TABULATION OF LENGTH

STATION	LINEAR FEET CHANNEL	LINEAR FEET MAJOR STRUCTURE
HAPPY CANYON CREEK 2+00.00 BEGIN CHANNEL 23+00.00 END CHANNEL	2,100.00	
HAPPY CANYON CREEK BOX CULVERT 2+75.75 BEGIN BOX CULVERT 3+21.12 END BOX CULVERT		45.37
HAPPY CANYON CREEK ACCESS 71+00.00 BEGIN ACCESS 85+32.07 END ACCESS	1,432.07	
REGIONAL TRAIL 23+00.00 BEGIN TRAIL 27+28.51 END TRAIL	428.51	
CHEROKEE TRAIL 51+50.00 BEGIN TRAIL 53+65.80 END TRAIL	215.80	
BELFORD AVENUE BRIDGE 93+64.92 BEGIN BRIDGE 95+63.15 END BRIDGE		198.23
TOTALS	4,176.38	243.60
SUMMARY	LIN. FT.	MILES
Channel	2,100.00	0.4
Trail & Access	2,076.38	0.4
Major Structures	243.60	0.05
GROSS AND NET LENGTH	4,419.98	0.85

BELFORD AVENUE DESIGN DATA	
Minimum Curve Radius (Feet)	762
Maximum Grade	5.0%
Minimum S.S.D. Horizontal (Feet)	305
Minimum S.S.D. Vertical (Feet)	305
Minimum Design Speed (MPH)	40
Posted Speed Limit (MPH)	35
Superelevation e(Max.)	NC
2035 Design Traffic	N/A
DHV Trucks %	N/A

TOWN OF PARKER APPROVALS

THE TOWN OF PARKER REVIEW CONSTITUTES GENERAL COMPLIANCE WITH THE TOWNS STANDARDS AND APPROVED VARIANCES, SUBJECT TO THESE PLANS BEING STAMPED, SIGNED, AND DATED BY THE PROFESSIONAL ENGINEER OF RECORD. REVIEW BY THE TOWN DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY AND CORRECTNESS OF ENGINEERING CALCULATION. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN THE RESPONSIBILITY OF THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT.

THIS REVIEW DOES NOT CONSTITUTE APPROVAL OF ANY PRIVATE ON-SITE IMPROVEMENTS WHICH MAY BE SHOWN. CONSTRUCTION CANNOT COMMENCE UNTIL ALL REQUIRED DRAINAGE/TRAFFIC REPORT(S), FINAL DEVELOPMENT PLAN(S), SPECIAL REVIEW(S), GRADING PERMIT, AND/OR OTHER PERMITS ARE COMPLETE, APPROVED AND ON FILE WITH THE TOWN OF PARKER.

TOWN OF PARKER, PUBLIC WORKS DIRECTOR — DATE

TOWN OF PARKER, PUBLIC WORKS MANAGER – STORMWATER — DATE

TOWN OF PARKER, PUBLIC WORKS MANAGER – TRANSPORTATION — DATE

PARKER
COLORADO

CONSTRUCTION PLANS

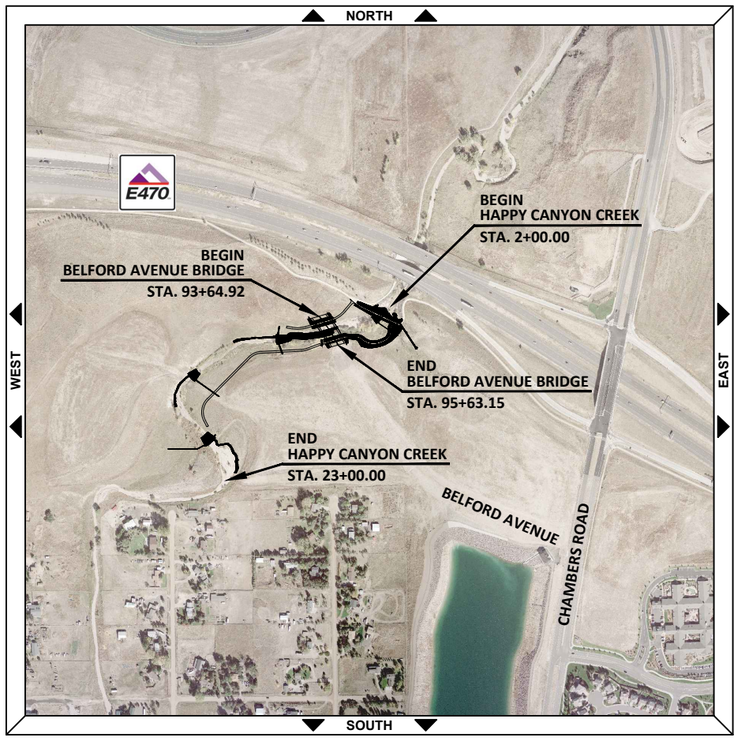
PLAN AND PROFILE OF PROPOSED
BELFORD AVENUE BRIDGE AND HAPPY CANYON CREEK
TOWN OF PARKER, COUNTY OF DOUGLAS, STATE OF COLORADO

