FINAL DRAINAGE REPORT

SURFSIDE ABBOTT AVENUE (90TH STREET TO 96TH STREET) DRAINAGE STUDY

Town of Surfside, Miami-Dade County
December, 2018

Prepared by:

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Certificate of Authorization #514

CGA Project #18-1160

Mohammed Sharifuzzaman, P.E. Project Manager
Florida Registration # 67640

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12/3/2018

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EXECUTIVE SUMMARY

I. INTRODUCTION

Calvin, Giordano, and Associates, Inc. (CGA) has performed a drainage study to evaluate and assess the existing drainage conditions along Abbott Avenue from 90th Street to 96th Street and to offer recommendations for improvements to resolve issues with reported ponding and setting water. This report describes related information discovered during site reconnaissance and project research and provides options, based on computer modeling, which alleviate the flooding.

II. AREAS OF CONCERN

Flooding with an unspecified elevation and duration has been occurring in the subject site and the adjacent neighborhoods. Recent flood complaints and site observations suggest that the subject corridor experiences approximately 1 foot or higher flood waters during frequent short-duration, high-intensity (±1 inch/hour) rainfall events.

III. CAUSES OF FLOODING

The Town of Surfside is very low-lying area and the existing roadway elevations range from 2.80 feet NGVD to 5.50 feet NGVD on average. The average wet season ground water elevation is 1.60 feet NGVD. There are not sufficient number of storm inlets or catch basins to capture stormwater runoff. The stormwater conveyance system is insufficient and can't carry the stormwater runoff efficiently through the existing pipe network and outfalls. The existing pipe sizes range from 10" diameter to 36" diameter. All the pipe networks are restricted by physical weirs (Elevation 2 feet NGVD) at the outfall locations, which have been mandated by permit for the purpose of maintaining the water quality regulatory requirement. The Town recently constructed three pump stations and nine drainage wells to improve the water quality of the receiving waters and to improve the existing drainage conditions. However, complete stormwater attenuation and level of service protection were not intended by the previous project.

Abbott Avenue is located along the east side of the Town, at the hydraulically most remote point of the drainage basin from the outfall discharge location. It is approximately 2,000 feet away from existing pump stations and outfalls. The elevations of Abbott Avenue are also very low with respect to the adjacent streets and roadways. As such, the following were identified as potential causes of flooding:

1. Abbott Avenue is, hydraulically, the most remote location from outfalls
2. Flat roadway profile and low grades
3. Naturally high ground water elevation
4. Insufficient size of existing conveyance pipe
5. Inadequate number of existing catch basins or storm inlets
6. Presence of permit-mandated water quality weirs within the control structures
7. Capacity of the master drainage system, pump stations, and drainage wells

IV. LEVEL OF SERVICE FOR ROADWAY

The ICPR flood routing model, spread calculations, and storm drain system analysis (ASAD model) indicated that the areas of concern (Abbott Avenue between 90th Street and 93rd Street) do not meet the level of service requirements normally expected by the regulatory agencies. The following are the

expected level of service: (1) Flood elevation or storm stage resulting from 5-year design storm events shall not encroach up to the roadway crown elevation. (2) Roadway spread resulting from 4 inch/hour intensity storm shall not encroach more than half of the travel lane width. (3) Hydraulic grade line resulting from 3-year 1-hour design storm shall not exceed the storm inlet grate elevation.

V. SUMMARY

The study reveals that, regardless of the proposed improvements, complete level of service compliance is not feasible, and the identified deficiencies can't be completely eliminated. However, the study also reveals that noticeable improvements in level of service may be achieved by implementing any one or a combination of the following improvements:

1. increasing conveyance pipe sizes,
2. increasing the number of storm inlets,
3. increasing the roadway profile slope,
4. adding a pump station at 92nd Street and Abbott Avenue intersection discharging into the Indian Creek,
5. adding a pump station and 3 associated drainage wells at the west end of 92nd Street, or

   replacing the existing pump station of 92nd Street with a new pump Station and drainage wells.

These improvements are anticipated to reduce or alleviate flooding during most frequent, short-duration storm events. For long-duration storm events, the area of concern will continue to experience flood conditions due to drainage deficiencies of the overall drainage basins and master drainage systems, but the flood conditions should be improved. Since meeting the complete level of service is not feasible, it may be best to view the data in terms of the practical improvements which may be achieved.

We modeled and analyzed the following scenarios:

Option 1 includes constructing a new Pump Station at Abbot Avenue and 92nd Street intersection discharging into Indian Creek via the proposed 12" diameter storm force main along 92nd Street. The proposed stormwater force main (FM) is proposed to replace previously abandoned water main (WM) along 92nd Street to minimize conflicts with existing other utilities. This option also includes addition of storm inlets along Abbott Avenue, upsizing of storm pipes at Abbott Ave and 91st Street intersection, and upsizing of storm pipes at Abbott Avenue and 92nd Street intersection. This option will significantly reduce flooding at a cost of approximately $982,000. Please refer to **Exhibit 9** for specifics and **Exhibit 10** for a breakdown of the costs.

Option 2 includes all proposed improvements of Option 1, and a new proposed Pump Station along with three pressurized drainage wells at the west end of 92nd Street. This will also significantly reduce flooding at a cost of approximately $1,720,000. Please refer to **Exhibit 9** for specifics and **Exhibit 10** for a breakdown of the costs.

Option 3 includes all improvements proposed in Option 1 & 2, and proposed 48" diameter conveyance pipe along 91st Street between Abbott Avenue and Bay Drive. This option will require significant alteration of existing storm pipe networks and other existing utilities along the streets. The construction cost is expected to be approximately $4,971,000. Due to significant disturbance of the existing roadways, utilities and associated cost, this option was considered to be the least feasible option for Abbott Avenue drainage improvements. Please refer to **Exhibit 9** for specifics and **Exhibit 10** for a breakdown of the costs.

The following table presents the reduction in roadway flooding levels which may be achieved with the proposed or equivalent improvements of Option 1, Option 2, and Option 3.

Resultant Road Flooding Depth above Edge of Pavement* (5 Year Frequency Storm)**

Areas of Concern/ Sub-Basin	Existing Flooding Conditions	Inches of Flooding Option 1	Inches of Flooding Option 2	Inches of Flooding Option 3
Abbott Ave (Basin 3)	10.68" to 16.08"	9.84" to 15.60"	5.16" to 12.00"	3.48" to 9.60"
Abbott Ave (Basin 4)	11.88" to 17.28"	11.04" to 16.80"	8.40" to 13.20"	5.52" to 10.80"

*The flood depths presented above are at the lowest edge of pavement grade, and are based on our flood routing model of the 5-year/1-hour and 5-year/24-hour design storm events.

**The rainfall depths of 5-year/1-hour and 5-year/24-hour storm events are 3.20 inches and 6.50 inches respectively.

Resultant Road Flooding Depth above Road Crown* (5 Year Frequency Storm)**

Areas of Concern/ Sub-Basin	Existing Flooding Conditions	Inches of Flooding Option 1	Inches of Flooding Option 2	Inches of Flooding Option 3
Abbott Ave (Basin 3)	0.00" to 5.28"	0.00" to 4.80"	0.00" to 1.20"	0.00" to 0.00"
Abbott Ave (Basin 4)	1.08" to 6.48"	0.24" to 6.00"	0.00" to 2.40"	0.00" to 0.00"

*The flood depths presented above are at the road crown elevations, and are based on our flood routing model of the 5-year/1-hour and 5-year/24-hour design storm events.

**The rainfall depths of 5-year/1-hour and 5-year/24-hour storm events are 3.20 inches and 6.50 inches respectively.

VI. CONCLUSION

It is recommended that improvements be constructed as presented in this study with an emphasis on practical improvement, not in an attempt to meet the full level of service requirements. Option 2 should be viewed as a necessary part of reducing flood stages. However, pipes or pipe replacement sizes would be subject to further design analysis and practical matters like existing utility conflicts, etc.

Due to the magnitude of site disturbance and total reconstruction requirement of roadways, drainage and existing utilities, Option 3 is not recommended by this study. However, it can be considered if the Town desires to make incremental improvements to its master drainage system over time with the ultimate goal of eventually meeting the level of service requirements at some point in the future.

SECTION ONE

INTRODUCTION

1.1 INTRODUCTION

Flooding with an unspecified elevation and duration has been occurring along Abbott Avenue and the surrounding neighborhood. Recent resident complaints and site observations suggest that the subject corridor frequently experiences approximately 1 foot or higher standing flood waters during short-duration, high-intensity (≥1 inch/hour) rainfall events. These neighborhoods are served by the Town of Surfside master drainage system. The recently improved stormwater management system of the Town consists of a network of underground storm sewers and associated outfall control structures discharging into Indian Creek and Biscayne Bay, 3 pump stations discharging into 9 drainage wells, and 1 existing pump station located at the west end of 92nd Street.

As a first step toward addressing these drainage concerns, the Town has retained Calvin, Giordano, and Associates, Inc. (CGA) to perform this drainage study of the subject area of concern to determine the probable cause of street flooding, to evaluate potential drainage improvements for Abbott Avenue and the surrounding neighborhood area, and to recommend appropriate improvements to mitigate the extent of the flooding issues as economically as possible meeting acceptable level of service.

The following is the expected level of service: (1) Flood elevation or storm stage resulting from 5-year design storm events shall not encroach up to the roadway crown elevation. (2) Roadway spread resulting from 4 inch/hour intensity storm shall not encroach more than half of the travel lane width. (3) Hydraulic grade line resulting from 3-year 1-hour design storm shall not exceed the storm inlet grate elevation.

This report describes related information discovered during site reconnaissance and project research and provides options which, based on computer modeling, are expected to mitigate the current flooding conditions.

1.2 BACKGROUND

1.2.1 Location

The Town of Surfside is located between Miami Beach to the south and Bal Harbour Village to the north, with the Atlantic Ocean to the east and the Village of Indian Creek and the Town of Bay Harbor Islands, separated from Surfside by Indian Creek, to the west. Please refer to location map in Appendix A. The Town is located on two barrier islands between Biscayne Bay (including its bayou, Indian Creek) and the Atlantic Ocean. Indian Creek and Biscayne Bay lie adjacent to the Town's western shore, which is entirely lined with concrete sea walls. Indian Creek is a brackish-water bayou of Biscayne Bay. Abbott Avenue is located toward the eastern side of the Town. Please refer to **Exhibit 1**, Location Map and **Exhibit 2**, Aerial Map.

1.2.2 Existing Developments

The Town of Surfside was incorporated on May 18, 1935 and encompasses a total land area of approximately 330 acres. Development began during the 1920's and the Town has been virtually built-out since the late 1980's. Approximately 49% of the residential development was constructed before 1960, and 72% was constructed before 1980, including the supporting infrastructure. The Town is nearly 100% developed with no significant natural vegetative cover, except landscaping on developed land and limited ocean dune vegetation. The Town's street system is configured in a relatively uniform grid, with most blocks being approximately 250-feet wide and 660-feet long. Please refer to the **Exhibit 7**, Existing Drainage Basin Map.

1.2.3 Topography

According to the historical records and survey documents, the average elevations of the study area within the existing road right-of-way range from approximately 2.80' NGVD to 5.50' NGVD. The wet season water table elevation is 1.60' NGVD (see **Exhibit 5**). The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) (see **Exhibit 4**) indicates that most of the Town is located primarily in Zone AE (Base Flood Elevation 8.00' NGVD), requiring a minimum Finished Floor Elevation of 8.00' NGVD for the residential home properties.

1.2.4 Existing Drainage Basins and Land Use

The Town's existing stormwater management system consists of 9 drainage basins as shown in Exhibit 7, Existing Drainage Basin Map. The existing drainage basins are as follows:

- Basin 1 – areas served by 95th Street drainage collector;
- Basin 2 – areas served by 94th Street drainage collector;
- Basin 3 – areas served by 92nd Street drainage collector and existing Pump Station;
- Basin 4 – areas contributing into 91st Street drainage collector;
- Basin 5 – areas served by 89th Street drainage collector;
- Basin 6 – areas served by Byron Avenue and 88th Street collector;
- Basin 7 – island area served by Biscaya Drive drainage collector;
- Basin 8 – west 88th Street area served by an exfiltration trench;
- Basin 9 – areas between Harding and Collins Avenues (FDOT) and areas east of Collins Avenue.

Table 1.2 A

Previously Permitted Land Use Breakdown

Drainage Basin	Total Area (ac)	Building Area (ac)	Roadways/pavement (ac)	Total Impervious (ac)	Pervious Area (ac)
Basin 1	27.81	8.46	8.34	16.8	11.01
Basin 2	30.40	9.30	8.83	18.13	12.27
Basin 3	41.04	12.08	11.96	24.04	17.00
Basin 4	32.39	9.46	9.67	19.13	13.26
Basin 5	32.60	9.39	9.68	19.07	13.53
Basin 6	54.60	16.37	15.46	31.83	22.77
Basin 8	7.24	2.35	2.06	4.41	2.83
Total	226.08	67.41	66.00	133.41	92.67
(%)	100%	29.82%	29.19%	59.01%	40.99%
	* Basin 7 and Basin 9 are not included in this study since those are either isolated or independent systems from the subject site * The land use data is obtained from previous permit data of Surfside Master Drainage System				

Further review of right-of-way area and aerial maps reveals that the actual impervious areas are relatively higher than those previously permitted land use data.

Table 1.2 B

Adjusted Land Use Breakdown

Drainage Basin	Total Area (ac)	Building Area (ac)	Roadways/pavement (ac)	Total Impervious (ac)	Pervious Area (ac)
Basin 1	27.81	8.46	10.46	18.92	8.89
Basin 2	30.40	9.30	11.64	20.94	9.46
Basin 3	41.04	12.08	15.75	27.83	13.21
Basin 4	32.39	9.46	12.90	22.36	10.03
Basin 5	32.60	9.39	12.96	22.35	10.25
Basin 6	54.60	16.37	19.98	36.35	18.25
Basin 8	7.24	2.35	2.56	4.91	2.33
Total	226.08	67.41	86.25	153.66	72.42
(%)	100%	29.82%	38.15%	67.97%	32.03%
	* Basin 7 and Basin 9 are not included in this study since those are either isolated or independent systems from the subject site * The land use data is adjusted due to higher percentage of Roadway Imperviousness				

1.2.5 USDA Soil Survey

Based on a review of the Miami-Dade County Soil Survey by United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), it appears that there are three (3) soil-mapping units noted within the overall drainage basin: 15-Urban Land, 39-Beaches, and 99-water. Please refer to **Exhibit 3**, USDA Soil Survey Map.

1.2.6 Existing Utilities

Abbott Avenue is heavily occupied by underground and aboveground utilities. Aboveground FPL facilities and Electric Poles are located behind the curb and gutter along the west side of the roadway. The poles are so close to the existing curb that any proposed drainage pipes along the curb and gutter may require relocation of the existing poles to accommodate the proposed drainage improvements. Existing underground utilities include FPL duct banks, AT&T duct banks, natural gas mains, water mains, water services, sanitary sewer mains, and sanitary sewer service laterals. The proposed drainage improvements will likely be in conflict with these underground facilities or will be at absolute minimum horizontal clearances.

SECTION TWO

EXISTING DRAINAGE CONDITIONS

2.1 EXISTING MASTER DRAINAGE SYSTEM

In 2013, the Town of Surfside completed a retrofit project of the existing drainage system primarily to improve the water quality of the receiving waters. Prior to the retrofit improvements, the existing storm drainage system consisted of a network of underground storm sewers and outfalls discharging directly into Indian Creek and Biscayne Bay. A pumping station at the western end of 92nd Street assisted the drainage of water from that street by pumping to an outfall into Indian Creek. Storm sewer pipe sizes in the system ranged in diameter from 10 inches to 36 inches.

The retrofitted stormwater management system consists of a network of underground storm sewers along with outfall control structures discharging into Indian Creek and Biscayne Bay, and 3 additional pump stations discharging to 9 drainage wells. The newly constructed control structures facilitate well discharge before overflow waters discharge to Biscayne Bay. The project addressed long-term concerns regarding water staging into the streets and poor water quality in the adjacent Biscayne Bay along the Town's shores. The project directly addressed The Trust for Public Land's Biscayne Bay Accessibility report, supported the SFWMD's Biscayne Bay Partnership Initiative (BBPI), and enhanced the level of service. The retrofit project was fully funded by an FDEP grant and utilized no Town funds.

In 2015, the Town completed drainage improvements for Biscaya Island along 88th Street. The Town constructed new check valves to prevent back flow into the existing roadways and upsized one 12" outfall to a 24" diameter outfall to improve conveyance.

The Town of Surfside has two state roadways within the Town; one north-south pair SR A1A/Collins Ave (northbound) and Harding Avenue (southbound); and one east-west SR-922/96th Street. Two pump stations discharging into the drainage wells and large bypass outfall pipes serve these FDOT roadways and the associated drainage basin area (Basin 9). The FDOT pump stations are located along 94th Street and 88th Street and are currently operated by the Town of Surfside.

2.2 EXISTING DRAINAGE OF ABBOTT AVENUE

The Town's street system is configured in a grid with most blocks 250-feet wide and 660-feet long. The existing single-family homes and residential developments drain into the street right-of-way via sheet flow. Every intersection of Abbott Avenue includes three or four storm inlets to collect the storm runoff. Roadway elevations range from 2.80 feet NGVD to 5.50 feet NGVD. The roadway profile is very flat along the north-south direction, causing widespread stormwater flow through the roadway section. Each storm inlet is responsible to serve a contributing area as large as 2.10 acres, which is a considerably large contributing area. The conveyance pipes connected to each storm inlet are as small as 10-inch diameter, causing high hydraulic gradients and resulting in on-street flooding. From each intersection of Abbott Avenue, the conveyance pipe network takes stormwater runoff to the west towards the outfall or pump station locations. These east-to-west conveyance pipe networks consist of 12" diameter (min.) to 36" dimeter (max.) storm pipes along each of the ±2,000 LF pathway to the west and are restricted by permit-mandated water quality weirs in the control structures. When the storm inlets and storm pipes fail to handle the surface runoff or rainfall intensity, flood water rises up to the surrounding street crown elevations and eventually spreads out throughout the drainage basins.

2.3 FIELD OBSERVATION OF RAIN EVENTS

Several attempts have been made to observe actual rainfall events at the subject site. CGA staff visited the site on September 2nd and September 3rd of 2018 to observe the effects of Tropical Storm Gordon. Tropical Storm Gordon brought an average of nearly 1" of rain across the South Florida Water Management District's 16-county region on Labor Day. The heaviest rainfall occurred in the everglades and highly populated areas of Miami-Dade and Broward Counties, with 3 to 5 inches of rain in most basins of southern Miami-Dade County.

CGA staff visited the site at 11:00 am on September 2, 2018, just immediately after a rainfall event. Surface water ponding was observed along Abbott Avenue at the intersections of 91st Street and 92nd Street. The Pump Station at 94th Street was running at the time. The ponding at the Abbott Avenue/91st Street intersection disappeared in less than 30 minutes. The SFWMD rainfall estimates indicate 1.50" of rain occurred during 24-hour period.

11:15 AM, 9-2-2018 11:35 AM, 9-2-2018

CGA staff visited the site once again on September 3rd, 2018 at 7:00 AM. The sky was cloudy with no rain at the time. During the period from 8:30 AM to 10 AM there was a considerable downpour. No surface water ponding was observed during the rain event. Runoff was entering into the inlets at a steady flow rate. The spread did not expand more than 5 feet in the street. The inlets were observed to have hydraulic head up to the top of the curb height for a very short period of time. The SFWMD rainfall estimates indicate 1.50" of rain occurred during 24-hour period.

91st Street and Abbott Ave intersection at 08:45 AM, 9-3-2018

SECTION THREE

DESIGN CRITERIA

3.1 FINISHED FLOOR ELEVATION CRITERIA:

According to SFWMD criteria, residential building floors must be at or above the 100-year flood elevations as determined from the most appropriate information, including Federal Flood Insurance Rate Maps. Both tidal flooding and the 100-year 3-day storm event shall be considered in determining elevations. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) indicates that most of the Town is located primarily in Zone AE (Base Flood Elevation 8.00' NGVD), requiring a minimum Finished Floor Elevation (FFE) of 8.00' NGVD. As such it is expected that the residential homes (FFE) are built at or above 8.00' NGVD.

3.2 ROADWAY LEVEL OF SERVICE (LOS) CRITERIA:

3.2.1 FLOOD ROUTING AND ROAD FLOOD CRITERIA:

According to DRER, all roadways in Miami-Dade County are required to have a minimum longitudinal slope of 0.2 percent for drainage purposes, and the design return periods for roadway drainage systems depend on the type of roadway. Two-lane roads in residential areas must accommodate runoff from all storms with a 5-year return period with maximum encroachment up to the crown of the roadway. As such roadway flooding up to the crown elevation for 5-year design storm is allowed by regulatory agencies. ICPR Modeling (Hydrologic and Hydraulic Model) for existing conditions (**Appendix C**) indicates that the Town roadways do not meet this flood criteria or level of service at this time.

3.2.2 ALLOWABLE SPREAD CRITERIA:

According to the FDOT Drainage Manual and standard engineering practice, the stormwater spread resulting from a rainfall intensity of 4.0" per hour must not encroach more than ½ of travel lane if the design speed is less than or equal to 45 mph. The spread is usually determined or affected by inlet capacity, run-off contributing areas, gutter slope, pavement cross slope, inlets spacing, etc. For 4.0"/hour intensity, the maximum allowable spread of stormwater along Abbott Avenue is calculated to be 9.25' as measured from face of curb toward the road crown. Spread Calculation (**Appendix A**) indicates that the Town roadways do not meet this criteria or level of service at this time.

3.2.3 STORM DRAIN SYSTEM CRITERIA:

Storm sewers shall be designed and sized for 3-year frequency per FDOT Zone 10 IDF curves. Rational Method for performing hydrologic calculations shall be used for storm drain calculations. Friction losses shall be included in computing the design hydraulic gradient for all storm drain systems. Additionally, energy losses associated with special pollution control structures (weirs, baffles, etc.) and those caused by utility conflict structures shall be included in the calculations. If design includes all major and minor energy losses, it is acceptable for the hydraulic gradient to reach the theoretical gutter elevation. Minor losses include: entrance, exit, junction and manhole, expansion, contraction, and bend. Hydraulic Grade Line (HGL) calculation/storm drain system calculations or ASAD model (**Appendix B**) indicates that the Town's roadway storm sewer systems do not meet this criteria or level of service at this time.

3.3 WATER QUALITY TREATMENT VOLUME CRITERIA:

SFWMD criteria require treatment of storm water equal to either the first inch of runoff or 2.5 inches times the percent imperviousness, whichever is greater. Dry retention volume shall be provided equal to 50 percent of the amounts computed for wet detention. Additional 50% water quality treatment volume shall be provided for verified impaired water body. To meet the State water quality standards, Miami-Dade County requires 100% of the first-inch of runoff to be retained on site.

Existing conditions of Town of Surfside do not allow for retention/detention areas or exfiltration trenches to provide conventional water quality treatment of the stormwater volume. Existing site conditions, site grades, water table depth, and surficial aquifer depth are more suitable for use of drainage wells accepting discharge from pump stations. As such, the Town has constructed three pump stations and nine drainage wells to reduce pollutants in stormwater discharge from entering Biscayne Bay.

The previous retrofit project by Town addressed the water quality treatment volume requirement. Miami-Dade County has a higher percentage of relatively small rainfall events. 95% of annual rainfall events occurring in Miami-Dade area are anticipated to be 1.50" or less in precipitation. It is expected that retention of stormwater runoff from a rainfall event of 1.5" will reduce by 95% pollutant loads from the contributing sub-basin areas discharging into Indian Creek and Biscayne Bay. As such, the three pump stations with associated drainage wells were designed and permitted with capacity to retain 1.50" of rainfall or precipitation reducing 95% pollutant loads for the receiving waters.

3.4 ALLOWABLE DISCHARGE CRITERIA:

According to SFWMD, for tidal areas, the allowable discharge is based on the proposed project's peak runoff rate after development not exceeding the rate which existed prior to development. The design storm event for allowable discharge calculations is designated as the 25-year/72-hour storm event. Any new improvements of Town's stormwater management system will need to meet this discharge criteria by not exceeding the pre-existing discharge rate established by previous permits. The Town's retrofitted drainage system meets this allowable discharge criteria. Also, all proposed improvements described in Option 1, 2 and 3 will meet this criteria.

SECTION FOUR

STORMWATER MODELING

4.1 FLOOD ROUTING FOR EXISTING CONDITIONS

The previous stormwater retrofit project utilized ICPR software for hydrologic and hydraulic modeling of the master drainage system. The town's master surface water management system was permitted through DERM and FDEP by using the ICPR model. As such, the best methodology to analyze the system, to determine level of service deficiencies, and to determine required improvements for Abbott Avenue drainage system would be to evaluate previously permitted ICPR model of the Town's master drainage system. As previously noted, the previous retrofit project was constructed to primarily improve the water quality of receiving waters and to improve the existing drainage conditions. However, the full level of service requirement was not intended or mandated by that stormwater retrofit project.

Interconnected Channel and Pond Routing Model (ICPR v3.10) is an engineering software tool developed by Streamline Technologies, Inc. and is a comprehensive hydrodynamic stormwater modeling system that includes an integrated hydrology component. It is extremely flexible and can be used for the design of single detention ponds for the smallest site plans or modeling of the largest and most complex regional systems with thousands of nodes and links. ICPR can simulate hydrologic and hydraulic conditions by generating runoff hydrographs and dynamically routing these hydrographs through dendritic, diverging, or looped stormwater management systems.

CGA utilized the previously permitted Interconnected Channel and Pond Routing (ICPR) Stormwater Model to simulate the rainfall events and subsequent storm stages. Please refer to ***Appendix C***, ICPR Model of Existing Conditions. The model indicates roadway level of service deficiencies as indicated in the following tables.

Table 4.1 A

Existing Level of Service Deficiencies (5 Year 1 Day Storm):

Design Storm/Sub-Basin	Rainfall (inches)	Peak Stage (ft NGVD)	Basin Level Min. Road Crown (ft. NGVD)	Abbott Ave Min. Road Crown (ft NGVD)	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Day						
Sub-Basin-1	6.50	4.50	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	4.50	3.90	4.80	Not met	Satisfied
Sub-Basin-3	6.50	4.24	3.40	3.80	Not met	Not met
Sub-Basin-4	6.50	4.24	3.80	3.70	Not met	Not met
Sub-Basin-5	6.50	4.04	3.50	4.00	Not met	N/A
Sub-Basin-6	6.50	4.12	3.50	4.00	Not met	Not met
Sub-Basin-8	6.50	4.04	3.30	N/A	Not met	N/A

Table 4.1 B

Existing Level of Service Deficiencies (5 Year 1 Hour Storm):

Design Storm/Sub-Basin	Rainfall (inches)	Peak Stage (ft NGVD)	Basin Level Min. Road Crown (ft NGVD)	Abbott Ave Min. Road Crown (ft NGVD)	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Hour						
Sub-Basin-1	6.50	4.09	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	3.84	3.90	4.80	Satisfied	Satisfied
Sub-Basin-3	6.50	3.79	3.40	3.80	Not met	Satisfied
Sub-Basin-4	6.50	3.79	3.80	3.70	Satisfied	Not met
Sub-Basin-5	6.50	3.50	3.50	4.00	Satisfied	N/A
Sub-Basin-6	6.50	3.52	3.50	4.00	Not met	Satisfied
Sub-Basin-8	6.50	3.46	3.30	N/A	Not met	N/A

The above tables indicate that the portion of Abbott Avenue between 90th Street and 93rd Street does not meet the Level of Service requirement for 5 Year frequency storm events. The lowest edge of pavement along this segment of the roadway is 2.80 feet NGVD at 91st Street intersection. The flood depth measures approximately 11.88 inches to 17.28 inches above the lowest edge of pavement grade. The proposed drainage improvements described in Section Five are anticipated to result in less flood depths above edge of pavement grade.

4.2 ROADWAY SPREAD CALCULATIONS

As described in Section 2.2, the Town's street system is configured in a grid with most blocks measuring approximately 250' by 660'. The storm inlets are located at every intersection along Abbot Avenue - approximately 600 LF apart. These existing conditions contribute to wider spread of the stormwater flow along the pavement cross section. The proposed additional storm inlets along Abbott Avenue will reduce the stormwater spread along roadway section. Please see **Appendix A** for existing/proposed spread calculations.

4.2 STORM DRAIN SYSTEM EVALUATION:

As described in Section 3.2.3, hydraulic gradient is allowed to reach the theoretical gutter elevation for a 3-year design storm frequency. To model and analyze the Storm Drain Hydrology and Hydraulics, ASADLt3 (Automated Storm Sewer Analysis & Design) software was utilized. A hypothetical East-to-West direction storm water trunk line was modeled and analyzed to evaluate the system performance (see **Appendix B**). The analysis indicates a 48" dimeter trunk line along each Street (east to west) could be the most appropriate size to meet the allowable hydraulic gradient not exceeding the gutter elevations. As previously described in Section 2.2, the east-west conveyance pipe networks from Abbott Avenue to the outfalls consist of 12" diameter (min.) to 36" dimeter (max.) storm pipes along each of the ±2,000 LF pathways to the west and are restricted by permit-mandated water quality weirs within the control structures. The weir elevation of 2.00' NGVD was utilized in the ASAD model as the tail water condition. The lowest curb inlet gutter elevation along Abbott Avenue is 2.80' NGVD. The existing pump stations and the drainage wells are located approximately 2,000 LF away from Abbott Avenue. Unfortunately, these extreme conditions frequently result in hydraulic gradient failure or flood conditions during high intensity storm events. The proposed improvement with Pump Station at Abbott Ave and 92nd Street intersection is expected to reduce the effects of hydraulic gradient failure.

SECTION FIVE

STORMWATER MODELING – PROPOSED IMPROVEMENTS

5.1 FLOOD ROUTING FOR PROPOSED IMPROVEMENTS

After evaluation of the existing conditions and ICPR model of the Town's master drainage system, CGA analyzed various alternatives and ICPR models to develop recommendations to help alleviate the deficiencies in the drainage system of Abbott Avenue.

The following general considerations were the basis to develop the recommendations:

a) The improvements need to be permittable with all regulatory agencies and be in general compliance with current design criteria set-up for acceptable stormwater practices in SFWMD and DRER.
b) The improvements need to provide a reliable upgrade and upsizing of the system to alleviate flood conditions.
c) The improvements need to be cost effective.
d) The improvements should not negatively impact adjacent properties.
e) The improvements need to be maintainable by the operating entity or the Town's Public Works Department.
f) The proposed improvements need to be feasible and achievable.

5.2 PROPOSED IMPROVEMENTS

Various measures and solutions were researched to improve the existing flood protection level of service. The most appropriate solutions were incorporated into alternative ICPR models for proposed conditions. Please refer to **Appendix D**, **Appendix E**, and **Appendix F** for ICPR Models for Proposed Improvements. Based on the model results, CGA offers the following improvements to be implemented for the Abbott Avenue drainage system and Surfside master drainage system:

Option 1:

a) Replace and upsize the existing conveyance pipes and storm inlets at 91st street /Abbott Avenue intersection.
b) Replace and upsize the existing conveyance pipes and storm inlets at 92nd street /Abbott Avenue intersection.
c) Provide a Pump Station (2,250 GPM) at the intersection of Abbott Avenue and 92st Street discharging into Indian Creek by a 12" diameter force main. The new 12" drainage FM shall be constructed in place of existing abandoned 8" WM along 92nd Street.
d) Provide 24" diameter conveyance pipe along Abbott Avenue between 91st street and the new proposed pump station.
e) Provide additional curb inlets along Abbott Avenue between 90st Street and 92nd Street.
f) The construction constraints for these improvements would be existing underground FPL/AT&T facilities along Abbott Avenue and existing Electric Poles behind back of curb. Relocation of FPL poles and underground FPL and AT&T facilities might be needed for these proposed improvements.

Option 2:

a) Implementation of all improvements of Option 1.
b) Provide three new pressurized drainage wells and a new pump station (10,500 GPM) at the west end of 92nd Street.
c) As an alternate option, the existing Pump Station at 92nd Street can be replaced with the new proposed pump station and the new pressurized drainage wells.

Option 3:

d) Implementation of all improvements of Option 1 and Option 2.
e) Provide 48" conveyance Trunk line along 91st Street.
f) This option will require extensive utility reconstruction/relocation and complete roadway restoration to construct the proposed 48" drainage pipe.

The above described improvements will significantly improve the existing level of service for high intensity short-duration storm events. However, due to the deficiencies of the overall master drainage system including insufficient number of pump stations and drainage wells, inadequate size of storm drains, inadequate number of storm inlets, the required level of service for all drainage basins will never be met. The preliminary construction cost estimate for these options is as follows:

Option 1	$982,000
Option 2	$1,720,000
Option 3	$4,971,000

The following is the proposed level of service (OPTION 1) based on the alternative ICPR models for proposed conditions:

Table 5.2.1 A

Proposed Level of Service (5 Year 1 Day Storm) (OPTION 1):

Design Storm/Sub-Basin	Rainfall (inches)	Exist Peak Stage (ft)*	Prop. Peak Stage (ft)*	Basin Level Min. Road Crown (ft)*	Abbott Ave Min. Road Crown (ft)*	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Day							
Sub-Basin-1	6.50	4.50	4.50	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	4.50	4.49	3.90	4.80	Not met	Satisfied
Sub-Basin-3	6.50	4.24	4.20	3.40	3.80	Not met	Not met
Sub-Basin-4	6.50	4.24	4.20	3.80	3.70	Not met	Not met
Sub-Basin-5	6.50	4.04	3.99	3.50	4.00	Not met	N/A
Sub-Basin-6	6.50	4.12	4.06	3.50	4.00	Not met	Not met
Sub-Basin-8	6.50	4.04	3.99	3.30	N/A	Not met	N/A

*Elevations are referenced to National Geodetic Vertical Datum of 1929 (NGVD)

Table 5.2.1 B

Proposed Level of Service (5 Year 1 Hour Storm) (OPTION 1):

Design Storm/Sub-Basin	Rainfall (inches)	Exist. Peak Stage (ft)*	Prop. Peak Stage (ft)*	Basin Level Min. Road Crown (ft)*	Abbott Ave Min. Road Crown (ft)*	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Hour							
Sub-Basin-1	6.50	4.09	4.09	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	3.84	3.84	3.90	4.80	Satisfied	Satisfied
Sub-Basin-3	6.50	3.79	3.72	3.40	3.80	Not met	Satisfied
Sub-Basin-4	6.50	3.79	3.72	3.80	3.70	Satisfied	Not met
Sub-Basin-5	6.50	3.50	3.49	3.50	4.00	Satisfied	N/A
Sub-Basin-6	6.50	3.52	3.52	3.50	4.00	Not met	Satisfied
Sub-Basin-8	6.50	3.46	3.45	3.30	N/A	Not met	N/A

*Elevations are referenced to National Geodetic Vertical Datum of 1929 (NGVD)

The following is the proposed level of service (OPTION 2) based on the alternative ICPR models for proposed conditions:

Table 5.2.2 A

Proposed Level of Service (5 Year 1 Day Storm) (OPTION 2):

Design Storm/Sub-Basin	Rainfall (inches)	Exist Peak Stage (ft)*	Prop. Peak Stage (ft)*	Basin Level Min. Road Crown (ft)*	Abbott Ave Min. Road Crown (ft)*	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Day							
Sub-Basin-1	6.50	4.50	4.48	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	4.50	4.48	3.90	4.80	Not met	Satisfied
Sub-Basin-3	6.50	4.24	3.90	3.40	3.80	Not met	Not met
Sub-Basin-4	6.50	4.24	3.90	3.80	3.70	Not met	Not met
Sub-Basin-5	6.50	4.04	3.93	3.50	4.00	Not met	N/A
Sub-Basin-6	6.50	4.12	3.99	3.50	4.00	Not met	Satisfied
Sub-Basin-8	6.50	4.04	3.93	3.30	N/A	Not met	N/A

*Elevations are referenced to National Geodetic Vertical Datum of 1929 (NGVD)

Table 5.2.2 B

Proposed Level of Service (5 Year 1 Hour Storm) (OPTION 2):

Design Storm/Sub-Basin	Rainfall (inches)	Exist. Peak Stage (ft)*	Prop. Peak Stage (ft)*	Basin Level Min. Road Crown (ft)*	Abbott Ave Min. Road Crown (ft)*	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Hour							
Sub-Basin-1	6.50	4.09	4.08	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	3.84	3.81	3.90	4.80	Satisfied	Satisfied
Sub-Basin-3	6.50	3.79	3.33	3.40	3.80	Satisfied	Satisfied
Sub-Basin-4	6.50	3.79	3.50	3.80	3.70	Satisfied	Satisfied
Sub-Basin-5	6.50	3.50	3.48	3.50	4.00	Satisfied	N/A
Sub-Basin-6	6.50	3.52	3.52	3.50	4.00	Not met	Satisfied
Sub-Basin-8	6.50	3.46	3.44	3.30	N/A	Not met	N/A

*Elevations are referenced to National Geodetic Vertical Datum of 1929 (NGVD)

The following is the proposed level of service (OPTION 3) based on the alternative ICPR models for proposed conditions:

Table 5.2.3 A

Proposed Level of Service (5 Year 1 Day Storm) (OPTION 3):

Design Storm/Sub-Basin	Rainfall (inches)	Exist Peak Stage (ft)*	Prop. Peak Stage (ft)*	Basin Level Min. Road Crown (ft)*	Abbott Ave Min. Road Crown (ft)*	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Day							
Sub-Basin-1	6.50	4.50	4.45	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	4.50	4.44	3.90	4.80	Not met	Satisfied
Sub-Basin-3	6.50	4.24	3.70	3.40	3.80	Not met	Satisfied
Sub-Basin-4	6.50	4.24	3.70	3.80	3.70	Satisfied	Satisfied
Sub-Basin-5	6.50	4.04	3.87	3.50	4.00	Not met	N/A
Sub-Basin-6	6.50	4.12	3.95	3.50	4.00	Not met	Satisfied
Sub-Basin-8	6.50	4.04	3.87	3.30	N/A	Not met	N/A

*Elevations are referenced to National Geodetic Vertical Datum of 1929 (NGVD)

Table 5.2.3 B

Proposed Level of Service (5 Year 1 Hour Storm) (OPTION 3):

Design Storm/Sub-Basin	Rainfall (inches)	Exist. Peak Stage (ft)	Prop. Peak Stage (ft)	Basin Level Min. Road Crown (ft)*	Abbott Ave Min. Road Crown (ft)*	Basin Level LOS criteria	Abbott Ave LOS criteria
5 Year 1 Hour							
Sub-Basin-1	6.50	4.09	4.05	3.70	4.90	Not met	Satisfied
Sub-Basin-2	6.50	3.84	3.72	3.90	4.80	Satisfied	Satisfied
Sub-Basin-3	6.50	3.79	3.19	3.40	3.80	Satisfied	Satisfied
Sub-Basin-4	6.50	3.79	3.26	3.80	3.70	Satisfied	Satisfied
Sub-Basin-5	6.50	3.50	3.36	3.50	4.00	Satisfied	N/A
Sub-Basin-6	6.50	3.52	3.46	3.50	4.00	Satisfied	Satisfied
Sub-Basin-8	6.50	3.46	3.37	3.30	N/A	Not met	N/A

*Elevations are referenced to National Geodetic Vertical Datum of 1929 (NGVD)

SECTION SIX

SUMMARY & RECOMMENDATIONS

6.1 SUMMARY

The Abbott Avenue drainage study was conducted to investigate the potential causes of localized flooding along Abbott Avenue in the Town of Surfside. The study reveals that, regardless of the proposed improvements, complete level of service compliance is not feasible due to the absence of adequate retention facilities, drainage well discharge, conveyance pipes, number of storm inlets, and discharge pipes into the Bay. However, the study also reveals that significant improvements in level of service may be achieved by increasing conveyance pipe sizes, by addition of a pump discharge from Abbott Avenue to Indian Creek, and by addition of three new drainage wells and a pump station at the west end of 92nd Street. So, while the adequate level of service can't be achieved with reasonable cost, it may be best to view the data in terms of the practical improvements which may be achieved with relatively low cost.

The following table presents the reduction in road flooding levels which may be achieved with the proposed or equivalent improvements.

Table 6.1 A

Resultant Road Flooding Depth above Edge of Pavement (5 Year Frequency Storm)

Areas of Concern/ Sub-Basin	Existing Flooding Conditions	Inches of Flooding Option 1	Inches of Flooding Option 2	Inches of Flooding Option 3
Abbott Ave (Basin 3)	10.68" to 16.08"	9.84" to 15.60"	5.16" to 12.00"	3.48" to 9.60"
Abbott Ave (Basin 4)	11.88" to 17.28"	11.04" to 16.80"	8.40" to 13.20"	5.52" to 10.80"

The flood depths presented above are based on lowest edge of pavement grade, and 5-year 1-hour/5-year 24-hour design storm events flood routing model.

Table 6.1 B

Resultant Road Flooding Depth above Road Crown (5 Year Frequency Storm)

Areas of Concern/ Sub-Basin	Existing Flooding Conditions	Inches of Flooding Option 1	Inches of Flooding Option 2	Inches of Flooding Option 3
Abbott Ave (Basin 3)	0.00" to 5.28"	0.00" to 4.80"	0.00" to 1.20"	0.00" to 0.00"
Abbott Ave (Basin 4)	1.08" to 6.48"	0.24" to 6.00"	0.00" to 2.40"	0.00" to 0.00"

The flood depths presented above are based on Road Crown elevation and on flood routing models of the 5-year/1-hour and 5-year/24-hour design storm events. It should be noted that this is referencing the roadway crown elevation and not the catch basin grate elevations, which are likely to be lower and experience deeper flooding.

6.2 RECOMMENDATIONS

It is recommended that improvements be constructed as presented in this analysis with an emphasis on practical improvement, not in an attempt to meet the full level of service requirements.

Option 1 will provide a mechanism to remove stormwater from Abbott Ave with some reduction of peak stages. However, it does not provide full level of service requirements. The ICPR model indicates that the peak stages resulting from 5-year/1-hour and 5-year/24-hour storm events reach the road crown elevation along Abbott Ave.

Option 2 should be viewed as a necessary part of reducing flood stages and is recommended by this drainage study. Pipes or pipe replacement sizes would be subject to further design analysis and practical matters like existing utility conflicts. The ICPR model indicates that the peak stages resulting from 5-year/1-hour storm are below the road crown elevation. However, the peak stages resulting from 5-year/24-hour storm events reach the road crown elevation along Abbott Ave.

Due to the magnitude of site disturbance and total reconstruction requirement of roadways, drainage and existing utilities, Option 3 is not recommended by this study. However, it can be considered if the Town desires to make incremental improvements to its master drainage system over time with the ultimate goal of eventually meeting the level of service requirements at some point in the future.

