

# TECHNICAL SPECIFICATIONS



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## INFILTRATION AND INFLOW REMOVAL PHASE 2A LATERAL REPAIRS – PVC LATERAL REPLACEMENT

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**City of Hallandale Beach Bid No. 21-00x**

### CONTRACT DOCUMENTS

**Prepared by:**

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**June, 2021**

**Document 00002**

**PROJECT DATA**

Project Title: City of Hallandale Beach Infiltration and  
Inflow Removal Phase 2A Lateral Repairs  
PVC Lateral Replacement

Project Number: City Bid No. 21-00x

Project Address: Throughout the City of Hallandale Beach

Project Owner: City of Hallandale Beach, Florida  
100 West Hallandale Beach Boulevard  
Hallandale Beach, Florida 33004

Owner's Representative: Jeff Odoms  
Public Works Director  
City of Hallandale Beach  
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Hallandale Beach, Florida 33009  
Phone: 954-457-1611  
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**END OF PROJECT DATA**

**Document 00004**

**LIST OF DRAWINGS**

<b>SHEET NO.</b>	<b>TITLE</b>
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none	
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**END OF LIST OF DRAWINGS**

BID SHEET

Item	Original Quantity	Unit	Unit Cost	Original Total cost
Schedule 40 PVC Replacement Lateral including connections to existing pipe	5,000	LF	_____	_____
Sod	1,000	SY	_____	_____
Limerock	200	Tons	_____	_____
Asphalt	1,500	SY	_____	_____
Residential Traffic Control (MOT)	3	Per Day	_____	_____
Furnish and Install Cleanout	150	EA	_____	_____
Contingency	1	LS	\$10,000.00	\$10,000.00
TOTAL BID AMOUNT				<input type="text"/>

## SCOPE OF SERVICES

The CITY has previously conducted inflow and infiltration analysis and has spent over \$1 million lining mainline pipes. The quantities in the bid sheet are an estimate of the number of lateral repairs that require PVC replacement for the project. There are 219 laterals that were identified as leaking.

This is a unit price contract so repairs will be based on the unit prices. CONTRACTOR will endeavor to minimize the costs to the CITY, while ensuring that the appropriate repairs are made. CITY will estimate the savings resulting from this Contract as a result of the reduction of the flow.

The purpose of this contract is to accomplish the following:

Where the lateral is short (under 10 ft) and shallow (under 3 ft), replace with Schedule 80 PVC to cleanout (add cleanout if not present).

Where the lateral is Orangeburg, replace with Schedule 80 PVC.

Notable:

1. The decision on which laterals will require replacement will be made by the ENGINEER based on a report generated from the televising of the lines.
2. If the problem is on the customer side of the property line, the customer will be notified, and no further work will be undertaken.
3. The Contractor shall furnish and install cleanouts as needed; the Contractor shall submit a recommendation in the form of a report to the ENGINEER. The City will determine the best course of action to complete the recommended work.
4. All Manholes (MHs) have GPS and inspection info that will be provided to the contractor via dropbox after award. The winning bidder will be provided access to a dropbox of all mainline inspections and manhole inspection.
5. The main lines have recently been lined and inspected so roots should not be an issue. If the laterals need to be repaired and protrudes (rare), this will need to be included in the cost of the lateral repair.
6. Alterations of the specification to qualify other bidders exclusively will not be considered
7. Decision on the fix to each lateral will be made the ENGINEER
8. CONTRACTOR MUST call 811 to locate all utilities including water service lines before digging. CONTRACTOR will coordinate with CITY and Customer during period when lateral may be disconnected.

## SECTION 01000 - CONTRACTOR SPECIAL CONDITIONS

### 1. DEMONSTRATING WORK EXPERTISE

CONTRACTOR shall demonstrate competence to perform the work. CONTRACTOR, as the bidder, shall at minimum, provide the following:

- List of public utility clients in Florida (a minimum of five; the minimum value of work with one utility of \$200,000 or greater for lateral replacements, is required). The list shall include a minimum of five clients noting the work completed (which must be primarily laterals replacement and installation of cleanout plugs with the specified products).
- Where similar projects have been completed, including name, address, phone number and position of utility contact.
- Five years of experience dealing with the specified products and examples of completed work.
- Repairing at least 1,000 service laterals in place.

### 2. INVESTIGATION AND UTILITIES.

2.1. CONTRACTOR shall have the sole responsibility of satisfying itself concerning the nature and location of the Work and the general and local conditions, and particularly, but without limitation, with respect to the following: those affecting transportation, access, disposal, handling and storage of materials; availability and quality of labor; water and electric power; availability and condition of roads; work area; living facilities; climatic conditions and seasons; physical conditions at the work-site and the project area as a whole; topography and ground surface conditions; nature and quantity of the surface materials to be encountered; subsurface conditions; equipment and facilities needed preliminary to and during performance of the Work; and all other costs associated with such performance. The failure of CONTRACTOR to acquaint itself with any applicable conditions shall not relieve CONTRACTOR from any of its responsibilities to perform under the Contract Documents, nor shall it be considered the basis for any claim for additional time or compensation.

2.2. CONTRACTOR shall locate all existing roadways, railways, drainage facilities and utility services above, upon, or under the Project site, said roadways, railways, drainage facilities and utilities being referred to in this Sub-Section 2.2 as the "Utilities". CONTRACTOR shall contact the owners of all Utilities to determine the necessity for relocating or temporarily interrupting any Utilities during the construction of the Project. CONTRACTOR shall schedule and coordinate its Work around any such relocation or temporary service interruption. CONTRACTOR shall be responsible for properly shoring, supporting and protecting all Utilities at all times during the course of the Work.

### 3. BID QUANTITIES

Quantities given in the Bid Schedule, while estimated from the best information available, are approximate only. Payment for unit price items shall be based on the actual number of units

installed for the Work. Bids shall be compared on the basis of number of units stated in the Bid Schedule as set forth in the Bidding Documents. Said unit prices shall be multiplied by the bid quantities for the total Bid price. Any Bid not conforming to this requirement may be rejected. Special attention to all Bidders is called to this provision, for should conditions make it necessary or prudent to revise the unit quantities, the unit prices will be fixed for such increased or decreased quantities. Compensation for such additive or subtractive changes in the quantities shall be limited to the unit prices in the Bid.

#### 4. PROGRESS PAYMENTS.

4.1. Prior to submitting its first monthly Application for Payment, CONTRACTOR shall submit to CITY, for their review and approval, a schedule of values based upon the Contract Price, listing the major elements of the Work and the dollar value for each element. After its approval by the CITY AND ENGINEER, this schedule of values shall be used as the basis for the CONTRACTOR's monthly Applications for Payment. This schedule shall be updated and submitted each month to the ENGINEER along with a completed and notarized copy of the Application for Payment.

