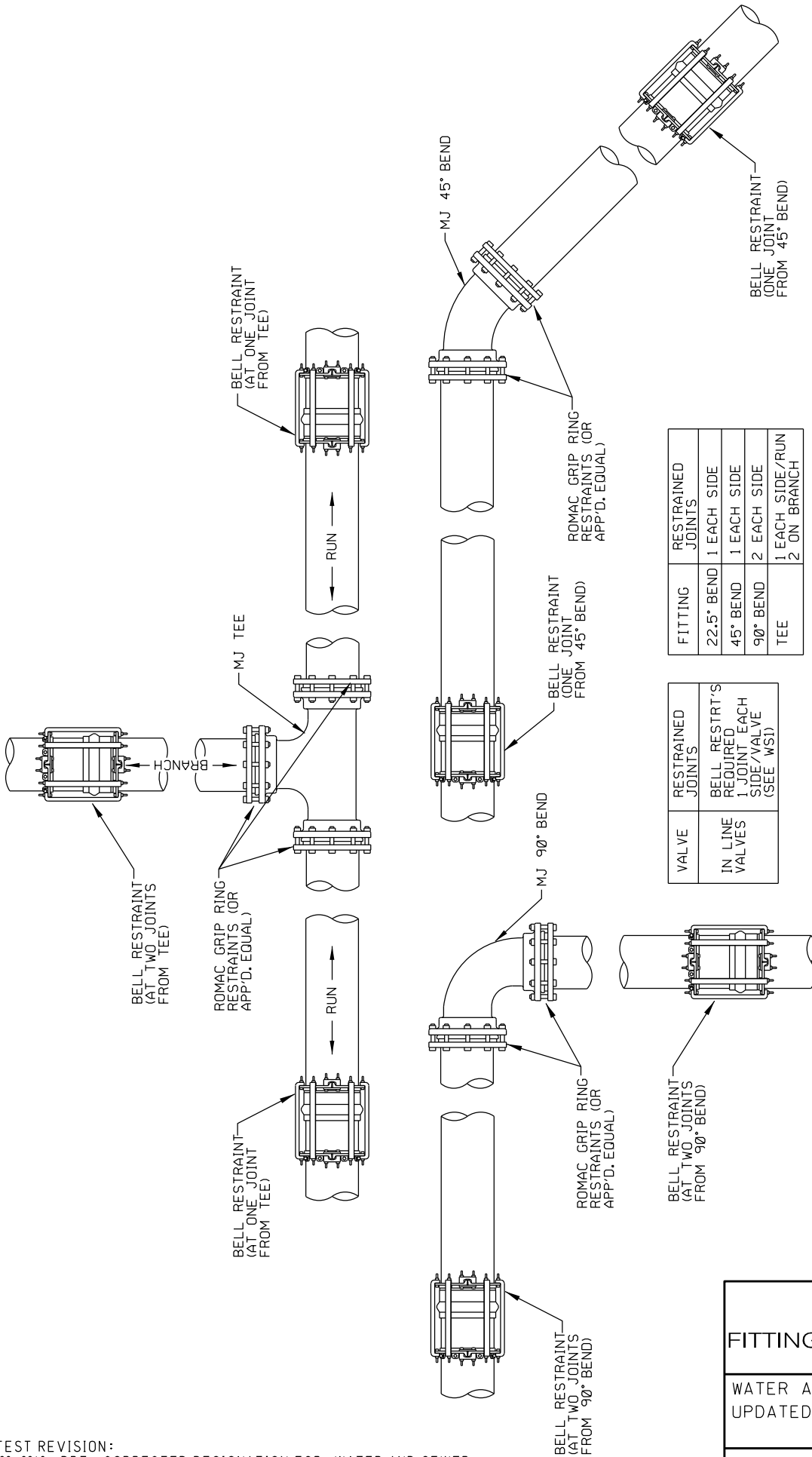


TYPICAL TAPPING SLEEVE
 (FOR WATERLINE OR SEWER FORCEMAIN)

WS2

TYPICAL TAPPING SLEEVE	
WATER OR SEWER UPDATED: 2/16/98	WS2
GRAND STRAND WATER & SEWER AUTHORITY	



FITTING	RESTRAINED JOINTS
22.5° BEND	1 EACH SIDE
45° BEND	1 EACH SIDE
90° BEND	2 EACH SIDE
TEE	1 EACH SIDE/RUN 2 ON BRANCH

VALVE	RESTRAINED JOINTS
IN LINE VALVES	BELL RESTRAINTS REQUIRED AT EACH JOINT/VALVE SIDE/VALVE (SEE WS1)