6.3 REFERENCES

The following reference material has been utilized in the preparation of this report:

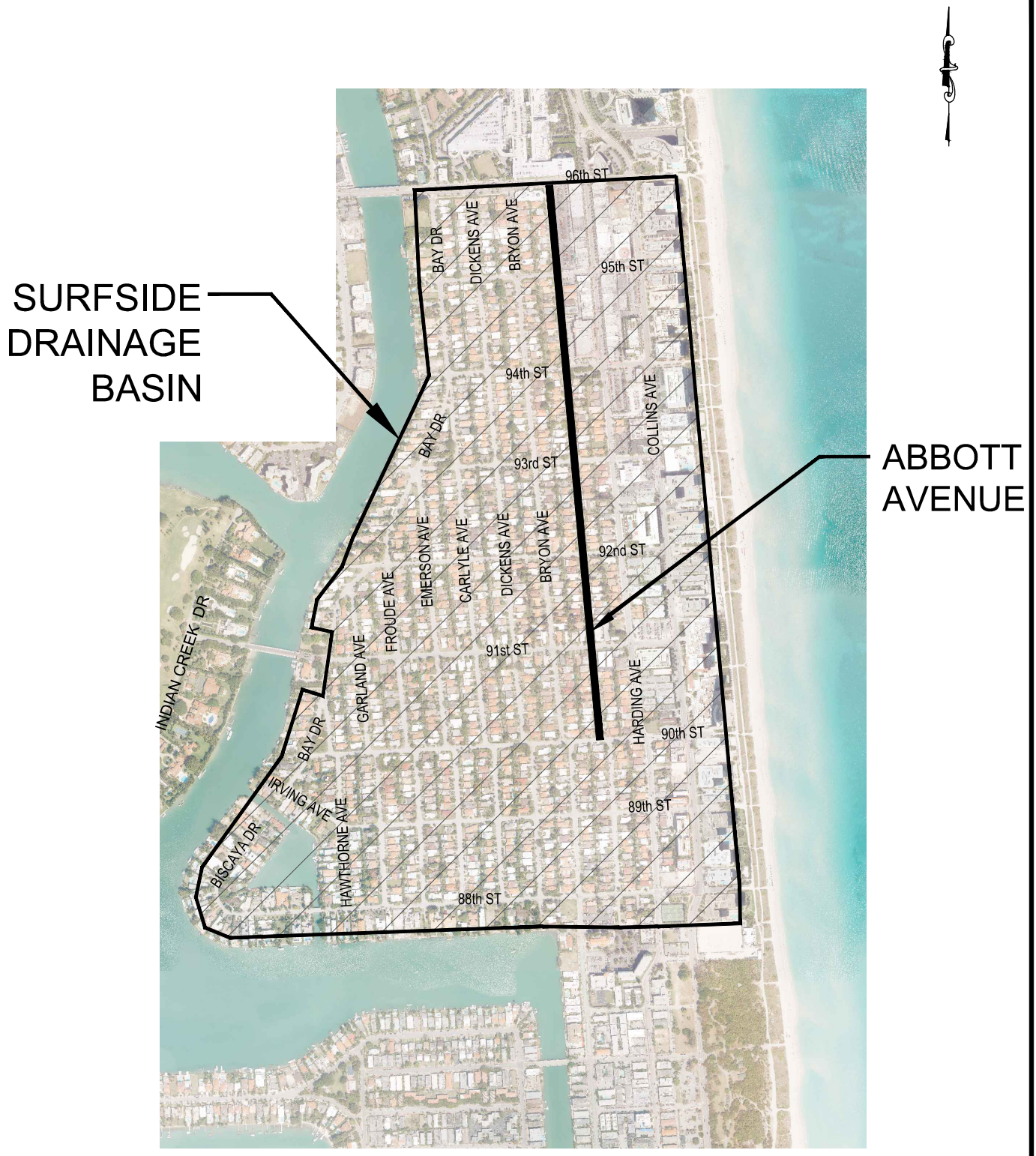
1. USDA Urban Hydrology for Small Watersheds TR-55
2. SFWMD ERP Permit Manual
3. DRER Engineering Criteria
4. DRAINAGE REPORT for Town of Surfside Drainage Improvements, September 2008

EXHIBITS

- Exhibit 1 Location Map
- Exhibit 2 Aerial Map
- Exhibit 3 USDA Soil Survey Map
- Exhibit 4 FEMA Flood Insurance Rate Map
- Exhibit 5 Miami-Dade County Average October Ground Water Map
- Exhibit 6 Abbott Avenue Typical Section
- Exhibit 7 Existing Drainage Basin Map
- Exhibit 8 Proposed Drainage Improvements Maps
- Exhibit 9 Proposed Drainage Improvements Details
- Exhibit 10 Proposed Drainage Improvements Cost Estimates
- Exhibit 11 Field Pictures
- Exhibit 12 Flood Pictures

EXHIBIT 1

LOCATION MAP

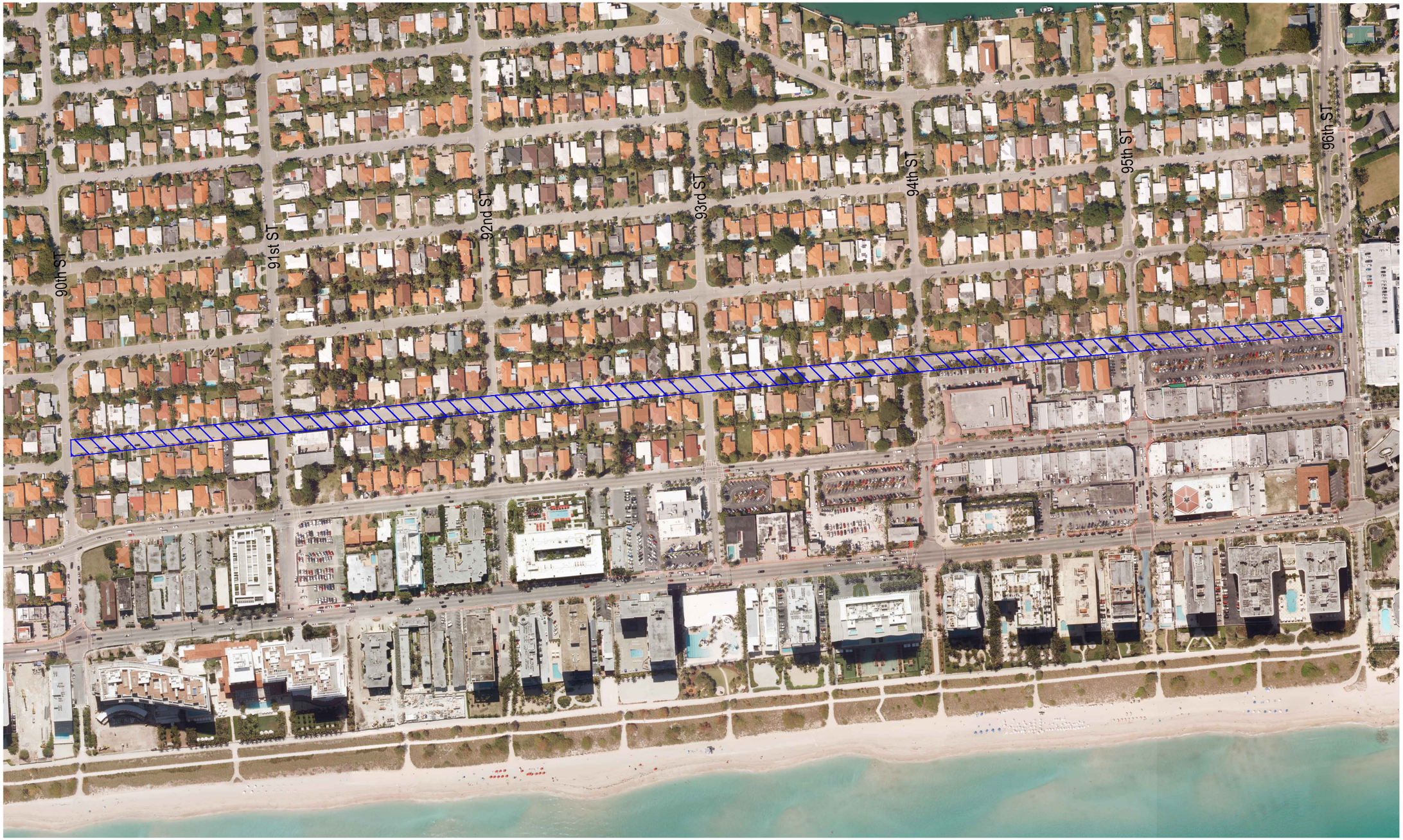


Calvin, Giordano & Associates, Inc. EXCEPTIONAL SOLUTIONS™	**SURFSIDE ABBOTT AVE. DRAINAGE STUDY** SURFSIDE, FLORIDA	**LOCATION MAP**	SHEET **EXH1**

EXHIBIT 2

AERIAL MAP

GRAPHIC SCALE
0 75 150 300
(IN FEET)
1" = 300'



LEGEND

ABBOTT AVENUE STUDY LIMITS

SHEET: EXH2

AERIAL MAP

SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

Calvin, Giordano & Associates, Inc.
EXCEPTIONAL SOLUTIONS

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\CADD Files\Drawings\C-EXH 2.dwg – (Plotted by: Katharine Kupsky on Friday, August 31, 2018 10:35:22 AM)

EXHIBIT 3

USDA SOIL SURVEY MAP

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Miami-Dade County Area, Florida

TOWN OF SURFSIDE

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh
- 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
- Gully
- Short Steep Slope
- Other

Political Features

Public Land Survey
- Township and Range
- Section

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 17N

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 1, Jan 22, 2007

Date(s) aerial images were photographed: 2/28/1999; 12/25/1999

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

Miami-Dade County Area, Florida (FL686)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
15	Urban land	321.9	95.8%
39	Beaches	3.9	1.1%
99	Water	10.4	3.1%
Totals for Area of Interest (AOI)		336.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Miami-Dade County Area, Florida Version date:1/22/2007 11:40:42 AM

15—Urban land

Map Unit Setting

Mean annual precipitation: 53 to 70 inches
Mean annual air temperature: 69 to 83 degrees F
Frost-free period: 358 to 365 days

Map Unit Composition

Urban land: 98 percent
Minor components: 2 percent

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: No parent material

Minor Components

Udorthents

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear

39—Beaches

Map Unit Setting

Elevation: 0 to 20 feet
Mean annual precipitation: 53 to 70 inches
Mean annual air temperature: 69 to 83 degrees F
Frost-free period: 358 to 365 days

Map Unit Composition

Beaches: 95 percent
Minor components: 5 percent

Description of Beaches

Setting

Landform: Beaches on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear

Properties and qualities

Slope: 0 to 2 percent

Drainage class: Poorly drained
Depth to water table: About 0 to 72 inches
Frequency of flooding: Very frequent

Interpretive groups
Land capability (nonirrigated): 8w

Minor Components

Canaveral
Percent of map unit: 5 percent
Landform: Ridges on marine terraces, dunes on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear

99—Water

Map Unit Setting
Mean annual precipitation: 62 to 70 inches
Mean annual air temperature: 73 to 81 degrees F
Frost-free period: 358 to 365 days

Map Unit Composition
Water: 100 percent

References

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EXHIBIT 4

FEMA FLOOD INSURANCE RATE MAP

JOINS PANEL 0092

Town of Bay Harbor Islands 120637

Town of Surfside 120659

Dade County Unincorporated Areas 120635

ZONE AE (EL 9)

ZONE AE (EL 10)

ZONE AE (EL 8)

ZONE X

ZONE VE (EL 10)

ZONE VE (EL 11)

ZONE AE (EL 8)

ZONE AE (EL 8)

ZONE VE (EL 11)

ZONE VE (EL 10)

ZONE VE (EL 11)

ZONE X

COASTAL BASE FLOOD ELEVA
APPLY ONLY LANDWARD OF

35

93RD ST

92ND ST

91ST ST

94TH ST

89TH ST

88TH ST

86TH ST

BAY DR

CARLYLE AV

EMERSON AV

ABBOTT AV

BYRON AV

DUCHESS AV

FARAGUT AV

CAMDEN AV

HAWTHORNE AV

SEVERO AV

BISCAYA DR

INDIAN CREEK DR

INDIAN CREEK

INDIAN CREEK VILLAGE

MI BEACH

BISCAYNE ISLAND

TOWN OF SURFSIDE

CITY OF MIAMI BEACH

A1A

RM 23

APPROXIMATE SCALE
500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

DADE COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 94 OF 625

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BAY HARBOR ISLANDS, TOWN OF	120637	0094	J
INDIAN CREEK VILLAGE, VILLAGE OF	120646	0094	J
MIAMI BEACH, CITY OF	120651	0094	J
MIAMI SHORES, VILLAGE OF	120652	0094	J
NORTH BAY VILLAGE, CITY OF	120654	0094	J
NORTH MIAMI, CITY OF	120655	0094	J
SURFSIDE, TOWN OF	120659	0094	J
UNINCORPORATED AREAS	120635	0094	J

Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

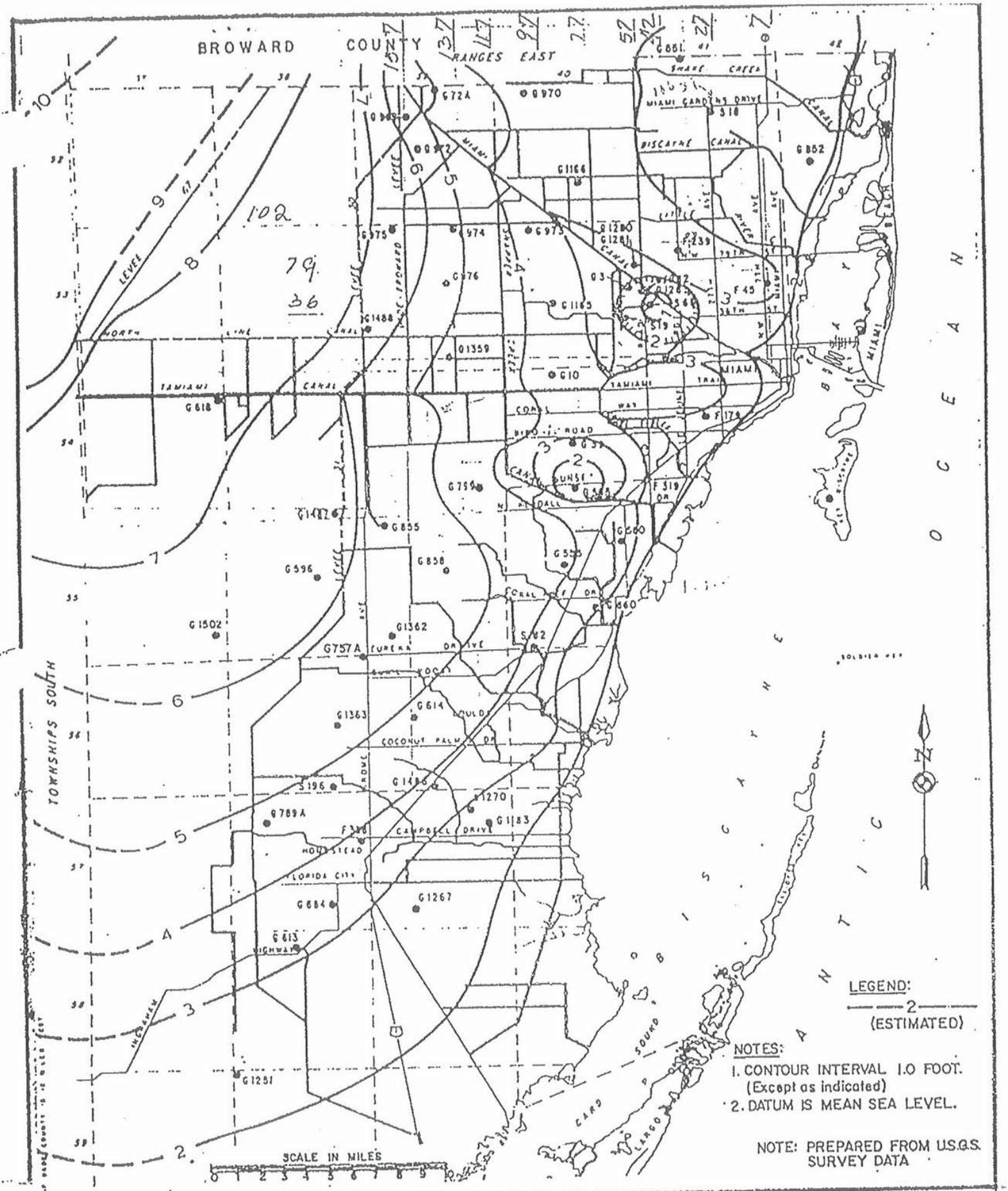
MAP NUMBER
12025C0094 J

MAP REVISED:
MARCH 2, 1994

Federal Emergency Management Agency

EXHIBIT 5

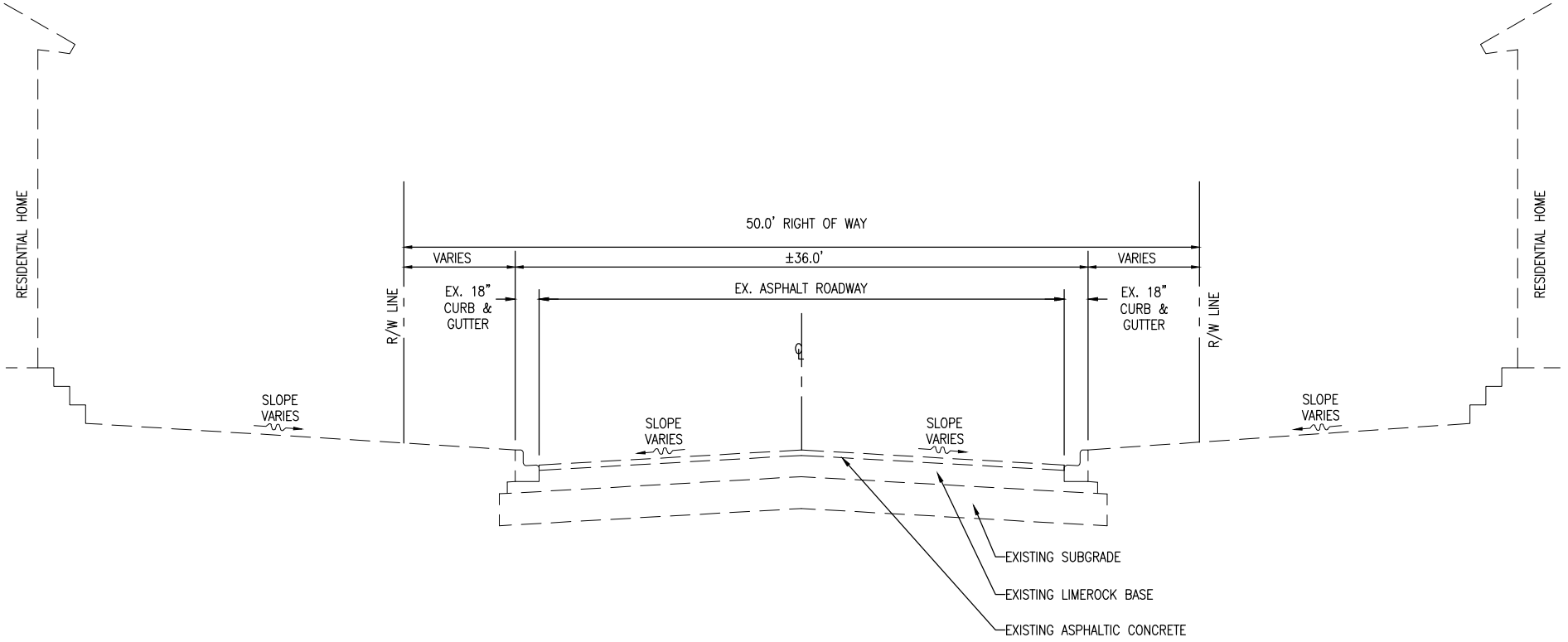
MIAMI-DADE COUNTY AVERAGE OCTOBER GROUND WATER MAP



METROPOLITAN DADE COUNTY PUBLIC WORKS DEPARTMENT	APPROVED 4/5/72	REVISED 2/19/75 4/14/77	DESIGN STANDARDS AVERAGE OCTOBER GROUND WATER LEVEL 1960–75	W.C. 2.2 SHEET 1 OF 1

EXHIBIT 6

ABBOTT AVENUE TYPICAL SECTION



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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

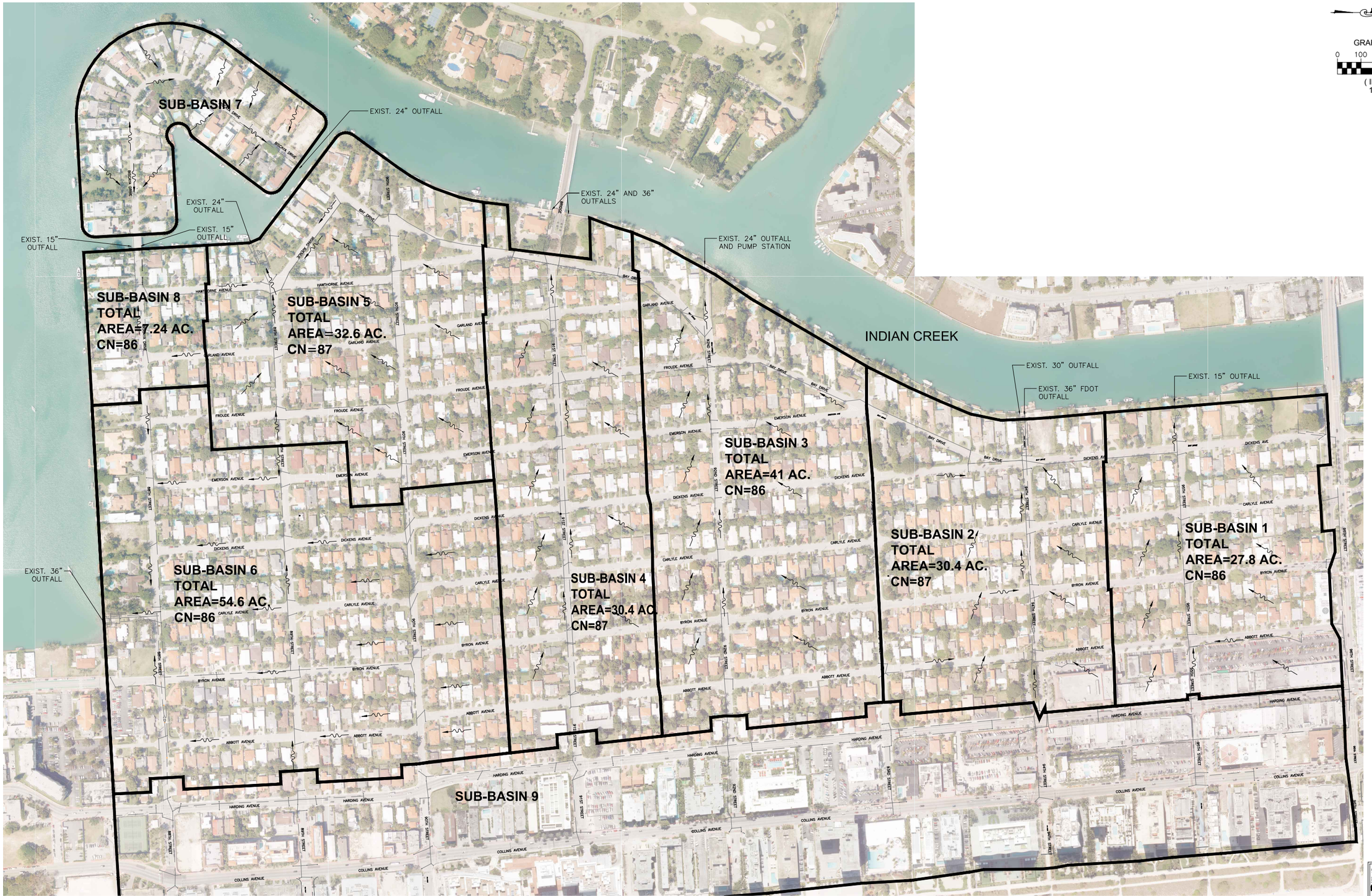
TYPICAL SECTION

SHEET

EXH6

EXHIBIT 7

EXISTING DRAINAGE BASIN MAP



GRAPHIC SCALE
0 100 200 400
(IN FEET)
1" = 400'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

EXISTING DRAINAGE BASIN MAP

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: NTS

PROJECT No: 181160

SHEET: **EXH7**

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\C-XX-DRAINAGE MAP.dwg - (Plotted by: Katherine Kupsky on Wednesday, October 17, 2018 4:17:15 PM)

EXHIBIT 8

PROPOSED DRAINAGE IMPROVEMENTS MAPS

GRAPHIC SCALE

0 100 200 400

(IN FEET)
1" = 400'

LEGEND

OPTION 1 - IMPROVEMENTS SHOWN IN GREEN

OPTION 2 - IMPROVEMENTS SHOWN IN GREEN AND RED

OPTION 3 - IMPROVEMENTS SHOWN IN GREEN, RED, AND CYAN

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

PROPOSED DRAINAGE BASIN MAP

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: NTS

PROJECT No: 181160

SHEET: **EXH8**

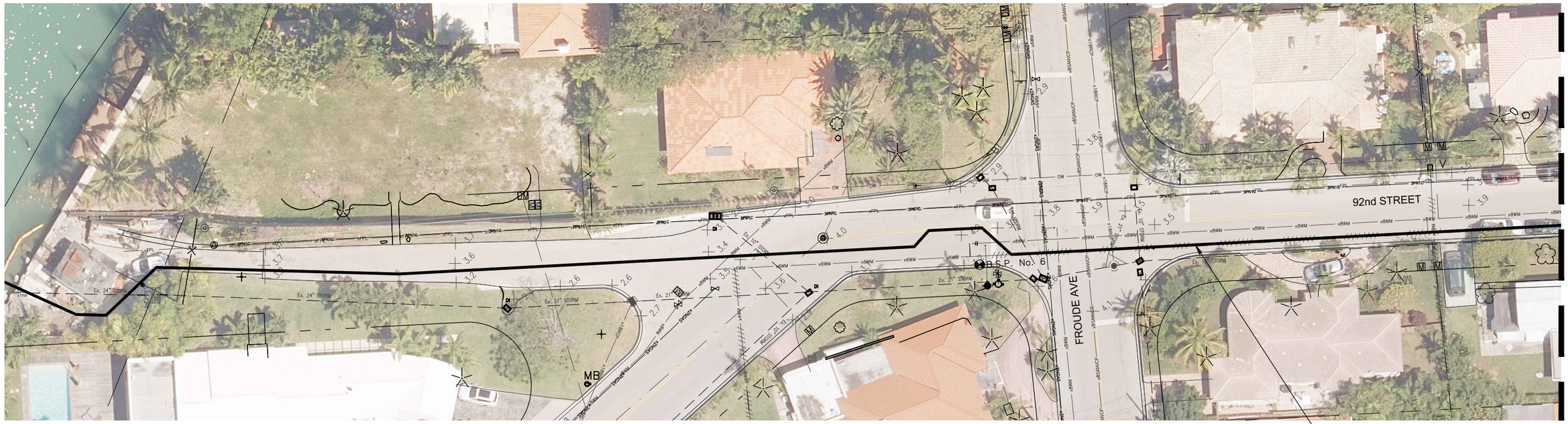
File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\C-XX-DRAINAGE MAP.dwg -- (Plotted by: Katharine Kupsky on Wednesday, October 17, 2018 4:15:55 PM)

EXHIBIT 9

PROPOSED DRAINAGE IMPROVEMENTS

DETAILS

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'



PROPOSED 12" HDPE
DRAINAGE FORCE MAIN

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 1
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

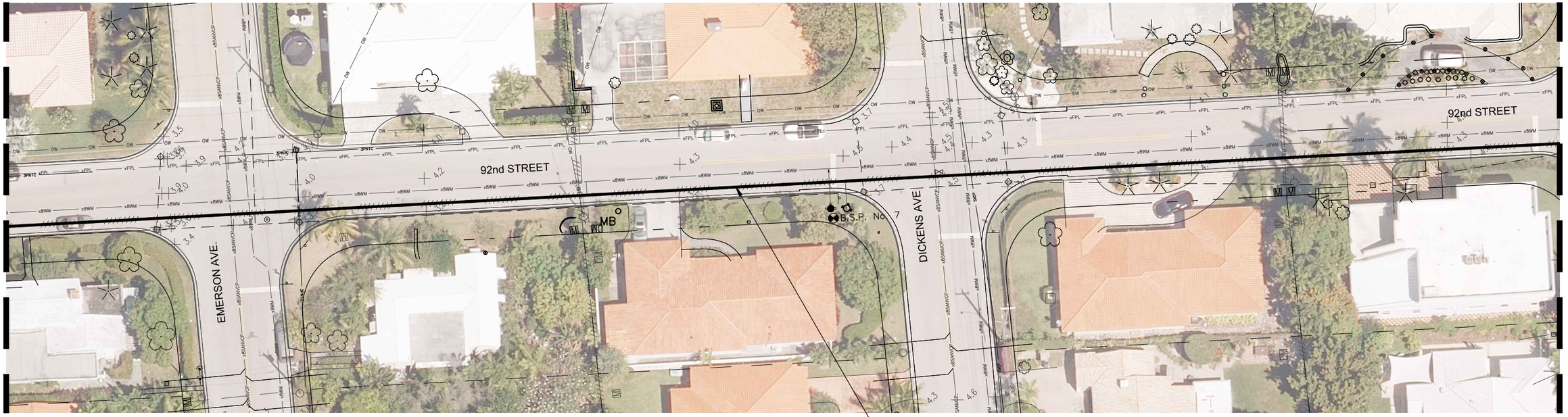
SHEET: **C1**

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt1.dwg – (Plotted by: Katharine Kupsky on Friday, October 12, 2018 4:54:32 PM)

MATCH LINE A SEE SHEET C1 - OPTION 1

MATCH LINE B SEE SHEET C3 - OPTION 1

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'



PROPOSED 12" HDPE
DRAINAGE FORCE MAIN

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 1
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: **C2**

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt1.dwg – (Plotted by: Katharine Kupsky on Friday, October 12, 2018 4:54:59 PM)

MATCH LINE B SEE SHEET C2 - OPTION 1

GRAPHIC SCALE
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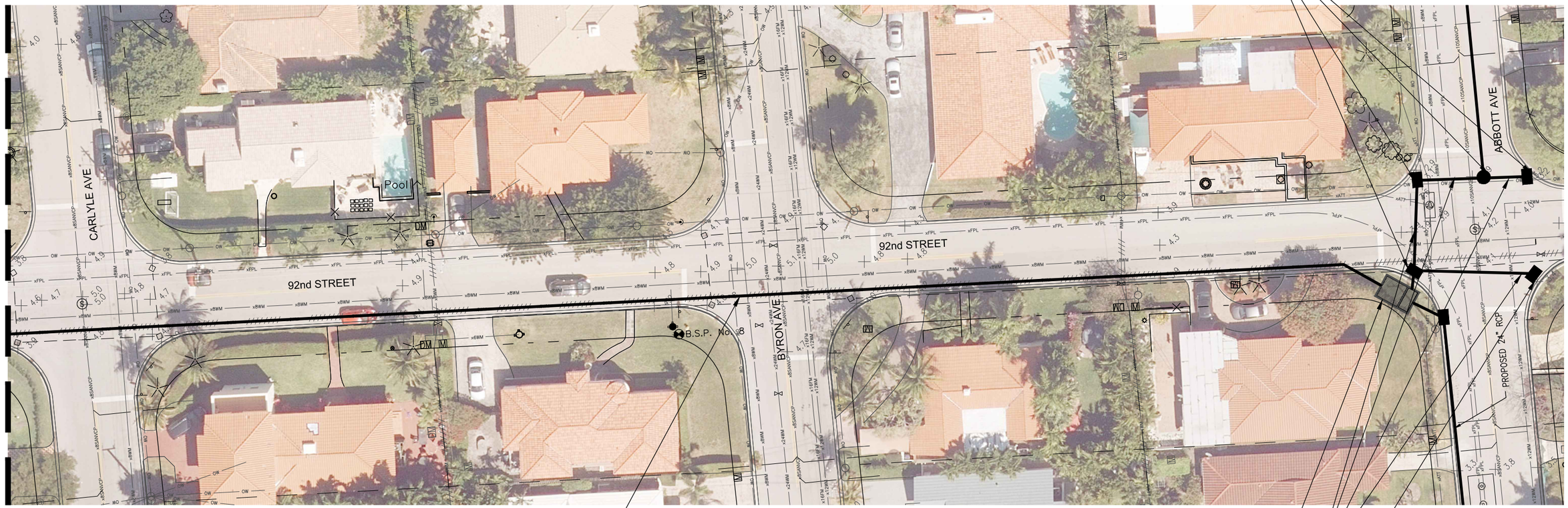
(IN FEET)
1" = 40'



EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

PROPOSED 12" HDPE DRAINAGE FORCE MAIN

PROPOSED LIFT STATION

PROPOSED 18" PIPE

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 1
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN
PROJECT No: 181160
SHEET: C3

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt1.dwg – (Plotted by: Katharine Kupsky on Friday, October 12, 2018 4:55:25 PM)

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 1
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C4

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt1.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 4:55:50 PM)

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 1
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

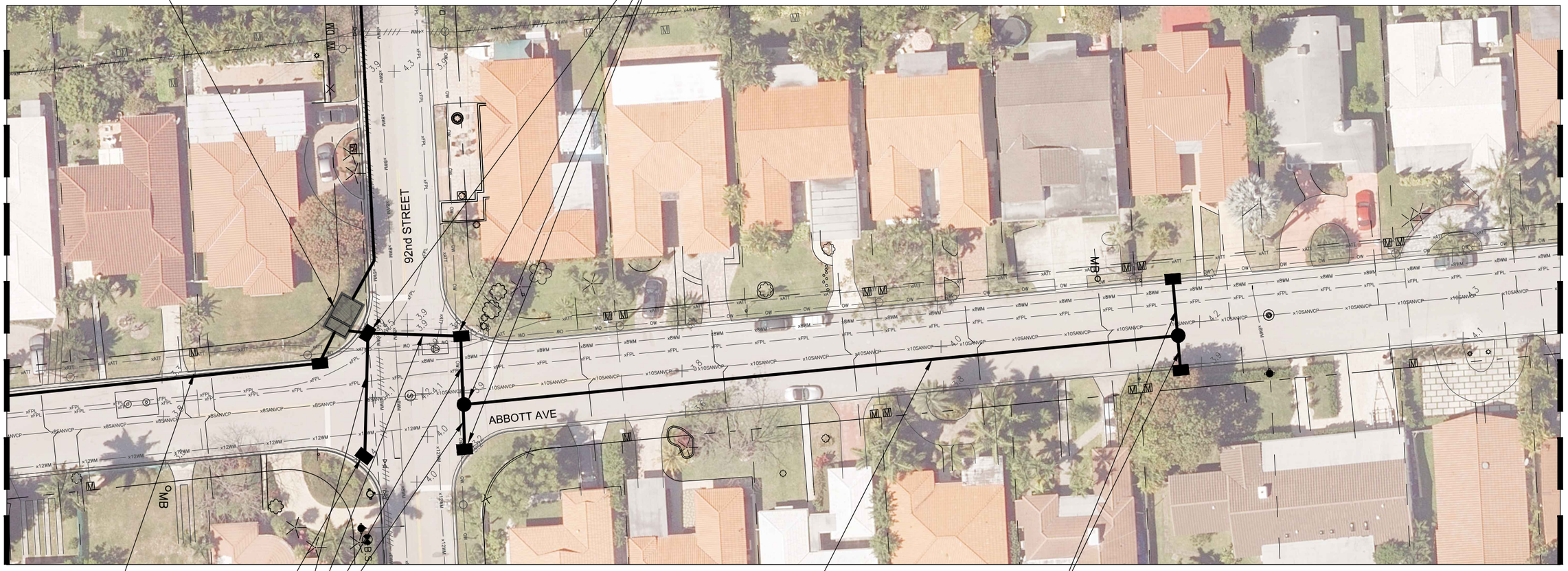
DATE: 7/20/18

SCALE: AS SHOWN
PROJECT No: 181160
SHEET: C5

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

PROPOSED LIFT STATION

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED



PROPOSED 24" RCP

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

PROPOSED 18" PIPE

PROPOSED 24" RCP

PROPOSED 18" RCP

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 1
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN
PROJECT No: 181160
SHEET: C6

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt1.dwg – (Plotted by: Katharine Kupsky on Friday, October 12, 2018 4:56:39 PM)

GRAPHIC SCALE

0 10 20 40

(IN FEET)

1" = 40'

MATCH LINE E SEE SHEET C6 - OPTION 1

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 1

PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.,
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C7

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt1.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 4:57:05 PM)

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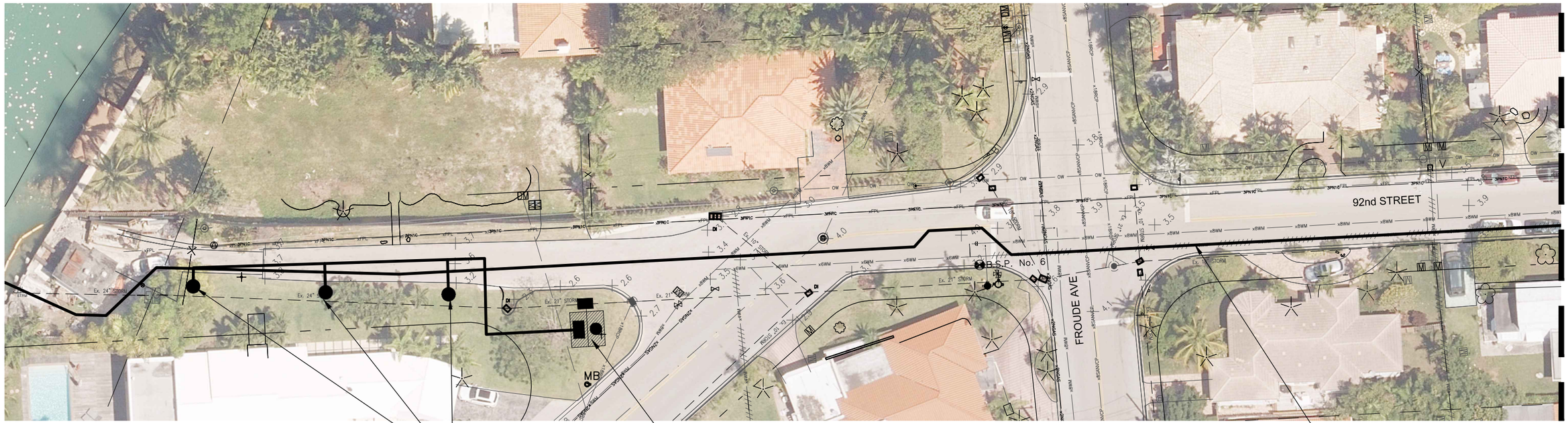
(IN FEET)
1" = 40'



MATCH LINE A SEE SHEET C2 - OPTION 2

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 2
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640
DATE: 7/20/18

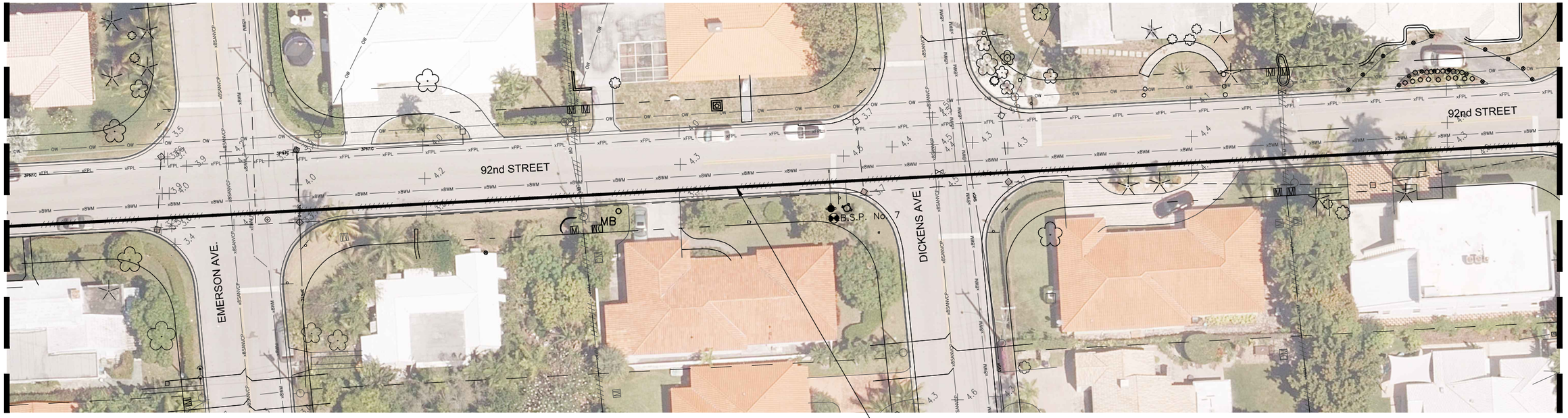
SCALE: AS SHOWN
PROJECT No: 181160

SHEET: **C1**

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

MATCH LINE A SEE SHEET C1 - OPTION 2

MATCH LINE B SEE SHEET C3 - OPTION 2



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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 2
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

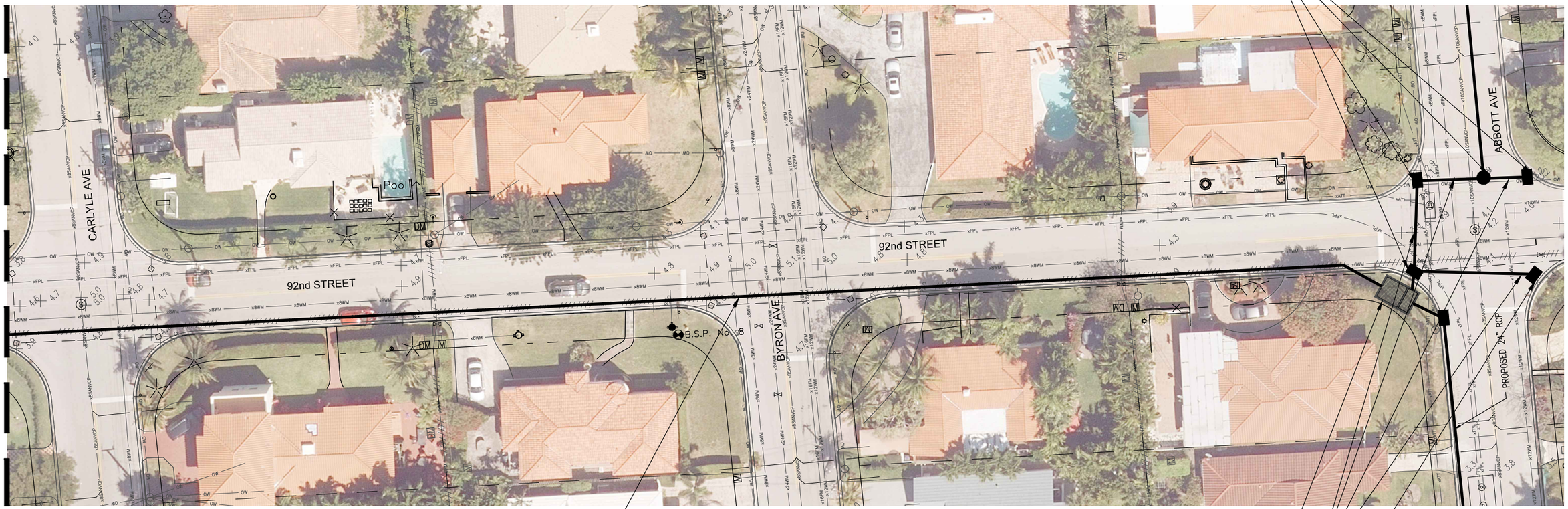
SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C2

MATCH LINE B **SEE SHEET C2 - OPTION 2**

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'



EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

PROPOSED 12" HDPE DRAINAGE FORCE MAIN

PROPOSED LIFT STATION

PROPOSED 18" PIPE

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 2
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640
DATE: 7/20/18

SCALE: AS SHOWN
PROJECT No: 181160
SHEET: **C3**

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 2
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C4

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 2
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

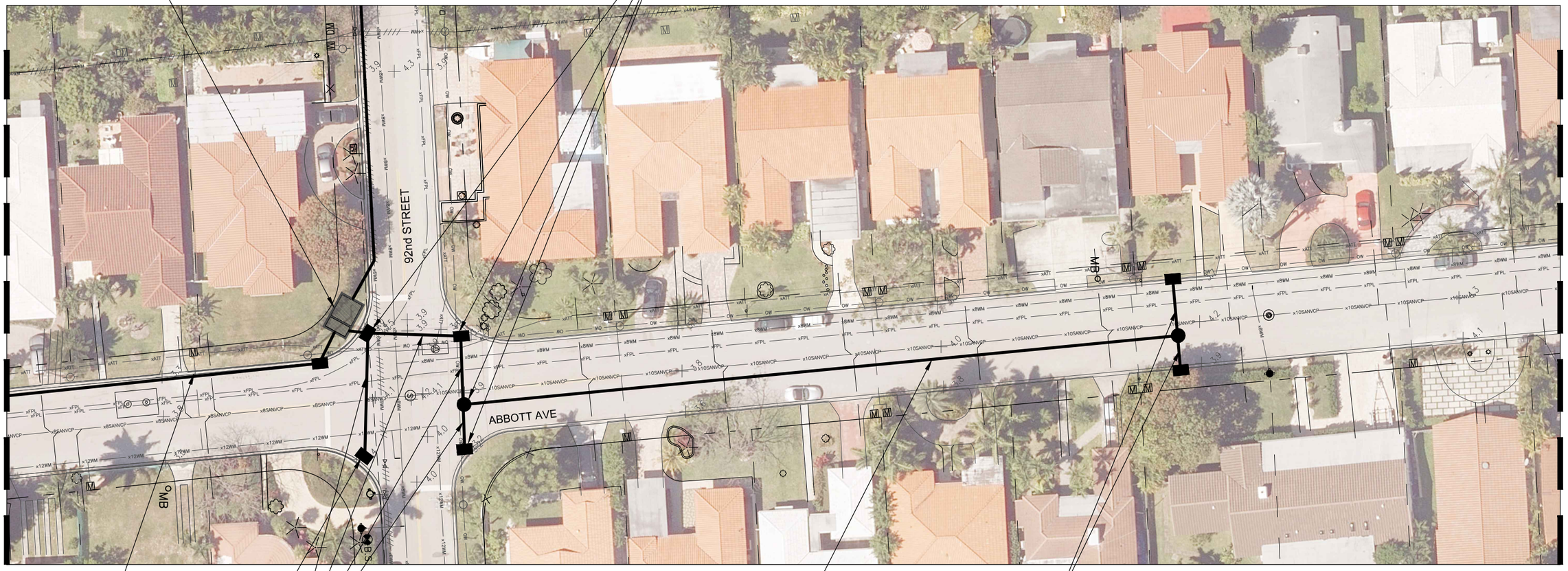
PROJECT No: 181160

SHEET: **C5**

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

PROPOSED LIFT STATION

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED



MATCH LINE D SEE SHEET C5 - OPTION 2

MATCH LINE E SEE SHEET C7 - OPTION 2

PROPOSED 24" RCP

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

PROPOSED 18" PIPE

PROPOSED 24" RCP

PROPOSED 18" RCP

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 2
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: **C6**

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt2.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 5:04:37 PM)

GRAPHIC SCALE

0 10 20 40

(IN FEET)

1" = 40'

MATCH LINE E SEE SHEET C6 - OPTION 2

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 2

PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.,
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

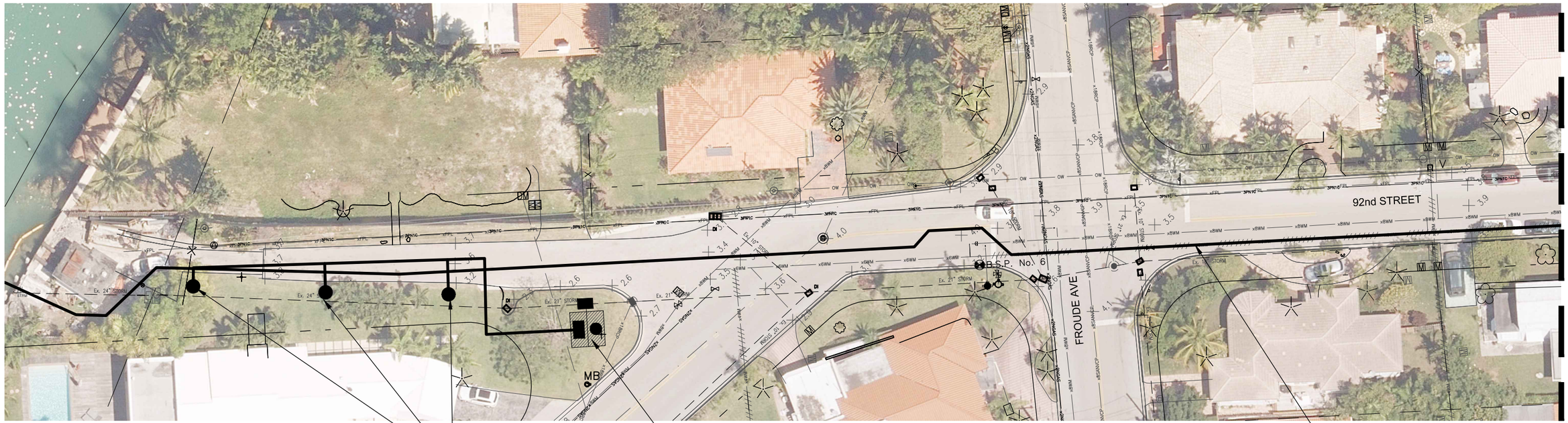
DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C7

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'



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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

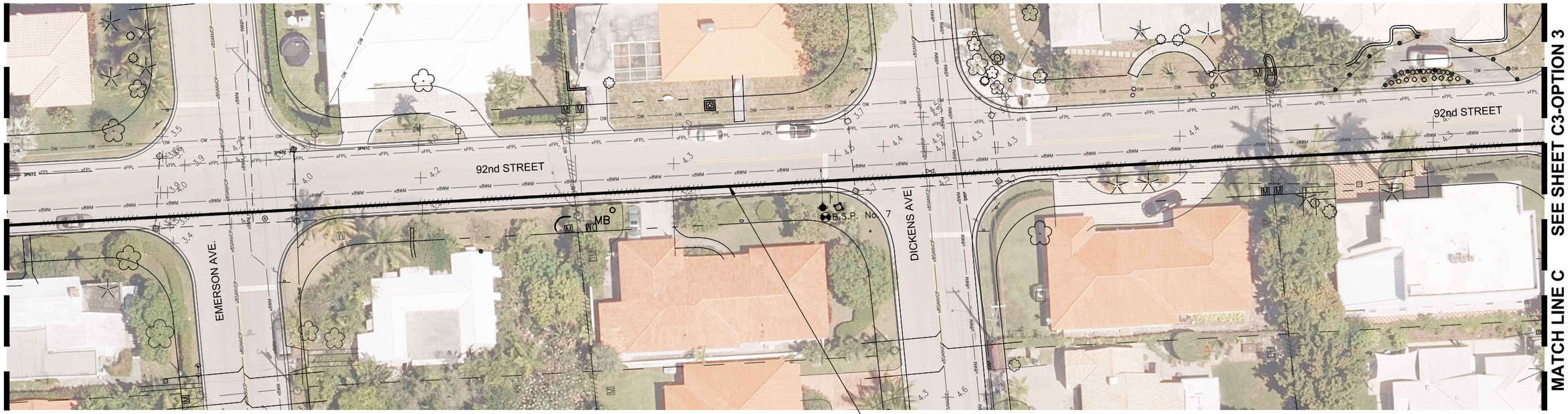
SCALE: AS SHOWN
PROJECT No: 181160

SHEET: **C1**

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt3.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 5:06:39 PM)

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

MATCH LINE A SEE SHEET C1-OPTION 3



MATCH LINE C SEE SHEET C3-OPTION 3

PROPOSED 12" HDPE
DRAINAGE FORCE MAIN

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

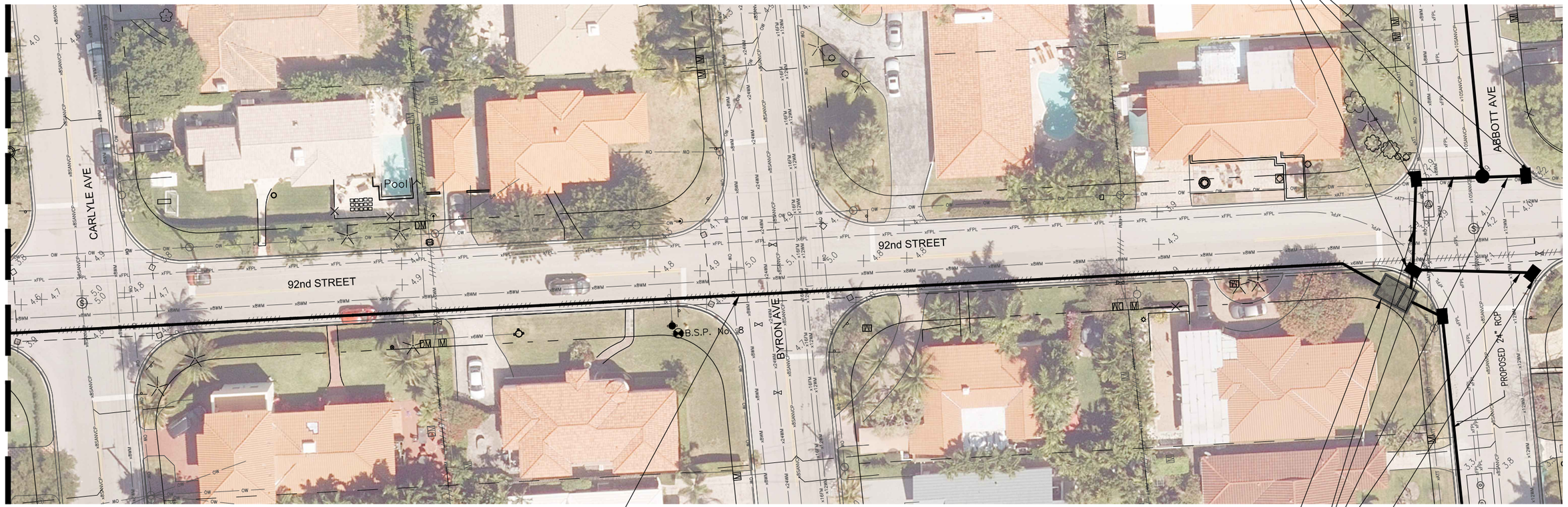
SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C2

