

# SINGLE BARREL 8'-0" X 8'-0"

## CONCRETE BOX CULVERT

### STA 960+50

### ALBIN ROAD

0216001

LARAMIE COUNTY

## PRELIMINARY

### GENERAL NOTES

**SPECIFICATIONS:** WYDOT Standard Specifications for Road and Bridge Construction, 2010 Edition.

**DIMENSIONS:** Longitudinal dimensions are along flow line. Slopes are vertical : horizontal.

**CONCRETE AGGREGATE:** Ensure all concrete mix designs employed in the project meet the following alkali-silica reactivity (ASR) screening.

Conduct the AASHTO T 303 (ASTM C 1260) test using a combined sample of fine aggregate and coarse aggregate, in the same proportions that will be used in the concrete mix design. If the test results indicate an expansion at 16 days from casting of 0.10 percent or less, the aggregate is considered non-reactive and mitigation measures are not required.

If the test results indicate an expansion at 16 days from casting of greater than 0.10 percent, mitigate the aggregate reactivity through the use of a class F fly ash as approved for ASR mitigation in accordance with the Materials Testing Manual, silica fume, and/or lithium nitrate additive. Demonstrate adequate mitigation by conducting the ASTM C 1567 test and ensuring the test results indicate an expansion at 16 days from casting of 0.10 percent or less. When conducting the ASTM C 1567 test, use a combined sample of fine aggregate and coarse aggregate, in the same proportions that will be used in the concrete mix design and use the cementitious material that is to be used in the mix design.

Ensure the AASHTO T 303 (ASTM C 1260), and ASTM C 1567 tests have been performed within 12 months of the submittal date.

Submit qualifying AASHTO T 303 (ASTM C 1260) and ASTM C 1567 test results to the engineer a minimum of 14 calendar days before concrete production. Submit test results to the Materials Program along with each mix design request.

**REINFORCING STEEL:** Ensure reinforcing steel conforms to ASTM A 615 (Grade 60) for all bars, including ties and stirrups. Concrete cover to face of reinforcing steel is 2" unless noted. Dimensions for bent bars are out to out. Ensure bars marked with an asterisk (\*) are coated.

#### BAR MARKS



**EYEBOLTS:** Use galvanized bar conforming to ASTM A 709 (Grade 36). Work necessary for the eyebolts is incidental to the contract pay item Class A Concrete.

**WEEP HOLE ASSEMBLIES:** Work necessary for the weep hole assemblies is incidental to the contract pay item Class A Concrete.

**PREFORMED EXPANSION JOINT FILLER:** Work necessary for the preformed expansion joint filler is incidental to the contract pay item Class A Concrete.

**REMOVAL OF STRUCTURES AND OBSTRUCTIONS:** Remove the existing 72"Ø x 60'-0"± corrugated metal pipe.

**CULVERT EXCAVATION:** The estimated quantity of culvert excavation, including removal of the existing pipe and excavation for the new culvert, is 90 CY and is incidental to the contract pay item Removal of Structures and Obstructions.

**OPTIONAL CONSTRUCTION JOINT BASE:** If the optional construction joint in the bottom slab is used, work necessary for the base is incidental to the contract pay item Class A Concrete.

### DESIGN DATA

**SPECIFICATIONS:** AASHTO LRFD Bridge Design Specifications, 8th Edition.

**ADT:** 185 (Year 2008)

#### LOADING:

Live Load: HL93  
Lateral live load surcharge: 2 ft earth or 72 psf  
Dead Load: Design fill: 0.6 ft±  
Vertical earth pressure: 120 pcf  
Lateral earth pressure: 72 pcf

**REINFORCED CONCRETE:** Load and Resistance Factor Design -  
Class A Concrete  $f'_c = 4000$  psi  
Reinforcing Steel  $f_y = 60,000$  psi (Grade 60)

**APPROACH ROADWAY WIDTH:** 36'-0"

### REFERENCES

- Supplementary Specifications:  
SS-100K Adjustment for Structural Steel
- Standard Plans:  
206-1A Culvert and Trench Excavation  
511-1A Wire Enclosed Riprap and Gabions