4.2. Prior to submitting its first monthly Application for Payment, CONTRACTOR shall submit to CITY AND ENGINEER a complete list of all its proposed SUBCONTRACTORS and materialmen, showing the work and materials involved and the dollar amount of each proposed subcontract and purchase order. The first Application for Payment shall be submitted no earlier than thirty (30) days after the Commencement Date.

4.3. If payment is requested on the basis of materials and equipment not incorporated into the Project, but delivered and suitably stored at the site or at another location agreed to by the CITY in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that the CITY has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances, together with evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect CITY's interest therein, all of which shall be subject to the CITY's satisfaction.

#### 5. DAILY REPORTS, AS-BUILTS AND MEETINGS.

5.1. Unless waived in writing by CITY, CONTRACTOR shall complete and submit to ENGINEER on a monthly basis a daily log of the CONTRACTOR's work for the preceding week in a format approved by the ENGINEER and CITY. The daily log shall document all activities of CONTRACTOR at the Project site including, but not limited to, the following:

5.1.1. Weather conditions showing the high and low temperatures during work hours, the amount of precipitation received on the Project site, and any other weather conditions which adversely affect the work.

5.1.2. Soil conditions which adversely affect the work.

5.1.3. The hours of operation by CONTRACTOR's and SUBCONTRACTOR's personnel.

5.1.4. The number of CONTRACTOR's and SUBCONTRACTOR's personnel present and working at the Project site, by subcontract and trade.

5.1.5. All equipment presents at the Project site, description of equipment uses and designation of time equipment was used (specifically indicating any down time);

5.1.6. Description of Work being performed at the Project site.

5.1.7. Any unusual or special occurrences at the Project site.

5.1.8. Materials received at the Project site.

5.1.9. A list of all visitors to the Project site; and

5.1.10. Any problems that might impact either the cost or quality of the Work or the time of performance.

The daily log shall not constitute nor take the place of any notice required to be given by CONTRACTOR to CITY or ENGINEER pursuant to the Contract Documents.

5.2 CONTRACTOR shall provide as-built drawings for actual piping that has been replaced. Contractor shall provide the final as-built drawings in an agreed upon format to the ENGINEER, which will provide the CITY the ability to compare its current map(s) versus map(s) generated from the project's completion.



## SECTION 01025 - MEASUREMENT AND PAYMENT

### 1. MEASUREMENT

1.1 The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the CITY unless otherwise specified. The CITY or ENGINEER will witness all field measurements.

1.2 When depth of cuts are indicated in the bid items, they shall be measured vertically from the existing grade at excavation point, paved or unpaved, to the finished pipe invert.

1.3 The quantities stated in the Bid Proposal are approximate only and are intended to serve as a basis for the comparison of bids and to fix the approximate amount of the cost of the Project. The CITY does not expressly or impliedly agree that the actual amount of the work to be done in the performance of the contract will correspond with the quantities in the Bid Proposal; the amount of work to be done may be more or less than the said quantities and may be increased or decreased by the CITY as circumstances may require. The increase or decrease of any quantity shall not be regarded as grounds for an increase in the unit price or in the time allowed for the completion of the work, except as provided in the Contract Documents.

### 2 PAYMENT ITEMS

#### 2.1 Various Items

2.1.1 Items with Bid form units of "EA" will be measured and paid at the unit price per each as delineated by the pipe size named in the Bid Form. Each unit price bid shall include, but not be limited to, all necessary or required labor, equipment, tools, and materials for traffic control, lateral pipe cleaning and preparation of the existing lateral, including blocking or plugging incoming lines; removal, transportation and disposal of material generated by cleaning and preparation; television surveys; lateral liner; testing; cleanup; documentation and reporting; and all labor, materials and equipment required to provide a complete and acceptable liner installation.

2.1.2 Items with Bid form units of "LF" will be measured and paid for at the unit price per foot. This item will be full compensation for all additional costs associated with the work. Each linear foot price bid shall include, but not be limited to, all necessary or required labor, equipment, tools, and materials for traffic control, added sewer pipe cleaning and preparation of the existing sewer, including blocking or plugging incoming lines; removal, transportation and disposal of material generated by cleaning and preparation; television surveys; pipe liner; cleaning; testing; cleanup; documentation and reporting; and all labor, materials and equipment required to provide a complete and acceptable liner installation.

Reconnection of service laterals to pipe is assumed as a part of the pay item for lateral replacement.

## PART (1) - TECHNICAL SPECIFICATIONS - EXCAVATION AND PIPE LAYING

### 1. Terminology

Figure I-1 shows a trench cross-section which identifies the meaning and limits of terminology used in this specification for the terms foundation, bedding, haunching, initial backfill, pipe embedment and pipe zone and is not intended to specify the shape of the trench.

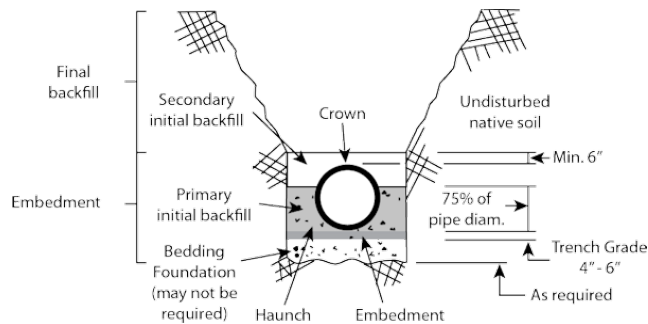


Figure I-1

### 2. Responsibility for Materials

#### 2.1 Pipe Storage and Handling

2.1.1 The interior of all pipe, fittings and other accessories shall be kept free from dirt and foreign matter at all time

Satisfactory protection from damage shall be provided.

2.1.2 All pipe, fittings and accessories shall be loaded and unloaded in such manner as to avoid shock or damage. Under no circumstances shall such material be dropped. Pipe shall not be skidded or rolled against pipe already on the ground.

### 3. Clearing and Grubbing

#### 3.1 Clearing and Disposition of Materials

3.1.1 Where clearing and grubbing are necessary, the CONTRACTOR shall clear and grub the entire width of the right-of-way or easement except as may be noted in the Contract Documents or designated by the CITY.

3.1.2 CONTRACTOR shall remove and replace in kind, all vegetation unless otherwise directed by the ENGINEER.

### 4. Excavation

#### 4.1 Excavation - General

4.1.1 The excavation for all work included in this project is included in the cost per unit of work installed, unless otherwise stated herein, and the unit price for work includes all excavation and

grading in whatever nature of material may be encountered. No additional allowance to the unit price bid by the CONTRACTOR for the project or any part thereof will be allowed on any claim for extra compensation because of excavation and/or grading being of a nature different from that contemplated by CONTRACTOR. The CONTRACTOR is charged with the responsibility of actually investigating and examining the site of the project before preparing his Bid and satisfying him/herself in this respect.

#### 4.2 Pavement Cutting

4.2.1 Prior to trenching, pavement shall be cut or scored to straight edges, six inches (6") outside each edge of the proposed trench to avoid unnecessary damage to the remainder of the pavement. Edges of the existing pavement shall be recut and trimmed to square, straight edges after the pipe system has been installed and prior to placement of the new base and pavement.

