



## **Town of Surfside**

### **SUSTAINABILITY & RESILIENCY COMMITTEE MEETING**

#### **AGENDA**

**April 17, 2019 – 6:30 p.m.**

Chief Terrill Williamson Police Training Room  
9293 Harding Ave, 2<sup>nd</sup> Floor, Surfside, FL 33154

- 1. Call to Order/Roll Call**
- 2. Approval of Meeting Minutes: January 16, 2019**
- 3. Abbot Avenue Drainage**
- 4. Dune Height Graphs – James Hickey, CGA**
- 5. Public Comments (3-minute time limit per speaker)**
- 6. Adjournment**

THIS MEETING IS OPEN TO THE PUBLIC. IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT OF 1990, ALL PERSONS THAT ARE DISABLED; WHO NEED SPECIAL ACCOMMODATIONS TO PARTICIPATE IN THIS MEETING BECAUSE OF THAT DISABILITY SHOULD CONTACT THE OFFICE OF THE TOWN CLERK AT 305-861-4863 EXT. 226 NO LATER THAN FOUR DAYS PRIOR TO SUCH PROCEEDING.

AGENDA ITEMS MAY BE VIEWED AT THE OFFICE OF THE TOWN CLERK, TOWN OF SURFSIDE TOWN HALL, 9293 HARDING AVENUE. ANYONE WISHING TO OBTAIN A COPY OF ANY AGENDA ITEM SHOULD CONTACT THE TOWN CLERK AT 305-861-4863. A COMPLETE AGENDA PACKET IS ALSO AVAILABLE ON THE TOWN WEBSITE AT [www.townofsurfsidefl.gov](http://www.townofsurfsidefl.gov).

TWO OR MORE MEMBERS OF TOWN COMMISSION OR OTHER TOWN BOARDS MAY ATTEND AND PARTICIPATE AT THIS MEETING.

THESE MEETINGS MAY BE CONDUCTED BY MEANS OF OR IN CONJUNCTION WITH COMMUNICATIONS MEDIA TECHNOLOGY, SPECIFICALLY, A TELEPHONE CONFERENCE CALL. THE LOCATION 9293 HARDING AVENUE, SURFSIDE, FL 33154, WHICH IS OPEN TO THE PUBLIC, SHALL SERVE AS AN ACCESS POINT FOR SUCH COMMUNICATION.



## Town of Surfside

### SUSTAINABILITY & RESILIENCY COMMITTEE MINUTES

**January 16, 2019 – 6:30 p.m.**

Chief Terrill Williamson Police Training Room  
9293 Harding Ave, 2<sup>nd</sup> Floor, Surfside, FL 33154

#### 1. Call to Order/Roll Call

The meeting was called to order at 6:32 p.m.

The following were present:

- Bertha Goldenberg
- Deborah Cimadevilla
- Clara Diaz-Leal
- Andrea Travani

Also present:

- Daniel Dietch, Mayor, Town Commission Liaison
- Lillian Arango, Town Attorney
- James Hickey, Town Planner
- Guillermo Olmedillo, Town Manager
- Duncan Tavares, Asst. Town Manager
- Elora Riera, Deputy Town Clerk
- Sandra Lee, Calvin, Giordano and Associates, Inc.

#### 2. Approval of Meeting Minutes: December 18, 2018

Committee Member Goldenberg made a motion to approve the meeting minutes as written. The motion was seconded by Committee Member Diaz-Leal and all voted in favor.

#### 3. Election of Officers

Committee Member Travani commented that he would be willing to serve as the Chair.

Committee Member Cimadevilla made a motion to nominate Andrea Travani as Chair. The motion was seconded by Committee Member Diaz-Leal and all voted in favor.

Committee Member Diaz-Leal made a motion to nominate herself as the Vice Chair. The motion was seconded by Committee Member Cimadevilla and all voted in favor.

Nirit of 9032 Dickens Avenue asked about the role of the Vice Chair. Town Attorney Arango explained the process for public speakers and explained the role of the Vice Chair.

**4. List of Environmental Resolutions and Ordinances – Guillermo Olmedillo, Town Manager**

Town Manager Olmedillo provided the Committee with a list of environmental resolutions and ordinances that are already in place with the Town. He answered questions from the Committee.

Committee Member Goldenberg commented that Miami-Dade County revised their landscape ordinance in 2009 and no longer uses the term “city scape” and now uses the term “Florida friendly” and suggested that perhaps the Town should revise their ordinance as well. She also mentioned rain sensors and moisture sensors and questioned how the Committee would go about discussing these items.

Town Manager Olmedillo explained how the Committee works and that they report to the Town Commission unlike the prior Subcommittee that reported to the Planning and Zoning Board.

Mayor Dietch arrived at 6:43 p.m.

**5. Beach and Dune Report Presentation – Sandra Lee, AICP CEP, LEED AP BD+C, CFM, Director Environmental, Calvin Giordano and Associates**

Assistant Town Manager Tavares introduced the item to the Committee.

Sandra Lee of Calvin Giordano and Associates provided a Beach and Dune Report PowerPoint presentation. She answered questions from the Committee.

Committee Member Diaz-Leal requested to see a list of ocean front buildings that have not complied with the revised lighting requirements.

The Committee would like to see a list of each of the existing trash receptacles in Town and who is in charge of each.

Discussion ensued regarding the beach and dune report and how to begin the process of creating a beach and dune management plan. Town Manager Olmedillo stated that Ms. Wheaton will be available at the next meeting to present the Miami Beach plan that is in place.

The Committee discussed the different recommendations that were outlined in the report and would like to address the following items in the beach and dune management plan:

- Partner with a company who has a specific know how in dealing with the control of light pollution to work with the Town
- Recommendation to have signage regarding the beach at the ocean front condos and hotels
- Program to constantly remove all of the invasive vegetation
- Thorough professional cleaning of the vegetation and then search for alternatives of yearly maintenance of invasive species
- Revise title to read “Control Feral Animals”

Mayor Dietch suggested the following topics: sand quality, solid waste, ropes and posts, permitting, survey and ownership.

The Committee would like to discuss the dune management height at their next meeting.

**6. Committee Priorities from the Town Commission**

Mayor Dietch introduced the item and explained the priorities from the Town Commission. Mayor Dietch stated that one of them is the Dune and Beach Management Plan, the second one is the past, present and future of all the sustainability initiatives in order to tell the story. The third item is the Abbott Avenue drainage.

Assistant Town Manager Tavares commented that staff has earmarked the March meeting for the Abbott Avenue drainage report.

Chair Travani stated that they should work on identifying areas and one of the ones that is a big challenge for the Town is sea level rise. He spoke about the possibility of receiving information on how much water the soil in Town absorbs.

Board Member Cimadevilla encouraged all members to review the CGA report that was presented during the last Commission meeting regarding the Abbott Avenue drainage.

**7. Public Comments**

There were no public comments.

**8. Adjournment**

Vice Chair Diaz-Leal moved to adjourn the meeting at 8:42 p.m. Committee Member Goldenberg seconded the motion and all voted in favor.

