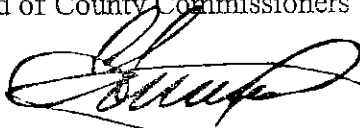


Memorandum



Date: February 22, 2017

To: Honorable Chairman Esteban L. Bovo, Jr.
and Members, Board of County Commissioners

From: Carlos A. Gimenez
Mayor 

Subject: Resolution Approving Amendment Number One for Design-Build Services for Replacement of Water Mains and Service Conversions in the Shenandoah Area (Phase B) – Project No. DB13-WASD-04; Contract No. 14LCCF001

Agenda Item No. 8(O)(2)

Recommendation

It is recommended that the Board of County Commissioners (Board) approve the attached resolution authorizing execution of Amendment Number One to Miami-Dade Water and Sewer Department's (WASD) design-build contract as referenced above with Lanzo Construction Co., Florida (Lanzo); and waive competitive bidding pursuant to Section 5.03(D) of the Home Rule Charter and Section 2-8.1(b) of the County Code in accordance with Section 255.20(1)(c)(10) of the Florida Statutes to add sewer pipeline construction services to the original scope of work. It is in the best interest of the County to waive the competitive process because of the time it would take to competitively bid the sewer pipeline work. The sewer pipelines are failing in the Shenandoah neighborhoods creating an undue hardship on the public health. Lanzo is uniquely qualified to perform the sewer pipeline work as they are currently working at the site installing water improvements. A recommendation to waive competitive bidding from the Design-Criteria Professional of this design-build contract pursuant to Section 255.20 (1)(c)(10)(d) is attached to this memorandum.

Amendment Number One increases the total value of this design-build contract by \$4.3 million to \$14,056,995 with a time extension of 305 calendar days, changing the contract's substantial completion date. The additional time will allow Lanzo to reach substantial completion for the original scope of work and the added sewer pipeline construction work by August 5, 2017. The contract's final completion date October 4, 2017 remains the same.

Project Description

The scope of work for Amendment Number One is enclosed (see Exhibit A attached)

Delegation of Authority

The authority of the County Mayor or County Mayor's designee to execute and implement Amendment Number One is consistent with those authorities granted under the Code of Miami-Dade County.

Scope

The impact of this agenda item is countywide, as the County's water and wastewater system is interconnected; however, the project is located in District 5, which is represented by Commissioner Bruno A. Barreiro.

Fiscal Impact / Funding Sources

Amendment Number One will be funded by Future WASD Revenue Bonds. The Budget Project Number is 9653371: Peak Flow Management Facilities, Volume 3, Proposed Multi-Year Capital Budget Book FY 2016-2022, Page 69.

Track Record/Monitor

WASD's Deputy Director Hardeep Anand will monitor the implementation of Amendment Number One.

Background

On February 3, 2015 the Board awarded a design-build project to Lanzo in the total amount of \$9,756,995 with a total contract term of 910 days. The project consists of the removal and replacement of existing undersized and deteriorated water mains more than 50 years old in the Shenandoah area of the County bounded by SW 17 Avenue, SW 27 Avenue, SW 16 Street and SW 22 Street. The existing scope of work includes, but is not limited to, the design and construction of 45,750 linear feet of 8-inch and 1,200 linear feet of 6-inch ductile iron pipe including testing and restoration within homeowners' properties. Additionally, 664 water service conversions will be completed from the rear of the property to the front of the property.

The Notice to Proceed for this project was issued to Lanzo on April 8, 2015 with a completion date of October 4, 2017. The construction of the water mains began on October 29, 2015.

A condition assessment of the existing sanitary sewer pipelines in the Shenandoah neighborhood was completed by WASD approximately twelve (12) months after this design-build contract was awarded to Lanzo. It was concluded that the sanitary sewer pipelines are in extremely poor condition as most of them have exceeded their life span; like the water pipes, they were installed in the early to mid-1900s. The assessment identified a total of 441 sewer pipelines that need to be replaced with new pipelines of the same diameter at the same elevation. Of the 441 sewer pipelines, 66 sanitary sewer mains and 112 sewer laterals have already failed and need immediate attention as they are broken with holes and/or cracks causing sewage flows to seep into the ground, causing significant environmental concerns. Excavation of the roads will be required to replace those sewer pipelines. The remaining 263 sewer pipelines will be replaced using a trenchless technology that does not impact the roadways. This portion of the work will be bid out using the County's competitive process immediately after Lanzo completes the contract's original scope of work and the additional sewer pipeline construction work.

Approval of Amendment Number One will enable Lanzo to coordinate the water pipeline work together with the sewer pipeline work accelerating the replacement of the severely damaged sewer lines and reducing the impacts of roadwork construction to the area. The proposed sewer work will also benefit WASD's efforts in addressing the conditions that placed County-owned Pump Station No. 16 in a moratorium status.

Company Name and Address: Lanzo Construction Co., Florida
125 SE 5 Court
Deerfield, Florida 33441

Principal Company Qualifiers: Michael R. Bone, Vice-President

How Long in Business: 46 Years

**Previous Agreements with the County
Within the Past Three (3) Years**

Per R-421-16: (See Exhibit C as attached)

According to the Firm History Report provided by the Internal Services Department's (ISD's) Division of Small Business Development Lanzo has been nine (9) contracts with Miami-Dade County with a total contract value of \$53,255,640.53.

County Evaluations within the Past Three

Years Per R-421-16: (See Exhibit D as attached)

Based on ISD's CIIS database, Lanzo has 22 evaluations with an average rating of 3.5 points out of a maximum score of 4.0 points.

Original Term of Design-Build Contract:

910 Days

Modified Term of Design-Build Contract:
(No Change)

910 Days

Original Amount of Design-Build Contract:

\$9,756,995

Modification Amount of Design-Build Contract: \$4,300,000

Total Modified Contract Amount:

\$14,056,995

Percent Increase Per Amendment Number One: 44 percent

**Small Business Enterprise (SBE)
Subcontractors Added:**

None

Small Business Development (SBD) Contract Measures and Compliance

Contract Measures Assigned to the Original Design-Build Contract:

The participation goals noted below were assigned to the original design-build contract.

- 26 percent SBE A/E goal
- 20 percent SBE-Construction goal
- 12.4 percent Community Workforce goal

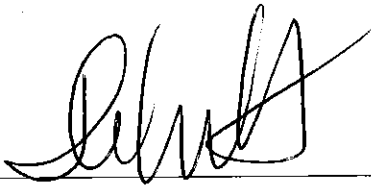
**Compliance Status of the Contract Measures Assigned to the Original Design-Build Contract
Per R-1001-15: (See Exhibit E as attached)**

SBD verified that Lanzo is in compliance and has exceeded the 85 percent requirement based on work performed/requisitioned.

Contract Measures Assigned to Amendment Number One:

On July 22, 2016, the participation goals noted below were assigned to Amendment Number One. (See Exhibit F as attached)

- 2 percent SBE-Goods & Services goal
- 17.48 percent SBE-Construction goal
- 12.40 percent Community Workforce Program goal



Jack Osterholt
Deputy Mayor

Memorandum



Date: February 2, 2017

To: Lester Sola
Department Director
Miami-Dade Water and Sewer Department

From: David Vazquez, P.E. *D. Vazquez*
Program Management Division
Miami-Dade Water and Sewer Department

Subject: Design-Criteria Professional Recommendation for the replacement of gravity sanitary sewer mains and laterals in the Shenandoah Area (Phase B); Project No: DB13-WASD-04; Contract No. 14LCCF001- Lanzo Construction Co., Florida

As the Design-Criteria Professional for the subject project, I am making this recommendation pursuant to Section 255.20(1)(c)(10)(d), Florida Statutes. I have reviewed the proposed scope of work for Design-Build Contract 14LCCF001; Project No. DB13-WASD-04 with Lanzo Construction Co., Florida (Lanzo) for Replacement of Water Mains and Service Conversions in the Shenandoah Area (Phase B). My recommendation is to waive the competitive selection process for the new scope for the following reasons:

1. A condition assessment of the existing sanitary sewer pipelines in the Shenandoah neighborhood (Phase B) was completed by the Water and Sewer Department (WASD) after this design-build contract was awarded to Lanzo. It was concluded that the sanitary sewer pipelines installed in the early 1900's are in extremely poor condition as most of them have exceeded their life span and are failing. If left unaddressed, these conditions could lead to sanitary sewer service interruptions and contamination of the ground water causing a life safety emergency.
 2. Lanzo has been performing active construction work in Phase B by installing new water mains, water services and fire hydrants for over one year. Before completion of the job, Lanzo is also scheduled to perform permanent pavement restoration work for the areas affected within Phase B. Allowing Lanzo to perform the sewer repair work under this contract will reduce inconvenience to the residents as the work is performed by one contractor as a continuation of the ongoing work, while reducing impacts to traffic and County costs associated with roadway and surface restoration work at a future date.
- c: Antonio Cotarelo, Deputy Director of Operations, Miami-Dade Water and Sewer Department
Hardeep Anand, Deputy Director of Capital Improvements, Miami-Dade Water and Sewer Department

EXHIBIT A
SCOPE OF SERVICES
LANZO CONSTRUCTION CO., FLORIDA
AMENDMENT NUMBER ONE
PROJECT NO. DB13-WASD-04 (PHASE B)

In addition, the DESIGN-BUILDER agrees to remove and replace gravity sanitary sewer mains and laterals in the Shenandoah Area (Phase A). The Work includes, but is not limited to, furnishing and installing PVC SDR 26 gravity sanitary sewer pipe of various sizes for mains, wyes, tees and specials; furnishing and installing gravity sewer PVC SDR 26 gravity sewer pipe and fittings for laterals; field locating laterals; post installation TV inspection of gravity sewers and laterals; removal and disposal of existing gravity sewer pipe; excavation and dewatering; excavation in backyard easements; compaction; reconnecting existing laterals on replaced gravity sewer mains; installation/replacement of lime rock base; completing temporary and permanent paving; removal and replacement of concrete pavement; removal and replacement of concrete curb & gutter, valley gutter, traffic separators and sidewalk; removal and replacement of concrete pavers, stone pavers, brick pavers and other special finish type driveways and sidewalks; removal and replacement of chain link and wooden fencing; site restoration for work in rights-of-way and backyard easements; removal and replanting of trees; disposal of removed materials; pipe connections to existing manholes; constructing sewer cleanouts; bypass of existing sewers and laterals; traffic control; replacement of pavement markings; and other appurtenant and miscellaneous related items and work for a completed Project.

Work also includes bypass pumping of sewage or plugging and monitoring, if needed, and all other appurtenant and miscellaneous related items and work for a completed Project. The DESIGN-BUILDER shall obtain all applicable permits required by law for performance of the Work.

The DESIGN-BUILDER shall comply with the COUNTY'S Implementing Order 10-13 "Public Involvement Plan".



MIAMI DADE COUNTY
Small Business Development
Firm History Report

From: 11/15/2013 To: 11/15/2016

PRIMES

FIRM NAME: LANZO CONSTRUCTION CO., FLORIDA
 125 SE 5th Ct
 Deerfield, FL 33441-0000

PROJECT #	CONTRACT	DEPT.	MEASURES	AWARD DATE	AWARD AMOUNT
* P0135 (7360)	1	WS	SET ASIDE CSBE 100%	02/05/2014	\$216,332.60
			48-INCH CONCRETE WATER MAIN AT SW 87TH AVENUE BETWEEN SW 132ND STREET AND SW 133RD STREET AND AT INTERSECTION OF SW 87TH AVENUE AND SW 107TH STREET BY DIG AND REPLACE		\$216,332.60
* P0140 (7360)	1	WS	NO MEASURE	04/28/2014	\$135,952.49
			EMERGENCY REPAIR OF 48-INCH ON NW 72 AVE AND NW 70 ST		\$135,952.49
* P0149 (7360)	1	WS	NO MEASURE	08/05/2014	\$225,830.00
			EMERGENCY 96INCH ACCESS MANHOLE AND PCCP PIPE		\$225,830.00
* P0159 (7360)	1	WS	NO MEASURE	11/17/2014	\$811,169.50
			EMERGENCY REPAIR TO ROUTE 18 AND 17 48-INCH AND 36-INCH WATER MAINS AT TEN LOCATIONS		\$811,169.50
DB13-WASD-04 (BUILD)	1	WS	GOAL CSBE 20%	02/03/2015	\$8,698,795.00
			DESIGN-BUILD SERVICES FOR THE REPLACEMENT OF WATER MAINS AND SERVICE CONVERSIONS IN THE SHENANDOAH AREA (PHASE B)		\$8,698,795.00

EXHIBIT C



MIAMI DADE COUNTY
Small Business Development
Firm History Report

From: 11/15/2013 To: 11/15/2016

PRIMES

FIRM NAME: LANZO CONSTRUCTION CO., FLORIDA
 125 SE 5th Ct
 Deerfield, FL 33441-0000

PROJECT #	CONTRACT	DEPT.	MEASURES	AWARD DATE	AWARD AMOUNT
* P0169 (7360)	1	WS	NO MEASURE	04/07/2015	\$494,543.50
EMERGENCY REPAIR TO PIPE SEGMENT ON 54 INCH PCCP LOCATED NEAR NE 82 STREET AND MIAMI AVENUE					
W-927	1	WS	GOAL CSBE 14.45%	05/05/2015	\$12,772,258.00
SOUTHWEST WELLFIELD REMOVAL OF CALCIUM CARBONATE FROM THE MIDDLE LAGOON					
W-931	1	WS	GOAL SBE 4% GOAL CSBE 7.27%	10/27/2015	\$10,760,850.36
FURNISH AND INSTALL 36-INCH D.I. WATER TRANSMISSION MAIN ALONG SW 152 ST. FROM SW 137 AVE. TO SW 112 AVE.					
S-598	1	WS	GOAL CSBE 5.11% GOAL SBE 5.16%	09/02/2016	\$19,139,909.08
CD 4.5(1) INSTALLATION OF 4.1 MILES OF 54 INCH FORCE MAIN FROM SW 280 ST. AND SW 127 AVENUE TO EXISTING 54 INCH FORCE MAIN AT SW 248 ST. AND SW 107 AVENUE					

* Indicates closed or expired contracts
 Disclaimer: Payments shown may not reflect current information

EXHIBIT D

EXHIBIT



**Capital Improvements Information System
Contractor Evaluations Report**

<u>Dept</u>	<u>Contract</u>	<u>Type</u>	<u>Contractor / Architect Name</u>	<u>Date</u>	<u>Rater</u>	<u>Period</u>	<u>Rate</u>
WS	<u>W-849</u>	CON	LANZO CONSTRUCTION CO FLORIDA	3/27/2008	Nelson Cespedes	Project conclusion or closeout	<u>3.0</u>
WS	<u>W-789</u>	CON	LANZO CONSTRUCTION CO FLORIDA	3/27/2008	Nelson Cespedes	Project conclusion or closeout	<u>3.0</u>
WS	<u>S-737</u>	CON	LANZO CONSTRUCTION CO FLORIDA	3/27/2008	Nelson Cespedes	Project conclusion or closeout	<u>3.0</u>
WS	<u>S-751</u>	CON	LANZO CONSTRUCTION CO FLORIDA	3/31/2008	Nelson Cespedes	Project conclusion or closeout	<u>3.0</u>
WS	<u>S-828 (A)</u>	CON	LANZO CONSTRUCTION CO FLORIDA	4/15/2009	Marlo Garcia	Completion of construction	<u>3.2</u>
WS	<u>DB13-WASD-04</u>	DES	LANZO CONSTRUCTION CO FLORIDA	7/25/2016	Nelson Cespedes	Interim	<u>3.6</u>
WS	<u>W-931</u>	CON	LANZO CONSTRUCTION CO FLORIDA	7/28/2016	Alexis Valdex	Interim	<u>3.9</u>
WS	<u>W-927</u>	CON	LANZO CONSTRUCTION CO FLORIDA	7/28/2016	Joaquin O. Roa	Interim	<u>3.9</u>
WS	<u>P0075</u>	7360	LANZO CONSTRUCTION CO FLORIDA	10/30/2012	Nelson Cespedes	Project conclusion or closeout	<u>3.5</u>
WS	<u>P0083</u>	7360	LANZO CONSTRUCTION CO FLORIDA	6/17/2013	Gary Clarke	Project conclusion or closeout	<u>2.7</u>
WS	<u>P0095</u>	7360	LANZO CONSTRUCTION CO FLORIDA	2/27/2015	Pedro Vigil	Project conclusion or closeout	<u>3.7</u>
WS	<u>P0096</u>	7360	LANZO CONSTRUCTION CO FLORIDA	2/27/2015	Pedro Vigil	Project conclusion or closeout	<u>3.8</u>
WS	<u>P0118</u>	7360	LANZO CONSTRUCTION CO FLORIDA	2/27/2015	Pedro Vigil	Project conclusion or closeout	<u>3.6</u>
WS	<u>P0135</u>	7360	LANZO CONSTRUCTION CO FLORIDA	2/27/2015	Pedro Vigil	Project conclusion or closeout	<u>4.0</u>
WS	<u>P0140</u>	7360	LANZO CONSTRUCTION CO FLORIDA	2/27/2015	Pedro Vigil	Project conclusion or closeout	<u>3.9</u>
WS	<u>P0149</u>	7360	LANZO CONSTRUCTION CO FLORIDA	2/27/2015	Pedro Vigil	Completion of construction	<u>3.7</u>
WS	<u>P0159</u>	7360	LANZO CONSTRUCTION CO FLORIDA	2/27/2015	Pedro Vigil	Completion of construction	<u>3.5</u>
WS	<u>P0087</u>	7360	LANZO CONSTRUCTION CO FLORIDA	3/3/2015	Pedro Vigil	Project conclusion or closeout	<u>3.7</u>
WS	<u>P0101</u>	7360	LANZO CONSTRUCTION CO FLORIDA	3/3/2015	Pedro Vigil	Project conclusion or closeout	<u>3.8</u>
WS	<u>P0072</u>	7360	LANZO CONSTRUCTION CO FLORIDA	3/3/2015	Nelson Cespedes	Project conclusion or closeout	<u>3.6</u>
WS	<u>P0169</u>	7360	LANZO CONSTRUCTION	5/19/2015	Nelson Cespedes	Project conclusion or closeout	<u>3.7</u>

WS P0159 7360 CO FLORIDA
LANZO 6/11/2015 Mario Aguirre Project conclusion or closeout 3.2
CONSTRUCTION
CO FLORIDA

Evaluation Count: 22 Contractors: 1 Average Evaluation: 3.5

12

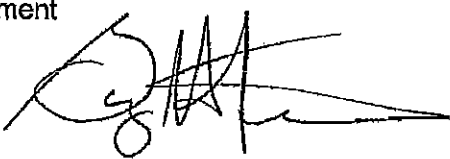
EXHIBIT E

Memorandum



Date: November 2, 2016

To: Lester Sola, Director
Miami-Dade Water and Sewer Department

From: Gary T. Hartfield, Director
Small Business Development Division
Internal Services Department 

Subject: Project No. DB13-WASD-04, Design Build Services for the Replacement of Water Mains and Service Conversions in the Sherandoah Area (Phase B) Sic 871 - Amendment No. 1

The subject project was reviewed for compliance with the 26% Small Business Enterprise - Architectural and Engineering (SBE-A/E) goal, the 20% SBE-Construction goal, the 12.4% Community Workforce Program goal, and the Responsible Wages and Benefits requirements. The prime contractor, Lanzo Construction Company, Florida (Lanzo), is in compliance with the 26% SBE-A/E goal equal to \$250,120.00 and has paid the SBE-A/E firm meeting the goal a total of \$712,759.50. Pursuant to the Monthly Utilization Report dated September 15, 2016, Lanzo reported it has performed/requisitioned \$3,229,907.20 for the construction portion of the contract and that SBE-Construction firms have requisitioned \$564,376.98 to date. Resolution R-1001-15 requires 85% of the SBE goal applicable to the portion of the contract work performed to date be met before Board of County Commissioners (BCC) considers a change order/amendment. Lanzo has achieved 87% of the SBE goal applicable to the portion of the construction work performed to date. Lanzo is in compliance with Resolution R-1001-15.

Lanzo's Community Workforce Program Plan, accepted on January 30, 2015, included a workforce of 24, which required three (3) CWP positions for compliance with the 12.4% goal. Lanzo reported that three (3) new hires would be needed. SBD found nine (9) possible new hires working on the project that did not reside in the Designated Target Area and a subcontractor not included on the CWP Plan. In correspondence dated February 25, and June 15, 2016, SBD requested Lanzo provide an updated CWP plan that included all subcontractors and documents to support any efforts to hire from the project DTA. On August 1, 2016 SBD accepted Lanzo's updated workforce plan which included a workforce of 37 which required five (5) CWP positions. SBD approved one (1) employee for compliance with the goal, reducing Lanzo's CWP deficit from five (5) to four (4) positions. Lanzo's compliance with the goal will be determined at project completion.

The prime and subcontractors are currently in compliance with wage requirements. Please do not hesitate to contact Alice Hidalgo-Gato, SBD Section Chief, at 305-375-3153 if you need additional information.

- c: Doug Yoder, Deputy Director for Operations, WASD
- Hardeep Anand, Deputy Director, WASD
- Margaret Moss, Chief, Small Business Initiatives, WASD
- Edith Brown, Chief, Contract Compliance Division, WASD
- Patty Palomo, Chief, Intergovernmental Affairs, WASD
- Raul Caballero, Project Manager, WASD
- Alice Hidalgo-Gato, SBD Section Chief, ISD

EXHIBIT F



Small Business Development Division Project Worksheet

Project/Contract Title: DESIGN-BUILD SERVICES FOR THE REPLACEMENT OF WATER MAINS AND SERVICE CONVERSIONS IN THE SHENANDOAH AREA (PHASE B) **Received Date:** 07/21/2016
Project/Contract No: DB13-WASD-04 (BUILD) CO#1 **Funding Source:** MULTIPLE
Department: WATER AND SEWER **Resubmittal Date(s):**
Estimated Cost of Project/Bid: \$4,300,000.00
Description of Project/Bid: To establish a design-build project where the scope of services shall include, but is not be limited to, surveying, geotechnical investigations, engineering, design, permitting, technical specifications, construction, testing and commissioning services, customer contact, negotiation and agreement execution for the implementation of new 8-inch water mains. The project consists of the replacement of the existing undersized and deteriorated water mains in order to improve system pressure and provide fire flow protection, and for water service conversions (transfer of services from the rear to the front of properties) in the Shenandoah Area (Phase B) in the City of Miami.

Contract Measure Recommendation		
Measure	Program	Goal Percent
Goal	SBE/GS	2.00%
Goal	SBE/CONS	17.48%
Workforce Goal	CWP	12.40%

Reasons for Recommendation

DB13-WASD-04 - Amendment Number One - Replacement of Gravity Sanitary Sewer Mains and Sewer Laterals in the Shenandoah Area Phase B
 An analysis of the factors contained in Section IV of Implementing Order #3-22 indicates that a 17.48% SBE-Con and a 2.00% SBE-G/S Subcontractor Goals are appropriate in the following: Road and Highway Building Material and Water and Sewer Line and Related Structures Construction.
 Funding Sources: Water Renewal and Replacement Fund, Future WASD Revenue Bonds, WASD 2013 Revenue Bonds and WASD Revenue Bonds Sold
 CWP Estimated Workforce: CWP Workforce Recommendation:
 Commodity Code: 75000-Road And Highway Building Materials (Not Asphaltic)
 Trade Category: 237110-Water And Sewer Line And Related Structures Construction

Small Business Contract Measure Recommendation				
Subtrade	Cat.	Estimated Value	% of Items to Base Bid	Availability
Water and Sewer Line and Related Structures Construction	SBE/CONS	\$751,640.00	17.48%	689
ROAD AND HIGHWAY BUILDING MATERIALS (NOT ASPHALTIC)	SBE/GS	\$86,000.00	2.00%	16
Total		\$837,640.00	19.48%	

Living Wages: YES NO **Highway:** YES NO **Heavy Construction:** YES NO
Responsible Wages: YES NO **Building:** YES NO

Responsible Wages and Benefits applies to all construction projects over \$100,000 that do not utilize federal fund. For federally funded projects, unless prohibited by federal or state law or disallowed by a governmental funding source, the HIGHER wage between Davis Bacon and Responsible Wages and Benefits shall apply.



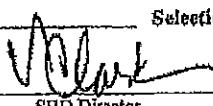
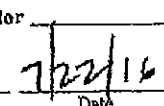
Small Business Development Division
Project Worksheet

Project/Contract Title: DESIGN-BUILD SERVICES FOR THE REPLACEMENT OF WATER MAINS AND SERVICE CONVERSIONS IN THE SHENANDOAH AREA (PHASE B)
Project/Contract No: DB13-WASD-04 (BUILD) CO#1
Department: WATER AND SEWER
Estimated Cost of Project/Bldr: \$4,300,000.00

Received Date: 07/21/2016

Funding Source: MULTIPLE

Resubmittal Date(s):

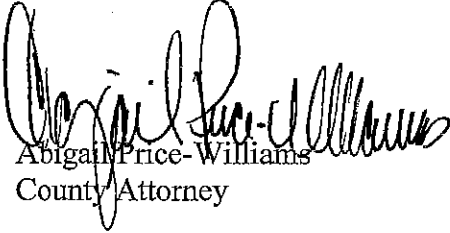
REVIEW RECOMMENDATION			
Tier 1 Set Aside _____	Tier 2 Set Aside _____		
Set Aside _____	Level 1 _____	Level 2 _____	Level 3 _____
Trade Set Aside (MCC) _____	Goal _____	Bid Preference _____	
No Measure _____	Deferred _____	Selection Factor _____	
CWP _____			
		SBD Director	Date



MEMORANDUM
(Revised)

TO: Honorable Chairman Esteban L. Bovo, Jr.
and Members, Board of County Commissioners

DATE: February 22, 2017

FROM: 
Abigail Price-Williams
County Attorney

SUBJECT: Agenda Item No. 8(0)(2)

Please note any items checked.

- "3-Day Rule" for committees applicable if raised
- 6 weeks required between first reading and public hearing
- 4 weeks notification to municipal officials required prior to public hearing
- Decreases revenues or increases expenditures without balancing budget
- Budget required
- Statement of fiscal impact required
- Statement of social equity required
- Ordinance creating a new board requires detailed County Mayor's report for public hearing
- No committee review
- Applicable legislation requires more than a majority vote (i.e., 2/3's , 3/5's , unanimous) to approve
- Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 8(0)(2)
2-22-17

RESOLUTION NO. _____

RESOLUTION AUTHORIZING THE WAIVER OF FORMAL COMPETITIVE BID PROCEDURES, PURSUANT TO SECTION 5.03(D) OF THE HOME RULE CHARTER AND SECTION 2-8.1(B) OF THE CODE OF MIAMI-DADE COUNTY AND AS PROVIDED FOR IN SECTION 255.20 OF THE FLORIDA STATUTES BY A TWO-THIRDS (2/3) VOTE OF THE BOARD; AUTHORIZING THE COUNTY MAYOR OR THE COUNTY MAYOR'S DESIGNEE TO EXECUTE AMENDMENT NUMBER ONE TO DESIGN-BUILD CONTRACT NO. 14LCCF001 BETWEEN MIAMI-DADE COUNTY AND LANZO CONSTRUCTION CO., FLORIDA FOR DESIGN-BUILD SERVICES FOR REPLACEMENT OF WATER MAINS AND SERVICE CONVERSIONS IN THE SHENANDOAH AREA (PHASE B); ADDING REPLACEMENT OF GRAVITY SEWER MAINS AND LATERALS; INCREASING TOTAL COMPENSATION BY \$4,300,000.00 FROM \$9,756,995.00 TO \$14,056,995.00 WITH A TIME EXTENSION OF 305 CALENDAR DAYS EXTENDING THE SUBSTANTIAL COMPLETION DATE FOR THE ORIGINAL SCOPE OF WORK AND FOR ADDITIONAL WORK TO REPLACE SEWER PIPELINES; AND AUTHORIZING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO EXECUTE SAME AND TO EXERCISE THE PROVISIONS CONTAINED THEREIN

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board finds that it is in the best interest of the County to waive formal competitive bid procedures pursuant to Section 5.03(D) of the Home Rule Charter, Section 2-8.1(b) of the Code of Miami-Dade County, and as provided for in Section 255.20 of the Florida Statutes by a two-thirds (2/3) vote of the Board, and authorizes the County Mayor or County Mayor's designee to execute Amendment Number One to

Contract No. 14LCCF001, Design-Build Services for Replacement of Water Mains and Service Conversions in the Shenandoah Area (Phase B); substantially in the form attached hereto and made a part hereof; adding replacement of gravity sanitary sewer mains and laterals; increasing total compensation by \$4,300,000.00, from \$9,756,995.00 to \$14,056,995.00 with a time extension of 305 calendar days extending the substantial completion date for the original scope of work and for additional work to replace sewer pipelines to August 5, 2017; and authorizing the County Mayor or County Mayor's designee to execute same and exercise all the provisions contained therein, including the termination provision.

The foregoing resolution was offered by Commissioner , who moved its adoption. The motion was seconded by Commissioner and upon being put to a vote, the vote was as follows:

Esteban L. Bovo, Jr., Chairman	
Audrey M. Edmonson, Vice Chairwoman	
Bruno A. Barreiro	Daniella Levine Cava
Jose "Pepe" Diaz	Sally A. Heyman
Barbara J. Jordan	Joe A. Martinez
Jean Monestime	Dennis C. Moss
Rebeca Sosa	Sen. Javier D. Souto
Xavier L. Suarez	

The Chairperson thereupon declared the resolution duly passed and adopted this 22nd day of February, 2017. This resolution shall become effective upon the earlier of (1) 10 days after the date of its adoption unless vetoed by the County Mayor, and if vetoed, shall become effective only upon an override by this Board, or (2) approval by the County Mayor of this Resolution and the filing of this approval with the Clerk of the Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: _____
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.



Henry N. Gillman

AMENDMENT NUMBER ONE
TO
DESIGN-BUILD CONTRACT
BETWEEN MIAMI-DADE COUNTY
AND
LANZO CONSTRUCTION CO., FLORIDA
CONTRACT NUMBER 14LCCF001

THIS AMENDMENT NUMBER ONE, is made and entered into this _____ day of _____, 2017, by and between Miami-Dade County, a political subdivision of the State of Florida (hereinafter referred to as the "COUNTY"), and LANZO CONSTRUCTION CO., FLORIDA, a Florida corporation authorized to do business in the State of Florida and with offices in Miami-Dade County (hereinafter referred to as "LANZO" or "DESIGN-BUILDER," and collectively with the County, the "Parties").

WITNESSETH

WHEREAS, on February 3, 2015, the COUNTY and LANZO entered into a Design-Build Contract (the "Contract") for the replacement of water mains and service conversions in the Shenandoah Area (Phase B) ("Original Work") with a total compensation amount of \$9,756,995.00; and

WHEREAS, the Contract requires substantial completion and final completion within 545 calendar days and 910 calendar days, respectively, from the Notice to Proceed which was issued on April 8, 2015; and

WHEREAS, LANZO has completed the design portion of the Contract relative to the Original Work and has begun construction of the replacement of the water mains and service conversions; and

WHEREAS, the COUNTY, through the Miami-Dade Water and Sewer Department (hereinafter referred to as the "Department"), conducted a condition assessment of its existing gravity sanitary sewer mains within the Shenandoah Area (Phase B) and concluded that the gravity sanitary sewer mains and laterals are in an extremely poor condition that warrant immediate replacement; and

WHEREAS, this condition assessment was not available at the time the Contract was awarded and, therefore, the scope of work for the replacement of the gravity sanitary sewer mains and laterals was not included in the Original Work; and

WHEREAS, the COUNTY has requested that LANZO provide additional design-build services for the replacement of the gravity sanitary sewer mains and laterals in the Shenandoah Area ("Additional Work") while it is performing the water main replacements and service conversions in the Shenandoah Area (Phase B); and

WHEREAS, the COUNTY has determined that it will cost \$4,300,000.00, inclusive of contingency and dedicated allowances accounts, for the Additional Work; and

WHEREAS, the Parties agree that it may take an additional 305 days to obtain substantial completion for both the Original Work and the Additional Work; and

WHEREAS, the Parties agree to extend the time for substantial completion from 545 days to 850 days from the original Notice to Proceed; and

WHEREAS, the Parties agree that both the Original Work and the Additional Work can be completed within the original Final Completion time; and

WHEREAS, LANZO has agreed to perform the gravity sanitary sewer mains and laterals replacement work in accordance with the terms of this Amendment,

NOW, THEREFORE, in consideration of the mutual covenants hereinafter contained, the COUNTY and LANZO hereby agree to the following:

1. Delete Article 5.2 and replace with the following:

5.2) TERM OF THE CONTRACT: The DESIGN-BUILDER must engineer, design, permit, construct, test, and commission the Work to bring the Work to Substantial Completion within 850 days of the Notice to Proceed issued on April 8, 2015 (NTP) on August 5, 2017 (the "Substantial Completion Date") and into Final Completion within 910 days from the NTP on October 4, 2017 (the "Final Completion Date").

2. Delete Sub-Articles 5.2.1.2 and 5.2.1.3 and replace them with the following:

5.2.1.2) The DESIGN-BUILDER shall complete the following activities by the Substantial Completion Date:

- a) placement into service of all new water mains and water services in public right-of-way and completion of all work associated with surveying, geotechnical investigations, engineering, design, technical specifications, permitting, construction, testing and commissioning services for the complete and fully operational installation of the new 8-inch water mains and water services, and
- b) placement into service of all new gravity sewer mains and laterals, including the cleanout services in public right-of-way, and completion of all work associated with technical specifications, permitting, construction, testing and commissioning services for the complete and fully operational installation of the new gravity sewer mains and laterals, including cleanouts, as shown in the attached Exhibit "A" Schedule of Values.

5.2.1.3) The DESIGN-BUILDER shall complete the following activities by the Final Completion Date:

- a) completion of all water service conversions (transfer of services from the rear to the front of properties) and all required piping, fittings and accessories for the water service conversions, including all customer contact, negotiation and agreement execution; engineering; design; permitting; construction; testing; commissioning services; and restoration within private property, and
- b) completion of all post installation TV inspections for gravity sanitary sewer mains and laterals and completion of all installations of required piping,

~~fittings and accessories for the gravity sanitary sewer mains and laterals, including permitting, construction, testing, commissioning services and restoration work.~~

Final Completion and Project Closeout shall include obtaining acceptance by all applicable regulatory agencies including WASD of all Work and Services under the Contract, including all remaining site restorations, record documents, and all other remaining incomplete or unacceptable work items identified at or subsequent to Substantial Completion.

Complete all remaining Work under the Contract, including all final restorations, COUNTY approval of as-built and record drawings and other record documentation, and all other remaining Work items identified by the DIRECTOR or the Director's designee for Substantial Completion or thereafter prior to Final Completion.

