



**TECHNICAL SPECIFICATIONS
for**

CITY OF WEST PALM BEACH, FLORIDA

CITY-WIDE ROADWAY RESURFACING AND CONCRETE WORK

SECTION 01010

SUMMARY OF WORK

1.01 PROJECT LOCATION:

All of the work is located in the City of West Palm Beach, Palm Beach County, Florida, as shown on the Project Drawings.

1.02 SCOPE OF WORK:

A. Contractor's Duties:

- The Contractor shall furnish and install all labor, materials, equipment, tools, services, and incidentals which is reasonable and necessary to complete all work required by these specifications. Omission of a specific item or component shall not relieve the Contractor of the responsibility of furnishing the items as part of the work and at no additional expense to the Owner.

B. Work Summary:

- The Contractor shall perform the work complete, in place:
 - ✓ tests where applicable
 - ✓ repairs, replacements, and restoration required as a result of damages caused during this construction.

END OF SECTION

SECTION 01011

SPECIAL PROJECT PROCEDURES

1.01 TRAFFIC CONTROL:

- A. Method of traffic control while performing the work within roadways shall be coordinated by the Contractor with the City and Palm Beach County Engineering, as necessary, and approved by the Engineer-of-Record and appropriate governmental agencies prior to performing work.

1.02 EXISTING UTILITY AND STRUCTURES PROTECTION:

- A. Existing utilities and facilities shall be located by the Contractor prior to commencement of each task.
- B. It shall be the Contractor's responsibility to contact utility companies and call SUNSHINE at (800) 432-4770 at least 48 hours before starting construction so maintenance personnel can locate and protect facilities, if required by the utility company.
- C. The Contractor will provide adequate pre- and post-construction photos of the existing surface conditions of the entire vicinity before construction and when project is complete. The Contractor will be responsible for any repairs required as a result of construction in performance of this Contract. **The Contractor will submit two (2) copies of the photos on disc to the Engineer-of-Record prior to submittal of final payment.**
- D. Contractor shall give written notification of construction (one week minimum) to all residents (commercial or residential) in the vicinity of the construction.

1.03 SALVAGED MATERIAL:

Any existing equipment or material which is removed or replaced as a result of construction under this project may be designated as salvage by the City and if so shall be removed, cleaned, and delivered to the site in a protected place specified by the City. Any equipment or material not worthy of salvaging, as directed by the City, shall be disposed of by the Contractor at a suitable location. Upon request of the Engineer, Contractor shall submit evidence of proper disposal.

1.04 RECORD DOCUMENTS:

- A. The Contractor shall maintain on site one set of the following record documents for use to record actual revision to the Work:
 - a. Construction Drawings
 - b. Specifications
 - c. Addenda
 - d. Change Orders and other modifications to the Contract
 - e. Approved Shop Drawings, product data, and samples
- B. The Contractor shall provide record drawings for 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.

The record drawings shall correctly and accurately show all changes made during construction from the Contract Documents and shall reflect surveyed information which shall be performed, signed and sealed by a professional land surveyor registered in the State of Florida. The drawings shall be neat and legible. All elevations shall be based on State Plane Coordinates NGVD-29

Datum. Record Drawings, at the minimum shall show the following information:

1. Piping - Record drawings shall show the following field information:
 - a. Materials used to construct lines, including invert elevations.
 - b. Station, offset, and top of pipe and roadway elevation at 100 foot intervals, at each change of grade, valves, fittings, and at the point of utility crossings. Show all variations in required cover over pipe.
 - c. Station and offset of water services, valves, fittings, hydrants, terminal ends, blow-off points, sampling points, etc.
 - d. Station, offset, and length of all sleeves and casing pipes.
 - e. Detailed sketch for each tie-in point, and utility crossings.
 - f. Location and/or clearances of utilities (gas main, electrical and communication conduits, telephone conduit/duct bank, tv cables, etc.) and miscellaneous structures crossed or otherwise exposed during construction.
 2. Structures - Record drawings shall show the following information:
 - a. Station, offset, top of grate, and invert elevation of structures including structure dimensions and wall thickness.
 - b. Influent and effluent pipe inverts.
- C. Upon completion of the project, final record drawings will be provided to the City on CD-Rom, Autocad Release 2009 DWG format, along with one set of plans signed and sealed by a professional Land Surveyor registered in the state of Florida.
- D. Engineer-of-Record/Owner (City) reserves the right to review Contractor's As-Built drawings during course of construction.

Final pay and connections to any existing utility main will not be approved until Record Drawings are approved and accepted by Engineer-of-Record/Owner (City).

1.05 INSPECTION FEES:

Contractor shall be responsible for all inspection fees incurred by regulatory/governmental agencies.

1.06 PROVISION FOR THE CONTROL OF DUST:

Extreme precautions shall be taken during construction to minimize the amount of dust created. Wetting down the site may be required or directed by the City to prevent dust as a result of vehicular traffic.

1.07 SPECIAL CONSIDERATIONS:

All work under this contract shall be performed with minimal interruption of operation to the existing facility. Where it is necessary to make connection to or changes in existing facilities, the required interruption shall be kept to a minimum as allowed by the City.

END OF SECTION

SECTION 01019

GENERAL REQUIREMENTS

1.01 EXISTING UTILITIES AND STRUCTURES:

The existing utilities and facilities shown have been located from the Owner's and other records. Guaranties are not made that all existing facilities are shown or that those shown are entirely accurate. The Contractor will assure himself of any utilities, structures or facilities prior to performing any Work. Prior to the start of Work, the Contractor will request the Owner to advise him of the location of their facilities in the vicinity and will notify the Engineer of any deviation between existing conditions and the drawings. The Contractor will assume liability for damages sustained or costs incurred because of his operations in the vicinity of existing utilities or structures. The Contractor will be solely responsible for the protection and maintenance of existing utilities to provide uninterrupted service to commercial and residential customers.

1.02 PRESERVING WATER QUALITY:

The Contractor will exercise extreme care to minimize degradation of water quality at the site. All necessary provisions will be taken to insure compliance with the water quality standards of the State of Florida.

The Contractor will take steps to collect and dispose of all sewage that leaks and/or spills during the performance of this contract. Any leakage or spillage will be cleaned up to the satisfaction of the Department of Environmental Protection.

1.03 PROTECTION OF EXISTING AND ADJACENT PROPERTIES:

Unless indicated otherwise, all shrubbery, paved streets and walks, fences and walls, adjacent structures and equipment will be fully protected against damage during each stage of the project. Any damage by the Contractor will be fully restored to original condition.

1.04 RESTORATION OF DAMAGED SURFACES, STRUCTURES AND PROPERTY:

Where pavement, trees, shrubbery, fences or other property or surface structures not designated as pay items, have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirements of the Contract Documents, state laws, municipal ordinances or the specific direction of the Engineer, or through failure to employ usual and reasonable safeguards, such property and surface structures will be replaced or repaired at the expense of the Contractor to a condition equal to that before Work began within a time frame approved by the Engineer.

1.05 SUBSTITUTIONS:

For substitution of products in place of those specified, bidder must submit shop drawings and technical data at least seven (7) calendar days prior to the Bid Opening date to substantiate "an approved equal" by the City, except specified items followed by the words "no substitution".

Submit five copies of request for substitution. Include in request:

1. Complete Data substantiating compliance of proposed substitution with Contract Documents.
2. For Products:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturers' literature:
 - (1) Product description.
 - (2) Performance and test data.

- (3) Reference standards.
- c. Samples.
- d. Name and address of similar projects on which product was used, and date of installation.

3. For construction methods:

- a. Detailed description of proposed method.
 - b. Drawings illustrating methods.
4. Itemized comparison of proposed substitution with product or method specified.
5. Data relating to changes in construction schedule.
6. Relation to separate contracts.
7. Accurate cost data on proposed substitution in comparison with product or method specified.

1.06 CONSTRUCTION WATER:

The Contractor will be responsible for making application for hydrant meters with backflow preventers. The City 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. All associated fees including construction water will be paid for by the Contractor, see attached fee schedule. In an event that damage to these facilities occurs, the Contractor will be responsible for all costs associated with their replacement by the City's standard rate.

1.07 SANITARY FACILITIES:

If necessary, the Contractor shall provide temporary restroom facilities for field crews. Location of such facilities will be subject to the approval of the City. Existing City/Residence facilities are not available for use by the Contractor.

1.08 WORKING HOURS:

All water and sewer work on this contract shall be conducted during normal working hours (7:00 A.M. to 3:30 P.M.) on weekdays. No work shall be performed on weekends or City observed holidays. Inspection services needed beyond normal working hours will be paid for by the Contractor.

1.09 ASSEMBLIES OR UNITS:

Where the Contractor is required to furnish and install an assembly or unit, the Contractor shall furnish all component parts as required by the manufacturer of the unit.

1.10 ACCESS TO THE WORK SITE:

The Contractor may use only the roads and/or easements designated by the Owner for access to the work locations. The Contractor shall be responsible for maintaining, protecting and restoring the routes to the satisfaction of the Owner and Engineer.

1.11 SECURITY:

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 been fully accepted by the City.

1.12 TRENCH SAFETY ACT:

All work shall conform to the Florida Trench Safety Act. Contractor shall include in his price the cost

of conforming to the Trench Safety Act.

1.13 PRECONSTRUCTION CONFERENCE/PROJECT PROGRESS MEETING:

- A. Before the Contractor starts the work, a conference will be held to establish procedures for handling Shop Drawings and other submittal, and for processing Applications for Payment, and to establish a working understanding among the parties as to the work.
- B. At each project progress meeting, the Contractor shall develop and submit for approval a progress schedule and phasing plan demonstrating complete fulfillment of all contract requirements including all activities of subcontractors, equipment vendors and suppliers. An updated schedule shall be submitted with each pay request.

1.14 TESTS:

All tests and analyses, which are called for in the Specifications and/or Drawings (geotechnical, concrete, bacteriological, pressure and leakage, etc.) are to be performed by an Independent Testing Laboratory, and shall be at the Contractor's expense.

1.15 REMOVAL OF ALL TEMPORARY FACILITIES & RESTORATION OF SITE:

Upon completion of the work, it shall be the responsibility of the Contractor to remove all temporary facilities including but not limited to pumps, fences, signs, temporary power, materials or other debris. The site, adjacent properties and Owner facilities, shall be restored to their original condition.

~~1.16 VIDEO TAPING~~

~~At least one (1) week prior to start of construction, the Contractor shall have video tapes taken of all areas where construction is to take place. Such video tapes shall be provided to the Engineer before construction commences. These video tapes shall serve as a record of the existing conditions for disputes arising from restoration, and should therefore be taken along the line of construction at sufficient detail as necessary to clearly depict details of existing conditions. The video tapes shall be standard 3/4" VHS cassette type tapes in color. The Contractor shall be responsible for providing the necessary equipment for the viewing of the video tapes at the Engineer's office for the duration of the project. All video tapes shall be indexed and catalogued in such a manner that each photographed area is readily identifiable and shall also indicate the date and time (hour, minutes & seconds) on which the photograph was made. The Contractor shall also have video tape taken of any unusual conditions encountered during construction that are not already a matter of photographic record. In any area where existing conditions cannot be determined by means of video tapes, the area shall be restored as approved by the Engineer at the Contractor's expense. All video tapes shall become the property of the Owner.~~

1.17 RECORD DOCUMENTS:

- A. The Contractor shall maintain on site one set of the following record documents for use to record actual revision to the Work:
 - a. Construction Drawings
 - b. Specifications
 - c. Addenda
 - d. Change Orders and other modifications to the Contract
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- B. The Contractor shall provide record drawings for 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.

The record drawings shall correctly and accurately show all changes made during construction from the Contract Documents and shall reflect surveyed information which shall be performed,

signed and sealed by a professional land surveyor registered in the State of Florida. The drawings shall be neat and legible. All elevations shall be based on State Plane Coordinates NGVD-29 Datum. Record Drawings, at the minimum shall show the following information:

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 - b. Station, offset, and top of pipe and roadway elevation at 100 foot intervals, at each change of grade, valves, fittings, and at the point of utility crossings. Show all variations in required cover over pipe.
 - c. Station and offset of water services, valves, fittings, hydrants, terminal ends, blow-off points, sampling points, etc.
 - d. Station, offset, and length of all sleeves and casing pipes.
 - e. Detailed sketch for each tie-in point, and utility crossings.
 - f. Location and/or clearances of utilities (gas main, electrical and communication conduits, telephone conduit/duct bank, tv cables, etc.) and miscellaneous structures crossed or otherwise exposed during construction.
 2. Structures - Record drawings shall show the following information:
 - a. Station, offset, top of grate, and invert elevation of structures including structure dimensions and wall thickness.
 - b. Influent and effluent pipe inverts.
- C. Upon completion of the project, final record drawings will be provided to the City on CD-Rom, Autocad Release 2000 DWG format, along with one set of blueprint, and one set mylar, signed and sealed by a professional Land Surveyor registered in the state of Florida.
- D. Engineer-of-Record/Owner (City) reserves the right to review Contractor's As-Built drawings during course of construction.
- E. Final pay and connections to any existing utility main will not be approved until Record Drawings are approved and accepted by Engineer-of-Record/Owner (City).

1.18 PROVISION FOR THE CONTROL OF DUST:

The Contractor shall take the necessary steps to prevent objectionable blowing or drifting of dust, sand, and other debris where the construction occurs in residential, commercial, or other developed areas.

Extreme precautions shall be taken during construction to minimize the amount of dust created. Wetting the site or other means as directed by the City, may be required for control of dirt.

1.19 OBSTRUCTION:

- A. 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 water, chemical, electrical, gas, or other lines 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 occurs to an existing line, the Contractor shall repair the line at no cost to the City.
- B. 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.

1.20 CLEAN-UP:

The Contractor shall maintain the site of the work in a neat condition. The Contractor shall remove all excess materials, excess excavated materials and all debris resulting from his operations within a time frame approved by the Engineer.

1.21 DESIGN PROFESSIONALS REPRESENTING OWNER:

Various Design Professionals (i.e. Civil, Mechanical, Electrical, Groundwater Hydrologists, etc.) as consultants to the Owner prepared the drawings and specifications for the project. The Owner may have the various Design Professionals provide services to the Owner during construction phase of the project. The Design Professionals will be representatives of the Owner and visits to the site by the Design Professionals will be on the basis of paragraph 1.22 of this section. Also paragraph 1.23 of this section includes the various Design Professionals for this project.

1.22 VISITS TO SITE BY OWNER'S REPRESENTATIVE:

The Owner's representative will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed work and to determine, in general, if the work is proceeding in accordance with the Contract Documents.

The Owner's representative's efforts will be directed toward providing for the Owner a greater degree of confidence that the completed work will conform to the drawings and these specifications. On the basis of such visits and on-site observations, the Owner's representative will keep the Owner informed of the progress of the work and will endeavor to guard the Owner against defects and deficiencies in the work.

1.23 LIMITATIONS ON OWNER'S REPRESENTATIVE RESPONSIBILITIES:

- A. Neither the Owner's representative's authority to act under these specifications and drawings or elsewhere in other documents nor any decision made by the Owner's representative in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the Owner's representative to the Contractor, any sub-Contractor, any manufacturer, fabricator, supplier or distributor, or any of their agents or employees or any other person performing any of the work.
- B. The Owner's representative shall not be responsible to the Contractor's means, methods, techniques, sequences or procedures of construction, or safety precautions and programs incident thereto, and the Owner's representative shall not be responsible for the Contractor's failure to perform the work in accordance with the drawings and these specifications.
- C. The Owner's representative shall not be responsible for the acts or omissions of the Contractor or of any sub-Contractors, or of any other persons at the site or otherwise performing any of the work.

1.24 WARRANTY:

The Contractor shall be responsible for defects in materials (including latent defects) or workmanship for a period of one year after the date of final acceptance of the project by the Owner. Such defects include, but not limited to, any settlement noted in backfill, fill, or in structures built over the backfill or fill during the warranty period in accordance with the GENERAL CONDITIONS will be considered to be caused by improper compaction methods and shall be corrected by the Contractor at no cost to the Owner. Structures damaged by settlement shall be restored to their original condition by the Contractor at no cost to the Owner.

The Contractor shall furnish factory warranty on all equipment furnished for the performance and completion of the project against defects in materials and/or workmanship. The factory warranty shall become effective on the date of delivery and acceptance by the Owner. Should any defects in materials or workmanship, the Contractor shall replace at no cost to the Owner.

END OF SECTION

SECTION 01020

MAINTENANCE AND PROTECTION OF PROPERTIES

PART 1 - GENERAL

1.01 EXISTING UTILITY AND STRUCTURES PROTECTION

- A. Existing utilities and facilities shall be located prior to commencement of each task.
- B. The existing utilities and facilities, as shown on the Contract Drawings, have been located from the best available City records. There is no guaranty that all existing facilities are shown or that those shown are entirely accurate. The Contractor shall undertake the work necessary to assure of the location of any utilities, structures or facilities prior to performing any Work. As a minimum, prior to the start of Work, the Contractor shall contact the appropriate authorities to locate existing facilities in the vicinity, as outlined in the General Notes on the contract drawings. The City and the Engineer will assume no liability for damages sustained or costs incurred because of the Contractor's operations in the vicinity of existing utilities or structures. The Contractor shall immediately notify the Engineer of any deviation between existing conditions and the drawings.

~~C. Video Records:~~

- ~~1. At least one (1) week prior to start of construction, the contractor shall have videotapes taken of all areas where construction is to take place, including all work to be performed on private property. Such videotapes shall be provided to the Engineer before construction commences. These video tapes shall serve as a record of the existing conditions for disputes arising from restoration, and should therefore be taken along the line of construction at sufficient detail as necessary to clearly depict details of existing conditions. It is recommended that walls, driveways and homes exhibiting cracks or other damage be recorded as well.~~
- ~~2. Videotapes shall be limited to one video per street or a maximum of 2,000 linear feet of roadway per tape.~~
- ~~3. The videotapes shall be standard 3/4" VHS cassette type tapes in color. The label shall also indicate the date and time on which the photograph was made.~~
- ~~4. Label and catalog by street name and beginning and ending intersections.~~
- ~~5. All videotapes shall become the property of the Owner.~~

1.02 MAINTENANCE OF AREA UNDER CONSTRUCTION

- A. The Contractor should use the following as a guideline to plan and control the areas under construction.
 - 1. No trench shall be open at the end of each workday.
 - 2. Restrict the length of open excavation (down to pipe zone) to a maximum of 100-LF.
 - 3. Contractor shall be responsible to restore local traffic access at end of each workday whenever necessary or applicable.
 - 4. Contractor shall coordinate with the City to insure detour routes will be clear.

5. Contractor shall provide bridging or temporary backfill of an open trench within a reasonable time period when requested to allow access to residential and commercial driveways throughout the duration of work. All driveways shall be open and accessible each night at the end of work.
- B. All closed trenches shall receive a temporary rock surface in order to accommodate local vehicular and pedestrian traffic each night. Temporary surface shall be a minimum of four inches road base material, compacted, graded and maintained by the Contractor.
- C. The Contractor shall perform his construction activities within the following time periods. Within 3 days after acceptance of the trench backfill, the base shall be restored including priming and/or sealing and shall be open for traffic. The asphalt wearing surface shall be replaced no earlier than 1 week after completion of the base course with complete surface restoration within the ROW including grassing, sodding and all concrete work within 2 weeks after completion of restoration of the base course. Any restoration or repair work required to be completed on private property must be completed within either 48 hours of completion of work or in the case of repair to construction damage, following notification for the need for such repair.

1.03 EXISTING UTILITIES COORDINATION

A. Watermain

The Contractor shall coordinate with the City prior to constructing, testing, or tying into existing watermain.

B. Power Supply for Electric Dewatering Pumps (if overnight, dewatering will be necessary).

1. The Contractor shall arrange for the service drops with Florida Power and Light Company.
2. All costs associated with obtaining, maintaining and removal of these temporary service drops shall be included in the bid price for potable water pipeline.

C. Underground Communications and Power Utilities

The Contractor shall be responsible for verifying locations of all existing utilities, (including but not limited to AT&T, BellSouth, FPL, Cable TV, City of West Palm Beach and Florida Public Utilities (gas)) within the limits of the project prior to beginning construction in accordance with the General Notes. Contractor shall immediately notify the Engineer of any conflicts.

1.04 PROTECTION OF EXISTING AND ADJACENT PROPERTIES:

- A. All shrubbery, paved streets and walks, driveways, fences and walls, adjacent structures and equipment shall be fully protected against damage during each stage of the project. Any damage by the Contractor shall be fully restored to original condition unless indicated otherwise on the drawings or by City officials.
- B. The use of heavy vibratory rollers in compacting the fill has the potential to cause some movement of any nearby structures founded on shallow mats/footings. For these reasons, the use of heavy vibratory drum rollers is not recommended in residential and commercial areas. Trench backfill should be compacted using walk behind vibratory equipment. As part of the pre-construction activities, the contractor is required to perform a condition survey of buildings adjacent to the roadways as a basis for establishing preconstruction building

assessments for defense or verification of construction damage claims. It will be necessary for the Contractor to provide a vibration monitoring plan as part of his construction activities. Ground particle velocities at buildings adjacent to work activities should not exceed 0.25 inch per second.

- C. Contractor shall protect all property that may be affected by his work or operations. The location and extent of underground and covered facilities are not guaranteed and the Contractor is cautioned to proceed with care in order to prevent the undermining or damage to existing structures, piping, or facilities.
- D. In the event any of the Contractor's activities were to disrupt or endanger any facilities, he shall at his own expense make all necessary repairs or replacements necessary to correct the situation to the satisfaction of the Engineer. Such work shall progress continuously to completion on a 24-hour per day, seven workday basis. The Contractor shall be responsible for the services of repair crews on call 24 hours per day for emergencies that arise involving work under this Contract.

1.05 SITE CONDITIONS

A. Site Investigation and Representation

1. The Contractor acknowledges satisfaction as to the general nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, availability of labor, water, electric power, roads, and uncertainties of weather, or similar physical conditions, the character of equipment and facilities needed preliminary to and during the prosecution of the work, and all other matters which can in any way affect the work or the cost thereof under this contract.
2. Failure by the Contractor to become acquainted with the physical conditions and all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of successfully performing the work.
3. The Contractor warrants that as a result of examination and investigation of all the aforesaid data, the Contractor can perform the work in a good and workmanlike manner and to the satisfaction of the Owner. The Owner assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefore is assumed by the Owner.

B. Information on Site Conditions

1. Any information obtained by the Engineer regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities as applicable, and similar data will be available for inspection at the office of the Engineer upon request. Such information is offered as supplementary information only. Neither the Engineer nor the Owner assumes any responsibility for the completeness or interpretation of such supplementary information.
2. For convenience, soil boring data is provided in the Appendix B.
3. Subsurface Investigations
 - (a) The Contractor shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater condition, the character

of equipment and facilities required preliminary to and during the performance of the work, the general and local conditions and all other matters which can in any way affect the work under this Contract. The prices established for the work to be done shall reflect all costs pertaining to the work. Any claims for extras based on the substrata or ground water table conditions will be disallowed.

- (b) The Contractor further acknowledges that he assumes all risk contingent upon the nature of the subsurface conditions actually encountered by him in performing the work covered by the Contract, even though such actual conditions may result in the Contractor performing more or less work than he originally anticipated.

C. Utilities

1. The Contractor shall be responsible for determining, at his cost, the locations of all utilities within the project area, and shall be responsible for contacting each utility for location and notification prior to commencing work.