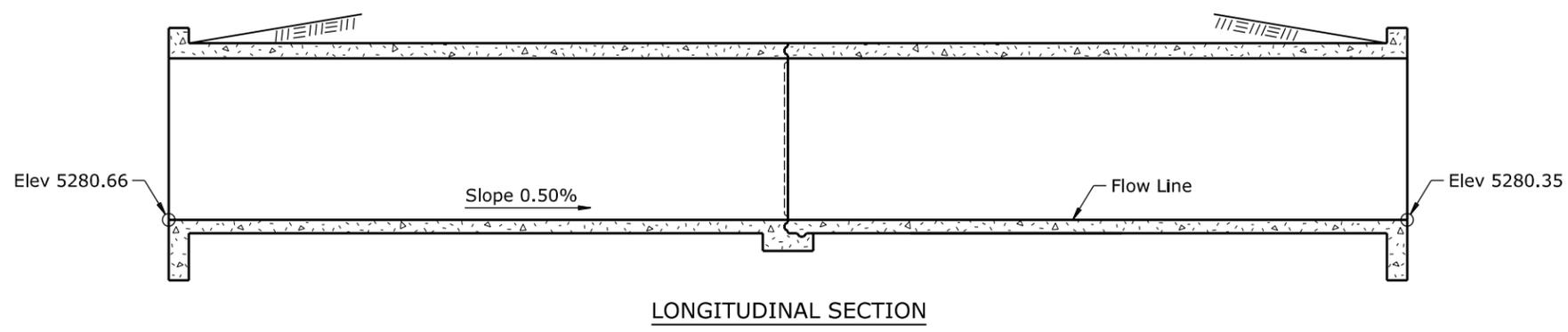
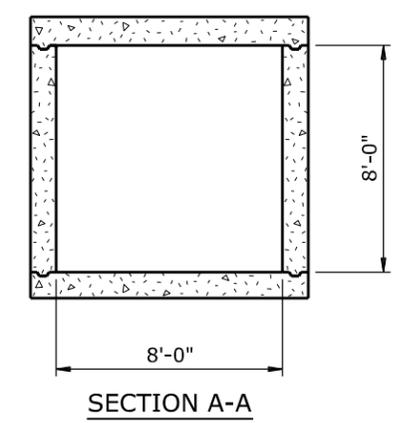
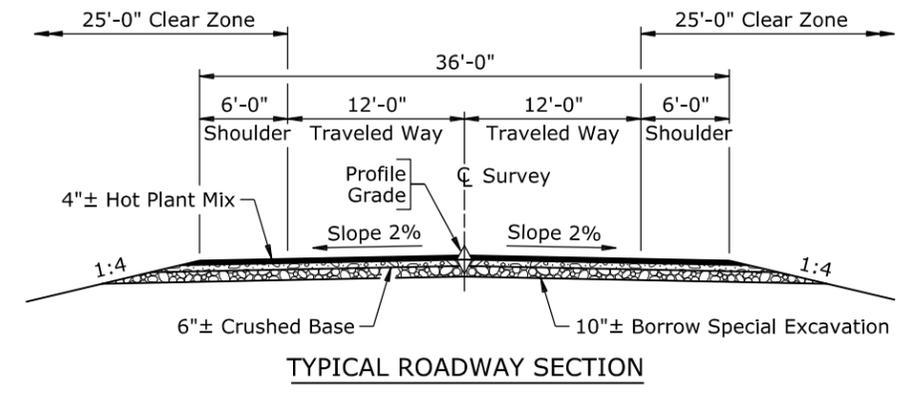
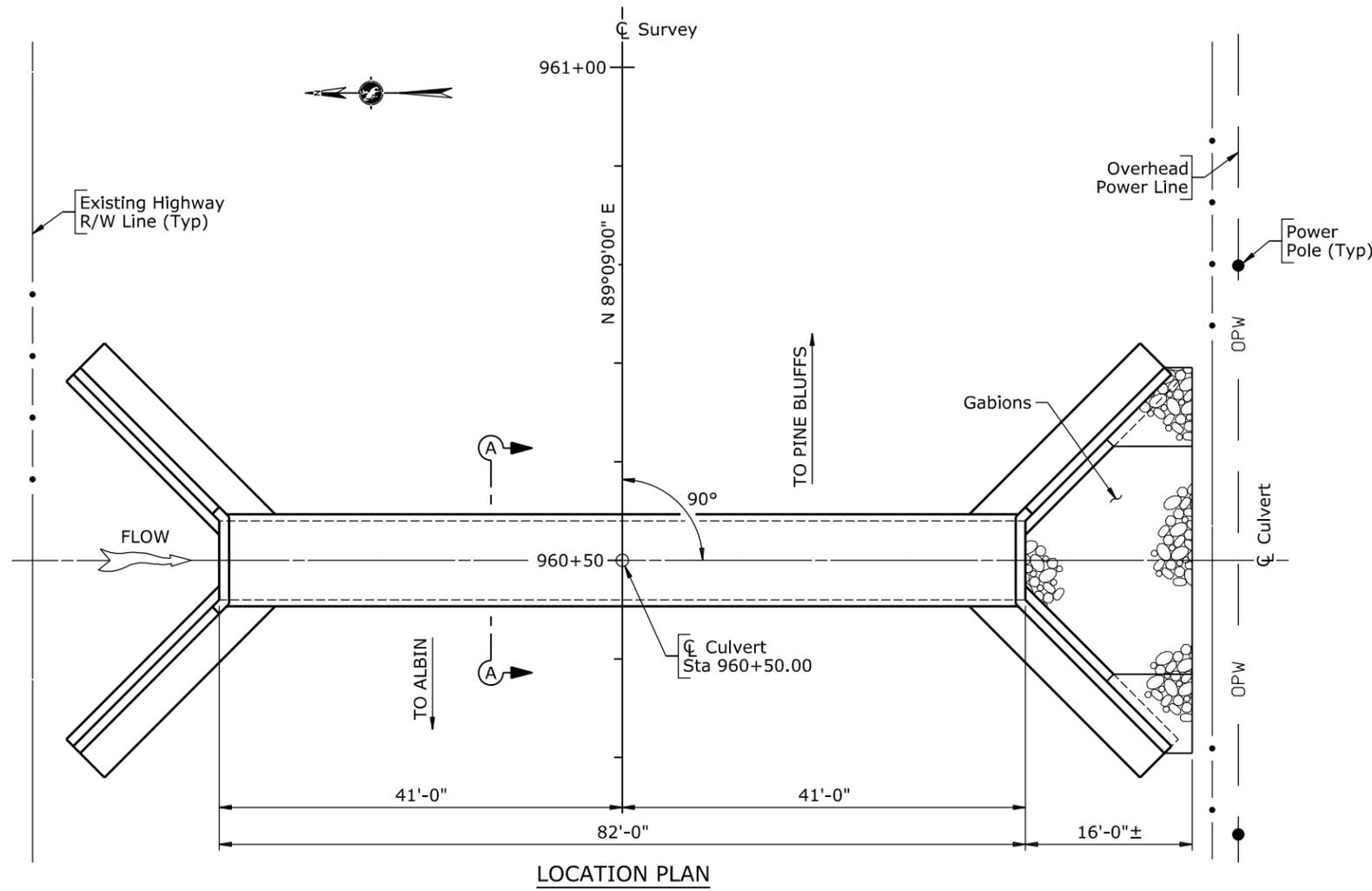
**STRUCTURE NO. M-IJG-C**  
**ML1105B, RM 0.05**  
**SEC 20, T17N, R60W**