#### 4.3 Excavation and Preparation of Trench

4.3.1 The trench shall be dug so that the pipe can be laid to the alignment and depth required. The trench shall be braced and drained in such a manner that the work may be performed in a safe and efficient manner. The pipe trench shall be dry prior to placement of bedding stone.

4.3.2 The trench width shall be ample to permit the pipe to be laid and jointed properly. The minimum width of the trench shall be at least two (2) feet for lateral replacement.

#### 4.4 Trench Bottom

4.4.1 The soil surface at the trench bottom shall be free of any protrusions which may cause point loading on any portion of the pipe or bell, and shall provide a firm, stable and uniform support for the pipe.

4.4.2 Over-Excavation: During the course of construction, should the CONTRACTOR inadvertently over-excavate the trench more than six inches (6") (150 mm) below the bottom of the pipe, but less than twelve inches (12") (300 mm) below the bottom of the pipe, the CONTRACTOR shall fill that area of over-excavation with acceptable USCS Class I, II or III (see Exhibit I, Part (4) Section 4 for definitions) embedment material and compact to a density approximately equal to the native soil. The CONTRACTOR shall fill any area of over-excavation more than twelve inches (12") (300 mm) below the bottom of the pipe with USCS Class I material in the same manner as required for foundation bedding but shall do so at his expense.

4.4.3 Ledge rock, hard pan, cobbles, boulders or stones larger than one and one-half inches (1½") (40 mm) shall be removed from the trench bottom to permit a minimum bedding thickness of six inches (6") (150 mm) under pipe.

4.4.4 Foundation Bedding: Class I bedding, to a depth specified by the engineer, shall be required as a foundation in wet, yielding or mucky locations. Foundation bedding shall be constructed by removal of the wet, yielding or mucky material and replaced with sufficient Class I material to correct the instability. Foundation bedding, if necessary, will be paid for per ton of material used except cases where the instability is caused by negligence of the CONTRACTOR.

4.4.5 In stable trenches, trench bottom may be either native undisturbed soils of USCS Class II, III, or IV, or thoroughly compacted USCS Class I, II, or III material from three inches (3") to six

inches (6") depth to provide a stable, continuous support for the pipe system. In USCS Class V soil areas, foundation bedding is required. All foundation bedding shall be USCS Class I material. In no case shall pipe be bedded on solid rock.

## 5. Pipe Handling

### 5.1 Placing Pipe Material into Trench

5.1.1 Proper implements, tools and facilities satisfactory to the ENGINEER shall be provided and used for the safe and convenient prosecution of the work. All pipes, fittings, valves and hydrants shall be carefully lowered into the trench piece-by-piece by means of a derrick, ropes or other suitable tools or equipment, in such a manner as to prevent damage to materials and protective coatings and linings. Under no circumstances shall pipe or other pipe materials or appurtenances be dropped or dumped into the trench.

5.1.2 Before each length of pipe is lowered into the trench, it shall be thoroughly inspected for structural soundness and cleanliness. Each length of pipe shall be lowered separately.

5.1.3 No length of pipe which is known to be defective shall be laid or placed in the trench. Defective pipe or fittings shall be conspicuously tagged, removed and replaced with satisfactory pipe or fittings without additional charge. Discolored (white) PVC shall be rejected immediately and removed from the project site.

## 6. Laying and Joining Pipe and Fittings

### 6.1 General Procedure

6.1.1 Before being set in place, each component of piping shall be inspected for damage and cleaned. Damaged components shall be rejected. Pipe bells shall be laid on the upstream end.

6.1.2 Sewer laying shall commence at the lowest elevation and shall terminate only at manholes on a gravity system, or service branches or clean outs on sewer services. Trenches shall be dewatered, as necessary. Whenever pipe laying is interrupted, including lunch time, the end of the pipe shall be temporarily plugged to prevent the entrance of water, mud, animals or other foreign matter, and the pipe shall be secured to prevent its being dislodged.

### 6.2 Location and Alignment

6.2.1 Pipe and fittings shall be embedded in the trench with the bell end dug by hand and the invert conforming to the required elevations, slopes and alignment, and with the pipe bottom uniformly and continuously supported by a firm bedding and foundation.

### 6.3 Joining Pipe and Fittings

6.3.1 All joints shall be assembled in accordance with recommendations of the pipe manufacturer.

## 7. Haunching

7.1 Haunching of pipe from the invert to the spring line shall be by hand placement of USCS Class I, II, or III material to ensure that the material is worked under the haunch. Where bedding was

constructed of USCS Class I material, the same shall be used for haunching. All material shall be properly compacted.

## 8. Initial Backfill

8.1 Initial backfill shall extend from the spring line to one foot (1') above the top of the pipe. Placement of initial backfill may be either by hand or mechanical means. Material for initial backfill may be USCS Class I, II, or III only.

8.1.1 CONTRACTOR shall keep the initial backfill free from rocks and clods which could damage the pipe while the filling operation is being undertaken. The purpose of extending the initial backfill to levels over the top of the pipe shall be to protect the pipe from impact damage resulting from any large objects in the final backfill. Machine compaction of initial backfill directly over the pipe is not desirable unless adequate cover has been provided to protect the pipe. Adequate cover will depend on the type of compaction equipment and shall be as specified by the ENGINEER.

## 9. Final Backfill

### 9.1 Backfill Material

9.1.1 All backfill material shall be USCS Class I, II, III or acceptable dry, native Class IV materials, and shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks, or stones, or other deleterious material which in the opinion of the ENGINEER is unsuitable.

9.1.2 Use of Excavated Material as Backfill: When the type of backfill material is not specified on the drawing, the excavated material may be used provided it consists of loam, clay, sand, or gravel which, in the opinion of the ENGINEER, is satisfactory for backfill.

### 9.2 Backfill Placement

9.2.1 Backfilling from the embedment zone to surface grade may be by hand or mechanical placement. In areas subject to traffic, compaction of backfill in eight-inch (8") lifts shall be used to achieve ninety eight percent (98%) of Modified proctor density. Whenever trenches are in or across driveways, paved areas or streets, the CONTRACTOR shall be responsible for any settlement which occurs within one (1) year of preliminary acceptance. In areas of open terrain, backfill shall be made in twelve-inch (12") lifts and heaped sufficiently to be level after natural compaction.

## 10. Dewatering

10.1 All piping shall be laid in a dry trench excavation, unless otherwise approved by ENGINEER. Dewatering system shall be utilized in accordance with good standard practice and must be efficient enough to lower the ground water level in advance of the excavation and maintain it continuously to keep the trench bottom and sides firm and dry. If a sewer system is under construction, it shall not be used as a conduit to remove ground water from the pipe trench. The CONTRACTOR shall have on the job, or available for immediate use at all times, dewatering equipment adequate to handle the job for which it is intended.

