

GENERAL NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2011 AND THE PROJECT SPECIAL PROVISIONS.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 (1-800-922-1987) AT LEAST 3 DAYS (2 DAYS NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH CDOT STANDARD PLAN NO. M-206-2.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

THE FINAL FINISH FOR SURFACES OF CURBS SHALL BE CLASS 2. ALL OTHER EXPOSED CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINAL FINISH TO ONE FOOT BELOW FINISHED GRADE, UNLESS NOTED OTHERWISE.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

LEVELING PADS ARE UNLAMINATED BEARINGS. THEY SHALL BE CUT OR MOLDED FROM AASHTO ELASTOMER GRADE 3, 4, OR 5 AS DESCRIBED IN TABLES 705-1 AND 705-2 WITH A DUROMETER (SHORE "A") HARDNESS OF 60.

ALL BOLTS SHALL BE 7/8"Ø, HIGH STRENGTH, UNLESS OTHERWISE NOTED.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 (ASTM A709) GRADE 50, UNLESS OTHERWISE NOTED.

ALL PROVISIONS FOR BRIDGE DECK CONCRETE SHALL ALSO APPLY TO APPROACH SLAB CONCRETE.

ROUGHENED CONSTRUCTION JOINTS REQUIRE THE CONCRETE SURFACE TO BE EVENLY ROUGHENED TO A MINIMUM AMPLITUDE OF 1/4".

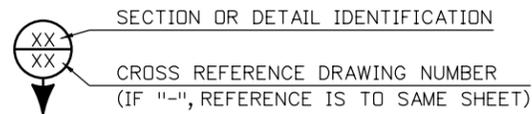
CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS PLACED.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.

Ⓝ DENOTES NON COATED REINFORCING STEEL.

FOR BURIED UTILITY INFORMATION
THREE (3) BUSINESS DAYS
BEFORE YOU DIG
CALL 811
 (or 1-800-922-1987)
 UTILITY NOTIFICATION
 CENTER OF COLORADO (UNCC)
 www.uncc.org



THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06.

REINFORCING BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
3 BAR DIAMETERS (REFERENCE DIMENSION)	1 1/2"	1 7/8"	2 1/4"	2 5/8"	3"	3 3/8"	3 7/8"	4 1/4"
6 BAR DIAMETERS (REFERENCE DIMENSION)	3"	3 3/4"	4 1/2"	5 1/4"	6"	6 3/4"	7 5/8"	8 1/2"
EPoxy COATED REINFORCING BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
CLASS B SPLICE (STAGGERED) LENGTH FOR 4,500 PSI CONCRETE	1'-7"	2'-0"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"
CLASS C SPLICE (UNSTAGGERED) LENGTH FOR 4,500 PSI CONCRETE	2'-1"	2'-7"	3'-1"	3'-8"	4'-9"	6'-1"	7'-8"	9'-5"
NON COATED REINFORCING BAR SIZE	#4 Ⓝ	#5 Ⓝ	#6 Ⓝ	#7 Ⓝ	#8 Ⓝ	#9 Ⓝ	#10 Ⓝ	#11 Ⓝ
CLASS B SPLICE (STAGGERED) LENGTH FOR 4,500 PSI CONCRETE	1'-4"	1'-8"	2'-0"	2'-4"	3'-1"	3'-10"	4'-11"	6'-0"
CLASS C SPLICE (UNSTAGGERED) LENGTH FOR 4,500 PSI CONCRETE	1'-9"	2'-2"	2'-7"	3'-1"	4'-0"	5'-1"	6'-5"	7'-10"

THESE SPLICE LENGTHS MAY BE DECREASED BY 20% IF BARS ARE NOT SPACED LESS THAN 6 INCHES ON CENTER AND HAVE 3 INCHES OR MORE OF COVER PROVIDED IN THE DIRECTION OF THE SPACING.

THESE SPLICE LENGTHS MAY BE DECREASED 25% IF BARS ARE ENCLOSED WITHIN A SPIRAL COMPOSED OF 1/4" MINIMUM DIAMETER AND SPACED AT NOT MORE THAN A 4 INCH PITCH

THESE SPLICE LENGTHS SHALL BE INCREASED BY 20% FOR 3 BAR BUNDLES AND 33% FOR 4 BAR BUNDLES.

WHEN THE CONTRACTOR ELECTS TO SUBSTITUTE EPOXY COATED REINFORCEMENT FOR NON-EPOXY COATED REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE FOR EPOXY COATED REINFORCING.

DESIGN DATA

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SIXTH EDITION (2012) WITH 2013 INTERIMS

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN

DEAD LOAD: ASSUMES 36 LBS. PER SQ. FT. FOR BRIDGE DECK OVERLAY
 ASSUMES 225 LBS. LN. FT. FOR BRIDGE RAIL TYPE 3

LIVE LOAD: HL-93 (DESIGN TRUCK OR TANDEM, AND DESIGN LANE LOAD)
 OR CDOT PERMIT VEHICLE

RAILING TEST LEVEL 2 (TL-2)

SEISMIC ZONE 1

REINFORCED CONCRETE:
 CLASS D CONCRETE: f'c = 4,500 PSI
 REINFORCING STEEL: fy = 60,000 PSI
 SEVERITY OF SULFATE EXPOSURE: CLASS - (TBD)

STRUCTURAL STEEL:
 AASHTO M270 (ASTM A709) GRADE 36: fy = 36,000 PSI
 AASHTO M270 (ASTM A709) GRADE 50: fy = 50,000 PSI

PRECAST PRESTRESSED CONCRETE:
 CLASS PS CONCRETE: f'c = (SEE DETAILS)
 PRESTRESSING STRAND: f's = 270,000 PSI

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BOW MOUNTAIN BRIDGE DESCRIPTION

1 SPAN (42'-6") BRIDGE,
 CONCRETE SLAB AND PRESTRESSED CONCRETE
 BOX GIRDER, SIDE BY SIDE

BOW MOUNTAIN ROAD OVER FOURMILE CANYON CREEK
 24'-0" ROADWAY CURB TO CURB, 0° SKEW
 BRIDGE RAIL TYPE 3

WAGONWHEEL GAP BRIDGE DESCRIPTION

1 SPAN (91'-3 3/8") BRIDGE,
 CONCRETE SLAB AND PRESTRESSED CONCRETE
 BOX GIRDER

WAGON WHEEL GAP ROAD OVER FOURMILE CANYON CREEK
 ROADWAY VARIES CURB TO CURB, 45° SKEW (LAYOUT LINE)
 BRIDGE RAIL TYPE 3

LEE HILL APPROACH BRIDGE DESCRIPTION

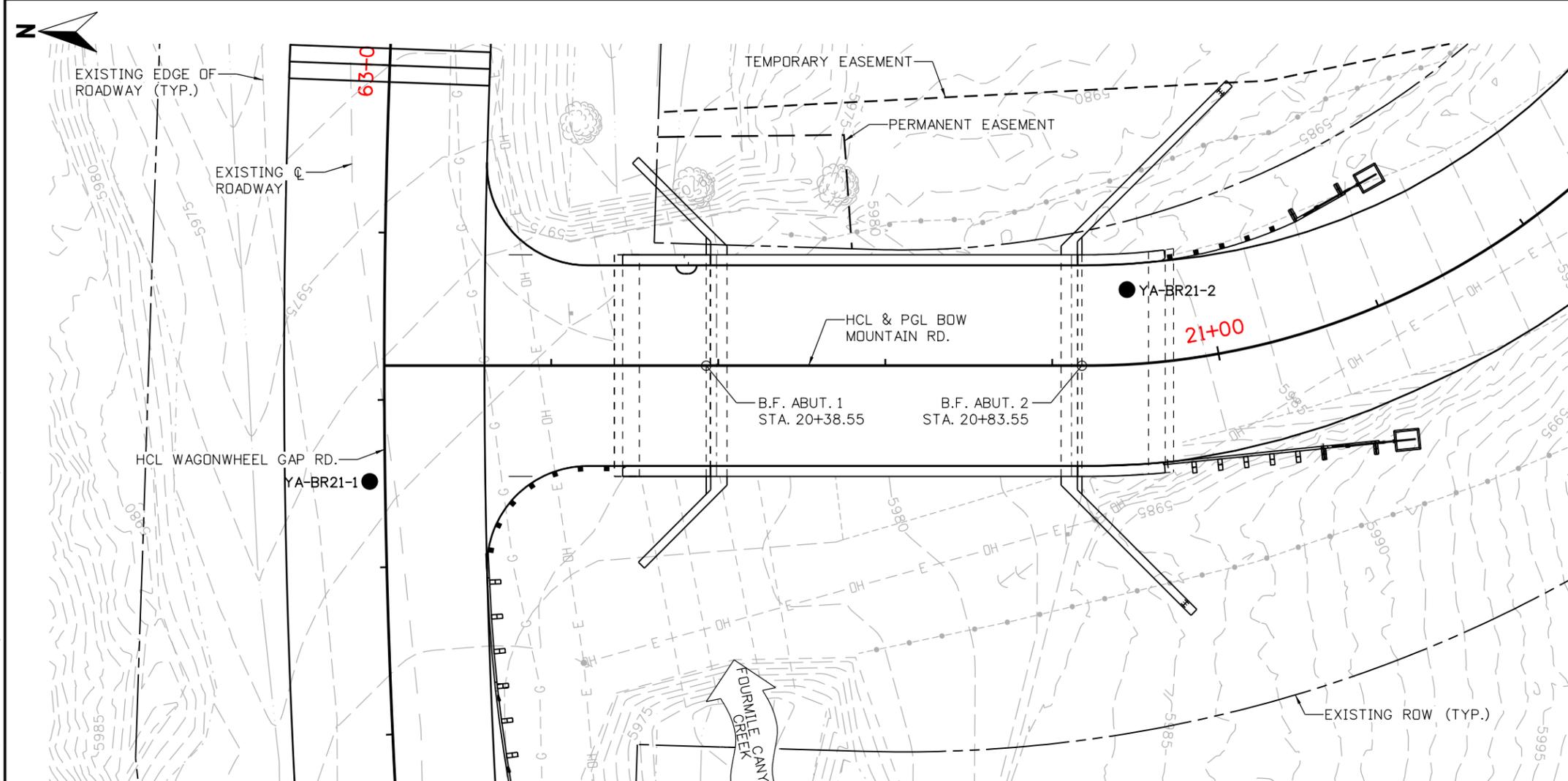
1 SPAN (57'-6") BRIDGE,
 CONCRETE SLAB AND PRESTRESSED CONCRETE
 BOX GIRDER, SIDE BY SIDE

WAGON WHEEL GAP ROAD OVER FOURMILE CANYON CREEK
 32'-6" ROADWAY CURB TO CURB, 0° SKEW
 BRIDGE RAIL TYPE 3

60% SET	CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED:	CAD:	CHECKED:	DATE:	WAGONWHEEL GAP ROAD BRIDGES GENERAL INFORMATION PROJECT NO: 4043.SEPT12C34 SHEET NO: 67
							DLT	BMT		3/4/2016	

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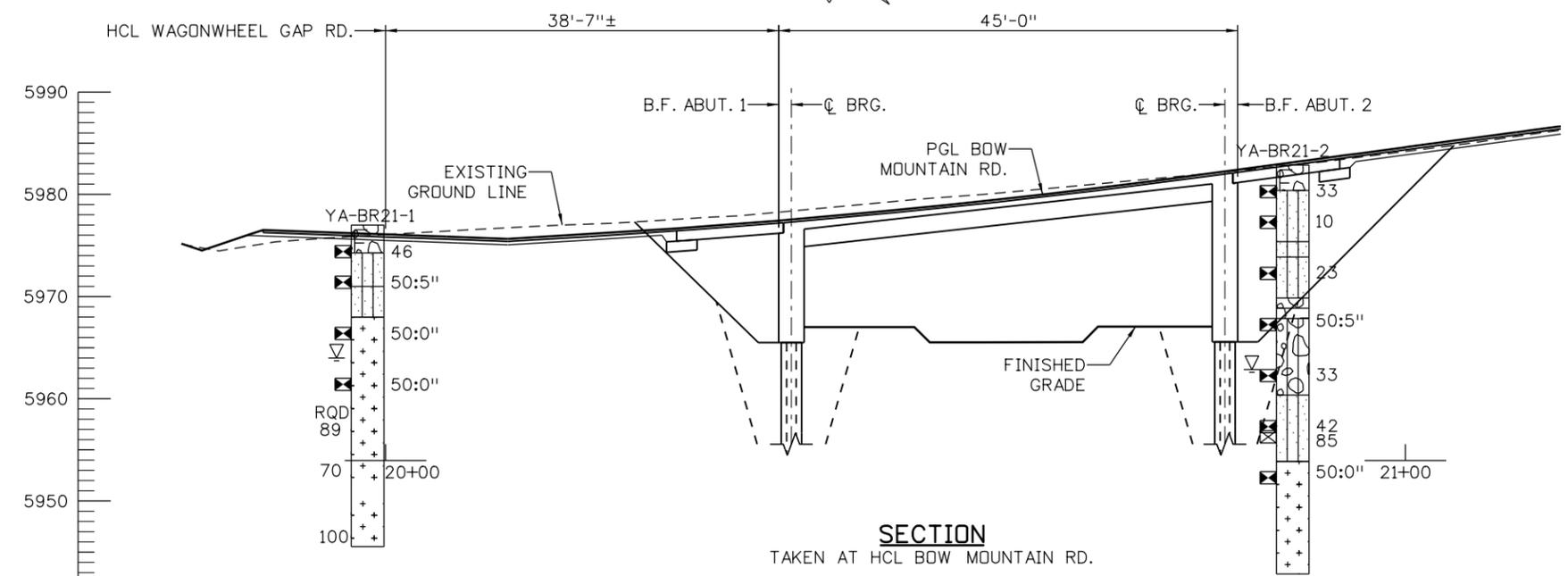
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PLAN

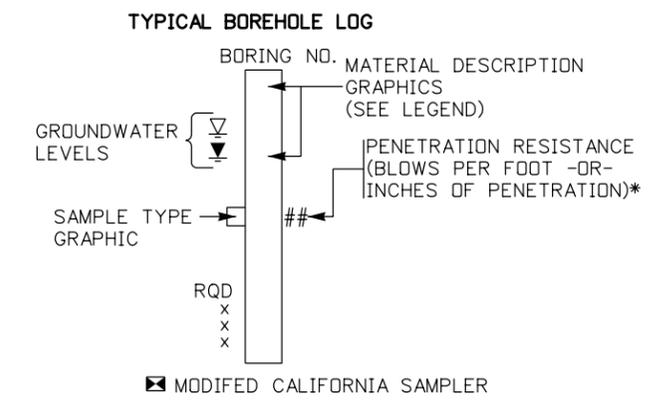


● APPROXIMATE BORING LOCATION



SECTION

TAKEN AT HCL BOW MOUNTAIN RD.



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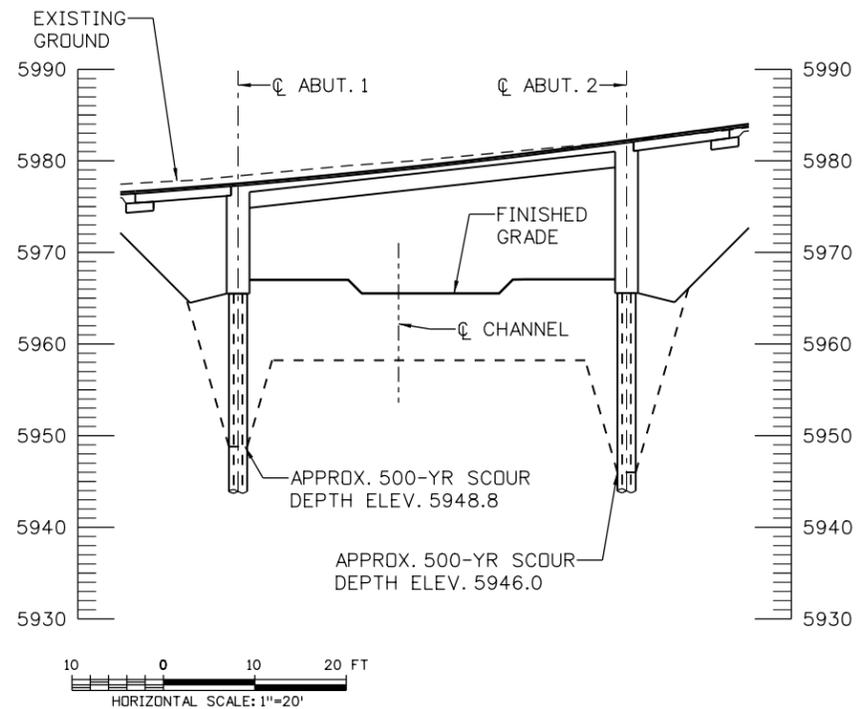
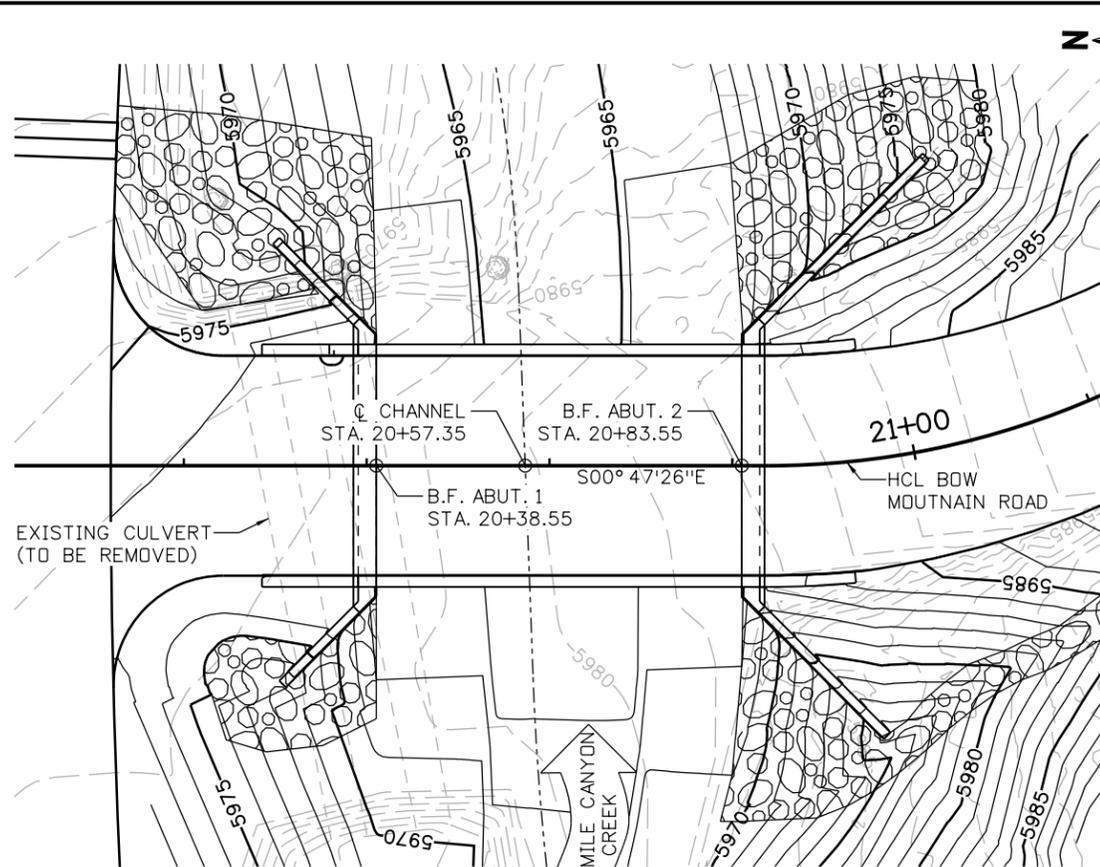
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BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