F.O.R. Set
NOVEMBER, 2016

SCALE OF ORIGINAL DRAWINGS

ON PLAN 1" = 40'

ON PROFILE 1" = 40' HORIZONTAL
1" = 4' VERTICAL



BASIS OF BEARING:

THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 6, TOWNSHIP 6 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN BEING MONUMENTED AS SHOWN HEREON HAVING A BEARING OF NORTH 00°29'49" WEST, AS DETERMINED BY GPS OBSERVATION FROM NGS CONTROL POINTS IN THE COLORADO CENTRAL ZONE, STATE PLAN COORDINATE SYSTEM, TOWN OF PARKER, COUNTY OF DOUGLAS, STATE OF COLORADO.

INDEX OF SHEETS

*SHEETS TO BE INCLUDED POST F.O.R. REVIEW

BENCHMARKS: (COMPARK SOUTH)

SOURCE BENCHMARKS:
DOUGLAS COUNTY BM 1.115010
A DOUGLAS COUNTY GIS MONUMENT SET IN CONCRETE LOCATED APPROXIMATELY 130 FEET SOUTHWESTERLY OF THE CENTERLINE OF CHAMBERS ROAD AND 95 FEET NORTHWESTERLY OF THE CENTERLINE OF COMPARK BOULEVARD.
ELEVATION = 5752.84 (NAVD 88)

SITE BENCHMARKS:
A NO. 5 REBAR WITH 2" ALUMINUM CAP STAMPED "LS 28286, 2001" FOUND AT THE SOUTHWEST CORNER OF SECTION 6, T6S, R66W LOCATED ON THE WEST LINE OF FIRST STREET APPROXIMATELY 1000 FEET NORTH OF ELM AVENUE.
ELEVATION = 5845.51

A 2.5" IRON PIPE WITH 3.25" ALUMINUM CAP STAMPED "PLS 12405, 1997" FOUND AT THE SOUTHEAST CORNER OF SECTION 6, T6S, R66W LOCATED APPROXIMATELY 960 FEET NORTH OF THE CENTERLINE OF AVENTERRA PARKWAY AND APPROXIMATELY 1050 FEET WEST OF THE CENTERLINE OF CHAMBERS ROAD.
ELEVATION = 5808.06

811 Know what's below. Call before you dig.

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Print Date: 11/18/2016 8:04:44 AM	Sheet Revisions			As Constructed	BELFORD-HAPPY CANYON CREEK TITLE SHEET	Project No./Code
File Name: A115360-01TTL01.dwg	(R-X)	Date	Comments	Initials	No Revisions:		
Horizontal Scale: NTS Vertical Scale: NTS					Revised:	Designer: DCS / Structure Numbers	
FELSBURG HOLT & ULLEVIG 6300 South Syracuse Way, Suite 600 Centennial, CO 80111 tel 303.721.1440 fax 303.721.0832					Void:	Detailer: DCS / Subset: TITLE / Sheets: T-1 of 1	Sheet Number 1

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GENERAL NOTES

ALL WORK TO BE CONDUCTED WITHIN THE PROJECT LIMITS SHALL BE COMPLETED IN ACCORDANCE WITH THE TOWN OF PARKER DESIGN AND CONSTRUCTION STANDARDS, LATEST EDITION, CDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, AND ITS SUPPLEMENTS, CDOT STANDARD PLANS (M&S STANDARDS), LATEST EDITION, AND THE APPROVED PLANS AND SPECIFICATIONS.

ALL WORK ZONE TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), LATEST EDITION, THE CURRENT COLORADO SUPPLEMENTS, AND THE APPROVED PLANS AND SPECIFICATIONS.

UTILITIES

UTILITY INFORMATION AS SHOWN ON THE PLAN SHEETS ARE PLOTTED FROM THE BEST AVAILABLE INFORMATION. THE CONTRACTOR'S ATTENTION IS DIRECTED TO PARAGRAPH 105.11 OF THE STANDARD SPECIFICATIONS CONCERNING UTILITIES. THE CONTRACTOR SHALL CALL 811 FOR UTILITY LOCATIONS AT LEAST 2 WORKING DAYS PRIOR TO ANY DIGGING, NOT INCLUDING THE DAY OF ACTUAL CONTACT.

811 Know what's below. Call before you dig.

IT IS ESTIMATED THAT EIGHT (8) HOURS WILL BE REQUIRED FOR UTILITY POTHOLING.

EARTHWORK

WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE AS ORDERED BY THE ENGINEER AND WILL NOT BE PAID FOR SEPARATELY.

