TECHNICAL SPECIFICATIONS

WM#2 (PH2) Beach Rd Water Main (WM) Replacement Project

Prepared For:

Village of Tequesta

JANUARY 2026

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FL. P.E. NO. 37290

This item has been digitally signed and sealed by Thomas C. Jensen on date adjacent to seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on electronic copies.

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SUMMARY OF WORK

PART I - GENERAL

1.01 WORK COVERED BY THESE CONTRACT DOCUMENTS

The Contractor shall furnish all labor and materials necessary to perform the water main replacement as shown on the plans in Tequesta, Florida. The project shall include all piping, fittings, couplings, accessories and appurtenances, site restoration, temporary provisions to maintain water service to residents to the extent practical, testing, bacteriological clearance of the water main, pressure testing of the water main, water service connection, removal and/or grout filling of the existing piping as specified, obtaining all required permits, compliance with permit conditions, Village of Tequesta (Village) Water Utility Standards and Palm Beach County (PBC) Standards, and any other items depicted on the drawings and described in these documents and reference materials.

In addition to infrastructure improvements, this project shall include roadway, swale and shoulder restoration located in the public right-of-way including pavement, signage, driveways, fencing, landscaping and other miscellaneous items. These items shall be restored as shown on the construction drawings but at a minimum they should be restored to their original condition or better.

Contractor's Duties:

1. Except as specifically noted, provide and pay for:
    a. Mobilization and demobilization
    b. Labor, materials, and equipment
    c. Tools, construction equipment, and fuel
    d. Water and utilities required for construction.
    e. Temporary utilities, provisions, and controls
    f. Freight and sales tax
    g. Maintenance of traffic
    h. Surveying and field engineering
    i. Locating and protecting existing utilities
    j. Compliance with all of the conditions of the permits issued and required to be obtained by the Contractor for this project.
    k. Coordination of schedule with all property owners effected by the water main installation and service relocation.

1.02 CONTRACTS

A. Construct the Work under a Unit Price contract.

B. Subcontractors (when used) shall be supervised by and work directly for the contractor.

1.03 WORK BY OTHERS AND FUTURE WORK

A. The Owner reserves the right to add to the work in accordance with the Contract Documents.

1.04 WORK SEQUENCE

A. Sequence of work will be discussed and decided at the Pre-Work Conference.

B. To the greatest extent practical, the new water main areas will need to be placed into service prior to the existing water main being abandoned and all customers shall be served during the duration of construction with minimum disruption. Where this is not feasible, the contractor shall employ temporary connections as needed.

C. Work shall only be performed during the authorized construction hours and days as specified by the Village of Tequesta. If work needs to be performed outside of the authorized hours and/or days to allow the work to progress, special permission from the Village shall be requested by the Contractor a minimum of 14 days before this work is to begin.

D. The Contractor shall coordinate closely with the Village of Tequesta for an optimal construction schedule that minimizes disruption to service and normal traffic flow. Evening and weekend work hours may be required and shall be coordinated with the Village of Tequesta prior to commencement.

1.05 CONTRACTOR-FURNISHED PRODUCTS AND RESPONSIBILITIES

A. Products furnished to the site and paid for by the Contractor:

1. All products necessary to complete the work described herein these contract documents and specifications.

B. Contractor's Responsibilities:

1. Review and incorporate Owner-reviewed shop drawings, product data, and samples into the construction of the project.
2. Prepare, apply for, and obtain permits that are specified to be obtained by the Contractor.
3. Provide for the notification of residents for work on private property, including door hangers, individual meetings, public meetings, etc.

4. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
5. Repair or replace items damaged after receipt.
6. Arrange and pay for product delivery to site.
7. Handle, store, install, and delivered products.
8. Submit claims for transportation damage and replace damaged, defective, or deficient items.
9. Arrange for manufacturers' warranties, inspections, and service.

1.06 CONTRACTOR'S USE OF THE PREMISES

A. All work shall be within the limits of the County right-of-way (ROW) and easements to the greatest extent practical. The Contractor shall be responsible for maintenance of traffic when working within the public ROW. This project will require close coordination between the Village, County and the Contractor during construction.

B. The Contractor shall be fully responsible for the safety and security of the construction area including any temporary measures required to maintain its protection. The Contractor will be responsible for any damages or theft incurred to his tools, equipment, machinery, and new work in-place not yet fully accepted by the Owner.

C. The Contractor shall be responsible for maintenance of traffic when working within the public ROW.

D. The Contractor shall maintain vehicular and pedestrian access to driveway entrances to the greatest extent practical. A minimum of one traffic lane should remain open to the greatest extent practical.

1.07 PERMITS REQUIRED

A. The Contractor will be responsible for complying with all conditions specified in each of the project’s permits and licenses. A description of the project permits is described in Specification 01060.

PART 2 – PRODUCTS

NOT USED.

PART 3 – EXECUTION

NOT USED.

END OF SECTION

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SECTION 01030

HURRICANE PREPAREDNESS

PART 1 - GENERAL

1.01 HURRICANE PREPAREDNESS PLAN

A. The Contractor's attention is drawn to the possibility of hurricane or severe storm conditions occurring at the site of work during the course of Contract Work.

B. Within fourteen (14) days of the date of the Notice to Proceed, the Contractor shall submit to the Engineer and Owner a Hurricane Preparedness Plan. The plan should outline the necessary measures which the Contractor proposes to perform at no additional cost to the Owner in case of a hurricane or severe weather warning.

C. In the event of inclement weather, or whenever the Owner shall direct, the Contractor shall, and will, cause Subcontractors to carefully protect the Work and materials against damage or injury. Work and materials damaged due to inclement weather shall be removed and replaced at the expense of the Contractor.

1. Hurricane Watch: Upon designation of a hurricane watch, the Contractor shall be responsible for storing all loose supplies and equipment on the job site that may pose a danger. In addition, the Contractor shall remove all bulkheads and plugs in pipelines that would impede drainage in the event of flooding. Structures that may be in danger of floatation shall be flooded. The Contractor shall also cooperate with the Owner in protecting any other structures at the site.

2. Hurricane Warning: No mobile "temporary facility" under the control of or on the property of the Owner shall be staffed during a hurricane warning. Contractor facilities meeting these criteria shall be evacuated. Reasonable steps shall be taken to protect all such facilities and their contents from damage and to avoid the facility causing damage to the surroundings. Reasonable steps shall be taken to protect existing improvements from damage and to avoid damage to the surroundings caused by staged materials, equipment, or other facilities related to the project.

D. The Contractor may be required to backfill excavation depending on the severity of the approaching storm or the expected amount of rainfall. Additionally, erosion protection and inlet protection may also be required by the Owner depending on the site conditions at the time of the Hurricane Watch.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

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SECTION 01039

COORDINATION AND MEETINGS

PART 1 – GENERAL

1.01 DESCRIPTION

A. The Owner shall schedule and administer preconstruction meetings, public involvement meetings/communications, and specially called meetings throughout the progress of the work. The Owner shall:

1. Distribute written notice of each meeting.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record the minutes, include all significant proceedings and decisions.
5. Reproduce and distribute copies of minutes:

    a. To all participants in the meeting.
    b. To all parties affected by decisions made at the meeting.

B. The Contractor shall schedule and administer progress meetings. The Contractor shall:

1. Distribute written notice of each meeting.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record the minutes, include all significant proceedings and decisions.
5. Reproduce and distribute copies of minutes:

    a. To all participants in the meeting.
    b. To all parties affected by decisions made at the meeting.

C. Representatives of the Contractor, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. Specified in other Sections:

1. Section 01010: Summary of Work
2. Section 01060: Regulatory Requirements and Notifications

1.03 PRE-CONSTRUCTION MEETING

A. To be held prior to the Notice to Proceed.

B. Location: The project site, or as designated by the Owner/Engineer.

C. Attendance:

1. Owner's Representative
2. Engineer’s Representative
3. Contractor
4. Contractor's Superintendent
5. Major Subcontractors
6. Other’s as appropriate

D. Agenda:

1. Record of Attendance.
2. Project Summary Description.
3. Local Utilities to be affected or in the project area:
    a. Water lines
    b. Sewer lines
    c. Storm lines
    d. Gas lines
    e. Telephone lines
    f. Cable TV lines
    g. Electric lines
    h. Roadways
4. Contractor Responsibilities:
    a. Start date.
    b. Completion date
    c. Work schedule
    d. Notification Requirements
    e. Regulatory Permit Requirements
    f. Testing
    g. Space utilization
    h. Rights-of-Way occupancy
    i. Progress Meetings
    j. Progress Payment Application
    k. As-builts (Records/Drawings)
    l. Photographs
    m. Shop drawings
    n. Subcontractors
    o. Project coordination

5. Owner Responsibilities:

    a. Progress Meeting Attendance
    b. Special meetings
    c. Partial and final payment
    d. Change Orders
    e. Public announcements and public relations
    f. Project acceptance

6. Engineer Responsibilities:

    a. Technical representative of Owner
    b. Interpreter of contract documents
    c. Periodic inspections of job progress
    d. Reviews partial and final payment applications.
    e. Reviews Change Orders
    f. Checks and approves shop drawings.
    g. Reviews record drawings.
    h. Prepares Health Department Clearance Package
    i. Performs final inspection and issues certificate of completion.

7. Resident Inspector Responsibilities:

    a. Owner's representative on site
    b. Review materials and work and reports any deficiencies to Owner/Engineer
    c. Reviews applications for payment
    d. Works with Contractor on public notification of work items
    e. Attends progress meetings.
    f. Observes testing work.
    g. Maintains daily diary of work tasks.
    h. Furnishes reports to Owner/Engineer as deemed advisable.

1.04 PROGRESS MEETINGS

A. The Contractor shall hold periodic meetings as required by progress of the work.

B. Location of the meetings: Project site, or as designated by the Owner or Engineer.

C. Attendance:

1. Owner's Representative
2. Engineer's Representative
3. Subcontractors as appropriate
4. Suppliers/others as appropriate

1.05 EMERGENCY MEETINGS

A. Emergency meetings may be called by Owner, Engineer or Contractor with a minimum of three hours notice to resolve conditions of an emergency nature.

1.06 PUBLIC INVOLVEMENT MEETINGS/COMMUNICATIONS

A. There may will be public involvement meetings and communications for the project. The Contractor shall participate in these meetings and communications as deemed necessary by the Owner.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

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SECTION 01050

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

This section defines the method which will be used to determine the quantities of work performed, materials supplied and establishes the basis upon which payment will be made.

A. The Unit Cost Prices stated in the Contract shall be considered payment in Full for the completion of all work. Payment shall be made under each item only for work as it is not specifically included under other items.

B. The Contractor shall furnish all labor, equipment and material required to complete the construction and testing of the watermain extension and associated appurtenances.

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

1.02 ESTIMATED QUANTITIES

Where quantities are shown, they are approximate and are given only as a basis of calculation upon which the award of the contract is to be made. The Village or Engineer does not assume any responsibility for the final quantities, nor shall Contractor claim misunderstanding because of such estimate of quantities. Final payment will be made only for the satisfactorily completed quantity of each item.

1.03 MEASUREMENT STANDARDS

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

1.04 METHOD OF MEASUREMENT

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

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

1.05 PAYMENT

Lump Sum Items - Where payment for items is shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum item.

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

1.06 COSTS INCLUDED IN PAYMENT ITEMS

No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work.

- Clearing and grubbing.
- Trench excavation, including necessary pavement removal, except as otherwise specified.
- Structural fill, backfill, density testing and grading.
- Site cleanup.
- Foundation and borrow materials, except as hereinafter specified.
- Stormwater pollution prevention plan.
- Survey layout and as-builts.
- Testing and placing system in operation.
- Any material and equipment required to be installed and utilized for tests.
- Maintaining the existing quality of service during construction.
- Appurtenant work as required for a complete and operable system.
- Cost for security (if special circumstances apply, approval must be received by the Engineer, in writing).
- Material storage areas.
- Disposal of excess fill and debris.
- Scheduling and calling for utility locates.
- Dewatering.
- Preconstruction site videos.
- Preparation of record drawings.
- Mechanical joint restraint systems (to be included in the unit cost of the DI fittings).

Site cleanup - Contractor's attention is called to the fact that cleanup is considered a part of the work of construction. No payment will be made until cleanup is essentially complete.

Work Outside Authorized Limits – No final payments will be made for work constructed outside the authorized limits of work.

1.07 APPLICATIONS FOR PAYMENT

Applications for Payment shall be prepared by the Contractor and submitted to the Engineer in accordance with the schedule established by the General Conditions of the Contract and the Agreement.

Applications for Payment shall be submitted in the number and form established by the Engineer at the Preconstruction Conference. The form shall be completely filled out and executed by an authorized representative of the Contractor. Supporting data such as schedules of stored materials shall be attached to each copy of the Application.

1.08 CHANGE ORDER PROCEDURE

As defined in the General Conditions, a Change Order is a written order to the Contractor signed by the Village authorizing an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time which is issued after the execution of the Agreement.

The following procedure shall be used in processing Change Orders:

For Additions to the Work – The Village shall issue a written order to the Contractor directing him to accomplish the additional work. The Contractor shall review the order and if they feel that the additional work entitles him to additional payment or additional time, they may submit a claim as prescribed in the General Conditions of the Contract.

For Deletions from the Work – The Village shall issue a written order to the Contractor directing him to make the change. If the Village feels that the contract price should be reduced as a result of the change, the Village shall make a claim for the reduction as provided in the General Conditions of the Contract.

A. GENERAL CONDITIONS

1. BONDS AND INSURANCE

    a. Measurement and Payment: A lump sum amount not exceeding 2.0 percent of the Bid Amount for Item B, Water Main Replacement.

2. MOBILIZATION AND DEMOBILIZATION

    a. Measurement and Payment: A lump sum amount not exceeding 5.0 percent of the Bid Amount for item B, Water Main Replacement (excluding any Allowances or alternate bid items), to include, but not be limited to: videos/photos, clearing and grubbing, site cleanup, project setup, sanitary facilities, labor associated with permit acquisition, construction staging area preparation and closure, project signage and project coordination/management, mobilization of material/equipment/crews and the complete demobilization from the project area. The lump sum amount shall be paid as noted below;

Construction % Complete	Allowable % of Lump Sum for Mobilization/Demobilization
5%	25%
10%	50%
25%	75%
100%	100%

3. MAINTENANCE OF TRAFFIC

   a. Measurement and Payment: A lump sum amount to include, but not be limited to: all signage, temporary striping, flagmen, barricades, temporary asphalt, temporary stabilized access around the construction equipment, notification to adjacent land owners, assistance to provide garbage collection, mail/package delivery and daily access (if needed) of other utility/emergency support vehicles, all in accordance with Section 01570, Traffic Regulation.

B. WATER MAIN REPLACEMENT

1. PVC WATER MAIN: Pipe will be measured per linear foot along the centerline of the pipe installed for the size of pipe installed. No deduction will be made for the length of valves and fittings installed in the line. Where the measurement terminates at a valve, bend, tee or other fittings, the centerline of the valve or fitting shall be the point of termination. All dewatering, surveying, density testing, pigging of the main and all other testing (with any temporary fittings/valves/piping/pumps required), along with the preparation of record drawings shall be included in the unit cost of the pipe. The cost to adjust other utilities (electric, cable, telephone, etc.) if required, and the coordination with that utility, shall also be included in the pipe cost.

2. HDPE WATER MAIN: Pipe will be measured per linear foot along the centerline of the pipe installed for the size of pipe installed. No deduction will be made for the length of valves and fittings installed in the line. Where the measurement terminates at a valve, bend, tee or other fittings, the centerline of the valve or fitting shall be the point of termination. All dewatering, surveying, density testing, pigging of the main and all other testing (with any temporary fittings/valves/piping/pumps required), along with the preparation of record drawings shall be included in the unit cost of the pipe. The cost to adjust other utilities (electric, cable, telephone, etc.) if required, and the coordination with that utility, shall also be included in the pipe cost.

3. GATE VALVE WITH BOX: Measurement shall be on the basis of furnishing and installing each type of valve and size of valve required including the valve box as noted per Village standard.

4. GATE VALVE VAULT: Measurement shall be on the basis of furnishing and installing each type of valve and size of valve required, along with the required saddles and corp stops (2 – required) within a concrete vault (size noted on detail)

with gravel weep hole and traffic bearing hatch frame and cover. Refer to the gate valve vault detail on sheet C-13.

5. 10”x10” TAPPING SLEEVE AND VALVE: Measurement shall be on the basis of furnishing and installing the type and of tapping sleeve and valve approved by the Village, at the locations shown, including preparation of site, excavation/backfill, tapping the pipe, pressure test and associated installation hardware.

6. DI FITTINGS: Measurement of DI fittings shall be on the basis of weight (pounds) per the contractors supplied shop drawing cut sheets. The use of mechanical restraints (megalugs, bell restraints, tie rods, etc) shall be included in the unit price of the DI fitting.

7. FIRE HYDRANT ASSEMBLY: Measurement shall be on the basis of furnishing and installing each complete fire hydrant assembly per the details on the plans, including, but not limited to excavation, backfill, dewatering and compaction, MJ tee (size as noted), valve is paid for under Item B.3.c., DI pipe (size as noted) and all required MJ restraints.

8. DIRECTIONAL BORE, 12” HDPE DR11:

   a. STA. 4+75 TO STA. 15+93 (SHT. C-5): Measurement shall be based upon a complete bore as shown on the plans with the size as noted using HDPE. Payment shall be based upon the linear foot of bore from the entry/exit points (surface to surface) including all MOT, rig site preparation work, carrier pipe and casing (if noted), dual pull wires for locates, preparation/submittal of a frac out plan, submittal of a bore plan with personnel experience and bore rig to be used along with site cleanup. All associated restoration (asphalt, roadway, sidewalk, driveway or sod) shall be paid under the respective unit price item.

   b. 12” HDPExMJ ADAPTER: Measurement shall be based upon the supply of a complete HDPE x MJ adapter per size noted and installed with all required appurtenances.

9. OFFSET ARV ASSEMBLY: Measurement shall be per each complete installation of the ARV Assembly and associated piping, valving and concrete vault with access lid as noted on the plans and supplied per the details.

10. CONNECTIONS TO EXISTING: Measurement shall be based upon the complete connection to the Village’s existing water main at the locations noted on the plans. Cost shall include all coordination with Village staff and Engineer, work on off hours (if needed), Village assistance on existing valve closures, pipe modifications, couplings/adapters, excavation and backfill, vac truck on-site (if required), cleanup of any spills, swabbing the pipe/fittings with chlorine for the water main connection, observation of connection at line pressure and site restoration. All associated fittings

and MJ restraints (on new pipe and existing pipe) shall be paid for under the DI Fitting pay item. All associated restoration (asphalt, roadway, sidewalk, driveway, or sod) shall be paid under the unit price item.

11. SAMPLE POINTS: Measurement shall be based upon a complete sample point and its appurtenances per the Village Standard, to include the complete bacteriological analysis by an independent State certified laboratory and the complete removal of the sample point upon acceptance of the testing results from FDEP/HRS.

12. GROUT FILL EXISTING WATER MAIN: Measurement shall be based upon the complete grouting of the existing water main to the limits noted, payable on a linear foot basis, to include locates, pipe cutting, pipe disposal, capping for grouting and venting, flowable fill and backfill/compaction, and any necessary appurtenances required. All required surface restoration shall be paid for under the related pay item.

13. REMOVE/REPLACE DRAIN PIPE/BASINS (SHT. C-7): Measurement shall be based upon the complete removal and replacement of the private storm drainage system shown on sheet C-7. Contractor shall verify size of HDPE ADS Corrugated pipe and nyloplast drainage structures. Portions/all of the system could be reused depending upon condition of pipe/boxes. Payment shall be made on a lump sum basis.

14. WATER SERVICES OFF MAIN:

    a-c. SADDLE: Measurement shall be on the basis of furnishing and installing the type/size of saddle approved by the Village, at the locations shown, including the tap on the pipe and associated installation hardware.

    d-e. CORP STOPS: Measurement shall be on the basis of furnishing and installing the type/size of corp stop approved by the Village, at the locations shown, including all installation hardware.

    f-g. POLY PIPE: Pipe will be measured on a per linear foot along the centerline of the pipe installed for the size of pipe installed.

    h. CONNECTIONS TO EXISTING METER ASSEMBLY: Measurement shall be based upon the complete connection to the existing water meters at the locations/size noted. Contractor shall provide all misc. pipe/fittings required to make a complete connection and coordinate with the village for any required service shutdowns. Payment shall be made on a lump sum basis.

15. WATER SERVICE/FIRE LINE MODIFICATIONS: Measurement is based upon the complete installation of each new water service and fire line with all necessary appurtenances per the details on the plans up to the new meter location and/or existing fire line. The modifications include disconnecting the old service line and reconnecting the new service line to the existing meter as a new above ground by-

pass meter assembly. Payment shall be based upon the completion of each new condo water service and fire line and shall include condo notification and moving/replacing material encountered to install the new service line. Contractor shall include any required plumbing/fire line permits. Payment shall be made on a lump sum basis for each location.

16. MISCELLANEOUS RESTORATON

a. ROADWAY TRENCH: Measurement shall be on a square yardage basis for the limits shown. Contractor shall confirm with Engineer on limits in the field prior to performing the work. The cost includes all saw cutting, disposal of existing material, new base rock, grading, compaction, densities, and placement/finishing with new asphalt per the County detail.

b. MILL AND RESURFACE (1”): Measurement shall be on a square yardage basis for the milling and resurfacing of a minimum of 1-inch at the locations and limits noted on the plans. Contractor shall confirm with County/Village/Engineer on limits in the field prior to performing the work. The cost includes all disposal of existing material, RPM’s and placement/finishing the new asphalt roadway. All thermoplastic pavement markings will be paid separately under that item.

c. PAVEMENT MARKINGS: Measurement shall be on a lump sum basis for a complete re-stripe of the impacted roadways with thermoplastic material, to include any temporary markings.

d. CONCRETE SIDEWALK: Measurement shall be on a square yardage basis for the installation of new concrete sidewalk to the limits shown. Contractor shall confirm with Engineer/County on limits in the field prior to performing the work. The cost includes all saw cutting, disposal of existing, grading, compaction, densities, wire mesh or steel (match existing) and placement/finishing the new concrete sidewalk.

e. ASPHALT SIDEWALK: Measurement shall be on a square yardage basis for the installation of new asphalt sidewalk to the limits shown. Contractor shall confirm with Engineer/County on limits in the field prior to performing the work. The cost includes all saw cutting, disposal of existing, grading, compaction, densities, and placement/finishing the new asphalt sidewalk.

f. CONCRETE DRIVEWAY: Measurement shall be on a square yardage basis for the installation of new concrete driveway to the limits shown or as required by the Village. Contractor shall confirm with Village/Engineer on limits in the field prior to performing the work. The cost includes all saw cutting, disposal of existing material, grading, base material, compaction, densities, and placement/finishing the new asphalt driveway. The cost includes all disposal of existing material, grading, compaction, densities, and placement/finishing the

new concrete driveway.

g. PAVER DRIVEWAY/WALKWAYS: Measurement shall be on a square yardage basis for the removal and re- installation of the existing paver bricks to include subgrade, paver base material, compaction and densities. No separate payment will be made for replacement of any damaged bricks.

h. CONCRETE HEADER CURB: Measurement shall be based on the total length of 12” or 18” concrete header curb that is removed, disposed of and replaced. The cost included all saw cutting, disposal, grading, compaction, steel (match existing) and placement/finishing of the curb.

i. CONCRETE TYPE D CURB: Measurement shall be based upon the linear footage of Type D curb installed as shown on the plans. This pay item includes the cost of all saw cutting, disposal of existing, compaction, densities, grading, concrete formwork, steel, concrete and placement/finishing the curb per FDOT/County requirements.

j. CONCRETE TYPE F CURB: Measurement shall be based upon the linear footage of Type F curb installed as shown on the plans. This pay item includes the cost of all saw cutting, disposal of existing, compaction, densities, grading, concrete formwork, steel, concrete and placement/finishing the curb per FDOT/County requirements.

k. VALLEY GUTTER: Measurement shall be based upon the linear footage of valley gutter installed as shown on the plans. This pay item includes the cost of all saw cutting, disposal of existing, compaction, densities, grading, concrete formwork, steel, concrete and placement/finishing the gutter per FDOT/County requirements.

l. BAHIA SOD: Measurement shall be based upon the number of square yards of Bahia sod (for the type of sod noted/match existing/or as directed by the Engineer) completed and accepted under the terms of the contract except that the maximum width to be used in the computation shall be twenty (20) feet. Payment shall include all necessary soil preparation, topsoil, sod (pegged as required) and water to establish the sod.

m. FLORATAM SOD: Measurement shall be based upon the number of square yards of Floratam sod (for the type of sod noted/match existing/or as directed by the Engineer) completed and accepted under the terms of the contract except that the maximum width to be used in the computation shall be twenty (20) feet. Payment shall include all necessary soil preparation, topsoil, sod (pegged as required) and water to establish the sod.

C. ALTERNATE BID ITEM NO. 1

1. GROUT FILL EXISTING WATER MAIN RIVER CROSSING: Measurement shall be based upon the complete grouting of the existing water main to the limits noted, payable on a linear foot basis, to include locates, pipe cutting, pipe disposal, capping for grouting and venting, flowable fill and backfill/compaction, and any necessary appurtenances required. All required surface restoration shall be paid for under the related pay item.

END OF SECTION

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SECTION 01060

REGULATORY REQUIREMENTS AND NOTIFICATIONS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Obtain and pay for all permits and licenses as required for construction of the project.

B. Schedule all inspections and obtain all written approvals of the agencies required by the permits and licenses.

C. Comply with all conditions specified in each of the permits and licenses.

D. The Contractor shall keep a copy of all permits and easements complete with conditions, attachments, exhibits, and modifications at the work site and provide copies of the permits to the appropriate subcontractors. The Contractor is responsible for ensuring that the permit conditions are explained to the appropriate construction personnel.

1.02 PERMITS OBTAINED BY OWNER

The Owner will apply and pay for the following permits:

1. PALM BEACH COUNTY HEALTH DEPARTMENT: The General Permit for Construction of a Water Main Extension for PWSs from the Palm Beach County Health Department for the project has been obtained for this project by the Owner. A copy of this permit has been included in Appendix A. All contracts shall conform to the conditions of this permit.

2. PALM BEACH COUNTY RIGHT OF WAY DEPARTMENT: The General Utility Permit for the Palm Beach County Right of Way Department has been obtained for this project by the Owner. A copy of this permit has been included in Appendix A. All contracts shall conform to the conditions of this permit.

3. ARMY CORPS OF ENGINEERS: The Individual Utility Permit for the Army Corps of Engineers has been obtained for this project by the Owner. A copy of this permit has been included in Appendix A. All contracts shall conform to the conditions of this permit.

1.03 PERMITS OBTAINED BY CONTRACTOR

A. The Contractor shall prepare and pay for the Notice of Intent (NOI) to use the Generic Permit for Stormwater Discharge from Construction Activity, which will

include Stormwater Pollution Prevention Plan (SWPPP) as required by F.A.C. 62-621.300(4) and the Environmental Protection Agency (EPA) as part of the National Pollutant Discharge Elimination System (NPDES). (See Appendix B)

1. Contractor shall prepare, submit and obtain the appropriate dewatering permits and/or any temporary stormwater discharge permits from the South Florida Water Management District and/or Florida Department of Environmental Protection.

1.04 NOTIFICATION

A. The Contractor is required to notify the Owner and any applicable permitting agency who requires notification as part of their permit condition within the timeframe stated on the permit. If no time exists, notification shall be a minimum of 48 hours prior to initiating construction.

B. Utility Companies: Contractor shall notify the Sunshine State One Call of Florida (SSOCF) service at 811, 48 hours prior to digging for direct bury and 10 days prior to digging or initiating construction of underwater construction activities, as required by Florida Statues Chapter 556 throughout the duration of the construction project.

C. The Contractor shall give the Engineer not less than seven (7) calendar days notice of the time and place (or places) where he will start the work.

1.04 PERMIT CONDITIONS

A. Contractor shall comply with and furnish all items necessary to satisfy any general or specific conditions that are a part of the Owner obtained permits.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

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SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Submit Applications for Payment to Engineer in accordance with the schedule established by conditions of the Contract and Agreement between Owner and Contractor.

1.02 RELATED REQUIREMENTS

A. In other parts of the Construction Documents:

1. Drawings and general provisions of the Contract, including the General and Supplemental Conditions provided as part of the Village's Standard Specifications, apply to this section.
2. Agreement between Owner and Contractor
3. General Conditions and Terms of the Contract

B. Specified in Other Sections:

1. Section 01010: Summary of Work
2. Section 01700: Contract Close-Out

1.03 FORMAT AND DATA REQUIRED

A. Submit itemized applications typed in a format approved by Engineer. All applications for payment must be numbered, dated, and signed by the Contractor.

B. Provide itemized data on payment application (format, schedules, line items and values accepted by Engineer).

1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to the date of submittal of application.
2. Fill in summary of dollar values.
3. Execute certification with the signature of a responsible officer of the contract firm.
4. Have resident project representative review and sign application prior to submission to Engineer.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project
2. Application number and date
3. Detailed list of enclosures
4. For stored products:

    a. Item number and identification
    b. Description of specific material

B. Submit one copy of data and cover letter for each copy of application.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Application for payment is required for progress payments.

B. Only one application will be acceptable in any one calendar month.

1.07 SUBMITTAL PROCEDURE

A. Submit Applications for Payment to Engineer at the time stipulated in the Agreement.

B. Number: Four copies of each progress Application.

C. When Engineer finds the Application properly completed and correct, he will transmit the applications for payment to the Owner.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED

END OF SECTION

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SECTION 01153

CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDE

A. Promptly implement Change Order Procedures

1. Provide full written data required to evaluate changes.
2. Maintain detailed records of work done on a time-and-material/force account basis.
3. Provide full documentation to Engineer on request.

B. Designate in writing the member of Contractor's organization:

1. Who is authorized to accept changes in the Work
2. Who is responsible for informing others in the Contractor's employ of the authorization of changes in the Work.

C. Owner will designate in writing the person who is authorized to execute Change Orders.

1.02 RELATED REQUIREMENTS

A. The amount of established unit prices.

B. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

C. Terms and Conditions of the Contract:

1. Methods of determining cost or credit to Owner resulting from changes in Work made on a time-and-materials basis.
2. Contractor's claims for additional costs.

D. Specified in other Sections.

1. Section 01152: Applications for Payment
2. Section 01310: Progress Schedules and Submittals
3. Section 01600: Material and Equipment
4. Section 01720: Project Record Drawings

1.03 PRELIMINARY PROCEDURES

A. Owner or Engineer may initiate changes by submitting a proposal Request to Contractor. Request will include the following:

1. Detailed description of the Change, Products, and location of the change in the Project.
2. Supplementary or revised Drawings and Specifications.
3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.
4. A specific period of time during which the requested price will be considered valid.
5. Such request is for information only, and is not an instruction to execute the changes, nor to stop work in progress.

B. Contractor may initiate changes by submitting a written notice to Engineer, containing:

1. Description of the proposed changes
2. Statement of the reason for making the changes.
3. Statement of the effect on the Contract Sum and the Contract Time.
4. Statement of the effect on the work of separate contractors.
5. Documentation supporting any changes in Contract Sum or Contract Time, as appropriate.

1.04 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data to allow Engineer to evaluate the quotation.

B. On request, provide additional data to support time and cost computation including the following:

1. Labor required.
2. Equipment required.
3. Products required:
    a. Recommended source of purchase and unit cost.
    b. Quantities required.
4. Taxes, insurance bonds.
5. Credit for work deleted from Contract, similarly documented.
6. Overhead and profit.
7. Justification for any change in Contract Time.

C. Support each claim for additional costs, and for work done on a time-and-material / force account basis, with documentation as required for a lump sum proposal, plus the following additional information:

1. Name of the Owner's authorization agent who ordered the work, and date of the order.
2. Dates and time work performed, and by whom.

3. Time record, summary of hours worked, and hourly rates paid.
4. Receipts and invoices for:
    a. Equipment used, listing dates and times of use.
    b. Products used, listing quantities.
    c. Subcontracts.

D. Document requests for substitutions for products as specified in Section 01600.

1.05 PREPARATION OF CHANGE ORDERS

A. Engineer will prepare each Change Order.

B. Form: Change Order format provided in the Contract Documents.

C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of change.

D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

1.06 LUMP SUM / FIXED PRICE CHANGE ORDER

A. Content of Change Orders will be based on either:

1. Engineer's Proposal Request and Contractor's responsible Proposal as mutually agreed upon between Owner and Contractor.
2. Contractor's Proposal for a change, as recommended by Engineer.

B. Owner and Engineer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

C. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

1.07 UNIT PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. Engineer definition of the scope of the required changes.
2. Contractor's Proposal for a change, as recommended by Engineer.
3. Survey of completed work

B. The amount of the unit prices shall be:

1. Those stated in the Agreement.
2. Those mutually agreed upon between Owner and Contractor.

C. When quantities of each of the items affected by the Change Order can be determined prior to start of the work:

1. Owner and Engineer will sign and date the Change Order as authorization for Contractor to proceed with the changes.
2. Contractor shall sign and date the Change Order to indicate agreement with the terms therein.

D. When quantities of the items cannot be determined prior to start of the Work:

1. Engineer or Owner will issue a Change Order directing Contractor to proceed with the change on the basis of unit prices and will cite the applicable unit prices.
2. At completion of the change, the Engineer will determine the cost of such work based on the unit prices and quantities used.
a. Contractor shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.
3. Engineer will sign and date a second Change Order to establish the change in Contract Sum and in Contract Time.
4. Owner and Contractor will sign and date the second Change Order to indicate their agreement with the terms therein.

1.08 CORRELATION WITH CONTRACTOR'S SUBMITTALS

A. Contractor shall periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Sum.

B. Contractor shall periodically revise the Construction Schedule to reflect each change in Contract Time.

1. Revise sub-schedules to show changes for other items of work affected by the changes.

C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

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SECTION 01310

PROJECT SCHEDULES AND SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Submit, to the Owner and Engineer as applicable, shop drawings, estimated construction progress schedule, project data and samples required by specification sections.

1.02 RELATED WORK

A. General Conditions and Terms of the Contract

B. Specified in other Sections:

1. Section 01010: Summary of Work

1.03 SCHEDULES

A. Promptly after award of contract, prepare and submit to the Engineer estimated construction progress schedules for the work, including a separate schedule listing dates for submission and dates reviewed shop drawings, project data and samples will be needed for each product.

1.04 FORM OF SCHEDULES

A. Prepare schedules in suitable electronic format. A horizontal bar chart should be used as additional illustration and for revised progress schedules.

1. Provide separate horizontal bar for each trade or operation.
2. Horizontal time scale: Identify the first workday of each week.
3. Scale and spacing: To allow space for notations and future revisions.
4. Minimum sheet size: 11” x 17”

B. Format of listings: The chronological order of the start of each item of work.

C. Identification of listings: By major specification section numbers.

1.05 CONTENT OF SCHEDULES

A. Construction Progress Schedule shall:

1. Show the complete sequence of construction by activity.
2. Show the dates for the beginning and completion of each major element of construction; specifically, list:

a. Mobilization / Demobilization
b. Subcontractor work

c. Water Main construction. Provide specific timelines for expected completion of each project area. Dates of connections and phasing should be included.
d. Testing
e. Restoration

3. Show projected percentage of completion for each item, as of the first day of each month.

B. Submittals Schedule for Shop Drawings, Product Date and Samples. Show:

1. The dates for Contractor's submittals.

1.06 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission of schedule.

B. Show changes occurring since previous submission of schedule.

1. Major changes in scope.
2. Activities modified since previous submission.
3. Revised projections of progress and completion.
4. Other identifiable changes.

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended, and its effect.
3. The effect of changes on schedules of other contractors working in the area.

1.07 SUBMISSIONS

A. Submit initial schedules within 7 days after award of Contract.

1. Engineer will review schedules with Owner and return review copy within 5 days after receipt.
2. If required, resubmit within 2 days after return of review copy.

B. Submit updated progress schedules with each application for payment.

1.08 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:

1. Job site file.
2. Subcontractors.
3. Other concerned parties.

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS

A. Original drawings, prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate some portion of the Work; showing fabrication, layout, setting or erection details including, but not limited to the following:

1. Watermain Piping, Valves, Fittings, and Appurtenances
2. Asphalt Mix Design
3. Gravel Parking and Pavement Base Course
4. Concrete Mix Designs (with specific locations), grouts, etc.
5. Boring Log for Horizontal Directional Drill

B. Shop drawings shall be prepared by a qualified detailer.

C. Identify details by reference to sheet and detail numbers shown on Contract Drawings.

2.02 PROJECT DATA

A. Manufacturer's standard schematic drawings

1. Modify drawings to delete information which is not applicable to project.
2. Supplement standard information to provide additional information application to project.

B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.

1. Clearly mark each copy to identify pertinent materials, products or models.
2. Show dimensions and clearances required.
3. Show performance characteristics and capacities.

2.03 SAMPLES

A. Physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.

B. Office samples of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of product or material, with integrally related parts and attachment devices.
2. Full range of color samples.

PAY REQUESTS

A. Pay Requests shall be made in accordance with the requirements of the Agreement between Owner and Contractor.

PART 3 - EXECUTION

3.01 CONTRACTOR RESPONSIBILITIES

A. Review Shop Drawings, Project Data and Samples prior to submission. Contractor's approval stamp shall be on each submittal when received by the Engineer. Unstamped submittals will not be reviewed and will be returned as "rejected" to the Contractor.

B. Verify:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.

C Coordinate each submittal with requirements of Work and the Contract Documents.

D. Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.

E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Engineer's review of submittals, unless Engineer gives written acceptance of specific deviations.

F. Notify Engineer, in writing at the time of submission, of deviations in submittals from requirements of Contract Documents.

G. Begin no work which requires submittals until return of submittals with Engineer's stamp and initials or signature indicating review.

H. After Engineer's review, distribute copies.

3.02 SUBMISSION REQUIREMENTS

A. Schedule submissions at least 14 days before dates reviewed submittals will be needed.

B. All submittals shall be made electronically.

C Accompany submittals with transmittal letter, in duplicate, containing:

1. Date.
2. Project title and number.
3. Contractor's name and address.
4. Notification of deviations from Contract Documents.
5. Other pertinent data.

D. Submittals must include:

1. Date of submittal and revision dates.
2. Project title and number.
3. The names of:
    a. Engineer.
    b. Contractor.
    c. Subcontractor.
    d. Supplier.
    e. Manufacturer.
    f. Separate detailer when pertinent.
4. Identification of product or material.
5. Relation to adjacent structure or materials.
6. Field dimensions clearly identified as such.
7. Identification of deviations from Contract Documents.
8. Contractor's stamp, initialed or signed, certifying review of submittal, verification of field measurements and compliance with Contract Documents.

3.03 RESUBMISSION REQUIREMENTS

A. Shop Drawings.

1. Revise initial drawings as required and resubmit as specified for initial submittal.
2. Indicate on drawings any changes which have been made other than those requested by Engineer.

B. Project Data and Samples:

1. Submit new datum and samples as required for initial submittal.

3.04 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

A. Distribute copies of Shop Drawings and Project Datum which carry Engineer's stamp, to:

1. Contractor's file.
2. Job site file.
3. Record Documents file.
4. Other prime contractors.
5. Subcontractors.
6. Supplier.
7. Fabricator.

END OF SECTION

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SECTION 01360

PRE-CONSTRUCTION AUDIO-VIDEO DOCUMENTATION

PART I - GENERAL

1.01 PERFORMANCE

A. Section generally defines Contractor's responsibilities, unless otherwise noted, for the following:

1. Audio-Video Documentation
2. Equipment
3. Submittals
4. Technique
5. Quality Assurance

1.02 QUALITY ASSURANCE

A. Documentation shall be performed by a responsible commercial firm known to be skilled and regularly engaged in the preparation of pre/post-construction color audio-video documentation. All pre and post construction videos are to be completed by a firm with extensive amount of previous experience in producing preconstruction documentation.

B. Completed documentation shall reproduce bright, sharp pictures with accurate colors and shall be free from distortion, tearing, rolling, or any other significant picture imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume and clarity and be free of distortion.

C. Construction shall not proceed until the Owner and the Engineer have reviewed the documentation and notified the Contractor of its acceptability. Three copies of the pre and post construction audio-video documentation shall be provided on a DVD that is able to be viewed on a Windows operating system.

PART II - PRODUCTS

2.01 RECORDING EQUIPMENT

A. Utilize color video camera having:

1. Horizontal Resolution of 350 lines at center.
2. 8:1 Zoom, minimum

B. Utilize digital format recorder having:

1. Minimum horizontal resolution of 540 lines, 60 fields.

2.02 RECORDING MEDIA

A. Utilize new, Digital Video Disc (DVD) having:

1. DVD shall be DVD-R. DVD-RAM shall not be accepted.
2. 4 3/4" diameter discs
3. High resolution
4. 4.7 gigabyte storage per layer with two layers (minimum).

PART III - EXECUTION

3.01 COVERAGE

A. Record coverage of all surface features located in the construction's zone of influence (including the proposed storages area(s)) including, but not limited to:

1. Roadways, driveways, sidewalks, backyard easements
2. Homes, landscaping, walls, gates, decorative concrete structures, parking lots, pavement, future easement areas
3. Drainage structures, above grade utilities, drainage swales, canals.
4. Landscaping, trees, shrubbery, fences, irrigation heads, meters.
5. Backyard existing pole locations in demolition areas and house meter/franchise utility connection locations. All video work on private property must be closely coordinated with the County and homeowner.

B. Record individual features of each item with particular attention being focused upon the existence of any faults, fractures, or defects.

C. Control pan rate, rate of travel, camera height, and zoom rate to maintain a steady clear view at all times.

D. Optical image stabilization shall be utilized in order to provide a smooth, clear view at all times.

E. Limit recorded coverage to one side of any street at any one time.

3.02 AUDIO CONTENT

A. Simultaneously record audio content during videotaping.

B. Audio recording shall assist in viewer orientation and in any needed identification, clarification, or description of features being recorded.

C. Audio recording will only consist of camera operator commentary.

3.03 INDEXING

A. Permanently label each tape with a sequential tape number and the project name.

B. Index each DVD with a digital record of the time and date of the recording that is continuously displayed as the DVD is played.

C. Prepare a written log which describes the contents of each DVD including:

1. Structure/location names.
2. Coverage begin/end, station and location.
3. Recording date.

3.04 CONDITIONS

A. Record coverage during dry, clear weather and during daylight hours only.

B. Record coverage when the area to be covered is free of debris or obstructions.

END OF SECTION

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SECTION 01410

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor will employ and pay for the services of an independent testing laboratory to perform certain specified testing. All testing described in the Contract Documents shall be paid for by the Contractor.

