

evaughtn 6/15/26 PM 5/3/2016 p:\VDCPW\APP1\BKR\mbakercorp.com\pmp\ood\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\104\08\_Sheet\_L\_Files\06\_Structures\DWG\Walls\138200\_WALL\_01.dgn

**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.

ALL WORK IN AND AROUND CREEKS, DITCHES, OR IRRIGATION CANALS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 107 AND 108 OF THE PROJECT SPECIFICATIONS. REFER TO THESE SECTIONS FOR CONTROL OF WATER AND CONSTRUCTION LIMITATIONS.

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

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.

ALL LONGITUDINAL AND TRANSVERSE DIMENSIONS ARE MEASURED HORIZONTALLY AND DO NOT INCLUDE ANY CORRECTIONS FOR GRADE.

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-206-1.

ALL ACRONYMS AND ABBREVIATIONS ARE CONSISTENT WITH CDOT STANDARD PLAN NO. M-100-2, UNLESS NOTED OTHERWISE.

FOR ROADWAY GEOMETRICS, REMOVALS, UTILITY INFORMATION, AND SIGN DETAILS, REFER TO ROADWAY PLANS.

FOR FINISHED GRADING REFER TO DRAINAGE PLANS.

GEOTECHNICAL INFORMATION AND RECOMMENDATIONS CAN BE FOUND IN THE DRAFT FINAL GEOTECHNICAL INVESTIGATION REPORT, 1602 GOLD RUN TO SALINA JUNCTION, BOULDER, COLORADO, DATED APRIL 12, 2016.

**REINFORCED CONCRETE NOTES**

A CUT STONE VENEER FINISH WILL BE REQUIRED, AS SHOWN ON THE PLANS, ON EXPOSED CONCRETE SURFACES. THESE FINISHES ARE TO BE SELECTED FROM TEST PANELS PROVIDED BY THE CONTRACTOR.

THE FINAL FINISH FOR THE 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.

EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 INCH, UNLESS NOTED OTHERWISE.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

ANY CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS MAY BE CONSTRUCTED ONLY IF APPROVED IN WRITING BY THE ENGINEER.

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

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

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED. (N) DENOTES NON-COATED REINFORCING.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER OR LESS THAN 3" OF LATERAL COVER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS B OR D CONCRETE	1'-3"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"

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

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR NON-COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER OR LESS THAN 3" OF LATERAL COVER.

BAR SIZE	#4 (N)	#5 (N)	#6 (N)	#7 (N)	#8 (N)	#9 (N)	#10 (N)	#11 (N)
SPLICE LENGTH FOR CLASS B OR D CONCRETE	1'-1"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

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

**INDEX OF DRAWINGS**

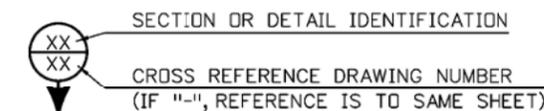
112	GENERAL INFORMATION
113-115	GENERAL LAYOUT RETAINING WALL 1
116-117	GENERAL LAYOUT RETAINING WALL 2
118-119	GENERAL LAYOUT RETAINING WALL 3
120-121	GENERAL LAYOUT RETAINING WALL 4
122-123	GENERAL LAYOUT RETAINING WALL 5
124-126	GENERAL LAYOUT RETAINING WALL 6
127-128	GENERAL LAYOUT RETAINING WALL 7
129-130	GENERAL LAYOUT RETAINING WALL 8
131	CUT STONE VENEER DETAILS
132-134	SOLDIER PILE WALL DETAILS
135	SOLDIER PILE WALL EXCAVATION AND BACKFILL
136	SOIL NAIL WALL EXCAVATION AND BACKFILL
137	PEDESTRIAN RAILING (STEEL) (SPECIAL) DETAILS

**RETAINING WALL DESCRIPTIONS**

- RETAINING WALL 1:  
ANCHORED WALL (GROUND NAIL WALL)  
WAGONWHEEL GAP ROAD LT.
- RETAINING WALL 2:  
ANCHORED WALL (GROUND NAIL WALL)  
WAGONWHEEL GAP ROAD LT.
- RETAINING WALL 3:  
ANCHORED WALL (GROUND NAIL WALL)  
WAGONWHEEL GAP ROAD LT.
- RETAINING WALL 4:  
ANCHORED WALL (GROUND NAIL WALL)  
WAGONWHEEL GAP ROAD LT.
- RETAINING WALL 5:  
CANTILEVER NON-GRAVITY WALL (SOLDIER PILE WALL)  
WAGONWHEEL GAP ROAD RT.
- RETAINING WALL 6:  
ANCHORED WALL (GROUND NAIL WALL)  
WAGONWHEEL GAP ROAD LT.
- RETAINING WALL 7:  
ANCHORED WALL (GROUND NAIL WALL)  
WAGONWHEEL GAP ROAD RT.
- RETAINING WALL 8:  
CANTILEVER NON-GRAVITY WALL (SOLDIER PILE WALL)  
WAGONWHEEL GAP ROAD LT.

**SUMMARY OF APPROXIMATE QUANTITIES**

ITEM	DESCRIPTION	UNIT	RETAINING WALL 1	RETAINING WALL 2	RETAINING WALL 3	RETAINING WALL 4	RETAINING WALL 5	RETAINING WALL 6	RETAINING WALL 7	RETAINING WALL 8	TOTALS
206	STRUCTURE EXCAVATION	CY	65	8	33		3	135	53	36	333
206	STRUCTURE BACKFILL (CLASS 2)	CY	24	4	10	4	6	22	12	13	95
503	DRILLED CAISSON (24 INCH)	LF					93	221	196	405	916
504	GROUND NAIL (15 FOOT)	EA	84	9	47	6		168	42		356
502	STRUCTURAL STEEL	LB					7,385	17,178	14,874	32,309	71,746
601	CONCRETE CLASS D (WALL)	CY					7.7	18.2	15.9	45.6	87.4
601	CUT STONE VENEER	SF	2,261	283	1,267	175	397	4,819	1,836	2,244	13,283
602	REINFORCING STEEL	LB	9,007	1,050	4,691	648		14,755	4,076		34,227
602	REINFORCING STEEL (EPOXY COATED)	LB					1,150	2,727	2,380	6,833	13,090
641	SHOTCRETE	SY	270	32	141	20		443	122		1,027



<b>90% SET</b>	 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:	 <b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b>	 <b>Michael Baker INTERNATIONAL</b>	DESIGNED:	CAD:	CHECKED:	DATE:	<b>WAGONWHEEL GAP ROAD</b> <b>GENERAL INFORMATION</b>	PROJECT NO: 4043.SEP12C34	SHEET NO: 86
							DLT	BMT	5/3/2016				

**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.

ALL WORK IN AND AROUND CREEKS, DITCHES, OR IRRIGATION CANALS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 107 AND 108 OF THE PROJECT SPECIFICATIONS. REFER TO THESE SECTIONS FOR CONTROL OF WATER AND CONSTRUCTION LIMITATIONS.

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

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.

ALL LONGITUDINAL AND TRANSVERSE DIMENSIONS ARE MEASURED HORIZONTALLY AND DO NOT INCLUDE ANY CORRECTIONS FOR GRADE.

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-206-1.

ALL ACRONYMS AND ABBREVIATIONS ARE CONSISTENT WITH CDOT STANDARD PLAN NO. M-100-2, UNLESS NOTED OTHERWISE.

FOR ROADWAY GEOMETRICS, REMOVALS, UTILITY INFORMATION, AND SIGN DETAILS, REFER TO ROADWAY PLANS.

FOR FINISHED GRADING REFER TO DRAINAGE PLANS.

GEOTECHNICAL INFORMATION AND RECOMMENDATIONS CAN BE FOUND IN THE DRAFT FINAL GEOTECHNICAL INVESTIGATION REPORT, 1602 GOLD RUN TO SALINA JUNCTION, BOULDER, COLORADO, DATED APRIL 12, 2016.

**REINFORCED CONCRETE NOTES**

A CUT STONE VENEER FINISH WILL BE REQUIRED, AS SHOWN ON THE PLANS, ON EXPOSED CONCRETE SURFACES. THESE FINISHES ARE TO BE SELECTED FROM TEST PANELS PROVIDED BY THE CONTRACTOR.

THE FINAL FINISH FOR THE 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.

EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 INCH, UNLESS NOTED OTHERWISE.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

ANY CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS MAY BE CONSTRUCTED ONLY IF APPROVED IN WRITING BY THE ENGINEER.

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

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

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.  $\text{\textcircled{N}}$  DENOTES NON-COATED REINFORCING.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER OR LESS THAN 3" OF LATERAL COVER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS B OR D CONCRETE	1'-3"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"

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

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR NON-COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER OR LESS THAN 3" OF LATERAL COVER.

BAR SIZE	#4 $\text{\textcircled{N}}$	#5 $\text{\textcircled{N}}$	#6 $\text{\textcircled{N}}$	#7 $\text{\textcircled{N}}$	#8 $\text{\textcircled{N}}$	#9 $\text{\textcircled{N}}$	#10 $\text{\textcircled{N}}$	#11 $\text{\textcircled{N}}$
SPLICE LENGTH FOR CLASS B OR D CONCRETE	1'-1"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

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

**INDEX OF DRAWINGS**

WAGONWHEEL GAP ROAD BRIDGES  
83-84 GENERAL INFORMATION

BOW MOUNTAIN BRIDGE  
85-86 GENERAL LAYOUT  
87-88 BRIDGE HYDRAULIC INFORMATION  
89 CONSTRUCTION LAYOUT  
90 SUPERSTRUCTURE DETAILS  
91 APPROACH SLAB DETAILS

WAGONWHEEL GAP BRIDGE  
92-93 GENERAL LAYOUT  
94-95 BRIDGE HYDRAULIC INFORMATION  
96 CONSTRUCTION LAYOUT  
97 CONSTRUCTION PHASINGPHASING  
98 SUPERSTRUCTURE DETAILS

LEE HILL APPROACH BRIDGE  
99-100 GENERAL LAYOUT  
101-102 BRIDGE HYDRAULIC INFORMATION  
103 CONSTRUCTION LAYOUT  
104 APPROACH SLAB DETAILS

WAGONWHEEL GAP ROAD BRIDGES  
105 WINGWALL DETAILS  
106-107 PRESTRESSED CONCRETE BOX  
108-109 BRIDGE RAIL TYPE 3  
110-111 EXPANSION DEVICE (0-4 INCH)

**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<sup>3/8</sup>") 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



SECTION OR DETAIL IDENTIFICATION

CROSS REFERENCE DRAWING NUMBER  
(IF "--", REFERENCE IS TO SAME SHEET)

<b>90% SET</b>	<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><b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b></p> <p><b>Michael Baker</b> <b>INTERNATIONAL</b></p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>WAGONWHEEL GAP ROAD BRIDGES <b>GENERAL INFORMATION</b> (1 OF 2)</p>
							DLT	BMT		5/3/2016	

brett.terrell 5:59:20 PM 5/3/2016 pm:\DCPW\APP1\lbr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDG\_01.dgn

brett.terrell 5:59:41 PM 5/3/2016 p:\DCPW\BPI\Bkr.mbakercorp.com\p\proj\Boulder\Boulder\County\_Emergency\_Transportation\104\08\_Sheet\_Files\06\_Structures\135200\_Bridges\135200\_BROG\_02.dgn

**SUMMARY OF QUANTITIES:**

ITEM	DESCRIPTION	UNIT	BOW MOUNTAIN BRIDGE	WAGONWHEEL GAP BRIDGE	LEE HILL APPROACH BRIDGE	TOTALS
206	STRUCTURE EXCAVATION	CY	696	399	186	1,281
206	STRUCTURE BACKFILL (CLASS 1)	CY	542	627	314	1,483
206	MECHANICAL REINFORCEMENT OF SOIL	CY	535	621	310	1,466
206	SHORING (AREA 1)	LS	1			1
403	HOT MIX ASPHALT (GRADING SX) (75) (PG 58-28)	TN	179	199	153	531
502	STEEL PILING (HP 12x74)	LF	180	240	200	620
515	WATERPROOFING (MEMBRANE)	SY	174	300	230	704
601	CONCRETE CLASS D	CY	178.7	199.0	152.9	530.6
602	REINFORCING STEEL (EPOXY COATED)	LB	26,791	29,846	22,923	79,560
602	STRUCTURAL CONCRETE COATING	SF	1,675	2,601	2,266	6,542
602	STRUCTURAL CONCRETE COATING (ANTI-GRAFFITI)	SF	1,675	2,601	2,266	6,542
606	BRIDGE RAIL TYPE 3	LF	130	163	187	480
618	PRESTRESSED CONCRETE BOX (DEPTH LESS THAN 32 INCHES)	SF	1,012	1,604	1,342	3,958
621	TEMPORARY STREAM CROSSING	LS	1	1	1	3

**90% 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

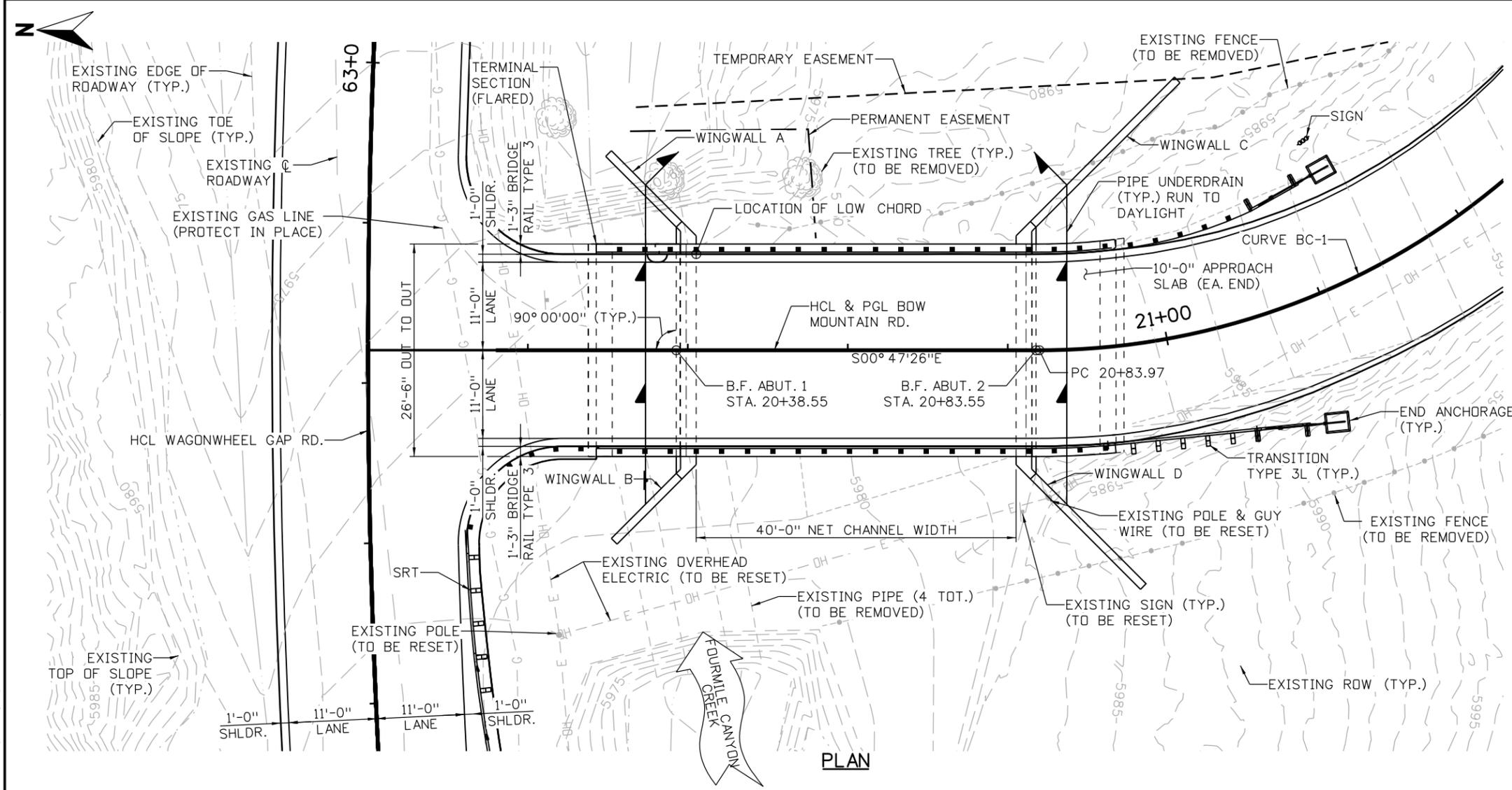
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



**BOULDER COUNTY TRANSPORTATION DEPARTMENT  
ENGINEERING DIVISION**  
  
 DESIGNED: **DLT** CAD: **BMT** CHECKED: DATE: **5/3/2016**

**WAGONWHEEL GAP ROAD BRIDGES  
GENERAL INFORMATION  
(2 OF 2)**  
 PROJECT NO: 4043.SEPT12C34 SHEET NO: **88**

brett.terrell 6/03/2016 PM 5:31:2016 pm:\DCPW\APP1\lbr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\_County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDG\_03.dgn



**NOTES:**

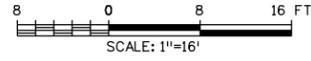
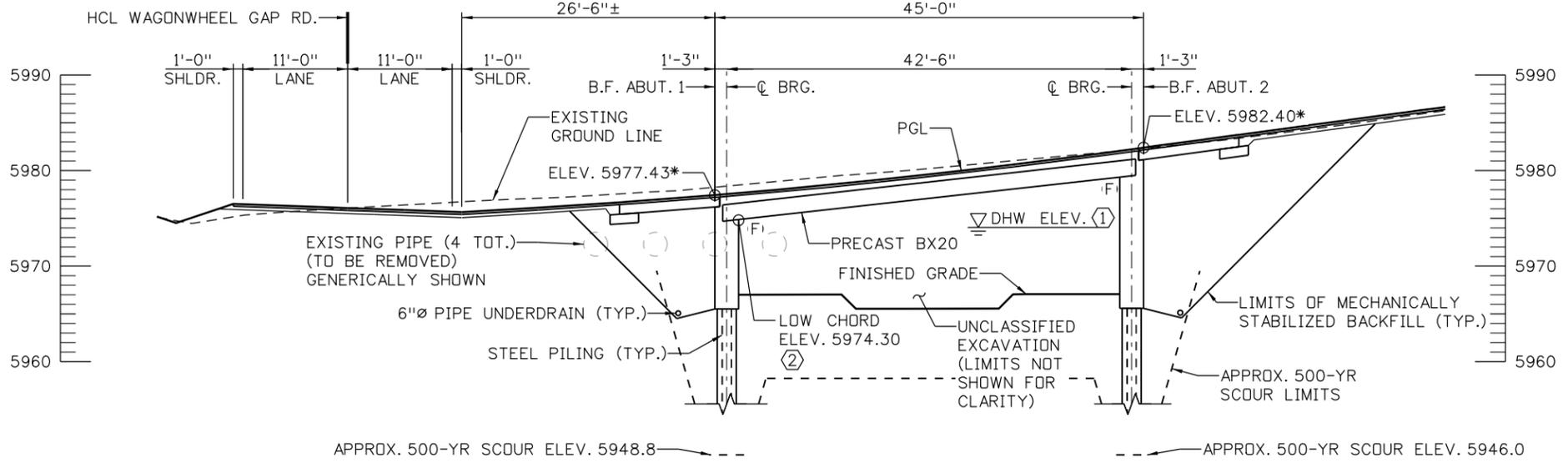
- FOR GUARDRAIL DETAILS REFER TO ROADWAY PLANS.
- SHORING MAY BE NECESSARY TO FACILITATE A CONSTRUCTION WORK ZONE AND SHALL BE BORNE BY THE CONTRACTOR.
- CREEK RESTORATION DETAILS HAVE NOT BEEN DETERMINED AT THIS TIME.
- BOW MOUNTAIN ROAD SHALL BE CLOSED FOR BRIDGE CONSTRUCTION.

**KEYNOTES:**

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

**CURVE BC-1 DATA:**

Δ = 52° 40' 49" LT.  
 R = 90.00'  
 L = 82.75'  
 T = 44.56'  
 PI 21+28.53  
 N 265420.20  
 E 52272.00



90% 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

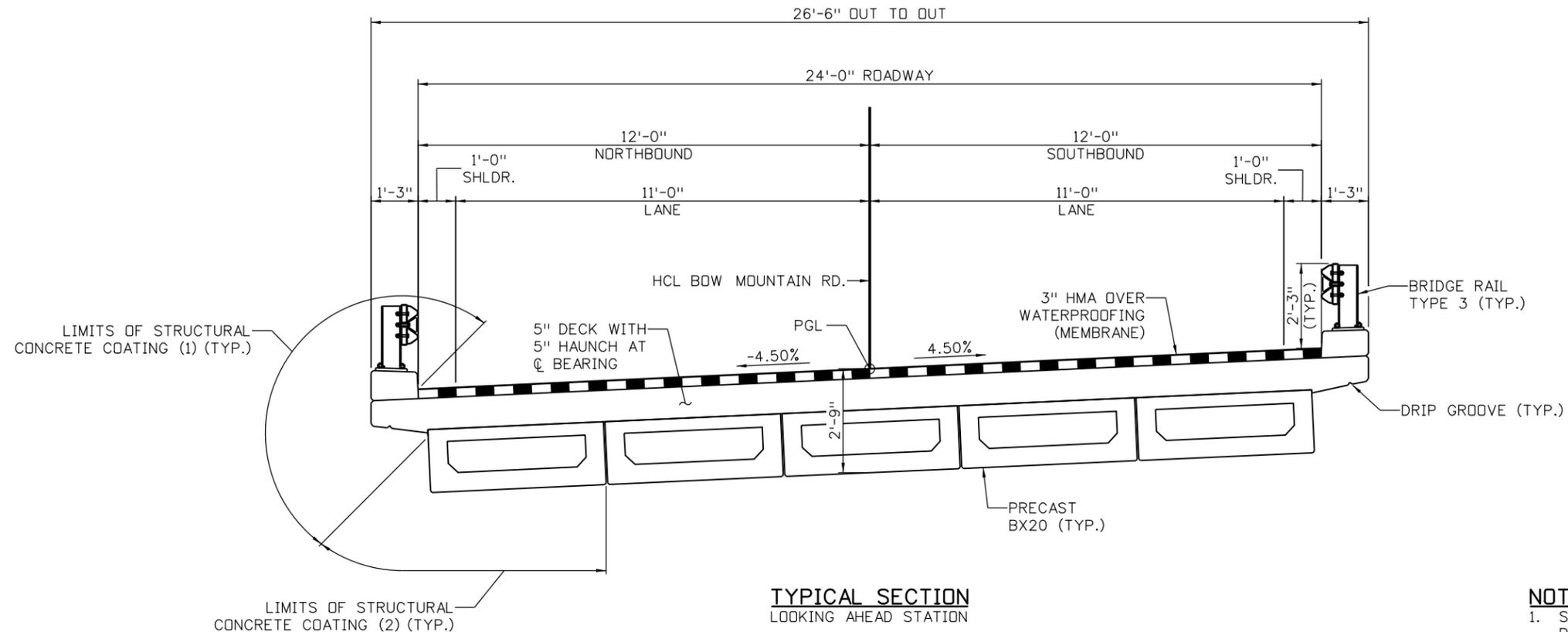
NO.	DATE	REVISION DESCRIPTION:



**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
 Michael Baker INTERNATIONAL  
 DESIGNED: DLT CAD: BMT CHECKED: DATE: 5/3/2016

**BOW MOUNTAIN BRIDGE**  
**GENERAL LAYOUT**  
 (1 OF 2)  
 PROJECT NO: 4043.SEPT12C34 SHEET NO: 89

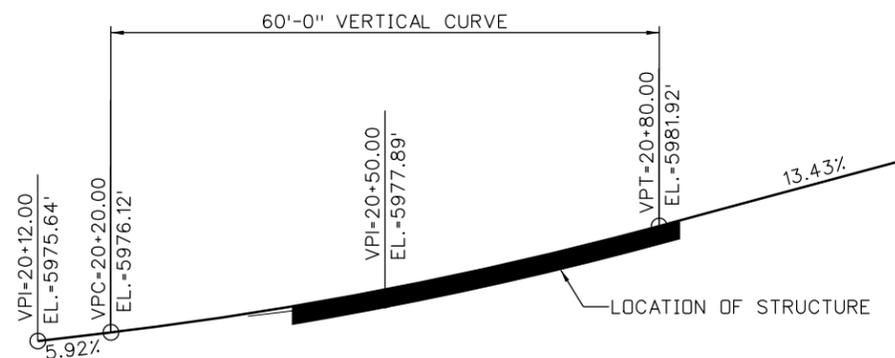
brett.terrell 6/02/2016 PM 5:3/2016 pm:\DCPW\APP1\lbr.mbakercorp.com\prowd\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\OGN Bridges\138200\_BRDC\_04.dgn



**TYPICAL SECTION**  
LOOKING AHEAD STATION

**NOTES:**

1. STRUCTURAL CONCRETE COATING (1) SHALL BE BROWN, EQUIVALENT TO FEDERAL STANDARD 595C COLOR NO. 20062.
2. STRUCTURAL CONCRETE COATING (2) SHALL BE GRAY, EQUIVALENT TO FEDERAL STANDARD 595C COLOR NO. 26044.
3. HMA SHALL BE GRADING SX (75) (PG 58-28).



