

**STREET IMPROVEMENTS FOR**  
**135th Street West**  
from 13th Street to 21st Street North

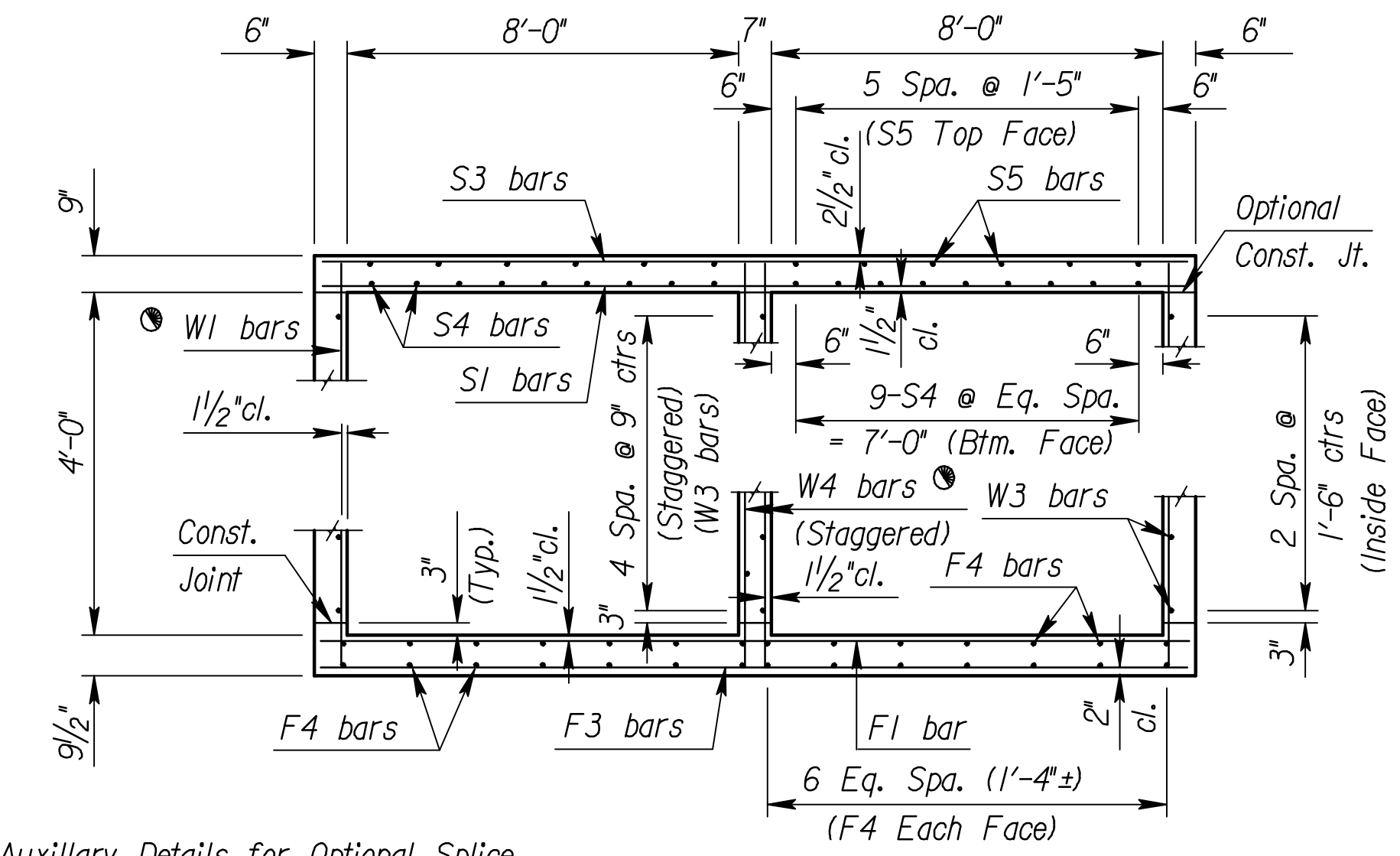
