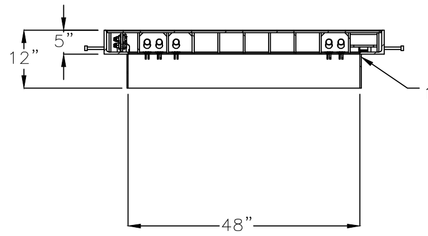
PUMP STATION DETAILS - 91ST STREET

SHEET NUMBER	CP-402
PROJECT NUMBER	11494.01

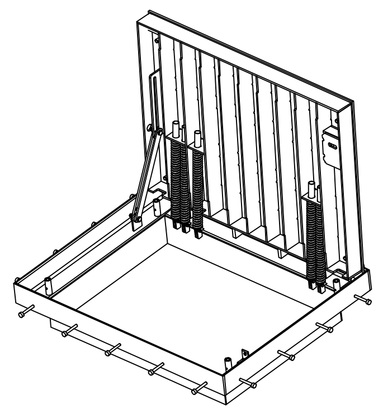
STATUS: CONSTRUCTION DOCUMENTS







SECTION B-B



NOTES:
1–MATERIAL: STEEL A36, HOT DIP GALVANIZED AFTER FABRICATION
2– AASHTO HL–93 WHEEL LOADING DESIGNED FOR A MAXIMUM WHEEL LOAD OF 16000–LBS PLUS 33% IMPACT FACTOR. (EQUIVALENT TO H–20)
3– IT IS ESSENTIAL THAT ALL BOLTS ARE IN PLACE WHENEVER COVER IS EXPOSED TO TRAFFIC
"LOCTITE 242 BLUE", MUST BE APPLIED TO ALL BOLTS AFTER EACH USE.
4–SUITABLE FOR USE IN TRAFFIC PER ASTM C1802–14 LOAD LEVEL 7
5– APPROXIMATE WEIGHT:1043.86 lbs.

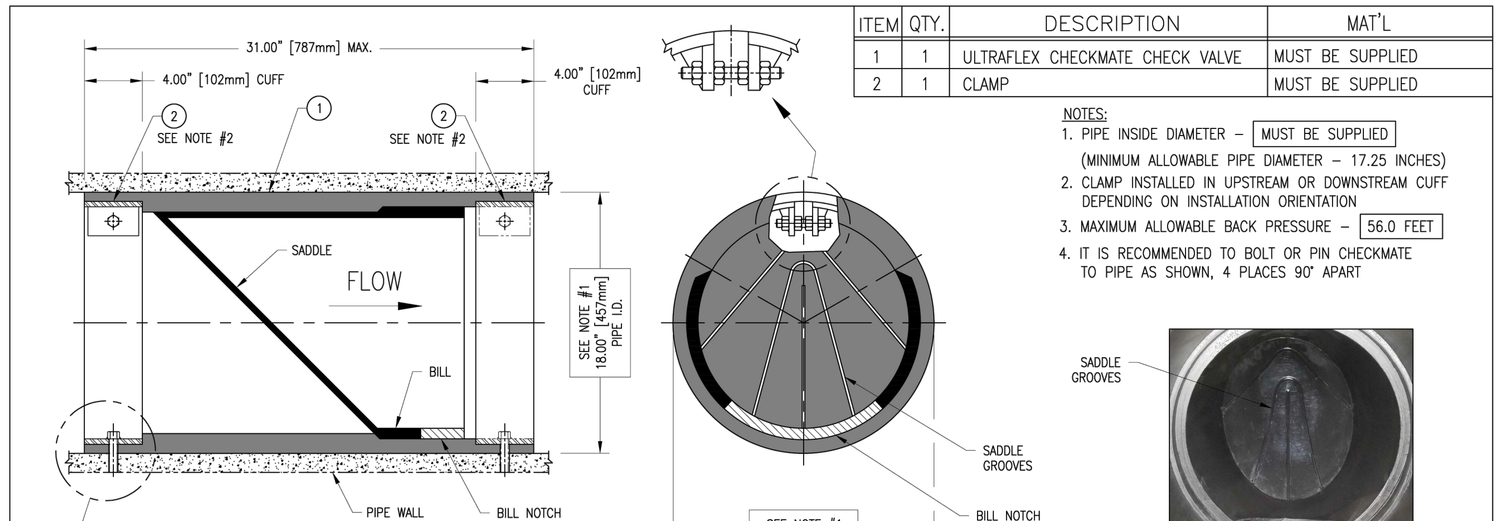
DIMENSIONS IN INCHES AND TOLERANCES PER ASME Y14.5M

TOLERANCES UNLESS OTHERWISE SPECIFIED:
<10° = ± 1/8
>10° = ± 1/4

U.S.F. FABRICATION INC.
HIALEAH, FLORIDA

HATCH DT93AHS 36X48 A1G2K12n7
GENERAL ARRANGEMENT

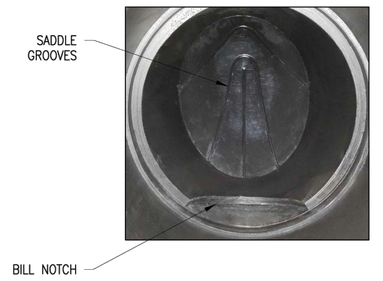
DRAWN BY:	SCALE: 1:20	SHEET 1 OF 2	DATE: 07/27/22
APPD BY: SBOB	DWG NO. 1000210054	SIZE: B	0



PIN PER NOTE #4
RECOMMENDED PINNING CONFIGURATION
(SUPPLIED BY CUSTOMER) (SEE I.O.M.)
NOT TO SCALE

ITEM	QTY.	DESCRIPTION	MAT'L
1	1	ULTRAFLEX CHECKMATE CHECK VALVE	MUST BE SUPPLIED
2	1	CLAMP	MUST BE SUPPLIED

NOTES:
1. PIPE INSIDE DIAMETER – MUST BE SUPPLIED (MINIMUM ALLOWABLE PIPE DIAMETER – 17.25 INCHES)
2. CLAMP INSTALLED IN UPSTREAM OR DOWNSTREAM CUFF DEPENDING ON INSTALLATION ORIENTATION
3. MAXIMUM ALLOWABLE BACK PRESSURE – 56.0 FEET
4. IT IS RECOMMENDED TO BOLT OR PIN CHECKMATE TO PIPE AS SHOWN, 4 PLACES 90° APART



PRELIMINARY DRAWING
NOT FOR APPROVAL PURPOSES

CUSTOMER: XXX
ORDER No: XXX

* PATENT PENDING *

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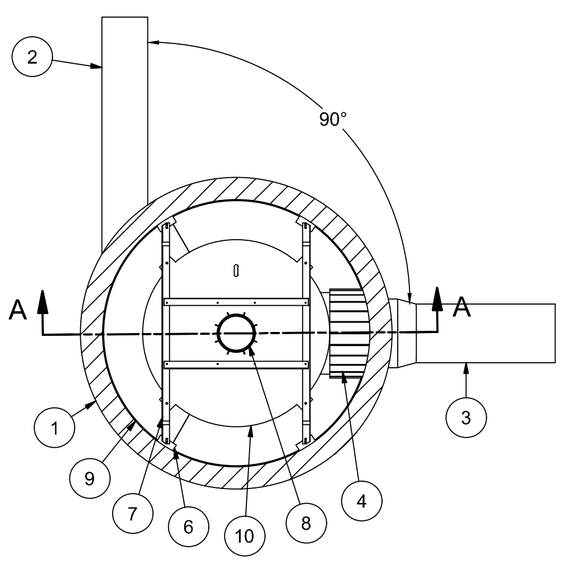
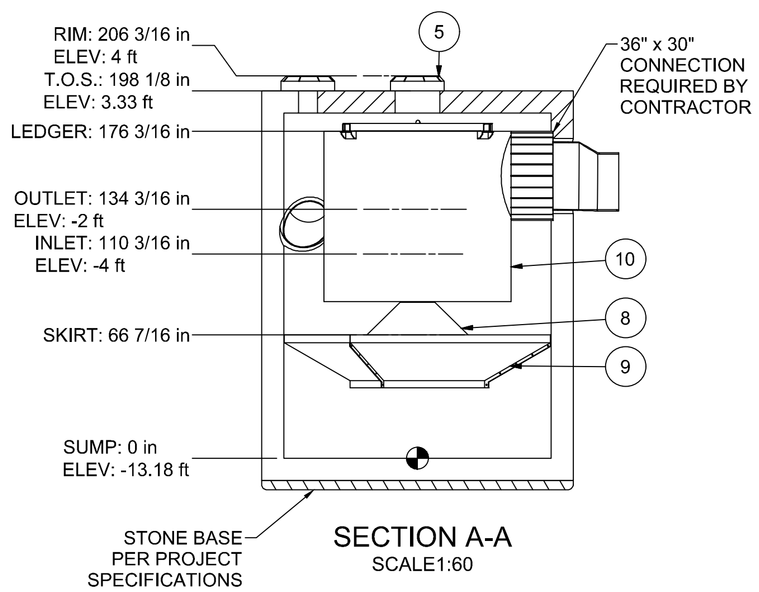
OPPORTUNITY No: XXXXX | SALES ORDER No: TXX–XXXX

Tideflex® Technologies
A Division of Red Valve Company, Inc.
750 HOLIDAY DR. STE.400
PITTSBURGH, PA. 15220
info@redvalve.com
412.279.0044
fax 412.279.5410

TT PRODUCT: 18" ULTRAFLEX CHECKMATE CHECK VALVE
TT PART No: CMCBUF–180–APPROVAL
DR. BY: TLM DATE: 2–9–17 CHKD. BY: DATE:
CAD SCALE: FULL
PLOT SCALE: 1 = 1
DWG No: TTS–XXXX REV —

PIPE DETAILS					
PIPE	MATERIAL	LENGTH	INV UP	INV DOWN	SLOPE
INLET	PVC	20.0 ft	-2.00 ft	-4.00 ft	10.00
OUTLET	PVC	13.0 ft	-2.00 ft	-2.10 ft	0.77





SECTION A-A
SCALE1:60

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.

2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING DOWNSTREAM DEFENDER MANHOLE.

3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

4. CONTRACTOR IS RESPONSIBLE FOR MATERIALS AND LABOR TO BRING CASTINGS TO FINISHED GRADE

PARTS LIST		
ITEM	DESCRIPTION	SIZE (in)
1	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)	144
2	INLET PIPE (BY OTHERS)	24
3	OUTLET PIPE (BY OTHERS)	30
4	PIPE COUPLING (BY OTHERS)	
5	FRAME AND COVER	24
6	LEDGER ANGLE	
7	SUPPORT FRAME	
8	CENTER SHAFT AND CONE	
9	BENCHING SKIRT	
10	DIP PLATE	

DD SIZE	4'	6'	8'	10'	12'
OUTLET STUB ID	12"	18"	24"	30"	36"
OUTLET STUB OD	12.5"	18.7"	24.8"	36"	42"

EQUIPMENT PERFORMANCE
The stormwater treatment unit shall adhere to the hydraulic parameters given in the chart below and provide the removal efficiencies and storage capacities as follows:

1. Performance objectives: The unit shall be capable of treating the peak flow rate listed below.
2. Peak Hydraulic Capacity: 38.0 cfs (1076 l/s)
3. Sediment Storage Capacity: 14.70 cu. yd. (11.13 cu. m)
4. Continuous Oil Storage Capacity: 1770 gal. (6700 liters)
5. Sediment shall be stored in a zone that is isolated from the main flow path and protected from reintrainment by a benching skirt.

REVISION HISTORY			
REV	BY	DESCRIPTION	DATE
-	KSM	FIRST RELEASE	3/30/2022

PROJECTION

IF IN DOUBT ASK

DATE: 3/30/2022 | SCALE: 1:60
DRAWN BY: KSM | CHECKED BY: | APPROVED BY

Title:
12-ft DIAMETER
DOWNSTREAM DEFENDER

WQU - 92ND STREET
PUMP STATION - 91ST STREET
SURFSIDE, FL

Patent: www.hydro-int.com/patents

Hydro International®
hydro-int.com

WEIGHT: | MATERIAL:
STOCK NUMBER: 2
DRAWING NO.: 22_12_1161-12ftDD-2
SHEET SIZE: B | SHEET: 1 OF 3 | Rev: -

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PH: (305) 667-5474
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REVISIONS

NO.	DESCRIPTION	DATE

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ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
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CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT
TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

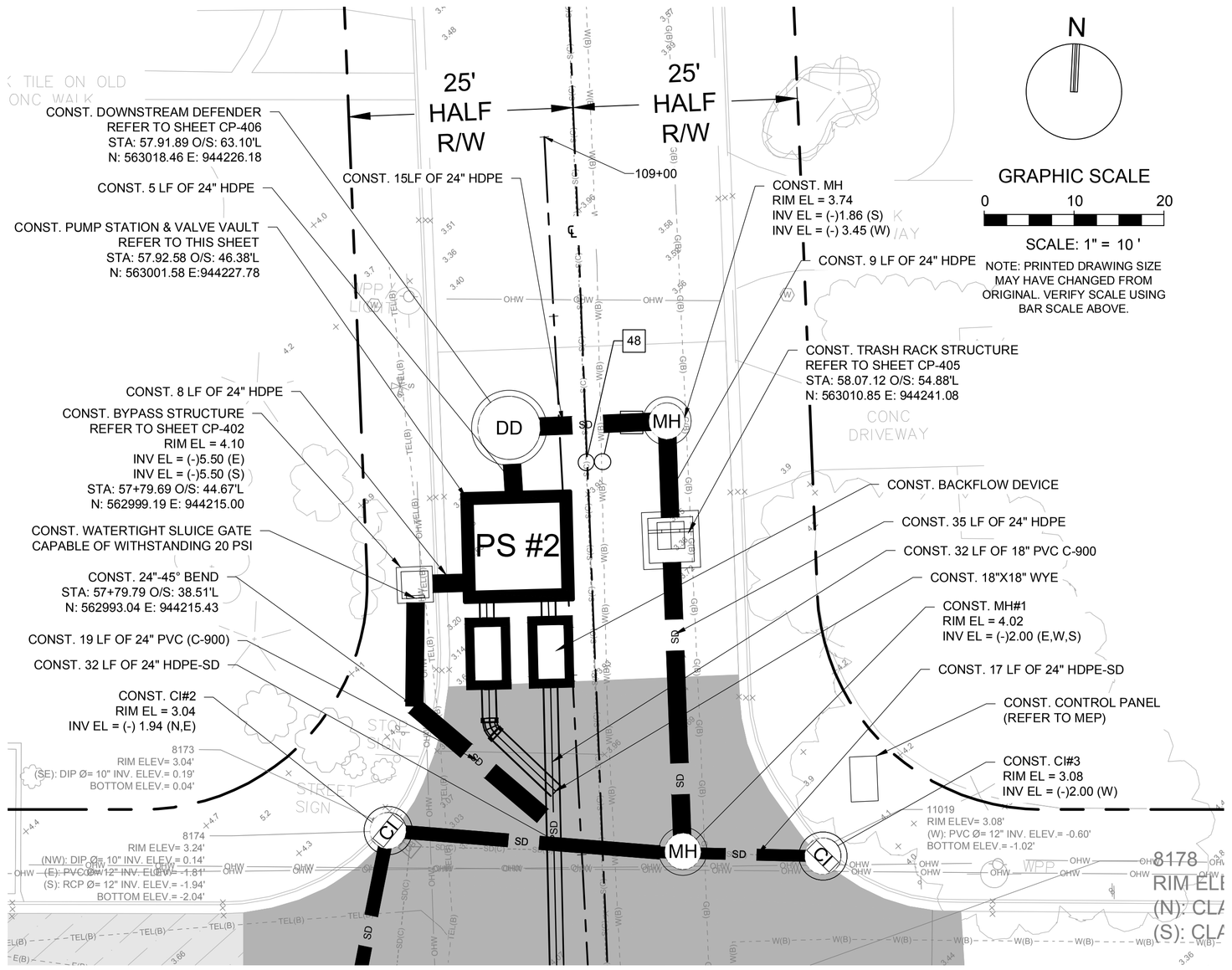
PROJECT
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE
PUMP STATION DETAILS - 91ST STREET

SHEET NUMBER **CP-403**

PROJECT NUMBER **11494.01**

STATUS: CONSTRUCTION DOCUMENTS



2 STORMWATER PUMP STATION #2 LOCATION PLAN

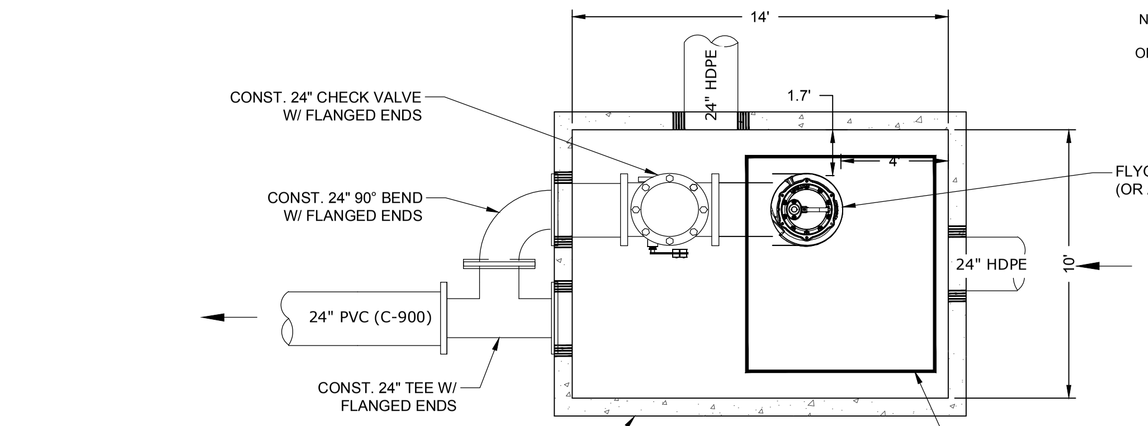
SCALE: 1"=10'

PIPE CROSSINGS:

45 EX. WATER OVER PROP. 24" STORM (TH18)
B.O.P. EL. = 0.37' (NFV)
T.O.P. EL. = (-)1.28' - (24" HDPE-SD)
CLEARANCE = 1' MINIMUM

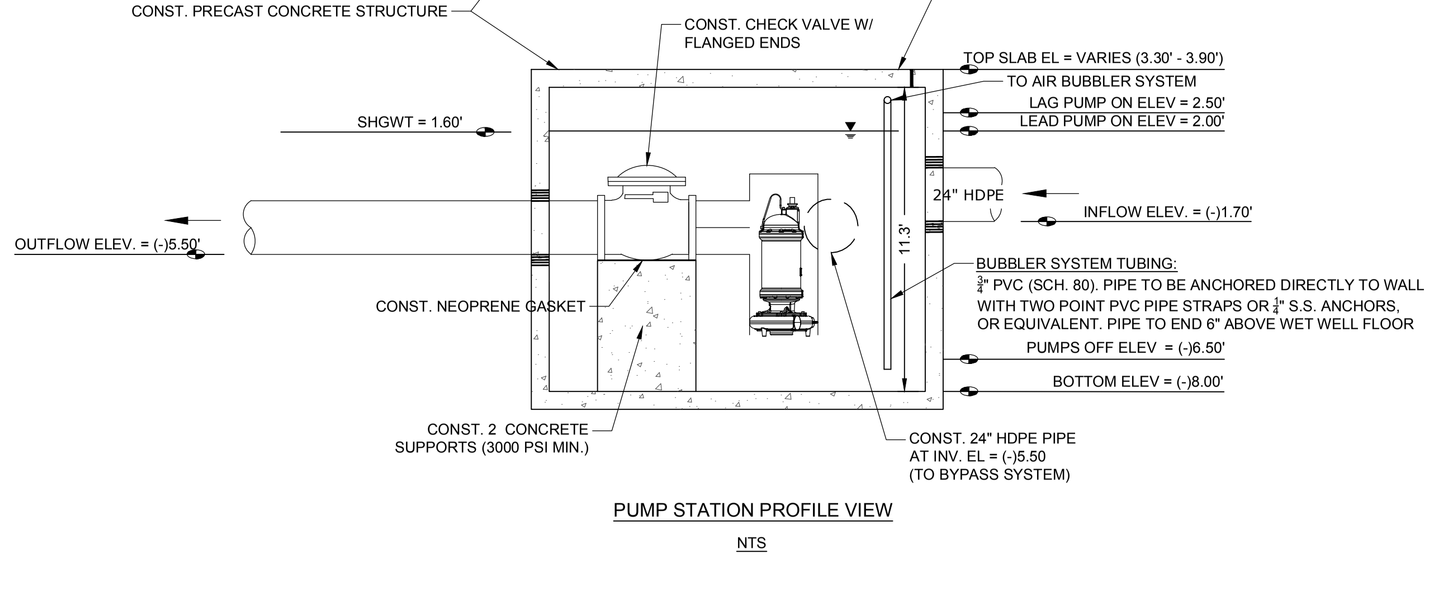
48 EX. 8" SAN. SEWER OVER PROP. 24" STORM.
B.O.P. EL. = (-)0.28' - (8" VCP-SAN.)
T.O.P. EL. = (-)1.28' - (24" HDPE-SD)
CLEARANCE = 1.00'

GRAPHIC SCALE
0 10 20
SCALE: 1" = 10 '
NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.
N



PUMP STATION PLAN VIEW

NTS



PUMP STATION PROFILE VIEW

NTS

1. ALL ELEVATIONS ARE REFERENCING THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD).
2. ALL CONSTRUCTION SHALL CONFORM TO THE TOWN OF SURFSIDE AND MIAMI-DADE COUNTY WATER & SEWER UTILITY DEPARTMENT STANDARDS AND FLORIDA BUILDING CODE, LATEST REVISION.
3. CONCRETE SHALL HAVE NOT LESS THAN 3000 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS. PRE-CAST CONCRETE SHALL BE 4000 P.S.I. CLASS II MINIMUM.
4. REINFORCING STEEL SHALL CONFORM TO A.S.T.M. SPEC. A-615 AND SHALL BE DEFORMED ACCORDING TO A.S.T.M. SPEC. 305.
5. ALL PIPING SHALL BE DUCTILE IRON PER AWWA C151, 40 MIL, EPOXY LINED, FLANGED JOINTS UNLESS OTHERWISE NOTED. ALL FITTING SHALL BE DUCTILE IRON OR CAST IRON PER AWWA C110, FLANGED JOINTS UNLESS OTHERWISE NOTED.
6. ALL PIPE OPENINGS SHALL BE CAST AT TIME OF FABRICATION.
7. STORMWATER PUMPS SHALL BE THE FOLLOWING (OR APPROVED EQUIVALENT):
   A. LAG PUMP: FLYGT SUBMERSIBLE, MODEL PL 7061/675 WITH P0675.000 35-45-6AA-W 140 HP MOTORS, 460 VOLTS, 3 PHASE, CAPABLE OF DELIVERING 11,100 GALLONS PER MINUTE AT A TOTAL DYNAMIC HEAD OF 33.3 FEET TDH.
   B. LEAD PUMP: FLYGT SUBMERSIBLE, MODEL NP 3202 WITH N3202.670 30-18-6AA-W 35 HP MOTORS, 460 VOLTS, 3 PHASE, CAPABLE OF DELIVERING 2,130 GALLONS PER MINUTE AT A TOTAL DYNAMIC HEAD OF 37.8 FEET TDH.
8. OPENINGS AROUND PIPES SHALL BE SEALED WITH EMBECO MORTAR.
9. ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM WITHIN THE LIMITS OF CONSTRUCTION.
10. SHOP DRAWING FOR COMPLETE LIFT STATION SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL AND THEN SUBMITTED TO THE TOWN OF SURFSIDE UTILITY DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO DELIVERY TO SITE.
11. CONTRACTOR SHALL ENSURE NO FLOATATION OF WET WELL DURING CONSTRUCTION.
12. CHECK VALVE SHALL BE KENNEDY, IRON BODY, BRONZE MOUNTED, SWING CHECK, LEVER & WEIGHT, OR APPROVED EQUAL.
13. PIPE COUPLING SHALL BE CAST IRON, DRESSER STYLE 127 OR APPROVED EQUAL.
14. SIX (6) COPIES OF THE OPERATIONAL AND MAINTENANCE MANUAL AND COPIES OF ELECTRICAL CONTROL PANEL SCHEMATIC, IN 24"X36" FORMAT TOGETHER WITH A PDF DOCUMENT, SHALL BE SUBMITTED TO THE TOWN OF SURFSIDE.
15. ALL FITTINGS INSIDE WETWELL AND VALVE PIT SHALL BE FLANGED, AND ALL HARDWARE INSIDE WETWELL SHALL BE STAINLESS STEEL # 316.
16. ELECTRICAL CONTROL PANEL SHALL BE PROVIDED WITH A UL LABEL, AND BE MANUFACTURED BY A UL 508 MANUFACTURER.
17. A BAKELITE PLAQUE SHALL BE PROVIDED, NOT SMALLER THAN 60 SQUARE INCHES, WITH WHITE ENGRAVED LETTERS ON A RED BACKGROUND, WITH THE FOLLOWING NOTATIONS:

    TOWN OF SURFSIDE, FLORIDA
    STORMWATER PUMP STATION
    PLEASE REPORT RED FLASHING ALARM LIGHT
    CALL TELEPHONE NO. 305-861-4863
    TO REPORT POLLUTION CALL MDC-DERM

18. MOTOR STARTERS, CIRCUIT BREAKERS AND ELECTRICAL CONTROL DEVICES SHALL BE SQUARE-D #8536 AND SHALL BE SIZED PER N.E.C. CODE (2002).
19. ELECTRICAL PANEL MUST HAVE A STORAGE COMPARTMENT INSIDE PANEL DOOR FOR OPERATIONAL AND MAINTENANCE MANUAL.
20. ELECTRICAL SYSTEM SHALL BE PROTECTED BY A LIGHTNING ARRESTOR AND SURGE CAPACITOR.
21. POWER TOOL OUTLET TO BE MOUNTED IN DEAD FRONT AND MUST BE A G.F.I. RECEPTACLE.
22. HIGH-LEVEL ALARM LIGHT TO BE WIRED SEPARATE FROM CONTROL WIRING AND BE CIRCUIT BREAKER PROTECTED. THE THREE (3) FLASHING ALARM LIGHTS SHALL BE MANUFACTURED BY INGRAM PRODUCTS PART No. LX40F WITH LEXAN ALARM GLOBE (RED - HIGH WATER ALARM, YELLOW/AMBER - AUXILARY POWER, GREEN - FP&L POWER) WITH L.E.D. LAMP OF EQUIVALENT WATTAGE.
23. SEAL OFFS TO BE PROVIDED ON ALL ELECTRICAL CONDUITS ENTERING CONTROL PANEL FROM WET WELL TYPE ES SEALING HUBS.
24. PROVIDE TWO (2) HOUR METERS.
25. SELECTOR SWITCHES SHALL BE SQARE-D 9001-KS43BH1 TO BE PROVIDED. ROUND TYPE 120V CRAMER 635G TO BE PROVIDED.
26. PILOT LIGHTS SHALL BE SQUARE-D 9001-KP38R9.
27. LIGHTNING ARRESTOR SHALL BE GENERAL ELECTRIC.
28. SURGE ARRESTOR SHALL BE GENERAL ELECTRIC.
29. WET WELL AND VALVE BOX SHALL BE COATED OUTSIDE WITH TWO COATS (ONE BLACK, ONE RED) OF KOPPERS BITUMASTIC No. 300 M , OR EQUIVALENT. THE INSIDE OF THE WET WELL WILL RECIEVE A MAINSTAY COATING. THE INSIDE OF THE VALVE BOX SHALL BE COATED WITH TWO COATS (ONE BLACK, ONE RED) OF KOPPERS BITUMASTIC 300-M, OR EQUIVALENT.
30. CUT OFF LIFTING HOOKS BELOW SLABS AND GROUT HOLES FLUSH.
31. BY AIR FLOW ROTAMETER SHALL BE SCHURTLE AND KOERTING MODEL 20-7010V, OR EQUIVALENT.
32. ACCESS HATCH, FRAMES, AND COVERS SHALL BE HEAVY-DUTY ALUMINUM W. STAINLESS STEEL HINGES AND BOLTS, CAPABLE TO RESIST AASHTO H-20-44 WHEEL LOAD PER AASHOTO M306. HATCHES SHALL BE WATERTIGHT AND EQUIPPED WITH SPRING LOADED COVERS FOR EASY OPENING.

~~ALL ELEVATIONS ARE BASED ON NGVD1929~~

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PH: (305) 667-5474
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Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

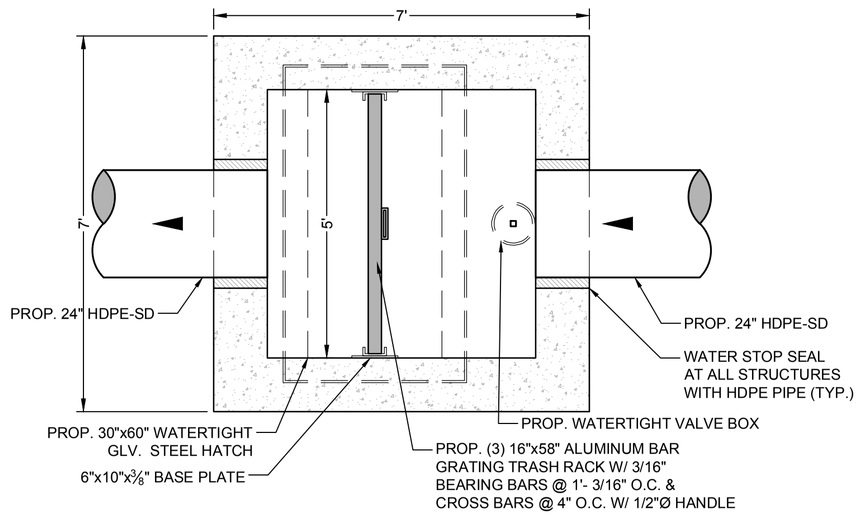
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

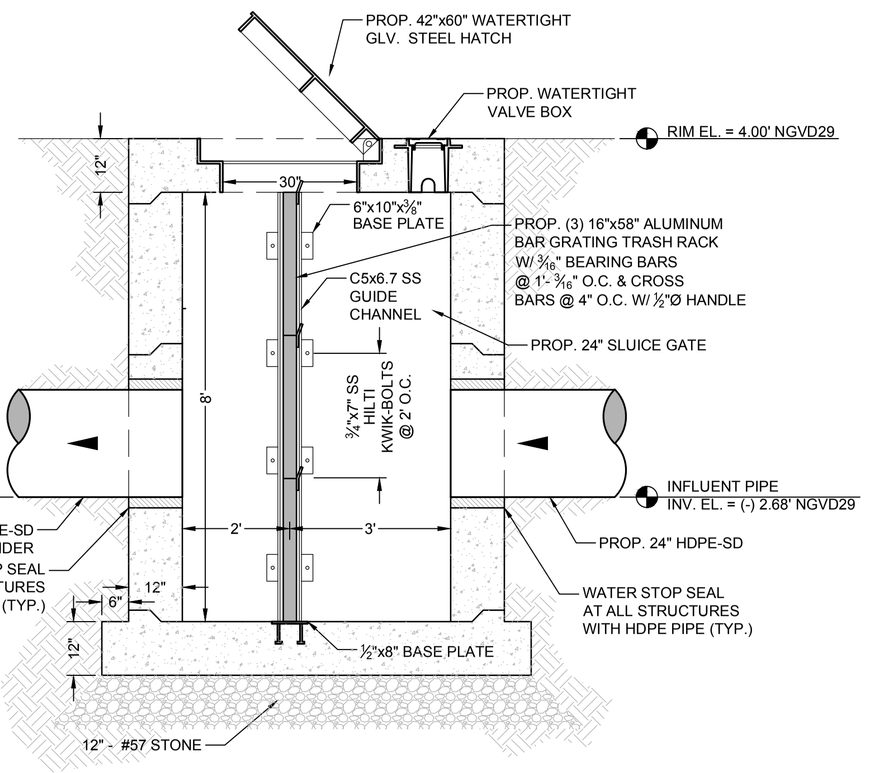
PUMP STATION PLAN - 92ND STREET

SHEET NUMBER	CP-404
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



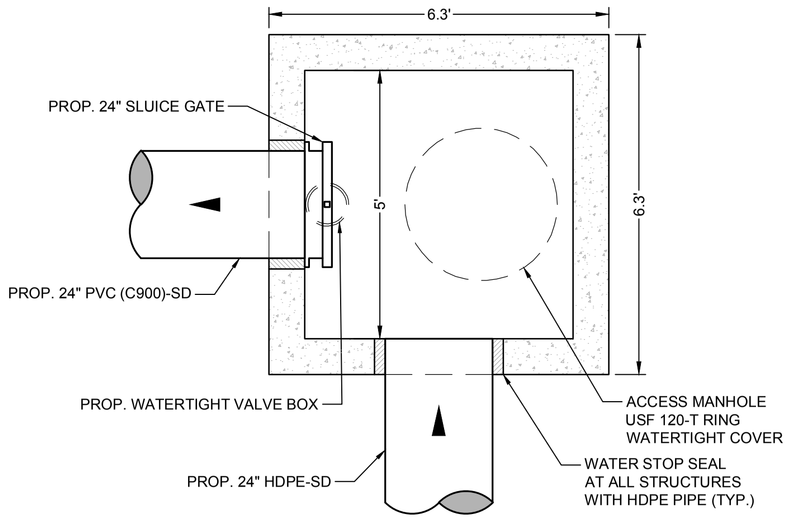
PLAN



ELEVATION

1 TRASH RACK STRUCTURE DETAIL (9ND STREET)

NOT TO SCALE



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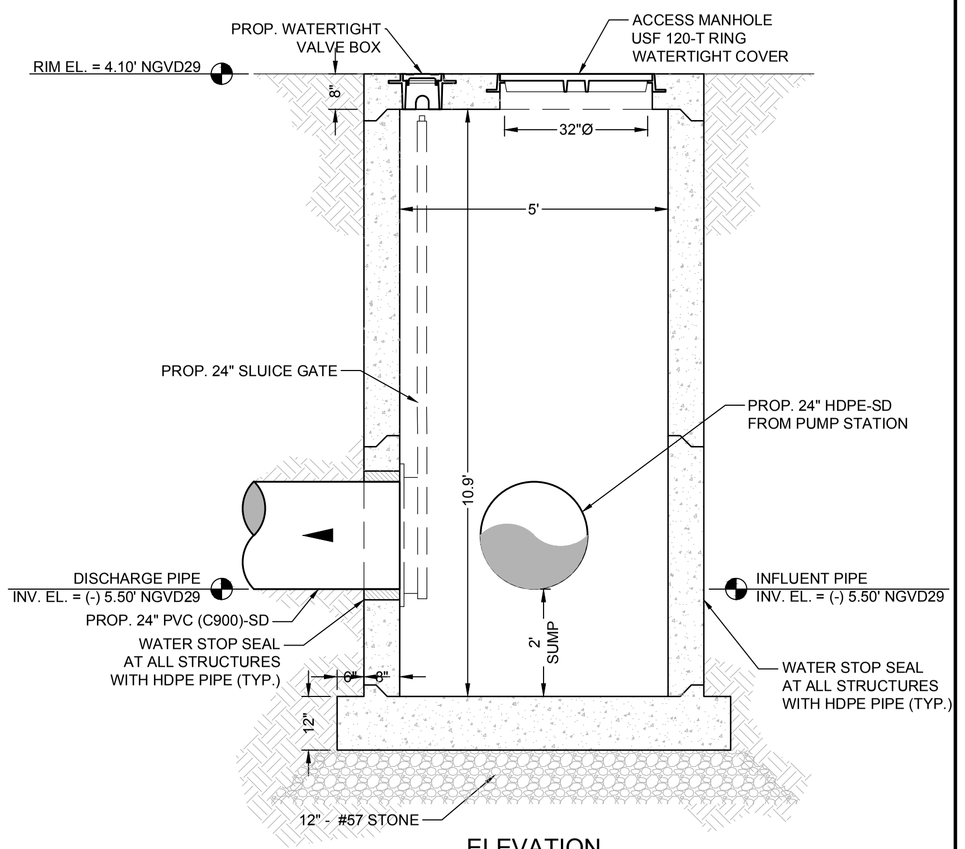
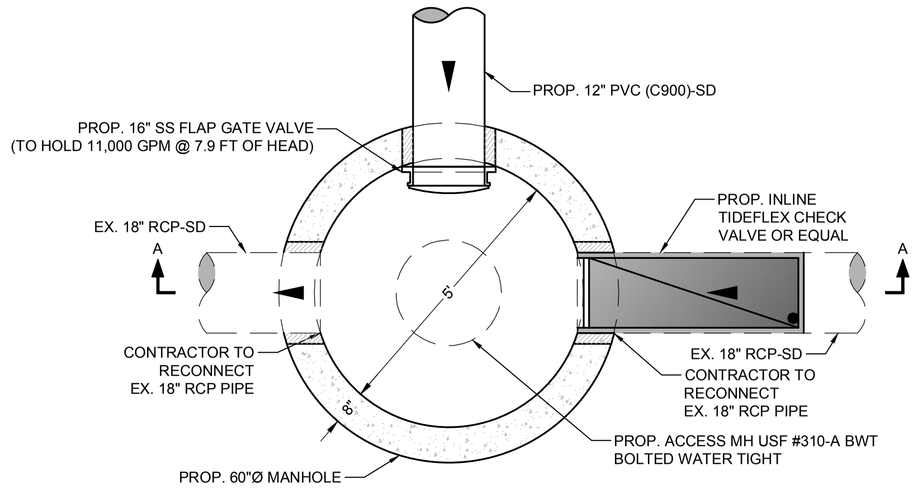


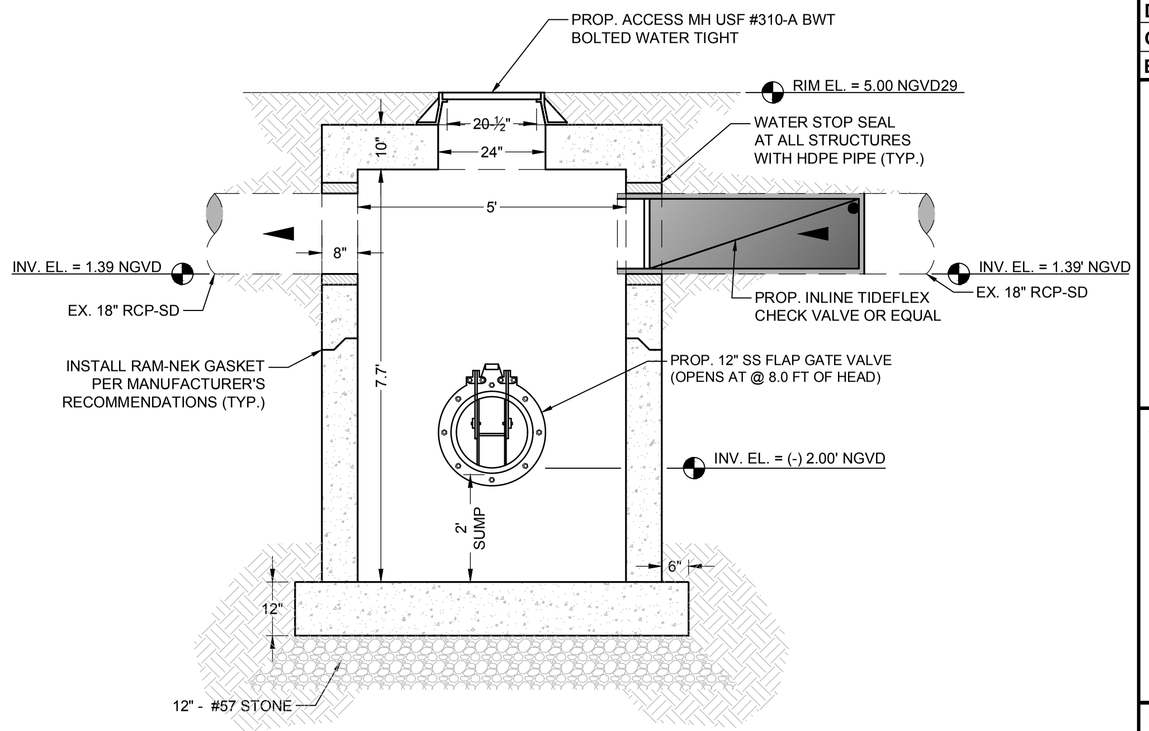
ELEVATION

2 BY-PASS STRUCTURE #1 (92nd STREET) DETAIL

NOT TO SCALE



PLAN VIEW



SECTION A-A

3 CONTROL STRUCTURE #1 (92ND STREET)

NOT TO SCALE

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REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

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DRAWN BY:	MB
CHECKED BY:	SW
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(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PUMP STATION DETAILS - 92ND STREET

SHEET NUMBER	CP-405
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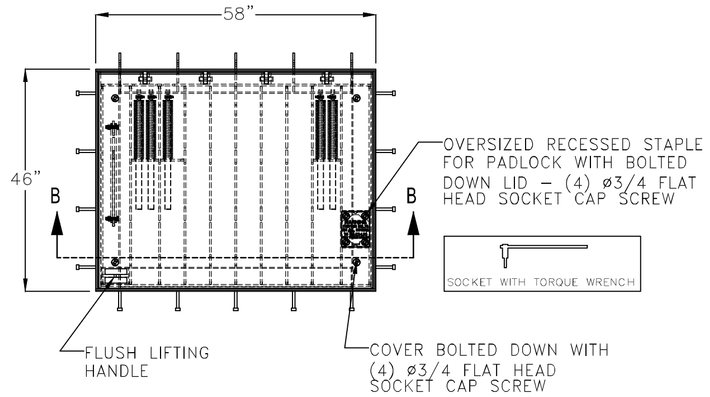
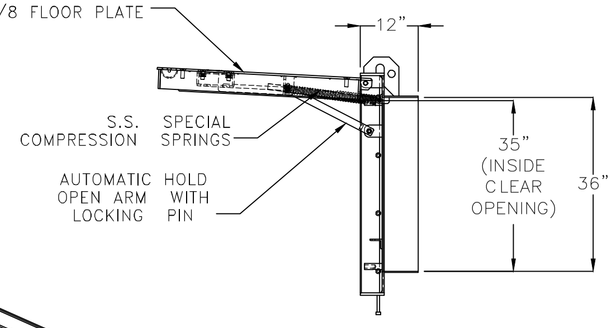
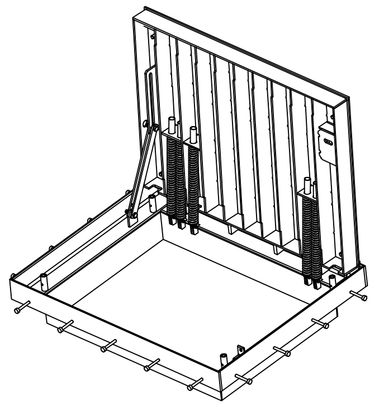
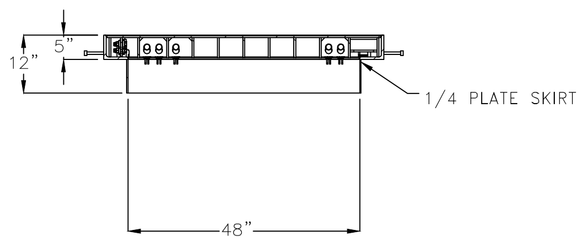






NOTES:
1–MATERIAL: STEEL A36, HOT DIP GALVANIZED AFTER FABRICATION
2– AASHTO HL–93 WHEEL LOADING DESIGNED FOR A MAXIMUM WHEEL LOAD OF 16000–LBS PLUS 33% IMPACT FACTOR. (EQUIVALENT TO H–20)
3– IT IS ESSENTIAL THAT ALL BOLTS ARE IN PLACE WHENEVER COVER IS EXPOSED TO TRAFFIC
"LOCTITE 242 BLUE", MUST BE APPLIED TO ALL BOLTS AFTER EACH USE.
4–SUITABLE FOR USE IN TRAFFIC PER ASTM C1802–14 LOAD LEVEL 7
5– APPROXIMATE WEIGHT:1043.86 lbs.



