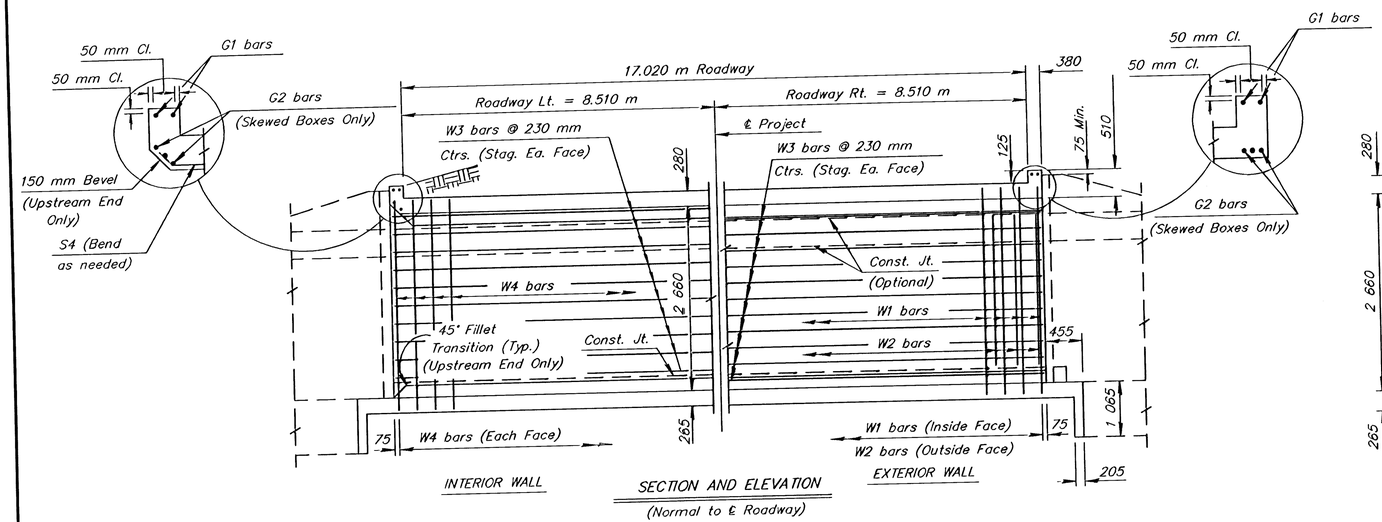
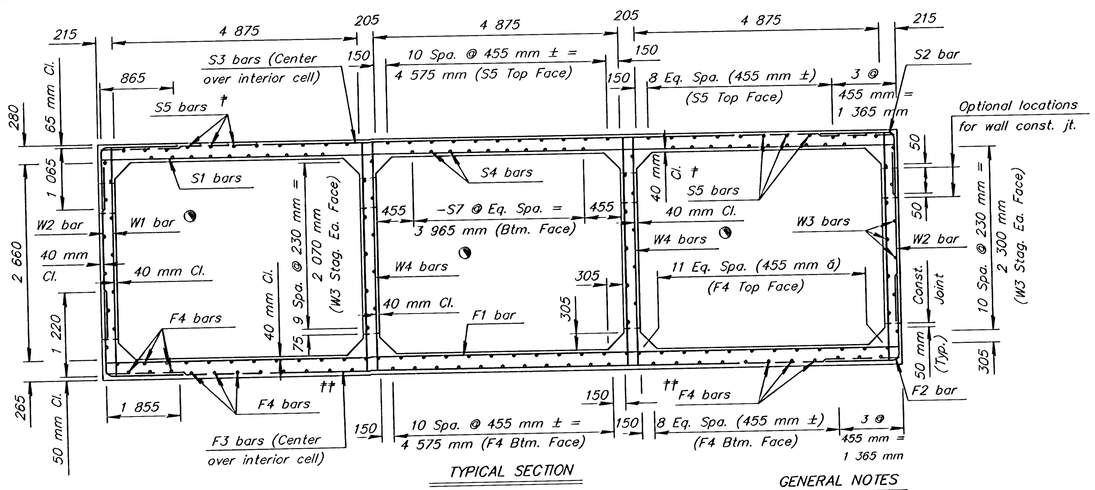
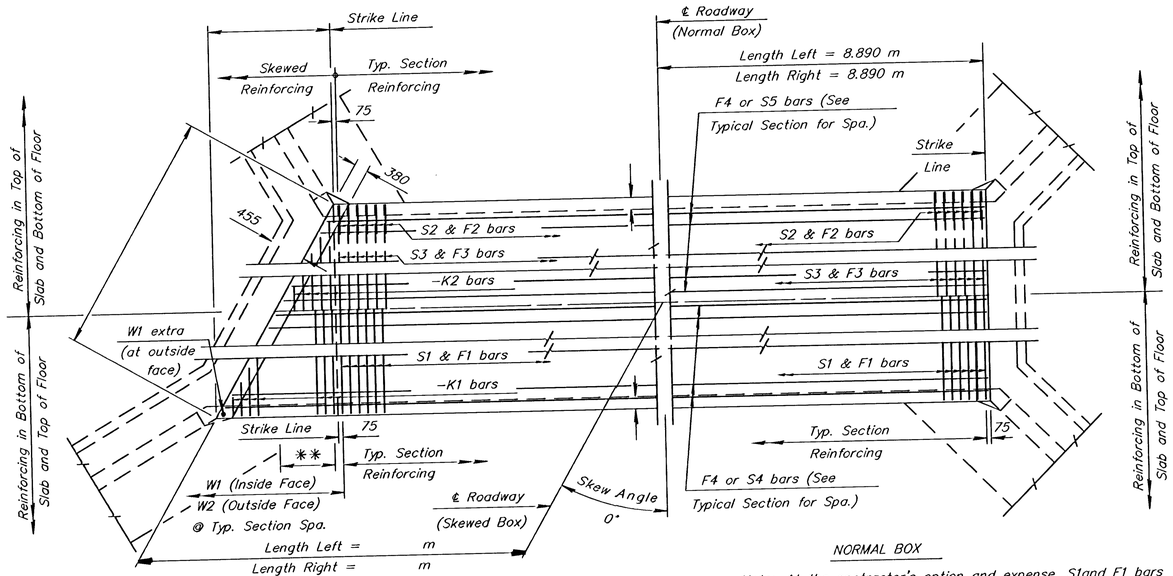
FHWA REGION NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS	87N-0078-01	1997	11	33



