

2.0 WASTEWATER COLLECTOR SYSTEM

2.1 Gravity Sewer Main Materials

Ductile iron pipe shall be designed as per ANSI A21.50 and ANSI A21.51 for a working pressure of 150 psi, laying condition B. Pipe shall be manufactured as per AWWA C141 in 18 ft. minimum lengths.

Pipe joints shall be of the push-on type as per AWWA C151. Pipe lining shall be cement mortar with a seal coat of bituminous material, all in accordance with AWWA C104.

Polyvinyl Chloride (PVC) pipe shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13364-B (with minimum tensile modulus of 500,000 psi) as defined in Specification 01784. PVC pipe shall have integral wall bell and spigot joints for the conveyance of domestic sewage. Fittings shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13364-B as defined in Specification 01784. Fittings must be manufactured by pipe supplier or approved equal, and have bell and/or spigot configurations compatible with that of the pipe. Compounds with superior properties are also acceptable.

Pipe shall have a maximum Standard Dimension Ratio (SDR) of 35. Where laying conditions so warrant, and in accordance with manufacturer's recommendations, lower SDR values (stronger pipe) may be required.

Installation shall consist of either Class I or Class II bedding material (as defined hereinafter), placed 6" below the pipe barrel and continuing to a minimum of 6" above the pipe, as per ASTM D2321. In addition, the installation of PVC pipe shall satisfy the flexible pipe requirements as outlined hereinafter. No Clay or VCP Pipe will be accepted.

Additional Requirements for PVC Pipe

A. Installation of PVC pipe shall follow the recommendations of ASTM-D-2321 "Underground Installation of Flexible Thermoplastic Sewer Pipe". For flexible pipe bedding and embedment material shall be either Class I or Class II, in any area where the pipe will be installed below existing or future ground water levels or where the trench could be subject to inundations, only Class I material shall be used for bedding and embedment.

B. The manufacturer's specifications or otherwise approved method shall be used in determining the stiffness class of the pipe to be installed so as to attain the required deflection control. The class of the pipe must be approved by the Engineer prior to installation.

C. The maximum allowable deflection after installation shall be LESS THAN 5% of the pipe diameter. The mandrel (go/no-go) deflection test must be performed on each line prior to acceptance, and no less than 10 days after installation. The Contractor shall supply the mandrel used for this performance test. The mandrel device shall be cylindrical in shape and have 9 possible contact points with the pipe. The mandrel's length and diameter (ID of proving ring) shall equal the dimensions in the following table, and shall be subject to the Engineer's approval.

For flexible PVC pipes, the following shall apply:

Nominal Diameter	Length	Proving Ring Dia./Mandrel
8"	8"	7.40"

D. For flexible PVC pipe, the pipe shall be produced with bell and construction. Joining will be accomplished by rubber gasket in accordance with manufacturer's recommendation, unless otherwise directed or approved Engineer. Flexible watertight elastomeric seals in accordance D3212-81, may also be used. Each pipe length shall be clearly marked information including pipe size, profile number, and class number.

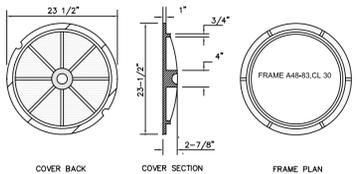
E. A minimum trench width shall be one pipe diameter plus 9" on each side of the pipe.

F. The bedding (6" minimum) and embedment materials shall be per ASTM D2321. The embedment materials shall be installed from trench wall to trench wall and from the invert to a minimum of 6" above the crown of the pipe.

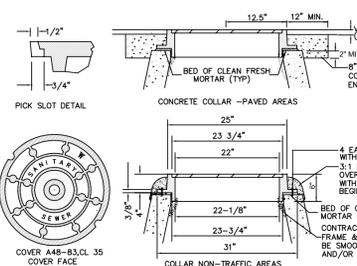
G. The bedding and embedment materials shall be compacted to a minimum of 90% Standard Proctor density for Class I and II materials. Bedding and embedment materials classifications shall be defined as follows:

Class I	Angular (1/4" to 1-1/2") graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, crushed gravel and crushed shells.
Class II	Coarse sands and gravels with maximum particle size of 1-1/2", including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW & SP are included in this class.