Respectfully submitted:

Accepted this \_\_\_\_\_ day of \_\_\_\_\_, 2019

Attest:

\_\_\_\_\_  
Elora Riera, CMC  
Deputy Town Clerk



## MEMORANDUM

ITEM NO.
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**To:** Honorable Mayor, Vice-Mayor and Members of the Town Commission

**From:** Guillermo Olmedillo, Town Manager 

**Date:** December 11, 2018 / January 8, 2019

**Subject:** Abbott Avenue Drainage Improvements

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The Town of Surfside is located on a low-lying barrier island between Biscayne Bay and the Atlantic Ocean and is susceptible to flooding due to tides, high water table, low lying grounds.

Drainage improvements were completed by the Town in 2013 under a FEMA grant to address water quality issues prior to discharge to the Bay. While the project did provide quantity/conveyance/storage improvements incidental to the quality improvements, that was not the primary focus of that project.

Over the past few years the Town has received numerous complaints of water standing in the Abbott Avenue roadway during common rain events. In response to these complaints, the Town commissioned Calvin, Giordano and Associates, Inc. ("CGA") to perform a drainage study and prepare a report to identify the likely causes and recommended steps to mitigate or eliminate the standing water.

CGA has completed the study and has provided its report (Attachment "A" - Section Five of the Report), which concludes that the desired level of service, that will keep the streets dry at all times, for all drainage basins within the Town, cannot be met, but includes mitigating recommendations.

The options presented are:

**Option 1.**

- a) Replace and upsize the existing conveyance pipes and storm inlets at 91<sup>st</sup> Street/Abbott Avenue intersection.

- b) Replace and upsize the existing conveyance pipes and storm inlets at 92<sup>nd</sup> Street/Abbott Avenue intersection.
- c) Provide a Pump Station (2,250 GPM) at the intersection of Abbott Avenue and 92<sup>nd</sup> 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 92<sup>nd</sup> Street.
- d) Provide 24" diameter conveyance pipe along Abbott Avenue between 91<sup>st</sup> Street and the new proposed pump station.
- e) Provide additional curb inlets along Abbott Avenue between 90<sup>th</sup> Street and 92<sup>nd</sup> 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.

*Estimated cost including design, permitting and construction is \$982,000.*

### **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 92<sup>nd</sup> Street.
- c) As an alternative option, the existing Pump Station at 92<sup>nd</sup> Street can be replaced with the new proposed pump station and the new pressurized drainage wells.

*Estimated cost including design, permitting and construction is \$1,720,000.*

### **Option 3.**

- a) Implementation of all improvements of Options 1 and 2.
- b) Provide 48" conveyance Trunk line along 91<sup>st</sup> Street.
- c) This option will require extensive utility reconstruction/relocation and complete roadway restoration to construct the proposed 48" drainage pipe.

*Estimated cost including design, permitting and construction is \$4,971,000.*

Any of these options may be financed by one or more of the following:

1. Borrow for the project.
2. Use Stormwater reserves for the project.
3. Levy a special assessment on the properties that benefit from the improvement.
4. Use property tax revenues to fund the project.

From the consultant's report we can conclude that the fiscally prudent way to engage in these improvements is to start with Option 1, and evaluate the performance of these improvements, then consider the additional suggested improvements.

Town Administration is recommending to engage CGA to provide design and permitting services to facilitate the recommended improvements in Option 1, and budget funds to construct the improvements in the upcoming fiscal year's budget.

Reviewed by RS/GO

Prepared by CK

## 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 91<sup>st</sup> street /Abbott Avenue intersection.
- b) Replace and upsize the existing conveyance pipes and storm inlets at 92<sup>nd</sup> street /Abbott Avenue intersection.
- c) Provide a Pump Station (2,250 GPM) at the intersection of Abbott Avenue and 92<sup>nd</sup> 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 92<sup>nd</sup> Street.
- d) Provide 24" diameter conveyance pipe along Abbott Avenue between 91<sup>st</sup> street and the new proposed pump station.
- e) Provide additional curb inlets along Abbott Avenue between 90<sup>th</sup> Street and 92<sup>nd</sup> 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 92<sup>nd</sup> 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 91<sup>st</sup> 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:

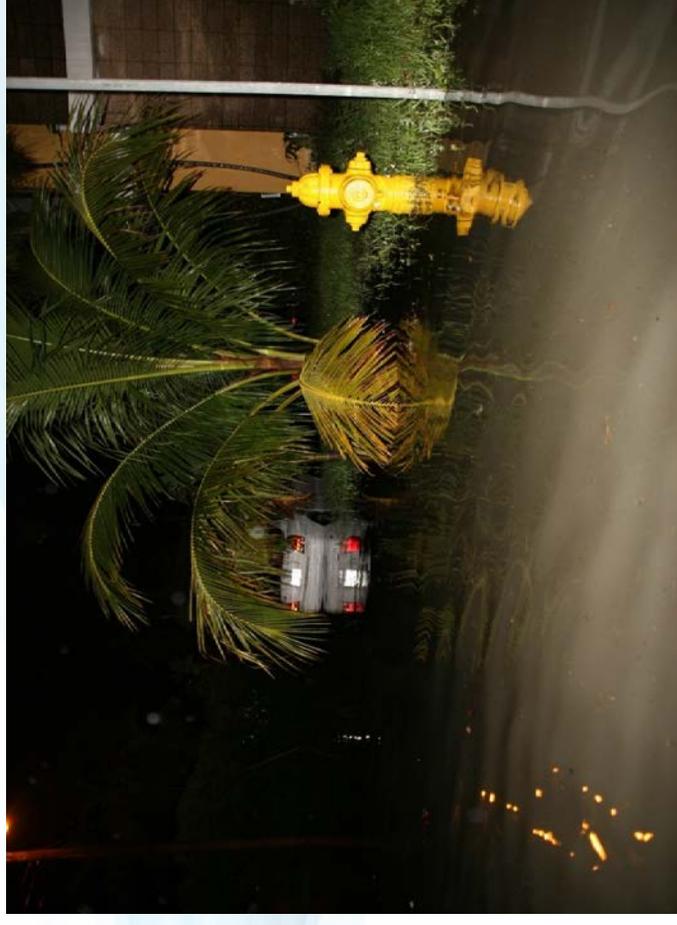
Option 1	\$982,000
Option 2	\$1,720,000
Option 3	\$4,971,000

# **ABBOTT AVENUE DRAINAGE STUDY**

**TOWN OF SURFSIDE, FLORIDA**

# OBJECTIVE OF THE STUDY

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.



# MAGNITUDE OF FLOOD

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 ( $\pm 1$  inch/hour) rainfall events.