ESTIMATED QUANTITIES				
ITEM NO.	ITEM	UNIT	TOTAL QUANTITY	ESTIMATE
202.03100	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	LUMP SUM	X EA
212.03900	PERVIOUS BACKFILL MATERIAL	CY	X	
511.01000	GABIONS	CY	X	
513.00005	CLASS A CONCRETE	LS	LUMP SUM	X CY
514.00015	REINFORCING STEEL	LS	LUMP SUM	X LB

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM REVISIONS			
REVIEW	DESIGN	DETAIL	Design Section Q R Stuv
		HHH ✓ NNN	Drwg No. P-0005 Sheet 1 of 2
APPROVAL	QTY'S		

Nov 2019

Wyo. Proj. 0216001  
 Sheet of Sheets



WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
PRELIMINARY LAYOUT			
SINGLE BARREL 8'-0" X 8'-0" CONCRETE BOX CULVERT			
STA 960+50 Albin Road			
0216001		La	
DESIGN	_____	Design Section Q R Stuv	
REVIEW	_____	Drwg No. P-0005 Sheet 2 of 2	
APPROVAL	_____		

4.01 - Example

Section 4.01 - Preliminary

# SINGLE BARREL 8'-0" X 8'-0"

## CONCRETE BOX CULVERT

### STA 960+50

### ALBIN ROAD

0216001

LARAMIE COUNTY

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BAR MARKS



EYEBOLTS: Use galvanized bar conforming to ASTM A 709 (Grade 36). Work necessary for the eyebolts is incidental to the contract pay item Class A Concrete.

WEEP HOLE ASSEMBLIES: Work necessary for the weep hole assemblies is incidental to the contract pay item Class A Concrete.

PREFORMED EXPANSION JOINT FILLER: Work necessary for the preformed expansion joint filler is incidental to the contract pay item Class A Concrete.

REMOVAL OF STRUCTURES AND OBSTRUCTIONS: Remove the existing 72"Ø x 60'-0"± corrugated metal pipe.

CULVERT EXCAVATION: The estimated quantity of culvert excavation, including removal of the existing pipe and excavation for the new culvert, is 90 CY and is incidental to the contract pay item Removal of Structures and Obstructions.

OPTIONAL CONSTRUCTION JOINT BASE: If the optional construction joint in the bottom slab is used, work necessary for the base is incidental to the contract pay item Class A Concrete.

DESIGN DATA

SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, 8th Edition.

ADT: 185 (Year 2008)

LOADING:

Live Load: HL93  
Lateral live load surcharge: 2 ft earth or 72 psf  
Dead Load: Design fill: 0.6 ft±  
Vertical earth pressure: 120 pcf  
Lateral earth pressure: 72 pcf

REINFORCED CONCRETE: Load and Resistance Factor Design -  
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Reinforcing Steel  $f_y = 60,000$  psi (Grade 60)

APPROACH ROADWAY WIDTH: 36'-0"

