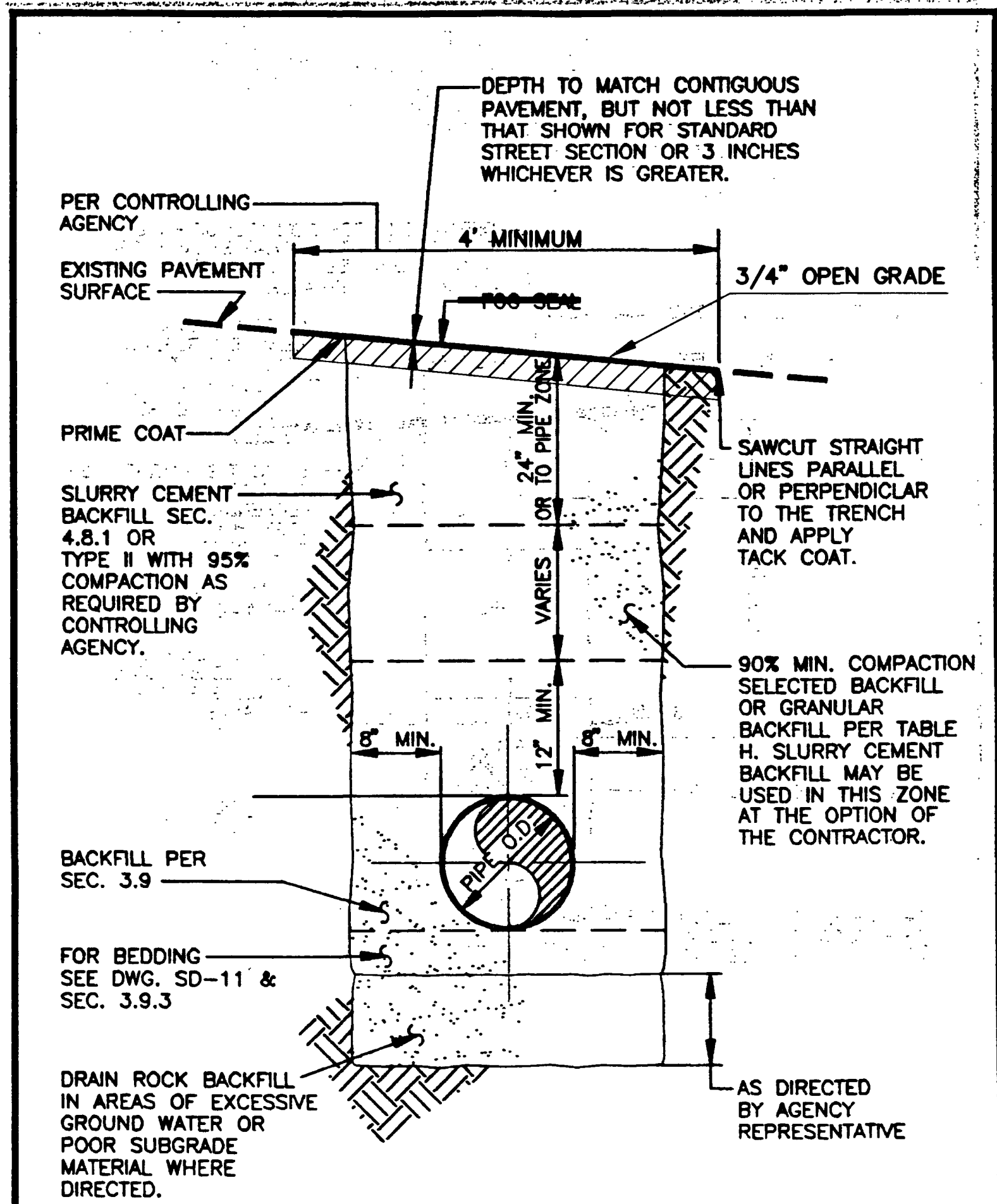




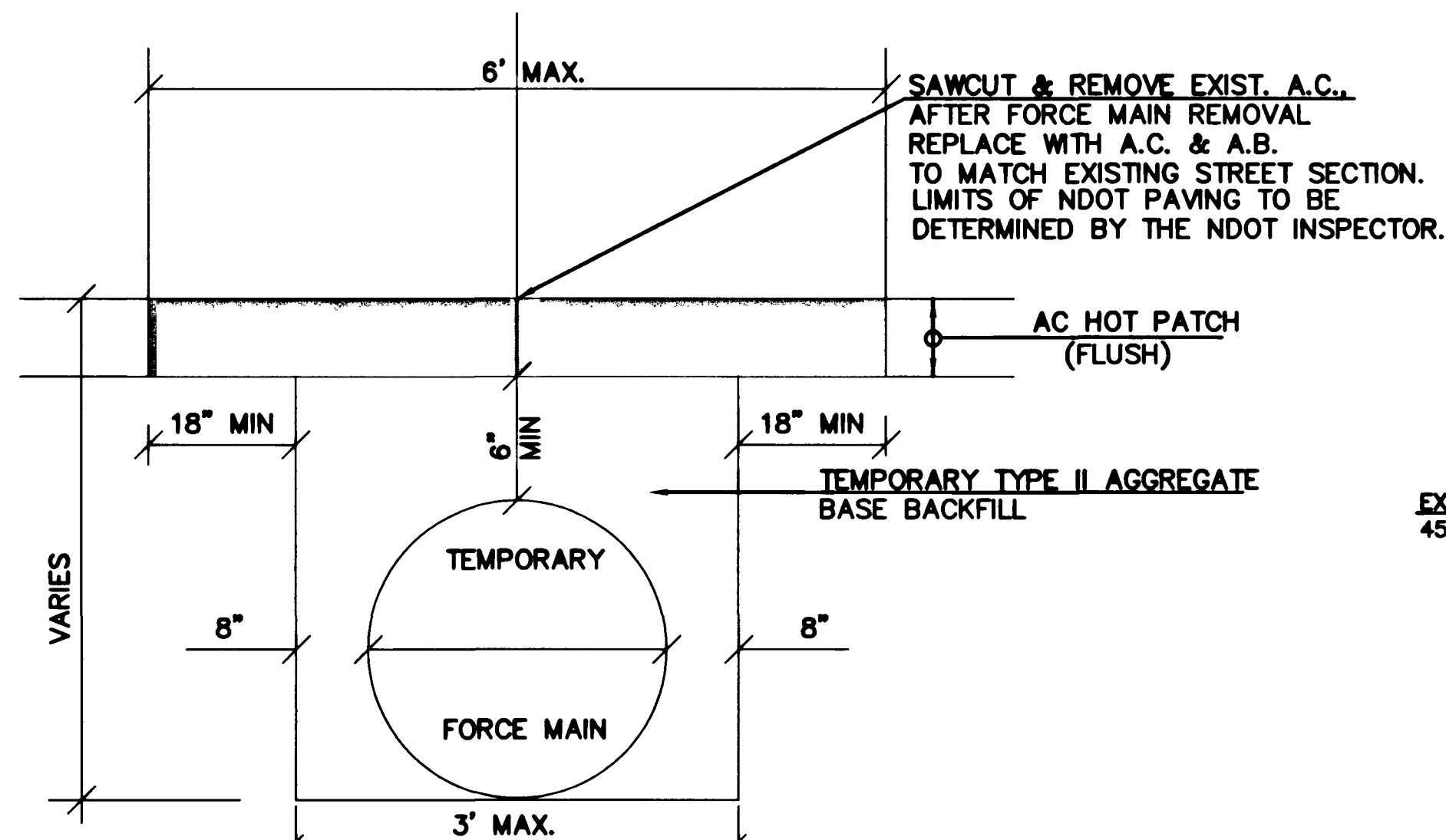
TYPICAL TRENCH SECTION BACKFILL SPECIFICATION PAVED GREATER THAN 60' R/W
ISSUED: NUMBER: SD-16B

