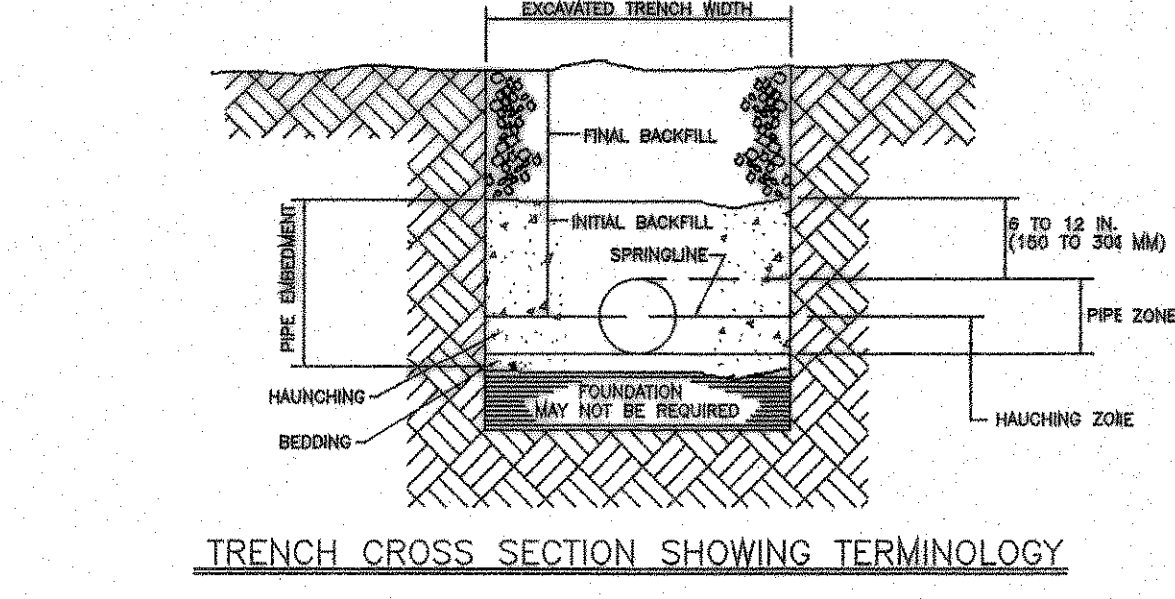
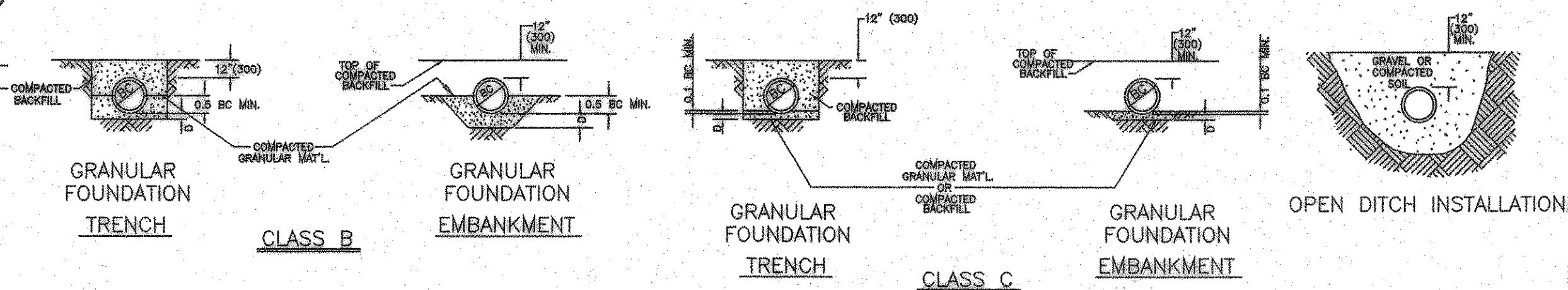