B. The Owner may employ and pay for the services of an independent testing laboratory to perform certain specified testing in addition to what is called for in the Contract Documents.

1. The Contractor shall cooperate with the laboratory to facilitate the execution of its required services.
2. Employment of a laboratory by the Owner shall in no way relieve Contractor's obligations to perform the work of the Contract.

C. Inspection, Sampling and Testing is required for:

1. Densities and Proctors (for soil compaction)
2. Bacteriological Clearance
3. Concrete Strength
4. Any water quality monitoring as required by the project permits.
5. Other operations specified in these specifications or as required by the Engineer or Owner.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. General Conditions of the contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities. See sections GC 7 and GC 37 of the General Conditions and Terms.

1.03 QUALIFICATION OF LABORATORY

A. Meet "Recommended Requirements for Independent Laboratory Qualification," published by American Council of Independent Laboratories.

B. Meet basic requirements of ASTM E329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction."

C. Authorized to operate in the Village, County, and State in which the Project is located.

D. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

E. Testing Equipment:

1. Calibrated at reasonable intervals by devices of accuracy traceable to either:

a. National Bureau of Standards
b. Accepted values of national physical constants.

1.04 LABORATORY DUTIES

A. Cooperate with Engineer and Contractor; provide qualified personnel after due notice.

B. Perform specified inspections, sampling, and testing of materials and methods of construction:

1. Comply with specified standards.
2. Ascertain compliance of materials with requirements of Contract Documents.

C. Promptly notify Engineer and Contractor of observed irregularities or deficiencies of work or products.

D. Promptly submit written report of each test and inspection; one copy each to Engineer, Owner, and Contractor, and one copy to Record Documents File. Each report shall include:

1. Date issued.
2. Project title and number
3. Testing laboratory name, address, and telephone number
4. Name and signature of laboratory inspector
5. Date and time of sampling or inspection
6. Record of temperature and weather conditions
7. Date of test
8. Identification of product and specification section
9. Location of sample or test in the Project
10. Type of inspection or test
11. Results of tests and compliance with Contract Documents
12. Interpretation of test results, when requested by Engineer.

E. Perform additional tests as required by Engineer or the Owner

1.05 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents
2. Approve or accept any portion of the work.
3. Perform any duties of the Contractor.

1.06 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel and provide access to work and to manufacturer's facilities.

B. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes which require control by the testing laboratory.

D. Provide to the laboratory a representative proctor sample of the materials to be used for backfilling throughout the project.

E. Furnish copies of product test reports as required.

F. Furnish incidental labor and facilities:

1. To provide access to work to be tested
2. To obtain and handle samples at the project site or at the source of the product to be tested.
3. To facilitate inspections and tests
4. For storage and curing of test samples

G. Notify laboratory, in advance of operations to allow for laboratory assignments of personnel and scheduling of tests.

H. Pay for services of the Testing Laboratory to perform additional inspections, sampling and testing required:

1. For Contractor's convenience.
2. When initial tests indicate Work does not comply with Contract Documents.

Such payment shall be made directly by the Contractor.

I. Contractor will be responsible for payment for all failing tests.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

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SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install, and maintain temporary utilities required for construction; remove on completion of entire project.

B. Provide temperature, ventilation, and lighting requirements, if applicable, as specified in each individual section.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. Specified in other Sections:

1. Section 01010: Summary of Work

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with federal, state, and local codes and regulations, and with utility company requirements.

PART 2 - PRODUCTS

2.01 MATERIALS (GENERAL)

A. Materials may be new or used but must be adequate in capacity for the required usage. They MUST NOT create unsafe conditions and MUST NOT violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

A. The Contractor must maintain power to all existing buildings, pump stations, businesses, residences, and other related areas.

B. The Contractor is responsible for providing and paying for all power required for his operations. The Contractor shall make arrangements with The Owner for temporary power.

C. The Contractor is responsible for arranging power for his office trailers(s), power tools, etc., at his own expense. The Contractor shall pay the costs of all power used.

D. Provide Power Centers for miscellaneous tools and equipment used in the work:

1. Weatherproof distribution box with minimum of four 20-amp., 120-volt grounded outlets.

2. Locate so that power is available at any point of use with minimum 100-foot Construction-Type power cords.

3. Provide circuit breaker protection for each outlet.

E. Provide adequate artificial lighting for all areas of work, when natural light is not adequate for work, and for areas accessible to persons other than Contractor's employees.

F. If Contractor requires service other than specified above, he shall arrange for, provide maintenance, and pay all costs incurred.

2.03 TEMPORARY WATER

A. The Contractor will be responsible for making an application to the Village of Tequesta for hydrant meters with backflow preventers. The Village of Tequesta will install necessary connections and backflow preventers at locations needed by the Contractor and approved by the Engineer. Maintenance of such is the responsibility of the Contractor.

B. Construction water will be paid for by the Contractor. In an event that damage to these facilities occurs, the Contractor will be responsible for all costs associated with their replacement by the Village's standard rate.

2.04 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide temporary sanitary facilities in compliance with laws and regulations. Location of such facilities will be subject to the approval of the Village of Tequesta as applicable. Existing Village facilities are not available for use by the Contractor.

B. The Contractor shall provide for regular service, cleaning, and maintenance of temporary facilities and enclosures.

PART 3 - EXECUTION

3.01 GENERAL

A. Maintain and operate systems to ensure continuous service.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore existing facilities used for temporary services to specified, or to original, condition.

END OF SECTION

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SECTION 01560

TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Furnish, install, and maintain temporary control facilities required for construction; remove on completion of entire project any features not intended to remain on the project site.

B. Provide noise control, dust control, water control, debris control, pollution control and erosion control as specified in the appropriate sections of these documents.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with federal, state, and local codes and regulations and utility company requirements.

B. Comply with the requirements of all permits and easements issued by the Army Corps of Engineers, FDEP, Palm Beach County Health Department, SFWMD, Village of Tequesta, Palm Beach County, and any other agencies that have issued permits for the project.

1.03 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

PART 2 - PRODUCTS

2.01 MATERIALS (GENERAL)

A. Materials may be new or used but must be adequate in capacity and quality for the required usage, MUST NOT create unsafe conditions and MUST NOT violate requirements of applicable codes and standards.

2.02 TEMPORARY NOISE CONTROL

A. Mechanical equipment shall be fitted with mufflers to reduce noise from internal combustion type engines.

B. Bells, sirens, alarms, etc., shall be adjusted to provide adequate warnings to personnel on the project site; however, they shall be regulated to an intensity that is amenable to the neighboring communities and within applicable limitations stated within level code of ordinance.

C. Exterior construction work noises shall be kept to a minimum during evening, night, and early morning hours.

D. In addition to on-site control, noise considerations shall be made to off-site vehicles and equipment (mobilization, demobilization, deliveries, etc.).

2.03 TEMPORARY DUST CONTROL

A. Dust formed as a result of the construction shall be controlled by the Contractor. Cleaning of work areas and application of dust control materials are the most effective methods of dust control. Contractor shall adhere to the methods indicated in the Stormwater Pollution Prevention Plan (SWPPP) prepared by the Contractor.

2.04 TEMPORARY WATER CONTROL

A. The flow of water through the construction site shall be controlled by the Contractor such that it does not damage any constructed items; however, it shall be diverted and channeled to effectively leave the site as soon as possible. Puddling and ponding on the site is not permitted.

B. Water shall be controlled such that it does not enter excavated areas, nor is deposited on or against constructed features.

2.05 TEMPORARY DEBRIS CONTROL

A. Provision shall be made by each Contractor to have available and adequate containers to hold any and all debris that is generated from the project. Containers should be covered to prevent wind blowing paper, plastic, and lightweight products around and off the site.

B. Provide acceptable containers for deposit of debris and waste. Instructions shall be given to personnel to utilize the trash containers. Containers shall be placed in convenient places at the site.

C. At least once per week, a thorough cleaning of trash and debris shall be made at the construction site. An acceptable method of disposal shall be employed.

D. Maintain all areas under the Contractor’s control free of extraneous debris, garbage and waste matter.

E. Initiate and maintain a specific program to prevent accumulation of debris at the construction site, storage and parking areas, or along access roads and haul routes.

F. Prohibit overloading of trucks to prevent spillage on access and haul roads.

G. Provide periodic inspection of traffic areas to enforce requirements.

2.06 POLLUTION CONTROL

A. Provide methods, means and facilities required to prevent contamination of soil, water or air by the discharge of noxious substances from construction operations.

B. Immediately remove and properly dispose of all contaminated materials upon discovery of spillage of noxious substances.

C. Take special precautions to prevent harmful substances from entering public waters.

D. Provide systems for control of atmospheric pollutants and prevent toxic concentrations of chemicals.

2.07 EROSION CONTROL

A. Abide by the Erosion Control Plan on the Drawings and described in the SWPPP submitted as part of the FDEP Notice of Intent.

B. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills and from borrow and waste disposal areas to prevent erosion and sedimentation.

C. Hold areas of bare soil exposed at one time to a minimum and provide temporary control measures such as berms, dikes and drains.

D. Construct fills and waste areas by selective placement to eliminate surface silts and clays which erode.

PART 3 - EXECUTION

3.01 GENERAL

A. Comply with all applicable requirements of local building codes.

B. Maintain and operate systems to assure continuous service.

C. Modify and extend systems as work progress requires.

D. Preserve from damage all property along the line of work or which is in the vicinity of or is in any way affected by the Work. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the Owner.

3.02 INSPECTIONS

A. Prior to placing temporary facilities into service, inspect and test each service and arrange for inspections and tests by governing authorities and obtain required certifications and permits for use thereof.

3.03 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore permanent facilities used for temporary services to specified conditions.

END OF SECTION

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SECTION 01561

PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.01 GENERAL

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

B. The Contractor shall verify the exact locations and depths of all utilities shown and the Contractor shall make exploratory excavations of all utilities that may interfere with the work. All such exploratory excavations shall be performed as soon as practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the Contractor's Work. When such exploratory excavations show the utility location as shown to be in error, the Contractor shall so notify the Engineer.

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

1.02 RIGHTS-OF-WAY

A. The Contractor shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the Contractor enter upon the rights-of-way involved until notified by the Engineer that the Owner has secured authority from the proper party. After authority has been obtained, the Contractor shall give said party due notice of its intention to begin work, if required by said party, and shall remove, shore, support or otherwise protect such pipeline, transmission line, ditch, fence, or structure or replace the same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the Owner shall determine the sequence and order of the Work. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the Owner to the Contractor, to the extent, amount, in the manner, and at the times permitted. No such decision as to the method or time of conducting the Work or the use of territory shall be made the basis of any claim for delay or damage, except as provided for temporary suspension of the Work in the General Conditions of the Contract.

1.03 PROTECTION OF STREET OR ROADWAY MARKERS

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

1.04 RESTORATION OF PAVEMENT/SIDEWALKS

A. General: All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement Owner. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.

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

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

1.05 EXISTING UTILITIES AND IMPROVEMENTS

A. General: The Contractor shall protect all Underground Utilities and other improvements which may be impaired during construction operations. It shall be the Contractor's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The Contractor shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

B. Utilities to be Moved: In case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the Contractor, be notified by the Contractor to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the Contractor shall notify the Engineer a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

C. Where the proper completion of the work requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated, the Contractor shall, at the Contractor's expense, remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the Engineer and the Owner of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the Contractor in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.

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

E. Underground Utilities Indicated: Existing utility lines that are indicated or the locations of which are made known to the Contractor prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the Contractor.

F. Underground Utilities Not Indicated: In the event that the Contractor damages any existing utility lines that are not indicated or the locations of which are not made known to the Contractor by Florida One Call prior to excavation, a written report thereof shall be made immediately to the Engineer. If directed by the Engineer, repairs shall be made by the Contractor under the provisions for changes and extra work contained in the General Conditions of the Contract. The Contractor shall be responsible for all repair or relocation costs for any failure by the Contractor to contact appropriate utilities for locations prior to digging.

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

H. Maintaining in Service: All oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines,

storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the work shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the Engineer are made with the Owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The Contractor shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

I. Existing Water Services: Contractor shall protect and provide temporary support for existing water services. Any water service damaged by the Contractor, shall be replaced at the Contractor's expense, with a new water service complete with new water main tap.

1.06 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

A. General: The Contractor shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or Owner. All existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the Contractor or a certified tree company under permit from the jurisdictional agency and/or the Owner. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs. All trees to remain in right-of-way shall be protected and fenced with orange barricade fencing.

B. Trimming: Symmetry of the tree shall be preserved; no stubs or splits or branches left; clean cuts shall be made close to the trunk or large branch. Spikes shall not be used for climbing live trees. All cuts over 1-1/2 inches in diameter shall be coated with an asphaltic emulsion material.

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

1.07 NOTIFICATION BY THE CONTRACTOR

A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and

street lighting facilities; and all roadway and state highway rights-of-way, the Contractor shall notify the respective authorities representing the Owners or agencies responsible for such facilities not less than 3-days nor more than 7-days prior to excavation so that a representative of said Owners or agencies can be present during such work if they so desire. The Contractor shall also contact 811 at least 2 business days, but no more than 14 days, prior to such excavation.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.02 FENCING

A. Materials to Contractor's option, fence height should match existing.

2.03 BARRIERS

A. Materials to Contractor's option, as appropriate to serve required purpose.

PART 3 - EXECUTION

3.01 GENERAL

A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.

B. Maintain barriers during entire construction period.

C. Relocate barriers as required by progress of construction.

3.02 TREE AND PLANT PROTECTION

A. Preserve and protect existing trees and plants adjacent to work areas.

B. Consult with Owner's Representative and remove agreed-upon roots and branches which interfere with the Work:

1. Employ qualified tree surgeon to remove branches, and to treat cuts.

C. Protect root zones of trees and plants:

1. Do not allow vehicular traffic and parking.
2. Do not store materials or products.
3. Prevent dumping of refuse or chemically injurious materials or liquids.
4. Prevent puddling or continuous running water.

D. Carefully supervise all work to prevent damage.

E. Replace trees and plants which are damaged or destroyed due to work operations under this contract.

3.03 REMOVAL

A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by Owner's representative.

B. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

END OF SECTION

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SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED`

A. Products

B. Workmanship

C. Manufacturer's Instructions

D. Transportation and Handling

E. Storage and Protection

F. Substitutions and Product Options

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. Specified in other Sections:

1. Section 01010: Summary of Work
2. Section 01090: Reference Standards
3. Section 01300: Submittals and Progress Schedules

1.03 PRODUCTS

A. Products include materials, products, equipment, and systems.

B. Comply with specifications and referenced standards as minimum.

C. DO NOT provide used materials and products, except as specifically allowed by notation or indication in Contract Documents.

1.04 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform work by persons qualified to produce workmanship of specified quality.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and rocking.

1.05 MANUFACTURER'S INSTRUCTIONS

A. When Work is specified to comply with manufacturer's printed instructions, obtain and distribute copies to persons involved, and maintain one set at job site in field office.

B. Perform work in accordance with manufacturer's instructions and specified requirements.

C. Should a conflict exist between Specifications and manufacturer's instructions, consult with Engineer.

1.06 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accordance with construction schedules; coordinate to avoid delay of progress, conflict with work and with conditions at the site.

B. Transport products by methods to avoid product damage; deliver dry in an undamaged condition in manufacturer's unopened containers or packaging.

C. Provide equipment and personnel to handle product by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.07 STORAGE AND PROTECTION

A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.

B. Store sensitive products in weather-tight enclosures; maintain within temperatures and humidity ranges recommended/required by manufacturer's instructions. PVC pipe shall not be stored in a place where it can be exposed to ultraviolet light.

C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

E. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged and are maintained under required conditions.

F. After installation, provide coverings to protect products from damage of traffic and construction operations and remove when no longer needed.

1.08 PRODUCT OPTIONS

A. Within 30 days after date of Contract, submit complete list of major products proposed, with name of manufacturer, trade name and model.

B. Options:

1. Products specified only by reference standard: Any product meeting that standard.

2. Product specified by naming several manufacturers: Product of any named manufacturer meeting specifications.

3. Products specified by naming one or more manufacturers and “or equivalent”: Submit a request for substitution for any manufacturer not specifically named. See bid documents for specific instructions regarding substitution requests.

1.09 SUBSTITUTIONS

A. Substitutions will be considered during the bidding process. See the instructions to bidders for more information on how to propose a substitution. Subsequent to the bidding process, substitutions will be considered only when a product becomes unavailable due to no fault of the Contractor.

B. Document each request with five sets (5) of complete data, drawings and samples as appropriate, substantiating compliance of proposed substitution with Contract Documents including:

1. General information about the proposed substitution:

a. For Products:

1) Product identification, including manufacturer's name and address.

2) Manufacturers’ literature:
   a) Product description.
   b) Performance and test data.
   c) Reference standards.

3) Samples

4) Name and address of similar projects on which product was used, and date of installation.

b. For construction methods:

1) Detailed description of proposed method.

2) Drawings illustrating methods.

2. Comparison of the qualities of the proposed substitution with the specified.
3. Changes required in other elements of the work because of the substitution.
4. Effect on the construction schedule.
5. Cost data comparing the proposed substitution with the product specified.
6. Any required license fees or royalties
7. Availability of maintenance service, and the source replacement materials.

C. Request constitutes a representation that Contractor:

1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
2. Will provide the same warranty for substitution as for specified product.
3. Will coordinate installation and make other changes which may be required for work to be complete in all respects.
4. Waives claims for additional costs which may subsequently become apparent.

D. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request, or when acceptance will require significant revision of the Contract Documents.

E. Engineer will review to determine acceptability of proposed substitution and will notify Contractor of acceptance or rejection in writing within a reasonable time.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

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SECTION 01700

CLOSEOUT PROCEDURES

PART I - GENERAL

1.01 DESCRIPTION

A. Comply with requirements stated in the Agreement between Owner and Contractor and in Specifications for administrative procedures in closing out the Work.

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Section 01720 - Project Record Documents

1.03 SUBSTANTIAL COMPLETION

A. Substantial completion shall be defined as beneficial use of the rehabilitated and replaced wells, including functional use of ancillary equipment of each system. The Contractor shall deliver to the Engineer the Record Drawings and a draft copy of the Operations and Maintenance manuals for review and deliver to the Owner a complete set of all spare parts.

B. When Contractor considers the Work to be substantially complete, Contractor shall submit to Engineer:

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

C. Within a reasonable time after receipt of such notice, Engineer will perform a field investigation to determine the status of completion.

D. Should Engineer determine that the Work is not substantially complete:

1. Engineer will promptly notify the Contractor in writing, giving the reasons, therefore.
2. Contractor shall remedy the deficiencies in the Work and send a second written notice of substantial completion to the Engineer.
3. Engineer will reinvestigate the Work.

E. When the Engineer finds that the Work is substantially complete, he will:

1. Prepare and deliver to Owner a tentative Certificate of Substantial Completion with a tentative list of items to be completed or corrected before final payment.
2. After consideration of any objections made by the Owner and when Engineer considers the Work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

1.04 FINAL SITE REVIEWS

A. When Contractor considers Work to be complete, he shall submit written certification that:

1. Contract Documents have been reviewed.
2. Work has been investigated for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
5. Work is completed and ready for Final Investigation.

B. Engineer will perform a field investigation to verify the status of completion with reasonable promptness after receipt of such certification.

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

1. Engineer will promptly notify the Contractor in writing, listing the incomplete or defective work.
2. Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to Engineer that the Work is complete.
3. Engineer will reinvestigate the Work.

When the Engineer finds that the Work is acceptable under the Contract Documents, he shall request the Contractor to make closeout submittals.

1.05 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

A. Project Record Drawings to the requirements specified.

B. Operating and Maintenance Manuals to the requirements specified.

C. Contractor's affidavit of payment of debts and claims.

1. Contractor's release or waiver of liens.

D. Separate releases or waivers of liens for subcontractors, suppliers, and others with lien rights against property of Owner, together with list of those parties.

1.06 FINAL ADJUSTMENTS OF ACCOUNTS

A. Submit a final statement of accounting to Engineer.

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

1. The original Contract Sum.
2. Additions and deductions resulting from:

a. Previous Change Orders.
b. Allowances.
c. Unit Prices.
d. Deductions for uncorrected Work.
e. Deductions for liquidated damages.
f. Deductions for re-inspection payments.
g. Other adjustments.

3. Total Contract Sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

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

1.07 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Condition of the Contract.

1.08 FINAL CERTIFICATE FOR PAYMENT

A. Engineer will issue final certificate in accordance with provisions of the Contract Documents.

1.09 POST-CONSTRUCTION INSPECTION

A. Prior to expiration of one year from Date of Substantial Completion, Engineer will make visual field investigation of Project in company with Owner and Contractor to determine whether correction of Work is required, in accordance with provisions of the Contract Documents.

B. For Guarantees beyond one year, Engineer will make field investigations at request of Owner after notification to Contractor.

C. Engineer will promptly notify Contractor, in writing, of any observed deficiencies.

PART II - PRODUCTS

NOT USED

PART III - EXECUTION

NOT USED

END OF SECTION

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SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. The Contractor shall maintain at the site for the Owner one (1) record copy of the following:

1. Drawings
2. Specifications
3. Addenda
4. Change orders and other modifications to the Contract.
5. Engineer field orders or written instructions
6. Approved shop drawings, product data, and samples
7. Field test records

B. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

C. Village standards

D. Specified in other Sections:

1. Section 01300: Submittals
2. Section 01310: Project Schedules
3. Section 01700: Contract Close-out

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. The Contractor shall store documents and samples in the field office apart from documents used for construction.

1. Provide files and racks for storage of documents.
2. Provide locked cabinet or secure storage space for storage of samples.

B. File documents and samples in accordance with Specifications – Table of Contents.

C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

D. Make documents and samples available at all times for inspection by Engineer and Village. Record drawing information shall be maintained concurrently with Pay Requests.

1.03 MARKING DEVICES

A. Provide felt tip marking pens for recording information in the color red.

1.04 RECORDING (SEE ALSO GENERAL CONDITIONS AND TERMS)

A. The Contractor shall provide record drawings for all pay applications, partial releases and final release submittals. With each submittal provide survey data, signed and sealed by the Contractor's Surveyor, to support elevation information depicted on the record drawings.

B. Label each document "PROJECT RECORD" in neat large, printed letters.

C. Record information concurrently with construction progress. DO NOT conceal or backfill any work until required information is recorded.

D. Drawings-General: The Record Drawings shall correctly and accurately be drawn to record actual construction. Legibly mark to record actual construction:

1. Horizontal location of pipes and other improvements shall be provided any time the pipe passes a permanent surface reference point. Permanent surface reference points must be permanent structures manholes, catch basins, concrete sidewalk or concrete curbs. Edge of pavement and road intersections may not be used without the Engineer's approval. Any deviations from the alignment shown on the drawings must be noted.

2. Existing utilities that are not shown on the plans that are found in the field are to be noted and recorded on the record drawings. Actual locations of all utilities including water service and sanitary laterals shall be noted and recorded on the record drawings.

    a. Field changes of dimension and detail
    b. Drainage and Control Structure inverts and weir elevations. Roadway, sidewalk, planters, parking area, and site perimeter elevations
    c. Sanitary manhole rim and invert elevations
    d. Changes made by Work Change Directives or by Change Order
    e. Details not on original Contract Drawings
    f. Limits of work including temporary storage equipment area
    g. All information required by the Village Standards

E. Drawings – General Requirements for Pressure Mains. Record Drawings shall legibly and accurately depict record of actual construction and showing the following, as a minimum:

1. Material used to construct mains

2. Location and top of pipe elevation of all fittings, including sleeves, and valves by stationing and offsets
3. Top of pipe elevation at every 50 feet and at every change of direction
4. Length of restrained pipe
5. All elevations and horizontal control of all storm sewer, gravity sewers including laterals, fittings and clean outs, electric cables, television cables, telephone cables, force mains and water mains which are crossed or exposed
6. Locations and elevations as required to define major horizontal/vertical pipe deflections/conflicts. Data shall include beginning and end of deflection/conflicts, all changes in elevations and alignment and the location and elevation of subject conflict item.
7. Location and elevation of all connections to existing systems
8. Locations and elevations as required to describe all other improvements

F. Drawings – Specific Requirements for Pressure Mains

1. General - FOR ALL LAYERS:
   a. All references to "proposed" and "plan" are to be removed from the Final Record Drawings
   b. All lines, structures, and other items that are relocated will be removed and shown in the proper location (handwritten notes and "x"ing out will not be allowed)
   c. All record drawings will be signed and sealed by Certified Land Surveyor or Professional Engineer licensed to practice in the State of Florida. If certified by a Surveyor, P.E. will sign off stating that the record drawings were checked by the Engineer, verifying that they inspected the work.
   d. Clearly mark existing infrastructure which is to remain.
   e. Clearly mark existing infrastructure which has been abandoned, and how it was abandoned.
   f. Station, length, width and depth of flowable fill used.
   g. Record Drawings shall not be greater than 1" - 30' in scale.
   h. All Detail sheets shall be included with each record drawing.
   i. Location by station and elevation, width, depth and length of flowable fill used for all uses.
   j. Supply all surveys of the project and or property.

2. Water and Force Mains - TO BE SHOWN ON ONE LAYER:

   Water Utility Record Drawings shall conform with the requirements of the Village of Tequesta Utility Department. Records shall include locations (horizontal and vertical) of all pipelines, structures, fittings, valves, and appurtenances and all water/utility crossings (including sanitary laterals) for proposed mains in accordance with Village and Palm Beach County Health Department requirements. Water main record drawings shall include at a minimum:

   a. Pressure class and material of proposed pipe

   b. Top of Pipe elevations and horizontal location every 100 feet

   c. Locations and elevation of all fittings including bends, tees, gate valves, double detector check valves, fire hydrants, etc. All tie-ins to existing lines shall be as built.

   d. Water meter locations (with stations/offsets)

   e. The ends of all proposed water service at the buildings or homes shall be as built or where the water service terminates.

   f. Limits of restrained joints on proposed and existing main

   g. Locations of joint deflections

   h. Thrust block locations and size.

3. Sanitary Sewers - TO BE LOCATED ON THE SAME LAYER AS WATER AND FORCE MAINS

   a. Manhole rim elevation, invert elevations and directions.

   b. Length of run between sanitary structures, type of and size of pipe material with calculated percentage of slope for the run of pipe.

   c. Location of sanitary service wyes with station and offset, together with the invert elevation, station and offset, pipe diameter, lateral fittings, and material (clean-out).

   d. Locations and type of flexible eccentric coupling with station and offset, and adjoining pipe diameters and materials.

   e. Applicable lift station information should be filled out on the detail sheet for lift stations.

4. Water/Sanitary/Storm Pipe Crossings and Separations - PART OF WATER, SANITARY, AND/OR STORM LAYER

   a. Pipe types, sizes and material

   b. Crossings: Top and bottom elevations of pipes crossing each other and the distance between the outside of the two lines

c. Separation: Distance between the OD of the two lines

5. Conflict Storm/Water/Sanitary Structures - PART OF EACH APPLICABLE LAYER:

   a. Top and bottom of casing

   b. All info asked for in storm or sanitary manhole descriptions with the addition of top of all pipes.

6. Casings - PART OF EACH APPLICABLE LAYER:

   a. Material and thickness

   b. Top of and invert of casing

   c. Length and station and offset of ends.

   d. If used, station and offset for vent, including tap location, and fittings.

7. Storm Sewers - TO BE LOCATED ON A SEPARATE LAYER:

   a. Manhole and catch basin rim elevation, outfalls and top of headwall invert elevations and direction, weir elevations, bottom of manholes and catch basins (sumps)

   b. Length of run between storm structures, type of and size of pipe material with calculated percentage of slope for the run of pipe

   c. Location of service connections (without manholes) together with the invert elevation, pipe diameter and material

   d. Dry retention, wet retention, dry detention, wet detention areas

   e. Exfiltration trenches, Station at beginning and end of system, width, depth

   f. Top of and toe of slope on berm elevation designed to stop flooding.

8. Streetlights - TO BE LOCATED ON A SEPARATE LAYER:

   a. Manufacturer, model, and height of poles shall be shown on the record drawings.

   b. Manufacturer, model, and wattage and voltage of lights shall be shown on the record drawings.

   c. Pull boxes, station and offset.

   d. Length of conduit runs between boxes and poles, type of, and size of pipe material. Show as laid in the ground, not as a wiring

schematic, with amount, by color, type of, and size of wiring material.

e. Service connection, type (FP&L owned and metered) station and offset.

9. Irrigation - TO BE LOCATED ON A SEPARATE LAYER:

a. Backflow preventer, control stand location, control valve, zone, station and offset.

b. Main line piping size, material, lengths, depth

c. Heads, Type (1/4, half, 3/4, full circle) zone, station and offset.

d. Control Stand, station and offset.

10. Landscaping - TO BE LOCATED ON A SEPARATE LAYER:

a. Tree type, caliper, and height

b. Tree grate, size, and model

c. Station, elevation, length, width, and depth of Structural Soil used

d. Top of and toe of slope on berm elevation for landscaping

11. Private Construction Impacts to Right-of-Way - TO BE LOCATED ON A SEPARATE LAYER:

a. Private utility or revocable easements in the Village or County's ROW or on Village property must be shown on the plan. Any improvements within the easement need to be shown and called out as private. The recording information should be on the as-built.

b. Privately owned lighting, irrigation and landscaping in the Village or County right-of-way needs to be called out as private and identified.

c. All aerial and underground footer easements (in ROW)

G. Specifications and Addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.

2. Changes made by field order or by Change Order

H. Photographs:

1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.

2. Changes made by field order or by Change Order

1.05 SUBMITTAL

A. Record drawings shall be submitted to the Engineer with pay applications, and partial and final releases per Village standards. If no Village standards exist, utilize the following formats:

1. All incoming as-built survey AutoCAD drawing files shall be received on CD-ROM in a jewel case and in state plane coordinates. The disk label shall include the following:
    a. Engineering and/or Survey Company Name with prepared by statement
    b. Project Name
    c. Village of Tequesta Project Number
    d. Date the data is burned onto disk.
    e. Designate "Record Drawings", "Preliminary Record Drawings", or "Final Record Drawings"
2. Four (4) - 24" by 36" hard copies, signed and sealed.
3. An electronic PDF of the record drawing
4. AutoCAD Files must be submitted in DWG format, latest AutoCAD version.
5. Each file should be for one section of development and one layer as described in 1.04. Multiple sections will not be accepted in one file.
6. Tie into section corners in the Florida State Plane Coordinate System to insure proper orientation at each end of baseline. Section corner tie sheets can be obtained from the Palm Beach County Surveyor's web page.

B. At Contract close-out, deliver Record Documents to Engineer for the Owner.

C. Accompany submittal with transmittal letter in duplicate, containing:

1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each Record Document
5. Signature of Contractor or his authorized representative

1.06 AS-BUILT SURVEYS

A. CONTROL INFORMATION FOR AS-BUILT UTILITY SURVEY WORK

1. All as-built drawings shall state in 1" lettering "AS-BUILT RECORD SURVEY" located in the bottom right-hand side of the drawing original and/or copies, along with the as-built date
2. All as-built surveys shall meet the minimum requirements of the Chapter 61G17, Florida Administrative Code Pursuant to Section 472 of the Florida Statutes. All surveys shall be based on a minimum horizontal control Third Order, "Class 2."
3. All state plane coordinates shall be based on the Florida State Plane Horizontal Data (East Zone); Florida High Precision Geodetic Network (Superstation) and NAD 83/1990 – final adjustment.
4. State plane coordinates shall be physically tied to a minimum of two known state plane coordinate benchmarks that utilize number 3 above. State plane coordinates shall be shown on survey at benchmarks used.
5. The Contractor shall provide the Engineer and Owner with record drawings in NAVD 1988
6. All record data shall be digitally positioned on the design drawings prepared by the engineer of record. Said design drawings shall be complete and include both plan and profile views of the infrastructure.
7. All as-builts shall clearly depict as-built utility lines that were constructed along with all easements.
8. All as-builts shall include the information required by the Village Standards

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

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SECTION 02110

CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SCOPE

A. The Work to be performed under this item shall consist of either the clearing of or the clearing and grubbing of the area of construction as designated on the drawings.

B. Clearing - Where clearing only is required, it shall consist of the cutting and removal of all trees, stumps, brush, logs, hedges, and the removal of all fences, concrete, debris, asphalt, and other loose or projecting material from the designated area. The grubbing of stumps and roots will be required.

C. Clearing and Grubbing - Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which, in the opinion of the Engineer, is unsuitable, including grubbing of stumps, roots, matter roots, foundations and disposal from the project of all spoil materials resulting from clearing and grubbing by burning or otherwise.

1.02 REFERENCES

A. Florida Department of Transportation Standard Specifications for Road and Bridge construction (FDOT), latest edition.

PART 2 - MATERIALS

2.01 MATERIALS FOR REPLACEMENT

A. All materials required to be brought on to the site for filling of holes caused by grubbing or otherwise shall be as specified in Section 02200 – Trenching, Bedding and Backfill.

PART 3 - EXECUTION

3.01 SCHEDULE

A. The Contractor shall schedule the clearing or clearing and grubbing work at a satisfactory time in advance of the project improvement construction operation.

3.02 SPOIL MATERIALS REMOVAL

A. All materials to be disposed of by removal from the site shall be disposed of off-site in a legal manner by the Contractor at the Contractor's expense. The manner and location of disposal of materials shall be subject to review by the Engineer and shall not create an unsightly or objectionable view.

3.03 CLEARING

A. Clear the area of all objectionable materials. Trees and other debris unavoidably falling outside the specified limits must be cut up, removed, and disposed of in a satisfactory manner. Preserve and protect from injury all trees not to be removed. The trees, stumps, and brush shall be cut to a height of not more than 12-inches above the ground. The grubbing of stumps and roots will be required.

B. On-site burning of debris will not be allowed.

3.04 CLEARING AND GRUBBING

A. In areas designated to be cleared and grubbed, all stumps, roots, buried logs, brush, grass and other unsatisfactory materials shall be removed.

B. All holes remaining after the grubbing operation in embankment areas shall have the sides broken down to flatten out the slopes, and shall be filled with acceptable material, moistened and properly compacted in layers to the density required in Section 02225. The same construction procedure shall be applied to all holes remaining after grubbing in excavation areas where the depth of holes exceeds the depth of the proposed excavation.

END OF SECTION

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SECTION 02150

DEWATERING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. The Work covered by this Section consists of furnishing all permits, labor, equipment, appliance and materials, and performing all operations required for dewatering all excavations, if required, complete.

1.02 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. Specified in other Sections:

1. Section 01060: Regulatory Requirements and Notifications
2. Section 02225: Trenching, Bedding and Backfill.

PART 2 - PRODUCTS

2.01 TEMPORARY FACILITIES

A. All materials and equipment shall be suitable and adequate to function continuously as a dewatering system.

B. All material and equipment used in the dewatering system remain the property of the Contractor and shall be removed off-site when dewatering is completed.

C. All dewatering equipment shall conform with the noise standards set forth in the Village of Tequesta Code of Ordinances.

2.02 SUBMITTALS

A. Submit the dewatering method or plan in accordance with Submittal specifications prior to commencing dewatering if it is determined by the Contractor that dewatering beyond that allowed by a no-notice dewatering permit is required to construct the project.

B. The Contractor shall prepare and submit the necessary permit applications and supporting documents for the purposes of obtaining a dewatering permit from the SFWMD and any other required agencies.

PART 3 - EXECUTION

3.01 METHODS

A. The method of dewatering is to be selected by the Contractor and may include:

1. Wellpoints
2. Sump pumps
3. Bedding rock
4. Dewatering wells
5. Other approved items

3.02 DISCHARGE

A. The Contractor shall provide all labor, materials, tools and equipment necessary to properly control the quality of the discharge from his dewatering operations as described herein. The Contractor shall comply with all applicable laws, rules and regulations governing the discharge of water from his dewatering operations.

B. The Contractor shall not discharge water in any manner that will:

1. Adversely affect water quality of nearby water bodies
2. Violate Federal, State or local laws or regulations
3. Allow discharge to flow onto private property
4. Deter movement of traffic
5. Damage portions of the work previously constructed.
6. Damage portions of existing facilities or structures
7. Violate the conditions of the SFWMD Dewatering Permit
8. Violate the conditions of the Stormwater Pollution Prevention Plan

C. The Contractor shall obtain and pay for any permits required to discharge the dewatering waters.

D. The Contractor shall coordinate and pay for any water quality monitoring program that may be required by the applicable dewatering permit(s).

END OF SECTION

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SECTION 02225

TRENCHING, BEDDING, AND BACKFILL

PART 1 - GENERAL

1.01 SECTION INCLUDES

The Work covered by this section consists of furnishing all labor, equipment, and materials, and performing all earthwork operations to include:

A. Excavation and backfill of structures, foundations, and pavements.

B. Surface preparation for structures, foundations, and pavements

C. Excavation and backfill of pipe trenches

D. Roadway area grading

E. Soil compaction and stabilization requirements for pipe trenches and roadway areas

F. Soil testing for pipe trenches and parking areas

1.02 REFERENCES

A. Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.

B. American Society for Testing and Materials (ASTM)

D698 Moisture-Density Relationship of Soils

D1556 Standard Method of Test for Density of Soil in Place by Sand Cone Method

D1557 Method for Test for Moisture-Density Relations of Soils Using a 10-Pound Rammer and 18-Inch Drop

D2487 Classification of Soils for Engineering Purposes

D6938 Density of Soil and Soil-Aggregate in Place by Nuclear Methods

1.03 RELATED SECTIONS SPECIFIED ELSEWHERE

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. Specified in other Sections:

1. Section 01410: Testing Laboratory Services
2. Section 02150: Dewatering
3. Section 02660: Pressure Pipe Systems

C. Village of Tequesta Engineering Standards

1.04 FIELD MEASUREMENTS AND COORDINATION

A. Verify that survey benchmark, control point, and intended elevations for the work are as shown on the Drawings.

B. Verify that work associated with lower elevation utilities is complete before placing higher elevation utilities.

1.05 SUBSURFACE SOILS DATA

A. The Owner and Engineer make no representations or statements as to site or soil conditions, and therefore do not assume any responsibility for actual site or soil conditions.

PART 2 - PRODUCTS

2.01 EXCAVATION

A. All excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

2.02 SOURCE QUALITY CONTROL

A. If tests for a material type fail three times, the Engineer may reject the source supplier and require the Contractor to submit a new source for approval, at no additional cost to the Owner. The in-situ material is considered acceptable material and may be used, provided it meets the specified requirements.

B. Quality control of the work shall be the Contractor's responsibility and the Contractor shall make every effort to produce the best quality work as specified on the Drawings and in these Specifications.

2.03 STRUCTURAL FILL AND BACKFILL

A. Fill and backfill under and around all structures shall be suitable on-site excavated material or approved imported material. Material shall be free of organic material, shall not have more than 10 percent by dry weight passing the U.S. Standard No. 200 sieve, and shall have no rocks larger than 3-inches in size. On-site Fine Sand (SP), without roots or other deleterious materials, is suitable material. Imported material may be provided by the Contractor at no additional cost to the Owner.

B. On-site soils with more than 10% by dry weight passing the U.S. Standard No. 200 sieve and/or particle sizes larger than 3-inches are not suitable for use as fill under pavements or structures.

C. Backfill behind walls shall be as specified above except that they shall not have more than 4% by dry weight passing the U.S. Standard No. 200 sieve.

2.04 EARTHFILL

A. On-site excavated material free from roots, trash, and rocks larger than 3-inches.

2.05 FLOWABLE FILL

A. Provide and place flowable fill in accordance with the requirements of Section 121 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.

2.06 WATER FOR COMPACTION

A. The Contractor shall furnish potable water, as required. The Contractor may coordinate with the Village of Tequesta Engineering Department to arrange for a hydrant meter for water during construction. Costs associated with the hydrant meter shall be paid for by the Contractor. Water trucks shall be used as required.

2.07 EQUIPMENT

A. All equipment shall be suitable and adequate to perform the Work specified. Compaction equipment shall be vibratory type. It is recommended that the Contractor perform a pre-construction assessment of existing adjacent structures and monitor those structures for settlement during the construction period. Contractor shall notify Owner of any settlements that occur at existing adjacent structures.

PART 3 – EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum locations. Protect bench marks, survey control points, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

B. Locate, identify, and protect utilities that remain from damage.

3.02 STRIPPING TOPSOIL

A. See Section 02110, Clearing and Grubbing. Stripping of topsoil shall be performed prior to any cutting, excavation, removal and/or replacement or fill materials.

B. Strip topsoil from designated areas within boundaries of proposed construction lines to a depth of approximately 6-inches to 8.5-inches. The top materials stripped shall be removed and disposed of offsite, unless authorized for use on the site landscaping areas by the Engineer or Owner. Top materials shall not be used under roadway or parking areas.

C. Stripping of topsoil shall ensure the entire site is stripped and scraped clean of all brush, weeds, grass, roots, vegetation, etc.

3.03 CUTTING

A. Except as otherwise specified, after stripping of topsoil all site areas which are above elevation required shall be cut to subgrades required by drawings.

3.04 FILLING

A. Except as otherwise specified, after stripping of topsoil all site areas which are below elevation required shall be compacted as specified and then over such areas clean granular fill placed and compacted in layers not exceeding 6-inches in un-compacted thickness. Each layer of fill shall be compacted to at least 95% of the modified proctor maximum dry density required on the construction drawings (ASTM D1557 or AASHTO T-180). Filling and compaction shall continue until subgrades required for various areas are reached. All holes and depressions caused from removal of trees, stumps, etc. shall be filled and compacted. Fill shall be good clean material as previously specified.

3.05 EXCAVATION UNDER STRUCTURES AND PAVEMENT AREAS

A. Excavation shall be performed to elevations and dimensions required by drawings with suitable allowance made for construction operations and inspections. Excavation carried to depths below required elevations shall be replaced in loose layers a maximum of 6-inches in depth and compacted in a manner to achieve a minimum density of 98% as determined by and in accordance with the modified proctor required on the construction drawings (ASTM D-1557 or AASHTO T-180). The Contractor may place additional concrete in lieu of replacing and compacting excess excavation as specified above to fill excess cut. Correction of excess cut shall be responsibility of the Contractor at no additional cost to the Owner.

B. Compact disturbed load bearing soil in direct contact with foundations to achieve a minimum density of 98% as determined by and in accordance with modified proctor required on the construction drawings (ASTM D-1557 or AASHTO T-180).