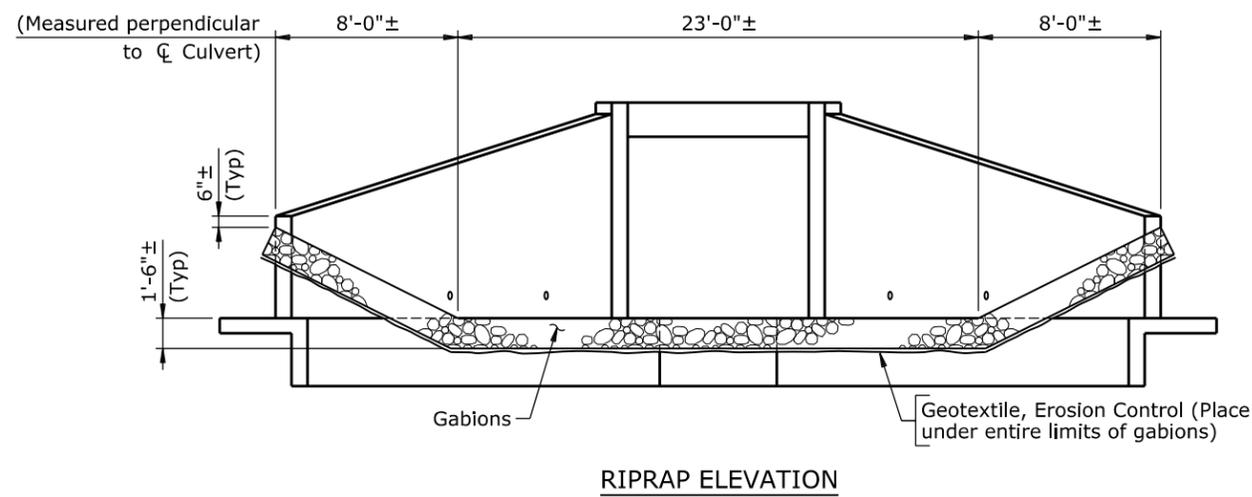
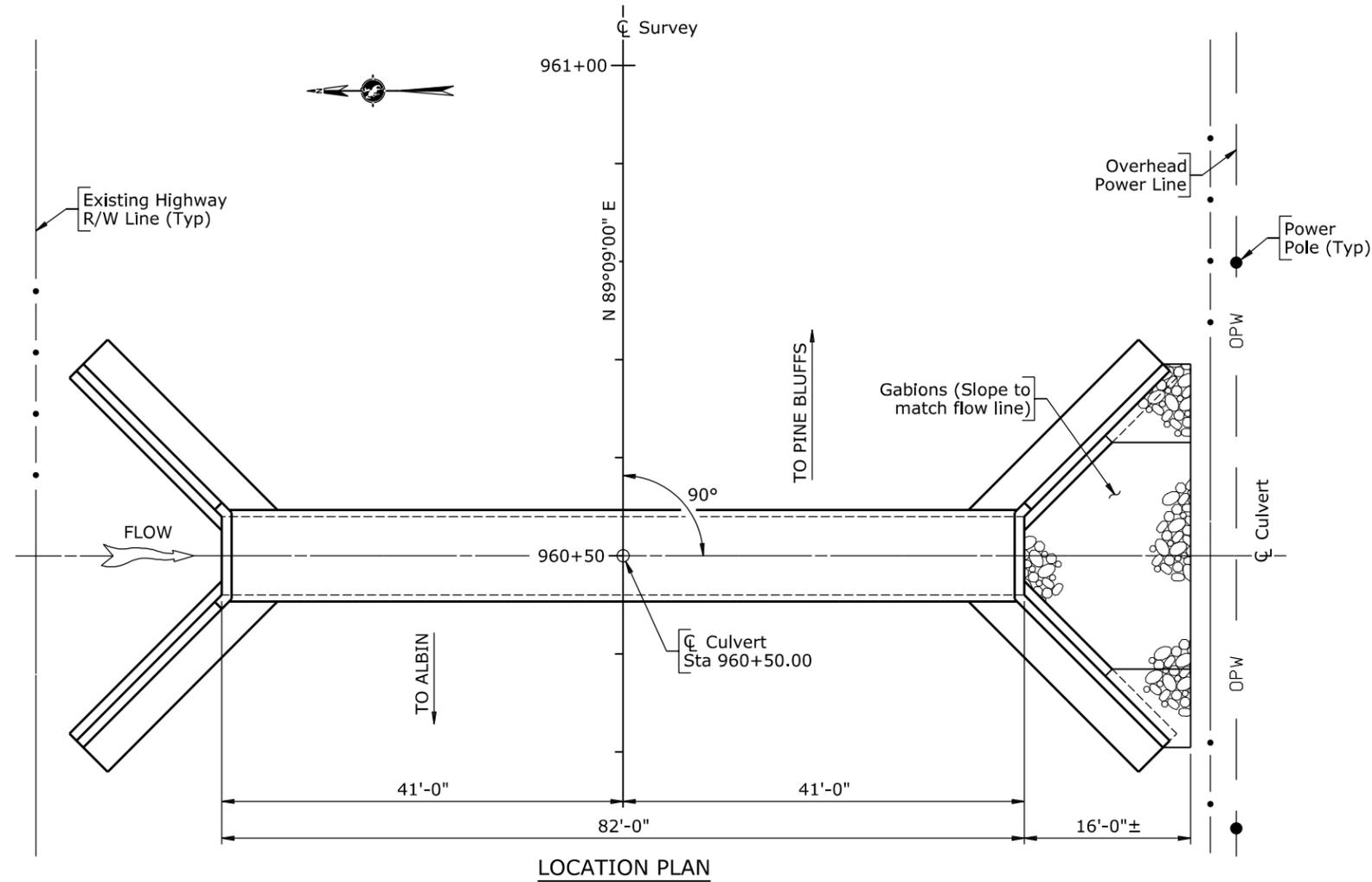
REFERENCES

- Supplementary Specifications:  
SS-100K Adjustment for Structural Steel
- Standard Plans:  
206-1A Culvert and Trench Excavation  
511-1A Wire Enclosed Riprap and Gabions

STRUCTURE NO. M-IJG-C  
ML1105B, RM 0.05  
SEC 20, T17N, R60W

ESTIMATED QUANTITIES				
ITEM NO.	ITEM	UNIT	TOTAL QUANTITY	ESTIMATE
202.03100	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	LUMP SUM	1 EA
212.03900	PERVIOUS BACKFILL MATERIAL	CY	12	
511.01000	GABIONS	CY	30	
513.00005	CLASS A CONCRETE	LS	LUMP SUM	106.2 CY
514.00015	REINFORCING STEEL	LS	LUMP SUM	10,330 LB