ENGINEERING GEOLOGY

PROJECT NO: 4043.SEPT12C34 SHEET NO: **70**

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DATA FOR FOURMILE CANYON CREEK AT BOW MTN. RD.:

DRAINAGE AREA: UNKNOWN
 AVERAGE CHANNEL SLOPE: 0.06 FT/FT
 CHANNEL BOTTOM MATERIAL:
 COHESIVE NON-COHESIVE
 BOTTOM MATERIAL SIZE: CLAY SILT SAND
 GRAVEL COBBLES OTHER
 STREAM FORM: STRAIGHT MEANDERING BRAIDED
 MANNINGS "n" FOR DESIGN:
 CHANNEL = 0.065 OVERBANK = 0.015 TO 0.080
 DEBRIS: BRUSH TREES/LOGS ICE OTHER

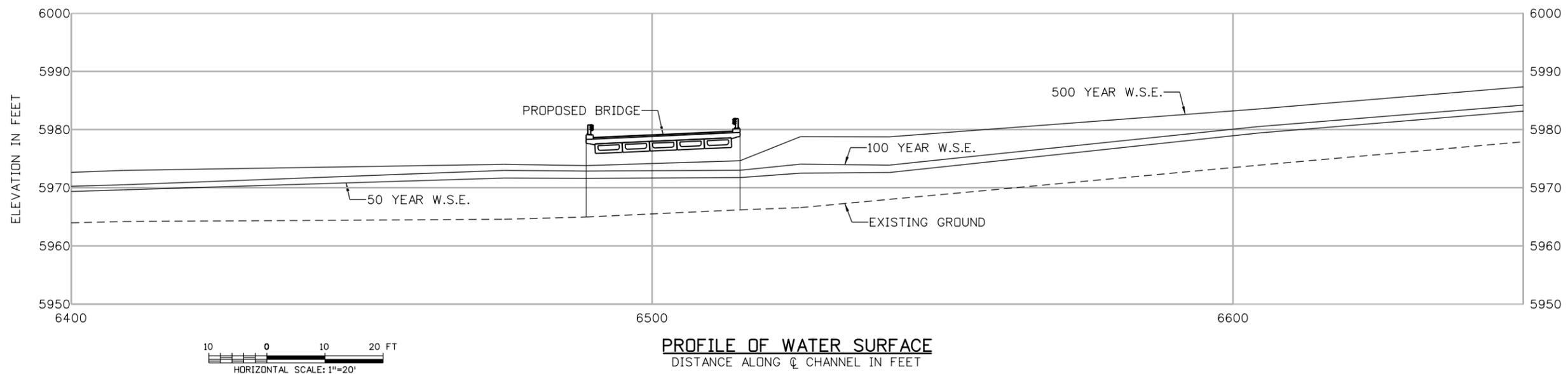
COMPARISON OF HYDRAULICS

	VELOCITY	FREEBOARD	WSEL
EXISTING CULVERT	20.5 FT/S	N/A	5982.77
PROPOSED BRIDGE	9.0 FT/S	N/A	5974.25



PROPOSED BRIDGE PLAN VIEW

PROPOSED BRIDGE SECTION VIEW
TAKEN ALONG HCL BOW MOUNTAIN ROAD



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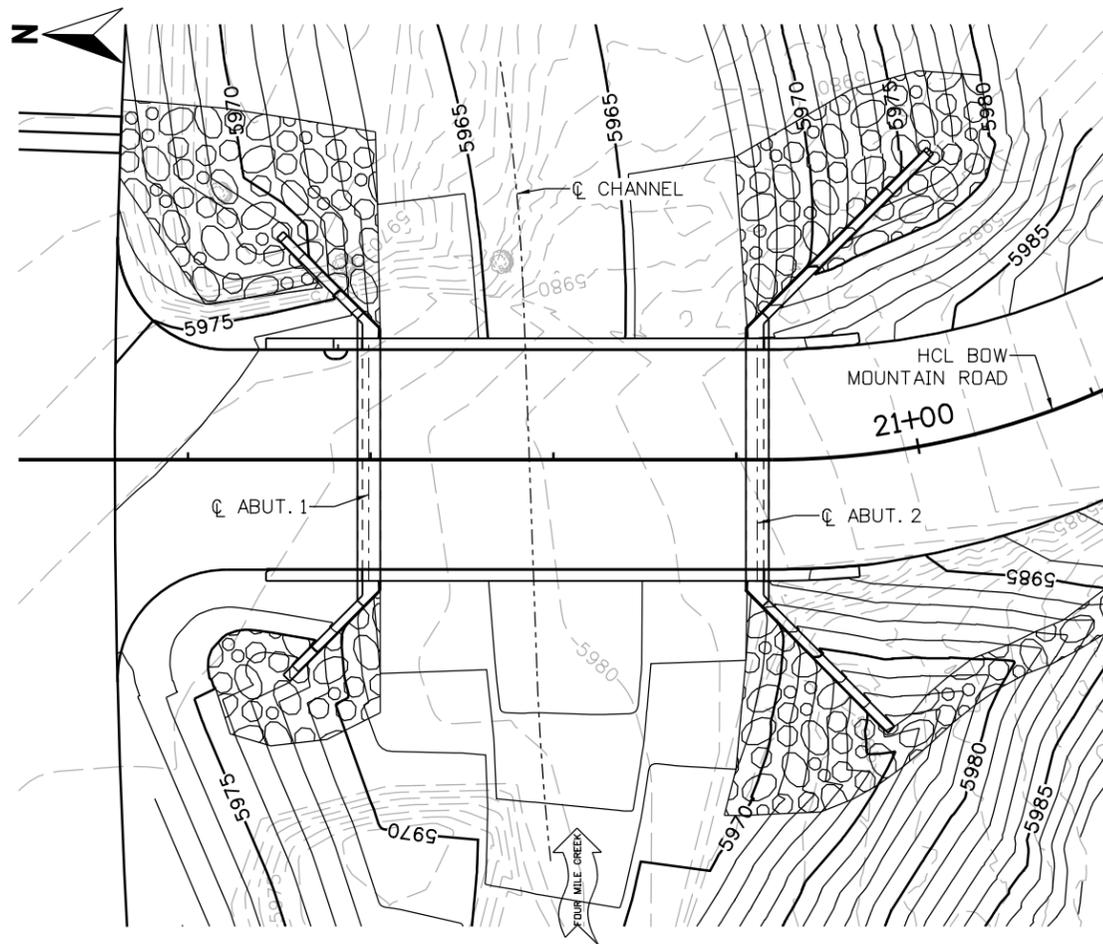


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BOW MOUNTAIN BRIDGE
BRIDGE HYDRAULIC
INFORMATION (1 OF 2)

PROJECT NO: 4043.SEPT12C34 SHEET NO: 71

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(24 INCH) RIPRAP & GEOTEXTILE LIMITS PLAN

SOIL RIPRAP (24 INCH) & GEOTEXTILE			
LOCATION	STATION	OFFSET	ELEVATION
ABUTMENT 1	A		
	B		
	C		
	D		
	E		
	F		
	G		
	H		
	I		
	J		
ABUTMENT 2	K		
	L		
	M		
	N		
	O		
	P		
	Q		
	R		
	S		
	T		

ALL ELEVATIONS REPRESENT TOP OF RIPRAP

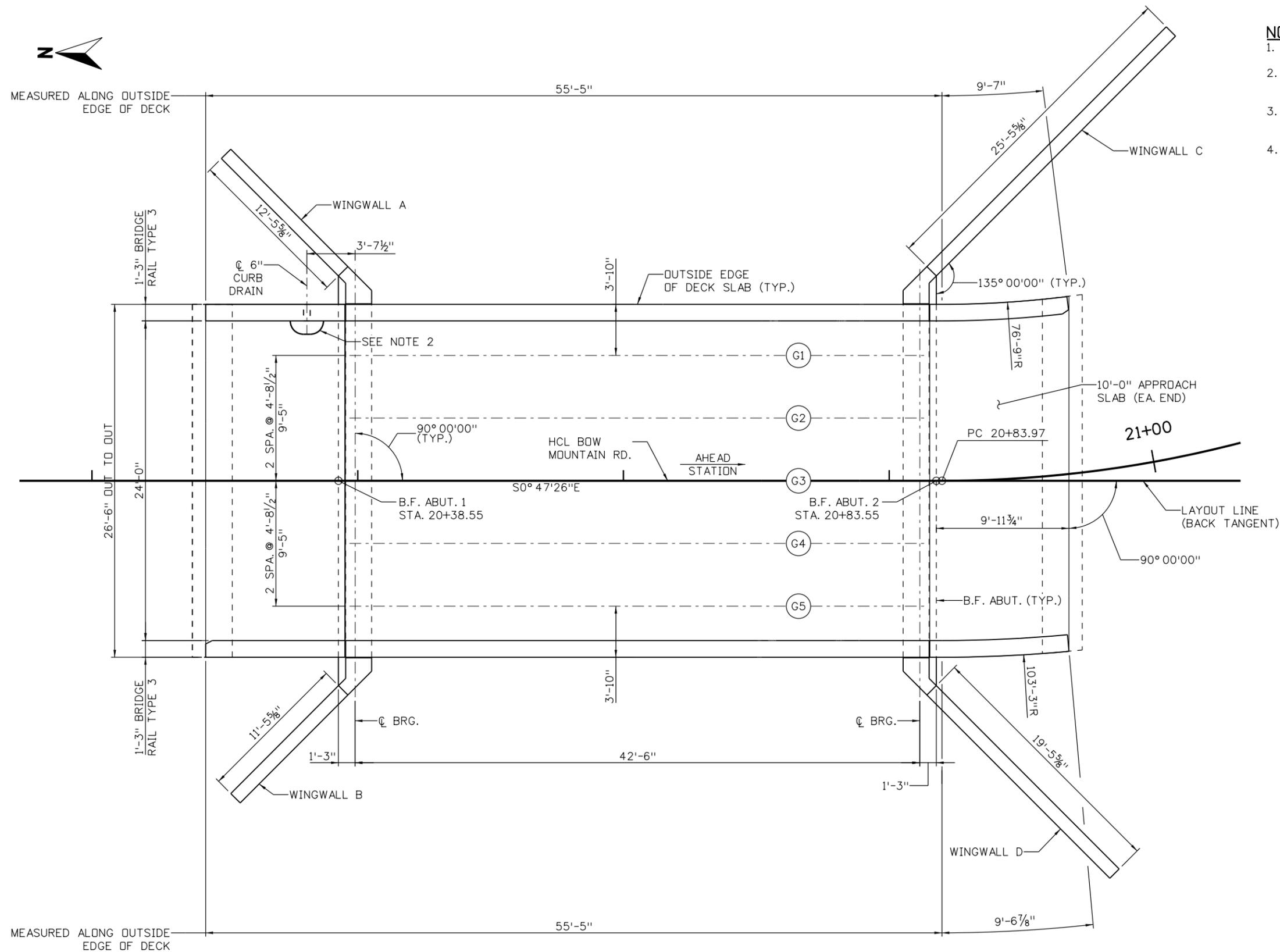
NOTES:

1. SEE TABULATION OF DRAINAGE AND EROSION CONTROL QUANTITIES.
2. SEE FINAL GESC PLANS FOR EROSION CONTROL BLANKET LOCATIONS.
3. RIPRAP SPILLWAY QUANTIFIED AND PAID FOR SEPARATELY.
4. FOR GRADING AND CONTOUR INFORMATION, SEE DITCH AND CHANNEL GRADING PLAN.



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NOTES:

1. LAYOUT LINE IS TANGENT FROM PC 20+83.97.
2. CUP ASPHALT 0" AT 1'-0" RADIUS TO TOP OF DECK AT CURB DRAIN.
3. MOVE BRIDGE RAIL POST AND BEND REINFORCING TO CLEAR CURB DRAIN.
4. APPROACH SLAB LENGTH IS MEASURED ALONG HORIZONTAL CONTROL LINE FROM B.F. ABUTMENT.



PLAN

60% SET

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811
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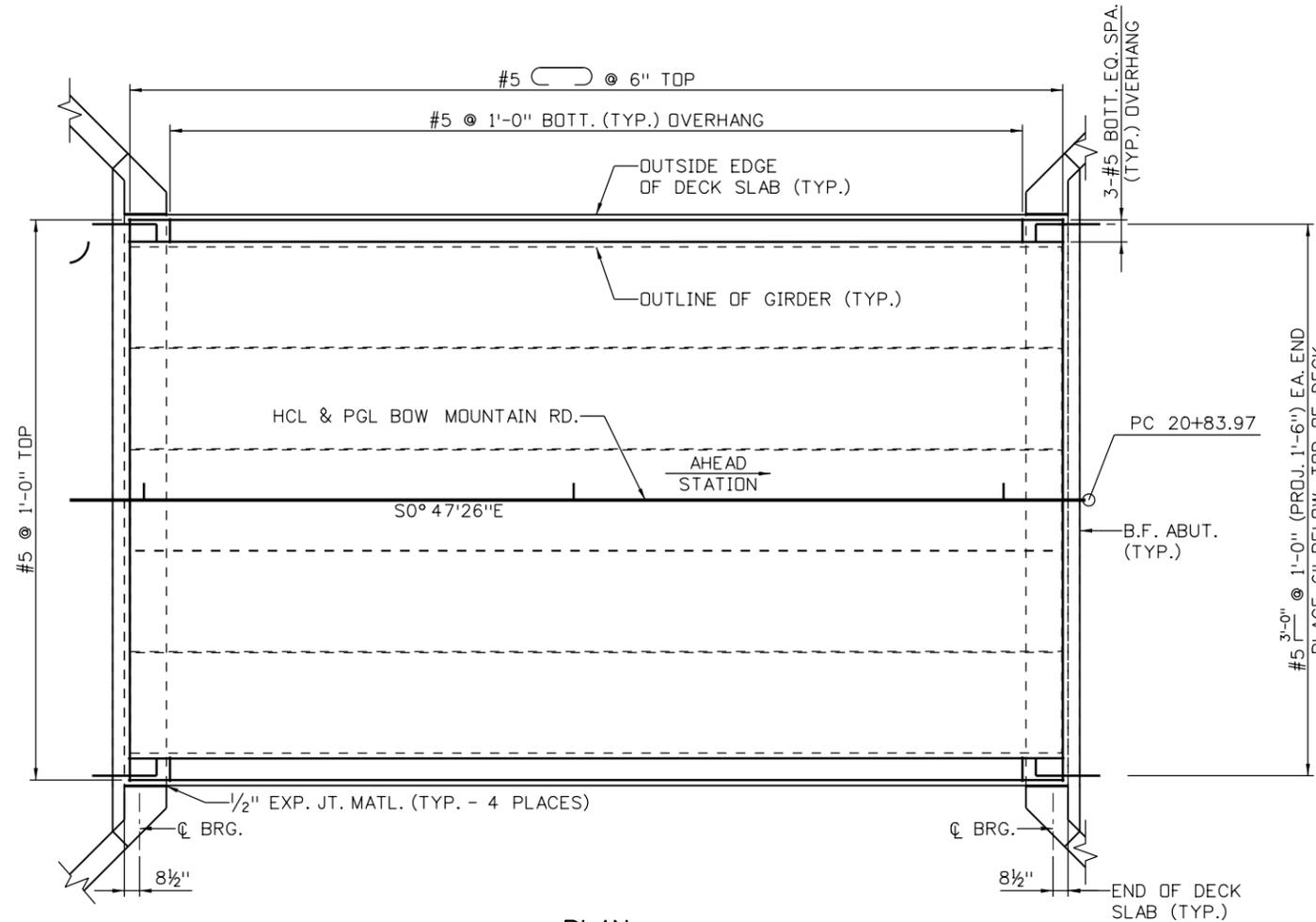
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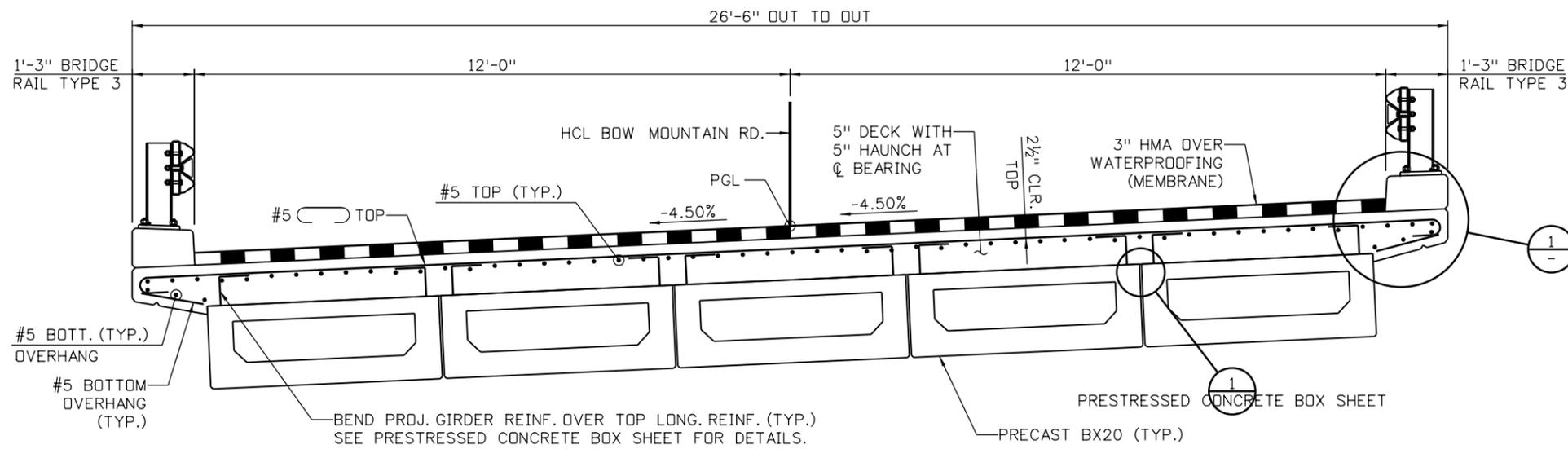
BOW MOUNTAIN BRIDGE CONSTRUCTION LAYOUT