C. Verify that the specified density extends to 2-feet below the bottom of the structure or pavement base course to be installed.

D. Slope banks with machine to angle of repose or provide necessary shoring.

E. Do not interfere with 45 degree bearing splay of existing foundations without providing adequate means of shoring protection.

F. Grade top perimeter of excavating to prevent surface water from draining into excavation.

G. Notify the Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

H. Correct areas over excavated in accordance with this section.

I. Remove excavated material unsuitable for backfill from site.

J. When muck or other deleterious materials is encountered in the excavation, it shall be completely removed within the area of the structure or pavement and to a depth where acceptable material is encountered. After removal of all muck or other deleterious material, the area shall be backfilled with approved fill material to the specified grade.

3.06 TRENCH EXCAVATION AND PREPARATION

A. Excavation: Excavate as required for the installation of all piping, utilities, conduits, and appurtenances.

B. Trench Width: Cut trenches sufficiently wide to enable installation, compaction and inspection. The maximum width will not be limited except where excessive trench width would cause damage to adjacent structures or piping.

C. Grade: Excavate the bottom of the trench to the line and grade shown, or as established by the Engineer with proper allowance for pipe bedding.

D. All trench work shall comply with OSHA Standards and the Trench Safety Act of 1990, with latest revisions.

E. Piping shall be installed in a dry trench.

F. When acceptable material is encountered in the trench, the bottom shall be excavated and graded to the depth required so as to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground at every point between bell holes.

G. Bell holes shall be provided at each joint to permit the joint to be made properly. At no time shall the bells support the pipe when in the trench.

H. When muck or other deleterious materials is encountered in the trench, it shall be completely removed for the width of the trench at the pipe and to a depth where acceptable material is encountered. After removal of all muck or other deleterious material, the trench shall be backfilled with bedding material to the bottom of pipe grade.

I. See the Village of Tequesta for additional requirements.

3.07 MAINTENANCE OF EXCAVATION

A. The excavation shall be maintained at a dry condition at all times.

B. All side slopes shall be such that material will not slide into the bottom of the excavation and any material doing so shall be immediately removed. Trench side slopes shall be in accordance with local codes, OSHA requirements, and the Trench Safety Act.

C. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed.

D. Trees, shrubbery, fences, poles, bollards and all other property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the Engineer.

E. The attention of the Contractor is drawn to the fact that during excavation at the project site, the possibility exists of the Contractor encountering various utilities (water, chemical, electrical, gas, or other) not shown on the drawings. The Contractor shall exercise extreme care before and during excavation to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, the Contractor shall repair the line at no cost to the Owner.

F. It is the responsibility of the Contractor to ensure that all utility or other poles, the stability of which may be endangered by the close proximity of excavation, are temporarily stayed in position while the Work proceeds in the vicinity of the pole and that the utility or other companies concerned be given reasonable advance notice of any such excavation by the Contractor.

3.08 BACKFILL UNDER STRUCTURES AND PAVEMENT AREAS

A. Backfilling of excavated areas under, around or over building and structural appurtenances and pavement, concrete or pavers shall be performed with clean fill materials which are free of debris, organics, trash or other deleterious substances. Suitable compaction equipment shall be used to obtain density described previously for the entire depth of backfilling. Each layer of backfill under structures, pavements, and pavers shall be compacted to a minimum of 98% as determined by and in accordance with the modified proctor required on the construction drawings (ASTM D-1557 or AASHTO T-180). Each layer of compacted backfill shall not exceed 6-inches in thickness. The completed, compacted surface shall be at the proper final subgrade elevation.

B. Verify that the specified density extends to 18-inches below the bottom of the structure or pavement base course to be installed.

3.09 TRENCH BACKFILLING

A. Haunch Backfill: Carefully place pipe bedding material so as not to damage the pipe in maximum 6-inch loose lifts and compact to the pipe centerline. Use hand-held compaction equipment.

B. Pipe Zone: Backfill with pipe bedding material in maximum 6-inch loose lifts and compact to a point at a minimum of 12-inches above the pipe crown or in accordance with Palm Beach County standard detail, whichever is greater.

C. Under Pavement/Concrete/Paver Areas, and Structures: In areas where backfill settlement must be held to a minimum, backfill above the pipe zone with pipe bedding material in maximum 6-inch loose lifts and compact to a minimum 98% maximum dry density as determined by and in accordance with the modified proctor required on the construction drawings (ASTM D-1557 or AASHTO T-180) up to the subgrade elevation. Backfilling and compaction within the FDOT Rights of Way shall be in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition.

D. Outside Pavement/Concrete/Paver Areas: In areas where backfill settlement is not critical, backfill above the pipe zone with earth fill material to a density equal to or greater than the soil adjacent to the pipe trench, but not less than 95% of the maximum dry density as determined by and in accordance with the modified proctor required on the construction drawings (ASTM D-1557 or AASHTO T-180), to final grade.

E. No material shall be used for backfilling which contains muck or other deleterious material or material with an excessive void content. All backfill shall be composed of select clean granular material.

F. All trenches, and excavation shall be backfilled immediately after all pipe and joints have been investigated and approved by the Engineer or the Village, subject to satisfactory pressure and leakage test results, as required.

G. Backfill, in general, shall be kept up with the rate of pipe laying. No more than 100 feet of pipe trench shall be open at one time at any one project location.

H. See the Village of Tequesta Standards for additional requirements.

3.10 BACKFILL AROUND STRUCTURES

A. Obtain the Engineer's acceptance of concrete work and attained concrete strength prior to backfilling.

B. Backfill with structural backfill material placed in maximum 6-inch loose lifts and compacted to a minimum 98% of maximum dry density as determined by and in accordance with the modified proctor required on the construction drawings (ASTM D-1557 or AASHTO T-180).

C. Compact backfill adjacent to structures with equipment that will not damage the structure.

D. Backfill with flowable fill or other material only if reviewed and approved by the Engineer.

3.11 SITE GRADING

A. Fill and contour site areas with earth fill material to elevations shown and as required to prepare the site for landscape grading and sodding.

B. Place materials in maximum 6-inch loose lifts and compact as required to limit subsequent settlement.

3.12 COMPACTION TESTING

A. In-situ compaction testing shall be performed by a certified laboratory.

B. Compaction testing shall be done by nuclear density equipment or other approved methods. (ASTM D-2937, D-1557, D-6938, AASHTO T-180, AASHTO T-90).

C. Density testing shall be performed as follows:

1. Pipe Trenches: 1 test per lift per 100-feet of pipe.
2. Fill Under/Around Structures: 1 test per lift under each structure or 1 backfill test per lift per drainage or sanitary structure installed.
3. Fill Under Pavement Areas: 1 test per lift per 2,000 square feet of compacted surface area.

D. Test results in a specific location are only representative of a larger area if the Contractor has used consistent compaction means and methods and the soils are practically uniform throughout. If it is determined by the Owner/Engineer that there are variations in the compaction methods and/or soil uniformity, additional testing may be required.

3.13 FINAL AND FINISH GRADING

A. Using clean topsoil, perform all final and finish grading in all yard and planting areas indicated on drawings. Topsoil shall be placed to a minimum of 4-inch thickness, rototilled to a minimum depth of 8-inch, leveled and finish graded in all areas. No pavement base course material or broken asphalt will be allowed as topsoil materials in landscaping areas.

B. Final grading shall be performed, and grades shaped to finished elevations indicated. Finish grades (top of the soil) shall be approximately 1-1/2 inch below edges of pathways, curbs and other paved or concrete slabs. After sod installation, the top of the sod shall not be more than ½-inch below or shall be flush with the grade established by any adjacent paved or curbed surface.

C. The Contractor shall verify that all finish subgrades are correct prior to beginning installation of sod and planting materials. Upon completion of the project work, the Contractor shall prepare "record drawings" verifying that all finish grades are in accordance with the contract documents and shall submit same to the Engineer for review and acceptance prior to requesting final inspection of the project. The "record drawings" shall be prepared by a surveyor registered in the State of Florida.

D. Upon project completion, all areas of the site within immediate construction and adjacent areas shall be completely cleaned of all debris occasioned by this construction. Particular attention is called to any cement, mortar, masonry drippings and plaster which shall be completely removed from planting and lawn areas and shall be disposed of off-site.

E. All areas adjacent to the site and all areas not within contract construction areas shall be left in reasonably the same condition as they were found prior to commencement of construction.

F. Any damage to the existing adjacent facilities including adjacent lakes or roads, and related areas such as, but not limited to, finish grades, slopes, grass sod, structures, pipe, etc. shall be repaired and restored to a proper and appropriate condition acceptable to the Owner and Engineer.

3.14 EXCESS MATERIAL

A. Remove all excess suitable material from the site and dispose of at the Contractor’s expense.

B. Unsuitable materials shall also be removed and disposed of off-site at the Contractor's expense.

END OF SECTION

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SECTION 02270

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Work specified in this Section consists of measures required to control erosion on the project and in areas outside the project area where Work is accomplished in conjunction with the project, so as to prevent pollution of water, detrimental effects of public or private property adjacent to the project area and damage to Work on the project. These measures will consist of construction and maintenance of temporary erosion control features or, where practical, the construction and maintenance of permanent erosion control features.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. Specified in other Sections:

1. Section 01060: Regulatory Requirements and Notifications
2. Section 02936: Sodding

1.03 START OF WORK

A. Do not start work until erosion control measures are in place.

PART 2 - PRODUCTS

2.01 GENERAL

A. No testing of materials used in construction of temporary erosion control features will be required.

B. Materials used for the construction of the temporary erosion and sedimentation control measures not to be incorporated into the completed project may be new or used.

PART 3 - EXECUTION

3.01 GENERAL

A. Construct temporary and permanent erosion and sediment control measures to prevent the pollution of adjacent water ways in conformance with the laws, rules and regulations of Federal, State and local agencies and the conditions.

B. Temporary erosion control features shall consist of, but are not limited to, temporary grassing, temporary sodding, temporary mulching, spoil containment pits, sandbagging, slope drains, sediment basins, artificial coverings, berms, baled hay or straw, floating silt barriers, staked silt barriers and staked silt fences. Design details for some of these items may be found in the Village of Tequesta Engineering Standard Details, Chapter 6 of the Florida Land Development Manual: A Guide to Sound Land Water Management (Department of Environmental Regulation) or the Water Quality Section of the applicable edition of the FDOT Roadway and Traffic Design Standards.

C. Incorporate permanent erosion control features into the project within seven (7) days of any construction activity. Correct conditions, using temporary measures, that develop during construction to control erosion prior to the time it is practical to construct permanent control features.

D. The Contractor will be required to prepare, submit, and obtain a Notice of Intent (NOI) to use Generic Permit for Stormwater Discharge from the Florida Department of Environmental Protection which will include a Stormwater Pollution Prevention Plan (SWPPP) prepared by the Contractor as required by F.A.C. 62-621.300(4) and the Environmental Protection Agency (EPA) as part of the National Pollutant Discharge Elimination System (NPDES) prior to beginning work.

3.02 INSTALLATION

A. Temporary Grassing: This Work shall consist of furnishing and placing grass seed in accordance with Section 02485, Grassing.

B. Baled Hay or Straw:

1. This Work shall consist of construction of baled hay or straw dams to protect against downstream accumulations of silt. The baled hay or straw dams shall be constructed in accordance with the details shown in FDOT's Roadway and Traffic Design Standards.

2. The dam shall be placed so as to effectively control silt dispersion under conditions present on this project. Alternate solutions and usage of materials may be used if approved.

C. Temporary Silt Fences and Staked Silt Barriers: This Work shall consist of furnishing, installing, maintaining and removing staked turbidity barriers in accordance with the manufacturer's directions, these specifications, conditions of the project permits, and the details as shown in FDOT's Roadway and Traffic Design Standards.

3.03 REMOVAL OF TEMPORARY EROSION CONTROL FEATURES

A. In general, remove or incorporate into the soil any temporary erosion control features existing at the time of construction of the permanent erosion control features in such a manner that there will be no detrimental effect.

3.04 MAINTENANCE OF EROSION CONTROL FEATURES

A. General: Provide routine maintenance of permanent and temporary erosion control features until the project is completed and accepted.

B. Maintenance of erosion control measures shall be in strict accordance with condition of the applicable NPDES, and the Village of Tequesta requirements.

3.05 PROTECTION DURING SUSPENSION OF CONTRACT TIME

A. In the event that it is necessary that the construction operations be suspended for any appreciable length of time, shape the top of the earthwork in such a manner as to permit runoff of rainwater and construct earth berms along the top edges of embankments to intercept runoff water. Should such preventive measures fail, immediately take such other action as necessary to effectively prevent erosion and siltation.

END OF SECTION

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SECTION 02310

SITE GRADING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the Work under this section.

1.02 WORK INCLUDED

A. The Work covered by this section shall include all labor, equipment, services and materials necessary for bringing the site to elevations shown in the plans. This section shall include all necessary excavations for streets. It shall include the construction of embankments and fills by the loading, movement, deposition and compaction of suitable fill materials resulting from above listed excavations. It shall include stockpiling of any excess material to an on-site location as specified by the Owner.

B. It shall include rough grading within the roadways and driveways to the elevations or cross-section details shown on the drawings.

C. It shall include the erection and maintenance of any barricades that are required for accident prevention and property protection.

D. It shall include removal and disposal of muck, rock boulders or any foreign material interfering with construction.

1.03 RELATED WORK

A. Section 02110 – Clearing and Grubbing

B. Section 02225 – Trenching, Bedding and Backfill for Pipe

PART 2 - PRODUCTS

NOT USED

PART 3 – EXECUTION

3.01 GENERAL

A. The Contractor shall acquaint himself with all Work to be performed as specified and shown on the Drawings. He shall ascertain where all excavation will be required and shall be solely responsible for all excavating to complete the Contract.

3.02 PAYMENT

A. No extra payment will be allowed for type or classification of material in excavation.

3.03 MATCHING EXISTING GRADES

A. Where existing roadbed surfaces are not at the elevation required prior to subgrade compaction, the Contractor shall perform any such excavation, filling, earthmoving and grading as may be necessary to attain the proper compacted subgrade elevation before proceeding with base course construction.

3.04 UNSUITABLE MATERIAL

A. All muck, large rocks and boulders encountered during the Work under this Contract shall be removed and disposed of in a manner approved by the Engineer.

3.05 EXCAVATION

A. All excavation shall be unclassified regardless of material encountered.

B. The Contractor shall make probing's or sounding for subsurface rock to ascertain its location and depth.

C. It shall be the Contractor's responsibility to be familiar with soil conditions on the site. Borings, in addition to those provided by others, if any, shall be acquired by the Contractor, at the Contractor's expense.

D. Any wet excavated materials shall be drained before hauling or moving.

3.06 EMBANKMENT (FILL)

A. Embankment shall be constructed from suitable materials resulting from roadway or site excavation or approved materials furnished from off-site borrow areas.

B. Embankments shall be placed in successive layers of not more than 8-inches in thickness, measured loose, for the full width of the embankment.

C. Each layer of the material used in the formation of roadbed embankments shall be compacted at optimum moisture content to a density of at least 98% of the Maximum Density as determined by Moisture-Density Tests AASHTO T-180 test results.

D. The existing material on the site may vary as to stability. The Contractor shall satisfy himself by site inspection borings, probing's, etc., prior to bidding, as to the subsurface character of the material.

E. All unstable soil shall be removed and shall be replaced by material approved by the Engineer.

3.07 GRADING

A. Due to the minimal longitudinal slope of the roadways, the Contractor shall be required to demonstrate (through finish rock and first lift of asphalt as-builts) a positive flow from high points to low points along the edge of pavement and road crown as indicated on the Contract Drawings.

B. Deviations from the proposed grades and drainage patterns as indicated on drawings will be reviewed at the discretion of the Engineer.

C. The disposal of large rocks in excess of 8-inches, within roadways and parking areas is prohibited. Where allowable, the disposal of large rocks by burial in areas designated by the Engineer shall have a minimum 30-inches of cover below finished grade elevation.

3.08 SURVEYS

A. All initial surveys, including detail construction stakes, will be furnished by the Contractor.

B. The Contractor will carefully maintain benchmarks, monuments, stakes, and other reference points, and if disturbed or destroyed, be replaced as directed at the Contractor's expense.

C. The Contractor shall provide roadway/sidewalk grades for record drawings for review by the Village and Engineer.

END OF SECTION

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SECTION 02320

DIRECTIONAL BORING OF PIPE

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes materials, installation standards, and execution for the installation of High Density Polyethylene (HDPE) or Fusible Polyvinyl Chloride (FPVC) pipe for this project by the directional bore installation method. Directional bore may also be referred to as Horizontal Directional Drill (HDD) throughout this and other sections.

B. The Contractor shall furnish all labor, materials, equipment and, incidentals required for the horizontal direction drill (HDD) installation of pressure pipe, as shown on the Drawings and as specified herein. This includes retaining any specialized personnel required in the event of a frac-out during construction and as required to comply with permit conditions of approval.

C. The Drawings show the Basis of Design for the HDD installations for this project. The entry and exit locations, minimum clearances, and horizontal location shown on the plan and profile drawings must be met by the installed pipe. The Contractor may utilize an alternative drill profile path than is shown on the drawings at no additional cost to the owner. Alternative path must remain within the easements procured for the project.

D. Activities required for the HDD installations of pressure pipe, as shown on the Drawings and as specified herein shall be performed in accordance with the conditions of the project permits complete with conditions, attachments, exhibits, and modifications as described in Section 01060.

E. The Contractor shall determine if a casing pipe is needed to prevent frac-out or upheaval, settlement, cracking, movement, or distortion of the surface material including roadways, retaining walls, and channel bottom for any portion of the HDD installation. If the Contractor determines that a casing pipe is needed, then the materials and labor for installing the steel casing pipe shall be included in the base bid line item unit cost for the HDD pipeline.

F. Contractor shall be responsible for all installation processes and procedures associated with the installation by horizontal directional drilling in accordance with this specification.

1.02 SUBMITTALS

A. Submit shop drawings in accordance with the General Conditions, and Section 01300 and the following:

A. The project drilling plan, pullback calculations signed and sealed by a Florida licensed professional engineer, and an emergency contingency plan shall be submitted and approved two weeks prior to the commencement of the directional drilling operations. If night time drilling and/or boring is to occur, the Contractor shall also submit a night-time drilling plan two weeks prior to the commencement of the directional drilling operations.

B. Prepare and submit project drilling plans for review by the Engineer. The project drilling plans shall include a list and description of materials and equipment to be used, anticipated noise emanation for all equipment, a description of each drill entry and exit angles, depth of pilot hole at points on a 30-ft interval along the drill, bend radius of the pipe, pullback monitoring plan, fluorescent dye monitoring plan, drill fluid disposal plan, technical information including a MSDS (Material Safety Data Sheet) for the drilling slurry compounds, drill fluid containment plan, and damage prevention provisions. If the Contractor determines that a casing pipe is needed, the drilling plan shall also include information on the materials and equipment to be used for the casing installation. The Contractor shall keep a copy of the drilling plan at the work site.

C. The following product data is required from the pipe supplier and/or fusion provider:

a. Pipe Size
b. Dimensionality
c. Pressure Class per applicable standard
d. Color
e. Recommended Minimum Bending Radius
f. Recommended Maximum Safe Pull Force
g. Fusion technician qualification indicating conformance with this specification

D. Pullback and service load calculations have determined that a minimum DR-11 DIPS HDPE pipe (as indicated on the project drawings) or DR–14 DIPS FPVC is the minimum standard Dimensional Ratio for the watermain pipe. These calculations are based on the conditions shown on the drawings and included within the specifications, including the carrier pipe being filled with water before it is pulled through the bore hole. Pipes shall NOT be thinner or smaller than indicated on the plans. If the contractor proposed installation of the HDD differs significantly from what is shown on

the drawings and described herein, contractor shall provide calculations showing that the DR is adequate for this project, including calculations signed/sealed by an engineer licensed in the State of Florida, demonstrating that a factor of safety of at least 2.0 against buckling, pull back stress, and long term performance stress for the proposed carrier pipe material considering the materials, bore hole path, and equipment to be used for this installation. If it is determined that a thicker pipe material must be used, then the additional cost shall be borne by the contractor.

E. The Contractor is required to bring to the attention of the Engineer any known design discrepancies with these specifications and the actual drilling methods that the Contractor will be performing. This shall be stated in writing to the Engineer no later than the pre-construction meeting.

F. The Contractor shall prepare and submit a pilot bore record drawing to the Engineer prior to reaming the pilot bore hole. The Contractor is responsible for updating the pilot bore hole record drawing as work progresses and should submit the pilot bore record drawing to the Engineer within 48 hours of completing the pilot bore. After receiving the bore hole record drawing, the Engineer has 48 hours to state any objections to the pilot bore before the Contractor begins reaming the pilot bore hole.

G. Submit a flushing and pigging plan for cleaning the pipes after installation, including the specifics of the proposed pig.

H. Submit pipe fusion procedures, samples, and operator's qualifications as described in the execution part of this section.

I. Provide shop drawing submittal and sample of pipe, fused joint, and trace wire.

J. The following record drawings are required from the contractor specifically for the HDD installation in addition to the requirements contained in Section 01720:

   a. The record plan and profile will reflect the actual installed alignment, and reflect the horizontal offset from the baseline and depth of cover.
   b. A daily project log, along with tracking log sheets, should they be used, shall be provided. Tracking log sheet data, should it be employed, shall include any and all that apply, including inclination, depth, azimuth, and hydraulic pull-back and rotational force measured.

K. The following record data is required from the contractor and/or fusion provider to the owner or pipe supplier upon request:

a. Approved datalogger device reports
b. Fusion joint documentation containing the following information:
c. Pipe Size and Thickness
d. Machine Size
e. Fusion Technician Identification
f. Job Identification
g. Fusion Joint Number
h. Fusion, Heating, and Drag Pressure Settings
i. Heat Plate Temperature
j. Time Stamp
k. Heating and Cool Down Time of Fusion
l. Ambient Temperature

PART 2 – MATERIALS AND EQUIPMENT

2.01 PIPE AND FITTINGS

See Section 02660.

2.02 BOLT AND NUTS FOR MECHANICAL JOINT CONNECTIONS AND/OR ADAPTORS

See Section 02660.

2.03 DRILLING SYSTEM EQUIPMENT

A. GENERAL

The directional drilling equipment, as a minimum, shall consist of a directional drilling rig of sufficient capacity to perform the bore(s) and pull-back of the pipe(s), a drilling fluid mixing & delivery system of sufficient capacity to successfully complete the crossing, a guidance system to accurately guide boring operations, and trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project. All required equipment shall be included in the emergency and contingency plan as submitted per these specifications.

B. DRILL PIPE

Drill pipe shall be steel with sufficient strength to withstand the maximum rated pullback and pushing load of the drilling equipment. Drill pipe, tool joints shall be flush and capable of transmitting maximum rated torque of the drilling equipment.

C. DRILLING FLUID

Drilling fluid shall be bentonite and water formulated to move cuttings to the surface and lubricate the pipe during pullback. No other additives shall be added to the bentonite mixture without prior approval.

1. The water and additives shall be mixed thoroughly to assure the absence of any clumps or clods.
2. No hazardous additives may be used.
3. Drilling fluid shall be maintained at a viscosity sufficient to suspend cuttings and maintain the integrity of bore wall(s).
4. Drilling fluid shall be disposed of off-site in accordance with local, state and federal requirements and/or permit conditions.

D. DRILLING FLUID MIXING SYSTEM

1. A drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid for the project.
2. The mixing system shall be able to ensure thorough mixing of the drilling fluid. The drilling fluid reservoir tank shall be sized for adequate storage of the fluid.
3. The mixing system shall continually agitate the drilling fluid during drilling operations.

E. DRILLING FLUID DELIVERY AND RECOVERY SYSTEM

1. The drilling fluid pumping system shall have a minimum capacity to supply drilling fluid in accordance with the drilling equipment pull-back rating at a constant required pressure.
2. The delivery system shall have filters or other appropriate in-line equipment to prevent solids from being pumped into the drill pipe.
3. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and properly disposed of. The use of spill containment measures shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid recycling system (if used) to prevent spills into the surrounding environment. Pumps, vacuum truck(s), and/or storage of sufficient size shall be in place to contain excess drilling fluid.
4. A closed-loop drilling fluid system and a drilling fluid cleaning system should be used to whatever extent practical, depending upon project size and conditions. Under no circumstances shall drilling fluid that has escaped containment be reused in the drilling system.

F. DRILLING EQUIPMENT

1. Drilling equipment shall be in good condition and designed to have sufficient power to drill the required length hole, backream, and pull the pipe as shown on the Drawings.
2. The drilling rig hydraulic system shall be of sufficient pressure and volume to power drilling operations. The hydraulic system shall be free from leaks.
3. Mixing, pumping, recycling, and holding/separation tanks shall be capable of delivering mixed drilling fluid to the cutting head. Drilling fluids recycling equipment including baffle tanks, shaker screen, de-sanding and de-silting hydro cyclones shall be utilized and designed to minimize spillage and quantities of drilling fluids necessary for these installations.
4. The machine shall be anchored to withstand the pulling, pushing and rotating forces required to complete the project.
5. The drilling rig shall have a system to monitor pull-back hydraulic pressure during pull-back operations.

G. DRILL HEAD

1. The horizontal directional drilling equipment shall produce a stable fluid lined tunnel with the use of a steer-able drill head and any subsequent pre-reaming heads.
2. The system must be able to control the depth and direction of the drilling operation.
3. Drill head shall contain all necessary cutters and fluid jets for the operation, and shall be of the appropriate design for the ground medium being drilled.

H. DRILLING CONTROL SYSTEM

1. Calibration of the electronic detection and control system shall be verified prior to the start of the bore.
2. The drilling head shall be remotely steer-able by means of an electronic or magnetic detection system. The drilling head location shall be monitored in three dimensions:
   a. Offset from the baseline,
   b. Distance along the baseline, and
   c. Depth of cover.
3. Point of rotation of the head shall also be monitored.
4. For gravity application and on-grade drilling, sonde/beacon or approved equipment applicable for grade increments of $1/10^{th}$ of one percent shall be used.

I. DOWNHOLE TOOLS

1. Cutting heads, backreamers, and hole openers shall be suitable for the soil and rock conditions anticipated by the Contractor.

2. Grips, pulling heads, and swivels shall be compatible with the pipe material. Design these components to transmit without distortion the maximum rated pullback force of the equipment used. Grips, pulling heads, and swivels shall be specifically engineered for directional drilling applications.

J. PIPE PULL HEADS

1. Pipe pull heads shall be utilized that employ a positive through-bolt design assuring a smooth wall against the pipe cross-section at all times.

2. Pipe pull heads shall be specifically designed for use with HDPE/fusible polyvinylchloride pipe, as applicable, and shall be as recommended by the pipe supplier.

K. BREAK-OUT TOOLS

Remote breakout wrenches may either be manual or hydraulic and shall be used to connect or break tool joints forward of the drill rig. Drill rig rotational power shall not be used with remote wrenches to make or break tool joints.

L. REMOTE TRACKING SYSTEM

Tracking equipment shall be capable of determining the location of the cutting head at +/-1% of the depth.

M. EMERGENCY SPILL EQUIPMENT

1. A Vactor Truck and Spill Kit shall be onsite and available at all times.

N. PIPE ROLLERS

1. Pipe rollers, if required, shall be of sufficient size to fully support the weight of the pipe during handling and pullback operations.

2. A sufficient quantity of rollers and spacing, per the pipe supplier's guidelines shall be used to assure adequate support and excessive sagging of the product pipe.

2.04 TEMPORARY PILE INSTALLATION EQUIPMENT

If required, pile installation equipment shall be suitable for the soil conditions anticipated by the Contractor.

2.05 CASING PIPE AND INSTALLATION EQUIPMENT

If the Contractor determines that a casing pipe is needed, the Contractor shall provide all of the material and equipment for installing the steel casing. The equipment shall be suitable for the soil conditions anticipated by the Contractor.

PART 3 – EXECUTION

3.01 DELIVERY AND OFF-LOADING

A. Delivery, temporary storage, and handling of the pipe shall be in strict accordance with the recommendations of the manufacturer.

B. All pipe shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the site. Any pipe damaged in shipment shall be replaced as directed by the owner or engineer.

C. Each pipe shipment should be inspected prior to unloading to see if the load has shifted or otherwise been damaged. Notify owner or engineer immediately if more than immaterial damage is found. Each pipe shipment should be checked for quantity and proper pipe size, color, and type.

D. Pipe should be loaded, off-loaded, and otherwise handled in accordance with AWWA M23, and all of the pipe supplier's guidelines shall be followed.

E. Off-loading devices such as chains, wire rope, chokers, or other pipe handling implements that may scratch, nick, cut, or gouge the pipe are strictly prohibited.

F. During removal and handling, be sure that the pipe does not strike anything. Significant impact could cause damage, particularly during cold weather.

G. If appropriate unloading equipment is not available, pipe may be unloaded by removing individual pieces. Care should be taken to insure that pipe is not dropped or damaged. Pipe should be carefully lowered, not dropped, from trucks.

3.02 HANDLING AND STORAGE

A. Any length of pipe showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the work. Damaged areas, or possible areas of damage may be removed by cutting out and removing the suspected incident fracture area. Limits of the acceptable length of pipe shall be determined by the owner or engineer.

B. Before installation of HDPE, check pipe and fittings for cuts, gouges in excess of 10% of the wall thickness, buckling, kinking, or splitting. Remove any pipe section containing defects by cutting out the damaged section in a complete cylinder.

C. Before installation of FPVC, check pipe and fittings for cuts, cracks, gouges in excess of 10% of the wall thickness, buckling, kinking, or splitting. Remove any pipe section containing defects by cutting out the damaged section in a complete cylinder.

D. Pipe lengths should be stored and placed on level ground. Pipe should be stored at the job site in the unit packaging provided by the manufacturer. Caution should be exercised to avoid compression, damage, or deformation to the ends of the pipe. The interior of the pipe, as well as all end surfaces, should be kept free from dirt and foreign matter.

E. Pipe shall be handled and supported with the use of woven fiber pipe slings or approved equal. Care shall be exercised when handling the pipe to not cut, gouge, scratch or otherwise abrade the piping in any way.

F. If pipe is to be stored for periods of 1 year or longer, the pipe should be shaded or otherwise shielded from direct sunlight. Covering of the pipe which allows for temperature build-up is strictly prohibited. Pipe should be covered with an opaque material while permitting adequate air circulation above and around the pipe as required to prevent excess heat accumulation.

G. Pipe shall be stored and stacked per the pipe supplier's guidelines.

3.03 LOCATION AND PROTECTION OF UNDERGROUND UTILITIES

A. Correct location of all underground utilities that may impact the HDD installation is the responsibility of the Contractor, regardless of any locations shown on the drawings or previous surveys completed.

B. Utility location and notification services shall be contacted by the Contractor prior to the start of construction.

C. All existing lines and underground utilities shall be positively identified, including exposing those facilities that are located within an envelope of possible impact of HDD installation as determined for the project specific site conditions. It is the Contractor and HDD system operator's responsibility to determine this envelope of safe offset from existing utilities. This will include, but is not limited to, soil conditions and layering, utility proximity and material, HDD system and equipment, and foreign subsurface material.

3.04 DRILLING LAYOUT AND TOLERANCES

A. The drill path shall be accurately surveyed with entry and exit areas placed in the appropriate locations within the areas indicated on drawings. If using a magnetic guidance system, drill path will be surveyed for any surface geomagnetic variations or anomalies.

B. Instrumentation shall be provided and maintained at all times that accurately locates the pilot hole, measures drill-string axial and torsional loads and measures drilling fluid discharge rate and pressure.

C. Entry and exit areas shall be drilled so as not to exceed the bending limitations of the pipe as recommended by the pipe supplier.

3.05 PILOT BORE

A. Construct a pilot bore at the center line alignment and grade as shown in the drawings. Circulate drilling fluids to maintain an open bore at all times. The Contractor is responsible for updating the pilot bore hole record drawing as work progresses. Reaming shall not commence until successful completion of the path of pilot bore pulled from the end of the HDD path (exit pit) to the beginning location of the HDD path (entry pit). If the pilot bore could not be successfully completed, then do not proceed with the reaming procedure until the Owner, Owner's Representative, Engineer, and Contractor have met to discuss alternative options for the pipeline crossing. The pilot bore and reaming procedure shall be controlled by a magnetic survey system including accelerometers, magnetometers, connector wire, and survey probe. The guidance system shall be capable of measuring depth, location, pitch, and roll of the bore and shall be able to indicate depth up to 120 feet.

B. The pipe bore shall follow the line and grade shown in the drawings. The pipe exit location shall be at the design location shown on the drawings with a tolerance of ±3 feet on line and a tolerance of ±3 feet on grade. The pipe shall remain within the right-of- ways and easements at all times, as shown on the drawings.

C. Install the pilot bore in a manner that does not cause upheaval, settlement, cracking, movement, or distortion of the surface material.

D. In the event that the pilot bore does deviate from the bore path, it may require contractor to pull-back and re-drill from the location along bore path before the deviation.

E. If the Contractor determines that a casing pipe is needed on the pipe entry/exit side, then the casing pipe shall be installed prior to the construction of the pilot bore and the pilot bore shall be constructed to align with the casing pipe below the ground surface.

F. The Contractor shall limit curvature in any direction to reduce force on the pipe during pull-back. The minimum radius of curvature shall be no less than that specified by the pipe supplier and as indicated on the drawings.

3.06 DRILLING FLUIDS

A. Contain, clean-up, and dispose of any and all drilling fluid in accordance with state and federal regulations and permit conditions. Install erosion and sedimentation control measures including straw bales to prevent drilling mud from spilling out of the entrance/exit pit. The volume of bentonite in the drill string shall be monitored at all times during directional drill operations. Limit pressures in order to not buckle the surface of the pipe during installation.

3.07 WIRELINE GUIDANCE SYSTEM

A. Use a surface monitoring wireline guidance system when conducting each drill. The surface grid shall consist of an energized wire coil laid-out and surveyed on the surface of the ground along the drill paths.

B. Remove all surface grid coil wires from all drill paths after HDD installations are complete.

3.08 BORE HOLE REAMING AND PIPE INSTALLATION

A. Upon complete acceptance of the pilot bore, pull the drill pipe back through the bore using an oversized backreamer larger than the proposed pipe to be pulled back through the bore hole. Repeat backreaming as necessary to enlarge the bore to provide sufficient clearance for the pipe.

B. Multiple reaming passes shall be used at the discretion of the Contractor and shall conform to this specification.

C. In the event of a drilling fluid fracture, returns loss or other loss of drilling fluid, the Contractor shall be responsible for restoring any damaged property to original condition and cleaning up the area in the vicinity of the damage or loss.

D. Attach pulling head and swivel and pull pipe through with closed end. Pull pipe back in one continuous pull to avoid closure of the bore hole. Fill the pipe with water prior to installation.

E. Pipe shall be fused prior to insertion, if the site and conditions allow, into one continuous length.

F. Contractor shall handle the pipe in a manner that will not over-stress the pipe prior to insertion. Vertical and horizontal curves shall be limited so that the pipe does not bend past the pipe supplier’s minimum allowable bend radius, buckle, or otherwise become damaged. Damaged portions of the pipe shall be removed and replaced.

G. The pipe entry area shall be graded as needed to provide support for the pipe and to allow free movement into the bore hole.

H. Install the pipe in a manner that does not cause upheaval, settlement, cracking, movement, or distortion of the surface material.

I. The elevation of the casing and/or carrier pipe at the location of the connection point of the directional bore shall be 36" below the natural grade or at the elevation shown on the construction plans and shall be in a horizontal location for ease of connection to continuing mains. Should this not be possible due to the acute angle of the bore, the contractor shall furnish and install appropriate fittings to provide for a horizontal continuation.

J. The pipe will be installed in a manner so as not to exceed the recommended bending radius and Safe Pulling Force established by the pipe supplier.

K. The pipe shall be guided into the bore hole to avoid deformation of, or damage to, the pipe.

L. The pipe may be continuously or partially supported on rollers or other Owner and Engineer approved friction decreasing implement during joining and insertion, as long as the pipe is not over-stressed or critically abraded prior to, or during installation.

M. A swivel shall be used between the reaming head and the fusible polyvinylchloride pipe to minimize torsion stress on the pipe assembly.

N. Buoyancy modification shall be at the sole discretion of the Contractor, and shall not exceed the pipe supplier’s guidelines in regards to maximum pull force or minimum bend radius of the pipe. Damage caused by buoyancy modifications shall be the responsibility of the Contractor.

O. The pipe shall be installed in a manner that does not cause upheaval, settlement, cracking, or movement and distortion of surface features. Any damages caused by the Contractor’s operations shall be corrected by the Contractor.

P. Upon completing the pipe installation, drilling materials inside the pipe shall be removed.

Q. If the Contractor determines that a casing pipe is needed or is called out on the drawings, the HDPE or FPVC pipe shall be fitted with spacers if required to center the pipe in the annulus between the steel casing pipe and the HDPE or FPVC pressure pipe. The annulus space shall then be grout-filled at the surface end.

3.09 PIPE FUSION AND LAYOUT - HDPE

A. Join entire length of pipe to be pulled through bore prior to commencement of pullback operation. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations.

Butt fusion joining shall result in a joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall not be used.

B. Each operator performing fusion joining pipe shall be qualified in the use of the manufacturer's recommended fusion procedure(s) by appropriate training or experience in the use of the fusion procedure. A sample joint shall be fused according to the procedure that passes the following inspections and tests:

1. The joint shall be visually examined during and after joining and found to have the same appearance as a photograph or sample of an acceptable joint that was joined in accordance with the procedure.

2. The joint shall be tested or examined by one of the following methods:

a. Pressure and tensile test as described in 49 CFR 192.283

b. Ultrasonic inspection and found to be free of flaws that would cause failure

c. Cut into at least three longitudinal straps, each of which is:

1). Visually examined and found to be free of voids or unbonded areas on the cut surface of the joint

2). Deformed by bending, torque, or impact and if failure occurs, it must not initiate in the joint area.

C. The contractor shall determine the location for laying out the joined fused pipe prior to pullback. Support weight of upland portions of the joined pipe on rollers and guide posts to minimize pullback forces and guide pipeline during pullback.

3.10 PIPE FUSION AND LAYOUT - FPVC

A. Join entire length of pipe to be pulled through bore prior to commencement of pullback operation. The joining method shall be butt fusion and be performed in strict accordance with the pipe manufacturer's recommendations. The fusion joining shall result in a joint weld strength equal to or greater than the tensile strength of the pipe. Socket fusion shall not be used.

B. Fusible polyvinylchloride pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's guidelines.

C. Each operator performing fusion joining pipe shall be qualified in the use of the manufacturer's recommended fusion procedure(s) by appropriate training or experience in the use of the fusion procedure. A sample joint shall be fused according to the procedure that passes the following inspections and tests:

1. The joint shall be visually examined during and after joining and found to have the same appearance as a photograph or sample of an acceptable joint that was joined in accordance with the procedure.

2. The joint shall be tested or examined by one of the following methods:

   a. Pressure and tensile test as described in 49 CFR 192.283

   b. Ultrasonic inspection and found to be free of flaws that would cause failure

   c. Cut into at least three longitudinal straps, each of which is:

      1). Visually examined and found to be free of voids or unbonded areas on the cut surface of the joint

      2). Deformed by bending, torque, or impact and if failure occurs, it must not initiate in the joint area.

3 Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion of fusible polyvinyl chloride pipe. The software shall register and/or record the parameters required by the pipe supplier and these specifications. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

D. Only appropriately sized and outfitted fusion machines that meet the recommendations of the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following elements:

1. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches. Plates shall be clean and free of any debris or contamination. Heater controls shall function properly; cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe supplier's guidelines.

2. CARRIAGE – Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.

3. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.

4. DATA LOGGING DEVICE – An approved datalogging device with the current version of the pipe supplier's recommended and compatible software shall be used. Datalogging device operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of

time, an independent 110V power source shall be available to extend battery life.

5. Other equipment specifically required for the fusion process shall include the following:

    a. Pipe rollers shall be used for support of pipe to either side of the machine as needed.

    b. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement, extreme temperatures, and /or windy weather, per the pipe supplier's recommendations.

    c. An infrared (IR) pyrometer for checking pipe and heat plate temperatures.

    d. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.

    e. Facing blades specifically designed for cutting fusible polyvinylchloride pipe shall be used.

E. JOINT RECORDING - Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion of fusible polyvinyl chloride pipe. The software shall register and/or record the parameters required by the pipe supplier and these specifications. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

3.11 TESTING

A. After completion of the joint fusing and before the pipe pullback, the pipe shall be pressure tested in accordance with Section 02670.

B. Pullback pipe completely with locate/tracer wire per specs.

C. After completion of the HDD installation:

1. Flush and test the pipe in accordance with Section 02670.

2. Payment of pipe sections will only be provided for installed and successfully tested pipe.

3. If the pipe does not pass the pressure test after installation, if feasible remove the entire pipe from the bore hole, repair the pipe, and perform pressure testing prior to reinstalling the pipe and again after reinstallation. If it is not feasible to remove the pipe without exceeding the manufacturer's maximum allowable tensile stress for the pipe, the Contractor shall repeat

the installation with another pipe along a similar route approved by the Owner, which meets the requirements of the original design at no additional cost to the Owner.

4. Testing of locate/tracer wire after completion shall demonstrate continuity. Payment contingent upon successful continuity test.

3.11 MECHANICAL JOINT ADAPTOR CONNECTIONS

A. See Sections 02660.

3.12 RESTORATION OF PAVED, IMPROVED AND UNIMPROVED AREAS

A. The shoulders, ditches, banks and slopes of roads crossed and paralleled shall be restored to their former condition and properly sodded so that they shall not wash out before becoming consolidated. Restoration shall be as required by the jurisdictional authority and as specified within the Contract Document. Road and crossings and parallel installations are to be continuously maintained until the completion of the work. No direct compensation shall be paid for Contractor's repair or maintenance of crossings and parallel installations.

B. Within 14 days after completion of the directional drilling operations, the staging area shall be returned to its original condition. Paved surfaces shall be repaired and unpaved surfaces areas shall be restored.

END OF SECTION

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SECTION 02660

PRESSURE PIPE SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The Work covered by this section consists of providing all labor, material and equipment, and performing all construction required to install water main, fittings, valves, fire hydrants, water services and accessories as specified and shown on the drawings.

1.02 SUBMITTALS

A. Reports on pressure tests, leakage tests and bacteriological tests will be prepared and submitted by the Contractor.

B. Record drawings must be submitted in accordance with the Village of Tequesta Standards.

C. Submit product data for all pipe, service connections, fittings, valves, accessories and other appurtenances in accordance with Division 1 specifications.