TRENCH BACKFILL

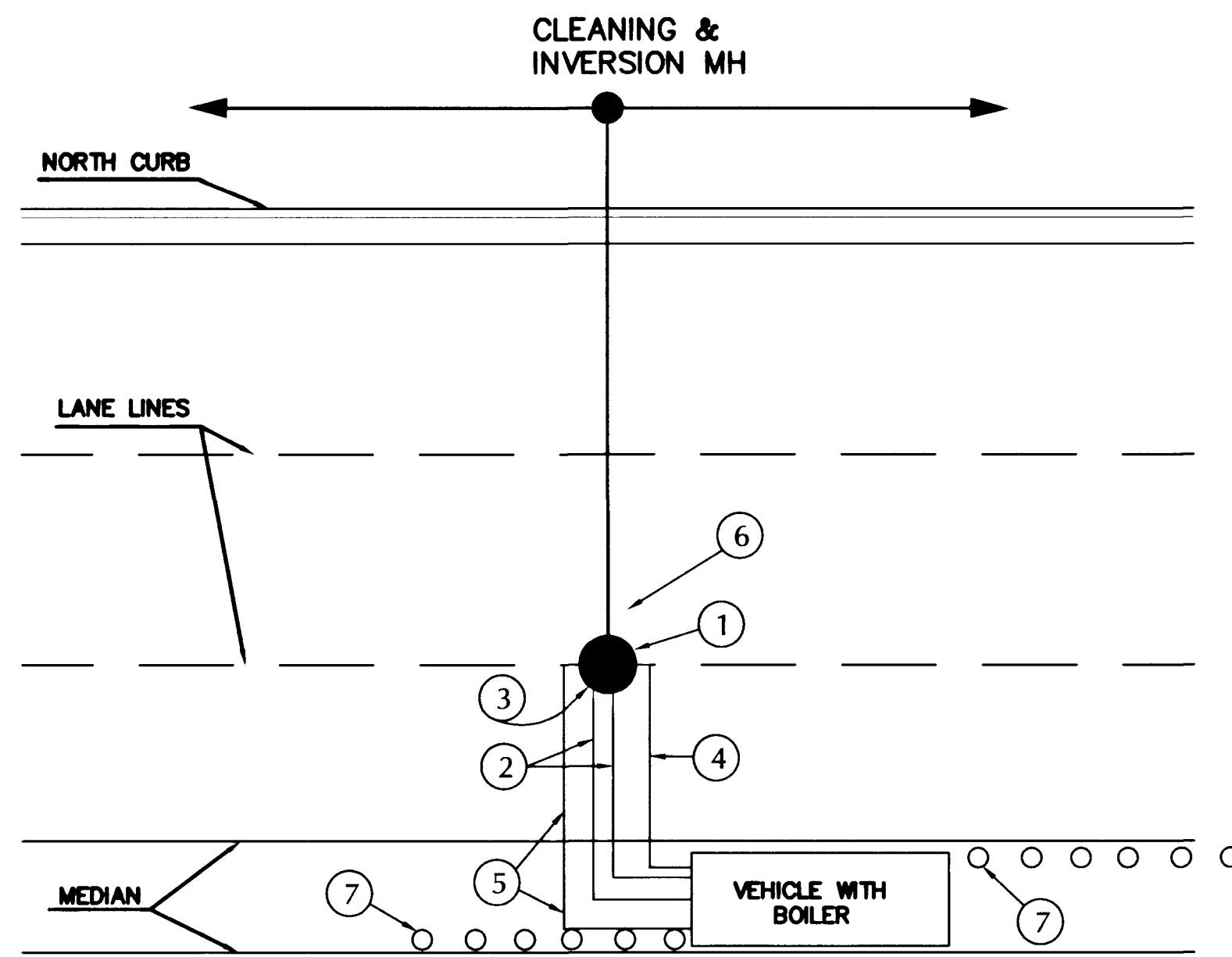
FOR BONANZA ROAD & BRUCE STREET SEWER CONSTRUCTION
NTS

NOTE:

NDOT HAS AN A.C. OVERLAY PROJECT SCHEDULED FOR CHARLESTON BOULEVARD FROM MAIN STREET TO NELLIS BOULEVARD THAT IS TO FOLLOW THE PROPOSED CLV SEWER PROJECT.



TYPICAL TRENCH FOR TEMPORARY FORCE MAIN INSTALLATION
NTS



NOTES:

1. REMOVE TOP OF MANHOLE.
2. INSTALL WATER CIRCULATION LINES BELOW GRADE IN TRENCH.
3. CONNECT TO MANHOLE BELOW GRADE AND INSTALL TEMPORARY MANHOLE COVER.
4. INSTALL TEMPORARY TRENCH COVER.
5. AFTER LINER CURING COMPLETELY REMOVE CIRCULATION LINES, BACKFILL AND PERMANENTLY PAVE TRENCH WITH A PAVEMENT AND BASE SECTION TO MATCH EXISTING PAVEMENT AND BASE SECTION, RESTORE MEDIAN CURB AND SURFACING, AND RESTORE MANHOLE.
6. DURING CURING, THE LANE THE MANHOLE IS IN CAN BE CLOSED AT NIGHTTIME (9:00PM TO 5:30AM) ONLY.
7. IMPACT ATTENUATION BARRELS TO BE ADDED. 36" MIN. HEIGHT AND 18" WIDTH.