RECOMMENDATIONS FOR INSTALLATION AND USE OF SOILS AND AGGREGATES FOR FOUNDATION, EMBEDMENT AND BACKFILL

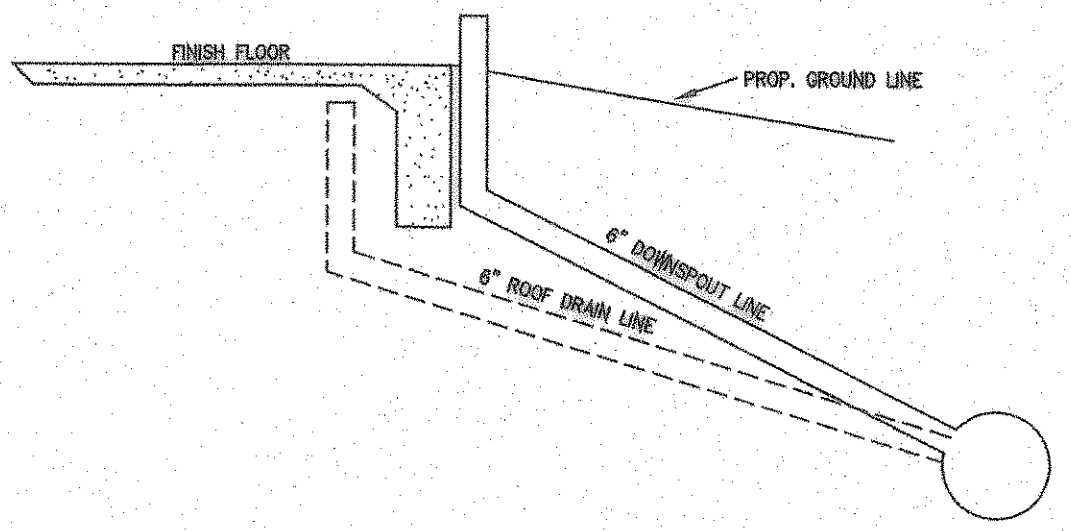
	CLASS IA	CLASS IB	CLASS II	CLASS III
GENERAL RECOMMENDATIONS AND RESTRICTIONS	DO NOT USE WHERE CONDITIONS MAY CAUSE MIGRATION OF FINES FROM ADJACENT SOIL AND LOSS OF PIPE SUPPORT. SUITABLE FOR USE AS DRAINAGE BLANKET AND UNDERDRAIN IN ROCK CUTS WHERE ADJACENT MATERIAL IS SUITABLY GRADED.	PROCESS MATERIAL AS REQUIRED TO OBTAIN GRADATION WHICH WILL MINIMIZE MIGRATION OF ADJACENT MATERIALS. SUITABLE FOR USE AS DRAINAGE BLANKET AND UNDERDRAIN.	WHERE HYDRAULIC GRADIENT EXISTS CHECK GRADATION TO MINIMIZE MIGRATION. "CLEAN GROUPS" SUITABLE FOR USE AS DRAINAGE BLANKET AND UNDERDRAIN.	DO NOT USE WHERE WATER BOTTOM AS RESTRICTED OVER-EXCAVATED TRENCH MAY CAUSE INSTABILITY.
FOUNDATION	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM. DO NOT USE IN THICKNESSES GREATER THAN 12 IN. TOTAL. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.
BEDDING	SUITABLE AS RESTRICTED ABOVE. INSTALL IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	SUITABLE ONLY IN DRY TRENCH CONDITIONS. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).
HAUNCHING	SUITABLE AS RESTRICTED ABOVE. INSTALL IN 6-IN. MAXIMUM LAYERS. WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.	INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS WORK IN AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 IN. (6 IN. IN ROCK CUTS).	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS WORK AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.
INITIAL BACKFILL	SUITABLE AS RESTRICTED ABOVE. INSTALL TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.	INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.
EMBEDMENT/COMPACTION	PLACE AND WORK BY HAND TO INSURE ALL EXCAVATED AREAS ARE FILLED. FOR HIGH DENSITY USE VIBRATORY COMPACTORS.	MINIMUM DENSITY 85% STD. PROCTOR USE HAND TAMPER OR VIBRATORY COMPACTORS.	MINIMUM DENSITY 85% STD. PROCTOR USE HAND TAMPER OR VIBRATORY COMPACTORS.	MINIMUM DENSITY 80% STD. PROCTOR USE HAND TAMPER OR VIBRATORY COMPACTORS. MAINTAIN MOISTURE CONTENT NEAR OPTIMUM TO MINIMIZE COMPACTIVE EFFORT.
FINAL BACKFILL	COMPACT AS REQUIRED BY THE ENGINEER.	COMPACT AS REQUIRED BY THE ENGINEER.	COMPACT AS REQUIRED BY THE ENGINEER.	COMPACT AS REQUIRED BY THE ENGINEER.