1.03 REFERENCE STANDARDS

A. Water system components which come into contact with drinking water must conform with ANSI/NSF Standard 61-1991, Drinking Water Components.

B. All potable water system components shall be supplied and installed per the applicable FDEP and the Village of Tequesta Standards. Refer to the Village of Tequesta for a list of approved products and submittal procedures.

C. ANSI/ASTM D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

D. ANSI/AWWA C104 – Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

E. ANSI/AWWA C105 – Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.

F. ANSI/AWWA C110 – Standard for Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in. for Water and Other Liquids.

G. ANSI/AWWA C111 – Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

H. ANSI/AWWA C115 – Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray Iron Treaded Flanges.

I. ANSI/AWWA C150 – Standard for the Thickness Design of Ductile-Iron Pipe.

J. ANSI/AWWA C151 – Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.

K. ANSI/AWWA C153 – Standard for Ductile-Iron Compact Fittings, 3 in. through 24 in. and 54 in. through 64 in. for Water Service.

L. AWWA C210 – Standard for Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.

M. AWWA C220 – Standard for Stainless-Steel Pipe, 4 in. and Larger.

N. AWWA C504 – Standard for Rubber-Seated Butterfly Valves.

O. AWWA C508 – Standard for Swing-Check Valves for Waterworks Service, 2 in. through 24 in.

P. AWWA C509 – Standard for Resilient-Seated Gate Valves for Water Supply Service.

Q. AWWA C511 – Standard for Reduced-Pressure Principal Backflow-Prevention Assembly.

R. AWWA C512 – Standard for Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.

S. AWWA C600 – Standards for Installation of Ductile-Iron Water Mains and Their Appurtenances.

T. AWWA C605 – Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.

U. AWWA C606 – Standard for Grooved and Shouldered Joints.

V. AWWA C900 – Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in. for Water Distribution.

W. AWWA C901 – Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½ in. through 3 in. for Water Services.

X. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

Y. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

Z. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

AA. ASTM D3139 - Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.

BB. ASTM F437-82 - Threaded Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80.

CC. ASTM F439-87 - Standard Specification for Socket - Type Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe Fittings, Schedule 80.

DD. ASTM 493-85 - Solvent Cements for Chlorinated Poly Vinyl Chloride (CPVC) Plastic Pipe and Fittings.

EE. ASME/ANSI B16.5 –1996 – Pipe Flanges and Flanged Fittings.

FF. ASME/ANSI B 31.3 – 1996 – ASME Code for Pressure Piping.

GG. ASME/ANSI B 16.9 – Pipe Fittings.

1.04 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. The Village of Tequesta Standards and approved product list.

C. Specified in other Sections.

1. Section 02150: Dewatering
2. Section 02200: Trenching, Bedding and Backfill
3. Section 02670: Flushing, Testing, and Disinfection

1.05 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide data on pipes, casings, pipe fittings, valves, thrust collars and accessories.

C. Manufacturer's Certificate: Certify that pipe, fittings, and valves meet or exceed respective ANSI, AWWA, and/or NSF Standards.

PART 2 - PRODUCTS

2.01 GENERAL

A. Although they may not be specifically shown on the drawings or called for elsewhere in the Technical Provisions, the Contractor shall include the cost of all fittings, piping supports, and miscellaneous appurtenances needed to provide a secure, working pipe and valve system. Piping shall be supported by thrust restraints and tie rods as necessary to ensure a stable installation. Adjustable pipe supports or piers shall be arranged to relieve attached equipment of all strain due to the weight of the pipe, fittings, valves, and the contents of the pipe. All tie rods, nuts, bolts, fasteners, and other similar appurtenances shall be 316 stainless steel throughout project to protect against corrosive environment.

2.02 APPROVED PRODUCTS

A. All products that come into contact with potable water shall be as specified by the Village of Tequesta Standards and Village of Tequesta approved products list.

B. DUCTILE IRON PIPE

Ductile iron pipe and fittings shall conform to AWWA/ANSI C151/A21.52, Class 51 (minimum) Pressure Class 350, unless heavier class is required for conditions. Sizes 3” to 12” diameter shall be class 52. Sizes 14” and above shall be class 51. All ductile iron pipe shall be polyethylene encased in accordance with ANSI/AWWA C105/A21.5. If no standard exists, the following shall be used:

1. Joints: All buried pipe at fittings must be restrained, mechanical joints. “Push on” and mechanical joints shall be in accordance with AWWA/ANSI C111/C21.11. Restrained joint assemblies with mechanical joint pipe shall be by approved restraining devices. Exposed joints shall be AWWA approved flanged joint pipe, in accordance with ANSI/AWWA C115, or as detailed on the drawings. Flanges shall be threaded unless otherwise noted. All above ground flanges shall be flat faced unless they are mating up to existing raised flanges. All gaskets shall be full faced 1/8” Toruseal or approved equal.

2. Fittings: Buried fittings shall be AWWA approved mechanical joint fittings. Exposed fittings shall be flanged fitting or as detailed on the drawings. Conform to AWWA C153 with a minimum pressure rating of 350 psi.

3. The internal surface of all piping and fittings in contact with potable water shall be cement mortar lined and seal coated in accordance with AWWA C104, A21, unless other noted.

4. External surfaces of all buried ductile iron pipe and fittings shall be coated with a bituminous coating approximately one mil thick in accordance with

AWWA C151/A21.51 latest revision. DIP water main shall have a line of blue paint or blue tape the full length of the new run-on top of the pipe and on both sides.

5. Restrained joint fittings for 24-inch and smaller diameter pipe shall be ductile iron, “Flex-Ring” as manufactured by America Cast Iron Pipe Company, “TR Flex” and manufactured by US pipe Company, “Super-lock” as manufactured by Clow corporations, or an approved equal. Restrained joint fittings for 30-inch and larger pipe shall be ductile iron, American Cast Iron Pipe Co., Lok-Fast or approved equal. Restrained joint pipe shall be constructed on all new water mains adjacent to all bends, crosses, tees, etc., where a change in direction occurs. Refer to the table on the drawings for restrained pipe lengths.

C. DUCTILE IRON FITTINGS

All products that come into contact with potable water shall be as specified by the Village of Tequesta Standards. All ductile iron fittings shall be polyethylene encased in accordance with ANSI/AWWA C105/A21.5. If no standard exists, the following shall be used:

1. Potable Water: Ductile iron fittings shall conform to ANSI/AWWA Standard C110 A21.10 latest revision. Fittings 4-inch and larger shall be cement lined and seal coated in accordance with ANSI/AWWA Standard C104 A21.4 latest revision.

D. POLYVINYL CHLORIDE (PVC): AWWA C-900

All products that come into contact with potable water shall be as specified by the Village of Tequesta Standards. If no standard exists, the following shall be used:

1. PVC will be acceptable for water mains up to and including 30-inch diameter pipe.

2. PVC must meet requirements as set forth in AWWA C900 and C905 and bear the National Sanitation Foundation seal for potable water pipe. Provisions must be made for contraction and expansion at each join with a rubber ring and integral thickened bell as part of each joint. Pipe and fitting must be assembled with nontoxic lubricant.

3. Water mains shall be blue in color.

4. Design working pressure for water mains shall be C900, DR-18 (Pressure Class 150) 4” to 12”, C900, DR-18 (Pressure Rating 235) 14” to 30”.

5. Connections for pipe 2-inches or greater in diameter shall be rubber compression ring-type. Pipe shall be extruded with integral thickened wall bells without increase in dimension ration (DR). Rubber ring gaskets shall

consist of synthetic compounds meeting the requirements of ASTM Designation F477 and suitable for the designated service.

6. Fittings: Ductile iron fittings shall be used on all PVC C900 & C905 mains. Fittings shall conform to AWWA/ANSI C110/A21.10 with a minimum pressure rating of 350 psi. All ductile iron fittings shall be polyethylene encased in accordance with ANSI/AWWA C105/A21.5.

E. HIGH DENSITY POLYETHYLENE (HDPE) PIPE

This section applies to HDPE pressure pipe:

1. Polyethylene pipe and fittings shall be high-density polyethylene (HDPE) ASTM 3408 for municipal piping systems. The pipe manufacturer shall verify that the dimension ratio (DR) is capable of withstanding all forces and pressures that may be applied to the pipe before, during, and after installations of all HDPE piping. The pipe for this project shall be DR-9 and DR-11 at a minimum, where noted, and be DIPS sized. Any increases in wall thickness that may be determined as required for the project by the pipe manufacturer and shall be provided by the contractor at no additional cost.

2. All HDPE pipe for pressure pipe shall be in accordance with Village Standards.

3. Polyethylene pipe and fittings shall be joined by the heat butt fusion process to produce a homogenous, sealed, leak tight joint unless otherwise noted as a mechanical joint or electrofusion connection. Fusion process shall meet the requirements of ASTM D-3261. At the point of fusion, the outside diameter and minimum wall thickness shall meet the outside diameter and minimum wall thickness specifications of ASTM F-714.

4. Polyethylene fittings shall be made from the material meeting the same requirements as the pipe. Polyethylene fittings shall be fabricated by the same manufacturer of the pipe. The piping shall be homogenous throughout and free of visible cracks, holes, voids, foreign inclusions, fillers, or other deleterious defects and shall be identical in color, density, melt index, and other physical properties throughout.

5. All HDPE MJ Adapters (DIPS) shall be installed with Back-up Rings, Mechanical Restraint, and stainless-steel stiffener that meets AWWA C906 standards. Back-up Rings shall be manufactured of ductile-iron conforming to ASTM A536-80. The gland shall be such that it can replace the standardized mechanical joint gland and can be used with the standardized mechanical joint bell conforming to ANSI/AWWA A21.11/C111 and ANSI/AWWA A21.53/C110 of the latest revision. Twist-off nuts sized same

as tee-head bolts shall be used to ensure proper actuating of restraining devices.

6. HDPE Pipe shall be color coded with three continuous stripes the full length of the Pipe at 120-degree intervals around the pipe.

7. The manufacturer shall certify that samples of the manufacturer's production pipe have been tested in-house, in accordance with ASTM D-2837, and validated in accordance with the latest revisions of PPI ASTM D-2837 and validated in accordance with the latest revisions of PPI TR-3.

F. POLYETHYLENE TUBING

All products that come into contact with potable water shall be as specified by the Village of Tequesta Standards. If no standard exists, the following shall be used:

1. Polyethylene tubing shall conform to AWWA C901 subject to the Standard Code Designation PE4710, Pipe Class 200, and Dimension Ratio (DR) 9.

2. Tubing shall bear identification markings, which shall remain legible during normal handling, storage, and installation, and which have been applied in a manner than will not reduce the strength of the product or otherwise damage the tubing. Marking on the tubing shall include the following and shall be applied at intervals of not more than 5 feet. Nominal size, material code designation, dimension ratio, pressure class, manufacturer's name or trademark and production record code, and seal (mark) of the testing agency that certified the suitability of the tubing material for potable water products is required.

3. Joints for polyethylene tubing shall be of the compression type utilizing a totally confined grip seal and coupling nut. Stainless steel tube stiffener insert shall also be used for tubing services.

4. All fittings and stops to be high quality water works brass. No PVC fittings or adapters will be permitted. Fittings shall be brass equipped with compression-type connectors.

G. FIRE HYDRANTS

See specification section 02660, Section 2.02A. If no standard exists, the following shall be used:

1. All fire hydrants shall comply with AWWA Standard C-502 latest revisions thereof and the following design standards.

2. Fire hydrants shall be of the compression type, opening against the pressure and closing with the line pressure with a 5-1/4-inch minimum valve opening.

The hydrant shall be equipped with two 2-1/2-inch hose and one 4-1/2-inch steamer nozzles to meet the American National Standard hose thread.

3. Hydrants shall be furnished with a sealed oil or grease reservoir location in the bonnet so that all threaded and bearing surfaces are automatically lubricated when the hydrant is operated. The hydrant will be designed for disassembly by use of a short disassembly wrench or the hydrant shoe having integral cast tieback lugs on the main valve to permit the main valve assembly and valve seat to be removed without digging earth or disassembling the hydrant barrel.

4. Hydrants shall be furnished with a breakable feature that will break cleanly upon impact. This shall consist of a two-part breakable safety flange with a breakable stem coupling. The upper and lower barrels shall be fluted and ribbed above and below the safety flange or have an extra strength lower barrel.

5. The hydrant internal valve shall be 5-1/4-inch minimum. The pentagonal operating nuts and the cap nuts shall be 1-1/2-inch point to flat. Drain valve outlets shall be plugged or omitted. The hydrants shall open counterclockwise and the direction of opening shall be case on top.

6. Fire hydrant color shall be yellow to match the existing hydrants. Paint shall be reflective type with glass beads all in accordance with N.F.P.A. #291.

7. Installation. Hydrants shall be installed plumb with the larger nozzle facing the street or access area. Where possible, the tee on the main shall be an anchor tee to which the gate valve is attached and installed onto. A Grade Lock long sweep device with anchor fittings shall then be attached to the gate valve and the hydrant shall be attached to the Grade Lock device. Where anchor fitting cannot be used, the components shall be tied together with ¾-inch stainless, galvanized or bituminous coated steel rods.

H. THRUST RESTRAINT

See specification section 02660, Section 2.02A. If no standard exists, the following shall be used:

1. All bends, tees, crosses, reducers and dead ends shall be restrained through an approved means of joint restraint unless an alternate restraint method is shown on the drawings. All branch valves shall be restrained with joint restraints or approved equal or anchor tees, or anchor couplings. Any line terminated during the construction phase that is a known future extension shall have a plugged valve placed at the end and be restrained. Thrust restraints shall be placed in accordance with the restraint table shown in the construction plans. If installed cover is less than the depth referenced

in the table, increase restrained length per manufacturer's recommendation. Existing pressure pipes that are modified by the construction or connected to new piping systems shall be restrained by bell restraints, split-ring restraints, or thrust blocks as appropriate.

2. All restraints shall be EBAA 1900 and 2000 style for PVC installations and EBAA 1100 style for ductile iron MJ connections.

I. LOCATOR FOR WATER MAIN PIPE

See specification section 02660, Section 2.02A. If no standard exists, the following shall be used:

1. On all pipe construction, 10 gauge, THHN insulated, solid copper wire shall be laid and secured on top of pipe. Wire shall be continuous from valve box to valve box, wrapped two times around each joint of pipe and extended inside each valve box to enable location devices to be attached without digging up the valve box. Locator wire shall be routed to ARV boxes at the request of the Village.

2. Service wire shall be laid in the trench with all services, connected to the main wire and wrapped around the service piping or tubing. Wire for water mains shall be blue in color.

3. All wire connections shall be made with Dri-Splice wire connectors, Imperial Snip-Snap fittings filled with waterproof silicone sealant or approved equal. All splices shall be inspected and tested before burial.

4. Blue warning tape, as applicable to water main, shall also be provided 18-inches above pipe.

J. VALVE BOXES

See specification section 02660, Section 2.02A. If no standard exists, the following shall be used:

1. All valve boxes shall be cast iron construction with 5-inch shafts, equal to Tyler pipe 6850 series or Bingham Taylor equivalent. Valve box lids shall have a 1-inch-deep skirt and shall have the words "WATER", where appropriate, cast in the top. Valve operating nuts shall be brought to within 30-inch of the surface using valve extension rods if required.

K. WATER SERVICES

All water service material and fittings shall be main products in conformance with the Village of Tequesta Utility Standards. Joints in PE service piping shall not be allowed.

PART 3 - EXECUTION

3.01 SALVAGEABLE MATERIAL

A. Any existing equipment or material which is removed or replaced as a result of construction under this project may be designated as salvageable by the Village of Tequesta and if so, shall be removed, cleaned, and delivered to a protected location specified by the Village. Any equipment or material not worthy of salvaging, as directed by the Village, shall be disposed of in a legal manner by the Contractor at an off-site location. Upon request of the Engineer, the Contractor shall submit evidence of proper disposal.

3.02 POTABLE WATER SYSTEM

A. Potable Water system components shall be installed per the requirements of the Village of Tequesta Standards.

3.03 IDENTIFICATION AND COLOR CODING OF PIPE & FITTINGS

A. POTABLE WATER MAINS

1. All water main pipe and fittings shall be color coded or marked using safety blue as a predominant color to differentiate drinking water from reclaimed or other water. Underground plastic pipe shall be solid wall Blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into, or applied to, the external pipe wall.

2. Underground metal or concrete pipe shall have safety blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90-degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe. For pipes with an internal diameter of 24-inches or greater, tape or paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe.

3. Aboveground pipe at drinking water treatment plants shall be color coded and labeled in accordance with subsection 62-555.320(10), F.A.C.

4. All aboveground potable water pipe shall be painted solid blue.

5. Blue Warning tape with “WATER” printed on the tape shall be placed in the trench during backfill of the water pipe, a vertical distance of 18-inch above the crown of the pipe.

3.04 MARKING BY MANUFACTURER

A. Special markings shall be plainly marked on the applicable pipe indicating the weight, class of pipe, casting period, manufacturer's mark and year pipe was produced.

3.05 EXISTING UTILITIES

A. The plans depict the approximate location of the known existing subsurface water, sanitary sewer, electric, telephone, gas, cable, and storm water utilities.

B. The Contractor will arrange for underground utilities to be located by appropriate utility owners in advance of the Contractor's operations. The Contractor shall pothole all locations where the proposed pipe crosses an existing underground facility to verify that a conflict does not exist.

C. Notify the Engineer of any substantial changes that would require a deviation in the plans.

D. Repair any damage done to existing utilities and private property at no additional expense to the Owner.

3.06 PREPARATION

A. Where applicable, ream pipe and tube ends and remove burrs.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.07 BEDDING

A. Excavate trench and install pipe bedding as specified in Section 02200, Earthwork, Excavation and Backfill.

3.08 SURFACE CONDITIONS

A. Inspection

1. Prior to all Work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this work may properly commence.

2. Verify that all equipment may be installed in accordance with all pertinent codes and regulations, the original design, shop drawings, and the reference standards.

B. Discrepancies

1. In the event of discrepancy, immediately notify the Engineer.

2. Do not proceed with installation in area of discrepancy until all such discrepancies have been fully resolved.

3.09 PIPE INSTALLATION GENERAL

A. Verify that building service connection(s) and size, location and invert of municipal utility water mains are as indicated.

B. Take all precautions necessary to ensure that pipe, valves, fittings, and other accessories are not damaged in unloading, handling, and installation. Examine each piece of material just prior to installation to determine that no damage has occurred. Remove any damaged material from the site and replace with undamaged material.

C. Exercise care to keep foreign material and dirt from entering pipe during storage handling and installation. Close ends of in-place piping at the end of any work period to preclude the entry of animals and foreign material.

D. Use only those tools specifically intended for cutting the size, material and type pipe involved. Make cut to prevent damage to pipe or lining and to leave a smooth end at right angles to the axis of the pipe.

E. Pipe deflection at joints shall be limited to 75% of the manufacturer's maximum deflection tolerance.

F. All piping shall be laid to line in a clean, dry trench online and grade with all valves and appurtenances plum.

G. No wet taps, line stops, or connections to active water lines shall be performed on a Friday without prior permission from the Village.

H. Underground pressure piping systems shall be securely anchored by acceptable means at all tees, plugs, caps, bends and valves, and at all other locations where unbalanced forces exist or as directed by the Utility or Engineer. Restrained joints shall be used in accordance with manufacturer's recommendations.

I. Black bags (fabric or geotextile only) shall be placed over hydrants not in service. No plastic garbage bags.

J. All coupons shall be kept and provided to the Village.

K. Special Exterior Protection for Corrosion: When specifically required, extra protection shall be provided for underground cast or ductile iron pipe and fittings within areas of severe corrosive conditions. This shall be accomplished by the installation of encasement or outside protection, AWWA C105, through the area of

concern. Soil-test evaluation to determine the necessity for extra protection in suspect areas shall be as set forth in ANSI Standard A21.5.

L. In case of conflict between various installation requirements, the more stringent requirement shall apply.

3.10 PIPE/SLEEVE INSTALLATION – DIRECTIONAL BORE (PLUMBING CONNECTION)

A. This work shall include all services, equipment, materials, and labor for the complete and proper installation, testing, restoration of underground utilities and environmental protection and restoration.

B. The proposed plan installation locations are approximate; the intent is to construct the water service in the general area shown and to avoid existing utilities and obstructions. The general horizontal location is shown on the plans, but the entry and exit locations, and minimum clearances are not shown on the plans. The Contractor may utilize an alternative drill path than is shown on the drawings with the approval of the Owner at no additional cost to the Owner.

C. Submittals:

a. Specifications on material to be used shall be submitted to Engineer. Material shall include the pipe, fittings and any other item which is to be an installed component of the project.

D. Contactor shall notify all companies with underground utilities in the work area via the state or local “one-call” to obtain utility locates. Once the utilities have been located Contractor shall physically identify the exact location of the utilities by vacuum or hand excavation, when possible, in order to determine the actual location and path of any underground utilities which might be within 20 feet of the bore path. Contractor shall not commence boring operations until the location of all underground utilities within the work area have been verified.

E. The Contractor is required to bring to the attention of the Engineer any known design discrepancies with these specifications and the actual drilling methods that the Contractor will be performing. This shall be stated in writing to the Engineer no later than the pre-construction meeting.

F. No joints in HDPE sleeves shall be allowed.

G. Horizontal directional drilling shall consist of the drilling of a small diameter pilot hole from one end of the alignment to the other, followed by enlarging the hole diameter for the pipeline insertion. The exact method and techniques for completing the directionally drilled installation will be determined by the Contractor, subject to the requirements of these Specifications.

H. The elevation of the sleeve and/or carrier pipe at the location of the connection point of the directional bore shall be 36" below the natural grade and shall be in a horizontal location for ease of connection to continuing lateral or mainline. Should this not be possible due to the acute angle of the bore, the contractor shall furnish and install appropriate fittings to provide for a horizontal continuation.

I. The required piping shall be assembled in a manner that does not obstruct adjacent roadways, driveways, or public activities. The Contractor shall erect temporary fencing and submit Maintenance of Traffic plans for approval by Palm Beach County and the Village.

J. During the drilling, reaming, or pullback operations, the Contractor shall make adequate provisions for handling the drilling fluids, or cuttings at the entry and exit pits. To the extent practical, the Contractor shall maintain a closed loop drilling fluid system. When the Contractor's provisions for storage of the fluids or cuttings on site are exceeded, these materials shall be hauled away to a suitable legal disposal site. After completion of the directional drilling work, the entry and exit pit locations shall be restored in accordance with the project specifications.

K. Following service operations, the Contractor will de-mobilize equipment and restore the worksite to original condition. All excavations will be restored in accordance with the project specifications.

3.11 VALVES AND VALVE BOXES

A. Unless a beveled gear valve is specified, for valves 2-inch through 12-inch, install valves for with operator stems in the vertical plane through the pipe axis and out of the plane of flow. Locate valves were shown on Drawings. Thoroughly clean valves before installation. Check valves for satisfactory operation.

B. Equip all underground valves with gearing or operator switch valve boxes. Set box in alignment with valve stem centered on valve nut. Set the valve box to prevent transmitting shock or stress to the valve. Set the box cover flush with the finished ground surface or pavement.

3.12 PIPE PENETRATIONS

A. Use sleeves where pipes, valve stem extensions, or equipment parts pass through poured in place concrete or masonry walls or slabs. Sleeves shall be either cast iron or fabricated steel wall pipe with intermediate flange seep ring of sufficient size to allow sealing around pipe and clearance for valve stems or equipment. Extend vertical sleeves through slabs 1-inch above top surface.

B. Where new pipe must penetrate concrete wall on non-water bearing concrete structures, drill penetration in neat, workmanlike manner, install pipe, grout in place with non-shrink grout, and refinish surface to match adjacent.

3.13 THRUST RESTRAINT

A. Provide reaction anchors of concrete blocking, metal harness, retainer gland type or restrained joint type at all changes in direction of pressure pipelines and as shown on drawings.

B. Concrete reaction anchors shall bear against undisturbed earth and shall be of the size and shape necessary to resist service conditions of the pipe.

C. Use metal harness restraints as shown on drawings to restrain existing pipe segments.

D. Where retainer glands are used, extreme care shall be taken so that each set screw is tightened as recommended by the manufacturer before the pipe is backfilled and tested.

E. Existing piping shall be restrained with bell restraints as required by the thrust restraint table shown on the plans.

F. Anchor tees shall be used for fire hydrants attached to new water mains. Anchor couplings shall be used for fire hydrants attached to existing water mains.

3.14 FIELD QUALITY CONTROL

A. Compaction testing shall be performed in accordance with Section 02200.

B. If tests indicate Work does not meet specified requirements, remove Work, replace, and retest at no cost to Owner.

3.15 CONSTRUCTION CONSTRAINTS

The Contractor shall give special considerations to accommodate the business owners and residents in minimizing downtime and disruption of water and sewer services during the entire construction period.

A. The Contractor will be required to submit as-builts including laboratory results to the Village of Tequesta after the completion of each phase for preparation of Request for Partial Release and submission to the Palm Beach County Health Department.

The Contractor shall coordinate with the Village of Tequesta when service shutdowns are required for performance of the Work. The Village will be required to deliver (Village's standard) Boil Water Notices in notifying affected customers of a service interruption and delivering those notices to affected customers at least 48 hours prior to any service interruption. The Contractor shall comply with the following limitations:

1. Each service interruption required for transferring (relocating) an existing water service will be limited to a maximum of two hours;

2. Each service interruption required for connecting new water service to water meter will be limited to a maximum of one hour;

3. Each service interruption required for tie-in of new main to existing distribution system will be limited to a maximum of four hours.

B. The Contractor shall coordinate with the Village of Tequesta on their preferred method of transferring existing water services to proposed water mains.

END OF SECTION

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SECTION 02670

FLUSHING, TESTING AND DISINFECTION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Flushing, Pressure Testing, and Disinfection of systems including, but not limited to, the potable water mains shown to be relocated on the Plans.

B. The Contractor shall furnish all necessary pumps, hoses, piping, fittings, meters, gauges, chemicals and labor to conduct specified testing.

C. Testing shall be repeated at the Contractor's expense until satisfactory results are achieved.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

B. Specified in other Sections:

1. Section 02660: Pressure Pipe Systems

1.03 REFERENCES

A. ANSI/AWWA C651 - Standard for Disinfecting Water Mains.

1.04 SUBMITTALS

A. Test Reports: Indicate results comparative to specified requirements. Submit two (2) copies of test results to Engineer in accordance with Submittal specifications.

B. Final approval of the bacteriological samples shall be received from the Florida Department of Environmental Protection (Palm Beach County Health Department) prior to the time that the system is placed into operation. Sampling procedures shall be done in accordance with FDEP requirements.

C. Bacteriological sampling locations shall meet FDEP requirements and be taken where shown on the drawings and as directed by the Engineer at no additional cost to Owner. Costs for all bacteriological testing shall be borne by the Contractor.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with ANSI/AWWA C651.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable FDEP requirements for performing the work of this Section.

B. Work shall conform to Village of Tequesta Standards.

PART 2 - PRODUCTS

2.01 DISINFECTION CHEMICALS

A. Chemicals shall be in accordance with the Village of Tequesta Standards. If no standards exist, the below chemicals shall be used.

B. Chemicals: The disinfecting agent shall be sodium hypochlorite solution ANSI/AWWA B303 or liquid chlorine ANSI/AWWA B301. Dry hypochlorite, similar to "HTH" or equal may also be used as the disinfecting agent. Bleach or Clorox is not acceptable.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that the installed potable water systems have been cleaned, inspected, and tested.

B. Coordinate scheduling and disinfection activity with the Engineer and the Village of Tequesta.

3.02 FLUSHING AND PRESSURE TESTING - PIPING

The Contractor shall furnish and install suitable temporary testing plugs or caps for the water lines, all necessary pressure pumps, hose, pipe connections, meters, gauges and other similar equipment, and all labor required, all without additional compensation for conducting pressure and leakage tests and flushing of the new water lines and force mains. Flushing and pressure testing shall be in accordance with the Village of Tequesta Standards. If no standards exist, flushing and pressure testing shall be conducted in the following order.

A. After all piping lines have been installed and before pressure testing and final connections to equipment, each run of pipe shall be thoroughly flushed so as to remove all debris and foreign matter from the piping and equipment. Clean and flush all piping using potable water. Cleaning and flushing shall be achieved by pigging or cannon flushing if approved by the Village of Tequesta Standards. Each section of pressured main will be thoroughly cleaned with two (2) polyurethane foam pigs as manufactured by Girard Poly-Pig Inc. or an approved equal. Each pig will run through the line prior to running the second pig. Contractor shall furnish and install required pig launch and exit assemblies or temporary piping required for cannon flushing. Non-abrasive pigs shall be employed. Flushed water may be discharged

to the onsite catch basins or water bodies and be coordinated with Owner. The Contractor to provide means of discharging water to catch basins at the Contractor's expense.

B. Pressure and leakage tests shall be conducted in the presence of the Engineer, or his representative. All pressure mains, fittings, water services, and appurtenances shall undergo pressure and leakage tests. The Contractor will provide all necessary apparatus including a suitable pressure gage, pump, measuring device, piping connections and fittings and the necessary labor to conduct the test. Leakage is defined as the quantity of water added to the pipe being tested during the test period. The Contractor shall submit to the Engineer the testing pattern he proposes to follow prior to testing for the Engineer's approval. The Contractor shall not test more than 1,500 feet of pipe in a single test without approval from the Engineer.

C. Pressure testing ductile iron and PVC piping systems:

1. The test pressure for the water piping constructed of ductile iron and PVC pipe shall be 150 psi. The test pressure for force main piping shall be 100 psi. These pressures shall be maintained for a period of not less than two hours. Tests shall be made between valves and as far as practicable and as approved by the Engineer. Potable water from the distribution system shall be used. Pressure shall not vary more than five (5) psi for piping during the test periods or as approved by the Engineer. Additionally, allowable leakage shall be computed on the basis of AWWA C-600, C-605 where practical.

2. All leaks evident at the surface shall be uncovered and repaired regardless of the total leakage as indicated by the test, and all pipes, valves and fittings and other materials found defective under the test shall be removed and replaced at the Contractor's expense. Tests shall be repeated until leakage has been reduced below the allowable amount.

3. Should, in the judgment of the Engineer, it not be practical to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made as approved by the Engineer and the Village of Tequesta. In any event, the Contractor shall be responsible for the ultimate water tightness of the plant piping within the preceding requirements.

3.03 DISINFECTION

A. The Contractor shall furnish and install suitable temporary connections to the piping, all necessary pressure pumps, hose, pipe connections, meters, gauges and other similar equipment, and all labor required, all without additional compensation for the disinfection of all required potable water piping systems. Disinfection shall be in accordance with the Village of Tequesta Standards. If no standards exist, disinfection shall be conducted on the following systems in the following manner:

1. All relocated and new potable water and private fire line piping.

B. Conform to AWWA Standards and as modified herein.

C. Maintain disinfectant for a minimum of 8 hours in such a manner that the entire system will be filled with water containing a minimum chlorine concentration of 50 ppm at any point. At the Village and/or the Engineer's request and at no additional cost to the Owner, this step may be required to be performed immediately before pressure testing.

D. After the disinfecting agents have been permitted to remain for the specified contact periods, the water lines, and valves shall be thoroughly flushed with water until the residual chlorine tests are less than 4 ppm in each instance. The determination of the amount of residual chlorine in the system shall be made at such points and in accord with standard tests by means of a standard orthotolodine test set.

E. Replace permanent system devices removed for disinfection.

3.04 BACTERIOLOGICAL SAMPLING

A. It shall be the responsibility of the Contractor under this Contract to perform the bacteriological testing required by the Florida Department of Environmental Protection (Palm Beach County Health Department) and the Village of Tequesta to obtain clearance of all piping. The Contractor shall be responsible to disinfect and repeat testing as needed until clearance is obtained for all required systems. The Contractor shall be responsible to pay for additional water needed if the bacteriological testing must be repeated.

B. The piping requires two (2) passing consecutive daily samples taken from the locations called out on the plans or as determined by the Engineer. The samples shall be taken concurrently at all the respective sample point locations.

C. Sampling must be coordinated with the Engineer and other construction activities so as to minimize re-sampling.

D. The Contractor shall submit schedule for bacteriological testing and pressure tests.

E. The Contractor shall incur all costs needed to provide bacteriological clearance of the piping systems.

F. If repeated tests of such samples show the presence of coliform organisms, the disinfection shall be repeated until tests indicate an absence of contamination.

3.05 QUALITY CONTROL

A. The laboratory and personnel collecting bacteriological samples shall be Florida state certified in accordance with FDEP requirements.

3.06 CONNECTIONS TO EXISTING MAINS

A. The Contractor shall make connections to existing mains as shown on the drawings. The connections of new water main to existing main shall be made only after the new mains have passed their pressure and leakage test and completed the disinfection and bacteriological clearance procedures as mandated by the Palm Beach County Health Department and shall be under the Owner's immediate supervision.

END OF SECTION

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SECTION 02740

ASPHALT PAVING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

All applicable provisions of the bidding and Contract Requirements, and Division 1 – General Requirements shall govern the Work under this section.

1.02 WORK INCLUDED

A. This section of the specifications covers the control and general conduct of asphalt paving construction for roads, parking, walks and court areas.

B. All Work within the right-of-way shall be constructed using materials and methods in accordance with the Contract drawings, Palm Beach County Standards and Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

1. Grade deviations from Contract and Drawings shall conform to Section 02210, Grading.

C. Provide all labor, materials, necessary equipment and services to complete the Asphaltic Surfaces work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

D. Including, but not necessarily limited to the following:

1. Preparation of subgrade

2. Installation and compaction of base course

3. Spreading of asphalt surface course

1.03 RELATED WORK

A. Section 02225 – Trenching, Bedding, and Backfill

B. Section 02210 – Grading

C. Section 02751 – Concrete Paving

1.04 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials (AASHTO)

1. M140 - Standard Specification for Emulsified Asphalt Nineteenth Edition;

Revised Per Interim Specifications – Specifications - 1999 R (1998)

2. M276 - Standard Specification for Viscosity Graded Asphalt Cement Nineteenth Edition R (1996)

3. T245 - Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus Nineteenth Edition; ASTM D1559-76

B. American Society for Testing and Materials (ASTM)

1. D1559 - Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus

2. D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

3. D2171 - Standard Test Method for Viscosity of Asphalts by Vacuum Capillary Viscometer (RAP Asphalt Mixes)

C. Asphalt Institute (AI)

1. MS-2- Mix Design Method for Asphalt Concrete and Other Hot Mix Types

2. MS-22- Principles of Construction of Hot-Mix Asphalt Pavement, Addendum

1.05 TRAFFIC CONTROL

A. The Contractor shall provide and maintain access to and from all properties along the line of Work. The Contractor shall also provide temporary by-passes and maintain them in a safe and usable condition whenever detouring of traffic to parallel routes cannot be done without hardship or excessive increases in travel by the public.

1.06 SPECIAL SUBGRADE CONDITIONS

A. When special subgrade conditions are encountered for which these "Asphaltic Surfaces Specifications" are not applicable, portions of these specifications shall be deleted or revised to provide a properly finished paved surface. A requested revision or deletion of the specifications shall be accompanied with reports and laboratory tests on existing field conditions. Any change from these "Asphaltic Surfaces Specifications" shall be approved by the Engineer and shall be in effect only for a specified area or paving project.

1.07 QUALITY ASSURANCE

A. DOT Standard Specifications.

1. Work and materials shall conform to all applicable requirements of Florida Department of Transportation "Standard Specifications for Road and Bridge Construction – Current Edition" (referred to herein as DOT).

B. American Society for Testing and Materials.

1. ASTM 3515-80 "Standard Specification for Hot-Mixed, Job Laid, Bituminous Paving Mixtures."

1.08 SUBMITTALS

A. Job Mix Designs: The Contractor shall submit a mix design for each pavement course proposed for construction for the Owner's review and approval 45 days prior to schedule production and lay down of the mix. The design mix submittal shall be formatted as indicated in Asphalt Institute Manual MS-2, the "Marshall Stability Method"; and shall include type/name of mix, gradation analysis, grade of asphalt cement, Marshall Stability in pounds flow, effective asphalt content in percent (%), and corresponding copies of governing State Department of Transportation (DOT) material specifications or regulatory authorities having jurisdiction for each proposed material.

B. The Contractor may submit to the Owner a superpave asphalt mix design for review and approval, in lieu of a Marshall Mix Design asphalt, meeting the specifications of the governing State Department of Transportation or regulatory authorities having jurisdiction.

C. Material Certificates: The Contractor shall submit certificates stating that asphalt mix to be supplied complies with the specifications of the governing State Department of Transportation (DOT) or regulatory authority having jurisdiction, as well as copies the regulatory specifications corresponding to the asphalt mix formula and material. The certificates shall be signed by the asphalt mix producer and the Contractor.

1.09 JOB CONDITIONS

A. Apply prime and tack coats when ambient temperature is above 50 degrees, and when temperature has not been below 35 degrees for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.

B. Construct asphalt concrete surface course only when atmospheric temperature is above 40 degrees, and when base is dry. Base course may be placed when air temperature is above 30 degrees and rising.

1.10 LOCATIONS, LAYOUT AND GRADES

A. Locate and layout paved areas and rights-of-way with reference to benchmarks, property lines or buildings according to the Contract drawings and accepted by the

Engineer. The Contractor shall not utilize electronic files from the Engineer for layout.

B. Determine locations of paved edges and right-of-way lines from surveyor's permanent reference monuments and information on the Horizontal Control drawings.

C. Where permanent reference monuments are not available, obtain proper line locations from authorities having jurisdiction.

D. Establish and maintain required lines and elevations.

E. Furnished rock as-builts shall demonstrate a positive flow along the edge of pavement and road crown from the high point to the low point (catch basin/inlet) as indicated on the Contract drawings.

PART 2 – PRODUCTS

2.01 FILL

A. All fill shall be clean rock and sand (maximum rock size = 1-inch).

B. Fill shall be compacted thoroughly as per Section 02225 – Trenching, Bedding and Backfill.

2.02 LIMEROCK

A. Limerock shall be obtained from pits for which all overburden has been removed previous to blasting and shall show no tendency to air slake and must undergo the following chemical requirements.

1. Carbonates of Calcium Min. 70.0% (Miami Limerock) and Magnesium. (24-foot roadway).
   Min 60.0 (Miami Limerock) and Magnesium. (22-foot roadway)
   95.0 (Ocala Limerock)

2. Oxides of Iron and Aluminum Max. 2.0%

3. Organic Matter Max 5.0%

4. Any constituents of other than the above shall be silica or inert material.

5. The material shall be crushed to such size that not less than 97% shall pass a 3-1/2-inch sieve and it shall be graded uniformly down to dust. All fine material shall consist entirely of duct of fracture.

6. Limerock from on-site may be used if the material meets the requirements of this section of the specifications.

B. All limerock shall comply with requirements set forth under DOT Section 911.

C. Limerock Bearing Requirements – Limerock material used in construction of limerock base shall have an average LBR vales of not less than 100. The average LBR value of materials produced at a particular source shall be determined in accordance with an approved quality control procedure.

D. Equipment: The equipment for constructing the rock base shall be in first class working condition and shall include:

1. Vibratory compactor weighing not more than three tons. If approved in writing by the Engineer, larger vibratory compaction equipment may be allowed if operated in static mode only.

2. Self-propelled blade grader weighing not less than three tons. The wheel base shall be not less than 15-feet and blade length not less than 10-feet.

3. Scarifiers shall have teeth space not to exceed 4-1/2-inches.

4. Provision for furnishing water at the construction site by tank or hose at a rate not less than 50 gallons per minute.

2.03 PRIME COAT

A. Prime coat shall be Grade RC-70, cut-back asphalt, DOT Section 916-2.

B. Prime coat shall have full compatibility with surface treatment asphalt.

C. The bituminous material shall conform to the requirements of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 300-2.

D. The sand for cover shall be clean dry sand.

2.04 TACK COAT

A. The bituminous material to be used for the tack coat shall conform to the requirements of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 300-2.

2.05 ASPHALT

A. GENERAL:

1. The asphaltic concrete surface course shall be in accordance with Palm Beach County, Florida Department of Transportation Standard Specifications for type S-III asphaltic concrete wearing surface, 1-1/2-inches in compacted thickness or as indicated on the Drawings, in accordance with Section 330-10 Compacting Mixture and 331 Type S-III Asphaltic Concrete of aforesaid DOT standard specification.

2. Final lift of asphaltic concretes shall be virgin material only and shall be placed at the end of the project. (First lift may be RAP, reclaimed asphaltic paving, in accordance with DOT standards).

2.06 SEAL COATING

A. Homogeneous mixture of emulsified coal tar pitch, asbestos, sand and other inert fillers.

It shall be easily remixed if settlement occurs in storage (except in the case of freezing). It shall be capable of application and complete coverage by rubber squeegee, brush, or approved mechanical method, to the surface of bituminous pavements at the spreading rate of 0.2 to 0.3 gallons per square yard in two coats.

B. Approved product: "TARFEX" manufactured by Bitucote Products Co. or approved equal.

PART 3 – EXECUTION

3.01 COLD MILLING

A. Milling of existing asphalt pavement shall be at the depth and location as indicated on the Construction Drawings or as directed by the Owner.

B. The milled surface shall be reasonably smooth and free of excessive scarification marks, gouges, ridges, continuous grooves, or other damage. The milled pavement surface shall be thoroughly cleaned of all loose aggregate particles, dust, and other objectionable material by the use of power brooms, power blowers, power vacuums or other means.

C. The Contractor shall coordinate the adjustment of manhole, meter boxes, drainage inlets, and valve boxes with the milling operation.

D. All milled material shall become the property of the Contractor and shall be disposed of off-site or used in conformance with Section 02300 or for

utilization as Reclaimed Asphalt Pavement, in conformance with the specification provided above, as approved by the Owner.

3.02 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12-inches into adjacent sound pavement, unless otherwise indicated or directed by the Owner. Re-compact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 gallons per square yard.

C. Patching: Fill excavated pavements with hot-mix asphalt base mix, and while it is still hot, compact flush with adjacent surface.

3.03 BARRICADES

A. Provide substantial temporary barricades around all areas of operation and maintain until Work under this section is completed and approved.

B. Install temporary traffic markers, signals, and signs as per Palm Beach County Highway Construction & Engineering Services Division Standard Specification to:

1. Eliminate potentially hazardous conditions.

2. Maintain adequate traffic patterns free of conflict with work under this Contract.

3.04 PREPARATION OF SUBGRADE

A. This Work consists of bringing the bottom of excavations and top of embankments of the roadway between the outer limits of the shoulders or base course to a surface conforming to the grades, lines, and cross sections shown on the plans. The subgrade shall be of uniform density ready to receive the rock base of the paving course.