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED



PROPOSED 12" HDPE DRAINAGE FORCE MAIN

PROPOSED LIFT STATION

PROPOSED 18" PIPE

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.,
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN
PROJECT No: 181160
SHEET: **C3**

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C4

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: **C5**

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

PROPOSED LIFT STATION

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

MATCH LINE EC SEE SHEET C5-OPTION 3

MATCH LINE E SEE SHEET C7-OPTION 3

92nd STREET

ABBOTT AVE

PROPOSED 24" RCP

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

PROPOSED 18" PIPE

PROPOSED 24" RCP

PROPOSED 18" RCP

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C6

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt3.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 5:08:48 PM)

GRAPHIC SCALE

0 10 20 40

(IN FEET)
1" = 40'

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

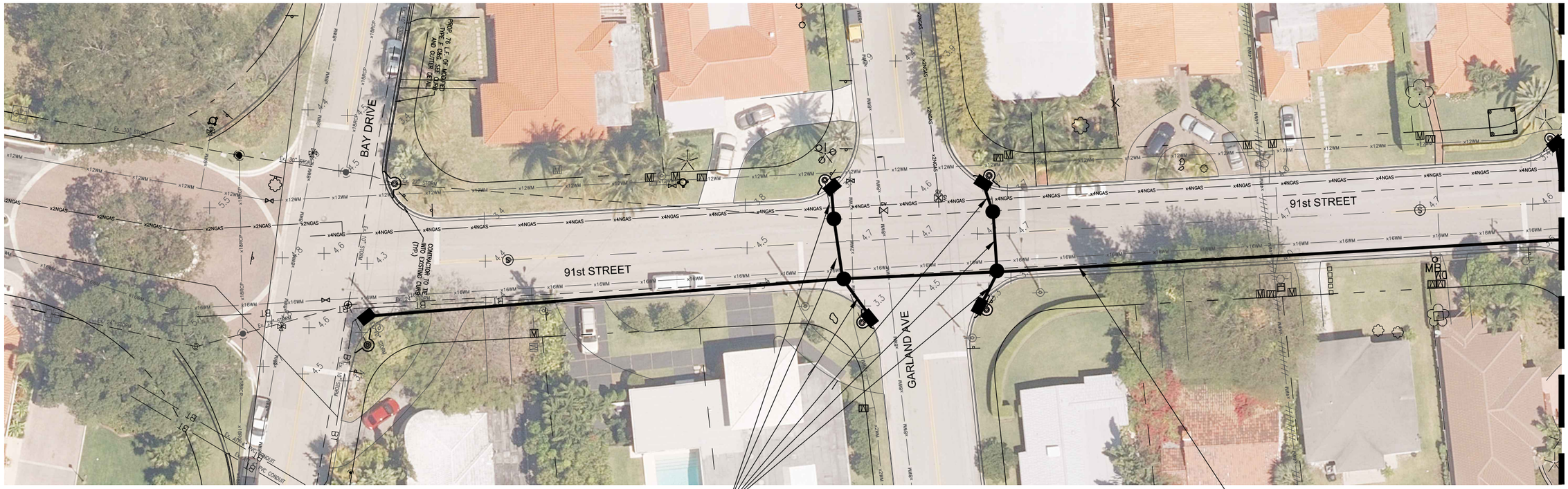
SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C7

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt3.dwg -- (Plotted by: Katharine Kupsky on Friday, October 12, 2018 5:09:13 PM)

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'



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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

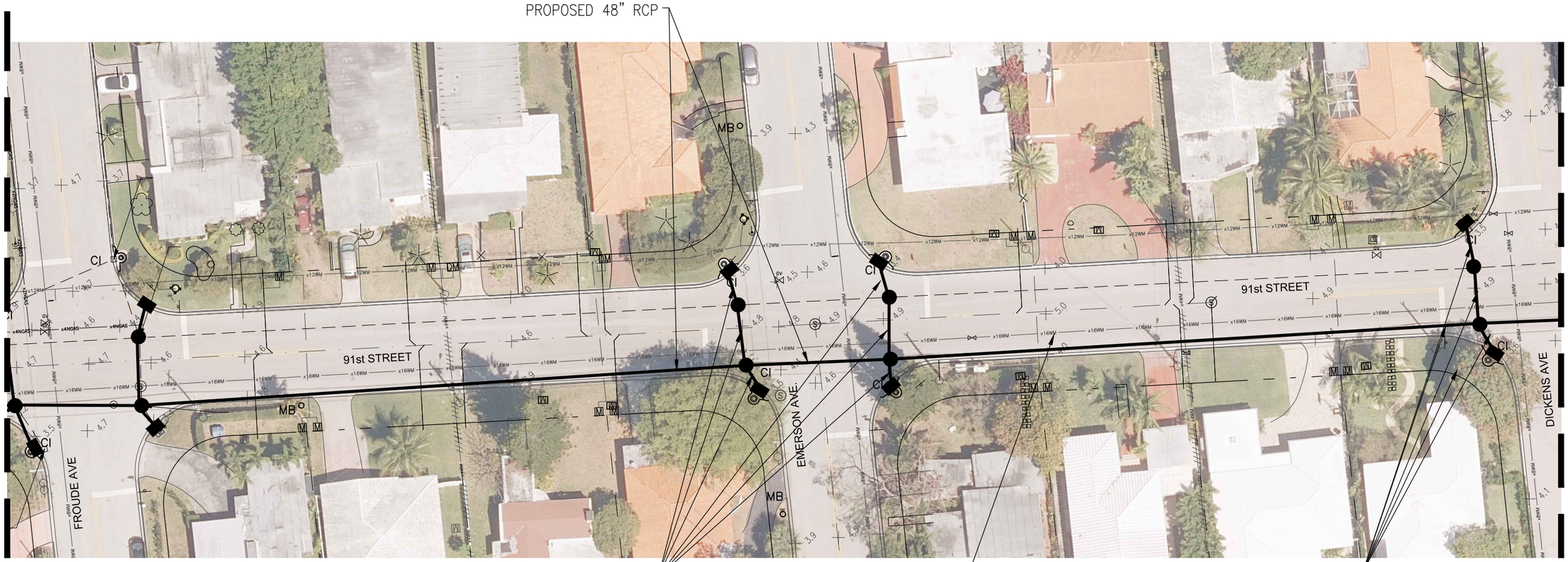
PROJECT No: 181160

SHEET: **C8**

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt3.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 5:09:38 PM)

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

PROPOSED 48" RCP



PROPOSED 18" RCP

PROPOSED 48" RCP

PROPOSED 18" RCP

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C9

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

PROPOSED 18" RCP

PROPOSED 18" RCP

PROPOSED 18" RCP

SEE SHEET C9-OPTION 3

MATCH LINE G

SEE SHEET C11-OPTION 3

MATCH LINE H

91st STREET

91st STREET

CARLYLE AVE

BYRON AVE

PROPOSED 48" RCP

PROPOSED 48" RCP

PROPOSED 48" RCP

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.,
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

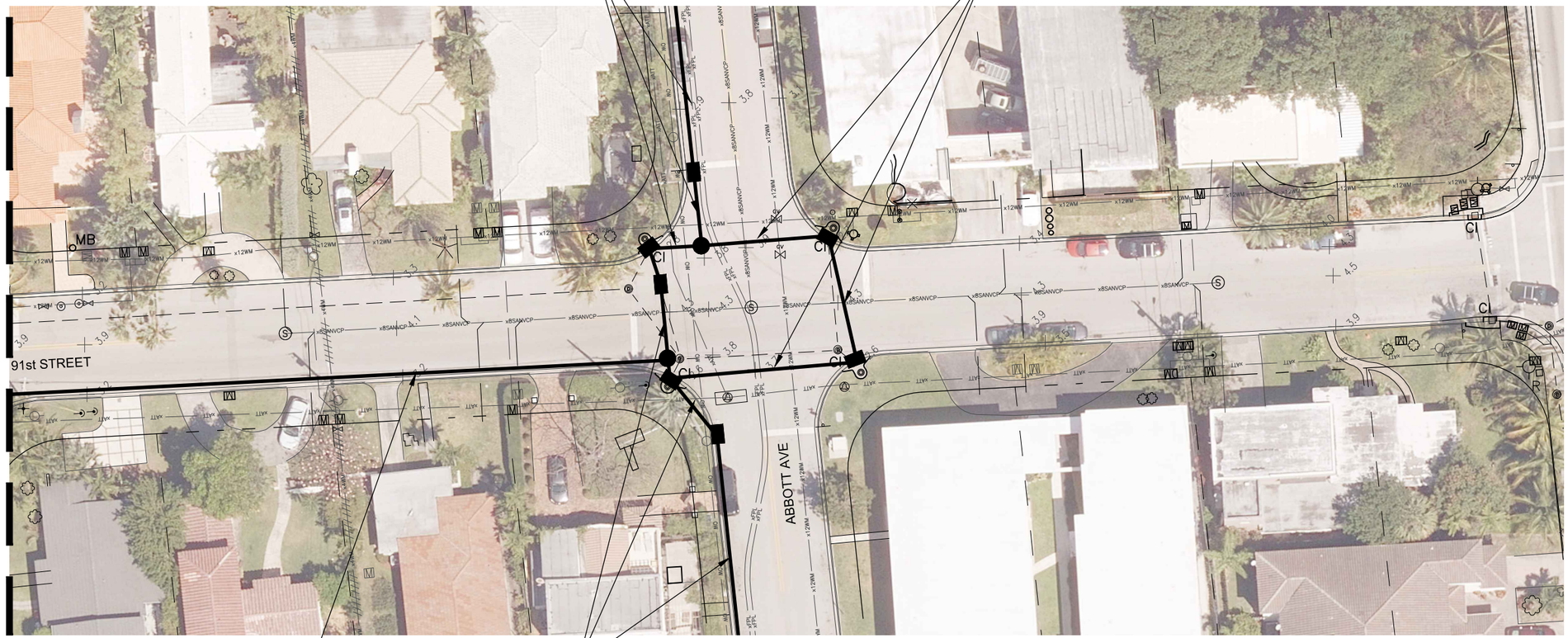
SHEET: **C10**

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181160_C-STRM-opt3.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 5:10:27 PM)

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1" = 40'

PROPOSED 24" RCP

PROPOSED 18" RCP



PROPOSED 48" RCP

PROPOSED 24" RCP

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

OPTION 3
PROPOSED DRAINAGE IMPROVEMENTS DETAILS

MOHAMMED SHARIFUZZAMAN, P.E.,
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: C11

EXHIBIT 10

PROPOSED DRAINAGE IMPROVEMENTS

COST ESTIMATES

Calvin, Giordano & Associates, Inc.
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(phone) 954.921.7781 · (fax) 954.266.6487
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ENGINEER'S OPINION
OF PROBABLE COST
WORKSHEET

DATE
12/3/2018

PROJECT TITLE	CG&A PROJECT NO.
Abbott Avenue Drainage Improvements-OPTION 1	18-1160
Order of Magnitude Cost Estimate	

LOCATION

Surfside, FL

ESTIMATED BY MS | **CHECKED BY MS** | **APPROVED BY MS**

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE MAT. & LAB	ESTIMATED AMOUNT
1	Mobilization	1	LS	5%	$26,905.00
2	Maintenance of Traffic	1	LS	$10,000.00	$10,000.00
3	Pavement Marking & Signage	1	LS	$5,000.00	$5,000.00
4	Landscape and Irrigation	1	LS	$10,000.00	$10,000.00
5	Clearing & Grubbing	1	LS	$20,000.00	$20,000.00
6	Erosion Control	1	LS	$5,000.00	$5,000.00
7	Storm Inlets	17	EA	$4,000.00	$68,000.00
8	Storm Manholes	5	EA	$4,000.00	$20,000.00
9	15"/18" RCP w/ Trench Restoration	400	LF	$62.00	$24,800.00
10	24" RCP w/ Trench Restoration	900	LF	$73.00	$65,700.00
11	48" RCP w/ Trench Restoration	0	LF	$150.00	$0.00
12	Milling & Resurface	1	LS	$20,000.00	$20,000.00
13	Drainage Pump Station	1	LS	$100,000.00	$100,000.00
14	12" HDPE Drainage FM	2,000	LF	$85.00	$170,000.00
15	Modified Curb & Gutter	900	LF	$19.00	$17,100.00
16	Swale / SOD restoration	1,000	SY	$2.50	$2,500.00
17	Utiity Adjustment/Relocation	1	LS	$100,000.00	$100,000.00
				SUBTOTAL	**$665,005.00**
				TOTAL	**$665,005.00**
				20% Contingency =	**$133,001.00**
				Design/Permitting Services(13%)=	**$103,740.78**
				Construction Engineering & Inspection Services (10%)=	**$79,800.60**
				Cost Total	**$981,547.38**

MOHAMMED SHARIFUZZAMAN, P.E.
State of Florida Professional Engineer
Florida Registration No. 67640

PAY ITEM NOTES:

1. Pay Item for Clearing and Grubbing includes, but not limited to, removal of asphaltic concrete, sidewalks, curbs, curb and gutter
2. Pay Item for Pipe/culvert includes, but not limited to, construction dewatering, concrete jacket, concrete collar, connection to exist. pipes
3. Pay Item for Erosion Control includes, but not limited to, Silt fence, Floating Turbidity Barrier, Inlet Protection Systems, NPDES permitting
4. Pay Item for Pavement Marking and Signage includes, but not limited to, removal of signs, relocation of signs, installation of signs, restoration of pavement markings and RPMs
5. Pay Item for Landscape and Irrigation includes, but not limited to, Root Pruning, Tree Removal, Tree Relocation, Storage and Disposal, Coordination w/ Town of Surfside, Permitting for Tree removal/relocation, Removal/Relocation/Reconstruction of Irrigation facilities

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ENGINEER'S OPINION
OF PROBABLE COST
WORKSHEET

DATE
12/3/2018

PROJECT TITLE	CG&A PROJECT NO.
Abbott Avenue Drainage Improvements-OPTION 2	18-1160
Order of Magnitude Cost Estimate	

LOCATION

Surfside, FL

ESTIMATED BY MS | **CHECKED BY MS** | **APPROVED BY MS**

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE MAT. & LAB	ESTIMATED AMOUNT
1	Mobilization	1	LS	5%	$26,905.00
2	Maintenance of Traffic	1	LS	$10,000.00	$10,000.00
3	Pavement Marking & Signage	1	LS	$5,000.00	$5,000.00
4	Landscape and Irrigation	1	LS	$10,000.00	$10,000.00
5	Clearing & Grubbing	1	LS	$20,000.00	$20,000.00
6	Erosion Control	1	LS	$5,000.00	$5,000.00
7	Storm Inlets	17	EA	$4,000.00	$68,000.00
8	Storm Manholes	5	EA	$4,000.00	$20,000.00
9	15"/18" RCP w/ Trench Restoration	400	LF	$62.00	$24,800.00
10	24" RCP w/ Trench Restoration	900	LF	$73.00	$65,700.00
11	48" RCP w/ Trench Restoration	0	LF	$150.00	$0.00
12	Milling & Resurface	1	LS	$20,000.00	$20,000.00
13	Drainage Pump Station	1	LS	$100,000.00	$100,000.00
14	12" HDPE Drainage FM	2,000	LF	$85.00	$170,000.00
15	Modified Curb & Gutter	900	LF	$19.00	$17,100.00
16	Swale / SOD restoration	1,000	SY	$2.50	$2,500.00
17	Utiity Adjustment/Relocation	1	LS	$100,000.00	$100,000.00
18	3- 24" dia drainage wells and pump station system	1	LS	$500,000.00	$500,000.00
				SUBTOTAL	**$1,165,005.00**
				TOTAL	**$1,165,005.00**
				20% Contingency =	**$233,001.00**
				Design/Permitting Services(13%)=	**$181,740.78**
				Construction Engineering & Inspection Services(10%)=	**$139,800.60**
				Cost Total	**$1,719,547.38**

MOHAMMED SHARIFUZZAMAN, P.E.
State of Florida Professional Engineer
Florida Registration No. 67640

PAY ITEM NOTES:

1. Pay Item for Clearing and Grubbing includes, but not limited to, removal of asphaltic concrete, sidewalks, curbs, curb and gutter
2. Pay Item for Pipe/culvert includes, but not limited to, construction dewatering, concrete jacket, concrete collar, connection to exist. pipes
3. Pay Item for Erosion Control includes, but not limited to, Silt fence, Floating Turbidity Barrier, Inlet Protection Systems, NPDES permitting
4. Pay Item for Pavement Marking and Signage includes, but not limited to, removal of signs, relocation of signs, installation of signs, restoration of pavement markings and RPMs
5. Pay Item for Landscape and Irrigation includes, but not limited to, Root Pruning, Tree Removal, Tree Relocation, Storage and Disposal, Coordination w/ Town of Surfside, Permitting for Tree removal/relocation, Removal/Relocation/Reconstruction of Irrigation facilities

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ENGINEER'S OPINION
OF PROBABLE COST
WORKSHEET

DATE
12/3/2018

PROJECT TITLE	CG&A PROJECT NO.
Abbott Avenue Drainage Improvements-OPTION 3	18-1160
Order of Magnitude Cost Estimate	

LOCATION

Surfside, FL

ESTIMATED BY MS | **CHECKED BY MS** | **APPROVED BY MS**

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE MAT. & LAB	ESTIMATED AMOUNT
1	Mobilization	1	LS	5%	$53,122.10
2	Maintenance of Traffic	1	LS	$50,000.00	$50,000.00
3	Pavement Marking & Signage	1	LS	$20,000.00	$20,000.00
4	Landscape and Irrigation	1	LS	$30,000.00	$30,000.00
5	Clearing & Grubbing, Demolition	1	LS	$200,000.00	$200,000.00
6	Erosion Control	1	LS	$20,000.00	$20,000.00
7	Storm Inlets	12	EA	$4,000.00	$48,000.00
8	Storm Manholes	2	EA	$4,000.00	$8,000.00
9	15"/18" RCP w/ Trench Restoration	216	LF	$62.00	$13,392.00
10	24" RCP w/ Trench Restoration	900	LF	$73.00	$65,700.00
11	48" RCP w/ Trench Restoration	2,000	LF	$150.00	$300,000.00
12	Milling & Resurface	1	LS	$20,000.00	$20,000.00
13	Drainage Pump Station	1	LS	$100,000.00	$100,000.00
14	12" HDPE Drainage FM	2,000	LF	$85.00	$170,000.00
15	Modified Curb & Gutter	900	LF	$19.00	$17,100.00
16	Swale / SOD restoration	100	SY	$2.50	$250.00
17	Utiity Adjustment/Relocation	1	LS	$100,000.00	$100,000.00
18	3- 24" dia drainage wells and pump station system	1	LS	$300,000.00	$300,000.00
19	Additional Drainage Structures	44	EA	$8,000.00	$352,000.00
20	Additional Roadway Restoration	1	LS	$500,000.00	$500,000.00
21	Additional Utility Relocation/Adjustment	1	LS	$1,000,000.00	$1,000,000.00
				SUBTOTAL	**$3,367,564.10**
				TOTAL	**$3,367,564.10**
				20% Contingency =	**$673,512.82**
				Design/Permitting Services(13%)=	**$525,340.00**
				Construction Engineering & Inspection Services(10%)=	**$404,107.69**
				Cost Total	**$4,970,524.61**

MOHAMMED SHARIFUZZAMAN, P.E.
State of Florida Professional Engineer
Florida Registration No. 67640

PAY ITEM NOTES:

1. Pay Item for Clearing and Grubbing includes, but not limited to, removal of asphaltic concrete, sidewalks, curbs, curb and gutter
2. Pay Item for Pipe/culvert includes, but not limited to, construction dewatering, concrete jacket, concrete collar, connection to exist. pipes
3. Pay Item for Erosion Control includes, but not limited to, Silt fence, Floating Turbidity Barrier, Inlet Protection Systems, NPDES permitting
4. Pay Item for Pavement Marking and Signage includes, but not limited to, removal of signs, relocation of signs, installation of signs, restoration of pavement markings and RPMs
5. Pay Item for Landscape and Irrigation includes, but not limited to, Root Pruning, Tree Removal, Tree Relocation, Storage and Disposal, Coordination w/ Town of Surfside, Permitting for Tree removal/relocation, Removal/Relocation/Reconstruction of Irrigation facilities

EXHIBIT 11

FIELD PICTURES

ABBOTT AVE CLOSURE AT 94TH STREET

ABBOTT AVE AND 92ND STREET INTERSECTION, PROPOSED PUMP STATION LOCATION (OPTION-2)

ABBOTT AVE AT 92ND STREET (LOOKING SOUTH)

ABBOTT AVENUE AT 92ND STREET (LOOKING NORTH)

EXISTING GAS MAIN, WATER MAIN, FPL AND AT&T DUCT BANKS ALONG ABBOTT AVE

ABBOTT AVENUE AT 91ST STREET (LOOKING NORTH)

FPL POLES BEHIND BACK OF CURB, ABBOTT AVENUE AT 91st STREET

TYPICAL HOUSES ALONG ABBOTT AVENUE, FFE MAINTAINED BY STEPS

92ND STREET AT BAY DRIVE, PROPOSED NEW PUMP STATION AND DRAINAGE WELLS LOCATION (OPTION-3)

EXISTING PUMP STATION AT 92ND STREET, CURRENTLY NOT IN SERVICE

EXHIBIT 12

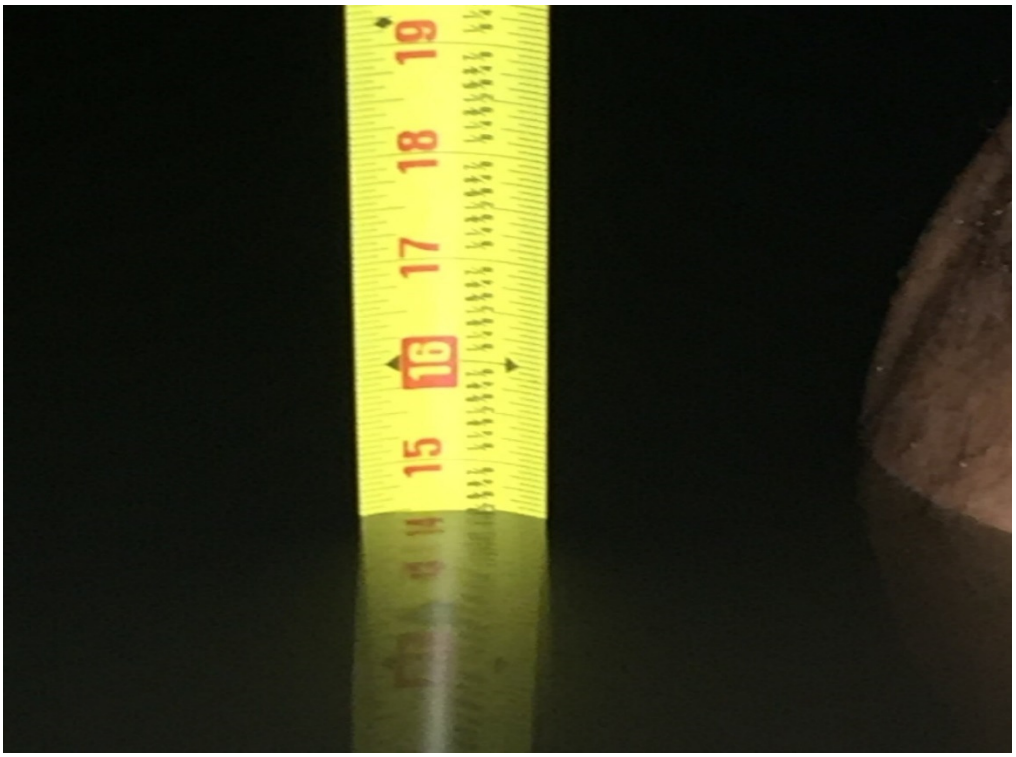
FLOOD PICTURES

ABBOTT AVE, SEPTEMBER 26, 2016
(ESTIMATED 1.0 INCH OF RAIN PER SFWMD RAINFALL DATA)

ABBOTT AVE, OCTOBER 15, 2016
(ESTIMATED 3.0 INCHES OF RAIN PER SFWMD RAINFALL DATA)

92ND STREET AT ABBOTT AVE INTERSECTION, JULY 24, 2016
(ESTIMATED 1.50 INCHES OF RAIN PER SFWMD RAINFALL DATA)

ABBOTT AVE, SEPTEMBER 5, 2016
(ESTIMATED 1.0 INCH OF RAIN PER SFWMD RAINFALL DATA)



91ST STREET AT ABBOTT AVE INTERSECTION, OCTOBER 3, 2016
(ESTIMATED 3.0 INCHES OF RAIN PER SFWMD RAINFALL DATA)

ABBOTT AVE AT 91ST STREET, OCTOBER 3, 2016
(ESTIMATED 3.0 INCHES OF RAIN PER SFWMD RAINFALL DATA)

ABBOTT AVE, JULY 23, 2018
(ESTIMATED 1.0 INCHES OF RAIN PER SFWMD RAINFALL DATA)

ABBOTT AVE, JUNE 7, 2017
(ESTIMATED 1.5 INCHES OF RAIN PER SFWMD RAINFALL DATA)

APPENDIX A

ROADWAY SPREAD CALCULATIONS

Name of The Project: ABBOTT AVE DRAINAGE STUDY (TYPICAL EXISTING SPREAD CONDITIONS)

Q (cfs) = (0.56/n)*S_x^(1.67)*S^(0.5)*T^(2.67)

Q_i = Q[$R_f E_0$ + R_s(1-E_0)], (Equation 11, Chapter 7, Hec-12, March 1984) for Inlets on Grade.

R_f = 1-0.09(V-V_0),

E_0 = 1-(1-W/T)$^{2.67}$,

R_s = 1/[1+0.15$V^{1.8}$/$S_x L^{2.3}$]

In Sag $Q_i = C_W(L+1.8W)d^{1.5}$ Hec-12 Eq. 19

C_W = 2.3

n= 0.016

Impervious, C = 0.95 Pervious C = 0.25 Single Residential Family, C = 0.60 Comm. Development, C = 0.80

From Station	To Station	Str Sta	Side LT/RT	Str. No.	Imp. Width (ft)	Perv. Width (ft)	SRF Width (ft)	Comm. Development (ft)	Flow Length (ft)	Wt. Coef. Of Runoff	Area (acres)	I Intensity (in/hr)	Q in/hr (cfs)	Q_i in/hr (cfs)	Inlet Bypass (cfs)	S_x Cross Slope (ft/ft)	S Long. Slope (ft/ft)	T_{calc} Spread (ft)	$T_{allowable}$ Spread (ft)	Comments
P-6 Inlets																				
0	330	300+00	LT	S-1	18	7	112	0	330	0.63	1.04	4.00	2.68			3.00%	0.20%	10.95	9.25	P-6 in Sag
330	605	300+00	LT	S-1	18	7	112	0	275	0.63	0.86	4.00	2.24	9.85	0.00	3.00%	0.20%	10.24	9.25	P-6 in Sag

Name of The Project: ABBOTT AVE DRAINAGE STUDY (TYPICAL PROPOSED SPREAD CONDITIONS)

Q (cfs) = (0.56/n)*S_x^(1.67)*S^(0.5)*T^(2.67)

Q_i = Q[$R_f E_0$ + R_s(1-E_0)], (Equation 11, Chapter 7, Hec-12, March 1984) for Inlets on Grade.

R_f = 1-0.09(V-V_0),

E_0 = 1-(1-W/T)$^{2.67}$,

R_s = 1/[1+0.15$V^{1.8}$/$S_x L^{2.3}$]

In Sag $Q_i = C_W(L+1.8W)d^{1.5}$ Hec-12 Eq. 19

C_W = 2.3

n= 0.016

Impervious, C = 0.95 **Pervious C = 0.25** **Single Residential Family, C = 0.60** **Comm. Development, C = 0.80**

From Station	To Station	Str Sta	Side LT/RT	Str. No.	Imp. Width (ft)	Perv. Width (ft)	SRF Width (ft)	Comm. Development (ft)	Flow Length (ft)	Wt. Coef. Of Runoff	Area (acres)	I Intensity (in/hr)	Q in/hr (cfs)	Q_i in/hr (cfs)	Inlet Bypass (cfs)	S_x Cross Slope (ft/ft)	S Long. Slope (ft/ft)	T_{calc} Spread (ft)	$T_{allowable}$ Spread (ft)	Comments
P-6 Inlets																				
0	165	300+00	LT	S-1	18	7	112	0	165	0.63	0.52	4.00	1.37			3.00%	0.20%	8.52	9.25	P-6 in Sag
165	330	300+00	LT	S-1	18	7	112	0	165	0.63	0.52	4.00	1.37	9.85	0.00	3.00%	0.20%	8.52	9.25	P-6 in Sag

APPENDIX B

STORM DRAIN SYSTEM CALCULATIONS

STORM SEWER HYDRAULICS

System: **1**

PROJECT			
Number:	TOWN OF SURFSIDE	Organization:	CALVIN, GIORDANO and ASSOCIATE
Description:	Drainage Study	Designed by:	MS
County:	MIAMI-DADE	Checked by:	MS

CONDITIONS					
Outfall Tailwater El:	1.60	Storm Event - IDF Curve		Runoff Coeff. (default)		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	1.60	10	3	0.90	0.20	0.00

HGL method: Do NOT jump to pipe crown.

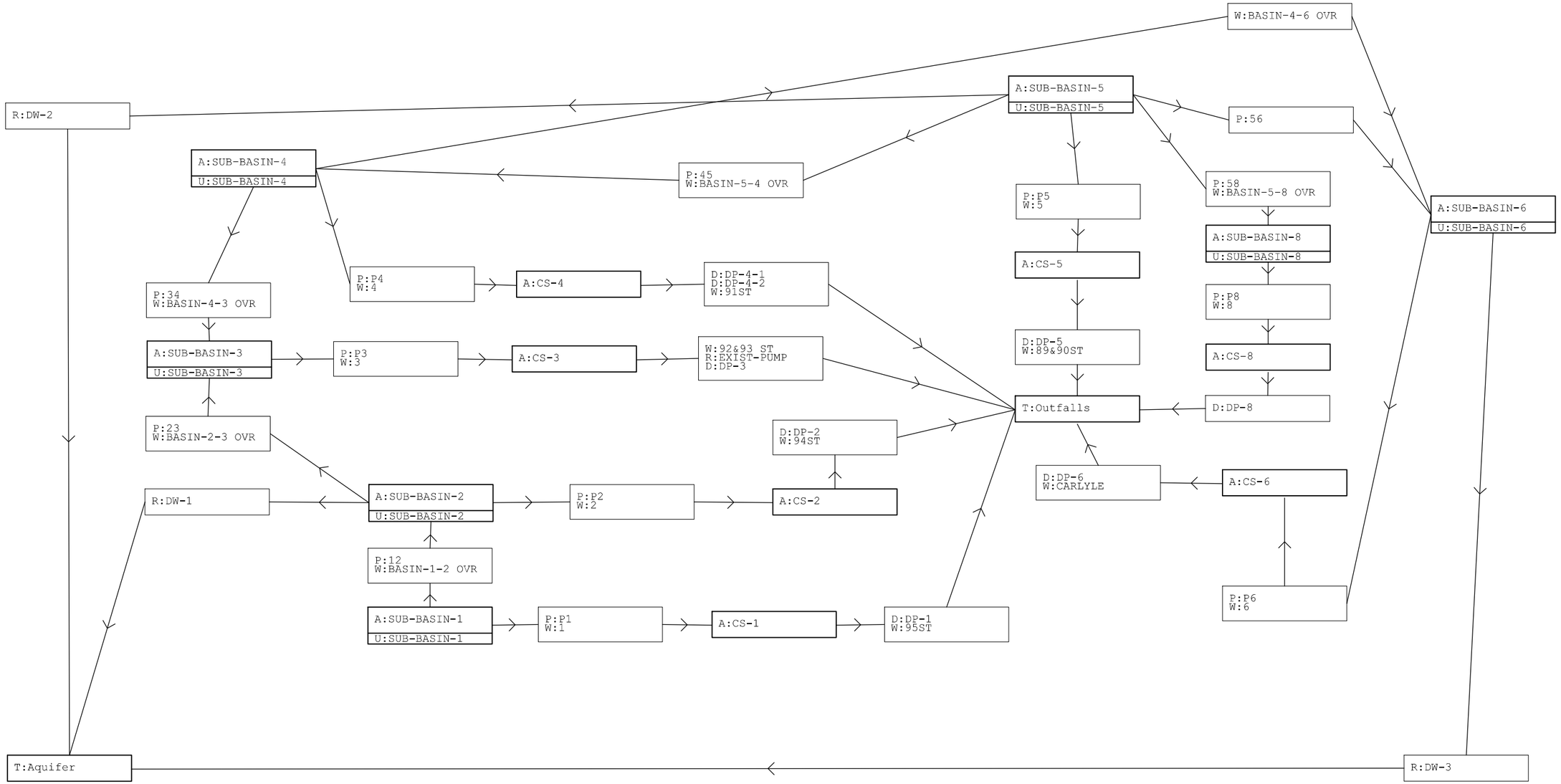
FROM / TO			Drainage Areas				Tc	Travel Time	Inten.	Total CA	Flow (cfs)		Inlet Elevations		Pipe Elevations		Fall	Pipe	HGL	Flow	Velocity	Capacity	Mann'g
Station		Offset	Area	Runoff	C*A	Lcl CA					Qb	Sum(Qb)	Inlet	HGL	HGL			Height	(%)	Type	Actual		'N'
Type	Brls	Len		Coeff		UpStrm						CIA		Min HGL	Crown Line			Width	FL		Physical		
			(A)	(C)	(CA)	Tot CA	(min)	(min)	(in/hr)	(ac)		**TOTAL**	Clear.	Jnc Loss	Flow Line		(ft)	(in)	(%)		(fps)	(cfs)	
S-1		**S-2**	2.93	0.90	2.63	2.91					0.00	0.00	2.80	3.58	3.58	3.56	0.018	48.00	0.0066	Full	1.01		
		0.00	1.38	0.20	0.27	0.00	30.00	2.25	4.35	2.91		12.66		0.00	0.00	0.00						0.00	0.0120
P-6	1	270.00	0.00	0.00	0.00	2.91						**12.66**	-0.78	0.00	-4.00	-4.00	0.000	48.00	0.0000		0.00		
S-2		**S-3**	2.93	0.90	2.63	2.91					0.00	0.00	4.00	3.56	3.56	3.50	0.067	48.00	0.0246	Full	1.94		
		0.00	1.38	0.20	0.27	2.91	32.25	2.25	4.19	5.82		24.42		0.00	0.00	0.00						0.00	0.0120
P-6	1	270.00	0.00	0.00	0.00	5.82						**24.42**	0.44	0.00	-4.00	-4.00	0.000	48.00	0.0000		0.00		
S-3		**S-4**	2.93	0.90	2.63	2.91					0.00	0.00	3.90	3.50	3.50	3.36	0.140	48.00	0.0517	Full	2.82		
		0.00	1.38	0.20	0.27	5.82	34.50	1.60	4.05	8.73		35.39		0.00	0.00	0.00						0.00	0.0120
P-6	1	270.00	0.00	0.00	0.00	8.73						**35.39**	0.40	0.00	-4.00	-4.00	0.000	48.00	0.0000		0.00		
S-4		**S-5**	2.93	0.90	2.63	2.91					0.00	0.00	3.70	3.36	3.36	3.12	0.237	48.00	0.0877	Full	3.67		
		0.00	1.38	0.20	0.27	8.73	36.10	1.23	3.96	11.65		46.09		0.00	0.00	0.00						0.00	0.0120
P-6	1	270.00	0.00	0.00	0.00	11.65						**46.09**	0.34	0.00	-4.00	-4.00	0.000	48.00	0.0000		0.00		
S-5		**S-6**	2.93	0.90	2.63	2.91					0.00	0.00	3.50	3.12	3.12	2.76	0.357	48.00	0.1323	Full	4.50		
		0.00	1.38	0.20	0.27	11.65	37.32	1.00	3.89	14.56		56.60		0.00	0.00	0.00						0.00	0.0120
P-6	1	270.00	0.00	0.00	0.00	14.56						**56.60**	0.38	0.00	-4.00	-4.00	0.000	48.00	0.0000		0.00		
S-6		**S-7**	2.93	0.90	2.63	2.91					0.00	0.00	2.80	2.76	2.76	2.26	0.500	48.00	0.1852	Full	5.33		
		0.00	1.38	0.20	0.27	14.56	38.32	0.84	3.83	17.47		66.97		0.00	0.00	0.00						0.00	0.0120
P-6	1	270.00	0.00	0.00	0.00	17.47						**66.97**	0.04	0.00	-4.00	-4.00	0.000	48.00	0.0000		0.00		
S-7		**S-8**	2.93	0.90	2.63	2.91					0.00	0.00	4.00	2.26	2.26	1.60	0.665	48.00	0.2462	Full	6.14		
		0.00	1.38	0.20	0.27	17.47	39.17	0.00	3.79	20.39		77.21		0.00	0.00	0.00						0.00	0.0120
P-6	1	270.00	0.00	0.00	0.00	20.39						**77.21**	1.74	0.00	-4.00	-4.00	0.000	48.00	0.0000		0.00		

Units: ENGLISH

APPENDIX C

ICPR MODEL FOR EXISTING CONDITIONS

Node-Reach Diagram
ICPR Input Data
Node Maximum Report
Link Maximum Report



File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\PRE NODE REACH.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 2:05:16 PM)

NO	DATE	REVISION	BY	NO	DATE	REVISION	BY

Calvin, Giordano & Associates, Inc.
EXCEPTIONAL SOLUTIONS
1800 Eller Drive, Suite 600, Fort Lauderdale, Florida 33316
Phone: 954.921.7781 • Fax: 954.921.8807
Certificate of Authorization 514

SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

ICPR MODEL - EXISTING CONDITIONS NODE REACH DIAGRAM

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: ----

==========
==== Basins ==========
==========

Name: SUB-BASIN-1 Node: SUB-BASIN-1 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 27.810 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-2 Node: SUB-BASIN-2 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 30.400 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-3 Node: SUB-BASIN-3 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 41.040 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-4 Node: SUB-BASIN-4 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.390 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-5 Node: SUB-BASIN-5 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.600 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-6 Node: SUB-BASIN-6 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 54.600 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-8 Node: SUB-BASIN-8 Status: Onsite

Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 30.00
Area(ac): 7.240 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Nodes

Name: Aquifer Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	-60.000
99999.00	-60.000

Name: CS-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000

8.000	0.0001	

Name: CS-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: Outfalls Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	1.600
99999.00	1.600

Name: SUB-BASIN-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.090	0.0000
8.000	19.3100

Name: SUB-BASIN-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.690	0.0000
8.000	21.1000

Name: SUB-BASIN-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.690	0.0000
8.000	28.0000

Name: SUB-BASIN-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.120	0.0000
8.000	23.0000

Name: SUB-BASIN-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.110	0.0000
8.000	19.5000

Name: SUB-BASIN-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.060	0.0000
8.000	32.7500

Name: SUB-BASIN-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.330	0.0000
8.000	4.8400

==========
==== Cross Sections ====
==========

Name: SECTION 1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	3.250	0.016000
18.000	3.800	0.016000
36.000	3.250	0.016000

==========
==== Operating Tables ====
==========

Name: DRAINAGE WELLS Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

DRAINAGE WELL CAPACITY: 500 GPM/FT. OF AVAILABLE HEAD

US Stage(ft)	Discharge(cfs)
1.900	7.70
8.000	7.70

Name: EXIST-PUMP Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)

2.000	14.20
8.000	14.20

Pipes

Name: 12	From Node: Sub-Basin-1	Length(ft): 650.00	
Group: BASE	To Node: Sub-Basin-2	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM / DOWNSTREAM	Solution Algorithm: Automatic	
Geometry: Circular	Circular	Flow: Both	
Span(in): 18.00	18.00	Entrance Loss Coef: 0.00	
Rise(in): 18.00	18.00	Exit Loss Coef: 1.00	
Invert(ft): -1.500	-1.500	Bend Loss Coef: 0.00	
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in): 0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 23	From Node: Sub-Basin-2	Length(ft): 800.00	
Group: BASE	To Node: Sub-Basin-3	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM / DOWNSTREAM	Solution Algorithm: Automatic	
Geometry: Circular	Circular	Flow: Both	
Span(in): 18.00	18.00	Entrance Loss Coef: 0.00	
Rise(in): 18.00	18.00	Exit Loss Coef: 1.00	
Invert(ft): -1.500	-1.500	Bend Loss Coef: 0.00	
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in): 0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 34	From Node: Sub-Basin-4	Length(ft): 800.00	
Group: BASE	To Node: Sub-Basin-3	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM / DOWNSTREAM	Solution Algorithm: Automatic	
Geometry: Circular	Circular	Flow: Both	
Span(in): 18.00	18.00	Entrance Loss Coef: 0.00	
Rise(in): 18.00	18.00	Exit Loss Coef: 1.00	
Invert(ft): -1.500	-1.500	Bend Loss Coef: 0.00	
Manning's N: 0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in): 0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in): 0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 45	From Node: Sub-Basin-5	Length(ft): 800.00	
Group: BASE	To Node: Sub-Basin-4	Count: 1	
		Friction Equation: Automatic	
	UPSTREAM / DOWNSTREAM	Solution Algorithm: Automatic	
Geometry: Circular	Circular	Flow: Both	
Span(in): 18.00	18.00	Entrance Loss Coef: 0.00	
Rise(in): 18.00	18.00	Exit Loss Coef: 1.00	

Invert(ft):	-1.500	-1.500	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 56 From Node: Sub-Basin-5 Length(ft): 250.00
Group: BASE To Node: Sub-Basin-6 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 58 From Node: Sub-Basin-5 Length(ft): 550.00
Group: BASE To Node: Sub-Basin-8 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-4.320	-1.120	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P1 From Node: Sub-Basin-1 Length(ft): 600.00
Group: BASE To Node: CS-1 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	15.00	15.00	Flow:	Both
Rise(in):	15.00	15.00	Entrance Loss Coef:	0.00
Invert(ft):	-0.820	-1.830	Exit Loss Coef:	1.00
Manning's N:	0.020000	0.020000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P2	From Node:	Sub-Basin-2	Length(ft):	600.00
Group:	BASE	To Node:	CS-2	Count:	1
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	12.00	12.00		Entrance Loss Coef:	0.00
Rise(in):	12.00	12.00		Exit Loss Coef:	1.00
Invert(ft):	-0.210	-2.740		Bend Loss Coef:	0.00
Manning's N:	0.020000	0.020000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P3	From Node:	Sub-Basin-3	Length(ft):	600.00
Group:	BASE	To Node:	CS-3	Count:	1
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	12.00	12.00		Entrance Loss Coef:	0.00
Rise(in):	12.00	12.00		Exit Loss Coef:	1.00
Invert(ft):	-0.630	-2.330		Bend Loss Coef:	0.00
Manning's N:	0.020000	0.020000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P4	From Node:	Sub-Basin-4	Length(ft):	600.00
Group:	BASE	To Node:	CS-4	Count:	2
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	24.00	24.00		Entrance Loss Coef:	0.00
Rise(in):	24.00	24.00		Exit Loss Coef:	1.00
Invert(ft):	-0.630	-2.330		Bend Loss Coef:	0.00
Manning's N:	0.013000	0.013000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P5	From Node:	Sub-Basin-5	Length(ft):	250.00
Group:	BASE	To Node:	CS-5	Count:	1
				Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	12.00	12.00		Entrance Loss Coef:	0.00
Rise(in):	12.00	12.00		Exit Loss Coef:	1.00
Invert(ft):	0.420	-4.320		Bend Loss Coef:	0.00
Manning's N:	0.020000	0.020000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P6		From Node: Sub-Basin-6	Length(ft):	600.00
Group: BASE		To Node: CS-6	Count:	1
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	36.00	36.00	Entrance Loss Coef:	0.00
Rise(in):	36.00	36.00	Exit Loss Coef:	1.00
Invert(ft):	0.880	-1.730	Bend Loss Coef:	0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P8		From Node: Sub-Basin-8	Length(ft):	250.00
Group: BASE		To Node: CS-8	Count:	2
			Friction Equation:	Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm:	Automatic
Geometry:	Circular	Circular	Flow:	Both
Span(in):	12.00	12.00	Entrance Loss Coef:	0.00
Rise(in):	12.00	12.00	Exit Loss Coef:	1.00
Invert(ft):	-1.200	-1.580	Bend Loss Coef:	0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==========
==== Drop Structures ==========
==========

Name: DP-1		From Node: CS-1	Length(ft):	100.00
Group: BASE		To Node: Outfalls	Count:	1
	UPSTREAM	DOWNSTREAM	Friction Equation:	Automatic
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	15.00	15.00	Flow:	Positive
Rise(in):	15.00	15.00	Entrance Loss Coef:	0.000
Invert(ft):	-1.410	-1.830	Exit Loss Coef:	1.000
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-1 ***

TABLE

Count:	7	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600

Span(in): 48.00 Invert(ft): 2.000
Rise(in): 9.00 Control Elev(ft): 2.000

Name: DP-2 From Node: CS-2 Length(ft): 100.00
Group: BASE To Node: Outfalls Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	30.00	30.00	Flow:	Positive
Rise(in):	30.00	30.00	Entrance Loss Coef:	0.000
Invert(ft):	-2.740	-3.070	Exit Loss Coef:	1.000
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-2 ***

TABLE

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Positive Weir Disc Coef: 3.200
Geometry: Rectangular Orifice Disc Coef: 0.600

Span(in): 48.00 Invert(ft): 2.000
Rise(in): 9.00 Control Elev(ft): 2.000

Name: DP-3 From Node: CS-3 Length(ft): 100.00
Group: BASE To Node: Outfalls Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	24.00	24.00	Flow:	Positive
Rise(in):	24.00	24.00	Entrance Loss Coef:	0.000
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.000
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-3 ***

TABLE

Count: 1 Bottom Clip(in): 0.000
Type: Vertical: Mavis Top Clip(in): 0.000
Flow: Positive Weir Disc Coef: 3.200
Geometry: Rectangular Orifice Disc Coef: 0.600

Span(in): 48.00 Invert(ft): 2.100
Rise(in): 9.00 Control Elev(ft): 2.100

Name: DP-4-1 From Node: CS-4 Length(ft): 100.00
Group: BASE To Node: Outfalls Count: 1

