

Construction Plans
for
EXCHANGE DRIVE
FORCE MAIN REPLACEMENT

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AJIT LALCHANDANI
County Administrator

RAYMOND E. HANSON, P.E.
Utilities Department Director

UTILITIES DEPARTMENT
ORANGE COUNTY, FLORIDA

MARCH 2014

PREPARED BY

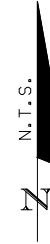
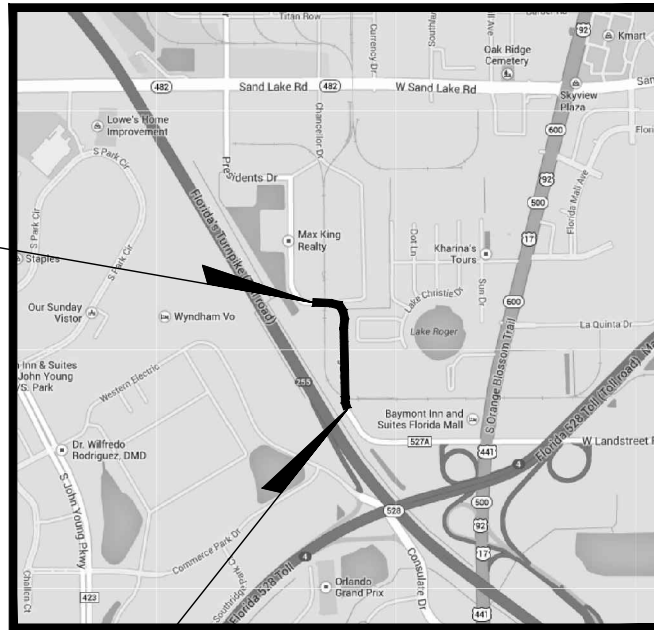
cph	A Full Service A & E Firm	
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1117 E. Robinson St., Orlando, FL 32801 Ph: 407.425.0452		
Licenses:		
Eng. C.O.A. No. 3215 Survey L.B. No. 7143	Arch. Lic. No. AA2600926	Landscp. Lic. No. LC0000298

BID SET

ORG/SUB ORG 1539-16
ORANGE COUNTY UTILITIES
PROJECT SEQUENCE NO. 70585

END PROJECT
STA. 29+64
C/L CONST. EXCHANGE DRIVE

BEGIN PROJECT
STA. 10+00
C/L CONST. EXCHANGE DRIVE



VICINITY MAP

UTILITY CONTACTS

UTILITIES	COMPANY	TELEPHONE
WATER	ORLANDO UTILITIES COMMISSION	(407) 244-8736
WATER SANITARY SEWER RECLAIMED WATER	ORANGE COUNTY FIELD SERVICES	(407) 836-6818
ELECTRIC	DUKE ENERGY (FORMERLY PROGRESS ENERGY)	(800) 700-8744
TELEPHONE/FIBER OPTIC	AT&T	(386) 257-7430
CABLE - TV	BRIGHT HOUSE CABLE	(407) 532-8509
GAS	TECO (PEOPLE GAS)	(407) 420-6609
RAILROAD	CSX COASTLINE RAILROAD	(904) 359-1650
OCU CONSTRUCTION DIVISION		(407) 254-9798
OCU ENGINEERING DIVISION		(407) 254-9900
OCU CONSTRUCTION DIVISION'S INSPECTOR		(407) 254-9798

NOTE: THIS LISTING IS PROVIDED AS AN AID. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY AND ARRANGE FOR FIELD LOCATION OF ALL FACILITIES THAT WILL BE ENCOUNTERED DURING CONSTRUCTION.

INDEX OF SHEETS

SHEET NO.	SHEET DESCRIPTION
C-1	COVER SHEET
C-2	GENERAL NOTES, VICINITY MAP AND INDEX OF SHEETS
C-3	GENERAL NOTES
C-4	PROJECT SHEET LAYOUT
C-5	SUMMARY OF PAY ITEMS
C-6 - C-9	PLAN AND PROFILE SHEETS
C-10 - C-12	CONSTRUCTION DETAILS
C-13	ASSET TABLES

Drawing name: I:\2014\Projects\2014\Drawings\2014\Drawings\14-000\14-000.dwg; Date: 7/1/2014; Time: 4:08pm; User: dph

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Designed by: RMG Date: 7/01/2014
Drawn by: GNP Scale: AS NOTED
Checked by: SNR
Approved by: DEM
Job No. 028424 © 2014

EXCHANGE DRIVE
FORCE MAIN REPLACEMENT

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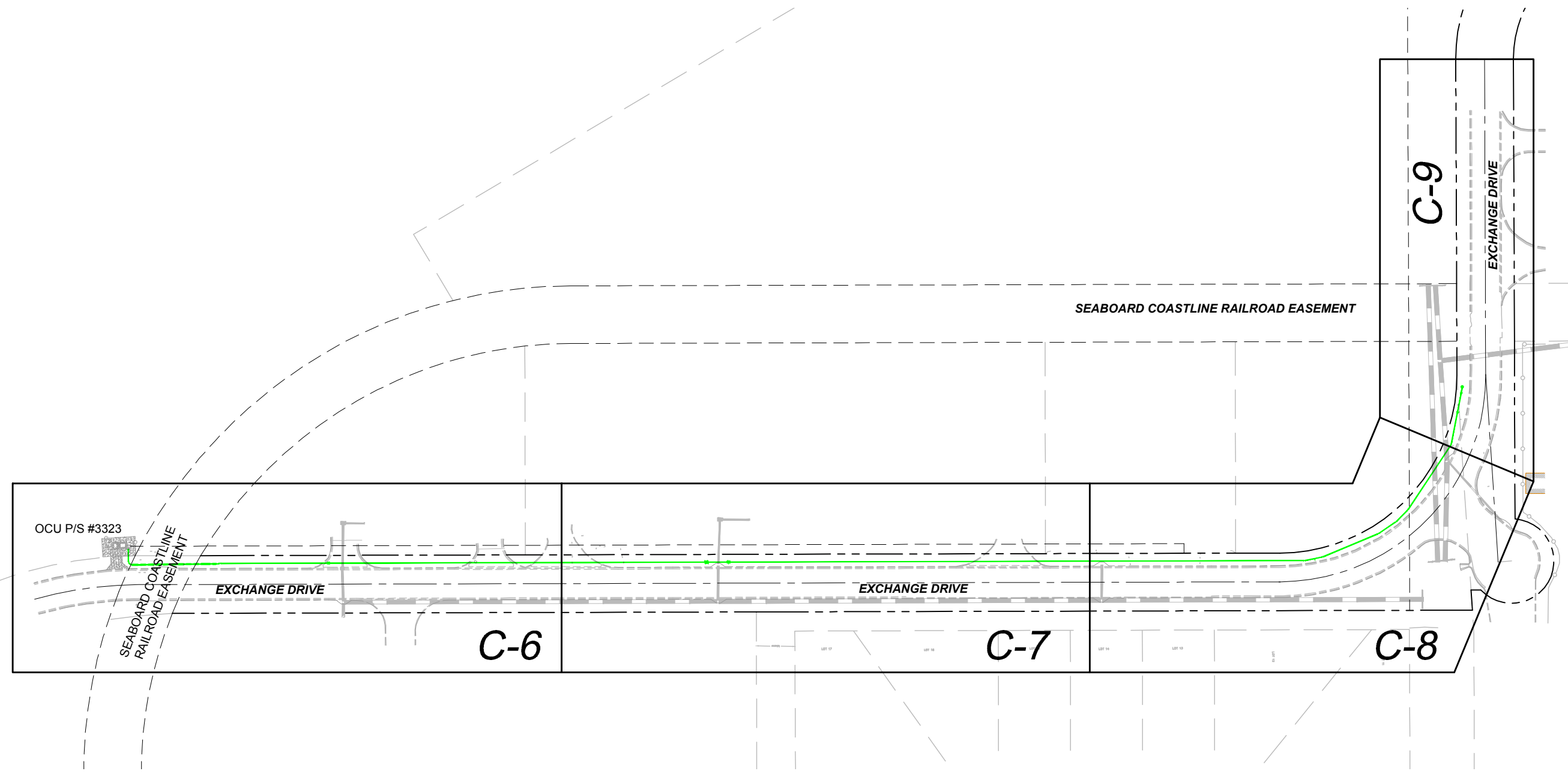
DAVID E. MAHLER, P.E.
REG-#50041