PROJECT NO: 4043.SEPT12C34 SHEET NO: **73**

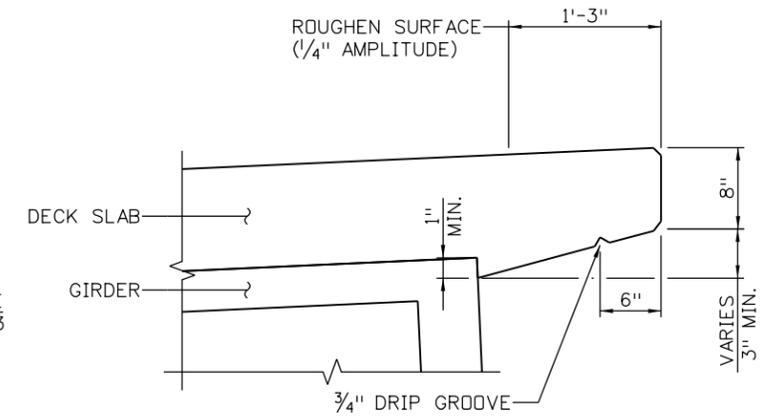
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PLAN



TYPICAL SECTION
LOOKING AHEAD STATION



DETAIL 1-1

RIGHT OVERHANG SHOWN,
LEFT OVERHANG SIMILAR

NOTES:

1. DECK SLAB SHALL BE CONCRETE CLASS D.
2. PROJECTING BRIDGE RAIL REINFORCEMENT NOT SHOWN. FOR RAILING DETAILS, SEE BRIDGE RAIL TYPE 3.
3. THE CONTRACTOR MAY ELECT TO SPLICE TOP REINFORCEMENT. ALTERNATE ALL LAP SPLICES.
4. HAUNCH VARIES TO 1" MINIMUM AT Q SPAN.

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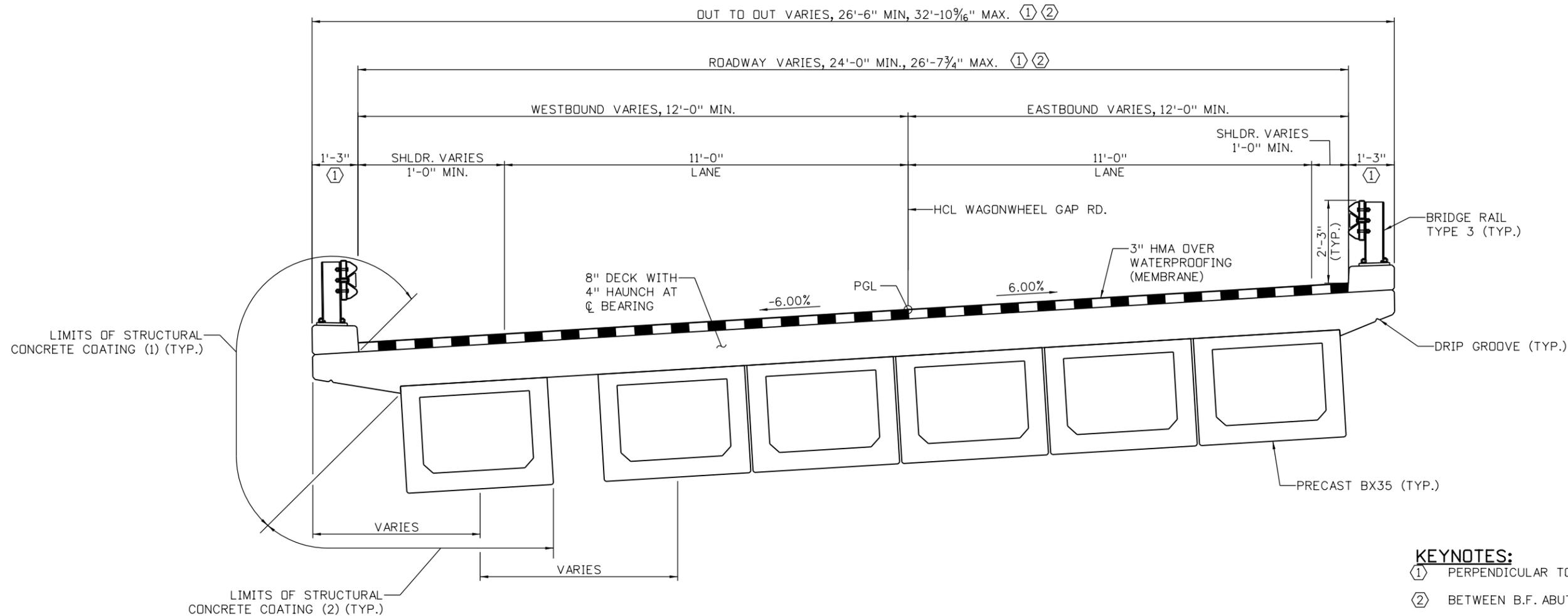


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BOW MOUNTAIN BRIDGE SUPERSTRUCTURE DETAILS
PROJECT NO: 4043.SEPT12C34 SHEET NO: 74

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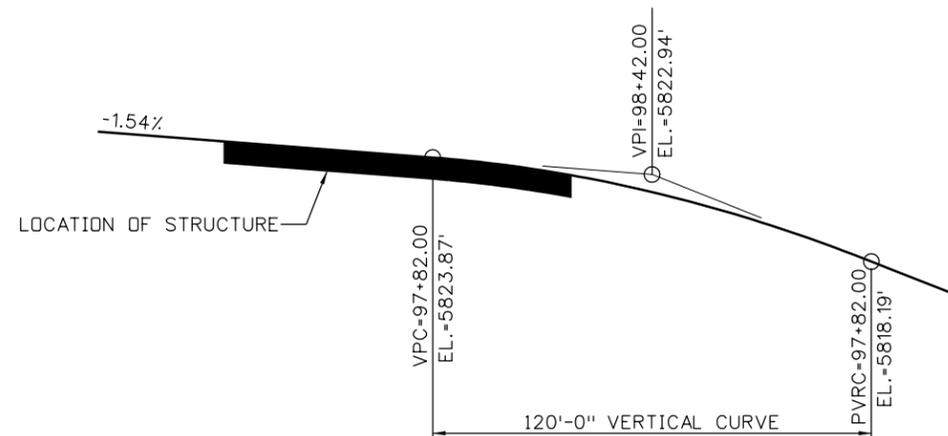


KEYNOTES:

- (1) PERPENDICULAR TO EDGE OF DECK.
- (2) BETWEEN B.F. ABUT 1 AND B.F. ABUT. 2.

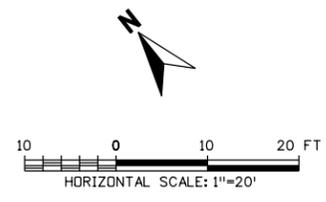
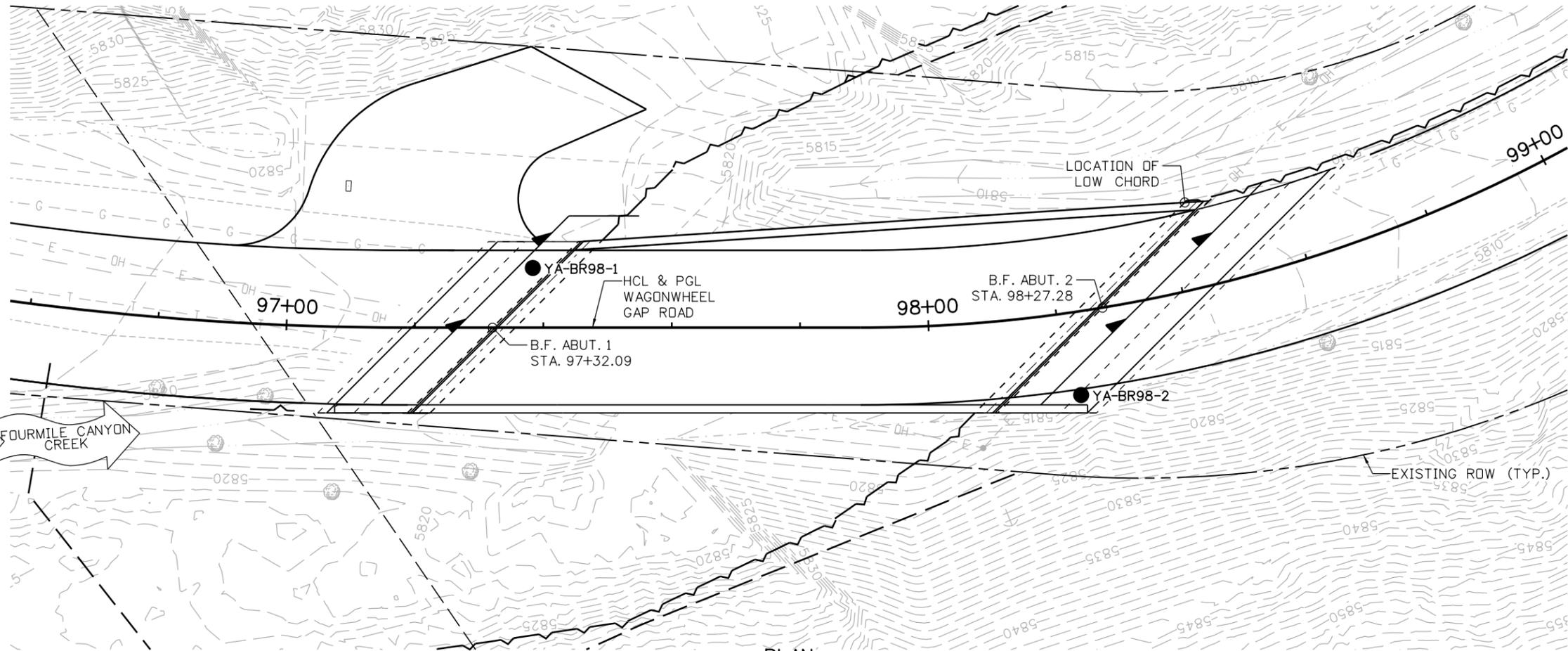
NOTES:

1. STRUCTURAL CONCRETE COATING (1) SHALL BE FEDERAL STANDARD COLOR NO. XXX, GREY OR EQUIVALENT.
2. STRUCTURAL CONCRETE COATING (2) SHALL BE FEDERAL STANDARD COLOR NO. XXX, BROWN OR EQUIVALENT.
3. HMA SHALL BE GRADING SX (75) (PG 58-28).



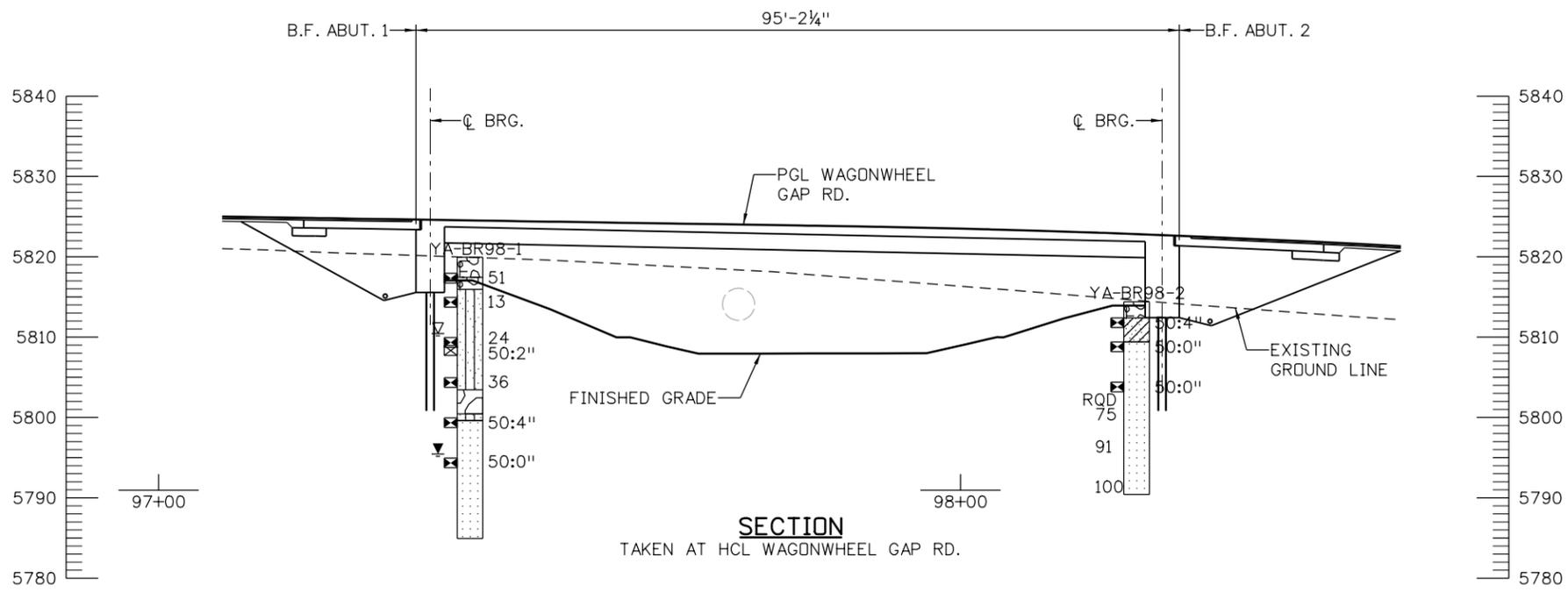
60% SET	<p style="font-size: 8px; margin: 0;">CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p style="font-size: 8px; margin: 0;">BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p style="font-size: 8px; margin: 0;">Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p style="font-size: 8px; margin: 0;">WAGONWHEEL GAP BRIDGE GENERAL LAYOUT (2 OF 2)</p> <p style="font-size: 8px; margin: 0;">PROJECT NO: 4043.SEPT12C34 SHEET NO: 76</p>
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PLAN

● APPROXIMATE BORING LOCATION



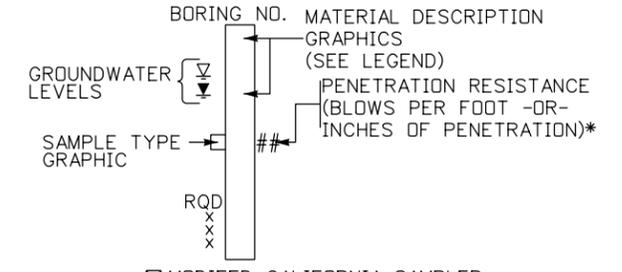
SECTION

TAKEN AT HCL WAGONWHEEL GAP RD.

LEGEND

- Fill with Gravel as major soil
- USCS Silty Sand
- Boulders
- USCS Sand Clayey
- Sandstone

TYPICAL BOREHOLE LOG



*E.G. A VALUE OF 50/3 OR 50:3 INDICATES THAT 50 BLOWS WERE APPLIED TO THE SAMPLER, WITH A PENETRATION OF 3 INCHES.

