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IFB NO. Y18-702-RM **ISSUED: August 28, 2017**

INVITATION FOR BIDS

FOR

BARRY STREET DRAINAGE IMPROVEMENTS PROJECT

****

PART H
TECHNICAL SPECIFICATIONS

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PART H
Volume II

TECHNICAL PROVISIONS

FOR

BARRY STREET
DRAINAGE IMPROVEMENTS

ORANGE COUNTY, FLORIDA

PREPARED FOR:

ORANGE COUNTY PUBLIC WORKS DEPARTMENT
ROADS AND DRAINAGE DIVISION
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JULY 2017

PART H
TECHNICAL PROVISIONS

for:

BARRY STREET
DRAINAGE IMPROVEMENTS
ORANGE COUNTY, FLORIDA

ACKNOWLEDGMENTS

As always, Inwood has enjoyed the opportunity to serve Orange County on this assignment, and would like to express our appreciation for the continued support of the County Commissioners.

Orange County Board of County Commissioners

Teresa Jacobs, County Mayor

Betsy Vanderley, District 1

Bryan Nelson, District 2

Pete Clarke, District 3

Jennifer Thompson, District 4

Emily Bonilla, District 5

Victoria P. Siplin, District 6

CERTIFICATION

The engineering material and data contained within the following **Technical Provisions** was prepared by Inwood Consulting Engineers for the sole use by the Orange County Roads and Drainage Division.

_____, P.E.
Steven M. Sommerfeldt, P.E.
Florida Registration No. 64074
Date: 7-31-17

STEVEN M. SOMMERFELDT ★ LICENSE No.64074 ★ STATE OF FLORIDA ★ PROFESSIONAL ENGINEER

PART H
TECHNICAL PROVISIONS

for

BARRY STREET
DRAINAGE IMPROVEMENTS
ORANGE COUNTY, FLORIDA

SCOPE OF WORK

This contract includes the work necessary to properly construct a stormwater system along the west side of Fairvilla Road. The project area is located along Fairvilla Road in west Orange County between Colonial Drive (SR 50) and Old Winter Garden Road, bordered on the east by Barry Street and Irene Drive on the west (Section 29, Township 22S, and Range 29E). The area of interest for this scope of work is along the west side of Fairvilla Road from the property at 580 Fairvilla Road to the northwest corner of the Fairvilla Road and SR 50 at the intersection.

The work includes upsizing the existing stormsewer by installing a combination of 18" and 30" reinforced concrete pipes along Fairvilla Road and a 30" steel carrier crossdrain pipe (installed by jack and bore methods) across SR 50 at the intersection with Fairvilla Road.

Also included in this project are the installation of concrete drainage structures, the construction of shallow drainage ditches, and the construction and reconstruction of sidewalks, driveways, and curb and gutter. The work required to complete the project includes, but is not limited to, construction of the above items, demolition of the existing drainage infrastructure and the work associated with these tasks. In order to construct the proposed improvements, the work also includes activities related to: mobilization, dewatering, clearing and grubbing, site grading, temporary traffic control, erosion control countermeasures and site restoration.

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TECHNICAL PROVISIONS

for

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DRAINAGE IMPROVEMENTS
ORANGE COUNTY, FLORIDA

INDEX OF DRAWINGS

(Prepared by Inwood Consulting Engineers)

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TECHNICAL PROVISIONS

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"**Standard Specifications**" shall mean the January 2017 edition of the Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, and supplements thereto, and Orange County Road Construction Specifications. The project shall be constructed in accordance with these specifications and the Florida Department of Transportation (FDOT) "**Standard Specifications for Road and Bridge Construction**," January 2017 edition, and "**Supplemental Specifications for Road and Bridge Construction**," (January 2017), hereafter referred to as the "**Standard Specifications**," and "**Orange County Road Construction Specifications**," latest edition. "**Additional Specifications**" (if any) may also be provided herein by the Engineer in an effort to more clearly define the Work under this Contract.

When reference is made to a Division, Section, or Article, it shall mean a Division, Section, or Article of said "Standard Specification". Wherever the Standard Specifications indicate a mailing address for a State office or Agency, the office or agency and the address shown area hereby deleted and replaced by the following:

Orange County Roads and Drainage	4200 South John Young Parkway
Division – Public Works Department	Orlando, Florida 32839

Where duplication of specifications occur, the Florida Department of Transportation (FDOT) "Standard Specifications for Road and Bridge Construction (January 2017)" shall apply unless reference is made to a material or equipment specification as required by Orange County. Where discrepancies occur between the "Standard Specifications", "Supplemental Specifications", "Orange County Specifications" and the Engineer's "Additional Specifications", provisions of Section 5-2 of the Standard Specifications for Road and Bridge Construction (January 2017) shall apply.

Each reference to Basis of Payment in said "Standard Specifications" is superseded by the conditions contained in the Technical Provisions and all other conditions related to Basis of Payment contained in these specifications.

The work specified in this contract represents the type of services to be accomplished. Work under this contract is limited to specified areas as listed in the scope of work. Areas have been inventoried and calculated as to quantities. Any discrepancies or disagreements concerning quantities and limits of work shall be immediately reported in writing (shall reflect the new measurements taken by the Contractor and the contract measurements) to the County representative. Discrepancies or disagreements will be mutually resolved prior to beginning work in any area in question. The County will make the final determination on any unresolved matters.

TECHNICAL PROVISIONS

TP 101 - Mobilization

MOBILIZATION

Mobilization shall include all items detailed in Article 101 of the Standard Specifications, the Special Provisions and on the plans, except as directed by the Engineer.

Preservation of Property Corners including all items detailed in Section 7-11 of the Standard Specifications shall be included in the contract price for mobilization.

Basis of Payment

The work and incidental costs covered under Mobilization will be paid for at the contract lump sum price and will be paid in partial payments in accordance with the following:

Percent of Original Contract Amount Earned	Allowable Percent of the Lump Sum Price for the Items*
5	25
10	50
25	75
50	100

*Partial payments as detailed above will be limited to 10% of the original Construction Subtotal Bid. Construction Subtotal Bid is defined as the total of all line items, exclusive of any alternatives or options, and exclusive of the Mobilization line item. Any remaining amount will be paid upon completion of all work.

Includes all surveys necessary for construction, preparation of as-built drawings. As-built drawings and certification to be provided under this pay item. Includes providing video documentation of before and after field conditions. Includes all efforts necessary to construct and dismantle a temporary staging area to be used by the Contractor for transport of materials to and from the construction area. Also includes the cost for preparing a dewatering plan, permitting through SFWMD and FDEP (if necessary) and the cost for dewatering the project site.

Payment shall be made under:

Pay Item:

101-1	Mobilization	Lump Sum

Pay Item Footnote No. 101-1
Includes all applicable survey costs and costs necessary for a video survey. Includes all efforts necessary to construct and dismantle a temporary staging area (including check dams) as needed to accommodate typical wet season rainfall events occurring during construction. Includes all monitoring and investigation efforts by a geotechnical engineer as necessary during and after construction due to signs of ground settling / shifting. See General Notes for additional items included under this pay item.

TECHNICAL PROVISIONS

TP 102 – Maintenance of Traffic

MAINTENANCE OF TRAFFIC

All Maintenance of Traffic work shall conform to the requirements of Section 102 of the Standard Specifications, Index 600 of the FDOT Design Standards, the plans, and/or as herein modified, except as directed by the Engineer.

The road shall be kept open to two-way traffic on a paved surface during construction except when full closures are allowed by the plans or by the Engineer. The Contractor shall not be permitted to isolate residences or places of business. Access shall be provided to all residences and all places of business whenever construction interferes with the existing means of access.

The Contractor shall furnish, erect and maintain all necessary traffic control devices, including flagmen and pilot cars, in accordance with the *Manual of Uniform Traffic Control Devices for Streets and Highways,* published by the U.S. Department of Transportation, Federal Highway Administration. The Contractor shall provide and maintain in a safe condition the entire project limits included, but not limited to pre existing conditions, driving lanes, temporary approaches, crossings, and intersections with trails, roads, streets, business parking lots, residences, garages and completed work. The Contractor shall take all necessary precautions for the protection of the work and the safety of the public in accordance with Section 102.

The Contractor shall present his signed and sealed Maintenance of Traffic Plan to the Engineer at the preconstruction conference, and shall be fully and solely responsible for the adequacy of the Maintenance of Traffic plan regardless of the source. The plan shall be signed and sealed by a professional engineer licensed in the State of Florida.

The Contractor shall be responsible for installation of signs for all business along the project corridor. Signs should be manufactured and installed in accordance with FDOT design standards. No special compensation will be made to the contractor to defray costs of any of the work or delays for complying with the requirements of installing business signs, but such costs shall be considered as having been included in the price stipulated for the Maintenance of Traffic pay item.

Basis of Payment

All materials, work and incidental costs related to Maintenance of Traffic will be paid for at the contract lump sum price. All material, labor and equipment necessary for the construction and maintenance of the entire project limits included, but not limited to pre-existing conditions, driving lanes, temporary approaches, crossings, intersections with trails, roads, streets, business parking lots, residences, garages, temporary driving lanes, side streets, driveway connections, and completed work, as may be directed by the Engineer shall be included in the contract price.

TECHNICAL PROVISIONS

TP 102 – Maintenance of Traffic

Payment will be made under:

Pay Item:

102-1	Maintenance of Traffic	Lump Sum
102-14	Traffic Control Officer	Hour
102-60	Work Zone Sign	Each Day
102-71-13	Barrier Wall, Temporary, F&I, Concrete	Linear Foot
102-74-1	Channelizing Device - Types I, II, DI, VP, Drum, or LCD	Each Day
102-99	Portable Changeable Message Sign, Temporary	Each Day

Pay Item Footnote No. 102-1
Includes the cost of the as needed removal or relocation of existing signs and pavement markings which conflict with the traffic control plan during a phase of construction, prior to commencement of that phase.

TECHNICAL PROVISIONS

TP 104 – Prevention, Control and Abatement of Erosion and Water Pollution

PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION

Prevention, control and abatement of erosion and water pollution shall conform to the requirements of Section 104 of the Standard Specifications, National Pollution Discharge Elimination System (NPDES) requirements, except as modified by these Technical Provisions or as directed by the Engineer.

The Contractor shall present at the Preconstruction Conference its Storm Water Pollution Prevention Plan (SWPPP) and a separate schedule to manage erosion and water pollution. This schedule shall include a complete outline of the proposed construction of all erosion and pollution control and abatement items required.

The Contractor shall be responsible for the preparation and submittal of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Florida Department of Environmental Protection (FDEP) and shall obtain the FDEP Generic Permit for Stormwater Discharge from Large and Small Construction Activities.

Basis of Payment

All work and incidental costs required to comply with the articles of this specification will be paid at the contract lump sum price for Prevention, Control and Abatement of Erosion and Water Pollution.

Payment will be made under:

Pay Item:

104-1	Prevention, Control and Abatement of Erosion and Water Pollution	Lump Sum

Pay Item Footnote No. 104-1
Includes the cost of all items required for erosion control including, but not limited to, synthetic bales, inlet protection, silt fence, and temporary grassing, as shown in the plans or as directed by the County.

TECHNICAL PROVISIONS

TP 110 – Clearing and Grubbing

CLEARING AND GRUBBING

All clearing and grubbing shall be performed in accordance with the requirements of Section 110 of the Standard Specifications, except as directed by the Engineer.

Scope of work to include but not be limited to, the removal of all rigid, asphalt pavement, Portland cement concrete pavement, curb, curb and gutter, ditch pavement, sidewalk, driveway aprons, concrete slabs, concrete structures, brick, fences, gravity walls, retaining walls, pipes, etc.

Clearing and Grubbing shall also include the removal of existing pavement and base course and backfilling with suitable material, as shown in the construction plans. Removal of the existing roadway shall also include the proper disposal of the removed materials as specified above.

Basis of Payment

All work and incidental costs required to perform clearing and grubbing as herein specified will be paid for at the contract lump sum price.

Payment shall be made under:

Pay Item:		
110-1-1	Clearing and Grubbing	Acre
110-7-2A	Mailbox (Relocate Existing)	Each

Pay Item Footnote No. 110-1-1
Includes but is not limited to the sawcut, removal, and disposal of existing pavement, driveway concrete, and curb and base as required to construct the project. Includes the removal of existing manholes, culvert pipes, curb inlets, mitered end sections, concrete spillways, etc. called out in the plans. Includes the transport and disposal of all removed materials to an approved Orange County disposal site yard, or as directed by the County. Includes the cost of temporary fencing for securing the work zone and preventing pedestrial traffic. It is the Contractor's responsibility to replace in-kind or better any damaged fencing identified to remain, damaged mailboxes, or any other private property disturbed during construction. Includes the relocation of personal property by the Contractor. Coordination efforts with the property owner for the relocation of private property shall also be included. Includes the cost of resident notification prior to the commencement of work. The Contractor shall notify all residents within the work area as to when the work will take place and explain the level of inconvenience that will be involved. This notification shall take place five (5) days prior to commencement of any work in that area. The notification will be by an approved door hanger to be placed on each house and any vehicles parked on the roadways.

Pay Item Footnote No. 110-7-2A
Includes the cost of all materials, labor, and equipment required for relocating mailbox.

TECHNICAL PROVISIONS

TP 120-1 – Excavation, Embankment and Grading

EXCAVATION, EMBANKMENT AND GRADING

All excavation, embankment and grading work shall conform to the requirements of Section 120 of the Standard Specifications (Excavation and Embankment), and the provisions of this section, except as directed by the Engineer.

Fill material shall be free of vegetation, deleterious material, rock, concrete, metal, wood, plastic, paper, garbage, gravel, trash, etc. The County reserves the right to inspect the source of the supply prior to delivery. In general, fill material are comprised of mixture approximately 45% clean native soil, 40% sand, maximum 10% muck and maximum 5% vegetation (allowable). Material shall be clean fill material without any construction debris with uniform moisture content prior to and during compaction throughout each layer of material. Use backfill material having placement moisture content within 2% on the dry side of optimum. At the end of each day's operation, slope the backfill surface in order to permit runoff of rainwater away from the slope face, or provide some other positive drainage. Muck, sand, and clay shall not be accepted as fill dirt. Loads that contain undesirable material shall not be accepted and removal of the material shall be the responsibility of the Contractor at no cost to the County. Quantities for imported clean fill dirt shall be verified by the County's Representative. Delivery tickets shall be provided by the Contractor to the County's Representative. Where unsuitable materials have been excavated, the area shall be backfilled with suitable material and paid for under this TP.

Basis of Payment

Excavation, embankment and grading will be paid for at the contract lump sum price.

Payment shall constitute full compensation for all work described herein and in the Special Provisions and shall include grading of shoulders, graded road connections, slopes, compaction, final dressing, subsoil excavation, replacement material and all work required for completing the project that is not paid for under the other pay items. Also included are removals and off-site disposal or on-site utilization of all materials, structures, abandoned utilities and obstructions as directed by the Engineer. Also includes removal and disposal of subsoil (muck or other organic soils) up to 18 CY (one truckload). All subsoil encountered and deemed necessary for removal shall be approved by the County for removal prior to doing so.

Payment shall be made under:

Pay Item:		
120-1	Excavation, Embankment and Grading	Cubic Yard

Pay Item Footnote No. 120-1
Includes the cost of all work required for ditch excavation, embankment fill, and associated grading.

TECHNICAL PROVISIONS

TP 160 – Stabilizing

STABILIZING

All work shall be performed in accordance with the requirements of Section 160 of the Standard Specifications (Stabilizing) and shall be constructed to the limits, thickness, and specified limerock bearing ratio as shown on the plans, except as directed by the Engineer.

Method of Measurement

Quantities of stabilized subgrade measured for payment under this Section shall be the actual area in square yards of satisfactorily installed stabilized subgrade.

Basis of Payment

Stabilized subgrade will be paid for at the contract unit price per square yard installed and accepted and shall include the cost of furnishing and hauling additional stabilizing materials required, and all mixing, shaping and compacting of the stabilized area. The increased thickness of the Type B stabilization under curb and gutter sections shall be considered incidental and included in the contract unit price.

Payment shall be made under:

Pay Item:		
160-4	Type B Stabilization, 12” (For Driveways)	Square Yard

TECHNICAL PROVISIONS

TP 285 – Optional Base Course

OPTIONAL BASE COURSE

Work specified in this Section consists of constructing Optional Base Course in Section 280 of the "Standard Specifications", except as amended herein. The plant, methods of operation and equipment shall conform to Section 320; general construction requirements shall be as specified in Section 320; and materials and compositions shall conform to Section 330 of the "Standard Specifications", except as directed by the Engineer.

Method of Measurement

Quantities measured for payment under this Section shall be the actual area in square yards of optional base course installed within the limits of the contract.

Basis of Payment

Optional Base Course will be paid for at the contract unit price per square yard, completed and accepted. No additional payment will be made for thickness greater than indicated neither on the plans nor for pavement of unauthorized areas.

Payment shall constitute full compensation including but not limited to all labor, equipment, materials including bituminous material (plant mix), bituminous material (tack coat) and all other incidental costs necessary to complete the work as specified.

Payment shall be made under:

Pay Item:		
285-701	Optional Base, Base Group 01, 4" (For Driveways)	Square Yard

TECHNICAL PROVISIONS

TP 327 – Milling of Existing Asphalt Pavement

MILLING OF EXISTING ASPHALT PAVEMENT

Milling of existing asphalt pavement shall be performed in accordance with the requirements of Sections 327 and 300 of the "Standard Specifications", except as amended herein. The work specified in this Section consists of removing existing asphaltic concrete pavement by milling to lower the finished grade adjacent to existing curb prior to resurfacing, except as directed by the Engineer.

Milled material becomes the property of the Contractor.

Equipment

The milling machine shall be capable of maintaining a depth of cut and cross slope that achieves the results specified in the plans and specifications. The overall length of the machine (out to out measurements excluding the conveyor) shall be a minimum of 18 feet. The minimum cutting width shall be 6 feet.

The milling machine shall be equipped with a built-in automatic grade control system that controls the transverse slope and the longitudinal profile to produce the specified results.

Any commercially manufactured milling machine meeting the above requirements shall be accepted prior to starting the project. If after milling has started the milling machine cannot consistently produce the specified results, the milling machine will be rejected for further use.

Equipment permitted when milling adjacent to existing curbs or other areas. Use of a smaller milling machine will be subject to the Engineer's acceptance, where it is impractical to use the above-described equipment.

The milling machine shall be equipped with means to effectively limit the amount of dust escaping the removal operation.

Construction

The Contractor shall remove the existing raised reflective pavement markers prior to milling. Include the cost of removing existing pavement markers in the price for milling.

The milling machine shall be operated to minimize the amount of dust being emitted from the machine. Pre-wetting of the pavement may be required.

Where traffic will be maintained on the milled surface prior to placing the new asphaltic concrete, the striation patterns shall produce an acceptable riding surface. The Engineer will accept the traveling speed of the milling machine to produce an acceptable riding surface.

TECHNICAL PROVISIONS

TP 327 – Milling of Existing Asphalt Pavement

Before opening a milled area to traffic, the pavement shall be thoroughly swept with power broom or other acceptable equipment to remove, to the greatest extent practicable, fine material, which will dust under traffic. This operation shall be conducted in such a manner that will minimize the potential of creating a traffic hazard and minimize air pollution.

Sweeping the milled surface with a power broom is required before placing asphaltic concrete.

The sweeping operation shall be performed immediately after the milling to prevent milled material infiltrating into the storm sewer system when the milling operation is near a municipal curb and gutter or a closed drainage system.

This operation shall include thoroughly removing all milled material from the gutter to prevent it from being swept into inlet openings or grates. Curbs shall not be damaged during the removal operation. The Engineer may require the equipment and/or methods be changed to achieve satisfactory results.

Milled Surface

Milled surfaces shall have a reasonably uniform texture, shall be within ¼ inch of a true profile grade and shall have no deviation in excess of ¼ inch from a straightedge applied to the pavement perpendicular to the centerline. Variations of the longitudinal joint between multiple cut areas shall not exceed ¼ inch. Areas varying from a true surface in excess of the above stated tolerance may be accepted without correction if the Engineer determines that they were caused by a pre-existing condition, which could not have reasonably been corrected by the milling operations. Any unsuitable texture or profile, as determined by the Engineer, shall be corrected by the Contractor at no additional compensation.

The Engineer may require re-milling of any area where a surface lamination causes a non-uniform texture to occur.

Method of Measurement

Quantities measured for payment under this Section shall be square yards, of milling acceptably completed.

Basis of Payment

Milling Existing Asphalt Pavement will be paid for at the contract unit price per square yard.

Payment shall be full compensation for all work specified in this Section, including hauling off or otherwise disposing of the milled material.

