

Roadway Ditches

SECTION

4100**Roadway Ditches**

NO.	DATE	TITLE
4101	04-20-10	Typical Cross Section Intercepting Ditch
4102	04-18-17	Typical Cross Section Temporary Intercepting Ditch
4104	04-21-15	Typical Cross Section Earth Excavation Bench Backslope
4107	10-15-13	Typical Cross Section Stepped Backslope
4108	10-15-13	Typical Cross Section Possible Borrow in R.O.W. with Berm
4109	10-15-13	Typical Cross Section Possible Borrow in R.O.W.
4110	10-15-13	Typical Cross Section Excavation in Rock
4111	10-15-13	Excavation in Rock Using Pre-Splitting Method

SECTION

4200**Channel Change Ditches**

NO.	DATE	TITLE
4201	09-07-73	Typical Cross Section Type 1 Channel
4202	09-07-73	Typical Cross Section Type 2 Channel
4203	12-08-95	Typical Details for Outlet Ditch Through Foreslope Berm
4204	10-03-00	Details of Typical Special Ditch

SECTION
4300

MISCELLANEOUS

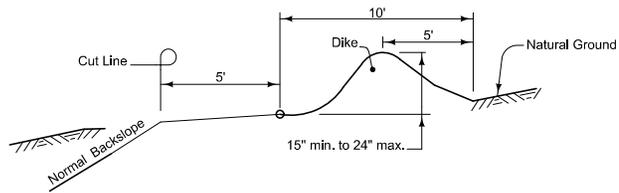
NO.	DATE	TITLE
4301	--	VOID
4302	04-03-01	Typical Details for Obliteration Existing Roadbed
4309	10-20-09	Immediate Placement of Embankment at Culvert Extension
4311	04-18-17	Barnroof Foreslope at Drainage Structure
4312	10-15-19	Barnroof Foreslope at Skewed Drainage Structure
4315	04-15-08	Culvert Abandonment with Flowable Mortar (Rectangular structures less 8' in either height or width or circular structures less than 10' Dia.)
4316	04-15-08	Culvert Abandonment with Flowable Mortar (Rectangular structures at least 8' in both height and width or circular structures 10' Dia. or larger)
4317	04-21-20	Fill for Culverts used in Bridge Replacements
4318	04-21-20	Fill for Culvert used in Bridge Replacements with Restricted Height
4320	10-18-11	Foreslope Benching for Slide Repair

SECTION
4400

EROSION CONTROL

NO.	DATE	TITLE

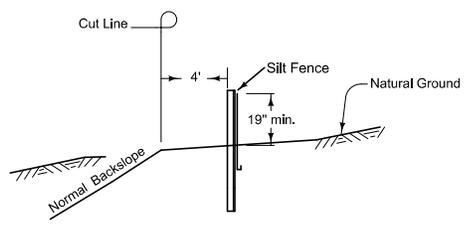
4101
04-20-10



Refer to plans for locations of intercepting ditches. Dike for intercepting ditch shall be made by taking earth from roadway side. Do not excavate back of dike.

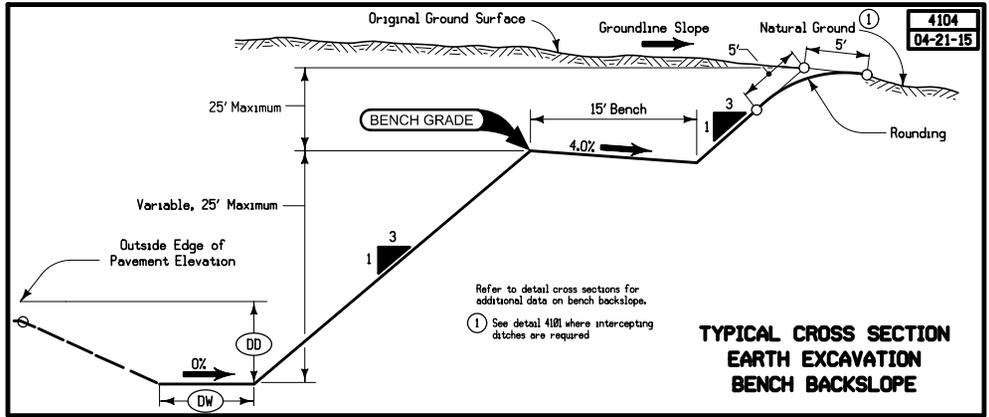
**TYPICAL CROSS SECTION
INTERCEPTING DITCH**