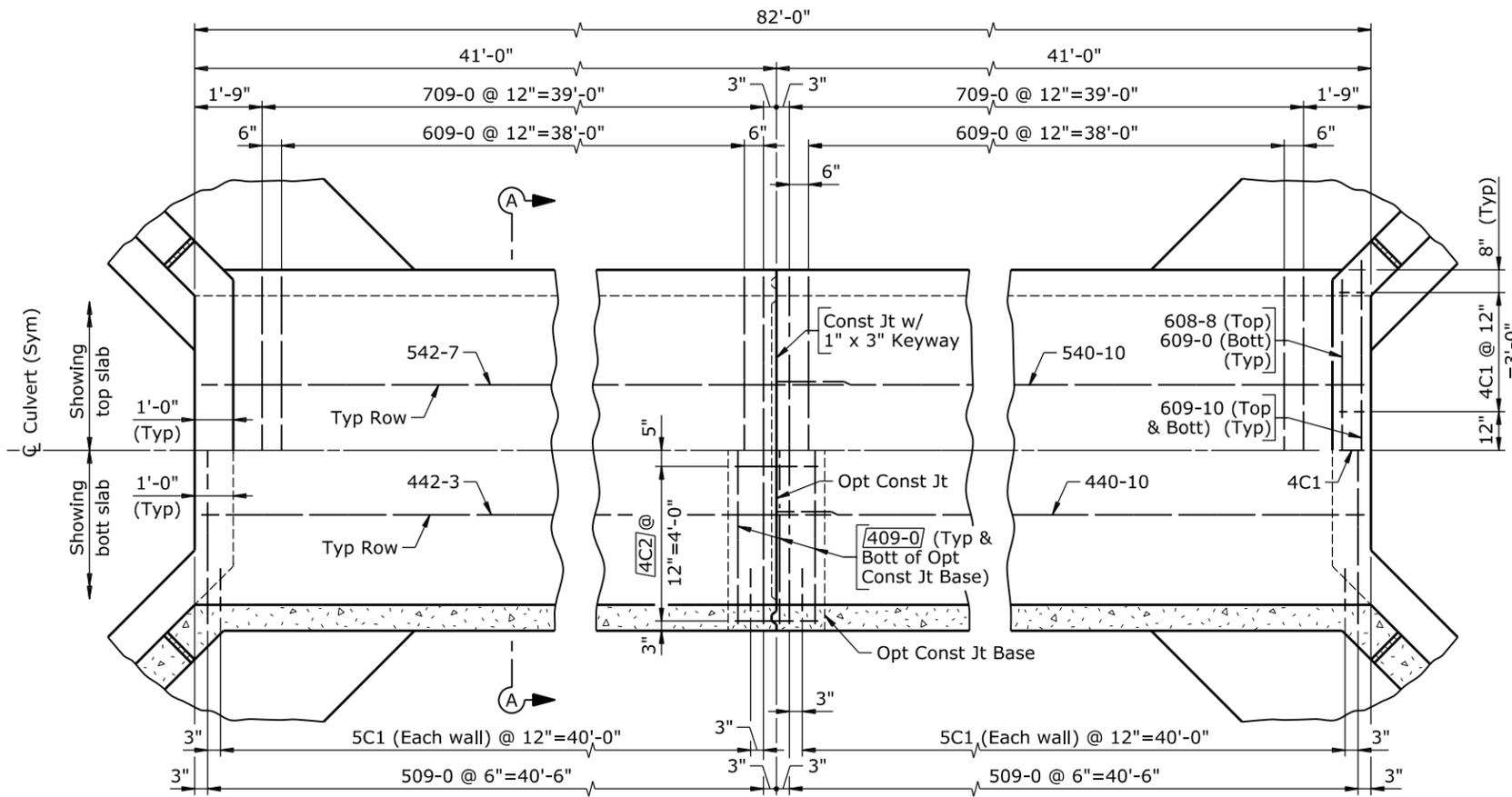
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REVIEW	DESIGN	DETAIL	Design Section Q R Stuv
	HHH ✓ NNN		Drwg No. 0005 Sheet 1 of 4
APPROVAL	QTY'S		