1.06 PROTECTION OF EXISTING UTILITIES

A. Contractor's Responsibility for Utility Properties and Service

1. Where the Contractor's operations could cause damage or inconvenience to telephone, television, power, water, or sewer systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the Contractor with the owner of the utility affected.
2. Notify all utility offices which are affected by the construction operation at least 48 hours in advance. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities.
3. The Contractor shall be solely and directly responsible to the Owner and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.
4. Neither the Owner nor its officers or agents shall be responsible to the Contractor for damages as a result of the Contractor's failure to protect utilities encountered in the work.
5. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.
6. In the event the Contractor encounters sanitary service or water service lines that interfere with trenching, he may, by obtaining prior approval of the property owner, City or Fire Department as applicable, and the Engineer, cut the service, dig through, and restore the service with similar and equal materials at the Contractor's expense.
7. The Contractor shall replace in kind, at his own expense, all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract documents or ordered by the Engineer.

B. Interfering Structures

1. Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground.
2. Protect underground and aboveground existing structures from damage, whether or not they lie within the limits of the easements obtained by the Owner. Where such existing fences, gates, driveways, sheds, buildings, or any other structure must be removed in order to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the property owner involved at the Contractor's own expense. Notify the Engineer of any damaged underground structure, and make repairs or replacements before backfilling.
3. Without additional compensation, the Contractor may remove and replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes, and signposts that interfere with the Contractor's operations.

C. Field Relocation

1. During the progress of construction, it is expected that minor relocations of the work will be necessary. Such relocations shall be made only by direction of the Engineer. If existing structures are encountered which prevent the construction, and which are not properly shown on any Contract Drawings, notify the Engineer before continuing with the construction in order that the Engineer may make such field revisions as necessary to avoid conflict with the existing structures. If the Contractor shall fails to so notify the Engineer and proceeds with the construction despite this interference when an existing structure is encountered, he shall do so at his own risk.

D. Easements

1. Limits of the existing utility easements are to be assumed to be the paved road rights-of-way unless otherwise noted on the plans. If new work is to be done beyond the horizontal limits of the paved rights-of-way, the Contractor must request such deviation from the plans from the Engineer.

1.07 PRESERVATION, RESTORATION, AND CLEANUP

A. Site Restoration and Cleanup

1. At all times during the work, keep the premises clean and orderly, and upon completion of the work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.
2. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, gardens, shrubbery, or fences, regardless of whether these are on private property, or on state, county, or city rights-of-way. Remove all excavated materials from grassed and planted areas and leave these surfaces in a condition equivalent to their original condition.
3. All existing drainage ditches and culverts shall be reopened and graded and natural drainage restored. Restore culverts broken or damaged to their original condition and location.
4. Upon completion of pipe laying and backfilling operations, clean all former grassed and planted areas, leaving all disturbed areas free from rocks, gravel, clay, or any other foreign material. The finished surface shall conform to the original surface, and shall be free-draining and free from holes, ruts, rough spots, or other surface features detrimental to a seeded area.

B. Finishing of Site, Borrow, and Storage Areas

1. Upon completion of the project, all areas used by the Contractor shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the abutting property. Areas used for the deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain.

C. Street Cleanup During Construction

1. Thoroughly clean all spilled dirt, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation. Sidewalks, unless under construction, shall be kept clear of material, and available for pedestrian use at all times.

D. Dust Prevention

1. Give all unpaved streets, roads, detours, haul roads or disturbed areas used in the construction area an approved dust-preventive treatment or periodically water to prevent dust. Applicable environmental regulations for dust prevention shall be strictly enforced.

E. Preservation of Irrigation and Drainage Ditches

1. After backfilling of the trenches, restore all irrigation and storm drain ditches destroyed, damaged, or otherwise modified during construction to a condition equivalent, in the opinion of the Engineer, to the condition of the ditch before construction. Ditches so reconstructed shall be built in their original locations.

END OF SECTION

SECTION 01022

CONTRACTOR'S ACTIVITIES AND TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 PRESERVING WATER QUALITY:

The Contractor shall exercise extreme care to minimize degradation of ground water quality at the site. All necessary provisions shall be taken to insure compliance with the water quality standards of the State of Florida.

The Contractor shall take steps to collect and dispose of all sewage that leaks and/or spills during the performance of this contract. Any leakage or spillage shall be cleaned up to the satisfaction of the Florida Department of Environmental Protection.

1.02 SECURITY:

The Contractor shall be fully responsible for the safety and security of the work area. Any temporary measures required to maintain the security of the area shall be the Contractor's responsibility.

1.03 CONSTRUCTION CONSIDERATIONS

A. Hydraulic Uplift

The Contractor shall be completely responsible for any pipelines, manholes, foundations, or similar structures that may become buoyant during the construction operations due to the ground water or floods and before the item is put into operation. Should there be any possibility of buoyancy of an item, the Contractor shall take the necessary steps to prevent its buoyancy. Damage to any items due to floating or flooding shall be repaired or the items replaced at the Contractor's expense.

B. Cutting and Patching

The Contractor shall perform all cutting and patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. The Contractor shall not endanger any work of others by cutting, excavating or otherwise altering their work and shall only cut or alter work with the written consent of the Engineer and of the other contractors whose work will be affected.

C. Weather Conditions

Work that may be affected by inclement weather shall be suspended until proper conditions prevail. In the event of impending storms the Contractor shall take necessary precautions to protect all work, materials and equipment from exposure. The Owner reserves the right, through the opinion of the Engineer, to order that additional protection measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the Owner for damage to the work from the elements of weather.

D. Hurricane Preparedness Plan

Within 30 days prior to beginning construction, 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. Such services shall be provided at no additional cost to the Owner.

- E. Local ordinances to be observed during progression of Work
 - 1. Noise: Minimize noise to as great as extent as practicable at all times. Air compressing plants shall be equipped with silencers and the exhaust of all gasoline motors or other power equipment shall be provided with mufflers. In the vicinity of hospitals and schools, special care shall be used to avoid noise or other nuisances. Strictly observe Chapter 42, Article V of the Town of Palm Beach Code of Ordinances and all other local regulations and ordinances covering noise control.
 - 2. Dust Prevention: Applicable environmental regulations for dust prevention including Chapter 42, Article IV of the Town of Palm Beach Code of Ordinances shall be strictly enforced.

1.04 SALVAGED MATERIAL

Any existing equipment or material which is removed or replaced as a result of construction under this project may be designated as salvage by the City and if so shall be removed, cleaned and stored on or adjacent to the site in a protected place specified by the City or loaded onto trucks provided by the City. Any equipment or material not worthy of salvaging, as directed by the City, shall be disposed of by the Contractor at a suitable location. Upon request of the Engineer, Contractor shall submit evidence of proper disposal.

1.05 TEMPORARY FACILITIES

A. GENERAL

The Contractor shall provide all temporary facilities necessary for the proper completion of the work, as necessary and as specified. These shall include electrical power, water, ventilation, sanitary facilities and telephone service. The Contractor shall furnish, install and maintain all temporary utilities during the contract period including removal upon completion of the work. Such facilities shall comply with regulations and requirements of the National Electrical Code, OSHA, Florida Power and Light, and applicable Federal, State and local codes, etc.

B. CONSTRUCTION WATER

The City will install necessary connections for backflow preventers and meters, but only at such locations and in such manner as may be approved by the City. The Contractor will be responsible for applying for the backflow preventers and meters. Maintenance of such is the responsibility of the Contractor. All associated fees including construction water will be paid for by the Contractor. Contact the City for current fee schedule. In an event that damage to these facilities occurs, the Contractor will be responsible for all costs associated with their replacement in accordance to the City's standard rate.

C. SANITARY FACILITIES:

The Contractor shall provide temporary restroom facilities for field crews. Existing facilities are not available for use by the Contractor.

1.06 REMOVAL OF ALL TEMPORARY FACILITIES & RESTORATION OF SITE:

Upon completion of the work, it shall be the responsibility of the Contractor to remove all temporary facilities including but not limited to pipes, pumps, fences, signs, temporary power, materials or other debris. The site, adjacent properties and City and Town facilities, shall be restored to their original condition.

1.07 SYSTEM CONNECTIONS AND TEMPORARY WATER SERVICE

- A. The water distribution system to be replaced in this contract is active and fully functional. The Contractor shall develop a plan to provide temporary service to all properties during the construction period. Specific temporary service plans shall be submitted for each street where service will be disrupted. Temporary service plans shall be submitted no later than 30 days prior to work on any street. The temporary service plan shall include:
1. Locations of temporary tie-ins.
 2. Temporary pipe configurations.
 3. Testing and disinfection procedures.
 4. Notification of property owners.
 5. Inventory of fittings and equipment to be on hand or used in the temporary service plan.
 6. Procedures for restoring full service and removing temporary connections.
- These plans shall be coordinated with the project schedule, and be revised as necessary for the weekly progress meetings.
- B. Temporary water service shall not be supplied from a hydrant, but shall be through an approved system tap on an active water main. The tap shall be fully accessible to the City for inspection and latter plugging. The Contractor shall provide a meter box or manhole at each tapping location for this purpose.
- C. Temporary water service shall be a minimum 2-inch diameter for up to five (5) properties and three (3) inch diameter for five (5) to ten (10) properties. No more than ten (10) properties shall be served from a temporary service.
- D. Twelve (12) inches of cover is required on temporary piping at driveways and intersections.

END OF SECTION

**SECTION 01025
MEASUREMENT AND PAYMENT**

BASE BID – BASIS OF PAYMENT

PART 1 - GENERAL

1.01 BASIS FOR PAYMENTS

A. The various major items of Work will be paid for in the lump sum, allowance or unit cost amounts listed in the Schedule of Bid Items. All bid items shall include all labor, equipment, materials and testing as specified to construct the item, completed, tested and accepted. Attached is a description of the Work listed in the Schedule of Bid Items (B3) and is not intended to be complete and all-inclusive of the required work items. The Work shall include all miscellaneous and ancillary items necessary to construct a complete and functional Project.

1.02 SCHEDULE OF VALUES

A. The descriptions below generally outline the scope of work required for those elements of the Work to be paid for under each lump sum or unit cost item listed in the Schedule of Bid Items. The Contractor shall submit a schedule of values.

1.03 BREAKDOWN OF BASE BID

A. In the event that the actual quantity of material installed exceeds the quantity shown, the CONTRACTOR will be paid the unit price shown for the quantity of the value shown on the bid breakdown.

B. A credit will be similarly provided to the City by the CONTRACTOR for quantities less than those shown on the bid breakdown.

1.04 PROJECT ALLOWANCES

A. The CONTRACTOR will be required to furnish documentation evidencing expenditures charged to these allowance accounts prior to the release of funds by the City. Furthermore, the CONTRACTOR shall obtain written pre-approval by the City's PROJECT MANAGER before the expenditure of these funds. Documentation for use of the allowance accounts shall be assembled by the CONTRACTOR and provided immediately to the City's PROJECT MANAGER. No allowance funds will be released by the City without the prior written approval of the City's PROJECT MANAGER.

B. The allowance accounts are not for use by the CONTRACTOR to cover shortfalls in the CONTRACTOR'S lump sum bid amount.

C. All uncommitted allowance funds will be returned to the City by the contract at the substantial completion of the project via deductive change order.

1.05 PAYMENTS

- A. Shall be in accordance with the provisions of the GENERAL CONDITIONS.

PART 2 - BASIS OF PAYMENT

BID ITEM 1: CLEARING AND GRUBBING

- A. This item shall be paid on a per acre basis. The work of clearing shall consist of the cutting, removal, and satisfactory disposal of all vegetation and debris. The work of grubbing shall consist of the removal and satisfactory disposal of all vegetation and surface debris. Where the material being removed is high in organic matter content, such as root mat and other vegetative matter, it shall be considered vegetation and removed as part of the work of grubbing. The work of clearing and grubbing shall also include the removal and satisfactory disposal of crops, weeds, and other annual growth; the removal and satisfactory disposal of fences, steps, walls, column footings, other footings, foundation slabs, other foundation components, signs, junked vehicles, and other rubble and debris; and the filling of holes and depressions.

The Contractor's unit price shall include full compensation for all labor, materials and equipment required for removal of the above mentioned items within the project limits as indicated on the plans or within the scope of work. The material shall be completely removed and properly disposed of off-site at no additional cost to the Owner.

BID ITEMS 2 - 4: MILL EXISTING ASPHALT PAVEMENT, 1", 2" & 3" AVG DEPTH

- A. This item shall be paid on a square yard basis. The Contractor's unit price shall include full compensation for all labor, materials and equipment required for milling of all existing pavement and base (asphalt pavement of varying thickness) within the project limits as indicated on the plans or within the scope of work. This item includes all saw-cutting and joints at connections to existing pavement.

BID ITEMS 5 - 6: ASPHALT REMOVAL, UP TO 2" AND 2" – 4"

- A. This item shall be paid on a square yard basis. The Contractor's unit price shall include full compensation for all labor, materials and equipment required for removing all existing pavement (asphalt pavement of varying thickness) within the project limits as indicated on the plans or within the scope of work. This item includes all saw-cutting and joints at connections to existing pavement.

BID ITEM 7: ASPHALT PAVEMENT AND BASE REMOVAL & DISPOSAL (VARYING THICKNESS)

- A. This item shall be paid on a square yard basis. The Contractor's unit price shall include full compensation for all labor, materials and equipment required for removal of all existing pavement and base (asphalt pavement of varying thickness) within the project limits as indicated on the plans. This item includes all saw-cutting and joints at connections to existing pavement. The existing pavement and base shall be completely removed and shall be properly disposed of off-site at no additional cost to the Owner.

BID ITEM 8 - 10: TYPE S-III ASPHALTIC CONCRETE WITH TACK COAT

- A. Payment for installing new Type S-III asphalt in one 1-inch lift(s), at locations as indicated on the plans or within the scope of work shall be made at the Contractor's unit price per square yard (SY) for Type S-III asphalt and shall include all labor, material, and equipment required to construct an asphalt concrete surface as shown on the plan view and detail drawings or within the scope of work. The unit price shall include compensation for multiple mobilizations, labor, materials, and equipment required to construct the new asphalt concrete base course. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications.
- B. This unit price shall also include all necessary labor, materials, and equipment to transition to existing pavement, tack coating, compaction, rolling, brooming, and any other work required to complete the work.

BID ITEM 11: DOUBLE COURSE MICROSURFACING

- A. The Microsurfacing shall be paid for by the square yard and accepted by the Project Manager. The price shall be full compensation for furnishing all preparation; mixing and applying these materials; and all labor, equipment, tools, test designs, cleaning, and incidentals necessary to complete the job as specified herein.

BID ITEM 12: CRACK SEAL ASSOCIATED WITH MICROSURFACING

- A. The crack seal shall be paid for by the gallon and accepted by the Project Manager. The price shall be full compensation for furnishing all preparation; mixing and applying these materials; and all labor, equipment, tools, test designs, cleaning, and incidentals necessary to complete the job as specified herein.

BID ITEM 13: RUT FILL ASSOCIATED WITH MICROSURFACING

- A. The rut fill shall be paid for by the ton and accepted by the Project Manager. The price shall be full compensation for furnishing all preparation; mixing and applying these materials; and all labor, equipment, tools, test designs, cleaning, and incidentals necessary to complete the job as specified herein.

BID ITEM 14 - 16: REMOVE AND REPLACE 4", 6" and 6" ADA CONCRETE SIDEWALK & RAMPS

- A. Payment for removing, furnishing and installing 4" or 6" concrete sidewalk and/or 6" ADA sidewalk ramps shall be based on a linear foot basis for the concrete installed and accepted by the City. The contract unit price shall include all labor, materials, and equipment necessary to remove and replace in accordance with the plans and specifications or within the scope of work. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest

edition and the City of West Beach specifications, including sawcutting, joints, and connections. Removed material shall be properly disposed of off-site at no additional cost to the Owner. Cost of ramps also includes detectable warning surfaces, as approved by City.

BID ITEM 17: SAW CUT EXISTING CONCRETE/PAVEMENT UP TO 12"

- A. Payment for saw cutting shall be based on a linear foot basis. The contract unit price shall include all labor, materials, and equipment necessary to sawcut in accordance with the plans and specifications or within the scope of work. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications.

BID ITEM 18 - 21: REMOVE AND REPLACE TYPE D, F, VALLEY GUTTER AND HEADER CURB

- A. Payment for removing, furnishing and installing type D curb, type F curb, valley gutter and/or header curb shall be based on a linear foot basis for the concrete installed and accepted by the City. The contract unit price shall include all labor, materials, and equipment necessary to remove and replace in accordance with the plans and specifications or within the scope of work. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications, including sawcutting, joints, and connections. Removed material shall be properly disposed of off-site at no additional cost to the Owner.

BID ITEM 22: VALVE BOX (ADJUST TO GRADE)

- A. Payment for adjusting a water valve to be flush with a revised grade will be made at a unit basis (per each) for each adjustment completed and accepted by the City. The contract unit price shall include all labor, materials, and equipment necessary to adjust a water meter box in accordance with the plans and specifications or within the scope of work. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications.

BID ITEM 23: MANHOLE (ADJUST RIM & COVER TO GRADE)

- A. Payment for adjusting a manhole to be flush with a revised grade will be made at a unit basis (per each) for each adjustment completed and accepted by the City. The contract unit price shall include all labor, materials, and equipment necessary to adjust a water meter box in accordance with the plans and specifications or within the scope of work. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications.

BID ITEM 24: REMOVE AND REPLACE PAVER BRICK (TRAFFIC RATED)

- A. Payment for removing, furnishing and installing paver bricks within crosswalks, intersections, roadways and/or speed tables shall be based on a square yard basis for the bricks installed and accepted by the City. The contract unit price shall include all labor, materials, and equipment necessary to remove and replace in accordance with the plans and specifications or within the scope of work. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications, including sawcutting, joints, and connections. Removed material shall be properly disposed of off-site at no additional cost to the Owner.

BID ITEM 25: REMOVE AND REPLACE STAMPED ASPHALT SPEED BUMPS

- A. Payment for removing, furnishing and installing stamped asphalt speed humps shall be based on a square yard basis for the asphalt installed and accepted by the City. The contract unit price shall include all labor, materials, and equipment necessary to remove and replace in accordance with the plans and specifications or within the scope of work. The contract unit price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications, including sawcutting, painting, joints, and connections. Removed material shall be properly disposed of off-site at no additional cost to the Owner.

BID ITEM 26: TOP SOIL

- A. Payment for this item shall be made on a unit price per cubic yard basis. Measure and payment is on the basis of cubic yards of actual material provided and installed in accordance with the drawings and specifications. The quantity of planting soil shall be verified with the project Engineer. The unit cost of this item includes soil mix for plant backfill which shall be 80% existing top soil and 20% peat or other approved compost material by the City, providing a specification of compost material to be used at the pre-construction meeting, the addition of additives specified in the plans to the backfill soil mix and the application of herbicide.

BID ITEMS 27 & 28: BAHIA AND ST AUGUSTINE SOD

- A. Payment for this item shall be made on a Unit Price per Square Yard Basis. The unit price bid for this item shall be full compensation for all labor, materials and equipment required for soil preparation and sod placement in accordance with the drawings and specifications or within the scope of work. The unit price bid for this item shall include all watering for planting and establishment of the sod during the contract and guarantee period.

BID ITEMS 29: SEEDING

- A. Payment for this item shall be made on a Unit Price per Square Yard Basis. The unit price bid for this item shall be full compensation for all labor, materials and equipment required for soil preparation and seed placement in accordance with the drawings and specifications or within the scope of work. The unit price bid for this item shall include all watering for planting and establishment of the seeding during the contract and guarantee period.

BID ITEM 30- 35: ROOT, STUMP AND TREE REMOVAL

- A. Payment for root, stump and tree removal shall be made on a unit price (per each) basis. The unit price bid for this item shall be full compensation for all labor, materials and equipment required to remove roots, stumps, trees and palms in accordance with the drawings or within the scope of work and/or specifications provided by the Florida Department of Transportation's Design Standards, latest edition.

BID ITEM 36: REMOVE AND REPLACE TRAFFIC SIGNAL LOOPS/WIRING (PER PALM BEACH COUNTY STANDARD)

- A. Payment for this item shall be made at a unit basis (per each) for each assembly. The price shall include full compensation for removing, furnishing and installing all traffic detection loops shown on Drawings or within the scope of work. The contract lump sum price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, Palm Beach County and the City of West Beach specifications.

BID ITEM 37: SINGLE POST SIGN, F&I, LESS THAN 12 SF

- A. Payment for this item shall be made at a unit basis (per each) for each assembly. The price shall include full compensation for furnishing and installing all Roadway Signage of the types and at the locations shown on Drawings or within the scope of work. The contract lump sum price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications.

BID ITEM 38-40: REFLECTIVE PAVEMENT MARKERS (RPM'S)

- A. Payment for this item shall be made at a unit basis (per each) for each item. The price shall include full compensation for furnishing and installing all RPM's of the types and at the locations shown on Drawings or within the scope of work. The contract lump sum price shall also include other miscellaneous work required to complete the work in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition and the City of West Beach specifications.

BID ITEMS 41 - 63: PAVEMENT MARKINGS

- A. The quantity of paint pavement markings installed shall be based on a linear foot basis for the markings installed and accepted by the City. All pavement markings shall be roadway duty paint – yellow and white as appropriate. The lump sum price shall include all materials, equipment, preparation, any temporary pavement markings, and other miscellaneous work or materials required to complete the work in accordance with Florida Department of Transportation Section 711 and City of West Palm Beach Specifications.
- B. The quantity of thermoplastic pavement markings installed shall be based on a linear foot basis for the pavement markings installed and accepted by the City. All pavement markings shall be thermoplastic materials – yellow and white as appropriate. The unit price shall include all measurements, materials (including retro reflective pavement markers), equipment, preparation, any temporary pavement markings, and other miscellaneous work or materials required to complete the work in accordance with Florida Department of Transportation Section 711 and City of West Palm Beach Specifications.

BID ITEM 64: MOBILIZATION

- A. Payment for mobilization will be made per work order for the price bid for the item, which price shall be full compensation for all materials, labor, equipment, tools and all other incidentals necessary to complete this item. This item also includes all costs for scheduling, temporary facilities, utilities, demobilization and all other costs required to complete the work, tested and accepted, which are not included in other bid items. Includes all required mobilizations for all items. The Contractor shall provide a full detailed breakdown of this item in his schedule of values.

BID ITEM 65: MAINTENANCE OF TRAFFIC (ALLOWANCE)

- A. Only direct reimbursable costs for certified subcontractor supplied MOT items, such as rental of cones, rental of barricades, rental of directional and other signage including rental of variable message boards, will be paid for under this pay item. Payment will be based on City approved paid invoices from said subcontractor. No Contractor markup will be allowed on the rental of these MOT items.

No payment for Contractor supplied labor for traffic setups, flagmen and or supervision will be allowed.
- B. Included in this allowance is the preparation of MOT plans that will be prepared for each phase of the work by the FDOT certified subcontractor that will be supplying the MOT barricades and signage. All MOT plans shall be reviewed and approved by the City and FDOT. All work authorized for payment will be authorized in writing by the OWNER. The City reserves the right to award any, all or none of the money associated with this allowance.
- C. Allowance will be determined per each Work Order Issued.

BID ITEM 66: CONSTRUCTION PERMITS (ALLOWANCE)

- A. Payment for Contractor required construction permits will be made as direct reimbursable allowance. No markup by the contractor will be allowed.
- B. Allowance will be determined per each Work Order Issued.