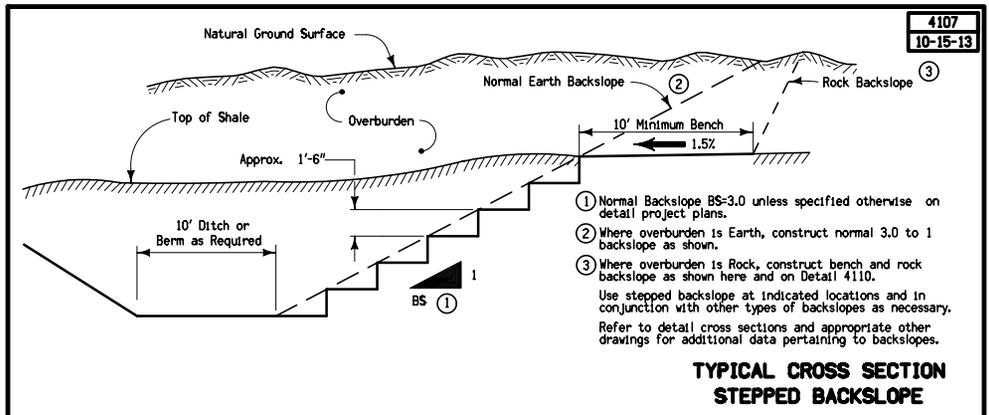
4102
04-18-17

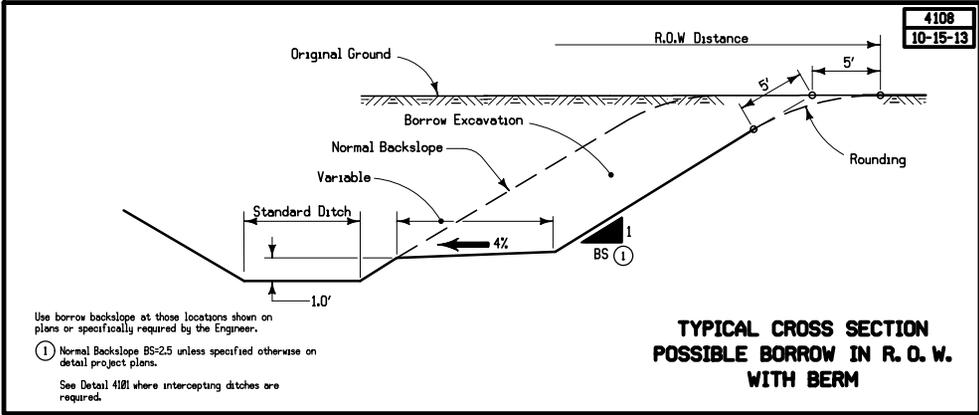


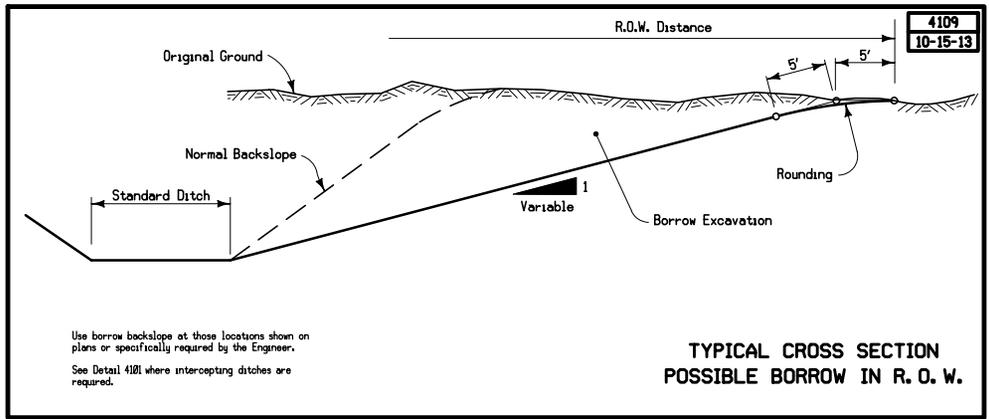
Refer to plans for locations of temporary intercepting ditches.
Refer to Standard Road Plan EC-201 for silt fence installation details.
Refer to Tab 100-16

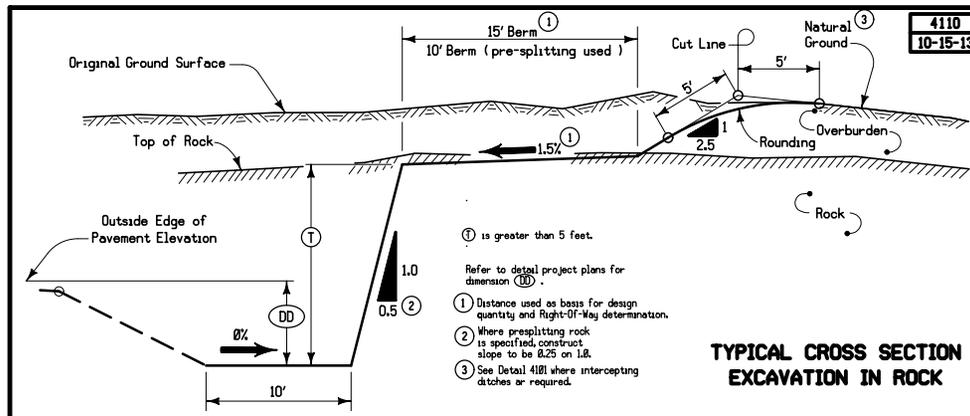
**TYPICAL CROSS SECTION
TEMPORARY INTERCEPTING DITCH**

