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#REF001
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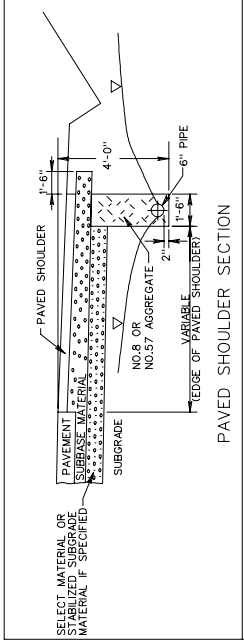
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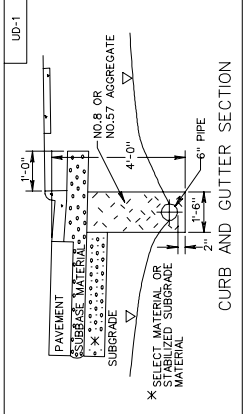
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#LEV006

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

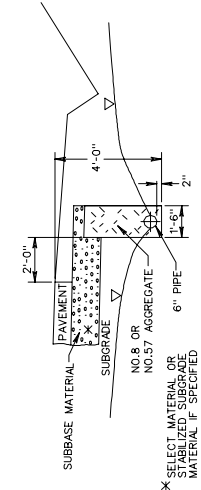
| REVISED | STATE | FEDERAL AID PROJECT | ROUTE | STATE PROJECT | SHEET NO. |
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| | VA. | | | | |



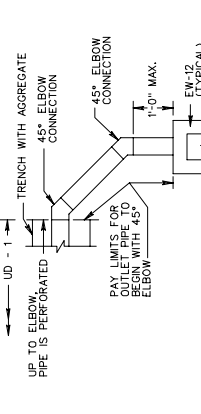
PAVED SHOULDER SECTION



CURB AND GUTTER SECTION



WITHOUT PAVED SHOULDER



PLAN VIEW OF OUTLET PIPE AT FILL

NOTES:

- WHERE THE LONGITUDINAL PERFORATED PIPE ALIGNS WITH A DRAINAGE STRUCTURE (DROP INLET, MANHOLE, ETC.) IT SHALL BE CONNECTED TO THE DRAINAGE STRUCTURE WHERE THE LONGITUDINAL PERFORATED PIPE IS CONTINUOUS; IT SHALL BE CONNECTED TO EACH SIDE OF THE DRAINAGE STRUCTURE.
- INVERT ELEVATION AT OUTLET END OF OUTLET PIPE TO BE A MINIMUM OF 1'-0" ABOVE INVERT ELEVATION OF RECEIVING DRAINAGE DITCH OR STRUCTURE.
- ALL CONNECTIONS (ELBOWS, WYES, ETC.) WITHIN PAY LIMITS FOR OUTLET PIPE ARE TO BE OF THE SAME CRUSHING STRENGTH AS THE OUTLET PIPE.
- OUTLET PIPE ARE TO BE INSTALLED ON 2% MIN. (3% DESIRABLE) GRADE.
- THE NORMAL DEPTH OF UNDERDRAIN IS TO BE 4'-0" BELOW THE NEAR EDGE OF PAVEMENT AS SHOWN. THE LONGITUDINAL GRADE OF THE UNDERDRAIN SHALL FOLLOW THAT OF THE ROADWAY WITH A MINIMUM GRADE OF 0.2%.
- WHERE THE BOTTOM OF SELECT MATERIAL IS DEEPER THAN 4'-0" BELOW THE PAVEMENT, THE BOTTOM OF THE UNDERDRAIN IS TO BE CONSIDERED WITH THE BOTTOM OF SELECT MATERIAL AND THE TRENCH DEPTH AND BACKFILL QUANTITY INCREASED ACCORDINGLY.
- WHEN USED WITH STABILIZED OPEN-GRADED DRAINAGE LAYER, THE BOTTOM OF THE CURB AND GUTTER SHALL BE CONSTRUCTED PARALLEL TO THE SLOPE OF SUBBASE COURSES OUT TO THE DEPTH OF THE PAVEMENT.
- OUTLET PIPE TO BE SECURELY CONNECTED TO EW-12 OR OTHER DRAINAGE STRUCTURE.
- ∗ DENOTES WATER TABLE.
- OUTLET PIPE CONFIGURATION TO PROVIDE FOR PASSAGE OF INSPECTION CAMERA WITH 2 1/2" I.D. HEAD.