TECHNICAL PROVISIONS

TP 327 – Milling of Existing Asphalt Pavement

Payment shall be made under:

Pay Item:		
327-70-19	Milling Existing Asphalt Pavement, 1" Avg. Depth	Square Yard

SUPERPAVE ASPHALTIC CONCRETE PAVING

334-1 GENERAL

Work specified in this Provision consists of the application of Asphaltic Concrete structural courses properly produced and laid upon a prepared and accepted base in accordance with these specifications and in conformity with the lines, grades, thicknesses and cross-sections provided in the plans. Base preparation and Asphaltic Concrete Friction Courses are covered under separate provisions.

This Provision is intended to stand alone for the production and placement of structural course asphalt and replaces Sections 330 and 334 of the FDOT Standard Specifications for Road and Bridge Construction except when specific references are made to these or other Sections. Any references to FDOT Specification Sections shall mean the latest FDOT Standard Specifications for Road and Bridge Construction, including Supplements. Any incorrect references to or conflicts with the FDOT specifications, test methods, or standards shall be brought to the attention of the Engineer for clarification.

The Engineer will have the right to disapprove of any material or process that does not conform to these specifications.

The Contractor shall document all QC procedures, Process Control, inspection, and all test results and make them available for review by the Engineer throughout the Contract duration.

All test methods designated as FM refer to the FDOT Florida Sampling and Testing Methods.

334-2 CONTRACTOR QUALITY CONTROL REQUIREMENTS

334-2.1 GENERAL: The Contractor shall be responsible for the overall quality of the materials and workmanship of the work covered under this Provision.
Ensure that the qualifications and certifications of personnel and laboratories are maintained throughout the Contract duration. Provide proof of qualifications and all applicable certifications to the County prior to construction operations commencing. Notify the County immediately when there is a change in any qualification or certification during the Contract duration.

334-2.2 PERSONNEL: Provide personnel who are both qualified and certified in all activities related to asphalt mix production at the plant and placement on the roadway, especially for the sampling, testing and inspection of materials and construction

activities. At a minimum, a certified Paving Level II technician shall be present on site at all times during paving operations. Provide documentation to the Engineer that the personnel responsible for the production and placement of asphalt products under the Contract are qualified and certified.

334-2.3 TESTING LABORATORY: Furnish or have furnished a fully equipped asphalt laboratory (permanent or portable) at the production site. Provide documentation to the Engineer that any Laboratory used is FDOT qualified and certified.

334-2.4 EQUIPMENT: Provide equipment and methods conforming to Section 320 of the FDOT Standard Specifications for Road and Bridge Construction. Provide a sufficient number of trucks to transport the asphalt mixture from the plant to the job site such that paving of each lane can proceed in one smooth uninterrupted operation. In determining the number of trucks required the Contractor shall consider the capacity of the trucks, the length of the approved haul route from the plant to the job site, traffic conditions, weather conditions, and any other factors that could impact the round trip travel time. Stopping the paver to wait for trucks bringing the asphalt mixture will not be acceptable. In addition to meeting the requirements in Section 320-5, the paving machine shall be capable of pushing the asphalt truck as it dumps the asphalt mixture into the hopper. Stopping the paving machine to allow the next asphalt truck to back up to it to fill the hopper is not an acceptable procedure, and shall not be allowed.

Unless otherwise approved by the Engineer, the paving machine shall weigh a minimum of 26,000 pounds.

334-2.5 MINIMUM QUALITY CONTROL REQUIREMENTS: Perform the following activities necessary to maintain quality and process control and meet specification requirements:

Stockpiles: Ensure each aggregate component is placed in an individual stockpile, and separated from adjacent stockpiles, either by space or by a system of bulkheads. Prevent the intermingling of different materials in stockpiles. Form and maintain stockpiles in a manner that will prevent separation, contamination, segregation, etc. Identify each individual stockpile, including RAP, as shown on the mix design.

Incoming Aggregate: Obtain gradations and bulk specific gravity (Gsb) values from aggregate supplier for reference; determine the gradation of all component materials; routinely compare gradations and Gsb values to mix design.

Cold Bins: Calibrate the cold gate/feeder belt for each material; determine cold gate/feeder belt settings; observe operation of cold feeder for uniformity.

Dryer: Observe pyrometer for aggregate temperature control; observe efficiency of the burner.

For Batch Plants: Determine percent used and weight to be pulled from each bin to assure compliance with Mix Design, check mixing time, and check operations of weigh bucket and scales.

For Drum Mixer Plants: Determine aggregate moisture content, and calibrate the weigh bridge on the charging conveyor.

Control Charts: Plot and keep charts updated daily for all Quality Control Sampling and Testing and post in the asphalt lab where they can be seen. Maintain the following charts:

1. Sample test results for the following: No. 8 sieve, No. 200 sieve, asphalt binder content, air voids, and density.

2. Gradation of incoming aggregate.

3. Gradation and asphalt content of RAP.

4. Any other test result or material characteristic (as determined by the Contractor) necessary for process control.

The above listed minimum activities are to be considered normal activities necessary to control the production of hot mix asphalt at an acceptable quality level. It is recognized, however, that depending on the type of process or materials, some of the activities listed may not be necessary and in other cases, additional activities may be required. The frequency of these activities will also vary with the process and the materials. When the process varies from the defined process average and variability targets, the frequency of these activities will be increased until the proper conditions have been restored.

334-2.6 MINIMUM PROCESS CONTROL TESTING REQUIREMENTS:

Asphalt Plant

1. Hot Mix Asphalt: Determine the asphalt binder content; mix gradation and volumetric properties at a minimum frequency of one per day. In the event that the daily production exceeds 1,000 tons, perform these tests a minimum of two times per day.

2. Aggregate (Including RAP): One sample per 1,000 tons of incoming material as it is stockpiled for gradation. The testing of RAP material shall include the determination of asphalt binder content and gradation of extracted aggregate.

3. Monitor the mix temperature for the first five loads and every fifth load thereafter.

4. Monitor the aggregate moisture content from stockpiles or combined cold feed aggregate - one per day.

5. Other tests (as determined necessary by the Contractor) for process control.

Roadway

1. Monitor the mix temperature for the first five loads and every fifth load thereafter.

2. Monitor the prime/tack spread rate as needed to control operations and ensure that it meets or exceeds the target spread rate.

3. Monitor the pavement cross slope at a frequency necessary to fulfill the requirements of the plans and section 334-3.10.3 below, and identify a system to control the cross slope of each pavement layer during construction.

4. Monitor the mix spread rate at the beginning of each day's production, and as needed to control the operations, at a minimum of once per 200 tons placed to ensure that the spread rate meets or exceeds the target spread rate. When determining the spread rate, use an average of five truckloads of mix.

5. Monitor mat placement thickness every 25' to ensure the minimum design thickness is met.

6. Monitor the pavement temperature with an infrared temperature device. Monitor the roadway density with either 6 inch diameter roadway cores, a nuclear density gauge, or other density measuring device, at a minimum frequency of once per 1,500 feet of pavement. When the layer thickness is greater than or equal to 1 inch (or the spread rate is greater than or equal to 105 lb/yd2) and an approved rolling pattern may be used in lieu of density testing, monitor the density (for informational purposes only) by cutting and testing a 6 inch diameter core at a minimum frequency of three cores per day. Maintain daily records of the testing results and make them available for review by the Engineer throughout the life of the Contract.

7. Monitor the pavement smoothness with a 15-foot rolling straightedge as required by section 334-3.10.4 below.

TECHNICAL PROVISIONS

TP 334 – Superpave Asphaltic Concrete Pavement

334-3 GENERAL CONSTRUCTION REQUIREMENTS

334-3.1 DESCRIPTION

Construct plant-mixed hot bituminous pavements. Establish and maintain a quality control system in accordance with section 334-2 above that provides assurance that all materials, products and completed construction submitted for acceptance meet Contract requirements.

334-3.2 LIMITATIONS OF OPERATIONS

334-3.2.1 Weather Limitations: Do not transport asphalt mix from the plant to the roadway unless all weather conditions are suitable for the laying operations.

334-3.2.2 Limitations of Laying Operations:

334-3.2.2.1 General: Spread the mixture only when the surface upon which it is to be laid has been previously prepared, is intact, firm, and properly cured, and is substantially dry. Do not place friction course until the adjacent shoulder area has been dressed and grassed.

334-3.2.2.2 Temperature: Spread the mixture only when the air temperature in the shade and away from artificial heat is at least 40ºF and rising for layers greater than 1 inch in thickness and at least 45ºF and rising for layers 1 inch or less in thickness (including leveling courses). The minimum temperature requirement for leveling courses with a spread rate of 50 lb/yd2 or less is 50ºF and rising.

334-3.2.2.3 Wind: Do not spread the mixture when the wind is blowing to such an extent that proper and adequate compaction cannot be maintained or when sand, dust, etc., are being deposited on the surface being paved to the extent that the bond between layers will be diminished.

334-3.2.2.4 Night Paving: Provide sufficient lighting for night operations.

334-3.3 ROADWAY SURFACE PREPARATION

334-3.3.1 Cleaning: Prior to the laying of the mixture, clean the surface of the base or pavement to be covered of all loose and deleterious material by the use of a vacuum truck. Power brooms or blowers may be used when the use of a vacuum truck is impractical, supplemented by hand brooming where necessary.

334-3.3.2 Patching and Leveling Courses: Where an asphalt mix is to be placed on an existing pavement or old base which is irregular, or wherever the plans

indicate, bring the existing surface to proper grade and cross-section by the application of patching or leveling courses. Wherever a patch is required, the width shall be taken out to the full width of each lane affected and the length shall extend far enough longitudinally to fully encompass the affected area. The existing pavement receiving a patch or leveling course shall be milled as shown on the plans or as required by the Engineer.

334-3.3.3 Application Over Surface Treatment: Where an asphalt mix is to be placed over a newly constructed surface treatment, sweep and dispose of all loose material from the paving area.

334-3.3.4 Coating Surfaces of Contacting Structures: Paint all structures which will be in actual contact with the asphalt mixture, with the exception of the vertical faces of existing pavements and curbs or curb and gutter, with a uniform coating of asphalt cement to provide a closely bonded, watertight joint.

334-3.3.5 Tack Coat:

334-3.3.5.1 Tack Coat Required: Apply a tack coat, meeting the requirements of Section 300 in the FDOT Standard Specifications for Road and Bridge Construction, on existing pavement structures that are to be overlaid with an asphalt mix and between successive layers of all asphalt mixes. The use of Trackless Polymer Modified Asphalt Emulsion Tack Coat (MTSS-1HM) is not allowed unless approved by the Engineer.

334-3.3.5.2 Tack Coat at Engineer's Option: Apply a tack coat on the following surfaces only when so directed by the Engineer:

1. Freshly primed bases.
2. Surface treatment.

334-3.4 ASPHALT PLANT PREPARATION

Ensure the following requirements are met at the asphalt plant:

Asphalt Cement

- Asphalt cement is delivered to the asphalt plant at a temperature not to exceed 370ºF.
- Asphalt cement is maintained in storage within a range of 230 to 370ºF in advance of mixing operations.
- Constant heating is maintained within these limits, and that high fluctuations in temperature during a day's production is avoided.

TECHNICAL PROVISIONS

TP 334 – Superpave Asphaltic Concrete Pavement

Aggregate Blending:

- All aggregates to be blended or proportioned are placed in separate bins at the cold hopper.
- Proportioning is performed by means of securely positioned calibrated gates or other approved devices.
-

Aggregate Cold Bins:

- Bin compartments are constructed to prevent any spilling or leakage of aggregate from one bin to another.
- Bin compartments have the capacity and design to permit a uniform flow of aggregates.
- Bin compartments are mounted over a feeder of uniform speed, which will deliver the specified proportions of aggregate to the drier.
- Bins are equipped with vibrators to ensure a uniform flow of aggregate at all times.
- Each bin compartment is provided with a gate which is adjustable in the vertical direction.
- Gates can be held securely at any specified vertical opening.
- Gates are equipped with a measuring device for measuring the vertical opening of the gates from a horizontal plane level with the bottom of the feeder.

Mineral Filler:

Mineral filler (if required in the mix design) is fed or weighed in separately from the other aggregates.

Aggregate Heating and Drying:

- Aggregates are heated and dried before screening.
- The temperature of the aggregates is controlled so that the temperature of the completed mixture at the plant falls within the permissible range allowed by this Section.

Aggregate Screening:

- Oversized pieces of aggregate are removed by the use of a scalping screen.
- Oversized material is not returned to the stockpile for reuse unless it has been crushed

and reprocessed into sizes that will pass the scalping screen.

- The quantity of aggregates being discharged onto the screens does not exceed the capacity of the screens to actually separate the aggregates into the required sizes.
- A maximum of 10% plus-10 material in the minus-10 bin is maintained.

334-3.5 MIXTURE PREPARATION

Ensure the following requirements are met:

334-3.5.1 Batch Mixing: The dried aggregates and mineral filler (if required), prepared as specified and proportioned to meet the verified mix design, shall be conveyed to the empty mixer. The accurately measured hot asphalt binder shall be introduced into the mixer simultaneously with, or after, the hot aggregates. The blended materials shall be continuously mixed until thoroughly uniform with all particles fully coated. The mixing time begins when the measuring devices for both the asphalt and the aggregates indicate that all the material is in the mixer, and continues until the material begins to leave the mixing unit. In no case will the mixing time be less than 35 seconds.

334-3.5.2 Continuous Mixing: The dried aggregates and mineral filler (if required), prepared as specified and proportioned to meet the verified mix design, shall be introduced into the mixer in synchronization with the accurate feeding of the hot asphalt cement. The blended materials shall be sufficiently mixed until thoroughly uniform with all particles fully coated.

334-3.5.3 Mix Temperature: The ingredients of the mix shall be heated and combined in such a manner as to produce a mixture with a temperature, when discharged from the pugmill or surge bin, which is within the master range as defined below.

The temperature of the completed mixture shall be determined using a quick-reading thermometer through a hole in the side of the loaded truck immediately after loading. A 1/4 inch hole on both sides of the truck body within the middle third of the length of the body, and at a distance from 6 to 10 inches above the surface supporting the mixture shall be provided.

The normal frequency for taking asphalt mix temperatures will be for each day, for each design mix on the first five loads and once every five loads thereafter. The temperature of the asphalt mix at the plant and at the roadway shall be taken at the normal frequency before the mix is placed. The temperature shall be recorded on the front of the respective delivery ticket. The Engineer shall review the plant and roadway temperature readings and may take additional temperature measurements at any time.

The master range for all mix designs will be the established temperature from the mix design ±30ºF. Reject for use on the project any load or portion of a load of asphalt mix at the plant or at the roadway with a temperature outside of this master range. The Engineer will be immediately notified of the rejection.

If any single load at the plant or at the roadway is within the master range but differs from the established mix temperature by more than ±25ºF or if the average difference of the temperature measurements from the established mix temperature for five loads exceeds ±15ºF, the temperature of every load will be monitored until the temperature falls within the specified tolerance range in Table 334-1; at this time the normal frequency may be resumed.

Table 334-1
Temperature Tolerance From Verified Mix Design

Any Single Measurement	±25ºF
Average of Any Five Consecutive Measurements	±15ºF

334-3.5.4 Maximum Period of Storage: The maximum time that any mix may be kept in a hot storage or surge bin shall be 72 hours.

334-3.5.5 Contractor's Responsibility for Mixture Requirements: Produce a homogeneous mixture, free from moisture and with no segregated materials, that meets all specification requirements. Also apply these requirements to all mixes produced by the drum mixer process and all mixes processed through a hot storage or surge bin, both before and after storage.

334-3.6 MIXTURE TRANSPORT

Transport the mixture in tight vehicles previously cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck body. Do not use diesel fuel or any other hazardous or environmentally detrimental material as a coating for the inside surface of the truck body. Cover each load during cool and cloudy weather and at any time there is a probability of rain.

334-3.7 MIXTURE PLACEMENT

334-3.7.1 Requirements Applicable to All Mixture Types:

334-3.7.1.1 Alignment of Edges: Lay all asphalt concrete mixtures, including leveling courses, other than the pavement edge just adjacent to curb and gutter or other true edges, by the stringline method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than ±1.5 inches from the stringline.

334-3.7.1.2 Temperature of Spreading: Maintain the temperature of the mix at the time of spreading within the master range as defined in 334-3.5.3.

334-3.7.1.3 Rain and Surface Conditions: Immediately cease transportation of asphalt mixtures from the plant when rain begins at the roadway. Do not place asphalt mixtures while rain is falling, or when there is standing water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer and the temperature of the mixture caught in transit still meets the requirements as specified in 334-3.7.1.2, the Contractor may then place the mixture caught in transit.

334-3.7.1.4 Speed of Paver: Establish the forward speed of the asphalt paver based on the rate of delivery of the mix to the roadway but not faster than the optimum speed needed to adequately compact the pavement.

334-3.7.1.5 Number of Crews Required: For each paving machine operated, use a separate crew, each crew operating as a full unit. The technician who will be in charge of all paving operations shall be state approved and properly certified as deemed appropriate by the Engineer. The Contractor's technician in charge of the paving operations may be responsible for more than one crew but must be physically accessible to the Engineer at all times when placing mix.

334-3.7.1.6 Checking Depth of Layer: Check the depth of each layer at frequent intervals, and make adjustments when the thickness deviates from the design thickness. When making an adjustment, allow the paving machine to travel a minimum distance of 32 feet to stabilize before the second check is made to determine the effects of the adjustment.

334-3.7.1.7 Hand Spreading: In limited areas where the use of the spreader is impossible or impracticable, the Contractor may spread and finish the mixture by hand.

334-3.7.1.8 Straightedging and Back-patching: Straightedge and backpatch after obtaining initial compaction and while the material is still hot.

334-3.7.2 Requirements Applicable to Courses Other Than Leveling:

334-3.7.2.1 Spreading and Finishing: Upon arrival, dump the mixture in the approved mechanical spreader, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the work is completed, the required specified thickness is placed. Carry a uniform amount of mixture ahead of the screed at all times.

334-3.7.2.2 Thickness of Layers: Construct each course of Type SP mixture in layers of thickness as shown in Section 334-4.1.3.

334-3.7.2.3 Laying Width: For regular roadways, pave to the full lane width, except in areas where physically constrained. For other applications such as sidewalks, provide a spreader capable of placing and screeding to the plan width. If necessary due to the traffic requirements, lay the mixture in strips in such a manner as to provide for the passage of traffic. As an option, where the road is closed to traffic, lay the mixture to the full width with machines traveling in echelon. Plan longitudinal joints such that they are not placed where a permanent wheel path will occur.

334-3.7.2.4 Correcting Defects: Before starting any rolling, check the surface. Correct any irregularities; remove all drippings, fat sandy accumulations from the screed, and fat spots from any source; and replace them with satisfactory material. Do not skin patch. When correcting a depression while the mixture is hot, scarify the surface and add fresh mixture.

334-3.7.3 Requirements Applicable Only to Leveling Courses:

334-3.7.3.1 Patching Depressions: Before spreading any leveling course, fill all depressions in the existing surface more than 1 inch deep by spot patching with leveling course mixture, and then compact them thoroughly.

334-3.7.3.2 Spreading Leveling Courses: Place all courses of leveling by the use of two motor graders, equip one with a spreader box. Other types of leveling devices may be used if approved by the Engineer.

334-3.7.3.3 Rate of Application: When using Type SP-9.5 (fine graded) for leveling, do not allow the average spread of a layer to be less than 50 lb/yd2 or more than 75 lb/yd2. The quantity of mix for leveling shown in the plans represents the average for the entire project.

334-3.8 MIXTURE COMPACTION

334-3.8.1 Equipment and Sequence: For each paving or leveling train in operation, furnish a separate set of rollers, with their operators.

Select equipment, sequence, and coverage of rolling to meet the specified mix design density. The coverage is the number of times the roller passes over a given area of pavement.

Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

334-3.8.2 Standard Rolling Procedure: Meet the following equipment, sequence, and coverage requirements:

1. Seal Rolling: Provide two coverages with a tandem steel-wheeled roller, weighing 5 to 12 tons, following as close behind the spreader as possible without pick-up, undue displacement, or blistering of the material. Use static mode only for all compaction. No vibration will be allowed.

2. Intermediate rolling: Provide five coverages with a self-propelled pneumatic-tired roller, following as close behind the seal rolling operation as the mix will permit.

3. Final rolling: Provide one coverage with a tandem steel-wheeled roller (static mode only), weighing 5 to 12 tons, after completing the seal rolling and intermediate rolling, but before the surface pavement temperature drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

For patching and leveling courses, the first structural layer placed on a milled surface, and on the first overbuild course, use only a self-propelled pneumatic-tired roller.