HIGH DENSITY CORRUGATED POLYETHYLENE PIPE
H-20 AND E-80 LIVE LOADS

NOMINAL DIAMETER IN. (MM)	H-20 E-80	MINIMUM COVER IN. & (MM)	MAXIMUM COVER FT. (M)
12 (300)	12 (300)	24 (600)	58 (18)
15 (375)	12 (300)	24 (600)	59 (18)
18 (450)	12 (300)	24 (600)	62 (19)
24 (600)	12 (300)	24 (600)	61 (19)
30 (750)	12 (300)	24 (600)	61 (19)
36 (900)	12 (300)	24 (600)	61 (19)
42 (1050)	12 (300)	24 (600)	61 (19)
48 (1200)	12 (300)	24 (600)	61 (19)

STRUCTURAL DESIGN CALCULATIONS BASED UPON LOAD FACTOR DESIGN METHODOLOGY PER AASHTO.



DOWNSPOUT DETAIL

NOTE:
1. AT ALL LOCATIONS OF DOWNSPOUTS AND ROOF DRAINS A 6" PVC PIPE IS TO BE INSTALLED FROM THE 12" PVC LINE TO THE FOUNDATION AND EXTEND UP ABOVE THE FINISH FLOOR ELEV. SEE ARCH. PLAN FOR THE CONNECTION DETAIL AND THE ROOF PLAN FOR ACTUAL DOWNSPOUT AND ROOF DRAIN LOCATIONS.

*WHEN USING MECHANICAL COMPACTORS AVOID CONTACT WITH PIPE. WHEN COMPACTING OVER PIPE CROWN MAINTAIN A MINIMUM OF 6 IN. COVER WHEN USING SMALL MECHANICAL COMPACTORS. WHEN USING LARGER COMPACTORS MAINTAIN MINIMUM CLEARANCES AS REQUIRED BY THE ENGINEER.
*THE MINIMUM DENSITIES GIVEN IN THE TABLE ARE INTENDED AS THE COMPACTION REQUIREMENTS FOR OBTAINING SATISFACTORY EMBEDMENT STIFFNESS IN MOST INSTALLATION CONDITIONS.

GENERAL NOTES:

- MATERIALS: UNLESS OTHERWISE SPECIFIED ON THE PLANS OR HEREIN, CORRUGATED POLYETHYLENE PIPE SHALL CONFORM TO AASHTO M-294, LATEST EDITION, STANDARD SPECIFICATION FOR CORRUGATED POLYETHYLENE PIPE.
- RESINS: CORRUGATED POLYETHYLENE PIPE SHALL BE MANUFACTURED FROM HIGH DENSITY POLYETHYLENE VIRGIN COMPOUNDS, AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM D-3390 FOR THE CELL CLASSIFICATION 324420C.
- COUPLING BANDS: EXCEPT AS OTHERWISE REQUIRED HEREIN, COUPLING BANDS AND OTHER HARDWARE FOR CORRUGATED POLYETHYLENE PIPE SHALL DEMONSTRATE THAT THEY MEET THE SOIL TIGHTNESS REQUIREMENTS OF AASHTO SECTION 26.4.2.4 "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES."
COUPLING BANDS SHALL LAP EQUALLY ON EACH OF THE PIPES BEING CONNECTED TO FORM A TIGHTLY CLOSED JOINT AFTER INSTALLATION.
THE CORRUGATIONS IN THE BAND SHALL INDEX THE CORRUGATIONS IN THE PIPE ENDS TO ENGAGE THE FIRST OR SECOND CORRUGATION FROM THE END OF EACH PIPE.
WHEN INFILTRATION OF EXFILTRATION IS A CONCERN, THE COUPLING MAY BE REQUIRED TO HAVE GASKETS. THE GASKET MATERIAL SHALL BE CLOSED-CELL EXPANDED RUBBER OR NEOPRENE.

- DESIGNATION OF TYPE: THE TYPES OF PIPE WILL BE INDICATED BY THE FOLLOWING DESCRIPTIONS
TYPE C: THIS PIPE WILL HAVE A FULL CIRCULAR CROSS-SECTION, WITH A CORRUGATED SURFACE BOTH INSIDE AND OUTSIDE.
TYPE S: THIS PIPE WILL HAVE A FULL CIRCULAR CROSS-SECTION, WITH AN OUTER CORRUGATED PIPE WALL AND A SMOOTH INNER LINER.
TYPE D: THIS PIPE SHALL CONSIST OF AN ESSENTIALLY SMOOTH WATERWAY BRACED CIRCUMFERENTIALLY WITH CIRCULAR RIBS WHICH ARE FORMED SIMULTANEOUSLY WITH A SMOOTH OUTER WALL.
- INSTALLATION: CORRUGATED POLYETHYLENE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321, LATEST EDITION, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS."