	UPSTREAM	DOWNSTREAM		
			Friction Equation:	Automatic
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	24.00	24.00	Flow:	Positive
Rise(in):	24.00	24.00	Entrance Loss Coef:	0.000
Invert(ft):	-4.060	-2.300	Exit Loss Coef:	1.000
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
Bot Clip(in):	0.000	0.000	Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-4-2	From Node:	CS-4	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	30.00	30.00	Solution Algorithm:	Automatic
Rise(in):	30.00	30.00	Flow:	Positive
Invert(ft):	-1.070	-1.820	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-2 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-5	From Node:	CS-5	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Positive
Invert(ft):	-4.320	-2.470	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-5 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-6	From Node:	CS-6	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

```
              UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Circular       Circular                  Solution Algorithm: Automatic
     Span(in): 36.00          36.00                                Flow: Positive
     Rise(in): 36.00          36.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.730         -3.610                       Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-6 ***
                                                                                  TABLE
                 Count: 1                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Positive                Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 48.00                       Invert(ft): 2.000
              Rise(in): 9.00                  Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
         Name: DP-8                From Node: CS-8               Length(ft): 100.00
        Group: BASE                  To Node: Outfalls                Count: 2

              UPSTREAM       DOWNSTREAM                 Friction Equation: Automatic
     Geometry: Circular       Circular                  Solution Algorithm: Automatic
     Span(in): 15.00          15.00                                Flow: Positive
     Rise(in): 15.00          15.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.580         -1.580                       Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-8 ***
                                                                                  TABLE
                 Count: 2                      Bottom Clip(in): 0.000
                  Type: Vertical: Mavis           Top Clip(in): 0.000
                  Flow: Positive                Weir Disc Coef: 3.200
              Geometry: Rectangular           Orifice Disc Coef: 0.600

              Span(in): 48.00                       Invert(ft): 2.000
              Rise(in): 9.00                  Control Elev(ft): 2.000


=================================================================================================
==== Weirs ======================================================================================
=================================================================================================

         Name: 1                   From Node: Sub-Basin-1
        Group: BASE                  To Node: CS-1
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                   Span(in): 240.00
                   Rise(in): 99999.00
                 Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------
         Name: 2                   From Node: Sub-Basin-2
```

```
        Group: BASE                 To Node: CS-2
         Flow: Both                   Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------------
         Name: 3                 From Node: Sub-Basin-3
        Group: BASE                To Node: CS-3
         Flow: Both                  Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 4.200
       Control Elevation(ft): 4.200
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------------
         Name: 4                 From Node: Sub-Basin-4
        Group: BASE                To Node: CS-4
         Flow: Both                  Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------------
         Name: 5                 From Node: Sub-Basin-5
        Group: BASE                To Node: CS-5
         Flow: Both                  Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 4.700
       Control Elevation(ft): 4.700
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------------
         Name: 6                 From Node: Sub-Basin-6
        Group: BASE                To Node: CS-6
         Flow: Both                  Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 5.200
       Control Elevation(ft): 5.200
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
```

```
      Orifice Discharge Coef: 0.600


-------------------------------------------------------------------------------------------------
         Name: 8                  From Node: Sub-Basin-8
        Group: BASE                 To Node: CS-8
         Flow: Both                   Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


-------------------------------------------------------------------------------------------------
         Name: 89&90ST            From Node: CS-5
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 2
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 999999.00
                Invert(ft): 4.900
       Control Elevation(ft): 4.900
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


-------------------------------------------------------------------------------------------------
         Name: 91ST               From Node: CS-4
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 1
         Type: Vertical: Gravel    Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


-------------------------------------------------------------------------------------------------
         Name: 92&93 ST           From Node: CS-3
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 2
         Type: Vertical: Gravel    Geometry: Rectangular

                    Span(in): 180.00
                    Rise(in): 999999.00
                Invert(ft): 3.800
       Control Elevation(ft): 3.800
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


-------------------------------------------------------------------------------------------------
         Name: 94ST               From Node: CS-2
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 999999.00
```

```
                Invert(ft): 4.600
      Control Elevation(ft): 4.600
                                          TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
        Name: 95ST               From Node: CS-1
       Group: BASE                 To Node: Outfalls
        Flow: Both                   Count: 1
        Type: Vertical: Paved     Geometry: Rectangular

                  Span(in): 240.00
                  Rise(in): 999999.00
                Invert(ft): 4.550
      Control Elevation(ft): 4.550
                                          TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
        Name: BASIN-1-2 OVR      From Node: SUB-BASIN-1
       Group: BASE                 To Node: SUB-BASIN-2
        Flow: Both                   Count: 1
        Type: Vertical: Paved     Geometry: Rectangular

                  Span(in): 420.00
                  Rise(in): 9999.00
                Invert(ft): 4.100
      Control Elevation(ft): 4.100
                                          TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600

Bay Drive Roadway Overflow

-------------------------------------------------------------------------------------------------------
        Name: BASIN-2-3 OVR      From Node: SUB-BASIN-2
       Group: BASE                 To Node: SUB-BASIN-3
        Flow: Both                   Count: 1
        Type: Vertical: Paved     Geometry: Rectangular

                  Span(in): 420.00
                  Rise(in): 999.00
                Invert(ft): 4.500
      Control Elevation(ft): 4.500
                                          TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
        Name: BASIN-4-3 OVR      From Node: SUB-BASIN-4
       Group: BASE                 To Node: SUB-BASIN-3
        Flow: Both                   Count: 1
        Type: Vertical: Paved     Geometry: Irregular

                     XSec: SECTION 1
                Invert(ft): 3.250
      Control Elevation(ft): 3.250
     Struct Opening Dim(ft): 9999.00
                                          TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
        Weir Discharge Coef: 3.200
     Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
        Name: BASIN-4-6 OVR      From Node: SUB-BASIN-4
```

```
        Group: BASE                 To Node: SUB-BASIN-6
         Flow: Both                   Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 420.00
                    Rise(in): 999.00
                  Invert(ft): 4.000
       Control Elevation(ft): 4.000
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------------------------------
        Name: BASIN-5-4 OVR      From Node: SUB-BASIN-5
       Group: BASE                 To Node: SUB-BASIN-4
         Flow: Both                   Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 420.00
                    Rise(in): 999.00
                  Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------------------------------
        Name: BASIN-5-8 OVR      From Node: SUB-BASIN-5
       Group: BASE                 To Node: SUB-BASIN-8
         Flow: Both                   Count: 1
         Type: Vertical: Paved     Geometry: Rectangular

                    Span(in): 420.00
                    Rise(in): 999.00
                  Invert(ft): 3.500
       Control Elevation(ft): 3.500
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------------------------------
        Name: CARLYLE            From Node: CS-6
       Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 1
         Type: Vertical: Gravel    Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 999999.00
                  Invert(ft): 4.600
       Control Elevation(ft): 4.600
                                       TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



================================================================================================
==== Rating Curves ============================================================================
================================================================================================

        Name: DW-1               From Node: Sub-Basin-2            Count: 3
       Group: BASE                 To Node: Aquifer                 Flow: Positive

             TABLE           ELEV ON(ft)     ELEV OFF(ft)
          #1: Drainage Wells  2.000           1.600
          #2:                 0.000           0.000
          #3:                 0.000           0.000
          #4:                 0.000           0.000
```

Name: DW-2 From Node: Sub-Basin-5 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: DW-3 From Node: Sub-Basin-6 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: EXIST-PUMP From Node: CS-3 Count: 1
Group: BASE To Node: Outfalls Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	EXIST-PUMP	2.100	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

==========
==== Hydrology Simulations ==========
==========

Name: 005Y001H
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\005Y001H.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Fdot-1
Rainfall Amount(in): 3.20

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 005Y024H
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\005Y024H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 010Y024H
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\010Y024H.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 7.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 025Y072H
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\025Y072H.R32

Override Defaults: Yes

```
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 11.00

Time(hrs)       Print Inc(min)
--------------- ---------------
96.000          5.00

------------------------------------------------------------------------------------------------
         Name: 100Y072H
     Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\100Y072H.R32

      Override Defaults: Yes
    Storm Duration(hrs): 72.00
          Rainfall File: Sfwmd72
    Rainfall Amount(in): 15.00

Time(hrs)       Print Inc(min)
--------------- ---------------
96.000          5.00

------------------------------------------------------------------------------------------------
         Name: QUALITY
     Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\QUALITY.R32

      Override Defaults: Yes
    Storm Duration(hrs): 1.63
          Rainfall File: Scsiii
    Rainfall Amount(in): 1.58

Time(hrs)       Print Inc(min)
--------------- ---------------
12.000          1.00
24.000          15.00

================================================================================================
==== Routing Simulations ======================================================================
================================================================================================

         Name: 005Y001H           Hydrology Sim: 005Y001H
     Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\005Y001H.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 6.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         1.000

Group           Run
--------------- -----
BASE            Yes


------------------------------------------------------------------------------------------------
         Name: 005Y024H           Hydrology Sim: 005Y024H
     Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\005Y024H.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                    End Time(hrs): 48.00
     Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
        Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
```

BASE Yes

Name: 010Y024H Hydrology Sim: 010Y024H
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\010Y024H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 48.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	5.000
48.000	15.000

Group	Run
BASE	Yes

Name: 025Y072H Hydrology Sim: 025Y072H
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\025Y072H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 120.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: 100Y072H Hydrology Sim: 100Y072H
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\100Y072H.I32

Execute: No Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 120.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: QUALITY Hydrology Sim: QUALITY

Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\EXIST\QUALITY.I32

```
     Execute: No          Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 24.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:
```

Time(hrs)	Print Inc(min)
24.000	5.000

Group	Run
BASE	Yes

ABBOTT AVENUE DRAINAGE STUDY
ICPR MODEL FOR EXISTING CONDITIONS
NODE MAXIMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Aquifer	BASE	005Y001H	0.00	-60.00	1.60	-61.6000	0	0.45	69.30	0.00	0.00
Aquifer	BASE	005Y024H	0.00	-60.00	1.60	-61.6000	0	7.72	69.30	0.00	0.00
Aquifer	BASE	010Y024H	0.00	-60.00	1.60	-61.6000	0	6.94	69.30	0.00	0.00
Aquifer	BASE	025Y072H	0.00	-60.00	1.60	-61.6000	0	17.04	69.30	0.00	0.00
Aquifer	BASE	100Y072H	0.00	-60.00	1.60	-61.6000	0	12.90	69.30	0.00	0.00
Aquifer	BASE	QUALITY	0.00	-60.00	1.60	-61.6000	0	0.98	69.30	0.00	0.00
CS-1	BASE	005Y001H	2.72	2.09	8.00	0.0026	132	2.72	2.39	2.72	2.39
CS-1	BASE	005Y024H	14.87	2.11	8.00	0.0023	132	14.86	2.61	14.87	2.61
CS-1	BASE	010Y024H	14.66	2.12	8.00	0.0022	132	14.65	2.70	14.66	2.70
CS-1	BASE	025Y072H	62.31	2.14	8.00	0.0022	132	62.30	2.76	62.31	2.76
CS-1	BASE	100Y072H	62.81	2.76	8.00	0.0022	132	62.79	4.13	62.81	4.13
CS-1	BASE	QUALITY	1.82	2.07	8.00	0.0024	132	1.82	1.75	1.82	1.75
CS-2	BASE	005Y001H	1.56	2.21	8.00	0.0023	128	1.56	1.20	1.56	1.20
CS-2	BASE	005Y024H	14.86	2.23	8.00	-0.0027	128	14.86	1.41	14.86	1.41
CS-2	BASE	010Y024H	14.65	2.24	8.00	-0.0027	128	14.65	1.46	14.65	1.46
CS-2	BASE	025Y072H	62.30	2.25	8.00	-0.0026	128	62.30	1.63	62.30	1.63
CS-2	BASE	100Y072H	62.80	2.95	8.00	-0.0026	128	62.80	10.92	62.80	10.92
CS-2	BASE	QUALITY	6.97	2.00	8.00	-0.0023	128	1.89	0.45	0.00	0.00
CS-3	BASE	005Y001H	2.52	2.10	8.00	-0.0549	128	2.48	1.39	2.52	14.20
CS-3	BASE	005Y024H	14.52	2.10	8.00	-0.0549	128	14.52	2.03	14.52	14.20
CS-3	BASE	010Y024H	15.13	2.11	8.00	-0.0550	128	14.91	7.11	15.13	14.22
CS-3	BASE	025Y072H	63.11	2.76	8.00	-0.0551	128	63.11	21.00	63.11	21.00
CS-3	BASE	100Y072H	62.80	4.20	8.00	-0.0550	128	62.80	53.60	62.80	53.60
CS-3	BASE	QUALITY	2.31	2.10	8.00	-0.0551	128	2.23	1.09	2.31	14.20
CS-4	BASE	005Y001H	2.49	2.78	8.00	-0.0038	173	2.49	17.42	2.49	17.42
CS-4	BASE	005Y024H	14.55	2.88	8.00	0.0033	173	14.55	20.21	14.55	20.21
CS-4	BASE	010Y024H	14.93	2.91	8.00	0.0033	173	14.93	21.12	14.93	21.12
CS-4	BASE	025Y072H	63.11	2.98	8.00	0.0033	173	63.11	22.41	63.11	22.41
CS-4	BASE	100Y072H	62.80	3.66	8.00	-0.0039	173	62.80	30.05	62.80	30.05
CS-4	BASE	QUALITY	1.67	2.42	8.00	-0.0040	173	1.67	7.10	1.67	7.06
CS-5	BASE	005Y001H	1.71	2.25	8.00	-0.0036	119	1.71	1.59	1.71	1.59
CS-5	BASE	005Y024H	14.63	2.28	8.00	-0.0037	119	14.63	1.89	14.63	1.89
CS-5	BASE	010Y024H	15.00	2.30	8.00	-0.0037	119	15.00	2.06	15.00	2.06
CS-5	BASE	025Y072H	63.11	2.31	8.00	-0.0037	119	63.11	2.18	63.11	2.18
CS-5	BASE	100Y072H	62.81	4.40	8.00	-0.0037	119	62.79	15.95	62.81	15.95
CS-5	BASE	QUALITY	6.59	2.00	8.00	-0.0037	119	1.63	0.68	0.00	0.00
CS-6	BASE	005Y001H	1.75	3.06	8.00	0.0057	292	1.74	11.92	1.75	11.92
CS-6	BASE	005Y024H	14.88	3.38	8.00	-0.0104	158	14.87	14.49	14.88	14.49
CS-6	BASE	010Y024H	14.93	3.54	8.00	-0.0108	158	14.93	15.58	14.93	15.58
CS-6	BASE	025Y072H	63.11	3.69	8.00	-0.0109	158	63.11	16.56	63.11	16.56
CS-6	BASE	100Y072H	62.80	3.94	8.00	-0.0108	158	62.79	18.05	62.80	18.05
CS-6	BASE	QUALITY	6.42	2.00	8.00	-0.0050	364	1.73	3.13	0.00	0.00
CS-8	BASE	005Y001H	1.99	2.25	8.00	-0.0044	126	1.99	3.14	1.99	3.14
CS-8	BASE	005Y024H	14.63	2.28	8.00	-0.0040	126	14.63	3.78	14.63	3.78
CS-8	BASE	010Y024H	15.01	3.88	8.00	-0.0036	126	14.99	11.21	15.01	11.21
CS-8	BASE	025Y072H	63.11	4.64	8.00	0.0068	126	62.91	16.41	63.11	12.96
CS-8	BASE	100Y072H	62.80	5.08	8.00	0.0944	126	62.02	52.60	62.80	13.85
CS-8	BASE	QUALITY	1.25	2.08	8.00	-0.0027	126	1.21	0.66	1.25	0.59
Outfalls	BASE	005Y001H	0.00	1.60	1.60	0.0000	0	1.87	51.32	0.00	0.00

ABBOTT AVENUE DRAINAGE STUDY
ICPR MODEL FOR EXISTING CONDITIONS
NODE MAXIMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Outfalls	BASE	005Y024H	0.00	1.60	1.60	0.0000	0	14.69	58.58	0.00	0.00
Outfalls	BASE	010Y024H	0.00	1.60	1.60	0.0000	0	14.97	68.34	0.00	0.00
Outfalls	BASE	025Y072H	0.00	1.60	1.60	0.0000	0	63.10	79.36	0.00	0.00
Outfalls	BASE	100Y072H	0.00	1.60	1.60	0.0000	0	62.80	146.56	0.00	0.00
Outfalls	BASE	QUALITY	0.00	1.60	1.60	0.0000	0	1.66	23.15	0.00	0.00
SUB-BASIN-1	BASE	005Y001H	2.72	4.09	8.00	-0.0056	172212	1.25	26.15	2.76	8.64
SUB-BASIN-1	BASE	005Y024H	14.86	4.50	8.00	-0.0131	241537	12.50	35.60	16.61	15.10
SUB-BASIN-1	BASE	010Y024H	14.65	4.67	8.00	-0.0156	270744	12.50	42.75	14.97	17.64
SUB-BASIN-1	BASE	025Y072H	62.30	4.82	8.00	-0.0159	296193	60.50	52.14	62.46	23.43
SUB-BASIN-1	BASE	100Y072H	62.80	5.08	8.00	-0.0181	341634	60.50	72.81	61.72	38.19
SUB-BASIN-1	BASE	QUALITY	1.82	3.14	8.00	-0.0066	8872	1.67	6.58	1.89	6.67
SUB-BASIN-2	BASE	005Y001H	1.56	3.84	2.80	0.0624	32476	1.25	28.73	1.10	26.64
SUB-BASIN-2	BASE	005Y024H	14.86	4.50	2.80	0.0616	172321	13.03	39.45	12.15	26.62
SUB-BASIN-2	BASE	010Y024H	14.65	4.67	2.80	0.0615	208630	12.80	47.47	14.64	34.16
SUB-BASIN-2	BASE	025Y072H	62.30	4.82	2.80	0.0626	240198	60.62	57.38	62.27	46.22
SUB-BASIN-2	BASE	100Y072H	62.80	5.08	2.80	0.0626	296793	61.05	87.98	61.70	77.65
SUB-BASIN-2	BASE	QUALITY	1.89	2.02	2.80	-0.0616	182	1.66	12.73	5.71	23.59
SUB-BASIN-3	BASE	005Y001H	2.51	3.79	2.80	-0.0032	253213	1.25	44.25	2.48	1.39
SUB-BASIN-3	BASE	005Y024H	14.55	4.24	2.80	-0.0127	355973	12.46	60.52	14.52	2.03
SUB-BASIN-3	BASE	010Y024H	14.93	4.40	2.80	-0.0141	391868	12.37	69.27	14.91	7.11
SUB-BASIN-3	BASE	025Y072H	63.11	4.66	2.80	-0.0156	451683	60.42	75.99	63.11	21.00
SUB-BASIN-3	BASE	100Y072H	62.80	5.08	2.80	-0.0164	548763	60.83	102.14	62.80	53.60
SUB-BASIN-3	BASE	QUALITY	2.19	2.94	2.80	-0.0082	56423	1.59	4.53	2.23	1.09
SUB-BASIN-4	BASE	005Y001H	2.49	3.79	8.00	-0.0152	137587	1.25	30.53	1.39	20.45
SUB-BASIN-4	BASE	005Y024H	14.55	4.24	8.00	-0.0154	229345	12.50	41.45	12.45	22.62
SUB-BASIN-4	BASE	010Y024H	14.93	4.39	8.00	-0.0147	261414	12.50	49.80	12.35	23.38
SUB-BASIN-4	BASE	025Y072H	63.11	4.65	8.00	-0.0145	315008	60.50	60.01	60.25	16.62
SUB-BASIN-4	BASE	100Y072H	62.80	5.08	8.00	-0.0187	402183	60.37	79.12	60.36	19.00
SUB-BASIN-4	BASE	QUALITY	1.67	2.59	8.00	0.0037	233	1.63	5.61	1.67	5.22
SUB-BASIN-5	BASE	005Y001H	1.71	3.50	8.00	0.0621	67567	1.25	31.99	4.86	24.94
SUB-BASIN-5	BASE	005Y024H	14.63	4.04	8.00	0.0636	161066	12.50	42.66	12.61	29.40
SUB-BASIN-5	BASE	010Y024H	15.00	4.38	8.00	0.0623	219890	12.50	51.05	12.43	29.47
SUB-BASIN-5	BASE	025Y072H	63.11	4.65	8.00	-0.0628	267832	60.50	61.55	60.25	27.00
SUB-BASIN-5	BASE	100Y072H	62.80	5.08	8.00	-0.0627	341649	60.50	85.72	62.58	32.41
SUB-BASIN-5	BASE	QUALITY	1.42	2.01	8.00	-0.0621	179	1.67	8.40	2.53	26.15
SUB-BASIN-6	BASE	005Y001H	1.75	3.52	8.00	0.0166	134686	1.25	50.74	1.74	35.02
SUB-BASIN-6	BASE	005Y024H	14.88	4.12	8.00	-0.0197	305791	12.50	69.26	14.87	37.59
SUB-BASIN-6	BASE	010Y024H	14.93	4.39	8.00	-0.0208	384501	12.50	83.10	14.93	38.68
SUB-BASIN-6	BASE	025Y072H	63.11	4.65	8.00	-0.0208	460080	60.83	103.99	63.11	39.66
SUB-BASIN-6	BASE	100Y072H	62.80	5.08	8.00	-0.0205	583284	60.58	163.61	62.79	41.15
SUB-BASIN-6	BASE	QUALITY	1.61	2.00	8.00	-0.0149	787	1.65	16.68	1.73	26.23
SUB-BASIN-8	BASE	005Y001H	1.99	3.46	8.00	-0.0123	41881	0.95	13.55	1.99	3.14
SUB-BASIN-8	BASE	005Y024H	14.63	4.04	8.00	-0.0128	63491	12.61	17.10	14.63	3.78
SUB-BASIN-8	BASE	010Y024H	15.00	4.37	8.00	-0.0126	76052	12.43	20.75	14.99	11.21
SUB-BASIN-8	BASE	025Y072H	63.11	4.65	8.00	-0.0113	86313	60.25	24.21	62.91	16.41
SUB-BASIN-8	BASE	100Y072H	62.80	5.08	8.00	-0.0129	102120	60.70	33.55	62.02	52.60
SUB-BASIN-8	BASE	QUALITY	1.21	2.13	8.00	-0.0070	146	1.93	2.34	1.21	0.66

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
1	BASE	005Y001H	0.00	0.00	0.000	2.72	4.09	2.72	2.09
1	BASE	005Y024H	0.00	0.00	0.000	14.86	4.50	14.87	2.11
1	BASE	010Y024H	0.00	0.00	0.000	14.65	4.67	14.66	2.12
1	BASE	025Y072H	0.00	0.00	0.000	62.30	4.82	62.31	2.14
1	BASE	100Y072H	62.80	1.56	0.000	62.80	5.08	62.81	2.76
1	BASE	QUALITY	0.00	0.00	0.000	1.82	3.14	1.82	2.07
12	BASE	005Y001H	2.80	6.25	1.221	2.72	4.09	1.56	3.84
12	BASE	005Y024H	18.11	6.39	1.265	14.86	4.50	14.86	4.50
12	BASE	010Y024H	19.18	6.38	1.370	14.65	4.67	14.65	4.67
12	BASE	025Y072H	67.91	6.38	1.349	62.30	4.82	62.30	4.82
12	BASE	100Y072H	70.00	6.38	1.330	62.80	5.08	62.80	5.08
12	BASE	QUALITY	1.89	4.92	1.257	1.82	3.14	1.89	2.02
2	BASE	005Y001H	0.00	0.00	0.000	1.56	3.84	1.56	2.21
2	BASE	005Y024H	0.00	0.00	0.000	14.86	4.50	14.86	2.23
2	BASE	010Y024H	0.00	0.00	0.000	14.65	4.67	14.65	2.24
2	BASE	025Y072H	62.30	0.13	0.000	62.30	4.82	62.30	2.25
2	BASE	100Y072H	62.80	9.55	0.005	62.80	5.08	62.80	2.95
2	BASE	QUALITY	0.00	0.00	0.000	1.89	2.02	6.97	2.00
23	BASE	005Y001H	1.10	2.40	-1.036	1.56	3.84	2.51	3.79
23	BASE	005Y024H	12.14	2.38	-1.177	14.86	4.50	14.55	4.24
23	BASE	010Y024H	12.06	2.34	-1.173	14.65	4.67	14.93	4.40
23	BASE	025Y072H	60.32	2.01	-1.190	62.30	4.82	63.11	4.66
23	BASE	100Y072H	60.69	1.95	-1.200	62.80	5.08	62.80	5.08
23	BASE	QUALITY	6.62	0.42	-1.155	1.89	2.02	2.19	2.94
3	BASE	005Y001H	0.00	0.00	0.000	2.51	3.79	2.52	2.10
3	BASE	005Y024H	14.55	0.50	0.000	14.55	4.24	14.52	2.10
3	BASE	010Y024H	14.93	5.54	0.001	14.93	4.40	15.13	2.11
3	BASE	025Y072H	63.11	19.72	0.006	63.11	4.66	63.11	2.76
3	BASE	100Y072H	62.80	52.72	0.022	62.80	5.08	62.80	4.20
3	BASE	QUALITY	0.00	0.00	0.000	2.19	2.94	2.31	2.10
34	BASE	005Y001H	0.84	1.57	0.306	2.49	3.79	2.51	3.79
34	BASE	005Y024H	12.02	1.23	0.319	14.55	4.24	14.55	4.24
34	BASE	010Y024H	12.00	1.03	-0.317	14.93	4.39	14.93	4.40
34	BASE	025Y072H	77.17	0.81	0.334	63.11	4.65	63.11	4.66
34	BASE	100Y072H	77.32	0.81	0.335	62.80	5.08	62.80	5.08
34	BASE	QUALITY	7.13	0.81	0.317	1.67	2.59	2.19	2.94
4	BASE	005Y001H	0.00	0.00	0.000	2.49	3.79	2.49	2.78
4	BASE	005Y024H	0.00	0.00	0.000	14.55	4.24	14.55	2.88
4	BASE	010Y024H	0.00	0.00	0.000	14.93	4.39	14.93	2.91
4	BASE	025Y072H	0.00	0.00	0.000	63.11	4.65	63.11	2.98
4	BASE	100Y072H	62.80	9.40	0.002	62.80	5.08	62.80	3.66
4	BASE	QUALITY	0.00	0.00	0.000	1.67	2.59	1.67	2.42
45	BASE	005Y001H	0.41	0.16	-1.020	1.71	3.50	2.49	3.79
45	BASE	005Y024H	29.13	0.48	-1.120	14.63	4.04	14.55	4.24
45	BASE	010Y024H	29.11	0.47	-1.126	15.00	4.38	14.93	4.39
45	BASE	025Y072H	77.04	0.47	-1.125	63.11	4.65	63.11	4.65
45	BASE	100Y072H	77.33	0.48	-1.140	62.80	5.08	62.80	5.08
45	BASE	QUALITY	7.13	0.48	-1.066	1.42	2.01	1.67	2.59
5	BASE	005Y001H	0.00	0.00	0.000	1.71	3.50	1.71	2.25

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
5	BASE	005Y024H	0.00	0.00	0.000	14.63	4.04	14.63	2.28
5	BASE	010Y024H	0.00	0.00	0.000	15.00	4.38	15.00	2.30
5	BASE	025Y072H	0.00	0.00	0.000	63.11	4.65	63.11	2.31
5	BASE	100Y072H	62.80	14.78	0.003	62.80	5.08	62.81	4.40
5	BASE	QUALITY	0.00	0.00	0.000	1.42	2.01	6.59	2.00
56	BASE	005Y001H	2.93	3.85	2.126	1.71	3.50	1.75	3.52
56	BASE	005Y024H	11.76	3.85	-2.102	14.63	4.04	14.88	4.12
56	BASE	010Y024H	11.27	3.84	-2.103	15.00	4.38	14.93	4.39
56	BASE	025Y072H	58.71	3.87	2.115	63.11	4.65	63.11	4.65
56	BASE	100Y072H	57.74	3.85	2.121	62.80	5.08	62.80	5.08
56	BASE	QUALITY	2.13	3.84	-2.112	1.42	2.01	1.61	2.00
58	BASE	005Y001H	3.64	1.88	-1.496	1.71	3.50	1.99	3.46
58	BASE	005Y024H	12.03	2.04	-1.520	14.63	4.04	14.63	4.04
58	BASE	010Y024H	11.96	2.08	-1.516	15.00	4.38	15.00	4.37
58	BASE	025Y072H	59.85	2.14	-1.523	63.11	4.65	63.11	4.65
58	BASE	100Y072H	59.67	2.01	-1.529	62.80	5.08	62.80	5.08
58	BASE	QUALITY	2.88	1.29	-1.492	1.42	2.01	1.21	2.13
6	BASE	005Y001H	0.00	0.00	0.000	1.75	3.52	1.75	3.06
6	BASE	005Y024H	0.00	0.00	0.000	14.88	4.12	14.88	3.38
6	BASE	010Y024H	0.00	0.00	0.000	14.93	4.39	14.93	3.54
6	BASE	025Y072H	0.00	0.00	0.000	63.11	4.65	63.11	3.69
6	BASE	100Y072H	0.00	0.00	0.000	62.80	5.08	62.80	3.94
6	BASE	QUALITY	0.00	0.00	0.000	1.61	2.00	6.42	2.00
8	BASE	005Y001H	0.00	0.00	0.000	1.99	3.46	1.99	2.25
8	BASE	005Y024H	0.00	0.00	0.000	14.63	4.04	14.63	2.28
8	BASE	010Y024H	15.00	9.20	0.001	15.00	4.37	15.01	3.88
8	BASE	025Y072H	62.91	16.10	-3.127	63.11	4.65	63.11	4.64
8	BASE	100Y072H	62.02	51.79	-82.213	62.80	5.08	62.80	5.08
8	BASE	QUALITY	0.00	0.00	0.000	1.21	2.13	1.25	2.08
89&90ST	BASE	005Y001H	0.00	0.00	0.000	1.71	2.25	0.00	1.60
89&90ST	BASE	005Y024H	0.00	0.00	0.000	14.63	2.28	0.00	1.60
89&90ST	BASE	010Y024H	0.00	0.00	0.000	15.00	2.30	0.00	1.60
89&90ST	BASE	025Y072H	0.00	0.00	0.000	63.11	2.31	0.00	1.60
89&90ST	BASE	100Y072H	0.00	0.00	0.000	62.81	4.40	0.00	1.60
89&90ST	BASE	QUALITY	0.00	0.00	0.000	6.59	2.00	0.00	1.60
91ST	BASE	005Y001H	0.00	0.00	0.000	2.49	2.78	0.00	1.60
91ST	BASE	005Y024H	0.00	0.00	0.000	14.55	2.88	0.00	1.60
91ST	BASE	010Y024H	0.00	0.00	0.000	14.93	2.91	0.00	1.60
91ST	BASE	025Y072H	0.00	0.00	0.000	63.11	2.98	0.00	1.60
91ST	BASE	100Y072H	0.00	0.00	0.000	62.80	3.66	0.00	1.60
91ST	BASE	QUALITY	0.00	0.00	0.000	1.67	2.42	0.00	1.60
92&93 ST	BASE	005Y001H	0.00	0.00	0.000	2.52	2.10	0.00	1.60
92&93 ST	BASE	005Y024H	0.00	0.00	0.000	14.52	2.10	0.00	1.60
92&93 ST	BASE	010Y024H	0.00	0.00	0.000	15.13	2.11	0.00	1.60
92&93 ST	BASE	025Y072H	0.00	0.00	0.000	63.11	2.76	0.00	1.60
92&93 ST	BASE	100Y072H	62.80	24.04	0.015	62.80	4.20	0.00	1.60
92&93 ST	BASE	QUALITY	0.00	0.00	0.000	2.31	2.10	0.00	1.60
94ST	BASE	005Y001H	0.00	0.00	0.000	1.56	2.21	0.00	1.60
94ST	BASE	005Y024H	0.00	0.00	0.000	14.86	2.23	0.00	1.60

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
94ST	BASE	010Y024H	0.00	0.00	0.000	14.65	2.24	0.00	1.60
94ST	BASE	025Y072H	0.00	0.00	0.000	62.30	2.25	0.00	1.60
94ST	BASE	100Y072H	0.00	0.00	0.000	62.80	2.95	0.00	1.60
94ST	BASE	QUALITY	0.00	0.00	0.000	6.97	2.00	0.00	1.60
95ST	BASE	005Y001H	0.00	0.00	0.000	2.72	2.09	0.00	1.60
95ST	BASE	005Y024H	0.00	0.00	0.000	14.87	2.11	0.00	1.60
95ST	BASE	010Y024H	0.00	0.00	0.000	14.66	2.12	0.00	1.60
95ST	BASE	025Y072H	0.00	0.00	0.000	62.31	2.14	0.00	1.60
95ST	BASE	100Y072H	0.00	0.00	0.000	62.81	2.76	0.00	1.60
95ST	BASE	QUALITY	0.00	0.00	0.000	1.82	2.07	0.00	1.60
BASIN-1-2 OVR	BASE	005Y001H	0.00	0.00	0.000	2.72	4.09	1.56	3.84
BASIN-1-2 OVR	BASE	005Y024H	16.61	12.17	0.080	14.86	4.50	14.86	4.50
BASIN-1-2 OVR	BASE	010Y024H	14.97	14.76	0.143	14.65	4.67	14.65	4.67
BASIN-1-2 OVR	BASE	025Y072H	62.46	20.46	0.134	62.30	4.82	62.30	4.82
BASIN-1-2 OVR	BASE	100Y072H	61.72	34.48	-0.099	62.80	5.08	62.80	5.08
BASIN-1-2 OVR	BASE	QUALITY	0.00	0.00	0.000	1.82	3.14	1.89	2.02
BASIN-2-3 OVR	BASE	005Y001H	0.00	0.00	0.000	1.56	3.84	2.51	3.79
BASIN-2-3 OVR	BASE	005Y024H	0.00	0.00	0.000	14.86	4.50	14.55	4.24
BASIN-2-3 OVR	BASE	010Y024H	14.65	7.71	0.001	14.65	4.67	14.93	4.40
BASIN-2-3 OVR	BASE	025Y072H	62.30	19.90	0.005	62.30	4.82	63.11	4.66
BASIN-2-3 OVR	BASE	100Y072H	61.66	44.35	0.030	62.80	5.08	62.80	5.08
BASIN-2-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.89	2.02	2.19	2.94
BASIN-4-3 OVR	BASE	005Y001H	1.40	4.07	-0.064	2.49	3.79	2.51	3.79
BASIN-4-3 OVR	BASE	005Y024H	12.45	5.89	-0.055	14.55	4.24	14.55	4.24
BASIN-4-3 OVR	BASE	010Y024H	12.35	6.53	-0.047	14.93	4.39	14.93	4.40
BASIN-4-3 OVR	BASE	025Y072H	0.00	0.00	0.034	63.11	4.65	63.11	4.66
BASIN-4-3 OVR	BASE	100Y072H	0.00	0.00	0.061	62.80	5.08	62.80	5.08
BASIN-4-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.67	2.59	2.19	2.94
BASIN-4-6 OVR	BASE	005Y001H	0.00	0.00	0.000	2.49	3.79	1.75	3.52
BASIN-4-6 OVR	BASE	005Y024H	14.55	12.88	0.002	14.55	4.24	14.88	4.12
BASIN-4-6 OVR	BASE	010Y024H	13.51	15.09	-0.012	14.93	4.39	14.93	4.39
BASIN-4-6 OVR	BASE	025Y072H	60.96	15.58	-0.069	63.11	4.65	63.11	4.65
BASIN-4-6 OVR	BASE	100Y072H	60.60	22.92	-0.201	62.80	5.08	62.80	5.08
BASIN-4-6 OVR	BASE	QUALITY	0.00	0.00	0.000	1.67	2.59	1.61	2.00
BASIN-5-4 OVR	BASE	005Y001H	0.00	0.00	0.000	1.71	3.50	2.49	3.79
BASIN-5-4 OVR	BASE	005Y024H	0.00	0.00	-0.001	14.63	4.04	14.55	4.24
BASIN-5-4 OVR	BASE	010Y024H	0.00	0.00	-0.002	15.00	4.38	14.93	4.39
BASIN-5-4 OVR	BASE	025Y072H	0.00	0.00	0.006	63.11	4.65	63.11	4.65
BASIN-5-4 OVR	BASE	100Y072H	0.00	0.00	0.061	62.80	5.08	62.80	5.08
BASIN-5-4 OVR	BASE	QUALITY	0.00	0.00	0.000	1.42	2.01	1.67	2.59
BASIN-5-8 OVR	BASE	005Y001H	0.00	0.00	0.000	1.71	3.50	1.99	3.46
BASIN-5-8 OVR	BASE	005Y024H	12.62	6.10	-0.062	14.63	4.04	14.63	4.04
BASIN-5-8 OVR	BASE	010Y024H	14.68	9.28	-0.060	15.00	4.38	15.00	4.37
BASIN-5-8 OVR	BASE	025Y072H	61.38	12.57	0.098	63.11	4.65	63.11	4.65
BASIN-5-8 OVR	BASE	100Y072H	60.75	14.60	1.326	62.80	5.08	62.80	5.08
BASIN-5-8 OVR	BASE	QUALITY	0.00	0.00	0.000	1.42	2.01	1.21	2.13
CARLYLE	BASE	005Y001H	0.00	0.00	0.000	1.75	3.06	0.00	1.60
CARLYLE	BASE	005Y024H	0.00	0.00	0.000	14.88	3.38	0.00	1.60
CARLYLE	BASE	010Y024H	0.00	0.00	0.000	14.93	3.54	0.00	1.60

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
CARLYLE	BASE	025Y072H	0.00	0.00	0.000	63.11	3.69	0.00	1.60
CARLYLE	BASE	100Y072H	0.00	0.00	0.000	62.80	3.94	0.00	1.60
CARLYLE	BASE	QUALITY	0.00	0.00	0.000	6.42	2.00	0.00	1.60
DP-1	BASE	005Y001H	2.72	2.39	0.008	2.72	2.09	0.00	1.60
DP-1	BASE	005Y024H	14.87	2.61	-0.011	14.87	2.11	0.00	1.60
DP-1	BASE	010Y024H	14.66	2.70	-0.015	14.66	2.12	0.00	1.60
DP-1	BASE	025Y072H	62.31	2.76	-0.026	62.31	2.14	0.00	1.60
DP-1	BASE	100Y072H	62.81	4.13	-0.026	62.81	2.76	0.00	1.60
DP-1	BASE	QUALITY	1.82	1.75	-0.011	1.82	2.07	0.00	1.60
DP-2	BASE	005Y001H	1.56	1.20	0.005	1.56	2.21	0.00	1.60
DP-2	BASE	005Y024H	14.86	1.41	-0.017	14.86	2.23	0.00	1.60
DP-2	BASE	010Y024H	14.65	1.46	-0.017	14.65	2.24	0.00	1.60
DP-2	BASE	025Y072H	62.30	1.63	-0.017	62.30	2.25	0.00	1.60
DP-2	BASE	100Y072H	62.80	10.92	-0.017	62.80	2.95	0.00	1.60
DP-2	BASE	QUALITY	0.00	0.00	0.000	6.97	2.00	0.00	1.60
DP-3	BASE	005Y001H	2.52	0.00	0.001	2.52	2.10	0.00	1.60
DP-3	BASE	005Y024H	14.52	0.00	0.003	14.52	2.10	0.00	1.60
DP-3	BASE	010Y024H	15.13	0.02	0.019	15.13	2.11	0.00	1.60
DP-3	BASE	025Y072H	63.11	6.80	0.053	63.11	2.76	0.00	1.60
DP-3	BASE	100Y072H	62.80	15.35	0.050	62.80	4.20	0.00	1.60
DP-3	BASE	QUALITY	2.31	0.00	0.001	2.31	2.10	0.00	1.60
DP-4-1	BASE	005Y001H	2.49	8.67	-0.046	2.49	2.78	0.00	1.60
DP-4-1	BASE	005Y024H	14.55	10.06	-0.047	14.55	2.88	0.00	1.60
DP-4-1	BASE	010Y024H	14.93	10.56	-0.048	14.93	2.91	0.00	1.60
DP-4-1	BASE	025Y072H	63.11	11.14	-0.047	63.11	2.98	0.00	1.60
DP-4-1	BASE	100Y072H	62.80	13.68	-0.057	62.80	3.66	0.00	1.60
DP-4-1	BASE	QUALITY	1.67	3.53	-0.011	1.67	2.42	0.00	1.60
DP-4-2	BASE	005Y001H	2.49	8.75	-0.046	2.49	2.78	0.00	1.60
DP-4-2	BASE	005Y024H	14.55	10.15	-0.047	14.55	2.88	0.00	1.60
DP-4-2	BASE	010Y024H	14.93	10.56	-0.048	14.93	2.91	0.00	1.60
DP-4-2	BASE	025Y072H	63.11	11.27	-0.047	63.11	2.98	0.00	1.60
DP-4-2	BASE	100Y072H	62.80	16.37	-0.057	62.80	3.66	0.00	1.60
DP-4-2	BASE	QUALITY	1.67	3.53	-0.011	1.67	2.42	0.00	1.60
DP-5	BASE	005Y001H	1.71	1.59	-0.009	1.71	2.25	0.00	1.60
DP-5	BASE	005Y024H	14.63	1.89	-0.013	14.63	2.28	0.00	1.60
DP-5	BASE	010Y024H	15.00	2.06	-0.021	15.00	2.30	0.00	1.60
DP-5	BASE	025Y072H	63.11	2.18	-0.023	63.11	2.31	0.00	1.60
DP-5	BASE	100Y072H	62.81	15.95	-0.022	62.81	4.40	0.00	1.60
DP-5	BASE	QUALITY	0.00	0.00	0.000	6.59	2.00	0.00	1.60
DP-6	BASE	005Y001H	1.75	11.92	-0.076	1.75	3.06	0.00	1.60
DP-6	BASE	005Y024H	14.88	14.49	-0.163	14.88	3.38	0.00	1.60
DP-6	BASE	010Y024H	14.93	15.58	-0.170	14.93	3.54	0.00	1.60
DP-6	BASE	025Y072H	63.11	16.56	-0.172	63.11	3.69	0.00	1.60
DP-6	BASE	100Y072H	62.80	18.05	-0.170	62.80	3.94	0.00	1.60
DP-6	BASE	QUALITY	0.00	0.00	0.000	6.42	2.00	0.00	1.60
DP-8	BASE	005Y001H	1.99	3.14	-0.054	1.99	2.25	0.00	1.60
DP-8	BASE	005Y024H	14.63	3.78	-0.047	14.63	2.28	0.00	1.60
DP-8	BASE	010Y024H	15.01	11.21	0.126	15.01	3.88	0.00	1.60
DP-8	BASE	025Y072H	63.11	12.96	0.127	63.11	4.64	0.00	1.60

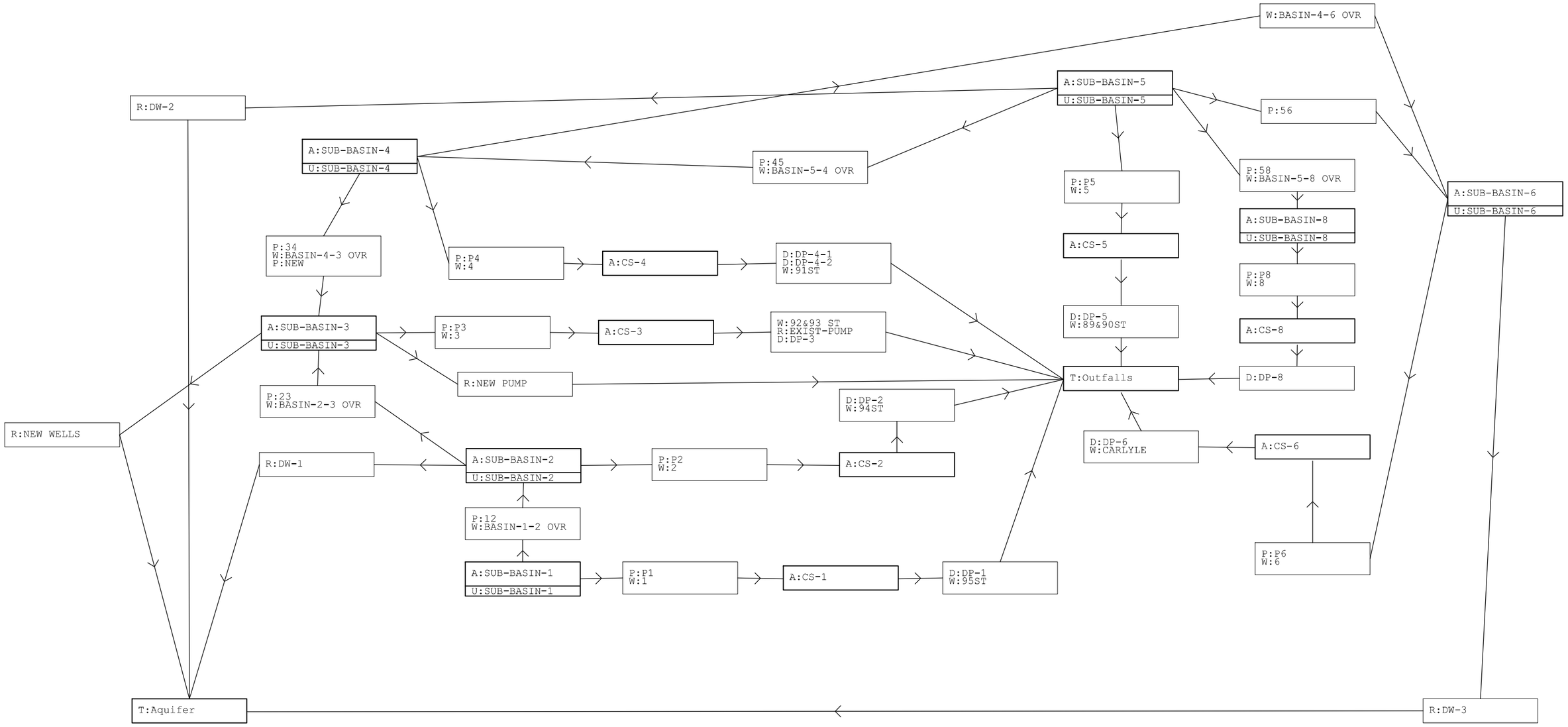
Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DP-8	BASE	100Y072H	62.80	13.85	0.189	62.80	5.08	0.00	1.60
DP-8	BASE	QUALITY	1.25	0.59	-0.010	1.25	2.08	0.00	1.60
DW-1	BASE	005Y001H	0.40	23.10	23.100	1.56	3.84	0.00	-60.00
DW-1	BASE	005Y024H	5.91	23.10	23.100	14.86	4.50	0.00	-60.00
DW-1	BASE	010Y024H	5.43	23.10	23.100	14.65	4.67	0.00	-60.00
DW-1	BASE	025Y072H	9.58	23.10	23.100	62.30	4.82	0.00	-60.00
DW-1	BASE	100Y072H	7.22	23.10	23.100	62.80	5.08	0.00	-60.00
DW-1	BASE	QUALITY	0.89	23.10	23.100	1.89	2.02	0.00	-60.00
DW-2	BASE	005Y001H	0.41	23.10	23.100	1.71	3.50	0.00	-60.00
DW-2	BASE	005Y024H	5.93	23.10	23.100	14.63	4.04	0.00	-60.00
DW-2	BASE	010Y024H	5.46	23.10	23.100	15.00	4.38	0.00	-60.00
DW-2	BASE	025Y072H	9.90	23.10	23.100	63.11	4.65	0.00	-60.00
DW-2	BASE	100Y072H	7.30	23.10	23.100	62.80	5.08	0.00	-60.00
DW-2	BASE	QUALITY	0.89	23.10	23.100	1.42	2.01	0.00	-60.00
DW-3	BASE	005Y001H	0.45	23.10	23.100	1.75	3.52	0.00	-60.00
DW-3	BASE	005Y024H	6.15	23.10	23.100	14.88	4.12	0.00	-60.00
DW-3	BASE	010Y024H	5.66	23.10	23.100	14.93	4.39	0.00	-60.00
DW-3	BASE	025Y072H	10.87	23.10	23.100	63.11	4.65	0.00	-60.00
DW-3	BASE	100Y072H	8.16	23.10	23.100	62.80	5.08	0.00	-60.00
DW-3	BASE	QUALITY	0.98	23.10	23.100	1.61	2.00	0.00	-60.00
EXIST-PUMP	BASE	005Y001H	0.49	14.20	14.200	2.52	2.10	0.00	1.60
EXIST-PUMP	BASE	005Y024H	8.70	14.20	14.200	14.52	2.10	0.00	1.60
EXIST-PUMP	BASE	010Y024H	7.98	14.20	14.200	15.13	2.11	0.00	1.60
EXIST-PUMP	BASE	025Y072H	38.84	14.20	14.200	63.11	2.76	0.00	1.60
EXIST-PUMP	BASE	100Y072H	25.31	14.20	14.200	62.80	4.20	0.00	1.60
EXIST-PUMP	BASE	QUALITY	1.04	14.20	14.200	2.31	2.10	0.00	1.60
P1	BASE	005Y001H	2.72	2.39	-0.179	2.72	4.09	2.72	2.09
P1	BASE	005Y024H	14.86	2.61	-0.185	14.86	4.50	14.87	2.11
P1	BASE	010Y024H	14.65	2.70	-0.185	14.65	4.67	14.66	2.12
P1	BASE	025Y072H	62.30	2.76	-0.185	62.30	4.82	62.31	2.14
P1	BASE	100Y072H	61.31	2.84	-0.196	62.80	5.08	62.81	2.76
P1	BASE	QUALITY	1.82	1.75	-0.181	1.82	3.14	1.82	2.07
P2	BASE	005Y001H	1.56	1.20	0.326	1.56	3.84	1.56	2.21
P2	BASE	005Y024H	14.86	1.41	-0.327	14.86	4.50	14.86	2.23
P2	BASE	010Y024H	14.65	1.46	-0.327	14.65	4.67	14.65	2.24
P2	BASE	025Y072H	62.02	1.50	-0.327	62.30	4.82	62.30	2.25
P2	BASE	100Y072H	60.81	1.50	0.331	62.80	5.08	62.80	2.95
P2	BASE	QUALITY	1.89	0.45	-0.327	1.89	2.02	6.97	2.00
P3	BASE	005Y001H	2.48	1.39	0.137	2.51	3.79	2.52	2.10
P3	BASE	005Y024H	14.59	1.53	0.137	14.55	4.24	14.52	2.10
P3	BASE	010Y024H	15.03	1.57	0.158	14.93	4.40	15.13	2.11
P3	BASE	025Y072H	61.73	1.60	0.189	63.11	4.66	63.11	2.76
P3	BASE	100Y072H	60.81	1.60	0.162	62.80	5.08	62.80	4.20
P3	BASE	QUALITY	2.23	1.09	0.179	2.19	2.94	2.31	2.10
P4	BASE	005Y001H	2.49	17.42	1.308	2.49	3.79	2.49	2.78
P4	BASE	005Y024H	14.55	20.21	1.561	14.55	4.24	14.55	2.88
P4	BASE	010Y024H	14.93	21.12	1.562	14.93	4.39	14.93	2.91
P4	BASE	025Y072H	63.11	22.41	1.652	63.11	4.65	63.11	2.98
P4	BASE	100Y072H	61.31	23.11	1.647	62.80	5.08	62.80	3.66