10.2 Water pumped or drained from the work shall be handled in accordance with current South Florida Water Management District and Broward County rules, regulations, and procedures, in a suitable manner without damage to adjacent property, to work under construction or to street pavement, parks or private property. Water shall not be discharged onto streets without adequate protection of the surface at the point of discharge. No water shall be discharged into a wastewater system. No water containing settleable solids shall be discharged into storm sewers.

10.3 Any and all damage caused by dewatering shall be promptly repaired by the CONTRACTOR at his expense. All permits required for dewatering operations shall be obtained by the CONTRACTOR and a copy filed with the CITY and ENGINEER.

## EXHIBIT I

### PART (2) - TECHNICAL SPECIFICATIONS - MATERIALS

#### 1. PIPE MATERIALS

1.1 All pipe shall be Schedule 40 PVC and shall match the diameter of the laterals being replaced

1.2 Connection materials shall be Schedule 40 glued connections. In certain cases, Fernco coupling may be used as deemed appropriate by the ENGINEER.

PART (3) - TECHNICAL SPECIFICATIONS- GENERAL MATERIAL SPECIFICATIONS FOR INSTALLATION OF PIPELINES

1. Concrete and Cement

1.1Cement

1.1.1 Portland Cement shall be of a standard brand and shall conform to the requirements of ASTM C150-latest edition, except as hereinafter stated. One bag of cement shall be considered as weighing ninety-four (94) pounds. Type I shall be used unless higher cement is specified, in which event Type III shall be used. For Type I, the maximum amount of tricalcium silicate shall be sixty (60) percent. Cement may be shipped either in paper or cloth sacks and the package shall have the brand and name of manufacturer plainly marked on the outside. All cement shall be stored in weather-proof

buildings in such a manner as will prevent absorption of moisture by the lower layers. Shipment shall be segregated by lot for identification. Type I cement which has been in storage more than ninety (90) days shall be re-tested before use. Where carload shipments are used, a certificate from an approved testing laboratory shall be submitted prior to use of such cement on the job.

1.2Fine Aggregate

1.2.1 Composition :Fine aggregate shall consist of natural sand and shall be graded from coarse to fine within the following limits shown on Table I4.1.Sand failing to meet the minimum requirement for material passing the Number 50 and/or Number 100 Sieve may be used, provided other satisfactory inorganic

fine materials are added. If two sands are used, each must be mixed after separate weighing in proportions as set by CITY or ENGINEER.

TABLE I4.1

U.S. Standard Square Opening Sieve	Percent of Total by Weight Passing Min.Max.	
No. 4	97	100
No. 8	80	100
No. 30	25	75
No. 50	10	30
No. 100	2	10
No. 200 (By Washing)	0	4

1.2.2 Stockpiling: Fine aggregate shall be stored on a well-drained site which has been cleared, grubbed and cleaned. Stockpiles shall be built up to prevent segregation of large and small particles.

1.2.3 Unsuitable Materials in Fine Aggregate: Not more than one percent (1%) by weight of clay lumps or soft, disintegrated or coated grains shall be present in the fine aggregate. It shall also be free from foreign material such as dirt, wood, paper, burlap, or other unsuitable material. When tested in accordance with AASHTO T-21-27, it shall show a color not darker than standard .When tested for mortar strength in accordance with AASHTO T-71-38, the fine aggregate shall have a



tensile strength at three (3) days (Type III), or at seven (7) days, (Type I); not less than 95 percent of that developed by mortar having the same water-cement ratio and consistency, made of the same cement and graded Ottawa Sand having a fineness modulus of 2.40, plus or minus 0.05.

### 1.3 Coarse Aggregate

1.3.1 Composition: Coarse aggregate shall consist of crushed stone. It shall be washed to remove clay, loam and dust. At his discretion, the ENGINEER may waive the washing requirement for stone having a loss of not more than thirty per cent (30%) when tested in accordance with the provisions of AASHTO T-96-38.

1.3.2 Unsuitable Material in Coarse Aggregate: The coarse aggregate shall not contain more than the following percentages of deleterious material:

Soft Fibrous, Disintegrated Particles (Weight) 3.0%  
 Clay Lump (Weight) 0.2%  
 Finer Than No. 200 Sieve (Weight) 0.5%  
 Flat or Elongated Particles (Count) 10.0%

When subjected to AASHTO Test T-96-38, the aggregate shall have a loss not greater than sixty-five percent (65%). Aggregate shall be free from loam, wood, leaves, or other foreign material.

1.3.3 Gradation: For unreinforced foundations, for paving or for other unreinforced mass concrete, the gradation of coarse aggregate shall be as shown in Table I4.2. For reinforced footings, reinforced walls over 6" in thickness, ordinary floor slabs and similar structures, the gradation shall be as shown on Table I4.3. For handrails, reinforced walls, thin reinforced floor slabs electrical conduit encasement, and similar construction, the gradation shall be as shown on Table I4.4.

TABLE I4.2

Passing Square Opening Sieve	Percent by Weight
2« Inch	- 100
2 Inch	95 - 100
1 Inch	35 - 70
« Inch	10 - 30
No. 4	0 - 5

TABLE I4.3

Passing Square Opening Sieve	Percent by Weight
1« Inch	- 100
1 Inch	90 - 100
« Inch	25 - 60
No. 4	0 - 10
No. 8	0 - 5

TABLE I4.4

Passing Square Opening Sieve	Percent by Weight
1 Inch	- 100
3/4 Inch	90 - 100
3/8 Inch	20 -55
No. 4	0 -10
No. 8	0 - 5

1.3.4 Stockpiles: Stockpiles shall be constructed in layers not exceeding three feet (3') in height, and material shall be deposited in such manner as to prevent segregation of coarse and fine materials. Each type of aggregate shall be placed in a separate stockpile. Stockpile sites shall be cleared, grubbed and drained before using.

#### 1.4 Water

1.4.1 Water shall be clean and free from salt, oil or organic substances. Laboratory tests shall be made to determine suitability of any water for use in concrete unless same is secured from a public water supply.

#### 1.5 Concrete Classification

1.5.1 Concrete shall contain cement, coarse aggregate, and fine aggregate meeting the Specifications contained in previous paragraphs of this Part. Unless otherwise specified or shown in the plans, the design strength of the several elements included in the plans shall be:

a) Four thousand (4,000) pounds minimum compressive strength per square inch at twenty-eight (28) days for all piers, reinforced walls, floors, slabs, and other special sections where specifically shown on the plans or Standard Details.

b) Two thousand five hundred (2,500) pounds minimum compressive strength per square inch at twenty-eight (28) days for all blocking, reinforced footings, for retaining walls not subject to hydrostatic pressure, or where specifically shown on the plans or shown in the Standard Details.

#### 1.6 Concrete Proportioning

1.6.1 Concrete aggregate shall be proportioned by weight. When the sources of supply shall have been determined by the CONTRACTOR and approved by the ENGINEER, the mix shall be set by an approved testing laboratory. Mix shall be designed for a "slump" suitable for the character of structure in which

the concrete is to be incorporated. All concrete shall be as specified above in paragraph 1.5.1.