END OF SECTION

SECTION 01026

UNIT PRICES

PART 1 - GENERAL

1.01 **RELATED DOCUMENTS:**

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.02 **SUMMARY:**

- A. This Section specifies administrative and procedural requirements for unit prices.
 - 1. A unit price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.
 - 2. Unit prices include all necessary labor, materials, equipment and incidentals, overhead, profit and applicable taxes.
 - 3. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.01 **UNIT PRICE SCHEDULE:**

- A. Unit prices for all items are as shown in the Bid Form. These unit prices shall be considered an integral part of this Section.

END OF SECTION 01026

SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. This section covers all work required for the verification of preconstruction conditions, layout of proposed utility improvements, quality control and data gathering for the preparation of post-construction record drawings.

1.02 SUBMITTALS

- A. Submit name, address and telephone number of Florida Registered Land Surveyor before starting work.
- B. Submit copies of all post-construction record drawings and certificate signed by the approved Florida Registered Land Surveyor indicating that the elevations and locations of the work are as the work was constructed.

1.03 DEFINITIONS

- A. Location: "As-Built" location station, offset distance and direction relative to the existing construction baseline.
- B. Elevation: "As-Built" elevation relative to the National Geodetic Vertical Datum of 1929 (NGVD).
- C. Major Deflection: Change in horizontal or vertical alignment greater than 12-inches accomplished without the use of fittings.

1.04 QUALITY ASSURANCE

- A. Land surveyor employed shall be registered in the State of Florida and acceptable to the ENGINEER.
- B. Where applicable, employ a professional engineer of the discipline required for specific source on project, licensed in the State of Florida.

1.05 PROJECT RECORD DOCUMENTS DATA

- A. Maintain a complete and accurate log of control and survey data for project record documents as project progresses.
- B. Upon completion of the project or other intervals as requested by ENGINEER, submit certified "as-built" site survey data of the project improvements. Scale shall be same as ENGINEER's drawings and may be used as a base for surveyor's field data (redline markups).
- C. The following data (as applicable to project) shall be provided as a minimum:

1. Location and elevation of all pressure pipe fittings and valves.
 2. 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.
 3. Location and elevation of all connections to existing systems.
 4. Locations and elevations at appropriate intervals along centerline of pressure pipe to limit distance between data points to no more than 100 feet.
 5. Locations, invert(s) and rim/grate elevations of all new sanitary manholes. Location to be center of manhole.
 6. Cross sections of all repaved roadways at maximum 100 foot intervals.
 7. Locations and elevations as required to describe all other improvements.
- D. Submit final record drawings prior to final pay application at completion of project as specified in Section 01700 – Contract Closeout.
- E. Provide in tabular form, based on the obtained applicable field data, the final "As-Built" quantities for the project. "As-Built" quantities shall be referenced to the bid items and their units of measure as indicated in the CONTRACTOR's Bid Proposal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify locations of survey control points prior to starting work. Promptly notify ENGINEER of any discrepancies discovered.

3.02 SURVEY REFERENCE POINTS

- A. Protect survey control points prior to starting site work; preserve permanent reference points during construction. Make no changes without prior written notice to ENGINEER.
- B. Promptly report to ENGINEER the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control.
- C. Provide affidavit from approved Florida Registered Surveyor that all survey control points were re-established following completion of construction.

3.03 SURVEY REQUIREMENTS

- A. ENGINEER will furnish CONTRACTOR with horizontal and vertical control information. Responsibility for construction of the Work to correct dimensions, alignment and grade shall be CONTRACTOR's. Additional control points, as applicable, shall be provided for and established by surveyor.

- B. Establish and define all baselines. Provide necessary stationing along baseline. All ends and intersections of baselines shall be tied to a minimum of two permanent features.
- C. Establish locations of right-of-way lines and property lines as applicable and locations and elevations of proposed improvements. Locate and lay out by instrumentation and similar appropriate means:
 - 1. All utility improvements including locations and elevation.
 - 2. Major pipeline deflections/conflicts.
 - 3. The locations and elevations as applicable to valves, fitting, services and connections to existing utilities.
 - 4. Alignment and cross section of roadway, driveway and sidewalk restorations. As applicable, roadways, driveways and sidewalks shall be reconstructed to existing horizontal and vertical dimensions, unless shown otherwise.
- D. Periodically verify layouts by same means indicated above.
- E. As-built information of all utilities installed within the limits of pavement must be obtained prior to initial backfilling of trench.

3.04 SURVEYS FOR MEASUREMENT AND PAYMENT

- A. Final project record drawings with "as-built" information of the installed utility systems and all bid quantities shall be submitted and approved by ENGINEER prior to application for final payment.
- B. "As-Built" quantity data shall be presented in tabular form and reference the individual bid items and their respective units of measure as given in the CONTRACTOR's Bid Proposal.
- C. "As-Built" information shall be used by CONTRACTOR to prepare his final statement of accounts as specified in Section 01700 – Contract Closeout.
- D. Current "as-built" information shall be available for ENGINEER's use for evaluation of partial pay requests.

END OF SECTION

SECTION 01068

DEFINITIONS AND STANDARDS

PART I GENERAL

1.01 DEFINITIONS:

- A. Except as specifically defined otherwise, the following definitions supplement definitions of the Contract, General Conditions, Supplementary Conditions, and other general contract documents, and apply to the work.
1. Owner: **City of West Palm Beach**
 2. General Requirements: Provision of Division 1 sections of these specifications.
 3. Indicated: Shown on drawings by notes, graphics or schedules, or written into other portions of Contract Documents. Terms such as shown, noted, Scheduled, and Specified, have same meaning as indicated, and are used to assist the reader in locating particular information.
 4. Directed, Requested, Approved, Accepted, etc.: These terms imply by the Engineer, unless otherwise indicated.
 5. Approved by the Engineer: In no case releases Contractor from responsibility to fulfill requirements of Contract Documents.
 6. Project Site: Space available to Contractor at location of project, either exclusively or to be shared with separate contractors, for performance of the work.
 7. Furnish: Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar subsequent requirements.
 8. Install: Operations at project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar requirements.
 9. Provide: Furnish and install, complete and ready for intended use.
 10. Engineer: Design Consultant
 11. Installer: Entity (firm or person) engaged to install work, by Contractor, subcontractor, or sub-subcontractor. Installers are required to be skilled in work they are engaged to install.
 12. Specification Text Format: Underscoring facilitates scan reading, or other meaning. Imperative language is directed at contractor, unless otherwise noted.
 13. Overlapping/Conflicting Requirements: Most stringent (generally) language written directly into Contract Documents is to be used. Overlapping/conflicting requirements do not indicate that a less stringent requirement might be acceptable. Refer uncertainties to Engineer for decision before proceeding.
 14. Where optional requirements are specified in a parallel manner option is intended to be Contractor's unless otherwise indicated.

15. Minimum Requirements: Indicated requirements are for a specific minimum acceptable level of quality/quantity, as recognized in the industry. Actual work must comply (within specified tolerances), or may exceed minimums within reasonable limits. Refer uncertainties to Architect/Engineer before proceeding.
16. Abbreviations, Plural Words: Abbreviations, where not defined in Contract Documents, will be interpreted to mean the normal construction industry terminology, determined by recognized grammatical rules, by the Engineer. Plural words will be interpreted as singular and singular words will be interpreted as plural where applicable for context of Contract Documents.
17. Testing Laboratory: An independent entity engaged for the project to provide inspections, tests, interpretations, reports, and similar services.

1.02 STANDARDS AND REGULATIONS:

- A. Industry Standards: Applicable standards of construction industry have same force and effect on performance of the work as if copied directly into Contract Documents or bound and published herewith. Standards referenced in Contract Documents or in governing regulations have precedence over non-referenced standards, insofar as different standards may contain overlapping or conflicting requirements. Comply with standards in effect as of date of Contract Documents, unless otherwise indicated.
- B. Abbreviations: Where abbreviations or acronym are used in Contract Documents, they mean the well-recognized name of entity in building construction industry. Refer uncertainties to Engineer before proceeding.
- C. Trade Union Jurisdictions: Maintain current information on jurisdiction matters, regulations, actions, and pending actions; and administer/supervise performance of work in a manner which will minimize possibility of dispute, conflicts, delays, claims, or losses.
- D. Trades: Except as otherwise indicated, the use of titles such as carpentry, in specification text, implies neither that the work must be performed by an accredited or unionized trades person of corresponding generic name (such as carpenter), nor that specified requirement apply exclusively to work by trades person of that corresponding generic name.

END OF SECTION

SECTION 01090

REFERENCE STANDARDS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Abbreviations and acronyms used in Contract Documents to identify reference standards.

1.02 QUALITY ASSURANCE

- A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents, or applicable codes establish stricter standards.
- B. Publication Date: The publication in effect on the date of issue of the Contract Documents, except when a specified publication date is specified.

1.03 ABBREVIATIONS, NAMES AND ADDRESSES OF ORGANIZATIONS

- A. Obtain copies of referenced standards direct from the publication source when needed for proper performance of the Work, or when required for submittal by the Contract Documents.

AASHTO American Association of State Highway and
 Transportation Officials
 444 North Capitol Street, N.W.
 Washington, D.C. 20001

ACI American Concrete Institute
 Box 19150
 Redford Station
 Detroit, MI 48219

AISC American Institute of Steel Construction
 1221 Avenue of the Americas
 New York, N.Y. 10020

AISI American Iron and Steel Institute
 1000 16th Street, N.W.
 Washington, D.C. 20036

ANSI	American National Standards Institute 1430 Broadway New York, N.Y. 10018
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, N.Y. 10017
ASTM	American Society of Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, CO 80235
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
CRSI	Concrete Reinforcing Steel Institute 180 North LaSalle Street, Suite #2110 Chicago, IL 60601
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington Navy Yard, Bldg. 197 Washington, D.C. 20407
MIL	Military Specification Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
NEMA	National Electrical Manufacturer's Association 2101 "L" Street, N.W. Washington, D.C. 20037
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 20076
PCI	Prestressed Concrete Institute 20 North Wacker Drive Chicago, IL 60606

PS Product Standard
 U.S. Department of Commerce
 Washington, D.C. 20203

UL Underwriter's Laboratories, Inc.
 333 Pfingston Road
 Northbrook, IL 60062

- B. When no reference is made to a code, standard, or specification, the standard specifications of the ASTM, the ANSI, the ASME, the IEEE, or the NEMA shall govern.
- C. Contractor shall, when required, furnish evidence satisfactory to the Engineer that materials and methods are in accordance with such standards where so specified.
- D. In the event any questions arise as to the application of these standards or codes, copies shall be supplied on site by the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The ENGINEER shall schedule and administer pre-construction meeting, periodic progress meetings, and specially called meetings throughout progress of the Work.
 - 1. Prepare agenda for meetings.
 - 2. Make physical arrangements for meetings.
 - 3. Preside at meetings.
 - 4. Record the minutes; include significant proceedings and decisions.
 - 5. Reproduce and distribute copies of minutes within fifteen (15) working days after each meeting.
 - a. To participants in the meeting.
 - b. To parties affected by decisions made at the meeting.
- B. Representatives of CONTRACTORS, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. The CONTRACTOR shall attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.02 RELATED REQUIREMENTS

- A. Section 00100: Instructions to Bidders.
- B. Section 01310: Construction Schedules.
- C. Section 01340: Submittals.
- D. Section 01720: Project Record Documents

1.03 PRE-CONSTRUCTION MEETING

- A. Schedule a preconstruction meeting no later than 15 days after date of Notice to Award.
- B. Location: A central site, convenient for all parties, designated by the OWNER.
- C. Attendance:
 - 1. OWNER's Representative.
 - 2. ENGINEER and his professional consultants.
 - 3. Resident Project Representative.
 - 4. CONTRACTOR's Superintendent.
 - 5. Major Subcontractors.
 - 6. Major suppliers.
 - 7. Utilities
 - 8. Others as appropriate.

- D. Suggested Agenda:
1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected Construction Schedules.
 2. Critical work sequencing.
 3. Major equipment deliveries and priorities.
 4. Project Coordination.
 - a. Designation of responsible personnel.
 5. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change Orders.
 - e. Applications for Payment.
 6. Adequacy of distribution of Contract Documents.
 7. Procedures for maintaining Record Documents.
 8. Use of premises:
 - a. Office, work and storage areas.
 - b. OWNER's requirements.
 9. Construction facilities, controls and construction aids.
 10. Temporary utilities.
 11. Housekeeping procedures.

1.04 PROGRESS MEETINGS

- A. Schedule regular periodic meetings. The progress meetings will be held every 30 days with the first meeting 30 days after the pre-construction meeting or 30 days after the date of Notice to Proceed.
- B. Hold called meetings as required by progress of the Work.
- C. Location of the meetings: Project field office of CONTRACTOR or ENGINEER.
- D. Attendance:
1. OWNER'S representatives.
 2. ENGINEER, and his professional consultants as needed.
 3. Subcontractors as appropriate to the agenda.
 4. Suppliers as appropriate to the agenda.
 5. Others as appropriate.
- E. Suggested Agenda:
1. Review, approval of minutes of previous meeting.
 2. Review of work progress since previous meeting.
 3. Field observations, problems, conflicts.
 4. Problems which impede Construction Schedule.
 5. Review of off-site fabrication, delivery schedules.
 6. Corrective measures and procedures to regain projected schedule.
 7. Revisions to Construction Schedule.
 8. Progress, schedule, during succeeding work period.

9. Coordination of schedules.
 10. Review submittal schedules; expedite as required.
 11. Maintenance of quality standards.
 12. Pending changes and substitutions.
 13. Review proposed changes for:
 - a. Effect on Construction Schedule and on completion date.
 - b. Effect on other contracts of the Project.
 14. Other business.
 15. Construction schedule.
 16. Critical/long lead items.
- F. The CONTRACTOR is to attend progress meetings and is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics such as deliveries of materials and equipment, progress of the Work, etc.
- G. The CONTRACTOR is to provide a current submittal log at each progress meeting in accordance with Section 01340.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01210

SAFETY AND CONVENIENCE

PART 1 – GENERAL

1.01 SAFETY EQUIPMENT

- A. The Contractor shall do all work necessary to protect the general public from hazards, including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalk or walkway, and trenches or excavations in roadway. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public and the work. All barricades and signs shall be clean and serviceable, in the opinion of the Engineer.
- B. During construction, the Contractor shall construct and at all times maintain satisfactory and substantial temporary chain link fencing, solid fencing, railing, barricades or steel plates, as applicable, at all openings, obstructions, or other hazards in streets, sidewalks, floor, roofs, and walkways. All such barriers shall have adequate warning lights as necessary, or required, for safety. All lights shall be regularly maintained, and in a fully operational state at all times.
- C. All work shall conform to the Trench Safety Act. Contractor shall include in his price the cost of conforming to the Trench Safety Act.

1.02 ACCIDENT REPORTS

- A. In addition, the Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Engineer.
- B. If a claim is made by anyone against the contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

1.03 PROTECTION AND ACCESS TO PRIVATE PROPERTY

- A. Protect stored materials located adjacent to the proposed work. Notify property owners affected by the construction at least 24 hours in advance of the time construction begins. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from vehicular access to his residence or place of business for a period exceeding 2 hours, unless the Contractor has made special arrangements with the affected persons.
- B. The Contractor shall conduct his work zone in such a manner as to reasonably exclude all personnel not employed by him, the Engineer, and the Owner.

1.04 FIRE PREVENTION AND PROTECTION

- A. The Contractor shall perform all work in a fire-safe manner. He shall supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. The Contractor shall comply with applicable federal, state and local fire-prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

1.05 ACCESS FOR POLICE, FIRE, AND POSTAL SERVICE

- A. Notify the fire department and police department before closing any street or portion thereof. No closing shall be made without the Owner's approval. Notify said departments when the streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 30 linear feet, without special written permission from the fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access.
- B. The Contractor shall leave a night emergency telephone number or numbers with the police department, the Engineer, and the Owner, so that contact may be made easily at all times in case of barricade and flare trouble or other emergencies.
- C. Maintain postal service facilities in accordance with the requirements of the U.S. Postal Service. Move mailboxes to temporary locations designated by the U.S. Postal Service, and at the completion of the work in each area, replace them in their original location and in a condition satisfactory to the U.S. Postal Service.

END OF SECTION

SECTION 01300

SUBMITTALS

1.01 DESCRIPTION OF REQUIREMENTS:

The types of submittals controlled by these general requirements include shop drawings, procedure manuals, samples and miscellaneous work-related submittals. The individual submittal requirements are specified herein and in applicable sections for each unit of work.

1.02 GENERAL SUBMITTAL REQUIREMENTS:

A. Coordination and Sequencing:

The Contractor shall coordinate preparation and processing of submittals with performance of the work so that the work will not be delayed by submittals. The Contractor shall coordinate and sequence different categories of submittals for the same work, and for interfacing units of work, so that one will not be delayed for coordination with another. No extension of time will be allowed because of failure to properly coordinate and sequence submittals.

B. Preparation of Submittal:

Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals. Each submittal shall clearly state where the item is to be installed. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through Contractor's office will be returned without action. All results of testing by independent labs or agencies shall be submitted to the Engineer. This shall include both passing and failing tests.

1.03 SPECIFIC CATEGORY SUBMITTAL REQUIREMENTS:

Except as otherwise indicated in individual work sections, comply with general requirements specified herein for each indicated category of submittal.

A. Contingency sewage disposal plan for by-pass pumping, per Section 01450, 3.01C.

1.04 SHOP DRAWINGS AND SAMPLES:

As soon as practicable and within thirty (30) days after the date of execution of the Contract, the Contractor, in conformance with the conditions of the contract, shall submit to the Engineer for approval, six (6) copies (in addition to those copies necessary for his own requirements) of the shop drawings.

Shop drawings submitted to the Engineer for his review, shall first be checked and approved by the Contractor, as indicated by a "Checked" stamp marked "Approved" on each copy of the shop drawing.

Shop drawings received without the Contractor's "Checked and Approved" stamp will be returned without further action.

Shop drawings shall be submitted, but not be limited to, the following:

1. Pipe and Fittings (all types & materials)
2. Concrete Mix Design
3. Maintenance of Traffic Plan
4. Asphalt Design
5. Testing Lab and Procedures
6. Precast Manholes & Inlets

7. Coating Systems
8. Grating, and Manhole Covers
9. Valves (all types & materials)
10. Street Light Poles, Fixtures, and Conduits
11. Decorative Pavers and Split Face Blocks

Product Data:

Collect required data into one submittal for each unit of work or system; and mark each copy to show which choices and options are applicable to the project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data for each submittal at the project site, available for reference by the Engineer. For purposes of this submittal, manufacturer's fabrication drawings shall be synonymous with shop drawings.

The Contractor shall not submit product data or allow its use on the project, until compliance with requirements of the Contract Documents has been confirmed. Submittal is for information and record only, unless otherwise indicated.

1.05 DOCUMENTS:

Maintain at the job site one copy of all drawings, specifications; addenda; approved shop drawings; change orders; field orders; other contract modifications; and other approved documents submitted by the Contractor in compliance with various sections of the specifications. Each of these Project Record Documents shall be clearly marked "Project Record Copy" and maintained in good condition; available at all times for review by the Engineer and not used for construction purposes.

1.06 BOND AND COMPLETED OPERATION INSURANCE:

Prior to final payment, the Contractor shall submit proof that bonds and completed operations insurance are in effect as required by the GENERAL CONDITIONS.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Promptly after award of the Contract and within ten (10) days after the effective date of the Agreement, prepare and submit to the ENGINEER estimated construction progress schedules for the Work, with subschedules of related activities which are essential to its progress.
- B. Submit revised progress schedules on a monthly basis.
- C. No partial payments shall be approved by the ENGINEER until there is an approved construction progress schedule on hand.
- D. The CONTRACTOR shall designate an authorized representative of his firm who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the CONTRACTOR shall have direct project control and complete authority to act on behalf of the CONTRACTOR in fulfilling the commitments of the CONTRACTOR's schedule.

1.02 RELATED REQUIREMENTS

- A. Section 00700: Standard General Conditions of the Construction Contract.
- B. Section 01010: Summary of Work.
- C. Section 01200: Project Meetings.
- D. Section 01340: Submittals.

1.03 FORM OF SCHEDULES

- A. Prepare schedules in the form of a horizontal bar chart or critical path method.
 - 1. Provide separate horizontal bar for each trade or operation within each structure or item.
 - 2. Horizontal time scale: In weeks from start of construction and identify the first work day of each month.
 - 3. Scale and spacing: To allow space for notations and future revisions.
 - 4. Minimum sheet size: 24 x 36 inches.
- B. Format of listings: The chronological order of the start of each item of work for each structure.
- C. Identification of listings: By major specification section numbers as applicable and structure.

1.04 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity.
 - 2. Show the dates for the beginning of, and completion of, each major element of construction in no more than a two-week increment scale.
 - 3. Show projected percentage of completion for each item, as of the first day of each month.
 - 4. Show projected dollar cash flow requirements for each month of construction.
- B. Submittals Schedule for Shop Drawings, and Samples in accordance with Section 01340. Show:
 - 1. The dates for CONTRACTOR's submittals.

2. The dates submittals will be required for OWNER-furnished products, if applicable.
3. The dates approved submittals will be required from the ENGINEER.

C. A typewritten list of all long lead items (equipment, materials, etc.)

1.05 PROGRESS REVISIONS

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

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 prime CONTRACTORS.

1.06 SUBMISSIONS

A. Submit initial schedules to the ENGINEER within 10 days after the effective date of the Agreement.

1. The ENGINEER will review schedules and return review copy within 21 days after receipt.
2. If required, resubmit within 7 days after return of review copy.

B. Submit revised monthly progress schedules with that month's application for payment.

C. Submit one reproducible transparency and five opaque reproductions.

1.07 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:

1. ENGINEER.
2. Job site file.
3. Subcontractors.
4. Other concerned parties.
5. OWNER (two copies).

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 RESPONSIBILITY FOR SCHEDULE COMPLIANCE

A. The CONTRACTOR agrees that whenever it becomes apparent from the current monthly schedule that delays to the critical path have resulted, and hence, that the contract completion date will not be met or when so directed by the ENGINEER, he will take some or all of the following actions at no additional cost to the OWNER, submitting to the ENGINEER for approval, a written statement of the steps he intends to take to remove or arrest the delay to the critical path in the approved schedule.

1. Increased construction manpower in such quantities and crafts as will substantially eliminate, in the judgment of the ENGINEER, the backlog of work.
2. Increase the number of working hours per shift, shifts per working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of the ENGINEER, the backlog of work.

3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities, and comply with the revised schedule.
4. Costs incurred by the OWNER arising from such lengthening of hours, including furnishing of Inspectors, shall be the CONTRACTOR's responsibility and shall be deducted from monies due him. Failure of the CONTRACTOR to comply with the requirements of the ENGINEER may be grounds for determination by the OWNER that the CONTRACTOR is not proceeding at such rates as will ensure completion within the specified time and may result in the termination of the right of the CONTRACTOR to continue the work.

