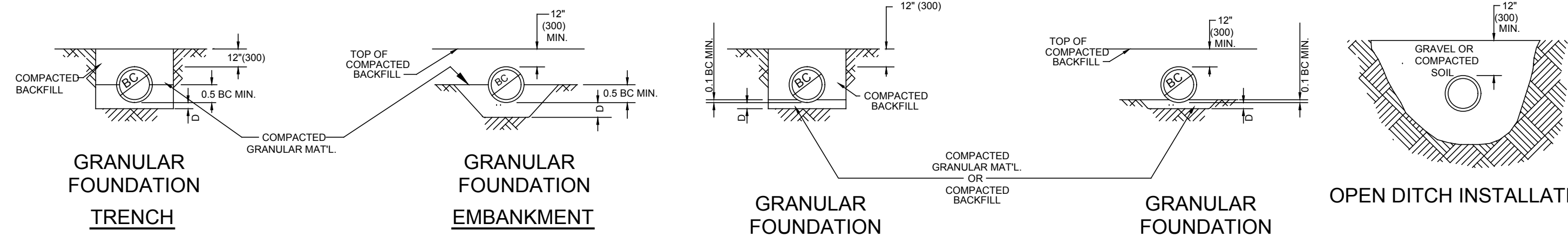
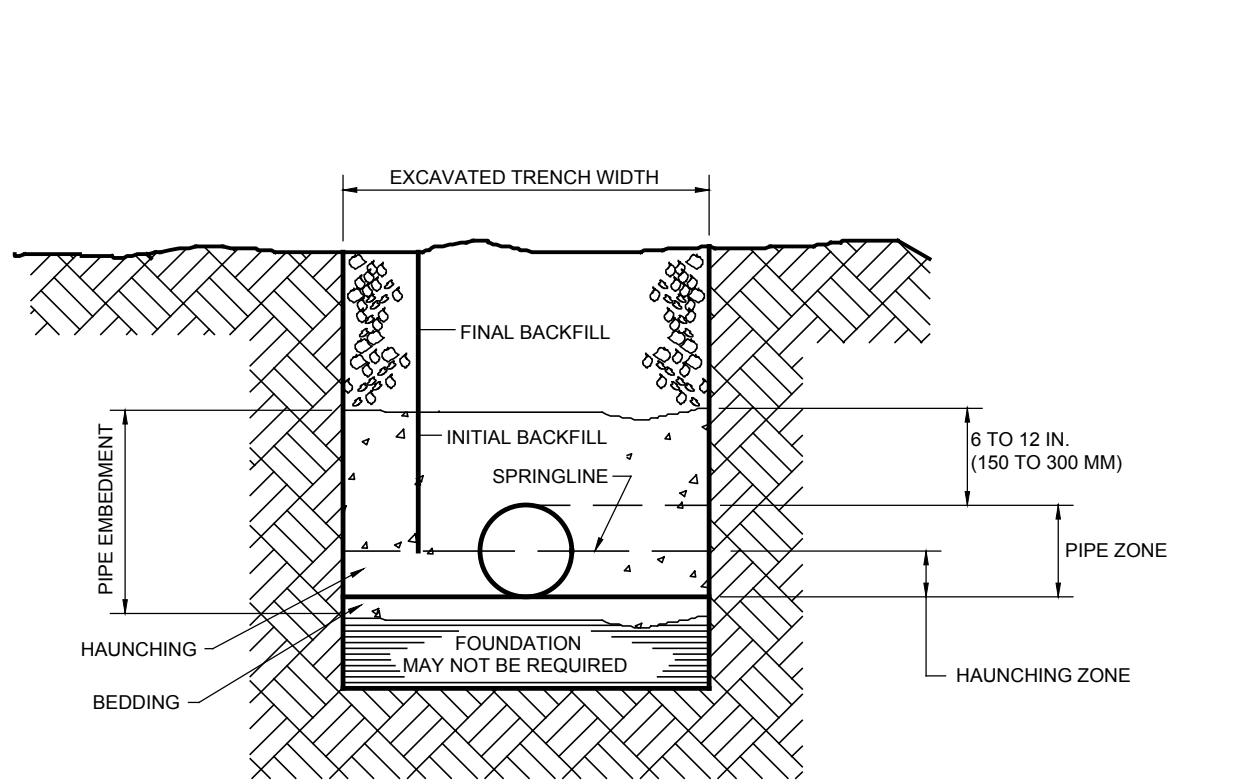


