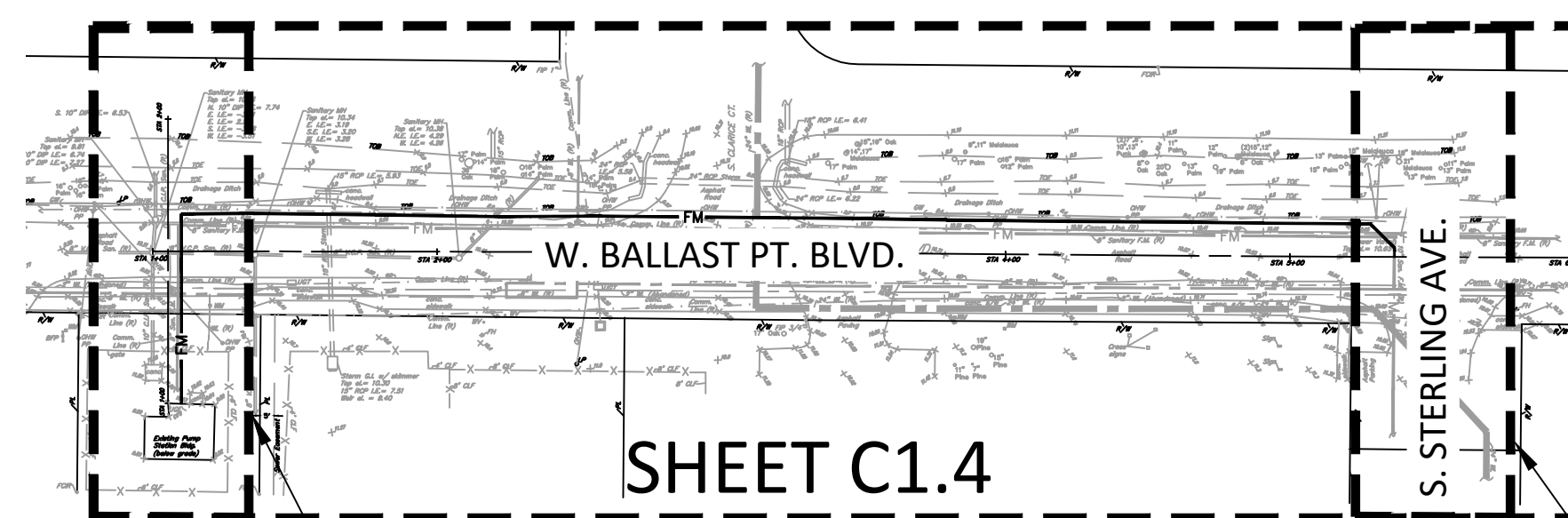


W. PEARL AVE. OVERALL PROJECT AREA

Scale: 1" = 60'



W. BALLAST PT. BLVD. OVERALL PROJECT AREA

Scale: 1" = 60'

100% CONSTRUCTION DRAWINGS

BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION

MILLS and ASSOCIATES, INC.  
CONSULTING ENGINEERS & LAND SURVEYORS  
3242 HENDERSON BOULEVARD \* SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

FOR

CITY OF TAMPA  
WASTEWATER DEPARTMENT  
2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

DRWN BY: CVL DATE 07/16/20  
DSGN BY: DATE  
CHKD BY: LEM DATE 07/16/20  
SCALE: 1" = 20'

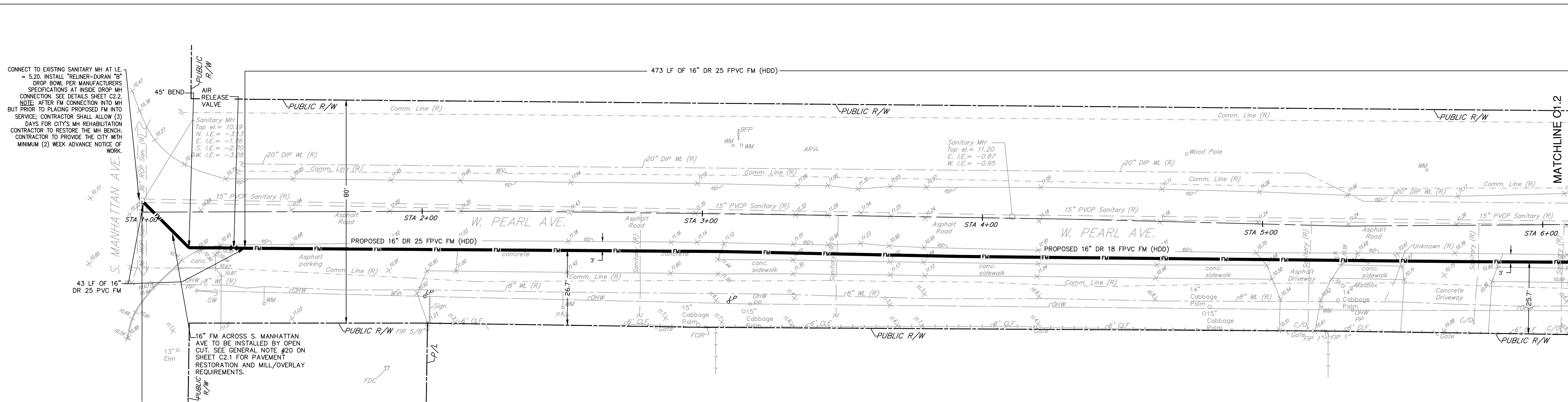
LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 - L.B. NO. 3868  
STATE OF FLORIDA

BALLAST POINT PS  
FORCEMAIN

OVERALL PROJECT AREAS

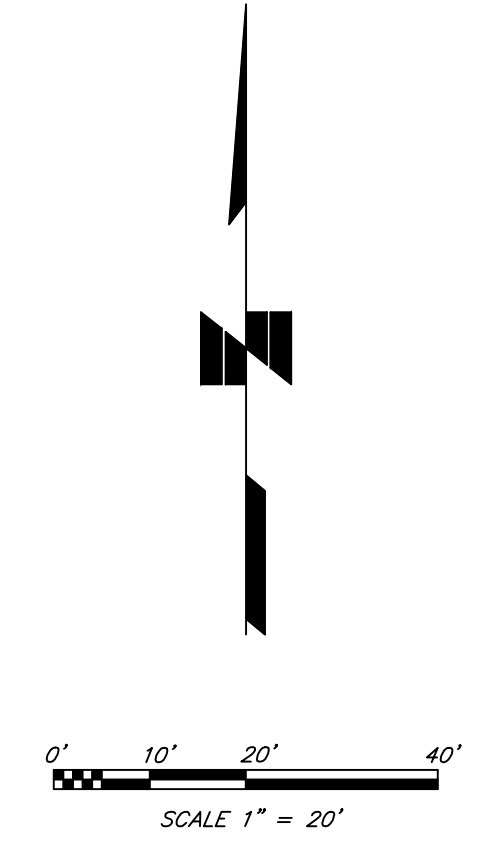
C0.1

JOB NO.  
20-009



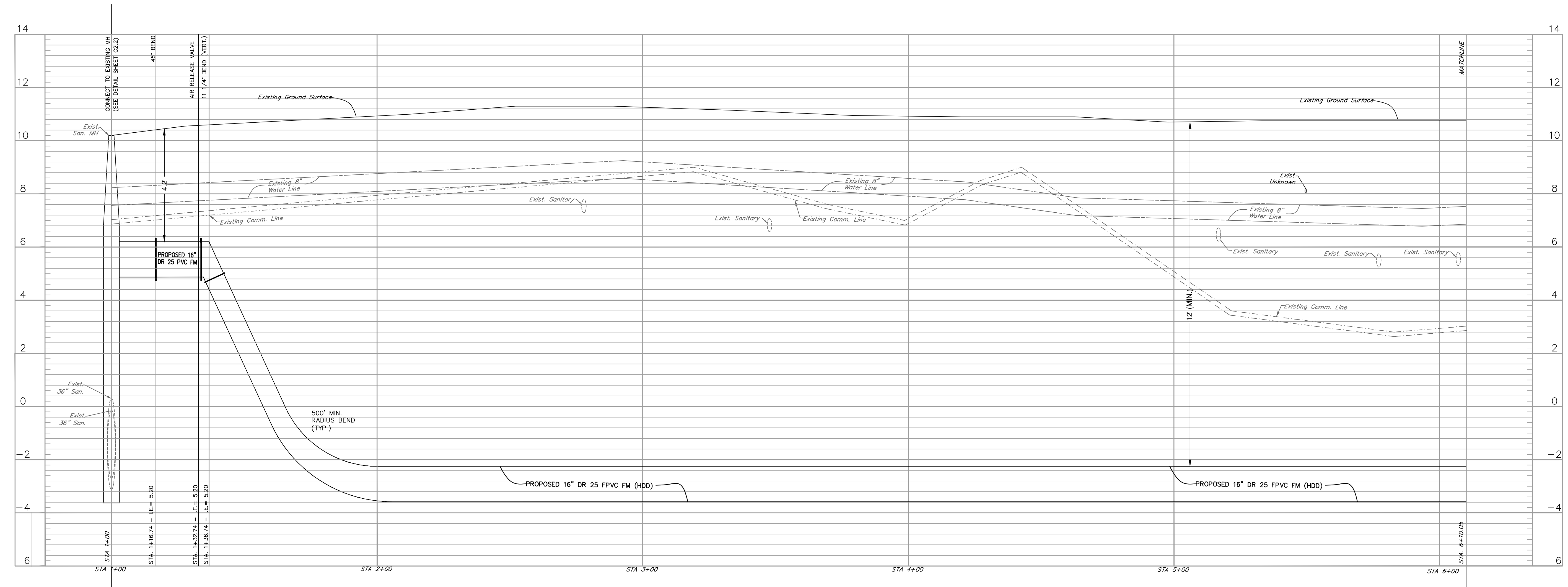
**PLAN VIEW**

Horizontal Scale: 1" = 20'



- LEGEND (As Applicable)**
- BC Back of Curb
  - BFP Backflow Preventer
  - (C) Calculated
  - CLF Chain Link Fence
  - CMP Corrugated Metal Pipe
  - CO Clean Out
  - Conc. Concrete
  - EP Edge of Pavement
  - FDC Fire Department Connector
  - FF Finished Floor Elevation
  - FL Flow Line
  - GI Grate Inlet
  - GW Guy Wire
  - H/C Handicapped Parking Sign
  - HP High Point
  - ID Identification
  - Invert Elevation
  - FDIR Found Capped Iron Rod
  - FCM Found Concrete Monument
  - FH Fire Hydrant
  - FIR Found Iron Rod
  - LB Licensed Business
  - L.P. Light Pole
  - (M) Measured data
  - MEC Match Existing Curb
  - MEP Match Existing Pavement
  - MES Matched End Section
  - MH Manhole
  - O/A Overall
  - OR Official Records
  - OHW Overhead Wires
  - (P) Plot data
  - Ped. xing Pedestrian Crossing
  - PK&D Parker-Kalon Nail & Disk (as noted)
  - (R) Reported
  - PVC Polyvinyl chloride
  - RCP Reinforced Concrete Pipe
  - R/W Right of Way
  - San. Sanitary
  - SCD Sanitary CO
  - SF Square Feet
  - SIF Set 5/8" IR with Cap: LB3868
  - S/W Sidewalk
  - TEM Temporary Bench Mark
  - TC Top of Curb
  - TE Top Elevation
  - T.O.B. Top of Bank
  - (Typ.) Typical
  - OHW Overhead Wires
  - OHW Overhead
  - UOE Underground Electric
  - UP Utility Pole
  - Ver. Verizon
  - WM Water Meter
  - WV Water Valve

- NOTES:**
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**PROFILE VIEW**

Horizontal Scale: 1" = 20'  
Vertical Scale: 1" = 2'

100% CONSTRUCTION DRAWINGS

BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION
CVL	11/2/27	16" FM REVISION PER COT COMMENT			

**MILLS and ASSOCIATES, INC.**  
CONSULTING ENGINEERS & LAND SURVEYORS  
3242 HENDERSON BOULEVARD • SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