VACINITY MAP AND INDEX
OF SHEETS

Sheet No.
C-2

BID SET

GNP - Z →



OCU P/S #3323

SEABOARD COASTLINE
RAILROAD EASEMENT

EXCHANGE DRIVE

C-6

EXCHANGE DRIVE

C-7

C-8

SEABOARD COASTLINE RAILROAD EASEMENT

EXCHANGE DRIVE

C-9

Drawing Name: I:\2014\201406\20140618\20140618.dwg Date: 7/01/2014 4:02pm gph/cph

No.	Date	Revision	By	No.	Date	Revision	By
1				1			
2				2			
3				3			
4				4			

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REG.#50041

PROJECT SHEET LAYOUT

Sheet No. **C-4**

BID SET

Item No.	Description	Quantity	Units	Sheet	Sheet	Sheet	Sheet
				C-6	C-7	C-8	C-9
1	Mobilization, Demobilization, Bonds & Permits (5%)	1	LS				
2	Preconstruction Audio-Video Documentation	1	LS				
3	Indemnification	1	LS				
4	Project Record Documents	1	LS				
5	Maintenance of Traffic	1	LS				
6	Utility System Dewatering	1	LS				
7	Asphalt Roadway Replacement (assume 10-ft easement driveway, includes sub grade base & asphalt)	235	SY	123	112		
8	Concrete Curb and/or Curb and Gutter Replacement (assume @ 10-LF each)	78	LF	48	30		
9	Chain Link Fence Install/Replacement (assume 20' x 35')	110	LF	110			
10	Bypass Pump Station	1	LS				
11	Abandon-in-Place Pipe (4-inch FM)	155	LF			155	
12	Remove Existing Pipe (4-inch FM)	1,247	LF	459	550	238	
13	Furnish and Install Force Main (Open-Cut - 4-inch PVC)	1,391	LF	353	550	424	64
14	Furnish and Install Force Main (4-inch PVC - w/ casing spacers under railroad)	95	LF	95			
15	Furnish and Install Gravity Sanitary Sewer Main (10-inch PVC)	20	LF				20
16	Precast Concrete Manhole (60-inch Diameter Lined Manhole)	1	EA				1
17	Seal & Recoat Manhole (Upstream & Downstream)	19	VF			8	11
18	Re-Construct Manhole Benching	1	EA			1	

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SUMMARY OF PAY ITEMS

Sheet No.
C-5

Drawing Name: I:\2014\CD\010\010\Bid Drawing\028424.dwg Owner: H&B - civil\khalil@h&b.com Date: Jul 01, 2014 - 15:59:58

BID SET

SITE BENCHMARK #1
TOP OF PK NAIL & DISK
WITH "BM" LB #7143
ELEV = 100.59
N:1492059.831
E:524026.151

CONTRACTOR TO CONNECT
NEW FORCE MAIN TO THE
EXISTING FORCE MAIN AT THE
PUMP STATION VALVE VAULT

CONTRACTOR SHALL EXCAVATE DOWN TO
NEW FORCE MAIN TO THE
EXISTING FORCE MAIN AT THE
PUMP STATION VALVE VAULT
AND CASKING SPACERS AND
INSTALL NEW FORCE MAIN AND CASKING
SPACERS INTO THE EXISTING CASING

REPLACE EXISTING FENCE
WITH NEW BLACK VINYL FENCE

CONTRACTOR SHALL
INSTALL NEW CASING
END SEALS

OPEN CUT AND RESTORE
EXISTING DRIVEWAY

REMOVE AND REPLACE
± 10 L.F. OF EXISTING CURB

EXISTING SANITARY
MANHOLE TO REMAIN

REMOVE AND REPLACE
± 9 L.F. OF EXISTING CURB

REMOVE AND REPLACE
± 10 L.F. OF EXISTING CURB

REMOVE AND REPLACE
± 8 L.F. OF EXISTING CURB

STA. 11+00 (23'LT.)±
INSTALL 4" 45° BEND

STA. 11+02 (21'LT.)±
INSTALL 4" 45° BEND

STA. 11+92 (21'LT.)±
INSTALL 4" 11 1/4° BEND

REMOVE ± 459 L.F.
OF EXISTING F.M.

STA. 13+07 (22'LT.)±
INSTALL 4" 45° BEND

EXCHANGE DRIVE
14+00

OPENCUT AND RESTORE
EXISTING DRIVEWAY

OPENCUT AND RESTORE
EXISTING DRIVEWAY
15+00

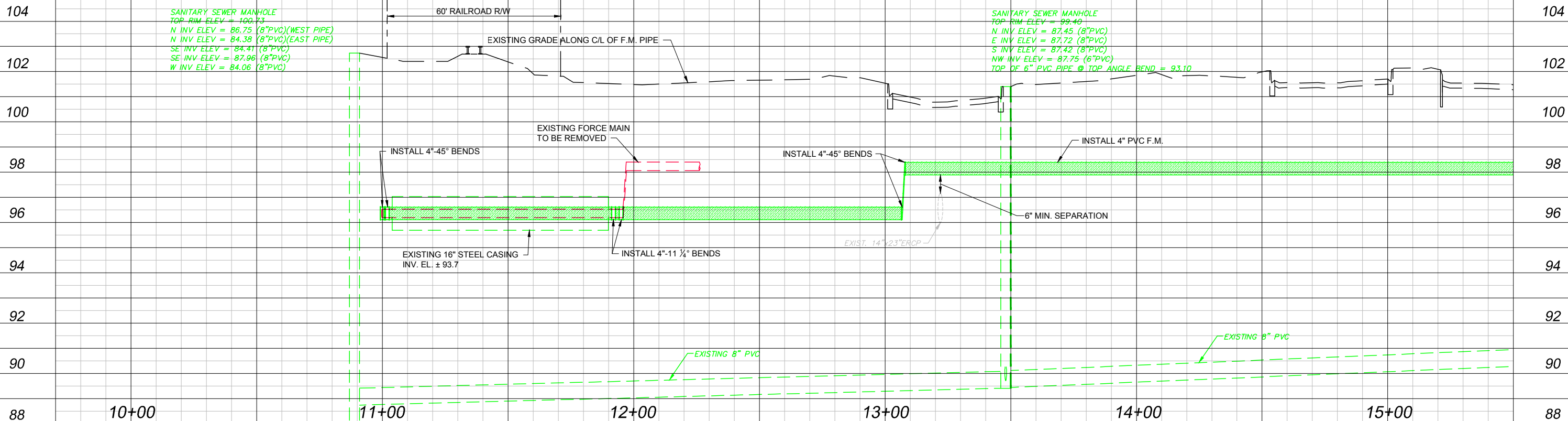
MATCHLINE STA. 15+50

NOTES:

- CONTRACTOR SHALL PROVIDE BY PASS PUMPING OF FLOWS WHILE EXISTING FORCE MAIN IS BEING REMOVED AND NEW FORCE MAIN IS BEING INSTALLED.
- NEW FORCE MAIN CAN BE TEMPORARILY CONNECTED TO EXISTING AT END OF EACH WORK DAY AND GO BACK TO NORMAL PUMP STATION OPERATIONS.

NOTES:

- CONTRACTOR CAN ONLY CLOSE ONE DRIVEWAY AT A TIME.
- IF A CASING DOES NOT EXIST UNDER RAILROAD, THEN CONTRACTOR SHALL LEAVE SECTION OF EXISTING FORCE MAIN IN PLACE FROM RAILROAD R/W TO RAILROAD R/W AND CONNECT NEW FORCE MAIN AT THESE TWO LOCATIONS.
- CONTRACTOR MUST COORDINATE AND COMPLY WITH ALL REPORTING AND INSPECTION REQUIREMENTS OF THE RAILROAD AT NO ADDITIONAL COST TO THE OWNER.



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BID SET

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Checked by: SNR 1"=4' V
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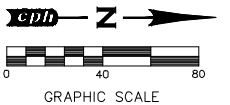
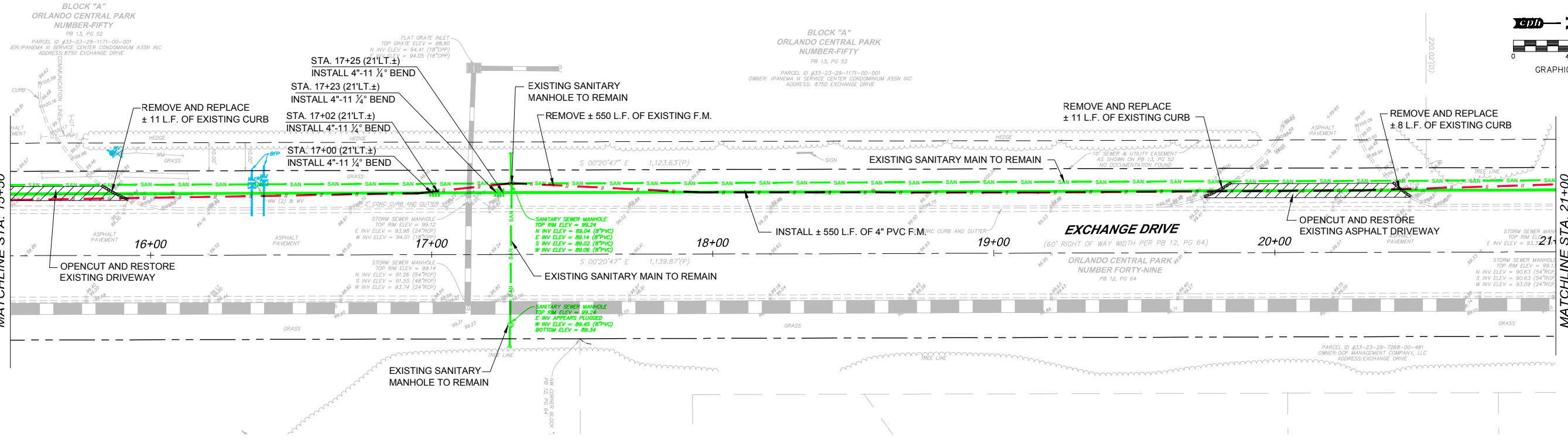
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REG.#50041