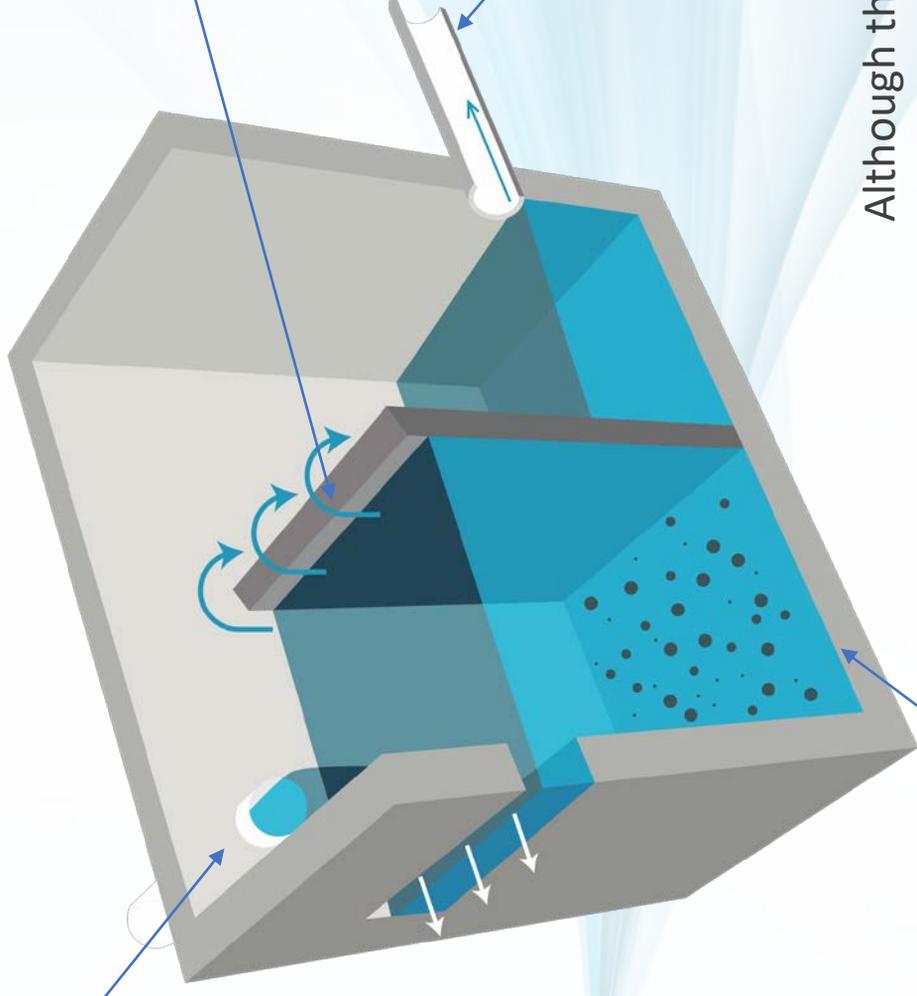


# BASIN CHARACTERISTICS

- 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.

# PERMIT REQUIRED WEIRS AND BAFFLES AND WHY

Drainage water flows into the structure



Elevation +2.0 NGVD-Water must reach this min elevation to be conveyed through the system

Cleaner water flows out to wells or bay

Sediment, silt, sand debris falls here as it is heavier than water

Although this system protects the environment by removing a portion of the pollutants prior to discharge, it also impedes drainage water flow off streets and to its final destination

## BASIN CHARACTERISTICS (CONT.)

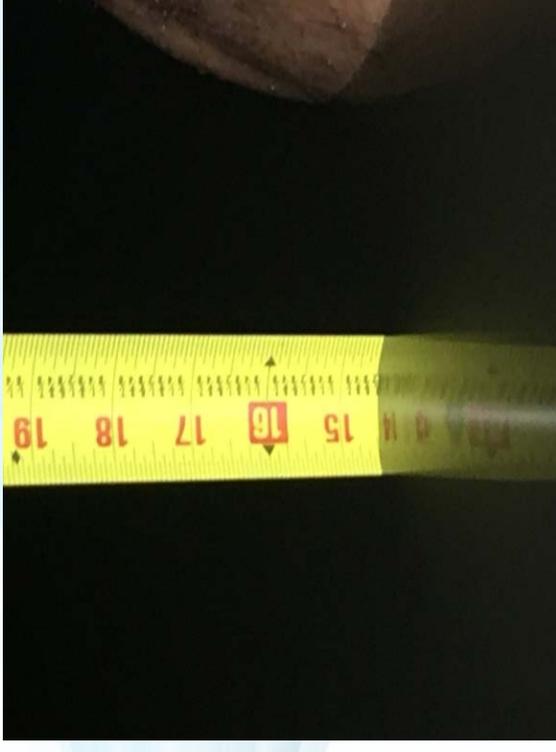
- The Town recently constructed three pump stations and nine drainage wells to improve the water quality of the receiving waters (by discharging the drainage water into wells rather than Bay).
- Project was completely funded by FDEP with their goal being reduction of pollutants and not stormwater conveyance. Project was confined to Bay Dr.
- 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.

# SUMMARY OF 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



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



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

# LEVEL OF SERVICE (LOS) FOR ROADWAY

The following are the expected level of service:

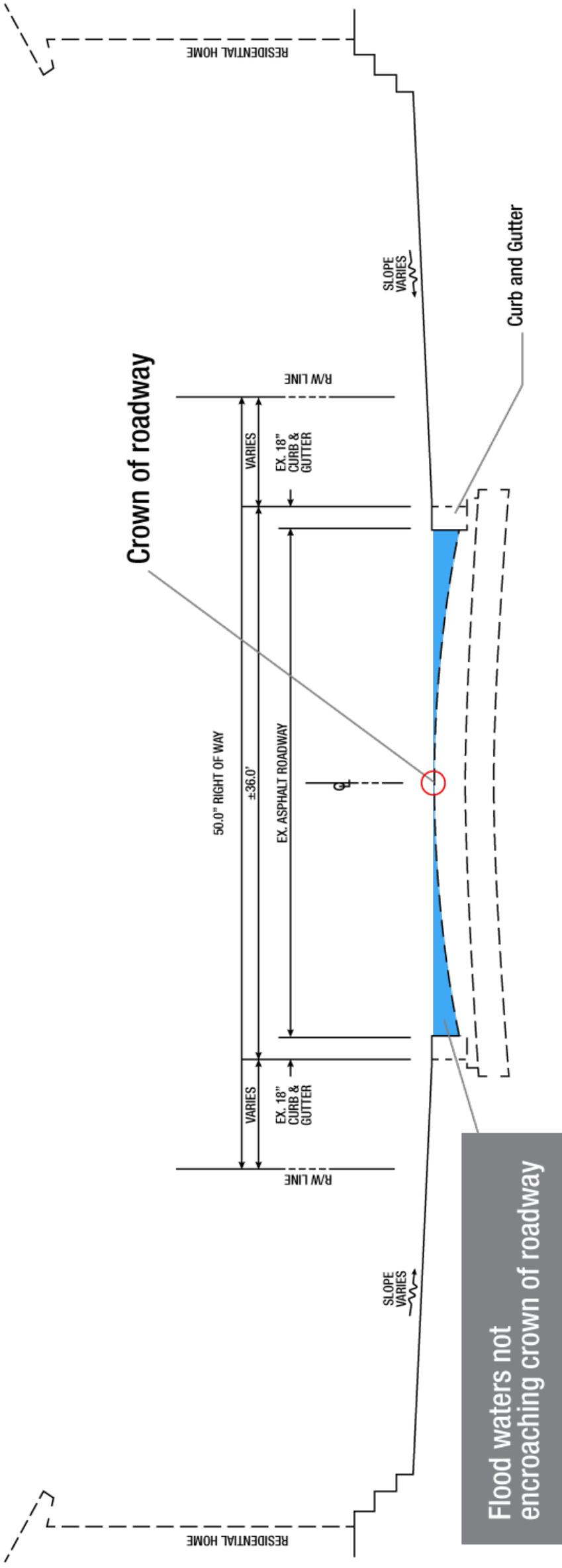
1. Flood elevation or storm stage resulting from 5-year design storm events shall not encroach up to the roadway crown elevation.
2. Roadway spread resulting from 4 inch/hour intensity storm shall not encroach more than half of the travel lane width.
3. Hydraulic grade line resulting from 3-year 1-hour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