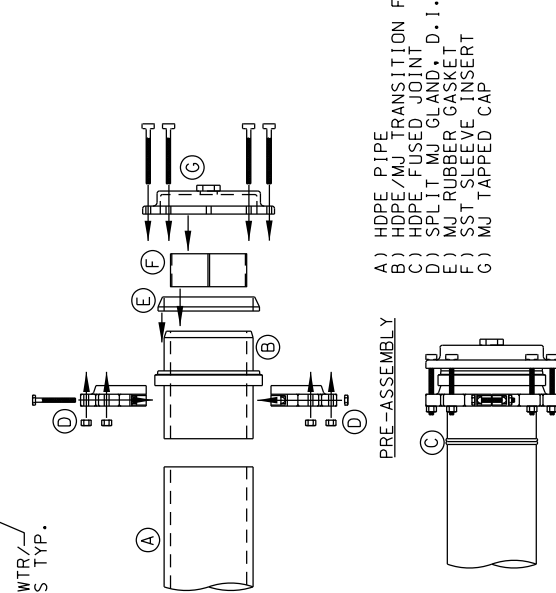
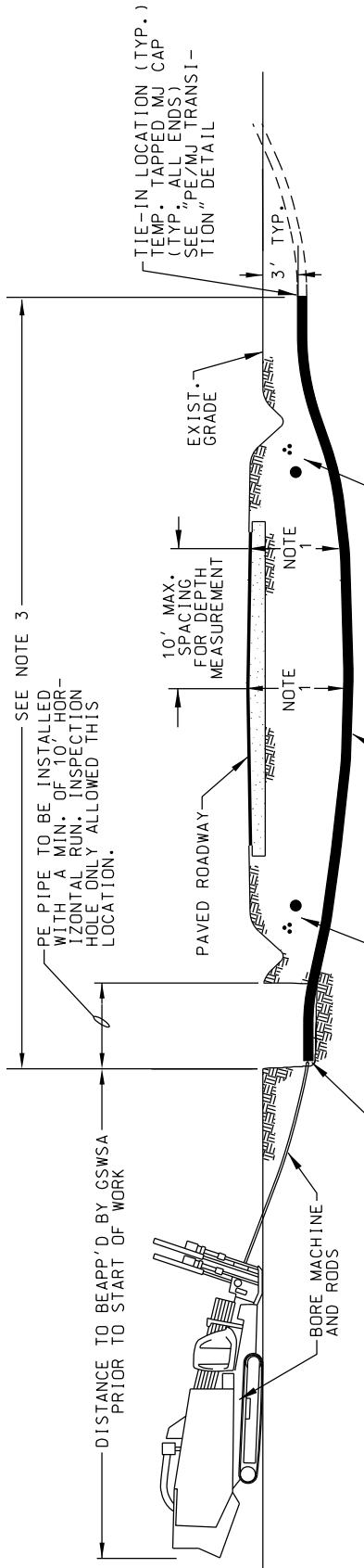
NOTES:

1. TABLE OF NO. OF RESTRAINTS REQUIRED ARE FOR SIZES THROUGH 12"; FOR LARGER THAN 12" NO. REQUIRED IS TO BE DETERMINED BY GSWSA.
2. PER GSWSA STANDARDS, MATERIAL APPROVAL THRU THE SUBMITTAL PROCESS ARE REQUIRED PRIOR TO ANY INSTALLATIONS.
3. PIPE BELL RESTRAINTS ARE REQUIRED TO BE INSTALLED ON THE TWO JOINTS (MINIMUM) IMMEDIATELY FOLLOWING THE PE/MJ ADAPTERS ON EACH END OF HDPE PIPE.

TYPICAL FITTING AND JOINT RESTRAINT

WS3

TYPICAL FITTING AND JOINT RESTRAINT	
WATER AND SEWER UPDATED: 5/23/2016	
GRAND STRAND WATER & SEWER AUTHORITY	WS3



- A) HDPE PIPE
- B) HDPE MJ TRANSITION FITTING
- C) HDPE FUSED JOINT
- D) SPLIT MJ GLAND, D.I.
- E) MJ RUBBER GASKET
- F) SST SLEEVE INSERT
- G) MJ TAPPED CAP

PE/MJ TRANSITION ASSEMBLY

CABLES, WTR/SWR LINES TYP.

TYPICAL DIRECTIONAL BORE; SDR 17 MIN. OR APP'D EQUAL

NOTES:

1. AN ELECTRONICALLY-DEVELOPED PROFILE AND PLAN SHALL BE PROVIDED FROM ENTRY TO EXIT FOR EACH DIRECTIONAL BORE SECTION BY THE DIRECTIONAL BORE CONTRACTOR. THIS SHALL INCLUDE ACCURATE HORIZONTAL AND VERTICAL DIMENSIONS.

2. ALL BORE SECTIONS SHALL BE HYDROSTATICALLY TESTED PER GSWSA STANDARDS BOTH UPON COMPLETION OF THE ABOVE-GROUND FUSION OPERATION AND AGAIN AFTER INSTALLATION, WHICH IS PRIOR TO CONNECTION TO THE MAIN PROJECT WATER/SEWER LINE. A FINAL TEST WILL BE A PART OF THE TOTAL MAIN LINE SYSTEM TEST.

3. LENGTH OF CROSSING, LOCATION OF INSPECTION/OBSERVATION EXCAVATION, NUMBER OF P.E. PIPE JOINTS, LOCATION OF BORE MACHINE, AUGER ENTRANCE LOCATION AND TIE-IN POINTS ARE TO BE APPROVED BY GSWSA PRIOR TO ANY START OF WORK OR ORDERING OF MATERIALS.

4. THIS DETAIL IS ALSO APPLICABLE TO STREAMS, WETLANDS, LARGE STORM DRAINS AND SIMILAR APPLICATIONS FOR DIRECTIONAL BORE WITH POLYETHYLENE PIPE.

5. THE BORE DEVELOPED FOR THE LEAD END OF THE PIPE SHALL BE KEPT AT A MINIMUM DIAMETER FOR THE PIPE INSTALLATION. THE AUGER HEAD SIZE SHALL BE APPROVED BY THE AUTHORITY PRIOR TO THE START OF WORK. THE LEADING END SHALL BE PULLED THROUGH WITHOUT THE D.I., M.J., RING FLANGE ATTACHED FOR LARGER THAN 6" PIPE INSTALLATIONS. THE D.I., M.J., RING FLANGE FOR SAID LEADING END SHALL BE INSTALLED AFTER THE PIPE INSTALLATION WITH THE USE OF A SPLIT D.I., M.J., FLANGE PER THE DETAIL DRAWING.

6. THE MANUFACTURER AND TYPE OF DRILLERS MUD SELECTED FOR USE SHALL BE APPROVED BY THE AUTHORITY PRIOR TO THE START OF WORK.

7. PIPE BELL RESTRAINTS ARE REQUIRED TO BE INSTALLED ON THE TWO JOINTS (MINIMUM) IMMEDIATELY FOLLOWING THE PE/MJ ADAPTERS ON EACH END OF HDPE PIPE.

8. HDPE MJ TRANSITION ADAPTERS TO BE SIZE-ON-SIZE. ANY REQUIRED CHANGE IN PIPE DIAMETER SHALL BE MADE USING DUCTILE IRON (D.I.) MJ FITTING WITH RESTRAINTS. HDPE REDUCERS ARE NOT ALLOWED.