#### 1. Concrete Mixing

1.7.1 Concrete mixing shall be by means of a modern batch mixer equipped with an accurately operating water measuring device and an automatic time locking device.

1.7.2 Where a central batching plant is not operated, each mixer must have available an approved portable weighing device for use in proportioning. Each batch shall be mixed for one and one-half (1½) minutes after charging has been completed, and during such mixing period, that drum shall operate with a peripheral speed of not less than one-hundred and fifty-three (153), nor more than two-hundred and twenty-five (225) feet per minute. The number of revolutions per minute shall be between fourteen (14) and twenty (20). Retempering concrete or use of concrete in which initial set has taken place will not be allowed. Transit mixed concrete from an approved batching plant and suitable truck mixer may be approved by the ENGINEER.

## 1.8 Forms

1.8.1 Forms for concrete work may be of dressed lumber, plywood, metal or a combination thereof as may be approved by the ENGINEER. Where dressed lumber is used, the boards shall be surfaced both sides with tongue and groove edges, and for forms exceeding four feet (4') in height, the thickness of individual boards shall not be less than one and one-quarter (1¼) inches dressed. Forms shall be constructed mortar tight and with sufficient supports, walls and bracing to hold the concrete in line and shape without bulging.

1.8.2 Forms shall be held together by form ties so arranged as to permit the ends of the bolts to be removed to a depth of at least one and one-half (1½) inches beneath the surface of the concrete. The cavity, so formed, shall be filled as soon as possible with cement mortar proportioned so as to blend in with color and bond to the remaining portion of the wall. On thin walls not subject to hydrostatic pressure, wiring of forms will be permitted.

1.8.3 Forms for walls, basins, flumes or other exposed structures having straight outlines, shall be erected and set so as to be true in alignment and braced sufficiently to remain in that condition throughout pouring of concrete. Corners and edges shall finish true and plumb, and curved surfaces and edges shall finish true to radius. Concrete of the highest grade and form, only, will be acceptable.

1.8.4 Where forms are to be reused, they shall be cleaned thoroughly after dismantling, coated with form release agent and stored to prevent warping and twisting.

## 1.9 Reinforcing Steel

1.9.1 All steel for reinforcement bars shall be billet steel, open hearth of intermediate grade, having a tensile strength of not less than seventy thousand (70,000) pounds per square inch. For bars under three-fourths inch (¾") in diameter, the bend test requirements shall be that the bar shall be bent cold one hundred and eighty (180) degrees around a pin having a diameter three (3) times that of the bar under test, without evidence of breaking. For bars three-fourth inch (¾") in diameter and over, the bend test requirements shall be that the bar shall be bent cold ninety degrees (90°) around a pin having a diameter three (3) times the diameter of the bar under test without evidence of cracking.

1.9.2 Bars shall conform in every respect to ASTM Specification A615 latest revision, for billet steel reinforcements, intermediate grade.

1.9.3 Deformed bars must not be used. Bars deformed by cold twisting or bars from rerolled stock will not be acceptable, except by special permission of the ENGINEER. The CONTRACTOR's Bid shall be based on reinforcement steel as specified, not on steel from rerolled stock.

1.9.4 Reinforcement steel bars must be kept in racks off the ground and classified by numbers until used. Bars must be wire-brushed clean of mill scales, dirt, etc., before being placed in the forms.

1.9.5 The brand of manufacturer shall be legibly rolled on all bars, and when loaded for mill shipment, all bars shall be properly separated and tagged with manufacturer's test identification number.

1.9.7 All steel bars shall be epoxy coated unless otherwise noted.

2.0 Not used

3.0 Embedment Materials

3.1 Classification

3.1.1 Embedment materials listed here include a number of processed materials plus the soil types defined according to the Unified Soil Classification System (USCS) in ASTM D2487. These materials are grouped into five (5) broad categories according to their suitability for this application.

3.1.2 Class I: Angular, one-quarter inch (¼") to one and one-half inch (1½") (6 to 40 mm) graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed shells and crushed stone. (Note: The size range and resulting high void ratio of Class I material makes it suitable for use to dewater trenches during pipe installation. This permeable characteristic dictate that its use be limited to locations where pipe support will not be lost by migration of fine-grained natural material from the trench walls and bottom or migration of other embedment materials into the Class I material. When such migration is possible, the material's minimum size range should be reduced to finer than one-quarter inch (¼") (6 mm) and the gradation properly designed to limit the size of the voids. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration to fines.)

3.1.3 Class II: Coarse sands and gravels with maximum particle size of one and one-half inches (1½") (40 mm), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil Types GW, GP, SW and SP are included in this class. (Note: Sands and gravels which are clean or borderline between clean and with fines should be included. Coarse-grained soils with less than twelve percent (12%), but more than five percent (5%) fines are neglected in ASTM D2487 and the USCS but should be included. The gradation of Class II material influences its density and pipe support strength when loosely placed. The gradation of Class II material may be critical to the pipe support and stability of the foundation and embedment, if the material is imported and is not native to the trench excavation. A gradation other than well graded, such as uniformly graded or gap graded, may permit loss of support by migration into void spaces of a finer grained natural material from the trench wall and bottom. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration of fines.)

3.1.4 Class III: Fine sand and clayey (clay filled) gravels, including fine sands, sand-clay mixtures and gravel-clay mixtures. Soil Types GM, GC, SM and SC are included in this class.

3.1.5 Class IV: Silt, silty clays and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. Soil Types MH, ML, CH and CL are included in this class. (Note: Caution shall be used in the design and selection of the degree and method of compaction for Class IV soils because of the difficulty in properly controlling the moisture content under field conditions. Some Class IV soils with medium to high plasticity and with liquid limits greater than fifty percent (50%) (CH, MH, CH-MH) exhibit reduced strength when wet and should only be used for bedding, haunching and initial backfill in arid locations where the pipe embedment will not be saturated by groundwater, rainfall or exfiltration from the pipe. Class IV soils with low to medium plasticity and with liquid limits lower than fifty percent (50%) (CL, ML, CL-ML) also require careful consideration in design and installation to control moisture content, but need not be restricted in use to arid locations.)

3.1.6 Class V: This class includes the organic soils OL, OH and PT as well as soils containing frozen earth, debris, rocks larger than one and one-half inches (1½") (40 mm) in diameter and other foreign materials. **These materials shall not be used for bedding, haunching or initial backfill.**

#### 4. Roadway Materials

##### 4.1 Limerock for Roadway Base

4.1.1 The limerock base course material shall conform to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, Section 911, Miami Oolitic Formation.

##### 4.2 Prime Coat

4.2.1 The material used for prime coat shall be cut-back asphalt, meeting the requirements of Section 300 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, and all supplements thereto. The cover material for the prime coat shall be either sand (either bare or hot-asphalt coated) or screenings at the CONTRACTOR's option. The sand shall be non-plastic and free from any appreciable amount of silt, clay balls and root articles and from any noticeable sticks, trash, vegetation or other organic matter.