SECTION B-B

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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/64
ANGULAR: MACH ± 1°
TWO PLACE DECIMAL ± .01
THREE PLACE DECIMAL ± .005
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5M-1994
BREAK ALL SHARP EDGES
TOLERANCES UNLESS OTHERWISE SPECIFIED:
<10' = ± 1/8
>10' = ± 1/4

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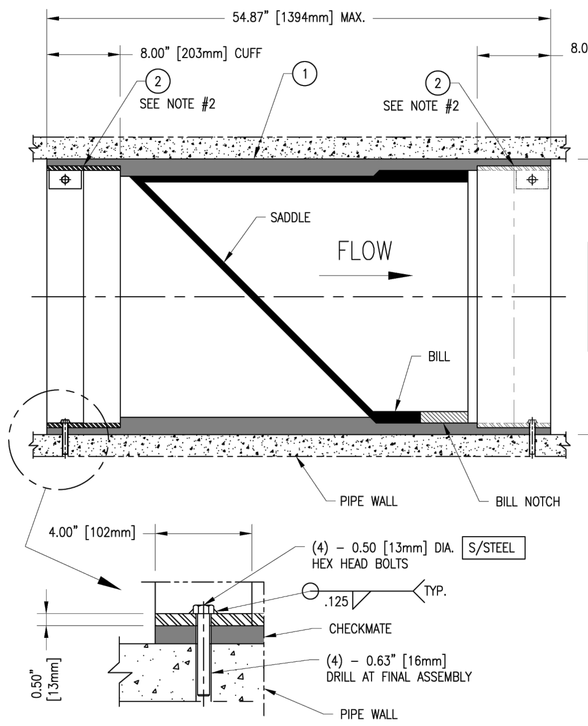
U.S.F. FABRICATION INC.
HIALEAH, FLORIDA

HATCH DT93AHS 36X48 A1G2K12n7
GENERAL ARRANGEMENT

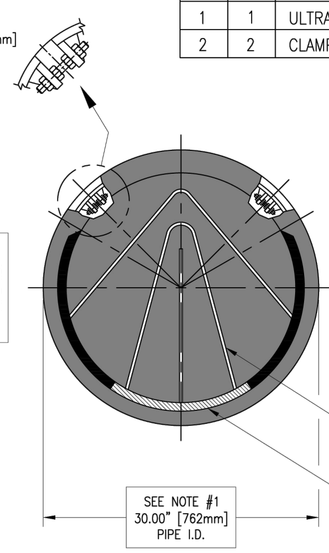
DRAWN BY:	SCALE: 1:20	SHEET 1 OF 2	DATE: 07/27/22
SROB			
APPD BY: SROB	DWG. NO. 1000210054	SHEET SIZE: B	REV: 0

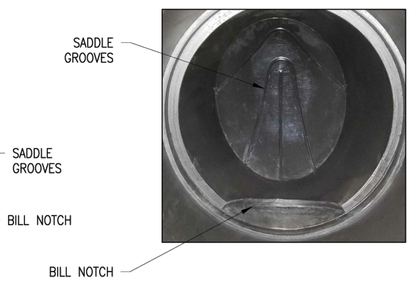


PIN PER NOTE #4
RECOMMENDED PINNING CONFIGURATION
(SUPPLIED BY CUSTOMER) (SEE I.O.M.)
NOT TO SCALE

ITEM	QTY.	DESCRIPTION	MAT'L
1	1	ULTRAFLEX CHECKMATE CHECK VALVE	MUST BE SUPPLIED
2	2	CLAMP	MUST BE SUPPLIED

NOTES:
1. PIPE INSIDE DIAMETER – MUST BE SUPPLIED (MINIMUM ALLOWABLE PIPE DIAMETER – 29.37 INCHES)
2. CLAMP INSTALLED IN UPSTREAM OR DOWNSTREAM CUFF DEPENDING ON INSTALLATION ORIENTATION
3. MAXIMUM ALLOWABLE BACK PRESSURE – 38.0 FEET
4. IT IS RECOMMENDED TO BOLT OR PIN CHECKMATE TO PIPE AS SHOWN, 4 PLACES 90° APART





PRELIMINARY DRAWING
NOT FOR APPROVAL PURPOSES

* PATENT PENDING *

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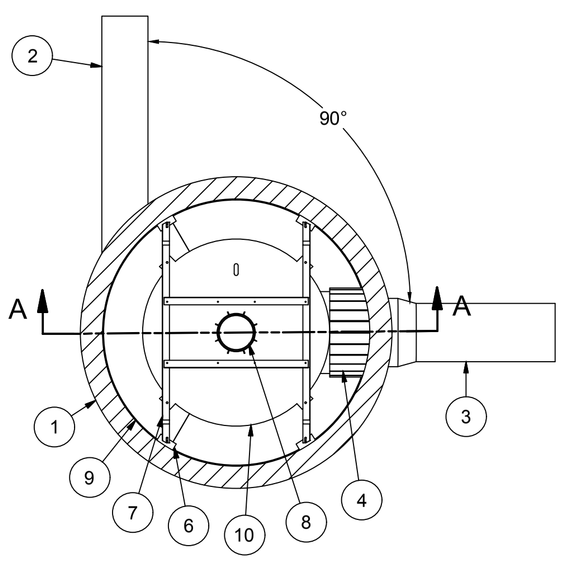
CUSTOMER: XXX
ORDER No: XXX

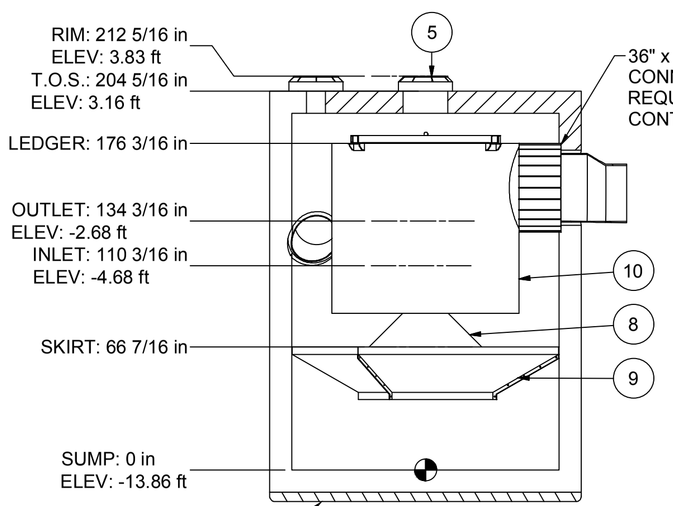
OPPORTUNITY No: XXXXX | SALES ORDER No: TXX–XXXX

Tideflex® Technologies
A Division of Red Valve Company, Inc.
750 HOLIDAY DR. STE.400
PITTSBURGH, PA. 15220
info@redvalve.com
412.279.0044
fax 412.279.5410

TT PRODUCT: 30" ULTRAFLEX CHECKMATE CHECK VALVE
TT PART No: CMCBUF–300–APPROVAL
DR. BY: TLM | DATE: 2–6–17 | CHKD. BY: | DATE:
CAD SCALE: FULL
PLOT SCALE: 1 = 1
REV
DWG No: TTS–XXXX

PIPE DETAILS					
PIPE	MATERIAL	LENGTH	INV UP	INV DOWN	SLOPE
INLET	PVC	30.0 ft	-2.68 ft	-4.68 ft	6.67
OUTLET	PVC	10.0 ft	-2.68 ft	-2.70 ft	0.20





SECTION A-A
SCALE1:60

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.
2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING DOWNSTREAM DEFENDER MANHOLE.
3. CONTRACTOR TO CONFIRM RIM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.
4. CONTRACTOR IS RESPONSIBLE FOR MATERIALS AND LABOR TO BRING CASTINGS TO FINISHED GRADE

PARTS LIST		
ITEM	DESCRIPTION	SIZE (in)
1	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)	144
2	INLET PIPE (BY OTHERS)	24
3	OUTLET PIPE (BY OTHERS)	30
4	PIPE COUPLING (BY OTHERS)	
5	FRAME AND COVER	24
6	LEDGER ANGLE	
7	SUPPORT FRAME	
8	CENTER SHAFT AND CONE	
9	BENCHING SKIRT	
10	DIP PLATE	

DD SIZE	4'	6'	8'	10'	12'
OUTLET STUB ID	12"	18"	24"	30"	36"
OUTLET STUB OD	12.5"	18.7"	24.8"	36"	42"

EQUIPMENT PERFORMANCE
The stormwater treatment unit shall adhere to the hydraulic parameters given in the chart below and provide the removal efficiencies and storage capacities as follows:

1. Performance objectives: The unit shall be capable of treating the peak flow rate listed below.
2. Peak Hydraulic Capacity: 38.0 cfs (1076 l/s)
3. Sediment Storage Capacity: 14.70 cu. yd. (11.13 cu. m)
4. Continuous Oil Storage Capacity: 1770 gal. (6700 liters)
5. Sediment shall be stored in a zone that is isolated from the main flow path and protected from reintrainment by a benching skirt.

REVISION HISTORY			
REV	BY	DESCRIPTION	DATE
-	KSM	FIRST RELEASE	3/30/2022

PROJECTION

IF IN DOUBT ASK

DATE: 3/30/2022	SCALE: 1:60	
DRAWN BY: KSM	CHECKED BY:	APPROVED BY

Title
12-ft DIAMETER
DOWNSTREAM DEFENDER

WQU - 91ST STREET
PUMP STATION - 91ST STREET
SURFSIDE, FL

Patent: www.hydro-int.com/patents

Hydro International
hydro-int.com

WEIGHT:	MATERIAL:
STOCK NUMBER: 1	
DRAWING NO.: 22_12_1161-12ftDD-1	
SHEET SIZE: B	SHEET: 1 OF 3	Rev: -

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REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
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BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PUMP STATION DETAILS - 92ND STREET

SHEET NUMBER	CP-406
PROJECT NUMBER	11494.01

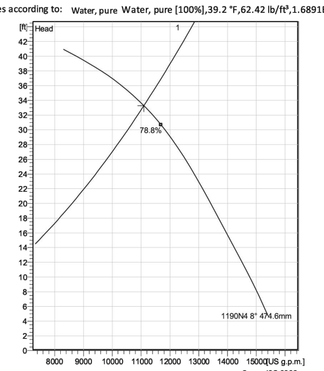
STATUS: CONSTRUCTION DOCUMENTS

PL 7061/675 3~ 1190N4

Axial flow propeller pumps with fixed or adjustable pitch blades for high capacity low head pumping of clean or slightly contaminated liquids.
Cast iron design optimized for high-flow efficiency.

Technical specification

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s



Curve: ISO 9906

Configuration

Motor number
P0675.000 35-45-6AA-W 140hp

Installation type
L - Column pipe Semi permanent, Wet

Impeller diameter
474.6 mm

Discharge diameter
32 inch

Pump information

Impeller diameter
474.6 mm

Discharge diameter
32 inch

Inlet diameter

Maximum operating speed
1185 rpm

Number of blades
4

Max. fluid temperature
40 °C

Materials

Impeller
Stainless steel

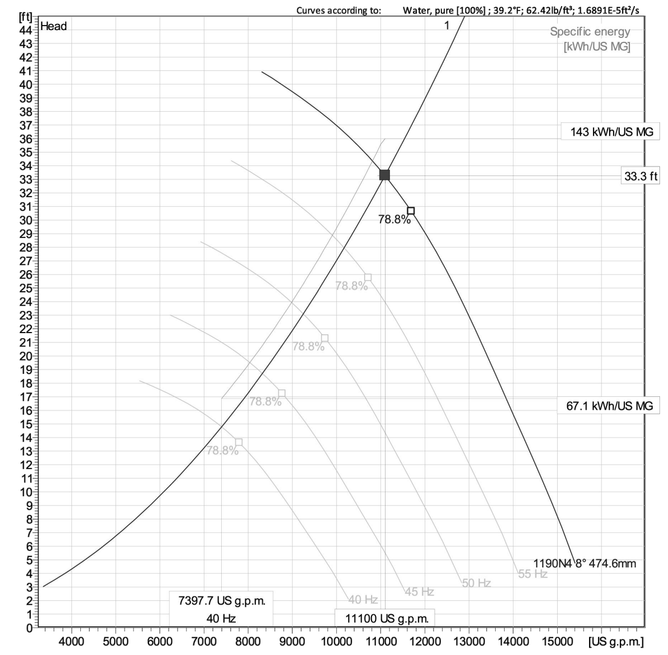
Project		**Created by**	Rick Reyes
Block		**Created on**	5/19/2022 **Last update** 5/19/2022

Program-version: 610 - 3240022 (Build 69) | Date-version: 4/28/2022 10:53 AAPN | User-group(s): Xylem USA - INT

PL 7061/675 3~ 1190N4

VFD Analysis

Curves according to: Water, pure [100%] ; 39.2°F; 62.42lb/ft³; 1.6891E-5ft²/s



Operating Characteristics

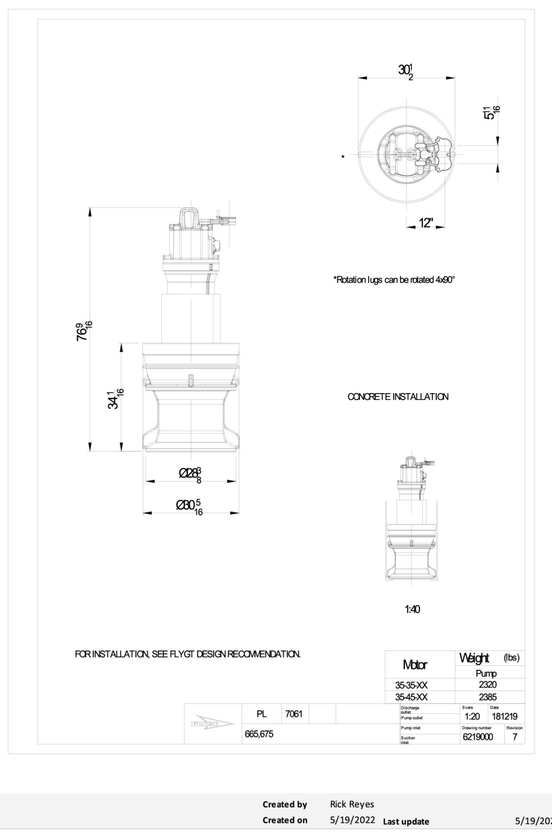
Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		US g.p.m.	ft	hp	US g.p.m.	ft	hp		WHr/US MG	ft
1	60 Hz	11100	33.3	120	11100	33.3	120	78.1 %	143	28.7
1	55 Hz	10200	28	92.2	10200	28	92.2	78.1 %	164	24.9
1	50 Hz	9250	23.1	69.3	9250	23.1	69.3	78.1 %	187	21.4
1	45 Hz	8320	18.7	50.5	8320	18.7	50.5	78.1 %	216	18.1

Project		**Created by**	Rick Reyes
Block		**Created on**	5/19/2022 **Last update** 5/19/2022

Program-version: 610 - 3240022 (Build 69) | Date-version: 4/28/2022 10:53 AAPN | User-group(s): Xylem USA - INT

PL 7061/675 3~ 1190N4

Dimensional drawing



Project		**Created by**	Rick Reyes
Block		**Created on**	5/19/2022 **Last update** 5/19/2022

Program-version: 610 - 3240022 (Build 69) | Date-version: 4/28/2022 10:53 AAPN | User-group(s): Xylem USA - INT

PL 7061/675 3~ 1190N4

Technical specification

Motor - General

Motor number P0675.000 35-45-6AA-W 140hp	**Phases** 3~	**Rated speed** 1185 rpm	**Rated power** 140 hp
ATEX approved FM	**Number of poles** 6	**Rated current** 177 A	**Stator variant** 1
Frequency 60 Hz	**Rated voltage** 460 V	**Insulation class** H	**Type of Duty**
Version code 000			

Motor - Technical

Power factor - 1/1 Load 0.79	**Motor efficiency - 1/1 Load** 92.5 %	**Total moment of inertia** 42.3 lb ft²	**Starts per hour max.** 0
Power factor - 3/4 Load 0.73	**Motor efficiency - 3/4 Load** 93.0 %	**Starting current, direct starting** 1200 A	
Power factor - 1/2 Load 0.62	**Motor efficiency - 1/2 Load** 92.5 %	**Starting current, star-delta** 400 A	

Project		**Created by**	Rick Reyes
Block		**Created on**	5/19/2022 **Last update** 5/19/2022

Program-version: 610 - 3240022 (Build 69) | Date-version: 4/28/2022 10:53 AAPN | User-group(s): Xylem USA - INT

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REVISIONS

NO.	DESCRIPTION	DATE

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ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PUMP STATION DETAILS - 91ST STREET

SHEET NUMBER	**CP-407**
PROJECT NUMBER	**11494.01**

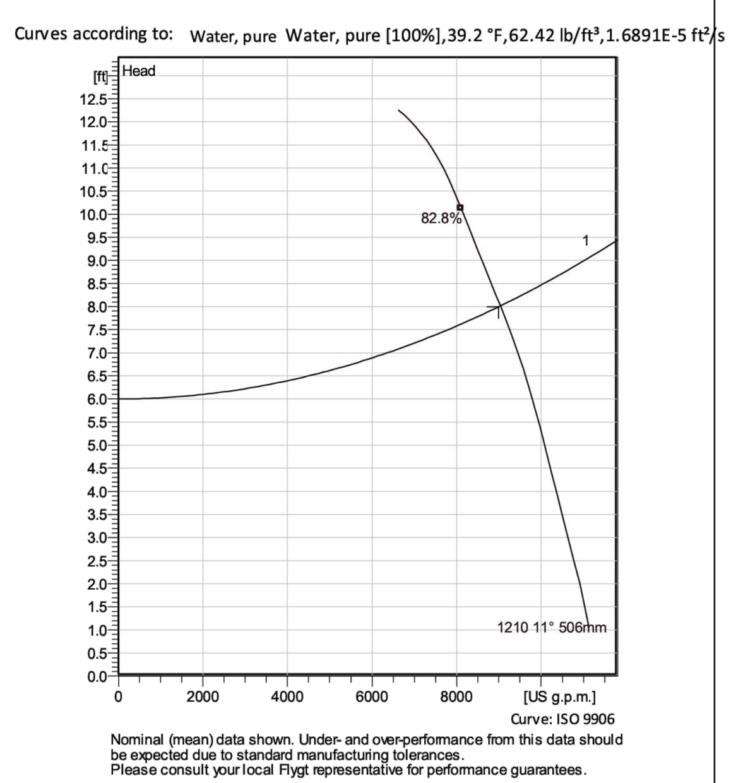
STATUS: CONSTRUCTION DOCUMENTS

PL 7065/715 3~ 1210

Axial flow propeller pumps with fixed or adjustable pitch blades for high capacity low head pumping of clean or slightly contaminated liquids. Cast iron design optimized for high-flow efficiency.

FLYGT a xylem brand

Technical specification



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

Configuration

Motor number
P0715.000 43-30-12FA-W 45hp

Installation type
L - Column pipe Semi permanent, Wet

Impeller diameter
506 mm

Discharge diameter
32 inch

Pump information

Impeller diameter
506 mm

Discharge diameter
32 inch

Inlet diameter

Maximum operating speed
590 rpm

Number of blades
4

Max. fluid temperature
40 °C

Material

Impeller
Stainless steel

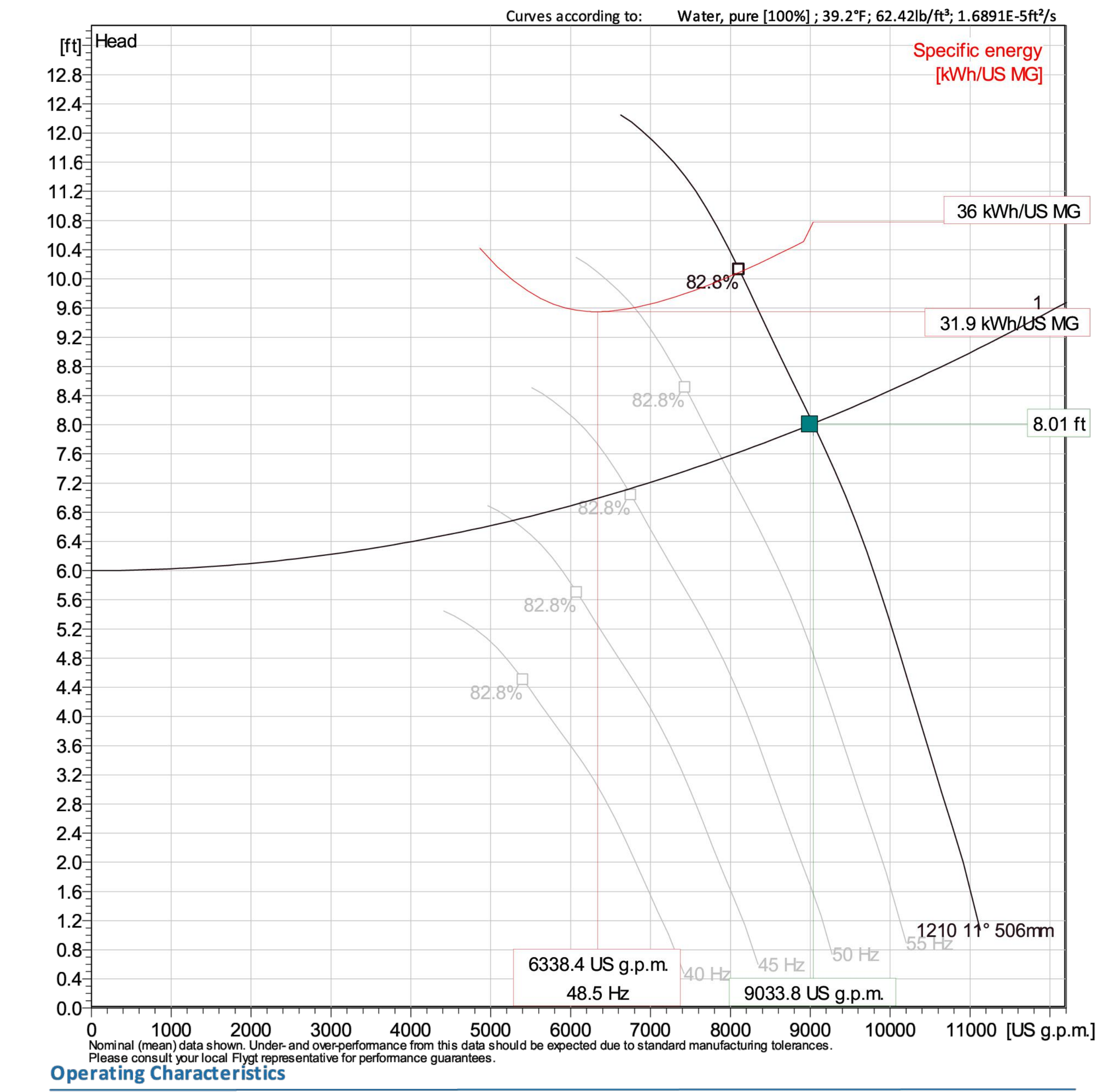
Project	Xylect-22240613	Created by	Rick Reyes		
Block		Created on	5/3/2024	Last update	5/3/2024

Program version 73.0 - 4/23/2024 (Build 125) · Data version 4/23/2024 12:36 A4P4 · User group(s) Xylem: USA - INT

PL 7065/715 3~ 1210

VFD Analysis

FLYGT a xylem brand



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
1	40 Hz									

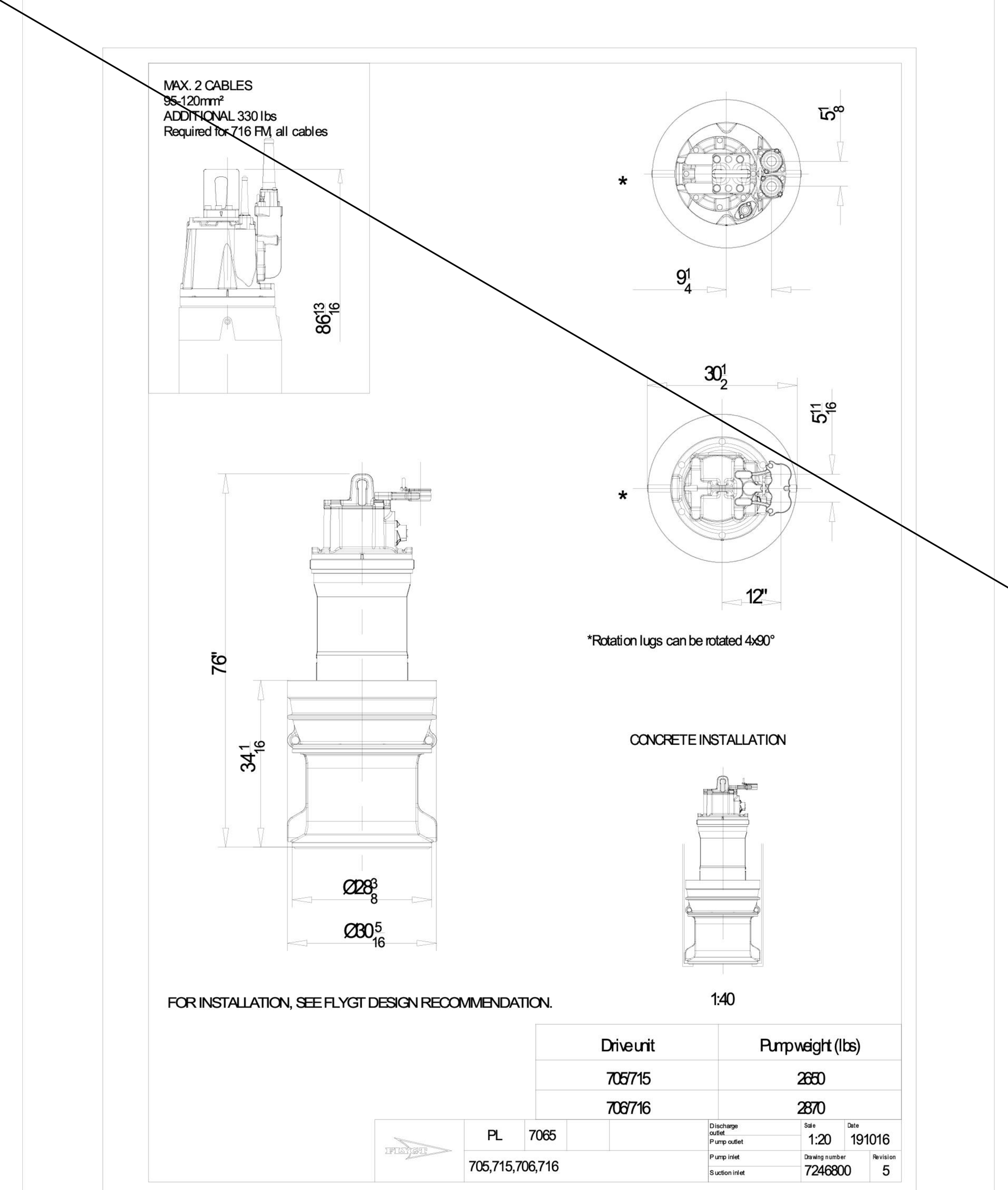
Project	Xylect-22240613	Created by	Rick Reyes		
Block		Created on	5/3/2024	Last update	5/3/2024

Program version 73.0 - 4/23/2024 (Build 125) · Data version 4/23/2024 12:36 A4P4 · User group(s) Xylem: USA - INT

PL 7065/715 3~ 1210

Dimensional drawing

FLYGT a xylem brand



Project	Xylect-22240613	Created by	Rick Reyes		
Block		Created on	5/3/2024	Last update	5/3/2024

Program version 73.0 - 4/23/2024 (Build 125) · Data version 4/23/2024 12:36 A4P4 · User group(s) Xylem: USA - INT

PL 7065/715 3~ 1210

Technical specification

FLYGT a xylem brand

Motor - General

Motor number
P0715.000 43-30-12FA-W 45hp

Phases
3~

Rated speed
590 rpm

Rated power
45 hp

ATEX approved
FM

Number of poles
12

Rated current
77 A

Stator variant
1

Frequency
60 Hz

Rated voltage
460 V

Insulation class
H

Type of Duty
S1

Version code
000

Motor - Technical

Power factor - 1/1 Load
0.60

Motor efficiency - 1/1 Load
90.0 %

Total moment of inertia
61.9 lb ft²

Starts per hour max.
15

Power factor - 3/4 Load
0.53

Motor efficiency - 3/4 Load
89.5 %

Starting current, direct starting
295 A

Power factor - 1/2 Load
0.41

Motor efficiency - 1/2 Load
88.0 %

Starting current, star-delta
98.3 A

Project	Xylect-22240613	Created by	Rick Reyes		
Block		Created on	5/3/2024	Last update	5/3/2024

Program version 73.0 - 4/23/2024 (Build 125) · Data version 4/23/2024 12:36 A4P4 · User group(s) Xylem: USA - INT

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PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

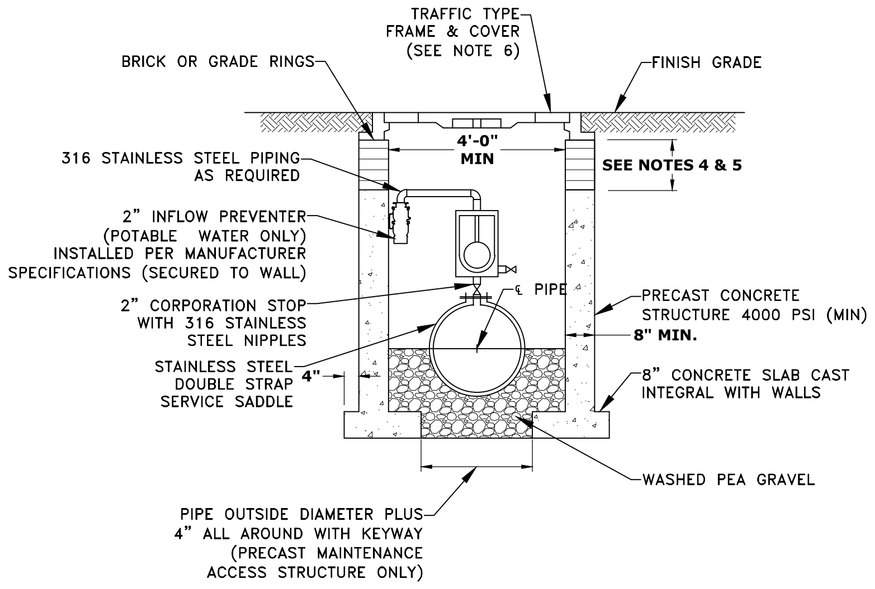
SHEET TITLE

PUMP STATION DETAILS - 92ND STREET

SHEET NUMBER **CP-408**

PROJECT NUMBER **11494.01**

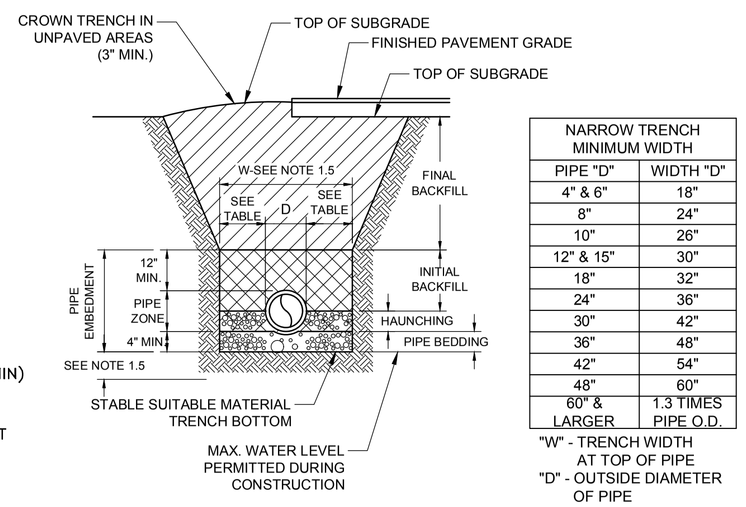
STATUS: CONSTRUCTION DOCUMENTS



1. LIFT HOLES ARE TO BE SEALED WITH MORTAR INSIDE AND OUTSIDE AFTER INSTALLATION.
2. MAINTENANCE ACCESS STRUCTURE WALLS TO BE COATED INSIDE AND OUTSIDE WITH 16 MIL. THICKNESS COAL TAR EPOXY. SEE NOTES 9. AND 10., DETAIL NO. 312.
3. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF, EXPANDING GROUT. ACTUAL LOCATION AND MAINTENANCE ACCESS STRUCTURE FRAME ELEVATION SHALL BE DETERMINED BY ENGINEER BASED ON AS-BUILT SURVEY DATA.
4. THE CHIMNEY AREA SHALL BE MINIMUM OF 4" AND A MAXIMUM OF 12" IN HEIGHT. A MINIMUM OF 3 COURSES OF BRICK SHALL BE INSTALLED.
5. GRADE RINGS ARE AN ACCEPTABLE ALTERNATIVE TO BRICK. A MINIMUM OF 3 GRADE RINGS SHALL BE INSTALLED. SET IN TWO STRIPS OF SEALANT/ADHESIVE COMPOUND ON EACH SEALING FACE.
6. SET MAINTENANCE ACCESS STRUCTURE FRAME ON A BED OF PORTLAND CEMENT AND SILICA SAND. BRING MORTAR UP OVER FRAME.

9 AIR RELEASE VALVE W/ MAINTENANCE ACCESS STRUCTURE

NOT TO SCALE



NARROW TRENCH MINIMUM WIDTH	
PIPE "D"	WIDTH "D"
4" & 6"	18"
8"	24"
10"	26"
12" & 15"	30"
18"	32"
24"	36"
30"	42"
36"	48"
42"	54"
48"	60"
60" & LARGER	1.3 TIMES PIPE O.D.

"W" - TRENCH WIDTH AT TOP OF PIPE
"D" - OUTSIDE DIAMETER OF PIPE

1. NOTES - PRESSURE FLOW AND STORM SEWER PIPE.

1.1. GENERAL: TRENCH CONSTRUCTION SHALL BE IN CONFORMANCE WITH FDOT STANDARD SPECIFICATIONS SECTION 125. PVC PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE UNI-BELL PVC PIPE ASSOCIATION. HANDBOOK OF PVC PIPE, DESIGN AND CONSTRUCTION. CONCRETE PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH ANSI / ASCE 15-93.

1.2. PIPE BEDDING: PROVIDE BELL HOLES AT EACH JOINT, FOR PIPES LARGER THAN 4" IN DIAMETER, TO PERMIT PROPER ASSEMBLY AND PIPE SUPPORT.

1.3. HAUNCHING: USE MATERIAL MEETING THE CLASSIFICATION OF A-3 IN ACCORDANCE WITH ASTM D3282 (AASHTO M-145). MAXIMUM PARTICAL SIZE SHALL BE LESS THAN 1.5 INCHES.

1.4. INITIAL BACKFILL: USE SAME MATERIAL AS SPECIFIED FOR FINAL BACKFILL (SEE NOTE 2.9).

1.5. UNSUITABLE SOIL EXCAVATION: SE SHEET PD-2 FOR ADDITIONAL REQUIREMENTS. MINIMUM DIMENSIONS SHALL BE THE LARGER OF THE REQUIREMENTS SHOWN ON THIS SHEET AND SHEET PD-2.

30 TRENCH SECTION FOR BURIED PIPES AND CULVERTS

NOT TO SCALE

2. GENERAL NOTES:

2.1. TRENCH WALLS - EXCAVATE TRENCH TO ENSURE SIDES WILL BE STABLE UNDER WORKING CONDITIONS. TRENCH WALLS TO BE SLOPED OR SUPPORTED IN ACCORDANCE WITH THE CHAPTER 90-96 OF THE LAWS OF FLORIDA (THE TRENCH SAFETY ACT) AND FEDERAL OSHA STANDARD CFR SECTION 1926.650 SUBPART - P.

2.2. DEWATERING: WHEN RUNNING OR STANDING WATER OCCURS IN THE TRENCH BOTTOM, OR THE TRENCH BOTTOM DISPLAYS A "QUICK" CONDITION, WATER SHALL BE REMOVED TO BELOW THE PIPE INVERT BY A SUITABLE MEANS, UNTIL THE PIPE IS BACKFILLED TO A SUFFICIENT HEIGHT TO PREVENT PIPE FLOATATION.

2.3. MINIMUM TRENCH WIDTH: PROVIDE A TRENCH WIDTH SUFFICIENT, BUT NO WIDER THAN NECESSARY, TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING BACKFILL MATERIAL. SEE TABLE FOR MINIMUM TRENCH WIDTHS. WHERE SOIL CONDITIONS REQUIRE TRENCH WALLS TO BE SUPPORTED, MINIMUM WIDTH SHALL BE BETWEEN INNER FACE OF TRENCH SUPPORTS.

2.4. MOVABLE SHEETING, TRENCH BOXES OR SHIELDS: WHEN MOVABLE TRENCH SUPPORT IS USED, THE MINIMUM DISTANCE BETWEEN INNER FACE OF TRENCH SUPPORT, AND THE OUTER PIPE WALL, SHALL BE AT LEAST ONE PIPE DIAMETER OR 2 FEET WHICH EVER IS GREATER.

2.5. PREPARATION OF TRENCH BOTTOM: TRENCH BOTTOM SHALL BE PREPARED TO PROVIDE A FIRM STABLE UNIFORM FOUNDATION THE FULL LENGTH OF THE PIPE. IF UNSUITABLE MATERIAL IS ENCOUNTERED AT BOTTOM OF TRENCH, CONTINUE TO EXCAVATE TILL SUITABLE MATERIAL IS ENCOUNTERED. IF DEPTH TO SUITABLE MATERIAL IS GREATER THAN 2 FEET BELOW BOTTOM OF TRENCH, NOTIFY ENGINEER OF SUCH CONDITION BEFORE CONTINUING FURTHER TRENCH EXCAVATION.

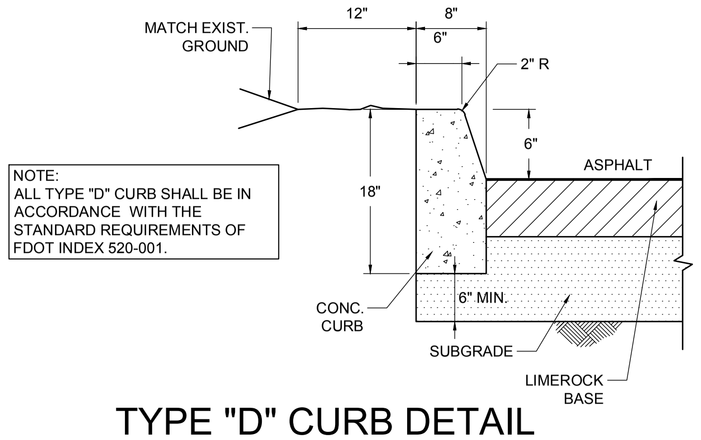
2.6. PIPE BEDDING: BEDDING MATERIAL SHALL CONFORM TO ASTM D-2321, AND MEET THE REQUIREMENTS OF FDOT SPECIFICATION SECTION 125-8 BACKFILLING. FOR PVC AND OTHER "FLEXIBLE" PIPES, EXCAVATE 4" BELOW PROPOSED OUTSIDE BOTTOM OF PIPE, BACKFILL AND COMPACT WITH SPECIFIED BEDDING MATERIAL TO PROPER GRADE.

2.7. HAUNCHING: MATERIAL SHALL MEET AND BE INSTALLED AND COMPACTED INACCORDANCE WITH THE REQUIREMENTS OF FDOT SPECIFICATION SECTION 125-8 BACKFILLING. PLACE AND CONSOLDATE MATERIAL UNDER THE PIPE HAUNCH, UP TO THE PIPE SPRINGLINE, FOR THE FULL WIDTH OF THE TRENCH, BEFORE PLACING AND COMPACTING THE REMAINDER OF THE EMBEDMENT IN THE PIPE ZONE. HAUCHING MATERIAL SHALL BE PLACED AND CONSOLIDATED BY HAND SHOVEL SLICING ALONG HAUNCH OF PIPE AND BY WATERING (JETTING OR PUDDLING) OR HAND TAMPING. MECHANICAL COMPACTION IS NOT TO BE USED WITHIN 1 PIPE DIAMETER OR 2 FEET, WHICH EVER IS GREATER, EITHER SIDE OF THE OUTSIDE WALL OF THE PIPE.

2.8. INITIAL BACKFILL: SHALL EXTEND FROM THE SPRINGLINE OF THE PIPE TO 1 FOOT ABOVE THE TOP OF PIPE. MATERIAL SHALL BE PLACED AND CONSOLIDATED AS SPECIFIED FOR THE HAUNCHING MATERIAL.

2.9. FINAL BACKFILL: MATERIAL SHALL MEET AND BE INSTALLED AND COMPACTED INACCORDANCE WITH THE REQUIREMENTS OF FDOT SPECIFICATION SECTION 125-8 BACKFILLING. SELECT BACKFILL MEETING THE CLASSIFICATION OF A-1, A-3, OR A-2-4 IN ACCORDANCE WITH ASTM D3282 (AASHTO M-145). THE MATERIAL MUST NOT CONTAIN MUCK, STUMPS, ROOTS, BRUSH, VEGITABLE MATTER. RUBBISH, CONSTRUCTION DEBRI OR OTHER MATERIAL THAT WILL NOT COMPACT INTO A SUITABLE EMBANKMENT. MATERIAL MUST HAVE MAXIMUM PARTICLE SIZE AS FOLLOWS: WITHIN 12" OF TOP OF SUBGRADE - 31/2"; 12" TO 24" BELOW TOP OF SUBGRADE - 6"; GREATER THAN 24" BELOW TOP OF SUBGRADE - 12" OR COMPACTED THICKNESS OF LAYER BEING PLACED, WHICH EVER IS LESS. FINAL BACKFILL MAY BE NATIVE MATERIAL MEETING THE SPECIFIED REQUIREMENTS. UNLESS OTHERWISE NOTED.

2.10. COMPACTION TEST: COMPACTION PERCENTAGES SHOWN FOR TRENCH SECTION BACKFILL MATERIAL REFER TO ASTM - D698 (AASHTO - T-99, STANDARD PROCTOR). COMPACTION PERCENTAGES FOR LIMEROCK BASE COURSE MATERIAL REFER TO ASTM - D1557 (AASHTO -T-180, MODIFIED PROCTOR).



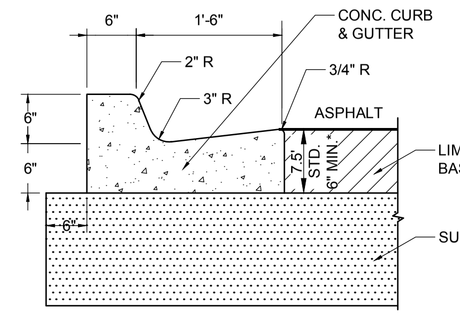
NOTE:
ALL TYPE "D" CURB SHALL BE IN ACCORDANCE WITH THE STANDARD REQUIREMENTS OF FDOT INDEX 520-001.

4 TYPE "D" CURB DETAIL PER FDOT INDEX No. 520-001

NOT TO SCALE

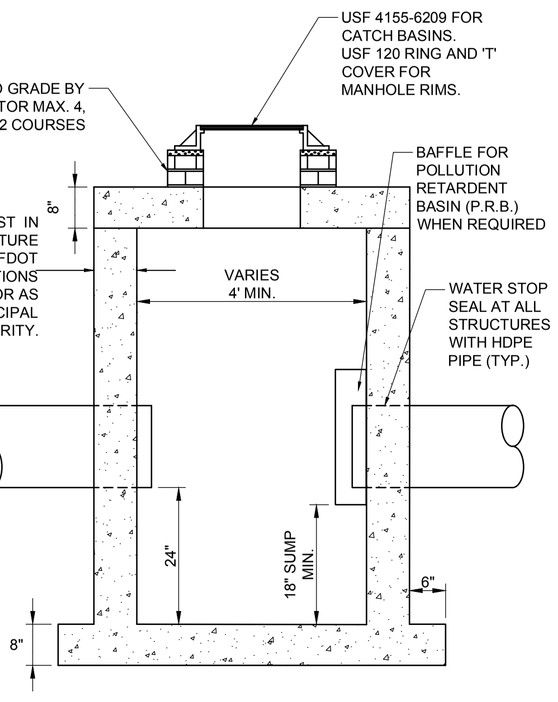
NOTES:
ALL TYPE "F" CURB & GUTTER SHALL BE IN ACCORDANCE WITH THE STANDARD REQUIREMENTS OF FDOT INDEX 520-001.

*WHEN USED ON HIGH SIDE OF ROADWAYS, THE CROSS SLOPE OF THE GUTTER SHALL MATCH THE CROSS SLOPE OF THE ADJACENT PAVEMENT. THE THICKNESS OF THE LIP SHALL BE 6", UNLESS OTHERWISE SHOWN ON PLANS.



5 TYPE "F" CURB DETAIL PER FDOT INDEX No. 520-001

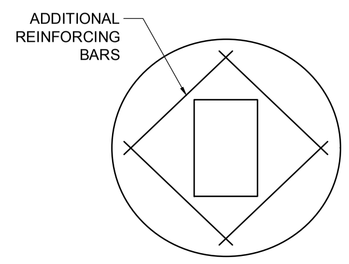
NOT TO SCALE



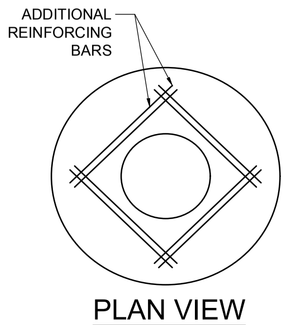
NOTES:
1. STRUCTURE MANUFACTURER AND/OR CONTRACTOR SHALL CONFIRM ALL STEEL REINFORCEMENT MEETS FDOT STANDARDS PER INDEX 425-010, SECTION 415 AND 425 PRIOR TO SUBMITTING ANY SHOP DRAWINGS FOR APPROVAL.
2. LOCKING GRATES TO BE PROVIDED.

11 CATCH BASIN / DRAINAGE MANHOLE DETAIL

NOT TO SCALE



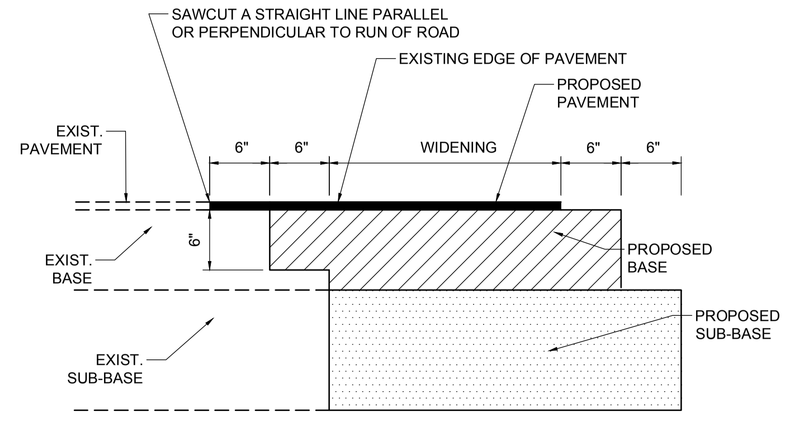
PLAN VIEW
TOP SLAB
FOR CATCH BASINS



PLAN VIEW
TOP SLAB
FOR MANHOLES

12 CATCH BASIN / MANHOLE FRAME DETAIL

NOT TO SCALE



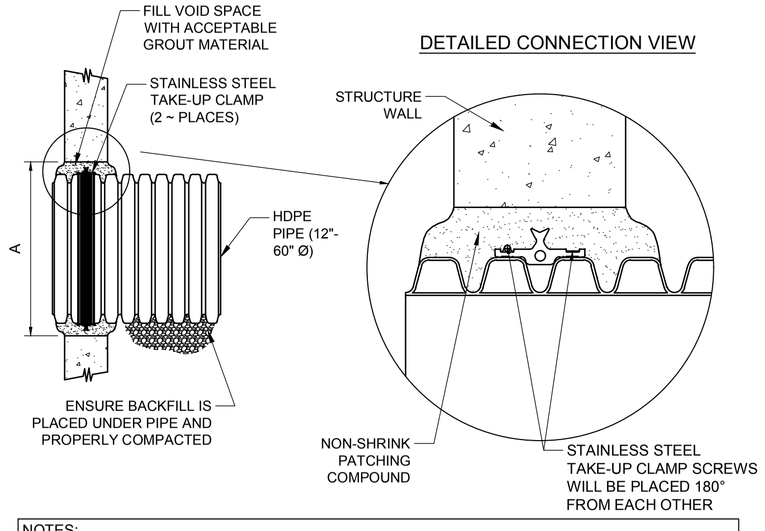
7 SAWCUT WIDENING DETAIL

NOT TO SCALE

SPACING OF REQUIRED ROADWAY, PARKING AREA, AND UTILITY TRENCH TESTS								
	Proctor Maximum Density		L.B.R.		DENSITY / Per Lift		THICKNESS	
	MAX. SPACING		MAX. SPACING		MAX. SPACING		MAX. SPACING	
	LIN. FEET	SQ. FEET	LIN. FEET	SQ. FEET	LIN. FEET	SQ. FEET	LIN. FEET	SQ. FEET
COMPACTED OR STABILIZED SUBGRADE	1000	12,000	1000	12,000	500	6,000	200	2,400
LIMEROCK BASE	4000	24,000	--	--	500	6,000	200	2,400
ASPHALT	--	--	--	--	1500	18000	Every 200 Tons	
UTILITY TRENCH	One per Soil Type		--	--	500	6,000	--	--
Embankment / Backfill	One per Soil Type		--	--	500	6,000	--	--
ALL TESTING SHALL BE TAKEN IN A STAGGERED SAMPLING PATTERN FROM A POINT 12" INSIDE THE LEFT EDGE OF THE ITEM TESTED TO THE CENTER, TO A POINT 12" INSIDE THE RIGHT EDGE. A MINIMUM OF 2 TESTS SHALL BE TAKEN INCLUDING UTILITY TRENCHS AND ROADWAY RESTORATION. SEE FDOT STANDARD SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.								