**PROFILE GRADE**  
BOW MOUNTAIN ROAD



90% 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:

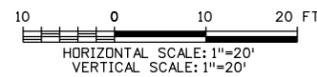
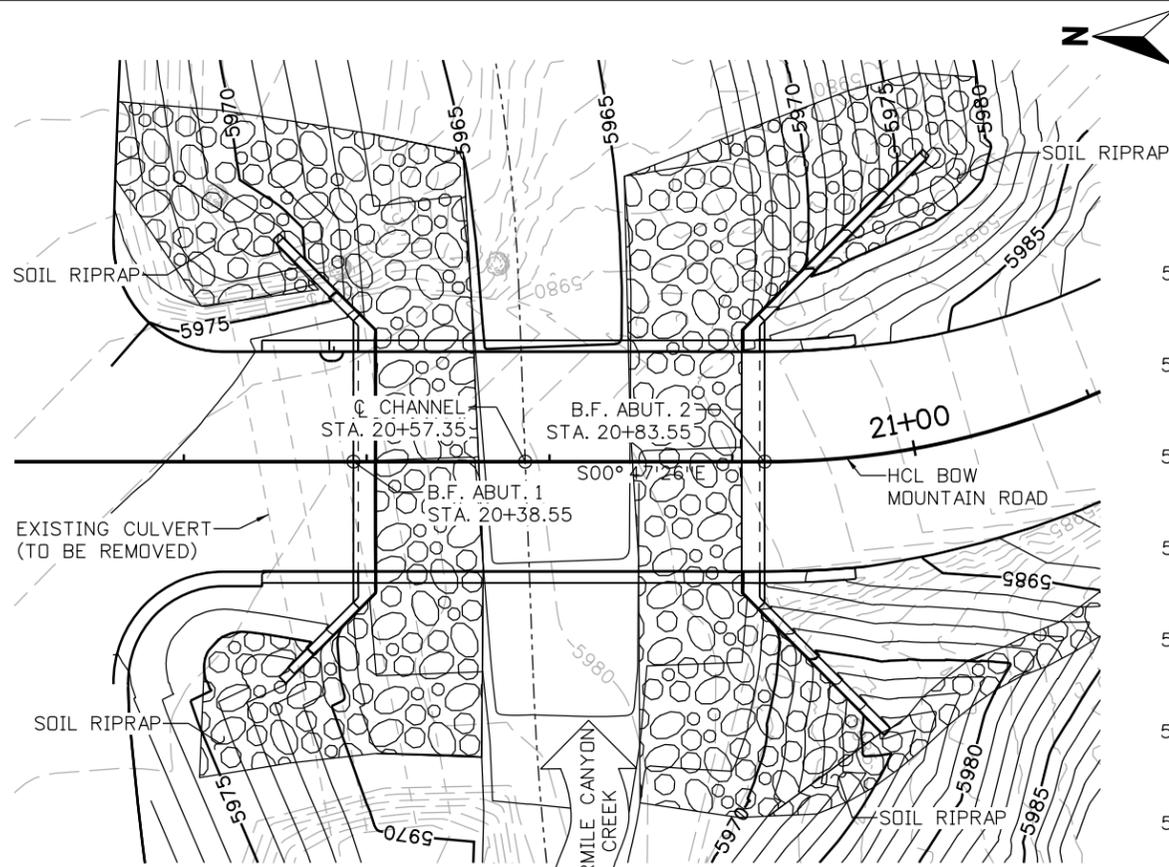


**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

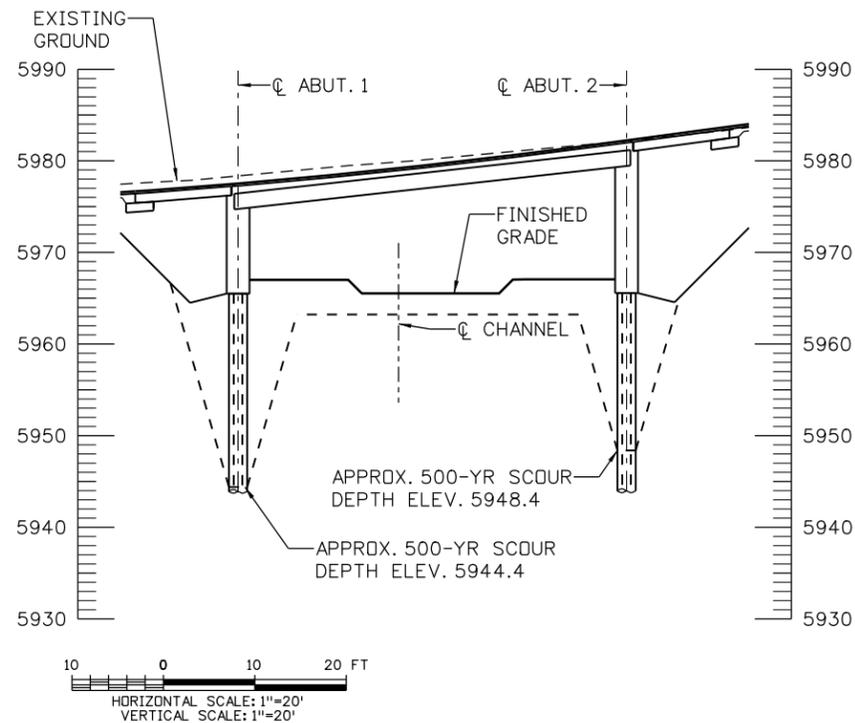
DESIGNED:	CAD:	CHECKED:	DATE:
DLT	BMT		5/3/2016

**BOW MOUNTAIN BRIDGE**  
**GENERAL LAYOUT**  
**(2 OF 2)**  
PROJECT NO: 4043.SEPT12C34 SHEET NO: 90

brett.terrell 6:00:57 PM 5/3/2016 p:\DCPW\APP1\lbr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDG\_06.0.dgn



**PROPOSED BRIDGE PLAN VIEW**



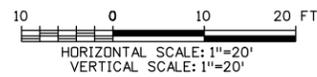
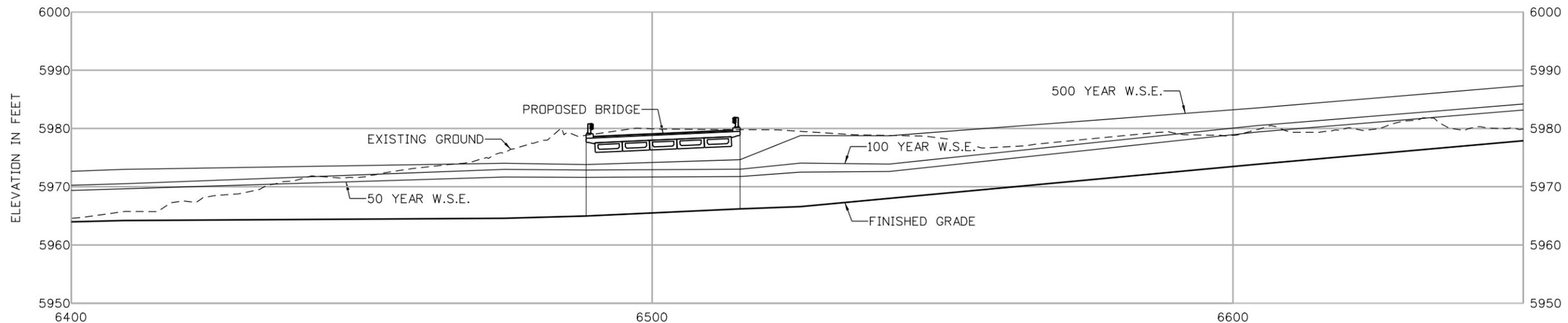
**PROPOSED BRIDGE SECTION VIEW**  
TAKEN ALONG HCL BOW MOUNTAIN ROAD

**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

**COMPARISON OF HYDRAULICS**

	VELOCITY	FREEBOARD	WSEL
EXISTING CULVERT	20.5 FT/S	N/A	5982.77
PROPOSED BRIDGE	7.0 FT/S	N/A	5974.05



**PROFILE OF WATER SURFACE**  
DISTANCE ALONG  $\varnothing$  CHANNEL IN FEET

90% 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:

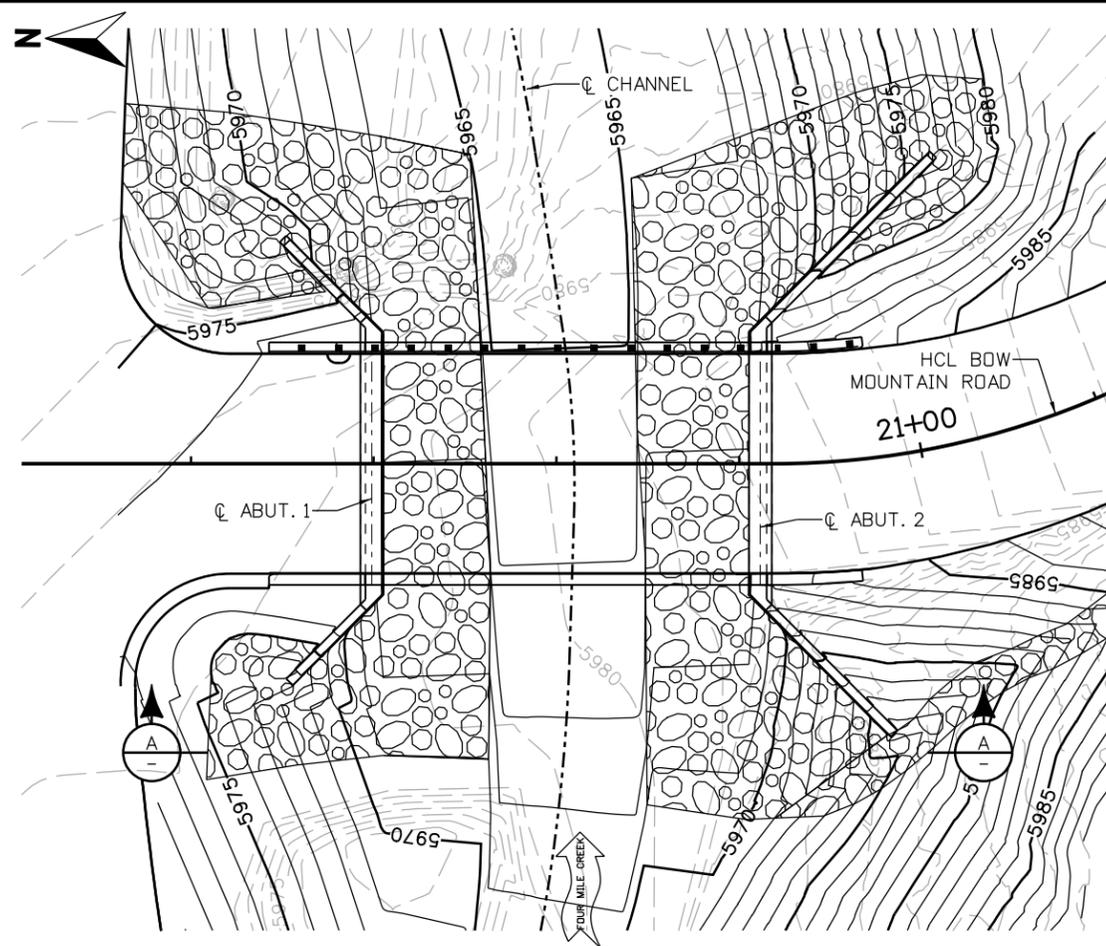


**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
 Michael Baker INTERNATIONAL  
 DESIGNED: CMM CAD: BMT CHECKED: DATE: 5/3/2016

**BOW MOUNTAIN BRIDGE**  
**BRIDGE HYDRAULIC**  
**INFORMATION (1 OF 2)**

PROJECT NO: 4043.SEPT12C34 SHEET NO: 91

brett.terrell 6/01/22 PM 5:37:2016 p:\VDCPW\BPT\BKR.mbakercorp.com\prow\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\06N\Bridges\135200\_BRDC\_06.dgn



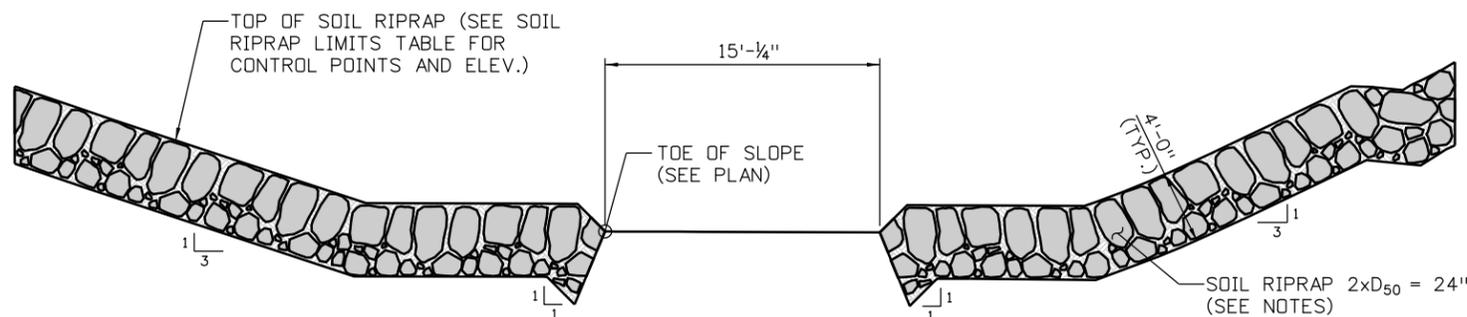
(24 INCH) RIPRAP LIMITS PLAN

RIPRAP (24 INCH) LIMITS TABLE			
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		

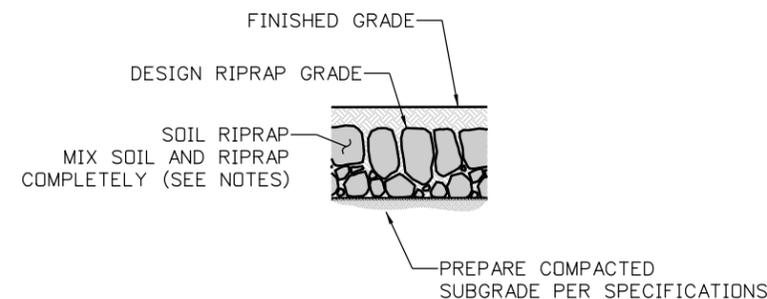
ALL ELEVATIONS REPRESENT TOP OF RIPRAP

**NOTES:**

1. SEE TABULATION OF DRAINAGE AND EROSION CONTROL QUANTITIES.
2. SEE FINAL SWMP PLANS FOR EROSION CONTROL BLANKET LOCATIONS.
3. MIX UNIFORMLY 65% RIPRAP BY VOLUME WITH 35% OF APPROVED SOIL BY VOLUME PRIOR TO PLACEMENT.
4. BENCH RIPRAP AS NECESSARY TO MATCH PROPOSED GRADE AND PLACE STONE-SOIL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE FINISHED GRADE.
6. FOR GRADING AND CONTOUR INFORMATION, SEE DITCH AND CHANNEL GRADING PLAN.



SECTION A



SOIL RIPRAP TYPICAL SECTION

90% 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

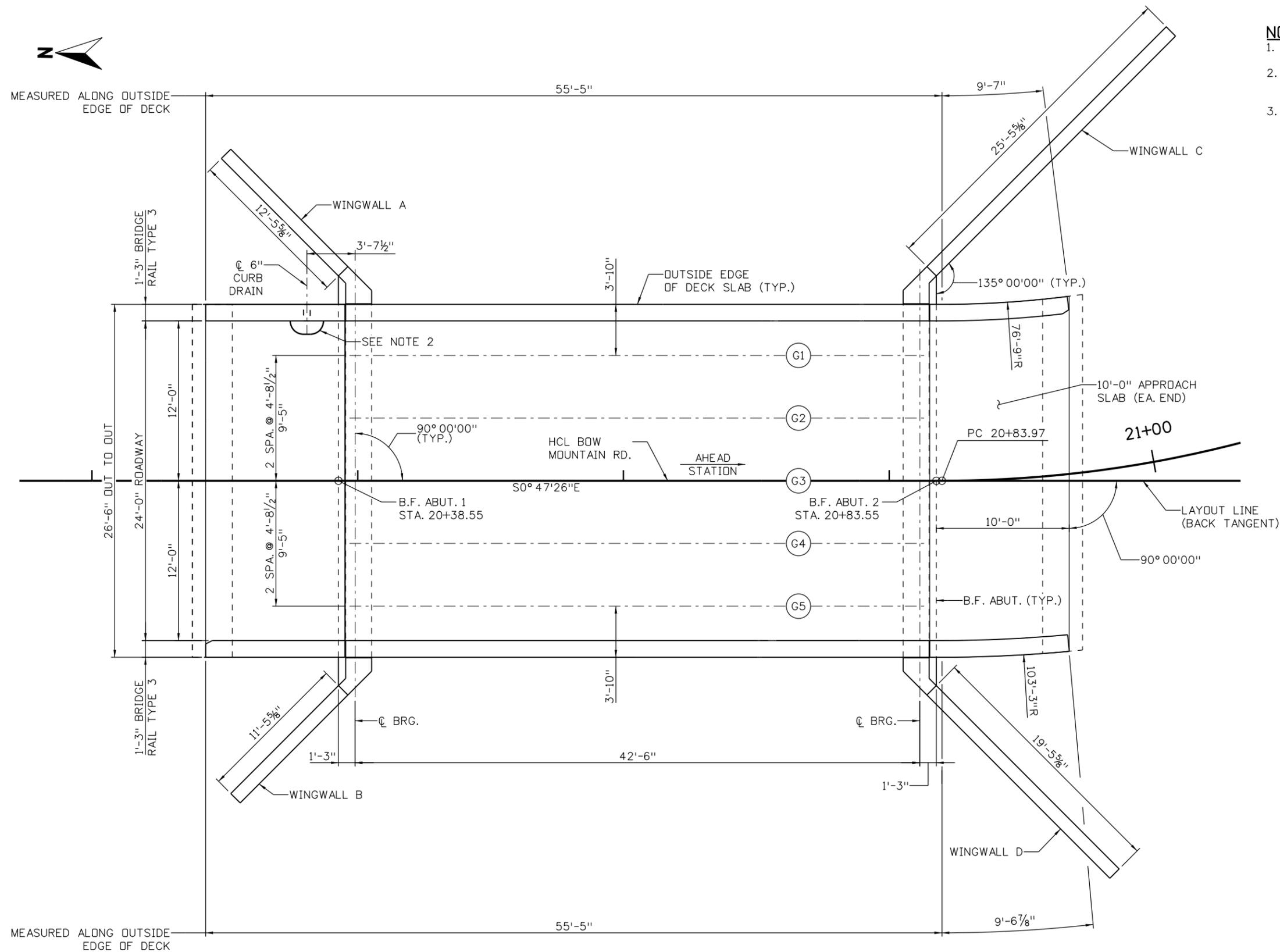
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
Michael Baker INTERNATIONAL  
DESIGNED: CMM CAD: BMT CHECKED: DATE: 5/3/2016

**BOW MOUNTAIN BRIDGE**  
**BRIDGE HYDRAULIC**  
**INFORMATION (2 OF 2)**  
PROJECT NO: 4043.SEPT12C34 SHEET NO: 92

brett.terrell 6/01/19 PM 5/3/2016 p:\VDCP\W\BPT\BKR.mbakercorp.com\prow\Documents\Projects\Lakewood\Office\Boulder\_County\_Emergency\_Transportation\T04\08\_Sheet\_L\_Files\06\_Structures\06N\Bridges\135200\_BR06\_07.dgn



**NOTES:**

- LAYOUT LINE IS TANGENT FROM PC 20+83.97.
- CUP ASPHALT 0" AT 1'-0" RADIUS TO TOP OF DECK AT CURB DRAIN.
- MOVE BRIDGE RAIL POST AND BEND REINFORCING TO CLEAR CURB DRAIN.



