FLORIDA DEPARTMENT OF TRANSPORTATION

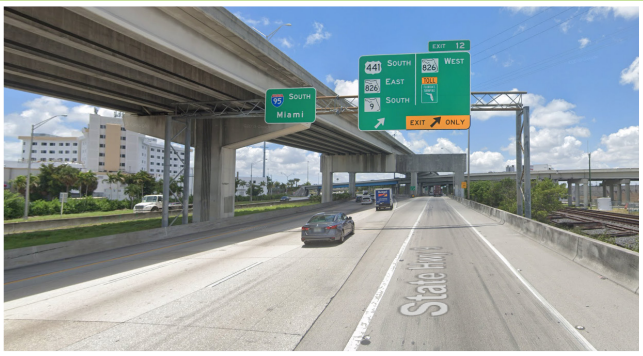
PROJECT DEVELOPMENT & ENVIRONMENT (PD&E) STUDY

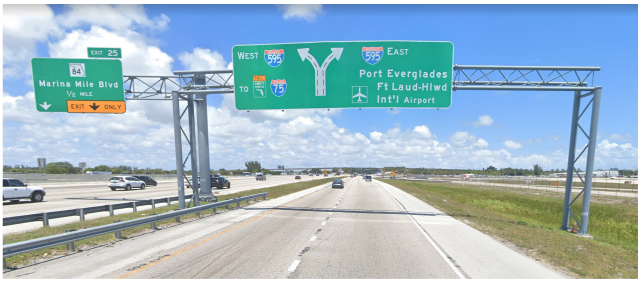
Interstate 95 (I-95/SR 9) • From South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, FL • FPID No.: 436903-1-22-02 • ETDM No.: 14254

CONCEPTUAL DRAINAGE REPORT

DRAFT

JUNE 2021





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Interstate 95 (I-95) / State Road 9 (SR 9)
Project Development and Environment Study

Project Study Limits:
From South of Hallandale Beach Boulevard (SR 858) to
North of Hollywood Boulevard (SR 820), Broward County
Mileposts 0.0 – 3.1
ETDM Number 14254

Broward County
FPID Number 436903-1-22-02

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AUGUST 2021

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1.0 Introduction

The Florida Department of Transportation (FDOT), District Four is conducting a Project Development and Environment (PD&E) Study to increase capacity and evaluate the arterial and ramp terminal improvements at the interchanges of I-95 and Hallandale Beach Boulevard (SR 858), Pembroke Road (SR 824) and Hollywood Boulevard (SR 820). These improvements result in the need to upgrade and modify the corresponding stormwater collection, treatment and conveyance systems to meet applicable regulatory agency criteria within the project corridor.

The purpose of this report is to define the conceptual drainage design, and to evaluate and identify the recommended stormwater management facility locations to comply with the permit agency requirements and FDOT design criteria. This report identifies the existing drainage systems within the project limits and the stormwater management facilities to meet state design criteria.

2.0 Location and Description of Project

2.1 Project Description

FDOT District Four is conducting a PD&E Study for I-95 from south of Hallandale Beach Boulevard to north of Hollywood Boulevard, a distance of approximately three miles (see ***Figure 2.1***). The PD&E Study is proposing improvements to the Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard interchanges. The project is located in Broward County, Florida and is contained within the municipalities of Hallandale Beach, Pembroke Park, and Hollywood.

This project will evaluate the potential modification of existing entrance and exit ramps serving the three interchanges within the project limits. Widening and turn lane modifications will be evaluated along Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard to facilitate the ramp modifications and improve the access and operation of the corridors upstream and downstream from the interchanges.

2.2 Project Location

The proposed project improvements of I-95 from south of Hallandale Beach Boulevard to north of Hollywood Boulevard is located within Broward County,

Florida under Township 51S, Range 42E, and Sections 16, 17, 20, 21, 28 and 29 and is contained within the municipalities of Hallandale Beach, Pembroke Park, and Hollywood (see ***Figure 2.1-Project Location Map***).

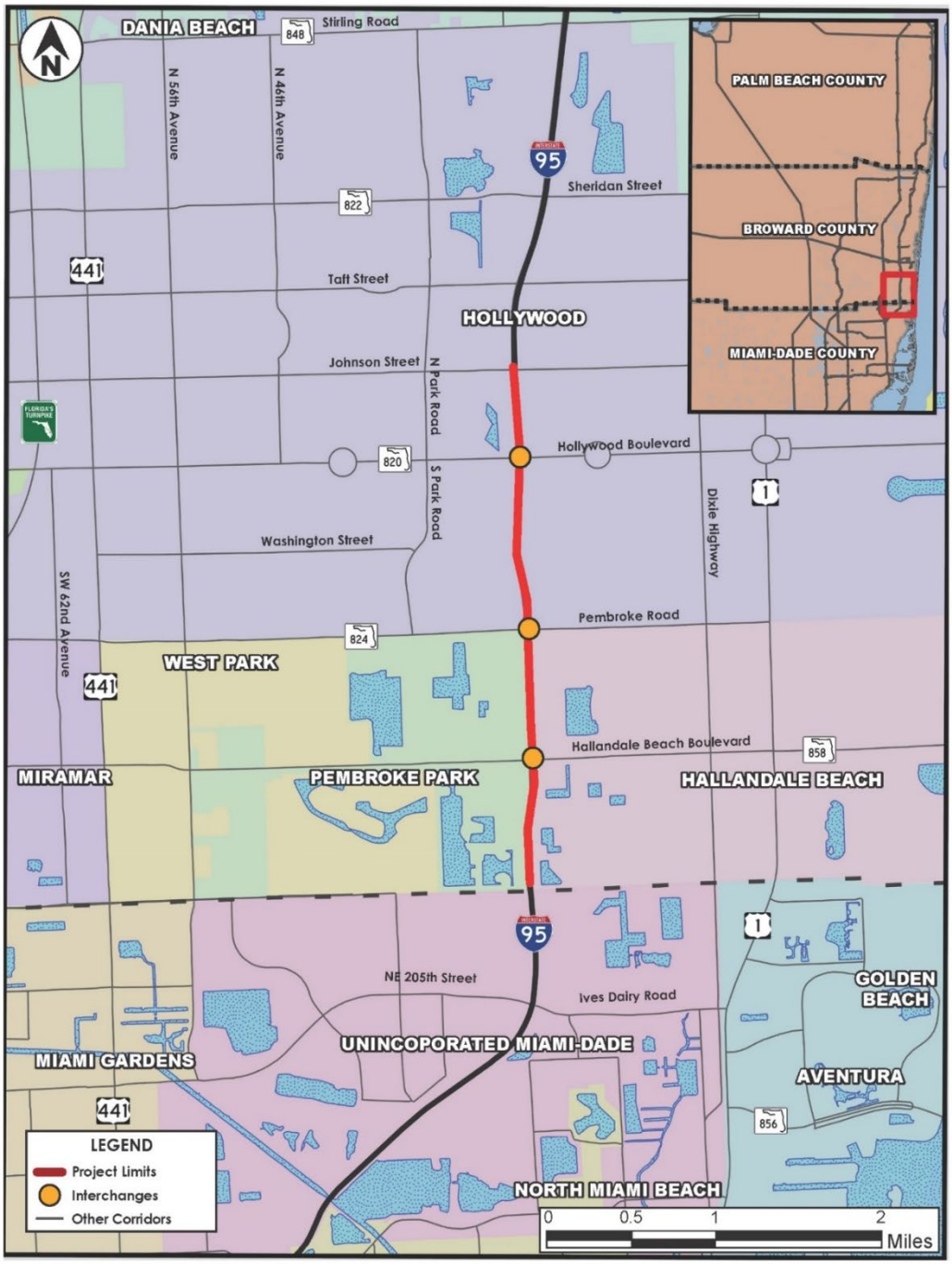


Figure 2.1 – Project Location Map

3.0 TYPICAL SECTIONS

3.1 EXISTING TYPICAL SECTIONS

The existing roadway typical section of I-95 are shown in **Figures 3.1 - 3.4**. within the project limits. The typical section of I-95 between the beginning of the project and Hallandale Beach Boulevard consists of one express lanes, four general use lanes, an auxiliary lane and roadside swales in each direction. Typical section of the I-95 between Hallandale Beach Boulevard and the end of the project has two express lanes, four general use lanes, an auxiliary lane and roadside swales in each direction.

Three existing full interchanges within the project limits are located at Hallandale Beach Boulevard, Pembroke Road, and Hollywood Boulevard. Hallandale Beach Boulevard consists of four lanes west of I-95 and six lanes east of I-95. Pembroke Road and Hollywood Boulevard each have six lanes west of I-95 and four lanes east of I-95. All three interchanges are currently diamond interchanges.

3.2 PROPOSED TYPICAL SECTIONS

The PD&E Study is proposing a collector distributor roadway system within the project area. The collector distributor roadway system will remove the Pembroke Road interchange from interacting with the I-95 mainline. In the northbound direction, all exiting traffic to Pembroke Road and Hollywood Boulevard will utilize a new collector distributor off-ramp just south of Hallandale Beach Boulevard. The collector distributor roadway system will extend to just north of Hollywood Boulevard serving the exit traffic to Pembroke Road, entry traffic from Pembroke Road and entry traffic from Hollywood Boulevard. In the southbound direction, the new collector distributor roadway system will not be continuous, it will end and begin at Pembroke Road. The first section combines the off-ramps to Hollywood Boulevard and Pembroke Road and the second section moves the Pembroke Road on-ramp to enter I-95 south of the Hallandale Beach Boulevard on-ramp.

Figures 3.1 – 3.4 shows the existing and proposed roadway cross sections between interchanges.

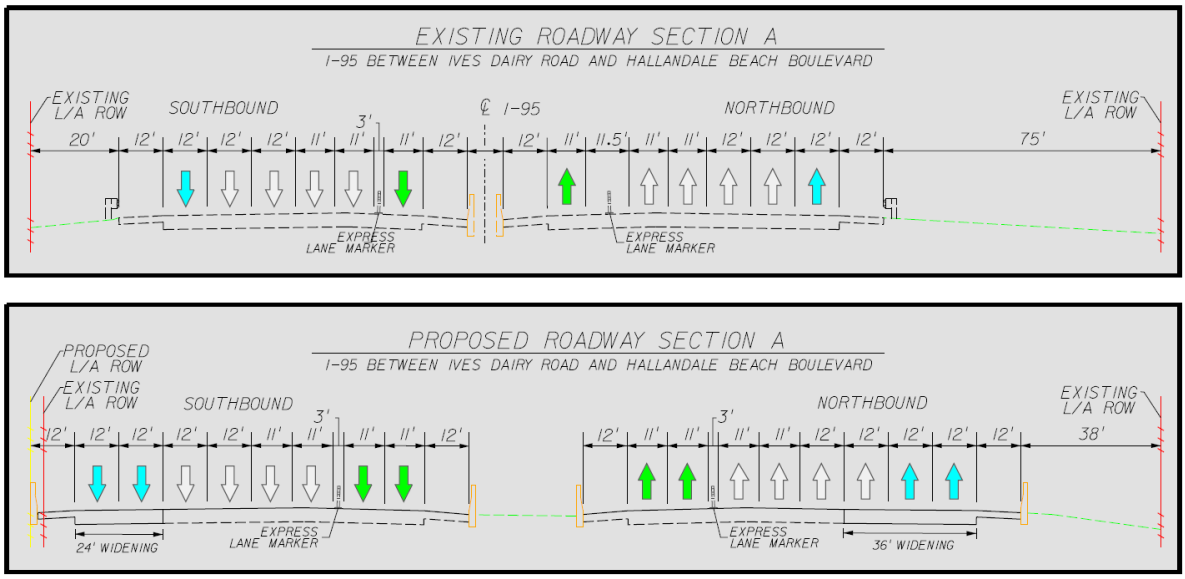


Figure 3.1 – I-95 between Ives Dairy Road and Hallandale Beach Boulevard Existing and Proposed Cross Section

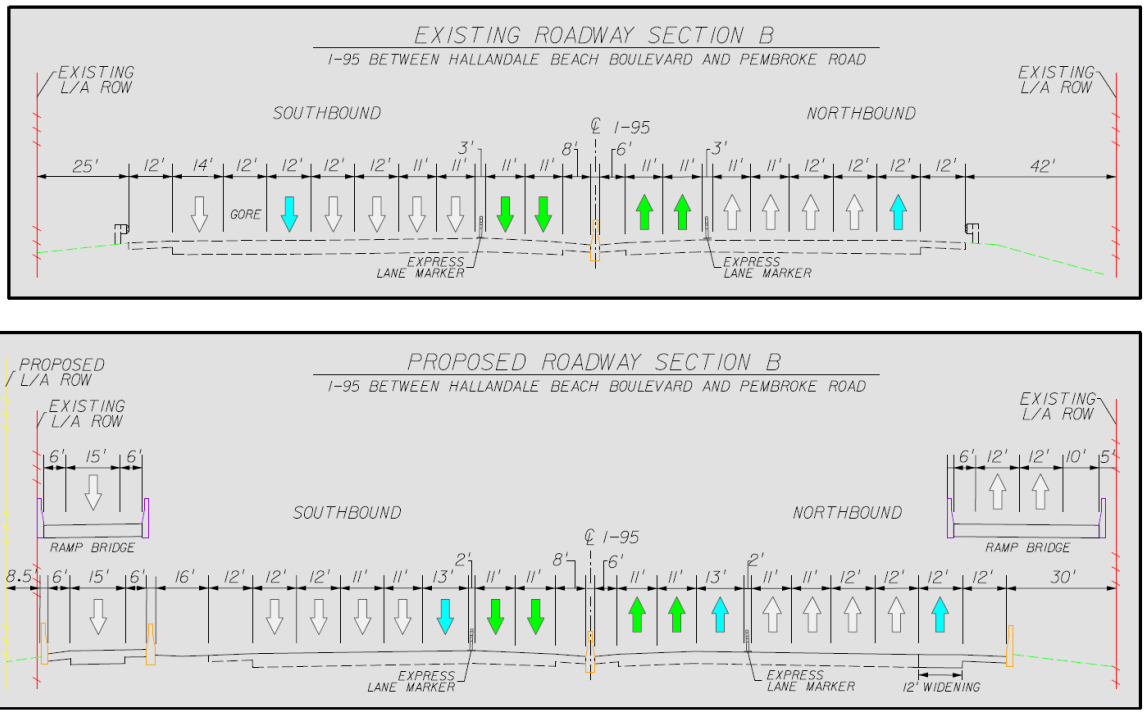


Figure 3.2 – I-95 between Hallandale Beach Boulevard and Pembroke Road Existing and Proposed Cross Section

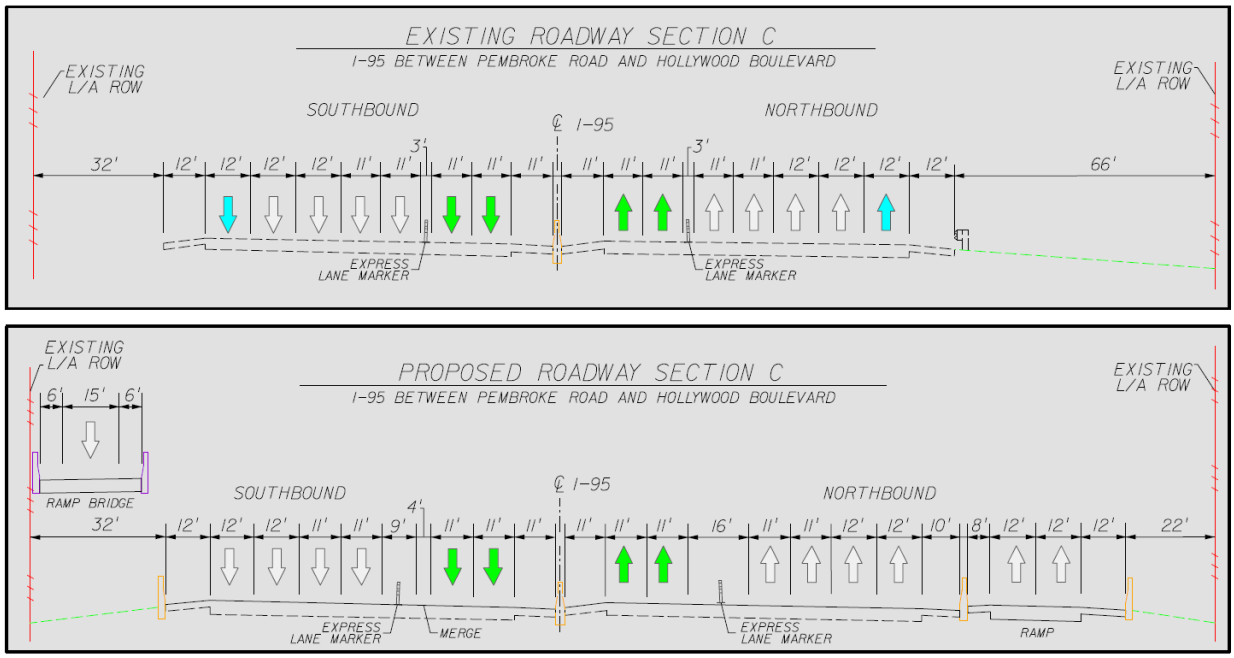


Figure 3.3 – I-95 between Pembroke Road and Hollywood Boulevard Existing and Proposed Cross Section

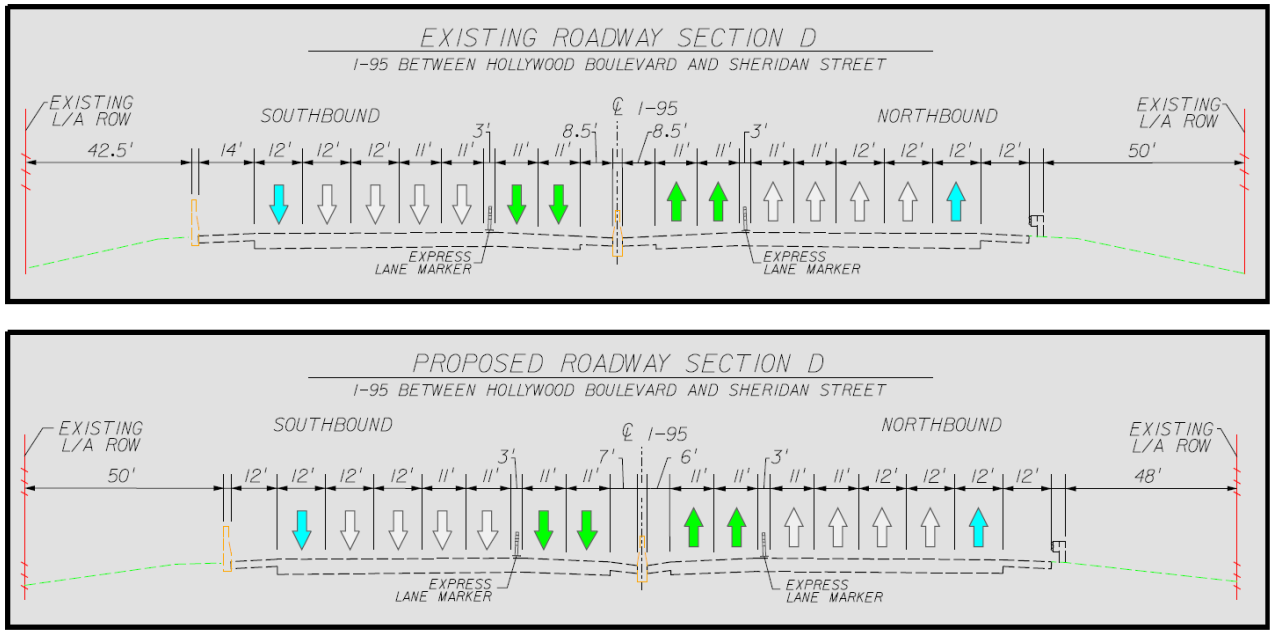


Figure 3.4 – I-95 between Hollywood Boulevard and Sheridan Street Existing and Proposed Cross Section

3.3 Cross Drains

Existing cross drains were located based on existing construction plans, FDOT Straight Line Diagrams (SLDs), and field investigations.

The existing cross drain locations are summarized in **Table 3.1** and shown in **Appendix F**. More information and analysis of existing cross drains is required during the design and permitting phase.

Table 3.1 – Summary of Cross Drains

CD No.	Approx. Location	Size and Material	Approx. Length	Description
CD-1	228+76	30" RCP	196.0 ft	Connected with median barrier wall inlet
CD-2	266+83	30" RCP	218.7 ft	Connected with median barrier wall inlet
CD-2A	274+91	84" UNKNOWN	UNKNOWN	Coming from Chaves Lakes Apartment crossing I-95
CD-3	302+65	30" RCP	202.7 ft	Connected with median barrier wall inlet
CD-4	319+87	24" RCP	219.0 ft	Connected with median barrier wall inlet
CD-5	325+35	24" RCP	219.8 ft	Connected with median barrier wall inlet
CD-6	341+10	36" RCP	220.1 ft	*Under bridge middle of Hollywood Boulevard*

4.0 Roadway Drainage

4.1 Existing Drainage Systems

The existing drainage system is divided into three separate basins, typically divided by major east-west arterial crossings at Hallandale Beach Boulevard, Pembroke Road and Johnson Street. The basins have been identified in the latest I-95 improvement documents (FDOT project FPID 422796-1-52-01 and 422796-2-52-01) as System 4, 5 and 6 as described below:

- **System 4 (Basin 1):** This drainage basin encompasses I-95 from south of the Miami Dade/Broward County Line to Hallandale Beach Boulevard (see ***Appendix A*** – Drainage Maps). Runoff from I-95 sheet flows into roadside swales located along both sides of I-95. These dry detention roadside swales provide for water quality treatment and stormwater attenuation through the use of ditch block weirs. Basin 1 has a swale bottom elevation of 2.5 feet

North American Vertical Datum of 1988 (NAVD 88) and a discharge elevation of 3.5 feet NAVD 88. The excess stormwater runoff overflows these weirs and discharges south into infield ponds at the I-95 and Ives Dairy Road interchange, which ultimately discharges to the C-9/Snake Creek Canal. This basin is located within the South Florida Water Management District (SFWMD) C-9 East Basin. CSX needs to be coordinated during final design stage.

- **System 5 (Basin 2):** This drainage basin encompasses I-95 from Hallandale Beach Boulevard to Pembroke Road. Runoff from I-95 sheet flows into roadside dry detention swales located along both sides of I-95 and a dry pond located at the corner of Hallandale Beach Boulevard and I-95 northbound on-ramp. These dry detention roadside swales provide water quality treatment and stormwater attenuation through the use of ditch block weirs. This system consists of swales with a bottom elevation of 1.5 feet NAVD 88 and discharge elevation of 4.0 feet NAVD 88. According to existing permit information this basin discharges into an FDOT borrow pit called Chaves Lake, which is located at the northeast quadrant of I-95 and Hallandale Beach Boulevard. However, no drainage connection was observed during our field investigation. Excess stormwater runoff from Chaves Lake overflows to the C-10 Canal through a pump station located within the west side of the I-95 right of way between Hallandale Beach Boulevard and Pembroke Road. This basin is located within the SFWMD's C-10 Basin.

- **System 6 (Basin 3 & 4):** This drainage basin encompasses I-95 from Pembroke Road to Johnson Street. Runoff from I-95 sheet flows into the roadside dry detention swales located along both sides of the I-95 and Hollywood Boulevard interchange infield areas. This system has a swale bottom elevation of 1.5 feet NAVD 88 and discharge elevation of 2.5 feet NAVD 88. These roadside swales and interchange infield areas provide water quality treatment and stormwater attenuation through the use of ditch block weirs. Excess stormwater runoff overflows these weirs and discharges into the C-10 Canal just north of Johnson Street. This basin is located within the SFWMD's C-10 Basin.

Side Street/Arterial Street Drainage: There are three arterial streets within the project limits of the I-95 corridor; Hallandale Beach Boulevard, Pembroke Road and Hollywood Boulevard. Each of those side streets, beyond the interchanges,

has its own drainage system. Since the improvements are mostly at the interchanges, the impact to the existing drainage systems of the side streets beyond interchanges are considered minor.

Offsite System: An offsite storm-sewer system exists along the I-95 corridor within the project limits. The system is designed to alleviate the adverse flooding conditions for the City of Hallandale Beach and the Town of Pembroke Park as described in the SFWMD permit No. 06-02942-P, application 010601-42, dated October 2001. The permitted system includes the Chaves Lake, located within the City of Hallandale Beach, connected to the adjacent Hallandale Beach High School Lake via an open channel. The school lake is connected through an 84" pipe to a main pump station on the west side of I-95 just south of the CSX Railroad. From the pump station a 64" stormwater force main is installed along the west side of I-95 to discharge into the modified CSX western channel. A 42" force main from another pump station located on Behan Lake, within the Town of Pembroke Park, is connected to a 64" force main outfall of the I-95 Pump Station. At the end of the conveyance channel, along the CSX Railroad, a ditch bottom inlet with a 72" diameter pipe is located to discharge the flow to the C-10 canal. This system is not expected to be impacted by the proposed I-95 improvements.

4.2 Proposed Drainage Systems

The proposed drainage system is primarily divided into four separate basins following existing drainage basins as identified in the latest I-95 improvement documents (FDOT project FPID 422796-1-52-01 and 422796-2-52-01) as System 4, 5 and 6. However, with the improvement at the interchanges of I-95 and addition of new ramps, the proposed drainage systems will be altered significantly. Each of the proposed basins is subdivided into sub-basins and storage has been calculated accordingly. Proposed drainage systems are based on the preferred stormwater management sites after considering three alternatives and evaluating them with a matrix on the PD&E Study Pond Siting Report. ***Appendix A*** includes the preferred conceptual drainage design for each basin along the corridor within the study limits.

Due to limited availability of open space within right of way, providing required storage pond/swale is not enough capacity. Therefore, exfiltration trenches are used to provide the required deficit storage. Preliminary exfiltration trench length was estimated using hydraulic conductivity ("K" value) from adjacent permitted

project. K = 2.95 X 10^{-4} cfs/ft^2-ft from South County Neighborhood Improvements. Permit Number 06-01979-S is used for estimation of French drain length. For more accurate French drainage length calculations during final design, "K" value at French drain location is required. **Appendix I** includes adjacent permit and exfiltration trench calculations for each basin along I-95.

The proposed drainage systems are described below:

- **Basin 1**: This drainage basin encompasses I-95 between station limits 206+50 and 247+38 between the limits of the Miami Dade/Broward County Line and Hallandale Beach Boulevard. The basin is subdivided into 1-L and 1-R. Runoff from I-95 sheet flows into roadside swales and French drains located along both sides of I-95. These roadside swales will provide water quality treatment and stormwater attenuation using ditch block weirs. Basin 1L and 1R are comprised of swales S-L1, S-R1, S-R2, S-R3 and S-R4. Dry detention pond S-L2 is in a new parcel. This system consists of dry swales with a bottom elevation of 2.0 feet NAVD 88. Weir control elevation is raised to 4.2 feet NAVD 88 to accommodate the required treatment and attenuation volume for this basin. The excess stormwater runoff overflows these weirs and discharges into infield ponds at the I-95 and Ives Dairy Road interchange, which ultimately discharges to the C-9/Snake Creek Canal. This basin is located within the SFWMD's C-9 East Basin.

  Peak stages in S-L1 and S-L2 are to be compared for existing and proposed conditions. The stages for proposed conditions need to be lower or similar to stages for existing conditions.

  Since there is deficit in provided storage within propose swale/pond, French drain is proposed to provide additional storage.

- **Basin 2**: This drainage basin encompasses I-95 between station limits 247+38 and 287+92 between Hallandale Beach Boulevard and Pembroke Road. The basin is subdivided into 2A-L, 2A-R, 2B-L and 2B-R. Runoff from this segment of I-95 sheet flows into the remaining roadside swales, ponds and French drains located along both sides of I-95 identified as S-L3, SL-4, S-R5, S-R6, S-R7 and SR-8. Among those, S-L3, SL-4, S-R7 and SR-8 are in eight (8) new parcels. These roadside swales will provide water quality treatment and stormwater attenuation using ditch block weirs. This system consists of dry swales with a

bottom elevation of 1.5 feet NAVD 88 to provide partial treatment and attenuation for this basin and a weir control elevation raised to 4.0 feet NAVD 88. This basin is located within the SFWMD's C-10 Basin. The remaining required storage volume will be compensated in proposed exfiltration trench.

Since there is deficit in provided storage within propose swale/pond, French drain is proposed to provide additional storage.

- **Basin 3:** This drainage basin encompasses I-95 between station limits 287+92 and 341+98, between Pembroke Road and Hollywood Boulevard. The basin is subdivided into 3A, 3B-L and 3B-R. Runoff from this segment of I-95 sheet flows into remaining roadside swales and French drains located along both sides of I-95 identified as SR-9. Modified roadside swales provide partial water quality treatment and stormwater attenuation using ditch block weirs. This system consists of dry detention swales with a bottom elevation of 1.5 feet NAVD 88 and a weir control elevation raised to 3.5 feet NAVD 88. The rest of the storage for treatment and attenuation will be discharged to Basin 4 and routed to the proposed stormwater pond within the Sunset Golf Course on the east side of the I-95 corridor and ultimately will be discharged to the SFWMD' C-10 Canal. This basin is located within the SFWMD's C-10 Basin.

  Since there is deficit in provided storage within propose swale/pond, French drain is proposed to provide additional storage.

- **Basin 4**: This drainage basin encompasses I-95 between station limits 341+98 and 369+46, between Hollywood Boulevard and Johnson Street. The basin is subdivided into 4-L and 4-R. Runoff from this segment of I-95 sheet flows into the remaining roadside swales located along both sides of I-95 identified as S-L6, S-L7, S-R12, S-R13, S-R14 and S-R15. Among those, swale S-R13 is in two (2) new parcels. This system consists of dry swales with a bottom elevation of 1.5 feet NAVD 88 and a weir control elevation raised to 3.5 feet NAVD 88. These modified roadside swales provide water quality treatment and stormwater attenuation using ditch block weirs. The excess stormwater runoff will be discharged to the stormwater pond within the Sunset Golf Course on the east side of the I-95 corridor and ultimately discharged into the C-10 Canal just north of Johnson Street. This basin is located within the SFWMD's C-10 Basin.

Peak stages in S-L6 and S-L7 are to be compared for existing and proposed conditions. The stages for proposed conditions need to be lower or similar to stages for existing conditions.

Side Street/Arterial Street Drainage: There are three arterial streets within the project limits of I-95 corridor; Hallandale Beach Boulevard, Pembroke Road and Hollywood Boulevard. Each of those side streets, beyond the interchanges, has its own drainage system. The exfiltration trenches will be provided as necessary to accommodate the improvements. **Appendix J** shows exfiltration trench length calculations for side streets.

5.0 Geotechnical Characteristics

5.1 Soil Information

Based on the U.S. Department of Agriculture (USDA) Web Soil Survey, it was determined that the soil property within the project falls in hydrologic soil group A. Udorthents (shaped), the predominant soil in the corridor, is a somewhat poorly drained soil with the depth to SHGWT ranging from 2.0 feet NAVD to 4.0 feet NAVD. The Soil Properties Map is included in the Custom Soil Resource Report in ***Appendix B***. ***Appendix B1*** includes the Preliminary Geotechnical Report.

5.2 Wellfield Protection Areas

The project is outside the limits of any wellfield protection areas. Therefore, no wellfield protection measures are required. The near wellfield areas are located east of the project corridor between Hallandale Beach Boulevard and Pembroke Road. ***Figure 5.1*** shows the Broward County Wellfield Map.

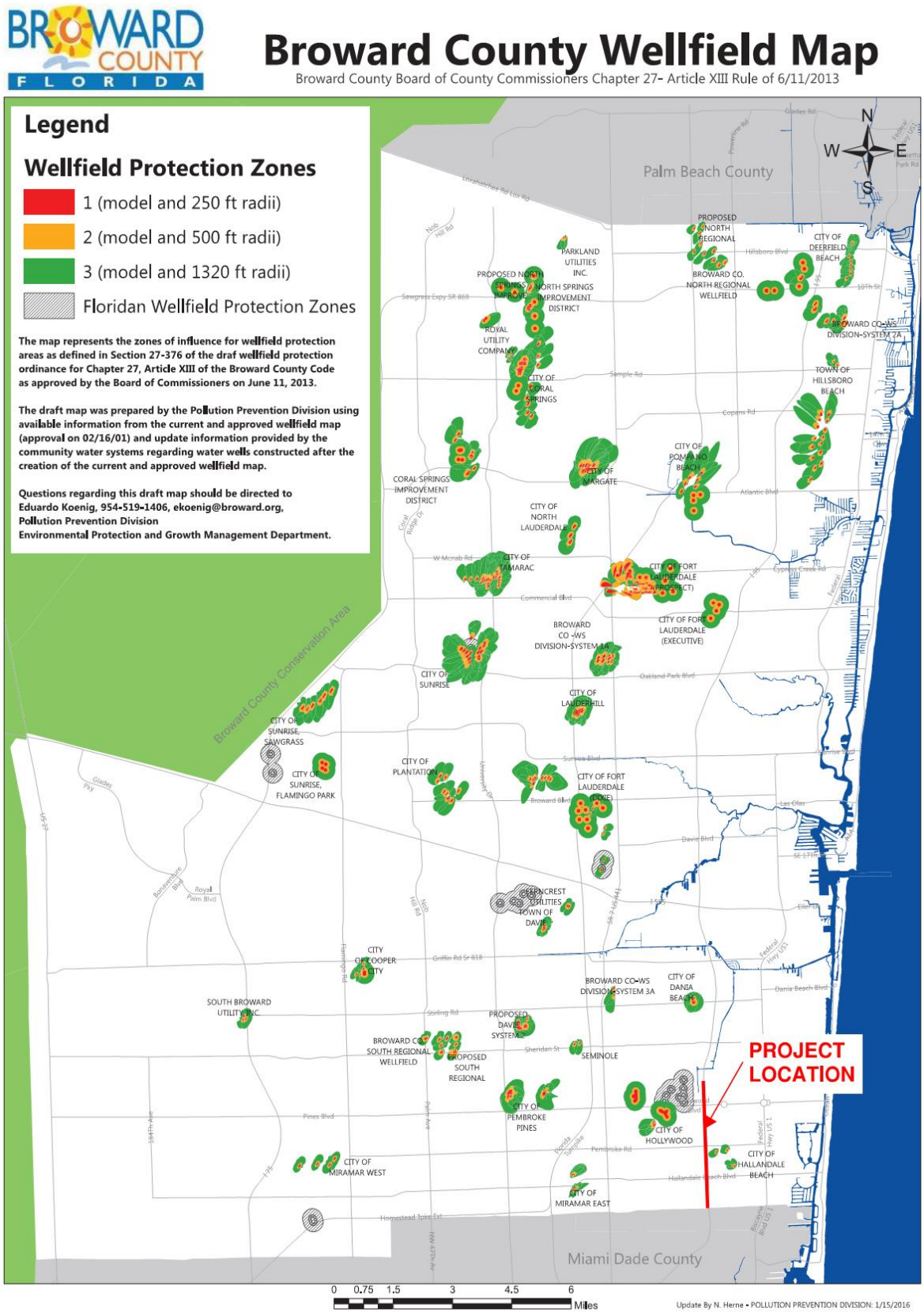


Figure 5.1 – Broward County Wellfield Map

5.3 ENVIRONMENTAL

5.3.1 CONTAMINATION

A contaminated site area is located south of Pembroke Road with an area of 176 acres. Below is a summary of the site:

- Facility Name: Petroleum Products Corp
  Address: 3130 SW 19th Street, Hallandale Beach, FL 33009

- Facility Type: N/A
  Pollutant: Chromium, Lead
  Lead Agency Name: SEP

Figure 5.2 shows the Broward County Contaminated Sites Map.

Figure 5.2 – Broward County Contaminated Sites Map

5.3.2 WETLAND

There are no wetlands present within the project corridor based on the Broward County Wetland and Other Surface Water Location Map. However, there are other surface waters adjacent to the project corridor (see ***Figure 5.3***).

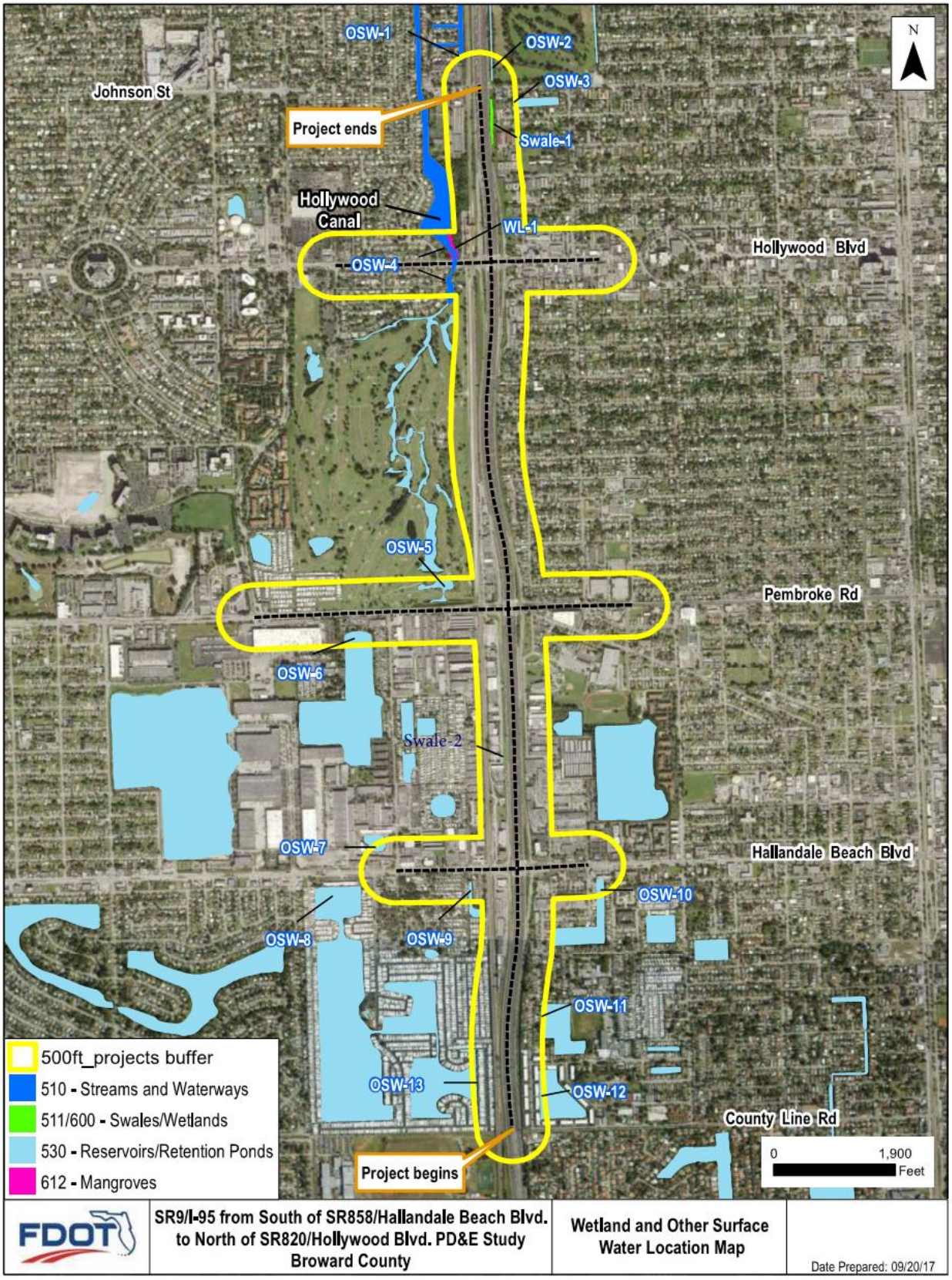


Figure 5.3 – Broward County Wetland and Other Surface Water Location Map

5.3.3 Historical, Archaeological and Endangered Species

There are few historical, archaeological and environmental areas located within the project limits. A copy of the Broward County Historical, Archaeological and Environmental Area Maps are included in ***Appendix C***.

5.4 Land Use

The project land use is primarily commerce and low medium residential. No future land use change is anticipated within the project corridor. ***Figure 5.4*** shows a copy of the Broward County Land Use Plan.

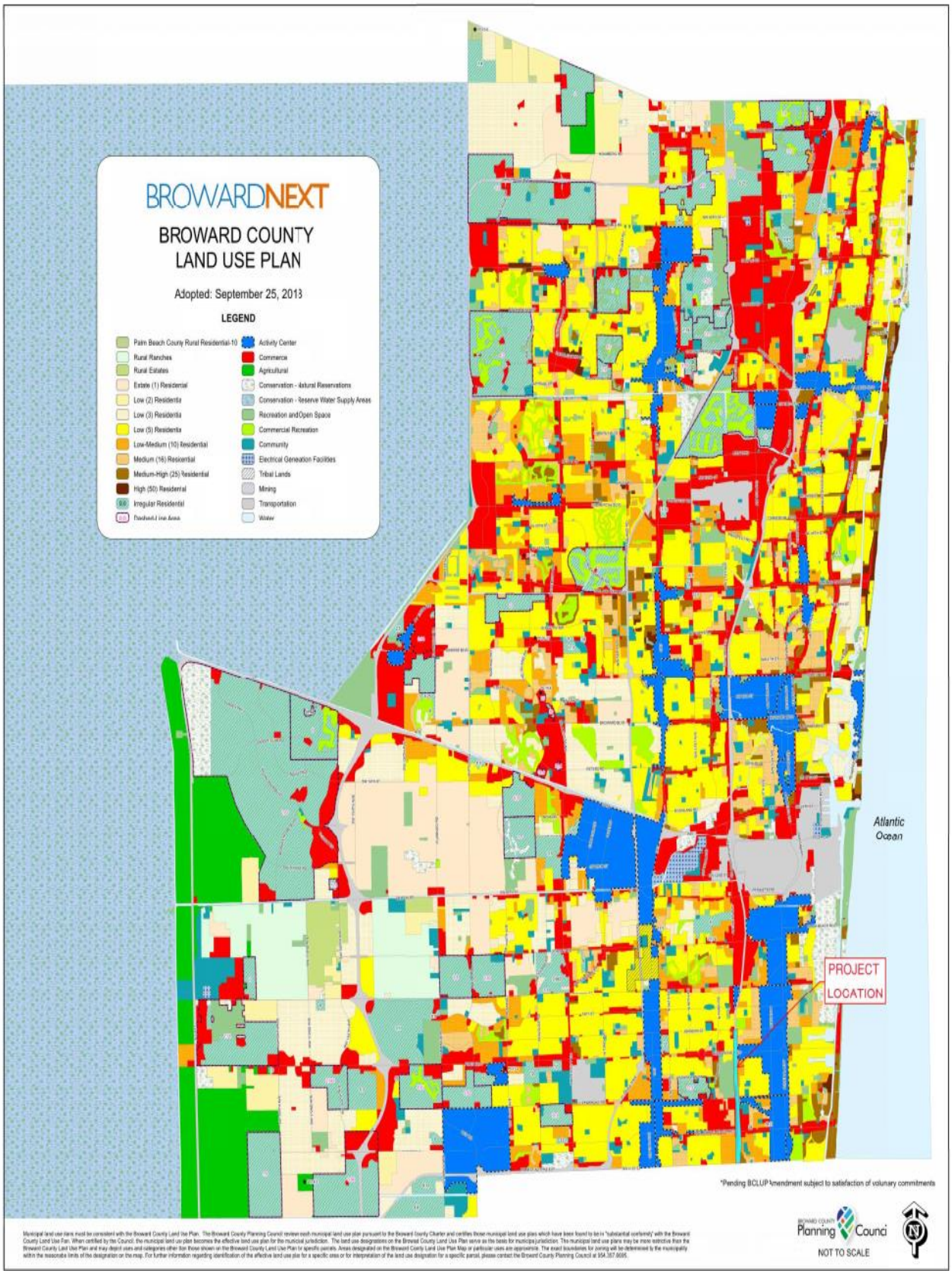


Figure 5.4 – Broward County Land Use Plan

6.0 STORMWATER MANAGEMENT PERMITTING

The project agency having stormwater permitting jurisdiction over the proposed improvements is the SFWMD. SFWMD has authority over the C-9 and C-10 Canals which are the water bodies receiving the stormwater runoff for the project area. ***Figures 6.1*** and ***6.2*** show SFWMD drainage basins C-9 and C-10 and ***Figure 6.3*** shows the Broward County Drainage Districts Map.

Within the project corridor there are several permits involved. The following are the permits pertaining to the project:

- ERP No. 88-00053-S, Application Number 03168-B, I-95 HOV Lanes
- ERP No. 88-00053-S, Application Number 120327, I-95 Managed Lanes
- ERP No. 06-01465-S I-95 Phase 3C
- ERP No. 06-02942-P Pump Station
- ERP 06-01955-S Orange Brook Golf Course

Copy of the existing permits are included in ***Appendix D.***

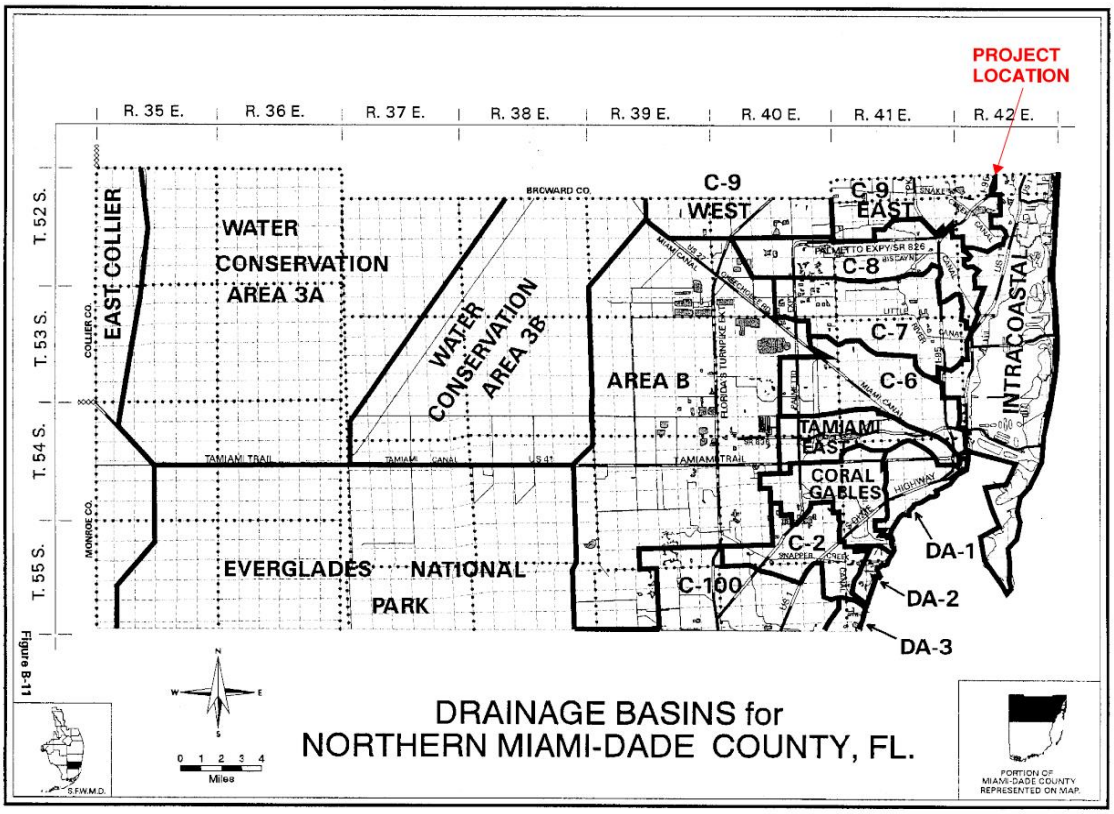


Figure 6.1 – SFWMD Basin C-9

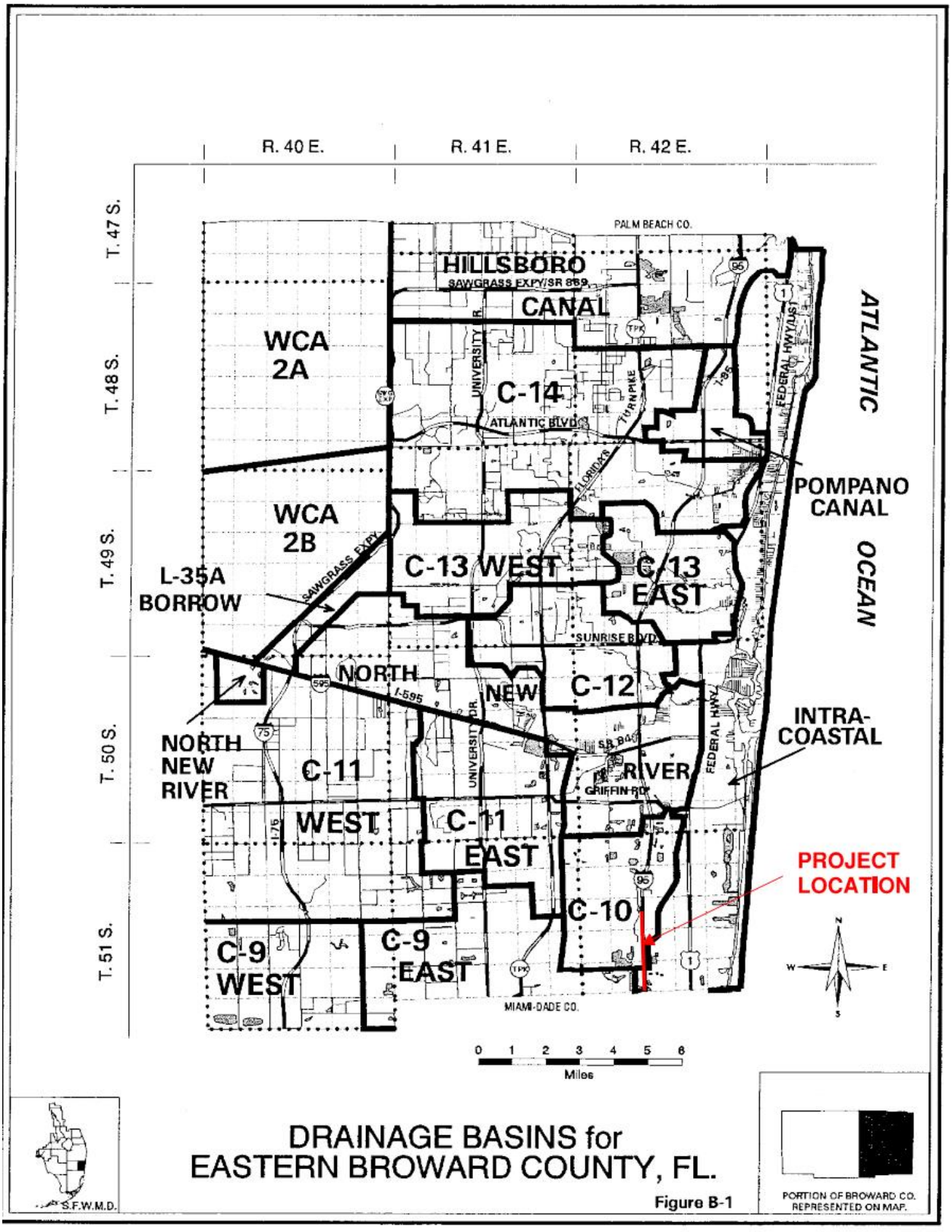


Figure 6.2 – SFWMD Basin C-10

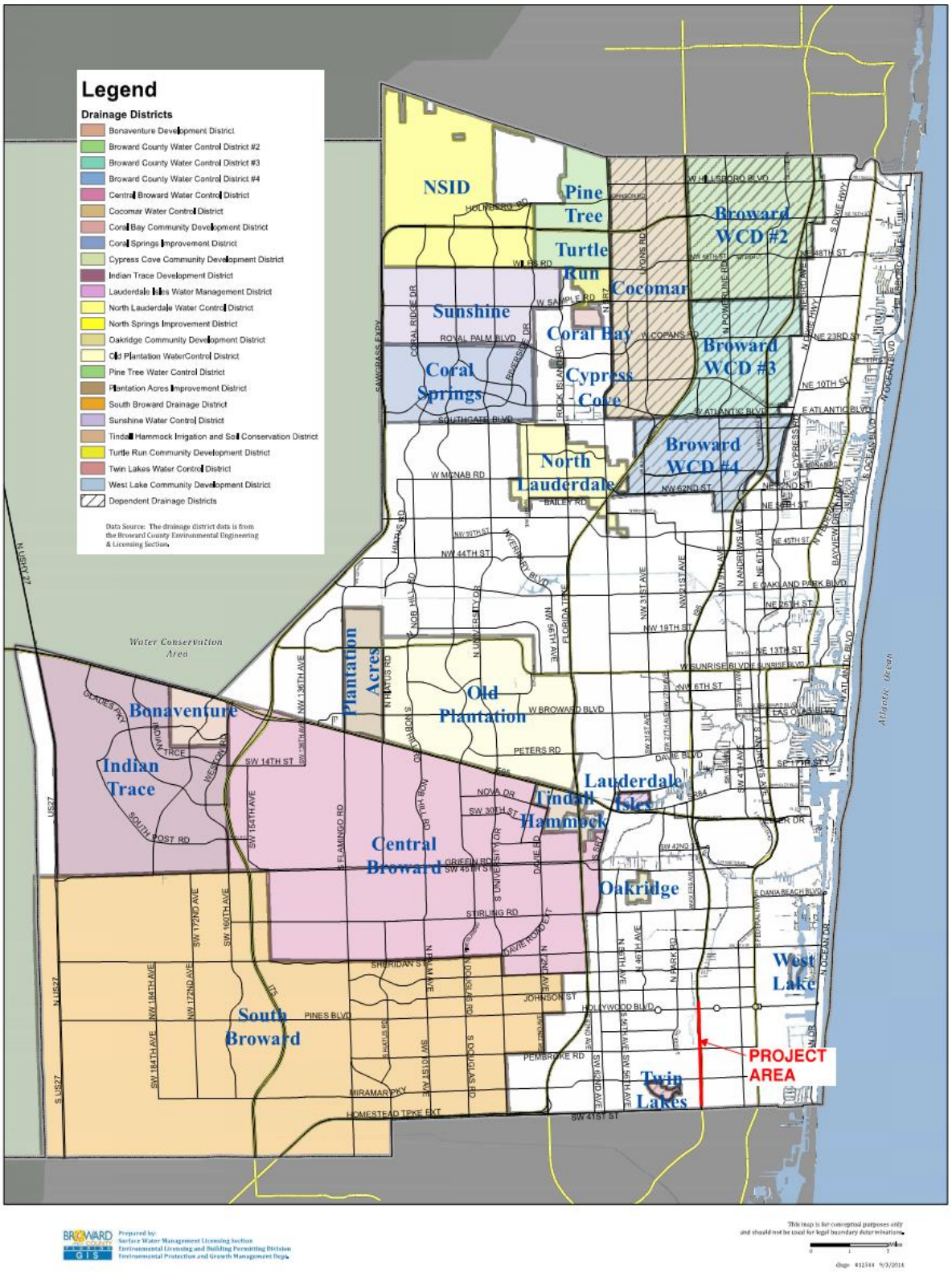


Figure 6.3 – Broward County Drainage Districts

6.1 Required Permits

The agencies with stormwater permitting jurisdiction over the proposed study area and the required permits include:

- South Florida Water Management District (SFWMD) - General Environmental Resource Permit (ERP)

- United States Army Corps of Engineers – Dredge and fill permit is required for proposed work in, under or above surface waters or wetlands, as associated with the bridge widening work at the Hollywood Canal.

- South Florida Water Management District (SFWMD) - Consumptive Water Use Permit - For dewatering and irrigation.

- Florida Department of Environmental protection – An NPDES (Erosion Control Plans, Stormwater Pollution Prevention Plan, Notice of Intent and Notice of Termination) Permit is required due to disturbance of more than one acre of soil.

Since proposed improvement is next to CSX right of way and sharing some of its conveyance system, coordination with CSX is required.

6.2 Water Quality Criteria

6.2.1 SFWMD Criteria

The SFWMD requires that all projects meet state water quality standards as set forth in Chapter 17-302, Florida Administrative Code (FAC). According to the SFWMD Environmental Resource Permit Information Manual, 2014, all projects must meet the following volumetric retention/detention requirements:

- Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater. A wet detention system is a system which maintains the control elevation at the seasonal high groundwater elevation and does not bleed-down more than one-half inch of detention volume in 24 hours.

- Dry detention volume shall be provided equal to 75% of the above amounts computed for wet detention. Dry detention systems must maintain the control elevation at or above one foot above the seasonal high groundwater elevation.
- Retention volume shall be provided equal to 50% of the above amounts computed for wet detention.
- For projects with more than 50% of imperviousness, discharge to the receiving water bodies must be made through baffles, skimmers, or other mechanism suitable for preventing oil and grease from discharging to or from the retention/detention areas.
- Projects having greater than 40% impervious area and discharging directly to an Outstanding Florida Waters (OFW) shall provide at least one-half inch of dry detention or retention pretreatment as part of the required retention/detention.
- Projects discharging directly to Outstanding Florida Waters (OFW) must provide an additional 50% water quality pre-treatment as part of the required retention/detention (SFWMD Criteria). Do we need to add the French drain Criteria?

6.3 Water Quantity Criteria

6.3.1 SFWMD Criteria

The SFWMD requires that off-site discharge rates be limited to rates not causing adverse impacts to existing off-site properties, and not exceed:

1. Historic discharge rates;
2. Rates determined in previous SFWMD permit action; or
3. Rates specified in District criteria (Pre vs Post Rates Governing Criteria).

The SFWMD Basis of Review addresses stormwater quantity (peak discharge) and requires that off-site discharge rates and volumes do not adversely impact off-site areas. Typically, this means that post-development peak discharge rate must be equal or less than the pre-development discharge rate.

SFWMD requires that post development peak discharges flows during a 25-year, 72-hour rain storm event do not exceed pre-development peak discharge flows or the basin allowable discharge rate as described above. The 25-year, 3-day

rainfall amount at the project location is 13.4 inches. Design Aids are included in ***Appendix E.***

6.3.2 Florida Department Of Transportation (FDOT) Criteria

The general design storm frequency for drainage conveyance systems (ditches and storm sewers) within FDOT District Four jurisdiction is the 10-year frequency as required by the FDOT Drainage Manual.

FDOT requires sufficient clearance between the base bottom elevation of the roadway and the design high water elevation (DHW), in order to maintain the integrity of the pavement structure. The design high water elevation has been determined as 1.00 feet NAVD 88 for Basin 1 and 0.50 feet NAVD 88 for Basins 2 through 4 based on the existing ERP permits and Broward County Water Table Map. See ***Figure 6.4*** for more information on DHW elevation.

Vertical clearance from Weir elevation to base of lowest elevation within the roadway segment is used for base clearance for French drain.

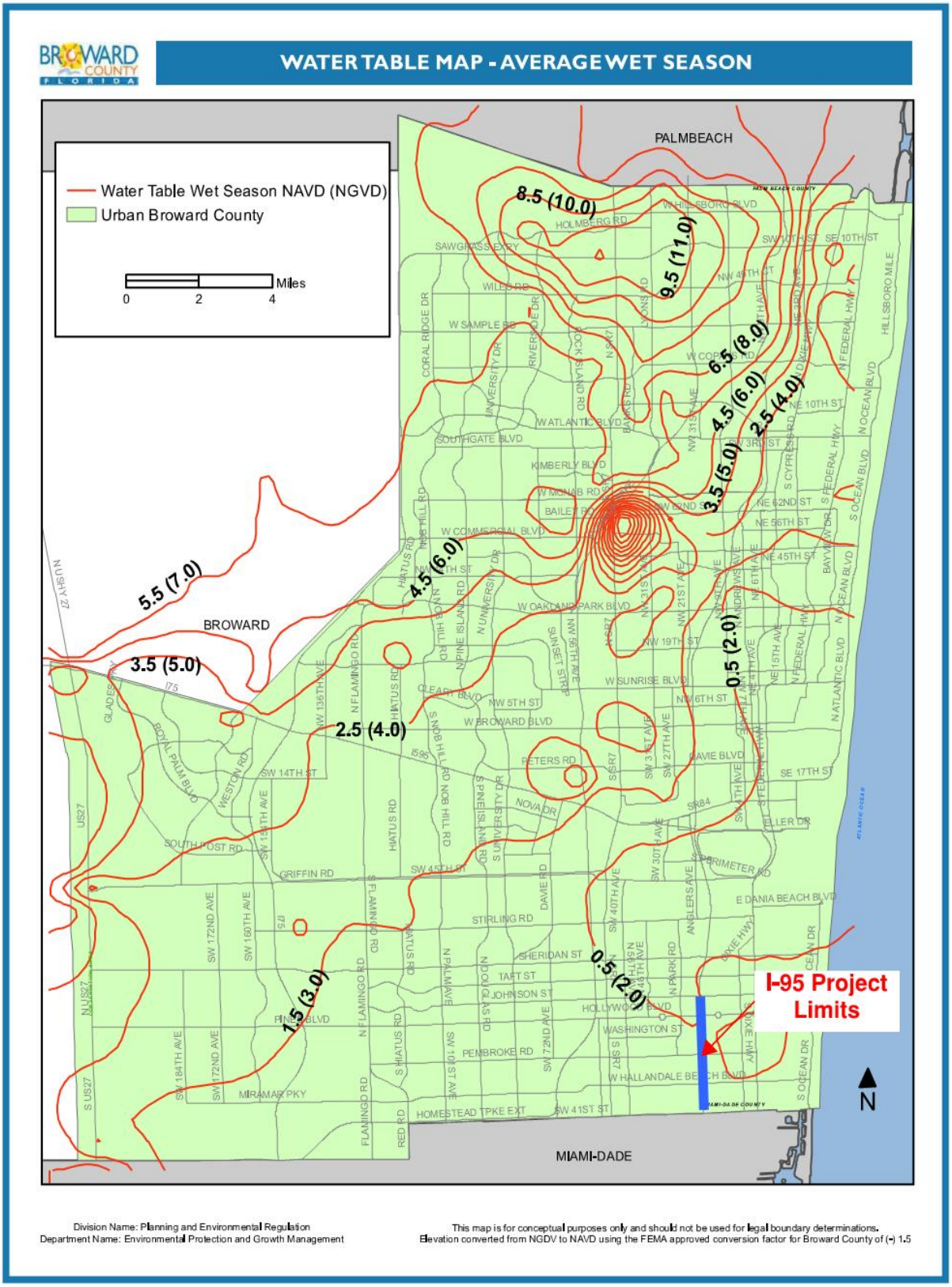


Figure 6.4 – Broward County Water Table Map

6.3.3 FDOT Drainage Manual Maintenance Criteria

French Drain: French drains is in-situ soil hydraulic conductivity, and/or hydraulic head are sufficient to promote exfiltration of the required stormwater volumes. The following design criteria and parameter are applicable:

1. French Drains cannot be located in well filed protection zones with less than 30 days travel time to a potable water supply well. There are not well fields within the subject project limits.
2. French Drains cannot be located where there are contaminated soils. There are no known sources of contamination within the project limits.
3. Where possible, exfiltration pipe should have a minimum diameter of 24 inches with an invert elevation at or above the seasonal high groundwater elevation.
4. Baffles, skimmers and sumps must provide at inlet points to minimize entrance of oils and sediments into exfiltration system.
5. Trench width shall be a minimum of 2 feet plus the outside diameter.
6. Rock in trench must be enclosed in filter material.
7. Maximum French Drain distance with access through only one end is as follows
    a. 150 feet for pipe diameters 24 to 30 inches
    b. 200 feet for pipe diameter 36 inches and larger
8. Maximum French Drain distance with access through both ends is as follows
    a. 300 feet for pipe diameters 24 to 30 inches
    b. 400 feet for pipe diameter 36 inches and larger
9. In-situ soil exfiltration capacity must be determined by the FDOT percolation test method. Percolation test hole must be advanced to a depth that will yield a minimum of 6 gpm per one foot of head of exfiltration capacity, but not exceeding 20 feet deep.
10. Maximum allowable exfiltration rate per linear foot of trench must not exceed 0.15 cubic feet per second (cfs) per foot of trench (for percolated pipes)
11. Depth of French Drain trench must be at the percolation test hole depth elevation, where conditions permit.
12. French Drains systems must not be installed within MSE walls or within influence zone of the wall.
13. Existing French Drain will include a safety factor of 4.0 due to the age of the system exceed 20 years.
14. For proposed French Drain, safety factor of 2.0 should be applied for water quantity calculation purposes.

Pipe Sizes and Lengths: The FDOT Drainage Manual requires that the minimum pipe diameter be 18 inches. Maximum lengths without maintenance access structures as follows:

- 300 feet for pipe diameter of 18 inches
- 400 feet for pipe diameter of 24 to 36 inches
- 500 feet for pipe diameter 42 inches and larger and box culverts

Storm Drains: Collection and conveyance systems have been designed for the 10-Year frequency design storm event using a minimum time of concentration of 10 minutes, per FDOT D6 requirements. The physical pipe slope(s) are designed to produce a velocity of at least 2.5 feet per second (fps) when the storm drain is flowing full. In areas where 2.5 fps is not feasible, an absolute minimum velocity of 2.0 fps is provided. Storm drains have been modeled in ICPR as structure nodes. It is important to note that since the proposed closed system is self-contained, all structures will have a 2-foot sump minimum except when connected to a French Drain, in which case the sump will be raised to 4 feet to address siltation, maintenance concerns, and skimmer clearance.

Swales: The observed criteria for swales are as follows:

1. Sodded or grass swales shall have a flat (horizontal) bottom width of 5 feet minimum for maintenance purposes.
2. Swales front and back slopes shall meet roadway clear zone criteria, as applicable for the proposed roadway facility.
3. Desired front slopes will be 1:6

Additionally, the following project-specific constraints that were considered during the proposed swale design are as follows

1. Right-of-way (R/W) Constraints
2. Utility conflicts
3. Landscaping conflicts
4. Driveway and side street conflicts

6.4 Floodplain Encroachment

The project falls within the limits of the Community Panel 12011C0568H and 12011C731H of the FEMA FIRM Maps of Broward County (see ***Appendix F***). The project is located within the flood zone AH, AE, and X.

Floodplain encroachment calculations will be completed when roadway geometry and cross sections are developed further. Our preliminary evaluation

indicates that the volume of excavation proposed by the ponds will mitigate the expected encroachment.

7.0 Stormwater Management Facilities Evaluation

The SFWMD requires that all projects achieve compliance with State Water Quality and Quantity standards, as established in Chapter 62-302, FAC. This stormwater management design will be submitted to the SFWMD for Permit and the stormwater quality and quantity criteria of the agency that has jurisdiction over the project limits will be evaluated.

The Pond Siting Report documents show the required stormwater management needs and selects the preferred pond sites from the hydraulically feasible alternative pond sites. The proposed drainage system is primarily divided into four separate basins following the existing drainage basins. However, with the improvement at the interchanges of I-95 and addition of new ramps, the proposed drainage systems within each basin have been altered significantly. Each of the proposed basins is subdivided into sub-basins and storage has been calculated for the total basin area. For the selection of the preferred stormwater management facilities, priority was given to facilities available within the I-95 right of way and within FDOT owned parcels. After that, offsite parcels were chosen based on affected parcels by the proposed roadway improvements, consideration of location, undeveloped, non-commercial or non-residential parcels and the joint use pond feasibility such as the Sunset Golf Course. The remaining swales were re-graded and additional ponds (swale locations) designed to provide the required water quality and quantity volume for the entire project area. ***Appendix G*** summarizes the drainage calculations.

8.0 Stormwater Management System Design

8.1 Project Datum

The vertical datum used in this report and calculations is NAVD 88. The difference in height between the NAVD 88 datum and the NGVD 29 shift was determined using the National Geodetic Survey VERTCON online tool.

The datum shift used to convert NGVD 29 to NAVD 88 were the NAVD 88 values. These values will always be lower than NGVD 29. The values within the project limits are summarized below:

- I-95 and Hallandale Boulevard interchange -1.588 feet.
- I-95 and Pembroke Road interchange -1.594 feet.
- I-95 and Hollywood Boulevard interchange -1.598 feet.

8.2 Control Elevations

8.2.1 Seasonal High Groundwater Table (SHGWT)

The Seasonal High Water (SHW) elevation has been determined from 1.00 feet NAVD 88 for Basin 1 to 0.50 feet NAVD 88 for Basins 2 through 4 based on the existing ERP permits and Broward County Water Table Map. The assumed SHGWT elevations are consistent with the existing permits for the various drainage systems within the project limits. ***Figure 6.4*** shows the Broward County Water Table Map. Seasonal High Water Table Technical memo is included in **Appendix K.**

9.0 Stormwater Modeling

9.1 Design Approach and Rainfall Depths

The water quality and attenuation impact analysis is based on volumetric water storage calculations. Water quantity calculations are performed based on SFWMD design criteria and the required storage for attenuation was determined for the 25-year, 72-hour storm event. The required and provided storage volume calculations have been performed to attain the required storage capacity at the stormwater management facilities. Tables 1, 2 and 3 in ***Appendix G*** documents the drainage calculations.

The following rainfall depths for the various design storms were obtained from the SFWMD rainfall depth maps:

- 3-year, 24-hour: 6.00"
- 10-year, 24-hour: 8.40"
- 25-year, 72-hour: 13.40"
- 100-year, 24-hour: 12.50"

See ***Appendix E*** for the SFWMD rainfall maps.

10.0 Conceptual Drainage Design Recommendations

Based on the proposed roadway improvements, the existing dry detention swales and ponds will be impacted and volume capacity reduced by the interchange new ramps along I-95. The remaining stormwater facilities will be re-graded in order to partially accommodate the impervious area runoff. The project will require additional right of way takes to comply with the regulatory agencies stormwater treatment and attenuation criteria. In addition, runoff from Basin 3 and 4 will be conveyed to the Sunset Golf Course to provide the required stormwater management needs.

Conversations between FDOT and the City of Hollywood, owner of the Sunset Golf Course, have taken place regarding the joint use pond feasibility in the golf course. Please refer to ***Appendix H*** for meetings correspondence.

The existing weir control elevations for Basins 1 and 4 will be modified to accommodate the required volume capacity at the proposed stormwater facilities. Existing outfall connections for Basin 1, Basin 4 and Golf Courses to the SFWMD Canals will be maintained.

11.0 Conclusions

The Pond Siting Report was used to identify the best alternative ponds (swales) outside of the existing I-95 right of way for each basin to meet SFWMD permit criteria. Based on the conceptual drainage design analysis for the proposed interchange improvements and the stormwater quality and quantity calculations additional offsite right of way acquisition and the joint use of the Sunset Golf Course pond to accommodate the additional runoff will be required to comply with the SFWMD applicable standards and design criteria. Refer to Summary of Required/Provided Storage Volume and Tables 1, 2 and 3 in ***Appendix G*** for the drainage calculations.

Summary of Required/Provided Storage Volume

SFWMD BASIN	BASIIN	TOTAL AREA (AC)	IMP. AREA (AC)	WATER QUALITY (AC-FT)	WATER QUANTITY (AC-FT)	REQUIRED VOLUME (AC-FT)	PROVIDED STORAGE VOLUME (AC-FT)				SURPLUS /DEFICIT VOLUME (AC-FT)
							POND/SWALE WITHIN R/W	POND/SWALE OUTSIDE R/W	FRENCH DRAIN	TOTAL	
C-9	Basin 1L	24.19	20.91	4.36	6.85	6.85	4.95	0.89			
	Basin 1R	19.09	13.28	2.77	2.96	2.96	3.01	0			
	Basin 1	**43.28**	**34.19**	**7.13**	**9.81**	**9.81**	**7.96**	**0.89**	**0.98**	**9.83**	**0.02**
C-10	Basin 2A-L	12.75	12.32	2.18	5.23	5.23	0	6.69			
	Basin 2B-L	4.42	3.71	0.77	-0.05	0.77	0	0			
	Basin 2A-R	11.58	10.28	2.14	3.17	3.17	1.38	0			
	Basin 2B-R	5.91	4.53	0.94	1.84	1.84	0	2.1			
	Basin 2	**34.66**	**30.84**	**6.03**	**10.19**	**11.01**	**1.38**	**8.79**	**0.86**	**11.03**	**0.02**
	Basin 3A	25.12	23.79	4.96	7.56	7.56	0.19	0			
	Basin 3B-L	10.13	7.26	1.51	2.2	2.2	0.62	0			
	Basin 3B-E	10.22	8.85	1.84	3.06	3.06	0.78	0			
	Basin 3	**45.47**	**39.9**	**8.31**	**12.82**	**12.82**	**1.59**	**0**	**9.29**	**10.88**	**(1.94)**
	Basin 4L	12.62	10.82	2.25	3.64	3.64	1.43	0			
	Basin 4R	12.81	9.15	1.91	2.85	2.85	4.66	0.69			
	Basin 4	**25.43**	**19.97**	**4.16**	**6.49**	**6.49**	**6.09**	**0.69**	**0**	**6.78**	**0.29**
	TOTAL	**148.84**	**124.9**			**40.13**				**38.52**	**(1.61)**

Summary of Control Structures Elevation

BASIN	CONTROL STRUCTURE EL (FT-NAVD88)	
	EXISTING	PROPOSED
Basin 1	3.50	4.20
Basin 2	4.00	4.00
Basin 3 & 4	2.50	3.50

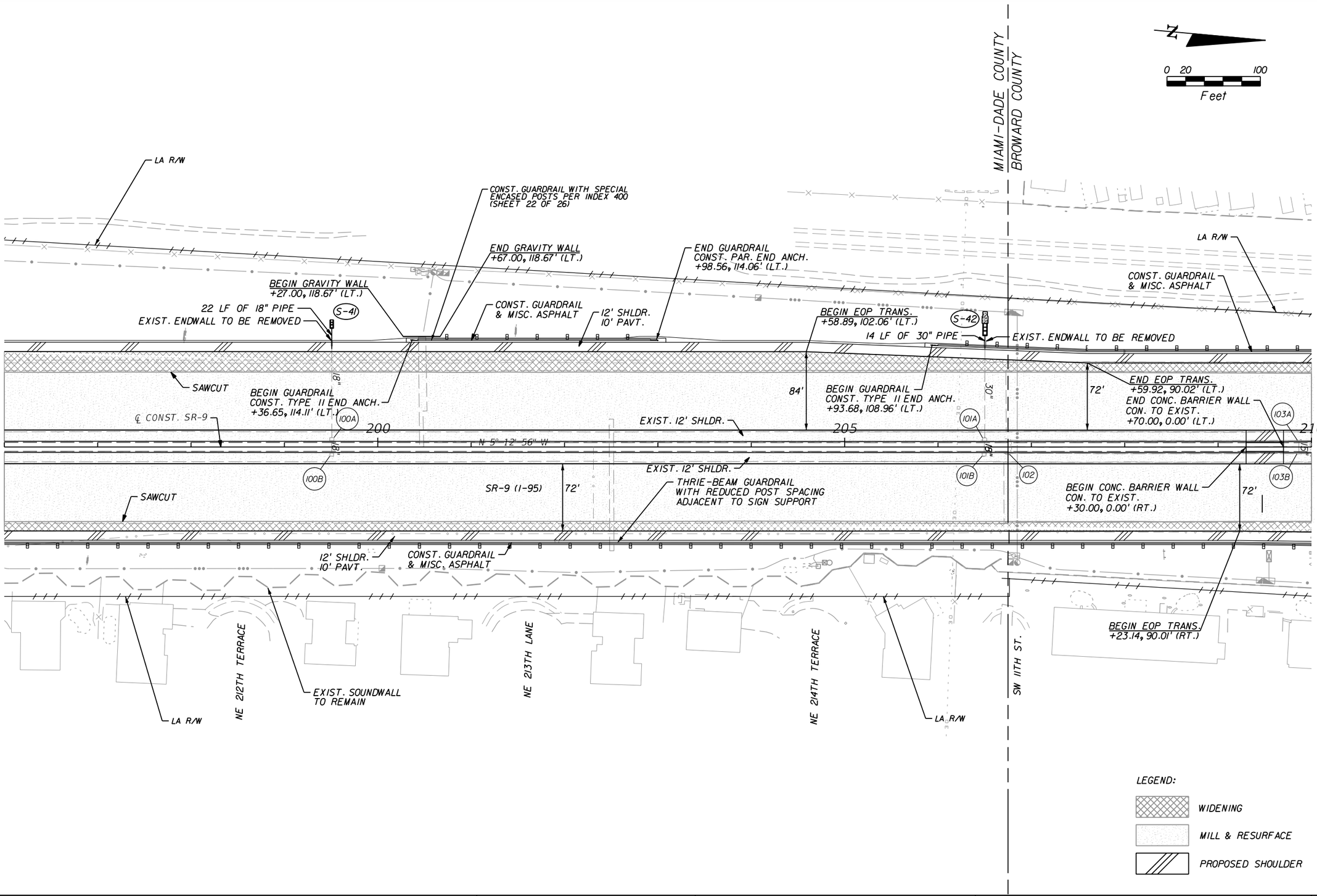
12.0 REFERENCES

FDOT Drainage Manual, dated January 2020
FDOT Project Development and Environmental Manual, July 2020
FDOT Drainage Design Guide, January 2020
FDOT District IV Drainage Practices & Guidance
SFWMD Environmental Resource Permit Information Manual, 2014
FEMA Flood Insurance Rate Maps
USDA-NRCS Soil Survey of Broward County, FL

APPENDIX A

Drainage Maps

AS-BUILT ROADWAY SHEETS



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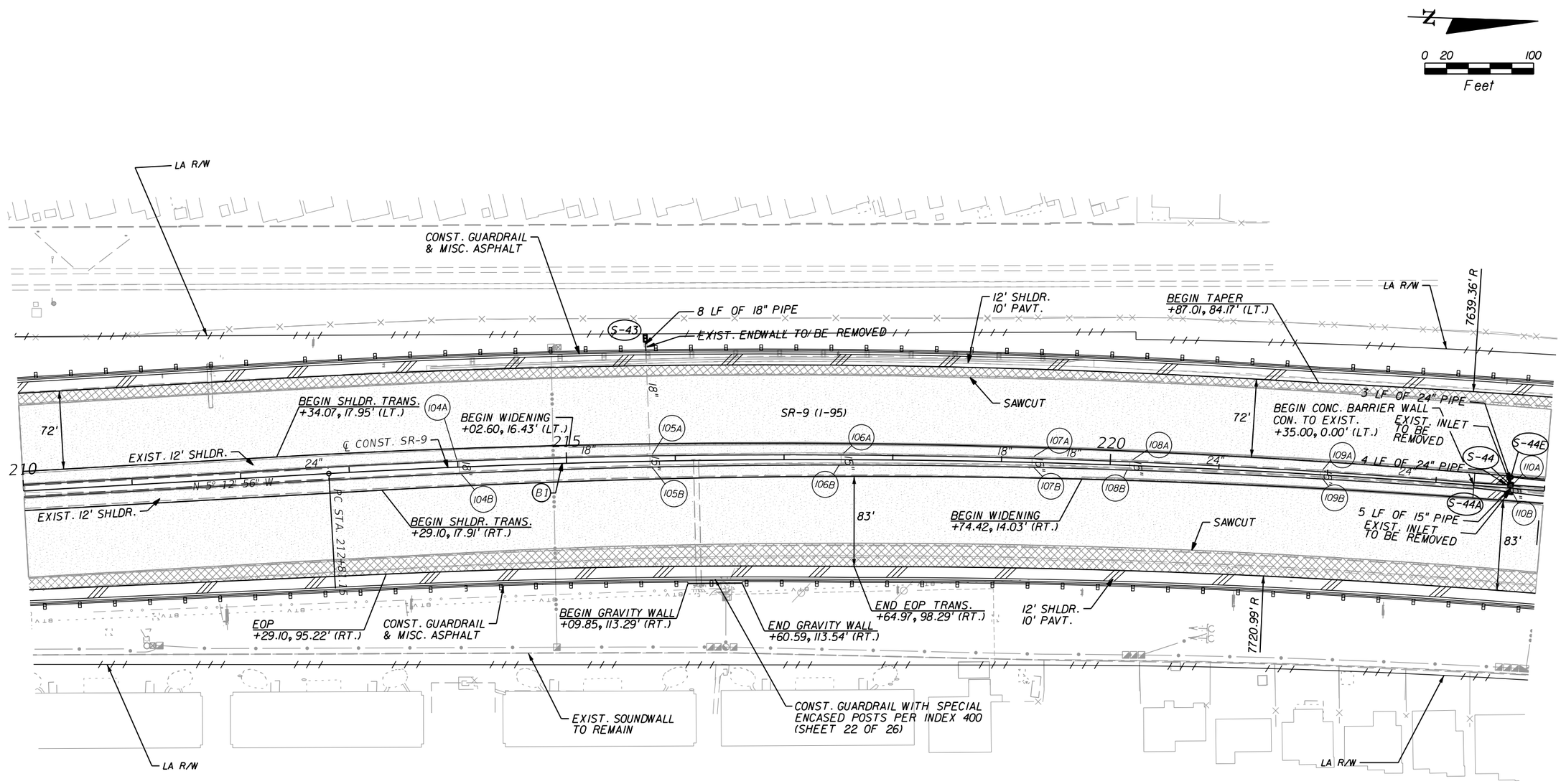

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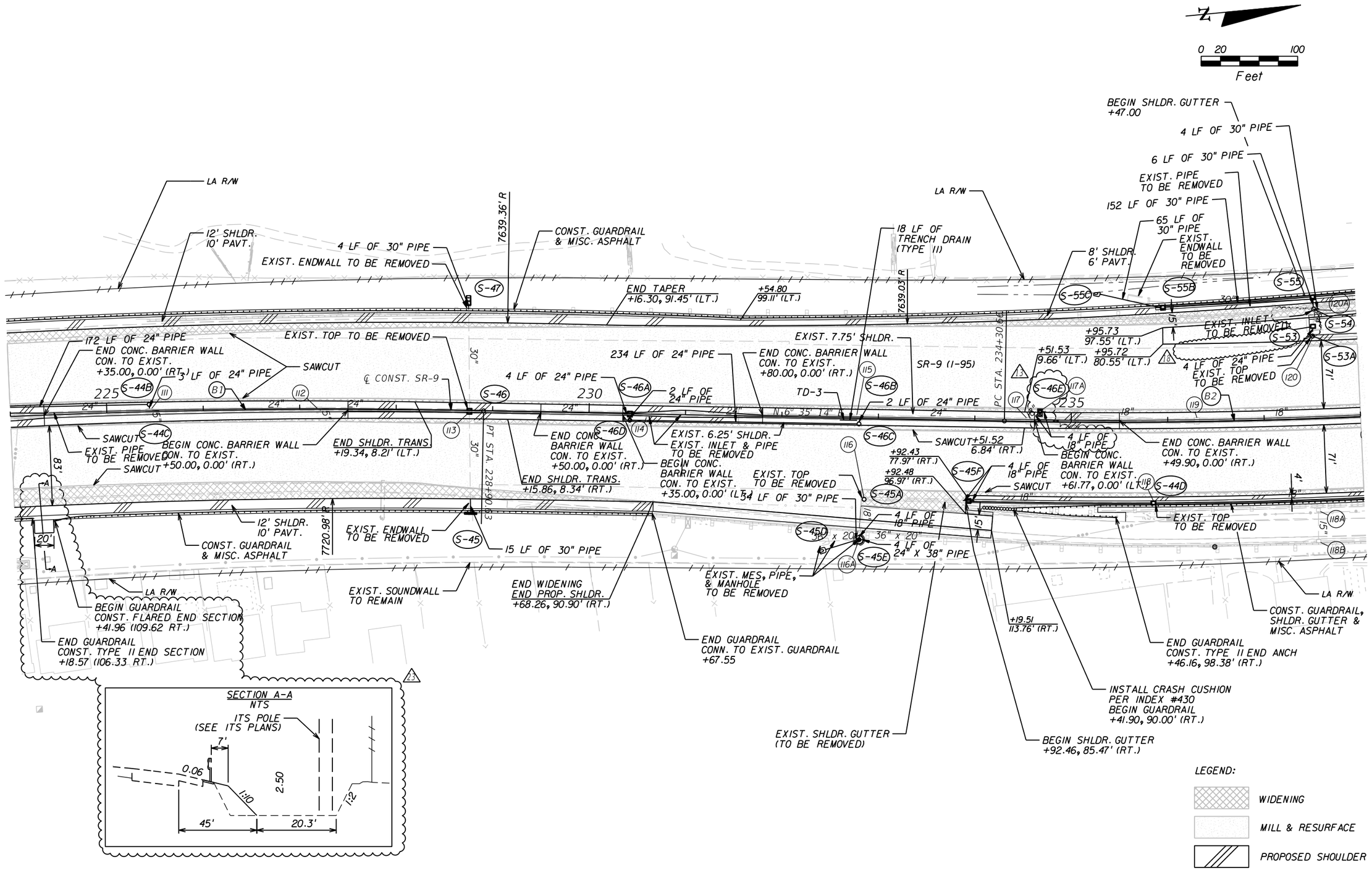

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DATE	DESCRIPTION	DATE	DESCRIPTION
1/13/14	13 ADDED S-46E		
8/21/14	16 REVISED PIPE BETWEEN S-53 AND S-54 DUE TO AS-BUILT ELEVATIONS		
12/18/15	23 ITS ACCESS AS-BUILT		

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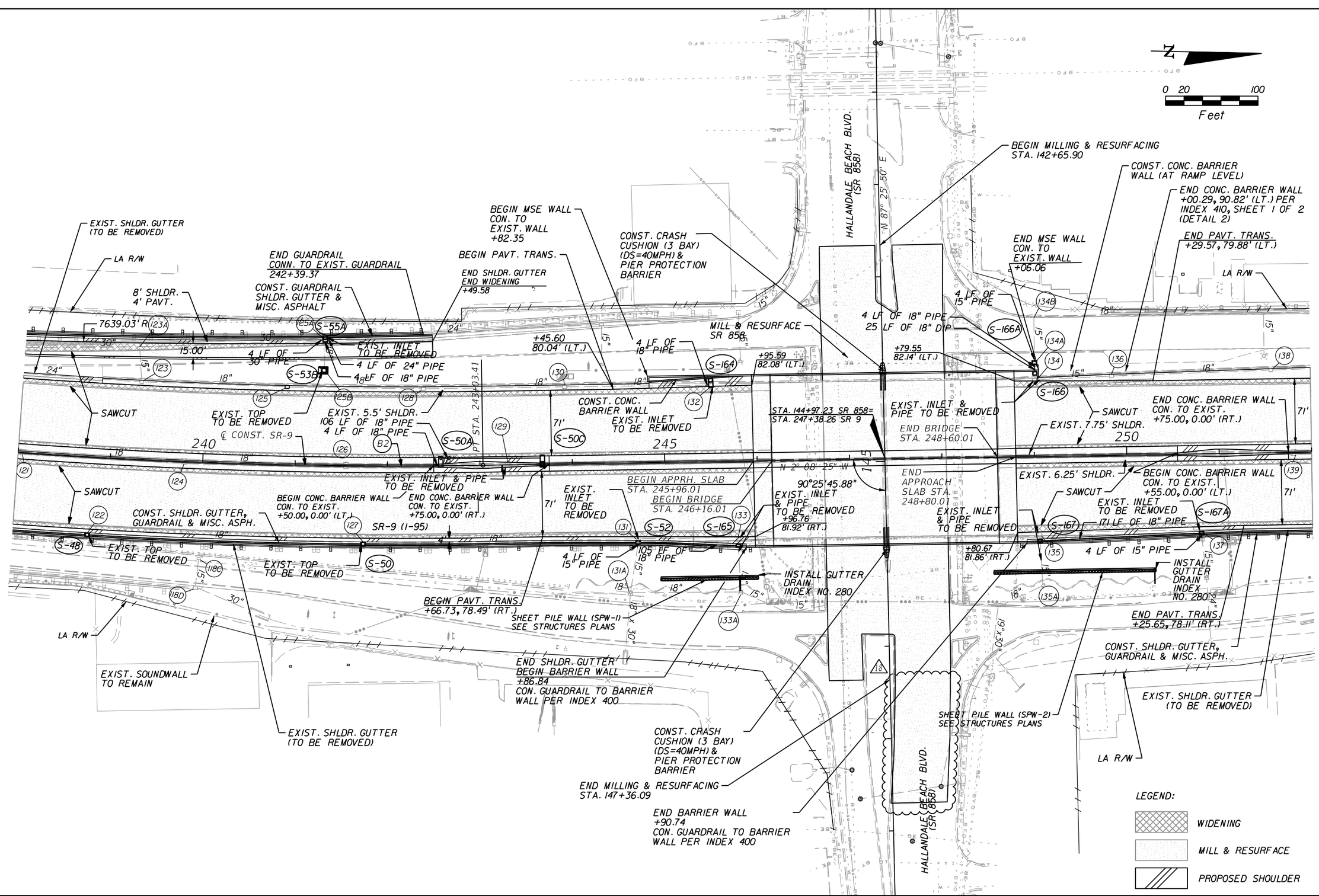

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DATE	DESCRIPTION	DATE	DESCRIPTION
5/5/14	18 CHANGED MILLING AND RESURFACING LIMITS AT HALLANDALE BEACH BLVD.		

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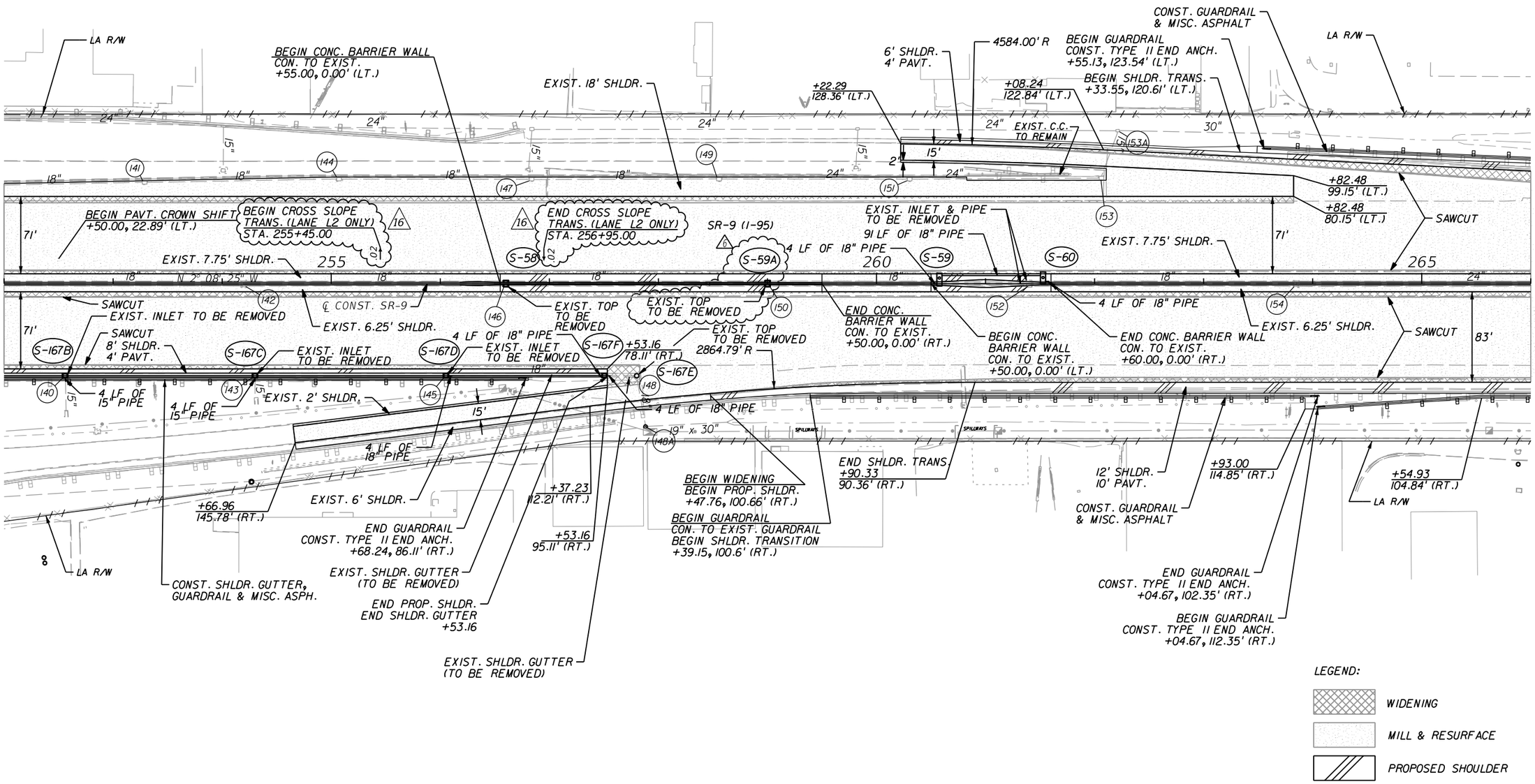

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10/9/13	6 ADDED S-59A		
3/5/14	16 UPDATED CROSS SLOPE TRANSITION		

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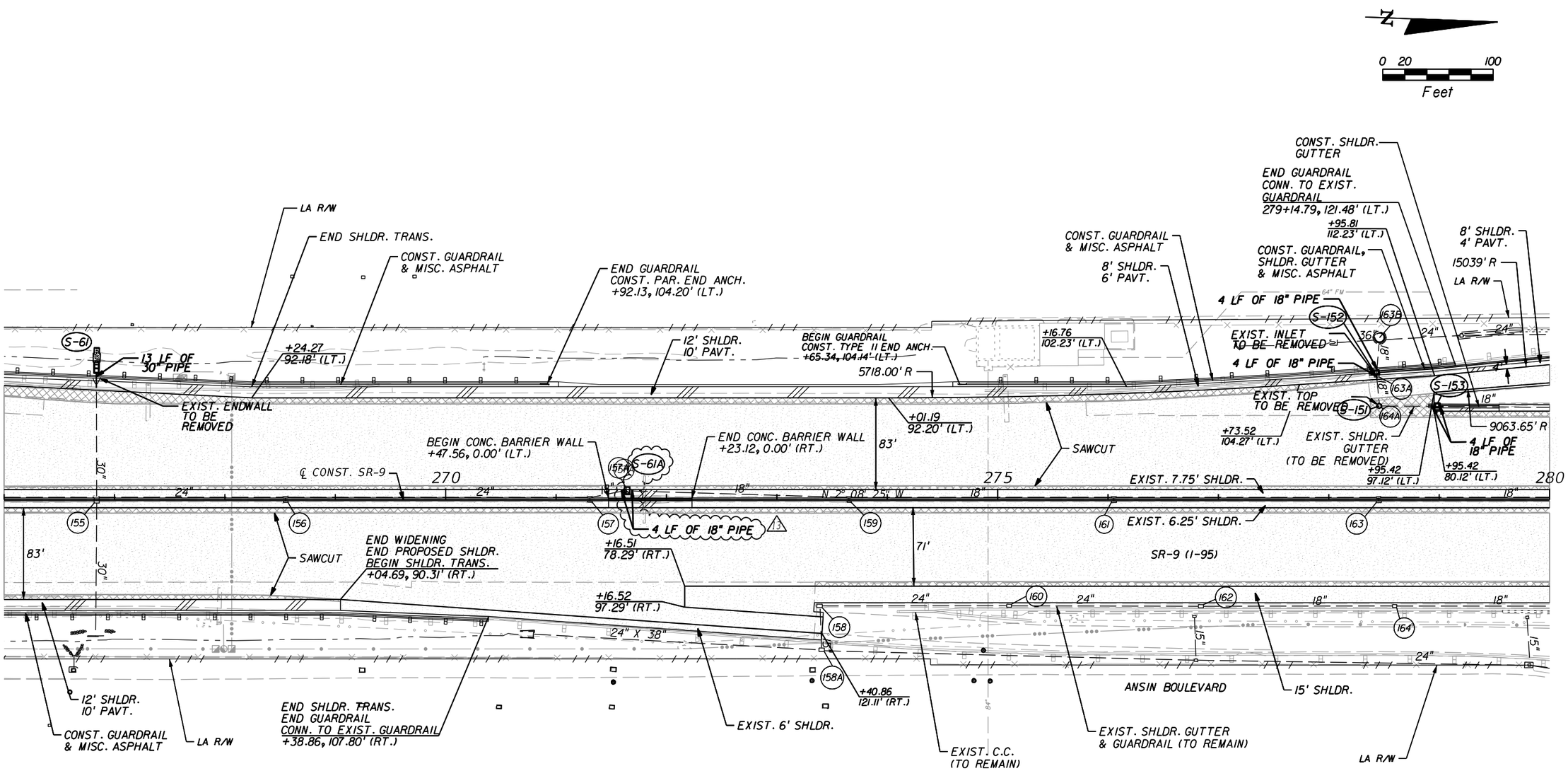

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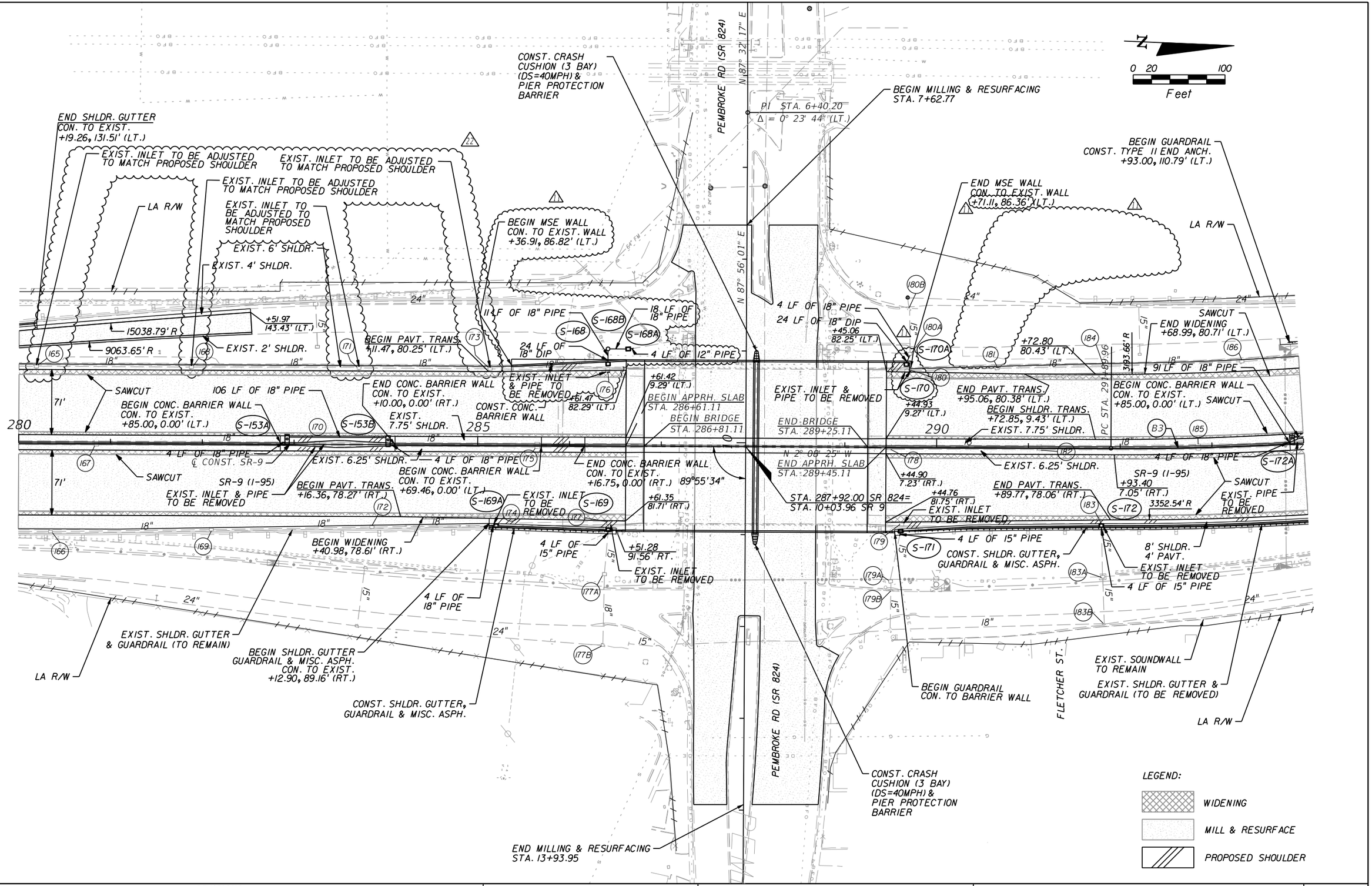

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12/13/13	1 ADDED S-168A & S-168B; S-170 ADJUSTED; ADJUST MSE WALLS 7; REVISE MSE WALL 8 CALL OUT; EXTRA CALL OUTS REMOVED		
8/31/15	22 ADDED CALL OUTS FOR EXIST. INLETS TO BE ADJUSTED.		