RECOMMENDATIONS FOR INSTALLATION AND USE OF SOILS AND AGGREGATES FOR FOUNDATION, EMBEDMENT AND BACKFILL

	CLASS IA	SOIL CLASS 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 CONDITIONS IN 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 AS RESTRICTED ABOVE. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM AS RESTRICTED ABOVE. DO NOT USE IN THICKNESSES GREATER THAN 12 IN. TOTAL. INSTALL AND COMPACT IN 6-IN. MAXIMUM LAYERS.	SUITABLE AS FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM AS RESTRICTED ABOVE. 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. WORK AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.	SUITABLE AS RESTRICTED ABOVE. INSTALL AND COMPACT TO A MINIMUM OF 6 IN. ABOVE PIPE CROWN.
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 VOIDS AND HAUNCH AREAS ARE FILLED. FOR HIGH DENSITIES USE VIBRATORY COMPACTORS.	MINIMUM DENSITY 85 % STD. PROCTOR USE HAND TAMPERS OR VIBRATORY COMPACTORS.	MINIMUM DENSITY 85 % STD. PROCTOR USE HAND TAMPERS OR VIBRATORY COMPACTORS. MAINTAIN MOISTURE CONTENT NEAR OPTIMUM TO MINIMIZE COMPACTIVE EFFORT.	MINIMUM DENSITY 90 % STD. PROCTOR USE HAND TAMPERS 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.



CLASS B (PRIVATE)



TRENCH CROSS SECTION SHOWING TERMINOLOGY

CLASS C (PRIVATE)

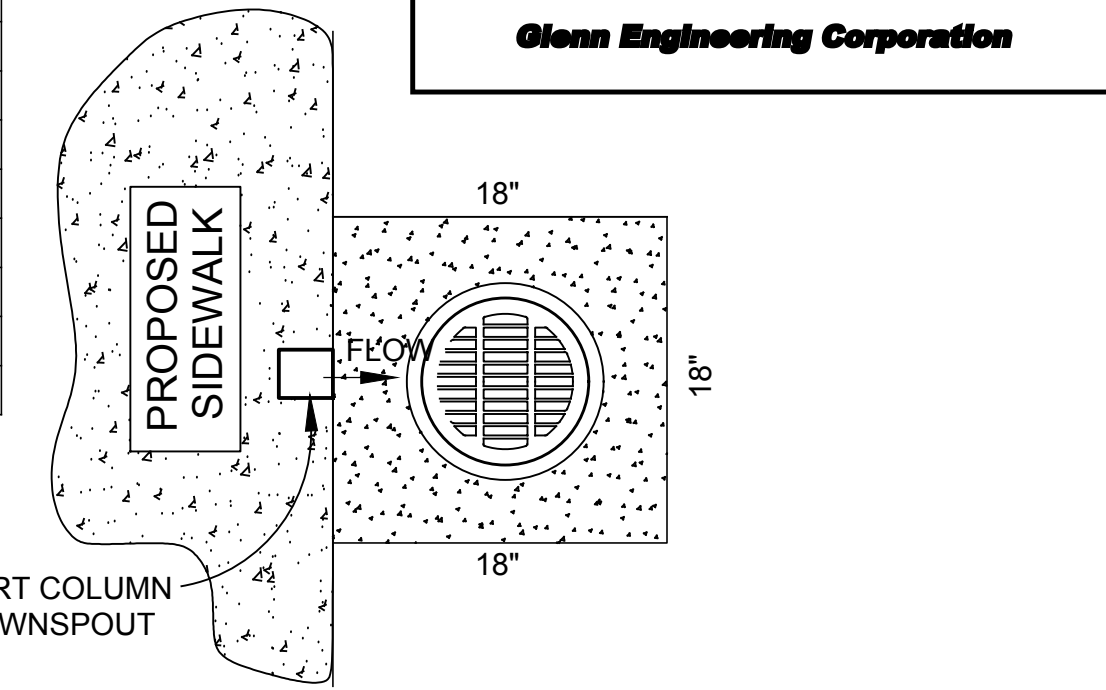
HIGH DENSITY CORRUGATED POLYETHYLENE PIPE HEIGHT OF COVER H-20 AND E-80 LIVE LOADS