3.02 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME

- A. If the CONTRACTOR desires to make changes in his method of operating which affect the approved schedule, he shall notify the ENGINEER in writing stating what changes are proposed and the reason for the change. If the ENGINEER approves these changes, the CONTRACTOR shall revise and submit for approval, without additional cost to the OWNER, all of the affected portion of the schedule. The schedule shall be adjusted by the CONTRACTOR only after prior approval of his proposed changes by the ENGINEER.
- B. Adjustments may consist of changing portions of the activity sequence and/or activity durations, division of approved activities, or other adjustments as may be approved by the ENGINEER. The addition of extraneous, non-working activities and/or activities which add unapproved restraints to the schedule shall not be approved.
- C. If the completion of any activity, whether or not critical, falls more than 100 percent behind its approved duration, the CONTRACTOR shall submit for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.
- D. Shop drawings which are not approved on the first submittal or within the scheduled time shall be immediately rescheduled, as well as pipelines and tanks which do not pass leak tests.
- E. The contract completion time will be adjusted only for causes specified in this contract. In the event the CONTRACTOR requests an extension of any contract completion date, he shall furnish such justification and supporting evidence as the ENGINEER may deem necessary for a determination as to whether the CONTRACTOR is entitled to an extension of time under the provisions of this contract. ENGINEER will, after receipt of such justification and supporting evidence make findings of fact and will advise the CONTRACTOR in writing thereof. If the ENGINEER finds that the CONTRACTOR is entitled to any extension of any contract completion date under the provisions of this contract, the ENGINEER's determination as to the total number of days extension shall be based upon the currently approved schedule and on all data relevant to the extension. Such data shall be included in the next monthly updating of the schedule. The CONTRACTOR acknowledges and agrees that actual delays in activities which, according to the schedule, do not affect any contract completion date shown by the critical path in the schedule do not have any effect on the contract completion date or dates, and therefore, will not be the basis for a change therein.
- F. From time to time it may be necessary for the contract schedule and/or completion time to be adjusted by the ENGINEER to reflect the effects of job conditions, weather, technical difficulties, strikes, unavoidable delays on the part of the OWNER or his representatives, and other unforeseeable conditions which may indicate schedule adjustments and/or completion time extension. Under such conditions, the CONTRACTOR shall reschedule the work and/or contract completion time to reflect the changed conditions, and the CONTRACTOR shall revise his schedule accordingly. No additional compensation shall be made to the CONTRACTOR for such schedule changes except for unavoidable overall contract time extensions beyond the actual completion of all unaffected work in the contract, in which case the CONTRACTOR shall take all possible action to minimize any time extension and any additional cost to the OWNER. It is specifically pointed out that the use of available float time in the schedule may be used by the OWNER as defined by the ENGINEER, as well as by the CONTRACTOR. Float time is defined as the amount of time between the early start date, and the late start date, or the early finish date and the late finish date, of any of the activities in the schedule.

- G. The OWNER controls the float time in the approved schedule and, therefore, without obligation to extend either the overall completion date or any intermediate completion dates set out in the schedule, the OWNER may initiate changes to the contract work that absorb float time only. OWNER-initiated changes that affect the critical path on the approved schedule shall be the sole grounds for extending (or contracting) said completion dates. CONTRACTOR initiated changes that encroach on the float time identified in the approved schedule may be accomplished with the OWNER's concurrence. Such changes, however, shall give way to OWNER-initiated changes competing for the same float time.

3.03 COORDINATING SCHEDULES WITH OTHER CONTRACT SCHEDULES

- A. Where work is to be performed under this contract concurrently with and/or contingent upon work performed on the same facilities or area under other contracts, the CONTRACTOR's schedule shall be coordinated with the schedules of the other contracts. The CONTRACTOR shall obtain the schedules of the other appropriate contracts from the ENGINEER for the preparation and updating of his schedule and shall make the required changes in his schedule when indicated by changes in corresponding schedules.

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The Contractor will employ the services of an independent Testing Laboratory (approved by City) to perform specified testing. The Contractor shall pay the costs of all testing laboratory services.
 - 1. The Contractor shall cooperate with the laboratory to facilitate the execution of its required services.
 - 2. Employment of the laboratory shall in no way relieve the Contractor's obligations to perform the Work in accordance with the requirements of the Contract Documents.

1.02 RELATED REQUIREMENTS

- A. Section 15029: Testing Piping Systems.
- B. Section 02225: Trenching, Backfilling and Compaction.
- C. Section 02510: Pavement Repair and Resurfacing.

1.03 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. The Laboratory is not authorized to:
 - 1. Release, revoke alter or enlarge on requirements of the Contract Documents.
 - 2. Approve or accept any portion of the Work.
 - 3. Perform any duties of the Contractor.

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel and/or the Engineer. Provide access to the Work or manufacturer's operations.
- 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 to be used for concrete and other mixes which require control by the testing laboratory.
- D. Furnish copies of test reports as required.
- E. Furnish incidental labor and facilities:

1. To provide access to Work to be tested.
 2. To obtain and handle samples at the project site to be tested.
 3. To facilitate inspections and tests.
 4. For storage and curing of test samples.
- F. Notify the laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of test.
- G. Make arrangements with the laboratory and pay for additional samples and tests required for the Contractor's convenience.

PART 2 - PRODUCTS - NOT USED.

PART 3 - EXECUTION

3.01 PAYMENT

- A. Testing of materials and products will be performed by an independent testing laboratory. Testing will be performed to least encumber the performance of the Work.
- B. The Contractor shall pay for the costs of all testing as required.
- C. When the Work of this Contract or portions thereof are completed, notify the Engineer to perform or witness the tests. Do not proceed with additional portions of Work until test results have been verified.

END OF SECTION

SECTION 01501

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Temporary Utilities: Electricity, lighting, telephone service and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work and water control.
- C. Construction Facilities: Access roads, parking, progress cleaning, project signage and temporary buildings.

1.02 RELATED SECTIONS:

- A. Section 01570 -Traffic Regulation.

1.03 TEMPORARY ELECTRICITY:

- A. Cost: By Contractor; provide and pay for any required temporary power service.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES:

- A. Provide and maintain lighting for construction operations as necessary.

1.05 TEMPORARY VENTILATION:

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapors or gases.

1.06 TELEPHONE SERVICE:

- A. Provide, maintain and pay for telephone service to field office at time of project mobilization.

1.07 TEMPORARY SANITARY FACILITIES:

- A. Provide and maintain required temporary restroom facilities and enclosures for field crews.

1.08 BARRIERS:

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations maintaining access to public rights-of-way and existing buildings and driveways. Maintain access to fire hydrants.
- B. Provide protection for vegetation designated to remain. Replace damaged plant life.
- C. Protect vehicular traffic, stored materials, site and structures from damage.

1.09 FENCING:

- A. Construction: Contractor shall construct temporary fence six (6) feet high as requested by the Engineer.

1.10 WATER CONTROL:

- A. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping equipment. Contractor responsible for obtaining any required South Florida Water Management District dewatering permits.
- B. Protect site from puddling or running water.

1.11 TEMPORARY BYPASSING FACILITIES:

- A. Contractor to provide all pumps, labor and materials required to bypass the flow of sewage during sewer main replacement, manhole work, and lift station modifications.

1.12 PROTECTION OF INSTALLED WORK:

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.

1.13. SECURITY:

- A. Provide security and facilities to protect Work, existing facilities and Owner's operations from unauthorized entry, vandalism or theft.

1.14 PROGRESS CLEANING AND WASTE REMOVAL:

- A. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition.
- B. Collect and remove waste materials, debris and rubbish from site daily and dispose off-site.

1.15 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS:

- A. Remove temporary utilities, equipment, facilities and materials prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing (and permanent) facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.16 TEMPORARY WATER SERVICES:

See Section 01019-2, Paragraph 1.06.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 01540

SECURITY AND PROTECTION

PART 1 GENERAL

1.01 DESCRIPTION:

- A. Requirements: This section specified minimum requirements of temporary provisions for security and protection is the Contractor's sole responsibility, and is not limited to the minimums established by the requirements hereof. Except as otherwise indicated, the use of alternative security and protection methods of facilities, equivalent to those specified in the Contractor's option. The work of this section is defined to exclude required insurance coverage, performance/payment bonds, first aid requirements, general supervision, quality control, damage surveys, enclosure of completed work and stored materials, inspections and test of the work, instruction to Owner's personnel and similar recognized protection/security provision, which are, nevertheless, specified in other parts of the contract documents, if required.
- B. The types of security and protection facilities and services required for the entire project include, but are not limited to, the following:
 - 1. Barricades, warning signs, lights.
 - 2. Security enclosure and lockup of work.
 - 3. Personnel security program.
 - 4. Environmental protection.

1.02 QUALITY ASSURANCE:

Regulations: Comply with governing regulations for the installation and operation of security and protection facilities, including the rules and recommendations of fire and building departments, police, rescue squad's watchman services and similar local organizations and companies.

1.03 JOB CONDITIONS:

- A. Scheduled Uses: Provide security and protection at the times first needed t the site; and maintain, expand and modify the facilities as needed throughout the construction period.
- B. Conditions of Use: Use security and protection facilities and services in a safe, sanitary, lawful and publicly acceptable manner, which will not interfere unduly with performance of the work nor result in other deleterious effects.

1.04 MATERIALS OF SECURITY AND PROTECTION FACILITIES:

General: For use in security and protection facilities, provide either new or used materials and equipment, which are in substantially undamaged and serviceable conditions. Provide types and quality levels which are recognized in the construction industry as suitable for the intended use in each application.

1.05 INSTALLATION OF SECURITY/PROTECTION FACILITIES:

General: Use qualified tradesmen for the installation of security and protection facilities. Locate facilities where they will serve the total project construction work adequately, and result in a minimum interference with performance of the work. Relocate, modify and extend facilities as required during the course of the work, to properly accommodate the entire work of the project. Provide and maintain a reasonably neat and uniform appearance in security and protection facilities, acceptable to the Owner.

1.06 BARRICADES, WARNING SIGNS AND LIGHTS:

A. General: Comply with recognized standards and code requirements for the erection of substantial and structurally adequate barricades wherever needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs and inform personnel at the site, and the general public where exposure exists of the hazard being projected. Provide lighting where appropriate and needed for the recognition of the facility, including flashing red lights where appropriate.

B. Storage: Where materials and equipment must be temporarily stored, prior to and during construction, and are of substantial value or attractive for possible theft, provide secure lockup and enforce strict discipline in connection with the timing of installation and release of materials, so that the opportunity for theft and vandalism is minimized.

1.07 ENVIRONMENTAL PROTECTION:

General: Provide protection facilities, operate temporary facilities, conduct construction activities and enforce strict discipline for personnel at the project site in ways and by methods which comply with environmental protection regulations, and which will minimize the possibility that the air, waterways and subsoil might be contaminated or polluted, or that other undesirable and deleterious effects might result from performance of the work at the project site. Avoid the use of tools and equipment which produce harmful noise; and restrict the use of noise-making tools and equipment to the hours of use which will minimize noise complaints by persons or residents near the project.

1.08 TERMINATION AND REMOVAL:

General: Maintain protection and security facilities and services in good operating condition through the time and use and until the completion and use of permanent work makes each temporary service unnecessary, or until the Owner's occupancy has replaced the need for the service or until its discontinuation has been otherwise authorized. Remove each facility promptly after its use has been terminated. Complete or restore permanent work which may have been delayed or otherwise affected by the temporary facility. Replace work which cannot be satisfactorily restored. Except as otherwise indicated, the materials and equipment of temporary security and protection facilities remain the property of the Contractor

END OF SECTION

SECTION 01570

MAINTENANCE OF TRAFFIC

1.01 DESCRIPTION:

Provide all labor, material and services to perform all operations required for the maintenance and protection of vehicular and pedestrian traffic in conformance to all applicable F.D.O.T. laws and regulation and subject to approval and permits by City, Palm Beach County (if applicable), and F.D.O.T. (if applicable).

1.02 SUBMITTAL:

Submit Traffic Control Plans and Construction Schedule to the City, Palm Beach County (if applicable), and the F.D.O.T. (If applicable) for review and approval at least 30 days prior to the start of construction.

1.03 SIGNS AND DEVICES:

- a. Traffic Control and Informational Signs.
- b. Traffic Cones and Drums, and Lights.
- c. Flagman Equipment.

1.04 CONSTRUCTION PARKING CONTROL:

Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles and Owner's operations.

1.05 FLAGPERSONS:

Provide trained and equipped flagpersons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

1.06 LIGHTS:

Use lights during hours of low visibility to delineate traffic lanes and to guide traffic.

1.07 TRAFFIC SIGNS AND DEVICES:

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed, to direct construction and affected public traffic. The contractor shall submit traffic control through work zone plans based on F.D.O.T. Roadway and Traffic Design Standards, 1995 Edition; Index No. 620 for work within intersections, and F.D.O.T. Index No. 621 and 625 for work requiring the closure of a traffic lane.
- B. Relocate as Work progresses, to maintain effective traffic control.

1.08 REMOVAL:

- A. Remove equipment and devices when no longer required.
- B. Repair damage caused by installation.

1.09 SPECIFICATIONS BY REFERENCE:

- A. State of Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Section 102, 1996 Edition.
- B. State of Florida Manual of Traffic Control and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations.
- C. The Manual of Uniform Traffic Control Devices, latest edition.

1.10 SPECIFIC TRAFFIC CONTROL:

- A. Contractor shall maintain through traffic on all public roads at all times unless stated otherwise herein.
- B. Contractor shall maintain access to all vehicular driveways (public or private) at all times. Contractor shall backfill and install temporary rock base as necessary in order to provide safe and functional access to all driveways.
- C. Contractor shall coordinate with the Police and Fire Departments for whom the Contractor will provide satisfactory access at all times.
- D. Contractor shall maintain, at the minimum, one travel lane, each direction, when performing work within the Palm Beach County Right-of-Way.

1.11 EXECUTION:

The Contractor shall arrange his work to cause minimum disturbance to normal pedestrian and vehicular traffic; and shall be held responsible for providing and maintaining suitable means of access (including emergencies) to all public and private properties during all stages of the construction.

If it becomes necessary to block off an entire street to vehicular traffic during construction (other than for an emergency situation), the Contractor must contact the City for approval prior to completely blocking off the street.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 DEFINITIONS

A. Productions:

1. New items for incorporation in the Work, whether purchased by CONTRACTOR or OWNER for the Project, or taken from previously purchased stock and may also include existing materials or components required for reuse.
2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change the meaning of such other terms used in the Contract Documents as those terms are self-explanatory and have well recognized meanings in the construction industry.
3. Items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published project literature, that is current as of the date of the Contract Documents.

1.2 SUBMITTALS

A. Administrative Submittals:

1. List of all proposed substitute or "equal" items/methods.
2. Schedule of factory tests required by Contract Documents. Identify Tests for which ENGINEER's presence has been specified.

B. Quality Control Submittals:

1. Factory Tests: As specified in the individual Specifications.
 - a. Procedures: Preliminary outlines.
 - 1) Final Accepted Procedures: Prior to start of factory testing.
 - b. Test Documentation: Results of successful testing, including certification of procedures and results.

1.3 PREPARATION FOR SHIPMENT

- A. When practical, factory assemble products. Matchmark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with a strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project and CONTRACTOR, equipment number, and approximate weight. Include complete packing lists and bills of materials with each shipment.

- C. Spare Parts, Special Tools, Test Equipment, Expendables, and Maintenance Materials:
1. Furnish as required by the Specifications prior to (i) starting functional testing or (ii) operation of the equipment by the OWNER, or (iii) 75 percent Project completion, whichever occurs first.
 2. Properly package to avoid damage, in original cartons insofar as possible. Replace parts damaged or otherwise inoperable.
 3. Firmly fix to, and prominently display on, each package.
 - a. Minimum 3-inch by 6-inch manila shipping tag with the following information printed clearly:
 - 1) Manufacturer's part description and number.
 - 2) Applicable equipment description.
 - 3) Quantity of parts in package.
 - 4) Equipment manufacturer.
 - 5) Applicable Specification section.
 - 6) Name of CONTRACTOR
 - 7) Project name.
 4. Deliver materials to site.
- D. Protect equipment from exposure to the elements and keep thoroughly dry and dustfree at all times. Protect painted surfaces against impact, abrasion, discoloration, or other damage. Grease or oil all bearings and similar items.

1.4 DELIVERY AND INSPECTION

- A. Deliver products in accordance with the accepted current progress schedule and coordinate to avoid conflict with Work and conditions at the site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.
- B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label date of manufacture and shelf life, where applicable. Include UL labels on products so specified.
- C. Unload products in accordance with manufacturer's instructions for unloading, or as specified. Record the receipt of products at the site. Inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from the site and expedite delivery of identical new undamaged products and remedy incomplete or lost products to provide that specified, so as not to delay the progress of the Work.

1.5 HANDLING, STORAGE, AND PROTECTION

- A. Handle products in accordance with the manufacturer's written instructions, and in a manner to prevent damage. Store products, upon delivery, in accordance with manufacturer's instructions, with labels intact and legible, in approved storage yards or sheds provided in accordance with Section 01500, CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by OWNER.

- B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered but not installed in the Work.
- C. Store electrical, instrumentation, and control products, and equipment with bearings in weathertight structures maintained above 60 degrees F. Protect electrical, instrumentation and control products, and insulation against moisture, water, and dust damage. Connect and operate continuously all space heaters furnished in electrical equipment.
- D. Store fabricated products aboveground, on blocking or skids, and prevent soiling or staining. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
- E. Store finished products that are ready for installation in dry and well ventilated areas. Do not subject to extreme changes in temperature or humidity.
- F. Hazardous Materials: Prevent contamination of personnel, the storage building, and the site. Meet the requirements of the product specifications, codes, and manufacturer's instructions.

1.6 SUBSTITUTE AND /OR EQUAL PRODUCTS

- A. Meet the requirements in the General Conditions, the Specification sections, and as set forth herein.
- B. Listing of proposed substitute and/or "equal" items or methods.
 1. With consideration of the additional evaluation time necessary for ENGINEER's review of such items, indicate for each item the review status (either substitute or "equal") and estimated submission date.
 2. CONTRACTOR, in indicating the review status of the proposed items, acknowledges that the time shown for ENGINEER's review on the current accepted schedule is sufficient only to allow ENGINEER to accomplish review for the status indicated and not sufficient to perform both a review for or "equal" status and a subsequent review for substitute status on the same product.
 3. ENGINEER may return unreviewed those submissions (i) not shown on the current accepted schedule, (ii) for which the review status differs from that indicated on the accepted list unless previously approved in writing by ENGINEER, (iii) not in accordance with the General Conditions and as specified herein, (iv) which are incomplete, or (v) which are uncertified, in which case CONTRACTOR shall provide the specified product.
- C. Submit seven copies of proposed substitute or "equal" item/method, to include all supporting data to allow ENGINEER's review. Complete, sign, and transmit with each proposed substitute or "equal" item/method submission.
- D. Disposition of Or "Equal" Item: In accordance with Article SHOP DRAWINGS in Section 01300, SUBMITTALS, or in accordance with following paragraph.

- E. Disposition of Substitute Item/Method:
1. Accepted: ENGINEER will evidence such acceptance by recommendation of a Change Order for CONTRACTOR and OWNER execution. Such Change Order will accompany ENGINEER's evaluation and acceptance of CONTRACTOR's proposed substitute.
 2. Rejected:
 - a. One copy retained by ENGINEER.
 - b. One copy returned to CONTRACTOR with a commentary by ENGINEER.
 - c. Remaining copies will be destroyed.
 - d. CONTRACTOR shall provide item specified in Contract Documents

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide manufacturer's standard materials suitable for service conditions unless otherwise specified in the individual Specifications.
- B. Where product specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance specifications.
- C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, and manufacturer's services and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Equipment, Components, Systems, Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, state, and local health and safety regulations.
- E. Safety Guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, or galvanized or aluminum coated 1/2-inch mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.
- F. Provide materials and equipment listed by UL wherever standards have been established by that agency.
- G. Equipment Finish: Provide manufacturer's standard finish and color, except where specific color is indicated.

2.2 FABRICATION AND MANUFACTURE

- A. General:
 1. Manufacture parts to U.S.A. standard sizes and gauges.

2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
 3. Design structural members for anticipated shock and vibratory loads.
 4. Use 1/4-inch minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
 5. Modify standard products as necessary to meet performance Specifications.
- B. Lubrication System:
1. Require no more than weekly attention during continuous operation.
 2. Convenient and accessible. Oil drains with bronze or stainless steel valves and fill plugs easily accessible from the normal operating area or platform. Locate drains to allow convenient collection of oil during oil changes without removing equipment from its installed position.
 3. Provide constant-level oilers or oil level indicators for oil lubrication systems.
 4. For grease type bearings, which are not easily accessible, provide and install stainless steel tubing; protect and extend tubing to convenient location with suitable grease fitting.

PART 3 EXECUTION

3.1 INSPECTION

- A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove damaged material or equipment from the site and expedite delivery of identical new material or equipment. Delays to the Work resulting from material or equipment damage which necessitates procurement of new products will be considered delays within CONTRACTOR's control.

3.2 INSTALLATION

- A. Equipment Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. Install equipment on concrete bases 4 inches above grade minimum (unless otherwise specified) and a minimum of 3 inches wider and longer than equipment baseplate, or as otherwise shown, with anchor bolts accurately placed using templates. Fill all spaces between baseplate and concrete with grout.
- C. Repaint painted surfaces that are damaged prior to equipment acceptance.
- D. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions and as may be specified. Retain a copy of manufacturer's instruction at site, available for review at all times.
- E. For material and equipment specifically indicated or specified to be reused in the Work:
1. Use special care in removal, handling, storage, and reinstallation to assure proper function in the complete Work.

2. Arrange for transportation, storage, and handling of products that require offsite storage, restoration, or renovation. Include costs for such Work in the Contract Price.

3.3 FIELD FINISHING

- A. In accordance with individual Specifications sections.

3.4 ADJUSTMENT AND CLEANING

- A. Perform required adjustments, tests, operation checks, and other startup activities.

3.5 LUBRICANTS

- A. Fill lubricant reservoirs and replace consumption during testing, startup, and operation prior to acceptance of equipment by OWNER.

END OF SECTION

SECTION 01610

DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.01 GENERAL:

- A. This Section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.

1.02 TRANSPORTATION AND DELIVERY:

- A. Transport and handle items in accordance with manufacturer's instructions.
- B. Schedule delivery to reduce long-term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the Engineer.
- C. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- D. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
- E. All items delivered to the site shall be unloaded and placed in a manner which will not hamper the Contractor's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.
- F. Provide necessary equipment and personnel to unload all items delivered to the site.
- G. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer or Engineer's representative. Notify Engineer verbally, and in writing, of any problems.

1.03 STORAGE AND PROTECTION:

- A. Store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the engineer by him. Instruction shall be carefully followed and a written record of this kept by the Contractor. Arrange storage to permit access for inspection.
- B. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.
- C. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulation of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Pre-cast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in a manner to reduce breakage, cracking and spalling to a minimum.

END OF SECTION

SECTION 01640

PRODUCTS AND SUBSTITUTIONS

PART 1 GENERAL

1.01 PRODUCTS' LIST:

- A. Within 10 days after commencement date of Contract, submit to Engineer two copies of a complete list of all products proposed to be used, with name of the manufacturer and the installing subcontractor. Tabulate list by each specification section.
- B. For products specified under reference standards, include with listing of each product:
 - 1. Name and address of manufacturer.
 - 2. Trade name.
 - 3. Model or catalog designation.
 - 4. Manufacturer's data:
 - a. Performance and test data.
 - b. Reference standards.
- C. Contractor's Option: For products specified only by reference standards, select any product meeting that standard. For products specified by naming several products or manufacturers, select any one of the products or manufacturers names, which complies with the specifications.

1.02 SUBSTITUTIONS:

- A. For a period of 10 days after commencement date of Contract, Engineer may consider written requests from Contractor for substitution of approved products.
- B. Conditions: Refer to Supplementary Conditions. Requests by Contractor will be considered when reasonable, timely, fully documented and qualifying under one or more of the following circumstances:
 - 1. Related to an "or equal" or similar provision in contract documents.
 - 2. Required product cannot be supplied in time for compliance with Contract Time Requirements.
 - 3. Required product is not acceptable to governing authority, or determined to be non-compatible, or cannot be properly coordinated, warranted or insured or has other recognized disability as certified by Contractor.
 - 4. Substantial advantage is offered Owner after deducting offsetting disadvantages including delays, additional compensation to Engineer for redesign, investigation, evaluation and other necessary services and similar considerations.
- C. Submit a separate request for each product, three copies of each submittal, to include the following:
 - 1. Complete data substantiating compliance of proposed substitution with Contract Documents.