LONGITUDINAL PERFORATED PIPE

| TYPE OF PIPE | CRUSHING STRENGTH | W.T. 6" NOMINAL DIAMETER |
|-----------------|-------------------|--------------------------|
| SMOOTH WALL PVC | .153 | |
| CORRUGATED PE | | ASHTO M-252 |

NON-PERFORATED OUTLET PIPE

| TYPE OF PIPE | CRUSHING STRENGTH | W.T. 6" NOMINAL DIAMETER |
|-----------------|-------------------|--------------------------|
| SMOOTH WALL PVC | .153 | |
| SMOOTH WALL PE | | 70 PSI ∗ ∗ ∗ |

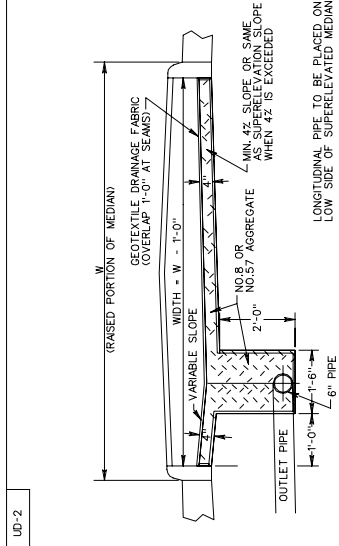
∗ WALL THICKNESS (MIN) - INCHES
∗ ∗ ∗ TESTED ACCORDING TO ASTM D-2412 AT 5% DEFLECTION.

| SPECIFICATION REFERENCE |
|-------------------------|
| 240 |
| 501 |
| 701 |

STANDARD GROUNDWATER UNDERDRAIN

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/06
108.01



WITHOUT SUBBASE MATERIAL

LONGITUDINAL PERFORATED PIPE

| TYPE OF PIPE | CRUSHING STRENGTH | W.T. 6" NOMINAL DIAMETER |
|-----------------|-------------------|--------------------------|
| SMOOTH WALL PVC | 0.153 | |
| CORRUGATED PE | | ASHTO M-252 |

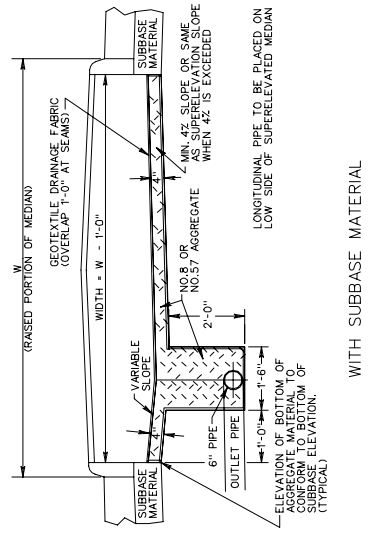
NON-PERFORATED OUTLET PIPE

| TYPE OF PIPE | CRUSHING STRENGTH | W.T. 6" NOMINAL DIAMETER |
|-----------------|-------------------|--------------------------|
| SMOOTH WALL PVC | 0.153 | |
| SMOOTH WALL PE | | 70 PSI ∗ ∗ ∗ |

∗ WALL THICKNESS (MIN) - INCHES
∗ ∗ ∗ TESTED ACCORDING TO ASTM D-2412 AT 5% DEFLECTION.

NOTES:

- WHERE THE LONGITUDINAL PERFORATED PIPE ALIGNS WITH A DRAINAGE STRUCTURE (DROP INLET, MANHOLE, ETC.) A NON-PERFORATED OUTLET PIPE IS NOT REQUIRED. INSTEAD, THE PERFORATED PIPE IS TO BE CONNECTED DIRECTLY TO THE DRAINAGE STRUCTURE, WHERE THE LONGITUDINAL PERFORATED PIPE IS CONTINUOUS; IT SHALL BE CONNECTED TO EACH SIDE OF THE DRAINAGE STRUCTURE.
- INVERT ELEVATION AT OUTLET END OF OUTLET PIPE TO BE A MINIMUM OF 1'-0" ABOVE INVERT ELEVATION OF RECEIVING DRAINAGE DITCH OR STRUCTURE.
- ALL CONNECTIONS (ELBOWS, WYES, ETC.) WITHIN PAY LIMITS FOR OUTLET PIPE ARE TO BE OF THE SAME CRUSHING STRENGTH AS THE OUTLET PIPE. LOCATED AT A MINIMUM OF 500' APART.
- OUTLET PIPE TO BE SECURELY CONNECTED TO EW-12 OR OTHER DRAINAGE STRUCTURE.
- WHEN UNDERDRAIN MUST TRAVERSE UNDER CROSSOVER LOCATIONS, PERFORATED OUTLET PIPE ONLY IS TO BE USED UNDER CROSSOVER PAVEMENT.



WITH SUBBASE MATERIAL

OUTLET PIPE

STANDARD UNDERDRAIN FOR USE WITH RAISED GRASS MEDIAN STRIPS

VIRGINIA DEPARTMENT OF TRANSPORTATION

REV. 2/06
108.02

| SPECIFICATION REFERENCE |
|-------------------------|
| 240 |
| 501 |
| 701 |

REV. 2/06
SPECIAL DESIGN SECTION
DRAWING NO. A-80

| PLAN NO. | PROJECT | FILE NO. | SHEET NO. |
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