3. Add the following to the end of Sub-Article 7.4.1

7.4.1) CONTRACT MEASURES: The DESIGN-BUILDER is required under this Contract to achieve the following Contract measures for the replacement of the gravity sanitary sewer main and laterals as shown in the attached "Exhibit B" SBD Worksheet:

17.48% Small Business Enterprise (SBE) Goal for the construction portion of the sewer and lateral replacement work and
2.00% SBE Goal for the Goods and Services of the Contract and
12.40% Community Workforce Program

4. Delete Sub-Article 10.1.1.2 and replace it with the following:

10.1.1.2) The aggregate fixed Lump Sum for all payments to the DESIGN-BUILDER for Design-Build Services authorized on this Project is as follows:

- | | | |
|----|--|-----------------|
| 1. | DESIGN-BUILD SERVICES (Water Main Replacement)
Engineering, Design and Permitting, Technical Support During Construction and other Professional Services: | \$ 962,000.00 |
| | Construction, Testing and Commissioning: | \$ 7,295,000.00 |
| 2. | DESIGN-BUILD SERVICES (Gravity Sanitary Sewer Mains and Laterals Replacement)
Construction, Testing and Commissioning: | \$ 3,809,091.00 |
| | DESIGN-BUILD CONTRACT PRICE | \$12,066,091.00 |

5. Delete Article 10.2 and replace it with the following:

10.2) CONTINGENCY ALLOWANCE ACCOUNT:

10.2.1) This Project is under a Design-Build Contract for the design and construction of a facility on public property (replacement of water mains); therefore, a

~~Contingency Allowance Account is permissible, per Ordinance No. 00-65.~~
This Contingency Allowance Account, computed as ten percent (10%) of the design-related portion of the Contract value, is ninety-six thousand two hundred dollars (\$96,200.00), plus five percent (5%) of the construction-related portion of the Contract value, which is three hundred sixty-four thousand seven hundred fifty dollars (\$364,750.00), and will be used by MDWASD, at its sole option, for unforeseen conditions necessitating additional design and construction, resulting in additions to the Design-Build Contract Price. In this regard, the total of the Contingency Allowance Account for the water main replacement is four hundred sixty thousand nine hundred fifty dollars (\$460,950.00).

10.2.2) This Project is under a Design-Build Contract for the construction of a facility on public property (replacement of gravity sanitary sewer mains and laterals); therefore, a Contingency Allowance Account is permissible, per Ordinance No. 00-65. This Contingency Allowance Account, computed as ten percent (10%) of the construction-related portion of the Contract value, is three hundred eighty thousand nine hundred nine dollars (\$380,909.00), and will be used by MDWASD, at its sole option, for unforeseen conditions necessitating additional construction, resulting in additions to the Design-Build Contract Price.

6. Delete Sub-Article 10.3.1 and replace it with the following:

10.3.1) At the discretion of the COUNTY'S REPRESENTATIVE, the DESIGN-BUILDER may be authorized to perform services outside the basic services described in Article 12 below, under a Dedicated Allowance Account specifically established for said purpose. Compensation to the DESIGN-BUILDER for any of these services will be subject to the Design-Build contract terms and conditions and shall not exceed the individual amount authorized by the COUNTY'S REPRESENTATIVE through direct negotiation with the DESIGN-BUILDER prior to the performance of the Work. Amounts provided in the aforementioned allowance are as follows:

10.3.1.1)	Permit Fees, Inspections, Impact Fees	\$228,850.00
10.3.1.2)	Installation of Electrical Grounding for Water Service Relocations	\$166,000.00
10.3.1.3)	Removal and Remediation of Contamination Fill Material	\$ 43,176.00
10.3.1.4)	Off Duty Police Officer	\$236,080.00
10.3.1.5)	Installation of Sub-Meters	\$ 43,176.00
10.3.1.6)	Quantity Adjustment	\$431,763.00

Total amount of Dedicated Allowance Account items above is one million one hundred forty-nine thousand forty-five dollars (\$1,149,045.00).

7. Delete Sub-Article 10.3.4 and replace with the following:

10.3.4) The sum of the Contingency Account and the Dedicated Allowance Account is one million nine hundred ninety-nine thousand nine hundred four dollars (\$1,990,904.00) for all payments to the DESIGN-BUILDER for any

~~Additional Services authorized by the COUNTY'S REPRESENTATIVE on this Project.~~

Therefore, the TOTAL CONTRACT AMOUNT for this Contract shall be limited to fourteen million fifty-six thousand nine hundred ninety-five dollars (\$14,056,995.00). Any further amounts required for this Contract must be submitted to the County Commission to authorize an amendment to the total Contract amount.

8. Add the following to the end of Sub-Article 12.1:

The DESIGN-BUILDER shall comply with COUNTY'S Implementing Order 10-13, "Public Involvement Plan". The DESIGN-BUILDER'S Public Involvement Plan has been reviewed and approved by the Department and is attached hereto as Exhibit "C".

In addition, the DESIGN-BUILDER agrees to remove and replace gravity sanitary sewer mains and laterals in the Shenandoah Area (Phase B) attached hereto as Exhibit "D". The Work includes, but is not limited to, furnishing and installing PVC SDR 26 gravity sanitary sewer pipe of various sizes for mains, wyes, tees and specials; furnishing and installing gravity sewer PVC SDR 26 gravity sewer pipe and fittings for laterals; field locating laterals; post installation TV inspection of gravity sewers and laterals; removal and disposal of existing gravity sewer pipe; excavation and dewatering; excavation in backyard easements; compaction; reconnecting existing laterals on replaced gravity sewer mains; installation/replacement of lime rock base; completing temporary and permanent paving; removal and replacement of concrete pavement; removal and replacement of concrete curb & gutter, valley gutter, traffic separators and sidewalk; removal and replacement of concrete pavers, stone pavers, brick pavers and other special finish type driveways and sidewalks; removal and replacement of chain link and wooden fencing; site restoration for work in rights-of-way and backyard easements; removal and replanting of trees; disposal of removed materials; pipe connections to existing manholes; constructing sewer cleanouts; bypass of existing sewers and laterals; traffic control; replacement of pavement markings; and other appurtenant and miscellaneous related items and work for a completed Project.

Work also includes bypass pumping of sewage or plugging and monitoring, if needed, and all other appurtenant and miscellaneous related items and work for a completed Project. The DESIGN-BUILDER shall obtain all applicable permits required by law for performance of the Work. The specifications for the Scope of Work are attached hereto as Exhibit "E".

9. All terms, covenants and conditions of the Contract not expressly modified or revised herein shall remain in full force and effect.

IN WITNESS WHEREOF, the Parties hereto have executed this Contract by their duly authorized officers on the date first written above.

ATTEST:

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF COUNTY
COMMISSIONERS

By: _____
Harvey Ruvin
Clerk of the Board

By: _____
Carlos A. Gimenez
County Mayor

WITNESSETH:

By: Mark Garretti

Lanzo Construction Co., Florida
Firm Name (Place Corporate Seal)

MARK GARRETTI
Typed or print name

By: Michael R. Bone
Vice President

By: Michael A. Green

Michael R. Bone
Print name

Michael A. Green
Typed or print name

Approved as to form
and legal sufficiency.
[Signature] 7/28/16
Assistant County Attorney

EXHIBIT A

Schedule of Values

SHENANDOAH GRAVITY SEWER REPLACEMENT				PHASE B		
Bid Item	Description	Item Type	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1	For removing the existing 8-inch gravity sewer main, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 0 - 5.99 feet.	-	LF	6,782	85.00	\$576,470.00
2	For removing the existing 8-inch gravity sewer main, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 6 - 8.99 feet.	-	LF	5,937	90.00	\$534,330.00
3	For removing the existing 8-inch gravity sewer main, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 9 - 11.99 feet.	-	LF	288	93.08	\$24,940.00
4	For removing the existing 10-inch gravity sewer main, and furnishing and installing 10-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 0 - 5.99 feet.	-	LF	280	80.60	\$24,808.00
5	For removing the existing 10-inch gravity sewer main, and furnishing and installing 10-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 6 - 8.99 feet.	-	LF	680	93.00	\$61,380.00
6	For removing the existing 10-inch gravity sewer main, and furnishing and installing 10-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 9 - 11.99 feet.	-	LF	688	98.00	\$65,484.00
7	For removing the existing 12-inch gravity sewer main, and furnishing and installing 12-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 0 - 5.99 feet.	-	LF	200	103.00	\$20,600.00
8	For removing the existing 12-inch gravity sewer main, and furnishing and installing 12-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 6 - 8.99 feet.	-	LF	687	93.00	\$62,031.00
9	For removing the existing 15-inch gravity sewer main, and furnishing and installing 16-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 6 - 8.99 feet.	-	LF	-	135.00	\$0.00
10	For removing the existing 15-inch gravity sewer main, and furnishing and installing 16-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in right-of-way</u> , where the average depth for the run from manhole to manhole is 9 - 11.99 feet.	-	LF	1,007	124.00	\$128,890.00
11	For removing the existing 8-inch gravity sewer main, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in backyard easements</u> , where the average depth for the run from manhole to manhole is 0 - 5.99 feet. To include all additional costs for excavation, logistics, accessibility and other required work.	CONTINGENT	LF	-	200.00	\$0.00
12	For removing the existing 8-inch gravity sewer main, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in backyard easements</u> , where the average depth for the run from manhole to manhole is 6 - 8.99 feet. To include all additional costs for excavation, logistics, accessibility and other required work.	CONTINGENT	LF	-	230.00	\$0.00
13	For removing the existing 8-inch gravity sewer main, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in backyard easements</u> , where the average depth for the run from manhole to manhole is 9 - 11.99 feet. To include all additional costs for excavation, logistics, accessibility and other required work.	CONTINGENT	LF	-	280.00	\$0.00
14	For removing the existing 8-inch gravity sewer main, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings <u>in backyard easements</u> , where the average depth for the run from manhole to manhole is 12 - 15 feet. To include all additional costs for excavation, logistics, accessibility and other required work.	CONTINGENT	LF	-	300.00	\$0.00
15	For removing the existing sewer lateral, in association with main line replacement <u>in right-of-way</u> , and furnishing and installing 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 0 - 5.99 feet.	-	LF	4,350	120.00	\$522,000.00

SHENANDOAH GRAVITY SEWER REPLACEMENT				PHASE B		
Bid Item	Description	Item Type	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
16	For removing the existing sewer lateral, in association with main line replacement <u>in right-of-way</u> , and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 6 - 8.99 feet.	-	LF	678	120.00	\$81,360.00
17	For removing the existing sewer lateral, in association with main line replacement <u>in right-of-way</u> , and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 9 - 11.99 feet.	-	LF	1,500	120.00	\$180,000.00
18	For removing the existing sewer lateral, in association with main line replacement <u>in backyard easements</u> , and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 0 - 5.99 feet.	CONTINGENT	LF	-	200.00	\$0.00
19	For removing the existing sewer lateral, in association with main line replacement <u>in backyard easements</u> , and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 6 - 8.99 feet.	CONTINGENT	LF	-	200.00	\$0.00
20	For removing the existing sewer lateral, in association with main line replacement <u>in backyard easements</u> , and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 9 - 11.99 feet.	CONTINGENT	LF	-	200.00	\$0.00
21	For removing the existing sewer lateral, on existing gravity sewer mains <u>in right-of-way</u> that are to remain in place, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 0 - 6.99 feet.	-	LF	1,800	90.75	\$163,350.00
22	For removing the existing sewer lateral, on existing gravity sewer mains <u>in right-of-way</u> that are to remain in place, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 6 - 8.99 feet.	-	LF	700	90.75	\$63,525.00
23	For removing the existing sewer lateral, on existing gravity sewer mains <u>in right-of-way</u> that are to remain in place, and furnishing and installing 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, where the average depth for the run from manhole to manhole is 9 - 11.99 feet.	-	LF	25	90.75	\$2,268.75
24	For furnishing 8-inch x 8-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, and adapters to connect to the existing or proposed sewer lateral.	-	EA	356	650.00	\$231,400.00
25	For furnishing 10-inch x 8-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral.	-	EA	37	650.00	\$24,050.00
26	For furnishing 12-inch x 8-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral.	-	EA	20	650.00	\$13,000.00
27	For furnishing 16-inch x 8-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral.	-	EA	35	650.00	\$22,750.00
28	For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and installing 8-inch x 8-inch wye or tee for sewer lateral, on existing 8-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, filling material and method of connection. The need for wye or tee replacement shall be determined by the Department.	CONTINGENT	EA	105	1,000.00	\$105,000.00
29	For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and installing 10-inch x 8-inch wye or tee for sewer lateral, on existing 10-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, filling material and method of connection. The need for wye or tee replacement shall be determined by the Department.	CONTINGENT	EA	10	1,300.00	\$13,000.00
30	For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and installing 12-inch x 8-inch wye or tee for sewer lateral, on existing 12-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, filling material and method of connection. The need for wye or tee replacement shall be determined by the Department.	CONTINGENT	EA	10	1,800.00	\$18,000.00

SHENANDOAH GRAVITY SEWER REPLACEMENT				PHASE B		
Bid Item	Description	Item Type	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
31	For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and installing 15-inch x 8-inch wye or tee for sewer lateral, on existing 15-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, filling material and method of connection. The need for wye or tee replacement shall be determined by the Department.	CONTINGENT	EA	-	8,000.00	\$0.00
32	For removing the existing damaged section of host pipe on an existing 8-inch gravity sewer line that has a cured-in-place pipe liner that is to remain in place and removing up to 4 feet of existing sewer lateral as measured along the lateral from the centerline of the gravity sewer main. For furnishing and installing 8-inch x 6-inch saddle tee for sewer lateral, in accordance with MDWASD Standard Detail SS 3.2, and 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and	CONTINGENT	EA	9	1,500.00	\$13,500.00
33	For removing the existing damaged section of host pipe on an existing 10-inch gravity sewer line that has a cured-in-place pipe liner that is to remain in place and removing up to 4 feet of existing sewer lateral as measured along the lateral from the centerline of the gravity sewer main. For furnishing and installing 10-inch x 6-inch saddle tee for sewer lateral, in accordance with MDWASD Standard Detail SS 3.2, and 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and	CONTINGENT	EA	2	1,500.00	\$3,000.00
34	For removing the existing damaged section of host pipe on an existing 12-inch gravity sewer line that has a cured-in-place pipe liner that is to remain in place and removing up to 4 feet of existing sewer lateral as measured along the lateral from the centerline of the gravity sewer main. For furnishing and installing 12-inch x 8-inch saddle tee for sewer lateral, in accordance with MDWASD Standard Detail SS 3.2, and 8-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and	CONTINGENT	EA	2	1,500.00	\$3,000.00
35	For making pipe connections to existing manholes.		EA	134	650.00	\$87,100.00
36	For furnishing and installing 8-inch SDR 26 heavy wall gravity sewer pipe wye or tee and fittings for sewage clean-out, and concrete box and lid, in accordance with MDWASD Standard Detail SS 1.0, as required and directed by the Department.	CONTINGENT	EA	30	700.00	\$21,000.00
37	For constructing fiberrock base for Type "M" permanent paving repairs.		SY	13,000	18.50	\$240,500.00
38	For constructing Type "M" asphaltic concrete surface course permanent pavement repairs		SY	15,600	13.00	\$202,800.00
39	For cold milling City of Miami roadway surface course for permanent pavement repairs (nominal 1 inch thick), in areas where no water main installations and/or replacements are taking place.	CONTINGENT	SY	1,000	4.00	\$4,000.00
40	For constructing Type "M" permanent pavement repairs for City of Miami roadway (nominal 1 inch thick machine-laid asphaltic concrete friction surface overlay), in areas where no water main installations and/or replacements are taking place.	CONTINGENT	SY	1,000	20.00	\$20,000.00
41	For replacing pavement markings damaged, removed or obliterated by the Contractor's operation, in areas where no water main installations and/or replacements are taking place.		AGGREGATE SUMS	1	5,000.00	\$5,000.00
42	For replacement of concrete sidewalk removed or damaged during removal or replacement of sanitary sewer gravity main or lateral.	CONTINGENT	SY	2,000	40.00	\$80,000.00
43	For replacement of concrete curb and gutter, valley gutter and traffic separators removed or damaged during removal or replacement of sanitary sewer gravity main or lateral.	CONTINGENT	LF	5,000	14.00	\$70,000.00
44	For concrete pavement replacement, including cutting, removing, and protecting and replacing all existing concrete pavement surfaces such as concrete-surfaced roadways, parking lots, driveways, and other concrete surfaces removed or damaged during removal or replacement of sanitary sewer gravity main or lateral.	CONTINGENT	SF	5,000	7.00	\$35,000.00
45	For supplemental payment for tree removal and replanting, 12-inch diameter or greater, if confining with sewer repair work and approved by the Department.	CONTINGENT	EA	-	700.00	\$0.00

SHENANDOAH GRAVITY SEWER REPLACEMENT				PHASE B		
Bid Item	Description	Item Type	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
46	For replacement of chain link or wooden fence of any height, if conflicting with sewer repair work and approved by the Department.	CONTINGENT	LF	-	10.00	\$0.00
47	For the cost of repairs to pavers including concrete pavers, stone pavers, brick pavers and other finishes not covered under another bid item, if conflicting with sewer repair work and approved by the Department.	CONTINGENT	SF	-	5.00	\$0.00
48	For the cost of repairs of special concrete finishes including stamped concrete, artistic decoration concrete, specialty painting textures and other finishes not covered under another bid item, if conflicting with sewer repair work and approved by the Department.	CONTINGENT	SF	200	19.17	\$3,834.00
49	For furnishing traffic control, in areas where no water main installations and/or replacements are taking place.		AGGREGATE SUM	1	7,500.50	\$7,500.50
50	For bypass pumping of sewage for the gravity sewer mains along SW 18th Terrace between SW 27th Avenue and SW 22nd Avenue due to the 8-inch sewage force main connection at SW 18 Terrace and SW 27th Avenue, where authorized and approved by the Department.	CONTINGENT	E A	4	1,000.00	\$4,000.00
51	For post installation TV inspection of gravity sewer main of any size to include providing recording to the Department.		LF	16,467	3.00	\$49,401.00
52	For post installation TV inspection of gravity sewer laterals using a lateral launcher from the main line or a camera from a cleanout if existing to include providing recording to the Department.		LF	8,950	3.16	\$28,182.50
63	SUBTOTAL (Sum of Item Nos. 1 through 52)			BID SUBTOTAL		\$3,809,080.51
54	For providing uniformed, off-duty police officers for the purpose of maintenance of traffic	DEDICATED ALLOWANCE	AGGREGATE SUM	1	\$100,000.00	\$100,000.00
55	For cost of required permits, fees, inspections, impact fees, if authorized by the Department	DEDICATED ALLOWANCE		1	\$10,000.00	\$10,000.00
56	For unforeseen conditions, for minor construction changes, and for quantity adjustments, if ordered by the Department	CONTINGENT		10%	\$3,809,080.51	\$380,908.05
57	TOTAL (Sum of Item Nos. 53, 54, 55 and 56)			BID TOTAL		\$4,300,000.00

EXHIBIT B

Small Business Development Division Project Worksheet



Project/Contract Title:

DESIGN-BUILD SERVICES FOR THE REPLACEMENT OF WATER MAINS AND SERVICE CONVERSIONS IN THE SHENANDOAH AREA (PHASE B)

Received Date: 07/21/2016

Project/Contract No:

DB13-WASD-04 (BUILD) CO#1

Funding Source:

MULTIPLE

Resubmittal Date(s):

Department:

WATER AND SEWER

Estimated Cost of Project/Bid:

\$4,300,000.00

Description of Project/Bid:

To establish a design-build project where the scope of services shall include, but is not be limited to, surveying, geotechnical investigations, engineering, design, permitting, technical specifications, construction, testing and commissioning services, customer contact, negotiation and agreement execution for the implementation of new 8-inch water mains. The project consists of the replacement of the existing undersized and deteriorated water mains in order to improve system pressure and provide fire flow protection, and for water service conversions (transfer of services from the rear to the front of properties) in the Shenandoah Area (Phase B) in the City of Miami.

Measure	Program	Goal Percent
Goal	SBE/GS	2.00%
Goal	SBE/CONS	17.48%
Workforce Goal	CWP	12.40%

DB13-WASD-04 - Amendment Number One - Replacement of Gravity Sanitary Sewer Mains and Sewer Laterals in the Shenandoah Area Phase B

An analysis of the factors contained in Section IV of Implementing Order #3-22 indicate that a 17.48% SBE-Cons and a 2.00% SBE-G/S Subcontractor Goals are appropriate in the following: Road and Highway Building Material and Water and Sewer Line and Related Structures Construction.

Funding Sources: Water Renewal and Replacement Fund, Future WASD Revenue Bonds, WASD 2013 Revenue Bonds and WASD Revenue Bonds Sold

CWP Estimated Workforce: CWP Workforce Recommendation:

Commodity Code: 73000-Road And Highway Building Materials (Not Asphaltic)

Trade Category: 237110-Water And Sewer Line And Related Structures Construction

Small Business Goal Measure Recommendation	Cat.	Estimated Value	% of Items to Base Bid	Availability
Subgrade	SBE/CONS	\$751,640.00	17.48%	689
Water and Sewer Line and Related Structures Construction	SBE/GS	\$86,000.00	2.00%	16
ROAD AND HIGHWAY BUILDING MATERIALS (NOT ASPHALTIC)				
Total		\$837,640.00	19.48%	

Living Wages: YES NO Highway: YES NO Heavy Construction: YES NO

Responsible Wages: YES NO Building: YES NO

Responsible Wages and Benefits applies to all construction projects over \$100,000 that do not utilize federal funds. For federally funded projects, unless prohibited by federal or state law or disallowed by a governmental funding source, the HIGHER wage between Davis Bacon and Responsible Wages and Benefits shall apply.

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Small Business Development Division
Project Worksheet

Project/Contract Title: DESIGN-BUILD SERVICES FOR THE REPLACEMENT OF WATER MAINS AND SERVICE CONVERSIONS IN THE SHENANDOAH AREA (PHASE B)
Project/Contract No: DB13-WASD-04 (BUILD) CO#1
Department: WATER AND SEWER
Estimated Cost of Project/Bid: \$4,500,000.00

Received Date: 07/21/2016

Funding Source: MULTIPLE

Resubmittal Date(s):

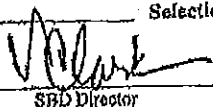

RECOMMENDATION			
Tier 1 Set Aside _____	Tier 2 Set Aside _____		
Set Aside _____	Level 1 _____	Level 2 _____	Level 3 _____
Trade Set Aside (MCC) _____	Goal _____	Bid Preference _____	
No Measure _____	Deferred _____	Selection Factor _____	
CWP _____	 SBD Director		 Date

EXHIBIT C

PUBLIC INVOLVEMENT APPROACH

As required by Miami-Dade County Implementing Order 10-13, please provide a written Public Involvement Plan (Plan) for Contract Number 14LCCF001; Project No. DB14-WASD-04. The goal of the Plan is to keep residents and businesses informed and up-to-date on the Project's progress therefore achieving effective community awareness. The Plan needs to be in effect during the entire design/construction phase of the Project and must include the following components:

1. Lanzo Design-Build Team to document specific public involvement strategies;
2. Lanzo Design-Build Team to complete, as needed, field assessments, identify and create database of stakeholders affected including homeowners, businesses and schools, county commission offices, municipal commission and city manager offices, affected by design and construction;
3. Lanzo Design-Build Team will attend pre-construction and progress briefings to determine needed public outreach strategies;
4. Lanzo Design-Build Team to coordinate and/or attend community meetings throughout the design/construction phases as needed
5. Lanzo Design-Build Team to create, design and development a social media site and project-related informational materials as needed. Bi-lingual/tri-lingual printed materials;
6. Lanzo Design-Build Team to distribute advisories/door to door distributions/door hanger's/email distribution/maillings as needed so the community is aware of potential impacts;
7. Lanzo Design-Build Team to coordinate emergency communications as needed;
8. Lanzo Design-Build Team to planning, organizing and attending special events and meetings to include briefings with affected parties, including municipalities, schools, businesses and homeowner associations as needed;
9. Lanzo Design-Build Team to handle Project inquiries from the community and creation of a log to include types of issues and timeframe to resolve and resolution information. Concerns must be handled (including social media) within a 24 hour period. WASD must have access to the log and provided with weekly updates;
10. Lanzo Design-Build Team to engage stakeholders in maintenance of traffic plans throughout the construction phase as necessary;
11. Lanzo Design-Build Team to handle one-on-one coordination with affected property owners during construction phase, and have an on-site public information officer as needed, but not less than two hours daily on a rotating schedule to include morning, afternoon, evening, and weekend hours.

EXHIBIT D

SHENANDOAH PHASE B GRAVITY SEWER

PHASE	Line to be replaced	EAMID	Diameter	Depth	Length	UP/MH	DW/MH
B	Yes	462293	15	9.5	334	169	168
B	Yes	463926	8	5	297	092	093
B	Yes	467179	8	4.04	232	091	092
B	Yes	467430	8	5	255	022	023
B	Yes	467569	8	6	336	203	202
B	Yes	469410	8	4	266	151	152
B	Yes	470257	8	4.03	250	018	017
B	Yes	470310	8	6.02	296	30	031
B	Yes	471056	10	7	337	049	050
B	Yes	471084	8	5	146	41	040
B	Yes	471346	8	4	281	047	046
B	Yes	472943	8	6.3	265	262	263
B	Yes	472974	10	9	334	120	119
B	Yes	473279	8	8.2	300	255	254
B	Yes	474309	8	4	322	008	007
B	Yes	474538	8	4	328	252	253
B	Yes	474598	8	4	175	128	129
B	Yes	475912	8	4.4	422	052	051
B	Yes	476715	8	8	201	095	094
B	Yes	477524	8	4.05	291	029	030
B	Yes	479049	8	8	295	256	255
B	Yes	479310	8	4.08	260	066	065
B	Yes	479318	8	8	253	204	203
B	Yes	479373	8	6	289	007	009
B	Yes	480730	8	4	227	150	149
B	Yes	481236	8	4	336	370	369
B	Yes	481627	8	7.02	327	027	028
B	Yes	482596	8	3	298	176	175
B	Yes	482626	8	5.1	289	184	182
B	Yes	483523	8	5	253	196	195
B	Yes	483768	8	6	218	194	193
B	Yes	484383	8	8.02	326	058	059
B	Yes	485057	8	4	288	087	086
B	Yes	485310	8	6.4	271	197	195
B	Yes	486804	8	5	264	006	003
B	Yes	487929	8	4.08	288	086	085
B	Yes	492154	8	4.2	234	257	258
B	Yes	492840	8	9	268	254	191
B	Yes	494002	12	8.03	335	155	157
B	Yes	494456	8	8	268	403	404
B	Yes	494936	12	9	320	153	154
B	Yes	494952	8	5	337	178	177
B	Yes	495030	10	7	334	135	136
B	Yes	495694	8	7	327	026	027

SHENANDOAH PHASE B GRAVITY SEWER

PHASE	Line to be replaced	EAMID	Diameter	Depth	Length	UP/MH	DW/MH
B	Yes	496807	8	8	335	121	120
B	Yes	498803	8	7.02	317	061	060
B	Yes	498895	15	8	347	172	171
B	Yes	499895	8	6	248	177	174
B	Yes	500176	8	7.08	333	122	121
B	Yes	502304	8	8	193	481	483
B	Yes	503144	8	4	297	320	320
B	Yes	504078	8	4.3	299	053	052
B	Yes	505796	8	5.07	188	096	095
B	Yes	506780	8	5	338	125	124
B	Yes	507196	8	5	90	183	182
B	Yes	507568	8	7	307	195	193
B	Yes	507708	8	6.6	300	084	085
B	Yes	508325	10	10.02	334	313	343
B	Yes	508581	10	4.02	280	048	049
B	Yes	510660	8	7.06	334	133	134
B	Yes	513342	8	8	266	187	186
B	Yes	513839	15	9.5	335	171	170
B	Yes	580336	12	5.04	199	154	155

Note: The Department reserves the right to remove sanitary sewer gravity mains and appurtenances from the list and replace or add with other sanitary sewer gravity mains and appurtenances as it deems necessary. The Department also reserves the right to install/replace sanitary sewer gravity mains and appurtenances with its own forces or as a part of another Contract.

SPECIFICATIONS
FOR
REMOVAL AND REPLACEMENT OF
SANITARY SEWER GRAVITY MAINS FOR SHENANDOAH DESIGN BUILD
PART B

1.00 SCOPE

This project consists of the removal and replacement gravity sewer mains and laterals in the area of the Shenandoah design build.

The work includes, but is not limited to, furnishing and installing PVC DR 26 gravity sewer pipe for mains, wyes, tees and specials; furnishing and installing gravity sewer PVC DR 26 pipe for laterals; field locating laterals; TV inspection of gravity sewers and laterals; removal and disposal of existing gravity sewer pipe; excavation; excavation in backyard easements; compaction; reconnecting existing laterals on replaced gravity sewer mains; limerock base; traffic control, temporary and permanent paving; site restoration for work in right-of-ways; disposal of removed materials; connections to existing manholes; constructing sewer cleanouts; cleaning sewer mains and laterals for cured-in-place rehabilitation work; root removal and other pipe preparation work; bypass of existing sewers and laterals; and other appurtenant and miscellaneous related items and work for a completed Project.

The Contractor may perform sewer replacement work using trenchless methods acceptable to the Department (CIP, Sectional CIP, sewer lateral lining, combination of CIP with point repairs). The trenchless work performed shall be paid for at the same unit price bid for the dig and replace work with no additional compensation provided.

The Department reserves the right to install/replace sanitary sewer gravity mains and appurtenances with its own forces or as a part of another Contract as it deems necessary. The Department also reserves the right to separately contract new sanitary sewer gravity main/appurtenances construction.

Work also includes bypass pumping of sewage or plugging and monitoring, if needed, and all other appurtenant and miscellaneous related items and work for a completed Project. The terms "work", "construction", "repair" and "cleaning" shall each be construed to denote any and all activities under this contract, regardless of its nature.

It is the intent of the Department to repair faults in its gravity sewers utilizing modern conventional methods. This includes any items of labor, equipment and materials deemed reasonable and necessary to perform such repairs.

The Department has allocated certain funds for this project. Should the amounts bid exceed expected levels, the Department reserves the right to either reduce quantities and/or delete elements of the work while proceeding at the prices bid, or reject bids and re-advertise at its sole option.

The County does not guarantee that the full amount of the Contract will be issued to the

Contractor. The actual amount of work is a prerogative of the County in its sole discretion and dependent only upon its needs. The combined total for all work authorized shall not exceed the Contract Award amount.

This is a non-exclusive contract. Other contracts for the rehabilitation of sanitary sewers by the Dig and Replace method may be advertised, bid and under construction concurrent with this Project.

The Contractor is also alerted that various "Standards" are used herein for reference and criteria and that he should obtain copies for his general use and protection. Abbreviated titles are used throughout these Specifications and although most of them are widely known, their complete titles are given below in order to avoid any misunderstanding.

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ATSSA	American Traffic Safety Services Association
AWWA	American Water Works Association
OSHA	Occupational Safety and Health Administration
FDOT	Florida Department of Transportation
WASD	Miami-Dade Water and Sewer Department
NASSCO	National Association of Sewer Service Companies
MUTCD	Manual on Uniform Traffic Control Devices
DCPWM	Dade County Public Work Manual

The above list shall not be considered complete, as there are other "Standards" used in this document. However, in most cases complete titles have been given.

Wherever "Standards" are indicated herein for reference, the referenced portion shall have the same force and effect as if it was included herein in its entirety, latest edition or revision, if date of publication is not shown.

2.00 INFORMATION FURNISHED BY THE DEPARTMENT

Marked up Sewer Atlas plates will be presented to the Contractor to locate the work on an ongoing basis. Television logs and summary sheets for the sewers to be repaired will also be provided with each Work Order, if so requested and if available. File video will also be made available for review, where possible, if so requested, and if available.

Any error or omissions in the Specifications as to the standard of the work, shall not relieve the Contractor of the obligation to furnish a satisfactory, first class job in strict conformity with the best practice found in structures, pipeline work, or in work of a similar type. The failure of the Bidder to direct the attention of the Engineer to errors or discrepancies will not relieve the Bidder, should he be awarded the Contract, of the responsibility of performing the work to the satisfaction of the Engineer.

Due to the possibility of typing errors or omissions, the Standard Details which may be included elsewhere shall not be considered as forming a complete listing of all Standard Details which may apply to this Project. Perform all work shown on the Standard Details, as specified herein or necessary for a complete, functional installation and no extra compensation will be made due to the omissions or incorrect listing of a Standard Detail in the Contract Documents. All Department

Standard Details are incorporated in these Contract Documents by reference and all work shall be performed in accordance with all applicable Departmental Standard Details.

3.00 SEQUENCE OF WORK AND TIME OF COMPLETION

CAPITALIZED ITEMS INDICATE WORK OR FUNCTIONS TO BE PERFORMED BY DEPARTMENT FORCES. All other items shall be performed by the Contractor, with special emphasis on the fact that numerous standard and miscellaneous work phases are not mentioned specifically, but shall be performed by the Contractor as required for a completed Project.

The Contractor's equipment must be in first class operating condition, including proper mufflers and other silencing accessories. All equipment must be properly lubricated on a special maintenance type schedule to reduce noise, including tracks, rollers, idlers, sheaves and other noise producing components. Care must be taken to prevent oil spillage of any kind or oil dripping from equipment.

Prior to the commencement of the Contract, the Department reserves the right to inspect all equipment supplied by the Contractor to perform work under this Contract, and the Contractor shall make all equipment available to the Department for inspection prior to commencement of the Contract. In addition, if after commencement of the work, the equipment proves less than satisfactory and is unduly or needlessly disturbing the neighbors in the opinion of the Engineer, he will have the right to order the Contractor to immediately modify the equipment to make it satisfactory, or to change to other equipment that is satisfactory at no additional cost to the Department.

Department forces will make efforts to reroute the contributing sewer systems, but the Contractor is advised that he shall have to bypass pump or plug and monitor the total sewage flow if rerouting is not feasible and sufficient storage capacity is not available upstream (see Section 6.01, "Bypass Pumping/Flow Control").

The general sequence for the work, which is typical of each work location, shall be as follows:

NOTE: Whenever the property owners' use of the sanitary sewer must be interrupted by the work, the Contractor shall notify the residents well in advance of the interruption. This notification shall be accomplished with door hanger notification cards to be placed at the addresses of affected customers. Property owners shall be informed when service interruption will take place and the approximate duration. This notice shall be provided a minimum of 24 hours in advance of commencement of service interruption. The Contractor shall make every effort to minimize inconvenience to the public and property owners. Should the Engineer find it necessary to order efforts above those instituted by the Contractor's in this regard, the Engineer's order shall be final, and no extra compensation will be made to the Contractor.

