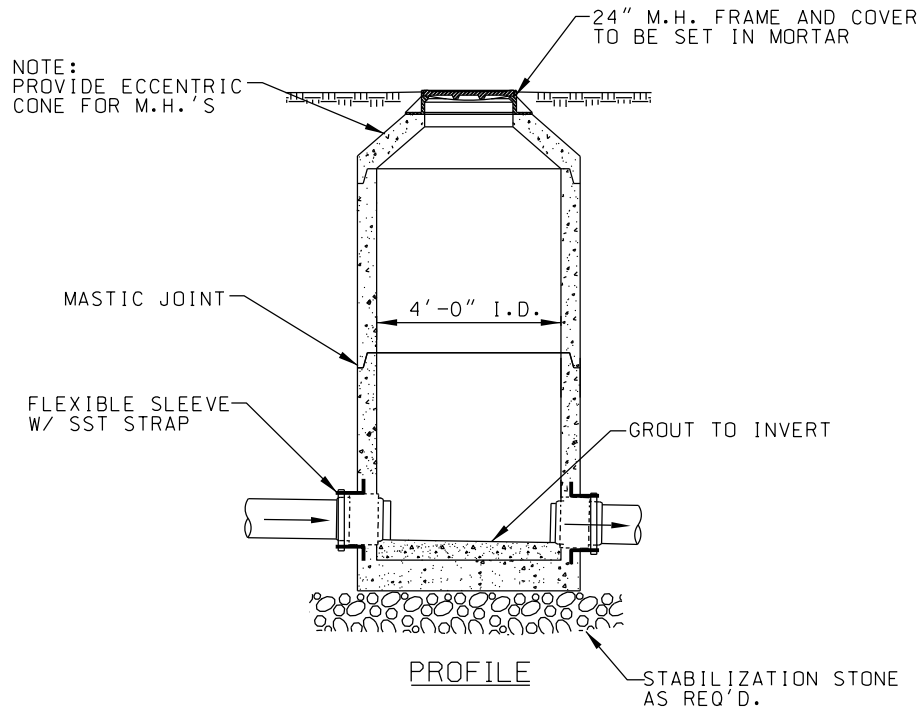
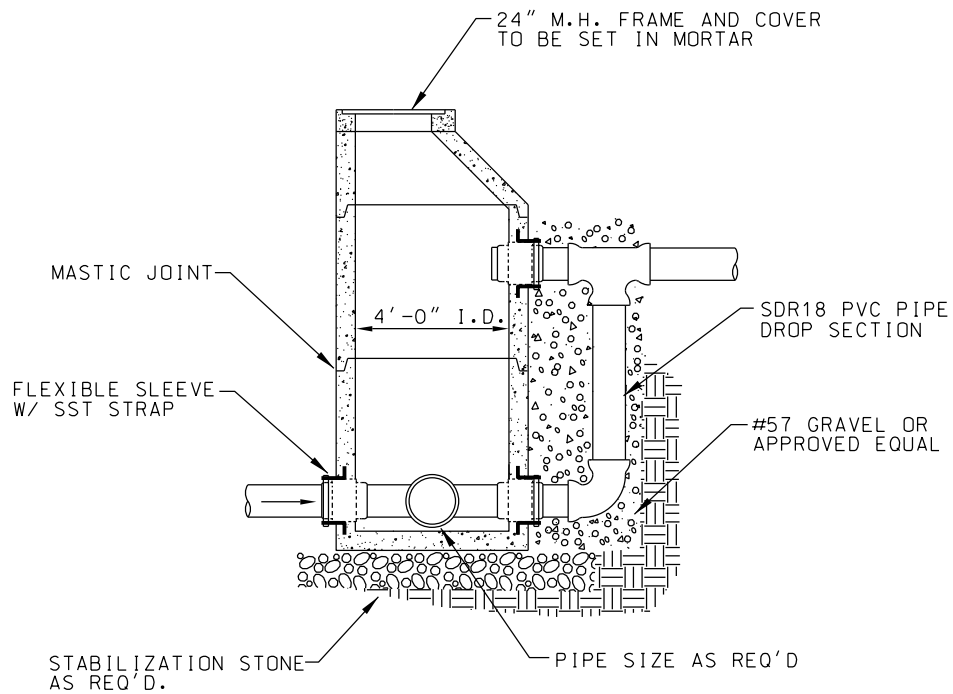


PLAN



TYPICAL SECTION OF PRECAST SANITARY MANHOLE

S1



TYPICAL SECTION OF PRECAST SANITARY SEWER DROP MANHOLE

S2

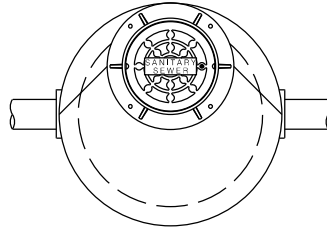
LATEST REVISION:
08/28/06 DRT REVISED TO SHOW "#57 GRAVEL OR APPROVED EQUAL" RATHER
THAN "CONCRETE BLOCKING FOR DROP PIPE SUPPORT".

TYPICAL SECTION OF PRECAST SANITARY SEWER DROP MANHOLE

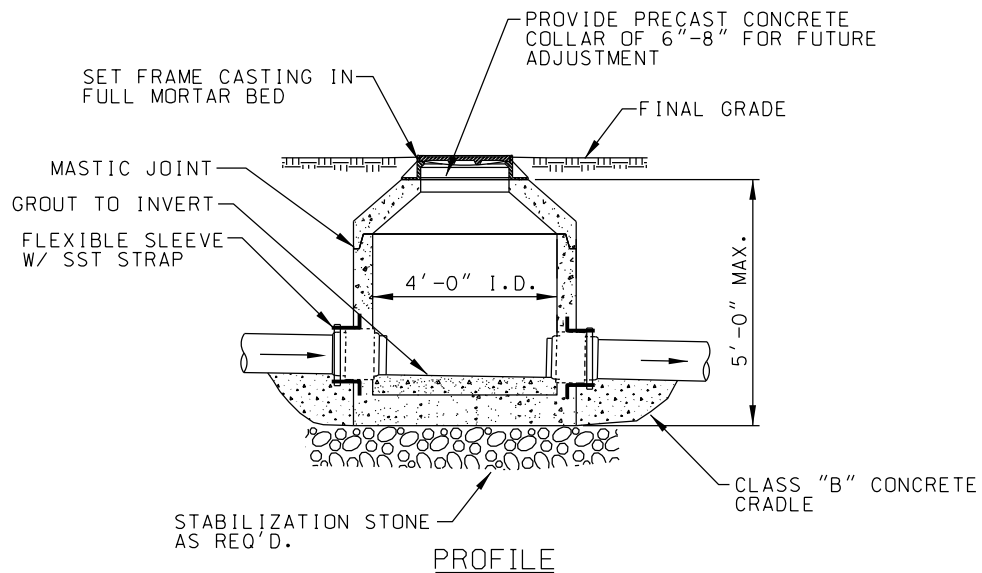
SEWER ONLY
UPDATED: 08/28/06

S2

GRAND STRAND
WATER & SEWER AUTHORITY



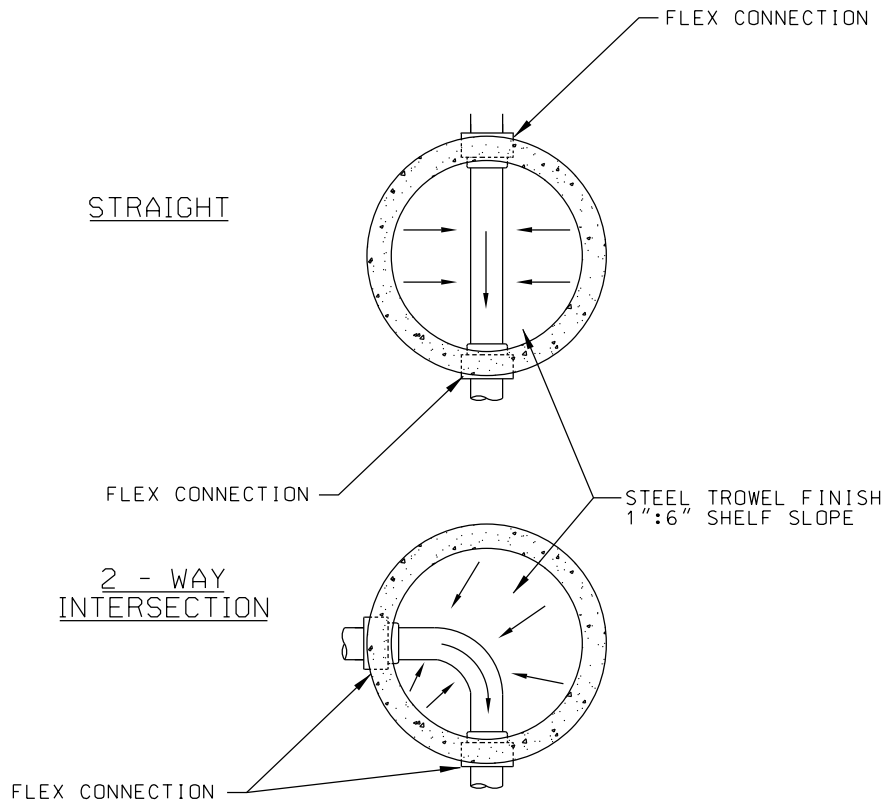
PLAN



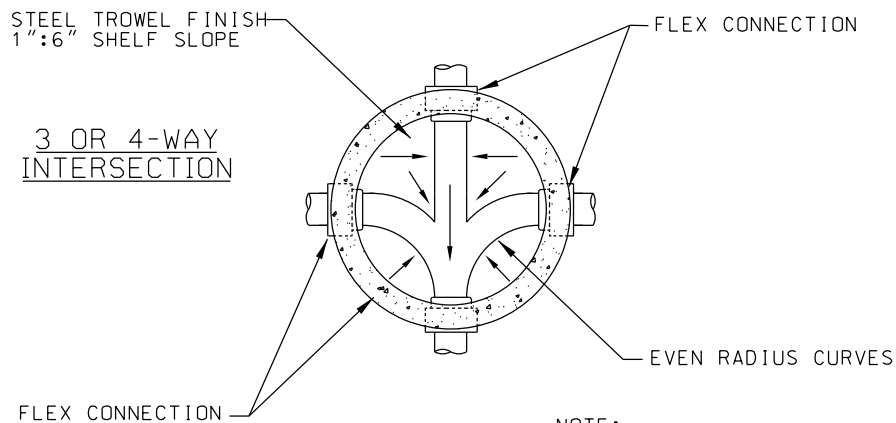
TYPICAL SECTION OF PRECAST SANITARY SEWER SHALLOW MANHOLE

S3

TYPICAL SECTION OF PRECAST SANITARY SEWER SHALLOW MANHOLE		
SEWER ONLY UPDATED: 7/6/2012		S3
GRAND STRAND WATER & SEWER AUTHORITY		