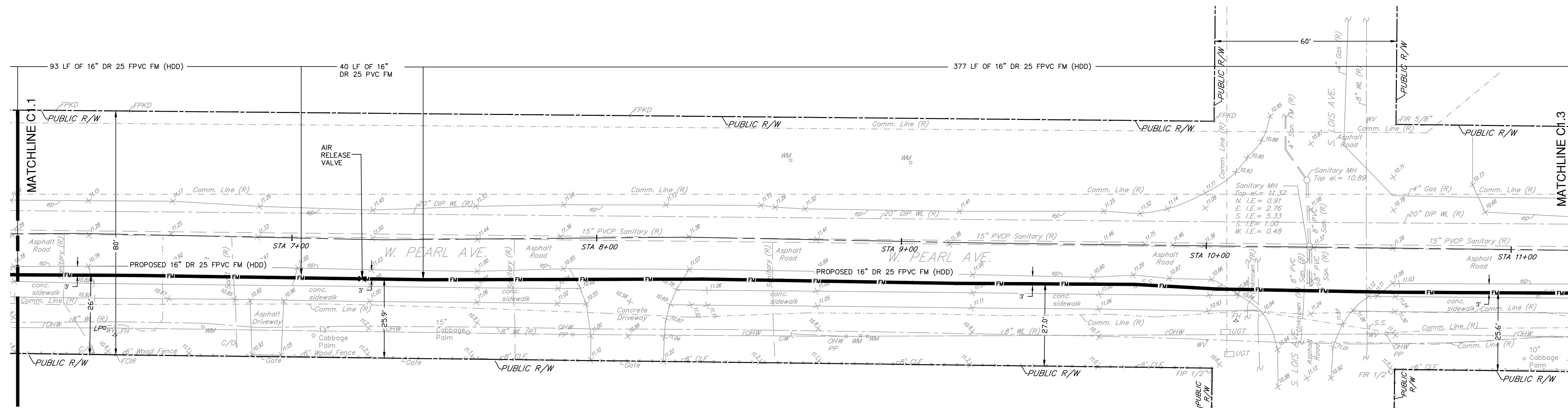
FOR  
**CITY OF TAMPA**  
WASTEWATER DEPARTMENT  
2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

DRWN BY: CVL DATE 07/16/20  
DSGN BY: \_\_\_\_\_ DATE \_\_\_\_\_  
CHKD BY: LEM DATE 07/16/20  
SCALE: **1" = 20'**

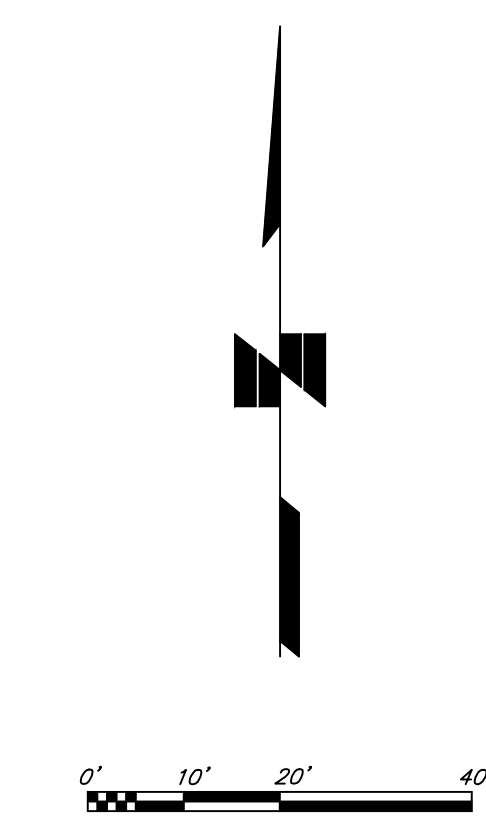
LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 - L.B. NO. 3868  
STATE OF FLORIDA

**BALLAST POINT PS  
FORCEMAIN**  
PEARL AVE. PROPOSED FM  
STA. 1+00 TO 6+10.05

**C1.1**  
JOB NO.  
20-009

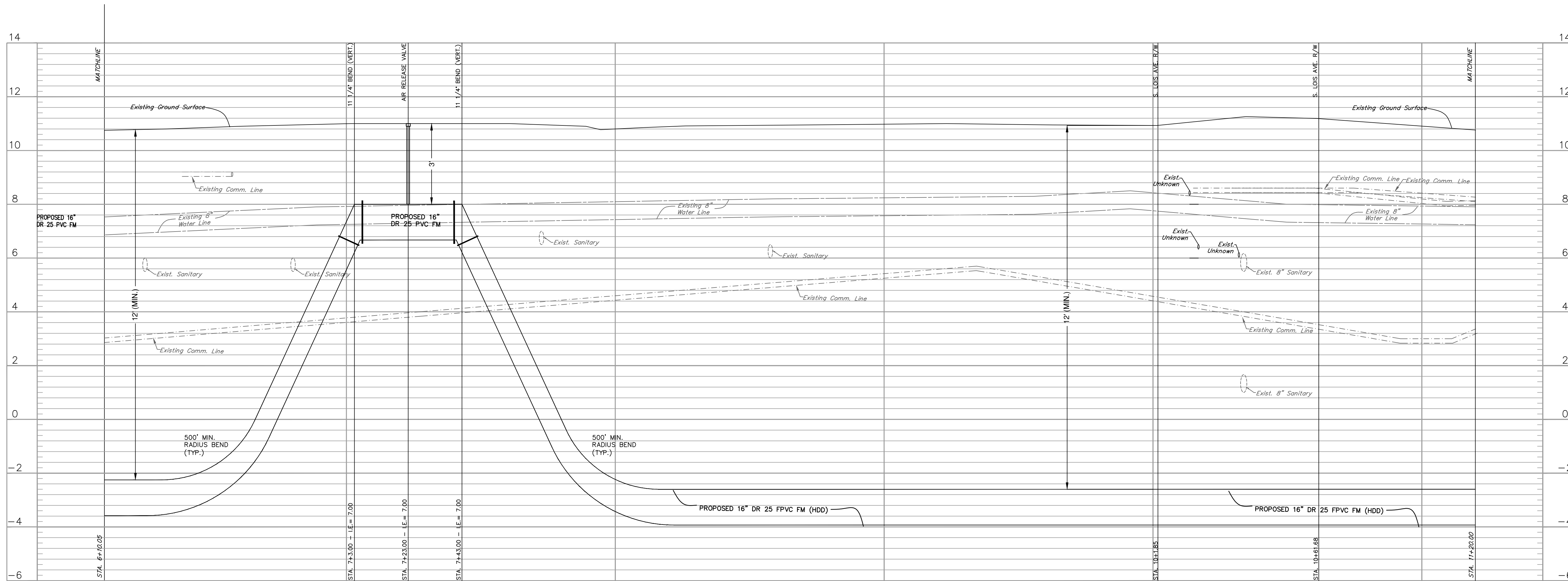


PLAN VIEW  
Horizontal Scale: 1" = 20'



- LEGEND (As Applicable)
- BC Back of Curb
  - BFP Backflow Preventer
  - (C) Calculated
  - CLF Chain Link Fence
  - CMP Corrugated Metal Pipe
  - CO Clean Out
  - Conc. Concrete
  - EP Edge of Pavement
  - FDC Fire Department Connector
  - FF Finished Floor Elevation
  - FL Flow Line
  - GI Grate Inlet
  - GW Guy Wire
  - HP Handicapped Parking Sign
  - HP High Point
  - ID Identification
  - IE Invert Elevation
  - FCIR Found Gapped Iron Rod
  - FCM Found Concrete Monument
  - FH Fire Hydrant
  - FR Found Iron Rod
  - LB Licensed Business
  - L.P. Light Pole
  - (M) Measured data
  - MEC Match Existing Curb
  - MEP Match Existing Pavement
  - MES Mitered End Section
  - MH Manhole
  - O/A Overall
  - OR Official Records
  - OHW Overhead Wires
  - (P) Plot data
  - Ped. xing Pedestrian Crossing
  - PK&D Parker Kalon Nail & Disk (as noted)
  - (R) Reported
  - PVC Polyvinyl chloride
  - RCP Reinforced Concrete Pipe
  - R/W Right of Way
  - San. Sanitary
  - SOD Square Feet
  - SIR Set 5/8" IR with Cap: LB3868
  - S/W Sidewalk
  - TBM Temporary Bench Mark
  - TC Top of Curb
  - TE Top Elevation
  - T.O.B. Top of Bank
  - (TYP) Typical
  - OHW Overhead Wires
  - USE Underground Electric
  - UP Utility Pole
  - Ver. Verizon
  - WM Water Meter
  - WV Water Valve

- NOTES:
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  3. CONTRACTOR SHALL LIMIT CURVATURE IN ANY DIRECTION TO REDUCE FORCE ON THE PIPE DURING PULL BACK. THE BEND RADII FOR FUSIBLE POLYVINYL CHLORIDE (PVC) PIPE SHALL NOT BE LESS THAN 500' FOR 16-INCH PIPE.



PROFILE VIEW  
Horizontal Scale: 1" = 20'  
Vertical Scale: 1" = 2'

100% CONSTRUCTION DRAWINGS

BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION
CVL	11/27	16" FM REVISION PER COT COMMENT			

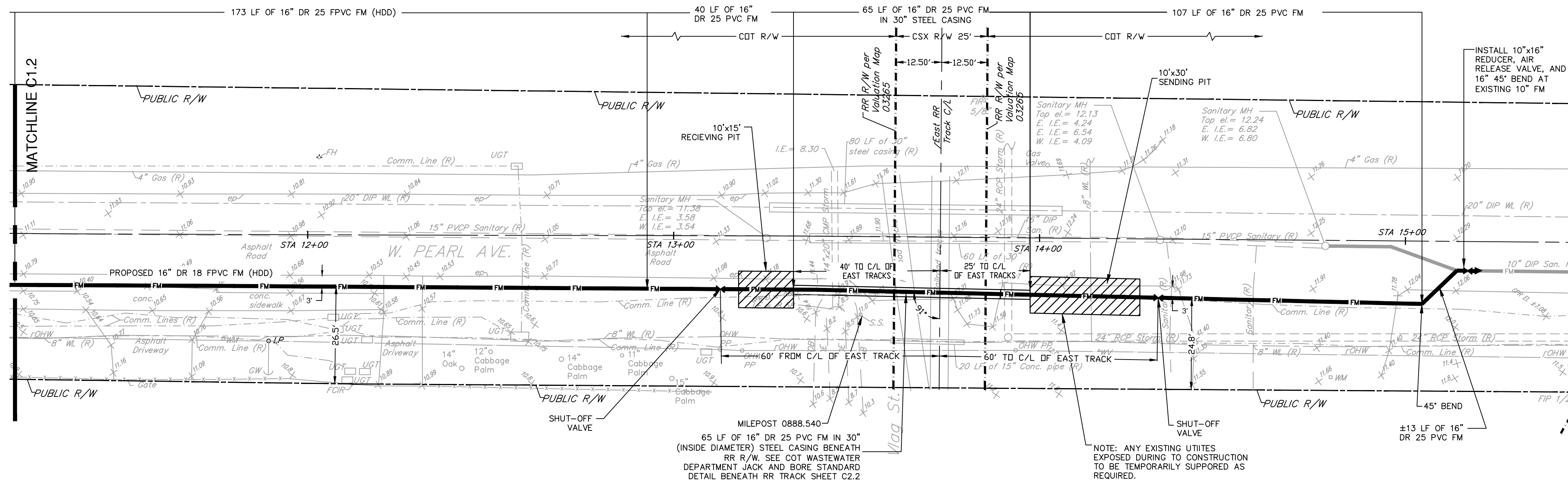
MILLS and ASSOCIATES, INC.  
CONSULTING ENGINEERS & LAND SURVEYORS  
3242 HENDERSON BOULEVARD • SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

FOR  
CITY OF TAMPA  
WASTEWATER DEPARTMENT  
2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

DRWN BY: CVL DATE 07/16/20  
DSGN BY: DATE  
CHKD BY: LEM DATE 07/16/20  
SCALE: 1" = 20'

LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 - L.B. NO. 3868  
STATE OF FLORIDA