B. All soft and yielding material and other portions of the subgrade which will not compact readily shall be removed and replaced with suitable material and the entire subgrade brought to line and grade to provide a foundation of uniform compaction and supporting power.

C. Stumps, roots, and other deleterious organic matter encountered in the preparation of the subgrade shall be removed.

D. Where fills are required on areas covered or partly covered by existing paving, the entire area of such existing paving shall be scarified to a depth of at least six inches, and the scarified material spread evenly over the area to be filled to a width not less than that of the proposed paving.

E. Material for fills shall consist of sand or other suitable material approved by the Engineer free from stumps, roots, brushes, and other deleterious organic matter.

F. Where fill is more than 1-foot in depth, the backfill material above the ground water table shall be compacted in 8-inch depth lifts or as noted on the plans, whichever is less. Each individual layer of fill under the rock base shall have a density of 98% of the maximum density as determined by the AASHTO T-180 unless shown otherwise on the plans. Each individual layer of fill under the shoulder area shall have a density of 98% of the maximum density as determined by AASHTO T-180, unless shown otherwise on the plans.

G. The bottom of all excavated areas and the top of all fills where rock base is to be constructed shall be thoroughly compacted by rolling. Water shall be used to insure thorough compaction. The stability of the top 12-inch thickness of the subgrade immediately under the base, for the full base width plus 1-foot on each side, shall be minimum LBR 40.

H. Bring subgrade which has been properly filled and shaped to a firm unyielding surface, by rolling an entire area with an approved power roller:

1. Thoroughly compact area inaccessible to the roller with approved hand tamper.

2. Apply water sufficiently to compact the subgrade where the subgrade is of a dry, sandy nature and cannot be rolled.

I. The subgrade shall be maintained free from ruts, depressions or other irregularities until rock base material is spread.

J. For all roads, streets and paved areas other than State Highway, the stabilized subgrade shall have a minimum Limerock Bearing Ratio (LBR) of 40, unless otherwise noted on the plans.

K. Where the bearing value of the existing subgrade is adequate without addition of stabilizing material, the subgrade shall be scarified and disked, harrowed, bladed or tilled for removal of boulders, roots, etc. to assure uniformity and thorough mixing of material to the full width and depth of required stabilization. The compacted subgrade shall conform to the lines, grades and cross-section shown on the plans.

L. Test subgrade for crown and elevation after preparation and immediately before base of paving course is laid:

1. Remove or add material and compact to bring to a correct elevation and uniform bearing if the subgrade is found not to be at the specified elevation at all points.

2. Adjust the manhole rims, catch basin frames and valve boxes where necessary to match proposed finish grade.

3.05 CONSTRUCTION OF BASE COURSE

A. This Work consists of construction of lime rock base course for the asphaltic concrete wearing surface. The base course shall be constructed on the prepared subgrade in an 8-inch thick limerock bases constructed in two 4-inch lifts as shown on the drawings. Twelve (12) inches thick limerock bases shall be constructed in two six-inch lifts. The limerock base shall be a minimum LBR of 100.

B. Spreading Rock: The rock shall be transported to the points where it is to be used over rock previously placed and dumped on the end of the preceding spread. It shall then be spread uniformly with hand tools, or mechanical equipment. In no case shall rock be dumped directly on the subgrade. No hauling shall be done over the subgrade.

C. Compacting Rock:

1. Following spreading, the rock shall be rolled with a three-wheel roller weighing not less than ten tons, water being added as required, until the entire depth of base is compacted into a dense unyielding mass.

2. No greater are of rock base shall be placed during any one day than that which can be rolled and compacted on the same day.

D. Finishing Base:

1. After watering and rolling, the entire surface shall be thoroughly scarified to a depth not less than 4-inches and shaped to exact crown and cross section, re-watered and again thoroughly rolled. Rolling shall continue until the entire depth of base is bonded and compacted into a dense, unyielding mass, true to grade and cross section.

a. Any irregularities which may develop in the surface during such finishing shall be corrected by the removal or addition of rock as the case may be.

b. If at any time the subgrade material becomes churned up and

mixed with the base rock, the Contractor shall dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean rock which shall be watered and rolled until satisfactorily compacted.

c. Where cracks or checks appear in the base either before or after priming, which in the opinion of the Engineer would impair the structural efficiency of the base course, the Contractor shall remove such cracks or checks by re-scarifying, reshaping, watering, rolling and adding rock where necessary.

d. During final compacting operations, if grading of any areas are necessary to obtain the true grade and cross section, the compacting operations for such areas shall be completed prior to making the density tests on the finished base.

E. Inferior Rock: If in the opinion of the Engineer at any time during the progress of the Work, rock of inferior quality is being delivered to the construction site, a laboratory analysis of the rock shall be made. Should the results of such tests indicate that the rock does not conform to specifications, the Contractor shall, at his own expense, remove such inferior material from the area indicated and deliver and spread satisfactory rock on said area.

F. Testing Surface: The finished surface of the rock base shall be true to the required cross section. Any irregularities in the grade greater than 1/4-inch, as determined by placing a 10-foot straight edge parallel with the centerline and use of full width crown board, shall be corrected by scarifying to a depth of 3-inches, removing or adding rock as may be required and again watering, rolling, and compacting the scarified area. In testing the surface for irregularities, the measurements under the straight edge shall not be taken in small holes caused by individual pieces of rock having been pulled out by the road grader. The finished rock base shall provide positive flow from the high point to the low point (catch basin/inlet) as indicated on the Contract Drawings.

G. Thickness Determination: Thickness of the base shall be measured by intervals as required by the Engineer. Measurements shall be taken at various points on the cross section. The measurements shall be taken in holes through the base of not less than 3-inches in diameter. Where the base is more than 1/2-inch less than the required compacted thickness, the Contractor shall correct such areas by scarifying and adding rock. The affected areas shall then be watered, rolled and brought to a satisfactory state of completion, and of required thickness and cross section.

H. Density: Density determinations shall be made by the Contractor or at intervals required by the Engineer. An average required density shall be 98% of

maximum density obtainable under AASHTO Method T-180. No section of base shall be accepted when more than 10% of tests fall below 98% of maximum density and in no case shall a density of less than 96% of maximum be accepted.

I. Testing: The Contractor shall coordinate with the Engineer for all testing. One test shall be made in accordance with AASHTO, T-180 for each class of material in the subgrade and base:

1. In place density tests in accordance with AASHTO T-147 shall be made in the locations shown on the plans. Two copies of the test reports will be sent directly to the Engineer for evaluation.

2. Any material which fails to meet these specifications shall be removed, replaced, and retested, all at the Contractor's expense.

3. Tests shall be taken at least every 1,000 square yards and taken at locations and lifts as directed by the Engineer.

3.06 PRIME COAT FOR BASE COURSE

A. Cleaning for prepared base:

1. Before any bituminous material is applied, all loose material (dust, dirt, caked clay and foreign matter) which might prevent proper bond with the existing surface shall be moved to the shoulders, to the full width of the treatment, by means of revolving brooms or approved mechanical sweepers and by mechanical blowers, of approved types, supplemented by hand sweeping. Dust and other loose materials not removed by mechanical means shall be removed with hand brooms. Particular care shall be taken to clean the outer edges of the strip to be treated in order to ensure that the prime coat will adhere. Sweeping and blowing shall be continued until all the loose dust and dirt is removed from the surfaces.

2. Application of bituminous material shall be made during the same day surface has been swept and as soon as practical thereafter.

B. Application for prime coat:

1. The bituminous material shall be applied to the clean dry surface of the rock base at such temperature as will ensure uniform distribution. The amount applied will be at the rate of approximately 0.10 to 0.20 gallons per square yard of base area. The application shall be made by means of self-propelled pressure distributor operating under a pressure not less than 20 pounds per square inch. Application of bituminous material shall be made on only one-half of the width of base at one time.

2. The primed base shall then be covered with a uniform layer of clean sand and kept thoroughly and uniformly covered by additional sand or sweeping until it shows no signs of picking up under traffic. For a period of one week after priming, the Contractor shall again broom any area where insufficient cover sand or excess of bituminous material causes "bleeding" and, if necessary, spread additional sand on such area.

C. Prime coat finish: After prime has cured or sat and been sanded, the shoulder shall be shaped to conform to all grade lines and cross sections and the entire area shall be rolled and compacted with a rubber tired roller or a power roller before asphalt surface is laid on the finished base.

3.06 BITUMINOUS TACK COAT

A. Before applying any bituminous material, all loose material: dust, dirt and foreign material, which might prevent proper bond with the existing surface, shall be removed for the full width of the application.

B. Application for tack coat:

1. The surface to receive the tack coat shall be clean and dry. The tack coat shall be clean and dry. The tack coat shall be applied with a pressure distributor except that on small jobs, if approved by the Engineer, the application may be made by other approved mechanical methods or by hand methods. The pressure distributor shall operate at a pressure not less than 20 pounds per square inch and at a consistency such that it can be properly pumped and sprayed uniformly over the surface.

2. The bituminous material shall be applied in a thin uniform layer. The rate of application shall be between 0.02 and 0.10 gallon per square yard. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying but shall not be applied so far in advance that it might lose adhesiveness as a result of being covered with dust or other foreign material. The tack coat surface shall be kept free from traffic until the wearing surface is laid.

3.07 ASPHALTIC CONCRETE WEARING SURFACE COURSE

A. Cleaning and preparing base:

1. Prior to the laying of the asphaltic concrete, the base of pavement to be covered shall be cleaned of all loose deleterious material by the use of power brooms or blowers. A tack coat shall be applied on all pavement. The tack coat shall not be applied so far in advance of laying operations as to allow shifting and sand or weather conditions to nullify its

effectiveness.

2. After the surface has been thoroughly cleaned, all holes shall be filled with asphaltic concrete, if necessary, and thoroughly compacted to conform to the existing surface and to form a smooth surface.

B. Placing asphaltic concrete: The asphaltic concrete surface course applied after the tack coat and be permitted a reasonable time for drying, but not to an extent that the tack coat is allowed to lose its adhesiveness:

1. Machine spreading: Upon arrival the mixture shall be dumped into the approved mechanical spreader and immediately spread and struck off to the full width required and to such appropriate loose depth for each successive course that when the work is completed the required weight of the mixture per square yard, or the specified thickness will be secured. An excessive amount of mixture shall be carried ahead of the screen at all times. Hand raking shall be done behind the machine as required.

2. Hand spreading: In limited areas, where, on account of irregularities or unavoidable obstacles, the use of mechanical spreading and finishing equipment is impractical, the mixture may be spread by hand, when so authorized by the Engineer.

3. The mixture shall be laid only when the surface to be covered is dry and only when weather conditions are suitable.

4. All structures which will be in actual contact with asphaltic mixture, including the face or surface of curbs or gutters and their vertical faces of existing pavements, shall be painted with a uniform coating of asphalt material to provide a closely bonded, watertight joint.

5. Where necessary, due to the traffic requirements, the mixture shall be laid in strips in such manner as to provide for the passage of traffic.

6. Any mixtures caught in transit by a sudden rain may be laid at the Contractor's risk. In no case shall the mixture be laid while rain is falling or when there is water on the surface to be covered.

7. The depth of the layer being spread shall be gauged as directed, and where the thickness fails to average the specified thickness, immediate steps shall be taken to correct the depth.

8. Before any rolling is started, the course surface shall be checked, any inequalities adjusted, and all drippings, fat sand accumulations from the

screed and fat spots from any source shall be removed and replaced with satisfactory material.

9. Straight-edging and back-patching shall be done after initial completion has been obtained and while the material is still hot. Any irregularity greater than 1/4-inch either longitudinally or traversely shall be corrected at this time.

10. No skin patching shall be done. When a depression is to be corrected while the mixture is hot, the surface shall be well scarified before the addition of fresh mixture. If irregularities occur and are not corrected while the mixture is still hot, the irregularities shall be cut out the full depth of the layer and replaced with fresh mixture.

C. Compacting mixture: After the spreading, the mixture shall be rolled when it has set sufficiently or come to the proper condition to be rolled, and when the rolling does not cause undue displacement or shoving:

1. The motion of the roller shall at all times be slow enough to avoid displacement and shall at once be corrected by the use of rakes and fresh mixture where required. The rolling shall include all transverse, longitudinal, and diagonal rolling, as may be necessary to obtain the maximum density.

2. The seal rolling with tandem steel rollers weighing from five to eight tons shall follow as close behind the spreader as is possible without picking up, or displacing or blistering the material.

3. Rolling with the self-propelled pneumatic-tired rollers shall follow as soon as possible and as close behind the seal rolling as the heat of the mixture will permit. The rolling shall be done while pavement temperature is between 175° and 240° F, and to such an extent that the self-propelled traffic roller shall cover every area of the surface with at least ten passes. Final rolling with tandem steel rollers shall be done after the rolling with self-propelled pneumatic tired rollers is completed. This final rolling shall be done before the pavement temperature is lower than 175°F and shall be continued until all roller marks or tire marks are eliminated.

4. Self-propelled pneumatic rollers shall be used for the rolling of patching and leveling courses. At the option of the Contractor, a steel-wheeled roller may be used to supplement the self-propelled pneumatic-tired rollers but not more than one steel-wheeled roller may be used in conjunction with the necessary number of self-propelled pneumatic-tired rollers. After final completion, the finished pavement shall at no

point have a density less than 95% of the laboratory compacted density.

5. Rolling with the self-propelled pneumatic-tired roller shall proceed at a speed from six to twelve miles per hour and the rate of rolling shall not exceed 3,000 square yards per hour per roller. A sufficient number of self-propelled pneumatic-tired rollers shall be used so that the rolling of the surface for the required number of 10 passes within this maximum rolling rate shall not delay any other phase of the placing operation and not result in excessive cooling of the mixture before the rolling is complete. In the event that the rolling is not properly maintained to schedule as outlined above, the laying operation shall be discontinued until the rolling operations are sufficiently caught up.

6. In all places inaccessible to a roller, such as adjacent to curbs, headers, gutters, bridges, manhole, etc., the required compaction shall be secured with tamps. Depressions which may develop before the completion of the rolling shall be remedied by loosening the mixture laid and adding new material to bring such depressions to a true surface.

7. Should any depressions remain after final compaction has been obtained, the mixture shall be removed sufficiently, and new material added to form a true and even surface. All high spots, high joints and honeycombs shall be adjusted as directed by the Engineer.

8. The mixture, after compaction, shall be of the thickness shown on the plans. After compaction, the surface shall not show an excess of asphalt. Any area showing such excess or other defect shall be cut out and replaced with fresh mixture and immediately compacted to conform with the surrounding area. Any mixture which becomes loose or broken, mixed with dirt in the wearing course shall be removed and replaced with fresh mixture which shall be immediately compacted to conform with surrounding areas.

9. Gasoline or oil from rollers shall not be allowed to deposit on the pavement and any pavement damaged by such deposits shall be removed and replaced as directed by the Engineer.

10. Any mixture remaining unbonded after rolling shall be removed and replaced.

D. Protection of pavement: After the completion of the pavement, no vehicular traffic of any kind shall be permitted on the pavement until it has set sufficiently as approved by the Engineer.

3.08 ASPHALT OVERLAY

A. Clean existing asphalt and clear of loose aggregate. Mill roadway as required to maintain plan grades and provide a smooth transition between all overlay sections adjacent to milled or existing roadway sections.

B. Risers shall be installed to bring existing manhole rims, valves, basins, etc to grade.

C. Structural patching necessary to seal existing cracks or potholes shall be done prior to tack coat. Tack coat shall be applied to ensure proper adhesion between the old surface and new asphalt.

D. Hot mix asphalt shall be applied at the depth specified on the plans. All edges and ends shall be sloped to create a smooth seam between old and new pavement surfaces.

3.09 ABUTTING EXISTING PAVING

A. Meet elevation of existing paving and structures, facilities and utilities where applicable by feathering the thickness of the new surface course for not more than 1-foot in the periphery of the structure, facility or utility. Do not cover access covers, manhole tops, water meters or other similar devices.

3.10 PAVEMENT EDGES

A. Make edges of paved area conform to details and sections as shown on drawings.

3.11 SEAL COATING

A. Preparation of surface: Pavement to be sealed must be sound and free of loose dust, dirt, stones, or other foreign matter:

1. Repair any breaks or holes.

2. Scrape off accumulations of oil or fuel drippings and scrub with detergent and water. Remove all traces of detergent.

3. Soft or damaged spots must be repaired.

4. Flush entire area with clean water.

5. Pavement should be damp (no puddles or excess water) when seal coating is applied.

B. Mixing: Stir seal coating to a uniform consistency, use no solvents for thinning. Dilute seal coating with 10% to 20% clean water, stirring to uniform consistency.

C. Application:

1. Seal coat may be applied to dampened surface with a rubber squeegee, soft bristled push broom, or approved mechanized equipment.

2. Seal coating may be poured directly onto pavement in a ribbon or windrow. Squeegee is placed on pavement at a slight angle to edge line of pavement and pulled in a window along pavement in parallel lines, always working excess material toward bottom edge of squeegee.

3. Seal coating should be applied in two (2) thin coats. After first coat is completely dry to touch, a second coat may be applied at right angles to the first. Rate of application will depend on porosity of surface.

4. Allow to cure for 24 hours before opening to traffic.

5. Do not apply seal coating when temperature is below 50°F, or falling, before sealer is dry, or rain appears imminent or forecast.

6. Apply in strict accord with manufacturers published instructions.

3.12 FIELD QUALITY CONTROL

A. Test in place asphalt concrete course for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Engineer:

1. In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:

a. Base Course: Not greater than ½-inch of specified thickness.

b. Wearing Course: Not greater than ¼-inch of specified thickness.

2. Test finished surface of each asphalt concrete course for smoothness, using 10-foot straight edge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.

a. Base Course Surface: 1/4-inch.

b. Wearing Course Surface: 1/8-inch.

B. Check surface area at intervals as directed by the Engineer.

C. Finish grade of asphaltic concrete wearing course shall be within ±0.04 feet of the grades indicated on the plans.

3.13 CLEANUP

A. Remove all debris and excess material immediately from project site.

B. Take down all barricades and temporary traffic markers, signals and signs only after all work included in this section is finished and inspected, and only after so directed by the Engineer.

C. Leave project area clean, orderly and free of any hazardous conditions.

END OF SECTION

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SECTION 02751

CONCRETE PAVING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the Work under this section.

1.02 SUMMARY

A. This section includes all concrete pavement, including but not limited to:

1. Driveways
2. Parking lots
3. Curbs and gutters
4. Sidewalks
5. Drainage Aprons

1.03 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the Portland Cement Concrete Paving work, as indicated on the drawings, as specified herein or both.

B. Including, but not necessarily limited to the following:

1. Fill, subgrade, and limerock base
2. Concrete formwork
3. Concrete reinforcement
4. Isolation and contraction joints
5. Concrete paving

1.04 RELATED WORK

A. Section 02225 – Trenching, Bedding, and Backfill

B. Section 02740 - Asphalt Paving

1.05 REFERENCE STANDARDS

A. American Society of Testing Materials (ASTM)

1. A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement

2. A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement

3. A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

4. C33 - Standard Specification for Concrete Aggregates

5. C94 - Standard Specification for Ready-Mixed Concrete

6. C150 - Standard Specification for Portland Cement

7. C171 - Standard Specification for Sheet Materials for Curing Concrete

8. C260 - Standard Specification for Air-Entraining Admixtures for Concrete

9. C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

10. C494/C494M - Standard Specification for Chemical Admixtures for Concrete

11. C979 - Standard Specification for Pigments for Integrally Colored Concrete

12. C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete

13. D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

14. D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

15. D3405 - Standard Specification for Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements

16. D5249 - Standard Specification for Backer Material for Use with Cold- and Hot- Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints

17. D5893 - Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements

B. American Concrete Institute (ACI)

1. 301R-99- Specifications for Structural Concrete

2. 304R- Placing and Handling Concrete, etc.

3. 309R-96- Guide for Consolidating of Concrete

4. 330.1 - Standard Specifications for Plain Concrete Parking Lots

5. 330R-92- Guide for Design & Construction of Concrete Parking Lots

6. 211.1R-91 -Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete

C. American Association of State Highway and Transportation Officials (AASHTO)

1. M182 - Standard Specifications for Burlap Cloth made from Jute for Kenaf

2. M153 - Standard Specifications for Preformed Sponge Rubber and Cork Expansion Joint Filler

1.06 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Perform work in accordance with local building and other applicable codes.

B. Installation: Performed only by skilled workmen with satisfactory record of performance on completed projects of comparable size and quality.

C. Inspection and Testing: Performed in accordance with Sections 01330, and 01410 unless otherwise specified:

1. Test cylinders- as per ASTM C-39.

a. Minimum of three (3) concrete test cylinders shall be taken for every 75 or less cubic yards of concrete placed.

b. Minimum of one (1) additional test cylinder shall be taken during any cold weather concreting and be cured on job site under same

conditions as the concrete it represents.

2. Slump test- as per ASTM C-143:

a. Minimum of one (1) slump test shall be taken for each set of test cylinders taken.

1.07 SUBMITTALS

A. Test Reports: Reports of concrete compression, yield, air content, and slump tests.

B. Certificates:

1. Manufacturer's certification that materials meet specification requirements.

2. Material content on a cubic yard basis of each class of concrete furnished.

a. Dry weights of cement.

b. Saturated surface-dried weights of fine and coarse aggregate.

c. Quantities, type and name of admixtures.

d. Weight of water.

3. Ready-mix delivery tickets, ASTM C-94.

C. Shop Drawings:

1. Show sizes and dimensions for fabrication and placing of reinforcing steel and bar supports.

2. Indicate bar schedules, stirrup spacing, and diagrams of bend bars.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size and length.

B. Handle and store materials to prevent contamination.

1.09 JOB CONDITIONS

A. Allowable concrete temperatures:

1. Hot weather: Maximum 90°F as per ASTM C-94.

B. Do not place concrete during rain, unless protection is provided.

PART 2 - PRODUCTS

2.01 FILL

A. As specified in Section 02741- Asphaltic Concrete Paving.

2.02 SUBGRADE

A. As specified in Section 02741 -Asphaltic Concrete Paving.

2.03 LIMEROCK BASE

A. As specified in Section 02741 -Asphaltic Concrete Paving.

2.04 READY-MIXED CONCRETE

A. Cement: ASTM C-150, normal Type 1.

B. Aggregate: ASTM C 33, uniformly graded, from a single source.

C. Water/Ready Mix Concrete: ASTM C 94.

D. Admixtures: Certified by manufacturer to contain not more than 0.1 % water-soluble chloride ions by mass of cement and to be compatible with other admixtures, as follows:

1. Air-Entraining Admixture: ASTM C 260;
2. Water-Reducing Admixture: ASTM C 494, Type A;
3. Water-Reducing and High-Range Admixture: ASTM C 494, Type F;
4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E; and,
5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
6. Fly ash and pozzolans: ASTM C-618.

E. Coarse aggregate: Not less than 50% clean, hard, crushed stone conforming to requirements of Table 2, size number 467 ASTM C-33.

F. Slump Range: 2-4 inches tested according to ASTM designation C-143 (AASHTO- T119).

G. Air content: 5% ± 1%.

H. Mix proportioning:

1. 28-day compressive strength of cured laboratory samples 3,000 psi.

2. Minimum cement content 5 sacks/cubic yard.

I. Calcium Chloride: The use of calcium chloride or admixtures containing more than 0.05% chloride ions is prohibited.

J. Curing Materials:

1. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry;

2. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap- polyethylene sheet;

3. Water: Potable.

4. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete;

5. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B;

6. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B;

7. White Waterborne Membrane-Forming Curing Compound; ASTM C 309, Type 2, Class B.

K. Mixes:

1. ASTM C-94.

2. Mix concrete only in quantities for immediate use.

3. Do not retemper or use set concrete.

2.05 CONCRETE MIXES AND MIXING

A. Concrete Mixes: Prepare design mixes, proportioned according to ACI 211.1R-91 and ACI 304, with the following properties:

1. Compressive Strength (28 Days): 3,000 psi; (curb/sidewalk)

B. Coloring Agent: When required, add coloring agent to mix according to manufacturer's written instructions.

1. Expansion and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork; and,

2. Coloring Agent: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

C. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.

D. Project-Site Mixing: On-site mixing must be approved by the Owner. Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

2.06 REINFORCEMENT

A. Reinforcing Steel Bars: 60 ksi yield strength; deformed billet steel bars; ASTM A-615, plain finish.

B. Welded Steel Wire Fabric: Plain type, ASTM A-185, hot dip galvanized, plain finish.

C. Tie Wire: FS QQ-W-461-G, annealed steel, black, 16 ga. minimum.

D. Bar Supports: Conform to "Bar Support Specifications," CRSI Manual of Standard Practice.

2.07 FORMWORK AND ACCESSORIES

A. Formwork: Matched, tight fitting and adequately stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of concrete, conform with ACU 347, Chapter 3, Material and Form Work.

B. Lumber:

1. Softwood framing lumber: Kiln dried, PS-20.

2. Boards less than 1-1/2-inch thick and 2-inches wide, used for basic forms and form liners: Kiln dried.

3. Grade marked by grading rules agency approved by American Lumber Standards Committee.

4. Light framing or studs for board or plywood forms, 2-inches to 4-inches width and thickness, construction standard grade.

5. Boards for basic forms, construction standard grade.

6. Board surface: Smooth.

C. Plywood:

1. Exterior type softwood plywood, PS 1-66.

2. Each panel stamped or branded indicating veneer grades, species, type and identification.

3. Wood faced plywood for Architectural concrete surfaces.

a. Panel veneer grades: B-C

b. Mill-oiled sides and mill-sealed edges of panels.

D. Ties

1. Material: Steel

2. Type: Snap tiles

3. Depth of break back: 1-inch.

E. Max. diameter: 1/4-inch

F. Form coatings:

1. Non-staining type.

2. Agent: Pine oil derivative.

2.08 ISOLATION AND CONTRACTION JOINTS

A. Minimum 3/4-inch-thick asphaltic impregnated fiberboard as per ASTM D-1751.

2.09 JOINTS, FILLERS, AND SEALANTS

A. Joint-Sealant Backer Materials: ASTM D5249, Non-Staining, compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

B. Joint Sealant: Non-priming, pourable self-leveling silicone sealant for concrete and asphalt.

1. Cold-Applied Joint Sealant ASTM D5893, self-leveling silicone sealant. Crafco Inc. "Roadwaver Silicone-SL"; Dow Coming "888, or 890-SL"; Sonneborn "Sonomeric 1 Sealant"; Tremco "Vulkem 45"; or approved equal and,

2. Hot-Applied Joint Sealant: ASTM D3405, Polymeric sealant. Crafco Inc. "ROADSAVER 22"; W.R. Meadows, Inc. "SEALTIGHT HI-SPEC", or approved equal.

C. Joint Fillers: Resilient pre-molded bituminous impregnated fiberboard units complying with ASTM D 1751, asphalt-saturated cellulosic fiber, ASSHTO M 153, Type I: or ASTM D 1752, cork or self-expanding cork.

D. Exterior Concrete Sealant: Sonneborn "Kure-N-Seal30" exterior acrylic sealer, or Euclid "Super Rez-Seal", or approved equal.

PART 3 - EXECUTION

3.01 BARRICADES

A. Provide substantial temporary barricades around all areas of operation and maintain until work under this section is completed and approved.

B. Install temporary traffic markers, signals, and signs as per D.O.T. Standard Specifications to:

1. Eliminate potentially hazardous conditions.

2. Maintain adequate traffic patterns free of conflict with work under this Contract.

3.02 PREPARATION OF SUBGRADE

A. Ensure rough grading has brought subgrade to required elevations.

B. Fill soft spots and hollows with additional fill.

C. Level and compact subgrade, to receive limerock base for concrete walks, curbs and gutters, to 98% compaction as per AASHTO T-180.

3.03 FORMWORK

A. The Contractor is responsible for the design, construction, removal and complete safety of formwork and shoring.

B. Form construction shall be provided to shape, lines dimensions of members shown: substantial, tight enough to prevent leakage, and properly braced or tied to maintain position and size, form sides and bottoms of members unless specifically excepted.

C. Fill voids of plywood joints with sealant and tool smooth.

D. Form vertical surfaces to full depth and securely position to required lines and levels. Ensure form ties are not placed so as to pass through concrete.

E. Arrange and assemble formwork to permit easy dismantling and stripping, and to prevent damage to concrete during formwork removal.

F. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations.

1. Maintain sufficient quantity of forms to allow continuance of work so that forms remain in place a minimum of 24 hours after concrete placement;

2. Forms shall be cleaned and casted with form release agent thoroughly after each use and before concrete is placed; and,

3. Flexible or curved forms shall be used on curves. Forms shall be of full depth of the concrete and of a strength when staked, sufficient to resist the presence of the concrete and the loads resulting from the finish operations without springing, setting or losing their shape.

3.04 REINFORCING

A. Reinforce concrete curbs and gutters. Allow for minimum 1-1/2-inch concrete cover.

B. Do not extend reinforcing through expansion and contraction of joints. Provide dowelled joints through expansion and contraction joints, with one end of dowels fitted with capping sleeve to allow free movement.

3.05 FORMING EXPANSION AND CONTRACTION JOINTS

A. Construct pre-molded expansion and contraction joints, tied construction joints, thickened edge expansion joints, isolation joints, and construction joints, straight with face perpendicular to concrete surface. Construct transverse joints perpendicular to centerline unless otherwise detailed.

1. Expansion joints and contraction joints, pre-molded as indicated on the drawings:

a. Provide joint filler for the entire depth of the slab section and not less than 1-inch below finished surface so as to allow for joint sealer.

b. Provide thickened edge expansion joint as indicated on the drawings.

c. Provide 1/2-inch contraction joints for curb and gutter at 10-feet on center.

d. Provide 1/2-inch expansion joints for curb and gutter and sidewalk at 100-feet on center.

2. Tied construction joints: As indicated on drawings;

3. Control joints: Depth shall be equal to of the concrete thickness or 1-inch, whichever is deeper. For sidewalks, control joint spacing shall be equal to the sidewalk width. For concrete pavement, control joint spacing shall be placed as shown on the drawings, no greater than 15-feet on center either way;

   a. Form tooled joints in fresh concrete by grooving top portion with recommended tool and finishing edges with jointer.

   b. Form sawed joints using powered saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into hardened concrete within 24 hours of the concrete placement and as soon as surface will not be tom, abraded, or otherwise damaged by cutting action.

4. Construction Joints: Place construction joints at end of placements and at locations where placement operations are stopped for period of more than 1h hour, except where such placements terminate at expansion joints. Construct joints using standard metal keyway-section forms or as shown on the drawings;

5. Isolation Joints: Locate isolation joints as indicated on the drawings. Provide premolded joint filler for isolation joints abutting site lighting poles, concrete curbs, catch basins, maintenance access structures, inlets, structures, walks and other fixed objects;

6. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 1-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together; and,

7. Joint Sealants: All joints shall be sealed with approved exterior pavement joint sealants and shall be installed per manufacturer's recommendations.

3.06 INSPECTION

A. Assure that excavation and formwork are completed, and excess water is removed.

B. Check that reinforcement is secured in place.

C. Verify that expansion joint material, anchors, and other embedded items are secured in position.

3.07 PREPARATION FOR PLACEMENT

A. Notify the Engineer and other inspectors at least 36 hours prior to inspection.

B. Equipment forms, and reinforcing shall be clean and wet down, reinforcing firmly secured in place, runways set up and not resting on or displacing reinforcing.

3.08 PLACING CONCRETE

A. Concrete Placement Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete. Place concrete in a continuous operation within planned joints or sections.

1. Moisten subbase to provide a uniform dampened condition at time concrete is placed;

2. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping according to recommendations in ACI 309R;

3. Screed and initial-float concrete surfaces with darby or bull float before excess moisture or bleed water appears on the surface;

4. Protect concrete from cold or hot weather during mixing, placing, and curing; and,

5. All concrete walks and aprons shall be a minimum of 4-inches thick as shown on the drawings, with a turned down edge as detailed.

B. Evaporation Retarder: Apply to concrete surfaces if hot, dry, or windy conditions exist. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Pavement Tolerances: Comply with tolerances in ACI 330.1, Specification for Plain Concrete Parking Lots.

D. Place concrete, screed and wood float surfaces to a smooth and uniform finish, free of open texturing and exposed aggregate.

E. Avoid working mortar to surface.

F. Round all edges, including edges of expansion and contraction joints, with ½-inch of radius edging tool.

G. Where concrete curbs are adjacent to pavement slabs, make concrete curbs and gutters integral with slabs. Make expansion and contraction joints of curbs coincide with slab joints.

H. Ensure finished surfaces do not vary from true lines, levels or grade by more than 1/8-inch in 10-feet when measured with straightedge.

I. Apply curing compound on finished surfaces immediately after finishing. Apply in accordance with manufacturer's recommendations.

3.09 FINISHES AND CURING

A. All exterior concrete shall receive a medium broom finish.

B. Curing: Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Cure concrete by one or a combination of the following methods:

1. Moisture cure concrete by water, continuous fog spray, continuously wet absorptive cover, or by moisture-retaining-cover curing. Keep surfaces continuously moist for at least 22 hours; and,

2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer’s written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3. Contractor shall protect against graffiti and other damages to finish, prior to curing and acceptance.

4. No sidewalk installed by the Contractor with visible cracks will be accepted by the Owner. Cracked sidewalk shall be removed, disposed of and replaced by the Contractor at no cost to the Owner. Cracked sidewalk replacement shall consist of a minimum of one flat (5-feet) of sidewalk.

C. All exterior concrete surface shall receive one coat of exterior sealer.

3.10 ADA DETECTABLE WARNINGS

A. Detectable warnings shall be installed at all locations where required, compliant with ADA guidelines and FDOT Index 304.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this section.

B. Protect concrete from damage. Provide adequate traffic control to prevent traffic from pavement for at least 14 days after placement.

C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than 2 days before date scheduled for substantial completion inspections.

D. Protection of Completed Work: During curing period, protect concrete from damaging mechanical disturbances, water flow, loading, shock, and vibration.

3.12 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

B. ACI Publications: Comply with ACI 301R-99 and ACI330R-92, unless modified by the requirements of the Contract Documents.

C. The Owner shall provide and pay for testing services. A slump test and air test shall be performed for each load delivered. Four standard test cylinders shall be taken for each 55 cubic yards of concrete or each day's pour, whichever is more frequent. Two cylinders shall be broken at 7 days and two cylinders shall be broken at 28 days.

3.13 CLEAN UP

A. Remove all debris and excess material immediately from project site.

B. Take down all barricades and temporary traffic markers, signals and signs only after all work included in this section is finished and inspected, and only after so directed by Owner or Engineer.

C. Leave project area neat, orderly and free of any hazardous conditions.

END OF SECTION

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SECTION 02846

PAVEMENT MARKINGS AND SIGNAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The Work included in this section consists of applying pavement markings as required for new pavement areas and to restore disturbed pavement areas and signage. Work shall adhere to all Village of Tequesta, Florida Department of Transportation (FDOT) and Palm Beach County standards.

1.02 RELATED REFERENCES

A. All markings shall conform to the requirements of the MUTCD, and FDOT Roadway and Traffic Design Standards.

B. Thermoplastic shall conform to the requirements of the FDOT Standard Specifications for Road and Bridge Construction (Section 711) latest edition.

C. Paint shall conform to the requirements of the FDOT Standard Specifications for Road and Bridge Construction (Section 710) latest edition.

1.03 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

PART 2 - PRODUCTS

2.01 THERMOPLASTIC

A. Stop bars, centerlines, crosswalk striping, directional arrows and any other markings within the right of way to be Alkyd thermoplastic only.

B. All other markings, including striping designating parking and loading spaces, to be paint type as shown on the plans.

2.02 TEMPORARY MARKINGS

A. Temporary markings on final asphalt shall be only backed construction tape. Lower asphalt lifts may be marked with paint or any other approved marking material.

2.03 REFLECTIVE PAVEMENT MARKERS (RPM'S)

A. RPM's shall meet FDOT Class B Specifications.

B. One blue RPM shall be installed in the center of any roadway adjacent to a fire hydrant.

2.04 SIGN PANELS

A. Aluminum or galvanized steel in accordance with the applicable requirements of Section 700 “Highway Signing” of the FDOT Standard Specifications.

B. Size, shape, and color as indicated on the drawings or as directed by the Engineer.

2.05 SIGN SUPPORT POSTS

A. Aluminum or galvanized steel in accordance with the applicable requirements of Section 700 “Highway Signing” of the FDOT Standard Specifications.

B. Size, shape and color as indicated on the drawings or as directed by the Engineer.

PART 3 - EXECUTION

3.01 APPLICATION

A. Sweep dust and loose material from the sealed surface.

B. Thermoplastic shall not be installed on a roadway until thirty (30) calendar days after final lift of asphalt has been completed.

C. If existing marking material is not compatible with Alkyd thermoplastic, it shall be removed prior to installation of new markings.

END OF SECTION

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SECTION 02936

SODDING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The Contractor shall furnish all labor, equipment, and materials necessary for grassing all areas disturbed by his operations and any other areas on the plans indicated to receive grassing. It is the intent of this specification that damaged areas are to be replaced in kind, with sod to be used for all maintained yard areas. The Contractor shall take all steps practical to minimize the area required to be sodded. All grassing shall be in accordance with Section 570-1 through 570-5 of the FDOT Standard Specifications for Road and Bridge Construction, except as modified herein.

1.02 STORAGE OF MATERIALS

A. The Contractor shall provide space for storage of sod prior to placement in a manner that will not endanger or restrict pedestrian or vehicular traffic or interfere with other aspects of the Work.

1.03 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Drawings and general provisions of the Contract, including the General Conditions and Terms and Division 1 Specification sections, apply to this section.

PART 2 - PRODUCTS

2.01 SOD

A. Types: Sod shall be St. Augustine Floratam, Argentine Bahia, Centipede, or Bermuda, depending on type of existing sod in adjacent area to be matched. Sod shall be well matted with roots. Where sodding will adjoin, or be in sufficiently close proximity to private lawns, types of sod other than those listed above may be used if desired by the affected property owners and approved by the Engineer. Sod shall be delivered in commercial-size rectangles, preferably 12-inch by 24-inch or larger.

B. Condition: The sod shall be sufficiently thick to secure a dense stand of live grass. The sod shall be live, fresh, and uninjured at the time of planting. It shall have a soil mat of sufficient thickness adhering firmly to the roots to withstand all necessary handling. It shall be reasonably free of weeds and other grasses. It shall be planted as soon as possible after being dug and shall be kept moist from the time it is planted.

2.02 GRASSING EQUIPMENT

A. Rollers: A cultipacker, traffic roller, or other suitable equipment will be required for rolling the grassed areas.

PART 3 - EXECUTION

3.01 GENERAL CONSTRUCTION METHODS

A. No grassing shall be done when the ground is unduly wet or otherwise not in a suitable condition. Whenever a suitable length of right-of-way, disturbed area, or other area has been graded, it shall be made ready, when directed by the Owner/Engineer, and grassed in accordance with these specifications. Grassing shall be incorporated into the project at the earliest practical time in the lift of the Contract.

3.02 SODDING

A. Preparation of Area to be Sodded: The ground which is to receive sod shall have been graded to proper elevations (2-inch below sodded grade) to match pre-construction conditions or proposed grades. All disturbed swales and ditches shall have been restored to their pre-construction condition or better. The pre-construction grade shall be maintained, and the prepared soil shall be loose and reasonably smooth. It shall be reasonably free of large clods, roots, patches of existing grass, and other material which will interfere with the sod-laying operations or subsequent mowing and maintenance operations.

B. Laying of Sod: Sod shall be installed in all areas so designated by the Owner/Engineer. Sod shall be carefully placed so that each piece abuts flush to all surrounding sod, regardless of whether surrounding sod is new or existing. All sod joints shall be staggered. Where new sod is to be placed adjacent to existing sod, the new sod must be cut in to match the elevation of the existing sod. Uneven sod which might cause mowing problems will be rejected. New sod laid on top of existing sod will also be rejected. All sod placed on steep slopes (greater than 1:1) shall be pinned with a wooden pin to keep it in place.

C. Rolling: Immediately after completion of the sod laying, the entire sodded area shall be rolled thoroughly with the equipment specified. At least two trips over the entire area will be required.

D. Watering: Newly sodded areas are to be watered by the Contractor as necessary to keep sod alive until the Contractor is closed out. Dead sod shall be replaced by the Contractor prior to contract closeout.

END OF SECTION

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SECTION 03100

CONCRETE FORMING

PART I - GENERAL

1.01 WORK INCLUDED

A. Formwork for cast-in place concrete, with shoring, bracing, and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

1.02 RELATED SECTIONS SPECIFIED ELSEWHERE

A. Section 03300 - Cast-in-Place Concrete

1.03 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

C. ACI 347 - Recommended Practice for Concrete Formwork.

D. PS 1 - Construction and Industrial Plywood.

E. Florida Building Code, Latest Edition

1.04 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 318.

B. Maintain one copy of each document on site.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for design, fabrication, erection, and removal of formwork.

1.06 COORDINATION

A. Coordinate this Section with other Sections of work which require attachment of components to formwork.

B. Coordinate formwork with reinforcement installation to provide sufficient concrete cover over reinforcement.

PART II - PRODUCTS

2.01 WOOD FORM MATERIALS

A. Form Materials: At the discretion of the Contractor.

2.02 FORMWORK ACCESSORIES

A. Wall Form Ties: Removable Snap-off type, 316 stainless steel, fixed length, cone type, with waterproofing rubber washer, 1-1/2 inch back break dimension, free of defects that could leave holes larger than 1-inch in concrete surface.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.

C. Corners Chamfer, wood strip type; 3/4 x 3/4-inch size; maximum possible lengths.

D. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

PART III – EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 EARTH FORMS

A. Earth forms are not permitted.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 318.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

D. Align joints and make watertight. Keep form joints to a minimum.

E. Obtain approval before framing openings in structural members which are not indicated on Drawings.

F. Provide chamfer strips on external corners of all exposed concrete elements.

G. Induce camber on existing roof slab structure prior to casting concrete.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes applied coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water.

D. Keep surfaces coated prior to placement of concrete.

3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in or passing through concrete work.

B. Locate and set in place items which will be cast directly into concrete.

C. Coordinate with Work of other sections in forming and placing openings, slots, regrets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

D. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Install waterstops continuous without displacing reinforcement. Heat seal joints watertight. Conform to manufacturers recommendations.

