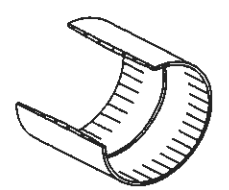
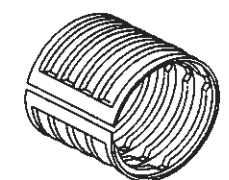


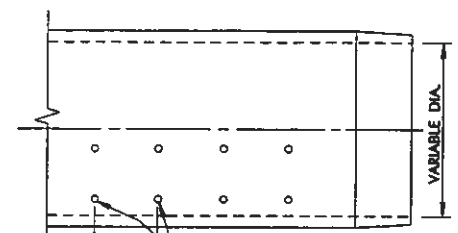
DESCRIPTION	REVISIONS	DATE
RE-ISSUE W/ENGLISH 1999 SPECS. Course Aggr. Mat. Table, Wire Specs. Amend Gen. Note No. 6	1gc 7/99	
	1gc 3/07	



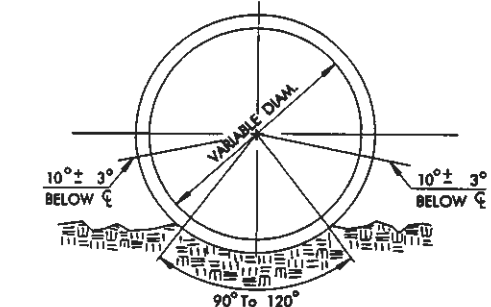
TYPICAL COUPLING FOR PVC PIPE UNDERDRAIN 1/4 SECTION REMOVED



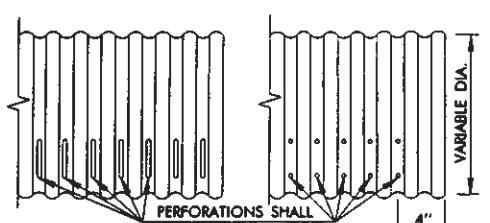
TYPICAL CORRUGATED COUPLING OR AN APPROVED EQUAL



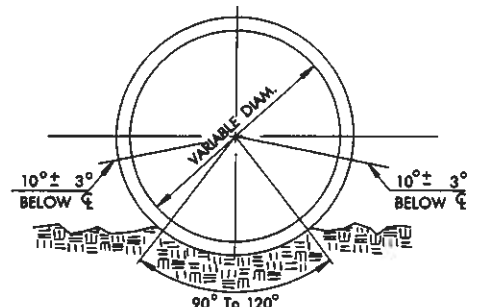
NOTE: PERFORATIONS 3/16" (MIN.) - 3/8" (MAX.) TO BE PLACED AT 3" C/C