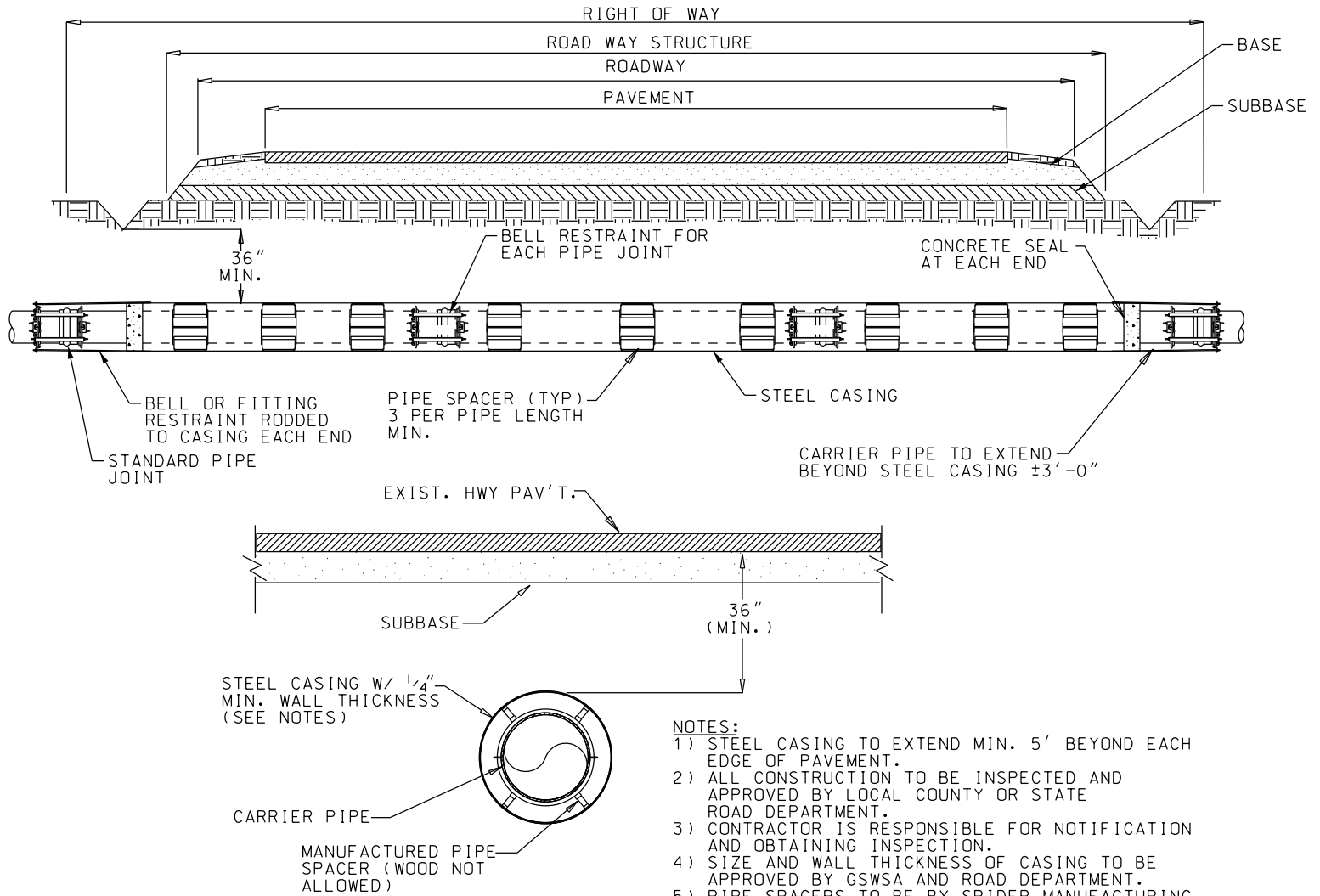
9. HDPE MJ TRANSITION ADAPTER "DR" TO MATCH "DR" OF HDPE BORE PIPE BEING INSTALLED.

TYPICAL HDPE DIRECTIONAL BORE

WS4

LATEST REVISIONS:
 05/23/2016 DRT ADDED NOTE #9
 06/27/2016 DRT REVISED TITLE

TYPICAL HDPE DIRECTIONAL BORE	
WATER OR SEWER UPDATED: 6/27/2016	
WS4	GRAND STRAND WATER & SEWER AUTHORITY



NOTES:

- 1) STEEL CASING TO EXTEND MIN. 5' BEYOND EACH EDGE OF PAVEMENT.
- 2) ALL CONSTRUCTION TO BE INSPECTED AND APPROVED BY LOCAL COUNTY OR STATE ROAD DEPARTMENT.
- 3) CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION AND OBTAINING INSPECTION.
- 4) SIZE AND WALL THICKNESS OF CASING TO BE APPROVED BY GSWA AND ROAD DEPARTMENT.
- 5) PIPE SPACERS TO BE BY SPIDER MANUFACTURING, BOYD'S FABRICATION OR APP'D EQUAL. MINIMUM THREE (3) SPACERS PER PIPE LENGTH.
- 6) ALL CARRIER PIPING SHALL BE RESTRAINED AT EACH JOINT WITHIN THE CASING PIPE.
- 7) ALL CARRIER PIPE SHALL BE PVC C900/C905 DR18 MINIMUM UNLESS OTHERWISE SPECIFIED.