F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.06 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

C. Use compressed air to remove remaining foreign matter.

3.07 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 318.

B. Camber slabs and beams 1/4 inch per 10 feet in accordance with ACI 318.

3.08 FIELD QUALITY CONTROL

A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

B. Do not reuse wood formwork more than three times for concrete surfaces to be exposed to view.

3.09 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms in a manner such that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

END OF SECTION

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SECTION 03300

CAST-IN-PLACE CONCRETE

PART I - GENERAL

1.01 Notice: Engineer shall be given 48 hours advance notice to all concrete placements and no concrete shall be placed without approval of Engineer.

1.02 WORK INCLUDED

A. Cast-in-place concrete foundations, walls, slab-on-grade, equipment pads, underground concrete vaults and structures, pipe supports, curbs, and sidewalks.

1.03 RELATED SECTIONS SPECIFIED ELSEWHERE

A. Section 01300 – Submittals

B. Section 01410– Testing Laboratory Services

C. Section 03100 - Concrete Forming

1.04 REFERENCES

A. ACI 301 - Specifications for Structural Concrete for Buildings.

B. ACI 318 - Building Code Requirements for Reinforced Concrete

C. ASTM C33 - Concrete Aggregates.

D. FDOT Standard Specifications for Road and Bridge Construction

E. ASTM C94 - Ready-mixed Concrete.

F. ASTM C150 - Portland Cement.

G. ASTM C260 - Air Entraining Admixtures for Concrete.

H. ASTM C494 – Chemical Admixtures for Concrete

I. ASTM C618 – Pozzolonic Materials.

1.05 QUALITY ASSURANCE

A. Perform Work: In accordance with ACI 301 and FDOT Standard Specifications.

B. Obtain materials from same source throughout the Work.

C. Submit manufacturer's certification that materials meet specification requirements.

D. Submit ready-mix delivery tickets, ASTM C94-78.

1.06 TESTS

A. Testing and analysis of concrete will be performed under provisions of this Section and Section 01 45 20.

B. Submit proposed mix design of each class of concrete to Engineer for review prior to commencement of work in accordance with Submittal Section. Submittal shall include proposed location for each class of concrete.

C. Independent Testing laboratory shall take cylinders and perform slump and air entrainment tests in accordance with ACI 301.

D. Provide 5 cylinders per set. Test one at 3 days, one at 7 days, two at 28 days, and hold one.

E. Slump tests shall be taken for every truck delivery and each set of test cylinders taken.

F. In general, cylinders shall be taken for each concrete pour event, and every 50 cubic yards placed.

G. All tests failing minimum specified criteria shall be billed to and paid for by the Contractor.

1.07 SUBMITTALS

A. Submit product data under provisions of Section 01 33 00 for fine and coarse aggregates, admixtures, concrete mix design, joint devices, attachment accessories, and curing compounds.

PART II - PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150 -Type II Cement.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: Clean potable water.

2.02 ADMIXTURES

A. Air Entrainment: ASTM C260. Use Darex II AEA or equal.

B. Water-reducing admixture may be used and must meet ASTM C-494 as a Type A and Type D. Use WRDA 64 or equal. Add in accordance with ACI-350.

C. Use of calcium chloride is not permitted.

D. Air entraining agent to normal weight concrete mix if used, shall not exceed 4%.

E. Superplasticizers, if used, must meet all ASTM requirements and have compatibility test results with approved mix design.

2.03 CONCRETE MIX

A. Mix concrete in accordance with ASTM C94.

B. Provide concrete to satisfy the following requirements

1. Compressive Strength (28 days): 4000 psi
2. Water/Cement ratio: maximum 0.48 without admixtures by weight.
3. Fly Ash (Recommended) Content: maximum 15% of cement content, Type F only.
4. Slump 4 $\pm$ 1 inch regular, 7-8 inch with superplasticizer, 6-8 inch pea rock pump mix.

C. Use set-retarding admixtures during hot weather only when approved by Engineer.

D. Air entraining agent may be considered in concrete mix; however, content must be kept to a minimum and carefully monitored for addition to mix design.

2.04 ACCESSORIES

A. Vapor Barrier: 10 mil thick clear polyethylene film, type recommended for below-grade application.

B. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

C. Water Stop (Other): Bentonite type strips Rx101, or applicable to condition, as manufactured by Volclay, or equal.

D. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture.

E. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel or Stainless-steel type; size and shape as required. Do not use concrete or clay bricks to support reinforcing.

F. Backing rod and sealant as indicated on drawings for construction joints.

PART III - EXECUTION

3.01 INSPECTION

A. Verify reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

B. Verify site dewatering conditions. All foundations shall be cast in the dry.

C. Verify requirements for concrete cover over reinforcement.

D. Clean forms of trash, wood, excess steel, and deleterious materials.

3.02 PREPARATION

A. Install vapor barrier under all slabs, footings, and other concrete exposed to earth. Lap joints a minimum of 6 inches. Do not disturb or damage vapor barrier while placing concrete. Repair damaged vapor barrier.

B. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, clean holes, insert steel dowels and epoxy in accordance with manufacturer's installation instructions keeping the minimum embedments specified on drawings.

C. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3.03 PLACING CONCRETE

A. Notify Engineer and Owner's Representative minimum 48 hours prior to commencement of concreting operations.

B. Place concrete in accordance with ACI 301 and FDOT Standard Specifications.

C. Hot Weather Placement ACI 301.

D. Cold Weather Placement ACI 301.

E. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

F. Place concrete continuously between predetermined construction and control joints. Do not break or interrupt successive pours such that cold joints occur.

G. Contractor shall be responsible for means and methods to ensure concrete is poured in a dry area.

H. Contractor needs to use mechanical vibrating equipment for consolidating concrete and should have a minimum of two (2) operable vibrators on the job.

I. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

J. Saw cut curb joints within 24 hours after placing. Use 3/16-inch-thick blade, cut 1/4 of slab thickness.

K. Screed floors level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.04 FINISHING

A. Provide formed concrete walls, columns, beams, Class 5 finish above the water line.

B. Finish concrete floor surfaces in accordance with ACI 301 steel trowel finish.

C. Finish exterior walking surfaces with light broom.

3.05 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Water cure concrete surfaces in accordance with ACI 301 for 7 days or apply curing compound.

C. Contractor shall use curing compounds for vertical surfaces.

3.06 PATCHING

A. Notify Engineer immediately upon removal of forms. No surfaces are to be patched or backfilled prior to being reviewed by the Engineer.

B. Patch imperfections as requested by the Engineer or his field representative in accordance with ACI 301 and FDOT Standard Specifications.

C. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.

3.07 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required levels, lines, details, elevations, dimensions, tolerances, or specified requirements.

B. Repair or replace concrete not properly placed will be determined by the Engineer or Owner's Representative.

C. Unless the removal of a defective slab is required by the Engineer, defective surfaces, such as honeycomb, shall be cut out entirely until homogeneous concrete is met, even if it means going through the slab.

D. Such areas shall be coated with an approved epoxy bonding material, which shall be applied in accordance with the manufacturer's instruction, before damp packing the area with a mix consisting of one part of Portland cement and two parts of sand and fine gravel, epoxy and sand mix, or any combination of materials and mixes as the situation dictates in the opinion of the Engineer.

E. The water content of the damp-pack material shall be such that a ball of the mix may be squeezed in the hand without bringing free water to the surface.

F. Damp-pack material shall be tamped into place and finished to match adjacent concrete surfaces.

G. Particular care shall be taken that no sagging of the material will occur.

H. The bond between any two layers of damp-pack shall be improved through the use of an approved epoxy bond agent.

I. Surfaces which have been damp-packed shall be kept continuously damp during and for a period of not less than seven days after completing the damp-pack operation, by polyethylene coverings thoroughly taped to the original concrete surface in a manner that loss of moisture, evidenced by lack of water droplets on the inside surface of the polyethylene, is avoided. If this moisture condition cannot be maintained, a continuous water cure may be required by the Engineer.

J. Under no circumstances shall Contractor apply a plaster coat over the honeycomb areas to conceal the existence of the honeycomb in the concrete.

K. Neither Embeco nor calcium chloride shall be used for filling honeycomb areas, nor shall they be mixed with damp-pack material.

L. Any concrete with excess air entraining agent will be rejected.

3.08 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 71 23.

B. Contractor will be required to contact Testing Lab to be present for concrete deliveries.

C. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

END OF SECTION

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APPENDIX A

ARMY CORPS OF ENGINEERS PERMIT

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, JACKSONVILLE DISTRICT
4400 PGA BOULEVARD, SUITE 500
PALM BEACH GARDENS, FLORIDA 33410

July 12, 2024

Regulatory Division
South Permits Branch
Palm Beach Gardens Section
SAJ-2022-00959 (NWP-JLA)

Village of Tequesta
Attn: Marjorie Craig
345 Tequesta Drive
Tequesta, Florida 33489
Sent via email: Mcraig@tequesta.org

Dear Ms. Craig:

The U.S. Army Corps of Engineers (Corps) has completed the review of your application for a Department of the Army permit received on March 26, 2024. Your application was assigned file number SAJ-2022-00959. A review of the information and drawings provided indicates that the project would result in the placement of approximately 1,127-linear feet of 12-inch HDPE watermain via the horizontal directional drill (HDD) method with an 18-inch bore. The subaqueous portion will be under the Indian River with a minimum of 25-feet below the existing grade of the federal channel.

Location	Latitude	Longitude
Entry Point	26.95237°	-80.07708°
Exit Point	26.95233°	-80.08058°

The activities subject to this permit are authorized pursuant to authorities under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403) and Section 14 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 408). The project is located in Waters of the US below the Indian River, south of the Beach Road Bridge (Section 15, Township 40 South, Range 43 East), Village of Tequesta, Martin County, Florida.

Your project, as depicted on the enclosed drawings (Attachment B), is authorized by Nationwide Permit (NWP) 58 (Utility Line Activities for Water and Other Substances). **This verification is valid until March 14, 2026.** In order for this NWP authorization to be valid, you must ensure that the work is performed in accordance with the Nationwide Permit General Conditions, the Jacksonville District Regional Conditions, and the General and Project-Specific Special Conditions listed below. Furthermore, if you commence or are under contract to commence this activity before the date that the

relevant NWP is modified or revoked, you will have 12 months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP. You can access the U.S. Army Corps of Engineers' (Corps) Jacksonville District's Regulatory Source Book webpage for links to view NWP information at: https://www.saj.usace.army.mil/Missions/Regulatory/Source-Book/. Please be aware this Internet address is case sensitive and should be entered as it appears above. Once there, you will need to select "Nationwide Permits." Among other things, this part of the Source Book contains links to the federal register containing the text of the pertinent NWP authorization and the associated NWP general conditions, as well as separate links to the regional conditions applicable to the pertinent NWP verification.

You must comply with all of the special and general conditions for NWP-58, including any project-specific conditions included in this letter and all conditions incorporated by reference as described above.

General Conditions:

1. The time limit for completing the work authorized ends on **March 14, 2026**.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity, or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort of if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit you must obtain the signature of the new owner on the attached transfer form (Attachment A) and forward a copy to this office to validate the transfer of this authorization.

5. You must allow a representative from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Project Specific Special Conditions:

The following project specific special conditions are included with this verification:

1. **Reporting Address:** The Permittee shall submit all reports, notifications, documentation and correspondence required by the general and special conditions of this permit to either (not both) of the following addresses:

    a. For electronic mail (preferred): SAJ-RD-Enforcement@usace.army.mil (not to exceed 15 MB).
    b. For standard mail: U.S. Army Corps of Engineers, Regulatory Division, Enforcement Section, P.O. Box 4970, Jacksonville, Florida 32232-0019.

The Permittee shall reference this permit number, SAJ-2022-00959 (NW-JLA), on all submittals.

2. **Commencement Notification:** Within 10 days from the date of initiating the work authorized by this permit the Permittee shall submit a completed "Commencement Notification" Form (Attachment C).

3. **Notice of Permit:** The Permittee shall complete and record the "Notice of Department of the Army Authorization" form (Attachment D) with the Clerk of the County Court, Registrar of Deeds or other appropriate official charged with the responsibility of maintaining records of title to or interest in real property within the county of the authorized activity. No later than 90 days from the effective date of this permit, the Permittee shall provide a copy of the recorded Notice of Permit to the Corps clearly showing a stamp from the appropriate official indicating the book and page at which the Notice of Permit is recorded in the official records and the date of recording.

4. **Notification of Work:** National Ocean Service (NOS) has been notified of this authorization. You must notify NOS and this office in writing, at least two weeks before you begin work and upon completion of the activity authorized by this permit. The post-construction notification will include "as-built plans" by a registered surveyor/engineer licensed in the State of Florida, that certify the project is constructed as authorized; and must include an accurate depiction of the location and configuration of the completed activity in relation to the mean high water or ordinary high water of the navigable water. The Permittee shall notify the District Engineer in writing at U.S. Army Corps of Engineers, Regulatory Division, Enforcement Section, P.O. Box 4970, Jacksonville, FL 32232-0019; and, the NOAA, either in mailed correspondence to Nautical Data

Branch Office of Coast Survey N/CS26, 1315 East-West Highway, Silver Spring, MD 20910-3282 or by electronic mail correspondence, with the requisite documents attached, through ocs.ndb@noaa.gov.

5. **As-Built Certification with X-Y-Z Coordinates:** Within 60 days of completion of the work authorized by this permit, the Permittee shall submit as-built drawings of the authorized work and a completed "As-Built Certification by Professional Engineer or Surveyor" form (Attachment E) to the Corps. The as-built drawings shall be signed and sealed by a registered professional engineer or surveyor and include the following:

    a. A plan view drawing of the location of the authorized work footprint (as shown on the permit drawings) on 8½-inch by 11-inch paper. The drawings shall include the X Y & Z State Plane coordination points of the object above the channel as it enters and exits the design edges of the authorized width of the channel, plus a minimum of 25 feet outside the channel edges.

    b. A list of any deviations between the work authorized by this permit and the work as constructed. In the event that the completed work deviates, in any manner, from the authorized work, describe on the attached "As-Built Certification by Professional Engineer" form the deviations between the work authorized by this permit and the work as constructed. Clearly indicate on the as-built drawings any deviations that have been listed. Please note that the depiction and/or description of any deviations on the drawings and/or "As-Built Certification by Professional Engineer" form does not constitute approval of any deviations by the Corps.

    c. The Department of the Army permit number on all sheets submitted.

6. **Assurance of Navigation and Maintenance:** The Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

7. **Cultural Resources/Historic Properties:**
    a. No structure or work shall adversely affect impact or disturb properties listed in the National Register of Historic Places (NRHP) or those eligible for inclusion in the NRHP.

    b. If, during permitted activities, items that may have historic or archaeological origin are observed the Permittee shall immediately cease all activities adjacent to the discovery that may result in the destruction of these resources and shall prevent his/her employees from further removing, or otherwise damaging, such resources. The applicant shall notify both the Florida Department of State, Division of Historical Resources, Compliance Review Section at (850)-245-6333 and the Corps, of the observations within the same business day (8 hours). Examples of submerged historical, archaeological or cultural resources include shipwrecks, shipwreck debris fields (such as steam engine parts, or wood planks and beams), anchors, ballast rock, concreted iron objects, concentrations of coal, prehistoric watercraft (such as log "dugouts"), and other evidence of human activity. The materials may be deeply buried in sediment, resting in shallow sediments or above them, or protruding into water. The Corps shall coordinate with the Florida State Historic Preservation Officer (SHPO) to assess the significance of the discovery and devise appropriate actions. Project activities shall not resume without verbal and/or written authorization from the Corps.

    c. Additional cultural resources assessments may be required of the permit area in the case of unanticipated discoveries as referenced in accordance with the above Special Condition and, if deemed necessary by the SHPO or Corps, in accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend, or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO for finds under his or her jurisdiction, and from the Corps.

    d. In the unlikely event that unmarked human remains are identified on non-federal lands; they will be treated in accordance with Section 872.05 Florida Statutes. All work and ground disturbing activities within a 100-meter diameter of the unmarked human remains shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archaeologist within the same business day (8-hours). The Corps shall then notify the appropriate SHPO. Based on the

circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend, or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the SHPO and from the Corps.

8. **In the Event of a Frac-Out:** Should a frac-out and release of drilling fluids occur within navigable waters of the U.S., and in-water work is required to remediate the action, the Permittee shall comply with the following special conditions:

    a. Frac-Out Contingency Plan: The Permittee shall comply with the frac-out contingency plan (Attachment H).

    b. Turbidity Barriers: Prior to the initiation of any in-water work due to a frac-out, the Permittee shall install floating turbidity barriers with a weighted skirt around all work areas that are in, or adjacent to, surface waters. The turbidity barriers shall remain in place and be maintained until the authorized work has been completed and all suspended and erodible materials have been stabilized. Turbidity barriers shall be removed upon stabilization of the work area.

    c. Manatee Conditions: The Permittee shall comply with the “Standard Manatee Conditions for In-Water Work – 2011” (Attachment F)

    d. Jacksonville District Programmatic Biological Opinion (JAXBO): Structures and activities authorized under this permit will be constructed and operated in accordance with all applicable PDCs contained in the JAXBO, based on the permitted activity. Johnson’s seagrass and its critical habitat were delisted from the Endangered Species Act on May 16, 2022. Therefore, JAXBO PDCs required to minimize adverse effects to Johnson’s seagrass and its critical habitat are no longer applicable to any project. Failure to comply with applicable PDCs will constitute noncompliance with this permit. In addition, failure to comply with the applicable PDCs, where a take of listed species occurs, would constitute an unauthorized take. The NMFS is the appropriate authority to determine compliance with the Endangered Species Act. The most current version of JAXBO can be accessed at the Jacksonville District Regulatory Division website in the Endangered Species section of the Sourcebook located at: http://www.saj.usace.army.mil/Missions/Regulatory/SourceBook.aspx

JAXBO may be subject to revision at any time. The most recent version of the JAXBO must be utilized during the design and construction of the permitted work.

9. **Erosion Control:** Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the work area into waters of the United States. The erosion control measures shall remain in place and be maintained until all authorized work is completed and the work areas are stabilized.

10. **Horizontal Directional Drilling (HDD):** Any directional boring vaults, junction boxes and/or pads will not be constructed within 50 feet of the top of the bank of the waterway.

11. **Eastern Indigo Snake Protection Measures and Inspection:** Permittee shall comply with U.S. Fish and Wildlife Service's "Standard Protection Measures for the Eastern Indigo Snake" dated August 12, 2013, as provided in Attachment G of this permit. All gopher tortoise burrows, active or inactive, shall be evacuated prior to site manipulation in the vicinity of the burrow. If excavating potentially occupied burrows, active or inactive, individuals must first obtain state authorization via a Florida Fish and Wildlife Conservation Commission (FWC) Authorized Gopher Tortoise Agent permit. The excavation method selected shall minimize the potential for injury of an indigo snake. The Permittee shall follow the excavation guidance provided in the most current FWC Gopher Tortoise Permitting Guidelines found at http://myfwc.com/gophertortoise. If an indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Holes, cavities, and snake refugia other than gopher tortoise burrows shall be inspected each morning before planned site manipulation of a particular area, and if occupied by an indigo snake, no work shall commence until the snake has vacated the vicinity of the proposed work.

12. **Notification of Unmarked Utilities:** No work shall be performed until after the permittee provides notification to the owner(s) or operator(s) of any marked utilities in the work area, unless the permittee is the same entity as the owner(s) or operator(s).

13. **Seagrass and Monitoring and Reporting Timeframes**: The Permittee shall comply with the following monitoring and reporting requirements to document any indirect impacts to submerged aquatic vegetation:

a. Perform a pre-construction aquatic resource survey documenting the location, species, and percent coverage of all onsite seagrass within 30 days from the date of initiating in-water work. Perform a post-construction survey within 30 days of completion of in-water work that documents the location of the onsite seagrass.
b. Submit both the pre and post construction surveys and report within 60 days from the completion of the post construction survey. The report shall include a summary of the pre and post surveys and indicate any direct or secondary impacts to the adjacent seagrass and corals. The report will be submitted to the Corps reporting address in special condition 1. Upon review of the report, the Corps will determine whether additional mitigative measures are required.

14. **Individual Section 408 Approval:** It has been determined that the activities authorized do not impair the usefulness of the Earman River and are not injurious to the public interest. The Permittee shall adhere to the conditions and limitations referenced in the Section 408 approval memo, 408-2023-0183 in Attachment I of this permit. All documentation required in the Section 408 approval memo, including insert items listed in the approval letter. Examples: GPS locations, limits of work performed, signed and sealed As-Built Drawings, the date the work was performed, etc. shall be submitted either electronically by email at ENPermits.CESAJ@usace.army.mil or by standard mail at Post Office Box 4970, Jacksonville Florida 32232-0019. For all questions related to the Section 408 approval, contact the Corps, Jacksonville Engineering Division by telephone at 904-232-2757. Engineering Division is the appropriate authority to determine compliance with the terms and conditions of Section 408 approval.

15. **Consent to Easement:** A portion of the authorized work may be located within the Federal right-of-way and therefore, may require a Department of the Army Consent to Easement. The Permittee shall complete the “Application for Consent to Cross U.S. Government Easement” (Attachment J) and submit to the Corps Real Estate Division SAJ-RE-Consent@usace.army.mil or Post Office Box 4970, Jacksonville, Florida 32232-0019 or by telephone at 904-570-4514. The application should include a boundary survey map along with the authorized construction plans and specifications for the project. Prior to commencement of construction, the Permittee shall provide a copy of the Corps approved Consent to Easement, or correspondence from the Real Estate Division indicating that a

Consent to Easement is not required, to the address identified in the **Reporting Address Special Condition**.

This letter of authorization does not include conditions that would prevent the 'take' of a state-listed fish or wildlife species. These species are protected under sec. 379.411, Florida Statutes, and listed under Rule 68A-27, Florida Administrative Code. With regard to fish and wildlife species designated as species of special concern or threatened by the State of Florida, you are responsible for coordinating directly with the Florida Fish and Wildlife Conservation Commission (FWC). You can visit the FWC license and permitting webpage (http://www.myfwc.com/license/wildlife/) for more information, including a list of those fish and wildlife species designated as species of special concern or threatened. The Florida Natural Areas Inventory (http://www.fnai.org/) also maintains updated lists, by county, of documented occurrences of those species.

This letter of authorization does not give absolute Federal authority to perform the work as specified on your application. The proposed work may be subject to local building restrictions mandated by the National Flood Insurance Program. You should contact your local office that issues building permits to determine if your site is located in a flood-prone area, and if you must comply with the local building requirements mandated by the National Flood Insurance Program.

This letter of authorization does not preclude the necessity to obtain any other Federal, State, or local permits, which may be required.

Thank you for your cooperation with our permit program. The Corps' Jacksonville District Regulatory Division is committed to improving service to our customers. We strive to perform our duty in a friendly and timely manner while working to preserve our environment. We invite you to complete our automated Customer Service Survey at https://regulatory.ops.usace.army.mil/customer-service-survey/. Please be aware this Internet address is case sensitive and you will need to enter it exactly as it appears above. Your input is appreciated – favorable or otherwise.

Should you have any questions related to this NWP verification or have issues accessing the documents referenced in this letter, please contact Jennifer Alexander at the Palm Beach Gardens Permits Section at 4400 PGA Boulevard, Suite 500, Palm Beach Gardens, Florida 33410, by telephone at 561-785-3961, or by email at Jennifer.L.Alexander@usace.army.mil.

Sincerely,

Jennifer L Alexander

Jennifer L. Alexander
Project Manager

Enclosures
Attachment A – Transfer Form
Attachment B – Drawings
Attachment C – Commencement Form
Attachment D – Notice of Permit
Attachment E – Certification Form with XYZ
Attachment F – Standard Conditions for Manatees
Attachment G – Standard Conditions for Eastern Indigo
Attachment H – Frac-out plan
Attachment I – Section 408 Memo
Attachment J – Consent to Easement

Cc:
Agent
CESAJ-RD-E
CESAJ-EN
CESAJ-RE
National Ocean Service (NOS)

DEPARTMENT OF THE ARMY PERMIT TRANSFER REQUEST

DA PERMIT NUMBER: SAJ-2022-00959 (NWP-JLA)

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. Although the construction period for works authorized by Department of the Army permits is finite, the permit itself, with its limitations, does not expire.

To validate the transfer of this permit and the associated responsibilities associated with compliance with its terms and conditions, have the transferee sign and date below and mail to the U.S. Army Corps of Engineers, Enforcement Section, Post Office Box 4970, Jacksonville, FL 32232-0019 or submit via electronic mail to: SAJ-RD-Enforcement@usace.army.mil (not to exceed 15 MB).

_____
(TRANSFEREE-SIGNATURE)

_____
(DATE)

_____
(NAME-PRINTED)

_____

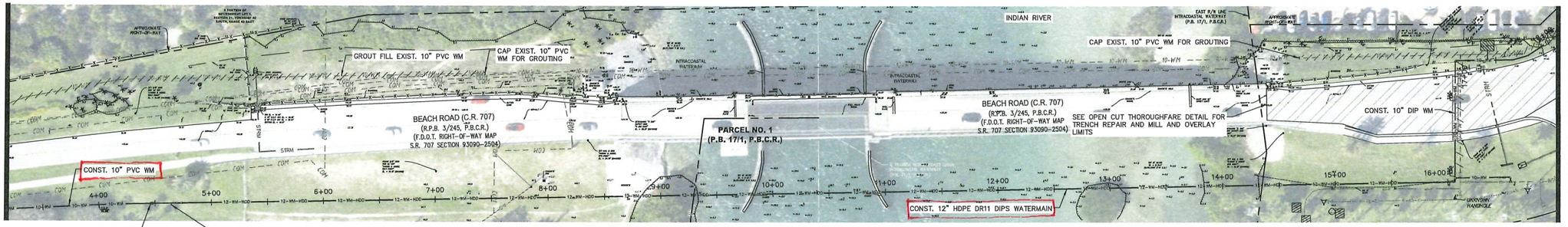
_____
(MAILING ADDRESS)

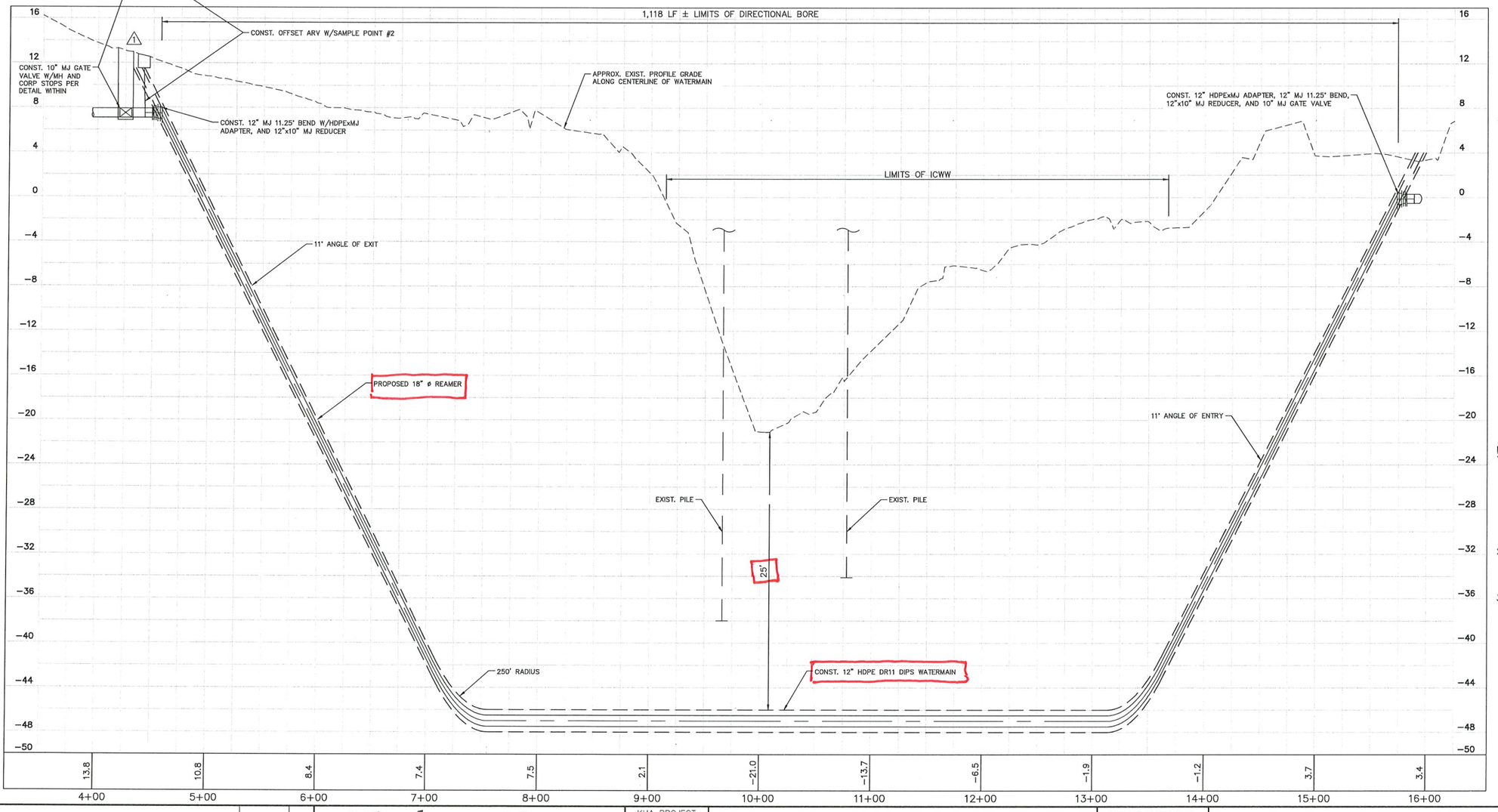
_____
(CITY, STATE, ZIP CODE)

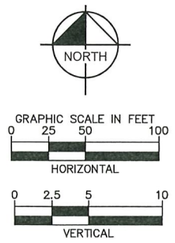
_____
(SUBDIVISION)

_____ _____
(LOT) (BLOCK)

_____
(STREET ADDRESS)







NOTES:
1. ALL CONFLICTS HAVE BEEN NUMBERED AND LABELED. SEE WATERMAIN CROSSING TABLE ON THIS SHEET. FOR CROSSINGS OF THE PROPOSED WATERMAIN OVER AN EXISTING UTILITY, THE TOP OF PIPE IS GIVEN FOR THE UTILITY. FOR CROSSINGS OF THE PROPOSED WATERMAIN UNDER AN EXISTING UTILITY, THE BOTTOM OF PIPE IS GIVEN FOR THE UTILITY.
2. ALL AC WM THAT IS CUT OUT TO MAKE CONNECTIONS SHALL BE PROPERLY BAGGED AND DISPOSED OF IN ACCORDANCE WITH LATEST AC MATERIAL DISPOSAL GUIDELINES.
3. NO AC PIPE THAT IS CUT FOR CONNECTIONS OR TO MAKE GROUT FILL CONNECTIONS WILL BE CRUSHED AND LEFT IN THE TRENCH.

100% SUBMITTAL

CALL 2 WORKING DAYS BEFORE YOU DIG
IT'S THE LAW! DIAL 811
Know what's below. Call before you dig.
SUNSHINE STATE ONE CALL OF FLORIDA, INC.

No.	REVISIONS	DATE	BY
1	ADD ARV/ SP#3	8/23/22	TCJ

Kimley»Horn

1920 WEKIVA WAY SUITE 200, WEST PALM BEACH, FL 33411
PHONE: 561-845-0665 FAX: 561-863-8175
WWW.KIMLEY-HORN.COM REGISTRY NO. 35106

KHA PROJECT 040097031
DATE JAN. 2024
SCALE AS SHOWN
DESIGNED BY SS
DRAWN BY MJM
CHECKED BY TCJ

WATER MAIN REPLACEMENT PROGRAM - PROJECT NO. 2

PREPARED FOR
VILLAGE OF TEQUESTA
TEQUESTA FLORIDA

LICENSED PROFESSIONAL
THOMAS C. JENSEN, P.E.
FLORIDA LICENSE NUMBER
37290
DATE: _____

WATER MAIN PLAN (DIRECTIONAL DRILL)

SHEET NUMBER
C-5

COMMENCEMENT NOTIFICATION

Within ten (10) days of initiating the authorized work, submit this form to via electronic mail to saj-rd-enforcement@usace.army.mil (preferred, not to exceed 15 MB) ***or*** *by standard mail to U.S. Army Corps of Engineers, Enforcement Section, P.O. Box 4970, Jacksonville, FL 32232-0019.*

1. **Department of the Army Permit Number**: SAJ-2022-00959(NW-JLA)

2. **Permittee Information**:

   Name: _____

   Email: _____

   Address: _____

   _____

   Phone: _____

3. **Construction Start Date**: _____

4. **Contact to Schedule Inspection**:

   Name: _____

   Email: _____

   Phone: _____

_____
Signature of Permittee

_____
Printed Name of Permittee

_____
Date

Prepared by:

Permittee: _____

Address: _____

_____

Phone:_____

NOTICE OF DEPARTMENT OF THE ARMY PERMIT

TAKE NOTICE the United States Army Corps of Engineers (Corps) has issued a permit or verification SAJ-2022-00959 to Village of Tequesta (Permittee) on July 12, 2024, authorizing work in navigable waters of the United States in accordance with Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) on a parcel of land known as Folio/Parcel ID: _____ located in Waters of the US below the Indian River, south of the Beach Road Bridge (Section 15, Township 40 South, Range 43 East), Village of Tequesta, Martin County, Florida.

Within 30 days of any transfer of interest or control of said property, the Permittee must notify the Corps in writing of the property transfer by submitting the completed permit transfer page included with the issued permit or verification. Notification of the transfer does not by itself constitute a permit transfer. Therefore, purchasers of that portion of the premises containing the area authorized to be filled (or any portion thereof) are notified that it is unlawful for any person to construct, alter, operate, maintain, remove or abandon any works, including dredging or filling, or any other work within, over, or under waters of the United States (including wetlands) without first having obtained a permit from the Corps in the purchaser's name.

Conditions of the Permit/Verification: The permit or verification is subject to General Conditions and Special Conditions which may affect the use of the work authorized in Indian River. Accordingly, interested parties should closely examine the entire permit or verification, all associated applications, and any subsequent modifications.

To obtain a copy of the authorization in its entirety submit a written request to:
U.S. Army Corps of Engineers
Regulatory Division - Special Projects & Enforcement Branch
Post Office Box 4970
Jacksonville, Florida 32232-0019

Questions regarding compliance with these conditions should be directed to:
U.S. Army Corps of Engineers
Enforcement Section
Post Office Box 4970
Jacksonville, Florida 32232-0019

Conflict Between Notice and Permit

This Notice of Authorization is not a complete summary of the issued permit or verification. Provisions in this Notice of Permit shall not be used in interpreting the permit or verification provisions. In the event of conflict between this Notice of Permit and the permit or verification, the permit or verification shall control.

This Notice is Not an Encumbrance
This Notice is for informational purposes only. It is not intended to be a lien, encumbrance, or cloud on the title of the premises.

Release
This Notice may not be released or removed from the public records without the prior written consent of the Corps.

This Notice of Authorization is executed on this _____ day of _____, _____. This document is being submitted for recordation in the Public Records of Palm Beach County, Florida as part of the requirement imposed by the authorization SAJ-2022-00959 issued by Corps.

Permittee:

_____

Address:

_____

_____

Phone:_____

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me this _____day of _____, 20____, by _____, who is personally known to me or has produced _____ as identification.

_____
Notary Public

(seal)

_____
Print

My Commission Expires_____

AS-BUILT CERTIFICATION BY PROFESSIONAL ENGINEER

Submit this form and one set of as-built engineering drawings to the U.S. Army Corps of Engineers, Enforcement Section, P.O. Box 4970, Jacksonville, FL 32232-0019. For electronic mail saj-rd-enforcement@usace.army.mil *(not to exceed 15 MB).*

1. Department of the Army Permit Number: SAJ-2022-00959(NWP-JLA)

2. Permittee Information:

Name: _____

Address: _____

_____

3. Project Site Identification (physical location/address):

_____

_____

_____

4. As-Built Certification: I hereby certify that the authorized work, including any mitigation required by Special Conditions to the permit, has been accomplished in accordance with the Department of the Army permit with any deviations noted below. This determination is based upon on-site observation, scheduled, and conducted by me or by a project representative under my direct supervision. I have enclosed one set of as-built engineering drawings.

_____ _____

Signature of Engineer Name (*Please type*)

_____ _____

(FL, PR, or VI) Reg. Number Company Name

_____ _____ _____

City State ZIP

(Affix Seal)

_____ _____

Date Telephone Number

Date Work Started:_____ Date Work Completed:_____

Identify any deviations from the approved permit drawings and/or special conditions (attach additional pages if necessary):

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com

f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8 ½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to the email address listed above.

CAUTION: MANATEE HABITAT

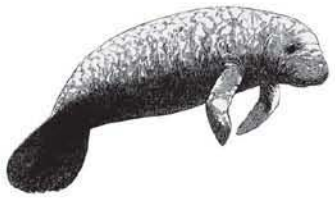
All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:



Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service

March 23, 2021

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida and Georgia for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov; Georgia Field Office: gaes_assistance@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or approval from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or approval from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11 x 17in or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat.

These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida and Georgia. Although they have a preference for uplands, they also utilize some wetlands and agricultural areas and often move seasonally between upland and lowland habitats, particularly in the northern portions of its range (North Florida and Georgia). Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Reliance on xeric sandhill habitats throughout the northern portion of the range in northern Florida and Georgia is due to the dependence on gopher tortoise burrows for shelter during winter. Breeding occurs during October through February. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. Taking of eastern indigo snakes is prohibited by the Endangered Species Act without a permit is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A <u>LIVE</u> EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes. Â
- Immediately notify supervisor or the applicants designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicants designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office: (904) 731-3336
Panama City Field Office: (850) 769-0552
South Florida Field Office: (772) 562-3909
Georgia Field Office: (706) 613-9493

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5 x 11in paper and then properly folded, is attached). Â Photos of eastern indigo snakes may be accessed on USFWS and/or FWC or GADNR websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicants designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

ATTENTION

Federally-Threatened Eastern Indigo Snakes may be present on this site!

Killing, harming, or harassing eastern indigo snakes is strictly prohibited and punishable under State and Federal Law.

If you see a LIVE eastern indigo snake on the site:

- Do NOT attempt to touch or handle the snake. Stop land disturbing activities and allow the snake time to move away from the site without interference.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor/applicant, and a U.S. Fish and Wildlife Service (USFWS) Ecological Services Field Office, with the location information and condition of the snake.
- If the snake is located near clearing or construction activities that will cause harm to the snake, the activities must pause until a representative of the USFWS returns the call (within one day) with further guidance.

If you see a DEAD eastern indigo snake on the site:

- Stop land disturbing activities and immediately notify supervisor/applicant, and a USFWS Ecological Services Field Office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

DESCRIPTION. The eastern indigo snake is one of the largest non-venomous snakes in North America, reaching up to 8 ft long. Named for the glossy, blue-black scales above and slate blue below, they often have orange to reddish color (cream color in some cases) in the throat area. They are not typically aggressive and will try to crawl away when disturbed.

SIMILAR SPECIES. The black racer resembles the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY. Eastern indigo snakes live in a variety of terrestrial habitat types. Although they prefer uplands, they also use wetlands and agricultural areas. They will shelter inside gopher tortoise burrows, other animal burrows, stumps, roots, and debris piles. Females may lay from 4 to 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTED STATUS. The eastern indigo snake is protected by the USFWS, Florida Fish and Wildlife Conservation Commission, and Georgia Department of Natural Resources. Any attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage eastern indigo snakes is prohibited by the U.S. Endangered Species Act. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses. Only authorized individuals with a permit (i.e., Recovery [10a1A] or HCP ITP [10a1B]), or an Incidental Take Statement associated with a USFWS Biological Opinion may handle an eastern indigo snake.

Please contact your nearest USFWS Ecological Services Field Office if a live or dead eastern indigo snake is encountered:

Jacksonville, FL, (904) 731-3336
Panama City, FL, (850) 769-0552
Vero Beach, FL, (772) 562-3909
Athens, GA, (706) 613-9493

If you see a LIVE eastern indigo snake on the site:

- Cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site without interference.
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, and the appropriate U.S. Fish and Wildlife Service (USFWS) office, with information regarding the location and condition of the snake.
- If the snake is in a vicinity where clearing or construction activities will cause harm to the snake, the activities must be paused until a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

If you see a DEAD eastern indigo snake on the site:

- Cease clearing activities and immediately notify the supervisor or designated applicant/agent, and the USFWS Field Office (see below for contact information), with the location and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

USFWS Ecological Services Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

Jacksonville Office: (904) 731-3336
Panama City Office: (850) 769-0552
Vero Beach Office: (772) 562-3909
Georgia Office: (912) 403-1873

Description. The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet long. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. They often have orange to reddish coloration in the throat area, yet some may only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

Similar Species. The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

Life History. The eastern indigo snake occurs in a variety of terrestrial habitats. Although they prefer uplands, they also use wetlands and agricultural areas. Eastern indigo snakes will often take shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 to 12 white eggs as early as April through June, with young hatching in late July through October.

Killing, harming, or harassing indigo snakes is strictly prohibited and punishable under State and Federal Law.

Only individuals currently authorized to handle an eastern indigo snake through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, are allowed to do so.

Legal Status. The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

ATTENTION:

THREATENED **EASTERN INDIGO SNAKES** MAY BE PRESENT ON THIS SITE!

Photo: Dirk Stevenson

Please read the following information provided by the U.S. Fish and Wildlife Service on standard protection measures for the eastern indigo snake.

Village of Tequesta
Beach Road Water Main Replacement – Phase 2
Indian River (North of the Jupiter Inlet)
Project Re-Assignment/USACE SAJ-2022-00959

PROJECT FRAC-OUT PLAN

The Contractor will implement the following Best Management Practices (BMPs) to minimize the potential for adverse environmental impacts during Horizontal Directional Drilling (HDD) activities:

- BMPs for erosion control within the staging area shall be implemented and maintained at all times during the drilling and back-reaming operations to prevent siltation and turbid discharges in excess of State Water Quality Standards pursuant to Rule 62-302, F.A.C. Methods shall include, but are not limited to, the immediate placement of turbidity containment devices such as turbidity screen, silt containment fence, hay bales, and earthen berms, etc. to contain the drilling mud; however, they will not impact surface waters.