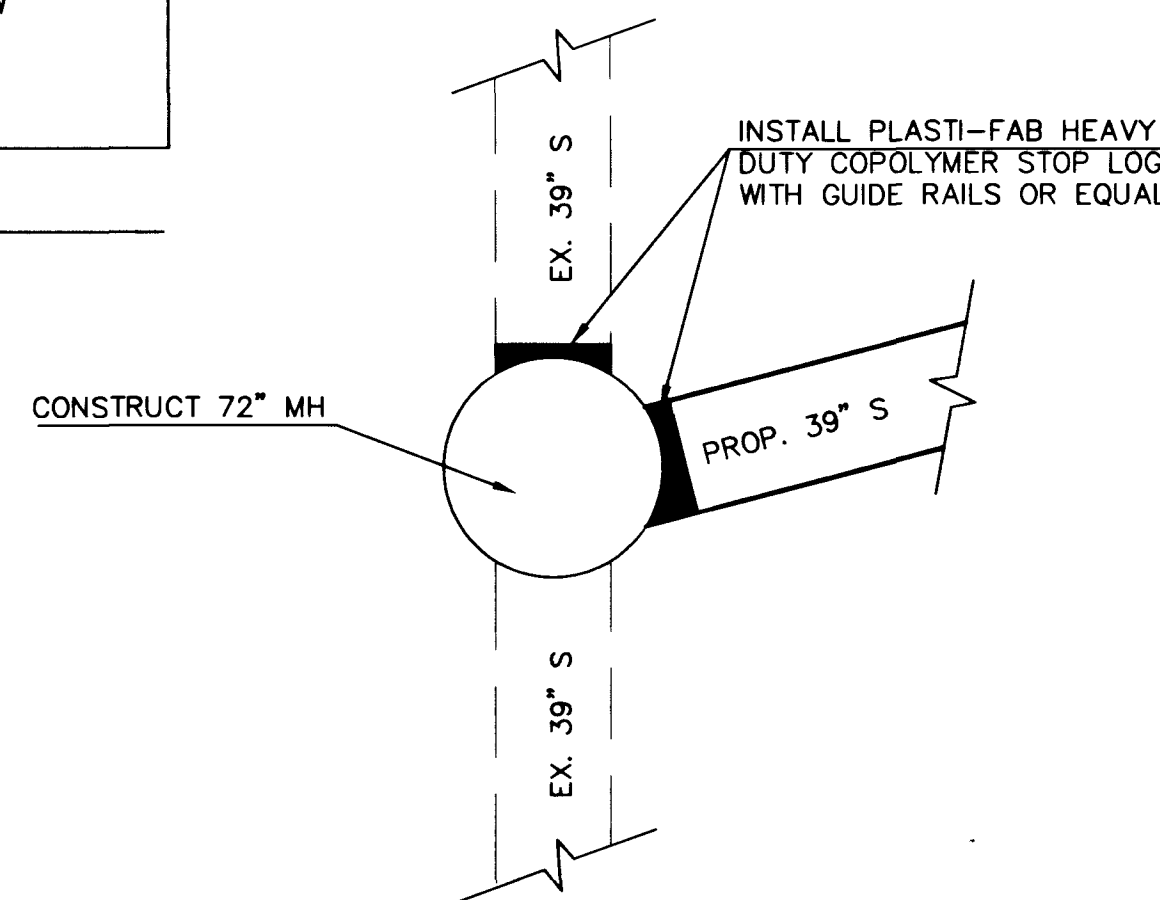
LINER RESIN CURING SETUP

NTS

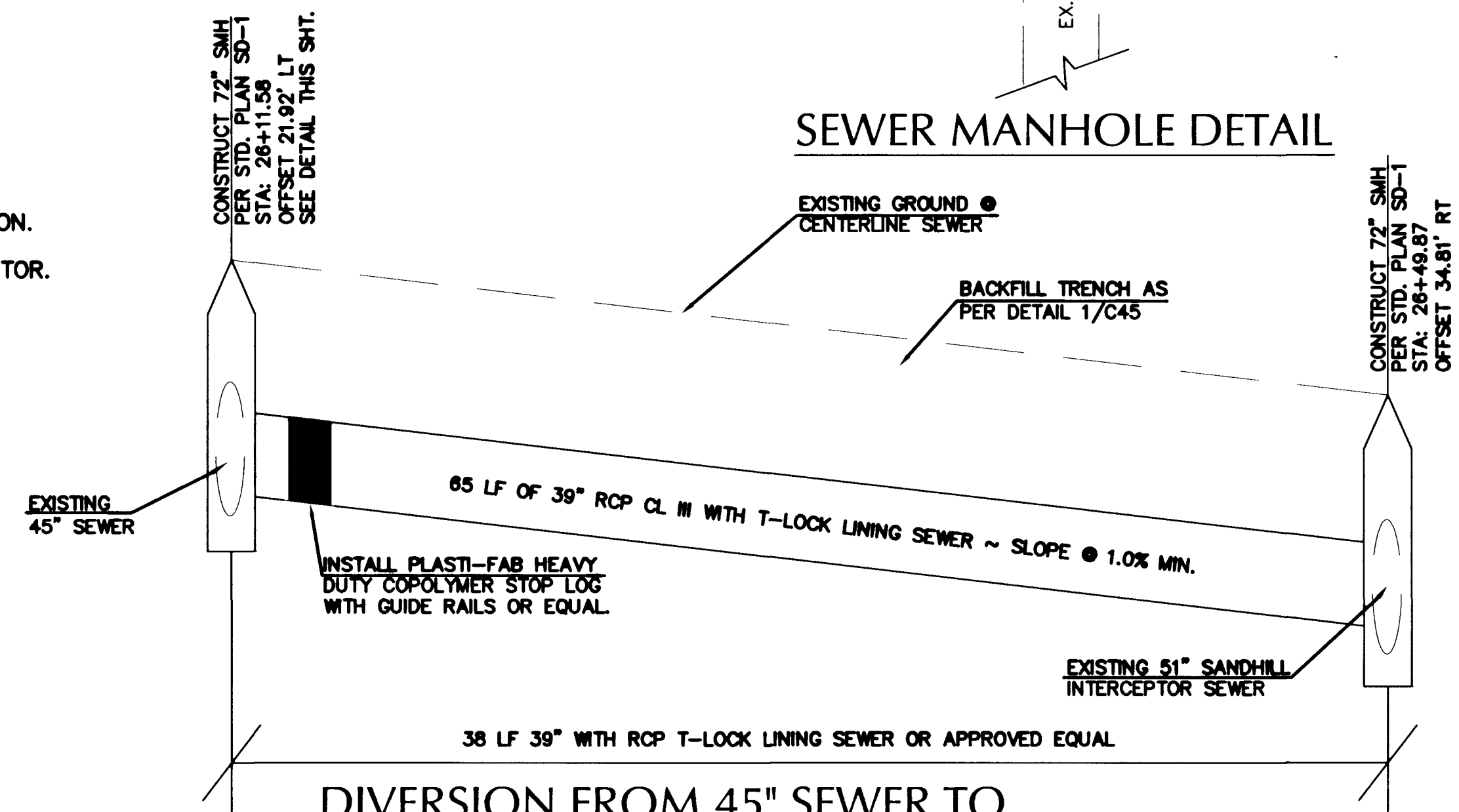
NOTE:

PROTECT WATERLINES IN PLACE. WHEREVER A WATERLINE IS ABOVE A STORM DRAIN OR SEWER WHERE COMPACTION REQUIREMENTS UNDER A WATERLINE CANNOT BE MET, BACKFILL TRENCH WITH CONTROL LOW STRENGTH MATERIAL (CLSM) TO THE SPRINGLINE OF THE WATERLINE. THIS REQUIREMENT IS FOR STRUCTURAL SUPPORT ONLY, ADDITIONAL HEALTH REGULATIONS MAY APPLY PER UDACS 2.19.