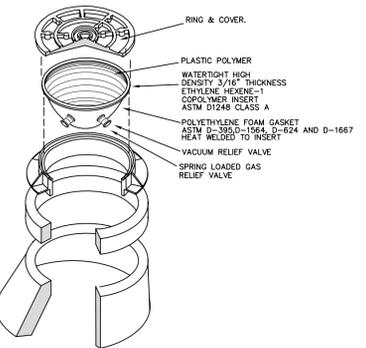
H. The minimum design slope for gravity sewer mains shall be 0.6%, and no gravity lines will be accepted with less than 0.5% slope "installed".



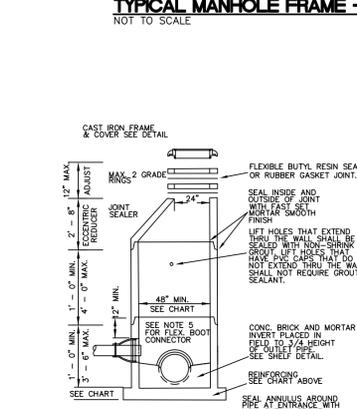
- NOTES:
- MANHOLE FRAME AND COVER SHALL BE MADE OF GRAY CAST IRON CONFORMING TO ASTM SPEC. A48-83 CL. 30/25 RESPECTIVELY, MANUFACTURED BY SAME MANUFACTURER. ALL CASTINGS SHALL CONFORM TO THE SHAPE AND DIMENSIONS SHOWN. THEY SHALL BE CLEAN AND PERFECT, WITHOUT BLOW OR SAND HOLES OR DEFECTS OF ANY KIND, TENDING TO IMPAIR THEIR STRENGTH. NO PLUGGING OR STOPPING OF DEFECTIVE HOLES WILL BE PERMITTED.
 - CASTINGS SHALL BE UNPAINTED AND SHALL HAVE THE LETTERS "MWC-FAY-NC" AND "SANITARY SEWER" CAST INTO COVER. LETTERS SHALL BE RAISED AND CLEARLY VISIBLE.
 - MANHOLE RING AND COVER SHALL WITHSTAND 11-20 VEHICULAR TRAFFIC. ROCKING COVERS SHALL NOT BE ACCEPTABLE.
 - MINIMUM AVERAGE WEIGHT: PLUS OR MINUS 5% RING 175 LBS., COVER 135 LBS., UNIT 310 LBS.
 - PERFORATED COVERS WILL NOT BE ALLOWED.