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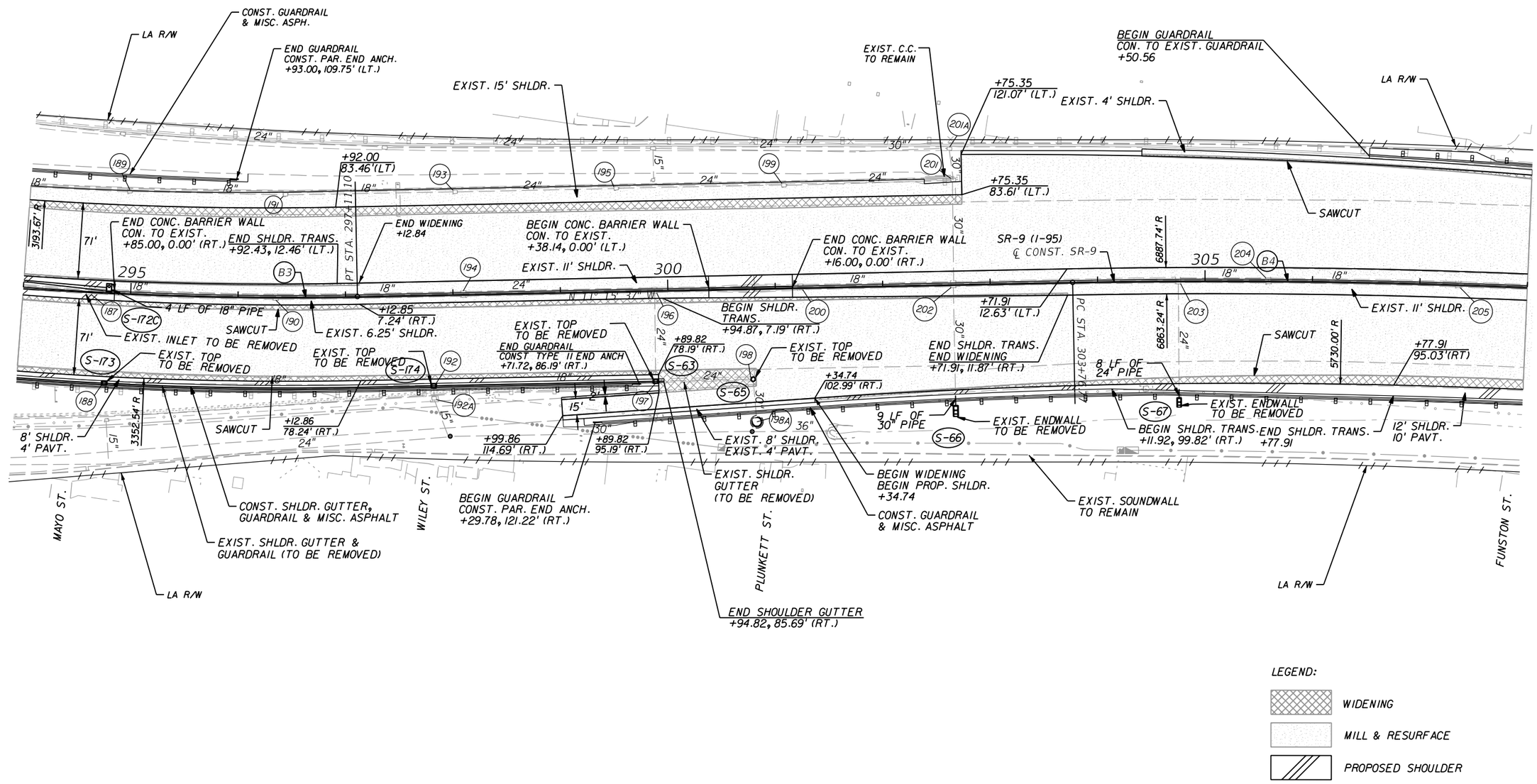

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SHEET NO. 48

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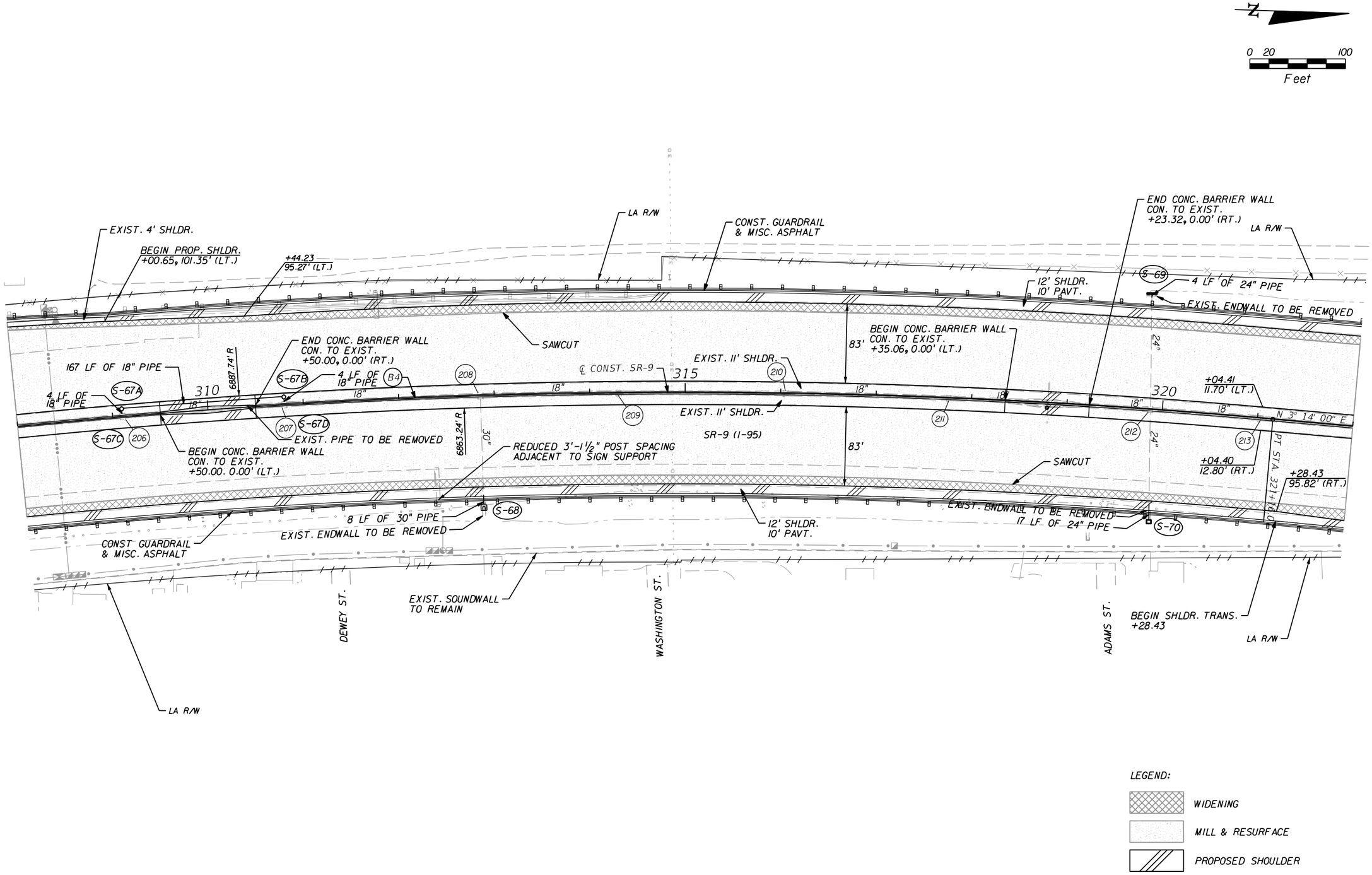

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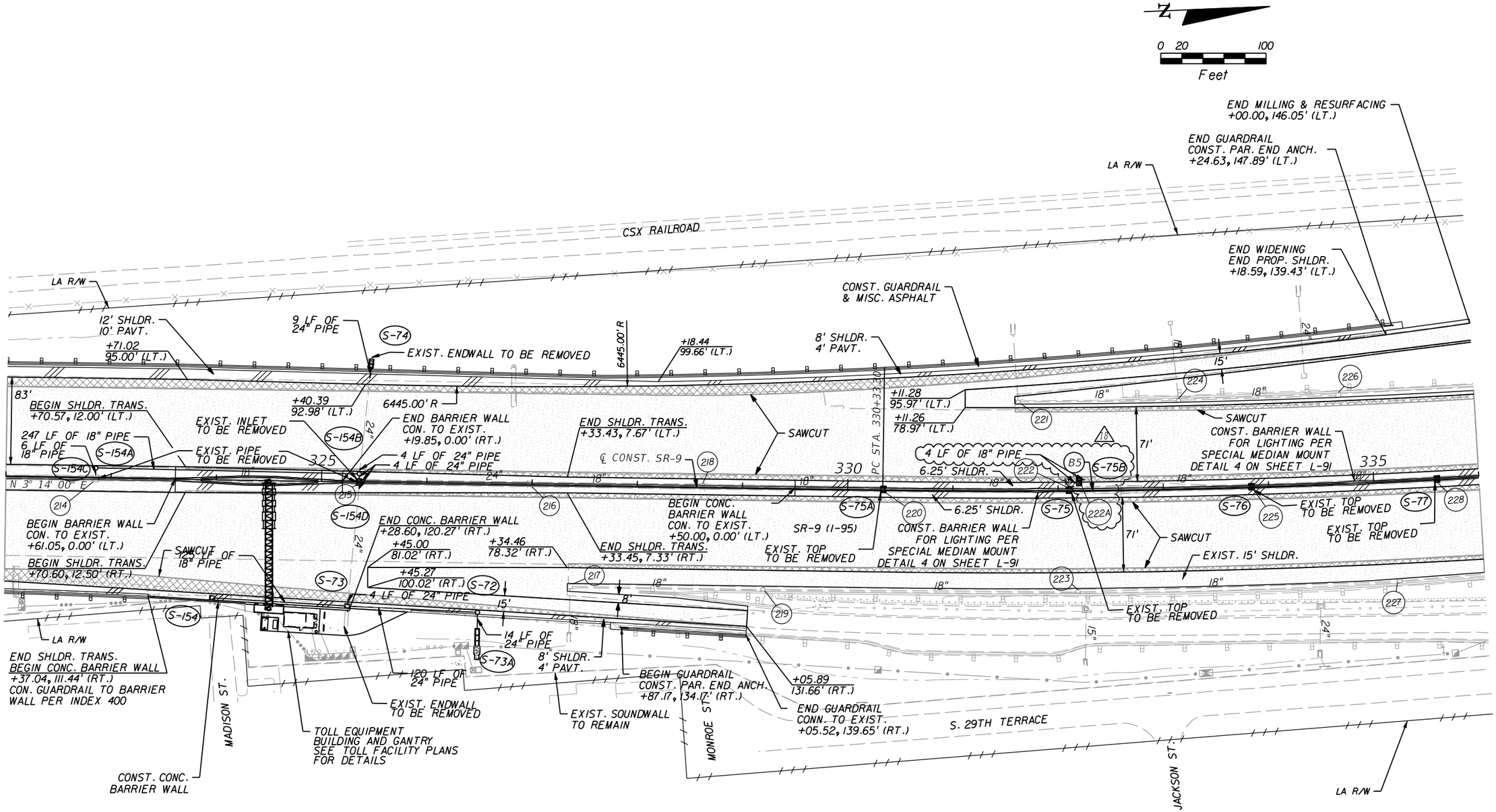
PLAN SHEETS

SHEET NO. 49



NOTE: NO RUMBLE STRIPS WITHIN TOLL PLAZA SHLDR. PAVT. LIMITS

LEGEND:

- WIDENING
- MILL & RESURFACE
- PROPOSED SHOULDER

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
5/5/14	18 ADDED S-75B		

C. BRIAN FULLER, P.E. # 49524
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CERTIFICATE OF AUTHORIZATION 2294

- ENGINEERS
- PLANNERS
- SURVEYORS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 50

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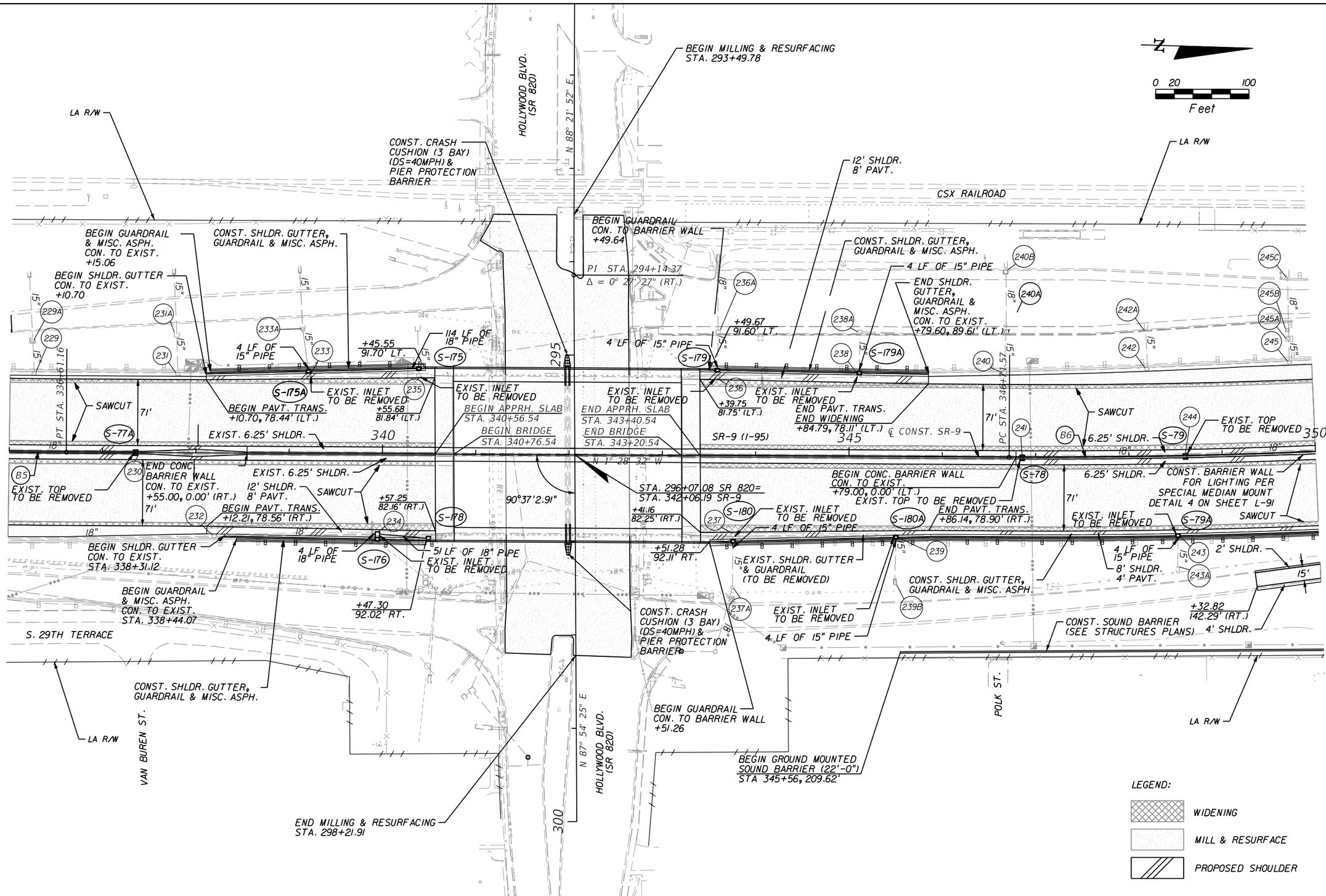

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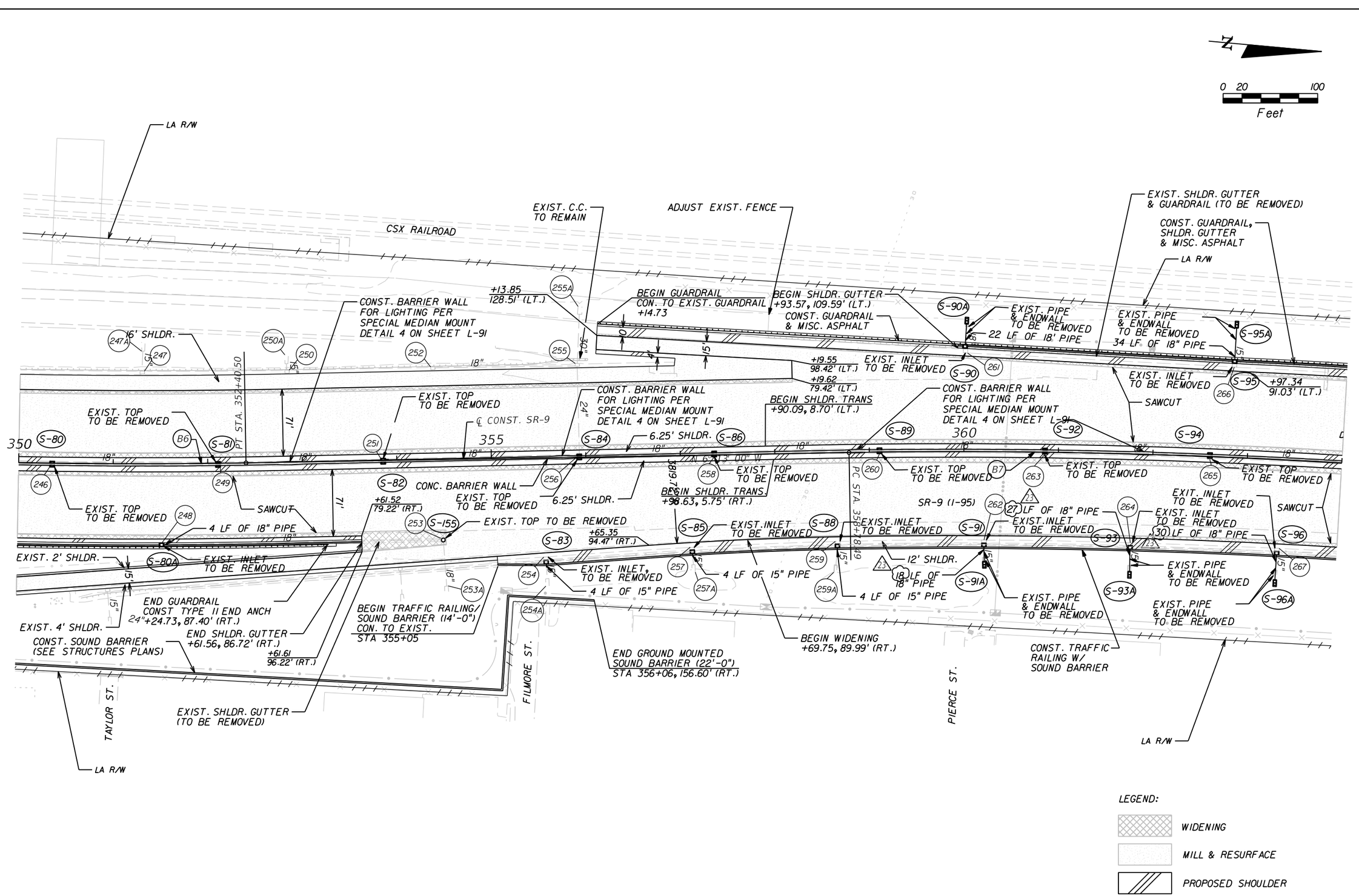
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 51



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
9/8/16	23 AS-BUILT		

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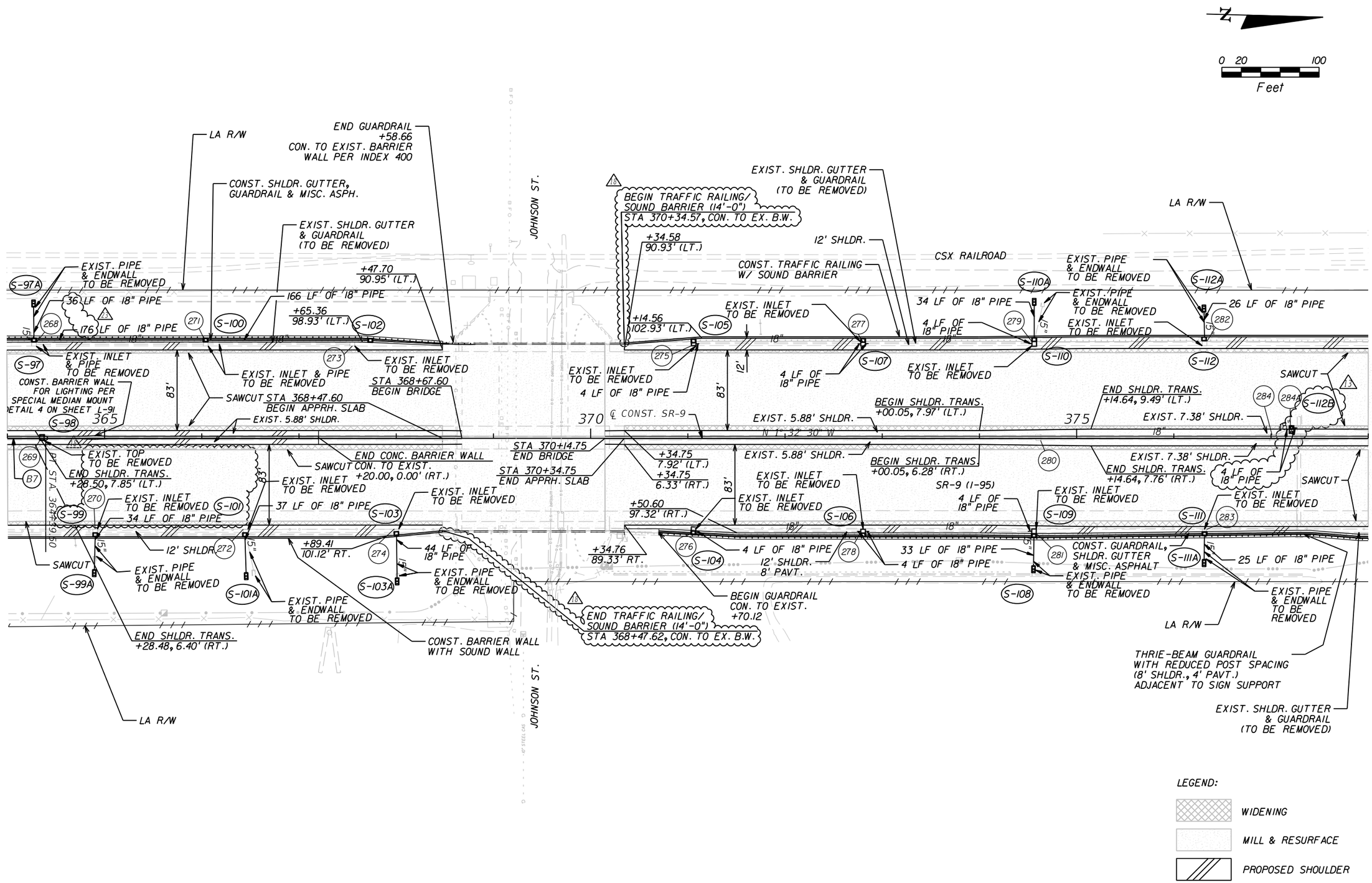
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 52



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
1/13/14	13 ADDED S-112B		
8/25/14	18 TRAFFIC RAILING STA. UPDATE & CALLOUT CLEAN-UP		
9/8/16	23 AS-BUILT		

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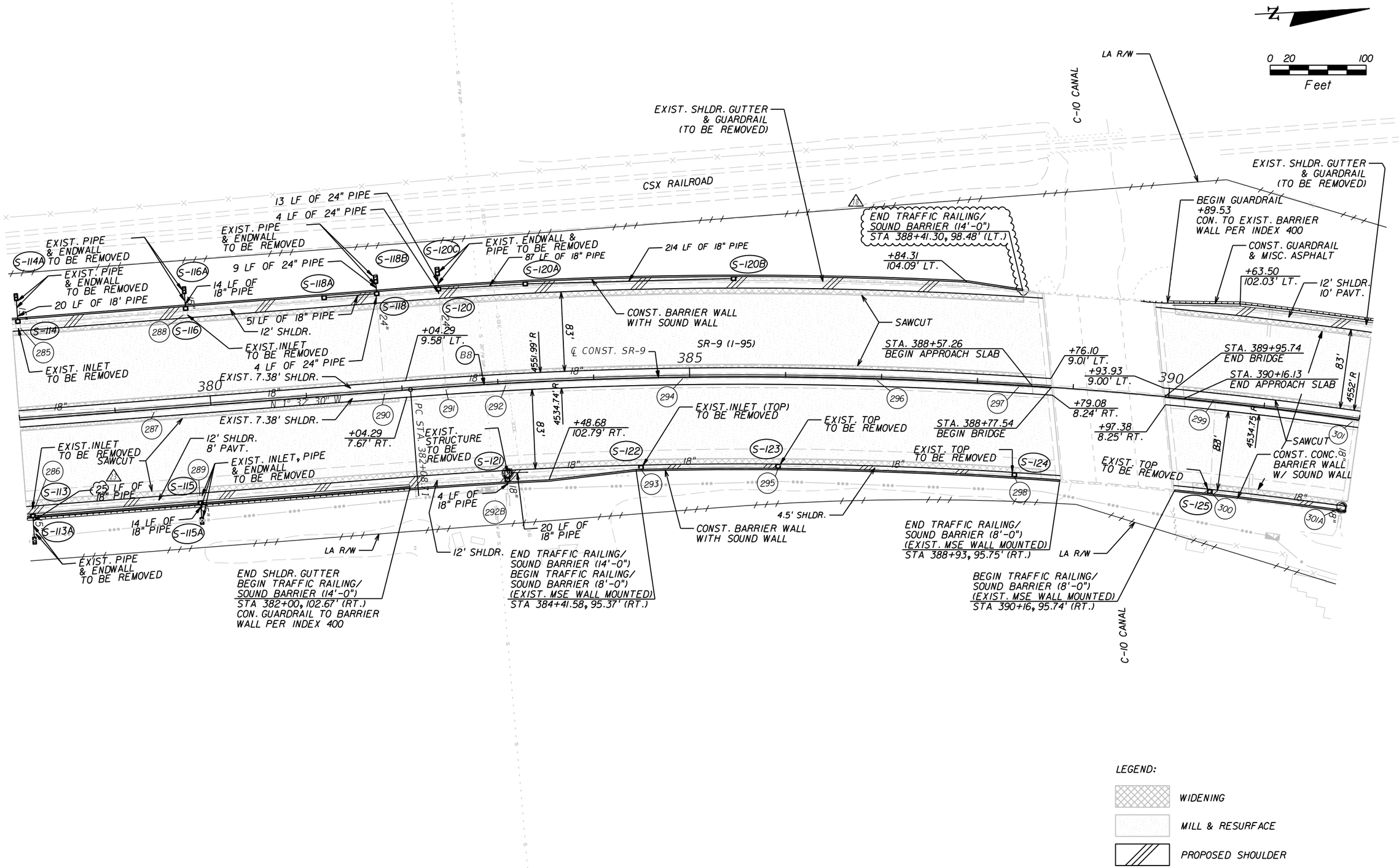
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 53



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
08/25/14	1 TRAFFIC RAILING STA. UPDATE		
09/08/16	2 AS-BUILT		

C. BRIAN FULLER, P.E. # 49524
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

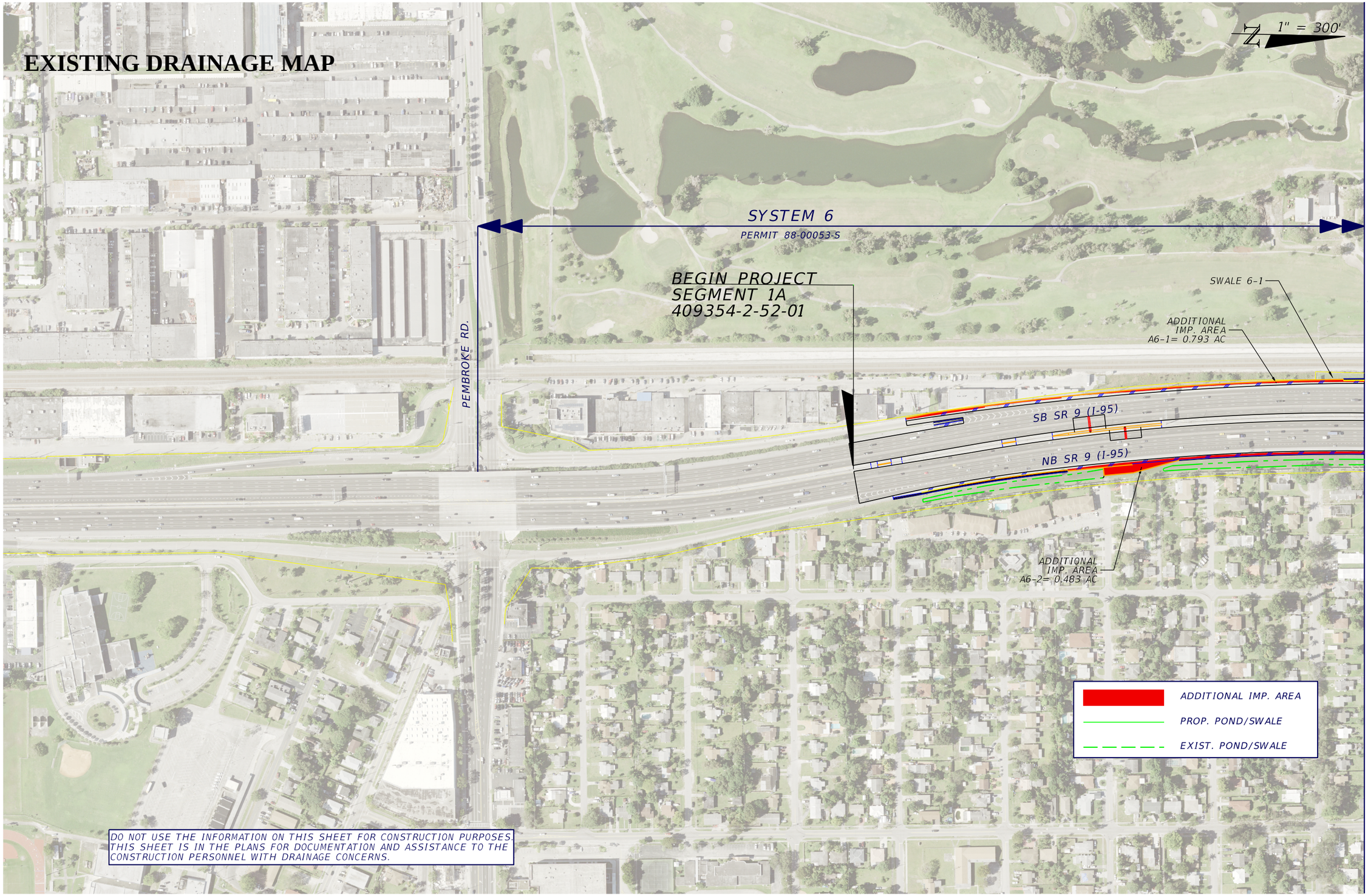
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 9	BROWARD MIAMI-DADE	422796-1-52-01 422796-2-52-01

PLAN SHEETS

SHEET NO. 54

EXISTING DRAINAGE MAPS

EXISTING DRAINAGE MAP



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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DAVID R. VERLANDER, P.E.
P.E. LICENSE NUMBER 81420
GAI CONSULTANTS, INC.
618 E. SOUTH STREET - SUITE 700
ORLANDO, FL 32801
CERTIFICATE OF AUTHORIZATION 9951

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	409354-2-52-01

SHEET NO. 1

EXISTING DRAINAGE MAP

1" = 300'

SYSTEM 6

PERMIT 88-00053-S

HOLLYWOOD BLVD.

MATCH LINE (STA. 316+29.21)

MATCH LINE (STA. 359+46.45)

ADDITIONAL IMP. AREA A6-1

ADDITIONAL IMP. AREA A6-4= 0.253 AC

ADDITIONAL IMP. AREA A6-5= 0.007 AC

ADDITIONAL IMP. AREA A6-8= 0.123 AC

SWALE 6-1

R/W LINE

SB SR 9 (I-95)

NB SR 9 (I-95)

R/W LINE

SWALE 6-3

SWALE 6-2

ADDITIONAL IMP. AREA A6-2

R/W LINE

ADDITIONAL IMP. AREA A6-3= 0.136 AC

R/W LINE

ADDITIONAL IMP. AREA A6-6= 0.006 AC

ADDITIONAL IMP. AREA A6-7= 0.176 AC

ADDITIONAL IMP. AREA

PROP. POND/SWALE

EXIST. POND/SWALE

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REVISIONS			
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CERTIFICATE OF AUTHORIZATION 9951

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	409354-2-52-01

SHEET NO. 2

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EXISTING DRAINAGE MAP

1" = 300'

SYSTEM 6
PERMIT 88-00053-S

SYSTEM 7
PERMIT 88-00053-S

SYSTEM 8
PERMIT 88-00050-S

SYSTEM 9
PERMIT 88-00050-S

MATCH LINE (STA. 359+46.45)

MATCH LINE (STA. 397+19.17)

JOHNSON ST.

STA. 381+80.50

C-10 CANAL

TAFT ST.

SB SR 9 (I-95)

NB SR 9 (I-95)

R/W LINE

SWALE 6-3

SWALE 9-1

SWALE 9-2

ADDITIONAL IMP. AREA A6-10 = 0.004 AC

ADDITIONAL IMP. AREA A6-9 = 0.009 AC

ADDITIONAL IMP. AREA A7-1 = 0.002 AC

ADDITIONAL IMP. AREA A7-2 = 0.002 AC

ADDITIONAL IMP. AREA A7-3 = 0.007 AC

ADDITIONAL IMP. AREA A7-4 = 0.003 AC

ADDITIONAL IMP. AREA A8-1 = 0.016 AC

ADDITIONAL IMP. AREA A8-2 = 0.078 AC

ADDITIONAL IMP. AREA A9-1 = 0.092 AC

ADDITIONAL IMP. AREA A9-2 = 0.013 AC

ADDITIONAL IMP. AREA A9-3 = 0.031 AC

ADDITIONAL IMP. AREA

PROP. POND/SWALE

EXIST. POND/SWALE

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REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	409354-2-52-01

SHEET NO. 3

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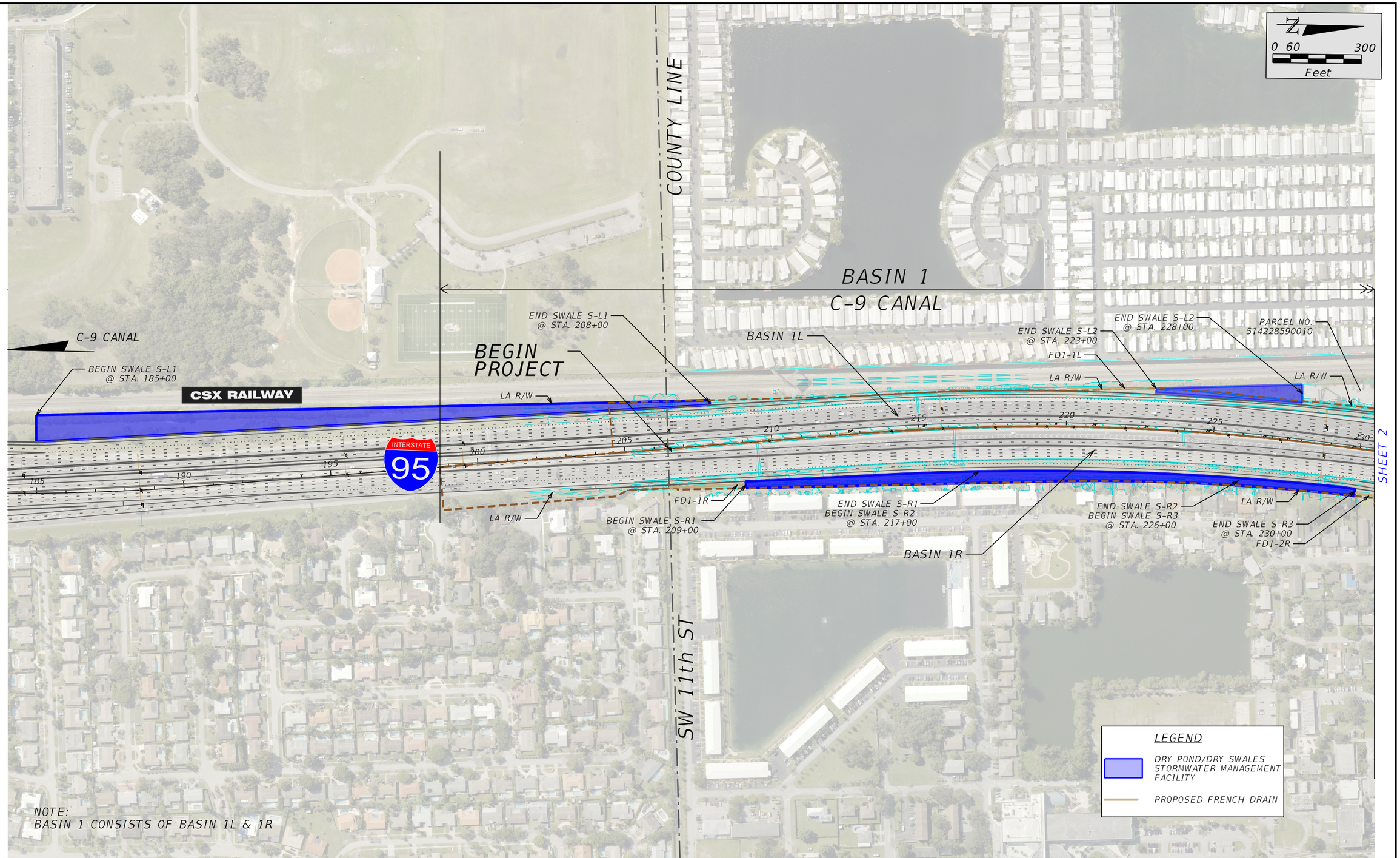
PROPOSED DRAINAGE MAPS



SHEET 2

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

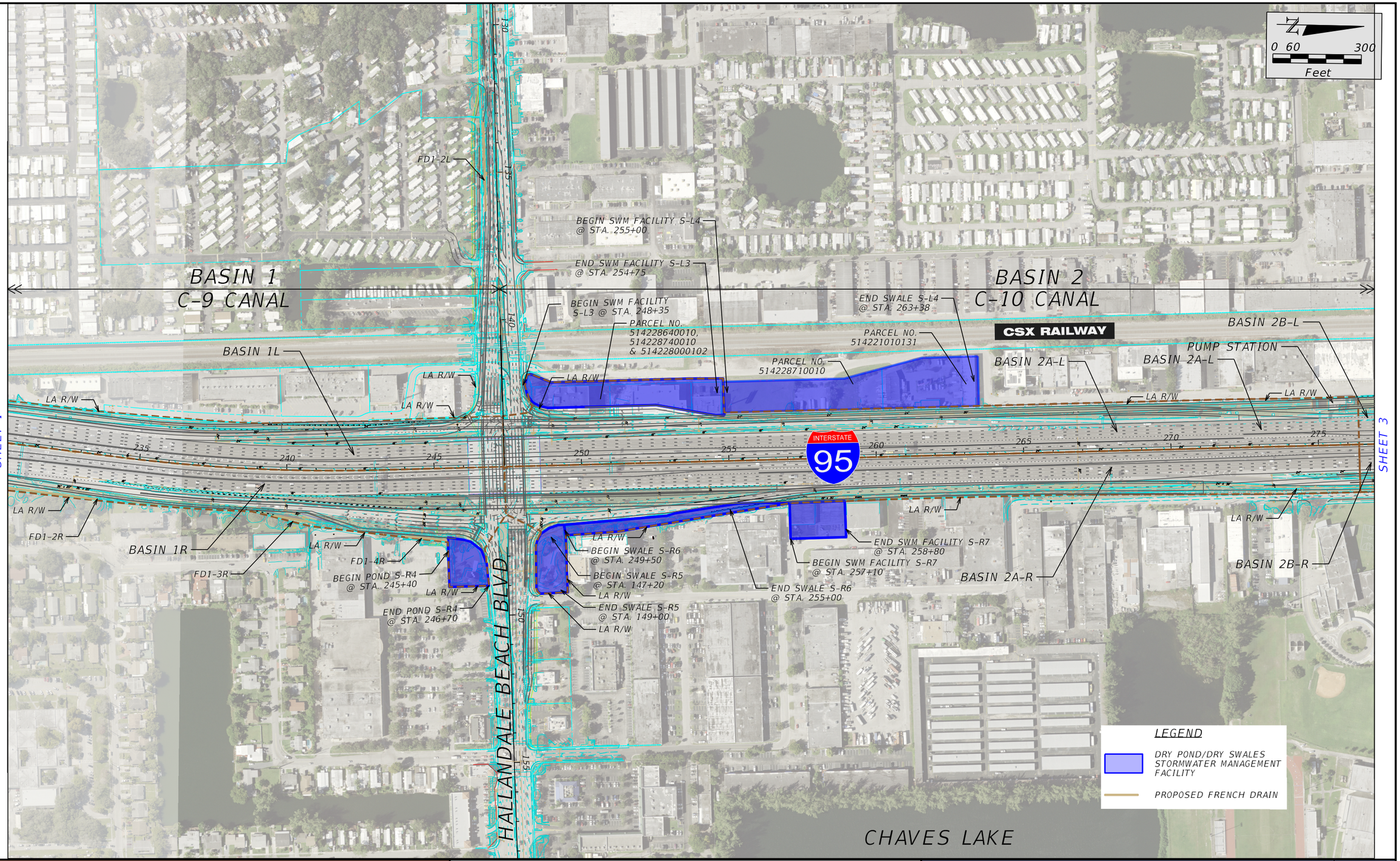
JUNE 2021

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY

From South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

I-95 (SR 9) CONCEPTUAL DRAINAGE MAP

SHEET NO. 1



FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

JUNE 2021

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY

From South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

I-95 (SR 9)
CONCEPTUAL DRAINAGE MAP

SHEET NO.
2

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

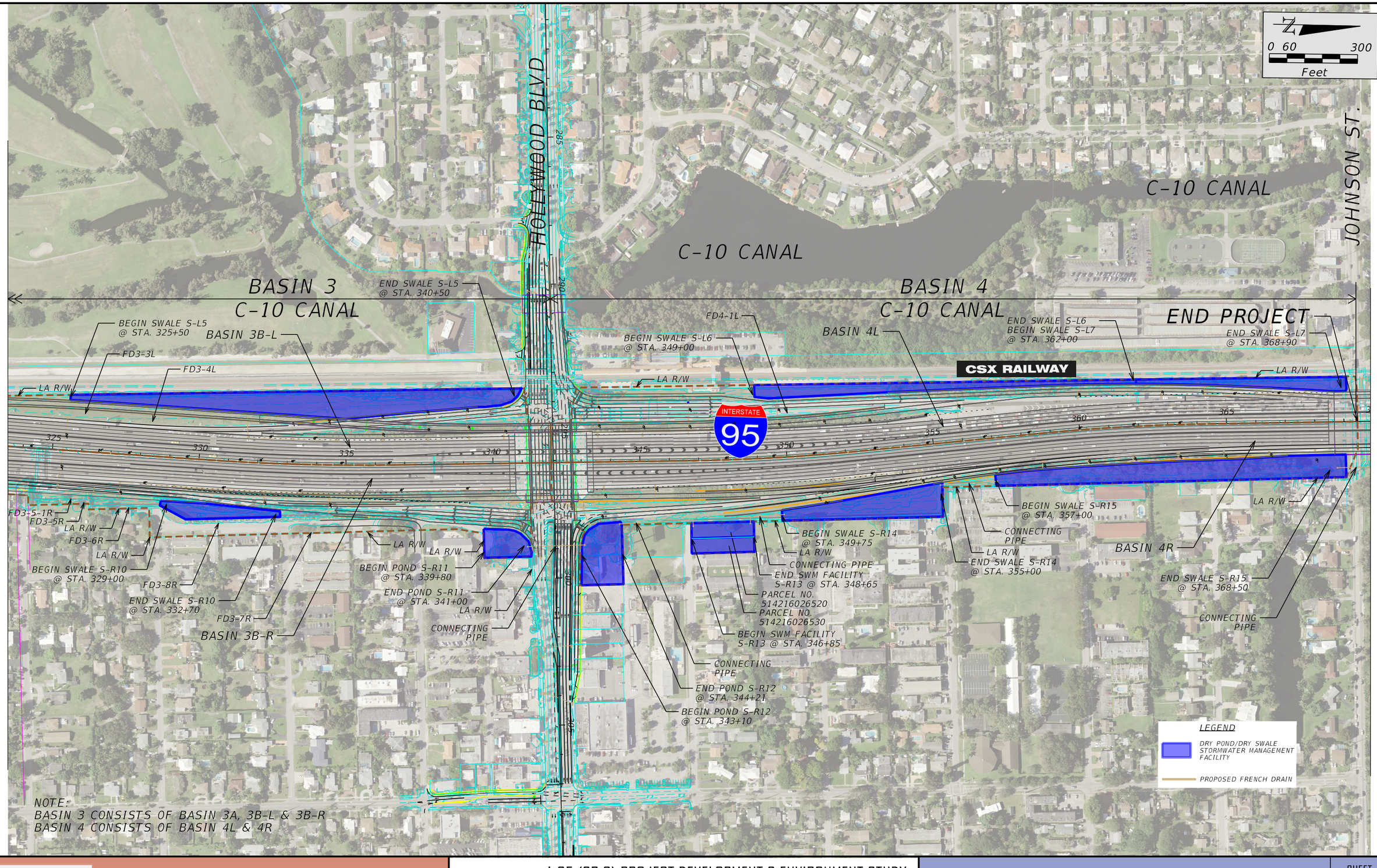
JUNE 2021

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY

From South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

I-95 (SR 9)
CONCEPTUAL DRAINAGE MAP

SHEET NO.
3



SHEET 3

FDOT

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

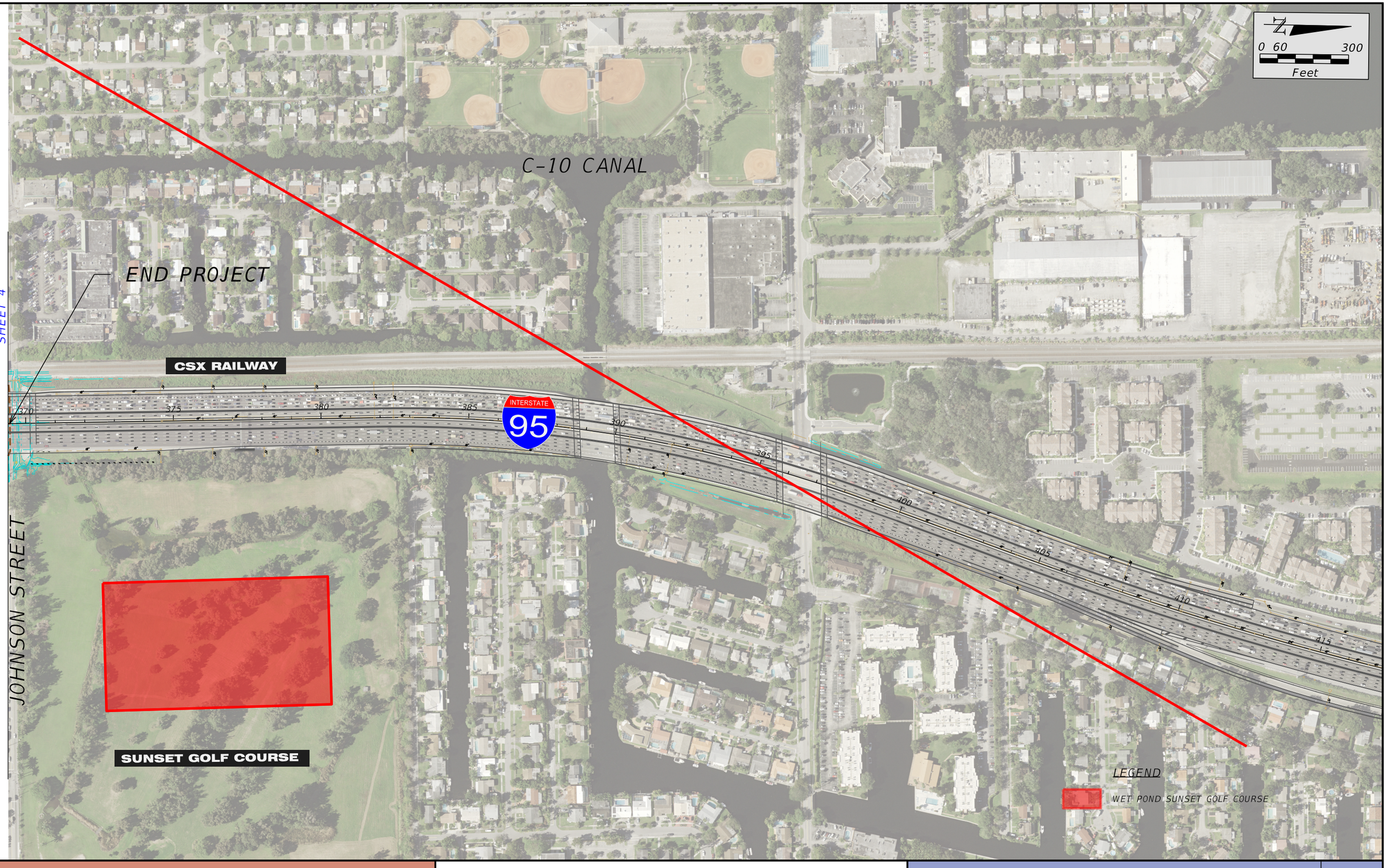
JUNE 2021

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY

From South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

I-95 (SR 9)
CONCEPTUAL DRAINAGE MAP

SHEET NO.
4



FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT FOUR
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

JUNE 2021

I-95 (SR 9) PROJECT DEVELOPMENT & ENVIRONMENT STUDY

From South of Hallandale Beach Boulevard (SR 858) to North of Hollywood Boulevard (SR 820)
FPID No.: 436903-1-22-02
ETDM No.: 14254

I-95 (SR 9) CONCEPTUAL DRAINAGE MAP

SHEET NO.
5

APPENDIX B

USDA - Soils Group Report

United States Department of Agriculture

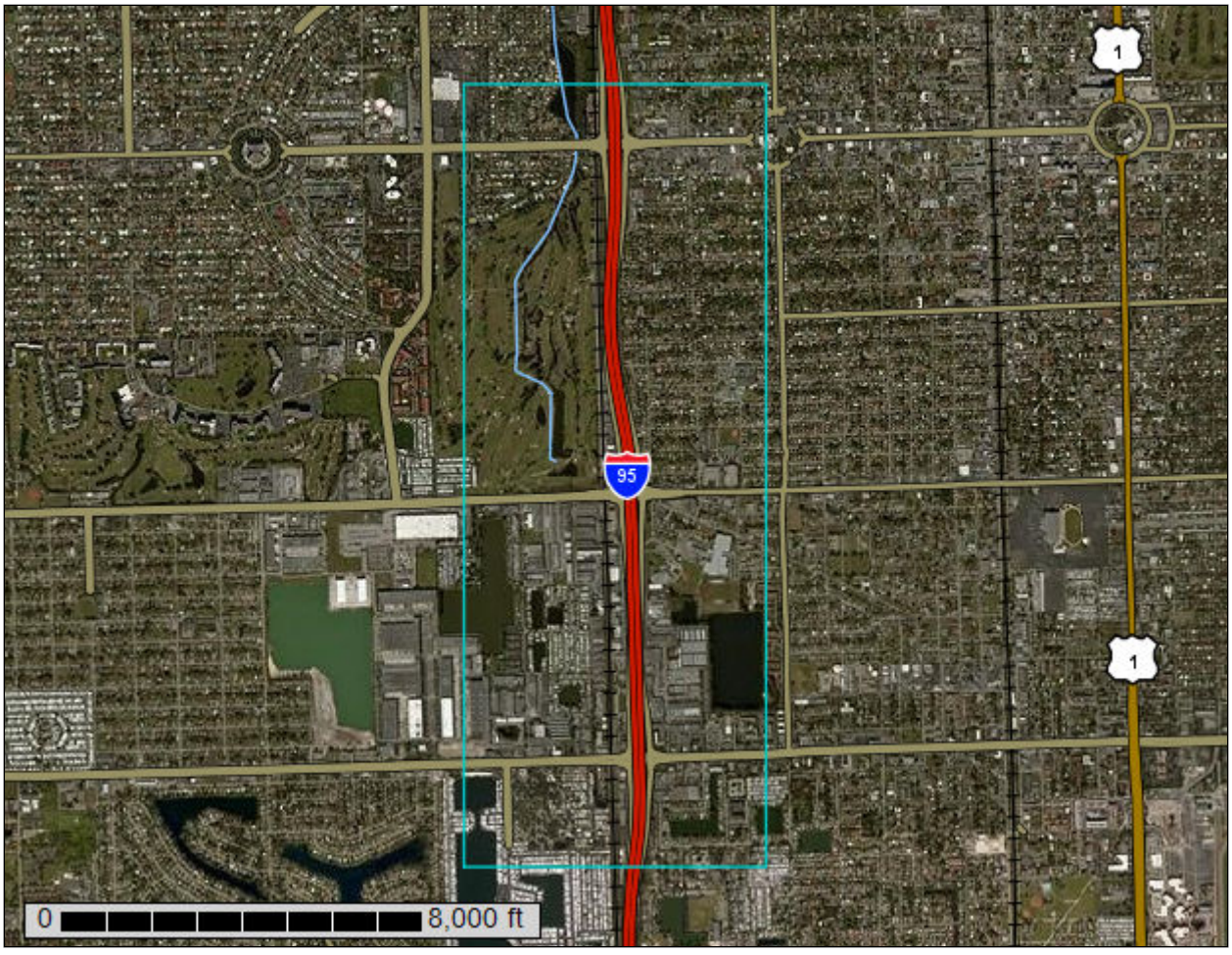
NRCS

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 Broward County, Florida, East Part

I-95 PD&E Study from Hallandale Blvd. to Hollywood Blvd.



July 28, 2017

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.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

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 Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

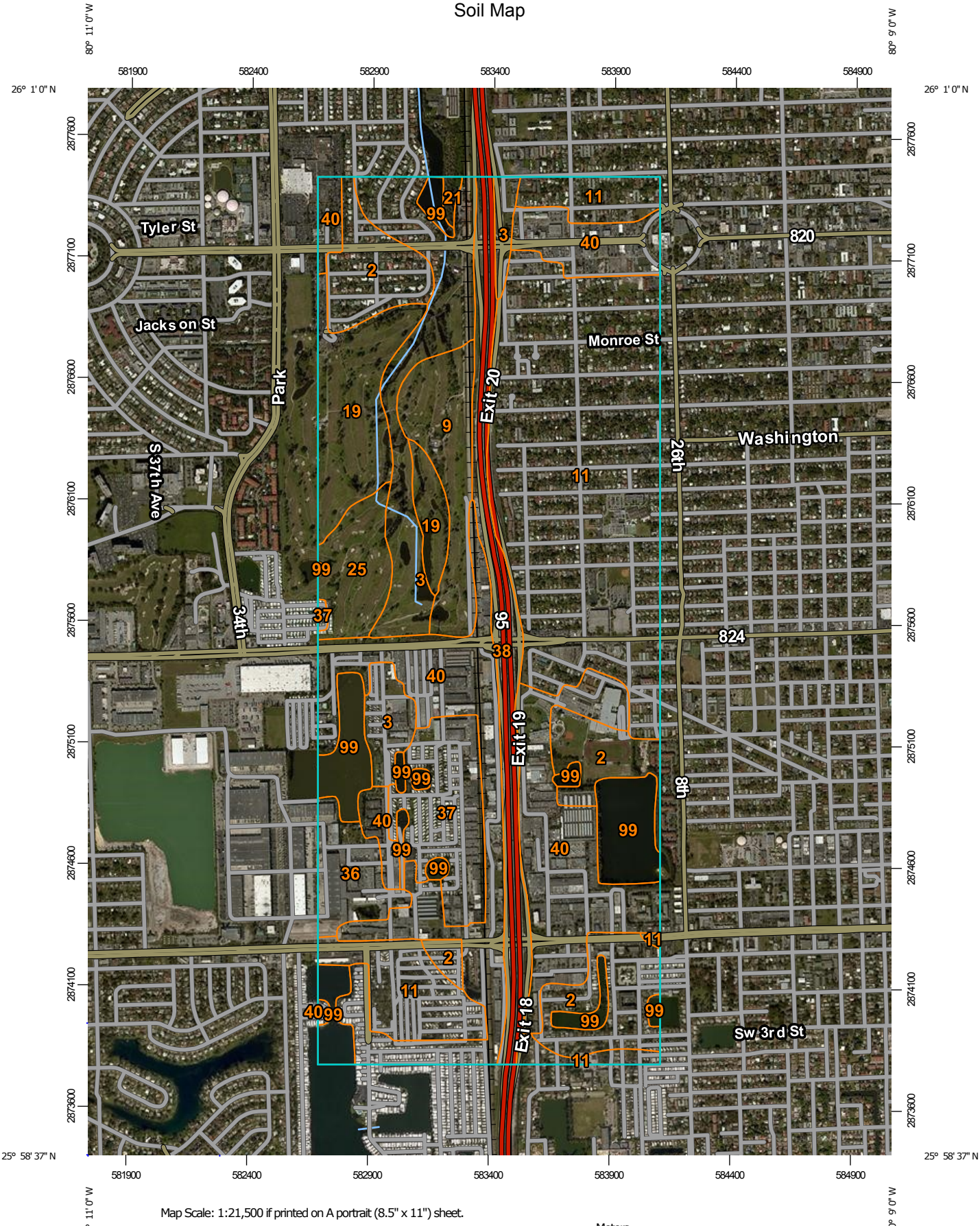
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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 Scale: 1:21,500 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 300 600 1200 1800

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Broward County, Florida, East Part
Survey Area Data: Version 12, Sep 14, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 11, 2010—Feb 11, 2015

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

Broward County, Florida, East Part (FL606)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
2	Arents-Urban land complex	113.3	8.8%
3	Arents, organic substratum-Urban land complex	109.5	8.5%
9	Dade fine sand	53.0	4.1%
11	Dade-Urban land complex	363.6	28.3%
19	Margate fine sand	77.5	6.0%
21	Okeelanta muck, drained, 0 to 1 percent slopes	2.7	0.2%
25	Pennsuco silty clay loam	35.2	2.7%
36	Udorthents	31.6	2.5%
37	Udorthents, marly substratum-Urban land complex	59.4	4.6%
38	Udorthents, shaped	74.2	5.8%
40	Urban land	283.7	22.1%
99	Water	80.1	6.2%
Totals for Area of Interest		**1,283.9**	**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.

Broward County, Florida, East Part

2—Arents-Urban land complex

Map Unit Setting

National map unit symbol: 1hn8f
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents and similar soils: 55 percent
Urban land: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

A - 0 to 4 inches: cobbly sand
C1 - 4 to 9 inches: cobbly sand
C2 - 9 to 32 inches: sand
2C - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A/D
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Arents, organic substratum

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Udorthents, marly substratum

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

3—Arents, organic substratum-Urban land complex

Map Unit Setting

National map unit symbol: 1hn8g
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Arents, organic substratum and similar soils: 55 percent
Urban land: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arents, Organic Substratum

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy dredge spoils over organic material over sandy marine deposits

Typical profile

A - 0 to 12 inches: gravelly sand
C - 12 to 38 inches: sand
Oa - 38 to 52 inches: muck
2C - 52 to 72 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

9—Dade fine sand

Map Unit Setting

National map unit symbol: 1hn8n
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Dade and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dade

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits over soft limestone

Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 27 inches: fine sand
Bh - 27 to 35 inches: fine sand
Cr - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G156AC521FL)

Hydric soil rating: No

Minor Components

Basinger

Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Hydric soil rating: Yes

Duette

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G156AC121FL)
Hydric soil rating: No

Margate

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Immokalee, limestone substratum

Percent of map unit: 1 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Hydric soil rating: No

11—Dade-Urban land complex

Map Unit Setting

National map unit symbol: 1hn8q
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Dade and similar soils: 55 percent
Urban land: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dade

Setting

Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy marine deposits over soft limestone

Typical profile

A - 0 to 8 inches: gravelly sand
E - 8 to 27 inches: fine sand
Bh - 27 to 35 inches: fine sand
Cr - 35 to 39 inches: weathered bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 60 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified

Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Basinger
Percent of map unit: 2 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Immokalee, limestone substratum
Percent of map unit: 2 percent
Landform: Flatwoods on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Margate
Percent of map unit: 1 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

19—Margate fine sand

Map Unit Setting
National map unit symbol: 1hn8z
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Margate and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Margate

Setting

Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Sandy marine deposits over limestone

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 16 inches: fine sand
Bw - 16 to 28 inches: fine sand
C - 28 to 32 inches: gravelly fine sand
2R - 32 to 36 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G156AC145FL)
Hydric soil rating: Yes

Minor Components

Basinger

Percent of map unit: 5 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Hydric soil rating: Yes

Plantation, undrained

Percent of map unit: 5 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Talf

Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

21—Okeelanta muck, drained, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tzwc
Elevation: 0 to 30 feet
Mean annual precipitation: 48 to 68 inches
Mean annual air temperature: 70 to 77 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Okeelanta, drained, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Okeelanta, Drained

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa - 0 to 31 inches: muck
Cg - 31 to 65 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Minor Components

Sanibel

Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Tequesta

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G156AC645FL)
Hydric soil rating: Yes

Basinger

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G156AC141FL)
Hydric soil rating: Yes

25—Pennsuco silty clay loam

Map Unit Setting

National map unit symbol: 1hn95
Elevation: 10 feet
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Pennsuco, drained, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pennsuco, Drained

Setting

Landform: Marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy marine deposits over limestone

Typical profile

A - 0 to 5 inches: silty clay loam
Bg - 5 to 38 inches: silt loam
2C - 38 to 53 inches: fine sand
2Cr - 53 to 80 inches: weathered bedrock

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 40 to 72 inches to paralithic bedrock
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 60 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 14.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Minor Components

Perrine

Percent of map unit: 2 percent
Landform: Marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G156AC341FL)
Hydric soil rating: Yes

Pennsuco, tidal

Percent of map unit: 2 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

Perrine variant

Percent of map unit: 1 percent
Landform: Tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Yes

36—Udorthents

Map Unit Setting

National map unit symbol: 1hn9j
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

C - 0 to 57 inches: cobbly sand

Properties and qualities

Slope: 2 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

37—Udorthents, marly substratum-Urban land complex

Map Unit Setting
National map unit symbol: 1hn9k
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, marly substratum, and similar soils: 55 percent
Urban land: 45 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Marly Substratum

Setting
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile
C - 0 to 32 inches: gravelly sand
2C - 32 to 60 inches: marly silt loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)

Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: A
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Description of Urban Land

Setting
Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups
Land capability classification (irrigated): None specified
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

38—Udorthents, shaped

Map Unit Setting
National map unit symbol: 1hn9l
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, shaped and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Shaped

Setting
Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Altered marine deposits

Typical profile

C1 - 0 to 30 inches: gravelly sand
C2 - 30 to 50 inches: sand
2R - 50 to 54 inches: weathered bedrock

Properties and qualities

Slope: 0 to 45 percent
Depth to restrictive feature: 40 to 72 inches to paralithic bedrock
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 10 percent
Landform: Marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

40—Urban land

Map Unit Setting

National map unit symbol: 1hn9n
Mean annual precipitation: 60 to 68 inches
Mean annual air temperature: 72 to 79 degrees F
Frost-free period: 358 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

Minor Components

Matlacha, limestone substratum

Percent of map unit: 5 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: No

99—Water

Map Unit Composition

Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

Interpretive groups

Land capability classification (irrigated): None specified
Other vegetative classification: Forage suitability group not assigned (G156AC999FL)
Hydric soil rating: Unranked

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Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–Broward County, Florida, East Part			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
2—Arents-Urban land complex			
Arents	55	High	A/D
Urban land	40	—	—

Hydrologic Soil Group and Surface Runoff–Broward County, Florida, East Part			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
3—Arents, organic substratum-Urban land complex			
Arents, organic substratum	55	High	A
Urban land	45	—	—
9—Dade fine sand			
Dade	94	Negligible	A
10—Duette-Urban land complex			
Duette	55	Negligible	A
Urban land	40	—	—
11—Dade-Urban land complex			
Dade	55	Negligible	A
Urban land	40	—	—
19—Margate fine sand, occasionally ponded, 0 to 1 percent slopes			
Margate	85	Negligible	A/D
20—Matlacha, limestone substratum-Urban land complex			
Matlacha, limestone substratum	50	Low	B
Urban land	45	—	—
21—Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes			
Okeelanta, drained	90	Negligible	A/D
25—Pennsuco silty clay loam			
Pennsuco, drained	95	Very high	B/D
36—Udorthents			
Udorthents	100	Negligible	A
37—Udorthents, marly substratum-Urban land complex			
Udorthents, marly substratum	55	Low	A
Urban land	45	—	—
38—Udorthents, shaped			
Udorthents, shaped	90	Low	A
40—Urban land			
Urban land	95	—	—
99—Water			
Water	100	—	—

Hydrologic Soil Group and Surface Runoff–Miami-Dade County Area, Florida			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**

Hydrologic Soil Group and Surface Runoff–Miami-Dade County Area, Florida			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
15—Urban land			
Urban land	98	—	—
41—Dade fine sand			
Dade	99	Negligible	A
99—Water			
Water	100	—	—

Data Source Information

Soil Survey Area: Broward County, Florida, East Part
Survey Area Data: Version 13, Oct 2, 2017

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 9, Oct 5, 2017

Hydric Soils

This table lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

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Report—Hydric Soils

Hydric Soils–Broward County, Florida, East Part				
Map symbol and map unit name	**Component**	**Percent of map unit**	**Landform**	**Hydric criteria**
9—Dade fine sand				
	Basinger	2	Drainageways on marine terraces	2
	Margate	1	Drainageways on marine terraces	2
11—Dade-Urban land complex				
	Basinger	2	Drainageways on marine terraces	2
	Margate	1	Drainageways on marine terraces	2
19—Margate fine sand, occasionally ponded, 0 to 1 percent slopes				
	Margate	85	Flats on marine terraces	2
	Basinger	5	Flats on marine terraces	2
	Plantation	5	Marshes on marine terraces	2, 3
21—Okeelanta muck, drained, frequently ponded, 0 to 1 percent slopes				
	Okeelanta, drained	90	Depressions on marine terraces	1, 3
	Sanibel	5	Depressions on marine terraces	2, 3
	Tequesta	3	Depressions on marine terraces	2, 3
	Basinger	2	Depressions on marine terraces	2
40—Urban land, 0 to 2 percent slopes				
	Boca	1	Flats on marine terraces, drainageways on marine terraces	2
	Hallandale	1	Flatwoods on marine terraces	2

Hydric Soils–Miami-Dade County Area, Florida				
Map symbol and map unit name	**Component**	**Percent of map unit**	**Landform**	**Hydric criteria**
15—Urban land, 0 to 2 percent slopes				
	Boca	1	Drainageways on marine terraces, flats on marine terraces	2
	Hallandale	1	Flatwoods on marine terraces	2

Data Source Information

Soil Survey Area: Broward County, Florida, East Part
Survey Area Data: Version 16, Jun 8, 2020

Soil Survey Area: Miami-Dade County Area, Florida
Survey Area Data: Version 12, Jun 9, 2020

APPENDIX B1

Geotechnical Information

REPORT OF GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 MISCELLANEOUS STRUCTURES, ROADWAY WIDENING AND PAVEMENT CORES
INTERSECTION OF S.R. 9 AND PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FP ID NO. 436303-1-52-01 | T.W.O. #12
PSI PROJECT NO. 0397-1021

February 4, 2016
Updated February 23, 2016

February 4, 2016
Updated February 23, 2016

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 4 & 6 MATERIALS AND RESEARCH OFFICE
14200 West S.R. 84
Davie, Florida 33323-5300

Attention: Mr. Matthew Gisondi, P.E.
Geotechnical Engineer

Re: Report of Geotechnical Engineering Services
S.R. 9 Miscellaneous Structures, Roadway Widening and Pavement Cores
Intersection of S.R. 9 and Pembroke Road
Broward County, Florida
FP ID No.: 427937-1-52-01 | T.W.O. #12
PSI Project No.: 0397-1021

Dear Mr. Gisondi:

Professional Service Industries, Inc. (PSI) has completed a geotechnical engineering study in connection with the noted project. Our services were provided in general accordance with our proposal No. 0397-165708. Authorization to perform our services was provided by means of Task Work Order (T.W.O.) No. 12, dated, December 12, 2015 to our existing contract with FDOT (Contract No. C9L13), executed on July 30, 2015.

We trust this report is adequate for your current needs; however, should you have any questions or should additional information be required, please do not hesitate to contact our office at (305) 471-7725.

Respectfully Submitted,

Professional Service Industries, Inc.
Certificate of Authorization No: 3684
THIS DOCUMENT HAS BEEN DIGITALLY
SIGNED AND SEALED BY:

PRINTED COPIES OF THIS DOCUMENT ARE
NOT CONSIDERED SIGNED AND SEALED. THE
SIGNATURE MUST BE VERIFIED ON THE
ELECTRONIC DOCUMENTS

Paul D. Passe, P.E.
Chief Engineer
FL. License No. 34750

Riley O'Brien, M.E., E.I.
Department Manager

cc: Addressee (PDF)
File (1 and PDF)

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1.0 PROJECT INFORMATION

The subject project is located at the intersection of S.R. 9 and Pembroke Road in Broward County, Florida. More specifically, the project includes the S.R. 9 north and southbound off-ramps and associated intersection improvements. A site vicinity map identifying the project location with respect to existing streets and features is presented in **Figure 1** of **Appendix A**.

Currently, plans are underway to improve the referenced off-ramps and intersection. As part of the improvements, the following new developments are planned:

- S.R. 9 north and southbound off-ramps will be widened to include an additional outside turn lane.
- The existing mast arm at the northeast corner of the intersection will be replaced
- Milling and resurfacing, as well as the addition of sidewalks are also planned along the off-ramps.

If any of the noted information is incorrect or has changed, please notify PSI so that we may amend the recommendations presented in this report, if appropriate.

2.0 FIELD EXPLORATIONS AND SUBSURFACE CONDITIONS

2.1 GENERAL

The field scope of services for the project included site reconnaissance, marking the field exploration locations, clearing underground utilities, maintenance of traffic (MOT), and conducting Standard Penetration Test (SPT) borings/sampling. The approximate locations at which the various field explorations were performed are presented as a Boring Location Plan within **Sheets 1** and **2** of **Appendix B**.

Plane coordinates data was collected at the field exploration locations using a hand held GPS instrument (Garmin 64 map) with the reported data being accurate to within 15 feet. The plane coordinates data is included within the Soil Profile sheets, as well as within **Table 1** of **Appendix C**. In addition **Table 1** within **Appendix C** includes, the following information:

- Northing/easting coordinates.
- Station/offset – interpreted from the provided Plan Sheet No. 47 dated December 31, 2013.
- Boring depths and groundwater depth.

Attenuator trucks, police officers, barricades, cones and sign devices were used as necessary and in general compliance with FDOT Design Standards (Index 600 series).

2.2 SPT BORINGS

To evaluate the subsurface conditions at the site, we drilled/sampled seven SPT borings that were advanced to depths ranging from 6 to 25 feet below existing grade. The SPT borings were performed using a CME-55 truck mounted drilling rig equipped with an automatic hammer.

After seating the sample spoon six inches, the number of successive blows required to drive the sampler twelve inches into the soil constitutes the test result commonly referred to as the "N" value. The “N” value has been empirically correlated with various soil properties and is considered

to be indicative of the relative density of cohesionless soils and the consistency of cohesive materials. The recovered split spoon samples were visually classified in the field and transported to our office for further review. Following completion of our field services, all boreholes were grout sealed, the asphalt surface patched where necessary and the areas around the test location generally cleaned as required.

2.3 PERCOLATION TESTS

PSI performed a percolation test at locations B-3 and B-5, with testing performed at depths of 10, 15 and 20 feet below grade. The percolation tests were performed in general accordance with the South Florida Water Management District (SFWMD) procedures for the "Usual Condition Constant Head" Percolation Test. SPT sampling was performed simultaneously as the boreholes were advanced using a 6-inch diameter casing. A 4-inch diameter perforated PVC pipe was placed in the borehole prior to retrieving the casing. Water was then pumped into the borehole in order to raise the water level as close to the ground surface as possible. Once the inflow equalized with the outflow rate, the average pumping rate and level of the water for this stabilized flow rate was recorded.

The hydraulic conductivity values determined from the tests are presented in **Table 2** of **Appendix C**. The values are in units of cubic feet of flow per second, per square foot of seepage area, per foot of head (cfs/ft^2-ft). The tabulated values are ultimate values. The designer should apply an appropriate factor of safety to the reported values.

2.4 PAVEMENT CORES

PSI collected four, six-inch diameter pavement cores for this project. Additionally, PSI performed SPT sampling below the extracted pavement core level. The sampling was intended to determine the base and subgrade thicknesses at the test locations.

The photographs of the sampled pavement cores are included within the Pavement Core Photographs and Coring Location Plans on **Figures 4** through **7** of **Appendix A**. A Summary of Pavement Evaluation Coring and Condition Data sheet (FDOT Form No. 675-030-09) is presented on **Table 3** in **Appendix C**.

Upon completion of field testing, the pavement core locations were patched and the site was generally cleaned, as required.

The District Pavement Materials Engineer, Mr. Jesus Caballero, P.E., has provided the following milling and resurfacing recommendations.

“The base course is limerock. The subgrade was determined to a silty to fine sand with some limerock fragments. The milling recommendation is for 1.50 inches with FC 12.5. In the majority of cases limerock is used for both the base and subgrade. It is recommended that 8.5 inches be used for the base and 12 inches for the subgrade. Core number 4 had asphalt base course type 3 instead of limerock base. Milepost data was obtained from the SR9/I-95 straight line diagrams.”

These recommendations are based solely on the condition of the existing pavement evaluation and cracking. These recommendations should not be considered final and are subject to change based on the anticipated design traffic loadings, as this information has not been taken into consideration during the preparation of this report.

2.5 Resilient Modulus (M_R) Bulk Soil Samples

PSI collected four bulk soil samples of the roadway embankment along the S.R. 9 (I-95) north and southbound off-ramp alignments for Resilient Modulus (M_R) testing. The samples were delivered to the State Materials Office (SMO) for M_R testing and soil classification. Based on the soil testing performed by SMO, the soils can be classified as A-3 (select material). The 90th percentile M_R value determined by SMO is 9,900 psi. The resilient modulus test results are presented in **Appendix C**.

2.6 Soil Survey of Broward County

The Soil Survey of Broward County, Florida, published by the United States Department of Agriculture (USDA) was reviewed for general near-surface soil information within the general project vicinity. The map is shown on **Figure 2** of **Appendix A** and lists the various soil units.

2.7 USGS Topographic Map

The USGS Topographic Map is presented in **Figure 3** of **Appendix A**.

2.8 Subsurface Conditions

The soil types encountered at the boring locations are presented in the Soil Profiles and Report of Core Borings included as **Sheets 1** and **2** of **Appendix B**. Soil stratification is based on an examination of the recovered soil samples, laboratory testing on select samples and interpretation of field boring logs by a geotechnical engineer. The depths represent the approximate boundaries between soil types of significantly different engineering properties. The actual transition may be gradual. In some cases, small variations in properties not considered pertinent to our engineering evaluation may have been abbreviated or omitted for clarity. The profiles represent the conditions at the boring locations only and variations may occur between the borings. **Table A** below summarizes the different strata encountered.

Table A: Soil Strata

Stratum	Soil Description	USCS Classification	AASHTO Soil Classification
1	(Topsoil) Dark Brown Organic Fine **SAND** with Trace of Roots and Occasional Limerock	OL	A-8
2	Asphalt	-	-
3	Light Brown/Gray **LIMEROCK** with Some Fine Sand and Few to Little Silt	GM	A-1-b
4	Light Brown/Gray Fine **SAND** with Little Limerock and Few Silt	SP-SM	A-3
5	Light Brown/Gray Fine **SAND**	SP	A-3
6	Light Brown/Gray **LIMESTONE** with Fine Sand	-	-

Based upon the exploratory borings and results of the laboratory testing, the near surface soils in the project area have been grouped into five different strata (plus asphalt). Each stratum group exhibits a range of engineering properties related to suitability for roadway construction as outlined by FDOT Standard Index 505. The Roadway Soil Survey sheet presented in **Sheet 3** of **Appendix B** shows the general range of engineering properties measured in the laboratory for the various soil strata encountered during our exploration.

2.9 GROUNDWATER CONDITIONS

When encountered, the groundwater levels were measured in the completed boreholes after termination of the drilling operations. The ground water level was encountered at depths ranging from 7.0 to 8.1 feet below the existing ground surface.

The variation in groundwater levels is due to the ground surface elevation difference that exists between the boring locations. Variations in groundwater elevations may be due to boreholes not given enough time to stabilize before readings were obtained. Seasonal variations, temperature, land use, and rainfall conditions may influence the depths of the groundwater. At a time of the year different from the time of drilling, there is a possibility of a change in the recorded levels. The water table measurement has been identified on **Sheets 1** and **2** of **Appendix B**.

2.10 ESTIMATED SEASONAL HIGH GROUNDWATER TABLE (ESHGWT)

Based on the information gathered from borings indicated the groundwater table fluctuated from approximately elevation -0.6 to +1.2 feet (NAVD 88), with an average of +0.4 feet (NAVD 88). To determine the ESHGWT well number 255936080091702-G-2478 (G-2478) was analyzed. Well G-2478 is located approximately 0.70 miles east of the project and has readings dating back to 1981. In our opinion, the 90th percentile value of groundwater elevation data during the wet season is the most reliable indicator to determine the ESHGWT. This value was reported to be +3.72 NGVD 29 (+2.13 NAVD 88).

Based on the results of our field explorations, elevations obtained by the Wantman Group Inc. from the DTM files and review of the well information in this area, we recommend that an ESHGWT elevation of +2.5 feet (NAVD 88) be utilized.

Based on the boring elevations provided from the DTM files we believe that the three feet clearance required for the roadway base course above the seasonal high groundwater table will be satisfied. It should be noted that to accurately determine the seasonal high groundwater levels a groundwater monitoring program should be conducted throughout the wet season.

3.0 LABORATORY TESTING

3.1 GENERAL

Soil samples collected from the borings were visually reviewed in the laboratory by a geotechnical engineer to confirm the field classification. Classification was based on visual observations with the aid of the laboratory test results performed on select samples. The results of the laboratory testing are tabulated in **Table 4** of **Appendix C.**

3.2 GRAIN SIZE ANALYSIS

Grain-size analysis tests were conducted in general accordance with the following methods:

- ASTM C-117-03 – Standard Test Method for Materials Finer than 75-µm (No.200) Sieve in Mineral Aggregates by Washing (AASHTO Designation T 11-05)
- ASTM C-136-05 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates (AASHTO Designation T 27-06)

The Particle Size Distribution Reports are also included in **Appendix C**.

3.3 MOISTURE CONTENT DETERMINATIONS

The laboratory moisture content test consists of determining the percentage of moisture in selected samples in general accordance with FDOT test designation FM 1-T265 (ASTM test designation D-2216).

3.4 ORGANIC CONTENT DETERMINATIONS

The organic content test consists of the determination of the percentage of organic material present in a soil sample in general accordance with FDOT Test Designation FM1-T267 (ASTM Test Designation D-2974, titled “Moisture, Ash, and Organic Matter of Peat and Other Organic Soils”).

4.0 ENGINEERING AND CONSTRUCTION RECOMMENDATIONS - ROADWAY

4.1 SITE MATERIALS

The site should be prepared in accordance with FDOT Standard Specifications for Road and Bridge Construction, Section 110 and 120. Any imported fill soils should consist of materials conforming to Design Standard Index 505 and compacted in general accordance with Section 120-9 of the Standard Specifications for Road and Bridge Construction. The Roadway Soil Survey sheet presented as **Sheet 3** of **Appendix B**, shows the general range of engineering properties measured in the laboratory for the various soil strata encountered during our exploration, as well as the construction recommendations. The following summarizes the generalized use of the subsurface materials that will most likely be encountered during construction.

1. The material from stratum number 1 (A-8) should be removed as part of the clearing and grubbing operations in accordance with Standard Specification for Road and Bridge Construction Section 110.

2. The material from stratum number 2 is Asphalt and should be removed or milled as required by the roadway design.

3. The material from strata numbers 3 (A-1-b), 4 (A-3), and 5 (A-3) are Select (S). These materials appear to be satisfactory for use in the embankment when utilized in accordance with Design Standard Index 505.

4. The material from stratum number 6 corresponds to the natural limestone formation. This material typically offers a high resistance to excavation. Special equipment and breaking tools may be required to excavate it. This material is also difficult to dewater due to its high porosity and permeability.

4.2 TEMPORARY SIDE SLOPES

The Contractor is responsible for the design of the temporary ground support system. Based on the results of the soil borings, an unsupported vertical cut is not considered stable or safe during construction. An unsupported vertical cut will cause cracks on the surface of the asphalt-paved roadway due to a reduction in the soil shear strength. Materials removed from the excavation should not be stockpiled immediately adjacent to the cut. Open excavations shall be backfilled as soon as possible to prevent instability, which may cause collapse of the excavations and injury to people. The Contractor is responsible for backfilling the excavation in a timely fashion such that cut instability (excavation failure) will not occur. The temporary ground support system should be in conformance with the Occupational Safety and Health Administration (OSHA) Standards.

4.3 GROUNDWATER CONTROL

Depending upon groundwater levels at the time of construction or as a result of perched/standing water after a rain event, some form of dewatering may or may not be required to achieve the required compaction. If required, groundwater can normally be controlled in shallow excavations with pumps and sumps. During subgrade soil preparation the soils below design grade could become disturbed by construction activities. If this becomes the case, the contractor may be directed by the engineer to remove the disturbed or pumping soils to a depth of one to two feet below design grade and backfill the area with structural fill. In such situations, FDOT Indices 500 and 505 should be followed closely.

4.4 General Roadway Construction Recommendations

The overall site preparation and mechanical densification work for the construction of the roadway should be in accordance with the FDOT Standard Specifications for Road and Bridge Construction and Standard Index requirements.

5.0 RECOMMENDATIONS FOR SOIL PARAMETERS – MISCELLANEOUS STRUCTURES

Based on the results of our field exploration program, a Standard Foundation Design can be used along with the soil parameters listed in **Table 5** of **Appendix C** with the FDOT MathCAD program (i.e. "Drilled Shaft Foundation for Sign & Signal Structures" version 2.05). The parameters were derived using correlations noted in the 2016 FDOT Soils and Foundation Handbook (SFH). A summary of the results is shown in **Table B** below.

Table B: Foundation Design Parameters for Mast Arm

Design Type	Minimum Shaft Embedment Length[1] (feet)	Offset (feet)	γ (Effective) (pcf)	ϕ (degrees)	Corrected N-Safety Value (bpf)
Standard	12	-[2]	57	37	17
Standard	14	-[2]	57	37	17
Standard	16	-[2]	57	37	17
Standard	18	-[2]	57	37	17
Standard	20	-[2]	57	37	17

Notes:
1. Shaft embedment length is measured from the existing ground.
2. Refers to foundation length below which the foundation will have equal to or greater than "2.5 times Shaft Diameter horizontal soil cover (face-to-pile to face-of-slope)". Refer to Page 162 of the SFH.

The drilled shaft should be constructed in accordance with Standard Specifications for Road and Bridge Construction, Section 455 "Structures Foundations".

6.0 FHWA CHECKLIST

As referenced in the Structures Design Guidelines, conformance to the FHWA Report "Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Plans and Specifications" prepared by the Geotechnical and Materials Branch, FHWA, Washington, D.C., dated October 1985 is required when preparing geotechnical reports. The FHWA checklist for this report is enclosed in **Appendix D**.

7.0 REPORT LIMITATIONS

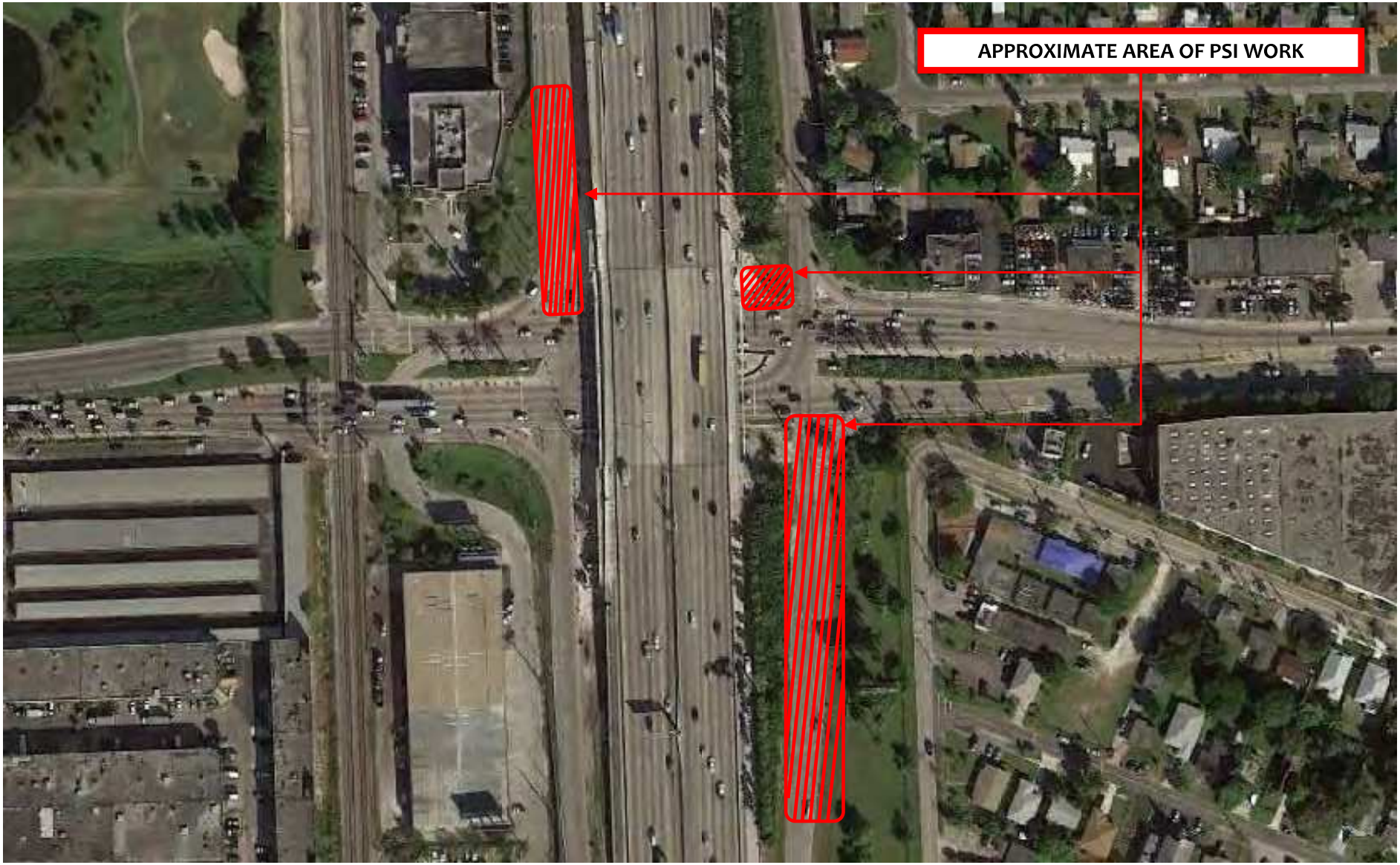
Our professional services have been performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices at the time of this report. This company is not responsible for the conclusions, opinions or recommendations made by others based on this data. No other warranties are implied or expressed. After the plans and specifications are complete, it is recommended that PSI be provided the opportunity to review the final design and specifications, in order to verify that the earthwork and recommendations are properly interpreted and implemented. At that time, it may be necessary to submit supplemental recommendations.

The scope of investigation was intended to evaluate soil conditions within the influence of the proposed roadway widening and miscellaneous structures. The analyses and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design, nature or location of the project.

The scope of our services did not include a formal environmental assessment for the presence or absence of hazardous or toxic materials in the soil and groundwater. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

APPENDIX A

SITE VICINITY MAP



GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA

DATE: 02/03/2015

DRAWN: RO

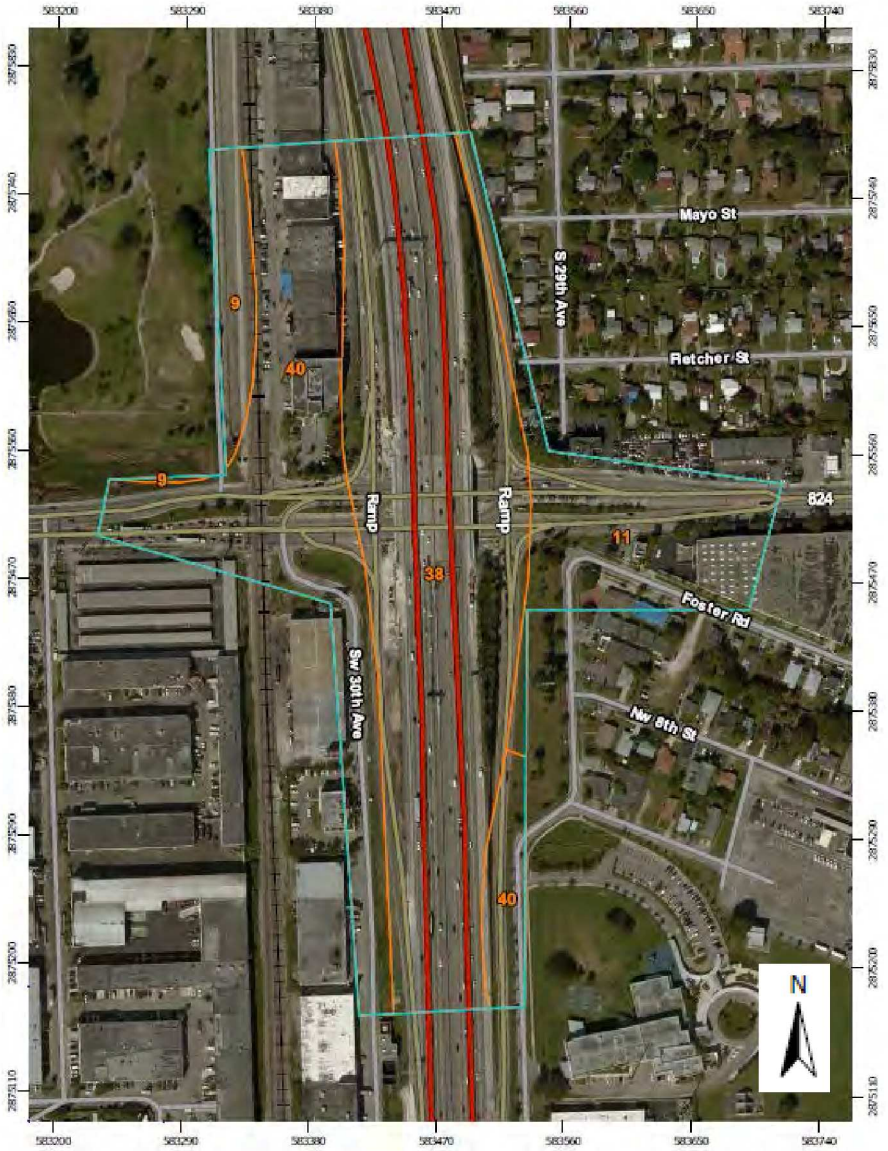
CHKD:: PP

FIGURE No.: 1

FP ID No.: 436303-1-52-01 | T.W.O. #12
PSI PROJECT No.: 0397-1021

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

USDA SOIL SURVEY MAP



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Map Unit Legend

Broward County, Florida, East Part (FL606)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
9	Dade fine sand	1.3	4.2%
11	Dade-Urban land complex	5.1	16.4%
38	Udorthents, shaped	14.8	47.5%
40	Urban land	9.9	32.0%
Totals for Area of Interest		**31.1**	**100.0%**

USDA Natural Resources Conservation Service

GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA

DATE: 02/03/2015

DRAWN: RO

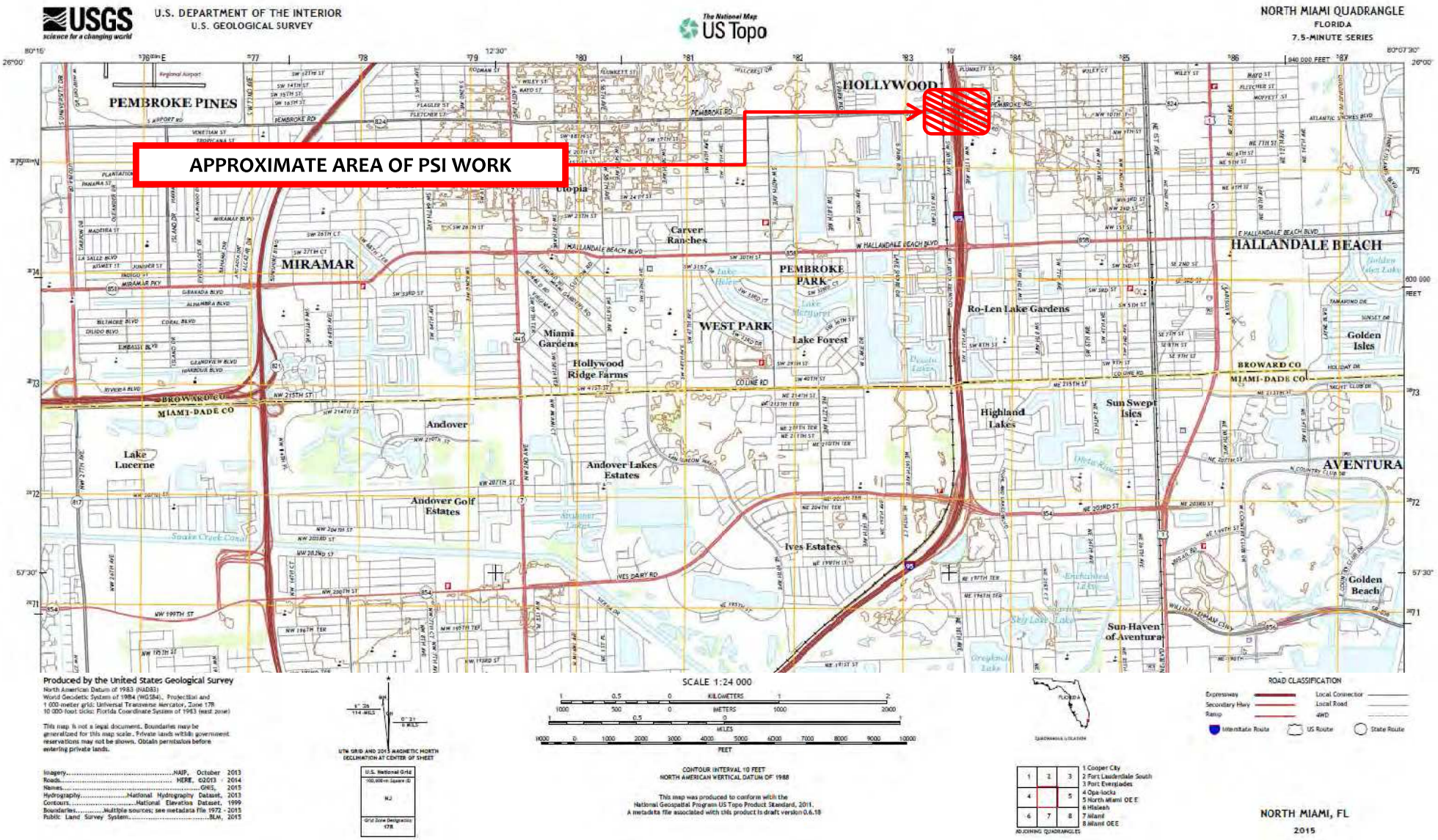
CHKD:: PP

FIGURE No.: 2

FP ID No.: 436303-1-52-01 | T.W.O. #12
PSI PROJECT No.: 0397-1021

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

USGS TOPOGRAPHIC MAP



GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA

DATE: 02/03/2015

DRAWN: RO

CHKD:: PP

FIGURE No.: 3

FP ID No.: 436303-1-52-01 | T.W.O. #12
PSI PROJECT No.: 0397-1021

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

PAVEMENT CORE PHOTOGRAPH/CORE LOCATION PHOTOGRAPH

PC-1
LENGTH = 5.00”

GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA

DATE: 01/26/2016

DRAWN: CD

CHKD:: RO

FIGURE No.: 4

FP ID No.: 436303-1-52-01 | T.W.O. #12
PSI PROJECT No.: 0397-1021

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

PAVEMENT CORE PHOTOGRAPH/CORE LOCATION PHOTOGRAPH

PC-2
LENGTH = 4.50”

GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA

DATE: 01/26/2016

DRAWN: CD

CHKD:: RO

FIGURE No.: 5

FP ID No.: 436303-1-52-01 | T.W.O. #12
PSI PROJECT No.: 0397-1021

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

PAVEMENT CORE PHOTOGRAPH/CORE LOCATION PHOTOGRAPH

PC-3
LENGTH = 6.25”

GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA

FIGURE No.: 6

FP ID No.: 436303-1-52-01 | T.W.O. #12
PSI PROJECT No.: 0397-1021

DATE: 01/26/2016

DRAWN: CD

CHKD:: RO

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

PAVEMENT CORE PHOTOGRAPH/CORE LOCATION PHOTOGRAPH

PC-4
LENGTH = 11.50”

GEOTECHNICAL ENGINEERING SERVICES
S.R. 9 AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA

DATE: 01/26/2016

DRAWN: CD

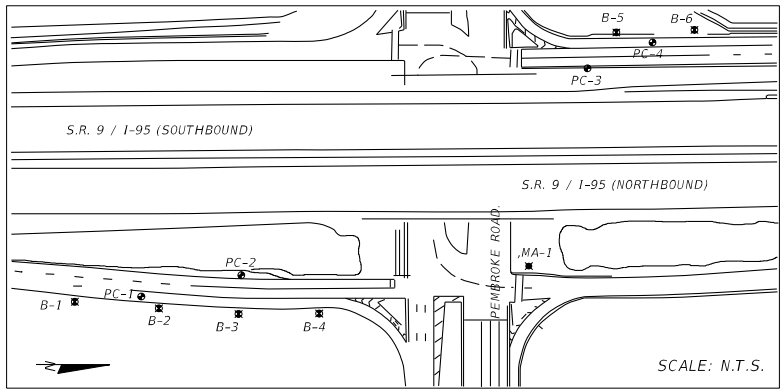
CHKD:: RO

FIGURE No.: 7

FP ID No.: 436303-1-52-01 | T.W.O. #12
PSI PROJECT No.: 0397-1021

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

APPENDIX B

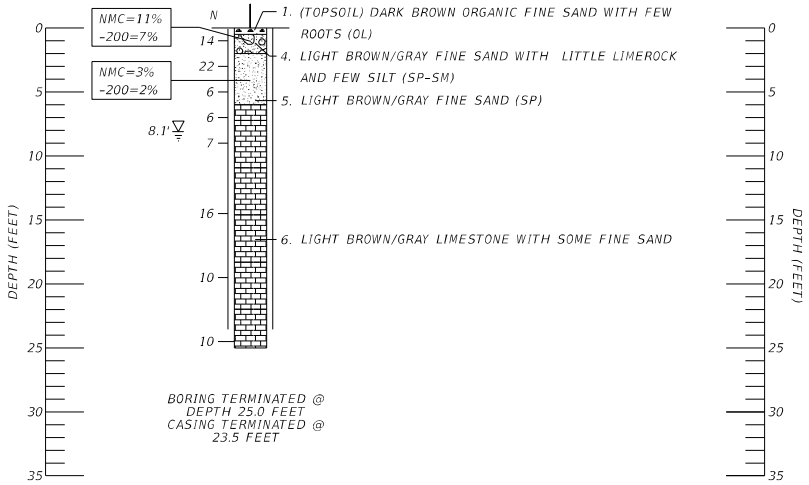


S.R. 9 (I-95) AT PEMBROKE ROAD
PSI PROJECT No. 0397-1021, T.W.O. #12

- APPROXIMATE SPT BORING LOCATION
- APPROXIMATE ASPHALT CORE LOCATION
- APPROXIMATE SPT/MAST ARM BORING LOCATION

BORING No.	MA-1
NORTHING	605254
EASTING	930236
STATION	288+91
OFFSET	140' RT.
DATE	01/05/16

0 5' 10'
VERTICAL SCALE
HORIZONTAL N.T.S.



BORING TERMINATED @ DEPTH 25.0 FEET
CASING TERMINATED @ 23.5 FEET

NOTES

- PLANE COORDINATES DATA AT THE BORING LOCATIONS WERE OBTAINED BY PSI USING A HAND HELD GPS INSTRUMENT (GARMIN 64MAM). THE DATA IS ACCURATE TO WITHIN 15 FEET.
- N — NUMBERS TO THE LEFT OF THE BORINGS INDICATE SPT "N" VALUE FOR 12" PENETRATION
- GROUNDWATER LEVEL, ON THE DATE OF DRILLING.
- 3-INCH DIAMETER CASING USED (NW)
- -200 — PERCENTAGE PASSING NO.200 SIEVE
- NMC — NATURAL MOISTURE CONTENT (%)
- OC — ORGANIC CONTENT (%)

DRILLED BY: LUIS RODRIGUEZ (PSI).

LEGEND

1. (TOPSOIL) DARK BROWN ORGANIC SILTY FINE SAND WITH TRACES OF ROOTS (OL)
2. ASPHALT
3. LIGHT BROWN/GRAY LIMEROCK WITH SOME FINE SAND AND FEW TO LITTLE SILT (GM)
4. LIGHT BROWN/GRAY FINE SAND WITH LITTLE LIMEROCK AND FEW SILT (SP-SM)
5. LIGHT BROWN/GRAY FINE SAND (SP)
6. LIGHT BROWN/GRAY LIMESTONE WITH SOME FINE SAND

STRATA 2 AND 3 WERE NOT ENCOUNTERED IN BORING MA-1 BUT WAS ENCOUNTERED IN OTHER AREAS OF THE PROJECT.

SPT NOTES

HAMMER WEIGHT	140 LBS.
HAMMER DROP HEIGHT	30 INCHES
TYPE OF HAMMER	AUTOMATIC
SPOON INSIDE DIAMETER	1.500 INCH
SPOON INSIDE DIAMETER (AT OPENING)	1.375 INCH
SPOON OUTSIDE DIAMETER	2.000 INCH
TYPE OF RIG	CME 55

GRANULAR MATERIALS - RELATIVE DENSITY	AUTOMATIC HAMMER SPT-N (BLOWS/12-INCH)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	**AUTOMATIC HAMMER SPT-N (BLOWS/12-INCH)**
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

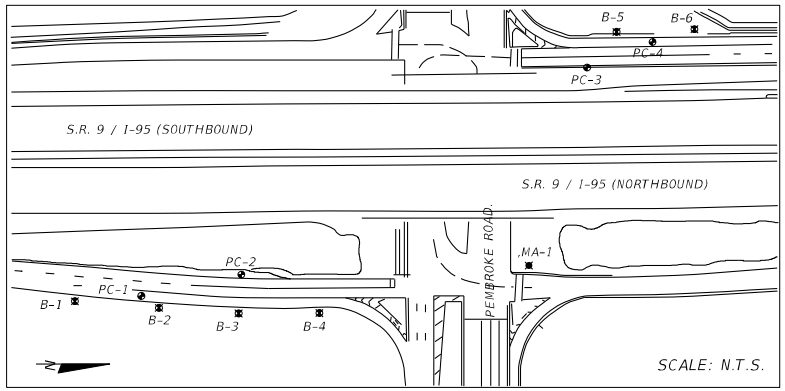
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

REPORT OF CORE BORINGS

SHEET NO. 1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

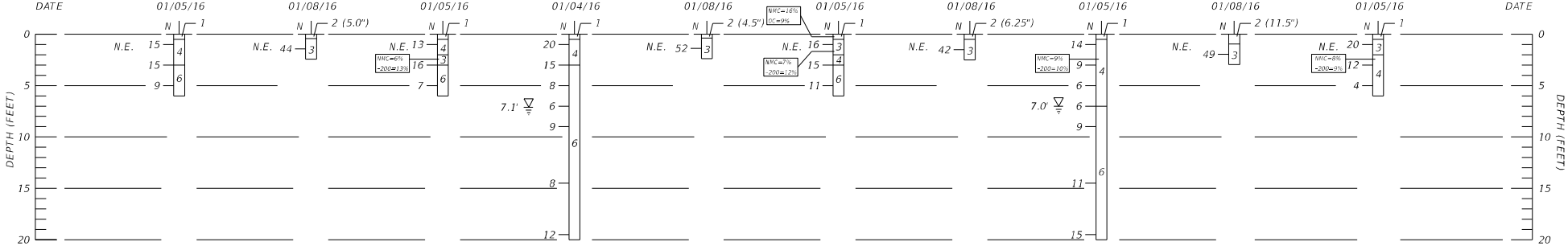


- APPROXIMATE SPT BORING LOCATION
- APPROXIMATE ASPHALT CORE LOCATION
- APPROXIMATE SPT/MAST ARM BORING LOCATION

0 5' 10'

VERTICAL SCALE
HORIZONTAL N.T.S.

BORING No.	B-1	PC-1	B-2	B-3	PC-2	B-4	PC-3	B-5	PC-4	B-6	BORING No.
NORTHING	604681	604765	604788	604889	604891	604991	605323	605359	605406	605459	NORTHING
EASTING	930298	930289	930304	930308	930258	930304	929981	929933	929944	929927	EASTING
STATION	283+15	284+00	284+24	285+25	285+28	286+27	289+68	290+07	290+51	291+05	STATION
OFFSET	183' RT.	178' RT.	193' RT	200' RT.	151' RT.	200' RT.	110' LT.	158' LT.	146' LT.	162' LT.	OFFSET
DATE	01/05/16	01/08/16	01/05/16	01/04/16	01/08/16	01/05/16	01/08/16	01/05/16	01/08/16	01/05/16	DATE



LEGEND

1. (TOPSOIL) DARK BROWN ORGANIC SILTY FINE SAND WITH TRACES OF ROOTS (A-8)
2. ASPHALT
3. LIGHT BROWN/GRAY LIMEROCK WITH SOMEFINE SAND AND FEW TO LITTLE SILT (A-1-b)
4. LIGHT BROWN/GRAY FINE SAND WITH LITLE LIMEROCK AND FEW SILT (A-3)
5. LIGHT BROWN/GRAY FINE SAND (A-3)
6. LIGHT BROWN/GRAY LIMESTONE WITH FINE SAND

NOTES

- PLANE COORDINATES DATA AT THE BORING LOCATIONS WERE OBTAINED BY PSI USING A HAND HELD GPS INSTRUMENT (GARMIN 64MAP). THE DATA IS ACCURATE TO WITHIN 15 FEET.
- N NUMBERS TO THE LEFT OF THE BORINGS INDICATE SPT "N" VALUE FOR 12" PENETRATION
- ▽ GROUNDWATER LEVEL, ON THE DATE OF DRILLING.
- N.E. GROWNDWATER LEVEL NOT ENCOUNTERED
- -200, PERCENTAGE PASSING NO.200 SIEVE
- NMC NATURAL MOISTURE CONTENT (%)
- OC ORGANIC CONTENT (%)
- PERCOLATION TESTS PERFORMED AT DEPTHS OF 10 FEET, 15 FEET AND 20 FEET WITHIN BORINGS B-3 AND B-5.
- SOIL IDENTIFIED IN LEGEND "5" WAS ONLY ENCOUNTERED IN BORING MA-1.
- DRILLED BY: LUIS RODRIGUEZ (PSI).

GRANULAR MATERIALS- RELATIVE DENSITY	AUTOMATIC HAMMER SPT-N (BLOWS/12-INCH)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	**AUTOMATIC HAMMER SPT-N (BLOWS/12-INCH)**
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

SPT NOTES

HAMMER WEIGHT	140 LBS.
HAMMER DROP HEIGHT	30 INCHES
TYPE OF HAMMER	AUTOMATIC
SPOON INSIDE DIAMETER	1.500 INCH
SPOON INSIDE DIAMETER (AT OPENING)	1.375 INCH
SPOON OUTSIDE DIAMETER	2.000 INCH
TYPE OF RIG	CME-55

S.R. 9 (I-95) AT PEMBROKE ROAD
PSI PROJECT No. 0397-1021, T.W.O. #12

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

SOIL PROFILES

SHEET NO. 2

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

DATE OF SURVEY: 01/04/16 - 01/08/16
SURVEY MADE BY: PSI
SUBMITTED BY: PAUL PASSE, P.E.

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
MATERIALS AND RESEARCH

DISTRICT: IV
ROAD NO.: 9
COUNTY: BROWARD

FINANCIAL PROJECT ID : 436303-1-52-01

PROJECT NAME: S.R. 9 (I-95) AT PEMBROKE ROAD

ROADWAY WIDENING AND MAST ARM STRUCTURES

S.R. 9 SURVEY BEGINS STA. : 288+91 SURVEY ENDS STA. : 291+05

	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS PERCENT PASS						ATTERBERG LIMITS (%)					CORROSION TEST RESULTS				
STRATUM NO.	NO. OF TESTS	% ORGANIC	NO. OF TESTS	MOISTURE CONTENT	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTIC INDEX	AASHTO GROUP	DESCRIPTION	NO. OF TESTS	RESISTIVITY ohm-cm	CHLORIDE ppm	SULFATES ppm	pH
1	1	9	1	16	-	-	-	-	-	-	-	-	-	(A-8)	(TOPSOIL) DARK BROWN ORGANIC SILTY FINE SAND WITH TRACES OF ROOTS	-	-	-	-	-
2.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ASPHALT	-	-	-	-	-
3.	-	-	2	6-7	2	53-55	47-48	34-36	18	12-13	-	-	-	(A-1-b)	LIGHT BROWN/GRAY LIMEROCK WITH SOME FINE SAND AND FEW TO LITTLE SILT	-	-	-	-	-
4.	-	-	3	8-11	3	76-83	67-71	47-50	16-19	7-10	-	-	-	(A-3)	LIGHT BROWN/GRAY FINE SAND WITH LITLE LIMEROCK AND FEW SILT	-	-	-	-	-
5.	-	-	1	3	1	100	93	67	13	2	-	-	-	(A-3)	LIGHT BROWN/GRAY FINE SAND	-	-	-	-	-
6.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	LIGHT BROWN/GRAY LIMESTONE WITH FINE SAND	-	-	-	-	-

EMBANKMENT AND SUBGRADE MATERIAL

STRATA BOUNDARIES ARE APPROXIMATE. MAKE FINAL CHECK AFTER GRADING.

▽ - WATER TABLE ENCOUNTERED

▼ - ESTIMATED SEASONAL HIGH GROUNDWATER

NOTES:

1. THE MATERIAL FROM STRATUM NUMBER 1 (A-8) SHOULD BE REMOVED AS PART OF THE CLEARING AND GRUBBING OPERATIONS IN ACCORDANCE WITH STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION SECTION 110.
2. THE MATERIAL FROM STRATUM NUMBER 2 IS ASPHALT AND SHOULD BE REMOVED OR MILLED AS REQUIRED BY THE ROADWAY DESIGN.
3. THE MATERIAL FROM STRATA NUMBERS 3 (A-1-b), 4 (A-3), AND 5 (A-3) ARE SELECT (S). THESE MATERIALS APPEAR TO BE SATISFACTORY FOR USE IN THE EMBANKMENT WHEN UTILIZED IN ACCORDANCE WITH DESIGN STANDARD INDEX 505.
4. THE MATERIAL FROM STRATUM NUMBER 6 CORRESPONDS TO THE NATURAL LIMESTONE FORMATION. THIS MATERIAL TYPICALLY OFFERS A HIGH RESISTANCE TO EXCAVATION. SPECIAL EQUIPMENT AND BREAKING TOOLS MAY BE REQUIRED TO EXCAVATE IT. THIS MATERIAL IS ALSO DIFFICULT TO DEWATER DUE TO ITS HIGH POROSITY AND PERMEABILITY.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

PROFESSIONAL SERVICE INDUSTRIES, INC. (PSI)
7950 N.W. 64TH STREET, MIAMI, FL 33166
PHONE: (305) 471-7725 - FAX: (305) 593-1915
CERTIFICATE OF AUTHORIZATION No. 3684
ENGINEER OF RECORD: PAUL PASSE, P.E. No. 34750

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

ROADWAY SOIL SURVEY

SHEET NO. 3

APPENDIX C

TABLE 1
SUMMARY OF TEST LOCATIONS
S.R. 9 AND PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. NO. 12
PSI PROJECT NO. 0397-1021

BORING No.	LATITUDE	LONGITUDE	NORTHING[1]	EASTING[1]	STATION[2]	OFFSET[2] (FEET)	BORING DEPTH (FEET)	GROUNDWATER DEPTH (FEET)	BORING ELEVATION (NAVD 88)	GROUNDWATER ELEVATION (NAVD 88)
MA-1	25.9964	80.1656	605254	930236	288+91	140 RT.	25	8.1	9.30	1.2
B-1	25.9948	80.1654	604681	930298	283+15	183 RT.	6	N.E.[3]	N/A	N/A
B-2	25.9951	80.1654	604788	930304	284+24	193 RT.	6	N.E.[3]	N/A	N/A
B-3	25.9954	80.1654	604889	930308	285+25	200 RT.	20	7.1	7.71	0.6
B-4	25.9957	80.1654	604991	930304	286+27	200 RT.	6	N.E.[3]	N/A	N/A
B-5	25.9967	80.1665	605359	929933	290+07	158 LT.	20	7.0	6.36	-0.6
B-6	25.9970	80.1665	605459	929927	291+05	162 LT.	6	N.E.[3]	N/A	N/A
PC-1	25.9950	80.1655	604765	930289	284+00	178 RT.	2	N.E.[3]	N/A	N/A
PC-2	25.9954	80.1656	604891	930258	285+28	151 RT.	2	N.E.[3]	N/A	N/A
PC-3	25.9966	80.1664	605323	929981	289+68	110 LT.	3	N.E.[3]	N/A	N/A
PC-4	25.9968	80.1665	605406	929944	290+51	146 LT.	3	N.E.[3]	N/A	N/A

NOTES:

(1) Northings and Eastings were obtained using a hand held GPS instrument (Garmin Map 64) that has a 15 foot accuracy.

(2) Station and Offset values were approximated from the provided Plan Sheet No. 47 dated December 31, 2013.

(3) N.E. = Not Encountered

(4) Boring elevations were only obtained for the borings were groundwater was encountered. Elevations were provided by Wantman Group Inc. from the DTM file.

TABLE 2
SUMMARY OF PERCOLATION TEST RESULTS
S.R. 9 AND PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. NO. 12
PSI PROJECT NO. 0397-1021

BORING No.	DATE PERFORMED	CASING DIAMETER (inches)	PERFORATED PVC DIAMETER (inches)	DEPTH OF HOLE (feet)	DEPTH TO GROUNDWATER LEVEL BELOW GROUND		HYDRAULIC HEAD	SATURATED HOLE DEPTH,	AVERAGE FLOW RATE,	HYDRAULIC CONDUCTIVITY,
					PRIOR TO TEST	DURING TEST	H_2 (feet)	D_S (feet)	Q (gpm)	K (cfs/ft^2-ft)
B-3	1/4/2016	6	4	10.0	7.1	0.0	7.1	2.9	2.0	6.08E-05
B-3	1/4/2016	6	4	15.0	7.1	0.0	7.1	7.9	4.0	6.90E-05
B-3	1/4/2016	6	4	20.0	7.1	0.0	7.1	12.9	9.0	1.08E-04
B-5	1/5/2016	6	4	10.0	7.0	0.0	7.0	3.0	2.0	6.12E-05
B-5	1/5/2016	6	4	15.0	7.0	0.0	7.0	8.0	5.0	8.72E-05
B-5	1/5/2016	6	4	20.0	7.0	0.0	7.0	13.0	11.0	1.34E-04

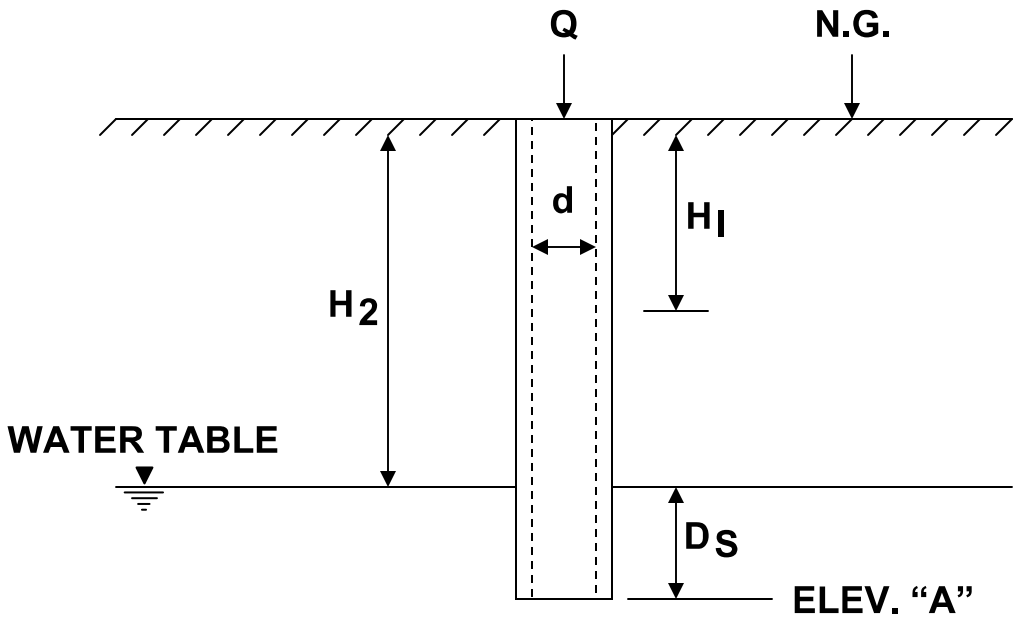
NOTES:

(1) The above hydraulic conductivity values are for a french drain installed to the same depth as the borehole tests. The values represent an ultimate value. The designer should apply the appropriate factor

(2) The hydraulic conductivity values were calculated based on the South Florida Water Management District's USUAL OPEN HOLE CONSTANT HEAD percolation test procedure as shown on the following page.

(3) A hole diameter of six inches was used for the computation of the Hydraulic Conductivity values presented in the above table. Cave in depths at the time of drilling was noted at 10 feet and 8 feet in borings B-3 and B-5, respectively.

USUAL OPEN – HOLE TEST



$$K = \frac{4Q}{\pi d (2H_2^2 + 4H_2D_S + H_2d)}$$

K= HYDRAULIC CONDUCTIVITY (CFS/FT.^{2} - FT.HEAD)

Q= "STABILIZED" FLOW RATE (CFS)

d= DIAMETER OF TEST HOLE (FEET)

H_2 = DEPTH TO WATER TABLE (FEET)

D_S = SATURATED HOLE DEPTH (FEET)

ELEV. "A"= PROPOSED TRENCH BOTTOM ELEV.

H_I = AVERAGE HEAD ON UNSATURATED HOLE SURFACE (FT.HEAD)

TABLE 3
SUMMARY OF PAVEMENT CORING AND EVALUATION AND CONDITION DATA SHEET (FDOT Form No. 675-030-09)
S.R. 9 AND PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. NO. 12
PSI PROJECT NO. 0397-1021

Cored By:	LUIS RODRIGUEZ (PSI)		Date: 1/8/2016	Page: Table 3	Typical Section No.		
PSI Project No.	0397-1021	Name:	S.R. 9 and Pembroke Road	Lanes: North and Soundbound Off-Ramp Inside Shoulders and Outside Lanes			
County:	BROWARD	S.R. No.	9	Shoulder Type & Condition:			
Median Curbed?	NO.	From	Southbound Off-Ramp	Inside:			
		To.	Northbound Off-Ramp				
		Beg. Sta.	288+00	End Sta: 291+05	Length:	680' Approx.	Outside:
			Lawn?	Other?	Curb & Gutter?		