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
P4	BASE	QUALITY	1.67	7.10	-1.567	1.67	2.59	1.67	2.42
P5	BASE	005Y001H	1.71	1.59	0.497	1.71	3.50	1.71	2.25
P5	BASE	005Y024H	14.63	1.89	-0.499	14.63	4.04	14.63	2.28
P5	BASE	010Y024H	15.00	2.06	-0.499	15.00	4.38	15.00	2.30
P5	BASE	025Y072H	63.11	2.18	-0.502	63.11	4.65	63.11	2.31
P5	BASE	100Y072H	61.10	2.21	0.506	62.80	5.08	62.81	4.40
P5	BASE	QUALITY	1.63	0.68	-0.498	1.42	2.01	6.59	2.00
P6	BASE	005Y001H	1.74	11.92	-1.419	1.75	3.52	1.75	3.06
P6	BASE	005Y024H	14.87	14.49	-1.450	14.88	4.12	14.88	3.38
P6	BASE	010Y024H	14.93	15.58	-1.450	14.93	4.39	14.93	3.54
P6	BASE	025Y072H	63.11	16.56	-1.461	63.11	4.65	63.11	3.69
P6	BASE	100Y072H	62.79	18.05	-1.455	62.80	5.08	62.80	3.94
P6	BASE	QUALITY	1.73	3.13	-1.452	1.61	2.00	6.42	2.00
P8	BASE	005Y001H	1.99	3.14	-0.338	1.99	3.46	1.99	2.25
P8	BASE	005Y024H	14.63	3.78	-0.324	14.63	4.04	14.63	2.28
P8	BASE	010Y024H	13.38	3.86	-0.329	15.00	4.37	15.01	3.88
P8	BASE	025Y072H	60.85	3.86	-0.329	63.11	4.65	63.11	4.64
P8	BASE	100Y072H	60.46	3.86	-1.143	62.80	5.08	62.80	5.08
P8	BASE	QUALITY	1.21	0.66	-0.327	1.21	2.13	1.25	2.08

APPENDIX D

ICPR MODEL FOR PROPOSED IMPROVEMENTS – OPTION 1

Node-Reach Diagram
ICPR Input Data
Node Maximum Report
Link Maximum Report



NO	DATE	REVISION	BY	NO	DATE	REVISION	BY

Calvin, Giordano & Associates, Inc.
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Certificate of Authorization 514

SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

ICPR MODEL - OPTION 1
NODE REACH DIAGRAM

MOHAMMED SHARIFUZZAMAN, P.E.
STATE OF FLORIDA PROFESSIONAL ENGINEER
LICENSE No. 67640

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: ----

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\option 1.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 2:16:35 PM)

==========
==== Basins ==========
==========

Name: SUB-BASIN-1 Node: SUB-BASIN-1 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 27.810 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-2 Node: SUB-BASIN-2 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 30.400 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-3 Node: SUB-BASIN-3 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 41.040 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-4 Node: SUB-BASIN-4 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.390 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-5 Node: SUB-BASIN-5 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.600 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-6 Node: SUB-BASIN-6 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 54.600 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-8 Node: SUB-BASIN-8 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 30.00
Area(ac): 7.240 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ==========
==========

Name: Aquifer Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	-60.000
99999.00	-60.000

Name: CS-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: Outfalls Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	1.600
99999.00	1.600

Name: SUB-BASIN-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.090	0.0000
8.000	19.3100

Name: SUB-BASIN-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.690	0.0000
8.000	21.1000

Name: SUB-BASIN-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.690	0.0000
8.000	28.0000

Name: SUB-BASIN-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000

3.120	0.0000
8.000	23.0000

Name: SUB-BASIN-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.110	0.0000
8.000	19.5000

Name: SUB-BASIN-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.060	0.0000
8.000	32.7500

Name: SUB-BASIN-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.330	0.0000
8.000	4.8400

==========
==== Cross Sections ====
==========

Name: SECTION 1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	3.250	0.016000
18.000	3.800	0.016000
36.000	3.250	0.016000

==========
==== Operating Tables ====
==========

Name: DRAINAGE WELLS Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

DRAINAGE WELL CAPACITY: 500 GPM/FT. OF AVAILABLE HEAD

US Stage(ft)	Discharge(cfs)
1.900	7.70
8.000	7.70

Name: EXIST-PUMP Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
2.000	14.20
8.000	14.20

Name: NEW PUMP Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
1.900	5.00
8.000	5.00

==== Pipes ====

Name: 12 From Node: Sub-Basin-1 Length(ft): 650.00
Group: BASE To Node: Sub-Basin-2 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 23 From Node: Sub-Basin-2 Length(ft): 800.00
Group: BASE To Node: Sub-Basin-3 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 34 From Node: Sub-Basin-4 Length(ft): 800.00
Group: BASE To Node: Sub-Basin-3 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 45		From Node: Sub-Basin-5	Length(ft): 800.00
Group: BASE		To Node: Sub-Basin-4	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	18.00	18.00	Entrance Loss Coef: 0.00
Rise(in):	18.00	18.00	Exit Loss Coef: 1.00
Invert(ft):	-1.500	-1.500	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 56		From Node: Sub-Basin-5	Length(ft): 250.00
Group: BASE		To Node: Sub-Basin-6	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	18.00	18.00	Entrance Loss Coef: 0.00
Rise(in):	18.00	18.00	Exit Loss Coef: 1.00
Invert(ft):	-1.500	-1.500	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 58		From Node: Sub-Basin-5	Length(ft): 550.00
Group: BASE		To Node: Sub-Basin-8	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	18.00	18.00	Entrance Loss Coef: 0.00
Rise(in):	18.00	18.00	Exit Loss Coef: 1.00
Invert(ft):	-4.320	-1.120	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: NEW		From Node: SUB-BASIN-4	Length(ft): 600.00
Group: BASE		To Node: SUB-BASIN-3	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Most Restrictive
Geometry:	Circular	Circular	Flow: Both
Span(in):	24.00	24.00	Entrance Loss Coef: 0.00
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00
Invert(ft):	-3.000	-3.000	Bend Loss Coef: 0.00
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P1		From Node: Sub-Basin-1	Length(ft): 600.00	
Group: BASE		To Node: CS-1	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	15.00	15.00	Entrance Loss Coef: 0.00	
Rise(in):	15.00	15.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.820	-1.830	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P2		From Node: Sub-Basin-2	Length(ft): 600.00	
Group: BASE		To Node: CS-2	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00	
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.210	-2.740	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3		From Node: Sub-Basin-3	Length(ft): 600.00	
Group: BASE		To Node: CS-3	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00	
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.630	-2.330	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P4		From Node: Sub-Basin-4	Length(ft): 600.00	
Group: BASE		To Node: CS-4	Count: 2	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	24.00	24.00	Entrance Loss Coef: 0.00	
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.630	-2.330	Bend Loss Coef: 0.00	
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw	

Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P5 From Node: Sub-Basin-5 Length(ft): 250.00
Group: BASE To Node: CS-5 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	12.00	12.00	Flow:	Both
Rise(in):	12.00	12.00	Entrance Loss Coef:	0.00
Invert(ft):	0.420	-4.320	Exit Loss Coef:	1.00
Manning's N:	0.020000	0.020000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P6 From Node: Sub-Basin-6 Length(ft): 600.00
Group: BASE To Node: CS-6 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	36.00	36.00	Flow:	Both
Rise(in):	36.00	36.00	Entrance Loss Coef:	0.00
Invert(ft):	0.880	-1.730	Exit Loss Coef:	1.00
Manning's N:	0.020000	0.020000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P8 From Node: Sub-Basin-8 Length(ft): 250.00
Group: BASE To Node: CS-8 Count: 2
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	12.00	12.00	Flow:	Both
Rise(in):	12.00	12.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.200	-1.580	Exit Loss Coef:	1.00
Manning's N:	0.020000	0.020000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==========
==== Drop Structures ==========
==========

```
        Name: DP-1               From Node: CS-1              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 15.00          15.00                                Flow: Positive
    Rise(in): 15.00          15.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.410        -1.830                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-1 ***
                                                                              TABLE
                  Count: 7                     Bottom Clip(in): 0.000
                   Type: Vertical: Mavis          Top Clip(in): 0.000
                   Flow: Positive              Weir Disc Coef: 3.200
              Geometry: Rectangular          Orifice Disc Coef: 0.600

              Span(in): 48.00                      Invert(ft): 2.000
              Rise(in): 9.00                Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
        Name: DP-2               From Node: CS-2              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 30.00          30.00                                Flow: Positive
    Rise(in): 30.00          30.00                    Entrance Loss Coef: 0.000
   Invert(ft): -2.740        -3.070                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-2 ***
                                                                              TABLE
                  Count: 1                     Bottom Clip(in): 0.000
                   Type: Vertical: Mavis          Top Clip(in): 0.000
                   Flow: Positive              Weir Disc Coef: 3.200
              Geometry: Rectangular          Orifice Disc Coef: 0.600

              Span(in): 48.00                      Invert(ft): 2.000
              Rise(in): 9.00                Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
        Name: DP-3               From Node: CS-3              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 24.00          24.00                                Flow: Positive
    Rise(in): 24.00          24.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.500        -1.500                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall
```

*** Weir 1 of 1 for Drop Structure DP-3 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.100
Rise(in):	9.00	Control Elev(ft):	2.100

Name:	DP-4-1	From Node:	CS-4	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Positive
Invert(ft):	-4.060	-2.300	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-4-2	From Node:	CS-4	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	30.00	30.00	Solution Algorithm:	Automatic
Rise(in):	30.00	30.00	Flow:	Positive
Invert(ft):	-1.070	-1.820	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-2 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-5	From Node:	CS-5	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Positive
Invert(ft):	-4.320	-2.470	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
			Outlet Ctrl Spec:	Use dc or tw

```
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-5 ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
         Name: DP-6                From Node: CS-6               Length(ft): 100.00
        Group: BASE                  To Node: Outfalls                Count: 1

               UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular       Circular                   Solution Algorithm: Automatic
     Span(in): 36.00          36.00                                 Flow: Positive
     Rise(in): 36.00          36.00                     Entrance Loss Coef: 0.000
   Invert(ft): -1.730         -3.610                        Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                           Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-6 ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
         Name: DP-8                From Node: CS-8               Length(ft): 100.00
        Group: BASE                  To Node: Outfalls                Count: 2

               UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular       Circular                   Solution Algorithm: Automatic
     Span(in): 15.00          15.00                                 Flow: Positive
     Rise(in): 15.00          15.00                     Entrance Loss Coef: 0.000
   Invert(ft): -1.580         -1.580                        Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                           Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-8 ***
                                                                                TABLE
                  Count: 2                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000
```

```
================================================================================================
==== Weirs =====================================================================================
================================================================================================

         Name: 1                   From Node: Sub-Basin-1
        Group: BASE                  To Node: CS-1
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 2                   From Node: Sub-Basin-2
        Group: BASE                  To Node: CS-2
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 3                   From Node: Sub-Basin-3
        Group: BASE                  To Node: CS-3
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.200
       Control Elevation(ft): 4.200
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 4                   From Node: Sub-Basin-4
        Group: BASE                  To Node: CS-4
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 5                   From Node: Sub-Basin-5
        Group: BASE                  To Node: CS-5
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.700
```

```
       Control Elevation(ft): 4.700
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 6                   From Node: Sub-Basin-6
       Group: BASE                  To Node: CS-6
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 5.200
       Control Elevation(ft): 5.200
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 8                   From Node: Sub-Basin-8
       Group: BASE                  To Node: CS-8
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 89&90ST             From Node: CS-5
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 2
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 999999.00
                  Invert(ft): 4.900
       Control Elevation(ft): 4.900
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 91ST                From Node: CS-4
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 1
        Type: Vertical: Gravel     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 92&93 ST            From Node: CS-3
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 2
```

```
         Type: Vertical: Gravel     Geometry: Rectangular

                     Span(in): 180.00
                     Rise(in): 999999.00
                   Invert(ft): 3.800
       Control Elevation(ft): 3.800
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: 94ST               From Node: CS-2
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 240.00
                     Rise(in): 999999.00
                   Invert(ft): 4.600
       Control Elevation(ft): 4.600
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: 95ST               From Node: CS-1
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 240.00
                     Rise(in): 999999.00
                   Invert(ft): 4.550
       Control Elevation(ft): 4.550
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: BASIN-1-2 OVR      From Node: SUB-BASIN-1
        Group: BASE                 To Node: SUB-BASIN-2
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 420.00
                     Rise(in): 9999.00
                   Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600

Bay Drive Roadway Overflow

-------------------------------------------------------------------------------------------------------
         Name: BASIN-2-3 OVR      From Node: SUB-BASIN-2
        Group: BASE                 To Node: SUB-BASIN-3
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 420.00
                     Rise(in): 999.00
                   Invert(ft): 4.500
       Control Elevation(ft): 4.500
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600
```

```
---------------------------------------------------------------------------------------------------
        Name: BASIN-4-3 OVR       From Node: SUB-BASIN-4
       Group: BASE                  To Node: SUB-BASIN-3
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Irregular

                      XSec: SECTION 1
                Invert(ft): 3.250
     Control Elevation(ft): 3.250
    Struct Opening Dim(ft): 9999.00
                                       TABLE
           Bottom Clip(ft): 0.000
              Top Clip(ft): 0.000
       Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
        Name: BASIN-4-6 OVR       From Node: SUB-BASIN-4
       Group: BASE                  To Node: SUB-BASIN-6
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                Span(in): 420.00
                Rise(in): 999.00
                Invert(ft): 4.000
     Control Elevation(ft): 4.000
                                       TABLE
           Bottom Clip(in): 0.000
              Top Clip(in): 0.000
       Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
        Name: BASIN-5-4 OVR       From Node: SUB-BASIN-5
       Group: BASE                  To Node: SUB-BASIN-4
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                Span(in): 420.00
                Rise(in): 999.00
                Invert(ft): 4.100
     Control Elevation(ft): 4.100
                                       TABLE
           Bottom Clip(in): 0.000
              Top Clip(in): 0.000
       Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
        Name: BASIN-5-8 OVR       From Node: SUB-BASIN-5
       Group: BASE                  To Node: SUB-BASIN-8
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                Span(in): 420.00
                Rise(in): 999.00
                Invert(ft): 3.500
     Control Elevation(ft): 3.500
                                       TABLE
           Bottom Clip(in): 0.000
              Top Clip(in): 0.000
       Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
        Name: CARLYLE             From Node: CS-6
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 1
        Type: Vertical: Gravel     Geometry: Rectangular

                Span(in): 240.00
                Rise(in): 999999.00
                Invert(ft): 4.600
     Control Elevation(ft): 4.600
                                       TABLE
           Bottom Clip(in): 0.000
```

Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

==========
==== Rating Curves ====
==========

Name: DW-1 From Node: Sub-Basin-2 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: DW-2 From Node: Sub-Basin-5 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: DW-3 From Node: Sub-Basin-6 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: EXIST-PUMP From Node: CS-3 Count: 1
Group: BASE To Node: Outfalls Flow: Both

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	EXIST-PUMP	2.100	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: NEW PUMP From Node: SUB-BASIN-3 Count: 1
Group: BASE To Node: Outfalls Flow: Both

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	NEW PUMP	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: NEW WELLS From Node: SUB-BASIN-3 Count: 3
Group: BASE To Node: Aquifer Flow: None

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	DRAINAGE WELLS	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

==========
==== Hydrology Simulations ====
==========

Name: 005YR001HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\005YR001HR.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Fdot-1
Rainfall Amount(in): 3.20

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 005YR024HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\005YR024HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 010YR024HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\010YR024HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 7.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 025YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\025YR072HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 11.00

Time(hrs)	Print Inc(min)
96.000	5.00

Name: 100YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\100YR072HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 15.00

Time(hrs)	Print Inc(min)
96.000	5.00

Name: QUALITY
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\QUALITY.R32

Override Defaults: Yes
Storm Duration(hrs): 1.63
Rainfall File: Scsiii
Rainfall Amount(in): 1.58

Time(hrs)	Print Inc(min)
12.000	1.00
24.000	15.00

==========
==== Routing Simulations ==========
==========

Name: 005YR001HR Hydrology Sim: 005YR001HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\005YR001HR.I32

```
     Execute: Yes         Restart: No            Patch: No
  Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 6.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 005YR024HR          Hydrology Sim: 005YR024HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\005YR024HR.I32

     Execute: Yes         Restart: No            Patch: No
  Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 48.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 010YR024HR          Hydrology Sim: 010YR024HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\010YR024HR.I32

     Execute: Yes         Restart: No            Patch: No
  Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 48.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 025YR072HR          Hydrology Sim: 025YR072HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\025YR072HR.I32

     Execute: Yes         Restart: No            Patch: No
  Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 120.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:
```

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: 100YR072HR Hydrology Sim: 100YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\100YR072HR.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 120.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: QUALITY Hydrology Sim: QUALITY
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 1\QUALITY.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	5.000

Group	Run
BASE	Yes

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS-OPTION 1
NODE MAXMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Aquifer	BASE	005YR001HR	0.00	-60.00	1.60	-61.6000	0	0.53	69.30	0.00	0.00
Aquifer	BASE	005YR024HR	0.00	-60.00	1.60	-61.6000	0	8.66	69.30	0.00	0.00
Aquifer	BASE	010YR024HR	0.00	-60.00	1.60	-61.6000	0	7.91	69.30	0.00	0.00
Aquifer	BASE	025YR072HR	0.00	-60.00	1.60	-61.6000	0	38.33	69.30	0.00	0.00
Aquifer	BASE	100YR072HR	0.00	-60.00	1.60	-61.6000	0	25.06	69.30	0.00	0.00
Aquifer	BASE	QUALITY	0.00	-60.00	1.60	-61.6000	0	1.03	69.30	0.00	0.00
CS-1	BASE	005YR001HR	2.72	2.09	8.00	0.0025	132	2.72	2.39	2.72	2.39
CS-1	BASE	005YR024HR	14.86	2.11	8.00	0.0026	132	14.85	2.61	14.86	2.61
CS-1	BASE	010YR024HR	14.66	2.12	8.00	0.0026	132	14.65	2.69	14.66	2.69
CS-1	BASE	025YR072HR	62.31	2.14	8.00	0.0028	132	62.30	2.76	62.31	2.76
CS-1	BASE	100YR072HR	62.81	2.49	8.00	0.0028	132	62.80	3.61	62.81	3.61
CS-1	BASE	QUALITY	1.82	2.07	8.00	0.0024	132	1.82	1.75	1.82	1.75
CS-2	BASE	005YR001HR	1.55	2.21	8.00	0.0023	128	1.55	1.19	1.55	1.19
CS-2	BASE	005YR024HR	14.85	2.23	8.00	-0.0027	128	14.85	1.41	14.85	1.41
CS-2	BASE	010YR024HR	14.65	2.23	8.00	-0.0027	128	14.65	1.46	14.65	1.46
CS-2	BASE	025YR072HR	62.30	2.25	8.00	-0.0026	128	62.30	1.60	62.30	1.60
CS-2	BASE	100YR072HR	62.80	2.84	8.00	0.0028	128	62.80	9.66	62.80	9.66
CS-2	BASE	QUALITY	6.37	2.00	8.00	-0.0023	128	1.89	0.44	0.00	0.00
CS-3	BASE	005YR001HR	2.85	2.10	8.00	-0.0548	128	2.34	1.36	2.85	14.20
CS-3	BASE	005YR024HR	14.32	2.10	8.00	-0.0549	128	14.55	1.51	14.32	14.20
CS-3	BASE	010YR024HR	14.98	2.11	8.00	-0.0547	128	14.86	5.62	14.98	14.21
CS-3	BASE	025YR072HR	63.07	2.56	8.00	-0.0551	128	63.06	18.24	63.07	18.24
CS-3	BASE	100YR072HR	62.82	4.17	8.00	-0.0549	128	62.82	51.20	62.82	51.20
CS-3	BASE	QUALITY	1.68	2.10	8.00	-0.0549	128	1.66	0.91	1.68	14.20
CS-4	BASE	005YR001HR	2.33	2.76	8.00	-0.0063	173	2.33	16.93	2.33	16.93
CS-4	BASE	005YR024HR	14.64	2.87	8.00	-0.0051	173	14.64	19.97	14.64	19.97
CS-4	BASE	010YR024HR	14.87	2.90	8.00	0.0048	173	14.87	20.93	14.87	20.93
CS-4	BASE	025YR072HR	63.07	2.97	8.00	0.0050	173	63.07	22.20	63.07	22.20
CS-4	BASE	100YR072HR	62.82	3.57	8.00	-0.0075	173	62.82	29.17	62.82	29.17
CS-4	BASE	QUALITY	1.66	2.39	8.00	-0.0049	173	1.66	6.30	1.66	6.24
CS-5	BASE	005YR001HR	1.71	2.25	8.00	-0.0036	119	1.70	1.59	1.71	1.59
CS-5	BASE	005YR024HR	14.34	2.28	8.00	-0.0037	119	14.33	1.87	14.34	1.87
CS-5	BASE	010YR024HR	14.96	2.29	8.00	-0.0037	119	14.95	2.04	14.96	2.04
CS-5	BASE	025YR072HR	63.07	2.31	8.00	-0.0037	119	63.07	2.16	63.07	2.16
CS-5	BASE	100YR072HR	62.83	3.98	8.00	-0.0037	119	62.82	14.71	62.83	14.71
CS-5	BASE	QUALITY	6.09	2.00	8.00	-0.0037	119	1.64	0.68	0.00	0.00
CS-6	BASE	005YR001HR	1.75	3.06	8.00	0.0053	292	1.74	11.91	1.75	11.91
CS-6	BASE	005YR024HR	14.62	3.35	8.00	-0.0100	158	14.61	14.25	14.62	14.25
CS-6	BASE	010YR024HR	14.87	3.52	8.00	-0.0108	158	14.86	15.44	14.87	15.44
CS-6	BASE	025YR072HR	63.07	3.67	8.00	-0.0107	158	63.06	16.40	63.07	16.40
CS-6	BASE	100YR072HR	62.82	3.92	8.00	-0.0108	158	62.82	17.96	62.82	17.96
CS-6	BASE	QUALITY	5.97	2.00	8.00	-0.0050	364	1.71	3.15	0.00	0.00
CS-8	BASE	005YR001HR	1.98	2.25	8.00	-0.0041	126	1.98	3.13	1.98	3.13
CS-8	BASE	005YR024HR	14.34	2.28	8.00	-0.0038	126	14.33	3.74	14.34	3.74
CS-8	BASE	010YR024HR	14.96	3.41	8.00	-0.0035	126	14.95	10.00	14.96	10.00
CS-8	BASE	025YR072HR	63.07	4.60	8.00	0.0063	126	63.44	15.78	63.07	12.86
CS-8	BASE	100YR072HR	62.27	5.05	8.00	0.0942	126	62.82	52.63	62.27	13.79
CS-8	BASE	QUALITY	1.25	2.08	8.00	-0.0027	126	1.13	0.68	1.25	0.60
Outfalls	BASE	005YR001HR	0.00	1.60	1.60	0.0000	0	1.83	55.92	0.00	0.00
Outfalls	BASE	005YR024HR	0.00	1.60	1.60	0.0000	0	14.60	63.04	0.00	0.00

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS-OPTION 1
NODE MAXMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Outfalls	BASE	010YR024HR	0.00	1.60	1.60	0.0000	0	14.98	71.76	0.00	0.00
Outfalls	BASE	025YR072HR	0.00	1.60	1.60	0.0000	0	63.06	81.11	0.00	0.00
Outfalls	BASE	100YR072HR	0.00	1.60	1.60	0.0000	0	62.82	144.96	0.00	0.00
Outfalls	BASE	QUALITY	0.00	1.60	1.60	0.0000	0	1.63	27.33	0.00	0.00
SUB-BASIN-1	BASE	005YR001HR	2.72	4.09	8.00	-0.0055	171854	1.25	26.15	2.79	8.64
SUB-BASIN-1	BASE	005YR024HR	14.85	4.50	8.00	-0.0137	240849	12.50	35.60	16.56	15.13
SUB-BASIN-1	BASE	010YR024HR	14.65	4.67	8.00	-0.0144	270414	12.50	42.75	14.97	17.63
SUB-BASIN-1	BASE	025YR072HR	62.30	4.82	8.00	-0.0172	295809	60.50	52.14	62.47	23.40
SUB-BASIN-1	BASE	100YR072HR	62.80	5.06	8.00	-0.0177	337238	60.50	72.81	61.81	38.76
SUB-BASIN-1	BASE	QUALITY	1.82	3.14	8.00	-0.0063	8897	1.67	6.58	1.86	6.67
SUB-BASIN-2	BASE	005YR001HR	1.55	3.84	2.80	0.0623	31499	1.25	28.75	1.10	26.73
SUB-BASIN-2	BASE	005YR024HR	14.85	4.49	2.80	-0.0622	171461	13.03	39.52	12.15	26.79
SUB-BASIN-2	BASE	010YR024HR	14.65	4.67	2.80	-0.0624	208220	12.80	47.56	14.64	34.14
SUB-BASIN-2	BASE	025YR072HR	62.30	4.81	2.80	0.0626	239721	60.62	57.49	62.28	46.13
SUB-BASIN-2	BASE	100YR072HR	62.80	5.06	2.80	0.0626	291301	61.06	87.78	61.75	78.50
SUB-BASIN-2	BASE	QUALITY	1.72	2.02	2.80	-0.0623	182	1.67	12.71	0.98	24.92
SUB-BASIN-3	BASE	005YR001HR	2.34	3.72	2.80	-0.0286	236193	1.25	45.80	2.34	6.36
SUB-BASIN-3	BASE	005YR024HR	14.65	4.20	2.80	-0.0249	346650	12.50	62.69	14.55	6.51
SUB-BASIN-3	BASE	010YR024HR	14.87	4.36	2.80	-0.0247	383477	12.44	74.40	14.86	10.62
SUB-BASIN-3	BASE	025YR072HR	63.06	4.61	2.80	-0.0236	441511	60.32	81.90	63.06	23.24
SUB-BASIN-3	BASE	100YR072HR	62.82	5.05	2.80	-0.0313	542621	60.55	111.69	62.82	56.20
SUB-BASIN-3	BASE	QUALITY	1.68	2.53	2.80	0.0112	218	1.16	6.62	1.66	5.91
SUB-BASIN-4	BASE	005YR001HR	2.33	3.72	8.00	-0.0103	122511	1.25	30.77	1.38	20.57
SUB-BASIN-4	BASE	005YR024HR	14.64	4.20	8.00	-0.0091	221158	12.50	41.72	12.49	24.09
SUB-BASIN-4	BASE	010YR024HR	14.87	4.36	8.00	-0.0091	253986	12.50	50.29	12.43	26.42
SUB-BASIN-4	BASE	025YR072HR	63.07	4.61	8.00	-0.0089	305953	60.50	60.83	60.28	25.57
SUB-BASIN-4	BASE	100YR072HR	62.82	5.05	8.00	-0.0108	396720	60.50	86.21	60.44	21.73
SUB-BASIN-4	BASE	QUALITY	1.66	2.52	8.00	-0.0052	263	1.67	5.79	1.61	5.74
SUB-BASIN-5	BASE	005YR001HR	1.70	3.49	8.00	0.0625	66584	1.25	31.99	0.54	25.72
SUB-BASIN-5	BASE	005YR024HR	14.33	3.99	8.00	-0.0619	153475	12.50	42.66	12.61	29.52
SUB-BASIN-5	BASE	010YR024HR	14.95	4.34	8.00	-0.0617	212862	12.50	51.05	12.43	29.66
SUB-BASIN-5	BASE	025YR072HR	63.07	4.61	8.00	-0.0625	260141	60.50	61.55	60.25	27.18
SUB-BASIN-5	BASE	100YR072HR	62.82	5.05	8.00	-0.0624	337016	60.50	85.72	62.71	30.93
SUB-BASIN-5	BASE	QUALITY	1.53	2.01	8.00	-0.0620	179	1.67	8.40	2.54	26.76
SUB-BASIN-6	BASE	005YR001HR	1.74	3.52	8.00	0.0154	134203	1.25	50.65	1.74	35.01
SUB-BASIN-6	BASE	005YR024HR	14.61	4.06	8.00	-0.0188	289378	12.50	69.20	14.61	37.35
SUB-BASIN-6	BASE	010YR024HR	14.87	4.35	8.00	-0.0205	374028	12.50	83.05	14.86	38.54
SUB-BASIN-6	BASE	025YR072HR	63.07	4.61	8.00	-0.0203	447320	60.50	101.71	63.06	39.50
SUB-BASIN-6	BASE	100YR072HR	62.82	5.05	8.00	-0.0205	575552	60.48	147.93	62.82	41.06
SUB-BASIN-6	BASE	QUALITY	1.74	2.00	8.00	-0.0148	787	1.65	16.68	1.71	26.25
SUB-BASIN-8	BASE	005YR001HR	1.98	3.45	8.00	-0.0135	41729	0.95	13.54	1.98	3.13
SUB-BASIN-8	BASE	005YR024HR	14.33	3.99	8.00	-0.0119	61870	12.61	16.93	14.33	3.74
SUB-BASIN-8	BASE	010YR024HR	14.96	4.33	8.00	-0.0123	74552	12.43	20.60	14.95	10.00
SUB-BASIN-8	BASE	025YR072HR	63.07	4.61	8.00	-0.0138	84666	60.25	23.85	63.44	15.78
SUB-BASIN-8	BASE	100YR072HR	62.82	5.05	8.00	-0.0127	101132	60.75	30.68	62.82	52.63
SUB-BASIN-8	BASE	QUALITY	1.25	2.13	8.00	-0.0070	146	2.00	2.29	1.13	0.68

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS-OPTION 1
LINK MAXMUM REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
1	BASE	005YR001HR	0.00	0.00	0.000	2.72	4.09	2.72	2.09
1	BASE	005YR024HR	0.00	0.00	0.000	14.85	4.50	14.86	2.11
1	BASE	010YR024HR	0.00	0.00	0.000	14.65	4.67	14.66	2.12
1	BASE	025YR072HR	0.00	0.00	0.000	62.30	4.82	62.31	2.14
1	BASE	100YR072HR	62.80	0.90	0.000	62.80	5.06	62.81	2.49
1	BASE	QUALITY	0.00	0.00	0.000	1.82	3.14	1.82	2.07
12	BASE	005YR001HR	2.79	6.25	0.987	2.72	4.09	1.55	3.84
12	BASE	005YR024HR	18.04	6.39	1.049	14.85	4.50	14.85	4.49
12	BASE	010YR024HR	19.13	6.39	1.048	14.65	4.67	14.65	4.67
12	BASE	025YR072HR	67.83	6.39	1.079	62.30	4.82	62.30	4.81
12	BASE	100YR072HR	69.83	6.38	1.084	62.80	5.06	62.80	5.06
12	BASE	QUALITY	1.86	4.93	0.955	1.82	3.14	1.72	2.02
2	BASE	005YR001HR	0.00	0.00	0.000	1.55	3.84	1.55	2.21
2	BASE	005YR024HR	0.00	0.00	0.000	14.85	4.49	14.85	2.23
2	BASE	010YR024HR	0.00	0.00	0.000	14.65	4.67	14.65	2.23
2	BASE	025YR072HR	62.30	0.10	0.000	62.30	4.81	62.30	2.25
2	BASE	100YR072HR	62.80	8.27	0.006	62.80	5.06	62.80	2.84
2	BASE	QUALITY	0.00	0.00	0.000	1.72	2.02	6.37	2.00
23	BASE	005YR001HR	1.10	2.48	-1.189	1.55	3.84	2.34	3.72
23	BASE	005YR024HR	12.14	2.55	-1.221	14.85	4.49	14.65	4.20
23	BASE	010YR024HR	12.05	2.58	-1.213	14.65	4.67	14.87	4.36
23	BASE	025YR072HR	60.01	2.42	-1.226	62.30	4.81	63.06	4.61
23	BASE	100YR072HR	60.19	2.24	-1.209	62.80	5.06	62.82	5.05
23	BASE	QUALITY	5.11	1.74	-1.202	1.72	2.02	1.68	2.53
3	BASE	005YR001HR	0.00	0.00	0.000	2.34	3.72	2.85	2.10
3	BASE	005YR024HR	0.00	0.00	0.000	14.65	4.20	14.32	2.10
3	BASE	010YR024HR	14.87	4.06	0.001	14.87	4.36	14.98	2.11
3	BASE	025YR072HR	63.06	16.91	0.005	63.06	4.61	63.07	2.56
3	BASE	100YR072HR	62.82	50.32	0.021	62.82	5.05	62.82	4.17
3	BASE	QUALITY	0.00	0.00	0.000	1.68	2.53	1.68	2.10
34	BASE	005YR001HR	0.88	1.58	0.390	2.33	3.72	2.34	3.72
34	BASE	005YR024HR	11.96	1.45	0.607	14.64	4.20	14.65	4.20
34	BASE	010YR024HR	11.88	1.40	0.548	14.87	4.36	14.87	4.36
34	BASE	025YR072HR	15.20	1.11	0.565	63.07	4.61	63.06	4.61
34	BASE	100YR072HR	10.63	1.11	0.565	62.82	5.05	62.82	5.05
34	BASE	QUALITY	0.91	1.01	0.564	1.66	2.52	1.68	2.53
4	BASE	005YR001HR	0.00	0.00	0.000	2.33	3.72	2.33	2.76
4	BASE	005YR024HR	0.00	0.00	0.000	14.64	4.20	14.64	2.87
4	BASE	010YR024HR	0.00	0.00	0.000	14.87	4.36	14.87	2.90
4	BASE	025YR072HR	0.00	0.00	0.000	63.07	4.61	63.07	2.97
4	BASE	100YR072HR	62.82	8.08	0.001	62.82	5.05	62.82	3.57
4	BASE	QUALITY	0.00	0.00	0.000	1.66	2.52	1.66	2.39
45	BASE	005YR001HR	5.90	1.82	-1.232	1.70	3.49	2.33	3.72
45	BASE	005YR024HR	26.59	1.87	-1.251	14.33	3.99	14.64	4.20
45	BASE	010YR024HR	6.73	1.89	-1.255	14.95	4.34	14.87	4.36
45	BASE	025YR072HR	22.54	2.01	-1.252	63.07	4.61	63.07	4.61
45	BASE	100YR072HR	11.64	1.95	-1.264	62.82	5.05	62.82	5.05
45	BASE	QUALITY	6.22	1.83	-1.232	1.53	2.01	1.66	2.52
5	BASE	005YR001HR	0.00	0.00	0.000	1.70	3.49	1.71	2.25
5	BASE	005YR024HR	0.00	0.00	0.000	14.33	3.99	14.34	2.28

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
5	BASE	010YR024HR	0.00	0.00	0.000	14.95	4.34	14.96	2.29
5	BASE	025YR072HR	0.00	0.00	0.000	63.07	4.61	63.07	2.31
5	BASE	100YR072HR	62.82	13.24	0.002	62.82	5.05	62.83	3.98
5	BASE	QUALITY	0.00	0.00	0.000	1.53	2.01	6.09	2.00
56	BASE	005YR001HR	3.62	3.84	2.120	1.70	3.49	1.74	3.52
56	BASE	005YR024HR	11.50	3.84	-2.107	14.33	3.99	14.61	4.06
56	BASE	010YR024HR	19.92	3.83	-2.111	14.95	4.34	14.87	4.35
56	BASE	025YR072HR	57.79	3.84	2.125	63.07	4.61	63.07	4.61
56	BASE	100YR072HR	57.49	3.86	-2.112	62.82	5.05	62.82	5.05
56	BASE	QUALITY	2.16	3.82	-2.074	1.53	2.01	1.74	2.00
58	BASE	005YR001HR	3.76	1.85	-1.500	1.70	3.49	1.98	3.45
58	BASE	005YR024HR	12.04	2.02	-1.500	14.33	3.99	14.33	3.99
58	BASE	010YR024HR	11.96	2.07	-1.509	14.95	4.34	14.96	4.33
58	BASE	025YR072HR	59.85	2.11	-1.507	63.07	4.61	63.07	4.61
58	BASE	100YR072HR	59.68	2.00	-1.508	62.82	5.05	62.82	5.05
58	BASE	QUALITY	2.62	1.18	-1.521	1.53	2.01	1.25	2.13
6	BASE	005YR001HR	0.00	0.00	0.000	1.74	3.52	1.75	3.06
6	BASE	005YR024HR	0.00	0.00	0.000	14.61	4.06	14.62	3.35
6	BASE	010YR024HR	0.00	0.00	0.000	14.87	4.35	14.87	3.52
6	BASE	025YR072HR	0.00	0.00	0.000	63.07	4.61	63.07	3.67
6	BASE	100YR072HR	0.00	0.00	0.000	62.82	5.05	62.82	3.92
6	BASE	QUALITY	0.00	0.00	0.000	1.74	2.00	5.97	2.00
8	BASE	005YR001HR	0.00	0.00	0.000	1.98	3.45	1.98	2.25
8	BASE	005YR024HR	0.00	0.00	0.000	14.33	3.99	14.34	2.28
8	BASE	010YR024HR	14.96	7.25	0.001	14.96	4.33	14.96	3.41
8	BASE	025YR072HR	63.44	15.44	-2.839	63.07	4.61	63.07	4.60
8	BASE	100YR072HR	62.82	51.87	-82.055	62.82	5.05	62.27	5.05
8	BASE	QUALITY	0.00	0.00	0.000	1.25	2.13	1.25	2.08
89&90ST	BASE	005YR001HR	0.00	0.00	0.000	1.71	2.25	0.00	1.60
89&90ST	BASE	005YR024HR	0.00	0.00	0.000	14.34	2.28	0.00	1.60
89&90ST	BASE	010YR024HR	0.00	0.00	0.000	14.96	2.29	0.00	1.60
89&90ST	BASE	025YR072HR	0.00	0.00	0.000	63.07	2.31	0.00	1.60
89&90ST	BASE	100YR072HR	0.00	0.00	0.000	62.83	3.98	0.00	1.60
89&90ST	BASE	QUALITY	0.00	0.00	0.000	6.09	2.00	0.00	1.60
91ST	BASE	005YR001HR	0.00	0.00	0.000	2.33	2.76	0.00	1.60
91ST	BASE	005YR024HR	0.00	0.00	0.000	14.64	2.87	0.00	1.60
91ST	BASE	010YR024HR	0.00	0.00	0.000	14.87	2.90	0.00	1.60
91ST	BASE	025YR072HR	0.00	0.00	0.000	63.07	2.97	0.00	1.60
91ST	BASE	100YR072HR	0.00	0.00	0.000	62.82	3.57	0.00	1.60
91ST	BASE	QUALITY	0.00	0.00	0.000	1.66	2.39	0.00	1.60
92&93 ST	BASE	005YR001HR	0.00	0.00	0.000	2.85	2.10	0.00	1.60
92&93 ST	BASE	005YR024HR	0.00	0.00	0.000	14.32	2.10	0.00	1.60
92&93 ST	BASE	010YR024HR	0.00	0.00	0.000	14.98	2.11	0.00	1.60
92&93 ST	BASE	025YR072HR	0.00	0.00	0.000	63.07	2.56	0.00	1.60
92&93 ST	BASE	100YR072HR	62.82	21.72	0.013	62.82	4.17	0.00	1.60
92&93 ST	BASE	QUALITY	0.00	0.00	0.000	1.68	2.10	0.00	1.60
94ST	BASE	005YR001HR	0.00	0.00	0.000	1.55	2.21	0.00	1.60
94ST	BASE	005YR024HR	0.00	0.00	0.000	14.85	2.23	0.00	1.60
94ST	BASE	010YR024HR	0.00	0.00	0.000	14.65	2.23	0.00	1.60
94ST	BASE	025YR072HR	0.00	0.00	0.000	62.30	2.25	0.00	1.60

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94ST	BASE	100YR072HR	0.00	0.00	0.000	62.80	2.84	0.00	1.60
94ST	BASE	QUALITY	0.00	0.00	0.000	6.37	2.00	0.00	1.60
95ST	BASE	005YR001HR	0.00	0.00	0.000	2.72	2.09	0.00	1.60
95ST	BASE	005YR024HR	0.00	0.00	0.000	14.86	2.11	0.00	1.60
95ST	BASE	010YR024HR	0.00	0.00	0.000	14.66	2.12	0.00	1.60
95ST	BASE	025YR072HR	0.00	0.00	0.000	62.31	2.14	0.00	1.60
95ST	BASE	100YR072HR	0.00	0.00	0.000	62.81	2.49	0.00	1.60
95ST	BASE	QUALITY	0.00	0.00	0.000	1.82	2.07	0.00	1.60
BASIN-1-2 OVR	BASE	005YR001HR	0.00	0.00	0.000	2.72	4.09	1.55	3.84
BASIN-1-2 OVR	BASE	005YR024HR	16.56	12.21	0.076	14.85	4.50	14.85	4.49
BASIN-1-2 OVR	BASE	010YR024HR	14.98	14.76	0.141	14.65	4.67	14.65	4.67
BASIN-1-2 OVR	BASE	025YR072HR	62.47	20.43	0.129	62.30	4.82	62.30	4.81
BASIN-1-2 OVR	BASE	100YR072HR	61.79	35.04	-0.104	62.80	5.06	62.80	5.06
BASIN-1-2 OVR	BASE	QUALITY	0.00	0.00	0.000	1.82	3.14	1.72	2.02
BASIN-2-3 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.55	3.84	2.34	3.72
BASIN-2-3 OVR	BASE	005YR024HR	0.00	0.00	0.000	14.85	4.49	14.65	4.20
BASIN-2-3 OVR	BASE	010YR024HR	14.65	7.58	0.001	14.65	4.67	14.87	4.36
BASIN-2-3 OVR	BASE	025YR072HR	62.30	19.69	-0.004	62.30	4.81	63.06	4.61
BASIN-2-3 OVR	BASE	100YR072HR	61.75	45.06	0.028	62.80	5.06	62.82	5.05
BASIN-2-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.72	2.02	1.68	2.53
BASIN-4-3 OVR	BASE	005YR001HR	1.42	3.06	-0.033	2.33	3.72	2.34	3.72
BASIN-4-3 OVR	BASE	005YR024HR	12.52	6.06	-0.038	14.64	4.20	14.65	4.20
BASIN-4-3 OVR	BASE	010YR024HR	12.44	8.06	-0.044	14.87	4.36	14.87	4.36
BASIN-4-3 OVR	BASE	025YR072HR	60.29	7.50	-0.030	63.07	4.61	63.06	4.61
BASIN-4-3 OVR	BASE	100YR072HR	60.13	2.88	0.017	62.82	5.05	62.82	5.05
BASIN-4-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.66	2.52	1.68	2.53
BASIN-4-6 OVR	BASE	005YR001HR	0.00	0.00	0.000	2.33	3.72	1.74	3.52
BASIN-4-6 OVR	BASE	005YR024HR	14.64	9.76	0.002	14.64	4.20	14.61	4.06
BASIN-4-6 OVR	BASE	010YR024HR	13.51	10.14	-0.005	14.87	4.36	14.87	4.35
BASIN-4-6 OVR	BASE	025YR072HR	66.14	9.86	0.016	63.07	4.61	63.07	4.61
BASIN-4-6 OVR	BASE	100YR072HR	68.54	9.72	-0.068	62.82	5.05	62.82	5.05
BASIN-4-6 OVR	BASE	QUALITY	0.00	0.00	0.000	1.66	2.52	1.74	2.00
BASIN-5-4 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.70	3.49	2.33	3.72
BASIN-5-4 OVR	BASE	005YR024HR	0.00	0.00	-0.001	14.33	3.99	14.64	4.20
BASIN-5-4 OVR	BASE	010YR024HR	0.00	0.00	-0.002	14.95	4.34	14.87	4.36
BASIN-5-4 OVR	BASE	025YR072HR	0.00	0.00	-0.004	63.07	4.61	63.07	4.61
BASIN-5-4 OVR	BASE	100YR072HR	60.50	0.99	0.021	62.82	5.05	62.82	5.05
BASIN-5-4 OVR	BASE	QUALITY	0.00	0.00	0.000	1.53	2.01	1.66	2.52
BASIN-5-8 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.70	3.49	1.98	3.45
BASIN-5-8 OVR	BASE	005YR024HR	12.62	5.94	-0.061	14.33	3.99	14.33	3.99
BASIN-5-8 OVR	BASE	010YR024HR	14.69	7.98	-0.065	14.95	4.34	14.96	4.33
BASIN-5-8 OVR	BASE	025YR072HR	61.49	11.51	0.090	63.07	4.61	63.07	4.61
BASIN-5-8 OVR	BASE	100YR072HR	61.01	13.36	1.324	62.82	5.05	62.82	5.05
BASIN-5-8 OVR	BASE	QUALITY	0.00	0.00	0.000	1.53	2.01	1.25	2.13
CARLYLE	BASE	005YR001HR	0.00	0.00	0.000	1.75	3.06	0.00	1.60
CARLYLE	BASE	005YR024HR	0.00	0.00	0.000	14.62	3.35	0.00	1.60
CARLYLE	BASE	010YR024HR	0.00	0.00	0.000	14.87	3.52	0.00	1.60
CARLYLE	BASE	025YR072HR	0.00	0.00	0.000	63.07	3.67	0.00	1.60
CARLYLE	BASE	100YR072HR	0.00	0.00	0.000	62.82	3.92	0.00	1.60
CARLYLE	BASE	QUALITY	0.00	0.00	0.000	5.97	2.00	0.00	1.60