The Contractor may use equipment, sequences, or coverages other than those specified in the standard rolling procedure if so authorized by the Engineer.

334-3.8.3 Compaction at Crossovers, Intersections, etc.: When using a separate paving machine to pave the crossovers, compact the crossovers with one, 8 to 12 ton tandem steel roller (static mode only). If placing crossovers, intersections, and acceleration and deceleration lanes with the main run of paving, also use a traffic roller to compact these areas.

334-3.8.4 Rolling Procedures: Ensure that the initial rolling is longitudinal.
Where the lane being placed is adjacent to a previously placed lane, pinch or roll the center joint prior to the rolling of the rest of the lane.
Roll across the mat, overlapping the adjacent pass by at least 6 inches. Roll slowly enough to avoid displacement of the mixture, and correct any displacement at once by the use of rakes and the addition of fresh mixture if required.
Continue final rolling to eliminate all roller marks.

334-3.8.5 Number of Pneumatic-tired Rollers Required: Use a sufficient number of self-propelled pneumatic-tired rollers to ensure that the rolling of the surface for the required number of passes does not delay any other phase of the laying operation and does not result in excessive cooling of the mixture before completing the rolling. In the event that the rolling falls behind, discontinue the laying operation until the rolling operations are sufficiently caught up.

334-3.8.6 Compaction of Areas Inaccessible to Rollers: Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.

334-3.8.7 Correcting Defects: Do not allow the rollers to deposit gasoline, oil, or grease onto the pavement. Remove and replace any areas damaged by such deposits as directed by the Engineer. While rolling is in progress, test the surface continuously, and correct all discrepancies to comply with the surface requirements. Remove and replace all drippings, fat or lean areas, and defective construction of any description. Remedy depressions that develop before completing the rolling by loosening the mixture and adding new mixture to bring the depressions to a true surface. Should any depression remain after obtaining the final compaction, remove the full depth of the mixture, and replace it with sufficient new mixture to form a true and even surface.
Correct all high spots, high joints, and honeycombing as directed by the Engineer. Remove and replace any mixture remaining unbonded after rolling. Correct all defects prior to laying the subsequent course.

334-3.9 JOINTS

334-3.9.1 General: When laying fresh mixture against the exposed edges of joints (trimmed or formed as provided below), place it in close contact with the exposed edge to produce an even, well-compacted joint after rolling.

334-3.9.2 Transverse Joints: Place the mixture as continuously as possible. Do not pass the roller over the unprotected end of the freshly laid mixture except when discontinuing the laying operation long enough to permit the mixture to become chilled.
When thus interrupting the laying operation, construct a transverse joint by cutting back on the previous run to expose the full depth of the mat.

334-3.9.3 Longitudinal Joints: For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. The Engineer may waive this requirement where offsetting is not feasible due to the sequence of construction.

334-3.10 SURFACE REQUIREMENTS

334-3.10.1 General: Construct a smooth pavement with good surface texture and the proper cross-slope.

334-3.10.2 Texture of the Finished Surface of Paving Layers: Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Correct any area of the surface that does not meet the foregoing requirements in accordance with 334-3.10.5.

Do not use asphalt concrete mixtures containing aggregates that cause a different color appearance in the final wearing surface in sections less than 1 mile in length and across the full width of the roadway unless approved by the Engineer.

334-3.10.3 Cross Slope: Construct a pavement surface with cross slopes in compliance with the requirements of the Contract Documents. Furnish a level with a minimum length of 4 feet or a digital measuring device approved by the Engineer for the control of cross slope. Make this level or measuring device available at the jobsite at all times during paving operations. Utilize electronic transverse screed controls on the paving machine (unless directed otherwise by the Engineer) to obtain an accurate transverse slope of the pavement surface.

334-3.10.3.1 Quality Control Checks: Measure the cross slope of the pavement surface by placing the measuring device perpendicular to the roadway centerline. Report the cross slope to the nearest 0.1%. Record all the measurements on an approved form and submit to the Engineer for documentation.

Measure the cross slope at a minimum frequency of one measurement every 100 feet during paving operations to ensure that the cross slope is uniform and in compliance with the design cross slope. When the difference between the measured cross slope and the design cross slope exceeds ±0.2% for travel lanes (including turn lanes) or ±0.5% for shoulders, make all corrections immediately to bring the cross slope into the acceptable range.

When the cross slope is consistently within the acceptable range, upon the approval of the Engineer, the frequency of the cross slope measurements can be reduced to one measurement every 250 feet during paving operations.

For intersections, tapers, crossovers, transitions at beginning and end of project and similar areas, adjust the cross slope to match the actual site conditions or as directed by the Engineer.

334-3.10.4 Pavement Smoothness: Construct a smooth pavement meeting the requirements of this Specification. The County will provide a representative to be present when smoothness testing is performed.

TECHNICAL PROVISIONS

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334-3.10.4.1 General: Furnish a 15 foot manual and a 15 foot rolling straightedge meeting the requirements of FM 5-509. Make them available at the job site at all times during paving operations. Obtain a smooth surface on all pavement courses placed, and then straightedge all final structural and friction course layers in accordance with 334-3.10.4.5.

334-3.10.4.2 Test Method: Perform all straightedge testing in accordance with FM 5-509 with one pass of the rolling straightedge operated along the outside wheel path of each lane being tested. The Engineer may require additional testing at other locations within the lane.

334-3.10.4.3 Traffic Control: Provide traffic control in accordance with 334-3.2 and FDOT Design Standard Indices (600 series as applicable) during all testing. When traffic control cannot be provided in accordance with the applicable indices, submit an alternative Traffic Control Plan. The cost of this traffic control is included in the Contract bid prices for other pay items.

334-3.10.4.5 Quality Control Checks:

334-3.10.4.5.1 General: Straightedge the final Type SP structural layer and friction course layer with a rolling straightedge. Test all pavement lanes and ramps where the width is constant using a rolling straightedge and document all deficiencies on a form approved by the Engineer. Notify the Engineer of the location and time of all straightedge checks a minimum of 48 hours before beginning. Testing shall be conducted by a certified Paving Level I or higher technician. Maintain a field record during testing on a form approved by the Engineer identifying the areas tested and listing the location and degree of all deficiencies found. The field record shall be signed by the technician conducting the test and the Engineer or Engineer's Representative observing the test.

334-3.10.4.5.2 Rolling Straightedge Exceptions: Testing with the rolling straightedge will not be required in the following areas: intersections, tapers, crossovers, parking lots and similar areas. In addition, testing with the rolling straightedge will not be performed on the following areas when they are less than 50 feet in length: turn lanes, acceleration/deceleration lanes and side streets. However, correct any individual surface irregularity in these areas that deviates from the plan grade in excess of 3/8 inch as determined by a 15 foot manual straightedge, and that the Engineer deems to be objectionable, in accordance with 334-3.10.5.

In addition, the Engineer may also waive the straightedging requirements on ramps and superelevated sections where the geometrical orientation of the pavement results in an inaccurate measurement with the rolling straightedge.

334-3.10.4.5.3 Intermediate Layers: Straightedge all intermediate Type SP layers (structural and overbuild) as necessary to construct a smooth pavement.

On roadways with a design speed 50 miles per hour or greater, when an intermediate Type SP layer will be opened to traffic, straightedge the pavement with a rolling straightedge and correct all deficiencies in excess of 3/8 inch within 72 hours of placement, unless directed otherwise by the Engineer. Correct all deficiencies in accordance with 334-3.10.5.

334-3.10.4.5.4 Final Type SP Structural Layer: Straightedge the final Type SP structural layer with a rolling straightedge, either behind the final roller of the paving train or as a separate operation. The Engineer will verify the straightedge testing by observing the Quality Control straightedging operations. Correct all deficiencies in excess of 3/16 inch in accordance with 334-3.10.5, and retest the corrected areas prior to placing the friction course.

For bicycle paths, straightedge the final structural layer with a rolling straightedge, either behind the final roller of the paving train or as a separate operation. Correct all deficiencies in excess of 5/16 inch in accordance with 334-3.10.5. Retest all corrected areas. If the Engineer determines that the deficiencies on the bicycle path are due to field geometrical conditions, the Engineer will waive corrections.

334-3.10.4.5.5 Friction Course Layer: Acceptance for pavement smoothness will be based on verified Quality Control measurements using the rolling straightedge. The Engineer will verify the straightedge testing by observing the Quality Control straightedging operations.

At the completion of all paving operations, straightedge the friction course as a separate operation. As an exception, if approved by the Engineer, straightedge the friction course behind the final roller of the paving train. Correct all deficiencies in excess of 3/16 inch in accordance with 334-3.10.5. Recheck all corrected areas.

334-3.10.5 Correcting Unacceptable Pavement: Correct all areas of unacceptable pavement at no cost to the County. Correct deficiencies in the Type SP structural layers or in the friction course by removing and replacing the full depth of the layer, extending for a distance on either side of the defective area as determined by the Engineer, but in no case less than 50 feet on either side of the defective area for the

full width of the paving lane. At the discretion of the Engineer, removal and replacement of the entire limits of the new pavement may be required.

334-3.11 FINISHED SURFACE PROTECTION

Keep sections of newly compacted asphalt concrete, which are to be covered by additional courses, clean until the successive course is laid.

Do not dump embankment or base material directly on the pavement. Dress shoulders before placing the friction course on adjacent pavement.

Equip blade graders operating adjacent to the pavement during shoulder construction with a 2 by 8 inch or larger board, or other attachment providing essentially the same results, attached to their blades in such manner that it extends below the blade edge in order to protect the pavement surface from damage by the grader blade.

To prevent rutting or other distortion, protect sections of newly finished dense graded friction course and the last structural layer prior to the friction course from traffic until the surface temperature has cooled below 160ºF.

The Contractor may use artificial methods to cool the pavement to expedite paving operations. The County may direct the Contractor to use artificial cooling methods when maintenance of traffic requires opening the pavement to traffic at the earliest possible time.

334-3.12 STRIPING

Following final cooling and compaction of the mat and prior to opening to traffic, place temporary painted traffic stripes in accordance with TP-710 and Standard Specification 710 on each paved surface that will receive traffic, including intermediate structural courses, final structural courses that will serve as the surface course, and friction courses. Following thirty (30) days after placement of the final surface course, structural or friction, place thermoplastic striping in accordance with TP-711 and Standard Specification 711 and place raised reflective pavement markers. Final pavement markings are subject to a 180 day observation period under normal traffic. The observation period shall begin with the satisfactory completion and acceptance of the work. The pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular damage. The County reserves the right to check the color and retroreflectivity within 30 days prior to the end of the observation period. Replace, at no additional expense to the County, any pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

334-4 SUPERPAVE ASPHALTIC CONCRETE

334-4.1 DESCRIPTION

334-4.1.1 General: Construct a Superpave Asphaltic Concrete pavement using the type of mixture specified in the Contract on a properly prepared and accepted base. Superpave mixes are identified as Type SP-9.5, Type SP-12.5 or Type SP-19.0.

Meet the requirements of 334-2 for personnel, plant, methods and equipment. Meet the general construction requirements of 334-3.

334-4.1.2 Traffic Levels: The requirements for Type SP Asphaltic Concrete mixtures are based on the design traffic level of the project, expressed in 18-Kip Equivalent Single Axle Loads (ESAL's). The traffic levels applicable for this specification are as shown in Table 1.

Table 1
Superpave Traffic Levels

Traffic Leve	Million ESAL's	Typical Applications
A	<0.3	Local roads, county roads, and ci streets where truck traffic is light prohibited
B	0.3 to <3	Arterial roads, Collector road access streets, medium duty ci streets and the majority of coun roadways
C	3 to < 10	

The traffic level(s) for the project are as specified in the Contract. A Type SP mix one traffic level higher than the traffic level specified in the Contract, up to a Traffic Level C mix, may be substituted at no cost to the County. In situations where the design traffic level is not specified in the Contract, a Traffic Level C mix shall be used.

334-4.1.3 Layers: Use only fine graded Superpave mixes.

334-4.1.3.1 Layer Thickness: The allowable structural layer thicknesses for fine Type SP Asphaltic Concrete mixtures are as follows:

Type SP-9.5..... 3/4 – 1 1/2 inches
Type SP-12.5..... 1 1/2 – 2 1/2 inches
Type SP-19.0..... 2- 3 inches

In addition to the minimum and maximum thickness requirements, the following restrictions are placed on fine mixes when used as a structural course:

Type SP-9.5 - Limited to the top two structural layers, two layers maximum.

Type SP-12.5 - May not be used in the first layer of courses over 3 1/2 inches thick, nor in the first layer of courses over 2 3/4 inches thick on limited access facilities.

Type SP-19.0 - May not be used in the final (top) structural layer.

334-4.1.3.2 Additional Requirements: The following requirements also apply to fine Type SP Asphaltic Concrete mixtures:

334-4.1.3.2.1 When construction includes the paving of adjacent shoulders (≤5 feet wide), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless called for differently in the contract documents.

334-4.1.3.2.2 All overbuild layers shall be Type SP Asphalt Concrete designed at the traffic level as stated in the Contract. Use the minimum and maximum layer thicknesses as specified above unless called for differently in the contract documents. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/4 inch, and the maximum allowable thickness may be increased 1/2 inch, unless called for differently in the contract documents.

334-4.2 MIX COMPOSITION

334-4.2.1 General: Compose the asphalt mixture using a combination of aggregates (coarse, fine or mixtures thereof), mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate proportions to meet the grading and physical properties of the approved mix design. Aggregates from various sources may be combined.

334-4.2.2 Mix Design: Submit to the Engineer the proposed mix design and proof that this mix design is on the FDOT District 5 accepted list. The Engineer will verify with the FDOT District 5 Bituminous Engineer that the mix is on the approved list. No mix design revisions will be allowed. A new design mix will be required for any substitution of an aggregate product, binder, or other design component unless approved by the Engineer. The Engineer will consider any marked variations from mix design parameters or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix

design have changed, and the Engineer will no longer allow the use of that mix design. Provide certification from the plant (either in a statement on the delivery ticket or on a separate sheet) that the mix provided is in conformance with the design mix.

334-4.2.3 Additional Information: Provide the following information to the Engineer with each FDOT approved mix design submitted for use:

- The approved FDOT Mix Design Number.
- The design traffic level and the design number of gyrations (N_{design}).
- The source and description of the materials to be used.
- The FDOT source number product code of the aggregate components furnished from an FDOT approved source.
- The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation in handling and processing as necessary.
- A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly - No. 200 [-75 µm]) should be accounted for and identified for the applicable sieves.
- The bulk specific gravity value for each individual aggregate (and RAP) component, as identified in the FDOT aggregate control program.
- A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.
- A target temperature at which the mixture is to be discharged from the plant and a target roadway temperature. Do not exceed a target temperature of 340°F for modified asphalts and 315°F for unmodified asphalts.
- The physical properties achieved at four different asphalt binder contents, one of which shall be at the optimum asphalt content, and must conform to all specified physical requirements.
- The ignition oven calibration factor.

334-4.3 MATERIALS

334-4.3.1 General Requirements: Meet the material requirements specified in Division III of the FDOT Standard Specifications for Road and Bridge Construction. Specific references are as follows:

Coarse Aggregate: Stone, Slag, Crushed Gravel, Crushed Reclaimed Portland Cement Concrete Pavement, Crushed Glass .....Section 901

Fine Aggregate.....Section 902
Superpave PG Asphalt Binder ..... Section 916-1

334-4.3.2 Superpave Asphalt Binder: Unless specified otherwise in the Contract, use a PG 67-22 asphalt binder unless the use of a different binder or recycling agent has been approved by the Florida Department of Transportation and the Engineer for a particular mix design.

334-4.3.3 Use of Reclaimed Asphalt Pavement (RAP) Material:

334-4.3.3.1 General Requirements: Reclaimed Asphalt Pavement (RAP) may be used as a component material of the asphalt mixture, with the exception of Friction Course mixes, subject to the following requirements:

- Assume responsibility for the production and placement of asphalt mixes which incorporate RAP as a component material.
- Use only RAP that has been approved by the FDOT. Provide documentation of the FDOT approval.
- Limit the amount of RAP material used in the mix to less than 20% by weight of total aggregate, unless otherwise approved the Engineer.
- Use any suitable means to prevent oversized RAP material from showing up in the completed recycled mixture. Take immediate corrective action if oversized RAP material appears in the completed recycled mix.
- Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.
- Provide RAP having a minimum average asphalt content of 4.0% by weight. The Engineer may sample the stockpile to verify that this requirement is met.

334-4.4 ACCEPTANCE

334-4.4.1 General: The asphalt mixture will be accepted based on one of the following methods as determined by the Engineer and/or the Contract Documents:

1) Certification, Contractor Process Control Testing, and Acceptance Testing by the Engineer
2) Other method(s) as determined by the Contract

334-4.4.2 Certification by the Contractor: Submit a Notarized Certification of Specification Compliance letter by an officer of the company who is in responsible charge of paving operations. The letter shall be submitted on company letterhead to

the Engineer and shall state that all material produced and placed on the project was in substantial compliance with the Specifications.

334-4.4.3 Contractor Process Control Testing: Provide supporting test data documenting all quality and process control testing as described in 334-2 above. A pre-
qualified Independent Laboratory as approved by the Engineer may be utilized for the Process Control testing.

334-4.4.4 Acceptance Testing by the Engineer: The Engineer may employ the use of a pre-qualified Independent Geotechnical Engineering firm and/or Laboratory to perform acceptance testing. For every 500 feet of pavement placed per lane per day, take a set of three (3) randomly placed cores, at least two (6") inches in diameter, for determining density and thickness. A minimum of two sets of three cores will be taken per roadway. Acceptance will be based on the following:

334-4.4.4.1 Density: The minimum acceptable average density for each course of asphaltic concrete placed shall be ninety-two (92%) percent of the design unit weight (G_{mm}) of the job mix, with no test lower than ninety and eight tenths (90.8%) percent or higher than ninety-five (95%) percent.

334-4.4.4.2 Thickness: Meet the minimum design thickness on all cores. When a deficiency in thickness is found, the Engineer may require additional cores to be taken to determine the extent of the thickness deficiency. For any thickness that is less than the design thickness, remove and replace the full depth of the layer, extending for a distance on either side of the defective area as determined by the Engineer, but in no case less than 50 feet on either side of the defective area for the full width of the paving lane. At the discretion of the Engineer, removal and replacement of the entire limits of the new pavement may be required. For any thickness that is greater than the design thickness, the Engineer will make a determination about acceptance.

334-4.4.4.3 Surface Tolerance: The asphalt mixture will be accepted on the roadway with respect to surface tolerance in accordance with the applicable requirements of 334-3.10.

334-4.4.4.4 Additional Tests: The County reserves the right to run any test at any time for informational purposes and for determining the effectiveness of the Contractor's quality control and process control.

TECHNICAL PROVISIONS

TP 334 – Superpave Asphaltic Concrete Pavement

334-4.5 METHOD OF MEASUREMENT

For the work specified under this Section the quantity to be paid for shall be the actual area in Square Yards (SY) of asphaltic concrete placed and accepted within the limits of the contract.

334-4.6 BASIS OF PAYMENT

Type SP Asphaltic Concrete will be paid for at the contract unit price per square yard, completed and accepted. No additional payment will be made for thickness of asphalt greater than the design thickness.

The bid price for the asphalt mix will include the cost of the liquid asphalt or the asphalt recycling agent. There will be no separate payment for the asphalt binder material in the asphalt mix.

Payment shall be made under:

Pay Item:		
334-1-13	Superpave Asphaltic Concrete, Traffic C, SP-9.5, 1” (For Driveways)	Ton

TECHNICAL PROVISIONS

TP 337 – Asphalt Concrete Friction Courses

ASPHALT CONCRETE FRICTION COURSES

337-1 DESCRIPTION

337-1.1 General: Construct a Superpave Asphaltic Concrete Friction Course pavement using the type of mixture specified in the Contract. Superpave Friction Course mixes are identified as Type FC-5, FC-9.5 and FC-12.5. Meet the requirements of TP 334-2 for personnel, plant, methods and equipment. Meet the general construction requirements of TP 334-3.

337-1.2 Thickness: The thickness of the friction course layer will be the plan thickness as shown in the plans per mix type. FC-9.5 will be 1", FC-12.5 will be 1-1/2", and FC-5 will be 3/4".

337-1.3 Contractor's Process Control: Provide the necessary quality and process control of the friction course mix production and placement in accordance with the applicable provisions of TP 334-2 and TP 334-3. The contractor will monitor the spread rate periodically to ensure uniform thickness. Provide quality control procedures for daily monitoring and control of spread rate. If the spread rate drops below the target value, immediately make all corrections necessary to bring the spread rate into the acceptable range.