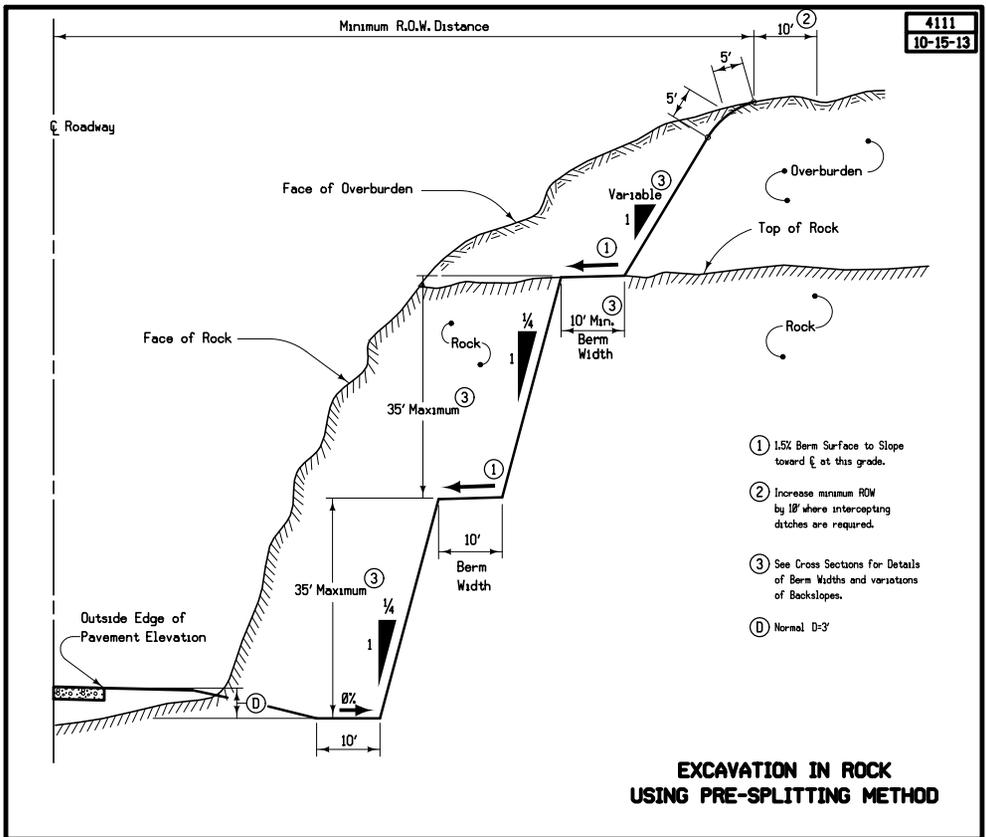


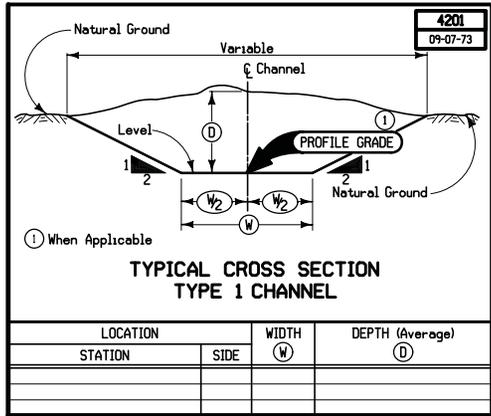


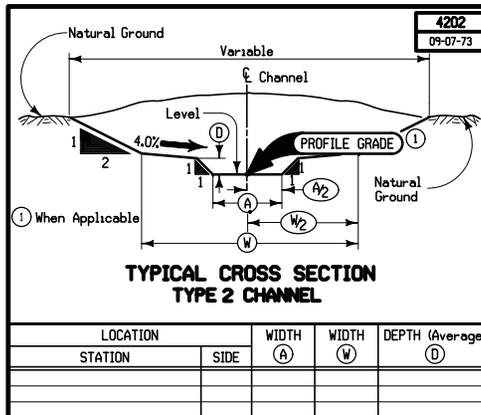


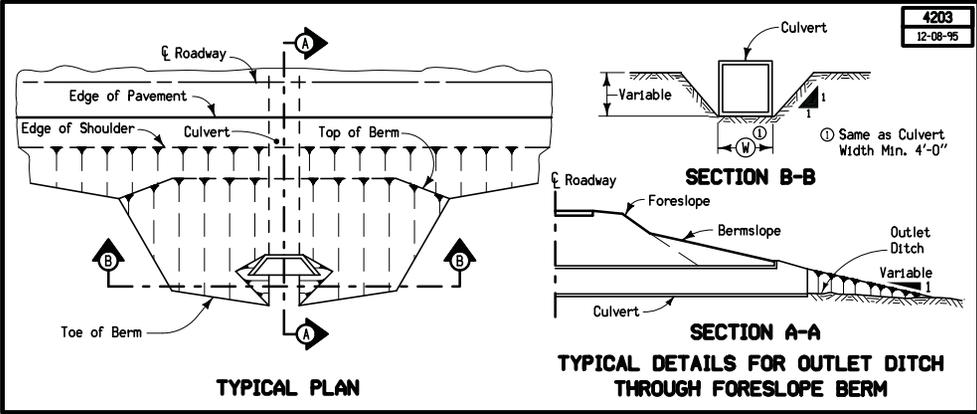




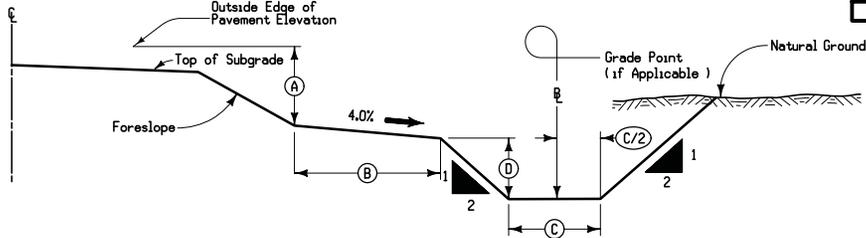








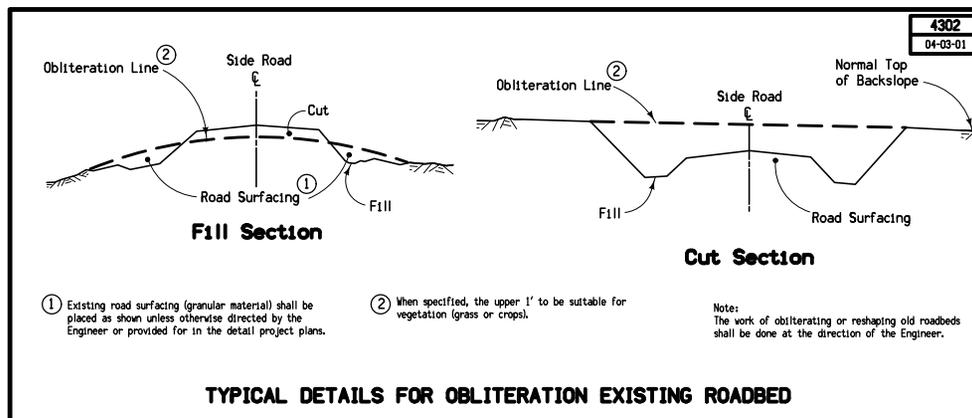
4204
10-03-00