##### 4.3 Tack Coat

4.3.1 The tack coat shall be Emulsified Asphalt, meeting the requirements of Section 300 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, and all supplements thereto.

##### 4.4 Asphaltic Concrete Type S-I or Type II

4.4.1 Except when otherwise directed by the Transportation Services Division hot bituminous mixtures shall conform with Sections 330, 331, or 332 for Type S-1 or Type II Asphaltic Concrete Surface Course of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition. The CONTRACTOR shall furnish sufficient proof that the named source of material supply to be used meets Florida Department of Transportation Road

Specifications. The ENGINEER may require additional tests from time to time and the CONTRACTOR shall furnish all material necessary for said tests.

## PART (4) - TECHNICAL SPECIFICATIONS - RESTORATION

### 1. Excess Material

All excavated material in excess of the quantity required for backfill in the Right-of-Way, shall be removed by CONTRACTOR at CONTRACTOR's cost to a site designated by the CITY. All unusable material shall be disposed of at the CONTRACTOR's expense unless otherwise noted in these Contract Documents.

### 2. Work in Right-of-Way

CONTRACTORS performing work within the public Right-of-Way shall be responsible to protect, during construction, all existing vegetation and facilities not authorized to be removed. CONTRACTOR shall be responsible for acquiring all state and local right-of-way permits. CONTRACTOR shall be responsible to restore all vegetation or facilities damaged during construction.

### 3. Tree Cutting

The indiscriminate cutting of trees or disfiguring of any feature of scenic value shall not be permitted. This includes methods such as the use of herbicides. The necessary trimming or cutting of trees by CONTRACTOR in the interest of public safety or continuity of facility service shall not be considered indiscriminate where such facilities cannot bypass the obstruction without violating the minimum clearance requirements.

### 4. Sidewalk/Driveway Replacement

#### 4.1 Materials

Sidewalk/driveway repairs shall be done using materials matching those disturbed during construction. Rock, asphalt, concrete, etc. shall be as specified in Exhibit I, Part (4) of the contract documents.

##### 4.1.1 Grassing

Grassing, mulching, and watering operations when required are to begin within three (3) weeks after completion of construction or as otherwise directed and shall be continually watered until growth is initiated or until sufficient local shower activity will ensure growth. All requirements regarding grassing, mulching and watering shall be in accordance with the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest revision or as otherwise stipulated. Any yards or parts or right-of-way in front of private property that contain a grass mat shall be resodded with similar type sod.

4.1.2 Concrete sidewalks/bikeways shall be a minimum of four inches (4") thick, except that alley intersections and driveways shall be six inches (6") thick. All concrete sidewalk/bikeway work shall be in conformance with Section 522 (Concrete Sidewalks), of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

4.1.3 Asphalt sidewalks/bikeways or access paths where authorized shall be constructed to specifications established by the Transportation Services Division, but shall be no less than six inches (6") of compacted limerock base over a stabilized subgrade, primed and surfaced with a minimum of one inch (1") of Type II asphaltic concrete.

#### 4.2 Public Safety (during construction, alteration or repair)

4.2.1 In areas of high vehicular traffic, the contractor shall provide a safe walkway around the work area.

4.2.2 Barricades or other barriers shall be used to prevent any possibility of injury to the public caused by the contractor's work.

4.2.3 Walk areas around the work areas shall be kept clean of sand, stones, and any other material that could cause a pedestrian accident.

4.2.4 Work areas left overnight shall be barricaded in accordance with an approved MOT

## 5. Pavement Cutting and Replacement

### 5.1 Road Pavement Cutting - Open Cuts

5.1.1 Unless otherwise noted on the drawings, and/or in accordance with the right-of-way permit, open cutting of existing pavement will generally not be allowed, but may be considered under one or more of the following conditions:

- a) Subsurface obstructions including rock.
- b) Extreme high-water table.
- c) Limited space for jack and bore pits.
- d) Condition of roadway surface - including imminent resurfacing and rebuilding, provided inspection and approval beforehand is made by the City.
- e) Extreme economic hardship is proven with adequate supportive data.

5.1.2 Where an open cut has been permitted, replacement of backfill, base and wearing surface shall be in accordance with the Standard Details (for both paved and unpaved roads) and/or special stipulations of the right-of-way permit.

5.1.3 Limerock from a Florida Department of Transportation approved pit shall be on the job site during open cutting. When the specified compacted limerock base is greater than six inches (6"), the base shall be constructed in two (2) or more lifts.

### 5.2 Temporary Restoration

5.2.1 If the restoration is incomplete at the end of the day, the trench shall be backfilled and made flush with existing pavement edges. Temporary asphaltic patches are permitted when restoration of the road is incomplete. When using a temporary patch, the cut shall be properly backfilled, with compaction meeting the density requirements specified, primed, then the cold or hot mix asphaltic patch applied. At such time when the conditions are corrected, the temporary cold or hot mix asphaltic patch used shall then be removed and the final asphaltic overlay shall be evenly applied, as required. The temporary patch may be utilized for a period from the commencement of the open cut, not to exceed ninety (90) days for each cut.

5.2.2 Upon backfill and completion of the base, if the hot mix asphalt is not immediately placed and when authorized, a temporary cold or hot mix asphaltic patch with a smooth all-weather surface may be utilized.



5.2.3 Before a lane is open to traffic, an asphaltic patch must be provided where applicable.

### 5.3 Conditions of Open Cuts

5.3.1 On dead-end streets, collector streets, and high traffic streets, trenching and pipe laying shall be performed in such a manner that at least one-way traffic is maintained at all times.

5.3.2 All trench lines across existing pavements, driveways, sidewalks, curbs, etc., shall be saw cut in straight parallel lines.

5.3.3 CONTRACTOR shall exercise care to minimize amount of pavement, sidewalk, driveways, and curbing to be removed. The final decision as to the amount of removal allowed shall rest with the ENGINEER.

5.3.4 Pavement shall not be left unrepaired overnight. If CONTRACTOR wishes to repave all damaged areas at one time, and such request is approved by ENGINEER, a cold patch mix shall be utilized immediately until final pavement restoration.

## 6.Paving

### 6.1 Limitation of Operations

6.1.1 Asphaltic Concrete shall be placed in accordance with FDOT SPEC Section 330.

6.1.2 Asphalt plant and placement operations shall not commence during periods of adverse weather. The mix shall be spread only on prepared, firm, and dry surfaces. Temperature shall be above forty degrees (40°)F and winds shall not be of velocity to cause blowing sand, dust, etc., to deposit upon the application surface.

6.1.3 Temperature - Temperature of the mixture at time of spreading shall be between 275° F and 350° F. All other mixture temperatures will be rejected.

