

DOUBLE BARREL 9'-0" X 9'-0" CONCRETE BOX CULVERT EXTENSION

STA 112+54

LANDER-HUDSON ROAD

P-20 (WY 789)

N202050

FREMONT COUNTY

PRELIMINARY

DESIGN DATA

SPECIFICATIONS: AASHTO Standard Specifications for Highway Bridges,
 17th Edition

ADT: 3500 (Year 2005)

LOADING:

Live Load: HS20
 Lateral live load surcharge: 2 ft earth or 72 psf
 Dead Load: Design fill: 7.0 ft
 Vertical earth pressure: 120 pcf
 Lateral earth pressure: 72 pcf

REINFORCED CONCRETE: Load Factor Design -
 Class B Concrete $f'_c = 3250$ psi
 Reinforcing Steel $f_y = 60,000$ psi (Grade 60)
 $f_y = 40,000$ psi (Grade 40)

APPROACH ROADWAY WIDTH: 72'-0"

REFERENCES

Supplementary Specifications: Dated
 SS-100K Adjustment for Structural Steel ----- 8-14-08
 SS-500G Structural Concrete with Quality
 Control and Quality Acceptance ----- Rev 5-2-07

WYDOT Plans: Sheet No.
 Bridge Drwg No. 2579 ----- 1 & 2 of 2

Standard Plans:
 206-1 Culvert and Trench Excavation
 511-1 Wire Enclosed Riprap and Gabions

ESTIMATED QUANTITIES - CODE 13

ITEM NO.	ITEM	UNIT	TOTAL QUANTITY	ESTIMATE
206.03300	CULVERT SUBEXCAVATION	CY	X	
212.03900	PERVIOUS BACKFILL MATERIAL	CY	X	
217.01010	GEOTEXTILE, EROSION CONTROL	SY	X	
217.01020	GEOTEXTILE, MATERIAL SEPARATION (WOVEN)	SY	X	
301.01020	CRUSHER RUN SUBBASE	TON	X	
511.01000	GABIONS	CY	X	
513.00015	CLASS B CONCRETE	LS	LUMP SUM	X CY
514.00015	REINFORCING STEEL	LS	LUMP SUM	X LB

STRUCTURE NO. OTT
ML20B, RM 83.22

WYOMING DEPARTMENT OF TRANSPORTATION			
BRIDGE PROGRAM			
REVISIONS			
APPROVED	DESIGN	Design Section Q R Stuv	
DATE	DETAIL	Drwg. No. P-0008 Sheet 1 of 3	
	o's.		

GENERAL NOTES

SPECIFICATIONS: WYDOT Standard Specifications for Road and Bridge Construction, 2003 Edition

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

LINE STYLE DESIGNATION: Phantom lines indicate existing structure, solid lines indicate new construction, hatched areas indicate removal.

REINFORCING STEEL: Concrete cover to face of reinforcing steel is 2" unless noted. Dimensions for bent bars are out to out.



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

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

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

REMOVAL OF CONCRETE: Remove portions of the existing culvert to the limits shown. Thoroughly clean concrete from reinforcing steel to remain in place and straighten as required. Remove and replace damaged reinforcing steel with the same size bar and weld-splice where necessary at no additional cost to the department. Work necessary for removal of concrete and the cutting, cleaning, and straightening of reinforcing steel is incidental to the contract pay item Class B Concrete.

CULVERT EXCAVATION: The estimated quantity of culvert excavation is X CY and is incidental to the contract pay item Class B Concrete.

CULVERT SUBEXCAVATION: The bottom limits of culvert subexcavation is 3'-0" below the bottom of the culvert. Line the bottom of the culvert subexcavation with geotextile material separation. Backfill with crusher run subbase conforming to Grading J. The estimated quantity of culvert subexcavation is calculated in accordance with Standard Plan 206-1, Culvert and Trench Excavation.

ADHESIVE ANCHORAGE SYSTEM: Use one of the following adhesive anchorage systems:

- Epoxy Anchoring Systems as manufactured by Covert Operations
- Epcon System as manufactured by ITW Ramset/Red Head
- AC100 Plus/AC5.5 Plus as manufactured by Powers Fasteners, Inc.
- Sure Anchor I (J-51) as manufactured by Dayton Superior
- HSE 2421 Epoxy Adhesive Anchor as manufactured by Hilti, Inc.
- HIT HY 150 System as manufactured by Hilti, Inc.

Drill and prepare holes for the adhesive anchorage system as recommended by the manufacturer. Install in accordance with the manufacturer's recommendations to provide pullout strength of equal or greater capacity to the corresponding reinforcing steel. Work necessary for the adhesive anchorage system is incidental to the contract pay item Class B Concrete.

