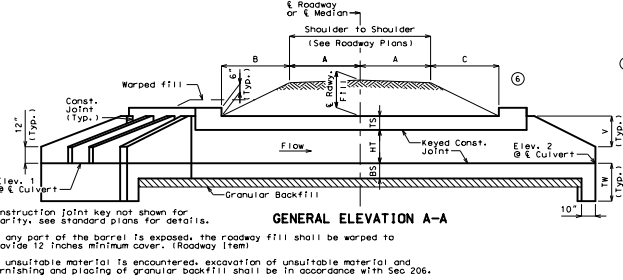
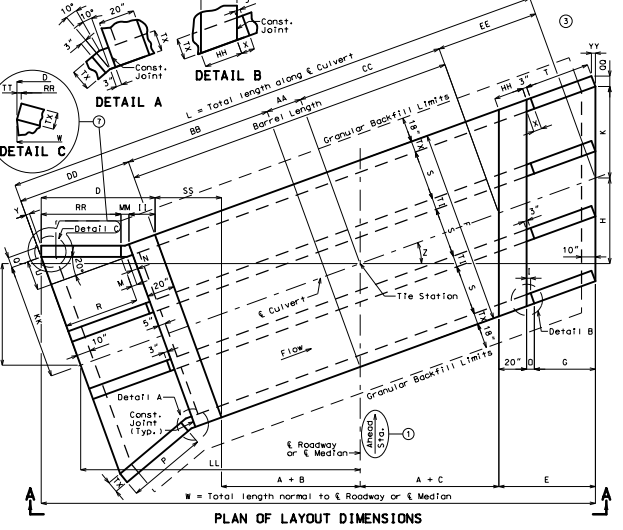


3' (x) CONCRETE BOX CULVERT



GENERAL ELEVATION A-A
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.



PLAN OF LAYOUT DIMENSIONS
W = Total length normal to E Roadway or E Median

Layout Dimensions			
Var.	Equation	Dfm.	Var.
S	--	x	K
HT	--	x	L
TS	--	x	M
BS	--	x	N
TX	--	x	O
TI	--	x	P
A	--	x	D
B	--	x	R
C	--	x	T
D	II + MM + RR (7)	x	U
E	G + O + 20"	x	V
F	55 + 2TX + 2TI	x	W
G	2V	x	X
H	IA + C + E (1 tan Z)	x	Y
I	3' (cos Z)	x	Z
J	IAA + BB + DD (1 sin Z)	x	AA
			BB
			CC
			DD
			EE
			FF
			GG
			HH
			II
			JJ
			KK
			LL
			MM
			NN
			OO
			PP
			QQ
			RR
			SS
			TT
			UU
			VV
			WW
			XX
			YY
			ZZ

Hydrologic Data		Elevations		Fill Heights	
Drainage Area =	... mi ²	Upstream (Elev. 1) =	... ft	Downstream (Elev. 2) =	... ft
Design Flood Frequency =	... years	Pr. Cr. at Tie Sta. =	...	Design (All units) =	... ft
Design Flood Discharge =	... cfs				
Design Flood (D.F.) Elevation =	... ft				
Base Flood (100-year) =	... ft				
Base Flood Elevation =	... ft				
Base Flood Discharge =	... cfs				
Estimated Backwater =	... ft				
Outlet Velocity =	... ft/s				
Roadway Overlapping	...				
Overlapping Flood Discharge =	... cfs				
Overlapping Flood Frequency =	... years				
Overlapping Flood Elevation =	... ft				

Estimated Quantities		Final	
Class 4 Excavation	cu. yard	x	
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 ASHTO LRF 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) fy = 60,000 psi
 Miscellaneous: MDDI 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 face of headwalls to precast sections measured along the shortest wall shall be 3 feet. Reinforcement and dimensions for wings and headwalls 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 during construction. See roadway plans for traffic control.
 B.M.

CULVERT-BRIDGE: ROUTE # OVER #		STANDARD PLAN	
ROUTE # FROM # TO #	...	STD. 703.37	...
ABOUT # MILES # OF # TIE STA.:	...	STD. 703.85	...
		STD. 703.86	...
		STD. 703.87	...
		STD. 706.35	...