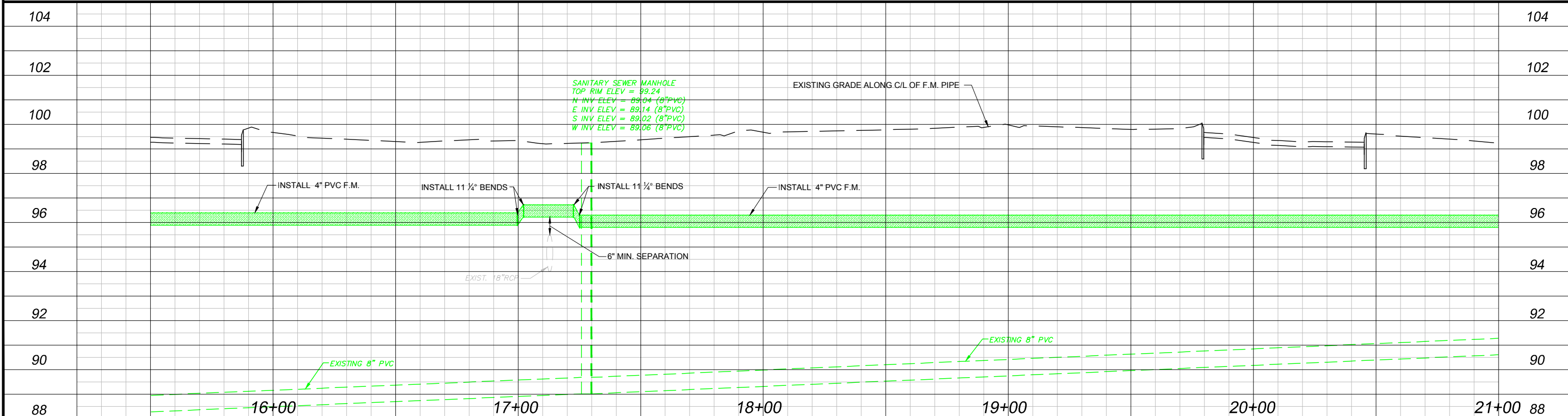
Exchange Drive
Force Main Replacement

PLAN AND PROFILE
STA. 10+00 TO STA. 15+00

SHEET NO.
C-6



- NOTES:**
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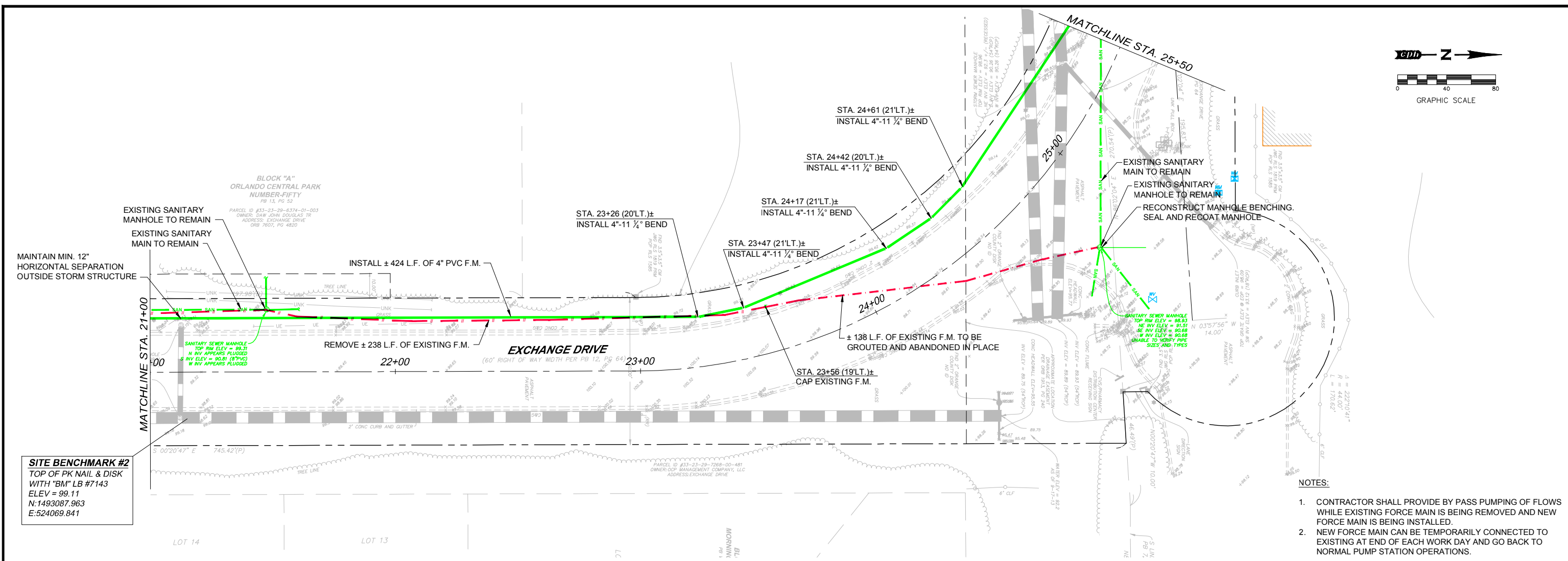
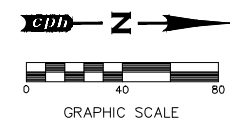
EXCHANGE DRIVE
FORCE MAIN REPLACEMENT

PLAN AND PROFILE
STA. 15+50 TO STA. 21+00

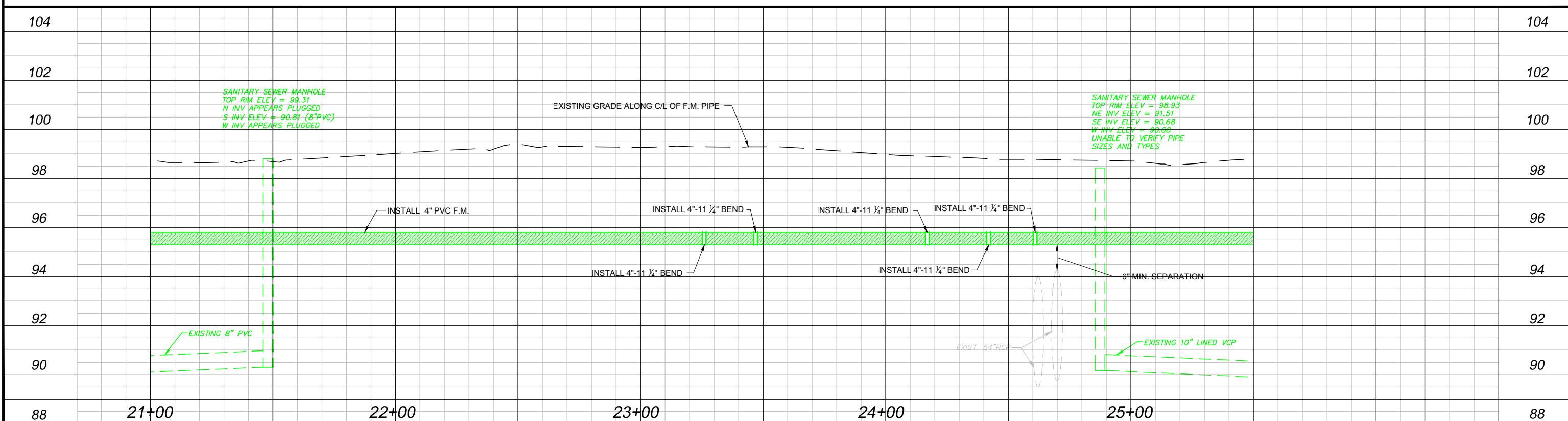
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BID SET



- NOTES:**
1. CONTRACTOR SHALL PROVIDE BY PASS PUMPING OF FLOWS WHILE EXISTING FORCE MAIN IS BEING REMOVED AND NEW FORCE MAIN IS BEING INSTALLED.
 2. NEW FORCE MAIN CAN BE TEMPORARILY CONNECTED TO EXISTING AT END OF EACH WORK DAY AND GO BACK TO NORMAL PUMP STATION OPERATIONS.



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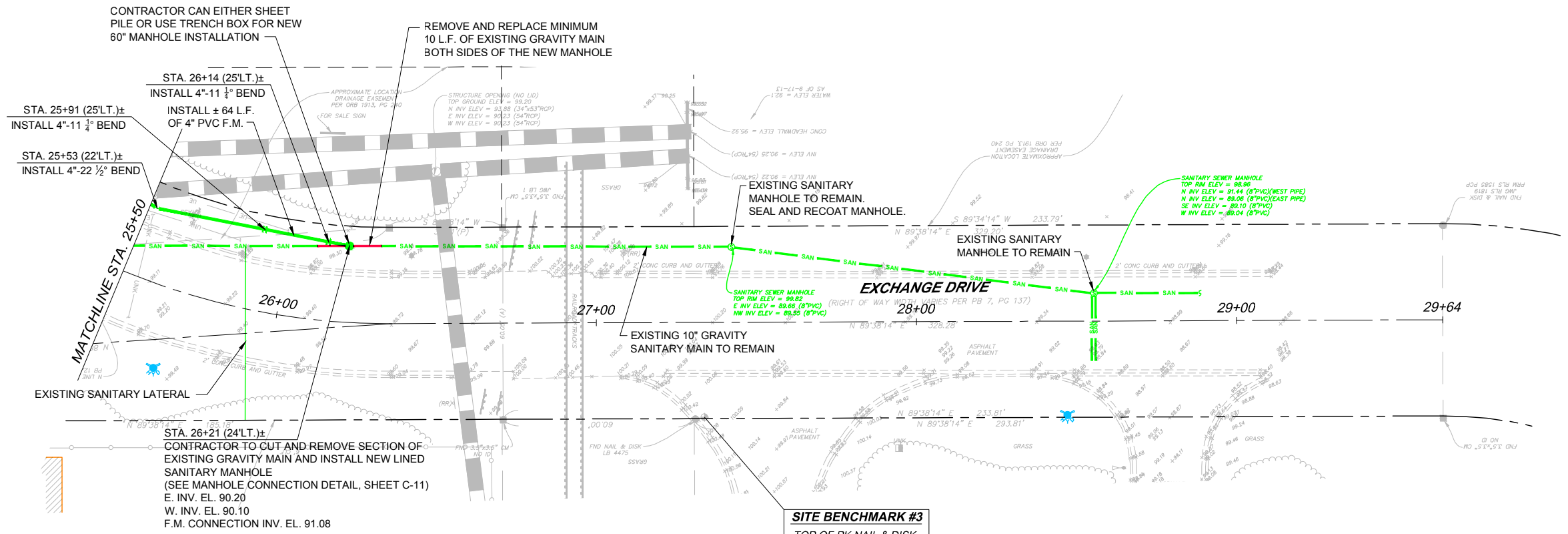
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REG.#50041