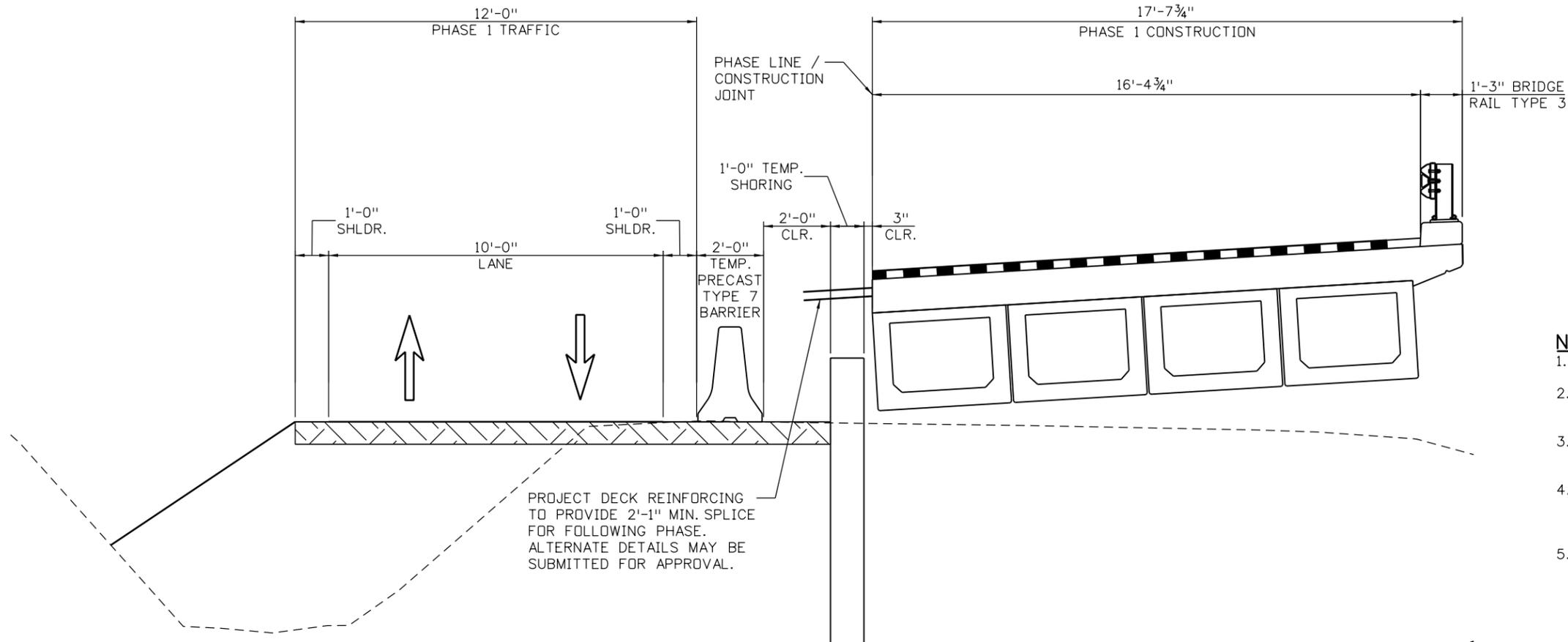
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WAGON WHEEL GAP ROAD ENGINEERING GEOLOGY
 PROJECT NO: 4043.SEPT12C34 SHEET NO: **77**

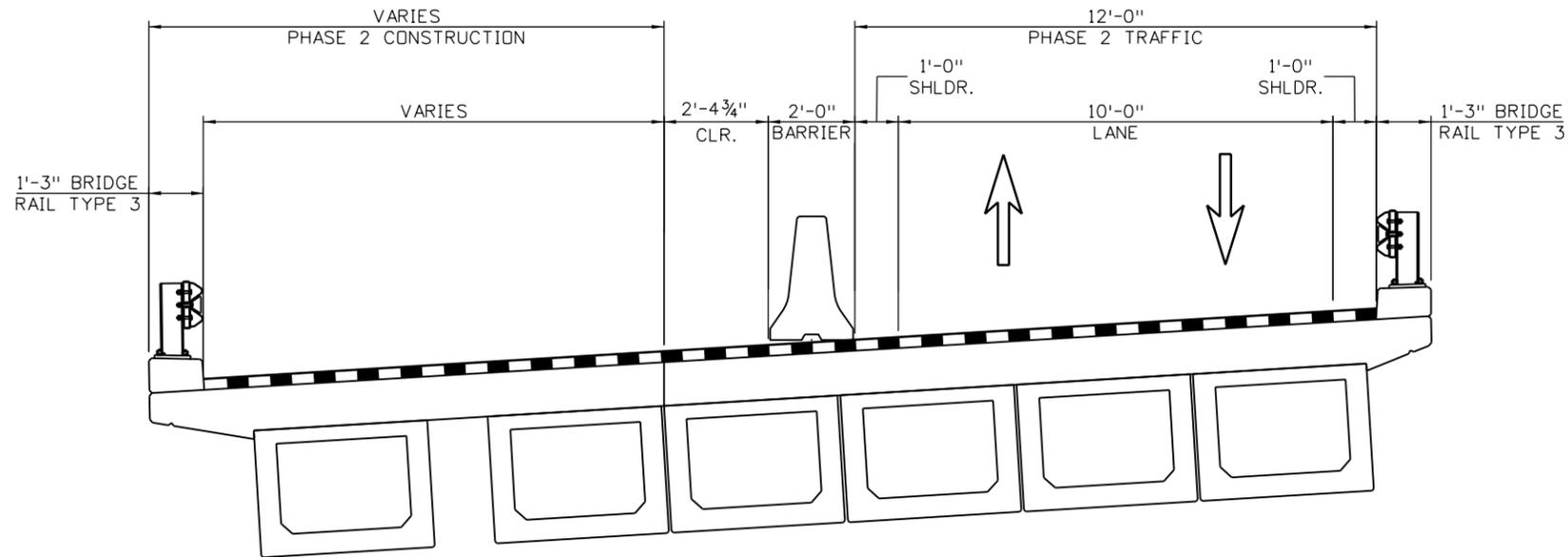
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PHASE 1 CONSTRUCTION
LOOKING AHEAD STATION WAGONWHEEL GAP RD.

NOTES:

1. PHASING PLAN APPLIES TO WAGONWHEEL GAP BRIDGE ONLY.
2. TEMPORARY EMBANKMENT AND STREAM CROSSING WILL BE NECESSARY TO ACCOMMODATE PHASING.
3. PHASING SCHEME TO SUPPORT ONE WAY TRAFFIC EACH WAY WITH TRAFFIC SIGNALS.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, PLACEMENT AND EXTENTS OF SHORING. SHORING SHOWN ON THE DRAWINGS IS CONCEPTUAL ONLY.
5. THE COST FOR TEMPORARY BARRIER, EMBANKMENT MATERIAL, STREAM CROSSING, ETC. SHALL BE INCLUDED IN ITEM 206 SHORING.



PHASE 2 CONSTRUCTION
LOOKING AHEAD STATION WAGONWHEEL GAP RD.

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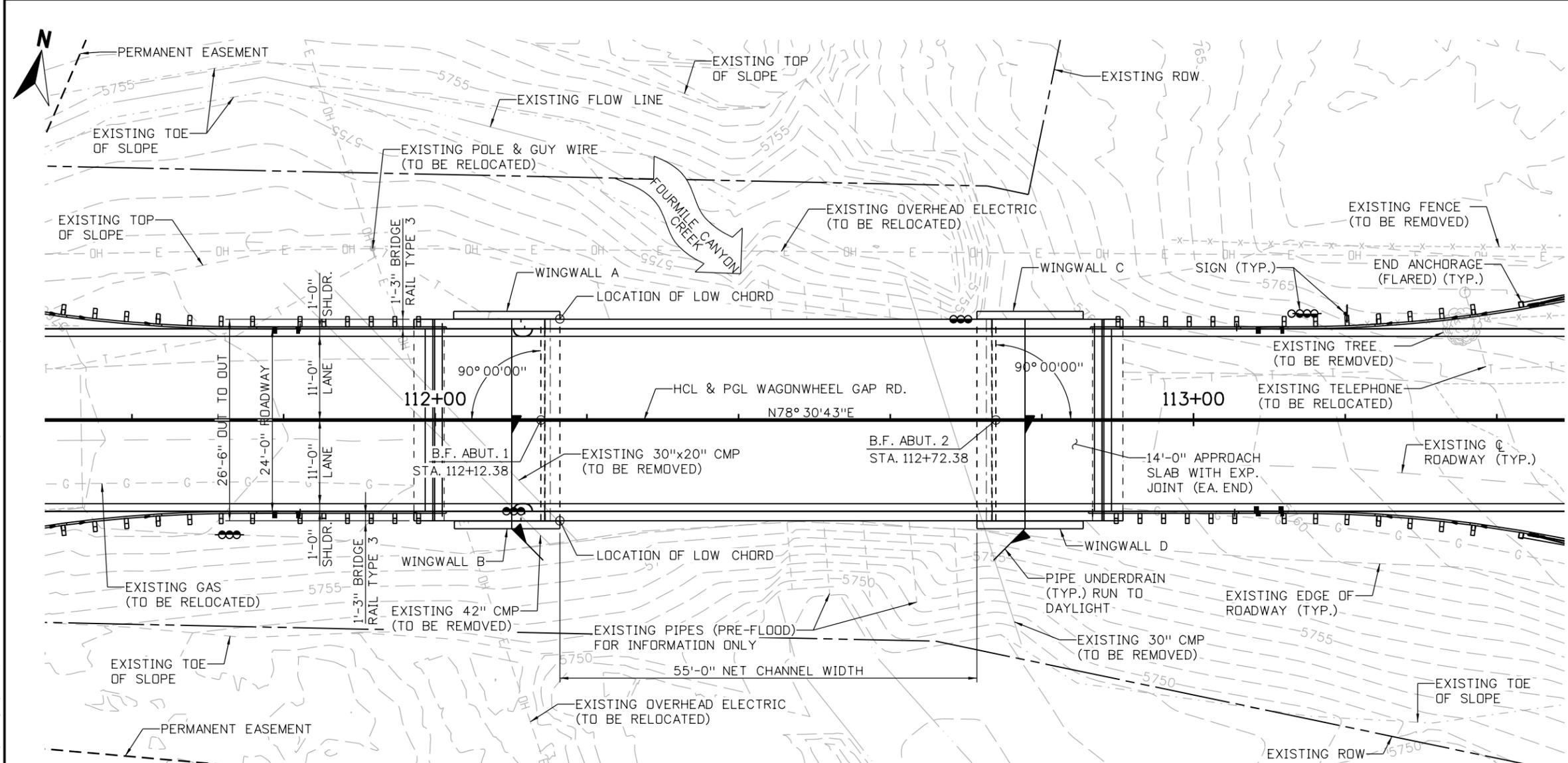
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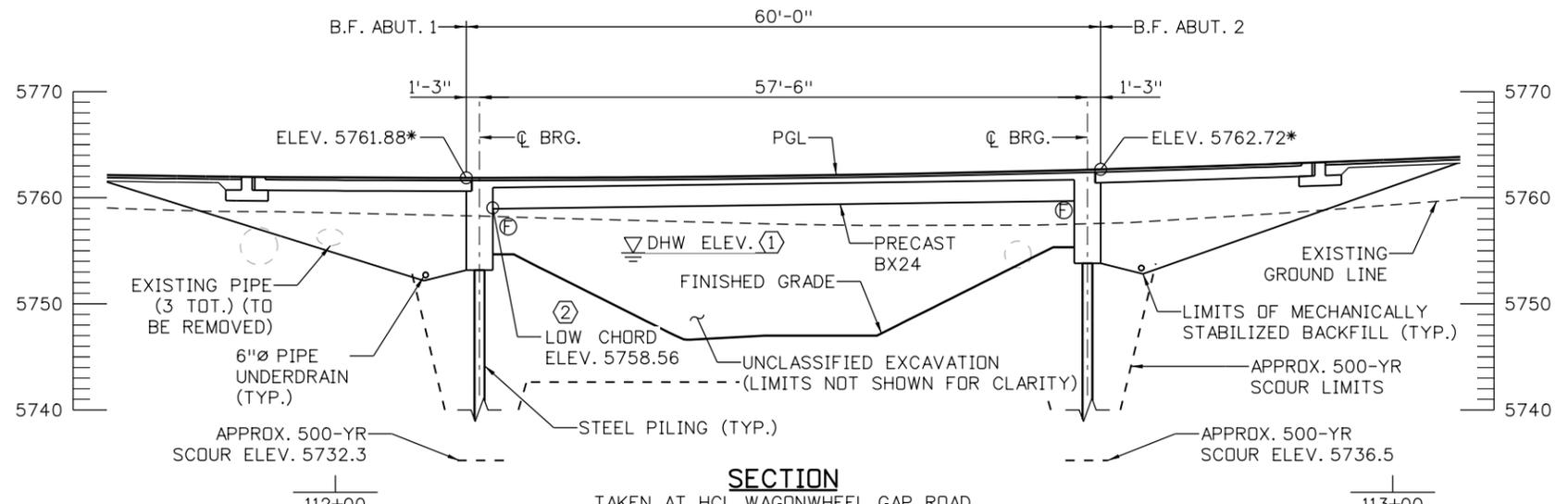
WAGONWHEEL GAP BRIDGE
CONSTRUCTION PHASING

PROJECT NO: 4043.SEPT12C34 SHEET NO: 78

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PLAN



SECTION

TAKEN AT HCL WAGONWHEEL GAP ROAD

KEYNOTES:

- ① 1'-0" MIN. FREEBOARD FOR THE 100-YR HYDRAULIC GRADE LINE AND ABOVE THE 100-YEAR ENERGY GRADE LINE.
- ② ELEVATION SHOWN INCLUDES AN ADDITIONAL 1/2" GIRDER DEPTH TOLERANCE.

NOTES:

- 1. FOR REMOVALS, UTILITY INFORMATION, SIGNS, AND GUARDRAIL DETAILS, SEE ROADWAY PLANS.
- 2. FOR FINISHED GRADING, SEE DRAINAGE PLANS.
- 3. GEOTECHNICAL INFORMATION AND RECOMMENDATIONS CAN BE FOUND IN THE PRELIMINARY DRAFT GEOTECHNICAL AND PAVEMENT INVESTIGATION REPORT, WAGONWHEEL GAP ROAD, BOULDER COUNTY, COLORADO, DATED MARCH 3, 2016.
- 4. CREEK RESTORATION DETAILS HAVE NOT BEEN DETERMINED AT THIS TIME.
- 8. WAGON WHEEL GAP ROAD SHALL MAINTAIN TWO 10'-0" LANES WITH 1'-0" SHOULDERS UTILIZING A TEMPORARY SHOOFLY DURING BRIDGE CONSTRUCTION.



60% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

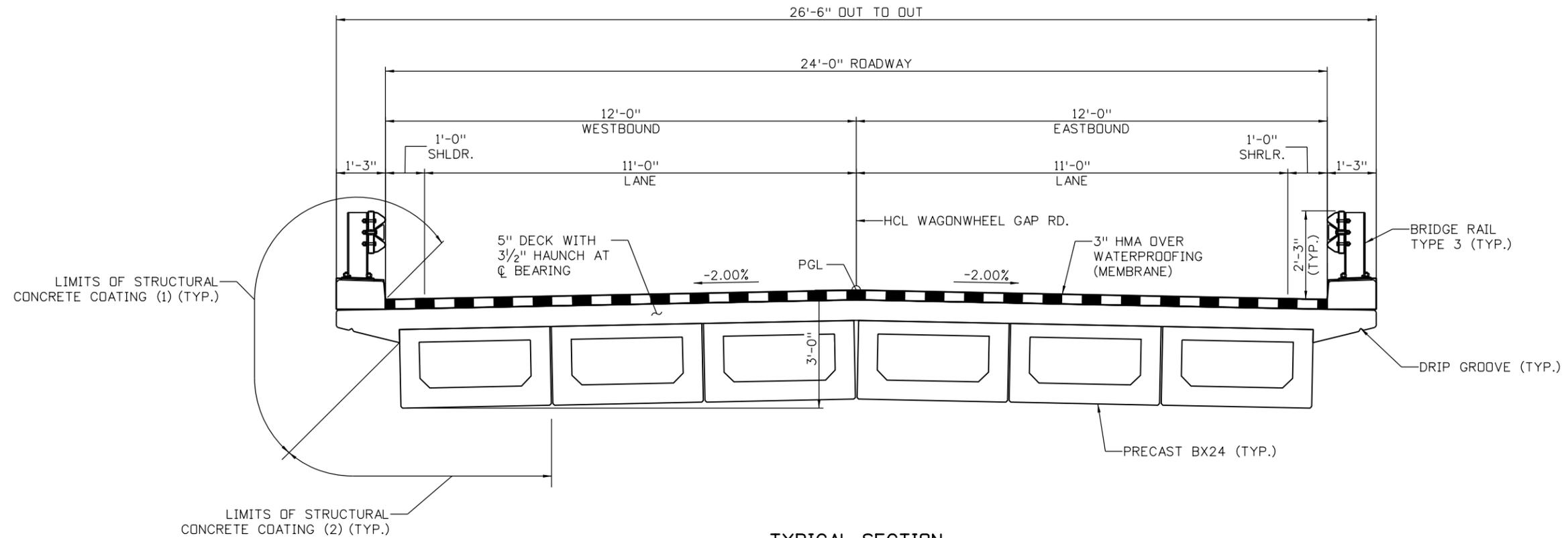
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LEE HILL APPROACH BRIDGE
GENERAL LAYOUT
(1 OF 2)