Core No.	Northing [1]	Easting [1]	Mile Post [3]	Lane	Wheel Path	Pavement Layer (inches) Top -	-	-	-	-	-	Core Length (in.)	Base Thickness (inches) [2]	Sub-grade Thickness (inches) [2]	Crack Depth (ft)	Type	Class	Extent	Pavement Condition	Rut Depth (in.)	Rut Location (ft)	Cross Slope (ft/6ft)
TRAVEL LANES																						
PC-1	604765	930289	1.47	NB-OR-R3	YES	—	--	---	---	--	--	5.00	24	-	—	--	---	--	FAIR	0.125	---	0.104
PC-2	604891	930258	1.49	NB-OR-IS	NO	—	--	—	---	--	—	4.50	24	-	—	—	---	--	FAIR	0.625	---	0.000
PC-3	605323	929981	1.57	SB-OR-IS	NO	—	--	---	---	--	--	6.25	24	-	—	--	---	--	FAIR	0.625	---	0.083
PC-4	605406	929944	1.58	SB-OR-L3	YES	—	--	---	---	--	--	11.50	24	-	—	--	---	--	FAIR	0.125	---	0.135

Notes:
(1) Northings and Eastings were obtained using a hand held GPS instrument (Garmin Map 64) that has a 15 foot accuracy.
(2) The SPT Split Spoon Sampler was only penetrated 24 inches into the base/sub-grade, therefore, base and sub-grade thicknesses could not be accurately measured. In order to estimate the base/subgrade thicknesses we suggest that the as-built plans be reviewed.
(3) Mile Posts were obtained from the S.R. 9 (I-95) striaght line diagrams.

TABLE 4
SUMMARY OF LABORATORY TEST RESULTS
S.R. 9 AND PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. NO. 12
PSI PROJECT NO. 0397-1021

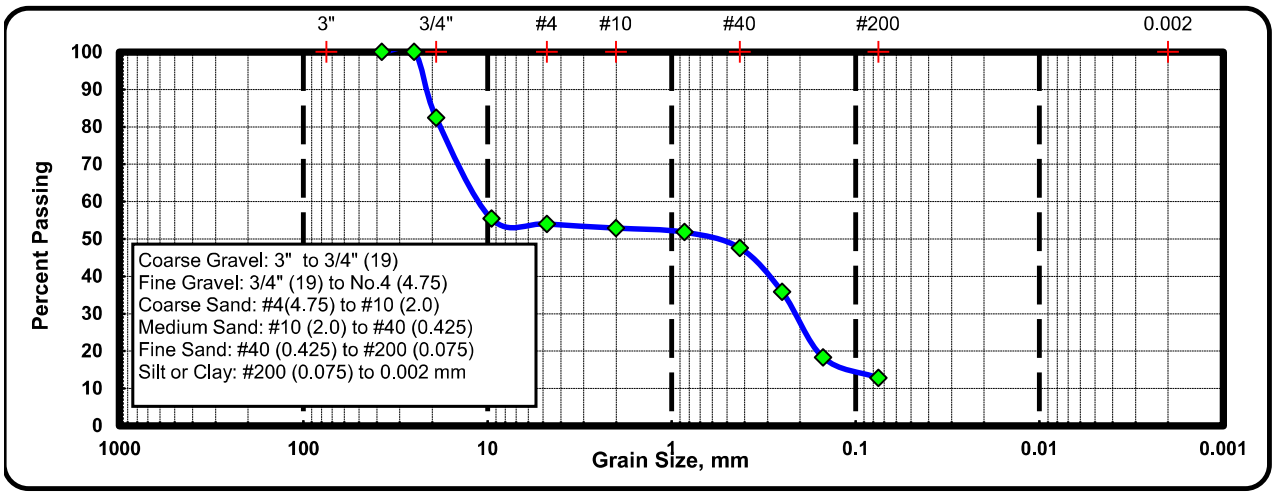
					SIEVE ANALYSES, PERCENT PASSING (%)												
BORING NUMBER	SAMPLE DEPTH INTERVAL (FEET)	STRATUM NUMBER	ORGANIC CONTENT (%)	MOISTURE CONTENT (%)	1.5"	1"	3/4"	3/8"	#4	#10	#20	#40	#60	#100	#200	USCS CLASS.	AASHTO CLASS.
B-4	0.0-0.5	1	9	16	-	-	-	-	-	-	-	-	-	-	-	OL	A-8
B-2	2.0-3.0	3	-	6	100	100	82	55	54	53	52	48	36	18	13	GM	A-1-b
B-4	0.5-2.0	3	-	7	100	100	86	71	56	55	53	47	34	18	12	GM	A-1-b
MA-1	0.5-2.0	4	-	11	100	100	90	83	79	76	74	67	47	16	7	SP-SM	A-3
B-5	2.0-4.0	4	-	9	100	100	100	92	87	83	81	71	50	19	10	SP-SM	A-3
B-6	2.0-4.0	4	-	8	100	100	100	88	84	81	79	69	49	18	9	SP-SM	A-3
MA-1	2.0-4.0	5	-	3	100	100	100	100	100	100	100	93	67	13	2	SP	A-3

PARTICAL SIZE DISTRIBUTION REPORT
S.R. 9 (I-95) AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. No. 12
PSI PROJECT No. 0397-1021

SIEVE ANALYSIS

Boring ID:	B-2	Depth Interval:	2.0'-3.0'

Percent Gravel (%):	46.0	Percent Sand (%):	41.2	Percent Fines (%):	12.8
D10 (mm):	N/A	D30 (mm):	0.22	D60 (mm):	11.12
Coefficient of Uniformity, Cu (D60/D10):	N/A	Coeff. of Curvature, Cc ($D30^2$/D10*D60):			N/A
CLASSIFICATION					
AASHTO:	A-1-b	USCS:	GM		



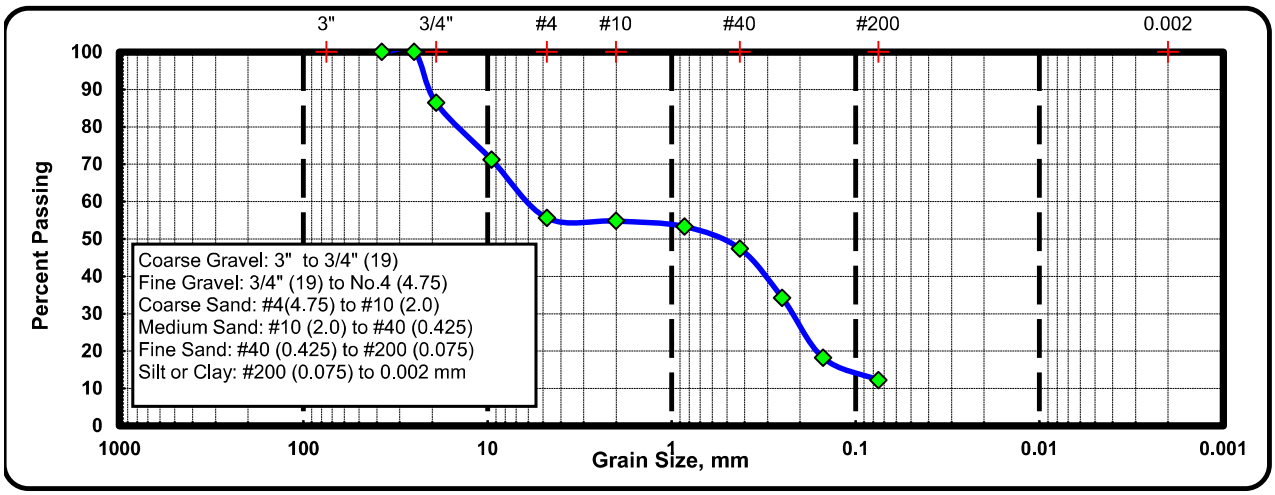
US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
1-1/2"	37.500	0	100
1"	25.000	0	100
3/4"	19.000	18	82
3/8"	9.500	45	55
#4	4.750	46	54
#10	2.000	47	53
#20	0.850	48	52
#40	0.425	52	48
#60	0.250	64	36
#100	0.15	82	18
#200	0.08	87	13
PAN	NA	100	0

PARTICAL SIZE DISTRIBUTION REPORT
S.R. 9 (I-95) AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. No. 12
PSI PROJECT No. 0397-1021

SIEVE ANALYSIS

Boring ID:	B-4	Depth Interval:	0.5'-2.0'

Percent Gravel (%):	44.4	Percent Sand (%):	43.4	Percent Fines (%):	12.2
D10 (mm):	N/A	D30 (mm):	0.22	D60 (mm):	6.09
Coefficient of Uniformity, Cu (D60/D10):	N/A	Coeff. of Curvature, Cc ($D30^2$/D10*D60):			N/A
CLASSIFICATION					
AASHTO:	A-1-b	USCS:	GM		



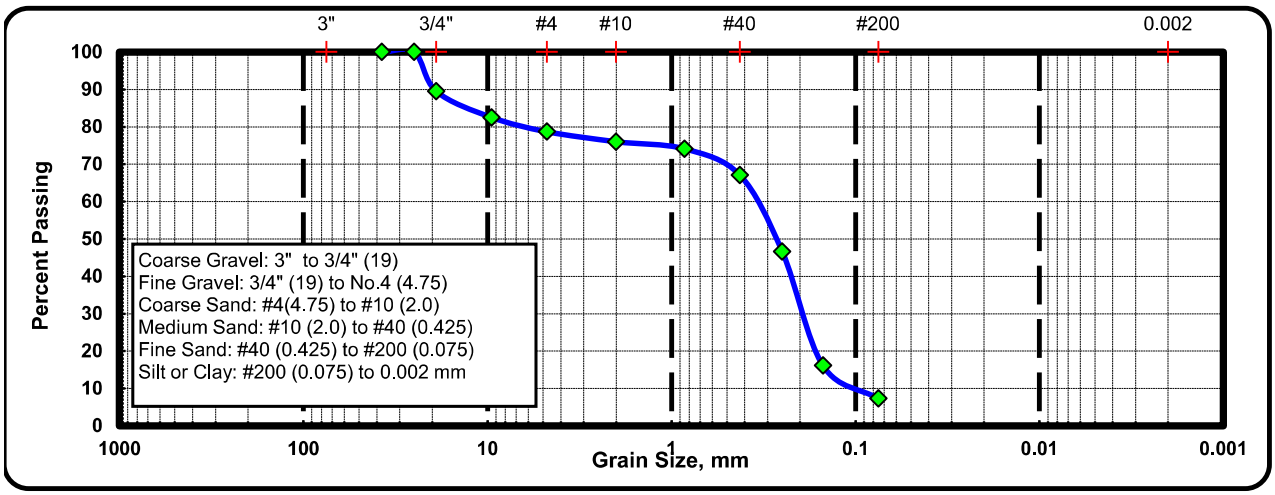
US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
1-1/2"	37.500	0	100
1"	25.000	0	100
3/4"	19.000	14	86
3/8"	9.500	29	71
#4	4.750	44	56
#10	2.000	45	55
#20	0.850	47	53
#40	0.425	53	47
#60	0.250	66	34
#100	0.15	82	18
#200	0.08	88	12
PAN	NA	100	0

PARTICAL SIZE DISTRIBUTION REPORT
S.R. 9 (I-95) AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. No. 12
PSI PROJECT No. 0397-1021

SIEVE ANALYSIS

Boring ID:	MA-1	Depth Interval:	0.5'-2.0'

Percent Gravel (%):	21.3	Percent Sand (%):	71.4	Percent Fines (%):	7.3
D10 (mm):	0.10	D30 (mm):	0.20	D60 (mm):	0.36
Coefficient of Uniformity, Cu (D60/D10):	3.72	Coeff. of Curvature, Cc ($D30^2$/D10*D60):			1.07
CLASSIFICATION					
AASHTO:	A-3	USCS:	SP-SM		



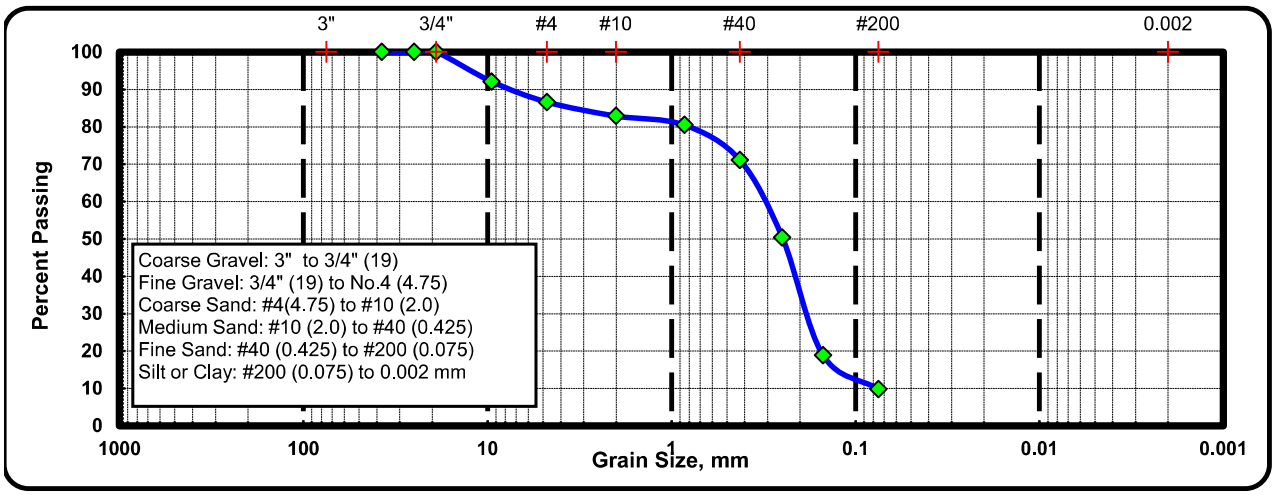
US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
1-1/2"	37.500	0	100
1"	25.000	0	100
3/4"	19.000	11	90
3/8"	9.500	18	83
#4	4.750	21	79
#10	2.000	24	76
#20	0.850	26	74
#40	0.425	33	67
#60	0.250	53	47
#100	0.15	84	16
#200	0.08	93	7
PAN	NA	100	0

PARTICAL SIZE DISTRIBUTION REPORT
S.R. 9 (I-95) AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. No. 12
PSI PROJECT No. 0397-1021

SIEVE ANALYSIS

Boring ID:	B-5	Depth Interval:	2.0'-4.0'

Percent Gravel (%):	13.4	Percent Sand (%):	76.8	Percent Fines (%):	9.8
D10 (mm):	0.08	D30 (mm):	0.19	D60 (mm):	0.33
Coefficient of Uniformity, Cu (D60/D10):	4.14	Coeff. of Curvature, Cc ($D30^2$/D10*D60):			1.30
CLASSIFICATION					
AASHTO:	A-3	USCS:	SP-SM		



US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
1-1/2"	37.500	0	100
1"	25.000	0	100
3/4"	19.000	0	100
3/8"	9.500	8	92
#4	4.750	13	87
#10	2.000	17	83
#20	0.850	20	81
#40	0.425	29	71
#60	0.250	50	50
#100	0.15	81	19
#200	0.08	90	10
PAN	NA	100	0

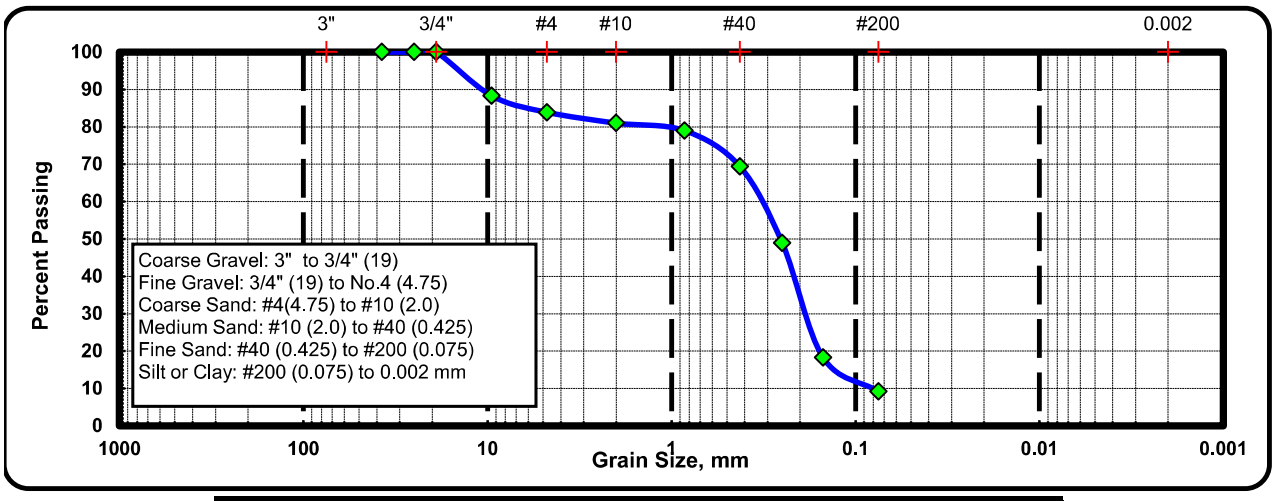
PARTICAL SIZE DISTRIBUTION REPORT
S.R. 9 (I-95) AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. No. 12
PSI PROJECT No. 0397-1021

SIEVE ANALYSIS

Boring ID:	B-6	Depth Interval:	2.0'-4.0'

Percent Gravel (%):	16.1	Percent Sand (%):	74.7	Percent Fines (%):	9.2
D10 (mm):	0.08	D30 (mm):	0.19	D60 (mm):	0.34
Coefficient of Uniformity, Cu (D60/D10):	4.23	Coeff. of Curvature, Cc ($D30^2$/D10*D60):			1.26

CLASSIFICATION			
AASHTO:	A-3	USCS:	SP-SM



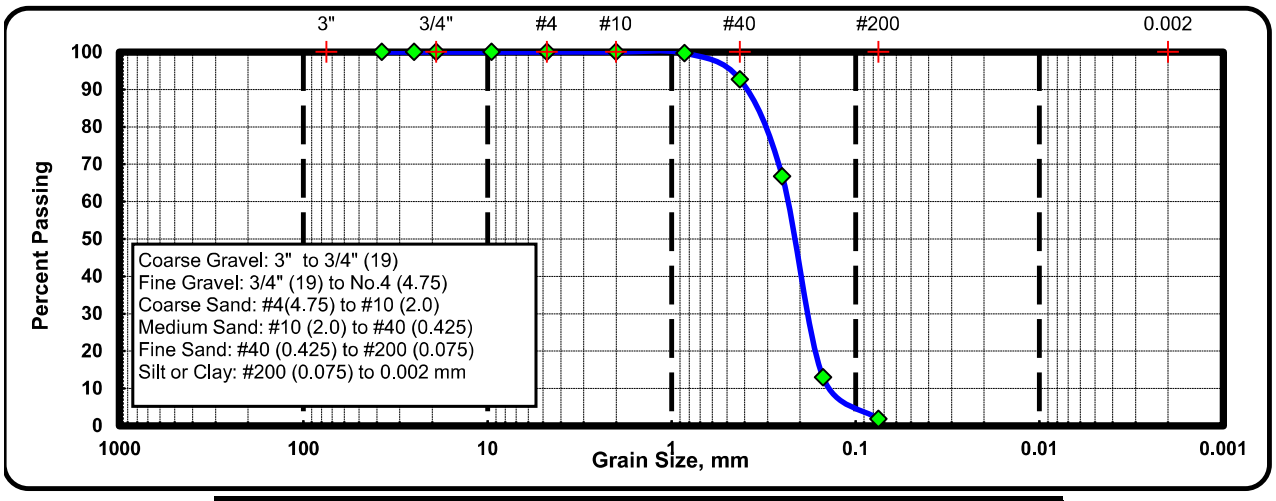
US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
1-1/2"	37.500	0	100
1"	25.000	0	100
3/4"	19.000	0	100
3/8"	9.500	12	88
#4	4.750	16	84
#10	2.000	19	81
#20	0.850	21	79
#40	0.425	31	69
#60	0.250	51	49
#100	0.15	82	18
#200	0.08	91	9
PAN	NA	100	0

PARTICAL SIZE DISTRIBUTION REPORT
S.R. 9 (I-95) AT PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. No. 12
PSI PROJECT No. 0397-1021

SIEVE ANALYSIS

Boring ID:	MA-1	Depth Interval:	2.0'-4.0'

Percent Gravel (%):	0.0	Percent Sand (%):	98.2	Percent Fines (%):	1.8
D10 (mm):	0.13	D30 (mm):	0.18	D60 (mm):	0.24
Coefficient of Uniformity, Cu (D60/D10):	1.83	Coeff. of Curvature, Cc ($D30^2$/D10*D60):			1.07
CLASSIFICATION					
AASHTO:	A-3	USCS:	SP		



US Standard Sieve No.	Sieve Size (mm)	Percent Retained (%)	Percent Passing Sieve (%)
1-1/2"	37.500	0	100
1"	25.000	0	100
3/4"	19.000	0	100
3/8"	9.500	0	100
#4	4.750	0	100
#10	2.000	0	100
#20	0.850	0	100
#40	0.425	7	93
#60	0.250	33	67
#100	0.15	87	13
#200	0.08	98	2
PAN	NA	100	0

TABLE 5
SUMMARY OF GEOTECHNICAL DESIGN PARAMETERS
S.R. 9 AND PEMBROKE ROAD
BROWARD COUNTY, FLORIDA
FPID: 436303-1-52-01 | T.W.O. NO. 12
PSI PROJECT NO. 0397-1021

	DEPTH (FEET)	MAST ARM AT THE NORTHEAST CORNER OF S.R. 9 AND PEMBROKE ROAD BORING NUMBER: MA-1
SAMPLING DEPTH INTERVAL	1.00	14
	3.00	22
	5.00	6
	7.00	6
	9.00	7
	14.50	16
	19.50	10
	24.50	10

PREDOMINANT SOIL TYPES: FINE SAND AND LIMESTONE		SHAFT LENGTHS (FEET)				
		12	14	16	18	20
VALUES FOR USE WITH FDOT DRILLED SHAFT SIGN AND SIGNAL STRUCTURES PROGRAM (BROM'S METHOD)	N-Automatic[1]	14	14	14	14	14
	Corrected N Value (N-Safety)[2]	17	17	17	17	17
	Effective Unit Weight (γ') (pcf)	57	57	57	57	57
	Friction Angle (ϕ)[3]	37	37	37	37	37
	Friction Coefficient (μ)	0.76	0.76	0.76	0.76	0.76
	Offset (feet)[4]	---	---	---	---	---
	Load Transfer Ratio (ω_{fdot})[5]	1.5	1.5	1.5	1.5	1.5

NOTES:

(1) The SPT N values were averaged over the depth interval of the corresponding shaft length. The averaged SPT N values were corrected for overbrden.

(2) The SPT N values were converted from an Automatic Hammer to those of a Safety Hammer, using a correction factor of 1.24 (Page 164 of the Soils and Foundation Handbook, 2016 [SFH]).

(3) The angle of friction is computed using the following equation: For Rock material with N-Values between 10 and 25 blows/foot, ϕ=N/4+33. (Page 162 of SFH).

(4) Refers to a depth below which the foundation will have equal to or greater than "2.5 times Shaft Diameter horizontal soil cover (face-of-pile to face-of-slope)". Refer to Page 162 of the SFH. Value should be determined by the designer.

(5) The Load Transfer Ratio is computed using Section 13.6.1.1 of the FDOT Structures Manual, Modifications to LTS-6.

Florida Department of Transportation

RICK SCOTT
GOVERNOR

State Materials Office
5007 NE 39th Avenue, Gainesville, FL 32609
(352) 955-6600

JIM BOXOLD
SECRETARY

MEMORANDUM

DATE: February 3, 2016

TO: Michael Kim

FROM: David Horhota

SUBJECT: Embankment Resilient Modulus Pavement Design
District 4, Broward County
FPN 436303-1: SR-9/I-95 and SR-824/Pembroke Road

Four (4), 2-bag samples were received by the State Materials Office (SMO) for determination of an embankment (roadbed) resilient modulus for pavement design. After visual observation of the four samples, it was determined that the material from each 2-bag sample looked visually similar and the material from each of the bags were combined to form one sample from each location. After combining materials from the bags, samples from each location were obtained for classification tests (Atterberg limits, particle size analysis, and organic content), Proctor density, and resilient modulus. The classification test results are reported in Tables 1 and 2. Information provide for this project by PSI, Inc. did not include sample depth.

Table 1. Summary of Initial Soil Gradation Results

Sample ID	Passing 3/4" (%)	Passing 1/2" (%)	Passing 3/8" (%)	Passing No. 4 (%)	Passing No. 10 (%)	Passing No. 40 (%)	Passing No. 60 (%)	Passing No. 100 (%)	Passing No. 200 (%)
MR-1	98.8	97.9	97.5	97.1	96.8	89.3	67.7	16.2	2.0
MR-2	96.6	95.0	94.0	93.4	93.0	85.4	62.9	14.0	2.0
MR-3	88.7	88.5	88.4	87.3	86.6	80.0	61.2	17.2	3.2
MR-4	100.0	100.0	100.0	99.8	99.6	91.9	66.1	13.7	1.5

Table 2. Summary of Soil Classification and Organic Content Results

Sample ID	Station Location	Offset	LL/PI	Soil Class.	Org. Content (%)
MR-1	283+70	188'RT	N.P.	A-3	0.2
MR-2	285+52	202' RT	N.P.	A-3	0.3
MR-3	289+85	159' LT	N.P.	A-3	0.3
MR-4	290+96	158' LT	N.P.	A-3	0.1

In addition to the classification testing, the following test program was conducted:

(1) Standard Proctor, AASHTO T 99
(2) Resilient Modulus (M_R), AASHTO T 307.

A summary of laboratory test results is included in Table 3. The resilient modulus values listed in this table were obtained using the relationship developed from each individual test (resilient modulus versus bulk stress - with bulk stress, Θ, defined as $\Theta = \sigma_1 + \sigma_2 + \sigma_3$), and using a bulk stress of 11 psi, which is the recommendation from Dr. Ping's research work in modeling the embankment in-situ stresses for Florida pavement conditions. Two results are listed for each location because two samples were prepared for each location and they represent the individual test result from each sample tested. The resilient modulus samples were compacted to within 1 pound per cubic foot (pcf) of the maximum density and 0.5 percent of the optimum moisture content as determined by AASHTO T99.

Table 3. Summary of T-99 and M_R Test Results

Sample ID	Passing No. 200 (%)	Standard Proctor Density (pcf)	Optimum Moisture Content (%)	Resilient Modulus @ Θ=11psi (psi)	Average Resilient Modulus (psi)
MR-1	2	102.9	13.5	10,192	10,438
				10,684	
MR-2	2	103.8	13.7	9,651	9,875
				10,098	
MR-3	3	102.7	13.6	10,498	10,051
				9,603	
MR-4	2	101.3	13.1	11,001	10,512
				10,023	

For this set of samples the minimum number of samples called for in the Soils and Foundations Handbook were not satisfied. This resulted in an inability to perform a true 90% method of analysis due to a lack of the required number of test values.

For those reasons it is recommended that the lowest average resilient modulus be used for the design. Based on the results for sample MR-2, a design **M_R of 9,900 psi** would be recommended for this project.

APPENDIX D

GEOTECHNICAL REPORT REVIEW CHECKLISTS

The following checklists cover the major information and recommendations which should be addressed in project geotechnical reports.

Section A covers site investigation information which will be common to all geotechnical reports for any type of geotechnical feature.

Sections B through I cover the basic information and recommendations which should be presented in geotechnical reports for specific geotechnical features: centerline cuts and embankments, embankments over soft ground, landslides, retaining walls, structure foundations and material sites.

Subject Page

SECTION A, Site Investigation Information 2
SECTION B, Centerline Cuts and Embankments 4
SECTION C, Embankments Over Soft Ground 6
SECTION D, Landslide Corrections 8
SECTION E, Retaining Walls 10
SECTION F, Structure Foundations - Spread Footings 11
SECTION G, Structure Foundations - Piles 12
SECTION H, Structure Foundations - Drilled Shafts 15
SECTION I, Materials Sites 16

In most sections and subsections, the user has been provided supplemental page references to the Soils and Foundations Workshop Manual. These page numbers appear in parentheses ( ) immediately adjacent to the section or subsection topic. Generalist engineers are particularly encouraged to read these references. Additional reference information on these topics is available in the Geotechnical Notebook, a copy of which is kept in all Division Offices by either the Bridge Engineer or the engineer with the soils responsibility.

Certain checklist items are of vital importance to have been included in the geotechnical report. These checklist items have been marked with an asterisk (*). A negative response to any of these asterisked items is cause to contact the geotechnical engineer for clarification of this omission.

"GTR REVIEW CHECKLIST" (SITE INVESTIGATION)

A. Site Investigation Information

Since the most important step in the geotechnical design process is the conduct of an adequate site investigation, presentation of the subsurface information in the geotechnical report and on the plans deserves careful attention.

Geotechnical Report Text (Introduction) (Pages 322-325)	Yes	No	Unknown or N/A
1. Is the general location of the investigation described and/or vicinity map included?		X	
2. Is scope and purpose of the investigation summarized?		X	
3. Is concise description given of geologic setting and topography of area?		X	
4. Are the field explorations and laboratory tests on which the report is based listed?	X		
5. Is general description of subsurface soil, rock, and groundwater conditions given?		X	
*6. Is the following information included with the geotechnical report (typically included in report appendices):			
a. Test hole logs? (Pages 25-33)		X	
b. Field test data?		X	
c. Laboratory test data? (Pages 74-75)		X	
d. Photographs (if pertinent)?			X
Plan and Subsurface Profile (Pages 24, 47-49, 335)			
*7. Is a plan and subsurface profile of the investigation site provided?		x	

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

A. Site Investigation Information (Cont.)	Yes	No	Unknown or N/A
8. Are the field explorations located on the plan view?	X		
*9. Does the conducted site investigation meet minimum criteria outlined in Table 2?	X		
10. Are the explorations plotted and correctly numbered on the profile at their true elevation and location?	X		
11. Does the subsurface profile contain a word description and/or graphic depiction of soil and rock types?	X		
12. Are groundwater levels and data measured shown on the subsurface profile?	X		
Subsurface Profile or Field Boring Log (Pages 16-17, 25-29)			
13. Are sample types and depths noted?	X		
*14. Are SPT blow counts, percent core recovery, and RQD values shown?	x		
15. If cone penetration tests were made, are plots of cone resistance and friction ratio shown with depth?	___	___	X
Laboratory Test Data (Pages 60, 74-75)			
*16. Were lab soil classification tests such as natural moisture content, gradation, Atterberg limits, performed on selected representative samples to verify field visual soil identifications?	X		
17. Are laboratory test results such as shear strength (Page 62), consolidation (Page 68), etc., included and/or summarized?	___	___	X

* A response other than (yes) or (N/A) for any of these checklist questions is cause to contact the appropriate geotechnical engineer for a clarification and/or to discuss the project.

APPENDIX C

Broward County Historical, Archaeological & Environmental Maps

BROWARD COUNTY LAND USE PLAN

CULTURAL RESOURCES / LOCAL AREAS OF PARTICULAR CONCERN: HISTORIC SITES

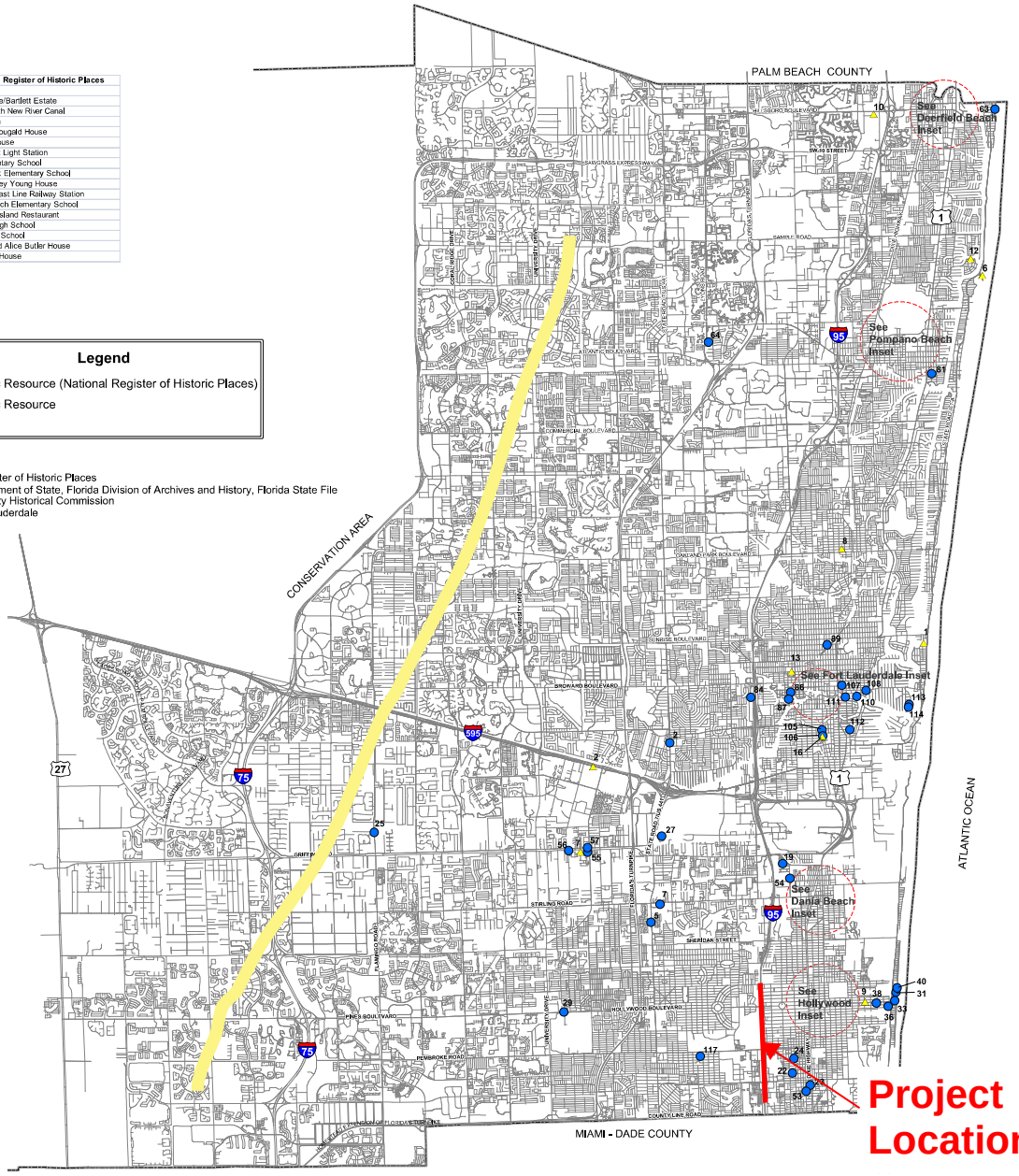
Map #	Historic Resource
1	Deerfield Beach Pioneer House (Kester Cottage)
2	Dixie Water Plant
3	Sailboat Bend Historic District
4	Old Fort Lauderdale High School Site
5	Seminole Indian Reservation
6	Great Southern Hotel
7	John M. and Gilda Bryan House
8	Hollywood Art and Culture Center (Johnson-Foster Funeral Home)
9	Hollywood Publishing Company/Hemmingway Restaurant
10	Ingram Arcade
11	Young Circle
12	Hollywood Woman's Club
13	Original Dania Methodist Church
14	A. C. Frost House
15	Martin C. Frost House
16	Dania Bank Building
17	Woodlawn Cemetery
18	Westlawn Memorial Cemetery
19	Ocean Waterway Mobile Home Park Office Building
20	Dania Beach Hotel
22	Old Hallandale Schoolhouse
23	J. W. Moffitt House
24	Hallandale Cemetery
25	Floyd L. Wray House/Wray Everglades Museum
27	Old Electrical Plant
29	North Perry Airport
30	Dunham's Grocery
31	Coral House
32	Golf View Hotel/Hutchinson Apartments
33	Hollywood Beach Hotel
34	Flora Apartments
35	Hollywood Temple Methodist Church
36	707 Van Buren Street
37	1329 Polk Street
38	Little White House
39	Floyd Wray Residence
40	Circle Villa Apartments
41	Avon Apartments
42	Lomell Apartments
43	1555 Hollywood Boulevard
44	1345 Hollywood Boulevard
45	Ollie H. Gore Residence
46	Dania Historical Society and Museum
47	Hotel Poinciana
48	29 South Federal Highway
49	118 Southwest 1 Avenue
50	124 Southwest 1 Avenue
51	La Normandie Restaurant
52	A. E. Anderson Residence
53	Frank Curci Residence
54	John Bryan House Site
55	Davie Community Church
56	Viele House
57	1911 Hotel
58	Deerfield Furniture Store
59	Waldron House/Kraeer Funeral Home
60	Valdama Howard House
61	Memorial Cemetery
62	Deerfield Beach First Baptist Church and Parsonage
63	Vina S. Gould House
64	Coconut Creek Windmill
65	George Foster Chapel/First United Methodist Church
66	Captain Campbell House
67	Shiver House
68	J. D. Blount House
69	George Blount House
70	Wallace Robinson House
71	W. H. McNab House
72	Dr. McClellan House and Office
73	McClellan Drugs
74	Pompano Mercantile Company
75	Bank Of Pompano
76	Pompano City Pump House and Fire Department
77	Pompano Beach Historical Society Museum
78	Bevill House
79	B. F. Bailey House
80	Frank Austin House
81	Pompano Beach Cemetery
82	Horace Robinson House
83	Giddens-Kimball House
84	Seaboard Airline Railroad Station
85	Brown Home
86	Fire Station No. 8
87	Southwest 11 Avenue Bridge
88	Commodore Brook House
89	Progresso Plaza
90	Retail Stores/Apartments
91	Tom M. Bryan Building
92	Tibbets
93	Colonial Hotel
94	Woman's Club
95	Reed Bryan House
96	Weidling Building
97	Tom M. Bryan House
98	Philemon Bryan House
99	King-Cromartie House
100	Shepherd Hotel
101	Maxwell Arcade
102	Coca-Cola Bottling Plant
103	South Side School
104	Fire Station No. 2
105	Frank Croissant House
106	Croissant Park Administration Building
107	Himmarshee Court
108	Sheppard Estate
109	John W. Needham House
110	Tom Bryan Home
111	E. N. Sperry House
112	Evergreen Cemetery
113	Tom Stilwell House
114	W. G. Bosworth House
116	Robert McNab House
117	Bowles-Strachan House

Map #	National Register of Historic Places
1	Bonnet House/Bartlett Estate
2	Lock #1, North New River Canal
3	New River Inn
4	Sample-McDougald House
5	Stranahan House
6	Hillsboro Inlet Light Station
7	Davie Elementary School
8	Oakland Park Elementary School
9	Joseph Wesley Young House
10	Seaboard Coast Line Railway Station
11	Deerfield Beach Elementary School
12	Cap's Place Island Restaurant
13	Old Dillard High School
14	Old Deerfield School
15	James D. and Alice Butler House
16	Sam Gilliam House

Legend

- Historic Resource (National Register of Historic Places)
- Historic Resource

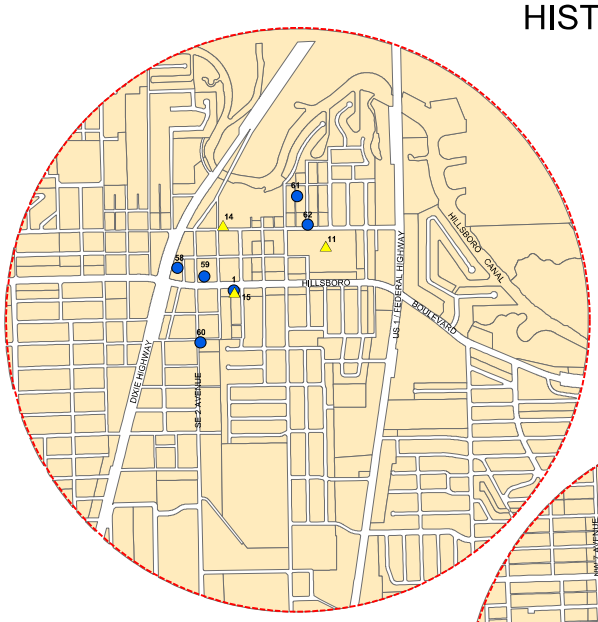
Source:
National Register of Historic Places
Florida Department of State, Florida Division of Archives and History, Florida State File
Broward County Historical Commission
City of Fort Lauderdale



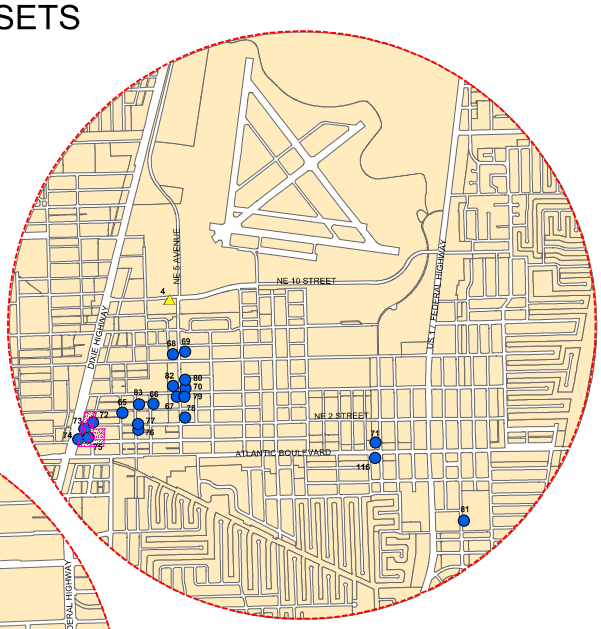
This is a generalized map. This map should not be used to determine parcel boundaries or limits of depicted items. Please contact the Broward County Planning Council office regarding questions pertaining to parcel boundaries or limits.

BROWARD COUNTY LAND USE PLAN

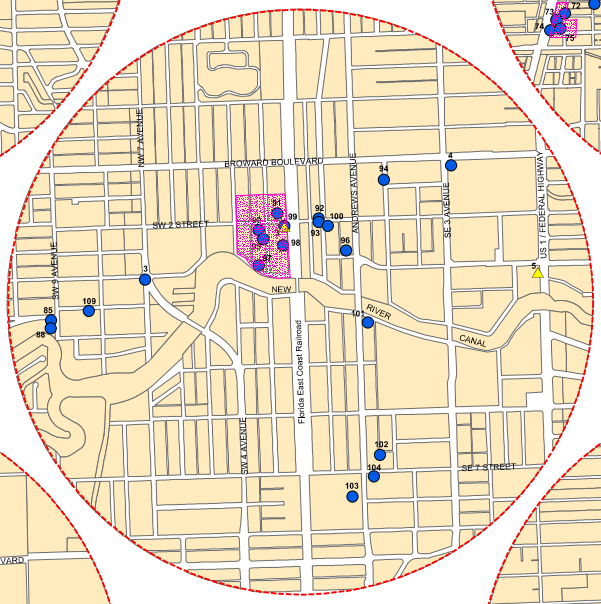
CULTURAL RESOURCE / LOCAL AREAS OF PARTICULAR CONCERN: HISTORIC SITES MAP INSETS



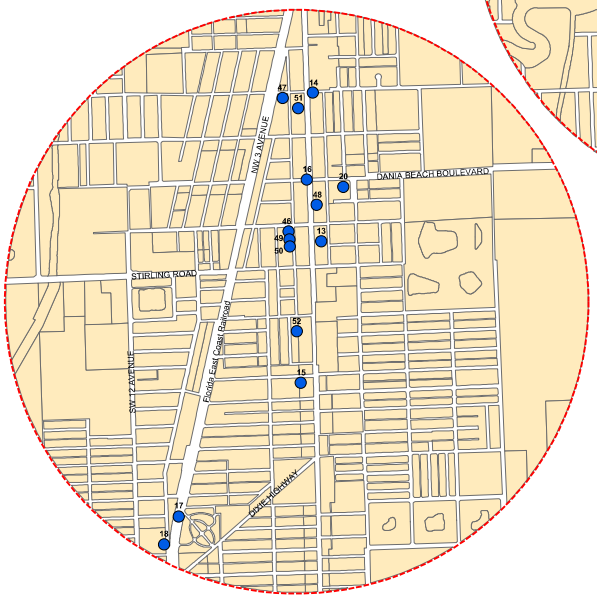
DEERFIELD BEACH



POMPANO BEACH



FORT LAUDERDALE



DANIA BEACH

HOLLYWOOD

Legend

- Historic Resource (National Register of Historic Places)
- Historic Resource
- Historic District

Source:

National Register of Historic Places
Florida Department of State, Florida Division of Archives and History, Florida State File
Broward County Historical Commission
City of Fort Lauderdale

N

NOT TO SCALE

This is a generalized map. This map should not be used to determine parcel boundaries or limits of depicted items. Please contact the Broward County Planning Council office regarding questions pertaining to parcel boundaries or limits.

Proposed to be deleted

BROWARD COUNTY LAND USE PLAN

CULTURAL RESOURCES / LOCAL AREAS OF PARTICULAR CONCERN: CULTURAL FACILITIES

NO. NAME

ARTS PARK
1 ArtsPark & Amphitheater at Young Circle
2 Central Broward Regional Park & ArtsPark
3 Miramar Cultural Center & ArtsPark
4 River of Grass ArtsPark

CULTURAL CENTER
5 Coral Springs Center for the Arts
6 David Posnack Jewish Community Center
7 Donnith Fletcher Art & Cultural Center
8 Hallandale Beach Cultural Community Center
9 Historic West Side School
10 Hollywood Beach Culture & Community Center
11 Pembroke Pines Historical Library
12 Pompano Beach Amphitheater
13 Ruth E. Cohen Art Gallery/Soref Jewish Community Cent
14 Stonewall Library & Archives
15 Sunrise Civic Center
16 The Township Aquatic Center
17 Third Avenue Art District

MUSEUM
18 Acadiome Building
19 Art & Culture Center of Hollywood
20 Bienes Museum of the Modern Book
21 Bonnet House Museum & Gardens
22 Broward County Historical Commission
23 Coral Springs Museum of Art
24 Ely Educational Museum
25 Flamingo Gardens
26 Fort Lauderdale Antique Car Museum
27 Fort Lauderdale Fire & Safety Museum
28 Hoch Heritage Center
29 IGFA Fishing Hall of Fame & Museum
30 International Swimming Hall of Fame
31 King Cromartie House
32 Museum of Art/Fort Lauderdale/Nova Southeastern Univ
33 Museum of Coral Springs History
34 Museum of Discovery & Science & IMAX 3D Theater
35 My Jewish Discovery Place Museum
36 Old Fort Lauderdale Village & Museum
37 Philemon Nathaniel Bryan House
38 Plantation Historical Museum
39 Replica 1899 Schoolhouse
40 Schacknow Museum of Fine Arts
41 Seminole Okalee Indian Village & Museum
42 Tradewinds McLean Farmhouse
43 Viele House
44 Walsh/Osterhoudt House
45 Wray Family Estate
46 Young At Art Children's Museum

NATIONAL REGISTER OF HISTORIC PLACES
47 Alfred and Olive Thorpe Lesson House (2007)
48 Bonnet House Museum & Gardens (1984)
49 Bryan Building (1997)
50 Cap's Place (1990)
51 Croissant Park Administration Building (2001)
52 Davie School Historical Museum (1988)
53 Deerfield Beach Elementary School (1990)
54 Dr. Willard Van Orsdel King House (2006)
55 Hammerstein House (2005)
56 Hillsboro Inlet Light Station (1974)
57 Hollywood Boulevard Historic Business District (1999)
58 Hollywood Garden Club (2005)
59 Hollywood Woman's Club (1995)
60 James D. and Alice Butler House (1995)
61 Joseph Wesley Young House (1989)
62 Link Trainer Building (1998)
63 Lock No. 1, North New River Canal (1978)
64 New River Inn (1972)
65 Nyberg-Swanson House (1999)
66 Oakland Park Elementary School (1988)
67 Old Deerfield School (1999)
68 Old Dillard High School (1991)
69 Old Seaboard Air Line Railway Station (1990)
70 S.S. Copenhagen Shipwreck (2001)
71 Sam Gilliam House (2001)
72 Sample-McDougald House (1984)
73 South Side School (2006)
74 St. Anthony School (1997)
75 Stranahan House (1973)
76 Williams House aka Gilda's Club (2005)

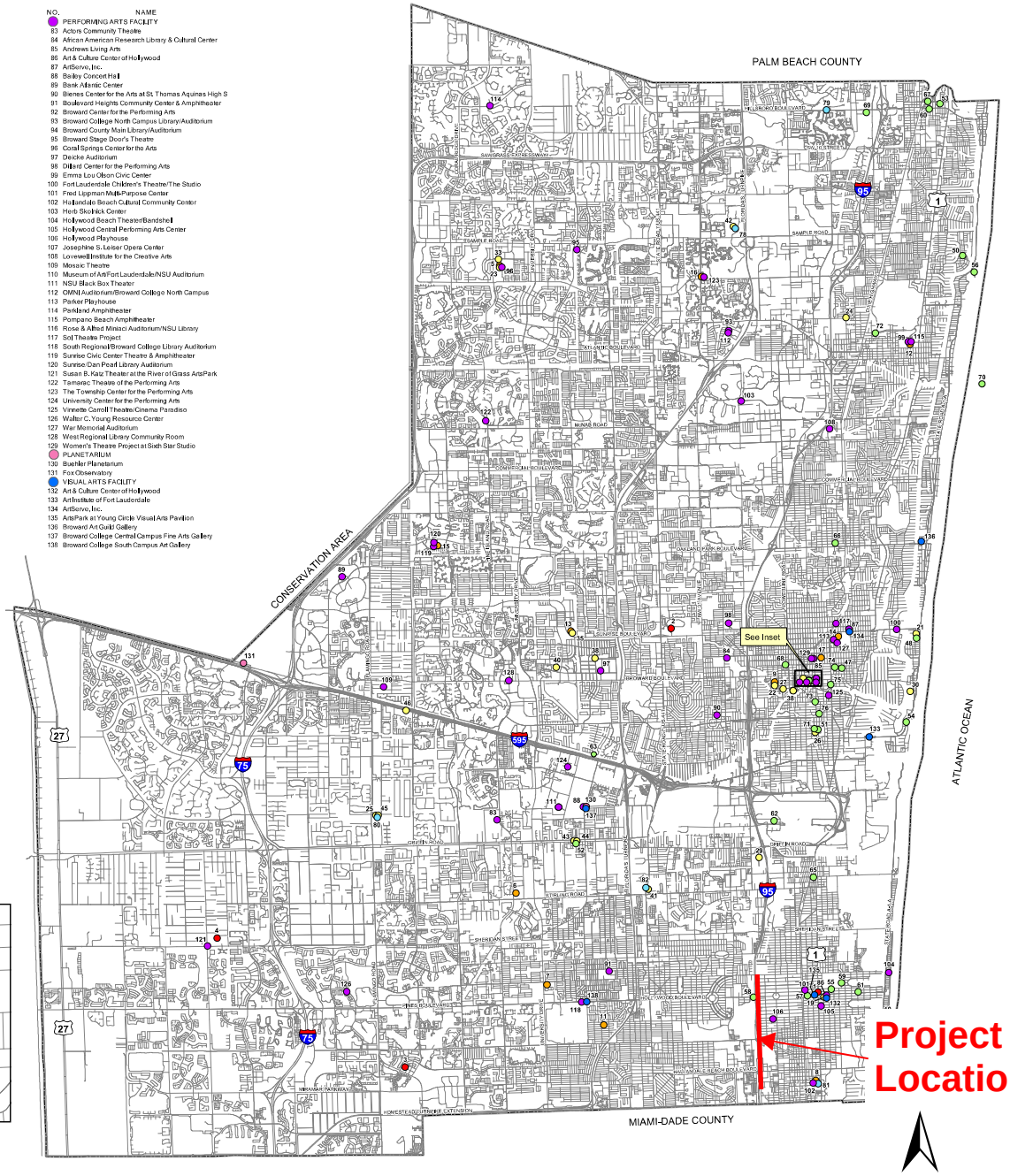
OTHER
77 Broward Cultural Division & Cultural Information Center
78 Butterfly World
79 Deerfield Beach Arboretum aka Tree Zoo
80 Flamingo Gardens
81 Hallandale Beach Cannon Site, World War II Memorial
82 Seminole Okalee Indian Village & Museum
0 PERFORMING ARTS FACILITY
83 Actors Community Theatre
84 African American Research Library & Cultural Center

NO. NAME

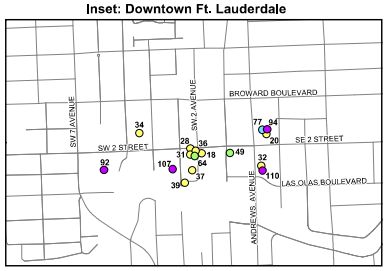
PERFORMING ARTS FACILITY
83 Actors Community Theatre
84 African American Research Library & Cultural Center
85 Andrews Living Arts
86 Art & Culture Center of Hollywood
87 ArtServe, Inc.
88 Bailey Concert Hall
89 Bank Atlantic Center
90 Bienes Center for the Arts at St. Thomas Aquinas High S
91 Boulevard Heights Community Center & Amphitheater
92 Broward Center for the Performing Arts
93 Broward College North Campus Library/Auditorium
94 Broward County Main Library/Auditorium
95 Broward Stage Door's Theatre
96 Coral Springs Center for the Arts
97 Deicke Auditorium
98 Dillard Center for the Performing Arts
99 Emma Lou Olson Civic Center
100 Fort Lauderdale Children's Theatre/The Studio
101 Fred Lippman Multi-Purpose Center
102 Hallandale Beach Cultural Community Center
103 Herb Skolnick Center
104 Hollywood Beach Theater/Bandshell
105 Hollywood Central Performing Arts Center
106 Hollywood Playhouse
107 Josephine S. Leiser Opera Center
108 Lovewell Institute for the Creative Arts
109 Mosaic Theatre
110 Museum of Art/Fort Lauderdale/NSU Auditorium
111 NSU Black Box Theater
112 OMNI Auditorium/Broward College North Campus
113 Parker Playhouse
114 Parkland Amphitheater
115 Pompano Beach Amphitheater
116 Rose & Alfred Miniaci Auditorium/NSU Library
117 Sol Theatre Project
118 South Regional/Broward College Library Auditorium
119 Sunrise Civic Center Theatre & Amphitheater
120 Sunrise/Dan Pearl Library Auditorium
121 Susan B. Katz Theater at the River of Grass ArtsPark
122 Tamarac Theatre of the Performing Arts
123 The Township Center for the Performing Arts
124 University Center for the Performing Arts
125 Vinnette Carroll Theatre/Cinema Paradiso
126 Walter C. Young Resource Center
127 War Memorial Auditorium
128 West Regional Library Community Room
129 Women's Theatre Project at Sixth Star Studio

PLANETARIUM
130 Bueller Planetarium
131 Fox Observatory

VISUAL ARTS FACILITY
132 Art & Culture Center of Hollywood
133 Art Institute of Fort Lauderdale
134 ArtServe, Inc.
135 ArtsPark at Young Circle Visual Arts Pavilion
136 Broward Art Guild Gallery
137 Broward College Central Campus Fine Arts Gallery
138 Broward College South Campus Art Gallery



Inset: Downtown Ft. Lauderdale



Source:
Broward County Cultural Division
II.C. Cultural Resources/Local Areas of Particular Concern - Cultural Facilities (October 25, 2011)

This is a generalized map. This map should not be used to determine parcel boundaries or limits of depicted items. Please contact the Broward County Planning Council office regarding questions pertaining to parcel boundaries or limits.

APPENDIX D

Existing Permits

FILE

South Florida Water Management District

John R. Wodraska, Executive Director
Tilford C. Creel, Deputy Executive Director

Post Office Box 24680 3301 Gun Club Road
West Palm Beach, Florida 33416-4680
Telephone (407) 686-8800
Florida WATS Line 1-800-432-2045

QUAO 9 & 7
ITEM 29 & 189
POSTED

I-95 ORIGINAL PERMIT

IN REPLY REFER TO:

CERTIFIED MAIL NO. P 938 448 997
Resource Control Department
Application No.: 03168-B

July 9, 1988

Permittee: Florida Department of Transportation
Address: 780 Southwest 24 Street
City: Ft. Lauderdale, FL 33315-2696

Dear Sir or Madam:

Subject: General Highway Permit No.: 88-53
Permittee: Florida Department of Transportation
Project : I-95 from Dade County Line to Johnson Street
Location : Broward County, S16,21,28/T51S/R42E

This letter is to acknowledge receipt of your Intent to Construct Works pursuant to Rule 40E-40, Florida Administrative Code.

Based on the information provided, District rules have been adhered to and a General Highway Permit is in effect for this project subject to the attached 13 Special Conditions and 26 Exhibits.

Should you object to these Conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you prior to the date specified in the "Notice of Rights," we will assume that you concur with the District's recommendation.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the addressee (and the persons listed in the attached distribution list) not later than 5:00 p.m. this 9thday of July , 1988, in accordance with Section 120.60(3), Florida Statutes.

Sincerely,

Edward W. Yaun, P.E., Supervising Professional
Surface Water Management Division

EWY:mc
Enclosures

Nancy H. Roen
Chairman - Plantation

J.D. York
Vice Chairman - Palm City

Nathaniel P. Reed
Hobe Sound

Oscar M. Corbin, Jr.
Ft. Myers

Arsenio Milian
Miami

Fritz Stein
Belle Glade

James F. Garner
Ft. Myers

Mike Stout
Windermere

Doran A. Jason
Key Biscayne

STAFF REPORT DISTRIBUTION LIST

PROJECT I-95 from Dade County Line to Johnson Street

APPLICATION NUMBER 03168-B

INTERNAL DISTRIBUTION

X Reviewer: M. Clemente
J.Hiscock
X B. Colavecchio
M. Cruz
C. de Rojas
K. Dickson
C. Drew
X M. Johnson
X V. Katilius
X S. Lamb
J. Mang
X C. McCray
P. Millar
J. Morgan
X C. Padera
X P. Rhoads
H. Schloss
X J. Show
M. Slayton
X D. Slyfield
W. Stimmel
D. Unsell
P. Walker
T. Waterhouse
J. Wodraska
X E. Yaun
X Field Representative
X Area Engineer
X Enforcement
X Office of Counsel
X Permit File

GOVERNING BOARD MEMBERS

Mr. Oscar M. Corbin
Mr. James F. Garner
X Mr. Doran A. Jason
Mr. Arsenio Milian
Mr. Nathaniel P. Reed
X Ms. Nancy H. Roen
Mr. Fritz Stein
Mr. Mike Stout
Mr. J.D. York

EXTERNAL DISTRIBUTION

DEPT. OF ENVIRONMENTAL REGULATION:
Ft. Myers
Orlando
Port St. Lucie
Tallahassee
X West Palm Beach

EXTERNAL DISTRIBUTION CONTINUED

X Applicant:
F.D.O.T.
X Applicant's Consultant:
F.D.O.T.
Applicant's Agent:

X Engineer, County of:
Broward
Engineer, City of:

Local Drainage District:

BUILDING AND ZONING

Boca Raton
Boynton Beach
Royal Palm Beach
Tequesta
West Palm Beach

COUNTY

X Broward	-Director, Water Mgmt. Div.
	-BCEQCB
Collier	-Agricultural Agent
Dade	-DERM
Lee	-Long Range Planning
	-Mosquito Control
	-E.P.S.
Martin	-Attorney
	-Board of County Commissioners
	-Community Development Director
Palm Beach	-Building Dept.
	-School Brd., Plant Planning
Polk	-Water Resources Dept.

OTHER

Fred Vidzes, Big Cypress Basin
Kissimmee River Coordinating Council

EXHIBIT 26

GENERAL HIGHWAY PERMIT SUMMARY SHEET

PROJECT NAME: I-95 from Dade County Line to Johnson Street

APPLICATION NO.: 03168-B

REVIEWER'S NAME: Maria C. Clemente

DATE: May 6, 1988

LOCATION: Broward County, S16,21,28/T51S/R42E

ABSTRACT:

On March 16, 1988 plans were submitted to the District for construction of approximately 17,500 LF of roadway. This application consists of the addition of High Occupancy Vehicle (H.O.V.) lanes, auxiliary lanes, paved shoulders, a concrete median barrier wall, new bridges over Hallandale Beach Boulevard, Pembroke Road and Hollywood Boulevard, realignment and widening of the ramps to these intersecting streets, and bridge widening over Johnson Street. The construction plans were in agreement with this District's requirements for roadway projects, therefore a General Permit authorizing construction was issued.

APPLICABLE LAND USE:

TOTAL	141.6 acres
WATER MANAGEMENT	19.9 acres
IMPERVIOUS	92.8 acres

COMMENTS:

1. The limits of this project are from the Dade-Broward County Line to north of Johnson Street in Broward County. The total project consists of approximately 141.6 acres. Presently, runoff from the southernmost 26.2 acres of the project flows into Dade County and runoff from the remaining 115.4 acres outfalls in Broward County.

2. Runoff from this project will flow to the following four separate drainage basins:

   Basin 1 runs from the Dade-Broward County Line to Hallandale Beach Boulevard. Runoff will be collected and retained in side ditches north of the county line by ditch blocks set at elevation 4.0 feet NGVD. The existing outfall route to Snake Creek Canal via side ditches into Dade County will be utilized. Retention will be provided in excess of 2.5 inches times the percentage of imperviousness for water quality.

Basin 2 runs from Hallandale Beach Boulevard to Pembroke Road. Currently, this basin is land-locked with no outfall. The proposed water management system will connect into the existing Hallandale Beach Boulevard system which will provide outfall to a proposed F.D.O.T. lake approximately 1/4 mile east of I-95 on N.W. 8th Avenue in the City of Hallandale. Discharge will be routed through structure S-65 which consists of 1-0.42' wide weir with a crest elevation of 4.0 feet NGVD to the Hallandale Beach Boulevard system. Retention will be provided for 1.4" of rainfall for the total area (existing and proposed) and exceeds the volume required for the additional impervious area. The available volume for water quality treatment is 2.0" of rainfall for the total impervious area.

Basin 3 runs from Pembroke Road to Johnson Street. Systems north and south of Hollywood Boulevard and east and west of I-95 (quadrants) are treated separately. Runoff from these quadrants will be detained by ditch blocks set at elevation 3.0 feet NGVD. These systems will direct treated runoff through a modified structure S-253 which consists of 1-1.5' wide weir with a crest elevation of 4.0 feet NGVD discharging to the Hollywood Canal. Retention will be provided in excess of 2.5 inches times the percentage of imperviousness for water quality.

Basin 4 is that portion of the project which lies north of Johnson Street. Ditch blocks set at elevation 3.0 feet NGVD will detain runoff prior to outfall to the existing outfall route to the Hollywood Canal (beyond the projects limits) via F.D.O.T. right-of-way will be utilized. Detention will be provided in excess of 2.5 inches times the percentage of imperviousness for water quality.

bcc: M.Clemente/Administration

FORM 0537
10 87

South Florida Water Management District
GENERAL PERMIT
NOTICE OF RIGHTS

This Notice of Rights is intended to inform the recipient of the administrative and judicial review which may be available as mandated by section 120.60(3), Florida Statutes. Be advised that although this notice is intended to be comprehensive, the review procedures set forth herein have been the subject of judicial construction and interpretation which may affect the administrative of judicial review available. Recipients are therefore advised to become familiar with Chapters 120 and 373, Florida Statutes, and the judicial interpretation of the provisions of these chapters.

1. If a substantially affected person objects to the staff's recommendation, that person has the right to request an administrative hearing on the proposed agency action. The substantially affected person may request either a formal or an informal hearing, as set forth below. Failure to comply with the prescribed time periods shall constitute a waiver of the right to a hearing.

2. If a substantially affected person believes a genuine issue of material fact is in dispute, that person may request a formal hearing pursuant to section 120.57(1), Florida Statutes, by filing a petition not later than:
   a. IF NOTICE OF THE APPLICATION WAS PUBLISHED BY THE APPLICANT, within fourteen (14) days after mailing of the proposed agency action or
   b. IF NOTICE OF THE APPLICATION WAS NOT PUBLISHED, within fourteen days after receipt of actual notice.

   The request for a section 120.57(1), F.S., formal hearing must comply with the requirements of Rule 40E-1.521, Florida Administrative Code, a copy of which is attached. Petitions are deemed filed upon receipt by the District. Failure to substantially comply with the provisions of Rule 40E-1.521, Florida Administrative Code, shall constitute a waiver of the right to a 120.57(1) hearing. If a petition for administrative hearing is not timely filed, the staff's proposed agency will automatically mature into final agency action.

3. If a substantially affected person believes that no issues of material fact are in dispute, that person may request an informal hearing pursuant to section 120.57(2), F.S., by filing a petition for hearing not later than:
   a. IF NOTICE OF THE APPLICATION WAS PUBLISHED BY THE APPLICANT, within fourteen (14) days after mailing of the proposed agency action or
   b. IF NOTICE OF THE APPLICATION WAS NOT PUBLISHED, within fourteen days after receipt of actual notice.

   A request for informal hearing shall be considered as a waiver of the right to request a formal section 120.57(1), F.S., hearing. A request for a section 120.57(1), F.S., formal hearing not in substantial compliance with the provisions of rule 40E-1.521, F.A.C., may be considered by the District as a request for informal hearing. If a petition for administrative hearing is not timely filed, the staff's proposed agency action will automatically mature into final agency action.

4. Pursuant to section 373.114, Florida Statutes, a party to the proceeding below may seek review of a Final Order rendered on the permit application before the Land and Water Adjudicatory Commission, as provided therein. Review under this section is initiated by filing a request for review with the Land and Water Adjudicatory Commission and serving a copy on the Department of Environmental Regulation and any person named in the Order within 20 days after rendering of the District's Order. However, when the order to be reviewed has statewide or regional significance, as determined by the Land and Water Adjudicatory Commission within 60 days after receipt of a request for review, the commission may accept a request for review from any affected person within 30 days after the rendering of the order. Review under section 373.114, Florida Statutes, is limited solely to a determination of consistency with the provisions and purposes of Chapter 373, Florida Statutes. This review is appellate in nature and limited to the record below.

5. A party who is adversely affected by final agency action on the permit application is entitled to judicial review in the District Court of Appeal pursuant to section 120.68, Florida Statutes, as provided therein. Review under section 120.68, Florida Statutes in the District Court of Appeal is initiated by filing a petition in the appropriate District Court of Appeal in accordance with Florida rule of appellate Procedure 9.110. The Notice of Appeal must be filed within 30 days of the final agency action.

6. Section 373.617(2), Florida Statutes, provides:

   > Any person substantially affected by a final action of any agency with respect to a permit may seek review within 90 days of the rendering of such decision and request monetary damages and other relief in the circuit court in the judicial circuit in which the affected property is located; however, circuit court review shall be confined solely to determining whether final agency action is an unreasonable exercise of the state's police power constituting a taking without just compensation. Review of final agency action for the purpose of determining whether the action is in accordance with existing statutes or rules and based on component substantial evidence shall proceed in accordance with Chapter 120.

7. Please be advised that exhaustion of administrative remedies is generally a prerequisite to appeal to the District Court of Appeal or the seeking of Circuit Court review of final agency action by the District on the permit application. There are, however, exceptions to the exhaustion requirement. The applicant is advised to consult the case law as to the requirements of exhaustion exceptions.

SPECIAL CONDITIONS

1. DISCHARGE FACILITIES: BASIN 2

   DESCRIPTION: 1-0.42' WIDE WEIR WITH A CREST ELEVATION OF 4.0 FEET NGVD.

   RECEIVING WATER: HALLANDALE BEACH BOULEVARD DRAINAGE SYSTEM.

   CONTROL ELEVATION: 4.0 FEET NGVD.

2. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF THE FLORIDA DEPARTMENT OF TRANSPORTATION.

3. WATER QUALITY DATA FOR THE WATER DISCHARGED FROM THE PERMITTEE'S PROPERTY OR INTO SURFACE WATERS OR GROUNDWATERS OF THE STATE SHALL BE SUBMITTED TO THE DISTRICT AS REQUIRED. PARAMETERS TO BE MONITORED MAY INCLUDE THOSE LISTED IN CHAPTER 17-3. IF WATER QUALITY DATA IS REQUIRED, THE PERMITTEE SHALL PROVIDE DATA AS REQUIRED ON VOLUMES OF WATER DISCHARGED, INCLUDING TOTAL VOLUME DISCHARGED DURING THE DAYS OF SAMPLING AND TOTAL MONTHLY DISCHARGES FROM THE PROPERTY OR INTO SURFACE WATERS OR GROUNDWATERS OF THE STATE.

4. SPECIAL CONDITIONS OF RULE 40E-4.381 (SURFACE WATER MANAGEMENT) ARE WAIVED UNLESS OTHERWISE PROVIDED HEREIN.

5. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

6. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

7. THE PERMITTEE SHALL PROSECUTE THE WORK AUTHORIZED IN A MANNER SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION, TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATER.

8. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, OPERATION, MAINTENANCE OR USE OF ANY FACILITY AUTHORIZED BY THE PERMIT.

9. THIS PERMIT IS ISSUED BASED ON THE APPLICANT'S SUBMITTED INFORMATION WHICH REASONABLY DEMONSTRATES THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS WILL NOT BE CAUSED BY THE COMPLETED PERMIT ACTIVITY. IT IS ALSO THE RESPONSIBILITY OF THE PERMITTEE TO INSURE THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS DO NOT OCCUR DURING CONSTRUCTION.

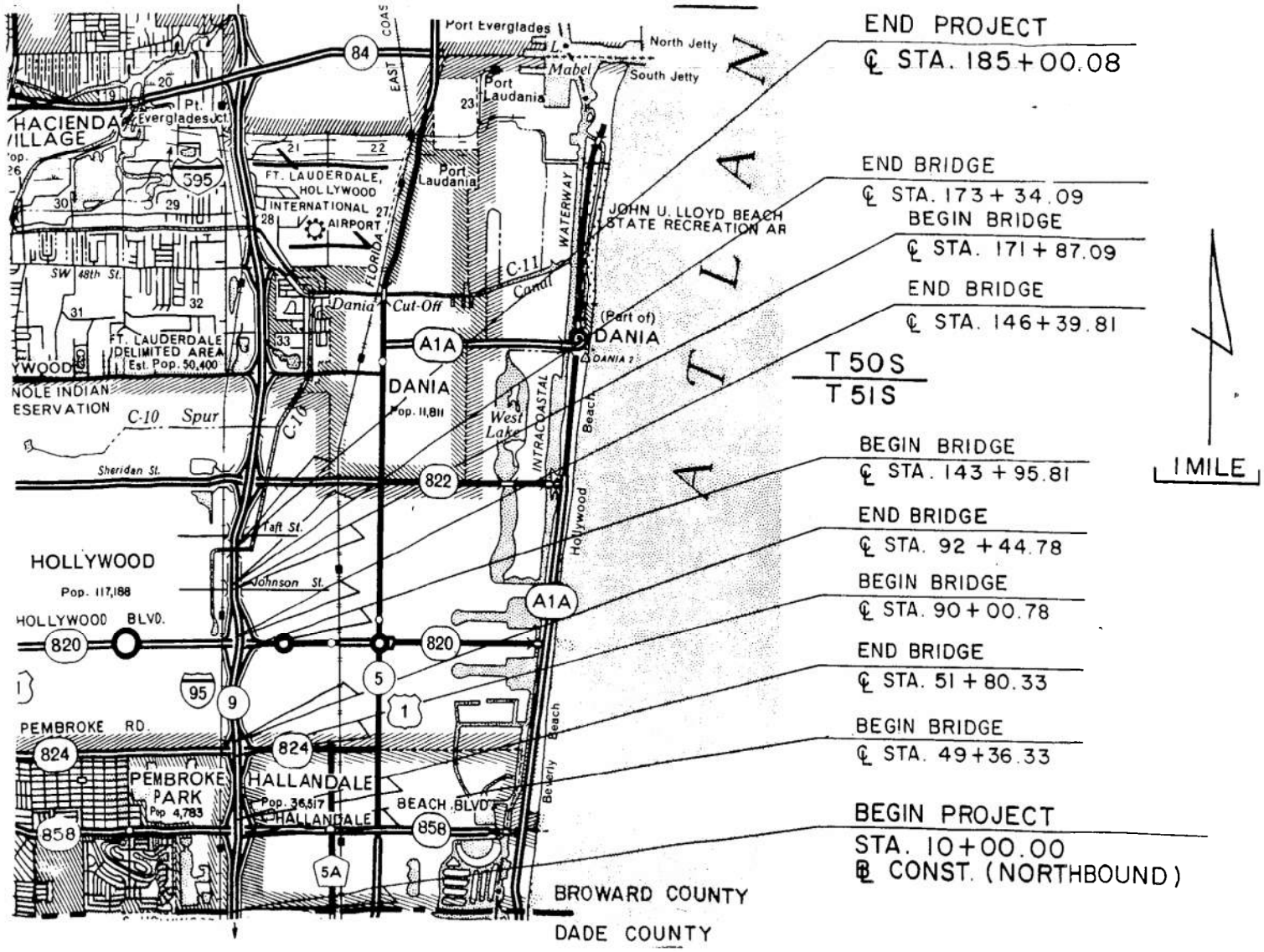
SPECIAL CONDITIONS CONTINUED

10. OFF-SITE DISCHARGES DURING CONSTRUCTION AND DEVELOPMENT SHALL BE MADE ONLY THROUGH THE FACILITIES AUTHORIZED BY THIS PERMIT. WATER DISCHARGED FROM THE PROJECT SHALL BE THROUGH STRUCTURES HAVING A MECHANISM SUITABLE FOR REGULATING UPSTREAM WATER STAGES. STAGES MAY BE SUBJECT TO OPERATING SCHEDULES SATISFACTORY TO THE DISTRICT.

11. PRIOR TO DEWATERING, PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL. INFORMATION SHALL INCLUDE AS A MINIMUM: PUMP SIZES, LOCATIONS AND HOURS OF OPERATION FOR EACH PUMP. IF OFF-SITE DISCHARGE IS PROPOSED, OR OFF-SITE ADVERSE IMPACTS ARE EVIDENT, AN INDIVIDUAL WATER USE PERMIT MAY BE REQUIRED. THE PERMITTEE IS CAUTIONED THAT SEVERAL MONTHS MAY BE REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION.

12. THE PERMIT DOES NOT CONVEY TO THE PERMITTEE ANY PROPERTY RIGHT NOR ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4, FAC.

13. THE PERMITTEE SHALL COMPLY WITH ALL APPLICABLE LOCAL SUBDIVISION REGULATIONS AND OTHER LOCAL REQUIREMENTS. IN ADDITION THE PERMITTEE SHALL OBTAIN ALL NECESSARY FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY CONSTRUCTION OR ALTERATION OF WORKS AUTHORIZED BY THIS PERMIT.



LOCATION MAP

EXHIBIT 1

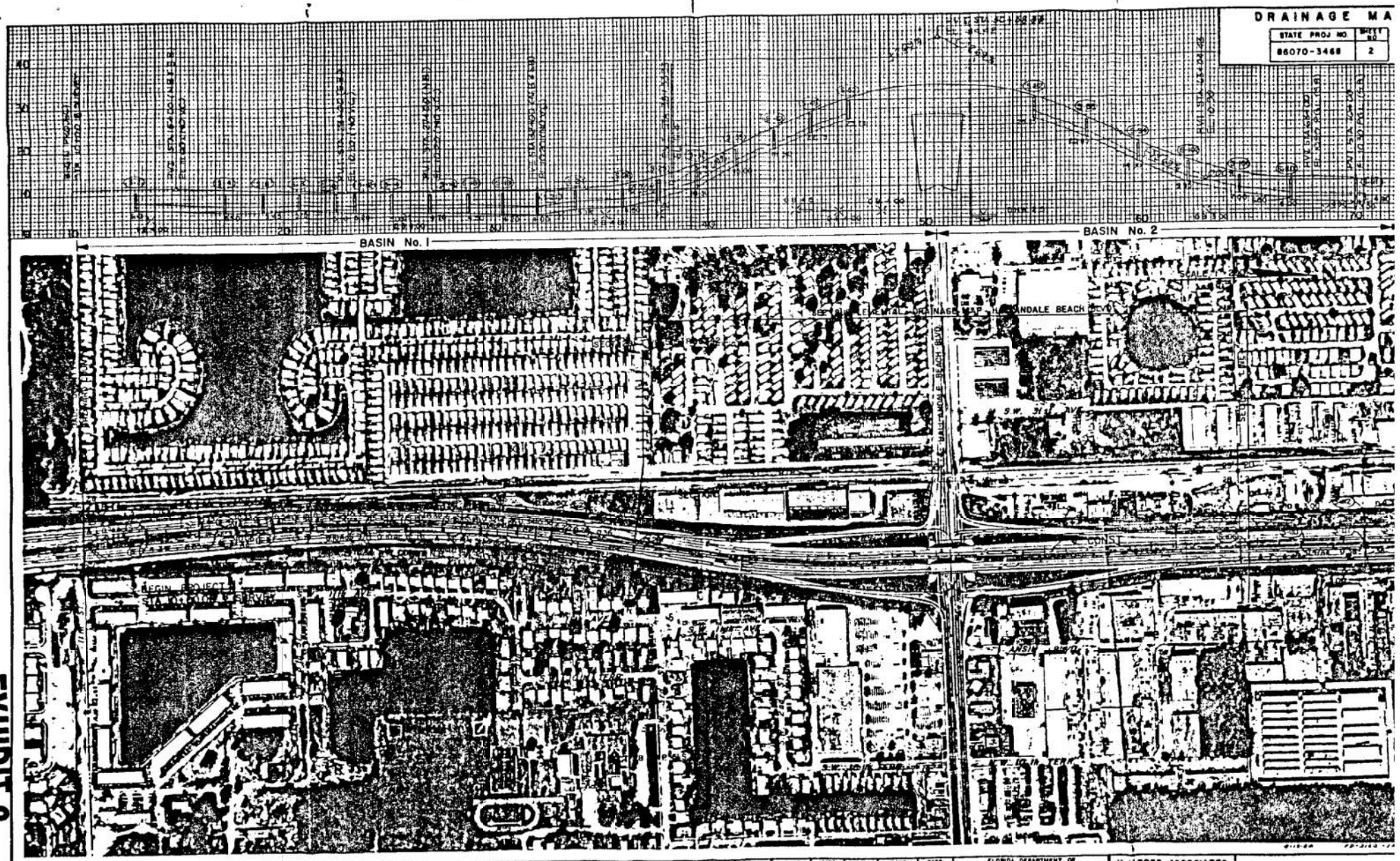
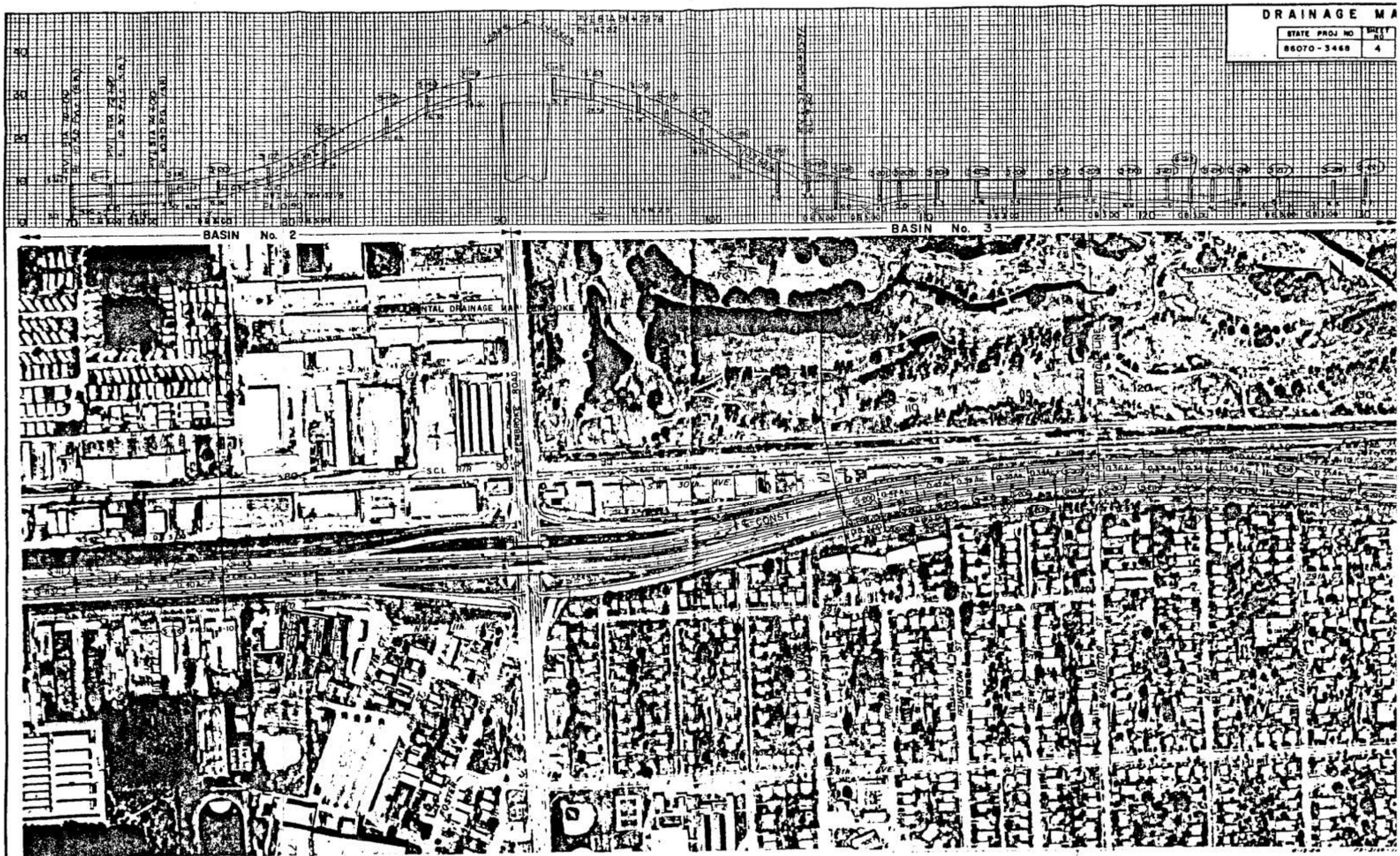

DRAINAGE MA
STATE PROJ NO.
86070-3468
SHEET NO.
2
BASIN No. 1
BASIN No. 2
BEGIN PROJECT
STA 80+00.00
SEE GENERAL DRAINAGE MAP
FORT LAUDERDALE BEACH BLVD
SW 31st AVE
CONST
ANSE
REVISIONS
DESIGNED BY
CHECKED BY
DRAWN BY
CHECKED BY
SUPERVISED BY
FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE 5-3-88
H. J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 N.W. 53 Terrace
MIAMI, FLORIDA 33166
DRAINAGE MAP

EXHIBIT 2

EXHIBIT 2

BASIN No. 1
BASIN No. 2
E. HALLANDALE BEACH BLVD.
SECTION LINE
SECTION CORNER
SECT. 29 TWP 51S RGE 42E
SECT 28 TWP 51S RGE
ANSIN BLVD.
S.C.L. R.R.
SCALE 1" = 100'
INDICATES CONTROL STRUCTURE
H.J. ROBB ASSOCIATES
CONSULTING ENGINEERS
SUPPLEMENTAL DRAINAGE
HALLANDALE BEACH BL
FLORIDA DEPARTMENT OF TRANSPORTATION
REVISIONS
DESCRIPTION
DATE
BY
CHECKED
APPROVED BY
STATE PROJ
8607G-3

EXHIBIT A



STATE PROJ NO	SHEET NO
86070-3468	4

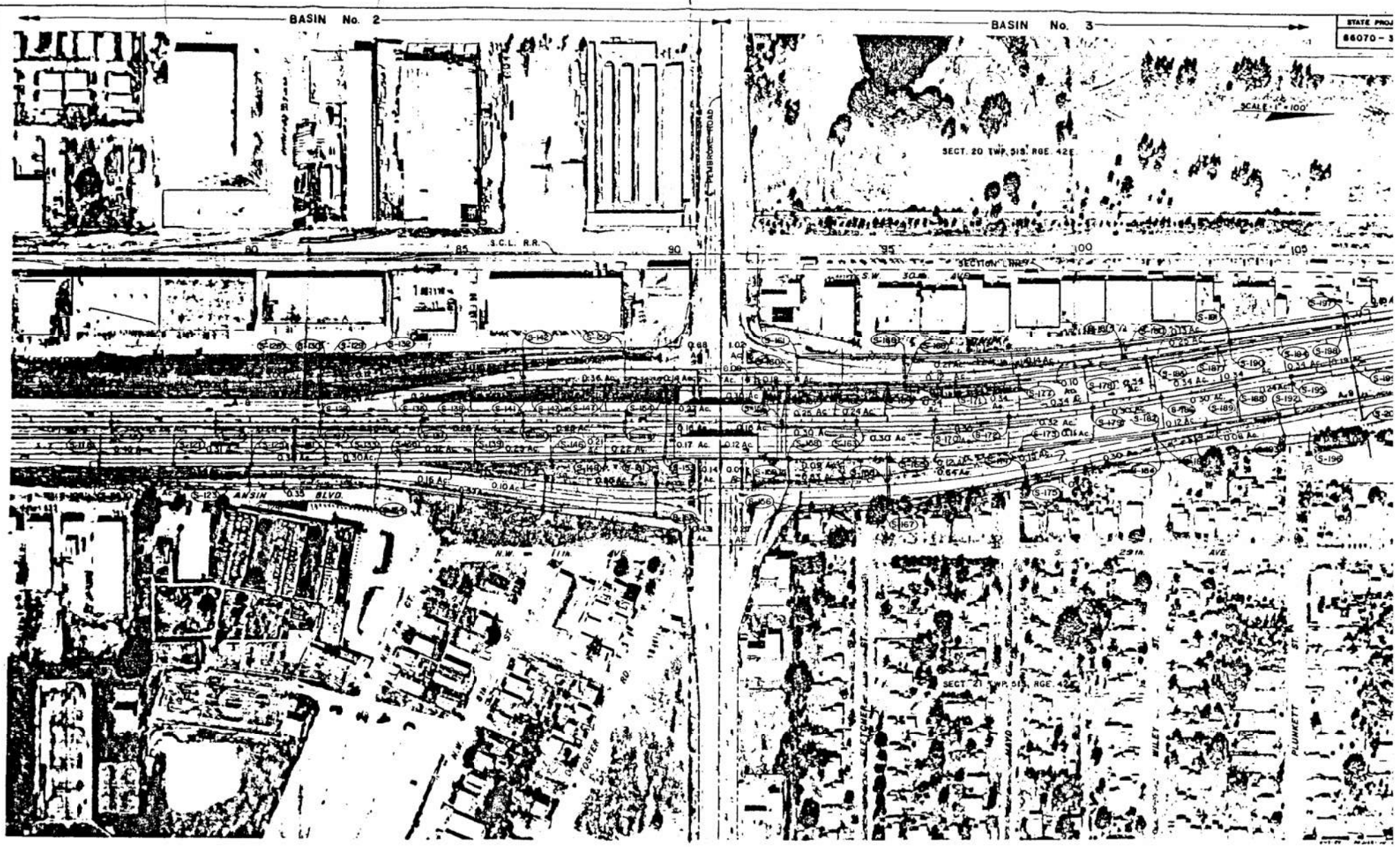
REVISIONS

FLORIDA DEPARTMENT OF TRANSPORTATION

APPROVED BY [signature] DATE 5-3-88

H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 N.W. 53 Terrace
MIAMI, FLORIDA 33166

DRAINAGE MAP



REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DESIGNED BY	NAME	DATE	DRAWN BY	NAME	DATE
CHECKED BY			CHECKED BY		

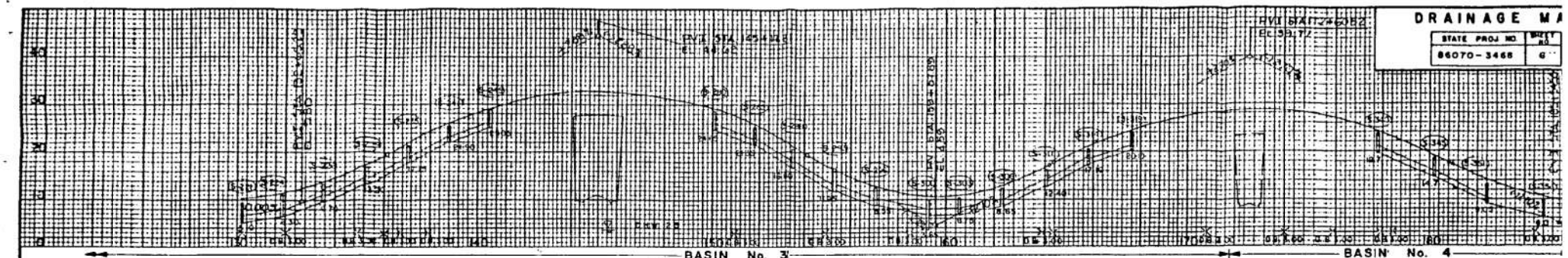
FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY

H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS

SUPPLEMENTAL DRAINAGE
PEMBROKE ROAD

EXHIBIT E

EXHIBIT C

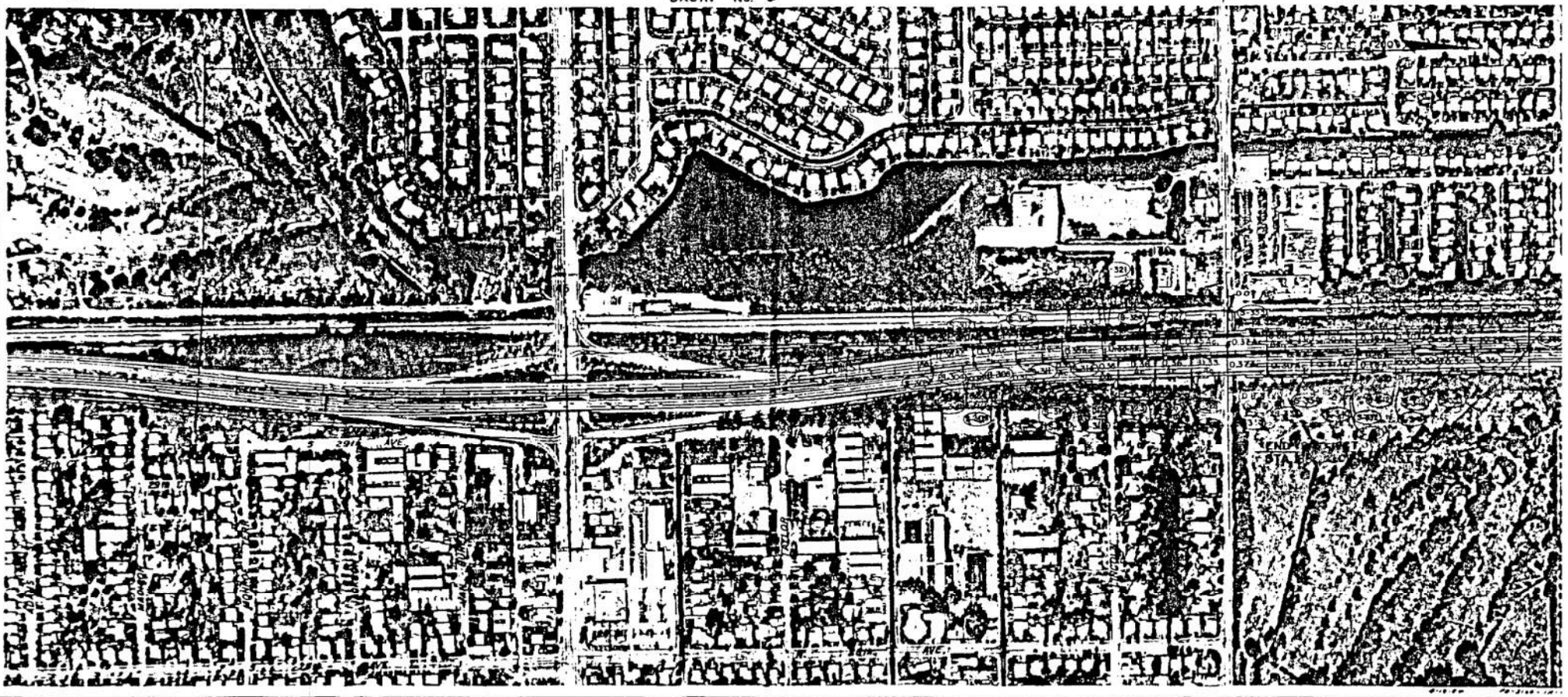


DRAINAGE MA

STATE PROJ NO	SHEET NO
86070-3466	G

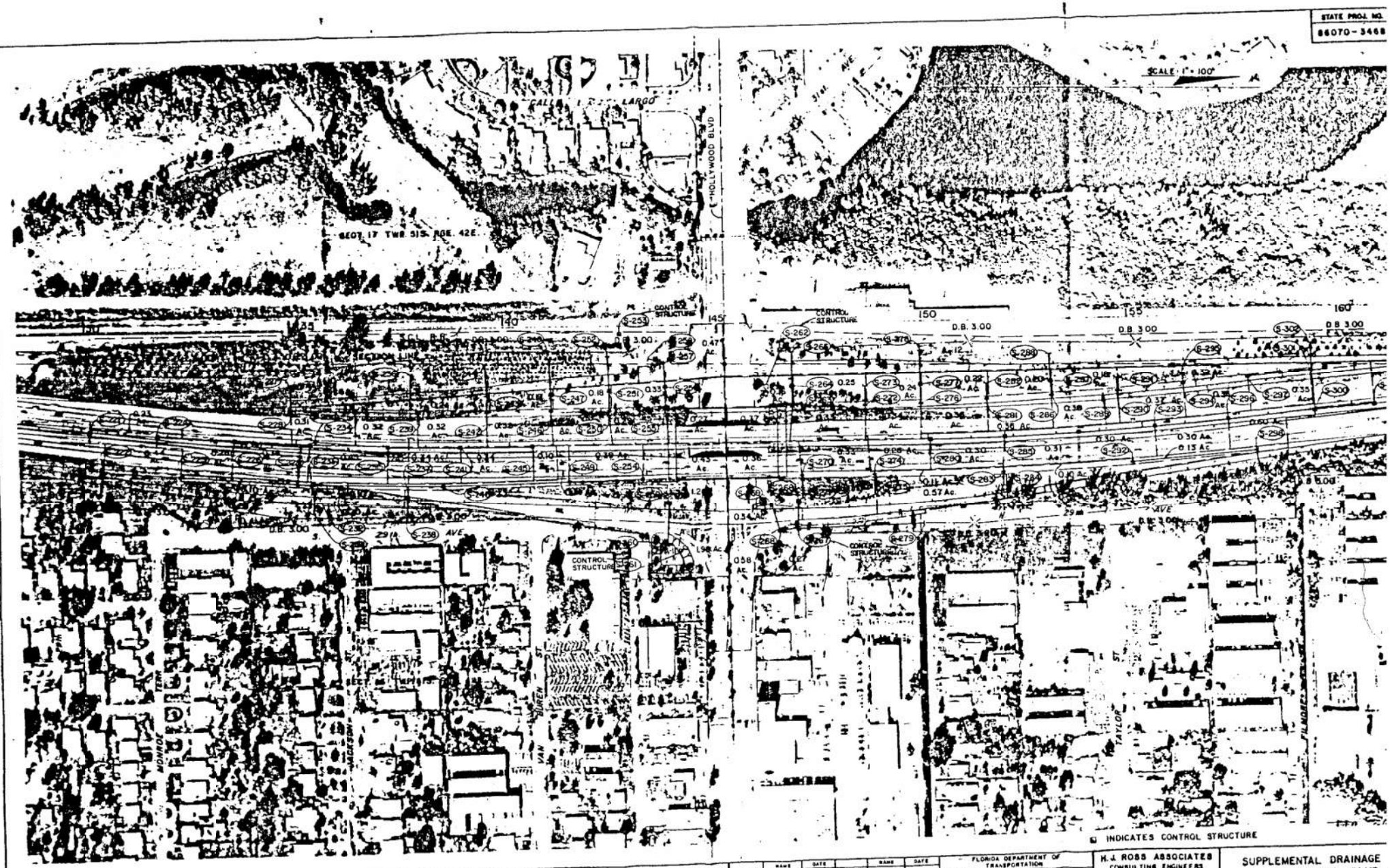
BASIN No. 3

BASIN No. 4



REVISIONS												DESIGNED BY / CHECKED BY	NAME	DATE	DRAWN BY / CHECKED BY	NAME	DATE	FLORIDA DEPARTMENT OF TRANSPORTATION	H.J. ROSS ASSOCIATES CONSULTING ENGINEERS	DRAINAGE MAP
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION									

EXHIBIT 7



REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

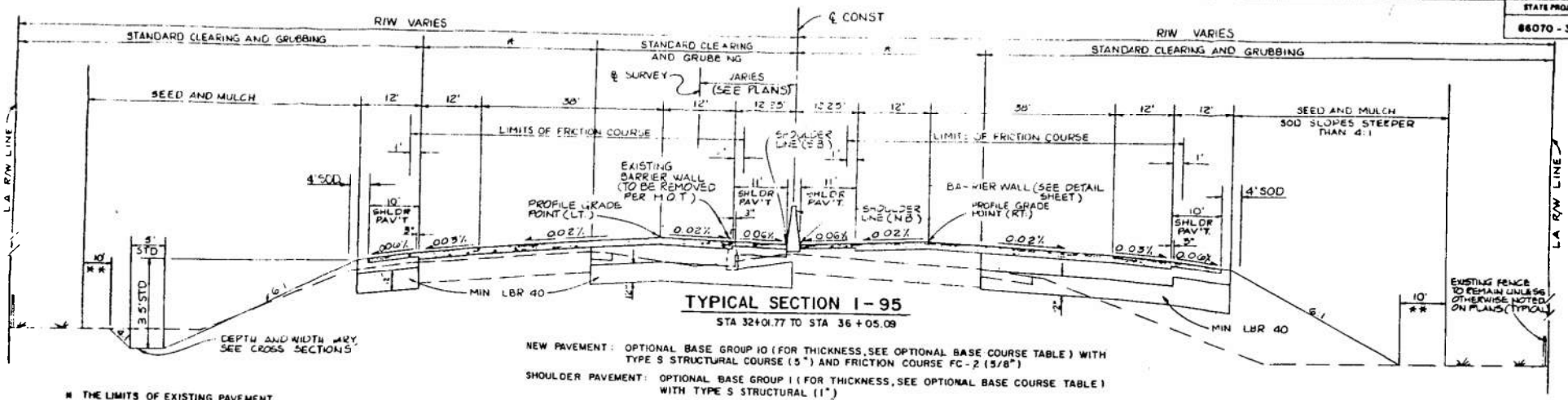
	NAME	DATE		NAME	DATE
DESIGNED BY			DRAWN BY		
CHECKED BY			CHECKED BY		
SUPERVISED BY					

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY: [signature] DATE: 5-3-88

H. J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 NW 53 TERRACE
MIAMI, FLORIDA 33166

SUPPLEMENTAL DRAINAGE
HOLLYWOOD BLVD.

STATE PROJ. NO
86070 - 348



TYPICAL SECTION I-95

STA 32+01.77 TO STA 36+05.09

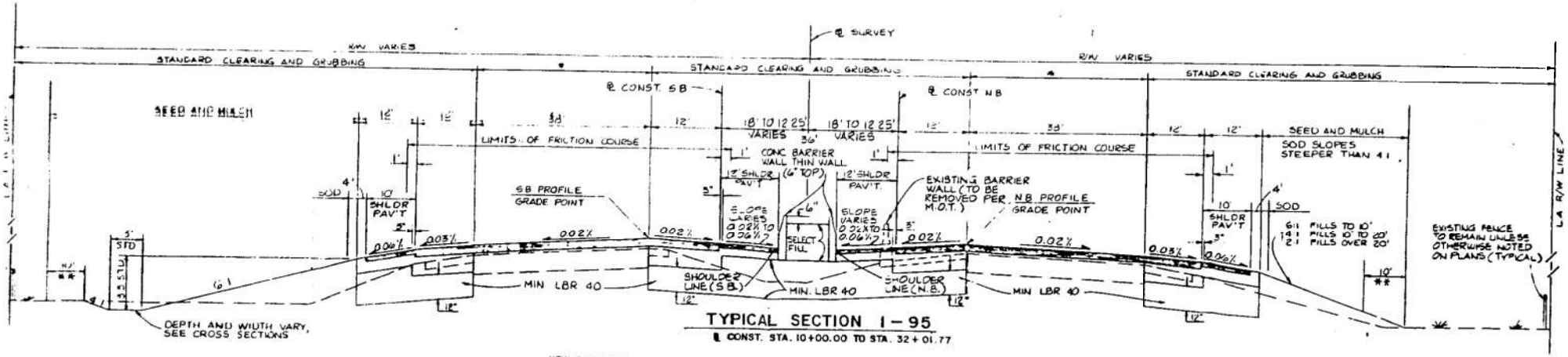
* THE LIMITS OF EXISTING PAVEMENT TO REMAIN AND TO BE RESURFACED VARY, SEE CROSS SECTIONS AND PLAN

** 10' OR AREA DISTURBED DURING CONSTRUCTION

NEW PAVEMENT: OPTIONAL BASE GROUP 10 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL COURSE (5") AND FRICTION COURSE FC-2 (5/8")

SHOULDER PAVEMENT: OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL (1")

RESURFACING: OVERBUILD EXISTING PAVEMENT WITH TYPE III (1000 lb STABILITY), AT 60 lb. PER SQ. YD. AVERAGE PLUS TYPE III LEVELING AT 60 lb PER SQ. YD. WITH TYPE S. STRUCTURAL COURSE (1") AND FRICTION COURSE FC-2 (5/8")



TYPICAL SECTION I-95

℄ CONST. STA. 10+00.00 TO STA. 32+01.77

NEW PAVEMENT: OPTIONAL BASE GROUP 10 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL COURSE (5") AND FRICTION COURSE FC-2 (5/8")

SHOULDER PAVEMENT: OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL (1")

RESURFACING: OVERBUILD EXISTING PAVEMENT WITH TYPE III (1000 lb STABILITY), AT 600 lb PER SQ. YD AVERAGE PLUS TYPE III LEVELING AT 60 lb PER SQ. YD. WITH TYPE S STRUCTURAL COURSE (1") AND FRICTION COURSE FC-2 (5/8")

FOR ADDITIONAL DETAILS SEE INDEX NO'S 281, 400, 410, 450, 452, 500, 505, 510, 520, 525.

1983 ADT 113,605
2003 ADT 211,400
K 8%, D 50%, T 4%
24 HOUR T 2%
DESIGN SPEED 60 MPH.

1. FOR TYPICAL SECTION NOTES SEE SHT. 10
2. FOR OPTIONAL BASE COURSE TABLE SEE SHT. 10

REVISIONS

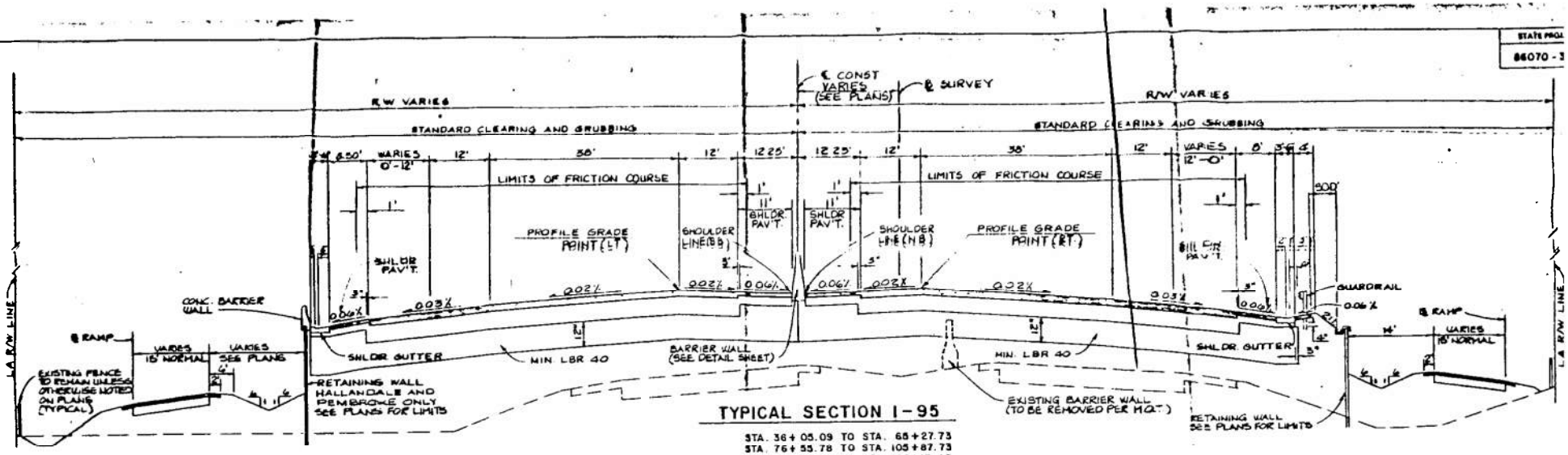
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		DATE
DESIGNED				
DRAWN				
CHECKED				

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED: [signature] DATE 5-3-88

H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 N.W. 53 Terrace
MIAMI, FLORIDA 33166

TYPICAL SECTIONS
I-95 H.O.V. LANES

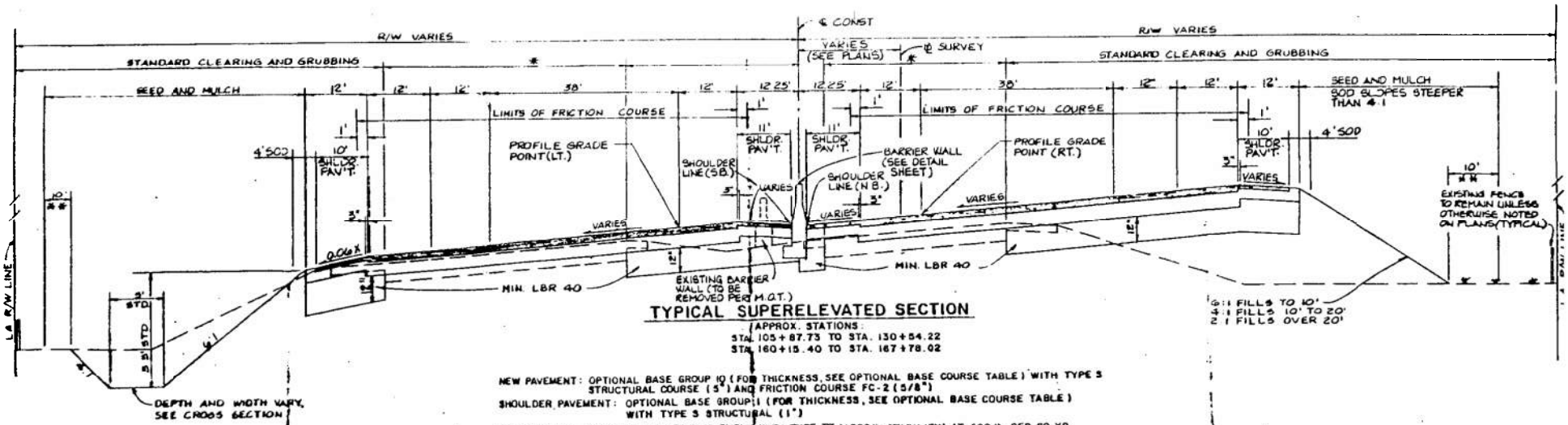


TYPICAL SECTION I-95

STA. 36+05.09 TO STA. 65+27.73
STA. 76+55.78 TO STA. 105+87.73
STA. 130+54.23 TO STA. 160+15.40

NEW PAVEMENT: OPTIONAL BASE GROUP 10 (FOR THICKNESS , SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL COURSE (5") AND FRICTION COURSE FC-2 (5/8")

SHOULDER PAVEMENT: OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL (1")



TYPICAL SUPERELEVATED SECTION

APPROX. STATIONS:
STA. 105+87.73 TO STA. 130+54.22
STA. 160+15.40 TO STA. 167+78.02

NEW PAVEMENT: OPTIONAL BASE GROUP 10 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL COURSE (5") AND FRICTION COURSE FC-2 (5/8")

SHOULDER PAVEMENT: OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL (1")

RESURFACING: OVERBUILD EXISTING PAVEMENT WITH TYPE III (1000lb STABILITY), AT 600 lb PER SQ YD. AVERAGE PLUS TYPE III LEVELING AT 60lb PER SQ. YD. WITH TYPE S STRUCTURAL COURSE (1") AND FRICTION COURSE FC-2 (5/8")

FOR ADDITIONAL DETAILS SEE INDEX NO'S 286, 400, 410, 460, 462, 500, 505, 510, 520, 525

* THE LIMITS OF EXISTING PAVEMENT TO REMAIN AND TO BE RESURFACED VARY, SEE CROSS SECTIONS AND PLANS

** 10' OR AREA DISTURBED DURING CONSTRUCTION

REVISIONS

NO.	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

H. J. ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI, FLORIDA 33166

TYPICAL SECTION
I-95 H.O.V. LAN

EXHIBIT

STATE PROJ
86070-3

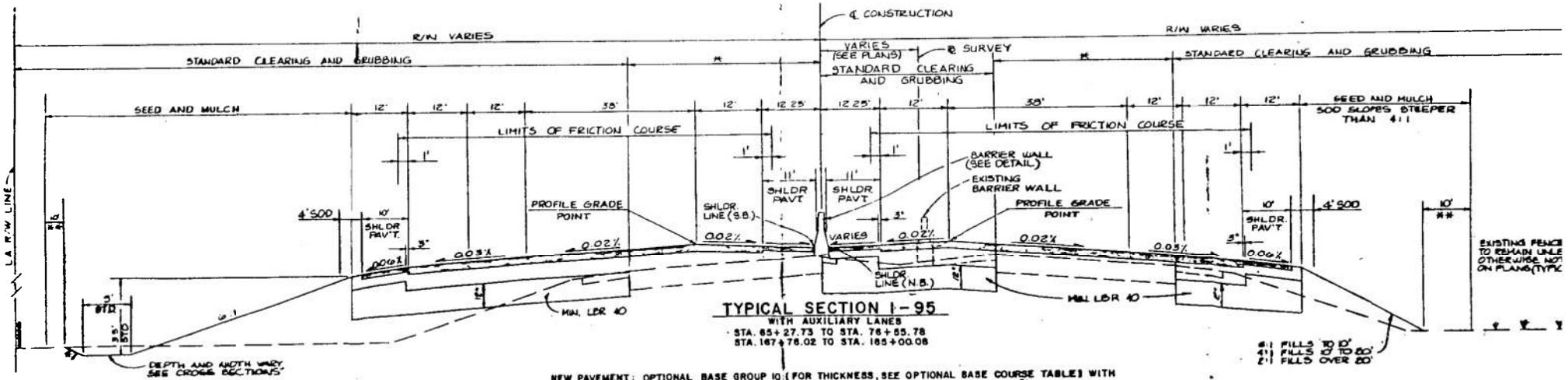
TYPICAL SECTION NOTES

1. ALL PERMANENT GRASS AREAS ARE TO RECEIVE A 4" TOPSOIL TREATMENT
2. NONE OF THE EXISTING LIMEROCK BASE THAT IS REMOVED SHALL BE USED IN THE CONSTRUCTION OF LIMEROCK BASE
3. ALL OF THE LIMEROCK BASE THAT IS REMOVED SHALL BE INCORPORATED IN THE STABILIZED PORTION OF THE SUBGRADE
4. THE QUANTITY INDICATED FOR RESURFACING REPRESENTS AN AVERAGE FOR THE SPECIFIED ROADWAY SECTION. THE RATE OF APPLICATION OF RESURFACING MAY BE DECREASED OR INCREASED AS NECESSARY AT LOCATIONS DESIGNATED BY THE ENGINEER.
5. WHEN SHOULDER PAVEMENT ADJACENT TO SHOULDER GUTTER IS LESS THAN 6' WIDE IT SHALL BE IDENTICAL TO THE ADJACENT ROADWAY PAVEMENT.
6. ALL STATIONING REFERS TO THE ℄ OF CONSTRUCTION OR TO ℄ OF RAMP UNLESS OTHERWISE NOTED.
7. PAVEMENT CROSS SLOPES SHOWN ARE NORMAL SLOPES WITHIN STATION LIMITS INDICATED, BUT VARY ACCORDING TO SUPERELEVATION TRANSITIONS.