NOTE:
SHAPE INVERT TO 1/2 PIPE
DIAMETER IN ALL CASES



NOTE:
SEE TYPICAL MANHOLE SECTION
DETAIL FOR CONTINUATION OF
MANHOLE CONSTRUCTION

TYPICAL MANHOLE INVERTS

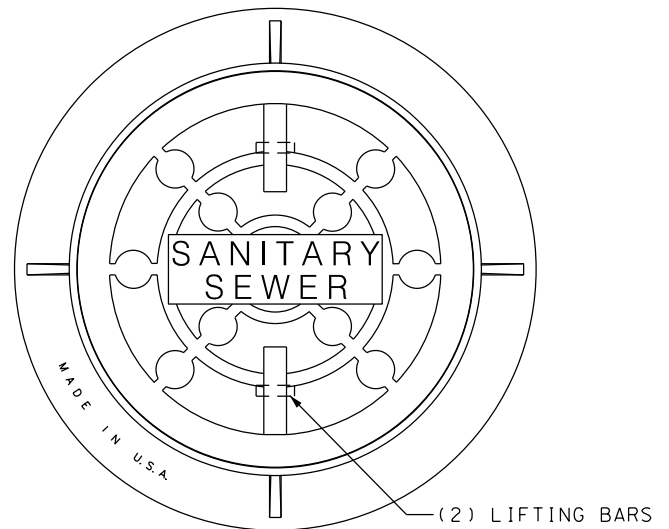
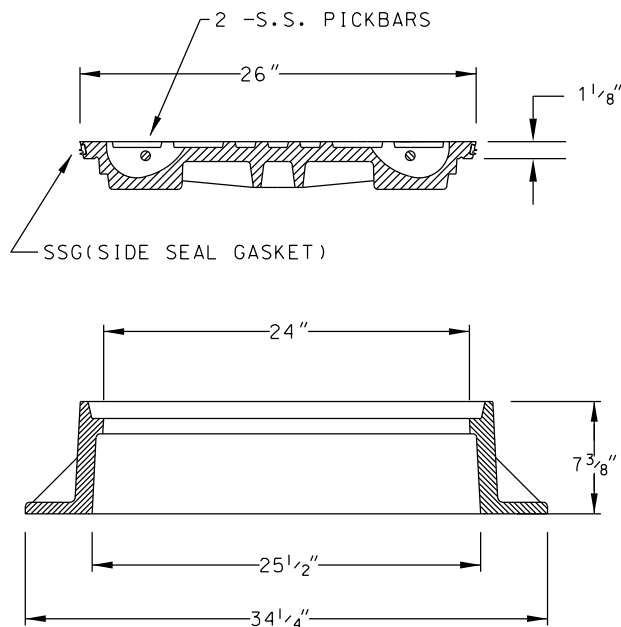
S4

TYPICAL MANHOLE INVERTS

SEWER ONLY
UPDATED: 12/26/97

S4

GRAND STRAND
WATER & SEWER AUTHORITY



- NOTES:
1. MATERIAL: ASTM-A48 CLASS 35B GRAY IRON.
 2. RING WT: 250 LBS. APP.
 3. COVER WT: 175 LBS. APP.
 4. POLYETHYLENE (H.D.P.E.) ADJUSTING RINGS AS MANUFACTURED BY LADTECH, INC. MAY BE USED FOR LEVELING AND FINAL GRADE OF MANHOLE FRAME AND COVER.
 5. SEE MANHOLE SELECTIONS FOR FRAME SETTING DETAILS.
 6. USE U.S. FOUNDRY 579-DC-SSG FRAME AND COVER OR APPROVED EQUAL.

TYPICAL WATERPROOF MANHOLE FRAME & COVER

S6

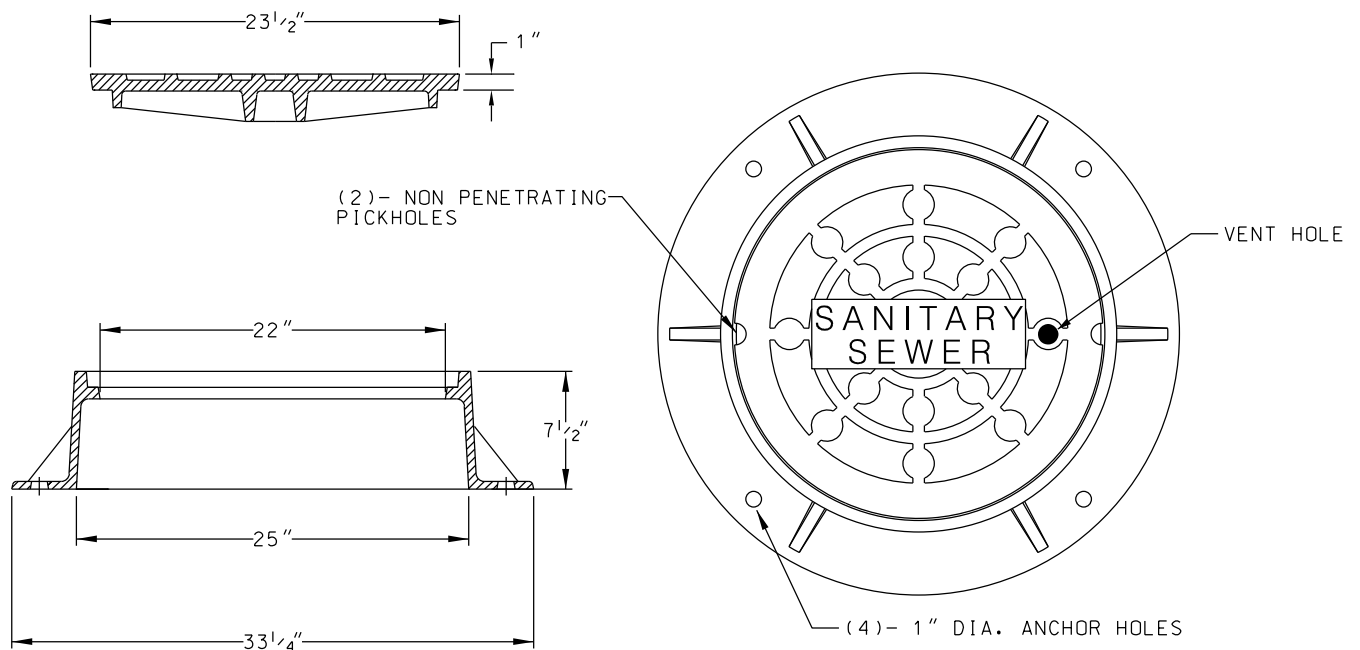
LATEST REVISION:
10/21/08 DRT CHANGED LETTERING FROM "S" TO "SANITARY SEWER"
ON MANHOLE COVER

TYPICAL
WATERPROOF MANHOLE
FRAME & COVER

SEWER ONLY
UPDATED: 10/21/2008

S6

GRAND STRAND
WATER & SEWER AUTHORITY



NOTES:

1. MATERIAL: ASTM-A48 CLASS 35B GRAY IRON.
2. RING WT: 160 LBS. APP.
3. COVER WT: 125 LBS. APP.
4. POLYETHYLENE (H.D.P.E.) ADJUSTING RINGS AS MANUFACTURED BY LADTECH, INC. MAY BE USED FOR LEVELING AND FINAL GRADE OF MANHOLE FRAME AND COVER.
5. USE U.S. FOUNDRY 668-KL-1 "VENT" FRAME AND COVER OR APPROVED EQUAL.

TYPICAL MANHOLE FRAME & COVER

S7

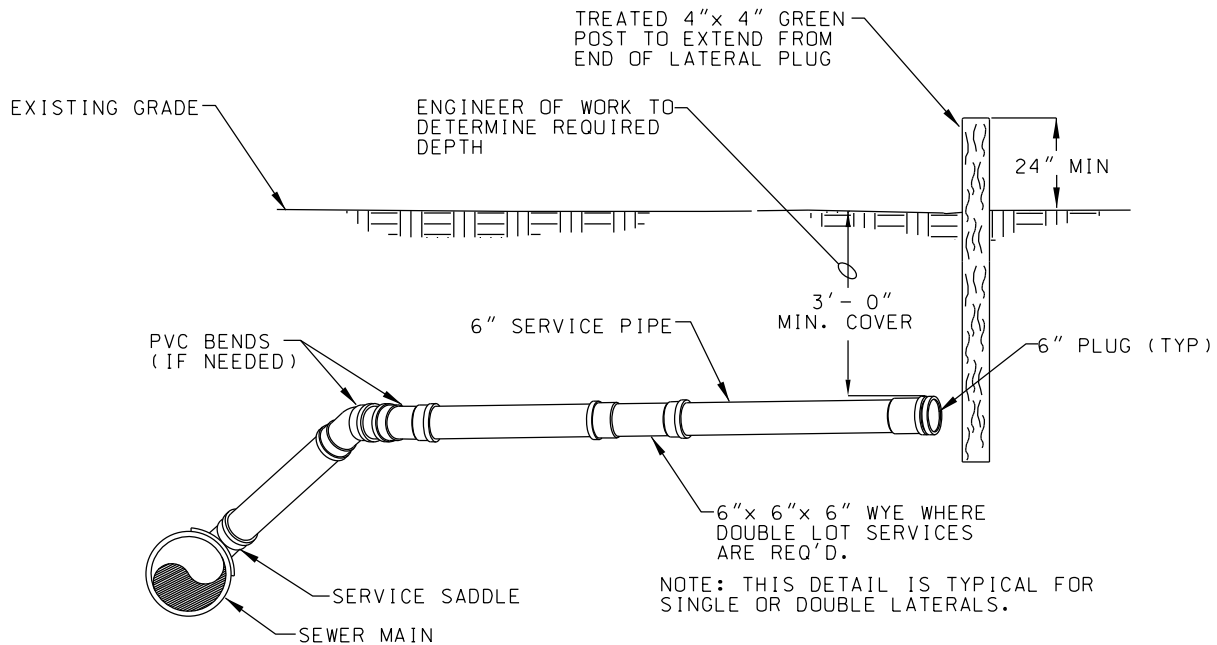
LATEST REVISION:
10/21/08 DRT CHANGED LETTERING FROM "S" TO "SANITARY SEWER"
ON MANHOLE COVER