To provide an additional level of resource protection, the following measures shall be taken to monitor any potential releases of drilling fluid:

- Measures used to prevent frac-out during the drilling operation include maintaining the proper depth for the soil conditions along the drilling route as well as proper management of drilling fluids circulation pressure by maintaining a total drilling pressure to be less than 10 PSI. Under the waterway, the minimum distance between the pipe and the bottom of the waterway will be 25 feet, as shown on the profile. This is suspected to be sufficient to reduce the risk of frac-out when drilling under the waterway.

- The volume of bentonite in the drill string will be monitored at all time during the directional drilling operation.

- The permitee/Contractor will identify, prior to commencement of construction, an environmental scientist/biologist with experience in water quality monitoring and habitat protection to be used in the event of a frac-out.

- Divers shall be on call, with a response time less than one hour, during drilling operations in order to respond to a potential frac-out release.

- All drilling fluids associated with the HDD operation will be contained on site. The volume of the drilling fluids recirculation/solids settlement pit will be determined by the Contractor at the Pre-Construction meeting. Periodically during the drilling process settled solids will be removed from the pit by a backhoe and disposed of at a site of the Contractor's choice in accordance with applicable regulations. At the conclusion of drilling operations, drilling fluid remaining in the pit will be settled and hauled to a disposal site of the Contractor's choice in accordance with applicable regulations. After back-reaming, drilling materials will be removed from the inside of the pipeline by pigging it from the exit point towards the rig area.

- At all times, adequate protection will be taken to avoid adverse impacts to Waters of the State. This shall include, but is not limited to halting of construction/drilling and/or placement of turbidity containment devices.
- A Vac Truck shall be onsite and available at all times.
- A Spill Kit (i.e., absorbent pads/brooms, goggles, gloves, etc.) shall be onsite and available at all times.

Release Procedure:

- If a frac-out is confirmed, all construction activity contributing to the frac-out shall cease immediately.
- If the return drilling mud/fluid is less than the projected amount to be recovered, divers shall begin their search for the missing material within one hour of potential release. Once the drilling mud and frac-out is located, then the drilling mud containment plan shall be immediately implemented.

Drilling Mud Containment Plan:

- If a frac-out occurs during construction activities, the permittee shall notify the Florida Department of Environmental Protection, Army Corps of Engineers, Palm Beach County, and the Village of Tequesta, within 24 hours of the occurrence. The notification shall include the time of the frac-out, the response time of the underwater diver, and the environmental conditions of the affected area.
- The scientist/biologist/divers will guide the suction hose of the pump to minimize both the removal of natural bottom material and the disturbance of any existing vegetation.
- Any escaped drilling lubricant must be pumped into filter bags or directly into a Vac Truck.
- A barge company will be contacted to transport a Vac Truck should it be needed to respond "in-water".
- Once the spill is contained, the escaped drilling lubricant shall be properly disposed of in an approved upland disposal site.
- Clean-up with a vacuum system shall commence within 24 hours.
- After containment/recovery of the drilling material/resources, a detailed written report shall be submitted to the FDEP and the ACOE, within 10 business days, indicating the location of the frac-out, amount of drilling material discharged and the amount of drilling mud recovered, the process in which the drilling mud was recovered, and the area that was affected by the drilling discharge.

Construction/Installation Methodology

The schedule for this project requires that all approvals (permits and easements) be completed by June 2024.

It is anticipated that the entire water main project will take approximately 8 months to complete after the commencement of construction.

The HDD will commence wholly within uplands and it will traverse the Indian River north of the Loxahatchee River at the Jupiter Inlet with a minimum of 25 ft of cover between the top of the bore hole and the bottom of the channel. A minimum separation distance of 10 ft from other utilities will be maintained. The approximate locations of the upland drill and receiving pits are shown in the exhibits. These pit locations are developed sites; no wetlands or protected species occur within these upland landing/staging areas of the project and they have been chosen to avoid potential impacts to resources as well as to minimize impacts to existing daily activities adjacent to these areas. The limits of these areas will be field-located by the contractor and identified by the installation of silt fence. All staging and activities necessary for the HDD will occur within these areas. The major elements of a typical operation are depicted on the exhibits. If dewatering for these pits is required, the contractor will obtain a standard dewatering permit from the South Florida Water Management District and the ground water will be discharged to the closest storm sewer.

During the HDD process, a bentonite slurry is typically used as a lubricant for the drilling and process so that the drill may be pushed through the drill hole with less friction. It is also used to maintain the opening of the drill hole, which helps to minimize the risk of frac-out (bentonite seeping through cracks in the floor of waterway) by filling the porous space around the hole. No additives will be used with the bentonite slurry.

Recognizing the potential concern for discharge through the waterway floor and into the surface water (frac-out), the applicant has minimized the potential for this by placing the bore with a minimum of 25 feet of cover over the reamed drill hole. By keeping the HDD alignment at a sufficient depth below the bottom of the waterway, the potential of frac-out occurring is significantly reduced.

The solids collected during the drilling operation will be contained within the drilling area, either by temporary berm or other form of containment chosen by the contractor. The solids will be trucked to an approved upland site. No significant adverse effects are anticipated as a result of this common HDD activity.

Maintenance of Water Quality

Surface water quality within the waterway will not be impacted during the drilling operations. The drilling operator will be trained and qualified in the operation of the equipment. The operator will monitor the pressure of the bentonite slurry in the drill conduit to a consistent pressure of less than 10 PSI. If any release of bentonite or a loss of pressure is observed, the drilling operation will cease immediately. The system will be evaluated and the malfunctions corrected before drilling is reinitiated.

Due to the amount of cover between the HDD and the waterway bottom, a minimum of 25 feet, the potential for frac-out is low. In the unlikely event of a frac-out, all drilling would be stopped and corrective measures would be implemented before drilling recommences. If the bentonite slurry were to be released on land, a local vacuum truck service will be contracted to remove the material as required.

Erosion Control of the HDD Operation

BMP's will be employed around the proposed drill pits. To contain the bentonite slurry, either a small earthen berm or other container will be used to filter the bentonite slurry and to re-circulate it into the drill hole in order to reduce costs and maintain environmental quality. If heavy precipitation is forecast, hay bales and silt fences may be used to minimize the slurry escaping the work area. Additional berms and ditching may be used at the contractor's discretion. If these measures are not adequate, drilling operations will cease until corrective measures can be employed.

Assessment of Potential Project Impacts

The engineer has designed the project such that no impacts to the surrounding areas, or significant adverse effects to Waters of the State are anticipated. Drilling is designed to commence in uplands and terminate in uplands. The proposed drilling will occur at a minimum of 25 feet below the waterway bottom to minimize the chance of frac-out. Therefore, it is the engineer's belief that the project will not result in or cause significant adverse impacts to the environment.

Bore Abandonment

For circumstances where the newly installed HDPE water main is compromised and requires abandonment, the Village along with their drill contractor will provide a written plan to the Corp prior to any abandonment action. Several plans could be utilized for the pipe abandonment depending upon where the pipe is along the bore path. Some abandonment procedures could be, the pulling out of the pipe and redrilling, pipe grouting and providing the Corp a new drill path, or the drilling out of the pipe with an oversized bit.

CESAJ-EN

20 August 2022

MEMORANDUM FOR Chief, Regulatory Division

SUBJECT: Beach Road Water Main Replacement HDD, Intracoastal Waterway, Martin County, Florida Regulatory File #SAJ-2022-00959.

1. Reference Regulatory email dated 10 May 2022, requesting Engineering Division review the permit package for SAJ-2022-00959 Beach Road Water Main Replacement HDD (2022-0058). The applicant proposes to improve utility services for the Village of Tequesta by installation of a 1,127 linear foot water main 12-inch HDPE cable below the Intracoastal Waterway via horizontal direction drill (HDD). Drill fluid pressure is greater than 10 PSI and appropriate documentation provided for the review.

2. Engineering Division does not object to issuance of the permit and approves the request for SAJ-2022-00959 Beach Road Water Main Replacement HDD, Intracoastal Waterway (2022-0058) as referenced herein as the proposed HDD depth placement meets SAJ criteria.

3. Approval of these modifications to Intracoastal Waterway Project, is in accordance with 33 U.S.C. 408. It also complies with the National Environmental Policy Act, as the proposed modifications were previously analyzed in the *Department of Army Permit SAJ-2022-00959.*

4. The applicant shall comply with Engineering Circular 1165-2-220, dated 10 September 2018, Policy and Procedural Guidance for Processing Requests to Alter U.S. Army Corps of Engineers Civil Works Projects Pursuant to 33 U.S.C. 408, Appendix K, paragraphs 1. to 16. (enclosed) and the time limit for completing the work authorized in *Department of Army Permit SAJ- SAJ-2022-00959.* The applicant is responsible for the quality control for performance of the work and for ensuring these actions do not interfere with the functions of the Intracoastal Waterway. Documentation of the completed work must be furnished to the Corps within 60 days after completion of the work for our records. This documentation will need to include a certification that the work was completed in accordance with the approved plans and specifications, GPS readings for the limits of the work performed, as-built drawings, and the date the work started and was completed.

5. If you have any questions, please feel free to contact the Engineering Division POC Murika Davis at 904-232-1604 or by email to murika.davis@usace.army.mil.

Laureen A. Borochaner, P.E.
Chief, Engineering Division

APPENDIX K

Standard Terms and Conditions

This appendix includes the standard conditions that must be included in all Section 408 approval notifications, except where marked as optional. Use of optional conditions should be based on scope and scale of the approved activity:

LIMITS OF THE AUTHORIZATION

1. This permission only authorizes you, the requester, to undertake the activity described herein under the authority provided in Section 14 of the Rivers and Harbors Act of 1899, as amended (33 USC 408). This permission does not obviate the need to obtain other federal, state, or local authorizations required by law. This permission does not grant any property rights or exclusive privileges, and you must have appropriate real estate instruments in place prior to construction and/or installation.
2. The time limit for completing the work authorized ends on _____ . If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached. **Addressed in the 408 approval letter or 408 EN Memo.**
3. Without prior written approval of the USACE, you must neither transfer nor assign this permission nor sublet the premises or any part thereof, nor grant any interest, privilege or license whatsoever in connection with this permission. Failure to comply with this condition will constitute noncompliance for which the permission may be revoked immediately by USACE.
4. The requester understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration of the work herein authorized, or if, in the opinion of the Secretary of the Army or an authorized representative, said work will cause unreasonable conditions and/or obstruction of USACE project authorized design, the requester will be required upon due notice from the USACE, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim can be made against the United States on account of any such removal or alteration.

INDEMNIFICATION AND HOLD HARMLESS

5. The United States will in no case be liable for:
    a. any damage or injury to the structures or work authorized by this permission that may be caused or result from future operations undertaken by the United States, and no claim or right to compensation will accrue from any damage; or
    b. damage claims associated with any future modification, suspension or revocation of this permission.

6. The United States will not be responsible for damages or injuries which may arise from or be incident to the construction, maintenance, and use of the project requested by you, nor for damages to the property or injuries to your officers, agents, servants, or employees, or others who may be on your premises or project work areas or the federal project(s) rights-of-way. By accepting this permission, you hereby agree to fully defend, **indemnify,** and **hold harmless** the United States and USACE from any and all such claims, subject to any limitations in law.
7. Any damage to the water resources development project or other portions of any federal project(s) resulting from your activities must be repaired at your expense.

REEVALUATION OF PERMISSION

8. The determination that the activity authorized by this permission would not impair the usefulness of the federal project and would not be injurious to the public interest was made in reliance on the information you provided.
9. This office, at its sole discretion, may reevaluate its decision to issue this permission at any time circumstances warrant, which may result in a determination that it is appropriate or necessary to modify or revoke this permission. Circumstances that could require a reevaluation include, but are not limited to, the following:
    a. you fail to comply with the terms and conditions of this permission;
    b. the information provided in support of your application for permission proves to have been inaccurate or incomplete; or
    c. significant new information surfaces which this office did not consider in reaching the original decision that the activity would not impair the usefulness of the water resources development project and would not be injurious to the public interest.

CONDUCT OF WORK UNDER THIS PERMISSION

10. You are responsible for implementing any requirements for mitigation, reasonable and prudent alternatives, or other conditions or requirements imposed as a result of environmental compliance.
11. Work/usage allowed under this permission must proceed in a manner that avoids interference with the inspection, operation, and maintenance of the federal project.
12. In the event of any deficiency in the design or construction of the requested activity, you are solely responsible for taking remedial action to correct the deficiency.
13. The right is reserved to the USACE to enter upon the premises at any time and for any purpose necessary or convenient in connection with government purposes, to make inspections, to operate and/or to make any other use of the lands as may be necessary in connection with government purposes, and you will have no claim for damages on account thereof against the United States or any officer, agent or employee thereof.

14. You must provide copies of pertinent design, construction, and/or usage submittals/documents. USACE may request that survey and photographic documentation of the alteration work and the impacted project area be provided before, during, and after construction and/or installation.
15. You may be required to perform an inspection of the federal project with the USACE, prior to your use of the structure, to document existing conditions.
16. USACE shall not be responsible for the technical sufficiency of the alteration design nor for the construction and/or installation work.
17. (optional, at the discretion of the district) Once permission is granted, you must notify the USACE District at least ( ) days before work/usage is started so that post- permission over sight can be performed by USACE.
18. (optional, at the discretion of the district) You must schedule a final inspection with the USACE within ( ) days after completion of the work/usage.
19. (optional, at the discretion of the district) You must submit a copy of "as-built" drawings within ( ) days of completion of work showing the new work as it relates to identifiable features of the federal project. **Included in the 408 approval letter.**

APPLICATION FOR CONSENT TO CROSS U.S. GOVERNMENT EASEMENT

APPLICATION IS MADE for a Department of the Army Consent to Easement to construct, maintain, control, operate and repair a (state type of structure) _____

_____

_____ over, under, across, in, or upon the Easement vested in the United States of America as shown on the attached [include boundary survey map with legal description/construction plans and specifications of project], and situated in Section___, Township___ South, Range___ East, County of_____, Florida.

Names and Mailing Addresses of Record Owners: _____

_____

_____

Physical Address (location of project work): _____

_____

Email Address_____

Applicant understands that permanent structures affixed to the land or otherwise constructed or situated in a manner lasting or meant to last indefinitely and not expected to change in status, condition, or place are not permitted within the U.S. Easement. Unauthorized structures include, but are not limited to, residential and commercial buildings, swimming pools, patios, outbuildings, fences, gazebos, satellite dishes, oil and gas wells, boat ramps and seawall enclosures of docking areas or other structures as defined in CFR Title 36, Section 327.20. Noncompliance may subject the Applicant to possible removal and enforcement action.

The undersigned agrees that construction of the facility or structure involved in this application shall not begin until the Consent to Cross U.S. Government Easement, herein applied for, shall have been granted and appropriate rights shall have been acquired from the record owners and encumbrances of the underlying fee in the land involved.

_____	_____
Property Owner(s) Name (Print)	Property Owner(s) Name (Print)
_____	_____
(Signature)	(Signature)

DATE: _____

RETURN TO: US Army Corps of Engineers, Jacksonville District
ATTN: Real Estate Division
P.O. Box 4970
Jacksonville, FL 32232-0019

PALM BEACH COUNTY HEALTH DEPARTMENT PERMIT

Notification of Acceptance of Use of a General Permit

Permitee:
Matthew Hammond, P.E.
Utility Director
Village of Tequesta
345 Tequesta Drive
Tequesta, FL 33469

Permit Number: 138296-051-DSGP
Issue Date: 08/26/2022
Expiration Date: 08/25/2027
County: Palm Beach
Project: Beach Road Watermain Replacement
Water Supplier: Village of Tequesta
PWS ID: 4501438

Dear Mr. Hammond:

On August 2, 2022 the Florida Department of Health-Palm Beach County, as an approved local program of the Florida Department of Environmental Protection, received a "*Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs*" [DEP Form No. 62-555.900(7)], under the provisions of Rule 62-4.530 and Chapter 62-555, Florida Administrative Code (F.A.C.). The proposed project includes:

Construction of approximately 6,200 LF of 10" PVC watermain, to replace an existing 8" asbestos cement water main, and all appurtances to improve the distribution system located along Beach Road in the Village of Tequesta, Florida.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule 62-555.405, F.A.C., all applicable rules in Chapters 62-4, 62-550, 62-555, F.A.C., and the General Conditions for All General Drinking Water Permits (found in 62-4.540, F.A.C.).

When any existing asbestos cement (AC) pipes are replaced under this permit, the permittee shall do so in accordance with the applicable rules of the Federal Asbestos Regulation and Florida DEP requirements. For specific requirements applicable to AC pipes, the permittee should contact the Air and Waste Management section managers prior to commencing any such activities at (561) 837-5900 #3. Please be aware that a notification is required to be submitted to the Department for a regulated project.

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation. Pursuant to Rule 62-555.345, F.A.C., the permittee shall submit a certification of construction completion [DEP Form No. 62-555.900(9)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form 62-555.900(8), F.A.C., with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule 62-4.030, F.A.C.

Sincerely,
For the Division Director

Jorge R. Patino, P.E.,
Environmental Administrator
Division of Environmental Public Health

LM/JH/JP

c: Project Engineer: Thomas Jensen, P.E.
Utility: Same

Civil Penalty May Be Incurred
if this project is placed into operation before obtaining a clearance from this office.

Requirements for clearance upon completion of projects are as follows:

1) Clearance Form
Submission of a fully completed Department of Environmental Protection (DEP) Form 62-555.900(9) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation*.

2) Record Drawings
Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings an specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

3) Bacteriological Results
Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315(6), 62-555.340, and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- Connection to an existing system
- The end point of the proposed addition
- Any water lines branching off a main extension
- Every 1,200 feet on straight runs of pipe

Each location shall be sampled on two consecutive days, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided. **All samples shall be collected by an employee of a state certified laboratory or a certified operator and be reported on DEP Reporting Format 62-550.730.**

For further clarification contact:
Mark Peters
Engineering Specialist III
Florida Department of Health Palm Beach
Plan Review & Permit Section
800 Clematis Street, 4th Floor
West Palm Beach, FL 33401
561-837-5934

NOTICE OF INTENT TO USE THE GENERAL PERMIT FOR CONSTRUCTION OF WATER MAIN EXTENSIONS FOR PWSs

INSTRUCTIONS: This notice shall be completed and submitted by persons proposing to construct projects permitted under the "General Permit for Construction of Water Main Extensions for Public Water Systems" in Rule 62-555.405, F.A.C. AT LEAST 30 DAYS BEFORE BEGINNING CONSTRUCTION OF A WATER MAIN EXTENSION PROJECT, complete and submit one copy of this notice to the appropriate Department of Environmental Protection (DEP) District Office or Approved County Health Department (ACHD) along with payment of the proper permit processing fee. (When completed, Part II of this notice serves as the preliminary design report for a water main extension project, and thus, it is unnecessary to submit a separate preliminary design report or drawings, specifications, and design data with this notice.) All information provided in this notice shall be typed or printed in ink. The DEP permit processing fee for projects requiring the services of a professional engineer during design is $650, and the DEP permit processing fee for projects not requiring the services of a professional engineer during design is $500.* Some ACHDs charge a county permit processing fee in addition to the DEP permit processing fee. Checks for permit processing fees shall be made payable to the Department of Environmental Protection or the appropriate ACHD. NOTE THAT A SEPARATE NOTIFICATION AND A SEPARATE PERMIT PROCESSING FEE ARE REQUIRED FOR EACH NON-CONTIGUOUS PROJECT.†

* *Except as noted in paragraphs 62-555.520(3)(a) and (b), F.A.C., projects shall be designed under the responsible charge of one or more professional engineers licensed in Florida.*

† *Non-contiguous projects are projects that are neither interconnected nor located nearby one another (i.e., on the same site, on adjacent streets, or in the same neighborhood).*

I. General Project Information

A. Name of Project: Beach Rd Watermain Replacement Phase 2

B. Description of Project and Its Purpose:

Replacement of 6,200 LF of existing AC watermain with 10" PVC along Beach Road. (A 12" HDPE horizontal directional drill will be included to cross the Indian River.) The existing AC and PVC pipe will be abandoned in place or removed and properly disposed of according to FAC regulations.

C. Location of Project

1. County Where Project Located: Palm Beach County
2. Description of Project Location:

South/West side of Beach Rd. in Tequesta, FL from the intersection of S. Beach Rd. and Coast Guard Way to 425 S. Beach Rd. (Cliveden Condo) and from 19670 S. Beach Rd. (Seawatch Condo) to 19955 S. Beach Rd.

D. Estimate of Cost to Construct Project: $1,200,000

E. Estimate of Dates for Starting and Completing Construction of Project:
October 2022 - June 2023

F. Permittee

PWS/Company Name: Village of Tequesta			PWS Identification No.:* 4501438
PWS Type:* ☒ Community ☐ Non-Transient Non-Community		☐ Transient Non-Community	☐ Consecutive
Contact Person: Matthew Hammond, PE		Contact Person's Title: Utility Director	
Contact Person's Mailing Address: 345 Tequesta Drive			
City: Village of Tequesta		State: FL	Zip Code: 33469
Contact Person's Telephone Number: 561-768-0459		Contact Person's Fax Number:	
Contact Person's E-Mail Address: mhammond@tequesta.org			

* *This information is required only if the permittee is a public water system (PWS).*

G. Public Water System (PWS) Supplying Water to Project

PWS Name: Village of Tequesta Water Treatment Plant			PWS Identification No.: 4501438
PWS Type: ☒ Community ☐ Non-Transient Non-Community		☐ Transient Non-Community	☐ Consecutive
PWS Owner: Village of Tequesta			
Contact Person: Matthew Hammond, PE		Contact Person's Title: Utility Director	
Contact Person's Mailing Address: 345 Tequesta Drive			
City: Village of Tequesta		State: FL	Zip Code: 33469
Contact Person's Telephone Number: 561-768-0459		Contact Person's Fax Number:	
Contact Person's E-Mail Address: mhammond@tequesta.org			

DEP Form 62-555.900(7)Alternate
Effective August 28, 2003
(Updated September 8, 2015)

NOTICE OF INTENT TO USE THE GENERAL PERMIT FOR CONSTRUCTION OF WATER MAIN EXTENSIONS FOR PWSs

Project Name: Beach Rd Watermain Replacement Phase 2	Permittee: Village of Tequesta

H. Public Water System (PWS) that Will Own Project After It Is Placed into Permanent Operation

PWS Name: Village of Tequesta Water Treatment Plant		PWS Identification No.:* 4501438
PWS Type:* ☒ Community ☐ Non-Transient Non-Community ☐ Transient Non-Community ☐ Consecutive		
PWS Owner: Village of Tequesta		
Contact Person: Matthew Hammond, PE	Contact Person's Title: Utility Director	
Contact Person's Mailing Address: 345 Tequesta Drive		
City: Village of Tequesta	State: FL	Zip Code: 33469
Contact Person's Telephone Number: 561-768-0459	Contact Person's Fax Number:	
Contact Person's E-Mail Address: mhammond@tequesta.org		

* *This information is required only if the owner/operator is an existing PWS.*

I. Professional Engineer(s) or Other Person(s) in Responsible Charge of Designing Project*

Company Name: Kimley-Horn & Associates		
Designer(s): Thomas c. Jensen, PE	Title(s) of Designer(s): Project Engineer	
Qualifications of Designer(s): ☒ Professional Engineer(s) Licensed in Florida – License Number(s): 37290 ☐ Public Officer(s) Employed by State, County, Municipal, or Other Governmental Unit of State† ☐ Plumbing Contractor(s) Licensed in Florida – License Number(s):^		
Mailing Address of Designer(s): 1920 Wekiva Way, Suite 200		
City: West Palm Beach	State: FL	Zip Code: 33411
Telephone Number of Designer(s): 561-248-5967	Fax Number of Designer(s):	
E-Mail Address(es) of Designer(s): tom.jensen@kimley-horn.com		

* *Except as noted in paragraphs 62-555.520(3)(a) and (b), F.A.C., projects shall be designed under the responsible charge of one or more professional engineers licensed in Florida.*

† *Attach a detailed construction cost estimate showing that the cost to construct this project is $10,000 or less.*

^ *Attach documentation showing that this project will be installed by the plumbing contractor(s) designing this project, documentation showing that this project involves a public water system serving a single property and fewer than 250 fixture units, and a detailed construction cost estimate showing that the cost to construct this project is $50,000 or less.*

II. Preliminary Design Report for Project*

A. Service Area, Water Use, and Service Pressure Information

1. Design Type and Number of Service Connections, and Average Daily Water Demands and Maximum-Day Water Demands, in the Entire Area to Be Served by the Water Mains Being Constructed Under this Project:

A = Type of Service Connection	B = Number of Service Connections	C = Average Daily Water Demand Per Service Connection, gpd	D = Total Average Daily Water Demand[a], gpd (Columns BxC for Residential Service Connections)	E = Total Maximum-Day Water Demand[b], gpd
Single-Family Home			0	
Mobile Home			0	
Apartment			0	
Commercial, Institutional, or Industrial Facility[a]				
Total	0		0	0

a. Description of Commercial, Institutional, or Industrial Facilities and Explanation of Method(s) Used to Estimate Average Daily Water Demand for These Facilities:

N/A

b. Explanation of Peaking Factor(s) or Method(s) Used to Estimate Maximum-Day Water Demand:

N/A

DEP Form 62-555.900(7)Alternate
Effective August 28, 2003
(Updated September 8, 2015)

Project Name: Beach Rd Watermain Replacement Phase 2	Permittee: Village of Tequesta

2. Explanation of Peaking Factor(s) or Method(s) Used to Estimate Design Peak-Hour Water Demand and, for Small Water Systems that Use Hydropneumatic Tanks or that Are Not Designed to Provide Fire Protection, Peak Instantaneous Water Demand:

   N/A

3. Design Fire-Flow Rate and Duration:
   N/A
4. Design Service Pressure Range:
   N/A

B. Project Site Information

1. ATTACH A SITE PLAN OR SKETCH SHOWING THE SIZE AND APPROXIMATE LOCATION OF NEW OR ALTERED WATER MAINS, SHOWING THE APPROXIMATE LOCATION OF HYDRANTS, VALVES, METERS, AND BLOW-OFFS IN SAID MAINS, AND SHOWING HOW SAID MAINS CONNECT TO THE PUBLIC WATER SYSTEM SUPPLYING WATER FOR THE PROJECT.
2. Description of Any Areas Where New or Altered Water Mains Will Cross Above or Under Surface Water or Be Located in Soil that Is Known to Be Aggressive:

   The proposed watermain will cross underneath the Indian River waterway by means of horizontal directional drilling with HDPE pipe.

C. Information About Compliance with Design and Construction Requirements

1. If this project is being designed to comply with the following requirements, initial in ink before the requirements. If any of the following requirements do not apply to this project or if this project includes exceptions to any of the following requirements as allowed by rule, mark "X" before the requirements and complete Part II.C.2 below. *RSWW = Recommended Standards for Water Works* as incorporated into Rule 62-555.330, F.A.C.

   ___ a. This project is being designed to keep existing water mains and service lines in operation during construction or to minimize interruption of water service during construction. [*RSWW* 1.3.a; exceptions allowed under FAC 62-555.330]

   ___ b. All pipe, pipe fittings, pipe joint packing and jointing materials, valves, fire hydrants, and meters installed under this project will conform to applicable American Water Works Association (AWWA) standards. [FAC 62-555.320(21)(b), *RSWW* 8.0, and AWWA standards as incorporated into FAC 62-555.330; exceptions allowed under FAC 62-555.320(21)(c)]

   ___ c. All public water system components, excluding fire hydrants, that will be installed under this project and that will come into contact with drinking water will conform to NSF International Standard 61 as adopted in Rule 62-555.335, F.A.C., or other applicable standards, regulations, or requirements referenced in paragraph 62-555.320(3)(b), F.A.C. [FAC 62-555.320(3)(b); exceptions allowed under FAC 62-555.320(3)(d)]

   ___ d. All pipe and pipe fittings installed under this project will contain no more than 8.0% lead, and any solder or flux used in this project will contain no more than 0.2% lead. [FAC 62-555.322]

   ___ e. All pipe and pipe fittings installed under this project will be color coded or marked in accordance with subparagraph 62-555.320(21)(b)3, F.A.C., using blue as a predominant color. (Underground plastic pipe will be solid-wall blue pipe, will have a co-extruded blue external skin, or will be white or black pipe with blue stripes incorporated into, or applied to, the pipe wall; and underground metal or concrete pipe will have blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe will have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90-degree intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint will be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipe with an internal diameter of 24 inches or greater, tape or paint will be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Aboveground pipe will be painted blue or will be color coded or marked like underground pipe.) [FAC 62-555.320(21)(b)3]

   X f. All new or altered water mains included in this project are sized after a hydraulic analysis based on flow demands and pressure requirements. ATTACH A HYDRAULIC ANALYSIS JUSTIFYING THE SIZE OF ANY NEW OR ALTERED WATER MAINS WITH AN INSIDE DIAMETER OF LESS THAN THREE INCHES. [FAC 62-555.320(21)(b) and *RSWW* 8.1]

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Project Name: Beach Rd Watermain Replacement Phase 2	Permittee: Village of Tequesta

g. The inside diameter of new or altered water mains that are included in this project and that are being designed to provide fire protection and serve fire hydrants will be at least six inches. [FAC 62-555.320(21)(b) and *RSWW* 8.1.2]

h. New or altered water mains that are included in this project and that are not being designed to carry fire flows do not have fire hydrants connected to them. [FAC 62-555.320(21)(b) and *RSWW* 8.1.5]

i. This project is being designed to minimize dead-end water mains by making appropriate tie-ins where practical. [FAC 62-555.320(21)(b) and *RSWW* 8.1.6.a]

j. New or altered dead-end water mains included in this project will be provided with a fire or flushing hydrant or blow-off for flushing purposes. [FAC 62-555.320(21)(b) and *RSWW* 8.1.6.b]

k. Sufficient valves will be provided on new or altered water mains included in this project so that inconvenience and sanitary hazards will be minimized during repairs. [FAC 62-555.320(21)(b) and *RSWW* 8.2]

l. New or altered fire hydrant leads included in this project will have an inside diameter of at least six inches and will include an auxiliary valve. [FAC 62-555.320(21)(b) and *RSWW* 8.3.3]

m. All fire hydrants that will be installed under this project and that will have unplugged, underground drains will be located at least three feet from any existing or proposed storm sewer, stormwater force main, pipeline conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C., or vacuum-type sanitary sewer; at least six feet from any existing or proposed gravity- or pressure-type sanitary sewer, wastewater force main, or pipeline conveying reclaimed water not regulated under Part III of Chapter 62-10, F.A.C.; and at least ten feet from any existing or proposed "on-site sewage treatment and disposal system." [FAC 62-555.314(4)]

n. At high points where air can accumulate in new or altered water mains included in this project, provisions will be made to remove the air by means of air relief valves, and automatic air relief valves will not be used in situations where flooding of the valve manhole or chamber may occur. [FAC 62-555.320(21)(b) and *RSWW* 8.4.1]

x o. The open end of the air relief pipe from all automatic air relief valves installed under this project will be extended to at least one foot above grade and will be provided with a screened, downward-facing elbow. [FAC 62-555.320(21)(b) and *RSWW* 8.4.2]

p. New or altered chambers, pits, or manholes that contain valves, blow-offs, meters, or other such water distribution system appurtenances and that are included in this project will not be connected directly to any sanitary or storm sewer, and blow-offs or air relief valves installed under this project will not be connected directly to any sanitary or storm sewer. [FAC 62-555.320(21)(b) and *RSWW* 8.4.3]

q. New or altered water mains included in this project will be installed in accordance with applicable AWWA standards or in accordance with manufacturers' recommended procedures. [FAC 62-555.320(21)(b), *RSWW* 8.5.1, and AWWA standards as incorporated into FAC 62-555.330]

r. A continuous and uniform bedding will be provided in trenches for underground pipe installed under this project; backfill material will be tamped in layers around underground pipe installed under this project and to a sufficient height above the pipe to adequately support and protect the pipe; and unsuitably sized stones (as described in applicable AWWA standards or manufacturers' recommended installation procedures) found in trenches will be removed for a depth of at least six inches below the bottom of underground pipe installed under this project. [FAC 62-555.320(21)(b), *RSWW* 8.5.2]

s. All water main tees, bends, plugs, and hydrants installed under this project will be provided with thrust blocks or restrained joints to prevent movement. [FAC 62-555.320(21)(b) and *RSWW* 8.5.4]

t. New or altered water mains that are included in this project and that will be constructed of asbestos-cement or polyvinyl chloride pipe will be pressure and leakage tested in accordance with AWWA Standard C603 or C605, respectively, as incorporated into Rule 62-555.330, F.A.C., and all other new or altered water mains included in this project will be pressure and leakage tested in accordance with AWWA Standard C600 as incorporated into Rule 62-555.330. [FAC 62-555.320(21)(b)1 and AWWA standards as incorporated into FAC 62-555.330]

u. New or altered water mains, including fire hydrant leads and including service lines that will be under the control of a public water system and that have an inside diameter of three inches or greater, will be disinfected and bacteriologically evaluated in accordance with Rule 62-555.340, F.A.C. [FAC 62-555.320(21)(b)2 and FAC 62-555.340]

x v. New or altered water mains that are included in this project and that will be installed in areas where there are known aggressive soil conditions will be protected through use of corrosion-resistant water main materials, through encasement of the water mains in polyethylene, or through provision of cathodic protection. [FAC 62-555.320(21)(b) and *RSWW* 8.5.7.d]

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Project Name: Beach Rd Watermain Replacement Phase 2	Permittee: Village of Tequesta

w. New or relocated, underground water mains included in this project will be laid to provide a horizontal distance of at least three feet between the outside of the water main and the outside of any existing or proposed vacuum-type sanitary sewer, storm sewer, stormwater force main, or pipeline conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C.; a horizontal distance of at least six feet between the outside of the water main and the outside of any existing or proposed gravity-type sanitary sewer (or a horizontal distance of at least three feet between the outside of the water main and the outside of any existing or proposed gravity-type sanitary sewer if the bottom of the water main will be laid at least six inches above the top of the sewer); a horizontal distance of at least six feet between the outside of the water main and the outside of any existing or proposed pressure-type sanitary sewer, wastewater force main, or pipeline conveying reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.; and a horizontal distance of at least ten feet between the outside of the water main and all parts of any existing or proposed "on-site sewage treatment and disposal system." [FAC 62-555.314(1); exceptions allowed under FAC 62-555.314(5)]

x. New or relocated, underground water mains that are included in this project and that will cross any existing or proposed gravity- or vacuum-type sanitary sewer or storm sewer will be laid so the outside of the water main is at least six inches above the other pipeline or at least 12 inches below the other pipeline; and new or relocated, underground water mains that are included in this project and that will cross any existing or proposed pressure-type sanitary sewer, wastewater or stormwater force main, or pipeline conveying reclaimed water will be laid so the outside of the water main is at least 12 inches above or below the other pipeline. [FAC 62-555.314(2); exceptions allowed under FAC 62-555.314(5)]

y. At the utility crossings described in Part II.C.1.w above, one full length of water main pipe will be centered above or below the other pipeline so the water main joints will be as far as possible from the other pipeline or the pipes will be arranged so that all water main joints are at least three feet from all joints in vacuum-type sanitary sewers, storm sewers, stormwater force mains, or pipelines conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C., and at least six feet from all joints in gravity- or pressure-type sanitary sewers, wastewater force mains, or pipelines conveying reclaimed water not regulated under Part III of Chapter 62-610, F.A.C. [FAC 62-555.314(2); exceptions allowed under FAC 62-555.314(5)]

X z. New or altered water mains that are included in this project and that will cross above surface water will be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement. [FAC 62-555.320(21)(b) and *RSWW* 8.7.1]

aa. New or altered water mains that are included in this project and that will cross under surface water will have a minimum cover of two feet. [FAC 62-555.320(21)(b) and *RSWW* 8.7.2]

bb. New or altered water mains that are included in this project and that will cross under surface water courses greater than 15 feet in width will have flexible or restrained, watertight pipe joints and will include valves at both ends of the water crossing so the underwater main can be isolated for testing and repair; the aforementioned isolation valves will be easily accessible and will not be subject to flooding; the isolation valve closest to the water supply source will be in a manhole; and permanent taps will be provided on each side of the isolation valve within the manhole to allow for insertion of a small meter to determine leakage from the underwater main and to allow for sampling of water from the underwater main. [FAC 62-555.320(21)(b) and *RSWW* 8.7.2]

cc. This project is being designed to include proper backflow protection at those new or altered service connections where backflow protection is required or recommended under Rule 62-555.360, F.A.C., or in *Recommended Practice for Backflow Prevention and Cross-Connection Control*, AWWA Manual M14, as incorporated into Rule 62-555.330, F.A.C.; or the public water system that will own this project after it is placed into operation has a cross-connection control program requiring water customers to install proper backflow protection at those service connections where backflow protection is required or recommended under Rule 62-555.360, F.A.C., or in AWWA Manual M14. [FAC 62-555.360 and AWWA Manual M14 as incorporated into FAC 62-555.330]

X dd. Neither steam condensate, cooling water from engine jackets, nor water used in conjunction with heat exchangers will be returned to the new or altered water mains included in this project. [FAC 62-555.320(21)(b) and *RSWW* 8.8.2]

NOTICE OF INTENT TO USE THE GENERAL PERMIT FOR CONSTRUCTION OF WATER MAIN EXTENSIONS FOR PWSs

Project Name: Beach Rd Watermain Replacement Phase 2	Permittee: Village of Tequesta

2. Explanation for Requirements Marked "X" in Part II.C.1 Above, Including Justification, Documentation, Assurances, and/or Alternatives as Required by Rule for Exceptions to Requirements in Part II.C.1:

Item F: N/A; we are increasing the size of the watermain so a hydraulic analysis wasn't performed.
Item O: The ARV's used in this project are an offset design. This assembly provides for a screened with an inflow preventer downward facing elbow above the top of pipe elevation within an offset vault. This can be seen on the detail sheets of the plans.
Item V: N/A; there are no known aggressive soils within the project limits.
Item Z: N/A; there are no above grade surface water crossings included in the project.
Item DD: N/A; there are no known steam or cooling systems connected to the system.

I completed Part II of this notice, and the information provided in Part II and on the attachment(s) to Part II is true and accurate to the best of my knowledge and belief.

Signature, Seal, and Date of Professional Engineer (PE) or Signature and Date of Other Person in Responsible Charge of Designing Project:*	Signature, Seal, and Date of Professional Engineer (PE) or Signature and Date of Other Person in Responsible Charge of Designing Project:*
Printed/Typed Name: Thomas C. Jensen PE	Printed/Typed Name:
License Number of PE or License Number or Title of Other Person in Responsible Charge of Designing Project:* 37290	License Number of PE or License Number or Title of Other Person in Responsible Charge of Designing Project:*
Portion of Preliminary Design Report for Which Responsible: 100%	Portion of Preliminary Design Report for Which Responsible:

* *Except as noted in paragraphs 62-555.520(3)(a) and (b), F.A.C., projects shall be designed under the responsible charge of one or more PEs licensed in Florida. If this project is being designed under the responsible charge of one or more PEs licensed in Florida, Part II of this notice shall be completed, signed, sealed, and dated by the PE(s) in responsible charge. If this project is not being designed under the responsible charge of one or more PEs licensed in Florida, Part II shall be completed, signed, and dated by the person(s) in responsible charge of designing this project.*

NOTICE OF INTENT TO USE THE GENERAL PERMIT FOR CONSTRUCTION OF WATER MAIN EXTENSIONS FOR PWSs

Project Name: Beach Rd Watermain Replacement	Permittee: Village of Tequesta

III. Certifications

A. Certification by Permittee

I am duly authorized to sign this notice on behalf of the permittee identified in Part I.F of this notice. I certify that, to the best of my knowledge and belief, this project complies with Chapter 62-555, F.A.C. I also certify that construction of this project has not begun yet and that, to the best of my knowledge and belief, this project does not include any of the following construction work:

- construction of water mains conveying raw or partially treated drinking water;
- construction of drinking water treatment, pumping, or storage facilities or conflict manholes;
- construction of water mains in areas contaminated by low-molecular-weight petroleum products or organic solvents;
- construction of an interconnection between previously separate public water systems or construction of water mains that create a "new system" as described under subsection 62-555.525(1), F.A.C.; or
- construction of water mains that will remain dry following completion of construction.

(A specific construction permit is required for each project involving any of the above listed construction work.)

I understand that, if this project is designed under the responsible charge of one or more professional engineers (PEs) licensed in Florida, the permittee must retain a Florida-licensed PE to take responsible charge of inspecting construction of this project for the purpose of determining in general if the construction proceeds in compliance with the Department of Environmental Protection construction permit, including the approved preliminary design report, for this project. I understand that the permittee must have complete record drawings prepared for this project. I also understand that the permittee must submit a certification of construction completion to the Department and obtain written approval, or clearance, from the Department before the permittee places this project into operation for any purpose other than disinfection or testing for leaks.

Signature and Date	Printed or Typed Name	Title
6/17/22	Matthew Hammond, PE	Utility Director

B. Certification by PWS Supplying Water to Project

I am duly authorized to sign this notice on behalf of the PWS identified in Part I.G of this notice. I certify that said PWS will supply the water necessary to meet the design water demands for this project. As indicated below, the water treatment plant(s) to which this project will be connected has(have) the capacity necessary to meet the design water demands for this project, and I certify that all other PWS components affected by this project also have the capacity necessary to meet the design water demands for this project. I certify that said PWS is in compliance with applicable planning requirements in Rule 62-555.348, F.A.C.; applicable cross-connection control requirements in Rule 62-555.360, F.A.C.; and to the best of my knowledge and belief, all other applicable rules in Chapters 62-550, 62-555, and 62-699, F.A.C.; furthermore, I certify that, to the best of my knowledge and belief, said PWS's connection to this project will not cause said PWS to be in noncompliance with Chapter 62-550 or 62-555, F.A.C. I also certify that said PWS has reviewed the preliminary design report for this project and that said PWS considers the connection(s) between this project and said PWS acceptable as designed.

- Name(s) of Water Treatment Plant(s) to Which this Project Will Be Connected:

  Village of Tequesta Water Treatment Plant

- Total Permitted Maximum Day Operating Capacity of Plant(s), gpd: 6,330,000
- Total Maximum Day Flow at Plant(s) as Recorded on Monthly Operating Reports During Past 12 Months, gpd:

Signature and Date	Printed or Typed Name	Title
6/17/22	Matthew Hammond, PE	Utility Director

C. Certification by PWS that Will Own Project After It Is Placed into Permanent Operation

I am duly authorized to sign this notice on behalf of the PWS identified in Part I.H of this notice. I certify that said PWS will own this project after it is placed into permanent operation. I also certify that said PWS has reviewed the preliminary design report for this project and that said PWS considers this project acceptable as designed.

