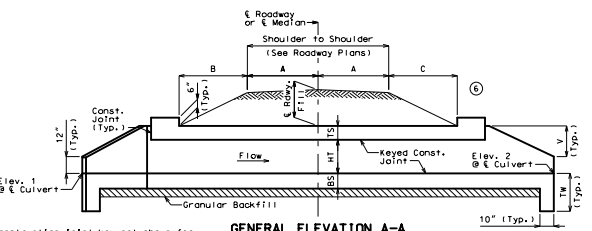
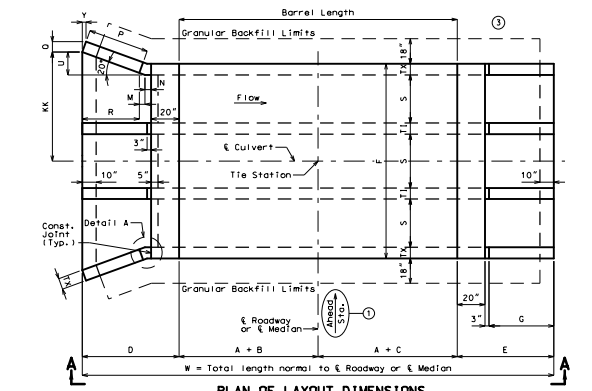


3' (x) CONCRETE BOX CULVERT



Construction joint key not shown for clarity. See standard plans for details.
If any part of the barrel is exposed, the roadway fill shall be warped to provide 12 inches minimum cover. (Roadway Item)
If unsuitable material is encountered, excavation of unsuitable material and furnishing and placing of granular backfill shall be in accordance with Sec 206.



W = Total length normal to Roadway or Median

Notes: This drawing is not to scale. Follow dimensions.

Layout Dimensions							
Var.	Equation	Dim.	Var.	Equation	Dim.	Var.	Equation
S	---	x	C	---	x	D	$TX(\cos 20^\circ)$
HT	---	x	D	$R + N + N + 20"$	x	R	$PT(\cos 20^\circ)$
TS	---	x	E	$G + 23"$	x	U	$(R + M)(\tan 20^\circ)$
BS	---	x	F	$35 + 27X + 27I$	x	V	$HT + TS - 12"$
TX	---	x	G	2V	x	W	$2A + B + C + D + E$
TI	---	x	M	$N(\cos 20^\circ)$	x	Y	$TX(\sin 20^\circ)$
A	---	x	N	$3" + TX(\tan 10^\circ)$	x	KK	$3S/2 + TI + U$
B	---	x	P	$2V(\sec 20^\circ)$	x	TW	$\text{Max}\{3.4" \text{ or } (B5 + 12")\}$

Hydrologic Data			
Drainage Area	=	---	mi ²
Design Flood Frequency	=	---	years
Design Flood Discharge	=	---	cfs
Design Flood (D.F.) Elevation	=	---	
Base Flood (100-year)	=	---	
Base Flood Elevation	=	---	
Base Flood Discharge	=	---	cfs
Estimated Backwater	=	---	ft
Outlet Velocity	=	---	ft/s
Roadway Overlapping	=	---	
Overlapping Flood Discharge	=	---	cfs
Overlapping Flood Frequency	=	---	years
Flood Elevation	=	---	

Elevations			
Upstream (Elev. 1)	=	---	ft
Downstream (Elev. 2)	=	---	ft
Pr. Cr. at Tie Sta.	=	---	

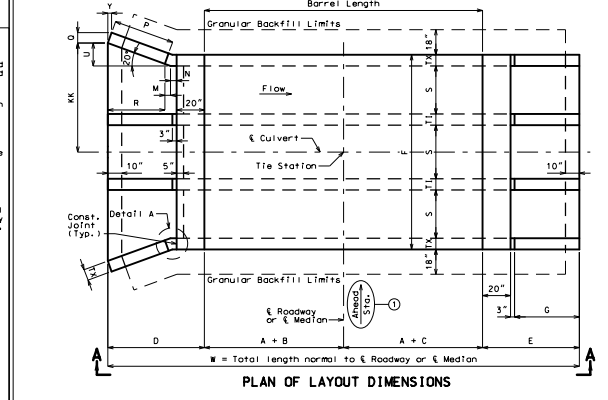
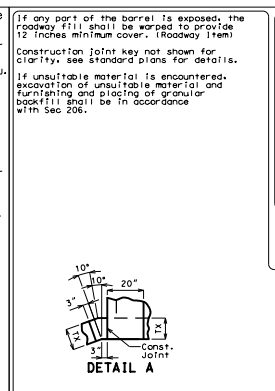
Estimated Quantities			
Class 4 Excavation	cu. yard	x	Final
Removal of Bridges	lump sum	1	
Class B-1 Concrete (Culverts-Bridge)	cu. yard	x	
Reinforcing Steel (Culverts-Bridge)	pound	x	

General Notes:
Design Specifications: 2010 AASHTO LRFD Bridge Design Specifications and 2010 Interim Revisions
Design Loading: Vehicular = HL-93 minus lane load, Earth = 120 lb/cf, Equivalent Fluid Pressure = 30 lb/cf (min.), 60 lb/cf (max.)
Design Unit Stresses: Class B-1 Concrete (Box Culvert): $f'_c = 4,000$ psi; Reinforcing Steel (Grade 60): $f_y = 60,000$ psi
Miscellaneous: MODI Construction personnel will indicate the type of box culvert constructed: Precast Concrete Box used; Cast-in-Place Concrete Box used
When alternate precast concrete box sections are used, the minimum distance from inside knee of headwall to precast sections measured along the shortest wall shall be 3 feet. Reinforcement and dimensions for wings and headwall shall be in accordance with Missouri Standard Plans.
Channel bottom shall be graded within the right of way for transition of channel bed to culvert openings. Channel banks shall be tapered to match culvert openings. (Roadway Item)
Traffic Handling: Structure to be closed during construction. Traffic to be maintained on roadway during construction. See roadway plans for traffic control.
B.W.