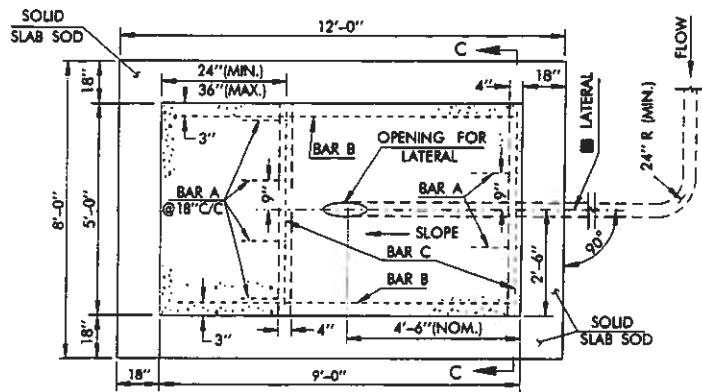
POLYVINYL (PVC) PIPE UNDERDRAIN



PERFORATIONS SHALL BE SPACED EVENLY ALONG THE LENGTH WITH MIN. OPENING AREA OF 1.0 SQ. INCHES PER LINEAR FOOT

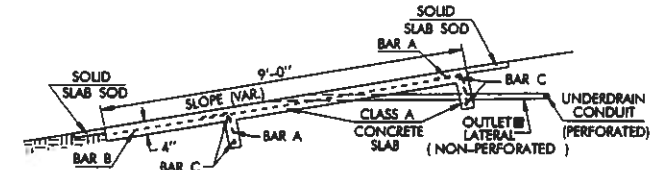


CORRUGATED POLYETHYLENE PIPE UNDERDRAIN



TOP VIEW

NOTE: OPENING FOR OUTLET LATERAL PIPE WILL VARY IN SIZE AND SHAPE, DEPENDING ON THE SIZE OF THE OUTLET LATERAL PIPE AND THE SLOPE OF THE STRUCTURE. THE OUTLET LATERAL PIPE SHALL BE CUT TO CONFORM TO THE TOP SURFACE OF THE OUTLET HEADWALL.



TYPICAL SECTION OUTLET LATERAL & OUTLET LATERAL HEADWALL

PRICE BID FOR CAST-IN-PLACE OUTLET LATERAL HEADWALL INCLUDES SURFACE PREPARATION, CLASS A CONCRETE, REINFORCING STEEL, LABOR AND ANY INCIDENTALS NECESSARY FOR CONSTRUCTION.

CLASS A CONCRETE SHALL MEET REQUIREMENTS OF SECTION 509 OF THE 1999 ENGLISH STANDARD SPECIFICATIONS AND HAVE A ROUGHENED OR BRUSHED SURFACE TEXTURE.

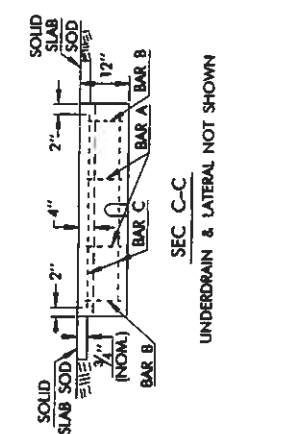
CONSTRUCTION QUANTITIES FOR ONE CONCRETE HEADWALL WITH CURTAIN WALLS EQUALS 0.65 CUBIC YARDS OF CLASS A CONCRETE AND 28.7 LBS. OF STEEL.

ALL REINFORCING STEEL SHALL BE #4 DEFORMED BARS AND MEET MINIMUM REQUIREMENTS OF SECTION 511 OF THE 1999 STANDARD SPECIFICATIONS.

PAYMENT FOR SOLID SLAB SODDING, ESTIMATED AT 5.7 SQ. YARDS PER MAT LOCATION, SHALL BE INCLUDED IN THE PRICE BID FOR THE OUTLET LATERAL HEADWALL.

OUTLET OPENING SHALL HAVE INSTALLED A REMOVABLE RODENT SCREEN HAVING A WIRE MESH DESIGN & 0.23" x 0.50" (NOM.) SQUARE OPENINGS. SCREEN MATERIAL MAY BE STAINLESS STEEL OR GALVANIZED WITH WIRE THICKNESS OF BETWEEN 0.023" & 0.038" AFTER SHAPING AND FABRICATION. RODENT SCREEN DESIGN SHALL BE APPROVED BY THE ENGINEER.

THE FINAL SECTION OF THE OUTLET LATERAL CONDUIT SHALL BE NON-PERFORATED SCHEDULE 40 OR TYPE 5 HIGH DENSITY POLYETHYLENE AND A MINIMUM 20'-0" IN LENGTH, INCLUDING COUPLINGS.