TYPICAL MANHOLE FRAME & COVER

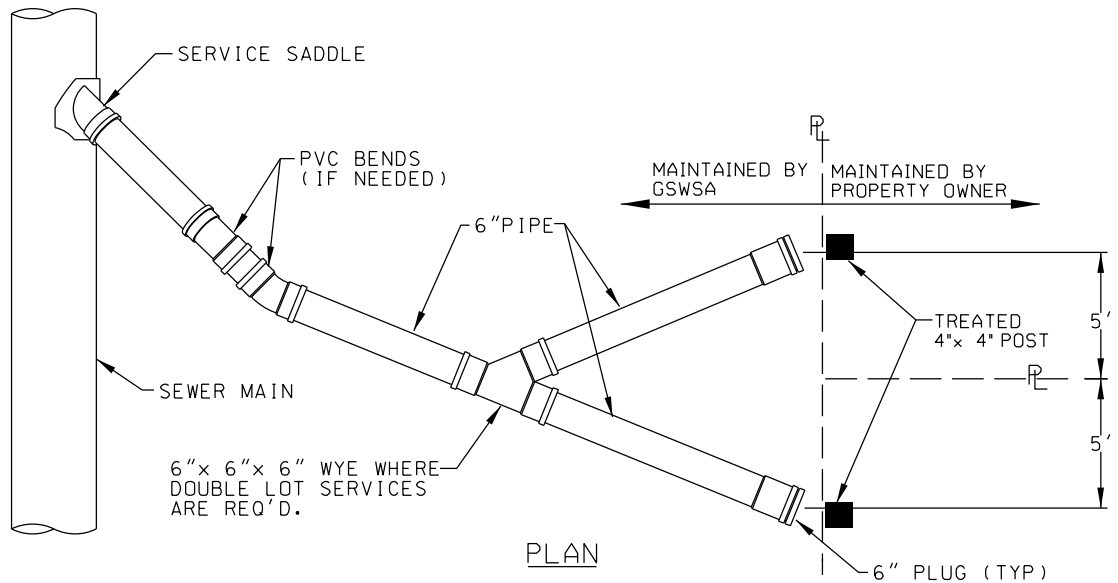
SEWER ONLY
UPDATED: 10/21/2008

S7

GRAND STRAND
WATER & SEWER AUTHORITY



ELEVATION



PLAN

TYPICAL SEWER SERVICE CONNECTION

S8

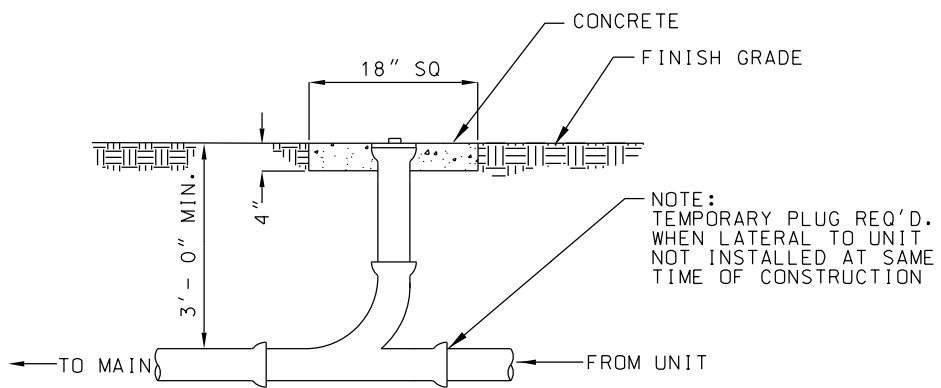
TYPICAL SEWER SERVICE CONNECTION

SEWER ONLY
UPDATED: 08/28/06

S8

GRAND STRAND
WATER & SEWER AUTHORITY

LATEST REVISION:
08/28/06 DRT ADDED THE WORD "GREEN" FOR 4" x 4" POST MARKER
DESCRIPTION.



TYPICAL SEWER CLEANOUT

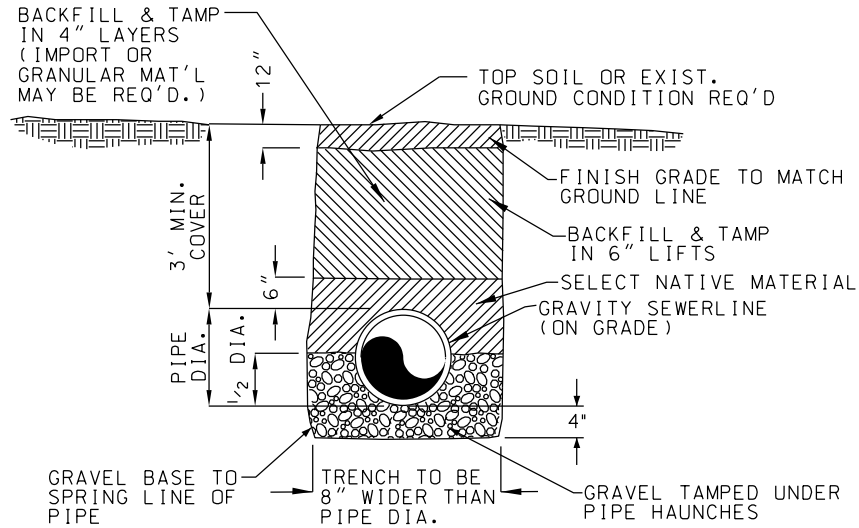
S9

TYPICAL SEWER CLEANOUT

SEWER ONLY
UPDATED: 12/26/97

S9

GRAND STRAND
WATER & SEWER AUTHORITY



NOTES FOR ALL TRENCH DETAILS

1. TRENCH SHALL BE BACKFILLED AND THOROUGHLY TAMPED WITH SUITABLE MATERIAL TO LEVEL OF STONE. STONE & PAV'T TO BE PLACED BY CONTR. WITH LEAST INTERFERENCE WITH TRAFFIC.
2. ALL CONSTRUCTION TO BE INSPECTED AND APPROVED BY LOCAL COUNTY OR STATE ROAD DEPT.
3. CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION AND OBTAINING INSPECTION.
4. GRAVEL BASE SHALL BE 4" MIN., AND EXTEND UP TO SPRING LINE OF PIPE. GRAVEL SHALL NOT EXCEED $\frac{3}{4}$ DIA.

TYPICAL TRENCH SECTION IN NATIVE GROUND CONDITION FOR GRAVITY SEWERLINE

S10

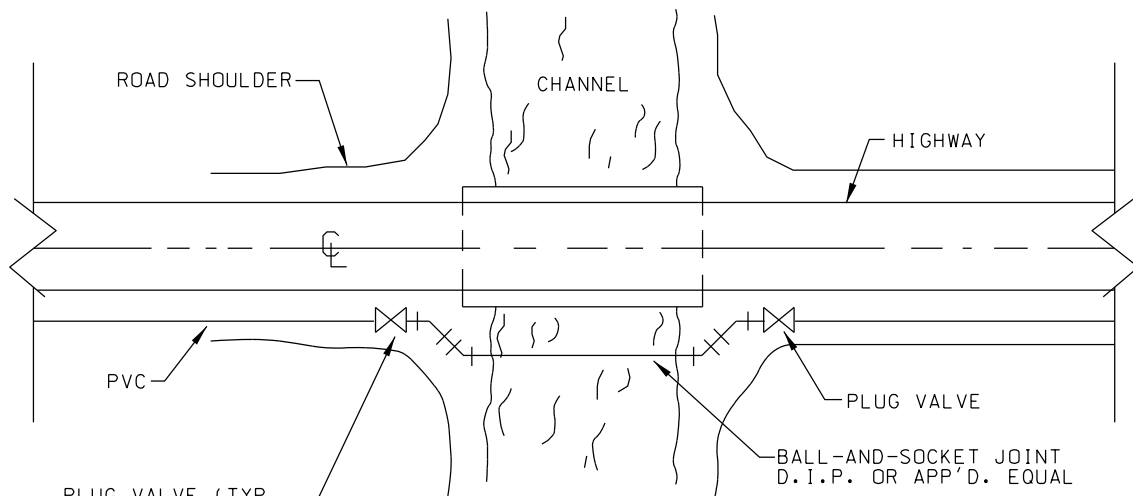
LATEST REVISION:
08/28/06 DRT CORRECTED TO SHOW 4" OF GRAVEL FROM TRENCH BOTTOM
TO BOTTOM OF PIPE.

TYPICAL TRENCH SECTION IN
NATIVE GROUND CONDITION
FOR GRAVITY SEWERLINE

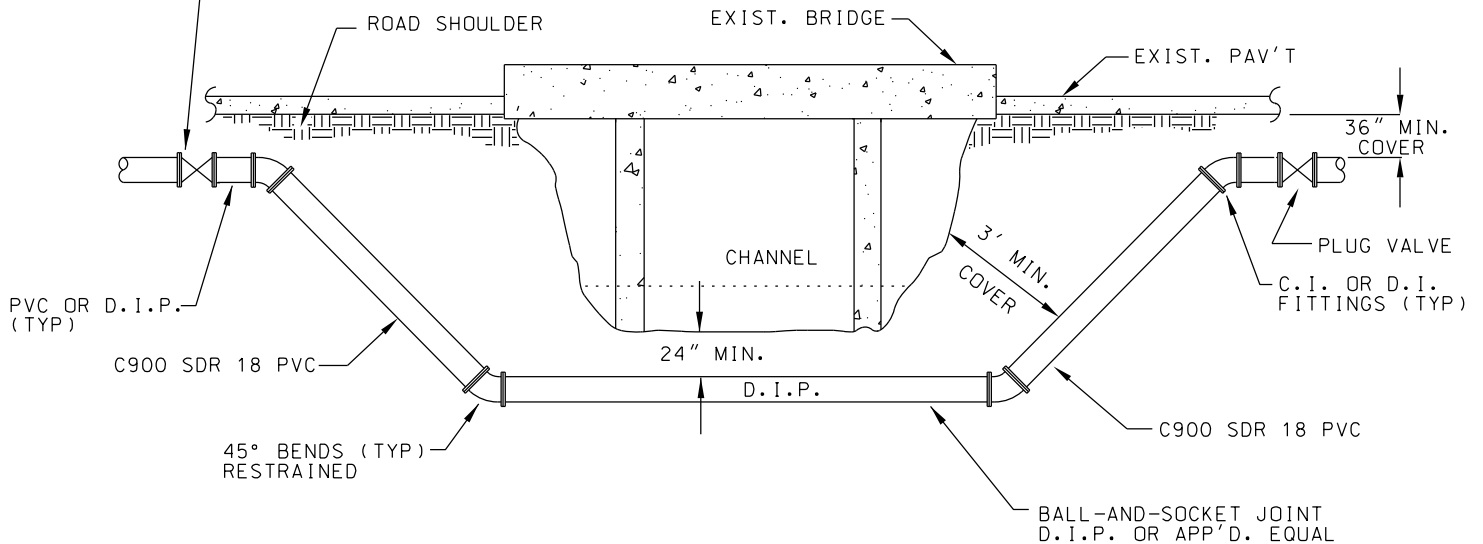
SEWER ONLY
UPDATED: 08/28/06

S10

GRAND STRAND
WATER & SEWER AUTHORITY



PLAN



PROFILE

NOTE:
PIPE TO BE INSTALLED IN SUCH
A MANNER THAT JOINTS WILL BE
ON UNDISTURBED SOIL.

NOTE: ALL JOINTS TO BE RESTRAINED.