33 COMPACTION TEST SCHEDULE

NOT TO SCALE



NOTES:
PERFORMANCE HIGHLY DEPENDENT ON INSTALLATION. CONTRACTOR MUST ENSURE MANHOLE GASKET IS UNIFORMLY SEATED AROUND STRUCTURE ADAPTER. EXTRA PRECAUTIONS MUST BE TAKEN TO PREVENT DIFFERENTIAL SETTLEMENT BETWEEN THE PIPE AND MANHOLE.

SEE ADS STANDARD DETAIL STD-201 AND ADS INSTALLATION GUIDE 1.05: WATERSTOP INSTALLATION FOR INSTALLATION RECOMMENDATIONS.

PIPE SIZE	PIPE OD		"A" MIN. HOLE DIA.	MIN. DISTANCE PIPE INVERT TO STRUCTURE INVERT
	A-PROFILE	H-PROFILE		
12"	14.5"	N/A	19.5"	3.7"
15"	17.6"	N/A	23.00"	4.0"
18"	21.2"	N/A	26.50"	4.2"
24"	27.8"	N/A	33.25"	4.5
30"	35.1"	N/A	40.50"	5.2"
36"	41.1"	41.1"	47.00"	5.5"
42"	47.7"	48.0"	53.00"	5.7"
48"	53.6"	54.0"	59.00"	5.7"
60"	66.3"	67.3"	72.00"	6.4"

17 GROUTED MANHOLE CONNECTION (HDPE PIPE) DETAIL

NOT TO SCALE

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FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

DRAINAGE DETAILS

SHEET NUMBER	CP-501
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS

MINIMUM LENGTH OF PIPE (FEET) TO BE RESTRAINED

(SOURCES: EBAA IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1, AND DIPRA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2)

FITTING TYPE		PIPE SIZE											
		4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"
90° HORIZONTAL BEND		14	20	25	30	35	45	54	62	73	84	93	101
45° HORIZONTAL BEND		6	8	11	13	15	19	22	26	30	35	38	42
22.5° HORIZONTAL BEND		3	4	5	6	7	9	11	12	15	17	18	20
11.25° HORIZONTAL BEND		1	2	3	3	4	4	5	6	7	8	9	10
90° VERTICAL OFFSET	UPPER BEND	55	79	103	125	147	189	228	266	319	368	412	454
	LOWER BEND	22	38	49	59	69	88	106	123	145	165	184	201
45° VERTICAL OFFSET	UPPER BEND	22	32	42	51	60	77	93	109	131	151	170	187
	LOWER BEND	10	14	19	23	28	35	43	50	59	67	75	82
22.5° VERTICAL OFFSET	UPPER BEND	7	12	17	21	26	34	42	49	60	70	78	87
	LOWER BEND	2	4	6	8	10	14	17	21	25	29	33	36
11.25° VERTICAL OFFSET	UPPER BEND	3	4	6	9	11	15	19	22	28	32	37	41
	LOWER BEND	1	1	1	2	3	5	7	8	10	12	14	16
PLUG (DEAD END)		32	45	59	70	83	107	129	151	190	220	244	270
IN-LINE VALVE		32	45	59	70	83	107	129	151	100	110	125	135
TEE (BRANCH RESTRAINT)	4"x 0	23											
	6"x 0	21	35										
	8"x 0	18	34	47									
	10"x 0	16	32	46	58								
	12"x 0	13	30	44	57	69							
	16"x 0	7	26	41	55	67	90						
	20"x 0	1	21	38	52	65	88	109					
	24"x 0	1	16	34	49	62	86	108	129				
	30"x 0	8	28	44	58	83	106	127	154				
	36"x 0	1	1	22	39	54	80	103	124	153	179		
	42"x 0	1	1	15	33	49	77	100	122	151	177	201	
	48"x 0	1	1	7	27	44	73	97	120	149	176	200	222
REDUCER (LARGER PIPE RESTRAINT)	6"x 0	23											
	8"x 0	38	25										
	10"x 0	57	43	24									
	12"x 0	72	60	44	41								
	16"x 0	99	90	78	75	45							
	20"x 0	123	116	107	105	81	45						
	24"x 0	146	140	132	131	111	82	45					
	30"x 0	157	153	148	141	133	113	87	56				
	38"x 0	182	179	175	169	163	147	126	101	56			
	42"x 0	205	202	199	194	189	175	158	138	100	54		
	48"x 0	226	224	221	217	213	201	187	169	138	98	53	

NOTES:

1. THE DATA IN THE ABOVE TABLE ARE BASED UPON THE FOLLOWING INSTALLATION CONDITIONS:
   - 1A: SOIL TYPE-SAND
   - 1B: TEST PRESSURE-150 PSI
   - 1C: DEPTH OF BURY-4'
   - 1D: TRENCH TYPE-3
   - 1E: SAFETY FACTOR-1.5
   - 1F: VERTICAL OFFSET-3'
   - 1G: MINIMUM PIPE LENGTH ALONG TEE RUN-5'
2. THE RESTRAINED PIPE LENGTHS APPLY TO DUCTILE IRON AND PVC PIPE.
3. ALL JOINTS BETWEEN UPPER AND LOWER BENDS SHALL BE RESTRAINED.
4. RESTRAINED PIPE LENGTHS APPLY TO PIPE ON BOTH SIDES OF VALVES AND FITTINGS.

KEITH

Subsurface Utility Engineering Consultants - Utility Locating - Utility Coordination
301 East Atlantic Boulevard, Pompano Beach, FL 33060
Tel.: 954-788-3400 Fax: 954-788-3500

TEST HOLE INVENTORY

Date:	6-22-2022	Client:	Town of Surfside
Project:	Abbott Avenue Drainage	Client Contact:	Jason D. Greene, CGFO, CFE, CPFIM
Description:	Locate underground utilities for proposed drainage lines	Client No.:	305.861.4863 Ext. 225
City:	Town of Surfside	Surveyor:	KEITH
County:	Miami-Dade	K & A No.:	11494.01
State Road:	N/A	K & A Crew:	JR / CE

Type of Utility

BE	- Buried Electric
BT	- Buried Telephone
CATV	- Cable TV
FM	- Force Main
FOC	- Fiber Optic Cable
FUEL	- Fuel / Oil Lines
GM	- Gas Main
RW	- Reclaimed Water
SAN	- Sanitary Sewer
SD	- Storm Drain
SL	- Street Lighting
TS	- Traffic Signal
WL	- Water Line (Service)
WM	- Water Main

Material

AC	- Asbestos Cement
CONC	- Concrete
CIP	- Cast Iron Pipe
CMP	- Corrugated Metal Pipe
DB	- Duct Bank
DBC	- Direct Buried Cable
DIP	- Ductile Iron Pipe
HDPE	- High Density Polyethylene
PE	- Polyethylene Pipe
PVC	- Polyvinyl Chloride
RCP	- Reinforced Concrete Pipe
STL	- Steel
UNK	- Unknown
VCP	- Vitrified Clay Pipe
CP	- Concrete Pipe
Conduits	- (amount x size)

Marked By

HL	- Hub & Lath
IRC	- 5/8" IR & Cap *
N/D	- Nail & Disk *
X	- "X" in Concrete

* Disk and Cap Stamped "KEITH TEST HOLE"

Units:	US Survey Feet

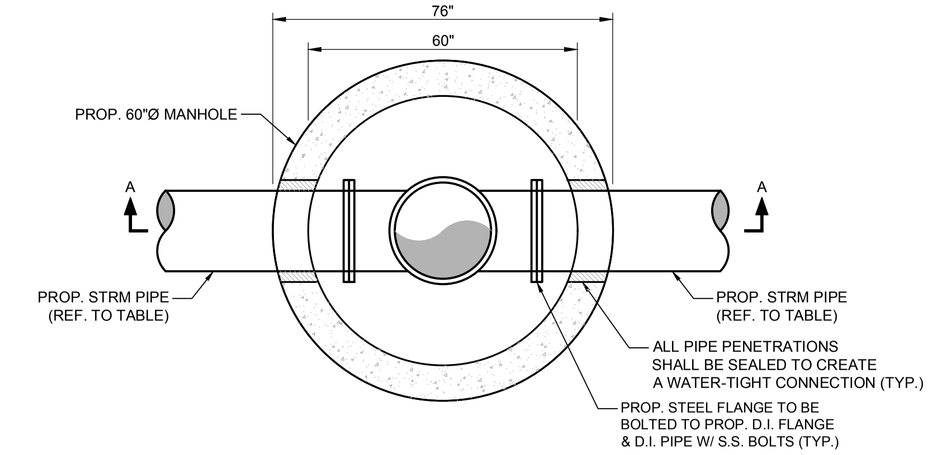
Test Hole No.	Marked By	Northing	Easting	Utility	Size (Inches)	Material	Direction	Cross Section View	Grade Elevation	Depth(feet)	Utility Elevation
1	IRC	562856.44	942510.82	WL	1"	PE	⟷	○	4.58	1.08	3.50
2	IRC	562886.04	942707.76	GM	1"	PE	⟋	○	3.47	1.96	1.51
2A	N/D	562874.83	942700.79	WM	4"	PVC	⟷	○	3.31	1.70	1.61
3	N/D	562884.27	942859.24	WM	8"	DIP	↓	◯	3.97	3.06	0.91
4	N/D	562892.02	943004.17	WM	4"	CIP	↓	○	3.93	2.84	1.09
5	N/D	562902.63	943151.35	WM	8"	DIP	↓	◯	4.25	2.81	1.44
6	N/D	562906.97	943279.95	WL	SEE COMMENTS	SEE COMMENTS	↓	○	4.35	2.54	1.81
7	N/D	562914.12	943425.04	WM	8"	DIP	↓	◯	4.56	2.36	2.20
8	N/D	562923.72	943553.76	WM	6"	DIP	↓	◯	4.47	2.44	2.03
9	N/D	562930.82	943701.83	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	4.96	3.92	1.04
10	N/D	562938.87	943824.25	WL	2"	PVC	↓	○	4.81	3.01	1.80
11	N/D	562939.14	943828.78	WM	8"	DIP	↓	◯	4.80	2.26	2.54
12	N/D	562945.36	943952.00	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	5.11	3.46	1.65
13	N/D	562945.45	943960.02	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	5.19	4.25	0.94
14	N/D	562946.21	943974.31	FM	SEE COMMENTS	SEE COMMENTS	↓	◯	5.06	3.46	1.60
15	N/D	562946.31	943976.29	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	5.03	3.45	1.58
16	N/D	562950.20	944230.97	WM	8"	PVC	↓	◯	4.11	3.04	1.07
17	N/D	562945.36	944231.38	WM	6"	CIP	↓	○	4.07	2.20	1.87
18	N/D	563028.87	944236.07	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	3.83	5.73	-1.90
19	N/D	562951.07	944249.89	WM	8"	PVC	↓	◯	4.26	3.26	1.00
20	N/D	562946.53	944249.85	WM	6"	CIP	↓	○	4.23	2.16	2.07
21	N/D	562253.69	942432.99	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	4.53	4.00	0.53
22	N/D	562227.22	942457.13	WM	12"	CIP	↓	◯	3.43	1.58	1.85
23	N/D	562202.11	942639.13	WM	2"	CIP	↓	○	4.49	1.79	2.70
24	N/D	562232.08	943222.04	WM	8"	DIP	↓	◯	4.80	3.08	1.72
25	N/D	562243.10	943347.12	WM	4"	CIP	↓	○	4.82	2.15	2.67
26	N/D	562247.90	943472.23	WM	8"	CIP	↓	◯	4.87	2.70	2.17
27	N/D	562261.90	943770.85	WM	8"	DIP	↓	◯	4.29	2.35	1.94
28	N/D	562272.93	943895.60	WM	4"	CIP	↓	○	4.03	2.25	1.78
29	N/D	562276.39	944021.87	WM	SEE COMMENTS	PVC	↓	◯	3.92	3.49	0.43
30	N/D	562276.31	944024.07	GM	2"	STL	↓	○	3.94	2.92	1.02
31	N/D	562277.37	944029.59	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	3.98	6.60	-2.62
32	N/D	562278.44	944042.90	FM	SEE COMMENTS	SEE COMMENTS	↓	◯	4.00	3.38	0.62
33	N/D	562278.50	944045.05	WM	SEE COMMENTS	DIP	↓	◯	4.00	3.38	0.62
34	N/D	562278.75	944048.79	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	4.00	3.26	0.74
35	N/D	562297.52	944319.71	GM	2"	STL	↓	○	4.25	2.70	1.55
36	N/D	562302.51	944321.96	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	4.12	6.02	-1.90
37	N/D	562285.58	944321.16	GM	2"	STL	↓	○	3.96	2.28	1.68
38	N/D	562285.58	944322.03	WM	SEE COMMENTS	SEE COMMENTS	↓	◯	3.94	5.06	-1.12
39	N/D	562287.77	944172.88	WM	4"	CIP	↓	○	3.98	2.45	1.53
40	N/D	562247.79	943497.80	GM	2"	STL	↓	○	4.80	1.83	2.97

COMMENTS

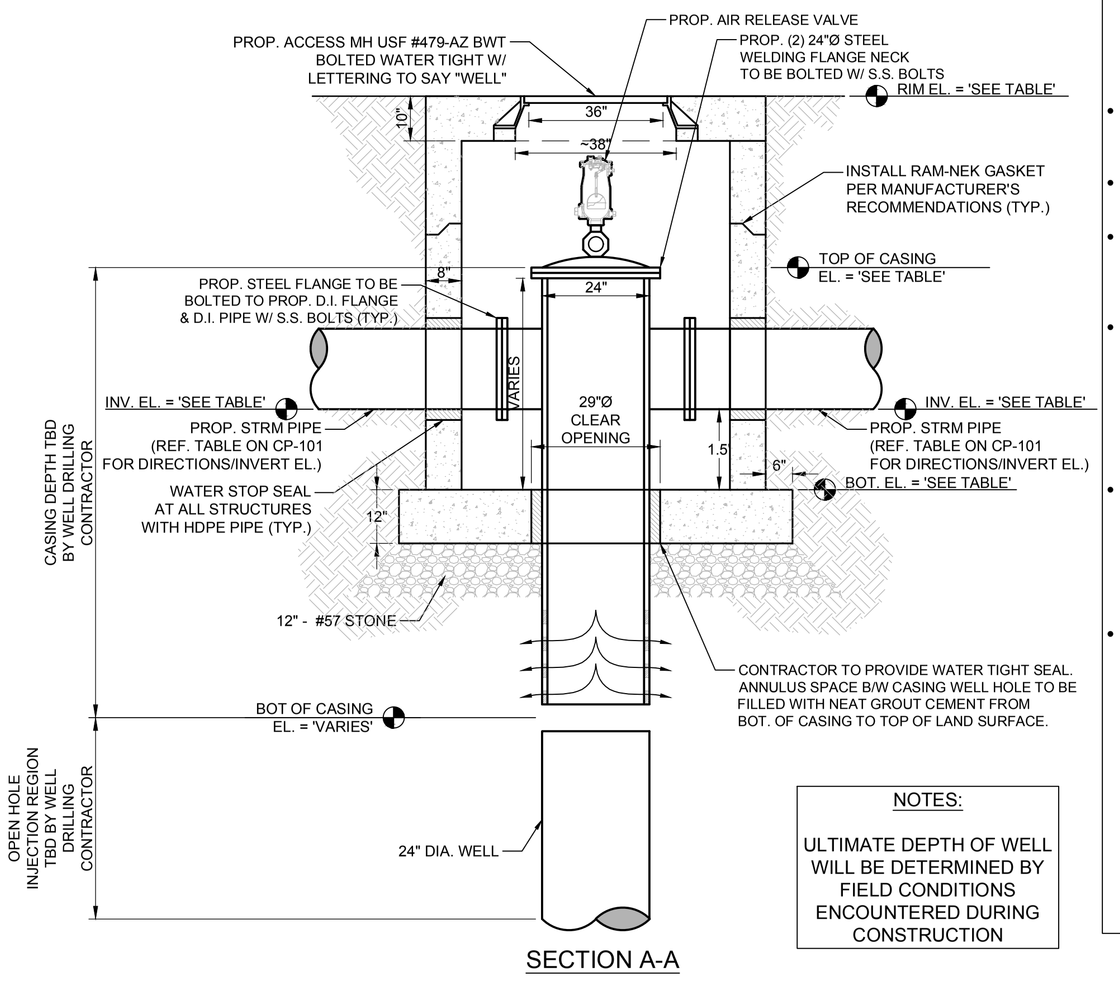
2	UNABLE TO LOCATE UTILITY AT REQUESTED LOCATION. SHIFTED TEST HOLE TO THE NORTH AND WAS ABLE TO VERIFY THE UTILITY
6	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 2.54
9	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 3.92'. PER UTILITY DRAWINGS THIS IS AN 8" PIPE
12	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 3.46'. PER UTILITY DRAWINGS THIS IS AN 8" PIPE
13	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 4.25'. PER UTILITY DRAWINGS THIS IS A 24" PIPE
14	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 3.46'. PER UTILITY DRAWINGS THIS IS A 16" PIPE
15	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 3.45'. PER UTILITY DRAWINGS THIS IS A 12" PIPE
18	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 5.73'. PER UTILITY DRAWINGS THIS IS AN 8" PIPE
21	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 4.00'. PER UTILITY DRAWINGS THIS IS AN 8" PIPE
29	UNABLE TO VERIFY SIZE DUE TO WATER TABLE. WAS ABLE TO PARTIALLY VISUALIZE THE PVC PIPE. PER UTILITY DRAWINGS THIS IS AN 8" PIPE
31	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 6.60'. PER UTILITY DRAWINGS THIS IS A 24" PIPE
32	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 3.38'. PER UTILITY DRAWINGS THIS IS A 16" PIPE
33	UNABLE TO VERIFY SIZE DUE TO WATER TABLE. WAS ABLE TO PARTIALLY VISUALIZE THE DUCTILE IRON PIPE. PER UTILITY DRAWINGS THIS IS A 12" PIPE
34	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 3.26'. PER UTILITY DRAWINGS THIS IS A 12" PIPE
36	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 6.02'. PER UTILITY DRAWINGS THIS IS AN 8" PIPE
38	UNABLE TO VERIFY SIZE AND MATERIAL DUE TO WATER TABLE. FELT CYLINDRICAL OBJECT WITH AIR LANCE AT A COVER DEPTH OF 5.06'. PER UTILITY DRAWINGS THIS IS AN 8" PIPE

DRAINAGE WELL TABLE

NO.	STR. DESCRIPTION	RIM EL.	INSIDE DIMENSIONS	INVERTS EL.	P.R.B.	TOP OF CASING EL.	BOTTOM EL.	COORDINATES (LATITUDE/LONGITUDE)	COMMENTS
DW #1	DRAINAGE WELL	4.33'	60" Ø	(-) 1.65' (E) - 12" PVC (C900) 0.50' (W) - 12" PVC (C900)	-	1.33'	(-) 3.65'	N 022°35'45.60" / W 081°56'13.65"	WATERTIGHT
DW #2	DRAINAGE WELL	4.09'	60" Ø	(-) 2.23' (E) - 18" PVC (C900) (-) 1.65' (W) - 12" PVC (C900)	-	1.09'	(-) 4.23'	N 022°35'45.66" / W 081°56'12.58"	WATERTIGHT
DW #3	DRAINAGE WELL	3.56'	60" Ø	(-) 1.50' (N) - 18" PVC (C900) (-) 2.50' (S) - 24" PVC (C900)	-	0.56'	(-) 4.50'	N 022°35'44.95" / W 081°56'11.72"	WATERTIGHT
DW #4	DRAINAGE WELL	3.49'	60" Ø	(-) 2.50' (N) - 24" PVC (C900) (-) 2.50' (S) - 24" PVC (C900)	-	0.49'	(-) 4.50'	N 022°35'42.98" / W 081°56'11.49"	WATERTIGHT
DW #5	DRAINAGE WELL	3.26'	60" Ø	(-) 2.50' (N) - 24" PVC (C900) (-) 2.27' (S) - 30" PVC (C900)	-	0.26'	(-) 4.50'	N 022°35'41.01" / W 081°56'11.26"	WATERTIGHT
DW #6	DRAINAGE WELL	3.75'	60" Ø	(-) 1.81' (E) - 30" PVC (C900) (-) 5.61' (W) - 30" PVC (C900)	-	0.75'	(-) 7.61'	N 022°35'39.24" / W 081°56'10.29"	WATERTIGHT



PLAN VIEW



SECTION A-A

NOTES:

ULTIMATE DEPTH OF WELL WILL BE DETERMINED BY FIELD CONDITIONS ENCOUNTERED DURING CONSTRUCTION

NOTES:

- REFER TO SHEET CP-101 DRAINAGE STRUCTURE TABLE.
- WELL BOX REINFORCEMENT SHALL BE DESIGNED BY PRE CASTER TO MEET FDOT STANDARDS AND SPECIFICATIONS.
- 24" DIAMETER WELL. CONTRACTOR TO DEVELOP WELL CAPABLE OF DISCHARGING **300 GPM PER FOOT OF HEAD**. FINAL WELL DIMENSIONS TO BE DETERMINED BY A LICENSED WELL CONTRACTOR. FINAL DEPTH OF CASING TO BE FIELD DETERMINED BY WELL CONTRACTOR. THE WELL CASING SHALL PENETRATE A ZONE CONTAINING A MINIMUM OF 10,000 mg/L TOTAL DISSOLVED SOLIDS (TDS).
- DRAINAGE WELL TO BE CONSTRUCTED IN ACCORDANCE WITH ALL APPLICABLE REGULATORY STANDARDS AND PERMITS.
- LIDS TO BE BOLTED DOWN (PENTA HEAD BOLTS, 4 ON INNER COVER AND 4 ON OUTER COVER).
- THE CONTRACTOR IS SOLELY RESPONSIBLE TO PREVENT ANY FLUID FROM DISCHARGING INTO THE DRAINAGE WELL WITHOUT WRITTEN AUTHORIZATION FROM FDEP TO USE THE WELL.
- THE WELL CASING SHALL BE 24" DIAMETER AND IN ACCORDANCE WITH RULE 62-532.500(1)(A), FAC WHICH SPECIFIES ALL WELL CASING SHALL BE NEW AND CONFORM TO AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) A53/A53M-99b, A135-01, A252-98, A589-96, OR AMERICAN PETROLEUM INSTITUTE (API) 5L-2000. REFER TO RULE FOR MORE DETAILS.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY EQUIPMENT FOR CONDUCTING THE WELL TEST AND SATISFACTORILY DISPOSING OF THE WATER PUMPED FROM THE WELL. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF 48 HOURS NOTICE TO THE CITY, ENGINEER AND/OR REGULATORY AGENCIES PRIOR TO THE START OF THE TEST.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SECURE THE NECESSARY WELL DRILLING PERMITS AND COMPLY WITH ALL PROVISIONS THEREOF. THIS SHALL INCLUDE (BUT NOT LIMITED TO) SECURING THE FINAL CONSTRUCTION/CLEARANCE PERMIT FOR A CLASS V WELL BY COMPLETING AND PROCESSING THE REQUIRED APPLICATION FORM (62-528.900.(3) THROUGH FDEP. IN ADDITION, THE CONTRACTOR IS REQUIRED TO PREPARE/PROVIDE THE REASONABLE ASSURANCE REPORT IN ACCORDANCE WITH FDEP REQUIREMENTS. THE CONTRACTOR SHALL HIRE A QUALIFIED FLORIDA LICENSED PROFESSIONAL GEOLOGIST/ENGINEER WITH THE REQUIRED HYDROGEOLOGICAL EXPERTISE TO DEVELOP THIS REPORT AND PROVIDE THE NECESSARY SIGNED AND SEALED COPIES.

1 DRAINAGE WELL

NOT TO SCALE

KEITH
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PH: (305) 667-5474
Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

REVISIONS

NO.	DESCRIPTION	DATE
1	BID RFI RESPONSES	11/10/23

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

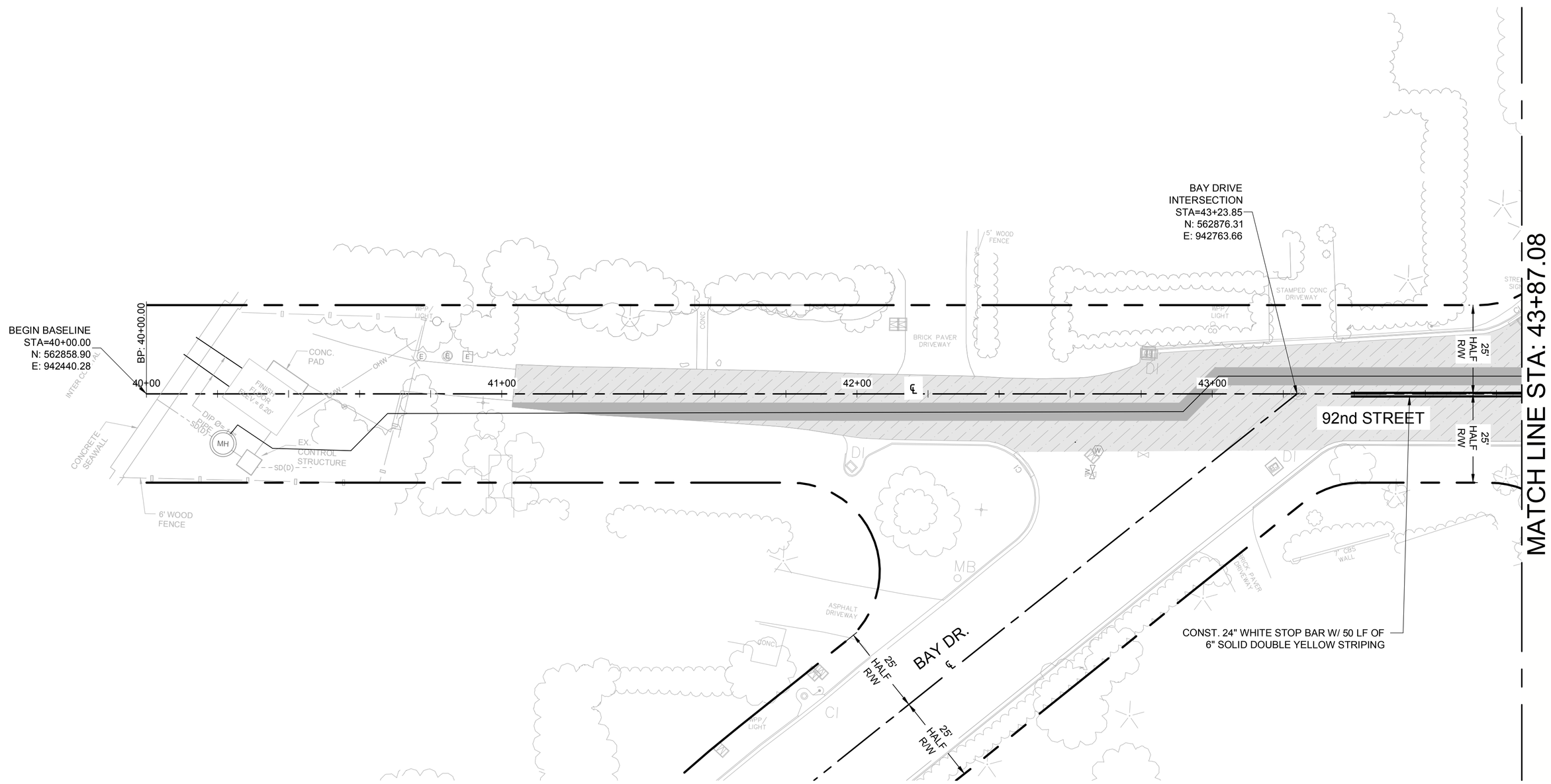
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

DRAINAGE DETAILS

SHEET NUMBER	CP-502
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



ALL ELEVATIONS ARE BASED ON NGVD1929

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NO.	DESCRIPTION	DATE

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(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

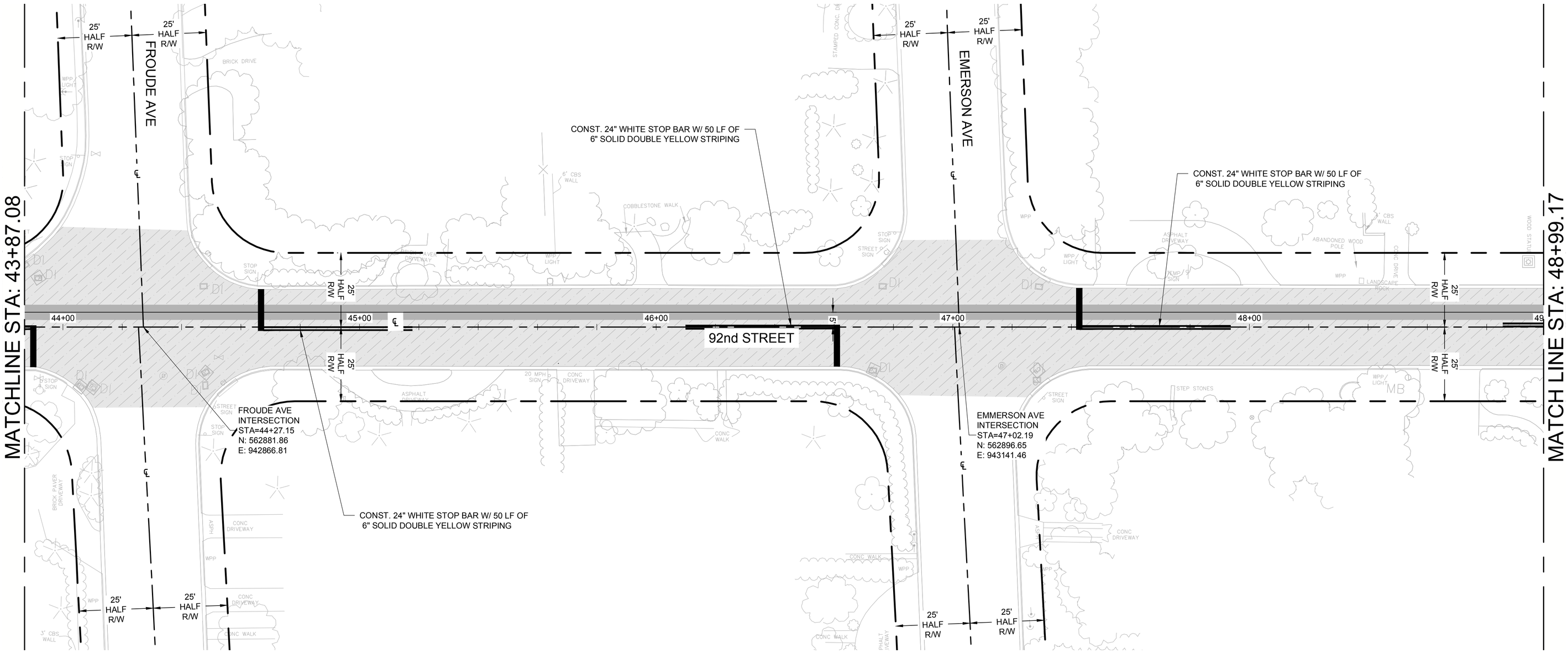
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PAVEMENT SIGNING AND MARKING PLAN - 92ND STREET

SHEET NUMBER	CM-101
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



N

GRAPHIC SCALE
0 20 40
SCALE: 1" = 20 '

NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.

ALL ELEVATIONS ARE BASED ON NGVD1929

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REVISIONS

NO.	DESCRIPTION	DATE

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ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

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(FOR THE FIRM)

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TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

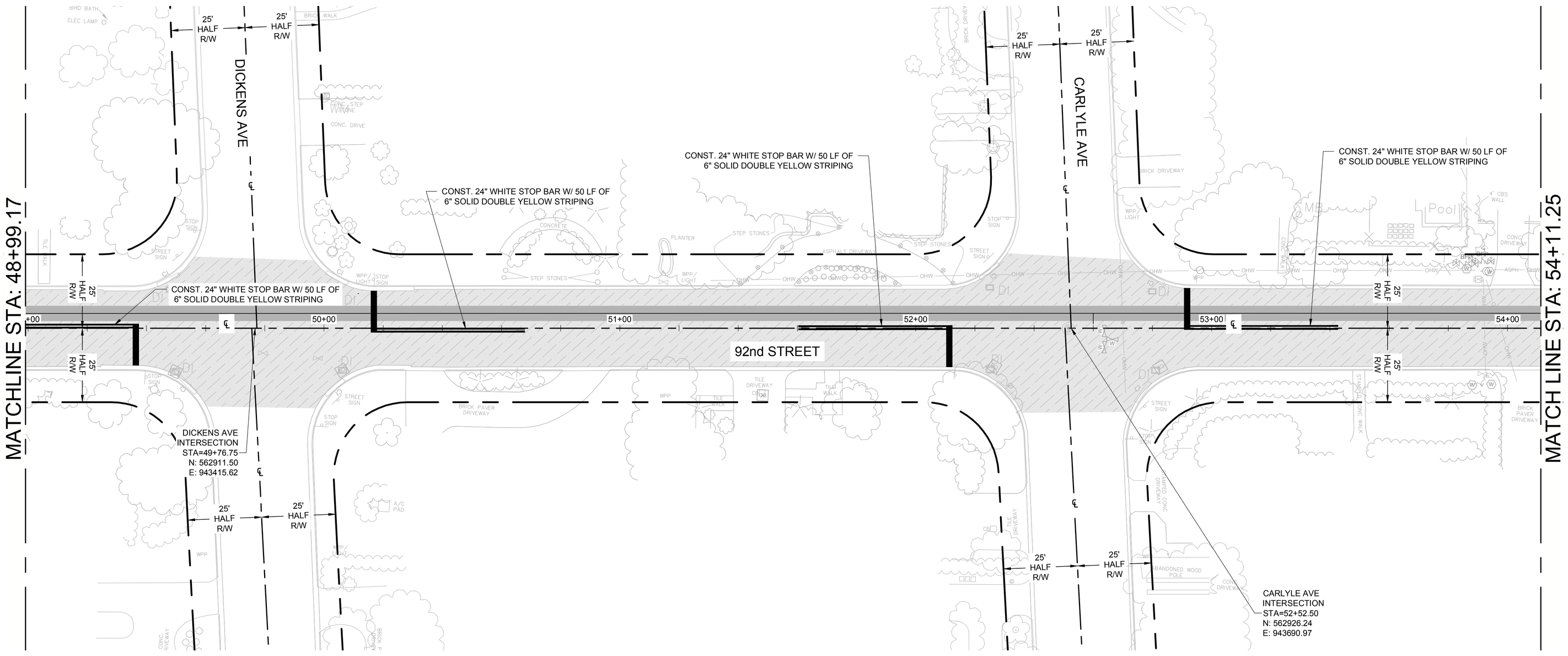
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PAVEMENT SIGNING AND MARKING PLAN - 92ND STREET

SHEET NUMBER	CM-102
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



N

GRAPHIC SCALE

0 20 40

SCALE: 1" = 20 '

NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.

ALL ELEVATIONS ARE BASED ON NGVD1929

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REVISIONS

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ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
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BID-CONTRACT:	

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TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

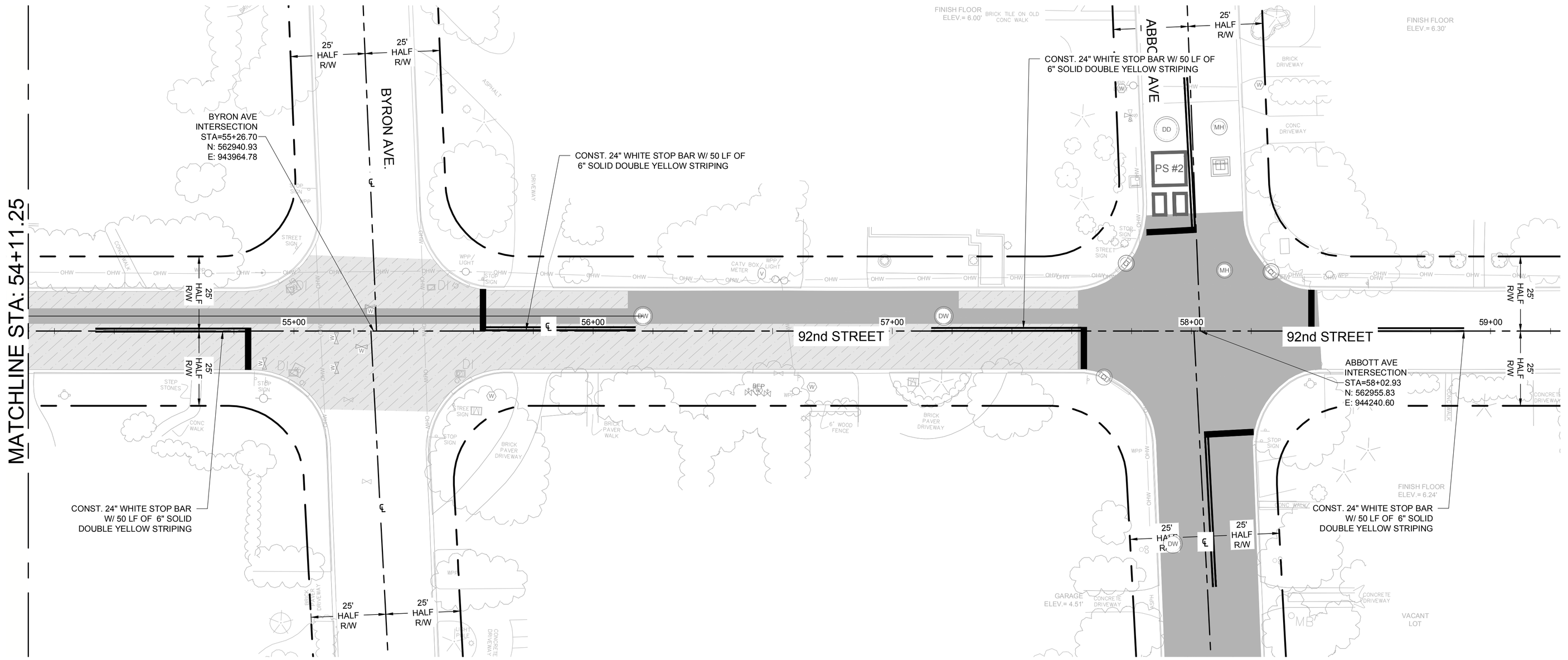
SHEET TITLE

PAVEMENT SIGNING AND MARKING PLAN - 92ND STREET

SHEET NUMBER **CM-103**

PROJECT NUMBER **11494.01**

STATUS: CONSTRUCTION DOCUMENTS



N

GRAPHIC SCALE

0 20 40

SCALE: 1" = 20 '

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REVISIONS

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DESIGNED BY:	CM
DRAWN BY:	MB
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BID-CONTRACT:	

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CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

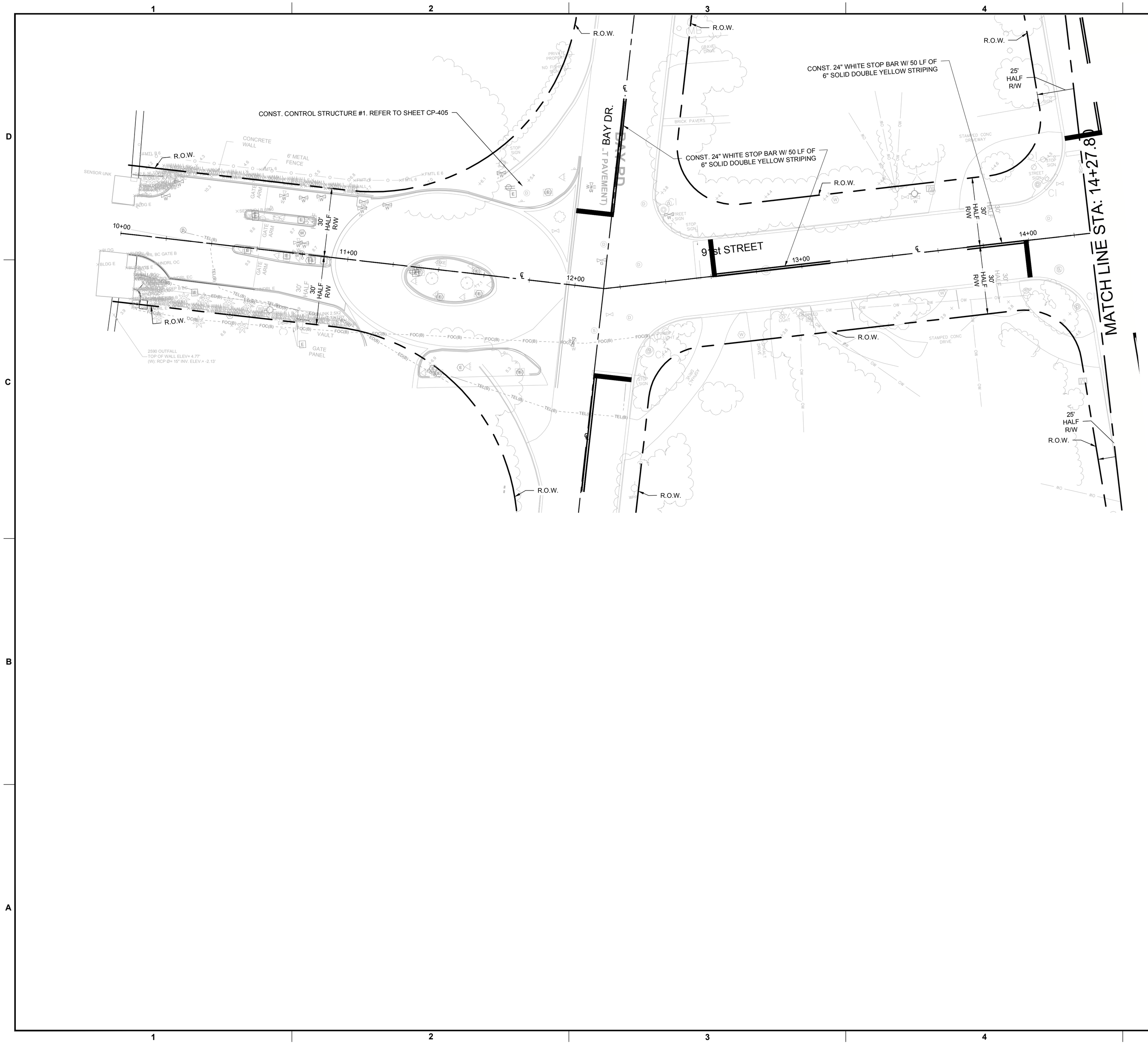
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PAVEMENT SIGNING AND MARKING PLAN - 92ND STREET

SHEET NUMBER	CM-104
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



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BID-CONTRACT:	

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CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

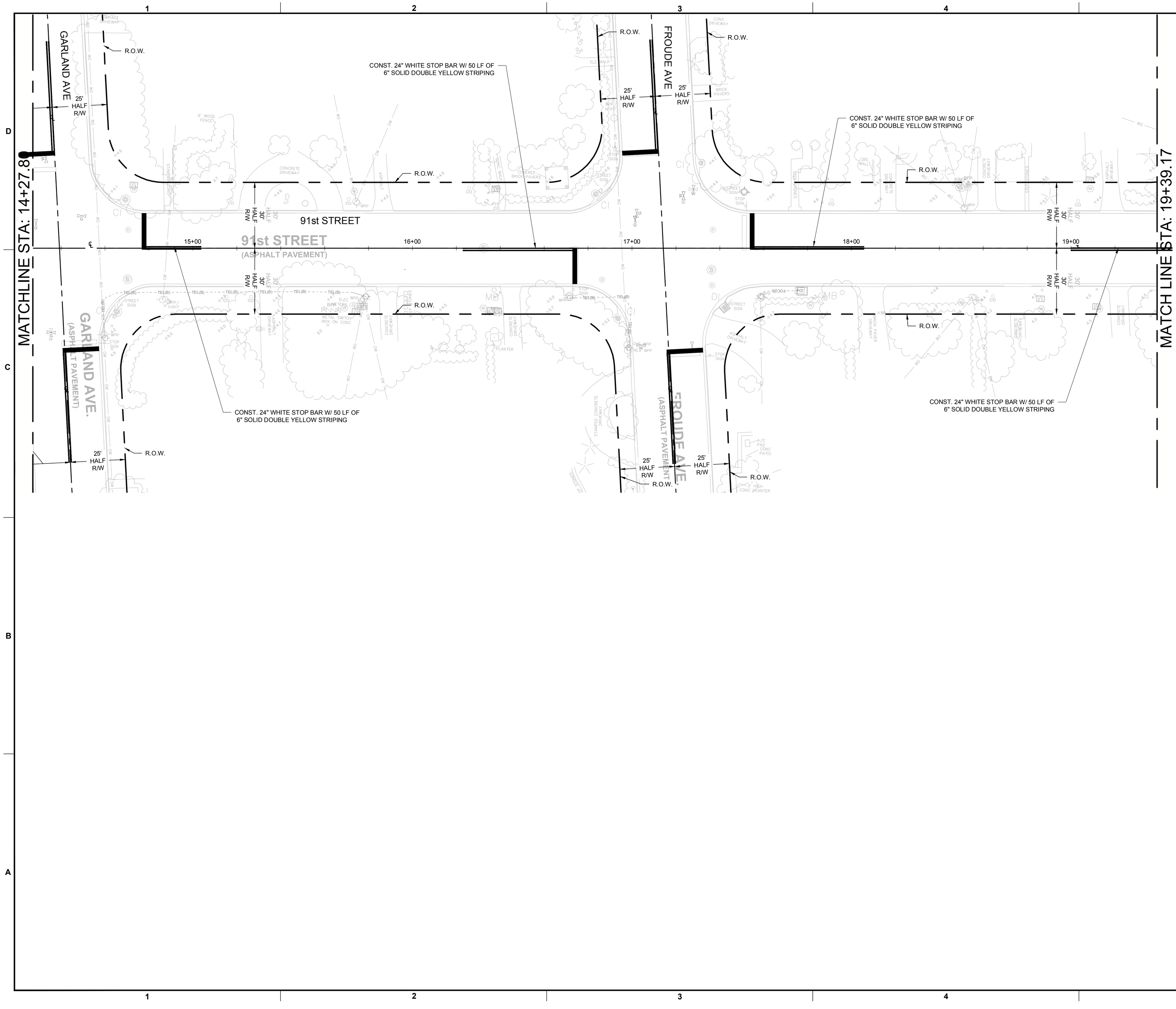
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PAVEMENT SIGNING AND MARKING PLAN - 91ST STREET

SHEET NUMBER	CM-105
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



ALL ELEVATIONS ARE BASED ON NGVD1929

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REVISIONS

NO.	DESCRIPTION	DATE

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	05/06/2024
DESIGNED BY:	CM
DRAWN BY:	MB
CHECKED BY:	SW
BID-CONTRACT:	

STEPHEN D. WILLIAMS, P.E.
FLORIDA REG. NO. 32090
(FOR THE FIRM)

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

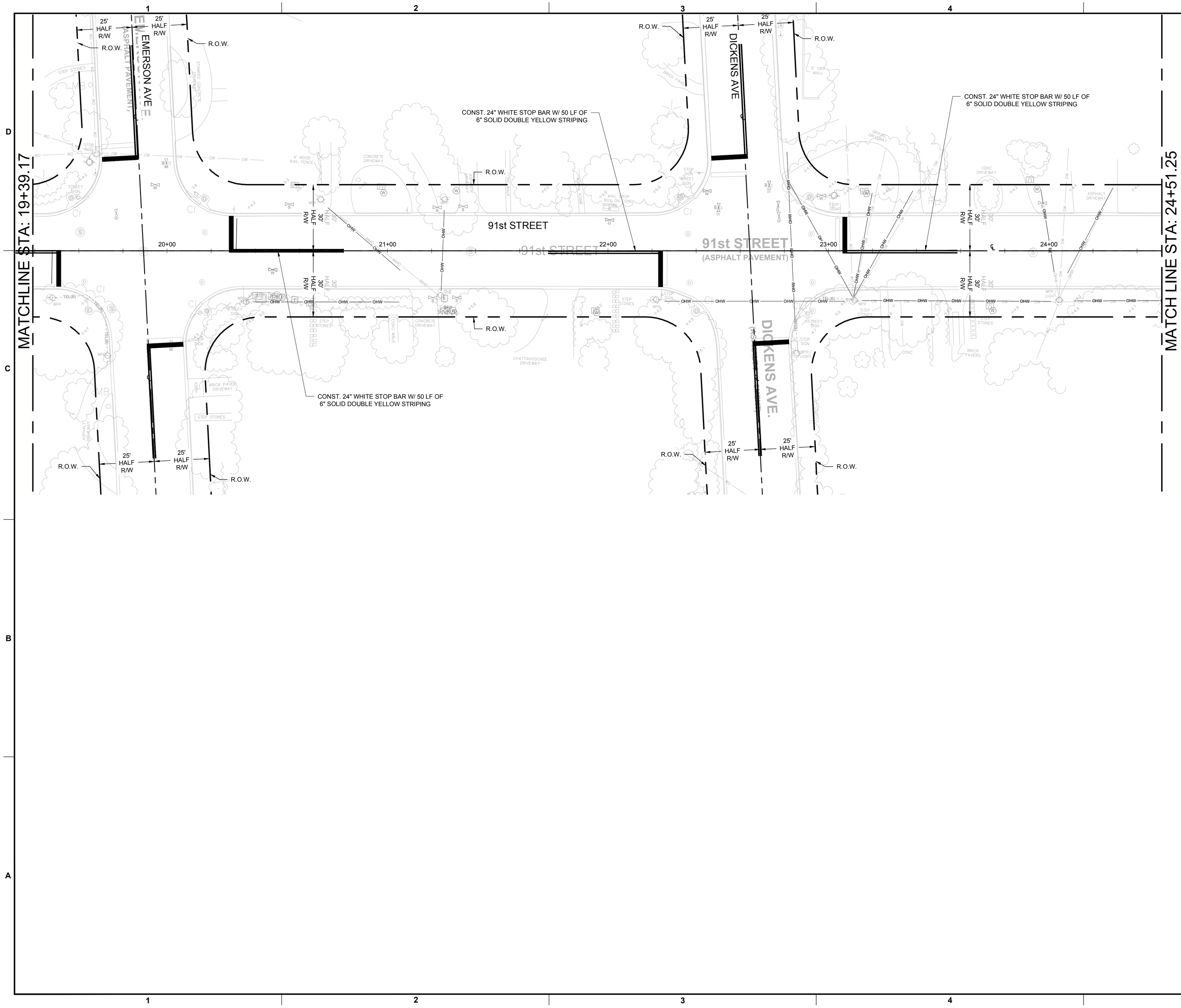
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

PAVEMENT SIGNING AND MARKING PLAN - 91ST STREET

SHEET NUMBER	CM-106
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS



N

GRAPHIC SCALE
0 20 40
SCALE: 1" = 20 '

NOTE: PRINTED DRAWING SIZE MAY HAVE CHANGED FROM ORIGINAL. VERIFY SCALE USING BAR SCALE ABOVE.