The Notification Form, to be attached to property owners door, shall state that a pipeline serving the listed address is being installed during approximate listed dates. If any spillage of sanitary flow occurs, the occupant should call a given phone number. The Contractor shall supply these notification forms, which must be approved by the Department. (Refer to Appendix "U" for information to be supplied on the "Notice".)

1. Contractor shall visit all line segments proposed for replacement or repair and notify the Department in writing of any site conditions, such as access, which would prevent or hinder the accomplishment of the work. Contractor shall also take Digital Photographs

and video tapes to document pre-existing above ground conditions to protect himself and when and directed by the Engineer shall provide the Engineer with a set of these Digital Photographs and video tapes. These photographs and tapes may be used to document the restoration process.

2. Pre-construction conference / Presentation - Review of Contractor's staffing and mobilization plan, as well as review of Contractor's equipment/work schedule before the Notice to Proceed is issued (see Section 3.01 "Preconstruction Conference and Job Meetings").
3. Contractor shall provide traffic cones, truck mounted beacons, and such additional maintenance of traffic measures as are required to satisfy local, state and federal highway requirements. See Section 6.00.3, "Maintenance of Traffic (M.O.T.)".
4. Prior to entering manholes and inspections, the atmosphere within each manhole shall be evaluated by the Contractor to determine the presence of toxic, flammable or explosive vapors or lack of oxygen. See Section 3.04, "Safety Requirements".
5. Reroute or plug contributing sewer systems to minimize flow in sewer, if feasible.
6. Prior to excavation, the Contractor shall sawcut and remove asphalt or concrete surfaces within the limits of allowable trench width. Where the existing sewer main is not located under asphalt or concrete surfaces, the Contractor shall remove and replace all shrubbery, trees, grass, and other items in the way of the excavation
7. Initiate bypass pumping or monitoring of remaining sewage flow, if required for the impacted sewer section.
8. Excavate material as specified in Section 6.04, "Excavation". Contractor shall utilize all measures necessary to comply with the Florida Trench Safety Act. When work is performed in a wet trench the existing gravity sewer lines shall be plugged on both ends to the satisfaction of the Engineer. The entry of sand, rocks and other materials which may damage sewage pumps shall be prevented to the satisfaction of the Engineer.
9. Contractor shall construct a suitable pipe foundation by means of excavating to suitable material, backfilling and placing acceptable bedding material, as specified in Sections 6.04 and 6.07 "Pipe Foundation - Gravity Sewers".
10. Installation of new pipe shall comply with the specific work order and Section 6.09 "Laying Pipe" of these Specifications.
11. Following acceptable installation of the new pipe main to true line and grades, the Contractor shall perform ties to the existing manholes and service laterals or mainline in the case of point repairs.
12. Modification of existing manholes shall be performed as directed by the Engineer and as specified in Section 6.10.3 "Modification of Existing Manholes" of these Specifications.
13. The Contractor shall perform cleaning of the new gravity main in accordance with Section 6.12, "Cleaning and Testing" of these Specifications. The Contractor shall clean and televise the entire line segment after a line replacement or after completion of a point repair.

14. Following successful replacement of the sewer main and reinstatement of the service laterals, the Contractor shall route normal flow back into the main.
15. The trench created in the process of gravity main removal and replacement shall be properly backfilled and compacted.
16. Where applicable, Contractor shall perform acceptable pavement replacement including limerock base course, asphaltic concrete paving and pavement markings replacement.
17. Post-Repair televising shall be performed in a timely manner following replacement of the gravity main or point repair including lateral point repairs to ensure proper installation, free from leaks or excessive deflection shall be performed in a timely manner following replacement of the gravity main to ensure proper installation, free from leaks or excessive deflection.
18. Perform all remaining work and final cleanup/restoration along restored section.
19. Remove and transport material to an approved disposable site.
20. Final inspection.
21. Repeat Steps 1 through 20 for each gravity sewer main to be repaired.

Refer to Section 6.00, "Construction Methods" for a detailed description of the above-listed procedures.

3.01 Pre-construction Conference and Job Meetings

After the Award of Contract and prior to the issuance of the "Notice to Proceed", a pre-construction conference will be held with the Contractor, the Department, and other interested parties who are essential in the completion of the Project, for the purpose of coordinating the work. The time and place of the meeting will be set by the Engineer. The Engineer will discuss requirements of such matters as project supervision and inspections, progress schedules and reports, Contract Change Orders, insurance, safety, and other items pertinent to the Project. All parties to this conference should be prepared to discuss any problems anticipated with the execution of the work under this Contract.

At this meeting, the Contractor shall submit a detailed staffing plan and weekly schedule, along with supporting data, demonstrating, to the Engineer's satisfaction, how the Contractor will perform all of the work issued. He must demonstrate the adequacy of the number of independent work crews that he represented in the Proposal as necessary to accomplish the total quantity of work. He shall increase the number of independent crews if he cannot demonstrate this to the Engineer's satisfaction. He shall also demonstrate that all of the crews he will provide to satisfy the need are, in fact, qualified (including M.O.T. certification) and experienced, suitably equipped, available and ready to begin timely and productive work.

The Contractor shall file with the Department a "Hurricane Preparedness Plan of Action" for approval. This plan shall be in accordance with the provisions of these specifications and be implemented when advised to do so by the Department.

Also, the Contractor must demonstrate to the Engineer's satisfaction the availability and dependability of the equipment to be used to perform the work. The equipment must be in a good working condition to avoid frequent breakdowns and work stoppages and delays. In addition, a job meeting will be held sometime before each work authorization is issued. All parties to this meeting should be prepared to discuss any problems anticipated with the execution of the work under this Contract.

In some cases, the pre-construction conference or job meeting may be held after the start work date stated in the written "Notice to Proceed" or work authorization. This may be due to difficulty with coordination of all parties concerned, or other similar reasons.

Such delays in holding the meetings will not relieve the Contractor of any responsibilities hereunder, and will not be an acceptable reason for him to request additional work completion time beyond that provided, since he could be obtaining permits, mobilizing his equipment and forces, ordering materials, performing minor work, or other work if approved by the Engineer, during the interim period.

Prior to commencing work, the Contractor shall prepare the weekly work schedule and provide copies to the Engineer. The construction schedule shall include the place of beginning, the proposed order of progression.

The Contractor and the Engineer shall meet bi weekly during the construction period to review progress, safety, quality and other project related issues. The Engineer reserves the right to increase or decrease the frequency of these meetings dependent on progress on the Project.

The Engineer will also employ field inspectors to monitor progress and quality of the Contractors work.

3.02 Project Signs

The County will supply signs for this Project. These signs will be ordered and produced by County forces and provided to the Contractor. During the construction period, the Contractor shall maintain the signs in good condition, satisfactory to the Engineer. Should the signs be defaced, damaged or destroyed, the Contractor shall be responsible for their repair or replacement to the satisfaction of the Engineer and no extra compensation will be allowed.

3.03 Permits

The Contractor is required to close out the permit with the permitting agency having jurisdiction in order to receive the money from the Dedicated Allowance Account established for that purpose. Permit fees will be reimbursed by the Department only when the Engineer receives confirmation to his satisfaction that the permit has been closed.

All necessary permits shall be obtained by the Contractor, with the exception of FDOT permits, which will be obtained by the Department.

The Contractor shall notify the appropriate Department Representative of the commencement of work and also immediately upon completion.

The Contractor's particular attention is called to any special condition of the permits relating to the construction procedures, excavation and backfill requirements, open trench restrictions (all of

which may be needed to repair a failed repair by open-cut means) and all other general and specific conditions. In the event any of the conditions of the permits are in conflict with the requirements of these Specifications, the more stringent conditions shall take precedence.

The Contractor shall assume throughout the life of the Contract all obligations and responsibilities imposed on the Department as permittee of the above-mentioned permits.

Any deviations from the Specifications or permits must first be approved by the Engineer, even if approval for the change has been given by the permitting agency. The Contractor shall notify the Department of the commencement of work and immediately upon completion. The Contractor shall also furnish to the Department an emergency 24-hour telephone number. The Contractor is responsible for all emergency activities required by the Permit.

The cost of any fees such as impact fees, inspection fees, etc. and the cost paid for all required permits shall be borne by the Department. The Contractor shall pay the required fees, obtain the permit(s) and then upon submission of proof of cost to the Department, be reimbursed for said cost out of the Dedicated Allowance for Permit Fee Reimbursement. This shall apply only to required permits and fees. Permits obtained or fees paid for the advantage of the Contractor or non-required permits obtained for whatever reason shall not be reimbursed. The necessity or non-necessity of a permit or fee shall be determined by the Engineer who's word shall be final. As specified in the paragraph above, all costs of compliance with the permit(s) shall be borne by the Contractor and included in his bid price. The retainage percentage as specified in Article 11 Partial and Final Payment and the 1/4 of one percent deduction for the Miami-Dade Inspector General will be deducted from any reimbursement payment.

It shall be the Contractor's responsibility to monitor and track available permit time and schedule and perform all work within permit time limits. If permits expire and need to be reapplied for, the Contractor will not be reimbursed unless first approved by the Engineer.

3.04 Safety Requirements

The Contractor shall be in compliance with all applicable provisions of the Occupational Safety and Health Act of 1970, in general, and any subsequent amendments and revisions thereto and specifically to the provisions concerning confined space entry. The Contractor's Manual of Safety Practices, dealing with the firm's policies on field safety procedures for employees, shall be submitted to the Engineer for his review before "Notice to Proceed" will be issued.

The Contractor shall conduct his operations in such a manner (utilizing warning devices, such as traffic cones, barricades and warning lights, and personnel such as flagmen and uniformed police officers) that the public is given adequate warning of hazards of the work site as may be deemed necessary by the County and/or the Engineer. See Section 6.00.5, "Maintenance of Traffic".

The Contractor shall comply with but not limited to the following OSHA Regulations that are found applicable to this project:

Process Safety Management (29 CFR 1910.119), Confined Space Entry Procedures (29 CFR 1910.146), Respiratory Protection (29 CFR 1910.134), Fall Prevention Protection (29 CFR 1926.104), Excavation Protection (29 CFR 1926.650), Personal Protective Equipment (29 CFR 1910.132), Electrical Safety (29 CFR 1910.301), Lockout/Tagout (29 CFR 1910.147), Air Monitoring (29 CFR 1910.1000), Asbestos & Lead Abatement (29 CFR 1910.1001, 1025), Commercial Diving (29 CFR 1910.401), Welding and Cutting (29 CFR 1926.350), Blood Borne Pathogens (29 CFR 1910.1030), Scaffolding (29 CFR

1926.451), Movement of Traffic (DOT Index), Industrial Truck / Forklift (29 CFR 1910.178), Crane Operations (29 CFR 1926 & ANSI).

In addition, the Contractor shall adhere to any other applicable Federal, State and Local Safety and Health Regulations involving General industry and/or Construction Standards not mentioned in the Specifications.

The Contractor's personnel will be in the vicinity of raw sewage. For his own protection, as well as for his employees, he shall check with Miami - Dade County Health Department, and based upon their recommendation, shall have his personnel properly immunized against disease associated with raw sewage.

Under this contract, personnel may be required to enter the existing manholes/sewers to perform certain items of work. Before entering, the Contractor shall be in compliance with Miami-Dade County Manhole Ordinance No. 83-3 (which mandates, in part, that above-ground safety personnel shall be on duty at all times when someone enters or works in a manhole/sewer and the air within a manhole/sewer shall be tested with a combination oxygen deficiency meter-explosion meter to determine oxygen content and explosion potential). A test for the presence of hydrogen sulfide shall also be performed. The work area must be ventilated mechanically by the use of an air blower, before entry and during occupancy, to insure that an adequate quantity of oxygen is supplied to the work area.

The Contractor shall conduct his operations in such a manner, utilizing warning devices such as traffic cones, barricades and warning lights, and personnel such as flagperson and uniformed police officers, that the public is given adequate warning of hazards of the work site as may be deemed necessary by the County and/or the Engineer. See Section 6.00.3 "Maintenance of Traffic (M.O.T.)".

In the instance of men working within the manholes, the Contractor shall provide safety provisions to cover any possible consequences of structural failure and/or flooding. Such provisions might take the form of, but not be limited to, stand-by pumping equipment; extra air supplies; and such other measures as the situation and good construction practices might dictate.

Certain products specified in these Specifications contain warnings by the manufacturers that under certain conditions, if instructions for use of the product are not followed, a hazardous condition may exist. It is the Contractor's responsibility to instruct his workers in the safe use of the product, or any product substitution and to provide them with the Material Safety Data Sheets.

All open excavations made in the earth shall be performed in compliance with the State of Florida Trench Safety Act, OSHA 29 CFR 1926.650, Subpart P (Chapter 90-96, Laws of Florida). The Contractor shall appoint a "competent person", in accordance with Subpart P, who shall be present at the jobsite. A "competent person" shall mean one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

The Contractor shall familiarize himself with the "Underground Facility Damage Prevention and Safety Act", Florida Statute 556. The Contractor shall contact the Sunshine State One-Call Center, at 1-800-432-4770, forty-eight hours prior to any excavation. Failure to familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and the penalties set forth therein. The Contractor shall also contact MD-WASD for utility locations forty-eight hours prior to excavation.

For trench excavations in excess of five (5) feet in depth, the Contractor shall comply with the provisions of the State of Florida "Trench Safety Act".

3.05 Procedure of Work Authorizations

The Contractor shall establish a Plan to perform and complete sewer repair work in the Shenandoah area by sections in order to minimize the disruption.

For proposed trenchless work, the Contractor shall provide the Engineer with a detailed plan of the work. The Contractor shall perform pre-CCTV video inspections at their cost to determine locations where dig and replace repairs are needed to bring the main into a condition where the gravity main, tees, wyes and laterals can receive a cured-in-place liner. The Department shall review the final pre-CCTV video for approval prior to performing the trenchless work.

3.06 Hurricane Preparedness

During such periods of time as are designated by the United States Weather Bureau as being a hurricane alert, watch or warning, the Contractor shall perform all precautions as necessary to safeguard the work and property, including the removal of all small equipment and materials from the site, lashing all other equipment and materials to each other and to rigid construction, and any other safety measures as indicated below.

Upon Notification of a Hurricane Alert:

- a. Upon issuance of a Hurricane Alert by the County Manager, all Contractors performing work within the right-of-way of a designated evacuation route shall immediately secure their work, backfill all excavations within the right-of-way and suitably prepare the roadway surface for full traffic flow. This work shall be completed within 24 hours of the issuance of the alert. Work shall not recommence until the "All Clear" is issued by the County Manager.
- b. Contractors performing work at all other locations shall remove all unnecessary debris, materials and equipment from the job site. The Contractor shall also keep his crew on standby on weekends and holidays during the Hurricane Alert period.

Upon Notification of a Hurricane Warning:

- a. Contractors shall prepare to execute their approved Plan of Action on their specific projects.

Upon Notification of a Hurricane Watch:

- a. Contractors shall implement their approved Plan of Action to protect the project and the public.
- b. For work within the public right-of-ways, the Contractor will be notified by the Department to suspend his construction operations. The Contractor will backfill all open trenches, remove all construction equipment and materials from the right-of-way and secure operations pending further notice.

4.00 MATERIALS AND EQUIPMENT FURNISHED BY THE DEPARTMENT

All materials shall be furnished by the Contractor.

4.01 Water Used in Construction

The Department will furnish water for construction purposes free of charge from the nearest fire hydrant using the Contractor's designated floating meter.

The Contractor shall obtain a project specific floating meter and maintain daily records for meter readings. The floating meter shall be used only for the work of this project; any other use will be considered tampering. The meter will be read on a monthly basis at a cost of \$50 by the Department's Water Distribution Meter Section. There will be no charge for consumption.

Water for construction activities will be furnished from adjacent MDWASD-owned water mains or the most convenient water source. In instances where no Department-owned source of water is available, the Contractor shall make his own arrangements with the municipality or other controlling authority and include the cost of all water required during construction in his overall construction cost. No reimbursement will be made.

When the project is occurring in Unincorporated Dade County, the City of Miami or Coral Gables, the Contractor shall present a Dade County, City of Miami or Coral Gables, respectively, Fire Department Permit during application with New Customer Division. This requirement may also apply to some municipal areas of Miami Dade County.

The deposit fee will be refunded to the Contractor upon return of the meter in a sound satisfactory condition. The largest meter available is 2-inches NPS. Effective October 1, 2007, the required deposit for a 2-inch meter is \$2,500.00 plus \$125.00 service charge. For current fees contact the Department's New Customer Division at (786) 268-5200. Additional fees may be required by other governmental agencies for utilizing existing sources of water. The Contractor shall bear all cost imposed by other governmental agencies for water use, meter use and all similar fees, at no cost to the Department

All piping, fittings, valves and equipment, including pumps and power, required for handling the water shall be furnished by the Contractor. Care shall be exercised in the use of the water and provision shall be made to protect the water supply for contamination and indiscriminate use by unauthorized persons. The Contractor shall use only potable water unless otherwise specifically called out elsewhere herein and then only in the case of sewage force mains, reclaim water mains or raw water mains.

Under no circumstance shall the Contractor utilize a water source, including existing piping, until such source or piping has been approved for use by the Engineer. In instances where no Department-owned source of water is available, the Contractor shall make his own arrangements with the municipality or other controlling authority and include the cost of all water required during construction in his overall construction cost. No reimbursement will be made.

4.02 Pipe and Fittings for Replacement of Sanitary Sewers

All materials for the sewer removal and replacement work shall be furnished by the Contractor. Any materials used by the Contractor from the Departments storage yard shall be replaced by the Contractor in a timely manner. Coordinate any material loans from Department storage yards with

the Engineer.

5.00 MATERIAL AND EQUIPMENT FURNISHED BY THE CONTRACTOR

The general requirements specified herein shall apply to all items of material and equipment in addition to the specifications for individual items appearing in the following Sections in the 5.00 series.

All material and equipment furnished by the Contractor for incorporation into the Project shall be new and of recent domestic manufacture, and shall be the products of reliable manufacturers who, unless otherwise specified, have been regularly engaged in the manufacture of such material and equipment for at least five years. All fittings and components shall, wherever possible, be standard stock articles of well known manufacturers. Where the Specifications designate the products of a particular manufacturer, the product specified has been found suitable for the intended use, but, unless otherwise provided, articles or products of similar characteristics may be offered for the approval of the Engineer. Complete descriptive data shall be furnished in quintuplicate regarding all materials furnished by the Contractor, consisting of dimension drawings, material identification, catalog references and other information necessary to clearly identify and evaluate each article. When substitutions are permitted, the Contractor shall make all necessary changes in adjacent or connected structures and equipment at his expense.

The Contractor is advised that the Sewer Atlas plates are schematic in nature and surveys of the existing sewer system, if any are available, may contain inaccuracies. He shall, therefore, take accurate measurements prior to conducting the work. Any delays caused by such problems shall be at the Contractor's expense and no extension of time will be allowed.

The Contractor shall exercise care to prevent damage to existing material and equipment components of the sewer system for the duration of the Contract, and shall repair or replace (with new items acceptable to the Department) any damaged or lost materials and equipment components. He will be relieved of such responsibility only upon final acceptance of all of the work by the Engineer.

With the following exceptions, materials and equipment removed from existing structures shall not be reused in the work even if deemed savable by the Engineer. All manhole covers and frames, if removed during construction of manhole replacement, shall be replaced with new approved material and castings.

Where contemplated changes, substitutions or appurtenant work require engineering design, in the opinion of the Engineer, the Contractor shall have such design services performed at his expense. Said engineering design services shall be of an extent satisfactory to the Engineer whose word shall be final and shall be performed by a Registered Professional Engineer licensed to practice in the State of Florida.

Unless otherwise specified, all steel bolts, nuts, washers and all other miscellaneous ferrous metal items furnished by the Contractor, shall be hot-dip galvanized in accordance with ASTM Standard A 123-89a, "Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products" or ASTM Standard A 153-87, "Zinc Coating (Hot-Dip) on Iron and Steel Hardware". Where the word "galvanized" or its abbreviation is used on the Specifications, it shall mean hot-dip galvanized. Fabricated items shall be hot-dip galvanized after fabrication. Internal threads shall be tapped or re-tapped after galvanizing.

All pipe, valves, reinforcing steel and miscellaneous materials shall be stored on blocks or racks. Pipe fittings shall be stored on blocks, racks or platforms. As far as possible, no material shall be stored so that it is in direct contact with the ground. All metal shall be thoroughly cleaned before being placed in the work.

Any savable pipe, fitting, or other miscellaneous material or equipment, removed during construction and not reused in the work shall be cleaned, hauled to and stored by the Contractor and at his expense, where directed by the Engineer, and shall remain the property of the Department, and all other material and equipment shall be disposed of by the Contractor at his own expense.

5.00.1 Warranty - Materials

All materials furnished by the Contractor, and particularly manufactured items, shall be certified by the manufacturers as to their material properties and suitability for the intended service. The materials shall be fully warranted by the Contractor and manufacturers to be free from defects in material or function for a one-year period after the date of acceptance by the Department of all work performed during the Contract duration. During the one-year warranty period, any defects which affect the strength, integrity or intended function of the repaired sewers or the repair components shall be repaired or replaced by and at the sole expense of the Contractor in a manner and with a method acceptable to the Engineer. If an item is replaced/repaired under the warranty, the item shall be individually warranted in the same manner for one (1) year from the date of acceptance of the repair or replacement as it was under the original basic warranty.

The Contractor shall procure extended manufacturer's warranties on equipment furnished by him. These warranties shall be kept in force and extended such that the Department will be provided a manufacturer's warranty with at least one year to run beyond the date of final acceptance of the Project. A copy of the warranty with these provisions clearly stated or with an attached letter of certification from the manufacturer to this effect shall be delivered with the material and no payment or partial payment for said material will be made until such warranty/certification is delivered to the Engineer.

As a part of final inspection, the Contractor shall deliver to the Department in a form satisfactory to the Engineer, either warranties or certifications of warranty extensions showing the warranty to be in effect at least one year beyond the planned date of final acceptance.

All costs for procuring, maintaining and extending these warranties shall remain with the Contractor, even in cases where the contract construction time for completion has been extended. These costs shall be included in the Contractor's bid price and no further compensation will be allowed.

In instances where the Department puts an item of equipment or material into full productive service prior to final acceptance, the warranty shall still be extended to at least one year past final acceptance. However, the Department will reimburse the Contractor for the prorated cost of the extended warranty from the time when the materials are placed in full productive service to the date of final acceptance based upon the manufacturer's invoice to the Contractor for this cost. Only the warranty cost will be reimbursed, no overhead or other costs will be allowed.

5.00.2 Shop Drawings

The Contractor shall submit to the Engineer for approval, shop drawings in accordance with the

requirements of Section 01340 Shop Drawings. Shop drawings, associated trade literature, calculations, schedules, manuals and similar documents shall be submitted for all materials and equipment to be furnished.

Prior to submission, the Contractor shall thoroughly check such drawings, satisfying himself that they meet the requirements for the Specifications and that they are coordinated with the arrangements set forth on other shop drawings, and shall place on them the date of his approval and his signature. Where items for which shop drawings are submitted are to meet special conditions listed in the Detailed Specifications, the conditions shall be so noted on the drawing. Where there is a deviation from the Specifications, the Contractor shall note it and state the reason why a deviation is required.

The approval of drawings and data will be general, and will mean that, upon examination of the drawings, no variations from the Contract requirements have been discovered, and approval will not relieve the Contractor of his responsibilities as defined under the Contract.

5.00.3 Project Record Documents

For Contracts where the work is performed at an on-site location, the Contractor shall maintain at the site one copy of the following:

1. Specifications and Manuals
2. Engineer's written orders or instructions.
3. Field test records.
4. Required Permits
5. Preconstruction photographs and/or videotapes
6. Plans or Atlas sheets
7. Daily Reports with all field notes.

For pipeline projects, the records listed above shall be made available to the Engineer at all times.

These documents shall be maintained in a clean, dry, legible condition and in good order, and shall not be used for construction purposes.

5.01 SEWER MAIN AWWA, PVC DR 26 HEAVY WALL GRAVITY SEWER PIPE

AWWA PVC DR 26 Heavy Wall Gravity Sewer Pipe shall conform to ASTM D3034 for 4" to 15" and F679 for 18" through 36". Gravity sewer pipe shall be green in color and shall be furnished and installed by the Contractor for this project for gravity mains and laterals.

All PVC DR 26 pipe shall be made from PVC thermoplastic having a cell classification of 12454 or 12364 as defined in ASTM Standard D 1784.

All pipe shall be suitable for use as a gravity sewer conduit. Provisions shall be made for

expansion and contraction at each joint with an elastomeric gasket. The bell shall consist of an integral wall section with a solid cross section elastomeric gasket which meets the requirements of ASTM F477. Gaskets shall be factory assembled and securely locked in place to prevent displacement during assembly. The joint design shall meet requirements of ASTM D3212 under both pressure and 22in Hg vacuum.

Gaskets supplied shall be EPDM or neoprene, unless otherwise specified. The proper number of gaskets, bolts, nuts and all necessary joint material, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protective containers.

All fittings and accessories shall have bell and spigot configurations compatible with the pipe.

Pipe Size (in)	Avg. OD	Nom. ID	Min. Thickness
6	6.275	5.793	0.241
8	8.400	7.754	0.323
10	10.50	9.692	0.404
12	12.50	11.538	0.481
15	15.30	14.124	0.588

As manufactured by: North American Pipe Corporation; JM Eagle; IPEX; or approved equal.

Fittings: Fittings: Harco, Plastic Trends or approved equal

5.02 SDR 26PVC PIPE FOR LATERALS

Laterals shall be constructed of 6-inch PVC SDR 26 heavy Walled Gasketed Sewer Pipe and Fittings. The pipe shall be made to conform to the requirements of ASTM D3034 for gasketed gravity sewer pipe. The pipe shall be made with an integral bell water-tight joint meeting the requirements of ASTM D3212.

Cell Classification: 12454 or 12364 as defined by ATSM D1784

Pipe Manufacturer: North American Pipe Corporation; Diamond Plastics Corporation; JM Eagle; IPEX; or approved equal.

Fittings: Harco, Plastic Trends or approved equal

5.03 PVC C905 PIPE FOR GRAVITY SEWER MAINS LARGER THAN 12-INCHES

Furnish PVC C905 gravity sewer pipe on gravity mains larger than 12-inches.

AWWA C905, PVC Pipe shall conform to ANSI/AWWA C905, "Polyvinyl Chloride (PVC) Pressure Pipe, 14 in. Through 48 In., for Water Transmission and Distribution", except as otherwise modified herein.

All PVC C905 pipe shall have cast-iron-equivalent (CI) outside dimensions and wall thickness dimensions as follows:

Size	Dimension (DR)	Ratio	Pressure (psi)	Rating	Min. Avg. Outside Diameter (in.)	Min. Thickness (in.)	Wall
16-inch	25		125		17.4	0.535	

Each length of pipe must be hydro-tested by the manufacturer at twice the pressure rating for a minimum of five seconds. A short term pressure test must be conducted once per production run where random pipe pieces are subjected to a gradual increase in pressure for a period of 60 to 70 seconds in compliance with ASTM 1599.

AWWA C905 pipe shall be made from PVC thermoplastic having a cell classification of 12454-B virgin compounds as defined in ASTM Standard D 1784-90.

Gaskets supplied for sewer force main shall be EPDM or neoprene, unless otherwise specified. The proper number of gaskets, bolts, nuts and all necessary joint material, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protective containers.

Pipe spigots shall be beveled. Pipe bells shall be extruded integral with the pipe barrel with a thickness equal to or greater than that of the barrel.

Pipe Manufacturer: North American Pipe Corporation; Diamond Plastics Corporation; JM Eagle; IPEX; or approved equal.

Fittings: Harco, Multi Fittings or approved equal

5.04 GRAVITY SEWER ADAPTERS

Connection to manholes – Manhole adapter with sand coating as manufactured by Harco
 Connections to existing laterals – Fernco couplings, flexible banded, sheer reinforced couplings
 Mainline to mainlines –316 stainless steel clamps or Hymax couplings, JCM repair couplings

5.05 CLEANOUTS

Construct cleanouts for replaced lateral where ordered by the Engineer. The cleanout assembly shall have a 6x6 wye, 45 degree pipe, riser and threaded plug constructed of PVC SDR 35.

Cleanouts in sidewalks shall be located inside the meter box defined in Standard Detail 22.0. Cleanouts in paved driving surfaces (paved parking swales, other drivable surfaces) shall be installed inside a No. 53 valve box marked sewer.

Cleanouts in backyards shall be in accordance with Standard Detail SS 21.0 Manhole/Valve Box in grass areas. The slab around the meter box or valve box shall be high enough so it does not easily get buried.

5.06 TELEVISION CAMERA SYSTEM

Television Camera System

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The television cameras used for the surveys shall be of types specifically designed and constructed for such surveys. The camera for the main line pipe survey shall be of the pan and tilt type, capable of turning to look at right angles to the pipe's axis over an entire vertical circle. **The Contractor shall stop, pan and tilt at every lateral in the line.** Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the large diameter pipes. Two sets of lights are required. One set shall be mounted on the camera's transport platform and point forward. The other set shall be mounted on the camera and point where the camera is looking. The camera shall be operative in 100 percent humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing a minimum 700 total line resolution (with 460 horizontal lines) color video picture.

The camera for the service lateral survey shall be of the miniature type. It shall be mounted on the end of its cable, and shall be pushed into the lateral via the cleanout at the property line or the camera shall be launched from the mainline using lateral launch system. The camera and cable shall be capable of snaking through the bends in 4-inch and 6-inch diameter service lateral pipes. A light shall be mounted coaxially to the camera and shall be suitable to allow a clear picture of the entire periphery of up to 8-inch diameter pipes. The miniature camera system resolution shall be 330 horizontal lines, minimum.

The camera system shall provide clear, recognizable pictures with the necessary details that meet the requirements of the Department. Furthermore, if the picture quality and definition for both the main line and miniature cameras are unsatisfactory to the needs of the Department, the equipment shall be removed and replaced with adequate equipment.

The video camera shall include a data view display feature capable of showing on the tape the following information:

- Contract No.
- City and State
- Date
- Contractor's Name
- Line Size
- Manhole Identification (both manholes), Pump Station and Work Order Number
- On-going Footage Counter

Provide a suitable blower to defog the line and promote a clear picture, as needed.

Push TV Camera System

A push camera may be used to perform the TV inspection of the new lateral. The lateral shall be inspected after the lateral pipe is installed, connected, backfilled and compacted (tee may be left without backfilling for TV inspection). Suitable backfill material shall be furnished by the Contractor. The Contractor shall, with prior approval from the Engineer, install a dual directional tee with a cap approximately six (6) feet from property line or one (1) foot in front of sidewalk to inspect the lateral with a push TV-camera. If the installation is below the water table, a pipe extension shall be added to the tee. The tee shall be of the same material as the lateral PVC C900 or ductile iron and furnished by the Contractor. The lateral installation shall be free of rocks and other material that may damage the tee during compaction.

Removable Data Storage Device Format to Match the Department's System

Information obtained shall be recorded on a removable data storage device (USB flash or external drive) format to match the Department's Equipment (MPG1 format, unless otherwise approved in writing by the Engineer). This is a necessary part of the Specifications and the Contractor's equipment must be approved by the Engineer.

In conjunction with internal television recording will be required to record the condition of all lengths of the sewers and the manholes plus unusual situations. All files in the removable data storage device shall be labeled and cross referenced to the internal inspection logs.

The Contractor will be required to have all removable data storage devices and necessary playback equipment readily accessible for review by the Engineer during the Project. The removable data storage device shall be submitted to the Engineer on a weekly basis and will be processed with the current monthly estimates.

5.07 BEDDING AND BACKFILL MATERIAL

Pipe Bedding

Pearock shall be used for small diameter PVC gravity sewer pipe bedding as indicated on the Details. Pearock shall consist of hard, durable particles of proper size and gradation, and shall be free from organic material, wood, trash, sand, loam, clay, excess fines, and other deleterious materials. The pearock shall conform to the requirements of ASTM C 33, Size Number 8, and be graded within the following limits:

<u>U.S. Sieve Size</u>	<u>Percent Finer by Weight</u>
2-inch	100
3/8-inch	85 to 100
No. 4	10 to 30
No. 8	0 to 10
No. 16	0 to 5

Crushed stone shall be used for bedding of 24-inch and larger diameter pipe and/or manholes as indicated on the Details in Appendix B. Crushed stone shall consist of hard, durable, sub-angular particles of proper size and gradation, and shall be free from organic material, wood, trash, sand, loam, clay, excess fines and other deleterious materials. The stone shall conform to the requirements of ASTM C 33, Size No. 57 (3/4-inch rock) and be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1/2-inch	100
1-inch	95 to 100
2-inch	25 to 100
No. 4	0 to 10
No. 8	0 to 5

All pipe bedding material for gravity sewer shall be new. Existing pipe bedding material may not be used.

Backfill

Except where a flowable fill sand concrete mix is required, granular soil backfill materials shall be utilized. Backfill material shall not be expansive nor have high organic content, shall be free of debris, lumps and clods, and shall meet the following requirements:

1. Maximum Liquid Limit shall not exceed 12 as determined by ASTM D 423.
2. Maximum Plasticity Index shall not exceed 35 as determined by ASTM D 424.
3. Not more than 10 percent of weight shall be finer than 74 micron (No. 200) U.S. Standard Sieve.

Backfilling shall be done in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering. Backfill to original ground surface or subgrade surface of openings, with sufficient allowance for settlement. The Engineer may require that the material used for this backfill be obtained from a source entirely apart from the structure. Use only material accepted by the Engineer.

Do not allow heavy construction equipment to cross over the trench until placing and compacting backfill material to the finished earthwork grade or to an elevation at least 4 feet above the crown of the pipe.

Trenches for pipe may have up to four (4) zones that must be backfilled.

Lowest Zone: The lowest zone is backfilled for deep undercuts up to 4 inches from the bottom of the pipe

Bedding Zone: The zone above the lowest zone is the bedding zone. Usually it will be the backfill which is the 6 inches of soil below the bottom of the pipe.

Cover Zone: The next zone is backfill that is placed after the pipe has been laid and will be called cover zone. This zone extend 12 inches above the top of the pipe. The cover zone and the bedding zone are considered the soil envelope for the pipe.

Top Zone: the top zone extends from 12 inches above the top of the pipe to the base or final grade.

Broken concrete shall not be used. Fill material containing limerock shall have sufficient sand to fill the voids in the limerock. No stones or rocks larger than 6-inches in diameter will be permitted in any backfill. Backfill material placed within 1-foot of piping and appurtenances or in the upper 6-inches of all backfill and fills shall not contain any stones or rocks larger than 1-inch in diameter.

Existing backfill material may be used, only if it meets the above mentioned requirements.

For initial backfill over pipelines, see Section 6.11.3.& 4.