OPTIONAL BASE COURSE TABLE

BASE GROUP	THICKNESS INCHES	BASE	OPTION CODE
10	10 1/2"	LIMEROCK	003
	9 1/2"	ASPHALT BASE TYPE I	006
	8"	ASPHALT BASE TYPE II	366
	6 1/2"	ASPHALT BASE TYPE III	367
1	4"	LIMEROCK	001
	4"	ASPHALT BASE TYPE I	008
	4"	ASPHALT BASE TYPE II	008
	4"	ASPHALT BASE TYPE III	007

THE CONTRACTOR SHOULD IDENTIFY THE "PROPOSED" OPTION ON WHICH HIS INITIAL BID IS BASED BY ENTERING THE THREE DIGIT OPTION CODE TO THE RIGHT SIDE OF THE ITEM NUMBER OF OPTIONAL BASE ITEM ON THE SUBMITTED BID PROPOSAL.



TYPICAL SECTION I-95
WITH AUXILIARY LANES
STA. 65+27.73 TO STA. 76+55.78
STA. 167+76.02 TO STA. 185+00.08

* THIS LIMITS OF EXISTING PAVEMENT TO REMAIN AND TO BE RESURFACED VARY, SEE CROSS SECTIONS AND PLANS

** 10' OR AREA DISTURBED DURING CONSTRUCTION

NEW PAVEMENT: OPTIONAL BASE GROUP 10 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL COURSE (6") AND FRICTION COURSE FC-2 (5/8")

SHOULDER PAVEMENT: OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL (1")

RESURFACING: OVERBUILD EXISTING PAVEMENT WITH TYPE III (1000lb STABILITY) AT 600 lb PER SQ. YD. AVERAGE PLUS TYPE III LEVELING AT 60lb PER SQ. YD. WITH TYPE S STRUCTURAL COURSE (1") AND FRICTION COURSE FC-2 (5/8")

FOR ADDITIONAL DETAILS SEE INDEX NO'S 281, 400, 410, 450, 452, 500, 505, 510, 520, 525

EXHIBIT 10

REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

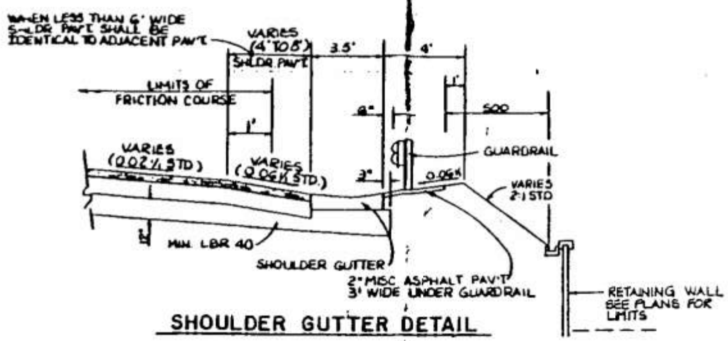
DESIGNED BY		DATE	DRAWN BY		DATE	
CHECKED BY			CHECKED BY			

FLORIDA DEPARTMENT OF TRANSPORTATION
DATE 5-3-88

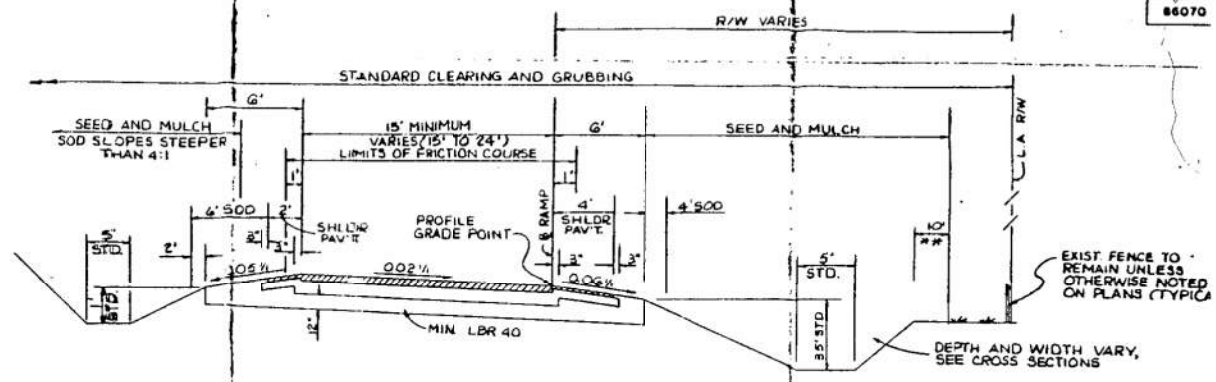
M.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 N.W. 53 Terrace
MIAMI, FLORIDA 33166

TYPICAL SECTIONS
I-95 H.O.V. LAN

EXHIBIT 11



SHOULDER GUTTER DETAIL



TYPICAL RAMP SECTION

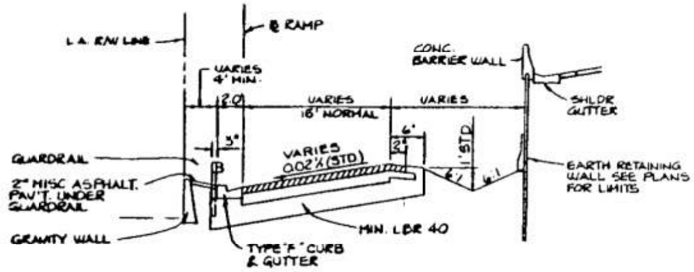
RAMPS "A", "B", "C", & "D" ON HALLANDALE, PEMBROKE & HOLLYWOOD

* THE LIMITS OF EXISTING PAVE... TO REMAIN AND TO BE RESUR... VARY, SEE CROSS SECTIONS ... PLAN

** 10' OR AREA DISTURBED DUR... CONSTRUCTION

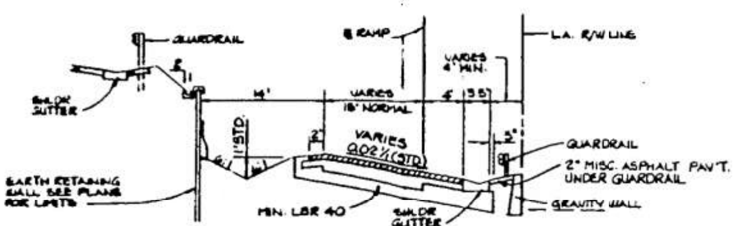
NEW PAVEMENT: OPTIONAL BASE GROUP 10 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL COURSE (5") AND FRICTION FC-2 (5/8")

SHOULDER PAVEMENT: OPTIONAL BASE GROUP 1 (FOR THICKNESS, SEE OPTIONAL BASE COURSE TABLE) WITH TYPE S STRUCTURAL (1")



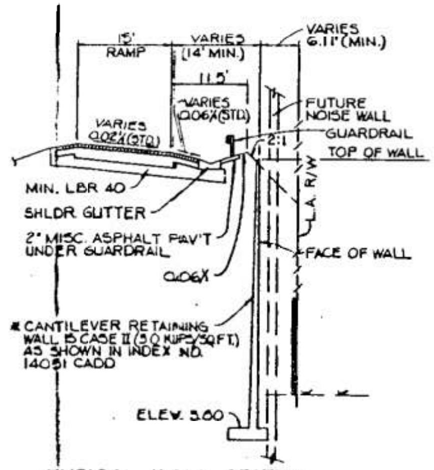
TYPICAL SECTION ON TIGHT RIGHT - OF - WAY

RAMP "C" HALLANDALE



TYPICAL SECTION ON TIGHT RIGHT = OF = WAY

RAMP "C" PEMBROKE
RAMP "A" HOLLYWOOD



TYPICAL WALL SECTION

RAMP "A" HALLANDALE

RAMP "A" WALL			
STATION	FACE OF WALL OFFSET	TOP ELEV.	WALL TYPE
237+00	28.09' RT.	5.20	GRAVITY WALL
237+50		6.85	
238+00		8.20	
238+50		9.20	
239+00		10.10	CANTILEVER RETAINING WALL
239+50		10.80	
240+00	14.00' RT.	11.40	
240+50		11.75	
241+00	14.00' RT.	11.90	
241+50	29.00' RT.	11.80	
242+00		11.60	
242+50	29.00' RT.	11.15	GRAVITY WALL
243+00	35.00' RT.	7.60	
243+25	45.00' RT	6.10	

* NOTE: OFFSETS ARE TO FACE OF WALL.

1. FOR TYPICAL SECTION NOTES SEE SHT. ...
2. FOR OPTIONAL BASE COURSE TABLE SEE ...

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
REVISIONS											

DESIGNED BY / CHECKED BY / DRAWN BY / CHECKED BY

FLORIDA DEPARTMENT OF TRANSPORTATION

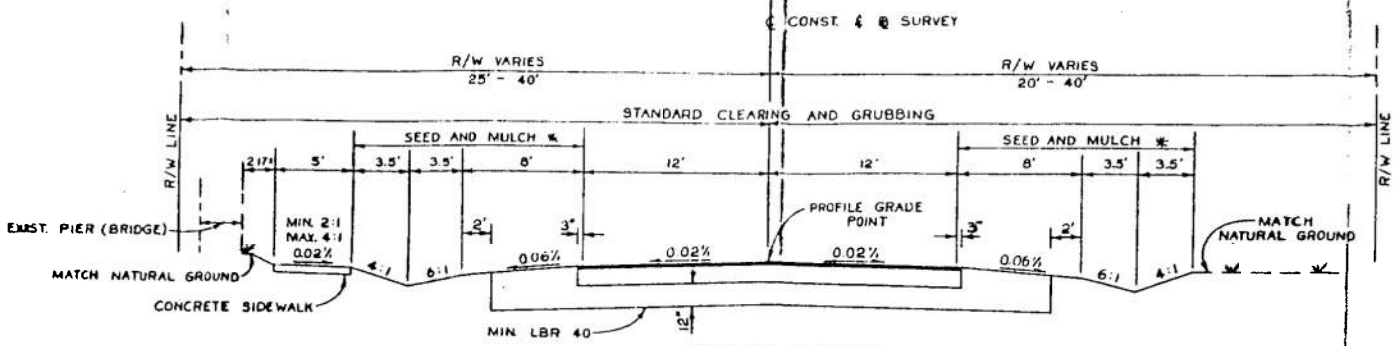
5-3-80

H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
3401 N.W. 33 Terrace
MIAMI, FLORIDA 33142

TYPICAL SECTIO[N]
RAMPS

STATE P... 86070

STATE PROJ. NO.
86070 - 341



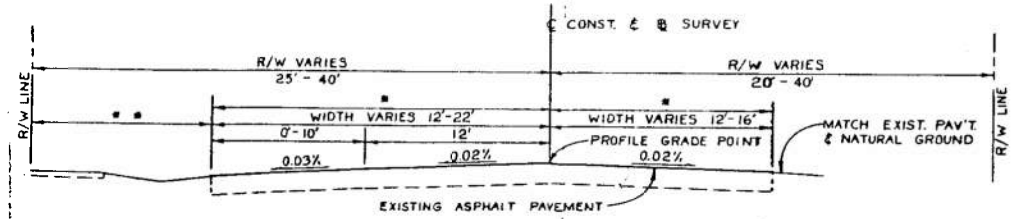
TYPICAL SECTION
STA. 13+60 TO STA. 18+00

NEW CONSTRUCTION: OPTIONAL BASE GROUP 9 (FOR THICKNESS, SEE BELOW) WITH TYPE S STRUCTURAL COURSE (3") AND FRICTION COURSE FC-1 OR FC-4 (1")

OPTIONAL BASE COURSES PERMITTED:	OPTION CODE:
10" LIMEROCK BASE COURSE	990
9" ASPHALT BASE COURSE TYPE I	325
7" ASPHALT BASE COURSE TYPE II	326
6" ASPHALT BASE COURSE TYPE III	327

NOTE:
THE CONTRACTOR SHOULD IDENTIFY THE "PROPOSED" OPTION ON WHICH HIS INITIAL BID IS BASED BY ENTERING THE THREE DIGIT OPTION CODE TO THE RIGHT SIDE OF THE ITEM NUMBER OF OPTIONAL BASE ITEM ON THE SUBMITTED BID PROPOSAL.

* UNDER I-95 BRIDGE (STA. 14+40 TO 1(USE 2" MISC ASPHALT PAVEMENT.



TYPICAL SECTION
STA. 11+00 TO STA. 13+44
STA. 18+00 TO STA. 19+00

* THE LIMITS OF EXISTING PAVEMENT TO REMAIN AND TO BE RESURFACED PER CROSS SECTIONS AND PLAN.

** EXISTING SIDEWALK AND SWALE TREATMENT VARIES, SEE CROSS SECTIONS AND PLAN.

RESURFACING: RESURFACE EXISTING PAVEMENT WITH TYPE III LEVELING AT 80 lb PER SQ. YD. AVERAGE AND TYPE S STRUCTURAL COURSE (1 1/2") WITH FRICTION COURSE FC-1 OR FC-4 (1")

FOR ADDITIONAL DETAILS SEE INDEX NOS. 304, 500, 513, 515 & 560

REVISIONS

DATE	BY	DESCRIPTION

DESIGNED
CHECKED
APPROVED

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED: Jamal W. Reynolds

H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 N.W. 53 Terrace
MIAMI, FLORIDA

JOHNSON STREET
TYPICAL SECTIONS

EXHIBIT 13

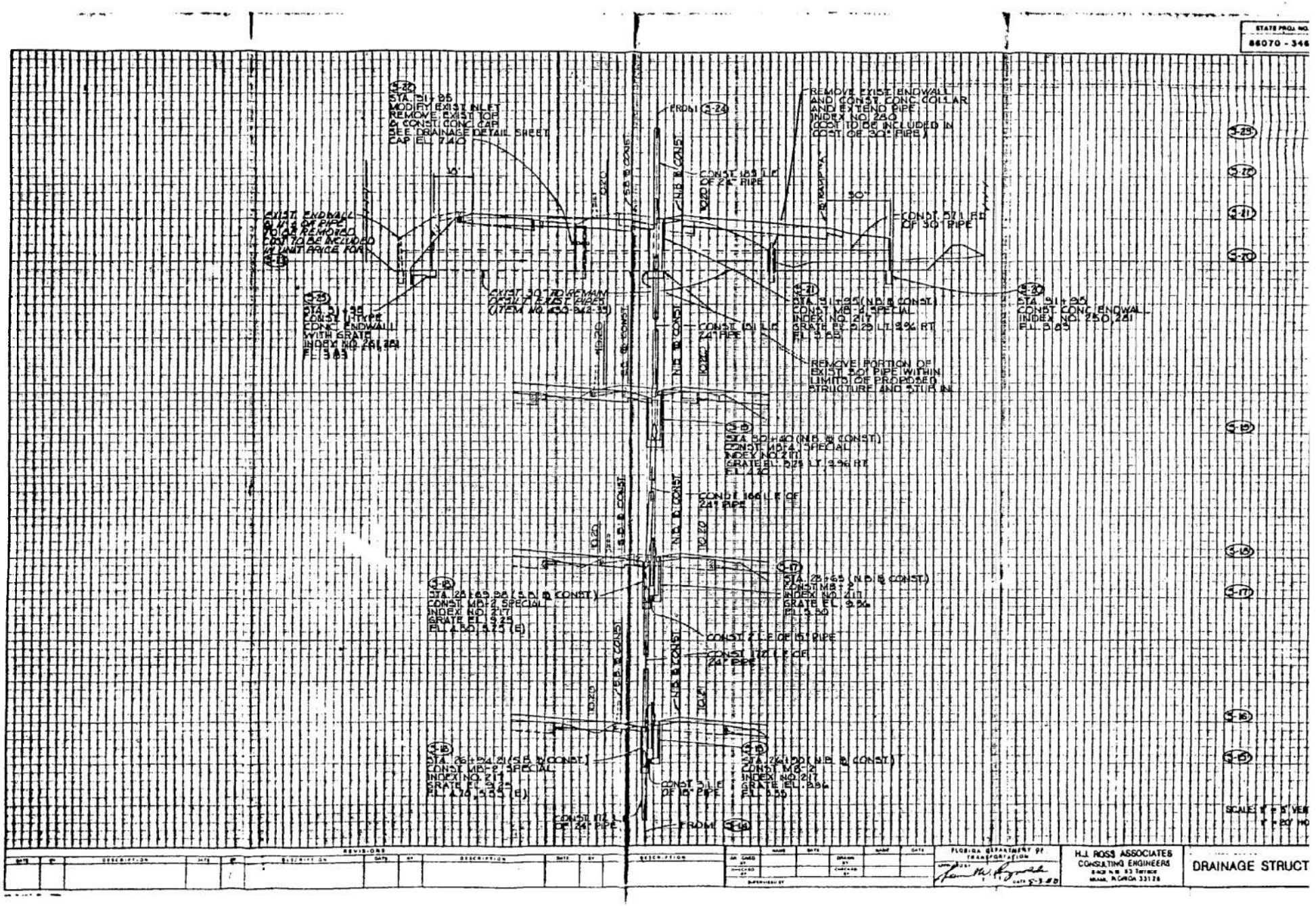

STATE PROJ. NO.
86070 - 346
(S-20)
STA. 21+25
MODIFY EXIST. INLET
REMOVE EXIST. TOP
& CONST. CONC. CAP
SEE DRAINAGE DETAIL SHEET
CAP EL. 7.40
FROM (S-24)
REMOVE EXIST. ENDWALL
AND CONST. CONC. COLLAR
AND EXTEND PIPE
INDEX NO. 280
(COST TO BE INCLUDED IN
CONST. OF 30" PIPE)
CONST. 169 L.F.
OF 24" PIPE
CONST. 57 L.F.
OF 30" PIPE
EXIST. ENDWALL
& M.E.S. OR PIPE
TO BE REMOVED
COST TO BE INCLUDED
IN UNIT PRICE FOR
(S-23)
STA. 21+95
CONST. 1 TYPE
CONC. ENDWALL
WITH GRATE
INDEX NO. 281, 281
FL. 3.83
EXIST. 30" RD. REMAIN
OF 24" EXIST. PIPE
(ITEM NO. 430-962-35)
CONST. 51 L.F.
24" PIPE
(S-21)
STA. 31+95 (N.B. & CONST.)
CONST. MBP-2 SPECIAL
INDEX NO. 217
GRATE EL. 9.29 LT. 9.96 RT.
FL. 5.85
(S-22)
STA. 31+95
CONST. CONC. ENDWALL
INDEX NO. 250, 281
FL. 3.83
REMOVE PORTION OF
EXIST. 30" PIPE WITHIN
LIMITS OF PROPOSED
STRUCTURE AND STUB IN
(S-19)
STA. 30+80 (N.B. & CONST.)
CONST. MBP-4 SPECIAL
INDEX NO. 217
GRATE EL. 9.29 LT. 9.96 RT.
FL. 4.20
CONST. 164 L.F. OF
24" PIPE
(S-18)
STA. 28+65 (N.B. & CONST.)
CONST. MBP-2
INDEX NO. 217
GRATE EL. 9.96
FL. 5.80
(S-17)
STA. 28+65 (N.B. & CONST.)
CONST. MBP-2
INDEX NO. 217
GRATE EL. 9.96
FL. 5.80
(S-16)
STA. 25+25 (S.D. & CONST.)
CONST. MBP-2 SPECIAL
INDEX NO. 217
GRATE EL. 9.25
FL. 4.80, 5.25 (E)
CONST. 2 L.F. OF 15" PIPE
CONST. 70 L.F. OF
24" PIPE
(S-15)
STA. 24+30 (N.B. & CONST.)
CONST. MBP-2
INDEX NO. 217
GRATE EL. 9.96
FL. 5.80
(S-14)
STA. 26+24.81 (S.D. & CONST.)
CONST. MBP-2 SPECIAL
INDEX NO. 217
GRATE EL. 9.25
FL. 4.70, 5.05 (E)
CONST. 3 L.F.
OF 15" PIPE
CONST. 172 L.F.
OF 24" PIPE
FROM (S-13)
SCALE: 1" = 5' VER
1" = 20' HO
REVISIONS
DESCRIPTION
FLORIDA DEPARTMENT OF
TRANSPORTATION
H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
DRAINAGE STRUCT

EXHIBIT 14

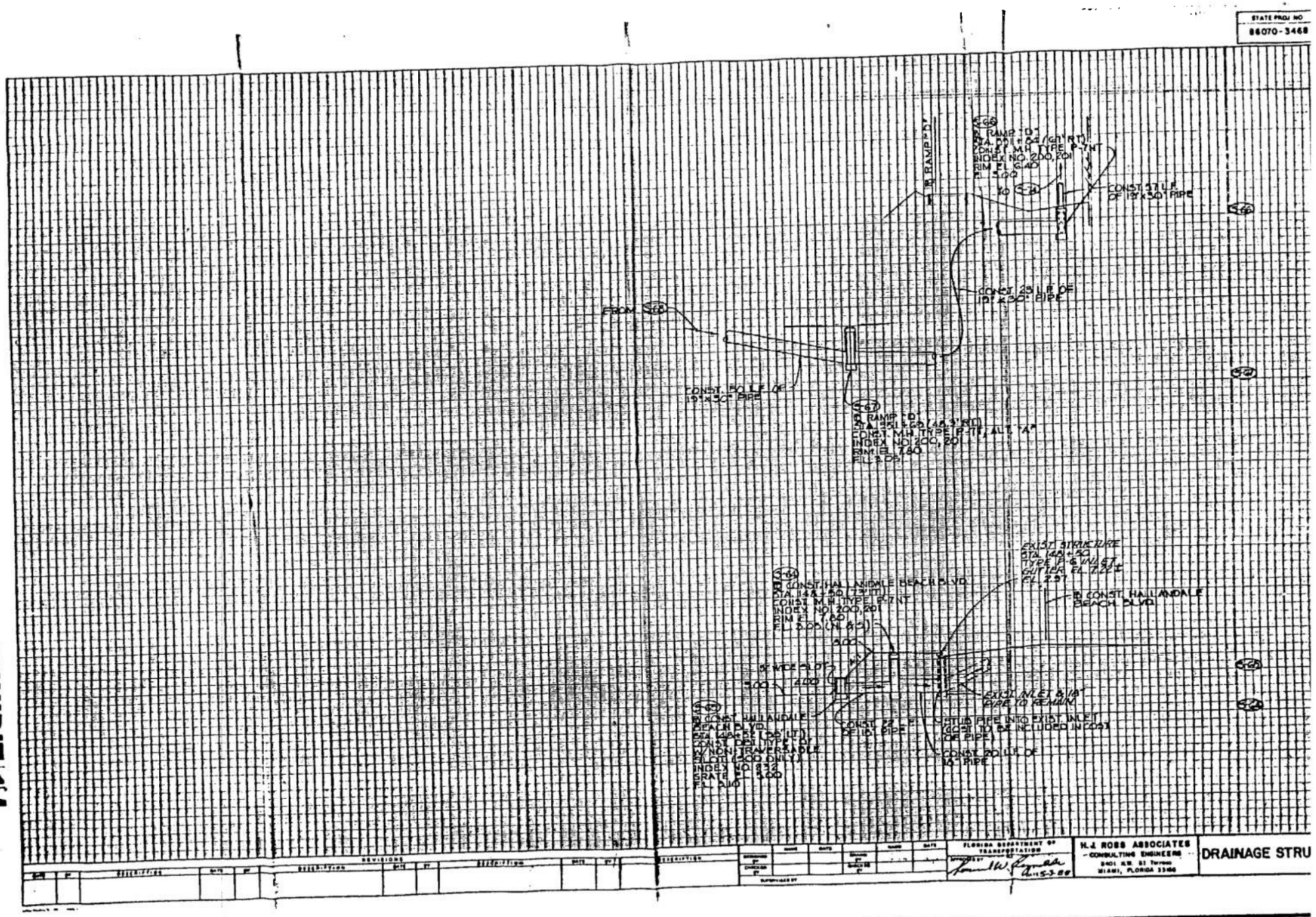
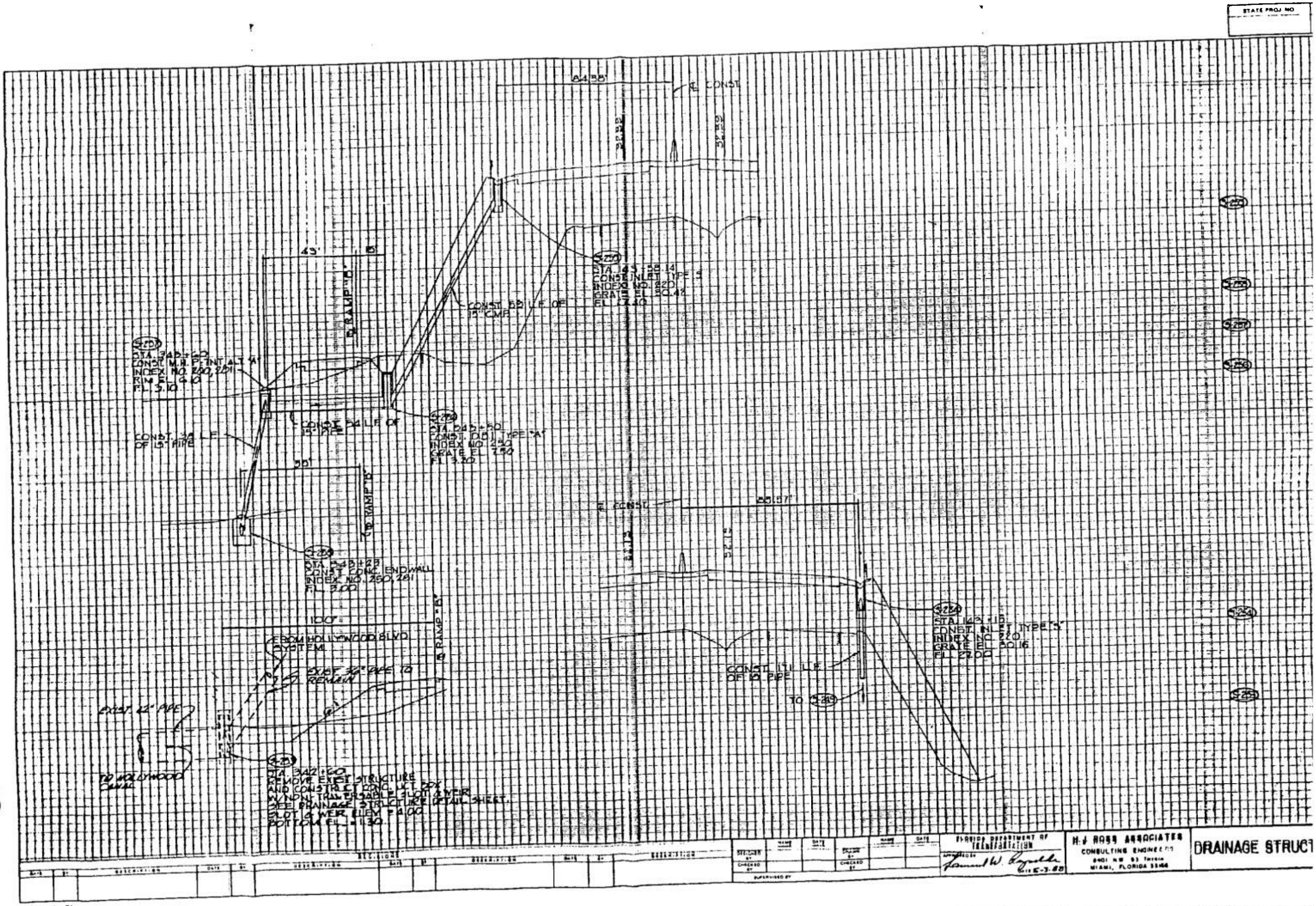

STATE PROJ NO
86070-3468
S-66
RAMP 'D'
STA. 201+64 (61' RT)
CONST. M.H. TYPE P-7 NT
INDEX NO. 200, 201
RIM EL 6.40
FL 3.00
CONST. 37 L.F. OF 18"x30" PIPE
CONST. 29 L.F. OF 18"x30" PIPE
FROM S-68
CONST. 50 L.F. OF 18"x30" PIPE
S-67
RAMP 'D'
STA. 135+69 (46.9' RT)
CONST. M.H. TYPE P-7 NT ALT. 'A'
INDEX NO. 200, 201
RIM EL 7.40
FL 3.09
EXIST. STRUCTURE
STA. 144+00
TYPE P-6 INLET
OUTLET EL 7.61±
FL 2.97
S-69
CONST. HALLANDALE BEACH BLVD.
STA. 148+50 (73' LT)
CONST. M.H. TYPE P-7 NT
INDEX NO. 200, 201
RIM EL 7.40
FL 3.09 (IN 6")
CONST. HALLANDALE BEACH BLVD.
5' WIDE SLOT
CONST. 22 L.F. OF 18" PIPE
STUB PIPE INTO EXIST. INLET (COST TO BE INCLUDED IN COST OF PIPE)
CONST. 20 L.F. OF 18" PIPE
S-69
CONST. HALLANDALE BEACH BLVD.
STA. 148+52 (56' LT)
CONST. DOUBLE 'V' NON-TRAVERSABLE SLOPE (SOD ONLY)
INDEX NO. 515
SRATE 3.00
FL 3.00
REVISIONS
DESCRIPTION
DATE
BY
FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE 5-3-88
H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI, FLORIDA 33166
DRAINAGE STRU

EXHIBIT 15

H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI FLORIDA
DRAINAGE STRUC
STATE PROJ NO
8607-3468

EXHIBIT 16


STATE PROJ NO
84.58'
℄ CONST
43'
15'
℄ RAMP "B"
STA. 343+60
CONST. M.H. P. INT ALT "A"
INDEX NO. 200, 201
RIM EL. 6.10
F.L. 3.10
CONST. 38 L.F. OF 15" PIPE
CONST. 54 L.F. OF 15" PIPE
STA. 343+50
CONST. D.B.I. TYPE "A"
INDEX NO. 230
GRATE EL. 7.50
F.L. 3.20
CONST. 55 L.F. OF 15" CMP
STA. 345+58.14
CONST. INLET TYPE 5
INDEX NO. 220
GRATE EL. 30.48
F.L. 27.40
50'
℄ RAMP "B"
STA. 343+23
CONST. CONC. ENDWALL
INDEX NO. 250, 251
F.L. 3.00
100'
℄ RAMP "B"
FROM HOLLYWOOD BLVD SYSTEM
EXIST. 36" PIPE TO REMAIN
EXIST. 42" PIPE
TO HOLLYWOOD CANAL
STA. 342+60
REMOVE EXIST STRUCTURE
AND CONSTRUCT CONC. ACT. BOX
W/ NON-TRAVERSABLE SLOT & WEIR
SEE DRAINAGE STRUCTURE DETAIL SHEET.
SLOT & WEIR ELEV. = 4.00
BOTTOM EL. = 1.30
℄ CONST
85.57'
CONST. 171 L.F. OF 15" PIPE
TO S-255
CONST. INLET TYPE "5"
INDEX NO. 220
GRATE EL. 30.16
F.L. 27.00
FLORIDA DEPARTMENT OF TRANSPORTATION
H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI, FLORIDA
DRAINAGE STRUCT

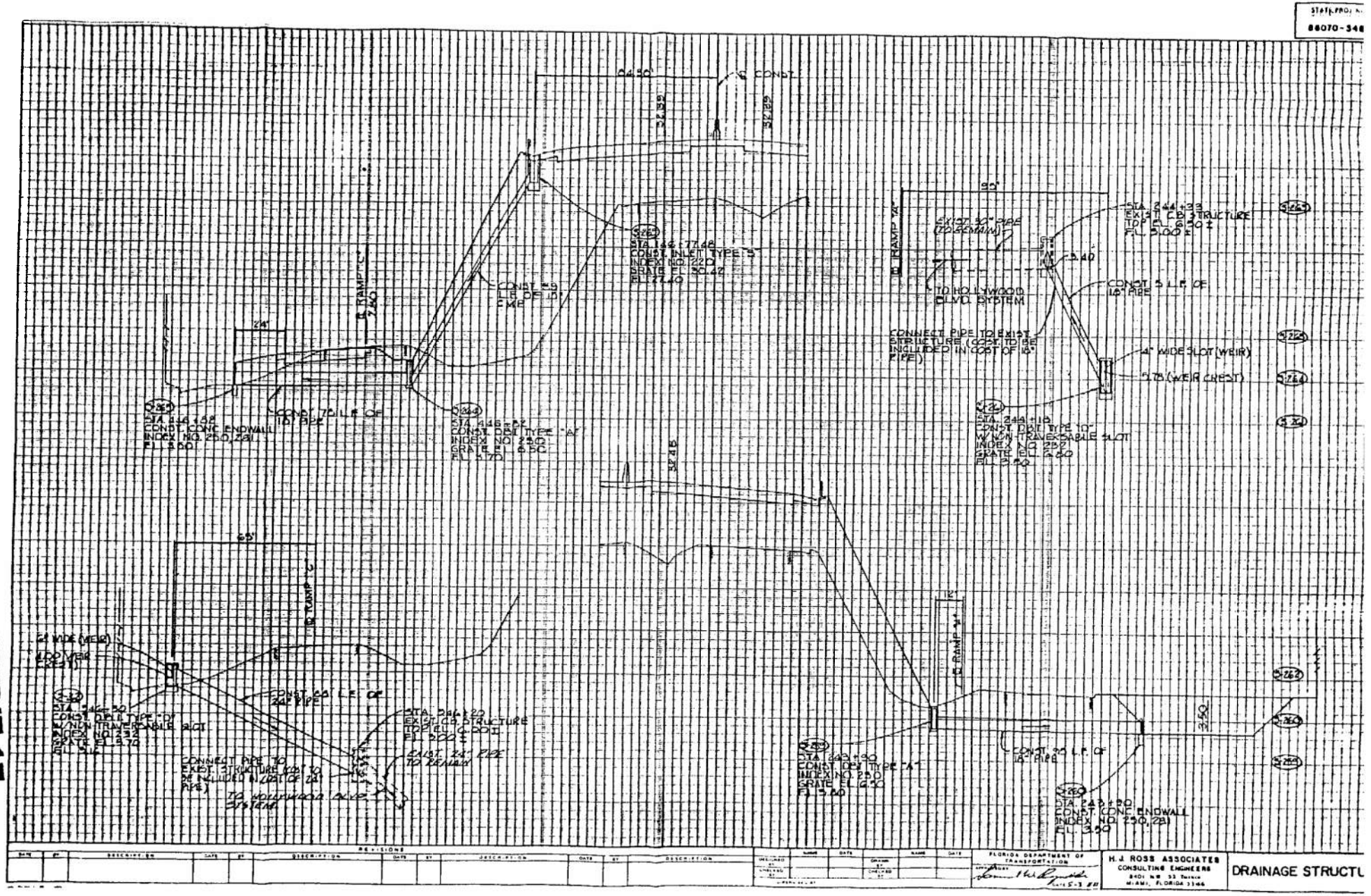

STATE PROJ. NO.
86070-348
EXHIBIT 17
24"
R. RAMP "C"
7.40
CONST. 70 L.F. OF 18" PIPE
STA. 246+56
CONST. CONC. ENDWALL
INDEX NO. 250, 281
FL. 3.50
STA. 246+27
CONST. DCII TYPE "A"
INDEX NO. 230
GRATE EL. 8.50
FL. 4.70
CONST. INLET TYPE "S"
INDEX NO. 220
GRATE EL. 10.42
FL. 7.40
CONST. 5 L.F. OF 18" PIPE
CONNECT PIPE TO EXIST. STRUCTURE (COST TO BE INCLUDED IN COST OF 18" PIPE)
TO HOLLYWOOD BLVD. SYSTEM
EXIST. 30" PIPE (TO REMAIN)
95°
STA. 244+33
EXIST. CB STRUCTURE
TOP EL. 6.30 ±
FL. 3.00 ±
3.40
4" WIDE SLOT (WEIR)
3 LB (WEIR CREST)
STA. 244+19
CONST. DCII TYPE "D"
W/NON-TRAVERSABLE SLOT
INDEX NO. 232
GRATE EL. 7.40
FL. 3.90
STA. 243+80
CONST. CONC. ENDWALL
INDEX NO. 250, 281
FL. 3.50
CONST. 20 L.F. OF 18" PIPE
3.50
R. RAMP "A"
12"
STA. 240+50
CONST. DCII TYPE "A"
INDEX NO. 230
GRATE EL. 9.20
FL. 5.40
38.46
CONST. 60 L.F. OF 24" PIPE
STA. 246+30
CONST. DCII TYPE "D"
W/NON-TRAVERSABLE SLOT
INDEX NO. 232
GRATE EL. 9.70
FL. 5.40
STA. 246+20
EXIST. CB STRUCTURE
TOP EL. 9.20 ±
FL. 5.00 ±
EXIST. 24" PIPE TO REMAIN
CONNECT PIPE TO EXIST. STRUCTURE (COST TO BE INCLUDED IN COST OF 24" PIPE)
TO HOLLYWOOD BLVD. SYSTEM
65'
R. RAMP "C"
4" WIDE (WEIR)
4 DO (WEIR CREST)
REVISIONS
DATE
BY
DESCRIPTION
CHECKED
NAME
DATE
DRAWN
CHECKED
FLORIDA DEPARTMENT OF TRANSPORTATION
H. J. ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI, FLORIDA 33166
DRAINAGE STRUCTU

EXHIBIT 18

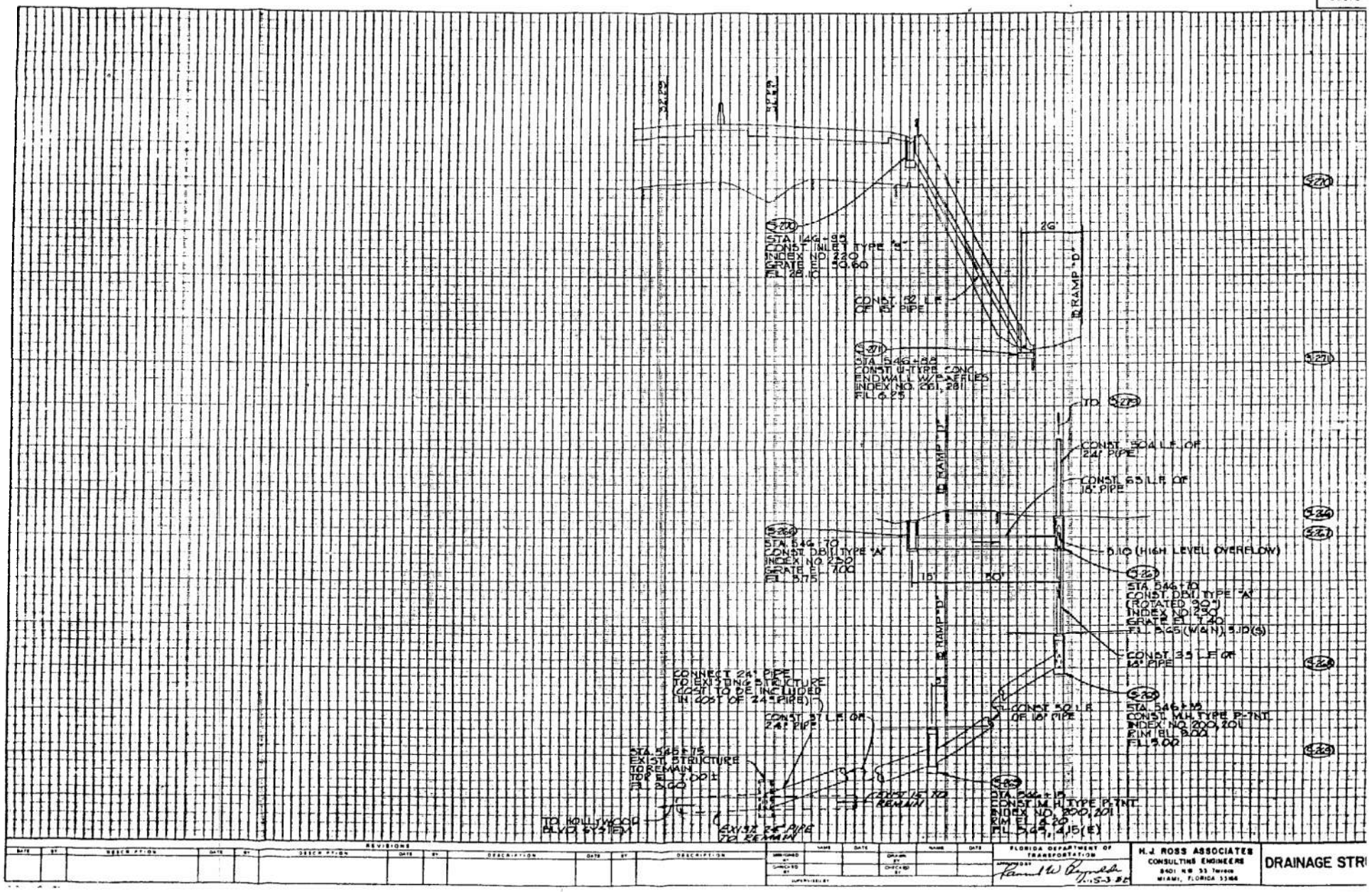
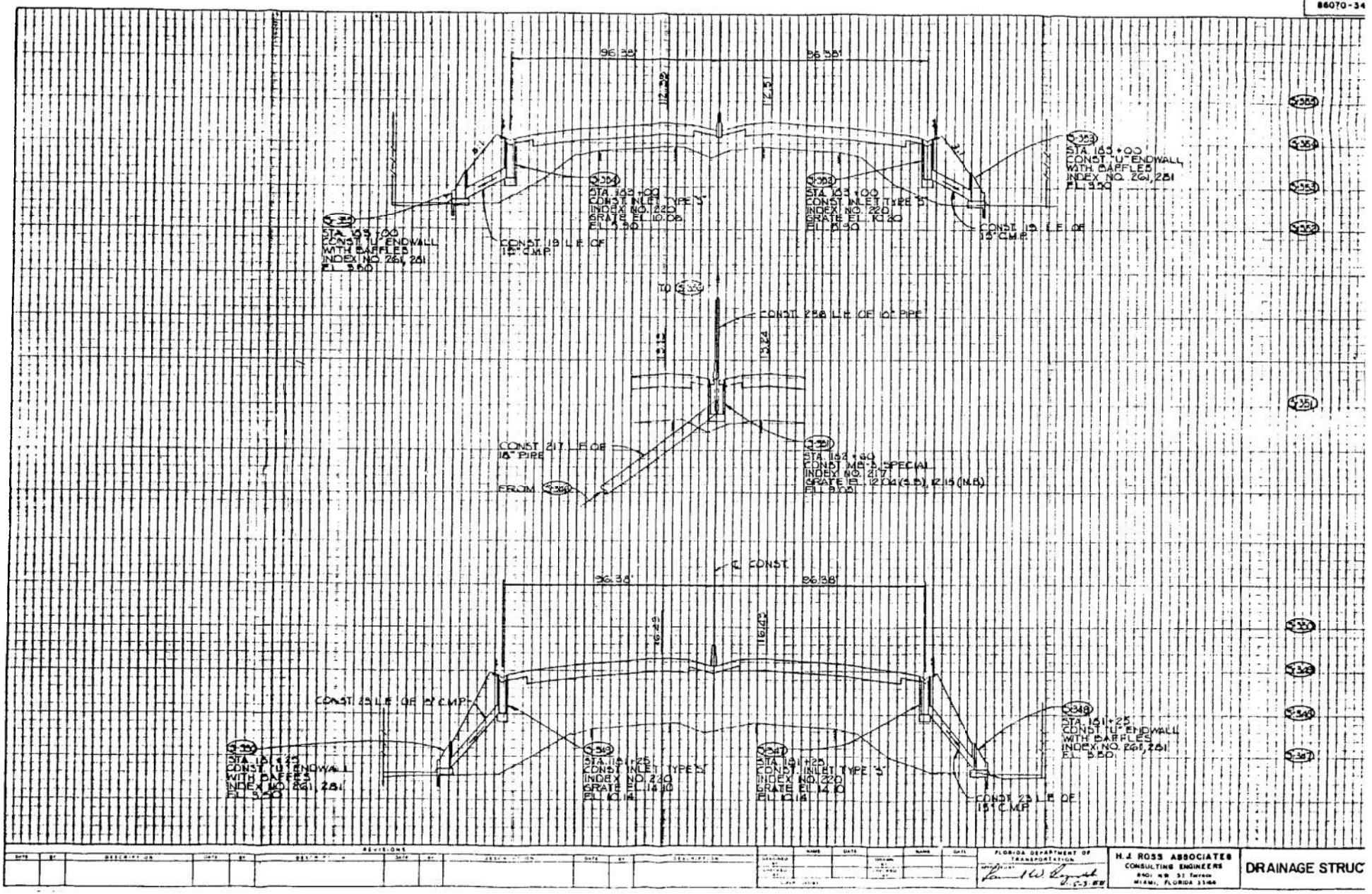
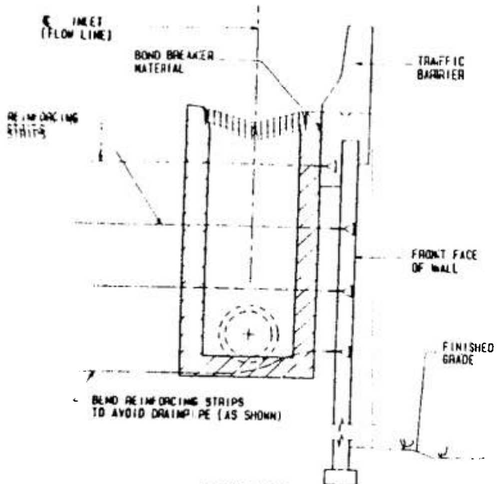

STATE PR
86070-
STA. 546+20
CONST. W-TYPE CONC.
ENDWALL W/P-4 FILES
INDEX NO. 291, 281
FIL 6.25
TO
CONST. 304 L.F. OF
24" PIPE
CONST. 65 L.F. OF
18" PIPE
D.I.O (HIGH LEVEL OVERFLOW)
STA. 546+10
CONST. DBL. TYPE "A"
(ROTATED 90°)
INDEX NO. 230
GRATE EL. 7.40
F3 - 5.65 (W & N) 5 JD'(S)
CONST. 35 L.F. OF
18" PIPE
STA. 546+10
CONST. DBL. TYPE "A"
INDEX NO. 230
GRATE EL. 7.00
EL. 5.75
STA. 546+15
CONST. M.H. TYPE P-7 NT.
INDEX NO. 200, 201
RIM EL. 8.00
FIL 5.00
CONST. 30 L.F.
OF 18" PIPE
CONNECT 24" PIPE
TO EXISTING STRUCTURE
(COST TO BE INCLUDED
IN COST OF 24" PIPE)
CONST. 7 L.F. OF
24" PIPE
STA. 546+15
CONST. M.H. TYPE P-7 NT.
INDEX NO. 200, 201
RIM EL. 8.20
FIL 5.45, 4.15 (E)
STA. 545+75
EXIST. STRUCTURE
TO REMAIN
TOP EL. 7.00±
FIL 3.00
EXIST. 15" TO
REMAIN
EXIST. 24" PIPE
TO REMAIN
TO HOLLYWOOD
BLVD. SYSTEM
REVISIONS
DATE
BY
DESCRIPTION
FLORIDA DEPARTMENT OF
TRANSPORTATION
H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 N.W. 53 Terrace
MIAMI, FLORIDA 33166
DRAINAGE STR

EXHIBIT 19


STATE PROJ. 86070-34
96.38'
112.32'
17.51'
S-354
S-353
STA. 165+00
CONST. "U" ENDWALL WITH BAFFLES
INDEX NO. 261, 281
EL. 5.20
S-352
S-351
S-350
S-349
S-348
S-347
CONST. 19 L.F. OF 15" C.M.P.
S-354
STA. 163+00
CONST. INLET TYPE "J"
INDEX NO. 220
GRATE EL. 10.08
EL. 5.50
S-353
STA. 163+00
CONST. INLET TYPE "J"
INDEX NO. 220
GRATE EL. 10.20
EL. 5.50
S-352
STA. 165+00
CONST. "U" ENDWALL WITH BAFFLES
INDEX NO. 261, 281
EL. 5.20
CONST. 19 L.F. OF 15" C.M.P.
TO S-350
CONST. 258 L.F. OF 18" PIPE
13.24'
12.12'
CONST. 217 L.F. OF 18" PIPE
FROM S-350
S-351
STA. 152+60
CONST. MH "J" SPECIAL
INDEX NO. 217
GRATE EL. 12.04 (S.B.), 12.15 (N.B.)
EL. 5.05
FL. CONST.
96.38'
116.42'
16.45'
CONST. 23 L.F. OF 24" C.M.P.
S-350
STA. 151+25
CONST. "U" ENDWALL WITH BAFFLES
INDEX NO. 261, 281
EL. 5.20
S-349
STA. 151+25
CONST. INLET TYPE "J"
INDEX NO. 220
GRATE EL. 14.10
EL. 10.18
S-348
STA. 151+25
CONST. INLET TYPE "J"
INDEX NO. 220
GRATE EL. 14.10
EL. 10.18
S-347
CONST. 23 L.F. OF 15" C.M.P.
REVISIONS
DESIGNED
DRAWN
CHECKED
FLORIDA DEPARTMENT OF TRANSPORTATION
H. J. ROSS ASSOCIATES
CONSULTING ENGINEERS
DRAINAGE STRUC

EXHIBIT

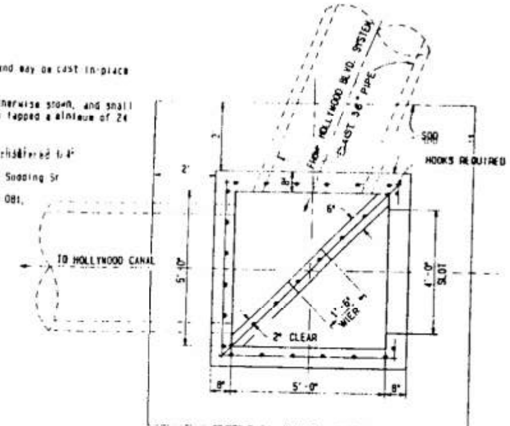
STATE PROJ.
86070-34



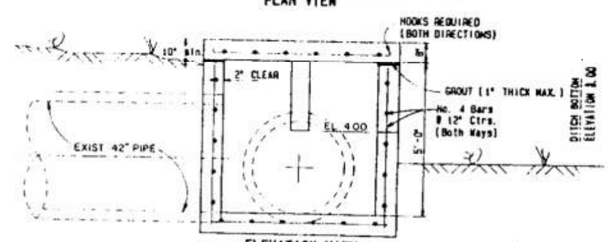
SECTION A-A

CONTROL STRUCTURE (S-253) NOTES:

1. Structure shall be constructed of Class I Concrete and may be cast in-place or precast.
2. All steel bars shall have 2" minimum cover unless otherwise shown, and shall be hooked where indicated. Horizontal steel shall be lapped a minimum of 24 bar diameters at corners.
3. All exposed corners and edges of [illegible] to be chamfered [illegible]
4. Sodding to be paid for under contract unit price for Sodding Sr
5. Control Structure shall be paid for under item 425-3 081, Juction Box (Special)

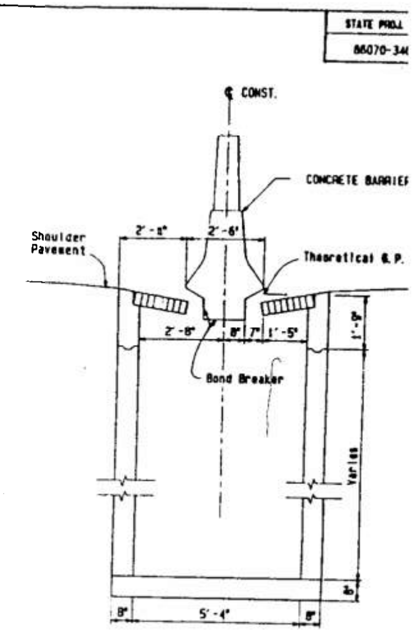


PLAN VIEW



ELEVATION VIEW

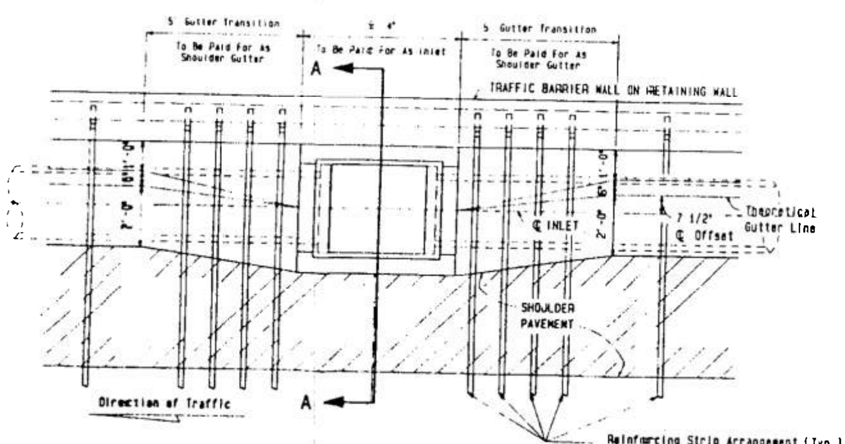
CONTROL STRUCTURE DETAIL (S-253)



"SPECIAL" MEDIAN BARRIER INLET TYPE 3, 4 & 5

NOTES

1. "SPECIAL" Median Barrier Inlet Descriptions
   - Type 3 Two single throats, opposite sides of barrier wall.
   - Type 4 Double throats, opposite sides of barrier wall.
   - Type 5 Double throats, one side of barrier wall, one single throat other side of barrier wall.
2. For grate details see Index No. 220. The parallel bar grate shall be used unless the reticuline grate is called for in the plans.
3. For dimensions of concrete barrier wall and concrete barrier wall incorporating light standards within the wall, refer to Concrete Barrier Wall and Miscellaneous Concrete Barrier Wall Details sheets.
4. Reinforcing steel shall have 2" minimum cover.
5. All reinforcing steel #4 bars. Longitudinal steel bars extend over full length of concrete barrier wall transition. Tie bars @ 12" ctrs. Reinforcing to be paid for under the contract unit price for concrete barrier wall - special. Reinforcing for the Median Barrier inlets shall be as shown in Index No. 217, unless otherwise noted.
6. For suppplemental details see Index Nos. 201 & 217.
7. Inlets to be paid for under the contract unit price for Inlets (MBI) (Type 1, 2, 3, 4 & 5), each. Barrier wall to be paid for under the contract unit price for Concrete Barrier Wall - LF.



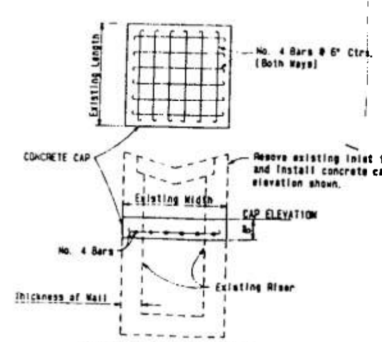
SHOULDER GUTTER TRANSITION

"SPECIAL" TYPE 'S' INLET AGAINST RETAINING WALL

SCALE: 1" = 2'

NOTE:

1. For grate and additional details see Index No. 230.
2. "SPECIAL" Type 'S' Inlets are to be paid for under the contract unit price for Inlets - Type S, each



MODIFY EXISTING INLET

(CONCRETE CAP DETAIL)

NTS

FLORIDA DEPARTMENT OF TRANSPORTATION

H. J. ROSS ASSOCIATES
CONSULTING ENGINEERS

DRAINAGE DETAILS

EXHIBIT 21

CROSS SECTI
SCALE: 1"= 5' VERT
1"= 20' HORZ
H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
FLORIDA DEPARTMENT OF TRANSPORTATION
STATE PROJ. NO.
86070-5468
℄ SURVEY
℄ S.B.
℄ N.B.
4.00
11.40
11.20
14+00
15+00
16+00
17+00

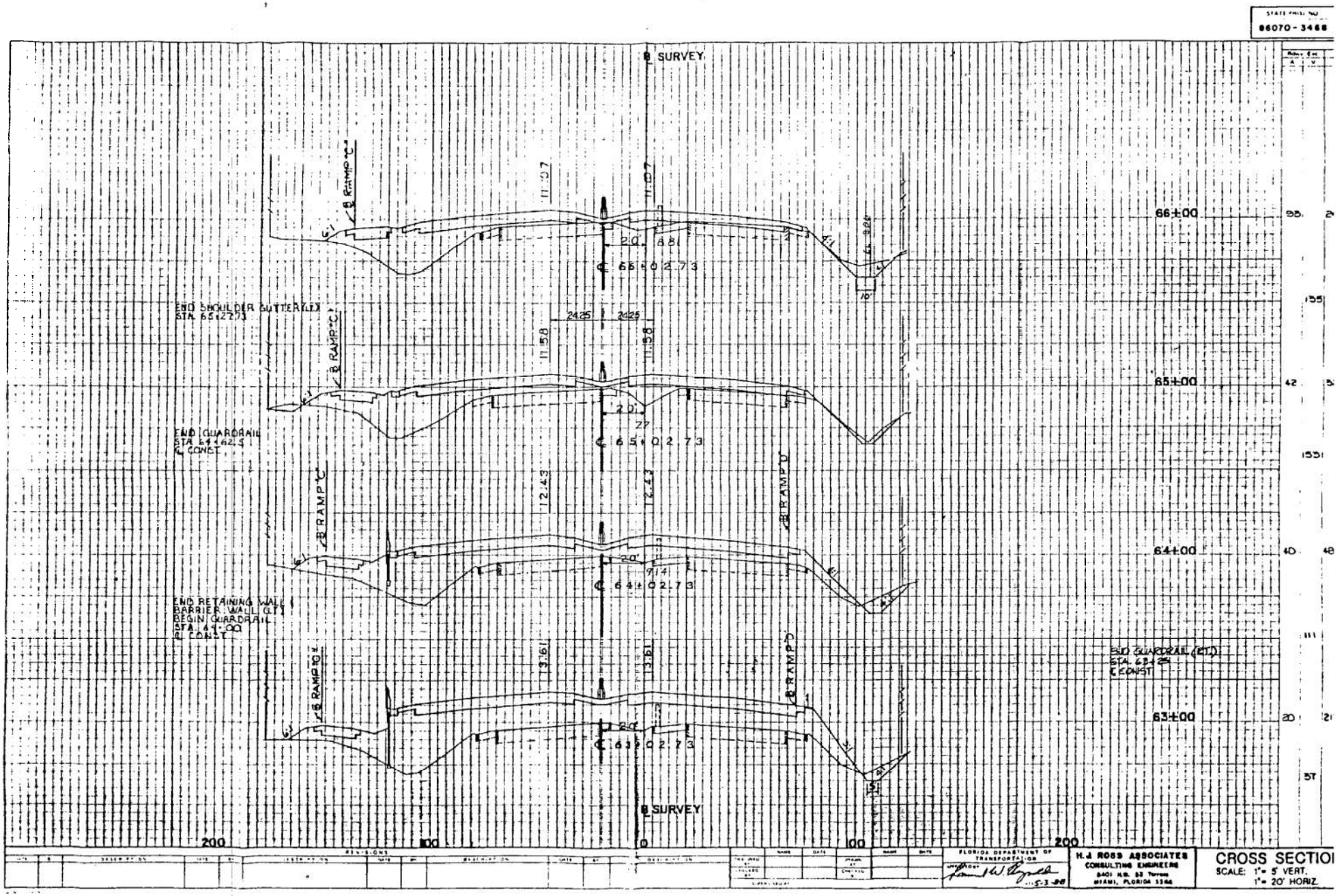
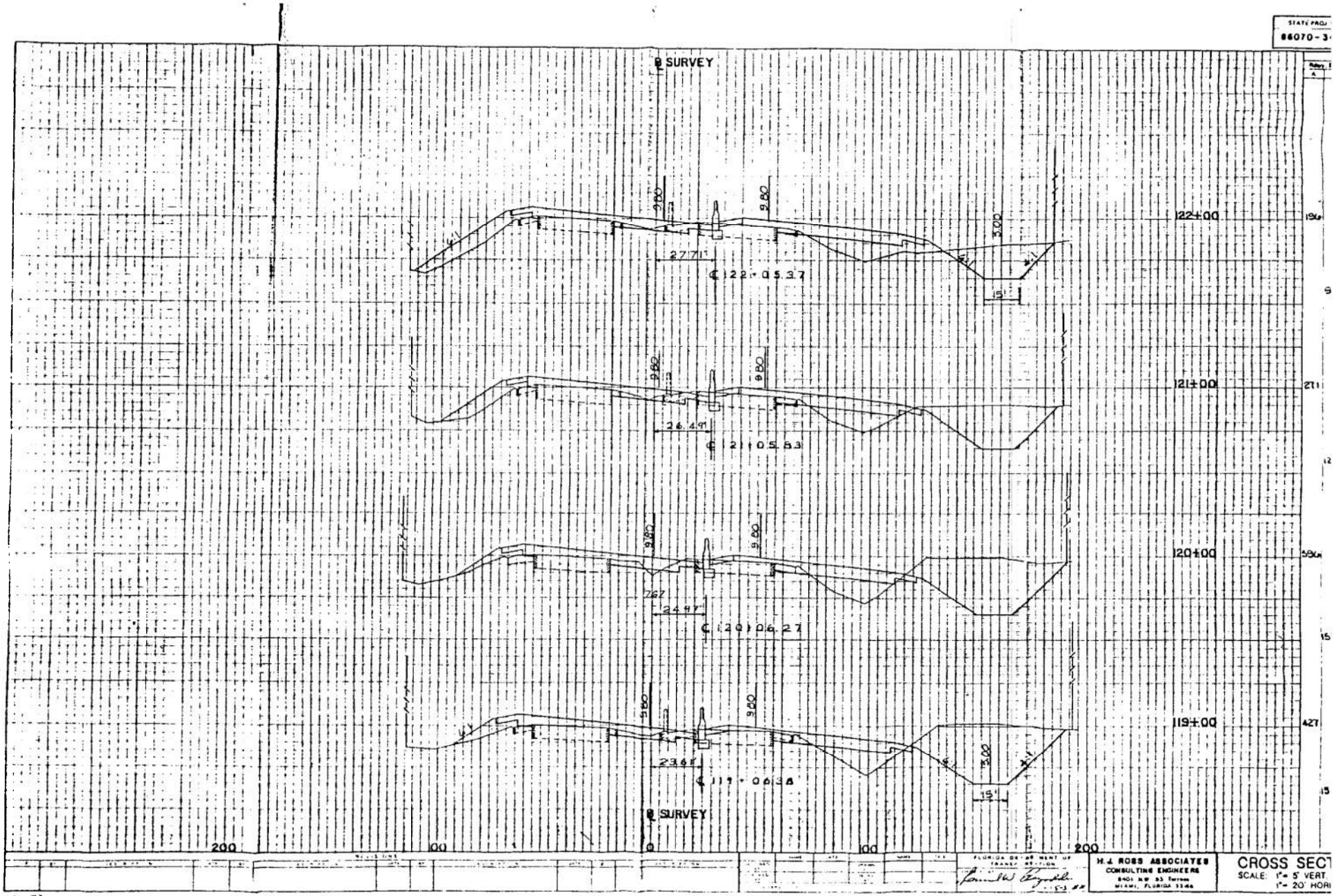

STATE PROJ. NO.
86070-3468
℄ SURVEY
℄ RAMP 'C'
℄ RAMP 'D'
END SHOULDER GUTTER(LT)
STA. 65+27.73
END GUARDRAIL
STA. 64+62.51
℄ CONST.
END RETAINING WALL
BARRIER WALL (LT)
BEGIN GUARDRAIL
STA. 64+00
℄ CONST.
END GUARDRAIL (RT)
STA. 63+25
℄ CONST.
66+00
65+00
64+00
63+00
11.07
11.58
12.43
13.61
24.25
20'
22'
200
100
0
REVISIONS
FLORIDA DEPARTMENT OF TRANSPORTATION
5-3-88
H.J ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI, FLORIDA 33166
CROSS SECTIO
SCALE: 1"= 5' VERT.
1"= 20' HORIZ.

EXHIBIT 22

EXHIBIT 23


STATE PROJ
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℄ SURVEY
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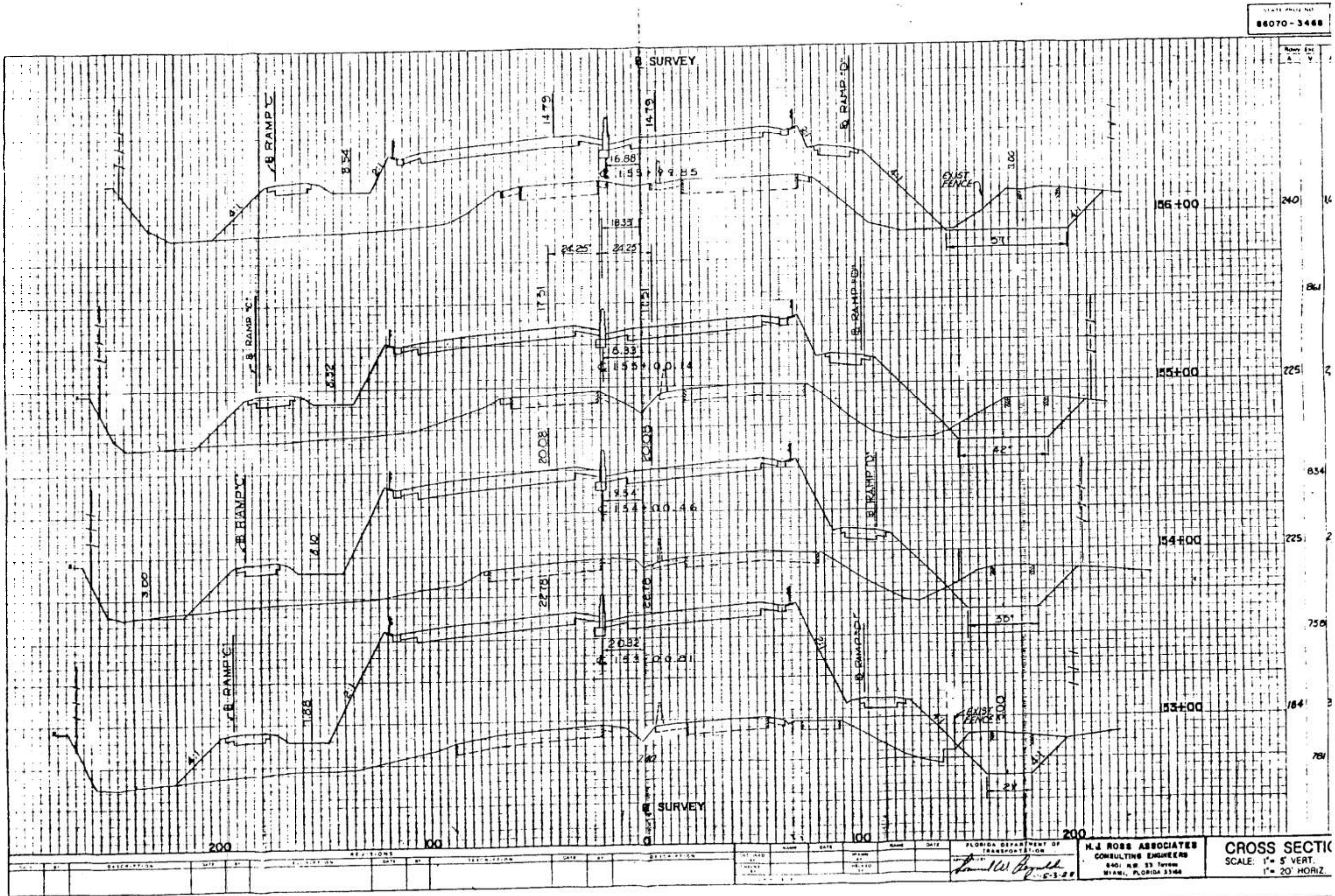
9.80
3.00
27.71'
℄ 122+05.37
15'
122+00
9.80
9.80
26.49'
℄ 121+05.83
121+00
9.80
9.80
7.67'
24.97'
℄ 120+06.27
120+00
9.80
9.80
3.00
23.61'
℄ 119+06.38
15'
119+00
℄ SURVEY
200
100
0
100
200
H. J. ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI, FLORIDA 33146
CROSS SECT
SCALE: 1"= 5' VERT.
1"= 20' HORI

EXHIBIT 24


86070-3468
SURVEY
RAMP "C"
RAMP "D"
EXIST FENCE
156+00
155+00
154+00
153+00
155+99.85
155+00.14
154+00.46
153+00.81
200
100
FLORIDA DEPARTMENT OF TRANSPORTATION
H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
8401 N.W. 53 Terrace
MIAMI, FLORIDA 33166
CROSS SECTI
SCALE: 1" = 5' VERT.
1" = 20' HORIZ.

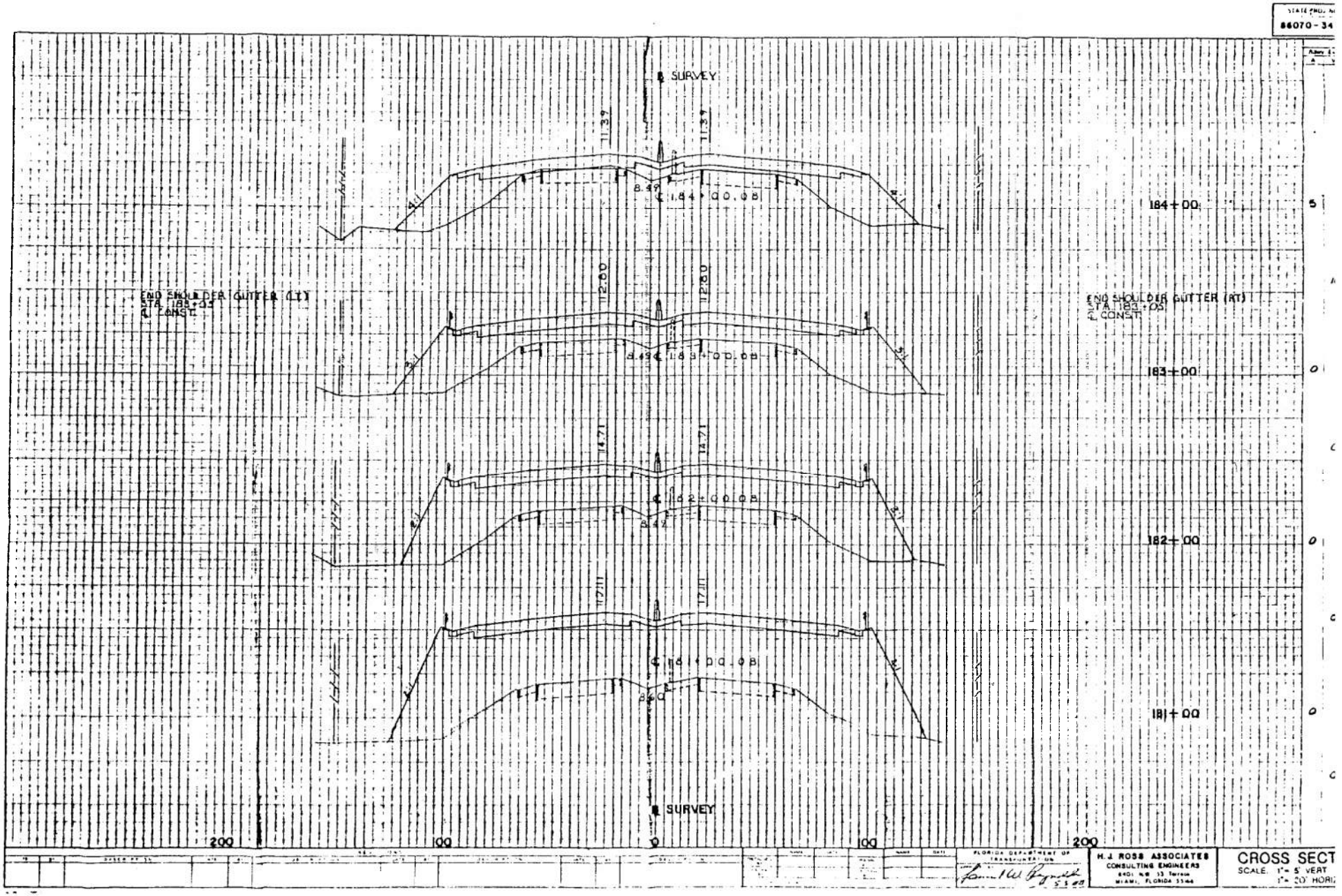

86070-34
℄ SURVEY
11.39
11.39
8.49
℄ 184+00.08
184+00
END SHOULDER GUTTER (LT)
STA. 185+05
℄ CONST.
12.80
12.80
8.49
℄ 183+00.08
END SHOULDER GUTTER (RT)
STA. 183+05
℄ CONST.
183+00
14.71
14.71
8.49
℄ 182+00.08
182+00
17.11
17.11
8.49
℄ 181+00.08
181+00
℄ SURVEY
200
100
0
100
200
H.J. ROSS ASSOCIATES
CONSULTING ENGINEERS
MIAMI, FLORIDA
CROSS SECT
SCALE: 1"= 5' VERT
1"= 20' HORIZ

EXHIBIT 25

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE
STANDARD GENERAL PERMIT NO. 88-00053-S
DATE ISSUED:May 2, 2012

Form #0941
08/95

PERMITTEE: FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 4
3400 WEST COMMERCIAL BLVD
FORT LAUDERDALE, FL 33309

PROJECT DESCRIPTION: Modification of a surface water management system to serve 4.16 acres of additional impervious area for a project known as SR-9/I-95 Express Lanes.

PROJECT LOCATION: BROWARD COUNTY, SEC 9, 16, 21, 28 TWP 51S RGE 42E

PERMIT DURATION: See Special Condition No:1. Pursuant to Rule 40E-4.321, Florida Administrative Code.

This is to notify you of the District's agency action concerning Notice of Intent for Permit Application No. 120327-4, dated March 27, 2012. This action is taken pursuant to Rule 40E-1.603 and Chapter 40E-40 , Florida Administrative Code (F.A.C.).

Based on the information provided, District rules have been adhered to and an Environmental Resource General Permit is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120, Florida Statutes, administrative hearing.
2. the attached 19 General Conditions (See Pages : 2 - 4 of 5),
3. the attached 11 Special Conditions (See Pages : 5 - 5 of 5) and
4. the attached 2 Exhibit(s)

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights," we will assume that you concur with the District's action.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the Permittee (and the persons listed in the attached distribution list) no later than 5:00 p.m. on this 2nd day of May, 2012, in accordance with Section 120.60(3), Florida Statutes.

BY: Anita R. Bain

Anita R. Bain
Bureau Chief - Environmental Resource Permitting
Regulation Division

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GENERAL CONDITIONS

1. All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall constitute a violation of this permit and Part IV, Chapter 373. F.S.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications shall be kept at the work site of the permitted activity. The complete permit shall be available for review at the work site upon request by District staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

3. Activities approved by this permit shall be conducted in a manner which does not cause violations of State water quality standards. The permittee shall implement best management practices for erosion and pollution control to prevent violation of State water quality standards. Temporary erosion control shall be implemented prior to and during construction, and permanent control measures shall be completed within 7 days of any construction activity. Turbidity barriers shall be installed and maintained at all locations where the possibility of transferring suspended solids into the receiving waterbody exists due to the permitted work. Turbidity barriers shall remain in place at all locations until construction is completed and soils are stabilized and vegetation has been established. All practices shall be in accordance with the guidelines and specifications described in Chapter 6 of the Florida Land Development Manual; A Guide to Sound Land and Water Management (Department of Environmental Regulation, 1988), incorporated by reference in Rule 40E-4.091, F.A.C. unless a project-specific erosion and sediment control plan is approved as part of the permit. Thereafter the permittee shall be responsible for the removal of the barriers. The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

4. The permittee shall notify the District of the anticipated construction start date within 30 days of the date that this permit is issued. At least 48 hours prior to commencement of activity authorized by this permit, the permittee shall submit to the District an Environmental Resource Permit Construction Commencement Notice Form Number 0960 indicating the actual start date and the expected construction completion date.

5. When the duration of construction will exceed one year, the permittee shall submit construction status reports to the District on an annual basis utilizing an annual status report form. Status report forms shall be submitted the following June of each year.

6. Within 30 days after completion of construction of the permitted activity, the permitee shall submit a written statement of completion and certification by a professional engineer or other individual authorized by law, utilizing the supplied Environmental Resource/Surface Water Management Permit Construction Completion/Certification Form Number 0881A, or Environmental Resource/Surface Water Management Permit Construction Completion Certification - For Projects Permitted prior to October 3, 1995 Form No. 0881B, incorporated by reference in Rule 40E-1.659, F.A.C. The statement of completion and certification shall be based on onsite observation of construction or review of as-built drawings for the purpose of determining if the work was completed in compliance with permitted plans and specifications. This submittal shall serve to notify the District that the system is ready for inspection. Additionally, if deviation from the approved drawings are discovered during the certification process, the certification must be accompanied by a copy of the approved permit drawings with deviations noted. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations shall be certified by a registered surveyor.

7. The operation phase of this permit shall not become effective: until the permittee has complied with the requirements of condition (6) above, and submitted a request for conversion of Environmental Resource Permit from Construction Phase to Operation Phase, Form No. 0920; the District determines the system to

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GENERAL CONDITIONS

be in compliance with the permitted plans and specifications; and the entity approved by the District in accordance with Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, accepts responsibility for operation and maintenance of the system. The permit shall not be transferred to such approved operation and maintenance entity until the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District, the permittee shall initiate transfer of the permit to the approved responsible operating entity if different from the permittee. Until the permit is transferred pursuant to Section 40E-1.6107, F.A.C., the permittee shall be liable for compliance with the terms of the permit.

8. Each phase or independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located within the area served by that portion or phase of the system. Each phase or independent portion of the system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the phase or portion of the system to a local government or other responsible entity.

9. For those systems that will be operated or maintained by an entity that will require an easement or deed restriction in order to enable that entity to operate or maintain the system in conformance with this permit, such easement or deed restriction must be recorded in the public records and submitted to the District along with any other final operation and maintenance documents required by Sections 9.0 and 10.0 of the Basis of Review for Environmental Resource Permit applications within the South Florida Water Management District, prior to lot or units sales or prior to the completion of the system, whichever comes first. Other documents concerning the establishment and authority of the operating entity must be filed with the Secretary of State, county or municipal entities. Final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final documents will result in the permittee remaining liable for carrying out maintenance and operation of the permitted system and any other permit conditions.

10. Should any other regulatory agency require changes to the permitted system, the permittee shall notify the District in writing of the changes prior to implementation so that a determination can be made whether a permit modification is required.

11. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40E-4 or Chapter 40E-40, F.A.C..

12. The permittee is hereby advised that Section 253.77, F.S. states that a person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the State, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required lease, license, easement, or other form of consent authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on sovereignty lands or other state-owned lands.

13. The permittee must obtain a Water Use permit prior to construction dewatering, unless the work qualifies for a general permit pursuant to Subsection 40E-20.302(3), F.A.C., also known as the "No Notice" Rule.

14. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities

GENERAL CONDITIONS

which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any system authorized by the permit.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding, unless a specific condition of this permit or a formal determination under Section 373.421(2), F.S., provides otherwise.

16. The permittee shall notify the District in writing within 30 days of any sale, conveyance, or other transfer of ownership or control of a permitted system or the real property on which the permitted system is located. All transfers of ownership or transfers of a permit are subject to the requirements of Rules 40E-1.6105 and 40E-1.6107, F.A.C.. The permittee transferring the permit shall remain liable for corrective actions that may be required as a result of any violations prior to the sale, conveyance or other transfer of the system.

17. Upon reasonable notice to the permittee, District authorized staff with proper identification shall have permission to enter, inspect, sample and test the system to insure conformity with the plans and specifications approved by the permit.

18. If historical or archaeological artifacts are discovered at any time on the project site, the permittee shall immediately notify the appropriate District service center.

19. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

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SPECIAL CONDITIONS

1. The construction phase of this permit shall expire on May 2, 2017.
2. Operation of the surface water management system shall be the responsibility of the permittee.
3. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.
4. Measures shall be taken during construction to insure that sedimentation and/or turbidity violations do not occur in the receiving water.
5. The District reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.
6. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.
7. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.
8. The permittee shall provide routine maintenance of all of the components of the surface water management system in order to remove all trapped sediments/debris. All materials shall be properly disposed of as required by law. Failure to properly maintain the system may result in adverse flooding conditions.
9. If prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, the permitted project should cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, should contact the Florida Department of State, Division of Historical Resources, Review and Compliance Section at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Project activities should not resume without verbal and/or written authorization from the Division of Historical Resources. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes.
10. The permittee acknowledges that, pursuant to Rule 40E-4.101(2), F.A.C., a notice of Environmental Resource or Surface Water Management Permit may be recorded in the county public records. Pursuant to the specific language of the rule, this notice shall not be considered an encumbrance upon the property.
11. Reference is made to Exhibit No. 2 by the Florida Department of Transportation, Project ID 422796-2-52-01 & 422796-1-52-01, State Road No. 9 / I-95. The plan set consisting of drainage plans and detail sheets. The drawings have been signed and sealed by Charles B. Fuller P.E., of Metric Engineering, Inc. on 3-26-12 and have been included in this permit by reference (please see permit file).

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NOTICE OF RIGHTS

As required by Sections 120.569(1), and 120.60(3), Fla. Stat., following is notice of the opportunities which may be available for administrative hearing or judicial review when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Not all the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (SFWMD or District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Fla. Stat. Persons seeking a hearing on a District decision which does or may determine their substantial interests shall file a petition for hearing with the District Clerk within 21 days of receipt of written notice of the decision, unless one of the following shorter time periods apply: 1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Fla. Stat.; or 2) within 14 days of service of an Administrative Order pursuant to Subsection 373.119(1), Fla. Stat. "Receipt of written notice of agency decision" means receipt of either written notice through mail, or electronic mail, or posting that the District has or intends to take final agency action, or publication of notice that the District has or intends to take final agency action. Any person who receives written notice of a SFWMD decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

Filing Instructions

The Petition must be filed with the Office of the District Clerk of the SFWMD. Filings with the District Clerk may be made by mail, hand-delivery or facsimile. **Filings by e-mail will not be accepted.** Any person wishing to receive a clerked copy with the date and time stamped must provide an additional copy. A petition for administrative hearing is deemed filed upon receipt during normal business hours by the District Clerk at SFWMD headquarters in West Palm Beach, Florida. Any document received by the office of the SFWMD Clerk after 5:00 p.m. shall be filed as of 8:00 a.m. on the next regular business day. Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the SFWMD Clerk, P.O. Box 24680, West Palm Beach, Florida 33416.
- Filings by hand-delivery must be delivered to the Office of the SFWMD Clerk. **Delivery of a petition to the SFWMD's security desk does <u>not</u> constitute filing. To ensure proper filing, it will be necessary to request the SFWMD's security officer to contact the Clerk's office.** An employee of the SFWMD's Clerk's office will receive and file the petition.
- Filings by facsimile must be transmitted to the SFWMD Clerk's Office at (561) 682-6010. Pursuant to Subsections 28-106.104(7), (8) and (9), Fla. Admin. Code, a party who files a document by facsimile represents that the original physically signed document will be retained by that party for the duration of that proceeding and of any subsequent appeal or subsequent proceeding in that cause. Any party who elects to file any document by facsimile shall be responsible for any delay, disruption, or interruption of the electronic signals and accepts the full risk that the document may not be properly filed with the clerk as a result. The filing date for a document filed by facsimile shall be the date the SFWMD Clerk receives the complete document.

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Initiation of an Administrative Hearing

Pursuant to Rules 28-106.201 and 28-106.301, Fla. Admin. Code, initiation of an administrative hearing shall be made by written petition to the SFWMD in legible form and on 8 and 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, District file number or any other SFWMD identification number, if known.
2. The name, address and telephone number of the petitioner and petitioner's representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the SFWMD's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the SFWMD's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the SFWMD's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the SFWMD to take with respect to the SFWMD's proposed action.

A person may file a request for an extension of time for filing a petition. The SFWMD may, for good cause, grant the request. Requests for extension of time must be filed with the SFWMD prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and that the SFWMD and any other parties agree to or oppose the extension. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

If the District takes action with substantially different impacts on water resources from the notice of intended agency decision, the persons who may be substantially affected shall have an additional point of entry pursuant to Rule 28-106.111, Fla. Admin. Code, unless otherwise provided by law.

Mediation

The procedures for pursuing mediation are set forth in Section 120.573, Fla. Stat., and Rules 28-106.111 and 28-106.401-.405, Fla. Admin. Code. The SFWMD is not proposing mediation for this agency action under Section 120.573, Fla. Stat., at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Sections 120.60(3) and 120.68, Fla. Stat., a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal pursuant to Florida Rule of Appellate Procedure 9.110 in the Fourth District Court of Appeal or in the appellate district where a party resides and filing a second copy of the notice with the SFWMD Clerk within 30 days of rendering of the final SFWMD action.

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Last Date For Agency Action: May 26, 2012

GENERAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: Sr-9/I-95 Express Lanes

Permit No.: 88-00053-S

Application No.: 120327-4 **Associated File:** 120330-2 WU Concurrent

Application Type: Environmental Resource (General Permit Modification)

Location: Broward County, S9, 16, 21, 28/T51S/R42E

Permittee : Florida Department Of Transportation District 4

Operating Entity : Permittee

Project Area: 4.16 acres

Project Land Use: Highway

Drainage Basin: C-10
Drainage Basin: C-9 EAST

Receiving Body: SFWMD C-9 Canal (Snake Creek Canal) & Hollywood Canal

Special Drainage District: NA

Conservation Easement To District : No
Sovereign Submerged Lands: No

PROJECT PURPOSE:

This application is a request for modification of a surface water management system to serve 4.16 acres of additional impervious area for a project known as SR-9/I-95 Express Lanes.

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PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

The project site is a section of I-95 from the Miami-Dade/Broward County line to Johnson Street. The site is currently a multilane divided Interstate highway with an existing surface water management system (SWMS) consisting of inlets, culverts and roadside detention swales directing runoff to the SFWMD C-9 Canal (Snake Creek Canal) and the Hollywood Canal. The site was originally issued Permit No. 88-00053-S in 1988, and was most recently modified in 2009 under Application No. 090225-1 for a project then known as I-95 Managed Lanes. This application is a request to modify the previously permitted design for what is now referred to as the I-95 Express Lanes project.

PROJECT BACKGROUND:

The FDOT is proposing to convert the existing I-95 HOV lane to two express lanes from the Golden Glades Interchange to the Broward Boulevard Park and Ride. Improvements to I-95 in this area have been previously authorized under three Surface Water Management permits (85-00070-S, 88-00053-S and 88-00050-S). Three applications have been submitted to modify each respective permit (120327-2, 120327-4 and 120327-6). This application is for the modification of Permit No. 88-00053-S which covers the stretch of I-95 from the Miami-Dade/Broward County line to Johnson Street.

PROPOSED PROJECT:

Proposed is the modification of Permit No. 88-00053-S for the construction and operation of a surface water management system to serve 4.16 acres of additional impervious area for a project known as SR-9/I-95 Express Lanes. The proposed surface water management system will consist of inlets, culverts and roadside detention swales which will provide water quality treatment prior to overflow into the SFWMD C-9 Canal (Snake Creek Canal) and the Hollywood Canal.

The project scope includes roadway widening, milling and resurfacing, shoulder reconstruction, drainage collection and conveyance, swale regrading and expansion and tolling infrastructure. The intention is to widen this section of I-95 in order to facilitate toll lanes where currently High Occupancy Vehicle (HOV) lanes exist.

WATER QUANTITY :

Discharge Rate :

The engineer-of-record has submitted an analysis which demonstrates that the post-development peak discharge rate for the 25-year 3-day design storm event will not exceed the existing condition.

Control Elevation :

Basin	Area (Acres)	Ctrl Elev (ft, NAVD 88)	WSWT Ctrl Elev (ft, NAVD 88)	Method Of Determination
site	4.16	.42	.42	Previously Permitted

WATER QUALITY :

Water quality treatment of 2.5" times the new impervious area will be provided in roadside detention swales.

The authorization for construction of the surface water management system is issued pursuant to the

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water quality net improvement provisions referenced in Rule Section 40E-4.303(1), Florida Administrative Code; therefore, the state water quality certification is waived.

Basin		Treatment Method	Vol Req.d (ac-ft)	Vol Prov'd
site	Treatment	Dry Detention	.65	.65

WETLANDS:

Mangrove wetlands exist along the canal banks adjacent to the bridges over the C-10 Canal and the C-10 Spur Canal. No work is proposed that would alter the existing bridges over these resources or require construction within in these water bodies. Due to the scope of work and the limits of project construction, there will be no impacts to wetland resources.

Wildlife Issues:

The C-10 Canal and C-10 Spur Canal do contain preferred habitat for wetland-dependent endangered or threatened wildlife species or species of special concern. Manatees are known to utilize these water bodies. However, no work is proposed that would alter existing bridges over these waterways or require construction in these water bodies. This permit does not relieve the applicant from complying with all applicable rules and any other agencies' requirements if, in the future, endangered/threatened species or species of special concern are discovered on the site.

CERTIFICATION AND MAINTENANCE OF THE WATER MANAGEMENT SYSTEM:

It is suggested that the permittee retain the services of a Professional Engineer registered in the State of Florida for periodic observation of construction of the surface water management (SWM) system. This will facilitate the completion of construction completion certification Form #0881 which is required pursuant to Section 10 of the Basis of Review for Environmental Resource Permit Applications within the South Florida Water Management District, and Rule 40E-4.361(2), Florida Administrative Code (F.A.C.).

Pursuant to Chapter 40E-4 F.A.C., this permit may not be converted from the construction phase to the operation phase until certification of the SWM system is submitted to and accepted by this District. Rule 40E-4.321(7) F.A.C. states that failure to complete construction of the SWM system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization unless a permit extension is granted.

For SWM systems permitted with an operating entity who is different from the permittee, it should be noted that until the permit is transferred to the operating entity pursuant to Rule 40E-1.6107, F.A.C., the permittee is liable for compliance with the terms of this permit.

The permittee is advised that the efficiency of a SWM system will normally decrease over time unless the system is periodically maintained. A significant reduction in flow capacity can usually be attributed to partial blockages of the conveyance system. Once flow capacity is compromised, flooding of the project may result. Maintenance of the SWM system is required to protect the public health, safety and the natural resources of the state. Therefore, the permittee must have periodic inspections of the SWM system performed to ensure performance for flood protection and water quality purposes. If deficiencies are found, it is the responsibility of the permittee to correct these deficiencies in a timely manner.

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RELATED CONCERNS:

Water Use Permit Status:

Water Use application number 120330-2 has been submitted and is being processed concurrently for this project.

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

CERP:

The proposed project is not located within or adjacent to a Comprehensive Everglades Restoration Project component.

Potable Water Supplier:

Not Applicable

Waste Water System/Supplier:

Not Applicable

Right-Of-Way Permit Status:

A District Right-of-Way Permit is not required for this project.

DRI Status:

This project is not a DRI.

Historical/Archeological Resources:

The District has received correspondence from the Florida Department of State, Division of Historical Resources indicating that no significant archaeological or historical resources are recorded in the project area and therefore is unlikely to have an effect upon any such properties.

DEO/CZM Consistency Review:

The issuance of this permit constitutes a finding of consistency with the Florida Coastal Management Program.

Third Party Interest:

No third party has contacted the District with concerns about this application.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF REVIEW:

DRDD 41-44 05/02/2012 Scanned

DIVISION APPROVAL:

NATURAL RESOURCE MANAGEMENT:

Barbara J. Conmy

DATE: 5/1/12

SURFACE WATER MANAGEMENT:

Carlos A. de Rojas, P.E.

DATE: 4/30/12

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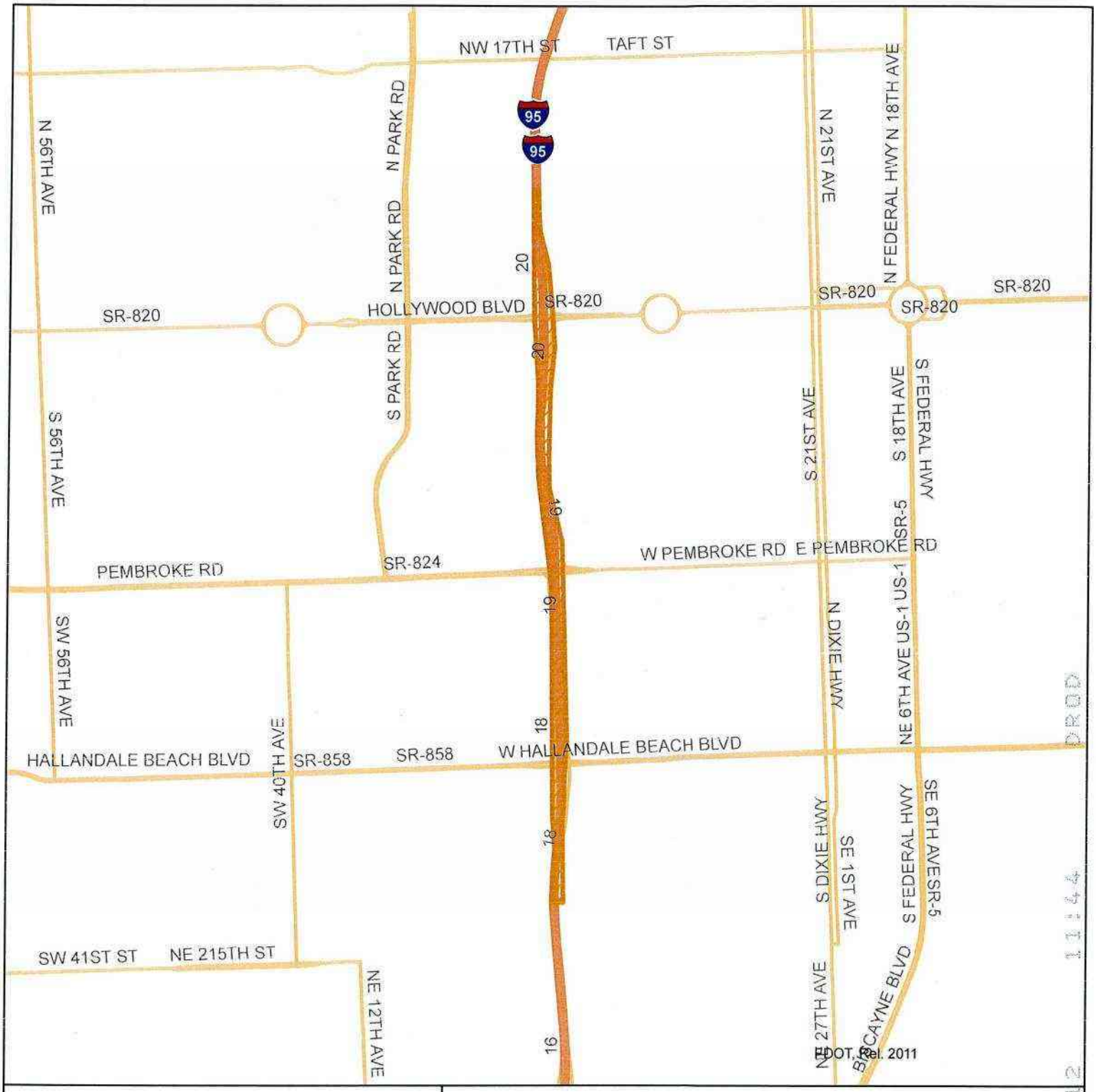

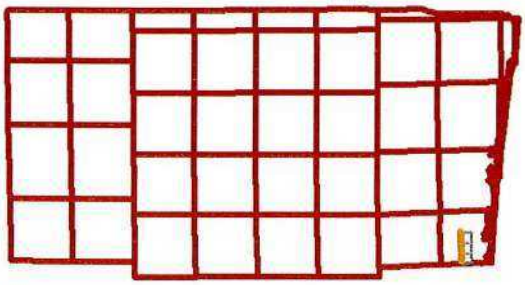

BROWARD COUNTY, FLORIDA

Legend

Application

Application Number: 120327-4

Sec 9, 16, 21, 28 / Twp 51 / Rge 42

Project Name: SR 9/I-95 EXPRESS LANES

N

Map Date: 2012-04-16

Permit Number: 88-00053-S

0 0.5 1 Miles

Exhibit 1

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APPLICATION No. 120327-4
PERMIT No. 88-00053-S
SR-9/I-95 Express Lanes

EXHIBIT NUMBER 2

PLAN SET TITLED:
State Road No. 9 / I-95
Project ID. 422796-2-52-01 & 422796-1-52-01

INCORPORATED BY REFERENCE

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STAFF REPORT DISTRIBUTION LIST

SR-9/I-95 EXPRESS LANES

Application No: 120327-4

Permit No: 88-00053-S

INTERNAL DISTRIBUTION

X Joseph D. Santangelo
X Robert F. Hopper
X Carlos A. de Rojas, P.E.
X Barbara J. Conmy
X ERC Engineering
X ERC Environmental
X H. Azizi
X Permit File

EXTERNAL DISTRIBUTION

X Permittee - Florida Department Of Transportation District 4
X Agent - Reynolds Smith And Hills, Inc

GOVERNMENT AGENCIES

X Broward County - Director, Water Mgmt Div
X Broward County Engineer
X Div of Recreation and Park - District 7 - FDEP

OTHER INTERESTED PARTIES

X Audubon of Florida - Charles Lee

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Regulation
Application No.: 170519-3

June 5, 2017

FLORIDA DEPARTMENT OF TRANSPORTATION
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

Dear Permittee:

SUBJECT: **Permit No.: 88-00053-S**
Project : OPERATIONAL IMPROVEMENTS AT SR9 / I-95 PEMBROKE ROAD (SR824)
Location: Broward County, S21/T51S/R42E

District staff has reviewed the information submitted May 19, 2017, for the widening of the northbound and southbound off-ramps at the I-95/Pembroke Road Interchange. The off-ramps will be widened to provide additional right turn lanes onto Pembroke Road. The engineer-of-record has demonstrated that the existing stormwater management system will be able to accomodate the runoff from the additional 0.20 acres of impervious area. No adverse water quality or quantity impacts are anticipated.

Construction authorization expires on June 5, 2017.

Based on that information, District staff has determined that the proposed activities are in compliance with the original environmental resource permit and appropriate provisions of paragraph 40E-4.331(2)(b) or 62-330.315(2)(g), Florida Administrative Code. Therefore, these changes have been recorded in our files.

Your permit remains subject to the General Conditions and all other Special Conditions not modified and as originally issued.

Should you have any questions or comments regarding this authorization, please contact this office.

Sincerely,

Carlos A. de Rojas, P.E.
Section Leader
Regulation Division

CD/js

c: Broward County Engineer
Wantman Group Inc

NOTICE OF RIGHTS

As required by Sections 120.569 and 120.60(3), Fla. Stat., the following is notice of the opportunities which may be available for administrative hearing or judicial review when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Not all of the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (SFWMD or District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Fla. Stat. Persons seeking a hearing on a SFWMD decision which affects or may affect their substantial interests shall file a petition for hearing with the Office of the District Clerk of the SFWMD, in accordance with the filing instructions set forth herein, within 21 days of receipt of written notice of the decision, unless one of the following shorter time periods apply: (1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Fla. Stat.; or (2) within 14 days of service of an Administrative Order pursuant to Section 373.119(1), Fla. Stat. "Receipt of written notice of agency decision" means receipt of written notice through mail, electronic mail, or posting that the SFWMD has or intends to take final agency action, or publication of notice that the SFWMD has or intends to take final agency action. Any person who receives written notice of a SFWMD decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

If the District takes final agency action which materially differs from the noticed intended agency decision, persons who may be substantially affected shall, unless otherwise provided by law, have an additional Rule 28-106.111, Fla. Admin. Code, point of entry.

Any person to whom an emergency order is directed pursuant to Section 373.119(2), Fla. Stat., shall comply therewith immediately, but on petition to the board shall be afforded a hearing as soon as possible.

A person may file a request for an extension of time for filing a petition. The SFWMD may, for good cause, grant the request. Requests for extension of time must be filed with the SFWMD prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and that the SFWMD and any other parties agree to or oppose the extension. A timely request for an extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

FILING INSTRUCTIONS

A petition for administrative hearing must be filed with the Office of the District Clerk of the SFWMD. Filings with the Office of the District Clerk may be made by mail, hand-delivery, or e-mail. Filings by facsimile will not be accepted. A petition for administrative hearing or other document is deemed filed upon receipt during normal business hours by the Office of the District Clerk at SFWMD headquarters in West Palm Beach, Florida. The District's normal business hours are 8:00 a.m. – 5:00 p.m., excluding weekends and District holidays. Any document received by the Office of the District Clerk after 5:00 p.m. shall be deemed filed as of 8:00 a.m. on the next regular business day. Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the District Clerk, 3301 Gun Club Road, West Palm Beach, Florida 33406.

- Filings by hand-delivery must be delivered to the Office of the District Clerk. Delivery of a petition to the SFWMD's security desk does not constitute filing. It will be necessary to request that the SFWMD's security officer contact the Office of the District Clerk. An employee of the SFWMD's Clerk's office will receive and file the petition.
- Filings by e-mail must be transmitted to the Office of the District Clerk at clerk@sfwmd.gov. The filing date for a document transmitted by electronic mail shall be the date the Office of the District Clerk receives the complete document. A party who files a document by e-mail shall (1) represent that the original physically signed document will be retained by that party for the duration of the proceeding and of any subsequent appeal or subsequent proceeding in that cause and that the party shall produce it upon the request of other parties; and (2) be responsible for any delay, disruption, or interruption of the electronic signals and accepts the full risk that the document may not be properly filed.

INITIATION OF AN ADMINISTRATIVE HEARING

Pursuant to Sections 120.54(5)(b)4. and 120.569(2)(c), Fla. Stat., and Rules 28-106.201 and 28-106.301, Fla. Admin. Code, initiation of an administrative hearing shall be made by written petition to the SFWMD in legible form and on 8 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, SFWMD file number or any other SFWMD identification number, if known.
2. The name, address, any email address, any facsimile number, and telephone number of the petitioner and petitioner's representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the SFWMD's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the SFWMD's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the SFWMD's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the SFWMD to take with respect to the SFWMD's proposed action.

MEDIATION

The procedures for pursuing mediation are set forth in Section 120.573, Fla. Stat., and Rules 28-106.111 and 28-106.401–.405, Fla. Admin. Code. The SFWMD is not proposing mediation for this agency action under Section 120.573, Fla. Stat., at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Section 120.68, Fla. Stat., and in accordance with Florida Rule of Appellate Procedure 9.110, a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal with the Office of the District Clerk of the SFWMD in accordance with the filing instructions set forth herein within 30 days of rendition of the order to be reviewed, and by filing a copy of the notice with the clerk of the appropriate district court of appeal.

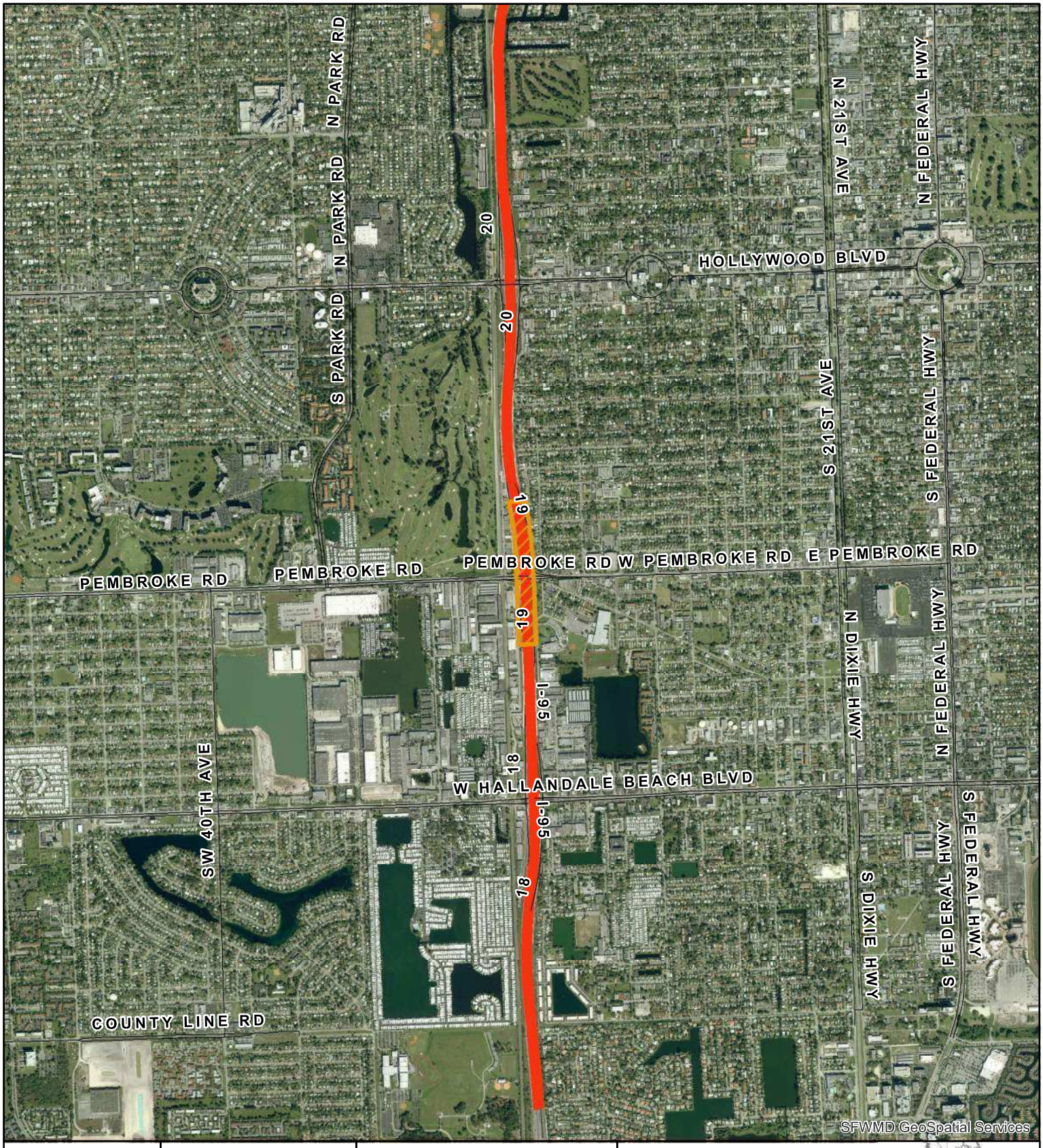


Exhibit No: 1	Exhibit Created On: 2017-06-02	BROWARD COUNTY, FL

REGULATION DIVISION

Project Name: OPERATIONAL IMPROVEMENTS AT SR9 / I-95 PEMBROKE ROAD (SR824)

sfwmd.gov

0 0.4 0.8 Miles

N

Application

Permit No: 88-00053-S

Application Number: 170519-3

Created by

IT GEOSPATIAL SERVICES

South Florida Water Management District

CONTRACT PLANS COMPONENTS

ROADWAY PLANS
SIGNING & PAVEMENT MARKING PLANS
SIGNALIZATION PLANS
LIGHTING PLANS

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

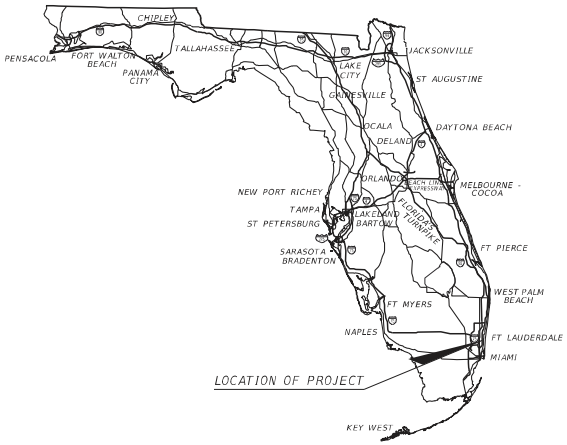
CONTRACT PLANS

FINANCIAL PROJECT ID 436303-1-52-01

SR-9/I-95 AND SR-824/PEMBROKE ROAD

BROWARD COUNTY (86070)

STATE ROAD NO. 9



INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
N/A	NOTES FOR REVIEWERS
2 - 3	TYPICAL SECTIONS
SQ-1 - SQ-8	SUMMARY OF QUANTITIES
4	PROJECT LAYOUT
5 - 10	ROADWAY PLANS
11	RAMP TERMINAL DETAIL
12 - 21	CROSS SECTIONS
22 - 26	TEMPORARY TRAFFIC CONTROL PLANS
CTL-1*	PROJECT NETWORK CONTROL SHEET
GR-1	ROADWAY SOIL SURVEY

** These sheets are included in the Index of Roadway Plans only to indicate that they are part of the Roadway Plans. These sheets are contained in a separate digitally signed and sealed document.*

END PROJECT
STA. 302+48.10 ℄ SR9
M.P. 1.813

BEGIN PROJECT
STA. 273+40.86 ℄ SR9
M.P. 1.262

GOVERNING DESIGN STANDARDS:

Florida Department of Transportation, FY 2016-17 Design Standards eBook (DSeB) and applicable Design Standards Revisions (DSRs) at the following website: http://www.dot.state.fl.us/rddesign/DesignStandards/Standards.shtm

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, 2016 Standard Specifications for Road and Bridge Construction at the following website: http://www.dot.state.fl.us/programmanagement/Implemented/SpecBooks

REVISIONS:

KEY SHEET REVISIONS	
DATE	DESCRIPTION

ROADWAY PLANS ENGINEER OF RECORD:

ANTHONY ALFRED, P.E.
P.E. NO.: 51857
WANTMAN GROUP, INC.
5219 NW 33RD AVE PROSPECT PARK 1
FORT LAUDERDALE, FLORIDA 33309
CONTRACT NO.: C-9G17
VENDOR NO. 65-0271367
CERTIFICATE OF AUTHORIZATION NO. 6091

FDOT PROJECT MANAGER:

DONOVAN PESSOA, P.E.