CULVERT-BRIDGE: ROUTE * OVER *			
ROUTE # FROM # TO #	ABOVE # MILES # OF #	TIE STA. #	
STD. 703.37			
STD. 703.81			
STD. 703.85			
STD. 703.87			
STD. 706.35			

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: 5/15/2015
PROJECT NO.: BOX 10
SHEET NO.: [Blank]

Standard Drawing Guidance
(Do not show on plans. Turn off the Bridge Construction level to hide)
Some details have been grouped together to allow easy substitution with alternate details. To edit grouped details, select them and press (Ctrl) U.
① Head station is shown for streams flowing left to right. Arrow must be flipped for streams that flow right to left.
② Modify Estimated Quantities as required. Don't leave blank rows but leave space between Estimated Quantities and General Notes for at least one pay item to be added during construction. See Alternate Details for culvert extensions or if five items are required.
③ Add any required transverse joints or appropriately spaced along the barrel. Label units and add actual lengths of units along the barrel.
④ Insert STD 703.60 when pipe inlets are required. Add pipe inlets to Plan of Layout Dimensions or appropriate locations and to Elevation A-A if visible from elevation. Add inlet data using notes where space allows, or use tables.
⑤ For nonstandard culverts with only one design fill height, add supplemental reinforcement table.
⑥ No need to revise General Elevation A-A for dual roadways. In Fill Heights table use a line designation after Rwy and insert another row for the other lane.
*** VARIABLE DESIGN FILL HEIGHTS ***
⑦ Select and delete the details grouped with the Fill Heights table. Select and move the alternate grouped details to drawing.
⑧ Place "See Member Thickness table" in the Equation column and place "Varies" in the Dim. column. If Dimension F varies, place "Varies" in the Dim. column.
⑨ Remove blank rows. End units may have different design fill heights but both units need to have the same member thickness.
⑩ This portion of table required when design fill height exceeds limits of the standard plans or when culvert cell height or span is not standard. If only a portion of the units are nonstandard, fill out entire table using the values from the standard table where applicable. Omit if not required.



Unit No.	Unit Length	Member Thickness	Top Slab Reinforcement				Bottom Slab Reinforcement				Wall Reinforcement		
			A1 Bars	J3 Bars	K2	Sz.Spa.	A1 Bars	H2 Bars	K2	Sz.Spa.	B1 Bars	B2 Bars	
x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x

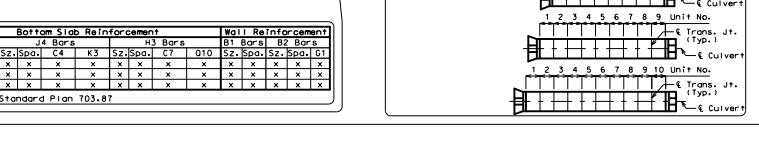
XX" Pipe Inlet Data			
Station	Offset	F.L. Elev.	
xxxxxx	xx.xx'	xxx.xx	
xxxxxx	xx.xx'	xxx.xx	
xxxxxx	xx.xx'	xxx.xx	

Pipe Inlet Data			
Station	Offset	Dia. F.L. Elev.	
xxxxxx	xx.xx'	xxx'	xxx.xx
xxxxxx	xx.xx'	xxx'	xxx.xx
xxxxxx	xx.xx'	xxx'	xxx.xx

Supplemental Reinforcement Table (Nonstandard culverts with only one design fill height)											
Top Slab Reinforcement				Bottom Slab Reinforcement				Wall Reinforcement			
A1 Bars	J3 Bars	H1 Bars	H2 Bars	A2 Bars	J4 Bars	H3 Bars	H3 Bars	B1 Bars	B2 Bars	B1 Bars	B2 Bars
Sz.Spa.	Sz.Spa.	C1	K2	Sz.Spa.	C5	O8	Sz.Spa.	C6	O9	Sz.Spa.	Sz.Spa.
C1	K2	Sz.Spa.	C5	O8	Sz.Spa.	C6	O9	Sz.Spa.	Sz.Spa.	C4	K3
C4	K3	Sz.Spa.	C7	O10	Sz.Spa.	Sz.Spa.	C7	O10	Sz.Spa.	Sz.Spa.	C1

Fill Heights			
Rwy at Culvert	=	---	ft
Design (Units 1 & 3)	=	---	ft
Design (Units 4 & 5)	=	---	ft
Design (Units 6 & 7)	=	---	ft

Estimated Quantities			
Class 4 Excavation	cu. yard	x	Final
Temporary Shoring	lump sum	1	
Partial Removal of Culvert-Bridge Concrete	lump sum	1	
Class B-1 Concrete (Culverts-Bridge)	cu. yard	x	
Reinforcing Steel (Culverts-Bridge)	pound	x	



Corresponds to the border of the standard drawing for ease in moving alternate details (Snap to corner)