BALLAST POINT PS  
FORCEMAIN  
PEARL AVE. PROPOSED FM  
STA. 6+10.05 TO 11+20.00  
JOB NO.  
20-009



**PLAN VIEW**

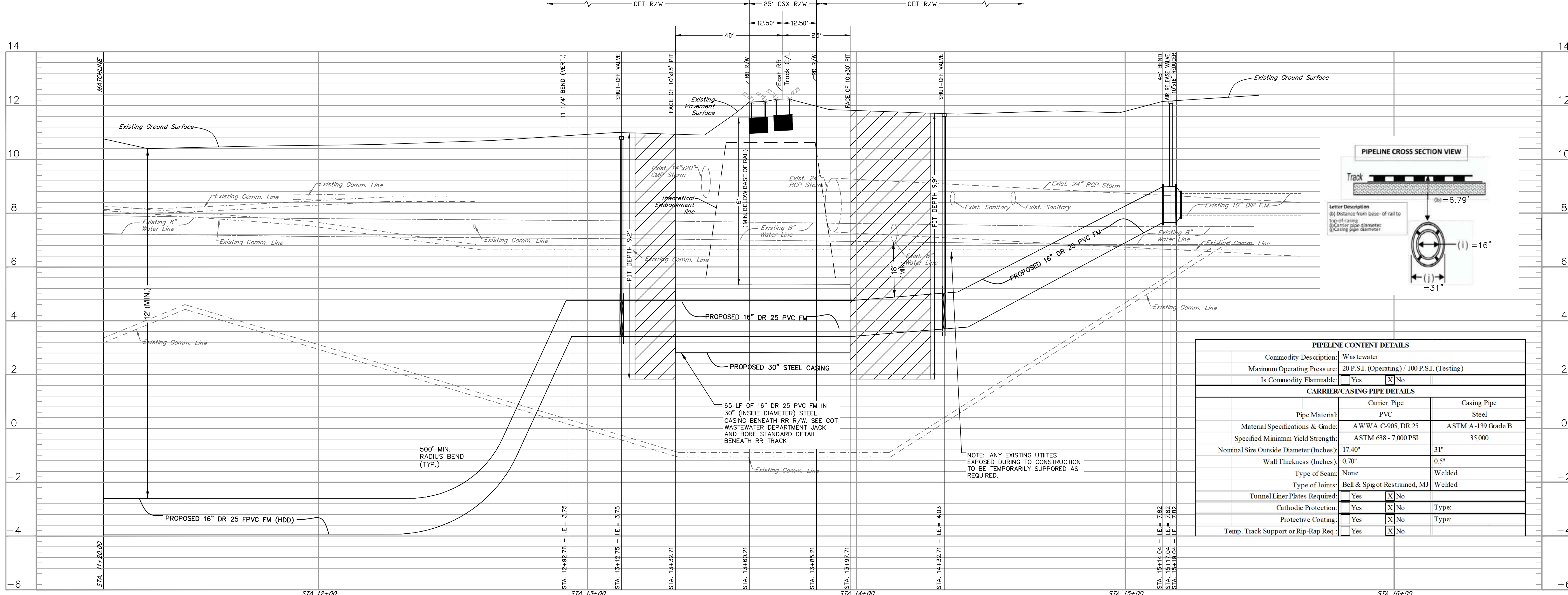
Horizontal Scale: 1" = 20'



CSX CROSSING VICINITY MAP  
NTS

**LEGEND (As Applicable)**

BC	Back of Curb
BFP	Backflow Preventer
(C)	Calculated
CLF	Chain Link Fence
CMP	Corrugated Metal Pipe
CO	Clean Out
Conc.	Concrete
EP	Edge of Pavement
FDC	Fire Department Connector
FF	Finished Floor Elevation
FL	Flow Line
GI	Gate Inlet
GW	Guy Wire
H/C	Handicapped Parking Sign
HP	High Point
ID	Identification
IE	Invert Elevation
FDR	Found Capped Iron Rod
FCM	Found Concrete Monument
FH	Fire Hydrant
FR	Found Iron Rod
LB	Licensed Business
L.P.	Light Pole
(M)	Measured data
MES	Match Existing Curb
MES	Match Existing Pavement
MES	Mitered End Section
MH	Manhole
Overall	Overall
OR	Official Records
OHW	Overhead Wires
(P)	Plot data
Peel wing	Peel wing
PK&D	Parker Kalon Nail & Disk (as noted)
(R)	Reported
PVC	Polyvinyl chloride
RCP	Reinforced Concrete Pipe
R/W	Right of Way
San.	Sanitary
SCD	Sanitary CD
5"	5" Square Feet
SIP	Set 5/8" IR with Cap: LB3868
S/W	Sidewalk
TM	Temporary Bench Mark
TC	Top of Curb
TE	Top Elevation
T.O.B.	Top of Bank
(Typ)	Typical
OHW	Overhead Wires
OVH	Overhang
UGE	Underground Electric
UP	Utility Pole
Ver.	Verizon
WM	Water Meter
WV	Water Valve



**PROFILE VIEW**

Horizontal Scale: 1" = 20'  
Vertical Scale: 1" = 2'

**PIPELINE CONTENT DETAILS**

Commodity Description:	Wastewater
Maximum Operating Pressure:	20 P.S.I. (Operating) / 100 P.S.I. (Testing)
Is Commodity Flammable:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

**CARRIER CASING PIPE DETAILS**

	Carrier Pipe	Casing Pipe
Pipe Material:	PVC	Steel
Material Specifications and Grade:	A WWA C-905, DR 25	ASTM A-139 Grade B
Specified Minimum Yield Strength:	ASTM 638 - 7,000 PSI	35,000
Nominal Size Outside Diameter (Inches):	17.40"	31"
Wall Thickness (Inches):	0.70"	0.5"
Type of Seam:	None	Welded
Type of Joints:	Bell & Spigot Restrained, MJ	Welded
Tunnel Lamer Plates Required:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Cathodic Protection:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Type:
Protective Coating:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Type:
Temp. Track Support or Rip-Rap Req.:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

- NOTES:**
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100% CONSTRUCTION DRAWINGS

BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION
CVL	5/21/21	CSX COMMENTS			
CVL	11/2/21	16" FM REVISION PER COT COMMENT			

**MILLS and ASSOCIATES, INC.**  
CONSULTING ENGINEERS & LAND SURVEYORS

3242 HENDERSON BOULEVARD • SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

FOR  
**CITY OF TAMPA**  
WASTEWATER DEPARTMENT

2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

DRWN BY: CVL DATE: 07/16/20  
DSGN BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
CHKD BY: LEM DATE: 07/16/20  
SCALE: 1" = 20'

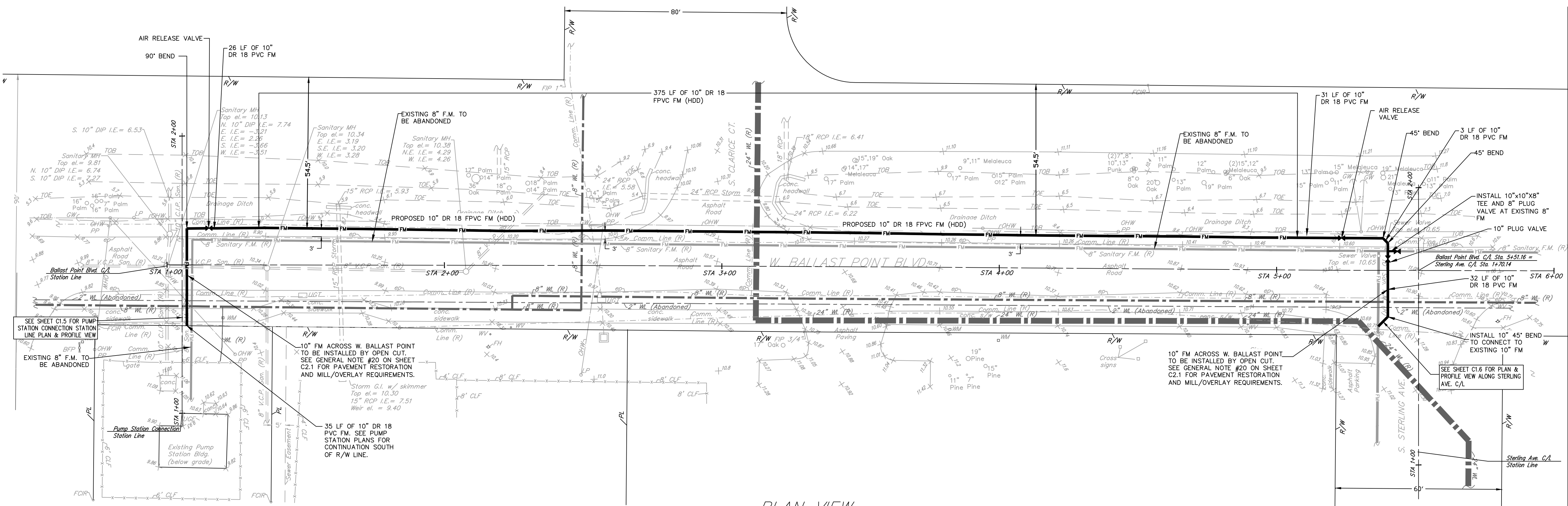
LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 - L.E. NO. 3868  
STATE OF FLORIDA

**BALLAST POINT PS  
FORCEMAIN**

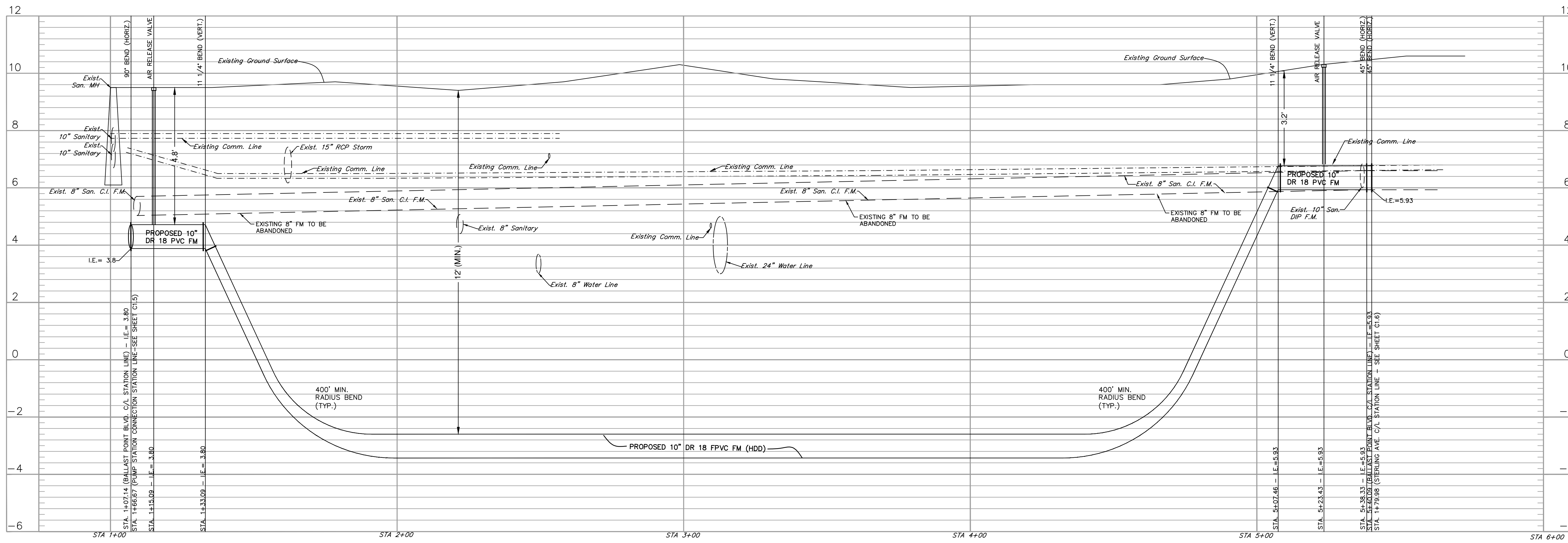
PEARL AVE. PROPOSED FM  
STA. 11+20.00 TO 16+00.00

**C1.3**

JOB NO.  
**20-009**



PLAN VIEW  
Horizontal Scale: 1" = 20'



PROFILE VIEW  
Horizontal Scale: 1" = 20'  
Vertical Scale: 1" = 2'

- LEGEND (As Applicable)
- BC Back of Curb
  - BFP Backflow Preventer
  - Calc. Calculated
  - CLF Chain Link Fence
  - CMP Corrugated Metal Pipe
  - CO Clean Out
  - Conc. Concrete
  - EP Edge of Pavement
  - FDC Fire Department Connector
  - FF Finished Floor Elevation
  - FL Flow Line
  - GI Gate Inlet
  - GW Guy Wire
  - H/C Handicapped Parking Sign
  - HP High Point
  - ID Identification
  - IE Invert Elevation
  - FCIR Found Capped Iron Rod
  - FCM Found Concrete Monument
  - FH Fire Hydrant
  - FR Found Iron Road
  - LB Licensed Business
  - LP Light Pole
  - M Measured data
  - MES Match Existing Curb
  - MEP Match Existing Pavement
  - MES Mitered End Section
  - MH Manhole
  - Overl. Overlaid
  - OJA Official Records
  - OP Overhead Wires
  - OHW Overhead Wires
  - (P) Plot data
  - Plad. v. Ped. v. Crossing
  - PK&D Parker Kalon Nail & Disk (as noted)
  - (R) Reported
  - PVC Polyvinyl chloride
  - RCP Reinforced Concrete Pipe
  - R/W Right of Way
  - San. Sanitary
  - San. CD Sanitary CD
  - SCD Square Feet
  - SIP Set 5/8" IR with Cap: LB386B
  - S/W Sidewalk
  - TBM Temporary Bench Mark
  - TC Top of Curb
  - TE Top Elevation
  - T.O.B. Top of Blank
  - (Typ) Typical
  - OHW Overhead Wires
  - OVH Overhang
  - UGE Underground Electric
  - UP Utility Pole
  - Ver. Verizon
  - WM Water Meter
  - WV Water Valve

- NOTES:
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100% CONSTRUCTION DRAWINGS