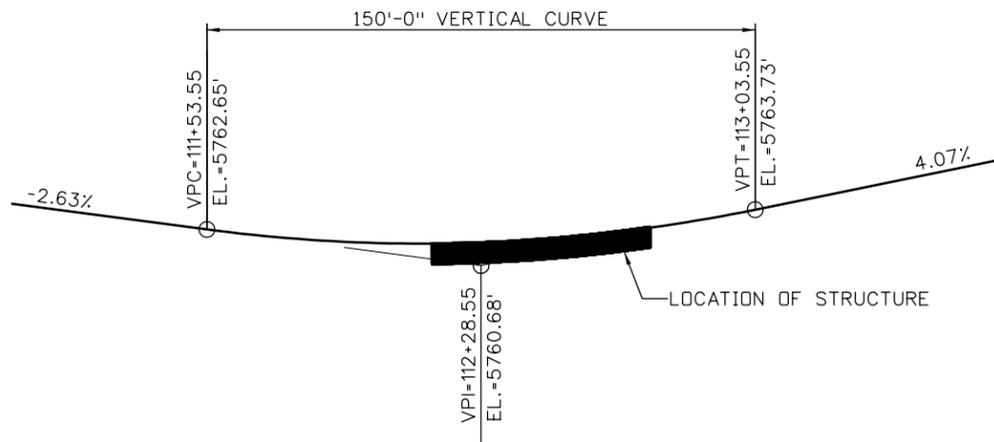
PROJECT NO: 4043.SEPT12C34 SHEET NO: **79**

* FINISHED GRADE ELEVATIONS

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TYPICAL SECTION
LOOKING AHEAD STATION



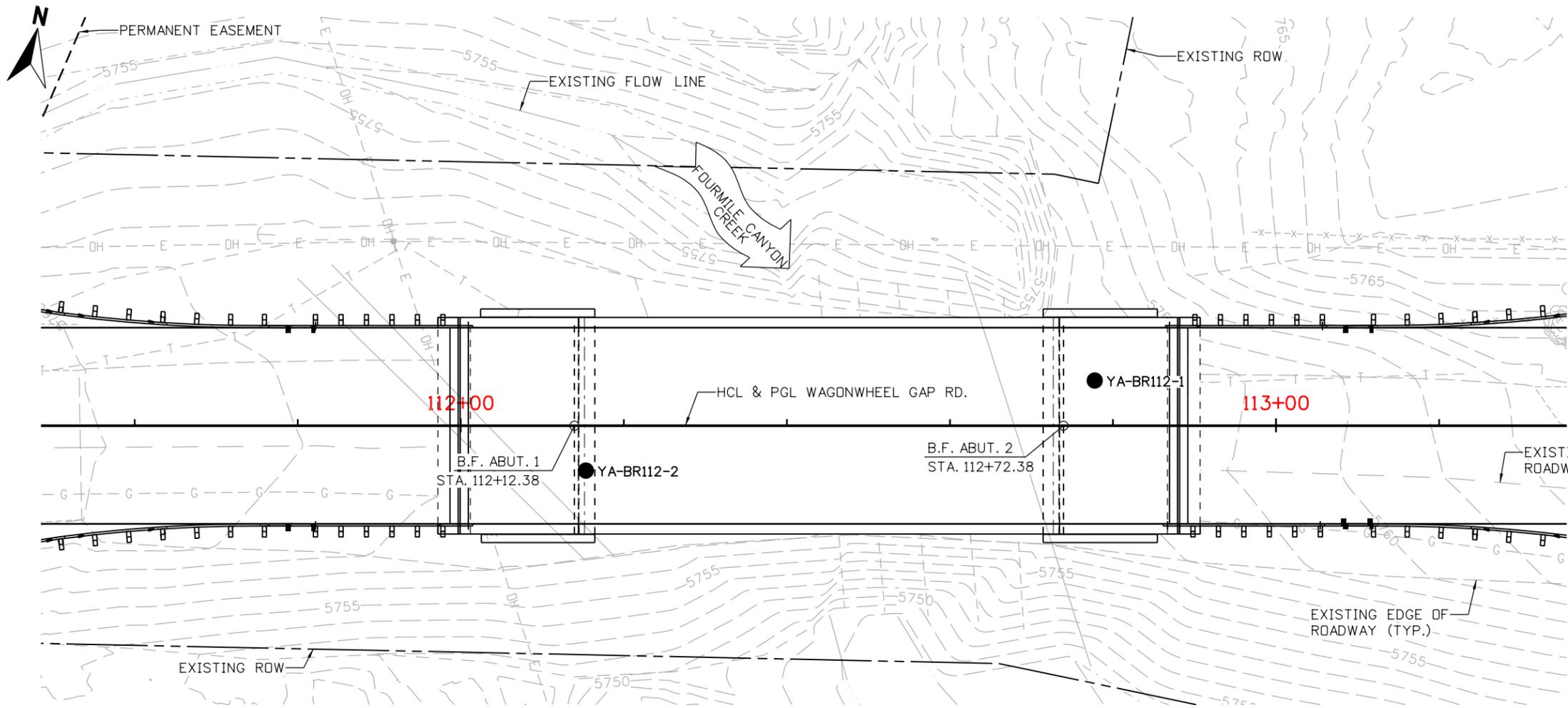
ROADWAY PROFILE GRADE
WAGONWHEEL GAP ROAD

NOTES:

1. STRUCTURAL CONCRETE COATING (1) SHALL BE FEDERAL STANDARD COLOR NO. XXX, GREY OR EQUIVALENT.
2. STRUCTURAL CONCRETE COATING (2) SHALL BE FEDERAL STANDARD COLOR NO. XXX, BROWN OR EQUIVALENT.
3. HMA SHALL BE GRADING SX (75) (PG 58-28).

60% SET	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED:	CAD:	CHECKED:	DATE:	LEE HILL APPROACH BRIDGE GENERAL LAYOUT (2 OF 2)
	DLT	BMT	3/4/2016	PROJECT NO: 4043.SEP12C34	SHEET NO: 80						

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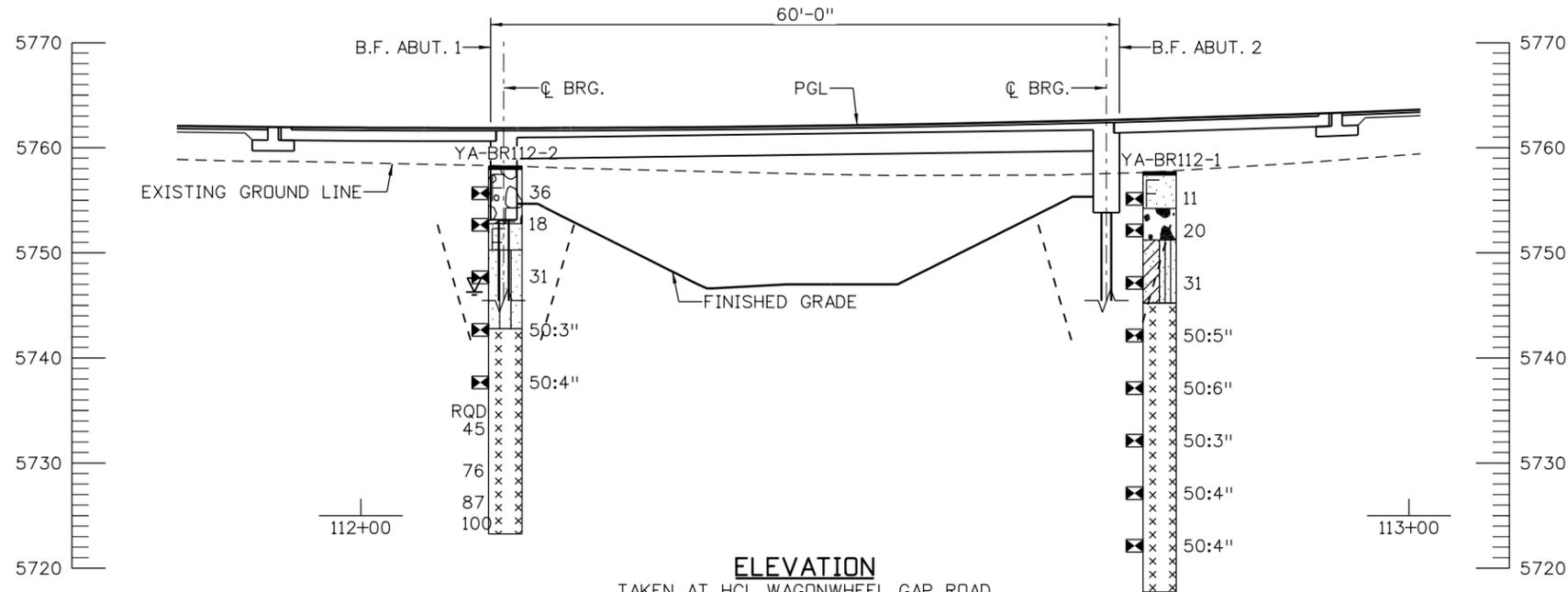


PLAN

● APPROXIMATE BORING LOCATION

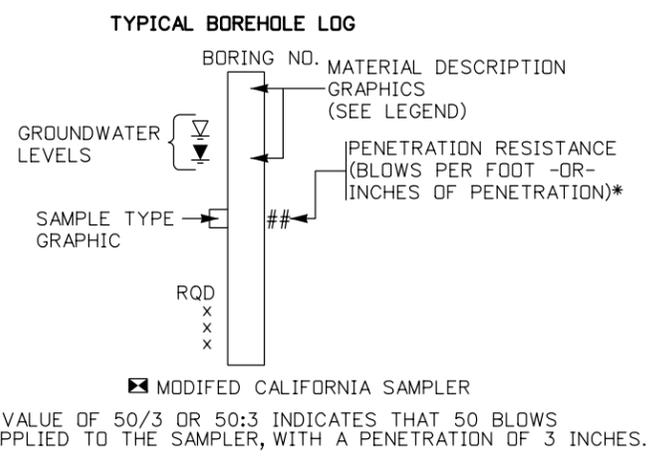
LEGEND

	ASPHALT		FILL WITH SAND AS MAJOR SOIL		USCS WELL-GRADED GRAVEL
	USCS CLAYEY SAND		FILL WITH GRAVEL AS MAJOR SOIL		USCS SILTY SAND
	SILTSTONE				



ELEVATION

TAKEN AT HCL WAGONWHEEL GAP ROAD



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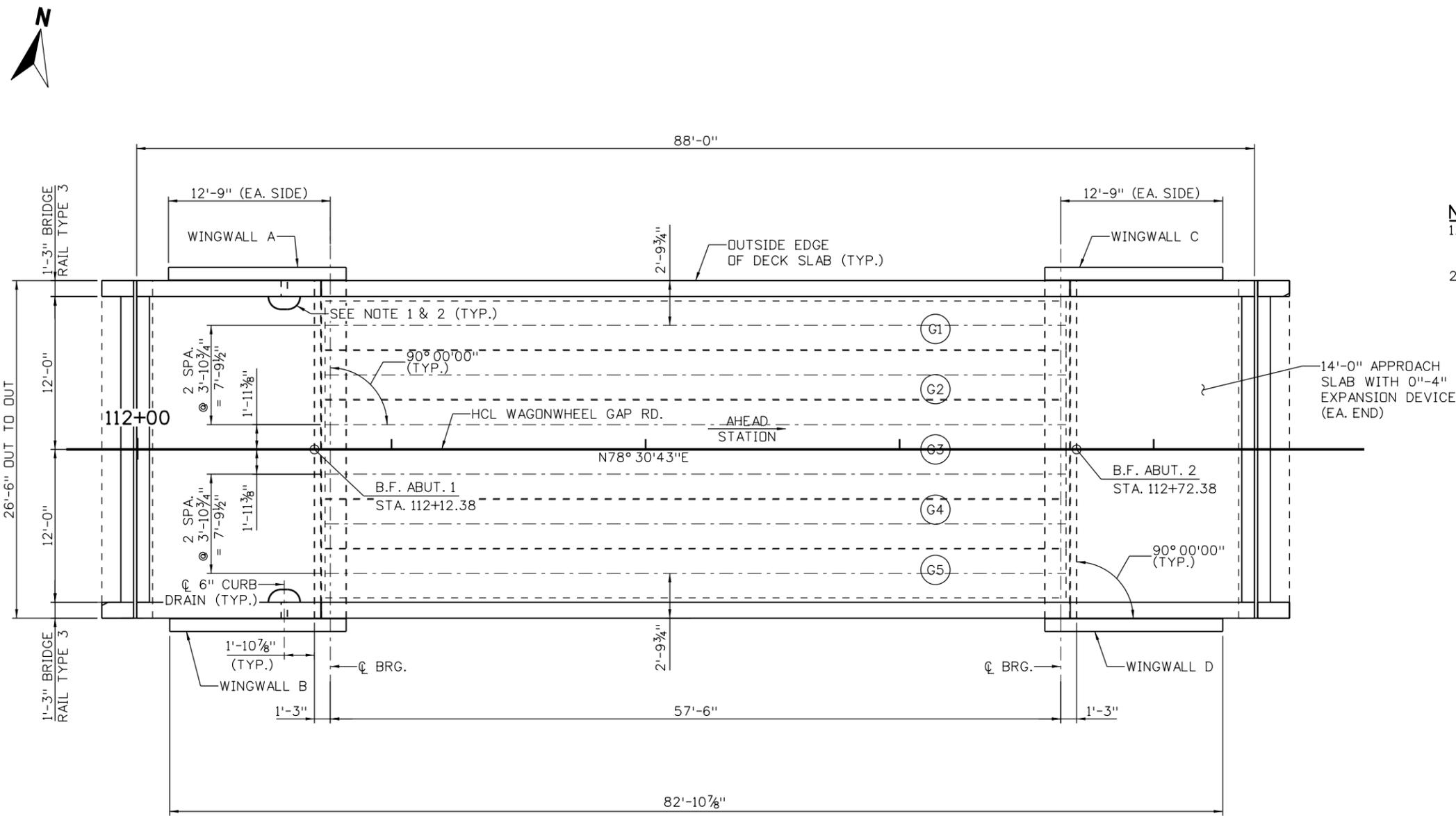
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ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED: **SCS** CAD: **MJW** CHECKED: DATE: **2/25/2016**

LEE HILL DRIVE
ENGINEERING GEOLOGY

PROJECT NO: 4043.SEPT12C34 SHEET NO: **81**

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NOTES:

1. CUP ASPHALT 0" AT 1'-0" RADIUS TO TOP OF DECK AT CURB DRAIN.
2. MOVE BRIDGE RAIL POST AND BEND REINFORCING TO CLEAR CURB DRAIN.

PLAN



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CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



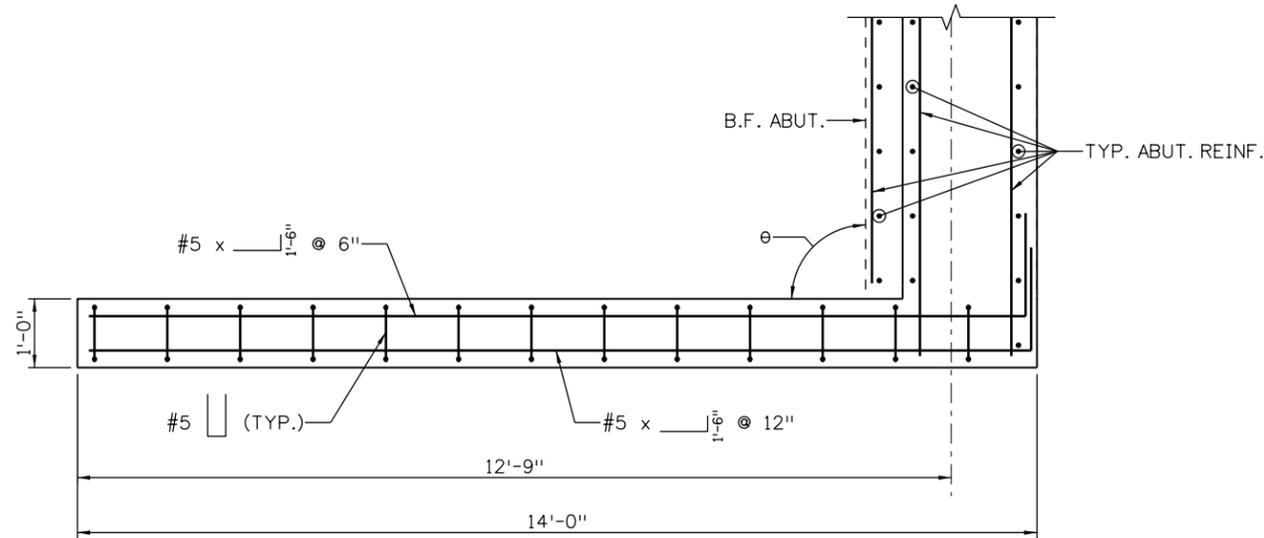
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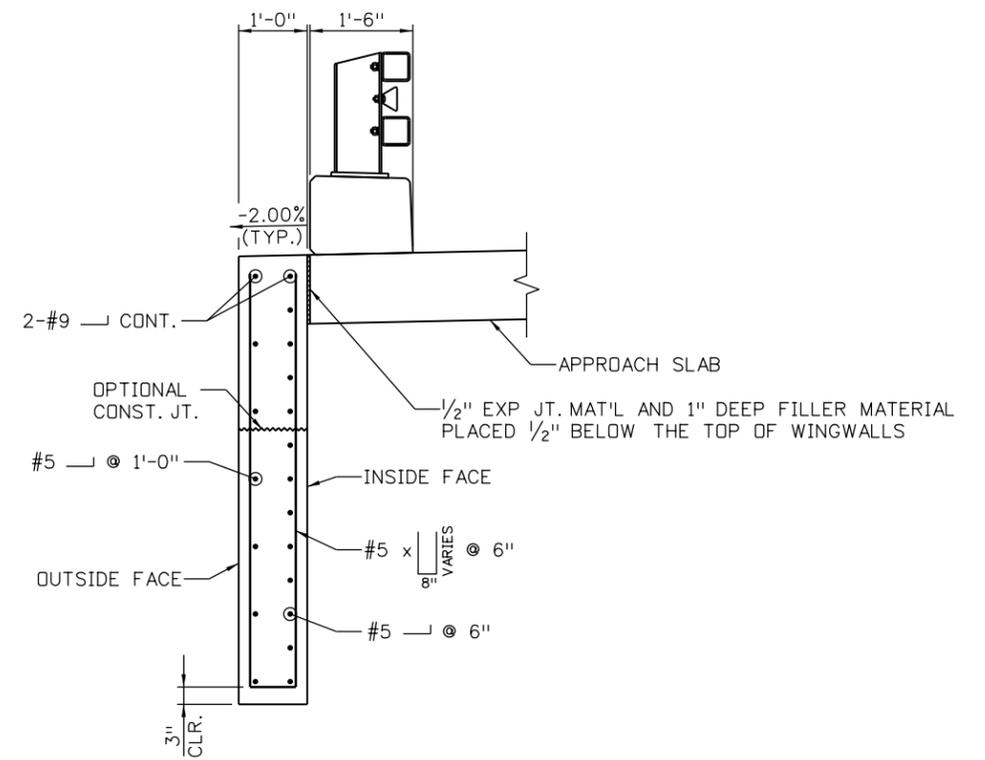
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
 Michael Baker INTERNATIONAL
 DESIGNED: DLT CAD: BMT CHECKED: DATE: 3/4/2016