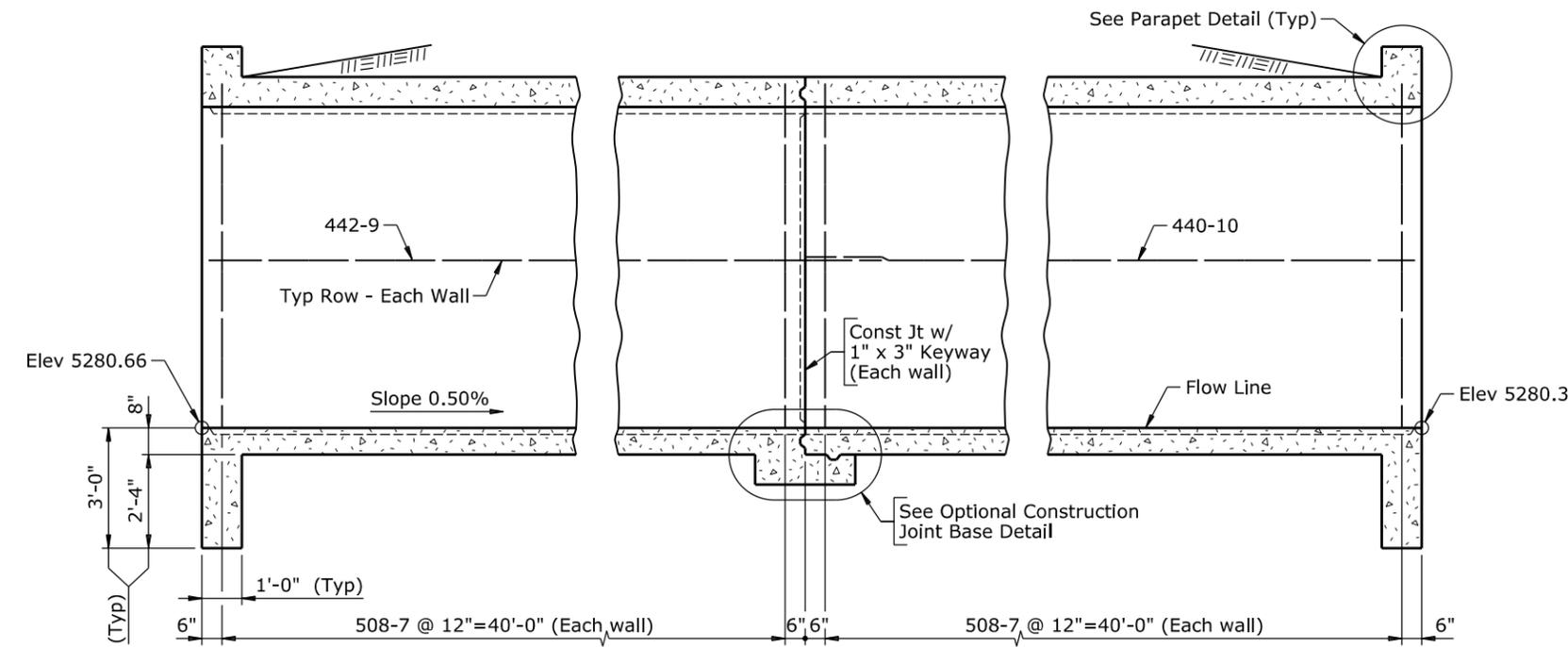
BILL OF REINFORCEMENT		
Location (Weight)	Mark	Number Required
Bottom Slab & Footings (81 LB) (4408 LB)	4C2	10
	409-0	6
	425-3	24
	440-10	10
	442-3	10
	5C3	164
	5C4	84
	505-2	196
Walls (2361 LB)	440-10	16
	442-9	16
	508-7	164
Top Slab & Parapets (3561 LB)	4C1	18
	540-10	10
	542-7	10
	608-8	2
	609-0	80
	609-10	4
	709-0	80
Wingwalls (1166 LB)	405-5	4
	409-10	4
	414-4	4
	418-9	4
	419-8	16
	509-4	4
	Set Bars	4
	620-2	8
Bending Diagrams		
4C1 (Tie) (4'-3")	4C2 (Tie) (6'-8")	5C3 (3'-0")
Set Diagram		
Set Bars (No. 5 Bars) (Avg length=6'-6 1/2")		

Note: Reinforcing steel shown as 4C2 is not included in the quantity of reinforcing steel.

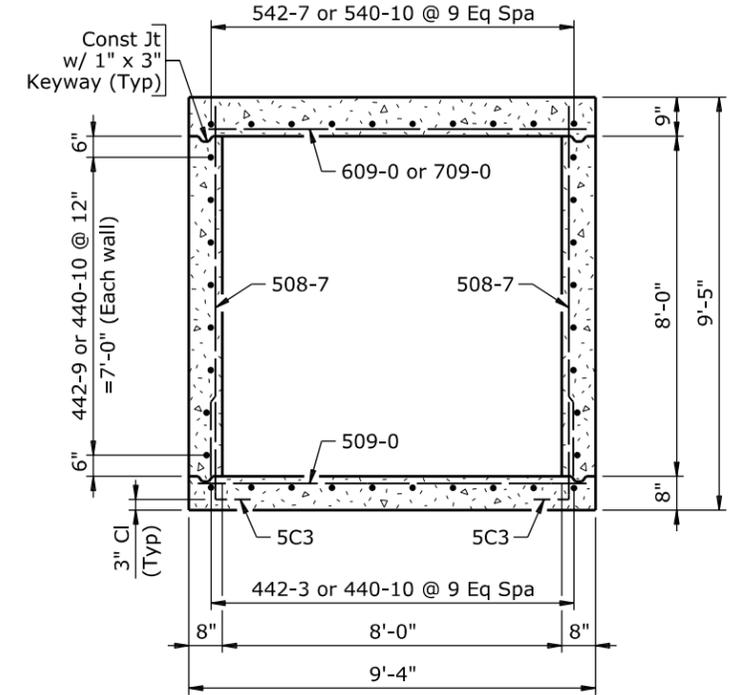
WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
CULVERT DETAILS			
SINGLE BARREL 8'-0" X 8'-0" CONCRETE BOX CULVERT			
STA 960+50 Albin Road			
0216001		La	
DESIGN	NNN ✓ MMM	Design Section Q R Stuv	
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APPROVAL	HHH ✓ NNN		