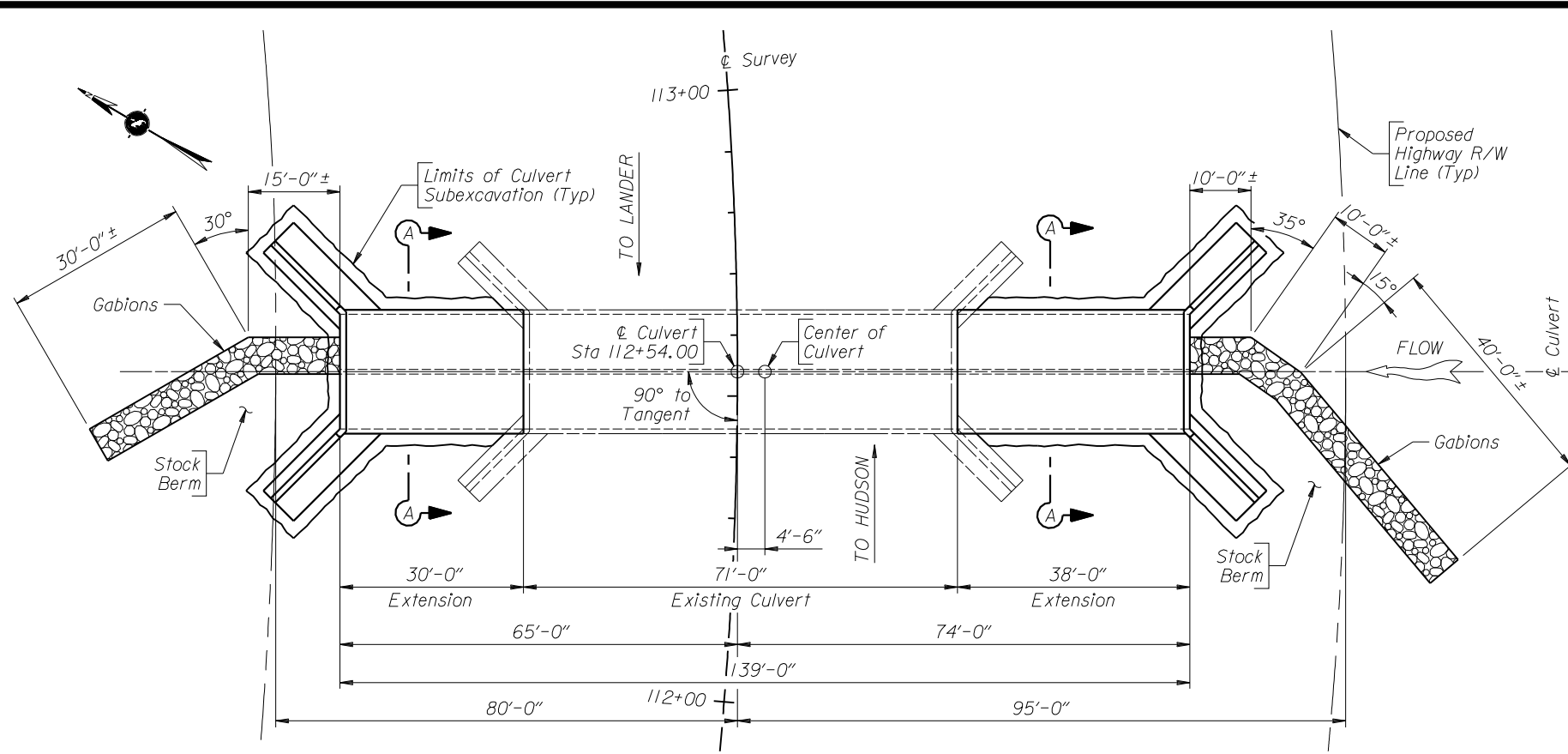
EPOXY RESIN BONDING COMPOUND: Clean the exterior ends of the existing culvert and coat with epoxy resin bonding compound. Place new concrete immediately after applying the bonding compound. If the bonding compound gels before concrete placement, remove by sandblasting and reapply. Use bonding compound conforming to Subsection 810.6, Epoxy Resin. Mix and apply in accordance with the manufacturer's recommendations. Work necessary for the epoxy resin bonding compound is incidental to the contract pay item Class B Concrete.

CULVERT BOTTOM BACKFILL: Backfill the bottom of the west barrel, along with the inlet and outlet areas behind the wire enclosed riprap, with 1'-0"± of excavated material from the adjacent highway embankment. Work necessary for the backfilling is incidental to the contract pay item Class B Concrete.

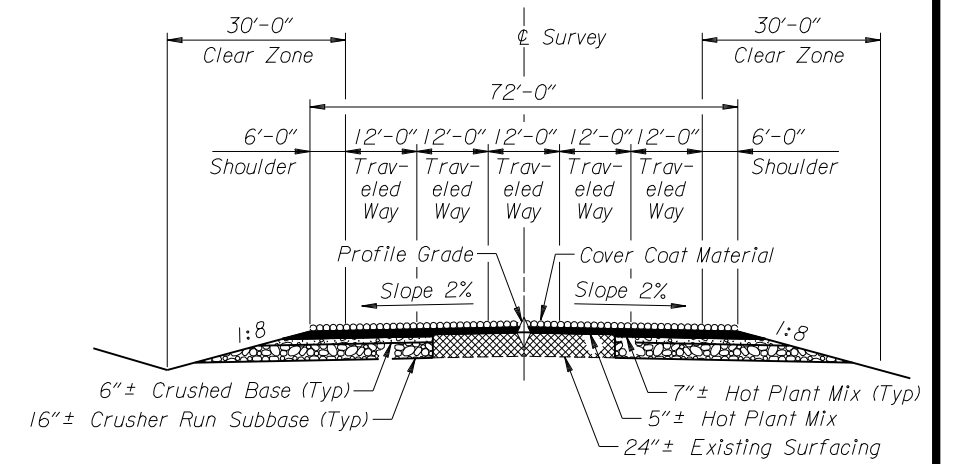
CULVERT CLEANING: Clean the east barrel of the existing culvert in accordance with the road plans.

WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
REVISIONS	PRELIMINARY GENERAL NOTES		
	DOUBLE BARREL 9'-0" X 9'-0" CONCRETE BOX CULVERT EXTENSION STA 112+54 Lander-Hudson Road P-20 (WY 789)		
	N202050 Fr		
APPROVED	DESIGN <u>PPP</u> ✓ 000	Design Section 0 R Stuv	
DATE	DETAIL <u>LLL</u> ✓ HHH	Drwg. No. P-0008 Sheet 2 of 3	
	Q'S. <u>JJJ</u> ✓ MMM		

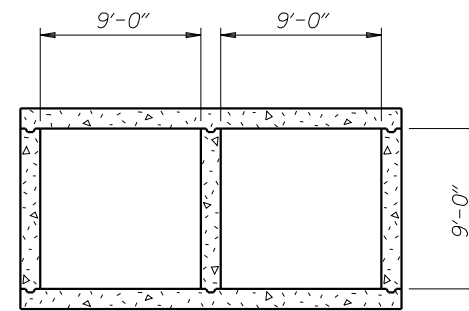
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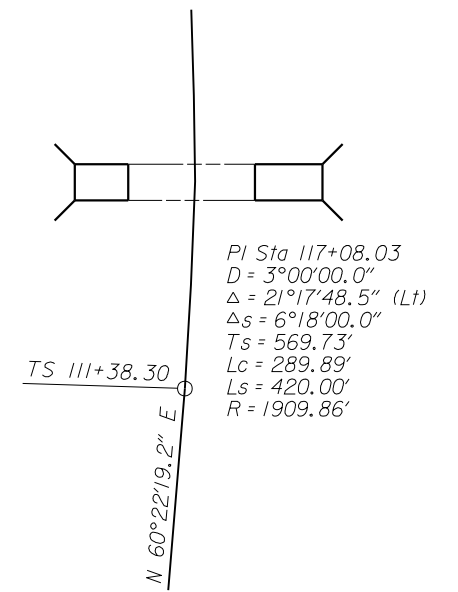
LOCATION PLAN