DEPTH OF MOISTURE – DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS:

FULL DEPTH OF ALL EMBANKMENTS
BASES OF CUTS AND FILLS = 8 INCHES

EXCAVATION REQUIRED FOR COMPACTION OF BASES OF CUTS AND FILLS WILL BE CONSIDERED SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPARATELY.

THE TYPE OF COMPACTION FOR EARTHWORK ON THIS PROJECT SHALL BE ASTM D698 FOR COHESIVE SOILS OR ASTM D 1557 FOR GRANULAR SOILS. THE FOLLOWING COMPACTION SPECIFICATIONS SHOULD BE FOLLOWED FOR EACH AREA:

BENEATH STRUCTURAL AREAS: 95% OF MAXIMUM DRY DENSITY
BENEATH NON–STRUCTURAL AREAS: 90% OF MAXIMUM DRY DENSITY

THE CONTRACTOR SHALL REFER TO THE FINAL GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION ON MOISTURE CONTROL AND COMPACTION.

RIGHT OF WAY

EXISTING RIGHT OF WAY INFORMATION AS SHOWN ON THE PLAN SHEETS ARE PLOTTED FROM THE BEST AVAILABLE INFORMATION.

CONSTRUCTION

REMOVAL OF CONCRETE PAVEMENT REQUIRED ON THIS PROJECT SHALL BE SAW CUT TO A VERTICAL EDGE. COST TO BE INCLUDED IN THE WORK.

ANY CONCRETE PAVEMENT, WHICH IS TO REMAIN AND IS DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATION, SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

SHORING MAY BE REQUIRED TO CONSTRUCT THE IMPROVEMENTS IDENTIFIED FOR THIS PROJECT INCLUDING UTILITY RELOCATIONS, STORM SEWER PIPES, DRAINAGE STRUCTURES AND OTHER PROPOSED IMPROVEMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY REQUIRED SHORING AREAS. ALL REQUIRED SHORING FOR THIS PROJECT WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.

THE CONCENTRATION OF WATER–SOLUBLE SULFATES OF THE ONSITE SOILS INDICATED CONCENTRATIONS OF LESS THAN 100 PPM (PARTS PER MILLION) TO 100 PPM. THIS IS CONSIDERED TO BE A NEGLIGIBLE CONCENTRATION RELATIVE TO POTENTIAL CORROSIVE ATTACK ON CONCRETE. THEREFORE, ALL CONCRETE IN CONTACT WITH THE SOILS ON THE SITE MAY BE DESIGNED FOR NEGLIGIBLE SULFATE EXPOSURE (SØ) IN ACCORDANCE WITH THE CURRENT AMERICAN CONCRETE INSTITUTE (ACI) MANUAL.

WATER MAY BE PURCHASED FROM THE STONEGATE WATER AND SANITATION DISTRICT.

THE END POSTS AND CORNER POSTS ARE NOT PAID FOR SEPARATELY BUT ARE INCLUDED IN THE FENCE BID ITEM.

This project is subject to a permit with the Colorado Department of Health for Stormwater Discharges Associated with Construction Activities. The permit shall be obtained by the Contractor. The Contractor shall prepare all applications required and submit to the Colorado Department of Health. The Contractor shall submit a copy of the permit to the Engineer prior to the start of Construction. The Contractor is Responsible for all permit application fees.

UTILITY LIST

THE FOLLOWING IS A LIST OF KNOWN UTILITIES WITH SERVICES WITHIN THE PROJECT LIMITS:

IRSA
BROOKS KAUFMAN (303) 688–3100 PHONE

CenturyLink
WILLIAM BENSON (303) 792–6069 PHONE

CDPHE
COLORADO DEPARTMENT OF HEALTH (303) 320–8333 PHONE

Comcast
KEVIN YOUNG (720) 490–3867 PHONE

Xcel Energy
MICHELLE O'NAN (303) 329–1618 PHONE

PARKER COLORADO
PUBLIC WORKS (303) 840–9546 PHONE
STREETS – ALEX MESTDAGH
STORM WATER – JACOB JAMES
EROSION CONTROL – ADAM NELSON

STONEGATE VILLAGE METRO DISTRICT
DISTRICT ENGINEER:
SCOTT BARNETT (303) 858–9909 PHONE
DISTRICT MANAGER:
KURT SCHLIEGER (303) 381–4968 PHONE

COMPARK VILLAGE CAMPUS METRO DISTRICT
CLIFFTON LARSON ALLEN (303) 779–4525 PHONE

STANDARD ABBREVIATION/DEFINITIONS

THE FOLLOWING IS A LIST OF ABBREVIATIONS USED IN THE CONTRACT DOCUMENTS:

HCL	–	HORIZONTAL CONTROL LINE
PGL	–	PROFILE GRADE LINE
HMA	–	HOT MIX ASPHALT
NTS	–	NOT TO SCALE
ROW	–	RIGHT OF WAY
RCP	–	REINFORCED CONCRETE PIPE
PVC	–	POLYVINYL CHLORIDE PIPE
PI	–	POINT OF INTERSECTION
PC	–	POINT OF CURVATURE
PRC	–	POINT OF REVERSE CURVATURE
PT	–	POINT OF TANGENT
VPI	–	VERTICAL POINT OF INTERSECTION
VPC	–	VERTICAL POINT OF CURVATURE
VPT	–	VERTICAL POINT OF TANGENT
NC	–	NORMAL CROWN
NIC	–	NOT IN CONTRACT
NA	–	NOT APPLICABLE
POSS	–	POINT OF SLOPE SELECTION
℄	–	PROPERTY LINE

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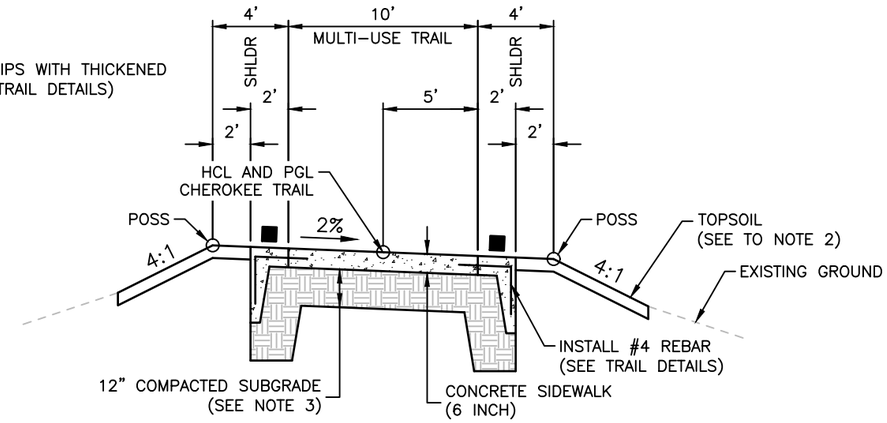
BELFORD–HAPPY CANYON CREEK
GENERAL NOTES

Designer:	DCS	Structure Numbers	
Detailer:	DCS		
Subset:	GENERAL	Sheets:	GN–1 of 1

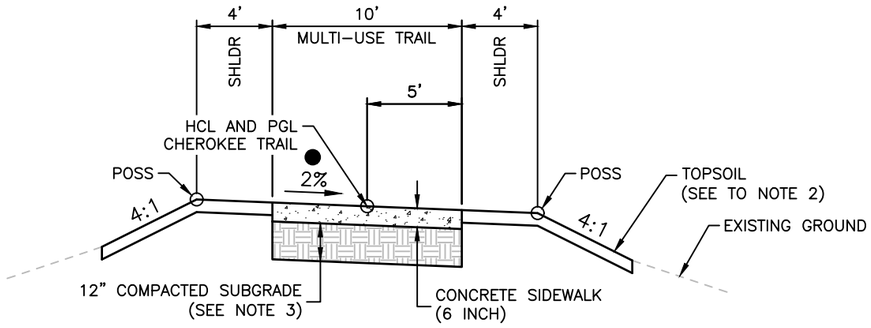
Project No./Code

Sheet Number 2

■ RUMBLE STRIPS WITH THICKENED EDGE (SEE TRAIL DETAILS)