TYPICAL ROADWAY BORE & JACK

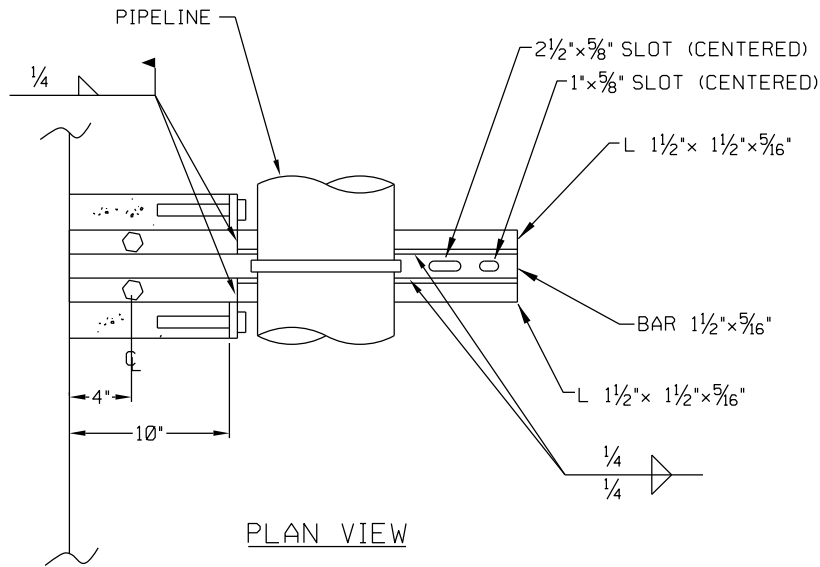
WS5

TYPICAL ROADWAY BORE & JACK

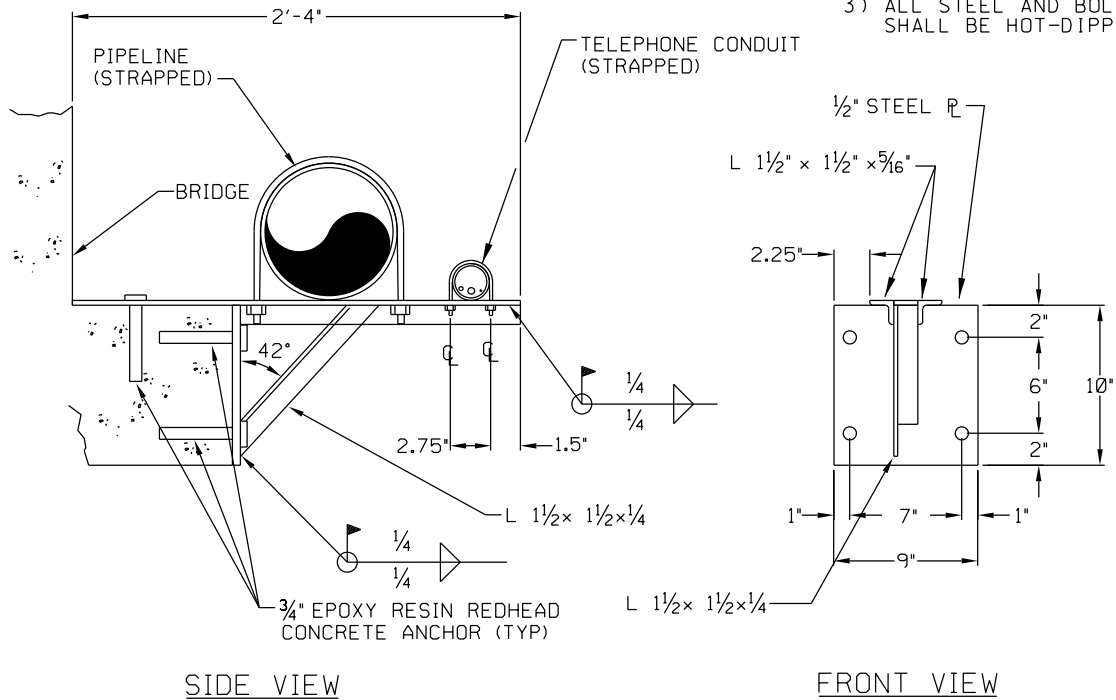
WATER OR SEWER
UPDATED: 7/14/2017

WS5

GRAND STRAND
WATER & SEWER AUTHORITY



- NOTES:
- 1) APPROX. 30 LBS. PER ASSEMBLY (LOAD-RATED FOR 2000 LBS.). ACTUAL WEIGHT OF PIPE AND CONTENTS ±1000 LBS. PER 20' SECTION (PER MANUFACTURER'S RECOMMENDATIONS).
 - 2) BRIDGE ATTACHMENT SPACING TO BE DETERMINED BY ENGINEER AND APPROVED BY GSWA.
 - 3) ALL STEEL AND BOLTED ASSEMBLY SHALL BE HOT-DIPPED GALVANIZED.