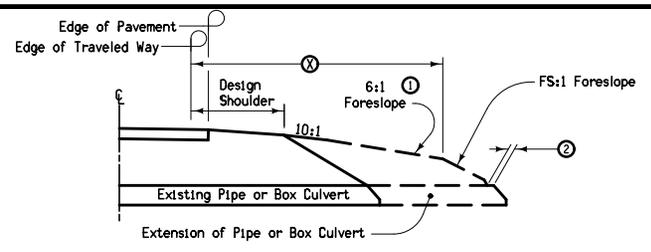
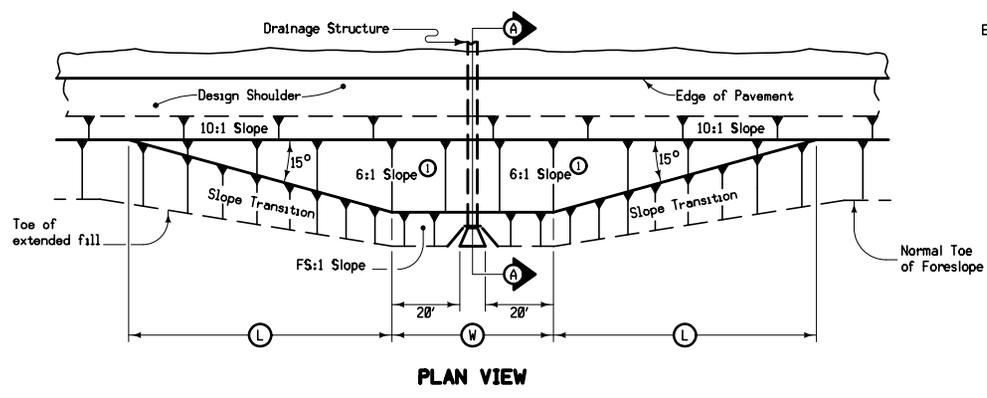


DETAILS OF TYPICAL SPECIAL DITCH

LOCATION		A	B	C	D
STATION TO STATION	SIDE	Feet	Feet	Feet	Feet

Note:
Details shown are typical. Refer to plan cross sections for additional data on Special Ditches.