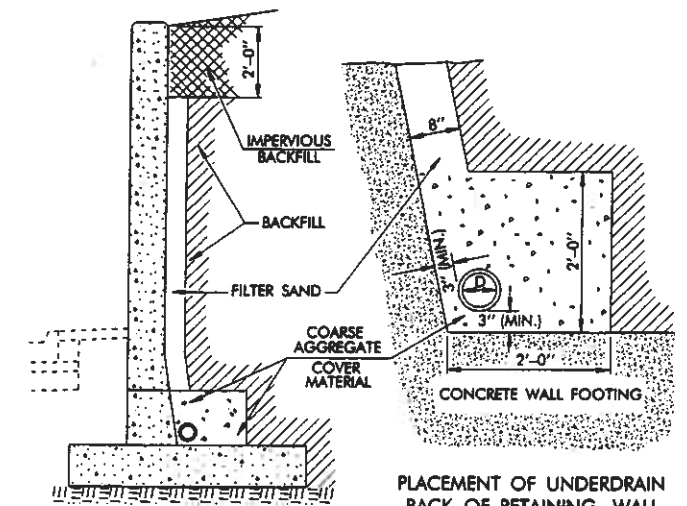


TYPICAL RODENT SCREEN

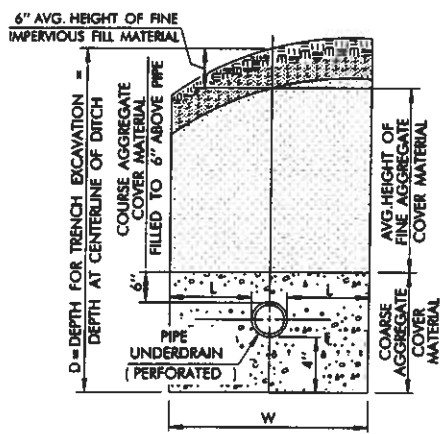
BAR A - 6 EACH

BAR B - 2 EACH

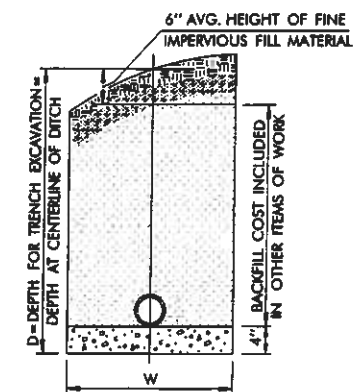
BAR C - 4 EACH @ 4'-6" STRAIGHT



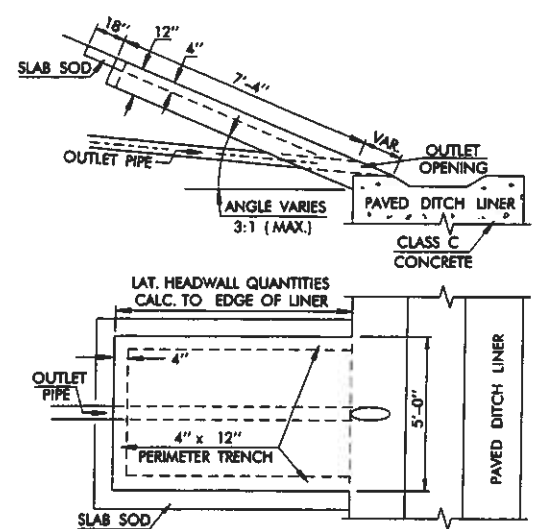
PLACEMENT OF UNDERDRAIN BACK OF RETAINING WALL



DETAIL TRENCH EXCAVATION PERFORATED PIPE UNDERDRAIN INSTALLATIONS



DETAIL TRENCH EXCAVATION NON-PERFORATED PIPE UNDERDRAIN INSTALLATIONS



TYPICAL SECTION VARIATION FOR PAVED DITCH W/ OUTLET LATERAL & HEADWALL ESTIMATED VOLUME = 0.52 CUBIC YARDS (PAVED DITCH LINER NOT INCLUDED)

COARSE AGGREGATE COVER MATERIAL GRADATION REQUIREMENTS						
U.S. STANDARD SIEVE SIZE (IN.)	1/2"	3/8"	#4	#8	#16	#50
PERCENT PASSING	100	90-100	20-55	0-25	0-5	0-2

THE COARSE AGGREGATE COVER MATERIAL SHALL MEET ALL OTHER REQUIREMENTS OF SECTION 703.04. THE FINE AGGREGATE COVER MATERIAL SHALL MEET ALL THE REQUIREMENTS OF SECTION 703.04.