TYPICAL BRIDGE ATTACHMENT

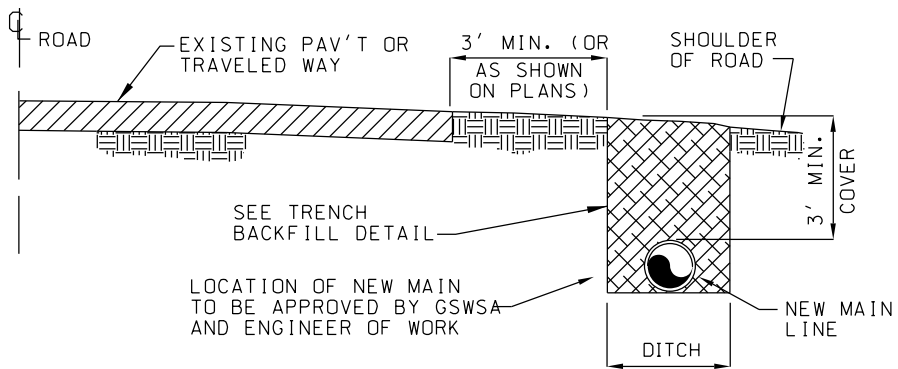
WS6

TYPICAL BRIDGE ATTACHMENT

WATER OR SEWER
 UPDATED: 2/11/98

WS6

GRAND STRAND
 WATER & SEWER AUTHORITY



TYPICAL MAIN LINE LOCATION
IN EDGE OF TRAVEL WAY

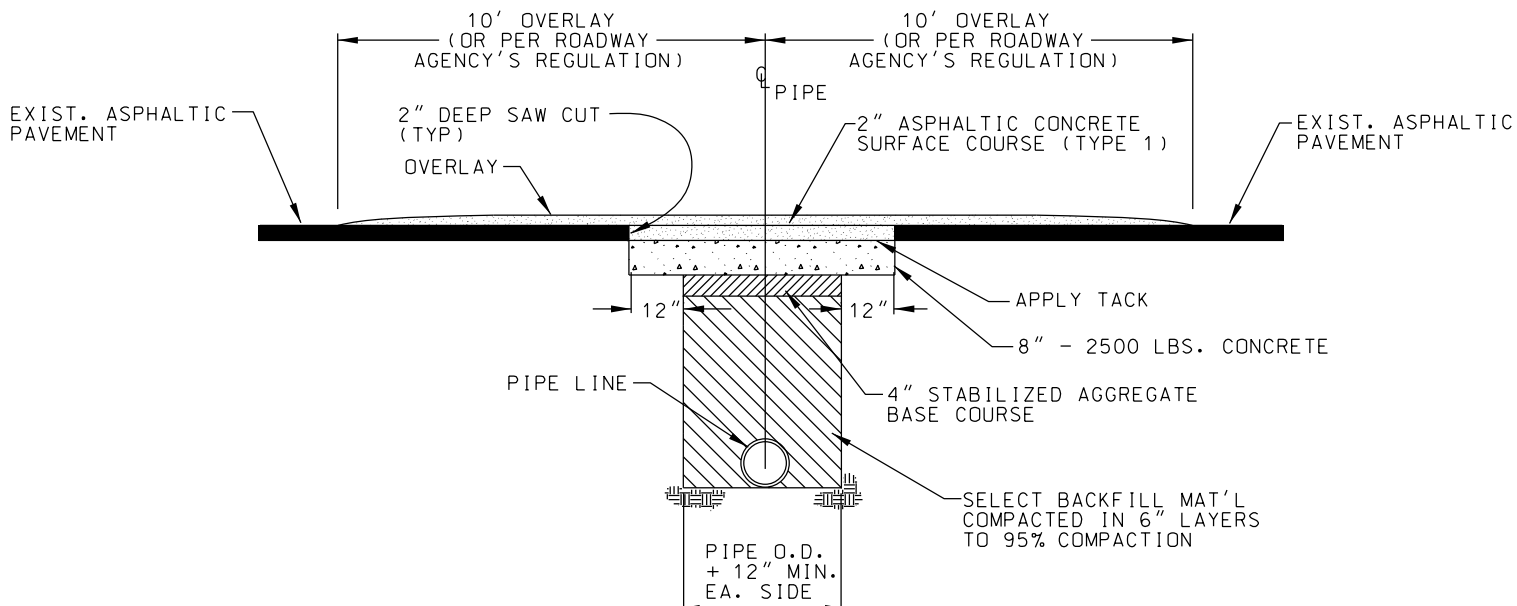
WS7

TYPICAL
MAIN LINE LOCATION IN
EDGE OF TRAVEL WAY

SEWER ONLY
UPDATED: 2/23/01

WS7

GRAND STRAND
WATER & SEWER AUTHORITY



NOTES:

- 1) PAVEMENT CUT TO EXTEND 12" BEYOND EDGES OF TRENCH AS SHOWN. PAVEMENT SHALL BE CUT TO TRUE LINE AND REMOVED BEFORE TRENCH IS CUT. ALL PAVEMENT REPAIRS TO BE IN ACCORDANCE WITH ROAD AGENCY SPECS.
- 2) IF PAVEMENT CUT IS ON A HIGH VOLUME MAIN ROAD NEAR A PAVED INTERSECTION, AND THE EDGE OF THE INTERSECTING ROAD IS ONLY A FEW FEET BEYOND THE NORMAL 5' (ONE SIDE DIMENSION) OVERLAY, THE OVERLAY IS TO BE EXTENDED TO THE EDGE OF THE INTERSECTING ROAD.