6.1.4 Rain and Surface Conditions - Any mixture caught in transit by a sudden rain may be laid, but at the CONTRACTOR's risk. Should such mixture prove unsatisfactory, it shall be removed and replaced with satisfactory mixture at the CONTRACTOR's expense. In no case shall the mixture be laid while rain is falling or when there is water on the surface to be covered.

### 6.2 Preparation of Surfaces

6.2.1 Prior to the laying of the mixture the edges of the area to be patched shall be saw cut in smooth, straight lines.

6.2.2 The surface of the base or pavement to be covered shall be cleaned of all loose and/or organic material. Any irregular areas shall be properly beveled or smoothed out.

6.2.3 All structures which will be in contact with the asphalt mixture shall be painted with a uniform tack coat of asphalt cement to provide a closely bonded, watertight joint. Tack coat shall be emulsified asphalt, meeting the requirements of Section 300 of the FDOT Standard Specifications for Road & Bridge Construction, latest edition and all supplements thereto.

6.2.4 A tack coat shall be required on the following surfaces:

- a) Between successive surface courses.
- b) Between successive leveling courses.
- c) Between the leveling and surface courses; and
- d) On old pavements to be patched or leveled.

A tack coat on freshly primed surfaces or surface treatment will be required only when so directed by the ENGINEER.

### 6.3 Placing Asphalt

6.3.1 Asphalt patches shall be filled by hand or by mechanical means. In either case, rolling shall immediately follow. When using mechanical spreaders for overlays or strip patches, the following paragraphs (6.3.1.1 through 6.3.1.6) shall be adhered to.

6.3.1.1 All asphaltic concrete mixtures (including leveling courses), other than those adjacent to curb and gutter or other true edges, shall be laid with the use of string lines to assure an accurate, uniform alignment of the pavement edge.

6.3.1.2 Depth of each layer shall be checked at frequent intervals, not to exceed twenty-five feet (25'). Any deviation from the required thickness, in excess of the allowable tolerance, shall be immediately corrected.

6.3.1.3 No layer shall be greater than two inches (2") when compacted. Where a surface course is constructed to a thickness greater than two inches (2"), it shall be constructed in approximately equal layers, each not exceeding two inches (2").

6.3.1.4 Laying Width: Where necessitated by traffic conditions, mixture shall be laid in strips in such manner as to provide for the passage of traffic. Where the road is closed to traffic, mixture may be laid to the full width, by machines traveling in parallel.

6.3.1.5 Spreading Finishing: Upon arrival, mixture shall be dumped into the approved mechanical spreader and immediately spread and struck-off to the full width required and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, will be secured. An excess amount of mixture shall be carried ahead of the screed at all times. Hand raking shall be done behind the spreader as necessary.

6.3.1.6 Correcting Defects: Before any rolling is started, the surface shall be checked, any irregularities adjusted, and all drippings, fat sandy accumulations from the screed, and fat spots from any source shall be removed and replaced with satisfactory material. No skin patching shall be done.

When a depression is to be corrected while the mixture is hot, the surface shall be well scarified before the addition of fresh mixture.

### 6.4 Compaction

6.4.1 Compaction on small patches shall be accomplished through the use of five-ton rollers, first rolling the edges of the patch, then following with the center of the patch to prevent upheaval or separation at the joints. Do not over roll.

6.4.2 When compacting overlays or longitudinal patches, the following equipment and sequences shall be used for each spreader in operation. CONTRACTOR shall furnish a separate set of rollers with their operators. Rolling shall be done in the following sequence, with the equipment as noted, unless otherwise permitted by the ENGINEER.

6.4.2.1 Seal rolling, using tandem steel rollers weighing six and one half (6.5) to seventeen (17) tons, following as close behind the spreaders as is possible without pick-up, undue displacement or blistering of the material. On hot days, and where the asphalt material is too hot to roll without damage, some delay may be necessary.

6.4.2.2 Rolling with self-propelled pneumatic-tire rollers, following as close behind the seal rolling as the mix will permit. Roller shall cover every portion of the surface with at least five (5) passes.

6.4.2.3 Final rolling with the six and one half (6.5) to seventeen (17) ton tandem steel roller, to be done after the seal rolling and pneumatic-tire rolling have been completed, but before the pavement temperature has dropped below 140°F.

6.4.2.4 CONTRACTOR shall take note not to over roll pavement.

6.4.3 Compaction of Crossovers: When a separate paving machine is being used to pave pipe crossovers, compaction of the crossovers may be done by one eight (8) to ten (10) ton tandem steel roller. If crossover, intersections with acceleration and deceleration lanes are placed with the main run of paving, a traffic roller shall also be used in the compaction of these areas.

#### 6.4.4 Rolling Procedures

6.4.4.1 Rolling shall be longitudinal. Where the lane being placed is adjacent to a previously placed lane, center joint shall be pinched or rolled, prior to the rolling of the rest of the lane.

6.4.4.2 After the rolling or pinching of the center joint, rolling shall continue across the mat by overlapping each previous roller path by at least one-half the width of the roller wheel. The motion of the roller shall be slow enough to avoid displacement of the mixture, and any displacement shall be corrected at once by the use of rakes, and the addition of fresh mixture, if required. Final rolling shall be continued until all roller marks are eliminated.

6.4.5 Compaction of Areas Inaccessible to Rollers: Areas which are inaccessible to a roller (such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.) shall be compacted by the use of hand tamps or other approved satisfactory means.

#### 6.5 Protection of Finished Surface

6.5.1 Sections of newly compacted asphaltic concrete which are to be covered by additional courses shall be kept clean until the successive course is laid.

6.5.2 Upon completion of the finished pavement, no dumping of any material directly on the pavement will be permitted. When shoulders are constructed after completion of the final surface,

blade graders operating adjacent to the pavement during construction shall have a two inch (2") by eight inch

(8") (or larger) board (or other attachment providing essentially the same results) attached to their blades in such a manner that it extends below the blade edge, in order to protect the pavement surface from damage by the grader blade. Vehicular traffic shall not be permitted on any pavement which has not set sufficiently to prevent rutting or other distortion.

## 6.6 Density

Density Required for Asphaltic Concrete Pavement: After final compaction, the density shall be at least ninety-five percent of the laboratory compacted density of the paving mixture.

## 6.7 Defects

6.7.1 Rollers shall not be allowed to deposit gasoline, oil or grease onto the pavement, and any areas damaged by such deposits shall be removed and replaced as directed by ENGINEER.

6.7.2 All drippings, fat or lean areas, and defective construction of any description shall be removed and replaced.

6.7.3 While rolling is in progress, surface shall be tested continuously, and all discrepancies corrected to comply with the surface requirements.

6.7.4 Depressions which develop before completion of the rolling shall be remedied by loosening the mixture and adding new mixture to bring depressions to a true surface. Should depression remain after final compaction has been obtained, full depth of the mixture shall be removed and replaced with sufficient new mixture to form a true and even surface. All high spots, high joints and honeycomb shall be corrected as directed by the ENGINEER.