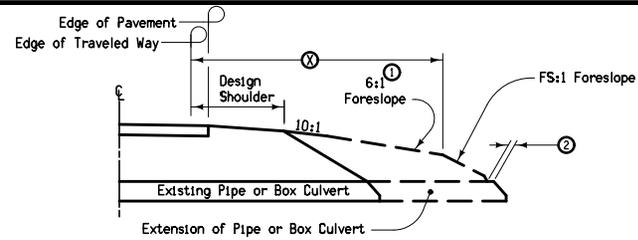
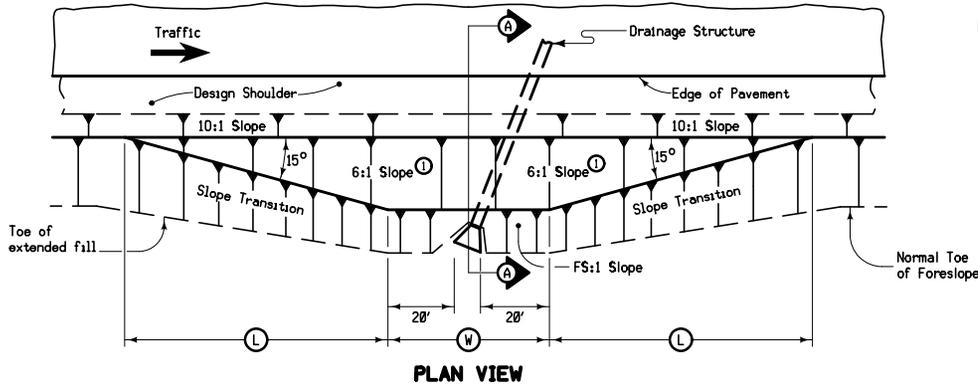




STRUCTURE LOCATION		W	L	X	FS
STATION	SIDE	Feet	Feet	Feet	

- Notes:
- ① At locations where an extended or newly constructed drainage structure extends beyond the normal foreslope cover, flatten the foreslope as indicated so as to cover the structure. Minimum earth cover is 6".
 - ① Slope may be flatter than 6:1.
 - ② 6" Minimum for pipe installations or to top of headwall on R.C.B.
 - ④ = Pipe or R.C.B. opening width plus 20 feet each side.

BARNROOF FORESLOPE AT DRAINAGE STRUCTURE

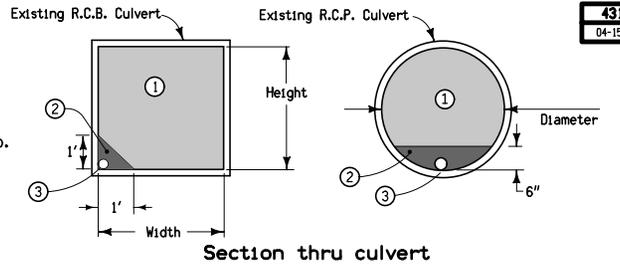
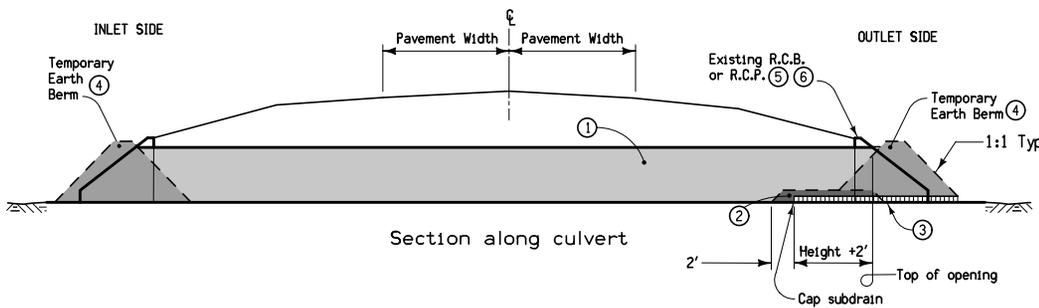
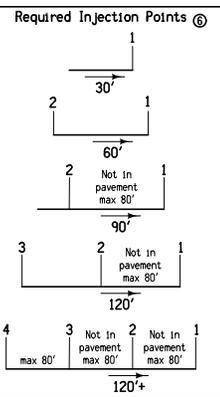


STRUCTURE LOCATION		W	L	X	FS
STATION ③	SIDE	Feet	Feet	Feet	

At locations where an extended or newly constructed drainage structure extends beyond the normal Foreslope cover, flatten as indicated so as to cover the structure. Minimum earth cover is 6 inches.