OPEN CUT REPAIR FOR HIGH VOLUME ASPHALT PAVEMENT

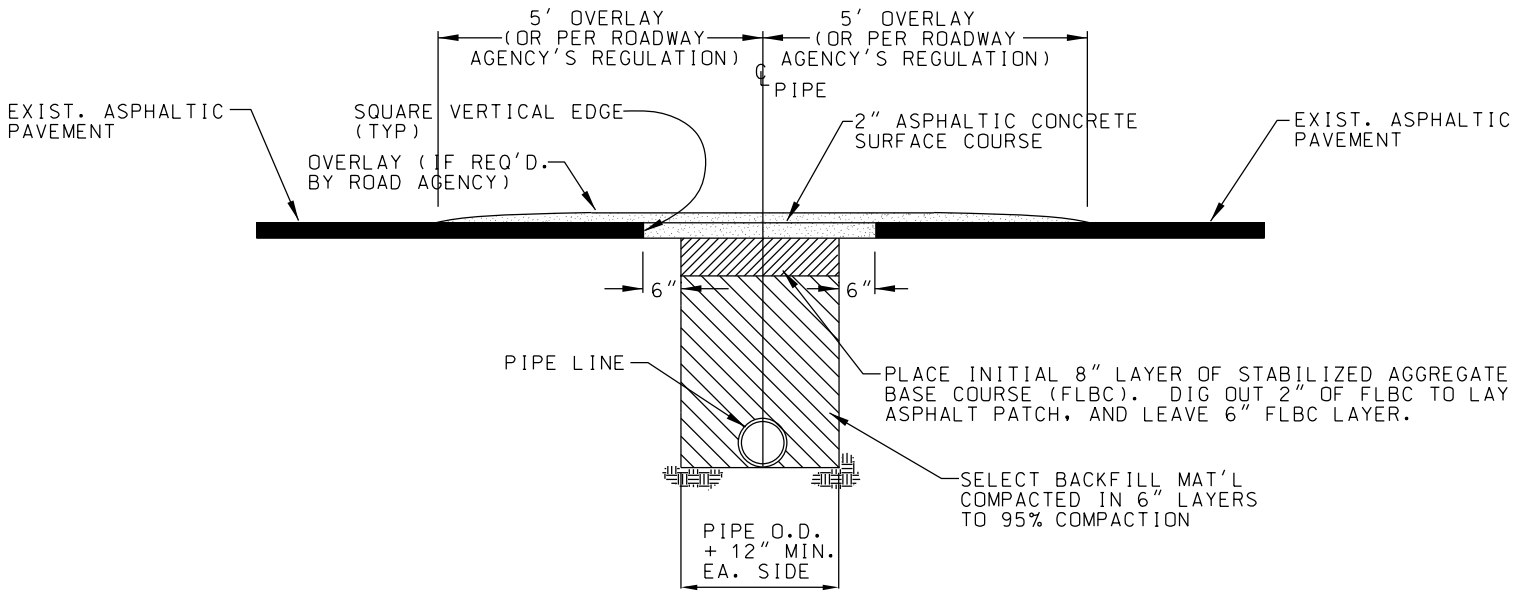
WS8

OPEN CUT REPAIR FOR
HIGH VOLUME
ASPHALT PAVEMENT

WATER OR SEWER
UPDATED: 12/26/97

WS8

GRAND STRAND
WATER & SEWER AUTHORITY



NOTES:

- 1) PAVEMENT CUT TO EXTEND 6" BEYOND EDGES OF TRENCH AS SHOWN. PAVEMENT SHALL BE CUT TO TRUE LINE AND REMOVED BEFORE TRENCH IS CUT. ALL PAVEMENT REPAIRS TO BE IN ACCORDANCE WITH ROAD AGENCY SPECS.
- 2) ROAD AGENCY MAY REQUIRE A CUT & PATCH OF TRENCH AREA AND AN OVERLAY OF ENTIRE APRON OR ENTRANCE FROM THE EDGE OF THE MAIN ROAD TO THE EDGE OF THE ROAD RIGHT-OF-WAY (SEE ENCROACHMENT PERMIT).
- 3) WHERE EXISTING PAVEMENT IS INSUFFICIENT THICKNESS TO DEVELOP TIGHT SEAL WITH NEW SURFACE, NEW PAVEMENT SHALL LAP EXISTING SURFACE WITH AT LEAST A 10' OVERLAP ON BOTH SIDES FOR SMOOTH TRANSITION OR AS PER SPEC'S. OF ROAD AGENCY.

OPEN CUT REPAIR FOR LOW VOLUME ASPHALT PAVEMENT

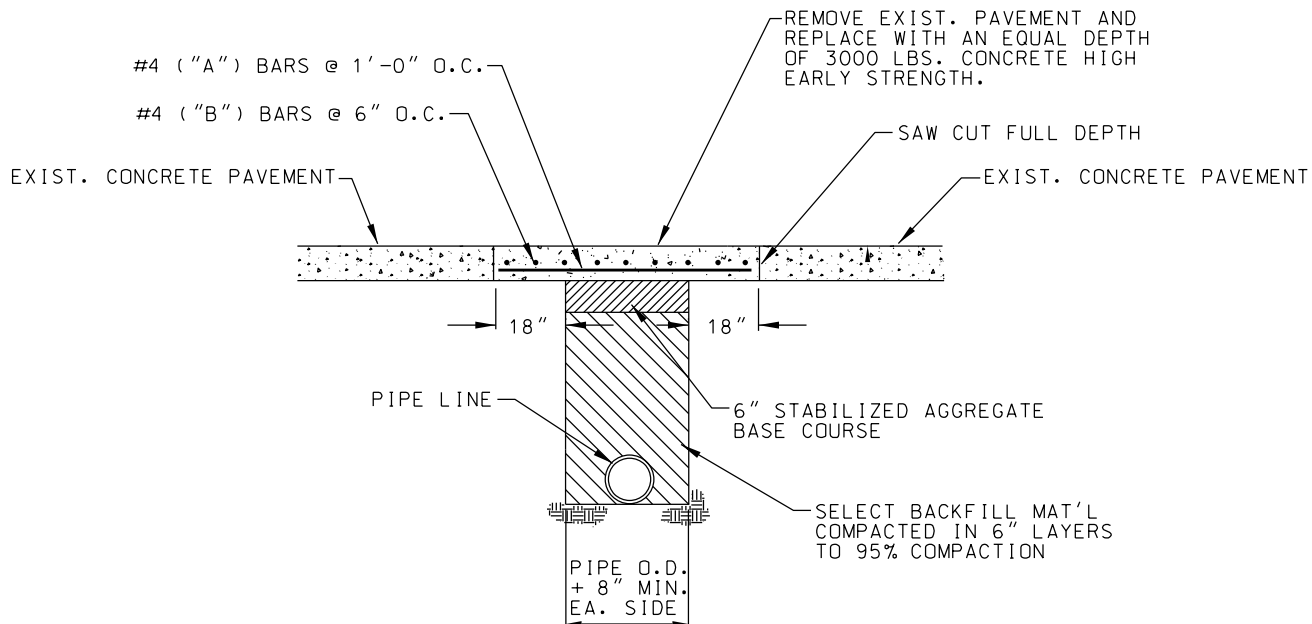
WS9

OPEN CUT REPAIR FOR
LOW VOLUME
ASPHALT PAVEMENT

WATER OR SEWER
UPDATED: 12/26/97

WS9

GRAND STRAND
WATER & SEWER AUTHORITY



NOTE:
 PAVEMENT CUT TO EXTEND 18" BEYOND EDGES
 OF TRENCH AS SHOWN. PAVEMENT SHALL BE
 CUT TO TRUE LINE AND REMOVED BEFORE
 TRENCH IS CUT. ALL PAVEMENT REPAIRS TO
 BE IN ACCORDANCE WITH ROAD AGENCY SPECS.