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
	19	1

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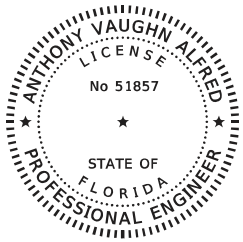

THIS DOCUMENT HAS BEEN DIGITALLY SIGNED AND SEALED BY:

Anthony V Alfred

Date: 2017.05.16 09:06:25 -04'00'

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON THE ELECTRONIC DOCUMENTS.

WANTMAN GROUP, INC.
5219 NW 33RD AVE PROSPECT PARK 19
FORT LAUDERDALE, FL 33309
CERTIFICATE OF AUTHORIZATION 6091
ANTHONY ALFRED, P.E.
P.E. LICENSE NUMBER 51857

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2A	SIGNATURE SHEET
2B - 3	TYPICAL SECTIONS
4	PROJECT LAYOUT
5 - 10	ROADWAY PLANS
11	RAMP TERMINAL DETAIL
12 - 13	DRAINAGE STRUCTURES

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ANTHONY ALFRED, P.E.
P.E. LICENSE NUMBER 51857
WANTMAN GROUP, INC
5219 NW 33RD AVE PROSPECT PARK 19
FORT LAUDERDALE, FL 33309
CERTIFICATE OF AUTHORIZATION 6091

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

SIGNATURE SHEET

SHEET NO. 2 A

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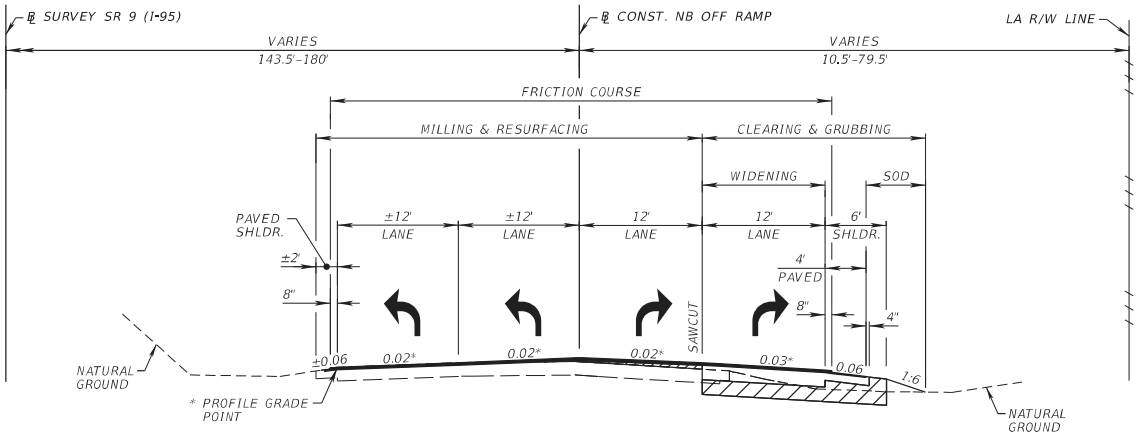

* CROSS SLOPE CORRECTION WITH OVERBUILD

TYPICAL SECTION NO. 1
NB SR 9 (I-95) OFF RAMP
STA. 514+86.35 TO STA. 520+04.05

MILLING
MILL EXISTING ASPHALT PAVEMENT FOR DEPTH (2 ¼")

RESURFACING
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½ "),
AND FRICTION COURSE FC-5 (PG 76-22) (¾")

WIDENING
OPTIONAL BASE GROUP 9 WITH
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (2 ½"),
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½"),
AND FRICTION COURSE FC-5 (¾")

MILLING (SHOULDER)
MILL EXISTING ASPHALT PAVEMENT FOR DEPTH (1 ½")

RESURFACING (SHOULDER)
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½ ")

NEW SHOULDER PAVEMENT
OPTIONAL BASE GROUP 1 WITH
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½")

NB SR 9 (I-95) OFF RAMP
STA. 506+07.45 TO STA. 514+86.35

MILLING
MILL EXISTING ASPHALT PAVEMENT FOR DEPTH (2 ¼")

RESURFACING
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½ "),
AND FRICTION COURSE FC-5 (PG 76-22) (¾")

MILLING (SHOULDER)
MILL EXISTING ASPHALT PAVEMENT FOR DEPTH (1 ½")

RESURFACING (SHOULDER)
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½ ")

NB SR 9 (I-95) OFF RAMP
STA. 513+41.14 TO STA. 514+86.35

NEW SHOULDER PAVEMENT
OPTIONAL BASE GROUP 1 WITH
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½")

TRAFFIC DATA
CURRENT YEAR = 2015 AADT = 21,700
ESTIMATED OPENING YEAR = 2022 AADT = 23,300
ESTIMATED DESIGN YEAR = 2042 AADT = 28,400
K = 9% D = 100% T = 4% (24 HOUR)
DESIGN HOUR T = 4%
DESIGN SPEED = 40 MPH

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ANTHONY ALFRED, P.E.
P.E. LICENSE NUMBER 51857
WANTMAN GROUP, INC.
5219 NW 33RD AVE
FORT LAUDERDALE, FL. 33309
CERTIFICATE OF AUTHORIZATION 6091

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

TYPICAL SECTION

SHEET NO. 2 B

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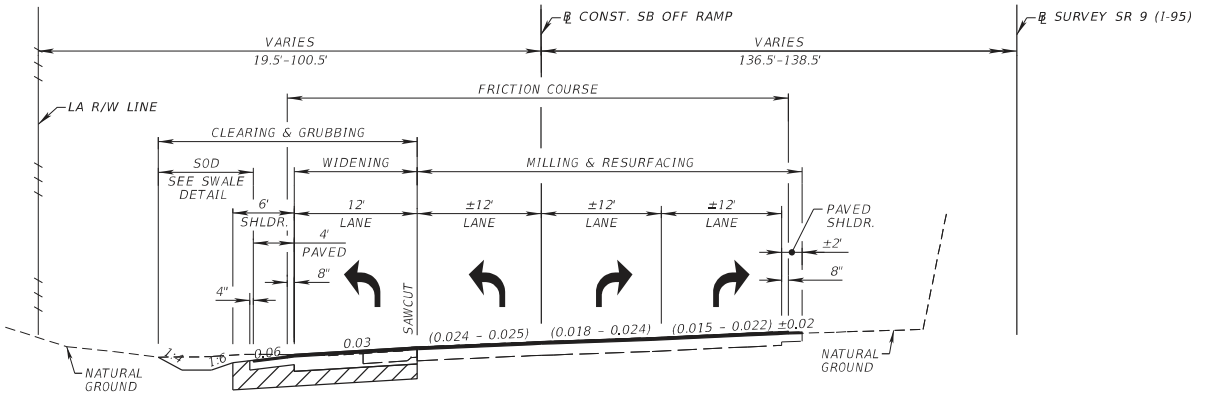

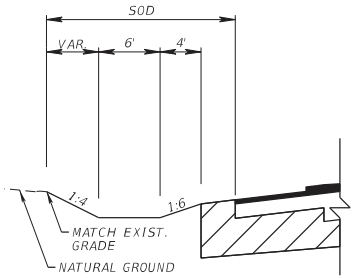

SWALE DETAIL
(NTS)

TRAFFIC DATA

CURRENT YEAR = 2015 AADT = 21,700
ESTIMATED OPENING YEAR = 2022 AADT = 23,300
ESTIMATED DESIGN YEAR = 2042 AADT = 28,400
K = 9% D = 100% T = 4% (24 HOUR)
DESIGN HOUR T = 4%
DESIGN SPEED = 40 MPH

TYPICAL SECTION NO. 2
SB SR 9 (I-95) OFF RAMP
STA. 800+77.12 TO STA. 803+62.97

MILLING
MILL EXISTING ASPHALT PAVEMENT FOR DEPTH (2 ¼")

RESURFACING
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½ "),
AND FRICTION COURSE FC-5 (PG 76-22) (¾")

WIDENING
OPTIONAL BASE GROUP 9 WITH
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (2 ½"),
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½"),
AND FRICTION COURSE FC-5 (¾")

NEW SHOULDER PAVEMENT
OPTIONAL BASE GROUP 1 WITH
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½")

SB SR 9 (I-95) OFF RAMP
STA. 803+62.97 TO STA. 814+34.14

MILLING
MILL EXISTING ASPHALT PAVEMENT FOR DEPTH (2 ¼")

RESURFACING
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½ "),
AND FRICTION COURSE FC-5 (PG 76-22) (¾")

MILLING (SHOULDER)
MILL EXISTING ASPHALT PAVEMENT FOR DEPTH (1 ½")

RESURFACING (SHOULDER)
TYPE SP-12.5 STRUCTURAL COURSE (TRAFFIC LEVEL D) (PG 76-22) (1 ½ ")

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ANTHONY ALFRED, P.E.
P.E. LICENSE NUMBER 51857
WANTMAN GROUP, INC.
5219 NW 33RD AVE
FORT LAUDERDALE, FL. 33309
CERTIFICATE OF AUTHORIZATION 6091

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

TYPICAL SECTION

SHEET NO. 3

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CURVE DATA NB-1
PI STA. = 508+04.88
Δ = 3° 52' 01" (LT)
D = 0° 58' 00"
T = 200.09
L = 400.02
R = 5,927.00
PC STA. = 506+04.79
PT STA. = 510+04.81

CURVE DATA SB-1
PI STA. = 806+94.16
Δ = 7° 58' 54" (LT)
D = 1° 01' 23"
T = 390.69
L = 780.12
R = 5,600.00
PC STA. = 803+03.47
PT STA. = 810+83.59

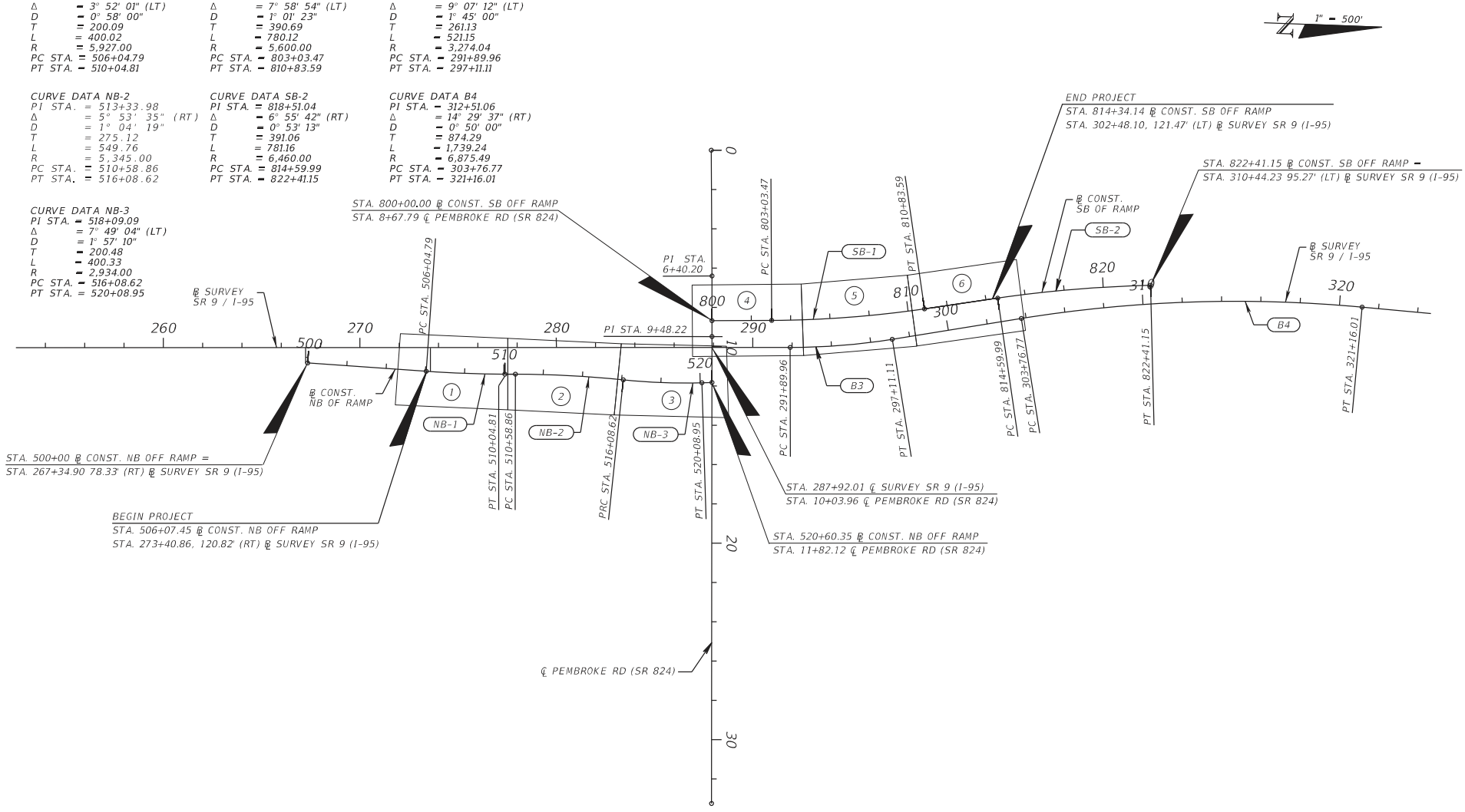
CURVE DATA B3
PI STA. = 294+51.08
Δ = 9° 07' 12" (LT)
D = 1° 45' 00"
T = 261.13
L = 521.15
R = 3,274.04
PC STA. = 291+89.96
PT STA. = 297+11.11

CURVE DATA NB-2
PI STA. = 513+33.98
Δ = 5° 53' 35" (RT)
D = 1° 04' 19"
T = 275.12
L = 549.76
R = 5,345.00
PC STA. = 510+58.86
PT STA. = 516+08.62

CURVE DATA SB-2
PI STA. = 818+51.04
Δ = 6° 55' 42" (RT)
D = 0° 53' 13"
T = 391.06
L = 781.16
R = 6,460.00
PC STA. = 814+59.99
PT STA. = 822+41.15

CURVE DATA B4
PI STA. = 312+51.06
Δ = 14° 29' 37" (RT)
D = 0° 50' 00"
T = 874.29
L = 1,739.24
R = 6,875.49
PC STA. = 303+76.77
PT STA. = 321+16.01

CURVE DATA NB-3
PI STA. = 518+09.09
Δ = 7° 49' 04" (LT)
D = 1° 57' 10"
T = 200.48
L = 400.33
R = 2,934.00
PC STA. = 516+08.62
PT STA. = 520+08.95



THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ANTHONY ALFRED, P.E.
P.E. LICENSE NUMBER 51857
WANTMAN GROUP, INC.
5219 NW 33RD AVE
FORT LAUDERDALE, FL. 33309
CERTIFICATE OF AUTHORIZATION 6091

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

PROJECT LAYOUT

SHEET NO. 4

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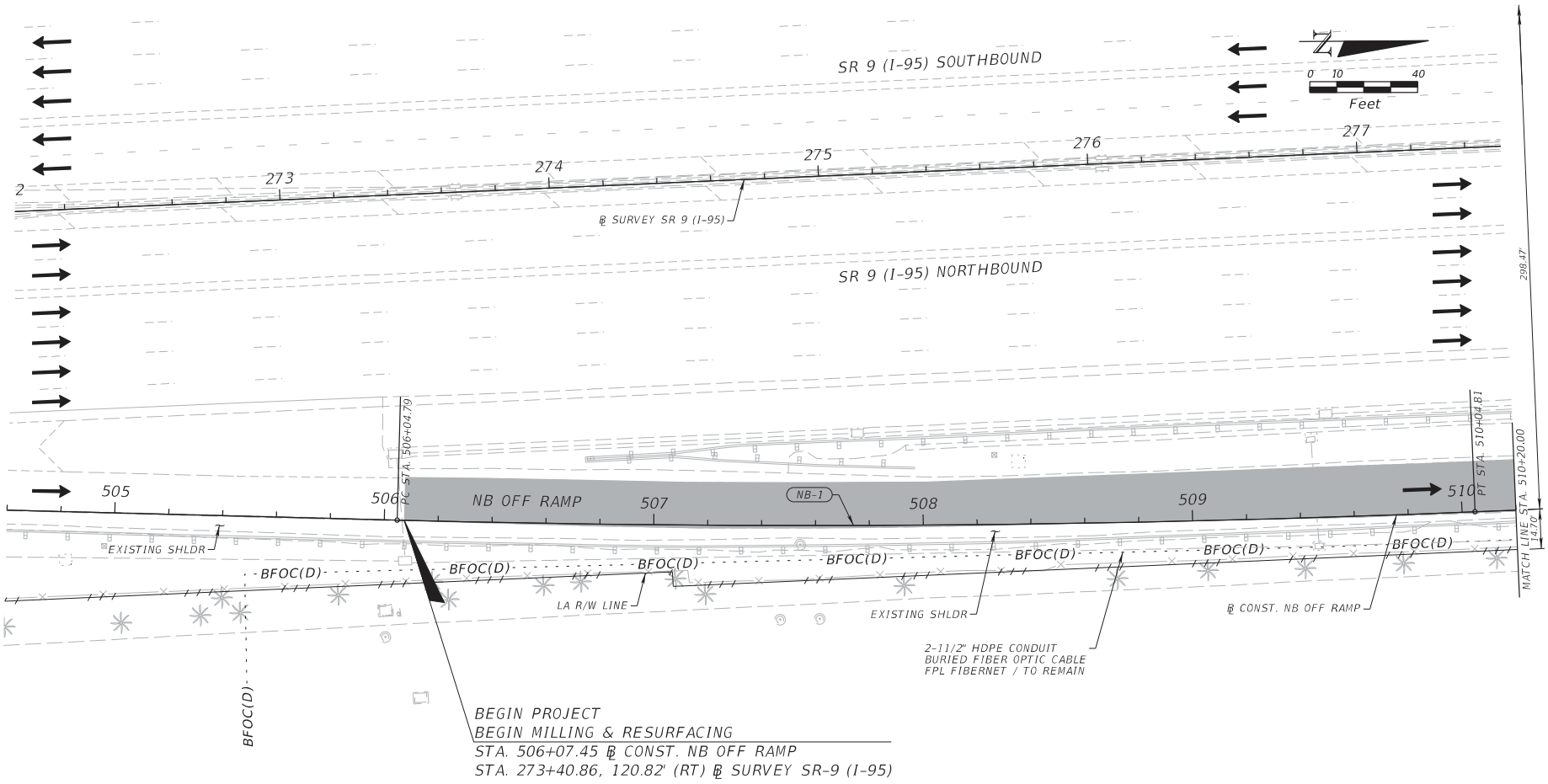

LEGEND

MILLING & RESURFACING

CURVE DATA NB-1
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L = 400.02
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PC STA. = 506+04.79
PT STA. = 510+04.81
e = MATCH EXISTING
DESIGN SPEED = 40 MPH

NOTE:

1. NO STAGING OR OTHER ACTIVITIES FOR THIS PROJECT WILL BE ALLOWED WITHIN OR ADJACENT TO THE ORANGEBROOK GOLF AND COUNTRY CLUB, THE LANIER JAMES EDUCATION CENTER OR THE HALLANDALE HIGH SCHOOL PROPERTIES.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

ROADWAY PLAN (1)

SHEET NO. 5

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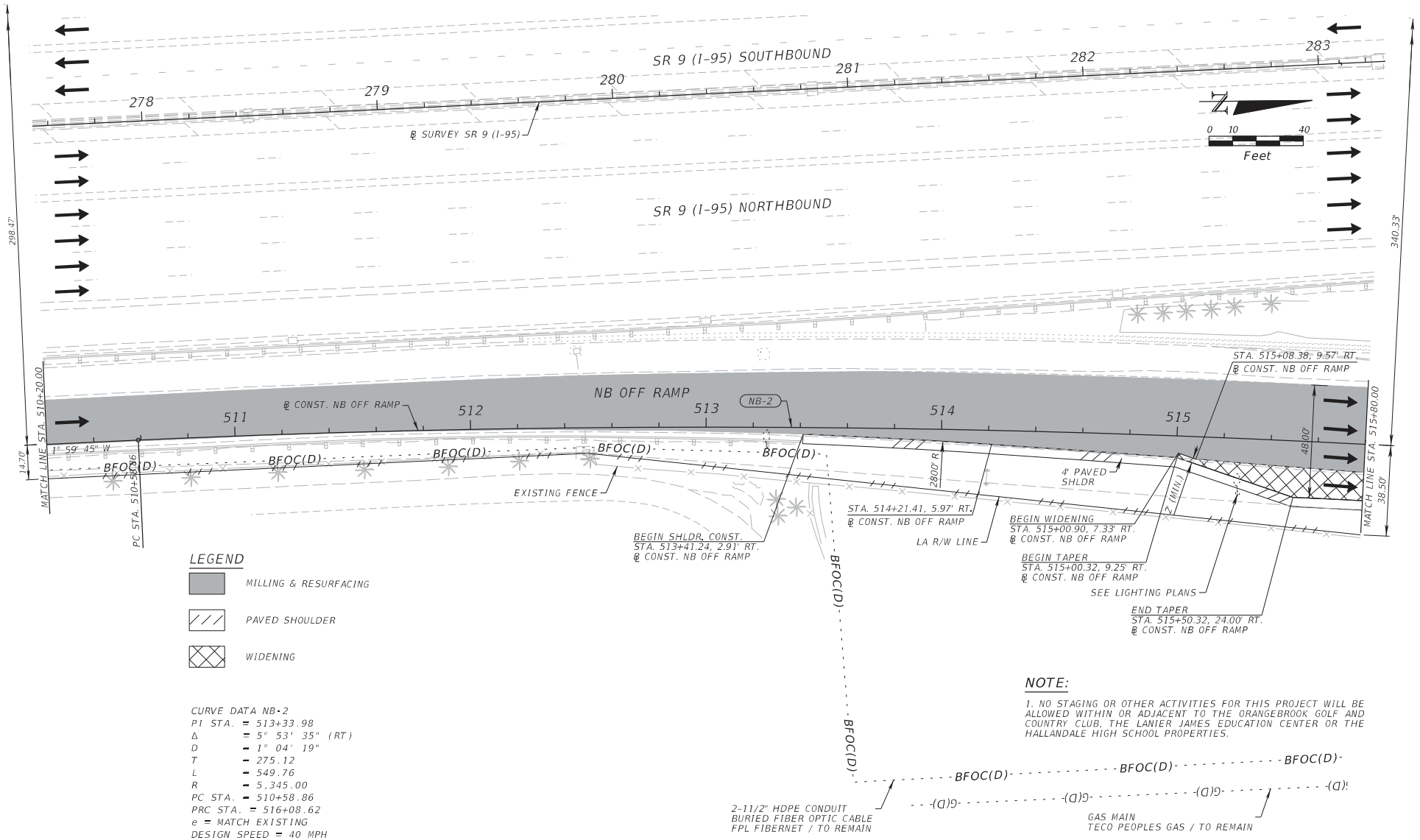

REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

ROADWAY PLAN (2)

SHEET NO. 6

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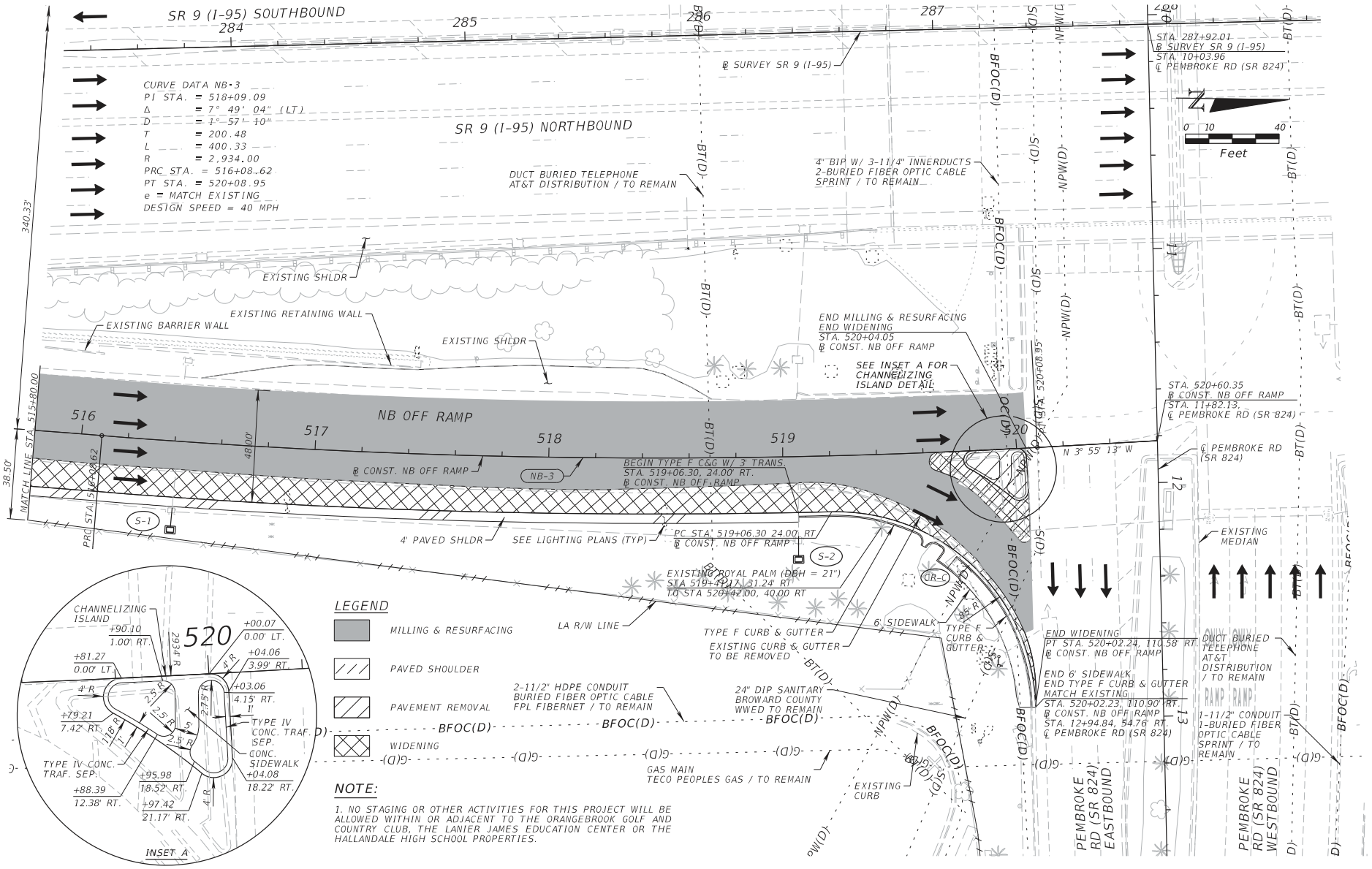

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

ROADWAY PLAN (3)

SHEET NO. 7

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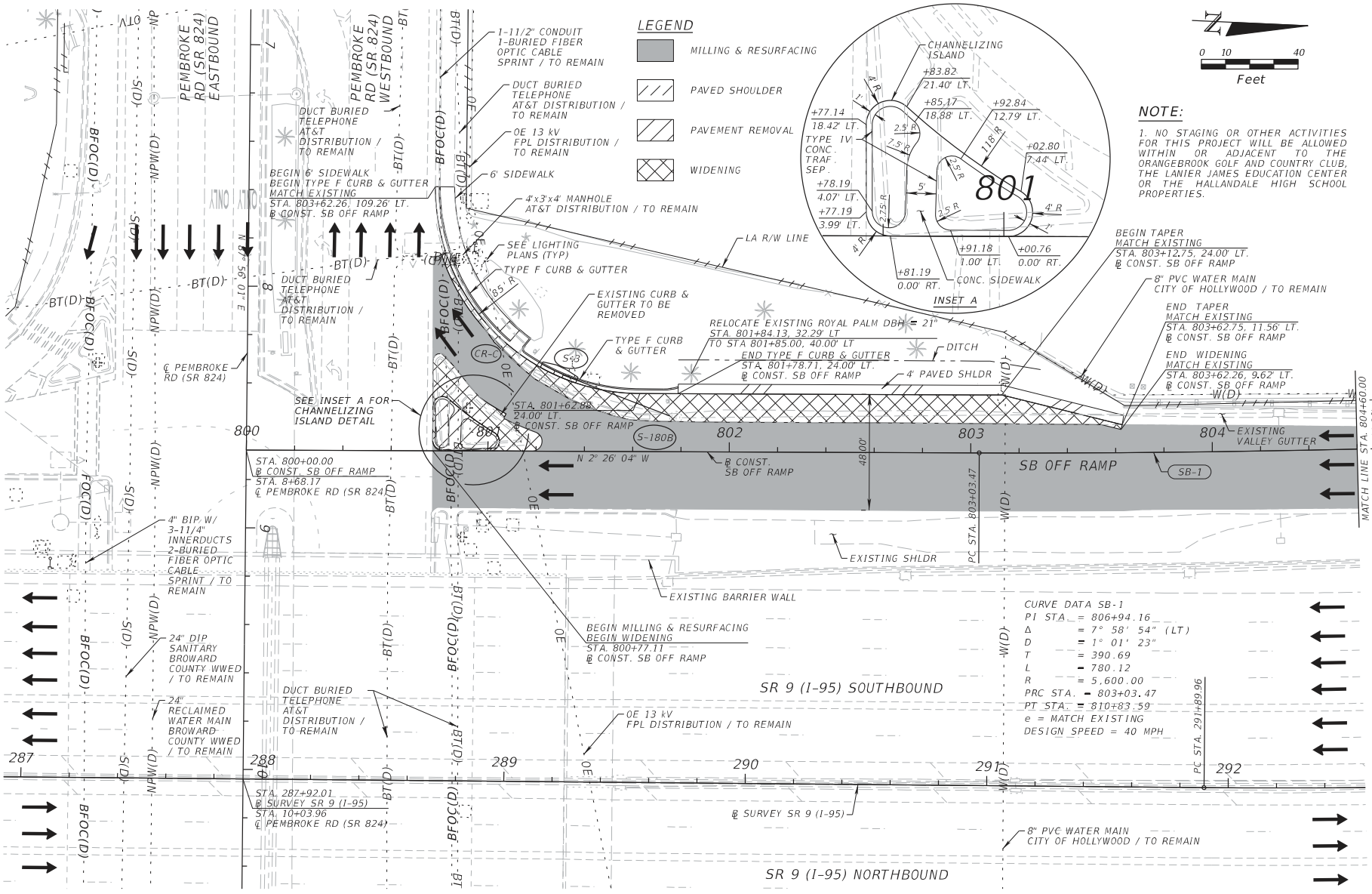

REVISIONS			
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

ROADWAY PLAN (4)

SHEET NO. 8

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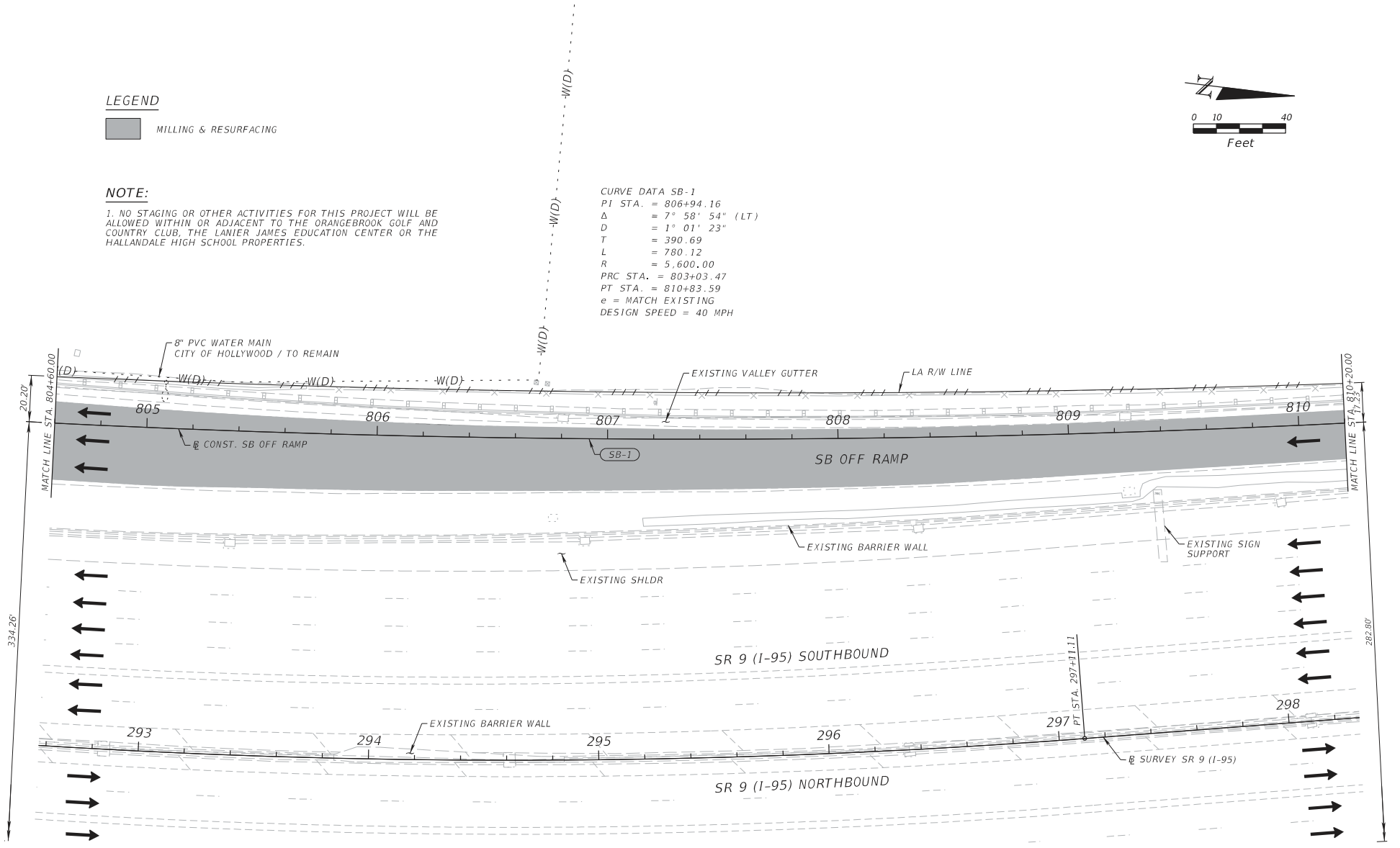

REVISIONS			
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WANTMAN GROUP, INC.
5219 NW 33RD AVE
FORT LAUDERDALE, FL. 33309
CERTIFICATE OF AUTHORIZATION 6091

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

ROADWAY PLAN (5)

SHEET NO. 9

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LEGEND

MILLING & RESURFACING

NOTE:

1. NO STAGING OR OTHER ACTIVITIES FOR THIS PROJECT WILL BE ALLOWED WITHIN OR ADJACENT TO THE ORANGEBROOK GOLF AND COUNTRY CLUB, THE LANIER JAMES EDUCATION CENTER OR THE HALLANDALE HIGH SCHOOL PROPERTIES.

CURVE DATA SB-1
PI STA. = 806+94.16
Δ = 7° 58' 54" (LT)
D = 1° 01' 23"
T = 390.69
L = 780.12
R = 5,600.00
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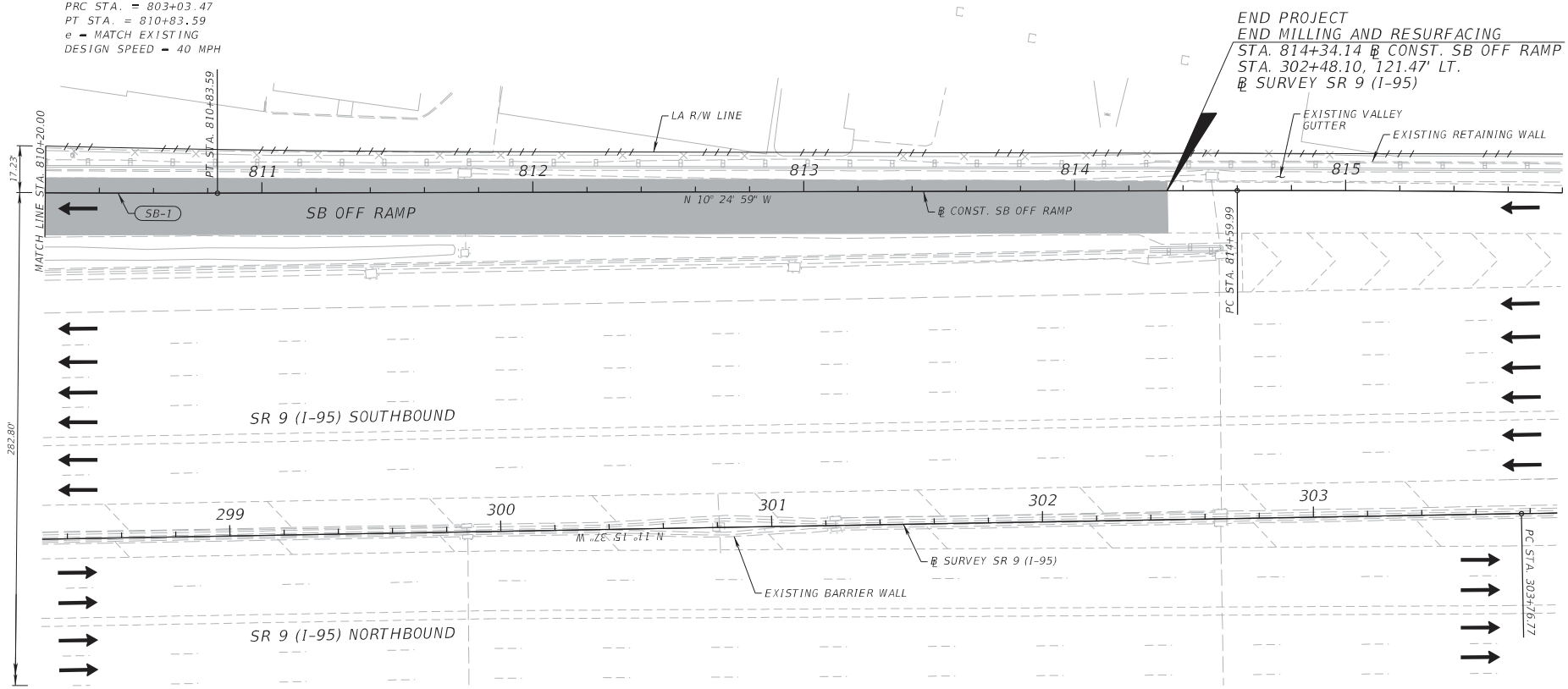

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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FORT LAUDERDALE, FL. 33309
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

ROADWAY PLAN (6)

SHEET NO. 10

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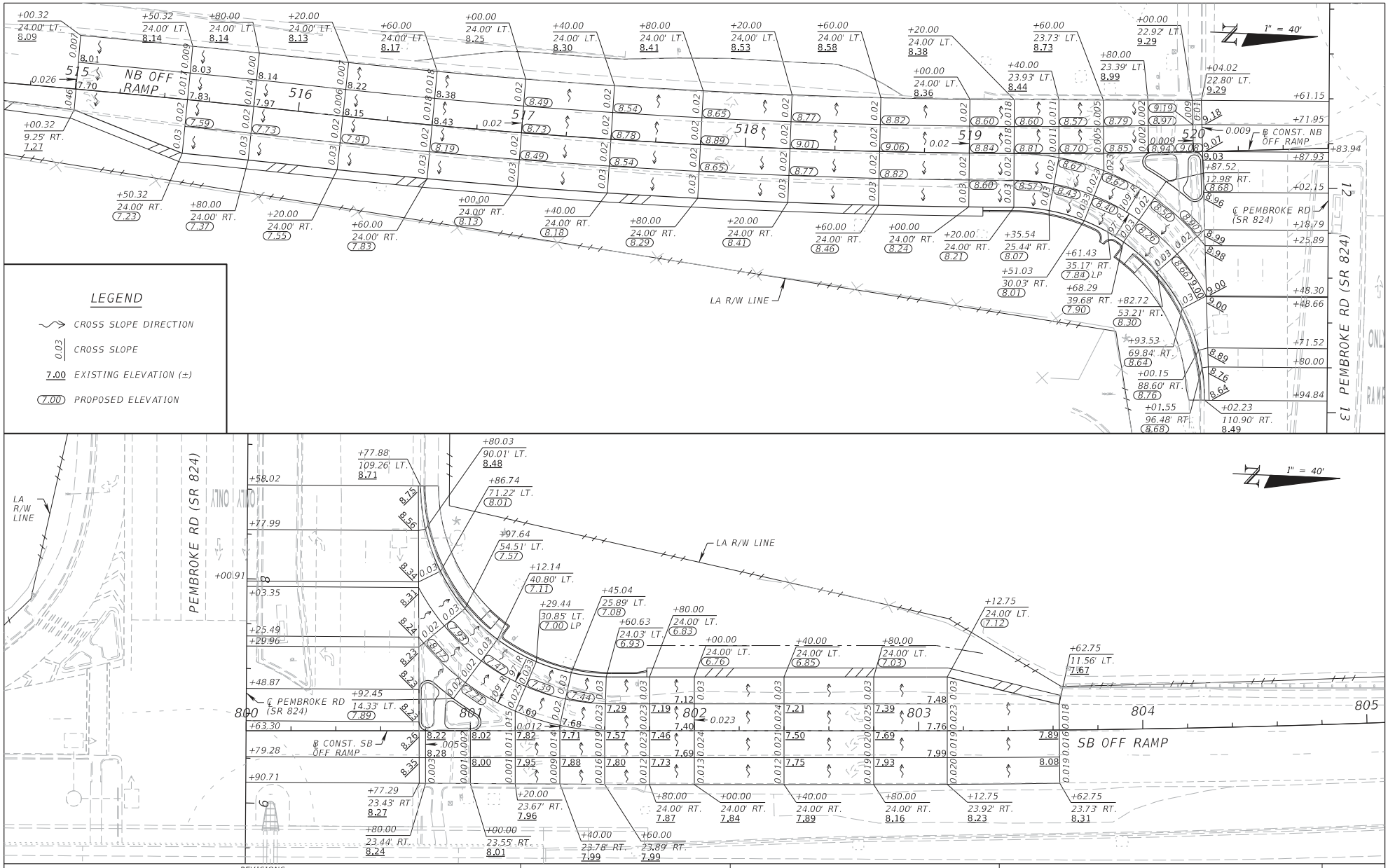

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REVISIONS			
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FORT LAUDERDALE, FL. 33309
CERTIFICATE OF AUTHORIZATION 6091

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

RAMP TERMINAL DETAILS

SHEET NO. 11

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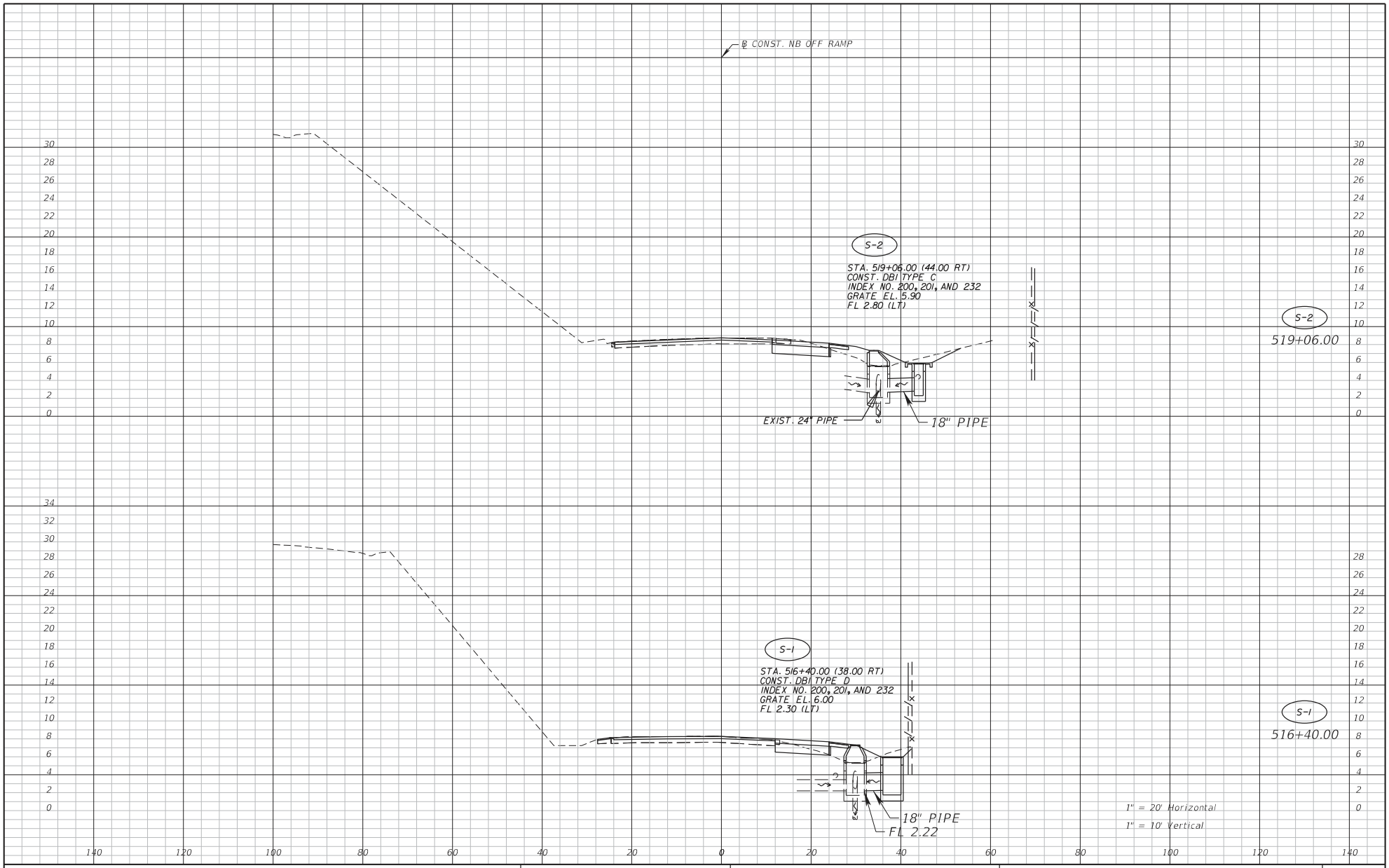

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

DRAINAGE STRUCTURES

SHEET NO. 12

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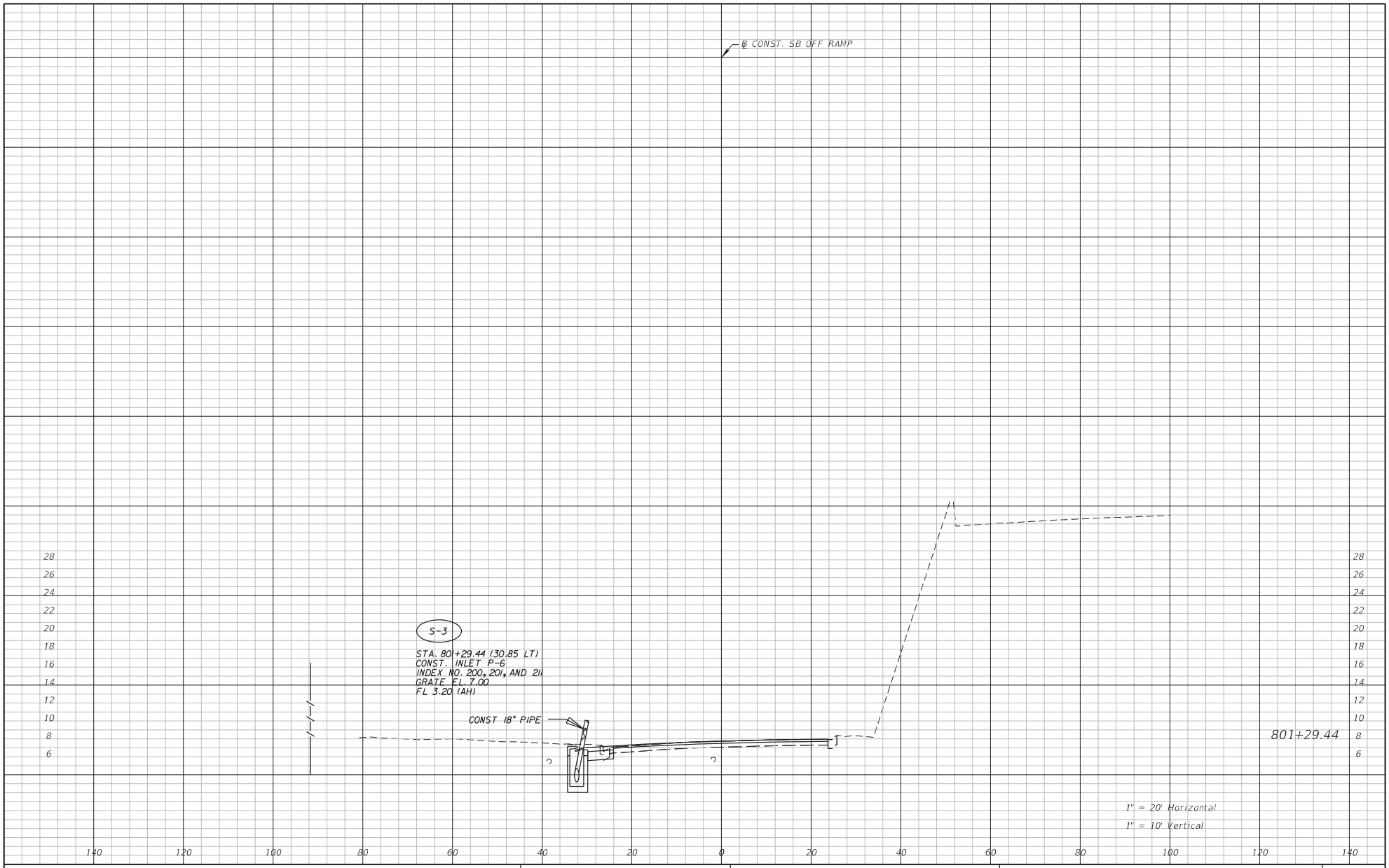

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REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
9	BROWARD	436303-1-52-01

DRAINAGE STRUCTURES

SHEET NO. 13

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STAFF REPORT DISTRIBUTION LIST

OPERATIONAL IMPROVEMENTS AT SR9 / I-95 PEMBROKE ROAD (SR824)

Application No: 170519-3

Permit No: 88-00053-S

INTERNAL DISTRIBUTION

X Joseph D. Santangelo
X Morgan Reins
X Carlos A. de Rojas, P.E.
X Barbara J. Conmy
X A. Waterhouse, P.E.
X J. Markle, P.E.

EXTERNAL DISTRIBUTION

X Permittee - Florida Department Of Transportation
X Agent - Wantman Group Inc

GOVERNMENT AGENCIES

X Broward County - Director, Water Mgmt Div
X Div of Recreation and Park - District 5 - Miranda Cunningham, FDEP

OTHER INTERESTED PARTIES

X Audubon of Florida - Charles Lee

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE PERMIT NO. 06-01465-S
DATE ISSUED:August 2, 2017

PERMITTEE: FLORIDA DEPARTMENT OF TRANSPORTATION
3400 WEST COMMERCIAL BOULEVARD
FORT LAUDERDALE, FL 33309

PROJECT DESCRIPTION: Conceptual approval of a stormwater management system serving an 8.6 mile highway widening project known as I-95 Express Lanes Phase 3C.

PROJECT LOCATION: BROWARD COUNTY, SEC 8,9,16,17,19,20,21,28,29,33 TWP 50S RGE 42E
SEC 4,8,9,16,17 TWP 51S RGE 42E

PERMIT DURATION: See Special Condition No:1.

This is to notify you of the District's agency action for Permit Application No. 170525-8, dated May 25, 2017. This action is taken pursuant to the provisions of Chapter 373, Part IV, Florida Statues (F.S).

Based on the information provided, District rules have been adhered to and an Environmental Resource Permit is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120, Florida Statutes, administrative hearing.
2. the attached 18 General Conditions (See Pages : 2 - 4 of 8),
3. the attached 10 Special Conditions (See Pages : 5 - 7 of 8),
4. the attached General Conditions for Authorizations for Use of Sovereign Submerged Lands (See Pages : 8 - 8 of 8) and
5. the attached 6 Exhibit(s)

Should you object to these conditions, please refer to the attached "Notice of Rights" which addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. Please contact this office if you have any questions concerning this matter. If we do not hear from you in accordance with the "Notice of Rights," we will assume that you concur with the District's action.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY THAT this written notice has been mailed or electronically transmitted to the Permittee (and the persons listed in the attached distribution list) this 2nd day of August, 2017, in accordance with Section 120.60(3), F.S. Notice was also electronically posted on this date through a link or the home page of the District's website (my.sfwmd.gov/ePermitting).

BY:_____
Ricardo A. Valera, P.E.
Bureau Chief - Environmental Resource
Regulation Division

GENERAL CONDITIONS

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, Florida Administrative Code (F.A.C.). Any deviations that are not so authorized shall subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the "State of Florida Erosion and Sediment Control Designer and Reviewer Manual" (Florida Department of Environmental Protection and Florida Department of Transportation June 2007), and the "Florida Stormwater Erosion and Sedimentation Control Inspector's Manual" (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice" indicating the expected start and completion dates. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.

6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
   a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex- "Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit"[Form 62-330.310(3)]; or
   b. For all other activities- "As-Built Certification and Request for Conversion to Operational Phase" [Form 62-330.310(1)].
   c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

7. If the final operation and maintenance entity is a third party:
   a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Applicant's Handbook Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
   b. Within 30 days of submittal of the as- built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that

GENERAL CONDITIONS

require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

9. This permit does not:
a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
b. Convey to the permittee or create in the permittee any interest in real property;
c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the Agency in writing:
a. Immediately if any previously submitted information is discovered to be inaccurate; and
b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification shall be provided in accordance with Section 872.05, F.S.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other

GENERAL CONDITIONS

uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

SPECIAL CONDITIONS

1. The conceptual phase of this permit shall expire on July 28, 2037.

2. Operation and maintenance of the stormwater management system shall be the responsibility of FLORIDA DEPARTMENT OF TRANSPORTATION.

3. A stable, permanent and accessible elevation reference shall be established on or within one hundred (100) feet of all permitted discharge structures no later than the submission of the certification report. The location of the elevation reference must be noted on or with the certification report.

4. The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

   a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injuries to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

   b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

   c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

   d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the animal(s) have moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the animal(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

   e. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com.

   f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 ft. by 4 ft. which reads Caution: Manatee Area must be posted. A second sign measuring at least 81/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to FWC at ImperiledSpecies@myFWC.com.

5. Manatee exclusion devices (such as grating) shall be installed and maintained over any existing or proposed pipes or culverts greater than 8 inches, but smaller than 8 feet in diameter that are submerged or partially submerged and reasonably accessible to manatees. If horizontal or vertical bars are used, no more than 8 inch gaps on center shall be allowed. Grates or valves shall be in place at the accessible

SPECIAL CONDITIONS

end(s) during all phases of the construction process and as a final design element to restrict manatee access.

6. 1. For the I-595 bridge crossing over the FPL Cooling Pond Canal:

No pile driving work shall be performed between November 15 and March 31, to reduce the possibility of injuring or killing a manatee during construction.

2. During pile-driving activities for concrete piles 12 inches in diameter or larger, the following measures shall be followed:

a. At least one observer shall be onsite and dedicated to the task of watching for manatees during the pile driving. Observers must have prior on-the-job experience as a dedicated manatee observer, observing for manatees during similar in-water work and shall perform no other duties that may interfere with their ability to observe for protected marine species. All pile-driving activity shall be confined to daylight hours. If pile driving is to occur between November 15 and March 31, the observer(s) must be approved by the FWC at least two weeks prior to construction commencement. FWC approval of observers shall be specific to this project and must occur as per FWC guidelines outlined at the following website: http://www.myfwc.com/wildlifehabitats/managed/manatee/watch-program/.

b. The pile driving activities will use a ramp-up measure. At the start of pile driving, hammers would initially be operated at low levels, then gradually increase to minimum necessary power required for pile installation. Monitoring for protected marine species will occur for 30 minutes prior to pile driving, during pile driving, and for 30 minutes after pile driving ends.

c. If the activities appear to harass or injure a protected marine species, then work shall cease immediately and not resume until after consultation with the Florida Fish and Wildlife Conservation Commission (FWC) at ImperiledSpecies@myfwc.com or 850-922-4330. Any additional conservation measures deemed necessary by FWC must be implemented to minimize the risks to protected species.

3. For the use of barges during work on the C-10 Canal, Dania Cutoff Canal bridge crossings, and also for in-water activity associated with the South Fork of the New River Canal bridge crossing:

At least one dedicated observer shall be present during bridge construction related activity in the water and shall perform no other duties that may interfere with their ability to observe for protected marine species. Observer(s) must have prior on-the-job experience observing during previous work where the activities were similar in nature to this project. Movement of a work barge or other associated vessels shall be minimized to the greatest extent possible at night.

7. A monitoring program shall be implemented in accordance with Exhibit No. 5.2. The monitoring program shall extend for a period of 5 years with annual reports submitted to District staff. At the end of the first monitoring period the mitigation area shall contain an 80% survival of planted vegetation. The 80% survival rate shall be maintained throughout the remainder of the monitoring program, with replanting as necessary. If native wetland, transitional, and upland species do not achieve an 80% coverage within the initial two years of the monitoring program, native species shall be planted in accordance with the maintenance program. At the end of the 5 year monitoring program the entire mitigation area shall contain an 80% survival of planted vegetation and an 80% coverage of desirable obligate and facultative wetland species.

SPECIAL CONDITIONS

8. Upon submittal of an application for construction approval involving wetland impacts or proposed restoration, the permittee shall submit a work schedule, subject to District staff review and approval, specifying completion dates for each restoration, monitoring and maintenance task.

9. No work shall occur within the District's right-of-way until all necessary right-of-way occupancy permits are obtained authorizing the proposed work in the District's right-of-way.

10. The following are exhibits to this permit:

Exhibit No. 1 Location Map
Exhibit No. 2 Summary Tables
Exhibit No. 3 Pre & Post Drainage Basin Maps
Exhibit No. 4 Roadway Plans
Exhibit No. 5 Environmental Documents
Exhibit No. 6 Sovereign Submerged Lands Sketch

GENERAL CONDITIONS FOR AUTHORIZATIONS FOR USE OF SOVEREIGN SUBMERGED LANDS

Project No. 170525-8

Chapter 18-21.004(7), F.A.C., provides that all authorizations granted by rule or in writing under Rule 18-21.005, F.A.C., except those for aquaculture activities and geophysical testing, shall be subject to the general conditions as set forth in paragraphs (a) through (i) below. The general conditions shall be part of all authorizations under this chapter, shall be binding upon the grantee, and shall be enforceable under Chapter 253 or Chapter 258, Part II, F.S.

Chapter 18-21.004(7), F.A.C., General Conditions for Authorizations:
(a) Authorizations are valid only for the specified activity or use. Any unauthorized deviation from the specified activity or use and the conditions for undertaking that activity or use shall constitute a violation. Violation of the authorization shall result in suspension or revocation of the grantee's use of the sovereignty submerged land unless cured to the satisfaction of the Board.

(b) Authorizations convey no title to sovereignty submerged land or water column, nor do they constitute recognition or acknowledgment of any other person's title to such land or water.

(c) Authorizations may be modified, suspended or revoked in accordance with their terms or the remedies provided in Sections 253.04 and 258.46, F.S., or Chapter 18-14, F.A.C.

(d) Structures or activities shall be constructed and used to avoid or minimize adverse impacts to sovereignty submerged lands and resources.

(e) Construction, use, or operation of the structure or activity shall not adversely affect any species which is endangered, threatened or of special concern, as listed in Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C.

(f) Structures or activities shall not unreasonably interfere with riparian rights. When a court of competent jurisdiction determines that riparian rights have been unlawfully affected, the structure or activity shall be modified in accordance with the court's decision.

(g) Structures or activities shall not create a navigational hazard.

(h) Structures shall be maintained in a functional condition and shall be repaired or removed if they become dilapidated to such an extent that they are no longer functional. This shall not be construed to prohibit the repair or replacement subject to the provisions of Rule 18-21.005, F.A.C., within one year, of a structure damaged in a discrete event such as a storm, flood, accident, or fire.

(i) Structures or activities shall be constructed, operated, and maintained solely for water dependent purposes, or for non-water dependent activities authorized under paragraph 18-21.004(1)(g), F.A.C., or any other applicable law.

NOTICE OF RIGHTS

As required by Sections 120.569 and 120.60(3), Fla. Stat., the following is notice of the opportunities which may be available for administrative hearing or judicial review when the substantial interests of a party are determined by an agency. Please note that this Notice of Rights is not intended to provide legal advice. Not all of the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

RIGHT TO REQUEST ADMINISTRATIVE HEARING

A person whose substantial interests are or may be affected by the South Florida Water Management District's (SFWMD or District) action has the right to request an administrative hearing on that action pursuant to Sections 120.569 and 120.57, Fla. Stat. Persons seeking a hearing on a SFWMD decision which affects or may affect their substantial interests shall file a petition for hearing with the Office of the District Clerk of the SFWMD, in accordance with the filing instructions set forth herein, within 21 days of receipt of written notice of the decision, unless one of the following shorter time periods apply: (1) within 14 days of the notice of consolidated intent to grant or deny concurrently reviewed applications for environmental resource permits and use of sovereign submerged lands pursuant to Section 373.427, Fla. Stat.; or (2) within 14 days of service of an Administrative Order pursuant to Section 373.119(1), Fla. Stat. "Receipt of written notice of agency decision" means receipt of written notice through mail, electronic mail, or posting that the SFWMD has or intends to take final agency action, or publication of notice that the SFWMD has or intends to take final agency action. Any person who receives written notice of a SFWMD decision and fails to file a written request for hearing within the timeframe described above waives the right to request a hearing on that decision.

If the District takes final agency action which materially differs from the noticed intended agency decision, persons who may be substantially affected shall, unless otherwise provided by law, have an additional Rule 28-106.111, Fla. Admin. Code, point of entry.

Any person to whom an emergency order is directed pursuant to Section 373.119(2), Fla. Stat., shall comply therewith immediately, but on petition to the board shall be afforded a hearing as soon as possible.

A person may file a request for an extension of time for filing a petition. The SFWMD may, for good cause, grant the request. Requests for extension of time must be filed with the SFWMD prior to the deadline for filing a petition for hearing. Such requests for extension shall contain a certificate that the moving party has consulted with all other parties concerning the extension and that the SFWMD and any other parties agree to or oppose the extension. A timely request for an extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

FILING INSTRUCTIONS

A petition for administrative hearing must be filed with the Office of the District Clerk of the SFWMD. Filings with the Office of the District Clerk may be made by mail, hand-delivery, or e-mail. Filings by facsimile will not be accepted. A petition for administrative hearing or other document is deemed filed upon receipt during normal business hours by the Office of the District Clerk at SFWMD headquarters in West Palm Beach, Florida. The District's normal business hours are 8:00 a.m. – 5:00 p.m., excluding weekends and District holidays. Any document received by the Office of the District Clerk after 5:00 p.m. shall be deemed filed as of 8:00 a.m. on the next regular business day. Additional filing instructions are as follows:

- Filings by mail must be addressed to the Office of the District Clerk, 3301 Gun Club Road, West Palm Beach, Florida 33406.

- Filings by hand-delivery must be delivered to the Office of the District Clerk. Delivery of a petition to the SFWMD's security desk does not constitute filing. It will be necessary to request that the SFWMD's security officer contact the Office of the District Clerk. An employee of the SFWMD's Clerk's office will receive and file the petition.
- Filings by e-mail must be transmitted to the Office of the District Clerk at clerk@sfwmd.gov. The filing date for a document transmitted by electronic mail shall be the date the Office of the District Clerk receives the complete document. A party who files a document by e-mail shall (1) represent that the original physically signed document will be retained by that party for the duration of the proceeding and of any subsequent appeal or subsequent proceeding in that cause and that the party shall produce it upon the request of other parties; and (2) be responsible for any delay, disruption, or interruption of the electronic signals and accepts the full risk that the document may not be properly filed.

INITIATION OF AN ADMINISTRATIVE HEARING

Pursuant to Sections 120.54(5)(b)4. and 120.569(2)(c), Fla. Stat., and Rules 28-106.201 and 28-106.301, Fla. Admin. Code, initiation of an administrative hearing shall be made by written petition to the SFWMD in legible form and on 8 1/2 by 11 inch white paper. All petitions shall contain:

1. Identification of the action being contested, including the permit number, application number, SFWMD file number or any other SFWMD identification number, if known.
2. The name, address, any email address, any facsimile number, and telephone number of the petitioner and petitioner's representative, if any.
3. An explanation of how the petitioner's substantial interests will be affected by the agency determination.
4. A statement of when and how the petitioner received notice of the SFWMD's decision.
5. A statement of all disputed issues of material fact. If there are none, the petition must so indicate.
6. A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the SFWMD's proposed action.
7. A statement of the specific rules or statutes the petitioner contends require reversal or modification of the SFWMD's proposed action.
8. If disputed issues of material fact exist, the statement must also include an explanation of how the alleged facts relate to the specific rules or statutes.
9. A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the SFWMD to take with respect to the SFWMD's proposed action.

MEDIATION

The procedures for pursuing mediation are set forth in Section 120.573, Fla. Stat., and Rules 28-106.111 and 28-106.401–.405, Fla. Admin. Code. The SFWMD is not proposing mediation for this agency action under Section 120.573, Fla. Stat., at this time.

RIGHT TO SEEK JUDICIAL REVIEW

Pursuant to Section 120.68, Fla. Stat., and in accordance with Florida Rule of Appellate Procedure 9.110, a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal with the Office of the District Clerk of the SFWMD in accordance with the filing instructions set forth herein within 30 days of rendition of the order to be reviewed, and by filing a copy of the notice with the clerk of the appropriate district court of appeal.

Last Date For Agency Action: September 23, 2017

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT STAFF REPORT

Project Name: I-95 Express Lanes Phase 3c

Permit No.: 06-01465-S

Application No.: 170525-8

Application Type: Environmental Resource (Conceptual Approval Modification)

Location: Broward County, S8,9,16,17,19,20,21,28,29,33/T50S/R42E
S4,8,9,16,17/T51S/R42E

Permittee : Florida Department Of Transportation

Operating Entity : Florida Department Of Transportation

Project Area: 15.70 acres

Permit Area: 416.76 acres

Project Land Use: Roadway

Drainage Basin: NORTH NEW RIVER
Drainage Basin: C-10
Drainage Basin: C-12

Receiving Body: See Exhibit 2 - Table 5

Special Drainage District: NA

Total Acres Wetland Onsite: 6.66
Total Acres Impacted Onsite : 6.66
Conservation Easement To District : No
Sovereign Submerged Lands: Yes **Type:** Letter Of Consent

PROJECT SUMMARY:

This Environmental Resource Permit Modification authorizes the conceptual approval of a stormwater management system serving an 8.6 mile highway widening project known as I-95 Express Lanes Phase 3C.

This project is for the widening of I-95 from south of Stirling Road to Broward Boulevard in Broward County for the purpose of converting the existing High Occupancy Vehicle (HOV) lanes to Express Toll Lanes and to provide an additional Express Toll Lane in each direction. A total of 15.47 acres of new impervious area is proposed. Additionally, a stretch of I-595 will be widened to accomodate the required auxiliary lanes that connect the I-95 and I-595 Express Lane systems (see Exhibit Nos. 1, 3 & 4).

The project extends through the C-10, North New River and C-12 Basins and through the Cities of Hollywood, Dania Beach and Fort Lauderdale.

The stormwater management system will consist of catch basins, storm sewer pipes, existing infield wet & dry ponds, expansion of existing roadside dry ponds (swales) and the construction of new dry detention ponds discharging to various canals (see Exhibit No. 2 - Table 5).

Issuance of this permit constitutes certification of compliance with state water quality standards in accordance with Rule 62-330.062 Florida Administrative Code (F.A.C.).

PROJECT EVALUATION:

PROJECT SITE DESCRIPTION:

Refer to Exhibit 1 for a Location Map and Exhibit No. 3 for Drainage Basin Maps.

The site is an existing stretch of Interstate-95 from south of Stirling Road to Broward Boulevard in Broward County, Florida.

For information on the wetlands and surface waters within the project, please refer to the Wetlands and Surface Waters section of this staff report.

LAND USE:

See Exhibit No. 2 - Table 3

WATER QUANTITY :

Discharge Rate :

The engineer-of-record has submitted an analysis which demonstrates that the post-development peak discharge rate for the 25-year 3-day design storm event will not exceed the existing condition (see Exhibit No. 2 - Table 5).

WATER QUALITY :

The project provides the required water quality treatment volume based on one inch over the basin area (see Exhibit No. 2 - Table 4).

In addition to the required water quality treatment volume, the applicant provided site specific pollutant loading calculations to demonstrate that the storm water management system reduces the post development loading of pollutants (specifically nutrients) to levels less than the loadings generated under the pre-development condition. The pollutant loading calculations are based upon the removal characteristics associated with the system.

The project also includes implementation of an Erosion Control Plan (Exhibit No. 4) as additional reasonable assurance of compliance with water quality criteria during construction and operation.

WETLANDS:

Wetlands And Other Surface Waters:

The project area contains wetlands and surface waters totaling 19.20 acres. Please see Exhibit No. 5.0 for wetland locations. The wetlands along the I-95 corridor consist of degraded mangrove fringes, dominated by exotic species, and are located within the Dania Cut-Off Canal, the C-10 and C-10 Spur Canals, and the South Fork of the New River Canal. There are three different types of wetlands along the I-595 corridor and these include white mangrove dominated wetlands, mudflats and forested wetlands with a mix of freshwater species and white and red mangroves. Additional wetland descriptions are located in the July 2017 environmental considerations report in the epermitting file.

The project will result in permanent impacts to 6.66 acres of wetlands and 1.05 acres of other surface

waters as described in the table below, and temporary impacts to 2.42 acres of wetlands. Exhibit No. 5.1 identifies the locations of wetlands and surface waters that will be impacted. Due to the limited space within the right-of-way, staff determined that additional reduction and elimination of direct impacts was not practicable.

Secondary impacts to mangrove wetlands within the C-10 Spur Canal and Dania Cut-Off Canal were assessed within 25 feet from the edge of the proposed bridge widening for a total of 0.04 acre. No secondary impacts in the C-10 Canal and South Fork of the New River canal are anticipated.

A series of stormwater ponds will be constructed below the I-595 bridge which will separate the north portion of the forested wetland area from the south portion. However, no secondary impacts are anticipated. The hydrology will be maintained, via the continuation of freshwater discharge from an adjacent ditch, the tidal influence from the South Fork of the New River Canal and equalizer pipes located in each pond. In addition, the water quality of the discharge into the wetland area will be significantly improved as it is currently discharged with no treatment. Finally, the ponds will still provide access to wildlife and will continue to provide a source of foraging for wading birds.

Mitigation Plan:

Wetland Impacts:

To mitigate for the wetland impacts within the canals along the I-95 corridor, the applicant will use mitigation functional units generated from the West Lake Park Mitigation Project and the wetland impacts along the I-595 bridge will be offset with the use of functional units from the Pond Apple Slough Mitigaton Area. Applications No. 170725-13 and 170725-15 are being issued concurrently to authorize the modification of Permits No. 06-05891-P and 06-07122-P to deduct 0.025 and 1.84 functional units, respectively, proposed as wetland mitigation. The amount of mitigation was determined by using the Uniform Mitigation Assessment Method in Chapter 62-345, F.A.C. The final scores can be found in the permit file.

The proposed mitigation is located within the same basin as the impacts; therefore, pursuant to Section 10.2.8 of Volume I, the project will not result in unacceptable cumulative impacts to the New River Basin.

Other Surface Waters Impacts:

The benthic surveys conducted by the applicant indicate that some discontinuous, patchy oyster beds were observed in the South Fork of the New River Canal, under the east bound lane of the I-595 bridge as well as south of the bridge and in the C-10 and C-10 Spur Canals. A majority of the observed oyster patches consisted of remnant shells and the total acreage of fill in the South Fork of the New River Canal is 0.06 acre and less than 0.01 acre in the C-10 and C-10 Spur Canals. No other benthic resources were observed within the overall project's proposed area of work in other surface waters. Therefore, mitigation is not required for work in other surface waters associated with this project. The benthic surveys can be found in the permit file.

Temporary Wetland Impacts:

The project includes temporary impacts to 2.10 acres of forested wetlands and 0.32 acre of mudflats along the I-595 bridge. Temporary access roads will be constructed for the duration of the project and will be removed upon completion. The wetland areas will be restored to their original condition as described in the restoration plan shown in Exhibit No. 5.2. An additional 0.79 acre of forested wetland areas will be impacted by the temporary road construction and then restored. However, these areas will be shaded after the bridge widening and mitigation units from the Pond Apple Slough Mitigation Area will be used to offset the shading impacts.

Monitoring/Maintenance:

Since 2.10 acres of forested wetland areas will be restored upon completion of the project, monitoring will be conducted by the permittee for five years or until District staff determines that restoration success has been achieved. The 0.32 acre of restored mudflats will not require monitoring as no vegetation will be planted. Exhibit No. 5.2 describes the monitoring methodology, locations, and maintenance activities. Monitoring will include vegetative cover, hydrologic conditions and success of the restoration, as well as wildlife usage and recommendations for maintenance work. Success criteria are found in the special conditions and Exhibit No. 5.2. A work schedule for monitoring shall be submitted at the time of the application for construction and annual reports shall be submitted to the District in accordance with that work schedule. After success is achieved, maintenance will be conducted in perpetuity by the permittee.

Wetland Inventory:

The temporary impacts to 2.10 acres of forested wetland areas and 0.32 acre of non-vegetated wetland areas are not shown in the table below since they will be restored directly following the completion of the bridge construction activities.

Wetland Inventory :

CONSTRUCTION NEW -I-95 Express Lanes Phase 3C

Site Id	Site Type	Pre-Development				Post-Development						
		Pre Flucs	AA Type	Acreage (Acres)	Current Wo Pres	With Project	Time Lag (Yrs)	Risk Factor	Pres. Adj. Factor	Post Fluccs	Adj Delta	Functional Gain / Loss
A	ON	612	Direct	3.11							.000	.000
B	ON	650	Direct	2.76							.000	.000
C	ON	630	Direct	.79							.000	.000
D	ON	510	Direct	1.05							.000	.000
			Total:	7.71								.00

Fluccs Code	Description
510	Streams And Waterways
612	Mangrove Swamps
630	Wetland Forested Mixed
650	Non-Vegetated

Fish And Wildlife Issues:

The wetlands or surface waters to be impacted provide habitat for wetland-dependent species including the West Indian manatee (Trichechus manatus). Correspondence from the Florida Fish and Wildlife Conservation Commission recommends that the permittee follow the Standard Manatee Construction Conditions for In-Water Work, as well as provide manatee exclusion devices on any existing or proposed pipes or culverts greater than 8 inches but less than 8 feet in diameter that are submerged or partially submerged and reasonably accessible to manatees. Additionally, no pile driving work shall be performed between November 15 and March 31 in the FPL Cooling Pond Canal and an observer will be required during pile-driving activities for concrete piles 12 inches in diameter or larger. An observer will also be

required while using barges on the C-10 Canal and Dania Cut-Off Canal bridge crossings, and during in-water activities associated with the South Fork of the New River Canal Bridge crossing. Special conditions are included to address these recommendations.

This permit does not relieve the applicant from complying with all applicable rules and any other agencies' requirements if, in the future, endangered/threatened species or species of special concern are discovered on the site.

SOVEREIGNTY SUBMERGED LANDS:

The existing bridge is located on sovereignty submerged lands- lands owned by the State of Florida and Easement No. 26451(3335-06) was granted to the applicant by the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida on January 26, 2014.

The project also requires the temporary use of sovereignty submerged lands adjacent to the existing easement to provide additional space for waterborne access and staging of equipment and materials during the bridge construction. Therefore, it also requires authorization from the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), pursuant to Article X, Section 11 of the Florida Constitution, and Section 253.77, F.S. For this project, the District is delegated the authority to review and take final action on behalf of the Board of Trustees, pursuant to Rule 18-21.0051(2), F.A.C.

The District has determined that the activity qualifies for a Letter of Consent, as long as the work performed is located within the boundaries as described and is consistent with the conditions herein. The sketch depicting the location of the temporary area is included as Exhibit No. 6.0.

RELATED CONCERNS:

Water Use Permit Status:

This permit does not release the permittee from obtaining all necessary Water Use authorization(s) prior to the commencement of activities which will require such authorization, including construction dewatering and irrigation.

CERP:

The proposed project is not located within or adjacent to a Comprehensive Everglades Restoration Project component.

Right-Of-Way Permit Status:

District Right-of-Way Permit Application No. 17-0526-2M is under review for the Dania Cut-Off Canal I-95 crossing. Right-of-Way Permits will also be required for the I-95 crossing over the C-10 and C-10 Spur Canals and the applicant is in the process of submitting the applications. The Right-of-Way permits will be required before the modification for the construction phase of this project is issued.

Historical/Archeological Resources:

The District has received correspondence from the Florida Department of State, Division of Historical Resources indicating that no significant archaeological or historical resources are recorded in the project area and the project is therefore unlikely to have an effect upon any such properties.

This permit does not release the permittee from compliance with any other agencies' requirements in the event that historical and/or archaeological resources are found on the site.

DEO/CZM Consistency Review:

The issuance of this permit constitutes a finding of consistency with the Florida Coastal Management Program.

Third Party Interest:

No third party has contacted the District with concerns about this application.

Enforcement:

There has been no enforcement activity associated with this application.

STAFF REVIEW:

DIVISION APPROVAL:

NATURAL RESOURCE MANAGEMENT:

Barbara J. Conmy

DATE: 02 Aug 2017

SURFACE WATER MANAGEMENT:

Carlos A. de Rojas, P.E.

DATE: 02-Aug-2017

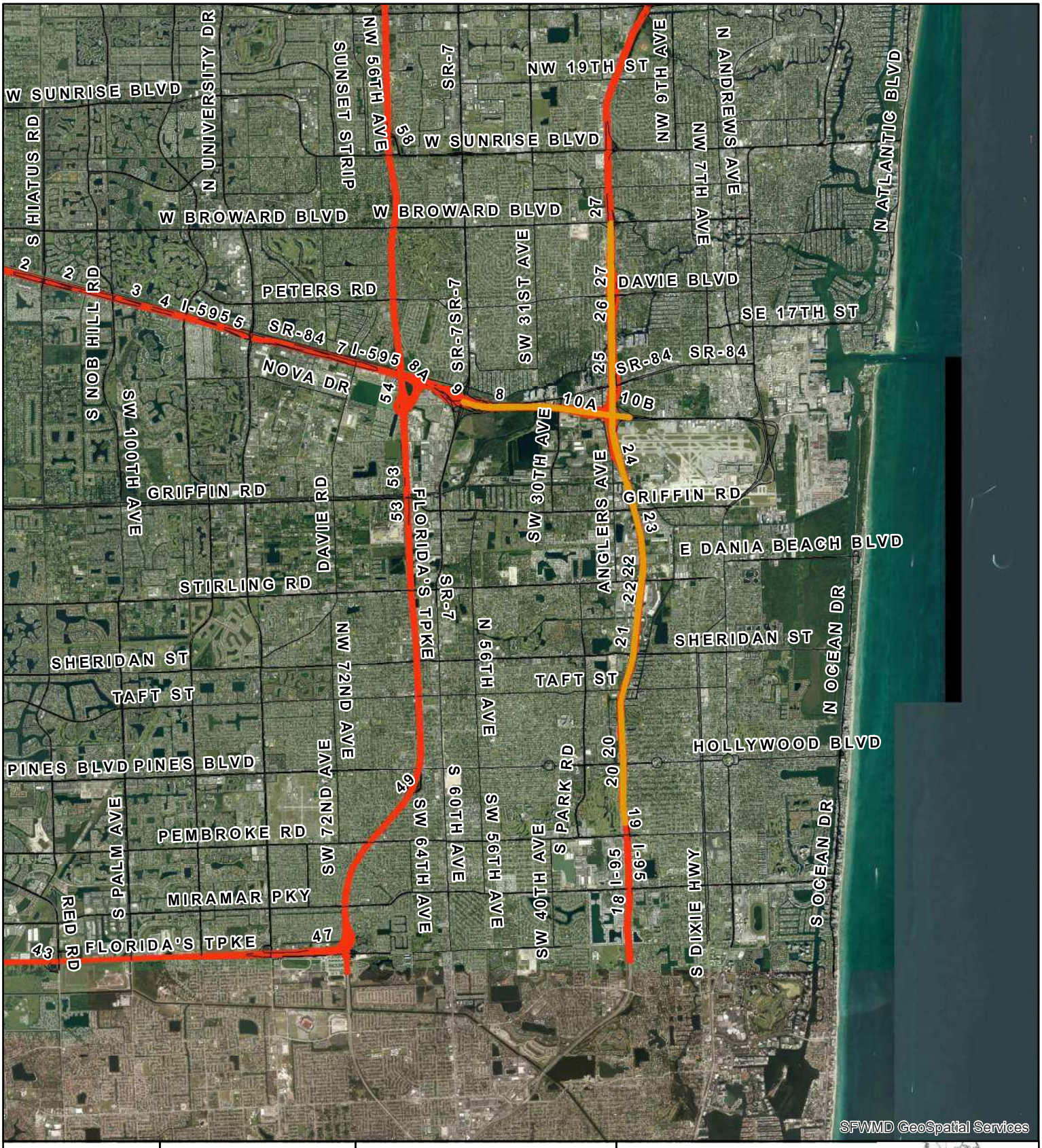

Exhibit No: 1	Exhibit Created On: 2017-06-06	BROWARD COUNTY, FL

REGULATION DIVISION

Project Name: I-95 EXPRESS LANES PHASE 3C

sfwmd.gov

0 1.5 3 Miles

N

Application

Permit No: 06-01465-S

Application Number: 170525-8

Created by IT GEOSPATIAL SERVICES

South Florida Water Management District

ORANGE BROOK
GOLF COURSE

South Florida Water Management District

Certification For Stormwater Discharge

Form #0113
Rev 1/91

SURFACE WATER MANAGEMENT PERMIT NO. 06-01955-S

(NON-ASSIGNABLE)

Date Issued: MAY 12, 1994

Authorizing: CONSTRUCTION AND OPERATION OF THE PROPOSED IMPROVEMENTS TO THE SURFACE WATER MANAGEMENT SYSTEM SERVING 208.4 ACRES OF THE ORANGEBROOK GOLF COURSE DISCHARGING TO THE C-10 CANAL.

Located In: BROWARD COUNTY, SEC. 17,20 TWP. 51S RGE. 42E

Issued To: HOLLYWOOD CITY OF
(ORANGE BROOK GOLF COURSE)
2600 HOLLYWOOD BOULEVARD
P O BOX 229045
HOLLYWOOD, FL 33022-9045

This Permit is issued pursuant to Application for Permit No. 931202-10 dated November 29, 1993. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any work or structure involved in the Permit. Said Application, including all plans and specifications attached thereto, as addressed by the Staff Report, is by reference made a part hereof.

This Permit may be revoked or modified at anytime pursuant to the appropriate provisions of Chapter 373, Florida Statutes.

This Permit does not convey to Permittee any property rights or privileges other than those specified herein, nor relieve the Permittee from complying with any law, regulation or requirement affecting the rights of other bodies or agencies. All structures and works installed by Permittee hereunder shall remain the property of the Permittee.

Within thirty (30) days after the completion of the construction of any work or structure relative to this Permit, the Permittee shall file with the District a written statement of completion on the appropriate form provided by the Board.

Special Conditions are as follows:

SEE SHEETS 2-3 OF 5 - 14 SPECIAL CONDITIONS.
SEE SHEETS 4-5 OF 5 - 12 LIMITING CONDITIONS.

Filed with the Clerk of the South Florida Water Management District

On Original signed by:
By Vern Kaiser
Deputy Clerk

South Florida Water Management District, by its Governing Board

Original signed by
By TONY BURNS
Assistant Secretary

MICROFILMED

SPECIAL CONDITIONS

1 . DISCHARGE FACILITIES:

1-43' WIDE SHARP CRESTED WEIR WITH CREST AT ELEV. 4' NGVD.
1-3' W X ' H RECTANGULAR NOTCH WITH INVERT AT ELEV. 2' NGVD.

RECEIVING BODY : C-10

CONTROL ELEV : 2 FEET NGVD.

2 . THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

3 . MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

4 . THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

5 . PRIOR TO THE INITIATION OF ANY WITHDRAWAL OF WATER (IRRIGATION, DEWATERING, PUBLIC WATER SUPPLY, ETC.), IT WILL BE NECESSARY TO APPLY FOR A WATER USE PERMIT. THE PERMITTEE IS CAUTIONED THAT A MINIMUM OF 90 DAYS IS REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION. THE PERMITTEE IS CAUTIONED THAT THE ISSUANCE OF A SURFACE WATER MANAGEMENT PERMIT SHALL NOT BE CONSTRUED TO BE A GUARANTEE THAT WATER WILL BE AVAILABLE.

6 . FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

7 . A BENCHMARK SHALL BE PROVIDED IN THE VICINITY OF THE CONTROL STRUCTURE AND A DESCRIPTION PROVIDED TO THE DISTRICT WHEN CERTIFYING CONSTRUCTION COMPLETION OF THE DRAINAGE FACILITIES.

8 . PRIOR TO JULY 9, 1994, THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT SHALL BE NOTIFIED BY THE PERMITTEE OR AUTHORIZED AGENT (VIA THE SUPPLIED CONSTRUCTION COMMENCEMENT NOTICE OR EQUIVALENT) OF THE ACTUAL OR ANTICIPATED CONSTRUCTION START DATE AND THE EXPECTED COMPLETION DATE/DURATION.

9 . WHEN THE DURATION OF CONSTRUCTION EXCEEDS ONE YEAR, CONSTRUCTION STATUS REPORTS SHALL BE SUBMITTED TO THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT ON AN ANNUAL BASIS (VIA THE SUPPLIED ANNUAL STATUS REPORT OR EQUIVALENT) BEGINNING ONE YEAR AFTER THE INITIAL COMMENCEMENT OF CONSTRUCTION DATE.

10. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE OR AUTHORIZED AGENT SHALL NOTIFY THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT OF THAT COMPLETION DATE AND SUBMIT CERTIFICATION BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY

MICROFILMED

SCANNED 10/15/2012 14:14:44 165E

THE DISTRICT (VIA THE SUPPLIED CONSTRUCTION COMPLETION/CONSTRUCTION CERTIFICATION OR EQUIVALENT). SUCH CERTIFICATION MAY CONSIST OF WORDING IN PARAGRAPH 3.1.7 "CONSTRUCTION COMPLETION CERTIFICATION" OF THE CURRENT BASIS OF REVIEW FOR SURFACE WATER MANAGEMENT PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT. IF THE CERTIFICATION LANGUAGE USED IS DIFFERENT FROM THE SUGGESTED LANGUAGE, A SET OF RECORD DRAWINGS CONSISTING OF ELEVATIONS, LOCATIONS AND DIMENSIONS OF COMPONENTS OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL ALSO BE SUBMITTED.

11. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF THE CITY OF HOLLYWOOD.

12. IF THE PROJECT DESIGN IS CHANGED AS A RESULT OF OTHER AGENCY REQUIREMENTS, A SURFACE WATER MANAGEMENT PERMIT MODIFICATION MAY BE REQUIRED. THE PERMITEE SHALL NOTIFY SFWMD STAFF OF DESIGN CHANGES REQUIRED BY OTHER AGENCIES FOR A DETERMINATION OF ANY NECESSARY PERMIT MODIFICATIONS.

13. FOR THE PROPOSED LAKE EXCAVATION AREAS WITHIN THE GOLF COURSE, LAKE SIDE SLOPES SHALL BE 4:1 (HORIZONTAL:VERTICAL) TO A DEPTH OF TWO FEET BELOW THE CONTROL ELEVATION. SIDE SLOPES SHALL BE NURTURED OR PLANTED FROM 2 FEET BELOW TO 1 FOOT ABOVE CONTROL ELEVATION TO INSURE VEGETATIVE GROWTH.

14. THE CITY OF HOLLYWOOD SHALL OPERATE THE SURFACE WATER MANAGEMENT SYSTEM IN SUCH A MANNER SO AS TO PREVENT CHLORIDE CONCENTRATIONS FROM EXCEEDING HISTORIC LEVELS. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY DATA BE SUBMITTED TO INSURE CONTINUED COMPLIANCE WITH THIS CONDITION.

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LIMITING CONDITIONS

1 . THE PERMITTEE SHALL PROSECUTE THE WORK AUTHORIZED IN A MANNER SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION, TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATERS.

2 . WATER QUALITY DATA FOR THE WATER DISCHARGED FROM THE PERMITTEE'S PROPERTY OR INTO SURFACE WATERS OF THE STATE SHALL BE SUBMITTED TO THE DISTRICT AS REQUIRED. PARAMETERS TO BE MONITORED MAY INCLUDE THOSE LISTED IN CHAPTER 17-302. IF WATER QUALITY DATA IS REQUIRED, THE PERMITTEE SHALL PROVIDE DATA AS REQUIRED, ON VOLUMES OF WATER DISCHARGED INCLUDING TOTAL VOLUME DISCHARGED, DURING THE DAYS OF SAMPLING AND TOTAL MONTHLY DISCHARGES FROM THE PROPERTY OR INTO SURFACE WATERS OF THE STATE.

3 . THE PERMITTEE SHALL COMPLY WITH ALL APPLICABLE LOCAL SUBDIVISION REGULATIONS AND OTHER LOCAL REQUIREMENTS. IN ADDITION, THE PERMITTEE SHALL OBTAIN ALL NECESSARY FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY CONSTRUCTION OR ALTERATION OF WORKS AUTHORIZED BY THIS PERMIT.

4 . THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE UNTIL A FLORIDA REGISTERED PROFESSIONAL ENGINEER CERTIFIES THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE DISTRICT. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL SUBMIT THE CERTIFICATION AND NOTIFY THE DISTRICT THAT THE FACILITIES ARE READY FOR INSPECTION AND APPROVAL. UPON APPROVAL OF THE COMPLETED SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL REQUEST TRANSFER OF THE PERMIT TO THE RESPONSIBLE ENTITY APPROVED BY THE DISTRICT.

5 . ALL ROADS SHALL BE SET AT OR ABOVE ELEVATIONS REQUIRED BY THE APPLICABLE LOCAL GOVERNMENT FLOOD CRITERIA.

6 . ALL BUILDING FLOORS SHALL BE SET AT OR ABOVE ELEVATIONS ACCEPTABLE TO THE APPLICABLE LOCAL GOVERNMENT.

7 . OFF-SITE DISCHARGES DURING CONSTRUCTION AND DEVELOPMENT SHALL BE MADE ONLY THROUGH THE FACILITIES AUTHORIZED BY THIS PERMIT. NO ROADWAY OR BUILDING CONSTRUCTION SHALL COMMENCE ON-SITE UNTIL COMPLETION OF THE PERMITTED DISCHARGE STRUCTURE AND DETENTION AREAS. WATER DISCHARGED FROM THE PROJECT SHALL BE THROUGH STRUCTURES HAVING A MECHANISM SUITABLE FOR REGULATING UPSTREAM WATER STAGES. STAGES MAY BE SUBJECT TO OPERATING SCHEDULES SATISFACTORY TO THE DISTRICT.

8 . NO CONSTRUCTION AUTHORIZED HEREIN SHALL COMMENCE UNTIL A RESPONSIBLE ENTITY ACCEPTABLE TO THE DISTRICT HAS BEEN ESTABLISHED AND HAS AGREED TO OPERATE AND MAINTAIN THE SYSTEM. THE ENTITY MUST BE PROVIDED WITH SUFFICIENT

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SCANNED 10/15/2012

OWNERSHIP SO THAT IT HAS CONTROL OVER ALL WATER MANAGEMENT FACILITIES AUTHORIZED HEREIN. UPON RECEIPT OF WRITTEN EVIDENCE OF THE SATISFACTION OF THIS CONDITION, THE DISTRICT WILL ISSUE AN AUTHORIZATION TO COMMENCE CONSTRUCTION.

9 . THE PERMIT DOES NOT CONVEY TO THE PERMITTEE ANY PROPERTY RIGHT NOR ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4, FAC.

10. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, OPERATION, MAINTENANCE OR USE OF ANY FACILITY AUTHORIZED BY THE PERMIT.

11. THIS PERMIT IS ISSUED BASED ON THE APPLICANT'S SUBMITTED INFORMATION WHICH REASONABLY DEMONSTRATES THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS WILL NOT BE CAUSED BY THE COMPLETED PERMIT ACTIVITY. IT IS ALSO THE RESPONSIBILITY OF THE PERMITTEE TO INSURE THAT ADVERSE OFF-SITE WATER RESOURCE IMPACTS DO NOT OCCUR DURING CONSTRUCTION.

12. PRIOR TO DEWATERING, PLANS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL. INFORMATION SHALL INCLUDE AS A MINIMUM: PUMP SIZES, LOCATIONS AND HOURS OF OPERATION FOR EACH PUMP. IF OFF-SITE DISCHARGE IS PROPOSED, OR OFF-SITE ADVERSE IMPACTS ARE EVIDENT, AN INDIVIDUAL WATER USE PERMIT MAY BE REQUIRED. THE PERMITTEE IS CAUTIONED THAT SEVERAL MONTHS MAY BE REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION.

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SCANNED 10/15/2012 11:14 AM

FLORIDA DEPARTMENT OF TRANSPORTATION
LAWTON CHILES
GOVERNOR
BEN G. WATTS
SECRETARY
3400 West Commercial Blvd.
Fort Lauderdale, Florida 33309-3421
Telephone: (305) 777-4343

June 28, 1994

Ms. Beth Colavecchio
Regulation Department
So. Florida Water Management District
3301 Gun Club Road
P.O. Box 24680
West Palm Beach, FL 33416-4680

Dear Ms. Colavecchio:

RE: Permit Processing Fee
Orangebrook Golf Course
SFWMD Application / Permit No. 931202-10 / 06-01955-S
Work Program Item No. 4110318
State Project No. 86018-3501
Broward County

Enclosed is the $3050.00 permit processing fee for the individual permit issued for the Orangebrook Golf Course referenced by SFWMD Permit No. 06-01955-S.

If you have any questions or need additional information, please do not hesitate to contact me at (305) 777-4343.

Sincerely,

Amie K. Goddeau, P.E.
District Permit Coordinator
D.E.M.O.

AKG

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RECYCLED PAPER

File

South Florida Water Management District

3301 Gun Club Road • P.O. Box 24680 • West Palm Beach, FL 33416-4680 • (407) 686-8800 • FL WATS 1-800-432-2045

May 6, 1994

City of Hollywood
2600 Hollywood Blvd.
Hollywood, FL 33022-9045

Dear Sir or Madam:

Subject: Application No. 931202-10, Orange Brook Golf Course
Broward County, S17,20/T51S/R42E

Enclosed is a copy of this District's staff report covering the request for permit application referenced therein. It is requested that you read this staff report thoroughly and understand its contents. The recommendations as stated in the staff report will be presented to our Governing Board for consideration on May 12, 1994.

Should you wish to object to the staff recommendation or file a petition, please provide written objections, petitions and/or waivers (refer to the attached "Notice of Rights") to:

Vern Kaiser, Deputy Clerk
South Florida Water Management District
Post Office Box 24680
West Palm Beach, Florida 33416-4680

The "Notice of Rights" addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. You are advised, however, to be prepared to defend your position regarding the permit application when it is considered by the Governing Board for final agency action, even if you agree with the staff recommendation, as the Governing Board may take final agency action which differs materially from the proposed agency action.

Please contact the District if you have any questions concerning this matter. If we do not hear from you prior to the date on the "Notice of Rights", we will assume you concur with our recommendations.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the addressee and the persons listed in the attached distribution list not later than 5:00 p.m. this 6th day of May 1994 in accordance with Section 120.60 (3), Florida Statutes.

Sincerely,

Steve Lamb
Director
Regulation Department

CERTIFIED MAIL #P 252 275 419
RETURN RECEIPT REQUESTED

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Governing Board:
Allan Milledge, Chairman - Miami
Valerie Boyd, Vice Chairman - Naples
Ken Adams - West Palm Beach
James E. Nall - Fort Lauderdale
Annie Betancourt - Miami
Franklin B. Mann - Fort Myers
Leah G. Schad - West Palm Beach
Frank Williamson, Jr. - Okeechobee
Eugene K. Pettis - Fort Lauderdale
Tilford C. Creel, Executive Director
Thomas K. MacVicar, Deputy Executive Director

South Florida Water Management District

Notice of Rights

Form #0500
Rev. 7/93

NOTICE OF RIGHTS

Enclosed is a copy of the Staff Review Summary regarding the subject permit application, which is this agency's Notice of Proposed Agency Action.

PETITION FOR FORMAL ADMINISTRATIVE PROCEEDINGS

Any person whose substantial interests are or may be affected by the action which is proposed in the enclosed Notice of Proposed Agency Action/Staff Review Summary, may petition for an administrative hearing in accordance with the requirements of Rule 40E-1.521, Florida Administrative Code, and be filed with (received by) the District Clerk, 3301 Gun Club Road, West Palm Beach, Florida 33406. Petitions for administrative hearing on the above application must be filed within **fourteen (14) days of actual receipt** of this Notice of Proposed Agency Action. Failure to file a petition within this time period shall constitute a waiver of any rights such person may have to request an administrative determination (hearing) under section 120.57, Florida Statutes, concerning the subject permit application. Petitions which are not filed in accordance with the above provisions are subject to dismissal.

FLORIDA LAND AND WATER ADJUDICATORY COMMISSION

A party to the proceeding below may seek review of a Final Order rendered on the permit application before the Land and Water Adjudicatory Commission. Review under section 373.114, Florida Statutes, is initiated by filing a request for review with the Land and Adjudicatory Commission and serving a copy on the Department of Environmental Protection and any person named in the Order within applicable statutory timeframes. This review is appellate in nature and limited to the record below.

DISTRICT COURT OF APPEAL

A party who is adversely affected by final agency action on the permit application is entitled to judicial review in the District Court of Appeal pursuant to section 120.68, Florida Statutes, as provided therein. Review under section 120.68, Florida Statutes, is initiated by filing a Notice of Appeal in the appropriate District Court of Appeal in accordance with Florida Rule of Appellate Procedure 9.110.

CIRCUIT COURT

Section 373.617(2), Florida Statutes, provides:

> Any person substantially affected by a final action of any agency with respect to a permit may seek review within 90 days of the rendering of such decision and request monetary damages and other relief in the circuit court in the judicial circuit in which the affected property is located; however, circuit court review shall be confined solely to determining whether final agency action is an unreasonable exercise of the state's police power constituting a taking with just compensation. Review of final agency action for the purpose of determining whether the action is in accordance with existing statutes or rules and based on competent substantial evidence shall proceed in accordance with Chapter 120.

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LAST DATE FOR GOVERNING BOARD ACTION:
JUNE 9, 1994

DRAFT
Subject to Governing Board Approval

SURFACE WATER MANAGEMENT STAFF REVIEW SUMMARY

I. ADMINISTRATIVE

APPLICATION NUMBER: 931202-10

PROJECT NAME: ORANGE BROOK GOLF COURSE

LOCATION: BROWARD COUNTY
S17,20/T51S/R42E

APPLICANT'S NAME: HOLLYWOOD CITY OF

OWNERS NAME AND ADDRESS: HOLLYWOOD CITY OF
2600 HOLLYWOOD BOULEVARD
P O BOX 229045
HOLLYWOOD, FL 33022-9045

DEVELOPER:

ENGINEER: FLORIDA DEPARTMENT OF TRANSPORATION

II. PROJECT DESCRIPTION

PROJECT AREA: 208.40 acres **DRAINAGE AREA:** 309.40 acres

DISTRICT DRAINAGE BASIN: C-10

RECEIVING BODY: C-10

CLASSIFICATION: CLASS III

PURPOSE:

This application is a request for Construction and Operation of proposed improvements to the surface water management system serving the existing 208.4 acre City of Hollywood's Orange Brook Golf Course (OBGC). Staff recommends approval with conditions.

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BACKGROUND:

On July 28, 1993, the City of Hollywood and the Florida Department of Transportation (FDOT) entered into a Joint Participation Agreement for the proposed improvements to the OBGC surface water management system. This agreement provides for FDOT funding of the proposed improvements with construction and operation to be undertaken by the City. Funding and construction of the proposed improvements would allow the FDOT Pembroke Road widening project to discharge into the OBGC water management system.

EXISTING FACILITIES:

The existing OBGC discharge facilities consist of a dam structure, 1-18000 GPM pump and several gated culverts. Currently runoff from the golf course and several adjacent parcels flows into the existing lake area within the golf course. Discharge is into the C-10 Canal which abuts the northeast corner of the OBGC.

PROPOSED FACILITIES:

This application covers the proposed improvements to the City of Hollywood's Orange Brook Golf Course (OBGC). These improvements include the reconfiguration of the lake system, replacement of pedestrian bridges, and replacement of the existing control structure which discharges into the C-10 Canal.

The new control structure will consist of 1-3' wide rectangular slide gate with the crest to be set at elevation 2.0' NGVD, 1-43' wide broad crested weir (dam) with a crest at elevation 4.0' NGVD and 1-18000 GPM pump with an on/off elevation at 4.0' NGVD. A second 18000 GPM pump will be installed and will only be used as backup. Discharge is into the C-10 Canal as presently occurs.

The proposed improvements to the surface water management system will include a pre-treatment swale between Pembroke Road (SR 824) and the first golf course lake. Runoff from the Pembroke Road system will be pre-treated prior to entering the golf course lake system. For the proposed lake excavation areas within the golf course, lake side slopes shall be constructed to meet the 4:1 side slope criteria.

The City of Hollywood will be required to monitor chloride concentrations within the golf course lake system. Chloride concentrations shall not exceed current levels (approximately 60 mg/l) as shown on Exhibit 14. Operation of the surface water management system shall be conducted in a manner so as not to increase chloride concentrations beyond current conditions.

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BASIN INFORMATION:

Basin	Area Acres	WSWT Elev (ft, NGVD)	Normal/Dry Ctrl Elev (ft, NGVD)	Method of Determination
GOLF COURSE	208.40	2.00	2	EXISTING CONTROL ELEVATION

DISCHARGE STRUCTURE INFORMATION:

Water Quality Structures:

Basin	Str. #	Bleeder Type	Dimensions	Invert Elev. (ft, NGVD)
GOLF COURSE	1	RECTANGULAR NOTCH	3' wide X 2' high	2.00

Major Discharge Structures:

Basin	Str. #	Description	Crest Elev. (ft, NGVD)
GOLF COURSE	1	43' wide SHARP CRESTED weir	4.00

Pump Discharge Structures:

Basin	Str. #	Capacity (GPM)	on/off elev. (ft, NGVD)
GOLF COURSE	1	18000	4/4

Receiving Body:

Basin	Str. #	Receiving Body
GOLF COURSE	1	C-10

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III. PROJECT EVALUATION

Discharge Rate:

In the table below, the allowable discharge is based on the pre-development condition which consists of the existing structure and facilities.

Design Storm Frequency: 25YR-3DAY **Design Rainfall:** 13.50 inches

Basin	Allow Disch (cfs)	Method of Determination	Design Disch (cfs)	Design Stage (ft, NGVD)
GOLF COURSE	150	PRE VS. POST	134	4.6

WATER QUALITY:

Detention of the first inch of runoff from the 309.4 acre drainage area will be provided within the lake system.

Basin	Treatment Method		Vol Req'd. (ac-ft)	Vol Prov'd (ac-ft)
GOLF COURSE	16.4 acres	WET DETENTION	25.80	25.80

IV. ENVIRONMENTAL ASSESSMENT

EXISTING ON SITE UPLAND COMMUNITIES:

ID NO	TOTAL ACREAGE	BIOLOGICAL CONDITION	COMMUNITY TYPE	COMMUNITY ACREAGE
1	208.40	N/A	GOLF COURSES	208.40

TOTAL ON SITE UPLAND ACREAGE: 208.40

ENVIRONMENTAL SUMMARY:

The project site consists of an existing golf course development. There are no isolated wetlands on site and the permit does not include any wetland protection or mitigation requirements.

The golf course lakes are waters of the state. Therefore the proposed recontouring of the lake slopes and alterations to the control structure require a Wetland Resource Permit. Application number 940224-1-D is currently

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being processed by this agency for the proposed work and is on the agenda for the May 12, 1994 Governing Board meeting.

Adverse impacts to wetlands are not anticipated as a result of the proposed construction.

SYSTEM OPERATION:

City Of Hollywood

PROPOSED LAND USE(S):

Recreational

WATER USE PERMIT STATUS:

A Water Use permit application for golf course irrigation is currently under review. The main issues are saline water intrusion and the potential competing use with the City of Hollywood Public Water Supply.

POTABLE WATER SUPPLIER:

City Of Hollywood

WASTE WATER SYSTEM/SUPPLIER:

City Of Hollywood

DRI STATUS:

This project is not a DRI.

SAVE OUR RIVERS:

The project is not within or adjacent to lands under consideration by the Save Our Rivers program.

SWIM BASIN:

The project is not within nor does it discharge directly to a designated SWIM basin.

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RIGHT-OF-WAY PERMIT STATUS:

A Right-of-Way Permit is not required for this project.

ENFORCEMENT ACTIVITY:

There has been no enforcement activity associated with this application.

THIRD PARTY INTEREST:

No third party has contacted the District with concerns about this application.

WELL FIELD ZONE OF INFLUENCE:

The project is located within Zone 3 of the City of Hollywood wellfield.

PRIMARY ISSUES RESOLVED:

No primary issues.

V. APPLICABLE LAND AREA

TOTAL PROJECT area and THIS PHASE area is for the existing golf course.

PROJECT

	TOTAL PROJECT	PREVIOUSLY PERMITTED	THIS PHASE	
TOTAL ACRES	208.40		208.40	acres
WTRM ACREAGE	16.40		16.40	acres
PAVEMENT	4.90		4.90	acres
BUILD COVERAGE	.40		.40	acres
PERVIOUS	186.70		186.70	acres

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VI. STAFF RECOMMENDATION

The Staff recommends that the following be issued:

Authorization for Construction and Operation of the proposed improvements to the surface water management system serving the Orangebrook Golf Course discharging to the C-10 Canal.

Based on the information provided, District rules have been adhered to.

Staff recommendation is for approval subject to the attached Standard Limiting and Special Conditions.

VII. STAFF REVIEW

AREA MANAGER

5/6/94
Anthony M. Waterhouse, P.E.

NATURAL RESOURCE MANAGEMENT DIVISION APPROVAL

APPLICATION REVIEWER

Anita R. Bain
Anita R. Bain

SUPERVISING PROFESSIONAL

Robert G. Robbins
Robert G. Robbins

DIVISION DIRECTOR:

Terrie A. Bates

DATE: 5-6-94

SURFACE WATER MANAGEMENT DIVISION APPROVAL

APPLICATION REVIEWER

Eduardo J. Lopez
Eduardo J. Lopez

SUPERVISING PROFESSIONAL

Carlos A. deRojas, P.E
Carlos A. deRojas, P.E

DIVISION DIRECTOR

Richard A. Rogers, P.E.

DATE: 5/6/94

DRAFT
Subject to Governing Board Approval

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LIMITING CONDITIONS

1 . THE PERMITTEE SHALL PROSECUTE THE WORK AUTHORIZED IN A MANNER SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION, TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATERS.

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8 . NO CONSTRUCTION AUTHORIZED HEREIN SHALL COMMENCE UNTIL A RESPONSIBLE ENTITY ACCEPTABLE TO THE DISTRICT HAS BEEN ESTABLISHED AND HAS AGREED TO

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SPECIAL CONDITIONS

1 . DISCHARGE FACILITIES:

1-43' WIDE SHARP CRESTED WEIR WITH CREST AT ELEV. 4' NGVD.
1-3' W X ' H RECTANGULAR NOTCH WITH INVERT AT ELEV. 2' NGVD.

RECEIVING BODY : C-10

CONTROL ELEV : 2 FEET NGVD.

2 . THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

3 . MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

4 . THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

5 . PRIOR TO THE INITIATION OF ANY WITHDRAWAL OF WATER (IRRIGATION, DEWATERING, PUBLIC WATER SUPPLY, ETC.), IT WILL BE NECESSARY TO APPLY FOR A WATER USE PERMIT. THE PERMITTEE IS CAUTIONED THAT A MINIMUM OF 90 DAYS IS REQUIRED FOR CONSIDERATION OF THE WATER USE PERMIT APPLICATION. THE PERMITTEE IS CAUTIONED THAT THE ISSUANCE OF A SURFACE WATER MANAGEMENT PERMIT SHALL NOT BE CONSTRUED TO BE A GUARANTEE THAT WATER WILL BE AVAILABLE.

6 . FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

7 . A BENCHMARK SHALL BE PROVIDED IN THE VICINITY OF THE CONTROL STRUCTURE AND A DESCRIPTION PROVIDED TO THE DISTRICT WHEN CERTIFYING CONSTRUCTION COMPLETION OF THE DRAINAGE FACILITIES.

8 . PRIOR TO JULY 9, 1994, THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT SHALL BE NOTIFIED BY THE PERMITTEE OR AUTHORIZED AGENT (VIA THE SUPPLIED CONSTRUCTION COMMENCEMENT NOTICE OR EQUIVALENT) OF THE ACTUAL OR ANTICIPATED CONSTRUCTION START DATE AND THE EXPECTED COMPLETION DATE/ DURATION.

9 . WHEN THE DURATION OF CONSTRUCTION EXCEEDS ONE YEAR, CONSTRUCTION STATUS REPORTS SHALL BE SUBMITTED TO THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT ON AN ANNUAL BASIS (VIA THE SUPPLIED ANNUAL STATUS REPORT OR EQUIVALENT) BEGINNING ONE YEAR AFTER THE INITIAL COMMENCEMENT OF CONSTRUCTION DATE.

10. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER

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MANAGEMENT SYSTEM, THE PERMITTEE OR AUTHORIZED AGENT SHALL NOTIFY THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT OF THAT COMPLETION DATE AND SUBMIT CERTIFICATION BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE DISTRICT (VIA THE SUPPLIED CONSTRUCTION COMPLETION/CONSTRUCTION CERTIFICATION OR EQUIVALENT). SUCH CERTIFICATION MAY CONSIST OF WORDING IN PARAGRAPH 3.1.7 "CONSTRUCTION COMPLETION CERTIFICATION" OF THE CURRENT BASIS OF REVIEW FOR SURFACE WATER MANAGEMENT PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT. IF THE CERTIFICATION LANGUAGE USED IS DIFFERENT FROM THE SUGGESTED LANGUAGE, A SET OF RECORD DRAWINGS CONSISTING OF ELEVATIONS, LOCATIONS AND DIMENSIONS OF COMPONENTS OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL ALSO BE SUBMITTED.