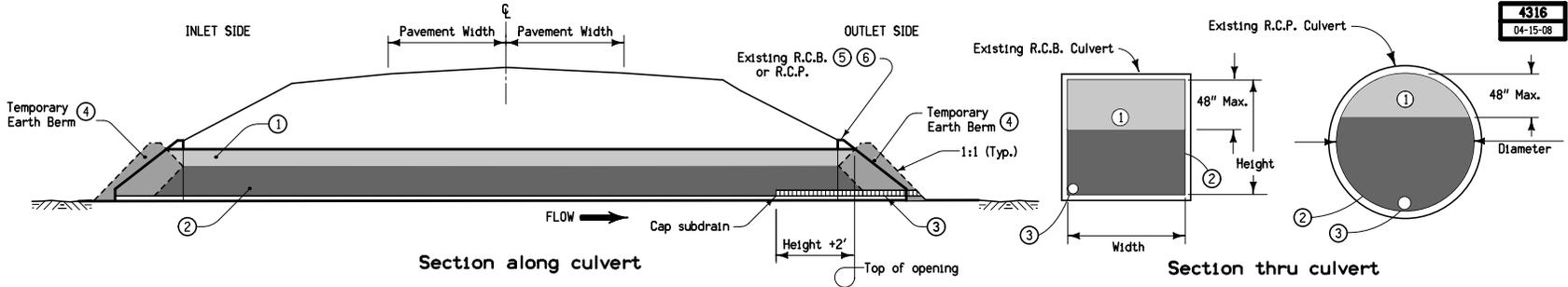
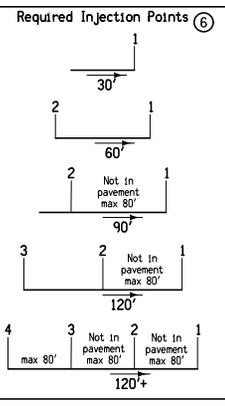
- ① Slope may be flatter than 6:1.
- ② 6 inch minimum for pipe installations or to top of headwall on RCB.
- ③ At $\frac{1}{2}$ of roadway.
- ④ = Pipe or RCB opening width plus 20 feet each side.

BARNROOF FORESLOPE AT SKEWED DRAINAGE STRUCTURE



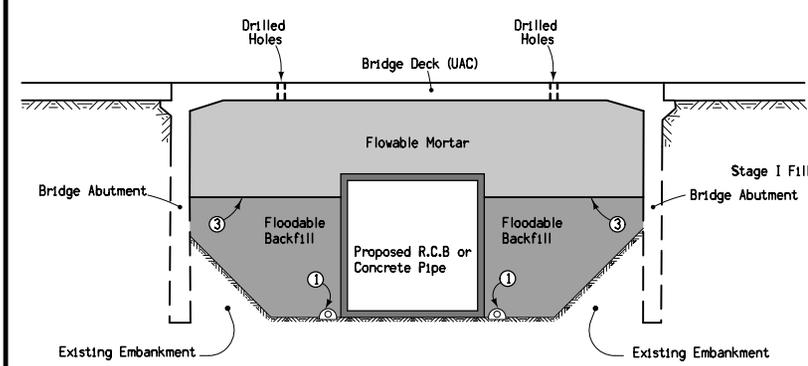
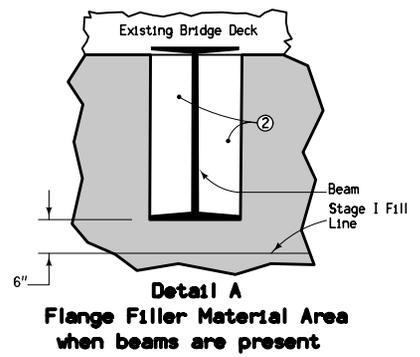
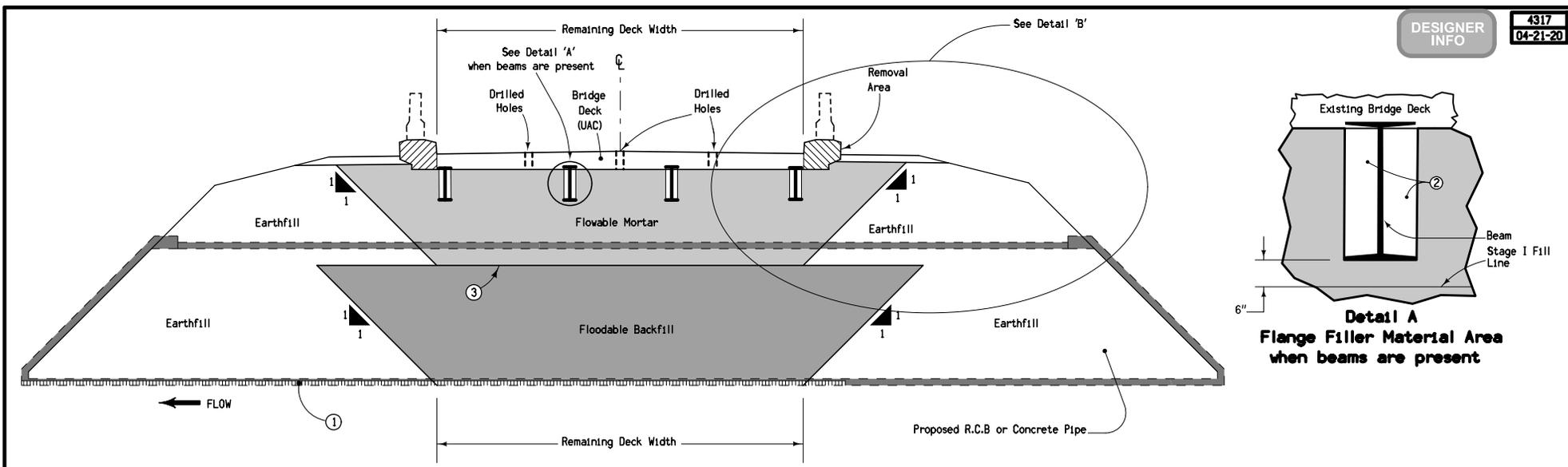
- ① Flowable Mortar.
- ② Granular Backfill.
- ③ 4" subdrain at flowline elevation of culvert shall be extended into the culvert a distance of 2' plus the height of the culvert. Granular Backfill covers subdrain and extends an additional 2'. Subdrain and granular backfill are incidental to flowable mortar.
- ④ Ends of culvert shall be plugged sufficiently to retain flowable mortar. Temporary earth berms are incidental to flowable mortar.
- ⑤ Removal of headwalls may be required.
- ⑥ Outlet shall be filled first. See injection point detail for additional information.