TYPICAL UNDER CHANNEL CROSSING AT BRIDGE

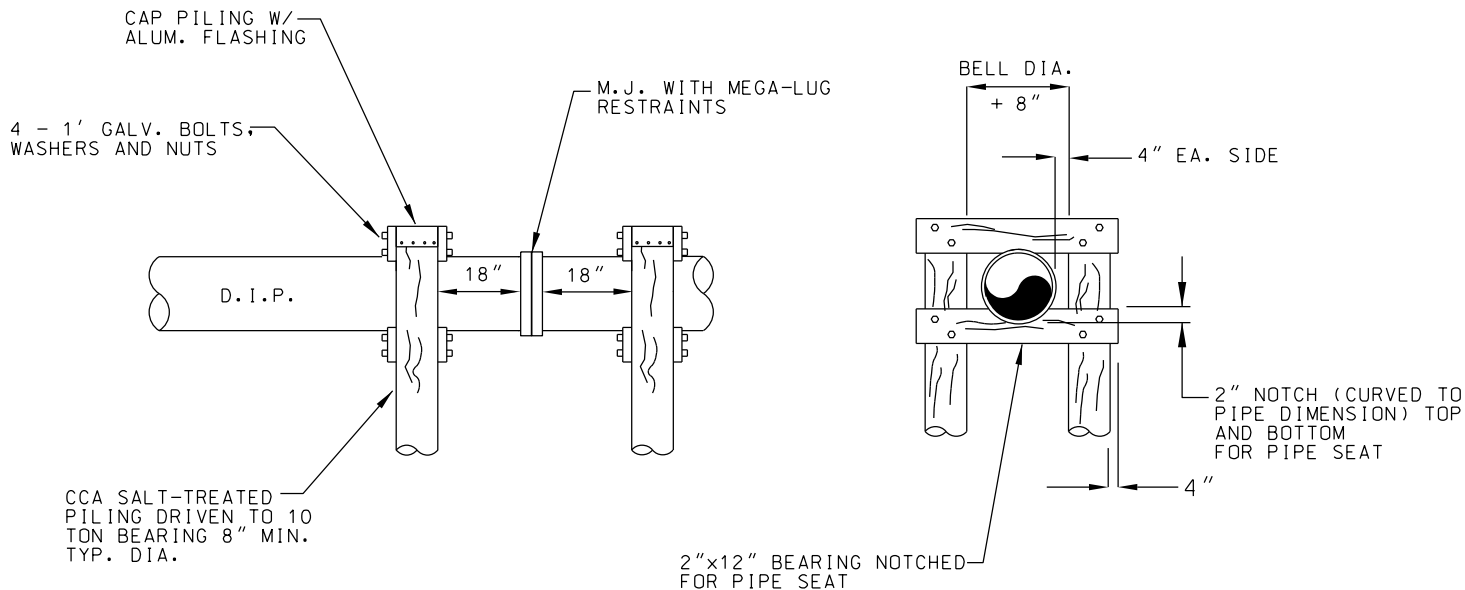
S11

TYPICAL
UNDER CHANNEL
CROSSING AT BRIDGE

SEWER ONLY
UPDATED: 2/11/98

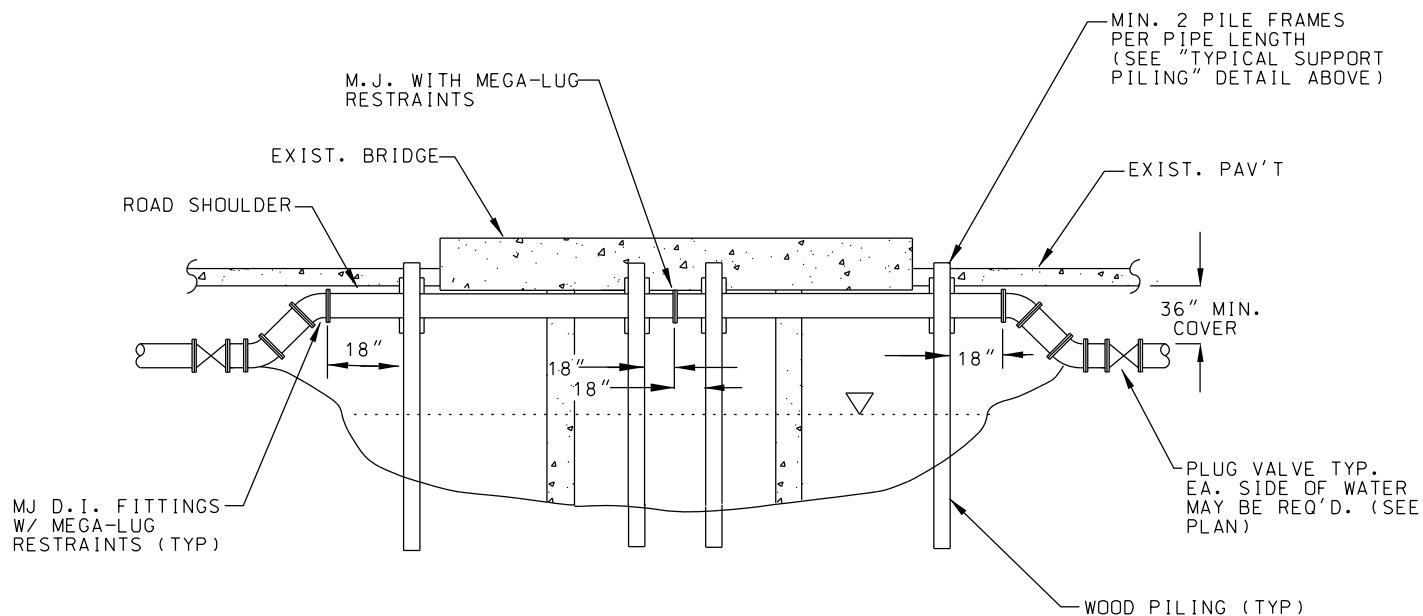
S11

GRAND STRAND
WATER & SEWER AUTHORITY



TYPICAL SUPPORT PILING

NOTE: GSWA TO APPROVE CONTRACTORS PROPOSED
LOCATION OF PILE FRAMES PRIOR TO INSTALLATION



TYPICAL ABOVE CHANNEL CROSSING AT BRIDGE

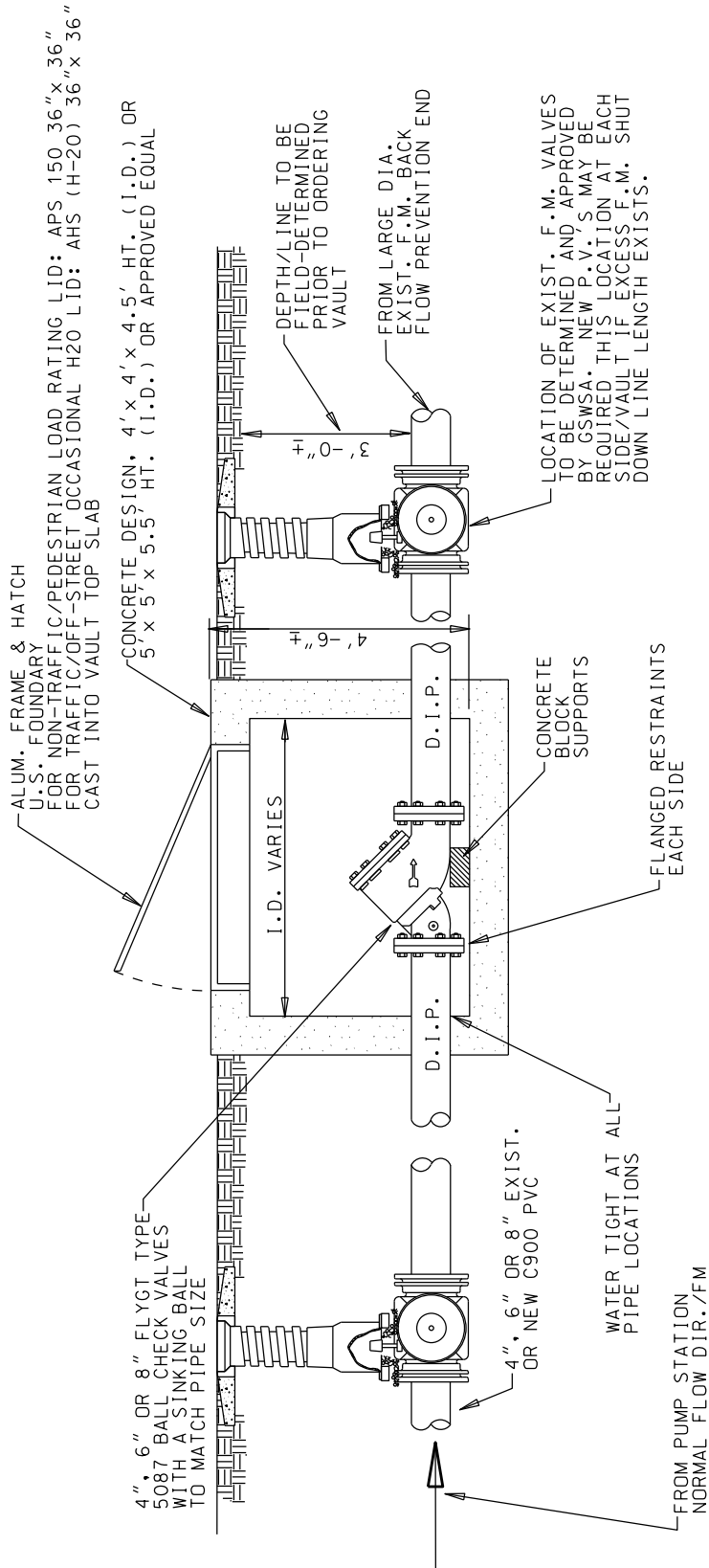
S12

TYPICAL
ABOVE CHANNEL
CROSSING AT BRIDGE

SEWER ONLY
UPDATED: 12/26/97

S12

GRAND STRAND
WATER & SEWER AUTHORITY



TYPICAL SEWER FORCEMAIN CHECK VALVE VAULT

S13

LATEST REVISION:
07/01/2024 DRT REVISED LID LOAD TEXT
07/6/2012 DRT PRESCRIBED D.I.P. FOR VAULT PIPING, AND REDIRECTED NOTE FOR PVC PIPING
BETWEEN P.S. AND PLUG VALVE.