**PLAN**

**90% 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**

**Michael Baker INTERNATIONAL**

DESIGNED: **DLT** CAD: **BMT** CHECKED: DATE: **5/3/2016**

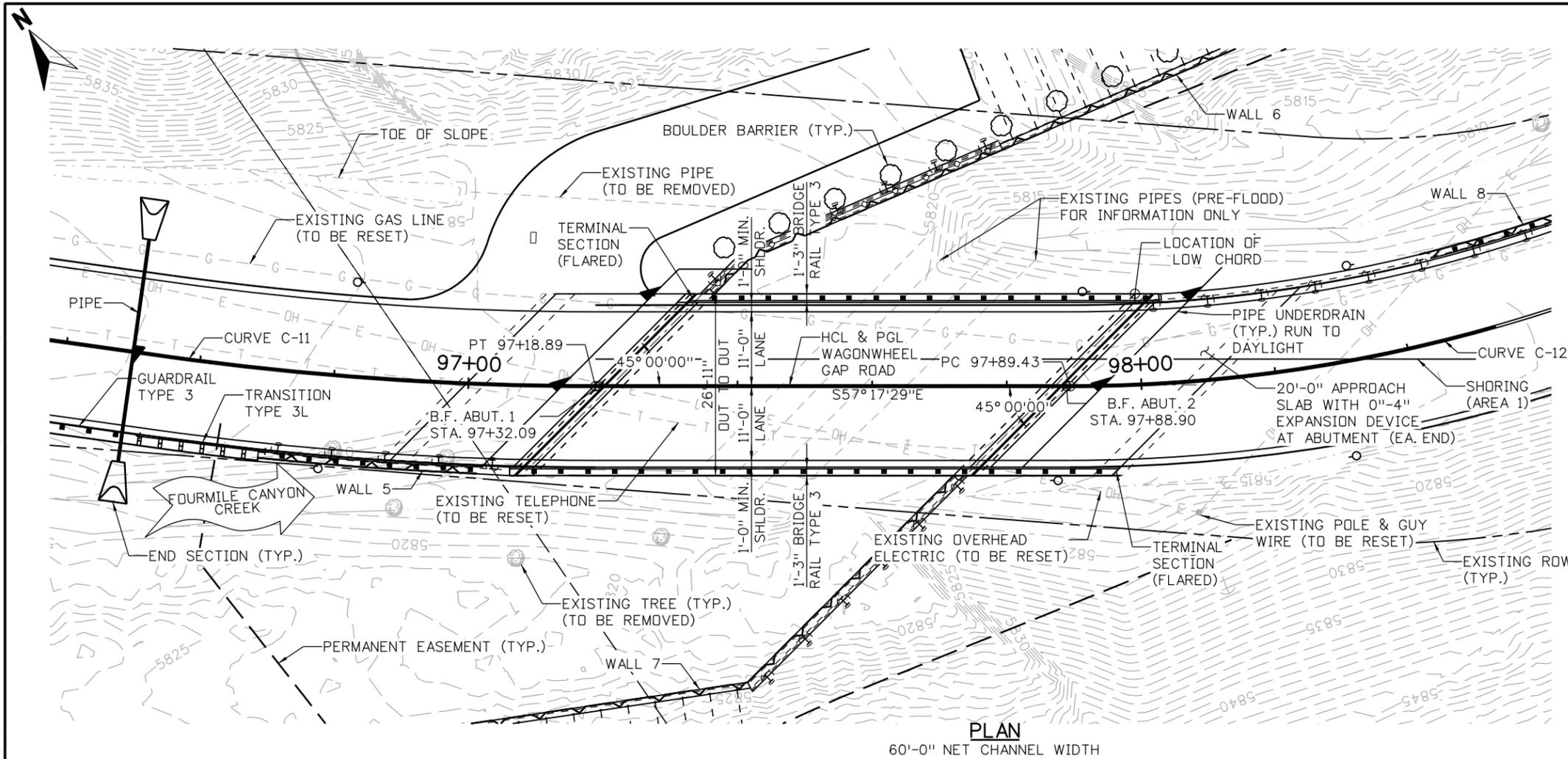
**BOW MOUNTAIN BRIDGE CONSTRUCTION LAYOUT**

PROJECT NO: 4043.SEPT12C34 SHEET NO: **93**





brett.terrell 6/3/2016 PM 5:31:07 \\DCPW\APP1\lbr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDG\_11.dgn



**NOTES:**

2. FOR PIPE AND HEADWALL DETAILS REFER TO DRAINAGE PLANS.
4. SCOUR DEPTHS HAVE NOT BEEN DETERMINED AT THIS TIME.
5. SHORING IS NECESSARY FOR PHASING. FOR DETAILS SEE CONSTRUCTION PHASING SHEET.
6. CREEK RESTORATION DETAILS HAVE NOT BEEN DETERMINED AT THIS TIME.
7. FOR WALL DETAILS, SEE RETAINING WALL PLANS.

**CURVE C-11 DATA:**

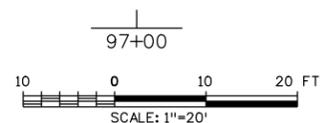
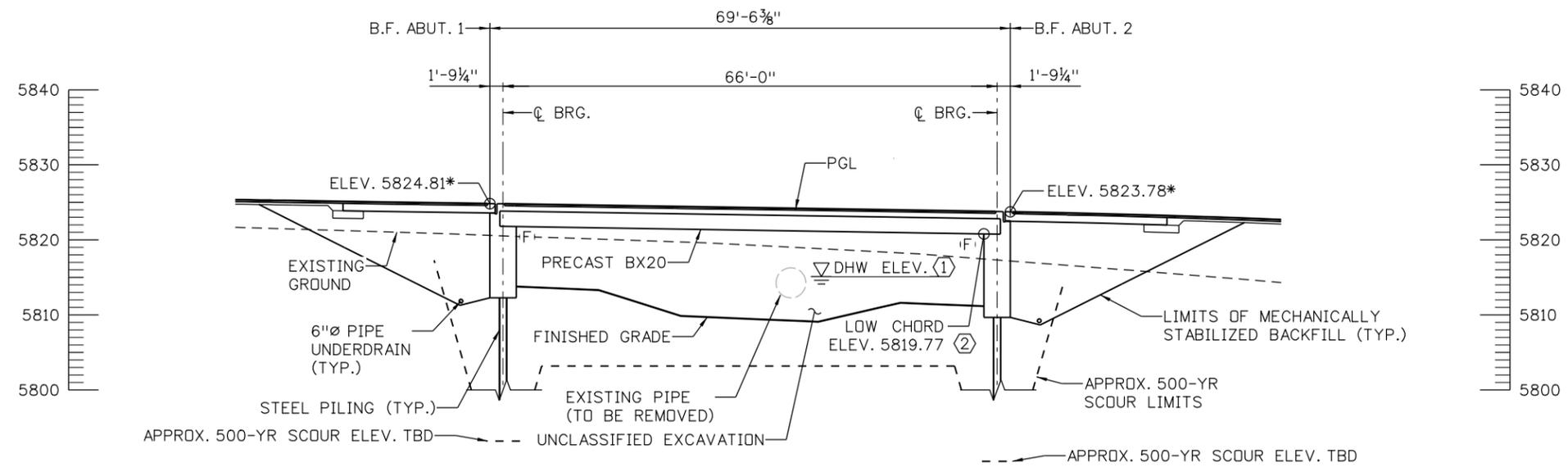
$\Delta = 07^\circ 58' 26''$  LT.  
 $R = 465.00'$   
 $L = 64.71'$   
 $T = 32.41'$   
 $PI = 96+86.58$   
 $N = 266802.01$   
 $E = 55050.40$

**CURVE C-12 DATA:**

$\Delta = 52^\circ 06' 52''$  LT.  
 $R = 231.00'$   
 $L = 210.11'$   
 $T = 112.95'$   
 $PI = 99+02.38$   
 $N = 266685.34$   
 $E = 55232.07$

**KEYNOTES:**

- ① 1'-0" MIN. FREEBOARD FOR THE 100-YEAR HYDRAULIC GRADE LINE AND ABOVE THE 100-YEAR ENERGY GRADE LINE.
- ② INCLUDES  $\pm 1/2$ " GIRDER DEPTH TOLERANCE.



90% 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:

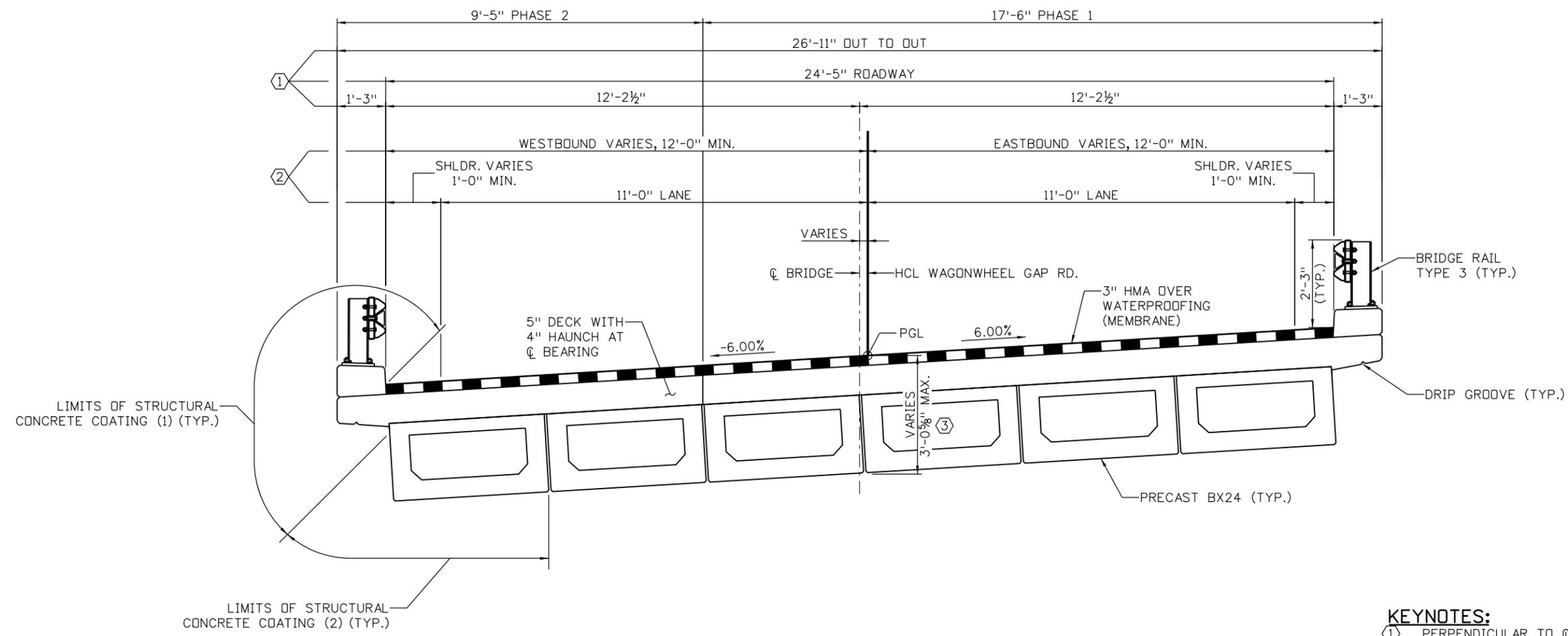


**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

DESIGNED: DLT	CAD: BMT	CHECKED:	DATE: 5/3/2016
---------------	----------	----------	----------------

**WAGONWHEEL GAP BRIDGE**  
**GENERAL LAYOUT**  
**(1 OF 2)**  
 PROJECT NO: 4043.SEPT12C34 SHEET NO: 96

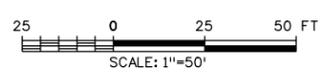
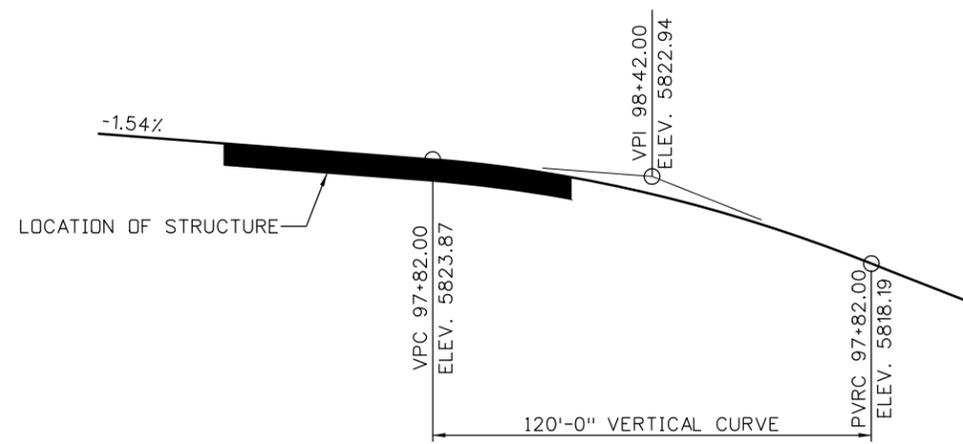
brett.terrell 6/3/2016 PM 5:3/2016 pm:\DCPW\APP1\lkr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDG\_12.dgn



**TYPICAL SECTION**  
LOOKING AHEAD STATION  
N.T.S.

- KEYNOTES:**
- ① PERPENDICULAR TO Q BRIDGE.
  - ② PERPENDICULAR TO HCL.
  - ③ DIMENSION INCLUDES +1/2" GIRDER DEPTH TOLERANCE.

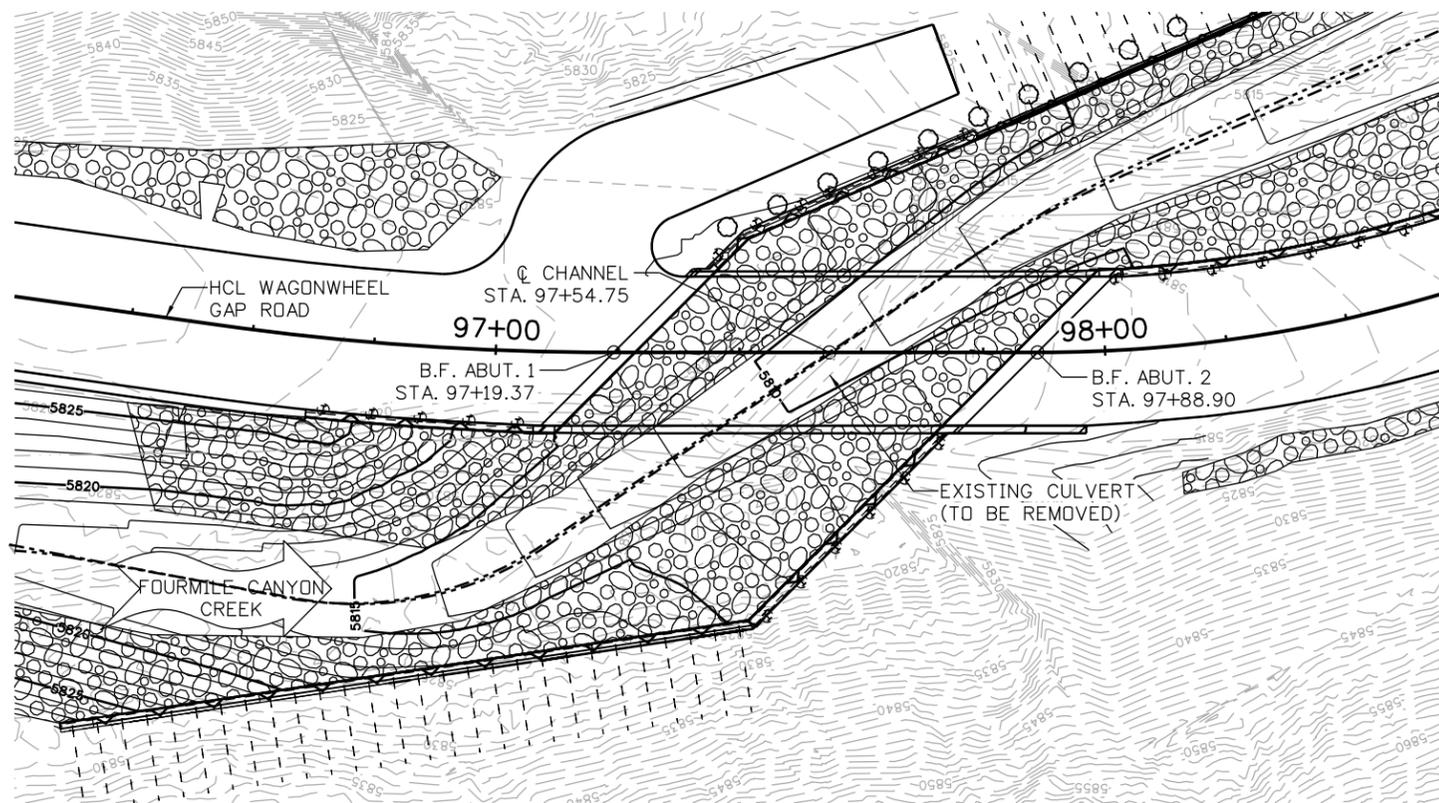
- NOTES:**
1. STRUCTURAL CONCRETE COATING (1) SHALL BE BROWN, EQUIVALENT TO FEDERAL STANDARD 595C COLOR NO. 20062.
  2. STRUCTURAL CONCRETE COATING (2) SHALL BE GRAY, EQUIVALENT TO FEDERAL STANDARD 595C COLOR NO. 26044.
  3. HMA SHALL BE GRADING SX (75) (PG 58-28).



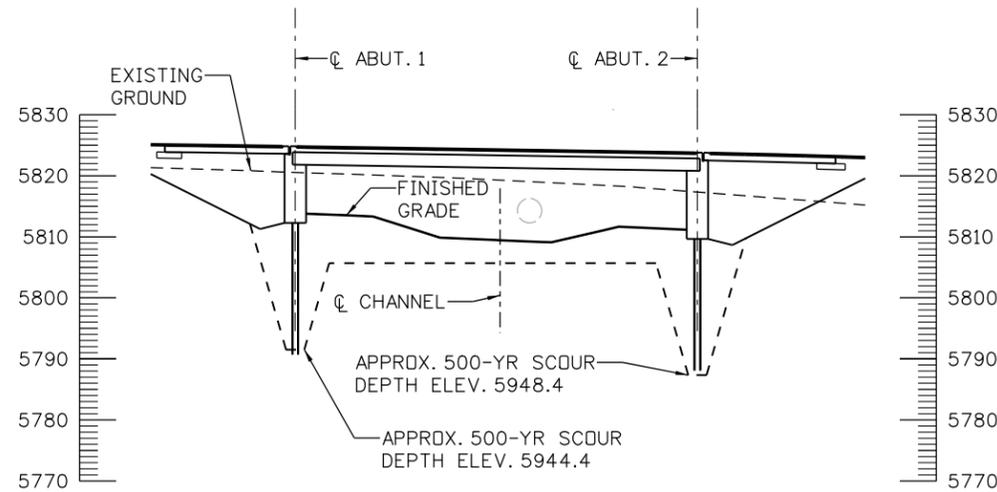
**ROADWAY PROFILE GRADE**  
WAGONWHEEL GAP ROAD

<b>90% SET</b>	<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>	NO.	DATE	REVISION DESCRIPTION:	<p><b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b></p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p><b>WAGONWHEEL GAP BRIDGE</b> <b>GENERAL LAYOUT</b> <b>(2 OF 2)</b></p>
		REVISIONS:	DLT	BMT		5/3/2016	PROJECT NO: 4043.SEPT12C34	SHEET NO: 97		

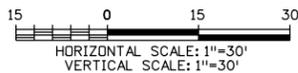
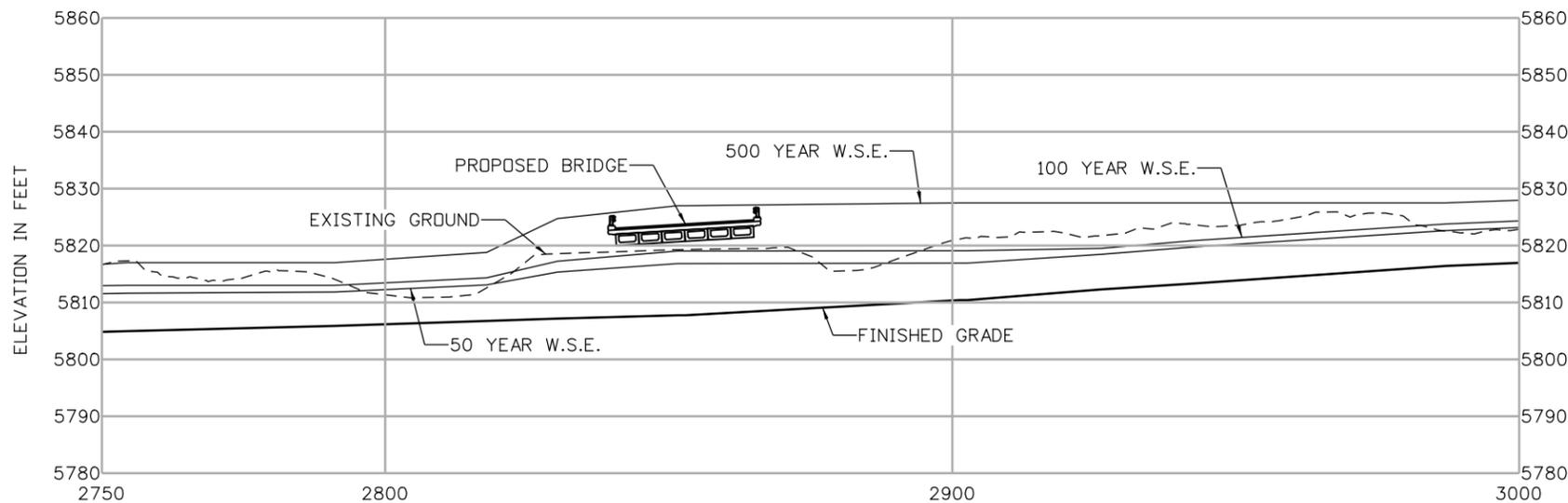
brett.terrell 6/3/2016 PM 5:31:00 \\DCPW\APP1\lbr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\County\Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDG\_14\_0.dgn



**PROPOSED BRIDGE PLAN VIEW**



**PROPOSED BRIDGE SECTION VIEW**  
TAKEN ALONG HCL WAGONWHEEL GAP ROAD



**PROFILE OF WATER SURFACE**  
DISTANCE ALONG  $\phi$  CHANNEL IN FEET

**DATA FOR WAGONWHEEL GAP 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

90% 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:



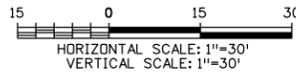
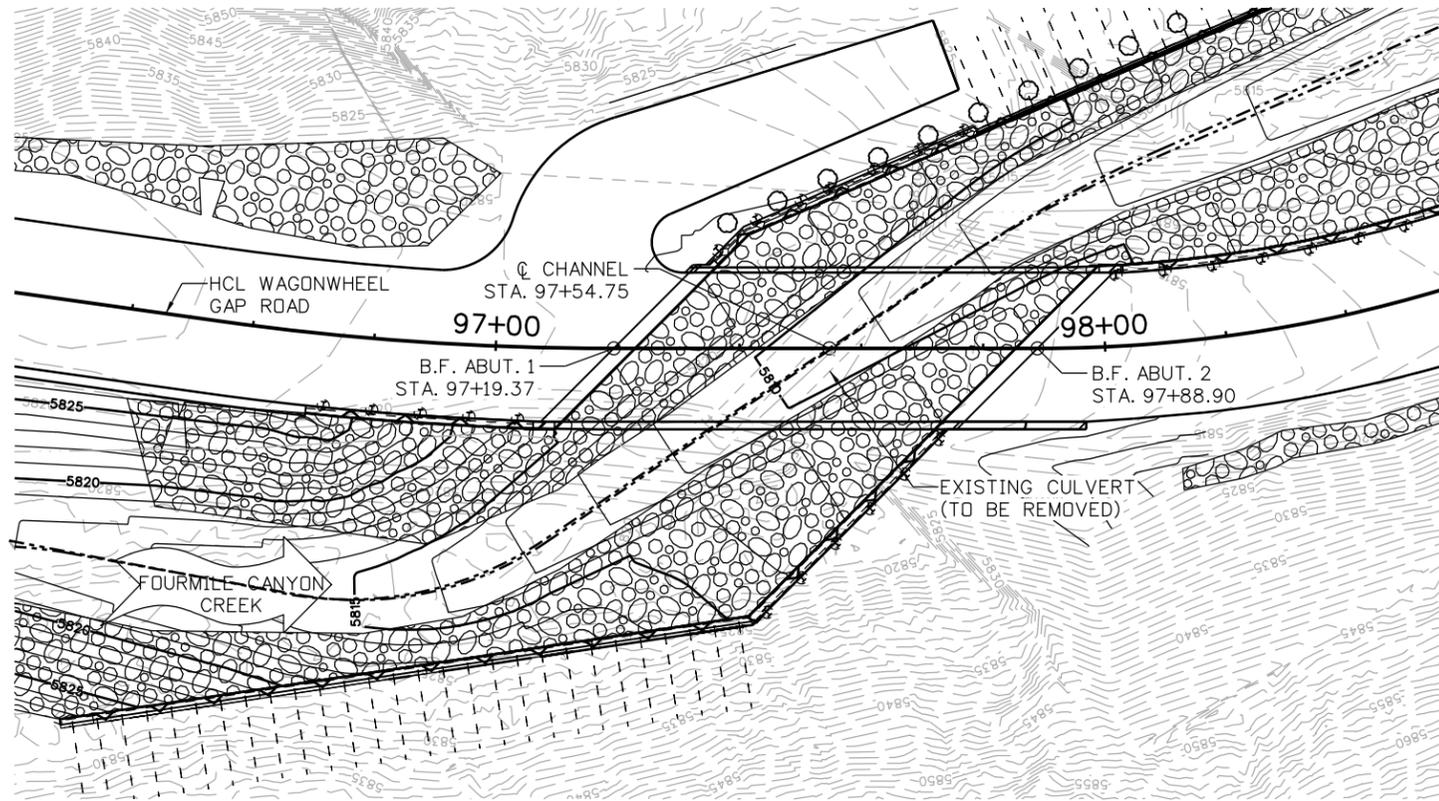
**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

DESIGNED:	CAD:	CHECKED:	DATE:
CMM	BMT		5/3/2016

**WAGONWHEEL GAP BRIDGE**  
**BRIDGE HYDRAULIC**  
**INFORMATION (1 OF 2)**

PROJECT NO: 4043.SEPT12C34 SHEET NO: 98

brett.terrell 6:04:15 PM 5/3/2016 p:\VDC\WAP\1.bkr.mbakercorp.com\pwr\00\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\06N\Bridges\135200\_BR00C\_14\_1.dgn



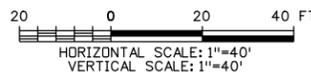
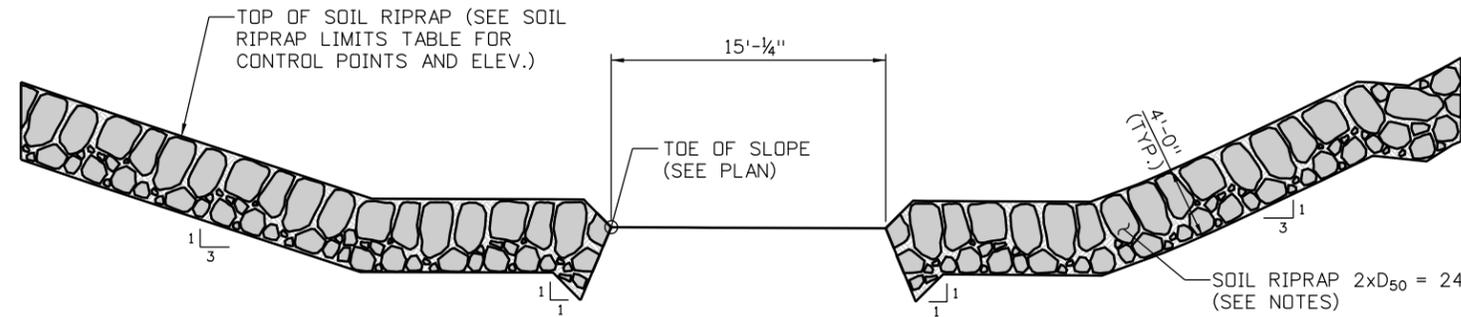
PROPOSED BRIDGE PLAN VIEW

RIPRAP (24 INCH) & GEOTEXTILE LIMITS				
	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			

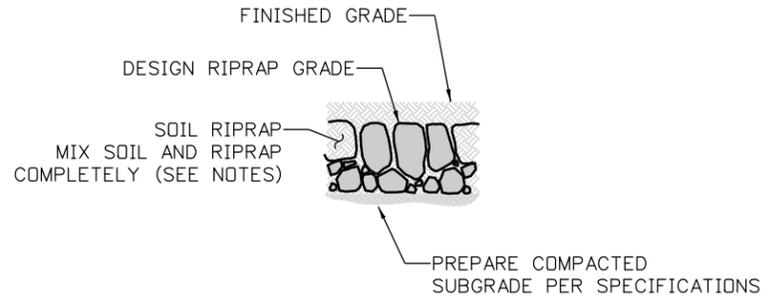
ALL ELEVATIONS REPRESENT TOP OF RIPRAP

**NOTES:**

- SEE TABULATION OF DRAINAGE AND EROSION CONTROL QUANTITIES.
- SEE FINAL SWMP PLANS FOR EROSION CONTROL BLANKET LOCATIONS.
- MIX UNIFORMLY 65% RIPRAP BY VOLUME WITH 35% OF APPROVED SOIL BY VOLUME PRIOR TO PLACEMENT.
- BENCH RIPRAP AS NECESSARY TO MATCH PROPOSED GRADE AND PLACE STONE-SOIL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE FINISHED GRADE.
- FOR GRADING AND CONTOUR INFORMATION, SEE DITCH AND CHANNEL GRADING PLAN.



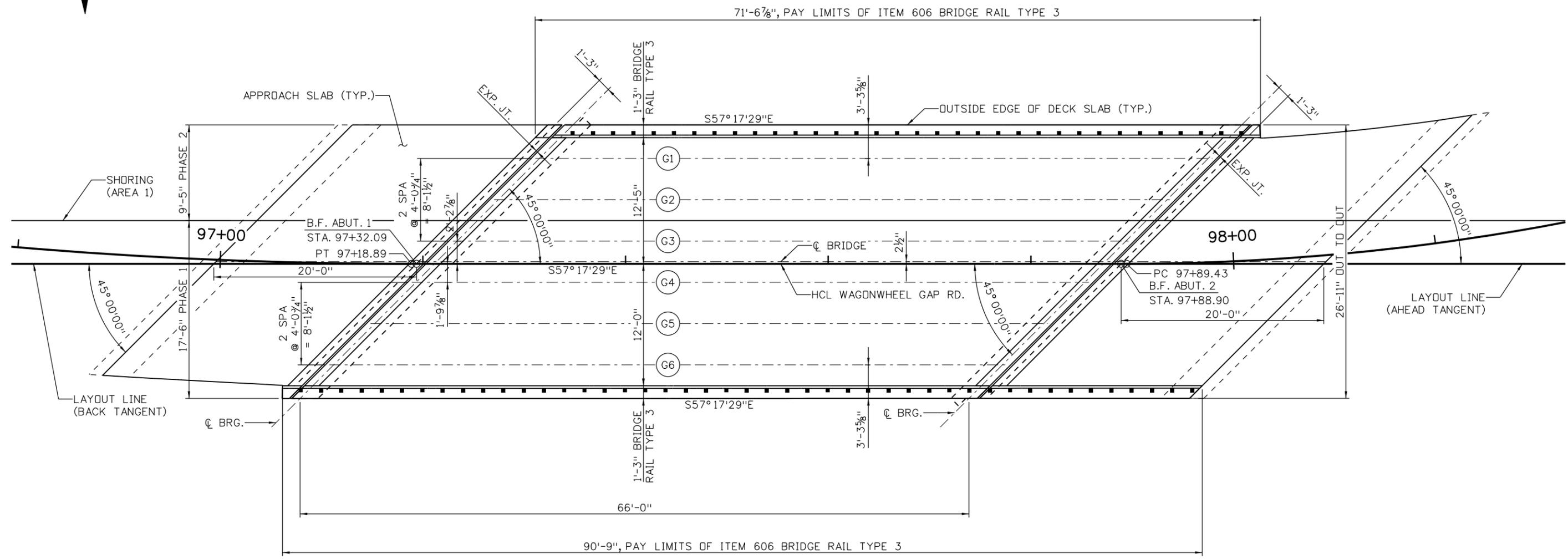
SECTION A-A



SOIL RIPRAP TYPICAL SECTION

90% 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><b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b></p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>WAGONWHEEL GAP BRIDGE BRIDGE HYDRAULIC INFORMATION (2 OF 2)</p>
							<p>Michael Baker INTERNATIONAL</p>	CMM	BMT		

brett.terrell 6/04/16 PM 5:31/2016 pm 5:\DCPW\APP1\Bkr.mbakercorp.com\pwwpro\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRD01\_15.dgn



PLAN



90% 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

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

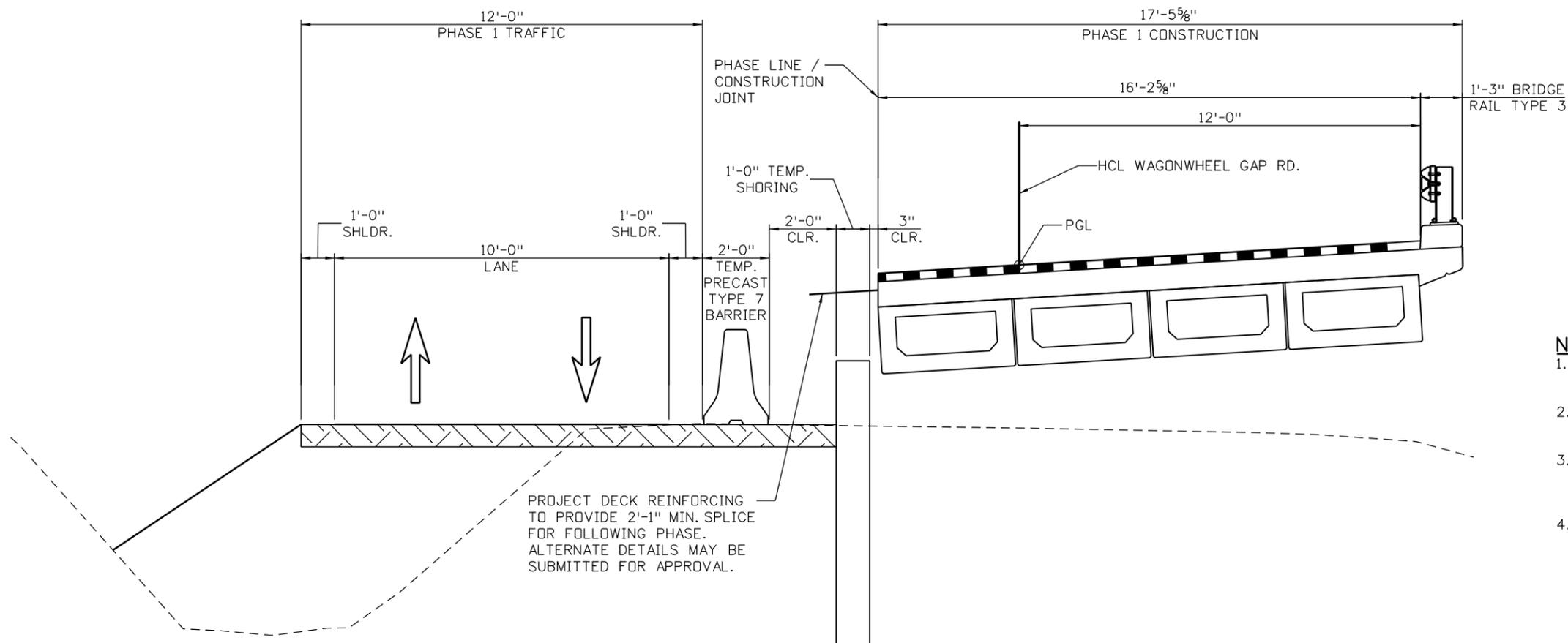


**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

DESIGNED:	CAD:	CHECKED:	DATE:
DLT	BMT		5/3/2016

**WAGONWHEEL GAP BRIDGE CONSTRUCTION LAYOUT**  
 PROJECT NO: 4043.SEPT12C34 SHEET NO: 100

brett.terrell 6/04/16 5:31 PM 5/3/2016 pm:\DCPW\APP1\Bkr.mbakercorp.com\pwwpro\d\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRD06\_16.dgn



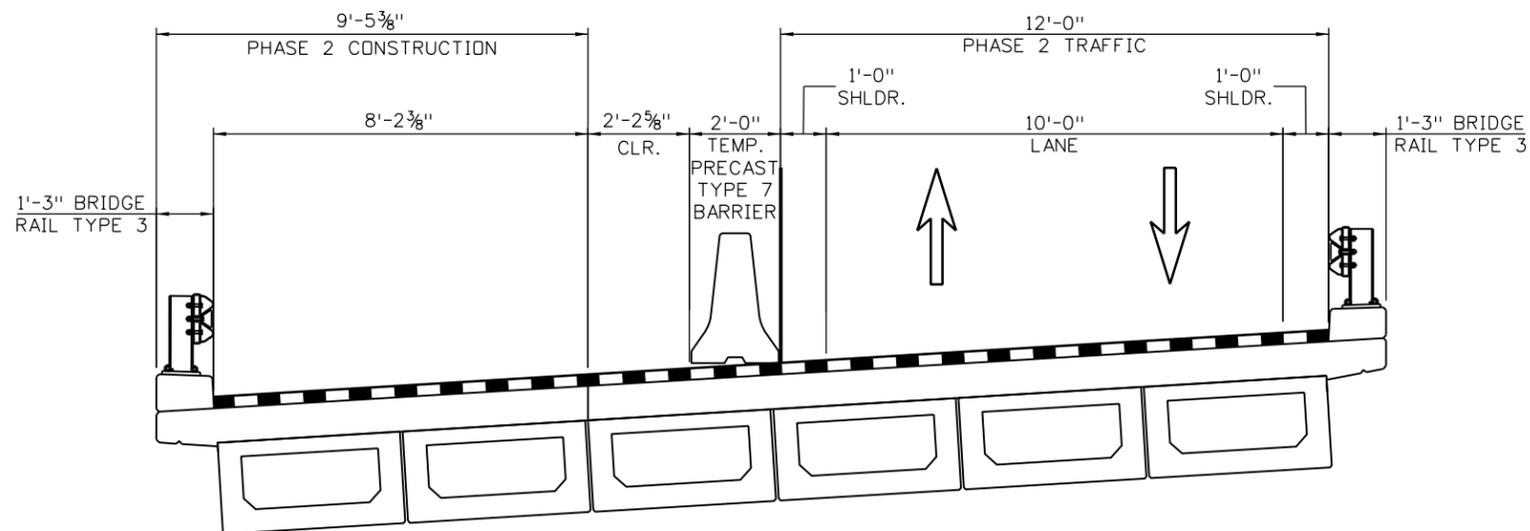
PROJECT DECK REINFORCING TO PROVIDE 2'-1" MIN. SPLICE FOR FOLLOWING PHASE. ALTERNATE DETAILS MAY BE SUBMITTED FOR APPROVAL.

**PHASE 1 CONSTRUCTION**

LOOKING AHEAD STATION  
SCALE: 1/4" = 1'-0"

**NOTES:**

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



**PHASE 2 CONSTRUCTION**

LOOKING AHEAD STATION  
SCALE: 1/4" = 1'-0"



90% 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:



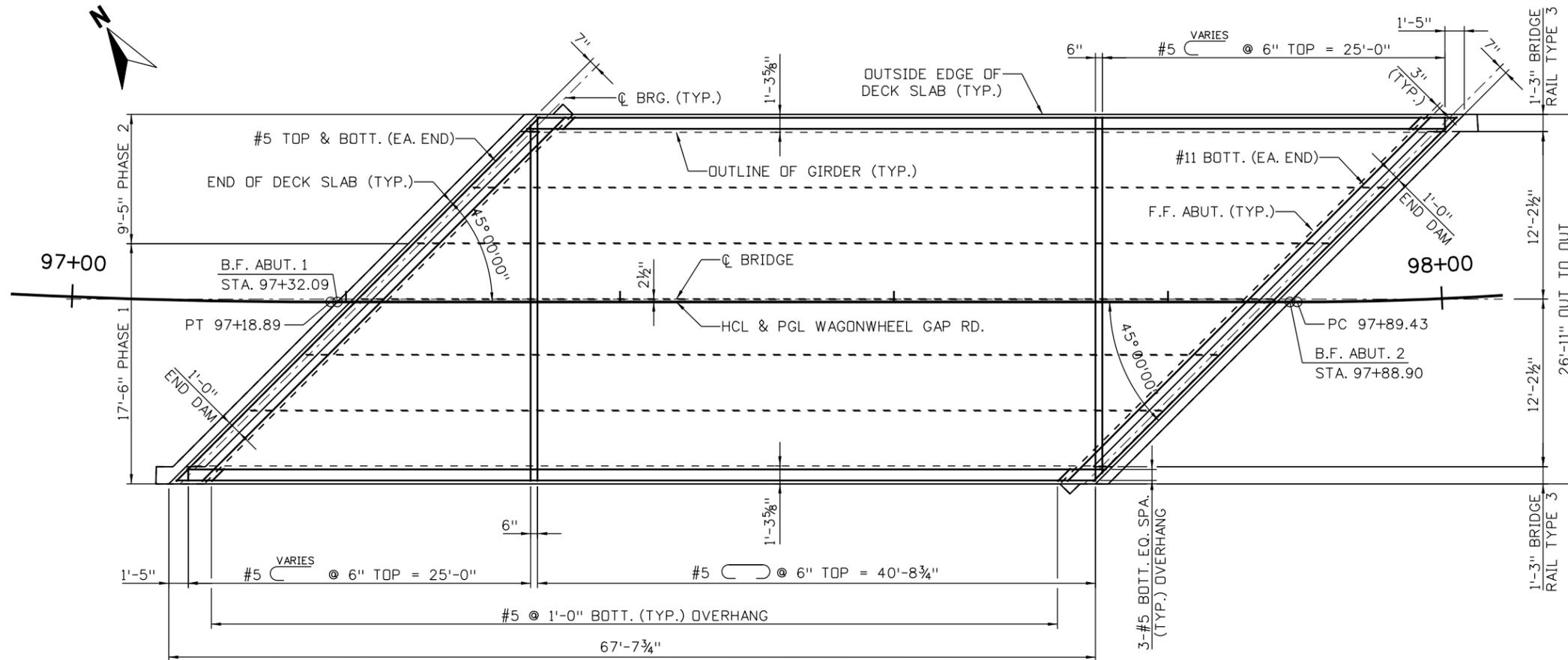
**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

DESIGNED:	CAD:	CHECKED:	DATE:
DLT	BMT		5/3/2016

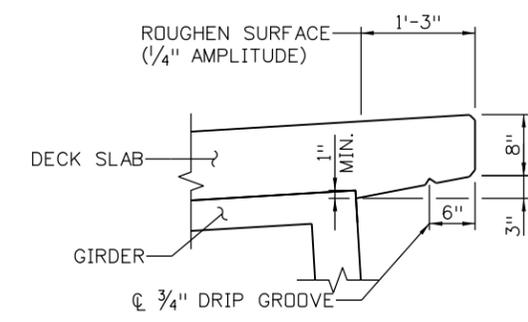
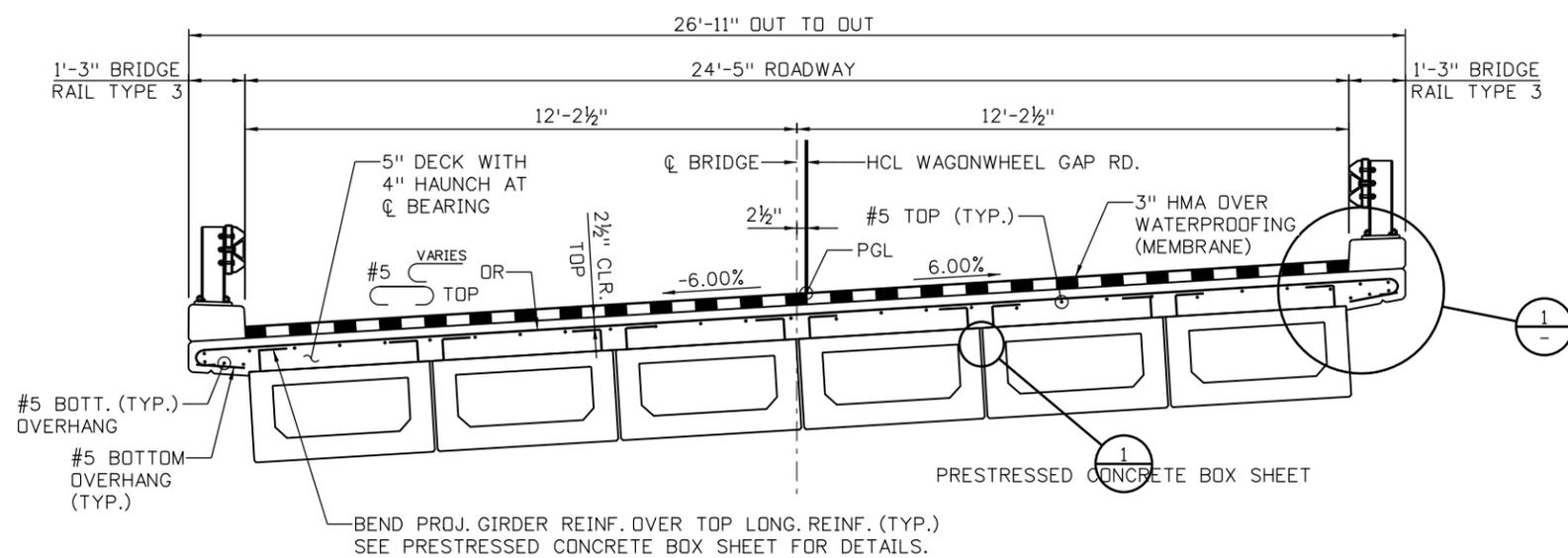
**WAGONWHEEL GAP BRIDGE CONSTRUCTION PHASING**