TYPICAL MANHOLE FRAME + COVER
NOT TO SCALE

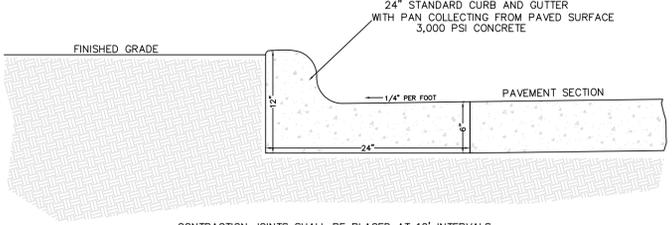


TYPICAL MANHOLE INSERT
NOT TO SCALE

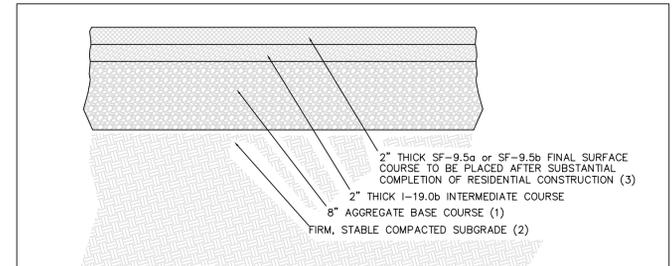


TYPICAL MANHOLE
NOT TO SCALE

- NOTES:
- PRECAST REINFORCED CONCRETE MANHOLES SHALL BE IN ACCORDANCE WITH ASTM C-478
 - MIN. CONCRETE COMPRESSIVE STRENGTH SHALL BE 4000 PSI
 - MANHOLES GREATER THAN 4' DEPTH SHALL HAVE MIN. 8" EXTENDED BASE
 - FLEXIBLE BUTYL RESIN JOINT SEALANT, RUBBER GASKET, JOINT SEAL SHALL BE IN ACCORDANCE W/ASTM C-441
 - FLEXIBLE EPDM RUBBER BOOT CONNECTORS SHALL BE IN ACCORDANCE W/ ASTM C923. INSTALLED BY MANUFACTURER W/STAINLESS STEEL COMPRESSION RING AND TAKE-UP CLAMP. CONNECTION TO MAIN SHALL BE BY CONTRACTOR WITH STAINLESS STEEL PIPE CLAMP
 - CONNECTIONS TO EXISTING MANHOLES SHALL BE BY CORING MANHOLE AND FIELD INSTALLING A FLEX. BOOT CONNECTOR. DO NOT ALLOW DEBRIS TO ENTER SYSTEM.
 - MORTAR SHALL BE QUICK SETTING, NON-SHRINK GROUT MIXED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
 - MANHOLE STEPS SHALL BE IN ACCORDANCE WITH ASTM G478 AND OSHA REGULATIONS ALIGN W/INVERT OUT.
 - PREFORMED MANHOLE INVERTS ARE NOT ACCEPTABLE UNLESS SPECIFICALLY APPROVED BY ENGINEER IN WRITING. STANDING WATER IN INVERT OF MANHOLE IS NOT ACCEPTABLE.
 - INVERT ON PLANS IS TO MH CL.

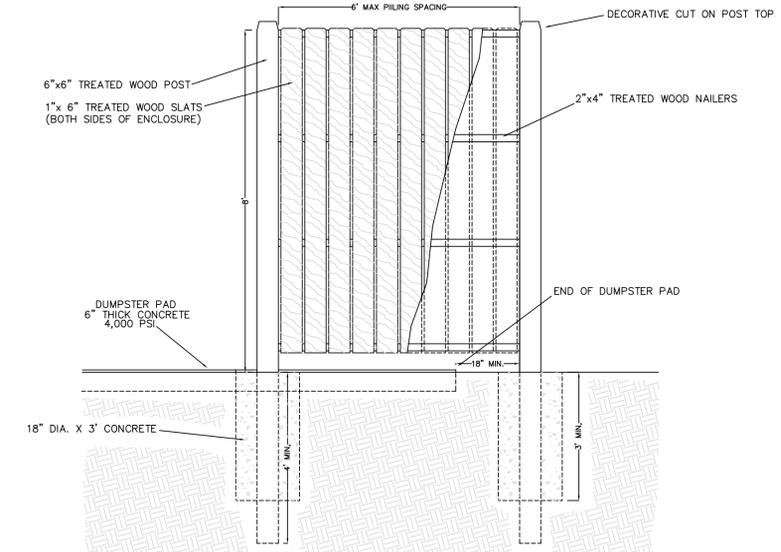


CONTRACTION JOINTS SHALL BE PLACED AT 10' INTERVALS. ALL CONTRACTION JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER.
CURB AND GUTTER PAVING SECTION
NOT TO SCALE