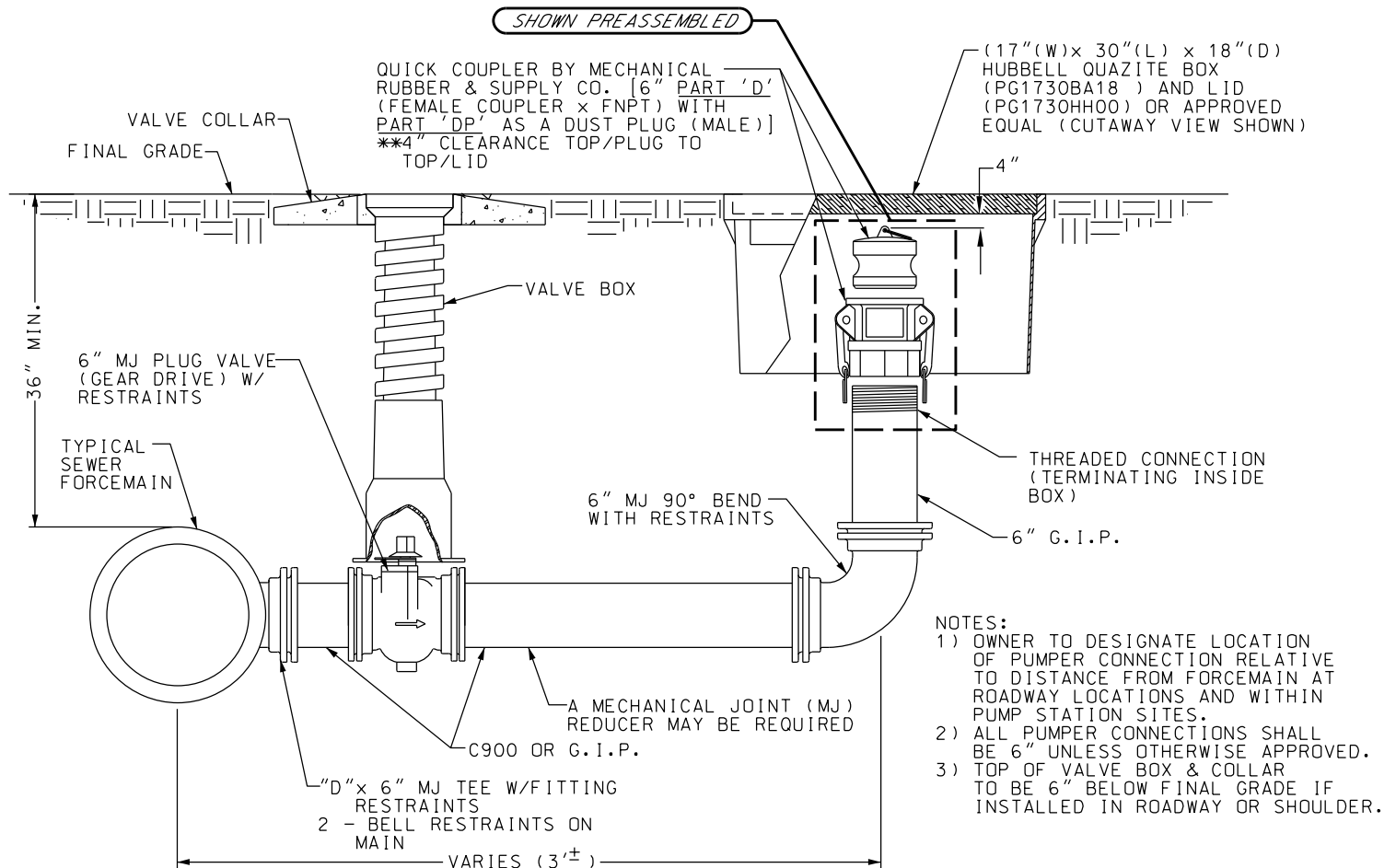
TYPICAL SEWER FORCEMAIN CHECK VALVE VAULT

SEWER ONLY
UPDATED: 07/01/2024

S13

GRAND STRAND
WATER & SEWER AUTHORITY

ENCLOSURE BOX AND LID SHALL BE
 MINIMUM "TIER 22" LOAD RATING:
 VERTICAL: 22,500 LBS (DESIGN) / 33,750 LBS (TEST)
 LATERAL: 800 LBS/SF (DESIGN) / 1,200 LBS/SF (TEST)
 (DRIVEWAY, PARKING LOT, AND OFF-ROADWAY APPLICATIONS
 SUBJECT TO OCCASIONAL NON-DELIBERATE HEAVY
 VEHICULAR TRAFFIC)



TYPICAL PUMPER CONNECTION FOR FORCEMAIN FLUSHING

S14

LATEST REVISION:
 07/6/2012 DRT CORRECTED FLOW ARROW DIRECTION ON PLUG VALVE.
 12/02/2013 DRT ADDED NOTE FOR TIER 22 ENCLOSURE BOX AND LID.

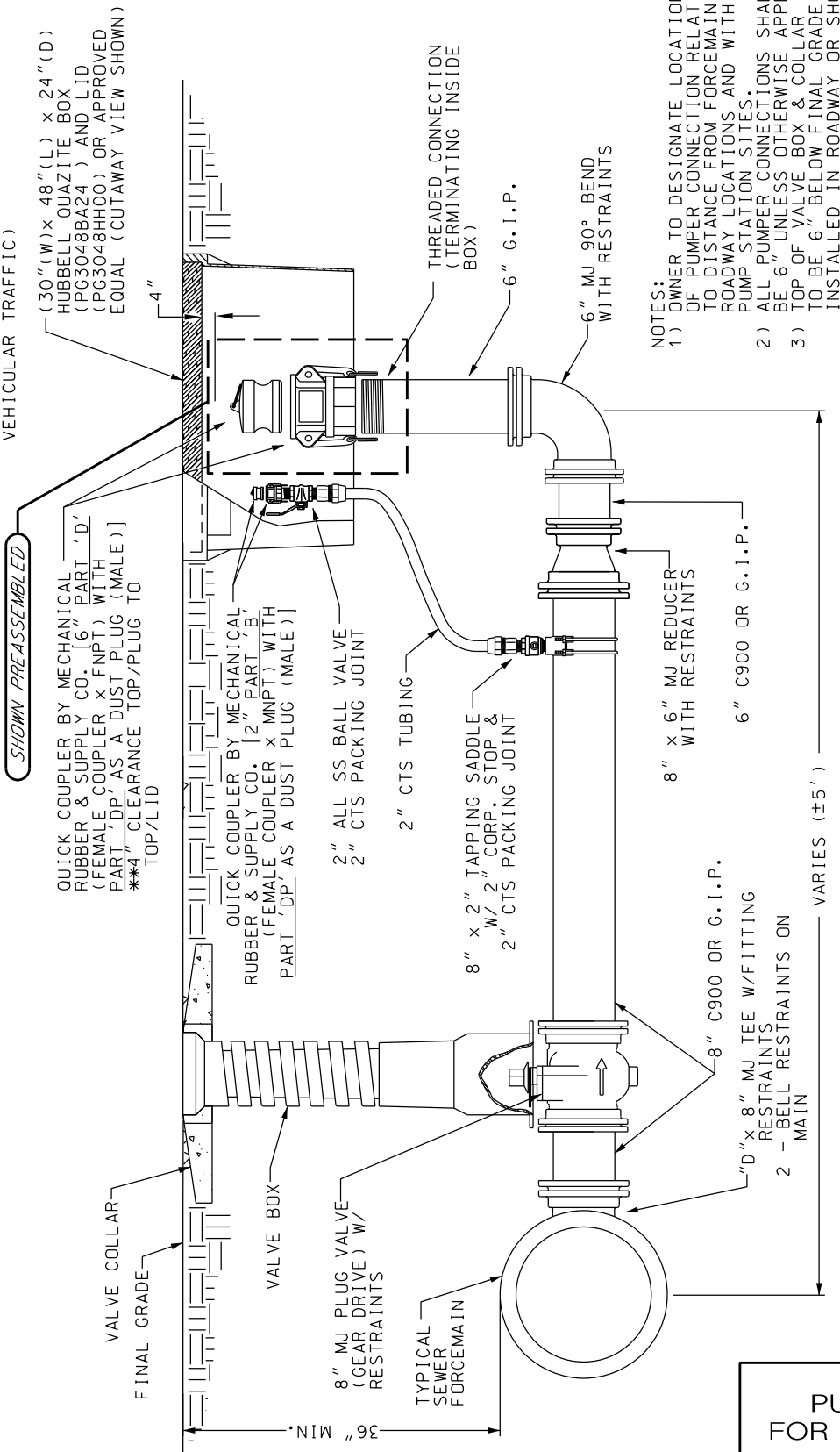
TYPICAL PUMPER CONNECTION FOR FORCEMAIN FLUSHING

SEWER ONLY
 UPDATED: 12/02/2013

S14

GRAND STRAND
 WATER & SEWER AUTHORITY

ENCLOSURE BOX AND LID SHALL BE MINIMUM TIER 22 LOAD RATING:
 VERTICAL: 22,500 LBS (DESIGN) / 33,750 LBS (TEST)
 LATERAL: 800 LBS/SF (DESIGN) / 1,200 LBS/SF (TEST)
 (DRIVEWAY, PARKING LOT, AND OFF-ROADWAY APPLICATIONS SUBJECT TO OCCASIONAL NON-DELIBERATE HEAVY VEHICULAR TRAFFIC)



- NOTES:
- 1) OWNER TO DESIGNATE LOCATION OF PUMPER CONNECTION RELATIVE TO DISTANCE FROM FORCEMAIN AT ROADWAY LOCATIONS AND WITHIN PUMP STATION SITES.
 - 2) ALL PUMPER CONNECTIONS SHALL BE 6" UNLESS OTHERWISE APPROVED.
 - 3) TOP OF VALVE BOX & COLLAR TO BE 6" BELOW FINAL GRADE IF INSTALLED IN ROADWAY OR SHOULDER.

PUMPER CONNECTION FOR FORCEMAIN FLUSHING (FOR IN-LINE BOOSTER PUMPING LOCATIONS)