NOMINAL DIAMETER IN. (MM)	MINIMUM COVER IN. & (MM)		MAXIMUM COVER FT. (M)
	H-20	E-80	
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.

RECORD DRAWING THIS IS TO CERTIFY THAT CHANGES AND CORRECTIONS HAVE BEEN MADE TO CONFORM TO THE CONTRACTOR'S RECORD OF THIS PROJECT.

SIGN: *Cheryl Amig*
DATE: 06/01/2020
Glenn Engineering Corporation



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-3350 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 RISERS 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)

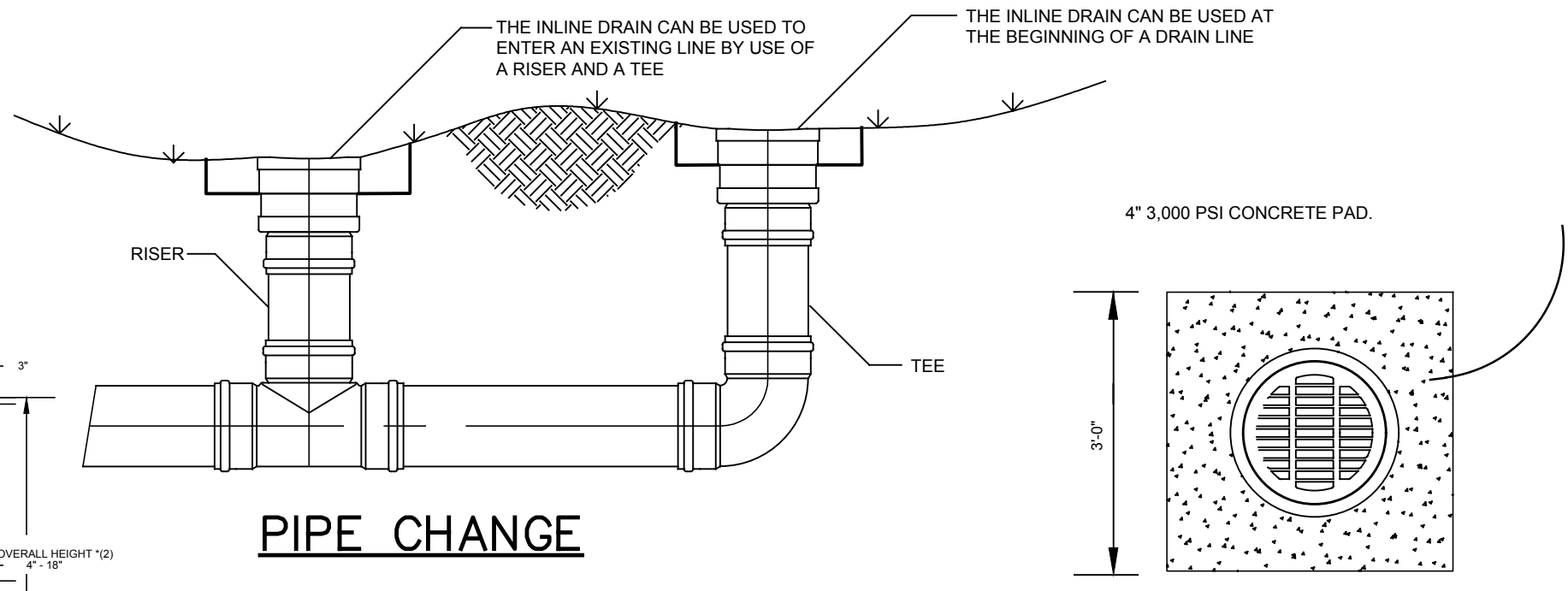
MULTIPLE INSTALLATION OF POLYETHYLENE PIPES