PROJECT NO: 4043.SEPT12C34 SHEET NO: 101

brett.terrell 6/05/12 PM 5/3/2016 p:\VDCPW\BPT\Baker\Boulder\Documents\Projects\Lakewood\Office\Boulder\County\Emergency\_Transportation\T04\08\_Sheet\_L\_Files\06\_Structures\135200\_BRDC\_19.dgn

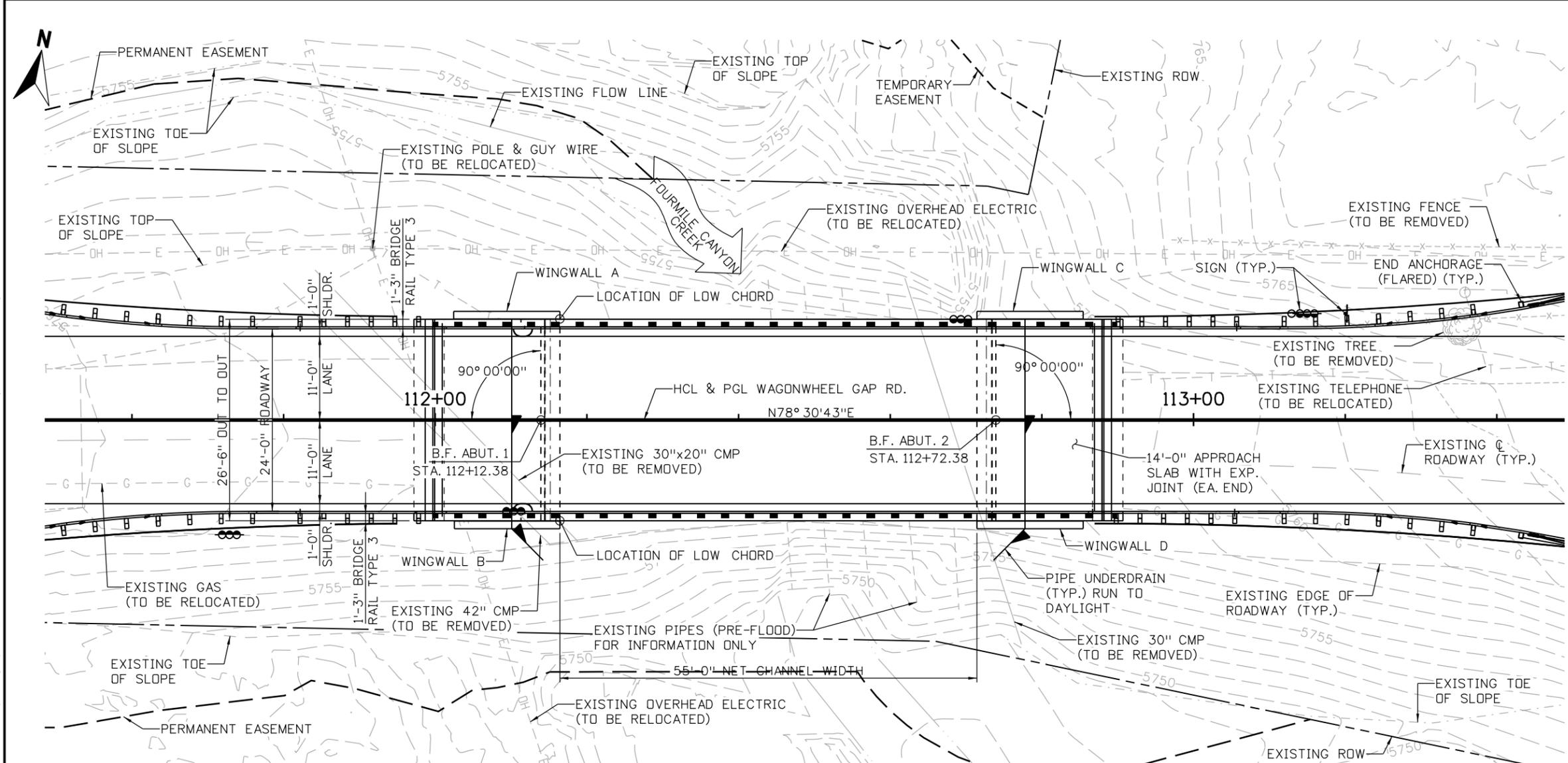


- NOTES:**
1. DECK SLAB SHALL BE CONCRETE CLASS D (BRIDGE).
  2. BRIDGE RAIL REINFORCEMENT NOT SHOWN. SEE BRIDGE RAIL TYPE 3 SHEET FOR DETAILS.
  3. END DAM REINFORCEMENT AND EMBEDS NOT SHOWN. SEE EXPANSION DEVICE (0-4 INCH) SHEET FOR DETAILS.
  4. HAUNCH VARIES TO 1" MINIMUM AT  $\phi$  SPAN.
  5. DECK AND DIAPHRAGM CONCRETE SHALL BE PLACED MONOLITHICALLY. A CONSTRUCTION JOINT BETWEEN THESE BRIDGE ELEMENTS IS NOT PERMITTED.
  6. PLACE TOP TRANSVERSE REINFORCING PERPENDICULAR TO  $\phi$  BRIDGE. OTHER TRANSVERSE REINFORCING SHALL BE PLACED ALONG SKEW AS SHOWN.
  7. SPLICE REINFORCING AT PHASING LINE. NON-STAGGERED MIN. LAP SPLICE LENGTH FOR #5 IS 2'-1". SEE ABUTMENT DETAILS FOR SPLICING DIAPHRAM REINFORCEMENT.

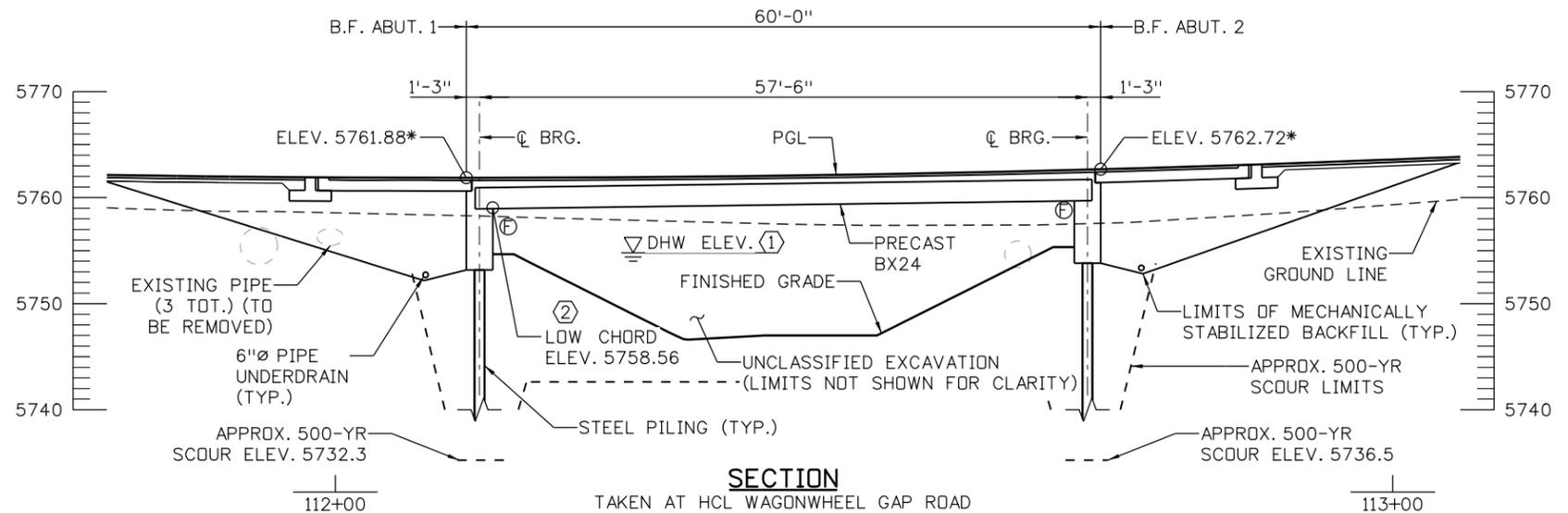


<b>90% SET</b>	CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	<b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b>	DESIGNED:	CAD:	CHECKED:	DATE:	<b>WAGONWHEEL GAP BRIDGE SUPERSTRUCTURE DETAILS</b>
						<b>Michael Baker</b> INTERNATIONAL	<b>DLT</b>	<b>BMT</b>	5/3/2016	

brett.terrell 6:05:33 PM 5/3/2016 pm:\DCPW\APP1\lbr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\_County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\OGN Bridges\138200\_BRDG\_21.dgn



**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.



**90% 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:

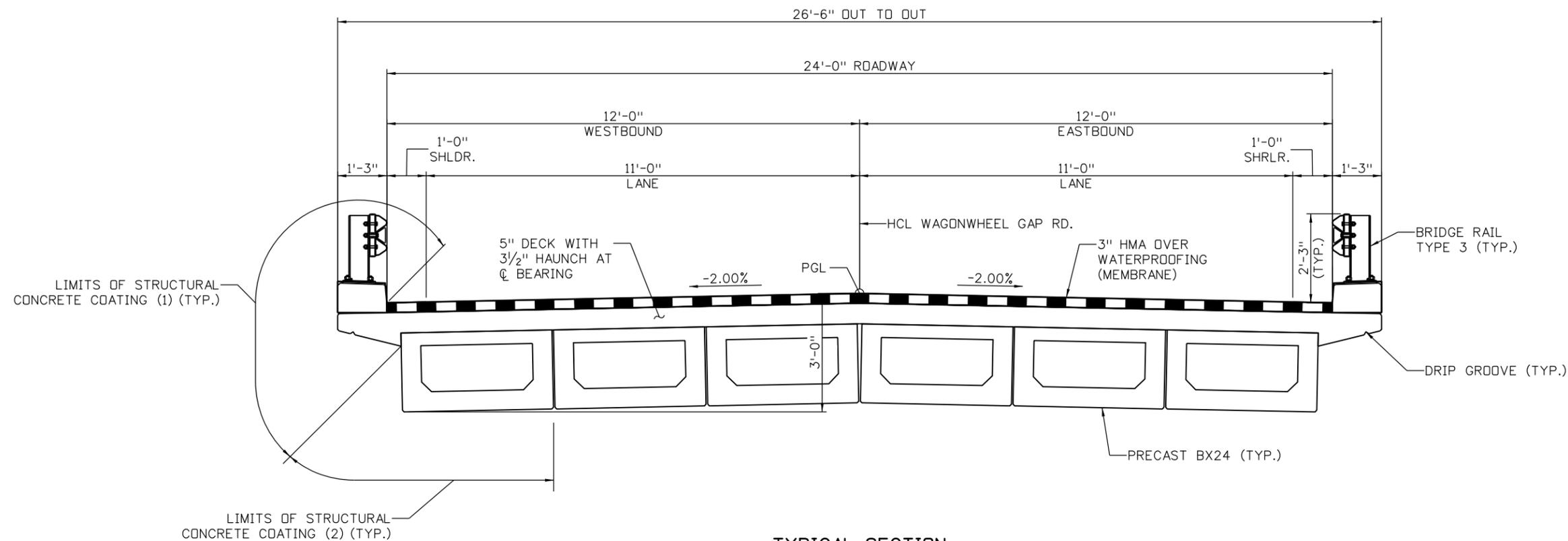
**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

**LEE HILL APPROACH BRIDGE**  
**GENERAL LAYOUT**  
**(1 OF 2)**  
 PROJECT NO: 4043.SEPT12C34 SHEET NO: 103

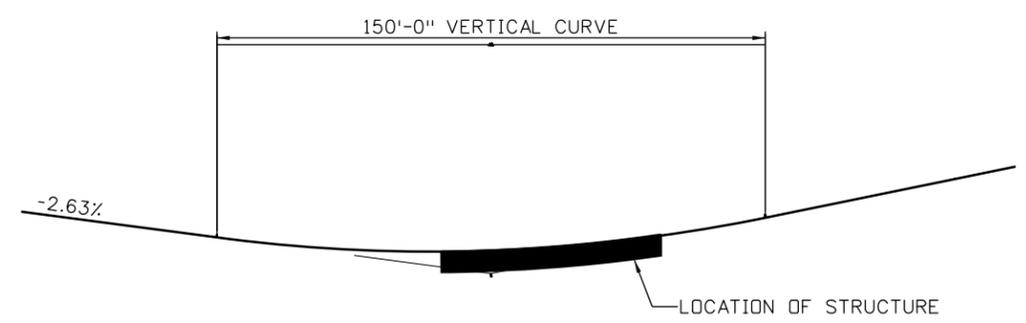
DESIGNED:	CAD:	CHECKED:	DATE:
DLT	BMT		5/3/2016

\* FINISHED GRADE ELEVATIONS

brett.terrell 6:05:51 PM 5/3/2016 p:\VDCPW\BPT1\bkr.mbakercorp.com\prowd\Documents\Projects\Lakewood\Office\Boulder\_County\_Emergency\_Transportation\104\08\_Sheet\_L\_Files\06\_Structures\06N\_Bridges\135200\_BRDC\_22.dgn



TYPICAL SECTION  
LOOKING AHEAD STATION

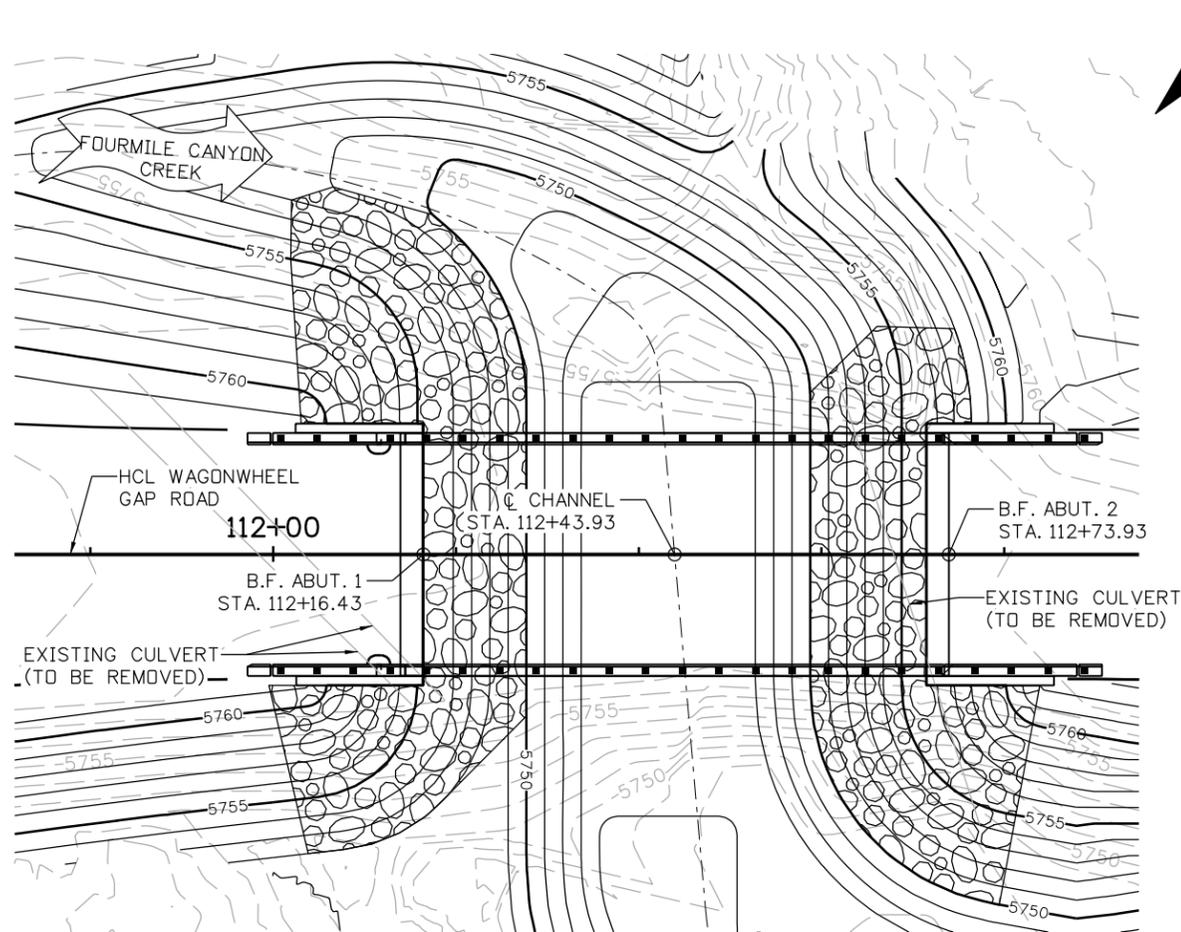


ROADWAY PROFILE GRADE  
WAGONWHEEL GAP ROAD

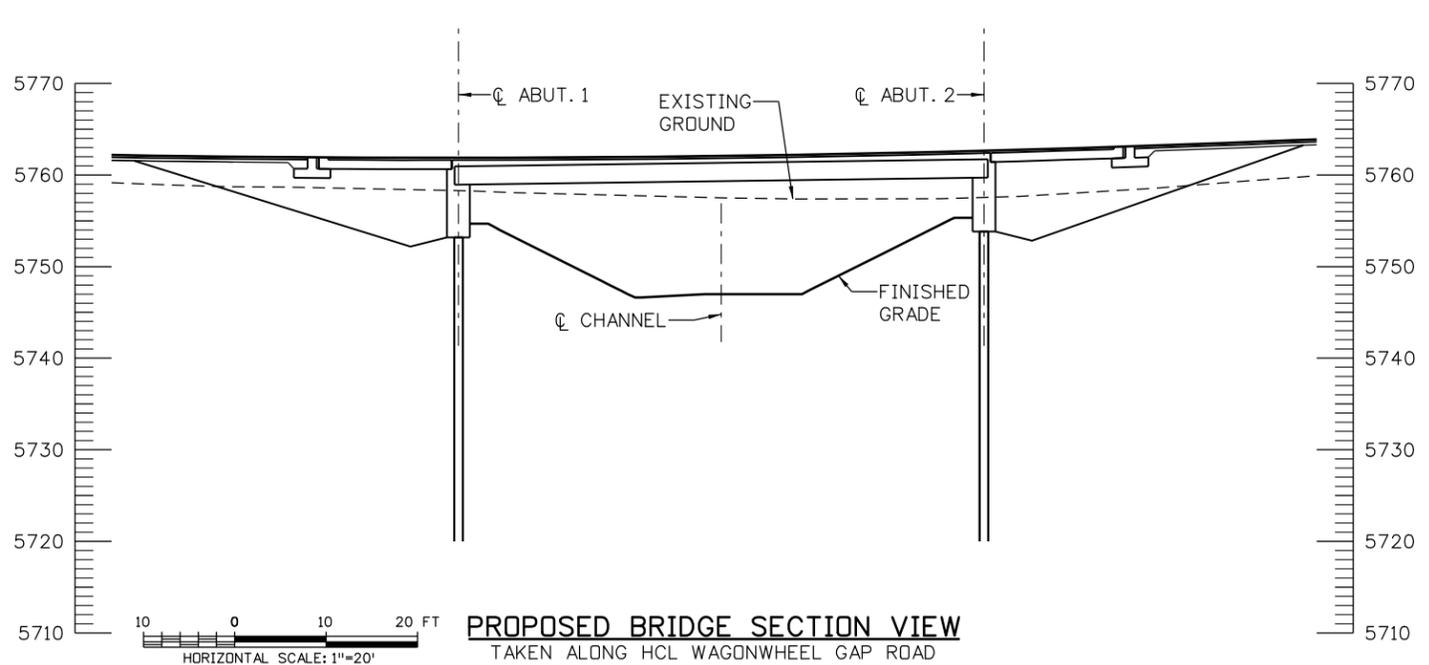
- NOTES:**
1. STRUCTURAL CONCRETE COATING (1) SHALL BE BROWN, EQUIVALENT TO FEDERAL STANDARD 595C COLOR NO. 20062.
  2. STRUCTURAL CONCRETE COATING (2) SHALL BE GRAY, EQUIVALENT TO FEDERAL STANDARD 595C COLOR NO. 26044.
  3. HMA SHALL BE GRADING SX (75) (PG 58-28).

