ATB/TRU-CULVERTS-FY2026 (PID 122339)
Proposed Culvert Replacement @ ATB-193-11.140

Culvert Geometry	Existing	~~Design Smooth~~	~~Design Corr.~~	~~Design Ellip.~~	Design Ellip.	~~Design Arch~~	Design Arch	Design Box
Existing Drainage Area (acres) ~ for reference only ~	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A
Existing Q 50-year (cfs) ~ for reference only ~	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A
Drainage Area (acres)	186	~~186~~	~~186~~	~~186~~	186	~~186~~	186	186
Roadway Elevation (feet)	972.0	~~972.0~~	~~972.0~~	~~972.0~~	972.0	~~972.0~~	972.0	972.0
Inside Width (inches)	84	~~60~~		~~68~~	76	~~71~~	77	72
Inside Height (inches)	36	~~60~~		~~43~~	48	~~47~~	52	48
Pipe Material	Slab Top	~~RCP | HDPE~~	~~CMP~~	~~RCP~~	RCP	~~1/2" Corr.~~	1/2" Corr.	Reinf. Conc.
Manning's n	0.0150	~~0.0120~~		~~0.0120~~	0.0120	~~0.0232~~	0.0232	0.0120
Length (feet)	35	~~40~~	~~40~~	~~40~~	40	~~40~~	40	40
Inlet Invert (feet)	966.3	~~966.3~~	~~966.3~~	~~966.3~~	966.3	~~966.3~~	966.3	966.3
Outlet Invert (feet)	966.0	~~966.0~~	~~966.0~~	~~966.0~~	966.0	~~966.0~~	966.0	966.0
Slope	0.0086	~~0.0075~~	~~0.0075~~	~~0.0075~~	0.0075	~~0.0075~~	0.0075	0.0075
Pipe Crown (feet)	969.3	~~971.3~~	~~966.3~~	~~969.9~~	970.3	~~970.2~~	970.6	970.3
Wall Thickness (inches)	12.0	~~6.0~~		~~6.0~~	6.5	~~0.5~~	0.5	12.0
Height of Cover (feet)	1.7	~~0.2~~	~~5.7~~	~~1.6~~	1.2	~~1.7~~	1.3	0.7

Notes:
1. Culvert is a replacement to an existing 84"x36" Slab Top.
2. Fill depth < 8' --> 15" minimum culvert size.
3. Design options that are struck through: Required culvert size exceeds site constraints or requires multiple barrels.
4. In accordance with L&D Volume 2 1105.1, a single-cell elliptical concrete culvert is proposed at this location.

Tailwater Data								
10-year TW (feet)	966.5	~~966.5~~	~~966.5~~	~~966.5~~	966.5	~~966.5~~	966.5	966.5
50-year TW (feet)	966.5	~~966.5~~	~~966.5~~	~~966.5~~	966.5	~~966.5~~	966.5	966.5
100-year TW (feet)	966.5	~~966.5~~	~~966.5~~	~~966.5~~	966.5	~~966.5~~	966.5	966.5

Hydraulic Data (Rational Method Flows & HY-8)								
Q 50-percent AEP (cfs)	41	~~41~~	~~41~~	~~41~~	41	~~41~~	41	41
OHWM (feet)	967.8	~~968.8~~			968.3		968.3	968.3
Q 10-percent AEP (cfs)	101	~~101~~	~~101~~	~~101~~	101	~~101~~	101	101
HW 10-percent AEP (feet)	969.3	~~970.4~~		~~970.0~~	969.7	~~970.0~~	969.8	969.8
V 10-percent AEP (fps)	7.8	~~8.7~~		~~11.7~~	11.5	~~6.8~~	6.8	10.9
Q 2-percent AEP (cfs)	163	~~163~~	~~163~~	~~163~~	163	~~163~~	163	163
HW 2-percent AEP (feet)	971.1	~~971.9~~		~~971.7~~	971.0	~~971.9~~	971.3	971.3
V 2-percent AEP (fps)	7.8	~~13.3~~		~~13.2~~	13.2	~~8.8~~	7.7	12.5
Q 1-percent AEP (cfs)	191	~~191~~	~~191~~	~~191~~	191	~~191~~	191	191
HW 1-percent AEP (feet)	972.2	~~972.7~~		~~972.8~~	971.8	~~973.1~~	972.1	972.0
V 1-percent AEP (fps)	9.1	~~13.8~~		~~13.6~~	13.8	~~10.4~~	8.6	13.1