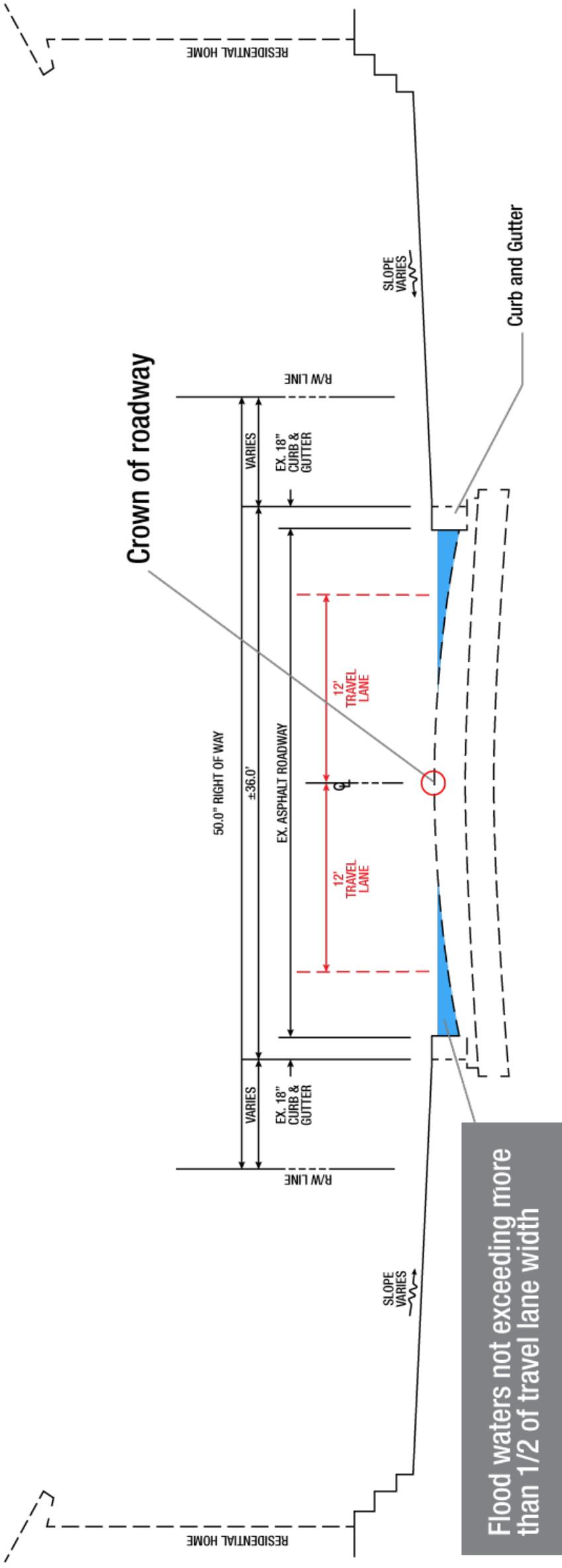
ABBOTT AVE, JUNE 7, 2017  
(ESTIMATED 1.5 INCHES OF RAIN)



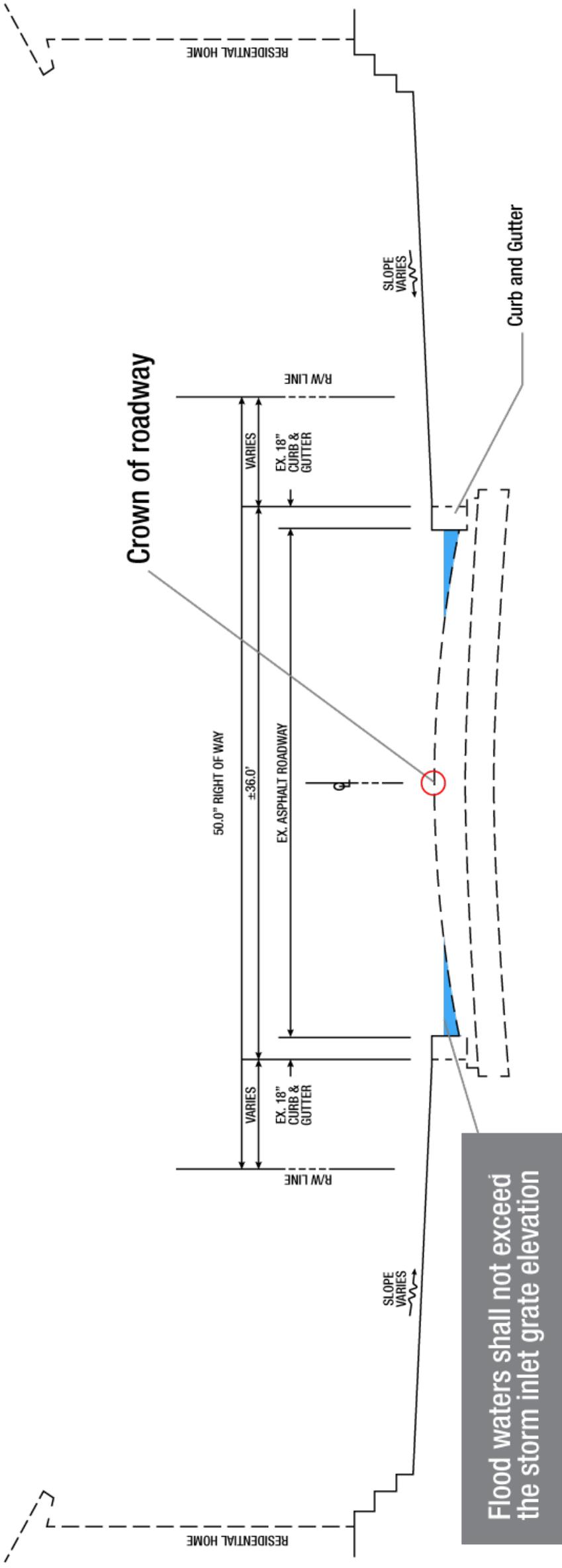
ABBOTT AVE, JULY 23, 2018  
(ESTIMATED 1.0 INCHES OF RAIN)



# LOS 1 - FLOOD ELEVATION OR STORM STAGE RESULTING FROM 5-YEAR DESIGN STORM EVENTS



# LOS 2 - ROADWAY SPREAD RESULTING FROM 4" PER HOUR INTENSITY STORM



# LOS 3 - HYDRAULIC GRADE LINE RESULTING FROM A 3-YEAR 1-HOUR DESIGN STORM

# WHAT IS REQUIRED FOR PROPER DRAINAGE

Every drainage system has 3 parts:  
**Collection**    **Transmission**    **Discharge**

These 3 parts work like links in a chain, and will only operate to a level of service as good as the weakest link in the chain.