<b>90% SET</b>	<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><b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b></p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LEE HILL APPROACH BRIDGE <b>GENERAL LAYOUT</b> (2 OF 2)</p>
							<p><b>Michael Baker INTERNATIONAL</b></p>	DLT	BMT		

brett.terrell 6/06/13 PM 5:37:2016 p:\VDCPW\BPT\BKR.mbakercorp.com\pwrdoc\Documents\Projects\Lakewood\Office\Boulder\_County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\UGM\Bridges\135200\_BR06\_24.dgn



**PROPOSED BRIDGE PLAN VIEW**



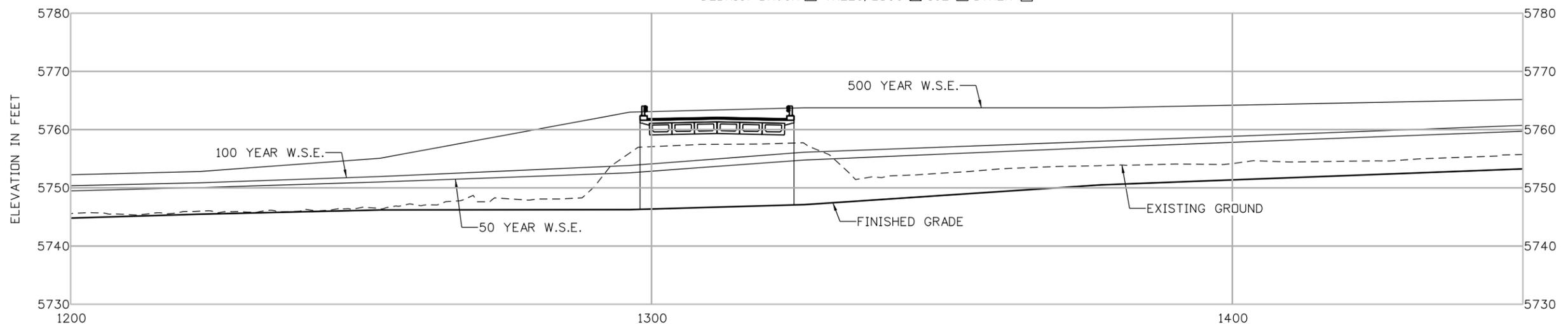
**PROPOSED BRIDGE SECTION VIEW**  
TAKEN ALONG HCL WAGONWHEEL GAP ROAD

**DATA FOR FOURMILE CANYON CREEK AT WAGONWHEEL GAP ROAD:**

- 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



**PROFILE OF WATER SURFACE**  
DISTANCE ALONG  $\text{C}$  CHANNEL IN FEET

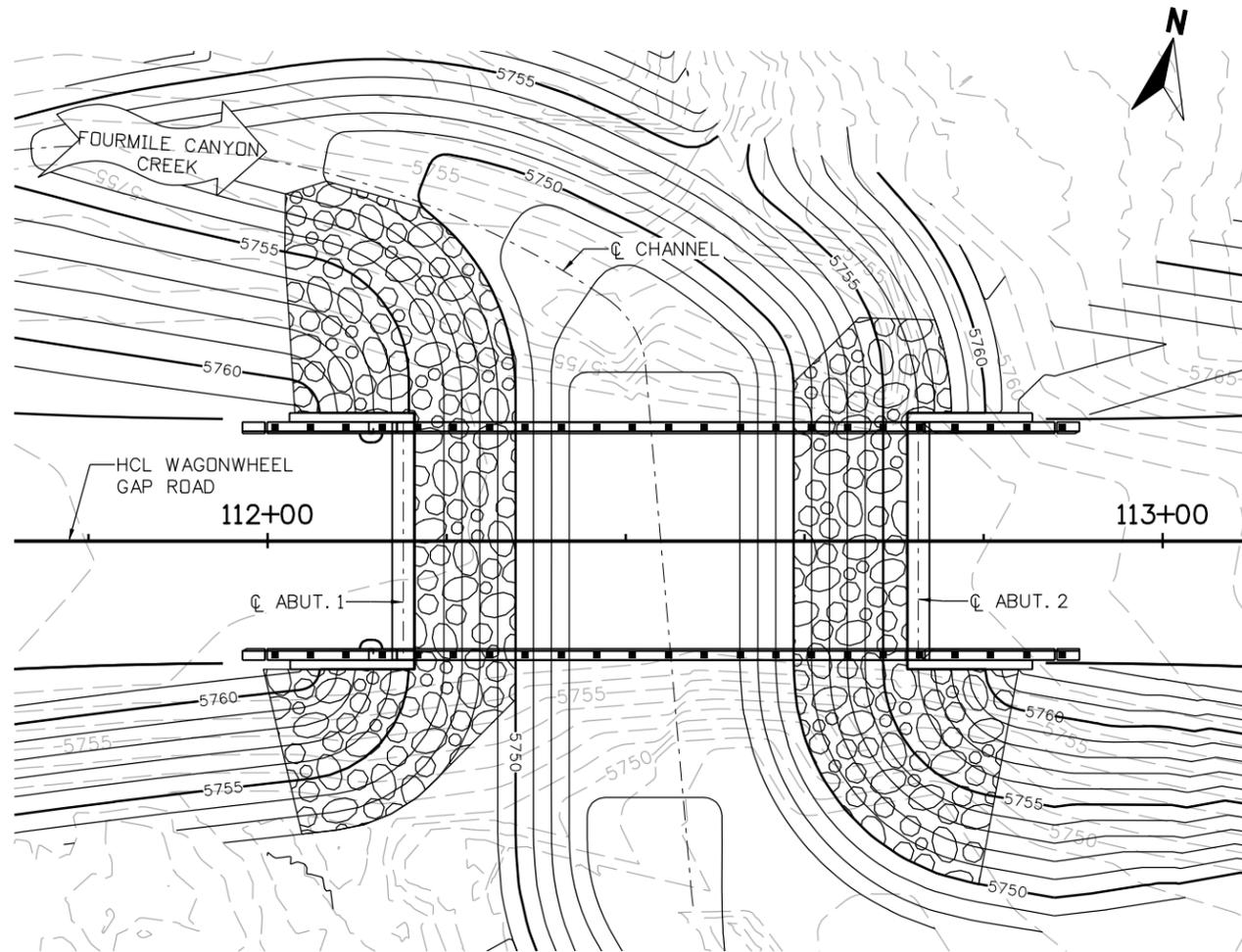
<b>90% SET</b>	CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	<b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b>	DESIGNED:	CAD:	CHECKED:	DATE:	<b>LEE HILL APPROACH BRIDGE</b> <b>BRIDGE HYDRAULIC</b> <b>INFORMATION (1 OF 2)</b>
		REVISIONS:	CMM	BMT		5/3/2016	PROJECT NO: 4043.SEPT12C34	SHEET NO: 105		



**Michael Baker INTERNATIONAL**

PROJECT NO: 4043.SEPT12C34  
SHEET NO: 105

brett.terrell 6:06:33 PM 5/3/2016 p:\DCPW\APP1\lkr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\OGN Bridges\138200\_BRDG\_25.dgn



**(24 INCH) RIPRAP & GEOTEXTILE LIMITS PLAN**

RIPRAP (24 INCH) & GEOTEXTILE LIMITS			
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		

**NOTES:**

1. SEE TABULATION OF DRAINAGE AND EROSION CONTROL QUANTITIES.
2. SEE FINAL SWMP 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.

90% 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:



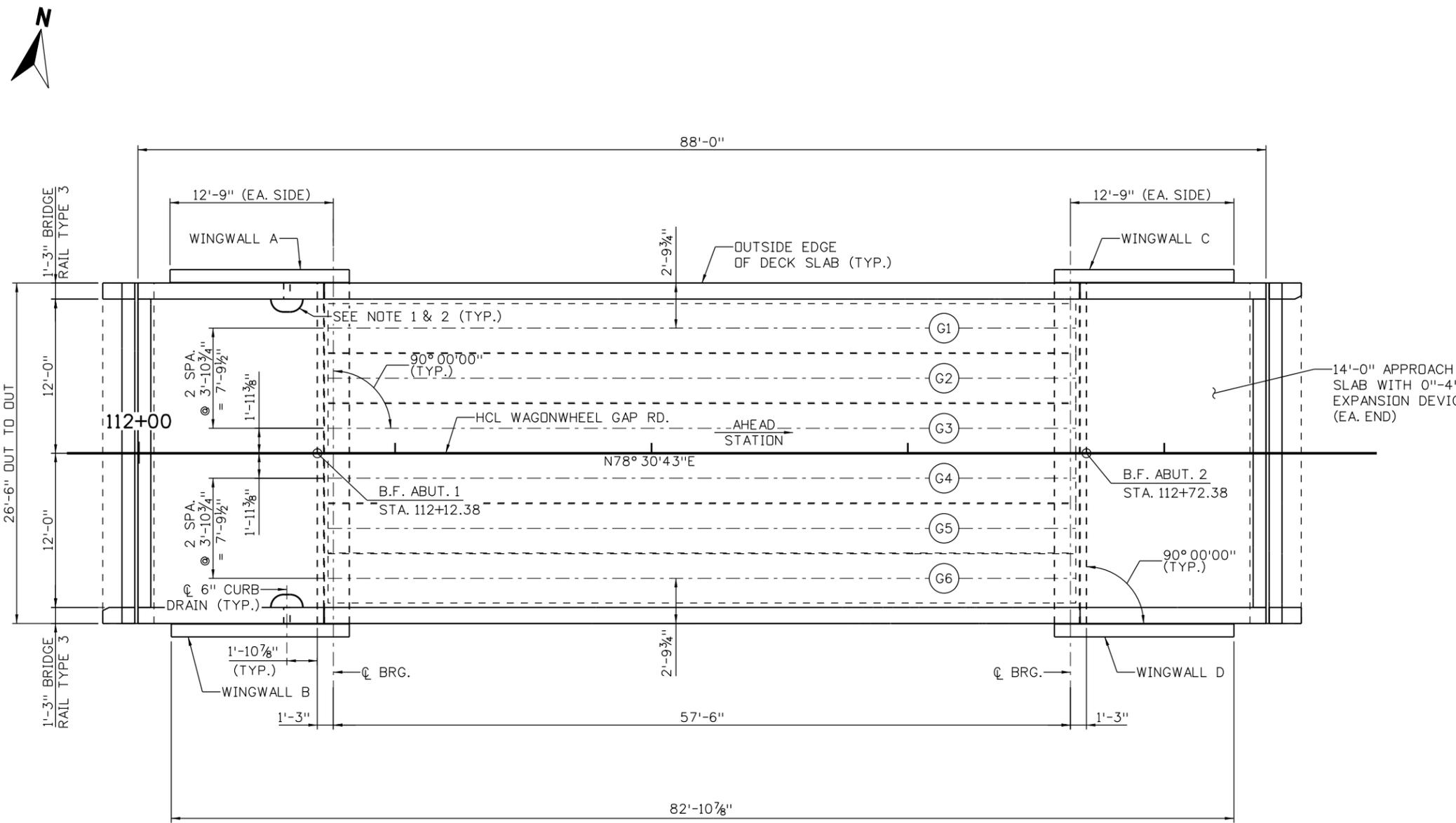
**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

DESIGNED:	CAD:	CHECKED:	DATE:
CMM	BMT		5/3/2016

LEE HILL APPROACH BRIDGE  
BRIDGE HYDRAULIC  
INFORMATION (2 OF 2)

PROJECT NO: 4043.SEPT12C34 SHEET NO: 106

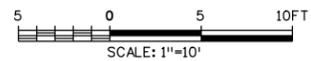
brett.terrell 6:06:53 PM 5/3/2016 p:\DCPW\APP1\lbr-mbakercorp.com\pwwpro\d\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\OGN\Bridges\138200\_BRDC\_26.dgn



**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



**90% 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

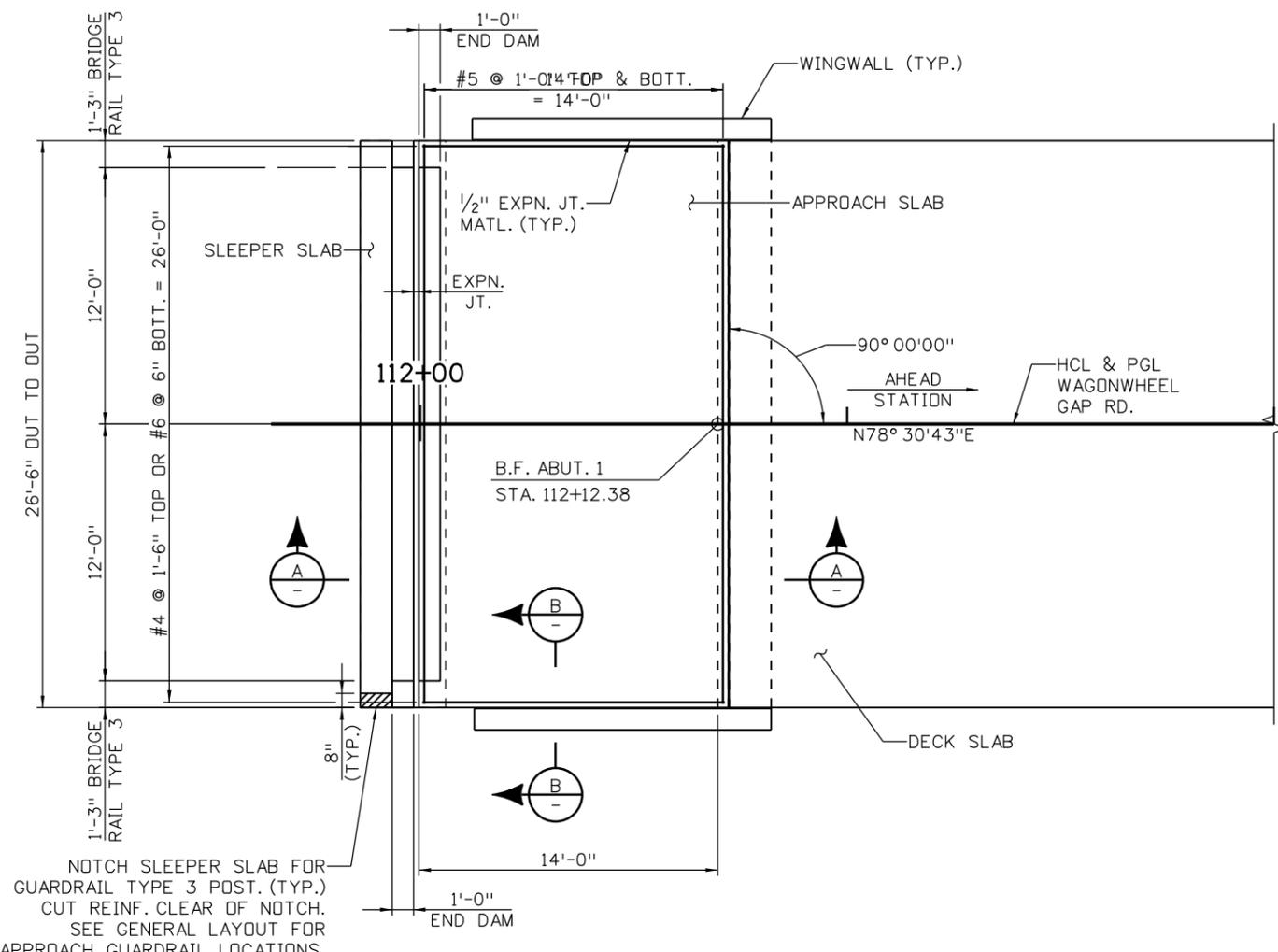
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

 **BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
 **Michael Baker INTERNATIONAL**

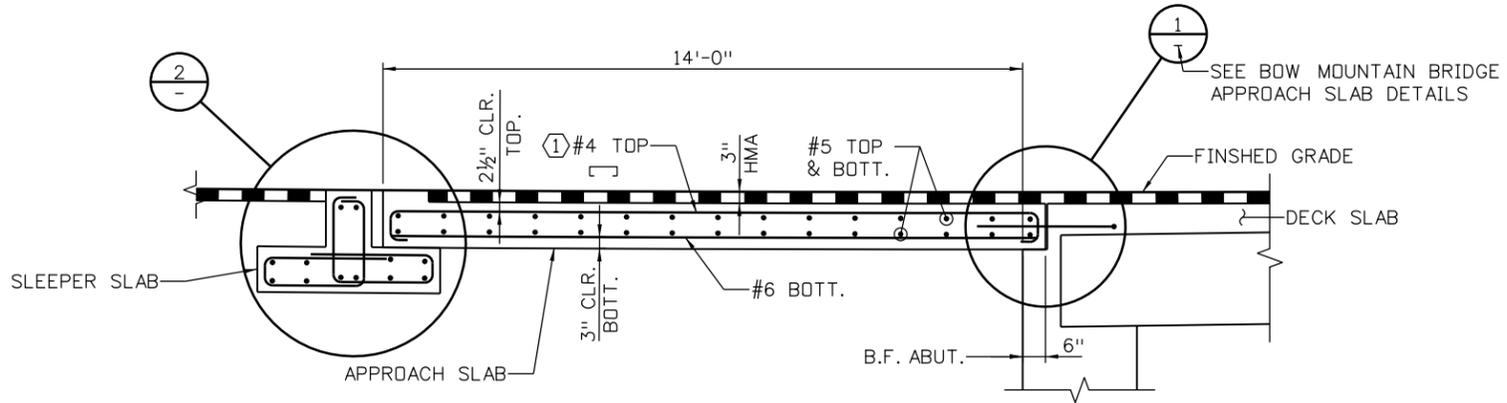
DESIGNED:	CAD:	CHECKED:	DATE:
<b>DLT</b>	<b>BMT</b>		<b>5/3/2016</b>

**LEE HILL APPROACH BRIDGE CONSTRUCTION LAYOUT**  
 PROJECT NO: 4043.SEPT12C34 SHEET NO: **107**

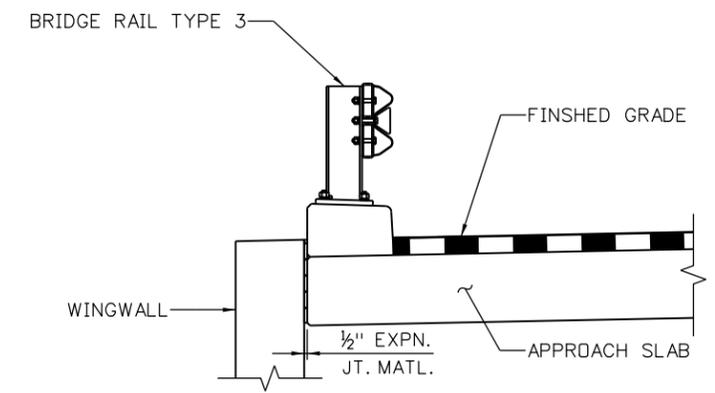
brett.terrell 6/07/12 PM 5/3/2016 p:\VDCP\WAPP1\br.mbakercorp.com\prowd\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\106N\Bridges\135200\_BRDC\_28.dgn



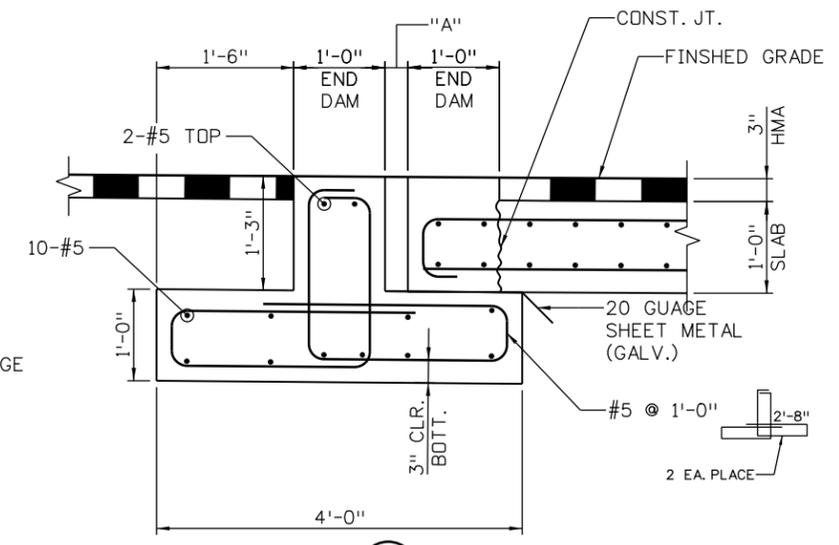
**PLAN**  
SCALE: 1/8" = 1'-0"  
PROJ. DECK SLAB REINF. NOT SHOWN



**TYPICAL SECTION A-A**  
SCALE: 1/4" = 1'-0"



**SECTION B-B**  
SCALE: 3/8" = 1'-0"



**DETAIL 2-2**  
SCALE: 1/2" = 1'-0"

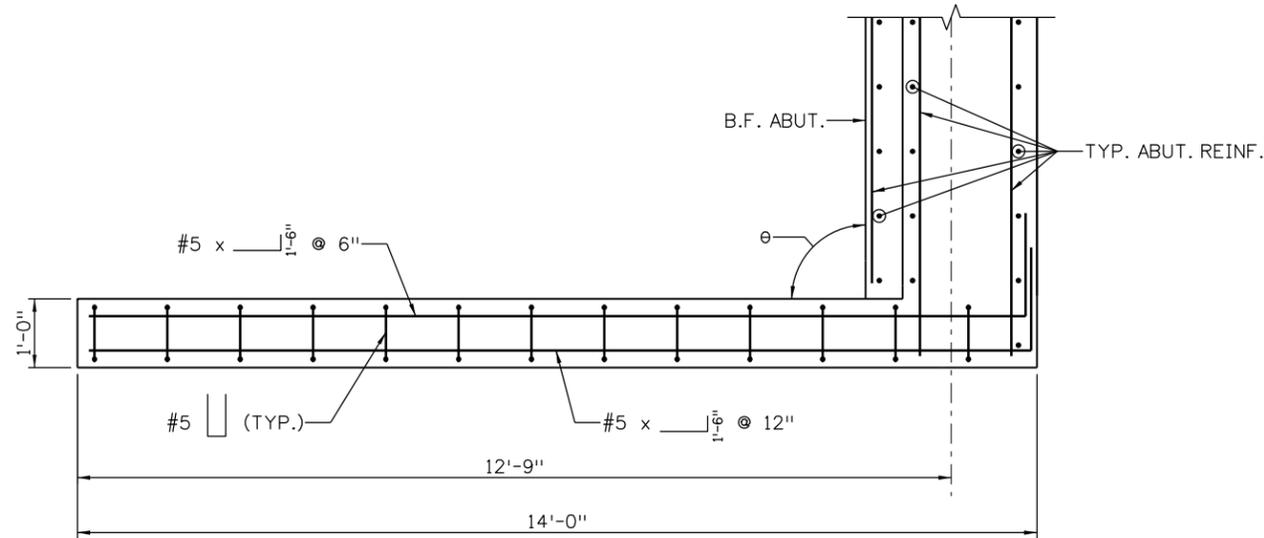
- NOTES:**
- APPROACH SLAB AND SLEEPER SLAB CONCRETE SHALL BE CONCRETE CLASS D (BRIDGE).
  - BRIDGE RAIL NOT SHOWN UNLESS NOTED OTHERWISE. FOR BRIDGE RAIL REINFORCING DETAILS SEE BRIDGE RAIL TYPE 3 SHEET.
  - SHEET METAL, EXPANSION JOINT MATERIAL AND JOINT FILLER SHALL BE INCLUDED WITH ITEM 601 CONCRETE CLASS D (BRIDGE).
  - EXPANSION DEVICE NOT SHOWN. FOR DIMENSION "A" AND OTHER DETAILS, SEE EXPANSION DEVICE (0-4 INCH) SHEET.