REVISIONS					
BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION

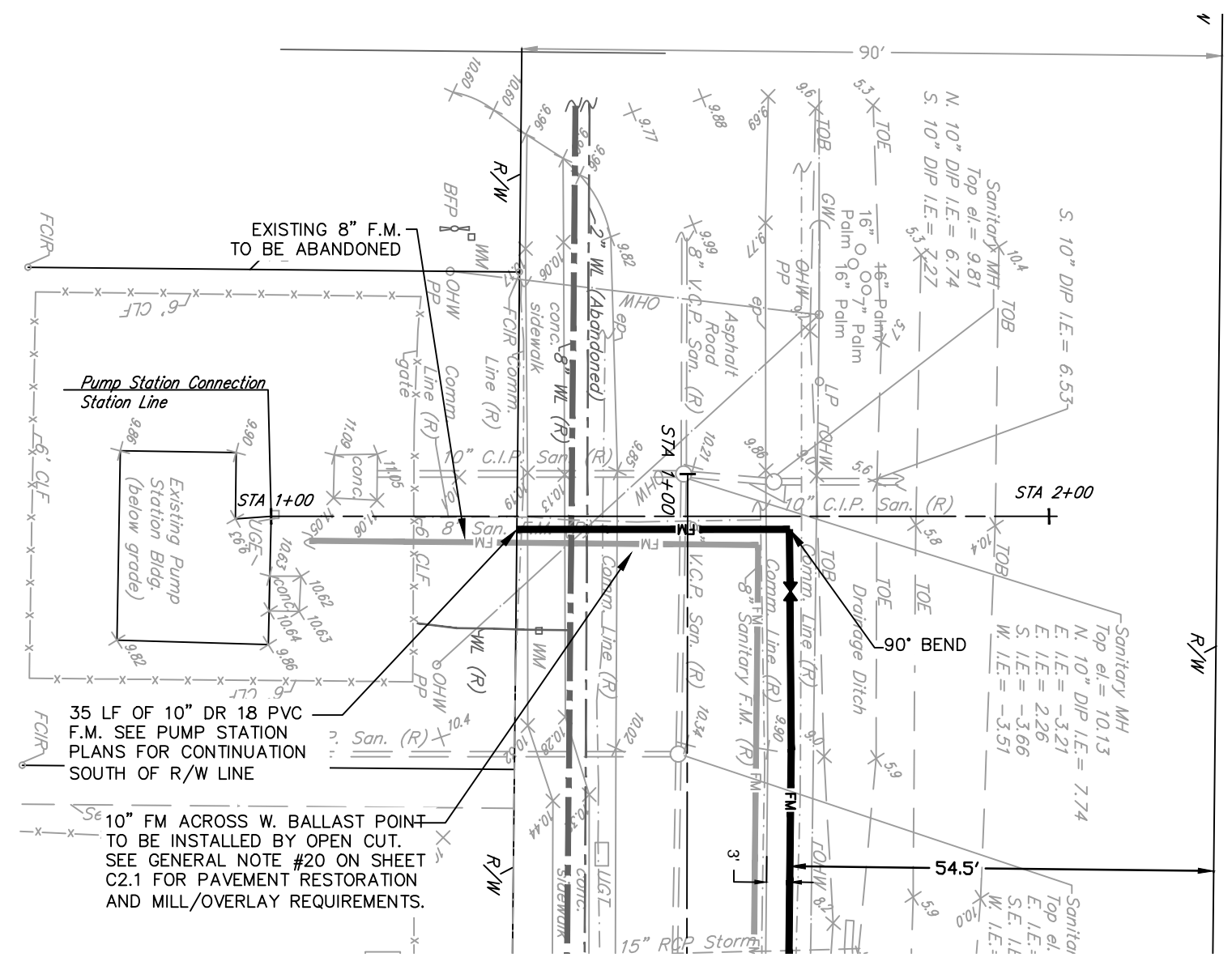
MILLS and ASSOCIATES, INC.  
CONSULTING ENGINEERS & LAND SURVEYORS  
3242 HENDERSON BOULEVARD • SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

FOR  
CITY OF TAMPA  
WASTEWATER DEPARTMENT  
2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

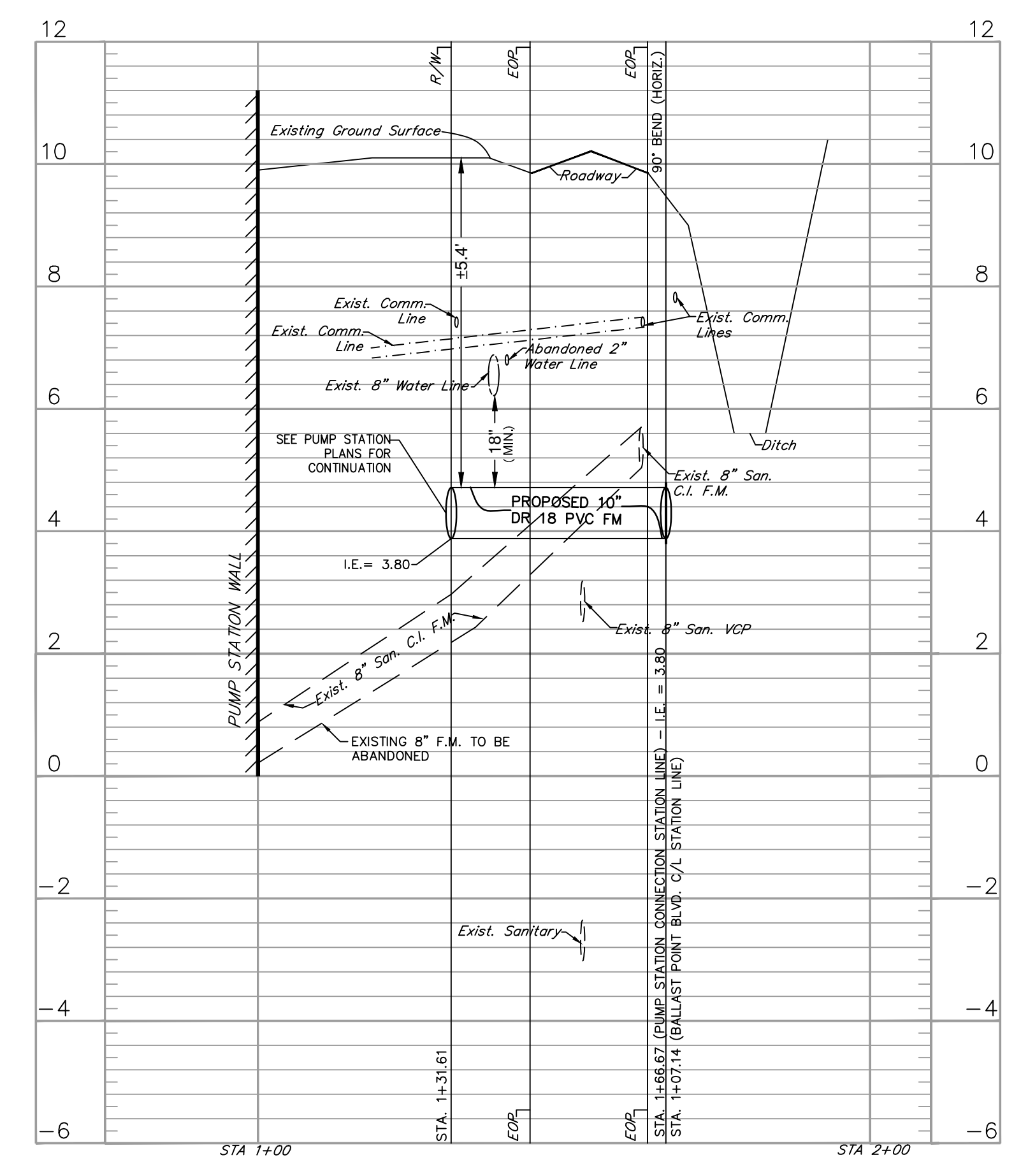
DRWN BY: CVL DATE 07/16/20  
DSGN BY: DATE  
CHKD BY: LEM DATE 07/16/20  
SCALE: 1" = 20'  
LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 L.B. NO. 3868  
STATE OF FLORIDA

PROJECT  
BALLAST POINT PS  
FORCEMAIN  
BALLAST PT. BLVD PROPOSED FM  
STA. 1+00 TO 6+00.00

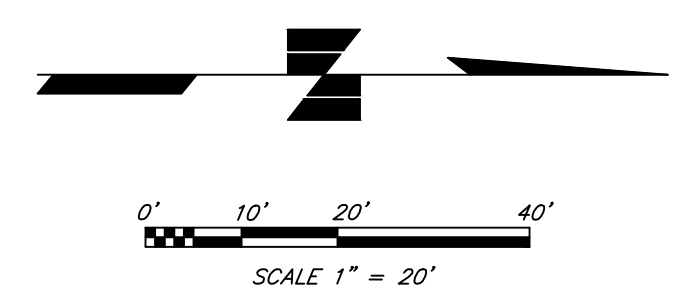
SHEET  
C1.4  
JOB NO.  
20-009



PUMP STATION CONNECTION PLAN VIEW  
Horizontal Scale: 1" = 20'



PUMP STATION CONNECTION PROFILE VIEW  
Horizontal Scale: 1" = 20'  
Vertical Scale: 1" = 2'



- LEGEND (As Applicable)
- BC Back of Curb
  - BFP Backflow Preventer
  - CL Chain Link Fence
  - CMP Corrugated Metal Pipe
  - CO Clean Out
  - Conc. Concrete
  - EP Edge of Pavement
  - FDC Fire Department Connector
  - FF Finished Floor Elevation
  - FL Flow Line
  - GI Grate Inlet
  - GW Gully Wire
  - H/C Handicapped Parking Sign
  - HP High Point
  - ID Identification
  - IE Invert Elevation
  - FCR Found Capped Iron Rod
  - FCM Found Concrete Monument
  - FH Fire Hydrant
  - FR Found Iron Rod
  - LB Licensed Business
  - L.P. Light Pole
  - (M) Measured data
  - MEC Match Existing Curb
  - MEP Match Existing Pavement
  - MES Mitered End Section
  - MH Manhole
  - O/A Overall
  - OR Official Records
  - OHW Overhead Wires
  - (P) Plot data
  - Pod. xing Pedestrian Crossing
  - PK&D Parker Kalon Nail & Disk (as noted)
  - (R) Reported
  - PVC Polyvinyl chloride
  - RCP Reinforced Concrete Pipe
  - R/W Right of Way
  - San. Sanitary
  - SCO Sanitary CO
  - SF Square Feet
  - SIR Set 5/8" IR with Cap: LB386B
  - S/W Sidewalk
  - TKM Temporary Bench Mark
  - TC Top of Curb
  - TE Top Elevation
  - T.O.B. Top of Bank
  - (Typ.) Typical
  - OHW Overhead Wires
  - OHV Overhang
  - USE Underground Electric
  - UP Utility Pole
  - Ver. Verizon
  - WM Water Meter
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100% CONSTRUCTION DRAWINGS