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SHEET NUMBER	CM-107
PROJECT NUMBER	11494.01

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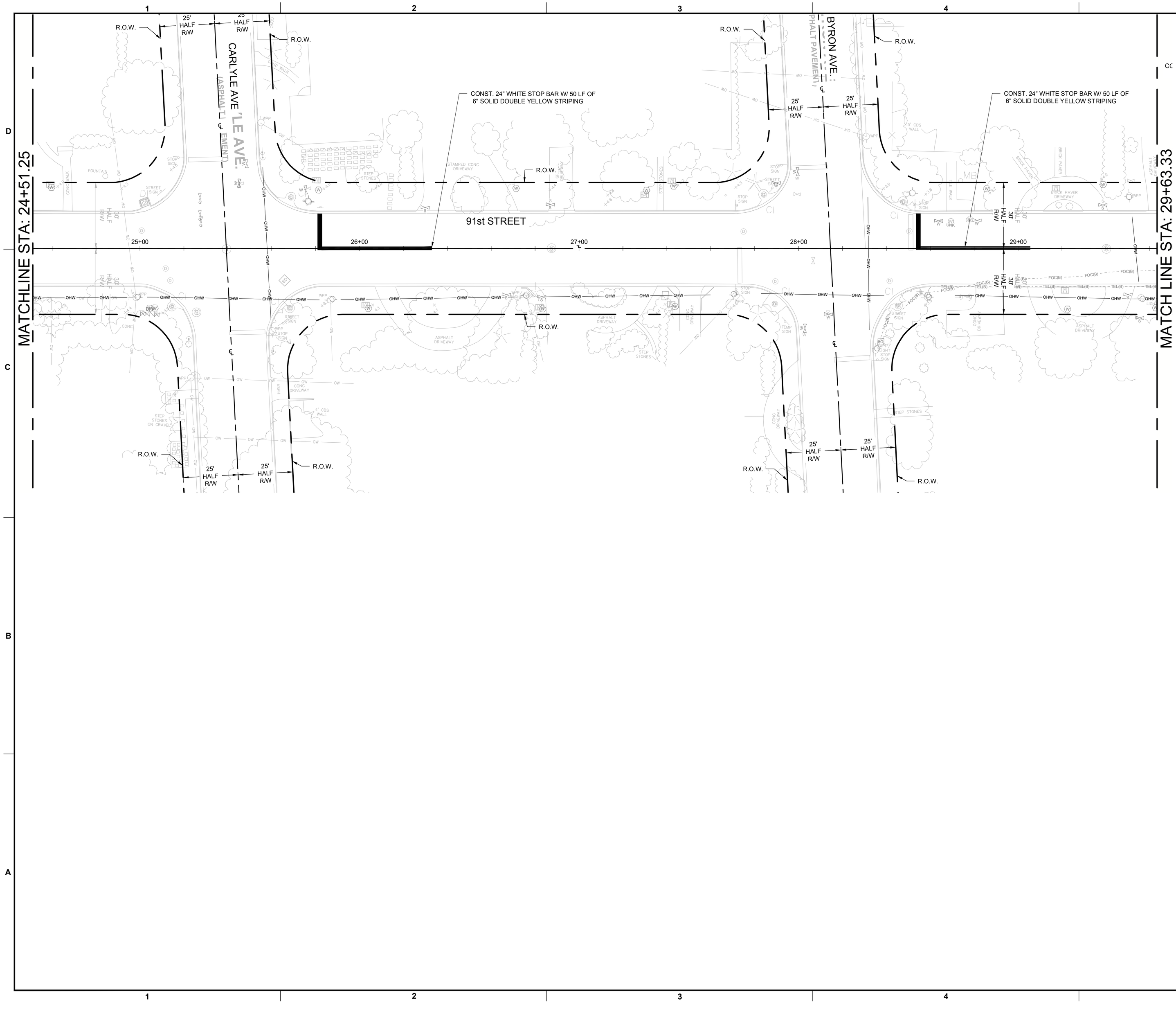

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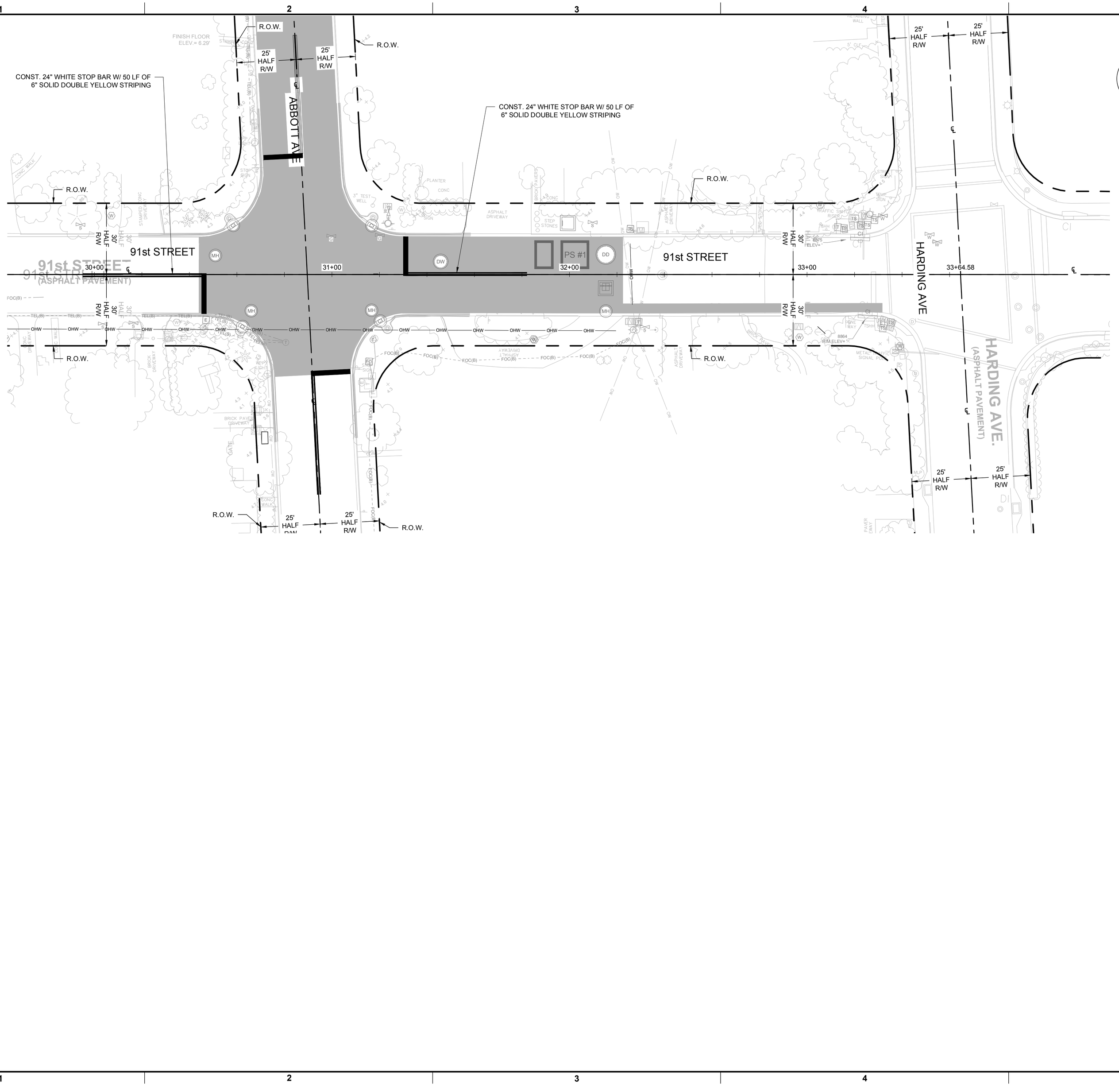

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PAVEMENT SIGNING AND MARKING PLAN - 91ST STREET

SHEET NUMBER	CM-105
PROJECT NUMBER	11494.01

STATUS: CONSTRUCTION DOCUMENTS

1.0 BASIC ELECTRICAL REQUIREMENTS

1.1 SCOPE OF WORK
A. FOR PURPOSE OF LEGIBILITY, DRAWINGS ARE DIAGRAMMATIC AND ALTHOUGH LOCATION OF EQUIPMENT IS SHOWN TO SCALE, THE CONTRACTOR SHALL VERIFY ALL INFORMATION AT THE SITE BEFORE BIDDING THE JOB.
B. WHEN DRAWINGS, NOTES AND THESE REQUIREMENTS ARE IN CONFLICT, THE MOST STRINGENT CONDITION SHALL APPLY UNLESS OTHERWISE APPROVED BY THE ENGINEER.
C. THE WORK CONSISTS OF ALL SUPERVISION, LABOR, MATERIALS, EQUIPMENT AND INSTALLATION REQUIRED FOR THE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS OR CALLED FOR IN THESE REQUIREMENTS.
D. FURNISH, INSTALL AND MAINTAIN TEMPORARY ELECTRICAL POWER AND LIGHTING REQUIRED FOR ALL TRADES.
E. CONNECT ELECTRICAL EQUIPMENT FURNISHED BY OTHER TRADES EVEN IF NOT SHOWN ON ELECTRICAL DRAWINGS.

1.2 CODES AND STANDARDS
PERFORM WORK AND FURNISH EQUIPMENT COMPLYING WITH CURRENT EDITIONS OF THE FOLLOWING CODES:
1) NATIONAL ELECTRICAL CODE (NEC 2017)
2) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
3) UNDERWRITERS' LABORATORIES (UL)
4) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
5) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
6) INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)
7) FLORIDA BUILDING CODE (FBC 2020)
8) INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)

1.3 SHOP DRAWINGS
WITHIN 30 DAYS AFTER THE DATE OF THE AWARD OF THE CONTRACT, AND BEFORE ANY MATERIAL OR EQUIPMENT IS PURCHASED, SUBMIT TO THE ENGINEER FOR APPROVAL, A COMPLETE LIST IN QUINTUPLICATE OF ELECTRICAL MATERIALS, AND EQUIPMENT TO BE INCORPORATED IN THE WORK. INCLUDE CATALOG NUMBER, DIMENSIONS, INTERCONNECTION DIAGRAMS AND INSTALLATION INSTRUCTIONS.

1.4 OPERATION AND MAINTENANCE MANUALS
O & M MAINTENANCE MANUALS MUST CONTAIN BUT NOT LIMITED TO THE FOLLOWING:
1) SYSTEM DESCRIPTION, AND OPERATING AND MAINTENANCE INSTRUCTIONS.
2) MANUFACTURER'S NAME AND MODEL NUMBER OF ALL COMPONENTS.
3) CONTROL AND WIRING DIAGRAMS WITH SEQUENCE OF OPERATION.
4) LIST OF RECOMMENDED SPARE PARTS.

1.5 AS BUILT DRAWINGS
AFTER FINAL INSPECTION, FURNISH A SET OF REPRODUCIBLE "AS BUILT DRAWINGS" SHOWING DEPTHS AND ROUTING OF CONCEALED ELECTRICAL BELOW GRADE INSTALLATIONS AND ALL VARIATIONS BETWEEN THE ACTUAL WORK AND AS IT WAS SHOWN ON THE CONTRACT DRAWINGS.

1.6 MATERIALS
A. FURNISH EQUIPMENT AND MATERIALS THAT ARE NEW AND LATEST DESIGN OF STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT.
B. ALL MATERIALS SHALL BEAR THE LABEL OF UNDERWRITER'S LABORATORY FOR THE INTENDED USE.
C. EQUIPMENT ENCLOSURES SHALL BE NEMA 12 FOR INDOOR USE, AND NEMA 4X (STAINLESS STEEL) OR 3R AS SHOWN ON DRAWINGS FOR OUTDOOR USE.
D. FURNISH LIGHTING FIXTURES WITH LAMPS AND 10 PERCENT (TWO MINIMUM) SPARE LAMPS OF EACH TYPE.
E. FURNISH FUSIBLE EQUIPMENT WITH FUSES AND 10 PERCENT (THREE MINIMUM) OF SPARE FUSES OF EACH TYPE.

1.7 INSTALLATION
A. INSTALL EQUIPMENT AT THE LOCATIONS SHOWN ON THE DRAWINGS FOLLOWING THE MANUFACTURER'S RECOMMENDATIONS.
B. COORDINATE INSTALLATION OF UNDERGROUND DUCTS AND CONDUITS WITH EXISTING UNDERGROUND UTILITIES. FIELD VERIFY ROUTING AND BURIAL DEPTH. DRAIN DUCTS AWAY FROM BUILDINGS TOWARD MANHOLES. LOW POINTS IN DUCT BANK RUNS ARE NOT ACCEPTABLE.
C. INSTALL FLOOR MOUNTED SELF SUPPORTED EQUIPMENT ON 4-INCHES HIGH CONCRETE PADS WITH STEEL REINFORCING. USE REQUIRED BOLTS, ANCHORS, INSERTS AND CONDUIT SLEEVES.
D. MAKE OPENINGS THROUGH WALLS, CEILINGS, ROADWAYS, FLOOR SLABS, ETC. REQUIRED FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT, BUT CUTTING, WELDING, OR OTHER WEAKENING OF BUILDING STRUCTURE TO SIMPLIFY ELECTRICAL EQUIPMENT AND MATERIALS' INSTALLATION ARE NOT PERMITTED. WHERE EXISTING WALLS, CEILINGS OR FLOOR SLABS HAVE TO BE CUT, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER BEFORE MAKING SUCH CUTS. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE DONE WHILE PROVIDING SUCH OPENINGS AND SHALL PATCH THE SURFACE TO MATCH ADJACENT MATERIALS AND FINISHES.
E. NO CONDUITS, SLEEVES, PIPES OR ANY OTHER ITEM SHALL BE EMBEDDED IN CONCRETE ALONG OR THROUGH ANY BEAM, COLUMN, FOOTING, GRADE BEAM, SLAB, WALL OR ANY OTHER STRUCTURAL MEMBER WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
F. COORDINATE SHIPPING LENGTHS OF SWITCH GEARS AND MOTOR CONTROL CENTERS. THOSE ITEMS SHALL BE ABLE TO BE REMOVED AND REPLACED IN THE FUTURE THROUGH THE PERMANENT ACCESS PROVIDED IN THE STRUCTURE.
G. PROVIDE 36- INCHES WIDE, 3/16- INCHES THICK RUBBER MATS IN THE FRONT AND REAR OF SWITCH GEARS, MOTOR CONTROL CENTERS AND SWITCHBOARDS. MATS TO COMPLY WITH FEDERAL SPECS ZZ-F-416A.

1.8 TESTING
UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL ENERGIZE, START-UP AND TEST OPERATE ALL THE SYSTEMS AND EQUIPMENT IN THE PRESENCE OF THE ENGINEER. INSULATION RESISTANCE TESTS SHALL BE MADE ON 240 VOLT FEEDER WITH A 500 VOLT DC MEGGER. DEFECTS FOUND SHALL BE CORRECTED.

2.0 RACEWAYS

2.1 RIGID CONDUIT
A. STEEL: HOT DIPPED ZINC COATED, GALVANIZED, THREADED RIGID STEEL CONFORMING TO ANSI C80, AND FED. SPEC WW-C-581. USE THREADED GALVANIZED STEEL FITTINGS.
B. ALUMINUM: CONTAINING LESS THAN 0.1 PERCENT COPPER AND CONFORMING TO FEDERAL SPECIFICATION WW-C-540C. USE THREADED ALUMINUM FITTINGS.
C. PLASTIC: RIGID, SCHEDULE 40, 90 DEGREES C., UL RATED, PVC PLASTIC CONFORMING TO UL 651, FED. SPEC. W-C-1094 AND NEMA TC-2. FITTINGS TO CONFORM WITH UL3 514 AND NEMA TC-3.

2.2 FLEXIBLE METAL CONDUIT
LIQUID-TIGHT: FLEXIBLE ZINC COATED CONFORMING TO UL 1 TYPE WITH LIQUID-TIGHT FLEXIBLE PLASTIC SHEATH, CONFORMING TO UL 360 STANDARD.
FITTINGS, PER FED. SPEC. W-R-406B AND UL 514.

2.3 LOCATION AND USE OF EACH TYPE OF CONDUIT
A. USE RIGID ALUMINUM CONDUIT FOR ABOVE GROUND EXPOSED INSTALLATIONS EXCEPT IN CORROSIVE AREAS WHERE PVC COATED RIGID GALVANIZED STEEL SHALL BE USED.
B. USE GALVANIZED THREADED RIGID STEEL CONDUIT AS FOLLOWS:
1) WHEREVER SPECIFICALLY CALLED FOR ON DRAWINGS.
2) WHERE RACEWAY ELBOWS FROM DUCT BANKS STUB-UP.
3) FOR UNDERGROUND WORK BEYOND BUILDINGS WHERE CONCRETE ENCASED PLASTIC CONDUITS HAVE NOT BEEN SPECIFIED. COAT BURIED GALVANIZED STEEL CONDUITS AND FITTINGS WITH TWO COATS OF CARBOLINE'S BITUMASTIC NO. 50 OR EQUAL.
C. USE PLASTIC CONDUIT AS FOLLOWS:
1) WHEN INSTALLED IN POURED CONCRETE SLABS OR WALLS.
2) FOR UNDERGROUND WORK UNDER SLABS.
3) IN DUCT BANKS OR, IF SPECIFICALLY CALLED FOR, IN TRENCHES. BACK-FILL TRENCHES WITH STRUCTURAL FILL 90 % COMPACTED (PROCTOR DENSITY) AND RESOD TO ORIGINAL CONDITION.
D. USE FLEXIBLE METAL CONDUIT (24 TO 60 INCHES LONG) FOR CONNECTIONS TO ROTATING OR VIBRATING EQUIPMENT.

2.4 INSTALLATION
A. DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL BENDS, FITTINGS, BOXES, AND SPECIALTIES WHICH MAY BE REQUIRED OR THE EXACT LOCATION OF CONDUITS. EXAMINE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL OF THE WORK AND PLAN IT ACCORDINGLY, FURNISHING SUCH FITTINGS AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. ARRANGE CONDUIT RUNS TO CLEAR BEAMS, PIPES AND OTHER OBSTRUCTIONS AND AVOID INTERFERENCES WITH OTHER TRADES WORK. ANY CHANGES FROM LOCATIONS SHOWN ON THE DRAWINGS MUST BE APPROVED BY THE ENGINEER.
B. INSTALL RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES AND CEILINGS. INSTALL HORIZONTAL RACEWAYS CLOSE TO CEILING OR CEILING BEAMS, AND ABOVE PIPES AND DUCTS.
C. SIZE RACEWAY ACCORDING TO NEC, BUT IN NO CASE SHALL BE LESS THAN INDICATED ON DRAWINGS. MINIMUM SIZE SHALL BE 3/4-INCH, EXCEPT FLEXIBLE CONDUITS TO LIGHT FIXTURES CAN BE 3/8" BUT NOT EXCEEDING SIX FEET LONG.
D. INSTALL CONDUITS PASSING THROUGH WALLS AND SLABS IN PVC SLEEVES. EXTEND SLEEVES THROUGH FULL CONCRETE THICKNESS AND PROVIDE 1/2- INCH CLEARANCE AROUND CONDUITS TO FACILITATE SEALING.
E. SEAL ANY OPENING MADE IN SLABS OR WALLS TO PREVENT SMOKE OR FIRE SPREAD AND THE PASSAGE OF WATER. USE SEALING COMPOUND APPROVED FOR THE PURPOSE.
F. USE EXPANSION FITTINGS WHEN CONDUITS CROSS STRUCTURAL EXPANSION JOINTS.
G. EXCEPT WHERE BOXES, PANELS AND OTHER EQUIPMENT HAVE THREADED OPENINGS, MAKE CONDUIT CONNECTIONS AS FOLLOWS:
1) DOUBLE LOCKNUTS, ONE INSIDE AND ONE OUTSIDE.
2) PROVIDE MALLEABLE, IRON OR STEEL BUSHING WITH BAKELITE LINER MOLDED AND BONDED INTO THE BUSHING.
3) PLACE GROUNDING BUSHING ON END OF CONDUIT IN ADDITION TO LOCKNUTS.

2.5 SUPPORT OF RACEWAY
A. INSTALL WALL MOUNTED ELECTRICAL EQUIPMENT, WIRING TROUGHS, JUNCTION BOXES AND GROUPS OF TWO OR MORE CONDUITS ON A SYSTEM OF EXTRUDED, GAUGE 12, 1-5/8 INCHES WIDE, ALUMINUM CHANNELS. ATTACH CHANNELS TO WALL WITH STAINLESS STEEL MACHINE BOLTS AND EXPANSION SHIELDS. CHANNELS TO BE SERIES P-1000 WITH COMPATIBLE HARDWARE AND FITTINGS AS MANUFACTURED BY UNISTRUT MFG. CO. OR EQUAL.
B. FASTEN VERTICAL AND HORIZONTAL RUNS OF RACEWAYS AT INTERVALS OF NOT MORE THAN 8 FEET AND WITHIN 3 FEET OF BENDS, OUTLETS AND JUNCTION BOXES.
C. SUPPORT SINGLE CONDUITS NOT LARGER THAN 1-1/2 INCHES IN DIAMETER BY MEANS OF TWO-HOLE PIPE STRAPS OR INDIVIDUAL PIPE HANGERS. FOR CONDUITS LARGER THAN 1-1/2 INCHES IN DIAMETER USE INDIVIDUAL PIPE HANGERS.
D. SPACE CONDUITS INSTALLED AGAINST CONCRETE SURFACES NOT LESS THAN 1/4 INCH AWAY FROM THE SURFACES BY CLAMP BACKS OR OTHER APPROVED MEANS.
E. FURNISH HANGER RODS MADE OF GALVANIZED STEEL OF NOT LESS THAN 1/4 INCH IN DIAMETER. WHEN CONCEALED ABOVE A SUSPENDED CEILING, GALVANIZED PERFORATED STEEL STRAPPING IS ACCEPTABLE.
F. SUPPORT BRANCH CIRCUIT RACEWAYS INSTALLED ABOVE SUSPENDED CEILING INDEPENDENTLY OF THE CEILING SUPPORT SYSTEM. WHEREVER POSSIBLE, THEY SHALL BE FASTENED TO THE UNDERSIDE OF THE SLAB ABOVE.

2.6 METAL FRAMING (CONTINUOUS SLOT METAL CHANNEL SYSTEM)
A. CONFIGURATION. SINGLE CHANNEL OR TWO SINGLE CHANNELS WELDED TOGETHER, WITH CONTINUOUS 7/8-INCH SLOT AND TO ACCEPT SPRING-HELD STEEL NUTS.
B. DIMENSIONS: FOR SINGLE CHANNEL, 1-5/8 INCHES BY 1-5/8 INCHES. FOR DOUBLE CHANNEL, 1-5/8 INCHES BY 3-1/4 INCHES BOTH 12-GAUGE. FITTINGS TO BE 1-5/8 INCHES WIDE BY 1/4 INCH-THICK MINIMUM.
C. FINISHING OF CHANNELS, PIPE CLAMPS AND FITTINGS TO BE HOT DIP GALVANIZED AFTER FABRICATION CONFORMING TO ASTM A123 OR A153, AS APPLICABLE MINIMUM WEIGHT OF COATING. 2.0 OUNCES PER SQUARE FOOT. NUTS, BOLTS AND SCREW TO BE ELECTRO GALVANIZED.

3.0 CONDUCTORS (600 VOLTS)

3.1 MATERIAL
A. FURNISH CONDUCTORS OF 98 % ANNEALED COPPER, 600 VOLT CLASS B, HEAT AND MOISTURE RESISTANT, THERMOPLASTIC TYPE THHN/THHW (SIZED BY THW RATING), WITH A POLYVINYL CHLORIDE INSULATION RESISTANT TO OIL, GASOLINE AND WEATHER. INSULATION SHALL MEET UL STANDARD 83.
B. CONDUCTORS TO BE STRANDED; #8 THROUGH #2 SHALL BE 7 STRAND; #1 THROUGH 4/0, 19 STRAND AND 250 MCM THROUGH 500 MCM, 37 STRAND.

3.2 IDENTIFICATION
A. COLOR CODE POWER CONDUCTORS AS FOLLOWS:
1) 120/240 VOLT SYSTEM: WHITE-NEUTRAL, BLACK-PHASE A, BLUE-PHASE B, RED-PHASE C.
2) 277/480 VOLT SYSTEM: GRAY-NEUTRAL, YELLOW-PHASE A, BROWN-PHASE B, ORANGE-PHASE C.
3) BONDING CONDUCTOR GREEN.
B. IDENTIFY FEEDERS, BRANCH CIRCUITS AND INSTRUMENTATION AND CONTROL WIRES AT TERMINATIONS, JUNCTION AND PULL BOXES.

3.3 INSTALLATION
A. DO NOT USE CONDUCTORS SMALLER THAN AWG #12 FOR POWER AND #14 FOR CONTROL UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
B. DO NOT PULL CONDUCTORS INTO CONDUITS UNTIL THE MECHANICAL WORK HAS BEEN COMPLETED.
C. GROUP AND TIE CONDUCTORS IN PANEL BOARDS, JUNCTION BOXES, PULL BOXES, ETC., FOR A NEAT AND ORDERLY APPEARANCE.
D. USE CONNECTORS, TERMINALS AND SPLICES THAT ARE DESIGNED AND APPROVED FOR THE SPECIFIC TYPE AND SIZE OF THE CONDUCTORS BEING CONNECTED.
E. FIREPROOF FEEDERS WHERE NOT PROTECTED BY CONDUITS LIKE IN MANHOLES, SWITCH GEARS, ETC.

4.0 OUTLET, PULL AND JUNCTION BOXES

A. OUTLET BOXES IN INDOOR FINISHED WALLS TO BE GALVANIZED STEEL, 4" X 4" X 1-1/2" CONFORMING TO FEDERAL SPECIFICATIONS WC-583 AND ANSI-C33.65.
B. EXTERIOR OUTLET BOXES, BOXES AND FITTINGS EMBEDDED IN CONCRETE, AND BOXES FOR EXPOSED CONDUIT RUNS SHALL BE CAST OF RUST RESISTING METAL, WITH FULL THREADED HUBS, AND SCREW TYPE RUBBER GASKET COVERS.
C. INSTALL BOXES FOR LIGHT SWITCHES LOCATED NEAR DOORS ON THE LOCK SIDE, EVEN WHERE THE SYMBOLS ARE INDICATED ON THE HINGE SIDES.
D. PULL AND JUNCTION BOXES SHALL BE OF 12 GAUGE WELDED ALUMINUM WITH HINGED COVER. NEMA 12 FOR INDOOR USE AND NEMA 4X FOR OUTDOOR USE. MINIMUM DIMENSIONS SHALL BE 12" X 12" X 6".
E. IN CORROSIVE AREAS OR WHERE CALLED FOR ON DRAWINGS, FURNISH PULL AND JUNCTION BOXES OF 14 GAUGE STAINLESS STEEL.
F. WHEN SPLICING CONTROL CONDUCTORS IN BOXES USE SCREW TYPE TERMINAL STRIP BLOCKS CLASS 9080 (G) AS MANUFACTURED BY SQUARE D OR EQUAL, IDENTIFY EVERY WIRE AT BOTH SIDES AND PROVIDE SPADE TYPE LUGS FOR TERMINATION.
G. PROVIDE PULL AND JUNCTION BOXES WHERE REQUIRED TO REDUCE LENGTH OF CABLE PULL OR REDUCE NUMBER OF ELBOWS BETWEEN OUTLETS.

5.0 SWITCHES AND RECEPTACLES

A. FURNISH WALL SWITCHES OF THE QUIET AND TOTALLY ENCLOSED TUMBLER TYPE, WITH BODIES OF PHENOLIC COMPOUND. WIRING TERMINALS SHALL BE OF THE SCREW TYPE. NO MORE THAN ONE SWITCH SHALL BE INSTALLED IN A SINGLE-GANG POSITION. SWITCHES SHALL CONFORM TO FEDERAL SPECIFICATIONS WS-5896E, HUBBEL 1221 AND 1223, OR APPROVED EQUAL.
B. USE 20A, 125 V, DUPLEX, U-SLOTTED, GROUNDING TYPE RECEPTACLES THAT CONFORM TO FEDERAL SPECIFICATIONS WC-596D, HUBBEL 5362, OR EQUAL.
C. AMOUNT DUPLEX RECEPTACLES VERTICALLY. BOXES MOUNTED BACK TO BACK ARE NOT PERMITTED. GANGED RECEPTACLES AND SWITCHES SHALL HAVE SINGLE MULTI-GANG COVER PLATE.
D. FURNISH HOSPITAL GRADE GROUND FAULT INTERRUPTER WITH DIFFERENTIAL CURRENT TRANSFORMER, SOLID STATE SENSING CIRCUITRY AND CIRCUIT INTERRUPTER. SENSITIVITY TO BE 5 MA, TRIPPING TIME 1/30TH OF A SECOND.
E. WHEN INSTALLING RECEPTACLES IN OUTDOOR LOCATIONS USE CAST-METAL OUTLET BOXES WITH GASKET WEATHERPROOF CAST-METAL COVER PLATES AND SPRING-FLAP CAP OVER EACH RECEPTACLE.
F. USE STAINLESS STEEL COVER PLATES FOR SWITCHES AND RECEPTACLES EXCEPT IN NON-INDUSTRIAL AREAS SUCH AS OFFICES, REST ROOMS, LABORATORIES, ETC.

6.0 MOTOR DISCONNECT SWITCHES & STARTERS

A. PROVIDE EACH MOTOR WITH A DISCONNECTING MEANS MEETING THE REQUIREMENTS OF N.E.C. ARTICLE 430. SWITCHES SHALL BE HEAVY DUTY, HORSE POWER RATED, SUITABLE TO BE PADLOCKED IN "OFF" POSITION AND CONFORM TO FEDERAL SPECS W-S-865, NEMA KS1 AND ANSI C33.64. IF FUSES ARE REQUIRED, THEY SHALL BE CURRENT LIMITING TYPE
B. SIZE DISCONNECTS AND STARTERS FOR THE FULL LOAD OF THE CONTROLLED MOTOR. THE HORSEPOWER RATINGS INDICATED ON THE DRAWINGS ARE SHOWN FOR THE BENEFIT OF THE CONTRACTOR AND DO NOT LIMIT EQUIPMENT SIZE.
C. FOR SINGLE-PHASE FRACTIONAL HORSEPOWER MOTORS, A SINGLE OR DOUBLE-POLE TOGGLE SWITCH WILL BE ACCEPTABLE PROVIDED THE AMPERE RATING OF THE SWITCH IS AT LEAST 125 PERCENT OF MOTOR RATING.
D. SWITCHES SHALL BE THE QUICK-BREAK TYPE AND DISCONNECT ALL UNGROUNDED CONDUCTORS.
E. FOR MOTORS LARGER THAN 1/4 HORSEPOWER, FURNISH STARTERS SPECIFICALLY DESIGNED FOR THE PURPOSE AND HAVING A HORSEPOWER RATING EQUAL TO THE MOTOR CONTROLLED.
F. PROVIDE MOTORS OF 1/8 HORSEPOWER OR LARGER WITH THERMAL-OVERLOAD PROTECTION. THE OVERLOAD PROTECTION DEVICE, OF THE MANUAL RESET TYPE AND WITH CONTACTS ON EACH PHASE, SHALL BE PART OF THE STARTER. SIZE THE OVERLOAD HEATER ELEMENTS ACCORDING TO THE MOTOR MANUFACTURER'S RECOMMENDATIONS AND BASED ON THE ACTUAL MOTOR NAMEPLATE FULL-LOAD CURRENT.
G. PROVIDE EACH MOTOR WITH A SUITABLE CONTROLLER OR DEVICE TO MAKE IT PERFORM AS REQUIRED. AUTOMATIC CONTROL DEVICES SUCH AS THERMOSTATS, FLOAT OR PRESSURE SWITCHES MAY DIRECTLY CONTROL THE START-STOP OF MOTORS UP TO 1/4 HORSEPOWER, PROVIDED THE DEVICES USED ARE DESIGNED FOR THE PURPOSE AND HAVE AN ADEQUATE HORSEPOWER RATING. WHEN THE AUTOMATIC-CONTROL DEVICE DOES NOT HAVE SUCH A RATING, A MAGNETIC STARTER SHALL BE USED WITH THE AUTOMATIC CONTROL DEVICE ACTIVATING THE COIL OF THE CONTACTOR.
H. PROVIDE 3 POSITION MANUAL-OFF-AUTO SWITCH WHEN MANUAL AND AUTOMATIC CONTROL IS REQUIRED. CONNECT THE SELECTOR SWITCH SO THAT ONLY THE AUTOMATIC DEVICES ARE BY-PASSED WHEN THE SWITCH IS IN THE "MANUAL" POSITION. ALL SAFETY DEVICES SUCH AS PRESSURE AND TEMPERATURE SWITCHES, MOTOR OVERLOAD AND SAFETY SWITCHES SHALL BE ACTIVE IN "MANUAL" AND "AUTOMATIC" POSITIONS.
I. MOTOR CONTROL CIRCUITS SHALL OPERATE AT 120V GROUNDED, OBTAINED FROM THE LOAD SIDE OF THE MOTOR-DISCONNECT MEANS. IF THE MOTOR CIRCUIT IS MORE THAN 120V TO GROUND, FURNISH A CONTROL TRANSFORMER WITH FUSED PRIMARY AND SECONDARY CIRCUITS. STARTERS FOR MOTORS WITH SPACE HEATERS SHALL HAVE CONTROL TRANSFORMERS SIZED FOR THE ADDITIONAL LOAD.
J. FURNISH COMBINATION MOTOR STARTERS OF THE MOLDED CASE, MOTOR CIRCUIT PROTECTOR, CIRCUIT BREAKER TYPE, THREE PHASE, OF THE VOLTAGE AND SIZE AS SHOWN ON THE DRAWINGS BUT NOT SMALLER THAN THE SIZE REQUIRED BY THE CONTROLLED MOTOR, 120 VOLT CONTROL CIRCUIT, 3 THERMAL INTERCHANGEABLE OVERLOAD RELAYS, "HAND-OFF-AUTO" OR "ON-OFF" SWITCH AS REQUIRED BY THE APPLICATION, RED AND GREEN PILOT LIGHTS AND FOUR NORMALLY CLOSED AND NORMALLY OPEN INTERLOCK CONTACTS.
K. THE STARTER DISCONNECT SHALL BE OPERABLE BY AN EXTERNAL "ON-OFF" LABELED HANDLE, INTERLOCKED TO PREVENT OPENING THE ENCLOSURE DOOR WHILE THE DISCONNECT IS IN THE "ON" POSITION EXCEPT WHEN CONSCIOUSLY OPERATING A PERMISSIVE RELEASE DEVICE.
L. FURNISH STARTERS MANUFACTURED BY SQUARE D, CLASS 8536, ALLEN BRADLEY BULLETIN NO. 509, OR EQUAL.

7.0 PANEL BOARDS

A. PROVIDE DEAD FRONT CIRCUIT BREAKER TYPE PANEL BOARDS WITH COPPER BUS AND AS SCHEDULED ON DRAWINGS. EACH PANEL BOARD SHALL BE PROVIDED WITH A SEPARATE GROUND BUS IN ADDITION TO THE NEUTRAL BUS. CIRCUIT BREAKERS SHALL BE BOLT-ON AND HAVE A MINIMUM INTERRUPTING RATING OF 10,000 AMPERES AT 120 VOLTS, AND 14,000 AMPERES AT 277 VOLTS. A TYPEWRITTEN DIRECTORY SHALL CLEARLY IDENTIFY THE LOAD SERVED BY EACH CIRCUIT AND SHALL BE MOUNTED INSIDE THE DOOR IN A METAL FRAME WITH PLASTIC COVER. CIRCUIT NUMBERS SHALL BE PERMANENTLY INDICATED ADJACENT TO EACH CIRCUIT BREAKER.

8.0 GROUNDING

A. INSTALL GROUNDING AS SHOWN ON DRAWINGS. WHERE NOT INDICATED, INSTALL IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. DO NOT USE CONDUCTORS SMALLER THAN SIZE AWG #12.
B. INACCESSIBLE CONNECTIONS SHALL BE MADE WITH THE EXOTHERMIC WELDING PROCESS USING EQUIPMENT MANUFACTURED BY BURUNDY OR ERICO PRODUCTS OR EQUAL.
C. ACCESSIBLE CONNECTIONS SHALL BE MADE WITH BURUNDY, MULTIPLE BOLT CONNECTORS SPECIFICALLY APPROVED FOR THE APPLICATION.
D. TO ASSURE ELECTRICAL CONTINUITY, INSTALL JUMPERS ACROSS METAL PARTS SEPARATED BY NON-CONDUCTING MATERIALS OR ATTACHED TOGETHER BY HIGH RESISTANCE JOINTS.
E. DO NOT EMBED GROUNDING CABLES DIRECTLY IN CONCRETE. USE SLEEVES WHEN PASSING CABLES THROUGH CONCRETE. BARE COPPER CABLES BURIED IN EARTH SHALL BE TINNED.
F. FURNISH GROUND RODS OF COPPER CLAD STEEL, 3/4 INCH IN DIAMETER, 10 FEET LONG, DRIVEN FULL LENGTH INTO THE EARTH. MAXIMUM RESISTANCE TO GROUND IS LIMITED TO 25 OHMS. ADDITIONAL GROUND RODS SHALL BE DRIVEN IF REQUIRED TO MAINTAIN THIS LEVEL.
G. PARTS TO BE GROUNDED: SWITCH GEAR AND PANEL BOARD FRAMES, FIXTURES AND DEVICES, CABLE SHEATHS, NEUTRAL OF TRANSFORMERS, BOXES AND RACEWAYS, MOTOR FRAMES, STREET LIGHTS, NON-CURRENT CARRYING PARTS OF APPLIANCES AND DEVICES, AND ALL OTHER PARTS AND EQUIPMENT AS REQUIRED BY NEC. NEVER USE A NEUTRAL WIRE AS GROUNDING MEANS.
H. BOND EQUIPMENT WITH CONDUCTORS INSTALLED IN SAME CIRCUIT RACEWAY AND SIZED AS FOLLOWS:
1) EQUIPMENT RATED 50 AMPERES OR UNDER WITH ONE AWG #8.
2) EQUIPMENT RATED 50 TO 125 AMPERES WITH ONE AWG #6.
3) EQUIPMENT RATED OVER 125 AMPERES WITH ONE AWG #6 AND ONE# 1/0 IN 3/4 INCH CONDUIT TO BUILDING GROUND LOOP OR GROUND ROD.
I. PROVIDE POWER AND LIGHTING CIRCUIT AND 120 VOLT GROUNDING RECEPTACLE WITH A GREEN GROUNDING CONDUCTOR OF THE SAME SIZE AND TYPE AS THE PHASE CONDUCTOR AND RUNNING IN THE SAME CONDUIT.
J. MAKE BONDING TO EQUIPMENT WITH APPROVED SOLDERLESS CONNECTOR. CONTACT SURFACE SHALL BE UNPAINTED AND THOROUGHLY CLEANED BEFORE CONNECTION IS MADE TO INSURE A GOOD METAL CONTACT.

9.0 TRANSFORMERS

A. FURNISH DRY TYPE, THREE OR SINGLE PHASE TRANSFORMERS OF THE SIZE AND VOLTAGE INDICATED ON THE DRAWINGS, WITH FOUR (TWO ABOVE AND TWO BELOW) 2-1/2 PROOF ENCLOSURE WITH FRONT ACCESSIBLE WIRING COMPARTMENT AND CONFORMING TO THE APPLICABLE REQUIREMENTS OF ANSI, IEEE, AND NEMA STANDARDS.
B. CORE AND COIL ASSEMBLY TO BE VACUUM IMPREGNATED WITH CLASS H INSULATION. TEMPERATURE RISE NOT TO EXCEED 115 DEGREE C.
C. TRANSFORMERS SOUND LEVEL NOT TO EXCEED FOLLOWING VALUES: 0 TO 9 KVA, 36 DB; 10 TO 45 KVA , 42 DB; 50 TO 100 KVA, 45 DB.
D. BOLT FLOOR MOUNTED TRANSFORMERS TO FLOOR. WHEN WALL MOUNTED, PROVIDE STEEL BRACKET ANGLES AND BOLT TRANSFORMER TO BRACKET. USE NEOPRENE ISOLATION PADS TO ISOLATE VIBRATIONS.
E. ADJUST PRIMARY TAPS TO PROVIDE A SECONDARY VOLTAGE WITHIN +5 OF NOMINAL VOLTAGE.

10.0 DUCT BANKS

A. DUCT BANKS OF THE SIZE INDICATED ON DRAWINGS, SHALL CONSIST OF A NUMBER OF INDIVIDUAL PVC DUCTS AS INDICATED, ENCASED IN A REINFORCED CONCRETE ENVELOPE.
B. USE PVC SCHEDULE 40 CONDUITS WITH MOLDED INTERLOCKING SPACERS. CONCRETE TO BE CLASS C, 2500 POUNDS PSI. PROVIDE # 12 AWG PULL WIRE IN ALL EMPTY CONDUITS.
C. SLOPE DUCTS A MINIMUM OF 3 INCHES PER 100 FEET. SLOPE TO BE AWAY FROM BUILDINGS, FROM ONE MANHOLE TO THE NEXT OR BOTH WAYS FROM A HIGH POINT BETWEEN MANHOLES. KEEP THE HIGHEST POINT NOT LESS THAN 24 INCHES BELOW THE FINISHED GRADE.