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12. IF THE PROJECT DESIGN IS CHANGED AS A RESULT OF OTHER AGENCY REQUIREMENTS, A SURFACE WATER MANAGEMENT PERMIT MODIFICATION MAY BE REQUIRED. THE PERMITEE SHALL NOTIFY SFWMD STAFF OF DESIGN CHANGES REQUIRED BY OTHER AGENCIES FOR A DETERMINATION OF ANY NECESSARY PERMIT MODIFICATIONS.

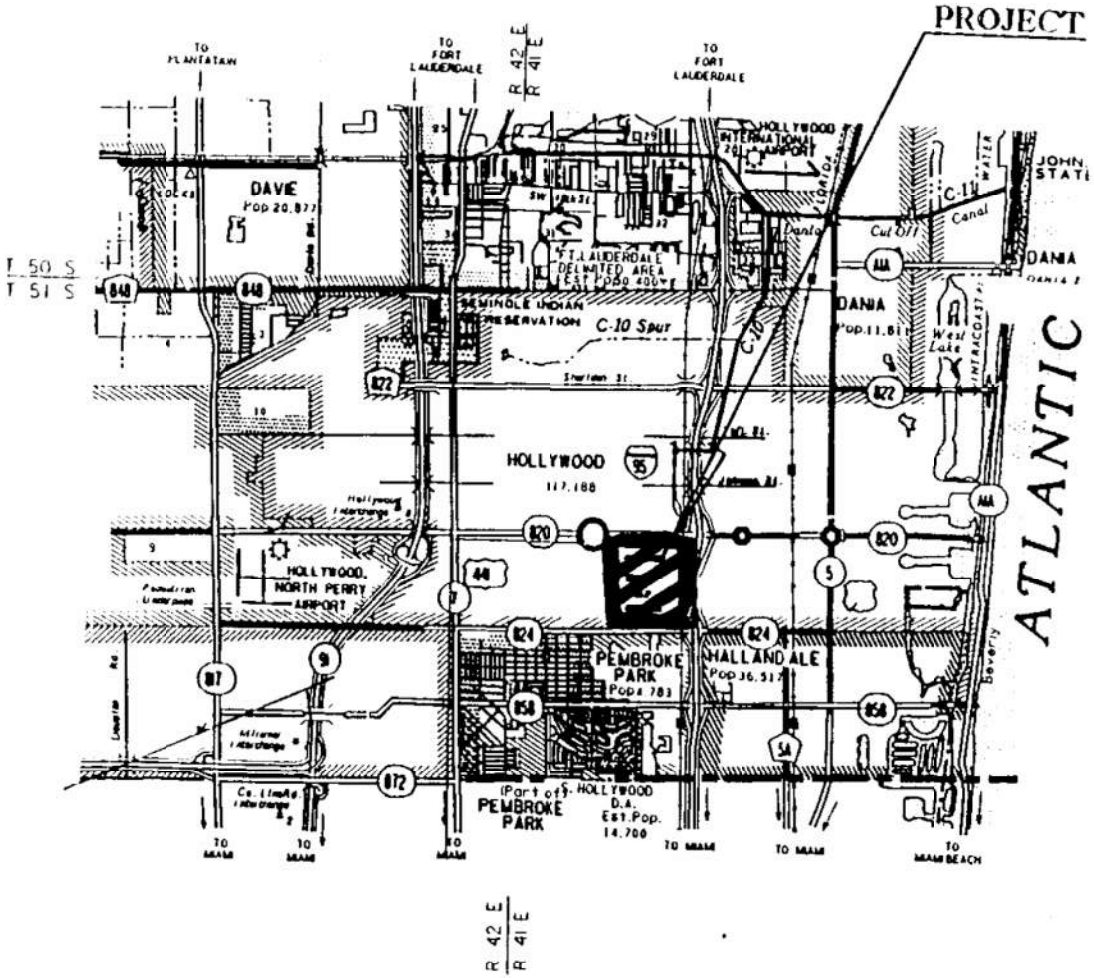
13. FOR THE PROPOSED LAKE EXCAVATION AREAS WITHIN THE GOLF COURSE, LAKE SIDE SLOPES SHALL BE 4:1 (HORIZONTAL:VERTICAL) TO A DEPTH OF TWO FEET BELOW THE CONTROL ELEVATION. SIDE SLOPES SHALL BE NURTURED OR PLANTED FROM 2 FEET BELOW TO 1 FOOT ABOVE CONTROL ELEVATION TO INSURE VEGETATIVE GROWTH.

14. THE CITY OF HOLLYWOOD SHALL OPERATE THE SURFACE WATER MANAGEMENT SYSTEM IN SUCH A MANNER SO AS TO PREVENT CHLORIDE CONCENTRATIONS FROM EXCEEDING HISTORIC LEVELS. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT WATER QUALITY DATA BE SUBMITTED TO INSURE CONTINUED COMPLIANCE WITH THIS CONDITION.

MICROFILMED

CITY OF HOLLYWOOD
ORANGE BROOK GOLF COURSE
(PEMBROKE ROAD)

EXHIBIT 1



LENGTH OF PROJECT		
	LINEAR, FT.	MILES
ROADWAY		
BRIDGES		
NET LENGTH OF PROJ.	N/A	N/A
EXCEPTIONS		
GROSS LENGTH OF PROJ.		

DATE | BY

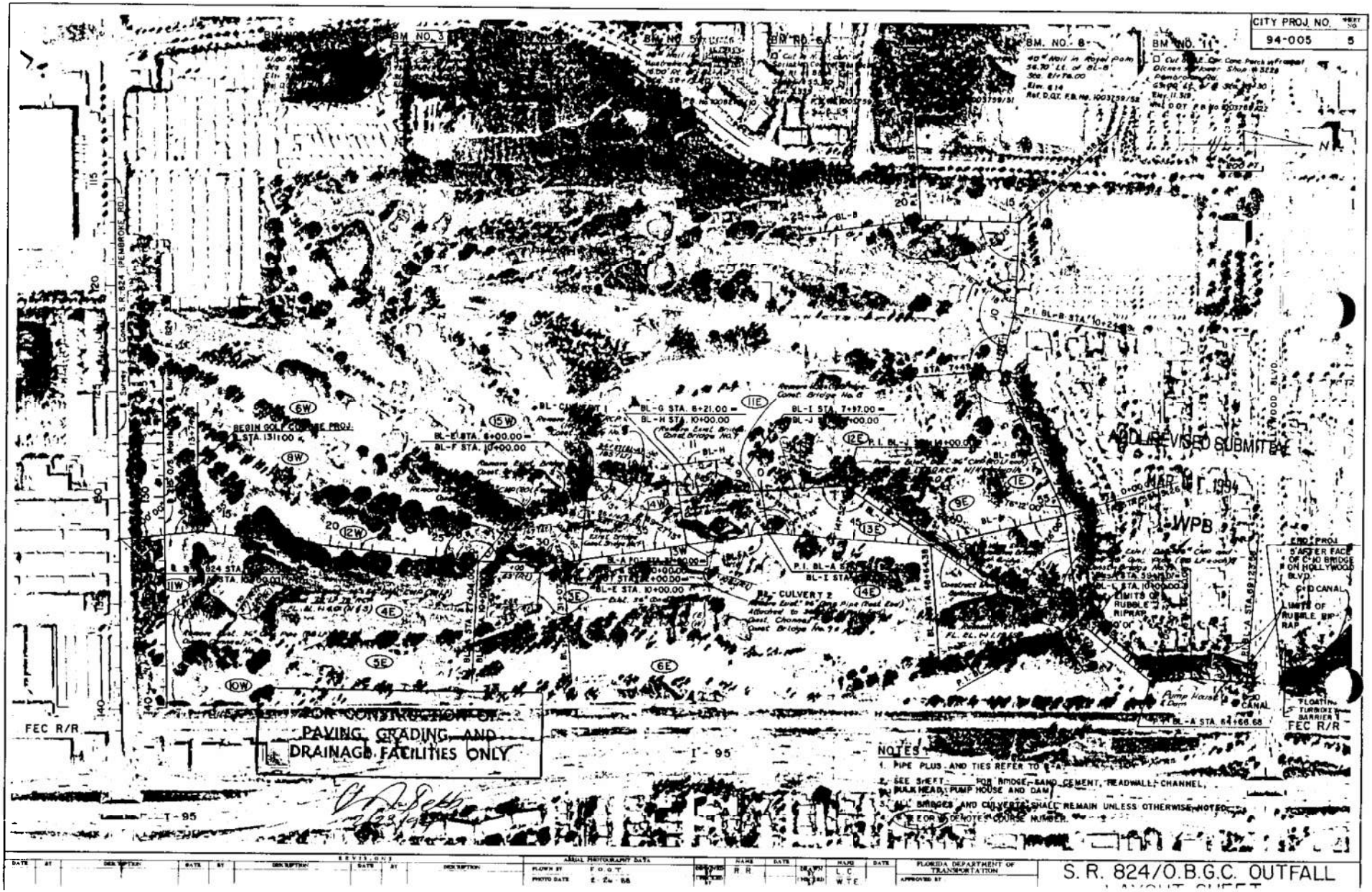
CHIEF ENGR. - DIST. - RENNA

FDOT PROJECT MANAGER - HOWARD WEEKS

MICROFILMED

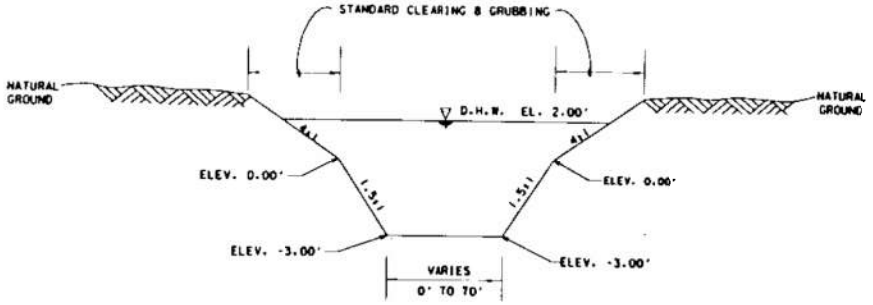
SCANNED 10/15/2012 11:14 JSE

EXHIBIT 2



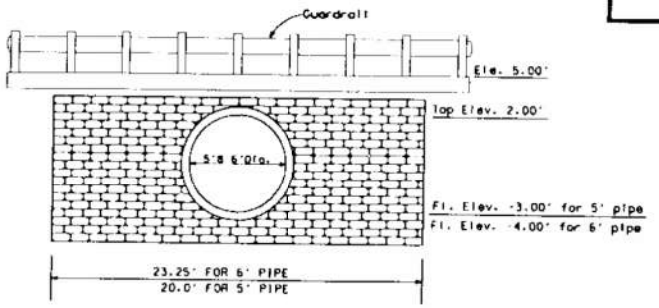
SCANNED 10/15/2012 11:14 JSE

CITY PROJ. NO.	SHEET NO.
94-005	3



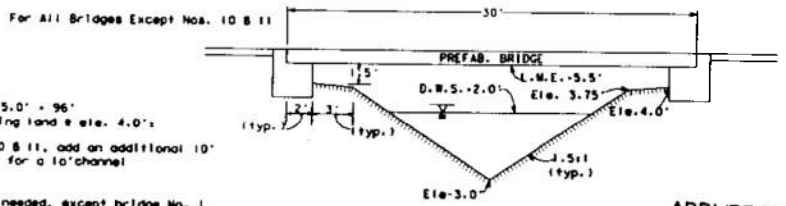
CANAL TYPICAL SECTION

N.T.S.



CULVERT TYPICAL SECTION

N.T.S.



NOTES:

Flow Area at ele. 5.0' = 96'
Tie in to surrounding land @ ele. 4.0':

For bridges Nos. 10 & 11, add an additional 10' of length to allow for a 10'channel bottom width.

No rubble will be needed, except bridge No. 1, since design velocities will be near 1 fps.

PROPOSED CHANNEL SECTION

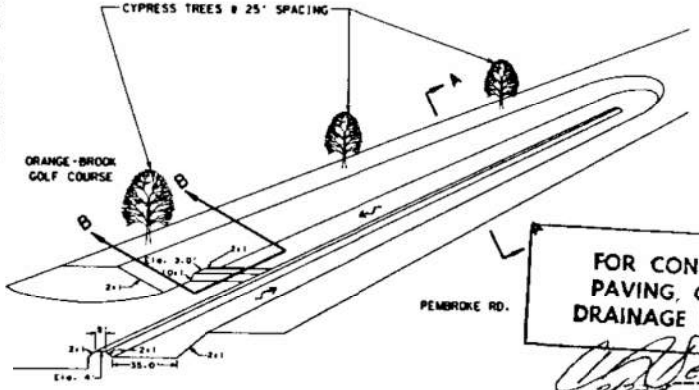
ORANGE-BROOK GOLF COURSE BRIDGES

N.T.S.

ADDL/REVISED SUBMITTAL

MAR 0 1 1994

WPB



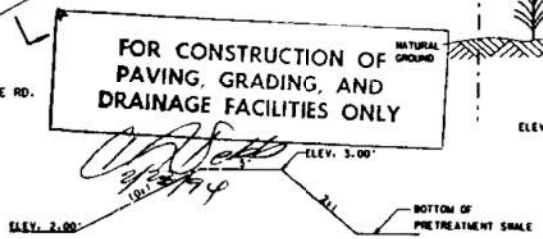
PROPOSED PRE-TREATMENT SWALE

ALONG PEMBROKE ROAD

PLAN VIEW

N.T.S.

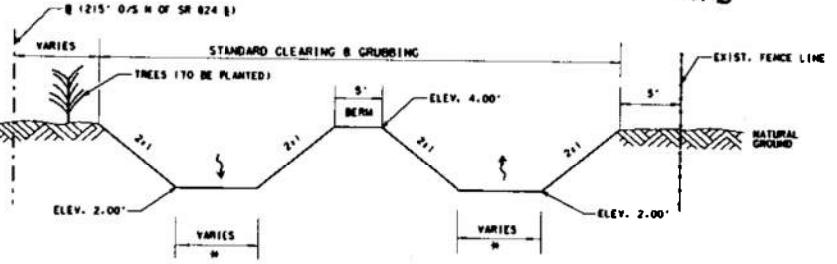
FOR CONSTRUCTION OF PAVING, GRADING, AND DRAINAGE FACILITIES ONLY



SECTION B-B

PRE-TREATMENT SWALE

N.T.S.



SECTION A-A

PRE-TREATMENT SWALE

STA. 131+00 TO 139+60

N.T.S.

* SEE CROSS-SECTIONS

MICROFILMED EXHIBIT 3

REVISIONS															
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

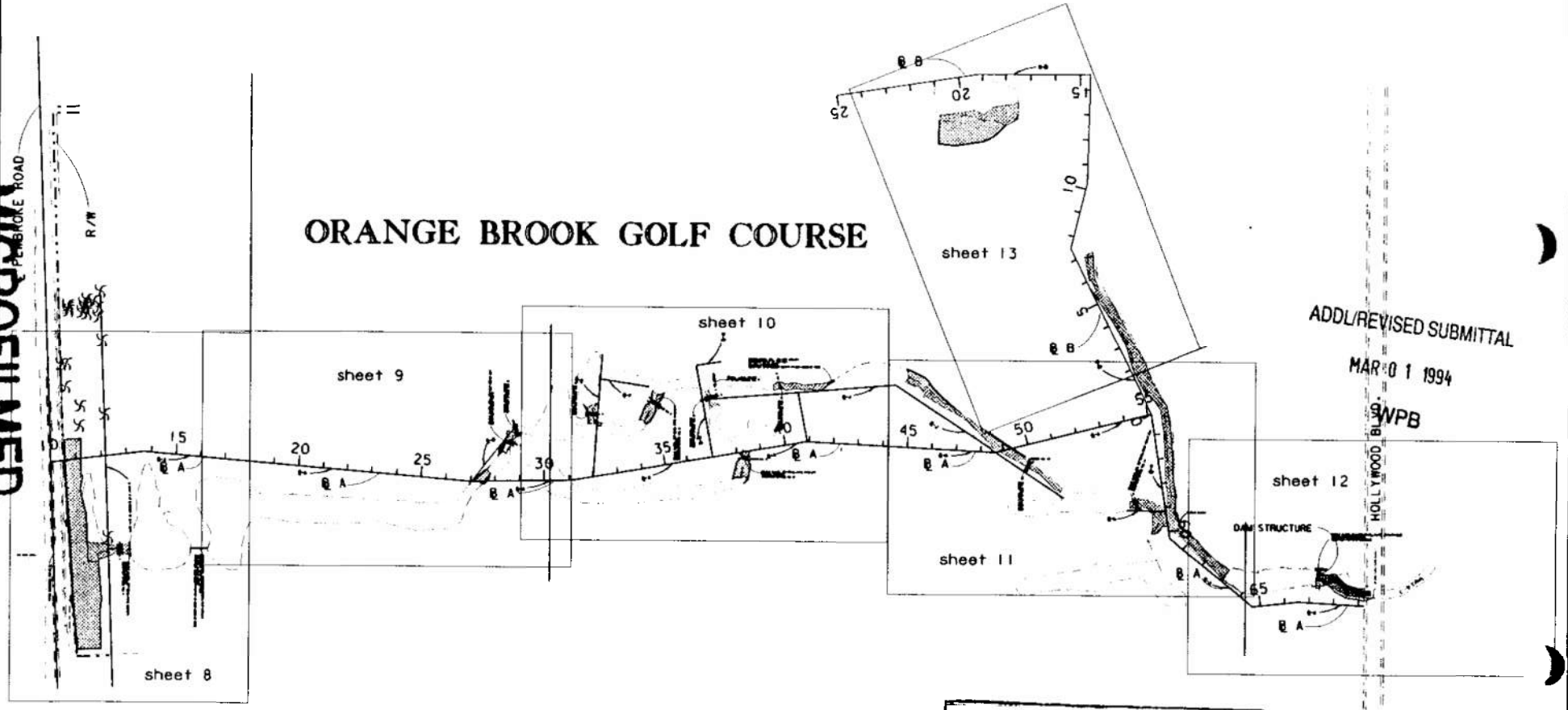
FLORIDA DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

SCANNED 10/15/2012 11:14 JCE

CITY PROJ. NO.	SHEET NO.
94-005	6

ORANGE BROOK GOLF COURSE



ADDL/REVISED SUBMITTAL

MAR 0 1 1994

WPB

FOR CONSTRUCTION OF PAVING, GRADING, AND DRAINAGE FACILITIES ONLY

2/25/94

REVISIONS															
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

CITY OF HOLLYWOOD

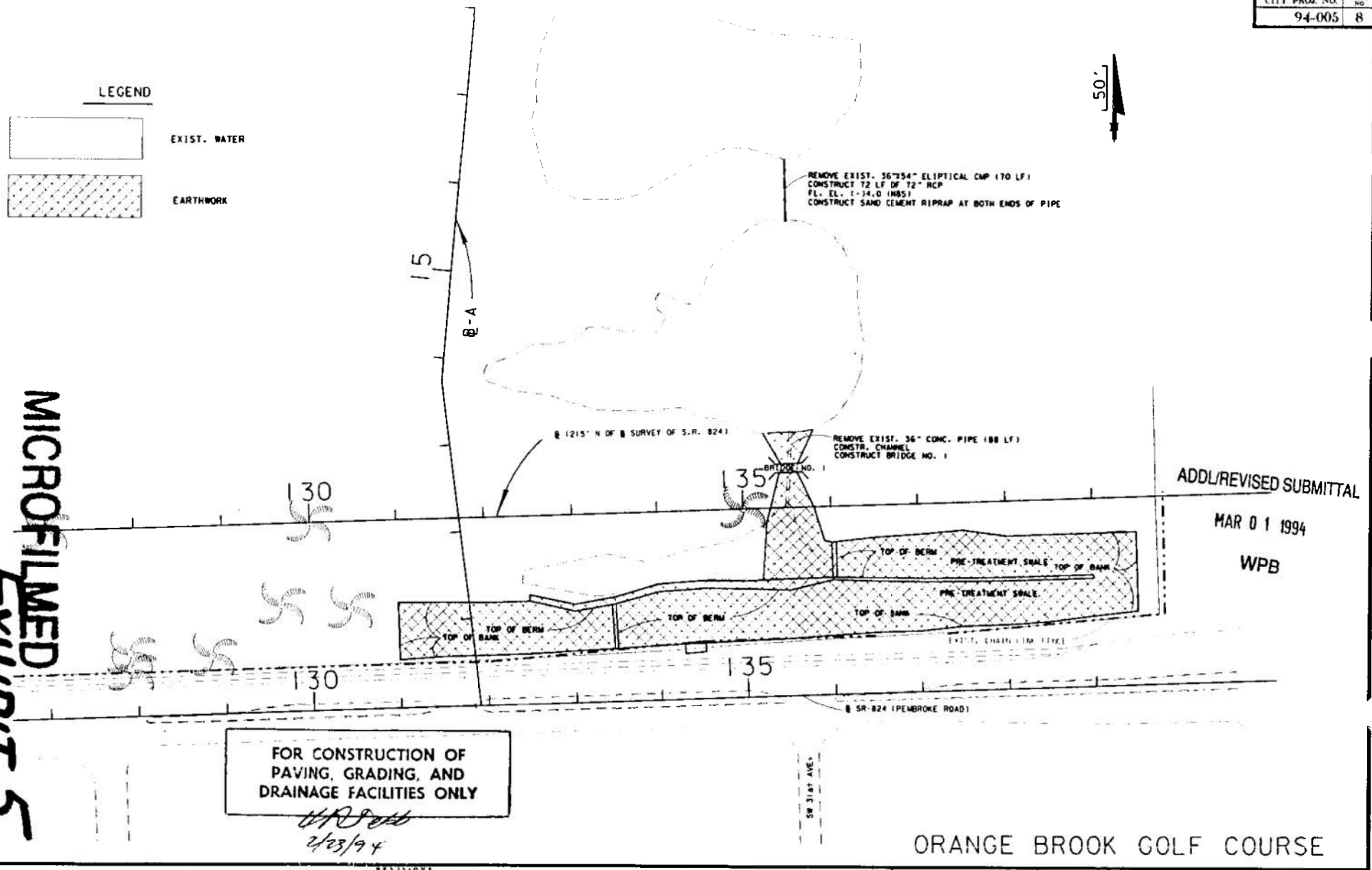
LAYOUT SHEET

MICROFILMED

EXHIBIT 4

SCANNED 10/15/2012 11:14 JRE

CITY PROJ. NO.	SHEET NO.
94-005	8



ADDL/REVISED SUBMITTAL

MAR 0 1 1994

WPB

MICROFILMED

EXHIBIT 5

FOR CONSTRUCTION OF PAVING, GRADING, AND DRAINAGE FACILITIES ONLY

2/23/94

ORANGE BROOK GOLF COURSE

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

REVISIONS

CITY OF HOLLYWOOD

PLAN SHEET

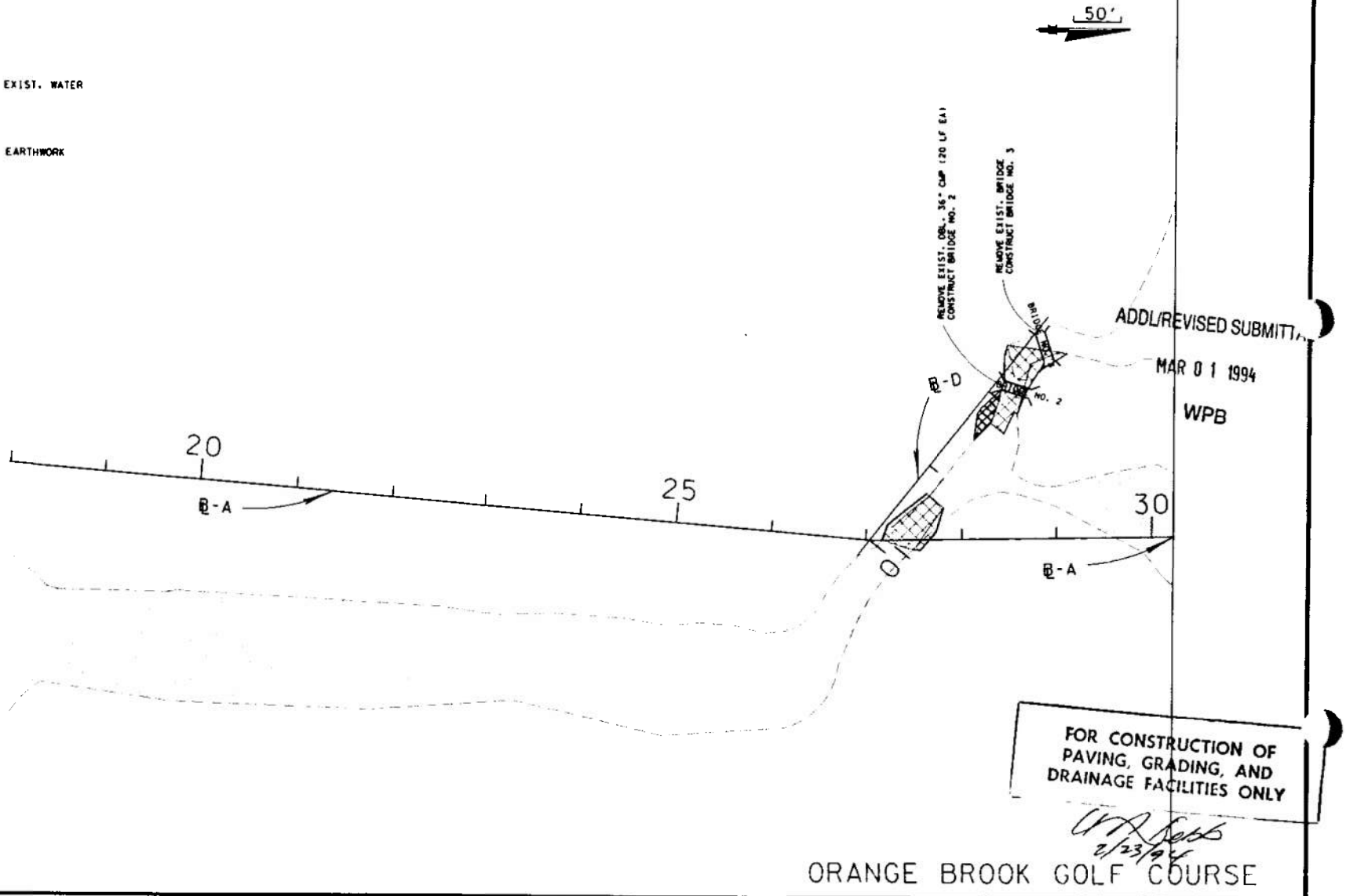
SCANNED 10/15/2012 11:14 JSE

CITY PROJ. NO.	SHEET NO.
94-005	9

LEGEND

EXIST. WATER

EARTHWORK



ADDL/REVISED SUBMITTAL

MAR 0 1 1994

WPB

FOR CONSTRUCTION OF PAVING, GRADING, AND DRAINAGE FACILITIES ONLY

2/23/94

ORANGE BROOK GOLF COURSE

REVISIONS															
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

CITY OF HOLLYWOOD

PLAN SHEET

MICROFILMED

EXHIBIT 6

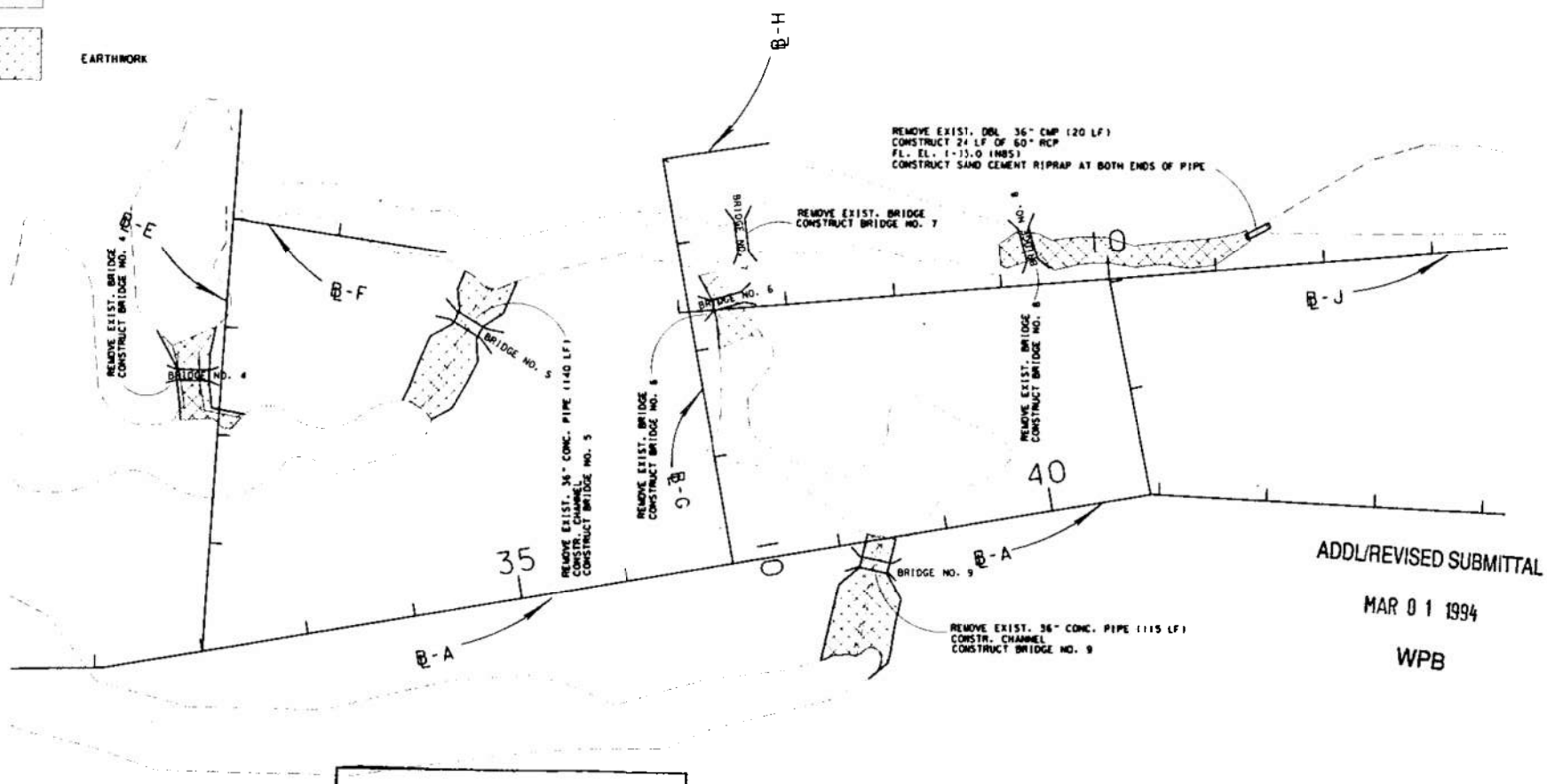
SCANNED 10/15/2013 13:14 JCB

CITY PROJ. NO.	SHEET NO.
94-005	10

LEGEND

EXIST. WATER

EARTHWORK



ADDL/REVISED SUBMITTAL

MAR 0 1 1994

WPB

FOR CONSTRUCTION OF PAVING, GRADING, AND DRAINAGE FACILITIES ONLY

2/23/94

ORANGE BROOK GOLF COURSE

REVISIONS																			
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

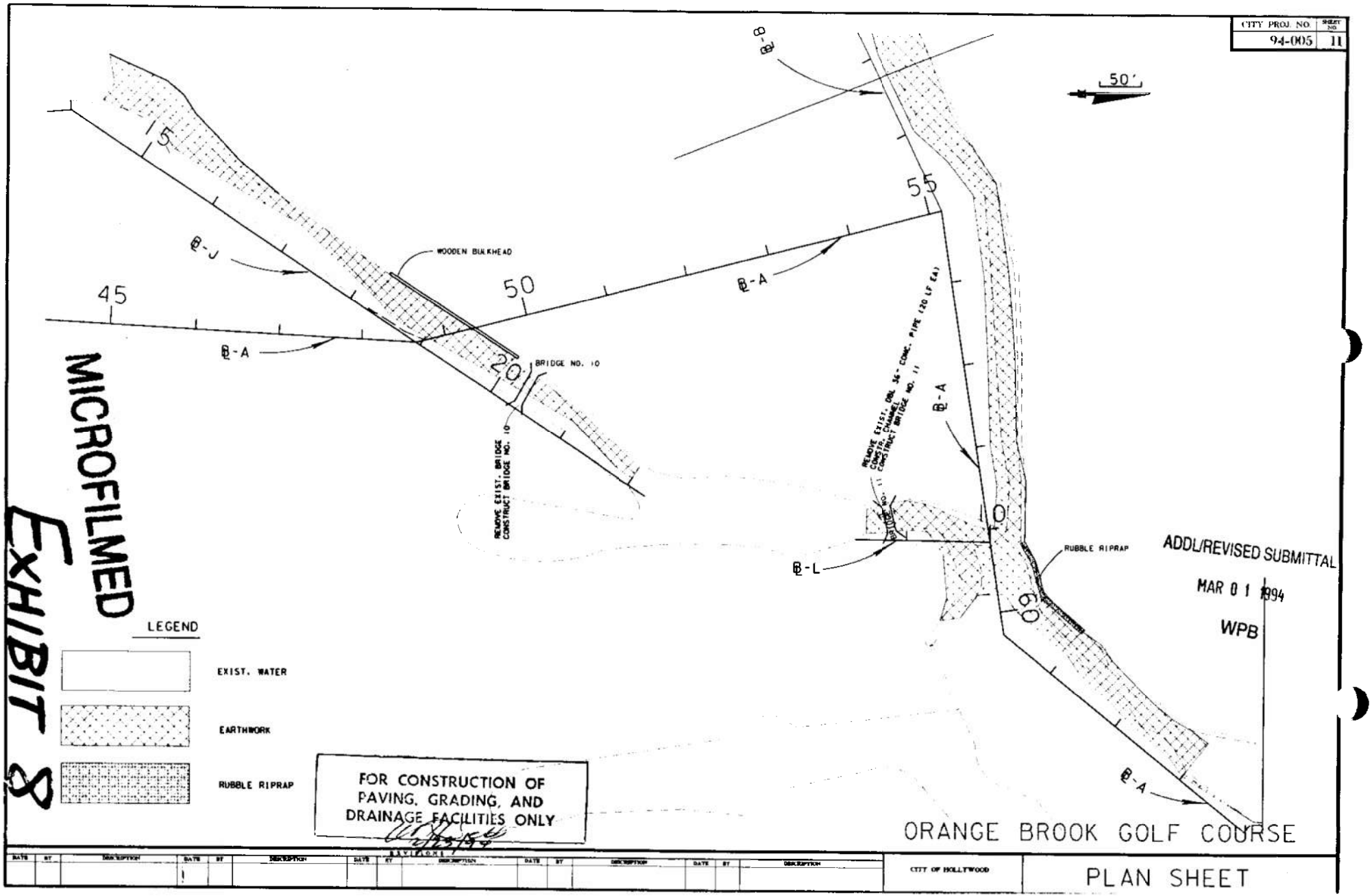
CITY OF HOLLYWOOD

PLAN SHEET

MICROFILMED

EXHIBIT 7

SCANNED 10/15/2012 11:14 JSH



MICROFILMED
EXHIBIT 8

SCANNED 10/25/2018 11:14 JSB

CITY PROJ. NO.	SHEET No.
94-005	12

50'

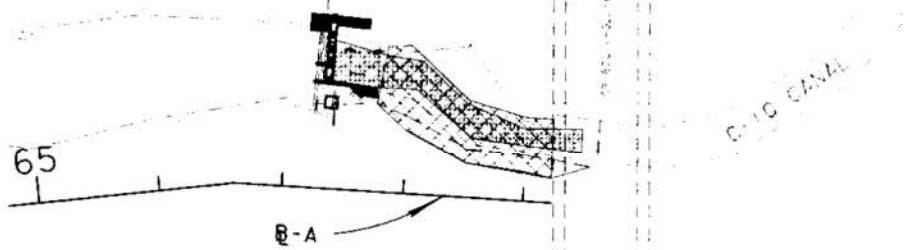
LEGEND

EXIST. WATER

EARTHWORK

RUBBLE RIPRAP

REMOVE EXIST. DAM STRUCTURE, PUMPS & PUMP-HOUSE
CONSTRUCT DAM STRUCTURE
CONSTRUCT PUMPS & PUMPHOUSE



C-13 CANAL

MICROFILMED

EXHIBIT 9

ADDL/REVISED SUBMITTAL

MAR 0 1 1994

WPB

FOR CONSTRUCTION OF
PAVING, GRADING, AND
DRAINAGE FACILITIES ONLY

2/23/94

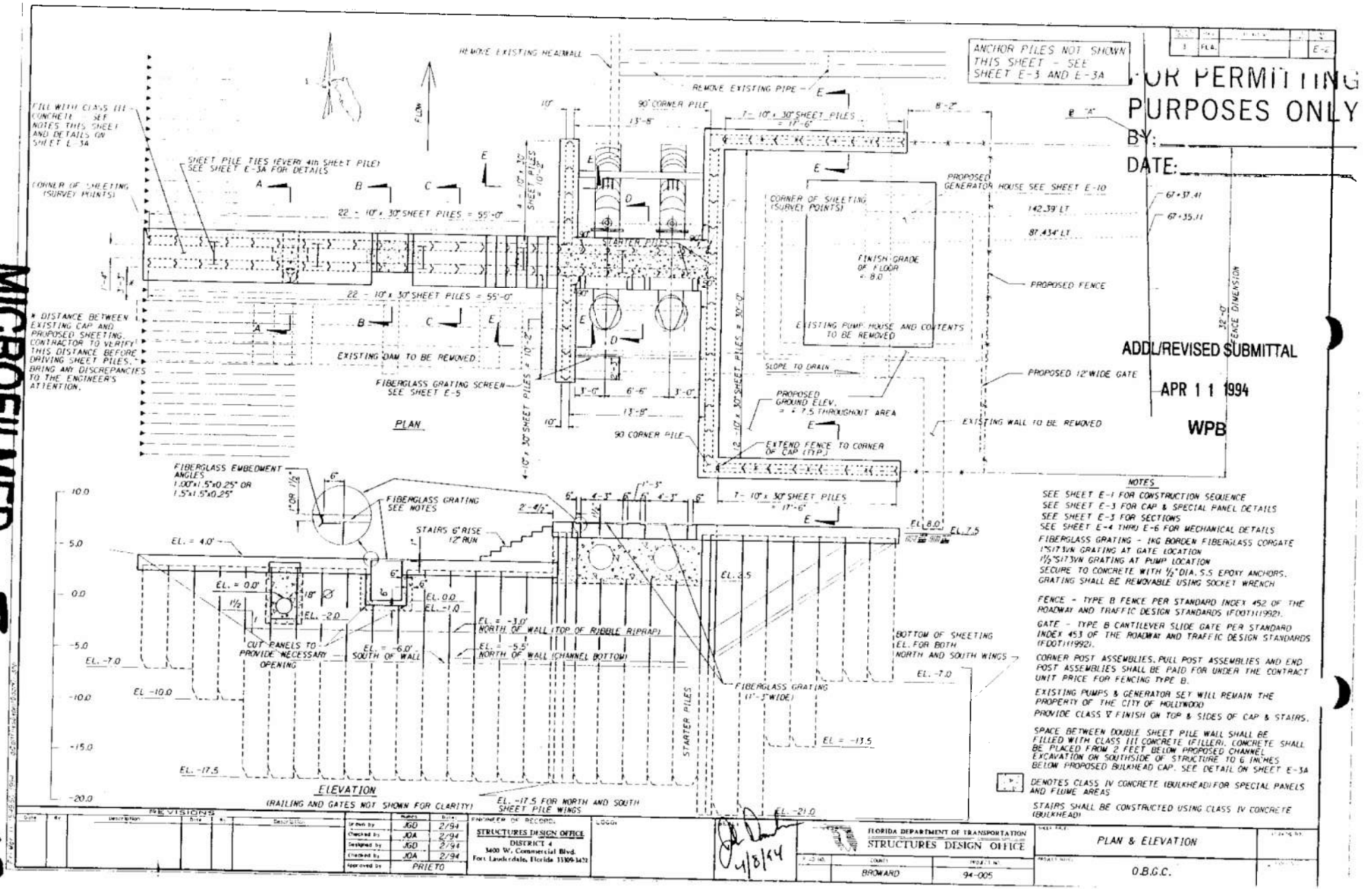
REVISIONS															
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	
			1												

ORANGE BROOK GOLF COURSE

CITY OF HOLLYWOOD

PLAN SHEET

SCANNED 10/15/2012 11:14 JEB



NOTES

SEE SHEET E-1 FOR CONSTRUCTION SEQUENCE
SEE SHEET E-3 FOR CAP & SPECIAL PANEL DETAILS
SEE SHEET E-3 FOR SECTIONS
SEE SHEET E-4 THRU E-6 FOR MECHANICAL DETAILS
FIBERGLASS GRATING - IKG BORDEN FIBERGLASS CORGATE
1"S17.5VN GRATING AT GATE LOCATION
1½"S17.5VN GRATING AT PUMP LOCATION
SECURE TO CONCRETE WITH ½" DIA. S.S EPOXY ANCHORS. GRATING SHALL BE REMOVABLE USING SOCKET WRENCH

FENCE - TYPE B FENCE PER STANDARD INDEX 452 OF THE ROADWAY AND TRAFFIC DESIGN STANDARDS (FDOT)(1992).

GATE - TYPE B CANTILEVER SLIDE GATE PER STANDARD INDEX 453 OF THE ROADWAY AND TRAFFIC DESIGN STANDARDS (FDOT)(1992).

CORNER POST ASSEMBLIES, PULL POST ASSEMBLIES AND END POST ASSEMBLIES SHALL BE PAID FOR UNDER THE CONTRACT UNIT PRICE FOR FENCING TYPE B.

EXISTING PUMPS & GENERATOR SET WILL REMAIN THE PROPERTY OF THE CITY OF HOLLYWOOD

PROVIDE CLASS V FINISH ON TOP & SIDES OF CAP & STAIRS.

SPACE BETWEEN DOUBLE SHEET PILE WALL SHALL BE FILLED WITH CLASS III CONCRETE (FILLER). CONCRETE SHALL BE PLACED FROM 2 FEET BELOW PROPOSED CHANNEL EXCAVATION ON SOUTHSIDE OF STRUCTURE TO 6 INCHES BELOW PROPOSED BULKHEAD CAP. SEE DETAIL ON SHEET E-3A

[ ] DENOTES CLASS IV CONCRETE (BULKHEAD) FOR SPECIAL PANELS AND FLUME AREAS

STAIRS SHALL BE CONSTRUCTED USING CLASS IV CONCRETE (BULKHEAD)

FOR PERMITTING PURPOSES ONLY
BY:
DATE:

ADDL/REVISED SUBMITTAL
APR 1 1 1994
WPB

REVISIONS						
Date	By	Description	Date	By	Description	

	Name	Date
Drawn by	JGD	2/94
Checked by	JOA	2/94
Designed by	JGD	2/94
Checked by	JOA	2/94
Approved by	PRIETO	

ENGINEER OF RECORD
STRUCTURES DESIGN OFFICE
DISTRICT 4
3400 W. Commercial Blvd.
Fort Lauderdale, Florida 33309-3421
LOGO

4/8/94

FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN OFFICE

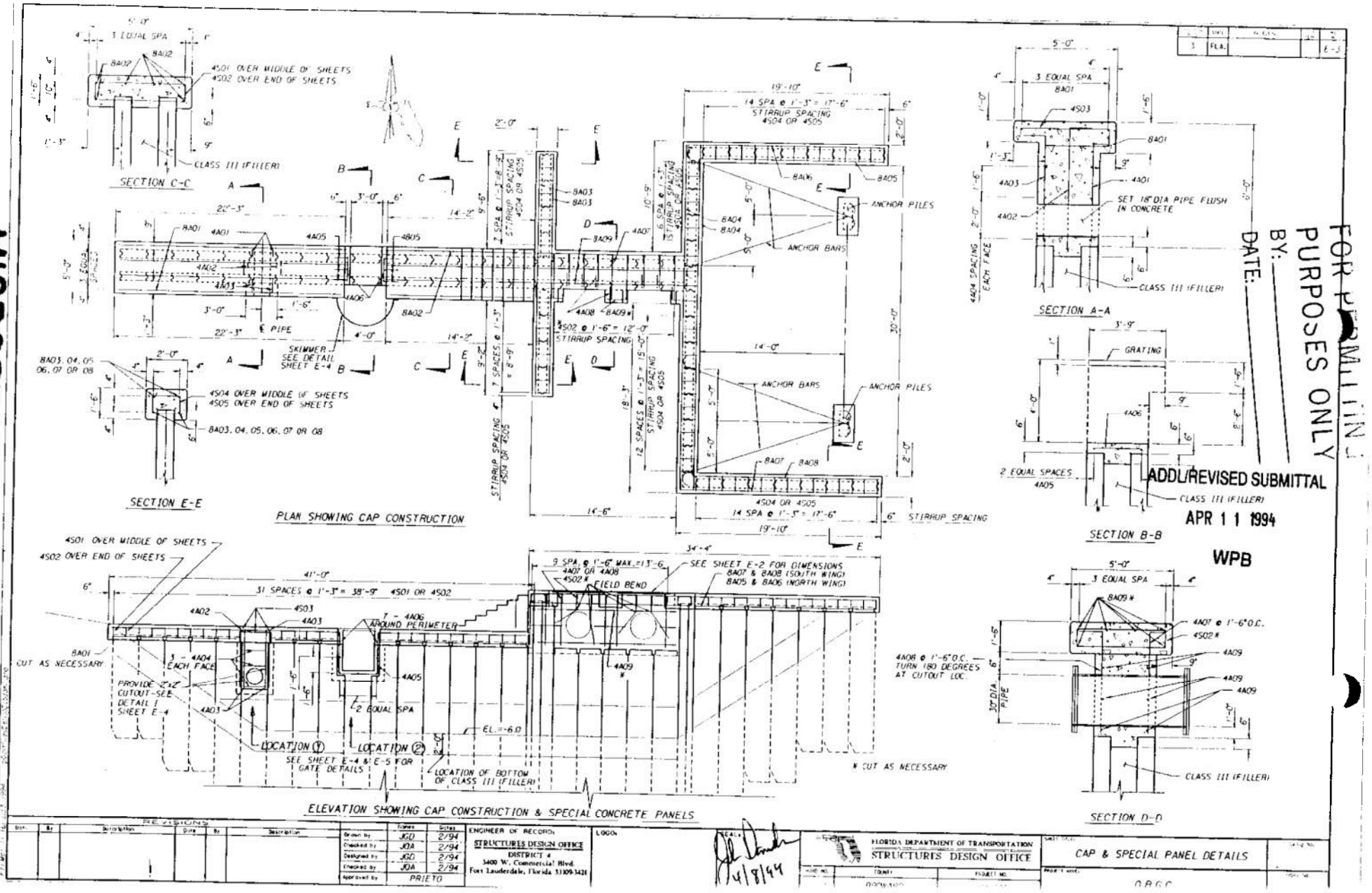
F.A.P. NO.	COUNTY	PROJECT NO.
	BROWARD	94-005

SHEET TITLE: PLAN & ELEVATION
PROJECT NAME: O.B.G.C.

E-2

MICROFILMED EXHIBIT 10

SCANNED 10/13/2010 11:14 JGE



FOR PERMITTING PURPOSES ONLY
BY:
DATE:

ADD'L/REVISED SUBMITTAL
APR 1 1 1994
WPB

MICROFILMED EXHIBIT 11

Drawn by	JGD	2/94
Checked by	JDA	2/94
Designed by	JGD	2/94
Checked by	JDA	2/94
Approved by	PRIETO	

ENGINEER OF RECORD
STRUCTURES DESIGN OFFICE
DISTRICT 4
3400 W. Commercial Blvd.
Fort Lauderdale, Florida 33309-3421

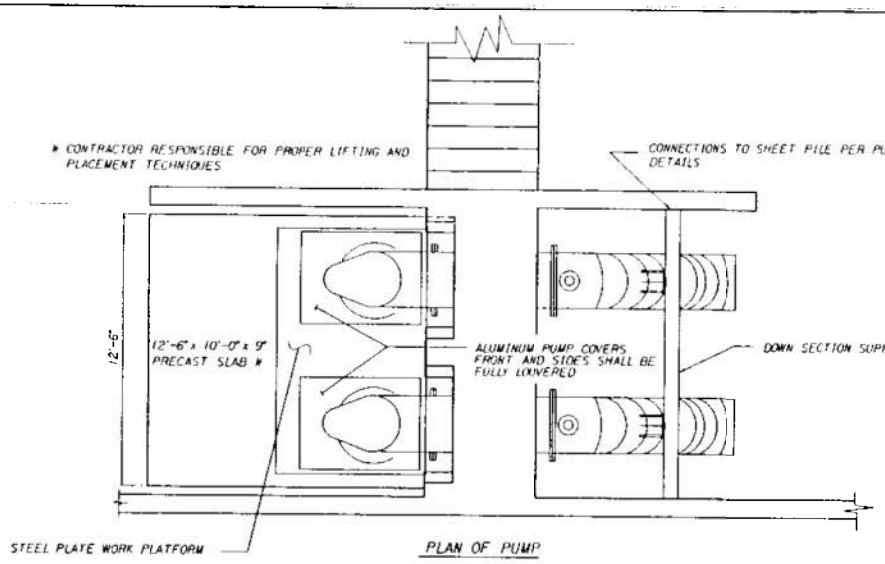
LOGO

4/8/94

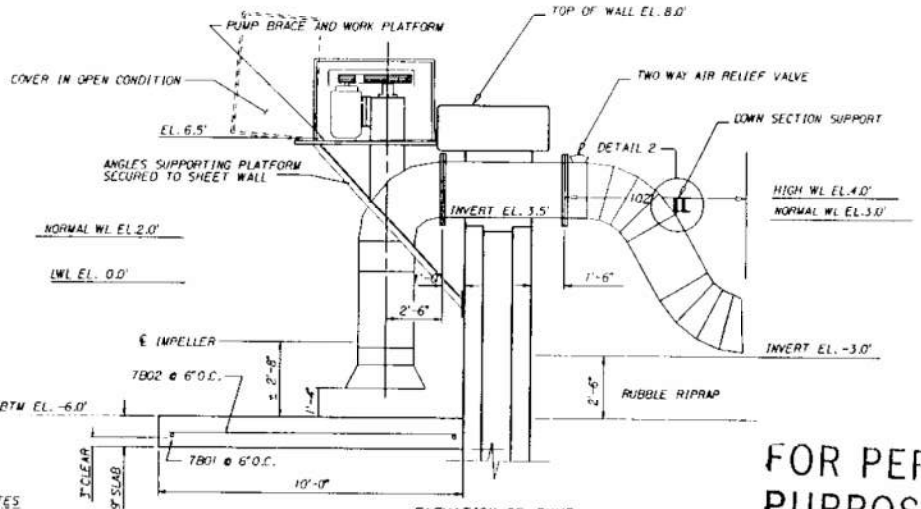
FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN OFFICE

CAP & SPECIAL PANEL DETAILS

SCANNED 10/15/2012 11:14 JCE

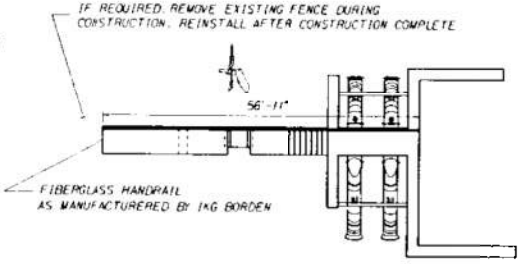


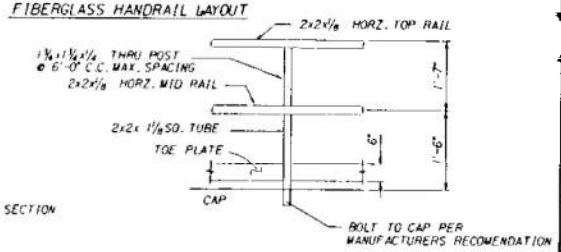
PLAN OF PUMP



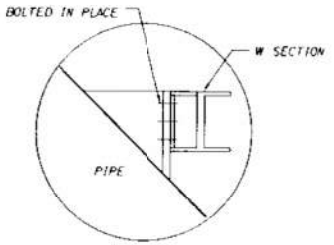
ELEVATION OF PUMP

SLAB NOTES
F'C = 5500 PSI
FY = 60000 PSI
SEE BAR LIST FOR BAR LENGTHS
PAID FOR UNDER P.I. NO. 400-4-15 AND 415-1-6





FIBERGLASS HANDRAIL DETAIL



DETAIL 2

NOTES

CONTRACTOR RESPONSIBLE FOR THE FOLLOWING:

DESIGN OF DOWN SECTION SUPPORT AND ALL CONNECTIONS TO PUMP TUBES AND ATTACHMENTS TO SHEET PILES. DESIGN SHALL MEET ALL REQUIREMENTS OF THE LATEST EDITION OF THE AISC AND AWS CODES. CONTRACTOR SHALL SUBMIT SHOP TO THE ENGINEER OF RECORD FOR APPROVAL.

DESIGN OF PUMP COVER. COVER SHALL BE MADE OF ALUMINUM. COVER SHALL BE FULLY LOUVERED. COVER SHALL BE HINGED AT BOTTOM NEAR PLATFORM TO PROVIDE OPENING AS SHOWN. COVER SHALL HAVE MEANS OF CONTROLING MOVEMENT PAST THIS FULL OPENING. ALSO PROVIDE STOP RESTRAINT IN THE DOWN POSITION. PROVIDE SHOP DRAWING FOR APPROVAL.

DESIGN AND DETAILS OF STEEL PLATFORM. PLATFORM SHALL ACT AS A SUPPORT FOR THE PUMP MOTORS AND BE CABABLE OF RESISTING A UNIFORM LOAD OF 85 LBS PER SQ. FOOT. PLATE SHALL BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL HARDWARE SHALL BE STAINLESS STEEL.

SEE SPECIAL PROVISIONS FOR PUMP INFORMATION AND REQUIREMENTS.

ADDL/REVISED SUBMITTAL

APR 1 1 1994

WPB

FOR PERMIT PURPOSES ONLY

BY:

DATE:

Date	By	Description	Date	By	Description

	Name	Date
Drawn by	BH	2/94
Checked by	JOA	2/94
Designed by	JOA	2/94
Checked by	JGA	2/94
Approved by	PRIETO	

ENGINEER OF RECORD
STRUCTURES DESIGN OFFICE
DISTRICT 4
3400 W. Commercial Blvd.
Fort Lauderdale, Florida 33309-3421

LOGO

4/8/94

FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES DESIGN OFFICE

ROAD NO.	COUNTY	PROJECT NO.
—	BROWARD	94-005

SHEET TITLE: PUMP AND HANDRAIL DETAILS

PROJECT NAME: O.B.G.C.

DRAWING NO.

SHEET NO.

MICROFILMED EXHIBIT 13

SCANNED 10/18/2012 11:14 JSB

CITY OF HOLLYWOOD, FLORIDA
INTER-OFFICE MEMORANDUM

DATE: December 17, 1993 **FILE:** WP-93-113

TO: Marty Pilote, Civil Engineer I

FROM: Operations Superintendent

SUBJECT: Chloride Results - Orangebrook

RECEIVED
DEC 20 1993
CITY OF HOLLYWO
City Engineering D

ISSUE:
Samples from the Lakes of Orangebrook Golf Course..

EXPLANATION:
Listed below are the chloride results of the samples taken at Orangebrook.

DATE	SAMPLES	CHLORIDE RESULTS
12/14/93	#1	60
12/14/93	#2	58
12/14/93	#3	30
12/14/93	#4	20

RECOMMENDATION:

For informational purposes only. If I can be of further assistance, please don't hesitate to call me.

Robert O. Boyce

ROB:df

ADDL/REVISED SUBMITTAL
JAN 21 1994
WPB

MICROFILMED

EXHIBIT 14

South Florida Water Management District

BEG. PERMIT NUMBER 06-02942-P

APPLICATION NO. 010601-42

PUMP STATION

06-02942-P

APPLICATION/PERMIT FILE RECORD & ACTION SHEET

District IV

Name: Florida Dept. of Transportation (I-95 Pump Station)

Permit No. 06-029-

Application No. 010601-

This file contains:

☐ ORIGINAL APPLICATION ☐ PERMIT ☐ SPECIAL CONDITION SH

☐ STAFF CALCULATION SHEET(S) ☐ DRAWING(S) ☐ STAFF REPORT

Chronological Correspondence/Action Record

Date	Subject	By	Comments
9-28-01	Staff Report Mailed	JB	K. Dickson, P.E., N. Je
10-11-01	Permit Issued		

FORM 40157
Rev. 08/95

ENVIRONMENTAL RESOURCE
PERMIT MODIFICATION NO. 06-02942-P
DATE ISSUED: OCTOBER 11, 2001

PERMITTEE: FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT IV
(I-95 PUMP STATION)
3400 WEST COMMERCIAL BLVD.
FORT LAUDERDALE, FL 33309

ORIGINAL PERMIT ISSUED: JANUARY 13, 2000

ORIGINAL PROJECT DESCRIPTION: AUTHORIZATION FOR CONSTRUCTION/OPERATION OF A SWM SYSTEM TO SERVE THE ADDITION OF A MA
TRACK ADJACENT TO THE EXISTING SINGLE MAIN WITHIN THE FORMER CSX RIGHT-OF-WAY, FROM OPA
JUST NORTH OF HOLLYWOOD BOULEVARD.

APPROVED MODIFICATION: AUTHORIZATION FOR CONSTRUCTION AND OPERATION OF A STORMWATER IMPROVEMENT PROJECT TO
SERVE FLOOD PRONE AREAS WITHIN THE CITY OF HALLANDALE BEACH AND THE TOWN OF PEMBROKE P
IN BROWARD COUNTY.

PROJECT LOCATION: BROWARD COUNTY,
SECTION 19,20 TWP 51S RGE 42E
SECTION 28,29 TWP 51S RGE 42E

PERMIT DURATION: Five years from the date issued to complete construction of the surface water management system as authorized herein. See attached Rule 40E-4.321, Florida Administrative Code.

This Permit Modification is approved pursuant to Application No. 010601-42, dated May 30, 2001. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which m arise by reason of the construction, operation, maintenance or use of any activities authorized by this Permit. This Permit is issued unc the provisions of Chapter 373, Part IV Florida Statutes(F.S.), and the Operating Agreement Concerning Regulation Under Part IV, Chapter 373 F.S. between South Florida Water Management District and the Department of Environmental Protection. Issuance of thi Permit constitutes certification of compliance with state water quality standards where necessary pursuant to Section 401, Public La 92-500, 33 USC Section 1341, unless this Permit is issued pursuant to the net improvement provisions of Subsections 373.414(1)(b), F or as otherwise stated herein.

This Permit Modification may be revoked, suspended, or modified at any time pursuant to the appropriate provisions of Chapter 373, F.S and Sections 40E-4.351(1), (2), and (4), Florida Administrative Code (F.A.C.). This Permit Modification may be transferred pursuant to th appropriate provisions of Chapter 373, F.S., and Sections 40E-1.6107(1) and (2), and 40E-4.351(1), (2), and (4), F.A.C.

All specifications and special and limiting/general conditions attendant to the original Permit,unless specifically rescinded by this or previous modifications, remain in effect.

This Permit Modification shall be subject to the General Conditions set forth in Rule 40E-4.381, F.A.C., unless waived or modified by the Governing Board. The Application, and Environmental Resource Permit Staff Review Summary of the Application, including all condition and all plans and specifications incorporated by reference, are a part of this Permit Modification. All activities authorized by this Permit Modification shall be implemented as set forth in the plans, specifications, and performance criteria as set forth and incorporated in the Environmental Resource Permit Staff Review Summary. Within 30 days after completion of construction of the permitting activity, the Permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual, pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.361 and 40E-4.381, F.A.C.

In the event the property is sold or otherwise conveyed, the Permittee will remain liable for compliance with this Permit until transfer is approved by the District pursuant to Rule 40E-1.6107, F.A.C.

SPECIAL AND GENERAL CONDITIONS ARE AS FOLLOWS:

SEE PAGES 2 - 3 OF 6 (13 SPECIAL CONDITIONS).
SEE PAGES 4 - 6 OF 6 (19 GENERAL CONDITIONS).

PERMIT MODIFICATION APPROVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

FILED WITH THE CLERK OF THE
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ON ORIGINAL SIGNED BY: JENNIFER KRUMLAUF
BY _____
DEPUTY CLERK

Original signed by T. BURNS
BY _____
ASSISTANT SECRETARY

12/13/01

SPECIAL CONDITIONS

1. DISCHARGE FACILITIES:

STRUCTURE NO. 1:

1-53760 GPM WITH PUMP ON AT ELEV. 3' NGVD AND WITH PUMP OFF AT ELEV. 2' NGVD.

RECEIVING BODY : C-10 CANAL

CONTROL ELEV : 2 FEET NGVD. /2 FEET NGVD DRY SEASON.

STRUCTURE NO. 2:

1-17920 GPM ' NGVD.

RECEIVING BODY : C-10 CANAL

CONTROL ELEV : 2 FEET NGVD. /2 FEET NGVD DRY SEASON.

2. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

3. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

4. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

5. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

6. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF FDOT, HALLANDALE BEACH AND PEMBROKE PARK.

7. ALL SPECIAL CONDITIONS, EXHIBITS AND TEXT OF STAFF REPORTS PREVIOUSLY STIPULATED BY PERMIT NUMBER 06-02942-P REMAIN IN EFFECT UNLESS OTHERWISE REVISED AND SHALL APPLY TO THIS MODIFICATION.

8. SILT SCREENS, HAY BALES AND/OR OTHER SUCH SEDIMENT CONTROL MEASURES AND TURBIDITY BARRIERS AND/OR OTHER TURBIDITY CONTROL MEASURES SHALL BE UTILIZED DURING CONSTRUCTION AS INDICATED IN THE CONSTRUCTION PLANS.

9. PRIOR TO CONSTRUCTION, THE PERMITTEE(S) SHALL PROVIDE THE DISTRICT WITH A COPY OF THE EXECUTED JOINT PARTICIPATION AGREEMENT.

10. PRIOR TO CONSTRUCTION, THE PERMITTEE(S) SHALL PROVIDE THE DISTRICT WITH A COPY OF THE EASEMENT DEED AUTHORIZING THE FACILITIES TO BE CONSTRUCTED ON THE PROPERTY OF HALLANDALE BEACH HIGH SCHOOL.

11. EXHIBIT NUMBER 3 AND EXHIBITS 8 THROUGH 55 DEPICT PLAN AND PROFILE VIEWS OF THE PROPOSED BACKBONE CONVEYANCE FACILITIES. THESE EXHIBITS ARE LOCATED IN THE PERMIT FILE AND ARE INCORPORATED HEREIN BY REFERENCE.

12. EXHIBIT 67 DEPICTS THE AREAS WHERE THE MAINTENANCE DREDGING OF THE C-10 CANAL WILL BE DONE. THIS EXHIBIT IS LOCATED IN THE PERMIT FILE AND IS INCORPORATED BY

REFERENCE.

13. THE AUTHORIZATION OF THE STORMWATER MANAGEMENT SYSTEM IS ISSUED PURSUANT TO THE WATER QUALITY NET IMPROVEMENT PROVISIONS REFERENCED IN RULE SECT. 40E-4.303(1); THEREFORE, WATER QUALITY CERTIFICATION IS WAIVED.

GENERAL CONDITIONS

1. ALL ACTIVITIES AUTHORIZED BY THIS PERMIT SHALL BE IMPLEMENTED AS SET FORTH IN THE PLANS, SPECIFICATIONS AND PERFORMANCE CRITERIA AS APPROVED BY THIS PERMIT. ANY DEVIATION FROM THE PERMITTED ACTIVITY AND THE CONDITIONS FOR UNDERTAKING THAT ACTIVITY SHALL CONSTITUTE A VIOLATION OF THIS PERMIT AND PART IV, CHAPTER 373, F.S.

2. THIS PERMIT OR A COPY THEREOF, COMPLETE WITH ALL CONDITIONS, ATTACHMENTS, EXHIBITS, AND MODIFICATIONS SHALL BE KEPT AT THE WORK SITE OF THE PERMITTED ACTIVITY. THE COMPLETE PERMIT SHALL BE AVAILABLE FOR REVIEW AT THE WORK SITE UPON REQUEST BY THE DISTRICT STAFF. THE PERMITTEE SHALL REQUIRE THE CONTRACTOR TO REVIEW THE COMPLETE PERMIT PRIOR TO COMMENCEMENT OF THE ACTIVITY AUTHORIZED BY THIS PERMIT.

3. ACTIVITIES APPROVED BY THIS PERMIT SHALL BE CONDUCTED IN A MANNER WHICH DOES NOT CAUSE VIOLATIONS OF STATE WATER QUALITY STANDARDS. THE PERMITTEE SHALL IMPLEMENT BEST MANAGEMENT PRACTICES FOR EROSION AND POLLUTION CONTROL TO PREVENT VIOLATION OF STATE WATER QUALITY STANDARDS. TEMPORARY EROSION CONTROL SHALL BE IMPLEMENTED PRIOR TO AND DURING CONSTRUCTION, AND PERMANENT CONTROL MEASURES SHALL BE COMPLETED WITHIN 7 DAYS OF ANY CONSTRUCTION ACTIVITY. TURBIDITY BARRIERS SHALL BE INSTALLED AND MAINTAINED AT ALL LOCATIONS WHERE THE POSSIBILITY OF TRANSFERRING SUSPENDED SOLIDS INTO THE RECEIVING WATERBODY EXISTS DUE TO THE PERMITTED WORK. TURBIDITY BARRIERS SHALL REMAIN IN PLACE AT ALL LOCATIONS UNTIL CONSTRUCTION IS COMPLETED AND SOILS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED. ALL PRACTICES SHALL BE IN ACCORDANCE WITH THE GUIDELINES AND SPECIFICATIONS DESCRIBED IN CHAPTER 6 OF THE FLORIDA LAND DEVELOPMENT MANUAL; A GUIDE TO SOUND LAND AND WATER MANAGEMENT (DEPARTMENT OF ENVIRONMENTAL REGULATION, 1988), INCORPORATED BY REFERENCE IN RULE 40E-4.091, F.A.C. UNLESS A PROJECT-SPECIFIC EROSION AND SEDIMENT CONTROL PLAN IS APPROVED AS PART OF THE PERMIT. THEREAFTER THE PERMITTEE SHALL BE RESPONSIBLE FOR THE REMOVAL OF THE BARRIERS. THE PERMITTEE SHALL CORRECT ANY EROSION OR SHOALING THAT CAUSES ADVERSE IMPACTS TO THE WATER RESOURCES.

4. THE PERMITTEE SHALL NOTIFY THE DISTRICT OF THE ANTICIPATED CONSTRUCTION START DATE WITHIN 30 DAYS OF THE DATE THAT THIS PERMIT IS ISSUED. AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF ACTIVITY AUTHORIZED BY THIS PERMIT, THE PERMITTEE SHALL SUBMIT TO THE DISTRICT AN ENVIRONMENTAL RESOURCE PERMIT CONSTRUCTION COMMENCEMENT NOTICE FORM NO. 0960 INDICATING THE ACTUAL START DATE AND THE EXPECTED COMPLETION DATE.

5. WHEN THE DURATION OF CONSTRUCTION WILL EXCEED ONE YEAR, THE PERMITTEE SHALL SUBMIT CONSTRUCTION STATUS REPORTS TO THE DISTRICT ON AN ANNUAL BASIS UTILIZING AN ANNUAL STATUS REPORT FORM. STATUS REPORT FORMS SHALL BE SUBMITTED THE FOLLOWING JUNE OF EACH YEAR.

6. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE PERMITTED ACTIVITY, THE PERMITTEE SHALL SUBMIT A WRITTEN STATEMENT OF COMPLETION AND CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER OR OTHER APPROPRIATE INDIVIDUAL AS AUTHORIZED BY LAW, UTILIZING THE SUPPLIED ENVIRONMENTAL RESOURCE PERMIT CONSTRUCTION COMPLETION/CONSTRUCTION CERTIFICATION FORM NO.0881. THE STATEMENT OF COMPLETION AND CERTIFICATION SHALL BE BASED ON ONSITE OBSERVATION OF CONSTRUCTION OR REVIEW OF ASBUILT DRAWINGS FOR THE PURPOSE OF DETERMINING IF THE WORK WAS COMPLETED IN COMPLIANCE WITH PERMITTED PLANS AND SPECIFICATIONS. THIS SUBMITTAL SHALL SERVE TO NOTIFY THE DISTRICT THAT THE SYSTEM IS READY FOR INSPECTION. ADDITIONALLY, IF DEVIATION FROM THE APPROVED DRAWINGS ARE DISCOVERED DURING THE CERTIFICATION PROCESS, THE CERTIFICATION MUST BE ACCOMPANIED BY A COPY OF THE APPROVED PERMIT DRAWINGS WITH DEVIATIONS NOTED. BOTH THE ORIGINAL AND REVISED SPECIFICATIONS MUST BE CLEARLY SHOWN. THE PLANS MUST BE CLEARLY LABELED AS "ASBUILT" OR "RECORD" DRAWING. ALL SURVEYED DIMENSIONS AND ELEVATIONS SHALL BE CERTIFIED BY A REGISTERED SURVEYOR.

7. THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE: UNTIL THE PERMITTEE HAS COMPLIED WITH THE REQUIREMENTS OF CONDITION (6) ABOVE, HAS SUBMITTED A REQUEST FOR CONVERSION OF ENVIRONMENTAL RESOURCE PERMIT FROM CONSTRUCTION PHASE TO OPERATION PHASE, FORM NO.0920; THE DISTRICT DETERMINES THE SYSTEM TO BE IN COMPLIANCE WITH THE PERMITTED PLANS AND SPECIFICATIONS; AND THE ENTITY APPROVED BY THE DISTRICT IN ACCORDANCE WITH SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995, ACCEPTS RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE SYSTEM. THE PERMIT SHALL NOT BE TRANSFERRED TO SUCH APPROVED OPERATION AND MAINTENANCE ENTITY UNTIL THE OPERATION PHASE OF THE PERMIT BECOMES EFFECTIVE. FOLLOWING INSPECTION AND APPROVAL OF THE PERMITTED SYSTEM BY THE DISTRICT, THE PERMITTEE SHALL INITIATE TRANSFER OF THE PERMIT TO THE APPROVED RESPONSIBLE OPERATING ENTITY IF DIFFERENT FROM THE PERMITTEE. UNTIL THE PERMIT IS TRANSFERRED PURSUANT TO SECTION 40E-1.6107, F.A.C., THE PERMITTEE SHALL BE LIABLE FOR COMPLIANCE WITH THE TERMS OF THE PERMIT.

8. EACH PHASE OR INDEPENDENT PORTION OF THE PERMITTED SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO THE INITIATION OF THE PERMITTED USE OF SITE INFRASTRUCTURE LOCATED WITHIN THE AREA SERVED BY THAT PORTION OR PHASE OF THE SYSTEM. EACH PHASE OR INDEPENDENT PORTION OF THE SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO TRANSFER OF RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE PHASE OR PORTION OF THE SYSTEM TO A LOCAL GOVERNMENT OR OTHER RESPONSIBLE ENTITY.

9. FOR THOSE SYSTEMS THAT WILL BE OPERATED OR MAINTAINED BY AN ENTITY THAT WILL REQUIRE AN EASEMENT OR DEED RESTRICTION IN ORDER TO ENABLE THAT ENTITY TO OPERATE OR MAINTAIN THE SYSTEM IN CONFORMANCE WITH THIS PERMIT, SUCH EASEMENT OR DEED RESTRICTION MUST BE RECORDED IN THE PUBLIC RECORDS AND SUBMITTED TO THE DISTRICT ALONG WITH ANY OTHER FINAL OPERATION AND MAINTENANCE DOCUMENTS REQUIRED BY SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995, PRIOR TO LOT OR UNIT SALES OR PRIOR TO THE COMPLETION OF THE SYSTEM, WHICHEVER OCCURS FIRST. OTHER DOCUMENTS CONCERNING THE ESTABLISHMENT AND AUTHORITY OF THE OPERATING ENTITY MUST BE FILED WITH THE SECRETARY OF STATE WHERE APPROPRIATE. FOR THOSE SYSTEMS WHICH ARE PROPOSED TO BE MAINTAINED BY THE COUNTY OR MUNICIPAL ENTITIES, FINAL OPERATION AND MAINTENANCE DOCUMENTS MUST BE RECEIVED BY THE DISTRICT WHEN MAINTENANCE AND OPERATION OF THE SYSTEM IS ACCEPTED BY THE LOCAL GOVERNMENT ENTITY. FAILURE TO SUBMIT THE APPROPRIATE FINAL DOCUMENTS WILL RESULT IN THE PERMITTEE REMAINING LIABLE FOR CARRYING OUT MAINTENANCE AND OPERATION OF THE PERMITTED SYSTEM AND ANY OTHER PERMIT CONDITIONS.

10. SHOULD ANY OTHER REGULATORY AGENCY REQUIRE CHANGES TO THE PERMITTED SYSTEM, THE PERMITTEE SHALL NOTIFY THE DISTRICT IN WRITING OF THE CHANGES PRIOR TO IMPLEMENTATION SO THAT A DETERMINATION CAN BE MADE WHETHER A PERMIT MODIFICATION IS REQUIRED.

11. THIS PERMIT DOES NOT ELIMINATE THE NECESSITY TO OBTAIN ANY REQUIRED FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY ACTIVITY APPROVED BY THIS PERMIT. THIS PERMIT DOES NOT CONVEY TO THE PERMITTEE OR CREATE IN THE PERMITTEE ANY PROPERTY RIGHT, OR ANY INTEREST IN REAL PROPERTY, NOR DOES IT AUTHORIZE ANY ENTRANCE UPON OR ACTIVITIES ON PROPERTY WHICH IS NOT OWNED OR CONTROLLED BY THE PERMITTEE, OR CONVEY ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4 OR CHAPTER 40E-40, F.A.C.

12. THE PERMITTEE IS HEREBY ADVISED THAT SECTION 253.77, F.S. STATES THAT A PERSON MAY NOT COMMENCE ANY EXCAVATION, CONSTRUCTION, OR OTHER ACTIVITY INVOLVING THE USE OF SOVEREIGN OR OTHER LANDS OF THE STATE, THE TITLE TO WHICH IS VESTED IN THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND WITHOUT OBTAINING THE REQUIRED LEASE, LICENSE, EASEMENT, OR OTHER FORM OF CONSENT AUTHORIZING THE PROPOSED USE. THEREFORE, THE PERMITTEE IS RESPONSIBLE FOR OBTAINING ANY NECESSARY AUTHORIZATIONS FROM THE BOARD OF TRUSTEES PRIOR TO COMMENCING ACTIVITY ON SOVEREIGNTY LANDS OR

OTHER STATE-OWNED LANDS.

13. THE PERMITTEE MUST OBTAIN A WATER USE PERMIT PRIOR TO CONSTRUCTION DEWATERING, UNLESS THE WORK QUALIFIES FOR A GENERAL PERMIT PURSUANT TO SUBSECTION 40E-20.302(4), F.A.C., ALSO KNOWN AS THE "NO NOTICE" RULE.

14. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, ALTERATION, OPERATION, MAINTENANCE, REMOVAL, ABANDONMENT OR USE OF ANY SYSTEM AUTHORIZED BY THE PERMIT.

15. ANY DELINEATION OF THE EXTENT OF A WETLAND OR OTHER SURFACE WATER SUBMITTED AS PART OF THE PERMIT APPLICATION, INCLUDING PLANS OR OTHER SUPPORTING DOCUMENTATION SHALL NOT BE CONSIDERED BINDING UNLESS A SPECIFIC CONDITION OF THIS PERMIT OR A FORMAL DETERMINATION UNDER SECTION 373.421(2), F.S., PROVIDES OTHERWISE.

16. THE PERMITTEE SHALL NOTIFY THE DISTRICT IN WRITING WITHIN 30 DAYS OF ANY SALE, CONVEYANCE, OR OTHER TRANSFER OF OWNERSHIP OR CONTROL OF A PERMITTED SYSTEM OR THE REAL PROPERTY ON WHICH THE PERMITTED SYSTEM IS LOCATED. ALL TRANSFERS OF OWNERSHIP OR TRANSFERS OF A PERMIT ARE SUBJECT TO THE REQUIREMENTS OF RULES 40E-1.6105 AND 40E-1.6107, F.A.C. THE PERMITTEE TRANSFERRING THE PERMIT SHALL REMAIN LIABLE FOR CORRECTIVE ACTIONS THAT MAY BE REQUIRED AS A RESULT OF ANY VIOLATIONS PRIOR TO THE SALE, CONVEYANCE OR OTHER TRANSFER OF THE SYSTEM.

17. UPON REASONABLE NOTICE TO THE PERMITTEE, DISTRICT AUTHORIZED STAFF WITH PROPER IDENTIFICATION SHALL HAVE PERMISSION TO ENTER, INSPECT, SAMPLE AND TEST THE SYSTEM TO INSURE CONFORMITY WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE PERMIT.

18. IF HISTORICAL OR ARCHAEOLOGICAL ARTIFACTS ARE DISCOVERED AT ANY TIME ON THE PROJECT SITE, THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE APPROPRIATE DISTRICT SERVICE CENTER.

19. THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE DISTRICT IN WRITING OF ANY PREVIOUSLY SUBMITTED INFORMATION THAT IS LATER DISCOVERED TO BE INACCURATE.

40E-4.321 Duration of Permits

(1) Unless revoked or otherwise modified the duration of an environmental resource permit issued under this chapter or Chapter 40E-40, F.A.C. is as follows:

(a) For a conceptual approval, two years from the date of issuance or the date specified as a condition of the permit, unless within that period an application for an individual or standard general permit is filed for any portion of the project. If an application for an environmental resource permit is filed, then the conceptual approval remains valid until final action is taken on the environmental resource permit application. If the application is granted. then the conceptual approval is valid for an additional two years from the date of issuance of the permit. Conceptual approvals which have no individual or standard general environmental resource permit applications filed for a period of two years shall expire automatically at the end of the two year period.

(b) For a conceptual approval filed concurrently with a development of regional impact (DRI) application for development approval (ADA) and a local government comprehensive plan amendment, the duration of the conceptual approval shall be two years from whichever one of the following occurs at the latest date:

1. the effective date of the local government's comprehensive plan amendment.
2. the effective date of the local government development order.
3. the date on which the District issues the conceptual approval, or
4. the latest date of the resolution of any Chapter 120.57, F.A.C., administrative proceeding or other legal appeals.

(c) For an individual or standard general environmental resource permit, five years from the date of issuance or such amount of time as made a condition of the permit.

(d) For a noticed general permit issued pursuant to chapter 40-E-400, F.A.C., five years from the date the notice of intent to use the permit is provided to the District.

(2)(a) Unless prescribed by special permit condition, permits expire automatically according to the timeframes indicated in this rule. If application for extension is made in writing pursuant to subsection (3), the permit shall remain in full force and effect until:

1. the Governing Board takes action on an application for extension of an individual permit, or
2. staff takes action on an application for extension of a standard general permit.

(b) Installation of the project outfall structure shall not constitute a vesting of the permit.

(3) The permit extension shall be issued provided that a permittee files a written request with the District showing good cause prior to the expiration of the permit. For the purpose of this rule, good cause shall mean a set of extenuating circumstances outside of the control of the permittee. Requests for extensions, which shall include documentation of the extenuating circumstances and how they have delayed this project, will not be accepted more than 180 days prior to the expiration date.

(4) Substantial modifications to Conceptual Approvals will extend the duration of the Conceptual Approval for two years from the date of issuance of the modification. For the purposes of this section, the term "substantial modification" shall mean a modification which is reasonably expected to lead to substantially different water resource or environmental impacts which require a detailed review.

(5) Substantial modifications to individual or standard general environmental resource permits issued pursuant to a permit application extend the duration of the permit for three years from the date of issuance of the modification. Individual or standard general environmental resource permit modifications do not extend the duration of a conceptual approval.

(6) Permit modifications issued pursuant to subsection 40E-4.331(2)(b), F.A.C. (letter modifications) do not extend the duration of a permit.

(7) Failure to complete construction or alteration of the surface water management system and obtain operation phase approval from the District within the permit duration shall require a new permit authorization in order to continue construction unless a permit extension is granted.

Specific authority 373.044, 373.113 F.S. Law Implemented 373.413, 373.416, 373.419, 373.426 F.S. History—New 9-3-81, Amended 1-31-82, 12-1-82, Formerly 16K-4.07(4), Amended 7-1-86, 4/20/94, Amended 7-1-86, 4/20/94, 10-3-95

September 28, 2001

Florida Department of Transportation District IV
3400 West Commercial Blvd.
Fort Lauderdale, FL 33309

Subject: Application No. 010601-42, **I-95 Pump Station**
Broward County, S19,20,28,29/T51S/R42E

Enclosed is a copy of this District's staff report covering the permit application referenced therein. It is requested that you read this staff report thoroughly and understand its contents. The recommendations as stated in the staff report will be presented to our Governing Board for consideration on **October 11, 2001.**

Should you wish to object to the staff recommendation or file a petition, please provide written objections, petitions and/or waivers (refer to the attached "Notice of Rights") to:

Jennifer Krumlauf, Deputy Clerk
South Florida Water Management District
Post Office Box 24680
West Palm Beach, Florida 33416-4680

The "Notice of Rights" addresses the procedures to be followed if you desire a public hearing or other review of the proposed agency action. You are advised, however, to be prepared to defend your position regarding the permit application when it is considered by the Governing Board for final agency action, even if you agree with the staff recommendation, as the Governing Board may take final agency action which differs materially from the proposed agency action.

Please contact the District if you have any questions concerning this matter.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a "Notice of Rights" has been mailed to the addressee this 28th day of September, 2001 in accordance with Section 120.60 (3), Florida Statutes.

Sincerely,

W.R. Howard, Jr. P.E., Deputy Director
Environmental Resource Regulation Division

WRH/jb

CERTIFIED # 7099 3400 0003 8293 7765
RETURN RECEIPT REQUESTED

GOVERNING BOARD
Trudi K. Williams, Chair
Lennart E. Lindahl, Vice Chair
Pamela Brooks-Thomas
Michael Collins
Hugh M. English
Gerardo B. Fernandez
Patrick J. Gleason, Ph.D., P.G.
Nicolás J. Gutierrez, Jr., Esq.
Harkley R. Thornton
EXECUTIVE OFFICE
Henry Dean, Executive Director

NOTICE OF RIGHTS

Section 120.569(1), Fla. Stat. (1997), requires that "each notice shall inform the recipient of any administrative hearing or judicial review that is available under this section, s. 120.57, or s. 120.68; shall indicate the procedure which must be followed to obtain the hearing or judicial review, and shall state the time limits which apply." Please note that this Notice of Rights is not intended to provide legal advice. Not all the legal proceedings detailed below may be an applicable or appropriate remedy. You may wish to consult an attorney regarding your legal rights.

Petition for Administrative Proceedings

1. A person whose substantial interests are affected by the South Florida Water Management District's (SFWMD) action has the right to request an administrative hearing on that action. The affected person may request either a formal or an informal hearing, as set forth below. A point of entry into administrative proceedings is governed by Rules 28-106.111 and 40E-1.511, Fla. Admin. Code, (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109), as set forth below. Petitions are deemed filed upon receipt of the original documents by the SFWMD Clerk.

a. Formal Administrative Hearing: If a genuine issue(s) of material fact is in dispute, the affected person seeking a formal hearing on a SFWMD decision which does or may determine their substantial interests shall file a petition for hearing pursuant to Sections 120.569 and 120.57(1), Fla. Stat. or for mediation pursuant to Section 120.573, Fla. Stat. within 21 days, except as provided in subsections c. and d. below, of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-106.201(2), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

b. Informal Administrative Hearing: If there are no issues of material fact in dispute, the affected person seeking an informal hearing on a SFWMD decision which does or may determine their substantial interests shall file a petition for hearing pursuant to Sections 120.569 and 120.57(2), Fla. Stat. or for mediation pursuant to Section 120.573, Fla. Stat. within 21 days, except as provided in subsections c. and d. below, of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-106.301(2), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

c. Administrative Complaint and Order: If a Respondent objects to a SFWMD Administrative Complaint and Order, pursuant to Section 373.119, Fla. Stat. (1997), the person named in the Administrative Complaint and Order may file a petition for a hearing no later than 14 days after the date such order is served. Petitions must substantially comply with the requirements of either subsection a. or b. above.

d. State Lands Environmental Resource Permit: Pursuant to Section 373.427, Fla. Stat., and Rule 40E-1.511(3), Fla. Admin. Code (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109(2)(c)), a petition objecting to the SFWMD's agency action regarding consolidated applications for Environmental Resource Permits and Use of Sovereign Submerged Lands (SLERPs), must be filed within 14 days of the notice of consolidated intent to grant or deny the SLERP. Petitions must substantially comply with the requirements of either subsection a. or b. above.

e. Emergency Authorization and Order: A person whose substantial interests are affected by a SFWMD Emergency Authorization and Order, has a right to file a petition under Sections 120.569, 120.57(1), and 120.57(2), Fla. Stat., as provided in subsections a. and b. above. However, the person, or the agent of the person responsible for causing or contributing to the emergency conditions shall take whatever action necessary to cause immediate compliance with the terms of the Emergency Authorization and Order.

f. Order for Emergency Action: A person whose substantial interests are affected by a SFWMD Order for Emergency Action has a right to file a petition pursuant to Rules 28-107.005 and 40E-1.611, Fla. Admin. Code, copies of which are attached to this Notice of Rights, and Section 373.119(3), Fla. Stat., for a hearing on the Order. Any subsequent agency action or proposed agency action to initiate a formal revocation proceeding shall be separately noticed pursuant to section g. below.

g. Permit Suspension, Revocation, Annulment, and Withdrawal: If the SFWMD issues an administrative complaint to suspend, revoke, annul, or withdraw a permit, the permittee may request a hearing to be conducted in accordance with Sections 120.569 and 120.57, Fla. Stat., within 21 days of either written notice through mail or posting or publication of notice that the SFWMD has or intends to take final agency action. Petitions must substantially comply with the requirements of Rule 28-107.004(3), Fla. Admin. Code, a copy of the which is attached to this Notice of Rights.

2. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the SFWMD's final action may be different from the position taken by it previously. Persons whose substantial interests may be affected by

any such final decision of the SFWMD shall have, pursuant to Rule 40E-1.511(2), Fla. Admin. Code (also published as an exception to the Uniform Rules of Procedure as Rule 40E-0.109(2)(c)), an additional 21 days from the date of receipt of notice of said decision to request an administrative hearing. However, the scope of the administrative hearing shall be limited to the substantial deviation.

3. Pursuant to Rule 40E-1.511(4), Fla. Admin. Code, substantially affected persons entitled to a hearing pursuant to Section 120.57(1), Fla. Stat., may waive their right to such a hearing and request an informal hearing before the Governing Board pursuant to Section 120.57(2), Fla. Stat., which may be granted at the option of the Governing Board.

4. Pursuant to Rule 28-106.111(3), Fla. Admin. Code, persons may file with the SFWMD a request for extension of time for filing a petition. The SFWMD, for good cause shown, may grant the extension. The request for extension must contain a certificate that the petitioner has consulted with all other parties, if any, concerning the extension and that the SFWMD and all other parties agree to the extension.

CIRCUIT COURT

5. Pursuant to Section 373.617, Fla. Stat., any substantially affected person who claims that final agency action of the SFWMD relating to permit decisions constitutes an unconstitutional taking of property without just compensation may seek judicial review of the action in circuit court by filing a civil action in the circuit court in the judicial circuit in which the affected property is located within 90 days of the rendering of the SFWMD's final agency action.

6. Pursuant to Section 403.412, Fla. Stat., any citizen of Florida may bring an action for injunctive relief against the SFWMD to compel the SFWMD to enforce the laws of Chapter 373, Fla. Stat., and Title 40E, Fla. Admin. Code. The complaining party must file with the SFWMD Clerk a verified complaint setting forth the facts upon which the complaint is based and the manner in which the complaining party is affected. If the SFWMD does not take appropriate action on the complaint within 30 days of receipt, the complaining party may then file a civil suit for injunctive relief in the 15th Judicial Circuit in and for Palm Beach County or circuit court in the county where the cause of action allegedly occurred.

7. Pursuant to Section 373.433, Fla. Stat., a private citizen of Florida may file suit in circuit court to require the abatement of any stormwater management system, dam, impoundment, reservoir, appurtenant work or works that violate the provisions of Chapter 373, Fla. Stat.

DISTRICT COURT OF APPEAL

8. Pursuant to Section 120.68, Fla. Stat., a party who is adversely affected by final SFWMD action may seek judicial review of the SFWMD's final decision by filing a notice of appeal pursuant to Florida Rule of Appellate Procedure 9.110 in the Fourth District Court of Appeal or in the appellate district where a party resides and filing a second copy of the notice with the SFWMD Clerk within 30 days of rendering of the final SFWMD action.

LAND AND WATER ADJUDICATORY COMMISSION

9. A party to a "proceeding below" may seek review by the Land and Water Adjudicatory Commission (LAWAC) of SFWMD's final agency action to determine if such action is consistent with the provisions and purposes of Chapter 373, Fla. Stat. Pursuant to Section 373.114, Fla. Stat., and Rules 42-2.013 and 42-2.0132, Fla. Admin. Code, a request for review of (a) an order or rule of the SFWMD must be filed with LAWAC within 20 days after rendition of the order or adoption of the rule sought to be reviewed; (b) an order of the Department of Environmental Protection (DEP) requiring amendment or repeal of a SFWMD rule must be filed with LAWAC within 30 days of rendition of the DEP's order, and (c) a SFWMD order entered pursuant to a formal administrative hearing under Section 120.57(1), Fla. Stat., must be filed no later than 20 days after rendition of the SFWMD's final order. Simultaneous with filing, a copy of the request for review must be served on the DEP Secretary, any person named in the SFWMD or DEP final order, and all parties to the proceeding below. A copy of Rule 42-2.013, Fla. Admin. Code is attached to this Notice of Rights.

PRIVATE PROPERTY RIGHTS PROTECTION ACT

10. A property owner who alleges a specific action of the SFWMD has inordinately burdened an existing use of the real property, or a vested right to a specific use of the real property, may file a claim in the circuit court where the real property is located within 1 year of the SFWMD action pursuant to the procedures set forth in Subsection 70.001(4)(a), Fla. Stat.

LAND USE AND ENVIRONMENTAL DISPUTE RESOLUTION

11. A property owner who alleges that a SFWMD development order (as that term is defined in Section 70.51(2)(a), Fla. Stat. to include permits) or SFWMD enforcement action is unreasonable, or unfairly burdens the use of the real property, may file a request for relief with the SFWMD within 30 days of receipt of the SFWMD's order or notice of agency action pursuant to the procedures set forth in Subsections 70.51(4) and (6), Fla. Stat.

MEDIATION

12. A person whose substantial interests are, or may be, affected by the SFWMD's action may choose mediation as an alternative remedy under Section 120.573, Fla. Stat. Pursuant to Rule 28-106.111(2), Fla. Admin. Code, the petition for mediation shall be filed within 21 days of either written notice through mail or posting or

publication of notice that the SFWMD has or intends to take final agency action. Choosing mediation will not adversely affect the right to an administrative hearing if mediation does not result in settlement.

Pursuant to Rule 28-106.402, Fla. Admin. Code, the contents of the petition for mediation shall contain the following information:

(1) the name, address, and telephone number of the person requesting mediation and that person's representative, if any;

(2) a statement of the preliminary agency action;

(3) an explanation of how the person's substantial interests will be affected by the agency determination; and

(4) a statement of relief sought.

As provided in Section 120.573, Fla. Stat. (1997), the timely agreement of all the parties to mediate will toll the time limitations imposed by Sections 120.569 and 120.57, Fla. Stat., for requesting and holding an administrative hearing. Unless otherwise agreed by the parties, the mediation must be concluded within 60 days of the execution of the agreement. If mediation results in settlement of the dispute, the SFWMD must enter a final order incorporating the agreement of the parties. Persons whose substantial interest will be affected by such a modified agency decision have a right to petition for hearing within 21 days of receipt of the final order in accordance with the requirements of Sections 120.569 and 120.57, Fla. Stat., and SFWMD Rule 28-106.201(2), Fla. Admin. Code. If mediation terminates without settlement of the dispute, the SFWMD shall notify all parties in writing that the administrative hearing process under Sections 120.569 and 120.57, Fla. Stat., remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action.

VARIANCES AND WAIVERS

13. A person who is subject to regulation pursuant to a SFWMD rule and believes the application of that rule will create a substantial hardship or will violate principles of fairness (as those terms are defined in Subsection 120.542(2), Fla. Stat.) and can demonstrate that the purpose of the underlying statute will be or has been achieved by other means, may file a petition with the SFWMD Clerk requesting a variance from or waiver of the SFWMD rule. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have concerning the SFWMD's action. Pursuant to Rule 28-104.002(2), Fla. Admin. Code, the petition must include the following information:

(a) the caption shall read:
Petition for (Variance from) or (Waiver of) Rule (Citation)

(b) The name, address, telephone number and any facsimile number of the petitioner;

(c) The name, address telephone number and any facsimile number of the attorney or qualified representative of the petitioner, (if any);

(d) the applicable rule or portion of the rule;

(e) the citation to the statue the rule is implementing;

(f) the type of action requested;

(g) the specific facts that demonstrate a substantial hardship or violation of principals of fairness that would justify a waiver or variance for the petitioner;

(h) the reason why the variance or the waiver requested would serve the purposes of the underlying statute; and

(i) a statement of whether the variance or waiver is permanent or temporary. If the variance or waiver is temporary, the petition shall include the dates indicating the duration of the requested variance or waiver.

A person requesting an emergency variance from or waiver of a SFWMD rule must clearly so state in the caption of the petition. In addition to the requirements of Section 120.542(5), Fla. Stat. pursuant to Rule 28-104.004(2), Fla. Admin. Code, the petition must also include:

a) the specific facts that make the situation an emergency; and

b) the specific facts to show that the petitioner will suffer immediate adverse effect unless the variance or waiver is issued by the SFWMD more expeditiously than the applicable timeframes set forth in Section 120.542, Fla. Stat.

WAIVER OF RIGHTS

14. Failure to observe the relevant time frames prescribed above will constitute a waiver of such right.

28-106.201 INITIATION OF PROCEEDINGS
(INVOLVING DISPUTED ISSUES OF MATERIAL FACT)

(2) All petitions filed under these rules shall contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding, and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and

(f) A demand for relief.

28-106.301 INITIATION OF PROCEEDINGS
(NOT INVOLVING DISPUTED ISSUES OF MATERIAL FACT)

(2) All petitions filed under these rules shall contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding, and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and

(e) A demand for relief.

28-107.004 SUSPENSION, REVOCATION, ANNULMENT, OR WITHDRAWAL

(3) Requests for hearing filed in accordance with this rule shall include:

(a) The name and address of the party making the request, for purposes of service;

(b) A statement that the party is requesting a hearing involving disputed issues of material fact, or a hearing not involving disputed issues of material fact; and

(c) A reference to the notice, order to show cause, administrative complaint, or other communication that the party has received from the agency.

42-2.013 REQUEST FOR REVIEW PURSUANT TO SECTION 373.114 OR 373.217

(1) In any proceeding arising under Chapter 373, F.S., review by the Florida Land and Water Adjudicatory Commission may be initiated by the Department or a party by filing a request for such review with the Secretary of the Commission and serving a copy on any person named in the rule or order, and on all parties to the proceeding which resulted in the order sought to be reviewed. A certificate of service showing completion of service as required by this subsection shall be a requirement for a determination of sufficiency under Rule 42-2.0132. Failure to file the request with the Commission within the time period provided in Rule 42-2.0132 shall result in dismissal of the request for review.

(2) The request for review shall identify the rule or order requested to be reviewed, the proceeding in which the rule or order was entered and the nature of the rule or order. A copy of the rule or order sought to be reviewed shall be attached. The request for review shall state with particularity:

(a) How the order or rule conflicts with the requirements, provisions and purposes of Chapter 373, F.S., or rules duly adopted thereunder;

(b) How the rule or order sought to be reviewed affects the interests of the party seeking review;

(c) The oral or written statement, sworn or unsworn, which was submitted to the agency concerning the matter to be reviewed and the date and location of the statement, if the individual or entity requesting the review has not participated in a proceeding previously instituted pursuant to Chapter 120, F.S., on the order for which review is sought;

(d) If review of an order is being sought, whether and how the activity authorized by the order would substantially affect natural resources of statewide or regional significance, or whether the order raises issues of policy, statutory interpretation, or rule interpretation that have regional or statewide significance from a standpoint of agency precedent, and all the factual bases in the record which the petitioner claims support such determination(s); and

(e) The action requested to be taken by the Commission as a result of the review, whether to rescind or modify the order, or remand the proceeding to the water management district for further action, or to require the water management district to initiate rulemaking to adopt, amend or repeal a rule.

28-107.005 EMERGENCY ACTION

(1) If the agency finds that immediate serious danger to the public health, safety, or welfare requires emergency action, the agency shall summarily suspend, limit, or restrict a license.

(2) the 14-day notice requirement of Section 120.569(2)(b), F. S., does not apply and shall not be construed to prevent a hearing at the earliest time practicable upon request of an aggrieved party.

(3) Unless otherwise provided by law, within 20 days after emergency action taken pursuant to paragraph (1) of this rule, the agency shall initiate a formal suspension or revocation proceeding in compliance with Sections 120.569, 120.57, and 120.60, F.S.

40E-1.611 EMERGENCY ACTION

(1) An emergency exists when immediate action is necessary to protect public health, safety or welfare; the health of animals, fish or aquatic life; the works of the District; a public water supply, or recreational, commercial, industrial, agricultural or other reasonable uses of land and water resources.

(2) The Executive Director may employ the resources of the District to take whatever remedial action necessary to alleviate the emergency condition without the issuance of an emergency order, or in the event an emergency order has been issued, after the expiration of the requisite time for compliance with that order.

DRAFT
Subject to Governing Board Approval

LAST DATE FOR GOVERNING BOARD ACTION:
OCTOBER 11, 2001

ENVIRONMENTAL RESOURCE PERMIT STAFF REVIEW SUMMARY

I.ADMINISTRATIVE

APPLICATION NUMBER: 010601-42

PERMIT NUMBER: 06-02942-P

PROJECT NAME: I-95 PUMP STATION

LOCATION: BROWARD COUNTY, S19,20/T51S/R42E
S28,29/T51S/R42E

APPLICANT'S NAME: FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT IV

OWNER'S NAME AND ADDRESS: FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT IV
3400 WEST COMMERCIAL BLVD
FORT LAUDERDALE, FL 33309

ENGINEER: CRAIG A SMITH AND ASSOCIATES

II. PROJECT DESCRIPTION

PROJECT AREA: 740.00 acres DRAINAGE AREA: 740.00 acres

DISTRICT DRAINAGE BASIN: C-10

RECEIVING BODY: C-10 CANAL

CLASSIFICATION: CLASS III

PURPOSE:

This application is a request for construction and operation of a stormwater improvement project to alleviate flooding conditions within areas of the City of Hallandale Beach and the Town of Pembroke Park. Staff recommends approval with conditions.

BACKGROUND:

Historically, portions of the City of Hallandale Beach and the Town of Pembroke Park have experienced significant flooding conditions. Most recently, Hurricane Irene in 1999 and the No Name Storm in 2000 resulted in significant flooding for extended periods of time within these two communities. These two

communities are on either side of I-95 in southern Broward County and drainage and flooding between the communities and the I-95 right-of-way is intermingled. The Florida Department of Transportation (FDOT) and the City of Hollywood have been working with these communities in developing a plan to alleviate flooding conditons in this area.

EXISTING FACILITIES:

The project drainage area includes portions of the City of Hallandale Beach and the Town of Pembroke Park, along the FDOT I-95 right-of-way.

There are very few existing drainage facilities within the affected areas of the City of Hallandale Beach and the Town of Pembroke Park. These areas have less than adequate drainage facilities with no positive drainage. Flooding of finished floors occurs during certain rainfall events. Chaves Lake located within the City of Hallandale Beach does provide a certain level of storage during storm conditions. However, this lake has no outfall and recovery of available storage takes days or weeks after major storm events.

PROPOSED FACILITIES:

In order to improve the flooding conditions within the City and Town, the following improvements are proposed as part of a tri-party Joint Participation Agreement between the Town of Pembroke Park, the City of Hallandale Beach and the FDOT. These improvements will provide a conveyance for runoff from the affected areas to the District's C-10 canal, effectively providing positive outfall where none previously existed.

Chaves Lake is to be connected to the adjacent Hallandale High School Lake via an open channel connection. The schools lake is to be connected to a proposed pumping station, on the west side of I-95, via an 84 inch diameter culvert which will be jack and bored under I-95. The pump station will consist of three 17,920 GPM (40 cfs each) pumps plus a standby pump. This pump station will serve the Chaves Lake Basin, within Hallandale Beach, and a portion of the Town of Pembroke Park. These pumps will turn off at elevation 2.0 feet NGVD which is the control elevation for Chaves Lake. They will turn on, one after another, when the stage reaches 3.0 feet, 3.5 feet and 4.0 feet NGVD in Chaves Lake. A stormwater force main will be constructed along the west side of I-95 and connected to the modified CSX Railroad ditch. A secondary pump station will be constructed on Beehan Lake within the Town of Pembroke Park. A force main will connect this pump station to the I-95 pump station's force main. The station will consist of two 8,960 GPM (20 cfs each) pumps plus a standby pump. This pump station will provide additional flood relief for the Town of Pembroke Park when one or more of the pumps within the I-95 pump station are not operating. By operating the pump station in this manner the total discharge into the CSX ditch will not exceed 120 cfs. Monitoring of the

pump station will be accomplished via a telemetry system. The CSX ditch will be deepened and widened in order to pass the additional 120 cfs and to provide water quality treatment for the contributing portion of the South Florida Rail Corridor Track expansion project. The Track expansion generates another 15 cfs that has been accounted for in the design of this project. The downstream end of the CSX ditch will be fitted with a ditch bottom inlet and a concrete box culvert. This structure will convey the runoff to the canal system, upstream of C-10, within the City of Hollywood. Maintenance dredging will be performed at three locations within the C-10 canal in order to pass the additional 135 cfs through the canal without raising the water surface elevations beyond existing conditions. The three locations are, upstream of the railroad bridge over the C-10 canal, the reach of C-10 between Stirling Road and Oakwood Boulevard and the first 400 linear feet of C-10, immediately south of it's junction with the Dania Cutoff Canal. The applicant has demonstrated that the proposed water surface profile will be lower than the existing water surface profile after the dredging has been accomplished.

The operation and maintenance responsibilities for each of the three parties is detailed in the Joint Participation Agreement which is attached as an exhibit to this staff report.

BASIN INFORMATION:

Basin	Area Acres	WSWT Elev (ft. NGVD)	Normal/Dry Ctrl Elev (ft. NGVD)	Method of Determination
I-95 PUMP STATION	740.00	2.00	2/2	MONITORING DATA

Pump Discharge Structures:

Basin	Str. #	Capacity (GPM)	on/off elev. (ft. NGVD)
I-95 PUMP STATION	1	53760	3/2
I-95 PUMP STATION	2	17920	

Receiving Body:

Basin	Str. #	Receiving Body
I-95 PUMP STATION	1	C-10 CANAL
I-95 PUMP STATION	2	C-10 CANAL

III. PROJECT EVALUATION

Discharge Rate:

This project proposes to discharge 135 cfs to the C-10 canal. The C-10 canal will be dredged in three locations so that the additional flow will not result in an increase in the water surface elevation above the existing condition.

Basin	Allow Disch (cfs)	Method of Determination	Design Disch (cfs)	Design Stage (ft. NGVD)
I-95 PUMP STATION	135	CONVEYANCE LIMITATION	135	n/a

WATER QUALITY:

Water quality treatment is being provided to the maximum extent possible within Chaves Lake in the City of Hallandale Beach and Beehans Lake within the Town of Pembroke Park. No new development is proposed as part of this application and the project consists of a stormwater improvement project to alleviate flooding conditions within those two communities. This permit is being issued pursuant to the water quality net improvement provisions referenced in Rule Sect. 40E-4.303(1), see Special Condition.

An erosion and sediment control plan (Exhibit 68) has been provided for the work area outside of the C-10 canal R/W. Broward County is requiring the applicant to provide a Turbidity Monitoring Plan for the work to be performed outside of and within the C-10 canal R/W. A copy of this plan will be submitted to the District once the plan is completed.

IV. ENVIRONMENTAL ASSESSMENT

WETLAND INVENTORY:

MOD PHASE-I-95 PUMP STATION

ONSITE

Pre-Development		Post-Development				
	TOTAL EXISTING	PRESERVED	UNDISTURBED	IMPACTED	ENHANCED	RESTORED/ CREATED
OSW	.38	0	0	.38	0	0

TOTALS	.38	0	0	.38	0	0

UPLAND COMP: PRESERVED: N/A ENHANCED: N/A

ENVIRONMENTAL SUMMARY:

This project is a modification of Permit Number 06-02942-P to include construction and operation of a surface water management system to serve 740 acres of developed lands located within portions of the City of Hallandale Beach, the Town of Pembroke Park and FDOT Right-of-Way discharging into C-10 Canal via the proposed pumping stations and associated drainage facilities in Broward County. The proposed project also involves 4.6 acres of maintenance dredging and 0.38 acres of new dredging within the connector area between Chaves Lake and Hallandale High School Lake and under the Hollywood Boulevard bridge. The applicant proposes these storm water improvements to address the adverse flooding conditions within these southern Broward communities. No wetlands have been identified in this project area. The applicant has provided erosion and turbidity control mechanisms as assurance that no adverse impacts to the adjacent water body will occur due to project related activities.

The proposed activities have been evaluated for potential secondary and cumulative impacts and to determine if the project is contrary to the public interest. Based upon the proposed project design, the District has determined that the project will not cause adverse secondary or cumulative impacts to the water resources and is not contrary to the public interest.

SYSTEM OPERATION:

Fdot, Hallandale Beach And Pembroke Park

PROPOSED LAND USE(S):

Government

WATER USE PERMIT STATUS:

A Water Use permit is not required for this project, at this time.

DRI STATUS:

This project is not a DRI.

SAVE OUR RIVERS:

The project is not within or adjacent to lands under consideration by the Save Our Rivers program.

SWIM BASIN:

The project is not within nor does it discharge directly to a designated SWIM basin.

RIGHT-OF-WAY PERMIT STATUS:

Application number 010814-1 was filed for a Right-of-Way Permit to authorize the applicant to dredge within the C-10 Canal R/W. This application is to be considered by the Governing Board on the same day as this Environmental Resource Permit application.

ENFORCEMENT ACTIVITY:

There has been no enforcement activity associated with this application.

THIRD PARTY INTEREST:

The City of Hollywood has expressed concerns related to potential adverse impacts to the adjacent Orangebrook Golf Course and the residential area adjacent to the C-10 canal. The FDOT has addressed this issue by designing the maintenance dredging and the conveyance facilities downstream of the pump station to result in no increase in the water surface profile of the C-10 canal.

WELL FIELD ZONE OF INFLUENCE:

The project is not located within the zone of influence of a wellfield.

V. APPLICABLE LAND AREA

The acreage in the Land Use Table is for existing development based on an estimation of percent impervious area (77%). No new development is proposed as part of this application.

PROJECT

	TOTAL PROJECT	PREVIOUSLY PERMITTED	THIS PHASE	
TOTAL ACRES	740.00		740.00	acres
PERVIOUS	167.98		167.98	acres
IMPERVIOUS	572.00		572.00	acres

DRAFT
Subject to Governing Board Approval

VI. STAFF RECOMMENDATION

The Staff recommends that the following be issued:

Authorization for construction and operation of a stormwater improvement project to serve flood prone areas within the City of Hallandale Beach and the Town of Pembroke Park in Broward County.

Based on the information provided, District rules have been adhered to.

Staff recommendation is for approval subject to the attached General and Special Conditions.

VII. STAFF REVIEW

NATURAL RESOURCE MANAGEMENT DEPARTMENT APPROVAL

ENVIRONMENTAL EVALUATION

for Anita R. Bain
Nirmala Jeyakumar

SUPERVISOR

Anita R. Bain
Anita R. Bain

DEPARTMENT DIRECTOR:

Robert G. Robbins

DATE: 9/27/01

SURFACE WATER MANAGEMENT DEPARTMENT APPROVAL

ENGINEERING EVALUATION

Kevin G. Dickson, P.E.

SUPERVISOR

Carlos A. DeRojas, P.E.

DEPARTMENT DIRECTOR:

for
Anthony M. Waterhouse, P.E.

DATE: 9/27/01

GENERAL CONDITIONS

1. ALL ACTIVITIES AUTHORIZED BY THIS PERMIT SHALL BE IMPLEMENTED AS SET FORTH IN THE PLANS, SPECIFICATIONS AND PERFORMANCE CRITERIA AS APPROVED BY THIS PERMIT. ANY DEVIATION FROM THE PERMITTED ACTIVITY AND THE CONDITIONS FOR UNDERTAKING THAT ACTIVITY SHALL CONSTITUTE A VIOLATION OF THIS PERMIT AND PART IV, CHAPTER 373, F.S.

2. THIS PERMIT OR A COPY THEREOF, COMPLETE WITH ALL CONDITIONS, ATTACHMENTS, EXHIBITS, AND MODIFICATIONS SHALL BE KEPT AT THE WORK SITE OF THE PERMITTED ACTIVITY. THE COMPLETE PERMIT SHALL BE AVAILABLE FOR REVIEW AT THE WORK SITE UPON REQUEST BY THE DISTRICT STAFF. THE PERMITTEE SHALL REQUIRE THE CONTRACTOR TO REVIEW THE COMPLETE PERMIT PRIOR TO COMMENCEMENT OF THE ACTIVITY AUTHORIZED BY THIS PERMIT.

3. ACTIVITIES APPROVED BY THIS PERMIT SHALL BE CONDUCTED IN A MANNER WHICH DOES NOT CAUSE VIOLATIONS OF STATE WATER QUALITY STANDARDS. THE PERMITTEE SHALL IMPLEMENT BEST MANAGEMENT PRACTICES FOR EROSION AND POLLUTION CONTROL TO PREVENT VIOLATION OF STATE WATER QUALITY STANDARDS. TEMPORARY EROSION CONTROL SHALL BE IMPLEMENTED PRIOR TO AND DURING CONSTRUCTION, AND PERMANENT CONTROL MEASURES SHALL BE COMPLETED WITHIN 7 DAYS OF ANY CONSTRUCTION ACTIVITY. TURBIDITY BARRIERS SHALL BE INSTALLED AND MAINTAINED AT ALL LOCATIONS WHERE THE POSSIBILITY OF TRANSFERRING SUSPENDED SOLIDS INTO THE RECEIVING WATERBODY EXISTS DUE TO THE PERMITTED WORK. TURBIDITY BARRIERS SHALL REMAIN IN PLACE AT ALL LOCATIONS UNTIL CONSTRUCTION IS COMPLETED AND SOILS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED. ALL PRACTICES SHALL BE IN ACCORDANCE WITH THE GUIDELINES AND SPECIFICATIONS DESCRIBED IN CHAPTER 6 OF THE FLORIDA LAND DEVELOPMENT MANUAL; A GUIDE TO SOUND LAND AND WATER MANAGEMENT (DEPARTMENT OF ENVIRONMENTAL REGULATION, 1988), INCORPORATED BY REFERENCE IN RULE 40E-4.091, F.A.C. UNLESS A PROJECT-SPECIFIC EROSION AND SEDIMENT CONTROL PLAN IS APPROVED AS PART OF THE PERMIT. THEREAFTER THE PERMITTEE SHALL BE RESPONSIBLE FOR THE REMOVAL OF THE BARRIERS. THE PERMITTEE SHALL CORRECT ANY EROSION OR SHOALING THAT CAUSES ADVERSE IMPACTS TO THE WATER RESOURCES.