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Design Storm Controls - HW (L&D 1006.2.1)

A. 2 feet below the near, low edge of the pavement for drainage areas 1000 acres or greater and 1 foot below for culverts draining less than 1000 acres.	✓	✓	~~N/A~~	✓	✓	✓	✓	✓
Pavement Overtopping, Allen-Comp Road @ Upstream Culvert	972.0	~~972.0~~	~~972.0~~	~~972.0~~	972.0	~~972.0~~	972.0	972.0
Difference = (Pavement - HW 10-percent AEP)	2.7	~~1.6~~	~~N/A~~	~~2.0~~	2.3	~~2.0~~	2.2	2.2
Note: The near low edge of pavement is the location where roadway overtopping will occur. This may or may not be located directly over the culvert. Where the overtopping point on the roadway is outside the watershed break, the ditch break overflow elevation should be utilized as a headwater control in lieu of 1006.2.1 A.								
B. 2 feet above the inlet crown of the culvert or above a tailwater elevation that submerges the inlet crown in flat terrain.	✓	✓	~~N/A~~	✓	✓	✓	✓	✓
Difference = (Pipe Crown - HW 10-percent AEP)	0.0	~~0.9~~	~~N/A~~	~~-0.1~~	0.6	~~0.2~~	0.8	0.5
Note: Arbitrary control which generally applies to small culverts. Where large structures (greater than or equal to 10 feet in span) are involved, the structure should be sized to pass the design storm while maintaining a free water surface through the structure, unless tail water controls. If applicable, use smooth pipe to establish HW.								
C. 4 feet above the inlet crown of a culvert in a deep ravine.	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A
Note: Arbitrary control which generally applies to small culverts. Where large structures (greater than or equal to 10 feet in span) are involved, the structure should be sized to pass the design storm while maintaining a free water surface through the structure, unless tail water controls. If applicable, use corrugated pipe to establish HW.								
D. 1 foot below the near edge of pavement for bicycle pathways.	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A

Check Storm Controls - HW (L&D 1006.2.2)

A. 2 feet below the lowest ground elevation adjacent to an occupied building for a 2-percent AEP storm (it is not intended, however, to lower existing high water elevations around buildings).	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A
Lowest Ground Elevation Adjacent to Occupied Building	982.0	~~982.0~~	~~982.0~~	~~982.0~~	982.0	~~982.0~~	982.0	982.0
Difference = (Lowest Ground - HW 2-percent AEP)	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A
B. Limit the maximum 1-percent AEP HW depth to twice the diameter or rise of the culvert.	✓	✓	~~N/A~~	✓	✓	✓	✓	✓
HW 1-percent AEP	972.2	~~972.7~~	~~N/A~~	~~972.8~~	971.8	~~973.1~~	972.1	972.0
Inlet Invert + 2 * (Diameter or Rise)	972.3	~~976.3~~	~~N/A~~	~~973.5~~	974.3	~~974.1~~	975.0	974.3
C. Size a replacement structure to prevent overtopping by the 1-percent AEP storm where overtopping would not occur with the existing structure.	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A
D. Size a replacement structure so that flooding of upstream land is not increased for the 1-percent AEP storm when compared to the existing structure. Before implementing this criteria consider the type of upstream property and land use.	✓	✗	~~N/A~~	✗	✓	✗	✓	✓
E. Controls specific to an FIS. See section 1006.4.	N/A	~~N/A~~	~~N/A~~	~~N/A~~	N/A	~~N/A~~	N/A	N/A