- a. Product identification, including manufacturer name and address.
 - b. Manufacturer's literature including product description, performance and test data and reference standards.
 - c. Samples where appropriate and/or requested.
 - d. Name and address of two similar projects on which product was used successfully in a similar application.
 - e. Detailed description of proposed construction method.
 - f. Drawings illustrating construction method.
- 2. Itemized comparison of proposed substitution with product or method specified.
 - 3. Date relating to changes in construction schedule; any change in the contract time; effect on other trades.
 - 4. Accurate cost data on proposed substitution in comparison with product or method specified, including a proposal of the net change in the contract sum.
- D. The Engineer will be the sole judge of the acceptability of the proposed substitution.
 - E. In making request for substitution Contractor represents:
 - 1. He has personally investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
 - 2. He will provide the same warranties, guarantees or bonds for the substitution as for the product or method specified herein.
 - 3. He will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects.
 - 4. He waives the right to claims for additional costs related to the substitution which may subsequently become apparent and waives all rights to additional payment and time which may subsequently be necessitated, by failure of the substitution to perform as specified, and for the required Work to make corrections thereof.
 - 5. Cost data is complete and includes all related costs under his contract.
 - F. Substitutions will not be considered if:
 - 1. They are indicated or implied on shop drawings or project data submittals without formal request submitted in accordance with the Contract Documents.
 - 2. Acceptance will require revision of the Contract Documents.
 - G. After date bids are reviewed, approval of substitutions shall be governed by change order procedure.

1.03 PROCEDURAL REQUIREMENTS:

- A. General Limitations: Where possible, provide entire required quantity of each generic product, material or equipment from a single source; and, where not possible to do so, match separate products as closely as possible. To extend selection process is under Contractor's control, provide compatible products, materials and equipment. Where available and

complying with requirements, provide standard products which have been used previously and successfully in similar applications, and which are recommended by manufacturers for applications indicated.

END OF SECTION

SECTION 01700

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Closeout procedures, final cleaning, project record documents, system demonstration, warranties and bonds.
- B. Closeout includes the general requirements near the end of the Contract Time in preparation for final acceptance, final payment, normal termination of the Contract, beneficial use by the Owner, and similar actions evidencing completion of the Work.

1.02 RELATED REQUIREMENTS

- A. Section 01010: Summary of Work.
- B. Section 01050: Field Engineering.
- C. Section 01500: Construction Considerations.

1.03 CLOSEOUT PROCEDURES

- A. Comply with procedures stated in the General Conditions of the Contract Documents for issuance of the Certificate of Substantial Completion and the Certificate of Final Completion.
- B. When the Contractor considers that the Work has reached final completion, submit written certification that the Contract Documents have been reviewed, the Work has been thoroughly inspected, and that the Work is considered to be completed in accordance with the Contract Documents and is ready for inspection by the Engineer.
- C. In addition to submittals required by the conditions of the Contract, provide all other submittals required by the Owner, other governing authorities or regulatory agencies, and submit to the Engineer a final statement of accounting giving the total adjusted Contract Sum, previous payments, and the sum remaining due.
- D. The Engineer will issue a final change order reflecting approved adjustments to the Contract Sum not previously made by Change Order.

1.04 SUBSTANTIAL COMPLETION

- A. When the Contractor considers the Work to be substantially complete, the Contractor will submit to the Engineer, or the Owner, as applicable:
 - 1. A written notice that the Work, or a designated portion thereof, is substantially complete.

2. Special guarantees, warranties, workmanship bonds, maintenance agreements and similar documents.
 3. Occupancy permits, operating certificates, test certificates and similar releases enabling the Owner's full and unrestricted use of the work and access to services and utilities.
 4. Record drawings, maintenance manuals, project photographs, property survey and similar record information.
 5. Tools, spare parts, extra stocks of materials and similar physical items to the Owner.
 6. Certification that all site temporary facilities and services, along with construction equipment, mock-ups and similar elements have been removed from the site and that all repairs, touch-ups and restorations of marred exposed finishes have been completed.
- B. Within a reasonable time after receipt of such notice, the Engineer will make an inspection to determine the status of completion.
- C. Should the Engineer determine that the Work is not substantially complete:
1. The Engineer will promptly notify the Contractor in writing, giving the reasons therefore.
 2. The Contractor will remedy the deficiencies in the Work, and send a second written notice of substantial completion to the Engineer.
 3. The Engineer will then re-inspect the Work.
- D. When the Engineer finds that the Work is substantially complete, it will:
1. Prepare and deliver to the 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 as provided in the General Conditions, and when the Engineer considers the Work substantially complete, it 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.

1.05 FINAL SUBMITTALS

- A. The following submittals, as applicable, are required prior to finalizing the Contract:
1. Final shop drawings.
 2. Record drawings.
- B. All guarantees, bonds, certifications, licenses, and affidavits required for work and equipment must be filed with the Engineer.

1.06 RELEASE OF LIENS OR CLAIMS

- A. Satisfactory evidence of release or waiver of all liens or claims must be submitted to the Owner prior to finalizing the Contract.

1.07 FINAL INSPECTION

- A. When the Contractor considers the Work complete, it will submit written certification that:
 - 1. The Contract Documents have been reviewed.
 - 2. The Work has been inspected for compliance with the Contract Document.
 - 3. The Work has been completed in accordance with the Contract Documents.
 - 4. The Work is in every way completed and ready for final inspection.
- B. The Engineer will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should the Engineer consider that the Work is incomplete or defective:
 - 1. The Engineer will promptly notify the Contractor in writing, listing the incomplete or defective work.
 - 2. The Contractor will take immediate steps to remedy the stated deficiencies, and send a second written certification to the Engineer that the Work is complete.
 - 3. The Engineer will re-inspect the work.
 - 4. When the Engineer finds that the Work is acceptable under the Contract Documents, it shall request the Contractor to make close-out submittals.

1.08 REINSPECTION FEES

- A. Should the Engineer perform re-inspections due to the failure of the Work to comply with the claims of status of completion made by the Contractor:
 - 1. The Contractor will compensate the Engineer for such additional services.
 - 2. The Owner will deduct the costs of such additional compensation from the final payment to the Contractor.

1.09 CONTRACTOR'S CLOSE-OUT SUBMITTALS TO THE ENGINEER

- A. Project record drawings.
- B. Contractor's affidavit of payment of debts and claims:
 - 1. Contractor's release or waiver of liens.
- C. Separate releases or waivers of liens for subcontractors, suppliers and others that have filed lien rights against property of the Owner in accordance with Section 713.06 Florida Statutes, together with a list of those parties.

- D. Final payment request with Consent of Surety for Final Payment and the Contractor's Certification of Final Completion.
- E. Certified copy of the Engineer's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.

1.10 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Engineer. The statement will reflect all approved adjustments to the Contract Sum, including:
 - 1. The original Contract Sum.
 - 2. Additions and deductions resulting from:
 - a. Approved Change Orders.
 - b. Allowances.
 - c. Unit Prices.
 - d. Deductions for uncorrected Work.
 - e. Deductions for liquidated damages.
 - f. Deductions for re-inspection payments.
 - g. Deductions for re-testing due to failed tests.
 - h. Other adjustments.
 - 3. Total Contract Sum, as adjusted.
 - 4. Previous payments.
 - 5. Sum remaining due.
- B. The Engineer will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Order.

1.11 FINAL CLEANING

- A. Perform prior to final inspection.
- B. Clean the site, sweep paved areas, rake clean other surfaces.
- C. Remove waste and surplus materials, rubbish and construction facilities from the project site and dispose of in a lawful manner.
- D. Remove stains, petrochemical spills and other foreign deposits.
- E. Except as otherwise indicated or requested by the Owner, remove temporary protection devices and facilities installed during the course of the Work to protect previously completed Work during the remainder of the construction period.
- F. Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site or bury debris or excess materials, or discharge volatile or other harmful or dangerous materials into the environment.
- G. Where extra materials of value remain after completion of the Work, dispose of or store such materials for use by the Owner as indicated in these Specifications.

1.12 PROJECT RECORD DOCUMENTS

- A. Store documents separate from those used for construction.
- B. Keep documents current. Do not permanently conceal any work until required information has been recorded.
- C. At Contract closeout, submit documents with transmittal letter containing date, project title, Contractor's name and address, list of documents and signature of Contractor.
- D. Drawings legibly marked to record actual construction and showing:
 - 1. Horizontal and vertical locations of underground utilities and appurtenances.
 - 2. Field changes of dimension and detail.
 - 3. Changes made by approved Field Order or by approved Change Order.
 - 4. Details not shown on original Contract Drawings.
- E. Specifications and Addenda with each Section legibly marked to record:
 - 1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment furnished and installed.
 - 2. Changes made by approved Field Order or by approved Change Order.

1.13 WARRANTIES AND BONDS

- A. Provide duplicate, signed, notarized originals. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.
- B. Submit material prior to final application for payment. For equipment put into use with Owner's permission during construction, submit within 10 days after first operation. For items of Work delayed materially beyond the date of Substantial Completion, provide updated submittals within 10 days after acceptance, listing the date of acceptance as the start of the warranty period.

1.14 FINAL APPLICATION FOR PAYMENT

- A. A. The Contractor will submit the Final Application for Payment in accordance with the procedures and requirements stated in the General Conditions.

1.15 FINAL CERTIFICATE FOR PAYMENT

- A. The Engineer will process the Final Application for Payment in accordance with the provisions of the General Conditions.

1.16 POST-CONSTRUCTION INSPECTION

- A. Prior to expiration of one year from the date of Substantial Completion, the Engineer will make a visual inspection of the Project in company with the Owner and the Contractor to

determine whether correction of Work is required, in accordance with the provisions of the General Conditions.

- B. The Engineer will promptly notify the Contractor, in writing, of any observed defects or deficiencies in the work.
- C. The Contractor shall immediately undertake all work required to remedy defects and repair the work to the satisfaction of the Engineer and the Owner.

PART 2 - PRODUCTS

2.01 ACCESSORIES

- A. Furnish to the Owner, upon acceptance of equipment, all accessories required to place each item of equipment in full operation.
- B. Accessory items include, but are not limited to, adequate oil and grease as required for first lubrication of equipment (after field testing), light bulbs, fuses, hydrant wrenches, valve keys, handwheels, chain operators, special tools, and other items as required for initial operation.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01720

RECORD DRAWINGS

PART 1 GENERAL

1.01 DESCRIPTION:

The work covered under this section shall include furnishing the Engineer all information necessary for a complete set of Record Drawings.

1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:

The Record Drawings information shall be in strict accordance with the following codes and standards:

- A. Local county, municipal and utility codes.
- B. Department of Environmental Regulation.
- C. State of Florida Department of Health and Rehabilitative Services.

1.03 MATERIALS:

The Contractor shall mark on the construction drawings of the Contract Documents all field information.

PART 2 PRODUCTS

2.01 RECORD DRAWINGS:

The Record Drawings shall correctly and accurately show all changes from the Contract Documents made during construction and shall reflect surveyed information which shall be performed by a professional land surveyor registered in the State of Florida. The drawings shall be neat and legible. Show all elevations and horizontal control of all storm sewer, gravity sewers including laterals, electric cables, television cables, telephone cables, force mains and water mains which are crossed or exposed.

- A. Force Mains: Record Drawings shall show the following field information:
 - 1. Show material used to construct mains.
 - 2. Show location of tapping/stopping fittings and valve, by distances from known above ground reference points (manholes, catch basins and bridges).
 - 3. Show all variations in required cover over pipe.

PART 3 EXECUTION

3.01 RECORDS:

Daily records of changes in location of piping, fixtures and other items shall be kept and recorded on the Record Drawings.

The Contractor shall review the completed Record Drawings and ascertain that all data furnished is accurate and truly represents the work actually installed. No Record Drawings information will be accepted from subcontractors.

3.02 SUBMITTAL:

The project shall not be considered to be in substantial completion until Record Drawings have been submitted and accepted by the Engineer. Prior to final payment, the Record Drawings shall be revised by the Contractor to reflect any changes which have occurred since the substantial completion submittal.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1: GENERAL

1.01 Summary

- .1 The extent of earthwork excavation, filling, and grading is shown on the Drawings.
- .2 Preparation of sub-grade for footings, interior slabs, and exterior walks, pavements, and gravel surfacing is included as part of this Work.
- .3 Provide and compact drainage fill material for interior slabs on grade and exterior concrete stoops to bottom of concrete.
 - a. This Work includes the installation of a vapor (or) moisture barrier where required.
- .4 Provide and compact sub-base material for concrete walks.
- .5 Provide and compact fill material for concrete footings to bottom of concrete.
- .6 Grading of areas to receive topsoil is included as part of this Work.
- .7 Moving and spreading of previously stockpiled topsoil is included as part of this Work.
- .8 Lake excavation and dry retention excavation.

1.02 Work Not Included

- .1 Gravel aggregate sub-base for asphalt paving.
- .2 Fine grading of topsoil.
- .3 Excavation and backfill work.

1.03 Quality Assurance

Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.04 Job Conditions

- .1 Site Information: Data furnished by Owner in Soils Exploration Report (following Instructions To Bidders) of indicated subsurface conditions is not intended as representations or warrants of continuity of such conditions between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn there from by Contractor. Data is made available for the convenience of Contractor.
 - a. Contractor may make additional test borings and other exploratory operations at no cost to Owner.
- .2 Existing Utilities: Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
 - a. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the Landscape Architect/Engineer immediately for directions as to procedure. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 - b. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Landscape Architect/Engineer, and then only after acceptable temporary utility services have been provided.

- 1) Provide minimum of 48-hour notice to Landscape Architect/Engineer, and receive written notice to proceed before interrupting utilities.
- .3 Use of Explosives:
 - a. The use of explosives will not be permitted.
- .4 Protection of Persons and Property: Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
- .5 Protection of Existing and Transplanted Vegetation: protect existing vegetation to remain. Should earthwork occur within areas of existing vegetation to remain, every possible effort should be made to avoid the removal of existing vegetation. Only a very minimal area should be cleared to perform the earthwork. Perform compensatory pruning, to the satisfaction of the Owner and Landscape Architect/Engineer, where remaining vegetation has been impacted.

PART 2: PRODUCTS

2.01 Soil Materials

- .1 Sub-base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, natural or crushed sand, as acceptable to the Landscape Architect/Engineer.
- .2 Drainage Fill: Washed, evenly graded mixture of crushed stone or crushed or uncrushed gravel with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 200 sieve.
- .3 Backfill and Fill Materials: Provide soil materials for backfill and fill, free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetable, and other deleterious matter. Material shall be as acceptable to the Soils Engineer and Landscape Architect/Engineer.
 - a. Excavated material meeting the above requirements may be used for fill, subject to approval by the Soils Engineer.
- .4 Granular Backfill Material
 - a. Granular material for trench backfill above pipe embedment shall be clean natural, unwashed gravel, sand, or crushed stone, ranging in size from medium gravel to medium sand. Granular backfill material shall conform to the following gradations:

SIEVE SIZES	PERCENTAGE BY WEIGHT
2-inches	100 percent
No. 200	5 percent to 15 percent
 - b. The presence of 5 percent to 10 percent of fine clay or loam particles is desirable, but materials containing clay or loam in the form of lumps shall not be acceptable.
 - c. Granular Pipe Embedment Materials
 - d. Granular fill material for pipe embedment or support shall consist of clean, natural, unwashed gravel, sand, or crushed stone free from cementations substances and flat or flaky particles in an amount sufficient to cause the material to cake or pack, thereby forming an unyielding support for the pipe. Granular fill material used for pipe embedment or support shall be of such sizes that 100 percent will pass a 3/4 inch screen and 95 percent will be retained on a No. 4 sieve. The presence of approximately ~ percent of fine clay or loam particles is desirable.
- 5 Topsoil: Shall be a mixture of soils and organic amendments to produce a loamy, friable, fertile

planting mix. Additives to existing soil shall be recycled wood waste or SNAP organic additive, or approved equal. Planting mix additives shall be well composted, and contain minimum micronutrients of 50 pounds per furrow acre. All proposed planting mixes shall be submitted with three representative samples and three separate certified laboratory results. Soil mix shall be certified to be free of pathogens and other deleterious substances.

.6 Sand: Clean, general-purpose sand, free of organic and deleterious materials.

.7 Vapor Barrier

a. Approved under slab vapor barrier shall be one of the following:

- “Moistop” by the Fortifiber Corp., Los Angeles, California
- “Plybar Plus II” by Glas-Kraft, Inc., Slatersville, Rhode Island
- “Permalon” by Reef Industries Inc., Houston, Texas
- Reinforced polyethylene sheet, 6 to 10 mil thick

.8 Moisture Barrier

a. Underslab moisture barrier for under wood floor area slabs only:
“Premoulded membrane vapor seal with ‘Plasmatic Core’ by W. R. Meadows.

PART 3: EXECUTION

3.01 Inspection

- .1 Examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the Landscape Architect/Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.
- .2 Proofrolling: shall be conducted from the stripped ground surface using a self propelled vibratory compactor which imparts a dynamic drum force of not less than 36,000 pounds (Dynapac CA-25) or equivalent). The area to be covered by the proofrolling shall include the full structural footprint plus a 10-foot wide perimeter zone, which extends beyond the maximum outside lines of the superstructures. Each section of sub-grade shall be subjected to multiple overlapping (minimum of 20 percent overlap of drum) coverage of the compactor as it operates at its maximum vibration frequency and a travel speed of no more than 1.5 miles per hour.
 - a. Proofrolling shall continue until no additional settlement is visually discernible at the rolled surface. In no case, however, should any section of sub-grade receive less than 5 roller passes. Pursuant to the project specifications. The stripped and grubbed surface shall meet a minimum relative compaction requirement of 98%. The maximum density of the soil shall be determined per ASTM D-1 557.”

3.02 Excavation

- .1 Excavation consists of removal and disposal of material encountered when establishing required grade elevations.
 - a. Earth excavation includes excavation of pavements and other obstructions visible on ground surface, underground structures, utilities, and other items indicated to be demolished and removed, together with earth and other materials encountered that are not classified as rock or unauthorized excavation.

- .2 Classifications of Excavations: The following classifications of excavation will be made only when additional earth excavation is authorized by Landscape Architect/Engineer and when rock excavation is encountered.
- a. Rock excavation in trenches and pits includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42 inches wide bucket on track-mounted power excavator equivalent to Caterpillar Model 215, rated at not less than 90 HP flywheel power and 30,000 lbs. drawbar pull. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as open excavation.
 - b. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with modern track-mounted heavy-duty excavating equipment without drilling or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or No. 977K or equivalent track-mounted loader, rated at not less than 170 HP flywheel power and developing 40,000-lb. Breakout force (measured in accordance with SAE J732C).
 - c. Typical of materials classified as rock are boulders 1/2 cu.yd. or more in volume, solid rock, rock in ledges, and rock-hard cementations aggregate deposits.
 - d. Intermittent drilling or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.
 - e. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by Landscape Architect/Engineer. Such excavation will be paid on basis of contract conditions relative to changes in Work.
- .3 Rock payment lines are limited to the following
- a. Two feet outside of concrete work for which forms are required, except footings.
 - b. One foot outside perimeter of footings.
 - c. In pipe trenches 6 inches below invert elevation of pipe and 2 ft. wider than inside diameter of pipe but not less than 3 ft. minimum trench width.
 - d. Neat outside dimensions of concrete work where no forms are required.
 - e. Under slabs on grade 6 inches below bottom of concrete slab
- .4 Unauthorized excavation consists of removal of materials beyond indicated sub-grade elevations or dimensions without specific direction of Landscape Architect/Engineer. Unauthorized excavation, as well as remedial work directed by Landscape Architect/Engineer, shall be at Contractor's expense.
- a. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Landscape Architect/Engineer.
 - b. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Landscape Architect/Engineer.
- .5 Additional Excavation: When excavation has reached required sub-grade elevations, notify Soils Engineer and Landscape Architect/Engineer so he can observe conditions.
- a. If unsuitable bearing materials are encountered at required sub-grade elevations, carry excavations deeper and replace excavated material as directed by the Soils Engineer after approval by Landscape Architect/Engineer.

- b. Removal of unsuitable material and its replacement, as directed, will be paid on basis of contract conditions relative to changes in work.
- .6 Stability of Excavations: Slope sides of excavations to comply with codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restriction or stability of material excavated.
- a. Maintain sides and slopes of excavations in a safe condition until completion of back filling.
- .7 Shoring and Bracing: Provide materials for shoring and bracing such as sheet piling, uprights, stringers, and cross-braces in good serviceable condition.
- a. Provide minimum requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction.
- b. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
- .8 De-watering: Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.
- a. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of sub-grades and foundations. Provide and maintain pumps, sumps, suction, and discharge lines, and other de-watering system components necessary to convey water away from excavations.
- b. Convey water removed from excavations and rainwater to collecting or runoff areas. Provide and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.
- .9 Material Storage: Stockpile satisfactory excavated material where directed, until required for fill, backfill, or grading. Place, grade, and slope stockpiles for proper drainage.
- a. Locate and retain soil materials away from edge of excavations.
- b. Dispose of excess soil material and waste materials as specified hereinafter.
- c. Do not stockpile material in areas of existing vegetation to remain. Those areas should be barricaded.
- .10 Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete form-work, installation of services, other construction required, and for inspection.
- a. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other Work.
- .11 Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations, and grades as shown.
- .12 Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 6 to 9 inch clearance on both sides of pipe or conduit.

- a. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations.
 - b. Where rock is encountered, carry excavation 6 inches below required elevation and backfill with a 6-inch layer of crushed stone or gravel prior to installation of pipe.
 - c. For pipes or conduit 5 inches or less in nominal size and for flat-bottomed multiple-duct conduit units, do not excavate beyond indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
 - d. For pipes or conduit 6 inches or larger in nominal size, tanks, and other mechanical/electrical work indicated to receive sub-base, excavate to sub-base depth indicated, or, if not otherwise indicated, to 6 inches below bottom of work to be supported.
 - e. Except as otherwise indicated, excavate for exterior water bearing piping (water, steam, condensate, drainage) so top of piping is not less than 2'-6" below finished grade.
 - f. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.
 - g. Where welded and wrapped black iron pipe, wrought iron pipe, or soft type "K" copper tubing with silver soldered joints is specified, a narrow trench made with special trenching machines will be acceptable, providing it can maintain a straight, true-to-line trench bottom in undisturbed earth to prevent damage to the pipe.
 - h. Excavation for manholes and other accessories to have 12 inches minimum and 24 inches maximum clearances on all sides.
 - i. Trenches interior to the building shall be excavated of sufficient width to allow ample working space and performed so walls and footings are not disturbed, weakened, or injured.
- .13 A temporary haul road shall be constructed and maintained from the off-site lake and dry retention areas to the school site, including the construction of a temporary canal crossing.

3.03 Compaction

- .1 General: Control soil compaction during construction providing minimum percentage of density specified for each area classification.

3.04 Backfill and Fill

- .1 General: Place acceptable soil material in layers to required sub-grade elevations for each area classification listed below.
 - a. Under building slabs at wood floor areas, use satisfactory excavated or borrow material to 6 inches below concrete, then use clean sand fill material to bottom concrete, then place moisture barrier.
 - b. Under building slabs, other than at wood floor areas, use satisfactory excavated or borrow material to 8 inches below concrete; then place and compact 8 inches of clean sand fill material; then place vapor barrier, lap and fold joints to bottom of concrete.
 - c. Under footings use satisfactory excavated or borrow material to bottom of concrete, unless otherwise indicated.
 - d. Under grassed areas use satisfactory excavated or borrow material.

e. Under concrete walks, stoops, and ramp use satisfactory excavated or borrow material to 4 inches below concrete, then use sub-base material to bottom of concrete.

f. Under paved areas use satisfactory borrow fill material to elevation required so as to allow installation of the respective sub-base and paving combinations.

g. Under and Around Plastic Pipe Within Building: Provided a minimum of 6 inches compacted sand bed under plastic pipe and provide a minimum of 6 inches compacted sand fill on sides and top of plastic pipe.