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DP-1	BASE	005YR001HR	2.72	2.39	-0.013	2.72	2.09	0.00	1.60
DP-1	BASE	005YR024HR	14.86	2.61	-0.018	14.86	2.11	0.00	1.60
DP-1	BASE	010YR024HR	14.66	2.69	-0.018	14.66	2.12	0.00	1.60
DP-1	BASE	025YR072HR	62.31	2.76	-0.018	62.31	2.14	0.00	1.60
DP-1	BASE	100YR072HR	62.81	3.61	-0.025	62.81	2.49	0.00	1.60
DP-1	BASE	QUALITY	1.82	1.75	-0.018	1.82	2.07	0.00	1.60
DP-2	BASE	005YR001HR	1.55	1.19	0.004	1.55	2.21	0.00	1.60
DP-2	BASE	005YR024HR	14.85	1.41	-0.017	14.85	2.23	0.00	1.60
DP-2	BASE	010YR024HR	14.65	1.46	-0.017	14.65	2.23	0.00	1.60
DP-2	BASE	025YR072HR	62.30	1.60	-0.017	62.30	2.25	0.00	1.60
DP-2	BASE	100YR072HR	62.80	9.66	-0.016	62.80	2.84	0.00	1.60
DP-2	BASE	QUALITY	0.00	0.00	0.000	6.37	2.00	0.00	1.60
DP-3	BASE	005YR001HR	2.85	0.00	0.001	2.85	2.10	0.00	1.60
DP-3	BASE	005YR024HR	14.32	0.00	0.002	14.32	2.10	0.00	1.60
DP-3	BASE	010YR024HR	14.98	0.01	0.013	14.98	2.11	0.00	1.60
DP-3	BASE	025YR072HR	63.07	4.04	0.041	63.07	2.56	0.00	1.60
DP-3	BASE	100YR072HR	62.82	15.28	0.034	62.82	4.17	0.00	1.60
DP-3	BASE	QUALITY	1.68	0.00	0.000	1.68	2.10	0.00	1.60
DP-4-1	BASE	005YR001HR	2.33	8.43	-0.065	2.33	2.76	0.00	1.60
DP-4-1	BASE	005YR024HR	14.64	9.93	-0.051	14.64	2.87	0.00	1.60
DP-4-1	BASE	010YR024HR	14.87	10.46	-0.048	14.87	2.90	0.00	1.60
DP-4-1	BASE	025YR072HR	63.07	11.06	-0.051	63.07	2.97	0.00	1.60
DP-4-1	BASE	100YR072HR	62.82	13.38	-0.075	62.82	3.57	0.00	1.60
DP-4-1	BASE	QUALITY	1.66	3.12	-0.007	1.66	2.39	0.00	1.60
DP-4-2	BASE	005YR001HR	2.33	8.50	-0.065	2.33	2.76	0.00	1.60
DP-4-2	BASE	005YR024HR	14.64	10.04	-0.051	14.64	2.87	0.00	1.60
DP-4-2	BASE	010YR024HR	14.87	10.46	-0.048	14.87	2.90	0.00	1.60
DP-4-2	BASE	025YR072HR	63.07	11.14	-0.051	63.07	2.97	0.00	1.60
DP-4-2	BASE	100YR072HR	62.82	15.79	-0.075	62.82	3.57	0.00	1.60
DP-4-2	BASE	QUALITY	1.66	3.12	-0.007	1.66	2.39	0.00	1.60
DP-5	BASE	005YR001HR	1.71	1.59	-0.009	1.71	2.25	0.00	1.60
DP-5	BASE	005YR024HR	14.34	1.87	-0.010	14.34	2.28	0.00	1.60
DP-5	BASE	010YR024HR	14.96	2.04	-0.021	14.96	2.29	0.00	1.60
DP-5	BASE	025YR072HR	63.07	2.16	-0.022	63.07	2.31	0.00	1.60
DP-5	BASE	100YR072HR	62.83	14.71	-0.022	62.83	3.98	0.00	1.60
DP-5	BASE	QUALITY	0.00	0.00	0.000	6.09	2.00	0.00	1.60
DP-6	BASE	005YR001HR	1.75	11.91	-0.076	1.75	3.06	0.00	1.60
DP-6	BASE	005YR024HR	14.62	14.25	-0.155	14.62	3.35	0.00	1.60
DP-6	BASE	010YR024HR	14.87	15.44	-0.169	14.87	3.52	0.00	1.60
DP-6	BASE	025YR072HR	63.07	16.40	-0.168	63.07	3.67	0.00	1.60
DP-6	BASE	100YR072HR	62.82	17.96	-0.169	62.82	3.92	0.00	1.60
DP-6	BASE	QUALITY	0.00	0.00	0.000	5.97	2.00	0.00	1.60
DP-8	BASE	005YR001HR	1.98	3.13	-0.051	1.98	2.25	0.00	1.60
DP-8	BASE	005YR024HR	14.34	3.74	-0.047	14.34	2.28	0.00	1.60
DP-8	BASE	010YR024HR	14.96	10.00	0.126	14.96	3.41	0.00	1.60
DP-8	BASE	025YR072HR	63.07	12.86	0.127	63.07	4.60	0.00	1.60
DP-8	BASE	100YR072HR	62.27	13.79	0.189	62.27	5.05	0.00	1.60
DP-8	BASE	QUALITY	1.25	0.60	-0.014	1.25	2.08	0.00	1.60
DW-1	BASE	005YR001HR	0.40	23.10	23.100	1.55	3.84	0.00	-60.00

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS-OPTION 1
LINK MAXMUM REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DW-1	BASE	005YR024HR	5.92	23.10	23.100	14.85	4.49	0.00	-60.00
DW-1	BASE	010YR024HR	5.44	23.10	23.100	14.65	4.67	0.00	-60.00
DW-1	BASE	025YR072HR	9.60	23.10	23.100	62.30	4.81	0.00	-60.00
DW-1	BASE	100YR072HR	7.23	23.10	23.100	62.80	5.06	0.00	-60.00
DW-1	BASE	QUALITY	0.89	23.10	23.100	1.72	2.02	0.00	-60.00
DW-2	BASE	005YR001HR	0.41	23.10	23.100	1.70	3.49	0.00	-60.00
DW-2	BASE	005YR024HR	5.94	23.10	23.100	14.33	3.99	0.00	-60.00
DW-2	BASE	010YR024HR	5.46	23.10	23.100	14.95	4.34	0.00	-60.00
DW-2	BASE	025YR072HR	10.51	23.10	23.100	63.07	4.61	0.00	-60.00
DW-2	BASE	100YR072HR	7.77	23.10	23.100	62.82	5.05	0.00	-60.00
DW-2	BASE	QUALITY	0.90	23.10	23.100	1.53	2.01	0.00	-60.00
DW-3	BASE	005YR001HR	0.43	23.10	23.100	1.74	3.52	0.00	-60.00
DW-3	BASE	005YR024HR	6.28	23.10	23.100	14.61	4.06	0.00	-60.00
DW-3	BASE	010YR024HR	5.80	23.10	23.100	14.87	4.35	0.00	-60.00
DW-3	BASE	025YR072HR	11.85	23.10	23.100	63.07	4.61	0.00	-60.00
DW-3	BASE	100YR072HR	8.43	23.10	23.100	62.82	5.05	0.00	-60.00
DW-3	BASE	QUALITY	0.91	23.10	23.100	1.74	2.00	0.00	-60.00
EXIST-PUMP	BASE	005YR001HR	0.59	14.20	14.200	2.85	2.10	0.00	1.60
EXIST-PUMP	BASE	005YR024HR	10.67	14.20	14.200	14.32	2.10	0.00	1.60
EXIST-PUMP	BASE	010YR024HR	9.98	14.20	14.200	14.98	2.11	0.00	1.60
EXIST-PUMP	BASE	025YR072HR	54.51	14.20	14.200	63.07	2.56	0.00	1.60
EXIST-PUMP	BASE	100YR072HR	52.70	14.20	14.200	62.82	4.17	0.00	1.60
EXIST-PUMP	BASE	QUALITY	1.22	14.20	14.200	1.68	2.10	0.00	1.60
NEW	BASE	005YR001HR	0.88	3.81	0.941	2.33	3.72	2.34	3.72
NEW	BASE	005YR024HR	11.96	3.49	1.464	14.64	4.20	14.65	4.20
NEW	BASE	010YR024HR	11.88	3.37	1.323	14.87	4.36	14.87	4.36
NEW	BASE	025YR072HR	15.20	2.68	1.363	63.07	4.61	63.06	4.61
NEW	BASE	100YR072HR	10.63	2.67	1.363	62.82	5.05	62.82	5.05
NEW	BASE	QUALITY	0.91	2.43	1.362	1.66	2.52	1.68	2.53
NEW PUMP	BASE	005YR001HR	0.42	5.00	5.000	2.34	3.72	0.00	1.60
NEW PUMP	BASE	005YR024HR	6.15	5.00	5.000	14.65	4.20	0.00	1.60
NEW PUMP	BASE	010YR024HR	5.67	5.00	5.000	14.87	4.36	0.00	1.60
NEW PUMP	BASE	025YR072HR	9.65	5.00	5.000	63.06	4.61	0.00	1.60
NEW PUMP	BASE	100YR072HR	7.27	5.00	5.000	62.82	5.05	0.00	1.60
NEW PUMP	BASE	QUALITY	0.91	5.00	5.000	1.68	2.53	0.00	1.60
NEW WELLS	BASE	005YR001HR	0.00	0.00	0.000	0.00	0.00	0.00	0.00
NEW WELLS	BASE	005YR024HR	0.00	0.00	0.000	0.00	0.00	0.00	0.00
NEW WELLS	BASE	010YR024HR	0.00	0.00	0.000	0.00	0.00	0.00	0.00
NEW WELLS	BASE	025YR072HR	0.00	0.00	0.000	0.00	0.00	0.00	0.00
NEW WELLS	BASE	100YR072HR	0.00	0.00	0.000	0.00	0.00	0.00	0.00
NEW WELLS	BASE	QUALITY	0.00	0.00	0.000	0.00	0.00	0.00	0.00
P1	BASE	005YR001HR	2.72	2.39	-0.176	2.72	4.09	2.72	2.09
P1	BASE	005YR024HR	14.85	2.61	-0.177	14.85	4.50	14.86	2.11
P1	BASE	010YR024HR	14.65	2.69	-0.168	14.65	4.67	14.66	2.12
P1	BASE	025YR072HR	62.30	2.76	-0.182	62.30	4.82	62.31	2.14
P1	BASE	100YR072HR	61.32	2.84	-0.185	62.80	5.06	62.81	2.49
P1	BASE	QUALITY	1.82	1.75	-0.176	1.82	3.14	1.82	2.07
P2	BASE	005YR001HR	1.55	1.19	-0.324	1.55	3.84	1.55	2.21
P2	BASE	005YR024HR	14.85	1.41	-0.330	14.85	4.49	14.85	2.23
P2	BASE	010YR024HR	14.65	1.46	-0.330	14.65	4.67	14.65	2.23

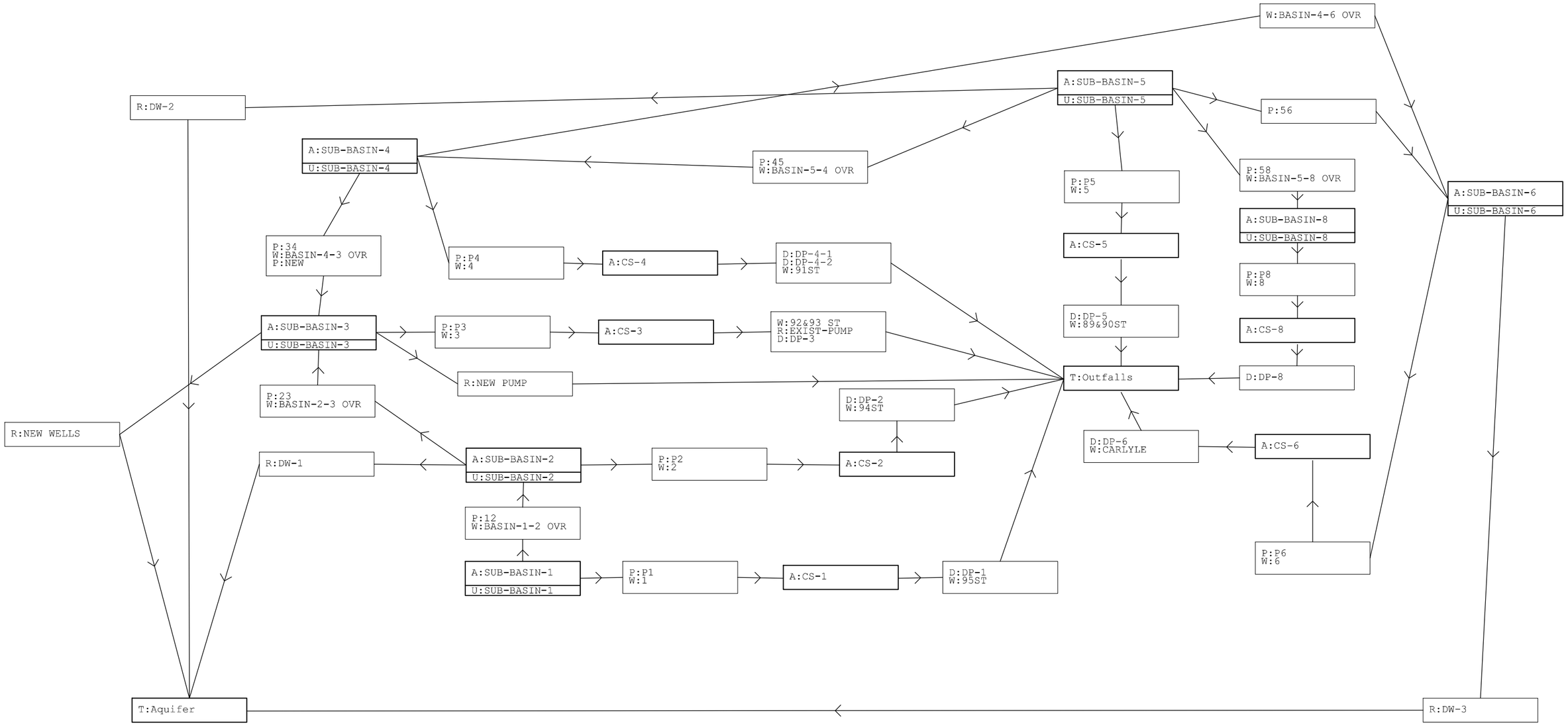
ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS-OPTION 1
LINK MAXMUM REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
P2	BASE	025YR072HR	62.07	1.50	-0.330	62.30	4.81	62.30	2.25
P2	BASE	100YR072HR	60.82	1.50	-0.330	62.80	5.06	62.80	2.84
P2	BASE	QUALITY	1.89	0.44	-0.330	1.72	2.02	6.37	2.00
P3	BASE	005YR001HR	2.34	1.36	0.136	2.34	3.72	2.85	2.10
P3	BASE	005YR024HR	14.55	1.51	-0.137	14.65	4.20	14.32	2.10
P3	BASE	010YR024HR	14.86	1.56	-0.136	14.87	4.36	14.98	2.11
P3	BASE	025YR072HR	64.44	1.60	0.207	63.06	4.61	63.07	2.56
P3	BASE	100YR072HR	67.07	1.60	0.142	62.82	5.05	62.82	4.17
P3	BASE	QUALITY	1.66	0.91	0.147	1.68	2.53	1.68	2.10
P4	BASE	005YR001HR	2.33	16.93	-1.567	2.33	3.72	2.33	2.76
P4	BASE	005YR024HR	14.64	19.97	-1.670	14.64	4.20	14.64	2.87
P4	BASE	010YR024HR	14.87	20.93	-1.677	14.87	4.36	14.87	2.90
P4	BASE	025YR072HR	63.07	22.20	-1.868	63.07	4.61	63.07	2.97
P4	BASE	100YR072HR	61.41	23.11	-1.784	62.82	5.05	62.82	3.57
P4	BASE	QUALITY	1.66	6.30	-1.588	1.66	2.52	1.66	2.39
P5	BASE	005YR001HR	1.70	1.59	-0.502	1.70	3.49	1.71	2.25
P5	BASE	005YR024HR	14.33	1.87	-0.499	14.33	3.99	14.34	2.28
P5	BASE	010YR024HR	14.95	2.04	-0.500	14.95	4.34	14.96	2.29
P5	BASE	025YR072HR	63.07	2.16	-0.501	63.07	4.61	63.07	2.31
P5	BASE	100YR072HR	61.18	2.21	0.505	62.82	5.05	62.83	3.98
P5	BASE	QUALITY	1.64	0.68	-0.500	1.53	2.01	6.09	2.00
P6	BASE	005YR001HR	1.74	11.91	-1.416	1.74	3.52	1.75	3.06
P6	BASE	005YR024HR	14.61	14.25	-1.432	14.61	4.06	14.62	3.35
P6	BASE	010YR024HR	14.86	15.44	-1.437	14.87	4.35	14.87	3.52
P6	BASE	025YR072HR	63.06	16.40	-1.432	63.07	4.61	63.07	3.67
P6	BASE	100YR072HR	62.82	17.96	-1.445	62.82	5.05	62.82	3.92
P6	BASE	QUALITY	1.71	3.15	-1.418	1.74	2.00	5.97	2.00
P8	BASE	005YR001HR	1.98	3.13	-0.347	1.98	3.45	1.98	2.25
P8	BASE	005YR024HR	14.33	3.74	0.326	14.33	3.99	14.34	2.28
P8	BASE	010YR024HR	13.43	3.86	0.323	14.96	4.33	14.96	3.41
P8	BASE	025YR072HR	60.87	3.86	0.325	63.07	4.61	63.07	4.60
P8	BASE	100YR072HR	60.47	3.86	-1.141	62.82	5.05	62.27	5.05
P8	BASE	QUALITY	1.13	0.68	0.321	1.25	2.13	1.25	2.08

APPENDIX E

ICPR MODEL FOR PROPOSED IMPROVEMENTS – OPTION 2

Node-Reach Diagram
ICPR Input Data
Node Maximum Report
Link Maximum Report



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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

ICPR MODEL - OPTION 2
NODE REACH DIAGRAM

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET:

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\option 2.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 2:17:05 PM)

==========
==== Basins ==========
==========

Name: SUB-BASIN-1 Node: SUB-BASIN-1 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 27.810 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-2 Node: SUB-BASIN-2 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 30.400 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-3 Node: SUB-BASIN-3 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 41.040 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-4 Node: SUB-BASIN-4 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.390 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-5 Node: SUB-BASIN-5 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.600 Time Shift(hrs): 0.00
Curve Number: 85.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-6 Node: SUB-BASIN-6 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 54.600 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-8 Node: SUB-BASIN-8 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 30.00
Area(ac): 7.240 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ==========
==========

Name: Aquifer Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	-60.000
99999.00	-60.000

Name: CS-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: Outfalls Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	1.600
99999.00	1.600

Name: SUB-BASIN-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.090	0.0000
8.000	19.3100

Name: SUB-BASIN-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.690	0.0000
8.000	21.1000

Name: SUB-BASIN-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.690	0.0000
8.000	28.0000

Name: SUB-BASIN-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000

3.120	0.0000
8.000	23.0000

Name: SUB-BASIN-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.110	0.0000
8.000	19.5000

Name: SUB-BASIN-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.060	0.0000
8.000	32.7500

Name: SUB-BASIN-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.330	0.0000
8.000	4.8400

==========
==== Cross Sections ====
==========

Name: SECTION 1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	3.250	0.016000
18.000	3.800	0.016000
36.000	3.250	0.016000

==========
==== Operating Tables ====
==========

Name: DRAINAGE WELLS Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

DRAINAGE WELL CAPACITY: 500 GPM/FT. OF AVAILABLE HEAD

US Stage(ft)	Discharge(cfs)
1.900	7.70
8.000	7.70

Name: EXIST-PUMP Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
2.000	14.20
8.000	14.20

Name: NEW PUMP Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
1.900	5.00
8.000	5.00

==== Pipes ====

Name: 12 From Node: Sub-Basin-1 Length(ft): 650.00
Group: BASE To Node: Sub-Basin-2 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 23 From Node: Sub-Basin-2 Length(ft): 800.00
Group: BASE To Node: Sub-Basin-3 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 34 From Node: Sub-Basin-4 Length(ft): 800.00
Group: BASE To Node: Sub-Basin-3 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

```
        Name: 45                  From Node: Sub-Basin-5        Length(ft): 800.00
       Group: BASE                  To Node: Sub-Basin-4             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Automatic
    Geometry: Circular       Circular                              Flow: Both
    Span(in): 18.00          18.00                       Entrance Loss Coef: 0.00
    Rise(in): 18.00          18.00                           Exit Loss Coef: 1.00
   Invert(ft): -1.500        -1.500                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


--------------------------------------------------------------------------------------------------
        Name: 56                  From Node: Sub-Basin-5        Length(ft): 250.00
       Group: BASE                  To Node: Sub-Basin-6             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Automatic
    Geometry: Circular       Circular                              Flow: Both
    Span(in): 18.00          18.00                       Entrance Loss Coef: 0.00
    Rise(in): 18.00          18.00                           Exit Loss Coef: 1.00
   Invert(ft): -1.500        -1.500                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


--------------------------------------------------------------------------------------------------
        Name: 58                  From Node: Sub-Basin-5        Length(ft): 550.00
       Group: BASE                  To Node: Sub-Basin-8             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Automatic
    Geometry: Circular       Circular                              Flow: Both
    Span(in): 18.00          18.00                       Entrance Loss Coef: 0.00
    Rise(in): 18.00          18.00                           Exit Loss Coef: 1.00
   Invert(ft): -4.320        -1.120                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


--------------------------------------------------------------------------------------------------
        Name: NEW                 From Node: SUB-BASIN-4        Length(ft): 600.00
       Group: BASE                  To Node: SUB-BASIN-3             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Most Restrictive
    Geometry: Circular       Circular                              Flow: Both
    Span(in): 24.00          24.00                       Entrance Loss Coef: 0.00
    Rise(in): 24.00          24.00                           Exit Loss Coef: 1.00
   Invert(ft): -3.000        -3.000                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall
```

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P1		From Node: Sub-Basin-1	Length(ft): 600.00	
Group: BASE		To Node: CS-1	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	15.00	15.00	Entrance Loss Coef: 0.00	
Rise(in):	15.00	15.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.820	-1.830	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P2		From Node: Sub-Basin-2	Length(ft): 600.00	
Group: BASE		To Node: CS-2	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00	
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.210	-2.740	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3		From Node: Sub-Basin-3	Length(ft): 600.00	
Group: BASE		To Node: CS-3	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00	
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.630	-2.330	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P4		From Node: Sub-Basin-4	Length(ft): 600.00	
Group: BASE		To Node: CS-4	Count: 2	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	24.00	24.00	Entrance Loss Coef: 0.00	
Rise(in):	24.00	24.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.630	-2.330	Bend Loss Coef: 0.00	
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw	

Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P5	From Node: Sub-Basin-5	Length(ft): 250.00
Group:	BASE	To Node: CS-5	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00
Invert(ft):	0.420	-4.320	Bend Loss Coef: 0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P6	From Node: Sub-Basin-6	Length(ft): 600.00
Group:	BASE	To Node: CS-6	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	36.00	36.00	Entrance Loss Coef: 0.00
Rise(in):	36.00	36.00	Exit Loss Coef: 1.00
Invert(ft):	0.880	-1.730	Bend Loss Coef: 0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P8	From Node: Sub-Basin-8	Length(ft): 250.00
Group:	BASE	To Node: CS-8	Count: 2
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00
Invert(ft):	-1.200	-1.580	Bend Loss Coef: 0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==========
==== Drop Structures ==========
==========

```
        Name: DP-1               From Node: CS-1              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 15.00          15.00                                Flow: Positive
    Rise(in): 15.00          15.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.410        -1.830                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-1 ***
                                                                              TABLE
                  Count: 7                     Bottom Clip(in): 0.000
                   Type: Vertical: Mavis          Top Clip(in): 0.000
                   Flow: Positive              Weir Disc Coef: 3.200
              Geometry: Rectangular          Orifice Disc Coef: 0.600

              Span(in): 48.00                      Invert(ft): 2.000
              Rise(in): 9.00                 Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
        Name: DP-2               From Node: CS-2              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 30.00          30.00                                Flow: Positive
    Rise(in): 30.00          30.00                    Entrance Loss Coef: 0.000
   Invert(ft): -2.740        -3.070                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-2 ***
                                                                              TABLE
                  Count: 1                     Bottom Clip(in): 0.000
                   Type: Vertical: Mavis          Top Clip(in): 0.000
                   Flow: Positive              Weir Disc Coef: 3.200
              Geometry: Rectangular          Orifice Disc Coef: 0.600

              Span(in): 48.00                      Invert(ft): 2.000
              Rise(in): 9.00                 Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
        Name: DP-3               From Node: CS-3              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 24.00          24.00                                Flow: Positive
    Rise(in): 24.00          24.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.500        -1.500                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall
```

*** Weir 1 of 1 for Drop Structure DP-3 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.100
Rise(in):	9.00	Control Elev(ft):	2.100

Name:	DP-4-1	From Node:	CS-4	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Positive
Invert(ft):	-4.060	-2.300	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-4-2	From Node:	CS-4	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	30.00	30.00	Solution Algorithm:	Automatic
Rise(in):	30.00	30.00	Flow:	Positive
Invert(ft):	-1.070	-1.820	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-2 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-5	From Node:	CS-5	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Positive
Invert(ft):	-4.320	-2.470	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
			Outlet Ctrl Spec:	Use dc or tw

```
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-5 ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
         Name: DP-6                From Node: CS-6              Length(ft): 100.00
        Group: BASE                  To Node: Outfalls               Count: 1

               UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular       Circular                   Solution Algorithm: Automatic
     Span(in): 36.00          36.00                                 Flow: Positive
     Rise(in): 36.00          36.00                      Entrance Loss Coef: 0.000
   Invert(ft): -1.730         -3.610                         Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                            Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-6 ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
         Name: DP-8                From Node: CS-8              Length(ft): 100.00
        Group: BASE                  To Node: Outfalls               Count: 2

               UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular       Circular                   Solution Algorithm: Automatic
     Span(in): 15.00          15.00                                 Flow: Positive
     Rise(in): 15.00          15.00                      Entrance Loss Coef: 0.000
   Invert(ft): -1.580         -1.580                         Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                            Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-8 ***
                                                                                TABLE
                  Count: 2                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000
```

```
================================================================================================
==== Weirs =====================================================================================
================================================================================================

         Name: 1                   From Node: Sub-Basin-1
        Group: BASE                  To Node: CS-1
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 2                   From Node: Sub-Basin-2
        Group: BASE                  To Node: CS-2
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 3                   From Node: Sub-Basin-3
        Group: BASE                  To Node: CS-3
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.200
       Control Elevation(ft): 4.200
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 4                   From Node: Sub-Basin-4
        Group: BASE                  To Node: CS-4
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600


------------------------------------------------------------------------------------------------
         Name: 5                   From Node: Sub-Basin-5
        Group: BASE                  To Node: CS-5
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                Invert(ft): 4.700
```

```
       Control Elevation(ft): 4.700
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 6                   From Node: Sub-Basin-6
       Group: BASE                  To Node: CS-6
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 5.200
       Control Elevation(ft): 5.200
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 8                   From Node: Sub-Basin-8
       Group: BASE                  To Node: CS-8
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 89&90ST             From Node: CS-5
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 2
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 999999.00
                  Invert(ft): 4.900
       Control Elevation(ft): 4.900
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 91ST                From Node: CS-4
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 1
        Type: Vertical: Gravel     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 92&93 ST            From Node: CS-3
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 2
```

```
         Type: Vertical: Gravel     Geometry: Rectangular

                     Span(in): 180.00
                     Rise(in): 999999.00
                   Invert(ft): 3.800
       Control Elevation(ft): 3.800
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: 94ST                From Node: CS-2
        Group: BASE                  To Node: Outfalls
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 240.00
                     Rise(in): 999999.00
                   Invert(ft): 4.600
       Control Elevation(ft): 4.600
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: 95ST                From Node: CS-1
        Group: BASE                  To Node: Outfalls
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 240.00
                     Rise(in): 999999.00
                   Invert(ft): 4.550
       Control Elevation(ft): 4.550
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: BASIN-1-2 OVR       From Node: SUB-BASIN-1
        Group: BASE                  To Node: SUB-BASIN-2
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 420.00
                     Rise(in): 9999.00
                   Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600

Bay Drive Roadway Overflow

-------------------------------------------------------------------------------------------------------
         Name: BASIN-2-3 OVR       From Node: SUB-BASIN-2
        Group: BASE                  To Node: SUB-BASIN-3
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 420.00
                     Rise(in): 999.00
                   Invert(ft): 4.500
       Control Elevation(ft): 4.500
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
          Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600
```

```
---------------------------------------------------------------------------------------------------
        Name: BASIN-4-3 OVR       From Node: SUB-BASIN-4
       Group: BASE                  To Node: SUB-BASIN-3
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Irregular

                     XSec: SECTION 1
              Invert(ft): 3.250
     Control Elevation(ft): 3.250
    Struct Opening Dim(ft): 9999.00
                                       TABLE
          Bottom Clip(ft): 0.000
             Top Clip(ft): 0.000
      Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600


---------------------------------------------------------------------------------------------------
        Name: BASIN-4-6 OVR       From Node: SUB-BASIN-4
       Group: BASE                  To Node: SUB-BASIN-6
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                Span(in): 420.00
                Rise(in): 999.00
              Invert(ft): 4.000
     Control Elevation(ft): 4.000
                                       TABLE
          Bottom Clip(in): 0.000
             Top Clip(in): 0.000
      Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600


---------------------------------------------------------------------------------------------------
        Name: BASIN-5-4 OVR       From Node: SUB-BASIN-5
       Group: BASE                  To Node: SUB-BASIN-4
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                Span(in): 420.00
                Rise(in): 999.00
              Invert(ft): 4.100
     Control Elevation(ft): 4.100
                                       TABLE
          Bottom Clip(in): 0.000
             Top Clip(in): 0.000
      Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600


---------------------------------------------------------------------------------------------------
        Name: BASIN-5-8 OVR       From Node: SUB-BASIN-5
       Group: BASE                  To Node: SUB-BASIN-8
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                Span(in): 420.00
                Rise(in): 999.00
              Invert(ft): 3.500
     Control Elevation(ft): 3.500
                                       TABLE
          Bottom Clip(in): 0.000
             Top Clip(in): 0.000
      Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600


---------------------------------------------------------------------------------------------------
        Name: CARLYLE             From Node: CS-6
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 1
        Type: Vertical: Gravel     Geometry: Rectangular

                Span(in): 240.00
                Rise(in): 999999.00
              Invert(ft): 4.600
     Control Elevation(ft): 4.600
                                       TABLE
          Bottom Clip(in): 0.000
```

```
              Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
    Orifice Discharge Coef: 0.600


================================================================================
==== Rating Curves =============================================================
================================================================================

        Name: DW-1               From Node: Sub-Basin-2            Count: 3
       Group: BASE                 To Node: Aquifer                 Flow: Positive

             TABLE           ELEV ON(ft)     ELEV OFF(ft)
          #1: Drainage Wells  2.000           1.600
          #2:                 0.000           0.000
          #3:                 0.000           0.000
          #4:                 0.000           0.000


--------------------------------------------------------------------------------
        Name: DW-2               From Node: Sub-Basin-5            Count: 3
       Group: BASE                 To Node: Aquifer                 Flow: Positive

             TABLE           ELEV ON(ft)     ELEV OFF(ft)
          #1: Drainage Wells  2.000           1.600
          #2:                 0.000           0.000
          #3:                 0.000           0.000
          #4:                 0.000           0.000


--------------------------------------------------------------------------------
        Name: DW-3               From Node: Sub-Basin-6            Count: 3
       Group: BASE                 To Node: Aquifer                 Flow: Positive

             TABLE           ELEV ON(ft)     ELEV OFF(ft)
          #1: Drainage Wells  2.000           1.600
          #2:                 0.000           0.000
          #3:                 0.000           0.000
          #4:                 0.000           0.000


--------------------------------------------------------------------------------
        Name: EXIST-PUMP         From Node: CS-3                   Count: 1
       Group: BASE                 To Node: Outfalls                Flow: Both

             TABLE           ELEV ON(ft)     ELEV OFF(ft)
          #1: EXIST-PUMP      2.100           1.600
          #2:                 0.000           0.000
          #3:                 0.000           0.000
          #4:                 0.000           0.000


--------------------------------------------------------------------------------
        Name: NEW PUMP           From Node: SUB-BASIN-3            Count: 1
       Group: BASE                 To Node: Outfalls                Flow: Both

             TABLE           ELEV ON(ft)     ELEV OFF(ft)
          #1: NEW PUMP        2.000           1.600
          #2:                 0.000           0.000
          #3:                 0.000           0.000
          #4:                 0.000           0.000


--------------------------------------------------------------------------------
        Name: NEW WELLS          From Node: SUB-BASIN-3            Count: 3
       Group: BASE                 To Node: Aquifer                 Flow: Both

             TABLE           ELEV ON(ft)     ELEV OFF(ft)
          #1: DRAINAGE WELLS  2.000           1.600
          #2:                 0.000           0.000
          #3:                 0.000           0.000
          #4:                 0.000           0.000


================================================================================
==== Hydrology Simulations =====================================================
================================================================================
```

Name: 005YR001HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\005YR001HR.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Fdot-1
Rainfall Amount(in): 3.20

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 005YR024HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\005YR024HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 010YR024HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\010YR024HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 7.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 025YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\025YR072HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 11.00

Time(hrs)	Print Inc(min)
96.000	5.00

Name: 100YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\100YR072HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 15.00

Time(hrs)	Print Inc(min)
96.000	5.00

Name: QUALITY
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\QUALITY.R32

Override Defaults: Yes
Storm Duration(hrs): 1.63
Rainfall File: Scsiii
Rainfall Amount(in): 1.58

Time(hrs)	Print Inc(min)
12.000	1.00
24.000	15.00

==========
==== Routing Simulations ==========
==========

Name: 005YR001HR Hydrology Sim: 005YR001HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\005YR001HR.I32

```
     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 6.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 005YR024HR          Hydrology Sim: 005YR024HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\005YR024HR.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 48.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 010YR024HR          Hydrology Sim: 010YR024HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\010YR024HR.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 48.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 025YR072HR          Hydrology Sim: 025YR072HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\025YR072HR.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 120.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:
```

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: 100YR072HR Hydrology Sim: 100YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\100YR072HR.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 120.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: QUALITY Hydrology Sim: QUALITY
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 2\QUALITY.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	5.000

Group	Run
BASE	Yes

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED IMPROVEMENTS - OPTION 2
NODE MAXIMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Aquifer	BASE	005YR001HR	0.00	-60.00	1.60	-61.6000	0	0.57	92.40	0.00	0.00
Aquifer	BASE	005YR024HR	0.00	-60.00	1.60	-61.6000	0	9.65	92.40	0.00	0.00
Aquifer	BASE	010YR024HR	0.00	-60.00	1.60	-61.6000	0	8.76	92.40	0.00	0.00
Aquifer	BASE	025YR072HR	0.00	-60.00	1.60	-61.6000	0	36.96	92.40	0.00	0.00
Aquifer	BASE	100YR072HR	0.00	-60.00	1.60	-61.6000	0	25.09	92.40	0.00	0.00
Aquifer	BASE	QUALITY	0.00	-60.00	1.60	-61.6000	0	1.18	92.40	0.00	0.00
CS-1	BASE	005YR001HR	2.72	2.09	8.00	0.0025	132	2.72	2.38	2.72	2.38
CS-1	BASE	005YR024HR	14.78	2.11	8.00	0.0021	132	14.77	2.60	14.78	2.60
CS-1	BASE	010YR024HR	14.66	2.12	8.00	0.0021	132	14.65	2.69	14.66	2.69
CS-1	BASE	025YR072HR	62.31	2.14	8.00	0.0022	132	62.30	2.76	62.31	2.76
CS-1	BASE	100YR072HR	61.91	2.40	8.00	0.0024	132	61.89	3.42	61.91	3.41
CS-1	BASE	QUALITY	1.83	2.07	8.00	0.0023	132	1.83	1.75	1.83	1.75
CS-2	BASE	005YR001HR	1.51	2.20	8.00	0.0023	128	1.51	1.19	1.51	1.19
CS-2	BASE	005YR024HR	14.76	2.23	8.00	-0.0028	128	14.76	1.40	14.76	1.40
CS-2	BASE	010YR024HR	14.66	2.23	8.00	-0.0028	128	14.65	1.46	14.66	1.46
CS-2	BASE	025YR072HR	62.31	2.25	8.00	0.0026	128	62.30	1.55	62.31	1.55
CS-2	BASE	100YR072HR	61.89	2.80	8.00	0.0048	128	61.89	9.09	61.89	9.09
CS-2	BASE	QUALITY	6.78	2.00	8.00	-0.0023	128	1.76	0.44	0.00	0.00
CS-3	BASE	005YR001HR	2.00	2.10	8.00	-0.0537	128	1.86	1.23	2.00	14.20
CS-3	BASE	005YR024HR	14.41	2.10	8.00	-0.0540	128	14.26	1.42	14.41	14.20
CS-3	BASE	010YR024HR	15.12	2.10	8.00	-0.0540	128	14.57	1.51	15.12	14.20
CS-3	BASE	025YR072HR	62.97	2.12	8.00	-0.0541	128	62.75	10.19	62.97	14.23
CS-3	BASE	100YR072HR	62.88	4.08	8.00	-0.0546	128	62.88	43.54	62.88	43.54
CS-3	BASE	QUALITY	7.26	2.00	8.00	-0.0023	128	1.73	0.43	0.00	0.00
CS-4	BASE	005YR001HR	1.67	2.71	8.00	-0.0084	173	1.66	15.42	1.67	15.42
CS-4	BASE	005YR024HR	14.30	2.81	8.00	-0.0116	173	14.30	18.11	14.30	18.11
CS-4	BASE	010YR024HR	14.60	2.87	8.00	-0.0117	173	14.60	19.93	14.60	19.93
CS-4	BASE	025YR072HR	62.77	2.93	8.00	-0.0124	173	62.77	21.47	62.77	21.47
CS-4	BASE	100YR072HR	62.89	3.32	8.00	-0.0115	173	62.89	26.48	62.89	26.48
CS-4	BASE	QUALITY	1.59	2.08	8.00	-0.0089	173	1.25	2.33	1.59	0.54
CS-5	BASE	005YR001HR	1.68	2.25	8.00	-0.0037	119	1.67	1.58	1.68	1.58
CS-5	BASE	005YR024HR	13.89	2.27	8.00	-0.0037	119	13.89	1.84	13.89	1.84
CS-5	BASE	010YR024HR	14.39	2.29	8.00	-0.0037	119	14.39	1.96	14.39	1.96
CS-5	BASE	025YR072HR	62.77	2.30	8.00	-0.0037	119	62.77	2.10	62.77	2.10
CS-5	BASE	100YR072HR	62.90	2.91	8.00	-0.0037	119	62.90	10.60	62.90	10.60
CS-5	BASE	QUALITY	6.33	2.00	8.00	-0.0037	119	1.70	0.66	0.00	0.00
CS-6	BASE	005YR001HR	1.74	3.05	8.00	0.0054	293	1.73	11.90	1.74	11.90
CS-6	BASE	005YR024HR	13.93	3.31	8.00	-0.0079	158	13.93	13.95	13.93	13.95
CS-6	BASE	010YR024HR	14.59	3.42	8.00	-0.0103	158	14.59	14.78	14.59	14.78
CS-6	BASE	025YR072HR	62.77	3.58	8.00	-0.0106	158	62.76	15.85	62.77	15.85
CS-6	BASE	100YR072HR	62.90	3.87	8.00	-0.0106	158	62.89	17.66	62.90	17.66
CS-6	BASE	QUALITY	5.85	2.00	8.00	-0.0050	364	1.66	3.17	5.85	0.00
CS-8	BASE	005YR001HR	1.94	2.25	8.00	-0.0040	126	1.93	3.12	1.94	3.12
CS-8	BASE	005YR024HR	13.89	2.27	8.00	-0.0033	126	13.89	3.67	13.89	3.67
CS-8	BASE	010YR024HR	14.39	2.34	8.00	-0.0037	126	14.39	5.06	14.39	5.06
CS-8	BASE	025YR072HR	62.77	4.43	8.00	-0.0033	126	62.75	12.49	62.77	12.49
CS-8	BASE	100YR072HR	62.90	4.98	8.00	0.0860	126	62.89	46.86	62.90	13.65
CS-8	BASE	QUALITY	1.22	2.08	8.00	-0.0027	126	1.21	0.70	1.22	0.62
Outfalls	BASE	005YR001HR	0.00	1.60	1.60	0.0000	0	1.71	54.67	0.00	0.00
Outfalls	BASE	005YR024HR	0.00	1.60	1.60	0.0000	0	14.13	60.71	0.00	0.00

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED IMPROVEMENTS - OPTION 2
NODE MAXIMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Outfalls	BASE	010YR024HR	0.00	1.60	1.60	0.0000	0	14.45	65.06	0.00	0.00
Outfalls	BASE	025YR072HR	0.00	1.60	1.60	0.0000	0	62.73	75.39	0.00	0.00
Outfalls	BASE	100YR072HR	0.00	1.60	1.60	0.0000	0	62.78	126.64	0.00	0.00
Outfalls	BASE	QUALITY	0.00	1.60	1.60	0.0000	0	1.59	7.52	0.00	0.00
SUB-BASIN-1	BASE	005YR001HR	2.72	4.08	8.00	-0.0053	169849	1.25	26.15	2.88	8.62
SUB-BASIN-1	BASE	005YR024HR	14.77	4.48	8.00	-0.0130	237916	12.50	35.60	16.23	15.53
SUB-BASIN-1	BASE	010YR024HR	14.65	4.66	8.00	-0.0147	269229	12.50	42.75	15.00	17.65
SUB-BASIN-1	BASE	025YR072HR	62.31	4.81	8.00	-0.0171	295023	60.50	52.14	62.50	23.38
SUB-BASIN-1	BASE	100YR072HR	61.89	5.05	8.00	-0.0177	335412	60.50	72.81	61.98	39.17
SUB-BASIN-1	BASE	QUALITY	1.83	3.14	8.00	-0.0064	8894	1.67	6.58	1.81	6.68
SUB-BASIN-2	BASE	005YR001HR	1.51	3.81	2.80	0.0622	25931	1.25	28.83	1.13	27.25
SUB-BASIN-2	BASE	005YR024HR	14.76	4.48	2.80	-0.0624	167640	13.07	39.90	17.50	27.72
SUB-BASIN-2	BASE	010YR024HR	14.65	4.66	2.80	-0.0626	206741	12.80	47.85	14.65	34.12
SUB-BASIN-2	BASE	025YR072HR	62.30	4.81	2.80	-0.0631	238741	60.61	57.75	62.29	46.07
SUB-BASIN-2	BASE	100YR072HR	61.89	5.04	2.80	-0.0631	288724	61.06	87.45	61.87	78.59
SUB-BASIN-2	BASE	QUALITY	1.55	2.02	2.80	-0.0626	182	1.67	12.74	3.18	25.65
SUB-BASIN-3	BASE	005YR001HR	1.88	3.33	2.80	-0.0617	148054	1.25	49.08	1.86	29.33
SUB-BASIN-3	BASE	005YR024HR	14.30	3.90	2.80	-0.0673	277289	12.67	68.19	14.26	29.52
SUB-BASIN-3	BASE	010YR024HR	14.60	4.19	2.80	-0.0684	344908	12.67	83.91	14.57	29.61
SUB-BASIN-3	BASE	025YR072HR	62.76	4.46	2.80	-0.0697	407243	60.59	104.12	62.75	38.29
SUB-BASIN-3	BASE	100YR072HR	62.88	4.96	2.80	-0.0685	522213	60.84	149.91	62.88	71.64
SUB-BASIN-3	BASE	QUALITY	1.58	2.01	2.80	-0.0621	218	1.68	18.86	1.73	28.53
SUB-BASIN-4	BASE	005YR001HR	1.66	3.50	8.00	-0.0121	78926	1.25	31.05	1.56	23.78
SUB-BASIN-4	BASE	005YR024HR	14.30	3.90	8.00	-0.0165	159689	12.54	42.53	12.93	32.95
SUB-BASIN-4	BASE	010YR024HR	14.60	4.19	8.00	-0.0157	219895	12.53	51.25	12.78	38.40
SUB-BASIN-4	BASE	025YR072HR	62.77	4.46	8.00	-0.0157	275528	60.50	62.18	60.63	43.54
SUB-BASIN-4	BASE	100YR072HR	62.89	4.96	8.00	-0.0166	378549	60.81	97.39	60.41	48.85
SUB-BASIN-4	BASE	QUALITY	1.59	2.08	8.00	-0.0113	263	1.62	7.53	1.61	8.50
SUB-BASIN-5	BASE	005YR001HR	1.67	3.48	8.00	0.0631	64705	1.25	31.99	3.45	28.84
SUB-BASIN-5	BASE	005YR024HR	13.89	3.93	8.00	0.0627	142512	12.50	42.66	12.61	30.11
SUB-BASIN-5	BASE	010YR024HR	14.39	4.17	8.00	0.0623	184344	12.50	51.05	12.43	30.15
SUB-BASIN-5	BASE	025YR072HR	62.77	4.46	8.00	0.0628	234187	60.50	61.55	61.30	35.29
SUB-BASIN-5	BASE	100YR072HR	62.90	4.96	8.00	0.0632	321694	60.50	85.72	60.83	49.44
SUB-BASIN-5	BASE	QUALITY	1.45	2.01	8.00	-0.0617	179	1.67	8.40	2.30	28.28
SUB-BASIN-6	BASE	005YR001HR	1.74	3.52	8.00	0.0149	133639	1.25	50.58	1.73	35.00
SUB-BASIN-6	BASE	005YR024HR	13.93	3.99	8.00	-0.0153	268780	12.50	69.11	13.93	37.05
SUB-BASIN-6	BASE	010YR024HR	14.59	4.19	8.00	-0.0195	326199	12.50	82.96	14.59	37.88
SUB-BASIN-6	BASE	025YR072HR	62.77	4.46	8.00	-0.0201	404695	60.50	101.54	62.76	38.95
SUB-BASIN-6	BASE	100YR072HR	62.89	4.96	8.00	-0.0200	549974	60.42	139.46	62.89	40.76
SUB-BASIN-6	BASE	QUALITY	1.57	2.00	8.00	-0.0147	787	1.65	16.61	1.66	26.27
SUB-BASIN-8	BASE	005YR001HR	1.93	3.44	8.00	-0.0133	41474	0.95	13.53	1.93	3.12
SUB-BASIN-8	BASE	005YR024HR	13.89	3.93	8.00	-0.0103	59530	12.61	16.57	13.89	3.67
SUB-BASIN-8	BASE	010YR024HR	14.39	4.17	8.00	-0.0131	68474	12.43	20.32	14.39	5.06
SUB-BASIN-8	BASE	025YR072HR	62.77	4.46	8.00	-0.0127	79111	60.25	23.66	62.75	12.49
SUB-BASIN-8	BASE	100YR072HR	62.89	4.96	8.00	-0.0103	97852	60.96	28.39	62.89	46.86
SUB-BASIN-8	BASE	QUALITY	1.21	2.14	8.00	-0.0070	146	1.92	2.23	1.21	0.70

ABBOTT AVE DRAINAGE STUDY
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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
1	BASE	005YR001HR	0.00	0.00	0.000	2.72	4.08	2.72	2.09
1	BASE	005YR024HR	0.00	0.00	0.000	14.77	4.48	14.78	2.11
1	BASE	010YR024HR	0.00	0.00	0.000	14.65	4.66	14.66	2.12
1	BASE	025YR072HR	0.00	0.00	0.000	62.31	4.81	62.31	2.14
1	BASE	100YR072HR	61.89	0.67	0.001	61.89	5.05	61.91	2.40
1	BASE	QUALITY	0.00	0.00	0.000	1.83	3.14	1.83	2.07
12	BASE	005YR001HR	2.95	6.24	0.987	2.72	4.08	1.51	3.81
12	BASE	005YR024HR	17.71	6.40	1.150	14.77	4.48	14.76	4.48
12	BASE	010YR024HR	18.89	6.40	1.133	14.65	4.66	14.65	4.66
12	BASE	025YR072HR	67.59	6.40	1.113	62.31	4.81	62.30	4.81
12	BASE	100YR072HR	69.20	6.39	1.115	61.89	5.05	61.89	5.04
12	BASE	QUALITY	1.88	4.93	1.093	1.83	3.14	1.55	2.02
2	BASE	005YR001HR	0.00	0.00	0.000	1.51	3.81	1.51	2.20
2	BASE	005YR024HR	0.00	0.00	0.000	14.76	4.48	14.76	2.23
2	BASE	010YR024HR	0.00	0.00	0.000	14.65	4.66	14.66	2.23
2	BASE	025YR072HR	62.30	0.06	0.000	62.30	4.81	62.31	2.25
2	BASE	100YR072HR	61.89	7.69	0.007	61.89	5.04	61.89	2.80
2	BASE	QUALITY	0.00	0.00	0.000	1.55	2.02	6.78	2.00
23	BASE	005YR001HR	1.12	3.01	1.427	1.51	3.81	1.88	3.33
23	BASE	005YR024HR	17.61	3.40	1.459	14.76	4.48	14.30	3.90
23	BASE	010YR024HR	12.06	3.13	1.430	14.65	4.66	14.60	4.19
23	BASE	025YR072HR	59.95	3.14	1.444	62.30	4.81	62.76	4.46
23	BASE	100YR072HR	59.77	3.15	1.428	61.89	5.04	62.88	4.96
23	BASE	QUALITY	1.04	2.28	-1.372	1.55	2.02	1.58	2.01
3	BASE	005YR001HR	0.00	0.00	0.000	1.88	3.33	2.00	2.10
3	BASE	005YR024HR	0.00	0.00	0.000	14.30	3.90	14.41	2.10
3	BASE	010YR024HR	0.00	0.00	0.000	14.60	4.19	15.12	2.10
3	BASE	025YR072HR	62.76	8.61	0.002	62.76	4.46	62.97	2.12
3	BASE	100YR072HR	62.88	42.66	0.018	62.88	4.96	62.88	4.08
3	BASE	QUALITY	0.00	0.00	0.000	1.58	2.01	7.26	2.00
34	BASE	005YR001HR	2.85	2.87	1.200	1.66	3.50	1.88	3.33
34	BASE	005YR024HR	17.71	2.84	1.206	14.30	3.90	14.30	3.90
34	BASE	010YR024HR	19.10	2.81	1.212	14.60	4.19	14.60	4.19
34	BASE	025YR072HR	68.18	2.81	1.221	62.77	4.46	62.76	4.46
34	BASE	100YR072HR	70.41	2.82	1.223	62.89	4.96	62.88	4.96
34	BASE	QUALITY	1.68	2.47	1.207	1.59	2.08	1.58	2.01
4	BASE	005YR001HR	0.00	0.00	0.000	1.66	3.50	1.67	2.71
4	BASE	005YR024HR	0.00	0.00	0.000	14.30	3.90	14.30	2.81
4	BASE	010YR024HR	0.00	0.00	0.000	14.60	4.19	14.60	2.87
4	BASE	025YR072HR	0.00	0.00	0.000	62.77	4.46	62.77	2.93
4	BASE	100YR072HR	62.89	4.22	0.001	62.89	4.96	62.89	3.32
4	BASE	QUALITY	0.00	0.00	0.000	1.59	2.08	1.59	2.08
45	BASE	005YR001HR	5.79	1.12	-1.276	1.67	3.48	1.66	3.50
45	BASE	005YR024HR	6.85	1.21	-1.294	13.89	3.93	14.30	3.90
45	BASE	010YR024HR	12.95	1.31	-1.295	14.39	4.17	14.60	4.19
45	BASE	025YR072HR	60.76	1.42	-1.304	62.77	4.46	62.77	4.46
45	BASE	100YR072HR	60.52	1.54	-1.291	62.90	4.96	62.89	4.96
45	BASE	QUALITY	5.85	1.20	-1.282	1.45	2.01	1.59	2.08
5	BASE	005YR001HR	0.00	0.00	0.000	1.67	3.48	1.68	2.25
5	BASE	005YR024HR	0.00	0.00	0.000	13.89	3.93	13.89	2.27