**KEYNOTES:**

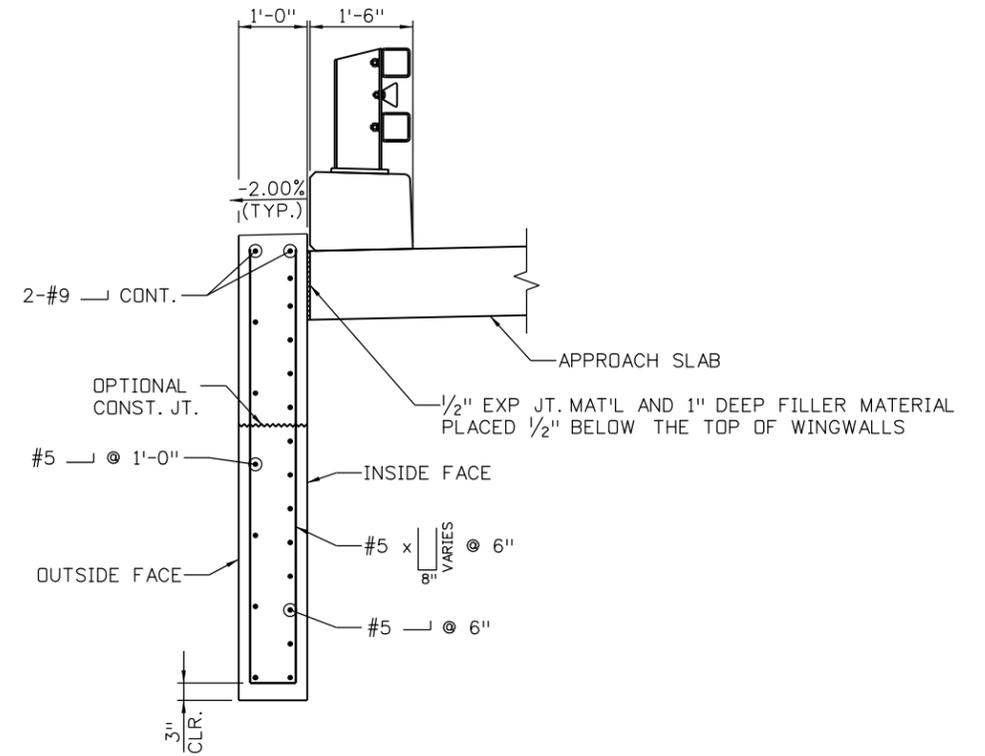
① CONTRACTOR MAY USE  $\overline{\overline{\square}}$  IN LIEU OF  $\square$

90% 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><b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b></p> <p><b>Michael Baker INTERNATIONAL</b></p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LEE HILL APPROACH BRIDGE <b>APPROACH SLAB DETAILS</b></p> <p>PROJECT NO: 4043.SEPT12C34 SHEET NO: 108</p>
							DLT	BMT		5/3/2016	

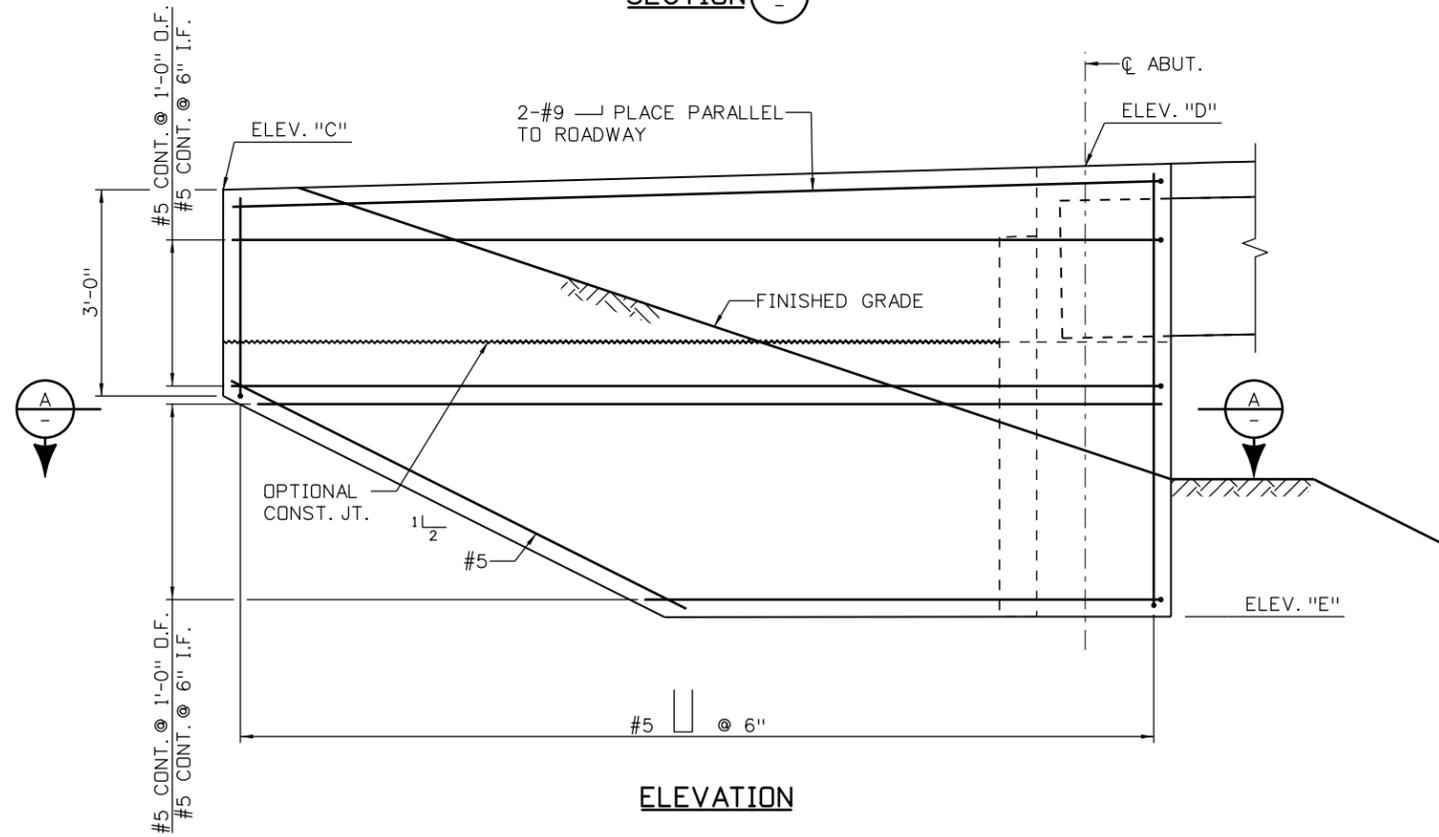
brett.terrell 6/07/30 PM 5/3/2016 pm:\DCPW\APP1\lbr.mbakercorp.com\pwwpro\d\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\06GN\_Bridges\138200\_BRDG\_29.dgn



SECTION A



TYPICAL SECTION  
FINISHED GRADE NOT SHOWN



ELEVATION

90% 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

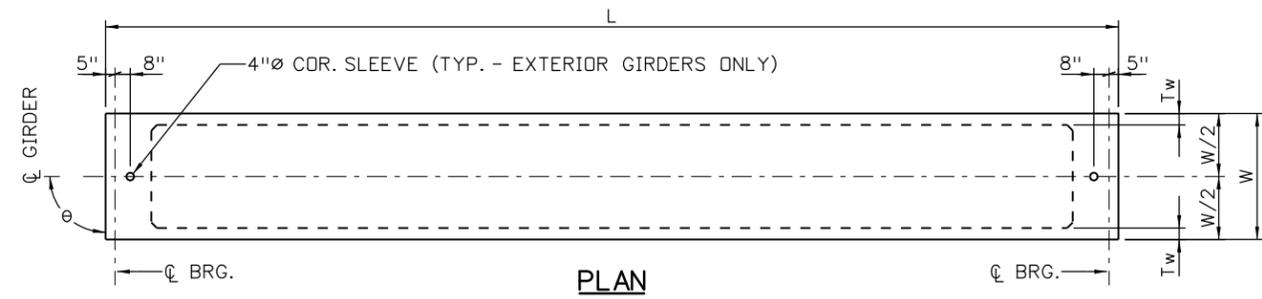
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



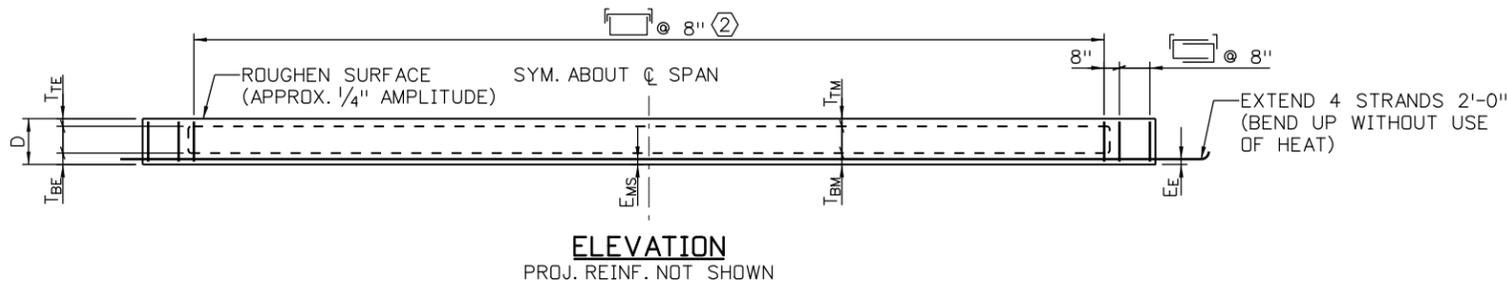
**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

WAGONWHEEL GAP ROAD BRIDGES  
**WINGWALL DETAILS**  
 DESIGNED: DLT  
 CAD: BMT  
 CHECKED: [blank]  
 DATE: 5/3/2016  
 PROJECT NO: 4043.SEPT12C34  
 SHEET NO: 109

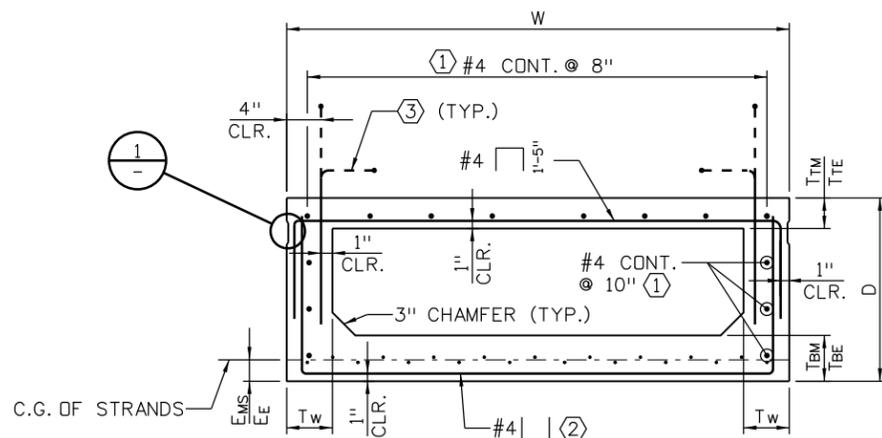
brett.terrell 6/8/08 PM 5:31/2016 pm:\DCPW\APP1\lbr.mbakercorp.com\pwwprodt\Documents\Projects\Lakewood\Office\Boulder\County\Emergency\_Transportation\T04\_08\_Sheet\_L\_Files\06\_Structures\06GN\_Bridges\138200\_BRDG\_30.dgn



PLAN

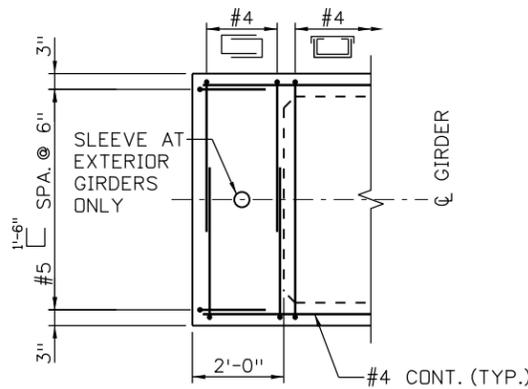


ELEVATION  
PROJ. REINF. NOT SHOWN



TYPICAL SECTION

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



TYPICAL END PLAN

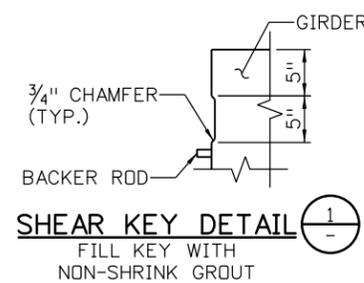
PROJ. REINF. NOT SHOWN

**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<sub>s</sub>) BUT NOT LESS THAN 1/4". THE MINIMUM COVER FOR PRESTRESSING STEEL IS 1/2".

A<sub>s</sub>\* = MINIMUM AREA OF THE PRESTRESSING STEEL  
d<sub>s</sub> = NOMINAL STRAND DIAMETER  
f<sub>s</sub> = ULTIMATE STRENGTH OF PRESTRESSING STEEL  
F<sub>j</sub> = JACKING FORCE PER GIRDER  
F<sub>f</sub> = FINAL FORCE PER GIRDER AFTER ALL LOSSES  
f<sub>ci</sub> = REQUIRED CONCRETE STRENGTH AT RELEASE OF PRESTRESS FORCE  
f<sub>c</sub> = 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.

90% 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**

DESIGNED:	CAD:	CHECKED:	DATE:
DLT	BMT		5/3/2016

WAGONWHEEL GAP ROAD BRIDGES  
**PRESTRESSED CONCRETE BOX (1 OF 2)**  
PROJECT NO: 4043.SEPT12C34 SHEET NO: 110

**GIRDER SCHEDULE**

BRIDGE	GIRDER TYPE	GIRDER NO.	L (FEET)	W (INCH)	D (INCH)	θ (DEG.)	T <sub>w</sub> (INCH)	T <sub>BM</sub> (INCH)	T <sub>TM</sub> (INCH)	T <sub>BE</sub> (INCH)	T <sub>TE</sub> (INCH)	# STRANDS	A <sub>s</sub> (SQ. IN.)	DEBONDED STRANDS (%)	E <sub>ms</sub> (INCH)	E <sub>E</sub> (INCH)	F <sub>J</sub> (KIPS)	F <sub>r</sub> (KIPS)	CONCRETE STRENGTH		Δ (INCH)	PREDICTED RELEASE CAMBER (INCH)	PREDICTED CAMBER (INCH)	
																			f' <sub>ci</sub> (PSI)	f' <sub>c</sub> (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													

**90% 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:



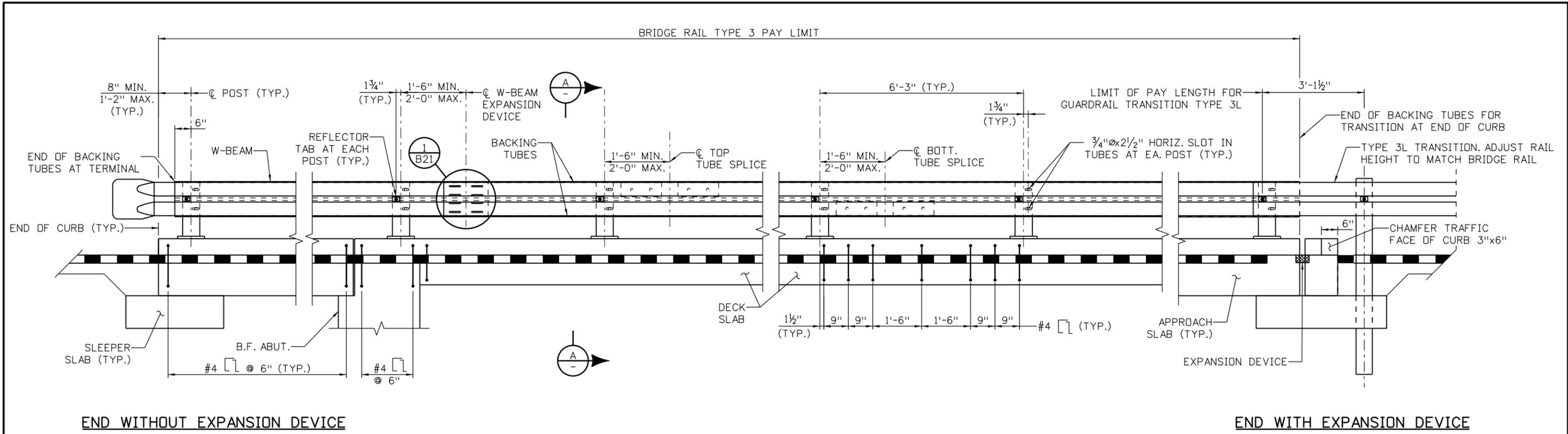
**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker INTERNATIONAL**

DESIGNED: **DLT**    CAD: **BMT**    CHECKED:    DATE: **5/3/2016**

WAGONWHEEL GAP ROAD BRIDGES  
**PRESTRESSED CONCRETE BOX (2 OF 2)**  
 PROJECT NO: 4043.SEPT12C34    SHEET NO: **111**

brett.terrell 6:08:34 PM 5/3/2016 p:\DCPW\APP1\Bkr.mbakercorp.com\pwwpro\d\Documents\Projects\Lakewood\Office\Lakewood\Boulder\County\_Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\06N\Bridges\138200\_BRD06\_31.dgn

brett.terrell 6/08/16 PM 5:31/2016 pm:\DCPW\APP1\lbr.mbakercorp.com\pwwork\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDG\_32.dgn



BRIDGE RAIL TYPE 3 PAY LIMIT

END WITHOUT EXPANSION DEVICE

END WITH EXPANSION DEVICE

ELEVATION

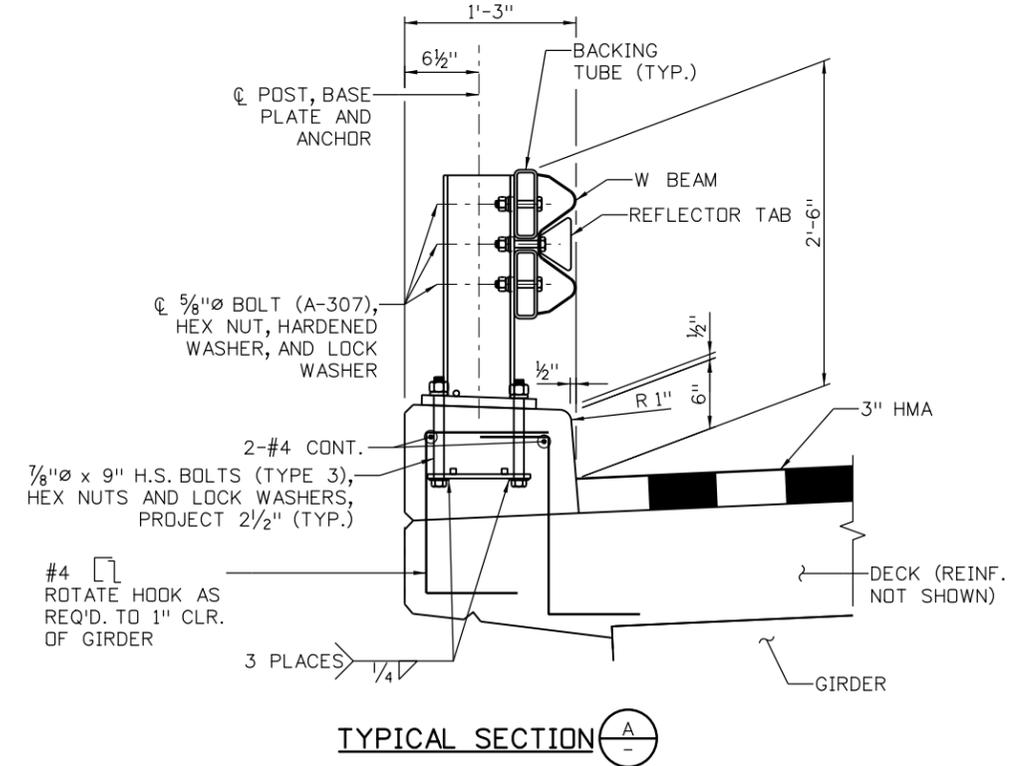
NOTES:

- 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.
- 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.