5.08 PAVING MATERIALS

5.04.1 General

Asphaltic concrete mixtures shall be obtained only from plants which comply with the requirements of F.D.O.T. Specifications, Section 320, as applicable, using materials specified herein, and producing the specified mixture. General construction requirements for all hot bituminous mixtures specified herein shall conform to F.D.O.T. Specifications, Section 330, as applicable, with the following modification and specified requirements.

Alignment of Edges: Lay all asphaltic concrete mixtures, including leveling courses, other than adjacent to curb and gutter or other true edges, by the stringline method to obtain an accurate, uniform alignment of the pavement edge.

Temperature of the Spreading: The Contractor shall maintain the temperature of the mix at the time of spreading within 25 F (14 C) \pm of the established mix temperature selected by the Contractor. As a minimum, the Engineer will take mix temperature of the mix on the road in averages.

Rain or Surface Conditions: Immediate cease transportation of asphalt mixture from the plant when rain begins at the roadway. Do not place asphalt mixtures while rain is falling, or when there is water on the surface to be covered.

Patch/Temporary Paving

Patch or Temporary Paving will be required along the entire route where the original paved surface is removed. The trench shall be backfilled up to a level of 1" (or as required by permitting agency, such as 1-1/2" in the City of Miami) below the existing pavement surface and temporary pavement shall be constructed up to the level of existing pavement grade. The Contractor shall install a suitable hot mix asphalt patch, to be left in place and installed over properly compacted lime rock base course or flowable fill, to be incorporated into the specified permanent pavement restoration as part of Type I, Type II or Type M-I paving replacement.

Temporary patch paving, if approved by the Engineer, may be utilized along the entire route where the original paved surface is removed. The trench shall be properly backfilled up to a level 1" (or as required by permitting agency, such as 1-1/2" in the City of Miami) below the existing pavement surface and a temporary, cold mixed sand/asphalt pavement shall be constructed up to the level of the existing pavement surface. The liquid asphalt shall be Grade RC-70 conforming to the requirements of F.D.O.T. Specifications, Section 916-2. The sand shall conform to the requirements of F.D.O.T. Specifications, Section 902 for fine aggregate.

Sand seal on the limerock base course will not be permitted in lieu of temporary paving.

Type I Paving Repairs (Limerock Base and 2" Asphaltic Concrete Surface)

All limerock material and the sources thereof shall be furnished by the Contractor. Limerock for pavement base shall be Miami limerock, obtained from local sources, where the overburden was removed from the pits prior to mining operations. The limerock shall comply with the

requirements of F.D.O.T. Specifications, Section 911.

Where Type S Asphalt Concrete is specified in the Contract, if approved by the Engineer, Type S Asphalt Concrete may be selected as an alternative for the final surface when no friction course is specified, and as a final layer of structural course prior to the friction course.

The asphaltic concrete shall be plant mixed, using the best grade of local aggregates of approved size and gradation and mixed with an approved binder. The asphaltic concrete shall conform to either the State of Florida Department of Transportation Specifications, Type S-1 Asphaltic Concrete, Section 331-1 through 331-5, or, Miami-Dade County Public Works Type I, as ordered by the Engineer.

Connections to Existing Pavement, Drives

Generally adhere to the limits of construction at the beginning and end of the project as detailed in the work order. However, if the Engineer determines that it is necessary to extend the construction in order to make suitable connections to existing pavement, the Engineer will authorize such a change in writing.

Pavement Markings

Pavement markings for this Project shall conform to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, as revised by the local governing agency.

A. Traffic Paint

1. Apply paint, traffic stripes, and markings in accordance with the Contract Documents, and remove traffic stripes and markings when required.
2. Use equipment that will produce continuously uniform dimensions of traffic stripes and markings of varying widths.
3. Traffic paint and procedures shall conform with F.D.O.T. Specifications, or, at the Contractor's option, fast dry traffic paint, as specified in F.D.O.T. Specifications Section 971-13, may be used.
4. Apply white and yellow pavement markings that will attain an initial retroreflectance of color, as existed before the repair.

B. Thermoplastic Traffic Stripes and Markings

1. Apply Thermoplastic traffic stripe and markings, or refurbish existing thermoplastic traffic stripes and markings, in accordance with the Contract Documents and remove traffic stripes and marking as required. Use only thermoplastic material listed in Section 711 of the F.D.O.T. Specifications.
2. Use equipment to install hot applied thermoplastic material constructed to provide continuous uniform heating temperatures.

3. Apply white and yellow pavement markings that will attain an initial retroreflectance of color, as existed before the repair.
4. Prior to installation of the thermoplastic material on all portland cement concrete surface, apply primer sealer recommended by the manufacturer as listed in Section 711 of F.D.O.T. Specifications

C. Reflective Pavement Markers

1. Place Reflective Pavement Markers (RPMs) and adhesive, which upon installation produces a positive guidance system to supplement other reflective pavement markings. Reflective pavement markers shall be installed as they existed before the repair. They shall be replaced with the appropriate color or colors and oriented in the correct direction as specified in Section 706 of the F.D.O.T. Specifications.

5.09 Concrete, Mortar and Grout

5.09.1 Concrete

Use concrete composed of a mixture of portland cement, aggregate, water and where specified, admixtures. All concrete work shall be constructed in accordance with all of the applicable provisions of Section: "Cast-in-Place Concrete, Reinforcing and Formwork," included herein at the end of the Specifications. All concrete used throughout the Project, shall contain Type II Portland cement with a minimum design strength of 4,000 psi.

5.09.2 Mortar

Mortar shall be composed of one part of Type II Portland cement to three parts of sand, with sufficient lime putty added to secure workability. In no case shall the lime putty exceed 10 percent, by weight, of the cement used.

5.09.3 Grout

Grout shall be non-shrink composed of one part of Type II Portland cement to three parts of sand.

Specifications for cement and sand for grout and mortar shall be the same as those for concrete.

Epoxy grout: "Five Star" epoxy grout by U.S. Grout Corp., or equal.

Hydraulic-Cement Grout (Nonshrink)

Non-shrink, non-metallic grout shall be meet ASTM C1107 Grade B or Grade C only. Grout must meet ASTM C 1107 at a temperature range of 50 to 90 degrees F at a flowable consistency and set in less than 5 minutes. The one day compressive strength shall be a minimum of 2,500 psi. Hydraulic Cement shall be Quikrete Hydraulic Water-Stop Cement, Unitex Rapid-Setting Hydraulic Cement or approved equal.

5.09.4 Flowable Fill

Furnish and place Flowable Fill as an alternative to compacted soil if approved by the Engineer. Flowable Fill shall be in accordance with Section 121 of Florida Department of Transportation "Standard Specifications" for Road and Bridge Construction.

Materials used shall conform with the requirements of FDOT Specifications as follows:

- 1. Portland Cement (Types I, II, or III)..... Section 921
- 2. Fly Ash, Slag and other Pozzolanic Materials for Portland Cement Concrete Section 929
- 3. Fine Aggregate (sand)* Section 902
- 4. Water..... Section 923
- 5. Air Entraining Admixtures** Section 923

*Any clean sand with 100% passing 3/8" sieve and not more than 10% passing the 200 mesh may be used.

The Contractor shall be responsible for producing a flowable mixture using these guidelines and adjusting his mixture design as called for by circumstances as may be directed by the Engineer.

Flowable fill material shall be proportioned to produce a 28-day compressive strength of approximately 50-150 psi.

Flowable fill shall be produced and delivered using concrete construction equipment. Placing flowable fill shall be by chute, pumping or other methods approved by the Engineer.

The flowable fill shall be placed to the designated fill line without vibration or other means of compaction. Placement shall be avoided during inclement weather, e.g. rain or ambient temperatures below 40 degrees F. The Contractor shall take all necessary precautions to prevent any damages caused by the hydraulic pressure of the fill during placement prior to hardening. Also, necessary means to confine the material within the designated space shall be provided by the Contractor.

The flowable fill shall be proportioned and placed as specified herein. In general, the strength desired is the maximum hardness that can be excavated at a later date using conventional excavating equipment. No curing protection is required. The fill shall be left undisturbed until material obtains sufficient strength. Sufficient strength is 250 psi penetration resistance as measured using a hand held penetrometer. The penetrometer shall be provided by the Contractor.

All flowable fill areas subject to traffic loads must have a durable riding surface.

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FLOWABLE FILL

FDOT - Approved Design Mixes for Miami-Dade County

PlantMix Number

Tarmac -end of Tpk.	06-FF-04
Fla. Rock & Sand - Card Sound	06-FF-05
Rinker Princeton	06-FF-07
Rinker Downtown	06-FF-08
Rinker Le Jeune	06-FF-08
Rinker Sweetwater	06-FF-08
Rinker North Miami	06-FF-08
Dade Concrete and Pumping	06-FF-09
Job-Mix Concrete Company	06-FF-10
Job-Mix Concrete Company	06-FF-11

Furnish a delivery ticket to the Engineer for each load of flowable fill delivered to the work site. Ensure that each ticket contain the following information

1. Project designation
2. Date
3. Time
4. Class and quantity of flowable fill

NOTE: A delivery ticket for the flowable fill shall be provided to the Department Inspector upon delivery of flowable fill, with proposed quantity to be used for the given area.

5.10 BRICK

Concrete brick shall conform to ASTM Standard C55-85 "Concrete Building Brick". Clay brick shall be used in manhole construction. Clay brick shall conform to ASTM Standard C62-89a, "Building Brick (Solid Masonry Units Made from Clay or Shale)".

Bricks shall have true edges and sharp corners and shall have been cured for at least 14 days before being placed.

5.11 STEEL REINFORCING

Bar reinforcement for concrete structures shall conform to the requirements of ASTM Standard A615-90, "Deformed and Plain Billet-Steel Bars for Concrete Reinforcement", Grade 60, Deformed, except that steel manufactured by the Bessemer Process will not be accepted. Wire mesh reinforcing for concrete structures shall be welded wire fabric meeting the requirements of ASTM Standard A185-90a "Steel Welded Wire Fabric, Plain, for Concrete Reinforcement".

The Contractor shall furnish the Engineer with the manufacturer's test certificates showing the steel to meet the above requirements, in addition to which the Engineer may take representative samples from the material on the job and have them tested by an independent testing laboratory.

Completely detailed shop drawings and bending schedules shall be submitted by the Contractor for the approval of the Engineer. Such approval shall be obtained before the bars are cut and bent.

5.12 Minimum Equipment to be Carried by the Sanitary Sewer Gravity Main Removal and Replacement Crew

The Contractor shall provide at all times, as a minimum, the following equipment with each sanitary sewer gravity main removal and replacement crew:

- Approved Debris Removal and Disposal Equipment (Vactor Truck)
- Waste Transportation Permit
- Shoring box
- Traffic plates
- Safety Cones (FDOT approved and as required by the permit)
- First Aid Kit
- Fire Extinguisher
- Rolla-Tapes (1 each)
- Metal Detector (Manhole Locators)
- Air Blowers with Ducts of sufficient size and capacity to provide a safe atmosphere
- Safety Harness with Rope
- Safety Ladder
- Safety Vests for each Crew Member
- Various Picks, Shovels, Pry Bars, Sledge Hammers, Water Coolers, Hand Tools and Personal Tools of Technicians
- Necessary Forms and Permits
- Debris Traps as necessary
- Fire Hydrant Wrench (2 each)
- Oxygen Deficiency / Explosion / Hydrogen Sulfide / Methane / etc. Meters
- Closed Circuit Television Inspection and Recording Equipment
- Marking paint
- Video and digital camera
- Set of Standard and Manuals
- Copy of the Contract Documents, including utility location tickets and all necessary permits
- Line Cleaning Vehicles
- Mirror with pole, for lamp testing pipe installation
- Ring Gauge, for testing pipe installation

"J" Pipe Plug

Illuminating Device

Provide Personnel Protective Equipment, Safety Harness with Rope & Tripod, "J" Pipe Plugs – Multiple size plugs from 6" to 24"

Night illuminating Devices

Miniature Camera Launch System for post televising of laterals 4" to 6" to be used from mainline

Miniature Push Camera to be used via the clean out

Laser Equipment to verify sewer grades

5.13 Castings

General: Materials used in the manufacture of the castings shall conform to ASTM Standard A48-94a), "Gray Iron Castings", for Class 35iron. Manhole and valve box covers shall have a roadway type surface, machined mating surface and shall be non-rocking.

Shop drawings shall be furnished for all castings supplied and said drawings shall include certified dimensions and weights of all components. Dimensions shall conform with Department Standard Detail requirements.

Finish casting dimensions shall be held to the following tolerances: Up to 4 inches, $\pm 1/32$ inch; 4 to 8 inches, $\pm 3/64$ inch; 8 to 12 inches, $\pm 1/16$ inch; 12 to 24 inches $\pm 1/8$ inch; above 24 inches, add the appropriate (minimum) value from those given above to $\pm 1/8$ inch. Note that this shall not affect the requirement that mating surfaces shall be machined and shall bear for their full length. Components shall be interchangeable with new and existing units without exceeding the tolerance add up specified above.

Weight of castings supplied shall not vary more than ± 5 percent from the certified weight supplied by the Contractor as a part of his shop drawings.

The foundry's name shall be cast in the bottom of each lid. Body and lid or frame and cover shall be manufactured by the same foundry. Manufacture of the various components comprising one set, such as for example; a valve box and lid, by different manufacturers is expressly forbidden.

Note that name cast into the bottom of the lid shall be the name of the actual foundry doing the casting. Name of an importing, purchasing or fabricating (from components) firm will not be acceptable. Methods of attaching this information other than casting are not acceptable.

Each shipment of castings provided by the Contractor shall be accompanied by a certification specifically stating that the materials of that shipment comply with all requirements of this Specification, specifically including dimensions and tolerances, materials of manufacture, weights of components, marking and foundry of origin. This certification shall be signed, dated and sealed by a registered professional engineer licensed to practice in state where the materials are cast or if not of domestic manufacture in the state where the supplying firm is located. One original of this certification shall be shipped with the materials and one original shall be sent to Supervisor, Specifications Unit, Miami-Dade Water and Sewer Department, P.O. Box 330316, Miami, Florida 33233-0316. Shipments sent without the certification as required above may not be accepted.

General Materials used in the manufacture of the castings shall conform to ASTM Standard

A48-83(90), "Gray Iron Castings", for Class 35iron. Manhole and valve box covers shall have a roadway type surface, machined mating surface and shall be non-rocking.

1. Material used in the manufacture of the castings shall conform to ASTM A48, "Gray Iron Castings", for Class 35iron. Manhole and valve box covers shall have a roadway type surface.
2. Castings shall be as manufactured by U.S. Foundry and Manufacturing Corp., Neenah Foundry, or approved equal.
3. Castings shall be furnished unpainted with shot blasted finish.

5.14 Sewer Lateral Cleanout

Sewer later cleanout shall be 6-inch minimum in size. It shall be installed using Polyvinyl Chloride (PVC) AWWA C 900/C905 wye type fitting, 45 degree bend, riser pipe and threaded clean-out plug. It shall have a concrete box and lid as shown on standard details.

5.15 Cured-In-Place Pipe Lining System

The finished liner shall incorporate thermosetting resin materials that will resist the corrosive effects of the raw sewage effluent and hydrogen sulfide gas. The cured-in-place pipe lining system shall comply with the recommendations of these Specifications and ASTM Standard D5813-95. Repairs in industrial areas will utilize an epoxy vinyl ester resin system and repairs in non-industrial areas a polyester resin system or an epoxy vinyl ester resin system. The Engineer shall determine the type of appropriate resin to be utilized for each line segment. Required resin shall be delivered in original sealed containers with the manufacturer's label, otherwise it may be rejected for use. In addition, the use of recycled resins or resins containing the by-product of recycled resins shall be strictly prohibited.

Qualification of curer-in-place liner Contractor: The Contractor must submit proof that his/her firm has been regularly and successfully engaged in the commercial installation of the liner product for a minimum of one (1) year, and has successfully performed an aggregate amount of at least 100,000 linear feet of sanitary sewer repairs of pipes 8 through 27 inches in diameter in subaqueous conditions.

5.15.1 Products

The finished liner pipe (in-place) shall be fabricated from materials which, when cured, will be chemically resistant to withstand internal exposure to domestic sewage including exposure to hydrogen sulfide gas.

The Contractor shall submit shop drawings and other information to the Engineer for review in accordance with Section 5.00.2, "Shop Drawings." The liner manufacturer shall submit a tabulation of time versus temperature. This tabulation shall show the lengths of time that exposed portions of the liner will endure without self-initiated cure or other deterioration beginning. This tabulation shall be in five (5) degree increments, ranging from 70 degrees F to 100 degrees F. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner.

For the liner system to be acceptable, a minimum amount of 500,000 linear feet of satisfactory wastewater collection system liners of any pipe size installed in the United States must be documented.

5.15.2 Materials for Main Lines

A. Resin and Felt Tube System

The resin shall be a corrosion resistant polyester and catalyst system. A fiber felt tube compatible with the inversion or pull in place installation process and having the following minimum physical properties for the cured pipe:

Tensile Strength	ASTM D638	3,000 psi
Flexural Strength	ASTM D790	4,500 psi
Flexural Modulus of Elasticity	ASTM D790	300,000 psi
Long-Term (50 Year)		
Flexural Modulus of Elasticity	ASTM D2990	150,000 psi

The polyester resin or an epoxy vinyl ester resin and fiber felt tubing system shall be in accordance with the requirements of ASTM F1216 or F1743 and be fabricated to a size that, when installed, will neatly fit the interior of the host pipe. Allowance shall be made for circumferential stretching during inversion and/or for longitudinal stretching during a direct (non-inversion) pull in. The cured-in-place pipe (CIPP) product shall fit tightly to the host sewer pipe (with minimal shrinkage) in such a way as to minimize water migration (tracking) between the liner and the host pipe.

B. Resin Submittals

Prior to any liner installation, the Contractor shall submit technical data sheets showing the physical and chemical properties and infrared spectrum analysis per ASTM E1251 (chemical fingerprint) of the proposed resin system as modified for the cured-in-place process. Resin samples will be provided as directed by the Engineer during the duration of the project and infrared spectrography chemical fingerprints shall be run and compared to the submitted fingerprint to verify the resin used is the resin submitted for use on this project. Copies of the certificates of analysis for resin used on the project must be made available to the Department on site prior to liner installation. Additionally samples of the cured liner from each installation consisting of a twelve inch (12") restrained sample shall be provided to the Inspector. The samples shall be permanently marked with Contract number and a date, Pump Station line segment and Work Order Number.

C. Tube Length

The minimum tube length shall be that deemed necessary by the Contractor to effectively span the distance between the access points (normally manholes) and to facilitate a good, "non-tracking" seal. The Contractor shall verify the lengths in the field before cutting liner to length and otherwise preparing it for installation.

D. Minimum Liner Thickness

The following Table presents the minimum liner wall thicknesses to be utilized. It is based upon the cured liner pipe characteristics presented above, and was calculated in

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accordance with Appendix XI of ASTM F1216, for the indicated existing nominal host pipe diameters and depths of installation, based upon the following design conditions and parameters:

- No structural support to the pipe liner from the existing pipe.
- Live load equivalent to two (2) H20 passing trucks.
- Water table at grade elevation.
- Soil density = 120 pcf.
- Modulus of soil reaction, no greater than 1,000 psi.
- Minimum ovality of the host pipe shall be 5 percent.
- Minimum safety factor = 2.0.
- Flexural modulus of elasticity shall be reduced by 50% minimum (to account for long term effects) and used in the design equation as EL.

Design liner to withstand live load equivalent plus all pertinent dead loads, hydrostatic pressure and grout pressure (if any).

Minimum Cured-in-Place Pipe Liner Thickness Millimeters (inches)						
Nominal Host Pipe Diameter (inches)	Depth of Installation in Feet					
	2-5-4	4-8	8-12	12-16	16-20	20-24
8	6.0 (0.236)	6.0 (0.236)	6.0 (0.236)	6.0 (0.236)	6.3 (0.248)	6.8 (0.268)
10	6.0 (0.236)	6.0 (0.236)	6.4 (0.252)	7.2 (0.283)	7.8 (0.307)	8.5 (0.335)
12	7.1 (0.280)	6.6 (0.260)	7.6 (0.299)	8.5 (0.335)	9.4 (0.370)	10.2 (0.402)
15	8.8 (0.346)	8.1 (0.319)	9.4 (0.370)	10.6 (0.417)	11.7 (0.461)	12.5 (0.492)
18	10.4 (0.409)	9.6 (0.378)	11.1 (0.437)	12.6 (0.496)	13.9 (0.547)	15.1 (0.594)
21	11.9 (0.469)	10.9 (0.429)	12.8 (0.504)	14.6 (0.575)	16.2 (0.638)	17.5 (0.689)
24	13.4 (0.528)	12.3 (0.484)	14.5 (0.571)	16.6 (0.654)	18.3 (0.720)	19.9 (0.783)
27	14.6 (0.575)	14.3 (0.563)	16.5 (0.650)	18.5 (0.728)	20.3 (0.799)	22.0 (0.866)
36	19.3 (0.760)	18.0 (0.709)	22.0 (0.866)	24.5 (0.965)	27.0 (1.063)	29.3 (1.154)

E. Liner Thickness Design

Contractor shall submit to the Engineer for approval, complete liner thickness design calculations for the liners to be installed, signed and sealed by a Professional Engineer registered in the State of Florida. No liner shall be accepted or installed until liner

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thickness design calculations have been approved by the Engineer. Liner thickness design calculations shall be in accordance with ASTM F1216 Appendix XI, based upon the design conditions and parameters presented above, for the indicated existing nominal host pipe diameters and depths of installation.

F. Warranty Period

The Warranty Period for the installed Cured in Place Liners in mains shall be two (2) years.

5.15.2.1 Materials for Laterals

All Lateral Lining Systems shall be pre-approved by the Department based on testing and evaluation done by the Department. Only products that have had a successful test application within the Department's system or have been evaluated as comparable to successful installations in the pilot program shall be considered for use.

Preapproved Products List

Available Manufacturers: Subject to compliance with requirements, manufacturers offering systems that may be incorporated in the Work include, but are not limited to, the following:

1. LMK Technologies
2. BLD Services LLC
3. Perma-Liner InnerSeal by Perma-Liner Industries, LLC
4. Trelleborg Pipe Seals (pending final inspection of test applications)
5. Interfit USA
6. Lanzo Lining
7. Ricman
8. Or approved equal

Acceptable Material Standards

ASTM F1216 or F1743 - Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

ASTM F2561 for the LMK Technologies proprietary product - The Standard Practice for Rehabilitation of a Sewer Service Lateral and its connection to the Main Using a One-Piece Main and Lateral Cured-in-Place Liner

Intent

It is the intent of this portion of this specification to provide for the rehabilitation of service lateral main line connections at approximately the locations shown determined by the Department, by the installation of a resin-impregnated, flexible, felt tube inverted into the existing service lateral utilizing a pressure apparatus positioned in the mainline pipe or through a clean-out. Curing shall be accomplished by ambient cure or other approved method to cure the resin into a hard impermeable pipe-within-a-pipe. When cured, the service lateral connection repair shall extend over the length of inversion in a tight fitting, watertight pipe-within-a-pipe to effect a water seal with the rehabilitated lateral pipe. The wall thickness shall taper at the ends providing a smooth transition.

The Department will select from a full wrap, brim type or no connection to the main line depending on the existing condition.

General Corrosion Requirements

The finished CIPP lateral liner shall be fabricated from materials which, when cured, will be chemically resistant to withstand internal exposure to domestic sewage including exposure to hydrogen sulfide gas. The CIPP lateral liner shall be a one-piece joint-less tube that will seal at the mainline interface.

Service Connection Repair (CIPP) Materials

Repairs shall utilize a polyester resin system or epoxy vinyl ester resin system. The connection full wrap or brim style is acceptable. The completed repair shall create a water and airtight seal inside the lined lateral and main.

The finished CIPP lateral liner shall be fabricated from materials which, when cured, will be chemically resistant to withstand internal exposure to domestic sewage including exposure to hydrogen sulfide gas. The CIPP lateral liner shall be a one-piece joint-less tube that will seal at the mainline interface.

The CIPP lateral liner shall be a minimum of 3 mm thick for lateral repairs 10 feet or less in depth from the ground surface and a minimum of 4.5 mm thick for lateral repairs deeper than 10 feet in depth.

The maximum pipe reduction for a 6-inch diameter lateral pipe shall be 5.625 inches. The maximum pipe reduction for an 8-inch diameter gravity main line pipe at the lateral connection shall be 7.4 inches.

No CIPP lateral liner reconstruction product that requires bonding to the existing lateral pipe for any part of the structural strength will be allowed.

The polyester resin or epoxy vinyl ester resin and fiber felt tubing system shall be in accordance with the requirements of ASTM F1216 or F1743 (ASTM 2561 for the LMK Technologies proprietary product) and be fabricated to a size that, when installed, will neatly fit the interior of the host pipe. Allowance shall be made for circumferential stretching during inversion and/or for longitudinal stretching during a direct (non-inversion) pull in. The cured-in-place pipe (CIPP) product shall fit tightly to the host sewer pipe (with minimal shrinkage) in such a way as to minimize water migration (tracking) between the liner and the host pipe.

A flexible, felt tube shall be fabricated to a size that when installed will neatly fit the internal circumference of the conduit specified by the specifications. The Contractor shall take care to ensure that the liner extends into the service connection at the main creating a watertight seal with the main liner, but that no portion of the lateral liner protrudes into the main at the completion of installation.

Requirements: The liner tube shall meet the following requirements.

1. The tube shall be fabricated to a size that when installed will tightly fit the internal circumference of the sewer main. Allowance shall be made for circumferential stretching during inversion.
2. The outside layer of the tube (before inversion) shall be plastic coated with a translucent flexible material that clearly allows inspection of the resin impregnation (wet out) procedure. The plastic coating shall not be subject to delamination after curing.
3. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the

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tube that is subject to delamination in the cured CIPP. No dry or unsaturated layers shall be evident.

4. The wall color of the interior pipe surface after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment can be made.
5. The resin system shall be a 100% solids, epoxy or silicate based system as preapproved by the Department.
6. The final service lateral connection repair CIPP installation shall conform to the minimum structural standards as listed below:

<u>Final CIPP</u>	<u>ASTM Standards</u>	<u>Results</u>
Flexural Stress	ASTM D790	4,500 psi
Flexural Modulus of Elasticity Long Term 50 Year	ASTM D790	300,000 psi

No structural support to the pipe liner from the existing pipe.

Live load equivalent to two (2) H20 passing trucks.

Water table at grade elevation.

Soil density = 120 pcf.

Modulus of soil reaction, no greater than 1,000 psi.

Minimum ovality of the host pipe shall be 5 percent.

Minimum safety factor = 2.0.

Flexural modulus of elasticity shall be reduced by 50% minimum (to account for long term effects) and used in the design equation as EL.

Mainline Connection/Interface Seal/Lateral Lining

The cured-in-place mainline/lateral liner connection repair system shall be a "T-Liner" as manufactured by LMK Enterprises, Service Connection Seal Plus Lateral (SCS+L) as manufactured by BLD Services LLC, or approved equivalent.

A water tight seal shall be created at the connection of the lateral to the main sewer by use of either a hydrophilic paste grout, a preformed self-stick hydrophilic rubber joint sealant (DeNeef "Swelldseal" or approved equal), or a molded hydrophilic neoprene rubber tubular gasket "hat" (LMK Enterprises "Insignia Connection Hat," or approved equal).

Experience

For the CIPP lateral liner system to be acceptable, a minimum of 300 successful lateral repairs in a wastewater collection system application in the United States must be documented.

Cleaning of Sewer Line

It shall be the responsibility of the Contractor to remove internal debris and roots out of the sewer line and lateral prior to lining. The Contractor shall clean the lateral three feet beyond the end of the service connection. Failures due to improper cleaning will be reinstalled by the Contractor at his expense.

Access

The Contractor shall have access to the service lateral through the gravity sewer mainline. If a cleanout is available at the property line, the contractor shall have access through it only with

written permission from the property owner.

Inspection of Pipelines

The interior of the pipeline shall be carefully video inspected to determine the location of any conditions which may prevent proper installation of the service connection repair (CIPP) liner into the service lateral, and it shall be noted so that these conditions can be corrected. The post video shall include a view of the liner interface with the host pipe looking downstream. A CCTV recording and suitable log shall be provided to the Department in a Granite format. This data shall be capable of being uploaded into the Department Granite database.

If inspection reveals an obstruction or defect that cannot be removed by conventional sewer cleaning equipment, the repair shall be placed on hold. The Department will determine the next step of making a point repair excavation to uncover and remove or repair the obstruction.

Post Work Inspection

The inspection shall be performed with the CCTV camera. With the camera viewing the connection point, an attempt shall be made to obtain a water flush by the occupant, when possible. If no water is viewed during this procedure, it will be assumed the service lateral is blocked and the responsibility to quickly clear the lateral shall be the Contractor's.

A notification form shall be attached to the door of each home or building where service laterals have been grouted. This notification to the occupant shall state that the lateral servicing this listed address was grouted on this particular date and if any blockage of sanitary sewage flow occurs, the occupant should call a given phone number.

Warranty Period

The Warranty Period for the installed Cured in Place Liners in laterals shall be two (2) years.

6.00 CONSTRUCTION METHODS

The Contractor is required to do a pre-construction inspection of each line section to be removed and replaced and to take digital color photographs and videotapes to document the pre-existing above ground conditions. The Engineer shall be provided with one (1) set of digital photographs, and videos, when requested by the Engineer or determined to be required by the Contractor. These photographs may be used for purposes of determining required surface restoration and pre-existing conditions.

The Contractor is referred to Section 3.00.3 for a General Sequence of Work, some tasks of which are amplified in this Section. In addition to specific construction methods specified in the Section 6.00 Series, the following general requirements shall apply to the work under this Contract.

The Contractor shall match the existing grades of the sewer line with the replacement pipe. If an insufficient grade condition exists, the Contractor shall notify the Engineer prior to implementing and grade changes.

All work under this Contract shall be performed by skilled workmen specifically experienced in similar installations and work subtasks and the Contractor shall provide all equipment necessary to accomplish satisfactory completion of the work.

The Contractor shall be responsible for assuring uninterrupted sewer service to affected

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customers through existing or newly constructed and opened sewers during construction, except as permitted or directed by the Engineer. The Contractor shall provide bypass pumping or plugging and monitoring of the sewers, on a case-by-case basis, where the Engineer deems it necessary. Bypass pumping is specified in Section 6.01, below.

The Contractor shall, by using temporary pipelines, hoses, plugs, and pumps, bypass the sewage around the section of main to be removed and replaced or plug upstream manhole and monitor incoming flow until that section is complete to the satisfaction of the Engineer.

Cost for temporary connections required for maintaining service during construction shall be included in other parts of the job and no additional compensation will be allowed.

In order to minimize the inconvenience to the property owners, the work shall be limited to one section of sewer at a time, unless otherwise permitted by the Engineer. A section (or reach) of sewer in these Specifications shall mean from manhole to manhole.

Should any phase of the work lag, the Engineer will suspend other phases until the lagging phase is brought up to schedule. Such action by the Engineer will be for the purpose of confining the construction work to as small an area as possible and shall not be used as justification to request an extension of completion time.

Unless approved otherwise by the Engineer, patch/temporary paving, as specified in 6.14.2, shall be placed the same day as the trench backfill, and it shall be overlaid/replaced with permanent paving within thirty days.

New pipe, fittings and related material and equipment shall be distributed along the right-of-way in advance of installation only to the extent approved by the Engineer. Such materials shall be so placed as to keep obstruction to traffic at a minimum.

During construction, and where applicable, the Contractor shall, by sprinkling with water or by other means approved by the Engineer, eliminate dust annoyance. No additional compensation will be paid to the Contractor for any costs incurred in complying with these provisions. In addition, the Contractor shall notify affected customers of construction work and paving activities. This notification shall be accomplished, at least 24 hours prior to start of work, with a notification card to be placed in door hangers at the addresses of affected customers. The notification shall include the Contractor's twenty-four hour contact number. Notification cards will be provided by the Department.

No request for additional compensation or Contract time (except for a non-compensable time extension at the sole discretion of the Engineer, whose decision shall be final) resulting from encountering utilities or structures not shown, or differing in location, will be considered. The Contractor shall explore sufficiently ahead of the Work to allow time for any necessary adjustments without delay to the progress of the installation. Costs due to delays occasioned by encountering underground utilities or structures which could have or should have been discovered by timely exploration ahead of the Work shall rest solely with the Contractor.

The Contractor acknowledges that by means satisfactory to himself, he has included in his bid all cost for dealing with construction problems created by observable above or on grade features adjacent to the site of the work whether or not described in the

Specifications.

6.00.1 Use of Public Streets

The use of public streets and alleys shall be such as to provide a minimum of inconvenience to the public and to other traffic. Any material or waste spilled from trucks shall immediately be removed by the Contractor and the streets cleaned to the satisfaction of the governing authority.

6.00.2 Care of Trees, Shrubs and Grass

In the course of the work, it may become necessary to remove trees if they interfere with the work. Miami-Dade County and various municipalities have ordinances regulating the removal, relocation and pruning of trees in the public right-of-way, and these ordinances shall be strictly adhered to. The Contractor shall obtain a permit from Miami-Dade County and/or other regulatory agencies having jurisdiction over the work area before removing, relocating and/or pruning any tree. The Contractor shall abide by all requirements and conditions of the permit. Reimbursement for permit fees only will be provided through the appropriate bid item in the Proposal. To facilitate reimbursement, the Contractor shall provide the Department with a copy of the permit and the original permit fee receipts.

The Contractor shall be fully responsible for maintaining in good condition all cultivated grassplots, trees and shrubs. Where maintained shrubbery, grass strips or area must be removed, destroyed or disturbed incident to the work, the Contractor shall, after completion of the work in said area, or as directed by the Engineer, replace or restore to the original condition, all destroyed, disturbed or damaged shrubbery or grass areas. 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. Roots of trees encountered by the excavation shall be pruned, with branches similarly pruned to balance. Trees shall be replaced in kind and size, at the Contractor's expenses, if they cannot be adequately protected and/or reestablished to Owner's satisfaction.

Weeded areas need not be replaced with grass sod, but shall be restored to a "green" area by dressing the area with a 3-inch-thick layer of the topsoil, and sowing a variety of permanent type grass seed over the area, as approved by the Engineer. The seeded area shall be watered and maintained until the Engineer is assured a good grass growth has developed, but not to exceed a maximum period of 60 days.

See also Section 6.15.3, "Landscaping" for planting solid sod.

6.00.3 Maintenance of Traffic (M.O.T.)

The Contractor shall implement M.O.T. plans for lane closures and/or detours. He shall be responsible for acceptance by all other governing authorities. Payment for providing the M.O.T. plans shall be paid under the appropriate bid item established for this purpose.

FHWA's MUTCD shall be the minimum standard under this project. The Contractor shall follow the basic principles and minimum standards contained in this manual for the 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 workers from hazards within the project limits. The Contractor must understand that the standards set forth in the aforementioned manual constitute the minimum requirements for normal conditions. The Engineer shall require additional

traffic control devices, warning devices, barriers, or other safety devices where unusual, complex, or particularly hazardous conditions may exist.