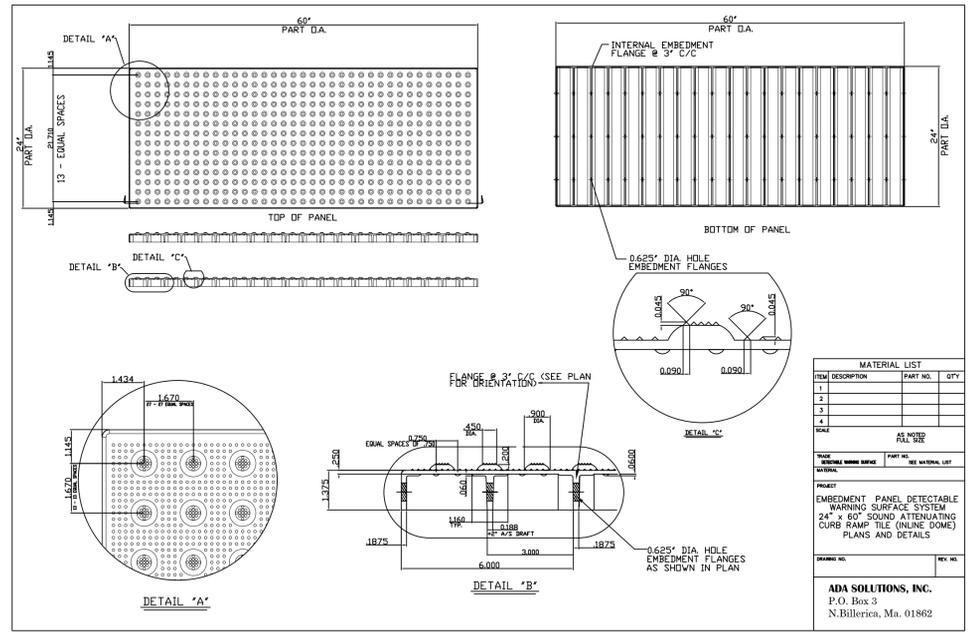


TYPICAL HEAVY DUTY ASPHALT PAVING SECTION

- NCDOT ABC materials compacted to a dry density of at least 100% of the Standard Proctor maximum dry density (ASTM D698)
- Subgrade soils compacted to a dry density of at least 100% of the Standard Proctor maximum dry density (ASTM D698)
- Optional, surface course may be placed with original intermediate paving



DUMPSTER PAD ENCLOSURE SIDE VIEW
NOT TO SCALE

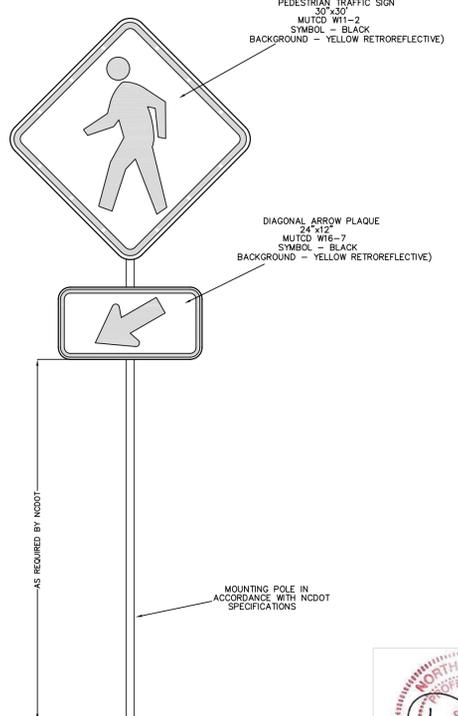


DETECTABLE PAVER PANELS - ADA SOLUTIONS, INC. or EQUAL
NOT TO SCALE

MATERIAL LIST

ITEM	DESCRIPTION	PART NO.	QTY.
1			
2			
3			
4			

SCALE: AS SHOWN
DATE: 10-06-20
PROJECT: EMBEDMENT PANEL DETECTABLE WARNING SURFACE SYSTEM 24" x 60" SOUND ATTENUATING CURB RAMP TILE (MINE DOME) PLANS AND DETAILS
DRAWN BY: MWR
REV. NO.:
ADA SOLUTIONS, INC.
P.O. Box 3
N.Billerica, Ma. 01862



PEDESTRIAN CROSSING SIGN
NOT TO SCALE

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DETAIL SHEET 2
NOT RELEASED FOR CONSTRUCTION



REVISIONS

NO.	DATE	DESCRIPTION	BY	DATE
1	10-06-20	TECH 2 - REVIEW COMMENTS	MWR	

PROJECT: **BERMUDA BAY - SOMERSET**
NORTH CAROLINA
KILL DEVIL HILLS
DARE COUNTY
BUILDING 201 AND 202-KDH REVIEW PLAN

DATE: 10-06-20
SCALE: N.T.S.
DESIGNED: MWR
DRAWN: MWR
SHEET: S10 OF 11
CAD FILE: 382500B1.DWG
PROJECT NO: 3825