NOTES:

1– ALL CIRCUITS TO CARRY A FULL GROUND WIRE PER N.E.C. ARTICLE 250.

2– ELECTRICAL SERVICE TO WITHSTAND UTILITY AVAILABLE FAULT CURRENT AND BUILT PER FPL STANDARD. CONTACT YAREMIS SANTOS PHONE (786) 449-6053 F.P.L. REPRESENTATIVE IN THIS AREA.

3– SEE STRUCTURAL DRAWINGS FOR INSTALLATION DETAILS.

4– THE SHORT CIRCUIT CURRENT RATING (SCCR) OF THE ELECTRICAL PANEL SHALL BE ADEQUATE TO WITHSTAND THE MAXIMUM SHORT CIRCUIT CURRENT AT THE EQUIPMENT TERMINALS. USE STANDARD VALUE XX kA. REFER TO FP&L CORRESPONDING FAULT CURRENT LETTER ON DRAWING E-XX. PANELS SHALL BE FULLY RATED.

5– METER CAN AND MAIN DISCONNECT TO BE MOUNTED ON UNISTRUCT.

6– MOTOR CIRCUIT BREAKER TO BE CAPABLE OF BEING PADLOCKED IN THE OPEN POSITION AND NOT OBSTRUCT CLOSING OR OPENING OF DEAD FRONT.

7– TELEMETRY ANTENNA FOUNDATION TO BE MIAMI DADE STANDARD AND COMPLIES WITH FBC.

8– AC AND MISCELLANEOUS BREAKERS ARE FACTORY FURNISHED AS AN INTEGRAL PART OF THE CONTROL PANEL.

9– MOTOR CIRCUIT PROTECTOR INDICATED IS AN ADJUSTABLE INSTANTANEOUS-TRIP MAGNETIC ONLY CIRCUIT BREAKERS FOR SINGLE MOTOR CIRCUIT PROTECTION AND ARE INTENDED FOR USE IN COMBINATION WITH MOTOR STARTERS WITH OVERLOAD RELAYS FOR THE PROTECTION OF MOTOR CIRCUITS FROM SHORT CIRCUITS AND OVERLOADS.

10– ALL CABLES SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY. MOTOR WIRES SHOWN ARE MOTOR POWER AND GROUND ONLY. SUBMERSIBLE PUMP CABLES MULTICONDUCTOR TO BE FURNISHED BY THE MANUFACTURER AS AN INTEGRAL PART OF THE MOTOR. IF THE PUMP IS FURNISHED WITH SEPARATED POWER AND CONTROL CABLES; CONTRACTOR SHALL INCREASE THE SIZE OF THE CONDUITS AS REQUIRED.

11– PUMP CONTROL PANEL SHALL BE MANUFACTURED AND LABELED PER UL 698A AND SUITABLE FOR SERVICE ENTRANCE USE.

12– PRESSURE TRANSDUCER TO BE SLX 130 OR EQUIVALENT.

13– WET WELL IS A CLASS I DIVISION 2 AND VALVE BOX IS A CLASS 1 DIVISION 2 HAZARDOUS LOCATION AS PER NFPA 820. SEAL OFF SHALL COMPLY WITH NEC. 501. PRESSURE TRANSDUCER AND FLOAT SWITCHES TO BE ADEQUATE FOR CLASS 1 DIVISION 2 LOCATION. ELECTRICAL EQUIPMENT IN VALVE VAULT TO BE ADEQUATE FOR CLASS 1 DIVISION 2 LOCATION.

14– MAIN DISCONNECT SWITCH SIZED TO MATCH MAIN CIRCUIT BREAKER AND IN A PAD LOCKABLE SERVICE RATED, xx kA.I.C. MIN. NEMA 4X STAINLESS STEEL ENCLOSURE. TOP SHALL NOT BE HIGHER THAN THE TOP OF THE CABINET.

15– CONTROL PANEL SHALL INCORPORATE TAMPER/INTRUSION SWITCH(ES) THAT ACTIVATES AN ALARM TO THE RTU WHENEVER THE PANEL IS OPENED. THE SWITCH SHALL BE LOCATED ON EACH PANEL DOOR WHERE A DOOR HANDLE IS PROVIDED.

16– THE TEMPERATURE RATING ASSOCIATED WITH THE AMPACITY OF A CONDUCTOR SHALL COMPLY WITH NEC 110.

17– MAXIMUM GROUND RESISTANCE SHALL NOT EXCEED 25 OHMS PER ELECTRODE AS PER NEC ARTICLE 250.

SYMBOL-LEGEND:

- UNDERGROUND POWER CONDUIT
- ELECTRICAL CIRCUIT RUN EXPOSED
- 3 100/75 — FUSED SAFETY SWITCH - NUMBER INDICATES POLES, TRIP AND FRAME - SIZE "O" FOR TRIP INDICATES A NON-FUSED SWITCH
- T — TRANSFORMER
- H — HORN
- B — BELL
- M — MOTOR
- DUPLEX CONVENIENCE OUTLET
- G.F.I. — GROUND FAULT INTERRUPTER RECEPTACLE
- J — JUNCTION BOX
- TSW4 — TOGGLE SWITCH ON-OFF TYPE
- PUSH BUTTON
- PUSH BUTTON, ON-OFF TYPE, MAINTAINED POSITION.
- LIMIT SWITCH
- OVERLOAD
- TEMPERATURE ACTUATED SWITCH
- RELAY CONTACT NORMALLY OPEN, CLOSES ON ENERGIZATION, OPENS ON
- RELAY CONTACT NORMALLY CLOSED, OPENS ON ENERGIZATION, CLOSES ON DE-ENERGIZATION
- PWR. XFMR. 3PH. — DELTA CONNECTION; WYE GROUNDED, NEUTRAL CONNECTION
- POTENTIAL XFMR. MEDIUM DRAWOUT PRIMARY FUSED NUMERAL INDICATES QUANTITY.
- CONTROL POWER XFMR.
- CURRENT LIMITING FUSE
- SC / LA — SURGE CAPACITOR & LIGHTNING ARRESTER
- FLOW SWITCH
- FLOAT SWITCH
- PRESSURE SWITCH
- TIME DELAY RELAY CONTACT

NOTES (CONTINUED):

18– ALL ELECTRICAL EQUIPMENT AND APPURTENANCES SHALL COMPLY WITH NEC 110.

19– MINIMUM CONDUIT SIZE TO BE 3/4" AND WIRE TO BE #12 CU.

20– LIGHTNING ARRESTER AND SURGE CAPACITOR SHALL BE INSTALLED IN PANEL AND CONNECTED TO A MULTI-WIRE LUG IN MAIN CIRCUIT BREAKER BY CONTROL PANEL MANUFACTURER.

21– GROUNDING AND NEUTRAL CONDUCTORS SHALL BE BONDED AT ENTRANCE POINT ONLY.

22– PROVIDE PANEL MANUFACTURER'S RECOMMENDED SPARE PARTS FOR TWO YEARS.

23– A. THE CONTRACTOR SHALL FURNISH SHORT-CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDIES AS PREPARED BY THE ELECTRICAL EQUIPMENT MANUFACTURER OR AN APPROVED ENGINEERING FIRM.
B. THE CONTRACTOR SHALL FURNISH AN ARC FLASH HAZARD ANALYSIS STUDY PER THE REQUIREMENTS SET FORTH IN NFPA 70E – STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE, AND NEC 110. THE ARC FLASH ANALYSIS SHALL BE PERFORMED ACCORDING TO THE IEEE 1584 EQUATIONS THAT ARE PRESENTED IN THE LATEST CURRENT EDITION OF THE NFPA-70E.
C. THE CONTRACTOR OF THE ARC FLASH HAZARD ANALYSIS SHALL PROVIDE WARNING LABEL INDICATING SEVERITY OF POTENTIAL EXPOSURE AND LEVEL OF PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED. LABEL TO BE AS PER DETAIL IN SHEET E-3.

24– RTU ANTENNA FOUNDATION, POLE SUPPORT AND CONDUIT TO RTU PANEL, PROVIDED AND INSTALLED BY CONTRACTOR.

25– AS PER NEC ARTICLE 409.110 REQUIREMENTS, THE CONTROL PANEL SHALL BE MARKED WITH A SHORT CIRCUIT RATING THAT IS DETERMINED BY BEING A LISTED AND LABELED ASSEMBLY OR BY ANOTHER APPROVED METHOD.

26– SCADA RTU AND COMMUNICATION EQUIPMENT WILL BE BY MISSION.

27– FINISHED FLOOR ELEVATIONS (FFE) AND TOP OF SLABS MUST BE TWO (2) FEET ABOVE BASE FLOOD ELEVATION AS ESTABLISHED BY THE AREA'S FEMA FIRM MAP/PANEL.

28– AN ADDITIONAL 6" MAY BE REQUIRED IN AREAS WHERE SEA LEVEL RISE IMPACTS MAY BE EXPECTED.

29– PROVIDE NEMA 6 J. BOX AND HARD WIRE TO THE VALVE PIT SUMP PUMP. FLOAT SWITCH TO BE INSTALLED INSIDE THE VALVE VAULT TO SEND SIGNAL TO RTU AND TO CONTROL PANEL FOR LOCAL SIGNAL AS IT IS SHOWN ON CONTROL WIRING DIAGRAM AND RTU TERMINAL BLOCK ON SHEET E-600.

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REVISIONS

NO.	DESCRIPTION	DATE

PRELIMINARY PLAN
NOT FOR CONSTRUCTION
THESE PLANS ARE NOT FULLY PERMITTED AND ARE SUBJECT TO REVISIONS MADE DURING THE PERMITTING PROCESS.
RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
BID-CONTRACT:

Zoila Morales, P.E.
P.E. NO. 64981

CLIENT

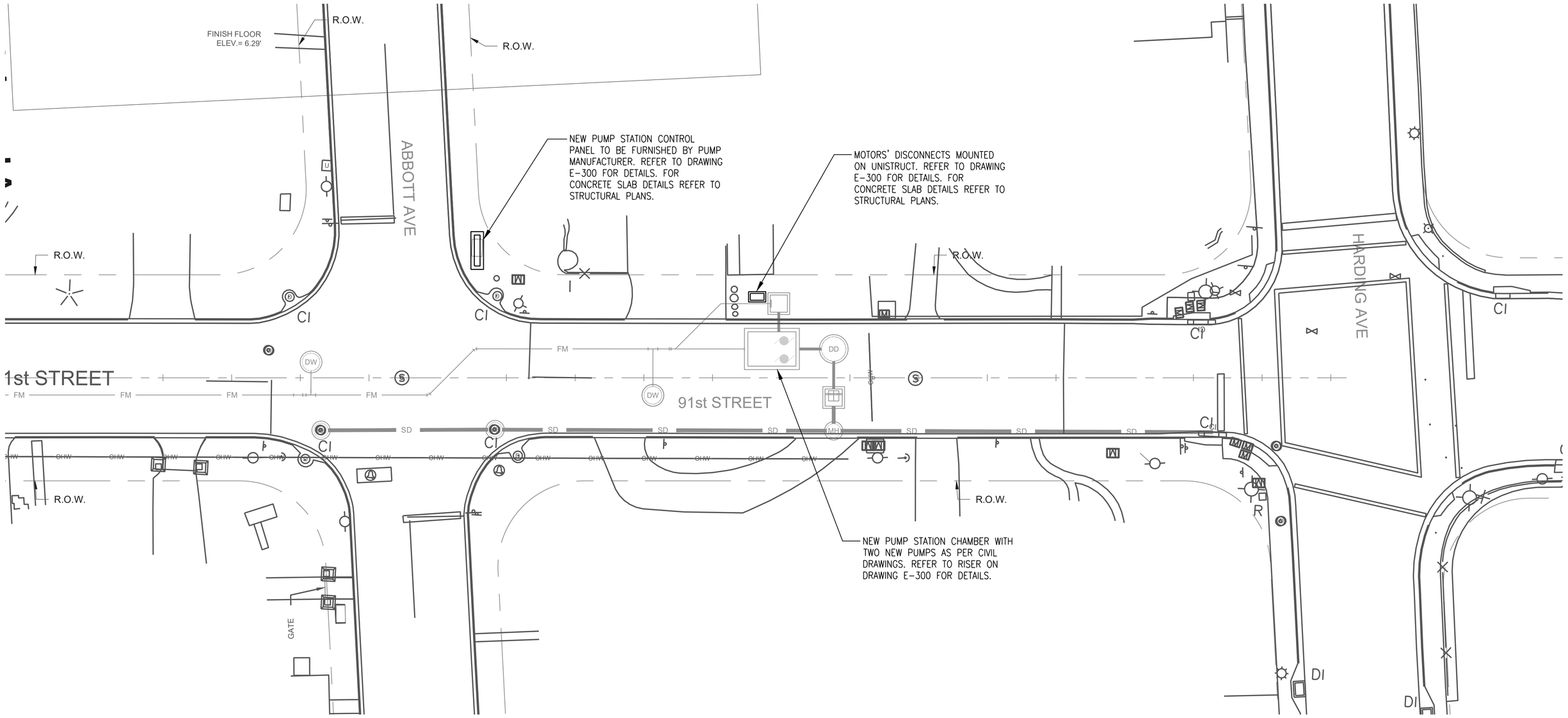
PROJECT
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE
ELECTRICAL GENERAL NOTES-91ST STREET

SHEET NUMBER E-100
PROJECT NUMBER 11494.01

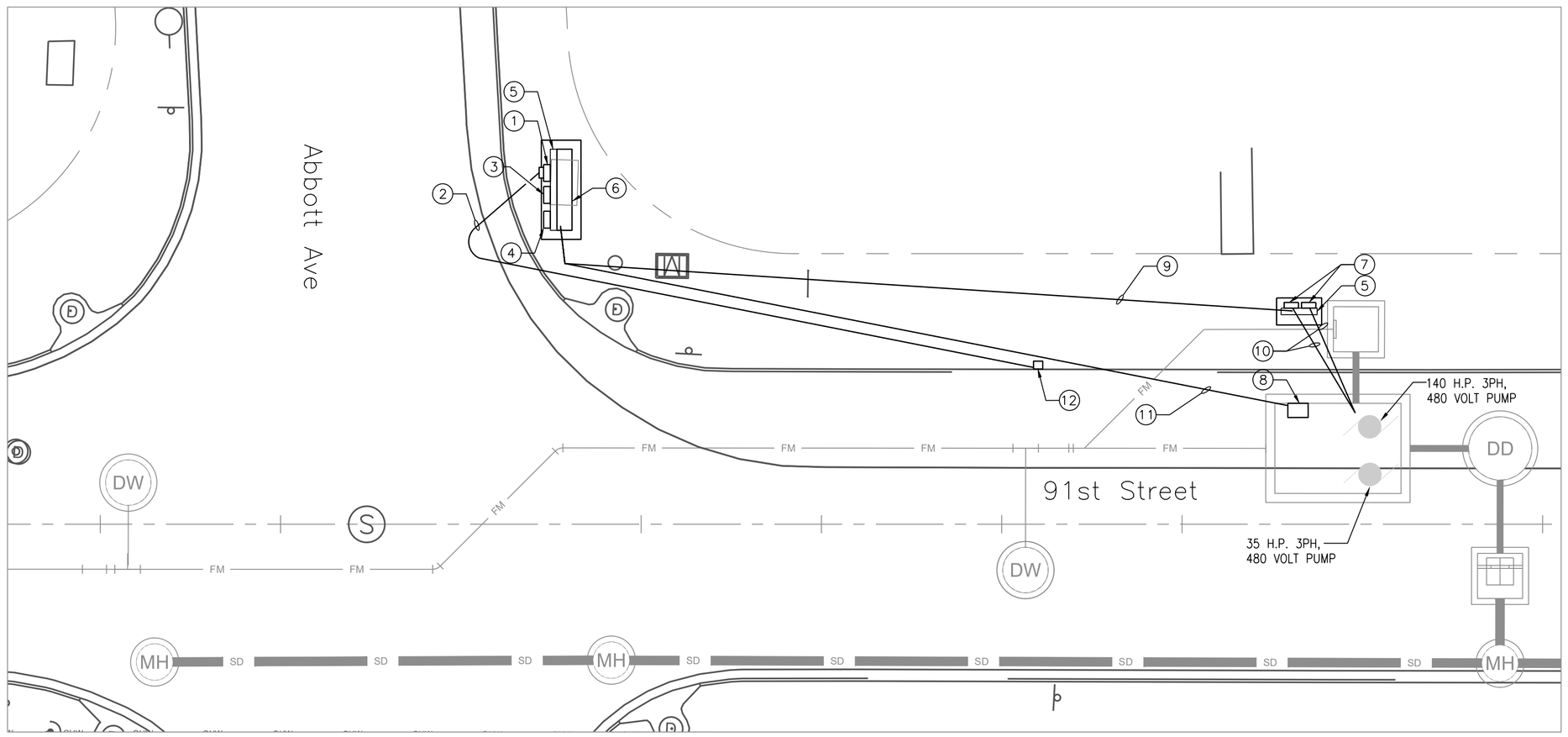
STATUS: PERMIT SET

Plotted by: me engineering cons On 2/1/2023 5:30 PM
Drawing name: D:\Projects\2022\220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 91st-MEP.dwg



ELECTRICAL SITE PLAN

SCALE: 1"=20'-0"



ELECTRICAL PLAN

SCALE: 1"=10'-0"

1. PROPOSED LOCATION OF 400 AMP METER. COORDINATE WITH F.P.L. SEE RISER ON DRAWING E-300.
2. NEW ELECTRICAL SERVICE. SEE DETAILS ON RISER ON DRAWING E-300. COORDINATE WITH FPL.
3. NEW 400 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 400 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
4. MANUAL TRANSFER SWITCH 400 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION TO A PORTABLE GENERATOR.
5. GALVANIZED UNISTRUCT. SEE DETAIL ON DRAWING E-300. FOR EXACT PAD LOCATION SEE CIVIL DRAWING.
6. CONTROL PANEL IN NEMA 4X ENCLOSURE INCLUDING MOUNTINH HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
7. 300 AND 100 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) NON FUSIBLE DISCONNECT SWITCH.
8. NEMA 6P WATERTIGHT JUNCTION BOX 6"X6"X6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2.
9. POWER WIRES IN RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. REFER TO RISER ON DRAWING E-300.
10. PUMP POWER CABLES IN RIGID STEEL CONDUITS FROM EACH PUMP DISCONNECT TO EACH PUMP. CABLES PROVIDED BY MANUFACTURER. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
11. TWO 2" AND TWO 1" RIGID STEEL CONDUITS. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
12. PROPOSED FPL POINT OF SERVICE. PROVIDE PULL BOX AT BASE OF POLE AS PER FPL STANDARDS. COORDINATE WITH FPL REPRESENTATIVE FOR EXACT LOCATION AND

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Plotted by: me engineering cons On 2/1/2023 5:30 PM

REVISIONS

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ISSUE DATE:
DESIGNED BY:
DRAWN BY:
CHECKED BY:
BID-CONTRACT:

Zoila Morales, P.E.
P.E. NO. 64981

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

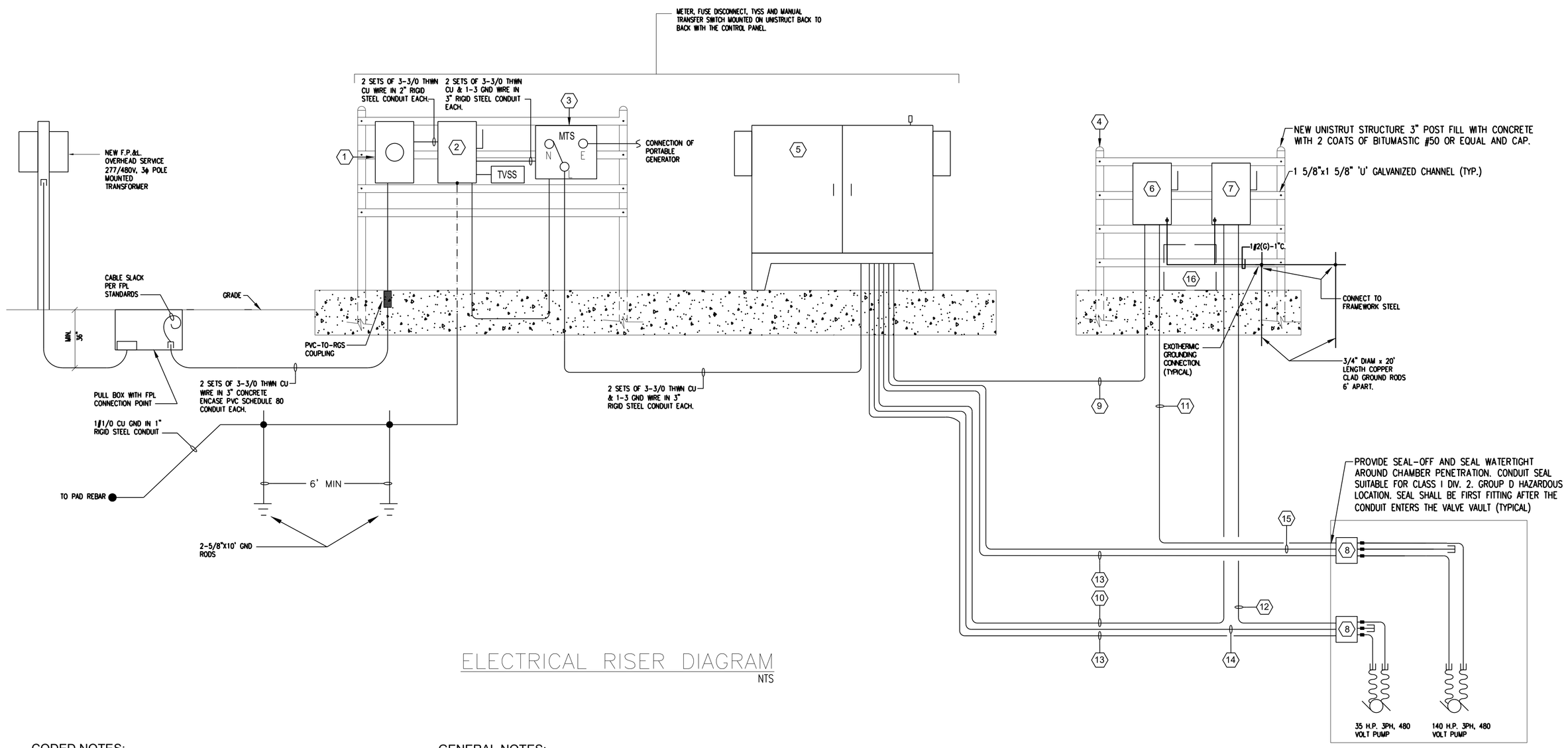
ELECTRICAL SITE AND DETAIL PLAN-91ST STREET

SHEET NUMBER **E-200**

PROJECT NUMBER 11494.01

STATUS: PERMIT SET

Drawing name: D:\Projects\2022\2202920-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 91st-MEP.dwg



ELECTRICAL RISER DIAGRAM
NTS

CODED NOTES:

1 NEW 400 AMP METER. COORDINATE WITH F.P.L. AND FOLLOW THEIR STANDARDS.
2 NEW 400 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 400 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
3 MANUAL TRANSFER SWITCH 400 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION OF A PORTABLE GENERATOR.
4 GALVANIZED UNISTRUCT. FOR EXACT PAD LOCATION SEE CIVIL DRAWING.
5 CONTROL PANEL IN NEMA 4X TYPE 316 STAINLESS STEEL ENCLOSURE (CONTINUOUS HINGE, PADLOCKABLE DOOR HANDLE). ENCLOSURE TO INCLUDE MOUNTING HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
6 300 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) NON FUSIBLE DISCONNECT SWITCH.
7 100 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) NON FUSIBLE DISCONNECT SWITCH.
8 NEMA 6P WATERTIGHT JUNCTION BOX 6"X6"X6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2. REFER TO DETAIL ON DRAWING E-400.
9 POWER WIRES (3-4/0 & 1-#4 GND) IN 3" RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. SIZE AS SHOWN.
10 POWER WIRES (3-#3 & 1-#8 GND) IN 1.5" RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. SIZE AS SHOWN.
11 PUMP POWER CABLES (3-4/0 & 1-#4 GND) IN 2.5" RIGID STEEL CONDUITS FROM PUMP DISCONNECT TO PUMP. CABLES PROVIDED BY MANUFACTURER. PROVIDE MINIMUM 10 FT OF SLACK CABLE INSIDE STRUCTURE.
12 PUMP POWER CABLES (3-#6 & 1-#8 GND) IN 1.0" RIGID STEEL CONDUITS FROM PUMP DISCONNECT TO PUMP. CABLES PROVIDED BY MANUFACTURER. PROVIDE MINIMUM 10 FT OF SLACK CABLE INSIDE STRUCTURE.
13 MANUFACTURER PROVIDED PUMP MONITORING PILOT CABLE IN 2" RIGID STEEL CONDUIT. PROVIDE MINIMUM 10FT OF SLACK CABLE INSIDE STRUCTURE.
14 MANUFACTURER RECOMMENDED CABLE FOR FLOAT SWITCHES IN 1" RIGID STEEL CONDUIT.
15 MANUFACTURER RECOMMENDED TUBING FOR BUBBLER TUBE IN 1" RIGID STEEL CONDUIT. INSTALL TUBING AND CONDUIT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
16 MOTOR CONNECTION BOX. REFER TO DETAIL ON DRAWING E-600.

GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE ENOUGH SLACK CABLE FOR CONNECTION INSIDE PROPOSED PULLBOX AT BASE OF FPL SERVICE POLE. CONTRACTOR TO COORDINATE WITH FPL AND FOLLOW THEIR STANDARDS.
- CONTRACTOR TO PROVIDE CONTROL PANEL SHOP DRAWINGS SHOWING WIRING DIAGRAMS WITH ALL POWER AND CONTROL INTERCONNECTIONS.
- CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR DISCONNECT SWITCHES, TVSS, GROUND ROD, CONDUCTOR, CONDUITS, ETC.
- CONTRACTOR TO KEEP LENGHT OF TRANSIENT VOLTAGE SURGE SUPPRESSOR LEADS TO A MINIMUM.

1- 140 H.P. PUMP	177 AMPS.
1- 35 H.P. PUMP	42 AMPS.
ENCLOSURES' AIR CONDITIONERS	14 AMPS
MISCELLANEOUS BASE LOAD	30 AMPS.
25% OF LARGEST MOTOR	44.25 AMPS.
TOTAL	307.25 AMPS.
PROVIDE SERVICE SIZE: 400 AMP. 277/480 VOLT, 3ϕ, 4W	

LOAD CALCULATION

CONTRACTOR TO PROVIDE ARC FLASH LABEL AS PER ANSI REQUIREMENTS. REFER TO EXAMPLE BELOW.

FAULT CURRENT CALCULATION
MAIN DISCONNECT

10,746 SYMM. S.C.A. AVAILABLE AT F.P.&L. Co. TRANSFORMER SECONDARY AS PER FPL LETTER ON THIS DRAWING

90 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L\text{-}L}} = \frac{(1.73)(90)(10{,}746)}{(2)(13{,}923)(480)} = 0.125$$

$$M = \frac{1}{1+f} = \frac{1}{1+0.125} = 0.889$$

Isca = AVAILABLE FROM UTILITY x M = (10,746)(0.889) = 9,553.2 Amps

PROVIDE 14k S.C.A. RATED FUSE AT THE MAIN

FAULT CURRENT CALCULATION
AT CONTROL PANEL

9,918.5 SYMM. S.C.A. AT MAIN

10 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L\text{-}L}} = \frac{(1.73)(10)(9{,}553)}{(2)(13{,}923)(480)} = 0.0124$$

$$M = \frac{1}{1+f} = \frac{1}{1+0.0124} = 0.988$$

Isca = Isca AT MAIN x M = (9,553)(0.988) = 9,438.4 Amps

PROVIDE 14k S.C.A. RATED BREAKERS AT CONTROL PANEL

FPL

January 31, 2023

Zoila Morales, P.E.
11401 SW 40th ST, Suite 301
Miami , FL 33165

Re: Available Fault Current for Abbott Ave Stormwater Improvements - 91st ST

Dear Zoila Morales, P.E.:

Thank you for contacting FPL about the available fault current at Abbott Ave Stormwater Improvements - 91st ST. Based on the plans you have provided dated July 22 2022, the maximum available fault current at the transformer secondary terminals is estimated to be 10746 symmetrical amperes at 277/480 volts. The protective device on the line side of the transformer currently in place or to be installed and serving your property located at the subject location is a 10 amp type KS fuse. The primary service voltage is 13.2kV L-L. This calculated symmetrical fault current is not intended for use as the basis for motor starting calculations and does not include:

- Consideration for any motor contribution or
- Fault current asymmetry.

The FPL equipment currently serving or planned to serve your facility may change over time as a result of any number of factors, including but not limited to transformer replacements due to load growth, electrical grid changes or emergencies. As a result, although we are providing you with this information for the sole purpose of assisting you in the completion of your study, you and your client should not design, install or operate your system in reliance upon any expectation that the specific size and type of equipment currently in place will remain so. If and when the size and type of the equipment changes, our employees are not always in a position to immediately notify customers.

As the construction project progresses, any questions or information you may need can be communicated through me. I have enclosed my business card for easy reference and look forward to hearing from you in the near future.

Sincerely,

Isabella Arcos

Isabella Arcos
Distribution Engineer
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Email: Isabella.Arcos@fpl.com or ima0ati@fpl.com
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REVISIONS

NO.	DESCRIPTION	DATE

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CHECKED BY:
BID-CONTRACT:

Zoila Morales, P.E.
P.E. NO. 64981

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

ELECTRICAL RISER DIAGRAM, NOTES AND LOAD CALCULATION- 91ST STREET

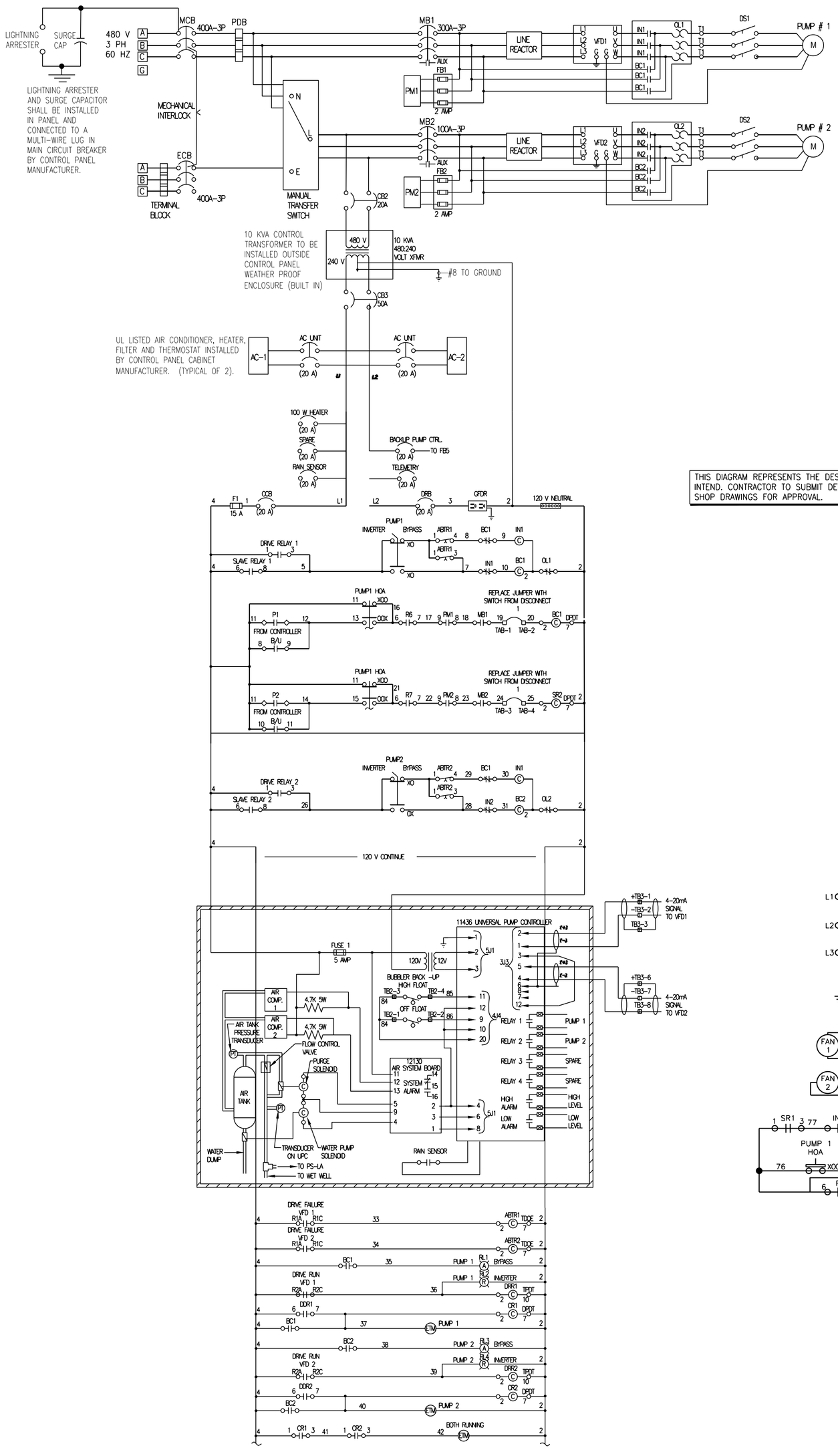
SHEET NUMBER **E-300**

PROJECT NUMBER 11494.01

STATUS: PERMIT SET

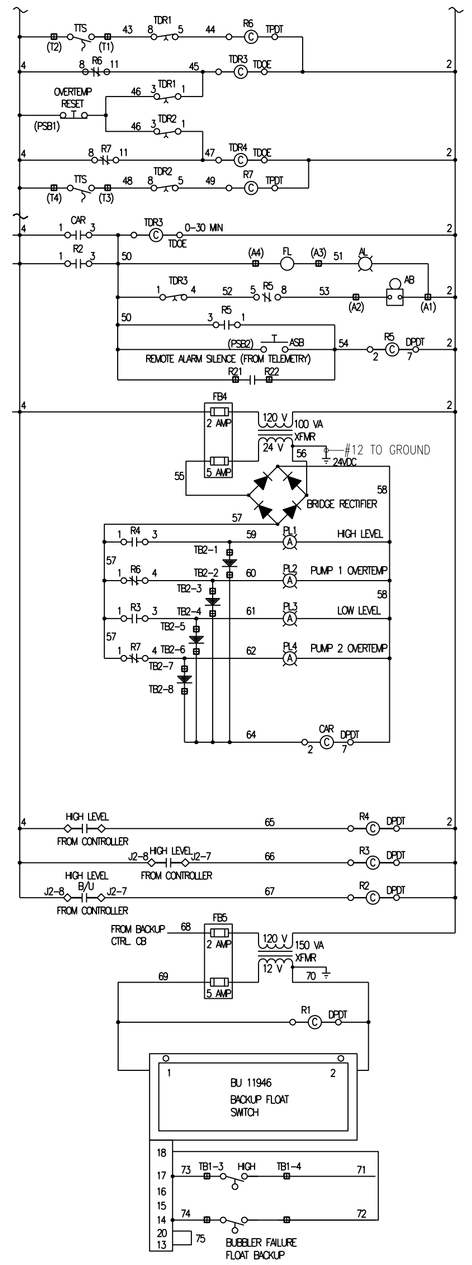
Plotted by: me engineering cons On 2/1/2023 5:30 PM

Drawing name: D:\Projects\2022\22022080-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX- 91st-MEP.dwg

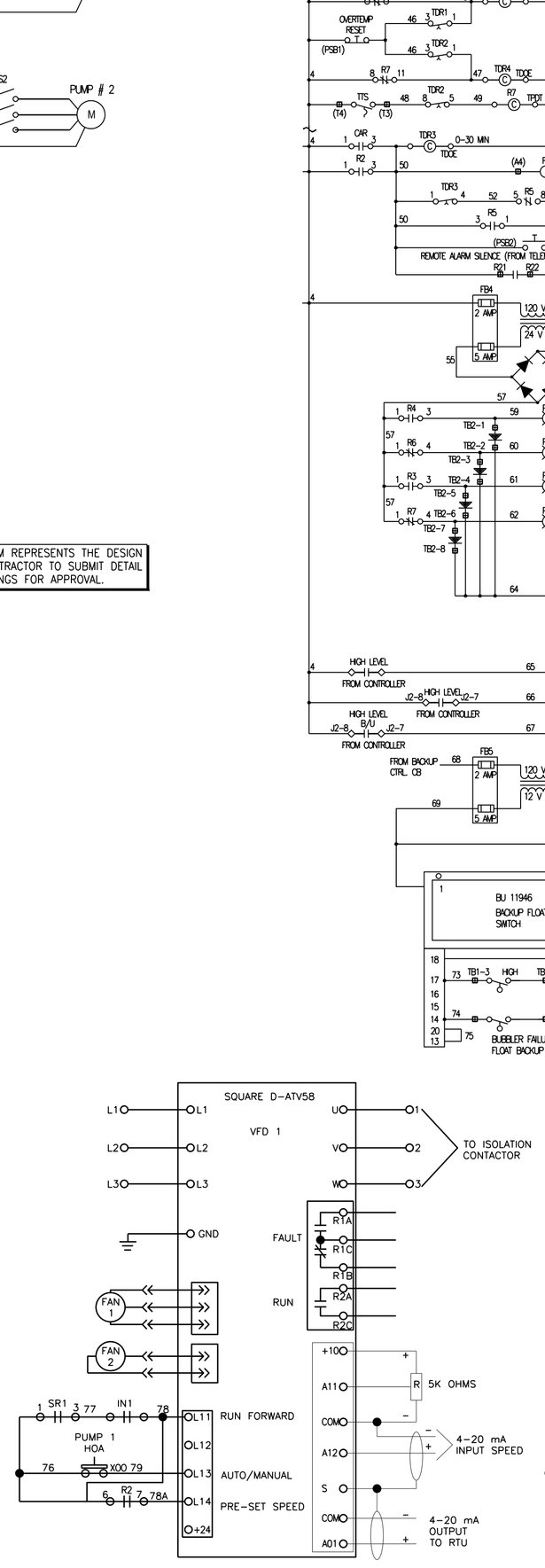


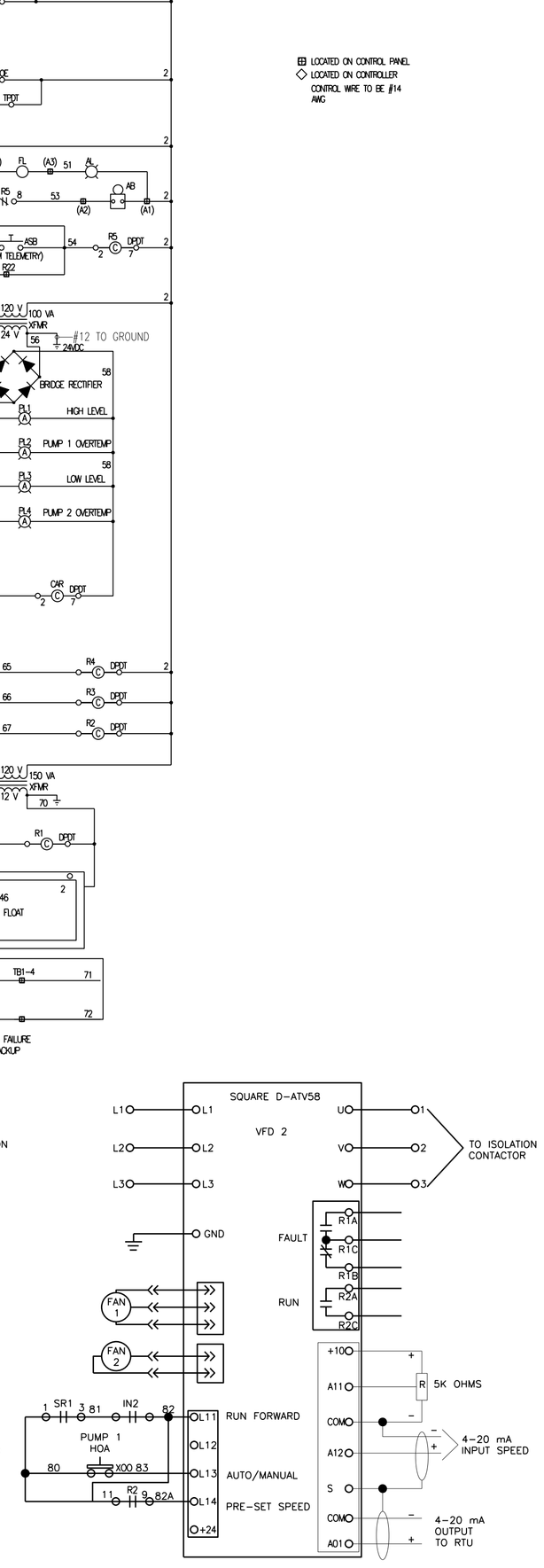
CONTROL WIRING DIAGRAM

THIS DIAGRAM REPRESENTS THE DESIGN INTEND. CONTRACTOR TO SUBMIT DETAIL SHOP DRAWINGS FOR APPROVAL.



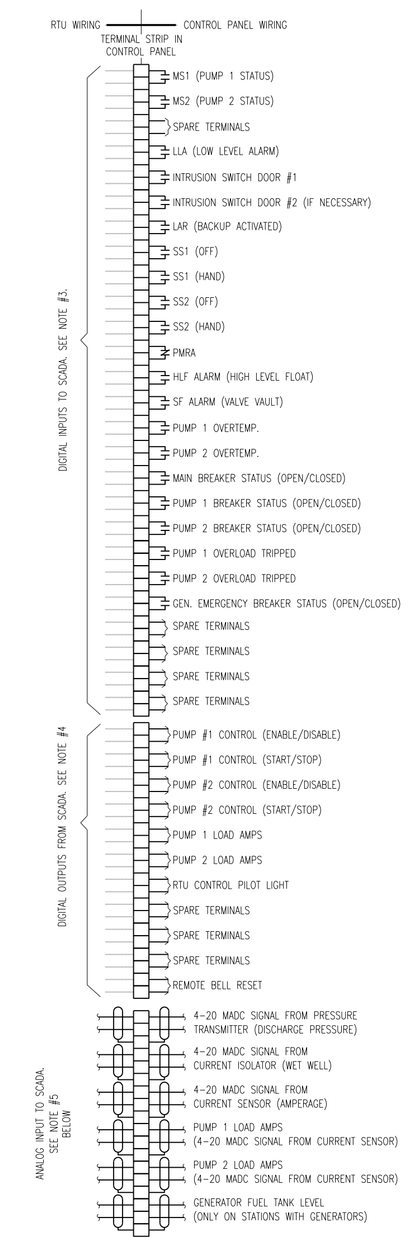
⊞ LOCATED ON CONTROL PANEL
◇ LOCATED ON CONTROLLER
CONTROL WIRE TO BE #14 AWG





COMPONENT LEGEND

AB – ALARM BELL
ABTR – AUTO BYPASS TIMER
AC – AIR COMPRESSOR
AH – ALARM HORN
AL – ALARM LIGHT
ALT – ALTERNATOR
ASB – ALARM SILENCE BUTTON
AV – AIR VENT
CAR – COMMON ALARM RELAY
CB – CIRCUIT BREAKER
CCB – CONTROL CIRCUIT BREAKER
DPDT – DOUBLE POLE DOUBLE THROW
DRB – DUPLEX RECEPTACLE BREAKER
DRR – DRIVE RUN RELAY
ECB – EMERGENCY CIRCUIT BREAKER
ETM – ELAPSED TIME METER
F – FUSE
FB – FUSE BLOCK
FL – FLASHER
FPDT – FOUR POLE DOUBLE THROW
FR – FLOW REGULATOR
FS – FLOW SWITCH
GFDR – GROUND FAULT DUPLEX RECEPTACLE
GND – EARTH GROUND
GR – GENERATOR RECEPTACLE
HOA – HAND-OFF-AUTO SELECTOR SWITCH
LA – LIGHTNING ARRESTOR
MB – MOTOR BREAKER
MCB – MAIN CIRCUIT BREAKER
MCP – MOTOR CIRCUIT PROTECTOR
MS – MOTOR STARTER
NC – NORMALLY CLOSED
NO – NORMALLY OPEN
OL – OVERLOAD
PDB POWER DISTRIBUTION BLOCK
PL – PILOT LIGHT
PM – PHASE MONITOR
PMR – PHASE MONITOR RELAY
PSB – PUSH BUTTON
R – RELAY
RL – RUNNING LIGHT
RTU – REMOTE TELEMETRY UNIT
SC – SURGE CAPACITOR
SR – SLAVE RELAY
T – TERMINAL
TB – TERMINAL BLOCK
TD – TIME DELAY
TDOE – TIME DELAY ON ENERGIZE
TDR – TIME DELAY RELAY
TPDT – TRIPLE POLE, DOUBLE THROW
TTS – THERMAL TERMINAL STRIP
VFD – VARIABLE FREQUENCY DRIVE
XFMR – TRANSFORMER



RTU TERMINAL BLOCK

SCADA WIRING INSTALLATION NOTES

1–. WIRING TO SCADA RTU PANEL TO BE FURNISHED AND INSTALLED BY CONTRACTOR. PUMP STATION CONTROL PANEL TERMINATIONS TO BE PERFORMED BY CONTRACTOR, AND RTU PANEL TERMINATIONS TO BE PERFORMED BY MD-WASD (SCADA).

2–. PROVIDE IN THE PANEL AT LEAST 20 SPARE TERMINALS, 1 POLE EACH.

3–. 4-20 MILLIAMPERES DIRECT CURRENT SIGNAL CABLE SHALL BE BELDEN 9341 TWISTED PAIR OR EQUAL INSTALLED IN A SEPARATE CONDUIT.

4–. LABEL INTERCONNECTING WIRES ACCORDING TO DRAWING.

5–. CONNECT FIELD DEVICES PRESSURE TRANSMITTER AND FLOW METER (IF AVAILABLE) TO THE RTU PANEL. USE BELDEN CABLE 9341 IN 1-INCH CONDUIT AS REQUIRED.

6–. ALL DIGITAL SIGNALS TO SCADA MUST BE PROVIDED THROUGH DRY CONTACTS.