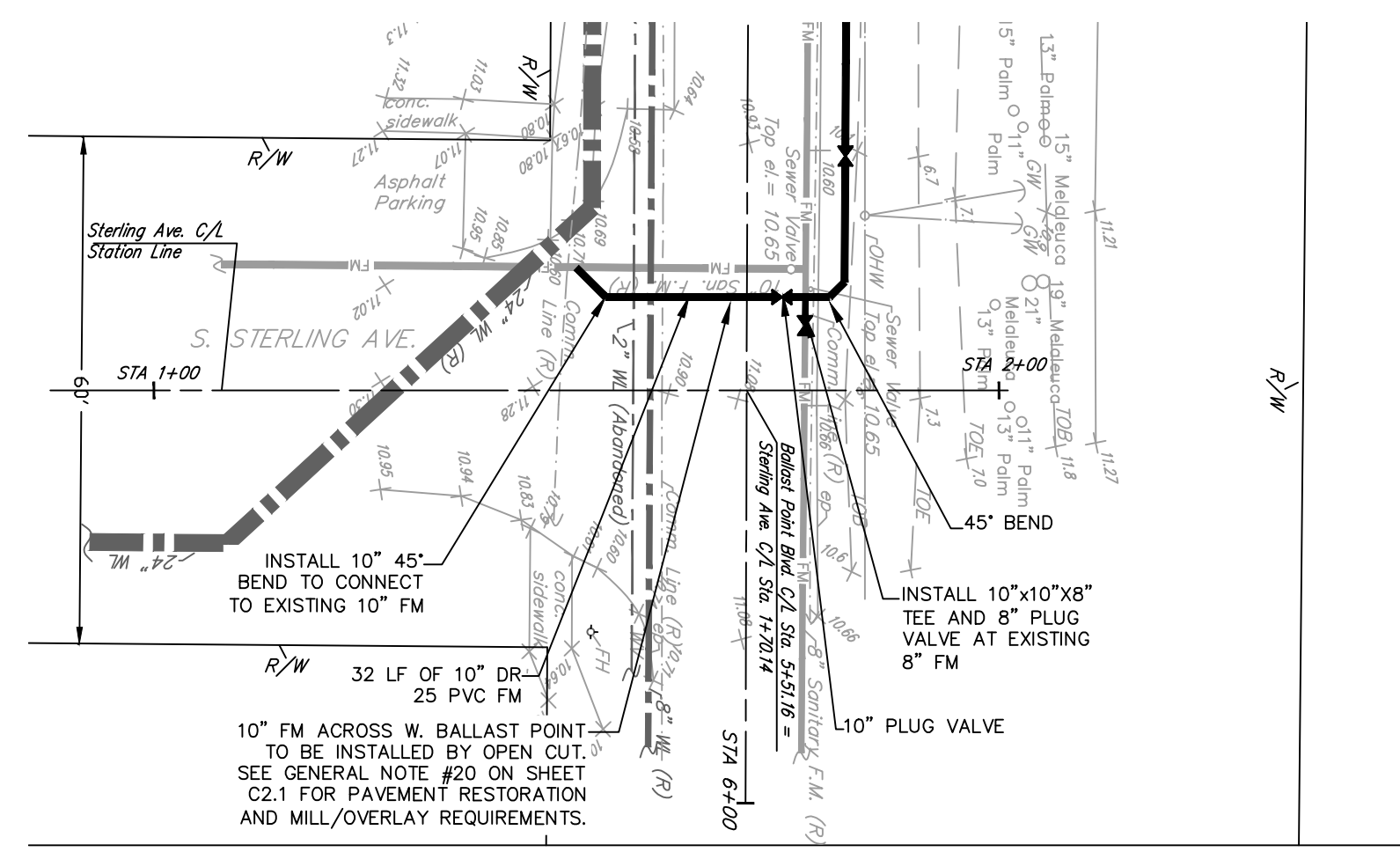
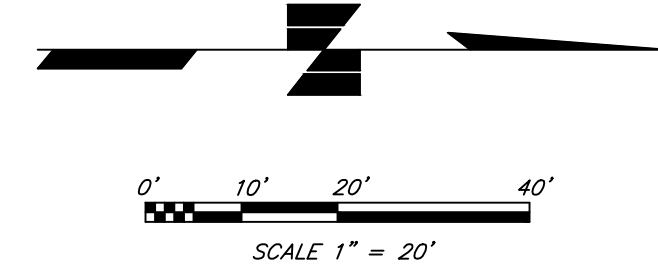
REVISIONS					
BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION

MILLS and ASSOCIATES, INC.  
CONSULTING ENGINEERS & LAND SURVEYORS  
3242 HENDERSON BOULEVARD • SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

FOR  
CITY OF TAMPA  
WASTEWATER DEPARTMENT  
2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

DRWN BY: CVL DATE 07/16/20  
DSGN BY: DATE  
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SCALE: 1" = 20'  
LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 - L.B. NO. 3868  
STATE OF FLORIDA

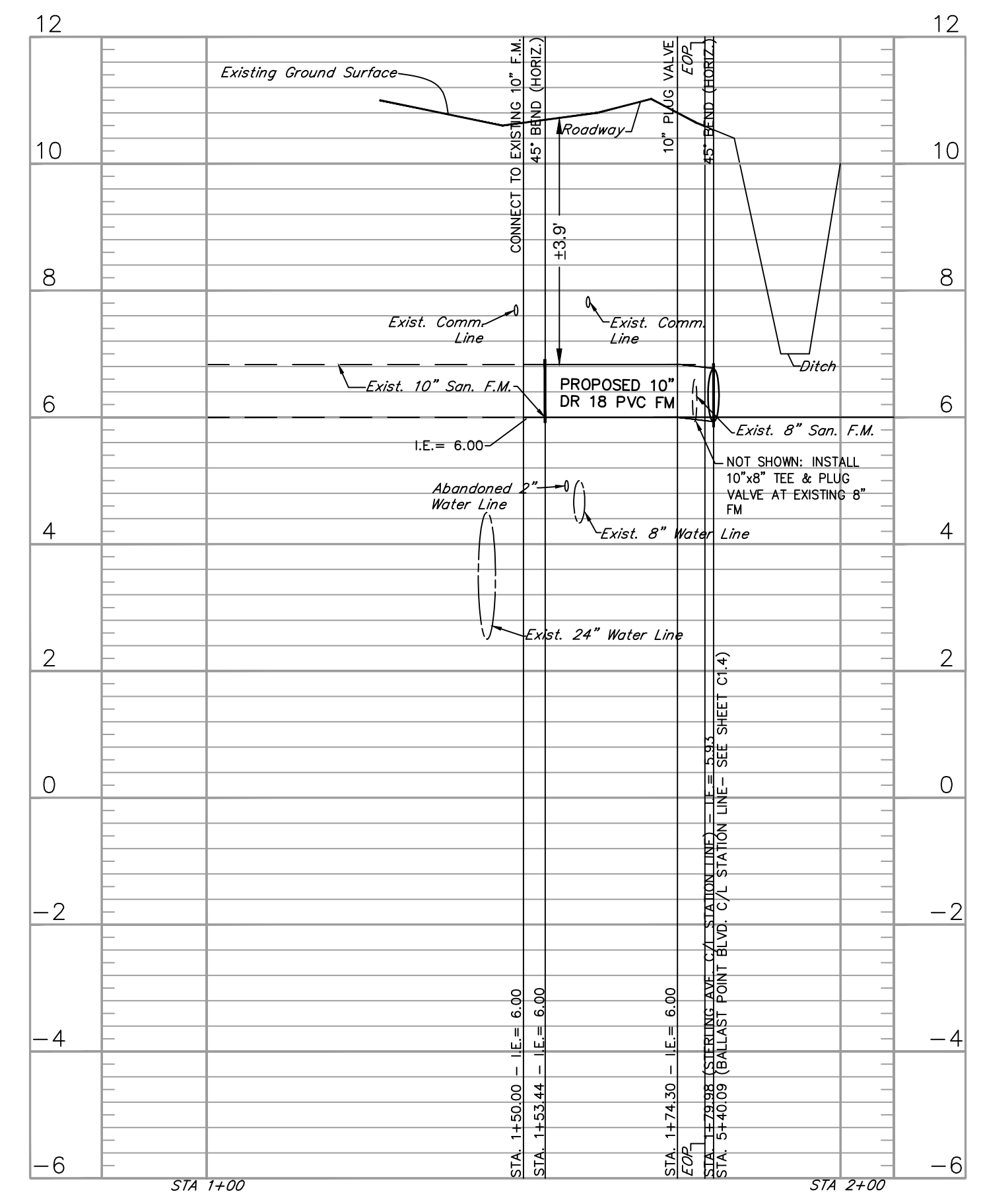
PROJECT  
BALLAST POINT PS  
FORCEMAIN  
BALLAST PT. BLVD PROPOSED FM  
PUMP STATION CONNECTION STATION LINE  
SHEET  
C1.5  
JOB NO.  
20-009



**STERLING AVE. PLAN VIEW**  
Horizontal Scale: 1" = 20'

- LEGEND (As Applicable)**
- BC Back of Curb
  - BFP Backflow Preventer
  - CL Chain Link Fence
  - CMP Corrugated Metal Pipe
  - CO Clean Out
  - Conc. Concrete
  - EP Edge of Pavement
  - FDC Fire Department Connector
  - FF Finished Floor Elevation
  - FL Flow Line
  - GI Grate Inlet
  - GW Guy Wire
  - H/C Handicapped Parking Sign
  - HP High Point
  - ID Identification
  - IE Invert Elevation
  - FCR Found Capped Iron Rod
  - FCM Found Concrete Monument
  - FH Fire Hydrant
  - FIR Found Iron Rod
  - FB Found Business
  - LP Light Pole
  - M(S) Measured data
  - MEC Match Existing Curb
  - MEP Match Existing Pavement
  - MES Mitered End Section
  - Mon Monotile
  - O/A Overall
  - OR Official Records
  - OHW Overhead Wires
  - (P) Plot data
  - PK&D Ped. xing Pedestrian Crossing
  - PK&D Parker Kalon Nail & Disk (as noted)
  - (R) Reported
  - PVC Polyvinyl chloride
  - RCP Reinforced Concrete Pipe
  - R/W Right of Way
  - San. Sanitary
  - SCO Sanitary CO
  - SF Square Feet
  - SIR Set 5/8" IR with Cap: LB386B
  - S/W Sidewalk
  - TKM Temporary Bench Mark
  - TC Top of Curb
  - TE Top Elevation
  - T.O.B. Top of Bank
  - (Typ.) Typical
  - OHW Overhead Wires
  - OHV Overhang
  - U/E Undergroud Electric
  - UP Utility Pole
  - Ver. Verizon
  - WM Water Meter
  - WV Water Valve

- NOTES:**
1. EXISTING UTILITIES ARE SHOWN FROM THE BEST INFORMATION AVAILABLE. UNDERGROUND UTILITY INFORMATION SHOWN IS FROM GPR INFORMATION COLLECTED ON 06/24/20 AND ASBUILT RECORD DRAWINGS SUPPLIED BY UTILITY PROVIDERS. PRIOR TO DIRECTIONAL DRILLING, CONTRACTOR SHALL EXCAVATE AND VERIFY EXISTING HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES VIA VACUUM OR CONVENTIONAL EXCAVATION.
  2. ANY EXISTING UTILITIES EXPOSED DURING CONSTRUCTION TO BE TEMPORARILY SUPPORTED AS REQUIRED.



**STERLING AVE. PROFILE VIEW**  
Horizontal Scale: 1" = 20'  
Vertical Scale: 1" = 2'

100% CONSTRUCTION DRAWINGS

REVISIONS					
BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION

**MILLS and ASSOCIATES, INC.**  
CONSULTING ENGINEERS & LAND SURVEYORS  
3242 HENDERSON BOULEVARD • SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

FOR  
**CITY OF TAMPA**  
WASTEWATER DEPARTMENT  
2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

DRWN BY: CVL DATE 07/16/20  
DSGN BY: \_\_\_\_\_ DATE \_\_\_\_\_  
CHKD BY: LEM DATE 07/16/20  
SCALE: 1" = 20'

LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 - L.B. NO. 3868  
STATE OF FLORIDA

PROJECT  
**BALLAST POINT PS  
FORCEMAIN**

BALLAST PT. BLVD PROPOSED FM  
STERLING AVE. C/L STATION LINE

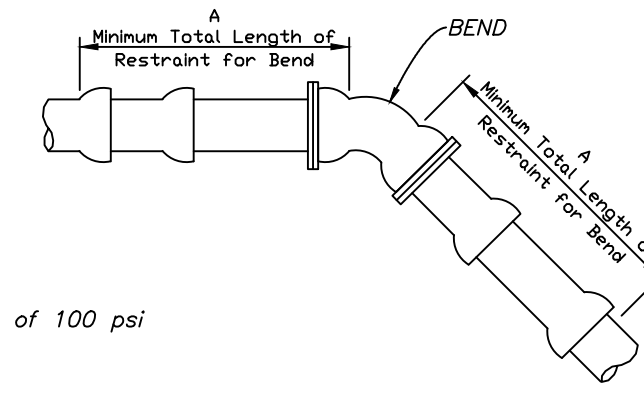
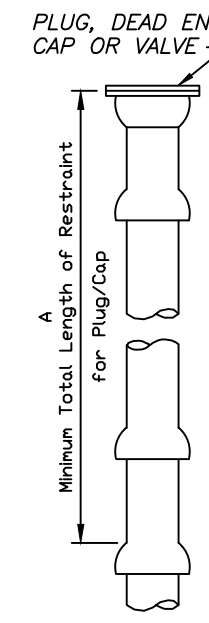
SHEET  
**C1.6**