The Contractor shall:

1. Maintain traffic within the limits of the Project for the duration of the construction period including any temporary suspensions of the work.
2. Construct and maintain any necessary detour facilities.
3. Provide necessary facilities for access to residences, businesses, schools, etc., along the Project.
4. Furnish, install, and maintain traffic control and safety devices during construction.
5. Provide any other special requirements for safe and expeditious movement of traffic as may be specified on the plans. The term Maintenance of Traffic includes all of such facilities, devices, and operations required for the safety and convenience of the public as well as for minimizing public nuisance.
6. Maintain all signs and devices placed for the purpose of detour when it is specified that traffic be detoured over roads or streets outside the project area.
7. Continually and adequately review traffic control devices to ensure proper installation and working order, including monitoring of lights and provide a responsible individual for this review who is certified as an American Traffic Safety Services Association Certified Worksite Supervisor

Prior to construction, the Contractor shall submit a Traffic Control Plan in accordance with Florida's Design Standards, 600 Series and the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). The Contractor shall also submit a letter to the Department providing the name and telephone number of the individual who will be the Worksite Traffic Supervisor (WTS). The WTS shall be responsible for the MOT on a 24-hour basis. The WTS shall be employed by the Contractor and shall be qualified by successfully completing an approved Advanced MOT training course given by an approved training agency. The MOT shall utilize traffic control devices listed in the Qualified Products List. The WTS shall be present at the worksite at all times.

As used herein, any reference to Dade County, its departments, or its published regulations, permits and data, shall be synonymous and interchangeable with other recognized governing bodies over particular areas or streets, or their departments, published regulations (i.e., Manual of Uniform Traffic Control Devices, M.U.T.C.D., F.D.O.T. Roadway and Bridge Standard Index Drawing Book), permits or data. The Contractor shall abide by all applicable laws, regulations, and codes thereof pertaining to M.O.T. on public streets, detour of traffic, traffic control and other provisions as may be required for this Project.

The Contractor shall be fully responsible for the M.O.T. on public streets, detour of traffic (including furnishing and maintaining regulatory and informative signs along the detour route), traffic control, and other provisions, throughout the Project, as required by the Dade County Department of Public Works, Traffic Engineering Division (Traffic Division) or Florida Department of Transportation (FDOT) and the above noted standards. Traffic shall be maintained according to corresponding typical traffic control details as outlined in the Dade County Public Works Manual and the above noted standards. No street shall be completely blocked, nor blocked more than one-half at any time, keeping the other one-half open for traffic, without specific approval. If required by traffic control permits or agencies, the Contractor shall work, odd or night hours, as required for traffic control reasons, and the cost of such work shall be considered

as incidental to construction and no extra compensation will be allowed.

If required by the Engineer, FDOT, agency having authority or as otherwise authorized by the Engineer, the Contractor shall make arrangements for the employment of uniformed off-duty policemen to maintain and regulate the flow of traffic through the work area. The number of men required and the number of hours on duty necessary for the maintenance and regulation of the traffic flow shall be subject to approval. The cost of such off-duty policemen, as authorized by the Engineer, shall be paid from the Dedicated Allowance Proposal Item established for this purpose. Traveling time for off-duty policemen shall not be paid. Payment will be made for each man-hour that such police officers actually provides this service at the work site. Both the off-duty police officer and the Department Inspector shall sign a Department provided form acknowledging actual hours that the officer was at the work site.

The Contractor shall provide all barricades with warning lights, necessary arrow boards and signs, to warn motorists of the work throughout the Project. Adequate approved devices shall be erected and maintained by the Contractor to detour traffic from the area worked by the Contractor.

Excavated or other material stored adjacent to or partially upon a roadway pavement shall be adequately marked for traffic safety at all times. The Contractor shall provide necessary access to all adjacent property during work.

The Contractor shall presume that a portion of the Work will be located in rights-of-way of State Roads and his bid price for traffic control shall include all additional costs (over and above normal traffic control measures) involved with complying with all F.D.O.T. requirements.

Where excavations are to be made in the vicinity of signalized intersections, the Contractor is alerted that vehicle loop detectors may have been embedded in the pavement. The Contractor shall verify these locations by inspecting the site of the work and by contacting the Traffic Division. Any loop detector which is damaged by the Contractor shall be repaired or replaced by the Contractor, and to the satisfaction of the Engineer and the Traffic Division. Payment shall be made from the appropriate bid item established for traffic loop replacement.

The Contractor shall notify the Traffic Division 24 hours in advance of the construction date, and 48 hours in advance of construction within any signalized intersection.

Temporary pavement will be required over all cuts in pavement areas, and also where traffic is to be routed over a swale or median areas. When the temporary pavement for routing traffic is no longer necessary, it shall be removed and the swale or median areas restored to their previous condition.

Pavement markings damaged during construction shall be remarked promptly by the Contractor, as required by the Traffic Division.

The Contractor shall presume that a portion of the Work will be located in State road rights of way and his bid price for traffic control shall include all additional costs (over and above normal traffic control measures) involved with complying with all F.D.O.T. requirements.

6.00.4 Working Hours

In general, the Contractor will be allowed to work one shift, between the hours of 7:00 a.m.

through 5:00 p.m., Monday through Friday but excluding normal holidays, or as per Department needs or permit requirements. In residential areas, this work "window" may be restricted to 8:00 a.m. through 6:00 p.m. Work on weekends, nights, and holidays will only be allowed where specifically approved in advance. The Contractor should anticipate, and include in his bid, being directed to work night and/or weekend hours, including the 5:00 p.m. through 7:00 a.m. period, to accommodate work in areas of heavy traffic and high flows or surcharges, which cannot be reduced during normal work hours. No additional payment will be made for requiring the Contractor to work these special shifts, in these cases.

Each week the Contractor shall provide the Engineer with an advanced copy of his weekly schedule, which shall include his intention to work more than one shift or other than the normal 7:00 a.m. to 5:00 p.m. work day, so that the Engineer may schedule suitable inspection.

6.00.5 Warranty - Workmanship

The sanitary sewer gravity main replacement surface restoration and other items of work shall be warranted to be free from defects by the Contractor for a basic period of one year from the date of acceptance. During the warranty period, any defects which affect the integrity, intended function, or strength of the new sewer pipe shall be repaired by and at the Contractor's sole expense in a manner, and by a method, acceptable to the Engineer. If an item of work is replaced/repaired under the basic warranty, the item of work shall be individually warranted in the same manner for one year from the date of acceptance of the repair or replacement as it was under the original basic warranty.

At the Engineer's discretion, an item of work may be placed on a warranty list during the Contract duration. In addition to other repairs, the items on this list will be reviewed and evaluated during the warranty period. The list will be made up of problem repairs identified during construction.

6.00.6 Default by Contractor

In case of default on the part of the Contractor, the Department will charge against its performance bond all expenses for services incidental to ascertaining and collecting losses under said bond, including accounting, engineering, and legal services, together with any and all cost incurred in connection with renegotiation of the contract.

6.01 Bypass Pumping/Flow Control

The Contractor shall be prepared to bypass pump the sewage effluent as a part of his operations, if necessary. He shall submit complete, detailed plans for this aspect of the work to the Engineer for approval in accordance with Section 3.01, "Preconstruction Conference and Job Meetings." The Contractor shall provide all necessary pumps, piping, and other equipment to accomplish this task with each mobilized crew and shall be prepared to perform all construction; obtain all permits; pay all costs; and perform complete restoration of all existing facilities to equal or better condition and to the satisfaction of the Engineer. Bypass pumping will occur where high flow rates and insufficient upstream storage capacity make this necessary. All costs of accomplishing the bypass pumping tasks, at whatever volume, and all associated work, such as restoration, shall be considered as incidental to the work covered by pay items in the Proposal and no extra compensation will be allowed.

When sewer line flows at the upstream manhole of the gravity main being replaced are above the maximum allowable requirements for the replacement or post-replacement television survey, the flows shall be reduced to the levels indicated by one of the following methods: manual operation of pumping stations by Department forces, by the Contractor plugging/blocking of the flows, or by the Contractor pumping/bypassing of the flows as acceptable to the Engineer.

In some applications, the sewer may be plugged and wastewater contained within the capacity of the collection system. This shall only be done when it has been determined the system can accommodate the surcharging without any adverse impact.

For all post-replacement television surveys, including service lateral reestablishment, testing and sealing, the depth of flow within the sewer shall not exceed that shown below for the respective pipe sizes as measured in the manhole.

1.	Maximum Depth of Flow	Television Survey
	4-inch - 10-inch Pipe	20 percent of pipe diameter
	12-inch - 18-inch Pipe	25 percent of pipe diameter
2.	Maximum Depth of Flow	Service Lateral Testing/Sealing
	4-inch - 12-inch Pipe	25 percent of pipe diameter
	15-inch - 18-inch Pipe	30 percent of pipe diameter

When sewer line flows at the upstream manhole of the line being removed and replaced, in the opinion of the Engineer, are too excessive to plug while the work is being performed; the Contractor shall submit for approval by the Engineer, a written plan and pump/bypass the flow as acceptable to the Engineer.

6.01.1 Plugging and Blocking

A sewer line plug shall be inserted into the line at a manhole upstream from the section being removed and replaced. The plug shall be so designed that all or any portion of the operation flows can be released. During removals and replacement, the flows shall be shut off and monitored or pumped / bypassed, as acceptable to the Engineer. After the work tasks have been completed, flows shall be restored to normal.

6.01.2 Pumping and Bypassing

When pumping / bypassing is required, as approved by the Engineer, the Contractor shall supply the necessary pumps, conduits and other equipment to divert the flow of sewage around the sewer section in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flows plus additional flow that may occur during periods of rain storms. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. A "setup" consists of the necessary pumps, conduits and other equipment to divert the flow of sewage around a sewer section, from the start to finish of work performed in the sewer section.

Pumps and equipment shall be continuously monitored by a maintenance person capable of starting, stopping, refueling and maintaining these pumps during the construction. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.

A.Surcharging Sewers

Where the raw sewage flow is blocked or plugged, sufficient precautions must be taken to protect the public health. Upstream flow shall be monitored. The sewer lines shall also be protected from damage. The following occurrences will not be allowed:

1. No sewage shall be allowed to back up into any homes or buildings.
2. No sewage shall overflow any manholes, cleanouts or any other access to the sewers.
3. Users upstream of the repair area shall be able to use all their water and sewer utilities without interruption.

If any of the above occur or are expected to occur, the Contractor shall bypass pump to alleviate one or all of the conditions. Additionally, the Contractor is required to observe the conditions upstream of the plug and be prepared to immediately start bypass pumping, if needed.

B. Pump Discharge

Any sump pumps, bypass pumps, trash pumps or any other type pump which pulls sewage/water or any type of material out of the manhole or sewer shall discharge this material into another manhole, or appropriate vehicle or container acceptable to the Engineer. Under no circumstances shall this material be discharged, stored or deposited on the ground, swale, road or open environment.

C. Maintenance of Traffic for Bypass Pumping

The Contractor shall take appropriate steps to ensure that all pumps, piping and hoses that carry raw sewage are protected from vehicular traffic and pedestrian traffic. Maintenance of traffic shall be performed in accordance with Section 6.00.3.

D. Sewage Spills

In the event, during any form of "Sewage Flow Control," that raw sewage is spilled, discharged, leaked or otherwise deposited in the open environment, due to the Contractor's work, the Contractor is responsible for any cleanup of solids and disinfection of the area affected. This work shall be performed at the Contractor's expense with no additional cost to the Department. The Contractor is also responsible for notifying the sewer system maintenance personnel and complying with any and all regulatory requirements in regards to the size spill with no additional cost to the Department. The Contractor shall be back charged for any fines, penalties or other costs or damages imposed upon the Department by any agency or private party as a result of a spill or improper discharge by the Contractor.

Lateral Removal

The Project requires the replacement of sewer lateral segments.

As to not impede the laying of the new pipe, the Contractor shall remove the existing pipe section to be replaced to the satisfaction of the Engineer. No sewer line shall be removed until provisions are made with the homeowner and is approved by the Engineer.

Excavated materials contaminated by sewage shall be disposed of at a location approved by the Engineer. Trucks used to transport contaminated materials shall be sealed to prevent spillage on the roadway. The Contractor shall conform to all requirements of federal, state and local governing agencies in the disposal of materials contaminated by sewage. All costs associated with the disposal of contaminated materials shall be paid for under the various Bid Items and no extra charges will be allowed.

6.02 Post-Replacement Video Surveys

Post replacement television surveys are required for all sanitary sewer gravity main lines and service laterals removed and replaced under this Contract.

6.02.1 Procedure - General

A. Scope

Upon completion of the sanitary sewer gravity main removal and replacement, including point repairs, the entire sewer line shall be fully televised from the inside face of one manhole to the inside face of the next manhole, and the service lateral pipe from the from the mainline to the service lateral or the cleanout to the mainline, as applicable. A clear voice-over narrative is required to help define the tape's subject and explain areas of interest and their locations in the pipe. The work consists of furnishing all labor, materials, accessories, equipment, tools, transportation, services and technical competence for performing all operations required to execute the internal closed circuit television inspection survey of all sewers cleaned, including isolating and evacuating all lines. The survey of the main line sewers shall be performed on one sewer section at a time, between adjacent manholes. On work orders involving replacement of service laterals, the post-work video surveys shall include both an "in-lateral" survey, as well as an "in-mainline" sewer survey with a pan and tilt camera.

B. Camera Movement

The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to permit proper documentation of the sewer's condition and features. In no case shall the television camera be pulled at a speed greater than 30 feet per minute. The camera shall be panned, tilted and rotated as is necessary to best view and evaluate all features and points of interest found. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. A blower shall be utilized, as needed, to defog the sewer line and promote a clear picture.

C. Non-Remote Control of Camera Movement

Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being surveyed to insure good communications between members of the crew.

D. Position / Footage Measurement

Measurement for location of repairs shall be by the footage meter on the cable, which shall

appear continuously on the video picture and tape. Footage meter shall be standardized to reflect the distance to the center of the starting manhole. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement meters shall read to tenths of a foot over the length of the section being surveyed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device. Logs and tapes shall all indicate the location of all noted features, relative to the centerline of the manholes.

E. At Points of Interest

Movement of the television camera shall be temporarily halted and the camera panned/tilted to clearly view the nature of each visible point source of infiltration and/or inflow until the leakage rate from that source is quantified. The camera shall also be stopped and similarly viewed at active service connections, if any, where flow is discharging. If the discharge persists, an evaluation shall be made as to its source by looking up the lateral and commenting as to whether the flow is clear water or sewage and whether any faults can be observed contributing to infiltration.

F. Camera Mounting

In general, the camera shall be mounted on a transport platform which will keep it above water. Use of a raft is not encouraged but will be accepted in cases where the Engineer believes other means are not practical. If a raft is utilized, an acceptable means must be utilized to keep the raft centered in the pipe, to the maximum extent practical.

6.02.2 Field Documentation for Post-Work Video Surveys

A. Voice Over Narration

The Contractor shall discuss the terminology to be used for this Project with the Engineer so that it will be compatible with terminology used by the Department. Use of non-Department standard terminology will be one cause for rejection of submitted documentation and will delay payment.

B. Photographs

Digital photographs, or other standard-size photographs of the television picture shall be taken by the Contractor upon request of the Engineer.

C. Video Recordings

The purpose of video recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. All video recordings shall be stored on a removable data storage device. The Contractor shall have all removable data storage devices and necessary playback equipment readily accessible for review by the Department and Engineer during the Project. A CCTV recording and suitable log shall be provided to the Department in a Granite XP format. This data shall be capable of being uploaded into the Department Granite XP database.

D. Copies Made Available

A copy of all records and files on removable data storage device shall be provided to the Engineer and the Department as part of the requirements for a complete Work Order.

6.03 Repairs of Department's Sewers

6.03.1 Sealing of Post-Replacement Leaks

Should the Contractor find it necessary to seal the replacement pipe to stop leakage after post-replacement televising, both his equipment and sealing method must meet the approval of the Engineer prior to use.

Extreme caution shall be utilized during leak sealing (pressure) operations in order to avoid damaging the already weakened sewer pipe. If any damage occurs, it shall be repaired ~~as specified under Section 6.15, "Repairs Due to Contractor's Operations,"~~ and to the satisfaction of the Engineer. Excessive pumping of grout which might plug a service lateral shall be avoided. Any service laterals blocked by the grouting operation shall be cleared immediately by the Contractor.

6.04 Excavation

The Contractor shall sawcut any asphalt or concrete surfaces within the limits of the allowable trench width. Where pavements or sidewalks are cut, they shall be cut by means of a mechanical pavement saw to form true and straight edges which shall, in general, be either parallel or at right angles with the centerline of the pipe. The cost of removing any natural growth, plantings and other landscaping features or existing structures shall be included in the price bid for the point repair. In order to protect himself from being held liable for damaging any existing, or already damaged pavement, the Contractor is advised to notify, in writing, the authority having jurisdiction over the street or roads where such defective pavement exists prior to proceeding with any work in the vicinity. A copy of all such notices shall be forwarded to the Engineer.

Remove boulders, logs, or any unforeseen obstacles encountered in excavating. All cleared materials shall be promptly removed, within 24-hours, from the work area and legally disposed of in an area provided by the Contractor, at no additional cost to the Department. Unless approved otherwise by the Engineer, debris accumulated along the route of the work will be removed daily.

The Contractor shall excavate pipe trenches to a minimum of six inches (unless otherwise specified) to the elevation of bottom of the proposed pipe barrel and to a width sufficient to provide adequate working room for the installation of the bedding material. See Section 6.07 "Pipe Foundations - Gravity Sewers," below.

If, in the opinion of the Engineer, the soil at that depth is unsatisfactory as foundation material because it contains marl, muck, organic matter, elastic silt and clays below the waterline, or other unsuitable material, the excavation shall be continued two (2) feet deeper, except if a suitable foundation material is exposed at a lesser depth, in which case further excavation will not be required. Where the soils permit, ensure that the trench sides are vertical. The cost of this extra excavation, and backfilling with select backfill material, shall be included in the price for the point repair and no additional payment will be made for this work.

If the soil is still unsuitable after the additional excavation as prescribed above, and the Engineer authorizes "Overcut," the trench bottom shall be excavated further in one-foot increments and paid for as "Trench Overcut." See Section 6.06, "Trench Overcut." and the Bid Item

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established for this purpose

Trench widths, when measured at a point 12 inches above the top of the pipe, shall unless otherwise approved by the Engineer, provide a 12-inch clearance on each side, between the outside of the pipe barrel and the face of the excavation, or sheeting if used. Trench width shall provide ample space to allow for use of a mechanical compactor to properly compact backfill on each side of the pipe.

When performing trench excavation of 5 feet deep or less, sheeting and shoring shall be installed where necessary to control trench width, protect the workmen and the general public, and prevent damage to this or adjacent work, surface features, other utilities or structures.

Interlocking steel sheeting shall be installed where necessary to control trench width, protect the workmen and the general public, and prevent damage to this or adjacent work, surface features, other utilities or structures. Provide interlocking steel sheeting and any other item required by the State of Florida Trench Safety Act or any other applicable agency or regulation.

If approved by the Engineer, wood sheeting may be used. If wood sheeting is utilized, and the bottom of the sheeting extends below a level 12 inches over the top of the pipe, and if the sheeting is not ordered to be left totally in place, the sheeting shall be cut off at the 12-inch over the top of pipe level and left in place. No payment will be made for this limited portion of sheeting left-in-place.

Where interlocking steel sheeting is used, the Department may require that the sheeting be cut off at a level two (2) feet below finished grade and that portion below that level be left in place. If ordered left-in-place, sheeting will be paid for under the appropriate Proposal Item.

If interlocking steel sheeting is used, the Department may permit its complete removal in lieu of the cut-off, providing removal can be accomplished without disturbing the bedding, pipe or pipe alignment. Any damage to the pipe bedding, pipe or pipe alignment of the constructed utility caused by removal of sheeting shall be cause for rejection of the affected portion of the work. Not more than 100-feet of trench shall be opened ahead of pipe laying operations at one time unless a greater length of open trench is approved by the Engineer. Costs for interlocking steel sheeting used and not left in place shall be included in the appropriate bid item in the Proposal.

In areas where trench widths are not limited by right-of-way and/or easement widths, property line restrictions, existing adjacent improvements, including pavements, structures, utilities, and maintenance of traffic, the trench sides may be sloped to the angle of repose of the excavated material, but only from a point one foot above the outside top of the pipe. In this case, restoration of all surface features damaged as a result of the wider trench, beyond the pay limits specified in this Document, shall be at the Contractor's sole expense.

A safely constructed moveable shield or Cofferdams Box, may be used in place of sheeting, as approved by the Engineer. When using a Cofferdams Box, the trench shall be opened immediately ahead of the shield as pipe laying proceeds inside the shield. When a moveable shield or box is used, the installed pipe shall be secured to prevent it from moving when the box is moved. An approved means shall be utilized to verify, at the time of shield movement, that the pipe has not been pulled forward, out of its socket. In general, the bottom of the shield shall be kept 12-inches above to top of the pipe, to minimize shield induced pipe movement. Ensure that the trench boxes are wide enough to accommodate compaction and density testing.

Excavation for manholes and other piping and appurtenances shall be sufficient to leave at least 12 inches clear between their outer surfaces and the embankment or sheeting that may be used to protect them.

Materials removed from the trenches shall be stored and disposed of in such a manner that they will not unduly interfere with traffic on public streets and sidewalks, and not be placed on private property. In congested areas, such materials as cannot be stored adjacent to the trench or used immediately as backfill shall be removed to approved places of storage. If any material creates a public hazard or other unsafe condition, in the opinion of the Engineer, it shall be removed immediately by the Contractor to a storage area.

When performing trench excavation in excess of 5 feet in depth, comply with the Occupational Safety and Health Administration's (OSHA) "Trench Safety Act". Method(s) and all subsequent revisions or updates adopted by the Departments. Sheeting and shoring shall be installed where necessary to control trench width. All compliance used shall protect the workmen and the general public, prevent damage to this or adjacent work, structures, utilities, pavements sidewalks, curbs, gutters and similar improvements both public and private, and to provide for proper maintenance of traffic. The trench width may vary to accomplish this and to comply with OSHA and the Trench Safety Act, but only from a point one (1) foot above the top of the pipe.

Bidder acknowledges that the Florida Trench Safety Act, Section 553.60 et seq., which became effective October 1, 1990, shall be in effect during the period of construction of the project. The Bidder by signing and submitting the bid is, in writing, assuring that it will perform any trench excavation in accordance with the trench safety standards specified in said Trench Safety act.

The Bidder is, and the Owner and Engineer are not, responsible to review or assess Bidder's safety precautions, programs or costs, or the means, methods, techniques or technique adequacy, reasonableness of cost, sequences or procedures of any safety precaution, program or cost, including but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et seq. cited as the "Trench Safety Act." Bidder is, and the Owner and Engineer are not, responsible to determine if any safety or safety related standards apply to the project, including but not limited to, the "Trench Safety Act."

6.04.1 Trench Stabilization

No claim for extras or additional payment will be considered for cost incurred in the stabilization of trench bottoms which are rendered soft or unstable as a result of construction methods, such as improper or inadequate sheeting, dewatering or other Contractor induced causes. In no event shall pipe be installed when such conditions exist and the Contractor shall correct such conditions so as to provide proper bedding or foundations for the proposed installation, at no additional cost to the Department.

6.05 Removal of Sanitary Sewer Gravity Mains

The Project requires the replacement of existing sewers with ductile iron or Polyvinyl Chloride (PVC) SDR 26.

As to not impede the laying of the new pipe, the Contractor shall remove the existing piping in its entirety as designated in the Work Order, to the satisfaction of the Engineer. No sewer line shall

be removed until a bypass line has been constructed approved by the Engineer and ready for operation.

Excavated materials contaminated by sewage shall be disposed of at a location approved by the Engineer. Trucks used to transport contaminated materials shall be sealed to prevent spillage on the roadway. The Contractor shall conform to all requirements of federal, state and local governing agencies in the disposal of materials contaminated by sewage. All costs associated with the disposal of contaminated materials shall be paid for under the various Bid Items and no extra charges will be allowed.

6.06 Trench Overcut

Trench overcut provisions herein shall be used only upon authorization by the Engineer. If, after excavating the trench to a depth of 2 feet 6 inches below the outside bottom elevation of the pipe barrel, and the soil at that depth is still unsatisfactory as foundation material because it contains marl, muck, organic matter, or other unsuitable material, and the Engineer authorizes overcut, the pipe trench shall be excavated deeper, in one-foot depth increments, until either a suitable foundation material is found, or the Contractor is directed by the Engineer to stop trench overcut operation and begin backfilling. In no case will trench overcut be more than 6 feet in depth, i.e., to a point 8.5 feet below the bottom of the pipe.

Selected backfill, as defined in Section 6.11 "Backfill and Compaction," shall then be compacted in 6-inch layers up to the bottom of the proposed 6 inches of pipe bedding.

6.07 Pipe Foundation - Gravity Sewers

1. General: Gravity sewers up to 24-inch diameter shall be reconstructed using Ductile Iron (AWWA C-151) or Polyvinyl Chloride (PVC) pipe and fittings.
2. Foundations for Ductile Iron: Sewer pipe constructed at a depth greater than 10 feet, and/or with a trench bottom below groundwater, shall have a rock foundation. The trench shall be excavated to a depth of at least 6 inches below the bottom of the pipe, the trench backfilled with a layer of rock firmly compacted, the pipe solidly bedded and additional rock firmly packed under and around the pipe up to the springline.
3. Foundations for PVC: Foundations shall generally be as similar to that specified above for Ductile Iron and also in conformance with ASTM D2321. Good bedding and haunching compaction is essential to produce an adequate PVC installation.
4. Rock Bottom: Where rock is encountered at the bottom of a trench in which pipe is to be installed, the excavation shall be extended to a depth at least 6 inches below the bottom of the pipe and backfilled with selected fine material in 6-inch layers. Each layer shall be firmly compacted, with the final layer carefully graded and compacted at the proper elevation to provide continuous support for the pipe barrels. At pipe bell locations, depressions shall be excavated in the trench bottom to provide clearance under the bell or socket.

5. **Soil Bottom:** Where rock is not encountered at the bottom of a trench excavation, and the soil is satisfactory for pipe foundation in the opinion of the Engineer, excavation shall be halted at an elevation slightly above that for bedding the pipe, and the pipe bed carefully excavated by hand in the undisturbed trench bottom to provide continuous bearing for the pipe barrels and clearance under the bells or sockets. As an alternative, machine excavation may extend slightly below the elevation for bedding the pipe with the trench bottom carefully backfilled and compacted as specified in Section 6.11 "Backfill and Compaction."

If after excavating to the depth of the pipe foundation, it is the opinion of the Engineer that the soil at that depth is unsatisfactory as foundation material because it contains marl, muck, organic matter, or other unsuitable material, the excavation shall be continued up to thirty (30) inches deeper, except if a suitable foundation material is exposed at a lesser depth, in which case further excavation will not be required. The cost of this extra excavation, and backfilling with select backfill material, shall be included in the price for point repair and no additional payment will be made for this work.

If the soil is still unsuitable after the additional excavation as prescribed above, and the Engineer authorizes "Overcut," the trench bottom shall be excavated further in one-foot increments and paid for as "Trench Overcut." See Section 6.06 "Trench Overcut."

The pipe foundation for PVC C900 mains or PVC C-900 or SDR 35 laterals shall be free of rocks and other material that may damage the pipe during compaction. The pipe bedding for PVC gravity sewer mains and laterals up to 6 inches above the crown of the pipe shall be clean sand or granular material free from large stones (maximum 1-inch).

6.08 Removal of Water

Wherever possible, the excavation shall be free from water before pipe or structures are installed. However, it is realized that in certain sections of the work this cannot be accomplished economically and the Contractor may request permission from the Engineer to use the Alternate Method of Construction. See Section 6.08.1.

Provide erosion control measures at the project and in areas outside the right-of-way where work is being accomplished in conjunction with the project, to prevent pollution of water, detrimental effect to the public or private property adjacent to the project right-of-way and damage to work at the project. Construct and maintain temporary erosion control devices or , where practical, as may be directed by the Engineer.

The Contractor shall provide all necessary pumps, underdrains, well point systems, and other means for removing water from trenches and other parts of the work. The Contractor shall continue dewatering operations until the backfill has progressed to a sufficient height over the pipe to prevent flotation or movement of the pipe in the trench, so that the backfill is above the natural water level.

Water from the trenches and excavation shall be disposed of in such a manner as will not cause injury to public health, to public or private property, to the work completed or in progress, to the surface of the streets, or to cause interference with the use of the same by public. Water from the trenches may be introduced into the sanitary sewer system after segregation from solids and fines through the use of settlement boxes or similar methods, as approved by the Engineer. The Contractor shall submit to the Engineer for approval, location of all erosion control devices, type of all erosion control devices, estimated time erosion control devices will be in operation, and containment or removal methods for pollutants or hazardous waste. Approval shall be received before starting the excavation.

The Contractor is cautioned that Miami-Dade County or other governing body having jurisdiction over the work location may have regulatory rules and ordinances prohibiting, or limiting, the discharge of water from any excavation into sanitary and storm sewer systems, or to canals and drainage ditches.

The Contractor shall be required to obtain all necessary permits approving the location and proposed method of disposal before discharging water from any excavation into any portion of the public right-of-way or into any existing drainage structure or facility. Fees for obtaining these permits shall be included in the Proposal as provided in the Reimbursement of Fees bid item.

6.08.1 Alternate Method of Construction

A combination of conditions in the substrata, watertable, or methods of disposal may be encountered during the course of the work which makes dewatering impossible, or possible only through the use of unusual methods, the cost of which may be excessive. When such conditions are encountered, but only after all reasonable means to dewater the excavation have been employed without success, the Contractor may, with the approval of the Engineer, employ the following Alternate Method of Construction.

The requirements set forth in other sections of these Specifications shall establish the required standards of construction quality for this work. Use of the Alternate Method of Construction described hereinafter shall in no way be construed as relieving the Contractor of his basic responsibility for satisfactory completion of the work. The unit prices bid in the Proposal shall be full payment for the various items of work. However, supplemental payments will be made to the Contractor as a result of the use of this alternate method of construction where the pipe invert is at or below elevation -2.0 NGVD29 and where the groundwater level is at or above four (4) feet above the pipe invert.

Subject to all of the requirements stated herein, construction will be permitted in accordance with the following specifications. All requirements of these Specifications shall apply to this construction unless otherwise specifically modified herein.

1. Removal of Water: The installation of pipe and appurtenances under water will be permitted and the requirements of Section 6.08, "Removal of Water", requiring complete removal of water will be waived.
2. Excavation: Excavation shall be performed in accordance with Section 6.04, "Excavation."

3. Pipe Bedding for Ductile: Pipe bedding shall be placed from 6 inches below the outside bottom of the pipe barrel up to the level of the springline of the pipe. The bedding material shall be as referenced in 5.03.1, "Pipe Bedding".

The bedding material shall be tamped and graded to provide a proper bedding for the pipe and shall then be shaped to receive the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.

4. Backfill: After the pipe has been installed, backfilling shall proceed in accordance with the provisions of Section 6.11 "Backfill and Compaction." Select backfill material shall be used to backfill around the pipe and to a level one foot above the outside top (crown) of the pipe. Under no circumstances will material other than select backfill or specified pipe bedding material be considered satisfactory for this purpose.

If the Alternate Method of Construction is used, all backfill material, including specified pipe bedding material, shall be carefully lifted into the trench and not released to fall freely therein until the bucket or container is at or just above water level. Under no circumstances shall backfill material be dumped or pushed into trenches containing water. Backfill material shall be carefully placed in uniform layers from below existing water level to a point not more than 18-inches above the water level. Backfill material shall be placed and compacted as is specified for normal backfilling as provided in Section 6.11 "Backfill and Compaction," from a point not more than 18-inches above the water level to the bottom of the pavement base or the ground surface if the trench is located outside of pavement areas.

Where the replacement gravity main to be installed has a pipe invert of elevation $-2.00'$ NGVD29 or lower and the groundwater is at or above four feet above the pipe invert, and where dewatering is not possible, as described herein, the Contractor shall receive additional compensation as provided in the appropriate bid item in the Proposal for installing the pipe main.

6.09 Laying Pipe

6.09.1 General

Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and, in general, conform with manufacturer's recommendations. At the time of laying, the pipe shall be examined carefully for defects, and should any pipe be discovered to be defective after being laid, it shall be removed and replaced with sound pipe by the Contractor at his expense.

Pipe and fittings shall, at all times, be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions. Pipe and other material shall be distributed along the right-of-way in advance of installation only to the extent approved by the Engineer. Such materials shall be so

placed as to keep obstruction to traffic minimum.

Upon satisfactory completion of the pipe bedding, a continuous trough for the pipe barrel and recesses for the pipe bells, or couplings, shall be excavated by hand digging. Lay all the pipe, true to the lines and grades given, with hubs up grade and tongue end fully entered into the hub continuous, uniform support with no pressure being exerted on the pipe joints from the trench bottom.

Pipe shall be installed in accordance with the manufacturer's recommendation. Before being lowered into the trench, the pipes and accessories shall be carefully examined and the interior of the pipes shall be thoroughly cleaned of all foreign matter and other methods acceptable to the Engineer. During suspension of work, for any reason, at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe. Any pipe which is disturbed or found defective shall be immediately removed and replaced with sound pipe.

Lines shall be laid straight and true to the lines, matching existing grade.

Any work within the pipe and fittings shall be performed with care to prevent damage to the interior wall of the pipe. Damaged interior walls shall be repaired or the pipe section or fitting replaced as required by the Engineer. No cables, lifting arms, hooks or other devices shall be inserted into the pipe or fitting. All lifting, pulling or pushing mechanisms shall be applied to the exterior of the pipe or fitting.

After pipe has been laid, reviewed and found satisfactory, sufficient backfill shall be placed along the pipe barrel to hold the pipe securely in place during the conduction of the required tests. Take up and relay any pipe that is not in true alignment or which shows any settlement after laying at no additional expense to the Department.

6.09.2 Ductile Iron

Installation of gravity sewers shall conform to the applicable requirements of ANSI/AWWA Standard C600-93, "Installation of Ductile Iron Water Mains and Appurtenances".

Cutting of ductile iron pipe for fittings and other connections shall be done by the Contractor in a neat and workmanship like manner without damage to the pipe, the lining, or the coating. Pipe shall be cut with a mechanical pipe saw. After cutting the pipe, the plain ends shall be filed to remove all sharp edges and burrs, and recoated with bitumastic.

Ductile iron pipe and fittings shall be encased in polyethylene encasement material, if required by the Engineer. The polyethylene encasement shall be installed in accordance with ANSI/AWWA C105/A21.5-93, "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids" Method A or B and when directed by the Engineer. Most common causes of corrosion include naturally corrosive soils or soils contaminants, such as muck, organic matter, certain waste materials, salt water, brackish water, and potential stray direct current.