DETAILS OF CULVERT ABANDONMENT WITH FLOWABLE MORTAR
(Rectangular structures less than 8' in either height or width.
Circular structures less than 10' Dia.)

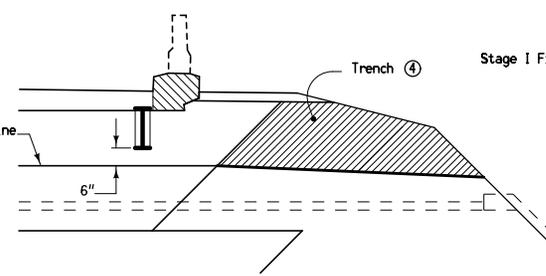


- ① Flowable Mortar, Minimum 2' thick.
- ② Granular backfill.
- ③ 4" Subdrain at flowline elevation of culvert shall be extended into the culvert a distance of 2' plus the height of the culvert. Subdrain and granular backfill are incidental to flowable mortar.
- ④ Ends of culvert shall be plugged sufficiently to retain flowable mortar. Temporary earth berms are incidental to flowable mortar.
- ⑤ Removal of headwalls may be required.
- ⑥ Outlet shall be filled first. See injection point detail for more information.
- ⑦ Culvert may be considered a permit-required confined space, per OSHA 29 CFR.

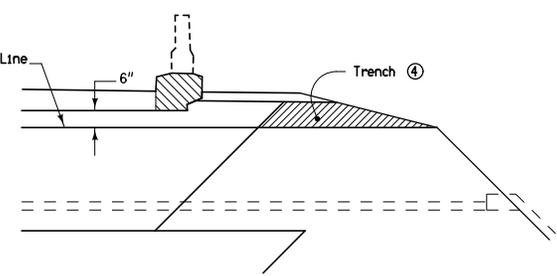
DETAILS OF CULVERT ABANDONMENT WITH FLOWABLE MORTAR
(Rectangular structures at least 8' in both height and width. Circular structures 10' Dia. or larger)



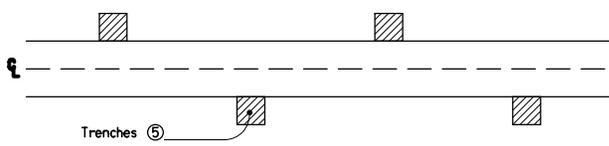
Section along Centerline



Detail B (Beam Bridge)



Detail B (Slab Bridge)