Sheet No.
C-8

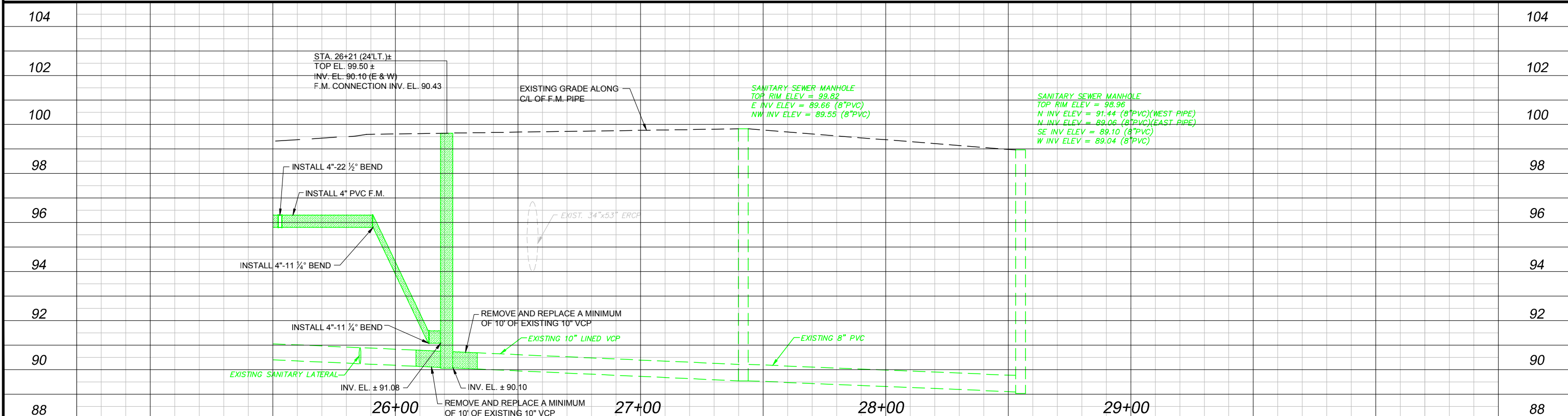
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BID SET