JOB NO.  
**20-009**



**GENERAL NOTES:**

- ELEVATION INFORMATION SHOWN ON THESE PLANS IS REFERENCED TO N.G.V.D. 1929 UNLESS OTHERWISE STATED.
- LOCATIONS OF EXISTING UNDERGROUND UTILITIES WERE PREPARED FROM THE MOST RELIABLE INFORMATION AVAILABLE. VERIFY THE LOCATION AND DEPTH OF ALL PERTINENT UTILITIES PRIOR TO CONSTRUCTION. NOTIFY UTILITY COMPANIES AT LEAST 48 HOURS BEFORE BEGINNING CONSTRUCTION.
- FORCE MAIN CONNECTION LOCATIONS ARE APPROXIMATE ONLY, BASED ON AS-BUILT PLANS AND/OR VISUAL OBSERVATIONS. CONTRACTOR SHALL EXCAVATE AS NECESSARY TO VERIFY SHOWN LOCATIONS.
- WHEN CHANGING THE SEWAGE FLOW FROM THE EXISTING FORCE MAIN TO THE NEW FORCE MAIN, THE CONTRACTOR MAY BE REQUIRED TO PERFORM THE WORK DURING LOW-FLOW TIMES AT NIGHT. CONTRACTOR SHALL COORDINATE SUCH WORK WITH CITY STAFF AND THE PROPERTY OWNERS.
- CONTRACTOR SHALL PROVIDE A BORING LOG TO DOCUMENT THE DEPTH AND HORIZONTAL LOCATION OF THE HDPE PIPE AT A MAXIMUM OF 15 FOOT INTERVALS.
- THE MINIMUM CLEARANCE BETWEEN THE PROPOSED FORCE MAIN AND ALL CROSSING UTILITIES SHALL BE 18-INCHES, UNLESS NOTED OTHERWISE.
- THE PROPOSED FORCE MAIN SHALL BE INSTALLED ACCORDING TO THE STATIONS, OFFSETS AND INVERT ELEVATIONS PROVIDED WITH NO INTERMEDIATE HIGH OR LOW POINTS BETWEEN THE SPECIFIED INVERT ELEVATIONS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- ALL FITTINGS AND BENDS SHALL BE DUCTILE IRON AWWA C-110 OR C-153. FITTINGS SHALL BE WRAPPED WITH GREEN POLYWRAP. FITTINGS SHALL BE LINED WITH PROTECTO 401 INTERIOR CERAMIC EPOXY.
- PLUG VALVES SHALL BE DEZURIK 100% PORT PEF.
- ALL FORCE MAIN VALVES, FITTINGS AND BENDS SHALL HAVE RESTRAINED MECHANICAL JOINTS UNLESS THE JOINTS ARE BUTT FUSED HDPE. ADDITIONALLY, ANY JOINTS WITHIN THE LIMITS TO BE RESTRAINED THAT ARE SHOWN ON THE PLANS SHALL ALSO BE RESTRAINED. RESTRAINING DEVICES SHALL BE "MEGA-LUG" AS MANUFACTURED BY EBAA IRON OR APPROVED EQUAL.
- ALL PROPOSED FORCE MAIN PIPE SHALL HAVE 2 LOCATING WIRES IN ACCORDANCE WITH THE PIPE LOCATING WIRE DETAIL. THE WIRES SHALL BE RAISED AND TERMINATED AT ALL PLUG VALVES, AIR RELEASE VALVES AND TERMINAL MANHOLES, SIMILAR TO THAT SHOWN ON THE AIR RELEASE VALVE DETAIL.
- AIR RELEASE BOXES SHALL BE INSTALLED IN GRASSED AREAS AND NOT IN PAVEMENT OR SIDEWALKS. FINAL LOCATIONS OF BOXES WILL BE DETERMINED IN THE FIELD AT HIGH POINTS.
- CONTRACTOR SHALL ENSURE THAT WHEN PLANNING HIS LAYOUT FOR BORING ENTRANCE AND EXIT LOCATIONS, THAT HE DOES NOT BLOCK A SOLE DRIVEWAY TO THE FRONTING PROPERTY OWNER WITHOUT PROVIDING AN ALTERNATE ACCESS.
- CONNECTIONS BETWEEN HDPE AND PVC OR DIP SHALL BE IN ACCORDANCE WITH THE HDPE TRANSITION DETAIL.
- DURING THE M.O.T., THE CONTRACTOR SHALL MAINTAIN ALL PEDESTRIAN WALKWAYS AT ALL TIMES, INCLUDING, BUT NOT LIMITED TO, SIDEWALKS, PEDESTRIAN RAMPS, CROSSWALKS AND BUS STOPS WHEN WORK IS BEING PERFORMED ON OR IN THE VICINITY OF A SIDEWALK, CROSSWALK, BUS STOPS OR OTHER PEDESTRIAN WAY. THE CONTRACTOR SHALL RELOCATE THE PEDESTRIAN WAY TEMPORARILY OR PROVIDE PEDESTRIANS WITH A SIGNED, SAFE PASSAGE AROUND THE WORK ZONE. PEDESTRIAN DETOURS SHALL BE IN ACCORDANCE WITH FDOT INDEX 660.
- PLUG VALVES SHALL BE DEZURIK OR APPROVED EQUAL.
- INSTALL AIR RELEASE VALVE (ARV) AT HIGH POINTS IN ACCORDANCE WITH STANDARD DETAILS AND AS DIRECTED BY THE CITY'S INSPECTOR. ARV BOX SHALL BE RATED FOR H-20 LOADING. FINAL LOCATION OF ARV SHALL BE IN GRASSED AREAS AND NOT IN SIDEWALK OR PAVEMENT. MARK FINAL LOCATION OF ARVS ON THE AS-BUILT DRAWINGS.
- THE CONTRACTOR SHALL PROTECT ALL TREES IN THE VICINITY OF THE PROPOSED CONSTRUCTION IN ACCORDANCE WITH CHAPTER 13 OF THE CITY OF TAMPA CODE. NO TREES SHALL BE PRUNED WITHOUT PRIOR APPROVAL FROM THE CITY OF TAMPA PARKS & RECREATION DEPARTMENT, NATURAL RESOURCE DIVISION, AND SHALL BE COMPLETED BY A CERTIFIED ARBORIST. ROOT PRUNING MAY BE REQUIRED AT CERTAIN LOCATIONS AND SHALL BE COMPLETED IN ACCORDANCE WITH CHAPTER 13 TECHNICAL MANUAL SPECIFICATIONS.
- CONTRACTOR SHALL OBTAIN A RIGHT-OF-WAY CLOSURE PERMIT FROM THE CITY OF TAMPA RIGHT-OF-WAY DEPARTMENT.
- PAVEMENT RESTORATION SHALL CONSIST OF 8-INCH CRUSHED CONCRETE BASE, AND 2-INCH ASPHALT (SUPERPAVE SP-9.5) AT TRENCH. MILL AND OVERLAY 1" OF ASPHALT 10' ON EITHER SIDE OF TRENCH.
- THE CONTRACTOR SHALL LIMIT CURVATURE IN ANY DIRECTION TO REDUCE FORCE ON THE PIPE DURING PULL-BACK. THE BEND RADI FOR FUSIBLE POLYVINYL CHLORIDE (PVC) PIPE SHALL NOT BE LESS THAN 400' FOR 12-INCH PIPE AND 10-INCH PIPE.
- CONTRACTOR IS REQUIRED TO DEVELOP MOT DRAWINGS FOR THE MANHATTAN ROAD CLOSURE SHOWING DETOUR ROUTES, VARIABLE MESSAGE BOARDS, AND SIGNAGE. THE MOT MUST BE SIGNED AND SEALED BY AN ENGINEER AND SUBMITTED TO THE CITY'S PERMITTING OFFICE THROUGH ACCELA.
- THE MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN THE PROPOSED FORCE MAIN AND ALL CROSSING UTILITIES SHALL BE 6 FEET AND 18 INCHES RESPECTIVELY.
- THE MINIMUM CLEARANCE BETWEEN THE FORCE MAIN AND WATER LINE SHALL BE 12" UNDER ALL CIRCUMSTANCES. IF THE FORCE MAIN IS BELOW THE WATER LINE AND HAS BETWEEN 12" AND 18" OF CLEARANCE, OR IF THE FORCE MAIN IS ABOVE THE WATER LINE REGARDLESS OF CLEARANCE, THEN A NOMINAL 18' LENGTH OF PIPE SHALL BE CENTERED OVER/UNDER THE WATER LINE.



**NOTES:**

- These tables are based on:
  - Maximum test pressure of 100 psi
  - Class "C" pipe bedding
  - Floor soil conditions
  - PVC pipe
  - For vertical offsets, shallower vertical fitting has a minimum cover of 3 feet.
- Restraining devices for PVC pipe shall be by Megalug (Series 2000 PV) or equal, meeting ASTM F1674.
- Any additional fittings within the restrained section shall be restrained accordingly.
- One standard length of PVC pipe (20 feet) shall be laid on either side of the fitting where possible.

**HORIZONTAL OFFSET:**

FITTING TYPE	RESTRAIN "A" (L <sub>F</sub> ) *																	
	4"	6"	8"	10"	12"	16"	18"	20"	24"	4"	6"	8"	10"					
11-1/4"	1*	2*	2*	2*	3*	3*	3*	4*	4*	1*	2*	2*	2*	3*	3*	3*	4*	4*
22-1/2"	2*	3*	3*	4*	5*	6*	6*	7*	8*	2*	3*	3*	4*	5*	6*	6*	7*	8*
45"	4*	5*	7*	8*	9*	11*	13*	14*	16*	4*	5*	7*	8*	9*	11*	13*	14*	16*
90"	9*	12*	15*	18*	21*	27*	29*	32*	37*	9*	12*	15*	18*	21*	27*	29*	32*	37*
PLUG / CAP / ISOLATION VALVE	26	36	47	56	66	85	94	102	119	26	36	47	56	66	85	94	102	119

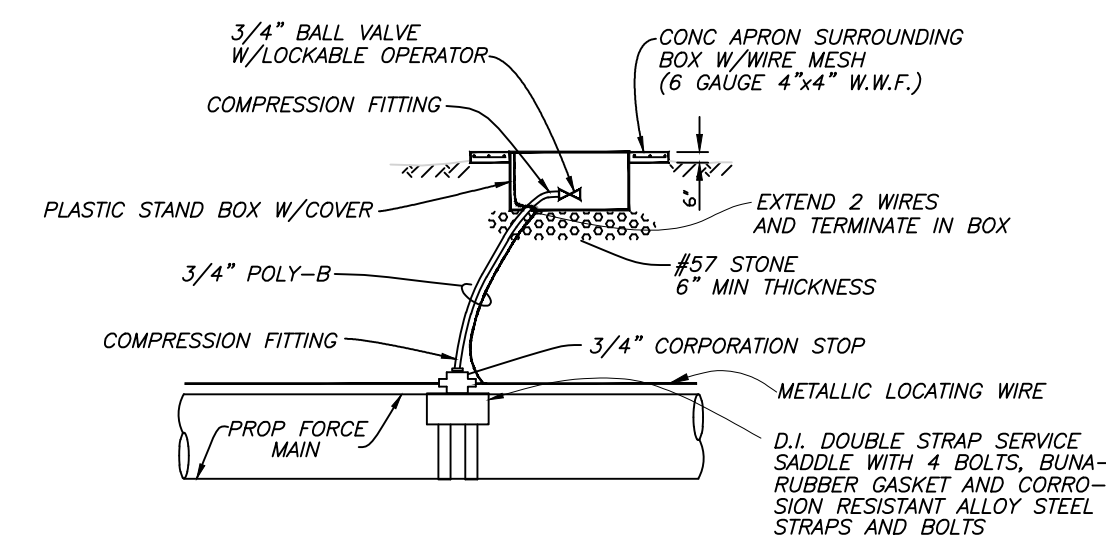
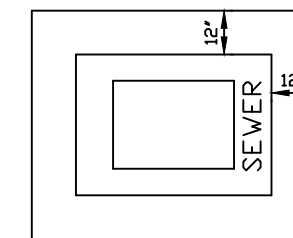
\* A = MINIMUM FOOTAGE OF PIPE TO BE RESTRAINED  
 \* MINIMUM ONE PIPE JOINT UPSTREAM AND DOWNSTREAM OF EACH FITTING SHALL BE RESTRAINED

**VERTICAL OFFSET:**

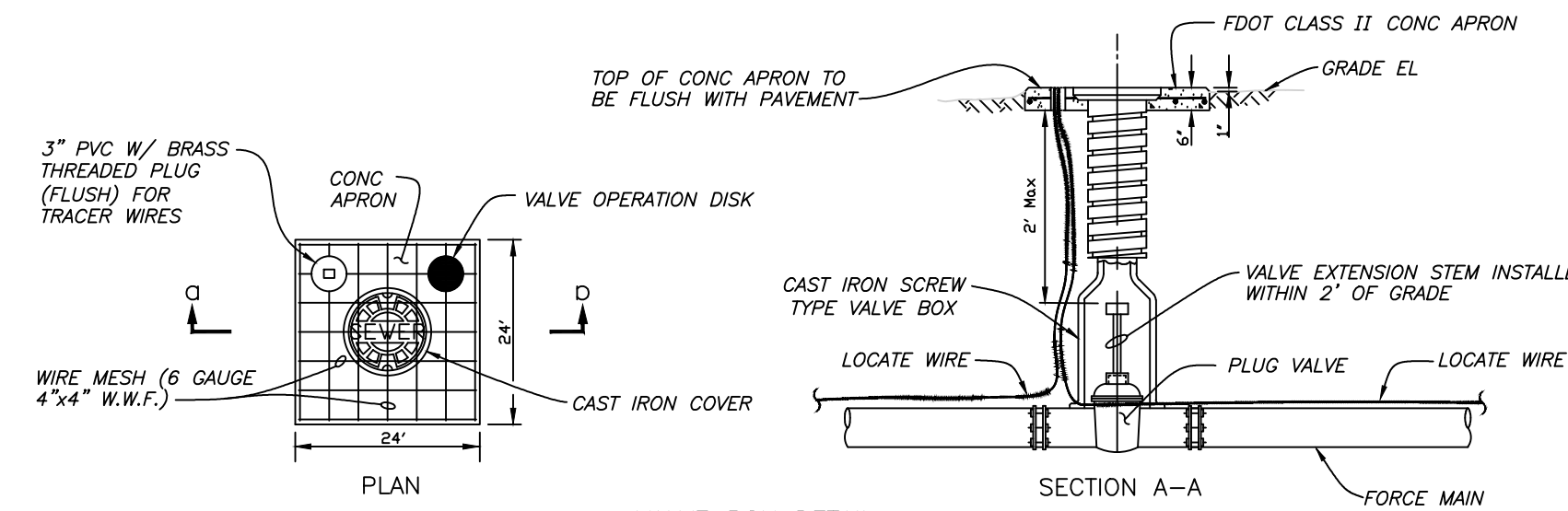
FITTING TYPE	RESTRAIN "A" (L <sub>F</sub> ) *																	
	4"	6"	8"	10"	12"	16"	18"	20"	24"	4"	6"	8"	10"					
11-1/4"	3*	4*	5*	6*	7*	9*	10*	11*	12*	3*	4*	5*	6*	7*	9*	10*	11*	12*
22-1/2"	5*	8*	10*	12*	14*	17*	19*	21*	24*	5*	8*	10*	12*	14*	17*	19*	21*	24*
45"	11*	15*	20	23	28	35	39	43	50	11*	15*	20	23	28	35	39	43	50