TRENCH WIDTH BASED ON OUTSIDE DIAMETER

PIPE (INSIDE) DIAMETER IN. (MM)	TRENCH WIDTH FT. (M)
15 (375)	3.0 (1)
18 (450)	3.2 (1)
24 (600)	3.9 (1.2)
30 (750)	4.8 (1.5)
36 (900)	5.4 (1.7)
42 (1050)	6.9 (2.1)
48 (1200)	7.4 (2.3)

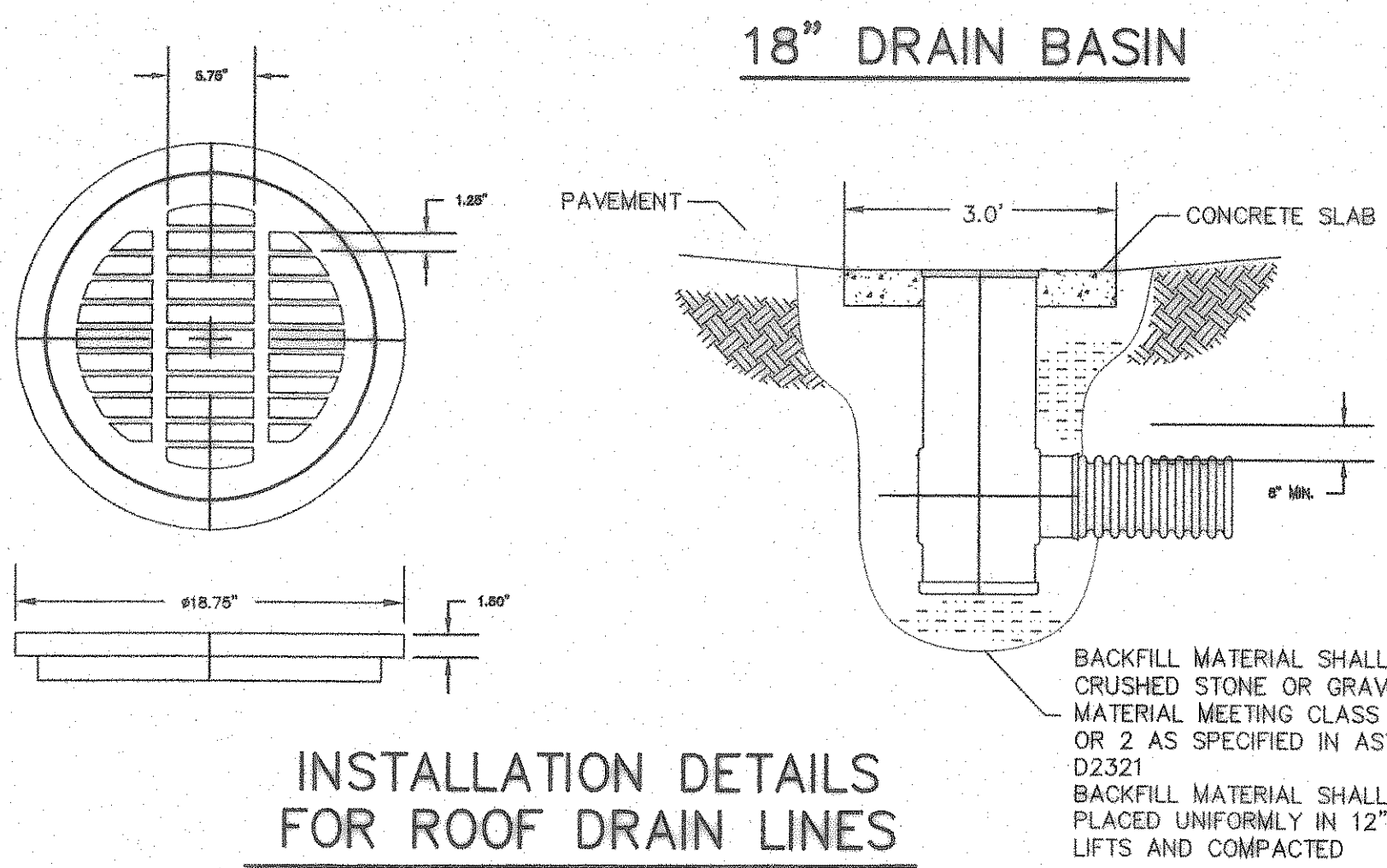
MULTIPLE INSTALLATION OF POLYETHYLENE PIPES