SITE BENCHMARK #3
TOP OF PK NAIL & DISK WITH "BM" LB #7143
ELEV = 99.98
N:1493514.229
E:523736.530

- NOTES:**
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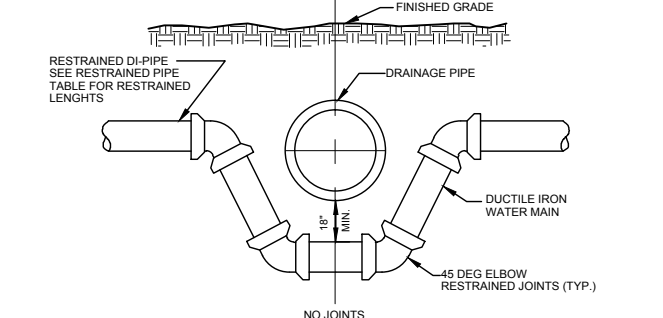
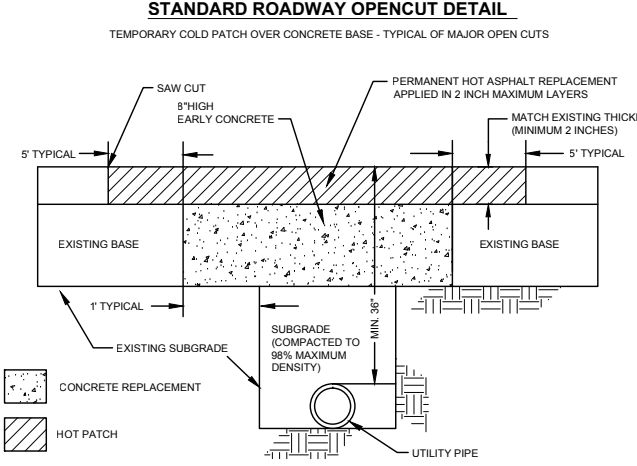
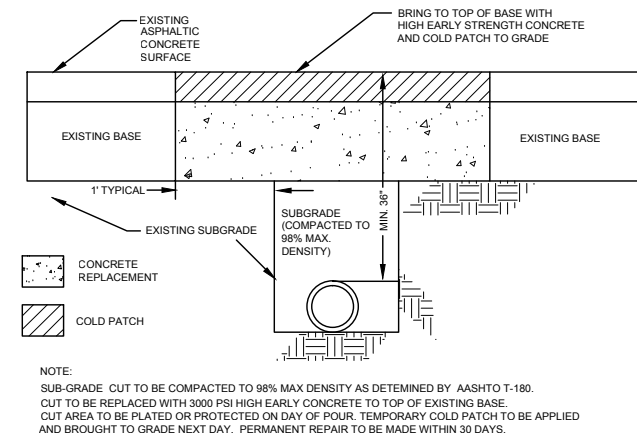
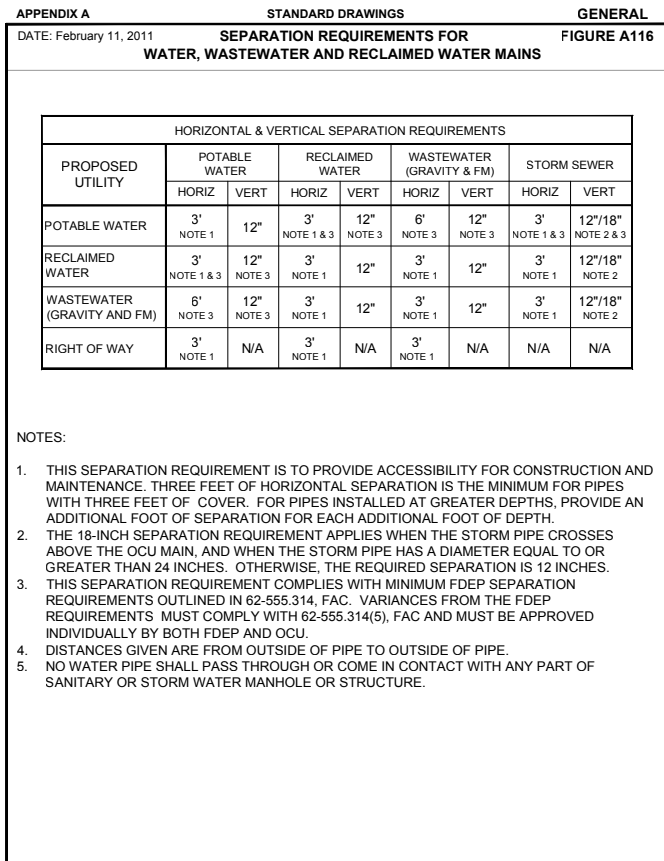
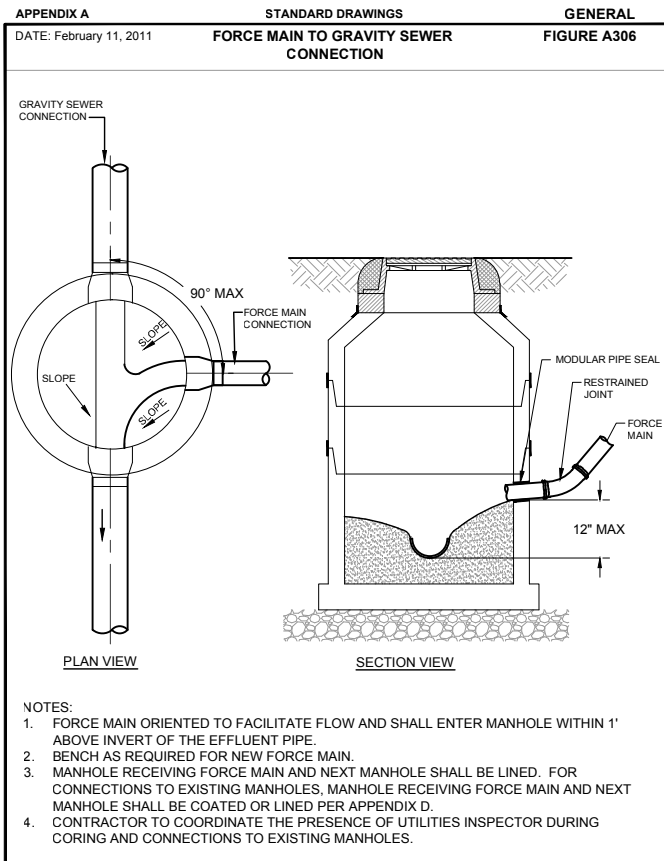
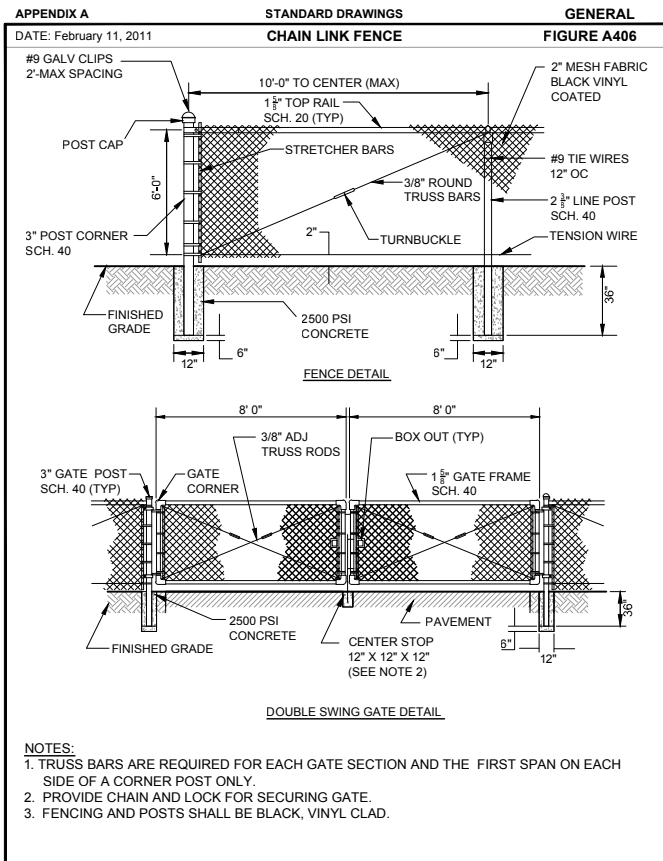
Exchange Drive
FORCE MAIN REPLACEMENT

PLAN AND PROFILE
STA. 25+50 TO STA. 29+64

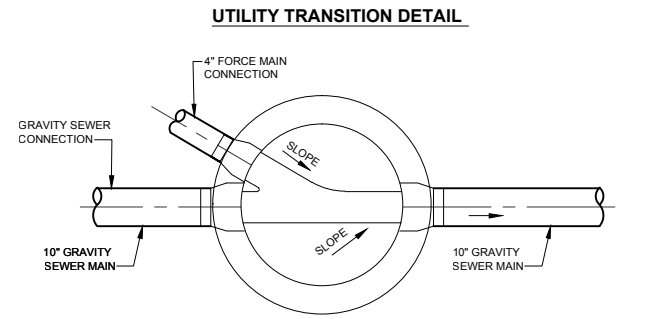
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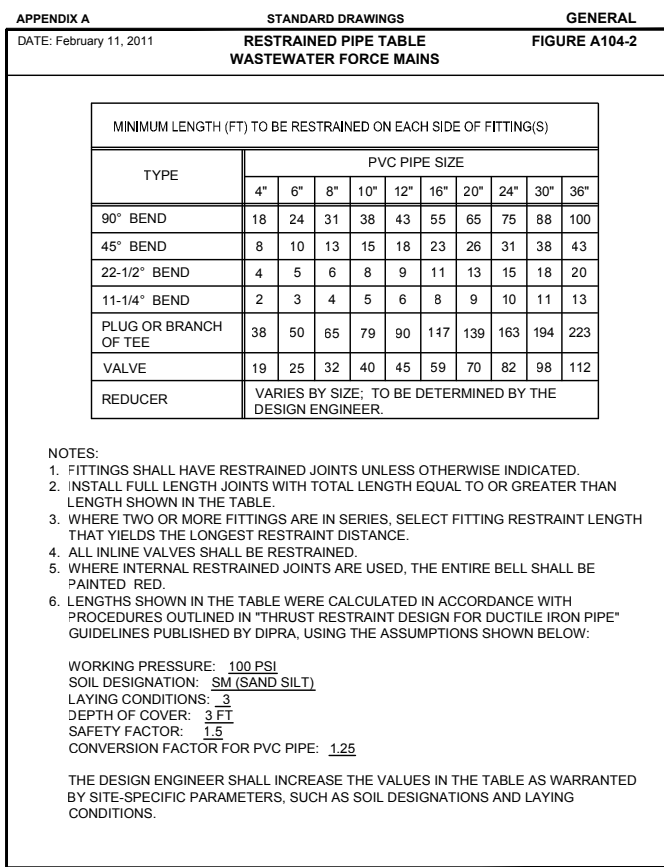
BID SET



NOTES:
 1. THIS METHOD TO BE USED WHEN INSUFFICIENT COVER EXISTS TO ALLOW UTILITY PIPE TO CROSS ABOVE STORM SEWER WITH 18" VERTICAL SEPARATION AND MAINTAIN 36" MIN. COVER TO FINISHED GRADE.
 2. SUBMIT SHOP DRAWINGS FOR EACH PARTICULAR SITUATION.
 3. ALL RESTRAINED JOINTS. NO THRUST COLLARS TO BE USED WITH THIS METHOD.