## **Collection:**

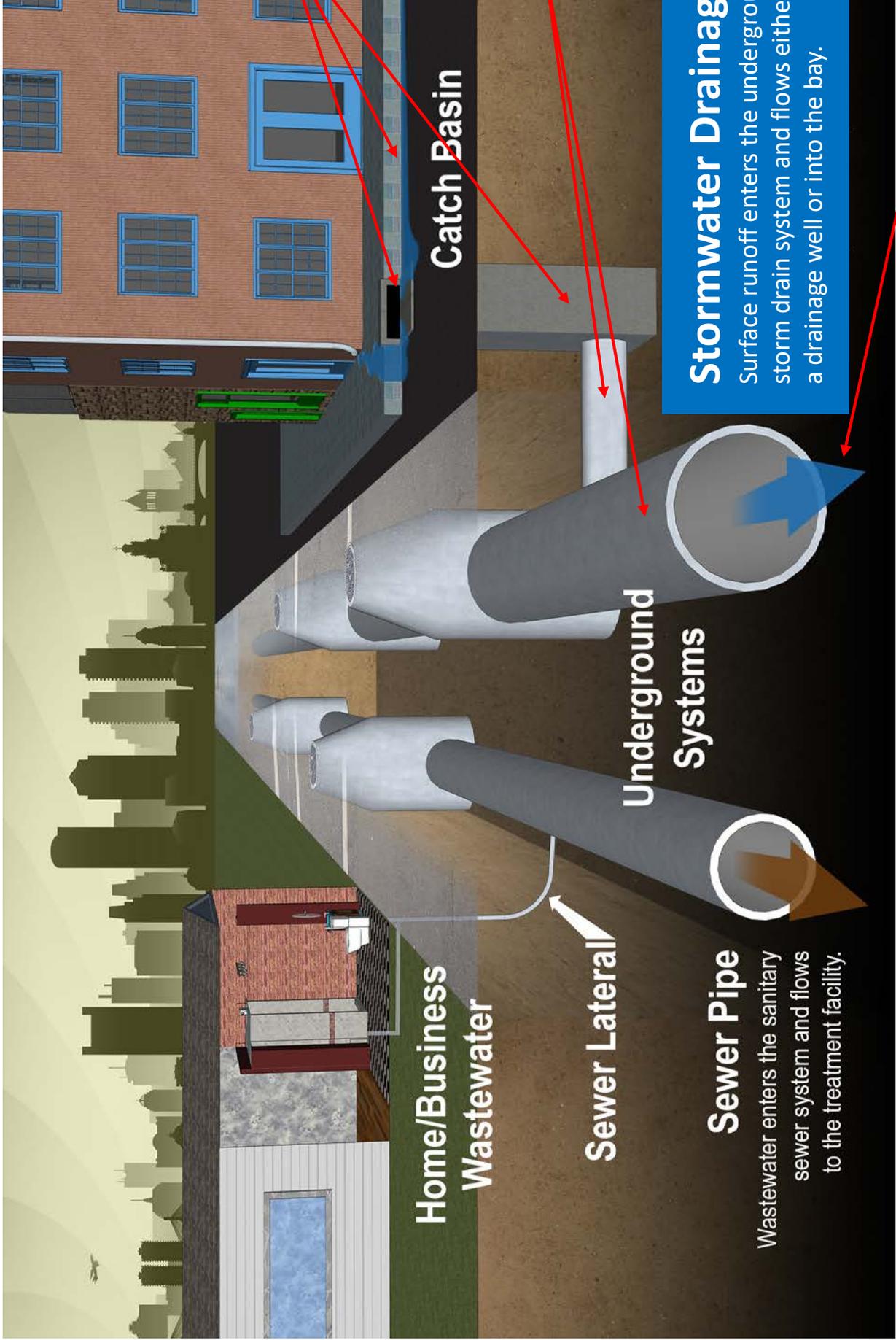
This link determines how the storm water gets into the pipes and consists of road slope and elevation, curb and gutter layout and design and drainage inlets and catch basins.

## **Transmission:**

This link determines how the storm water is transmitted from the roadways to its final destination and it consists of the drainage pipes, structures, weirs, baffles and pump stations.

## **Discharge:**

This link determines how and where the stormwater ends up and consists of drainage wells, pump stations and Bay outfall discharge pipes. Improving one link while ignoring the others may only have a marginal impact on the Town's Level of Service Improvement.



Collection

Transmission

Discharge

**Home/Business Wastewater**

**Sewer Lateral**

**Sewer Pipe**

Wastewater enters the sanitary sewer system and flows to the treatment facility.

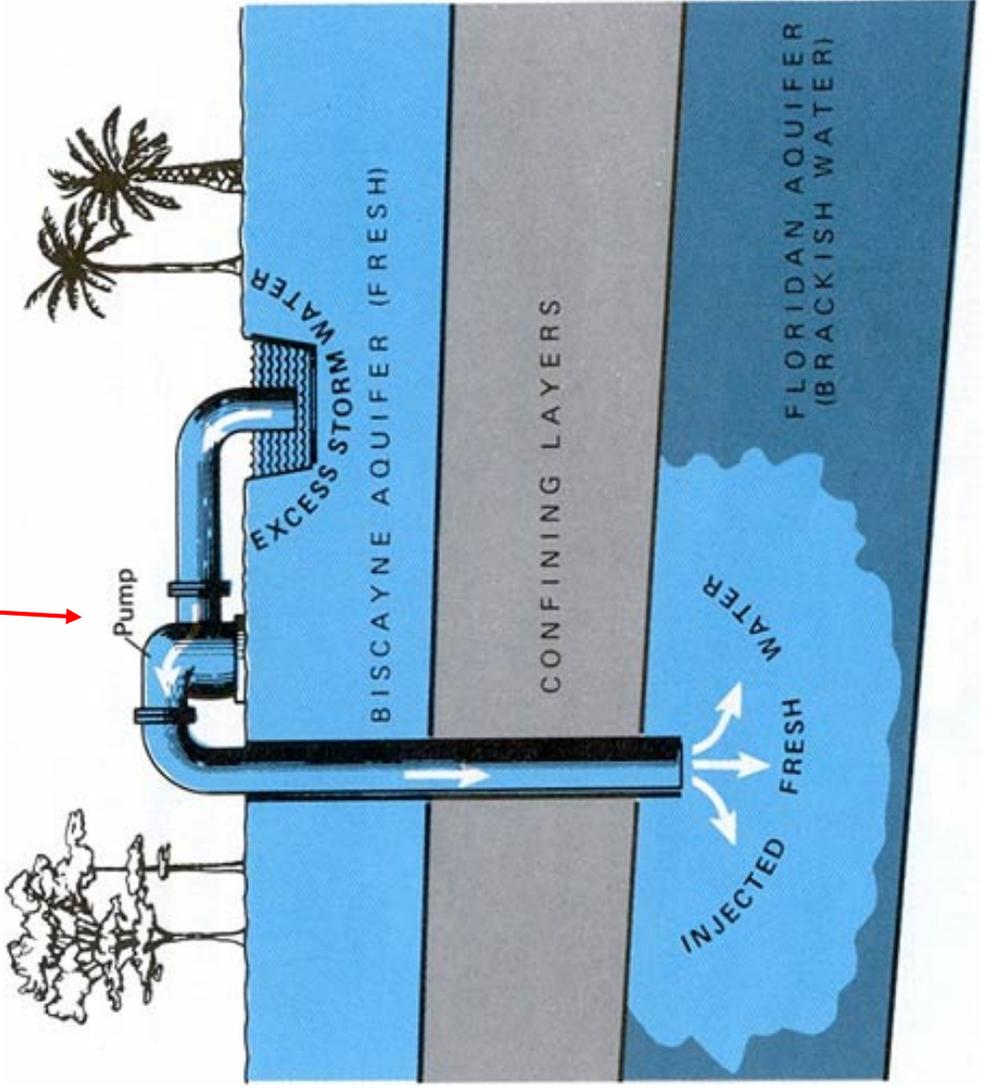
**Catch Basin**

**Underground Systems**

**Stormwater Drainage**

Surface runoff enters the underground storm drain system and flows either to a drainage well or into the bay.