.2 Backfill excavations as promptly as work permits, but not until completion of the following:

a. Acceptance by Landscape Architect/Engineer of construction below finish grade including, where applicable, damp proofing, waterproofing, and perimeter insulation.

b. Inspection, testing, approval, and recording locations of underground insulation.

c. Removal of concrete formwork.

d. Removal of trash and debris.

.3 Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than one vertical to four horizontal so that fill material will bond with existing surface.

a. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

.4 Placement and Compaction: Place backfill and fill materials in layers not more than 8 inches in loose depth. Before compaction moisten or aerate each layer as necessary to provide the optimum moisture content. Compact each layer to required percentage of maximum density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

a. Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately same elevation in each lift

3.05 Trench Back-filling

.1 After pipes and other equipment have been tested and approved, back filling shall be done with approved material, free from large clods or stone. Fill is to be properly compacted and stabilized before permitting weight or traffic on the backfill.

.2 Soil which has been removed from trenches for mechanical work is to be removed from within the building area and replaced with aggregate fill.

.3 Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and which are carried below bottom of such footings or which pass under wall footings. Place concrete to level of bottom of adjacent footing.

- a. Wrap pipe with one-inch glass fiber blanket by pipe installer prior to placement of concrete.
- .4 For piping or conduit less than 2'-6" below surface of roadways, provide 4 inches thick concrete base slab support. After installation and testing of piping or conduit, provide minimum 4 inches thick encasement (sides and top) of concrete prior to back filling or placement of roadway sub-base.
- .5 For piping or conduit below sidewalks, roads, and parking areas and more than 2'-6" below surface backfill trenches with granular fill.
- .6 Back-filled materials shall be placed evenly and carefully around and over pipe in 6 inches maximum layers. Each layer shall be thoroughly rammed and compacted with care being exercised so as not to damage or displace the pipe, until one foot of cover has been placed over the pipe. The remainder of the backfill material shall be placed, moistened, and compacted using mechanical tampers or other means as approved by the Landscape Architect/Engineer.

3.06 Grading

- .1 General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- .2 Grading Outside Building Lines: Grade areas adjacent to building to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:
 - a. Grassed Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below the required sub-grade elevations.
 - b. Walks: Shape surface of areas under walks to line, grade, and cross-section with finish surface not more than 0.10 foot above or below the required sub-grade elevation.
 - c. Paved Areas: Shape surface of areas under paved areas to line, grade, and cross-section with finish surface not more than 1/2 inch above or below the required sub-grade elevation.
- .3 Grading Surface of Fill Under Building Slabs and Footings: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2 inch when tested with a 10-foot straightedge.
- .4 Topsoil Spreading: Stripped and stockpiled topsoil shall be uniformly spread on areas indicated on the Drawings to be seeded, to a minimum thickness of 6 inches. Finish elevation of topsoil shall be as indicated on the Drawings. Finish grade of topsoil adjacent to building shall also drain away from building.

3.07 Maintenance

- .1 Protection of Graded Areas: Protect newly graded areas from traffic and erosion and keep free of trash and debris. Repair and re- establish grades in settled, eroded, and rutted areas to specified tolerances.
- .2 Reconditioning Compacted Areas: Where subsequent construction operations or adverse weather disturbs completed compacted areas, scarify surface, reshape, and compact to required density prior to further construction.

3.08 Disposal of Excess and Waste Materials

- .1 Removal from Owner's Property: Remove and dispose of waste materials, including excess unacceptable excavated materials, trash, and debris from the Owner's property.
- .2 Excess Acceptable Excavated Material: Shall be spread on site where indicated or where directed by Landscape Architect/Engineer. Utilize excavated wetland soils in the buffer and preservation perimeters to the extent possible. Replace wetland soils as a top dressing on drainage swales around the perimeter of the preservation areas, as shown on plans.

END OF SECTION

SECTION 02225

EXCAVATION, BACKFILL, AND COMPACTION

PART 1 GENERAL

1.01 SCOPE OF WORK:

The extent of trenching, backfill and compacting is shown on the drawings and/or specified. This section includes furnishing equipment, labor and material, and performing all operations necessary and incidental to perform the required work.

1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:

- A. American Association of State Highway and Transportation Officials (AASHTO).
- B. Florida Department of Transportation "Standard Specifications for Road and Bridge Construction," Sections 120 and 125, 1996 Edition.
- C. Florida Trench Safety Act (90-96), CS/HB 3183.
- D. Underground Facility Damage Prevention and Safety Act (FS556).

1.03 TRENCH SAFETY SYSTEM:

- A.
 - 1. The Contractor shall follow the provisions of the "Florida Trench Safety Act", which incorporates OSHA Standards 29CFR's 1926.650, Subpart P as the State's trench safety standards. Trench excavation exceeding 5 feet in depth shall have an adequate safety system consisting of sheeting and shoring, suitable trench box, or other suitable system meeting the requirements of the Act.
 - 2. Call ASunshine at 1-800-432-4770.
- B. The Contractor shall be solely responsible for making all excavations in a safe manner. Provide appropriate measures to retain side slopes to ensure that persons working in or near the excavation are protected.

PART 2 PRODUCTS

2.01 CONSTRUCTION WATER:

Conform to Section 01019 GENERAL REQUIREMENTS .

PART 3 EXECUTION

3.01 CLEARING OF THE SITE AND PREPARATION OF RIGHT-OF-WAYS:

Conform to Section 02105 CLEARING AND GRUBBING.

3.02 DISPOSAL OF CLEARED MATERIAL:

Conform to Section 02105 CLEARING AND GRUBBING.

3.03 OBSTRUCTIONS:

- A. This item refers to obstructions which may be removed and do not require replacement. Remove obstructions within the trench area or adjacent thereto without additional compensation. Obstructions of such include, but not limited to, tree roots, stumps, abandoned piling, buildings and concrete structures, logs, and debris of all types without additional compensation. The Engineer may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made, within the easement or right-of-way without adversely affecting the intended function of the facility, at no additional cost to the Owner.
- B. Dispose of obstructions removed from the excavation in accordance with Section 02105 CLEARING AND GRUBBING.

3.04 PROTECTION OF EXISTING UTILITIES AND STRUCTURES:

Conform to Section 01019 GENERAL REQUIREMENTS.

3.05 TRENCH EXCAVATION:

- A. The Contractor shall perform all aspects of excavation, of every description, and of whatever substance encountered to the dimensions and depths indicated on the drawings or as necessary. Excavation shall be unclassified regardless of material encountered. Unless otherwise indicated, excavation shall be by open cut.

No separate payment for excavation as such shall be made. The cost thereof shall be included in the unit prices of pipe installation.

The Contractor shall make their own estimate of the kind and extent of the various materials which will be encountered in the excavation. Undercutting will not be permitted, except when ordered by the Engineer.

- B. Where it is necessary to trim branches for equipment clearance, all severed root ends or cuts to branches over 2" diameter shall be treated with an asphalt base pruning paint. Backfill over exposed roots as soon as possible.
- C. Except in rock-and-water-bearing earth, mechanical excavation shall be limited to four inches above the elevation of the pipe invert. All additional excavation shall be made manually. Excavation in rock shall be made by a method approved by the Engineer.

3.06 SHORING, SHEETING AND BRACING:

The Contractor shall provide all trench and structural bracing, shoring, or sheeting necessary to construct and protect the excavation from damage to existing utilities of all types, roadways, structures, and private property, and as required for the safety of the public, and employees.

Increase trench widths accordingly by the thickness of the sheeting. Maintain sheeting in place until the pipe has been placed and backfilled at the pipe zone.

Sheeting shall be removed by the Contractor during backfilling operations in a manner that will not damage to the pipe or permit voids in the backfill.

If approved by the Engineer, sheeting can be left in place. The top of such sheeting left in place shall be cut off at a minimum elevation of 2.5 ft. below finished grade.

All sheeting, shoring and bracing of trenches shall conform to the safety requirements of the Trench Safety Act, and to Federal, State or local public agency having jurisdiction.

3.07 DEWATERING:

The Contractor shall, at all times, provide and maintain ample means and devices to promptly remove and dispose of all water from entering the trench excavation during the time the trench is being prepared for the pipe laying, during the laying of the pipe and until the backfill at the pipe zone has been completed, including compaction. These provisions shall apply during the daylight hours as well as overnight.

A wellpoint system or other Engineer approved dewatering method shall be utilized if necessary to maintain the excavation in a dry condition.

Dewatering by trench pumping will not be permitted if migration of fine grained material from bottom, side walls or bedding material will occur. In the event that satisfactory dewatering cannot be accomplished due to subsurface conditions or where dewatering could damage existing structures the Contractor shall obtain the Engineer's approval of wet trench construction procedures before commencing construction. Dewatering shall cease in a manner to allow the subsurface water to slowly return to normal levels.

The dewatering or any excavation areas and the disposal of the water shall be in strict accordance with the latest revision of all local and State government rules and regulations.

If required, the Contractor shall obtain all necessary dewatering permits from applicable Water Management District, pay for all associated fees, and comply with all provisions therein.

3.08 DISPOSAL OF REMOVED WATER:

Water pumped from the trench or other excavation shall be disposed of in storm sewers having adequate capacity, canals or suitable disposal pits as approved by the Engineer. Contractor is responsible for acquiring all permits required to discharge the water and shall protect waterways from turbidity during the dewatering operation. In areas where adequate disposal sites are not available, partially backfilled trenches may be used for water disposal only when the Contractor's plan for trench disposal is approved in writing by the Engineer. The Contractor's plan shall include temporary culverts, barricades and other protective measures to prevent damage to property or injury to any person or person.

Dispose of the water in a manner to prevent flooding of streets and damage to adjacent property. Drainage of trench water through the pipeline under construction is prohibited.

Engines driving dewatering pumps shall be equipped with residential type mufflers.

3.09 TRENCH WIDTH:

The minimum width of the trench shall be equal to the outside diameter of the pipe at the joint plus 12 in. each side of pipe for sheeted trench, with the maximum width of trench, measured at the top of the pipe, not to exceed the outside pipe diameter, plus the appropriate sloped trench wall to meet OSHA requirements, unless otherwise shown on the drawings.

Confine trench widths to dedicated rights-of-way, unless construction easements have been obtained from the affected property Owners.

Trench walls shall be maintained vertical from the bottom of the trench to a line measured at the top of the pipe. From the top of the pipe to the surface the trench walls shall be as vertical as possible under soil condition.

3.10 OPEN TRENCH:

The extent of open trench shall be limited so that no more than 100 feet of open trench in advance of the pipe laying operation.

Pipe trenches across roadways and driveways shall be backfilled as soon as pipe is installed. Where, in the opinion of the Engineer, adequate detour facilities are not available, no trench shall be left open across a roadway or commercial property driveway where adequate detour routes are not available for a period in excess of 30 minutes, or as directed by the governing authority.

All open trench shall be protected by the Contractor with barriers, warning devices and traffic control devices, which shall be kept in the correct position, properly directed and clearly visible at all times.

All open trench shall be backfilled at the end of the day and protected with appropriate signage, reflective tapes and devices. The barrier, warning and traffic control devices, as conformed to F.D.O.T. rules and regulations, shall be suitably lighted at all times.

3.11 LOCATION OF EXCAVATED MATERIALS:

Excavated materials suitable for backfill shall be piled in an orderly manner at a sufficient distance from the trench to avoid overloading and to prevent slides or cave-ins.

Place the excavated material only within the construction easement, right-of-way or approved working area. Do not obstruct any private driveways or public traveled roadways, streets, sidewalks, or driveways. Conform to all Federal, State and local codes governing the safe loading of all trenches with excavated material.

3.12 BOULDER REMOVAL:

Where encountered in the trench bed, all rocks, stones, boulders or concrete, having any dimension larger than permitted to be used for backfill in the paragraph entitled "Backfilling" of these specifications, shall be excavated to a depth of 8" below the bottom of the pipe and shall be removed from the site and disposed of by the Contractor. All undercut trench excavation shall be backfilled and tamped with materials as specified in the following paragraphs under UNSTABLE SUBGRADE.

Where bell-and spigot pipe is used, the 8 inch cushion shall be maintained under the bell as well as under the straight portion of the pipe.

3.13 UNSTABLE SUBGRADE:

All pipe and other structures shall be provided with a stable foundation; any material which, by reason of kind or condition, is not or cannot be made stable by drainage or compaction shall be removed or replaced.

In the event that unstable materials is encountered at or below the excavation depth specified and/or shown on the drawings, the Engineer shall be notified. Such material shall be removed and replaced with suitable material.

For the purpose of this specification, muck, peat, and other highly organic soils shall be considered to be unstable material. In addition, any soil which is or might become wet to such a degree that its moisture content is equal to or greater than 90% of its liquid limit will have to be specifically approved by the Engineer with regard to stability or shall be considered to be unstable material requiring removal and replacement.

If muck is encountered, it shall be completely removed in accordance with F.D.O.T. Roadway and Traffic Design Standard Index 500.

3.14 OVERDEPTH EXCAVATION:

Where unauthorized excavation occurs, the bottom of the excavation shall be brought up to the proper excavation elevation utilizing suitable and properly compacted backfill material at no additional expense to the Owner.

3.15 DISPOSAL OF EXCESS EXCAVATED MATERIAL AND DEBRIS:

The Contractor, at his own expense, shall dispose of all excavated materials not suitable for backfill at an appropriate legal site .

3.16 OTHER STRUCTURES:

Excavation shall be carried to the depths indicated and shall conform to the shape of the structure with sufficient allowance for setting forms, inspection, and proper performance of the work.

3.17 TRENCH BACKFILL:

A. MATERIAL:

Backfill material shall be excavated material, predominately sandy material and essentially free of rock, stones , organic material, asphaltic concrete, clay, concrete, boulders and other deleterious material.

1. Pipe Embedment:

The backfill material required for placement around the pipe and to a depth of 1 foot above the top of the pipe shall consist of clean, fine to medium sand or a mixture of sand, shell or crushed rock with a maximum size of 3/4" and not more than 10 percent passing the U.S. Standard Number 200 sieve, properly graded and mixed so that fine grain material from the side walls of the trench or backfill above the embedment will not migrate into the backfill material.

2. Above Pipe Embedment:

The backfill material used to bring the trench to final subgrade from a depth of 1 foot above the top of the pipe shall consist of sand or a mixture of clean mineral soils with no particle size larger than 3-1/2".

3. Additional Fill:

If sufficient suitable backfill material is not available from the excavation, additional fill meeting the above requirements shall be provided and paid for by the Contractor.

B. BACKFILL OPERATION:

1. Trench:

Pipe trench shall be backfilled immediately after the pipe is laid unless other protection for the pipe line is provided. Backfill materials shall be selected, deposited and compacted so as to eliminate the possibility of lateral displacement of the pipe.

2. Under Pipe:

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe. The pipe shall be carefully bedded in soil foundation that has been accurately shaped and rounded to conform to the lowest 3 of the outside circular portion of the pipe for its entire length, and when necessary, shall be tamped to secure uniform, firm support.

Where bell and spigot pipe is used, the bell holes shall be deep enough to ensure that the bell does not bear on the bottom of the excavation, and shall not be excessively wide in the longitudinal direction of the pipe.

3. Over Pipe:

From the centerline of the pipe, fittings and appurtenances, to an elevation two feet above the top of the pipe, the trench shall be backfilled by hand or by approved mechanical methods.

Backfilling material shall be deposited in the trench for its full width on each side of the pipe and appurtenances. Backfilling shall be carried out simultaneously on both sides of the pipe.

Do not push backfill into the trench in such a way as to permit free fall of the material until at least 2 feet of cover is provided over the top of the pipe. Under no circumstances allow sharp, heavy pieces of material to drop directly onto the pipe or the tamped material around the pipe.

C. COMPACTION EQUIPMENT:

Compaction equipment shall be of suitable type and adequate to obtain the amount of compaction specified. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations and shall be maintained in such condition that it will deliver the manufacturer's rated compactive effort.

Hydro-compaction (puddling) of the backfill material will not be permitted.

D. PLACING AND COMPACTION:

The backfill material placed around the pipe to final subgrade, shall be compacted to a density of not less than 98% the maximum dry density as determined by of AASHTO Method T-180.

The fill lift thickness shall be uniformly compacted and restricted to 8 inches maximum. Particular care shall be taken to insure that the backfill at the haunch is free from voids and is properly compacted.

E. COMPACTION TESTS:

The Engineer may at any time instruct the Contractor to partially excavate a previously backfilled trench or temporarily backfilling of a short section of the trench for the purpose of obtaining measurements of the density of the backfill.

The cost of the partial excavation and restoration of the backfill will be paid for by the Contractor.

The City will pay for the proctors and density tests. Any test failures will be paid by the Contractor.

Proctor and density tests shall be taken along the pipe, and at locations of manholes, inlets, and valves. The location, depth, and number of the tests shall be as selected by the Engineer. Maximum intervals between tests shall be 300 feet.

F. STRUCTURAL ELEMENTS:

Backfill adjacent to structural elements shall be placed, as far as practical, as the adjacent structural elements have been completed and accepted. Backfilling against concrete shall be done only when approved.

Compaction adjacent to structural elements shall be performed by the means of a self propelled, hand led vibratory compactor. The compactor shall impart a dynamic force of not less than 7000 pounds.

G. MISCELLANEOUS:

Backfilling and compacting around meter boxes, valve boxes, manholes, storm inlets, and other structures shall be accomplished in the same manner as the connected pipe. Extreme care shall be used in backfilling wellpoint holes to prevent voids and settlement. If necessary, the holes should be plugged with a concrete slurry, such plugging to be at the expense of the Contractor.

3.18 MAINTENANCE OF AREA UNDER CONSTRUCTION:

- A. As specified in this section, the Contractor shall keep the pipe laying operation as close to the excavation operation as possible during the execution of the work. Construction activity within this work area shall include all phases of the pipe laying operations including dewatering equipment, excavation, pipe laying, backfilling of trenches and the completion of the restored base construction as specified. No open trench will be left unprotected overnight or on weekends.
- B. This maintenance shall include, but not be limited to, the addition of crushed rock backfill material or temporary asphalt pavement in paved areas to keep the surface of backfilled trenches reasonably smooth, free from ruts and potholes and suitable for normal traffic flow.
- C. No additional payment will be made for the maintenance of the trench backfill prior to completion of the work outlined above.

3.19 RESTORATION OF SURFACE IMPROVEMENTS:

A. GENERAL:

All surface improvements on public or private property which have been damaged or removed during excavation or any of the other Contractor's operation or other various construction activities shall be restored to conditions equal to or better than conditions existing prior to beginning work.

These surface improvements include but are not limited to grass plots, sod, shrubbery, ornamental trees, signs, fences, mailboxes and other improvements on public or private property.

Road shoulders, alleys and driveways of shell, limerock, stabilized soil or gravel where disturbed shall be restored with like materials as removed. There shall be no mixing of unlike materials. The disturbed area shall be replaced with the appropriate materials to a minimum depth to restore it to a condition equal to or better than conditions existing prior to beginning work.

Roadways other than paved streets where disturbed shall be replaced with like materials to a minimum compacted thickness of twelve (12) inches. There shall be no mixing of unlike materials. These roadways shall be compacted to a minimum of 98% of the maximum dry density as determined by AASHTO Method T-180.

No additional cost for replacement of roadways other than paved streets will be allowed by the Owner.

B. PAVEMENT, CURB AND SIDEWALK REMOVAL:

Cut all bituminous and concrete pavements, regardless of the thickness, and all curbs and sidewalks, prior to excavation of the trenches with an approved pavement saw, hydro hammer, or approved pavement cutter. Unless otherwise indicated on the Plans, width of the pavement cut shall be at least equal to the required width of the trench at ground surface.

Replacement concrete sidewalks shall be restored with a new modular panel, and the old panels shall be completely removed. No partial panels will be accepted.

Pavement and concrete materials removed shall be hauled from the site and not used for trench backfill.

The Contractor shall remove pavements as part of the trench excavation. The material from permanent pavement removal shall be carefully separated from trench excavation material and disposed of by the Contractor.

3.20 WARRANTY:

In conformance with Section 01019 GENERAL REQUIREMENTS.

END OF SECTION

SECTION 02260

FINISH GRADING

PART 1 GENERAL

1.01 DESCRIPTION:

To bring to finished elevations all earth materials as called for in the drawings. This general work includes the completion of finish grading so that surfaces of compacted material are correctly oriented with the original grades.

PART 2 PRODUCTS

2.01 MATERIALS:

- A. Fill: All fill shall be clean sand, free from debris, vegetable matter and other deleterious substances.
- B. Topsoil: All topsoil material on the site that is determined by the Engineer to be satisfactory for landscaping and/or grassing operations shall be stockpiled near the excavation limits for such use unless otherwise directed by the Engineer.

PART 3 EXECUTION

3.01 GRADING:

Fill, backfill and rough grade as necessary to bring entire site level with elevations of undersides of concrete slabs, walks, paving and finished landscaping as indicated on drawings or in specifications.

3.02 FINISH GRADING:

- A. Where elevations are indicated on plans, obtain such finish elevations, and establish uniform slopes of finish grades between indicated elevations.
- B. Where elevations are not indicated, establish and obtain uniform slope from finished spot elevations at the exterior face of the building out to the nearest indicated elevations for finished grades, as shown on plans.

END OF SECTION

SECTION 02510

ASPHALTIC PAVEMENT AND BASE

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Perform all work associated with Asphaltic Concrete Pavement and Base as shown and as specified herein including all labor, materials, equipment supplies, and facilities associated with providing a finished product satisfying all the requirements of the Contract Documents.
- B. See GENERAL CONDITIONS which contain information and requirements that apply to the Work specified herein and are mandatory for this project.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

Commercial Standards: References in these specifications to "Standard Specifications" shall mean the "Standard Specifications for Road and Bridge Construction," Florida Department of Transportation, Latest Revision.

1.03 SUBMITTALS

- A. Submit, in writing, materials testing reports, job-mix formulas, and other pertinent information acceptable to the ENGINEER demonstrating that materials and methods proposed for use will comply with the provisions of this Section, in accordance with the GENERAL CONDITIONS.
- B. Suitability Tests of Proposed Materials: Tests for conformance with the Specifications shall be performed prior to start of the work. The samples shall be identified to show the name of the material, aggregate source, name of the supplier, contract number, and the segment of the WORK where the material represented by the sample is to be used. Results of all tests shall be submitted to the ENGINEER for review. Materials to be tested shall include aggregate base, coarse and fine aggregate for paving mixtures, mineral filler, and asphalt cement.
- C. Trial Batch: Before placing any paving material, a testing laboratory acceptable to the ENGINEER shall prepare a trial batch of asphalt concrete for each job-mix formula to be used for the Work. The trial batch shall be prepared using the aggregates and asphalt cement proposed, and acceptable to the ENGINEER. The compacted trial batch shall provide a basis for computing the voids ratio, provide an indication of the optimum asphalt content, and establish a basis for controlling compaction during construction. The cost of not more than two laboratory trial batch tests will be borne by the CITY but the CONTRACTOR shall furnish the materials at no cost. Any additional trial batch testing required shall be performed at the expense of the CONTRACTOR within the Scope of the Contract.