4. THE PERMITTEE SHALL NOTIFY THE DISTRICT OF THE ANTICIPATED CONSTRUCTION START DATE WITHIN 30 DAYS OF THE DATE THAT THIS PERMIT IS ISSUED. AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF ACTIVITY AUTHORIZED BY THIS PERMIT, THE PERMITTEE SHALL SUBMIT TO THE DISTRICT AN ENVIRONMENTAL RESOURCE PERMIT CONSTRUCTION COMMENCEMENT NOTICE FORM NO. 0960 INDICATING THE ACTUAL START DATE AND THE EXPECTED COMPLETION DATE.

5. WHEN THE DURATION OF CONSTRUCTION WILL EXCEED ONE YEAR, THE PERMITTEE SHALL SUBMIT CONSTRUCTION STATUS REPORTS TO THE DISTRICT ON AN ANNUAL BASIS UTILIZING AN ANNUAL STATUS REPORT FORM. STATUS REPORT FORMS SHALL BE SUBMITTED THE FOLLOWING JUNE OF EACH YEAR.

6. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE PERMITTED ACTIVITY, THE PERMITTEE SHALL SUBMIT A WRITTEN STATEMENT OF COMPLETION AND CERTIFICATION BY A REGISTERED PROFESSIONAL ENGINEER OR OTHER APPROPRIATE INDIVIDUAL AS AUTHORIZED BY LAW, UTILIZING THE SUPPLIED ENVIRONMENTAL

RESOURCE PERMIT CONSTRUCTION COMPLETION/CONSTRUCTION CERTIFICATION FORM NO.0881. THE STATEMENT OF COMPLETION AND CERTIFICATION SHALL BE BASED ON ONSITE OBSERVATION OF CONSTRUCTION OR REVIEW OF ASBUILT DRAWINGS FOR THE PURPOSE OF DETERMINING IF THE WORK WAS COMPLETED IN COMPLIANCE WITH PERMITTED PLANS AND SPECIFICATIONS. THIS SUBMITTAL SHALL SERVE TO NOTIFY THE DISTRICT THAT THE SYSTEM IS READY FOR INSPECTION. ADDITIONALLY, IF DEVIATION FROM THE APPROVED DRAWINGS ARE DISCOVERED DURING THE CERTIFICATION PROCESS, THE CERTIFICATION MUST BE ACCOMPANIED BY A COPY OF THE APPROVED PERMIT DRAWINGS WITH DEVIATIONS NOTED. BOTH THE ORIGINAL AND REVISED SPECIFICATIONS MUST BE CLEARLY SHOWN. THE PLANS MUST BE CLEARLY LABELED AS "ASBUILT" OR "RECORD" DRAWING. ALL SURVEYED DIMENSIONS AND ELEVATIONS SHALL BE CERTIFIED BY A REGISTERED SURVEYOR.

7. THE OPERATION PHASE OF THIS PERMIT SHALL NOT BECOME EFFECTIVE: UNTIL THE PERMITTEE HAS COMPLIED WITH THE REQUIREMENTS OF CONDITION (6) ABOVE, HAS SUBMITTED A REQUEST FOR CONVERSION OF ENVIRONMENTAL RESOURCE PERMIT FROM CONSTRUCTION PHASE TO OPERATION PHASE, FORM NO.0920; THE DISTRICT DETERMINES THE SYSTEM TO BE IN COMPLIANCE WITH THE PERMITTED PLANS AND SPECIFICATIONS; AND THE ENTITY APPROVED BY THE DISTRICT IN ACCORDANCE WITH SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995, ACCEPTS RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE SYSTEM. THE PERMIT SHALL NOT BE TRANSFERRED TO SUCH APPROVED OPERATION AND MAINTENANCE ENTITY UNTIL THE OPERATION PHASE OF THE PERMIT BECOMES EFFECTIVE. FOLLOWING INSPECTION AND APPROVAL OF THE PERMITTED SYSTEM BY THE DISTRICT, THE PERMITTEE SHALL INITIATE TRANSFER OF THE PERMIT TO THE APPROVED RESPONSIBLE OPERATING ENTITY IF DIFFERENT FROM THE PERMITTEE. UNTIL THE PERMIT IS TRANSFERRED PURSUANT TO SECTION 40E-1.6107, F.A.C., THE PERMITTEE SHALL BE LIABLE FOR COMPLIANCE WITH THE TERMS OF THE PERMIT.

8. EACH PHASE OR INDEPENDENT PORTION OF THE PERMITTED SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO THE INITIATION OF THE PERMITTED USE OF SITE INFRASTRUCTURE LOCATED WITHIN THE AREA SERVED BY THAT PORTION OR PHASE OF THE SYSTEM. EACH PHASE OR INDEPENDENT PORTION OF THE SYSTEM MUST BE COMPLETED IN ACCORDANCE WITH THE PERMITTED PLANS AND PERMIT CONDITIONS PRIOR TO TRANSFER OF RESPONSIBILITY FOR OPERATION AND MAINTENANCE OF THE PHASE OR PORTION OF THE SYSTEM TO A LOCAL GOVERNMENT OR OTHER RESPONSIBLE ENTITY.

9. FOR THOSE SYSTEMS THAT WILL BE OPERATED OR MAINTAINED BY AN ENTITY THAT WILL REQUIRE AN EASEMENT OR DEED RESTRICTION IN ORDER TO ENABLE THAT ENTITY TO OPERATE OR MAINTAIN THE SYSTEM IN CONFORMANCE WITH THIS PERMIT, SUCH EASEMENT OR DEED RESTRICTION MUST BE RECORDED IN THE PUBLIC RECORDS AND SUBMITTED TO THE DISTRICT ALONG WITH ANY OTHER FINAL OPERATION AND MAINTENANCE DOCUMENTS REQUIRED BY SECTIONS 9.0 AND 10.0 OF THE BASIS OF REVIEW FOR ENVIRONMENTAL RESOURCE PERMIT APPLICATIONS WITHIN THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT - AUGUST 1995. PRIOR TO LOT OR UNIT SALES OR PRIOR TO THE COMPLETION OF THE SYSTEM, WHICHEVER OCCURS FIRST. OTHER DOCUMENTS CONCERNING THE ESTABLISHMENT AND AUTHORITY OF THE OPERATING ENTITY MUST BE FILED WITH THE SECRETARY OF STATE WHERE APPROPRIATE. FOR THOSE SYSTEMS WHICH ARE PROPOSED TO BE MAINTAINED BY THE

COUNTY OR MUNICIPAL ENTITIES. FINAL OPERATION AND MAINTENANCE DOCUMENTS MUST BE RECEIVED BY THE DISTRICT WHEN MAINTENANCE AND OPERATION OF THE SYSTEM IS ACCEPTED BY THE LOCAL GOVERNMENT ENTITY. FAILURE TO SUBMIT THE APPROPRIATE FINAL DOCUMENTS WILL RESULT IN THE PERMITTEE REMAINING LIABLE FOR CARRYING OUT MAINTENANCE AND OPERATION OF THE PERMITTED SYSTEM AND ANY OTHER PERMIT CONDITIONS.

10. SHOULD ANY OTHER REGULATORY AGENCY REQUIRE CHANGES TO THE PERMITTED SYSTEM, THE PERMITTEE SHALL NOTIFY THE DISTRICT IN WRITING OF THE CHANGES PRIOR TO IMPLEMENTATION SO THAT A DETERMINATION CAN BE MADE WHETHER A PERMIT MODIFICATION IS REQUIRED.

11. THIS PERMIT DOES NOT ELIMINATE THE NECESSITY TO OBTAIN ANY REQUIRED FEDERAL, STATE, LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE START OF ANY ACTIVITY APPROVED BY THIS PERMIT. THIS PERMIT DOES NOT CONVEY TO THE PERMITTEE OR CREATE IN THE PERMITTEE ANY PROPERTY RIGHT, OR ANY INTEREST IN REAL PROPERTY, NOR DOES IT AUTHORIZE ANY ENTRANCE UPON OR ACTIVITIES ON PROPERTY WHICH IS NOT OWNED OR CONTROLLED BY THE PERMITTEE, OR CONVEY ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4 OR CHAPTER 40E-40, F.A.C.

12. THE PERMITTEE IS HEREBY ADVISED THAT SECTION 253.77, F.S. STATES THAT A PERSON MAY NOT COMMENCE ANY EXCAVATION, CONSTRUCTION, OR OTHER ACTIVITY INVOLVING THE USE OF SOVEREIGN OR OTHER LANDS OF THE STATE, THE TITLE TO WHICH IS VESTED IN THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND WITHOUT OBTAINING THE REQUIRED LEASE, LICENSE, EASEMENT, OR OTHER FORM OF CONSENT AUTHORIZING THE PROPOSED USE. THEREFORE, THE PERMITTEE IS RESPONSIBLE FOR OBTAINING ANY NECESSARY AUTHORIZATIONS FROM THE BOARD OF TRUSTEES PRIOR TO COMMENCING ACTIVITY ON SOVEREIGNTY LANDS OR OTHER STATE-OWNED LANDS.

13. THE PERMITTEE MUST OBTAIN A WATER USE PERMIT PRIOR TO CONSTRUCTION DEWATERING, UNLESS THE WORK QUALIFIES FOR A GENERAL PERMIT PURSUANT TO SUBSECTION 40E-20.302(4), F.A.C., ALSO KNOWN AS THE "NO NOTICE" RULE.

14. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, ALTERATION, OPERATION, MAINTENANCE, REMOVAL, ABANDONMENT OR USE OF ANY SYSTEM AUTHORIZED BY THE PERMIT.

15. ANY DELINEATION OF THE EXTENT OF A WETLAND OR OTHER SURFACE WATER SUBMITTED AS PART OF THE PERMIT APPLICATION, INCLUDING PLANS OR OTHER SUPPORTING DOCUMENTATION, SHALL NOT BE CONSIDERED BINDING UNLESS A SPECIFIC CONDITION OF THIS PERMIT OR A FORMAL DETERMINATION UNDER SECTION 373.421(2), F.S., PROVIDES OTHERWISE.

16. THE PERMITTEE SHALL NOTIFY THE DISTRICT IN WRITING WITHIN 30 DAYS OF ANY SALE, CONVEYANCE, OR OTHER TRANSFER OF OWNERSHIP OR CONTROL OF A PERMITTED SYSTEM OR THE REAL PROPERTY ON WHICH THE PERMITTED SYSTEM IS LOCATED. ALL TRANSFERS OF OWNERSHIP OR TRANSFERS OF A PERMIT ARE SUBJECT TO THE REQUIREMENTS OF RULES 40E-1.6105 AND 40E-1.6107, F.A.C. THE PERMITTEE

TRANSFERRING THE PERMIT SHALL REMAIN LIABLE FOR CORRECTIVE ACTIONS THAT MAY BE REQUIRED AS A RESULT OF ANY VIOLATIONS PRIOR TO THE SALE, CONVEYANCE OR OTHER TRANSFER OF THE SYSTEM.

17. UPON REASONABLE NOTICE TO THE PERMITTEE, DISTRICT AUTHORIZED STAFF WITH PROPER IDENTIFICATION SHALL HAVE PERMISSION TO ENTER, INSPECT, SAMPLE AND TEST THE SYSTEM TO INSURE CONFORMITY WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE PERMIT.

18. IF HISTORICAL OR ARCHAEOLOGICAL ARTIFACTS ARE DISCOVERED AT ANY TIME ON THE PROJECT SITE, THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE APPROPRIATE DISTRICT SERVICE CENTER.

19. THE PERMITTEE SHALL IMMEDIATELY NOTIFY THE DISTRICT IN WRITING OF ANY PREVIOUSLY SUBMITTED INFORMATION THAT IS LATER DISCOVERED TO BE INACCURATE.

SPECIAL CONDITIONS

1. DISCHARGE FACILITIES:

   STRUCTURE NO. 1:

   1-53760 GPM WITH PUMP ON AT ELEV. 3' NGVD AND WITH PUMP OFF AT ELEV. 2' NGVD.

   RECEIVING BODY : C-10 CANAL

   CONTROL ELEV : 2 FEET NGVD. /2 FEET NGVD DRY SEASON.

   STRUCTURE NO. 2:

   1-17920 GPM ' NGVD.

   RECEIVING BODY : C-10 CANAL

   CONTROL ELEV : 2 FEET NGVD. /2 FEET NGVD DRY SEASON.

2. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

3. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

4. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

5. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

6. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF FDOT. HALLANDALE BEACH AND PEMBROKE PARK.

7. ALL SPECIAL CONDITIONS, EXHIBITS AND TEXT OF STAFF REPORTS PREVIOUSLY STIPULATED BY PERMIT NUMBER 06-02942-P REMAIN IN EFFECT UNLESS OTHERWISE REVISED AND SHALL APPLY TO THIS MODIFICATION.

8. SILT SCREENS, HAY BALES AND/OR OTHER SUCH SEDIMENT CONTROL MEASURES AND TURBIDITY BARRIERS AND/OR OTHER TURBIDITY CONTROL MEASURES SHALL BE UTILIZED DURING CONSTRUCTION AS INDICATED IN THE CONSTRUCTION PLANS.

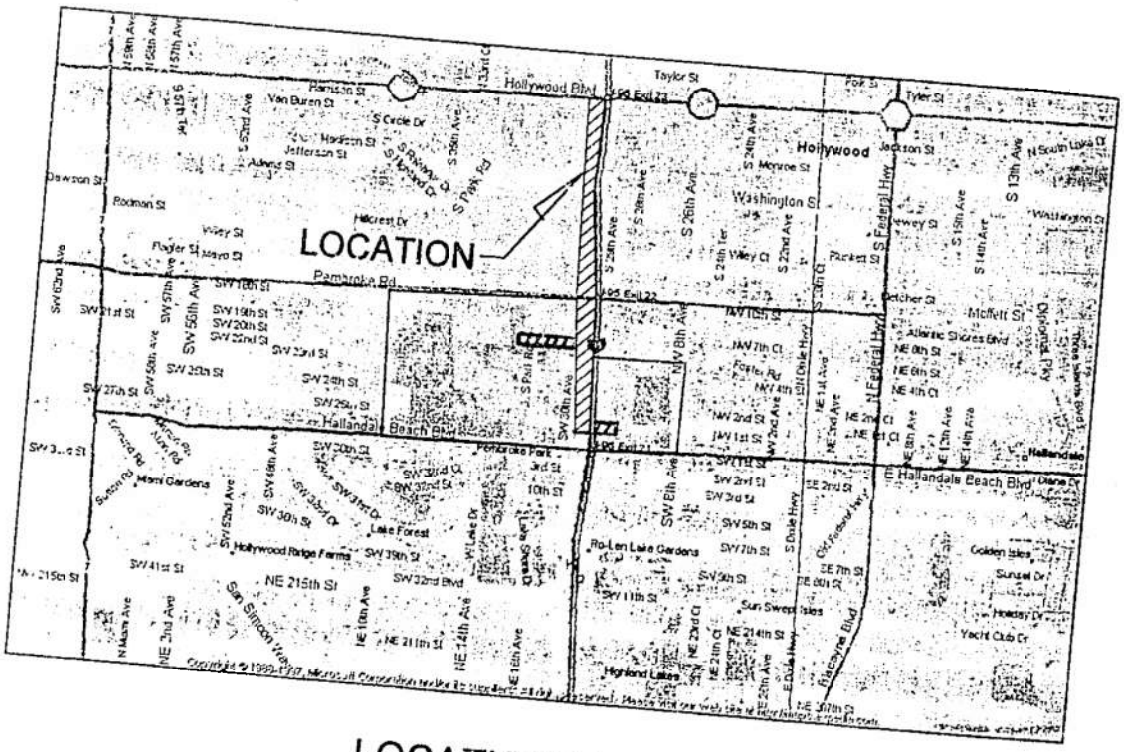
9. PRIOR TO CONSTRUCTION, THE PERMITTEE(S) SHALL PROVIDE THE DISTRICT WITH A COPY OF THE EXECUTED JOINT PARTICIPATION AGREEMENT.

10. PRIOR TO CONSTRUCTION, THE PERMITTEE(S) SHALL PROVIDE THE DISTRICT WITH A COPY OF THE EASEMENT DEED AUTHORIZING THE FACILITIES TO BE CONSTRUCTED ON THE PROPERTY OF HALLANDALE BEACH HIGH SCHOOL.

11. EXHIBIT NUMBER 3 AND EXHIBITS 8 THROUGH 55 DEPICT PLAN AND PROFILE VIEWS OF THE PROPOSED BACKBONE CONVEYANCE FACILITIES. THESE EXHIBITS ARE LOCATED IN THE PERMIT FILE AND ARE INCORPORATED HEREIN BY REFERENCE.

12. EXHIBIT 67 DEPICTS THE AREAS WHERE THE MAINTENANCE DREDGING OF THE C-10 CANAL WILL BE DONE. THIS EXHIBIT IS LOCATED IN THE PERMIT FILE AND IS INCORPORATED BY REFERENCE.

13. THE AUTHORIZATION OF THE STORMWATER MANAGEMENT SYSTEM IS ISSUED PURSUANT TO THE WATER QUALITY NET IMPROVEMENT PROVISIONS REFERENCED IN RULE SECT. 40E-4.303(1); THEREFORE, WATER QUALITY CERTIFICATION IS WAIVED.



LOCATION MAP

I-95 and Pembroke Road Pump Station
Carolina St. and Park Rd. Pump Station

Exhibit 1

APPENDIX E

Design Aids

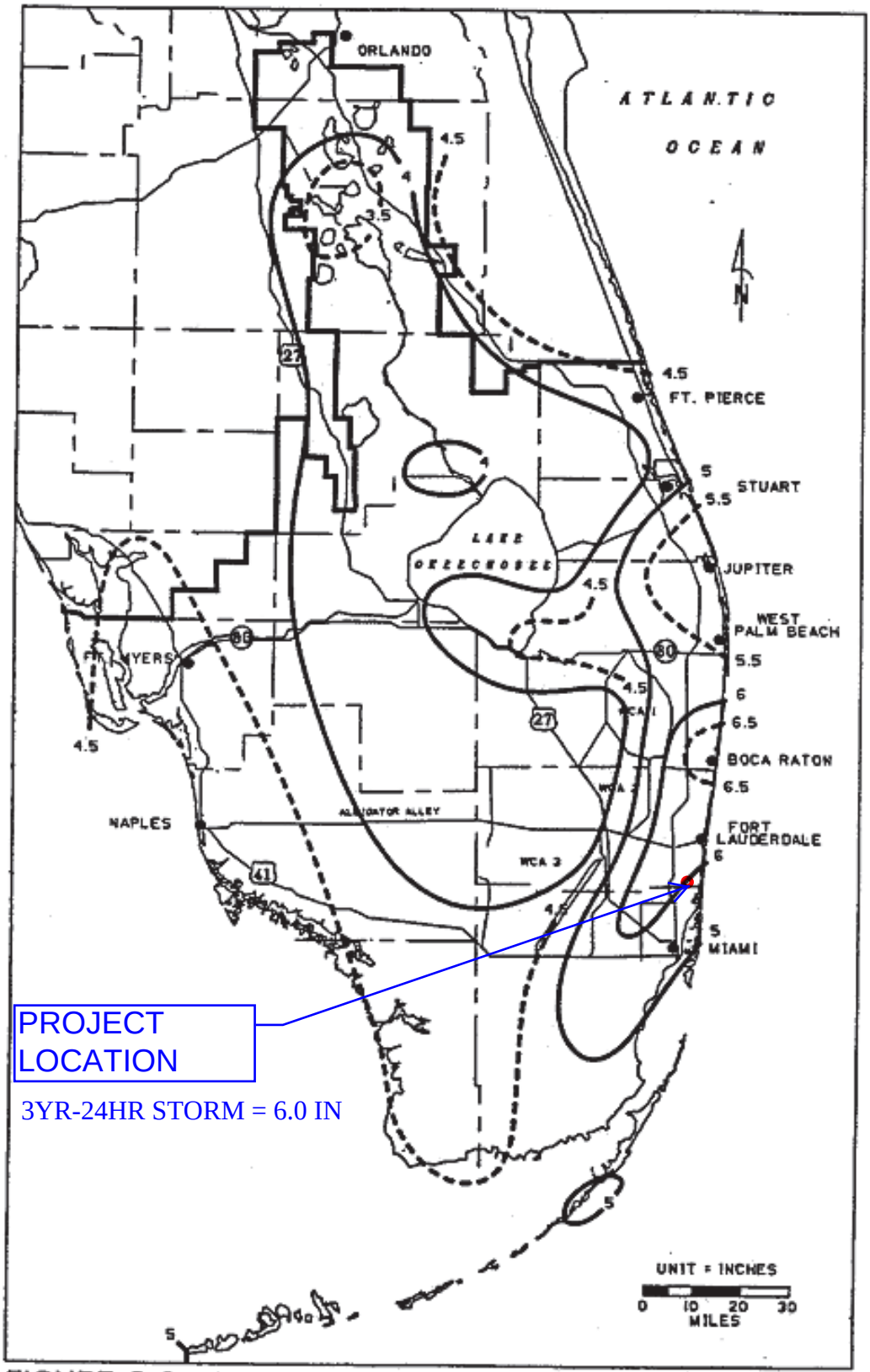


FIGURE C-2. 1-DAY RAINFALL: 3-YEAR RETURN PERIOD

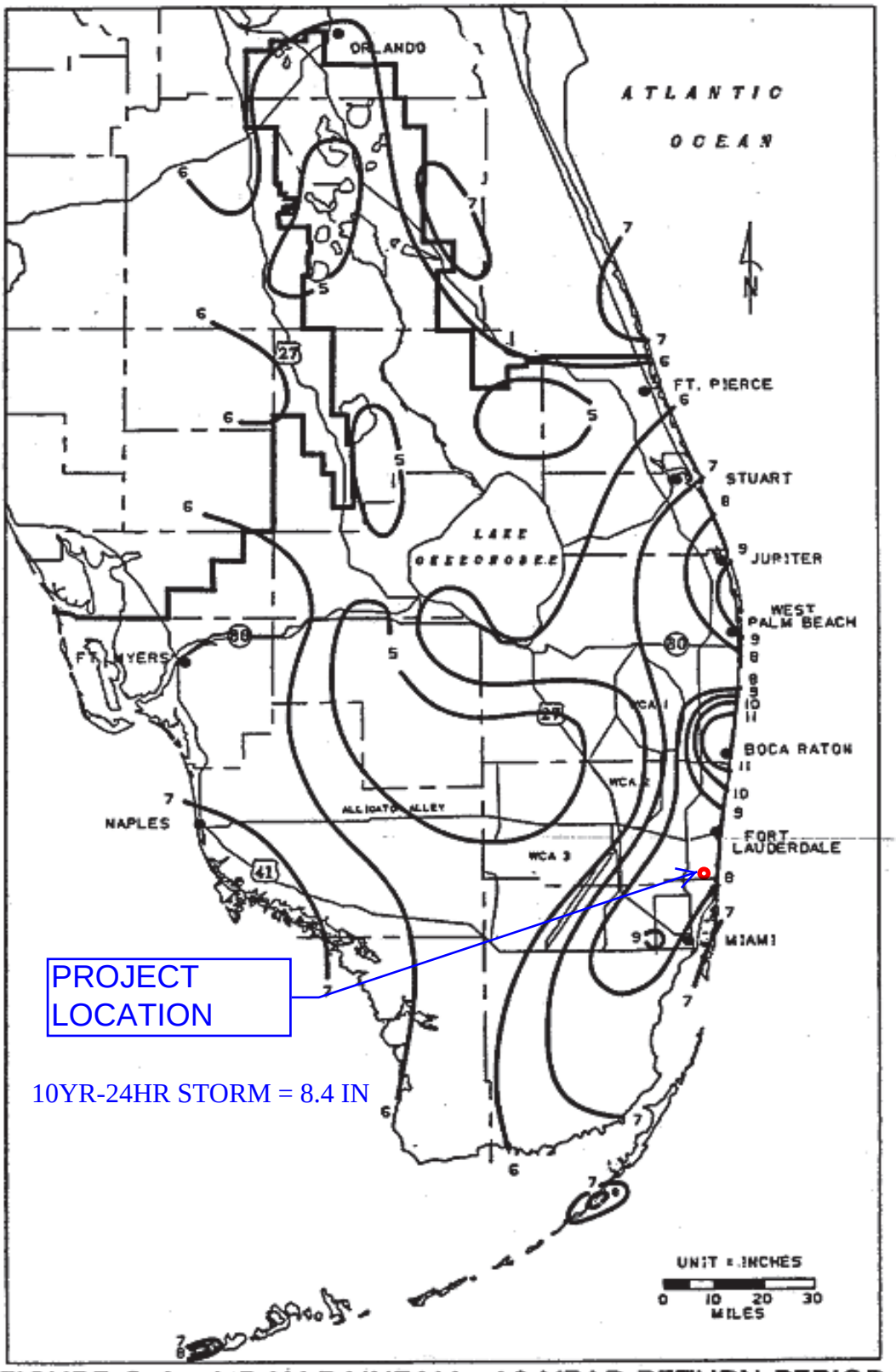


FIGURE C-4. 1-DAY RAINFALL: 10-YEAR RETURN PERIOD

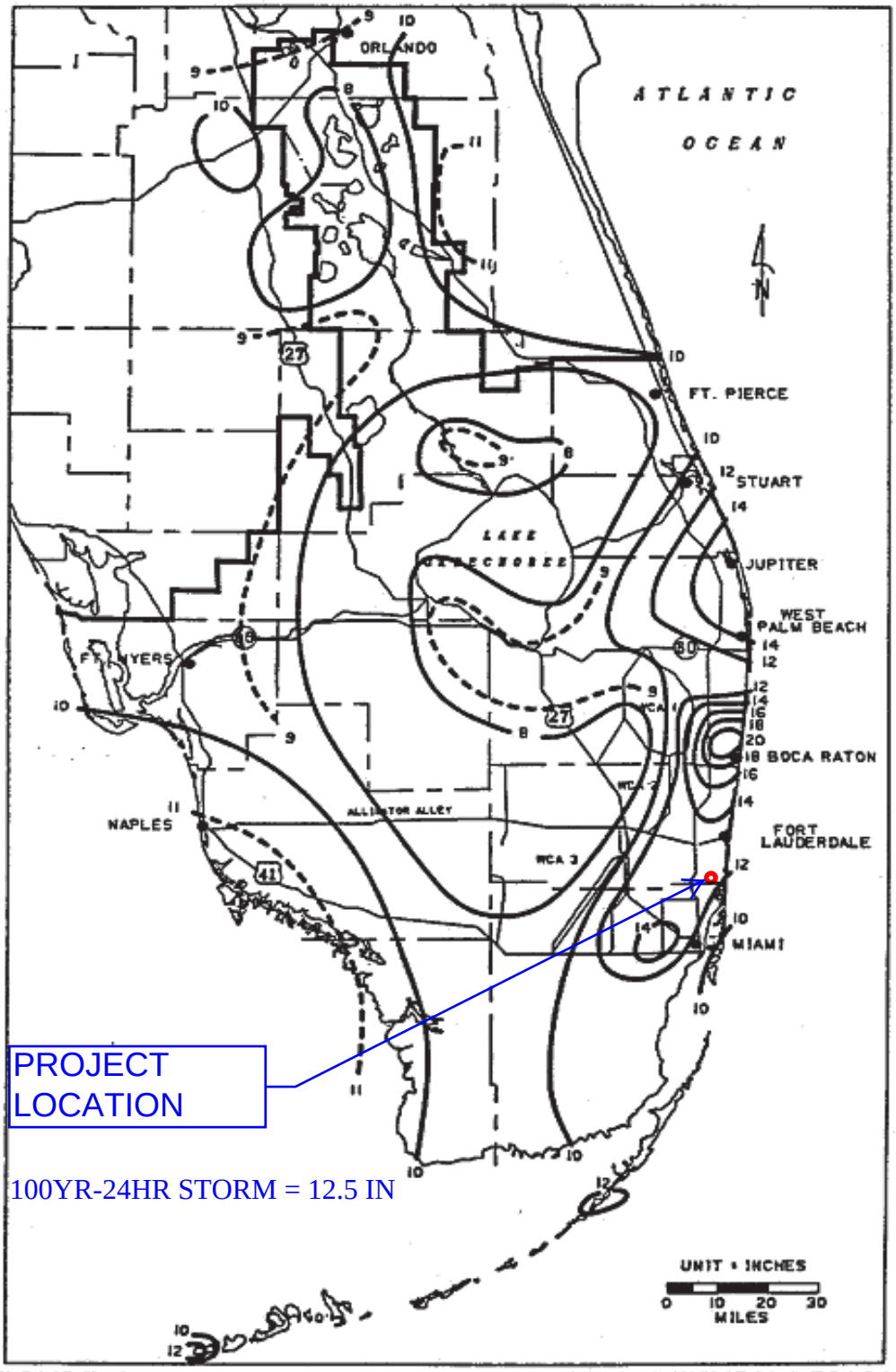


FIGURE C-6. 1-DAY RAINFALL: 100-YEAR RETURN PERIOD

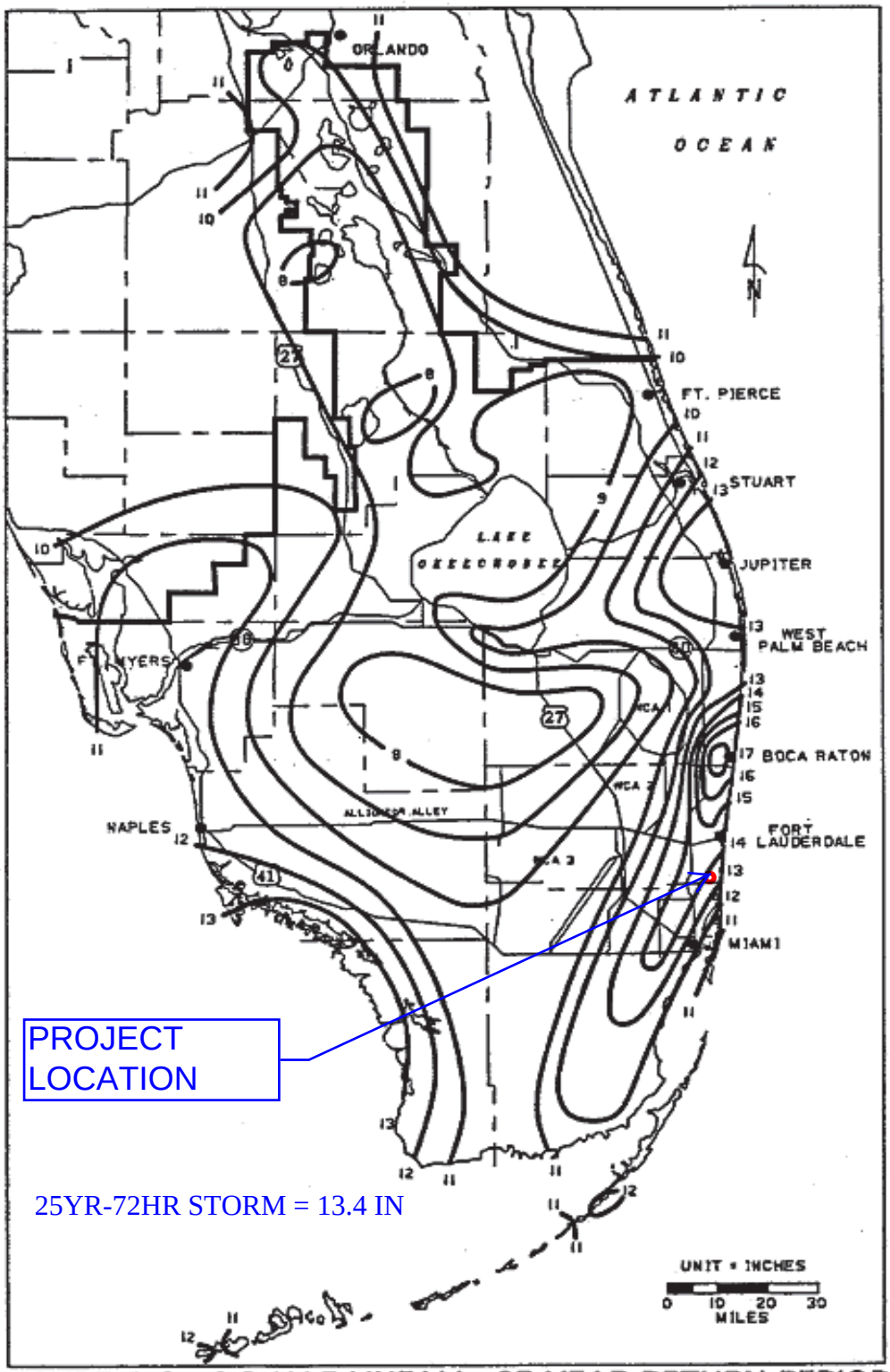


FIGURE C-8. 3-DAY RAINFALL: 25-YEAR RETURN PERIOD

APPENDIX D: SFWMD Basins
for Cumulative Impact Assessments & Mitigation Bank Service Areas

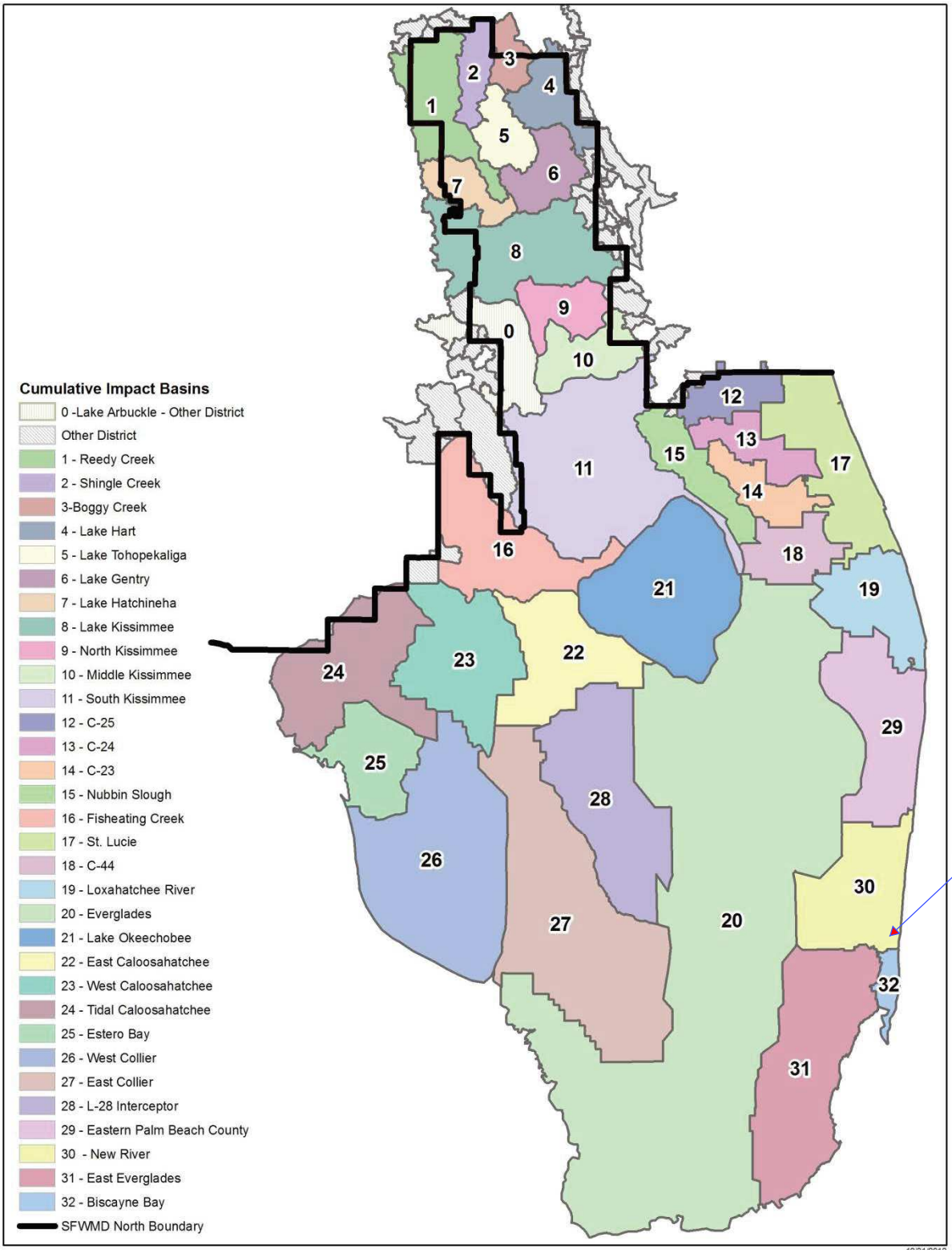


Table B-6: Definitions of Four SCS Hydrologic Soil Groups

Hydrologic Soil Group	Definition
A	Low Runoff Potential Soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well-to-excessively-drained sands or gravels. These soils have a high rate of water transmission.
B	Moderately Low Runoff Potential Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep, to deep, moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.
C	Moderately High Runoff Potential Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, soils with moderate fine to fine texture, or soils with moderate water tables. These soils have a slow rate of water transmission.
D	High Runoff Potential Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with high swelling potential, soils with a permanent high water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

Reference: USDA, SCS, NEH-4 (1972).

Table B-7: SCS Runoff Curve Numbers – Agricultural, Suburban, and Urban Land

Land Use Description		Hydrologic Soil Group A	B	C	D
Cultivated Land[a]:					
Without conservation treatment		72	81	88	91
With conservation treatment		62	71	78	81
Pasture or range land:					
Poor condition		68	79	86	89
Good condition		39	61	74	80
Meadow: good condition		30	58	71	78
Wood or Forest Land:					
Thin stand, poor cover, no mulch		45	66	77	83
Good cover [b]		25	55	70	77
Open Spaces, Lawns, Parks, Golf Courses, Cemeteries:					
Good condition: grass cover on 75% or more of the area		39	61	74	80
Fair condition: grass cover on 50% to 75% of the area		49	69	79	84
Poor condition: grass cover on 50% or less of the area		68	79	86	89
Commercial and Business Areas (85% impervious)		89	92	94	95
Industrial Districts (72% impervious)		81	88	91	93
Residential [c]					
Average lot size	Average % Impervious [d]				
1/8 acre or less	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
Paved Parking Lots, Roofs, Driveways [e]:		98	98	98	98
Streets and Roads:					
Paved with curbs and storm sewers [e]		98	98	98	98
Gravel		76	85	89	91
Dirt		72	82	87	89
Paved with open ditches		83	89	92	93
Newly graded area (no vegetation established)[f]		77	86	91	94

[a] For a more detailed description of agricultural land use curve numbers, refer to Table B-8. .
[b] Good cover is protected from grazing and litter and brush cover soil.
[c] Curve numbers are computed assuming the runoff from the house and driveway is directed toward the street with a minimum of roof water directed to lawns where additional infiltration could occur, which depends on the depth and degree of the permeability of the underlying strata.
[d] The remaining pervious areas (lawn) are considered to be in good pasture condition for these curve numbers.
[e] In some warmer climates of the country, a curve number of 96 may be used.
[f] Use for temporary conditions during grading and construction.
Note: These values are for Antecedent Moisture Condition II, and $I_a = 0.2S$.
Reference: USDA, SCS, TR-55 (1984).

APPENDIX F

Broward County FEMA Flood Panels

ance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

Hallandale Beach Blvd

I-95 PD&E Project Area

Begin Project

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0731H

FIRM

FLOOD INSURANCE RATE MAP

BROWARD COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 731 OF 751

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HALLANDALE BEACH, CITY OF	125110	0731	H
HOLLYWOOD, CITY OF	125113	0731	H
PEMBROKE PARK, TOWN OF	120052	0731	H
WEST PARK, CITY OF	120222	0731	H

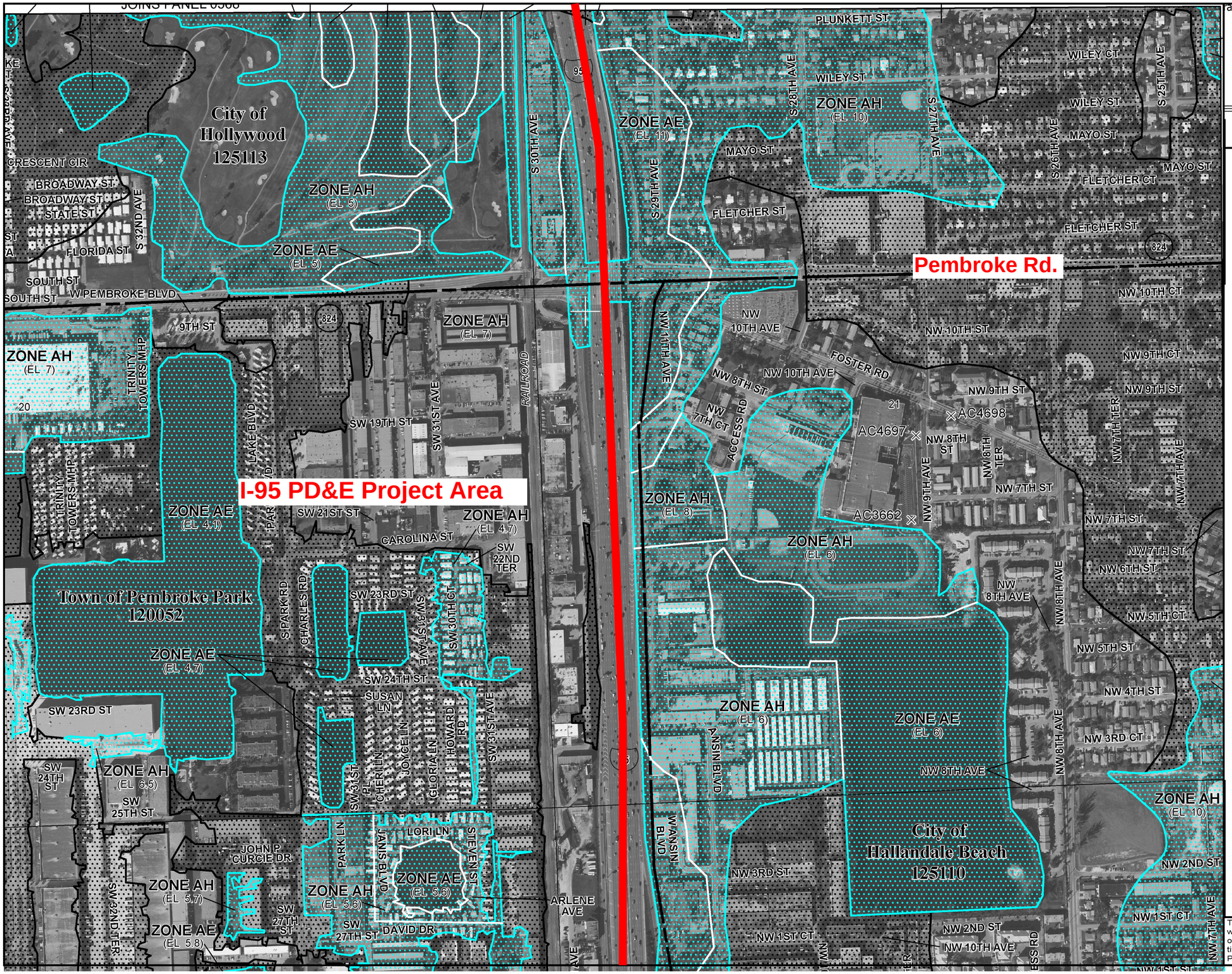
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 12011C0731H

EFFECTIVE DATE AUGUST 18, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



ance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0731H

FIRM

FLOOD INSURANCE RATE MAP

BROWARD COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 731 OF 751

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HALLANDALE BEACH, CITY OF	125110	0731	H
HOLLYWOOD, CITY OF	125113	0731	H
PEMBROKE PARK, TOWN OF	120052	0731	H
WEST PARK, CITY OF	120222	0731	H

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
12011C0731H

EFFECTIVE DATE
AUGUST 18, 2014

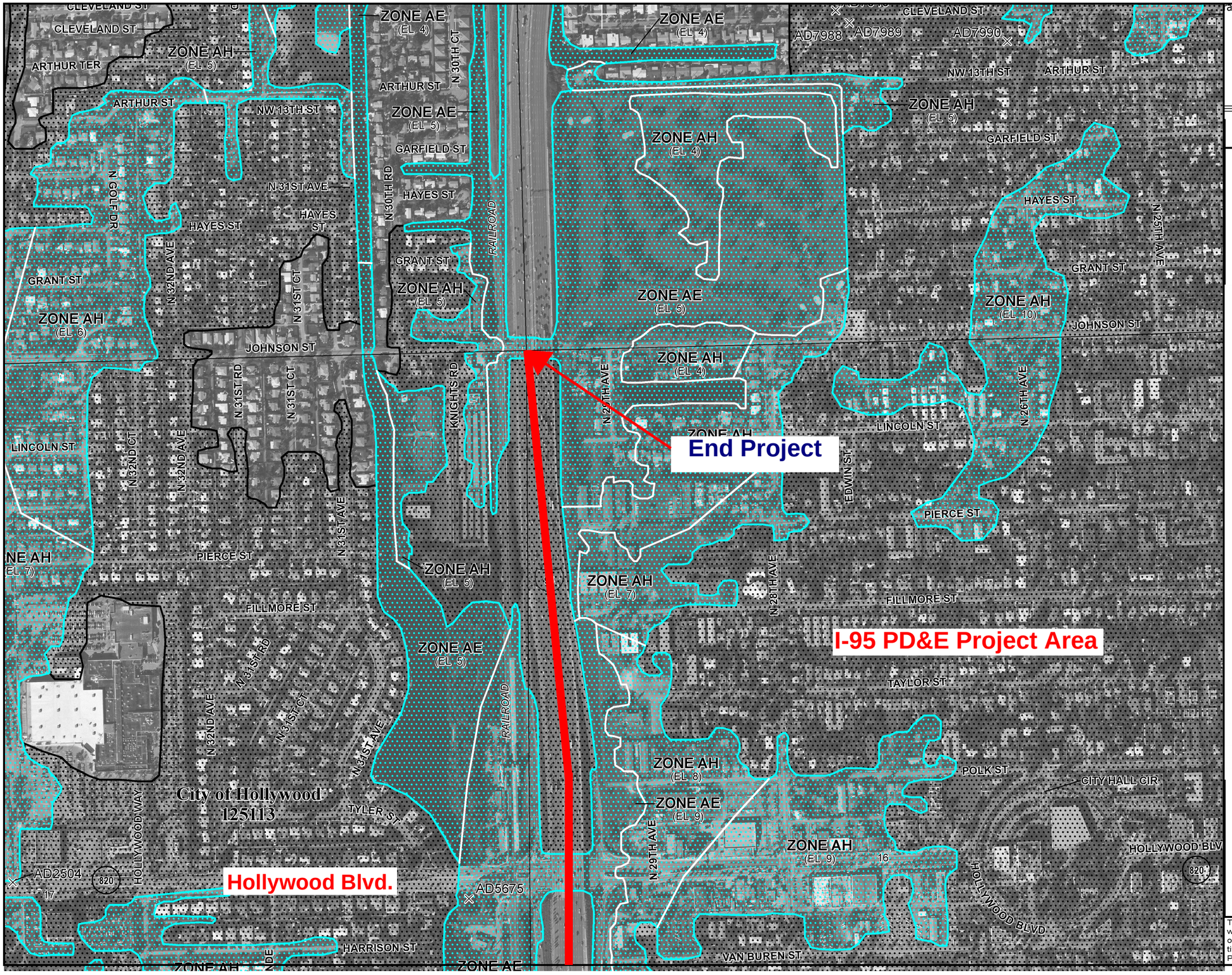
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

rance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

0 250 500 750 1,000 FEET



NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0568H

FIRM

FLOOD INSURANCE RATE MAP

BROWARD COUNTY, FLORIDA

AND INCORPORATED AREAS

PANEL 568 OF 751

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HOLLYWOOD, CITY OF	125113	0568	H

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
12011C0568H

EFFECTIVE DATE
AUGUST 18, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX G

Pre vs Post Development Areas, Basins Water Quality and Peak Attenuation per Basin, Stormwater Management Summary and Stormwater Management Areas / Pond-Swale Storage Calculations

TABLE 1. WATER QUALITY/QUANTITY SUMMARY															
Basin Area Calculation							Water Quality Calculation Summary	Water Quantity Calculation Summary	Required Storage For Stormwater Management	Storage Calculation Summary					Remarks
Project Basin		Station		Side	Total Area	Impervious Area	Water Quality Treatment Req'd	Net Runoff Increase (Post-Pre)		Available Storage within Exist. R/W (Ac.ft.)	Additional Storage Needed outside Exist. R/W (Ac.ft.)	Additional Storage Provided outside Exist. R/W (Ac.ft.)	Additional Storage Provided in French Drain (Ac.ft.)	Deficit/Surplus Storage (Ac.ft.)	
No.	Name	From	To	LT/RT	(Ac.)	(Ac.)	(Ac.ft.)	(Ac.ft.)	(Ac.ft.)						
1	Basin 1L	185+00	247+38	LT	24.19	20.91	4.36	6.85	6.85	4.95	1.90	0.89			Parcel 514228590010 (Partial)
2	Basin 1R	198+75	247+38	RT	19.09	13.28	2.77	2.96	2.96	3.01	-0.05	0.00			
From beginning of the project to Hallandale Beach Blvd. (Basin 1)									**9.82**	**7.96**	**1.86**	**0.89**	**0.98**	**0.01**	24" FD of 908 ft, 36" FD of 240 ft
3	Basin 2A-L	247+38	276+38	LT	12.75	12.32	2.18	5.23	5.23	0.00	5.23	6.69			Parcels 514228710010, 514221010131, 514228640010, 514228740010 & 514228000102
4	Basin 2B-L	276+38	287+92	LT	4.42	3.71	0.77	-0.05	0.77	0.00	0.77	0.00			
5	Basin 2A-R	247+38	276+38	RT	11.58	10.28	2.14	3.17	3.17	1.38	1.79	0.00			514228000092 & 514228000093
6	Basin 2B-R	276+38	287+92	RT	5.91	4.53	0.94	1.84	1.84	0.00	1.84	2.10			Parcel 514221280013
From Hallandale Beach Blvd. to Pembroke Road. (Basin 2)									**11.01**	**1.38**	**9.63**	**8.79**	**0.86**	**0.02**	36" FD of 325 ft
7	Basin 3A	287+92	322+01	RT	25.12	23.79	4.96	7.56	7.56	0.19	7.37	0.00			
8	Basin 3B-L	322+01	341+98	LT	10.13	7.26	1.51	2.20	2.20	0.62	1.58	0.00			
9	Basin 3B-R	322+01	341+98	RT	10.22	8.85	1.84	3.06	3.06	0.78	2.29	0.00			
From Pembroke Road to Hollywood Blvd. (Basin 3)									**12.82**	**1.59**	**11.23**	**0.00**	**9.29**	**(1.94)**	Provide in Sunset Golf Course; 24" FD of 1134 ft, 36" FD of 4466 ft
10	Basin 4L	341+98	369+46	LT	12.62	10.82	2.25	3.64	3.64	1.43	0.00	0.00			
11	Basin 4R	341+98	369+46	RT	12.81	9.15	1.91	2.85	2.85	4.66	0.00	0.69			Parcels 514216026520 & 514216026530
From Hollywood Blvd. to end of the project (Basin 4)									**6.49**	**6.09**	**0.00**	**0.69**	**0.00**	**0.29**	

Note: () indicates deficit volume

Minor discrepancy in calculation is due to rounding off numbers in excel sheet.

Basin 3 (Basin 3A, Basin 3BL & Basin 3B-R) - deficit of 1.94 ac-ft

Basin 4 (Basin 4L and Basin 4R) - surplus of 0.29 ac-ft

Therefore 1.61 ac-ft will be provided in Sunset Golf Course Pond

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 1L
POND No.

Designed By: DC
Checked By: MSP
Date: 06/09/21

OUTFALL C-9/ Snake Creek Canal

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	185+00	185+00
TO STA.	ft	247+38	247+38
LENGHT	ft	6237.95	6237.95
BASIN WIDTH	ft	168.9	168.9
PAVED WIDTH	ft	56	146
TOTAL AREA			
INSIDE ROW	Ac	24.19	24.19
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	24.19	24.19
IMP. AREA			
PAVED AREAS	Ac	8.02	20.91
WET OUT AREA	Ac	0.00	0.00
OTHER IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	9.01	20.91
PER. AREA			
Ap	Ac	15.18	3.28

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		2.02
2.5" on Pav. Area	Ac-ft		4.36
Greater of Above	Ac-ft		**4.36**

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A		PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA					
Paved Areas		98	8.02	98	20.91
Lakes and wet areas		100	0.00	100	0.00
Other		98	0.99	98	0.00
SUB-TOTAL (Ai)		**98.00**	**9.01**	**98.00**	**20.91**
PER. AREA					
Gravel Roads		91	0.00	91	0.00
Dirt Roads		89	0.00	89	0.00
Cultivated Land		91	0.00	91	0.00
Pasture or range		80	0.00	80	0.00
Meadow, good cond.		78	0.00	78	0.00
Wood or forest land		83	0.00	83	0.00
Lawns/sod, fair cond.		49	15.18	49	3.28
Other		0	0.00	0	0.00
SUB-TOTAL (Ap)		**49**	**15.18**	**49**	**3.28**
TOTAL AREA (At= Ai+Ap)					
CNw=Sum(A*CN)/At		**67**	**24.19**	**91**	**24.19**
DESIGN RAINFALL (25yr-72hr) (P)	in		13.4		13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in		4.87		0.95
DIRECT RUNOFF: R=(P-0.2S)^2/(P+0.8S)	in		8.93		12.33
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft		18.00		24.85

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **6.85**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 1R
POND No.
OUTFALL C-9/ Snake Creek Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:	AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA. ft	198+75	198+75
TO STA. ft	247+38	247+38
LENGHT ft	4862.95	4862.95
BASIN WIDTH ft	182	171
PAVED WIDTH ft	56	119
TOTAL AREA		
INSIDE ROW Ac	20.32	19.09
OUTSIDE ROW Ac	0	0
TOTAL AREA Ac	20.32	19.09
IMP. AREA		
PAVED AREAS Ac	6.25	13.28
WET OUT AREA Ac	0.00	0.00
OTHER IMP. AREA (Ramp) Ac	0.99	0.00
TOTAL (Ai) Ac	7.24	13.28
PER. AREA		
Ap Ac	13.07	5.81

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98	6.25	98	13.28
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	0.00
SUB-TOTAL (Ai)	**98.00**	**7.24**	**98.00**	**13.28**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	13.07	49	5.81
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**13.07**	**49**	**5.81**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**66**	**20.32**	**83**	**19.09**

WET DETENTION	SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin Ac-ft		1.59
2.5" on Pav. Area Ac-ft		2.77
Greater of Above Ac-ft		**2.77**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	5.04	2.03
DIRECT RUNOFF: R=(P-0.2S)^2/(P+0.8S)	in	8.81	11.23
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	14.91	17.87

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **2.96**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 2A-L
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	247+38	247+38
TO STA.	ft	276+38	276+38
LENGHT	ft	2900	2900
BASIN WIDTH	ft	164	164
PAVED WIDTH	ft	56	157.5
TOTAL AREA			
INSIDE ROW	Ac	10.92	10.92
OUTSIDE ROW	Ac	0	1.83
TOTAL AREA	Ac	10.92	12.75
IMP. AREA			
PAVED AREAS	Ac	3.73	10.49
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	1.83
TOTAL (Ai)	Ac	4.72	12.32
PER. AREA			
Ap	Ac	6.20	0.43

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		1.06
2.5" on Pav. Area	Ac-ft		2.18
Greater of Above	Ac-ft		**2.18**

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	3.73	98	10.49
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	1.83
SUB-TOTAL (Ai)	**98.00**	**4.72**	**98.00**	**12.32**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	6.20	49	0.43
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**6.20**	**49**	**0.43**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**70.2**	**10.92**	**96.3**	**12.75**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	4.25	0.38
DIRECT RUNOFF: $R=(P-0.2S)^2/(P+0.8S)$	in	9.38	12.95
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	8.53	13.76

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **5.23**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 2A-R
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	247+38	247+38
TO STA.	ft	276+38	276+38
LENGHT	ft	2899.61	2899.61
BASIN WIDTH	ft	174	174
PAVED WIDTH	ft	56	154.5
TOTAL AREA			
INSIDE ROW	Ac	11.58	11.58
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	11.58	11.58
IMP. AREA			
PAVED AREAS	Ac	3.73	10.28
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	4.72	10.28
PER. AREA			
Ap	Ac	6.86	1.30

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		0.97
2.5" on Pav. Area	Ac-ft		2.14
Greater of Above	Ac-ft		**2.14**

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	3.73	98	10.28
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	0.00
SUB-TOTAL (Ai)	**98.00**	**4.72**	**98.00**	**10.28**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	6.86	49	1.30
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**6.86**	**49**	**1.30**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**69.0**	**11.58**	**92.5**	**11.58**

		PRE-DEV.	POST-DEV.
DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	4.50	0.81
DIRECT RUNOFF: R=(P-0.2S)^2/(P+0.8S)	in	9.19	12.47
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	8.87	12.04

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **3.17**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 2B-L
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	276+38	276+38
TO STA.	ft	287+92	287+92
LENGHT	ft	1153.98	1153.98
BASIN WIDTH	ft	167	167
PAVED WIDTH	ft	106	140
TOTAL AREA			
INSIDE ROW	Ac	4.42	4.42
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	4.42	4.42
IMP. AREA			
PAVED AREAS	Ac	2.81	3.71
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	3.80	3.71
PER. AREA			
Ap	Ac	0.62	0.72

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		0.37
2.5" on Pav. Area	Ac-ft		0.77
Greater of Above	Ac-ft		**0.77**

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A		PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA					
Paved Areas		98.00	2.81	98	3.71
Lakes and wet areas		100	0.00	100	0.00
Other		98	0.99	98	0.00
SUB-TOTAL (Ai)		**98.00**	**3.80**	**98.00**	**3.71**
PER. AREA					
Gravel Roads		91	0.00	91	0.00
Dirt Roads		89	0.00	89	0.00
Cultivated Land		91	0.00	91	0.00
Pasture or range		80	0.00	80	0.00
Meadow, good cond.		78	0.00	78	0.00
Wood or forest land		83	0.00	83	0.00
Lawns/sod, fair cond.		49	0.62	49	0.72
Other		0	0.00	0	0.00
SUB-TOTAL (Ap)		**49**	**0.62**	**49**	**0.72**
TOTAL AREA (At= Ai+Ap)					
CNw=Sum(A*CN)/At		**91.1**	**4.42**	**90.1**	**4.42**
DESIGN RAINFALL (25yr-72hr) (P)	in		13.4		13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in		0.98		1.10
DIRECT RUNOFF: $R=(P-0.2S)^2/(P+0.8S)$	in		12.29		12.16
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft		4.53		4.48

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **-0.05**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 2B-R
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	276+38	276+38
TO STA.	ft	287+92	287+92
LENGHT	ft	1153.98	1153.98
BASIN WIDTH	ft	176	223
PAVED WIDTH	ft	56	171
TOTAL AREA			
INSIDE ROW	Ac	4.66	5.91
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	4.66	5.91
IMP. AREA			
PAVED AREAS	Ac	1.48	4.53
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	2.48	4.53
PER. AREA			
Ap	Ac	2.19	1.38

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		0.49
2.5" on Pav. Area	Ac-ft		0.94
Greater of Above	Ac-ft		**0.94**

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	1.48	98	4.53
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	0.00
SUB-TOTAL (Ai)	**98.00**	**2.48**	**98.00**	**4.53**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	2.19	49	1.38
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**2.19**	**49**	**1.38**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**75.0**	**4.66**	**86.6**	**5.91**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	3.33	1.55
DIRECT RUNOFF: $R=(P-0.2S)^2/(P+0.8S)$	in	10.09	11.70
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	3.92	5.76

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **1.84**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 3A
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	287+92	287+92
TO STA.	ft	322+01	322+01
LENGHT	ft	3409	3409
BASIN WIDTH	ft	315	321
PAVED WIDTH	ft	112	304
TOTAL AREA			
INSIDE ROW	Ac	24.65	25.12
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	24.65	25.12
IMP. AREA			
PAVED AREAS	Ac	8.77	23.79
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	1.98	0.00
TOTAL (Ai)	Ac	10.75	23.79
PER. AREA			
Ap	Ac	13.90	1.33

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	8.77	98	23.79
Lakes and wet areas	100	0.00	100	0.00
Other	98	1.98	98	0.00
SUB-TOTAL (Ai)	**98.00**	**10.75**	**98**	**23.79**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	13.90	49	1.33
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**13.90**	**49**	**1.33**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**70**	**24.65**	**95**	**25.12**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	4.21	0.48
DIRECT RUNOFF: R=(P-0.2S)^2/(P+0.8S)	in	9.40	12.84
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	19.32	26.88

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **7.56**

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		2.09
2.5" on Pav. Area	Ac-ft		4.96
Greater of Above	Ac-ft		**4.96**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 3B-L
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	322+01	322+01
TO STA.	ft	341+98	341+98
LENGHT	ft	1997.3	1997.3
BASIN WIDTH	ft	221	221
PAVED WIDTH	ft	56	158.3
TOTAL AREA			
INSIDE ROW	Ac	10.13	10.13
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	10.13	10.13
IMP. AREA			
PAVED AREAS	Ac	2.57	7.26
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	3.56	7.26
PER. AREA			
Ap	Ac	6.57	2.87

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		0.84
2.5" on Pav. Area	Ac-ft		1.51
Greater of Above	Ac-ft		**1.51**

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	2.57	98	7.26
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	0.00
SUB-TOTAL (Ai)	**98.00**	**3.56**	**98**	**7.26**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	6.57	49	2.87
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**6.57**	**49**	**2.87**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**66**	**10.13**	**84**	**10.13**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	5.10	1.89
DIRECT RUNOFF: $R=(P-0.2S)^2/(P+0.8S)$	in	8.77	11.37
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	7.40	9.60

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **2.20**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 3B-R
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	322+01	322+01
TO STA.	ft	341+98	341+98
LENGHT	ft	1997.3	1997.3
BASIN WIDTH	ft	223	223
PAVED WIDTH	ft	56	193
TOTAL AREA			
INSIDE ROW	Ac	10.22	10.22
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	10.22	10.22
IMP. AREA			
PAVED AREAS	Ac	2.57	8.85
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	3.56	8.85
PER. AREA			
Ap	Ac	6.67	1.38

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		0.85
2.5" on Pav. Area	Ac-ft		1.84
Greater of Above	Ac-ft		**1.84**

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	2.57	98	8.85
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	0.00
SUB-TOTAL (Ai)	**98.00**	**3.56**	**98**	**8.85**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	6.67	49	1.38
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**6.67**	**49**	**1.38**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**66**	**10.22**	**91**	**10.22**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	5.14	0.94
DIRECT RUNOFF: $R=(P-0.2S)^2/(P+0.8S)$	in	8.74	12.33
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	7.45	10.51

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **3.06**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 4L
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	341+98	341+98
TO STA.	ft	369+46	369+46
LENGHT	ft	2748.07	2748.07
BASIN WIDTH	ft	200	200
PAVED WIDTH	ft	56	171.5
TOTAL AREA			
INSIDE ROW	Ac	12.62	12.62
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	12.62	12.62
IMP. AREA			
PAVED AREAS	Ac	3.53	10.82
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	4.52	10.82
PER. AREA			
Ap	Ac	8.09	1.80

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		1.05
2.5" on Pav. Area	Ac-ft		2.25
Greater of Above	Ac-ft		**2.25**

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	3.53	98	10.82
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	0.00
SUB-TOTAL (Ai)	**98.00**	**4.52**	**98**	**10.82**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	8.09	49	1.80
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**8.09**	**49**	**1.80**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**67**	**12.62**	**91**	**12.62**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	5.02	0.99
DIRECT RUNOFF: $R=(P-0.2S)^2/(P+0.8S)$	in	8.82	12.28
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	9.28	12.92

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **3.64**

Project Name: I-95 (SR 9) Widening PD Study

Table 2. Basin Water Quality and Peak Attenuation per Basin

Project No. 436903-1-22-02

Drainage Area: Basin 4R
POND No.
OUTFALL C-10/ Hollywood Canal

Designed By: DC
Checked By: MSP
Date: 06/09/21

WATER QUALITY CRITERIA FROM SFWMD

DATA:		AREAS PRE-DEV.	AREAS POST-DEV.
FROM STA.	ft	341+98	341+98
TO STA.	ft	369+46	369+46
LENGHT	ft	2748.07	2748.07
BASIN WIDTH	ft	200	203
PAVED WIDTH	ft	56	145
TOTAL AREA			
INSIDE ROW	Ac	12.62	12.81
OUTSIDE ROW	Ac	0	0
TOTAL AREA	Ac	12.62	12.81
IMP. AREA			
PAVED AREAS	Ac	3.53	9.15
WET OUT AREA	Ac	0.00	0.00
IMP. AREA (Ramp)	Ac	0.99	0.00
TOTAL (Ai)	Ac	4.52	9.15
PER. AREA			
Ap	Ac	8.09	3.66

AREAS OUT OF CORRIDOR (Ac)		
DESCR.	PRE-DEV.	POST-DEV.
Pond		
Ao=		

PROP. PAV. WIDTH (FT)	

ADDITIONAL PAVED AREAS		
ITEM	AMOUNT (EA)	UNIT A. (Ac)
MED. OP.		
TURN LANE		
TURN OUT		
TOTAL AREAS (Ac)		0.00

WET DETENTION		SFWMD PRE-DEV.	SFWMD POST-DEV
1" on the Basin	Ac-ft		1.07
2.5" on Pav. Area	Ac-ft		1.91
Greater of Above	Ac-ft		**1.91**

PEAK ATTENUATION: SCS METHOD

SOIL TYPE A	PRE-DEV. CN	PRE-DEV. AREA (Ac)	POST-DEV. CN	POST-DEV. AREA (Ac)
IMP. AREA				
Paved Areas	98.00	3.53	98	9.15
Lakes and wet areas	100	0.00	100	0.00
Other	98	0.99	98	0.00
SUB-TOTAL (Ai)	**98.00**	**4.52**	**98**	**9.15**
PER. AREA				
Gravel Roads	91	0.00	91	0.00
Dirt Roads	89	0.00	89	0.00
Cultivated Land	91	0.00	91	0.00
Pasture or range	80	0.00	80	0.00
Meadow, good cond.	78	0.00	78	0.00
Wood or forest land	83	0.00	83	0.00
Lawns/sod, fair cond.	49	8.09	49	3.66
Other	0	0.00	0	0.00
SUB-TOTAL (Ap)	**49**	**8.09**	**49**	**3.66**
TOTAL AREA (At= Ai+Ap)				
CNw=Sum(A*CN)/At	**67**	**12.62**	**84**	**12.81**

DESIGN RAINFALL (25yr-72hr) (P)	in	13.4	13.4
WATERSHED STORAGE: S=(1000/CNw)-10	in	5.02	1.90
DIRECT RUNOFF: R=(P-0.2S)^2/(P+0.8S)	in	8.82	11.36
TOTAL RUNOFF: (Rt=At*R/12)	Ac-ft	9.28	12.12

NET RUNOFF = POST DEV. RUNOFF - PRE DEV. RUNOFF Ac-ft **2.85**

Table 3. Pre Vs. Post Development Areas					
STATION LIMITS	**BASIN**	**PRE-DEVELOPMENT**		**POST-DEVELOPMENT**	
		Pervious (Ac)	**Impervious (Ac)**	**Pervious (Ac)**	**Impervious (Ac)**
Project limit / SW 11th Street					
	Basin 1L	15.18	9.01	3.28	20.91
	Basin 1R	13.07	7.24	5.81	13.28
	SUBTOTAL	**28.25**	**16.25**	**9.08**	**34.19**
Hallandale Blvd					
	Basin 2A-L	6.20	4.72	0.43	12.32
	Basin 2A-R	6.86	4.72	1.30	10.28
	Basin 2B-L	0.62	3.80	0.72	3.71
	Basin 2B-R	2.19	2.48	1.38	4.53
	SUBTOTAL	**15.87**	**15.71**	**3.82**	**30.84**
Pembroke Road					
	Basin 3A	13.90	10.75	1.33	23.79
	Basin 3B-L	6.57	3.56	2.87	7.26
	Basin 3B-R	6.67	3.56	1.38	8.85
	SUBTOTAL	**27.14**	**17.87**	**5.58**	**39.90**
Hollywood Blvd					
	Basin 4L	8.09	4.52	1.80	10.82
	Basin 4R	8.09	4.52	3.66	9.15
	SUBTOTAL	**16.19**	**9.05**	**5.46**	**19.97**
Project Limit / Johnson Street					

Table 2. STORMWATER MANAGEMENT AREAS
POND-SWALE STORAGE CALCULATIONS (RT)

PREPARED BY	DC
CHECKED BY	RH
DATE:	6/9/21
REVISED:	AP

BASIN	SWALE					POND/SWALE STORAGE CALCULATION (RT)							REMARKS
Name	Name	Beg. Sta	End Sta	Provided Storage Volume within Exist. R/W (Ft^3)	*Provided Storage Volume outside Exist. R/W* (*Ft^3*)	Length of ditch (Ft)	LT-Slope X	RT-Slope Y	Avg. Bot. Width B	Avg. Swale Depth (Excluding Free Board) d	Top Width W	X-Area A	
Basin 1R	**S-R1**	209+00	217+00	34144	*0*	800	2.00	2.00	15.00	**2.20**	23.80	42.68	Modification of existing Swale
	S-R2	217+00	226+00	48312	*0*	900	2.00	2.00	20.00	**2.20**	28.80	53.68	Modification of existing Swale
	S-R3	226+00	230+00	18832	*0*	400	2.00	2.00	17.00	**2.20**	25.80	47.08	Modification of existing Swale
	S-R4	245+40	246+70	29858	*0*	130	2.00	2.00	100.00	**2.20**	108.80	229.68	Modification of existing Pond
			Subtotal =	**3.01 Ac-ft**	***0.00 Ac-ft***								
Basin 2A-R	**S-R5**	*147+20	*149+00	36225	*0*	180	3.00	3.00	73.00	**2.50**	88.00	201.25	Modification of existing Pond at NE corner of Hallandale
	S-R6	249+50	255+00	24063	*0*	550	3.00	3.00	10.00	**2.50**	25.00	43.75	Modification of existing Swale
	S-R7	257+10	258+80	0	*39313*	170	3.00	3.00	85.00	**2.50**	100.00	231.25	**Proposed Pond ROW parcels**
			Subtotal =	**1.38 Ac-ft**	***0.00 Ac-ft***								
Basin 2B-R	**S-R8**	281+05	286+90	0	*91406*	585	3.00	3.00	55.00	**2.50**	70.00	156.25	**Proposed Swale ROW parcels**
			Subtotal =	**0.00 Ac-ft**	***2.10 Ac-ft***								
	S-R9	292+00	295+00	8400	*0*	300	3.00	3.00	8.00	**2.00**	20.00	28.00	Modification of existing Swale
			Subtotal =	**0.19 Ac-ft**	***0.00 Ac-ft***								
Basin 3B-R	**S-R10**	329+00	332+70	15540	*0*	370	3.00	3.00	15.00	**2.00**	27.00	42.00	Modification of existing Swale
	S-R11	339+80	341+00	18240	*0*	120	2.00	2.00	72.00	**2.00**	80.00	152.00	Modification of existing pond at SE corner of Hollywood
			Subtotal =	**0.78 Ac-ft**	***0.00 Ac-ft***								
Basin 4R	**S-R12**	343+10	344+21	39738	*0*	111	2.00	2.00	175.00	**2.00**	183.00	358.00	Modification of existing pond at NE corner of Hollywood
	S-R13	346+85	348+65	0	*30240*	180	2.00	2.00	80.00	**2.00**	88.00	168.00	**Proposed Swale ROW Parcels**
	S-R14	349+75	355+00	61950	*0*	525	2.00	2.00	55.00	**2.00**	63.00	118.00	Modification of existing Swale with Wall
	S-R15	357+00	368+50	101200	*0*	1150	2.00	2.00	40.00	**2.00**	48.00	88.00	Modification of existing Swale with Wall
			Subtotal =	**4.66 Ac-ft**	***0.69 Ac-ft***								

* Stationing along Hallandale Beach Boulevard
** Stationing along Pembroke Road

Table 2. STORMWATER MANAGEMENT AREAS
POND-SWALE STORAGE CALCULATIONS (LT)

PREPARED BY	DC
CHECKED BY	RH
DATE:	6/9/21
REVISED:	AP

BASIN	SWALE					POND/SWALE STORAGE CALCULATIONS (LT)							REMARKS
Name	Name	Beg. Sta	End Sta	Provided Storage Volume within Exist. R/W (Ft^3)	*Provided Storage Volume outside Exist. R/W* (*Ft^3*)	Length of ditch (Ft)	LT-Slope X	RT-Slope Y	Avg. Bot. Width B	Avg. Swale Depth (Excluding Free Board) d	Top Width W	X-Area A	
Basin 1L	**S-L1**	185+00	208+00	215625	*0*	2300	3.00	3.00	30.00	**2.50**	45.00	93.75	Modification of existing Swale
	S-L2	223+00	228+00	0	*38750*	500	3.00	3.00	23.50	**2.50**	38.50	77.50	**Proposed Pond outside Exist. R/W**
			Subtotal =	**4.95 Ac-ft**	**0.89 Ac-ft**								
Basin 2A-L	**S-L3**	248+35	254+75	0	*108000*	640	3.00	3.00	60.00	**2.50**	75.00	168.75	**Proposed Pond outside Exist. R/W**
	S-L4	255+00	263+38	0	*183313*	838	3.00	3.00	80.00	**2.50**	95.00	218.75	**Proposed Pond outside Exist. R/W**
			Subtotal =	**0.00 Ac-ft**	***6.69 Ac-ft***								
Basin 3B-L	**S-L5**	325+50	340+50	27038	*0*	1500	3.00	2.00	48.00	**2.00**	58.00	106.00	Modification of existing Swale
			Subtotal =	**0.62 Ac-ft**	***0.00 Ac-ft***								
Basin 4L	**S-L6**	349+00	362+00	39000	*0*	1300	3.00	2.00	10.00	**2.00**	20.00	30.00	Modification of existing Swale (Wall is needed)
	S-L7	362+00	368+90	23460	*0*	690	3.00	2.00	12.00	**2.00**	22.00	34.00	Modification of existing Swale (Wall is needed)
			Subtotal =	**1.43 Ac-ft**	***0.00 Ac-ft***								

APPENDIX H

Correspondence

Meeting Minutes

Project:	FPID#436903-1-22-02, I-95 PD&E Study
Subject:	I-95 PD&E Study from South of Hallandale Beach Blvd. to North of Hollywood Blvd.
Date:	Wednesday, August 01, 2018
Location:	City of Hollywood City Hall, Rm. 215
Attendees:	See attached sign-in sheet

The meeting took place in the City of Hollywood City Hall at 2 PM to discuss the PD&E Study and drainage improvements for the I-95 corridor from South of Hallandale Beach Blvd. to North of Hollywood Blvd.

Introduction to the project

After introductions, Ryan Solis-Rios began describing the scope of the project and discussed the project's schedule. He mentioned that there is a public hearing scheduled to take place sometime in 2019 to present recommended alternative to the public. The study is expected to end in 2020. Mr. Solis-Rios continued describing the purpose of the project, stating that access on the highway and congestion at the interchange needs to be improved. Currently, there are no construction funds set aside for the project yet. Mr. Solis-Rios clarified that the I-95 express lanes will not be touched for this project.

Existing Drainage

After the description of the project's scope of work, Mohammad Pervez began to talk about the existing drainage system along I-95. Project limits and affected areas were pointed out on a printed aerial map of the area, as well as current outfalls at C-9 and C-10. Everything south of Hallandale drains to C-9 and everything north goes to C-10. Mr. Pervez stated that the I-95 currently drains off to the active swales on both sides. There is an 84'' pipe crossing under I-95 connecting Chavez Lake to the pump station within I-95 R/W. The Pump station discharges to a conveyance channel along CSX railroad which ultimately discharges to Hollywood/C-10 Canal. Mr. Pervez also stated that part of the runoff from SR 824 is currently being treated in the Orangebrook Golf Course before discharging to the Hollywood/C-10 Canal. Based on the permit history SR 824 is allowed to discharge 100 cfs to the Orangebrook Golf Course.

Proposed Drainage

Mr. Pervez mentioned that the improvements will include widening of the roadway which will fill-up the existing roadside swales. The improvement will consider new swales and stormwater facilities (some outside of the existing right of way, near service interchanges) where possible but it will likely not be enough to meet stormwater needs for the project. He also mentioned that one viable option to manage stormwater is to treat and attenuate the I-95 runoff in the Orangebrook Golf Course. Mr. Lopez asked how the additional runoff from Hollywood Blvd. and Pembroke Rd. will be managed and how much storage is needed. Mr. Pervez suggested that one alternative under consideration by the PD&E Study Team is to expand the ponds within the golf course to retain more water and to reduce the increased

discharge. He mentioned that the project will need approximately 17 acre-ft of storage based on the preliminary calculation.

While discussing about the drainage, Mr. Lopez reported that there is a drainage problem with private properties in the area along Johnson Street. The swales are overflowing to the private properties and losing discharge. A recommendation was made by Mr. Pervez to lower the swale bottom but keep at least 1 foot above seasonal high water to improve drainage and water retention. As a follow-up response after the meeting FDOT indicated that they are aware of it and FDOT Maintenance is investigating the issue. The PD&E team inquired about the Sunset Golf Course, a private golf course, for a potential stormwater management area. Mr. Lopez responded saying that the City will not be purchasing it, claiming it is too expensive right now for the City of Hollywood. PD&E Study Team stated that since Sunset golf course is to the very north end of the project, it will not be used for analysis but can be marked as a potential pond site for future projects to the north of this project limit.

Additional discussions related to the project

Mr. Vazquez inquired about the status of the Hillcrest Golf Course. Mr. Lopez mentioned that the Hillcrest Golf Course is no longer available, but the ponds still exist. Mr. Lopez stated that the drainage right-of-way for FDOT still exist and a diversion of flow to the Hillcrest Golf Course ponds is present in order to ease the burden of additional runoff at the Orangebrook Golf Course. Since the Hillcrest Golf Course (not owned by the City) will no longer be a Golf Course and further away from the project location, it will not be a viable stormwater management option for the project. The original Hillcrest Golf Course permit does not show any outfalls.

Mr. Pervez mentioned that the team will meet with South Florida Water Management District (SFWMD) and present the stormwater management options for the project.

Mr. Solis-Rios talked more about the project, stating that the timing of construction for the potential improvements is not yet known. The study is scheduled to end in 2020. Mr. Solis-Rios also mentioned that the final design phase of this project may overlap with the PD&E Study. The design usually does not change much after the public hearing. Mr. Vazquez mentioned that the City will have a Bond Referendum in March of 2019 and improvements to Orangebrook Golf Course is in the bond program. The City noted that improvements to Orangebrook Golf Course from the Bond program could include a full renovation or partial improvements, based on the funding availability. Mr. Vazquez asked what is needed from the City for the meeting. Mr. Solis-Rios stated that meeting minutes needed to be created to show that the project team met with the City of Hollywood to discuss the options and that there is an agreement that the Orangebrook Golf Course is a viable alternative for the stormwater management for the project. It was also discussed that FDOT would revisit the stormwater management alternatives with the City and all stakeholders in the final phase of the PD&E Study and further discuss the agreement with the City for the Orangebrook Golf Course.

The meeting concluded at 3:30 P.M.

Should anyone have additional questions or additions to this record of meeting, please respond to this email sender no later than 5 business days from receipt.

DRAINAGE COORDINATION MEETING WITH CITY OF HOLLYWOOD

I-95 PD&E Study
From South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID # 436903-1-22-02
ETDM# 14254

Wednesday, August 1, 2018
2:00 PM - 3:30 PM

SIGN IN SHEET

NAME	Initial	FDOT / COMPANY	TELEPHONE	EMAIL
1) Kenzot Jasmin		FDOT- D4	(954) 777-4462	Kenzot.Jasmin@dot.state.fl.us
2) Hui Shi	HS	FDOT	(954) 777-4657	Hui.Shi@dot.state.fl.us
3) Claudia Calvo	C.C.	FDOT	(954) 777-4476	Claudia.Calvo@dot.state.fl.us
4) Georgi Celusnek		FDOT	(954) 777-4462	Georgi.Celusnek@dot.state.fl.us
5) Luis Lopez	L.L.	City of Hollywood	(954) 921-3251	llopez@hollywoodfl.org
6) David Vazquez	DV	City of Hollywood	(954) 921-3404	DVazquez@hollywoodfl.org
7) Gus Zambrano		City of Hollywood	(954) 921-3201	GZambrano@hollywoodfl.org
8) Rick Mitinger		City of Hollywood	(954) 921-3990	RMitinger@hollywoodfl.org
9) Steve Joseph		City of Hollywood	(954) 967-4455	SJoseph@hollywoodfl.org
10) Mike Ciscar		The Corradino Group	(305) 586-7107	Mciscar@corradino.com
11) Ryan Solis-Rios	RJR	The Corradino Group	(954) 777-0044	Rsolis-rios@corradino.com
12) Will Suero	W.S.	HDR	(954) 535-1876	Will.Suero@hdrinc.com
13) Mohammad Pervez	M.P.	HDR	(954) 535-1876	Mohammad.Pervez@hdrinc.com
14) Rohan Hameed		HDR	(954) 535-1876	Rohan.Hameed@hdrinc.com
15) Derly Cano		HDR	(954) 535-1876	Derly.Cano@hdrinc.com
16) Christopher Alli	CA	HDR	(954) 535-1876	Christopher.Alli@hdrinc.com
17) Katheline Tabuteau	KT	HDR	(954) 535-1876	Katheline.Tabuteau@hdrinc.com
18) Imtyaz Shaikh		HDR	(954) 535-1876	Imtyazahmad.Shaikh@hdrinc.com
19) [illegible]		City of Hollywood		[illegible]
20) Wilford Zephyr	W.Z.	City of Hollywood	(954) 921-3994	wzephyr@hollywoodfl.org

DRAINAGE COORDINATION MEETING
WITH CITY OF HOLLYWOOD

I-95 PD&E Study
From South of Hallandale Beach Boulevard (SR 858)
to North of Hollywood Boulevard (SR 820)
Broward County, Florida
FPID # 436903-1-22-02
ETDM# 14254

Tuesday, November 10, 2020
10:00 AM

MEETING MINUTES

The summary of the meeting minutes is noted below in bold italics.

1. Introduction to the Project

a) Scope of the Project
b) Purpose and Need
c) Preferred Alternative
d) Schedule

- ***The Florida Department of Transportation (FDOT) staff and project team introduced themselves (see meeting invite for list of attendees).***
- ***The PD&E Study team presented a brief PowerPoint presentation of the PD&E Study covering the following information:***
    - ***Project Limits and Study Area***
    - ***Scope of the Project***
    - ***Needs of the Project***
    - ***Preferred Alternative Recommendations***
    - ***Schedule***
- ***The project team also presented a large roll plot depicting the PD&E Study recommended alternative on a plan view showing the number of lanes, proposed improvement areas, roadway cross sections, pond locations and adjacent projects.***

2. Drainage Overview

a) Existing Drainage
    - Existing I-95 Drainage
    - Existing Pembroke Road Drainage
    - I-95 Pump Station - Offsite System

- ***A drainage roll plot was presented depicting the existing and proposed drainage features (culverts, swales, ponds, basins, and pump stations) within the study limits.***
- ***The drainage engineers described all the basins within the study limits.***
  - ***Basin 1 covers from SW 11th Street to Hallandale Beach Boulevard. This basin discharges into the C-9 Snake Creek Canal. Water quality and quantity will be met within FDOT right of way.***
  - ***Basin 2 covers from Hallandale Beach Boulevard to Pembroke Road.***
  - ***Basin 3 covers from Pembroke Road to Hollywood Boulevard.***
  - ***Basin 4 covers from Hollywood Boulevard to Johnson Street.***
  - ***Basins 2, 3 and 4 discharge into the C-10 Canal. Water quality and quantity will be met by utilizing existing FDOT right of way, new right of way takes and using the Orangebrook Golf Course or the abandoned Sunset Golf Course.***

b) Proposed Drainage

- Drainage Criteria - Water Quality and Quantity
  - ***The project team discussed the design criteria being used in this project. The criteria includes FDOT, South Florida Water Management District and local requirements.***

- Proposed Drainage Approach
  - ***Based on the proposed roadway improvements, the existing dry detention swales and ponds will be impacted and volume capacity reduced by the interchange new ramps along I-95. The remaining stormwater facilities will be re-graded to accommodate partially the runoff for the impervious areas. The project will require additional right of way takes to comply with the regulatory agencies' stormwater treatment and attenuation criteria. In addition, runoff from Basin 2 and 3 will be conveyed to either the Orangebrook Golf Course or the abandoned Sunset Golf Course to provide the required stormwater management needs (see the two options below).***
    - ***Option 1 – Add new ponds in non-playable areas within the Orangebrook Golf Course and expand existing ponds draining Pembroke Road. This option will trigger a Section 4(f) process.***
    - ***Option 2 – Utilize the abandoned Sunset Golf Course. This is a recent purchase from the City that will be redesigned to become a passive park. No Section 4(f) process in needed to use this site.***
- Preliminary Water Quality and Quantity Analyses
  - ***Preliminary analyses were conducted to identify the number and locations of ponds. The results will be documented in a Conceptual Drainage Analysis Report.***
- Shared-Use Pond at Orangebrook Golf Course - Opportunities/Challenges/Summary
  - ***The project team identified two potential scenarios to use this golf course.***
    - ***Scenario 1: Use this golf course to meet the required stormwater needs based on current conditions and constructing new ponds outside***

playable areas. The Section 4(f) documentation approach will be to present this conversion of land to be considered a de minimis impact because the playable areas are being avoided. At a minimum, a temporary use of the City's property will be needed for construction.

- ***Scenario 2: Use this golf course to meet the required stormwater needs based on the City's future plan to redevelop the golf course and that this renovation will occur prior to the FDOT's roadway construction project. In this scenario, the City would renovate the golf course and then construct the ponds to FDOT specifications. The FDOT could provide funding for pond construction, but the City would construct them concurrently with their golf course renovations. Therefore, the current Section 4(f) determination will be "No Use" due to the above timing.***

- Shared-Use Pond at Sunset Golf Course - Opportunities/Challenges/Summary
  - ***The project team identified one potential scenario to use this golf course, which was presented as Option 2 above. The opportunity here is that it will not require a Section 4(f) process. The challenge with this site is that it will require a new pump station to pump the runoff from Basins 2 and 3.***

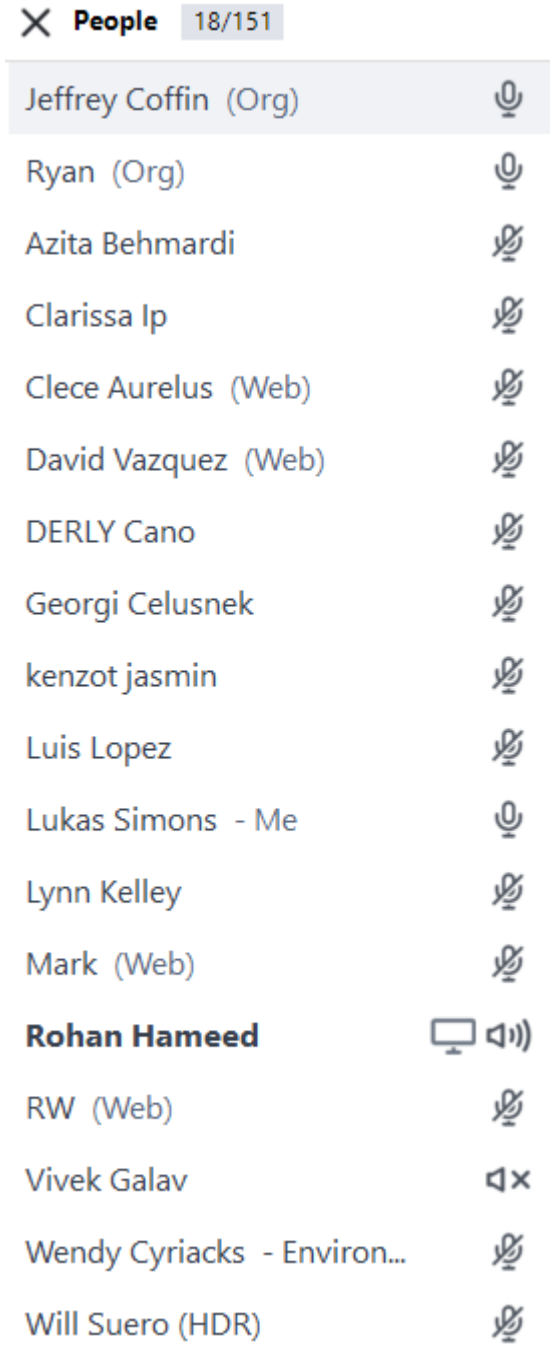
- Recommendation from the Project Team
  - ***The project team recommends proceeding with the abandoned Sunset Golf Course during the PD&E Study phase as it is currently considered an open space property. During the design phase, further evaluation will be done to evaluate both sites and reconsider both locations.***
  - ***FDOT and the City agreed on using the abandoned Sunset Golf Course to meet the stormwater needs in the PD&E Study and obtain LDCA. However, they also both agreed on keeping both golf course options open by documenting them in the official PD&E Study documents and drainage reports. FDOT will reevaluate during the Design phase the use of the Orangebrook Golf Course. By then, City of Hollywood site plans may be available about the renovation/reconstruction of the golf course.***

c) Next Steps

- Feedback from the City
  - ***Raul was concerned about the drainage issues within the abandoned Sunset Golf Course. Residents surrounding the golf course have been complaining about the high elevation of the C-10 Canal. The area of concern is east of I-95 and just south of Johnson Street. The swale is not contained and is discharging into the community.***
  - ***David recommended to continue with evaluating both golf course options. Currently the City has maintenance issues with FDOT that will need to be addressed, which affects future interests between both agencies.***
  - ***Azita asked if there were any other options not using the golf courses. The project team responded that significant ROW impacts will be required to meet the stormwater needs. One example is acquiring the entire NW quadrant of the I-95/Pembroke Road Interchange, which is not viable.***

- ***Luis mentioned that the impacted parcels along Hollywood Boulevard are prime locations for the City. He asked the project team if those parcels could remain available for businesses and/or future developments instead of drainage ponds.***
- ***David mentioned that the next step for the abandoned Sunset Golf Course is a master plan of the park. No rezoning has been issued. He expects a short term and long-term plan. This parcel was purchased as an open space with the intention of being a passive park.***
- ***Azita asked if vacant lots were looked and considered to reduce the 9.14 ac-ft needed from the golf courses. The project team responded that vacant lots were considered. The biggest issue with vacant lots is that these locations need to have connectivity with each other for the ponds to work and eventually discharge to larger bodies. Properties that are being looked at right now are parcels that are being impacted by the proposed roadway improvements.***
- ***Georgi asked regarding the I-595 Project and how they handled their golf courses. In this project, Arrowhead was a private golf course. Therefore, there was no Section 4(f).***

- Discuss an Agreement between FDOT and the City
  - ***Both agencies agreed on the next steps and that we need to continue to coordinate with each other as new information becomes available from both agencies.***
  - ***Kenzot will follow up with FDOT maintenance and operations to make sure all flooding issues at both golf courses can we worked out between both agencies.***


People 18/151
Jeffrey Coffin (Org)
Ryan (Org)
Azita Behmardi
Clarissa Ip
Clece Aurelus (Web)
David Vazquez (Web)
DERLY Cano
Georgi Celusnek
kenzot jasmin
Luis Lopez
Lukas Simons - Me
Lynn Kelley
Mark (Web)
Rohan Hameed
RW (Web)
Vivek Galav
Wendy Cyriacks - Environ...
Will Suero (HDR)

APPENDIX I

Exfiltration Trench Calculations – I95

Form #0115
Rev 08/95

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
SURFACE WATER MANAGEMENT
PERMIT MODIFICATION NO. 06-01979-S

DATE ISSUED: NOVEMBER 10, 1999

PERMITTEE: BROWARD COUNTY BOARD OF COUNTY COMMISSIONERS
(SOUTH COUNTY NEIGHBORHOOD IMPROVEMENT PROJECT PHASE 4)
115 S ANDREWS AVENUE, ROOM 321
FT LAUDERDALE , FL 33301

ORIGINAL PERMIT ISSUED: APRIL 13, 1995
ORIGINAL PROJECT DESCRIPTION: CONSTRUCTION AND OPERATION OF A SURFACE WATER MANAGEMENT SYSTEM TO SERVE A 368 ACRE PROJECT KNOWN AS SOUTH COUNTY NEIGHBORHOOD IMPROVEMENTS PROJECT (SCNIP) PHASE I, WITH TOTAL ON-SITE RETENTION (ORIGINAL PERMIT WAS ISSUED AS CONCEPTUAL APPROVAL ON JULY 14, 1994).

APPROVED MODIFICATION : AUTHORIZATION TO MODIFY PERMIT NO. 06-01979-S FOR CONSTRUCTION AND OPERATION OF A SURFACE WATER MANAGEMENT SYSTEM TO SERVE 256-ACRES (PHASE IV) OF EXISTING MIXED USE DEVELOPMENT (PRIMARILY RESIDENTIAL) WITHIN THE SOUTH COUNTY NEIGHBORHOOD IMPROVEMENT PROJECT (SCNIP)/LAKE FOREST, SECTIONS 9 AND 10 LOCATED IN SOUTHERN BROWARD COUNTY.

PROJECT LOCATION: BROWARD COUNTY , SECTION 29, 30 TWP 51S RGE 42E

PERMIT DURATION: Five years from the date issued to complete construction of the surface water management system as authorized herein. See attached Rule 40E-4.321, Florida Administrative Code.

This Permit Modification is approved pursuant to Application No. 990719-2, dated March 5, 1999. Permittee agrees to hold and save the South Florida Water Management District and its successors harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any activities authorized by this Permit. This Permit is issued under the provisions of Subsections 373.414(11)-(16), Florida Statutes(F.S.), and the Operating Agreement Concerning Regulation Under Part IV, Chapter 373 F.S. between South Florida Water Management District and the Department of Environmental Protection. Issuance of this Permit constitutes certification of compliance with state water quality standards where neccessary pursuant to Section 401, Public Law 92-500, 33 USC Section 1341, unless this Permit is issued pursuant to the net improvement provisions of Subsections 373.414(1)(b), F.S., or as otherwise stated herein.

This Permit Modification may be revoked, suspended, or modified at any time pursuant to the appropriate provisions of Chapter 373, F.S., and Sections 40E-4.351(1), (2), and (4), Florida Administrative Code (F.A.C.). This Permit Modification may be transferred pursuant to the appropriate provisions of Chapter 373, F.S., and Sections 40E-1.6107(1) and (2), and 40E-4.351(1), (2), and (4), F.A.C.

All specifications and special and limiting/general conditions attendant to the original Permit,unless specifically rescinded by this or previous modifications, remain in effect.

This Permit Modification shall be subject to the General Conditions set forth in Rule 40E-4.381,F.A.C.,unless waived or modified by the Governing Board. The Application, and Surface Water Management Staff Review Summary of the Application, including all conditions, and all plans and specifications incorporated by reference, are a part of this Permit Modification. All activities authorized by this Permit Modification shall be implemented as set forth in the plans , specifications , and performance criteria as set forth and incorporated in the Surface Water Management Staff Review Summary. Within 30 days after completion of construction of the permitted activity, the Permittee shall submit a written statement of completion and certification by a registered professional engineer or other appropriate individual, pursuant to the appropriate provisions of Chapter 373, F.S. and Sections 40E-4.361 and 40E-4.381, F.A.C.

In the event the property is sold or otherwise conveyed, the Permittee will remain liable for compliance with this Permit until transfer is approved by the District pursuant to Rule 40E-1.6107,F.A.C.

SPECIAL AND LIMITING CONDITIONS ARE AS FOLLOWS:
SEE PAGES 2-2 OF 4 (7 SPECIAL CONDITIONS).
SEE PAGES 3-4 OF 4 (19 LIMITING CONDITIONS).

PERMIT MODIFICATION APPROVED BY THE GOVERNING BOARD OF THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT

FILED WITH THE CLERK OF THE
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

ON Original signed by:

BY Vern Kaiser

DEPUTY CLERK

BY Original signed by TONY BURNS

ASSISTANT SECRETARY

SCANNED

SPECIAL CONDITIONS

1. THE PERMITTEE SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY EROSION, SHOALING OR WATER QUALITY PROBLEMS THAT RESULT FROM THE CONSTRUCTION OR OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM.

2. MEASURES SHALL BE TAKEN DURING CONSTRUCTION TO INSURE THAT SEDIMENTATION AND/OR TURBIDITY PROBLEMS ARE NOT CREATED IN THE RECEIVING WATER.

3. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THAT ADDITIONAL WATER QUALITY TREATMENT METHODS BE INCORPORATED INTO THE DRAINAGE SYSTEM IF SUCH MEASURES ARE SHOWN TO BE NECESSARY.

4. FACILITIES OTHER THAN THOSE STATED HEREIN SHALL NOT BE CONSTRUCTED WITHOUT AN APPROVED MODIFICATION OF THIS PERMIT.

5. ALL SPECIAL CONDITIONS PREVIOUSLY STIPULATED BY PERMIT NUMBER 06-01979-S REMAIN IN EFFECT UNLESS OTHERWISE REVISED AND SHALL APPLY TO THIS MODIFICATION.

6. OPERATION OF THE SURFACE WATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF BROWARD COUNTY.

7. EXHIBITS 2 THROUGH 27 CONSISTING OF KEY SHEETS; PAVING, GRADING AND DRAINAGE PLANS; AND PAVING, GRADING AND DRAINAGE DETAIL SHEETS, ARE INCORPORATED IN THE PERMIT BY REFERENCE AND ARE LOCATED IN THE PERMIT FILE.

SCANNED

LIMITING CONDITIONS

1. THE PERMITTEE SHALL IMPLEMENT THE WORK AUTHORIZED IN A MANNER SO AS TO MINIMIZE ANY ADVERSE IMPACT OF THE WORKS ON FISH, WILDLIFE, NATURAL ENVIRONMENTAL VALUES, AND WATER QUALITY. THE PERMITTEE SHALL INSTITUTE NECESSARY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING FULL COMPACTION OF ANY FILL MATERIAL PLACED AROUND NEWLY INSTALLED STRUCTURES, TO REDUCE EROSION, TURBIDITY, NUTRIENT LOADING AND SEDIMENTATION IN THE RECEIVING WATERS.

2. WATER QUALITY DATA FOR THE WATER DISCHARGED FROM THE PERMITTEE'S PROPERTY OR INTO SURFACE WATERS OF THE STATE WILL BE SUBMITTED TO THE DISTRICT AS REQUIRED BY SECTION 5.9, "BASIS OF REVIEW FOR SURFACE WATER MANAGEMENT PERMIT APPLICATIONS WITHIN SOUTH FLORIDA WATER MANAGEMENT DISTRICT - MARCH, 1994." PARAMETERS TO BE MONITORED MAY INCLUDE THOSE LISTED IN CHAPTER 62-302, F.A.C. IF WATER QUALITY DATA IS REQUIRED, THE PERMITTEE SHALL PROVIDE DATA ON VOLUMES OF WATER DISCHARGED, INCLUDING TOTAL VOLUME DISCHARGED DURING THE DAYS OF SAMPLING AND TOTAL MONTHLY DISCHARGES FROM THE PROPERTY OR INTO SURFACE WATERS OF THE STATE.

3. THIS PERMIT SHALL NOT RELIEVE THE PERMITTEE OF ANY OBLIGATION TO OBTAIN NECESSARY FEDERAL, STATE, LOCAL OR SPECIAL DISTRICT APPROVALS.

4. THE OPERATION PHASE OF THIS PERMIT WILL NOT BECOME EFFECTIVE UNTIL THE DISTRICT'S ACCEPTANCE OF CERTIFICATION OF THE COMPLETED SURFACE WATER WATER MANAGEMENT SYSTEM. THE PERMITTEE SHALL REQUEST TRANSFER OF THE PERMIT TO THE RESPONSIBLE OPERATIONAL ENTITY ACCEPTED BY THE DISTRICT, IF DIFFERENT FROM THE PERMITTEE. THE TRANSFER REQUEST CAN BE SUBMITTED CONCURRENTLY WITH THE CONSTRUCTION COMPLETION CERTIFICATION.

5. ALL ROAD ELEVATIONS SHALL BE SET IN ACCORDANCE WITH THE CRITERIA SET FORTH IN SECTION 6.5, "BASIS OF REVIEW FOR SURFACE WATER MANAGEMENT PERMIT APPLICATIONS WITHIN SOUTH FLORIDA WATER MANAGEMENT DISTRICT - MARCH, 1994."

6. ALL BUILDING FLOOR ELEVATIONS SHALL BE SET IN ACCORDANCE WITH THE CRITERIA SET FORTH IN SECTION 6.4, "BASIS OF REVIEW FOR SURFACE WATER MANAGEMENT PERMIT APPLICATIONS WITHIN SOUTH FLORIDA WATER MANAGEMENT DISTRICT - MARCH, 1994."

7. OFF-SITE DISCHARGES DURING CONSTRUCTION AND DEVELOPMENT WILL BE MADE ONLY THROUGH THE FACILITIES AUTHORIZED BY THIS PERMIT.

8. A PERMIT TRANSFER TO THE OPERATION PHASE SHALL NOT OCCUR UNTIL A RESPONSIBLE ENTITY MEETING THE REQUIREMENT IN SECTION 9.0, "BASIS OF REVIEW FOR SURFACE WATER MANAGEMENT PERMIT APPLICATIONS WITHIN SOUTH FLORIDA WATER MANAGEMENT DISTRICT - MARCH, 1994," HAS BEEN ESTABLISHED TO OPERATE AND MAINTAIN THE SYSTEM. THE ENTITY MUST BE PROVIDED WITH SUFFICIENT OWNERSHIP OR LEGAL INTEREST SO THAT IT HAS CONTROL OVER ALL WATER MANAGEMENT FACILITIES AUTHORIZED HEREIN.

9. THE PERMIT DOES NOT CONVEY TO THE PERMITTEE ANY PROPERTY RIGHT NOR ANY RIGHTS OR PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-4, FAC.

10. THE PERMITTEE SHALL HOLD AND SAVE THE DISTRICT HARMLESS FROM ANY AND ALL DAMAGES, CLAIMS, OR LIABILITIES WHICH MAY ARISE BY REASON OF THE CONSTRUCTION, OPERATION, MAINTENANCE OR USE OF ANY FACILITY AUTHORIZED BY THE PERMIT.

11. THIS PERMIT IS ISSUED BASED ON THE APPLICANT'S SUBMITTED INFORMATION WHICH REASONABLY DEMONSTRATES THAT ADVERSE WATER RESOURCE RELATED IMPACTS WILL NOT BE CAUSED BY THE COMPLETED PERMIT ACTIVITY. SHOULD ANY ADVERSE IMPACTS CAUSED BY THE COMPLETED SURFACE WATER MANAGEMENT SYSTEM OCCUR, THE DISTRICT WILL REQUIRE THE PERMITTEE TO PROVIDE APPROPRIATE MITIGATION TO THE DISTRICT OR OTHER IMPACTED PARTY. THE DISTRICT WILL REQUIRE THE PERMITTEE TO MODIFY THE SURFACE WATER MANAGEMENT SYSTEM, IF NECESSARY, TO ELIMINATE THE CAUSE OF THE ADVERSE IMPACTS.

12. WITHIN 30 DAYS OF ISSUANCE OF THIS PERMIT, THE PERMITTEE OR AUTHORIZED AGENT SHALL NOTIFY THE DISTRICT (VIA THE SUPPLIED CONSTRUCTION COMMENCEMENT NOTICE OR EQUIVALENT) OF THE ACTUAL OR ANTICIPATED CONSTRUCTION START DATE AND THE EXPECTED COMPLETION DATE.

13. WHEN THE DURATION OF CONSTRUCTION EXCEEDS ONE YEAR, THE PERMITTEE OR AUTHORIZED AGENT SHALL SUBMIT CONSTRUCTION STATUS REPORTS ON AN ANNUAL BASIS (VIA THE SUPPLIED ANNUAL STATUS REPORT OR EQUIVALENT) BEGINNING ONE YEAR AFTER THE INITIAL COMMENCEMENT OF CONSTRUCTION.

14. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE OR AUTHORIZED AGENT SHALL FILE A WRITTEN STATEMENT OF COMPLETION AND CERTIFICATION BY A FLORIDA REGISTERED PROFESSIONAL ENGINEER. THESE STATEMENTS MUST SPECIFY THE ACTUAL DATE OF CONSTRUCTION COMPLETION AND MUST CERTIFY THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE DISTRICT (VIA THE SUPPLIED CONSTRUCTION COMPLETION/CONSTRUCTION CERTIFICATION OR EQUIVALENT). THE CONSTRUCTION COMPLETION

SCANNED

CERTIFICATION MUST INCLUDE, AT A MINIMUM, EXISTING ELEVATIONS, LOCATIONS AND DIMENSIONS OF THE COMPONENTS OF THE WATER MANAGEMENT FACILITIES. ADDITIONALLY, IF DEVIATIONS FROM THE APPROVED DRAWING ARE DISCOVERED DURING THE CERTIFICATION PROCESS, THE CERTIFICATION MUST BE ACCOMPANIED BY A COPY OF THE APPROVED PERMIT DRAWINGS WITH DEVIATIONS NOTED.

15. WITHIN 30 DAYS OF ANY SALE, CONVEYANCE OR OTHER TRANSFER OF ANY OF THE LAND WHICH IS PROPOSED FOR DEVELOPMENT UNDER THE AUTHORIZATION OF THIS PERMIT, THE PERMITTEE SHALL NOTIFY THE DISTRICT OF SUCH TRANSFER IN WRITING VIA EITHER FORM 0483, REQUEST FOR PERMIT TRANSFER; OR FORM 0920, REQUEST FOR TRANSFER OF SURFACE WATER MANAGEMENT CONSTRUCTION PHASE TO OPERATION PHASE (TO BE COMPLETED AND SUBMITTED BY THE OPERATING ENTITY), IN ACCORDANCE WITH SECTIONS 40E-1.6105 AND 40E-4.351, F.A.C.

16. A PRORATED SHARE OF SURFACE WATER MANAGEMENT RETENTION/DETENTION AREAS, SUFFICIENT TO PROVIDE THE REQUIRED FLOOD PROTECTION AND WATER QUALITY TREATMENT, MUST BE PROVIDED PRIOR TO OCCUPANCY OF ANY BUILDING OR RESIDENCE.

17. A STABLE, PERMANENT AND ACCESSIBLE ELEVATION REFERENCE SHALL BE ESTABLISHED ON OR WITHIN ONE HUNDRED (100) FEET OF ALL PERMITTED DISCHARGE STRUCTURES NO LATER THAN THE SUBMISSION OF THE CERTIFICATION REPORT. THE LOCATION OF THE ELEVATION REFERENCE MUST BE NOTED ON OR WITH THE CERTIFICATION REPORT.

18. IT IS THE RESPONSIBILITY OF THE PERMITTEE TO INSURE THAT ADVERSE OFF-SITE WATER RESOURCE RELATED IMPACTS DO NOT OCCUR DURING CONSTRUCTION.

19. THE PERMITTEE MUST OBTAIN A WATER USE PERMIT PRIOR TO CONSTRUCTION DEWATERING, UNLESS THE WORK QUALIFIES FOR A GENERAL PERMIT PURSUANT TO SUBSECTION 40E-20.302(4), F.A.C.

SCANNED

40E-4.321 Duration of Permits

(1) Unless revoked or otherwise modified pursuant to Rules 40E-4.331 and 40E-4.441, F.A.C., the duration of a surface water management permit issued under this chapter is as follows:

(a) Two years from the date of issuance for Conceptual Approval, unless within that period an application for a construction and operation permit is filed for any portion of the project. If an application for a construction and operation permit is filed, then the Conceptual Approval remains valid until final action is taken on the application. If the application is granted, then the Conceptual Approval is valid for an additional two years from the date of issuance of the construction and operation permit. Conceptual Approvals which have no applications for construction and operation filed for a period of two years will expire automatically.

(b) Five years from the date of issuance for a construction permit.

(c) Perpetual for an operation permit.

(2) The Governing Board shall issue permit extensions provided that a permittee files a written request with the District showing good cause. For the purpose of this rule, good cause shall mean a set of extenuating circumstances outside of the control of the permittee. Requests for extensions, which shall include documentation of the extenuating circumstances and how they have delayed this project, will not be accepted more than 180 days prior to the expiration date.

(3) For a Conceptual Approval filed concurrently with a development of regional impact (DRI) application for development approval (ADA) and a local government comprehensive amendment, the duration of the Conceptual Approval shall be two years from whichever one of the following occurs a the latest date:

(a) the effective date of the local government's comprehensive plan amendment,

(b) the effective date of the local government development order, or

(c) the date on which the District issues the Conceptual Approval, or

(d) the latest date of the resolution of any Chapter 120 or other legal appeals.

(4) Substantial modifications to Conceptual Approvals will extend the duration of the Conceptual Approval for two years from the date of issuance of the modification. For the purposes of this section, the term "substantial modification" shall mean a modification which is reasonably expected to lead to substantially different water resource or environmental impacts which require a detailed review.

(5) Modifications to construction permits issued pursuant to a formal permit application extend the duration of the permit for three years from the date of issuance of the modification. Construction permit modifications do not extend the duration of a Conceptual Approval.

(6) Permit modifications issued pursuant to subsection 40E-4.331(2)(b), F.A.C. (letter modifications) do not extend the duration of a permit.

Specific authority 373.044, 373.113 F.S. Law Implemented 373.413, 373.416(1) F.S. History—New 9-3-81, Amended 1-31-82, 12-1-82, Formerly 16K-4.07(4), Amended 7-1-86, 4/20/94.