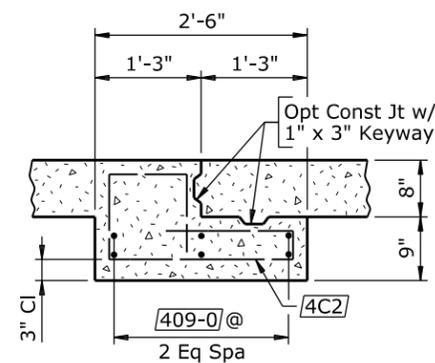
PLAN



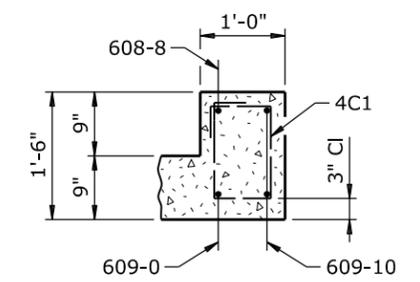
LONGITUDINAL SECTION  
(Showing reinforcing steel placed in walls)



SECTION A-A



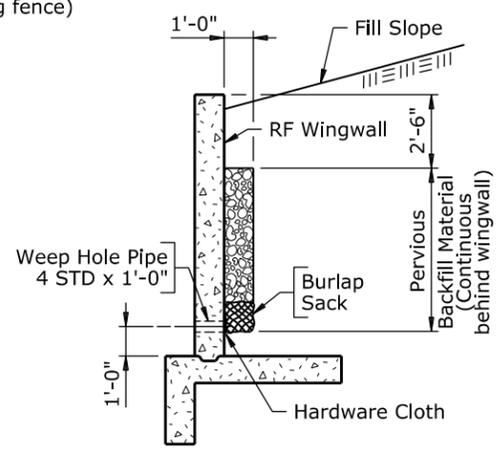
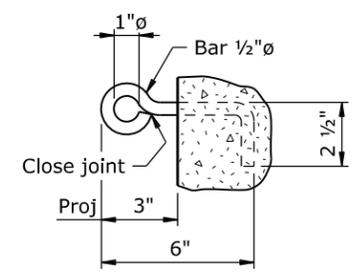
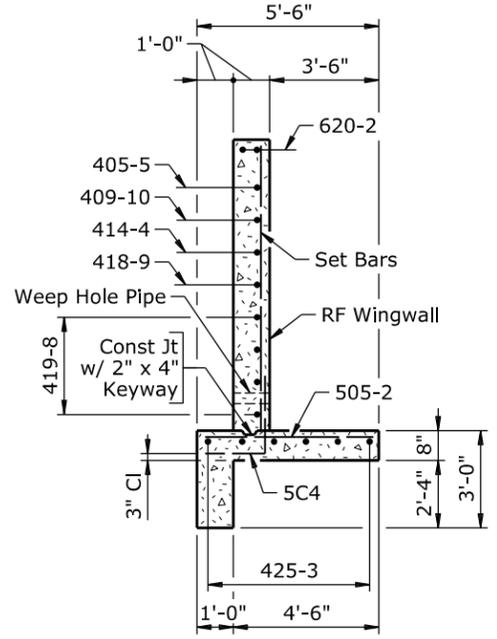
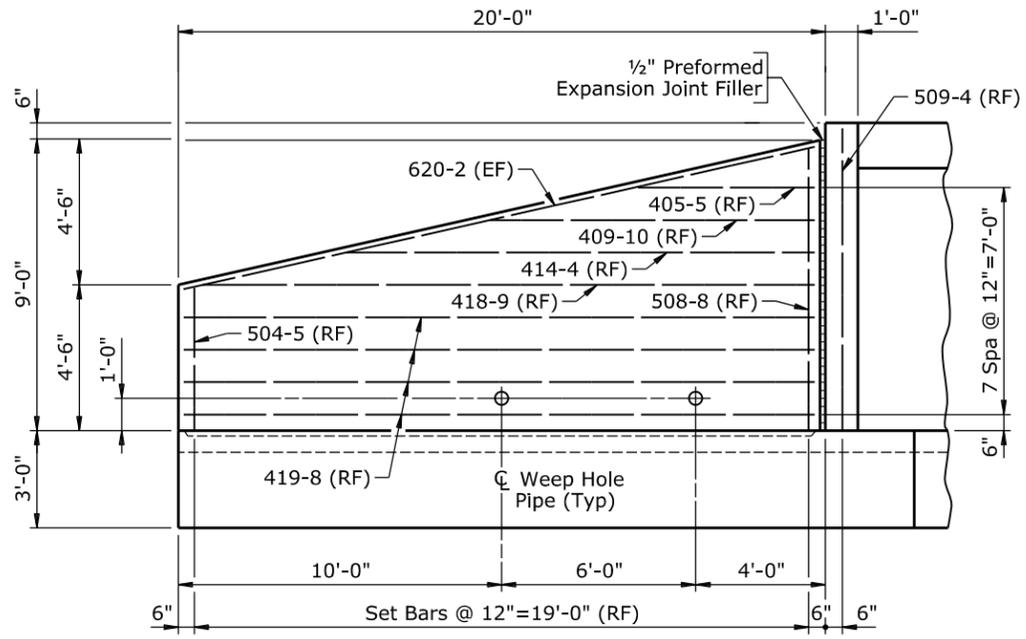
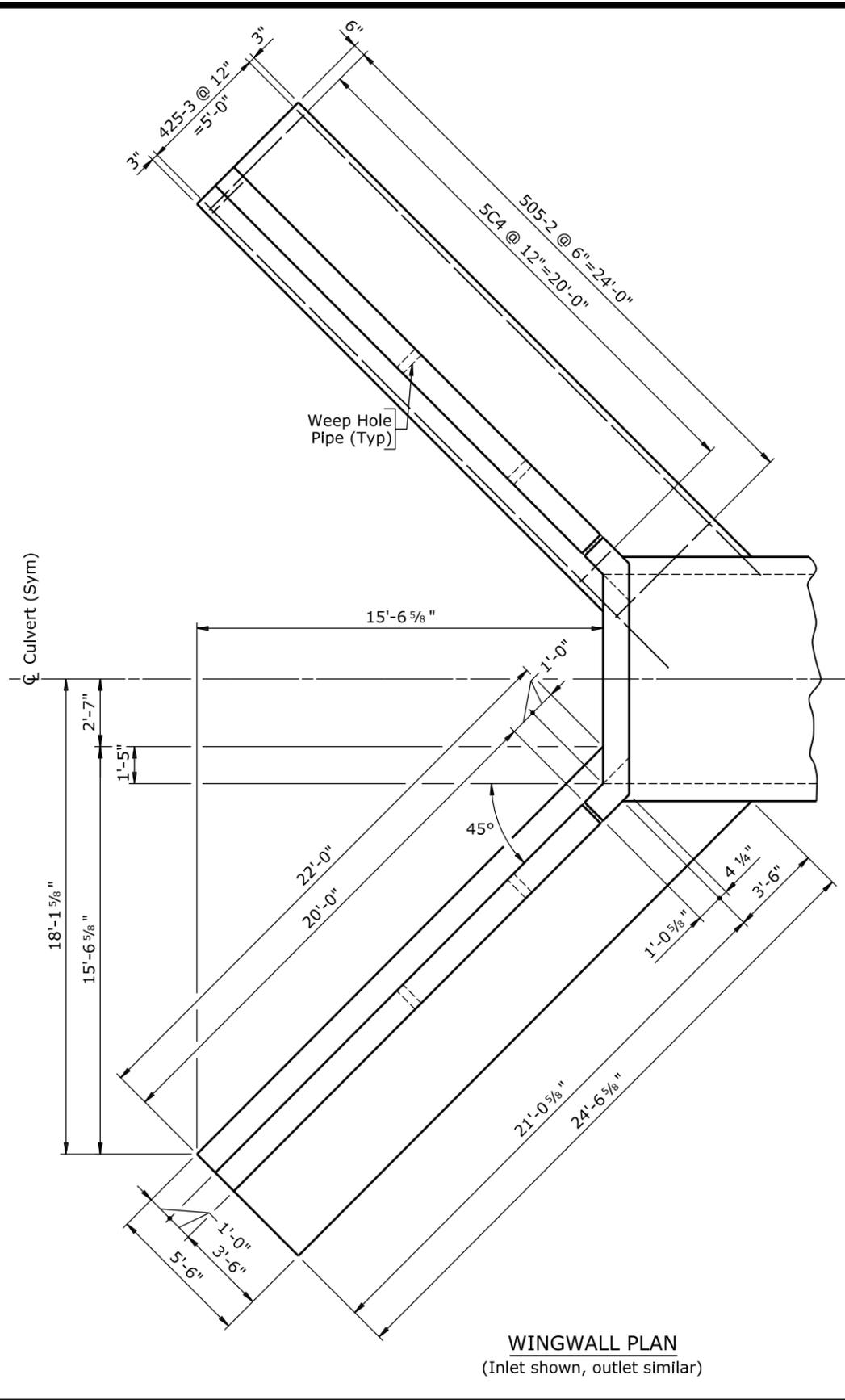
OPTIONAL CONSTRUCTION JOINT BASE DETAIL



PARAPET DETAIL

- Note: 1) Place short leg of 5C3 bars in bottom slab.  
2) Place 508-7 bars with 5C3 bars.  
3) Either inlet or outlet may be built first. If outlet is built first, reverse longitudinal reinforcing steel and optional construction joint base.

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
<b>CULVERT DETAILS</b>			
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<b>CONCRETE BOX CULVERT</b>			
<b>STA 960+50</b>			
<b>Albin Road</b>			
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- Note:
- 1) Place short leg of 5C4 bars in footing.
  - 2) Place Set Bars and 509-4 bars with 5C4 bars.
  - 3) Each weep hole assembly consists of a pipe 4 STD through the wingwall, one 6" x 6" piece of aluminum or galvanized steel wire 4 mesh hardware cloth (Minimum wire diameter 0.03") centered over pipe end and firmly anchored to rear face of wingwall, and one cubic foot of coarse aggregate in a securely tied burlap sack.

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DETAIL	HHH ✓	NNN	Q R Stuv
APPROVAL	HHH ✓	NNN	Drwg No. 0005
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