337-2 MIX COMPOSITION

337-2.1 General: Compose the asphalt mixture using a combination of aggregates (coarse, fine, or a mixture thereof) and asphalt binder. Some mixtures may require fibers and/or hydrated lime. Size, grade and combine the aggregate proportions to meet the grading and physical properties of the approved mix design and the requirements of this Section.

337-2.2 Mix Design: Any submitted mix design must be pre-approved by the FDOT. Submit to the Engineer the proposed mix design and proof that the mix design is on the FDOT District 5 accepted list. No mix design revisions will be allowed. A new design mix will be required for any substitution of an aggregate product, aggregate gradation, binder, or other design component unless approved by the Engineer. The Engineer will consider any marked variations from mix design parameters or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and the Engineer will no longer allow the use of that mix design. Provide certification from the plant (either in a statement on the delivery ticket or on a separate sheet) that the mix provided is in conformance with the design mix.

337-2.3 Asphalt Binder: Meet the requirements of Article 336 of the FDOT Standard Specifications for Road and Bridge Construction. Use PG 76-22 asphalt binder meeting the requirements of Article 916-1 of the FDOT Standard Specifications for Road and Bridge Construction. ARB-5 and ARB-12 shall not be used as the asphalt rubber binder unless otherwise approved by the Engineer. Reclaimed Asphalt Pavement (RAP) material shall not be used for superpave asphaltic concrete friction courses.

337-2.4 Additional Information: Provide the following information to the Engineer with each FDOT approved mix design submitted for use:

The approved FDOT Mix Design Number.
The design traffic level and the design number of gyrations (N_{design}).
The source and description of the materials to be used.
The FDOT source number product code of the aggregate components furnished from an FDOT approved source.
The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation in handling and processing as necessary.
A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly -No. 200 [-75 µm]) should be accounted for and identified for the applicable sieves.
The bulk specific gravity value for each individual aggregate (and RAP) component, as identified in the FDOT aggregate control program.
A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.
A target temperature at which the mixture is to be discharged from the plant and a target roadway temperature. Do not exceed a target temperature of 340°F for modified asphalts and 315°F for unmodified asphalts.
The physical properties achieved at four different asphalt binder contents, one of which shall be at the optimum asphalt content, and must conform to all specified physical requirements.
The ignition oven calibration factor.

337-3 SPECIAL CONSTRUCTION REQUIREMENTS

337-3.1 FC-9.5 and FC-12.5:

337-3.1.1 Temperature:

337-3.1.1.1 Air Temperature at Laydown: Spread the mixture only when the air temperature (the temperature in the shade away from artificial heat) is at 45ºF and rising.

337-3.1.1.2 Temperature of the mix: Heat and combine the asphalt binder and aggregate in a manner to produce a mix having a temperature, when discharged from the plant and at the time of spreading on the roadway, meeting the requirements of TP 334-3.5.3.

337-3.1.2 Prevention of Adhesion: To minimize adhesion to the drum during the rolling operations, the Contractor may add a small amount of liquid detergent to the water in the roller.

At intersections and in other areas where the pavement may be subjected to cross-traffic before it has cooled, spray the approaches with water to wet the tires of the approaching vehicles before they cross the pavement.

337-3.1.3 Transportation Requirements of Friction Course Mixtures: Cover all loads of friction course mixtures with a tarpaulin.

337-3.2 FC-5:

337-3.2.1 Hot Storage: When using surge or storage bins in the normal production of FC-5, do not leave the mixture in the surge or storage bin for more than one hour.

337-3.2.2 Longitudinal Grade Controls for Open-Graded Friction Courses: Use either longitudinal grade control (skid, ski or traveling stringline) or a joint matcher.

337-3.2.3 Temperature:

337-3.2.3.1 Air Temperature at Laydown: Spread the mixture only when the air temperature (the temperature in the shade away from artificial heat) is at 65ºF and rising. As an exception, place the mixture at temperatures lower than 65ºF, only when approved by the Engineer based on the Contractor's demonstrated ability to achieve a satisfactory surface texture and appearance of the finished surface. In no case shall the mixture be placed at temperatures lower than 60ºF.

337-3.2.3.2 Temperature of the Mix: Heat and combine the asphalt binder and aggregate in a manner to produce a mix having a temperature, when discharged from the plant and at the time of spreading on the roadway, meeting the requirements of TP 334-3.5.3. The target mixing temperature shall be established at 320ºF.

337-3.2.4 Compaction: Provide two, static steel-wheeled rollers, with an effective compactive weight in the range of 135 to 200 PLI, determined as follows:

$$PLI = \frac{\text{Total Weight of Roller (pounds)}}{\text{Total Width of Drums (inches)}}$$

(Any variation of this equipment requirement must be approved by the Engineer.) Establish an appropriate rolling pattern for the pavement in order to effectively seat the mixture without crushing the aggregate. In the event that the roller begins to crush the aggregate, reduce the number of coverages or the PLI of the rollers. If the rollers continue to crush the aggregate, use a tandem steel-wheel roller weighing not more than 135 lb/in (PLI) of drum width.

337-3.2.5 Special Equipment

337-3.2.5.1 Fiber Supply System: Use a separate feed system to accurately proportion the required quantity of mineral fibers into the mixture in such a manner that uniform distribution is obtained. Interlock the proportioning device with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes. Control the proportion of fibers to within plus or minus 10% of the amount of fibers required. Provide flow indicators or sensing devices for the fiber system, interlocked with plant controls so that the mixture production will be interrupted if introduction of the fiber fails.

When a batch plant is used, add the fiber to the aggregate in the weigh hopper or as approved and directed by the Engineer. Increase the batch dry mixing time by 8 to 12 seconds, or as directed by the Engineer, from the time the aggregate is completely emptied into the pugmill. Ensure that the fibers are uniformly distributed prior to the addition of asphalt binder into the pugmill.

When a drum-mix plant is used, add and uniformly disperse the fiber with the aggregate prior to the addition of the asphalt binder. Add the fiber in such a manner that it will not become entrained in the exhaust system of the drier or plant.

337-3.2.5.2 Hydrated Lime Supply System: For FC-5 mixes containing granite, use a separate feed system to accurately proportion the required quantity of hydrated lime into the mixture in such a manner that uniform coating of the aggregate is obtained prior to the addition of the asphalt. Add the hydrated lime in such a manner that it will not become entrained in the exhaust system of the drier or plant. Interlock the proportioning device with the aggregate feed or weigh system to maintain the correct proportions for all rates of production and batch sizes and to ensure that all mixture produced is properly treated with hydrated lime. Control the proportion of hydrated lime to within plus or minus 10% of the amount of hydrated lime required. Provide and interlock flow indicators or sensing devices for the hydrated lime system with plant controls so that the mixture production will be interrupted if introduction of the hydrated lime fails. The addition of the hydrated lime to the aggregate may be accomplished by Method (A) or (B) as follows:

337-3.2.5.2.1 Method (A) - Dry Form: Add hydrated lime in a dry form to the mixture according to the type of asphalt plant being used.

When a batch plant is used, add the hydrated lime to the aggregate in the weigh hopper or as approved and directed by the Engineer. Increase the batch dry mixing time by eight to twelve seconds, or as directed by the Engineer, from the time the aggregate is completely emptied into the pugmill. Uniformly distribute the hydrated lime prior to the addition of asphalt binder into the pugmill.

When a drum-mix plant is used, add and uniformly disperse the hydrated lime to the aggregate prior to the addition of the asphalt. Add the hydrated lime in such a manner that it will not become entrained in the exhaust system of the drier or plant.

337-3.2.5.2.2 Method (B) - Hydrated Lime/Water Slurry: Add the required quantity of hydrated lime (based on dry weight) in a hydrated lime/water slurry form to the aggregate. Provide a solution consisting of hydrated lime and water in concentrations as directed by the Engineer. Use a plant equipped to blend and maintain the hydrated lime in suspension and to mix it with the aggregates uniformly in the proportions specified.

337-3.2.5.3 Hydrated Lime Pretreatment: For FC-5 mixes containing granite, pretreat the aggregate with hydrated lime prior to incorporating the aggregate into the mixture. Use a feed system to accurately proportion the aggregate and required quantity of hydrated lime, and mix them in such a manner that uniform coating of the aggregate is obtained. Control the proportion of hydrated lime to within ± 10% of the amount required. Aggregate pretreated with hydrated lime in this manner shall be incorporated into the asphalt mixture within 45 days of pretreatment.

337-3.2.5.3.1 Hydrated Lime Pretreatment Methods: Pretreat the aggregate using one of the following two methods:

Pretreatment Method A – Dry Form: Add the required quantity of hydrated lime in a dry form to the aggregate. Assure that the aggregate at the time of preteatment contains a minimum of 3% moisture over saturated surface dry (SSD) conditions. Utilize equipment to accurately proportion the aggregate and hydrated lime and mix them in such a manner as to provide a uniform coating.

Pretreatment Method B – Hydrated Lime/Water Slurry: Add the required quantity of hydrated lime (based on dry weight) in a hydrated lime/water slurry form to the aggregate. Provide a solution consisting of hydrated lime and water in a concentration to provide effective treatment. Use equipment to blend and maintain the hydrated lime in suspension, to accurately proportion the aggregate and hydrated lime/water slurry, and to mix them to provide a uniform coating.

337-3.2.5.3.2 Blending Quality Control Records: Maintain adequate Quality Control records for the Engineer's review for all pretreatment activities. Include as a minimum the following information (for each batch or day's run of pretreatment): pretreatment date, aggregate certification information, certified test results for the hydrated lime, aggregate moisture content prior to blending, as-blended quantities of aggregate and hydrated lime, project number, customer name, and shipping date.

337-3.2.5.3.3 Certification: In addition to the aggregate certification, provide a certification with each load of material delivered to the HMA plant, that the material has been pretreated in conformance with these specifications. Include also the date the material was pretreated.

337-4 ACCEPTANCE

337-4.1 FC-9.5 and FC-12.5: Meet the requirements of TP 334-4.4.

337-4.2 FC-5: Meet the requirements of TP 334-4, excluding TP 334-4.4.4.

337-5 FAILING MATERIAL

Assume responsibility for removing and replacing all defective material placed on the project, at no cost to the County.

337-6 METHOD OF MEASUREMENT

For the work specified under this Section the quantity to be paid for shall be the actual area in Square Yards (SY) of asphaltic concrete friction course placed and accepted within the limits of the contract.

The bid price for the asphalt mix will include the cost of the asphalt binder, asphalt cement, anti-stripping agent, blending and handling and the tack coat application as directed in Article 300-8 of the FDOT Standard Specifications for Road and Bridge Construction, as well as fiber stabilizing additive and hydrated lime (if required). There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix.

337-7 BASIS OF PAYMENT

Price and payment will be full compensation for all the work specified under this Section (including the applicable requirements of Articles 300 and 320 of the FDOT Standard Specifications for Road and Bridge Construction.

Payment shall be made under:

Pay Item:		
337-7-73	Asphalt Concrete Friction Course, Inc Bit/Rubber, FC-9.5 Traffic Level C, PG 76-22	Ton

TECHNICAL PROVISIONS

TP 400 – Concrete Structures

CONCRETE STRUCTURES

The work specified in this Section consists of the construction of concrete structures and other concrete members at the locations and to the dimensions shown on the plans in accordance with Section 400 of the FDOT Standard Specifications for Road and Bridge Construction. All concrete construction not covered under a separate specific technical provision or pay item should be constructed in accordance with this technical provision.

Exposed concrete surfaces shall receive a Class I Surface Finish as required by Article 400-15.2.2 of the Standard Specifications, unless otherwise noted in the construction plans.

Method of Measurement

The quantity to be paid for under this Section shall be the volume, in cubic yards, of the classes of concrete shown in the plans, completed, in place, and accepted, except as noted herein.

Basis of Payment

Price and payment will be full compensation for the classes of concrete shown in the plans and shall include all labor, excavation, backfilling, compaction, forms, bracing, reinforcing steel, concrete, dewatering, and all items and incidentals necessary to complete this item of work. No separate payment will be made for obtaining the required concrete finish.

Approach slabs will be paid at the contract unit price each for concrete approach slab.

Payment shall constitute full compensation for all work and materials specified herein, and in Sections 400 and 415 of the FDOT Standard Specifications for Road and Bridge Construction.

Payment shall be made under:

Pay Item:		
400-1-2	Concrete Class I, Endwalls	Cubic Yard

TECHNICAL PROVISIONS

TP 425 – Inlets, Manholes, and Junction Boxes

INLETS, MANHOLES, AND JUNCTION BOXES

Construction of Inlets, Manholes and Junction Boxes shall conform to the requirements of Section 425 of the "Standard Specifications" and applicable FDOT Design Standards and Details contained in the plans, except as directed by the Engineer. Precast inlet tops shall not be used for any type of inlet.

Method of Measurement

The quantities measured for payment under this Section shall be the number of inlets, manholes, junction boxes, yard drains, special end walls, and shallow ditch drains satisfactorily completed and accepted, including drainage structure under drains where required.

Basis of Payment

Structures included in this Section will be paid for at the contract unit price each, completed and accepted. Payments shall constitute full compensation for furnishing all materials and completing all work described herein or shown on the plans, including all excavation; dewatering; subsoil excavation and replacement material; backfilling and compacting around structures; disposal of surplus material; and furnishing and placing of all concrete; reinforcing steel; gratings; frames; covers, and any other necessary fittings as shown in the plans, required for acceptable construction, or as directed by the Engineer. Where required, drainage structure underdrains shall be included in the unit price for inlets and manholes. Any alteration of pipe grades up to one (1) foot to clear utilities shall be made and connections to structures made at no additional cost to the County or utility.

Payment shall be made under:

Pay Item:		
425-1-341	Inlets, Curb, Type P-4, <10’	Each
425-1-441	Inlets, Curb, Type J-4, <10’	Each
425-1-461	Inlets, Curb, Type J-6, <10’	Each
425-1-541	Inlet, DT BOT, Type D, <10’	Each
425-1-561	Inlet, DT BOT, Type F, <10’	Each
425-2-41	Manhole, Type J-7, <10’	Each
425-2-61	Manhole, Type P-8, <10’	Each
425-2-91	Manhole, Type J-8, <10’	Each

TECHNICAL PROVISIONS

TP 430 – Pipe Culverts and Storm Sewers

PIPE CULVERTS AND STORM SEWERS

Construction of Pipe Culverts, Storm Sewers and Mitered End Sections shall conform to the requirements of Section 430 of the Standard Specifications, except as modified herein or as directed by the Engineer. All round and elliptical pipes shall be steel reinforced concrete pipe (SRCP). Construction of the steel carrier pipe by Jack & Bore shall also conform to the requirements of Section 556 of the FDOT Standard Specifications, except as modified herein or as directed by the Engineer.

Lifting holes in reinforced concrete pipe are prohibited.

Proposed storm sewer pipe to be connected to existing structures shall have openings cut into the existing structure without permanently damaging the structure. All structure openings shall be grouted watertight, with non-shrink grout, after pipe installation, and the structure shall be restored as approved by the Engineer.

The cost of connections to existing structures shall be included in the price bid for the pipe.

Final pipe inspection requirements shall conform to Section 430-4.8 of the Standard Specifications. All culverts and storm sewer pipes shall be videoed by the contractor and inspected and approved by the Engineer prior to final paving.

The only acceptable repair method shall be remove and relay / replace, or as otherwise directed by the Engineer. The repair cost shall be borne solely and completely by the Contractor.

Concrete Pipe Joints

Each joint in a concrete pipe culvert or storm sewer shall be wrapped on the exterior of the pipe with a band of filter fabric measuring 3 feet wide centered on the joint and lapped a minimum of 2 feet. The filter fabric shall meet the requirements of Section 985 of the Standard Specifications and shall be secured against the outside of the pipe by stainless metal or plastic strapping or by other methods approved by the Engineer. These costs shall be included in the per linear foot price for the pipe.

Method of Measurement

Quantities measured for payment under this Section shall be the length in linear feet of pipe culvert or storm sewer measured in place, completed and accepted. Measurements shall be from the inside face of structure wall to inside face of structure wall.

For mitered end sections the quantity measured for payment shall be the number completed and accepted.

TECHNICAL PROVISIONS

TP 430 – Pipe Culverts and Storm Sewers

Basis of Payment

Pipe Culverts and Storm Sewers will be paid for at the contract unit price completed and accepted. The unit price shall include connection of proposed pipes to existing structures and the replacement of the backfill, base course, and pavement removed for pipe trenching. Payment shall be full compensation for all work and materials described herein, including excavation (in whatever material is encountered), dewatering, removing unsuitable material and replacing with select bedding material, backfilling, compaction, furnishing and installing all pipe, disposing of surplus materials, and other work as may be required for an acceptable installation.

Payment shall be made under:

Pay Item:		
430- 175-115	Pipe Culvert, Reinforced Concrete, Round, 15” S/CD	Linear Feet
430- 175-118	Pipe Culvert, Reinforced Concrete, Round, 18” S/CD	Linear Feet
430- 175-124	Pipe Culvert, Reinforced Concrete, Round, 24” S/CD	Linear Feet
430- 175-130	Pipe Culvert, Reinforced Concrete, Round, 30” S/CD	Linear Feet
430- 185-130	Pipe Culvert, I.D. Steel Carrier Pipe, Round, Jack & Bore, 30”, S/CD	Linear Feet

Pay Item Footnote No. 430-175-115
Payment includes the cost of concrete jacket.

Pay Item Footnote No. 430-185-130
Includes the cost of all materials, labor and equipment required for Jack & Bore installation of steel carrier pipe. Refer to FDOT Standard Specifications Section 556 for details.

CONCRETE GUTTER, CURB ELEMENTS, AND TRAFFIC SEPARATOR

Construction of concrete curb and gutter, concrete traffic separator, and concrete valley gutter shall conform to the requirements of Section 520 of the Standard Specifications, except as directed by the Engineer.

Foundation

Foundation material upon which the concrete is to be placed shall be compacted to meet the specified densities and shall be thoroughly wetted but free of standing water just prior to placing concrete.

Contraction Joints

Contraction joints shall be sawed to a minimum depth of 1 1/2 inches. Sawing shall begin as soon as the concrete has hardened to the degree that excessive raveling will not occur. Sawing shall progress in the same direction and sequence as the concrete placement. Every third joint shall be sawed first, then saw intermediate joints.

For concrete placed before noon, all joints shall be sawed the same day of placement. For concrete placed after noon, all third joints shall be sawed the day of placement; all other joints prior to noon the following day.

Curing

Concrete shall be cured as provided in Section 520-8, except as modified herein or as approved by the Engineer. Curing material shall be applied to the concrete surfaces after finishing as soon as the concrete has hardened sufficiently to prevent marring the surface or within one hour after finishing is completed, whichever occurs first. Applying curing materials shall not be held up due to other activities on the project. Contractor shall schedule and provide manpower necessary to conform to these requirements.

Spraying equipment, including spray tip and nozzle, shall be as recommended by manufacturer's printed literature, or an acceptable equal. Suggested equivalent spraying equipment is:

Pump Sprayer: Model No. 1949, Chapin Mfg., (800) 444-3140
Drum Pump Sprayer: 12 Volt DC # 6061, Chapin Mfg.

Equipment shall be maintained and nozzles replaced as required to provide consistent uniform spray pattern.

A uniform coating meeting the manufacturer's recommended minimum application rate shall be applied. Areas appearing to have insufficient curing compound, as determined solely by the Engineer, shall be re-coated immediately to provide required uniform coverage.

Storage containers having greater than a five gallon capacity may be utilized only with prior approval by the Engineer. The contractor shall submit the manufacturer's descriptive literature describing the placement, storage and mixing requirements for storage containers exceeding five gallons. The contractor shall provide and utilize mechanical mixers for all containers larger than five gallons. The mixers shall be equivalent to the manufacture's requirements. The contractor shall conform to all storage, mixing and application requirements.

Repairs

Where replacement is necessary, complete sections between existing contraction joints shall be removed and replaced.

Method of Measurement

For curb or curb and gutter, the quantity to be paid will be plan quantity, in linear feet, measured along the face of the completed and accepted curb or curb and gutter.

For valley gutter or shoulder gutter, the quantity to be paid will be plan quantity, in linear feet, measured along the gutter line of the completed and accepted valley gutter or shoulder gutter.

For concrete traffic separator of constant width, the quantity to be paid will be plan quantity, in linear feet, measured along the center of its width, completed and accepted, including the length of the nose.

For concrete traffic separator of varying width, the quantity to be paid will be plan quantity, in square yards, completed and accepted.

Basis of Payment

Items covered by this Section will be paid for at the contract unit price. Payment shall constitute full compensation for all work described herein, including all labor, equipment, materials and incidentals necessary to complete each item of work.