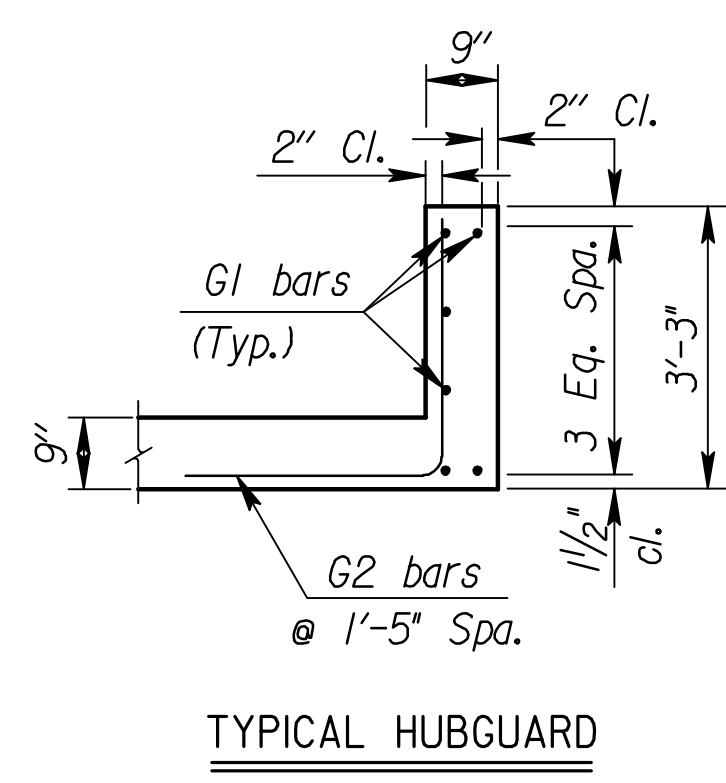
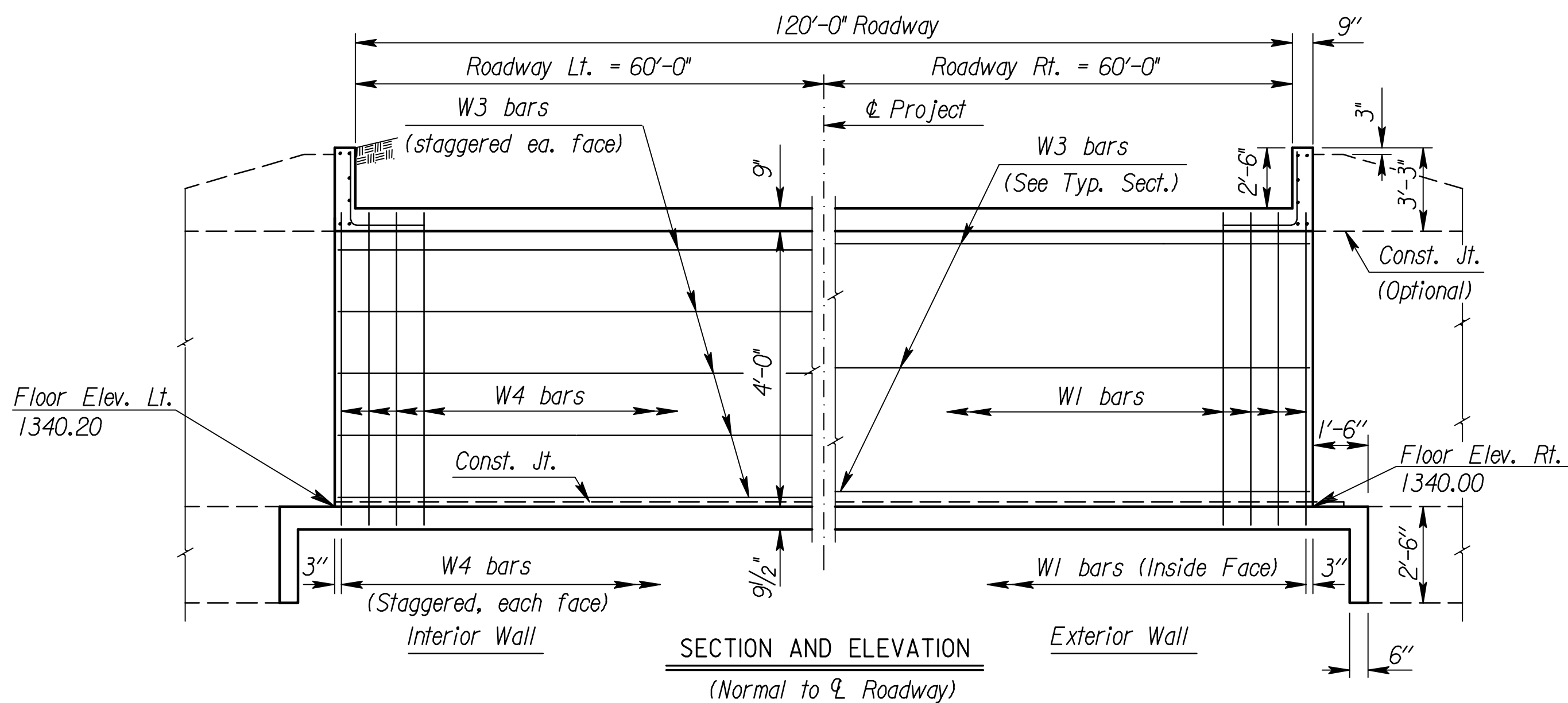
**STORM SEWER**  
**LINE 27**  
**2-8x4 RCB**  
**DETAILS**