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
5	BASE	010YR024HR	0.00	0.00	0.000	14.39	4.17	14.39	2.29
5	BASE	025YR072HR	0.00	0.00	0.000	62.77	4.46	62.77	2.30
5	BASE	100YR072HR	62.90	8.56	0.002	62.90	4.96	62.90	2.91
5	BASE	QUALITY	0.00	0.00	0.000	1.45	2.01	6.33	2.00
56	BASE	005YR001HR	2.61	3.84	-2.132	1.67	3.48	1.74	3.52
56	BASE	005YR024HR	17.62	3.83	-2.108	13.89	3.93	13.93	3.99
56	BASE	010YR024HR	11.67	3.87	-2.110	14.39	4.17	14.59	4.19
56	BASE	025YR072HR	58.04	3.84	-2.116	62.77	4.46	62.77	4.46
56	BASE	100YR072HR	57.61	3.85	-2.125	62.90	4.96	62.89	4.96
56	BASE	QUALITY	1.98	3.81	-2.104	1.45	2.01	1.57	2.00
58	BASE	005YR001HR	0.96	1.81	-1.486	1.67	3.48	1.93	3.44
58	BASE	005YR024HR	12.04	2.02	-1.508	13.89	3.93	13.89	3.93
58	BASE	010YR024HR	11.96	2.07	-1.505	14.39	4.17	14.39	4.17
58	BASE	025YR072HR	59.86	2.12	-1.503	62.77	4.46	62.77	4.46
58	BASE	100YR072HR	59.69	2.04	-1.510	62.90	4.96	62.89	4.96
58	BASE	QUALITY	2.37	1.02	-1.489	1.45	2.01	1.21	2.14
6	BASE	005YR001HR	0.00	0.00	0.000	1.74	3.52	1.74	3.05
6	BASE	005YR024HR	0.00	0.00	0.000	13.93	3.99	13.93	3.31
6	BASE	010YR024HR	0.00	0.00	0.000	14.59	4.19	14.59	3.42
6	BASE	025YR072HR	0.00	0.00	0.000	62.77	4.46	62.77	3.58
6	BASE	100YR072HR	0.00	0.00	0.000	62.89	4.96	62.90	3.87
6	BASE	QUALITY	0.00	0.00	0.000	1.57	2.00	5.85	2.00
8	BASE	005YR001HR	0.00	0.00	0.000	1.93	3.44	1.94	2.25
8	BASE	005YR024HR	0.00	0.00	0.000	13.89	3.93	13.89	2.27
8	BASE	010YR024HR	14.39	1.20	0.000	14.39	4.17	14.39	2.34
8	BASE	025YR072HR	62.76	12.02	0.002	62.77	4.46	62.77	4.43
8	BASE	100YR072HR	62.89	46.08	-73.954	62.89	4.96	62.90	4.98
8	BASE	QUALITY	0.00	0.00	0.000	1.21	2.14	1.22	2.08
89&90ST	BASE	005YR001HR	0.00	0.00	0.000	1.68	2.25	0.00	1.60
89&90ST	BASE	005YR024HR	0.00	0.00	0.000	13.89	2.27	0.00	1.60
89&90ST	BASE	010YR024HR	0.00	0.00	0.000	14.39	2.29	0.00	1.60
89&90ST	BASE	025YR072HR	0.00	0.00	0.000	62.77	2.30	0.00	1.60
89&90ST	BASE	100YR072HR	0.00	0.00	0.000	62.90	2.91	0.00	1.60
89&90ST	BASE	QUALITY	0.00	0.00	0.000	6.33	2.00	0.00	1.60
91ST	BASE	005YR001HR	0.00	0.00	0.000	1.67	2.71	0.00	1.60
91ST	BASE	005YR024HR	0.00	0.00	0.000	14.30	2.81	0.00	1.60
91ST	BASE	010YR024HR	0.00	0.00	0.000	14.60	2.87	0.00	1.60
91ST	BASE	025YR072HR	0.00	0.00	0.000	62.77	2.93	0.00	1.60
91ST	BASE	100YR072HR	0.00	0.00	0.000	62.89	3.32	0.00	1.60
91ST	BASE	QUALITY	0.00	0.00	0.000	1.59	2.08	0.00	1.60
92&93 ST	BASE	005YR001HR	0.00	0.00	0.000	2.00	2.10	0.00	1.60
92&93 ST	BASE	005YR024HR	0.00	0.00	0.000	14.41	2.10	0.00	1.60
92&93 ST	BASE	010YR024HR	0.00	0.00	0.000	15.12	2.10	0.00	1.60
92&93 ST	BASE	025YR072HR	0.00	0.00	0.000	62.97	2.12	0.00	1.60
92&93 ST	BASE	100YR072HR	62.88	14.33	0.009	62.88	4.08	0.00	1.60
92&93 ST	BASE	QUALITY	0.00	0.00	0.000	7.26	2.00	0.00	1.60
94ST	BASE	005YR001HR	0.00	0.00	0.000	1.51	2.20	0.00	1.60
94ST	BASE	005YR024HR	0.00	0.00	0.000	14.76	2.23	0.00	1.60
94ST	BASE	010YR024HR	0.00	0.00	0.000	14.66	2.23	0.00	1.60
94ST	BASE	025YR072HR	0.00	0.00	0.000	62.31	2.25	0.00	1.60

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
94ST	BASE	100YR072HR	0.00	0.00	0.000	61.89	2.80	0.00	1.60
94ST	BASE	QUALITY	0.00	0.00	0.000	6.78	2.00	0.00	1.60
95ST	BASE	005YR001HR	0.00	0.00	0.000	2.72	2.09	0.00	1.60
95ST	BASE	005YR024HR	0.00	0.00	0.000	14.78	2.11	0.00	1.60
95ST	BASE	010YR024HR	0.00	0.00	0.000	14.66	2.12	0.00	1.60
95ST	BASE	025YR072HR	0.00	0.00	0.000	62.31	2.14	0.00	1.60
95ST	BASE	100YR072HR	0.00	0.00	0.000	61.91	2.40	0.00	1.60
95ST	BASE	QUALITY	0.00	0.00	0.000	1.83	2.07	0.00	1.60
BASIN-1-2 OVR	BASE	005YR001HR	0.00	0.00	0.000	2.72	4.08	1.51	3.81
BASIN-1-2 OVR	BASE	005YR024HR	16.23	12.60	0.058	14.77	4.48	14.76	4.48
BASIN-1-2 OVR	BASE	010YR024HR	15.00	14.77	0.139	14.65	4.66	14.65	4.66
BASIN-1-2 OVR	BASE	025YR072HR	62.50	20.42	0.127	62.31	4.81	62.30	4.81
BASIN-1-2 OVR	BASE	100YR072HR	62.00	35.52	-0.102	61.89	5.05	61.89	5.04
BASIN-1-2 OVR	BASE	QUALITY	0.00	0.00	0.000	1.83	3.14	1.55	2.02
BASIN-2-3 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.51	3.81	1.88	3.33
BASIN-2-3 OVR	BASE	005YR024HR	0.00	0.00	0.000	14.76	4.48	14.30	3.90
BASIN-2-3 OVR	BASE	010YR024HR	14.65	7.11	0.001	14.65	4.66	14.60	4.19
BASIN-2-3 OVR	BASE	025YR072HR	62.30	19.26	0.003	62.30	4.81	62.76	4.46
BASIN-2-3 OVR	BASE	100YR072HR	61.89	44.89	0.022	61.89	5.04	62.88	4.96
BASIN-2-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.55	2.02	1.58	2.01
BASIN-4-3 OVR	BASE	005YR001HR	1.66	2.70	0.001	1.66	3.50	1.88	3.33
BASIN-4-3 OVR	BASE	005YR024HR	13.00	12.90	-0.012	14.30	3.90	14.30	3.90
BASIN-4-3 OVR	BASE	010YR024HR	12.82	18.00	-0.027	14.60	4.19	14.60	4.19
BASIN-4-3 OVR	BASE	025YR072HR	60.65	22.82	-0.052	62.77	4.46	62.76	4.46
BASIN-4-3 OVR	BASE	100YR072HR	60.46	30.86	-0.099	62.89	4.96	62.88	4.96
BASIN-4-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.59	2.08	1.58	2.01
BASIN-4-6 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.66	3.50	1.74	3.52
BASIN-4-6 OVR	BASE	005YR024HR	0.00	0.00	0.000	14.30	3.90	13.93	3.99
BASIN-4-6 OVR	BASE	010YR024HR	15.45	4.75	0.051	14.60	4.19	14.59	4.19
BASIN-4-6 OVR	BASE	025YR072HR	65.08	4.34	0.072	62.77	4.46	62.77	4.46
BASIN-4-6 OVR	BASE	100YR072HR	67.54	3.93	0.115	62.89	4.96	62.89	4.96
BASIN-4-6 OVR	BASE	QUALITY	0.00	0.00	0.000	1.59	2.08	1.57	2.00
BASIN-5-4 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.67	3.48	1.66	3.50
BASIN-5-4 OVR	BASE	005YR024HR	0.00	0.00	0.000	13.89	3.93	14.30	3.90
BASIN-5-4 OVR	BASE	010YR024HR	13.94	1.67	-0.046	14.39	4.17	14.60	4.19
BASIN-5-4 OVR	BASE	025YR072HR	61.30	7.81	-0.141	62.77	4.46	62.77	4.46
BASIN-5-4 OVR	BASE	100YR072HR	60.83	19.10	-0.284	62.90	4.96	62.89	4.96
BASIN-5-4 OVR	BASE	QUALITY	0.00	0.00	0.000	1.45	2.01	1.59	2.08
BASIN-5-8 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.67	3.48	1.93	3.44
BASIN-5-8 OVR	BASE	005YR024HR	12.62	5.59	-0.069	13.89	3.93	13.89	3.93
BASIN-5-8 OVR	BASE	010YR024HR	12.44	5.38	-0.065	14.39	4.17	14.39	4.17
BASIN-5-8 OVR	BASE	025YR072HR	62.12	9.87	-0.093	62.77	4.46	62.77	4.46
BASIN-5-8 OVR	BASE	100YR072HR	61.00	13.59	1.214	62.90	4.96	62.89	4.96
BASIN-5-8 OVR	BASE	QUALITY	0.00	0.00	0.000	1.45	2.01	1.21	2.14
CARLYLE	BASE	005YR001HR	0.00	0.00	0.000	1.74	3.05	0.00	1.60
CARLYLE	BASE	005YR024HR	0.00	0.00	0.000	13.93	3.31	0.00	1.60
CARLYLE	BASE	010YR024HR	0.00	0.00	0.000	14.59	3.42	0.00	1.60
CARLYLE	BASE	025YR072HR	0.00	0.00	0.000	62.77	3.58	0.00	1.60
CARLYLE	BASE	100YR072HR	0.00	0.00	0.000	62.90	3.87	0.00	1.60
CARLYLE	BASE	QUALITY	0.00	0.00	0.000	5.85	2.00	0.00	1.60

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DP-1	BASE	005YR001HR	2.72	2.38	-0.011	2.72	2.09	0.00	1.60
DP-1	BASE	005YR024HR	14.78	2.60	-0.016	14.78	2.11	0.00	1.60
DP-1	BASE	010YR024HR	14.66	2.69	-0.016	14.66	2.12	0.00	1.60
DP-1	BASE	025YR072HR	62.31	2.76	-0.028	62.31	2.14	0.00	1.60
DP-1	BASE	100YR072HR	61.91	3.41	-0.017	61.91	2.40	0.00	1.60
DP-1	BASE	QUALITY	1.83	1.75	-0.015	1.83	2.07	0.00	1.60
DP-2	BASE	005YR001HR	1.51	1.19	0.006	1.51	2.20	0.00	1.60
DP-2	BASE	005YR024HR	14.76	1.40	-0.019	14.76	2.23	0.00	1.60
DP-2	BASE	010YR024HR	14.66	1.46	-0.018	14.66	2.23	0.00	1.60
DP-2	BASE	025YR072HR	62.31	1.55	-0.017	62.31	2.25	0.00	1.60
DP-2	BASE	100YR072HR	61.89	9.09	-0.015	61.89	2.80	0.00	1.60
DP-2	BASE	QUALITY	0.00	0.00	0.000	6.78	2.00	0.00	1.60
DP-3	BASE	005YR001HR	2.00	0.00	0.001	2.00	2.10	0.00	1.60
DP-3	BASE	005YR024HR	14.41	0.00	0.001	14.41	2.10	0.00	1.60
DP-3	BASE	010YR024HR	15.12	0.00	0.002	15.12	2.10	0.00	1.60
DP-3	BASE	025YR072HR	62.97	0.03	0.034	62.97	2.12	0.00	1.60
DP-3	BASE	100YR072HR	62.88	15.01	0.041	62.88	4.08	0.00	1.60
DP-3	BASE	QUALITY	0.00	0.00	0.000	7.26	2.00	0.00	1.60
DP-4-1	BASE	005YR001HR	1.67	7.71	-0.078	1.67	2.71	0.00	1.60
DP-4-1	BASE	005YR024HR	14.30	8.99	-0.120	14.30	2.81	0.00	1.60
DP-4-1	BASE	010YR024HR	14.60	9.91	-0.119	14.60	2.87	0.00	1.60
DP-4-1	BASE	025YR072HR	62.77	10.74	-0.128	62.77	2.93	0.00	1.60
DP-4-1	BASE	100YR072HR	62.89	12.48	-0.119	62.89	3.32	0.00	1.60
DP-4-1	BASE	QUALITY	1.59	0.27	0.018	1.59	2.08	0.00	1.60
DP-4-2	BASE	005YR001HR	1.67	7.71	-0.078	1.67	2.71	0.00	1.60
DP-4-2	BASE	005YR024HR	14.30	9.12	-0.120	14.30	2.81	0.00	1.60
DP-4-2	BASE	010YR024HR	14.60	10.02	-0.119	14.60	2.87	0.00	1.60
DP-4-2	BASE	025YR072HR	62.77	10.74	-0.128	62.77	2.93	0.00	1.60
DP-4-2	BASE	100YR072HR	62.89	14.00	-0.119	62.89	3.32	0.00	1.60
DP-4-2	BASE	QUALITY	1.59	0.27	0.018	1.59	2.08	0.00	1.60
DP-5	BASE	005YR001HR	1.68	1.58	0.009	1.68	2.25	0.00	1.60
DP-5	BASE	005YR024HR	13.89	1.84	-0.008	13.89	2.27	0.00	1.60
DP-5	BASE	010YR024HR	14.39	1.96	-0.018	14.39	2.29	0.00	1.60
DP-5	BASE	025YR072HR	62.77	2.10	-0.021	62.77	2.30	0.00	1.60
DP-5	BASE	100YR072HR	62.90	10.60	-0.021	62.90	2.91	0.00	1.60
DP-5	BASE	QUALITY	0.00	0.00	0.000	6.33	2.00	0.00	1.60
DP-6	BASE	005YR001HR	1.74	11.90	-0.076	1.74	3.05	0.00	1.60
DP-6	BASE	005YR024HR	13.93	13.95	-0.115	13.93	3.31	0.00	1.60
DP-6	BASE	010YR024HR	14.59	14.78	-0.161	14.59	3.42	0.00	1.60
DP-6	BASE	025YR072HR	62.77	15.85	-0.165	62.77	3.58	0.00	1.60
DP-6	BASE	100YR072HR	62.90	17.66	-0.165	62.90	3.87	0.00	1.60
DP-6	BASE	QUALITY	5.85	0.00	0.000	5.85	2.00	0.00	1.60
DP-8	BASE	005YR001HR	1.94	3.12	-0.050	1.94	2.25	0.00	1.60
DP-8	BASE	005YR024HR	13.89	3.67	-0.039	13.89	2.27	0.00	1.60
DP-8	BASE	010YR024HR	14.39	5.06	-0.044	14.39	2.34	0.00	1.60
DP-8	BASE	025YR072HR	62.77	12.49	-0.126	62.77	4.43	0.00	1.60
DP-8	BASE	100YR072HR	62.90	13.65	0.174	62.90	4.98	0.00	1.60
DP-8	BASE	QUALITY	1.22	0.62	-0.012	1.22	2.08	0.00	1.60
DW-1	BASE	005YR001HR	0.40	23.10	23.100	1.51	3.81	0.00	-60.00

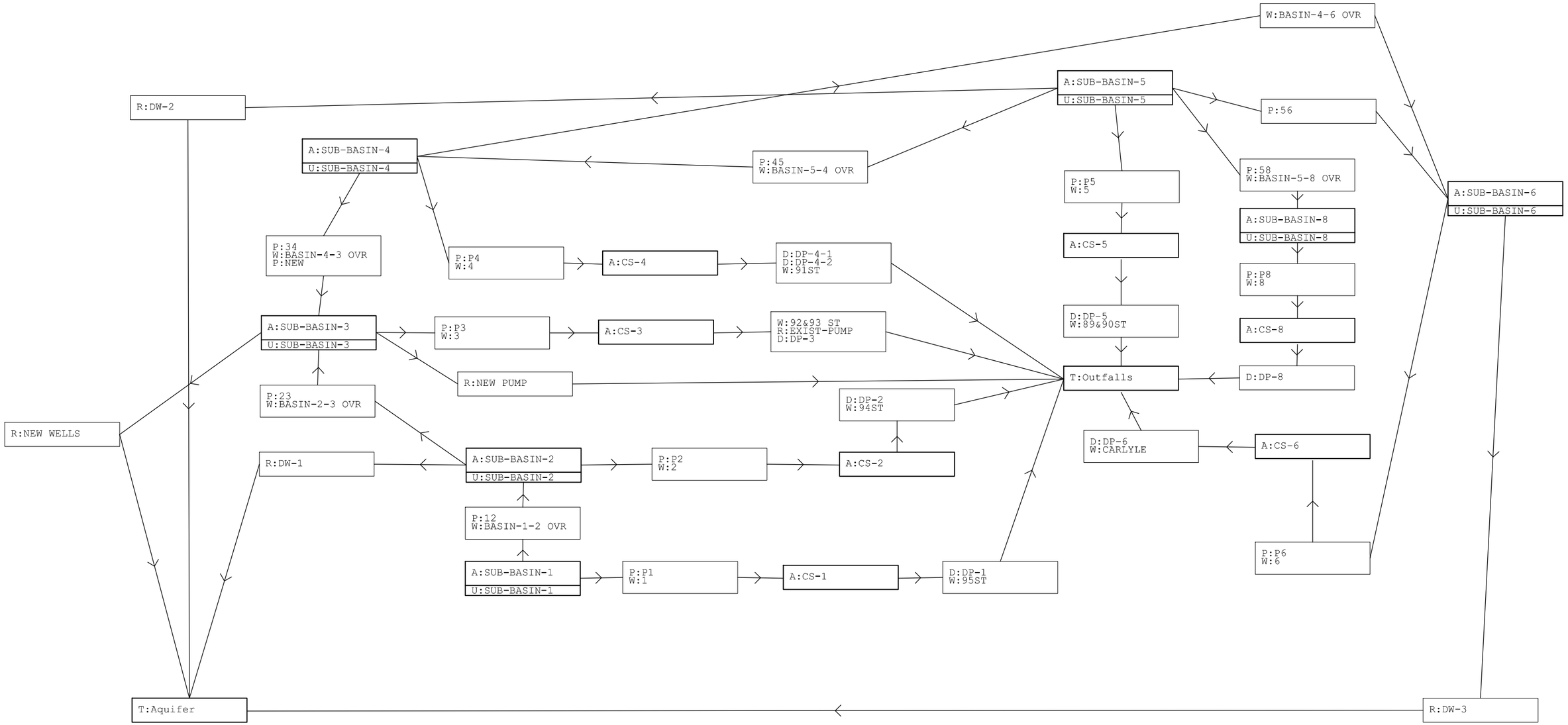
Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DW-1	BASE	005YR024HR	5.92	23.10	23.100	14.76	4.48	0.00	-60.00
DW-1	BASE	010YR024HR	5.44	23.10	23.100	14.65	4.66	0.00	-60.00
DW-1	BASE	025YR072HR	9.60	23.10	23.100	62.30	4.81	0.00	-60.00
DW-1	BASE	100YR072HR	7.23	23.10	23.100	61.89	5.04	0.00	-60.00
DW-1	BASE	QUALITY	0.89	23.10	23.100	1.55	2.02	0.00	-60.00
DW-2	BASE	005YR001HR	0.41	23.10	23.100	1.67	3.48	0.00	-60.00
DW-2	BASE	005YR024HR	5.94	23.10	23.100	13.89	3.93	0.00	-60.00
DW-2	BASE	010YR024HR	5.46	23.10	23.100	14.39	4.17	0.00	-60.00
DW-2	BASE	025YR072HR	10.37	23.10	23.100	62.77	4.46	0.00	-60.00
DW-2	BASE	100YR072HR	7.59	23.10	23.100	62.90	4.96	0.00	-60.00
DW-2	BASE	QUALITY	0.90	23.10	23.100	1.45	2.01	0.00	-60.00
DW-3	BASE	005YR001HR	0.42	23.10	23.100	1.74	3.52	0.00	-60.00
DW-3	BASE	005YR024HR	6.20	23.10	23.100	13.93	3.99	0.00	-60.00
DW-3	BASE	010YR024HR	5.71	23.10	23.100	14.59	4.19	0.00	-60.00
DW-3	BASE	025YR072HR	11.67	23.10	23.100	62.77	4.46	0.00	-60.00
DW-3	BASE	100YR072HR	8.28	23.10	23.100	62.89	4.96	0.00	-60.00
DW-3	BASE	QUALITY	0.91	23.10	23.100	1.57	2.00	0.00	-60.00
EXIST-PUMP	BASE	005YR001HR	0.86	14.20	14.200	2.00	2.10	0.00	1.60
EXIST-PUMP	BASE	005YR024HR	11.94	14.20	14.200	14.41	2.10	0.00	1.60
EXIST-PUMP	BASE	010YR024HR	11.86	14.20	14.200	15.12	2.10	0.00	1.60
EXIST-PUMP	BASE	025YR072HR	59.72	14.20	14.200	62.97	2.12	0.00	1.60
EXIST-PUMP	BASE	100YR072HR	59.37	14.20	14.200	62.88	4.08	0.00	1.60
EXIST-PUMP	BASE	QUALITY	0.00	0.00	0.000	7.26	2.00	0.00	1.60
NEW	BASE	005YR001HR	2.85	6.92	2.896	1.66	3.50	1.88	3.33
NEW	BASE	005YR024HR	17.71	6.85	2.911	14.30	3.90	14.30	3.90
NEW	BASE	010YR024HR	19.10	6.78	2.926	14.60	4.19	14.60	4.19
NEW	BASE	025YR072HR	68.18	6.79	2.948	62.77	4.46	62.76	4.46
NEW	BASE	100YR072HR	70.41	6.81	2.952	62.89	4.96	62.88	4.96
NEW	BASE	QUALITY	1.68	5.95	2.913	1.59	2.08	1.58	2.01
NEW PUMP	BASE	005YR001HR	0.42	5.00	5.000	1.88	3.33	0.00	1.60
NEW PUMP	BASE	005YR024HR	6.15	5.00	5.000	14.30	3.90	0.00	1.60
NEW PUMP	BASE	010YR024HR	5.67	5.00	5.000	14.60	4.19	0.00	1.60
NEW PUMP	BASE	025YR072HR	9.65	5.00	5.000	62.76	4.46	0.00	1.60
NEW PUMP	BASE	100YR072HR	7.27	5.00	5.000	62.88	4.96	0.00	1.60
NEW PUMP	BASE	QUALITY	0.91	5.00	5.000	1.58	2.01	0.00	1.60
NEW WELLS	BASE	005YR001HR	0.42	23.10	23.100	1.88	3.33	0.00	-60.00
NEW WELLS	BASE	005YR024HR	6.15	23.10	23.100	14.30	3.90	0.00	-60.00
NEW WELLS	BASE	010YR024HR	5.67	23.10	23.100	14.60	4.19	0.00	-60.00
NEW WELLS	BASE	025YR072HR	9.65	23.10	23.100	62.76	4.46	0.00	-60.00
NEW WELLS	BASE	100YR072HR	7.27	23.10	23.100	62.88	4.96	0.00	-60.00
NEW WELLS	BASE	QUALITY	0.91	23.10	23.100	1.58	2.01	0.00	-60.00
P1	BASE	005YR001HR	2.72	2.38	-0.174	2.72	4.08	2.72	2.09
P1	BASE	005YR024HR	14.77	2.60	-0.184	14.77	4.48	14.78	2.11
P1	BASE	010YR024HR	14.65	2.69	-0.179	14.65	4.66	14.66	2.12
P1	BASE	025YR072HR	62.30	2.76	-0.185	62.31	4.81	62.31	2.14
P1	BASE	100YR072HR	61.34	2.84	-0.182	61.89	5.05	61.91	2.40
P1	BASE	QUALITY	1.83	1.75	-0.176	1.83	3.14	1.83	2.07
P2	BASE	005YR001HR	1.51	1.19	0.322	1.51	3.81	1.51	2.20
P2	BASE	005YR024HR	14.76	1.40	-0.327	14.76	4.48	14.76	2.23
P2	BASE	010YR024HR	14.65	1.46	-0.326	14.65	4.66	14.66	2.23

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
P2	BASE	025YR072HR	62.23	1.50	-0.333	62.30	4.81	62.31	2.25
P2	BASE	100YR072HR	60.83	1.50	-0.332	61.89	5.04	61.89	2.80
P2	BASE	QUALITY	1.76	0.44	-0.326	1.55	2.02	6.78	2.00
P3	BASE	005YR001HR	1.86	1.23	-0.328	1.88	3.33	2.00	2.10
P3	BASE	005YR024HR	14.26	1.42	-0.327	14.30	3.90	14.41	2.10
P3	BASE	010YR024HR	14.57	1.51	-0.329	14.60	4.19	15.12	2.10
P3	BASE	025YR072HR	62.71	1.58	-0.330	62.76	4.46	62.97	2.12
P3	BASE	100YR072HR	66.20	1.60	-0.330	62.88	4.96	62.88	4.08
P3	BASE	QUALITY	1.73	0.43	-0.328	1.58	2.01	7.26	2.00
P4	BASE	005YR001HR	1.66	15.42	-1.796	1.66	3.50	1.67	2.71
P4	BASE	005YR024HR	14.30	18.11	-1.892	14.30	3.90	14.30	2.81
P4	BASE	010YR024HR	14.60	19.93	-1.894	14.60	4.19	14.60	2.87
P4	BASE	025YR072HR	62.77	21.47	-1.925	62.77	4.46	62.77	2.93
P4	BASE	100YR072HR	61.70	23.10	-1.946	62.89	4.96	62.89	3.32
P4	BASE	QUALITY	1.25	2.33	-1.867	1.59	2.08	1.59	2.08
P5	BASE	005YR001HR	1.67	1.58	-0.498	1.67	3.48	1.68	2.25
P5	BASE	005YR024HR	13.89	1.84	-0.503	13.89	3.93	13.89	2.27
P5	BASE	010YR024HR	14.39	1.96	-0.503	14.39	4.17	14.39	2.29
P5	BASE	025YR072HR	62.77	2.10	-0.503	62.77	4.46	62.77	2.30
P5	BASE	100YR072HR	61.40	2.21	0.508	62.90	4.96	62.90	2.91
P5	BASE	QUALITY	1.70	0.66	-0.500	1.45	2.01	6.33	2.00
P6	BASE	005YR001HR	1.73	11.90	-1.434	1.74	3.52	1.74	3.05
P6	BASE	005YR024HR	13.93	13.95	-1.451	13.93	3.99	13.93	3.31
P6	BASE	010YR024HR	14.59	14.78	-1.453	14.59	4.19	14.59	3.42
P6	BASE	025YR072HR	62.76	15.85	-1.464	62.77	4.46	62.77	3.58
P6	BASE	100YR072HR	62.89	17.66	-1.461	62.89	4.96	62.90	3.87
P6	BASE	QUALITY	1.66	3.17	-1.441	1.57	2.00	5.85	2.00
P8	BASE	005YR001HR	1.93	3.12	-0.338	1.93	3.44	1.94	2.25
P8	BASE	005YR024HR	13.89	3.67	0.321	13.89	3.93	13.89	2.27
P8	BASE	010YR024HR	13.71	3.86	0.324	14.39	4.17	14.39	2.34
P8	BASE	025YR072HR	60.90	3.86	0.304	62.77	4.46	62.77	4.43
P8	BASE	100YR072HR	60.48	3.86	-1.091	62.89	4.96	62.90	4.98
P8	BASE	QUALITY	1.21	0.70	0.311	1.21	2.14	1.22	2.08

APPENDIX F

ICPR MODEL FOR PROPOSED IMPROVEMENTS – OPTION 3

Node-Reach Diagram
ICPR Input Data
Node Maximum Report
Link Maximum Report



NO	DATE	REVISION	BY	NO	DATE	REVISION	BY

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SURFSIDE ABBOTT AVE. DRAINAGE STUDY

SURFSIDE, FLORIDA

ICPR MODEL - OPTION 3
NODE REACH DIAGRAM

DATE: 7/20/18

SCALE: AS SHOWN

PROJECT No: 181160

SHEET: ----

File Name: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\option 3.dwg - (Plotted by: Katharine Kupsky on Friday, October 12, 2018 2:17:35 PM)

==========
==== Basins ==========
==========

Name: SUB-BASIN-1 Node: SUB-BASIN-1 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 27.810 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-2 Node: SUB-BASIN-2 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 30.400 Time Shift(hrs): 0.00
Curve Number: 83.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-3 Node: SUB-BASIN-3 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 41.040 Time Shift(hrs): 0.00
Curve Number: 83.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-4 Node: SUB-BASIN-4 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.390 Time Shift(hrs): 0.00
Curve Number: 83.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-5 Node: SUB-BASIN-5 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 32.600 Time Shift(hrs): 0.00
Curve Number: 83.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-6 Node: SUB-BASIN-6 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 60.00
Area(ac): 54.600 Time Shift(hrs): 0.00
Curve Number: 83.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

Name: SUB-BASIN-8 Node: SUB-BASIN-8 Status: Onsite
Group: BASE Type: SCS Unit Hydrograph CN

Unit Hydrograph: Uh256 Peaking Factor: 256.0
Rainfall File: Storm Duration(hrs): 0.00
Rainfall Amount(in): 0.000 Time of Conc(min): 30.00
Area(ac): 7.240 Time Shift(hrs): 0.00
Curve Number: 84.00 Max Allowable Q(cfs): 999999.000
DCIA(%): 0.00

==========
==== Nodes ==========
==========

Name: Aquifer Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	-60.000
99999.00	-60.000

Name: CS-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: CS-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
8.000	0.0001

Name: Outfalls Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 1.600
Type: Time/Stage

Time(hrs)	Stage(ft)
0.00	1.600
99999.00	1.600

Name: SUB-BASIN-1 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.090	0.0000
8.000	19.3100

Name: SUB-BASIN-2 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.690	0.0000
8.000	21.1000

Name: SUB-BASIN-3 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 2.800
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.690	0.0000
8.000	28.0000

Name: SUB-BASIN-4 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000

3.120	0.0000
8.000	23.0000

Name: SUB-BASIN-5 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.110	0.0000
8.000	19.5000

Name: SUB-BASIN-6 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
3.060	0.0000
8.000	32.7500

Name: SUB-BASIN-8 Base Flow(cfs): 0.000 Init Stage(ft): 1.600
Group: BASE Warn Stage(ft): 8.000
Type: Stage/Area

Stage(ft)	Area(ac)
1.600	0.0000
2.330	0.0000
8.000	4.8400

==========
==== Cross Sections ====
==========

Name: SECTION 1 Group: BASE
Encroachment: No

Station(ft)	Elevation(ft)	Manning's N
0.000	3.250	0.016000
18.000	3.800	0.016000
36.000	3.250	0.016000

==========
==== Operating Tables ====
==========

Name: DRAINAGE WELLS Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

DRAINAGE WELL CAPACITY: 500 GPM/FT. OF AVAILABLE HEAD

US Stage(ft)	Discharge(cfs)
1.900	7.70
8.000	7.70

Name: EXIST-PUMP Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
2.000	14.20
8.000	14.20

Name: NEW PUMP Group: BASE
Type: Rating Curve
Function: US Stage vs. Discharge

US Stage(ft)	Discharge(cfs)
1.900	5.00
8.000	5.00

==== Pipes ====

Name: 12 From Node: Sub-Basin-1 Length(ft): 650.00
Group: BASE To Node: Sub-Basin-2 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 23 From Node: Sub-Basin-2 Length(ft): 800.00
Group: BASE To Node: Sub-Basin-3 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: 34 From Node: Sub-Basin-4 Length(ft): 800.00
Group: BASE To Node: Sub-Basin-3 Count: 1
Friction Equation: Automatic

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Solution Algorithm:	Automatic
Span(in):	18.00	18.00	Flow:	Both
Rise(in):	18.00	18.00	Entrance Loss Coef:	0.00
Invert(ft):	-1.500	-1.500	Exit Loss Coef:	1.00
Manning's N:	0.013000	0.013000	Bend Loss Coef:	0.00
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

```
        Name: 45                  From Node: Sub-Basin-5        Length(ft): 800.00
       Group: BASE                  To Node: Sub-Basin-4             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Automatic
    Geometry: Circular       Circular                                Flow: Both
    Span(in): 18.00          18.00                       Entrance Loss Coef: 0.00
    Rise(in): 18.00          18.00                           Exit Loss Coef: 1.00
   Invert(ft): -1.500        -1.500                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


-------------------------------------------------------------------------------------------------
        Name: 56                  From Node: Sub-Basin-5        Length(ft): 250.00
       Group: BASE                  To Node: Sub-Basin-6             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Automatic
    Geometry: Circular       Circular                                Flow: Both
    Span(in): 18.00          18.00                       Entrance Loss Coef: 0.00
    Rise(in): 18.00          18.00                           Exit Loss Coef: 1.00
   Invert(ft): -1.500        -1.500                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


-------------------------------------------------------------------------------------------------
        Name: 58                  From Node: Sub-Basin-5        Length(ft): 550.00
       Group: BASE                  To Node: Sub-Basin-8             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Automatic
    Geometry: Circular       Circular                                Flow: Both
    Span(in): 18.00          18.00                       Entrance Loss Coef: 0.00
    Rise(in): 18.00          18.00                           Exit Loss Coef: 1.00
   Invert(ft): -4.320        -1.120                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


-------------------------------------------------------------------------------------------------
        Name: NEW                 From Node: SUB-BASIN-4        Length(ft): 600.00
       Group: BASE                  To Node: SUB-BASIN-3             Count: 1
                                                          Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                  Solution Algorithm: Most Restrictive
    Geometry: Circular       Circular                                Flow: Both
    Span(in): 24.00          24.00                       Entrance Loss Coef: 0.00
    Rise(in): 24.00          24.00                           Exit Loss Coef: 1.00
   Invert(ft): -3.000        -3.000                          Bend Loss Coef: 0.00
  Manning's N: 0.013000      0.013000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall
```

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P1		From Node: Sub-Basin-1	Length(ft): 600.00	
Group: BASE		To Node: CS-1	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	15.00	15.00	Entrance Loss Coef: 0.00	
Rise(in):	15.00	15.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.820	-1.830	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P2		From Node: Sub-Basin-2	Length(ft): 600.00	
Group: BASE		To Node: CS-2	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00	
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00	
Invert(ft):	-0.210	-2.740	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P3		From Node: Sub-Basin-3	Length(ft): 600.00	
Group: BASE		To Node: CS-3	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00	
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00	
Invert(ft):	-2.330	-2.330	Bend Loss Coef: 0.00	
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw	
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc	
Bot Clip(in):	0.000	0.000	Stabilizer Option: None	

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name: P4		From Node: Sub-Basin-4	Length(ft): 600.00	
Group: BASE		To Node: CS-4	Count: 1	
			Friction Equation: Automatic	
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic	
Geometry:	Circular	Circular	Flow: Both	
Span(in):	48.00	48.00	Entrance Loss Coef: 0.00	
Rise(in):	48.00	48.00	Exit Loss Coef: 1.00	
Invert(ft):	-2.330	-2.330	Bend Loss Coef: 0.00	
Manning's N:	0.013000	0.013000	Outlet Ctrl Spec: Use dc or tw	

Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P5	From Node: Sub-Basin-5	Length(ft): 250.00
Group:	BASE	To Node: CS-5	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00
Invert(ft):	0.420	-4.320	Bend Loss Coef: 0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P6	From Node: Sub-Basin-6	Length(ft): 600.00
Group:	BASE	To Node: CS-6	Count: 1
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	36.00	36.00	Entrance Loss Coef: 0.00
Rise(in):	36.00	36.00	Exit Loss Coef: 1.00
Invert(ft):	0.880	-1.730	Bend Loss Coef: 0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Name:	P8	From Node: Sub-Basin-8	Length(ft): 250.00
Group:	BASE	To Node: CS-8	Count: 2
			Friction Equation: Automatic
	UPSTREAM	DOWNSTREAM	Solution Algorithm: Automatic
Geometry:	Circular	Circular	Flow: Both
Span(in):	12.00	12.00	Entrance Loss Coef: 0.00
Rise(in):	12.00	12.00	Exit Loss Coef: 1.00
Invert(ft):	-1.200	-1.580	Bend Loss Coef: 0.00
Manning's N:	0.020000	0.020000	Outlet Ctrl Spec: Use dc or tw
Top Clip(in):	0.000	0.000	Inlet Ctrl Spec: Use dc
Bot Clip(in):	0.000	0.000	Stabilizer Option: None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

==========
==== Drop Structures ==========
==========

```
        Name: DP-1               From Node: CS-1              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 15.00          15.00                                Flow: Positive
    Rise(in): 15.00          15.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.410        -1.830                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-1 ***
                                                                              TABLE
                  Count: 7                     Bottom Clip(in): 0.000
                   Type: Vertical: Mavis          Top Clip(in): 0.000
                   Flow: Positive              Weir Disc Coef: 3.200
              Geometry: Rectangular          Orifice Disc Coef: 0.600

              Span(in): 48.00                      Invert(ft): 2.000
              Rise(in): 9.00                  Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
        Name: DP-2               From Node: CS-2              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 30.00          30.00                                Flow: Positive
    Rise(in): 30.00          30.00                    Entrance Loss Coef: 0.000
   Invert(ft): -2.740        -3.070                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



*** Weir 1 of 1 for Drop Structure DP-2 ***
                                                                              TABLE
                  Count: 1                     Bottom Clip(in): 0.000
                   Type: Vertical: Mavis          Top Clip(in): 0.000
                   Flow: Positive              Weir Disc Coef: 3.200
              Geometry: Rectangular          Orifice Disc Coef: 0.600

              Span(in): 48.00                      Invert(ft): 2.000
              Rise(in): 9.00                  Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
        Name: DP-3               From Node: CS-3              Length(ft): 100.00
       Group: BASE                 To Node: Outfalls               Count: 1

              UPSTREAM       DOWNSTREAM                Friction Equation: Automatic
    Geometry: Circular       Circular                 Solution Algorithm: Automatic
    Span(in): 24.00          24.00                                Flow: Positive
    Rise(in): 24.00          24.00                    Entrance Loss Coef: 0.000
   Invert(ft): -1.500        -1.500                       Exit Loss Coef: 1.000
  Manning's N: 0.020000      0.020000                   Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                       Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                         Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall
```

*** Weir 1 of 1 for Drop Structure DP-3 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.100
Rise(in):	9.00	Control Elev(ft):	2.100

Name:	DP-4-1	From Node:	CS-4	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Positive
Invert(ft):	-4.060	-2.300	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-1 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-4-2	From Node:	CS-4	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	30.00	30.00	Solution Algorithm:	Automatic
Rise(in):	30.00	30.00	Flow:	Positive
Invert(ft):	-1.070	-1.820	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
Top Clip(in):	0.000	0.000	Outlet Ctrl Spec:	Use dc or tw
Bot Clip(in):	0.000	0.000	Inlet Ctrl Spec:	Use dc
			Solution Incs:	10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

*** Weir 1 of 1 for Drop Structure DP-4-2 ***

TABLE

Count:	1	Bottom Clip(in):	0.000
Type:	Vertical: Mavis	Top Clip(in):	0.000
Flow:	Positive	Weir Disc Coef:	3.200
Geometry:	Rectangular	Orifice Disc Coef:	0.600
Span(in):	48.00	Invert(ft):	2.000
Rise(in):	9.00	Control Elev(ft):	2.000

Name:	DP-5	From Node:	CS-5	Length(ft):	100.00
Group:	BASE	To Node:	Outfalls	Count:	1

	UPSTREAM	DOWNSTREAM		
Geometry:	Circular	Circular	Friction Equation:	Automatic
Span(in):	24.00	24.00	Solution Algorithm:	Automatic
Rise(in):	24.00	24.00	Flow:	Positive
Invert(ft):	-4.320	-2.470	Entrance Loss Coef:	0.000
Manning's N:	0.020000	0.020000	Exit Loss Coef:	1.000
			Outlet Ctrl Spec:	Use dc or tw

```
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                          Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-5 ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
         Name: DP-6                From Node: CS-6               Length(ft): 100.00
        Group: BASE                  To Node: Outfalls                Count: 1

               UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular       Circular                   Solution Algorithm: Automatic
     Span(in): 36.00          36.00                                 Flow: Positive
     Rise(in): 36.00          36.00                      Entrance Loss Coef: 0.000
   Invert(ft): -1.730         -3.610                         Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                            Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-6 ***
                                                                                TABLE
                  Count: 1                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000


-------------------------------------------------------------------------------------------------
         Name: DP-8                From Node: CS-8               Length(ft): 100.00
        Group: BASE                  To Node: Outfalls                Count: 2

               UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular       Circular                   Solution Algorithm: Automatic
     Span(in): 15.00          15.00                                 Flow: Positive
     Rise(in): 15.00          15.00                      Entrance Loss Coef: 0.000
   Invert(ft): -1.580         -1.580                         Exit Loss Coef: 1.000
  Manning's N: 0.020000       0.020000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                            Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 1 for Drop Structure DP-8 ***
                                                                                TABLE
                  Count: 2                       Bottom Clip(in): 0.000
                   Type: Vertical: Mavis            Top Clip(in): 0.000
                   Flow: Positive                 Weir Disc Coef: 3.200
               Geometry: Rectangular            Orifice Disc Coef: 0.600

               Span(in): 48.00                        Invert(ft): 2.000
               Rise(in): 9.00                   Control Elev(ft): 2.000
```

```
================================================================================
==== Weirs =====================================================================
================================================================================

         Name: 1                   From Node: Sub-Basin-1
        Group: BASE                  To Node: CS-1
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                 Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------
         Name: 2                   From Node: Sub-Basin-2
        Group: BASE                  To Node: CS-2
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                 Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------
         Name: 3                   From Node: Sub-Basin-3
        Group: BASE                  To Node: CS-3
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                 Invert(ft): 4.200
       Control Elevation(ft): 4.200
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------
         Name: 4                   From Node: Sub-Basin-4
        Group: BASE                  To Node: CS-4
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                 Invert(ft): 4.800
       Control Elevation(ft): 4.800
                                          TABLE
              Bottom Clip(in): 0.000
                 Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
        Orifice Discharge Coef: 0.600



--------------------------------------------------------------------------------
         Name: 5                   From Node: Sub-Basin-5
        Group: BASE                  To Node: CS-5
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                 Invert(ft): 4.700
```

```
       Control Elevation(ft): 4.700
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 6                   From Node: Sub-Basin-6
       Group: BASE                  To Node: CS-6
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 5.200
       Control Elevation(ft): 5.200
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 8                   From Node: Sub-Basin-8
       Group: BASE                  To Node: CS-8
        Flow: Both                    Count: 1
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 89&90ST             From Node: CS-5
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 2
        Type: Vertical: Paved      Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 999999.00
                  Invert(ft): 4.900
       Control Elevation(ft): 4.900
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 91ST                From Node: CS-4
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 1
        Type: Vertical: Gravel     Geometry: Rectangular

                    Span(in): 240.00
                    Rise(in): 99999.00
                  Invert(ft): 5.000
       Control Elevation(ft): 5.000
                                          TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
           Weir Discharge Coef: 3.200
         Orifice Discharge Coef: 0.600



------------------------------------------------------------------------------------------------
        Name: 92&93 ST            From Node: CS-3
       Group: BASE                  To Node: Outfalls
        Flow: Both                    Count: 2
```

```
         Type: Vertical: Gravel     Geometry: Rectangular

                     Span(in): 180.00
                     Rise(in): 999999.00
                   Invert(ft): 3.800
       Control Elevation(ft): 3.800
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: 94ST               From Node: CS-2
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 240.00
                     Rise(in): 999999.00
                   Invert(ft): 4.600
       Control Elevation(ft): 4.600
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: 95ST               From Node: CS-1
        Group: BASE                 To Node: Outfalls
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 240.00
                     Rise(in): 999999.00
                   Invert(ft): 4.550
       Control Elevation(ft): 4.550
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



-------------------------------------------------------------------------------------------------------
         Name: BASIN-1-2 OVR      From Node: SUB-BASIN-1
        Group: BASE                 To Node: SUB-BASIN-2
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 420.00
                     Rise(in): 9999.00
                   Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600

Bay Drive Roadway Overflow

-------------------------------------------------------------------------------------------------------
         Name: BASIN-2-3 OVR      From Node: SUB-BASIN-2
        Group: BASE                 To Node: SUB-BASIN-3
         Flow: Both                   Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                     Span(in): 420.00
                     Rise(in): 999.00
                   Invert(ft): 4.500
       Control Elevation(ft): 4.500
                                             TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
         Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600
```

```
---------------------------------------------------------------------------------------------------
         Name: BASIN-4-3 OVR       From Node: SUB-BASIN-4
        Group: BASE                  To Node: SUB-BASIN-3
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Irregular

                      XSec: SECTION 1
                Invert(ft): 3.250
       Control Elevation(ft): 3.250
      Struct Opening Dim(ft): 9999.00
                                        TABLE
            Bottom Clip(ft): 0.000
               Top Clip(ft): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
         Name: BASIN-4-6 OVR       From Node: SUB-BASIN-4
        Group: BASE                  To Node: SUB-BASIN-6
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                  Span(in): 420.00
                  Rise(in): 999.00
                Invert(ft): 4.000
       Control Elevation(ft): 4.000
                                        TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
         Name: BASIN-5-4 OVR       From Node: SUB-BASIN-5
        Group: BASE                  To Node: SUB-BASIN-4
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                  Span(in): 420.00
                  Rise(in): 999.00
                Invert(ft): 4.100
       Control Elevation(ft): 4.100
                                        TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
         Name: BASIN-5-8 OVR       From Node: SUB-BASIN-5
        Group: BASE                  To Node: SUB-BASIN-8
         Flow: Both                    Count: 1
         Type: Vertical: Paved      Geometry: Rectangular

                  Span(in): 420.00
                  Rise(in): 999.00
                Invert(ft): 3.500
       Control Elevation(ft): 3.500
                                        TABLE
            Bottom Clip(in): 0.000
               Top Clip(in): 0.000
        Weir Discharge Coef: 3.200
      Orifice Discharge Coef: 0.600



---------------------------------------------------------------------------------------------------
         Name: CARLYLE             From Node: CS-6
        Group: BASE                  To Node: Outfalls
         Flow: Both                    Count: 1
         Type: Vertical: Gravel     Geometry: Rectangular

                  Span(in): 240.00
                  Rise(in): 999999.00
                Invert(ft): 4.600
       Control Elevation(ft): 4.600
                                        TABLE
            Bottom Clip(in): 0.000
```