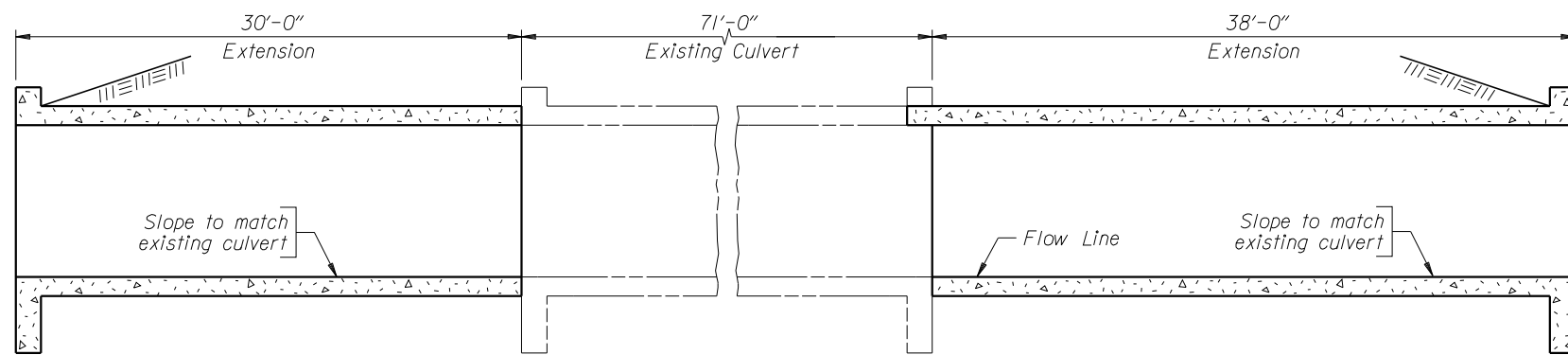
TYPICAL ROADWAY SECTION



SECTION A-A



HORIZONTAL CURVE DATA



LONGITUDINAL SECTION

WYOMING DEPARTMENT OF TRANSPORTATION	
BRIDGE PROGRAM	
PRELIMINARY LAYOUT	
DOUBLE BARREL 9'-0" X 9'-0"	
CONCRETE BOX CULVERT EXTENSION	
STA 112+54	
Lander-Hudson Road	
P-20 (WY 789)	
N202050 Fr	
APPROVED	DESIGN <input checked="" type="checkbox"/> LLL <input checked="" type="checkbox"/> HHH
DATE	Drwg. No. P-0008 Sheet 3 of 3

4.01 - Example

Section 4.01 - Preliminary

DOUBLE BARREL 9'-0" X 9'-0" CONCRETE BOX CULVERT EXTENSION

STA 112+54
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511-1 Wire Enclosed Riprap and Gabions

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ITEM NO.	ITEM	UNIT	TOTAL QUANTITY	ESTIMATE
206.03300	CULVERT SUBEXCAVATION	CY	360	
212.03900	PERVIOUS BACKFILL MATERIAL	CY	10	
217.01010	GEOTEXTILE, EROSION CONTROL	SY	80	
217.01020	GEOTEXTILE, MATERIAL SEPARATION (WOVEN)	SY	350	
301.01020	CRUSHER RUN SUBBASE	TON	713	
511.01000	GABIONS	CY	10	
513.00015	CLASS B CONCRETE	LS	LUMP SUM	172.8 CY
514.00015	REINFORCING STEEL	LS	LUMP SUM	20,630 LB

STRUCTURE NO. OTT
ML20B, RM 83.22

WYOMING DEPARTMENT OF TRANSPORTATION			
BRIDGE PROGRAM			
REVISIONS			
APPROVED	DESIGN	DATE	Design Section O R Stuy
	LLL ✓ HHH		Drwg. No. 0008 Sheet 1 of 6

GENERAL NOTES

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CULVERT EXCAVATION: The estimated quantity of culvert excavation is 40 CY and is incidental to the contract pay item Class B Concrete.

CULVERT SUBEXCAVATION: The bottom limits of culvert subexcavation is 3'-0" below the bottom of the culvert. Line the bottom of the culvert subexcavation with geotextile material separation. Backfill with crusher run subbase conforming to Grading J. The estimated quantity of culvert subexcavation is calculated in accordance with Standard Plan 206-1, Culvert and Trench Excavation.

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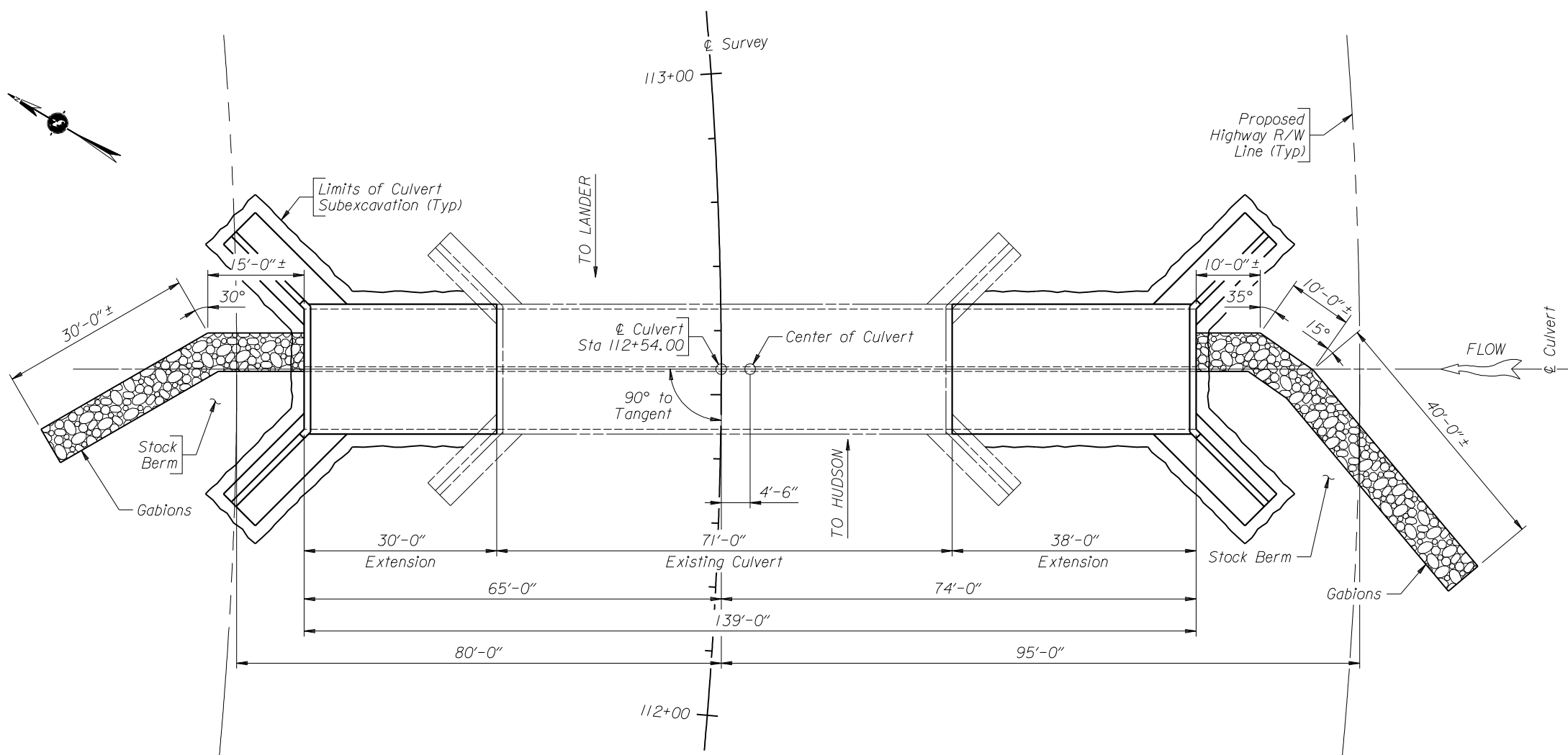
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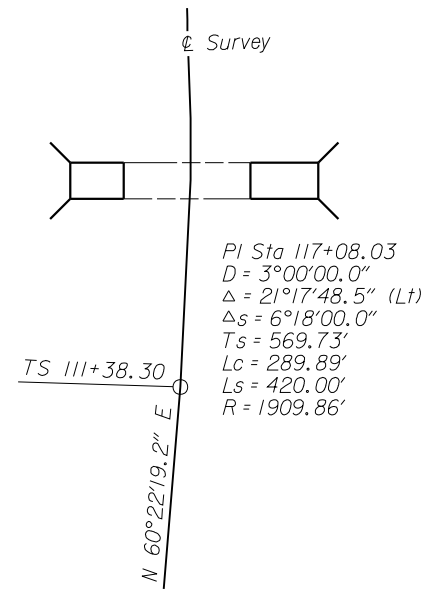
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CULVERT CLEANING: Clean the east barrel of the existing culvert in accordance with the road plans.