\* A = MINIMUM FOOTAGE OF PIPE TO BE RESTRAINED  
 \* MINIMUM ONE PIPE JOINT UPSTREAM AND DOWNSTREAM OF EACH FITTING SHALL BE RESTRAINED

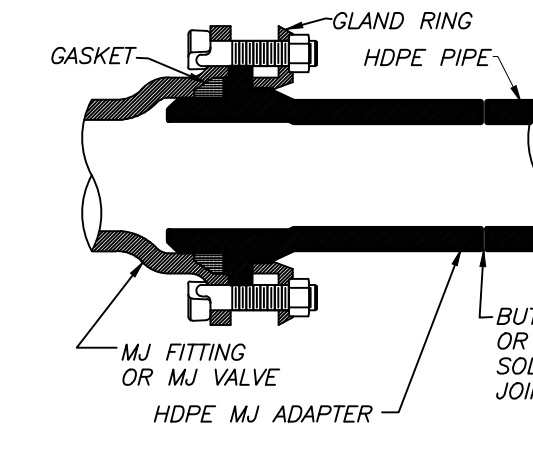
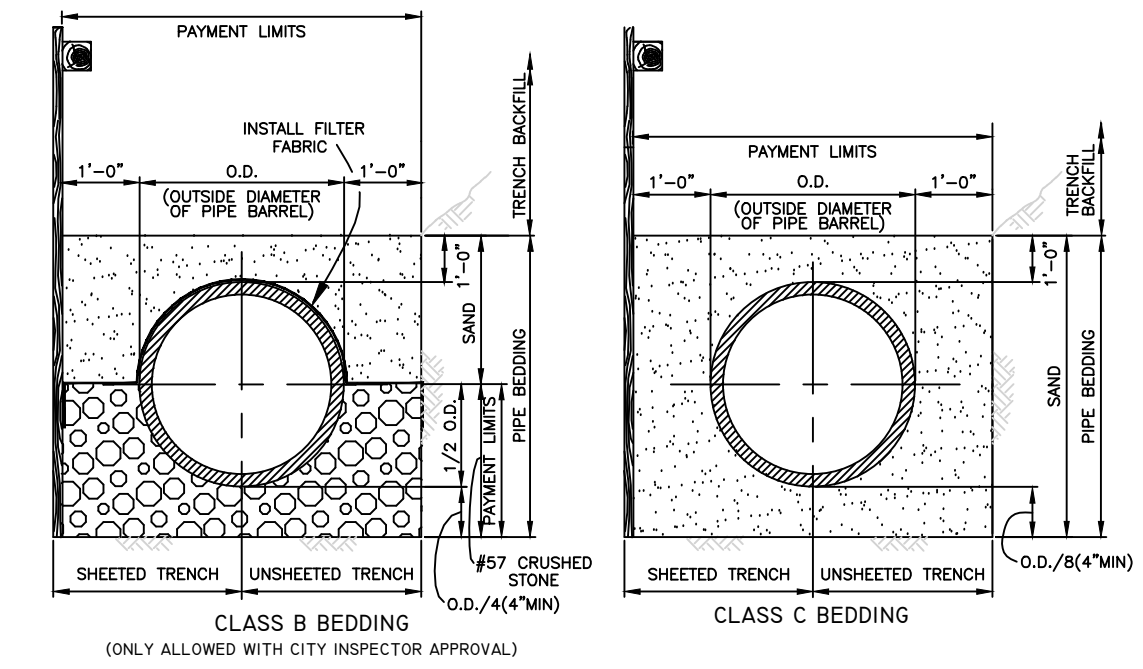
**FITTING RESTRAINT DETAIL**



**AIR RELEASE VALVE DETAIL**  
NOT TO SCALE

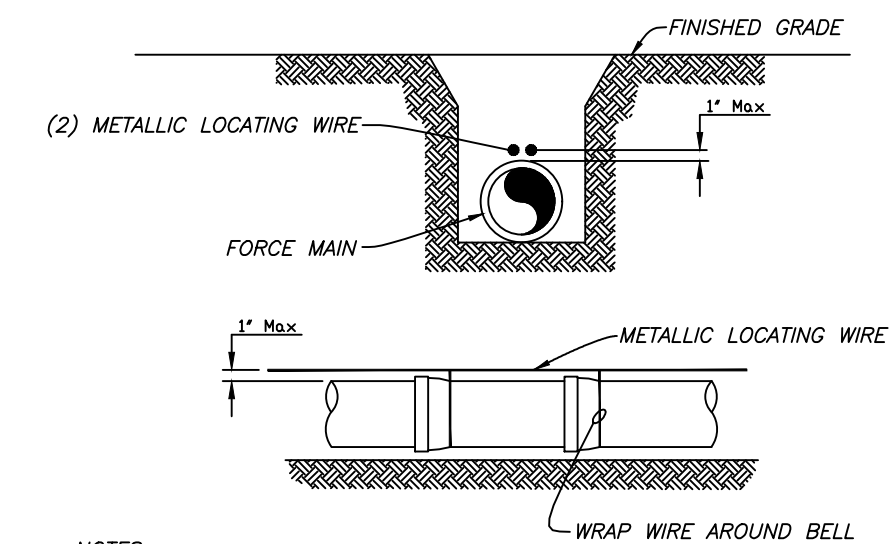


**VALVE BOX DETAIL**  
NOT TO SCALE



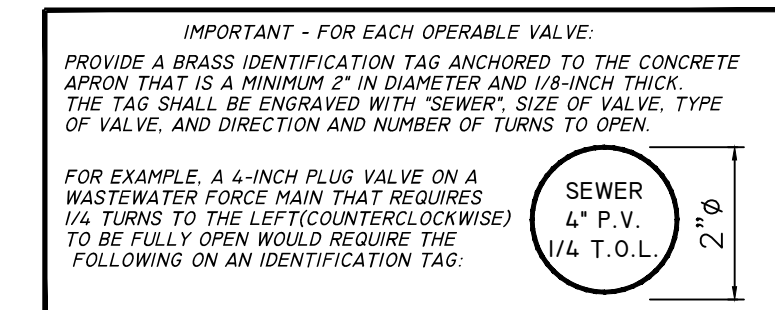
**HDPE TRANSITION DETAIL**  
Not To Scale

NOTE: Schematic shown for standard MJ fitting and plug valves.



**NOTES:**

- Pipe shall require 2 green insulated metallic locating wires capable of detection by a cable locator and shall be buried directly above the centerline of the pipe. Use duct tape as necessary to hold wire directly on top of pipe.
- Direct bury pipe shall have (2) 12 gauge insulated solid copper wires. Directional drilled pipe shall have (2) 8 gauge insulated solid copper wires or (2) 10 gauge insulated copper clad steel wires. For directional drilled HDPE pipe a 1" conduit may be pulled back with the locating wires to ease installation and to prevent the wires from breaking.
- Wire insulation must be suitable for buried service. HDPE or HMWPE are acceptable insulation materials. Nylon insulation is not acceptable.
- Wires must be spliced together with wire connectors suitable for buried service. Connectors shall be corrosion and moisture proof such as DBR kit by 3M, Snakelike by Copperhead Industries or equal. Twisting the wires and sealing with electrical tape alone is not acceptable.
- All tracer wires must pass a continuity test in the presence of a City inspector. No pipe will be accepted by the City until a continuity test passes.
- Locating wire shall terminate at the top of each valve box and air release valve. Wire shall be capable of extending 24" above top of box in such a manner so as not to interfere with valve operation.



**VALVE OPERATION DISK**

100% CONSTRUCTION DRAWINGS

BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION

MILLS and ASSOCIATES, INC.  
CONSULTING ENGINEERS & LAND SURVEYORS

3242 HENDERSON BOULEVARD \* SUITE 300  
TAMPA, FLORIDA 33609-3056  
TELEPHONE: (813) 876-5869

FOR

CITY OF TAMPA  
WASTEWATER DEPARTMENT  
2545 GUY N VERGER BLVD.  
TAMPA, FLORIDA 33605

DRWN BY: CVL DATE 07/16/20  
 DSGN BY: DATE  
 CHKD BY: LEM DATE 07/16/20  
 SCALE: 1" = 20'

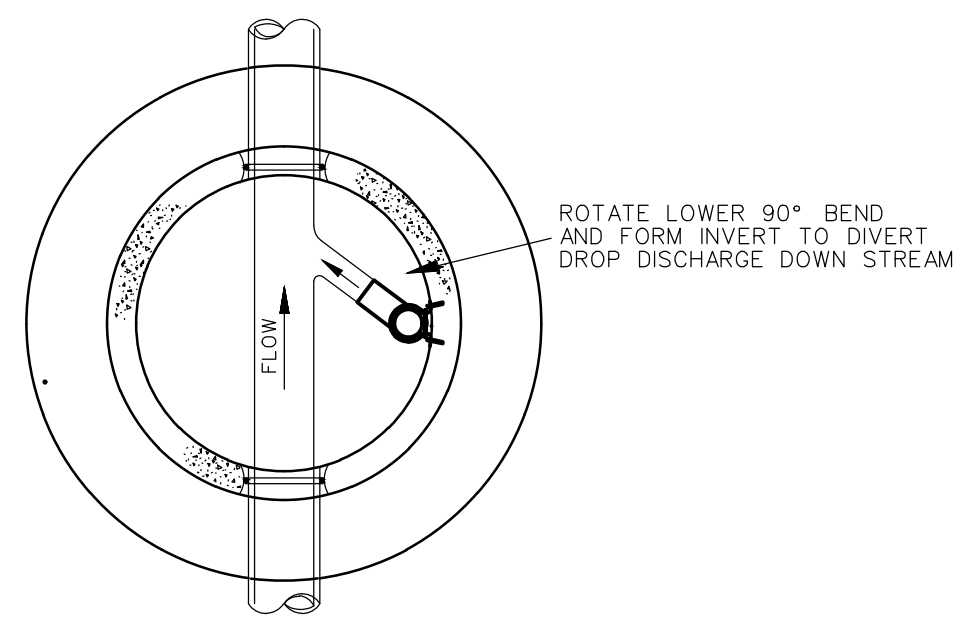
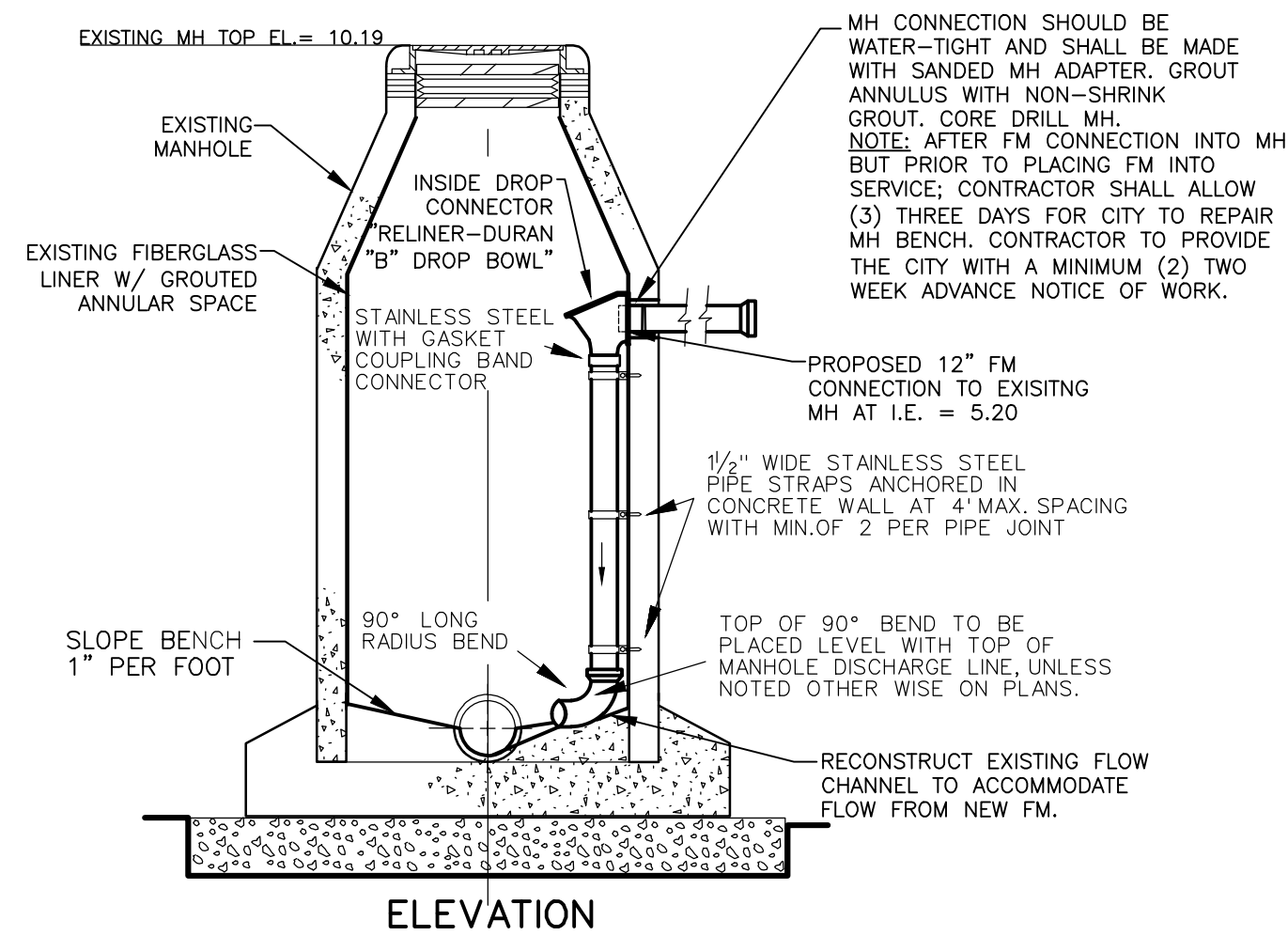
LAWRENCE E. MILLS  
P.E. NO. 22324 - P.L.S. NO. 3141  
E.B. NO. 3860 - L.B. NO. 3868  
STATE OF FLORIDA