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TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

CONTROL DETAILS-91ST STREET

SHEET NUMBER **E-400**

PROJECT NUMBER 11494.01

Drawing name: D:\Projects\2022\2202080-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 91stMEP.dwg

STATUS: PERMIT SET

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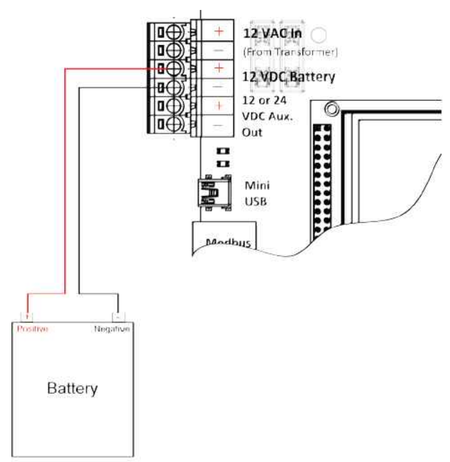
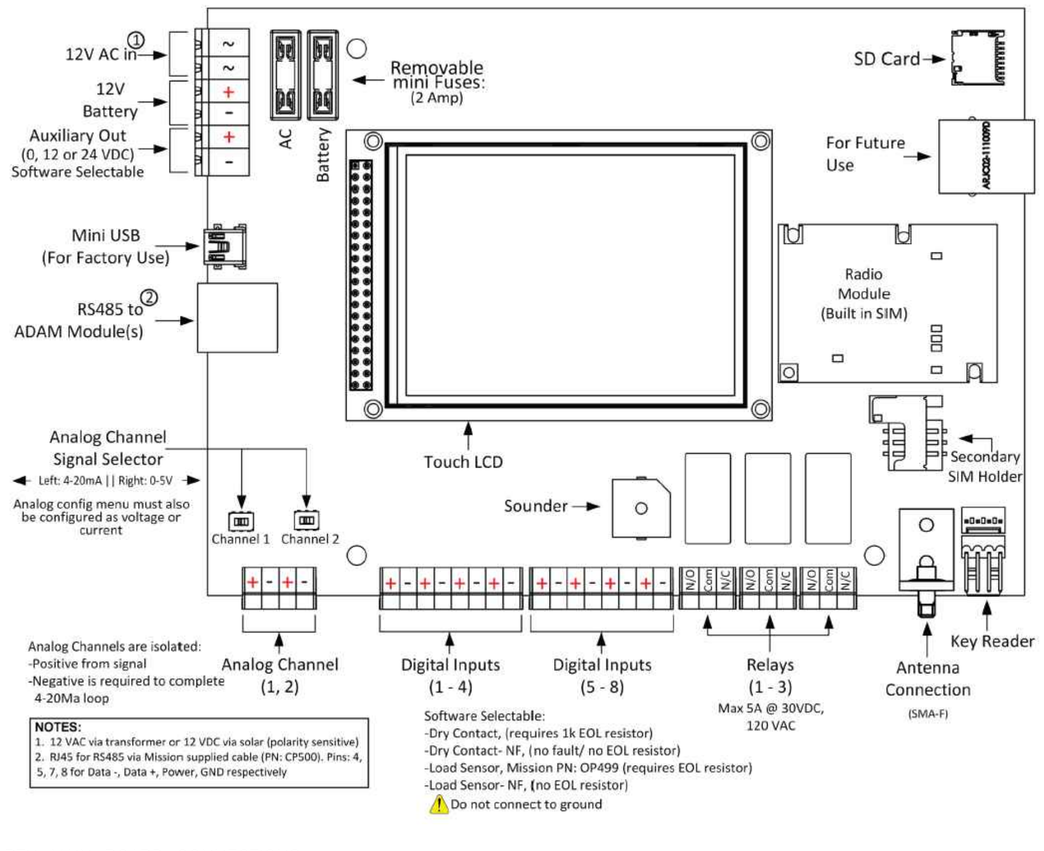
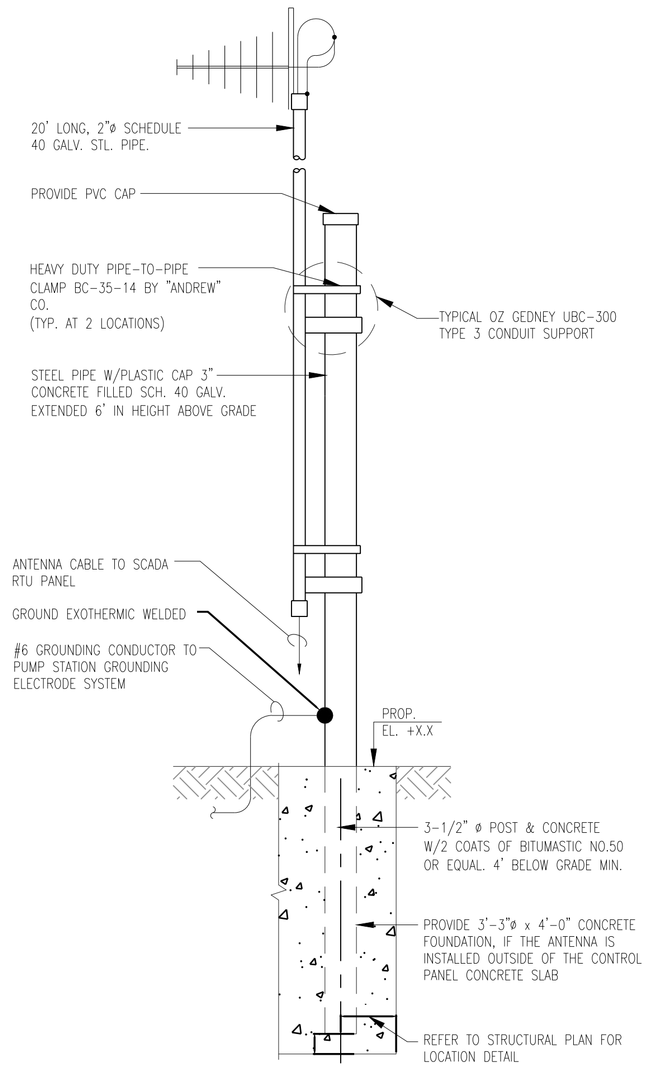
RTU TRANSFORMER WIRING
NOT TO SCALE



RTU BATTERY WIRING
NOT TO SCALE



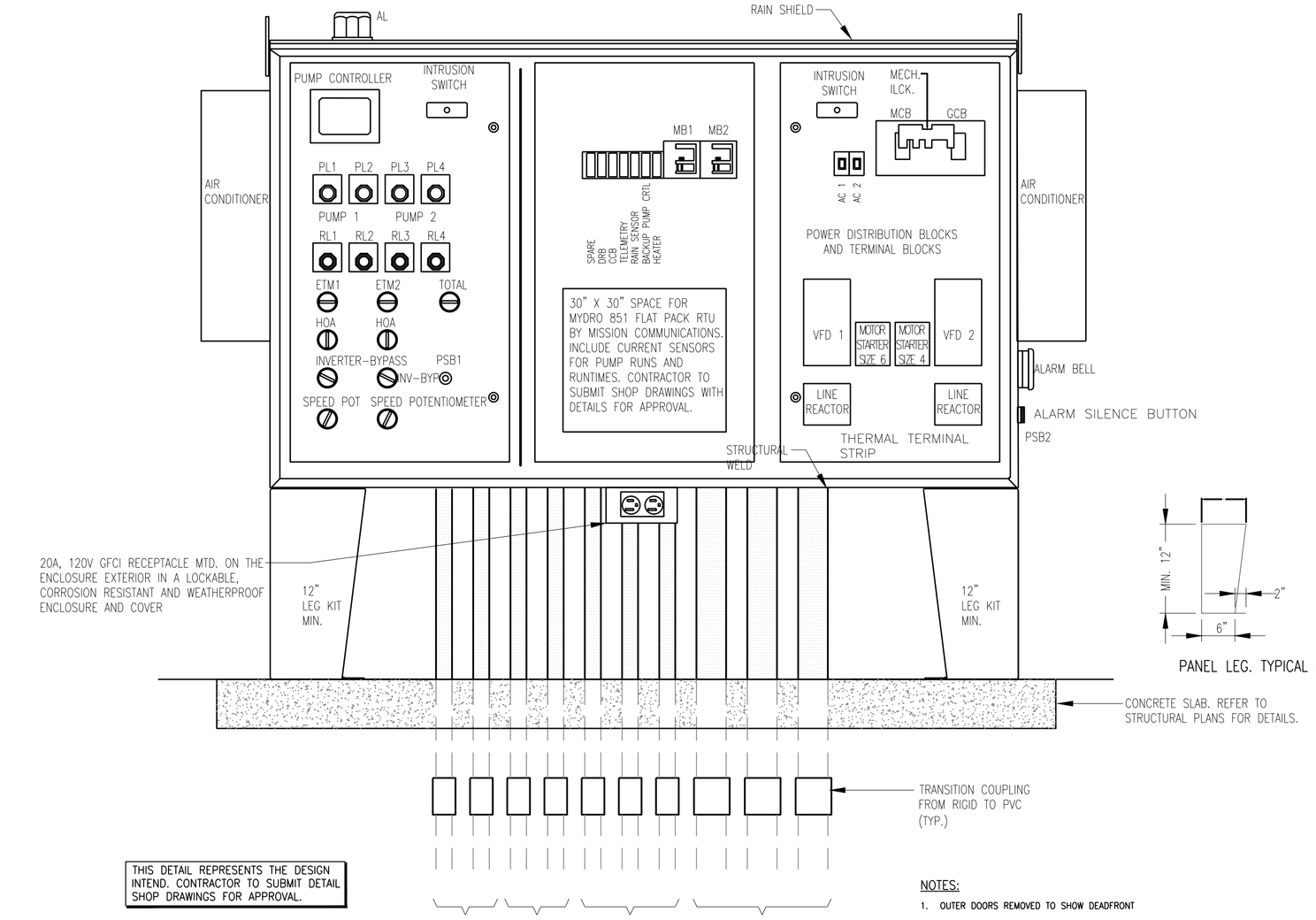
RTU MAIN BOARD CONNECTIONS
NOT TO SCALE



ANTENNA MOUNTING DETAIL
NOT TO SCALE

NOTE:
1- RUN ANTENNA WIRE FROM SCADA RTU PANEL TO ANTENNA THROUGH 2" POST.

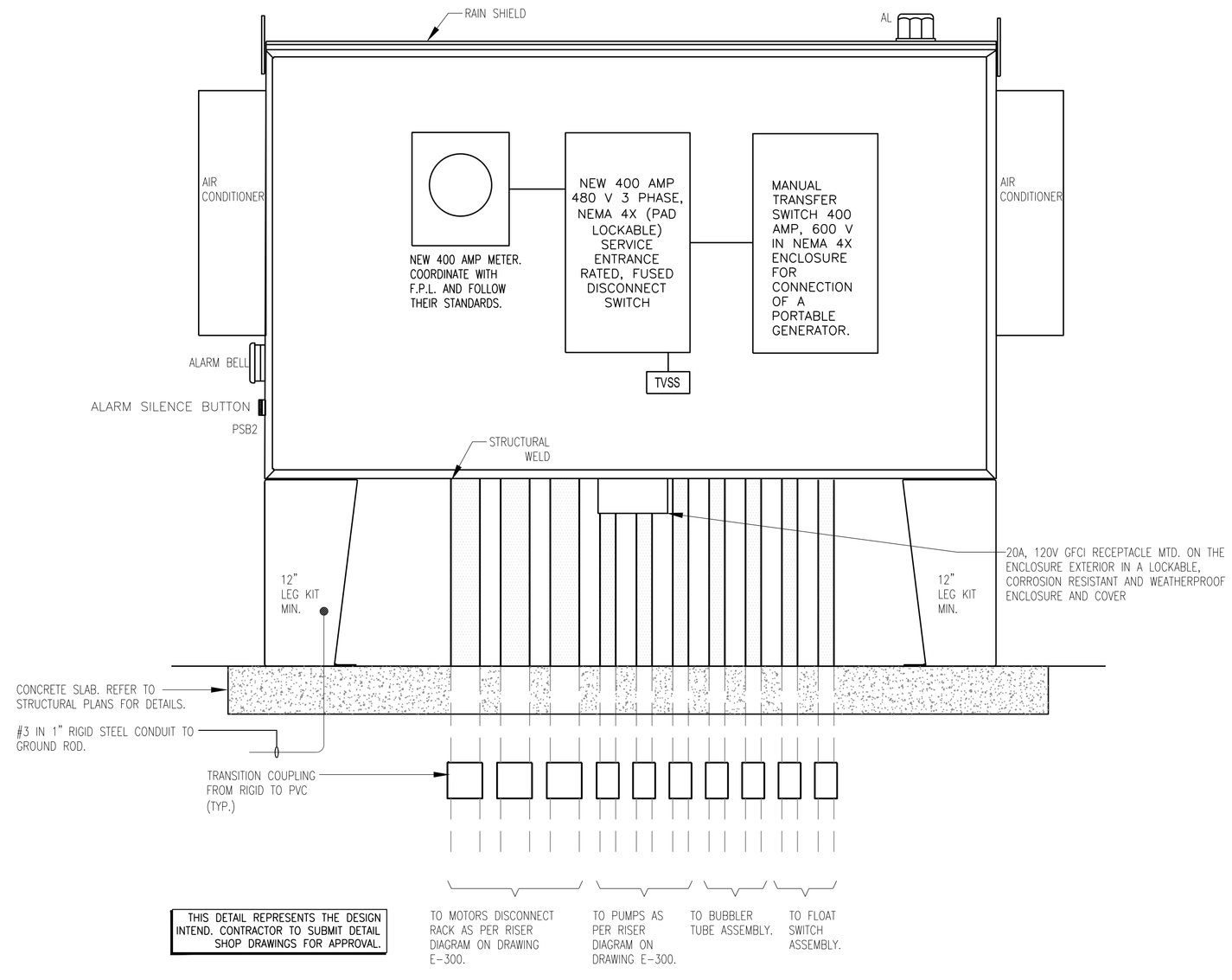
2- TELEMETRY ANTENNA FOUNDATION PER MISSION STANDARD AND COMPLIES WITH FBC CHAPTER 16.



THIS DETAIL REPRESENTS THE DESIGN INTEND. CONTRACTOR TO SUBMIT DETAIL SHOP DRAWINGS FOR APPROVAL.

NOTES:
1. OUTER DOORS REMOVED TO SHOW DEADFRONT
2. PROVIDE INNER AND OUTER DOOR STOP KITS
3. CONTROL CABINET DEPTH SHALL NOT EXCEED 12 IN.
4. SUPPORTS SHALL MEET LATEST WIND LOAD REQUIREMENTS OF THE LATEST FLORIDA BUILDING CODE
5. TOP OF CONTROL PANEL, RTU, AND ELECTRICAL SERVICE EQUIPMENT SHALL BE AT THE SAME ELEVATION

CONTROL PANEL DETAIL
NOT TO SCALE



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PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

CONTROL PANEL DETAILS - 91ST STREET

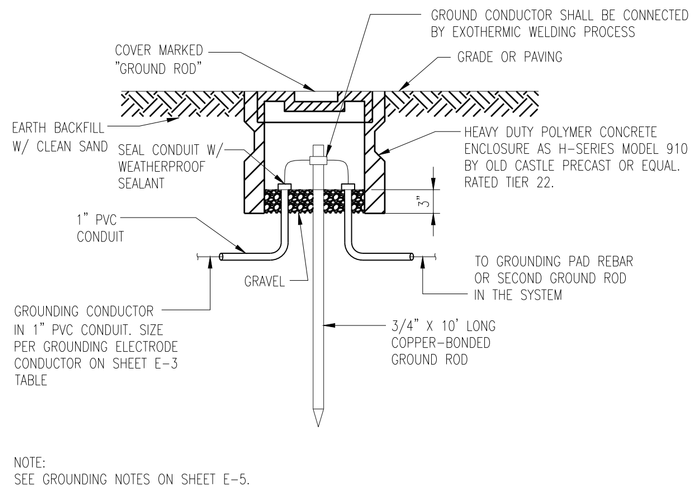
SHEET NUMBER **E-500**

PROJECT NUMBER 11494.01

STATUS: PERMIT SET

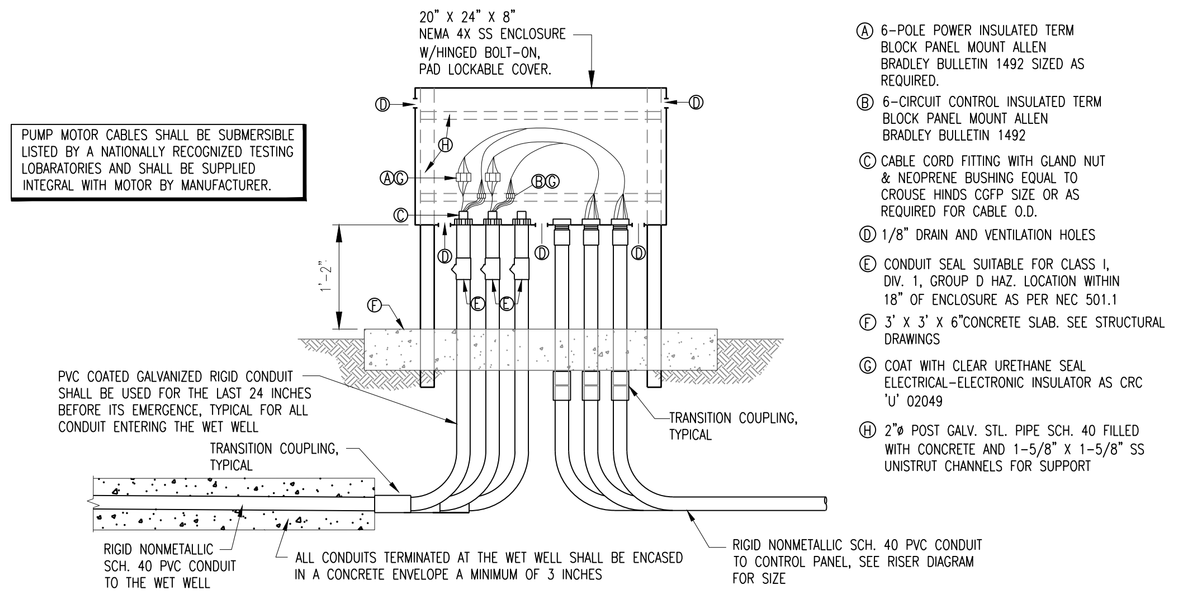
Plotted by: me engineering cons On 2/1/2023 5:30 PM

Drawing name: D:\Projects\2022\2220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 91st-MEP.dwg



NOTE:
SEE GROUNDING NOTES ON SHEET E-5.

TYPICAL GROUND ROD INSTALLATION DETAIL
N.T.S.



Ⓐ 6-POLE POWER INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492 SIZED AS REQUIRED.

Ⓑ 6-CIRCUIT CONTROL INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492

Ⓒ CABLE CORD FITTING WITH GLAND NUT & NEOPRENE BUSHING EQUAL TO CROUSE HINDS CGFP SIZE OR AS REQUIRED FOR CABLE O.D.

Ⓓ 1/8" DRAIN AND VENTILATION HOLES

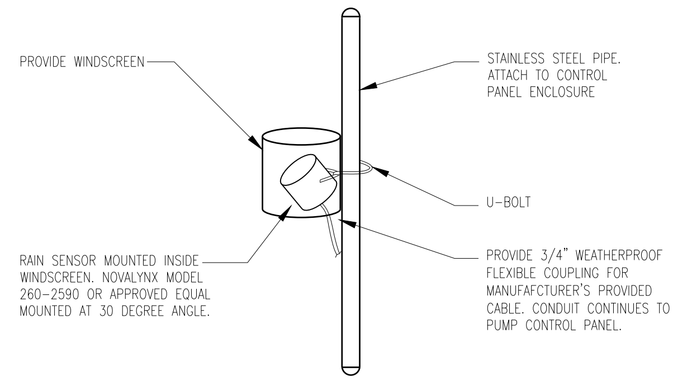
Ⓔ CONDUIT SEAL SUITABLE FOR CLASS I, DIV. 1, GROUP D HAZ. LOCATION WITHIN 18" OF ENCLOSURE AS PER NEC 501.1

Ⓕ 3' X 3' X 6"CONCRETE SLAB. SEE STRUCTURAL DRAWINGS

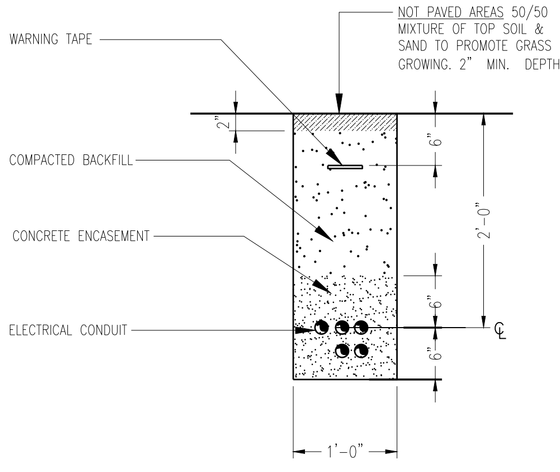
Ⓖ COAT WITH CLEAR URETHANE SEAL ELECTRICAL-ELECTRONIC INSULATOR AS CRC 'U' 02049

Ⓗ 2"ø POST GALV. STL. PIPE SCH. 40 FILLED WITH CONCRETE AND 1-5/8" X 1-5/8" SS UNISTRUT CHANNELS FOR SUPPORT

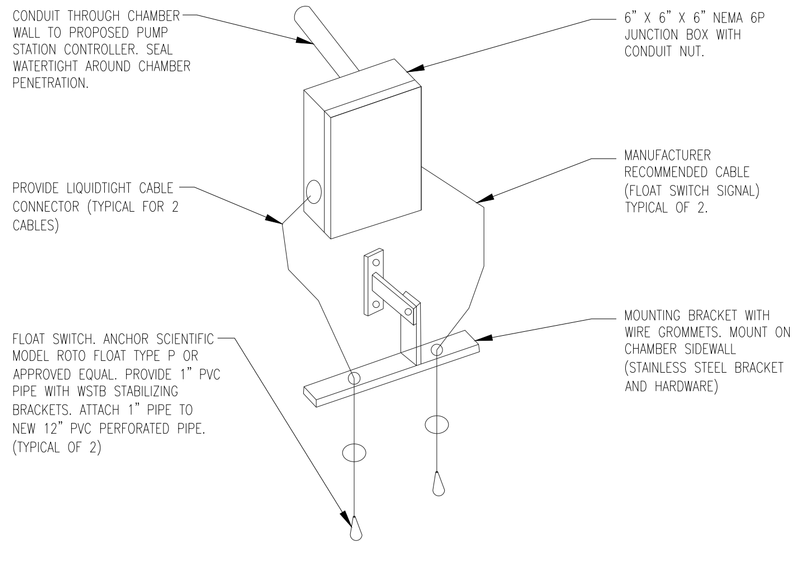
TYPICAL MOTOR CONNECTION BOX DETAIL
N.T.S.



RAIN SENSOR
N.T.S.



TRENCH DETAIL
N.T.S.



FLOAT SWITCH INSTALLATION DETAIL
N.T.S.

NOVALYNX *Precipitation*

260-2590 Precipitation Detector 260-2591 Leaf Wetness Sensor

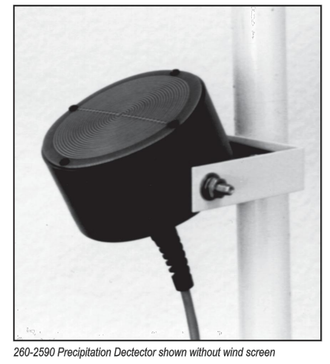
The **Model 260-2590 Precipitation Detector** is used to detect the onset of rainfall. A gold plated grid sensor activates the circuit when water is deposited onto the grid. The presence of water activates an internal relay that may be used to operate larger capacity external relays, alarms, doors, or may be used as an input to a data acquisition system.

An internal heater constantly dries the grid to prevent relay activation during times of dew, fog, or light moisture that is not actual precipitation. During periods of normal precipitation the heater is unable to dry the grid and the relay is activated. The heater power may be disconnected allowing the detector to be operated as a leaf wetness sensor.

The solid state electronics are mounted in a sealed weatherproof enclosure. The precipitation detector may be tilted to allow water to drain off. A mounting bracket is provided with the sensor to allow mounting onto a 1" pipe by a U-bolt. The wind screen may be used to prevent premature drying of the grid during precipitation events accompanied by high winds.

The unit requires +12 Vdc power for operation. A 100-240 Vac power adapter is provided with each unit.

260-2590 Precipitation Detector



260-2590 Precipitation Dectector shown without wind screen

Specifications

Sensor: Gold plated grid 4" dia
Output: Relay (0.5 amps)
Heater: Resistive element
Power: 12 Vdc (235 mA max.) 100-240 Vac 50-60 Hz adapter supplied
Size: Overall 4" dia x 2" high
Weight/shipping: 4 lbs/5 lbs (1.8 Kg/2.3 Kg)

Ordering Information

260-2590	Precipitation Detector, 100-240 Vac, 25' cable
260-2591	Leaf Wetness Sensor, 100-240 Vac, 25' cable
260-2592	Leaf Wetness Sensor with heater control, 100-240 Vac, 25' cable
330-0524	Additional Cable, per foot

NovaLynx Corporation PO Box 240 Grass Valley CA 95945
Phone: (530) 823-7185 Fax: (530) 823-8997 USA Toll Free: 1-800-321-3577
www.novalynx.com 137

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ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

ELECTRICAL DETAILS -91ST STREET

SHEET NUMBER **E-600**

PROJECT NUMBER 11494.01

STATUS: PERMIT SET

Drawing name: D:\Projects\2022\2220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 91st-MEP.dwg

1.0 BASIC ELECTRICAL REQUIREMENTS

1.1 SCOPE OF WORK
A. FOR PURPOSE OF LEGIBILITY, DRAWINGS ARE DIAGRAMMATIC AND ALTHOUGH LOCATION OF EQUIPMENT IS SHOWN TO SCALE, THE CONTRACTOR SHALL VERIFY ALL INFORMATION AT THE SITE BEFORE BIDDING THE JOB.
B. WHEN DRAWINGS, NOTES AND THESE REQUIREMENTS ARE IN CONFLICT, THE MOST STRINGENT CONDITION SHALL APPLY UNLESS OTHERWISE APPROVED BY THE ENGINEER.
C. THE WORK CONSISTS OF ALL SUPERVISION, LABOR, MATERIALS, EQUIPMENT AND INSTALLATION REQUIRED FOR THE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS OR CALLED FOR IN THESE REQUIREMENTS.
D. FURNISH, INSTALL AND MAINTAIN TEMPORARY ELECTRICAL POWER AND LIGHTING REQUIRED FOR ALL TRADES.
E. CONNECT ELECTRICAL EQUIPMENT FURNISHED BY OTHER TRADES EVEN IF NOT SHOWN ON ELECTRICAL DRAWINGS.

1.2 CODES AND STANDARDS
PERFORM WORK AND FURNISH EQUIPMENT COMPLYING WITH CURRENT EDITIONS OF THE FOLLOWING CODES:
1) NATIONAL ELECTRICAL CODE (NEC 2017)
2) NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
3) UNDERWRITERS' LABORATORIES (UL)
4) NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
5) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
6) INSULATED POWER CABLE ENGINEERS ASSOCIATION (IPCEA)
7) FLORIDA BUILDING CODE (FBC 2020)
8) INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)

1.3 SHOP DRAWINGS
WITHIN 30 DAYS AFTER THE DATE OF THE AWARD OF THE CONTRACT, AND BEFORE ANY MATERIAL OR EQUIPMENT IS PURCHASED, SUBMIT TO THE ENGINEER FOR APPROVAL, A COMPLETE LIST IN QUINTUPLICATE OF ELECTRICAL MATERIALS, AND EQUIPMENT TO BE INCORPORATED IN THE WORK. INCLUDE CATALOG NUMBER, DIMENSIONS, INTERCONNECTION DIAGRAMS AND INSTALLATION INSTRUCTIONS.

1.4 OPERATION AND MAINTENANCE MANUALS
O & M MAINTENANCE MANUALS MUST CONTAIN BUT NOT LIMITED TO THE FOLLOWING:
1) SYSTEM DESCRIPTION, AND OPERATING AND MAINTENANCE INSTRUCTIONS.
2) MANUFACTURER'S NAME AND MODEL NUMBER OF ALL COMPONENTS.
3) CONTROL AND WIRING DIAGRAMS WITH SEQUENCE OF OPERATION.
4) LIST OF RECOMMENDED SPARE PARTS.

1.5 AS BUILT DRAWINGS
AFTER FINAL INSPECTION, FURNISH A SET OF REPRODUCIBLE "AS BUILT DRAWINGS" SHOWING DEPTHS AND ROUTING OF CONCEALED ELECTRICAL BELOW GRADE INSTALLATIONS AND ALL VARIATIONS BETWEEN THE ACTUAL WORK AND AS IT WAS SHOWN ON THE CONTRACT DRAWINGS.

1.6 MATERIALS
A. FURNISH EQUIPMENT AND MATERIALS THAT ARE NEW AND LATEST DESIGN OF STANDARD PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN THE PRODUCTION OF SUCH EQUIPMENT.
B. ALL MATERIALS SHALL BEAR THE LABEL OF UNDERWRITER'S LABORATORY FOR THE INTENDED USE.
C. EQUIPMENT ENCLOSURES SHALL BE NEMA 12 FOR INDOOR USE, AND NEMA 4X (STAINLESS STEEL) OR 3R AS SHOWN ON DRAWINGS FOR OUTDOOR USE.
D. FURNISH LIGHTING FIXTURES WITH LAMPS AND 10 PERCENT (TWO MINIMUM) SPARE LAMPS OF EACH TYPE.
E. FURNISH FUSIBLE EQUIPMENT WITH FUSES AND 10 PERCENT (THREE MINIMUM) OF SPARE FUSES OF EACH TYPE.

1.7 INSTALLATION
A. INSTALL EQUIPMENT AT THE LOCATIONS SHOWN ON THE DRAWINGS FOLLOWING THE MANUFACTURER'S RECOMMENDATIONS.
B. COORDINATE INSTALLATION OF UNDERGROUND DUCTS AND CONDUITS WITH EXISTING UNDERGROUND UTILITIES. FIELD VERIFY ROUTING AND BURIAL DEPTH. DRAIN DUCTS AWAY FROM BUILDINGS TOWARD MANHOLES. LOW POINTS IN DUCT BANK RUNS ARE NOT ACCEPTABLE.
C. INSTALL FLOOR MOUNTED SELF SUPPORTED EQUIPMENT ON 4-INCHES HIGH CONCRETE PADS WITH STEEL REINFORCING. USE REQUIRED BOLTS, ANCHORS, INSERTS AND CONDUIT SLEEVES.
D. MAKE OPENINGS THROUGH WALLS, CEILINGS, ROADWAYS, FLOOR SLABS, ETC. REQUIRED FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT, BUT CUTTING, WELDING, OR OTHER WEAKENING OF BUILDING STRUCTURE TO SIMPLIFY ELECTRICAL EQUIPMENT AND MATERIALS' INSTALLATION ARE NOT PERMITTED. WHERE EXISTING WALLS, CEILINGS OR FLOOR SLABS HAVE TO BE CUT, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER BEFORE MAKING SUCH CUTS. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE DONE WHILE PROVIDING SUCH OPENINGS AND SHALL PATCH THE SURFACE TO MATCH ADJACENT MATERIALS AND FINISHES.
E. NO CONDUITS, SLEEVES, PIPES OR ANY OTHER ITEM SHALL BE EMBEDDED IN CONCRETE ALONG OR THROUGH ANY BEAM, COLUMN, FOOTING, GRADE BEAM, SLAB, WALL OR ANY OTHER STRUCTURAL MEMBER WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
F. COORDINATE SHIPPING LENGTHS OF SWITCH GEARS AND MOTOR CONTROL CENTERS. THOSE ITEMS SHALL BE ABLE TO BE REMOVED AND REPLACED IN THE FUTURE THROUGH THE PERMANENT ACCESS PROVIDED IN THE STRUCTURE.
G. PROVIDE 36- INCHES WIDE, 3/16- INCHES THICK RUBBER MATS IN THE FRONT AND REAR OF SWITCH GEARS, MOTOR CONTROL CENTERS AND SWITCHBOARDS. MATS TO COMPLY WITH FEDERAL SPECS ZZ-F-416A.

1.8 TESTING
UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL ENERGIZE, START-UP AND TEST OPERATE ALL THE SYSTEMS AND EQUIPMENT IN THE PRESENCE OF THE ENGINEER. INSULATION RESISTANCE TESTS SHALL BE MADE ON 240 VOLT FEEDER WITH A 500 VOLT DC MEGGER. DEFECTS FOUND SHALL BE CORRECTED.

2.0 RACEWAYS

2.1 RIGID CONDUIT
A. STEEL: HOT DIPPED ZINC COATED, GALVANIZED, THREADED RIGID STEEL CONFORMING TO ANSI C80, AND FED. SPEC WW-C-581. USE THREADED GALVANIZED STEEL FITTINGS.
B. ALUMINUM: CONTAINING LESS THAN 0.1 PERCENT COPPER AND CONFORMING TO FEDERAL SPECIFICATION WW-C-540C. USE THREADED ALUMINUM FITTINGS.
C. PLASTIC: RIGID, SCHEDULE 40, 90 DEGREES C., UL RATED, PVC PLASTIC CONFORMING TO UL 651, FED. SPEC. W-C-1094 AND NEMA TC-2. FITTINGS TO CONFORM WITH UL3 514 AND NEMA TC-3.

2.2 FLEXIBLE METAL CONDUIT
LIQUID-TIGHT: FLEXIBLE ZINC COATED CONFORMING TO UL 1 TYPE WITH LIQUID-TIGHT FLEXIBLE PLASTIC SHEATH, CONFORMING TO UL 360 STANDARD. FITTINGS, PER FED. SPEC. W-R-406B AND UL 514.

2.3 LOCATION AND USE OF EACH TYPE OF CONDUIT
A. USE RIGID ALUMINUM CONDUIT FOR ABOVE GROUND EXPOSED INSTALLATIONS EXCEPT IN CORROSIVE AREAS WHERE PVC COATED RIGID GALVANIZED STEEL SHALL BE USED.
B. USE GALVANIZED THREADED RIGID STEEL CONDUIT AS FOLLOWS:
1) WHEREVER SPECIFICALLY CALLED FOR ON DRAWINGS.
2) WHERE RACEWAY ELBOWS FROM DUCT BANKS STUB-UP.
3) FOR UNDERGROUND WORK BEYOND BUILDINGS WHERE CONCRETE ENCASED PLASTIC CONDUITS HAVE NOT BEEN SPECIFIED. COAT BURIED GALVANIZED STEEL CONDUITS AND FITTINGS WITH TWO COATS OF CARBOLINE'S BITUMASTIC NO. 50 OR EQUAL.
C. USE PLASTIC CONDUIT AS FOLLOWS:
1) WHEN INSTALLED IN POURED CONCRETE SLABS OR WALLS.
2) FOR UNDERGROUND WORK UNDER SLABS.
3) IN DUCT BANKS OR, IF SPECIFICALLY CALLED FOR, IN TRENCHES. BACK-FILL TRENCHES WITH STRUCTURAL FILL 90 % COMPACTED (PROCTOR DENSITY) AND RESOD TO ORIGINAL CONDITION.
D. USE FLEXIBLE METAL CONDUIT (24 TO 60 INCHES LONG) FOR CONNECTIONS TO ROTATING OR VIBRATING EQUIPMENT.

2.4 INSTALLATION
A. DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL BENDS, FITTINGS, BOXES, AND SPECIALTIES WHICH MAY BE REQUIRED OR THE EXACT LOCATION OF CONDUITS. EXAMINE THE STRUCTURAL AND FINISH CONDITIONS AFFECTING ALL OF THE WORK AND PLAN IT ACCORDINGLY, FURNISHING SUCH FITTINGS AS MAY BE REQUIRED TO MEET SUCH CONDITIONS. ARRANGE CONDUIT RUNS TO CLEAR BEAMS, PIPES AND OTHER OBSTRUCTIONS AND AVOID INTERFERENCES WITH OTHER TRADES WORK. ANY CHANGES FROM LOCATIONS SHOWN ON THE DRAWINGS MUST BE APPROVED BY THE ENGINEER.
B. INSTALL RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES AND CEILINGS. INSTALL HORIZONTAL RACEWAYS CLOSE TO CEILING OR CEILING BEAMS, AND ABOVE PIPES AND DUCTS.
C. SIZE RACEWAY ACCORDING TO NEC, BUT IN NO CASE SHALL BE LESS THAN INDICATED ON DRAWINGS. MINIMUM SIZE SHALL BE 3/4-INCH, EXCEPT FLEXIBLE CONDUITS TO LIGHT FIXTURES CAN BE 3/8" BUT NOT EXCEEDING SIX FEET LONG.
D. INSTALL CONDUITS PASSING THROUGH WALLS AND SLABS IN PVC SLEEVES. EXTEND SLEEVES THROUGH FULL CONCRETE THICKNESS AND PROVIDE 1/2- INCH CLEARANCE AROUND CONDUITS TO FACILITATE SEALING.
E. SEAL ANY OPENING MADE IN SLABS OR WALLS TO PREVENT SMOKE OR FIRE SPREAD AND THE PASSAGE OF WATER. USE SEALING COMPOUND APPROVED FOR THE PURPOSE.
F. USE EXPANSION FITTINGS WHEN CONDUITS CROSS STRUCTURAL EXPANSION JOINTS.
G. EXCEPT WHERE BOXES, PANELS AND OTHER EQUIPMENT HAVE THREADED OPENINGS, MAKE CONDUIT CONNECTIONS AS FOLLOWS:
1) DOUBLE LOCKNUTS, ONE INSIDE AND ONE OUTSIDE.
2) PROVIDE MALLEABLE, IRON OR STEEL BUSHING WITH BAKELITE LINER MOLDED AND BONDED INTO THE BUSHING.
3) PLACE GROUNDING BUSHING ON END OF CONDUIT IN ADDITION TO LOCKNUTS.

2.5 SUPPORT OF RACEWAY
A. INSTALL WALL MOUNTED ELECTRICAL EQUIPMENT, WIRING TROUGHS, JUNCTION BOXES AND GROUPS OF TWO OR MORE CONDUITS ON A SYSTEM OF EXTRUDED, GAUGE 12, 1-5/8 INCHES WIDE, ALUMINUM CHANNELS. ATTACH CHANNELS TO WALL WITH STAINLESS STEEL MACHINE BOLTS AND EXPANSION SHIELDS. CHANNELS TO BE SERIES P-1000 WITH COMPATIBLE HARDWARE AND FITTINGS AS MANUFACTURED BY UNISTRUT MFG. CO. OR EQUAL.
B. FASTEN VERTICAL AND HORIZONTAL RUNS OF RACEWAYS AT INTERVALS OF NOT MORE THAN 8 FEET AND WITHIN 3 FEET OF BENDS, OUTLETS AND JUNCTION BOXES.
C. SUPPORT SINGLE CONDUITS NOT LARGER THAN 1-1/2 INCHES IN DIAMETER BY MEANS OF TWO-HOLE PIPE STRAPS OR INDIVIDUAL PIPE HANGERS. FOR CONDUITS LARGER THAN 1-1/2 INCHES IN DIAMETER USE INDIVIDUAL PIPE HANGERS.
D. SPACE CONDUITS INSTALLED AGAINST CONCRETE SURFACES NOT LESS THAN 1/4 INCH AWAY FROM THE SURFACES BY CLAMP BACKS OR OTHER APPROVED MEANS.
E. FURNISH HANGER RODS MADE OF GALVANIZED STEEL OF NOT LESS THAN 1/4 INCH IN DIAMETER. WHEN CONCEALED ABOVE A SUSPENDED CEILING, GALVANIZED PERFORATED STEEL STRAPPING IS ACCEPTABLE.
F. SUPPORT BRANCH CIRCUIT RACEWAYS INSTALLED ABOVE SUSPENDED CEILING INDEPENDENTLY OF THE CEILING SUPPORT SYSTEM. WHEREVER POSSIBLE, THEY SHALL BE FASTENED TO THE UNDERSIDE OF THE SLAB ABOVE.

2.6 METAL FRAMING (CONTINUOUS SLOT METAL CHANNEL SYSTEM)
A. CONFIGURATION. SINGLE CHANNEL OR TWO SINGLE CHANNELS WELDED TOGETHER, WITH CONTINUOUS 7/8-INCH SLOT AND TO ACCEPT SPRING-HELD STEEL NUTS.
B. DIMENSIONS: FOR SINGLE CHANNEL, 1-5/8 INCHES BY 1-5/8 INCHES. FOR DOUBLE CHANNEL, 1-5/8 INCHES BY 3-1/4 INCHES BOTH 12-GAUGE. FITTINGS TO BE 1-5/8 INCHES WIDE BY 1/4 INCH-THICK MINIMUM.
C. FINISHING OF CHANNELS, PIPE CLAMPS AND FITTINGS TO BE HOT DIP GALVANIZED AFTER FABRICATION CONFORMING TO ASTM A123 OR A153, AS APPLICABLE MINIMUM WEIGHT OF COATING. 2.0 OUNCES PER SQUARE FOOT. NUTS, BOLTS AND SCREW TO BE ELECTRO GALVANIZED.

3.0 CONDUCTORS (600 VOLTS)

3.1 MATERIAL
A. FURNISH CONDUCTORS OF 98 % ANNEALED COPPER, 600 VOLT CLASS B, HEAT AND MOISTURE RESISTANT, THERMOPLASTIC TYPE THHN/THHW (SIZED BY THW RATING), WITH A POLYVINYL CHLORIDE INSULATION RESISTANT TO OIL, GASOLINE AND WEATHER. INSULATION SHALL MEET UL STANDARD 83.
B. CONDUCTORS TO BE STRANDED; #8 THROUGH #2 SHALL BE 7 STRAND; #1 THROUGH 4/0, 19 STRAND AND 250 MCM THROUGH 500 MCM, 37 STRAND.

3.2 IDENTIFICATION
A. COLOR CODE POWER CONDUCTORS AS FOLLOWS:
1) 120/240 VOLT SYSTEM: WHITE-NEUTRAL, BLACK-PHASE A, BLUE-PHASE B, RED-PHASE C.
2) 277/480 VOLT SYSTEM: GRAY-NEUTRAL, YELLOW-PHASE A, BROWN-PHASE B, ORANGE-PHASE C.
3) BONDING CONDUCTOR GREEN.
B. IDENTIFY FEEDERS, BRANCH CIRCUITS AND INSTRUMENTATION AND CONTROL WIRES AT TERMINATIONS, JUNCTION AND PULL BOXES.

3.3 INSTALLATION
A. DO NOT USE CONDUCTORS SMALLER THAN AWG #12 FOR POWER AND #14 FOR CONTROL UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
B. DO NOT PULL CONDUCTORS INTO CONDUITS UNTIL THE MECHANICAL WORK HAS BEEN COMPLETED.
C. GROUP AND TIE CONDUCTORS IN PANEL BOARDS, JUNCTION BOXES, PULL BOXES, ETC., FOR A NEAT AND ORDERLY APPEARANCE.
D. USE CONNECTORS, TERMINALS AND SPLICES THAT ARE DESIGNED AND APPROVED FOR THE SPECIFIC TYPE AND SIZE OF THE CONDUCTORS BEING CONNECTED.
E. FIREPROOF FEEDERS WHERE NOT PROTECTED BY CONDUITS LIKE IN MANHOLES, SWITCH GEARS, ETC.

4.0 OUTLET, PULL AND JUNCTION BOXES

A. OUTLET BOXES IN INDOOR FINISHED WALLS TO BE GALVANIZED STEEL, 4" X 4" X 1-1/2" CONFORMING TO FEDERAL SPECIFICATIONS WC-583 AND ANSI-C33.65.
B. EXTERIOR OUTLET BOXES, BOXES AND FITTINGS EMBEDDED IN CONCRETE, AND BOXES FOR EXPOSED CONDUIT RUNS SHALL BE CAST OF RUST RESISTING METAL, WITH FULL THREADED HUBS, AND SCREW TYPE RUBBER GASKET COVERS.
C. INSTALL BOXES FOR LIGHT SWITCHES LOCATED NEAR DOORS ON THE LOCK SIDE, EVEN WHERE THE SYMBOLS ARE INDICATED ON THE HINGE SIDES.
D. PULL AND JUNCTION BOXES SHALL BE OF 12 GAUGE WELDED ALUMINUM WITH HINGED COVER. NEMA 12 FOR INDOOR USE AND NEMA 4X FOR OUTDOOR USE. MINIMUM DIMENSIONS SHALL BE 12" X 12" X 6".
E. IN CORROSIVE AREAS OR WHERE CALLED FOR ON DRAWINGS, FURNISH PULL AND JUNCTION BOXES OF 14 GAUGE STAINLESS STEEL.
F. WHEN SPLICING CONTROL CONDUCTORS IN BOXES USE SCREW TYPE TERMINAL STRIP BLOCKS CLASS 9080 (G) AS MANUFACTURED BY SQUARE D OR EQUAL, IDENTIFY EVERY WIRE AT BOTH SIDES AND PROVIDE SPADE TYPE LUGS FOR TERMINATION.
G. PROVIDE PULL AND JUNCTION BOXES WHERE REQUIRED TO REDUCE LENGTH OF CABLE PULL OR REDUCE NUMBER OF ELBOWS BETWEEN OUTLETS.

5.0 SWITCHES AND RECEPTACLES

A. FURNISH WALL SWITCHES OF THE QUIET AND TOTALLY ENCLOSED TUMBLER TYPE, WITH BODIES OF PHENOLIC COMPOUND. WIRING TERMINALS SHALL BE OF THE SCREW TYPE. NO MORE THAN ONE SWITCH SHALL BE INSTALLED IN A SINGLE-GANG POSITION. SWITCHES SHALL CONFORM TO FEDERAL SPECIFICATIONS WS-5896E, HUBBEL 1221 AND 1223, OR APPROVED EQUAL.
B. USE 20A, 125 V, DUPLEX, U-SLOTTED, GROUNDING TYPE RECEPTACLES THAT CONFORM TO FEDERAL SPECIFICATIONS WC-596D, HUBBEL 5362, OR EQUAL.
C. AMOUNT DUPLEX RECEPTACLES VERTICALLY. BOXES MOUNTED BACK TO BACK ARE NOT PERMITTED. GANGED RECEPTACLES AND SWITCHES SHALL HAVE SINGLE MULTI-GANG COVER PLATE.
D. FURNISH HOSPITAL GRADE GROUND FAULT INTERRUPTER WITH DIFFERENTIAL CURRENT TRANSFORMER, SOLID STATE SENSING CIRCUITRY AND CIRCUIT INTERRUPTER. SENSITIVITY TO BE 5 MA, TRIPPING TIME 1/30TH OF A SECOND.
E. WHEN INSTALLING RECEPTACLES IN OUTDOOR LOCATIONS USE CAST-METAL OUTLET BOXES WITH GASKET WEATHERPROOF CAST-METAL COVER PLATES AND SPRING-FLAP CAP OVER EACH RECEPTACLE.
F. USE STAINLESS STEEL COVER PLATES FOR SWITCHES AND RECEPTACLES EXCEPT IN NON-INDUSTRIAL AREAS SUCH AS OFFICES, REST ROOMS, LABORATORIES, ETC.