Payment shall be made under:

Pay Item:		
520-1-10A	Concrete Curb & Gutter, Type F	Linear Feet
520-1-10B	Concrete Curb and Gutter, Drop Curb	Linear Feet

520-2-4	Concrete Curb, Type D	Linear Feet
520-3	Valley Gutter - Concrete	Linear Feet

Pay Item Footnote No. 520-1-10A, 520-1-10B, and 520-2-4
Includes the cost of all materials, labor and equipment required for construction of curb and gutter. Includes cost of curb transition from Type F Curb (at inlet edges) to existing curb, transitions between Type F Curb and Gutter to Drop Curb, transitions for Type D Curb, and transitions at sidewalk ramps.

TECHNICAL PROVISIONS

TP 522 – Concrete Sidewalks and Driveways

CONCRETE SIDEWALKS AND DRIVEWAYS

Construction of 4-inch and 6-inch thick concrete sidewalk shall conform to the requirements of Section 522 of the Standard Specifications, and Indexes 304 and 310 of the FDOT Design Standards, except as directed by the Engineer.

Foundation

Foundation material shall meet the specified densities and shall be thoroughly wetted but free of standing water just prior to placing concrete.

Contraction Joints

Contraction joints shall be sawed. All joints shall be straight lines oriented at 90 degrees to the edge of sidewalk, radially if in a curve, or as directed otherwise. The minimum depth of joints shall be 1 1/2 inches or 1/4 the nominal thickness of concrete placed, whichever is greater.

Joint installation shall proceed in the same direction and sequence as the concrete placement. Sawing shall begin as soon as the concrete has hardened to the degree that excessive raveling will not occur. Every third transverse joint and all longitudinal joints shall be sawcut within 8 hours after finishing. Remaining transverse joints, shall be sawcut by noon the following day.

Construction Joints

Construction joints shall be constructed at the end of all pours and at other locations where the concrete placement operations are stopped for as long as 30 minutes. They shall be placed at least 10 feet from any other transverse construction joint or end of pavement section.

Metal keyways shall be installed at all construction joints in sidewalks 6-inches and greater in thickness. Concrete thickness shall be increased by 2-inches for a minimum distance of 6-inches either side of construction joints.

Curing

Concrete shall be cured as provided in Section 520-8, except as modified herein. Curing material shall be applied to the concrete surfaces after finishing as soon as the concrete has hardened sufficiently to prevent marring the surface or within one hour after finishing is completed, whichever occurs first. Applying curing materials shall not be held up due to other activities on the project. Contractor shall schedule and provide manpower necessary to conform to these requirements.

TECHNICAL PROVISIONS

TP 522 – Concrete Sidewalks and Driveways

Spraying equipment, including spray tip and nozzle, shall be as recommended by the manufacturers' printed literature, or an acceptable equal. Suggested equivalent spraying equipment is as follows:

Pump Sprayer:	Model No. 1949, Chapin Mfg., (800) 444-3140
Drum Pump Sprayer:	12 Volt DC # 6061, Chapin Mfg.

Equipment shall be maintained and nozzles replaced as required to provide a consistently uniform spray pattern.

A uniform coating meeting the manufacturer's recommended minimum application rate shall be applied. Areas appearing to have insufficient curing compound, as determined solely by the County, shall be re-coated immediately to provide the required uniform coverage.

Storage containers having greater than a five gallon capacity may be utilized only with prior approval of the Engineer. The Contractor shall submit the manufacturer's descriptive literature describing the placement, storage and mixing requirements for storage exceeding five gallons. The Contractor shall provide and utilize mechanical mixers for all containers larger than five gallons. The mixers shall be equivalent to or exceed the manufacture's requirements.

The Contractor shall conform to all storage, mixing and application requirements.

Replacement

Where 6-inch concrete has to be replaced due to cracks, it shall be replaced with a uniform thickness of 8-inch concrete covering no less than 40 square feet and extending to existing sawed contraction joints. Replacement concrete shall extend at least 3-inches beneath existing concrete at a minimum thickness of 3-inches.

Method of Measurement

Quantities measured for payment under this Section shall be the actual area in square yards of concrete constructed in place.

Basis of Payment

Concrete Sidewalk including ramps, detectable warning surfaces (armor tiled domes) and driveways will be paid for at the contract unit prices, completed and accepted. Payment shall constitute full compensation for all work described herein, and shall include all labor, equipment, materials, clearing and grubbing, excavation, grading, compaction, expansion material (asphalt

impregnated), and all incidentals necessary to complete the work to the lines, grades, and thickness indicated on the plans.

Subgrade preparation and additional concrete required for thickened slabs as indicated on the plans or as directed by the Engineer shall be included in the contract unit price for 6-inch Concrete Sidewalk.

Payment shall be made under:

Pay Item:

522-2A	Concrete Sidewalk and Driveway, 6" Thick	Square Yard
522-2B	Concrete Sidewalk and Driveway (For Driveways), 6" Thick	Square Yard

Pay Item Footnote No. 522-2A
Includes detectable warning systems for all sidewalk curb ramps. Detectable warning systems shall meet all current ADA standards. Use only products from the FDOT Approved Products List.

TECHNICAL PROVISIONS

TP 570 –Performance Turf

PERFORMANCE TURF

The Contractor shall establish a stand of grass in all areas designated on the plans and disturbed by construction in accordance with Chapter 15, Environmental Control, Article XVII, Fertilizer Management Ordinance of the Orange County Code; Sections 162 and 570 of the Standard Specifications, except as directed by the Engineer.

Work under this Section shall include all seeding, mulching, sodding, fertilizing and watering necessary to provide routine maintenance of the grassed area until the work is accepted by the Engineer.

There must be at least 90% coverage of healthy grass prior to acceptance by the Engineer. The Engineer, at any time, may require replanting of any areas in which the establishment of the grass stand does not appear to be developing satisfactorily.

The Contractor shall mow grassed areas twice monthly, or as required by the Engineer, until final acceptance of the work.

Seeding and Mulching

Grass seed shall be common Bermuda and Bahia. In addition, brown top-millet will be included during summer months and annual rye in the winter months. All seed shall meet the requirements of the State Department of Agriculture.

Sodding

Sodding shall be Bahia. It may be placed in rolls or as individual pieces. In established areas, replacement sod shall be of the same type as the existing sod, unless otherwise approved by the Engineer.

Fertilizers

Fertilize as necessary based on soil testing performed in accordance with Section 162. For fertilizer rates and application times follow Chapter 15 Environmental Control, Article XVII Fertilizer Management Ordinance of the Orange County Code.

Method of Measurement

Payment shall be calculated based on the quantity in square yards as specified in the completed and accepted plans. The cost of establishing grass in other areas disturbed by construction activities shall be borne by the Contractor.

TECHNICAL PROVISIONS

TP 570 –Performance Turf

Basis of Payment

Payment shall be paid for at the contract unit price per square yard. Payment shall constitute full compensation for furnishing all materials and completing all the work specified herein, including ground preparation, fertilizing, seeding, mulching, sodding, watering, mowing and complete maintenance of the grassed area until final completion and acceptance by the Engineer.

Payment shall be made under:

Pay Item:		
570-1	Performance Turf, Sod	Square Yard

Pay Item Footnote No. 570-1
Includes the cost of pegging, fertilizer and water as required for establishment of permanent sodding. Sod placed on all slopes 1:3 or steeper shall be pegged. Also includes the cost of topsoil treatment on all permanent grass areas and mowing until the final project acceptance by the County.

TECHNICAL PROVISIONS

TP 630 –Conduit

CONDUIT

Furnish and install conduit for traffic control signals and devices, highway lighting, and other electrically powered or operated devices as shown in the plans or as directed by the Engineer. Conduit shall be installed in accordance to Section 630 for the FDOT Standard Specifications.

Materials

Materials used for this Section shall conform to the following requirements:

A. Conduit:
Use materials that have been tested and listed by a Nationally Recognized Testing Laboratory to the following industry standards:

Schedule 40 and 80 Polyvinyl Chloride (PVC)[1] .....UL 651
Fiberglass Reinforced Epoxy[2] ..... UL 2420
Intermediate Metal[3] .....UL 1242
Rigid Galvanized Metal[3,4] .....UL 6
Rigid Aluminum[4] .....UL 6A
PVC Coated Intermediate Metal[4] .....
...ASTM A135/A135M, ASTM, A513, ASTM A568/A568M, NEMA RN1-2005
Liquid Tight Flexible Metal ..... UL 360
High Density Polyethylene (HDPE) Standard Dimension Ratio (SDR) 9-11[5] .....
.....ASTM F2160
HDPE SDR 13.5[5] ..... ASTM F2160, NEMA TC-7
Schedule 40 and 80 HDPE ..... UL 651A

1. Use conduit with solvent weld slip-fit plastic couplings unless approved by the Engineer.
2. Use conduit having a minimum stiffness value of 250. Ensure that each section has a duct bell with an integral gasket on one end and a duct spigot on the other end.
3. Use conduit that is hot-dipped galvanized with a minimum coating of 1.24 ounces per square foot on both the inside and outside of the conduit. The weight of the zinc coating shall be determined using ASTM A90.
4. Use conduit with both ends reamed and threaded.
5. Can be used with preassembled cable and rope-in-conduit.

Requirements for conduit locate wire, locate wire grounding unit, warning tape, route markers, standard route marker (SRM), and electronic rout marker (ERM) shall be in accordance with the requirements provided in the Section 630-2.2 – 630-2.5.2 of the FDOT Standard Specifications.

TECHNICAL PROVISIONS

TP 630 –Conduit

Installation Requirements

Install the conduit in accordance with NEC or National Electrical Safety Code (NESC) requirements and the Design Standards. Consider the locations of conduit as shown in the Plans as approximate. Construct conduit runs as straight as possible, and obtain the Engineer's approval for all major deviations in conduit locations from those shown in the Plans. Include buried cable warning tape with all trenched conduit. Mark the location of the conduit system with route markers as shown in the Plans and approved by the Engineer. Ensure that all route markers used are new and consistent in appearance.

Conduit shall be installed in accordance with the requirements provided in the Section 630-3 of the FDOT Standard Specifications.

Method of Measurement

Quantities measured for payment under this Section shall be the length in linear feet of conduit, furnished and installed. Includes furnishing all hardware and materials and all testing as specified in Section 630 of the FDOT Standard Specifications, and all labor, casings, removal of excavated materials and spoils, removal an disposal of drilling fluids, locate wires, trenching, boring, backfilling, flowable fill and restoration materials necessary for a complete and accepted installation.

Payment for conduit placed underground will be based on the horizontal length of the trench or bore measured in a straight line between the centers of pull boxes, cabinets, poles, etc., in linear feet, regardless of the length or number of conduits installed. No allowance will be made for sweeps or vertical distances below the ground.

Payment for conduit placed aboveground or bridge mounted will be based on the actual length of conduit installed

Basis of Payment

Price and payment will be full compensation for all work specified in Section 630 of the FDOT Standard Specifications. Payment for conduit placed under existing turf will be made as open trench. Payment for conduit placed under existing pavement (roadway, driveways, or sidewalk) will be made as directional bore. If conduit is being placed under both existing turf and existing pavement between two pull boxes, payment for the total pull box-to-pull box length will be made as directional bore. Payment for conduit placed by jack & bore will be made as jack & bore, for the total pull box to pull box length

No additional payment will be made for multiple conduits in the same trench.

TECHNICAL PROVISIONS

TP 630 –Conduit

Payment shall be made under:

Pay Item:

630-1-12	Conduit, F&I, Underground	Linear Foot

TECHNICAL PROVISIONS

TP 660 –Vehicle Detection System

VEHICLE DETECTION SYSTEM

Furnish and install a vehicle detection system in accordance with the Plans. Use vehicle detection systems and loop sealant that meet the requirements of Section 660 of the FDOT Standard Specifications and are listed on the Department's Approved Product List (APL).

Materials

Materials for vehicle detection and data collection systems shall meet the requirements of Section 660-2 of the FDOT Standard Specifications.

Method of Measurement

The Contract unit price for each inductive loop detector and per assembly for loop assembly will include all equipment, materials as specified in the Contract Documents, and all labor, equipment, and miscellaneous materials necessary for a complete and accepted installation.

The Contract unit price for each component of an MVDS, VVDS, WMDS, or AVI detection system will include furnishing, placement, and testing of all materials and equipment, and for all tools, labor, equipment, hardware, operational software packages and firmware, supplies, support, personnel training, shop drawings, warranty documentation, and incidentals necessary to complete the work.

Installation Requirements

Installation requirements for vehicle detection systems shall conform to Section 660-3 of the FDOT Standard Specifications.

A. Installation Requirements for all detectors: Install, configure, and demonstrate a fully functional vehicle detection system as shown in the Plans. Connect all field equipment to the existing communication network, and provide all materials specified in the Contract Documents. Install all equipment according to the manufacturer's recommendations.

   Ensure that above-ground detectors can be mounted on existing poles or sign structures, or on new poles, as shown in the Plans. Furnish all equipment with the appropriate power and communication cables. Install the power cable and the communication cables according to the manufacturer's recommendation. Ensure that the cables comply with NEC 879 sizing requirements and meet all other applicable standards, specifications, and local code requirements.

   Do not install communication cables in the same conduit or pull boxes as power cables carrying voltage greater than 24 V_{DC}/V_{AC} or current in excess of 1.5 amps.

TECHNICAL PROVISIONS

TP 660 –Vehicle Detection System

Cut all wires to their proper length before assembly. Do not double back any wire to take up slack. Neatly lace wires into cables with nylon lacing or plastic straps. Secure cables with clamps and provide service loops at all connections.

In the event that power to the vehicle detection system or a subcomponent thereof is interrupted, ensure that the equipment automatically recovers after power is restored. Ensure that all programmable system settings return to their previous configurations and the system resumes proper operation.

Refer to Sections 660-3.2.1 – 660-3.2.10.3 of the FDOT Standard Specifications for further detector installation requirements.

B. Inductive Loop Detector Installation: Install vehicle loops in accordance with the manufacturer's instructions and the Design Standards, Index No. 17781.

C. Video Detector Installation: Install cameras and configure detection zones and settings in accordance with the Plans, manufacturer's recommendations, and as directed by the Engineer. Submit configuration settings (including, but not limited to, detector names, communication settings, and output assignments) and configuration file backups to the Engineer. Submit a graphical depiction of each camera site, its pole location, mounting height, the ratio of distance away from the camera versus the mounting height, the camera's mounting type (i.e., pole or structure), camera aiming procedures, and the placement of the proposed detection zone for each lane.

Do not use coaxial cable runs in excess of 500 feet. Mount and aim cameras in a manner that eliminates as much environmentally generated glare as possible.

D. Microwave Detector Installation: Install detector and configure detection zones and settings in accordance with the Plans, manufacturer's recommendations, and as directed by the Engineer. Submit configuration settings (including, but not limited to, detector names, communication settings, and output assignments) and configuration file backups to the Engineer.

E. Wireless Magnetometer Installation: Install in accordance with the Plans, manufacturer's recommendations, and as directed by the Engineer. Ensure that materials used for the installation of magnetometers in the road surface have cured completely before allowing vehicular traffic to travel over them.

F. AVI Detector Installation: Install in accordance with the Contract Documents, manufacturer's recommendations, and as directed by the Engineer.

TECHNICAL PROVISIONS

TP 660 –Vehicle Detection System

Warranty

Ensure that the detection system has a manufacturer's warranty covering defects for a minimum of 2 years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608 of the FDOT Standard Specifications.

Ensure the warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the County / Department or the maintaining agency.

Basis of Payment

Price and payment will be full compensation for all work specified in Section 660 of the FDOT Standard Specifications.

Payment shall be made under:

Pay Item:		
660-2-102	Loop Assembly, F&I, Type B	Assembly
660-2-106	Loop Assembly, F&I, Type F	Assembly

TECHNICAL PROVISIONS

TP 710 –Painted Pavement Markings

PAINTED PAVEMENT MARKINGS

The placing of painted traffic stripes and markings as shown on the plans shall conform to the requirements of Section 710 of the Standard Specifications, except as amended herein or as directed by the Engineer.

Method of Measurement

Quantities measured for payment shall be the units for each designated item in the proposal. The quantity to be paid for under this Section shall include all labor and material for the placing of all pavement markings as shown on the plans, including the removal of any existing pavement markings.

Basis of Payment

All materials, work and incidental costs related to Painted Pavement Markings will be paid for at the contract lump sum price for work completed and accepted. Payment shall be full compensation for all the work specified herein and shall include all equipment, labor and materials required for an acceptable installation. Payment for this section shall include one (1) application of painted pavement markings to be applied to the final pavement surface during the 30day cure period.

Payment shall be made under:

Pay Item:		
710-90	Painted Pavement Markings – Final Surface	Lump Sum

Pay Item Footnote No. 710-90
Includes the cost for retroreflective pavement markers. One application of retroreflective pavement markers requires 115 units. See Section 710 for the FDOT Standard Specifications for the number of applications required.

TECHNICAL PROVISIONS

TP 711 –Thermoplastic Pavement Markings

THERMOPLASTIC PAVEMENT MARKINGS

The placing of thermoplastic traffic stripes and markings as shown on the plans shall conform to the requirements of Section 711 of the Standard Specifications, except as amended herein or as directed by the Engineer.

Materials

The materials to be used under this Section shall be in accordance with Article 711-2 of the Standard Specifications.

Method of Measurement

The quantities to be paid for under this Section shall be the length measured in linear feet, net miles of Thermoplastic Solid Traffic Stripe or the per each quantity of messages and directional arrows as measured and accepted by the Engineer. The payment shall include all labor and material for the placing of all pavement markings as shown on the plans, including removal of existing pavement markings.

Basis of Payment

The quantity for the placing of the thermoplastic pavement markings shall be paid for at the contract unit price.

Payment shall be made under:

Pay Item:		
711-11-102	Thermoplastic, Standard, White, Solid, 8”	Gross Mile
711-11-111	Thermoplastic, Standard, White, Solid, 6”	Gross Mile
711-11-123	Thermoplastic, Standard, White, Solid, 12”	Linear Foot
711-11-124	Thermoplastic, Standard, White, Solid, Diag./Chevrons, 18”	Linear Foot
711-11-125	Thermoplastic, Standard, White, Solid, 24”	Linear Foot
711-11-131	Thermoplastic, Standard, White, Skip, 6”, 10-30 Skip	Gross Mile
711-11-141	Thermoplastic, Standard, White, 2-4 Dotted Guideline / 6-10 Gap Extension, 6”	Gross Mile
711-11-170	Thermoplastic, Standard, White, Arrow	Each
711-11-211	Thermoplastic, Standard, Yellow, Solid, 6”	Gross Mile

TECHNICAL PROVISIONS

TP 900-1 – As-Built Plans

AS-BUILT PLANS

The As-Built Plans shall incorporate all the changes made to the red line As-Built plans. They shall show locations and elevations of paving, swales, ditches, pipe inverts and structures constructed and all relocated or reset property corners, section corners and 1/4 section corners.

Upon the completion of the project, the Contractor shall submit to the County one (1) set of 24"x36" paper Full Size Drawings with Statement of Certifications, certifying that the project was constructed according to the Construction Plans and Specifications, and that the AS BUILT PLANS are correct representation of what was constructed. The plans shall delineate all red line information contained on the As-Built Plans.

The Contractor shall include the Statement of Certification on either the cover sheet certifying all of the sheets or certify each individual sheet. The Statement of Certifications shall be signed and sealed by a Professional Engineer and/or a Professional Surveyor and Mapper, both registered in the State of Florida.

Basis of Payment

Includes all efforts necessary for preparation of as-built (red-line) drawings showing approved deviations from plans and confirmed quantities to be used by engineer in the certification of as-built drawings.

As-Built Plans will be paid for at the contract lump sum price, completed and accepted.

Payment shall be made under:

Pay Item:		
900-1	As-Built Plans	Lump Sum

TECHNICAL PROVISIONS

TP 900-2 –Indemnification

INDEMNIFICATION

The Contractor shall indemnify, defend, and hold harmless the COUNTY and all its officers, agents, and employees, from all claims, losses, damages, costs, charges, or expenses arising out of any acts, action, neglect, or omission by the Contractor during the performance of the Contract, whether direct or indirect, and whether to any person or property to which the COUNTY or said parties may be subject, except that neither the Contractor nor any of its subcontractors are liable under this Section for damages arising out of the injury or damage to persons or property directly caused or resulting from the sole negligence of the COUNTY or any of its officers, agents, or employees.