Top Clip(in): 0.000
Weir Discharge Coef: 3.200
Orifice Discharge Coef: 0.600

==========
==== Rating Curves ==========
==========

Name: DW-1 From Node: Sub-Basin-2 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: DW-2 From Node: Sub-Basin-5 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: DW-3 From Node: Sub-Basin-6 Count: 3
Group: BASE To Node: Aquifer Flow: Positive

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	Drainage Wells	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: EXIST-PUMP From Node: CS-3 Count: 1
Group: BASE To Node: Outfalls Flow: Both

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	EXIST-PUMP	2.100	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: NEW PUMP From Node: SUB-BASIN-3 Count: 1
Group: BASE To Node: Outfalls Flow: Both

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	NEW PUMP	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

Name: NEW WELLS From Node: SUB-BASIN-3 Count: 3
Group: BASE To Node: Aquifer Flow: Both

	TABLE	ELEV ON(ft)	ELEV OFF(ft)
#1:	DRAINAGE WELLS	2.000	1.600
#2:		0.000	0.000
#3:		0.000	0.000
#4:		0.000	0.000

==========
==== Hydrology Simulations ==========
==========

Name: 005YR001HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\005YR001HR.R32

Override Defaults: Yes
Storm Duration(hrs): 1.00
Rainfall File: Fdot-1
Rainfall Amount(in): 3.20

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 005YR024HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\005YR024HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 6.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 010YR024HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\010YR024HR.R32

Override Defaults: Yes
Storm Duration(hrs): 24.00
Rainfall File: SFWMD-24HR
Rainfall Amount(in): 7.50

Time(hrs)	Print Inc(min)
30.000	5.00

Name: 025YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\025YR072HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 11.00

Time(hrs)	Print Inc(min)
96.000	5.00

Name: 100YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\100YR072HR.R32

Override Defaults: Yes
Storm Duration(hrs): 72.00
Rainfall File: Sfwmd72
Rainfall Amount(in): 15.00

Time(hrs)	Print Inc(min)
96.000	5.00

Name: QUALITY
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\QUALITY.R32

Override Defaults: Yes
Storm Duration(hrs): 1.63
Rainfall File: Scsiii
Rainfall Amount(in): 1.58

Time(hrs)	Print Inc(min)
12.000	1.00
24.000	15.00

==========
==== Routing Simulations ==========
==========

Name: 005YR001HR Hydrology Sim: 005YR001HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\005YR001HR.I32

```
     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 6.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
999.000         1.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 005YR024HR          Hydrology Sim: 005YR024HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\005YR024HR.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 48.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 010YR024HR          Hydrology Sim: 010YR024HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\010YR024HR.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 48.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          5.000
48.000          15.000

Group           Run
--------------- -----
BASE            Yes


-------------------------------------------------------------------------------------------------
        Name: 025YR072HR          Hydrology Sim: 025YR072HR
    Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\025YR072HR.I32

     Execute: Yes         Restart: No            Patch: No
 Alternative: No

       Max Delta Z(ft): 1.00                    Delta Z Factor: 0.00500
   Time Step Optimizer: 10.000
       Start Time(hrs): 0.000                    End Time(hrs): 120.00
    Min Calc Time(sec): 0.5000              Max Calc Time(sec): 60.0000
       Boundary Stages:                         Boundary Flows:
```

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: 100YR072HR Hydrology Sim: 100YR072HR
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\100YR072HR.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 120.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
30.000	30.000
50.000	5.000
72.000	5.000
120.000	30.000

Group	Run
BASE	Yes

Name: QUALITY Hydrology Sim: QUALITY
Filename: P:\Projects\2018\181160 Surfside Abbott Ave. Drainage Study\Engineering\Calculations\ICPR\OPTION 3\QUALITY.I32

Execute: Yes Restart: No Patch: No
Alternative: No

Max Delta Z(ft): 1.00 Delta Z Factor: 0.00500
Time Step Optimizer: 10.000
Start Time(hrs): 0.000 End Time(hrs): 24.00
Min Calc Time(sec): 0.5000 Max Calc Time(sec): 60.0000
Boundary Stages: Boundary Flows:

Time(hrs)	Print Inc(min)
24.000	5.000

Group	Run
BASE	Yes

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS - OPTION 3
NODE MAXIMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Aquifer	BASE	005YR001HR	0.00	-60.00	1.60	-61.6000	0	0.57	92.40	0.00	0.00
Aquifer	BASE	005YR024HR	0.00	-60.00	1.60	-61.6000	0	8.06	92.40	0.00	0.00
Aquifer	BASE	010YR024HR	0.00	-60.00	1.60	-61.6000	0	7.44	92.40	0.00	0.00
Aquifer	BASE	025YR072HR	0.00	-60.00	1.60	-61.6000	0	41.80	92.40	0.00	0.00
Aquifer	BASE	100YR072HR	0.00	-60.00	1.60	-61.6000	0	17.18	92.40	0.00	0.00
Aquifer	BASE	QUALITY	0.00	-60.00	1.60	-61.6000	0	1.25	92.40	0.00	0.00
CS-1	BASE	005YR001HR	2.74	2.09	8.00	-0.0013	132	2.74	2.37	2.74	2.37
CS-1	BASE	005YR024HR	14.68	2.10	8.00	-0.0019	132	14.68	2.58	14.68	2.58
CS-1	BASE	010YR024HR	14.68	2.12	8.00	-0.0019	132	14.68	2.68	14.68	2.68
CS-1	BASE	025YR072HR	62.32	2.14	8.00	-0.0019	132	62.31	2.76	62.32	2.76
CS-1	BASE	100YR072HR	61.91	2.37	8.00	-0.0019	132	61.89	3.35	61.91	3.35
CS-1	BASE	QUALITY	1.83	2.07	8.00	-0.0019	132	1.83	1.75	1.83	1.75
CS-2	BASE	005YR001HR	1.39	2.20	8.00	0.0023	128	1.38	1.15	1.39	1.15
CS-2	BASE	005YR024HR	14.67	2.23	8.00	-0.0034	128	14.66	1.39	14.67	1.39
CS-2	BASE	010YR024HR	14.68	2.23	8.00	-0.0037	128	14.67	1.45	14.68	1.45
CS-2	BASE	025YR072HR	62.32	2.24	8.00	-0.0037	128	62.31	1.51	62.32	1.51
CS-2	BASE	100YR072HR	61.90	2.79	8.00	0.0029	128	61.90	8.93	61.90	8.93
CS-2	BASE	QUALITY	7.02	2.00	8.00	-0.0023	128	1.54	0.43	0.00	0.00
CS-3	BASE	005YR001HR	1.46	2.10	8.00	-0.0539	128	1.68	1.19	1.46	14.20
CS-3	BASE	005YR024HR	13.48	2.10	8.00	-0.0541	128	13.88	1.36	13.48	14.20
CS-3	BASE	010YR024HR	14.35	2.10	8.00	-0.0541	128	14.67	1.46	14.35	14.20
CS-3	BASE	025YR072HR	62.77	2.11	8.00	-0.0542	128	62.58	6.59	62.77	14.22
CS-3	BASE	100YR072HR	62.91	4.02	8.00	-0.0546	128	62.91	39.10	62.91	39.10
CS-3	BASE	QUALITY	7.02	2.00	8.00	-0.0023	128	1.80	0.43	0.00	0.00
CS-4	BASE	005YR001HR	1.49	3.05	8.00	-0.0096	173	1.48	23.28	1.49	23.28
CS-4	BASE	005YR024HR	13.87	3.40	8.00	-0.0104	173	13.86	27.44	13.87	27.44
CS-4	BASE	010YR024HR	14.64	3.66	8.00	-0.0104	173	14.63	30.08	14.64	30.08
CS-4	BASE	025YR072HR	62.61	3.96	8.00	-0.0110	173	62.60	32.80	62.61	32.80
CS-4	BASE	100YR072HR	62.92	4.45	8.00	-0.0132	173	62.91	36.43	62.92	36.43
CS-4	BASE	QUALITY	1.66	2.03	8.00	-0.0097	173	2.23	4.23	1.66	0.16
CS-5	BASE	005YR001HR	1.58	2.24	8.00	-0.0037	119	1.58	1.51	1.58	1.51
CS-5	BASE	005YR024HR	13.80	2.27	8.00	-0.0037	119	13.80	1.80	13.80	1.80
CS-5	BASE	010YR024HR	14.06	2.28	8.00	-0.0037	119	14.06	1.93	14.06	1.93
CS-5	BASE	025YR072HR	62.60	2.30	8.00	-0.0037	119	62.60	2.06	62.60	2.06
CS-5	BASE	100YR072HR	62.92	2.74	8.00	-0.0037	119	62.92	8.13	62.92	8.13
CS-5	BASE	QUALITY	6.54	2.00	8.00	-0.0037	119	1.70	0.64	0.00	0.00
CS-6	BASE	005YR001HR	1.69	3.02	8.00	0.0055	303	1.68	11.57	1.69	11.57
CS-6	BASE	005YR024HR	13.89	3.29	8.00	-0.0071	158	13.88	13.79	13.89	13.79
CS-6	BASE	010YR024HR	13.90	3.40	8.00	-0.0094	158	13.90	14.65	13.90	14.65
CS-6	BASE	025YR072HR	62.61	3.53	8.00	-0.0105	158	62.60	15.55	62.61	15.55
CS-6	BASE	100YR072HR	62.92	3.84	8.00	-0.0104	158	62.91	17.47	62.92	17.47
CS-6	BASE	QUALITY	6.39	2.00	8.00	-0.0050	364	1.68	2.98	0.00	0.00
CS-8	BASE	005YR001HR	1.74	2.24	8.00	-0.0041	126	1.74	3.03	1.74	3.03
CS-8	BASE	005YR024HR	13.80	2.27	8.00	-0.0028	126	13.80	3.60	13.80	3.60
CS-8	BASE	010YR024HR	14.06	2.29	8.00	-0.0029	126	14.06	4.07	14.06	4.07
CS-8	BASE	025YR072HR	62.61	3.91	8.00	-0.0033	126	62.59	11.29	62.61	11.29
CS-8	BASE	100YR072HR	62.92	4.92	8.00	0.0742	126	62.92	41.90	62.92	13.52
CS-8	BASE	QUALITY	1.21	2.09	8.00	-0.0027	126	1.21	0.76	1.21	0.67
Outfalls	BASE	005YR001HR	0.00	1.60	1.60	0.0000	0	1.54	61.77	0.00	0.00
Outfalls	BASE	005YR024HR	0.00	1.60	1.60	0.0000	0	13.90	69.78	0.00	0.00

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS - OPTION 3
NODE MAXIMUM REPORT

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
Outfalls	BASE	010YR024HR	0.00	1.60	1.60	0.0000	0	14.22	73.85	0.00	0.00
Outfalls	BASE	025YR072HR	0.00	1.60	1.60	0.0000	0	62.63	85.16	0.00	0.00
Outfalls	BASE	100YR072HR	0.00	1.60	1.60	0.0000	0	62.73	129.00	0.00	0.00
Outfalls	BASE	QUALITY	0.00	1.60	1.60	0.0000	0	1.49	7.15	0.00	0.00
SUB-BASIN-1	BASE	005YR001HR	2.74	4.05	8.00	-0.0051	164630	1.25	26.15	2.77	8.57
SUB-BASIN-1	BASE	005YR024HR	14.68	4.45	8.00	-0.0132	232464	12.50	35.60	16.03	15.71
SUB-BASIN-1	BASE	010YR024HR	14.68	4.64	8.00	-0.0145	266157	12.50	42.75	15.01	17.49
SUB-BASIN-1	BASE	025YR072HR	62.31	4.81	8.00	-0.0165	293908	60.50	52.14	62.51	23.30
SUB-BASIN-1	BASE	100YR072HR	61.90	5.04	8.00	-0.0174	334800	60.50	72.81	61.99	39.09
SUB-BASIN-1	BASE	QUALITY	1.83	3.14	8.00	-0.0067	8959	1.67	6.58	1.86	6.68
SUB-BASIN-2	BASE	005YR001HR	1.38	3.72	2.80	0.0616	6523	1.32	27.44	1.27	27.12
SUB-BASIN-2	BASE	005YR024HR	14.66	4.44	2.80	-0.0638	160512	13.21	39.55	16.57	30.29
SUB-BASIN-2	BASE	010YR024HR	14.67	4.64	2.80	-0.0638	202913	12.82	47.15	14.68	33.33
SUB-BASIN-2	BASE	025YR072HR	62.31	4.80	2.80	-0.0637	237353	60.61	57.43	62.30	45.60
SUB-BASIN-2	BASE	100YR072HR	61.90	5.04	2.80	-0.0636	287961	61.06	86.91	61.87	78.17
SUB-BASIN-2	BASE	QUALITY	1.70	2.01	2.80	-0.0635	182	1.67	11.50	3.34	25.64
SUB-BASIN-3	BASE	005YR001HR	1.69	3.19	2.80	0.0618	116001	1.25	44.96	1.68	29.29
SUB-BASIN-3	BASE	005YR024HR	13.87	3.70	2.80	-0.0636	231557	12.58	60.75	13.88	29.46
SUB-BASIN-3	BASE	010YR024HR	14.64	4.02	2.80	-0.0635	304878	12.58	74.52	14.67	29.56
SUB-BASIN-3	BASE	025YR072HR	62.60	4.38	2.80	-0.0637	389083	60.58	94.60	62.58	34.69
SUB-BASIN-3	BASE	100YR072HR	62.91	4.91	2.80	-0.0718	509824	60.93	144.28	62.91	67.20
SUB-BASIN-3	BASE	QUALITY	1.64	2.01	2.80	-0.0637	218	1.68	17.64	1.80	28.53
SUB-BASIN-4	BASE	005YR001HR	1.48	3.26	8.00	-0.0097	28346	1.25	30.08	1.25	27.93
SUB-BASIN-4	BASE	005YR024HR	13.87	3.70	8.00	-0.0106	118576	12.50	41.61	12.84	33.55
SUB-BASIN-4	BASE	010YR024HR	14.64	4.02	8.00	-0.0199	184134	12.50	50.02	12.76	38.43
SUB-BASIN-4	BASE	025YR072HR	62.60	4.38	8.00	-0.0216	259161	60.50	61.71	60.59	43.89
SUB-BASIN-4	BASE	100YR072HR	62.91	4.91	8.00	-0.0226	367319	60.84	96.33	60.40	50.23
SUB-BASIN-4	BASE	QUALITY	1.59	2.03	8.00	-0.0098	263	1.70	7.12	1.94	10.26
SUB-BASIN-5	BASE	005YR001HR	1.58	3.36	8.00	0.0626	43494	1.25	29.36	3.17	28.53
SUB-BASIN-5	BASE	005YR024HR	13.80	3.87	8.00	0.0628	131527	12.50	40.78	12.64	28.69
SUB-BASIN-5	BASE	010YR024HR	14.06	4.12	8.00	0.0628	175830	12.50	49.15	12.44	28.56
SUB-BASIN-5	BASE	025YR072HR	62.60	4.38	8.00	-0.0621	220314	60.50	60.67	61.52	35.57
SUB-BASIN-5	BASE	100YR072HR	62.92	4.91	8.00	0.0630	312227	60.50	84.96	60.93	51.23
SUB-BASIN-5	BASE	QUALITY	1.46	2.01	8.00	-0.0626	179	1.67	7.07	2.11	28.03
SUB-BASIN-6	BASE	005YR001HR	1.69	3.46	8.00	0.0155	116710	1.25	47.67	1.68	34.67
SUB-BASIN-6	BASE	005YR024HR	13.88	3.95	8.00	-0.0150	257866	12.50	67.07	13.88	36.89
SUB-BASIN-6	BASE	010YR024HR	13.90	4.16	8.00	-0.0177	316693	12.50	81.10	13.90	37.75
SUB-BASIN-6	BASE	025YR072HR	62.60	4.38	8.00	-0.0200	381786	60.50	100.59	62.60	38.65
SUB-BASIN-6	BASE	100YR072HR	62.92	4.91	8.00	-0.0195	534174	60.42	138.54	62.91	40.57
SUB-BASIN-6	BASE	QUALITY	1.86	2.00	8.00	-0.0151	787	1.68	15.56	1.72	26.08
SUB-BASIN-8	BASE	005YR001HR	1.74	3.37	8.00	-0.0132	38595	1.00	12.62	1.74	3.03
SUB-BASIN-8	BASE	005YR024HR	13.80	3.87	8.00	-0.0106	57181	12.17	15.79	13.80	3.60
SUB-BASIN-8	BASE	010YR024HR	14.06	4.12	8.00	-0.0104	66661	12.17	18.36	14.06	4.07
SUB-BASIN-8	BASE	025YR072HR	62.60	4.38	8.00	-0.0113	76146	60.24	22.13	62.59	11.29
SUB-BASIN-8	BASE	100YR072HR	62.92	4.91	8.00	-0.0116	95824	61.05	27.12	62.92	41.90
SUB-BASIN-8	BASE	QUALITY	1.21	2.16	8.00	-0.0070	146	2.00	2.05	1.21	0.76

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
1	BASE	005YR001HR	0.00	0.00	0.000	2.74	4.05	2.74	2.09
1	BASE	005YR024HR	0.00	0.00	0.000	14.68	4.45	14.68	2.10
1	BASE	010YR024HR	0.00	0.00	0.000	14.68	4.64	14.68	2.12
1	BASE	025YR072HR	0.00	0.00	0.000	62.31	4.81	62.32	2.14
1	BASE	100YR072HR	61.90	0.59	0.000	61.90	5.04	61.91	2.37
1	BASE	QUALITY	0.00	0.00	0.000	1.83	3.14	1.83	2.07
12	BASE	005YR001HR	2.87	6.21	0.874	2.74	4.05	1.38	3.72
12	BASE	005YR024HR	17.29	6.43	1.046	14.68	4.45	14.66	4.44
12	BASE	010YR024HR	18.63	6.42	1.042	14.68	4.64	14.67	4.64
12	BASE	025YR072HR	67.45	6.41	1.072	62.31	4.81	62.31	4.80
12	BASE	100YR072HR	68.97	6.40	1.052	61.90	5.04	61.90	5.04
12	BASE	QUALITY	1.86	4.93	1.029	1.83	3.14	1.70	2.01
2	BASE	005YR001HR	0.00	0.00	0.000	1.38	3.72	1.39	2.20
2	BASE	005YR024HR	0.00	0.00	0.000	14.66	4.44	14.67	2.23
2	BASE	010YR024HR	0.00	0.00	0.000	14.67	4.64	14.68	2.23
2	BASE	025YR072HR	62.31	0.01	0.000	62.31	4.80	62.32	2.24
2	BASE	100YR072HR	61.90	7.53	0.006	61.90	5.04	61.90	2.79
2	BASE	QUALITY	0.00	0.00	0.000	1.70	2.01	7.02	2.00
23	BASE	005YR001HR	1.27	2.88	1.410	1.38	3.72	1.69	3.19
23	BASE	005YR024HR	16.57	5.86	1.500	14.66	4.44	13.87	3.70
23	BASE	010YR024HR	18.03	5.86	1.513	14.67	4.64	14.64	4.02
23	BASE	025YR072HR	67.40	5.38	1.430	62.31	4.80	62.60	4.38
23	BASE	100YR072HR	59.78	3.21	1.437	61.90	5.04	62.91	4.91
23	BASE	QUALITY	3.85	2.29	-1.391	1.70	2.01	1.64	2.01
3	BASE	005YR001HR	0.00	0.00	0.000	1.69	3.19	1.46	2.10
3	BASE	005YR024HR	0.00	0.00	0.000	13.87	3.70	13.48	2.10
3	BASE	010YR024HR	0.00	0.00	0.000	14.64	4.02	14.35	2.10
3	BASE	025YR072HR	62.60	5.03	0.001	62.60	4.38	62.77	2.11
3	BASE	100YR072HR	62.91	38.22	0.017	62.91	4.91	62.91	4.02
3	BASE	QUALITY	0.00	0.00	0.000	1.64	2.01	7.02	2.00
34	BASE	005YR001HR	2.33	2.89	1.233	1.48	3.26	1.69	3.19
34	BASE	005YR024HR	11.83	2.75	1.224	13.87	3.70	13.87	3.70
34	BASE	010YR024HR	11.76	2.75	1.228	14.64	4.02	14.64	4.02
34	BASE	025YR072HR	59.54	2.75	1.232	62.60	4.38	62.60	4.38
34	BASE	100YR072HR	69.56	2.82	1.228	62.91	4.91	62.91	4.91
34	BASE	QUALITY	1.68	2.35	1.223	1.59	2.03	1.64	2.01
4	BASE	005YR001HR	0.00	0.00	0.000	1.48	3.26	1.49	3.05
4	BASE	005YR024HR	0.00	0.00	0.000	13.87	3.70	13.87	3.40
4	BASE	010YR024HR	0.00	0.00	0.000	14.64	4.02	14.64	3.66
4	BASE	025YR072HR	0.00	0.00	0.000	62.60	4.38	62.61	3.96
4	BASE	100YR072HR	62.91	2.28	0.000	62.91	4.91	62.92	4.45
4	BASE	QUALITY	0.00	0.00	0.000	1.59	2.03	1.66	2.03
45	BASE	005YR001HR	1.92	1.48	-1.289	1.58	3.36	1.48	3.26
45	BASE	005YR024HR	15.91	1.80	-1.290	13.80	3.87	13.87	3.70
45	BASE	010YR024HR	12.89	1.61	-1.306	14.06	4.12	14.64	4.02
45	BASE	025YR072HR	60.71	1.68	-1.300	62.60	4.38	62.60	4.38
45	BASE	100YR072HR	60.50	1.78	-1.296	62.92	4.91	62.91	4.91
45	BASE	QUALITY	6.82	1.25	-1.306	1.46	2.01	1.59	2.03
5	BASE	005YR001HR	0.00	0.00	0.000	1.58	3.36	1.58	2.24
5	BASE	005YR024HR	0.00	0.00	0.000	13.80	3.87	13.80	2.27

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
5	BASE	010YR024HR	0.00	0.00	0.000	14.06	4.12	14.06	2.28
5	BASE	025YR072HR	0.00	0.00	0.000	62.60	4.38	62.60	2.30
5	BASE	100YR072HR	62.92	6.03	0.002	62.92	4.91	62.92	2.74
5	BASE	QUALITY	0.00	0.00	0.000	1.46	2.01	6.54	2.00
56	BASE	005YR001HR	2.53	3.88	-2.125	1.58	3.36	1.69	3.46
56	BASE	005YR024HR	11.00	3.81	-2.105	13.80	3.87	13.88	3.95
56	BASE	010YR024HR	11.04	3.81	-2.102	14.06	4.12	13.90	4.16
56	BASE	025YR072HR	58.40	3.84	-2.117	62.60	4.38	62.60	4.38
56	BASE	100YR072HR	57.69	3.85	-2.125	62.92	4.91	62.92	4.91
56	BASE	QUALITY	1.42	3.80	-2.111	1.46	2.01	1.86	2.00
58	BASE	005YR001HR	3.42	1.47	-1.492	1.58	3.36	1.74	3.37
58	BASE	005YR024HR	12.08	1.72	-1.506	13.80	3.87	13.80	3.87
58	BASE	010YR024HR	12.00	1.81	-1.494	14.06	4.12	14.06	4.12
58	BASE	025YR072HR	59.89	1.92	-1.504	62.60	4.38	62.60	4.38
58	BASE	100YR072HR	59.73	1.90	-1.495	62.92	4.91	62.92	4.91
58	BASE	QUALITY	2.65	0.93	-1.486	1.46	2.01	1.21	2.16
6	BASE	005YR001HR	0.00	0.00	0.000	1.69	3.46	1.69	3.02
6	BASE	005YR024HR	0.00	0.00	0.000	13.88	3.95	13.89	3.29
6	BASE	010YR024HR	0.00	0.00	0.000	13.90	4.16	13.90	3.40
6	BASE	025YR072HR	0.00	0.00	0.000	62.60	4.38	62.61	3.53
6	BASE	100YR072HR	0.00	0.00	0.000	62.92	4.91	62.92	3.84
6	BASE	QUALITY	0.00	0.00	0.000	1.86	2.00	6.39	2.00
8	BASE	005YR001HR	0.00	0.00	0.000	1.74	3.37	1.74	2.24
8	BASE	005YR024HR	0.00	0.00	0.000	13.80	3.87	13.80	2.27
8	BASE	010YR024HR	14.06	0.21	0.000	14.06	4.12	14.06	2.29
8	BASE	025YR072HR	62.60	9.33	0.001	62.60	4.38	62.61	3.91
8	BASE	100YR072HR	62.92	41.17	-64.636	62.92	4.91	62.92	4.92
8	BASE	QUALITY	0.00	0.00	0.000	1.21	2.16	1.21	2.09
89&90ST	BASE	005YR001HR	0.00	0.00	0.000	1.58	2.24	0.00	1.60
89&90ST	BASE	005YR024HR	0.00	0.00	0.000	13.80	2.27	0.00	1.60
89&90ST	BASE	010YR024HR	0.00	0.00	0.000	14.06	2.28	0.00	1.60
89&90ST	BASE	025YR072HR	0.00	0.00	0.000	62.60	2.30	0.00	1.60
89&90ST	BASE	100YR072HR	0.00	0.00	0.000	62.92	2.74	0.00	1.60
89&90ST	BASE	QUALITY	0.00	0.00	0.000	6.54	2.00	0.00	1.60
91ST	BASE	005YR001HR	0.00	0.00	0.000	1.49	3.05	0.00	1.60
91ST	BASE	005YR024HR	0.00	0.00	0.000	13.87	3.40	0.00	1.60
91ST	BASE	010YR024HR	0.00	0.00	0.000	14.64	3.66	0.00	1.60
91ST	BASE	025YR072HR	0.00	0.00	0.000	62.61	3.96	0.00	1.60
91ST	BASE	100YR072HR	0.00	0.00	0.000	62.92	4.45	0.00	1.60
91ST	BASE	QUALITY	0.00	0.00	0.000	1.66	2.03	0.00	1.60
92&93 ST	BASE	005YR001HR	0.00	0.00	0.000	1.46	2.10	0.00	1.60
92&93 ST	BASE	005YR024HR	0.00	0.00	0.000	13.48	2.10	0.00	1.60
92&93 ST	BASE	010YR024HR	0.00	0.00	0.000	14.35	2.10	0.00	1.60
92&93 ST	BASE	025YR072HR	0.00	0.00	0.000	62.77	2.11	0.00	1.60
92&93 ST	BASE	100YR072HR	62.91	10.07	0.007	62.91	4.02	0.00	1.60
92&93 ST	BASE	QUALITY	0.00	0.00	0.000	7.02	2.00	0.00	1.60
94ST	BASE	005YR001HR	0.00	0.00	0.000	1.39	2.20	0.00	1.60
94ST	BASE	005YR024HR	0.00	0.00	0.000	14.67	2.23	0.00	1.60
94ST	BASE	010YR024HR	0.00	0.00	0.000	14.68	2.23	0.00	1.60
94ST	BASE	025YR072HR	0.00	0.00	0.000	62.32	2.24	0.00	1.60

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
94ST	BASE	100YR072HR	0.00	0.00	0.000	61.90	2.79	0.00	1.60
94ST	BASE	QUALITY	0.00	0.00	0.000	7.02	2.00	0.00	1.60
95ST	BASE	005YR001HR	0.00	0.00	0.000	2.74	2.09	0.00	1.60
95ST	BASE	005YR024HR	0.00	0.00	0.000	14.68	2.10	0.00	1.60
95ST	BASE	010YR024HR	0.00	0.00	0.000	14.68	2.12	0.00	1.60
95ST	BASE	025YR072HR	0.00	0.00	0.000	62.32	2.14	0.00	1.60
95ST	BASE	100YR072HR	0.00	0.00	0.000	61.91	2.37	0.00	1.60
95ST	BASE	QUALITY	0.00	0.00	0.000	1.83	2.07	0.00	1.60
BASIN-1-2 OVR	BASE	005YR001HR	0.00	0.00	0.000	2.74	4.05	1.38	3.72
BASIN-1-2 OVR	BASE	005YR024HR	15.76	12.74	0.003	14.68	4.45	14.66	4.44
BASIN-1-2 OVR	BASE	010YR024HR	15.01	14.63	0.116	14.68	4.64	14.67	4.64
BASIN-1-2 OVR	BASE	025YR072HR	62.51	20.34	0.119	62.31	4.81	62.31	4.80
BASIN-1-2 OVR	BASE	100YR072HR	62.00	35.50	-0.105	61.90	5.04	61.90	5.04
BASIN-1-2 OVR	BASE	QUALITY	0.00	0.00	0.000	1.83	3.14	1.70	2.01
BASIN-2-3 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.38	3.72	1.69	3.19
BASIN-2-3 OVR	BASE	005YR024HR	0.00	0.00	0.000	14.66	4.44	13.87	3.70
BASIN-2-3 OVR	BASE	010YR024HR	14.67	5.94	0.001	14.67	4.64	14.64	4.02
BASIN-2-3 OVR	BASE	025YR072HR	62.31	18.65	0.003	62.31	4.80	62.60	4.38
BASIN-2-3 OVR	BASE	100YR072HR	61.90	44.44	0.019	61.90	5.04	62.91	4.91
BASIN-2-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.70	2.01	1.64	2.01
BASIN-4-3 OVR	BASE	005YR001HR	1.48	0.00	0.000	1.48	3.26	1.69	3.19
BASIN-4-3 OVR	BASE	005YR024HR	12.92	4.78	-0.018	13.87	3.70	13.87	3.70
BASIN-4-3 OVR	BASE	010YR024HR	12.78	8.85	-0.034	14.64	4.02	14.64	4.02
BASIN-4-3 OVR	BASE	025YR072HR	60.61	13.59	-0.048	62.60	4.38	62.60	4.38
BASIN-4-3 OVR	BASE	100YR072HR	60.93	24.37	-0.098	62.91	4.91	62.91	4.91
BASIN-4-3 OVR	BASE	QUALITY	0.00	0.00	0.000	1.59	2.03	1.64	2.01
BASIN-4-6 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.48	3.26	1.69	3.46
BASIN-4-6 OVR	BASE	005YR024HR	0.00	0.00	0.000	13.87	3.70	13.88	3.95
BASIN-4-6 OVR	BASE	010YR024HR	0.00	0.00	-0.002	14.64	4.02	13.90	4.16
BASIN-4-6 OVR	BASE	025YR072HR	64.87	1.85	0.054	62.60	4.38	62.60	4.38
BASIN-4-6 OVR	BASE	100YR072HR	67.40	1.07	0.277	62.91	4.91	62.92	4.91
BASIN-4-6 OVR	BASE	QUALITY	0.00	0.00	0.000	1.59	2.03	1.86	2.00
BASIN-5-4 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.58	3.36	1.48	3.26
BASIN-5-4 OVR	BASE	005YR024HR	0.00	0.00	0.000	13.80	3.87	13.87	3.70
BASIN-5-4 OVR	BASE	010YR024HR	14.06	0.36	0.000	14.06	4.12	14.64	4.02
BASIN-5-4 OVR	BASE	025YR072HR	61.52	8.54	-0.129	62.60	4.38	62.60	4.38
BASIN-5-4 OVR	BASE	100YR072HR	60.93	21.54	-0.293	62.92	4.91	62.91	4.91
BASIN-5-4 OVR	BASE	QUALITY	0.00	0.00	0.000	1.46	2.01	1.59	2.03
BASIN-5-8 OVR	BASE	005YR001HR	0.00	0.00	0.000	1.58	3.36	1.74	3.37
BASIN-5-8 OVR	BASE	005YR024HR	12.64	3.72	-0.048	13.80	3.87	13.80	3.87
BASIN-5-8 OVR	BASE	010YR024HR	12.45	3.48	-0.041	14.06	4.12	14.06	4.12
BASIN-5-8 OVR	BASE	025YR072HR	62.58	8.20	-0.062	62.60	4.38	62.60	4.38
BASIN-5-8 OVR	BASE	100YR072HR	61.09	13.35	1.047	62.92	4.91	62.92	4.91
BASIN-5-8 OVR	BASE	QUALITY	0.00	0.00	0.000	1.46	2.01	1.21	2.16
CARLYLE	BASE	005YR001HR	0.00	0.00	0.000	1.69	3.02	0.00	1.60
CARLYLE	BASE	005YR024HR	0.00	0.00	0.000	13.89	3.29	0.00	1.60
CARLYLE	BASE	010YR024HR	0.00	0.00	0.000	13.90	3.40	0.00	1.60
CARLYLE	BASE	025YR072HR	0.00	0.00	0.000	62.61	3.53	0.00	1.60
CARLYLE	BASE	100YR072HR	0.00	0.00	0.000	62.92	3.84	0.00	1.60
CARLYLE	BASE	QUALITY	0.00	0.00	0.000	6.39	2.00	0.00	1.60

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Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DP-1	BASE	005YR001HR	2.74	2.37	-0.014	2.74	2.09	0.00	1.60
DP-1	BASE	005YR024HR	14.68	2.58	-0.017	14.68	2.10	0.00	1.60
DP-1	BASE	010YR024HR	14.68	2.68	-0.017	14.68	2.12	0.00	1.60
DP-1	BASE	025YR072HR	62.32	2.76	-0.026	62.32	2.14	0.00	1.60
DP-1	BASE	100YR072HR	61.91	3.35	-0.031	61.91	2.37	0.00	1.60
DP-1	BASE	QUALITY	1.83	1.75	-0.016	1.83	2.07	0.00	1.60
DP-2	BASE	005YR001HR	1.39	1.15	0.006	1.39	2.20	0.00	1.60
DP-2	BASE	005YR024HR	14.67	1.39	-0.024	14.67	2.23	0.00	1.60
DP-2	BASE	010YR024HR	14.68	1.45	-0.026	14.68	2.23	0.00	1.60
DP-2	BASE	025YR072HR	62.32	1.51	-0.026	62.32	2.24	0.00	1.60
DP-2	BASE	100YR072HR	61.90	8.93	-0.015	61.90	2.79	0.00	1.60
DP-2	BASE	QUALITY	0.00	0.00	0.000	7.02	2.00	0.00	1.60
DP-3	BASE	005YR001HR	1.46	0.00	0.001	1.46	2.10	0.00	1.60
DP-3	BASE	005YR024HR	13.48	0.00	0.001	13.48	2.10	0.00	1.60
DP-3	BASE	010YR024HR	14.35	0.00	0.002	14.35	2.10	0.00	1.60
DP-3	BASE	025YR072HR	62.77	0.02	0.017	62.77	2.11	0.00	1.60
DP-3	BASE	100YR072HR	62.91	14.83	0.038	62.91	4.02	0.00	1.60
DP-3	BASE	QUALITY	0.00	0.00	0.000	7.02	2.00	0.00	1.60
DP-4-1	BASE	005YR001HR	1.49	11.46	-0.087	1.49	3.05	0.00	1.60
DP-4-1	BASE	005YR024HR	13.87	12.80	-0.107	13.87	3.40	0.00	1.60
DP-4-1	BASE	010YR024HR	14.64	13.69	-0.169	14.64	3.66	0.00	1.60
DP-4-1	BASE	025YR072HR	62.61	14.65	-0.193	62.61	3.96	0.00	1.60
DP-4-1	BASE	100YR072HR	62.92	16.11	-0.198	62.92	4.45	0.00	1.60
DP-4-1	BASE	QUALITY	1.66	0.08	0.018	1.66	2.03	0.00	1.60
DP-4-2	BASE	005YR001HR	1.49	11.83	-0.087	1.49	3.05	0.00	1.60
DP-4-2	BASE	005YR024HR	13.87	14.64	-0.107	13.87	3.40	0.00	1.60
DP-4-2	BASE	010YR024HR	14.64	16.39	-0.130	14.64	3.66	0.00	1.60
DP-4-2	BASE	025YR072HR	62.61	18.15	-0.151	62.61	3.96	0.00	1.60
DP-4-2	BASE	100YR072HR	62.92	20.33	-0.154	62.92	4.45	0.00	1.60
DP-4-2	BASE	QUALITY	1.66	0.08	0.018	1.66	2.03	0.00	1.60
DP-5	BASE	005YR001HR	1.58	1.51	0.008	1.58	2.24	0.00	1.60
DP-5	BASE	005YR024HR	13.80	1.80	0.007	13.80	2.27	0.00	1.60
DP-5	BASE	010YR024HR	14.06	1.93	-0.011	14.06	2.28	0.00	1.60
DP-5	BASE	025YR072HR	62.60	2.06	-0.022	62.60	2.30	0.00	1.60
DP-5	BASE	100YR072HR	62.92	8.13	-0.021	62.92	2.74	0.00	1.60
DP-5	BASE	QUALITY	0.00	0.00	0.000	6.54	2.00	0.00	1.60
DP-6	BASE	005YR001HR	1.69	11.57	-0.069	1.69	3.02	0.00	1.60
DP-6	BASE	005YR024HR	13.89	13.79	-0.100	13.89	3.29	0.00	1.60
DP-6	BASE	010YR024HR	13.90	14.65	-0.145	13.90	3.40	0.00	1.60
DP-6	BASE	025YR072HR	62.61	15.55	-0.164	62.61	3.53	0.00	1.60
DP-6	BASE	100YR072HR	62.92	17.47	-0.162	62.92	3.84	0.00	1.60
DP-6	BASE	QUALITY	0.00	0.00	0.000	6.39	2.00	0.00	1.60
DP-8	BASE	005YR001HR	1.74	3.03	-0.050	1.74	2.24	0.00	1.60
DP-8	BASE	005YR024HR	13.80	3.60	-0.030	13.80	2.27	0.00	1.60
DP-8	BASE	010YR024HR	14.06	4.07	-0.030	14.06	2.29	0.00	1.60
DP-8	BASE	025YR072HR	62.61	11.29	0.126	62.61	3.91	0.00	1.60
DP-8	BASE	100YR072HR	62.92	13.52	0.151	62.92	4.92	0.00	1.60
DP-8	BASE	QUALITY	1.21	0.67	-0.015	1.21	2.09	0.00	1.60
DW-1	BASE	005YR001HR	0.41	23.10	23.100	1.38	3.72	0.00	-60.00

ABBOTT AVE DRAINAGE STUDY
ICPR MODEL FOR PROPOSED CONDITIONS - OPTION 3
LINK MAXIMUM REPORT

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
DW-1	BASE	005YR024HR	6.21	23.10	23.100	14.66	4.44	0.00	-60.00
DW-1	BASE	010YR024HR	5.72	23.10	23.100	14.67	4.64	0.00	-60.00
DW-1	BASE	025YR072HR	10.41	23.10	23.100	62.31	4.80	0.00	-60.00
DW-1	BASE	100YR072HR	7.83	23.10	23.100	61.90	5.04	0.00	-60.00
DW-1	BASE	QUALITY	0.90	23.10	23.100	1.70	2.01	0.00	-60.00
DW-2	BASE	005YR001HR	0.42	23.10	23.100	1.58	3.36	0.00	-60.00
DW-2	BASE	005YR024HR	6.23	23.10	23.100	13.80	3.87	0.00	-60.00
DW-2	BASE	010YR024HR	5.75	23.10	23.100	14.06	4.12	0.00	-60.00
DW-2	BASE	025YR072HR	11.54	23.10	23.100	62.60	4.38	0.00	-60.00
DW-2	BASE	100YR072HR	8.38	23.10	23.100	62.92	4.91	0.00	-60.00
DW-2	BASE	QUALITY	0.91	23.10	23.100	1.46	2.01	0.00	-60.00
DW-3	BASE	005YR001HR	0.44	23.10	23.100	1.69	3.46	0.00	-60.00
DW-3	BASE	005YR024HR	6.34	23.10	23.100	13.88	3.95	0.00	-60.00
DW-3	BASE	010YR024HR	5.75	23.10	23.100	13.90	4.16	0.00	-60.00
DW-3	BASE	025YR072HR	11.95	23.10	23.100	62.60	4.38	0.00	-60.00
DW-3	BASE	100YR072HR	8.66	23.10	23.100	62.92	4.91	0.00	-60.00
DW-3	BASE	QUALITY	0.92	23.10	23.100	1.86	2.00	0.00	-60.00
EXIST-PUMP	BASE	005YR001HR	0.89	14.20	14.200	1.46	2.10	0.00	1.60
EXIST-PUMP	BASE	005YR024HR	11.96	14.20	14.200	13.48	2.10	0.00	1.60
EXIST-PUMP	BASE	010YR024HR	11.88	14.20	14.200	14.35	2.10	0.00	1.60
EXIST-PUMP	BASE	025YR072HR	59.73	14.20	14.200	62.77	2.11	0.00	1.60
EXIST-PUMP	BASE	100YR072HR	59.42	14.20	14.200	62.91	4.02	0.00	1.60
EXIST-PUMP	BASE	QUALITY	0.00	0.00	0.000	7.02	2.00	0.00	1.60
NEW	BASE	005YR001HR	2.33	6.97	2.976	1.48	3.26	1.69	3.19
NEW	BASE	005YR024HR	11.83	6.64	2.954	13.87	3.70	13.87	3.70
NEW	BASE	010YR024HR	11.76	6.65	2.963	14.64	4.02	14.64	4.02
NEW	BASE	025YR072HR	59.54	6.64	2.973	62.60	4.38	62.60	4.38
NEW	BASE	100YR072HR	69.56	6.80	2.965	62.91	4.91	62.91	4.91
NEW	BASE	QUALITY	1.68	5.66	2.953	1.59	2.03	1.64	2.01
NEW PUMP	BASE	005YR001HR	0.43	5.00	5.000	1.69	3.19	0.00	1.60
NEW PUMP	BASE	005YR024HR	6.28	5.00	5.000	13.87	3.70	0.00	1.60
NEW PUMP	BASE	010YR024HR	5.98	5.00	5.000	14.64	4.02	0.00	1.60
NEW PUMP	BASE	025YR072HR	10.41	5.00	5.000	62.60	4.38	0.00	1.60
NEW PUMP	BASE	100YR072HR	7.83	5.00	5.000	62.91	4.91	0.00	1.60
NEW PUMP	BASE	QUALITY	0.92	5.00	5.000	1.64	2.01	0.00	1.60
NEW WELLS	BASE	005YR001HR	0.43	23.10	23.100	1.69	3.19	0.00	-60.00
NEW WELLS	BASE	005YR024HR	6.28	23.10	23.100	13.87	3.70	0.00	-60.00
NEW WELLS	BASE	010YR024HR	5.98	23.10	23.100	14.64	4.02	0.00	-60.00
NEW WELLS	BASE	025YR072HR	10.41	23.10	23.100	62.60	4.38	0.00	-60.00
NEW WELLS	BASE	100YR072HR	7.83	23.10	23.100	62.91	4.91	0.00	-60.00
NEW WELLS	BASE	QUALITY	0.92	23.10	23.100	1.64	2.01	0.00	-60.00
P1	BASE	005YR001HR	2.74	2.37	-0.174	2.74	4.05	2.74	2.09
P1	BASE	005YR024HR	14.68	2.58	-0.179	14.68	4.45	14.68	2.10
P1	BASE	010YR024HR	14.68	2.68	-0.181	14.68	4.64	14.68	2.12
P1	BASE	025YR072HR	62.31	2.76	-0.181	62.31	4.81	62.32	2.14
P1	BASE	100YR072HR	61.37	2.84	-0.180	61.90	5.04	61.91	2.37
P1	BASE	QUALITY	1.83	1.75	-0.176	1.83	3.14	1.83	2.07
P2	BASE	005YR001HR	1.38	1.15	0.329	1.38	3.72	1.39	2.20
P2	BASE	005YR024HR	14.66	1.39	-0.327	14.66	4.44	14.67	2.23
P2	BASE	010YR024HR	14.67	1.45	-0.327	14.67	4.64	14.68	2.23

Name	Group	Simulation	Max Time Flow hrs	Max Flow cfs	Max Delta Q cfs	Max Time US Stage hrs	Max US Stage ft	Max Time DS Stage hrs	Max DS Stage ft
P2	BASE	025YR072HR	62.31	1.50	-0.334	62.31	4.80	62.32	2.24
P2	BASE	100YR072HR	60.84	1.50	-0.334	61.90	5.04	61.90	2.79
P2	BASE	QUALITY	1.54	0.43	-0.327	1.70	2.01	7.02	2.00
P3	BASE	005YR001HR	1.68	1.19	-0.326	1.69	3.19	1.46	2.10
P3	BASE	005YR024HR	13.88	1.36	-0.329	13.87	3.70	13.48	2.10
P3	BASE	010YR024HR	14.67	1.46	-0.329	14.64	4.02	14.35	2.10
P3	BASE	025YR072HR	62.58	1.56	-0.329	62.60	4.38	62.77	2.11
P3	BASE	100YR072HR	61.10	1.60	0.331	62.91	4.91	62.91	4.02
P3	BASE	QUALITY	1.80	0.43	-0.329	1.64	2.01	7.02	2.00
P4	BASE	005YR001HR	1.48	23.28	-5.468	1.48	3.26	1.49	3.05
P4	BASE	005YR024HR	13.86	27.44	-5.721	13.87	3.70	13.87	3.40
P4	BASE	010YR024HR	14.63	30.08	-5.701	14.64	4.02	14.64	3.66
P4	BASE	025YR072HR	62.60	32.80	-5.894	62.60	4.38	62.61	3.96
P4	BASE	100YR072HR	61.84	35.46	-5.887	62.91	4.91	62.92	4.45
P4	BASE	QUALITY	2.23	4.23	-5.763	1.59	2.03	1.66	2.03
P5	BASE	005YR001HR	1.58	1.51	-0.499	1.58	3.36	1.58	2.24
P5	BASE	005YR024HR	13.80	1.80	-0.504	13.80	3.87	13.80	2.27
P5	BASE	010YR024HR	14.06	1.93	-0.503	14.06	4.12	14.06	2.28
P5	BASE	025YR072HR	62.60	2.06	-0.505	62.60	4.38	62.60	2.30
P5	BASE	100YR072HR	61.52	2.21	0.507	62.92	4.91	62.92	2.74
P5	BASE	QUALITY	1.70	0.64	-0.499	1.46	2.01	6.54	2.00
P6	BASE	005YR001HR	1.68	11.57	-1.446	1.69	3.46	1.69	3.02
P6	BASE	005YR024HR	13.88	13.79	-1.464	13.88	3.95	13.89	3.29
P6	BASE	010YR024HR	13.90	14.65	-1.450	13.90	4.16	13.90	3.40
P6	BASE	025YR072HR	62.60	15.55	-1.463	62.60	4.38	62.61	3.53
P6	BASE	100YR072HR	62.91	17.47	-1.468	62.92	4.91	62.92	3.84
P6	BASE	QUALITY	1.68	2.98	-1.448	1.86	2.00	6.39	2.00
P8	BASE	005YR001HR	1.74	3.03	-0.337	1.74	3.37	1.74	2.24
P8	BASE	005YR024HR	13.80	3.60	0.314	13.80	3.87	13.80	2.27
P8	BASE	010YR024HR	14.05	3.86	0.304	14.06	4.12	14.06	2.29
P8	BASE	025YR072HR	60.94	3.86	0.301	62.60	4.38	62.61	3.91
P8	BASE	100YR072HR	60.50	3.86	-1.003	62.92	4.91	62.92	4.92
P8	BASE	QUALITY	1.21	0.76	0.302	1.21	2.16	1.21	2.09