SHEET TITLE  
MKEC PROJ #10265  
PROJECT NUMBER

JRA  
DESIGN BY  
DMU  
DRAWN BY  
JRA  
CHECKED BY

ISSUED  
February 2012  
REVISED

SHEET NO.  
**87 of 231**



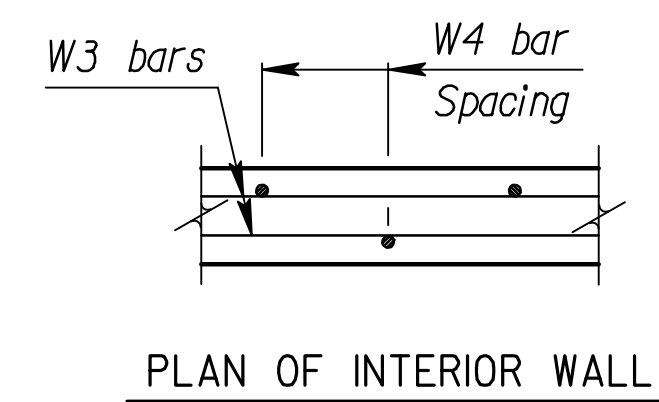
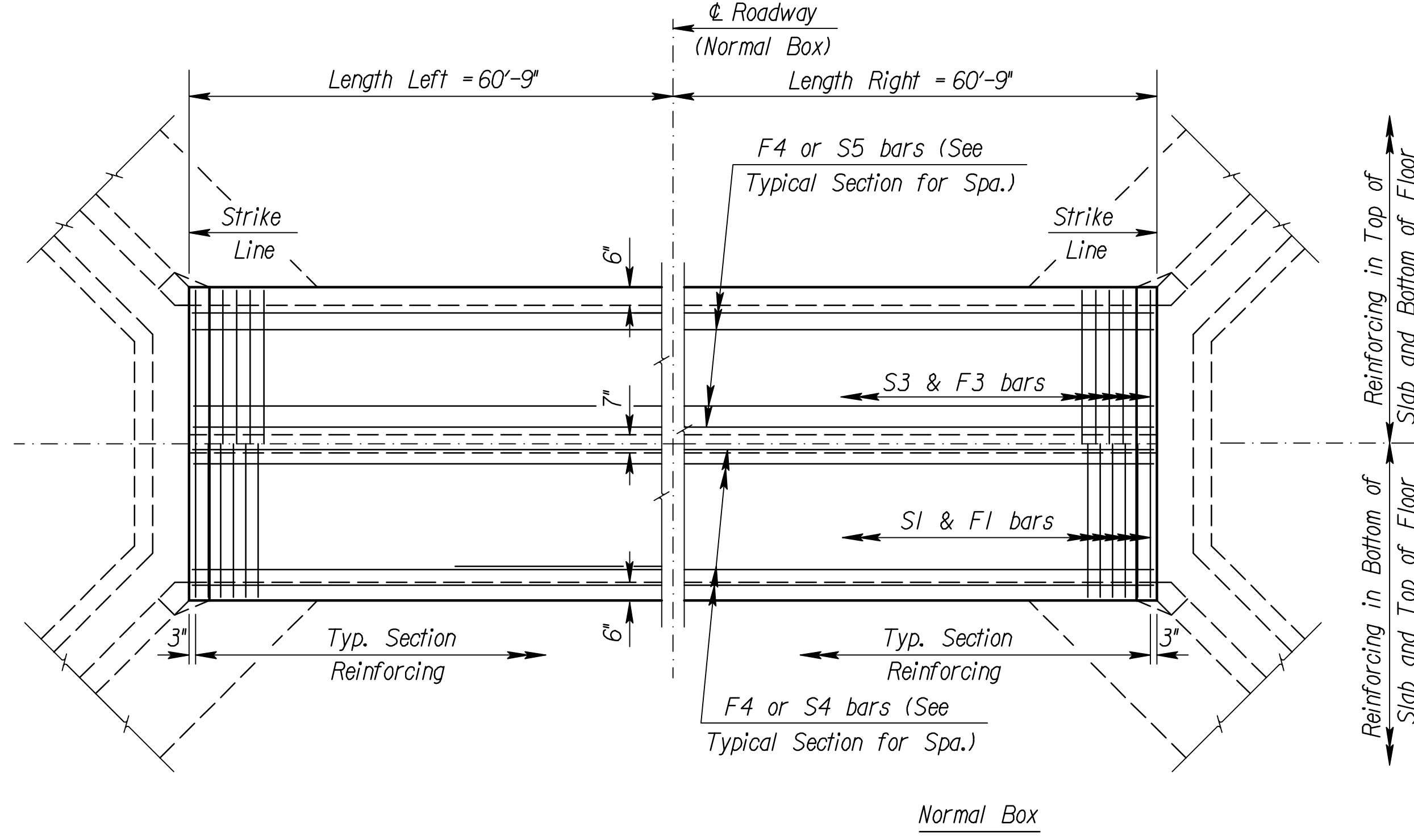
See RCB Auxiliary Details for Optional Splice.

