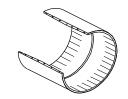
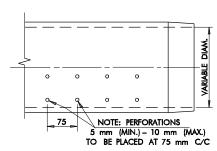
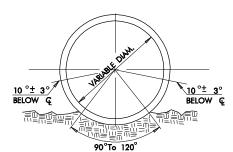


4.75 2.36 1.18 0.300



TYPICAL COUPLING FOR PVC PIPE UNDERDRAIN 1/4 SECTION REMOVED

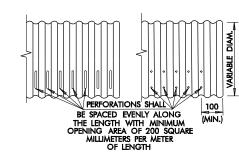


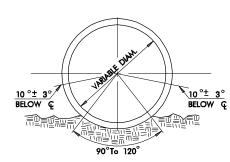


POLYVINYL ( PVC PIPE UNDERDRAIN

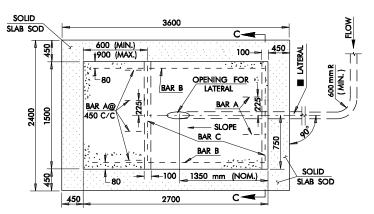


TYPICAL CORRUGATED COUPLING OR AN APPROVED EQUAL



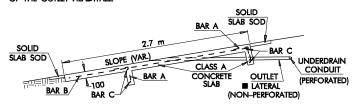


CORRUGATED POLYETHYLENE PIPE UNDERDRAIN



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.



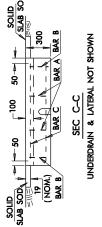
## TYPICAL SECTION OUTLET LATERAL & OUTLET LATERAL HEADWALL

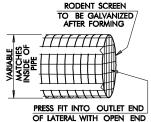
PRICE BID FOR CAST-IN-PLACE OUTLET LATERAL HEADWALL INCLUDES SURFACE PREPARATION, CLASS A CONCRETE, REINFORCING STEEL, LABOR AND ANY INCIDENTALS NECESSARY FOR CONSTRUCTION.

CLASS A CONCRETE SHALL MEET REQUIREMENTS OF SECTION 509 OF THE 1999 METRIC STANDARD SPECIFICATIONS AND HAVE A ROUGHENED OR BRUSHED SURFACE TEXTURE. CONSTRUCTION QUANTITIES FOR ONE CONCRETE HEADWALL WITH CURTAIN WALLS EQUALS 0.465 CUBIC METERS OF CLASS A CONCRETE AND 13.0 KILOGRAMS OF STEEL. ALL REINFORCING STEEL SHALL BE #13M DEFORMED BARS AND MEET MINIMUM REQUIREMENTS OF SECTION 511 OF THE 1999 METRIC STANDARD SPECIFICATIONS. PAYMENT FOR SOLID SLAB SODDING, ESTIMATED AT 4.82 SQ. METERS PER MAT LOCATION, SHALL BE INCLUDED IN THE PRICE BID FOR THE OUTLET LATERAL HEADWALL.

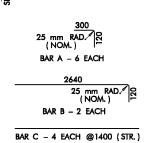
OUTLET OPENING SHALL HAVE INSTALLED A REMOVABLE RODENT SCREEN HAVING A WIRE MESH DESIGN & 5.52–11.78 mm SQUARE OPENINGS. SCREEN MATERIAL MAY BE STAINLESS STEEL OR GALVANIZED WITH WIRE THICKNESS OF 0.59–0.98 mm, AFTER SHAPING AND FABRICATION. RODENT SCREEN DESIGN SHALL BE APPROVED BY THE ENGINEER. THE FINAL SECTION OF THE OUTLET LATERAL CONDUIT SHALL BE NON-PERFORATED, SCHEDULE 40 OR TYPE S HIGH DENSITY POLYETHYLENE AND A MINIMUM 6.0 METERS IN LENGTH, INCLUDING COUPLINGS.

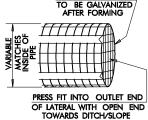
SLAB SOD





TYPICAL RODENT SCREEN





 FOR PIPE UNDERDRAIN LARGER THAN 300 mm IN DIAMETER, SEE ROADWAY STANDARD DRAWING SPI-3 FOR ADDITIONAL TRENCH EXCAVATION DETAILS. 6. NON-PERFORATED UNDERDRAIN PIPES SHALL BE TREATED AS PIPE CONDUITS. THAT IS, PAY ITEMS SHALL CONSIST OF TRENCH EXCAVATION AND BEDDING MATERIAL.