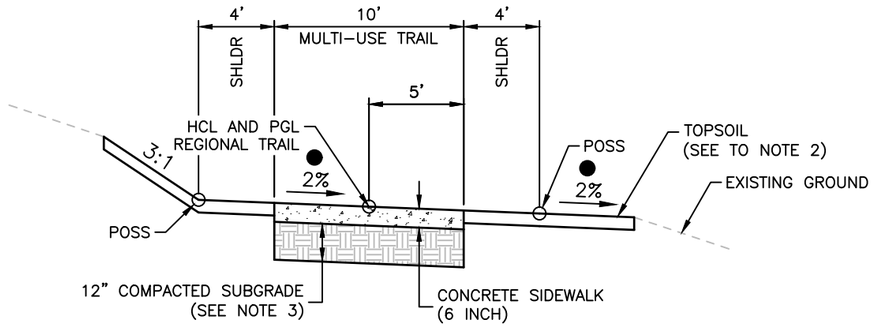


CHEROKEE TRAIL
STA 52+20.00 TO STA 52+97.00

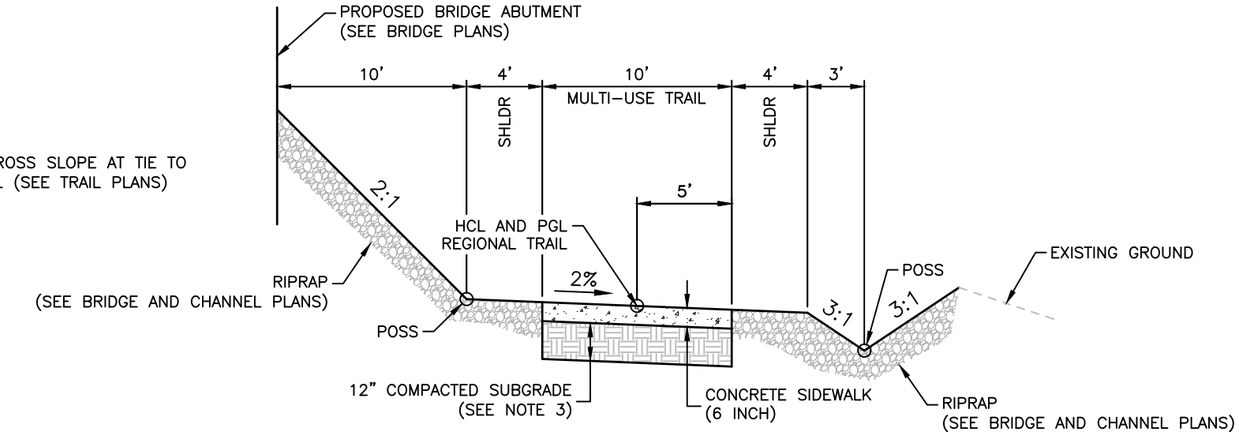


CHEROKEE TRAIL
STA 51+50.00 TO STA 52+20.00
STA 52+97.00 TO STA 53+65.80

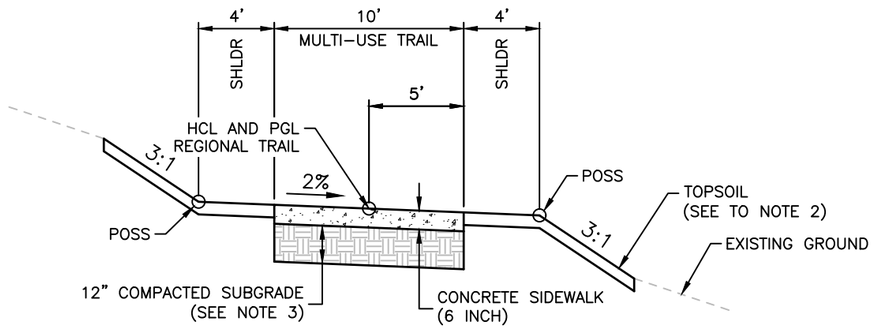
● TRANSITION CROSS SLOPE AT TIE TO EXISTING TRAIL (SEE TRAIL PLANS)



REGIONAL TRAIL
STA 26+00.00 TO STA 27+13.41



REGIONAL TRAIL
STA 24+56.59 TO STA 25+62.37



REGIONAL TRAIL
STA 23+00.00 TO STA 24+15.00

NOTES:

1. BREAK POINTS ON SLOPES AND IN BOTTOMS OF DITCHES SHALL BE ROUNDED DURING CONSTRUCTION FOR A PLEASING APPEARANCE. SEE STANDARDS FOR DETAILS OF CUT SLOPE TREATMENT, FLARING AND WIDENING.
2. THE TOPSOIL SHALL BE PLACED AT A MINIMUM DEPTH OF 4 INCHES. DUE TO THE ANTICIPATED EXCESS AMOUNT OF TOPSOIL, SOME SURFACES WILL CONTAIN TOPSOIL EXCEEDING 4 INCHES IN DEPTH.
3. THE SUBGRADE SHALL BE THOROUGHLY COMPACTED TO NINETY–FIVE PERCENT (95%) MODIFIED PROCTER DENSITY AT ± TWO PERCENT (2%) OF OPTIMUM MOISTURE.