Each length of pipe and fitting, immediately prior to being placed in position in the trench, shall be inspected, cleaned and prepared for installation. Pipe laying shall proceed up-grade with spigot

ends pointing in the direction of flow. All pipe shall be laid straight, matching existing grade, in each section between manholes. If any difficulty is experienced in assembling lengths of pipe together in the trench, the pipe sections shall be tried on the surface of the ground and each length of pipe plainly marked for position and sequence in which they are to be installed. At all times when work is not in progress, the exposed ends of all pipe or fittings shall be fully protected by a board or other approved stopper to prevent earth or other substances from entering the pipeline.

Each individual length of pipe and each fitting shall be solidly and evenly bedded throughout its length on a prepared bed on the floor of the trench and not supported in position on blocks or wedges. Pipe shall only be laid when the two preceding lengths have been thoroughly embedded in place to prevent any movement or disturbance of the finished joints.

Ductile iron solid sleeves shall be used to connect D.I. pipe spigots to existing D.I. manhole stub spigots.

Any pipe which is disturbed or found to be defective after laying shall be taken up and relaid or replaced.

All bolts, nuts, gaskets or other joint materials for use in the pipeline shall be properly protected.

Gaskets shall be properly stored, and care shall be exercised to keep them away from heat, light, oil, gasoline or other petroleum products. Gaskets shall be kept clean at all times and not handled with greasy or dirty hands.

6.09.3 Polyvinyl Chloride (PVC)

Each length of pipe, immediately prior to being placed in position in the trench, shall be inspected, cleaned and prepared for installation. Gaskets shall be thoroughly checked for breaks, cuts or other damage, and shall be free of oil, grease, dirt or other foreign matter. Pipe joints shall be assembled with care. Lubricant, if required, shall be as recommended by the manufacturer of the pipe, and shall have no deteriorating effects on the gasket and pipe materials. If assembly is underwater, lubricant recommended by the manufacturer for underwater use is required. Good alignment of the pipe is required for assembly. Align the spigot to the bell of the previously laid pipe and insert the spigot into the bell until it uniformly contacts the gasket. Apply steady pressure until the spigot easily slips through the gasket. Do not push or swing the spigot into the bell. Small diameter pipe and fittings may be assembled manually. Mechanical means such as bars and blocks, ratchets or jacks shall be used for joining larger pipe and fittings. Power equipment, such as backhoe bucket, shall not be used to assemble pipe and fittings, since excessive force may damage the gasket or bell.

Cutting the pipe in the field shall be done by the Contractor in a neat and workmanship like manner using manual or power saws. The pipe shall be marked around its entire circumference before cutting to assure a square cut. After cutting, the end shall be tapered with a beveling tool, rasp, or other approved equipment, to the proper taper. Mark the proper insertion depth on the cut and beveled end before installing the cut pipe into the pipeline. Pipe laying shall proceed up-grade from the lowest point of the proposed system, with spigot ends pointing in the direction of flow. All pipe shall be laid straight, true to the lines and matching existing grade, in each section between manholes. The pipe shall be laid so that the identification markings are located

on the top of the installed pipelines. At all times when work is not in progress, the exposed ends of all pipes shall be fully protected by an approved stopper to prevent groundwater, dirt, rocks or other substances from entering the pipe.

Each individual length of pipe shall be solidly and evenly bedded and haunched throughout its length on a prepared bed on the floor of the trench and not supported in position on blocks or wedges. Pipe shall only be laid when the two preceding lengths have been thoroughly embedded in place to prevent any movement or disturbance of the finished joint. Any pipe which is disturbed or found to be defective after laying shall be taken up and relaid or replaced, at no additional cost to the Department.

6.09.4 Pipe-to-Pipe Connections

Pipe-to-pipe connections shall be made by using flexible banded, sheer reinforced couplings or adapter couplings, each with compression joints, in compliance with ASTM C 425.

Ensure that the pipe manufacturer furnishes the Engineer with details regarding configuration of the joints and the amount of gasket material required to affect a satisfactory seal.

6.09.5 Pipe-to-Pipe Manhole Connections

When a sound pipe stub-out exists at a manhole to which connection is to be made, a pipe-to-pipe connection shall be made as described above. If a stub-out is not present or is faulty, an opening shall be cut in the manhole wall and the connection made. The connection shall consist of a pipe stub-out with elastomeric waterstop grouted into the opening with non-shrink grout. A flexible banded coupling, as shown on the details for new manholes, shall join the pipe stub-out to the replacement pipe. The invert or floor inside the manhole shall be cut and reshaped as necessary.

At the termination point of the new pipe at the manhole connection, each connection shall be sealed and structurally grouted in place. The existing manhole connection opening shall be sufficient in size to accommodate the new host pipe so that the correct invert elevation meets the existing elevation. The new host pipe shall be packed with water reactive jute to create a water tight seal at the connection. After the joint area is packed sufficiently with jute, a hydraulic type cement is used to seal the complete connection to the existing manhole. This hydraulic cement shall be applied to the exterior of the existing manhole as well as the interior of the manhole at the pipe connection.

6.09.6 Gravity Sewer Service Laterals

Lateral sewers shall be installed in accordance with all the applicable requirements for pipe installation. Branch fittings shall be installed in the main line sewer as it is constructed, in the locations and configuration of the original laterals or as designated by the Engineer up to the right of way line or as designated by the Engineer.

The existing laterals shall be hand excavated to a joint, saw cut, clean and square and the appropriate adapter installed to connect the replacement laterals. Care shall be taken to maintain the slopes of the existing laterals. The laterals shall be removed and replaced from the main line to a point along the existing lateral as determined by the Engineer to be in acceptable

condition.

When 4-inch diameter laterals are to be replaced, they shall be replaced with 6-inch diameter PVC or ductile iron pipe, as directed by the Engineer. When 4-inch laterals are found, which were not included in the work order, the Contractor shall immediately notify the Engineer, then make arrangements to replace the 4-inch lateral with a 6-inch lateral back to the property line.

The Contractor shall not excavate trenches for laterals on both sides of the street at the same time unless written permission has been secured in advance to close the street.

Placement of bedding/cover materials in the trench shall be the same for laterals as provided in Section 6.07 "Pipe Foundations - Gravity Sewers."

Service laterals replaced shall be televised from the main line or via cleanout.

Sewer Grades

Grades for the gravity sewer system shall set using laser equipment. The grade shall be verified during installation and after backfill by the Contractor.

The grades of the gravity mains shall be verified by the inspector on daily basis using the Contractor's equipment.

6.10 Manholes

6.10.1 Manholes, General

The Contractor is referred to the provisions of Section 6.08, "Removal of Water", and Section 6.11, "Backfill and Compaction" for specific procedures, requirements and testing methods appurtenant to the work of this Section.

All manholes shall be constructed of precast concrete as follows:

1. All concrete shall conform to Section 5.05 "Concrete, Mortar and Grout".
2. Reinforcing steel shall conform to Section 5.07 "Steel, Reinforcing".
3. Castings for manhole frames and covers shall conform to Section 5.09 "Castings".
4. Brick for manhole construction shall conform to Section 5.06 "Brick".
5. Cement mortar for construction shall conform to Section 5.05 "Concrete Mortar, and Grout". It shall be mixed dry and then wetted to proper consistency for use. No mortars that have stood for more than one hour shall be used.
6. Precast manholes shall conform to these Specifications, and to the appropriate sections of ASTM Standard C478-90b, "Precast Reinforced Concrete Manhole Sections", and the following modifications thereto:

- (a) Minimum shell thickness of manholes shall be eight inches (8").
- (b) The design of the structure shall include a precast base, cast integrally with the wall, of not less than eight inches (8) in thickness.
- (c) Lifting holes through the structures will not be permitted unless otherwise approved by the Engineer.
- (d) No construction joints will be allowed below an elevation of four (4) feet above mean sea level unless shown on the Plans. Construction joints will be allowed above elevation +4.0, if adequate key-ways and water stops, approved by the Engineer, are provided.
- (e) In precast concrete manholes, holes for sewer line connections, with a diameter equal to the outside diameter of the connecting sewer plus an additional four inches (4"), shall be formed in the manhole walls. No cutting or chipping at the pre-formed holes, or cutting additional holes in precast concrete will be allowed.
- (f) Built in ladders or climbing rugs will not be permitted except if shown on the Plans.
- (g) Openings shall be sealed with "non-shrink" grout. No "expanding" grout shall be used.

Excavation for the precast manhole structures shall be extended to a level 6-inches below the level of the outside bottom of the slab. Sheeting and shoring may be required in order to control the excavation dimensions, protect the workers, and prevent damage to the structure or other adjacent facilities. The resulting excavation shall be backfilled with drainfieldlimerock or specified pipe bedding material to a level to receive the structures at the proper elevation. Manhole exteriors shall be painted prior to installation with two coats of Kop-Coat Bitumastic 300-M, each having a minimum dry film thickness of 10 mils. The exterior surface of the manhole shall be thoroughly clean and dry prior to installation.

6.10.2 Manhole Accessories

All new sanitary sewer manholes shall be furnished with the following items. Where existing manholes will be modified or are scheduled to be refurbished, rehabilitation shall also include the following items unless otherwise approved by the Department.

Provide concrete protective coating system for manholes installed in locations identified to have high levels of sewer gas.

Provide high density polyethylene manhole infiltration inserts in accordance with WASD Standard Section 02625, unless the Department requires the installation of stainless steel insert.

Exterior Shrink Membrane on Corbel and Exterior Joint; On all manholes (excluding the HDPE grade rings) install a heat activated, high shrink membrane, on the manhole's exterior, at each section joint and from the cast iron frame to the corbel section. Membrane shall be Wrapid Seal, by Canusa Corrosion Protection and Sealing, or approved equal with the following properties:

PRODUCT COMPONENT	PROPERTY	TEST STANDARD	UNIT	RESULTS
ADHESIVE	Softening Point	ASTM E28	Deg. C (Deg. F)	100 (212)
	Lap Shear Strength	DIN 30 672	N/cm ² (psi)	8 (12)
BACKING	Tensile Strength	ASTM D638	MPa (psi)	20 (2900)
	Elongation	ASTM D638	%	600
	Hardness	ASTM D2240	Shore D	46
	Abrasion Resistance	ASTM D1044	mg	45
SLEEVE	Peel Strength	ASTM D1000	N/cm ² (psi)	15 (9)
	Water Absorption	ASTM D570	%	0.05
	Low Temp. Flexibility	ASTM D2671D	Deg. C (Deg. F)	-40 (-40)

6.10.3 Modification of Existing Manholes

After satisfactory replacement and testing of mains, all interior concrete surfaces of the affected manhole shall be high pressure washed.

The modifications to the invert channels of the manhole shall be of a similar material as existing and accurately shaped to a semi-circular bottom conforming to the inside of the adjacent sewer section. Steep slopes outside the invert channels shall be avoided. Changes in size and grade shall be made gradually and evenly. Changes in the direction of the sewer or entering branch shall be a smooth curve with radius as long as practicable.

Gravity sewers shall connect to the manholes at the original grade and grouted in place using materials as specified in Section 5.05 "Concrete, Mortar and Grout."

The first length of pipe into or out of the manhole shall be a two-foot length of plain end by plain end or plain end by bell ductile iron pipe. Plain end by plain end short lengths of pipe shall be joined to the ductile iron main by means of a ductile iron solid sleeve. C-907 PVC repair couplings shall not be used in ductile iron mains.

6.10.4 Installation of Manholes

Manholes shall be built at the points indicated on the Atlas sheet or directed by the Engineer.

Manholes shall be constructed in accordance with the Department Standard Details and approved shop drawings.

A minimum of three to a maximum of five courses of clay brick shall be constructed atop the manhole corbel, and stuccoed with 3/4-inch mortar inside and out.

After satisfactory installation and testing all interior concrete surfaces of the new manhole shall be sealed coated with two coats of Carbolite Bitumastic 300M with a minimum of 16 dry mils per coat. Prior to application, the concrete surface must be clean and thoroughly dry.

The invert channels of the manhole shall be formed of brick or brick rubble thoroughly bedded and covered with sand-cement grout, accurately shaped to a semi-circular bottom conforming to the inside of the adjacent sewer section. Steep slopes outside the invert channels shall be avoided. Changes in the direction of the sewer or entering branch shall be a smooth curve with radius as long as practicable.

Frames and covers shall be set accurately to grade with a minimum of 3 and a maximum of 5 courses of brick provided as a leveling course. It shall be the Contractor's responsibility to assure that the frames and covers are set to match existing and/or proposed finish paving grades at the manhole locations.

Gravity sewers shall connect to the manholes in accordance with Standard Details S.S. 7.0 and the following instructions: The first length of pipe into or out of the manhole shall be 2-feet long, maximum, and shall be either plain-end, or plain-end by bell ductile iron pipe. Plain end by plain end short lengths of pipe shall be joined to the ductile iron main by means of a ductile iron solid sleeve. C-900 PVC repair couplings shall not be used in ductile iron mains.

6.10.5 Installation of Manhole, Alternate Method

Installation methods given in this Section shall only apply if permission is granted by the Engineer to use the "Alternate Method of Construction" as specified in Section 6.08.1. All provisions of that Section shall be applied to the installation of manholes with the specific modifications as follows:

1. Excavation

Excavation shall be carried to a depth of two feet below the bottom of the bottom slab of the manhole.

2. Special Bedding

Bedding shall be crushed stone or gravel meeting the requirements of ASTM C33-90 "Standard Specifications for Concrete Aggregates", gradation 67.

The bedding shall be placed in the excavation from cut bottom to the level of the bottom of the bottom slab. Thereafter, it shall be thoroughly rammed and tamped by use of a crane and weight or other means suitable to the Engineer to provide a stable base for the structure. Tamping and, if necessary, additional filling shall be carried out until the Engineer is satisfied that a suitable base has been created for the structure.

3. Backfill

After the structure is installed, special bedding material as specified immediately above shall be carefully hand or machine tamped around the structure up to a level of no more than eighteen inches above the water level. Thereafter the procedure and materials specified in Section 6.11 "Backfill and Compaction", shall be used to complete the installation. During all backfilling operations the backfill level shall be kept even on all sides of the structure and the Contractor shall exercise every precaution to prevent damage to, or unplanned loading of, the structure or its appurtenances.

Manhole frame shall be set so that the tops of the covers are flush with the adjoining pavement or ground surface. Accessories such as the manhole inserts, internal frame seals and extensions shall be installed in accordance with the manufacturer's instructions.

6.11 Backfill and Compaction

6.11.1 General

Backfill to the original ground surface or subgrade surface of openings made, with a sufficient allowance for settlement. The engineer may require that the material used for this Backfill be obtained from a source entirely apart from the site. Use only material accepted by the Engineer.

Do not allow heavy construction equipment to cross over the pipes until placing a compacting backfill material to the finish earthwork grade.

Backfill material shall be clean and free from all organic material, clay, marl or unstable materials, debris, lumps or broken paving. No rocks or stones larger than 3 inches in diameter will be allowed in any backfill. Material for backfill may be material resulting from trench excavation, if suitable in the opinion of the Engineer.

Select backfill material specified in these Specifications or required by the Details in these Specifications shall meet all the general requirements for backfill material set forth above, and, in addition, shall be free of any rocks or stones larger than 2 inches in diameter. Select backfill material may be material resulting from trench excavation, if suitable in the opinion of the Engineer, carefully selected to comply with these requirements.

If sufficient suitable backfill material, including select backfill material, is not available from trench excavation, additional material shall be furnished by the Contractor as provided for in the Bid Proposal.

Backfilling will not be allowed until the work has been inspected by the Engineer, and the Engineer indicates that backfilling may proceed. Any work covered up or concealed without the knowledge or consent of the Engineer may be required to be uncovered or exposed at no cost to the Department.

A testing laboratory, designated by the Department, will make periodic field tests to determine the density being obtained in each lift, or layer, of the backfill or as determined by the Engineer. The

Department will pay the cost for each test that indicates that the density obtained in the backfill meets or exceeds the specified percentage. The Contractor shall pay the cost for each test that indicates that the density obtained in the backfill is insufficient and does not meet the specified percentage. When compacted backfill fails to meet the specified percentage of maximum density as shown by test results, it shall be reworked and recompacted in a manner approved by the Engineer, and then retested. The reworking, recompacting and retesting of the backfill shall be repeated as many times as may be necessary to obtain compacted backfill with density meeting or exceeding the specified percentage as indicated by test results. The Contractor shall exercise proper care to insure that no pipe will be broken or displaced by the use of the type of mechanical compacting equipment he selects. Compact the materials at a moisture content such that the specified density can be attained. If necessary to attain the specified density, add water to the material, or lower the moisture content by manipulating the material or allowing it to dry, as is appropriate.

Compact the backfill of trenches to the densities specified, as applicable, and in accordance with the requirements, all pre-existing ground voids and depressions encountered with select backfill and leveled to natural grade, as approved by the Engineer, at no extra cost to the Department.

During all backfill operations, the backfill level shall be kept even on all sides of the structure or pipe to prevent damage to, or unplanned loading of, the structure or pipeline.

6.11.2 Pipeline Backfill and Compaction - General

Upon excavating for the pipeline, if unsuitable soils (i.e. unstable soils including peat, muck, or other organic soils, elastic silt and clays below the water table) exists for the pipe line to rest upon, the subgrade shall be removed and replaced with suitable material, free of sludge, marl, muck, unsuitable soils or organic materials, in six-inch layers. Each layer shall be compacted with a powered hand-tamper to at least 95 percent of maximum density, as determined by AASHTO Specification T-180, or the density required by the governing authority. The same compaction procedure shall be used to backfill the excavation around the walls of the manholes. Where greater density is required by the permit or agency having jurisdiction, the Contractor shall comply with such special conditions.

The Contractor shall backfill all trenches and other excavations made in the process of installing the pipe. The cost of all backfilling shall be included in the price bid under the various items. The Contractor shall maintain the surface of the backfill free from major irregularities and potholes. Material for backfill shall be material excavated from the trench, if suitable.

Backfill and compaction shall, in general, be kept up with the rate of pipe laying. The final bedding material and initial backfill shall be placed as soon as practical before and after the laying of the pipe, respectively.

On parts of the line where groundwater level may be high enough to "float" the pipe, the placing of the backfill and the rate of pumping the trench shall be controlled, so as to prevent the pipe from "floating" or moving from the line and grade. In the event that sufficient suitable material is not available at any point to backfill the trench, the Contractor shall transport suitable material from points of the line where such material is available or shall otherwise furnish suitable material at no additional cost to the Department. Compacting the backfill material shall be done in such a manner that the compaction equipment is not used directly above the pipe until sufficient backfill

has been placed to ensure that such compaction equipment will not have a damaging effect on the pipe.

6.11.3 PVC-Backfill and Compaction

Backfilling and compacting of material to a plane two feet above the crown of the pipe shall be in layers not exceeding nine inches in thickness or as approved by the Engineer. Each layer shall be thoroughly compacted to at least ninety-five percent of maximum density, as determined by AASHTO Standard No. T-180, "Moisture-Density Relations of Soils using a 10-lb. (4.54 kg) Rammer and an 18-inch (457 mm) Drop." The material in the trench may be compacted by either a hand tamper or a mechanized power tamper, using care to avoid contact between the pipe and equipment. Compacting the backfill material shall be done in such a manner that the compaction equipment is not used directly above the pipe until sufficient backfill has been placed to ensure that such compaction equipment shall not damage the pipe.

Backfilling and compacting of material lying above a plane two feet above the crown of the pipe and below the pavement base or the surface of the ground, if out of pavement, shall be accomplished in layers not exceeding 9 inches in thickness. Each layer shall be thoroughly compacted with a powered hand tamper or a mechanized power tamper to at least 98 percent of maximum density, as determined by AASHTO Standard T-180, or such greater density as may be required by the governing authority over the area in which the work is performed.

6.11.4 Ductile Iron - Backfill and Compaction

Backfill above the bedding material, to a plane at least 1 foot above the pipe, shall be select backfill material not exceeding 2 inches in diameter. Above this point, backfill shall be of material not exceeding 6 inches in diameter.

Backfilling and compacting of material to a level of one foot above the crown of the pipe shall be in layers not exceeding 6 inches in thickness. Each layer shall be thoroughly compacted to at least 90 percent of maximum density, as determined by AASHTO Specification No. T-180-74. The material in the trench may be compacted by either hand tamper or a mechanical power tamper, provided the results obtained meet the approval of the Engineer.

Backfilling and compacting of material lying above a plane one foot above the crown of the pipe and below the pavement base shall be accomplished in layers not exceeding 9 inches in thickness. Each layer shall be thoroughly compacted with a powered hand tamper or a mechanized power tamper to at least 98 percent of maximum density, as determined by AASHTO Specification T-180.

6.12 Cleaning and Testing

6.12.1 General

Each section of gravity pipe sewer that has been repaired, upon completion or at such other time as the Engineer may direct, shall be cleaned, tested and inspected. All subsequent repairs shown necessary by the tests are to be made, broken, cracked or obviously defective pipe replaced and all deposits removed. The sewer shall be left true to line and grade, as herein specified, entirely clean, free from protruding gaskets, bulkheads, etc. and ready for use. During

the required lamping procedure, each section of sewer shall show a full circle of light from each end and a post-replacement television inspection shall be performed in accordance with Section 6.02. A copy of the video shall be provided to the Engineer, along with his monthly pay request.

Any defects found in the system shall be corrected by the Contractor to conform to the requirements of the Specifications.

In the event that a repaired sewer line component develops leaks during the period that the Contract Bond is in effect, the Contractor will be required to return and replace it with a new section of pipe, or if approved by the Engineer, to eliminate infiltration leaks by external grouting encasement or by the sealing the leaks as provided for in Section 6.03.1, "Sealing of Post Replacement Leaks".

Visual infiltration observations (via CCTV) shall be performed on the repaired section of line. Any visible infiltration shall be repaired by the Contractor, by a means and to a degree acceptable to the Engineer. Visible infiltration will not be acceptable under any circumstances. All post-replacement television surveys shall be performed in compliance with procedures outlined in section 6.02.

The Engineer will make an inspection for acceptance. The inspection will be made within three days of the notification. If the Engineer finds that the work has been satisfactorily completed, the Department will consider such inspection as final.

All labor materials and equipment for acceptance tests shall be furnished by the Contractor.

6.12.2 Deflection Tests

Deflection testing of the repaired PVC sewer mains, via video inspection, shall be performed by the Contractor and witnessed by the Inspector, both before and after backfilling. During the post backfilling and compaction video inspection, which shall occur no sooner than thirty (30) days after backfilling has been completed, the pipe will be observed for evidence of obvious ovality, deflected or offset joints, and other pipe defects.

The deflection, or deformation of the pipe due to external loading, shall not exceed approximately 7.5 percent. All labor, materials and equipment necessary for cleaning the sewers and performing the deflection testing shall be furnished by the Contractor.

The deflection will be based on the average inside diameter as presented in ANSI/AWWA C 900-89, "AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inches through 12 inches, for Water Distribution:", Table 1, for Polyvinyl Chloride (PVC) C 900 pipe. The mandrel sizes are listed as follows:

Pipe Size Nominal (<u>inches</u>)	Average Inside <u>Diameter</u>	Mandrel 7.5% <u>Deflection</u>
6	6.282	5.81
8	8.240	7.62
10	10.106	9.35
12	12.018	11.12

If any pipe fails the deflection test, performed by the Contractor or by the Department, unstable conditions and/or improper bedding will be assumed. The overly deflected pipe shall be removed and replaced by the Contractor, at his expense. Re-rounding of overly deflected pipe will not be allowed. A trench to unstable conditions, as shown on Department Standard Detail SS 18.0 Sheet 3 of 3, shall be excavated and new pipe installed to unstable soil condition specifications. New replacement pipe shall be connected to existing pipe to remain with new double bell PVC repair couplings (no stop) with a maximum 1-inch gap between the pipes inserted therein. The couplings shall conform to the Specifications herein for PVC pipe and fittings. The Contractor shall furnish the Department with a new one year Warranty or Contract Bond guaranteeing the replacement work and materials under the same terms and conditions as the original new Warranty or Contract Bond. The new warranty period shall commence from the Department's acceptance of the replacement work performed by the Contractor.

Lamping Test: Each section of sewer shall show, from each end, a full circle of light.

Perform TV inspection of the gravity system or if ordered by the Engineer perform infiltration/exfiltration test in addition.

Infiltration/exfiltration Test: All drain and gravity sewer line segments or sections shall be separately and individually lamped and tested for infiltration and exfiltration, unless otherwise allowed by the Engineer. A line "segment" or "section" shall be defined as a run of pipe between a manhole and the next manhole either up or down stream of that manhole. When allowed by the Engineer in writing, longer portions of the line may be tested. However, no more than three manhole sections or 1000 feet of sewer (whichever is the lesser) shall be tested at any one time. The exfiltration test will be conducted by filling the portion of the system being tested with water to a level which will provide a minimum head of 2-feet in a lateral connected to the test portion, or, in the event there are no laterals in the test portion, a minimum difference in elevation of 5-feet between the crown of the highest portion of the drain or sewer and the test level. The Contractor shall locate and repair all leaks until the leakage is reduced to the limits specified. Any observed leaks or obviously defective joints or pipes shall be repaired or replaced as directed by the Engineer.

6.13 Work in State Roads

The work of this Section covers the installation and excavated repair of gravity sewers in State Roads.

All work performed within the right-of-way of the Florida Department of Transportation (F.D.O.T.) shall comply with the requirements and conditions of the F.D.O.T.; including the requirements and conditions of the F.D.O.T. permits and with all requirements and conditions of this and other Sections of the Specifications. After the Contractor concurs that he can successfully perform the particular Work Order, the Department will obtain the F.D.O.T. permit, and provide the permit to the Contractor.

The Engineer shall coordinate a pre-construction meeting with the F.D.O.T. and the Contractor at least forty-eight (48) hours prior to the commencement of any work on State Roads. Contractor shall not begin to work until he has received notification from the Engineer to do so. Any and all roadway damage shall be replaced and/or constructed in accordance with the F.D.O.T. Roadway & Traffic Design Standard and Specifications for Roads and Bridges. The Contractor is therefore encouraged to be familiar with these publications.

Payment of fees associated with the permit shall be included in the Proposal as provided in the Dedicated Allowance item established for Permit Fee Reimbursement.

6.13.1 Hours of Work

Work in the F.D.O.T. right-of-way shall only take place between the hours specified on the specific permit.

6.13.2 Maintenance of Traffic Plans (M.O.T.)

After Notification of Award, the Contractor's Certified Work Zone Traffic Safety Supervisor shall immediately prepare and submit a Maintenance of Traffic (M.O.T.) Plan to the Engineer for approval. When the proposed work will take place inside the F.D.O.T. right-of-way, the M.O.T. Plan must also meet F.D.O.T. approval. Said Plan shall be in written form with sketches or drawings as necessary and shall comply with State of Florida Department of Transportation standards of M.O.T. in construction areas. The Plan shall be submitted at least two (2) weeks prior to the date of road closure, to the Department for processing the required "Roadway Lane Closure Request" form. No work shall take place in the state road prior to approval of the Maintenance of Traffic (M.O.T.) plan.

6.13.3 Lane Closures

Lane closures require a Lane Closure Permit, obtained two (2) weeks prior to planned construction, with a minimum 48-hour prior notice to local police (some police jurisdictions may require considerably more notice). Lane closures of a one day or less duration will generally not be approved for major collector streets nor for arterial streets during the hours of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., weekdays. Fees paid in obtaining a Lane Closure Permit shall be included in the Proposal as provided in the Dedicated Allowance for Permit Fee Reimbursement.

No lane closures will be allowed at all between the period of the day before Thanksgiving until the day following the New Year's holiday

6.14 Pavement Removal and Replacement

Work included under this Section covers the furnishing of all labor, equipment and material required for the removal, cutting and disposal of existing rigid portland cement concrete pavement, sidewalk, slope pavement, ditch pavement, curb and gutter, and all existing roadways, driveways and pavements of the various types encountered, removed or damaged under this Contract.

The Contractor shall protect and not displace property obstructions which are to remain in place, such as buildings, sewer, drains, water or gas pipes, conduits, poles, wall, posts, etc.

All existing utility castings, including valve boxes, junction boxes, manholes, handholes, pull boxes, inlets and similar structures in the areas of trench restoration, pavement replacement and pavement overlay shall be adjusted by the Contractor to bring them flush with the surface of the finished work, at no additional cost to the Department.

6.14.1 General Requirements

The Contractor shall be responsible for the protection from damage resulting from his construction operations of all pavements, including all limerock base courses and asphaltic surface courses within the work area. Payment for pavement restoration will be made only where such limerock base courses or surface courses are encountered within the limits defined in the pavement repair details shown on the Standard Details presented in Appendix B. Any base course or surface course beyond those limits, damaged as a result of the Contractor's operation, shall be restored in accordance with the applicable requirements of these Specifications, to the satisfaction of the Engineer, and to the satisfaction of the governing authority having jurisdiction over the work area at no additional cost to the Department. Any damage to adjacent lanes of pavement, which amounts to 25 percent or more in any one block (approximately 300 feet), will require that the Contractor resurface the entire width of the lane in which the damage occurred for the entire block, at no cost to the Department. In order to protect himself from being held liable for any existing damaged pavement, including detour routes, the Contractor is advised to notify, in writing, the authority having jurisdiction over the street and provide preconstruction photographs as described in Section 6.00, "Construction Methods", where such defective pavement exists prior to proceeding with any work in the vicinity. A copy of all such notices and photographs shall be forwarded to the Engineer.

No payment will be made for pavement restoration which falls outside the above described limits unless approved by the Engineer. The cost for such work shall be included in the price bid for the applicable item. All restoration work including, but not limited to, trench, asphalt, sidewalk and sod shall be completed within 30 days of repair. In the event the Contractor does not complete restoration in a timely manner, the Engineer reserves the right to not allow the Contractor to continue working on new work and withhold payment on completed work, until all pending work is complete.

Permanent pavement repair shall be in accordance with the details shown in the Standard Details herein, with edges straight and parallel and patches rectangular in plan. Any paving replacement required, beyond the limits shown in the details and as called for in the Specifications, shall be at the Contractor's expense, unless otherwise approved by the Engineer. Where trenches are located out of the existing pavement and damage occurs to the pavement, that pavement shall also be replaced by the Contractor at his expense, unless otherwise approved by the Engineer.

Pavement markings removed or obliterated by the Contractor's operations shall be promptly replaced, in kind, and paid for under the appropriate bid form as provided in the proposal, to the satisfaction of the Miami-Dade County Department of Public Works, Traffic Engineering Division, or other authority having jurisdiction over the work area. No payment will be made for pavement marking replacement outside of construction limits as described herein.

All equipment necessary for construction shall be on the job site in first class working condition. Spilling or dropping of petroleum products is prohibited and all defective equipment shall be removed or replaced immediately. The Contractor shall be subject to all DERM (Department of Environmental Resources Management) regulations and clean up requirements.

The percentages of maximum density for subgrade and limerock base specified herein are minimum. Greater percentages of maximum density shall be obtained, if so required, by the governing authority having jurisdiction over the work location.

Construct plant-mixed hot bituminous pavement and bases. Establish and maintain a quality

control system that provides assurance that all materials, product and completed construction submitted for acceptance meet Contract requirements.

Spread the mixture only when the surface upon which it is to be laid has been previously prepared, is intact, firm, and properly cured, and is dry and only when weather conditions are suitable.

The temperature of the mixture at the time of spreading shall be within limits of Florida D.O.T. specifications. No mixture shall be spread when the air temperature is less than 40 degrees Fahrenheit.

Any mixture caught in transit by a sudden rain may be laid at the Contractor's risk, if the base is in suitable condition. Under no circumstances shall asphaltic material be placed while rain is falling, or when there is water on the area to be paved.

6.14.2 Patch/Temporary Paving

Prior to commencing excavation, the asphalt surface shall be sawcut within the limits of the allowable trench width. Patch paving will be required along the entire route where the original paved surface is removed. Unless approved otherwise by the Engineer, patch paving shall be placed the same day the trench is backfilled. The trench shall be backfilled and lime rock placed in accordance with the applicable sections of the specifications up to a level 1-inch below the existing pavement surface.

Provide a finished surface that is reasonably smooth, of uniform texture, and shaped so as to drain without water ponding. Upon completion of the pavement, shape the surface of the adjacent earth to match the pavement edge.

Type I asphalt pavement shall be constructed up to the level of the existing pavement surface. The liquid asphalt shall be Grade RC-70, conforming to the requirements of D.O.T. Specifications, Section 916-2. The sand shall conform to the requirements of D.O.T. Specifications, Section 902 for fine aggregate.

Uniformly compact the hot bituminous mixtures with lightweight roller vibratory compactors as directed by the engineer. The Contractor may use hand tamps for compaction areas which are inaccessible to other compaction equipment.

Patch paving is to be installed one block at a time, not crossing any intersection, or a maximum of one line segment shall be completed before the Contractor may move forward with his excavation work. Backfill, compaction, lime rock and patch/temporary paving is to keep pace with the pipe installation. Written permission must be obtained from the Engineer and the municipal agency permitting the work to allow greater lengths than one line segment. Permitting agencies may reduce the allowable limits in their permit, or for other unforeseen right-of-way conditions.

Temporary patch paving, if approved by the Engineer and installed in accordance with Section 6.14.2, "Patch Temporary Paving", shall be maintained by the Contractor in a condition satisfactory to the Engineer until placement of permanent pavement. Removal shall include any surplus backfill material. Replacement of the temporary pavement with permanent pavement shall be made within 30 days. In replacing the temporary paving with Permanent pavement, all work shall be completed in sections compatible with specified traffic maintenance procedures.

No payment shall be made for temporary paving work and the cost for such work shall be included in the prices bid for other applicable items of work.

Sand seal on the limerock base course will not be permitted in lieu of temporary paving.

Unless approved otherwise by the Engineer, patch temporary paving, where required, shall be placed within twenty-four hours following the completion of sanitary sewer gravity main replacement, backfilling and placing of lime rock.

6.14.3 Type I Paving Repairs (Limerock Base and Asphaltic Concrete Surface)

Type I paving repairs shall be made with an 8-inch thick compacted limerock base and a minimum 2-inch thick asphaltic concrete surface placed in a minimum of two (2) compacted 1-inch lifts. Contrary to what is shown in the Standard Detail, the 2-inch thickness shall be installed for Type I paving repairs.

The backfill previously placed and compacted shall be excavated to the required depth below the existing road surface and the existing paving shall be cut back beyond all excavations, using an abrasive disc saw to trim the edges to straight and true lines. Eight inches of limerock base shall be placed in two layers, each layer compacted to not less than 98% percent density as specified in Section 6.11, "Backfill and Compaction." During rolling, the base shall be wetted down, as necessary, to secure the greatest possible compaction. After rolling, the entire surface of the base shall be thoroughly scarified to a depth of not less than 3 inches and shaped to conform to and be parallel with the existing surface, then watered and rolled again. Rolling and watering shall continue until the entire depth of the base is bonded and compacted into an unyielding mass.