S14-A

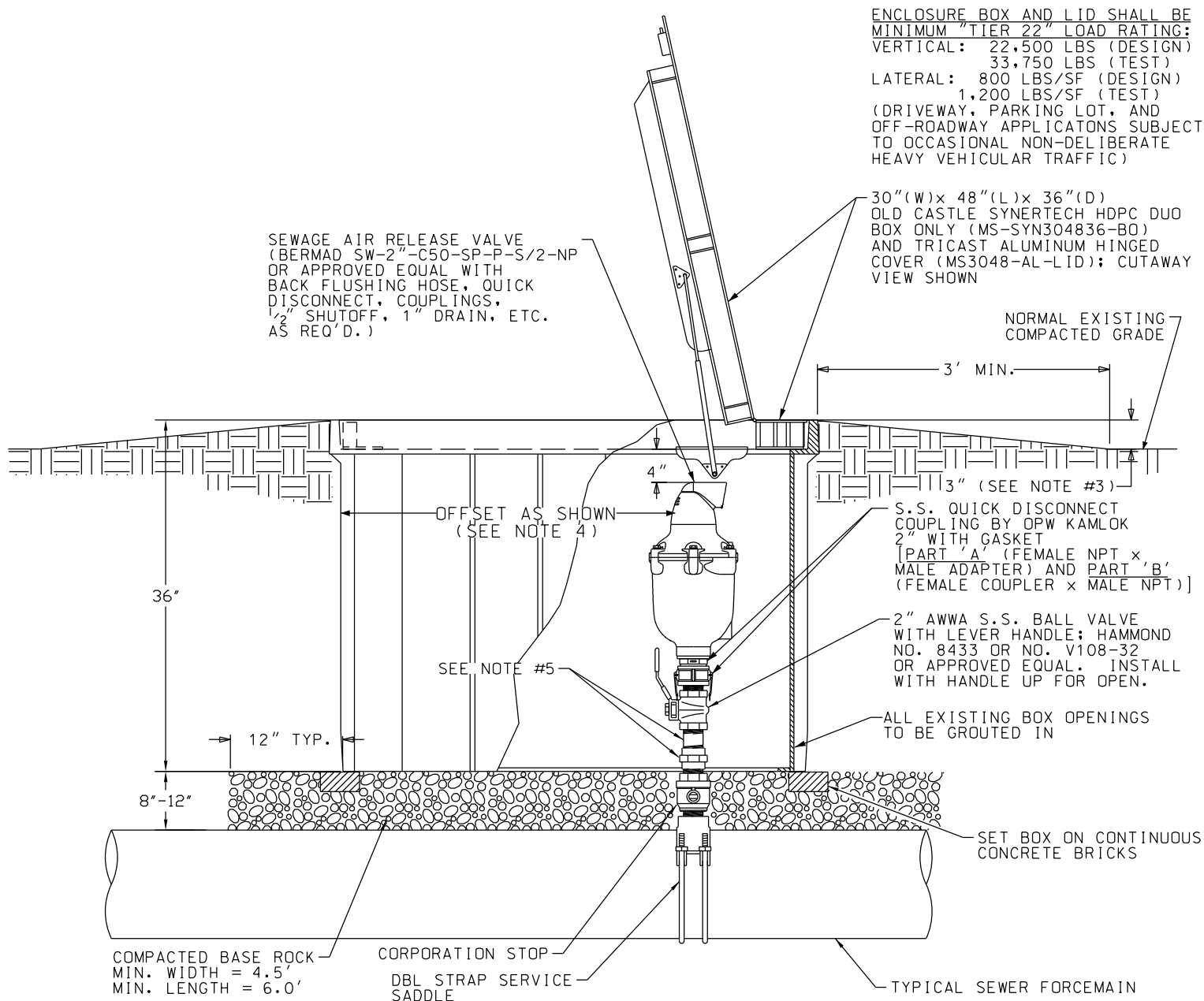
TYPICAL
 PUMPER CONNECTION
 FOR FORCEMAIN FLUSHING
 (10" AND LARGER)

SEWER ONLY
 ADDED: 02/20/2012
 UPDATED: 12/02/2013

S14-A

GRAND STRAND
 WATER & SEWER AUTHORITY

LATEST REVISION:
 07/06/2012 DRT ADDED "FOR IN-LINE BOOSTER PUMPING LOCATIONS" TO TITLE.
 06/28/2013 DRT CHANGED QUAZITE BOX LID SPECIFICATION.
 12/02/2013 DRT CHANGED LID TO "HH" (TIER 22) AND ADDED NOTE FOR TIER 22 ENCLOSURE BOX AND LID.



NOTES:

- 1) USE AN APPROVED JOINT COMPOUND ON ALL THREADED CONNECTIONS.
- 2) ROTATION & LOCATION OF BOX SETTING TO BE APPROVED BY THE INSPECTOR PRIOR TO INSTALLATION.
- 3) ARV ASSEMBLIES INSTALLED IN ROAD RIGHTS-OF-WAY MUST BE FLUSH WITH EXISTING SHOULDER GRADE. INSTALLATIONS IN EASEMENT AREAS SHALL BE RAISED ABOVE EXISTING GRADE AS SHOWN IN DETAIL.
- 4) ARV ASSEMBLY SHOULD BE OFFSET TO ONE SIDE OF THE BOX AS SHOWN TO ALLOW EASIER ACCESS TO QUICK DISCONNECT AND BALL VALVE HANDLE.
- 5) 2" S.S. NIPPLES AND COUPLINGS SHALL BE USED IF NEEDED.

TYPICAL SEWER FORCEMAIN AIR RELEASE VALVE ASSEMBLY

S15

LATEST REVISION:
 07/18/2008 DRT
 07/08/2008 DRT

06/28/2013 DRT
 09/10/2013 DRT
 12/02/2013 DRT

06/01/2018 DRT
 12/17/2018 DRT

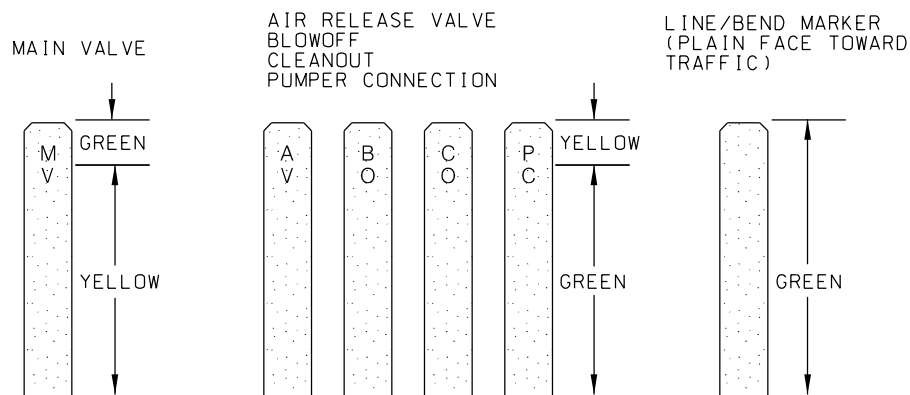
DESCRIBED PARTS 'A' & 'B' FOR QUICK DISCONNECT. SPECIFIED LARGER ENCLOSURE AND CHANGED SUPPLIER FROM STRONGWELL TO HUBBELL. REMOVED NOTE FOR STABILITY BLOCKING INSIDE
 CHANGED QUAZITE BOX LID SPECIFICATION.
 CHANGED QUAZITE BOX SPECIFICATION (DEPTH).
 CHANGED LID TO "HH" (TIER 22) AND ADDED NOTE FOR TIER 22 ENCLOSURE BOX AND LID. DELETED "H12 LOADING LID REQUIRED" NOTE.
 CHANGED BOX (OLD CASTLE SYNERTECH) AND LID (TRICAST ALUMINUM HINGED COVER) SPECIFICATIONS.
 CHANGED ARV TO "BERMAD SW-2"-C50-SP-P-S/2-NP OR APPROVED EQUAL."

TYPICAL SEWER FORCEMAIN AIR RELEASE VALVE ASSEMBLY

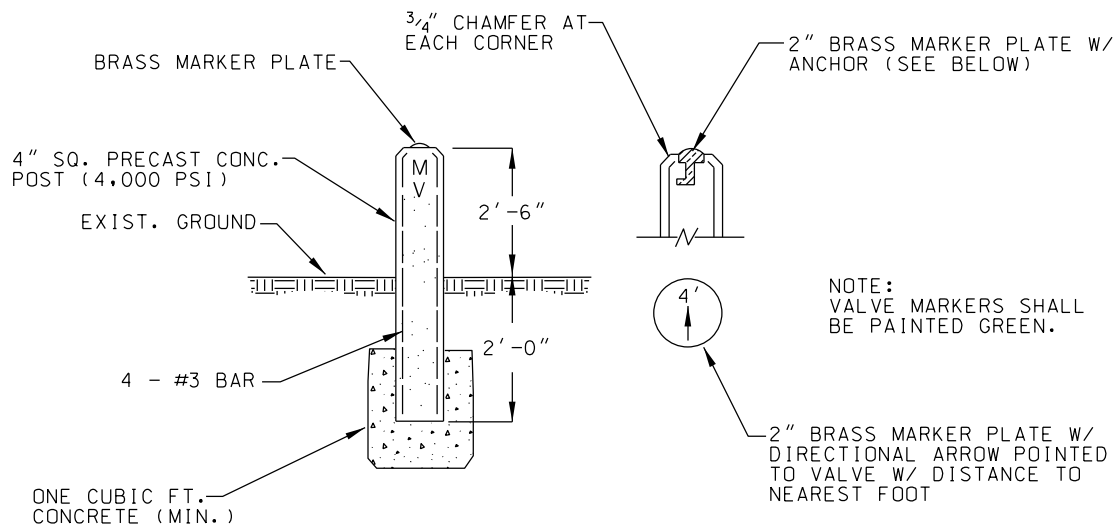
SEWER ONLY
 UPDATED: 12/17/2018

S15

GRAND STRAND
WATER & SEWER AUTHORITY



CONCRETE MARKER PAINT CODES



TYPICAL CONCRETE MARKERS

(VALVE, ARV, BLOWOFF, CLEANOUT,
PUMPER CONNECTION, LINE/BEND)

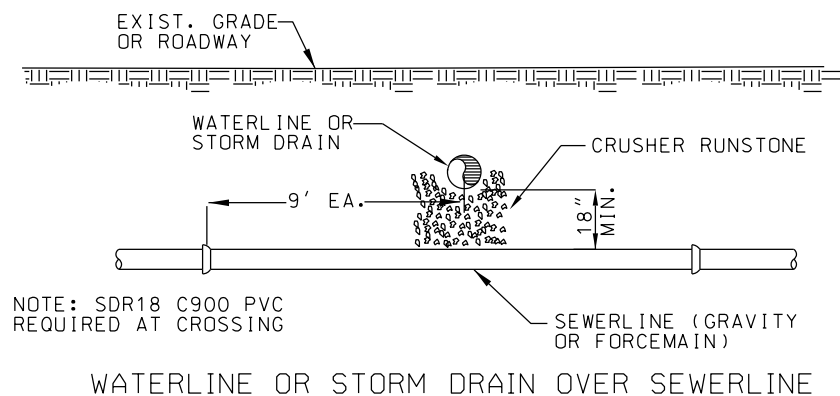
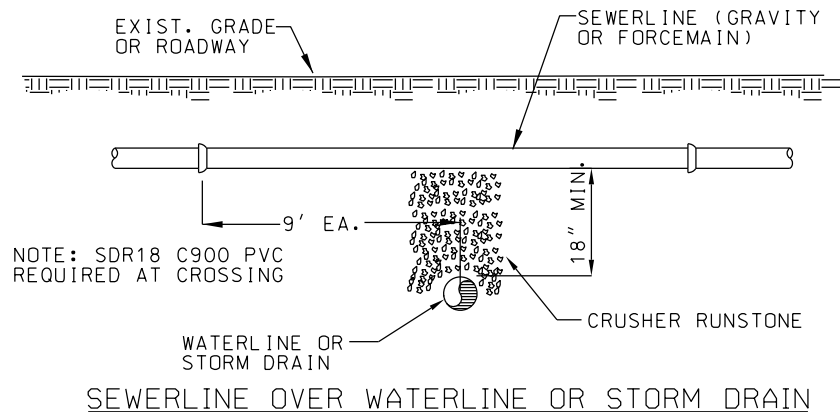
S16

TYPICAL CONCRETE MARKERS

SEWER ONLY
UPDATED: 5/13/02

S16

GRAND STRAND
WATER & SEWER AUTHORITY



WATERLINE OR STORM DRAIN CROSSINGS

S17

LATEST REVISION:

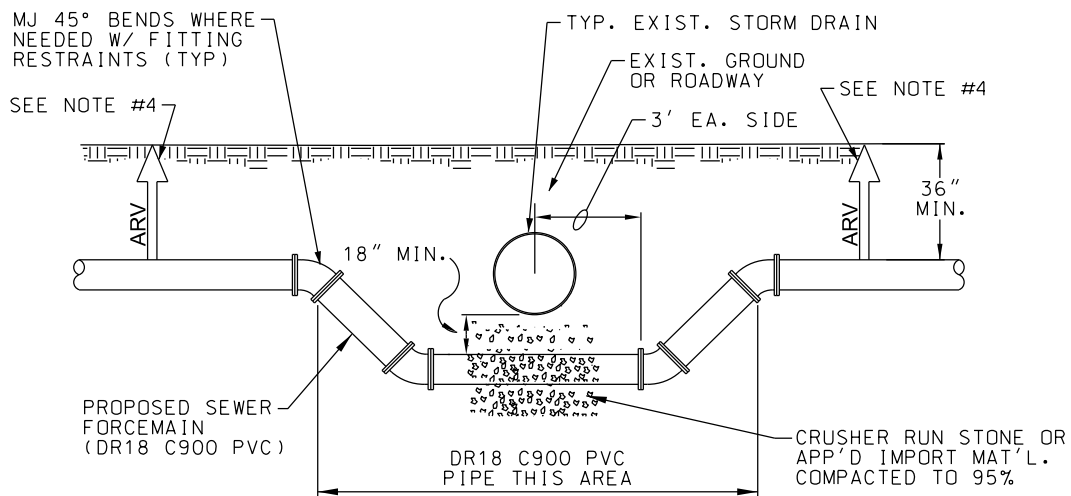
08/22/22 DRT REVISED TITLE, REMOVED DIP REFERENCES AND ADDED STORM DRAIN REFERENCES
08/28/06 DRT CORRECTED THE NOTE ABOUT PIPE MATERIAL POSSIBLY REQUIRED FOR WATERLINE CROSSINGS.

WATERLINE OR STORM DRAIN
CROSSINGS

SEWER ONLY
UPDATED: 08/22/2022

S17

GRAND STRAND
WATER & SEWER AUTHORITY



NOTES:

- 1) IN CASES WHERE D.I.P. FORCEMAIN IS NEEDED AT STORM DRAIN, D.I.P. SECTION MUST BE PROTECTO 401 LINED.
- 2) DEPRESS FORCEMAIN WHENEVER POSSIBLE TO ACCOMPLISH CLEARANCE WITHOUTH USE OF FITTINGS.
- 3) SEWER FORCEMAIN MAY BE PLACED ABOVE STORM DRAIN IF THERE IS 18" MIN. CLEARANCE OF STORM DRAINAND 36" GROUND COVER ABOVE AND AROUND.
- 4) A.R.V. SHALL BE REQUIRED ON EACH SIDE OF STORM DRAIN CROSSING AT HIGH POINT.

TYPICAL STORM DRAIN CROSSING

S18

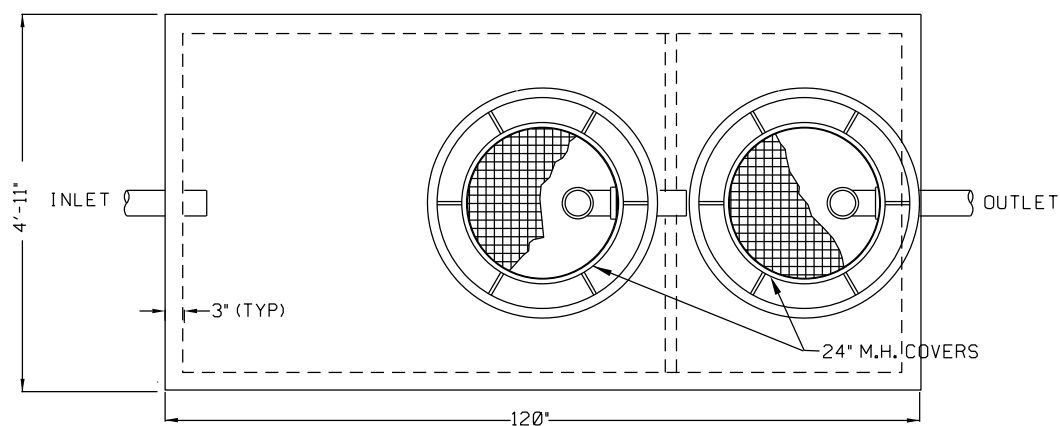
TYPICAL STORM DRAIN CROSSING

SEWER ONLY
UPDATED: 08/22/22

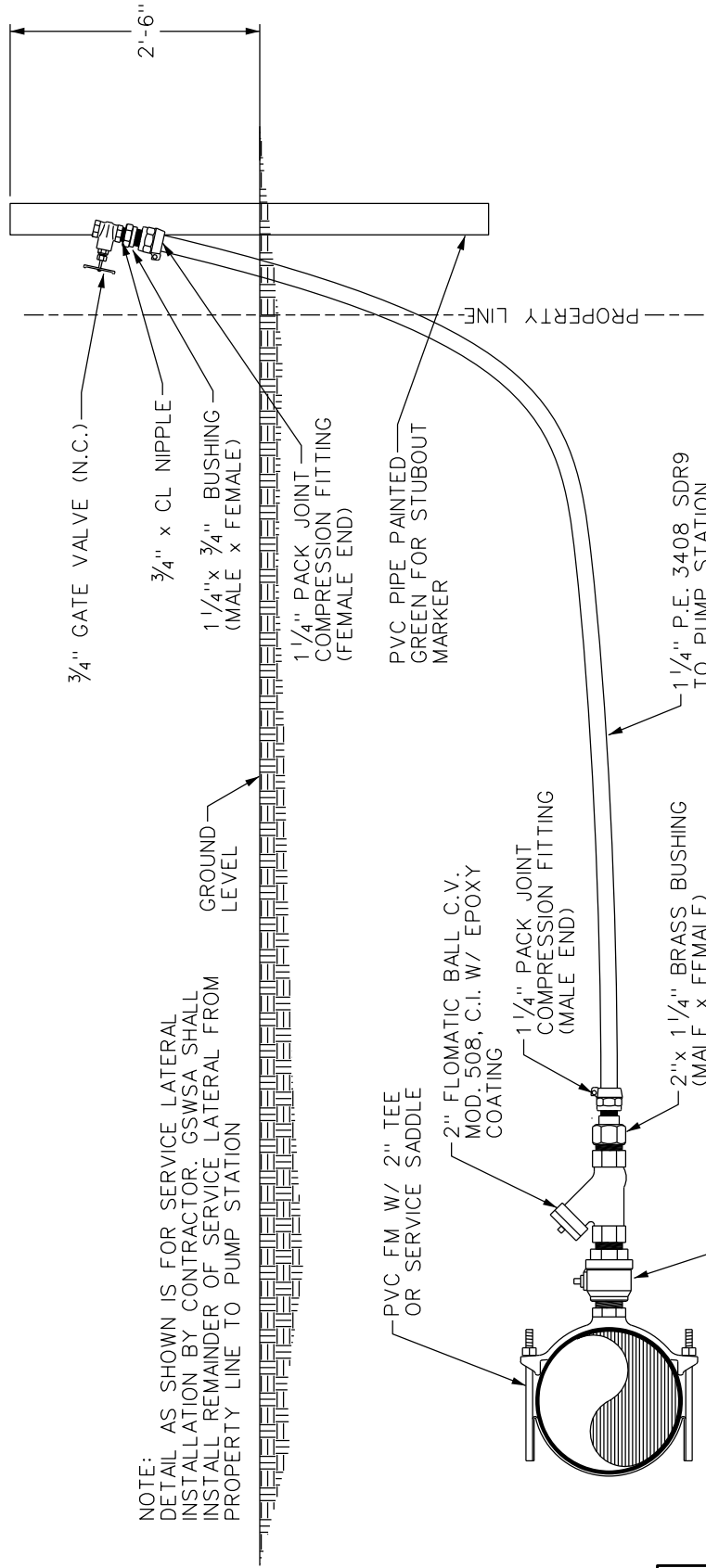
S18

GRAND STRAND
WATER & SEWER AUTHORITY

LATEST REVISION:
08/22/22 DRT REVISED PVC NOTES, DIP SPECIFICATION AND CLEARANCE
08/28/06 DRT NOTES. ADDED A.R.V. NOTES.
CORRECTED TYPO IN NOTE #4 ("USE").



TYPICAL GREASE TRAP	
SEWER ONLY UPDATED: 5/13/02	S19
GRAND STRAND WATER & SEWER AUTHORITY	



NOTE:
DETAIL AS SHOWN IS FOR SERVICE LATERAL
INSTALLATION BY CONTRACTOR. GSWA SHALL
INSTALL REMAINDER OF SERVICE LATERAL FROM
PROPERTY LINE TO PUMP STATION

FORCEMAIN – LATERAL DETAIL FOR GRINDER OR S.T.E.P. TANK INSTALLATIONS

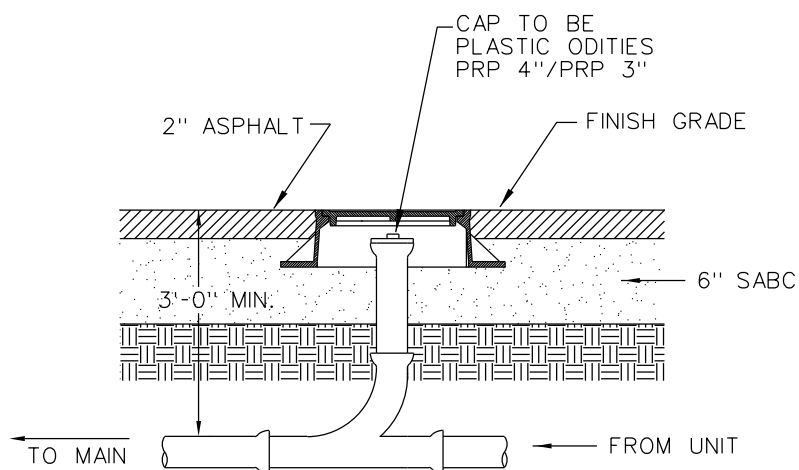
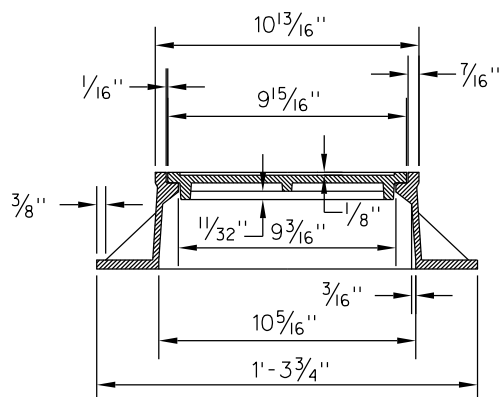
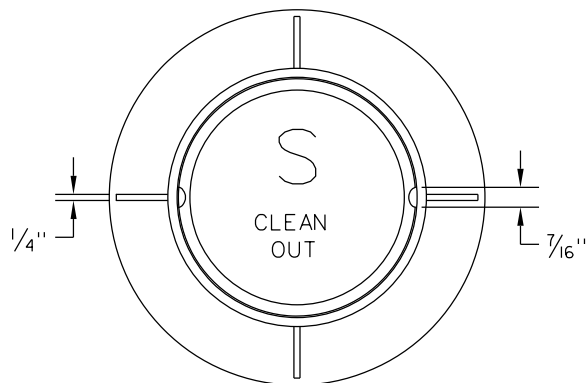
S20