INSTALLATION TECHNIQUE: (12" DIAMETER OR SMALLER)

PERFORATED PIPE UNDERDRAIN, WHEN INSTALLED IN A TRENCH, SHALL BE BEDDED ON 4" OF COARSE AGGREGATE COVER MATERIAL. THE INSTALLED PIPE SHALL THEN BE CAREFULLY BACKFILLED WITH THE REMAINING COARSE AGGREGATE COVER MATERIAL TO 6" ABOVE THE TOP OF THE PIPE. FILTER SAND SHALL BE INSTALLED TO APPROXIMATELY 6" BELOW THE ORIGINAL NATURAL GROUND AS APPROVED BY THE ENGINEER.

NON-PERFORATED PIPE UNDERDRAIN, WHEN INSTALLED IN A TRENCH, SHALL BE BEDDED IN A 4" LAYER CONSISTING OF COARSE AGGREGATE COVER MATERIAL OR A 50-50 MIX OF COARSE AGGREGATE COVER MATERIAL AND FILTER SAND. BEDDING MATERIAL LAYER SHALL CONFORM TO THE REQUIREMENTS OF SECTION 703.04. COST OF NON-PERFORATED PIPE UNDERDRAIN BEDDING LAYER TO BE INCLUDED WITH PIPE UNDERDRAIN COVER MATERIAL. THE REMAINING BACKFILL MAY BE NATIVE SOIL REMOVED IN THE TRENCHING OPERATION, FILTER SAND OR BACKFILLED REQUIRED BY THE ENGINEER, WITH COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 1999 ENGLISH STANDARD SPECIFICATIONS.
- THE EXTENT, LOCATION AND DEPTH OF DRAINS MAY BE ADJUSTED BY THE ENGINEER TO SUIT CONDITIONS FOUND DURING CONSTRUCTION.
- COST OF ALL FITTINGS TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PIPE UNDERDRAIN.
- FOR PIPE UNDERDRAIN OF UP TO 12" IN DIAMETER, W = 24" WITHOUT SHEETING AND SHORING; W = 36" WHEN SHEETING AND SHORING IS USED. SEE 1999 ENGLISH STANDARD SPI-3 FOR SHEETING & SHORING NOTES.
- FOR PIPE UNDERDRAIN LARGER THAN 12" IN DIAMETER, SEE 1999 ENGLISH STANDARD DRAWING SPI-3 FOR ADDITIONAL TRENCH EXCAVATION DETAILS.
- NON-PERFORATED UNDERDRAIN PIPES, LARGER THAN 12", SHALL BE TREATED AS PIPE CONDUITS. I.E., PAY ITEMS SHALL CONSIST OF TRENCH EXCAVATION AND BEDDING MATERIAL.
- MATERIALS SHOWN HERE ARE TYPICAL ONLY AND ARE NOT THE ONLY CHOICE FOR SUBSURFACE DRAINAGE PURPOSES.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613.06(P)	PERFORATED PIPE UNDERDRAIN-ROUND	L. F.
613.06(Q)	NON-PERFORATED PIPE UNDERDRAIN-ROUND	L. F.
613.06(R)	PIPE UNDERDRAIN COVER MATERIAL	C. Y.
613.06(S)	TRENCH EXCAVATION	C. Y.
613.06(T)	STANDARD BEDDING MATERIAL	C. Y.
653.06(C)	OUTLET LATERAL HEADWALL	EA.

■ DIMENSION TO BE SPECIFIED IN INCHES

APPROVED BY ROADWAY ENGINEER *Timothy A. Regula* DATE 3/1/07

OKLAHOMA DEPT. OF TRANSPORTATION ROADWAY STANDARD (ENGLISH) PIPE UNDERDRAIN INSTALLATIONS