SCANNED

HYDROLOGIC / HYDRAULIC CALCULATIONS

SOUTH COUNTY NEIGHBORHOOD IMPROVEMENTS PROJECT
PHASE IV – LAKE FOREST
SECTIONS 9 AND 10

ORIGINAL SUBMITTAL
JUL 19 1999
WPB

PREPARED BY CRAVEN THOMPSON AND ASSOCIATES
CT&A PROJECT NO. 930012.04

MAY, 1999

6/16/99

SCANNED

I. DRAINAGE OVERVIEW:

The areas included in the Lake Forest, Sections 9 and 10 – Phase 4, of the South County Neighborhood Improvement Project are approximately 151 and 105 acres respectively. The project is located in Unincorporated Broward County, bounded to the north by Hallandale Beach Boulevard, to the south by Lakes Helen and Margaret, west by Louisiana (SW 48th) Avenue and the East by SW 32nd Avenue (see Exhibits 1-A, and 1-B).

This project area is currently 95% residential, with a few commercial properties along Hallandale Beach Boulevard. This project is a part of the overall South County Neighborhood Improvement Project currently being undertaken by The Broward County Office of Environmental Services (BCOES) and involves the upgrading of community infrastructure including underground utilities, streets, sidewalks, etc. The SCNIP has been issued South Florida Water management District Conceptual Permit No. 06-01979-S, and Broward County Department of Natural Resource Protection Surface Water Management License No. 1. Both existing permits will be modified. This portion of the work in Sections 9 and 10 in Phase IV focuses solely on upgrading drainage including the addition and reconfiguration of exfiltration trench, swales, and collection and transmission structures. The percentages of pervious and impervious coverage are not proposed to be altered in this project. For the purpose of the drainage analysis the site will be dealt with as a whole, combining Sections 9 and 10. The total area of Phase 4 is 256 acres. Approximately 44 acres (17%) building, 43 acres (17%) of paved surface, roads, walks, etc., 34 acres (13%) in Lake Helen and Lake Margaret, and 135 acres (53%) green area. Note that Lake Helen and Lake Margaret are a total of 40 acres combined, however approximately 6 acres of lake are located in Section 12, an adjacent section of South County.

There are two adjacent watershed areas which will be considered to contribute storm water runoff to the on site lakes (Helen and Margaret). They are located to the south of 9 and 10 and consist of Section 11 (85 Acres) and Section 12 (134 Acres), which will be developed in Phase 5. Phase 5 will be accounted for in this analysis by a connection to the on site system modeled as overland flow weirs at the surface elevation between the off site Sections and the on site drainage basins and lakes.

The existing drainage system consists of overland flow through street side swales some of which get collected by catch basins to out-fall pipes into the lake. There are no off site discharge points existing and none are proposed at this time. However a future connection to the previously permitted SCNIP Phase 1 and 2 will be modeled as an alternative. This connection will be made through the existing 36" Reinforced Concrete Pipe under Hallandale Beach Boulevard.

The proposed drainage system will consist of exfiltration trenches, swales and a piping system, which will connect the majority of areas to an out-fall to the lake. These methods of conveyances will allow discharge to the lake out-fall pipes through bubble up structures located in the swales, and overland flow, there are no proposed direct connections to the existing lake out-falls. The remaining independent areas will rely on exfiltration trench and swale percolation with overland flow to the lake out-falls during heavy rainfall events.

SCANNED

The proposed drainage system was designed to protect proposed road crown elevation from a 10 year 1 day storm event and finished floors from a 100 year 3 day storm event. See exhibit DA-1 – DA-5, Drainage Area Maps, for design reach and node sizes and locations.

Broward County will be responsible for the operation of maintenance of the proposed storm water management system. Standard municipal maintenance practices will be performed at intervals as dictated by Broward County.

II. CALCULATIONS

The information regarding drainage areas, curve numbers and time of concentration can be found on Exhibit MD-01, Master Drainage Map, Advanced Interconnected and Pond Routing Ver. 2.11 (ADICPR) Input Data, and in the Technical Appendix. The wet season water table elevation for this project is approximately 2.5' NGVD (see Exhibit 1-C). This water table elevation was used for the calculation of on-site storage and exfiltration trench calculations.

The design storm for this project was the 25 year 3 day storm event distributed per SFWMD 72-hour distribution method. The rainfall depth for the 24-hour storm event is 9.5". The 25 year 1 day rainfall is 10.5 inches. The 72-hour rainfall depth is 14.27 (10.5x1.359) inches. The 100 year, 1 day rainfall is 13.00 inches (72 hour – 17.67 in.). The 10 year 1 day, 25 year 3 day and 100 year 3 day storm events for SCNIP Lake Forest can be found in the Technical Appendix.

The stage storage input data was taken from proposed pavement and catch basin inlet elevations and existing finished floor elevations, see Technical Appendix, Input Data. The stage-discharge computations and flood routing results are shown in Exhibit 5, Flood Routing Summary, ADICPR 10, 25 and 100 year storm events, Node Maximum and Link Maximum Summary.

The exfiltration trench capacities were based on the attached information compiled by All State Engineering and Testing Consultants, Inc. using the large diameter (60"-65") and small diameter (4"-7") usual open hole percolation tests (see exhibit V-A3). Test site locations and results are enclosed as Exhibit V-E2.

Avg. K= 2.95 x10^{-4} (cfs/ft^2-ft)

The average "K" value was used in the exfiltration rate calculations for the proposed exfiltration trenches. Case 1, a 4' x 4' cross section of exfiltration trench was used for 15" and 18" drainage pipes within the exfiltration trench. Case 2, a 6' x 6' cross section of exfiltration trench was used for pipes 24" and larger. Case 1 and Case 2 exfiltration trench details can be found as Exhibit V-E1.

The exfiltration rates were calculated using the SFWMD Criteria Manual. The exfiltration rates used in the hydraulic modeling were based on V_{BOT} and V_{SIDES}. The volume of storage in the trench was ignored. The exfiltration rates for the specified length and size of each exfiltration trench system was calculated for each sub-basin, then reduced by a safety factor of 2. (See Exhibit V-E2)

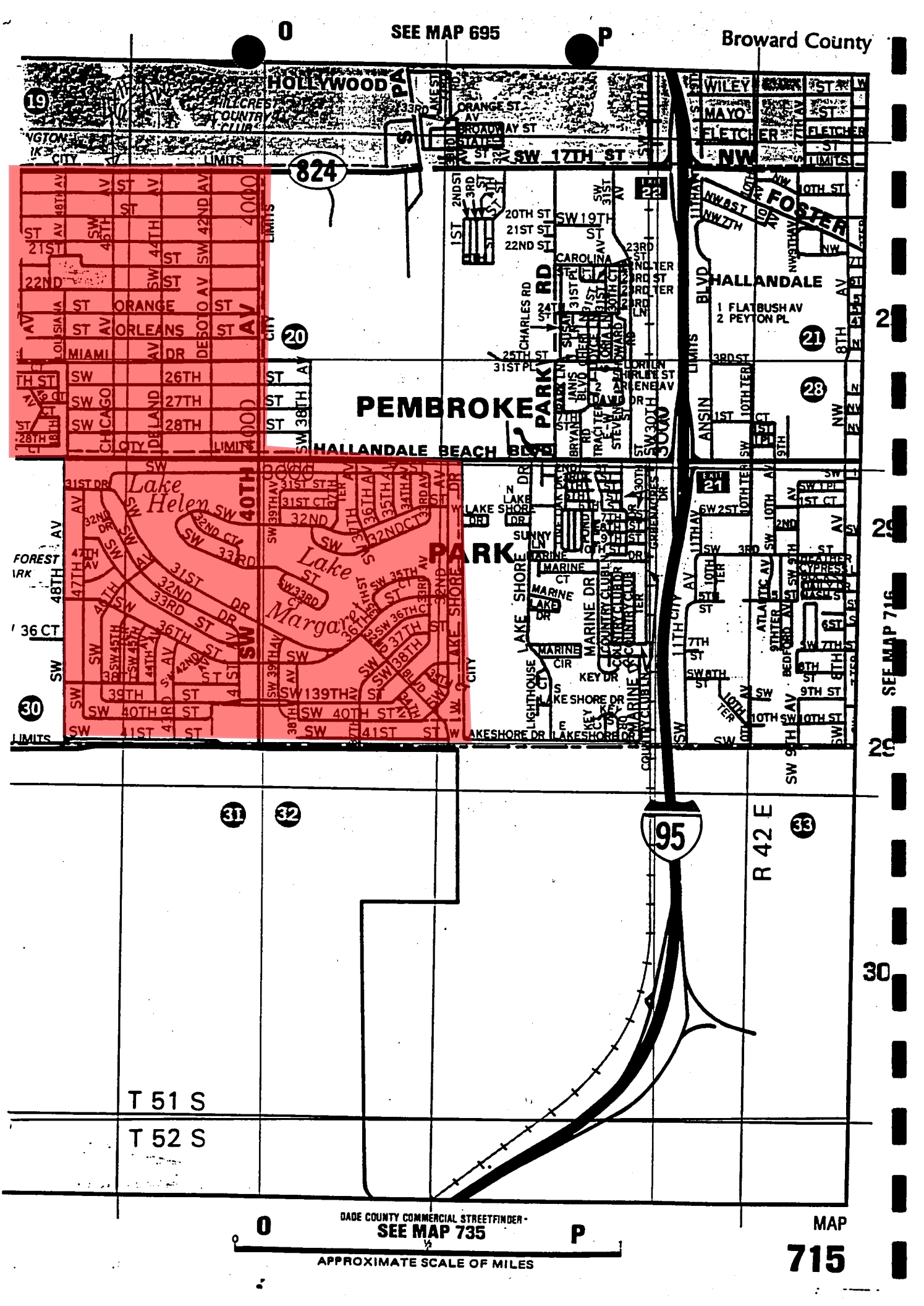

SEE MAP 695
Broward County
HOLLYWOOD
PEMBROKE
PEMBROKE PARK
HALLANDALE
HALLANDALE BEACH BLVD
SW 17TH ST
SW 40TH AV
Lake Helen
Lake Margaret
FOSTER
ANSIN
WILEY
MAYO
FLETCHER
LAKE SHORE
MARINE DR
SEE MAP 716
R 42 E
T 51 S
T 52 S
DADE COUNTY COMMERCIAL STREETFINDER
SEE MAP 735
APPROXIMATE SCALE OF MILES
MAP
715

Table 5- Summary of French Drain Calculations-I95								
SFWMD Basin	Basin	FD Name	FD Pipe Size (in)	FD Length (ft)	Provided Volume in FD (ac-ft)	Deficit Volume In Ponds (ac-ft)	Surplus/Deficit in Basin (ac-ft)	Remark
C-9	Basin 1	FD1_1R	36	240	0.43			
		FD1_2R	24	340	0.19			
		FD1_3R	24	142	0.06			
		FD1_4R	24	142	0.14			
		FD1_1L	24	284	0.16			
		TOTAL BASIN 1 =			**0.98**	**0.97**	**0.01**	
C-10	Basin 2	FD2_1L	36	325	0.86			
		TOTAL BASIN 2 =			**0.86**	**0.84**	**0.02**	
	Basin 3	FD3_1R	36	125	0.37			
		FD3_2R	36	317	0.75			
		FD3_3R	36	320	0.67			
		FD3_4R	36	200	0.42			
		FD3_5R	24	184	0.17			
		FD3-5-1R	36	340	0.54			
		FD3_6R	24	200	0.21			
		FD3_7R	36	925	1.37			
		FD3_8R	36	600	0.89			
		FD3_1L	36	430	0.80			
		FD3_2L	36	224	0.47			
		FD3_2L-1	36	485	1.00			
		FD3_3L	24	428	0.19			
		FD3_4L	24	322	0.14			
		FD3_5L	36	500	1.30			
		TOTAL BASIN 3 =			**9.29**	**11.23**	**-1.94**	
	Basin 4	-	-					0.3 ac-ft additional storage in Basin 4
		There is no proposed French Drain in Basin 4						

Since Basin 3 & 4 are interconnected, total deficit in avilabe storage in **Basin 3 & 4 is 1.64 ac-ft** (1.94 - 0.3 = 1.64)

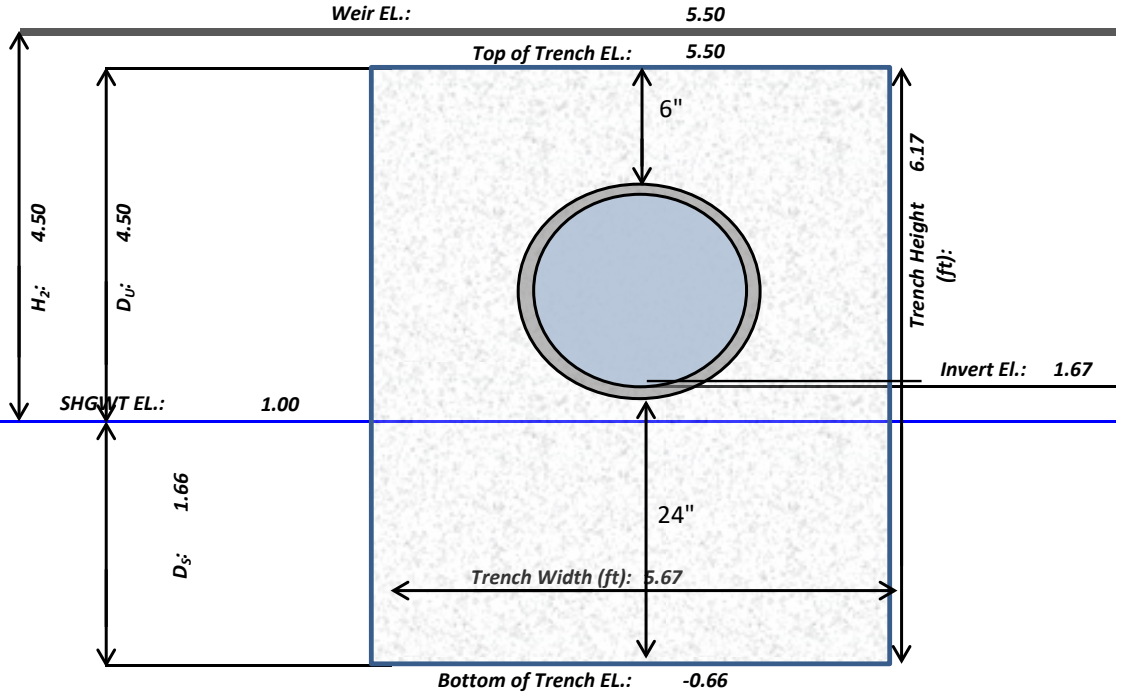
1.64 ac-ft storage will be provided in Sunset Golf Course pond located north-east side of I-95 & Johnson Street

I-95 PD&E

I-95

FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	**BASIN 1**
Location	**FD1_1R**
SHGWT EL. (ft-NAVD):	**1.00**
Pipe Size (in):	**36**
Length of French Drain, L (LF):	**240**
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	**1.67**
Top of Trench EL. (ft-NAVD):	5.50
Bottom of Trench EL. (ft-NAVD):	-0.66
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	**5.50**
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	**2.950E-04**
Depth to Water Table, H_2 (ft):	4.50
Non-Saturated Trench Depth, D_U (ft):	4.50
Saturated Trench Depth, D_S (ft):	1.66
H_2W:	25.52
$2H_2D_U$:	40.56
D_U^2:	20.28
$2H_2D_S$:	14.98
$(1.39x10^{-4})WD_U$:	0.003547
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	**5.15**
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	**3.35**
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.43**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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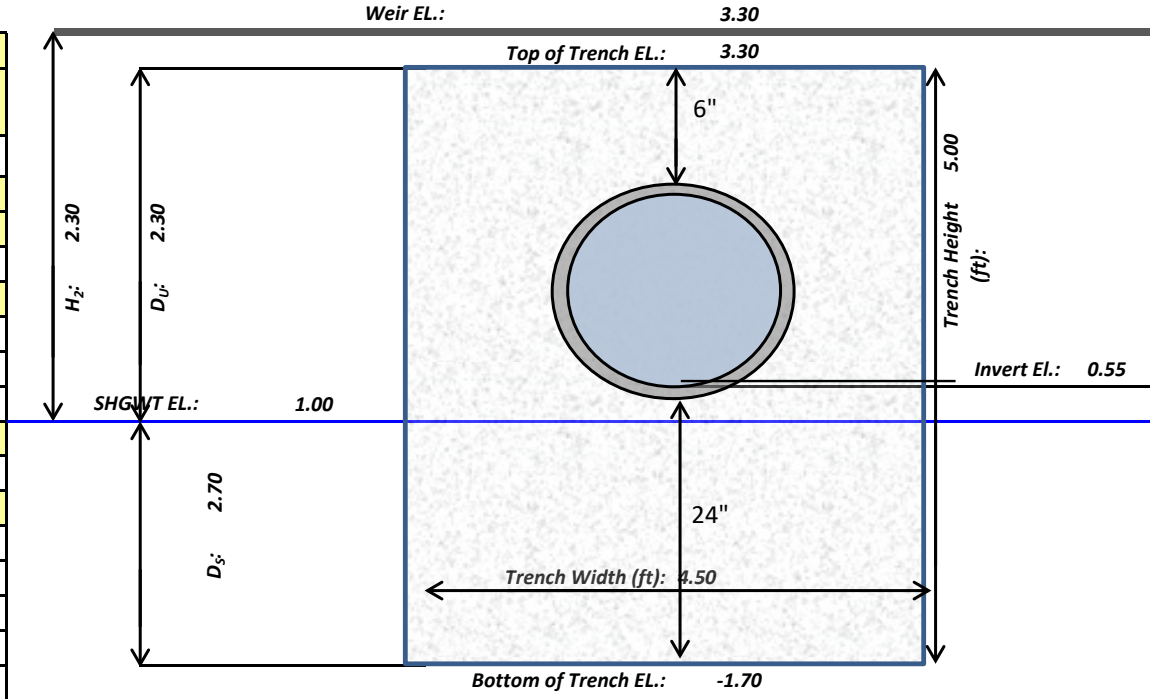
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 1
Location	FD1_2R
SHGWT EL. (ft-NAVD):	1.00
Pipe Size (in):	24
Length of French Drain, L (LF):	340
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	0.55
Top of Trench EL. (ft-NAVD):	3.30
Bottom of Trench EL. (ft-NAVD):	-1.70
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	3.30
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	2.30
Non-Saturated Trench Depth, D_U (ft):	2.30
Saturated Trench Depth, D_S (ft):	2.70
H_2W:	10.35
$2H_2D_U$:	10.58
D_U^2:	5.29
$2H_2D_S$:	12.42
$(1.39x10^{-4})WD_U$:	0.001439
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	3.30
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	2.27
$D_U > D_S$ and $W < 2H_T$(Yes/No):	No
Treatment Volume Provided, V (Ac-ft):	**0.19**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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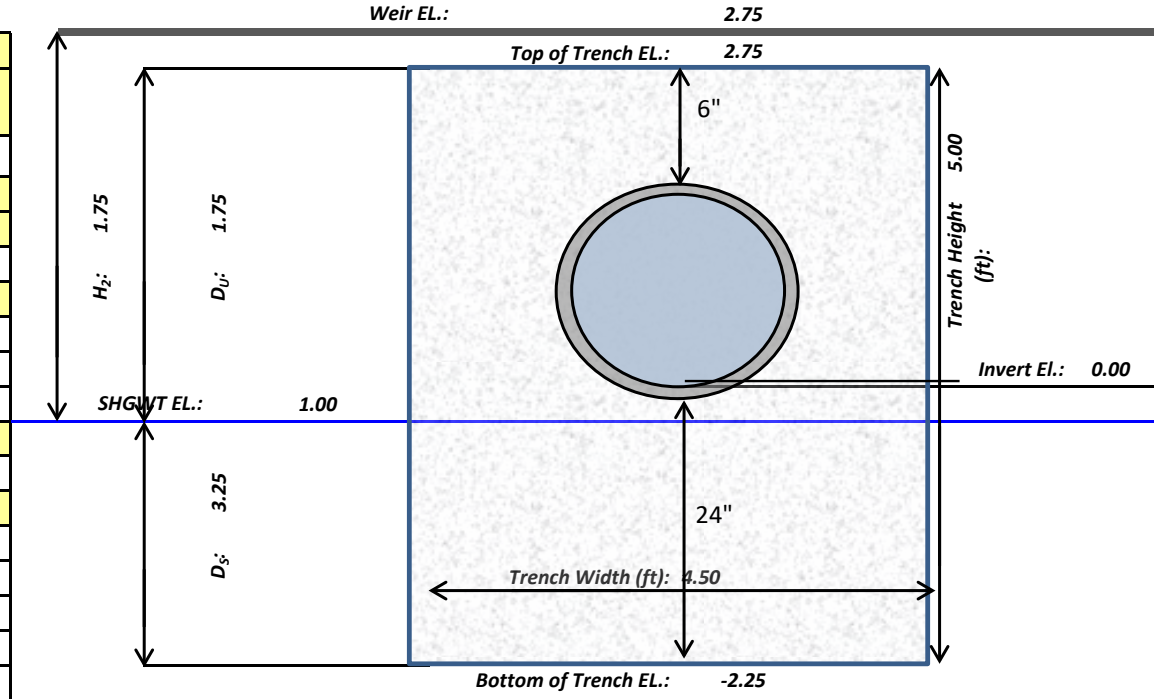
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 1
Location	FD1_3R
SHGWT EL. (ft-NAVD):	1.00
Pipe Size (in):	24
Length of French Drain, L (LF):	142
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	0.00
Top of Trench EL. (ft-NAVD):	2.75
Bottom of Trench EL. (ft-NAVD):	-2.25
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	2.75
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	1.75
Non-Saturated Trench Depth, D_U (ft):	1.75
Saturated Trench Depth, D_S (ft):	3.25
H_2W:	7.88
$2H_2D_U$:	6.13
D_U^2:	3.06
$2H_2D_S$:	11.38
$(1.39x10^{-4})WD_U$:	0.001095
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	1.09
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	0.76
$D_U > D_S$ and $W < 2H_T$(Yes/No):	No
Treatment Volume Provided, V (Ac-ft):	**0.06**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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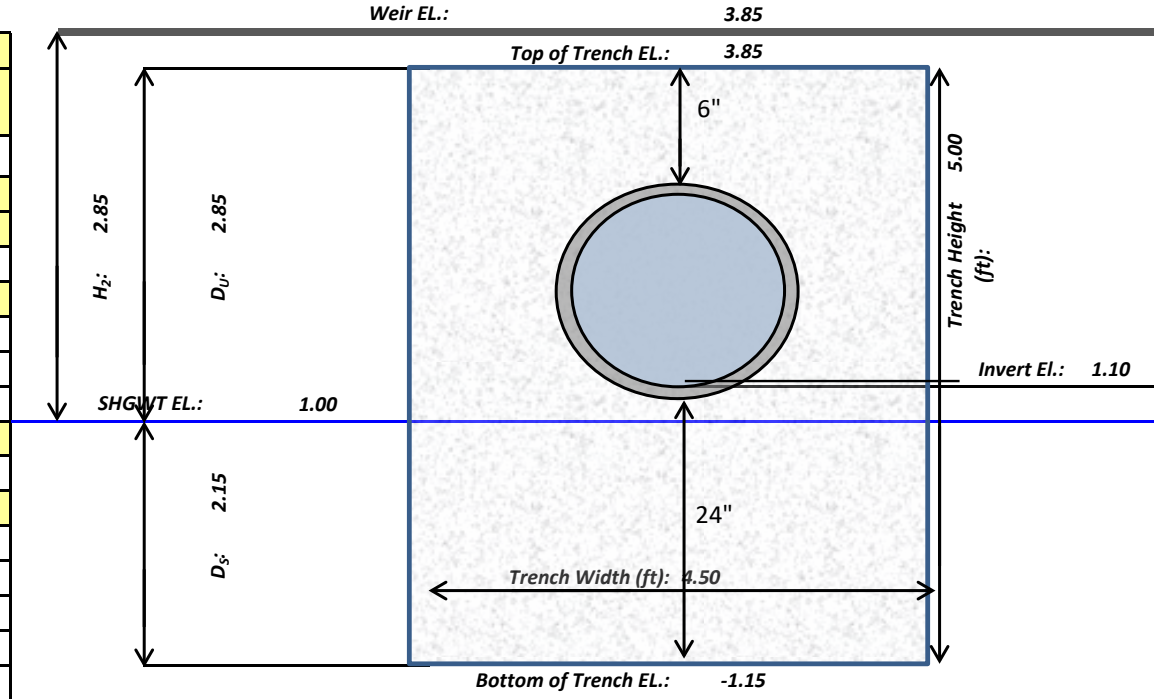
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 1
Location	FD1_4R
SHGWT EL. (ft-NAVD):	1.00
Pipe Size (in):	24
Length of French Drain, L (LF):	142
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	1.10
Top of Trench EL. (ft-NAVD):	3.85
Bottom of Trench EL. (ft-NAVD):	-1.15
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	3.85
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	2.85
Non-Saturated Trench Depth, D_U (ft):	2.85
Saturated Trench Depth, D_S (ft):	2.15
H_2W:	12.83
$2H_2D_U$:	16.25
D_U^2:	8.12
$2H_2D_S$:	12.26
$(1.39x10^{-4})WD_U$:	0.001783
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	1.64
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	1.11
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.14**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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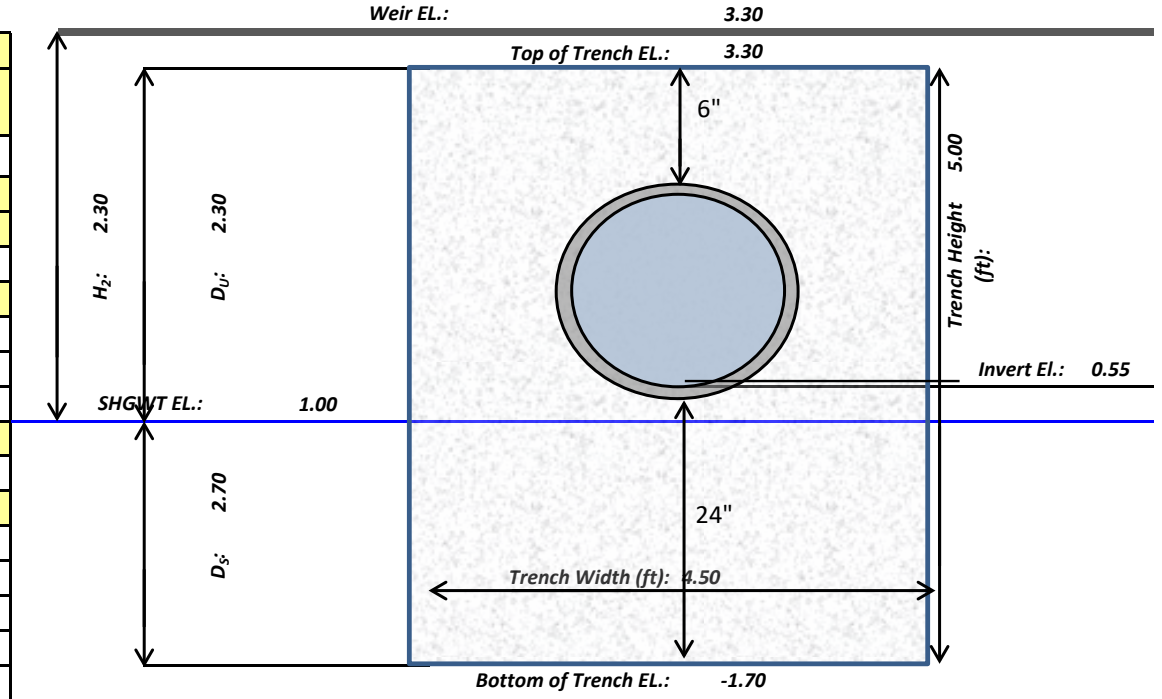
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 1
Location	FD1_1L
SHGWT EL. (ft-NAVD):	1.00
Pipe Size (in):	24
Length of French Drain, L (LF):	284
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	0.55
Top of Trench EL. (ft-NAVD):	3.30
Bottom of Trench EL. (ft-NAVD):	-1.70
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	3.30
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	2.30
Non-Saturated Trench Depth, D_U (ft):	2.30
Saturated Trench Depth, D_S (ft):	2.70
H_2W:	10.35
$2H_2D_U$:	10.58
D_U^2:	5.29
$2H_2D_S$:	12.42
$(1.39x10^{-4})WD_U$:	0.001439
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	2.76
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	1.89
$D_U > D_S$ and $W < 2H_T$(Yes/No):	No
Treatment Volume Provided, V (Ac-ft):	**0.16**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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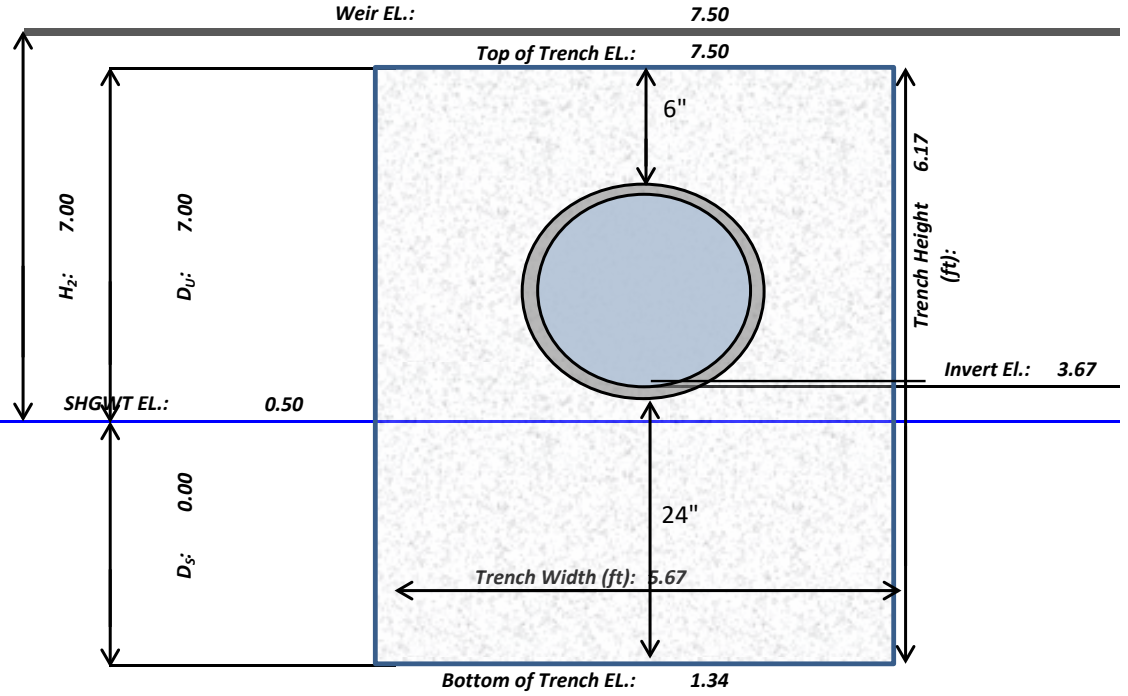
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD2_1R
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, *L* (LF):	310
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	3.67
Top of Trench EL. (ft-NAVD):	7.50
Bottom of Trench EL. (ft-NAVD):	1.34
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	7.50
Trench Width, *W* (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	7.00
Non-Saturated Trench Depth, D_U (ft):	7.00
Saturated Trench Depth, D_S (ft):	0.00
H_2W:	39.69
$2H_2D_U$:	98.09
D_U^2:	49.05
$2H_2D_S$:	0.00
$(1.39x10^{-4})WD_U$:	0.005516
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, *V* (ac-in):	9.82
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, *V* (ac-in):	6.20
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, *V* (Ac-ft):	**0.82**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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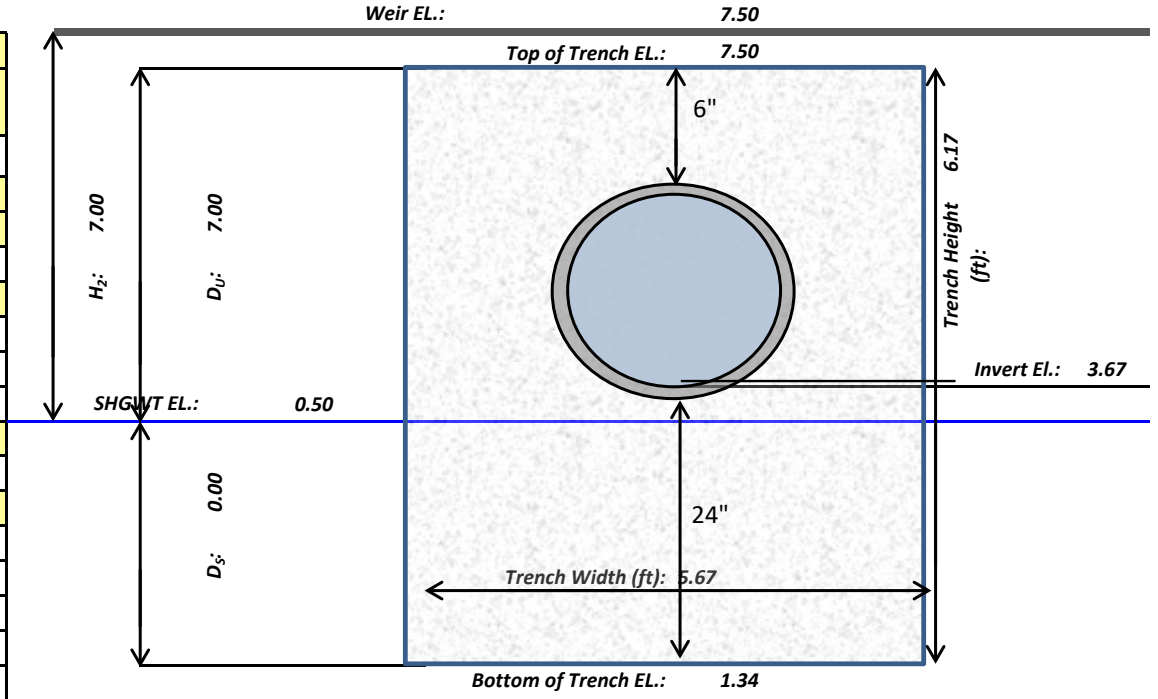
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 2
Location	FD2_1L
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	325
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	3.67
Top of Trench EL. (ft-NAVD):	7.50
Bottom of Trench EL. (ft-NAVD):	1.34
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	7.50
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	7.00
Non-Saturated Trench Depth, D_U (ft):	7.00
Saturated Trench Depth, D_S (ft):	0.00
H_2W:	39.69
$2H_2D_U$:	98.09
D_U^2:	49.05
$2H_2D_S$:	0.00
$(1.39x10^{-4})WD_U$:	0.005516
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	10.30
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	6.50
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.86**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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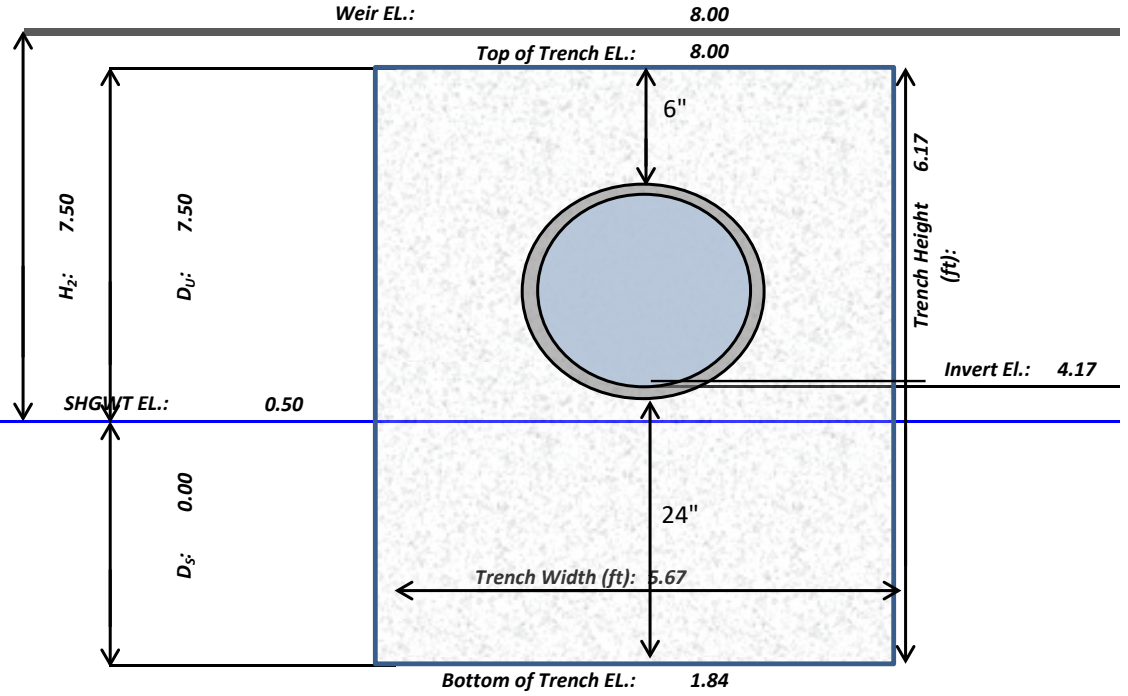
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	**BASIN 3**
Location	**FD3_1R**
SHGWT EL. (ft-NAVD):	**0.50**
Pipe Size (in):	**36**
Length of French Drain, *L* (LF):	**125**
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	**4.17**
Top of Trench EL. (ft-NAVD):	8.00
Bottom of Trench EL. (ft-NAVD):	1.84
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	**8.00**
Trench Width, *W* (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	**2.950E-04**
Depth to Water Table, H_2 (ft):	7.50
Non-Saturated Trench Depth, D_U (ft):	7.50
Saturated Trench Depth, D_S (ft):	0.00
H_2W:	42.52
$2H_2D_U$:	112.60
D_U^2:	56.30
$2H_2D_S$:	0.00
$(1.39x10^{-4})WD_U$:	0.005910
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, *V* (ac-in):	**4.38**
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, *V* (ac-in):	**2.81**
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, *V* (Ac-ft):	**0.37**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\ 2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\ 2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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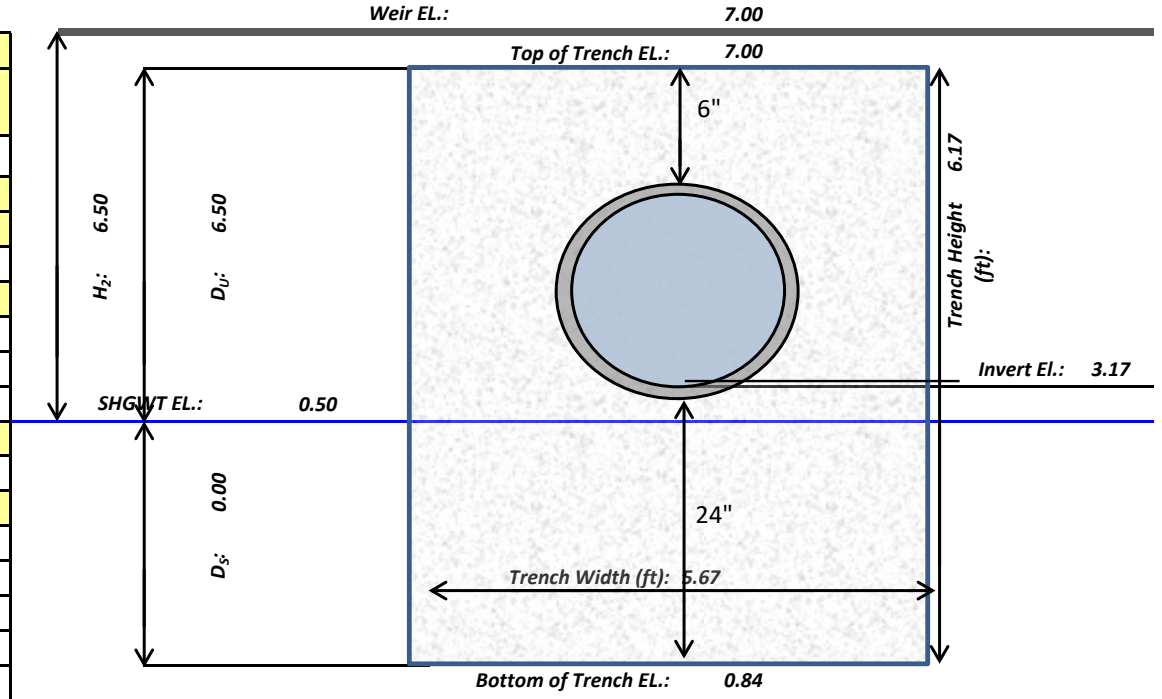
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_2R
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	317
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	3.17
Top of Trench EL. (ft-NAVD):	7.00
Bottom of Trench EL. (ft-NAVD):	0.84
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	7.00
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	6.50
Non-Saturated Trench Depth, D_U (ft):	6.50
Saturated Trench Depth, D_S (ft):	0.00
H_2W:	36.85
$2H_2D_U$:	84.59
D_U^2:	42.29
$2H_2D_S$:	0.00
$(1.39x10^{-4})WD_U$:	0.005122
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	9.03
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	5.58
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.75**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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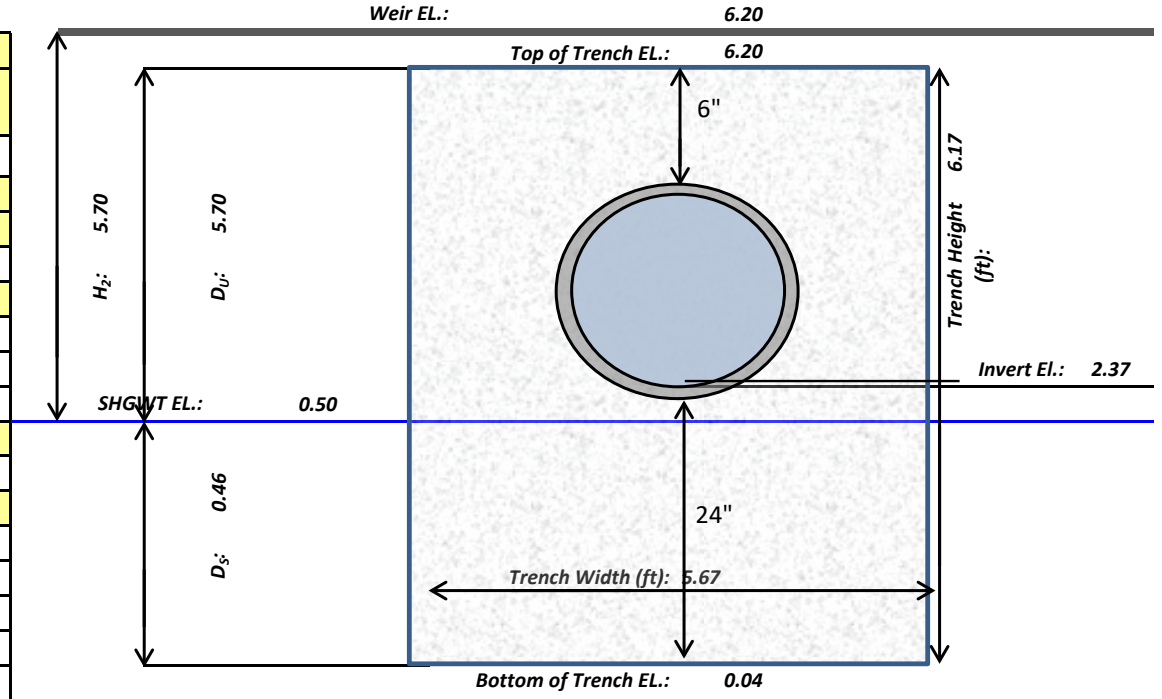
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	**BASIN 3**
Location	**FD3_3R**
SHGWT EL. (ft-NAVD):	**0.50**
Pipe Size (in):	**36**
Length of French Drain, *L* (LF):	**320**
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	**2.37**
Top of Trench EL. (ft-NAVD):	6.20
Bottom of Trench EL. (ft-NAVD):	0.04
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	6.20
Trench Width, *W* (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	**2.950E-04**
Depth to Water Table, H_2 (ft):	5.70
Non-Saturated Trench Depth, D_U (ft):	5.70
Saturated Trench Depth, D_S (ft):	0.46
H_2W:	32.32
$2H_2D_U$:	65.06
D_U^2:	32.53
$2H_2D_S$:	5.29
$(1.39x10^{-4})WD_U$:	0.004492
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, *V* (ac-in):	**8.06**
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, *V* (ac-in):	**5.01**
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, *V* (Ac-ft):	**0.67**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\,2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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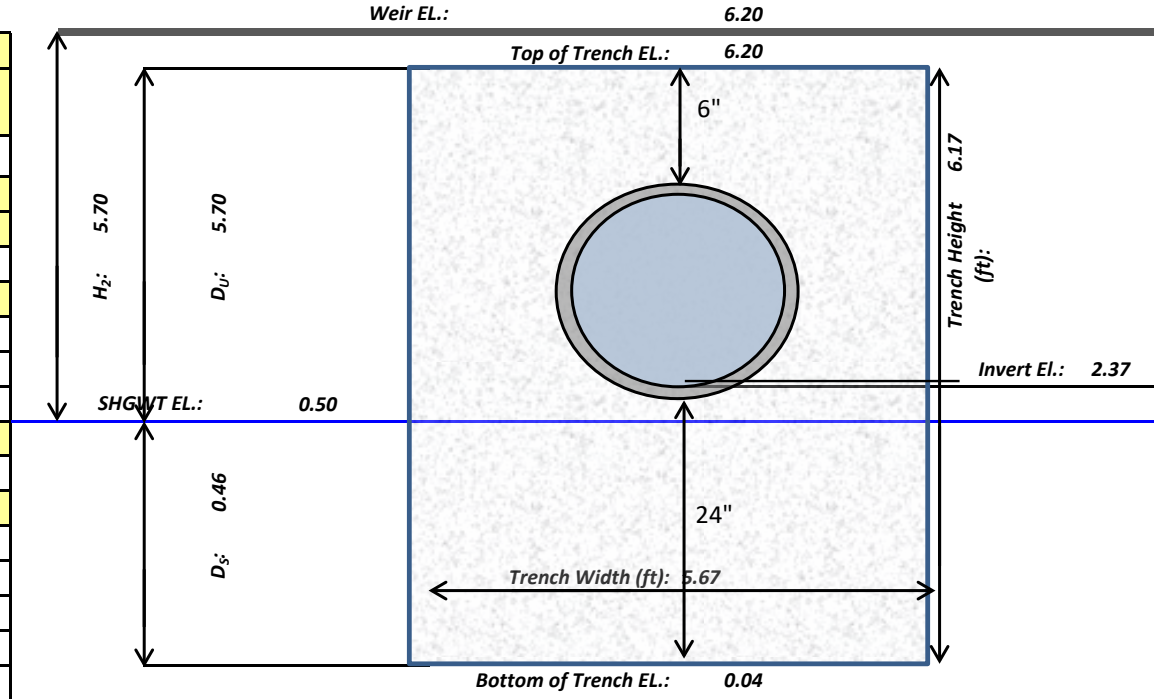
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	**BASIN 3**
Location	**FD3_4R**
SHGWT EL. (ft-NAVD):	**0.50**
Pipe Size (in):	**36**
Length of French Drain, L (LF):	**200**
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	**2.37**
Top of Trench EL. (ft-NAVD):	6.20
Bottom of Trench EL. (ft-NAVD):	0.04
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	**6.20**
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	**2.950E-04**
Depth to Water Table, H_2 (ft):	5.70
Non-Saturated Trench Depth, D_U (ft):	5.70
Saturated Trench Depth, D_S (ft):	0.46
H_2W:	32.32
$2H_2D_U$:	65.06
D_U^2:	32.53
$2H_2D_S$:	5.29
$(1.39x10^{-4})WD_U$:	0.004492
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	**5.04**
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	**3.13**
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.42**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\ 2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\ 2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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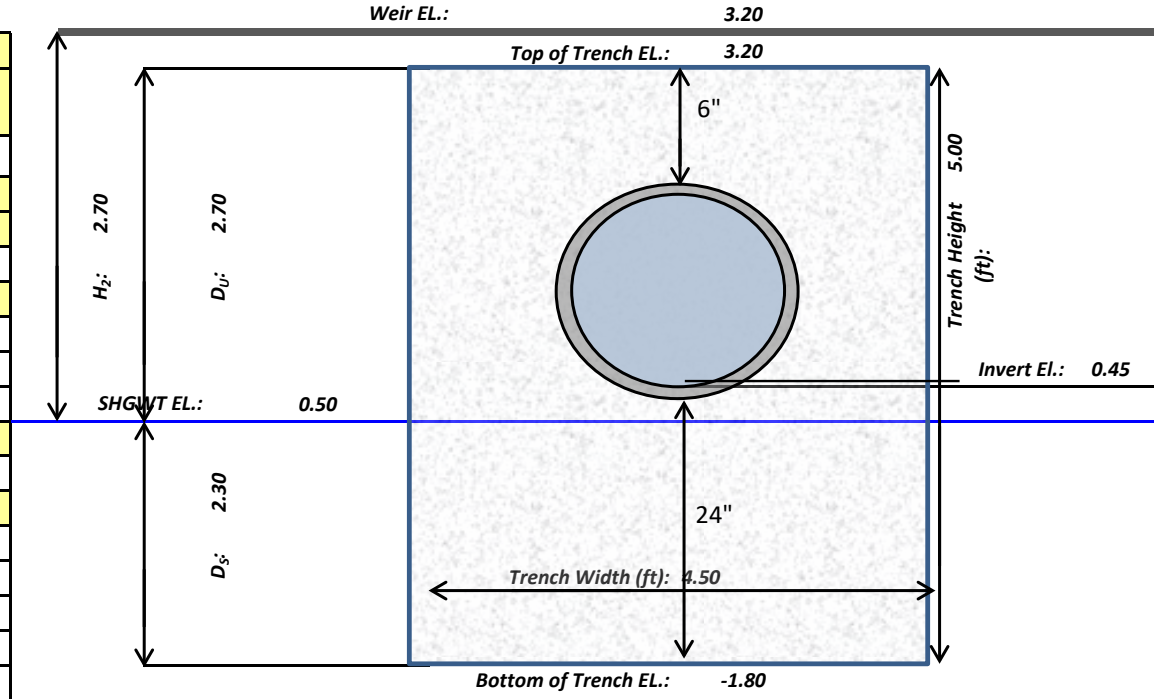
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	**BASIN 3**
Location	**FD3_5R**
SHGWT EL. (ft-NAVD):	**0.50**
Pipe Size (in):	**24**
Length of French Drain, L (LF):	**184**
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	**0.45**
Top of Trench EL. (ft-NAVD):	3.20
Bottom of Trench EL. (ft-NAVD):	-1.80
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	3.20
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	**2.950E-04**
Depth to Water Table, H_2 (ft):	2.70
Non-Saturated Trench Depth, D_U (ft):	2.70
Saturated Trench Depth, D_S (ft):	2.30
H_2W:	12.15
$2H_2D_U$:	14.58
D_U^2:	7.29
$2H_2D_S$:	12.42
$(1.39x10^{-4})WD_U$:	0.001689
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	**2.04**
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	**1.38**
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.17**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^{\ 2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^{\ 2} + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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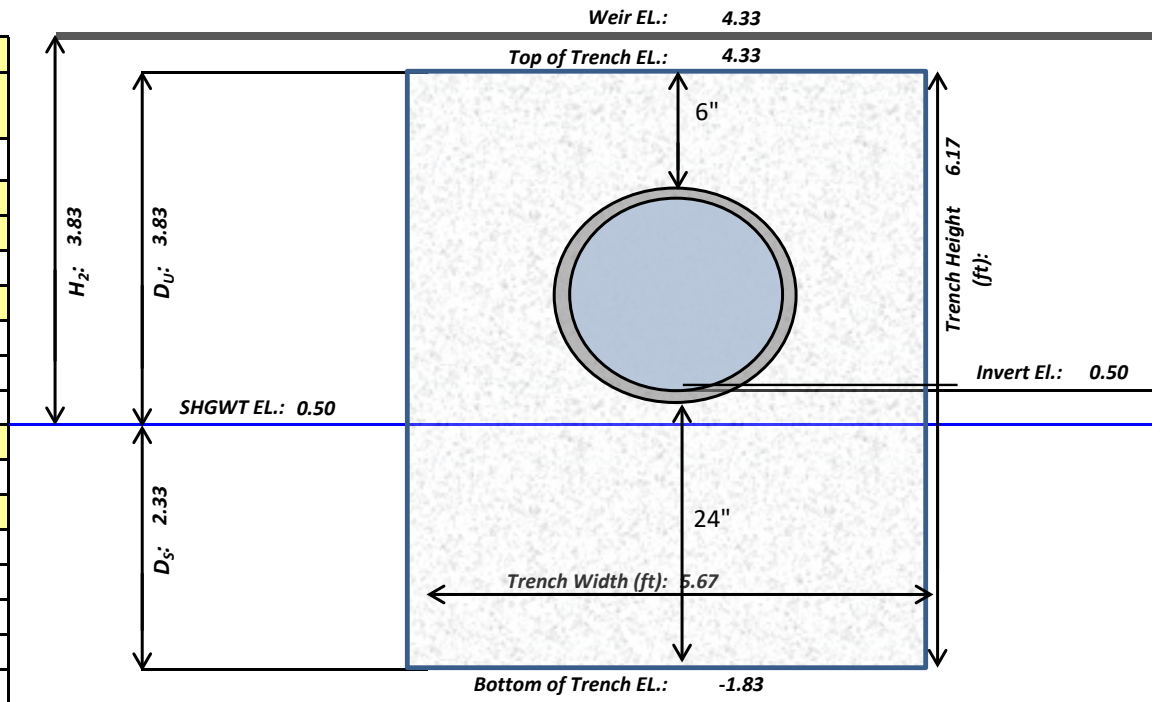
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_5-1R
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	340
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	0.50
Top of Trench EL. (ft-NAVD):	4.33
Bottom of Trench EL. (ft-NAVD):	-1.83
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	4.33
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	3.83
Non-Saturated Trench Depth, D_U (ft):	3.83
Saturated Trench Depth, D_S (ft):	2.33
H_2W:	21.72
$2H_2D_U$:	29.39
D_U^2:	14.69
$2H_2D_S$:	17.89
$(1.39x10^{-4})WD_U$:	0.003019
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	6.47
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	4.29
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.54**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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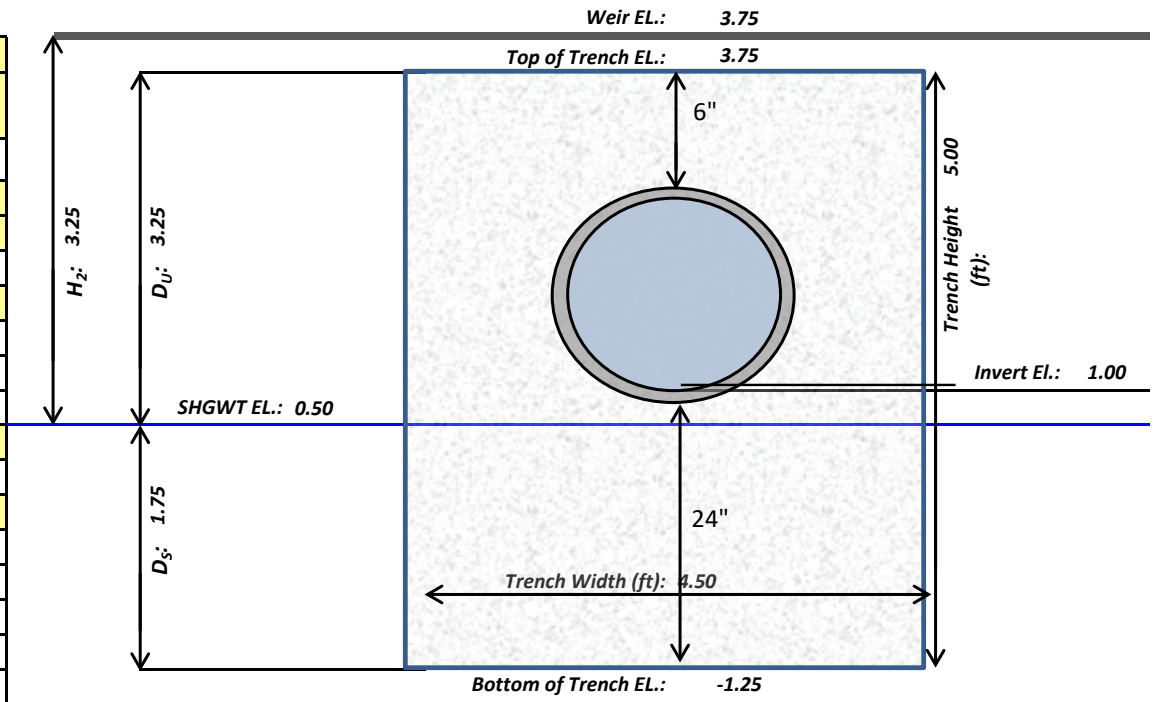
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_6R
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	24
Length of French Drain, L (LF):	200
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	1.00
Top of Trench EL. (ft-NAVD):	3.75
Bottom of Trench EL. (ft-NAVD):	-1.25
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	3.75
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	3.25
Non-Saturated Trench Depth, D_U (ft):	3.25
Saturated Trench Depth, D_S (ft):	1.75
H_2W:	14.63
$2H_2D_U$:	21.13
D_U^2:	10.56
$2H_2D_S$:	11.38
$(1.39x10^{-4})WD_U$:	0.002033
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	2.56
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	1.70
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.21**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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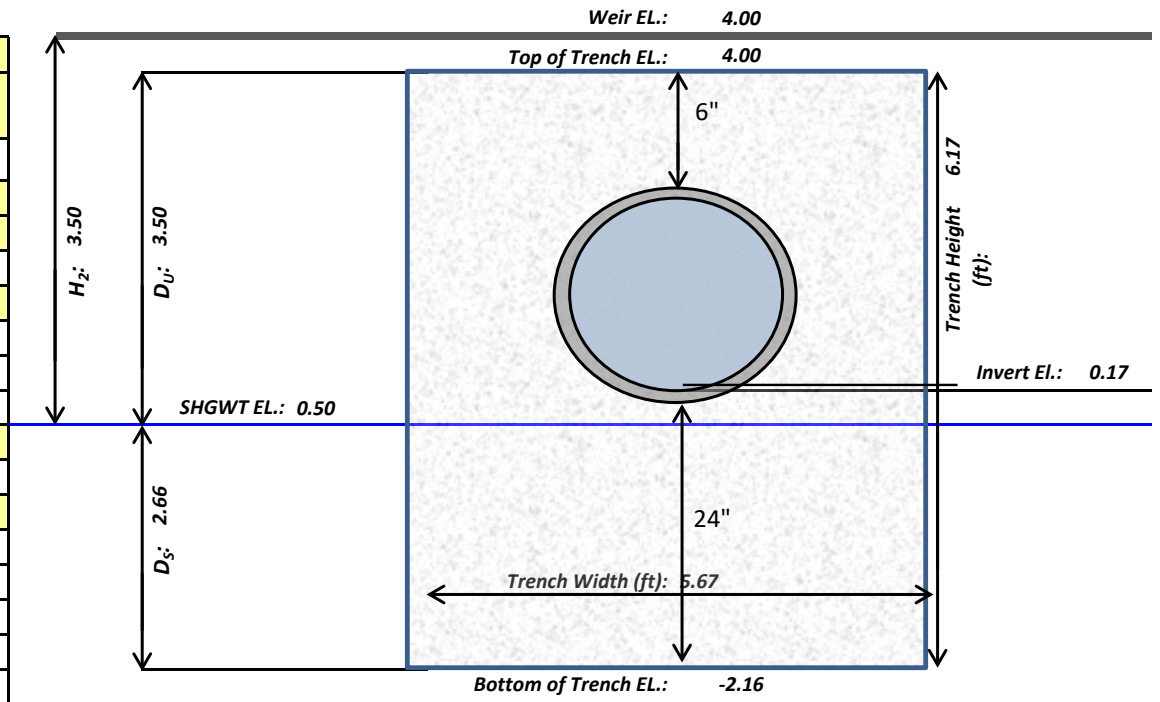
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_7R
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	925
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	0.17
Top of Trench EL. (ft-NAVD):	4.00
Bottom of Trench EL. (ft-NAVD):	-2.16
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	4.00
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	3.50
Non-Saturated Trench Depth, D_U (ft):	3.50
Saturated Trench Depth, D_S (ft):	2.66
H_2W:	19.85
$2H_2D_U$:	24.55
D_U^2:	12.27
$2H_2D_S$:	18.66
$(1.39x10^{-4})WD_U$:	0.002759
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	16.41
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	10.99
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**1.37**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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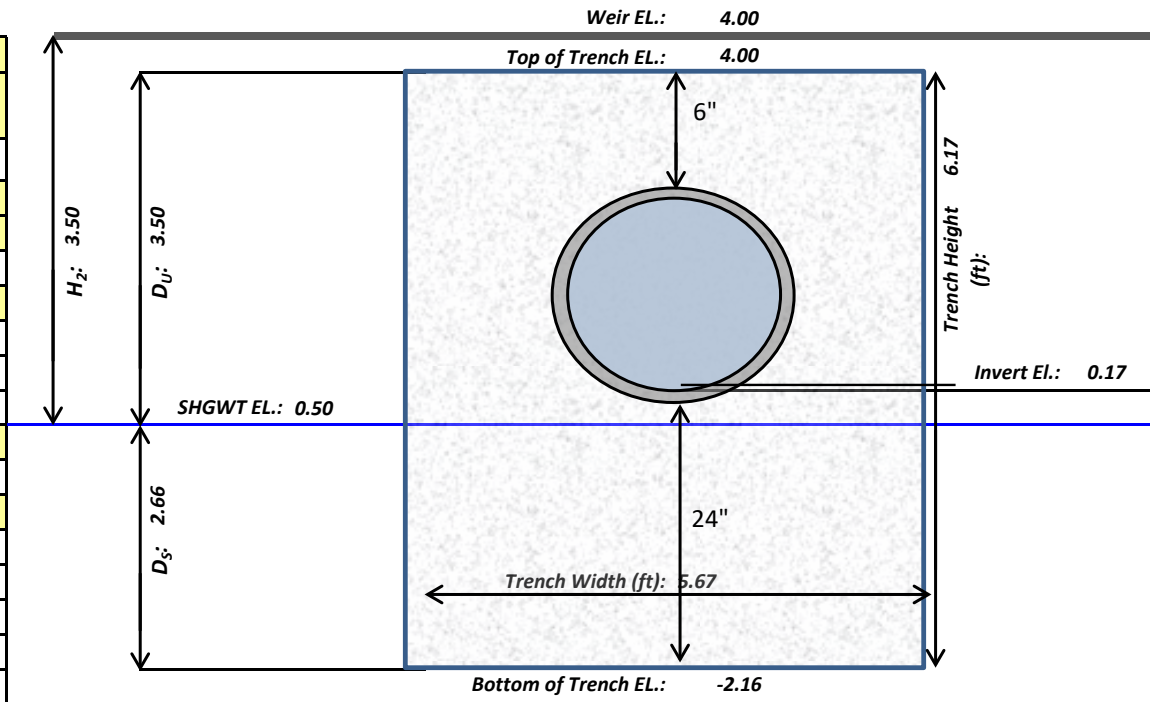
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_8R
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	600
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	0.17
Top of Trench EL. (ft-NAVD):	4.00
Bottom of Trench EL. (ft-NAVD):	-2.16
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	4.00
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	3.50
Non-Saturated Trench Depth, D_U (ft):	3.50
Saturated Trench Depth, D_S (ft):	2.66
H_2W:	19.85
$2H_2D_U$:	24.55
D_U^2:	12.27
$2H_2D_S$:	18.66
$(1.39x10^{-4})WD_U$:	0.002759
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	10.64
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	7.13
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.89**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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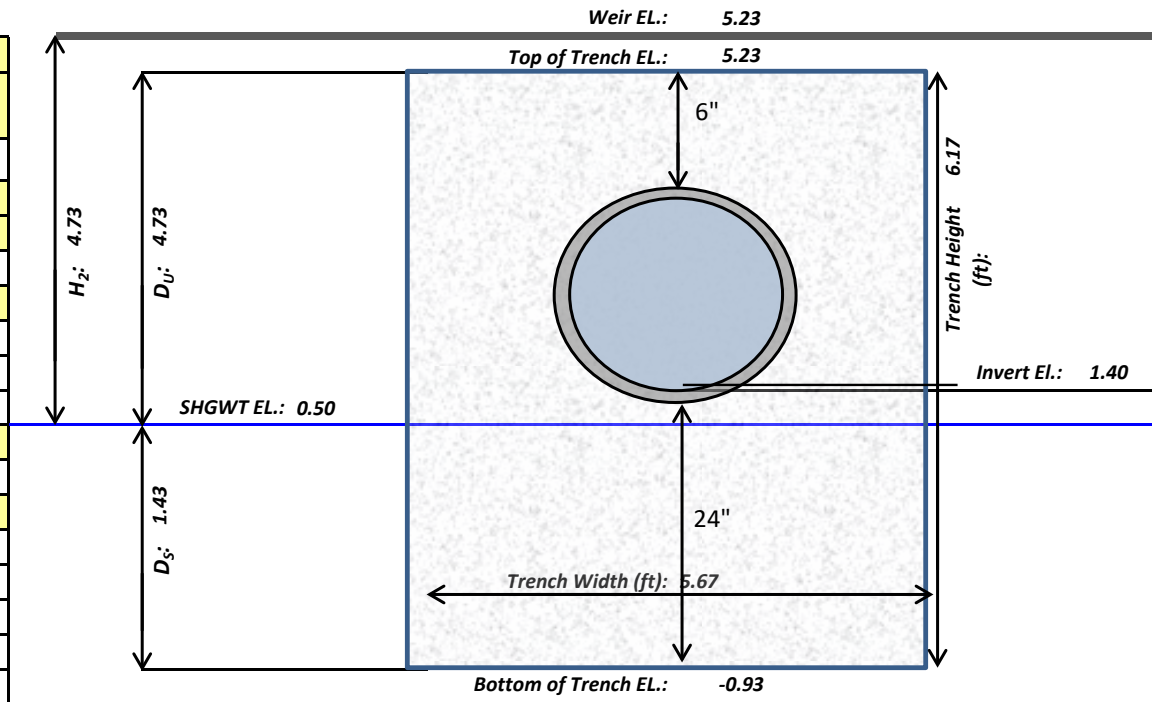
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_1L
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	430
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	1.40
Top of Trench EL. (ft-NAVD):	5.23
Bottom of Trench EL. (ft-NAVD):	-0.93
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	5.23
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	4.73
Non-Saturated Trench Depth, D_U (ft):	4.73
Saturated Trench Depth, D_S (ft):	1.43
H_2W:	26.82
$2H_2D_U$:	44.81
D_U^2:	22.40
$2H_2D_S$:	13.57
$(1.39x10^{-4})WD_U$:	0.003728
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	9.57
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	6.17
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.80**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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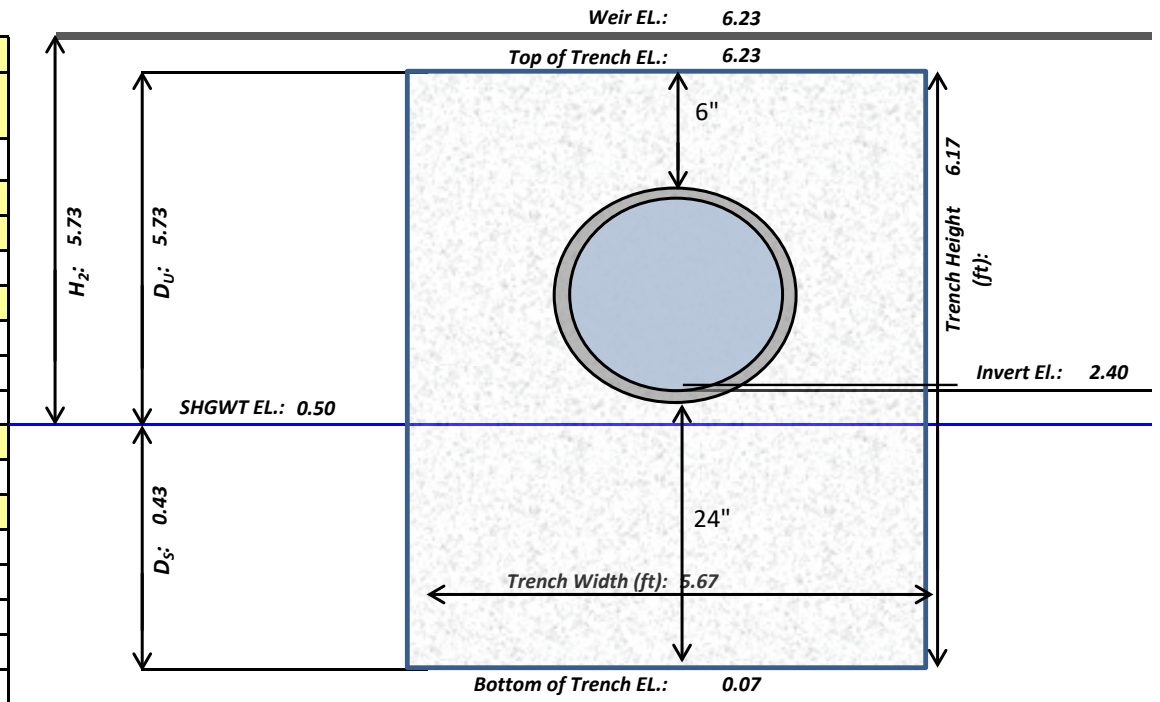
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_2L
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	224
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	2.40
Top of Trench EL. (ft-NAVD):	6.23
Bottom of Trench EL. (ft-NAVD):	0.07
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	6.23
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	5.73
Non-Saturated Trench Depth, D_U (ft):	5.73
Saturated Trench Depth, D_S (ft):	0.43
H_2W:	32.49
$2H_2D_U$:	65.74
D_U^2:	32.87
$2H_2D_S$:	4.97
$(1.39x10^{-4})WD_U$:	0.004516
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	5.66
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	3.51
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.47**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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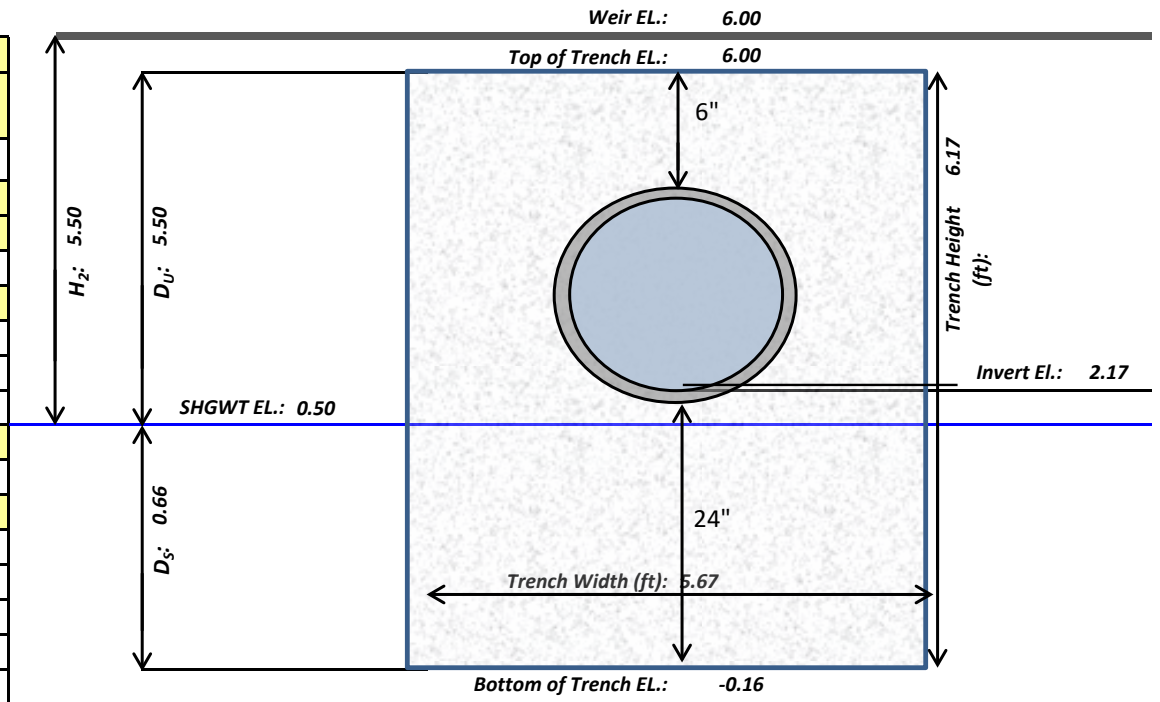
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_2L-1
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	485
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	2.17
Top of Trench EL. (ft-NAVD):	6.00
Bottom of Trench EL. (ft-NAVD):	-0.16
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	6.00
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	5.50
Non-Saturated Trench Depth, D_U (ft):	5.50
Saturated Trench Depth, D_S (ft):	0.66
H_2W:	31.19
$2H_2D_U$:	60.57
D_U^2:	30.29
$2H_2D_S$:	7.30
$(1.39x10^{-4})WD_U$:	0.004335
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	11.94
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	7.48
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**1.00**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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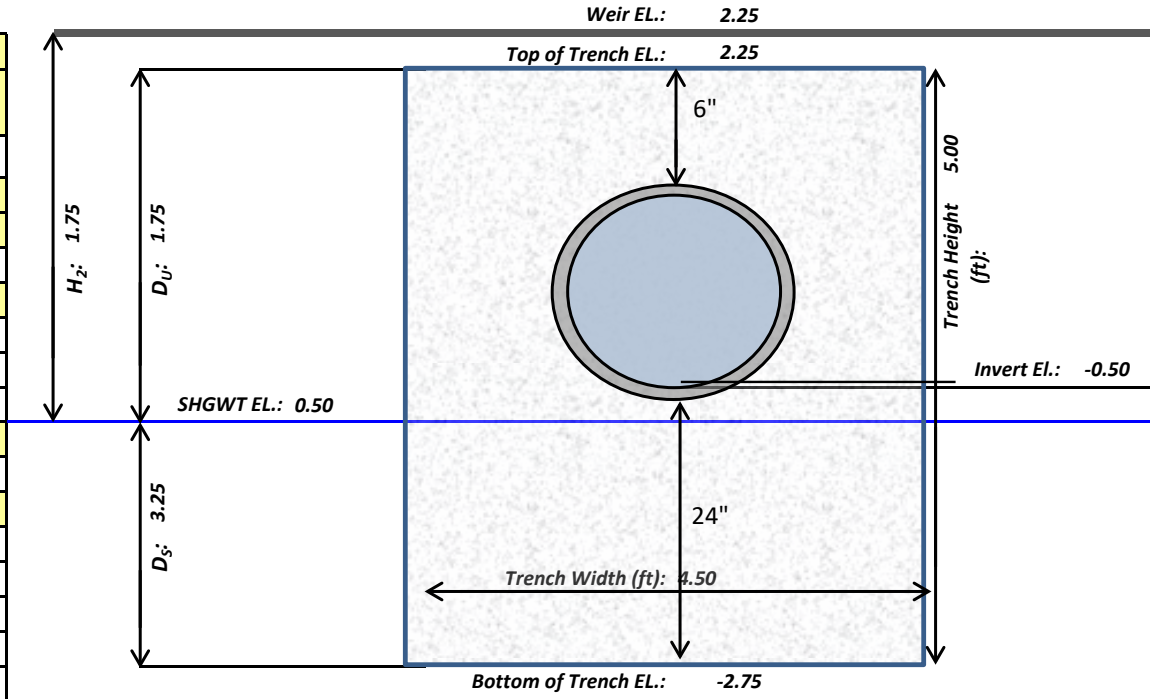
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_3L
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	24
Length of French Drain, L (LF):	428
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	-0.50
Top of Trench EL. (ft-NAVD):	2.25
Bottom of Trench EL. (ft-NAVD):	-2.75
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	2.25
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	1.75
Non-Saturated Trench Depth, D_U (ft):	1.75
Saturated Trench Depth, D_S (ft):	3.25
H_2W:	7.88
$2H_2D_U$:	6.13
D_U^2:	3.06
$2H_2D_S$:	11.38
$(1.39x10^{-4})WD_U$:	0.001095
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	3.29
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	2.29
$D_U > D_S$ and $W < 2H_T$ (Yes/No):	No
Treatment Volume Provided, V (Ac-ft):	**0.19**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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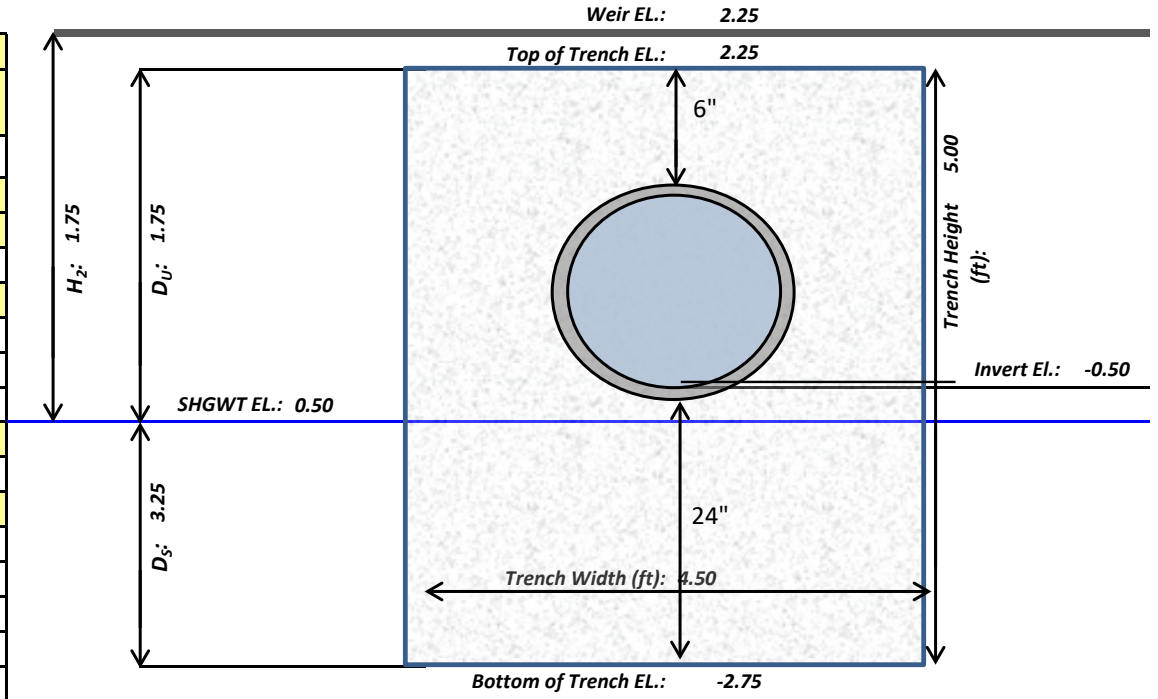
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_4L
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	24
Length of French Drain, L (LF):	322
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	-0.50
Top of Trench EL. (ft-NAVD):	2.25
Bottom of Trench EL. (ft-NAVD):	-2.75
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	2.25
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	1.75
Non-Saturated Trench Depth, D_U (ft):	1.75
Saturated Trench Depth, D_S (ft):	3.25
H_2W:	7.88
$2H_2D_U$:	6.13
D_U^2:	3.06
$2H_2D_S$:	11.38
$(1.39x10^{-4})WD_U$:	0.001095
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	2.47
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	1.72
$D_U > D_S$ and $W < 2H_T$ (Yes/No):	No
Treatment Volume Provided, V (Ac-ft):	**0.14**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

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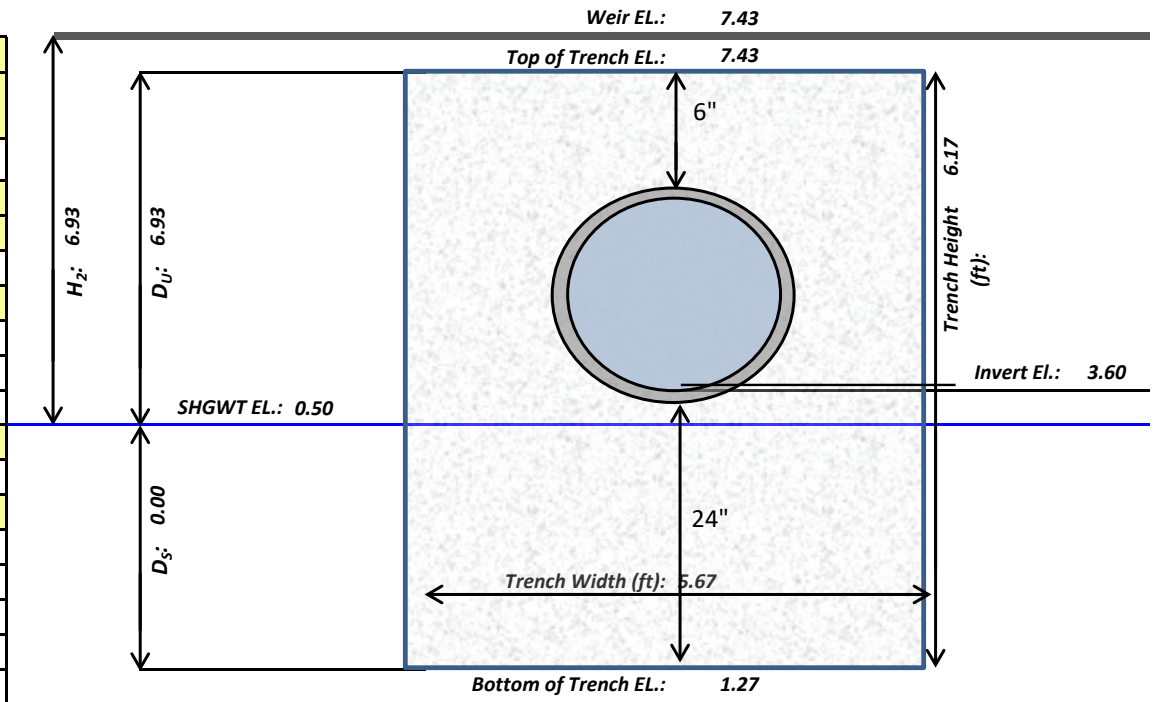
FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	BASIN 3
Location	FD3_5L
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	36
Length of French Drain, L (LF):	500
Pipe Thickness (in):	4.00
Pipe Invert EL. (ft-NAVD):	3.60
Top of Trench EL. (ft-NAVD):	7.43
Bottom of Trench EL. (ft-NAVD):	1.27
Trench Height, H_T (ft):	6.17
Weir EL. (ft-NAVD):	7.43
Trench Width, W (ft):	5.67
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	6.93
Non-Saturated Trench Depth, D_U (ft):	6.93
Saturated Trench Depth, D_S (ft):	0.00
H_2W:	39.29
$2H_2D_U$:	96.14
D_U^2:	48.07
$2H_2D_S$:	0.00
$(1.39x10^{-4})WD_U$:	0.005461
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	15.62
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	9.82
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**1.30**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

APPENDIX J

Exfiltration Trench Calculations – Side Streets

Table 6 - SUMMARY OF FRENCH DRAIN - SIDE STREETS											
Side Street	Basin	Station From	Station To	Additional Imp. Area (ac) (1)	Q = Direct Runoff (in) (2)	Total Runoff (ac-ft) (3)	Treatment Volume = 2.5" of Additional Imp. Area (ac-ft) (4)	Required Vol. in FD (ac-ft) (5)	Provided Volume in FD (ac-ft) (6)	Proposed FD Length (ft) (7)	Remark
Hallandale Beach Boulevard	HBB_WEST	130+00.00	144+25.66	0.28	13.16	0.31	0.06	0.31	0.35	279	
Hallandale Beach Boulevard	HBB_EAST	146+58.68	153+01.57	0.10	13.16	0.11	0.02	0.11	0.11	105	
Pembroke Pine Road	PR_WEST	264+76.92	275+96.36	0.21	13.16	0.23	0.04	0.23	0.29	284	
Pembroke Pine Road	PR_EAST	278+17.39	285+25.32	0.02	13.16	0.02	0.00	0.02	0.06	42	

CN = 98 = Imp. Area

S = 0.20

$$S = \frac{1000}{CN} - 10$$

P = 13.40 in Rainfall in (in) 25YR-72HR Storm

(1) - Additional Imp. Area (ac)

(2) - Direct Runoff

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

(3) = (2) X (1)

(4) = 2.5" X (1)/12

(5) = Maximum of (3) or (4)

(6) Provided Volume in FD - from FD Volume Calculations

(7) FD Length from FD Volume Calculations

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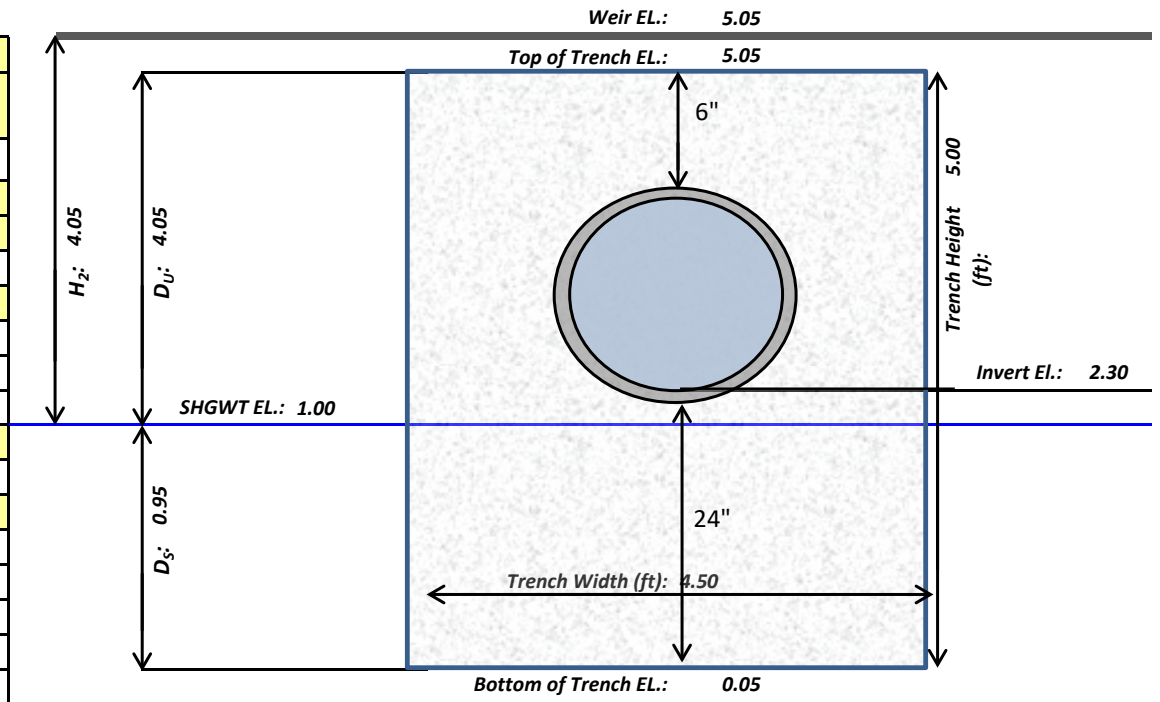
Hallandale Beach Boulevard West

FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	HBB_WEST
Location	
SHGWT EL. (ft-NAVD):	1.00
Pipe Size (in):	24
Length of French Drain, L (LF):	279
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	2.30
Top of Trench EL. (ft-NAVD):	5.05
Bottom of Trench EL. (ft-NAVD):	0.05
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	5.05
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	4.05
Non-Saturated Trench Depth, D_U (ft):	4.05
Saturated Trench Depth, D_S (ft):	0.95
H_2W:	18.23
$2H_2D_U$:	32.81
D_U^2:	16.40
$2H_2D_S$:	7.70
$(1.39x10^{-4})WD_U$:	0.002533
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	4.19
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	2.69
$D_U > D_S$ and $W < 2H_T$ (Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.35**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

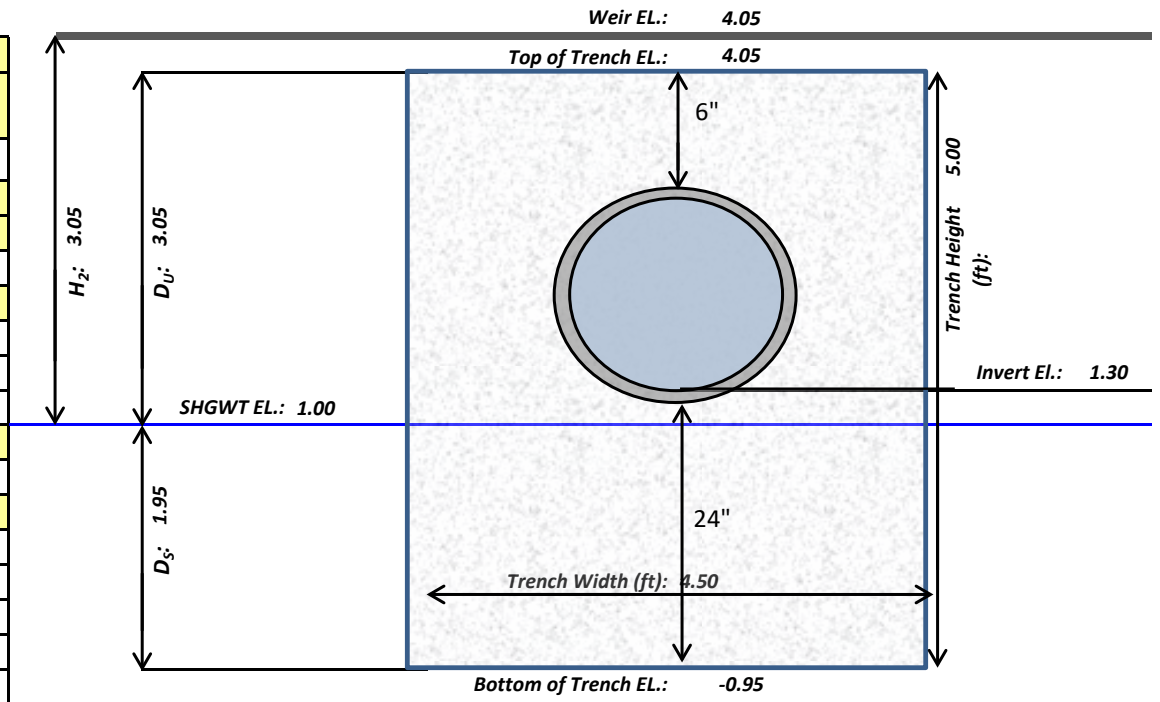
$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

I-95 PD&E SideStreets

Hallandale Beach Boulevard East

FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	HBB_EAST
Location	
SHGWT EL. (ft-NAVD):	1.00
Pipe Size (in):	24
Length of French Drain, L (LF):	105
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	1.30
Top of Trench EL. (ft-NAVD):	4.05
Bottom of Trench EL. (ft-NAVD):	-0.95
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	4.05
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	3.05
Non-Saturated Trench Depth, D_U (ft):	3.05
Saturated Trench Depth, D_S (ft):	1.95
H_2W:	13.73
$2H_2D_U$:	18.61
D_U^2:	9.30
$2H_2D_S$:	11.90
$(1.39x10^{-4})WD_U$:	0.001908
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	1.28
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	0.86
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.11**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

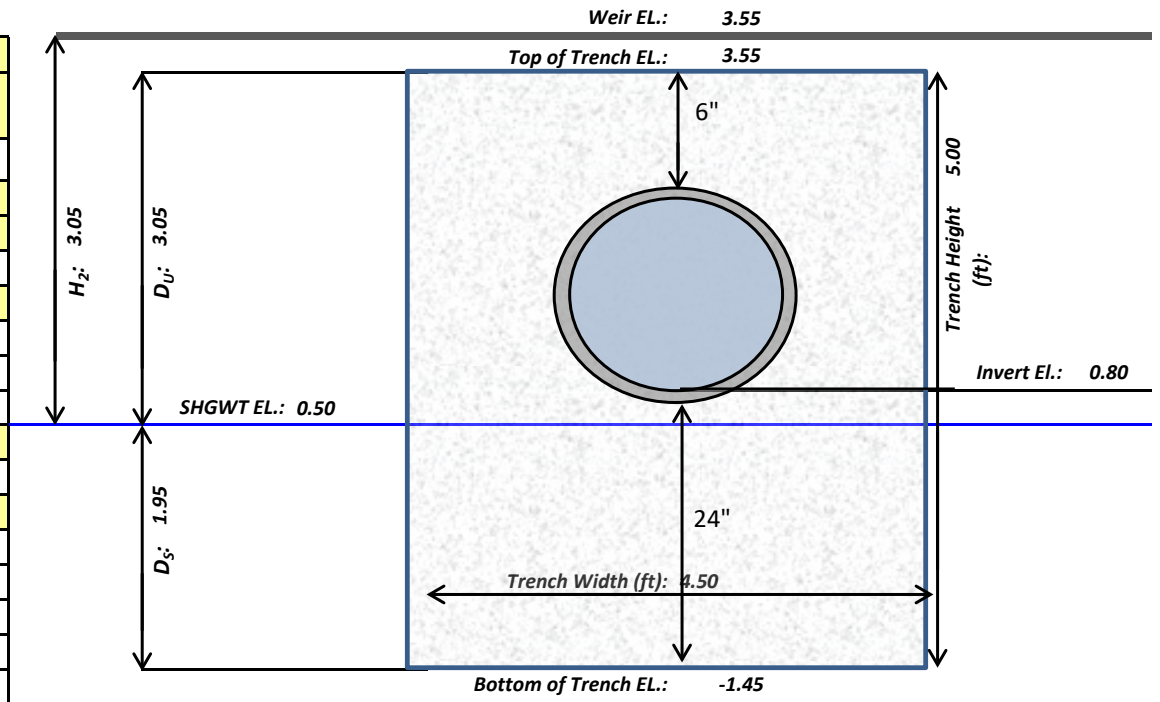
$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

I-95 PD&E SideStreets

Pembroke Road West

FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	PR_WEST
Location	
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	24
Length of French Drain, L (LF):	284
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	0.80
Top of Trench EL. (ft-NAVD):	3.55
Bottom of Trench EL. (ft-NAVD):	-1.45
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	3.55
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	3.05
Non-Saturated Trench Depth, D_U (ft):	3.05
Saturated Trench Depth, D_S (ft):	1.95
H_2W:	13.73
$2H_2D_U$:	18.61
D_U^2:	9.30
$2H_2D_S$:	11.90
$(1.39x10^{-4})WD_U$:	0.001908
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	3.47
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	2.32
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.29**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

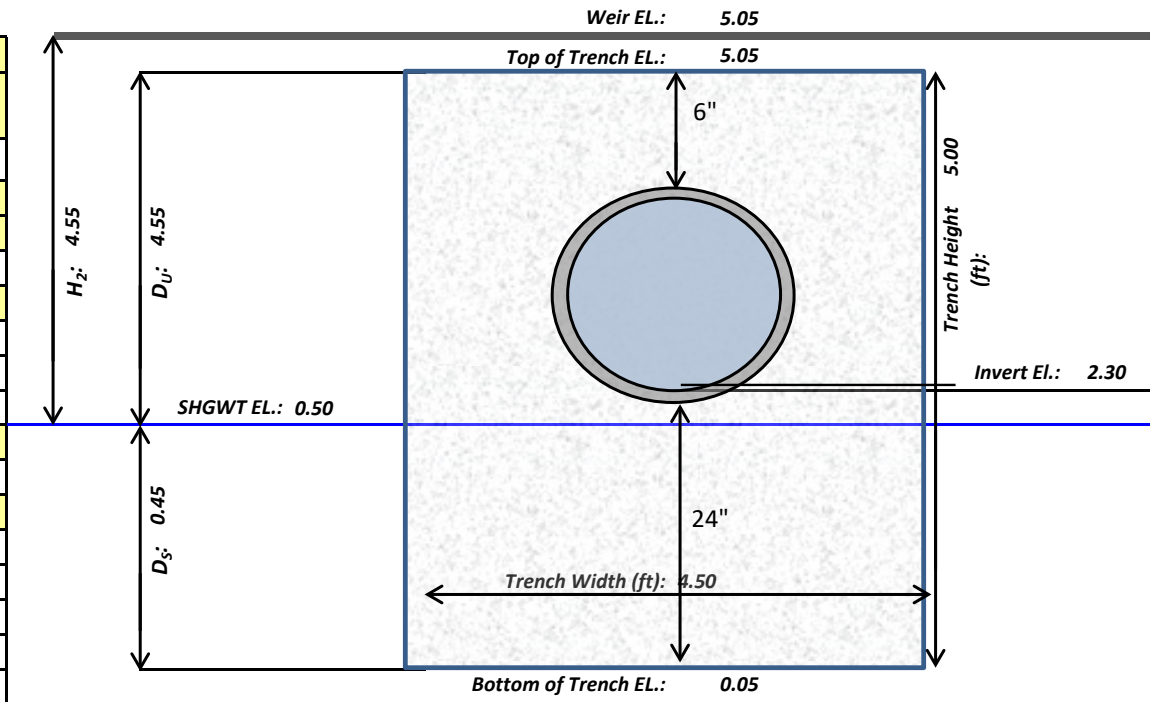
$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

I-95 PD&E SideStreets

Pembroke Road East

FRENCH DRAIN DESIGN & PROVIDED VOLUMES

BASIN	PR_EAST
Location	
SHGWT EL. (ft-NAVD):	0.50
Pipe Size (in):	24
Length of French Drain, L (LF):	42
Pipe Thickness (in):	3.00
Pipe Invert EL. (ft-NAVD):	2.30
Top of Trench EL. (ft-NAVD):	5.05
Bottom of Trench EL. (ft-NAVD):	0.05
Trench Height, H_T (ft):	5.00
Weir EL. (ft-NAVD):	5.05
Trench Width, W (ft):	4.50
Average Hydraulic Conductivity, K_{10} (cfs/ft^2/ft-head):	2.950E-04
Depth to Water Table, H_2 (ft):	4.55
Non-Saturated Trench Depth, D_U (ft):	4.55
Saturated Trench Depth, D_S (ft):	0.45
H_2W:	20.48
$2H_2D_U$:	41.41
D_U^2:	20.70
$2H_2D_S$:	4.10
$(1.39x10^{-4})WD_U$:	0.002846
If $D_U > D_S$ and $W < 2H_T$, Treatment Provided, V (ac-in):	0.68
If $D_S > D_U$ and/or $W > 2H_T$, Treatment Provided, V (ac-in):	0.43
$D_U > D_S$ and $W < 2H_T$(Yes/No):	Yes
Treatment Volume Provided, V (Ac-ft):	**0.06**



$$V = L[K_{10}(H_2W + 2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

$$V = L[K_{10}(2H_2D_U - D_U^2 + 2H_2D_S) + (1.39x10^{-4})WD_U]$$

APPENDIX K

Seasonal High Water (SHW) Table Technical Memo

HDR | ONE COMPANY *Many Solutions*℠

Memo

To:	Ryan Solis-Rios, P.E.		
From:	Derly Y. Cano, EI	Project:	PD&E I-95 from S of SR-858/Hallandale Beach Blvd. to N of SR-820/Hollywood Blvd., Broward County
CC:	Javier Manso, P.E., Mohammad Pervez, P.E., Rohan Hameed, P.E.		
Date:	July 11, 2017	FPID:	436903-1-22-02

RE: Seasonal High Water (SHW) for the project area

Seasonal High Water (SHW) Elevation

In order to determine the Seasonal High Water (SHW) elevation for the PD&E study of I-95 from south of SR-858/Hallandale Beach Blvd. to north of SR-820/Hollywood Blvd. the following material have been a analyzed:

1. Broward County Water Table Map – Average Wet Season: The Seasonal High Water Elevation for the project area has been identified as 0.5 ft. NAVD (2.0 ft. NGVD).
2. Existing environmental permit for SFWMD ERP 88-00053-S, for the Interstate 95 managed lanes – Fm No. 422796-1-52-01, according to the drainage design documents for this permit the Seasonal High Water showed is 0.50 ft. NAVD (2.00 ft. NGVD).
3. FDOT projects:
   - FPID 422796-1-52-01 and FPID 422796-2-52-01

     The scope of this project include the design to convert the existing High occupancy Vehicle (HOV) Lane to two Express Lanes along I-95 from the Golden Glades Interchange to south of Broward Blvd. and Ives Dairy Road Interchange at I-95 from NE 16th Ave. to East of Highlands Lake Blvd.

This project includes design information relevant to the PD&E study area as follows: System 5 includes the area from Hallandale Beach Blvd. to Pembroke Rd. this system consists of ditches with bottom elevation of 1.5 ft. NAVD and discharge elevation of 4.0 ft. NAVD. System 5 discharges into a self contained FDOT Borrow pit.

- FPID 409354-2-52-01

  The scope of this project includes the roadway widening to accommodate modifications to the existing I-95 Express ingress and egress points, and widening of bridges over Hollywood Blvd, Johnson Street, C-10 Canal, Taft Street, Sheridan Street, C-10 Spur Canal, Stirling Road and Griffin Road.

  This project includes design information relevant to the PD&E study area as follows: System 6 covers the area from Pembroke Rd. to Johnson St. The System 6 ditches have a ditch bottom elevation of 1.5 ft. NAVD and discharge elevation of 2.5 ft. NAVD. The ultimate discharge for System 6 outfalls is the Hollywood Canal (C-10 canal) as indicated in SFWMD ERP Permit No. 88-00053-S.

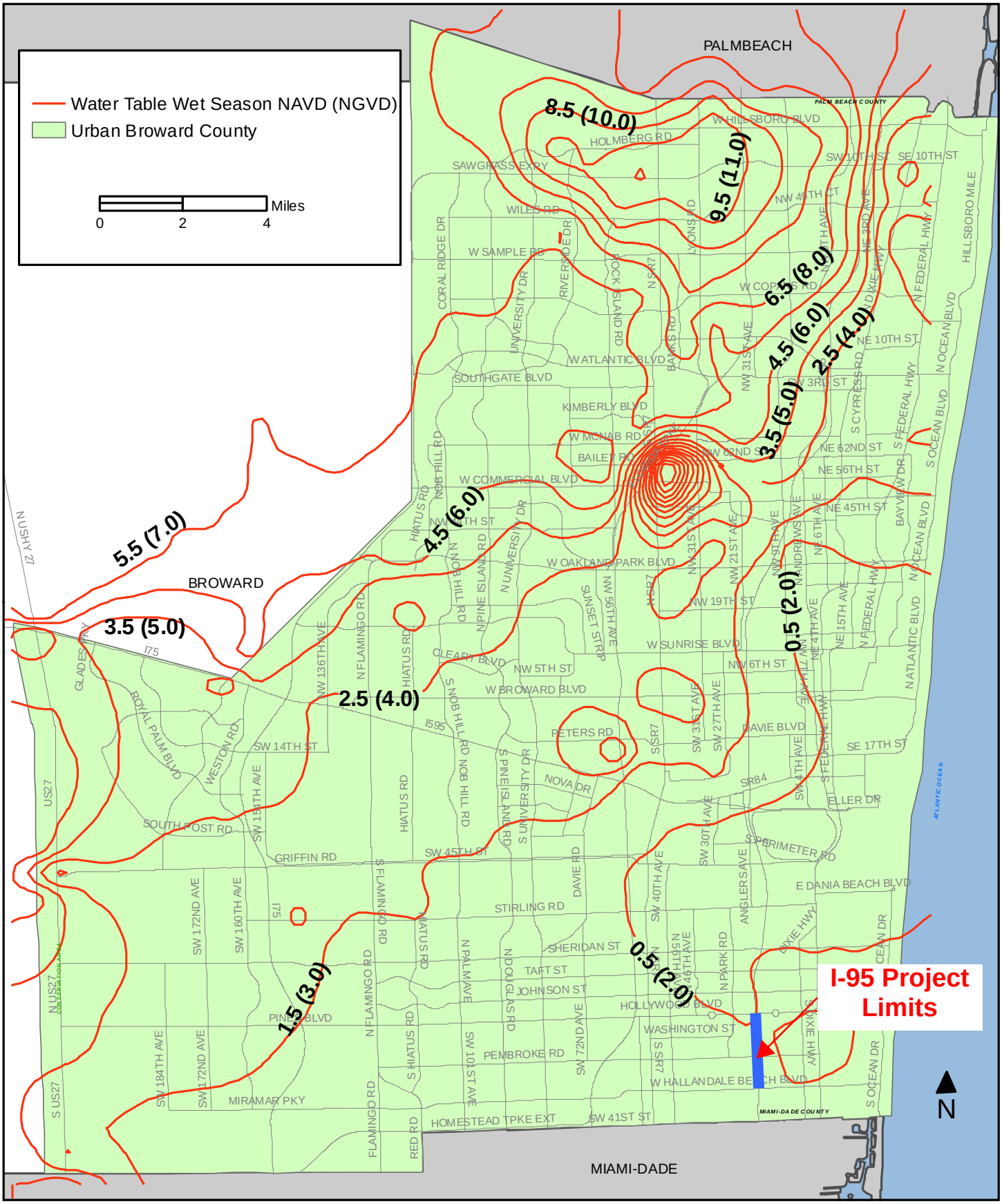
For the reference projects the pond bottom has been set based on SFWMD Environmental Resource Permit Handbook design criteria for dry retention as follow; bottom elevation shall be at least one foot above the average wet season water table elevation.

Conclusion and Recommendation:

Based on the information obtain from the various relevant sources the seasonal high water elevation for the project area has been recommended as 0.50 ft. NAVD (2.00 ft. NGVD).

Attached find the back-up information for the evaluation of the Seasonal High Water Elevation as described in this Memo.

WATER TABLE MAP - AVERAGE WET SEASON



Division Name: Planning and Environmental Regulation
Department Name: Environmental Protection and Growth Management

This map is for conceptual purposes only and should not be used for legal boundary determinations.
Elevation converted from NGDV to NAVD using the FEMA approved conversion factor for Broward County of (-) 1.5

Table E-1: Drainage System Area Calculations -Final Compilation

Existing Permit	System	Basin Limits	A Additional Impervious Area (Ac.)	B Runoff Volume of 25yr-3day Storm Event for Additional Impervious Area, V_{post} (Ac-ft) (post-condition) (CN=98)	C Runoff Volume of 25yr-3day Storm Event for Additional Impervious Area, V_{pre} (grass) (Ac-ft) (pre-condition) (CN=39)	D=B-C Increased Runoff Volume of 25yr-3day Storm Event for Additional Impervious Area (Ac-ft)	E Ditch Volume Being Filled (Ac-ft) (See Cross Section)	F=D+E Volume Required (Ac-ft)	G Volume Provided (Ac-ft) (See Cross Sections)	H Volume of 2.5" Over Additional Impervious Area w/ 75% Dry Detention Credit (Ac-ft)
Permit 85-00070-S	System 1 *	Begin Project to South of Miami Gardens Dr. (Sta. 34+00.00)	0.313	0.385	0.134	0.251	0.001	0.252	0.240	0.049
	System 2 *	South of Miami Gardens Dr. (Sta. 34+00.00) to Snake Creek Canal	0.918	1.129	0.392	0.737	0.047	0.784	0.433	0.143
	System 3	Snake Creek Canal to Miami-Dade Broward County Line	9.389	11.547	4.008	7.539	3.609	11.148	11.617	1.467
Permit 88-00053-S	System 4	Miami-Dade Broward County Line to Hallandale Beach Blvd.	**10.620** 1.847	2.271	0.788	1.483	0.204	**12.184** 1.687	**12.290** 1.504	0.289
	System 5 **	Hallandale Beach Blvd. to Pembroke Road	0.470	0.578	0.201	0.377	0.266	0.643	0.643	0.073
	System 6	Pembroke Road to Johnson Street	1.634	2.010	0.698	1.312	0.059	1.371	1.738	0.255
	System 7 **	Johnson Street to North of Johnson Street (Sta. 381+80.50)	0.211	0.259	0.090	0.169	0.037	0.207	0.033	0.033
Permit 88-00050-S	System 8 ***	North of Johnson Street (Sta. 381+80.50) to C-10 Canal	**4.162** 0.089	0.109	0.038	0.071	0.027	**3.907** 0.098	**3.917** 0.074	0.014
	System 9 ***	C-10 Canal to Sheridan Street	0.189	0.232	0.081	0.152	0.054	0.206	0.108	0.030
	System 10 ***	Sheridan Street to C-10 Canal Spur	0.734	0.903	0.313	0.589	0.036	0.625	0.478	0.115
	System 11	C-10 Canal Spur to Stirling Road	0.376	0.462	0.161	0.302	0.024	0.326	0.468	0.059
	System 12	Stirling Road to Griffin Road	0.637	0.783	0.272	0.511	0.000	0.511	0.673	0.100
			2.025					**1.766**	**1.803**	
							Total	**17.857**	**18.009**	

Legend

Column	Description
A	Additional impervious area
B, C	V = Q x A/12
	where:
	V = runoff volume (pre or post)
	Q = peak discharge for 25yr-3day storm
	$= (P-0.2S)^2 / (P+0.8S)$,
	where:
	S = (1000 / CN) - 10
	P = rainfall depth (inches) = 15 in
D	Increased runoff (Column B - Column C)
E	Ditch volume being filled (See Cross Sections)
F	Volume required (Column D + Column E)
G	Volume provided (See Cross Sections)
H	Volume of 2.5" over additional impervious area with a 50% detention credit
	V = (2.5/12) x (Column A) x 50%

Notes:

For System 1 use ditch bottom elevation of 4.0-ft NAVD and control elevation of 6.0-ft NAVD.
For System 2 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 2.7-ft NAVD.
For System 3 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 4.5-ft NAVD.
For System 4 use ditch bottom elevation of 2.5-ft NAVD and control elevation of 3.5-ft NAVD.
For System 5 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 4.0-ft NAVD.
For System 6 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 2.5-ft NAVD.
For System 7 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 2.5-ft NAVD.
For System 8 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 2.5-ft NAVD.
For System 9 use ditch bottom elevation of 1.0-ft NAVD and control elevation of 2.0-ft NAVD.
For System 10 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 2.6-ft NAVD.
For System 11 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 2.6-ft NAVD.
For System 12 use ditch bottom elevation of 1.5-ft NAVD and control elevation of 1.95-ft NAVD.

* The deficiency in required volume in Systems 1 and 2 are offset by compensatory volume provided in the adjoining System 3 SFWMD Permit No. 85-00070-S.
** The deficiency in required volume in Systems 4, 5, and 7 are offset by compensatory volume provided in the adjoining System 6 of SFWMD Permit No. 88-00053-S.
*** The deficiency in required volume in Systems 8, 9, and 10 are offset by compensatory volume provided in the adjoining Systems 11 and 12 of SFWMD Permit No. 88-00050-S.

Interstate 95 (I-95/ SR 9) PD&E Study

From South of Hallandale Beach Boulevard (SR 858) to
North of Hollywood Boulevard (SR 820), Broward County

FDOT
INTERSTATE
95