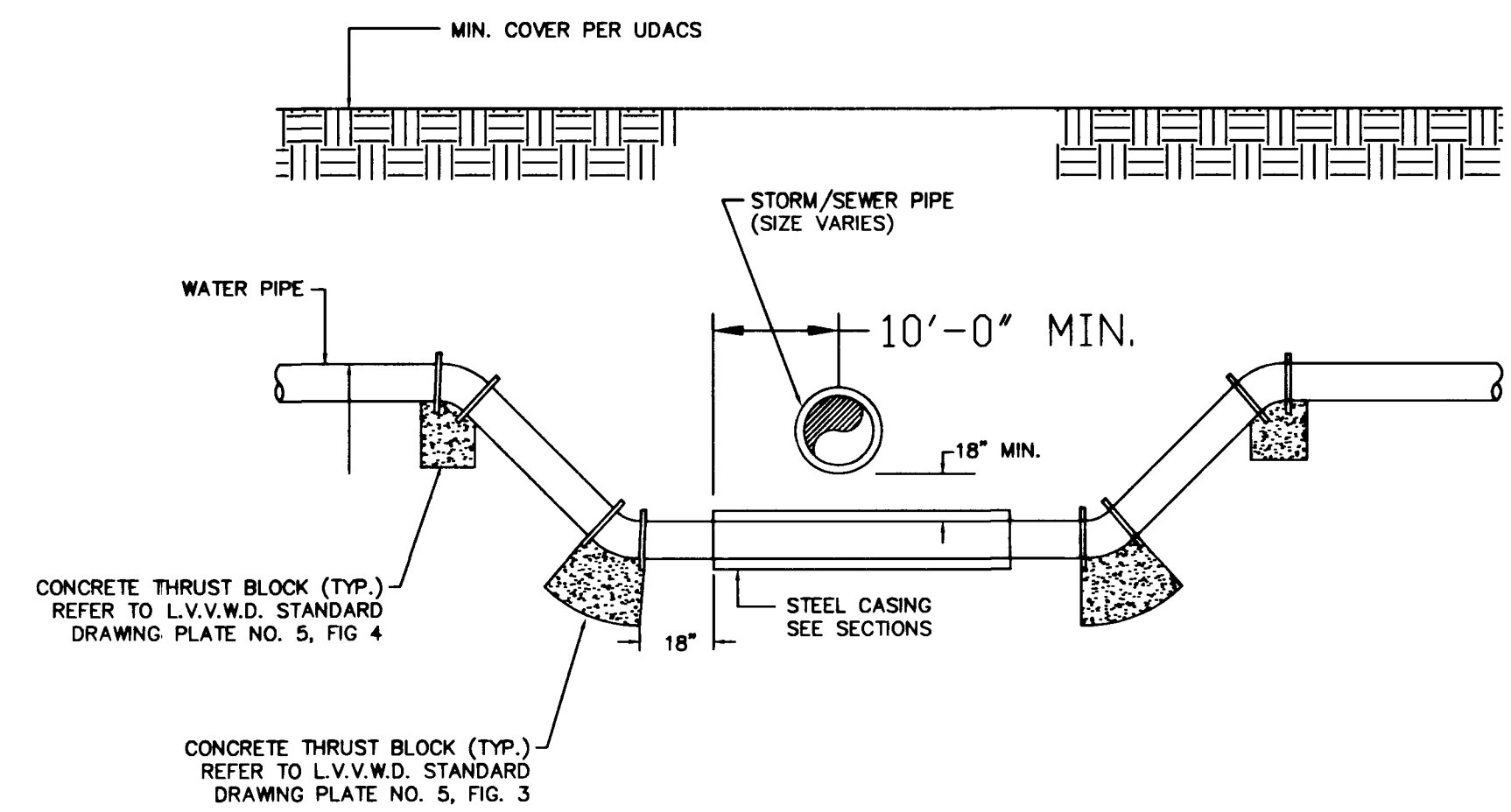
Robert J. Morgan 1st App'd 10/18/03 12/13/03
L.V.V.W.D. DATE



SEWER MANHOLE DETAIL



DIVERSION FROM 45" SEWER TO SANDHILL INTERCEPTOR 51" SEWER
NTS



WHERE THE WATER LINE IS LESS THAN 18 INCHES OVER THE STORM/SEWER LINE, WHERE THE WATERLINE IS UNDER THE STORM/SEWER LINE, AND WHERE THE HORIZONTAL SEPARATION AS REQUIRED BY THE WATER SUPPLY REGULATIONS, CANNOT BE MAINTAINED BECAUSE OF PHYSICAL OBSTRUCTIONS, THE WATER LINE SHALL BE PROTECTED BY CONSTRUCTION OF THE STORM/SEWER LINE AS FOLLOWS:

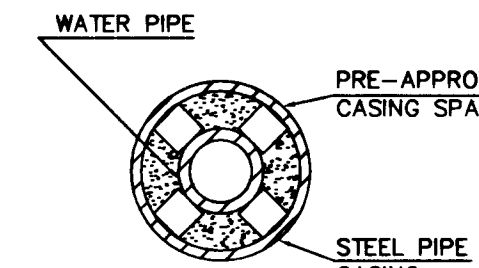
1. THE STORM/SEWER MAIN MUST BE CONSTRUCTED OF WATER SUPPLY QUALITY MATERIALS MEETING AWWA STANDARDS.
2. THE WATER MAIN SHALL BE D.I.P. WITH RESTRAINED JOINTS. INSTALL IN A STEEL CASING WHICH EXTENDS 10' ON EACH SIDE OF THE CROSSING.
3. THE STORM/SEWER MAIN OR WATER MAIN (DEPENDING ON THE FIELD CONDITIONS) SHALL BE TOTALLY ENCASED IN A MINIMUM OF FOUR (4) INCHES OF CEMENT SLURRY (300 PSF +/-) FOR A DISTANCE OF TEN (10) FEET ON EACH SIDE OF THE CROSSING ONLY WITH AGENCY APPROVAL. ENCASEMENT WILL NOT BE PERMITTED FOR ASBESTOS CEMENT PIPE.

EACH OF THESE PROVISIONS SHALL ALSO BE EXTENDED FOR OTHER THAN 90 DEGREE CROSSINGS TO THE POINT AT WHICH THE TEN FOOT SEPARATION BETWEEN THE WATER AND SEWER LINES IS ACHIEVED (10/SINE OF CROSSING ANGLE.)

TYPICAL CASING SECTION

NOTES:

D.I. CARRIER PIPE	PIPE DIA	CASING DIA
6	16	
8	18	
10	20	
12	24	
16	30	
24	42	

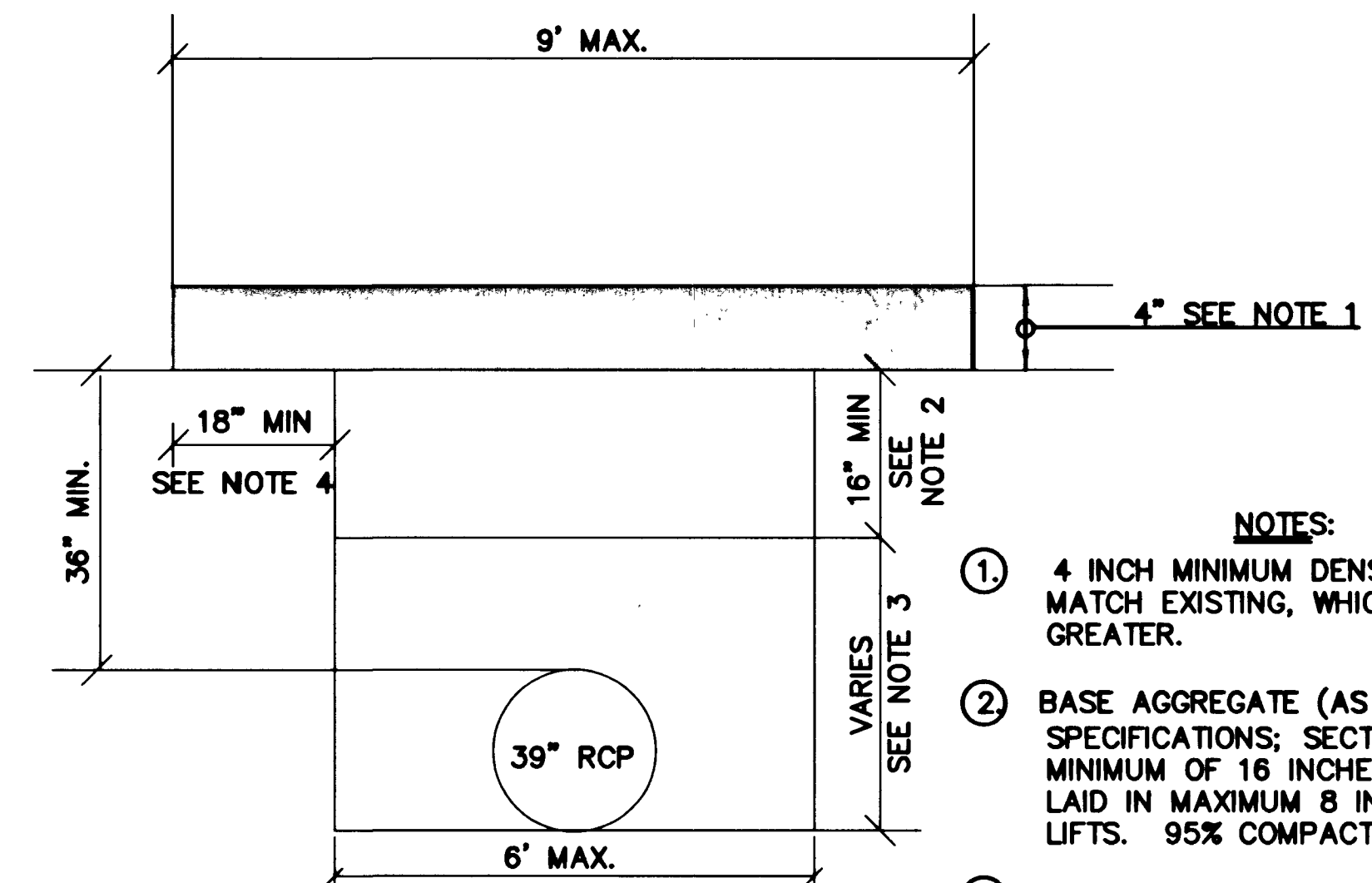


1. STEEL PIPE CASING SYMMETRICAL ABOUT WATER MAIN CENTERLINE.
2. PRE-APPROVED CASING SPACERS AND PRE-APPROVED END SEALS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATION. (REDWOOD SKIDS NOT ALLOWED. UDACS SECTION 3.26 NOT APPLICABLE). USE A "CENTERED" CONFIGURATION AND PROVIDE THE MANUFACTURER WITH THE FOLLOWING:
-PIPE OD
-CASING ID
-CASING LENGTH

1. STEEL PIPE CASING SHALL BE FABRICATED FROM A MINIMUM OF 1/4" THICK STEEL PLATES, CONFORMING TO THE REQUIREMENTS OF ASTM A283, GRADE B, C, OR D. ALL JOINTS SHALL BE WELDED. INTERIOR JOINTS SHALL BE GROUNDED TO A SMOOTH FINISH. ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH AWWA C206, "AWWA STANDARD FOR FIELD WELDING OF STEEL WATER PIPE". COATINGS FOR STEEL CASING ARE NOT REQUIRED.
2. PIPE CASING SHALL BE LAID TRUE TO LINE AND GRADE WITH NO BENDS OR CHANGES IN GRADE FOR THE FULL LENGTH OF THE CASING.
3. THE PIPE SHALL BE SUPPORTED AT EACH END OF EACH JOINT WITH SPACERS. AFTER INSTALLATION OF THE PIPE, THE CASING SHALL BE SEALED AT BOTH ENDS WITH CASING END SEALS. DUCTILE IRON PIPE JOINTS. INSIDE CASING ARE TO BE RESTRAINED.

STORM/SEWER WATER CROSSING DETAIL

NTS



UTILITY TRENCH DRAIN FOR CHARLESTON BLVD

STA. 26+11.58 TO STA. 26+49.87
21.92' LT 34.81' RT

BID# 04.1730.06

no	description of revisions	date	name

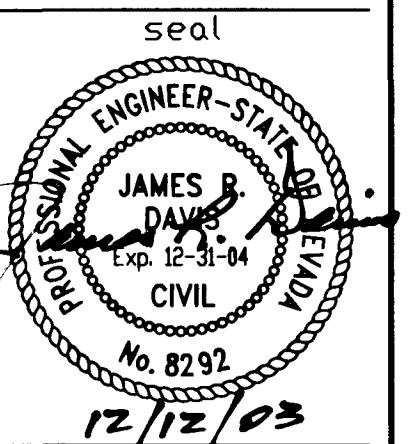
PROJECT NO. 1939.00

DATE 06-23-03

DRAWN BY JDM

DESIGN BY ARS

CHECKED BY DHM



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BRUCE STREET DIVERSION
BONANZA ROAD TO HARRIS AVENUE
AND
CHARLESTON BOULEVARD
SEWER REHABILITATION
SANDHILL ROAD TO NELLIS BOULEVARD
DETAIL SHEET

sheet

C45

SHEET 45 OF 45

drawing number

307-V841