NOTES:
 1. FORCE MAIN ORIENTED TO FACILITATE FLOW AND SHALL ENTER MANHOLE WITHIN 1' ABOVE INVERT OF THE EFFLUENT PIPE.
 2. BENCH AS REQUIRED FOR NEW FORCE MAIN.
 3. MANHOLE RECEIVING FORCE MAIN AND NEXT MANHOLE SHALL BE LINED. FOR CONNECTIONS TO EXISTING MANHOLES, MANHOLE RECEIVING FORCE MAIN AND NEXT UPSTREAM AND DOWNSTREAM MANHOLES SHALL BE COATED OR LINED PER APPENDIX D.
 4. CONTRACTOR TO COORDINATE THE PRESENCE OF UTILITIES INSPECTOR DURING CORING AND CONNECTIONS TO EXISTING MANHOLES.



Drawing Name: J:\2014\OCU\DWG\104-02\104-02.dwg Date: 7/11/2014 2:48pm User: cph\cph

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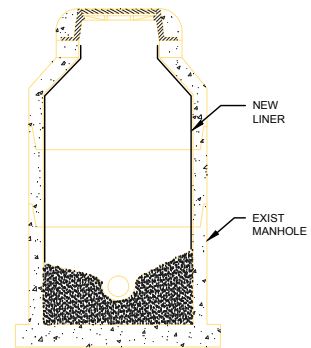
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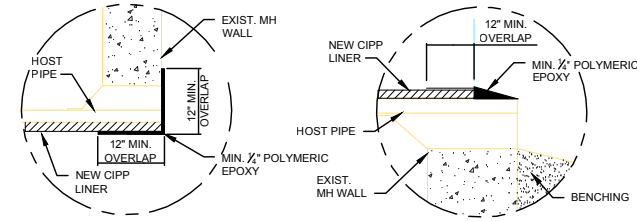
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CONSTRUCTION DETAILS

Sheet No.
C-11
 BID SET

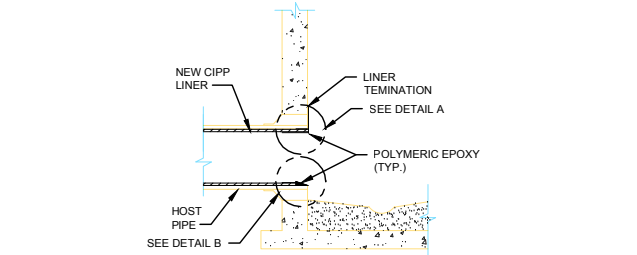


- NOTES:**
1. LINERS SHALL BE FIBERGLASS, HDPE, OR REINFORCED PLASTIC AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.
 2. PREPARE STRUCTURE INTERIOR. PRESSURE WASH OR SANDBLAST TO REMOVE ALL SCALE, LOOSE MATERIAL, GREASE AND SLUDGE BUILD UP.
 3. ACTIVE LEAKS SHALL BE REPAIRED WITH HYDRAULIC MORTAR. ALL OTHER STRUCTURAL REPAIRS DEEMED NECESSARY SHALL BE PERFORMED.

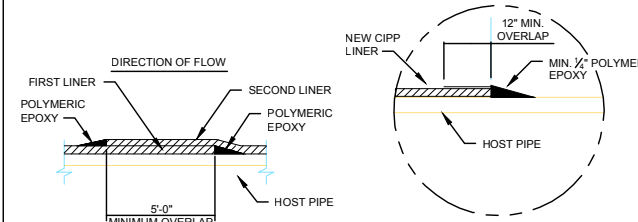


NOTE: IF THICKNESS IS GREATER THAN 1/2", CONTRACTOR MAY USE RAPID SET MORTAR w/ MIN. 1/2" THICK POLYMERIC EPOXY TOP COAT.

DETAIL A - AT MH OPENING DETAIL B - IN PIPE OR AT MH INVERT

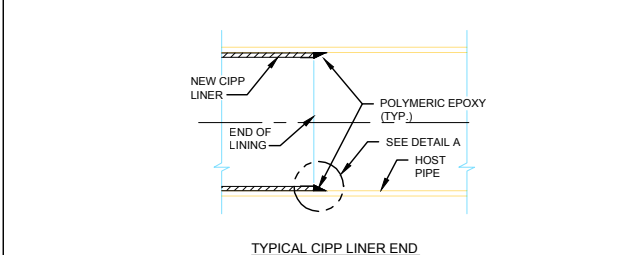


- NOTES:**
1. CONTRACTOR SHALL REPAIR DETERIORATION ON INSIDE CIRCUMFERENCE OF PIPE WALL TO FORM A SMOOTH SURFACE FOR THE END OF CIPP LINER.
 2. POLYMERIC EPOXY SHALL BE RAVEN 405 OR AQUATAPOXY A-6 EPOXY MORTAR SYSTEMS, BY RAVEN LINING SYSTEMS OR APPROVED EQUIVALENT.
 3. IF POLYETHYLENE IS USED FOR INTERIOR OF LINING, CONTRACTOR SHALL ABRASE THE POLYETHYLENE LAYER PRIOR TO APPLYING THE EPOXY.

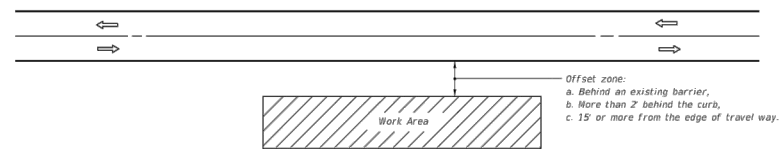


NOTE: IF THICKNESS IS GREATER THAN 1/2", CONTRACTOR MAY USE RAPID SET MORTAR w/ MIN. 1/2" THICK POLYMERIC EPOXY TOP COAT.