DIAMETER OF PIPE IN. (MM)	CLEAR DISTANCES BETWEEN PIPES FT. (M)
18 (450)	1' 2" (0.36)
24 (600)	1' 5" (0.44)
30 (750)	1' 8" (0.52)
36 (900)	1' 11" (0.60)
42 (1050)	2' 2" (0.68)
48 (1200)	2' 5" (0.76)

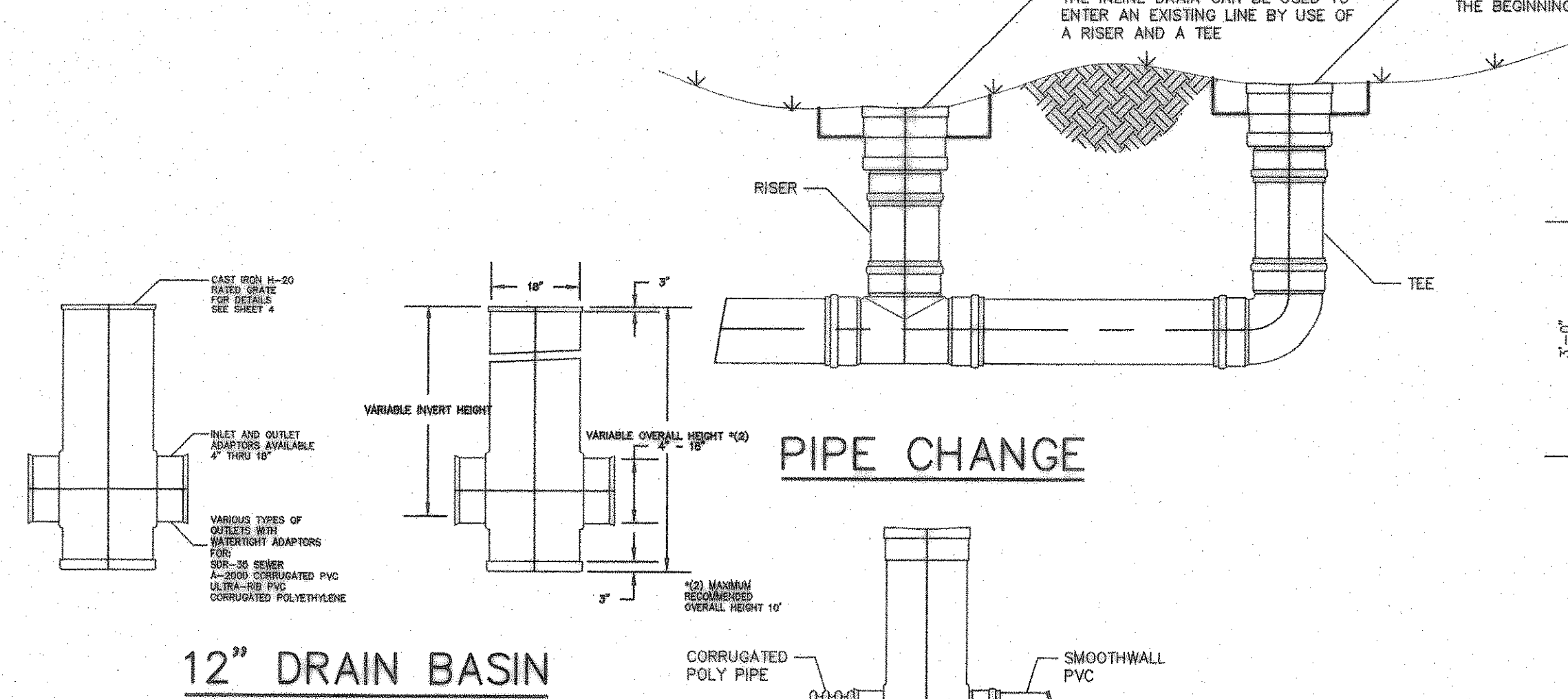
CLASSES OF EMBEDMENT AND BACKFILL MATERIALS