Standard Drawing Guidance
 Do not show on plans. Turn off the Bridge Construction level to hide alternate details. To add grouped details, select them and press <Ctrl> U.
 Some details have been grouped together to allow easy substitution with alternate details. To add grouped details, select them and press <Ctrl> U.
 Ahead station is shown for streams flowing left to right. Arrow must be flipped for streams that flow right to left.
 Modify Estimated Quantities as required. Don't leave blank rows but leave space between Estimated Quantities and General Notes for at least one row. Items to be added during construction. See Alternate Details for culvert extensions or if five items are required.
 Add any required transverse joints proportionally spaced along the barrel. Label units and add actual lengths of units along the barrel.
 Insert STD 703.60 when pipe inlets are required. Add pipe inlets to Plan of Layout Dimensions at appropriate locations and to Elevation A-A if visible from elevation. Add inlet data using notes where space allows or use tables.
 For nonstandard culverts with only one design fill height, add supplemental reinforcement table.
 No need to revise General Elevation A-A for dual roadways. In Fill Heights table add a line designation after E & Rwy and insert another row for the other lane.
 For skew 20 degrees or more, remove Detail C, remove it from equation for W and place "NA" in the Dfm. column of dimension II. It will first need to separate Detail C from Plan by selecting and pressing <Ctrl> U.
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 DATE: 6/1/2015
 PROJECT NO.: BOX 12
 COUNTY: MO
 SHEET NO.: 12

ALTERNATE AND SUPPLEMENTAL DETAILS

Supplemental Pipe Inlet Details
 Pipes With Same Diameter

Station	Offset	Dia.	F.L. Elev.
xxxx.xx	xx.xx'	XX	xxx.xx
xxxx.xx	xx.xx'	XX	xxx.xx
xxxx.xx	xx.xx'	XX	xxx.xx

 Pipes With Different Diameters

Station	Offset	Dia.	F.L. Elev.
xxxx.xx	xx.xx'	XX	xxx.xx
xxxx.xx	xx.xx'	XX	xxx.xx
xxxx.xx	xx.xx'	XX	xxx.xx

 Inlets Sized for Elevation A-A (Pipe Diameter/Culvert Ht)
 Ex: Use 0.5 detail for 36" pipe into a 6' tall culvert.

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	H3 Bars
Sz.Spa.	Sz.Spa.	C1	C2	Sz.Spa.	C6
C1	C2	Sz.Spa.	C5	C6	C7
C7	C8	C9	C10	C11	C12

 Substitution table for tables shown on Standard Plan 703.87

Fill Heights
 E Rwy at E Culvert = ... ft
 Design (Units 1 & 1) = ... ft
 Design (Units 8 & 1) = ... ft
 Design (Units 6 & 1) = ... ft

Estimated Quantities
 Class 4 Excavation cu. yard x
 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

Alternate Estimated Quantities for Culvert Extensions or when Five Items are Required
 1 2 3 4 Unit No. Trans. Jt. (Typ.)
 1 2 3 4 5 Unit No. Culvert
 1 2 3 4 5 6 7 Unit No. Trans. Jt. (Typ.)
 1 2 3 4 5 6 7 8 Unit No. Culvert
 1 2 3 4 5 6 7 8 9 Unit No. Trans. Jt. (Typ.)
 1 2 3 4 5 6 7 8 9 10 Unit No. Culvert

PLAN OF TRANSVERSE JOINTS AND STAGE CONSTRUCTION
 Remove if not applicable.

PLAN OF LAYOUT DIMENSIONS
 W = Total length normal to E Roadway or E Median
 L = Total length along E Culvert
 Granular Backfill Limits
 TIE Station
 E Culvert
 E Roadway or E Median
 Inlet

LOCATION SKETCH

Top Slab Reinforcement		Bottom Slab Reinforcement		Wall Reinforcement	
A1 Bars	J3 Bars	H1 Bars	H2 Bars	A2 Bars	H3 Bars
Sz.Spa.	Sz.Spa.	C1	C2	Sz.Spa.	C6
C1	C2	Sz.Spa.	C5	C6	C7
C7	C8	C9	C10	C11	C12

 Substitution table for tables shown on Standard Plan 703.87

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