Discharge



# PROPOSED IMPROVEMENTS

- 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.
- 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 (Transmission),
  2. increasing the number of storm inlets (Collection),
  3. increasing the roadway profile slope (Collection),
  4. adding a pump station at 92nd Street and Abbott Avenue intersection discharging into the Indian Creek (Discharge),
  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-higher capacity pump station and drainage wells (Transmission and Discharge).

## OPTION 1 IMPROVEMENTS:

- a) Provide additional curb inlets along Abbott Avenue between 90st Street and 92nd Street (Collection).
- b) Replace and upsize the existing conveyance pipes and storm inlets at 91st street /Abbott Avenue intersection (Collection & Transmission).
- c) Replace and upsize the existing conveyance pipes and storm inlets at 92nd street /Abbott Avenue intersection (Collection & Transmission).
- d) Provide 24” diameter conveyance pipe along Abbott Avenue between 91st street and the new proposed pump station (Transmission).
- e) 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 (Discharge).
- 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.

# EXISTING UTILITY CONSTRAINTS



<b>Color Code for:</b> Marking Excavation Sites & Underground Facilities	PROPOSED EXCAVATION	TEMPORARY SURVEY MARKINGS
ELECTRIC	GAS - OIL - STEAM CHEMICAL	WATER
COMMUNICATION CATV	RECLAIMED WATER IRRIGATION SLURRY	SEWER

**811**  
Know what's below.  
Call before you dig.

# EXISTING UTILITY CONSTRAINTS



ABBOTT AVE AT 92ND STREET (LOOKING SOUTH)



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



ABBOTT AVENUE AT 92ND STREET (LOOKING NORTH)



FPL POLES BEHIND BACK OF CURB

## **OPTION 2 IMPROVEMENTS:**

- 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 (Discharge).
- 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 (Discharge).

## **OPTION 3 IMPROVEMENTS:**

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

## **COST ESTIMATE FOR OPTIONS:**

Construction and design cost for option 1	\$982,000*
Construction and design cost for option 2	\$1,720,000*
Construction and design cost for option 3	\$4,971,000*

\*Subject to cost fluctuations due to timing of RFP/Bidding and current market conditions.

# OPTION #1

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	Utility Adjustment/Relocation	1	LS		\$100,000.00	\$100,000.00
				<b>SUBTOTAL</b>		<b>\$665,005.00</b>
				<b>TOTAL</b>		<b>\$665,005.00</b>
				20% Contingency =		\$133,001.00
				Design/Permitting Services (13%) =		\$103,740.78
				Construction Engineering & Inspection Services (10%) =		\$79,800.60
				<b>Cost Total</b>		<b>\$981,547.38</b>

# OPTION #2

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	Utility 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
				<b>SUBTOTAL</b>	<b>\$1,165,005.00</b>
				<b>TOTAL</b>	<b>\$1,165,005.00</b>
				20% Contingency =	\$233,001.00
				Design/Permitting Services(13%) =	\$181,740.78
				Construction Engineering & Inspection Services(10%) =	\$139,800.60
				<b>Cost Total</b>	<b>\$1,719,547.38</b>

# OPTION #3

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	Utility 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
				<b>SUBTOTAL</b>		<b>\$3,367,564.10</b>
				<b>TOTAL</b>		<b>\$3,367,564.10</b>
				20% Contingency =		\$673,512.82
				Design/Permitting Services(13%) =		\$525,340.00
				Construction Engineering & Inspection Services(10%) =		\$404,107.69
				<b>Cost Total</b>		<b>\$4,970,524.61</b>

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

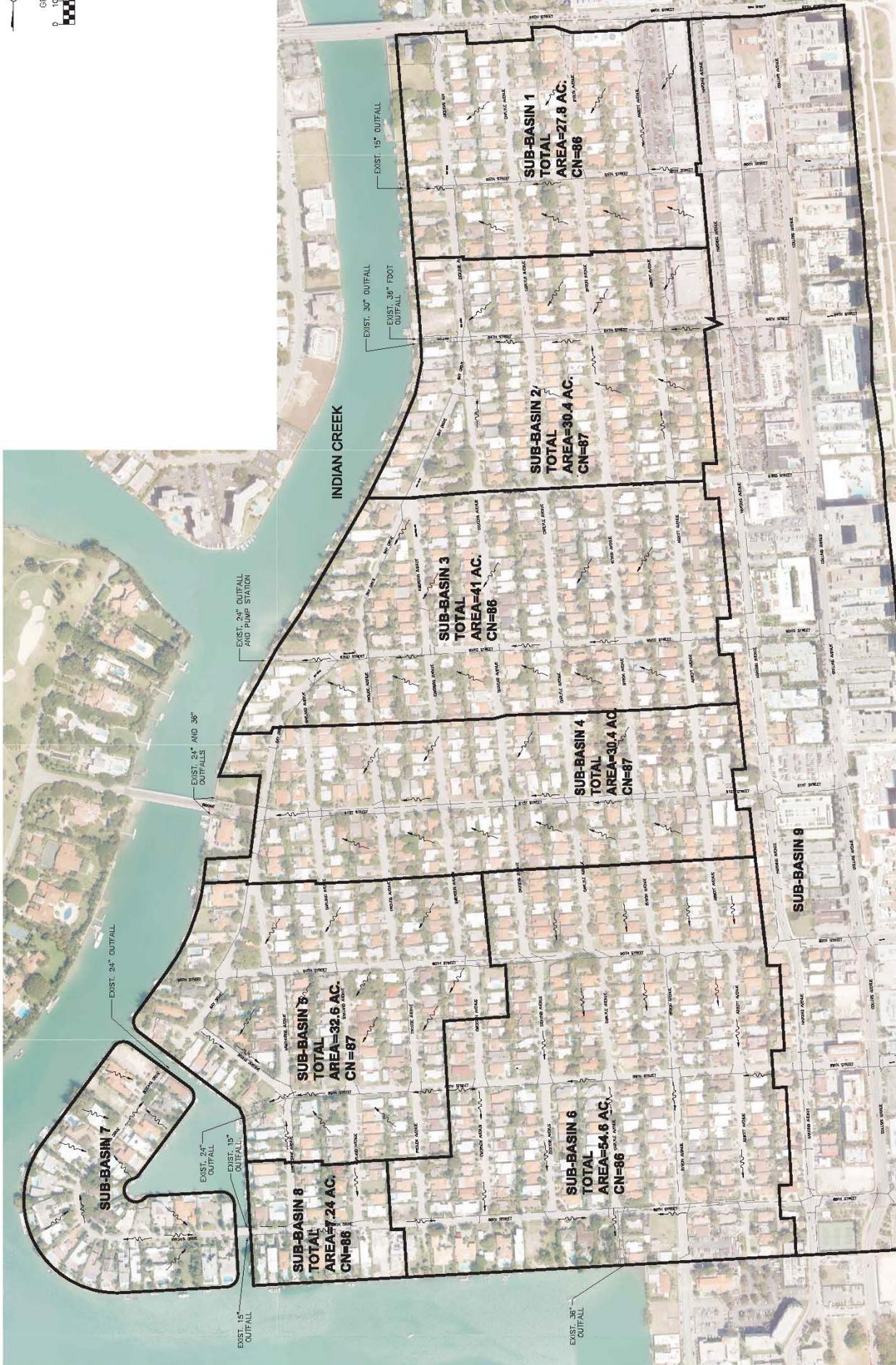
Areas of Concern/ Sub-Basin	Existing Flooding Conditions	Inches of Flooding Option 1	Inches of Flooding Option 2	Inches of Flooding Option 3
Abbott Ave (Basin 3)	10.68" to 16.08"	9.84" to 15.60"	5.16" to 12.00"	3.48" to 9.60"
	11.88" to 17.28"	11.04" to 16.80"	8.40" to 13.20"	5.52" to 10.80"