TYPICAL
FORCEMAIN LATERAL
FOR GRINDER OR S.T.E.P. TANK

SEWER ONLY
UPDATED: 08/22/22

S20

GRAND STRAND
WATER & SEWER AUTHORITY



SEWER SERVICE CLEAN-OUT
WITH TRAFFIC-DUTY
MINI-MANHOLE COVER

TRAFFIC-DUTY MINI-MANHOLE COVER FOR SEWER CLEANOUT

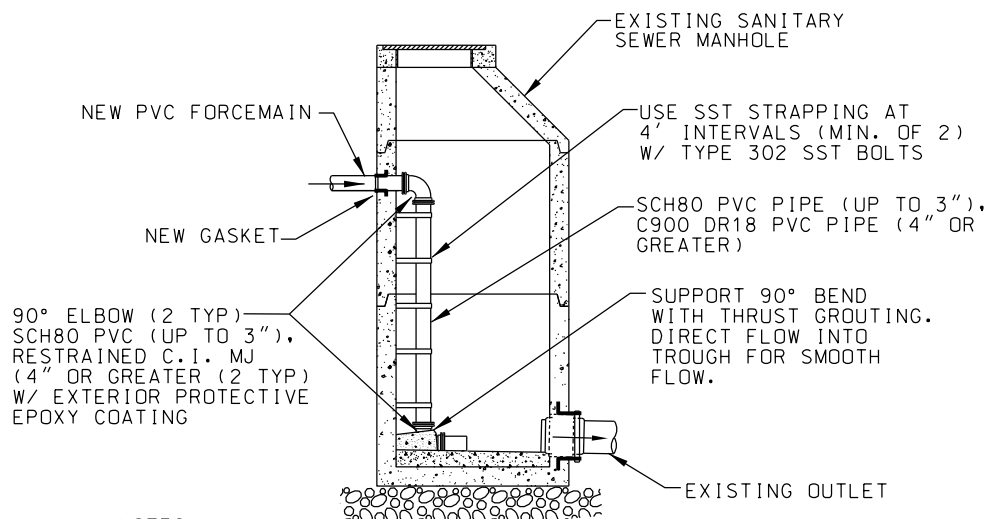
S22

MINI
MANHOLE
COVER

SEWER ONLY
UPDATED: 9/1/98

S22

GRAND STRAND
WATER & SEWER AUTHORITY



NOTES:

- 1) CORE-DRILL EXISTING MANHOLE WALL FOR NEW FM INSERTION.
FILL ANNULAR SPACE AROUND PIPE WITH EXPANDING MORTAR.
- 2) ALL PIPE ENTERING MANHOLE WALL OR INSIDE MANHOLE SHALL
BE SCH80 PVC (UP TO 3") OR C900 DR18 PVC (4" OR GREATER).
- 3) SPECIAL AND SPECIFIC APPROVAL FOR THE USE OF THIS INSIDE
DROP CONDITION MUST BE OBTAINED FROM THE AUTHORITY
PRIOR TO INCLUDING IT WITHIN ANY INSTALLATION.
- 4) MANHOLE TO BE COATED PER SECTION 4.2.8.j OF THE GSWSA
SEWER SYSTEM STANDARDS AND SPECIFICATIONS.

TYPICAL INSIDE DROP MANHOLE
FOR FORCEMAIN TIE-IN TO
EXISTING SANITARY MANHOLE

S23

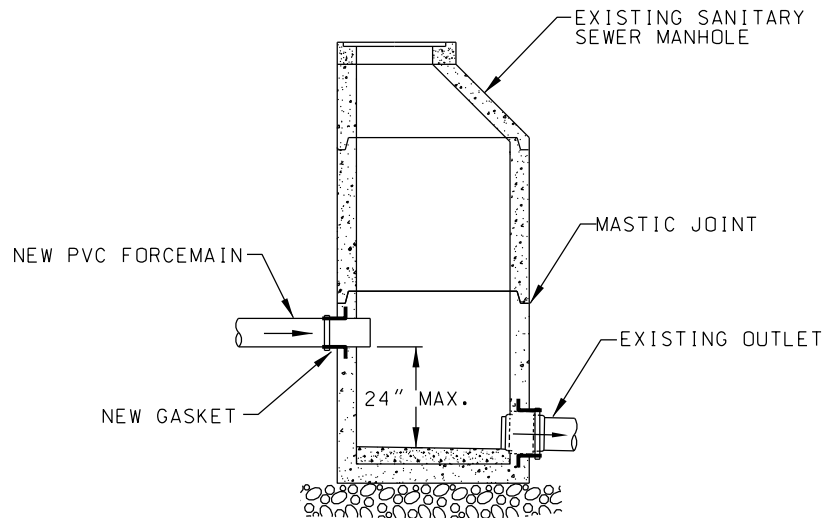
TYPICAL INSIDE DROP MANHOLE
FOR FORCEMAIN TIE-IN TO
EXISTING SANITARY MANHOLE

SEWER ONLY
UPDATED: 07/01/2024

S23

GRAND STRAND
WATER & SEWER AUTHORITY

LATEST REVISION:
05/21/2015 DRT ADDED NOTE #4.
07/01/2024 DRT UPDATED NOTE #4 SPEC'S SECTION.



NOTES:

- 1) CORE-DRILL EXISTING MANHOLE WALL FOR NEW FM INSERTION. FILL ANNULAR SPACE AROUND PIPE WITH NON-SHRINK GROUT. FINISHED NEW PIPE ENTRANCE TO BE WATERTIGHT.
- 2) PIPE ENTERING MANHOLE WALL SHALL BE SCH80 PVC (UP TO 3") OR C900 DR18 PVC (4" OR GREATER).

TYPICAL FORCEMAIN TIE-IN TO EXISTING SANITARY MANHOLE

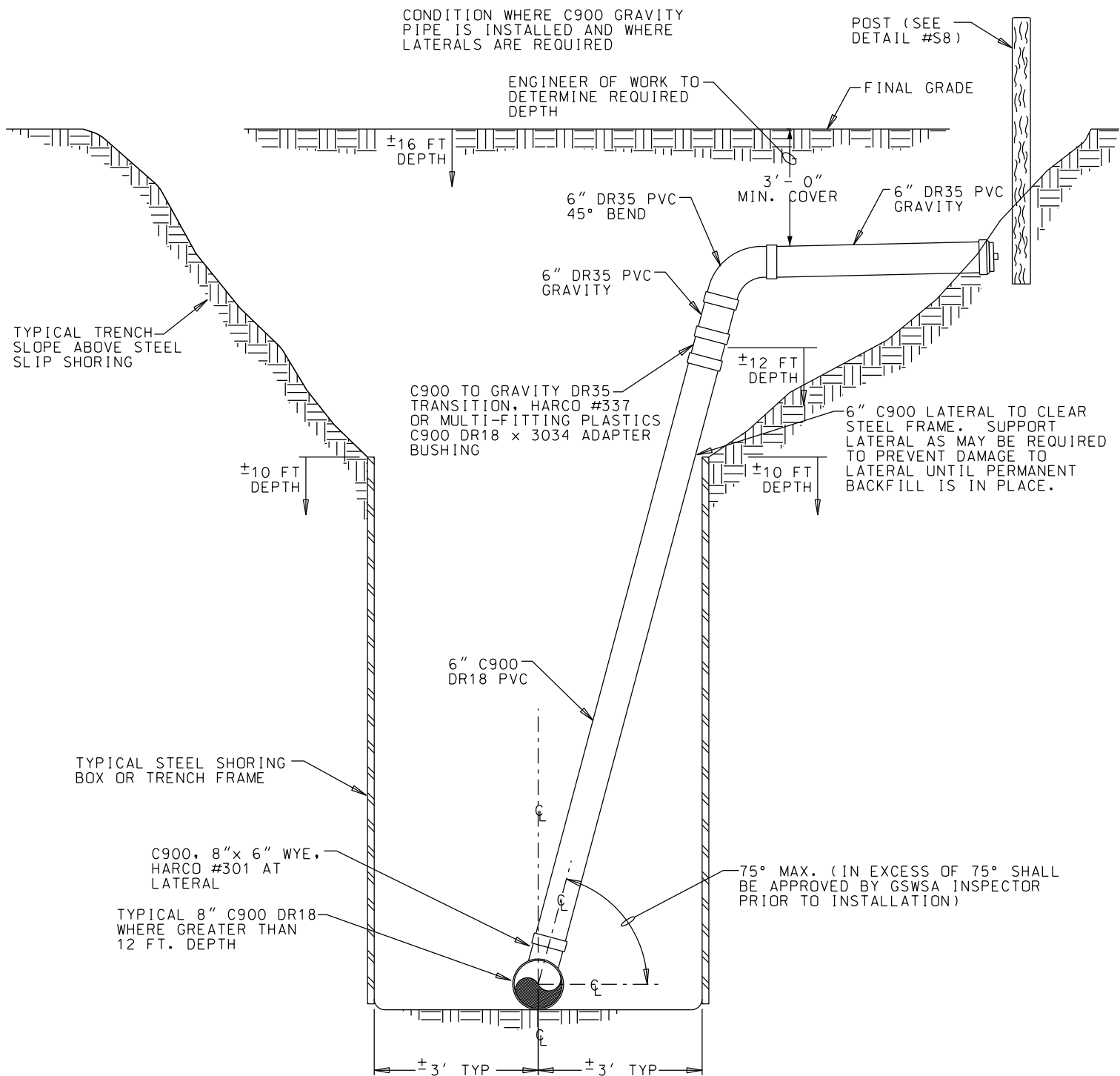
S24

TYPICAL FORCEMAIN TIE-IN TO
EXISTING SANITARY MANHOLE

SEWER ONLY
UPDATED: 5/30/02

S24

GRAND STRAND
WATER & SEWER AUTHORITY



**TYPICAL GRAVITY SEWER
IN EXCESS OF 12' DEPTH
(USE OF C900 PIPE & LATERAL CONNECTION)**

S25

**TYPICAL GRAVITY SEWER
IN EXCESS OF 12' DEPTH
(USE OF C900 PIPE & LATERAL
CONNECTION)**

SEWER ONLY
UPDATED: 07/03/19

S25

GRAND STRAND
WATER & SEWER AUTHORITY