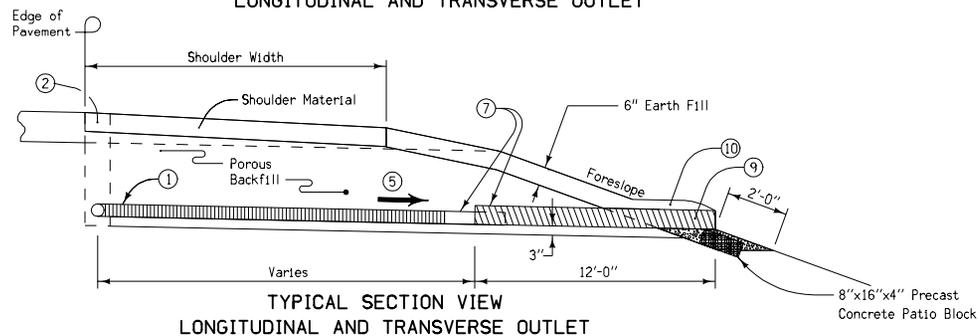
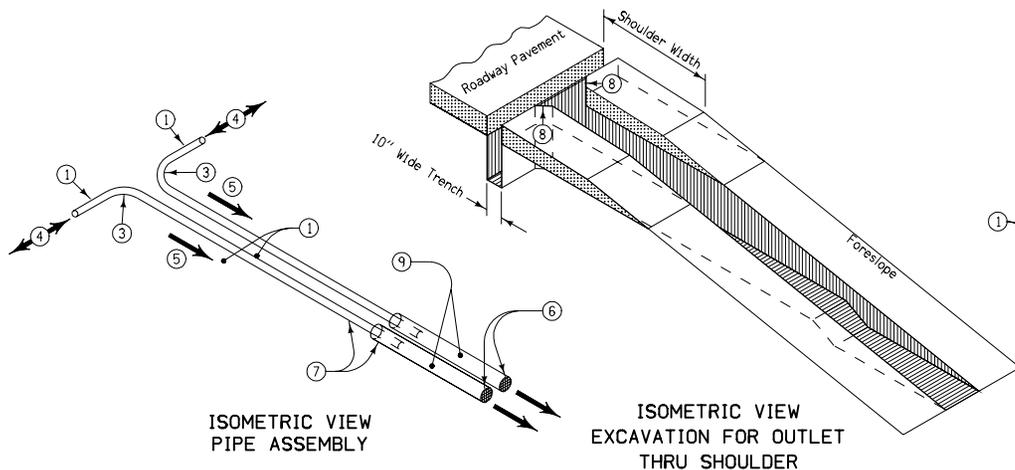


TYPICAL PLAN VIEW
LONGITUDINAL AND TRANSVERSE OUTLET

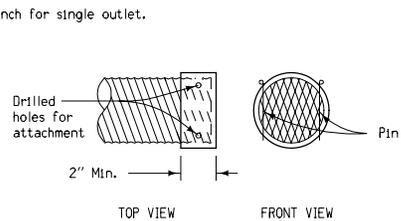


TYPICAL SECTION VIEW
LONGITUDINAL AND TRANSVERSE OUTLET

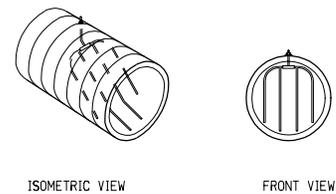


ISOMETRIC VIEW
PIPE ASSEMBLY

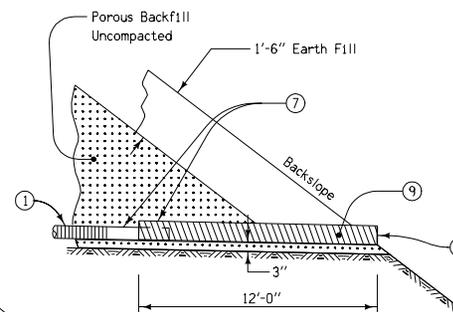
ISOMETRIC VIEW
EXCAVATION FOR OUTLET
THRU SHOULDER



REMOVABLE GRATE RODENT GUARD
DETAILS



REMOVABLE FORK RODENT GUARD
DETAILS



TYPICAL SECTION VIEW
BACKSLOPE OUTLET

Transverse and backslope drains only require single outlets. Double outlet pipes shall be used on all longitudinal subdrain systems, except at the end and beginning of the system. At these locations, a single outlet pipe will be required.

Contract Item:
Subdrain Outlet, RF-19E
Tabulation: 104-5C

- ① 4" perforated Subdrain (Polyethylene Corrugated Tubing).
- ② On projects where existing shoulder material is removed, the shoulder material shall be replaced as per "Placing Longitudinal Subdrains" of the current Standard and Supplemental Specifications.
- ③ 'Y' or 'T' connection shall not be allowed. Place subdrain on 1 foot minimum radius.
- ④ Direction of flow. Double outlets will be required at all locations, except where the subdrain system terminates.
- ⑤ 6" minimum drop in elevation between longitudinal subdrain and outlet. 12" minimum drop for projects using recycled subbase.
- ⑥ Removable grate rodent guard shall be used on all projects except those using recycled subbase. For projects using recycled subbase, use the removable fork rodent guard. See Materials I.M. 443.01 for approved suppliers.
- ⑦ 6" corrugated metal pipe outlet or 4" corrugated double-walled PE or PVC pipe with an appropriate coupler. If metal pipe is used, the pipes should be coupled in one of the following ways: (1) Use an inside fit reducer coupler (coupler must be inserted a minimum of 12" in CMP); or (2) Insert 12" of the 4" subdrain into the 6" metal outlet pipe, then fully seal the entire opening with grout.
- ⑧ Trench shall be beveled to provide a minimum of 3" of porous backfill surrounding all portions of subdrain pipe.
- ⑨ Corrugated metal pipe outlet 2" larger than existing subdrain pipe, or corrugated double-walled PE or PVC pipe of the same diameter as the existing subdrain pipe.
- ⑩ Class '10' material shall be mounded over outlet and carefully compacted to avoid damaging outlet pipe.

 Iowa Department of Transportation Project Development Division	
STANDARD ROAD PLAN	RF-19E
REVISION: Modify note 5.	REVISION NO. 10
<i>Deanna Masfield</i> APPROVED BY DESIGN METHODS ENGINEER	REVISION DATE 04-18-06

OUTLETS
FOR LONGITUDINAL, TRANSVERSE
AND BACKSLOPE SUBDRAINS