SECTION AND ELEVATION
(Normal to ℄ Roadway)



TYPICAL SECTION



** -F2 & -S2 bars (Top of Slab & Btm. of Floor)

SKEWED BOX (Lt. Skew Shown)

NORMAL BOX

PLAN

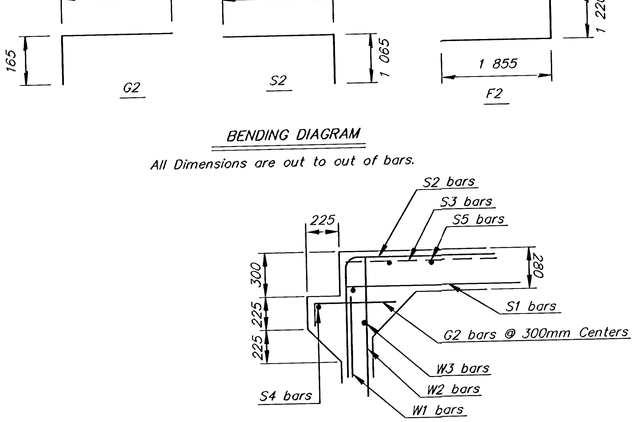
Note: At the contractor's option and expense, S1and F1 bars may be spliced at an interior wall and S3, and F3 bars may be spliced at mid-span of structure. See Table for required splice lengths.

◔ See RCB Auxillary Details for Optional Splice.

† Place when S3 bar extends to exterior walls.

†† Place when F3 bar extends to exterior walls.

Minimum Splice Lengths	
12M	405
15M	510
20M	610
22M	760
25M	990



BENDING DIAGRAM

All Dimensions are out to out of bars.

PAVEMENT REST DETAIL

GENERAL NOTES

DESIGN SPECIFICATION: AASHTO Specifications, 1983 Edition
DESIGN LOADING: MS20-44
UNIT STRESSES: Class AAA Concrete f'c = 28 MPa
Reinforcing Steel fy = 400 MPa

FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and includes the surfacing.

CONCRETE: Use concrete conforming to Class AAA Concrete. Bevel all exposed edges with a 20 mm triangular molding. Where Class AAA(AE) is specified, place this concrete in the top slab above the Construction Joint.

REINFORCING: Use reinforcing steel conforming to ASTM A615M, Grade 420. All dimensions relative to reinforcing steel are to the centerline of the bar unless otherwise noted.

EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Class AAA Concrete. Excavation for RCB bridges shall be paid for as Class III Excavation.