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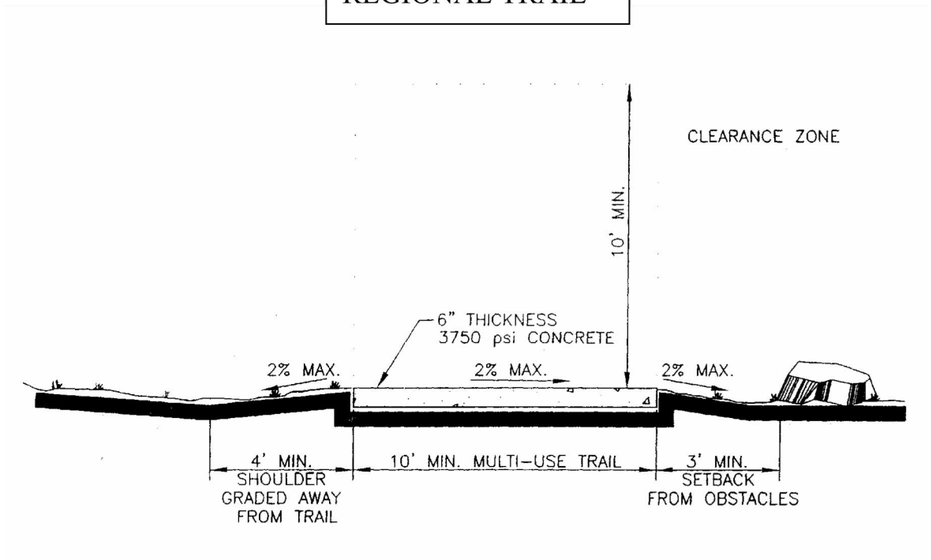
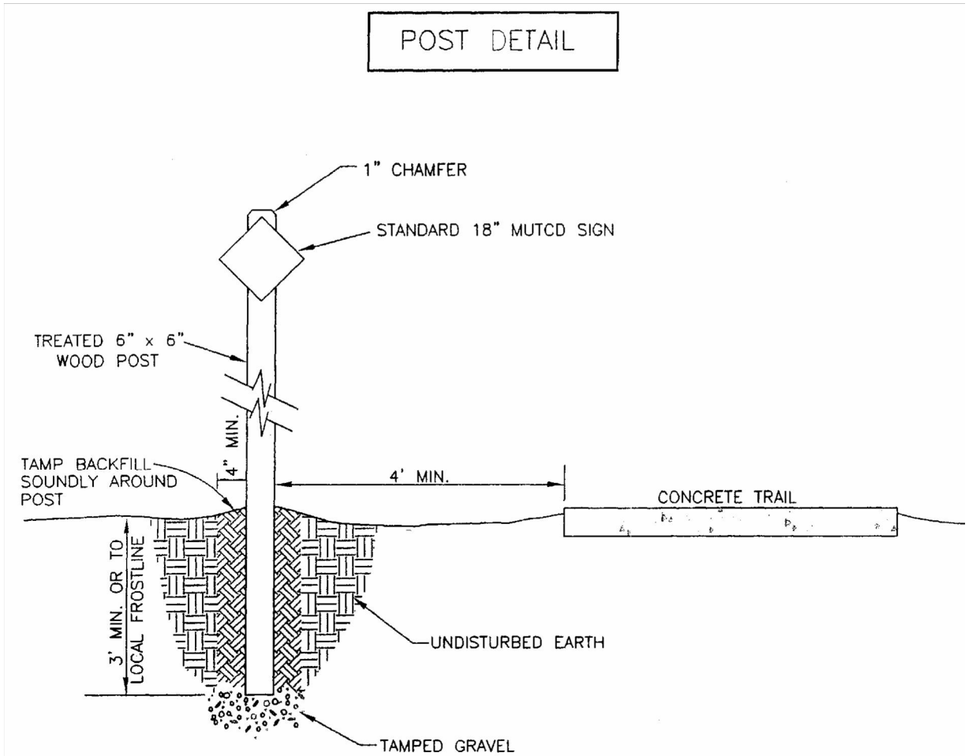
BELFORD–HAPPY CANYON CREEK TRAIL TYPICAL SECTIONS				Project No./Code
Designer: DCS	Structure Numbers			
Detailer: DCS				
Subset: TRAIL	Sheets:	TY–1 of 1	Sheet Number	3

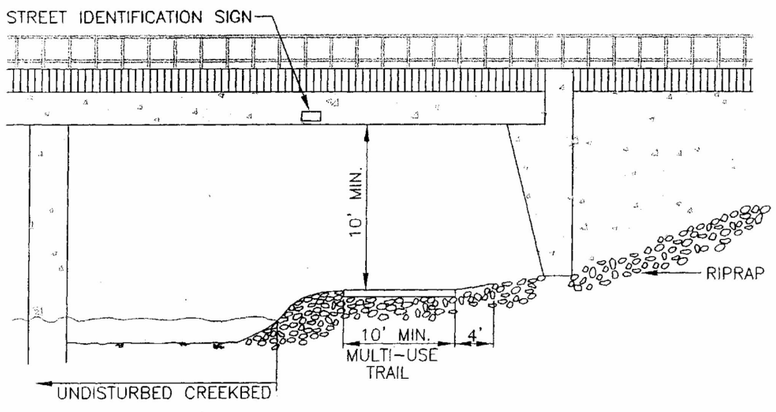
REGIONAL TRAIL



POST DETAIL



BRIDGE UNDERPASS



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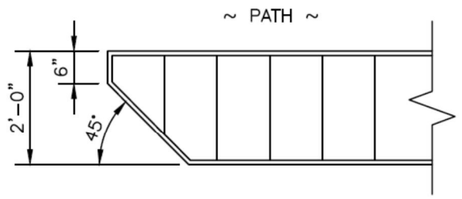
BELFORD-HAPPY CANYON CREEK TRAIL DETAILS

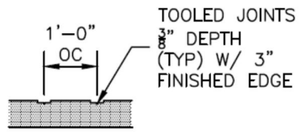
Designer:	DCS	Structure Numbers	
Detailer:	DCS		
Subset:	TRAIL	Sheets:	TD-1 of 2