OPEN CUT REPAIR FOR CONCRETE PAVEMENT

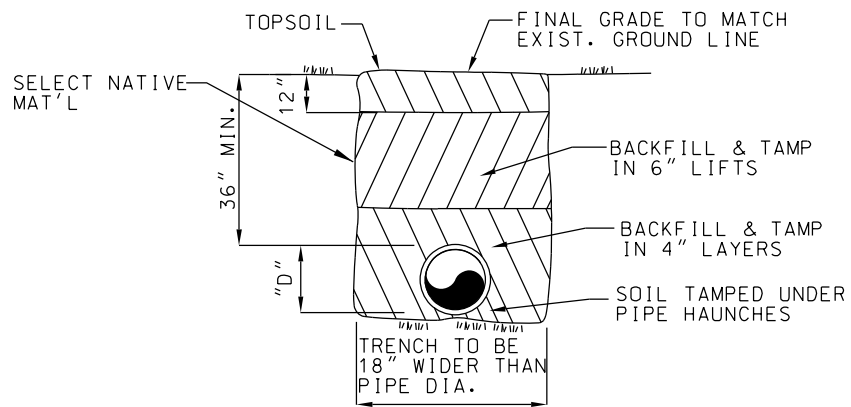
WS10

OPEN CUT REPAIR FOR
 CONCRETE PAVEMENT

WATER OR SEWER
 UPDATED: 12/26/97

WS10

GRAND STRAND
 WATER & SEWER AUTHORITY



TYPICAL PIPE BEDDING DETAIL

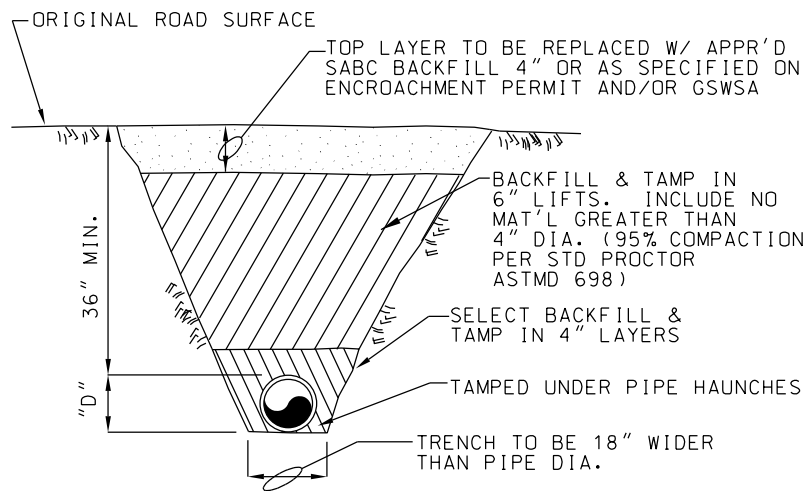
WS11

TYPICAL
PIPE BEDDING DETAIL

WATER OR SEWER
UPDATED: 12/26/97

WS11

GRAND STRAND
WATER & SEWER AUTHORITY



UNPAVED ROADWAY BEDDING DETAIL

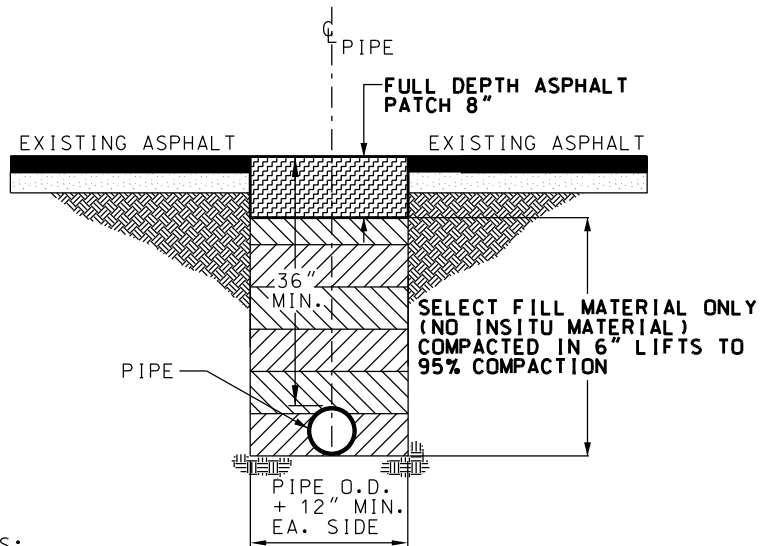
WS12

UNPAVED ROADWAY
BEDDING DETAIL

WATER OR SEWER
UPDATED: 12/26/97

WS12

GRAND STRAND
WATER & SEWER AUTHORITY



NOTES:

- 1) PAVEMENT SHALL BE CUT TO TRUE LINE AND REMOVED BEFORE TRENCH IS CUT. ALL PAVEMENT REPAIRS TO BE IN ACCORDANCE WITH ROAD AGENCY SPECS.
- 2) THIS DETAIL IS PER HORRY COUNTY ENGINEER'S OFFICE SPECIFICATIONS (4/30/2020).