Payment shall be made under:

Pay Item:		
900-2	Indemnification	Lump Sum

PART H
TECHNICAL PROVISIONS

for

BARRY STREET
DRAINAGE IMPROVEMENTS
ORANGE COUNTY, FLORIDA

GEOTECHNICAL ENGINEERING REPORT

(Prepared by Devo Engineering)

BARRY AVENUE DRAINAGE IMPROVEMENTS PROJECT

GEOTECHNICAL INVESTIGATION & RECOMMENDATIONS
UPGRADES TO EXISTING STORM SEWERS & S.R. 50 CROSS DRAIN

BARRY AVENUE DRAINAGE IMPROVEMENTS PROJECT

ORANGE COUNTY, FLORIDA

MARCH 2016

Prepared by

DEVO Engineering
CONSULTING GEOTECHNICAL ENGINEERS

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Prepared for

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devo@devoeng.com | www.devoeng.com

Date: March 28, 2016	*Devo's Project No:* 14-610.63

To:

INWOOD CONSULTING ENGINEERS
3000 Dovera Drive, Suite 200
Oviedo, FL 32765
phone: 407-971-8850; fax: 407-971-8955; email: ssommerfeldt@inwoodinc.com
attention: **STEVE SOMMERFELDT, P.E.**

Ref:

GEOTECHNICAL INVESTIGATION & RECOMMENDATIONS
UPGRADES TO EXISTING STORM SEWERS & S.R. 50 CROSS DRAIN
BARRY AVENUE DRAINAGE IMPROVEMENTS PROJECT, ORANGE COUNTY, FLORIDA

Dear Mr. Sommerfeldt:

Attached is our report for the above-referenced geotechnical engineering services to support the Inwood design of the "Barry Avenue Drainage Improvements Project".

We appreciate the opportunity to provide services on this project and trust that this report contains the geotechnical data and recommendations required for project design. Please do not hesitate to contact the undersigned at (407)-290-2371 if there are any questions.

Sincerely,

Devo Seereeram

Devo Seereeram, Ph.D., P.E.
Florida Registration No. 48303
date: March 7, 2016

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I.0 BACKGROUND INFORMATION

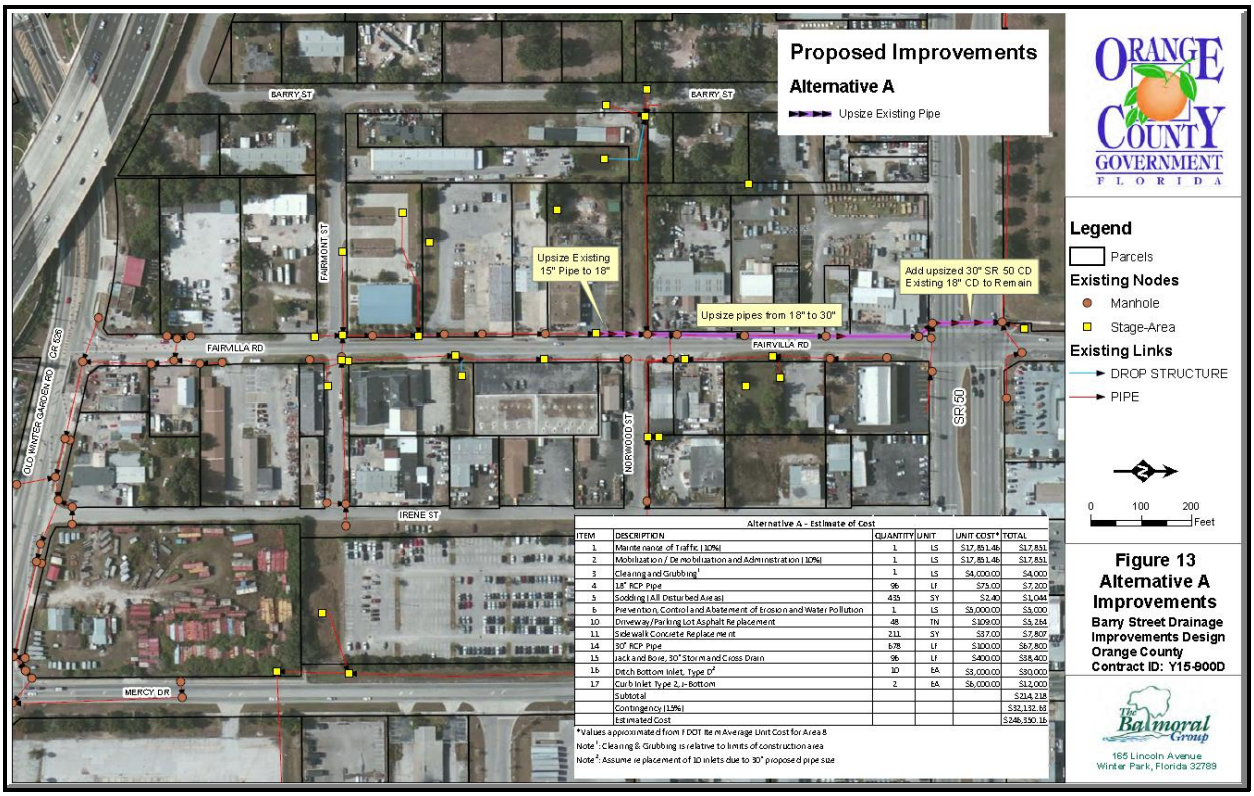
This particular urbanized basin is located south of State Road 50 near the Pine Hills (Barnett Park) area of west Orange County, Florida. The watershed is relatively flat and underlain by poorly drained soils (slow draining clayey substrate and water table near surface) and has a history of localized flooding for even small storm events, and this is further aggravated by the slow water level recovery (on the order of days) in the open conveyance systems (i.e., ditches). This sluggishness in the drainage system of this older neighborhood may be linked to the 1986 closure of the Fairvilla drainage well which historically drained this topographically "land-locked" basin. Surface water outfalls from this basin are of very limited capacity due to the flat grade and there is limited capacity in the receiving drainage systems to the north and to the south. There is a surface water outfall to the north into the State Road 50 drainage system, which discharges into Lake Lawne (the headwater of the Little Wekiva River). Note that the State Road 50 drainage system was not designed to accommodate the Barry Avenue drainage basin (Fairvilla drainage well basin) since that basin was historically drained by the well.

A part of the basin also discharges into the Old Winter Garden (OWG) Road drainage system to the south. This system cannot accept additional stormwater unless its first treated. The OWG system discharges into Lake Mann to the south of the Barry Avenue drainage basin. Inwood's analysis has determined that it is complicated to increase the stormwater discharge into the OWG system so such a retrofit option is not being pursued as part of the current project.

The selected drainage improvements plan involves up-sizing the existing pipe system draining to State Road 50 and also upsizing the cross drain under State Road 50. These are the elements of the retrofit project:

- ❶ cleaning out and reshaping the ditch which runs west to east from Barry Avenue to Fairvilla Road;
- ❷ pipe improvements (replacing the existing pipes with larger diameter pipes);
- ❸ install drainage structures; and
- ❹ a jack & bore under SR 50 to install proposed cross drain.

Exhibit 1 is a graphic of the proposed improvement works, showing the jack and bore (30" to augment existing 18") under this busy part of State Road 50. Pipe diameters leading to the cross-drain would increase from 15" to 18" and from 18" to 30".



Alternative A - Estimate of Cost

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT COST*	TOTAL
1	Maintenance of Traffic (10%)	1	LS	$17,851.46	$17,851
2	Mobilization / Demobilization and Administration (10%)	1	LS	$17,851.46	$17,851
3	Clearing and Grubbing[1]	1	LS	$4,000.00	$4,000
4	18" RCP Pipe	96	LF	$75.00	$7,200
5	Sodding (All Disturbed Areas)	435	SY	$2.40	$1,044
6	Prevention, Control and Abatement of Erosion and Water Pollution	1	LS	$5,000.00	$5,000
10	Driveway/Parking Lot Asphalt Replacement	48	TN	$109.00	$5,284
11	Sidewalk Concrete Replacement	211	SY	$37.00	$7,807
14	30" RCP Pipe	678	LF	$100.00	$67,800
15	Jack and Bore, 30" Storm and Cross Drain	96	LF	$400.00	$38,400
16	Ditch Bottom Inlet, Type D[2]	10	EA	$3,000.00	$30,000
17	Curb Inlet Type 2, J-Bottom	2	EA	$6,000.00	$12,000
	Subtotal				$214,218
	Contingency (15%)				$32,132.88
	Estimated Cost				$246,350.16

*Values approximated from FDOT Item Average Unit Cost for Area 8
Note[1]: Clearing & Grubbing is relative to limits of construction area
Note[2]: Assume replacement of 10 inlets due to 30" proposed pipe size

Exhibit 1. Proposed Improvements

2.0 OBJECTIVES

The objectives of this assessment are as follows:

① Investigate and assess the soil and ground water conditions along the alignments of the proposed stormwater pipes, manhole structures, and also at the State Road 50 cross drain.

② Provide recommendations for excavation of the pipe trenches and their associated structures, construction dewatering and ground water control, preparation of the pipe/structure bedding and backfilling.

③ Provide typical recommendations for the jack and bore pits at the State Road 50 cross-drain.

④ Provide limited soils data along the ditch which runs from Barry Avenue to Fairvilla Road for grading.

3.0 NRCS SOIL MAP UNITS

The Natural Resources Conservation Service (NRCS), an agency of the US Department of Agriculture, has mapped and published descriptions of the shallow soils (i.e., within 80 inches of land surface) in Orange County, Florida. In undeveloped areas (without the addition of impervious areas, the establishment of drainage systems, and/or site grading), the NRCS soil mapping is usually fairly reliable and it is good engineering practice to compare the published NRCS characterization data to the site-specific geotechnical data. Note that the area of interest is highly urbanized so there is a good possibility that the natural soil profile descriptions do not apply near the surface.

Figure 1.1 (attached) shows the NRCS soils map units within the study area. From a geotechnical engineering standpoint, this map is useful for detecting wetland areas which may contain surficial muck or poorly drained soils (i.e., high water table) or soils with shallow clayey substrate. Review of Figure 1.1 indicates that there are three (3) NRCS soil map units in the study area, one of which is classified as Urban Land (#50). The other two (2) soil map units are Wabasso fine sand (#51) and Wabasso-Urban land complex (#52), the soil descriptions of which are included in Table 1 and Table 2, respectively.

The key characteristics to note in Tables 1 and 2 are the clayey soils and the high water table, which are typical of Wabasso fine sands.

Table 1. Key NRCS Characterization Data for Wabasso fine sand (51)

This soil is nearly level and poorly drained. It is on broad flatwoods. In most years, a seasonal high water table is at a depth of less than 10 inches for 1 month to 5 months. It recedes to a depth of more than 40 inches during extended dry periods.

Hydrologic Soil Group		B/D
Typical Soil Profile		
Depth	Soil Color & Texture	Permeability
0 - 3 in	Black fine sand	12 to 40 ft/day
3 - 18 in	Light brownish gray fine sand	
18 - 21 in	Black fine sand	1.2 to 4 ft/day
21 - 45 in	Very pale brown sandy clay loam	< 0.4 ft/day
45 - 70 in	Light gray sandy clay loam	
70 - 80 in	light brownish gray loamy sand	12 to 40 ft/day

Table 2. Key NRCS Characterization Data for Wabasso-Urban land complex (52)		
This complex consists of Wabasso soil that is nearly level and poorly drained and of areas of Urban land. This complex is on the flatwoods. Some areas of Wabasso-Urban land complex have been modified by grading and shaping. The sandy and loamy material from drainage ditches or fill materials that is hauled in is often used to fill the low areas. In undrained areas, a seasonal high water table is at a depth of 10 to 40 inches for more than 6 months and at a depth of less than 10 inches for 1 month to 2 months. It recedes to a depth of more than 40 inches during extended dry periods. Drainage systems have been established in most areas. Depth to the high water table is dependent upon the functioning of the drainage system.		
Hydrologic Soil Group		B/D
Typical Soil Profile		
Depth	Soil Color & Texture	Permeability
Wabasso fine sand		
0 - 4 in	Dark gray fine sand	12 to 40 ft/day
4 - 16 in	Gray fine sand	
16 - 25 in	Black and dark brown fine sand	1.2 to 4 ft/day
25 - 35 in	Gray sandy clay	< 0.4 ft/day
35 - 42 in	Grayish brown sandy clay loam with common brownish yellow mottles	
42 - 80 in	Gray fine sand	12 to 40 ft/day
Urban land		
0 - 80 in	n.a.	n.a.

4.0 FIELD & LABORATORY TESTING

To provide geotechnical data for this assessment, the following scope of field work and laboratory testing was undertaken (refer to Figure 1.1 for test locations):

- Site reconnaissance by our senior geotechnical engineer, senior geotechnician, stakeout of borings and obtain utility clearance.
- Drilling of two (2) Standard Penetration Test (SPT) borings, each to a depth of 20 ft, at the approximate jack and bore pit locations on the opposite side of State Road 50. These test locations are labeled TB-1 and TB-2 in Figure 1.1.
- Drilling of five (5) Standard Penetration Test (SPT) borings, each to a depth of 12 ft along the alignment of the replacement storm sewer on Fairvilla Road. These test locations are labeled TB-3 to TB-7 in Figure 1.1.
- Three (3) hand auger borings to a maximum depth of 7 ft along the length of the channel from Barry Avenue to Fairvilla Road. These test locations are labeled HA-1 to HA-3 in Figure 1.1.
- Visual and tactile examination of soil samples.
- Five (5) fines fraction and natural moisture content tests on selected soil samples.
- Two (2) Soil Corrosivity Test on selected samples from borings TB-1 and TB-2.

5.0 GEOTECHNICAL DATA

Borings locations are shown in Figure 1.1 (attached).

The soil profiles for the hand auger borings (HA-1 to HA-3) are presented in Figure 2.1, while the soil profiles for TB-1 to TB-7 are in Figures 3.1 and 3.2. The inset table in Figures 3.1 and 3.2 show the typical correlations between the "N" values and in-place density and strength of sandy and clayey soils.

Generalized soil stratification lines are shown on the soil profile sheets for guidance and change in soil color and texture with depth.

The uppermost soil layer is grayish brown and light brown fine sand to a depth of 4 to 6 ft, although it is only about 2 to 2.5 ft thick at the hand augers within the canal. The next layer is generally brown silty fine sand which is slightly silty or clayey at some locations. At a depth of about 9 ft, the silty fine sands become more clayey, except at TB-1 and TB-3 where clay is encountered at 13.5 ft and 9.5 ft respectively.

The reader should refer to the individual soil profiles for boring-specific data as the above description of soil stratification is fairly generalized and the actual stratification is by no means uniform.

The depth to the water table is also shown on the soil profiles. As expected, the water table is fairly close to the ground surface (measured 2 to 3 ft below grade at the time of our exploration in Jan 2016). At the hand augers along the ditch bank, the water table was even closer to the land surface (0.5 to 2 ft). The seasonal high water table will be approximately 1 ft above these measured levels.

Tests were conducted on representative foundation soil samples taken from borings within the proposed SR 50 crossings. These tests disclosed pH values of 7.1 to 7.6, sulfate values of 90 to 125 ppm and chloride values of 58 to 91 ppm. These results are summarized in Table 3 and annotated at the representative depth on the soils boring profiles in Figure 3.1 attached.

Table 3. Environmental Classification Test Results

Boring Nos.	Sample depth range (ft)	pH	Sulfates (ppm)	Chlorides (ppm)
TB-1	8.0 to 10.0	7.6	125	91
TB-2	6.0 to 8.0	7.1	90	58

6.0 ASSESSMENT AND RECOMMENDATIONS

6.1 Storm Sewer Trenches

The soil and ground water conditions disclosed by the borings present no constraints to construction of the proposed reinforced concrete pipes and associated manholes/structures. The seasonal high water table is close to land surface in this corridor with depth expected to rise to about a foot below land surface. The water table was only 2 to 3 ft deep at the time of our investigation in January 2016. This information will be pertinent to the contractor when planning the execution of the works, particularly the dewatering and pumping requirements.

Table 5 presents our typical recommendations for the excavation and backfill of the storm sewer pipes with the proposed alignment.

6.2 Minor Stormwater Structures

Table 6 presents the geotechnical recommendations for minor storm sewer related structures.

6.3 Jack & Bore Under State Road 50

The contractor should use the soils data in Figure 3.1 for TB-1 and TB-2 to design the jack and bore system using FDOT Section 556 which is fairly comprehensive in its requirements. Based on the criteria presented in Chapter 7 of the FDOT "Structures Design Guidelines", summarized in Table 4, the environmental classification for the design for both steel and concrete pipes and any associated minor structures is "slightly aggressive".

Table 4. FDOT Environmental Classification Guidelines

Parameter	Unit	Slightly Aggressive Range	Moderately Aggressive Range	Extremely Aggressive Range
pH	-	> 6.6	≤ 6.6; ≥ 5.0	< 5.0 (concrete)
pH	-	> 6.6	≤ 6.6; ≥ 6.0	< 6.0 (Steel)
Chlorides	ppm	< 500	≤ 2,000; ≥ 500	>2,000
Sulfates	ppm	< 150	≤ 1,500; ≥ 150	> 1,500

1. For extremely aggressive conditions, only one of the above extremely aggressive criteria need to be met for an area to be extremely aggressive.
2. All parameters under "slightly aggressive" must be met for a slightly aggressive area.
3. Moderately aggressive; all sites not meeting criteria for slightly aggressive or extremely aggressive.

TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
A. PIPE TRENCH EXCAVATION		
A.1	General	Excavate trenches for pipe culverts and storm sewers to the elevation of the bottom of the pipe and to a width sufficient to provide adequate working room. Remove soil not meeting the classification specified as suitable backfill material in FDOT Standard Spec 125-8.3.2.2, to a depth of 4 inches below the bottom of the pipe elevation. For pipe trenches utilizing trench boxes, ensure that the trench box used is of sufficient width to permit thorough tamping of bedding material under and around the pipes as specified in FDOT Standard Spec 125-8.1.6. Do not disturb the installed pipe and its embedment when moving trench boxes. Move the trench box carefully to avoid excavated wall displacement or damage. As the trench box is moved, fill any voids left by the trench box and continuously place and compact the backfill material adjacent to and all along the side of the trench box walls to fill any voids created by the trench box. References: Section 125-4.4 of the *FDOT Standard Specifications for Road and Bridge Construction* pg. 739, Soil Engineering by Handy & Spangler
A.2	Trenches in Fill	For pipe lines placed above the natural ground line, place and compact the embankment, prior to excavation of the trench, to an elevation at least 2 feet above the top of the pipe and to a width equal to four pipe diameters, and then excavate the trench to the required grade. Reference: Section 125-4.4 of the *FDOT Standard Specifications for Road and Bridge Construction*

TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
A.3	Undercutting (where necessary)	Remove rock, boulders or other hard lumpy or unyielding material to a depth of 12 inches below the bottom of the pipe elevation. Remove muck or other soft material to a depth necessary to establish a firm foundation. Where the soils permit, ensure that the trench sides are vertical up to at least the mid-point of the pipe, and as directed by the Geotechnical Engineer. When undercutting is required in order to remove unsuitable material (either hard or soft), the trench shall be backfilled to a point 6 inches above the bottom of the pipe, with suitable granular material which will form a firm bed for the pipe, and the bottom shall be shaped to fit the pipe, to a point 6 in above the bottom of the pipe. Such bedding material shall be fine sand or other suitable granular material, obtained from the grading operations on the project, or a commercial material if no suitable material is available. When a pipe trench is undercut in order to remove unsuitable materials or for other reasons, it shall be brought to the required grade using materials as specified above, after which the bottom shall be compacted to match approximately the density of the soil in which the trench was cut. Reference: Section 125-4.4 of the *FDOT Standard Specifications for Road and Bridge Construction*
A.4	Dewatering	Dewatering will be required for construction of the proposed improvements. Dewatering may be achieved by well point, horizontal sock drains, or pumping from interior sumps. The design and effective operation of the dewatering system is the sole responsibility of the Contractor. The water table should be lowered to a level 2 ft below the base of the trench during excavation and backfilling. Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps, wellpoints and header pipe and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, perforated pipe drains, sumps and siphons. Section 125-8.1.1 and 125-8.1.2 of the *FDOT Standard Specifications for Road and Bridge Construction*

TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
A.5	Safety	When performing trench excavation in excess of 5 feet in depth, comply with the Occupational Safety and Health Administration's (OSHA) trench safety standards, 29 C.F.R., s. 1926.650, Subpart P, and all subsequent revisions or updates adopted by the Department of Labor and Employment Security. Ensure that trench boxes are wide enough to accommodate compaction and density testing. Contractor's submission of bid and subsequent execution of the Contract will serve as certification that all trench excavation in excess of 5 feet in depth will be in compliance with Section 553.62, Florida Statutes. Contractor shall consider all available geotechnical information available when designing the trench excavation safety system. Contractor shall also consider these and any more stringent trench safety standards as minimum Contract requirements. Reference: Section 125-1.1 of the *FDOT Standard Specifications for Road and Bridge Construction.*

TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
B. TRENCH BACKFILLING		
B.1	General	Backfill in dry conditions whenever normal dewatering equipment can accomplish the needed dewatering. A "LOT", as defined by FDOT, is one lift of backfill material placement, not to exceed 500 ft in length or a single run of pipe connecting two successive structures, whichever is less. Backfill on each side of the pipe for the first lift will be considered a separate LOT. Backfill on opposite sides of the pipe for the remaining lifts will be considered separate LOTs, unless the same compactive effort is applied. For multiple phase backfill, a LOT shall not extend beyond the limits of the phase. Place the material in horizontal layers not exceeding 6 inches in compacted thickness. Backfill around culverts and pipes simultaneously to approximately the same elevation. For pipes 15 inches inside diameter (15 inch ID) or greater than 15 inch ID, trenches may have up to four zones defined as follows: [a] Lowest Zone: The lowest zone is backfilled for deep undercuts up to within 4 inches of the bottom of the pipe. Backfill areas undercut below the Bedding Zone of a pipe with coarse sand, or other suitable granular material, obtained from the grading operations on the project, or a commercial material if no suitable material is available. [b] Bedding Zone: The zone above the Lowest Zone is the Bedding Zone. Usually it will be the backfill which is the 4 inches of soil below the bottom of the pipe. When rock or other hard material has been removed to place the pipe, the Bedding Zone will be the 12 inches of soil below the bottom of the pipe. Backfill with materials classified as A-1, A-2, or A-3. Material classified as A-4 may be used if the pipe is concrete pipe. [c] Cover Zone: The next zone is backfill that is placed after the pipe has been laid and will be called the Cover Zone. This zone extends to 12 inches above the top of the pipe. The Cover Zone and the Bedding Zone are considered the Soil Envelope for the pipe. Backfill with materials classified as A-1, A-2, or A-3. Material classified as A-4 may be used if the pipe is concrete pipe. [d] Top Zone: The Top Zone extends from 12 inches above the top of the pipe to the base or final grade. Backfill the area of the trench above the soil envelope of the pipe with materials allowed on Design Standard, Index No. 505. Reference: Sections 125-8.1.1 and 125-8.3 of the *FDOT Standard Specifications for Road and Bridge Construction*

TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
B.2	Backfill materials	Backfill to the original ground surface or subgrade surface of openings made for structures, with a sufficient allowance for settlement. The Engineer may require that the material used for this backfill be obtained from a source entirely apart from the structure. Use only material accepted by the Engineer. Backfill Material for Lowest Zone: Backfill areas undercut below the Bedding Zone of a pipe with coarse sand, or other suitable granular material, obtained from the grading operations on the project, or a commercial material if no suitable material is available. Backfill Material for Soil Envelope: In both the Bedding Zone and the Cover Zone of the pipe, backfill with materials classified as A-1, A-2, or A-3. All material used for backfill shall be of a quality acceptable to the Engineer and shall be free from large lumps, wood, or other extraneous material. Fine sands and slightly silty fine sands (A-3, A-2-4) are generally suitable as backfill and granular bedding provided they are not overly cemented. Slightly clayey fine sands (A-2-4) are also suitable but can present problems with moisture control to achieve compaction, especially during the rainy season. Clayey sands can also be difficult to compact since they usually come out in lumps when excavated and it is difficult to manage soil moisture. Backfill Material for Top Zone: Backfill the area of the trench above the soil envelope of the pipe with materials allowed on FDOT Design Standard, Index No. 505. Do not allow heavy construction equipment to cross over storm sewer pipes until placing and compacting backfill material to the finished earthwork grade or to an elevation at least 4 feet above the crown of the pipe. Reference: Section 125-8.1.3 and 125-8.3.2 of the *FDOT Standard Specifications for Road and Bridge Construction*

TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
B.3	Backfill Zones Compaction Requirements	[a] Lowest Zone: Compact the soil in the Lowest Zone to approximately match the density of the soil in which the trench was cut. [b] Bedding Zone: If the trench was not undercut below the bottom of the pipe, loosen the soil in the bottom of the trench immediately below the approximate middle third of the outside diameter of the pipe. If the trench was undercut, place the bedding material and leave it in a loose condition below the middle third of the outside diameter of the pipe. Compact the outer portions to meet the density requirements of the Acceptance Criteria. Place the material in lifts no greater than 6 inches (compacted thickness). [c] Cover Zone: Before placing the Cover Zone material, lay pipe according to FDOT Section 430. Excavate for pipe bells before laying pipe. Place the material in 6 inches layers (compacted thickness), evenly deposited on both sides of the pipe, and compact with mechanical tampers suitable for this purpose. Hand tamp material below the pipe haunch that cannot be reached by mechanical tampers. Meet the requirements of in FDOT 125-9.2. [d] Top Zone: Place the material in layers not to exceed 12 inches in compacted thickness. Meet the requirements of the density Acceptance Criteria. Reference: Section 125-8.3.2 and 125.8.3.3 of the *FDOT Standard Specifications for Road and Bridge Construction*.

TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH

<table>
<tr><th>ITEM NO.</th><th>ITEM DESCRIPTION</th><th>DISCUSSION & RECOMMENDATIONS</th></tr>
<tr><td>B.4</td><td>Acceptance Criteria</td><td>Obtain a minimum Quality Control (QC) density in any LOT of 100% of the Standard Proctor maximum density as determined by AASHTO T-99, Method C, or the requirements of 125-8.3.3.1 when applicable. For metal and plastic pipe, compact the backfill in the cover zone to a density of at least 95% of the Standard Proctor maximum density as determined by AASHTO T-99, Method C.

Exceptions to Pipe Density Requirements: Compact the backfill to a firmness approximately equal to that of the soil next to the pipe trench in locations outside the plane described by a two (horizontal) to one (vertical) slope downward from the roadway shoulder line or the back of curb as applicable. Apply 125-9.2.1 when compacting side-drain pipe backfill under driveways serving a property that is not a single residential lot.

Frequency: Conduct QC Standard Proctor maximum density sampling and testing at a minimum frequency of one test per soil type. The Verification test will be at a minimum of one test per soil type:

Reference: Section 125-9.2 of the FDOT Standard Specifications for Road and Bridge Construction
<table>
<tr><th>Test Name</th><th>Quality Control</th><th>Verification</th></tr>
<tr><td>Standard Proctor Maximum Density</td><td>One per soil type</td><td>One per soil type</td></tr>
<tr><td>Density</td><td>One per LOT</td><td>One per four consecutive LOTs and for wet conditions, the first lift not affected by water</td></tr>
<tr><td>Soil Classification</td><td>One per Standard Proctor Maximum Density</td><td>One per Standard Proctor Maximum density</td></tr>
</table>
</td></tr>
</table>

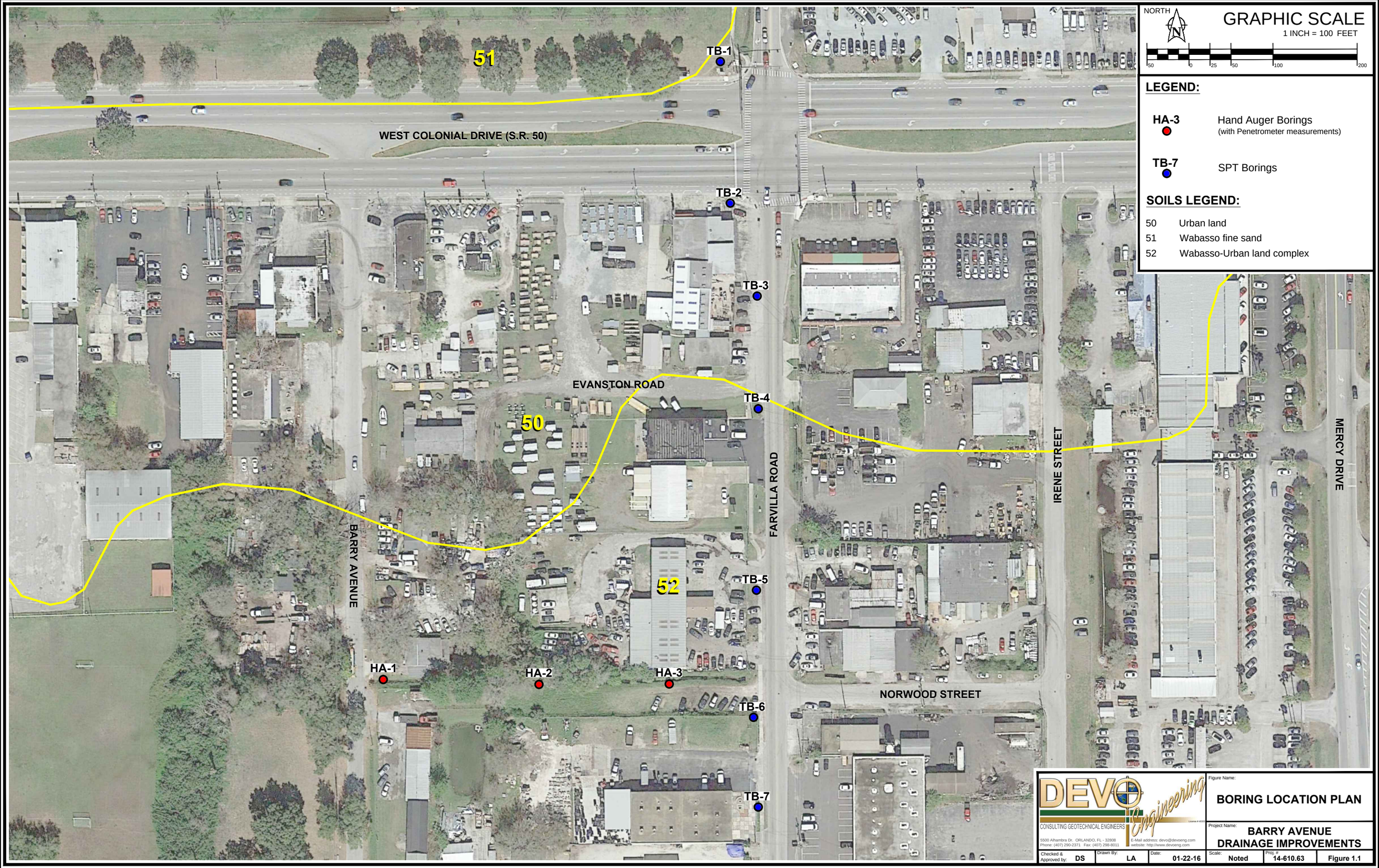
TABLE 5. EARTHWORK RECOMMENDATIONS FOR PIPE TRENCH		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
B.5	Backfill under wet conditions	Where wet conditions are such that dewatering by normal pumping methods would not be effective, the procedure outlined below may be used when specifically authorized by the Engineer in writing. The owner will permit the use of granular material below the elevation at which mechanical tampers would be effective, but only material classified as A-3. Place and compact the material using timbers or hand tampers until the backfill reaches an elevation such that its moisture content will permit the use of mechanical tampers. When the backfill has reached such elevation, use normally acceptable backfill material. Compact the material using mechanical tampers in such manner and to such extent as to transfer the compacting force into the material previously tamped by hand. The owner will permit the use of coarse aggregate below the elevation at which mechanical tampers would be effective. Use coarse aggregate as specified in Section 901 for Aggregate Size Number 89, 8, 78, 7, 68, 6, or 57. Place the coarse aggregate such that it will be stable and firm. Fully wrap the aggregate with a layer of Type D-4 filter fabric, as specified on Design Standard, Index No. 199. Do not place coarse aggregate within 4 feet of the ends of the trench or ditch. Use normally accepted backfill material at the ends. Reference: Section 125-8.3.4 of the *FDOT Standard Specifications for Road and Bridge Construction*
B.6	Precautions	Heavy construction equipment shall not be permitted to cross over storm sewer pipes until backfill material has been placed and compacted to the finished earthwork grade or to an elevation at least 4 ft above the crown of the pipe.
B.7	Minimum cover requirements	The minimum cover over the top of the pipe shall be as per Index 205 of the latest edition of the FDOT Roadway and Traffic Design Standards.
B.8	Quality Control	Comply with Orange County requirements.

TABLE 6. RECOMMENDATIONS FOR MINOR STORMWATER STRUCTURES		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
1	General	The soil and ground water conditions disclosed by the soil borings present no constraints to construction of minor structures associated with the proposed stormsewer pipes.
2	Foundation Support	The soil conditions are generally suitable for the construction and support of a catch box, manhole or similar structure. A maximum net bearing pressure of 2,000 lb/ft^2 is recommended to limit both the total and differential settlement of the foundation soils.
3	Lateral Earth Pressures	The walls of the proposed structure will be fixed at the top and will not be allowed to rotate. Therefore, the pressures exerted on the structure by the adjacent soil may be represented by lateral at-rest earth pressures. The structure should be designed to resist at-rest soil pressures equivalent to a fluid density of 52 pcf. The seasonal high water table is estimated to be 1 ft below land surface. The equivalent fluid pressure of 52 pcf does not include unbalanced hydrostatic forces. Hydrostatic forces should be included in all stability calculations. These equivalent fluid densities do not include a factor of safety; they also do not include lateral pressures from any surcharge loads (i.e., traffic, construction equipment, etc.) This recommendation assumes that the backfill is not over-compacted.
4	Uplift Pressures	In the post-backfilled condition, the seasonal high water table is estimated to be 1 ft below ground at the test locations for the purpose of calculating uplift hydrostatic pressures on base of the structures. The vertical soil pressure on top of any buried structure can be estimated by multiplying the unsaturated unit weight (115 lb/ft^3) by the height of fill over the structure and adding any appropriate surcharge loads.
5	Corrosion Potential	Corrosion series test parameters (i.e., pH, chlorides and sulfates) were performed on representative soil samples in the area of SR 50 and the results indicate a "slightly aggressive" environmental classification ranges published in the FDOT Structures Design Guidelines.
6	Construction Dewatering	All foundations shall be constructed in the dry. Dewatering will be required to facilitate the construction of the structures. Dewatering shall be performed in accordance with Sections C455-4 and C455-6.2 of the latest edition of the FDOT Supplemental Specifications to the Standard Specifications for Road and Bridge Construction. The contractor is solely responsible for the dewatering method. The water table shall be lowered to at least 2 ft below the base of the excavation. The contractor shall make adequate provisions to divert surface runoff and to collect and remove any water entering the excavation.

TABLE 6. RECOMMENDATIONS FOR MINOR STORMWATER STRUCTURES		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
7	Temporary Slopes During Excavation	Slopes for temporary excavations less than 4 ft deep shall be sloped at 1.5 Horizontal to 1 Vertical (1.5H:1V) or flatter. The slopes must be protected from erosion. Temporary excavations greater than 10 ft deep shall have side slopes of 2.0H:1V or flatter, or shall be braced using a plan certified by a professional engineer registered in the state of Florida. Excavated materials shall not be placed at top of slopes within a horizontal distance equal to the depth of excavation. The Contractor(s) performing the excavation for the construction of the structures shall comply with the Occupational Safety and Health Administration's (OSHA) trench excavation safety standards, 29 C.F.R., s. 1926.650, Subpart P, including all subsequent revisions or updates to these standards as adopted by the Department of Labor and Employment Security (DLES). The Contractor shall consider all available geotechnical information in his design of the trench excavation safety system. No material or excessive loads shall be applied at the surface within a distance from the edge of the trench equal to the depth of the trench.
8	Compaction Density for Foundation Soils	The foundation soils shall be uniformly compacted to obtain a minimum density equivalent to 95 percent of the Modified Proctor Maximum Density (ASTM D-1557) as tested to a minimum depth of two (2.0) ft below the base of the structure.
9	Backfill under wet conditions	Where wet conditions are such that dewatering by normal pumping methods would not be effective, the procedure outlined below may be used when specifically authorized by the Engineer in writing. The owner will permit the use of granular material below the elevation at which mechanical tampers would be effective, but only material classified as A-3. Place and compact the material using timbers or hand tampers until the backfill reaches an elevation such that its moisture content will permit the use of mechanical tampers. When the backfill has reached such elevation, use normally acceptable backfill material. Compact the material using mechanical tampers in such manner and to such extent as to transfer the compacting force into the material previously tamped by hand. The owner will permit the use of coarse aggregate below the elevation at which mechanical tampers would be effective. Use coarse aggregate as specified in Section 901 for Aggregate Size Number 89, 8, 78, 7, 68, 6, or 57. Place the coarse aggregate such that it will be stable and firm. Fully wrap the aggregate with a layer of Type D-4 filter fabric, as specified on Design Standard, Index No. 199. We recommend a minimum filter fabric overlap of 2 ft for this particular gravel bed width. Do not place coarse aggregate within 4 feet of the ends of the trench or ditch. Use normally accepted backfill material at the ends. Reference: Section 125-8.3.4 of the *FDOT Standard Specifications for Road and Bridge Construction*

TABLE 6. RECOMMENDATIONS FOR MINOR STORMWATER STRUCTURES		
ITEM NO.	**ITEM DESCRIPTION**	**DISCUSSION & RECOMMENDATIONS**
10	Structural Backfill - Soil Quality	Sands with less than 10 percent fines passing a U.S. No. 200 Sieve will be acceptable for backfill provided the moisture content is controlled to ensure that the materials can be compacted to the required density. The quality of the backfill material needs to be verified onsite by a representative of the project geotechnical engineer or the construction materials testing firm.
11	Compaction of Backfill Soils	Structural backfill shall be placed in level lifts not exceeding 12 inch loose thickness and be compacted to a minimum of 92 percent of its Modified Proctor Density (ASTM D-1557) and lifts not exceeding 6 inch loose thickness and be compacted to a minimum of 95 percent of its Modified Proctor Density (ASTM D-1557) within the final 2 ft of finished grade.
12	Protection of Existing Structures	Non-vibratory self propelled compaction equipment is recommended when compacting within 75 ft of existing structures. Soil placed adjacent to the completed portion of the structure shall be carefully compacted with light weight equipment such as a vibratory plate compactor.
13	Quality Control	A reputable and experienced soil testing firm shall be retained to provide on-site inspections and testing of the compaction and filling operations so that proper documentation of the required minimum compaction and compliance with the recommendations above can be provided.