TYPICAL SECTION

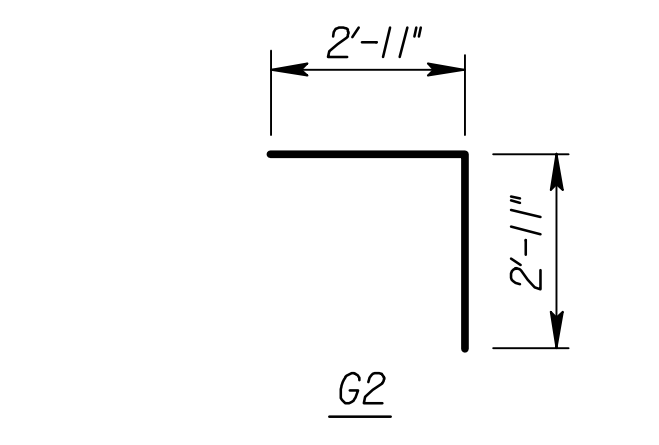
NOTE: The work on this sheet shall be subsidiary to \*Pipe, SWS, RCBC (2-8'x4')

GENERAL NOTES

- LOADING:** HS20-44 AASHTO Specifications, 1983 Edition.
- UNIT STRESSES:** Grade 4.0 Concrete;  $f'c = 4,000$  p.s.i. Reinforcing Steel;  $f_y = 60,000$  p.s.i.
- FILL HEIGHT:** Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.
- CONCRETE:** Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a  $\frac{3}{4}$  inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.
- REINFORCING:** All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.
- EXCAVATION:** Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.
- SEAL COURSE:** A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.
- FOUNDATION STABILIZATION:** The Foundation Stabilization quantity has been calculated to the limits shown on the "RCB Auxiliary Details" sheet. The depth may be increased by the Engineer. The Contractor may underrun Foundation Stabilization under the barrel if founded on firm material and with the Engineer's approval. Use Foundation Stabilization on all wingwalls unless founded on rock or granular material.
- QUANTITIES:** The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.
- GRANULAR BACKFILL (WINGWALLS):** Special backfill procedures may be required at the direction of the Engineer. See Auxiliary Details Sheet.
- STRIKE LINE:** Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.



PLAN OF INTERIOR WALL



BENDING DIAGRAM

(All dimensions are out to out of bars.)

For design purposes ONLY. Do NOT use for Construction CULVERT SUMMARY includes any apron welded wire fabric

Floor Elev. Lt.	Floor Elev. Rt.	Crown Gr. Elev.	Design Fill Ht.	Skew	Left Wings	Right Wings	Scour Apron	Soil Saver	Concrete			Reinf. Steel (Gr. 60)		
									Barrel (Cu.Yds.)	Wings (Cu.Yds.)	Total (Cu.Yds.)	Barrel (Lbs.)	Wings (Lbs.)	Total (Lbs.)
1340.20	1340.00	1347.10	0	0	FLARED	FLARED	YES	NO	152.92	44.44	197.36	28284	1936	30220

Minimum Splice Lengths	
#4	1'-4"
#5	1'-8"
#6	2'-0"

BAR SCHEDULE

F1				F3				F4				ΔS1			ΔS3			ΔS4			ΔS5						
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	No.	Length			
6	6"	243	17'-3"	5	7 1/2"	195	17'-3"	4	112	31'-4"	6	6"	243	17'-3"	5	7 1/2"	195	17'-3"	5	54	41'-6"	4	48	31'-4"			

W1				W3				W4				ΔG1			ΔG2 *		
Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	No.	Length	
4	9"	324	5'-3"	4	44	31'-4"	4	9"	162	5'-3"	5	12	17'-3"	5	24	5'-10"	

Δ Epoxy Coated Bars  
\* See bending Diagram

SUMMARY OF QUANTITIES (FOR INFORMATION ONLY)

Concrete (Grade 4.0)	135.6	C.Y.
Concrete (Grade 4.0)(AE)	62.0	C.Y.
Reinforcing Steel (Gr. 60)	16900	Lbs.
Reinforcing Steel (Gr. 60)(Epoxy Coated)	13510	Lbs.
Foundation Stabilization	63	C.Y.
Concrete for Seal Course (Set)	1	C.Y.
Granular Backfill (Wingwalls)(Set)	1	C.Y.

PLOTED: Thursday, February 16, 2012 11:19AM

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