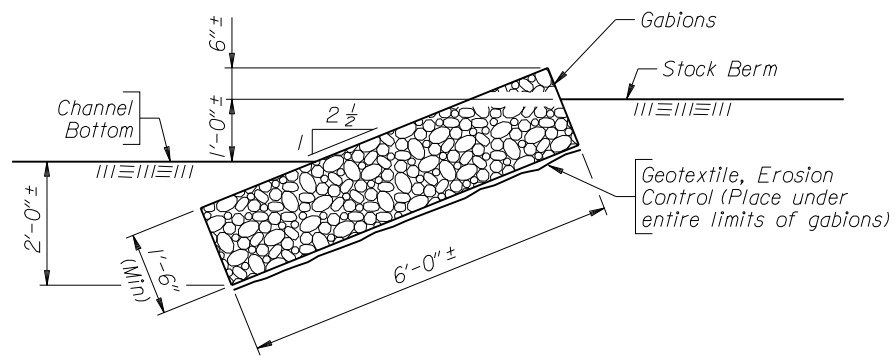
WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
REVISIONS	GENERAL NOTES		
	DOUBLE BARREL 9'-0" X 9'-0" CONCRETE BOX CULVERT EXTENSION STA 112+54 Lander-Hudson Road P-20 (WY 789)		
	N202050 Fr		
	APPROVED	DESIGN <u>PPP</u> ✓ 000	Design Section 0 R Stuv
DATE	DETAIL <u>LLL</u> ✓ HHH	Drwg. No. 0008	Sheet 2 of 6
	Q'S. <u>JJJ</u> ✓ MMM		