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

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

90% 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

811

NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT  
 ENGINEERING DIVISION

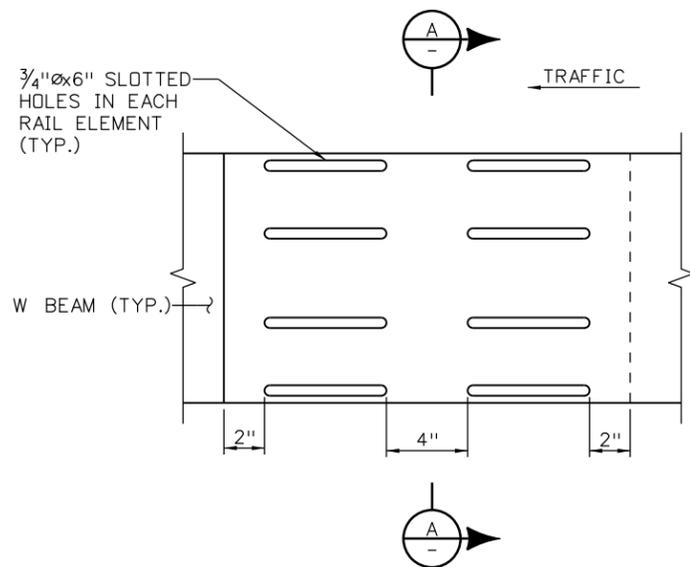
Michael Baker INTERNATIONAL

DESIGNED: DLT  
 CAD: BMT  
 CHECKED: [ ]  
 DATE: 5/3/2016

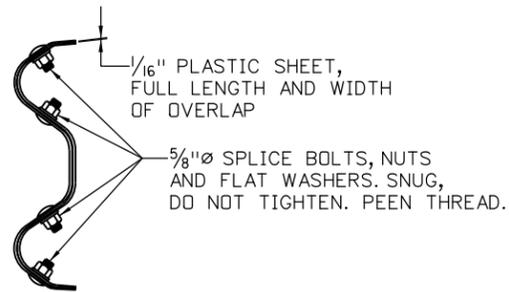
WAGONWHEEL GAP ROAD BRIDGES  
 BRIDGE RAIL TYPE 3  
 (1 OF 2)

PROJECT NO: 4043.SEPT12C34 SHEET NO: 112

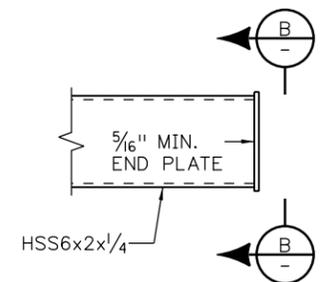
brett.terrell 6/09/16 PM 5:37/2016 p:\VDCPW\BPT1.bkr.mbakercorp.com\pwrdoc\Documents\Projects\Lakewood\_Office\Boulder\_County\_Emergency\_Transportation\T04\08\_Sheet\_L\_Files\06\_Structures\UGN\Bridges\138200\_BRDC\_33.dgn



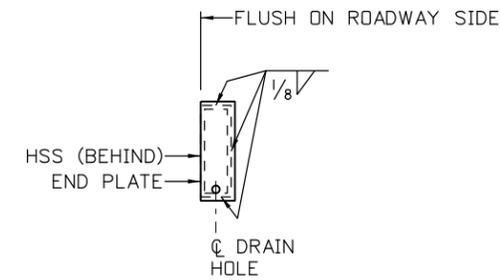
**W-BEAM EXPANSION DEVICE DETAIL** (1/B20)  
SPLICE BOLTS NOT SHOWN



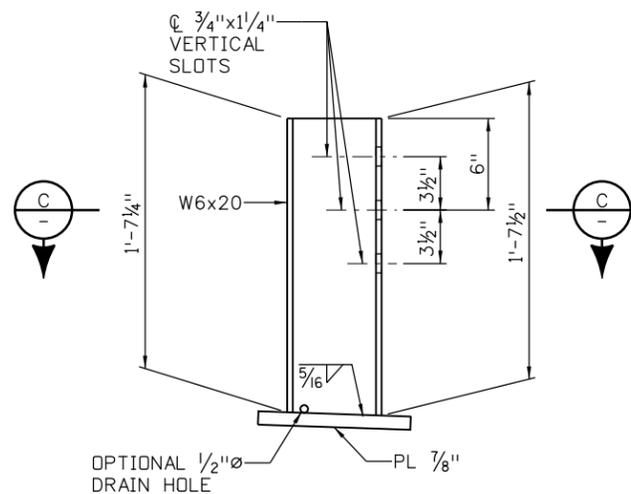
**SECTION A-A**



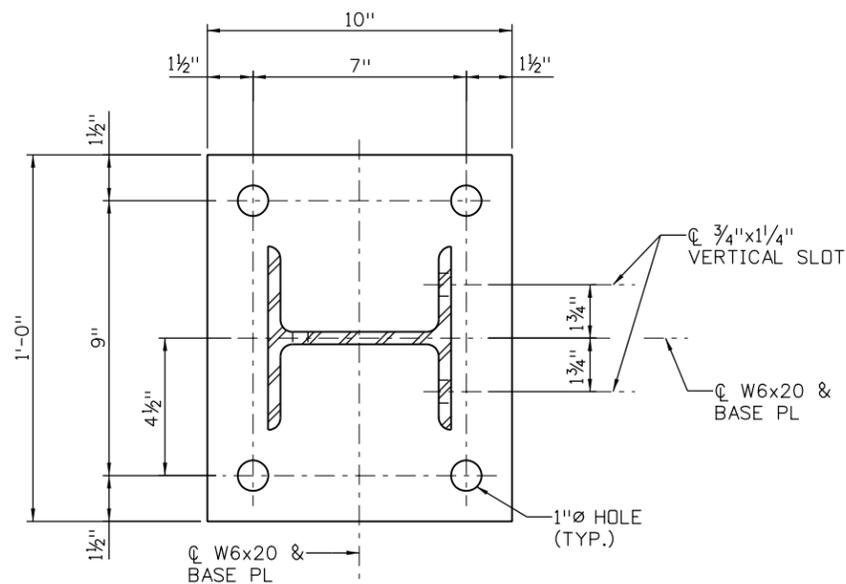
**BACKING TUBE DETAIL**



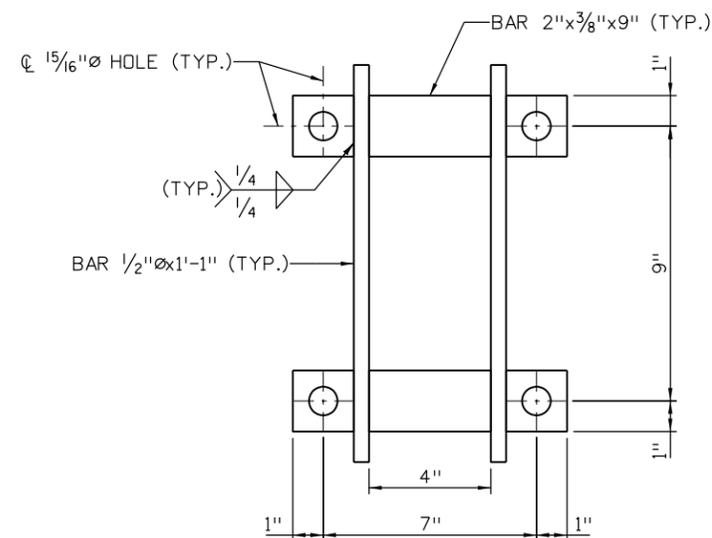
**VIEW B-B**



**POST DETAIL**



**SECTION C-C**



**ANCHOR DETAIL**

90% 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

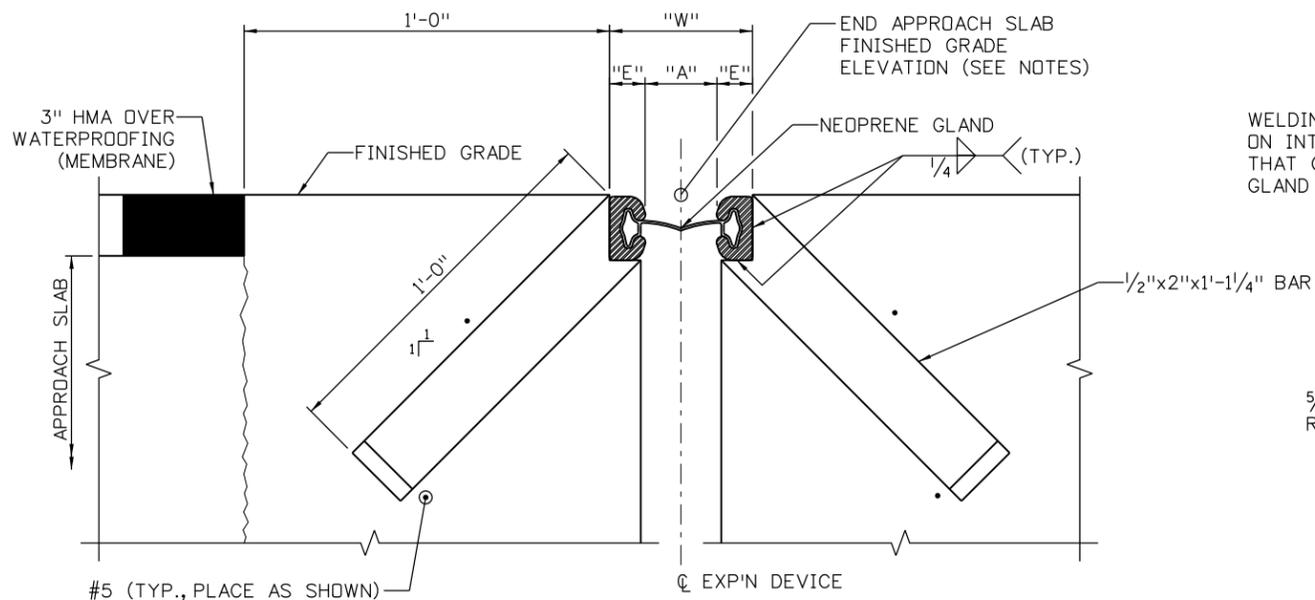
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



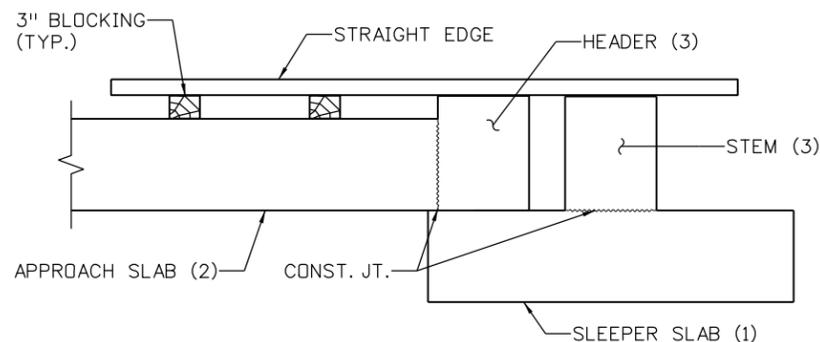
**BOULDER COUNTY TRANSPORTATION DEPARTMENT**  
**ENGINEERING DIVISION**  
**Michael Baker**  
INTERNATIONAL  
DESIGNED: DLT  
CAD: BMT  
CHECKED: DATE: 5/3/2016

WAGONWHEEL GAP ROAD BRIDGES  
**BRIDGE RAIL TYPE 3**  
**(2 OF 2)**  
PROJECT NO: 4043.SEPT12C34 SHEET NO: 113

brett.terrell 6/09:35 PM 5/3/2016 p:\DCPW\APP1\lbr.mbakercorp.com\prowd\Documents\Projects\Lakewood\Office\Boulder\County\_Emergency\_Transportation\T04\_08\_Sheet\_Files\06\_Structures\06N\_Bridges\138200\_BRDC\_34.dgn



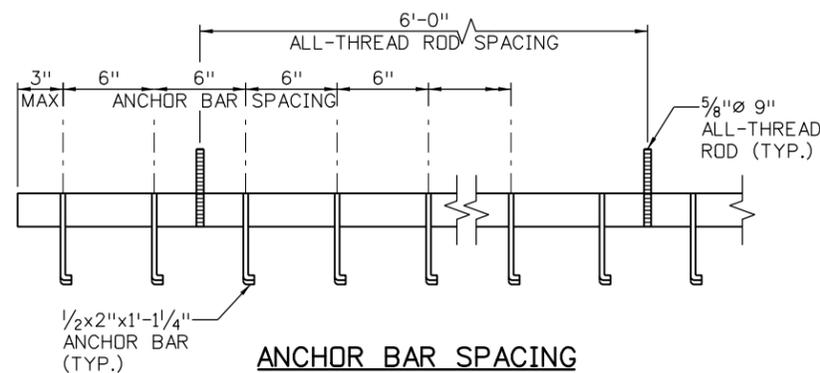
**SECTION B**  
STRIP SEAL



**GRADE PROJECTION SCHEME**  
(NUMBERS IN PARENTHESES REFER TO FIRST, SECOND AND THIRD CONCRETE POURS)

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

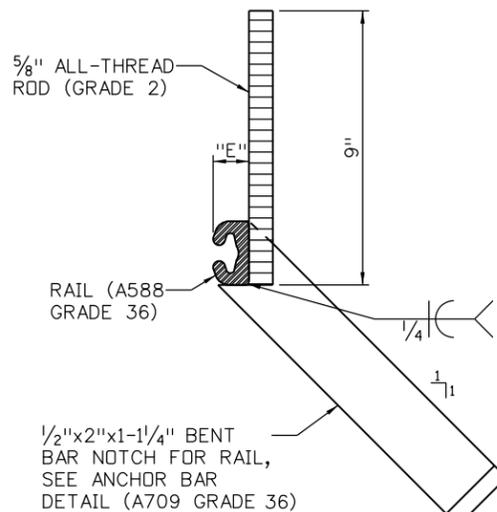
\*For E = 1 1/4" (Min.)



**ANCHOR BAR SPACING**

WELDING NOT ALLOWED ON INTERIOR OF RAIL THAT CONTACTS RUBBER GLAND

**RAIL FIELD SPLICE DETAIL**



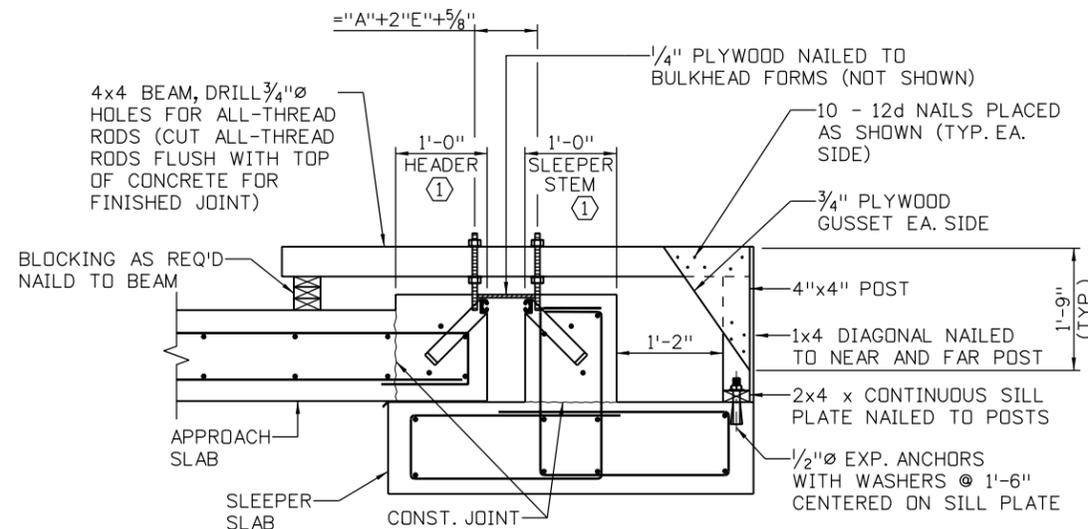
**ANCHORAGE DETAIL**

**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 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:**

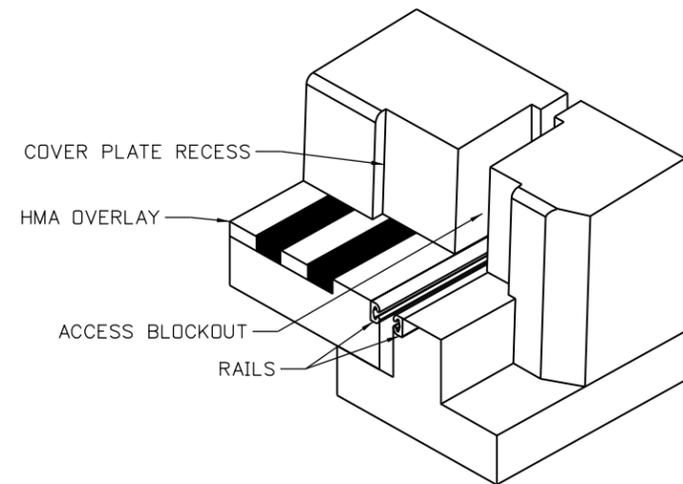
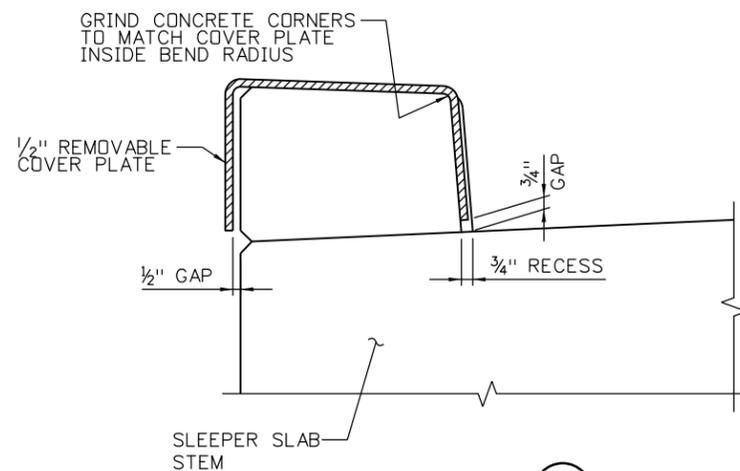
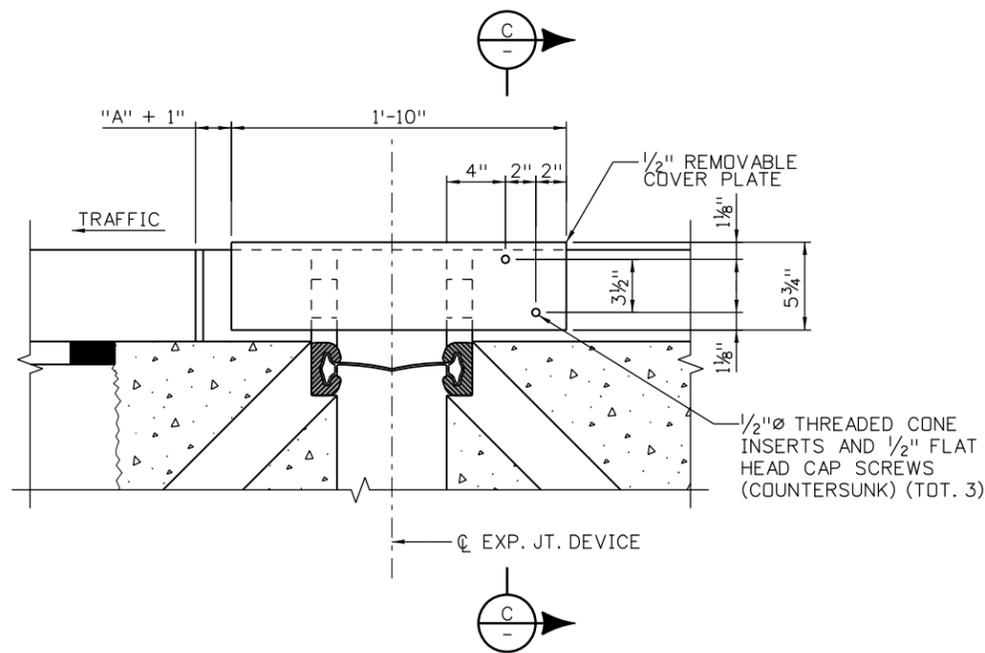
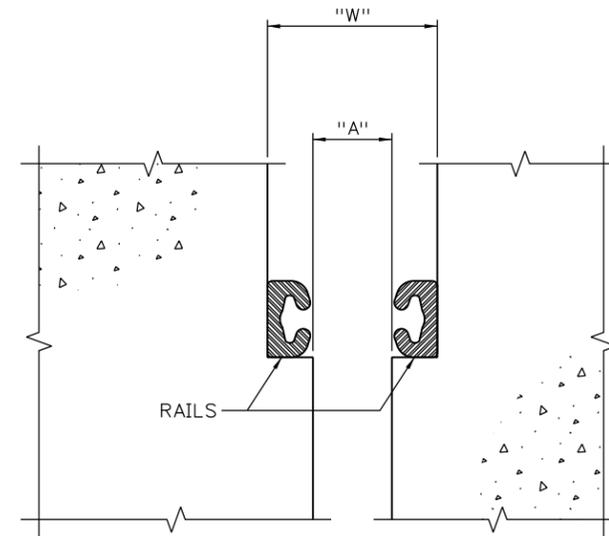
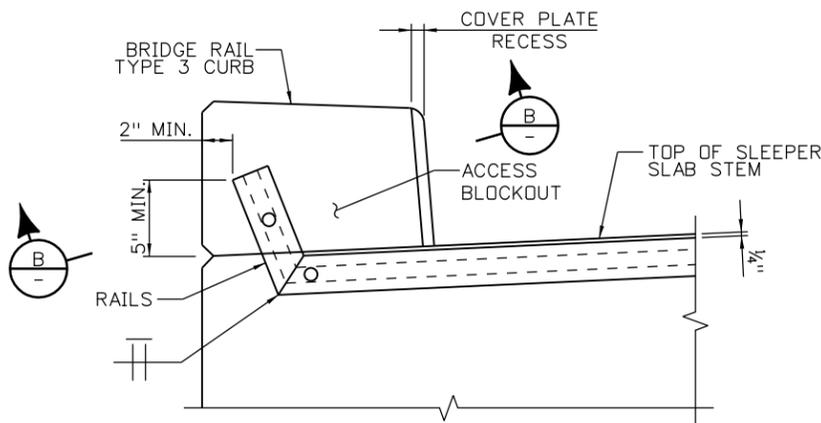
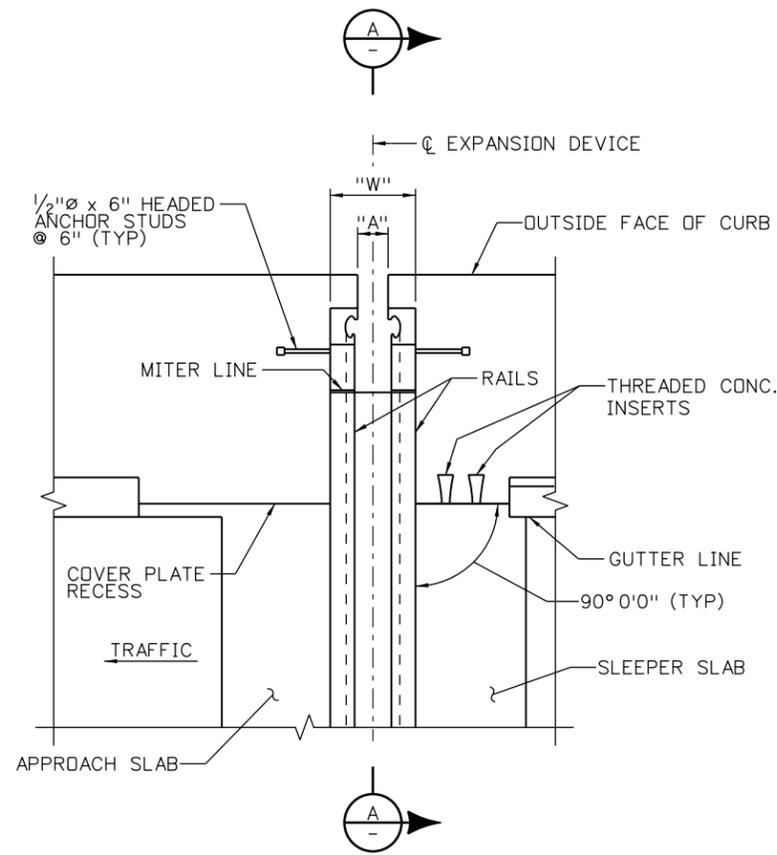
1. CONCRETE SHALL BE PLACED AFTER EXPANSION DEVICE HAS BEEN ADJUSTED TO PROPER GRADE AND APPROVED BY THE ENGINEER USING THE GRADE PROJECTION SCHEME



**EXPANSION DEVICE SUPPORT DETAIL**

<b>90% SET</b>	<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>	NO.	DATE	REVISION DESCRIPTION:	<p><b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b></p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p><b>WAGONWHEEL GAP ROAD BRIDGES</b> <b>EXPANSION DEVICE (0-4 INCH)</b> <b>(1 OF 2)</b></p>
						<p><b>Michael Baker</b> INTERNATIONAL</p>	DLT	BMT		

brett.terrell 6/10/01 PM 5/3/2016 p.w. \VDCPWAPP1.bkr.mbakercorp.com\prowod\Documents\Projects\Lakewood\Office\Boulder\County\Emergency\_Transportation\T04\08\_Sheet\_Files\06\_Structures\Bridges\138200\_BRDG\_35.dgn



90% 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><b>BOULDER COUNTY TRANSPORTATION DEPARTMENT</b> <b>ENGINEERING DIVISION</b></p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>WAGONWHEEL GAP ROAD BRIDGES <b>EXPANSION DEVICE (0-4 INCH)</b> (2 OF 2)</p>
							<p><b>Michael Baker INTERNATIONAL</b></p>	DLT	BMT		