If at any time the subgrade material becomes mixed with the limerock base course materials, the Contractor shall, without additional compensation, dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean rock which shall be watered and rolled until satisfactorily compacted.

After the limerock base course has been properly prepared and is dry and ready to receive the wearing surface, a tack coat of emulsified asphalt (Grade RS 2) shall be applied at a rate of 0.10 gallon per square yard, immediately followed by the asphaltic concrete surface. The tack coat shall be applied to the entire limerock base course uniformly, and shall thoroughly coat all surfaces. Care shall be taken to tack coat and bond the edges of surrounding pavement. The tack coat shall not advance ahead of the paving by more than 300 feet in business or residential areas unless otherwise approved by the Engineer.

Where the width of the repair permits, the asphaltic concrete plant mix material shall be placed by means of an approved mechanical spreader and finisher. The mixture shall be compacted to true grade and cross section by means of a tandem roller weighing not less than eight tons. The compacted asphaltic concrete mixture shall not be, in any case, less than one inch in thickness. Rolling shall proceed as closely behind the spreader as possible and all material shall be completely compacted the same day it is placed.

6.14.4 Type II Paving Repairs (Special Limerock Base and Asphaltic Concrete Surface)

Type II repairs shall be used only when the restoration work falls within the limits of a State Road and shall be performed in accordance with the latest Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The dimensions shall be as shown in

the Department's Standard Detail W-10742-C or Flowable Fill mix as required by the Florida D.O.T. In the event of conflict, the requirements of FDOT shall take precedence.

Construct an asphalt concrete friction courses as per F.D.O.T. Standard Section 337. For project required on State Right-of Way

6.14.5 Type M-I Paving Repairs (Limerock Base - Asphaltic Concrete Surface)

Type M-I repairs will be used only when the restoration work falls within the limits of the City of Miami.

Type M-I paving repairs shall be similar to Type I paving repairs except for the dimensions of the limerock base and the asphaltic concrete surface course.

The limerock base shall be 12 inches thick with a minimum width equal to the trench width plus one foot.

The asphaltic concrete wearing surface shall be a minimum 1-1/2-inches thick. In some cases the City of Miami may require greater thicknesses of wearing surfaces. Greater thickness shall be paid for from the Proposal Item established for Type V paving repairs.

6.14.6 Type V Paving Repairs (Asphaltic Concrete Wearing Surface Overlay)

Type V paving repairs shall consist of a machine-laid asphaltic concrete wearing surface overlay, which shall be a nominal one-inch thick asphaltic concrete, meeting the material requirements of Type I repairs, as specified herein above. As used herein, "overlay" shall mean Type V paving repairs. A special wearing surface may be substituted, if required. In general, the overlay shall be applied in a full lane width or widths, after the permanent paving repairs over the trench have been made.

All longitudinal and transverse asphalt replacement overlay wearing surfaces shall butt into adjacent existing asphalt wearing surfaces in full lane asphaltic pavement restoration. The finish elevation of the new full lane overlay shall meet existing elevations adjacent to the new work.

The existing asphaltic concrete surface shall be saw cut for its full depth or 1-inch minimum, and then stripped back for at least 2 feet into the area to be overlaid to a second cut which shall also be in clean straight lines. The second, or interior, cut edge shall be rolled with a tandem roller weighing not less than 8 tons before the overlay is applied. The stripped area shall be used to provide a smooth transition between the overlay and the existing pavement. Before placing the overlay, all cut edges and the surface of the stripped area shall be tack coated with emulsified asphalt as specified herein below.

If the Contractor requests in writing to "feather" the longitudinal edge, and if written permission is granted to "feather" the asphalt by the Department and the local municipality, a sanded mix of 70-30 type shall be used. "Feathering" shall begin 18 inches from the tapered edge.

Prior to installing a full lane width overlay over existing asphaltic pavement the trench and shoulders over the pipe shall be sawcut and filled with asphaltic pavement to the required depth, terminating flush with the existing adjacent asphalt in accordance with the municipality having jurisdiction over the work for Types I, II or M-1. Type V overlay will be installed as detailed above.

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When a minor amount of asphalt surface will remain, generally with large pipe installations, after the pipe has been installed and the required longitudinal saw cutting of the asphaltic pavement completed, the Contractor may request permission to remove all the asphalt in the lane, at his expense, by saw cutting the asphalt adjacent to the existing lane, then placing the Type V overlay flush with the adjacent asphalt. This would require that the Type I, II or M-1 finish elevation be lowered 1 inch to allow for the Type V overlay.

Before the overlay is applied, existing surfaces shall be swept clean of all dirt and debris, using a power driven broom if warranted by the size of the location to be overlaid and/or as ordered by the Engineer. Pavement edges shall be cleared of all encroaching vegetation, loose sand, rock and all other foreign matter. When the existing surface is thoroughly clean, a tack coat of Emulsified Asphalt, Grade PS-2 (anionic) shall be applied at the rate of approximately 0.10 gallon per square yard, immediately followed by the asphaltic concrete overlay. The tack coat shall not advance ahead of the paving by more than 300 feet in business or residential areas unless otherwise approved by the Engineer.

Machine-laid overlay shall be placed by means of an approved mechanical spreader and finisher, and the mixture shall be compacted to true grade and cross section by means of a tandem roller weighing not less than 8 tons.

The compacted overlay shall be thicker as required to produce a smooth uniform surface free of any irregularities, but shall not be less than one inch in thickness. Existing depressed areas in the asphaltic pavement, which could collect water after a rainfall shall be corrected before placing the asphaltic overlay. Rolling shall proceed as close behind the spreading of the asphaltic overlay as possible, and all materials shall be completely compacted the same day it is placed.

6.14.7 Asphaltic Concrete Friction Courses

This type of repair shall be made only on Florida Department of Transportation roadways to replace damaged existing friction courses. The particular friction course to be used at any repair location shall be as designated by the D.O.T. for that location.

Asphaltic Concrete Type FC-2 and FC-3 shall meet the requirements of D.O.T. Specifications for Friction Courses, Sections 337-1 through Section 337-7.

The friction course shall have a nominal thickness of 5/8-inch. The 5/8-inch nominal friction course may be placed over the 3-inches of newly placed Type S-1 asphaltic concrete or the existing asphalt concrete pavement may be milled to a nominal depth of 5/8-inch to allow for the placement of the FC-2 over the existing asphaltic concrete, as approved by the Department. Additional depth of milling of asphaltic concrete may be required by the Department for Type S-1 asphaltic concrete.

If the friction course is laid the same day that the underlying course was laid, no tack coat or primer is required, but if the underlying course is old enough to have cured, a tack coat of emulsified asphalt shall be applied at the rate of 0.10 gallons per square yard and topped with a 5/8-inch thick, machine-laid friction course.

6.14.8 Pavement Markings

Apply preformed reflectorized plastic pavement symbols, legends, stripes and markings, in accordance with the Contract documents and remove traffic stripes and marking as required.

Pavement markings removed or obliterated by the Contractor's operations shall be promptly replaced in kind to the satisfaction of the Miami-Dade County Department of Public Works, Traffic Engineering Division, or other authority having jurisdiction over the work area.

A. Traffic Paint

The colors of the paint shall be yellow or white, as existed before the repair.

Use equipment that will produce continuously uniform dimensions of traffic stripe and markings of varying widths and meet the following requirements:

- (a) Capable of traveling at uniform, predetermined rate of speed, in order to produce a uniform application of paint and capable of following straight lines and making normal curves in true arcs.
- (b) Capable of applying glass sphere to the surface of the completed stripe by an automatic sphere dispenser attached to the striping machine such that the glass spheres are dispensed closely behind the install line.
- (c) Capable of spraying the paint to the required thickness and width without thinning of the paint. Equip the paint tank with a mechanical agitator and nozzles equipped with cut-off valves which will apply broken or skip lines automatically.

Painting shall be done only during daylight hours and, as far as practicable, shall be terminated in time to permit sufficient drying by sunset. No paint shall be applied when moisture is present on the surface to be painted or when the air temperature is below 40 degrees F. Painting shall not be done when winds are sufficient to cause spray dust.

The surface which is to be painted shall be cleaned, by compressed air or other effective means, immediately before the start of painting, and shall be clean and dry when the paint is applied. Any vegetation or soil shall be removed from the pavement before edge striping is begun.

The paint shall be thoroughly mixed before it is poured into the painting machine and no thinning of the paint will be allowed at any time. Before the start of each day's work, the paint container, the connections, and the spray nozzles on the machine shall be thoroughly cleaned with paint thinner or other suitable cleaner.

The traffic stripe shall be of the specified width, with clean, true edges and without sharp breaks in the alignment. A uniform coating of paint shall be obtained and the finished stripe shall contain no light spots or paint skips. Any stripes which do not have a uniform, satisfactory appearance, both day and night, shall be corrected.

All newly painted stripes, including edge stripes, shall be protected until the paint is sufficiently dry to permit vehicles to cross the stripe without damage from the tires. While the center line stripes are being painted, all traffic shall be routed away from the painting operations and the newly painted stripe. When necessary, a pilot car shall be used to protect the painting operations from traffic interference.

Any portions of the stripes damaged by passing traffic or from other causes shall be repainted at the Contractor's expense.

Paint for temporary pavement markings shall also be used where thermoplastic markings are to be applied after the asphaltic concrete has "cured." The cure time shall be based on thermoplastic manufacturer's recommendations.

Costs associated with traffic paint are considered incidental and shall be included in the appropriate bid items for Pavement Removal and Replacement in the proposal.

B. Thermoplastic Traffic Stripes and Markings

Apply thermoplastic traffic stripes and markings, or refurbish existing thermoplastic traffic stripes and markings, in accordance with the Contract Documents and remove traffic stripes and markings as required.

Use equipment to install hot applied thermoplastic material constructed to provide continuous uniform heating to temperatures exceeding 390° F mixing and agitation of the material reservoir and the line dispensing devices to materials are to prevent accumulation and clogging. Use equipment which will provide for varying traffic stripes and markings application widths and meet the following requirements.

- (a) Mobile and capable of traveling at a uniform, predetermined rate of speed, in order to produce a uniform application of thermoplastic material and maneuverable to the extent that straight line can be followed and normal curve can be made in a true arc.
- (b) Capable of applying glass sphere to the surface of the completed stripe by an automatic sphere dispenser attached to the striping machine such that the glass spheres are dispensed closely behind the install line.
- (c) Equipped with a special kettle for uniformly melting and heating the thermoplastic materials. The kettle must be equipped with an automatic temperature control device and material thermometer for positive temperature control and to prevent overheating or scorching of the thermoplastic material.
- (d) Meet the requirements of the National Fire Protection Association, state and local authorities.

Thermoplastic pavement markings, including stripes, pavement messages, stop bars, directional arrows, reflective pavement markers and other miscellaneous items, shall be replaced as existed before the repair was made.

Ensure that the existing pavement markings are removed, such that scar or traces of remove markings will not conflict with the new stripes and markings method approved by the Engineer.

Prior to applying pavement stripes and markings, remove any material that would adversely affect the bond of the pavement stripes and markings by a method approved by the Engineer.

Apply traffic stripes or markings only on dry surface, and when the ambient air and surface temperature is at least 55° F and rising. Do not apply pavement markings when winds are sufficient to cause spray dust.

Prior to installation of thermoplastic material, apply a two-part epoxy primer sealer recommended

by the manufacturer, on all portland cement concrete surfaces. As specified in F.D.O.T. Specifications.

The thermoplastic shall be applied to the pavement utilizing either extrusion or spray application equipment. The application equipment shall be so constructed as to provide continuous mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the shaping die or gun shall be so constructed as to prevent accumulation and clogging. The equipment shall be constructed so that all mixing and conveying parts up to and including the shaping die or gun, maintain the material at the plastic temperature with heat transfer oil or electrical element controlled heat. Direct fire heat transfer will not be allowed.

The hand applicator equipment shall be insulated, have sufficient capacity to hold 150 pounds of molten material, and be sufficiently maneuverable to install crosswalks; lane, edge and center lines; arrows and legends.

The truck mounted unit for lane, edge and center lines shall consist of a mobile self-contained unit carrying its own material capable of operating at a minimum speed of five miles per hour while installing striping. Application time, weather limitations and surface preparation shall be in accordance with F.D.O.T. Specifications Sections 710-6.1, 710-6.2, 710-6.3

The material, when formed into traffic stripes or other markings, shall be readily renewable by placing an overlay of new material directly over an old line of compatible material in such a manner that no splitting or separation takes place.

The application temperature shall be within the range specified by the manufacturer of the thermoplastic compound being used.

All pavement edge lines, gore, island and diagonal strip markings, bike lane symbols and messages, wherever located, shall have a minimum thickness of 0.060 inch at the edges and a maximum thickness of 0.150 inch at the center. A minimum average film thickness of 0.060 inch shall be maintained. All lane lines, center lines, transverse markings (except shoulder markings) and pavement markings within traffic wearing area (such as dotted turning guide lines) shall have a minimum thickness of 0.090 inch at the edges and a maximum thickness of 0.188 inch at the center. A minimum average film thickness of 0.090 shall be maintained. All thickness measurements shall be an average in any three foot length.

The glass sphere top coating shall be applied by a type of glass sphere dispenser or gun which will embed the spheres into the line surface to at least one-half their diameter. The glass sphere top coating shall not incur more than a 10 percent loss during the first 30 days of traffic exposure.

Reflective pavement markers shall be installed as they existed before the repair: They shall be replaced with the appropriate color or colors and oriented in the correct direction as specified in Section 706 of the F.D.O.T. Specifications. Paving markings for this Project shall conform to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, as revised by the governing agency.

Costs associated with thermoplastic stripes and markings shall be included in the appropriate bid items for Pavement Removal and Replacement.

6.14.9 State Road Pavement Restoration (Flowable Fill Backfill and Base and Asphaltic Concrete Surface)

State Road pavement restoration, as per Florida D.O.T permit requirement and specification shall be made where required with a backfill/base of flowable fill/sand concrete mix as specified in Section 5.05.4 "Flowable Fill" herein. In all cases, regardless of watertable location, the flowable fill mix shall be placed from a plane 12 inches above the top of the pipe to an elevation 3 inches below the adjacent asphaltic surface. A 3-inch thick asphaltic concrete course shall be machine-laid in two equal layers. Then as required by the Florida D.O.T., the Contractor may be directed to cold-mill one inch and replace with one inch of material as described in Section 6.14.10, "Milling".

After the base surface has been properly prepared and is dry and ready to receive the wearing surface, a tack coat of emulsified asphalt (Grade RS-2) shall be applied at a rate of 0.10 gallon per square yard, immediately followed by the asphaltic concrete. The tack coat shall be applied to the entire base uniformly, and shall thoroughly coat all surfaces. Care shall be taken to tack coat and bond the edges of surrounding pavement.

The 3-inch asphaltic concrete course shall be plant mixed, using the best grade of local aggregates of approved size and gradation and mixed with an approved binder and conforming to the State of Florida Department of Transportation Specifications, Type S-1 Asphaltic Concrete, Section 331-1 through 331-5.

Where the width of the repair permits, the material shall be placed by means of an approved mechanical spreader and finisher. The mixture shall be compacted to true grade and cross section by means of a tandem roller weighing not less than eight tons. The compacted asphaltic concrete mixture shall not be, in any case, less than three inches in thickness. Rolling shall proceed as closely behind the spreader as possible and all material shall be completely compacted the same day it is placed.

6.14.10 Milling

Removed existing asphaltic concrete pavement by milling to improve the rideability of the finished pavement, to lower the finish grade adjacent to existing curb prior to resurfacing, or to completely remove existing pavement. Milling shall be performed so as to uniformly maintain the existing line and grade of the roadway.

Provide a milling machine capable of maintaining a depth of cut and cross slope that will achieve the results specified in the Contract Documents. Use a machine with a minimum overall length of 18 feet and minimum cutting width of 6 feet.

The Contractor may use a smaller milling machine when milling to lower the grade to existing curb or other areas where it is impractical to use the above describe equipment.

Equip the milling machine with means to effectively limit the amount of dust escaping during the removal operation.

Milling of the existing pavement for a 1-inch depth shall be done by using an automated pavement planer capable of maintaining an accurate depth. Milling equipment shall meet the approval of the Florida Department of Transportation. When milling to improve rideability or cross slope, remove the existing pavement to the average depth specified, in a manner that will restore the pavement surface to a uniform cross-section and longitudinal profile. The Engineer may require the use of a stringline to ensure maintaining the proper alignment.

After the pavement has been milled and the existing pavement removed provide positive drainage of the milled surface and the adjacent pavement, a tack coat shall be applied as specified on D.O.T. Standard Specifications.

Perform this operation on the same day of milling. Repave all milled surfaces no later than the day after the surface was milled

A full lane of one inch thick asphaltic concrete wearing surface of either Type S-1 Asphaltic Concrete or Type FC-2 Friction Course (per Florida Department of Transportation Specifications, Sections 331 and 337, respectively) shall be applied in accordance with the above specifications, or any other municipality having jurisdiction.

6.14.11 Concrete Driveway, Sidewalk and Curb and Gutter Removal and Replacement

Work under this Section covers the furnishing of all labor, equipment and material required for cutting, removing, protecting and replacing all existing concrete driveways, sidewalks, and curb and gutter of the various types encountered, removed or damaged under this Contract.

A. General Requirements

The Contractor shall be responsible for the protection from damage resulting from his construction operations of all concrete driveways, sidewalk, and curb and gutter within the work area. Payment for these types of restoration will be made only if such items are encountered within the limits of the trench width, 7.5 feet each side of the centerline of the trench. Any concrete driveway, sidewalk, or curb and gutter beyond those limits, damaged as a result of the Contractor's operation, shall be restored in accordance with the applicable requirements of these Specifications, and to the satisfaction of the Engineer, at no additional cost to the Department. In order to protect himself from being held liable for any existing damaged concrete driveways, sidewalks or curb and gutter, the Contractor is advised to notify in writing the authority having jurisdiction over the street where such damage exists prior to proceeding with any work in the vicinity. A copy of all such notices shall be forwarded to the Engineer.

No payment will be made for removal and replacement of concrete driveway, sidewalk, or curb and gutter which falls outside the above described limits. The cost for such concrete work shall be included in the price bid for the applicable item.

As used herein, "driveway" shall mean concrete driveway, and "curb and gutter" shall mean free standing curb, gutter, or combination curb and gutter.

The Contractor shall provide adequate means to protect each driveway, sidewalk, and curb and gutter installation from damage from vandals, animals, weather or other causes, until the concrete is hard. Should damage occur from such causes, the Contractor shall remove and replace the damaged item at his own expense.

All concrete and concrete work for driveway, sidewalk and curb and gutter replacement shall conform to Section 5.05 "Concrete, Mortar and Grout" herein, and to Specifications: "Cast-in-Place Concrete, Reinforcing and Formwork" included at the back of these Specifications.

B. Concrete Driveways

Concrete driveways, and sidewalks crossing driveways, shall be restored in full sections or blocks rather than 7.5 feet each side of the centerline of the trench, if the original construction was divided into such sections or blocks. The existing driveway (or sidewalk) shall be cut with an abrasive disc saw to trim the edges to straight and true lines, with edges parallel and rectangular in plan. The interior concrete shall then be broken up and removed from the site.

Driveways, and sidewalk crossing driveways, shall be replaced with a concrete slab having a minimum thickness of 6 inches. Steel reinforcement is not required unless the existing driveway (or sidewalk) is so reinforced, in which case the replaced driveway shall also be reinforced to match the existing.

Such forms as are necessary shall be set up and the subgrade regraded for a slab 6 inches thick. The subgrade shall be thoroughly compacted and wetted down prior to placing the concrete. The driveway shall be given a surface and edging to match, as nearly as possible, that of the existing driveway (or sidewalk). The finish and edging shall be obtained through the use of screens, trowels, edgers and any other tools normally required by the trade in performing this kind of work.

All forms for driveways (or sidewalks) including those for expansion joints, shall be metal, being clean and well oiled prior to placing concrete. The forms shall be set in place far enough in advance of concrete placing for the Engineer to check line and grade. Abrupt changes in line and grade will not be permitted. Forms shall be set to insure smooth curvature and alignment both vertically and horizontally. Forms shall be left in place for a minimum of 24 hours after concrete has been placed.

Replacement driveways (and sidewalks) shall match the elevation and alignment of existing driveways (and sidewalk) wherever a connection is made.

Special concrete treatment shall be replaced to match the existing driveway. No additional compensation shall be paid for this work.

C. Sidewalks

Sidewalks shall be restored in full sections. Compact fill areas, including cut areas under the sidewalk that have been excavated more than 6 inches below the bottom of the sidewalk, to a minimum of 95% density. The area to be compacted is defined as that area directly under the sidewalk. Form ½ inch expansion joints between the sidewalk and the curb or driveway or fixed objects and sidewalk intersections. The Contractor may use open type or sawed contraction joint.

Provide the 4000 psi concrete with the broom finish or to match the existing condition. Ensure that the surface variations are not more than 1/4 inch under 10 foot straightedge, or more than 1/8 inch on a 5 foot transverse section. Finish the edge of the sidewalk with an edging tool having a radius of ½ inch. Minimum thickness of the sidewalk shall be 4 inches.

D. Concrete Curb and Gutter and Traffic Separator

Construct portland cement concrete curb and gutter, concrete traffic separator, valley gutter, or any type of curb not specified.

Construct forms for this work of either wood or metal. Provide forms that are straight, free from warp or bends, and sufficient strength, when staked, to resist the pressure of the concrete without deviation from line and grade. For all items constructed on a radius, use flexible forms.

The Contractor may place these items by machine methods with the approval of the Engineer provided that the Contractor consistently produces an acceptable finished product, true to line, grade, and cross section.

Excavate to the required depth, and compact the foundation material upon which these items are to be placed as specified. Place the concrete (Class II concrete) in the forms, and tamp and spade it to prevent honeycombing, and until the top of the structure can be floated smooth and the edges rounded. Except for machine placed items, the Contractor may form joints by using dummy joints (either formed or sawed) or by using sheet metal templates.

The shape and final finish shall match that of the existing abutting curb and gutter.

6.15 Repairs Due to Contractor's Operations

The Contractor shall exercise caution to ensure that his operations do not damage the existing sewer. The Contractor shall be responsible for repairs to the sewers which are necessary due to damage caused by the Contractor's operations. Such repair shall be considered as part of the work and no extra compensation will be allowed.

Damaged pipe or manholes shall be replaced in kind or repaired by the Contractor to the satisfaction of the Engineer, with emphasis on providing a good, solid foundation for the new pipe. Temporary paving and permanent paving repairs shall also be made by the Contractor.

Contractor shall immediately repair any damage using methods satisfactory to the Engineer. If the Contractor fails to immediately repair any such damage, the Department shall have the right to make the repair or have the repair made, and may charge to the Contractor all costs, including administrative costs and overhead, incurred by the Department in connection with the repair. The

Department shall also charge to the Contractor any costs incurred or penalties imposed on the Department as a result of such damage.

The Contractor is strongly advised not to position equipment having greater than an AASHTO H-20 loading above the sewer line. Repair of any damage caused by such equipment loads shall be at the Contractor's expense.

Any repairs requiring excavation, except emergency work, shall have prior approval of the Engineer.

The Contractor shall indemnify, defend, and hold harmless the Department and all of its officers, agents and employees, from claims, losses, damages, cost, charges, or expenses arising out of any acts, action, neglect, or omission by the Contractor during the performance of the Contract.

6.15.1 Protection of Existing Utilities, Structures and Other Facilities

Do not commence work at points where the construction operations are adjacent to utility facilities or other property, until marking arrangements with the utility facilities to protect against damage that may result in expense, loss, disruption of service, or other undue inconvenience to the public or to the owners. The Contractor is solely and directly responsible to the owners and managers of such properties for all damages, injuries, expenses, losses, inconveniences, or delays cause by the Contractor's operation.

The Contractor shall exercise due caution throughout this project to minimize the possibility of damage to utilities resulting from his activities. The location of all overhead and underground utilities shall be verified by the Contractor and the Engineer notified of any conflict which might occur. The Contractor shall comply with the requirements of the utility companies and the Department's Engineer for determining which poles will need shoring during excavation and shall provide such shoring and support as required.

Where it is necessary to temporarily interrupt flow in house or building services, the Contractor shall notify the house or building owner or occupant, both before the interruption and again immediately before service is resumed. Before disconnecting any pipes or cables, the Contractor shall make suitable arrangements for their disconnection with the owner. The Contractor shall be responsible for any damage to such pipes, conduits or cables, and shall restore them to service promptly as soon as the work has progressed past the point involved.

Various drainage culverts and drainage ditches may be encountered along the route of the work. Any culverts which are disturbed, damaged or removed shall be repaired, restored or reinstalled. Drainage ditches shall be restored to the original cross sections existing prior to construction of this work. Ditches shall be left clean and free of all excavated materials or other materials deposited in them as a result of this construction. All existing headwalls and slabs for drainage ditches, removed or damaged as a result of this construction, shall be restored. This work shall be performed as directed by the Engineer, and the work shall be considered an incidental item and the cost included in the items listed in the Proposal.

6.15.2 Relocation of Existing Utilities

The relocation of existing utilities shall be the responsibility of the Contractor. This work shall be completed by either the forces of the existing utility or the Contractor's forces at the discretion of the responsible utility. If the work is to be performed by the Contractor all work shall be done in accordance with the utility company's requirements. Where temporary supports or protective encasements are required during the construction, the Contractor shall be responsible for this work at no additional cost.

The Department will make the necessary arrangements with utility companies for the removal or adjustment of utilities where the Engineer determines that such removal or adjustment is essential to the performance of the required construction. The Department will consider relocation or adjustment requests based on Contractors proposed use of particular methods of construction or a particular type of equipment as essential to the construction of the project.

Various storm sewer lines and inlets and slab-covered drainage ditches that conflict with the proposed construction may require adjustment, relocation or removal and reinstallation. This work shall be performed as directed by the Engineer, and the work shall be considered an incidental item and the cost included in the items listed in the Proposal.

Representatives of utility companies, the railroad companies, the traffic and transportation authorities, etc., shall be notified in accordance with the provisions set forth in the relevant sections of the Specifications and the permitting documents.

6.15.3 Landscaping

Work in this Section includes grading all areas disturbed by the Contractor's activities, furnishing

and planting trees shrubs and solid sod within established lawn areas of the Project that have been disturbed by the Contractor's operations, removing, restoring and/or replacing in kind all fences, bushes, trees (ie. trees less than 12" in height or trunk is greater than 12" in diameter), flowers, etc. and all landscape architectural features disturbed by the Work. Sod disturbed by the Contractor's operations shall be replaced with sod of the same variety. Except sod replacement, no additional payment shall be made for landscape restoration. See also Section 6.13, "Work in State Roads".

The Engineer reserves the right to adjust the number and location of any of the designated types of species to be used at any of the locations shown, in order to provide for any unanticipated effects which become apparent after the substantial completion of the project, or for other causes.

A. Sod

Establish a stand of grass within the specified areas, by furnishing and placing sod, and rolling, fertilizing, watering, and maintaining the sodded areas to ensure a healthy stand of grass.

Sodding shall be in accordance with Sections 575 and 981 of the F.D.O.T. specifications. Unless a particular type of sod is called for, sod may be of either centipede, Bahia grass or Bermuda grass at the Contractor's opinion. It shall be well matted with roots. Where sodding will adjoin, or be in sufficiently close proximity to, private lawns, other types of sod may be used if desired by the affected property owners and approved by the Engineer.

Sod shall be of firm texture having a compacted growth and good root development, as approved. Bitter Blue St. Augustine shall be replaced with similar sod. Sod shall be absolutely true to varietal type, and free from weeds or other objectionable vegetation, fungus, insects and disease of any kind.

The soil embedded in the sod shall be good clean earth, free from stones and other debris. The sod shall be free from fungus, vermin and other diseases. The sod and soil shall be approximately 1-1/2 to 2 inches thick.

Before being cut and lifted, the sod shall have been mowed at least three times with a lawnmower, with the final mowing not more than seven days before the sod is cut. The sod shall be cut into uniform dimensions. Sod shall be laid with closely abutting joints with a tamped or rolled surface.

B. Planting Sod

Place sod immediately after ground preparation. Do not use sod which has been cut for more than 72 hours. Do not sod when weather and soil conditions are unsuitable for proper result. Pre-wet the area prior to placing sod. Do not place sod on eroded or washed out sites.

Sod shall be placed on the graded and watered ground firmly butted on all sides by sod without leaving holes, slots or depressions. Sod shall be top dressed with soil where required to bring all fill to voids and provide a uniform grass mat. Soil shall firmly abut all structures to which it surrounds or contacts. Immediately after the sodding process, the entire grassed area shall be rolled thoroughly with a cultipacker, traffic approved roller, or other 1,000 pound roller. At least two trips over the entire area will be required.

Restoration of sod should be done from edge of pavement not middle of the street.

Sod which has yellowed or browned while stacked in transit shall not be used and shall be promptly removed from the site.

All established lawn areas that have been disturbed shall be sodded and shall have all rocks and stones over 2 inches in diameter removed from the ground area and disposed of. All stones of this size uncovered in the planting operation shall also be removed from the site.

Payment for providing and planting sod shall be made in accordance with the appropriate bid item in the Proposal, which payment shall include irrigation of newly planted sod until it is established, up to a maximum duration of 60 days.

C. Fence

Furnish, erect and reset fence of all type and the location shown or directed by the Engineer. Install the fence in accordance with the Florida Building Code, while observing codes or requirements of local agencies having jurisdiction. Construct the fence in close proximity to the right of way line except as may be detailed otherwise. The Contractor should assume responsibility for obtaining satisfactory permits or permission from property owners for any encroachments required to perform the work and for proper scheduling of the fence installation with the removal of existing fence where it is necessary to provide continuous security to adjacent areas already fenced.

D. Trees

Prior to any excavation or planting, mark all planting beds and individual locations of trees on the ground with a common bright orange colored spray paint, or with other approved methods, within the project limits. Obtain the Engineer's approval and make necessary utilities clearance requests.

Excavate plant holes after an area around the plant tree three times the size of the root ball until it has been tilled to a depth of the root ball. Center tree in the hole. Lower the tree into the hole so that it rest on a prepared hole bottom such that the roots are level with, or slightly above. Backfill with native soil, unless otherwise specified. When specified, or directed by the Engineer, stake and attach guy wire to the new trees. Payment for newly planted trees shall include weekly irrigation until trees are established, up to a maximum duration of 60 days.

6.18 Connection to Existing System

All connections to existing mains of the Miami-Dade Water and Sewer Department shall be made under the direct supervision of Department personnel. Valves separating the main being removed or replaced from other existing mains shall be operated by Department personnel upon request by the Contractor. **Under no circumstances shall any of these valves be operated by the Contractor's personnel.**

The Contractor's attention is called to the fact that connections to existing mains may involve the removal of a concrete anchor and cast iron plug; also that the existing mains may be cast iron with poured lead, sulphur compound, or rubber gasket type joints, concrete with flanged outlet connections, galvanized iron with threaded joints, or others. The Contractor should be equipped with the proper tools and equipment to make connections to any one or more of these types of existing mains. New gaskets shall always be installed, regardless of the conditions of the existing

one. Other joint accessories, such as nuts, bolts and glands, shall be reused only if judged to be in good condition by the Engineer.

All necessary sheeting, shoring, dewatering, excavation, backfill and compaction, surface repairs, and other items and work appurtenant to or incidental to the work shall be performed by the Contractor. The Contractor shall include all costs for items and work provided by him for this type of connection in his price or prices bid under the various Proposal Items. No other compensation will be provided.

6.19 Detection Loop Installation Specifications

The Contractor shall replace traffic loop assemblies where directed or approved by the Engineer.

A. Materials

1. Loop Wire

Loop wire and lead-in wire shall be of size AWG Number 14 stranded copper with a minimum of seven (7) strands. Insulation shall be stranded XHHW rated for 600 volts. Lead-in wire (from pull box to the controller) shall be No. 14 AWG shielded Belden cable or approval equivalent.

2. Splicing Material

Butt-end connectors shall be used for splicing. They shall be non-insulated, Conduit Part Number BS14, BS10; Ideal Model Number TV16X, TV12X; Thomas and Betts Catalog Number BB-2 or approved equivalent.

Solder shall be resin-core type.

Heat shrinkable tubing shall be dual/multiple wall Polyolefin Cole Flex brand Type ST300, or Alpha brand Type FIT-300, or Voltrex brand SRM series material, or approved equivalent.

3. Loop Sealant

Saw cuts in concrete or asphaltic concrete pavements shall be sealed with asphaltic roofing cement or steep asphalt Type III as specified in ASTM D312; or 3M Detector Loop Sealant, Euclid 495-H.P. Sealant, Preco "Gold Flex" Sealant, or approved equivalent.

B. Installation

1. Maintenance of Traffic

Maintenance of Traffic during performance of work shall conform to Part VI: **TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY AND EMERGENCY OPERATIONS** of the U.S. DEPARTMENT OF TRANSPORTATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" and the MIAMI-DADE COUNTY PUBLIC WORKS MANUAL.

2. General Procedures

Non-operative vehicle detection loops and lead-in wire (No. 14 A.W.G., XHHW) shall be entirely replaced with no splices, except to the lead-in cable (No. 14 A.W.G., Belden shielded) from pull box to the controller.

If the reason for the non-operability of the original loop is obviously a damaged lead-in cable (No. 14 A.W.G., Belden shielded), then replace the Belden shielded cable and splice in the pull box to the existing loop lead-in wire (No. 14 A.W.G., XHHW). The original loop should be megged prior to splicing to confirm that it is good.

The Contractor will assign a qualified superintendent to each work site that shall be present at all time during the course of the work and who shall be authorized to act for the Contractor. The Contractor shall notify the Engineer of the location of each worksite at the start of each workday.

All work shall be neat and exhibit good workmanship to the satisfaction of the Engineer. The Contractor shall be responsible for any damage caused by his carelessness.

3. Installation of Conduit by Directional Bore

The cost for installation of underground conduit by the Directional Bore method shall be included in the unit price bid for replacement of Traffic Loop Detector Assemblies. The Contractor assumes all risks associated with the use of the Directional Bore method, including damage to other underground utilities. Installation of underground conduits utilizing the Directional Bore method will only be performed only when specifically authorized by the Engineer in writing.

Payment for installation of underground conduit by the Directional Bore method shall include all costs associated with the operation, including costs incurred for any physical location of underground utilities, grading and restoration of sidewalk, curb and gutter and pavement removed or damaged as a result of the Contractor's operations.

When the Engineer specifies conduit installation under traditional line item other than directional bore, the Contractor may opt to use Directional Bore; however, payment will be made under the traditional conduit pay items.