1.04 QUALITY CONTROL

Testing by an independent testing firm will be required to verify proper placement and compaction of the subbase, base and pavement sections.

PART 2 - PRODUCTS

2.01 LIMEROCK BASE

Materials for limerock base shall be as specified in Section 911 of the Standard FDOT Specifications.

2.02 PRIME COAT

Prime coat material shall be RC-70 liquid asphalt applied to the pavement base at a uniform rate of 0.25 gallons per square yard. Sand cover shall be applied over prime coat if traffic will be using area before final paving is laid.

2.03 TACK COAT

Tack coat material shall be as specified in Section 300-2.3 of the Standard FDOT Specifications.

2.04 ASPHALTIC CONCRETE

- A. Type S-I Asphaltic Concrete conforming to all applicable requirements of Sections 320, 330 and 311 of the Standard FDOT Specifications.
- B. Where indicated by drawings, Type S-III Asphaltic Concrete conforming to all applicable requirements of Sections 320, 330 and 333 of the Standard FDOT Specifications, may be used.

2.05 TRAFFIC CONTROL MARKINGS

- A. Thermoplastic stripes and markings shall be as specified in Section 711 of the Standard FDOT Specifications.
- B. Reflective pavement markers shall be as specified in Section 706 of the Standard FDOT Specifications.
- C. Signing shall be as specified in Section 700 of the Standard FDOT Specifications.

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION

The subgrade shall be prepared as shown on the drawing details and as applicable to roadways and embankments. The surface of the subgrade after compaction shall be hard, uniform, smooth and true to grade and cross-section. Subgrade for pavement shall not vary more than 0.02 foot from the specified grade and cross section. Subgrade for base material shall not vary more than 0.04 foot from the specified grade and cross section. Compaction on Subgrade shall be 98% of the maximum density as determined by AASHTO T180 in the upper 12 inches.

3.02 LIMEROCK BASE

- A. Aggregate base shall be provided where shown and to the thickness shown. Imported aggregate bases shall be delivered to the job site as uniform mixtures and each layer shall be spread in one operation. Segregation shall be avoided and the base shall be free of pockets of coarse or fine material. Where the required thickness is 6 inches or less, the base materials may be spread and compacted in one course. Where the required thickness is more than 6 inches, the base material shall be spread and compacted in two or more courses of approximately equal thickness and the maximum compacted thickness of anyone course shall not exceed 8 inches. The relative compaction of each course of aggregate base shall be not less than 98 percent of maximum density at optimum moisture content when measured in accordance with ASTM D 1557. The compacted surface of the finished aggregate shall be hard, uniform, smooth and at any point shall not vary more than 0.02 feet from the specified grade or cross section.
- B. Requirements for limerock base other than those above shall be as specified by Section 200 of the Standard Specifications.

3.03 MILLING OF EXISTING ASPHALT PAVEMENT

- A. Removing existing asphaltic concrete pavement by milling at all locations indicated on the Drawings shall be as specified in Section 327 of the standard specifications.
- B. CONTRACTOR shall be responsible for the removal and disposal of the milled material off to an authorized site approved by the ENGINEER.
- C. The depth of cut for the mill width shall be tapered from an average depth of cut of 3/4-inch at the edge of pavement or curb.

3.04 PRIME COAT

- A. Prime coat shall be applied when the limerock base meets the specified density requirements and the moisture content of the top half of the base does not exceed 90 percent of the optimum moisture of the base material. At the time of priming, the limerock base shall be firm, unyielding and in such a condition that no undue distortion will occur.
- B. Prime coat shall be applied according to Section 300 of the Standard Specifications.

3.05 TACK COAT

- A. A tack coat shall be applied to the base and to the contact surfaces of all cold pavement joints, curbs, gutters, manholes and the like before the asphalt pavement is placed. Care shall be taken to prevent the application of tack coat material to surfaces that will not be in contact with the new asphaltic concrete pavement.
- B. Tack coat shall be applied in accordance with Section 300-7 of the Standard Specifications.

3.06 ASPHALTIC CONCRETE

- A. Paving shall be as specified in Section 330 of the Standard Specifications and the specifications herein.
- B. At the time of delivery to the Work site, the temperature of mixture shall be within $\pm 25^{\circ}$ F of the mix temperature.
- C. Asphalt concrete shall not be placed when the atmospheric temperature is below 40 degrees F or during unsuitable weather.
- D. The asphaltic concrete shall be evenly spread upon the subgrade or base to such a depth that, after rolling, it will be of the specified cross section and grade of the course being constructed.
- E. The depositing, distributing, and spreading of the asphalt concrete shall be accomplished in a single, continuous operation by means of a self-propelled mechanical spreading and finishing machine designed specially for that purpose. The machine shall be equipped with a screed or strike-off assembly capable of being accurately regulated and adjusted to distribute a layer of the material to a definite pre-determined thickness. When paving is of a size or in a location that use of a self-propelled machine is impractical the ENGINEER may waive the self-propelled requirement.
- F. Spreading, once commenced, must be continuous without interruption.
- G. The mix shall be compacted immediately after placing. Initial rolling with a steel-wheeled tandem roller, steel three-wheeled roller, vibratory roller, or a pneumatic-tired roller shall follow the paver as closely as possible. If needed, intermediate rolling with a pneumatic-tired roller shall be done immediately behind the initial rolling. final rolling shall eliminate marks from previous rolling. In areas too small for the roller a vibrating plate compactor or a hand tamper shall be used to achieve thorough compaction.
- H. Upon completion, the pavement shall be true to grade and cross-section. When a 10-foot straightedge is laid on the finished surface parallel to the center of the roadway, the surface shall not vary from the edge of the straightedge more than 1/8 inch except at intersections or changes of grade. In the transverse direction, the surface shall not vary from the edge of the straightedge more than 1/4 inch.
- I. The relative density after compaction shall be 98 percent of the density obtained by using ASTM D 1188 or D 2726. A properly calibrated nuclear asphalt testing device may be used for determining the field density of compacted asphalt concrete, or slabs or cores shall be laboratory tested in accordance with ASTM D 1188.

3.07 ASPHALTIC LEVELING COURSE

The requirements for the placement of an asphaltic leveling course over existing pavement in order to bring the existing pavement surface to proper grade and cross-section shall be in accordance with Section 330 in general, and specifically Sections 330-8.2, 330-9.3 and 330-10.1.7 of the Standard Specifications.

3.08 TRAFFIC CONTROL MARKING RESTORATION

- A. CONTRACTOR shall be responsible for restoring all traffic striping, reflective markers, signalization systems and signage which are damaged or disturbed during construction.
- B. CONTRACTOR shall submit pavement marking plans in accordance with the requirements of the applicable right-of-way authority. Plans shall be at a scale suitable to indicate the dimensional requirements of the pavement markings. Plans shall receive approval of ENGINEER, and the applicable right-of-way authority prior to implementation.
- C. The intent is to restore traffic control to the plan and markings existing prior to construction, or as indicated by the Drawings.
- D. Restoration shall conform with all applicable requirements of Sections 706, 710 and 711 of the Standard Specifications.

END OF SECTION

SECTION 02527

CURBS AND GUTTERS, SIDEWALKS AND DRIVEWAY APRONS

PART 1 GENERAL

1.01 DESCRIPTION:

Work covered by this section consists of furnishing all plant, labor, equipment, appliances and material, and performing all operations required to install the specified curb and gutter, sidewalk and driveway aprons, as detailed on the applicable drawings.

1.02 QUALITY ASSURANCE:

- A. Applicable Standards: The specifications, standards and publications (latest editions) listed below are to be considered a part of these specifications to the extent required by the references thereto:
 - 1. American Society for Testing and Materials (ASTM) A615 Standard Specifications for Deformed and Plain Billet Steel Bars C33 Standard Specifications for Concrete Aggregates C150 Standard Specification for Portland Cement.
- B. All construction shall conform to all applicable standards of the Florida Department of Transportation, Sections 520 and 522, and as shown on the applicable drawings as specified herein.

PART 2 PRODUCTS

2.01 MATERIALS:

- A. All materials shall conform to the appropriate portion of the referenced specifications.
- B. Concrete:
 - 1. Concrete for sidewalks shall be four (4) inches thick and 3,000 psi concrete.
 - 2. Driveway aprons, sidewalks at driveway
- C. Joint Filler:

Joint filler for all expansion joints shall be an approved suitable elastic waterproof premolded compound which will not become soft and push out in hot weather, nor become hot and brittle and chip out in cold weather. Filler shall not be more than 8" thick and shall extend the full depth and width of the concrete work involved.

PART 3 EXECUTION

3.01 EXPANSION JOINTS:

- A. Curbs and Gutters:

Provide expansion joints with filler as specified hereinbefore, on 20 ft. maximum centers, and at other locations indicated.

B. Driveway Aprons:

Provide expansion joints with filler as specified hereinbefore, at each end of all aprons where they abut the curb and gutter.

C. Concrete Sidewalk:

Provide expansion joints with filler as specified hereinbefore, where sidewalk abuts curb and gutter, driveway and other locations.

3.03 FINISHING:

A. After the concrete has been brought to required grade with a strike board and sufficiently tamped to bring the mortar to the surface, finish it as specified below.

1. Finish surface with trowel and float to and approximately true plane with light broom finish.
2. Do not apply neat cement to any concrete surface to hasten its hardening.

END OF SECTION

SECTION 02574

PAVEMENT REMOVAL AND REPLACEMENT

PART 1 GENERAL

1.1 DESCRIPTION OF WORK:

- A. Removal of existing sidewalks, aprons, and curbing.
- B. Replacement of sidewalks, aprons, and curbing.

1.2 REFERENCES:

FDOT – Florida Department of Transportation Standard Specifications for Road and Bridge Construction, 2000.

1.3 GENERAL:

Protection of Existing Improvements: The Contractor shall be responsible for the protection of all pavement, sidewalk, driveway, curbs, gutters, utilities and other improvements within the Work area. All damage to such improvements, as a result of the Contractor's operations, beyond the limits of the Work shall be repaired by the Contractor at his own expense.

1.4 REMOVAL:

- A. Where existing concrete is to be removed, the surfacing shall be mechanical saw cut prior to removal, leaving a uniform and straight edge, with minimum disturbance to the remaining adjacent surfacing.
- B. Where concrete pavements, sidewalks, curbs, etc., are required to be removed and there exists a formed joint within three (3) feet of the proposed saw cut and parallels the proposed saw cut, the removal line shall be extended to the formed joint.
- C. The Contractor shall remove and replace only those areas of pavement that he/she anticipates installing that week. The amount of pavement removal and replacement shall be scheduled with the approved traffic maintenance plan, so as to permit continuous flow of pedestrian and vehicular traffic.

1.4 REPLACEMENT:

- A. All replacements shall conform to the lines, grades and cross sections of the removed portions.
- B. Materials used for replacement shall be the same as that removed, i.e. concrete or asphaltic concrete paving, etc.

END OF SECTION

SECTION 02578

WEARING SURFACE AND BASE COURSES

1.01 SCOPE OF WORK:

Work under this section of the specifications consists of furnishing all materials, labor, equipment and performing all operations in connection with pavements and construction relative hereto.

1.02 DOT STANDARD SPECIFICATIONS:

Unless otherwise specified, all work under this section shall conform to Florida Department of Transportation Standard Specifications for Road and Bridge Construction, current edition.

1.03 COMPACTED SUBGRADE:

Work under this section shall conform with the requirements as indicated on the plans. Width and limit of work shall be as indicated on the Drawings.

1.04 WORK PLATFORM:

As required to support equipment.

1.05 PAVEMENT REMOVAL:

Where new pavement is to abut existing pavement, the existing pavement shall be saw-cut to straight lines and loose material shall be removed.

1.06 BASE COURSE:

The base course shall be 4-inch Asphalt Base Course, Type 3 per F.D.O.T. Standard Specifications for Road and Bridge Construction Section 280 and constructed to the lines, grades and dimensions shown on the plans.

1.07 LEVELING COURSE:

Where a surface course is constructed on an existing pavement or old base which is irregular, and wherever so indicated on the plans, the existing surface shall be brought to proper grade and cross section by the application of leveling courses. All work shall conform to DOT Standard Specifications.

1.08 ASPHALTIC CONCRETE SURFACE COURSE:

A. Materials and Construction Methods: Shall conform with the requirements of DOT Standard Specifications for Type S-III Asphaltic Concrete Surface Course Section 333, The wearing surface shall have a minimum thickness as shown on the plans.

1.09 PRIME AND TACK COATS:

A. General: Materials and construction methods shall conform with the requirements of DOT Standard Specifications for prime and tack coats for base courses - Section 300, Articles 300-1 through 300-7, with the exception that in lieu of sanding, the Contractor will apply a light uniform application of approved sand-asphalt mix and roll as directed prior to opening the primed base to traffic. Sanding will not be permitted.

B. Prime and tack coat is required under this contract.

- C. Materials: Bituminous materials and rates of application shall comply with the following, except the rate of application may be varied at the discretion of the Engineer at no additional charge to the City:

<u>PRIME COAT</u>		<u>TACK COAT</u>	
Type & Gals. per		Type & Gals. per	
<u>GRADE</u>	<u>SQ. YDS</u>	<u>GRADE</u>	<u>SQ. YDS.</u>
RC-70 0.15 or RC-250	0.15	RS-2 or CRS-2	0.05

*For Type I and Type II Asphaltic Concrete Wearing Surface.

On Sand-Asphalt Base:	RC-1S	0.08
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- D. Application: Prime coat shall be applied in accordance with current DOT Specifications.

A tack coat may be required on sand-asphalt base prior to placing wearing surface, at the discretion of the Engineer.

1.10 REWORKING SUBGRADE:

Where it is necessary to excavate and remove the existing subgrade in order to construct the base course, subgrade and finished surface to the dimensions and lines shown on the plans, grades to match existing. The Contractor shall excavate the excess subgrade and dispose of the excess material offsite.

1.11 GENERAL REQUIREMENTS FOR PLANT METHODS, CONSTRUCTION METHODS AND EQUIPMENT:

All plant mix asphaltic concrete mixtures and construction shall conform to Section 320 and to Section 330, Article 330-1 through 330-14 of the Florida Department of Transportation Standard Specifications where applicable.

END OF SECTION

SECTION 02618

PAVEMENT MARKING - THERMOPLASTIC

PART I GENERAL

1.01 SCOPE OF WORK:

- A. Work Included:
 - 1. Thermoplastic painted stripes
 - 2. Thermoplastic signs
 - 3. Thermoplastic arrows
 - 4. Thermoplastic letters

1.02 DESIGN REQUIREMENTS:

Pavement marking shall be in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, 1991 Edition, Section 711.

1.03 QUALITY ASSURANCE:

- A. Perform work in accordance with the Contract Documents in a neat and accurate manner.
- B. Equipment shall be of a type and design which will readily obtain the required uniformity of application of the pavement markings both as to thickness of coating and as to alignment.
- C. Applicable Publication: Florida Department of Transportation Standard Specifications for Road and Bridge Construction, 1991 Edition.

1.04 STANDARDS:

Where reference is made herein to the FDOT Specifications delete therefrom the basis of payment and other pay measurement requirements. Payment is to be a lump sum amount for the entire project.

PART II PRODUCTS

2.01 MATERIALS:

- A. Thermoplastic Paint: In accord with requirements as indicated in Section 711 of the FDOT Specifications.
- B. Color: White and yellow, as shown on the drawings. All handicapped related markings are to be painted blue.

PART III EXECUTION

3.01 CORRECTIVE MEASURES:

- A. Markings which fail to meet the guidelines, including the permissible tolerances and the appearance requirements, or are marred or damaged by traffic or from any other cause shall be corrected at no cost to the Owner. Drips and spattered paint shall be removed. Whenever it is necessary to remove paint it shall be done by means which will not damage the underlying surface of the pavement. When necessary to correct a deviation which exceeds the permissible tolerance in alignment, that portion of the stripe affected shall be removed and repainted in accordance with these guidelines.

- B. Corrective Devices: Misalignment, defective surfaces, and the like, shall be corrected by sandblasting or by any other type of mechanical device which will effectively remove the thermoplastic without damage to the pavement surface.

3.02 DIMENSION AND ALIGNMENT TOLERANCE:

- A. Dimensions: No marking shall be less than the indicated width. No marking shall exceed the indicated width by more than $\frac{1}{2}$ inch.
- B. Corrective Rates: Corrections of variation in the width of, and the alignment of stripes shall not be made abruptly but the stripes should be returned to the design width of the rate of at least 10 feet for each $\frac{1}{2}$ inch of correction.

END OF SECTION

SECTION 02741

MICROSURFACING ASPHALT PAVING

PART I GENERAL

1.01 SCOPE

This specification covers the materials, equipment, construction and application procedures for rut filling and/or surfacing of existing paved surfaces in accordance with DOT Standard Specifications for Roads and Structures 2007 and these Specifications. The micro-surfacing system shall be a mixture of cationic latex modified asphalt emulsion, mineral aggregate, mineral filler, water and other additives, properly proportioned, mixed and spread on the paved surface in accordance with this specification and as directed by the Engineer.

1.02 DESCRIPTION

Micro-Surfacing is a mixture of polymer-modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, properly proportioned, mixed and spread on a paved surface in accordance with a specification and as directed by the Engineer.

The mix should be capable of being spread in variable thickness cross-sections (wedges, ruts, scratch courses and surfaces) which, after curing and initial traffic consolidation, it shall resist compaction throughout the entire design tolerance range of bitumen content and variable thickness to be encountered. The end product should maintain a skid-resistant surface (high wet friction co-efficient) in variable thickness sections throughout the service life of the Micro-Surfacing. The mix is to be a quick-traffic system, meaning that it will be able to accept traffic after a short period of time. The amount of time will vary from job to job and will be evaluated on an individual job basis. Normally, this system will be required to accept rolling traffic on a one-half (1/2) inch thick surface within one hour after placement in +75°F temperature and 50 percent or less humidity.

1.03 RELATED SECTIONS

1. Section 02742 – Crack Sealing

PART 2 MATERIALS

2.01 EMULSIFIED ASPHALT

2.01.1

GENERAL

The emulsified asphalt shall be a quick-set latex modified cationic type CCS-1H emulsion with natural or synthetic latex and shall conform to the requirements specified in AASHTO M208 or ASTM D2397. It shall pass all applicable storage and settlement tests. The Contractor shall manufacture its own emulsion. The cement mixing test shall be waived for this emulsion.

The polymer material shall be milled or blended into the asphalt or emulsifier solution prior to the emulsification process.

The minimum amount and type of polymer modifier shall be determined by the laboratory performing the mix design. The minimum amount required will be based on asphalt weight content and will be certified by the emulsion supplier. In general, a three percent (3%) polymer solids, based on asphalt weight, is considered minimum.

The five-day (5) settlement test may be waived, provided job stored emulsion is used within thirty-six (36) hours from the time of the shipment, or the stored material has had additional emulsion blended into it prior to use.

Contractor or Emulsion supplier will provide written certification that they have manufactured emulsified asphalt for a minimum of five (5) years. A list of Florida contracts completed during the last five (5) years shall accompany the bid. The list shall include the Customers name, phone number, location of project and the superintendent in charge.

2.01.2 QUALITY TESTS

When tested according to the following tests, the emulsion shall meet the requirements of AASHTO M208 or ASTM D2397 for CSS-1h, plus the following:

AASHTO TEST NO.	ASTM TEST NO.	QUALITY	SPECIFICATION
AASHTO T59	ASTM D244	Residue after distillation	62% Minimum

The temperature for this test should be held below 280°F (138°C). Higher temperatures may cause the polymers to break down.

AASHTO TEST NO.	ASTM TEST NO.	TESTS ON RESIDUE	SPECIFICATION
AASHTO T53	ASTM D36	Softening Point	135 °F (57°C) Minimum
AASHTO T49	ASTM 2397	Penetration at 77°F (25°C)	40 - 90*
	ASTM 2170	Kinematic Viscosity @ 275 °F (135°C)	650 cSt/sec. Minimum °F

* Climate conditions should be considered when establishing this band.

Each load of emulsified asphalt shall be accompanied with a Certificate of Analysis/Compliance to assure that it is the same as that used in the mix design.

2.02 AGGREGATE

2.02.1 GENERAL

The mineral aggregate used shall be of the type and grade specified for the particular use of the Micro-Surfacing. The aggregate shall be a manufactured crushed stone such as granite, slag, limestone, chat, or other high-quality aggregate, or combination thereof. To assure the material is totally crushed, 100 percent of the parent aggregate will be larger than the largest stone in the gradation to be used.

2.02.2 QUALITY TESTS

When tested according to the following tests, the aggregate should meet these minimum requirements:

AASHTO TEST NO.	ASTM TEST NO.	QUALITY	SPECIFICATION
AASHTO T176	ASTM D2419	Sand Equivalent	65 Minimum

AASHTO T104	ASTM C88	Soundness	15% Maximum using NA ₂ SO ₄ or 25% Maximum using MgSO ₄
AASHTO T96	ASTM C131	Abrasion Resistance	30% Maximum

The abrasion test is to be run on the parent aggregate. The aggregate should meet state-approved polishing values. Proven performance may justify the use of aggregates that may not pass all of the above tests.

2.02.3 GRADING

When tested in accordance with AASHTO T27 (ASTM C136) and AASHTO T11 (ASTM C117), the target (mix design) aggregate gradation (including the mineral filler) shall be within one of the following bands.

SIEVE SIZE	TYPE II PERCENT PASSING	TYPE III PERCENT PASSING	STOCKPILE TOLERANCE
3/8 (9.5 mm)	100	100	
# 4 (4.75 mm)	90 - 100	70 - 90	± 5%
# 8 (2.36 mm)	65 - 90	45 - 70	± 5%
# 16 (1.18 mm)	45 - 70	28 - 50	± 5%
# 30 (600 um)	30 - 50	19 - 34	± 5%
# 50 (330 um)	18 - 30	12 - 25	± 4%
#100 (150 um)	10 - 21	7 - 18	± 3%
#200 (75 um)	5 - 15	5 - 15	± 2%

The job mix (target) gradation shall be within the gradation band for the desired type. After the target gradation has been submitted (this should be the gradation that the mix design is based on), then the percent passing each sieve shall not vary by more than the stockpile tolerance shown in the above table for each individual sieve, and still remain within the gradation band.

The aggregate will be accepted at the job location stockpile or when loading into the support units for delivery to the lay-down machine. The stockpile shall be accepted based on five gradation tests according to AASHTO T2 (ASTM D75). If the average of the five tests is within the gradation tolerances, then the materials will be accepted. If the tests show the material to be out, the contractor will be given the choice to either remove the material or blend other aggregate with the stockpiled material to bring it into specification. Materials used in blending must meet the quality tests before blending and must be blended in a manner to produce a consistent gradation. If blending is used, it will require that a new mix design be performed.

Screening shall be required at the stockpile prior to delivery to the paving machine if there are any problems created by having oversize material in the mix.

2.03 MINERAL FILLER

Mineral filler, if required, shall be any recognized brand of non-air entrained Portland cement or hydrated lime that is free from lumps. It may be accepted upon visual inspection. The type and amount of mineral filler needed shall be determined by a laboratory mix design and will be considered as part of the aggregate gradation. An increase or decrease of less than one percent (1%) may be permitted when the Micro-Surfacing is being placed if it is found to be necessary for better consistency or set times.

2.04 WATER

The water shall be potable and free of harmful soluble salts or reactive chemicals and any other contaminants.

2.05 ADDITIVES

Additives may be added to the emulsion mix or any of the component materials to provide the control of the quick-traffic properties. They must be included as part of the mix design and be compatible with the other components of the mix.