DIAMETER OF PIPE IN. (MM)	CLEAR DISTANCES BETWEEN PIPES FT. (M)
12 (300)	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)

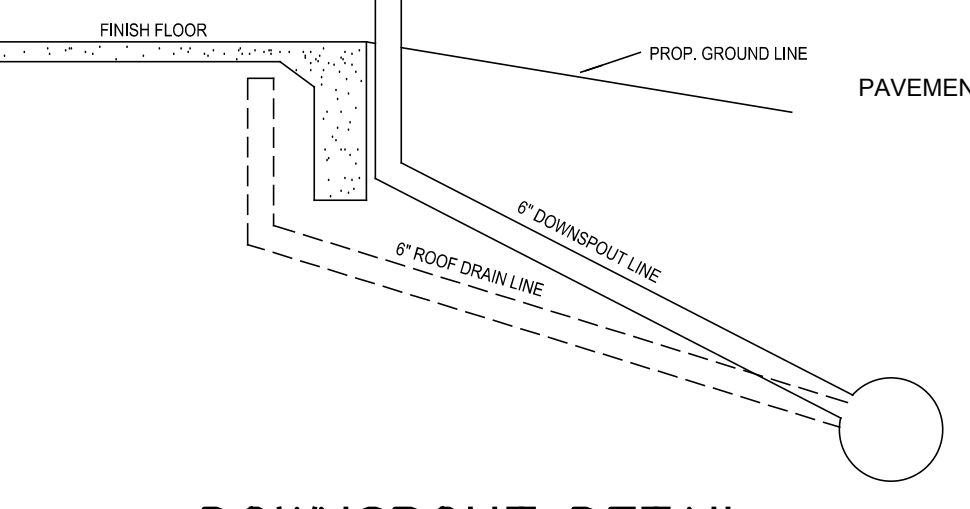
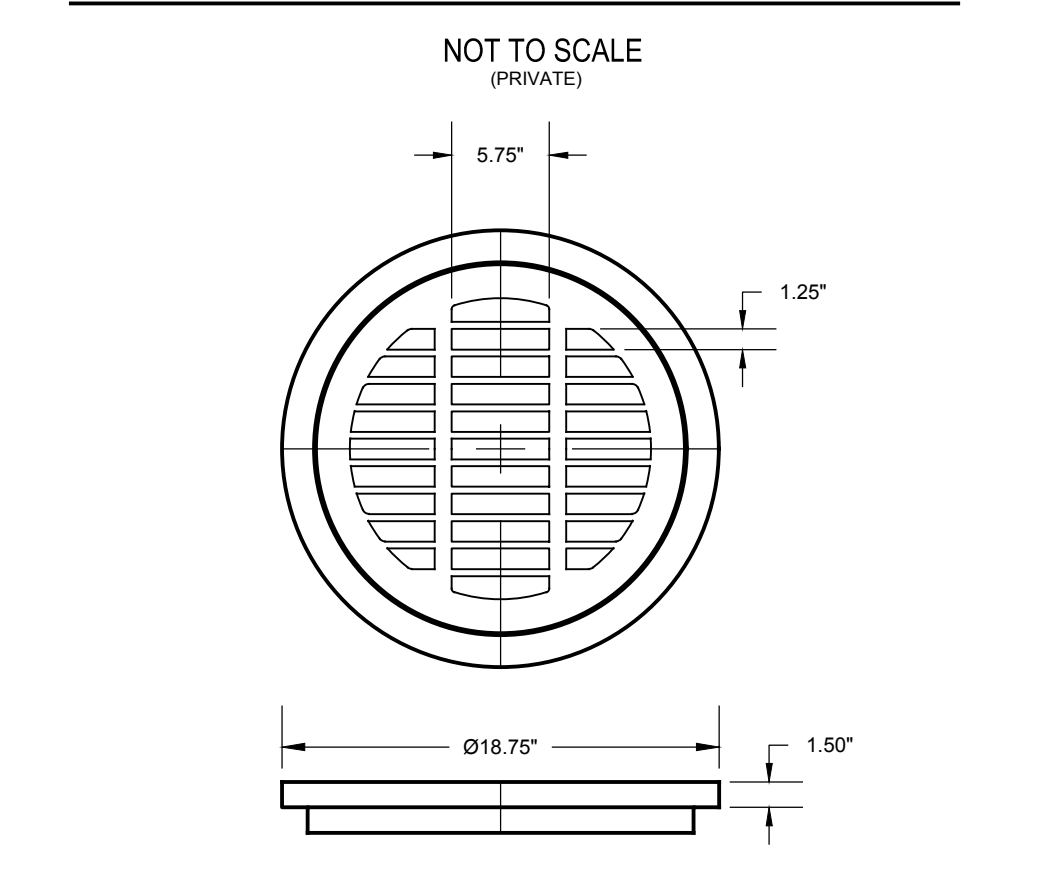
CLASSES OF EMBEDMENT AND BACKFILL MATERIALS