\*\*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"
	1.08" to 6.48"	0.24" to 6.00"	0.00" to 2.40"	0.00" to 0.00"

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



PROJECT NO.		DATE: 10/27/19	
SCALE		PROJECT NO.	
<b>EXISTING DRAINAGE BASIN MAP</b>			
<b>SURFSIDE ABBOTT AVE. DRAINAGE STUDY</b>			
SURFSIDE, FLORIDA			
Calvin, Giordano & Associates, Inc. EXCEPTIONAL SOLUTIONS 10000 W. Lake Nona Blvd., Suite 333-6 Lake Nona, FL 32157 Phone: 407.276.1400 Fax: 407.276.1407 Certificate of Authorization: 514			
REVISION	BY	NO.	DATE

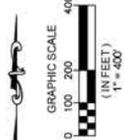
DESIGNED BY: CALVIN, GIORDANO & ASSOCIATES, INC.  
 STATE OF FLORIDA PROFESSIONAL ENGINEER  
 LICENSE NO. 1794

PROJECT NO. 19180

DATE: 10/27/19

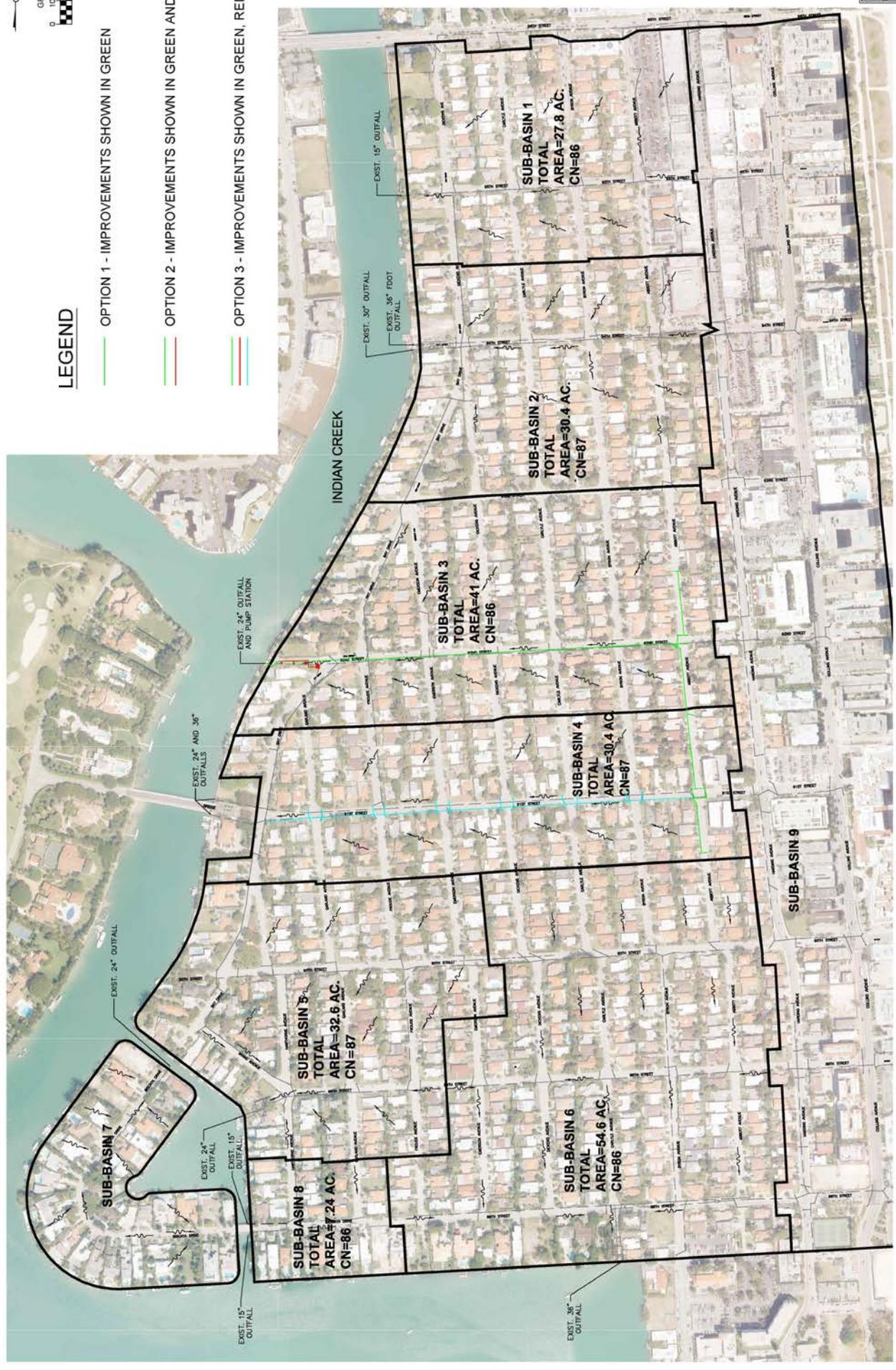
EXH7

The Name: P:\Projects\2018\61160 Surfside Abbott Ave Drainage Study\cadd Files\Drawings\0-KK-Drainage Map.dwg - (Plotted by: Katherine Kuehn on Wednesday, October 17, 2018 4:12:15 PM)



**LEGEND**

- OPTION 1 - IMPROVEMENTS SHOWN IN GREEN
- OPTION 2 - IMPROVEMENTS SHOWN IN GREEN AND RED
- OPTION 3 - IMPROVEMENTS SHOWN IN GREEN, RED, AND CYAN



<p>PROPOSED DRAINAGE BASIN MAP</p>																		
<p>SURFSIDE ABBOTT AVE. DRAINAGE STUDY</p>																		
<p>SURFSIDE, FLORIDA</p>																		
<p>EXH8</p>																		
<p>SCALE: NTS</p>	<p>PROJECT NO: 181180</p>																	
<p>DATE: 10/20/18</p>																		
<p>ENGINEER: CALVIN GIOVANNI, P.E. STATE OF FLORIDA PROFESSIONAL ENGINEER LICENSE NO. 17940</p>																		
<p>Calvin, Giovanni &amp; Associates, Inc. EXCEPTIONAL SOLUTIONS 10000 W. US HWY 90, SUITE 3335 FORT WORTH, TEXAS 76133 Phone: 817.432.2298 • Fax: 817.432.2807 Certificate of Authorization 514</p>																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	DATE	BY	REVISION													<p>BY: _____</p> <p>REVISION: _____</p>	
NO.	DATE	BY	REVISION															

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## 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.