6.0 MOTOR DISCONNECT SWITCHES & STARTERS

A. PROVIDE EACH MOTOR WITH A DISCONNECTING MEANS MEETING THE REQUIREMENTS OF N.E.C. ARTICLE 430. SWITCHES SHALL BE HEAVY DUTY, HORSE POWER RATED, SUITABLE TO BE PADLOCKED IN "OFF" POSITION AND CONFORM TO FEDERAL SPECS W-S-865, NEMA KS1 AND ANSI C33.64. IF FUSES ARE REQUIRED, THEY SHALL BE CURRENT LIMITING TYPE
B. SIZE DISCONNECTS AND STARTERS FOR THE FULL LOAD OF THE CONTROLLED MOTOR. THE HORSEPOWER RATINGS INDICATED ON THE DRAWINGS ARE SHOWN FOR THE BENEFIT OF THE CONTRACTOR AND DO NOT LIMIT EQUIPMENT SIZE.
C. FOR SINGLE-PHASE FRACTIONAL HORSEPOWER MOTORS, A SINGLE OR DOUBLE-POLE TOGGLE SWITCH WILL BE ACCEPTABLE PROVIDED THE AMPERE RATING OF THE SWITCH IS AT LEAST 125 PERCENT OF MOTOR RATING.
D. SWITCHES SHALL BE THE QUICK-BREAK TYPE AND DISCONNECT ALL UNGROUNDED CONDUCTORS.
E. FOR MOTORS LARGER THAN 1/4 HORSEPOWER, FURNISH STARTERS SPECIFICALLY DESIGNED FOR THE PURPOSE AND HAVING A HORSEPOWER RATING EQUAL TO THE MOTOR CONTROLLED.
F. PROVIDE MOTORS OF 1/8 HORSEPOWER OR LARGER WITH THERMAL-OVERLOAD PROTECTION. THE OVERLOAD PROTECTION DEVICE, OF THE MANUAL RESET TYPE AND WITH CONTACTS ON EACH PHASE, SHALL BE PART OF THE STARTER. SIZE THE OVERLOAD HEATER ELEMENTS ACCORDING TO THE MOTOR MANUFACTURER'S RECOMMENDATIONS AND BASED ON THE ACTUAL MOTOR NAMEPLATE FULL-LOAD CURRENT.
G. PROVIDE EACH MOTOR WITH A SUITABLE CONTROLLER OR DEVICE TO MAKE IT PERFORM AS REQUIRED. AUTOMATIC CONTROL DEVICES SUCH AS THERMOSTATS, FLOAT OR PRESSURE SWITCHES MAY DIRECTLY CONTROL THE START-STOP OF MOTORS UP TO 1/4 HORSEPOWER, PROVIDED THE DEVICES USED ARE DESIGNED FOR THE PURPOSE AND HAVE AN ADEQUATE HORSEPOWER RATING. WHEN THE AUTOMATIC-CONTROL DEVICE DOES NOT HAVE SUCH A RATING, A MAGNETIC STARTER SHALL BE USED WITH THE AUTOMATIC CONTROL DEVICE ACTIVATING THE COIL OF THE CONTACTOR.
H. PROVIDE 3 POSITION MANUAL-OFF-AUTO SWITCH WHEN MANUAL AND AUTOMATIC CONTROL IS REQUIRED. CONNECT THE SELECTOR SWITCH SO THAT ONLY THE AUTOMATIC DEVICES ARE BY-PASSED WHEN THE SWITCH IS IN THE "MANUAL" POSITION. ALL SAFETY DEVICES SUCH AS PRESSURE AND TEMPERATURE SWITCHES, MOTOR OVERLOAD AND SAFETY SWITCHES SHALL BE ACTIVE IN "MANUAL" AND "AUTOMATIC" POSITIONS.
I. MOTOR CONTROL CIRCUITS SHALL OPERATE AT 120V GROUNDED, OBTAINED FROM THE LOAD SIDE OF THE MOTOR-DISCONNECT MEANS. IF THE MOTOR CIRCUIT IS MORE THAN 120V TO GROUND, FURNISH A CONTROL TRANSFORMER WITH FUSED PRIMARY AND SECONDARY CIRCUITS. STARTERS FOR MOTORS WITH SPACE HEATERS SHALL HAVE CONTROL TRANSFORMERS SIZED FOR THE ADDITIONAL LOAD.
J. FURNISH COMBINATION MOTOR STARTERS OF THE MOLDED CASE, MOTOR CIRCUIT PROTECTOR, CIRCUIT BREAKER TYPE, THREE PHASE, OF THE VOLTAGE AND SIZE AS SHOWN ON THE DRAWINGS BUT NOT SMALLER THAN THE SIZE REQUIRED BY THE CONTROLLED MOTOR, 120 VOLT CONTROL CIRCUIT, 3 THERMAL INTERCHANGEABLE OVERLOAD RELAYS, "HAND-OFF-AUTO" OR "ON-OFF" SWITCH AS REQUIRED BY THE APPLICATION, RED AND GREEN PILOT LIGHTS AND FOUR NORMALLY CLOSED AND NORMALLY OPEN INTERLOCK CONTACTS.
K. THE STARTER DISCONNECT SHALL BE OPERABLE BY AN EXTERNAL "ON-OFF" LABELED HANDLE, INTERLOCKED TO PREVENT OPENING THE ENCLOSURE DOOR WHILE THE DISCONNECT IS IN THE "ON" POSITION EXCEPT WHEN CONSCIOUSLY OPERATING A PERMISSIVE RELEASE DEVICE.
L. FURNISH STARTERS MANUFACTURED BY SQUARE D, CLASS 8536, ALLEN BRADLEY BULLETIN NO. 509, OR EQUAL.

7.0 PANEL BOARDS

A. PROVIDE DEAD FRONT CIRCUIT BREAKER TYPE PANEL BOARDS WITH COPPER BUS AND AS SCHEDULED ON DRAWINGS. EACH PANEL BOARD SHALL BE PROVIDED WITH A SEPARATE GROUND BUS IN ADDITION TO THE NEUTRAL BUS. CIRCUIT BREAKERS SHALL BE BOLT-ON AND HAVE A MINIMUM INTERRUPTING RATING OF 10,000 AMPERES AT 120 VOLTS, AND 14,000 AMPERES AT 277 VOLTS. A TYPEWRITTEN DIRECTORY SHALL CLEARLY IDENTIFY THE LOAD SERVED BY EACH CIRCUIT AND SHALL BE MOUNTED INSIDE THE DOOR IN A METAL FRAME WITH PLASTIC COVER. CIRCUIT NUMBERS SHALL BE PERMANENTLY INDICATED ADJACENT TO EACH CIRCUIT BREAKER.

8.0 GROUNDING

A. INSTALL GROUNDING AS SHOWN ON DRAWINGS. WHERE NOT INDICATED, INSTALL IN COMPLIANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE. DO NOT USE CONDUCTORS SMALLER THAN SIZE AWG #12.
B. INACCESSIBLE CONNECTIONS SHALL BE MADE WITH THE EXOTHERMIC WELDING PROCESS USING EQUIPMENT MANUFACTURED BY BURUNDY OR ERICO PRODUCTS OR EQUAL.
C. ACCESSIBLE CONNECTIONS SHALL BE MADE WITH BURUNDY, MULTIPLE BOLT CONNECTORS SPECIFICALLY APPROVED FOR THE APPLICATION.
D. TO ASSURE ELECTRICAL CONTINUITY, INSTALL JUMPERS ACROSS METAL PARTS SEPARATED BY NON-CONDUCTING MATERIALS OR ATTACHED TOGETHER BY HIGH RESISTANCE JOINTS.
E. DO NOT EMBED GROUNDING CABLES DIRECTLY IN CONCRETE. USE SLEEVES WHEN PASSING CABLES THROUGH CONCRETE. BARE COPPER CABLES BURIED IN EARTH SHALL BE TINNED.
F. FURNISH GROUND RODS OF COPPER CLAD STEEL, 3/4 INCH IN DIAMETER, 10 FEET LONG, DRIVEN FULL LENGTH INTO THE EARTH. MAXIMUM RESISTANCE TO GROUND IS LIMITED TO 25 OHMS. ADDITIONAL GROUND RODS SHALL BE DRIVEN IF REQUIRED TO MAINTAIN THIS LEVEL.
G. PARTS TO BE GROUNDED: SWITCH GEAR AND PANEL BOARD FRAMES, FIXTURES AND DEVICES, CABLE SHEATHS, NEUTRAL OF TRANSFORMERS, BOXES AND RACEWAYS, MOTOR FRAMES, STREET LIGHTS, NON-CURRENT CARRYING PARTS OF APPLIANCES AND DEVICES, AND ALL OTHER PARTS AND EQUIPMENT AS REQUIRED BY NEC. NEVER USE A NEUTRAL WIRE AS GROUNDING MEANS.
H. BOND EQUIPMENT WITH CONDUCTORS INSTALLED IN SAME CIRCUIT RACEWAY AND SIZED AS FOLLOWS:
1) EQUIPMENT RATED 50 AMPERES OR UNDER WITH ONE AWG #8.
2) EQUIPMENT RATED 50 TO 125 AMPERES WITH ONE AWG #6.
3) EQUIPMENT RATED OVER 125 AMPERES WITH ONE AWG #6 AND ONE# 1/0 IN 3/4 INCH CONDUIT TO BUILDING GROUND LOOP OR GROUND ROD.
I. PROVIDE POWER AND LIGHTING CIRCUIT AND 120 VOLT GROUNDING RECEPTACLE WITH A GREEN GROUNDING CONDUCTOR OF THE SAME SIZE AND TYPE AS THE PHASE CONDUCTOR AND RUNNING IN THE SAME CONDUIT.
J. MAKE BONDING TO EQUIPMENT WITH APPROVED SOLDERLESS CONNECTOR. CONTACT SURFACE SHALL BE UNPAINTED AND THOROUGHLY CLEANED BEFORE CONNECTION IS MADE TO INSURE A GOOD METAL CONTACT.

9.0 TRANSFORMERS

A. FURNISH DRY TYPE, THREE OR SINGLE PHASE TRANSFORMERS OF THE SIZE AND VOLTAGE INDICATED ON THE DRAWINGS, WITH FOUR (TWO ABOVE AND TWO BELOW) 2-1/2 PROOF ENCLOSURE WITH FRONT ACCESSIBLE WIRING COMPARTMENT AND CONFORMING TO THE APPLICABLE REQUIREMENTS OF ANSI, IEEE, AND NEMA STANDARDS.
B. CORE AND COIL ASSEMBLY TO BE VACUUM IMPREGNATED WITH CLASS H INSULATION. TEMPERATURE RISE NOT TO EXCEED 115 DEGREE C.
C. TRANSFORMERS SOUND LEVEL NOT TO EXCEED FOLLOWING VALUES: 0 TO 9 KVA, 36 DB; 10 TO 45 KVA , 42 DB; 50 TO 100 KVA, 45 DB.
D. BOLT FLOOR MOUNTED TRANSFORMERS TO FLOOR. WHEN WALL MOUNTED, PROVIDE STEEL BRACKET ANGLES AND BOLT TRANSFORMER TO BRACKET. USE NEOPRENE ISOLATION PADS TO ISOLATE VIBRATIONS.
E. ADJUST PRIMARY TAPS TO PROVIDE A SECONDARY VOLTAGE WITHIN +5 OF NOMINAL VOLTAGE.

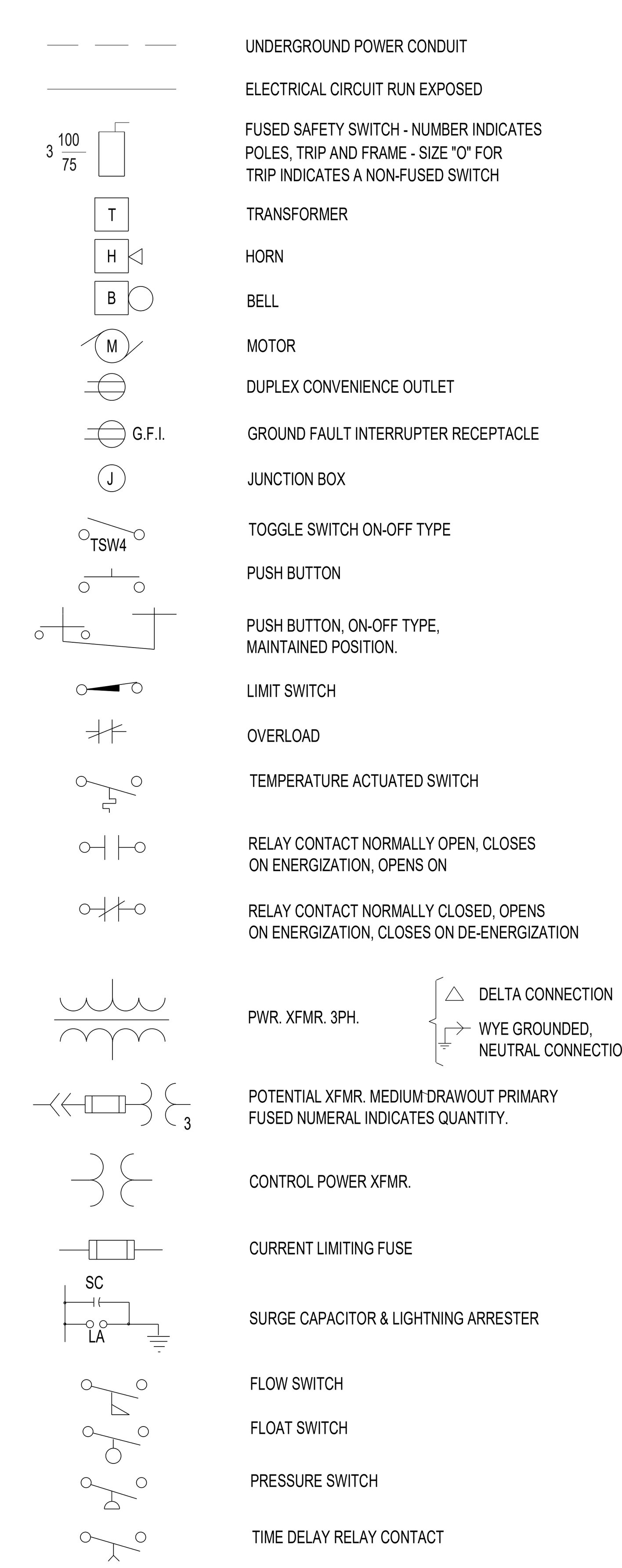
10.0 DUCT BANKS

A. DUCT BANKS OF THE SIZE INDICATED ON DRAWINGS, SHALL CONSIST OF A NUMBER OF INDIVIDUAL PVC DUCTS AS INDICATED, ENCASED IN A REINFORCED CONCRETE ENVELOPE.
B. USE PVC SCHEDULE 40 CONDUITS WITH MOLDED INTERLOCKING SPACERS. CONCRETE TO BE CLASS C, 2500 POUNDS PSI. PROVIDE # 12 AWG PULL WIRE IN ALL EMPTY CONDUITS.
C. SLOPE DUCTS A MINIMUM OF 3 INCHES PER 100 FEET. SLOPE TO BE AWAY FROM BUILDINGS, FROM ONE MANHOLE TO THE NEXT OR BOTH WAYS FROM A HIGH POINT BETWEEN MANHOLES. KEEP THE HIGHEST POINT NOT LESS THAN 24 INCHES BELOW THE FINISHED GRADE.

NOTES:

1- ALL CIRCUITS TO CARRY A FULL GROUND WIRE PER N.E.C. ARTICLE 250.
2- ELECTRICAL SERVICE TO WITHSTAND UTILITY AVAILABLE FAULT CURRENT AND BUILT PER FPL STANDARD. CONTACT YAREMIS SANTOS PHONE (786) 449-6053 F.P.L. REPRESENTATIVE IN THIS AREA.
3- SEE STRUCTURAL DRAWINGS FOR INSTALLATION DETAILS.
4- THE SHORT CIRCUIT CURRENT RATING (SCCR) OF THE ELECTRICAL PANEL SHALL BE ADEQUATE TO WITHSTAND THE MAXIMUM SHORT CIRCUIT CURRENT AT THE EQUIPMENT TERMINALS. USE STANDARD VALUE XX kA. REFER TO FP&L CORRESPONDING FAULT CURRENT LETTER ON DRAWING E-XX. PANELS SHALL BE FULLY RATED.
5- METER CAN AND MAIN DISCONNECT TO BE MOUNTED ON UNISTRUCT.
6- MOTOR CIRCUIT BREAKER TO BE CAPABLE OF BEING PADLOCKED IN THE OPEN POSITION AND NOT OBSTRUCT CLOSING OR OPENING OF DEAD FRONT.
7- TELEMETRY ANTENNA FOUNDATION TO BE MIAMI DADE STANDARD AND COMPLIES WITH FBC.
8- AC AND MISCELLANEOUS BREAKERS ARE FACTORY FURNISHED AS AN INTEGRAL PART OF THE CONTROL PANEL.
9- MOTOR CIRCUIT PROTECTOR INDICATED IS AN ADJUSTABLE INSTANTANEOUS-TRIP MAGNETIC ONLY CIRCUIT BREAKERS FOR SINGLE MOTOR CIRCUIT PROTECTION AND ARE INTENDED FOR USE IN COMBINATION WITH MOTOR STARTERS WITH OVERLOAD RELAYS FOR THE PROTECTION OF MOTOR CIRCUITS FROM SHORT CIRCUITS AND OVERLOADS.
10- ALL CABLES SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY. MOTOR WIRES SHOWN ARE MOTOR POWER AND GROUND ONLY. SUBMERSIBLE PUMP CABLES MULTICONDUCTOR TO BE FURNISHED BY THE MANUFACTURER AS AN INTEGRAL PART OF THE MOTOR. IF THE PUMP IS FURNISHED WITH SEPARATED POWER AND CONTROL CABLES; CONTRACTOR SHALL INCREASE THE SIZE OF THE CONDUITS AS REQUIRED.
11- PUMP CONTROL PANEL SHALL BE MANUFACTURED AND LABELED PER UL 698A AND SUITABLE FOR SERVICE ENTRANCE USE.
12- PRESSURE TRANSDUCER TO BE SLX 130 OR EQUIVALENT.
13- WET WELL IS A CLASS I DIVISION 2 AND VALVE BOX IS A CLASS 1 DIVISION 2 HAZARDOUS LOCATION AS PER NFPA 820. SEAL OFF SHALL COMPLY WITH NEC. 501. PRESSURE TRANSDUCER AND FLOAT SWITCHES TO BE ADEQUATE FOR CLASS 1 DIVISION 2 LOCATION. ELECTRICAL EQUIPMENT IN VALVE VAULT TO BE ADEQUATE FOR CLASS 1 DIVISION 2 LOCATION.
14- MAIN DISCONNECT SWITCH SIZED TO MATCH MAIN CIRCUIT BREAKER AND IN A PAD LOCKABLE SERVICE RATED, xx kA.I.C. MIN. NEMA 4X STAINLESS STEEL ENCLOSURE. TOP SHALL NOT BE HIGHER THAN THE TOP OF THE CABINET.
15- CONTROL PANEL SHALL INCORPORATE TAMPER/INTRUSION SWITCH(ES) THAT ACTIVATES AN ALARM TO THE RTU WHENEVER THE PANEL IS OPENED. THE SWITCH SHALL BE LOCATED ON EACH PANEL DOOR WHERE A DOOR HANDLE IS PROVIDED.
16- THE TEMPERATURE RATING ASSOCIATED WITH THE AMPACITY OF A CONDUCTOR SHALL COMPLY WITH NEC 110.
17- MAXIMUM GROUND RESISTANCE SHALL NOT EXCEED 25 OHMS PER ELECTRODE AS PER NEC ARTICLE 250.

SYMBOL-LEGEND:



NOTES (CONTINUED):

18- ALL ELECTRICAL EQUIPMENT AND APPURTENANCES SHALL COMPLY WITH NEC 110.
19- MINIMUM CONDUIT SIZE TO BE 3/4" AND WIRE TO BE #12 CU.
20- LIGHTNING ARRESTER AND SURGE CAPACITOR SHALL BE INSTALLED IN PANEL AND CONNECTED TO A MULTI-WIRE LUG IN MAIN CIRCUIT BREAKER BY CONTROL PANEL MANUFACTURER.
21- GROUNDING AND NEUTRAL CONDUCTORS SHALL BE BONDED AT ENTRANCE POINT ONLY.
22- PROVIDE PANEL MANUFACTURER'S RECOMMENDED SPARE PARTS FOR TWO YEARS.
23- A. THE CONTRACTOR SHALL FURNISH SHORT-CIRCUIT AND PROTECTIVE DEVICE COORDINATION STUDIES AS PREPARED BY THE ELECTRICAL EQUIPMENT MANUFACTURER OR AN APPROVED ENGINEERING FIRM.
B. THE CONTRACTOR SHALL FURNISH AN ARC FLASH HAZARD ANALYSIS STUDY PER THE REQUIREMENTS SET FORTH IN NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE, AND NEC 110. THE ARC FLASH ANALYSIS SHALL BE PERFORMED ACCORDING TO THE IEEE 1584 EQUATIONS THAT ARE PRESENTED IN THE LATEST CURRENT EDITION OF THE NFPA-70E.
C. THE CONTRACTOR OF THE ARC FLASH HAZARD ANALYSIS SHALL PROVIDE WARNING LABEL INDICATING SEVERITY OF POTENTIAL EXPOSURE AND LEVEL OF PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED. LABEL TO BE AS PER DETAIL IN SHEET E-3.
24- RTU ANTENNA FOUNDATION, POLE SUPPORT AND CONDUIT TO RTU PANEL, PROVIDED AND INSTALLED BY CONTRACTOR.
25- AS PER NEC ARTICLE 409.110 REQUIREMENTS, THE CONTROL PANEL SHALL BE MARKED WITH A SHORT CIRCUIT RATING THAT IS DETERMINED BY BEING A LISTED AND LABELED ASSEMBLY OR BY ANOTHER APPROVED METHOD.
26- SCADA RTU AND COMMUNICATION EQUIPMENT WILL BE BY MISSION.
27- FINISHED FLOOR ELEVATIONS (FFE) AND TOP OF SLABS MUST BE TWO (2) FEET ABOVE BASE FLOOD ELEVATION AS ESTABLISHED BY THE AREA'S FEMA FIRM MAP/PANEL.
28- AN ADDITIONAL 6" MAY BE REQUIRED IN AREAS WHERE SEA LEVEL RISE IMPACTS MAY BE EXPECTED.
29- PROVIDE NEMA 6 J. BOX AND HARD WIRE TO THE VALVE PIT SUMP PUMP. FLOAT SWITCH TO BE INSTALLED INSIDE THE VALVE VAULT TO SEND SIGNAL TO RTU AND TO CONTROL PANEL FOR LOCAL SIGNAL AS IT IS SHOWN ON CONTROL WIRING DIAGRAM AND RTU TERMINAL BLOCK ON SHEET E-600.

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REVISIONS

NO.	DESCRIPTION	DATE

PRELIMINARY PLAN
NOT FOR CONSTRUCTION
THESE PLANS ARE NOT FULLY PERMITTED AND ARE SUBJECT TO REVISIONS MADE DURING THE PERMITTING PROCESS.
RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	01/02/23
DESIGNED BY:	ZM
DRAWN BY:	MT
CHECKED BY:	ZM
BID-CONTRACT:	

Zoila Morales, P.E.
P.E. NO. 64981

CLIENT

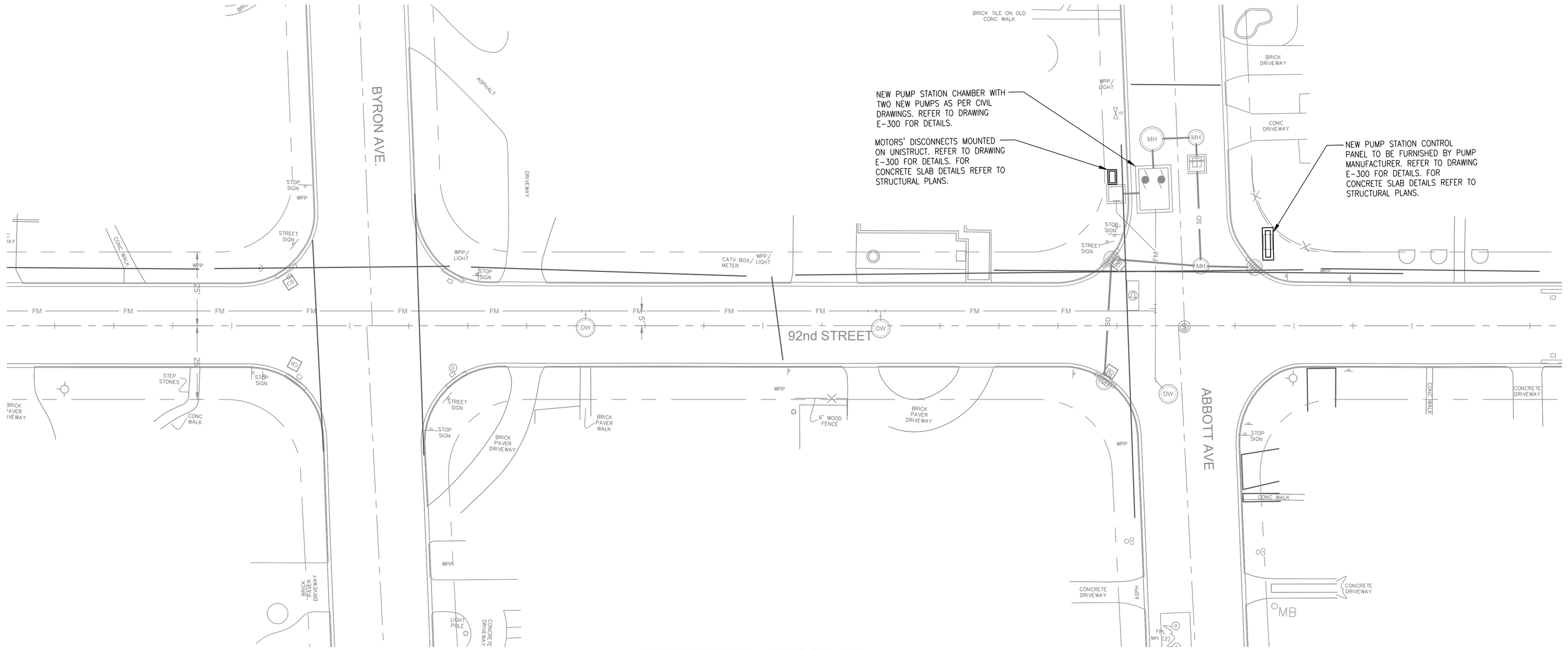
PROJECT
ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE
ELECTRICAL GENERAL NOTES-92ND STREET

SHEET NUMBER E-100
PROJECT NUMBER 11494.01

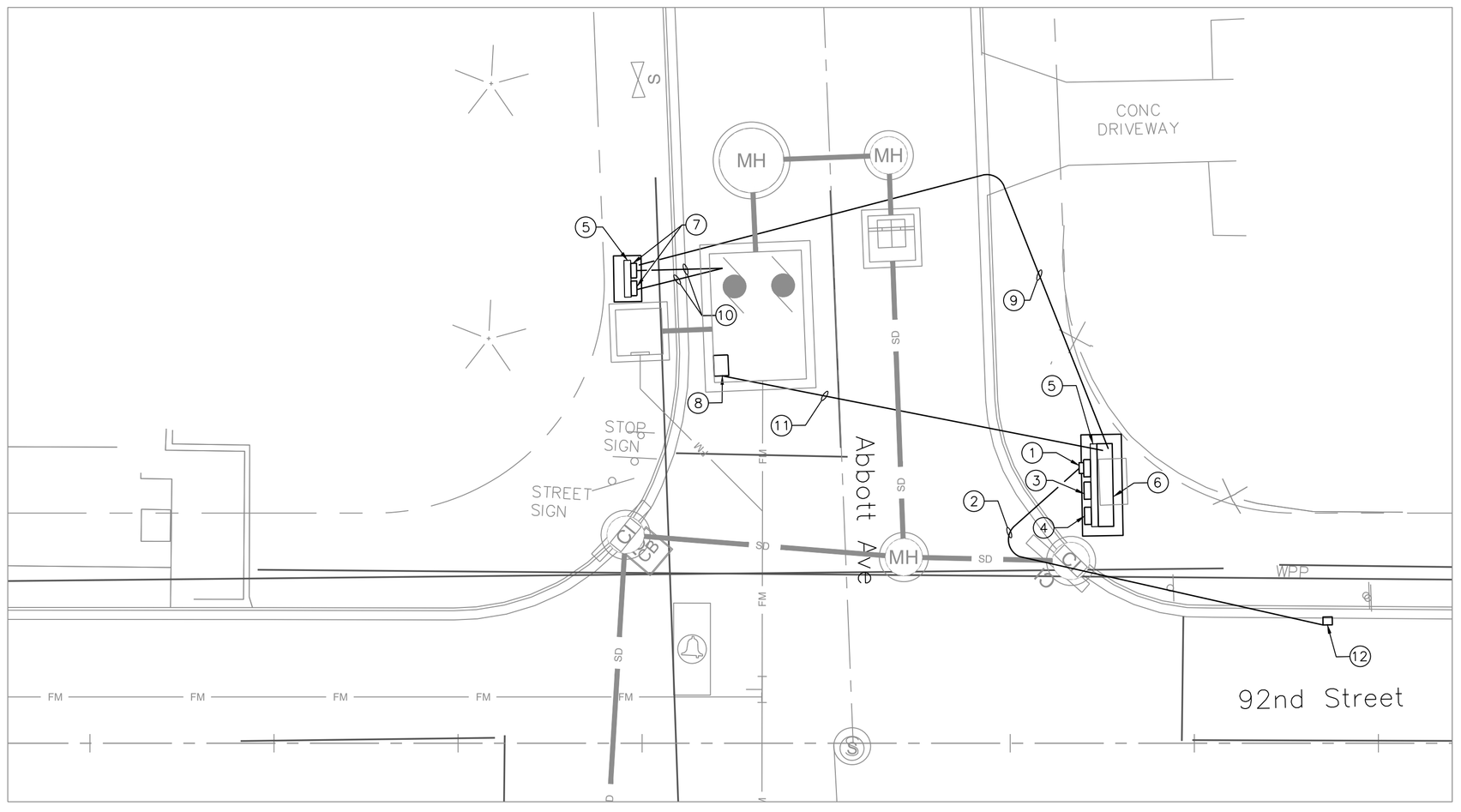
STATUS: PERMIT SET

Plotted by: me engineering cons On 2/1/2023 5:27 PM
Drawing name: D:\Projects\2022\220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 92nd-MEP.dwg



ELECTRICAL SITE PLAN

SCALE: 1"=20'-0"



ELECTRICAL PLAN

SCALE: 1"=10'-0"

CODED NOTES:

1. PROPOSED LOCATION OF 400 AMP METER. COORDINATE WITH F.P.L. SEE RISER ON DRAWING E-300.
2. NEW ELECTRICAL SERVICE. SEE DETAILS ON RISER ON DRAWING E-300. COORDINATE WITH FPL.
3. NEW 400 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 400 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
4. MANUAL TRANSFER SWITCH 400 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION TO A PORTABLE GENERATOR.
5. GALVANIZED UNISTRUCT. SEE DETAIL ON DRAWING E-300. FOR EXACT PAD LOCATION SEE CIVIL DRAWING.
6. CONTROL PANEL IN NEMA 4X ENCLOSURE INCLUDING MOUNTINH HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
7. 300 AND 100 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) NON FUSIBLE DISCONNECT SWITCH.
8. NEMA 6P WATERTIGHT JUNCTION BOX 6"X6"X6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2.
9. POWER WIRES IN RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. REFER TO RISER ON DRAWING E-300.
10. PUMP POWER CABLES IN RIGID STEEL CONDUITS FROM EACH PUMP DISCONNECT TO EACH PUMP. CABLES PROVIDED BY MANUFACTURER. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
11. TWO 2" AND TWO 1" RIGID STEEL CONDUITS. REFER TO RISER ON DRAWING E-300 FOR DETAILS.
12. PROPOSED FPL POINT OF SERVICE. PROVIDE PULL BOX AT BASE OF POLE AS PER FPL STANDARDS. COORDINATE WITH FPL REPRESENTATIVE FOR EXACT LOCATION AND REQUIREMENTS PRIOR ROUGH INSTALLATION.

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REVISIONS

NO.	DESCRIPTION	DATE

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DESIGNED BY:	ZM
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BID-CONTRACT:	

Zoila Morales, P.E.
P.E. NO. 64981

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

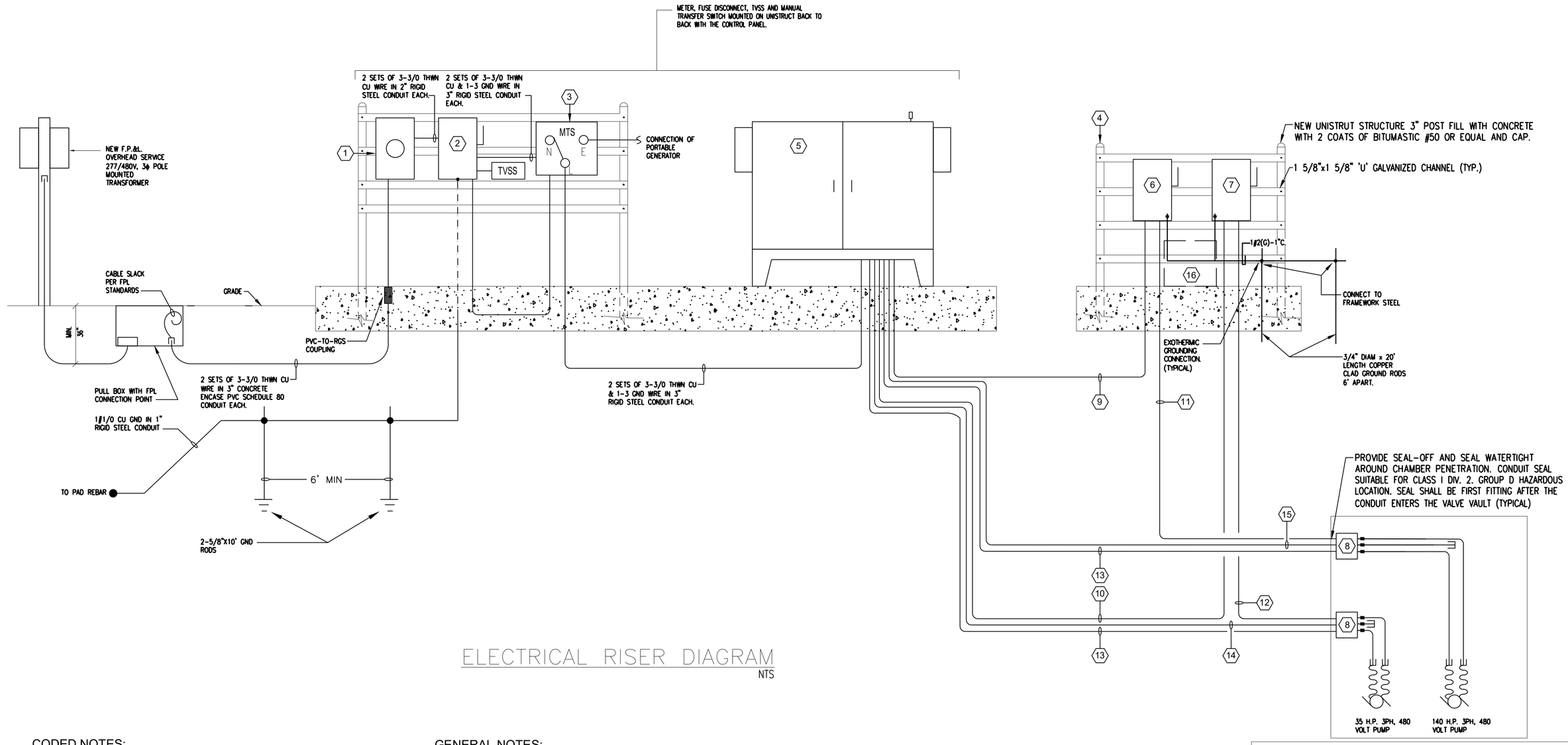
ELECTRICAL SITE AND DETAIL PLAN-92ND STREET

SHEET NUMBER	**E-200**
PROJECT NUMBER	11494.01

STATUS: PERMIT SET

Plotted by: me engineering cons On 2/1/2023 5:28 PM

Drawing name: D:\Projects\2022\22028\0-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 92nd-MEP.dwg



ELECTRICAL RISER DIAGRAM
NTS

CODED NOTES:

1. NEW 400 AMP METER. COORDINATE WITH F.P.L. AND FOLLOW THEIR STANDARDS.
2. NEW 400 AMP 480 V 3 PHASE, NEMA 4X (PAD LOCKABLE) 14K AIC SERVICE ENTRANCE RATED, FUSED DISCONNECT SWITCH. FUSE 400 A, 600 V BUSSMAN TYPE LPS-RK OR APPROVED EQUAL.
3. MANUAL TRANSFER SWITCH 400 AMP, 600 V IN NEMA 4X ENCLOSURE FOR CONNECTION OF A PORTABLE GENERATOR.
4. GALVANIZED UNISTRUCT. FOR EXACT PAD LOCATION SEE CIVIL DRAWING.
5. CONTROL PANEL IN NEMA 4X TYPE 316 STAINLESS STEEL ENCLOSURE (CONTINUOUS HINGE, PADLOCKABLE DOOR HANDLE). ENCLOSURE TO INCLUDE MOUNTING HARDWARE TO BE PROVIDED BY PUMP MANUFACTURER. REFER TO DETAILS ON DRAWING E-500.
6. 300 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) NON FUSIBLE DISCONNECT SWITCH.
7. 100 AMP 480 V, 3 PHASE NEMA 4X (PAD LOCKABLE) NON FUSIBLE DISCONNECT SWITCH.
8. NEMA 6P WATERTIGHT JUNCTION BOX 6"X6"X6" WITH CONDUIT NUT TO RUN SENSOR CABLES. RUN FLOAT SWITCH SIGNAL CABLES AS PER MANUFACTURER RECOMMENDATIONS FROM FLOAT SWITCHES AT MANHOLE TO RTU AT CONTROL PANEL. TYPICAL OF 2. REFER TO DETAIL ON DRAWING E-400.
9. POWER WIRES (3-4/0 & 1-#4 GND) IN 3" RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. SIZE AS SHOWN.
10. POWER WIRES (3-#3 & 1-#8 GND) IN 1.5" RIGID STEEL CONDUITS FROM CONTROL PANEL TO EACH PUMP DISCONNECT. SIZE AS SHOWN.
11. PUMP POWER CABLES (3-4/0 & 1-#4 GND) IN 2.5" RIGID STEEL CONDUITS FROM PUMP DISCONNECT TO PUMP. CABLES PROVIDED BY MANUFACTURER. PROVIDE MINIMUM 10 FT OF SLACK CABLE INSIDE STRUCTURE.
12. PUMP POWER CABLES (3-#6 & 1-#8 GND) IN 1.0" RIGID STEEL CONDUITS FROM PUMP DISCONNECT TO PUMP. CABLES PROVIDED BY MANUFACTURER. PROVIDE MINIMUM 10 FT OF SLACK CABLE INSIDE STRUCTURE.
13. MANUFACTURER PROVIDED PUMP MONITORING PILOT CABLE IN 2" RIGID STEEL CONDUIT. PROVIDE MINIMUM 10FT OF SLACK CABLE INSIDE STRUCTURE.
14. MANUFACTURER RECOMMENDED CABLE FOR FLOAT SWITCHES IN 1" RIGID STEEL CONDUIT.
15. MANUFACTURER RECOMMENDED TUBING FOR BUBBLER TUBE IN 1" RIGID STEEL CONDUIT. INSTALL TUBING AND CONDUIT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
16. MOTOR CONNECTION BOX. REFER TO DETAIL ON DRAWING E-600.

GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE ENOUGH SLACK CABLE FOR CONNECTION INSIDE PROPOSED PULLBOX AT BASE OF FPL SERVICE POLE. CONTRACTOR TO COORDINATE WITH FPL AND FOLLOW THEIR STANDARDS.
- CONTRACTOR TO PROVIDE CONTROL PANEL SHOP DRAWINGS SHOWING WIRING DIAGRAMS WITH ALL POWER AND CONTROL INTERCONNECTIONS.
- CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR DISCONNECT SWITCHES, TVSS, GROUND ROD, CONDUCTOR, CONDUITS, ETC.
- CONTRACTOR TO KEEP LENGHT OF TRANSIENT VOLTAGE SURGE SUPPRESSOR LEADS TO A MINIMUM.

1- 140 H.P. PUMP	177 AMPS.
1- 35 H.P. PUMP	42 AMPS.
ENCLOSURES' AIR CONDITIONERS	14 AMPS
MISCELLANEOUS BASE LOAD	30 AMPS.
25% OF LARGEST MOTOR	44.25 AMPS.
TOTAL	307.25 AMPS.

PROVIDE SERVICE SIZE: 400 AMP. 277/480 VOLT, 3ϕ, 4W

LOAD CALCULATION

CONTRACTOR TO PROVIDE ARC FLASH LABEL AS PER ANSI REQUIREMENTS. REFER TO EXAMPLE BELOW.

FAULT CURRENT CALCULATION
MAIN DISCONNECT

10,746 SYMM. S.C.A. AVAILABLE AT F.P.&L. Co. TRANSFORMER SECONDARY AS PER FPL LETTER ON THIS DRAWING

60 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L\text{-}L}} = \frac{(1.73)(60)(10{,}746)}{(2)(13{,}923)(480)} = 0.083$$

$$M = \frac{1}{1+f} = \frac{1}{1+0.083} = 0.923$$

Isca = AVAILABLE FROM UTILITY x M = (10,746)(0.923) = 9,918.5 Amps

PROVIDE 14k S.C.A. RATED FUSE AT THE MAIN

FAULT CURRENT CALCULATION
AT CONTROL PANEL

9,918.5 SYMM. S.C.A. AT MAIN

10 FEET #3/0 Cu. CONDUCTORS IN PVC CONDUIT

$$f = \frac{1.73 \times L \times I}{C \times E_{L\text{-}L}} = \frac{(1.73)(10)(9{,}918)}{(2)(13{,}923)(480)} = 0.0128$$

$$M = \frac{1}{1+f} = \frac{1}{1+0.0128} = 0.987$$

Isca = Isca AT MAIN x M = (9,918)(0.987) = 9,789 Amps

PROVIDE 14k S.C.A. RATED BREAKERS AT CONTROL PANEL

FPL

January 31, 2023

Zoila Morales, P.E.
11401 SW 40th ST, Suite 301
Miami, FL 33165

Re: Available Fault Current for Abbott Ave Stormwater Improvements - 92nd and Abbott

Dear Zoila Morales, P.E.:

Thank you for contacting FPL about the available fault current at Abbott Ave Stormwater Improvements - 92nd and Abbott. Based on the plans you have provided dated July 22 2022, the maximum available fault current at the transformer secondary terminals is estimated to be 10746 symmetrical amperes at 277/480 volts. The protective device on the line side of the transformer currently in place or to be installed and serving your property located at the subject location is a 10 amp type KS fuse. The primary service voltage is 13.2kV L-L. This calculated symmetrical fault current is not intended for use as the basis for motor starting calculations and does not include:

- Consideration for any motor contribution or
- Fault current asymmetry.

The FPL equipment currently serving or planned to serve your facility may change over time as a result of any number of factors, including but not limited to transformer replacements due to load growth, electrical grid changes or emergencies. As a result, although we are providing you with this information for the sole purpose of assisting you in the completion of your study, you and your client should not design, install or operate your system in reliance upon any expectation that the specific size and type of equipment currently in place will remain so. If and when the size and type of the equipment changes, our employees are not always in a position to immediately notify customers.

As the construction project progresses, any questions or information you may need can be communicated through me. I have enclosed my business card for easy reference and look forward to hearing from you in the near future.