LOCATION PLAN

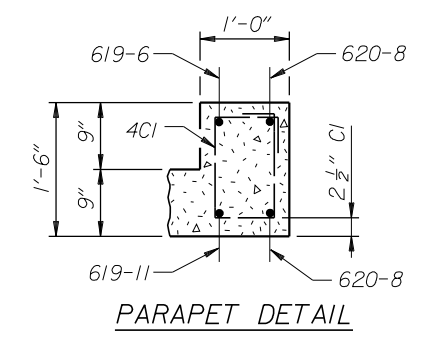
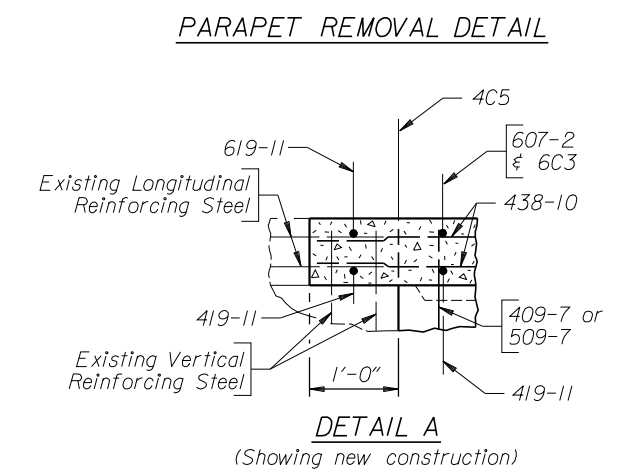
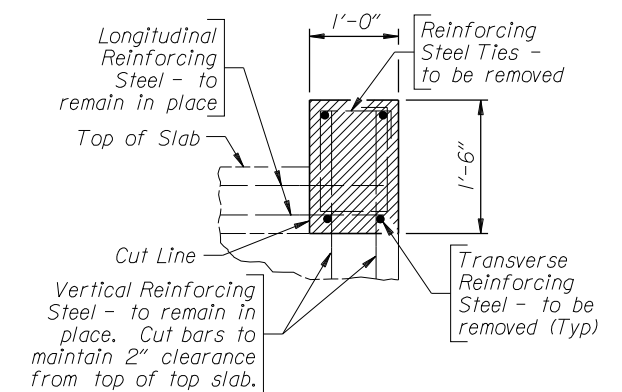
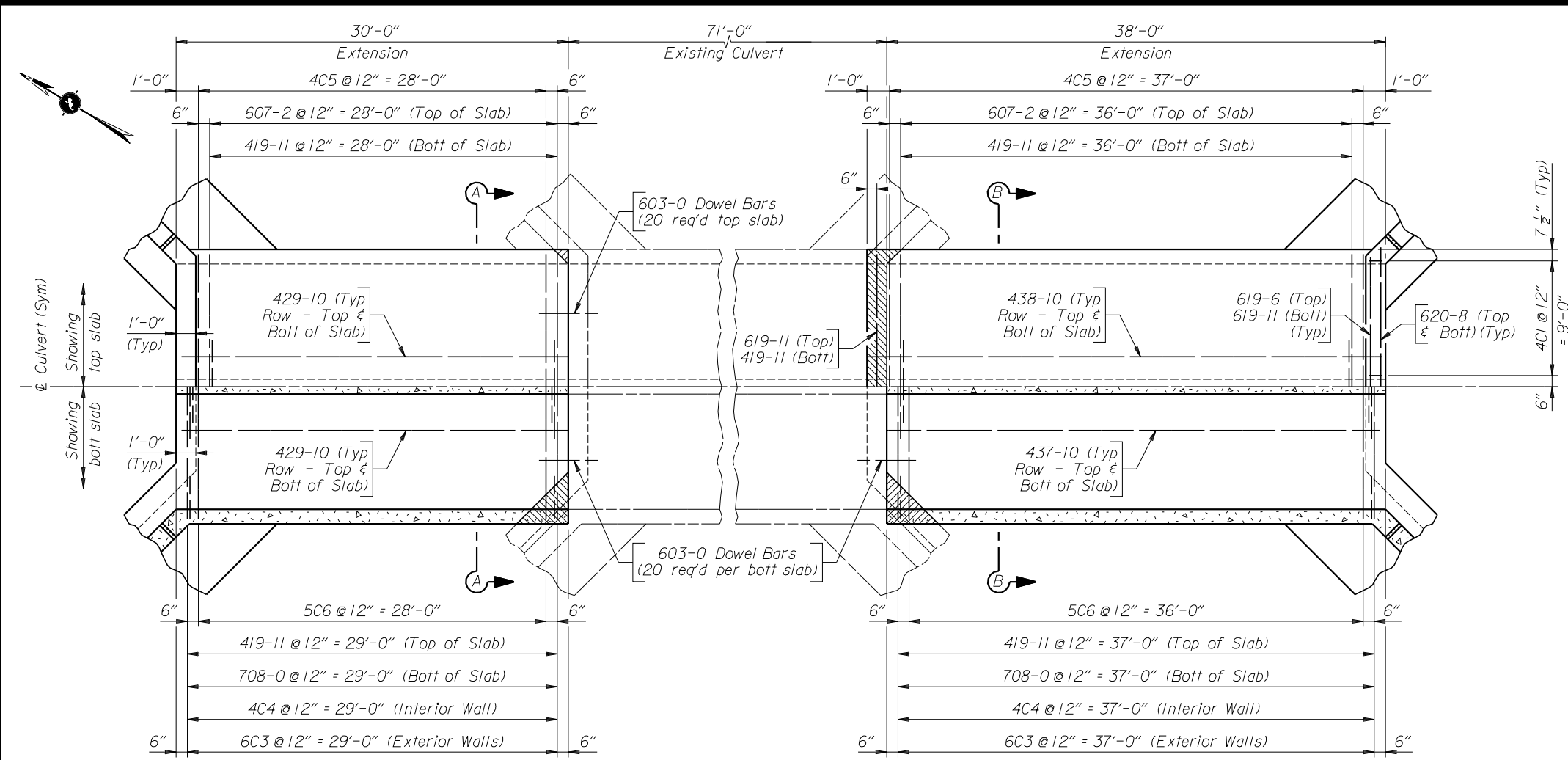