LEE HILL APPROACH BRIDGE
 CONSTRUCTION LAYOUT
 PROJECT NO: 4043.SEPT12C34 SHEET NO: 82

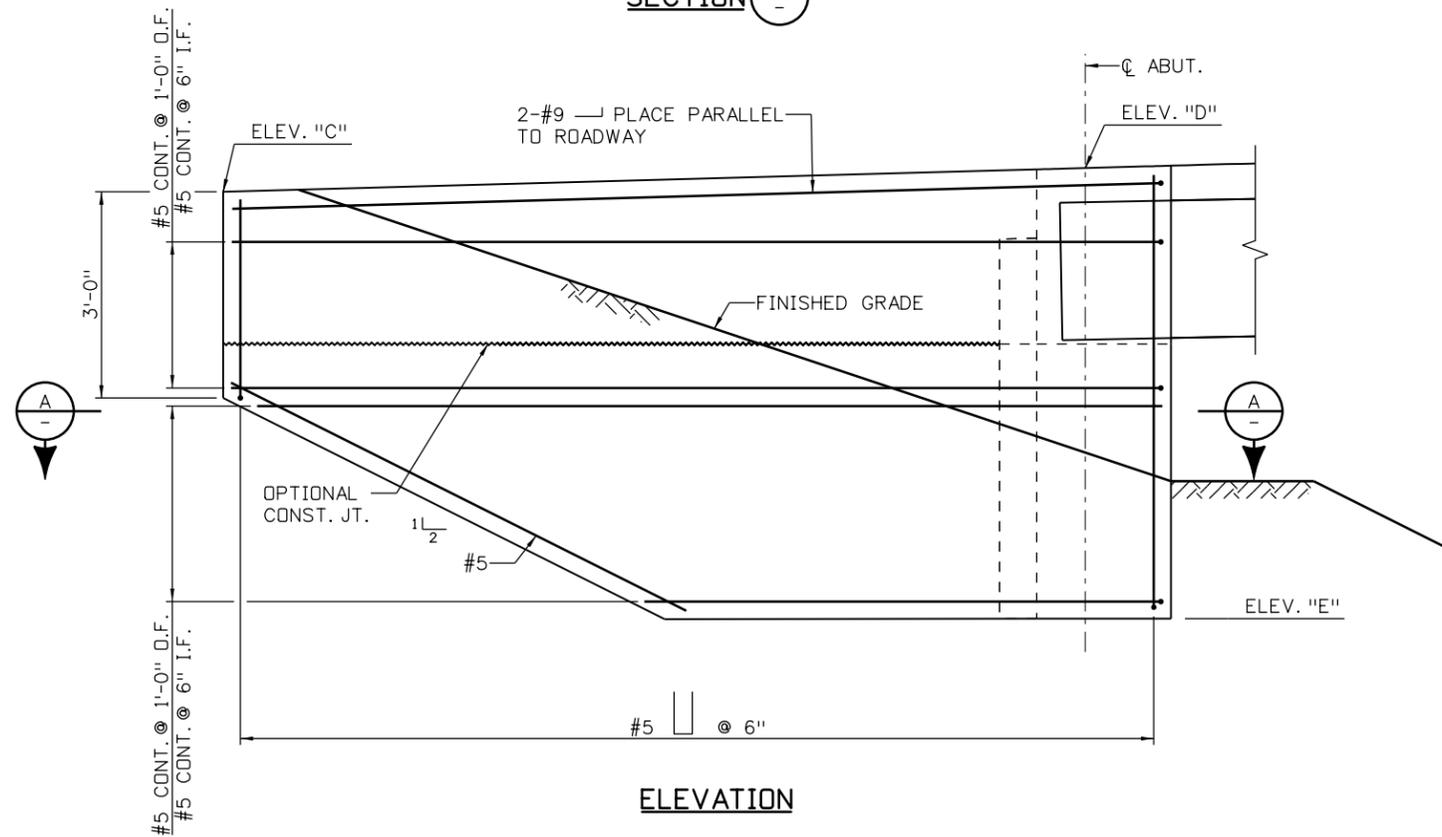
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SECTION A



TYPICAL SECTION
FINISHED GRADE NOT SHOWN



ELEVATION

60% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

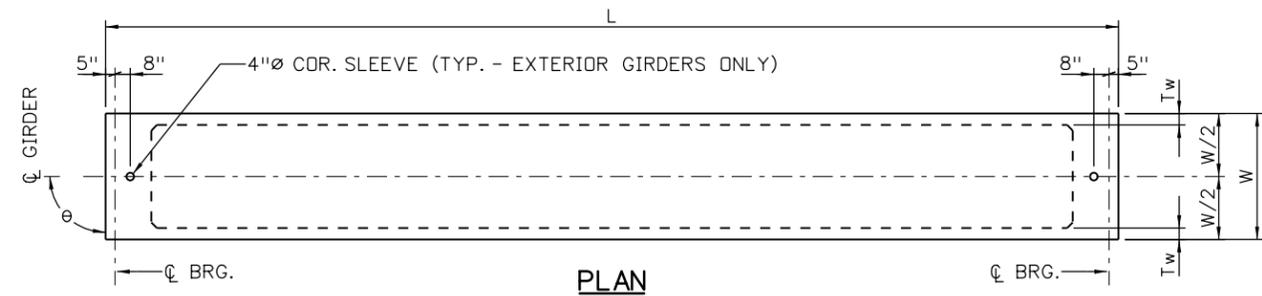
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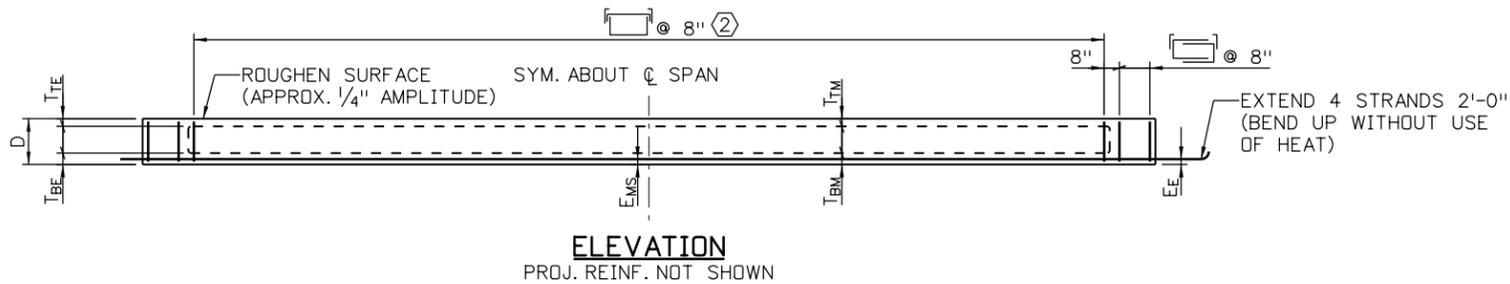
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
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WAGONWHEEL GAP ROAD BRIDGES
WINGWALL DETAILS
 DESIGNED: DLT CAD: BMT CHECKED: DATE: 3/4/2016
 PROJECT NO: 4043.SEPT12C34 SHEET NO: 83

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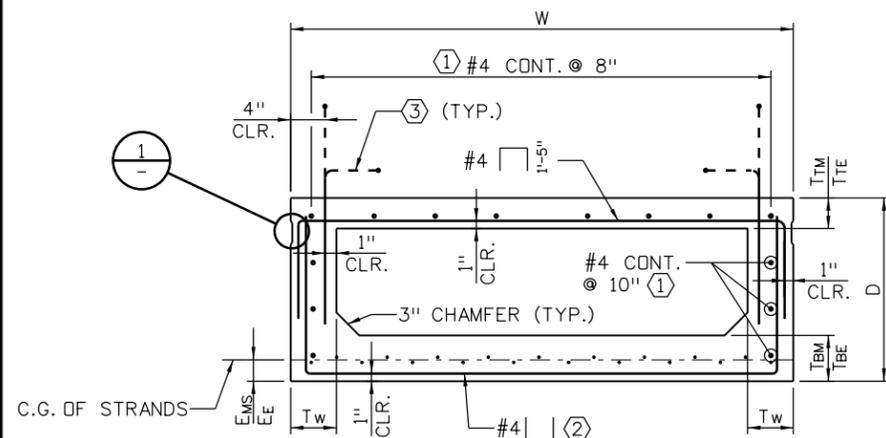


PLAN



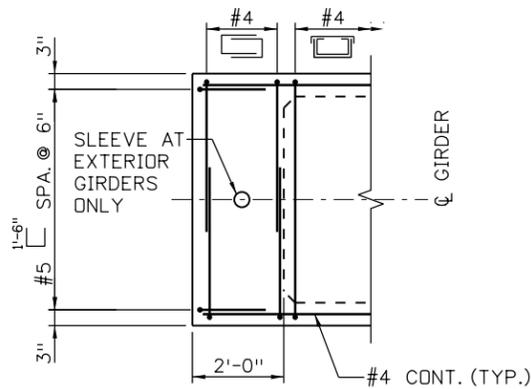
ELEVATION

PROJ. REINF. NOT SHOWN



TYPICAL SECTION

EXTERIOR STRAND SHALL NOT BE DEBONDED AND SHOULD BE PLACED ADJACENT TO ANCHOR STIRRUPS



TYPICAL END PLAN

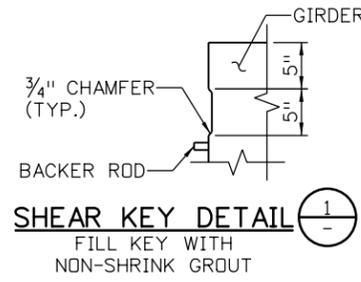
PROJ. REINF. NOT SHOWN

NOTES:

- ALL WORK NECESSARY TO FABRICATE AND INSTALL THE INTEGRAL PARTS OF THE GIRDER (INCLUDING THE INTERMEDIATE DIAPHRAGMS, IF ANY, AND LEVELING PADS), AS SHOWN ON THE PLANS, SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 618, PRESTRESSED CONCRETE BOX, WITH A PAY UNIT OF SQ. FT. MEASURED BY L x W.
- WHEN APPROVED BY THE ENGINEER, A MINIMUM TACK WELDING WILL BE PERMITTED ON ASTM A706 UNCOATED REINFORCING STEEL.
- REINFORCING PROJECTING FROM THE TOP OF THE GIRDER AND REINFORCING WITHIN 8'-0" OF AN EXPANSION DEVICE IN THE BRIDGE DECK SHALL BE EPOXY COATED. DAMAGED COATING ON GIRDER REINFORCING NEED NOT BE REPAIRED. THE MINIMUM COVER FOR REINFORCING STEEL IS 1".
- WELDED WIRE FABRIC MAY BE USED WITH D20 WIRES IN LIEU OF THE #4 BARS SHOWN.
- AT GIRDER ENDS NOT EMBEDDED IN CONCRETE DIAPHRAGMS, CUT STRANDS OFF 1" BELOW THE SURFACE OF THE CONCRETE AND FINISH WITH APPROVED EPOXY GROUT. AT GIRDER ENDS EMBEDDED IN CONCRETE DIAPHRAGMS, CUT STRANDS TO PROJECT 3", EXCEPT AS SHOWN. DO NOT MAKE COSMETIC REPAIRS WHEN DAMAGE IS LESS THAN 1/2" DEEP TO THE PARTS OF THE GIRDERS EMBEDDED IN CONCRETE.
- USE LOW RELAXATION STRANDS MEETING THE REQUIREMENTS OF ASTM A-416 GRADE 270. THE MINIMUM CLEAR DISTANCE BETWEEN GROUPS OR INDIVIDUAL STRANDS SHALL BE $2.3(d_s)$ BUT NOT LESS THAN 1/4". THE MINIMUM COVER FOR PRESTRESSING STEEL IS 1/2".

A_s^* = MINIMUM AREA OF THE PRESTRESSING STEEL
 d_s = NOMINAL STRAND DIAMETER
 f_s = ULTIMATE STRENGTH OF PRESTRESSING STEEL
 F_j = JACKING FORCE PER GIRDER
 F_f = FINAL FORCE PER GIRDER AFTER ALL LOSSES
 f_{ci} = REQUIRED CONCRETE STRENGTH AT RELEASE OF PRESTRESS FORCE
 f_c = REQUIRED CONCRETE STRENGTH AT 28 DAYS OF AGE
 L = LENGTH OF GIRDER ALONG THE GRADE OF THE GIRDER
 Δ = DEFLECTION AT C OF SPAN DUE TO CAST-IN-PLACE SLAB, DIAPHRAGMS, ASPHALT, CURBS, RAILS, AND WALKS
 θ = BRIDGE SKEW ANGLE

- CONCRETE SHALL BE CLASS PS.
- ENTRAINED AIR IS NOT REQUIRED FOR GIRDER CONCRETE.
- END BLOCKS SHALL BE USED ON ALL GIRDERS UNLESS OTHERWISE NOTED.
- USE 1/2" CHAMFER ON ALL CORNERS, EXCEPT AS NOTED.
- PREDICTED CAMBER IS THE CAMBER FOR THE GIRDER ALONE AT 90 DAYS. THE CONTRACTOR SHALL LIMIT THE CAMBER GROWTH TO A VALUE NOT TO EXCEED THE PREDICTED CAMBER PLUS 1" PRIOR TO THE DECK POUR BY WEIGHTING, SCHEDULING FABRICATION, POST TENSIONING, OR OTHER MEANS AND MUST REPORT TO THE ENGINEER VALUES OF CAMBER WHICH EXCEED THE PREDICTED CAMBER PLUS 1". REMEDIAL MEASURES, AS APPROVED BY THE ENGINEER, SHALL BE TAKEN IF THE PREDICTED CAMBER PLUS 1" IS EXCEEDED. THE APPROVED REMEDIAL MEASURES SHALL BE FREE OF ANY ADVERSE IMPACT. THE COSTS ASSOCIATED WITH ALL REMEDIAL MEASURES SHALL BE BORNE BY THE CONTRACTOR.
- SIDE BY SIDE BOXES SHALL NOT HAVE CAMBERS OF ADJACENT BOXES DIFFER BY MORE THAN 1" BEFORE THE DECK POUR. PRIOR TO PLACING DECK REINFORCING, THE CONTRACTOR SHALL ADJUST THIS DIFFERENTIAL TO WITHIN THIS LIMIT BY SORTING THE BOXES TO MINIMIZE DIFFERENTIALS, OR BY PULLING THE HIGH BOXES DOWN AND LOW BOXES UP.
- DEPTH (D) TOLERANCE SHALL BE +1/2", -1/4".
- THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING NECESSARY BRACING REQUIREMENTS, AND FOR PROVIDING ADEQUATE BRACING FOR THE SPECIFIC WIND AND WEATHER CONDITIONS TO BE ENCOUNTERED FOR EACH SPECIFIC PROJECT.
- ELASTOMERIC LEVELING PADS SHALL BE INCLUDED IN ITEM 618 PRESTRESSED CONCRETE BOX. SEE ABUTMENT SHEETS FOR DETAILS.



SHEAR KEY DETAIL

FILL KEY WITH NON-SHRINK GROUT

KEYNOTES:

- LIGHTLY TENSIONED STRANDS MAY BE USED AS ALTERNATE.
- #4 HOOK ORIENTATION IS AT THE CONTRACTOR'S OPTION (TYP.) (BUNDLE WITH #4 FOR 14' AT EACH END OF GIRDER)
- #3 (PROJECT 1'-2") SPA. WITH #4 STIRRUPS. FIELD BEND OVER TOP MAT OF LONG. SLAB STEEL. REPAIR DAMAGED EPOXY COATING.