Sincerely,

Isabella Arcos

Isabella Arcos
Distribution Engineer
Central Dade Service Center, Florida Power & Light
Phone: [Cell] 786-719-0535 [Office] 305-377-6087
Email: Isabella.Arcos@fpl.com or ima0ati@fpl.com
Office:122 SW 3rd ST, Miami, FL, 33130

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CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

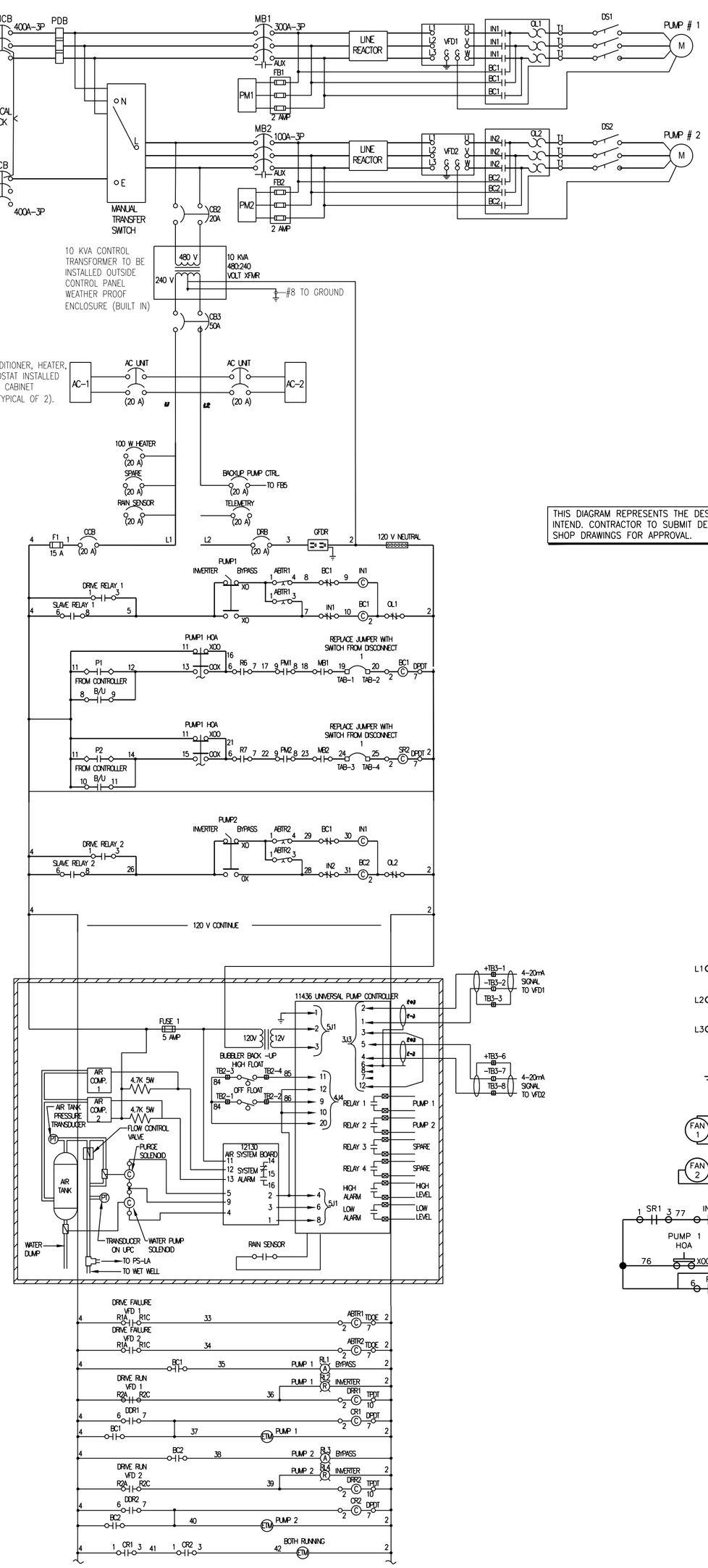
SHEET TITLE

ELECTRICAL RISER DIAGRAM, NOTES AND LOAD CALCULATION- 92ND STREET

SHEET NUMBER	**E-300**
PROJECT NUMBER	11494.01

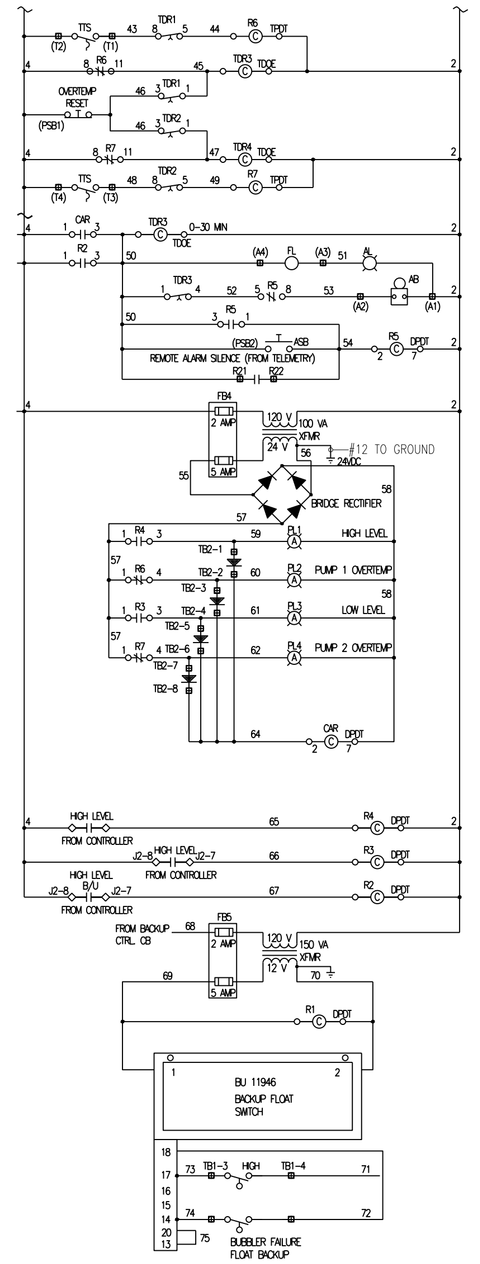
STATUS: PERMIT SET

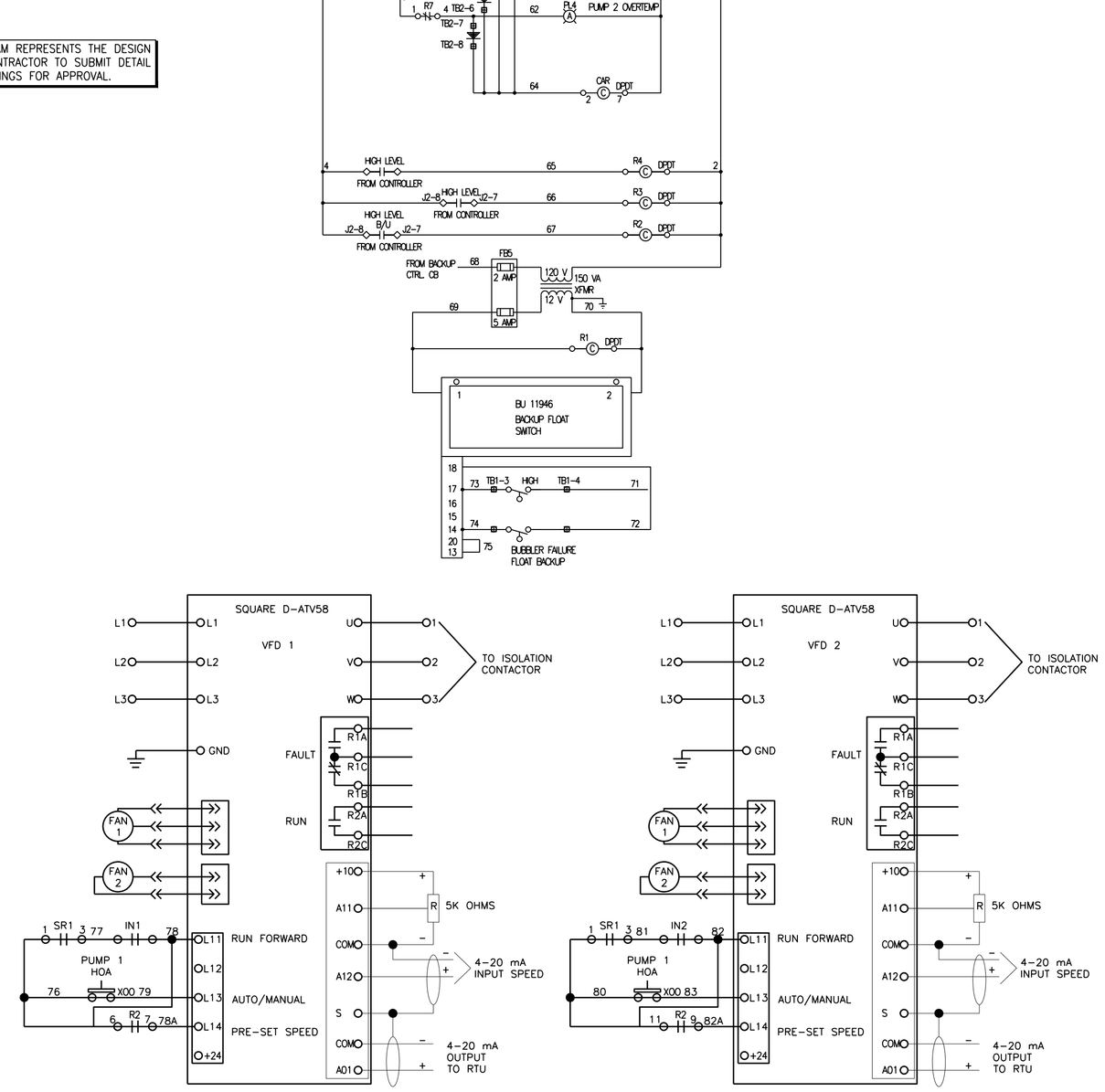
Drawing name: D:\Projects\2022\220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 92nd-MEP.dwg



CONTROL WIRING DIAGRAM

THIS DIAGRAM REPRESENTS THE DESIGN INTEND. CONTRACTOR TO SUBMIT DETAIL SHOP DRAWINGS FOR APPROVAL.

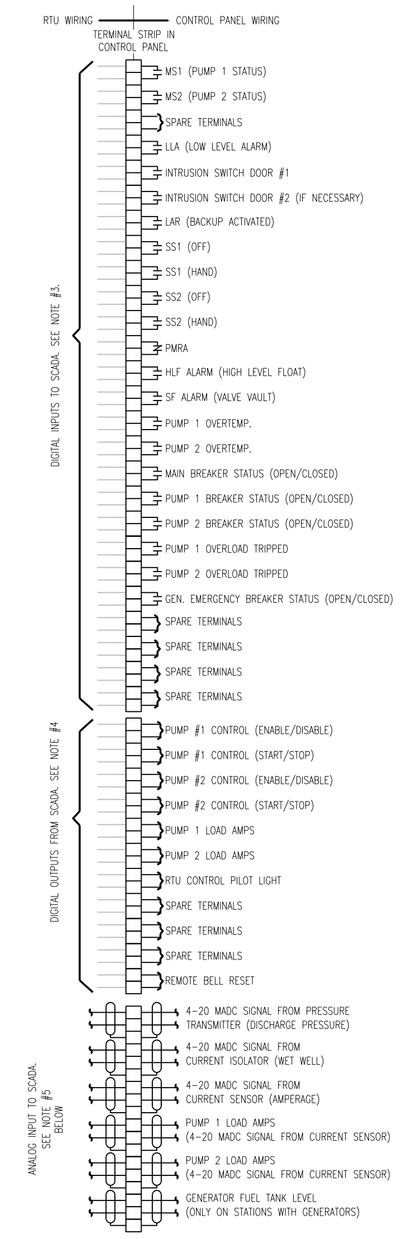




COMPONENT LEGEND

AB – ALARM BELL
ABTR – AUTO BYPASS TIMER
AC – AIR COMPRESSOR
AH – ALARM HORN
AL – ALARM LIGHT
ALT – ALTERNATOR
ASB – ALARM SILENCE BUTTON
AV – AIR VENT
CAR – COMMON ALARM RELAY
CB – CIRCUIT BREAKER
CCB – CONTROL CIRCUIT BREAKER
DPDT – DOUBLE POLE DOUBLE THROW
DRB – DUPLEX RECEPTACLE BREAKER
DRR – DRIVE RUN RELAY
ECB – EMERGENCY CIRCUIT BREAKER
ETM – ELAPSED TIME METER
F – FUSE
FB – FUSE BLOCK
FL – FLASHER
FPDT – FOUR POLE DOUBLE THROW
FR – FLOW REGULATOR
FS – FLOW SWITCH
GFDR – GROUND FAULT DUPLEX RECEPTACLE
GND – EARTH GROUND
GR – GENERATOR RECEPTACLE
HOA – HAND-OFF-AUTO SELECTOR SWITCH
LA – LIGHTNING ARRESTER
MB – MOTOR BREAKER
MCB – MAIN CIRCUIT BREAKER
MCP – MOTOR CIRCUIT PROTECTOR
MS – MOTOR STARTER
NC – NORMALLY CLOSED
NO – NORMALLY OPEN
OL – OVERLOAD
PDB POWER DISTRIBUTION BLOCK
PL – PILOT LIGHT
PM – PHASE MONITOR
PMR – PHASE MONITOR RELAY
PSB – PUSH BUTTON
R – RELAY
RL – RUNNING LIGHT
RTU – REMOTE TELEMETRY UNIT
SC – SURGE CAPACITOR
SR – SLAVE RELAY
T – TERMINAL
TB – TERMINAL BLOCK
TD – TIME DELAY
TDOE – TIME DELAY ON ENERGIZE
TDR – TIME DELAY RELAY
TPDT – TRIPLE POLE, DOUBLE THROW
TTS – THERMAL TERMINAL STRIP
VFD – VARIABLE FREQUENCY DRIVE
XFMR – TRANSFORMER

⊠ LOCATED ON CONTROL PANEL
◇ LOCATED ON CONTROLLER
CONTROL WIRE TO BE #14 AWG



RTU TERMINAL BLOCK

SCADA WIRING INSTALLATION NOTES

1–. WIRING TO SCADA RTU PANEL TO BE FURNISHED AND INSTALLED BY CONTRACTOR. PUMP STATION CONTROL PANEL TERMINATIONS TO BE PERFORMED BY CONTRACTOR, AND RTU PANEL TERMINATIONS TO BE PERFORMED BY MD-WASD (SCADA).

2–. PROVIDE IN THE PANEL AT LEAST 20 SPARE TERMINALS, 1 POLE EACH.

3–. 4–20 MILLIAMPERES DIRECT CURRENT SIGNAL CABLE SHALL BE BELDEN 9341 TWISTED PAIR OR EQUAL INSTALLED IN A SEPARATE CONDUIT.

4–. LABEL INTERCONNECTING WIRES ACCORDING TO DRAWING.

5–. CONNECT FIELD DEVICES PRESSURE TRANSMITTER AND FLOW METER (IF AVAILABLE) TO THE RTU PANEL. USE BELDEN CABLE 9341 IN 1–INCH CONDUIT AS REQUIRED.

6–. ALL DIGITAL SIGNALS TO SCADA MUST BE PROVIDED THROUGH DRY CONTACTS.

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P.E. NO. 64981

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

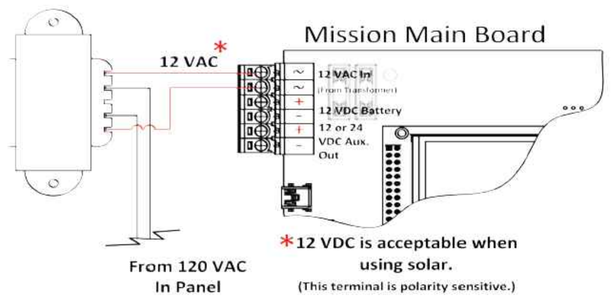
CONTROL DETAILS-92ND STREET

SHEET NUMBER	**E-400**
PROJECT NUMBER	11494.01

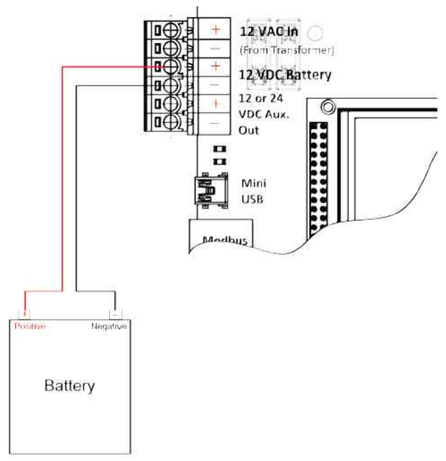
STATUS: PERMIT SET

Plotted by: me engineering cons On 2/1/2023 5:28 PM

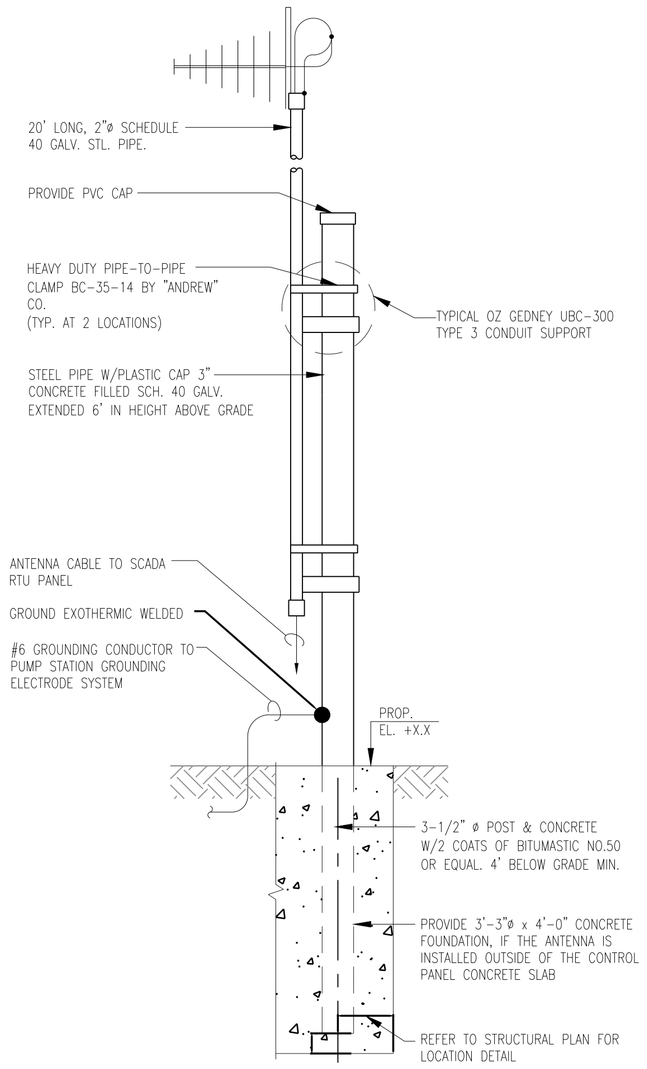
Drawing name: D:\Projects\2022\220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 92nd-MEP.dwg



RTU TRANSFORMER WIRING
NOT TO SCALE



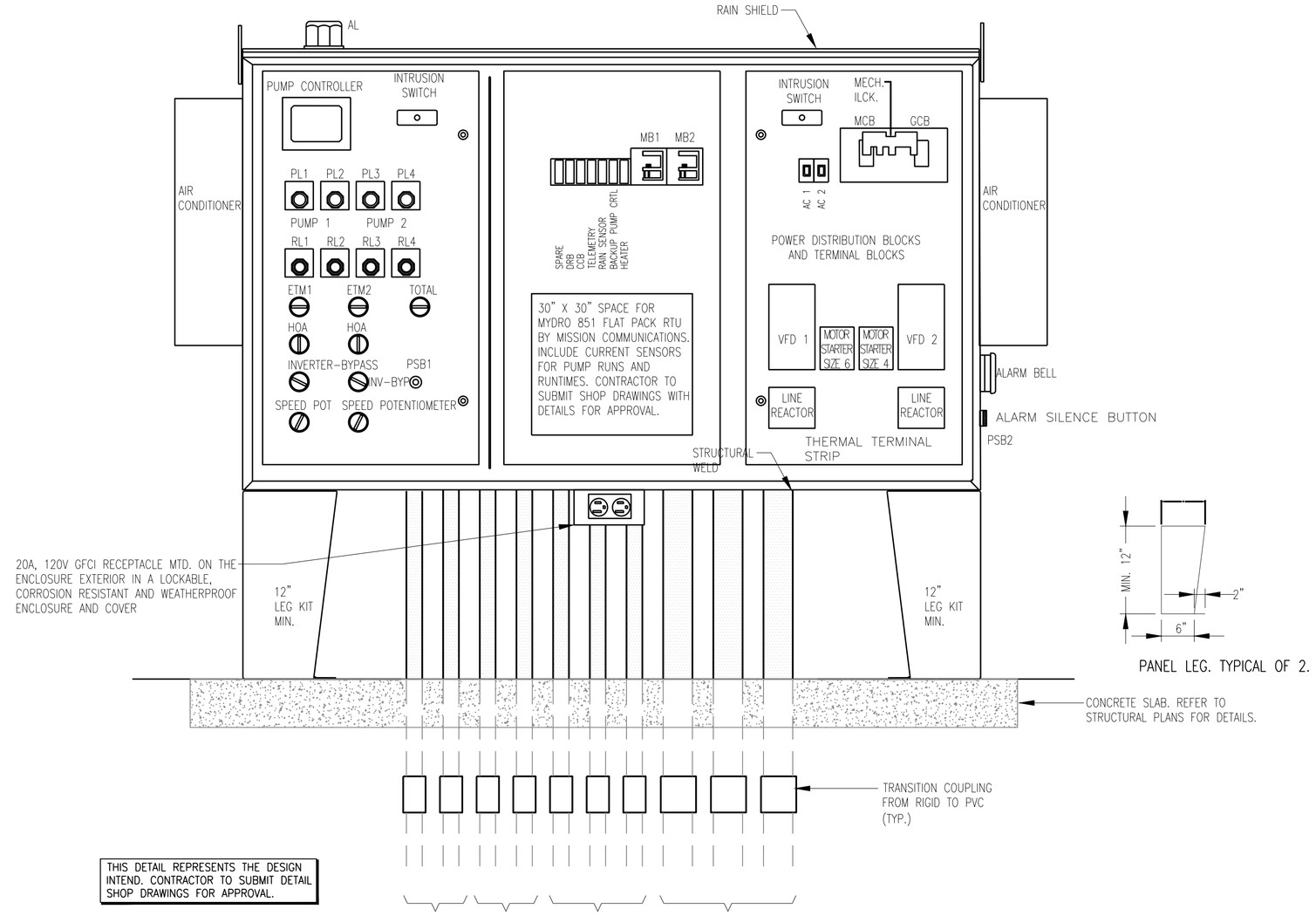
RTU BATTERY WIRING
NOT TO SCALE



ANTENNA MOUNTING DETAIL
N.T.S.

NOTE:
1- RUN ANTENNA WIRE FROM SCADA RTU PANEL TO ANTENNA THROUGH 2" POST.

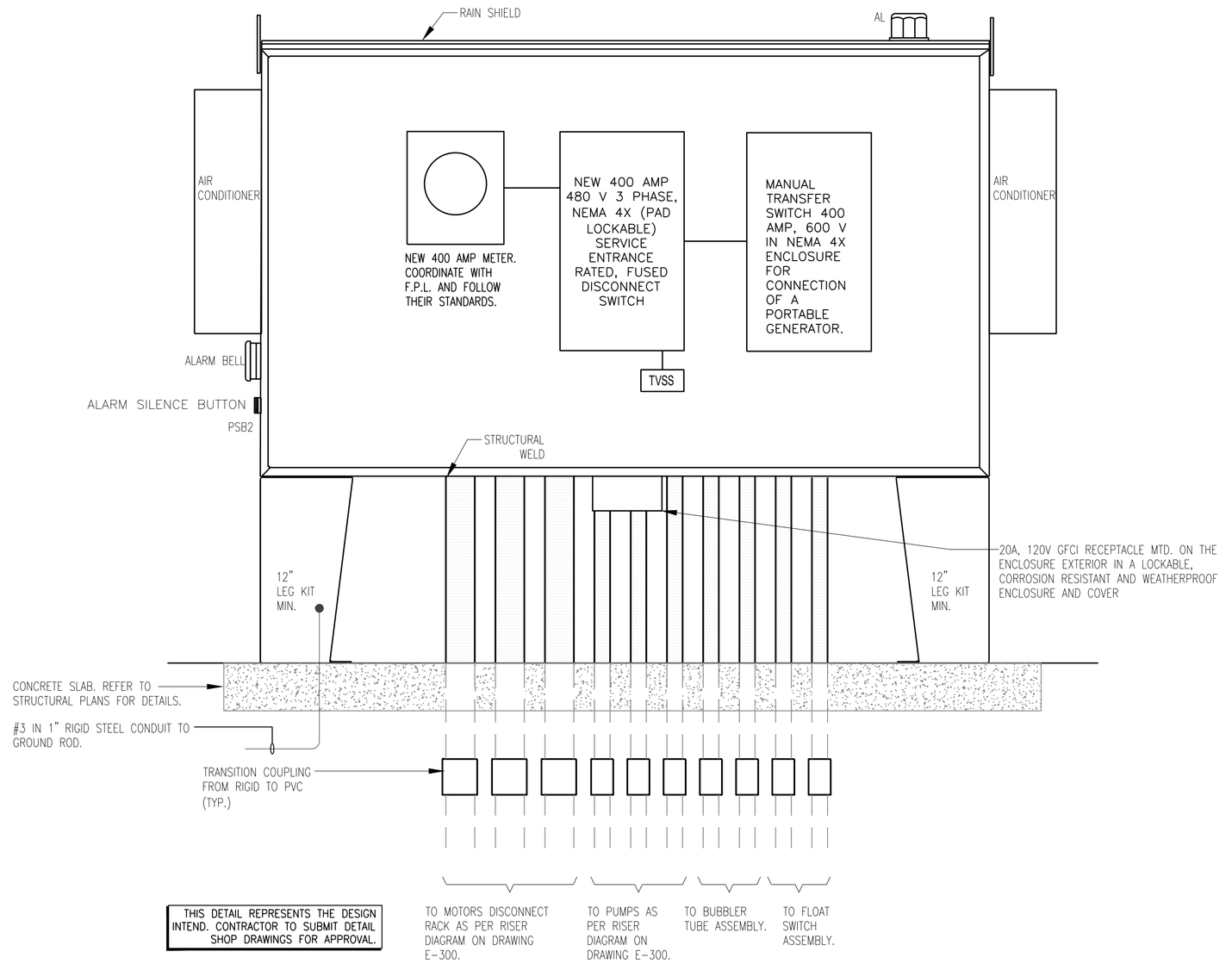
2- TELEMETRY ANTENNA FOUNDATION PER MISSION STANDARD AND COMPLIES WITH FBC CHAPTER 16.



THIS DETAIL REPRESENTS THE DESIGN INTEND. CONTRACTOR TO SUBMIT DETAIL SHOP DRAWINGS FOR APPROVAL.

NOTES:
1. OUTER DOORS REMOVED TO SHOW DEADFRONT
2. PROVIDE INNER AND OUTER DOOR STOP KITS
3. CONTROL CABINET DEPTH SHALL NOT EXCEED 12 IN.
4. SUPPORTS SHALL MEET LATEST WIND LOAD REQUIREMENTS OF THE LATEST FLORIDA BUILDING CODE
5. TOP OF CONTROL PANEL, RTU, AND ELECTRICAL SERVICE EQUIPMENT SHALL BE AT THE SAME ELEVATION

CONTROL PANEL DETAIL
NOT TO SCALE



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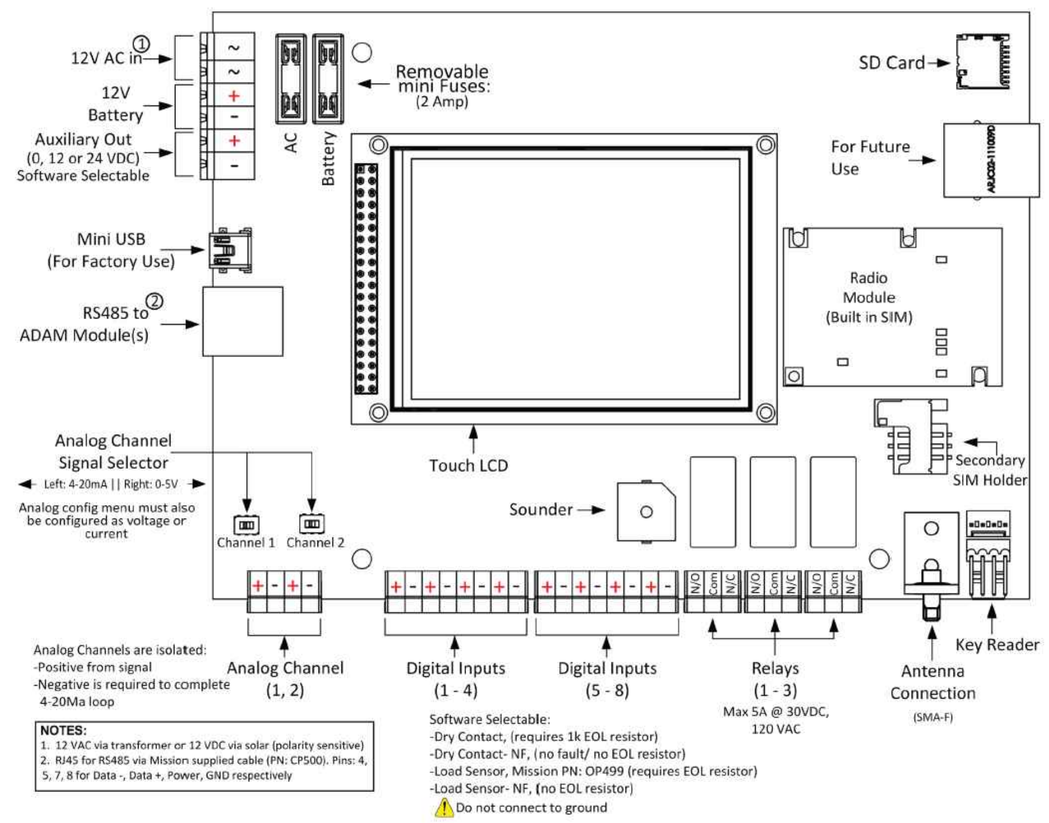

RTU MAIN BOARD CONNECTIONS
NOT TO SCALE

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PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

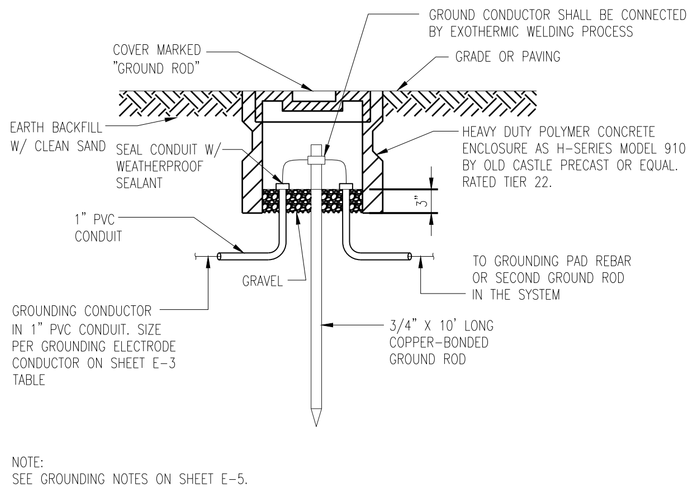
CONTROL PANEL DETAILS - 92ND STREET

SHEET NUMBER	E-500
PROJECT NUMBER	11494.01

STATUS: PERMIT SET

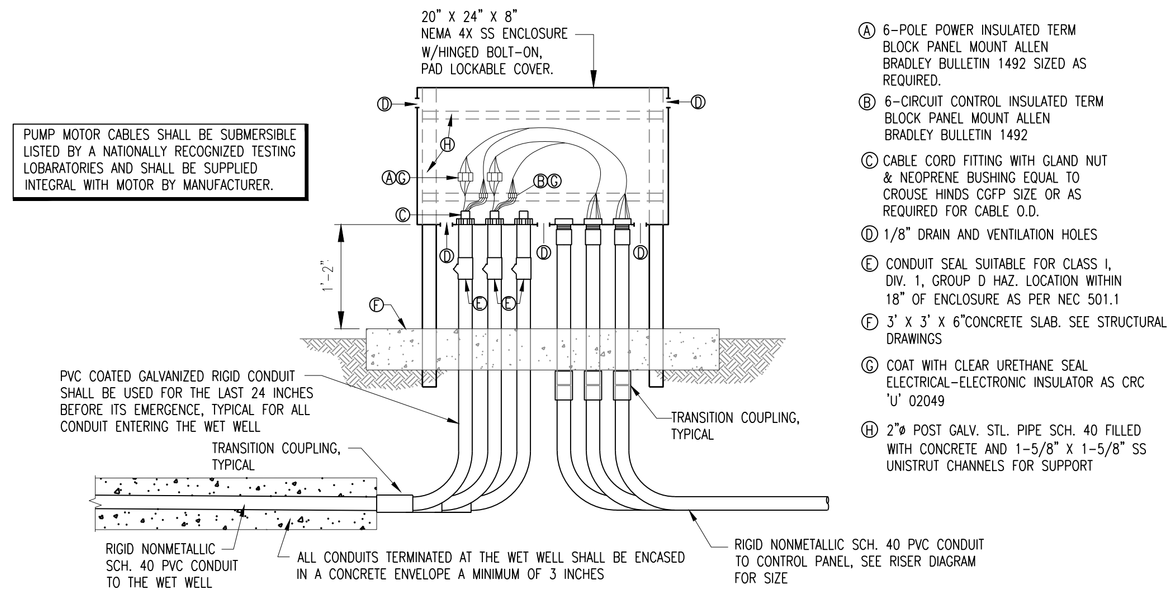
Plotted by: me engineering cons On 2/1/2023 5:28 PM

Drawing name: D:\Projects\2022\2220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 92nd-MEP.dwg



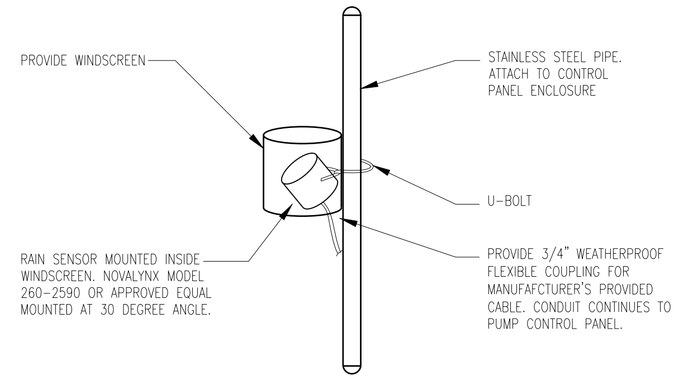
NOTE:
SEE GROUNDING NOTES ON SHEET E-5.

TYPICAL GROUND ROD INSTALLATION DETAIL
N.T.S.

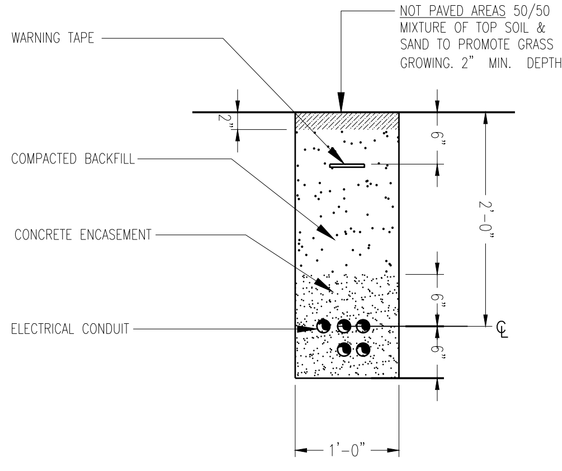


(A) 6-POLE POWER INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492 SIZED AS REQUIRED.
(B) 6-CIRCUIT CONTROL INSULATED TERM BLOCK PANEL MOUNT ALLEN BRADLEY BULLETIN 1492
(C) CABLE CORD FITTING WITH GLAND NUT & NEOPRENE BUSHING EQUAL TO CROUSE HINDS CGFP SIZE OR AS REQUIRED FOR CABLE O.D.
(D) 1/8" DRAIN AND VENTILATION HOLES
(E) CONDUIT SEAL SUITABLE FOR CLASS I, DIV. 1, GROUP D HAZ. LOCATION WITHIN 18" OF ENCLOSURE AS PER NEC 501.1
(F) 3' X 3' X 6"CONCRETE SLAB. SEE STRUCTURAL DRAWINGS
(G) COAT WITH CLEAR URETHANE SEAL ELECTRICAL-ELECTRONIC INSULATOR AS CRC 'U' 02049
(H) 2"ø POST GALV. STL. PIPE SCH. 40 FILLED WITH CONCRETE AND 1-5/8" X 1-5/8" SS UNISTRUT CHANNELS FOR SUPPORT

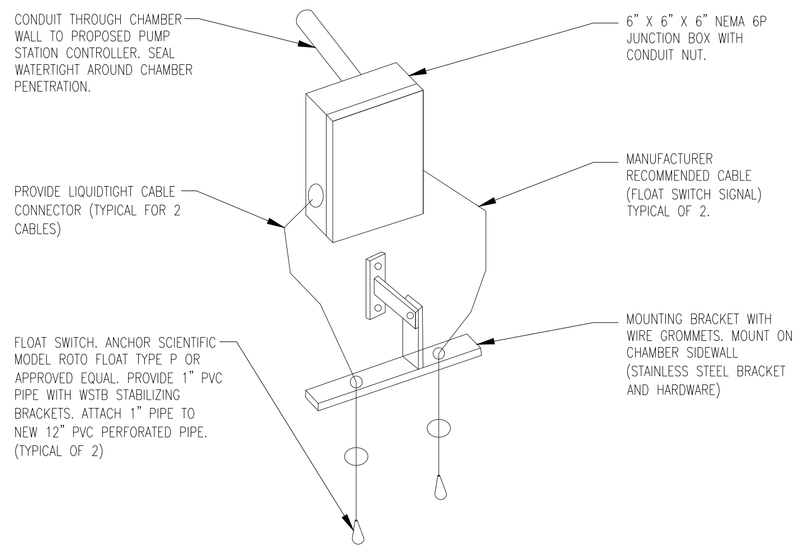
TYPICAL MOTOR CONNECTION BOX DETAIL
N.T.S.



RAIN SENSOR
N.T.S.



TRENCH DETAIL
N.T.S.



FLOAT SWITCH INSTALLATION DETAIL
N.T.S.

NOVALYNX — *Precipitation*

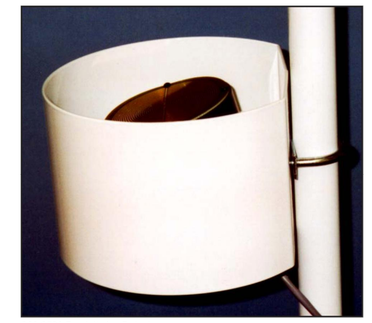
260-2590 Precipitation Detector — *260-2591 Leaf Wetness Sensor*

The **Model 260-2590 Precipitation Detector** is used to detect the onset of rainfall. A gold plated grid sensor activates the circuit when water is deposited onto the grid. The presence of water activates an internal relay that may be used to operate larger capacity external relays, alarms, doors, or may be used as an input to a data acquisition system.

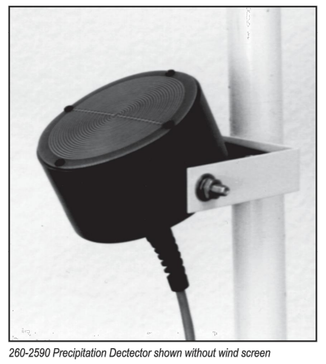
An internal heater constantly dries the grid to prevent relay activation during times of dew, fog, or light moisture that is not actual precipitation. During periods of normal precipitation the heater is unable to dry the grid and the relay is activated. The heater power may be disconnected allowing the detector to be operated as a leaf wetness sensor.

The solid state electronics are mounted in a sealed weatherproof enclosure. The precipitation detector may be tilted to allow water to drain off. A mounting bracket is provided with the sensor to allow mounting onto a 1" pipe by a U-bolt. The wind screen may be used to prevent premature drying of the grid during precipitation events accompanied by high winds.

The unit requires +12 Vdc power for operation. A 100-240 Vac power adapter is provided with each unit.



260-2590 Precipitation Detector



260-2590 Precipitation Dectector shown without wind screen

Specifications

Sensor: Gold plated grid 4" dia
Output: Relay (0.5 amps)
Heater: Resistive element
Power: 12 Vdc (235 mA max.) 100-240 Vac 50-60 Hz adapter supplied
Size: Overall 4" dia x 2" high
Weight/shipping: 4 lbs/5 lbs (1.8 Kg/2.3 Kg)

Ordering Information

260-2590	Precipitation Detector, 100-240 Vac, 25' cable
260-2591	Leaf Wetness Sensor, 100-240 Vac, 25' cable
260-2592	Leaf Wetness Sensor with heater control, 100-240 Vac, 25' cable
330-0524	Additional Cable, per foot

KEITH
301 East Atlantic Blvd.
Pompano Beach, FL 33060
PH: (954) 788-3400
Florida Engineering Business License: CA7928
Florida Surveyor and Mapper Business License: LB6860
Florida Landscape Architecture Business License: LC26000457

M.E. Engineering Consultants, Inc.
11401 SW 40TH Street Suite 301
Ph:(786)275-4635
CA 29121

REVISIONS

NO.	DESCRIPTION	DATE

PRELIMINARY PLAN NOT FOR CONSTRUCTION

THESE PLANS ARE NOT FULLY PERMITTED AND ARE SUBJECT TO REVISIONS MADE DURING THE PERMITTING PROCESS.

RESPONSIBILITY FOR THE USE OF THESE PLANS PRIOR TO OBTAINING PERMITS FROM ALL AGENCIES HAVING JURISDICTION OVER THE PROJECT WILL FALL SOLELY UPON THE USER.

ISSUE DATE:	01/02/23
DESIGNED BY:	ZM
DRAWN BY:	MT
CHECKED BY:	ZM
BID-CONTRACT:	

Zoila Morales, P.E.
P.E. NO. 64981

CLIENT

TOWN OF SURFSIDE FLORIDA MIAMI-DADE COUNTY

PROJECT

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

SHEET TITLE

ELECTRICAL DETAILS -92ND STREET

SHEET NUMBER	**E-600**
PROJECT NUMBER	11494.01

STATUS: PERMIT SET

Drawing name: D:\Projects\2022\220280-Abbott Avenue Stormwater Improvements\MEP\11494.01 CP-1XX - 92nd-MEP.dwg

Plotted by: me engineering cons On 2/1/2023 5:28 PM

QUOTATION FORM
FOR

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

Item No.	Estimated Quantity	Description	Total
1.	2 Each	For furnishing and installing pump station(s) No. 1 and No. 2 (including all valves, piping, inverted baffle, sluice gate, floats, valve vault(s) (including all piping, access hatch, and 24-inch check valve and check valve vault) Pressure transducers, access hatch, control panel and all electrical equipment / wiring / conduits / FPL Power drop / Control Panels and disconnects needed for the pump station) _____Dollars and _____Cents (_____$/each)	$ _____
2.	2 Each	For furnishing and installing downstream defender(s) (Including Manhole and Downstream Defender) _____Dollars and _____Cents (_____$/each)	$ _____
3.	1 Each	For furnishing and installing control structure(s) (including all Tide Flex Valves, Flap gates) _____Dollars and _____Cents (_____$/each)	$ _____
4.	2 Each	For furnishing and installing trash rack structure(s) (including all grates, Access Hatch) _____Dollars and _____Cents (_____$/each)	$ _____
5.	6 Each	For furnishing and installing drainage injection well(s) (including manhole structure, air release valves) _____Dollars and _____Cents (_____$/each)	$ _____

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QUOTATION FORM
FOR

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

Item No.	Estimated Quantity	Description	Total
6.	13 Each	For furnishing and installing Manhole(s)/Catch Basin(s) (including inlet tops) _____$Dollars and _____Cents (_____$/each)	$ _____
7.	1,622	For furnishing and installing 12-inch PVC (C-900) stormwater forcemain piping (Including all fittings, valves, air release valves, couplings, wire tracers, and pressure testing) _____Dollars and _____Cents (_____$/LF)	$ _____
8.	207	For furnishing and installing 18-inch PVC (C-900) stormwater forcemain piping (Including all fittings, valves, air release valves, couplings, wire tracers, and pressure testing) _____Dollars and _____Cents (_____$/LF)	$ _____
9.	714 LF	For furnishing and installing 24-inch PVC (C-900) stormwater forcemain piping (Including all fittings, valves, air release valves, couplings, wire tracers, and pressure testing) _____Dollars and _____Cents (_____$/LF)	$ _____
10.	531 LF	For furnishing and installing 24-inch HDPE Gravity stormwater piping _____Dollars and _____Cents (_____$/LF)	$ _____

11.	8200 SY	For asphalt, milling and resurfacing (Including all areas from 1 ½" restoration to 1" milling & resurfacing) _____Dollars and _____Cents (_____$/SY)	$	_____
12.	1 Lump Sum	For pavement marking and signing: This pay item shall include all the necessary pavement markings needed to be restored after pavement overlay. _____Dollars and _____Cents (LS) (_____$/LS)	$	_____
13.	**Subtotal**	**Bid Item 1 through 12, the sum of**	$	_____
14.	1 Each	Mobilization _____Dollars and _____Cents	$	_____
15.	1 Each	Maintenance of Traffic _____Dollars and _____Cents	$	_____
16.	1 Each	Erosion Control/BMPs/SWPPP Measures _____Dollars and _____Cents	$	_____
17.	1 Each	Construction Surveying / Stake-out / As-Built _____Dollars and _____Cents	$	_____

18. 1 Each — Construction Material Testing

_____ Dollars and

_____ Cents $ _____

19. Dedicate Allowance — For providing a certified industrial hygienist or State of Florida licensed engineer in environmental discipline to develop health and safety plan; the aggregate sum of.

Twenty-Five Thousand Dollars and

zero Cents $ 25,000.00

20. Dedicate Allowance — For all costs of required permit fees, inspections, impact fees, if authorized by the Engineer, the sum of 5% of the Subtotal Item 13, (0.05) X (Subtotal, Item 13).

_____ Dollars and

_____ Cents $ _____

21. Contingency Allowance — For unforeseen improvements, for minor construction changes and quantities adjustments at other intersections along 91st & 92nd Street, if ordered by the Town, the aggregate sum of

Two Hundred Thousand Dollars and

Zero Cents $ 200,000.00

22. Contingency Allowance — For unforeseen conditions, for minor construction changes and for quantity adjustments, if ordered by the Engineer, the sum of 10% of the Subtotal, Item 13, (.10) X (Subtotal, Item 13)

_____ Dollars and

_____ Cents $ _____

23. **TOTAL BASE BID** — Bid items 13 through 22, the sum of **$** _____

DAte

QUOTATION FORM
FOR

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

ALTERNATE BID ITEM A - Contractor to indicate if Additive or (Deductive)
Horizontal Directional Drill (HDD) for 12" Force Main Along 92nd Av. From Approximate Station 41+00 to 56+00.

_____Dollars and

_____Cents $ _____

ALTERNATE BID ITEM B - (Deductive)
Eliminate Pump Station No. 2, located at 92nd Av. (including all items in Bid Item #1 for Pump Station #2).

_____Dollars and

_____Cents $ _____

Time Allowance Account: For unforeseen conditions, for minor construction changes and for Quantity adjustments, if ordered by the Engineer the total of Forty (40) Calendar Days.

NOTE: For a detailed description of each Quotation Item, refer to Section 01 29 00 "Measurement and Payment" of the Specifications

QUOTATION FORM
FOR

ABBOTT AVENUE DRAINAGE IMPROVEMENTS

FLORIDA TRENCH SAFETY ACT

Bidder acknowledges that included in the various items of the Quotation and in the Total Bid Price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) effective October 1, 1990. The bidder further identifies the costs to be summarized below:

	Trench Safety Measure (Description)	Units of Measure (LF, SY)	Unit (Quantity)	Unit Cost	Extended Cost
A.	_____	_____	_____	_____	_____
B.	_____	_____	_____	_____	_____
C.	_____	_____	_____	_____	_____
D.	_____	_____	_____	_____	_____

TOTAL $ _____

DAte