6.7.5 Any mixture remaining unbonded after rolling shall be removed and replaced. Any mixture which becomes loose or broken, mixed or coated with dirt or in any way defective, prior to laying the wearing course shall be removed and replaced with fresh mixture which shall be immediately compacted to conform with the surrounding area.

6.7.6 Areas of defective surface may be repaired by the use of indirect heat. No method of repair involving open-flame heaters shall be used.

6.7.7 Any repairs required in this section shall be made at CONTRACTOR's expense.

## 7. Drainage Culvert Replacement

Not used

## 8. Grassing

### 8.1 Sodding Swales

8.8.1 In all flow areas, sod shall be placed to the proper grade and cross-section to ensure the design flow of water in the ditch. In excavating for the placement of sod, a minimum three inch (3") undercut is to be provided.

## 9. Removal and Replacement of Existing Lawns and Shrubbery

### 9.1 Removal of Vegetation

9.1.1 Removal and/or replacement of existing lawns and shrubbery shall be accomplished in so far as practicable in accordance with the desires of the property owner, and in all cases shall be acceptable to the ENGINEER. Where possible, sod lawn areas shall be removed in one foot (1') square or rolled sections, carefully preserved, and replaced on a prepared top soil base after all other construction operations are completed. Sod shall be rolled and watered as necessary to establish growth. In areas where the turf is not adequately thick to be removed as sod, the entire area that is damaged shall be replaced with a six inch (6") layer of topsoil, fertilized, raked and seeded with the same grass as is predominant in the existing lawn. The finished surface must be smooth and uniform throughout.

### 10. Restoration of Surfaces and/or Structures

10.1 The CONTRACTOR shall restore and/or replace paving, curbing, sidewalks, gutters, shrubbery, fences, sod or other disturbed surfaces or structures to a condition equal to that which existed before the work began to the satisfaction of the ENGINEER. The CONTRACTOR shall furnish all labor, materials and incidentals.

### 11. Settlement of Trenches

11.1 Whenever water lines are in or cross driveways, paved areas or streets, the CONTRACTOR shall be responsible for any trench settlement which occurs within one year from the time of preliminary acceptance.

## SUPPLEMENTAL CONDITIONS

### 1.0 LAYOUT OF WORK

Not used

### 2.0 CARE OF EXISTING LANDSCAPING

The CONTRACTOR shall be fully responsible for maintaining, in good condition, all cultivated grass, trees and shrubs.

Where maintained grass, trees or shrubs must be removed or destroyed as a result of the construction, the CONTRACTOR shall replace or restore to the original condition all destroyed or damaged grass or landscaping after completion of the pipe installation. Tree limbs which interfere with equipment operation and are approved for pruning shall be neatly trimmed and the tree cut coated with a tree paint.

3.0 Not used

### 4.0 RECORD DRAWINGS

During the entire construction process the CONTRACTOR shall maintain records of all deviations from the contract drawings and specifications and shall then prepare "record drawings" showing accurately and correctly all work as it was actually constructed in red pencil.

### 5.0 SEQUENCE OF OPERATION

The CONTRACTOR shall not open work to conflict with work already in progress. The ENGINEER may; however, require the CONTRACTOR to finish a section on which work is in progress prior to starting another section.

### 6.0 DRAINAGE

The CONTRACTOR shall always conduct work such that adequate drainage is provided and shall not interfere with or block existing drainage facilities such as gutters, ditches, storm drains or other drainage appurtenances.

### 7.0 811 LOCATE

The CONTRACTOR shall contact 811 for locates prior to doing any work

### 8.0 TRAFFIC CONTROL STANDARDS

All design, application, installation, maintenance and removal of all traffic control devices and all warning devices and barriers which are necessary to protect the public and workmen from hazards within the project limits shall be as specified in the State of Florida, Manual of Traffic and Highway Construction, Maintenance and Utility Operations. The standards established in the afore mentioned Manual constitute the minimum requirements for normal conditions. Additional traffic control devices, warning devices, barriers, or other safety devices shall be required where unusual, complex or particularly hazardous conditions exist.

## 9.0 WATER MANAGEMENT/EROSION CONTROL

The CONTRACTOR shall exercise extreme care to minimize contamination of rainfall run-off from the site. All necessary provisions and care shall be taken to ensure compliance with the Water Quality Standards of the State of Florida, more particularly the South Florida Water Management District. The CONTRACTOR shall make himself familiar with Chapter 17-3, Florida Administrative Code.

Compliance for protection of State Waters and/or jurisdictional areas require the use of hay bales, temporary swales, settling ponds, silt screens and other appropriate methods as necessary to prevent soils and sediment from entering such areas.

Prior to commencement of work the CONTRACTOR shall submit a plan of action and a list of materials he plans to use for sedimentation /erosion control to the owner for approval.

## 10. PUBLIC SAFETY (DURING CONSTRUCTION, ALTERATION OR REPAIR)

10.1 In areas of high vehicular traffic, the contractor shall provide a safe walkway around the work area.

10.2 Barricades or other barriers shall be used to prevent any possibility of injury to the public caused by the CONTRACTOR's work.

10.3 Walk areas around the work areas shall be kept clean of sand, stones, and any other material that could cause a pedestrian accident.

10.4 Work areas left overnight shall be barricaded. The contractor shall install flashing warning lights in areas required by the ENGINEER.

10.5 Unless an approved detour is provided at any open cut crossings, a minimum of one-way traffic will be maintained during the daylight hours and two-way traffic at night. All traffic detours will be restricted to limits of the Right-of-Way with necessary flagmen and/or marking devices. These detours shall be approved by the ENGINEER. Detour of traffic outside of the Right-of-Way will be considered with the approval of local governmental agencies and private concerns involved.

10.6 Not used

10.7 Detours

10.7.1 CONTRACTOR shall construct and maintain detour facilities wherever it becomes necessary to divert traffic from any existing roadway or bridge, or wherever construction operations block the flow of traffic. The location of all detours will require prior approval of the CITY.

10.7.2 Furnishing of Devices and Barriers

All traffic control devices (including signs), warning devices and barriers shall be furnished by the CONTRACTOR. Costs of such devices shall be incidental to construction and included in unit prices bid.

### 10.7.3 Maintenance of Devices and Barriers

Traffic control devices, warning devices, and barriers shall be kept in the correct position, properly directed, clearly visible and clean, at all times. Damaged, defaced or dirty devices or barriers shall immediately be repaired, replaced or cleaned as necessary.

### 10.8 Flagmen

CONTRACTOR shall provide competent flagmen to direct traffic where one-way operation in a single lane is in effect, and in other situations as may be required. Radios may be required if flagmen cannot maintain contact with each other.

10.9 During construction, all necessary signs, flagmen, and other safety devices shall be utilized.

10.10 All work shall be performed with the requirements set forth by the Occupational Safety Health Administration.

10.11 Notwithstanding anything to the contrary above, all public safety will be conducted in accordance with an approved MOT and maintained at all time in conformance with said MOT by the contractor.

End of Section



## CLEANOUT ASSEMBLY DETAIL