CLASS	TYPE	SOIL GROUP BY USDA D 2487	DESCRIPTION	PERCENTAGE PASSING SIEVE SIZES		
				NO. 10 (2.00 MM)	NO. 40 (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%	± 10%	± 5%
			MANUFACTURED, PROCESSED AGGREGATES, DENSE-GRADED, CLEAN	100%	± 50%	± 5%
II	COARSE-GRAINED SOILS, CLEAN	GW	WELL-GRADED GRAVELS AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES.	100%	± 50%	± 5%
			POORLY GRADED GRAVELS AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES.	100%	± 50%	± 5%
			WELL-GRADED SANDS AND GRAVELY SANDS; LITTLE OR NO FINES.	100%	± 50%	± 5%
			POORLY GRADED SANDS AND GRAVELY SANDS; LITTLE OR NO FINES.	100%	± 50%	± 5%
			COARSE-GRAINED SOILS, BORDERLINE CLEAN TO WIPES	100%	VARIES	5% TO 12%
III	COARSE-GRAINED SOILS, WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND SILT MIXTURES.	100%	± 50%	12% TO 50%
			CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.	100%	± 50%	12% TO 50%
			SILTY SANDS, SAND-SILT MIXTURES.	100%	± 50%	12% TO 50%
			CLAYEY SANDS, SAND-CLAY MIXTURES.	100%	± 50%	12% TO 50%
			CLAYEY SANDS, SAND-CLAY MIXTURES.	100%	± 50%	12% TO 50%