Signature and Date	Printed or Typed Name	Title
6/17/20	Matthew Hammond, PE	Utility Director

NOTICE OF INTENT TO USE THE GENERAL PERMIT FOR CONSTRUCTION OF WATER MAIN EXTENSIONS FOR PWSs

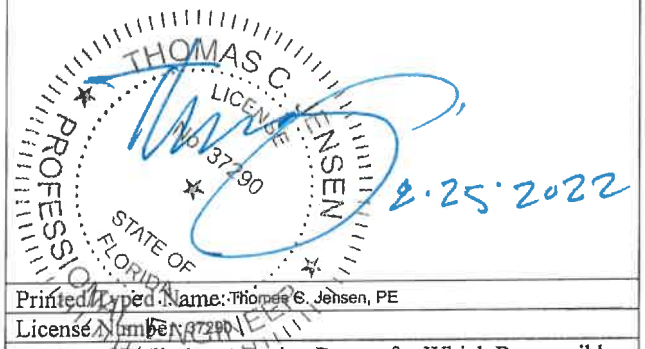
Project Name: Beach Rd Watermain Replacement Phase 2	Permittee: Village of Tequesta

D. Certification by Professional Engineer(s) in Responsible Charge of Designing Project*

I, the undersigned professional engineer licensed in Florida, am in responsible charge of designing this project. I certify that, to the best of my knowledge and belief, the design of this project complies with Chapter 62-555, F.A.C. I also certify that, to the best of my knowledge and belief, this project is not being designed to include any of the following construction work:

- construction of water mains conveying raw or partially treated drinking water;
- construction of drinking water treatment, pumping, or storage facilities or conflict manholes;
- construction of water mains in areas contaminated by low-molecular-weight petroleum products or organic solvents;
- construction of an interconnection between previously separate public water systems or construction of water mains that create a "new system" as described under subsection 62-555.525(1), F.A.C.; or
- construction of water mains that will remain dry following completion of construction.

(A specific construction permit is required for each project involving any of the above listed construction work.)

Signature, Seal, and Date:	Signature, Seal, and Date:
	
Printed/Typed Name: Thomas C. Jensen, PE	Printed/Typed Name:
License Number: 37290	License Number:
Portion of Preliminary Design Report for Which Responsible: 100%	Portion of Preliminary Design Report for Which Responsible:

* *Except as noted in paragraphs 62-555.520(3)(a) and (b), F.A.C., projects shall be designed under the responsible charge of one or more professional engineers (PEs) licensed in Florida. If this project is being designed under the responsible charge of one or more PEs licensed in Florida, Part III.D of this notice shall be completed by the PE(s) in responsible charge. If this project is not being designed under the responsible charge of one or more PEs licensed in Florida, Part III.D does not have to be completed.*

PALM BEACH COUNTY ENGINEERING DEPARTMENT PERMIT

PALM BEACH COUNTY LAND DEVELOPMENT DIVISION

RIGHT-OF-WAY CONSTRUCTION - UTILITY PERMIT

PROJECT NAME: Water main replacement program - project no.
PERMIT NUMBER: UT66507-0624
PERMITEE NAME: Village Of Tequesta
EXPIRATION DATE 06/20/2025

1. Improvements approved with this permit may be subject to removal due to Roadway Production's pending projects in the 5 year Road program.

2. AFTER THE PERMIT CONDITIONS HAVE BEEN ACCEPTED BY THE PERMITTEE, HE/SHE SHALL CONTACT GRACIELA MCAUSLAND FOR PROJECTS NORTH OF STATE ROAD 80 AND SEAN REILLY FOR PROJECTS SOUTH OF STATE ROAD 80 AT THE PBC TRAFFIC DIVISION (561) 684-4030. THEY WILL DETERMINE IF MAINTENANCE OF TRAFFIC PLAN (FOR VEHICLES AND/OR PEDESTRIANS) IS REQUIRED. IF REQUIRED, TH PLAN SHALL BE SUBMITTED VIA EPERMITTING UNDER THE MAINTENANCE OF TRAFFIC APPLICATION. A MINIMUM OF 2 WEEKS PRIOR TO START OF CONSTRUCTION. THE PERMITTEE/DULY AUTHORIZED AGENT SHALL BE RESPONSIBLE TO HAVE THE PLAN APPROVED PRIOR TO CONSTRUCTION.

   WHEN THE PLAN HAS BEEN APPROVED, OR DETERMINED NOT TO BE REQUIRED, THE PERMIT CONTACT, EITHER THE PERMITTEE OR THE ENGINEER OF RECORD, SHALL CONTACT THE CONSTRUCTION COORDINATION DIVISION AT (561) 684-4180, 48 HOURS BEFORE COMMENCEMENT OF WORK FOR A START DATE. (SEE CONDITION NUMBER 1 ON THE BACK OF THIS PERMIT)

3. This condition applies to Advanced Wireless Infrastructure Pole installation permits that exclude the associated underground electric, fiber optics, cables and other types of service conduits required to operate the pole mounted communication system (s). These supporting service lines are required to be permitted by a separate permit (if not included in this approval). "Pole installation only permits" shall not be connected without the supporting underground infrastructure being permitted. Operation without the proper permits will result in the removal of illegally installed components by the permittee and suspension of the Antenna use until properly permitted.

4. All construction within Palm Beach County jurisdiction shall be in accordance with the rules and regulations promulgated by Palm Beach County (this includes the Land Development Design Standards Manual and details).

5. The Permittee is required to coordinate with the property's applicable Drainage District for all work proposed or drainage discharge into that District's rights of way or easements.

6. All construction shall be in accordance with the requirements of the FDOT Utility Accommodation Manual 2017 Edition. This includes depth below grade based on bore diameter.

7. This permit does not include approval of Maintenance of Traffic (MOT). Contact Graciela MCausland for projects nor of Southern Blvd. or Sean Reilly for projects south of Southern Blvd., Construction Coordinators- Palm Beach County Traffic Division at 561-684-4030.

8. Coordinate with the local utility providers and provide the clearances to existing utilities established by those agencies At a minimum, maintain 4 feet of horizontal clearance between proposed underground facilities and existing utilities (wall to wall) and a minimum of 12 inches of vertical clearance.

9. The Permittee has executed an Interlocal Agreement with the County to guarantee proper restoration of the pavemen cut(s). Two satisfactory reviews from the PBC Construction Coordination Division shall be obtained by the permittee one for the initial final field review, the second six months after the initial final field review. Should the Permittee fail to restore the cut within 30 days of written notification, the County may do so and receive reimbursement per Interlocal Agreement

10. A current set of approved permit documents shall be on site at all times while preparing to work or performing work within a County maintained right of way. Failure to comply with this condition will result in a cease and desist order requiring the Contractor, crew and equipment to immediately vacate the right of way. Prior to leaving the site the contractor shall restore the area to a safe condition.

11. If necessary as part of the permitted work pothole and groundwater discharge (dewatering) locations shall be coordinated with the PBC Construction Coordination Division. Milling and resurfacing of the road pavement may be required due to the number of pothole locations. Avoid disturbing travel lane wheel paths if possible.

12. The Permittee shall provide evidence of insurance to the Construction Coordination Division prior to receiving a construction start date, as required by Ordinance No. 2019-030, and as may be amended.
The Certificate Holder shall be:

Palm Beach County Land Development
C/O Construction Coordination Division
2300 N. Jog Road
West Palm Beach, FL 33411

Under: DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES (Acord 101, additional Remarks Schedule):
The following must be added as Additional Insured for General Liability insurance:
Palm Beach County Board of County Commissioners, Its Employees, Agents and Contractors.

The limits of coverage of insurance required shall be not less than the following:
(a) Worker's Compensation and Employer's Liability Insurance
Worker's Compensation-Florida Statutory Requirements
Employer's Liability - $100,000 each accident
- $500,000 disease--policy limit
- $100,000 disease--each employee
(b) Comprehensive General Liability
Bodily injury and property damage-
$1,000,000 each occurrence
$3,000,000 general aggregate
(c) Automobile Liability
Bodily injury and property damage-
$1 ,000,000 combined single limit each accident

13. Please note that future roadway construction may require relocation of these facilities at no expense to Palm Beach County.

14. All inspections are scheduled through Construction Coordination (561) 684-4180 either by the permittee, the enginee record or his/her representative, who must be present at the inspections. Prior to scheduling a final field review with Construction Coordination, the Permittee shall submit to the Land Development Division a signed and sealed certification of completion from the Engineer-of-Record for the above work, referencing the permit number and indica the work was completed in substantial accordance with the approved plans.

If the Permittee is exempt from requirement to contract with a Professional Engineer for design, then the Permittee shall provide a certification of completion letter. The letter is not required to be signed and sealed by a Professional Engineer except in the case where a Professional Engineer is on staff and EOR for the usually exempt project.

15. WORK SHALL NOT COMMENCE UNTIL THE PERMITTEE HAS REQUESTED AND RECEIVED APPROVAL FOR A START DATE FROM THE CONSTRUCTION COORDINATION DIVISION AT 561-684-4180.
FAILURE TO BEGIN CONSTRUCTION ON THE START DATE WITHOUT 24 HOUR NOTIFICATION WILL RESULT CANCELED PERMIT APPLICATION. IF WORK COMMENCES WITHOUT AN APPROVED START DATE OR ON AN ALTERNATIVE DATE WITHOUT PROPER NOTICE, THIS PERMIT APPLICATION SHALL BE CANCELED.

16. All utility structures installed below grade, of any type, in the Palm Beach County right- of- way are required to have traffic bearing tops. This includes all valve boxes, meter boxes, hand holes, splice boxes, storm grates, manhole tops traffic boxes etc. This requirement applies to structures within the sidewalks, grassed areas and/or pavement.

All pull boxes, hand holes, etc., in Palm Beach County Right-of-Way are to be a minimum of Tier 15, (15K design load/ 22.5K Test load) traffic bearing in locations that are subject to occasional traffic.. Pull boxes, hand holes, etc., i the roadway (deliberate vehicular traffic applications) are to be a minimum of AASHTO H 20.

17. It is the contractor¿s responsibility to maintain vehicular and pedestrian detection at traffic signals during construction Vehicle detection must be repaired within 30 days of notice by Palm Beach County and pedestrian detection must be repaired within 3 days of notice by Palm Beach County. The cost for maintaining detection, repairing detection, or adding temporary detection during construction shall be at the expense of the permittee.

18. Permittee shall coordinate the proposed installation with the existing utilities in the permitted work area.

CONDITIONS FOR RIGHT-OF-WAY CONSTRUCTION (UTILITIES)

1. The Construction Coordination Division shall be contacted 48 hours before commencement of work to establish the start date and establish a timeline when field review(s) of the work are required. Construction shall be done Monday through Friday. Weekend work shall be approved by Construction Coordination 48 hours before Saturday. Plans bearing the approval stamp of the County Engineer and the approved permit shall be at the work site. Work may proceed beyond the permit expiration date if a start date was established and work started prior to the permit expiration date. When work is complete and the engineer's certification of completion has been submitted to the Land Development Division, the permittee/representative/engineer (as applicable) shall schedule a final review with Construction Coordination Division. If a permitted project has been completed but does not require an engineer's certification, the permittee/representative (as applicable) shall submit a letter to the Land Development Division indicating the work is complete and ready for final field review. Land Development will notify the permittee/representative to schedule final field reviews with Construction Coordination.

2. The permittee understands and agrees that the rights and privileges herein set out are granted only to the extent of the County's right, title and interest in the land to be entered upon and used by the permittee. THE PERMITTEE SHALL, AT ITS SOLE COST AND EXPENSE, PROTECT, DEFEND, REIMBURSE, INDEMNIFY, AND HOLD THE COUNTY, ITS ELECTED OFFICERS, AGENTS, AND EMPLOYEES, HARMLESS FROM AND AGAINST ALL CLAIMS, LIABILITY, EXPENSE, LOSS, DAMAGES CAUSES OF ACTION OF EVERY KIND OR CHARACTER, INCLUDING ATTORNEY'S FEES AND COSTS, WHETHER AT TRIAL OR APPELLATE LEVELS OR OTHERWISE, ARISING, DURING, AND AS A RESULT OF PERMITTEE'S PERFORMANCE UNDER THE ORDINANCE, HOWEVER, A PROVIDER'S DUTY UNDER THIS SECTION DOES NOT EXTEND TO LIABILITIES NOT CAUSED BY THE PROVIDER, INCLUDING LIABILITIES ARISING FROM THE COUNTY'S NEGLIGENCE, OR WILLFUL CONDUCT, NOTHING CONTAINED IN THIS SECTION SHALL BE CONSTRUED OR INTERPRETED: (A) AS DENYING TO EITHER PARTY ANY REMEDY OR DEFENSE AVAILABLE TO SUCH PARTY UNDER THE LAWS OF THE STATE OF FLORIDA; (B) AS A WAIVER OF SOVEREIGN IMMUNITY, OR (C) AS CONSENT BY THE COUNTY TO BE SUED. THE INDEMNIFICATION REQUIREMENTS SHALL SURVIVE AND BE IN EFFECT AFTER THE SUSPENSION, REVOCATION, TERMINATION OR EXPIRATION OF A PERMIT.

3. Permittee assumes full responsibility to maintain all areas under construction safe for the public and to properly route and direct traffic through the construction area. All Traffic control operations shall be done in accordance with the current Manual on Uniform Traffic Control Devices (Part VI). Supplements to this manual are the Florida Department of Transportation Road and Bridges Standard Plans (Index 102-100 through 102-600) and Standard Specifications to Road and Bridge Construction (latest edition). No obstruction to the travel lanes between 7:00 a.m. to 9:00 a.m. and 3:00 p.m. to 7:00 p.m. Monday through Friday, unless approved by the Palm Beach County Traffic Engineering Division. No time restrictions for local and subdivision roads or for construction down Saturday or Sunday, unless noted otherwise from Palm Beach County Engineering Traffic Division. Working hours are subject to change due to proximity to schools, traffic signals, special events or the type of MOT required.

4. Florida Statute 336.048 – Temporary closing traveling lane of road: Whenever any road on the county road or city street system is repaired, reconstructed, or otherwise altered in a manner that necessitates the closing of one or more traveling lanes of the road for a period of time exceeding 2 hours, the party performing such work shall give notice to the appropriate local law enforcement agency within whose jurisdiction such road is located prior to commencing work on the project.

5. The County shall have the right to inspect a Facility Placed or Maintained in the Right-of-Way as the County finds necessary to ensure compliance with this Ordinance. In the event the County determines that a violation of the Ordinance exists, which violation is not considered to an emergency or danger to the public health, safety or welfare, the County will provide Permittee written notice, setting forth the violation and requesting correction within a reasonable time. The Permittee hereby acknowledges the COUNTY'S right to inspect the area governed by this permit at any time prior to final acceptance by the COUNTY to assure compliance with all plans and specifications. All reviews, however, shall be performed at the COUNTY'S discretion and are strictly to assure compliance with project plans and specifications. PERMITTEE HEREBY ACKNOWLEDGES THAT THE COUNTY VIA SAID REVIEWS IS NOT THE EMPLOYER, SUPERVISOR, PRINCIPAL OR AGENT OF PERMITTEE. Permittee is at all times an independent contractor with full responsibility for all obligations and responsibilities imposed under this permit and imposed by law.

6. If a County maintained Thoroughfare Plan Road is open cut, the procedures in Land Development Division PPM EL-O-3605, including Form 3605.1 (Open Cut Restoration for Thoroughfare Plan Roads) shall be adhered to. If a Non-Thoroughfare Plan Road is open cut, Land Development Division PPM EL-O-3606, including Form 3606.1 (Open Cut Restoration for Non-Thoroughfare Plan Roads) shall be adhered to.

6a. If an asphalt driveway is cut and patched, the entire driveway shall be overlaid with a minimum one inch of asphalt, or entirely replaced. If a concrete driveway is cut, it shall be entirely replaced. Replacement area is from the intersecting road to the property line.

7. All areas in the right-of-way shall be left in a condition equal to or better than existed prior to construction. Shoulders disturbed within 8 feet of the edge of pavement shall be stabilized a minimum 50 PSI Florida Bearing Value, 6 inches in depth. Existing drainage shall not be impeded. Sidewalk areas disturbed during construction shall be maintained until repaved. Prior to or concurrent with final review, the permittee shall submit to the Construction Coordination Division copies of density reports done by an independent testing laboratory. If the construction should fail within one year from the date of final review by the Construction Coordination Division, the permittee is responsible for restoration.

8. The permittee certifies notification has or will be given at least 48 hours (excluding Saturday, Sundays and legal holidays) prior to starting excavation, to anyone having the right to bury gas pipe line within the public or private street, alley, right-of-way or gas utility easement for purposes of obtaining information concerning the possible location of gas pipe lines in the area of proposed excavation.

9. The permitted work shall be coordinated with any Utility or Cable TV facilities in the area of construction.

10. The permittee/developer shall provide and install pavement markings (thermoplastic, unless approved otherwise by the Palm Beach County Traffic Engineer), and reflective pavement markers in accordance with Palm Beach County Traffic Division's latest Typicals for Pavement Markings, Signing and Geometrics.

11. If traffic signalization equipment is in the area of construction, notify Palm Beach County Traffic Operations at (561) 233-3900. Do not disturb any material within six feet of a traffic signal pole or a guy wire and anchor. If damage to the equipment occurs during construction, it shall be repaired by Traffic Operations at the permittee's expense.

12. Provide a minimum cover of 36 inches in the right-of-way of Thoroughfare Plan Roads and a minimum of 30 inches for all others. Maintain a minimum clearance of 12 inches over or under drainage facilities.

13. When plastic pipe is permitted for boring, it shall meet the standards as set forth in the latest Florida Department of Transportation Design Standards.

14. Upon County's request, a Permittee shall be required to coordinate the Placement or Maintenance of a Facility with any other work construction, installation or repair that may be occurring or scheduled to occur within a reasonable time, in the subject Right-of-Way. The Permittee shall reasonable alter its Placement or Maintenance schedule, as necessary to minimize disruption and disturbance in the Right-of-Way. In the event of a conflict with a County project, the Permittee shall yield to the County's schedule to such that no two entities are working within the same area of the Right-of-Way at the same time.

15. In the event of widening, repair, or reconstruction of the subject road(s), the Permittee, any successors, legal heirs or assigns, shall upon request and within 30 days after notice by the Office of the County Engineer, remove or relocate the item(s) permitted within the right-of-way of the subject road(s) at no expense to Palm Beach County. Removal or relocation of a Facility at the direction of the County is governed by Florida Statutes 125.01, 125.42, 337.403 and 337.404, as amended.

16. After the completion of the Placement or Maintenance of a Facility in the Right-of-Way or each phase thereof, the Permittee shall, at its own expense, restore the Right-of-Way to at least its original condition before the permitted work, subject to the County's inspection. If the Permittee fails to make such restoration within thirty (30) days, or such longer period of time as may be reasonably required under the circumstances, following the completion of such Placement or Maintenance, the County may perform restoration and charge the costs of the restoration against the Permittee, pursuant to Section 337.402, Florida Statutes.

17. Issuance of this permit does not in any way create any rights on the part of the applicant to obtain a permit from a state or federal agency and does not create any liability on the part of the County for issuance of the permit if the applicant fails to obtain requisite approvals or fulfill the obligations imposed by a state or federal agency or undertakes actions that result in a violation of state or federal law.

18. All applicable state or federal permits must be obtained before any development is commenced.

APPENDIX B

GEOTECHNICAL INVESTIGATION

Geotechnical Engineering Report

Beach Road Water Main Replacement – Phase 2
Village of Tequesta, Florida
November 23, 2021
Terracon Project No. HD215057

Prepared for:
Kimley-Horn and Associates, Inc.
West Palm Beach, FL

Prepared by:
Terracon Consultants, Inc.
West Palm Beach, Florida

November 23, 2021

Terracon GeoReport

Kimley-Horn and Associates, Inc.
1920 Wekiva Way, Suite 200
West Palm Beach, FL 33411

Attn: Ms. Samantha Graybill, P.E.
P: (561) 290-0955
E: Samantha.Graybill@kimley-horn.com

Re: Geotechnical Engineering Report
Beach Road Water Main Replacement – Phase 2
South side of Beach Road, Crossing the Intracoastal Waterway
Village of Tequesta, Florida
Terracon Project No. HD215057

Dear Ms. Graybill:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PHD215057 dated August 26, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning the planned pipeline construction.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Mata, C Nick
Digitally signed by Mata, C Nick
DN: cn=Mata, C Nick, ou=General Users, email=Nick.Mata@terracon.com
Date: 2021.11.23 15:39:11 -05'00'

Nicholas Mata, P.E.
Project Engineer
Florida License No. 82381

DOUGLAS S. DUNKELBERGER LICENSE No 33317 STATE OF FLORIDA PROFESSIONAL ENGINEER
11/24/2021

Douglas S. Dunkelberger, P.E.
Principal
Florida License No. 33317

REPORT TOPICS

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

REPORT SUMMARY

Topic [1]	Overview Statement [2]
Project Description	The project consists of the installation of a replacement 12-inch diameter HDPE water main along the north and southsides of Beach Road in the vicinity of the Intracoastal Waterway. East of the Intracoastal Waterway, the watermain pipeline converts to 10-inch PVC piping and trends in a northerly direction on the west side of Beach Road. However, the focus of this geotechnical study was that portion of the pipeline that passes underneath the Intracoastal Waterway at the Beach Road Bridge (approximately 600 total linear feet). This segment of the pipeline will bottom at a depth corresponding to about 60 feet below the adjacent land surface.
Geotechnical Characterization	The SPT boring drilled at the site found about 4 feet of surficial fill followed by loose to medium dense sands that extend to about 33 feet below ground. Beneath the sands are intermixed medium dense sands with shell and limestone fragments and a limestone formation that continues to the termination depth of the boring at 65 feet below the land surface.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Geotechnical Engineering Report

Beach Road Water Main Replacement – Phase 2
South side of Beach Road, Crossing the Intracoastal Waterway
Village of Tequesta, Florida

Terracon Project No. HD215057

November 23, 2021

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Beach Road Water Main Replacement project to be located along the South side of Beach Road, Crossing the Intracoastal Waterway in Village of Tequesta, Florida. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Soil parameters for HDD design
- Site preparation and earthwork

The geotechnical engineering Scope of Services for this project included the advancement of one (1) test boring to depth of 65 feet below existing site grade.

Maps showing the site and boring location are shown in the **Site Location** and **Exploration Plan** sections, respectively.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project area for this study is located along the South side of Beach Road, Crossing the Intracoastal Waterway in Village of Tequesta, Florida (See **Site Location**).
Existing Improvements	None. The area of the proposed pipeline alignment exists as open, undeveloped land.
Current Ground Cover	The site is covered with grass and weeds.
Existing Topography	The relevant segment of the proposed replacement pipeline alignment appears to have ground surface elevations ranging between about +4 and +6 feet NAVD according to 30% design set plans provided to us by KHA.

Item	Description
Soil Survey Information	Review of the Web Soil Survey indicates the site is mapped with Soil Unit 35 (Quartzipsamments) on the west side of the Intracoastal and Soil Unit 48 (Urban Land) on the east side if the Intracoastal, and a ground water table depth of more than 80 inches below grade. The typical soil profile consists of sands to a depth of 80 inches. However, based on our experience in the site vicinity, we expect subsurface conditions to consist of medium dense to dense sands with sand to gravel-sized shell fragments intermixed with relatively clean to slightly silty loose to medium dense sands that extend to about 30 feet below the existing ground surface. Below 30 feet, a coquina limestone formation is present and should persist to roughly 50 feet below the land surface. Underlying the coquina limestone is a dense sand/shell mixture that continues to at least 60 feet.

PROJECT DESCRIPTION

Our understanding of the project conditions is as follows:

Item	Description
Project Description	The project consists of the installation of a replacement 12-inch diameter HDPE water main along the north, south, and west sides of Beach Road. However, the focus of this geotechnical effort will be that portion of the pipeline that passes underneath the Intracoastal Waterway at the Beach Road Bridge (approximately 600 linear feet). This segment of the pipeline will bottom well below the mudline corresponding to depth of about 60 feet below the adjacent land surface.

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and recommendations. Conditions encountered at the exploration points are indicated on the boring logs. The boring log and GeoModel can be found in the **Exploration Results** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profiles. For a more detailed view of the model layer depths at the boring location, refer to the GeoModel.

Model Layer	Layer Name	Depth below Grade (feet)	General Description
01	FILL	0 to 4.0	FILL consisting of sand with shell fragments.
02	SAND	4.0 to 33.0	Brown to orangish brown fine SAND (SP), loose to medium dense
03	SAND with Shell & Limestone Fragments	33.0 to 38.0 42.5 to 47.5	Light brown to light gray fine SAND with shell and limestone fragments (SP), medium dense
04	LIMESTONE	38.0 to 42.5 47.5 to 65[1]	Light gray LIMESTONE

[1]Boring termination depth

Groundwater

Groundwater was found at a depth of four (4) feet below ground surface while drilling. Groundwater level fluctuations occur due to rainfall and runoff and other factors not evident at the time the borings were performed. Given the site setting, groundwater levels are likely influenced by the tidal cycles. Therefore, groundwater levels during construction or at other times in the life of the project may be higher or lower than the levels indicated on the boring log. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

In general, the boring drilled at the west side of the Intracoastal Waterway found loose to medium dense sands and medium dense sands with shell and limestone fragments intermixed with a limestone formation that enters the subsurface profile at about 47 ½ feet below land and continues to at least 65 feet. The limestone formation is present at the anticipated depth of where the pipeline will bottom. The HDD construction procedures will need to consider this.

The **Lateral Earth Pressures** section provides soil parameters for the planning of any below grade operations.

The **Trench Backfill Recommendations** section addresses recommendations for backfilling trenches associated with the planned construction.

The **General Comments** section provides an understanding of the report limitations.

LATERAL EARTH PRESSURE PARAMETERS

Design Parameters

The soil parameters shown in the following table should be assumed for the planning of any below grade operations. The parameters are based on the results of our field exploration, visual classification of soils, empirical correlations (ref: Florida Department of Transportation Soils and Foundations Handbook, 2017) with SPT blow counts (N-Values), and our experience with similar materials and projects with similar scope.

Depth	USCS Classification	Total Weight (pcf)	Submerged Weight (pcf)	Friction Angle (ϕ') (deg.)	Cohesion (c') (psf)	Lateral Earth Pressure Coefficients		
						Active (Ka)	Passive (Kp)	At-Rest (K_0)
0.0 to 33.0	SP	115	52	31	0	0.32	3.12	0.48
33.0 to 38.0	SP	115	52	33	0	0.29	3.39	0.46
38.0 to 42.5	Limestone	130	67	32	0	0.30	3.25	0.47
42.5 to 47.5	SP	115	52	31	0	0.32	3.12	0.48
47.5 to 65.0	Limestone	130	67	40	5000	0.21	4.60	0.36

Estimated shear modulus values based on depth and relative density are provided in the following table.

Depth (feet)	U.S.C.S.	Relative Density	Shear Modulus, G (psf)
0.0 to 33.0	SP	Loose to Medium Dense	190,000
33.0 to 38.0	SP	Medium Dense	270,000
38.0 to 42.5	Limestone	Limestone (N-value of 18)	200,000
42.5 to 47.5	SP	Medium Dense	170,000
47.5 to 65.0	Limestone	Limestone (N-values between 23 and 50/4")	920,000

In estimating shear modulus values, an empirical formula (*Foundation Design-Principles and Practices* by D.P. Coduto, *Second Edition, 2001*) was used to relate the elastic modulus to both N-value and soil type. We assigned Poisson's ratios of 0.2 for loose soils and 0.3 for medium dense soils (*Geotechnical and GeoEnvironmental Engineering Handbook* by R. K. Rowe, 2000).

TRENCH BACKFILL RECOMMENDATIONS

- Any open trench excavations (for tying into the existing pipeline) should be accomplished in the dry (i.e. not in saturated or submerged conditions). Dewatering may be needed to accommodate compaction of bedding soils and backfill. The necessity for dewatering will be dependent on the depth of excavation below existing grade and the groundwater levels at the time of construction. The groundwater level should be maintained no higher than 2 feet below the bottom of the excavations. Actual dewatering "means and methods" should be left up to a contractor experienced in installation and operation of dewatering systems.
- Any unsuitable soils (very soft and/or loose soils), if encountered during construction, should be removed in their entirety from the bottom of the excavations and replaced with compacted, granular backfill.
- Should the excavation bottom become unstable due to persistent moisture or hydrostatic pressure, the bottom should be "over-excavated" a minimum of 12 inches (deep) and replaced with clean gravel (FDOT No. 57 Stone) that is completely enveloped within a filter fabric.
- Backfill should consist of relatively clean sands or gravels, with a maximum of 12% passing the U.S. No. 200 sieve and no particle size larger than 1 inch in any dimension. The sands found in the soil borings should generally meet this criterion.
- The fill should be placed in the dry in lifts that do not exceed 12 inches in vertical measure. Each lift should be compacted to at least 95% of the Modified Proctor maximum dry density (ASTM D-1557).
- As a minimum, all temporary excavations should be sloped or braced to provide stability and safe working conditions. The utility contractor, by contract, is usually responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations, as required, to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local, state, and federal safety regulations including the current Occupational Health and Safety Administration (OSHA) Excavation and Trench Safety Standards.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

ATTACHMENTS

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

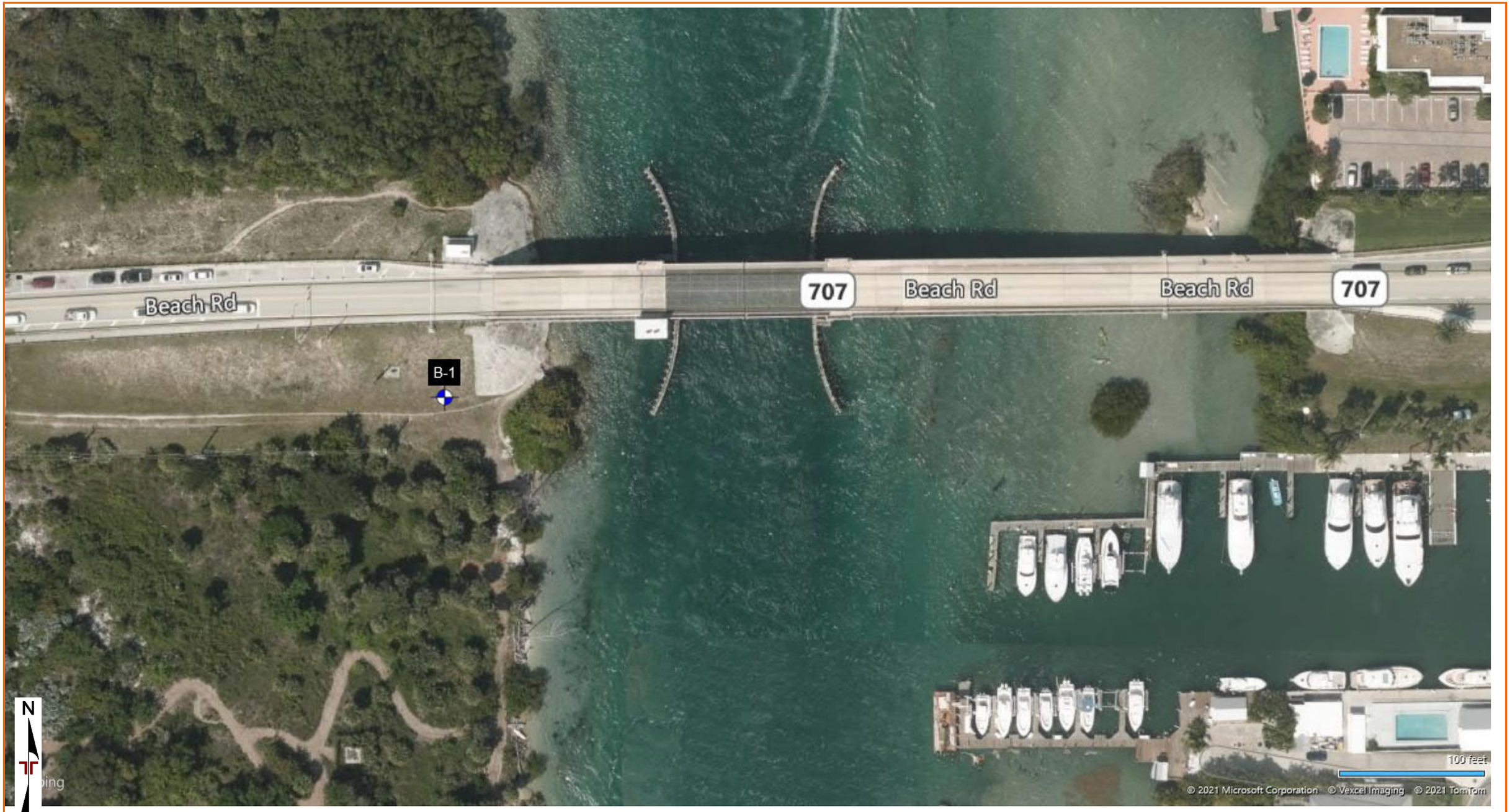
SITE LOCATION

Beach Road Water Main Replacement Phase 2 ■ Tequesta, FL
November 9, 2021 ■ Terracon Project No. HD215057

Terracon GeoReport

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: JUPITER, FL (1/1/1983).



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MAP PROVIDED BY MICROSOFT BING MAPS

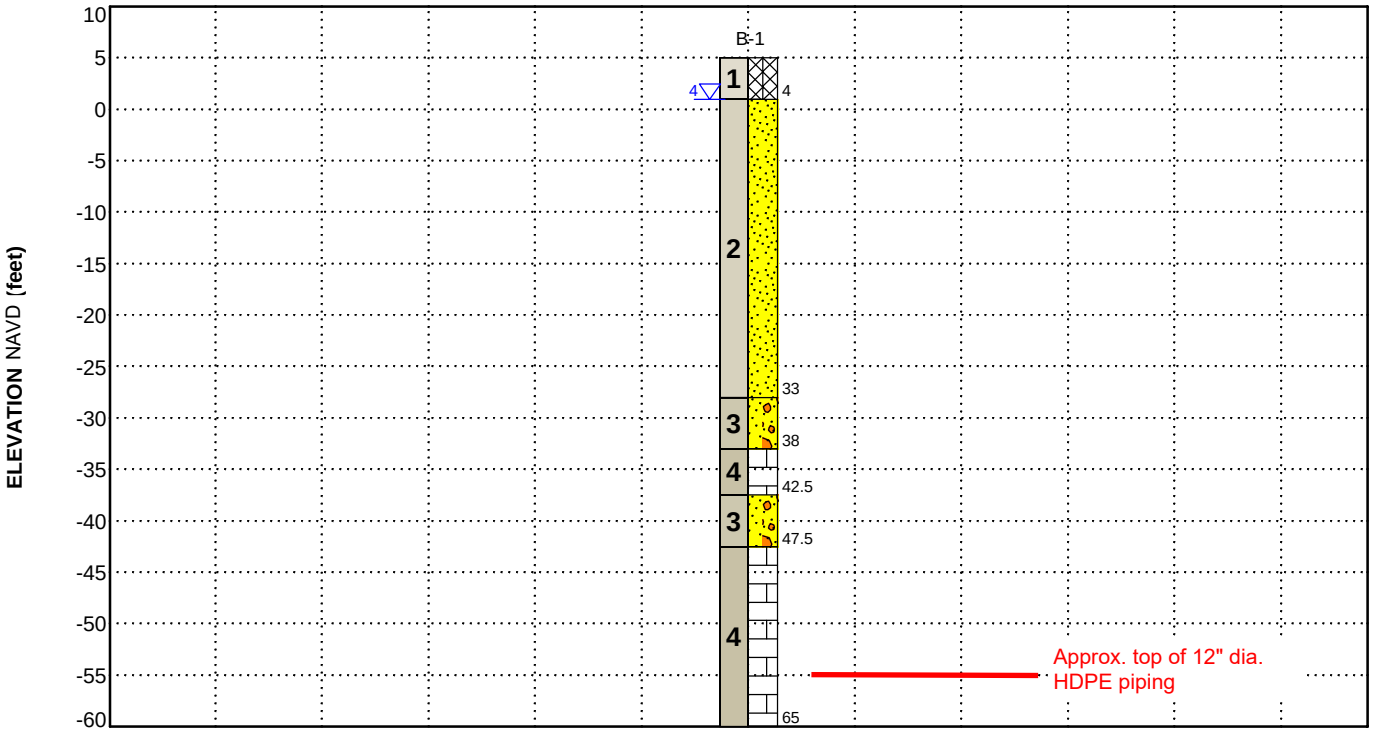
EXPLORATION RESULTS

Contents:

Note: All attachments are one page unless noted above.

GEOMODEL

Beach Road Water Main Replacement Phase 2 ■ Tequesta, FL
Terracon Project No. HD215057



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	FILL	Sand with trace shell fragments
2	SAND	Poorly graded fine SAND (SP), loose to medium dense
3	SAND with shell and limestone	Poorly graded fine SAND with shell and limestone fragments (SP), medium dense
4	LIMESTONE	LIMESTONE

LEGEND

- Fill
- Limestone
- Poorly-graded Sand
- Poorly-graded Sand with Gravel

▽ First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

BORING LOG NO. B-1

PROJECT: Beach Road Water Main Replacement Phase 2

CLIENT: Kimley-Horn and Associates Inc
West Palm Beach, FL

SITE: South side of Beach Road, at the I.C.W.W.
Tequesta, FL

LOCATION See Exploration Plan

Latitude: 26.9523° Longitude: -80.0795°

Approximate Surface Elev.: 5 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	FIELD TEST RESULTS
		FILL - , sand with trace shell fragments, light brown	
4.0	1+/-		
		SAND (SP), fine grained, brown to orangish brown, loose to medium dense	1-2-2-1 N=4
			4-6-8-8 N=14
			6-7-10-10 N=17
			6-6-8-9 N=14
			7-8-8-8 N=16
			7-9-11-12 N=20
			6-7-7-7 N=14
			5-9-11-9 N=20
33.0	-28+/-		
		SAND (SP), with some shell fragments, fine grained, light brown to orangish brown, medium dense	5-6-17-17 N=23
38.0	-33+/-		
		LIMESTONE, sandy, light gray	10-8-10-6 N=18
42.5	-37.5+/-		
		SAND (SP), with limestone fragments, fine grained, light gray, medium dense	5-6-7-7 N=13
47.5	-42.5+/-		
		LIMESTONE, sandy, light gray	11-10-13-14 N=23
			23-14-30-50/3 N = 44
			5-24-20-14 N=44
65.0	-60+/-		N = 50/4"

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary
Continuous sampling upper 12 feet
Samples at 3 to 5 foot intervals thereafter

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:
Begin Mud Rotary at 4 feet
Elevation shown is in NAVD

WATER LEVEL OBSERVATIONS

▽ *4 ft during drilling*

Terracon
1225 Omar Rd
West Palm Beach, FL

Boring Started: 10-12-2021 | Boring Completed: 10-12-2021

Drill Rig: Mobile B-57 | Driller: T.D.

Project No.: HD215057

BORING LOG NO. B-1

PROJECT: Beach Road Water Main Replacement Phase 2

CLIENT: Kimley-Horn and Associates Inc West Palm Beach, FL

SITE: South side of Beach Road, at the I.C.W.W. Tequesta, FL

GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 26.9523° Longitude: -80.0795° Approximate Surface Elev.: 5 (Ft.) +/- DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS
	Boring Terminated at 65 Feet				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Rope and Cathead

Advancement Method:
Mud Rotary
Continuous sampling upper 12 feet
Samples at 3 to 5 foot intervals thereafter

Abandonment Method:
Boring backfilled with bentonite grout upon completion

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *4 ft during drilling*

Terracon
1225 Omar Rd
West Palm Beach, FL

Boring Started: 10-12-2021	Boring Completed: 10-12-2021
Drill Rig: Mobile B-57	Driller: T.D.
Project No.: HD215057	

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)	Location
1	65	see Exploration Plan

Boring Layout and Elevations: Terracon personnel marked the boring locations using nearby referenced points. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet).

- Prior to drilling, Sunshine State One Call was contacted to mark public utilities at the site.
- Once underground utility clearance was obtained, we mobilized a truck mounted drilling rig, and drilled the Standard Penetration Test (SPT) borings.
- The Standard Penetration Test (SPT) borings were drilled using mud rotary methods. Soil sampling in the SPT borings was completed in general accordance with industry standard procedures wherein split-barrel samples were obtained. SPT split spoon sampling was continuous to a depth of 10 feet, and at 5-foot vertical intervals thereafter. In addition, we observed and recorded groundwater levels during drilling. Once the samples were collected and classified in the field, they were placed in appropriate sample containers for transport to our laboratory. The boreholes were backfilled with gravel or bentonite grout upon completion.

Laboratory Testing

All samples were examined in the laboratory by a geotechnical engineer and classified in accordance with the Unified Soil Classification System.

SUPPORTING INFORMATION

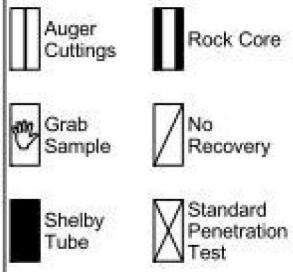
Contents:

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING



WATER LEVEL

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% of more passing the No. 200 sieve) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Automatic Hammer SPT N-Value (Blows/Ft.)**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (psf)**	**Automatic Hammer SPT N-Value (Blows/Ft.)**
Very Loose	< 3	Very Soft	Less than 500	< 1
Loose	3 – 8	Soft	500 to 1,000	1 – 3
Medium Dense	8 – 24	Medium Stiff	1,000 to 2,000	3 – 6
Dense	24 – 40	Stiff	2,000 to 4,000	6 – 12
Very Dense	> 40	Very Stiff	4,000 to 8,000	12 – 24
		Hard	> 8,000	> 24

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 – 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobble	12 in. to 3 in. (300 mm to 75 mm)
Gravel	3 in. to #4 sieve (75 mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other consituents	Percent of Dry Weight
Trace	< 5
With	5 – 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Particle Size
Non-Plastic	0
Low	1 – 10
Medium	11 – 30
High	> 30

Terracon

UNIFIED SOIL CLASSIFICATION SYSTEM

Terracon GeoReport

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [E]		GW	Well-graded gravel [F]
			Cu < 4 and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [E]		SW	Well-graded sand [I]
			Cu < 6 and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.