TYPICAL CIPP LINER OVERLAP DETAIL B - IN PIPE OR AT MH INVERT

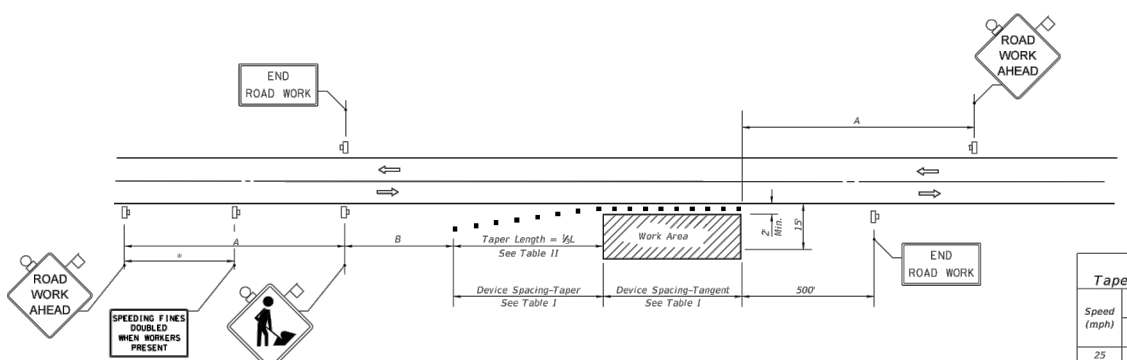


- NOTES:**
1. CONTRACTOR SHALL REPAIR DETERIORATION ON INSIDE CIRCUMFERENCE OF PIPE WALL TO FORM A SMOOTH SURFACE FOR THE END OF CIPP LINER.
 2. POLYMERIC EPOXY SHALL BE RAVEN 405 OR AQUATAPOXY A-6 EPOXY MORTAR SYSTEMS, BY RAVEN LINING SYSTEMS OR APPROVED EQUIVALENT.
 3. IF POLYETHYLENE IS USED FOR INTERIOR OF LINING, CONTRACTOR SHALL ABRASE THE POLYETHYLENE LAYER PRIOR TO APPLYING THE EPOXY.



- GENERAL NOTES**
1. If the work operation (excluding establishing and terminating the work area) requires that two or more work vehicles cross the offset zone in any one hour, traffic control will be in conformance with Index No. 602.
 2. No special signing is required.
 3. When a side road intersects the highway within the work area, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
 4. When construction activities encroach on a sidewalk refer to Index No. 600.
 5. For general TCZ requirements and additional information, refer to Index No. 600.
- CONDITIONS**
WHERE ANY VEHICLE, EQUIPMENT, WORKERS AND THEIR ACTIVITIES ARE BEHIND AN EXISTING BARRIER, MORE THAN 2' BEHIND THE CURB, OR 15' OR MORE FROM THE EDGE OF TRAVEL WAY.

- SYMBOLS**
- Work Area
 - Lane Identification + Direction of Traffic



DISTANCE BETWEEN SIGNS

Speed	Spacing (ft.)	
	A	B
40 mph or less	200	200
45 mph	350	350
50 mph or greater	500	500

*Midway between signs.

**Table 1
Device Spacing**

Speed (mph)	Max. Distance Between Devices (ft.)			
	Type I or Type II Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100

**Table II
Taper Length - Shoulder**

Speed (mph)	Sl (ft)			Notes
	8' Shldr.	10' Shldr.	12' Shldr.	
25	28	35	42	L = WS ² / 60
30	40	50	60	
35	55	68	82	
40	72	90	107	L = WS
45	120	150	180	
50	133	167	200	
55	147	183	220	
60	160	200	240	
65	173	217	260	
70	187	233	280	

8' minimum shoulder width
Sl = Length of shoulder taper in feet
W = Width of total shoulder in feet (combined paved and unpaved width)
S = Posted speed limit (mph)

- SYMBOLS**
- Work Area
 - Sign With 18" x 18" (Min.) Orange Flag And Type B Light
 - Channelling Device (See Index No. 600)
 - Work Zone Sign
 - Lane Identification + Direction of Traffic
- GENERAL NOTES**
1. When four or more work vehicles enter the through traffic lanes in a one hour period or less (excluding establishing and terminating the work area), the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs, see Index No. 603.
 2. SHOULDER WORK sign may be used as an alternate to the WORKER symbol sign only on the side where the shoulder work is being performed.
 3. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
 4. For general TCZ requirements and additional information, refer to Index No. 600.
- DURATION NOTES**
1. Signs and channelizing devices may be omitted if all of the following conditions are met:
 - a. Work operations are 60 minutes or less.
 - b. Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.

CONDITIONS
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCRACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY.

LAST REVISION 07/01/05	DESCRIPTION: FDOT 2014 DESIGN STANDARDS	INDEX NO. 601	SHEET NO. 1 of 1
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LAST REVISION 07/01/12	DESCRIPTION: FDOT 2014 DESIGN STANDARDS	INDEX NO. 602	SHEET NO. 1 of 1
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Drawing Name: I:\2014\CD\101018101\Drawings\028424.dwg; Date: Jul 11, 2014 - 2:48pm; User: c:\users\khalid.bilal\appdata\local\temp\101018101\101018101.dwg

6/20/2013 2:38:48 PM amf7079

6/20/2013 2:38:51 PM amf7079

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• Puerto Rico
• Connecticut
• Maryland
• Texas

Designed by: RMG Date: 7/01/2014
Drawn by: GNP Scale: AS NOTED
Checked by: SNR
Approved by: DEM
Job No. 028424 © 2014

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Survey L.B. No. 7143 Landscp. Lic. No. LC0000298

DAVID E. MAHLER, P.E.
REG.#5041

EXCHANGE DRIVE
FORCE MAIN REPLACEMENT

CONSTRUCTION DETAILS

Sheet No. **C-12**

Drawing Name: J:\2014\CD\106\106.dwg Drawing: 028424.dwg Date: 7/1/14 2:48pm 10/10/14

UNIQUE ID No.	ASSET TYPE	COUNTY FEATURE No.	STATION	OFFSET	NORTHING	EASTING	ELEV.	SIZE
FM-1	Couple		11+00	37' LT				4" x 4"
FM-2	45o Bend		11+00	23' LT				4"
FM-3	45o Bend		11+02	21' LT				4"
FM-4	11.25o Bend		11+92	21' LT				4"
FM-5	11.25o Bend		11+95	22' LT				4"
FM-6	45o Bend		13+07	22' LT				4"
FM-7	45o Bend		13+08	22' LT				4"
FM-8	11.25o Bend		17+00	21' LT				4"
FM-9	11.25o Bend		17+02	21' LT				4"
FM-10	11.25o Bend		17+23	21' LT				4"
FM-11	11.25o Bend		17+25	21' LT				4"
FM-12	11.25o Bend		23+26	20' LT				4"
FM-13	Cap		23+38	19' LT				4"
FM-14	11.25o Bend		23+47	21' LT				4"
FM-15	11.25o Bend		24+17	21' LT				4"
FM-16	11.25o Bend		24+42	20' LT				4"
FM-17	11.25o Bend		24+61	21' LT				4"
FM-18	22.50o Bend		25+53	22' LT				4"
FM-19	11.25o Bend		25+91	25' LT				4"
FM-20	11.25o Bend		26+14	25' LT				4"
FM-21	Manhole		26+21	24' LT				60"

No.	Date	Revision	By	No.	Date	Revision	By



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 © 2014

EXCHANGE DRIVE
 FORCE MAIN REPLACEMENT

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ASSET TABLES

Sheet No.
C-13

BID SET