HORIZONTAL CURVE DATA

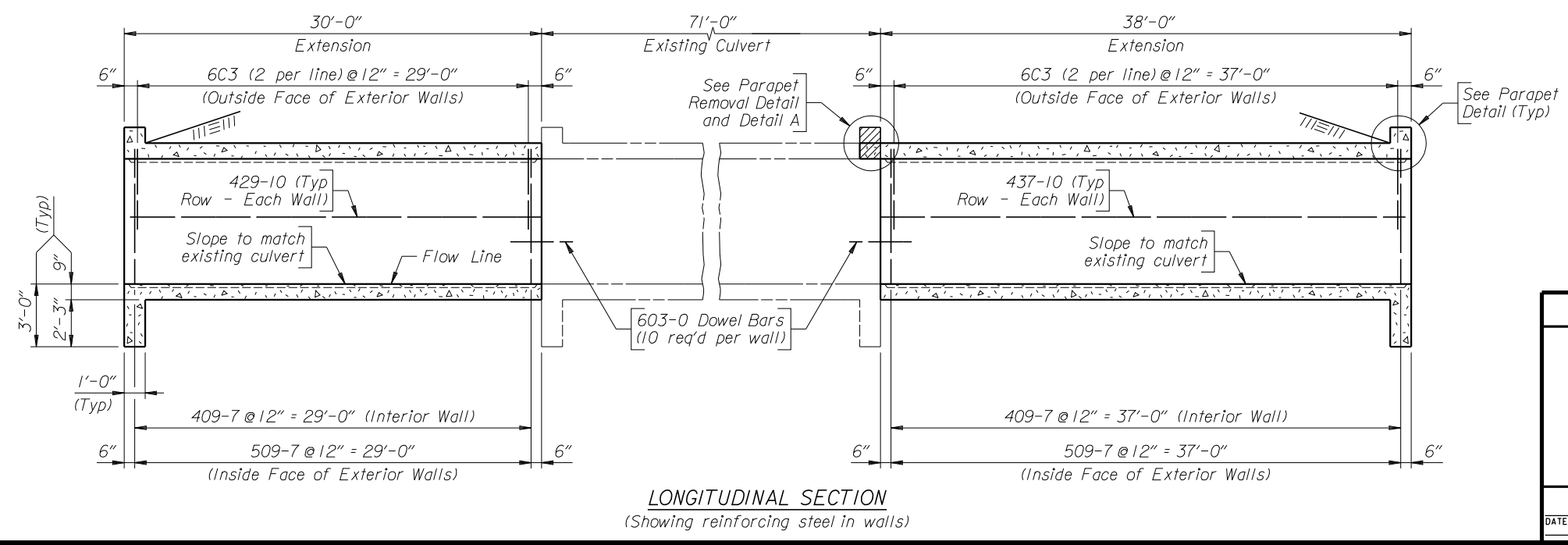


TYPICAL SECTION THRU RIPRAP

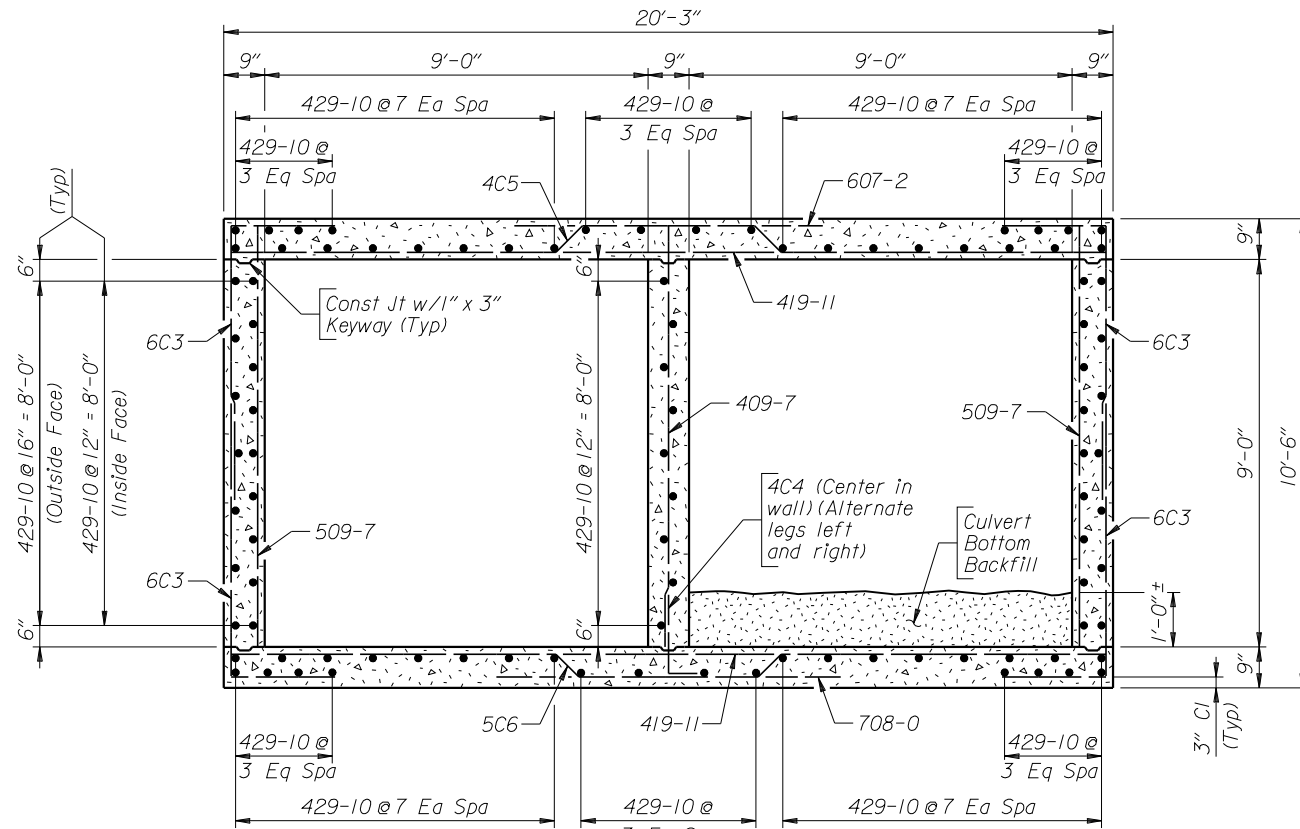
WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
CULVERT DETAILS			
DOUBLE BARREL 9'-0" X 9'-0" CONCRETE BOX CULVERT EXTENSION STA 112+54 Lander-Hudson Road P-20 (WY 789)			
APPROVED		N202050 Fr	
DESIGN	PPP ✓ 000	Design Section 0 R Stuv	
DETAIL	LLL ✓ HHH ✓ PPP	Drwg. No. 0008 Sheet 3 of 6	
DATE	JJJ ✓ MMM		



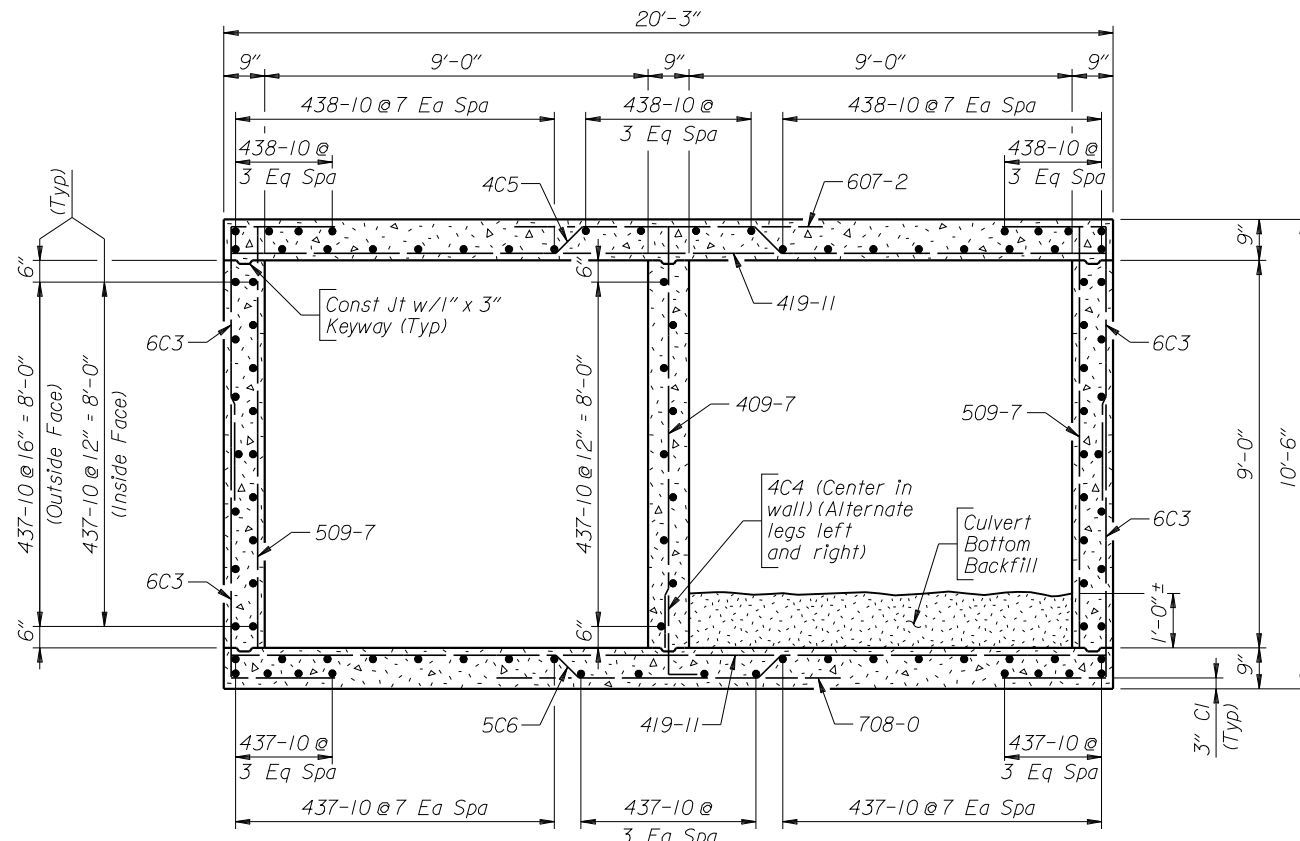
- Note: 1) Place cut line as close as possible to parapet and saw cut 1" deep minimum top and bottom.
2) Center 603-0 dowel bars in existing slabs and walls, embed 1'-6" into existing culvert, and set with an adhesive anchorage system.
3) For Sections A-A and B-B, see Sheet No. 5.



WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
CULVERT DETAILS			
DOUBLE BARREL 9'-0" X 9'-0" CONCRETE BOX CULVERT EXTENSION			
STA 112+54			
Lander-Hudson Road			
P-20 (WY 789)			
N202050		Fr	
APPROVED	DESIGN PPP 000	Design Section 0 R Stuv	
DATE	DETAIL LLL HHH PPP	Drwg. No. 0008 Sheet 4 of 6	
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SECTION A-A



SECTION B-B

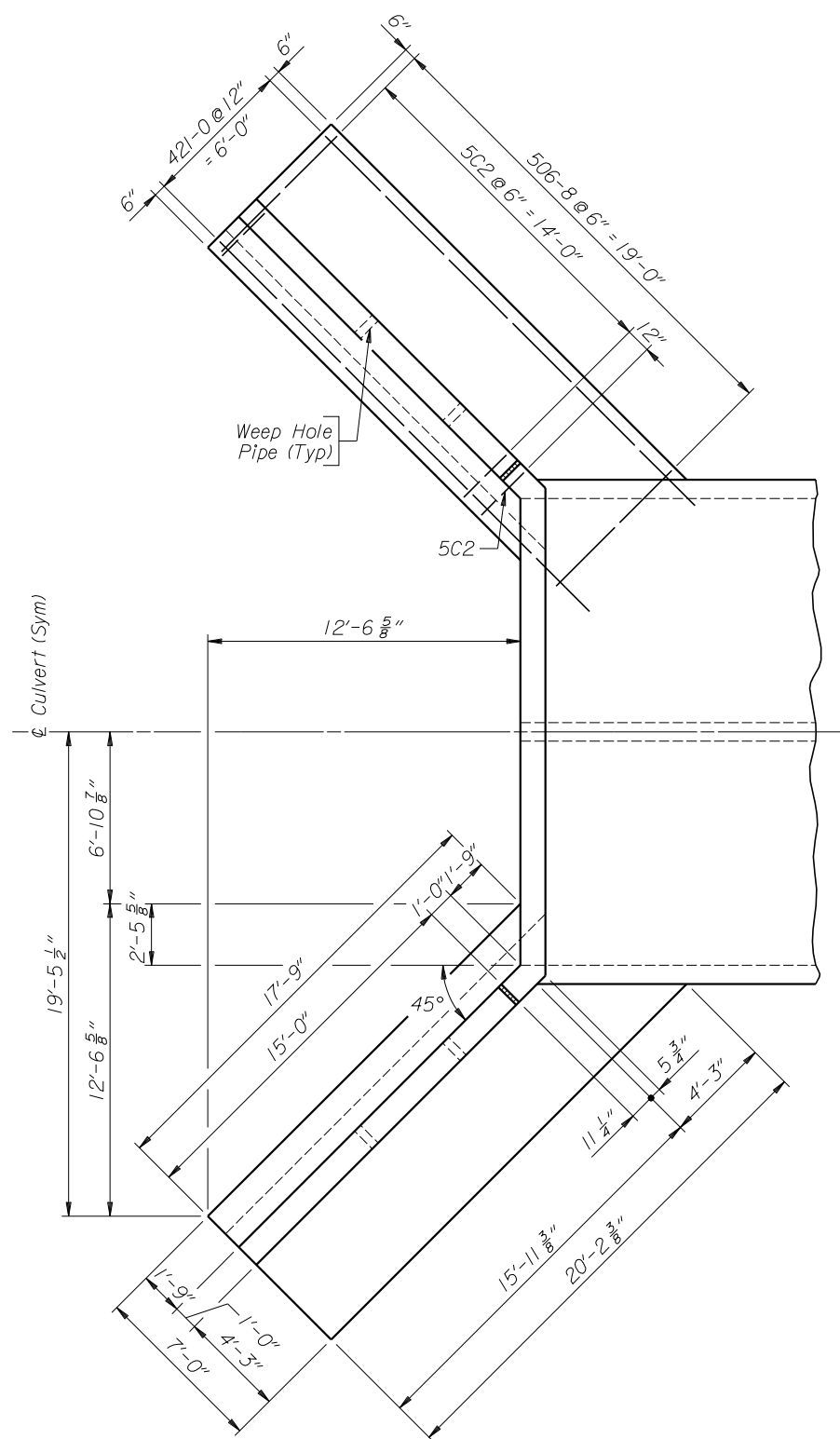
BILL OF REINFORCEMENT				
Location	Mark	Number Required	Bending Diagrams	
Bottom Slabs and Footings	4C4	68		
	419-11	68		
	421-0	28		
	429-10	28		
	437-10	28		
	5C2	120		
	5C6	66		
	506-8	156		
	6C3	136		
	603-0	40		
	708-0	68		
	Weight	9071 LB		
	Walls	409-7		68
		429-10		41
437-10		41		
509-7		136		
511-1		4		
6C3		136		
603-0		60		
Weight		5893 LB		
Top Slabs and Parapets		4C1	40	
		4C5	67	
	419-11	67		
	429-10	28		
	438-10	28		
	603-0	40		
	607-2	66		
	619-6	2		
	619-11	3		
	620-8	4		
	Weight	4365 LB		
	Wingwalls	403-9	4	
406-9		4		
409-9		4		
412-9		4		
414-8		20		
Set Bars		4		
515-5		8		
Weight		1295 LB		

- Note: 1) Place long leg of 6C3 bars in exterior walls.
 2) Place short leg of 4C4 bars in bottom slabs.
 3) Place 409-7 bars with 4C4 bars.
 4) Place 607-2 and 708-0 bars symmetrical about interior wall.
 5) For location of Sections A-A and B-B, see Sheet No. 4.