CLASS	TYPE	SOIL GROUP SYMBOL D 2487	DESCRIPTION	PERCENTAGE PASSING SIEVE SIZES		
				1 1/2 IN. (40 MM) NO. 4 (4.75 MM) NO. 200 (0.075 MM)		
IA	MANUFACTURED AGGREGATES OPEN-GRADED, CLEAN.	NONE	ANGULAR, CRUSHED STONE OR ROCK, CRUSHED GRAVEL, BROKEN CORAL, CRUSHED SLAG, CINDERS OR SHELLS; LARGE VOID CONTENT, CONTAIN LITTLE OR NO FINES.	100% <5% <5%		
IB	MANUFACTURED, DENSE-GRADED, CLEAN.	NONE	ANGULAR, CRUSHED STONE (OR OTHER CLASS IA MATERIALS) AND STONE/SAND MIXTURES WITH GRADATIONS SELECTED TO MINIMIZE MIGRATION OF ADJACENT SOILS; CONTAIN LITTLE OR NO FINES (SEE X1.8).	100% <5% <5%		
II	COARSE-GRAINED SOILS, CLEAN	GW	WELL-GRADED GRAVELS AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES.	100% <5% <5%		
		GP	POORLY-GRADED GRAVELS AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES.	<50% OF "COARSE FRACTION"		
		SW	WELL-GRADED SANDS AND GRAVELLY SANDS; LITTLE OR NO FINES.	>50% OF "COARSE FRACTION"		
		SP	POORLY-GRADED SANDS AND GRAVELLY SANDS; LITTLE OR NO FINES.	>50% OF "COARSE FRACTION"		
COARSE-GRAINED SOILS, BORDERLINE CLEAN TO W/FINES				E.G. GW-GC, SP-SM	SANDS AND GRAVELS WHICH ARE BORDERLINE BETWEEN CLEAN AND WITH FINES.	100% VARIES 5% TO 12%
III	COARSE-GRAINED SOILS, WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND SILT MIXTURES.	100% <5% OF "COARSE FRACTION" 12% TO 50%		
		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.	<5% OF "COARSE FRACTION"		
		SM	SILTY SANDS, SAND-SILT MIXTURES.	>50% OF "COARSE FRACTION"		
		SC	CLAYEY SANDS, SAND-CLAY MIXTURES.	>50% OF "COARSE FRACTION"		

AREA DRAIN DETAILS



INSTALLATION DETAILS FOR ROOF DRAIN LINES



12" DRAIN BASIN

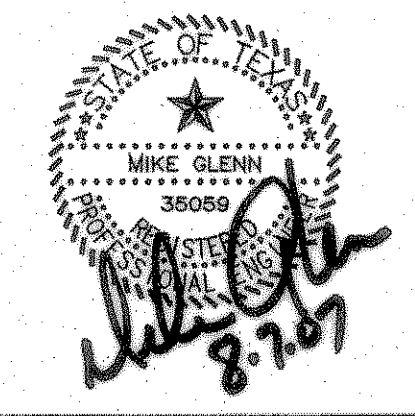
ADS OR HANCOR PIPE INSTALLATION DETAILS FOR STORM DRAIN LINES

RECORD DRAWING
This is to certify that changes and corrections have been made to conform to the contractor's record of this project.
Signed: *[Signature]* Date: 8.7.07
Glenn Engineering Corporation

ROOF DRAIN DETAILS
AS SHOWN
GLENN ENGINEERING
PHONE 972-717-5251 FAX 972-717-2075
106 DECKER COURT - SUITE 610 IRVING, TEXAS 75062

Consultants:
CIVIL: GLENN ENGINEERING CORP
STRUCTURAL: SHW GROUP, LLP
MEP: ESTES McCLURE AND ASSOCIATES.
FOOD SERVICE: H. G. RICE Inc.
LANDSCAPING: GRUBBS RAMSEY

FINAL PLANS FOR BIDDING AND CONSTRUCTING



Rockwall Independent School District

ROCKWALL ELEMENTARY SCHOOL #11
RISD, TEXAS

Project Number: 1441.05.021
Drawing Date: 3/09/2006
Drawn: R.HOWMAN
Checked: RAH
Scale: AS SHOWN
ACAD File: BUSIEK-Details-ALL.dwg
© 2006 SHW Group, LLP

- Revisions:
- 07/20/2006 CITY COMMENTS
 - 08/15/2006 CITY COMMENTS
 - 10/17/2006 REVISED BOX ELEVATIONS
 - 10/23/2006 WATER REVISIONS

Sheet Title:
ROOF DRAIN DETAILS

CU 1.12

Aug 07, 2007 - 2:24pm User: Robert Howman \\Roberthp\c-drive\ROCKWALL\SET\DETAILS\BUSIEK-Details-ALL.dwg