2.06 MIX DESIGN

2.06.1 GENERAL

Before the work commences, the contractor shall submit a signed mix design covering the specific materials to be used on the project. This design will be performed by a laboratory which has experience in designing Micro-Surfacing. After the mix design has been approved, no substitution will be permitted, unless approved by the Engineer.

2.06.2 MIX DESIGN

- (a) At least seven (7) working days before work commences, the Contractor shall submit a mix design certified by the latex modified emulsion manufacturer and present certified test results for the Engineer's approval. Compatibility of the aggregate and latex modified CSS-Ih shall be certified by the emulsion manufacturer. The job mix formula shall provide a minimum Marshall stability of 1,000 pounds and a flow of 6 to 16 units when tested according to modified ASTM 1559 or MSTO 245 procedures. Aggregate used in the job mix formula shall be of the material proposed by the Contractor for use on the project.
- (b) Composition of mixture. The Engineer shall approve the mix design and all micro-surfacing materials and methods prior to use and shall designate the proportions to be used within the following limits.

	Type II	Type III
Mineral aggregate (#/sy dry wt.)	10 - 30	18 - 35
%Emulsified filler (Residual)	5.5 - 9.0	4.0 - 8.5
%Mineral filler	0.5-3% dry weight	
Latex base modified	As required to provide the specific properties	
Additive	As required to provide the specific properties	

2.06.3 RATE OF APPLICATION

The Micro-Surfacing mixture shall be of the proper consistency at all times, so as to provide the application rate required by the surface condition. The average single application rate, as measured by the Engineer/Construction Coordinator shall be in accordance with the following table:

AGGREGATE TYPE	APPLICATION RATE
Type II (Single Course)	16-20 lb/yd ²
Type II (Double Course)	28-32 lb/yd ²

Suggested application rates are based upon the weight of dry aggregate in the mixture. Application rates are affected by the unit weight of the aggregate.

Microsurfacing is often put down in two full-width passes in place of rut-filling when the rutting or deformation is not severe. When two passes are used, the first pass (scratch course) is made using a metal or stiff rubber strike-off and applying on what the surface demands for leveling.

2.07 EQUIPMENT

2.07.1 GENERAL

All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working condition at all times to ensure a high-quality product.

2.07.2 MIXING EQUIPMENT

The machine shall be specifically designed and manufactured to lay Micro-Surfacing. The material shall be mixed by an automatic-sequenced, self-propelled Micro-Surfacing mixing machine, which shall be a continuous-flow mixing unit able to accurately deliver and proportion the aggregate, emulsified asphalt, mineral filler, control setting additive, and water to a revolving multi-blade, double-shafted mixer and to discharge the mixed product on a continuous-flow basis. The machine shall have sufficient storage capacity for aggregate, emulsified asphalt, mineral filler, control additive and water to maintain an adequate supply to the proportioning controls. The machine may be required to be a self-loading machine capable of loading materials while continuing to lay microsurfacing, thereby minimizing construction joints. If used, the self-loading machine shall be equipped to allow the operator to have full control of the forward and reverse speeds during applications of the Micro-Surfacing material and be equipped with opposite-side driver stations to assist in alignment. The self-loading device, opposite-side driver stations, and forward and reverse speed controls shall be original equipment manufacturer design. The Contractor will be required to own both the truck mount and continuous flow machines.

2.07.3 PROPORTIONING DEVICES

Individual volume or weight controls for proportioning each material to be added to the mix (i.e. aggregate, mineral filler, emulsified asphalt, additive, and water) shall be provided and properly marked. These proportioning devices are used in material calibration and determining the material output at any time.

2.07.4 SPREADING EQUIPMENT

The mixture shall be agitated and spread uniformly in the surfacing box by means of twin shafted paddles or spiral augers fixed in the spreader box. A front seal shall be provided to

insure no loss of the mixture at the road contact point. The rear seal shall act as a final strike-off and shall be adjustable. The spreader box and rear strike-off shall be so designed and operated that a uniform consistency is achieved to produce a free flow of material to the rear strike-off. The spreader box shall have suitable means provided to side shift the box to compensate for variations in the pavement geometry.

2.07.3.1 SECONDARY STRIKE-OFF

A secondary strike-off shall be provided to improve surface texture. The secondary strike-off shall have the same adjustments as the spreader box.

2.07.3.2 RUT-FILLING BOX

When required on the plans, before the final surface course is placed, preliminary micro-surfacing material may be required to fill ruts, utility cuts, depressions in the existing surface, etc. Ruts of one-half (1/2) inch (12.7 mm) or greater in depth shall be filled independently with a rut-filling spreader box, either five foot (5) (1.5 m) or six foot (6) (1.8 m) in width. For irregular or shallow rutting of less than one-half (1/2) inch (12.7 mm) in depth, a full-width scratch-coat pass may be used as directed by the Engineer. Ruts that are in excess of one and one-half (1-1/2) inches (38.1 mm) in depth may require multiple placements with the rut-filling spreader box to restore the cross-section. All rut-filling level-up material should cure under traffic for at least a twenty-four (24) hour period before additional material is placed on top of the level up.

2.07.4 AUXILIARY EQUIPMENT

Suitable surface preparation equipment, traffic control equipment, hand tools, and any other support and safety equipment shall be provided by the contractor as necessary to perform the work.

2.08 CALIBRATION

Each mixing unit to be used in the performance of the work shall be calibrated in the presence of the Engineer prior to construction. Previous calibration documentation covering the exact materials to be used may be acceptable, provided that no more than 60 days have lapsed. The documentation shall include an individual calibration of each material at various settings, which can be related to the machine metering devices. No machine will be allowed to work on the project until the calibration has been completed and/or accepted.

PART 3 APPLICATION

3.01 GENERAL

When required by local conditions, the surface shall be pre-wetted by fogging ahead of the spreader box. The rate of application of the fog spray shall be adjusted during the day to suit temperatures, surface texture, humidity, and dryness of the pavement. The Micro-Surfacing shall be of the desired consistency upon leaving the mixer. A sufficient amount of material shall be carried in all parts of the spreader at all times so that a complete coverage is obtained. Overloading of the spreader shall be avoided. No lumping, balling, or unmixed aggregate shall be permitted.

No streaks, such as those caused by oversized aggregate, shall be left in the finished surface. If excess streaking develops, the job will be stopped until the contractor proves to the Engineer, that the situation has been corrected. Excessive streaking is defined as more than four drag marks greater than one-half (1/2) inch wide and four inches (4) long or one inch (1) wide and three (3) inches long, in any 30 yd²

area. No transverse ripples or longitudinal streaks of one-fourth (1/4) inch in depth will be permitted, when measured by placing a ten (10) foot straight edge over the surface.

3.02 WEATHER LIMITATIONS

Micro-Surfacing shall not be applied if either the pavement or air temperature is below 50°F and falling, but may be applied when both pavement and air temperatures are above 45°F and rising. No Micro-Surfacing shall be applied when there is the possibility that the finished product will freeze within 24 hours. The mixture shall not be applied when weather conditions prolong opening to traffic beyond a reasonable time.

3.03 NOTIFICATION AND TRAFFIC CONTROL

3.03.1 NOTIFICATION

All homeowners and businesses affected by the construction shall be notified two (2) days in advance of surfacing. Suitable signs may be posted prior to the surfacing. Should work not occur on the specified day, a new notification will be distributed. The notification shall be in a form of a written posting, stating the time and date that the surfacing will take place. A current phone number of the contractor's on-site supervisor and a brief description of Microsurfacing. The contractor will be responsible for contacting any Waste Management companies, United States Mail Carriers, United Parcel Services, Palm Beach County School Board, Palm Tran, etc. two (2) days in advance that Microsurfacing is planned. Failure to do so will result in the contractor repairing the roadway at his/her cost.

3.03.2 TRAFFIC CONTROL

All traffic control devices shall be in accordance with State and Federal requirements and, further, shall conform to the requirements of the Manual on Uniform Traffic Control Devices. Suitable methods shall be used by the contractor to protect the Micro-Surfacing from damage from all types of vehicular traffic. Opening to traffic does not constitute acceptance of the work. The Engineer and Construction Coordinator shall be notified of the methods to be used.

3.04 SURFACE PREPARATION

3.04.1 GENERAL

Immediately prior to applying the Micro-Surfacing, the surface shall be cleared of all loose material, silt spots, vegetation, and other objectionable material. Any standard cleaning method will be acceptable. If water is used, cracks shall be allowed to dry thoroughly before applying Micro-Surfacing. Manholes, valve boxes, drop inlets and other service entrances shall be protected from the Micro-Surfacing by a suitable method. The Engineer/Construction Coordinator shall approve the surface preparation prior to surfacing. No dry aggregate either spilled from the lay-down machine or existing on the road, will be permitted.

3.04.2 CRACKS

Cracks will be pre-treated with an acceptable crack sealer prior to the application of the Micro-Surfacing. See Section 02742

3.05 JOINTS

No excess buildup, uncovered areas, or unsightly appearance shall be permitted on longitudinal or transverse joints. The contractor shall provide suitable-width spreading equipment to produce a minimum number of longitudinal joints throughout the project. When possible, longitudinal joints shall be placed on lane lines. Half passes and odd-width passes will be used only in minimum amounts. If half passes are used, they shall not be the last pass of any paved area. A maximum of three (3) inches (76.2 mm) shall be allowed for overlap of longitudinal lane line joints. Also, the joint shall have no more than a one-fourth (1/4) inch (6.4 mm) difference in elevation when measured by placing a ten (10) foot (3 m) straight edge over the joint and measuring the elevation drop-off.

3.06 MIX STABILITY

The Micro-Surfacing shall possess sufficient stability so that premature breaking of the material in the spreader box does not occur. The mixture shall be homogeneous during and following mixing and spreading. It shall be free of excess water or emulsion and free of segregation of the emulsion and aggregate fines from the coarser aggregate. Under no circumstances shall water be sprayed directly into the lay-down box while laying microsurfacing material.

3.07 HANDWORK

Areas which cannot be reached with the mixing machine shall be surfaced using hand squeegees to provide complete and uniform coverage. If necessary, the area to be handworked shall be lightly dampened prior to mix placement. Care shall be exercised to leave no unsightly appearance from handwork. The same type of finish as applied by the spreader box shall be required.

3.08 LINES

Care shall be taken to ensure straight lines along curbs and shoulders. No runoff on these areas will be permitted. Lines at intersections will be kept straight to provide a good appearance. If necessary, a suitable material will be used to mask off the end of streets to provide straight lines. Edge lines shall not vary by more than ± 2 inches (± 50 mm) horizontal variance in any 96 feet (30 m) of length.

3.09 CLEAN-UP

All areas, such as man-ways, gutters, and intersections, shall have the Micro-Surfacing mix removed as specified by the Engineer. The contractor shall, on a daily basis, remove any debris associated with the performance of the work, completely and thoroughly to the satisfaction of the Project Manager or his/her designee. In addition, the Contractor shall, at the request of the Project Manager pressure wash any area such as, curb and gutter, private driveways, etc. removing any and all stains associated with the placement of the Microsurfacing.

3.10 METHOD OF MEASUREMENT

AREA

The method of measurement and payment is based on the area covered, measured in square yards.

3.11 PAYMENT

The Microsurfacing shall be paid for by the unit area of work and accepted by the Project Manager. The price shall be full compensation for furnishing all preparation; mixing and applying these materials; and all labor, equipment, tools, test designs, cleaning, and incidentals necessary to complete the job as specified herein.

PART 4 EXPERIENCE

4.01 EXPERIENCE OF THE CONTRACTOR

The bidder will certify that he has had a minimum five (5) years experience in the Florida in the application of Micro-Surfacing material. A list of Florida contracts completed during the last five (5) years shall accompany the bid. The list shall include the Customers name, phone number, location of project and the superintendent in charge.

End of Section

SECTION 03000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 DESCRIPTION:

Supply and install all cast-in-place concrete as shown on the drawings and specified.

1.02 APPLICABLE CODES, STANDARDS AND SPECIFICATIONS:

The installation of cast-in-place concrete shall be in accordance with the following codes and standards:

- A. The local building code
- B. Portland Cement Association (PCA)
- C. American Concrete Institute (ACI)
- D. Concrete Reinforcing Steel Institute (CRSI)
- E. American Society for Testing and Materials (ASTM)
- F. Federal Specifications

1.03 TESTS AND INSPECTIONS:

- A. Testing Agency: A professional, independent testing laboratory, approved by the Engineer, shall perform all testing and inspection procedures specified.
- B. Payment: The City shall pay for all costs of sampling and testing of concrete cylinders. The Contractor shall pay for all tests that failed to meet the project requirements, and retest of same.
- C. Reports: Execute immediately after completion of each procedure or inspection and forward promptly to the Engineer five copies of each report.
- D. Molded Concrete Compression Cylinders: One set of four cylinders each sampling for each 50 cubic yards or fraction thereof for each day's placement of each mix design. Sample according to ASTM C172, process and cure according to ASTM C31 and prepare and test according to ASTM C39. Test one cylinder at age three days or seven days, as required by job conditions and two cylinders for one valid test at 28 days. Fourth cylinder is to be cured and held for testing at 42 days if 28-day test indicated deficient results, or as a spare in case of cylinder damage.

1.04 REINFORCEMENT:

Where reinforcement is indicated on the drawings, it shall conform to ASTM A615, Grade 60 and Section 03200.

1.05 FORMWORK:

Shall conform to ACI 347 and Section 03100.

1.06 SUBMITTALS:

- A. Mix designs: Submit mix designs prepared in accordance with ACI 318 and ACI 211.1, based upon ready-mix producer's statistical data for past mix design test results.
- B. Field Test Reports: Submit field test reports for all cylinder tests.

PART 2 PRODUCTS

2.01 PORTLAND CEMENT:

Conform to ASTM C150, Type II.

2.02 CONSTRUCTION WATER:

From domestic sources, free of harmful acids, alkalis, oil, organic or other deleterious materials. Conform to Section 01019 GENERAL REQUIREMENTS.

2.03 CONCRETE AGGREGATES:

- A. Conform to ASTM C33 or ASTM C330 (lightweight aggregates).
- B. Fine Aggregate: Clean, washed sand of hard, sound, uncoated grains.
- C. Course Aggregates: Clean, washed, sound and crushed.
- D. Aggregate Size Requirements: Use largest practicable aggregate size for each condition of placement subject to limitations stipulated in ACI Code 318, paragraph 3.3.

2.04 CONCRETE ADMIXTURES:

- A. Water Reducing Agent: A water reducing agent conforming to ASTM C494 may be used. The following are acceptable:
 - 1. Pozzolith - Master Builders Company
 - 2. Plastocrete - Sika Chemical Company
 - 3. WRDA - Grace Construction Materials
- B. Air Entrainment: All concrete shall entrain from two to four percent air, whether batched with or without other admixtures. One of the following, conforming to ASTM C260, may be used:
 - 1. MB-VR - Master Builders Company
 - 2. Sika-AER - Sika Chemical Company
 - 3. Darex AER - Grace Construction Materials

2.05 CURING MATERIALS:

- A. Chemical Curing: Liquid compound, membrane forming, shall conform to ASTM C309, as approved by the Engineer. The liquid compound shall not reduce the adhesion of tile, paint, roofing, waterproofing or other material to be applied to the concrete. No liquid compound shall be allowed to cure a first pour of concrete which will receive a second pour.
- B. Impervious Membrane Sheeting: Kraft paper of 4 mil polyethylene sheeting, in accordance with ASTM C171 may be used with approval of the Engineer.

2.06 CONCRETE MIX DESIGNS AND PROPORTIONS:

- A. Mix Design: Prepared according to ACI 211 and ACI 318, and submitted to the Engineer for review prior to batching any concrete, and based on previously tested and qualified component materials. Provide mix designs for all of the mixes. Pump mixes, when used, shall be approved in writing by the Engineer prior to use on the job.
- B. Admixtures: Enter specific brands into mix designs where they are required or used. All admixtures must be approved in writing by the Engineer prior to use.

- C. Mix: Concrete shall be composed of Portland Cement, coarse aggregate, fine aggregate, admixtures and water. Location or use of any of the following mixes will be shown on the drawings, or as stated herein.
- D. Specified Compressive Strength:
 - 1. Provide concrete of the compressive strengths as shown on the plans.
 - 2. Mix designs for the compressive strength specified shall have the minimum properties.

Specified 28-day Compressive Strength (f=c) (psi)	Maximum Water-Cement Ratio by Weight (lb/lb)	Minimum Cement Content (lbs/Cubic Yard)
5000	Determined by Mix Design, Not to Exceed 0.40	611
4000	0.45	564
3000	0.50	470
2000	0.65	376

- E. Slump Limits: Concrete, when placed at the forms, shall have a slump within the following limits as measured in accordance with ASTM C 143.
 - 1. Minimum slump of 1 inch.
 - 2. Tolerance of plus-or-minus 1 inch.
 - 3. Mass concrete: 2 inches.
 - 4. Reinforced concrete: 3 inches.

2.07 CEMENT GROUT AND DRYPACK:

- A. Cement Grout: Mix 1 volume Portland cement, 2-1/2 volumes fine aggregate and sufficient water for the mixture to flow under its own weight.
- B. Drypack: Mix 1 volume Portland cement, 2 volumes fine aggregate and enough water to hydrate cement (a stiff mix). Do not mix more than can be used in 30 minutes.

2.08 BRICK:

Clay brick shall be hardburned clay conforming to ASTM Designation: C32, Grade MA and concrete brick shall conform to ASTM Designation: C55, Grade A brick.

2.09 CONCRETE MASONRY UNITS:

Concrete masonry units shall conform to ASTM C139.

2.10 MOTAR:

Mortar, unless otherwise noted, shall consist of one (1) part Portland Cement (ASTM Designation: C150, Type I) and two (2) parts sand, as required.

PART 3 EXECUTION

3.01 BATCHING, MIXING AND PLACING CONCRETE:

- A. Use Ready-Mixed Concrete: Conform to ASTM C94. Plant and truck mixers subject to examination by Engineer.
- B. Water and Mixing: Mix concrete at least 10 minutes after last addition of water, 5 minutes of which is at the job. Retempering in truck is prohibited. Any concrete in truck longer than 1-1/2 hours after the water has been added, or any that has become harsh or nonplastic, shall be rejected.
- C. Load Tickets: Shall include all information required by ASTM C94 and be legible, showing quantities of all constituents in the batch, and bearing signature of plant inspector or bonded weighmaster. Maintain all tickets on file for inspection by the Engineer.
- D. Slumps: At point of delivery to forms, the slumps shall conform to those specified in this section of the specifications.
- E. Placing: The concrete shall be placed by suitable equipment as nearly as possible in its final location and without any segregation of the aggregate. Any free vertical drop shall not exceed 4-1/2 feet. Prior to placing concrete the forms shall be clean and free of debris with all surfaces wetted lightly. Slabs shall be cast in a "checkerboard" pattern allowing two days between adjacent casts. Before depositing new concrete on or against concrete which has set, the existing surfaces shall be cleaned of all laitance, foreign matter and loose particles and slushed with a neat cement grout. No concrete shall be placed without prior approval of the forms and reinforcing by the Engineer.
- F. Vibration: All concrete shall be placed with the aid of mechanical vibrating equipment supplemented by hand forking or spading. Vibration shall be transmitted directly to the concrete and not through the forms.

3.02 CURING:

The concrete shall be kept moist for seven days after pouring. Vertical forms may be left in place and horizontal surfaces moistened with water. If forms are removed, impervious membrane sheeting or chemical curing may be used.

3.03 CLEANUP:

In accordance with Section 01019 GENERAL REQUIREMENTS.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 DESCRIPTION:

Supply and install formwork for cast-in-place concrete as shown on the drawings and as specified.

1.02 APPLICABLE CODES, STANDARD AND SPECIFICATIONS:

The installation of forms shall be in accordance with the following codes and standards:

- A. American Concrete Institute (ACI)
- B. American Plywood Association (APA)

PART 2 PRODUCTS

2.01 WOOD FORMS:

All form lumber shall be free from warp, loose knots, dressed to uniform width and thickness. All forming shall conform to ACI 347.

- A. Unexposed Concrete Surfaces: No. 2 common lumber or better lumber.
- B. Exposed Concrete Surfaces: Commercial standard, moisture resistant, concrete form plywood.

2.02 METAL FORMS:

Use approved removable type metal forms. Recondition and clean before reusing. Do not oil or apply material which will stain exposed concrete or prevent bonding of stucco to concrete. Forms shall be smooth on interior so that no line shows on finished concrete.

2.03 FORM OIL:

Clear non-staining mineral paraffin based oil.

2.04 FORM TIES AND SPREADERS:

- A. Shall be metal, cone nut type. No embedded wood spreaders shall be permitted.
- B. Metal tie system shall be equal to the Penta-Tie System as manufactured by the Burke Co.
 - 1. Plastic cone shall not exceed one inch diameter at the form and shall taper over a maximum length of one inch.
 - 2. Metal ties shall break off within the concrete section and not within the cone formed void.

2.05 SHORING:

Shall be vertical support members designed to carry the weight of formwork and concrete; also the weight of any construction work above.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS:

- A. Provide complete forms of such strength and construction as to prevent any spread, shifting or settling when concrete is deposited, and tight enough to avoid any leakage or washing out of cement mortar.
- B. Design forms and false work supports so that they shall have sufficient rigidity to resist deflection more than 1/8-inch between supports after concrete has been placed and to assure a smooth and even appearance of surfaces.

Formwork for concrete containing a superplasticizer admixture shall be designed by a registered structural engineer and shall be reinforced to support the additional pressures exerted due to the admixture.
- C. Use bolts, rods and other approved devices for internal ties and spreaders; of such construction that when forms are removed, no metal is within one inch of an exterior nor within one-half inch of an interior concrete surface.
- D. Take special care that forms are true to required lines, grades and surfaces so as to give a uniform, neat and workmanlike finish to all concrete surfaces.
- E. Remove all dirt, chips, sawdust, rubbish, water and other foreign substances from forms by water hosing and air pressure before any concrete is deposited. Leave no wooden ties or blocking in concrete except where shown on the drawings for attachment to other work. Leave openings for the introduction of vibrators wherever necessary. Where required on account of excessive concrete drop, provide access in forms for placing of concrete to be approved by the Engineer.
- F. When removing forms, all bolts, anchoring wires and other fasteners shall be either removed, cut off to lengths as directed by the Engineer, or left in place for anchorage of other work.
- G. Forms shall be in good condition and thoroughly cleaned before being reused.

3.02 COORDINATION:

- A. Secure all pipe sleeves, anchors and bolts in position before concrete is placed.
- B. Obtain information and instructions from other trades and suppliers in ample time to schedule and coordinate the installation of items furnished by them to be embedded in concrete so provisions for their work can be made without delaying the project.

3.03 SURFACE TREATMENT:

Plywood panels shall have a smooth surface treatment to prevent any development of bond or adhesion of concrete and to seal plywood surfaces against moisture. Forms, except those lined with absorptive form lining, shall be clean coated with a nonstaining mineral oil applied shortly before placing the concrete. In lieu of oiling, forms of unexposed surfaces may be thoroughly wetted immediately before placing the concrete.

3.04 FORM REMOVAL:

- A. Determination of form removal timing is the Contractor's responsibility and shall be in accordance with ACI 347.

- B. Do not remove forms, shores and bracing until concrete has gained sufficient strength to carry its own weight, and construction and design loads which are liable to be imposed upon it. Verify strength of concrete by compressive test results.
- C. Remove formwork progressively and in accordance with code requirements and so that no shock loads or unbalanced loads are imposed on the structure.
- D. Reshore structural members where required due to design requirements of construction conditions and as required to permit progressive construction.

END OF SECTION