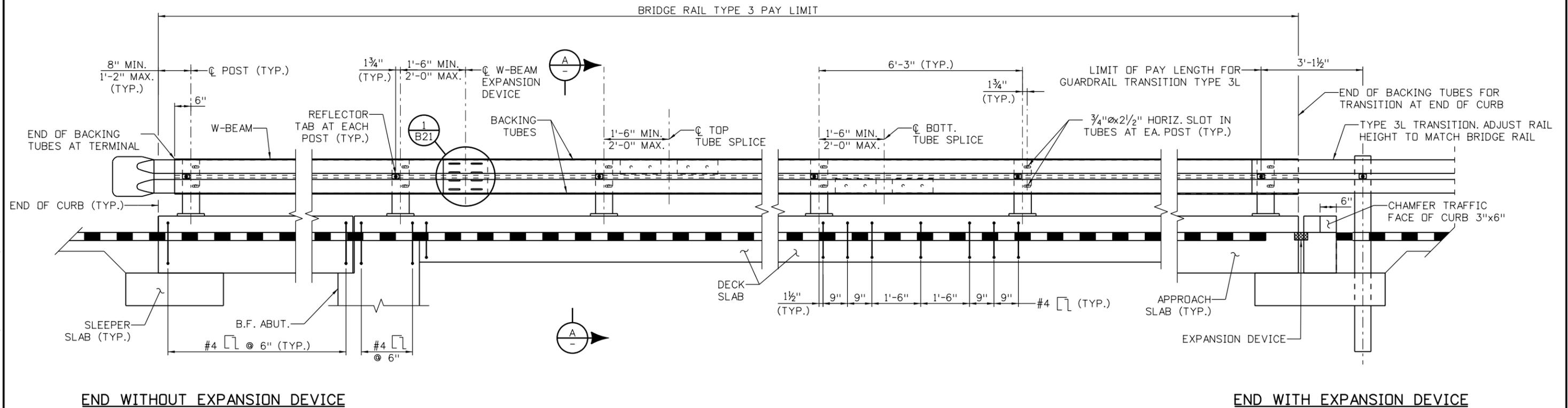
GIRDER SCHEDULE

BRIDGE	GIRDER TYPE	GIRDER NO.	L (FEET)	W (INCH)	D (INCH)	θ (DEG.)	T _w (INCH)	T _{BM} (INCH)	T _{TM} (INCH)	T _{BE} (INCH)	T _{TE} (INCH)	# STRANDS	A _s (SQ. IN.)	DEBONDED STRANDS (%)	E _{ms} (INCH)	E _{EE} (INCH)	F _J (KIPS)	F _r (KIPS)	CONCRETE STRENGTH		Δ (INCH)	PREDICTED RELEASE CAMBER (INCH)	PREDICTED CAMBER (INCH)	
																			f' _{ci} (PSI)	f' _c (PSI)				
BOW MOUNTAIN	BX20	G1, G5	43.33	56	20	90	6	6	4	6	4													
BOW MOUNTAIN	BX20	G2, G3, G4	43.33	56	20	90	6	6	4	6	4													
WAGON WHEEL GAP	BX24	G1, G6	58.33	48	24	90	6	6	4	6	4													
WAGON WHEEL GAP	BX24	G2, G3, G4, G5	58.33	48	24	90	6	6	4	6	4													
LEE HILL	BX35	G1	93.83	48	35		6	6.5	4	6.5	4													
LEE HILL	BX35	G2, G3, G4,	89.22	48	35		6	6.5	4	6.5	4													
LEE HILL	BX35	G5	89.22	48	35		6	6.5	4	6.5	4													
LEE HILL	BX35	G6	89.22	48	35		6	6.5	4	6.5	4													

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							DLT	BMT		3/4/2016	

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ELEVATION

NOTES:

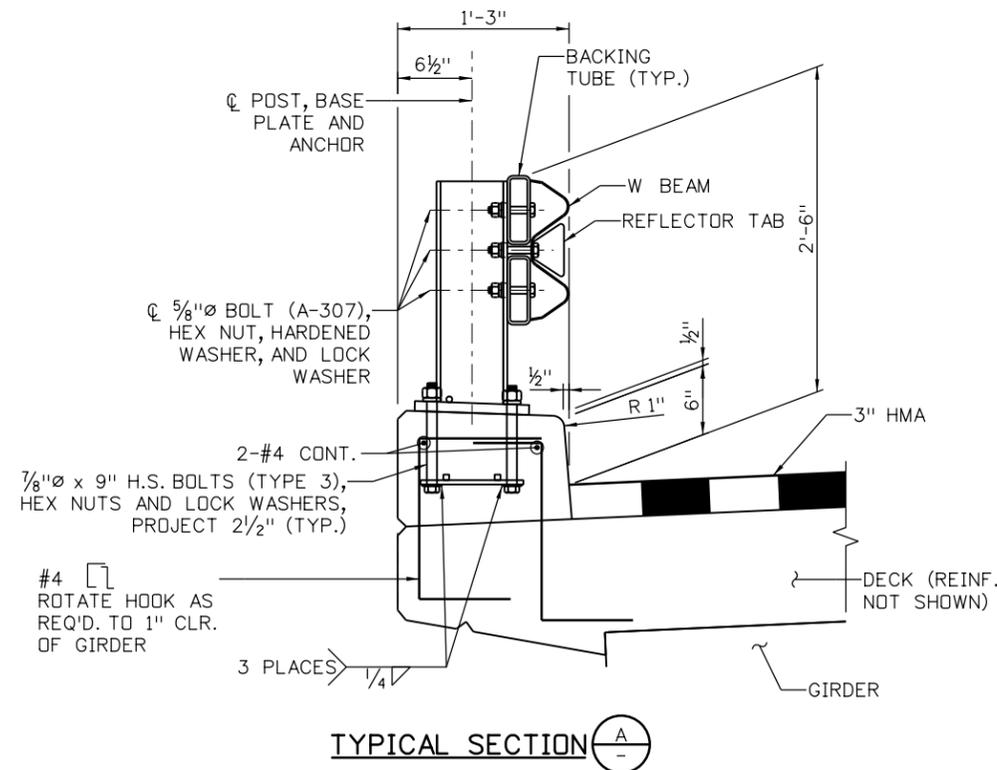
1. ALL TUBES SHALL BE FABRICATED FROM ASTM A-500 GRADE B STEEL. ALL POSTS, BASE PLATES, AND ANCHOR BOLTS SHALL BE FABRICATED FROM ASTM A-36 STEEL. ALL SPLICES AND EXPANSION DEVICES FOR TUBES SHALL BE FABRICATED FROM ASTM A-572, GRADE 50 STEEL. THE ABOVE MATERIAL, W-BEAM, AND ALL ANCHOR BOLTS AND MISCELLANEOUS BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED AND POWDER COATED AFTER FABRICATION IN ACCORDANCE WITH SECTION 509 AND 606. CONCRETE, REINFORCING STEEL, AND STRUCTURAL STEEL ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF SECTIONS 601, 602, AND 509 RESPECTIVELY.

STRUCTURAL STEEL:
 AASHTO M 183 (ASTM A 36) $f_y = 36,000$ psi
 ASTM A 223 (ASTM A 572) GRADE 50 $f_y = 50,000$ psi
 COLD FORMED ASTM A 500 GRADE B $f_y = 46,000$ psi

- POST ANCHORS, ENCASED IN CONCRETE, SHALL BE ASTM A36 STEEL, AND NEED NOT BE GALVANIZED.
- POSTS, POST ANCHORS, BASE PLATES, ANCHOR BOLTS, MISCELLANEOUS BOLTS, NUTS, WASHERS, TUBES, TUBE EXPANSION DEVICES, TUBE SPLICES, END PLATES, W-BEAM, W-BEAM EXPANSION DEVICES, CURB CONCRETE (CLASS D), AND CURB REINFORCING STEEL SHALL BE INCLUDED IN ITEM NO. 606 BRIDGE RAIL TYPE 3.
- THE BACKING TUBES SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVE WHEN THE RADIUS IS LESS THAN 1,500 FEET.
- TUBES SHALL BE CONTINUOUS OVER NO LESS THAN TWO POSTS. NO WELDED BUTT SPLICES WILL BE ALLOWED IN THE TUBE SECTIONS.
- POSTS SHALL BE PERPENDICULAR TO THE LONGITUDINAL ROADWAY GRADE.
- CONTRACTOR SHALL PROVIDE TERMINAL SECTION (FLARED) WHEN NO APPROACH GUARDRAIL IS USED WITH THE COST INCLUDED IN ITEM NO. 606 BRIDGE RAIL TYPE 3.
- FOR ADDITIONAL DETAILS, SEE CDDT STANDARD PLAN NO. M-606-1.
- PRIOR TO FABRICATION OF THIS ITEM, THREE SETS OF WORKING DRAWINGS WHICH COMPLY WITH THE REQUIREMENTS OF SECTION 105 SHALL BE SUBMITTED TO THE ENGINEER FOR INFORMATION ONLY.
- TERMINAL AND TRANSITION INCLUDED WITH ROADWAY QUANTITIES.

INFORMATION ONLY

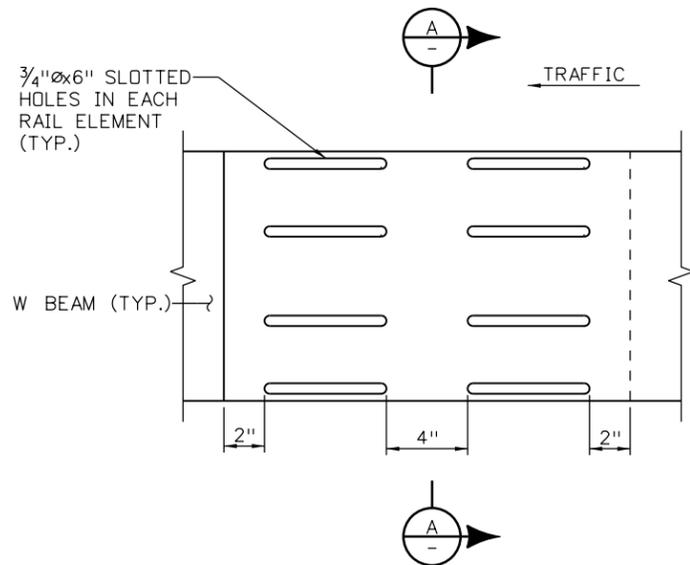
DESCRIPTION	UNIT	PER LIN. FT.
STRUCTURAL STEEL	LB.	45.4
CONCRETE CLASS D	CU. YD.	0.04
REINFORCING STEEL	LB.	4.8
BRIDGE RAIL TYPE 3 - W BEAM	LIN. FT.	1.0



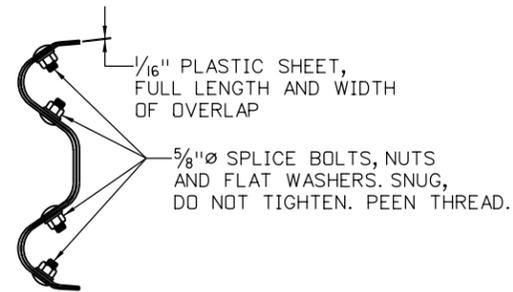
TYPICAL SECTION A-A

60% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	WAGONWHEEL GAP ROAD BRIDGES BRIDGE RAIL TYPE 3 (1 OF 2) PROJECT NO: 4043.SEPT12C34 SHEET NO: 86
							DLT	BMT		3/4/2016	

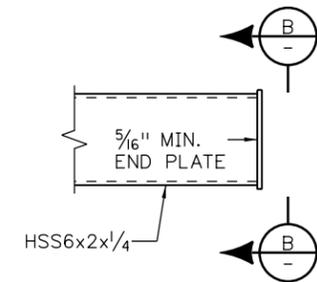
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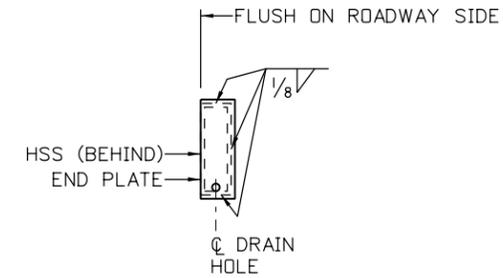
W-BEAM EXPANSION DEVICE DETAIL (1/B20)
SPLICE BOLTS NOT SHOWN



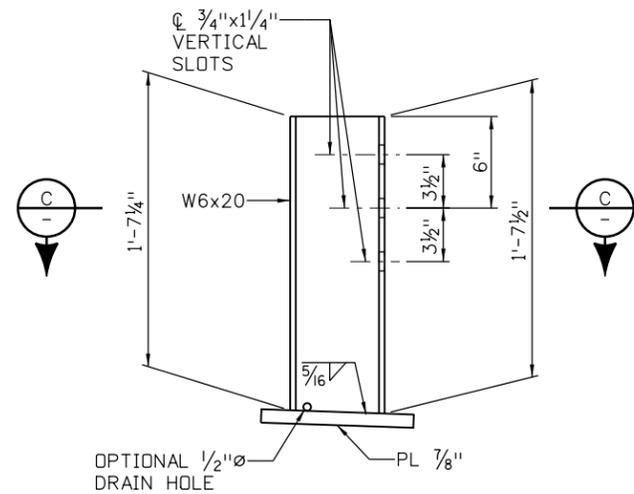
SECTION A



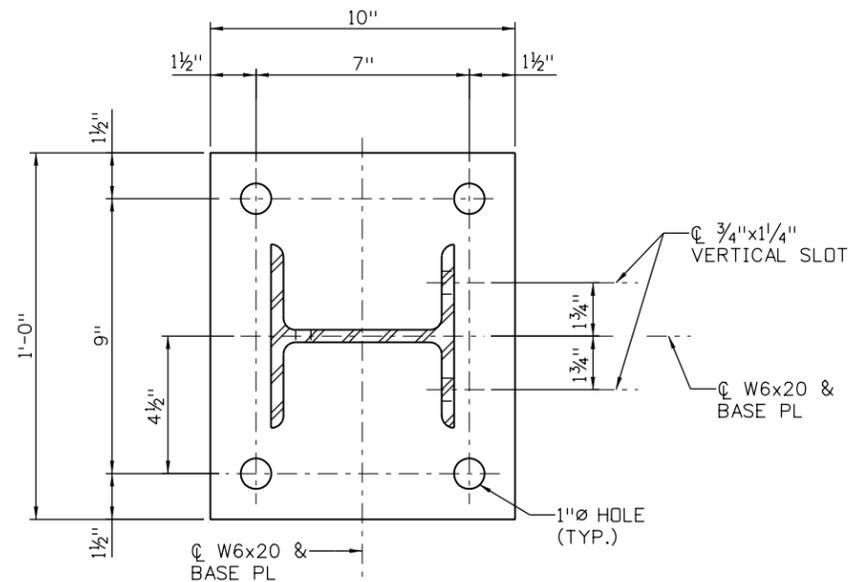
BACKING TUBE DETAIL



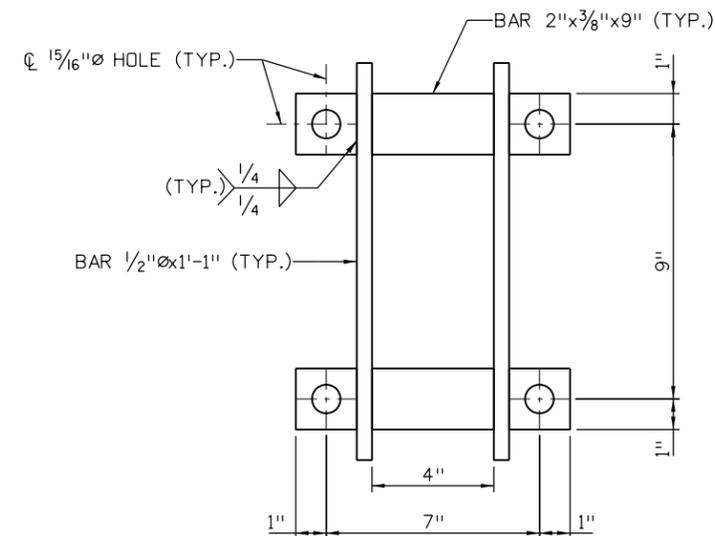
VIEW B



POST DETAIL



SECTION C



ANCHOR DETAIL

60% SET



CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

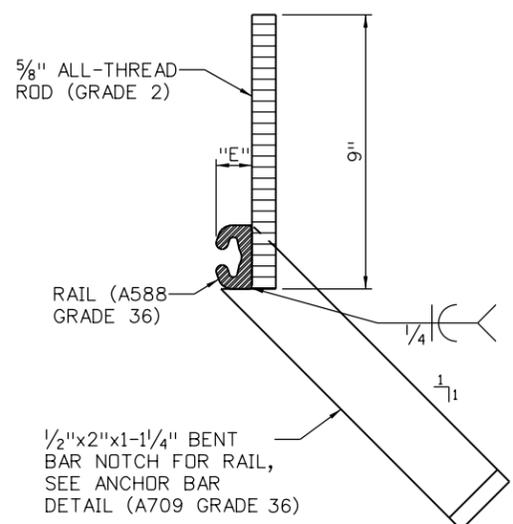
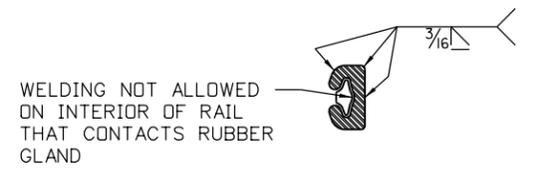
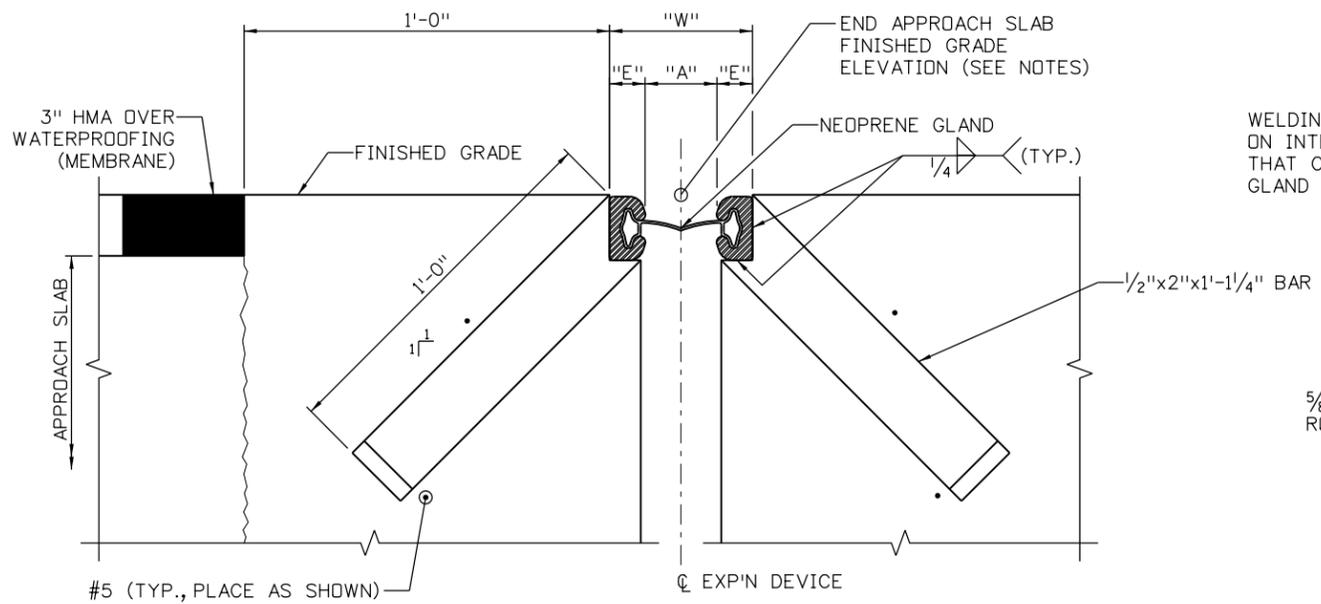


BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED: DLT	CAD: BMT	CHECKED:	DATE: 3/4/2016
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WAGONWHEEL GAP ROAD BRIDGES
BRIDGE RAIL TYPE 3
(2 OF 2)
PROJECT NO: 4043.SEPT12C34 SHEET NO: 87

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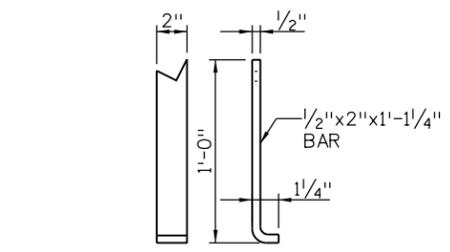
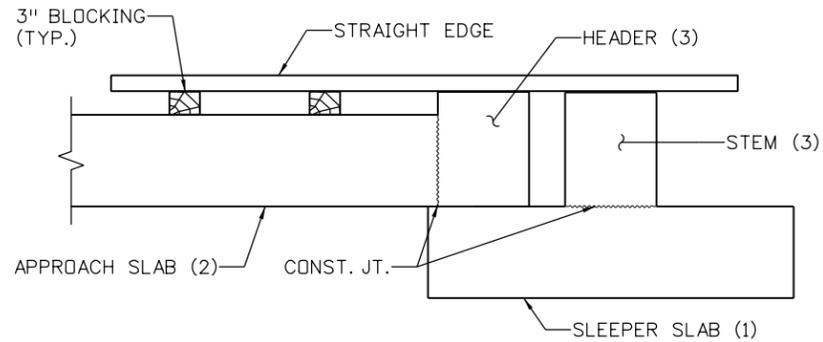


NOTES:

1. THE EXPANSION DEVICE SHALL BE INSTALLED ON GRADE, PARALLEL TO THE SLOPE AND GRADE OF THE DECK.
2. AFTER THE CONCRETE HAS ATTAINED INITIAL SET, THE ATTACHMENTS USED TO HOLD THE EXPANSION DEVICE ASSEMBLY IN IT'S PROPER POSITION SHALL BE REMOVED.
3. DO NOT PAINT STEEL SURFACES IN CONTACT WITH EITHER CONCRETE OR SEAL.
4. "W" AND "E" DIMENSIONS ARE DEPENDENT UPON THE PARTICULAR EXPANSION DEVICE SUPPLIED, AND SHALL BE SHOWN ON THE WORKING DRAWINGS.
6. SEE TABLE FOR DIMENSIONS "A" AND "W"; INTERPOLATE AS NEEDED. DO NOT INSTALL THE GLAND UNTIL DIMENSION "A" HAS OPENED UP TO AT LEAST 1/2". USE SECTION 518.10 (b) IN THE STANDARD SPECIFICATIONS TO DETERMINE THE STRUCTURE TEMPERATURE.
7. THE NEOPRENE GLAND SHALL BE INSTALLED IN ONE PIECE IN ACCORDANCE WITH SECTION 518 OF THE STANDARD SPECIFICATIONS.
8. SEE SECTION 518 IN THE STANDARD SPECIFICATIONS FOR WATER TIGHT INTEGRITY TESTING REQUIREMENTS.
9. SET ELEVATIONS AT TOP OF HEADER AND SLEEPER STEM WITH THE GRADE PROJECTION SCHEME.
10. PROVIDE EXPANSION DEVICE SUPPORT AS SHOWN AT 6'-0" INTERVALS.
11. FOR APPROACH AND SLEEPER SLAB REINFORCING SEE APPROACH SLAB DETAILS.

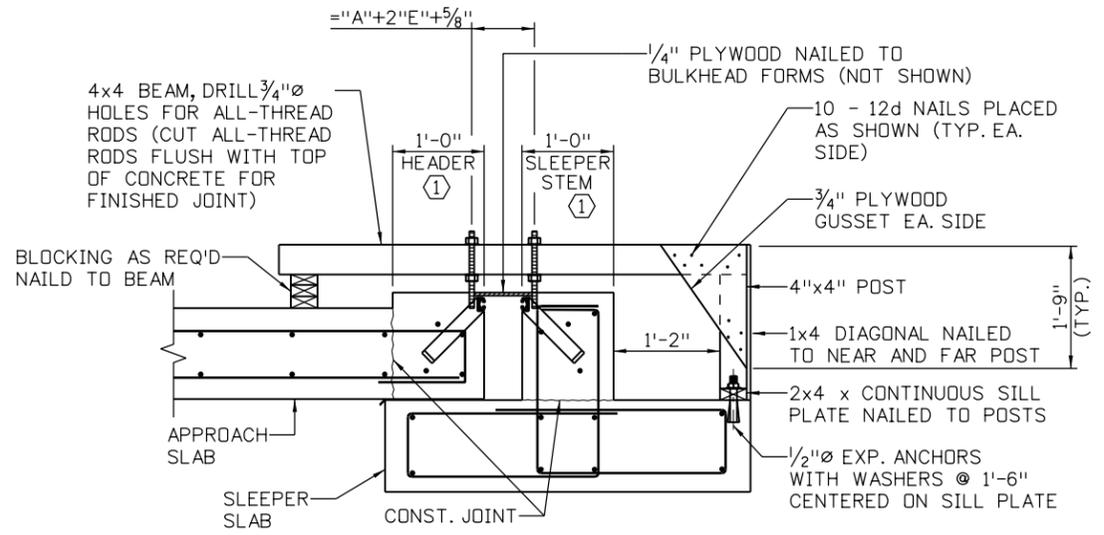
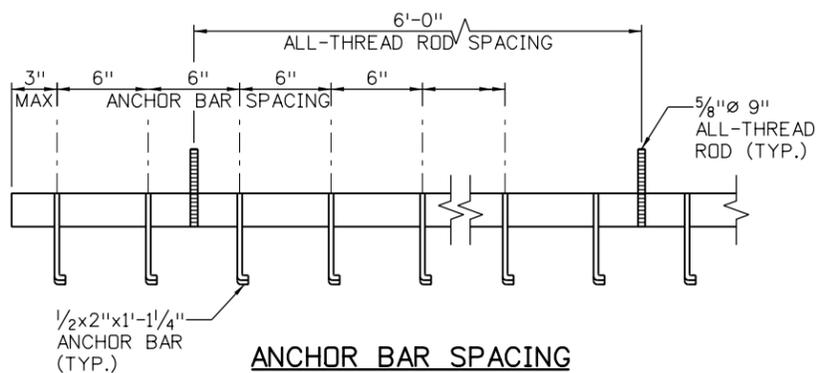
KEYNOTES:

- ① CONCRETE SHALL BE PLACED AFTER EXPANSION DEVICE HAS BEEN ADJUSTED TO PROPER GRADE AND APPROVED BY THE ENGINEER USING THE GRADE PROJECTION SCHEME



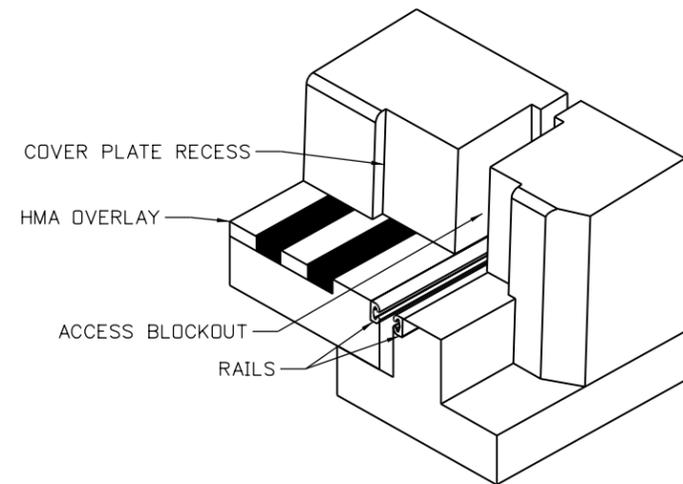
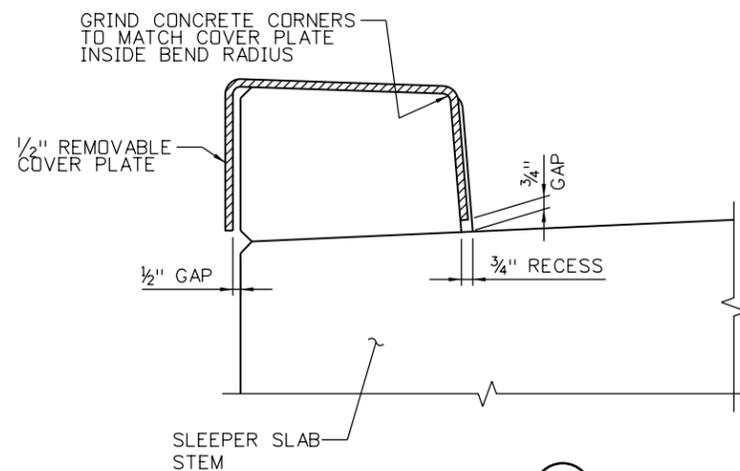
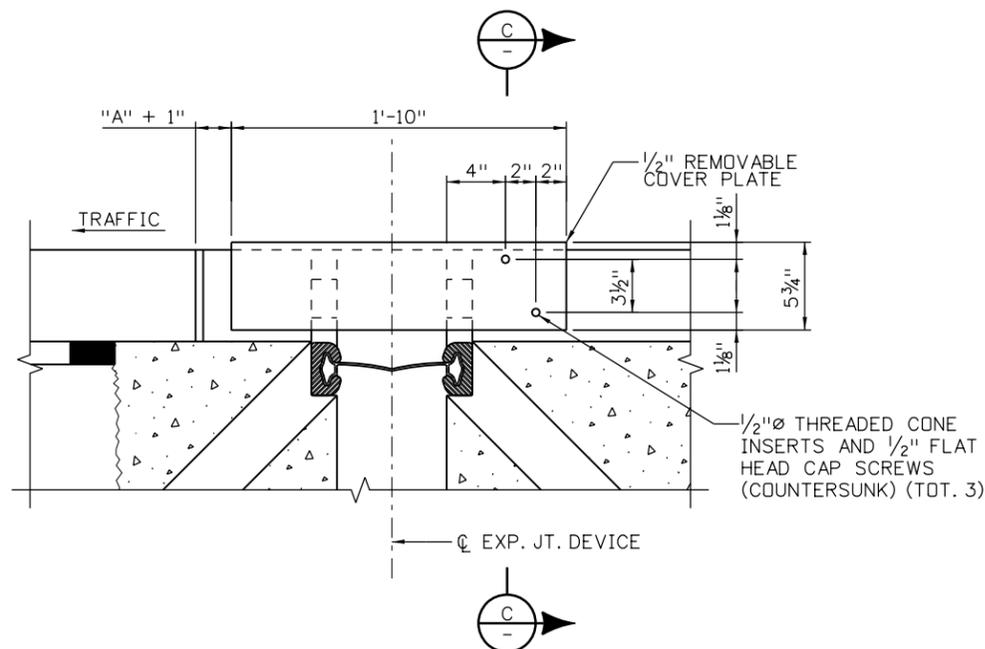
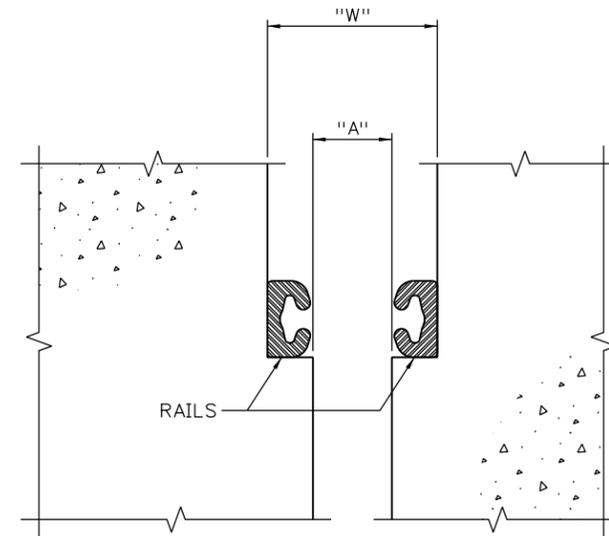
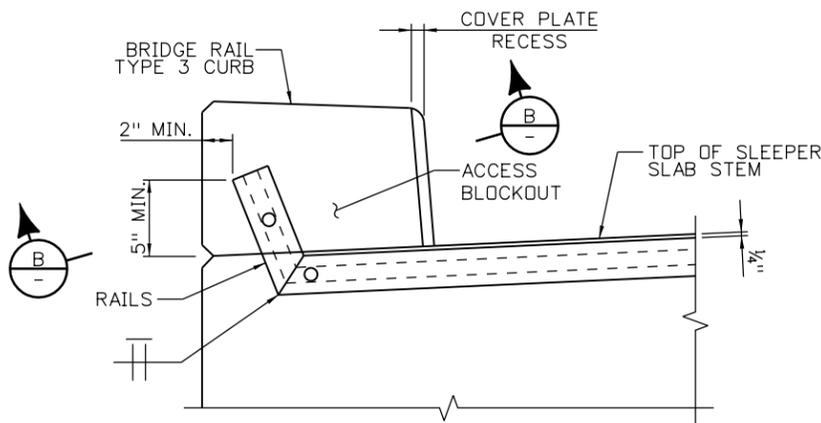
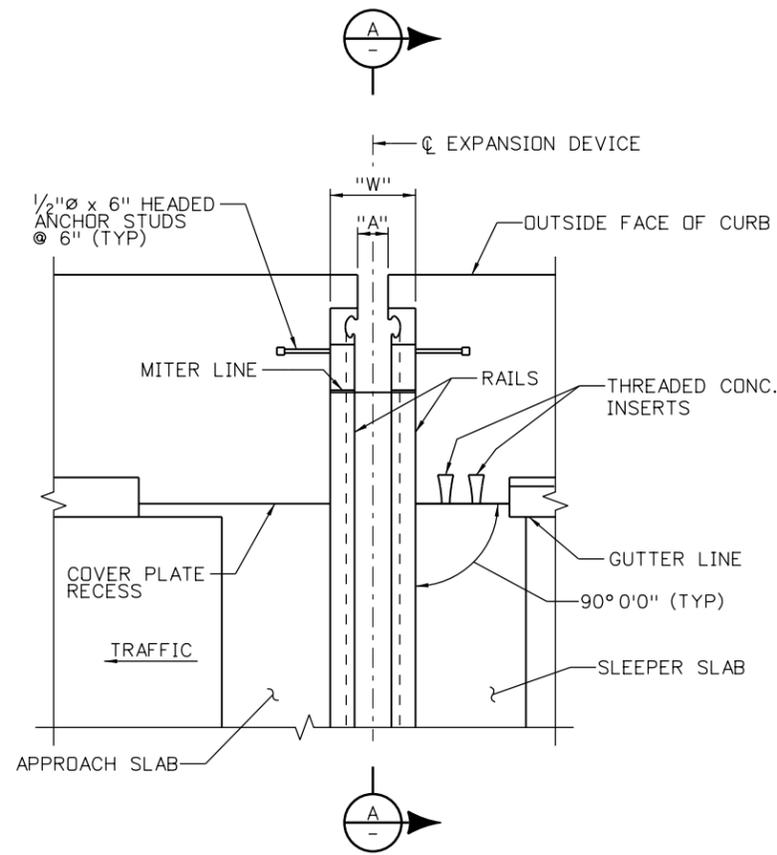
STR. TEMP	"A" (INCH)	"W" (INCH)
-30°F	2 3/4	5 7/8
0°F	2 3/16	6 5/16
30°F	1 15/16	5 1/16
60°F	1 3/4	4 7/8
90°F	1 9/16	4 11/16
120°F	1 5/16	4 1/16

*For E = 1 1/4" (Min.)



60% SET		CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES		NO.	DATE	REVISION DESCRIPTION:		BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION				WAGONWHEEL GAP ROAD BRIDGES EXPANSION DEVICE (0-4 INCH) (1 OF 2)	
		DESIGNED:	CAD:	CHECKED:	DATE:	Michael Baker INTERNATIONAL		DLT	BMT	3/4/2016	PROJECT NO: 4043.SEPT12C34	SHEET NO: 88	

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811
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NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
 Michael Baker INTERNATIONAL
 DESIGNED: DLT CAD: BMT CHECKED: DATE: 3/4/2016

WAGONWHEEL GAP ROAD BRIDGES
EXPANSION DEVICE (0-4 INCH)
 (2 OF 2)
 PROJECT NO: 4043.SEP12C34 SHEET NO: 89