## RECOMMENDATIONS (CONT.)

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 required 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.

NO	DATE	BY	NO	DATE	REVISION	BY


  
 Calvin, Giordano & Associates, Inc.
   
 EXCEPTIONAL SOLUTIONS™
   
 14000 N.W. 13th St., Suite 100
   
 Ft. Lauderdale, FL 33309
   
 Phone 954.327.8877 • Fax 954.327.8877
   
 Certificate of Authorization 514

**SURFSIDE ABBOTT AVE. DRAINAGE STUDY**
  
 SURFSIDE, FLORIDA

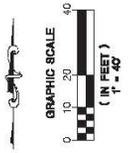
**OPTION 1**
  
**PROPOSED DRAINAGE**
  
**IMPROVEMENTS DETAILS**

DESIGNER: CALVIN, GIORDANO & ASSOCIATES, INC.
   
 STATE OF FLORIDA PROFESSIONAL ENGINEER
   
 LICENSE NO. 69460
   
 DATE: 10/2018

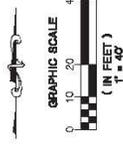
SCALE: AS SHOWN
   
 PROJECT No.: 181180
   
**SHEET: C4**



**MATCH LINE C**
  
**SEE SHEET C5 - OPTION 1**







EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED

PROPOSED LIFT STATION



PROPOSED 24" RCP

EXISTING DRAINAGE STRUCTURES TO BE RECONSTRUCTED  
PROPOSED 18" PIPE

PROPOSED 24" RCP

PROPOSED 18" RCP

MATCH LINE E SEE SHEET C7 - OPTION 1

MATCH LINE D SEE SHEET C5 - OPTION 1

File Name: P:\Projects\2018\181180 Surfside Abbott Ave. Drainage Study\cadd Files\Drawings\181180\_L-STM-011.dwg - (Plotted by: kaimhema.krupay on Friday, October 12, 2018 4:56:39 PM)



NO	DATE	BY	NO	DATE	REVISION	BY

Calvin, Giordano & Associates, Inc.  
EXCEPTIONAL SOLUTIONS™  
10000 W. BOULEVARD, SUITE 100  
FORT LAUDERDALE, FL 33328  
Phone 954.278.1111 Fax 954.278.8887  
Certificate of Authorization 514

**SURFSIDE ABBOTT AVE. DRAINAGE STUDY**  
SURFSIDE, FLORIDA

**OPTION 1**  
**PROPOSED DRAINAGE**  
**IMPROVEMENTS DETAILS**

SCALE: AS SHOWN  
PROJECT NO: 181180  
DATE: 10/12/18  
FORWARDER: GUYAN D.S.  
STATE OF FLORIDA PROFESSIONAL ENGINEER  
LICENSE NO. 69460

SHEET: **C6**



4 - Dune Height Graphs





TOWN OF SURFERS PARADISE NORTH LIMITS  
95TH STREET  
LOT 1A TOWN OF SURFERS PARADISE  
FOLIO: 14-2235-007-2640

COLLINS AVENUE  
LOT 12  
LOT 11  
LOT 10  
LOT 9  
LOT 8  
LOT 7  
LOT 6  
LOT 5  
LOT 4  
LOT 3  
LOT 2  
LOT 1  
COASTAL CONSTRUCTION CONTROL LINE (CCCL) - P.B. 74, PG. 25, M.D.C.R.  
FOLIO: 14-2235-042-0001  
BLOCK 2  
ALTOS DEL MAR NO. 5  
P.B. 8, PG. 106, M.D.C.R.  
BULKHEAD LINE - P.B. 105, PG. 8, M.D.C.R.  
PROPERTY LINE  
PROPERTY LINE  
PROPERTY LINE  
OCEAN SEVEN CONDO  
FOLIO: 14-2235-049-0001  
PG. 62, M.D.C.R.

95TH STREET  
LOT 12  
LOT 11  
LOT 10  
LOT 9  
LOT 8  
LOT 7  
LOT 6  
LOT 5  
LOT 4  
LOT 3  
LOT 2  
LOT 1  
SIMMONS OCEAN CONDO  
FOLIO: 14-2235-045-0001  
PG. 62, M.D.C.R.  
EROSION CONTROL LINE (ECL) - P.B. 105, PG. 8, M.D.C.R.  
PROPERTY LINE  
PROPERTY LINE  
PROPERTY LINE  
BEACH HOUSE HOTEL LLC  
FOLIO: 14-2235-007-0020  
BLOCK 1  
ALTOS DEL MAR NO. 5  
P.B. 8, PG. 106, M.D.C.R.  
BULKHEAD LINE - P.B. 105, PG. 8, M.D.C.R.  
PROPERTY LINE  
ALICE CONDO  
FOLIO: 14-2235-041-0001  
PG. 62, M.D.C.R.

94TH STREET  
LOT 12  
LOT 11  
LOT 10  
LOT 9  
LOT 8  
LOT 7  
LOT 6  
LOT 5  
LOT 4  
LOT 3  
LOT 2  
LOT 1  
TOWN OF SURFERS PARADISE  
FOLIO: 14-2235-006-2990  
PROPERTY LINE  
PROPERTY LINE  
PROPERTY LINE  
CHATEAU OCEAN CLUB  
FOLIO: 14-2235-045-0001  
BLOCK 2  
ALTOS DEL MAR NO. 5  
P.B. 8, PG. 106, M.D.C.R.  
BULKHEAD LINE - P.B. 105, PG. 8, M.D.C.R.  
PROPERTY LINE  
REBECCA CONDO  
FOLIO: 14-2235-019-0001  
PG. 62, M.D.C.R.

93RD STREET  
LOT 12  
LOT 11  
LOT 10  
LOT 9  
LOT 8  
LOT 7  
LOT 6  
LOT 5  
LOT 4  
LOT 3  
LOT 2  
LOT 1  
COASTAL CONSTRUCTION CONTROL LINE (CCCL) - P.B. 74, PG. 25, M.D.C.R.  
FOLIO: 14-2235-008-0010  
LOT 11 BLOCKER SURFERS CTR  
P.B. 70, PG. 31, M.D.C.R.  
TOWN OF SURFERS PARADISE  
FOLIO: 14-2235-006-0100  
PG. 62, M.D.C.R.  
EROSION CONTROL LINE (ECL) - P.B. 105, PG. 8, M.D.C.R.  
PROPERTY LINE  
PROPERTY LINE  
PROPERTY LINE  
MANAEE CONDO  
FOLIO: 14-2235-017-0001  
BULKHEAD LINE - P.B. 105, PG. 8, M.D.C.R.  
PROPERTY LINE  
SEASIDE TERRACE CONDO  
FOLIO: 14-2235-026-0001  
PROPERTY LINE  
FOUR WINDS CONDO  
FOLIO: 14-2235-016-0001  
PROPERTY LINE  
THE MAVERICK CONDO  
FOLIO: 14-2235-041-0001  
PROPERTY LINE