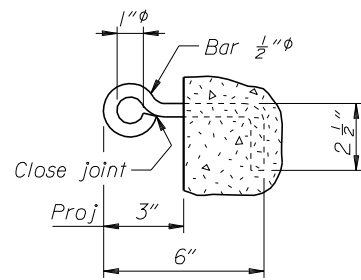
WYOMING DEPARTMENT OF TRANSPORTATION BRIDGE PROGRAM			
CULVERT DETAILS			
DOUBLE BARREL 9'-0" X 9'-0"			
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APPROVED	DESIGN PPP ✓ 000	Design Section 0 R Stuv	
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Apr 2007

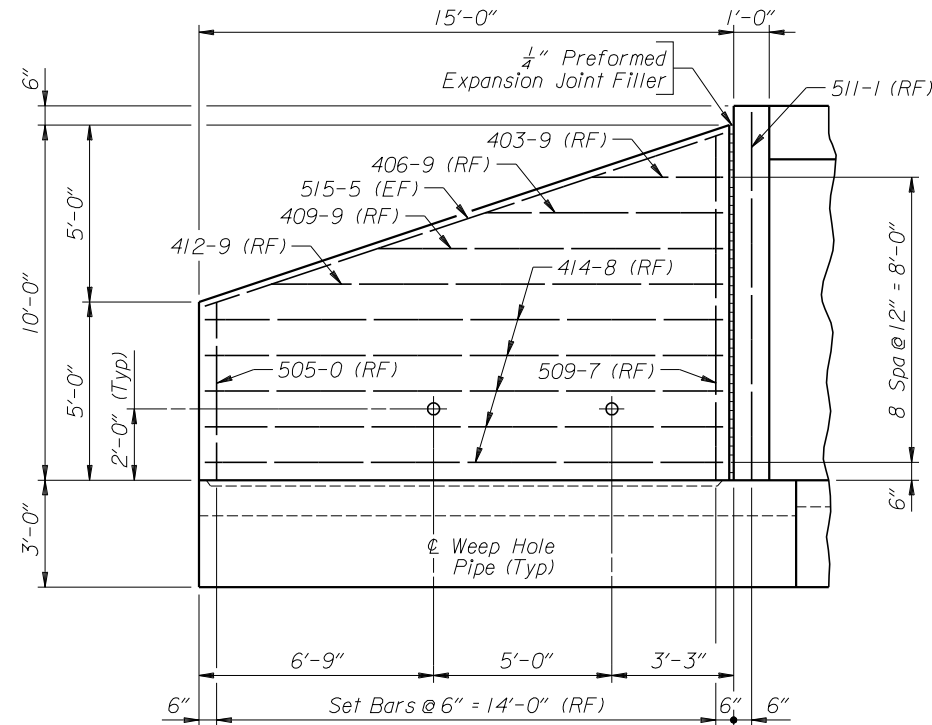
4.17 - Example



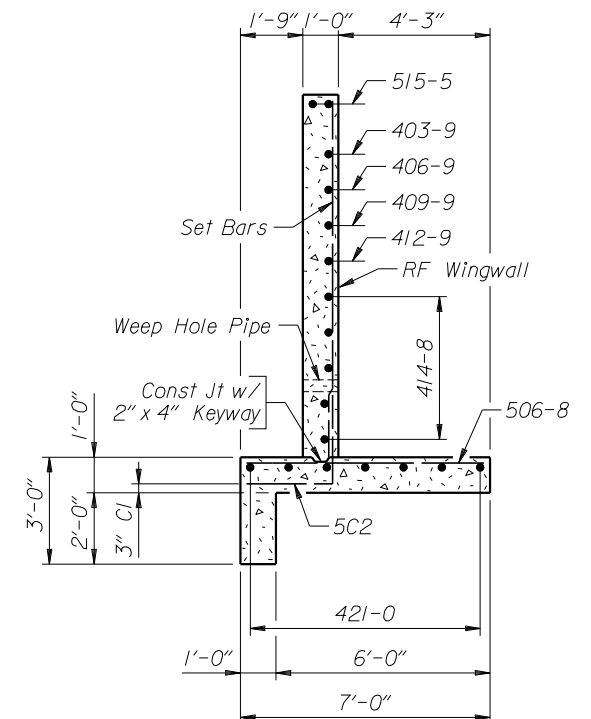
WINGWALL PLAN
 (Outlet shown, inlet similar)



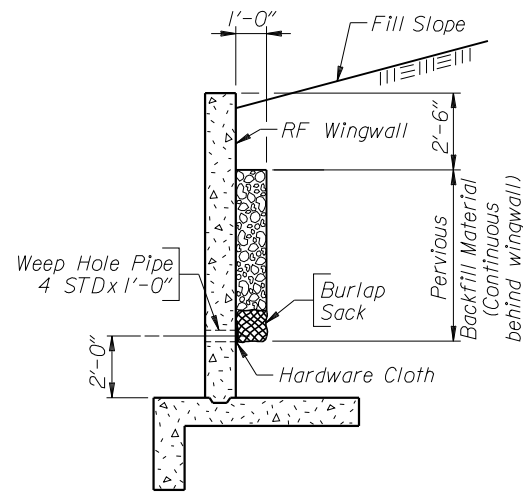
EYEBOLT DETAIL
 (16 req'd for securing fence)



TYPICAL WINGWALL ELEVATION



TYPICAL WINGWALL SECTION



WEEP HOLE ASSEMBLY DETAIL

- Note: 1) Place short leg of 5C2 bars in footing.
 2) Place Set Bars and 511-1 bars with 5C2 bars.
 3) Each weep hole assembly consists of a pipe 4 STD through the wingwall, one 6\"/>

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CULVERT DETAILS			
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APPROVED	DESIGN PPP ✓ 000	Design Section 0 R Stuv	
DATE	DETAIL LLL ✓ HHH PPP	Drwg. No. 0008 Sheet 6 of 6	
	Q'S. JJJ ✓ MMM		

Section 4.17 - Culverts