FIGURES



NORTH

GRAPHIC SCALE

1 INCH = 100 FEET

50 0 25 50 100 200

LEGEND:

HA-3	Hand Auger Borings (with Penetrometer measurements)
TB-7	SPT Borings

SOILS LEGEND:

50	Urban land
51	Wabasso fine sand
52	Wabasso-Urban land complex

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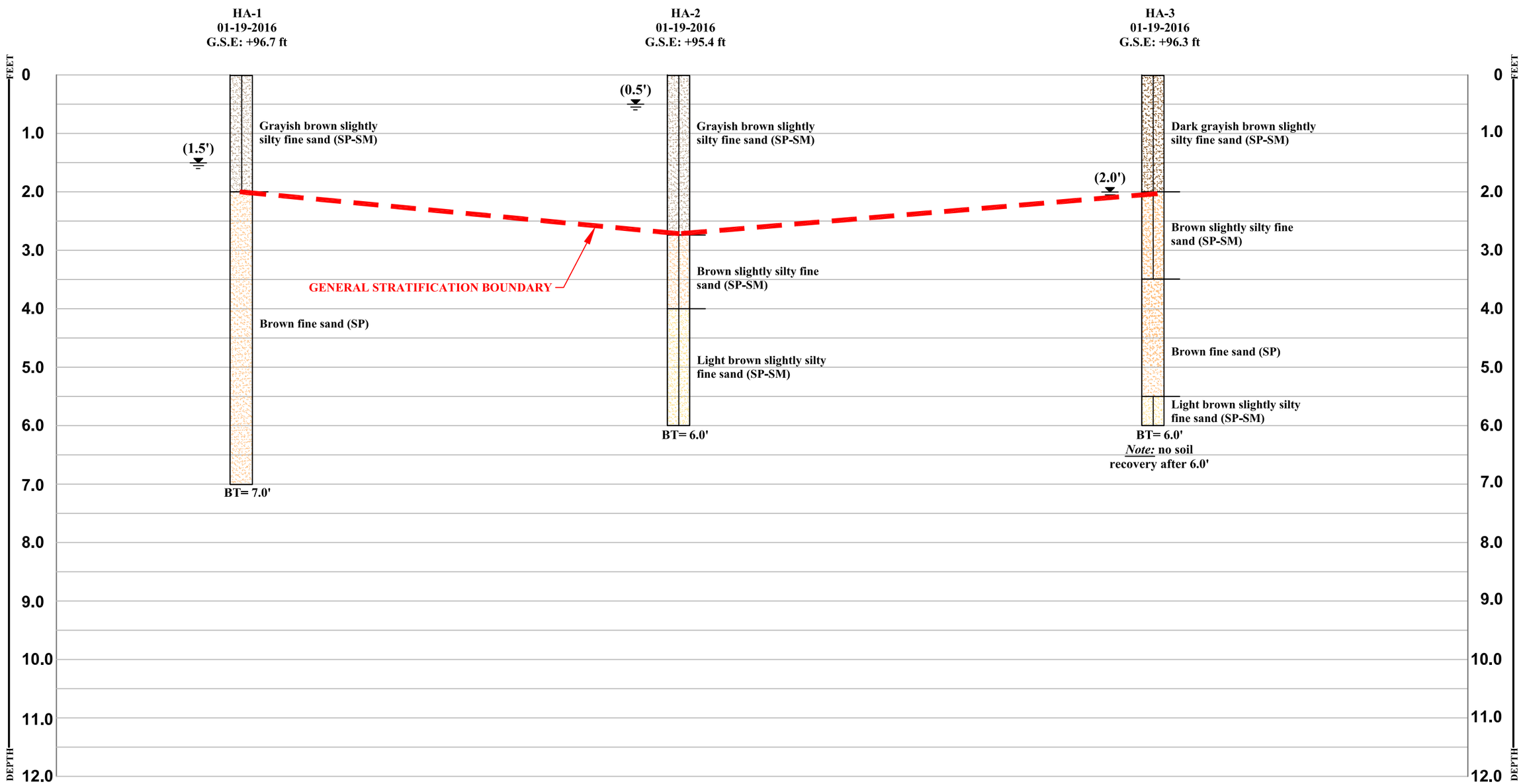
Figure Name: **BORING LOCATION PLAN**

Project Name: **BARRY AVENUE DRAINAGE IMPROVEMENTS**

Checked & Approved by:	Drawn By:	Date:	Scale:	Proj. #	
DS	LA	01-22-16	Noted	14-610.63	Figure 1.1



LEGEND

	BORINGS DRILLED ON DATE NOTED
⏚	WATER LEVEL MEASURED ON DATE OF DRILLING
B.T	BORING TERMINATION DEPTH IN FEET
w	NATURAL MOISTURE CONTENT %
-200	PERCENT PASSING US # 200 SIEVE
HA	HAND AUGERED
WH	SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SAMPLER ADVANCED UNDER WEIGHT OF ROD
N.E.	WATER LEVEL NOT ENCOUNTERED ON DATE OF DRILLING
G.S.E	SURVEYED GROUND SURFACE ELEVATION (FT/NAVD)

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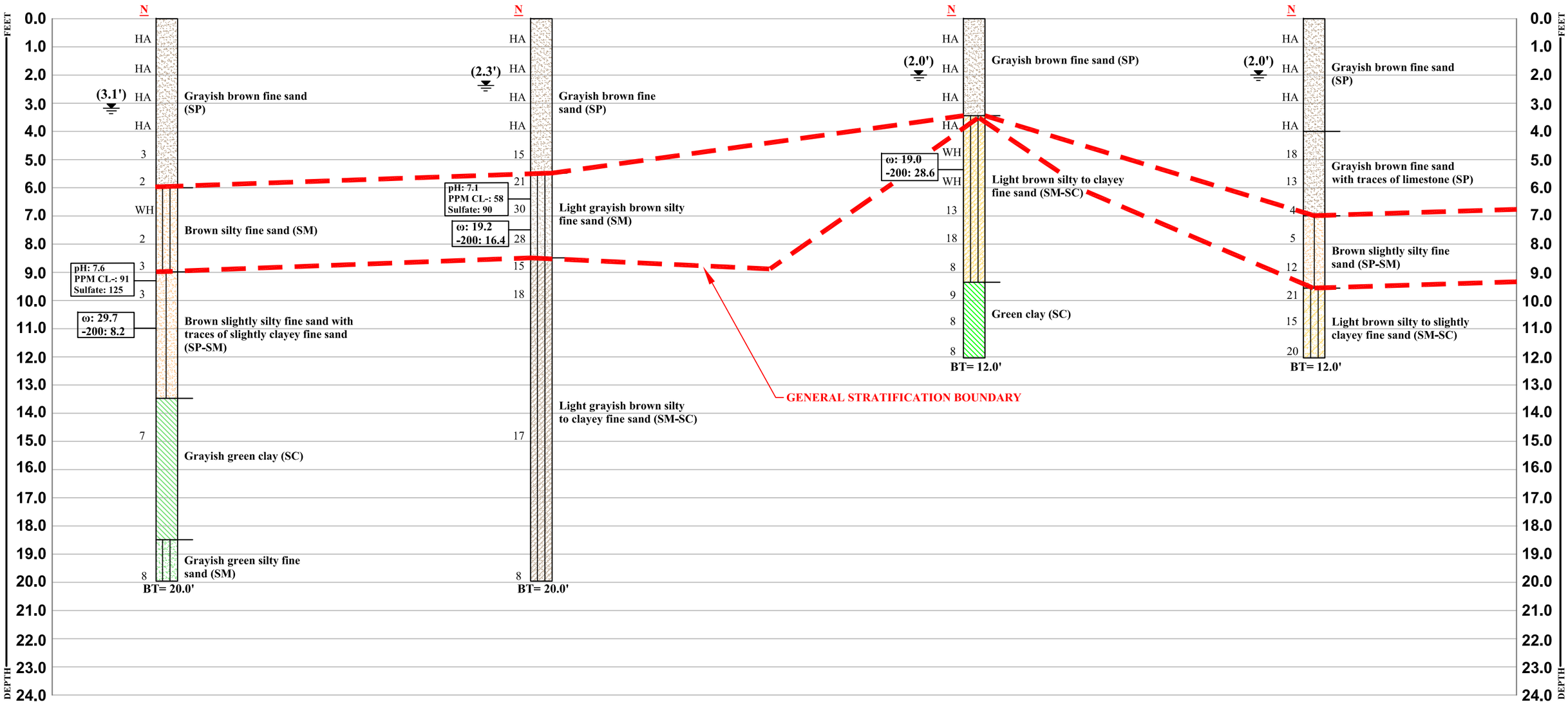
Figure Name:
SOIL PROFILES FOR BORINGS HA-1 TO HA-3

Project Name:
BARRY AVENUE DRAINAGE IMPROVEMENTS

Checked & Approved by:	Drawn By:	Date:	Scale:	Proj. #	
DS	DS	01-22-16	Noted	14-610.63	FIgure 2.1



LEGEND

	BORINGS DRILLED ON DATE NOTED
▽	WATER LEVEL MEASURED ON DATE OF DRILLING
N	STANDARD PENETRATION TEST RESISTANCE (BLOWS/FT)
B.T	BORING TERMINATION DEPTH IN FEET
w	NATURAL MOISTURE CONTENT %
-200	PERCENT PASSING US # 200 SIEVE
HA	HAND AUGERED
WH	SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SAMPLER ADVANCED UNDER WEIGHT OF ROD
N.E.	WATER LEVEL NOT ENCOUNTERED ON DATE OF DRILLING
PPM CL-	CHLORIDE ION CONCENTRATION (MG/L)
SULFATE	SULFATE ION CONCENTRATION (MG/L)
G.S.E	SURVEYED GROUND SURFACE ELEVATION (FT NAVD)

GRANULAR MATERIALS

Relative Density	SPT (Blows/ft.)
Very loose	Less than 4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Greater than 50

SILTS AND CLAYS

Consistency	SPT (Blows/ft.)
Very soft	Less than 2
Soft	2-4
Firm	4-8
Stiff	8-15
Very stiff	15-30
Hard	Greater than 30

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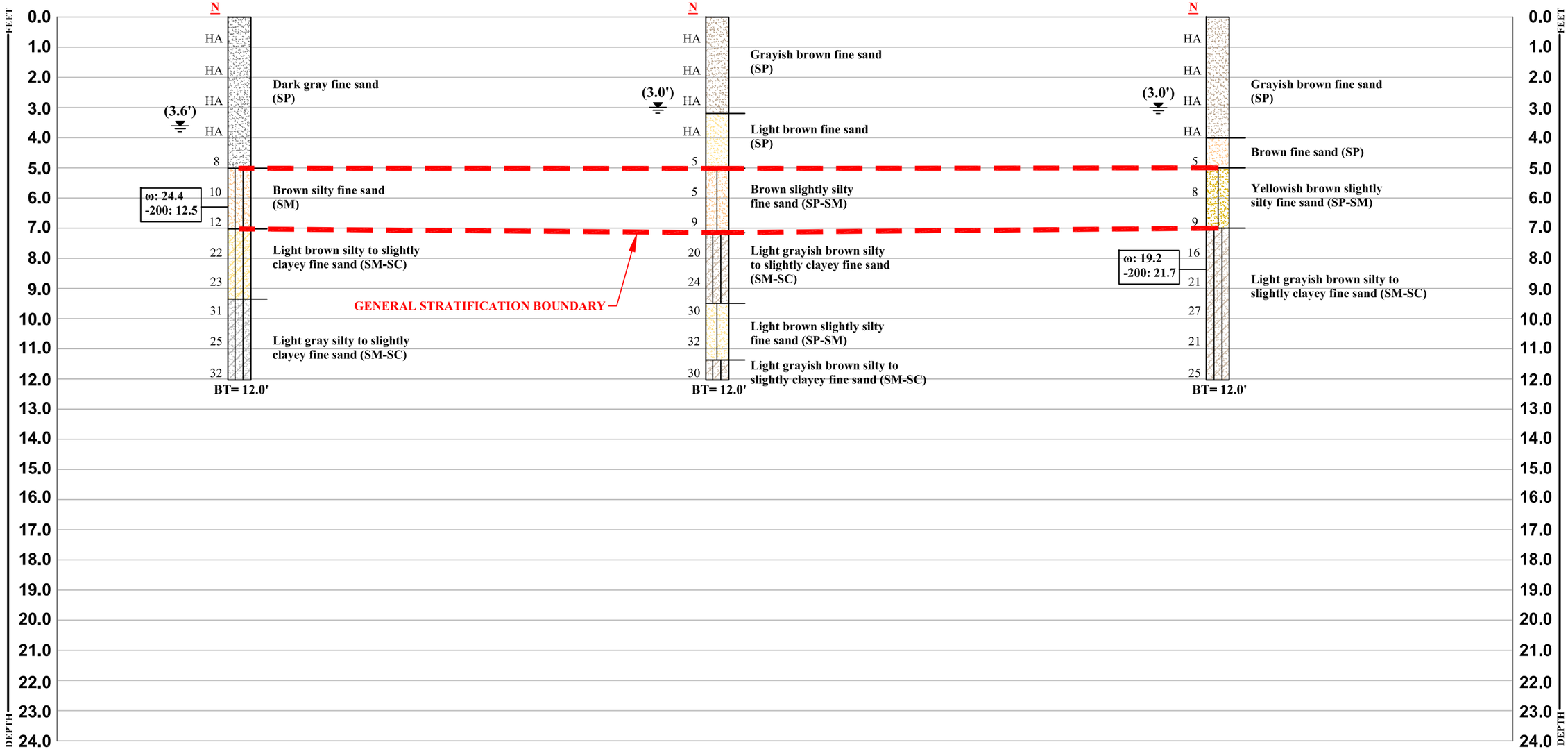
Figure Name: SOIL PROFILES FOR BORINGS TB-1 TO TB-4

Project Name: BARRY AVENUE DRAINAGE IMPROVEMENTS

Checked & Approved by:	Drawn By:	Date:	Scale:	Proj. #	
DS	DS	01-22-16	Noted	14-610.63	Figure 3.1



LEGEND

	BORINGS DRILLED ON DATE NOTED
▼	WATER LEVEL MEASURED ON DATE OF DRILLING
N	STANDARD PENETRATION TEST RESISTANCE (BLOWS/FT)
B.T	BORING TERMINATION DEPTH IN FEET
w	NATURAL MOISTURE CONTENT %
-200	PERCENT PASSING US # 200 SIEVE
HA	HAND AUGERED
WH	SAMPLER ADVANCED UNDER WEIGHT OF ROD AND HAMMER
WR	SAMPLER ADVANCED UNDER WEIGHT OF ROD
N.E.	WATER LEVEL NOT ENCOUNTERED ON DATE OF DRILLING
PPM Cl.-	CHLORIDE ION CONCENTRATION (MG/L)
SULFATE	SULFATE ION CONCENTRATION (MG/L)
G.S.E	SURVEYED GROUND SURFACE ELEVATION (FT NAVD)

GRANULAR MATERIALS

Relative Density	SPT (Blows/ft.)
Very loose	Less than 4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Greater than 50

SILTS AND CLAYS

Consistency	SPT (Blows/ft.)
Very soft	Less than 2
Soft	2-4
Firm	4-8
Stiff	8-15
Very stiff	15-30
Hard	Greater than 30

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Figure Name: SOIL PROFILES FOR BORINGS TB-5 TO TB-7

Project Name: BARRY AVENUE DRAINAGE IMPROVEMENTS

Checked & Approved by:	Drawn By:	Date:	Scale:	Proj. #	
DS	DS	01-22-16	Noted	14-610.63	Figure 3.2

PART H
TECHNICAL PROVISIONS

for

BARRY STREET
DRAINAGE IMPROVEMENTS
ORANGE COUNTY, FLORIDA

SFWMD PERMIT

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
ENVIRONMENTAL RESOURCE PERMIT NO. 48-02569-P
DATE ISSUED: December 20, 2016

PERMITTEE: ORANGE COUNTY PUBLIC WORKS ROADS AND DRAINAGE DIV
4200 SOUTH JOHN YOUNG PKWY
ORLANDO, FL 32839

FLORIDA DEPARTMENT OF TRANSPORTATION
719 SOUTH WOODLAND BOULEVARD
DELAND, FL 32720

PROJECT DESCRIPTION: Construction of stormwater retrofit activities consisting of increasing the capacity of the SR 50 cross drain by jack and boring an additional 30inch steel carrier pipe adjacent to the existing 18 inch RCP and upsizing the pipes along the west side of Fairvilla Road by replacing the existing 18 inch pipe with 30 inch RCP, to alleviate flooding of roads, and residential and commercial lots within the project area. No changes are proposed to both the stormsewer downstream of the cross drain under State Road 50, and the current outfall at Lake Lawne. (Chapter 62-330.451, FAC.)

PROJECT LOCATION: ORANGE COUNTY, SEC 29 TWP 22S RGE 29E

PERMIT DURATION: Five years from the date issued to complete construction of the surface water management system as authorized herein.

This is to notify you of the District's agency action for Permit Application No. 161206-7, dated December 6, 2016. This action is taken pursuant to Section(s) 62-330.401 and 62-330.402, Florida Administrative Code (F.A.C.).

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 20 General Conditions (See Pages : 2 - 4 of 5),
3. the attached 1 Specific Conditions in section 62-330.451 (See Pages : 5 - 5 of 5) and
4. the attached 1 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 , in accordance with Section 120.60(3), F.S. Notice was also electronically posted on this date through a link on the home page of the District's website (my.sfwmd.gov/ePermitting).

BY:_____
Mark S. Daron, P.E.
Engineer Supervisor
Orlando Service Center

GENERAL CONDITIONS

1. The general permit is valid only for the specific activity indicated. Any deviation from the specified activity and the conditions for undertaking that activity shall constitute a violation of the permit and shall subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. This general permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any construction, alteration, operation, maintenance, removal or abandonment authorized by this permit.

3. This general 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 general permit.

4. The general permit does not relieve the permittee from liability and penalties when the permitted activity causes harm or injury to: human health or welfare; animal, plant or aquatic life; or property. It does not allow the permittee to cause pollution that violates state water quality standards.

5. Section 253.77, F.S., provides that a person may not commence any excavation, construction, or other activity involving the use of state-owned 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 consent, lease, easement, or other form of authorization authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on state-owned lands.

6. The authorization to conduct activities under a general permit may be modified, suspended or revoked in accordance with Chapter 120, F.S., and Section 373.429, F.S.

7. This permit shall not be transferred to a third party except pursuant to Rule 62-330.340, F.A.C. The permittee transferring the general permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to sale, conveyance, or other transfer of ownership or control of the permitted project, activity, or the real property at which the permitted project or activity is located.

8. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the permitted activity to ensure conformity with the plans and specifications approved by the permit.

9. The permittee shall maintain any permitted project or activity in accordance with the plans submitted to the Agency and authorized in this general permit.

10. A permitee's right to conduct a specific activity under this general permit is authorized for a duration of five years.

11. 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 implemented and maintained immediately prior to, during, and after construction as needed to stabilize all disturbed areas, including other measures specified in the permit to prevent adverse impacts to the water resources and adjacent lands. Erosion and sediment control measures shall be installed and maintained 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), available at: www.dep.state.fl.us/water/wetlands/docs/erp/FLErosionSedimentManual_6_07.pdf, and the "Florida Stormwater Erosion and Sedimentation Control Inspector's Manual" (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008),

GENERAL CONDITIONS

available at: www.dep.state.fl.us/water/nonpoint/docs/erosion/erosion-inspectors-manual.pdf.

12. Unless otherwise specified in the general permit, temporary vehicular access within wetlands during construction shall be performed using vehicles generating minimum ground pressure to minimize rutting and other environmental impacts. Within forested wetlands, the permittee shall choose alignments that minimize the destruction of mature wetland trees to the greatest extent practicable. When needed to prevent rutting or soil compaction, access vehicles shall be operated on wooden, composite, metal, or other non-earthen construction mats. In all cases, access in wetlands shall comply with the following:
a. Access within forested wetlands shall not include the cutting or clearing of any native wetland tree having a diameter 4 inches or greater at breast height;
b. The maximum width of the construction access area shall be limited to 15 feet;
c. All mats shall be removed within 72 hours after the work commences; and
d. Areas disturbed for access shall be restored to natural grades immediately after the maintenance or repair is completed.

13. Barges or other work vessels used to conduct in-water activities shall be operated in a manner that prevents unauthorized dredging, water quality violations, and damage to submerged aquatic communities.

14. The construction, alteration, or use of the authorized project shall not adversely impede navigation or create a navigational hazard in the water body.

15. Except where specifically authorized in this general permit, activities must not:
a. Impound or obstruct existing water flow, cause adverse impacts to existing surface water storage and conveyance capabilities, or otherwise cause adverse water quantity or flooding impacts to receiving water and adjacent lands; or
b. Cause an adverse impact to the maintenance of surface or ground water levels or surface water flows established pursuant to Section 373.042, F.S., or a Works of the District established pursuant to Section 373.086, F.S.

16. 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 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.

17. The activity must be capable of being performed and of functioning as proposed, based on generally accepted engineering and scientific principles, and must comply with any applicable District special basin and geographic area criteria

18. The permittee shall comply with the following when performing work within waters accessible to federally- or state-listed aquatic species, such as manatees, marine turtles, smalltooth sawfish, and Gulf sturgeon:
a. All vessels associated with the project shall operate at "Idle Speed/No Wake" at all times while in the work area and where the draft of the vessels provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
b. All deployed siltation or turbidity barriers shall be properly secured, monitored, and maintained to prevent entanglement or entrapment of listed species.

GENERAL CONDITIONS

c. All in-water activities, including vessel operation, must be shutdown if a listed species comes within 50 feet of the work area. Activities shall not resume until the animal(s) has moved beyond a 50-foot radius of the in-water work, or until 30 minutes elapses since the last sighting within 50 feet. Animals must not be herded away or harassed into leaving. All on-site project personnel are responsible for observing water-related activities for the presence of listed species.
d. Any listed species that is killed or injured by work associated with activities performed shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922 and ImperiledSpecies@myFWC.com.
e. Whenever there is a spill or frac-out of drilling fluid into waters accessible to the above species during a directional drilling operation, the FWC shall be notified at imperiledspecies@myfwc.com with details of the event within 24 hours following detection of the spill or frac-out.

19. The permittee shall hold and save the Agency 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 activity authorized by the general permit.

20. The permittee shall immediately notify the Agency in writing of any submitted information that is discovered to be inaccurate.

SPECIFIC CONDITIONS

62-330.451 GENERAL PERMIT TO COUNTIES, MUNICIPALITIES, AND OTHER AGENCIES TO CONDUCT STORMWATER RETROFIT ACTIVITIES

1. Within 30 days after completion of construction, a registered professional shall submit certification that construction was completed in substantial conformance with the plans and calculations that were submitted in the notice to use this general permit.

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: 2016-12-07	ORANGE COUNTY, FL

Application

Application Number: 161206-7

REGULATION DIVISION

Project Name: BARRY STREET DRAINAGE IMPROVEMENTS PROJECT

0 1,850 3,700 Feet

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South Florida Water Management District