COARSE AGGREGATE COVER MATERIAL

9.5

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

INSTALLATION TECHNIQUE:

PERFORATED PIPE UNDERDRAIN, WHEN INSTALLED IN A TRENCH, SHALL BE BEDDED ON 100 mm OF COARSE AGGREGATE COVER MATERIAL. THE INSTALLED PIPE SHALL THEN BE CAREFULLY BACKFILLED WITH THE REMAINING COARSE AGGREGATE COVER MATERIAL TO 150 mm ABOVE THE TOP OF THE PIPE. FILTER SAND SHALL BE INSTALLED TO APPROXIMATELY 150 mm BELOW THE ORIGINAL NATURAL GROUND AS APPROVED BY THE ENGINEER.

NON-PERFORATED PIPE UNDERDRAIN, WHEN INSTALLED IN A TRENCH, SHALL BE BEDDED IN A 100 mm 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

**GENERAL NOTES** ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 1999 METRIC STANDARD SPECIFICATIONS.

2. 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 METER OF PIPE UNDERDRAIN.

4. FOR PIPE UNDERDRAIN OF UP TO 300 mm IN DIAMETER, W = 600 mm WITHOUT SHEETING AND SHORING: W = 900 mm WHEN SHEETING AND SHORING IS USED. SEE ROADWAY STANDARD SPI-3 FOR SHEETING AND SHORING NOTES.

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 BACKFILL REQUIRED BY

THE ENGINEER, WITH COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

U.S. STANDARD

SIEVE SIZE (mm)

REQUIREMENTS OF SECTION 703.04.

GRADATION REQUIREMENTS

100 90-100 20-55 0-25 0-5

MATERIALS SHOWN HERE ARE TYPICAL ONLY AND ARE NOT THE ONLY CHOICE FOR SUBSURFACE DRAINAGE PURPOSES.

BASIS OF PAYMENT	
ITEM	UNIT
PERFORATED PIPE UNDERDRAIN-ROUND	METER
■ NON-PERFORATED PIPE UNDERDRAIN-ROUND	METER
PIPE UNDERDRAIN COVER MATERIAL	CUBIC METER
TRENCH EXCAVATION	CUBIC METER
STANDARD BEDDING MATERIAL	CUBIC METER
OUTLET LATERAL HEADWALL	EACH
	ITEM  PERFORATED PIPE UNDERDRAIN-ROUND  NON-PERFORATED PIPE UNDERDRAIN-ROUND PIPE UNDERDRAIN COVER MATERIAL  TRENCH EXCAVATION  STANDARD BEDDING MATERIAL

■ DIMENSION TO BE SPECIFIED IN MILLIMETERS

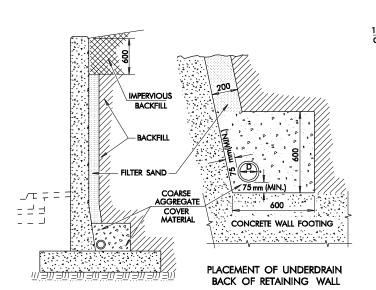
APPROVED BY ROADWAY ENGINEER

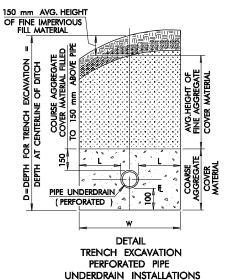
OKLAHOMA DEPT. OF TRANSPORTATION ROADWAY STANDARD (METRIC )

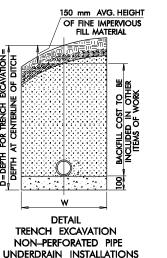
PIPE UNDERDRAIN INSTALLATION

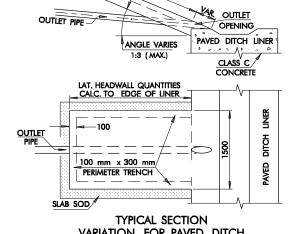
M00

1999 SPECIFICATIONS PUD-2 ALL DIMENSIONS ON THIS SHEET IN MILLIMETERS UNLESS OTHERWISE NOTED.









VARIATION FOR PAVED DITCH W/OUTLET LATERAL & HEADWALL ESTIMATED VOLUME = 0.46 CUBIC METERS (PAVED DITCH LINER NOT INCLUDED )