BALLAST POINT PS  
FORCEMAIN

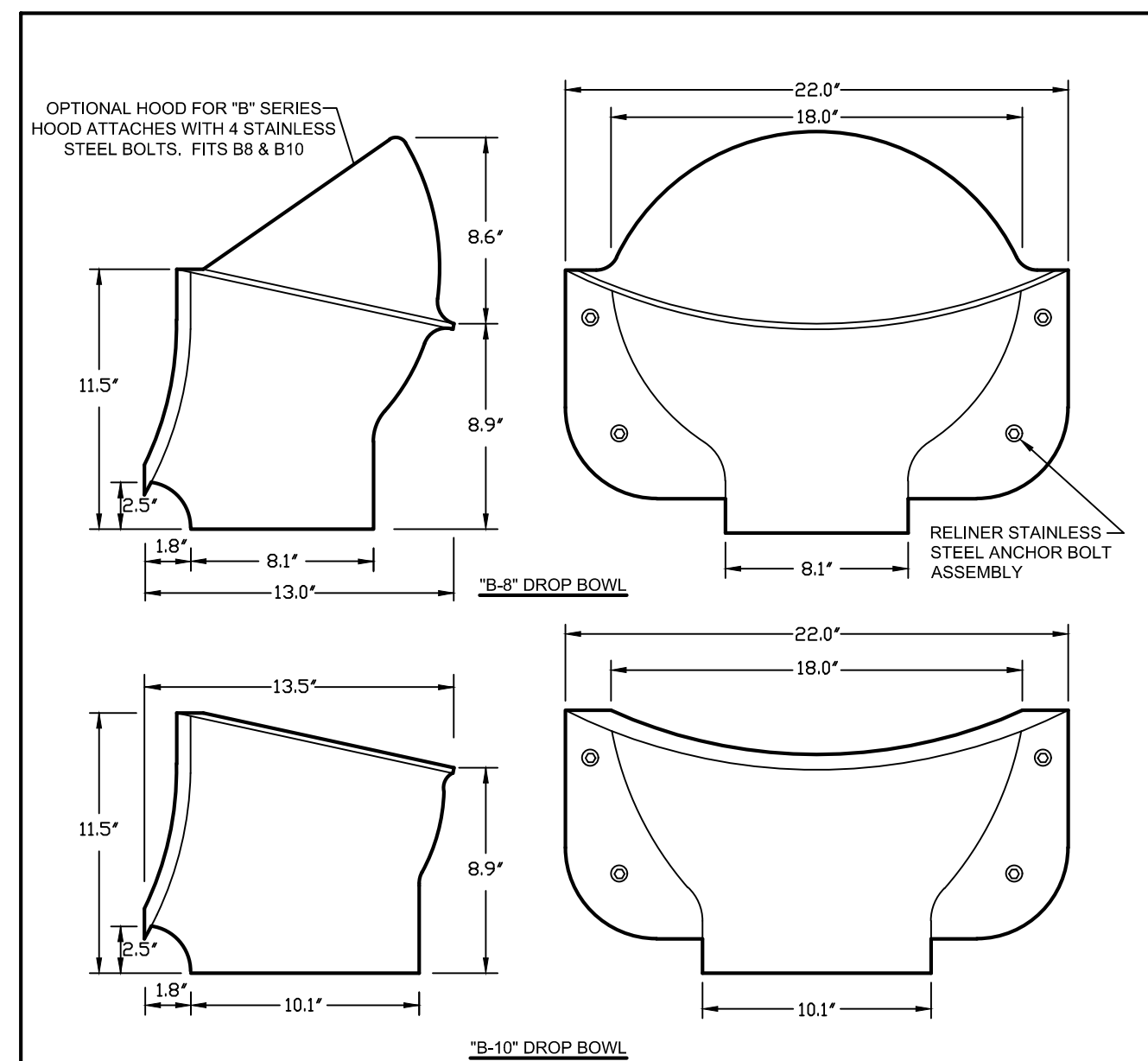
DETAILS AND NOTES

C2.1

JOB NO.  
20-009



FORCE MAIN CONNECTION TO EXISTING MANHOLE DETAIL  
NOT TO SCALE



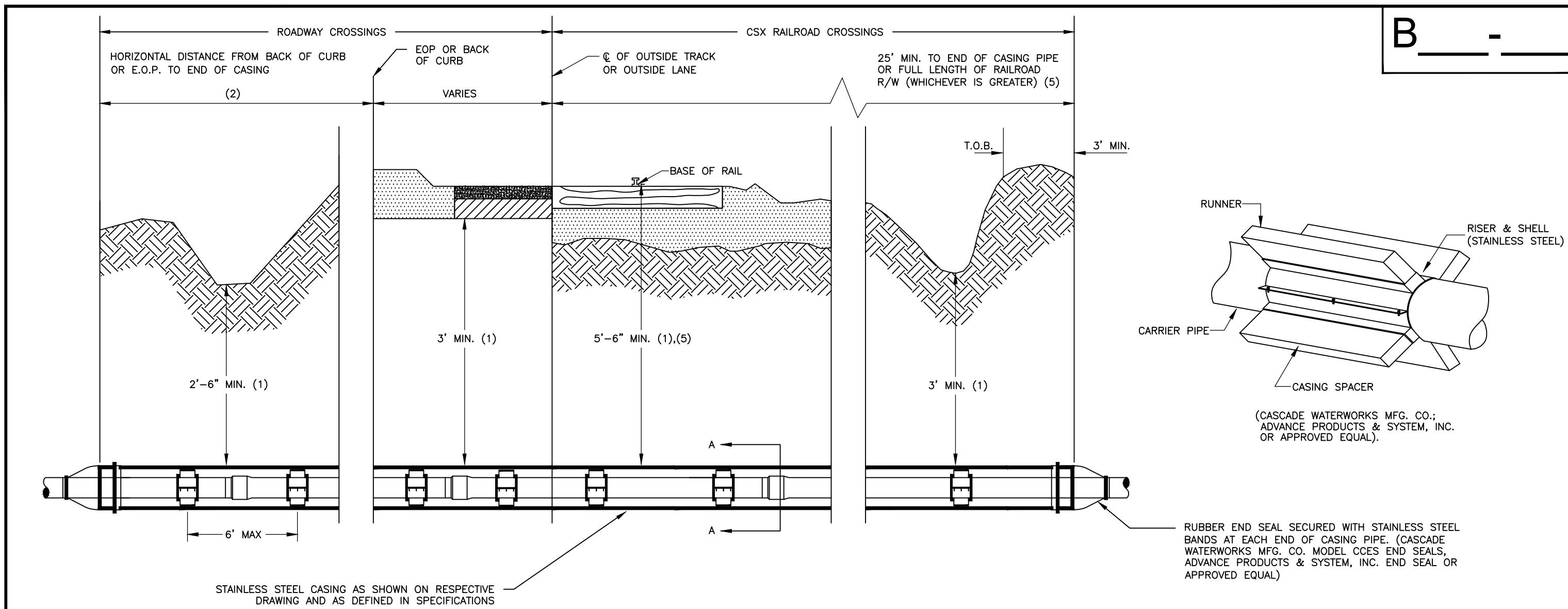
MODEL #	DESCRIPTION
B808	-18\"/>

USE 4 RELINER ANCHOR ASSEMBLIES TO ATTACH DROP BOWL TO MANHOLE WALL. USE RELINER STAINLESS STEEL PIPE BRACKETS TO SUPPORT DOWN PIPE. EXTERNAL PIPE COUPLER REQUIRED. PROVIDE SWEEP AT DOWN PIPE OUTLET.

MADE IN U.S.A.  
U.S. PAT. # 6274130  
CANADIAN PAT. # 2289565

**RELINER / DURAN, INC.**  
53 MT. ARCHER ROAD, LYME, CT. 06371  
(800) 508-6001 FAX: (877) 434-3191  
WWW.RELINER.COM

DESCRIPTION	DATE	SCALE
B8 & B10 DROP BOWLS FOR ROUND WALLS	11/28/16	NONE
	DRAWING NUMBER	
	B8DB B10DB	



- NOTES:
- VERTICAL DIMENSIONS TYPICAL FOR CASINGS
  - EXTEND 5' BEYOND CURB OR E.O.P., UNLESS ADDITIONAL DISTANCE IS REQUIRED BY ANOTHER AGENCY HAVING JURISDICTION OVER THE RIGHT OF WAY WHERE THE PIPELINE IS INSTALLED.
  - CASING PIPE SHALL CONFORM TO THE REQUIREMENTS OF AWWA C-200 AND ASTMA-139, GRADE B.
  - CASING PIPE SHALL BE SLOPED TO ONE END.
  - SEE CSX'S DESIGN & CONSTRUCTION STANDARD SPECIFICATIONS FOR PIPELINE OCCUPANCIES FOR MORE DETAILS AND REQUIREMENTS

CORRESPONDING CARRIER AND CASING PIPE SIZES													
NOMINAL INSIDE DIAMETER OF CARRIER PIPE (INCHES)	4	6	8	10	12	14	15	16	18	20	21	24	27
MINIMUM INSIDE DIAMETER OF CASING PIPE (INCHES)	12	18	20	24	30	30	30	30	36	36	36	48	48
MIN. CASING THICKNESS CITY, COUNTY & FDOT									3/8"			1/2"	
MIN. CASING THICKNESS RAILROADS (5)		3/8"			1/2"				9/16"			3/4"	

JACK & BORE DETAILS  
Not to Scale

JACINTO CARLOS FERRAS, P.E. #49454 DESIGN DIVISION HEAD WASTEWATER DEPARTMENT	No.	DATE	REVISIONS	DES: DR	CITY OF TAMPA WASTEWATER DEPARTMENT	STANDARD DETAILS JACK & BORE DETAILS	W.O. --- SHEET 14 OF 15
	3			DRN: BL			
	2			CHKD BY: LEM			
	1			DATE: 07/16/20			

100% CONSTRUCTION DRAWINGS

BY	DATE	DESCRIPTION	BY	DATE	DESCRIPTION

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TAMPA, FLORIDA 33605

DRWN BY: CVL  
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SCALE: 1" = 20'

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STATE OF FLORIDA

BALLAST POINT PS  
FORCEMAIN  
C2.2  
JOB NO.  
20-009  
DETAILS AND NOTES