ADS OR HANCOR PIPE INSTALLATION DETAILS FOR PRIVATE STORM DRAIN LINES



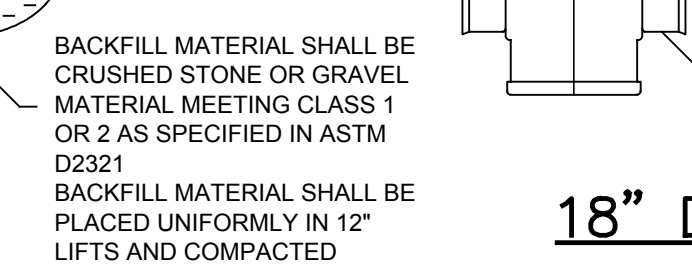
CANOPY DOWNSPOUT CONNECTION DETAIL



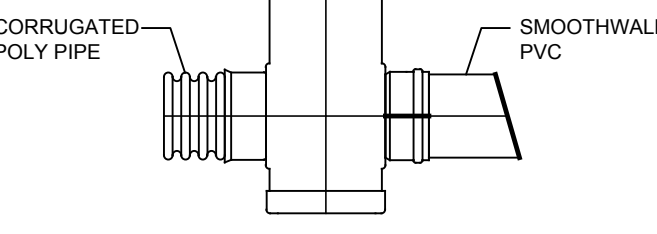
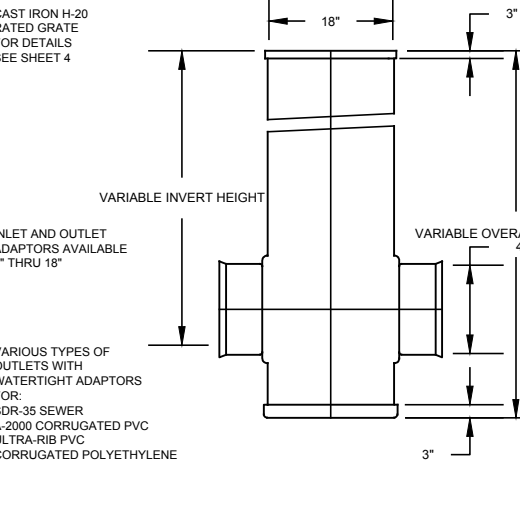
DOWNSPOUT DETAIL

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.

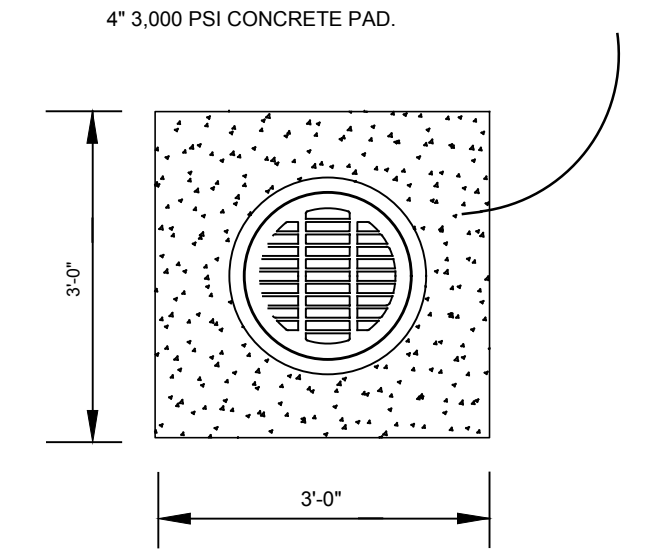
INSTALLATION DETAILS FOR ROOF DRAIN LINES



18" DRAIN BASIN



18" CAST IRON GRATE



Stantec Architecture Inc.
5717 Legacy Drive Suite 250
Plano, TX 75024-4246
Tel: (214) 473-2400 / Fax: (214) 473-2401
www.stantec.com

Copyright Reserved
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.
The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

Consultants
GLENN ENGINEERING
T.B.P.E. FIRM REGISTRATION NO. F - 303
PHONE 972-717-5151 FAX 972-717-2176
4500 FULLER DRIVE - SUITE 220 IRVING, TEXAS 75038



Revision

NO.	DESCRIPTION	BY	APPD	DATE
8 - RH #40		RAH	CMG	2020.05.13
7 - RH #79 - PC 20 - REV		RAH	CMG	2020.03.13
6 - RH #116 AND #117		RAH	CMG	2020.01.13
5 - RH #20 AND #21		RAH	CMG	2019.07.23
4 - RH #16		RAH	CMG	2019.07.12
3 - CITY COMMENTS		RAH	CMG	2019.04.30
2 - ASI #1 - CITY COMMENTS		RAH	CMG	2019.04.02
1		RAH	CMG	2019.03.01

Permit-Seal
MIKE GLENN
35059
The seal appearing on this document was authorized by Mike Glenn, P.E. 35059, on May 13, 2020.

Client/Project
Rockwall ISD
Elementary School #15
2911 Greenway Drive
Rockwall, TX 75087
Title
ROOF DRAIN DETAILS
Project No. 214000654
Scale AS SHOWN
Revision Drawing No.

8 C
05.14