Project No./Code

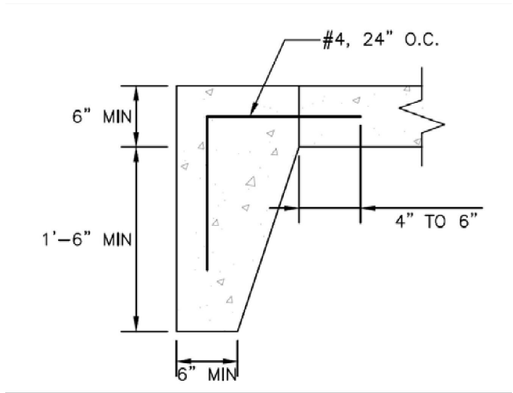
Sheet Number 4



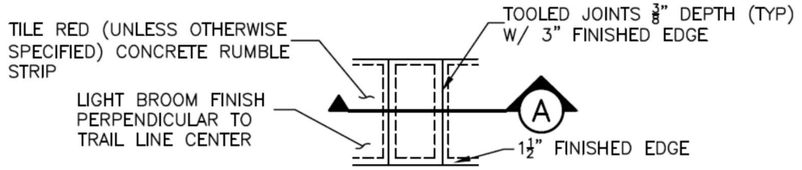
TYPICAL RETURN PLAN



SECTION A



THICKENED EDGE



TYPICAL SCORING PLAN

RUMBLE STRIPS WITH THICKENED EDGE DETAILS

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BELFORD-HAPPY CANYON CREEK TRAIL DETAILS

Designer:	DCS	Structure Numbers	
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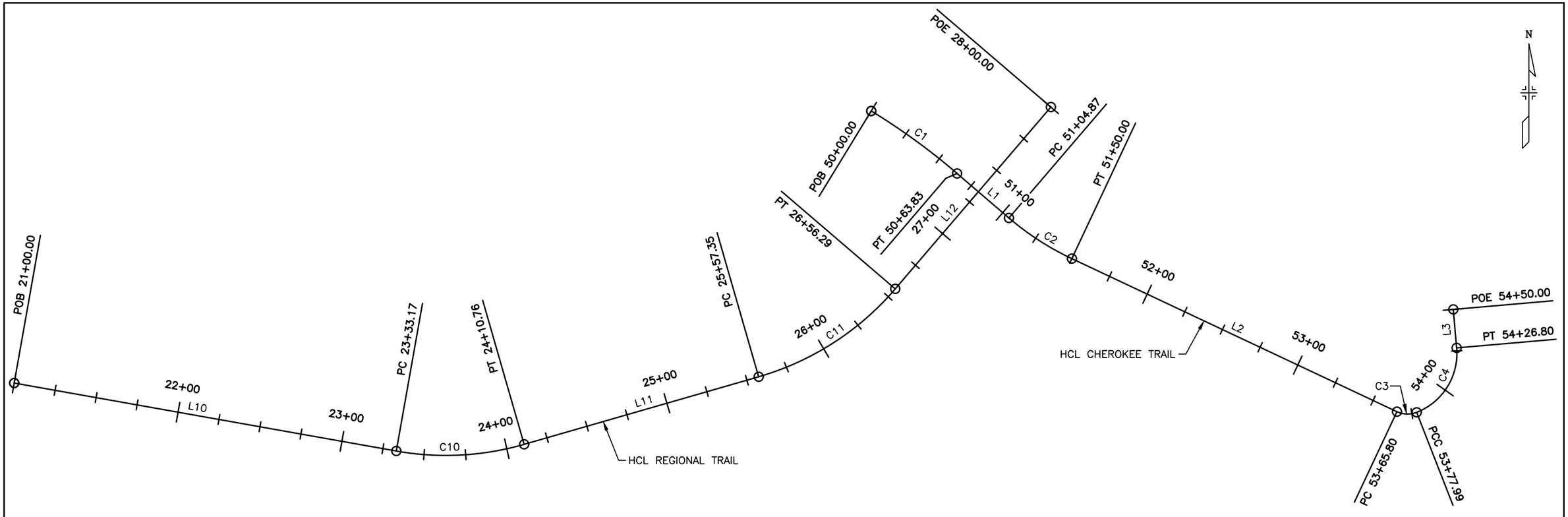
Subset:	TRAIL	Sheets:	TD-2 of 2

Project No./Code

Sheet Number 5



HCL – PARKER TRAIL

NO.		STATION	NORTHING	EASTING	LENGTH	LINE/CHORD BEARING	DELTA	TANGENT	RADIUS
L10		21+00.00 23+33.17	27876.4111 27835.5854	94062.1387 94291.7046	233.17'	S79°54'57.64"E			
C10	PC= PI= PT=	23+33.17 23+72.65 24+10.76	27835.5854 27828.6723 27839.5991	94291.7046 94330.5772 94368.5177	77.59'	N87°00'31.78"E	026°09'01.16"	39.48'	170.00'
L11		24+10.76 25+57.35	27839.5991 27880.1678	94368.5177 94509.3818	146.59'	N73°56'01.20"E			
C11	PC= PI= PT=	25+57.35 26+08.27 26+56.29	27880.1678 27894.2596 27932.9294	94509.3818 94558.3119 94591.4387	98.95'	N57°15'34.17"E	033°20'54.07"	50.92'	170.00'
L12		26+56.29 28+00.00	27932.9294 28042.0655	94591.4387 94684.9312	143.71'	N40°35'07.13"E			