Should the Contractor opt to utilize Directional Bore, in lieu of traditional trenching, the Engineer may delete other portions of the work such as Milling, Resurfacing and Pavement marking.

4. Descriptions

The work specified in this section consists of the installation of Meter type pull boxes to be used as terminals for conduit runs, junction points, and cable pulling points.

Excavation shall be performed with care so as to disturb the bottom of the excavation as little as possible. Prior to installing the pull boxes and following the installation of conduit, the bottom of the excavation shall be mechanically tamped. Boulders, logs, or any unforeseen obstacle encountered in excavating shall be removed and no additional compensation shall be allowed.

Pull boxes shall be supplied by the Contractor. The pull box shall be installed so as to provide an even finished surface.

All pull boxes shall be installed in existing or proposed sidewalk. If pull box location is not within or

adjacent to an existing or an immediately proposed sidewalk, a five by five foot, four inches thick concrete sidewalk flag shall be built around the pull box.

5. Meter Type Pull Box

Meter type pull boxes shall have an open-bottom, QuaziteComposolite Polymer Concrete design or precast concrete design constructed of Class I Concrete having a minimum compressive strength of 2,500 p.s.i. at twenty eight (28) days. Polymer concrete pull box shall be QuaziteComposolite Product No. PG1324BA12 or approved equivalent. Concrete pull box shall be Brooks 38 Series or approved equivalent.

In either case, both pull boxes shall be constructed per above specified manufacturers size, materials, and performance specifications. Therefore, the below specified pull box cover shall be fully interchangeable with either pull box.

All pull box covers furnished and installed shall be Polymer Concrete QuaziteComposolite Product No. PG1324HA00 or approved equivalent. No other design, size, modification, or materials shall be acceptable. Pull box covers shall be marked "TRAFFIC SIGNAL", "TELEPHONE", or "ELECTRIC" in upper case letters between 3/4 inch and 1-1/4 inches in height.

In addition, the covers shall be marked "MIAMI-DADE HD" in the lower right quadrant in upper case letters between 1/2 inch and 3/4 inch in height. Pull boxes shall be installed on appropriate conduit runs per Department standards and details.

6. Marking Saw Cuts

Unless otherwise specified, loop shall be 6 feet wide, not less than 2 feet from an adjacent lane, and extend back 30 feet from location 5 feet downstream of the stop bar's leading edge.

The Contractor shall use a chalk line or equivalent method to outline the pavement and routes for lead-in cables. The saw cut in the pavement shall not deviate by more than 1 inch from the chalk line.

Each twisted pair of loop wire lead-ins shall be placed in its own saw cut, except in the case of adjacent loops associated with the same vehicular movement in which case they may be placed in the same saw cut. The distance between loop wire leads shall be a minimum of 6 inches, except within 2 feet of the pavement edge.

The depth of all saw cuts, except across expansion joints, shall not exceed 1.75 inches, nor be less than 1.0 inches. The width of all saw cuts, except across expansion joints, shall not exceed .50 inch. The width of all saw cuts shall be sufficient to allow unforced placement of loop wires or lead-in cables into the saw cut.

The corner of loops shall be cut as shown in the Florida Department of Transportation's ROADWAY AND TRAFFIC DESIGN STANDARDS. Saw cuts through concrete pavement expansion joints be 3 inches deep from approximately 6 inches on each side of the joint. A 10-inch long, 2-inch PVC pipe shall be inserted across the expansion joint through which the loop wire will be threaded.

7. Installing Loop Wire

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All saw cuts shall be cleaned of dust, dirt, and other debris with an air compressor prior to the installation of the loop wire or lead-in cable.

Loop wire shall be placed in the saw cut in such a manner that the insulation is not damaged. The loop wire shall be pushed to the bottom of the saw cut with a non-metallic tool, which will not damage the insulation.

A non-metallic hold down material shall be used to secure the loop wire at the bottom of the saw cut. The hold down material shall be placed along the perimeter of the loop. The distance from the top of the hold down material to the pavement-wearing surface (excluding overlay) shall not be less than 0.75 inch.

8. Transition from Saw Cut to Conduit

Twisted pairs of loop and lead-ins shall be brought together to the "loop pocket(s)" as shown in the attached drawings; there, they shall enter the 2 inch PVC to continue their run on to the controller cabinet or to the slicing point with Belden Cable. As they enter the PVC in the "pocket" the twisting of the pairs shall be increased to minimize loop cross talk.

The PVC conduit termination in the pocket shall be sealed with a duct seal, approved by the Engineer. Asphaltic concrete cold mix shall be carefully placed and compacted at the bottom of the pocket around the wiring and PVC, and everything shall then be covered with a cold asphalt patch to make the installation complete.

Near the edge of pavement, where all home runs converge, existing pavement shall be carefully chiseled out, to avoid damaging good loop wires, to expose the conduits, which carry the wires to the pull box or cabinet.

The new twisted lead-in(s) shall be carefully fed through one of the conduits. All old unused lead-in(s) wires shall be removed from this point into the controller cabinet.

If the conduits are missing or inaccessible, as confirmed by the Engineer, new conduits shall be installed using pay items included in the Contract and approved by the Engineer.

Upon completion of this subtask, the conduits shall be protected by duct sealant. The area shall then be patched properly with asphalt.

9. Splices in Loop Lead-in Wire

Splices in Loop Lead-in Wire, as conditionally allowed above, shall be made by crimping and soldering, followed by the application of heat shrinkable tubing. The crimping, selection of heat shrinkable sleeve diameter, and the application of heat shall be done so that a suitable protected environment results for all of the splicing components within a moisture and corrosion resistant seal. The heat shrinkable tubing shall be dual/multiple wall Polyolefin Cole Flex brand Type ST300, Alpha brand Type FIT-300, Voltrex brand SRM series, or approved equivalent. See attached drawings.

10. Installation of Sealant

Preparation and application of the sealant for saw cuts shall be made in accordance with the manufacture's instructions. The sealant shall be properly cured before vehicular traffic is allowed

to travel over the sealant.

11. Terminations

Twisted loop lead-in wire which terminates in an existing pull box shall be spliced to shielded lead-in cable in accordance with the 1976 Miami Dade County Splicing Manual Subsections 10.05-10.06 (copy attached herein). Twisted loop lead-in wire, which terminates in the controller cabinet, shall have insulated terminal lugs properly attached to each wire by a calibrated ratchet-type crimping tool.

12. Identification

The Contractor shall identify and tag each loop lead-in installed in the controller or detector cabinet by lane and movement number, see example below.

<u>Lane</u>	<u>Movement</u>
Outside Lane	Movement 6
Center Lane	Movement 6
Inside Lane	Movement 6

13. Restoration

Once a loop installation assignment is complete, the area of work shall be cleaned and restored to its original condition. The Contractor shall replace or restore any landscaping or facility disturbed as a result of his activities. Tools, excess materials, containers, discarded packages, barricades, flags, and any other equipment and material brought by the Contractor to the work area shall be removed and taken away so as to open the lane(s) to traffic as quickly and safely as it is possible.

14. Testing

The Contractor shall measure and record the series resistance of each loop assembly and verify that it does not exceed 10 ohms. If the series resistance of a loop assembly is greater than 10 ohms, the loop assembly shall be inspected to find the excessive resistance and must be corrected by the Contractor.

The Contractor shall measure and record the insulation resistance of each loop assembly and verify that the resistance to ground is greater than 100 mega ohms.

The Contractor shall use a 500-volt DC insulation to measure the resistance. All measurements shall be referenced to a good earth ground (ground rod, metallic water pipe, etc.), with a resistance to ground of less than 25 ohms. Measurements shall be made with the transient suppression devices disconnected from the loop assembly.

If the insulation is less than 100 mega ohms, the Contractor shall determine if the problem is caused by the lead-in cable or loop wire and must replace the defective cable or loop wire at no additional cost.

A record of test measurements and recordings of loop assemblies shall be made using the attached form entitled: "MIAMI-DADE COUNTY PUBLIC WORKS DEPARTMENT TRAFFIC SIGNAL LOOP RESISTANCE MEASUREMENTS DATA SHEET". This form shall be signed by the Contractor's representative as indicated on the form, a copy of which shall be kept inside the

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Controller Cabinet for further use and reference.

15. Completion

The Contractor shall connect the loop to the proper termination point in the cabinet and reset the recall features of the controller to the settings specified on the controller-timing sheet for that location within one (1) working day of the loops being repaired.

The Contractor after completing the above work shall request a final inspection and submit at the time of final inspection the above referenced form filled in with all appropriate data.

C. FINAL INSPECTION

1. In order to avoid any loss of time and to expedite the inspection process, the Contractor shall meet the following conditions for final inspection:
 - a) 48 hours notice shall be given.
 - b) All documentation shall be completed.
 - c) All wiring shall be completed.
 - d) All pull box covers shall be easily removed.
 - e) All road restoration shall be completed, including the removal of all debris.
2. Failure to follow the above procedure or failure to pass inspection or failure to appear at the Final Inspection at the designated date & time, will result in the rescheduling of the final inspection.
3. As payment for time lost by County personnel, a penalty fee of One Hundred dollars (\$ 100.00) shall be charged to the Contractor. The Contractor shall pay said fee to the Public Works Department's Permits Section and the Contractor shall forward a copy of said receipt to the Inspector, prior to rescheduling inspection.
4. In the event the field inspection is deemed unacceptable or incomplete by the signal inspector, the Department shall forward within 48 hours, via e-mail or fax, a punch list for the Contractor to take the necessary corrective actions to complete all requirements of the project.
5. An authorized representative of the signal contractor shall check-off that all punch list items have been addressed; sign, date and return said form along with the fee payment receipt; along with the request for re-inspection, via e-mail or fax to the Inspector.
6. All work shall be completed within 10 calendar days. Excluded are any emergency repairs and/or safety issues, which the Contractor is to respond to within 4 hours of notification.
7. In the event, the Contractor is found to have failed to complete all punch list items; failed to appear; or the signalization and/or flashers are found to be malfunctioning, damaged, or inoperable at time of re-inspection, the inspection shall be rescheduled and an additional fee of one hundred dollars (\$100.00) shall be charged to the Contractor, again, as payment for time lost by county personnel per occurrence.

D. WARRANTY

Any repaired loop, which fails to meet the testing requirements, listed in article "Detection

Loop Installation Specifications" Section B-12 within 12 months, and which is found to not have failed due to action by third parties, shall be again replaced by the Contractor at no additional cost to the County. The 12-month warranty period shall commence on the date of final acceptance of the work.

ATTACHMENT

**Traffic Signal Loop Resistance
Measurements Data Sheet**

MIAMI-DADE COUNTY PUBLIC WORKS DEPARTMENT
Traffic Signal Loop Resistance Measurements Data Sheet

Asset No.: _____
 Project No. _____
 Location: _____
 Contractor: _____

This form shall be completed and delivered to the Inspector prior to final acceptance of any traffic signal installation.

	LOOP LOCATION	LOOP ASSEMBLY RESISTANCE		
		Series Resistance (<100 ohms)	Insulation Resistance (>100 mega-ohms)	Inductance (Micro-henries)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

 Signature of Contractor Representative
 (Traffic Signal Level II, I.M.S.A.)

 Date

 (Print Name)

 (I.M.S.A. Certification No.)

7.00 Cleaning Up Work Site

The Contractor shall at all times during the execution of this Contract keep the work site free and

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clear. Upon completion of the work, the Contractor shall, remove from the right of way and adjacent property all falsework, equipment, surplus and discarded materials, rubbish and temporary structures; restore in acceptable manner all property, both public and private, that has been damaged during the prosecution of the work; and leave the roadway in a neat and presentable condition throughout the entire length of the work under Contract, before acceptance and final payment by the Department.

In the event of delay exceeding two days after written notice is given to the Contractor by the Engineer to remove such materials, or to restore disturbed, displaced or damaged property, the Department may employ such labor or equipment as may be deemed necessary for the purpose, and the cost of such work, together with the cost of supervision, shall be charged to the Contractor and shall be deducted from any monies due him. The Project shall not be considered as having been completed until all such materials have been removed and disposed of properly.

8.00 MEASUREMENT AND PAYMENT

Payment for all work completed under this Contract shall be made in accordance with the provisions of Article 11 Partial and Final Payment of the Shenandoah Phase A Design-Build Services Contract the basis of the specific provisions of this Section of the Specifications.

The Contractor shall receive and accept the compensation as provided in the Proposal and Article 11 Partial and Final Payment as full payment for furnishing all labor, materials, tools and equipment, for performing all operations necessary to complete the work under this Contract, and also in full payment for all loss or damages arising from the nature of the Work, or from the action of the elements or from unforeseen difficulties which may be encountered during the execution of the work until the final acceptance by the Department.

The prices stated in the Proposal include full compensation for overhead and profit, all costs and expenses for taxes, labor, equipment, furnishing and repairing small tools and ordinary equipment, mobilization, home office expenses and general supervision, materials, commissions, transportation charges and expenses, patent fees and royalties, bond, insurance, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Department Drawings and specified herein. In addition, the Contractor shall include the actual cost of social security taxes, unemployment insurance, worker's compensation, fringe benefits, inclusive of life and health insurance, union dues, pension, pension plans, vacations, and insurance and contractor's public liability and property damage insurance involved in the work based on the actual wages paid to such labor and all other general costs and profits, prorated to each item.

Unless otherwise specifically stated elsewhere herein, the Contractor shall include in the prices bid all materials, electrical supply, fuel, lubricants, temporary equipment, temporary wiring, temporary piping and fittings, pumps, gages, and all other items of whatever nature required to completely test, balance and put into fully operational condition all equipment and/or systems supplied by either the Department or the Contractor and installed as a part of this Project. Further, any test materials supplied by the Contractor shall be completely satisfactory to the Department. Any decision as to whether a particular material is suitable for test purposes shall be at the sole discretion of the Engineer whose decision shall be final. Any material considered not suitable shall be immediately replaced by the Contractor with suitable material and no extra compensation will be allowed.

It is the intent of the Department to obtain a complete and working installation under this Contract,

and any items of labor, equipment, or materials which may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are specifically mentioned on the Work Order or stated herein.

It is intended that all work required to complete this Contract will be included in the various bid items as follows:

Trenchless:

The Contractor is allowed to use trenchless methods to perform the work in the most efficient and cost effective manner. The gravity sewer replacement work can be done by trenchless methods (CIP, Sectional CIP, sewer lateral lining, combination of CIP with point repairs) may be done with the approval of the Department and paid for at the unit price bid for dig and replace work that includes all applicable corresponding Bid line items. Calculations for CIP liner thickness and material (resin, etc.) shop drawings shall be provided to the Engineer for Approval. The Department shall review the final pre-CCTV video for approval prior to performing the trenchless work.

It is expected that there will be mains which will be done using a combination of Cured-in-Place and point repairs. Cured-in-Place Liners shall be installed from manhole to manhole and shall include all dig and replace repairs performed in order bring the pipe into a condition where it can receive the cured-in-place liner. There shall be no additional compensation for cured-in-place liner installed over point repairs done by dig and replace, pre-installation CCTV inspections, lateral grouting, reinstatement of laterals and other work similar items.

Unused funds in any bid item may be transferred to the dedicated allowance and used on another bid item to complete the work of this Amendment to the Design Build Contract.

Removal and Replacement of Existing Gravity Sanitary Sewer Mains:

Item 1.01 through 1.10

For removing the existing gravity sewer main, and furnishing and installing 8-inch, 10-inch, 12-inch and 15-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings in right-of-ways, will be paid for at the unit price bid per linear foot times the number of feet installed and accepted.

The price per foot for removing existing pipe and installing new pipe and fittings shall be full compensation for the completed pipeline, ready for service, and shall include, but not limited to, furnishing PVC SDR 26 heavy wall gravity sewer pipe, fittings and specials; excavation; removing, transporting and disposing of the existing sanitary sewer; removal, transportation and disposal of unsuitable subsoil material; maintaining sewage flow during construction as required; dewatering the excavation; transportation and handling costs delivered ditch-side; unloading materials from delivery trucks along the site of the work, and placing them into position in the trench; cutting ductile iron or PVC pipe; installing ductile iron or PVC pipe nipples; furnishing and installing couplings and adapters; furnishing and installing vegetable soap lubricant; providing, transporting and installing and compacting backfill, select backfill and pipe bedding materials; installing all tees, wyes and other necessary materials; furnishing all materials and equipment required to clean the main; supporting and protecting existing utilities as required; temporary replacement paving installation and removal; installing temporary pavement markings; replacing utilities, catch basins, shrub, landscaping, mail boxes, small trees not included in another bid item and all other similar items, to original locations and to equal or better than original conditions;

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satisfying all requirements of the necessary permits; and, all other appurtenant and miscellaneous items and work including final cleanup.

The quantity for payment shall be the horizontal projection of the centerline of the permanently installed pipe, measured to the nearest foot from inside manhole wall to inside manhole wall or pipe installed.

The depth of sewers shall be measured from the existing paved or unpaved surface as the average of the depth of the invert of the sewer main between the adjoining manholes or pipe installed.

Note: CCTV inspection of the mainline is included as part of another bid item. The cost of furnishing wye and tees is included as part of another bid item.

Item 1.11 through 1.14
Not Used

1.15 through 1.17

For removing the existing sewer lateral, in association with main line replacement in right-of-way, and furnishing and installing 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, will be paid for at the unit price bid times the number of feet installed and accepted which payment shall be full compensation for the completed lateral. This item shall include removal of the existing sewer lateral and replacement of lateral from the limit of item used to install the wye/tee (wye/tee plus 4 feet) up to the property line or as otherwise ordered by the Engineer. Payment of the unit price per foot for laterals installed and accepted shall provide full compensation for all necessary and required work including, but not limited to, excavation; removal, transportation, and legal disposal of existing pipe regardless of type; removal, transportation and disposal of material generated by cleaning and preparation; removal and reinstallation of existing shrubs, landscaping, mailboxes, and other miscellaneous items; transportation and handling costs; furnishing and installing 6-inch PVC SDR 26 sewer lateral pipe; reconnecting service laterals; maintaining sewage flows from residence during construction as required; backfill; compaction; complying with the State of Florida Trench Safety Act; supporting and protecting existing utilities as required; dewatering; sheeting and shoring, if necessary; cutting pipe; making all connections within the lines to existing sewers and structures; testing; cleanup; final cleanup; all appropriate and applicable work as specified in Item 1.01 through 1.10; all labor, materials and equipment required to provide a complete and satisfactory replacement, including all appurtenances, (including all applicable items of bid Item 1.01 through 1.10) in accordance with the Contract Documents, the Department's Standards, the manufacturer's specifications and compliance with all applicable regulatory requirements or special conditions imposed by agencies having jurisdiction; furnishing and installing any sod for the swale areas; and all incidentals related to lateral replacement to achieve a repaired service lateral complete in place and ready for use.

This item will only be used when the lateral replacement is in association with main line replacement.

Note: The Bid Item for the wye/tee pays for the main connection and the first 4 feet of lateral pipe. CCTV inspection of the lateral is included as part of another bid item.

The quantity for payment shall be horizontal projection of the centerline of the permanently installed lateral, measured to the nearest foot.

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1.18 through 1.20

Not Used

1.21 thru 1.23

For removing the existing sewer lateral, on existing gravity **sewer mains in right-of-way that are to remain in place** and furnishing and installing 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, will be paid for at the unit price bid times the number of feet installed and accepted which payment shall be full compensation for the completed lateral. This item shall include removal of the existing sewer lateral and replacement of lateral from the limit of item used to install the wye/tee (wye/tee plus 4 feet) up to the property line or as otherwise ordered by the Engineer. Payment of the unit price per feet for laterals installed and accepted shall provide full compensation for all necessary and required work including, but not limited to, excavation; removal, transportation, and legal disposal of existing pipe regardless of type; removal, transportation and disposal of material generated by cleaning and preparation; removal and reinstallation of existing shrubs, landscaping, mailboxes, and other miscellaneous items; transportation and handling costs; furnishing and installing 6-inch PVC SDR 26 sewer lateral pipe; reconnecting service laterals; maintaining sewage flows from residence during construction as required; backfill; compaction; complying with the State of Florida Trench Safety Act; supporting and protecting existing utilities as required; dewatering; sheeting and shoring, if necessary; cutting pipe; making all connections within the lines to existing sewers and structures; testing; cleanup; final cleanup; all appropriate and applicable work as specified in Item 1.01 through 1.10; all labor, materials and equipment required to provide a complete and satisfactory replacement, including all appurtenances, (including all applicable items of bid Item 1.01 through 1.10) in accordance with the Contract Documents, the Department's Standards, the manufacturer's specifications and compliance with all applicable regulatory requirements or special conditions imposed by agencies having jurisdiction; furnishing and installing any sod for the swale areas; and all incidentals related to lateral replacement to achieve a repaired service lateral complete in place and ready for use.

This item will only be used when the lateral replacement is in association with main line replacement.

Note: Bid Item for the wye/tee pays for the main connection and the first 4 feet of lateral pipe. CCTV inspection of the lateral is included as part of another bid item.

The quantity for payment shall be horizontal projection of the centerline of the permanently installed lateral, measured to the nearest foot.

1.24

For furnishing 8-inch x 6-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings, and adapters to connect to the existing or proposed sewer lateral, will be paid for at the unit price bid times the number of sewer lateral connections made and accepted, which payment shall be full compensation for excavating the existing lateral, furnishing and installing gravity sewer wye or tee acceptable to the Department (in accordance with Detail SS 0.0, Appendix "B"), installing the appropriate adapter or coupling regardless of pipe material, and shall include all applicable provisions of Items 1.01 through 1.10.

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1.25

For furnishing 10-inch x 6-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral, will be paid for at the unit price bid times the number of sewer lateral connections made and accepted, which payment shall be full compensation for excavating the existing lateral, furnishing and installing gravity sewer wye or tee acceptable to the Department (in accordance with Detail SS 0.0, Appendix "B"), installing the appropriate adapter or coupling regardless of pipe material, and shall include all applicable provisions of Items 1.01 through 1.10.

1.26

For furnishing 12-inch x 6-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral, will be paid for at the unit price bid times the number of sewer lateral connections made and accepted, which payment shall be full compensation for excavating the existing lateral, furnishing and installing gravity sewer wye or tee acceptable to the Department (in accordance with Detail SS 0.0, Appendix "B"), installing the appropriate adapter or coupling regardless of pipe material, and shall include all applicable provisions of Items 1.01 through 1.10.

1.27

For furnishing 16-inch x 6-inch wye or tee, installed as part of the gravity sewer main in association with main line replacement, and reconnecting to the existing sewer lateral piping. For furnishing and installing up to the first 4 feet, as measured along the lateral from the centerline of the gravity sewer main, of 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral; will be paid for at the unit price bid times the number of sewer lateral connections made and accepted, which payment shall be full compensation for excavating the existing lateral, furnishing and installing gravity sewer wye or tee acceptable to the Department (in accordance with Detail SS 0.0, Appendix "B"), installing the appropriate adapter or coupling regardless of pipe material, and shall include all applicable provisions of Items 1.01 through 1.10.

1.28

For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and installing 8-inch x 6-inch wye or tee for sewer lateral, on existing 8-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, fitting material and method of connection. The need for wye or tee replacement shall be determined by the Department and will be paid for at the unit price bid times the number of sewer lateral connections made and accepted and shall include all couplings and adapters.

Note: The installation of the wye or tee, short pipe length, adapters and couplings shall be paid as part of the applicable bid item for gravity sewer main installation on a per foot basis to the connection of the existing gravity main.

1.29

For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and

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installing 10-inch x 6-inch wye or tee for sewer lateral, on existing 10-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, fitting material and method of connection. The need for wye or tee replacement shall be determined by the Department and will be paid for at the unit price bid times the number of sewer lateral connections made and accepted and shall include all couplings and adapters.

Note: The installation of the wye or tee, short pipe length, adapters and couplings shall be paid as part of the applicable bid item for gravity sewer main installation on a per foot basis to the connection of the existing gravity main.

1.30

For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and installing 12-inch x 6-inch wye or tee for sewer lateral, on existing 12-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, fitting material and method of connection. The need for wye or tee replacement shall be determined by the Department and will be paid for at the unit price bid times the number of sewer lateral connections made and accepted and shall include all couplings and adapters.

Note: The installation of the wye or tee, short pipe length, adapters and couplings shall be paid as part of the applicable bid item for gravity sewer main installation on a per foot basis to the connection of the existing gravity main.

1.31

For removing the existing damaged wye or tee at the gravity sewer main, and furnishing and installing 15-inch x 6-inch wye or tee for sewer lateral, on existing 15-inch gravity sewer main that is to remain in place. MDWASD Standard Details SS 1.0 and SS 3.1 shall be used to determine the use of a wye or tee, fitting material and method of connection. The need for wye or tee replacement shall be determined by the Department and will be paid for at the unit price bid times the number of sewer lateral connections made and accepted and shall include all couplings and adapters.

Note: The installation of the wye or tee, short pipe length, adapters and couplings shall be paid as part of the applicable bid item for gravity sewer main installation on a per foot basis to the connection of the existing gravity main.

1.32

For removing the existing damaged section of host pipe on an existing 8-inch gravity sewer line that has a cured-in-place pipe liner that is to remain in place and removing up to 4 feet of existing sewer lateral as measured along the lateral from the centerline of the gravity sewer main. For furnishing and installing 8-inch x 6-inch saddle tee for sewer lateral, in accordance with MDWASD Standard Detail SS 3.2, and 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral.

1.33

For removing the existing damaged section of host pipe on an existing 10-inch gravity sewer line that has a cured-in-place pipe liner that is to remain in place and removing up to 4 feet of existing sewer lateral as measured along the lateral from the centerline of the gravity sewer main. For furnishing and installing 10-inch x 6-inch saddle tee for sewer lateral, in accordance with MDWASD Standard Detail SS 3.2, and 6-inch PVC SDR 26 heavy wall gravity sewer pipe and

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fittings and adapters to connect to existing or proposed sewer lateral.

1.34

For removing the existing damaged section of host pipe on an existing 12-inch gravity sewer line that has a cured-in-place pipe liner that is to remain in place and removing up to 4 feet of existing sewer lateral as measured along the lateral from the centerline of the gravity sewer main. For furnishing and installing 12-inch x 6-inch saddle tee for sewer lateral, in accordance with MDWASD Standard Detail SS 3.2, and 6-inch PVC SDR 26 heavy wall gravity sewer pipe and fittings and adapters to connect to the existing or proposed sewer lateral.

1.35

For making pipe connections to existing manholes, will be paid for at the unit price bid times the number of manholes modified and accepted, which payment shall be full compensation for maintaining sewage flow; pressure washing the inside of the manhole; breaking out, removing and disposing of the existing connection of the main to the structure; installing the appropriate collar or stub-out; repairing concrete flow channel; furnishing and installing non-shrink grout; grouting the invert connections with non-shrink grout; providing watertight leakproof connections; and shall include all applicable provisions of Items 1.01 through 1.10.

1.36

For furnishing and installing 6-inch SDR 26 heavy wall gravity sewer pipe wye or tee and fittings for sewage clean-out, and concrete box and lid, in accordance with MDWASD Standard Detail SS 1.0, as required and directed by the Department, will be paid for at the unit price bid per sewage lateral clean-out tee installed and accepted by the Engineer. The price bid shall be full compensation for installation of tee, fittings and accessories, installation of box in sidewalk or in concrete slab if in grassed area, and all other appurtenant and miscellaneous items and work. This bid item may only be used when encountering field conditions, including roots in pipe, changes in direction or other conditions that make the inspection of the lateral difficult with the main camera. Use of this item must have prior written approval of the Engineer in order for the Contractor to receive payment.

1.37

For constructing limerock base for Type "M" permanent paving repairs, will be paid for at the unit price bid times the number of square yards of such base installed and accepted, as measured along the main within the limits defined by the Standard Details appended hereto. Greater width is at the Contractor's option and expense. The price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete limerock base installation, ready to receive the tack and coat surface course.

1.38

For constructing Type "M" asphaltic concrete surface course permanent pavement repairs, will be paid for at the unit price bid times the number of square foot of such surface course installed and accepted as measured along the main within the limits defined by the Standard Details appended hereto. Greater widths are at the Contractors' option and expense. The price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete machine-laid asphaltic concrete surface course installation. Asphaltic surface course for paved driveway repairs, if necessary, will be paid for under this item. Asphaltic surface course for permanent paving repairs installed outside the main trench line limits as shown in the Standard Details under other Bid Items will be paid for under those Items. It will not be separately measured and paid for under this item.

1.39

For cold milling City of Miami roadway surface course for permanent pavement repairs (nominal 1.5 inch thick), in areas where no water main installations and/or replacements are taking place, will be paid for at the unit price bid times the number of square yard of such surface course installed and accepted as measured along the main within the limits defined by the Standard Details appended hereto. Greater widths are at the Contractors' option and expense. The price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete machine-laid milling.

1.40

For constructing Type "V" permanent pavement repairs for City of Miami roadway (nominal 1 inch thick machine-laid asphaltic concrete friction surface overlay), in areas where no water main installations and/or replacements are taking place, will be paid for at the unit price bid times the number of square yards of overlay, installed where approved or directed by the Engineer, and the price bid shall be full compensation for furnishing all materials, labor and equipment required for a complete installation and shall include the replacement of all pavement markings laying within the overlay area, not included in other Bid items. Type "V" pavement repairs will usually be in addition to the required Type "M" paving repairs. Where applicable, this includes the raising of frames within the overlay areas.

1.41

For replacing pavement markings damaged, removed or obliterated by the Contractor's operation, in areas where no water main installations and/or replacements are taking place, will be paid for from the aggregate sum amount bid by the Contractor for this purpose. Such amounts represent the amount the Contractor feels is necessary to comply with the governing agency's requirements. Any portion of this fund, remaining after the work has been paid for will remain with the Contractor. Conversely, no requests for additional reimbursement will be approved. Reflective Pavement Markers shall also be furnished and installed under this Item and there will be no additional compensation paid for this work. Since this item is bid as an aggregate sum, no other special provisions for measurement will be necessary.

1.42

For replacement of concrete sidewalk removed or damaged during removal or replacement of sanitary sewer gravity main or lateral, will be paid for at the unit price bid times the number of square feet of such sidewalk required, installed and accepted by the Engineer, and the price bid shall be full compensation for furnishing all labor, materials and equipment for a complete installation.

1.43

For replacement of concrete curb and gutter, valley gutter and traffic separators removed or damaged during removal or replacement of sanitary sewer gravity main or lateral, will be paid for at the unit price bid per linear foot times the number of linear feet required, constructed and accepted by the Engineer and as measured along the curb, installed where directed by the Engineer, and shall be full compensation for all materials, labor and equipment for a complete and satisfactory installation.

1.44

For concrete pavement replacement, including cutting, removing, and protecting and replacing all existing concrete pavement surfaces such as concrete-surfaced roadways, parking lots, driveways, and other concrete surfaces removed or damaged during removal or replacement of

sanitary sewer gravity main or lateral, will be paid for at the unit price bid times the number of square feet of such pavement required, installed and accepted by the Engineer, and the price bid shall be full compensation for furnishing all labor, materials and equipment for a complete installation.

1.45

Not Used

1.46

Not Used

1.47

Not Used

1.48

For the cost of repairs of special concrete finishes including stamped concrete, artistic decoration concrete, specialty painting textures and other finishes not covered under another bid item, if conflicting with sewer repair work and approved by the Department, will be paid for at the unit price bid times the number of square feet of such surface required and installed where directed by the Engineer, and the price bid shall be full compensation for all work including the furnishing of all labor, equipment, and material required for cutting, removing and restoration of existing surface, removal of any tree roots and debris, including restoring finishes to original or better whether stamp concrete artistic decoration concrete, specialty painting textures or other finishes including formwork, placing, backfill and compacting, finishing and curing; legally disposing of all demolition debris and removed materials paying all applicable tipping fees; and all other miscellaneous items and work required for a complete and satisfactory installation.

Measurement for payment shall be the number of square feet actually removed and replaced. All other replacement due to removal or damage as a result of the Contractor's operation shall be at the Contractor's expense.

1.49

For furnishing traffic control, in areas where no water main installations and/or replacements are taking place, will be paid at the aggregate sum price bid.

1.50

For bypass pumping of sewage for the gravity sewer mains along SW 16th Terrace between SW 27th Avenue and SW 22nd Avenue due to the 8-inch sewage force main connection at SW 16 Terrace and SW 27th Avenue, where authorized and approved by the Department, will be paid at the aggregate sum price bid.

1.51

For post installation TV inspection of gravity sewer main of any size to include providing recording to the Department, will be at unit price bid times the LF of gravity sewer main inspected by CCTV.

1.52

For post installation TV inspection of gravity sewer laterals using a lateral launcher from the main line or a cameral from a cleanout if existing to include providing recording to the Department, will be at unit price bid times the LF of gravity sewer lateral inspected by CCTV.

1.53

Subtotal

1.54

Dedicated Allowance, Uniformed Off-Duty Police

This item establishes a fund for reimbursement of the direct cost for providing off-duty police officers for the purposes of maintenance of traffic, where directed by the Department of Public Works, Traffic Engineering Division and/or FDOT and where authorized by the Engineer. Payment under this item shall only reimburse the Contractor for the direct cost of providing off-duty police officers for maintenance of traffic, which cost shall be full compensation. Payment shall only reimburse the Contractor for the cost for each man-hour that such police officers plus any hourly surcharge from the local jurisdiction, actually provided this service at the work site where authorized by the Engineer, no overhead or other additional cost will be allowed. The time of arrival and departure will be recorded and acknowledged by the Inspector and the officer. No reimbursement is allowed for travel time or lunch. Any portion of this fund remaining after all authorized payments have been made will be withheld from contract payment and will remain with the County.

1.55

Dedicated Allowance, Permit Fees

For cost of required permits, fees, inspections, impact fees, if authorized by the Department.

1.56

Allowance Account, Unforeseen Conditions, Minor Construction Changes and Quantity Adjustments, additional work not covered by other items, if ordered by the Engineer.

This account is for all labor, materials, equipment and services necessary for modification or extra work required to complete the Project because of unforeseen conditions, unforeseen conflicts between existing elements of work and the proposed work; for minor changes required to resolve any unforeseen conditions, revised regulations, technological and products development, operational changes, schedule requirements, program interface, emergencies and other miscellaneous costs; and for adjustments to estimated quantities shown on the unit prices of the proposal to conform to actual quantities installed; and associated time related to this work only if ordered by the Engineer.

Payment to the Contractor under the Allowance Account items will only be made for work ordered in writing by the Engineer, in accordance with Article 11 Partial and Final Payment. Any portion of these accounts remaining after all authorized payments have been made will be withheld from Contract payments, and will remain with the County.

The allowance account may be used to complete work in any bid item that overruns the proposed quantities. Unused funds in any bid item may be transferred to the dedicated allowance and used on another bid item to complete the work of this **Amendment to the Design Build Contract.**

END OF SPECIFICATIONS