OPEN CUT REPAIR FOR COUNTY ASPHALT ROADWAY

WS13

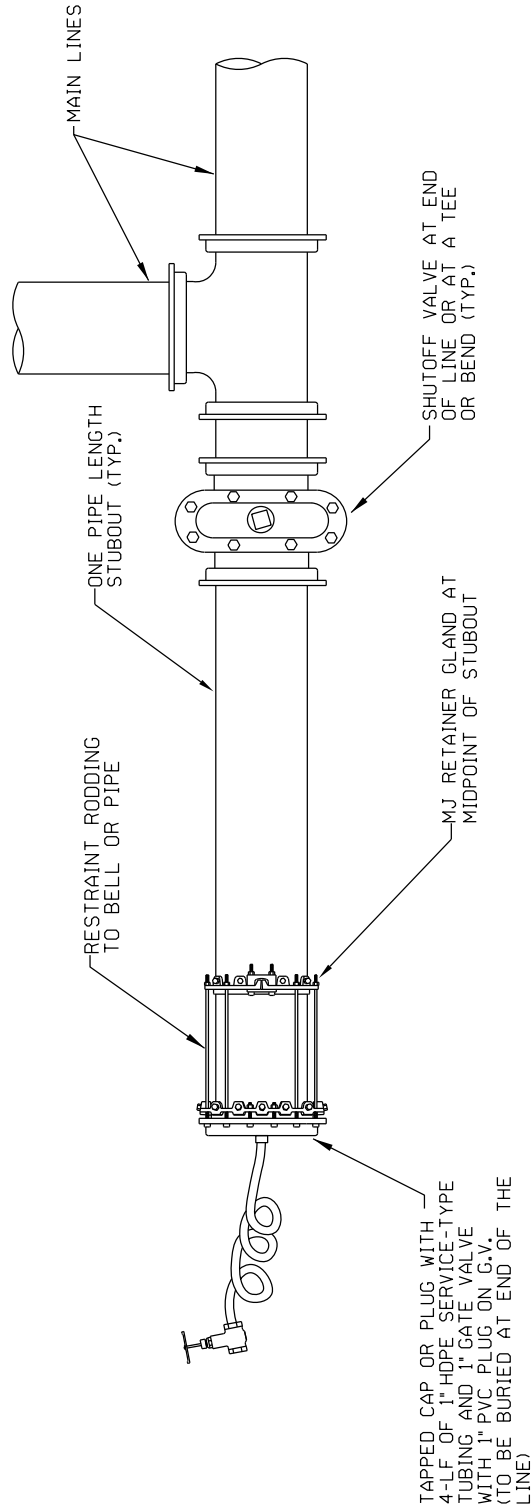
LATEST REVISION:
06/08/20 DRT REVISED BACKFILL MATERIAL, ASPHALT PATCH THICKNESS
AND ASPHALT CUT WIDTH PER NEW STANDARD DETAIL FROM HORRY COUNTY
ENG. DEPT.

OPEN CUT REPAIR FOR
COUNTY
ASPHALT ROADWAY

WATER OR SEWER
UPDATED: 06/08/2020

WS13

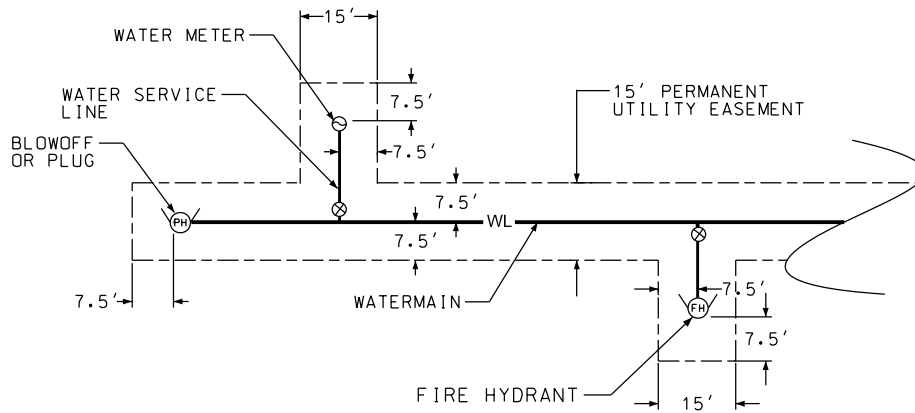
GRAND STRAND
WATER & SEWER AUTHORITY



TYPICAL FUTURE WATERLINE OR FORCEMAIN STUBOUT

WS14

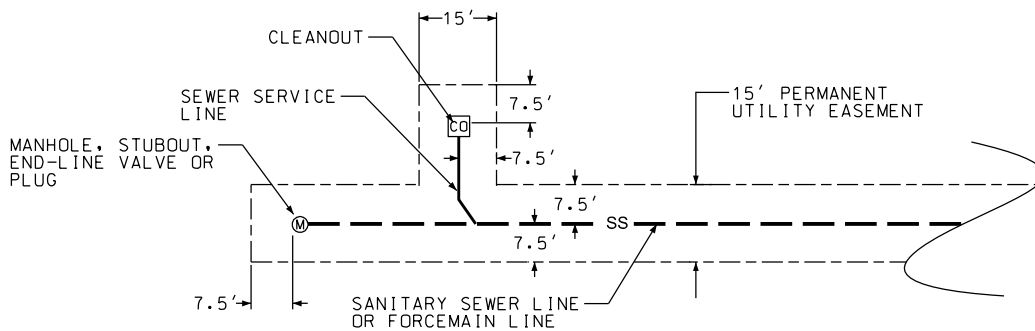
<p>TYPICAL FUTURE WATERLINE OR FORCEMAIN STUBOUT</p>	
<p>WATER OR SEWER UPDATED: 5/13/02</p>	
<p>WS14</p>	
<p>GRAND STRAND WATER & SEWER AUTHORITY</p>	



NOTE:
 ALL UTILITY EASEMENTS TO BE CONVEYED OVER WATERLINES AND WATER SERVICE LINES SHALL BE 15' IN WIDTH AND 7.5' BEYOND FIRE HYDRANT, WATER METER OR PLUG

TYPICAL GSWSA WATER UTILITY EASEMENT FOR DEVELOPER PROJECTS

WS15



NOTE:
 ALL UTILITY EASEMENTS TO BE CONVEYED OVER SEWER LINES AND SEWER SERVICE LINES SHALL BE MINIMUM 15' IN WIDTH AND 7.5' BEYOND MANHOLE, STUBOUT, PLUG OR CLEANOUT. THE WIDTH OF THE EASEMENT SHALL BE BASED ON A 1:1 SLOPE AS MEASURED FROM THE BOTTOM OF THE PIPE IN 5' INCREMENTS (SEE CHART).

EASEMENT CHART	
UTILITY DEPTH	EASEMENT WIDTH
0' - 7.5'	15'
7.6' - 10'	20'
10.1' - 12.5'	25'
12.6' - 15'	30'
15.1' - 17.5'	35'
17.6' - 20'	40'

TYPICAL GSWSA SEWER UTILITY EASEMENT FOR DEVELOPER PROJECTS

WS15

TYPICAL WATER & SEWER UTILITY EASEMENT FOR DEVELOPER PROJECTS

WATER OR SEWER
 UPDATED: 06/19/08

WS15

GRAND STRAND
 WATER & SEWER AUTHORITY