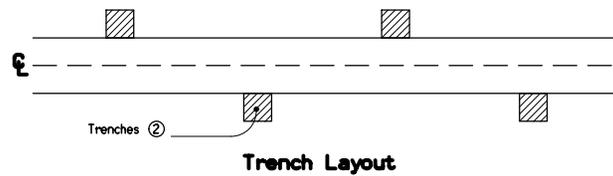
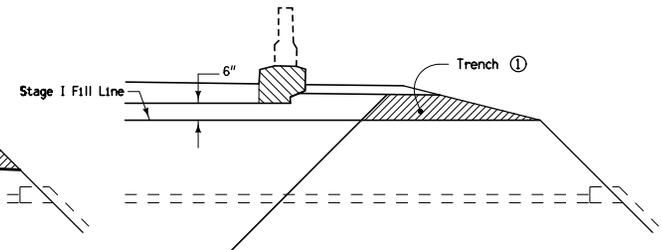
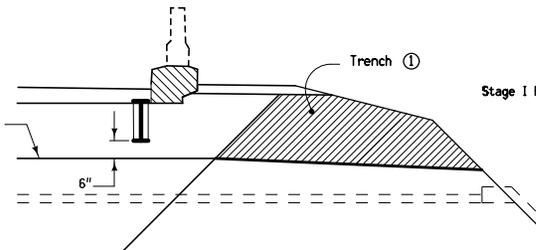
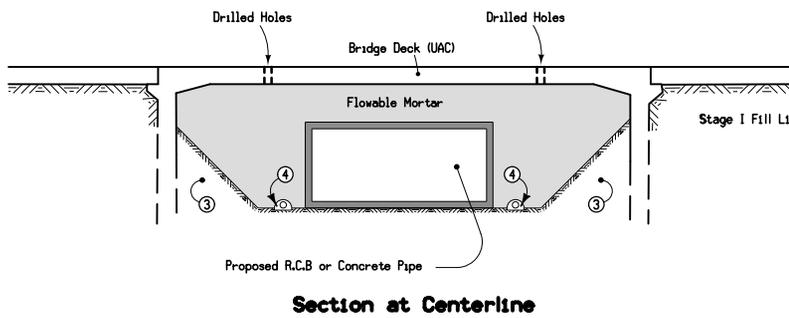
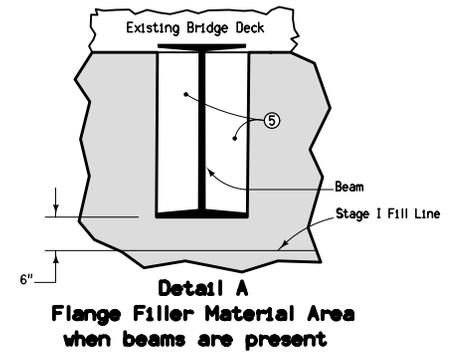
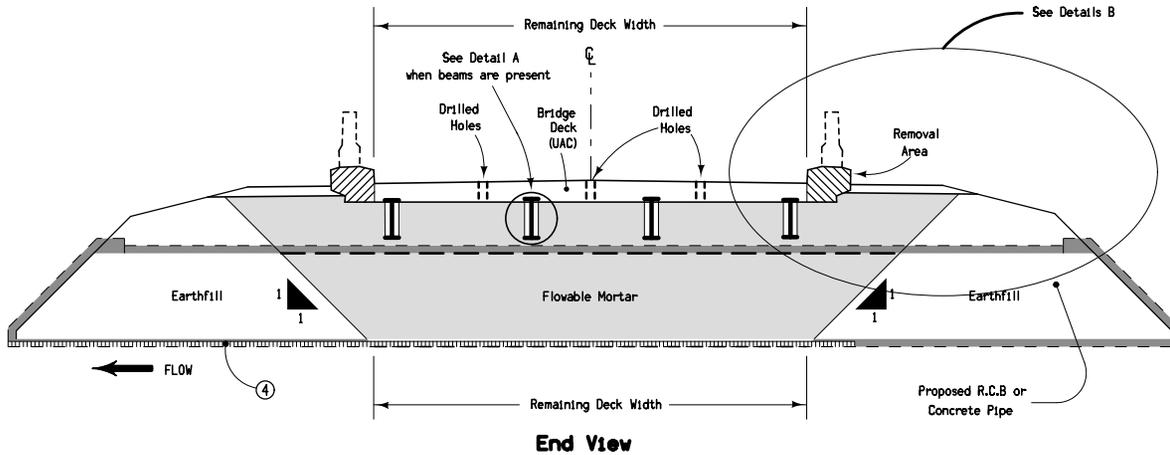


Trench Layout

■ Denotes pay limits for flowable mortar
 ■ Denotes pay limits for flooded backfill

- ① 4" Subdrain at flowline elevation of culvert with 4" cover of porous backfill.
- ② Place Flange Filler Material to fill pocket area between flanges to prevent flowable mortar from building up. Flange Filler Material is incidental to flowable mortar.
- ③ Fill void with the maximum amount of Floodable Backfill possible. Distance from Floodable Backfill to bridge beams (when present) or bridge deck shall not exceed 5'.
- ④ Cut trenches in the soil plug to provide drainage for the flowable mortar. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.
- ⑤ Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.

FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS



- ① Cut trenches in the soil plug to provide drainage for the flowable mortar. Backfill the trenches with open graded crushed stone, gravel, or recycled PCC to allow water to drain. Backfill material is incidental to flowable mortar.
- ② Place trenches at 20' spacing with a minimum of two trenches on each side of the roadway.
- ③ Existing embankment.
- ④ 4" Subdrain with 4" cover of porous backfill at flowline elevation of culvert.
- ⑤ Place Flange Filler Material to fill pocket area between flanges to prevent flowable mortar from building up. Flange Filler Material is incidental to flowable mortar.

FILL FOR CULVERT USED IN BRIDGE REPLACEMENTS WITH RESTRICTED HEIGHT