SEAL COURSE: A concrete seal course will be required. The seal course shall be unreinforced Concrete (Commercial Grade) with a minimum depth of 75 mm or as determined by the Engineer. Concrete for the seal course shall be paid for as "Concrete for Seal Course." See Sheet 21.

FOUNDATION STABILIZATION: The Engineer may require Foundation Stabilization. The Engineer shall determine the depth of Foundation Stabilization. Foundation Stabilization shall be paid for at the unit price set for Foundation Stabilization. See the "Auxiliary Details" sheet.

QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when they are required by the plans. Payment for additional quantities that result from including a seal course and/or a floating apron, as a change in the original plans, shall be made at the unit price bid for the various items involved.

GRANULAR BACKFILL (WINGWALLS): The Engineer may require special backfill procedures. See the "Auxiliary Details" sheet.

STRIKE LINE: Construct the wingwalls and that portion of the RCB outside the Strike Line level. Construct the wingwall footings with the culvert floor. See the wingwall detail sheets.

RCB-RCP CONNECTION: See sheet 8 for pipe connection details.

CULVERT SUMMARY

Flow Line Elev. Lt. (m)	Flow Line Elev. Rt. (m)	Crown Grade Elevation (m)	Design Fill Ht. (m)	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Granular Backfill	Concrete (AE) Barrel (m^3)	Concrete (AE) Wings (m^3)	Concrete (AE) Total (m^3)	Reinf. Steel (Gr. 420) Barrel (kg)	Reinf. Steel (Gr. 420) Wings (kg)	Reinf. Steel (Gr. 420) Total (kg)	Reinf. Steel (Gr. 420)(Epoxy) Barrel (kg)	Reinf. Steel (Gr. 420)(Epoxy) Wings (kg)	Reinf. Steel (Gr. 420)(Epoxy) Total (kg)
408.200	408.300	411.436	0.000	0°	45°	45°	No	No	no	223.6	29.1	252.7	13 758.3	1 532.0	15 290.3	14 073.9	–	14 073.9

* See Bending Diagram

BAR SCHEDULE

F1 Size	F1 Spa.	F1 No.	F1 Length	F2 * Size	F2 * Spa.	F2 * No.	F2 * Length	F3 Size	F3 Spa.	F3 No.	F3 Length	F4 Size	F4 No.	F4 Length	S1 Size	S1 Spa.	S1 No.	S1 Length	S2 * Size	S2 * Spa.	S2 * No.	S2 * Length	S3 Size	S3 Spa.	S3 No.	S3 Length	S4 Size	S4 No.	S4 Length	S5 Size	S5 No.	S5 Length
15	150	116	15 340	22	190	184	3 075	25	190	92	9 600	12	189	8 860	22	150	116	15 340	22	190	184	1 930	25	190	92	15 340	15	44	17 300	12	66	8 860

K1 Size	K1 Spa.	K1 No.	K1 Length	K2 Size	K2 Spa.	K2 No.	K2 Length	W1 Size	W1 Spa.	W1 No.	W1 Length	W2 Size	W2 Spa.	W2 No.	W2 Length	W3 Size	W3 No.	W3 Length	W4 Size	W4 Spa.	W4 No.	W4 Length	G1 Size	G1 No.	G1 Length	G2 * Size	G2 * No.	G2 * Length	S Size	S Spa.	S No.	S Length
			*				*	12	305	116	3 115	15	190	184	1 920	12	84	8 860	15	150	464	3 115	22	4	15 350	12	104	750				

SUMMARY OF QUANTITIES		
Concrete For Seal Course	59.4	m^3
Class AAA Concrete (AE)	252.7	m^3
Class III Excavation	862.0	m^3
Reinforcing Steel (Gr. 420)	15 290	kg
Reinforcing Steel (Epoxy Coated)(Gr. 420)	14 074	kg
Foundation Stabilization (Set)	1	m^3
Granular Backfill (Wingwalls) (Set)	1	m^3

NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

TRIPLE 4.9 m x 2.7 m RFB
(0° SKEW.)
STATION 0+346

~~BR3.16.08 F SI~~

FHWA APPROVAL		8-5-97	APP'D KENNETH F. HURST
DESIGNED	DCO	DETAILED	QUANTITIES TRACED
DESIGN CK.	RAM	DETAIL CK.	QUAN.CK. TRACE CK.

Std. Base File :/usr7/mrcb/brd3160B.dgn
Plotted By : $$USERNAME$$
Plot File : $$$$$$$$$$DGNSPEC$$$$$$$$$$
Plot Date : $$$$$SYTIME$$$$$
Server File : /usr2/
Server : witch
View=PLOT