HCL – E470 TRAIL

NO.		STATION	NORTHING	EASTING	LENGTH	LINE/CHORD BEARING	DELTA	TANGENT	RADIUS
C1	PC= PI= PT=	50+00.00 50+31.98 50+63.83	28039.6943 28023.0114 28002.2052	94577.0255 94604.3105 94628.5981	63.83'	S53°59'09.26"E	009°08'32.78"	31.98'	400.00'
L1		50+63.83 51+04.87	28002.2052 27975.5018	94628.5981 94659.7697	41.05'	S49°24'52.87"E			
C2	PC= PI= PT=	51+04.87 51+27.57 51+50.00	27975.5018 27960.7331 27951.0696	94659.7697 94677.0095 94697.5507	45.13'	S57°06'36.30"E	015°23'26.87"	22.70'	168.00'
L2		51+50.00 53+65.80	27951.0696 27859.2038	94697.5507 94892.8240	215.80'	S64°48'19.74"E			
C3	PC= PI= PT=	53+65.80 53+72.26 53+77.99	27859.2038 27856.4559 27858.8084	94892.8240 94898.6649 94904.6759	12.19'	S88°05'21.16"E	046°34'02.84"	6.45'	15.00'
C4	PC= PI= PT=	53+77.99 54+06.42 54+26.80	27858.8084 27869.1674 27897.4855	94904.6759 94931.1459 94928.6846	48.81'	N31°49'47.19"E	073°35'40.47"	28.42'	38.00'
L3		54+26.80 54+50.00	27897.4855 27920.5941	94928.6846 94926.6761	23.20'	N04°58'03.05"W			

HORIZONTAL SCALE: 1"=60'

0 30 60 120

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Revised:
Void:

BELFORD–HAPPY CANYON CREEK TRAIL GEOMETRIC LAYOUT

Designer: DCS
Detailer: DCS
Subset: TRAIL
Structure Numbers:
Sheets: TG–1 of 1

Project No./Code

Sheet Number 6

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\, Dustin.Shaklee

PROPERTY OF
470 COMPARK LLC
C/O MPV COMPARK MANAGEMENT LLC
DENVER, CO 80206

PROPOSED R.O.W.
BELFORD AVENUE

PERMANENT SLOPE AND
DRAINAGE EASEMENT
BELFORD AVENUE

BEGIN CONSTRUCTION
REGIONAL TRAIL
STA 23+00.00

23+00

PC 23+33.17

PT 24+10.76

24+00

10'

5'

HCL REGIONAL TRAIL

DROP STRUCTURE (TYP)
(SEE CHANNEL PLANS)

25+00

PC 25+57.35

26+00

PT 26+56.29

STA 26+31.00
BEGIN TRAIL CROSS
SLOPE TRANSITON

RIPRAP
(SEE BRIDGE AND CHANNEL PLANS)

CHANNEL MAINTENANCE
ACCESS

PROPERTY OF
COMPARK 190 LLC
4600 S ULSTER ST SUITE 1400
DENVER, CO 80237-2850

FOR HYDRAULIC INFORMATION
(SEE CHANNEL PLANS)

PROPOSED BELFORD AVENUE
(BY OTHERS)

BELFORD AVE

PROPOSED R.O.W.
BELFORD AVENUE

PERMANENT SLOPE AND
DRAINAGE EASEMENT
BELFORD AVENUE

PROPOSED WATER LINE
(BY OTHERS)

PROPOSED SANITARY SEWER LINE
(BY OTHERS)

PROPERTY OF
470 COMPARK LLC
C/O MPV COMPARK MANAGEMENT LLC
DENVER, CO 80206

50+00

END CONSTRUCTION
REGIONAL TRAIL
STA 27+28.51

MATCH EXISTING
TRAIL SLOPE

28+00

R=15'

PT 50+63.83

27+00

10'

5'

R=15'

PC 51+04.87

51+00

PT 51+50.00

52+00

PROPOSED BELFORD
AVENUE BRIDGE
(SEE BRIDGE PLANS)

HAPPY CANYON CREEK

PROPOSED CHEROKEE TRAIL
(SEE TP-2)

PROPERTY OF
COMPARK 190 LLC
4600 S ULSTER ST SUITE 1400
DENVER, CO 80237-2850

NOTES:

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.

2. EASEMENTS SHALL NOT BE CLEARED AND GRUBBED UNLESS IT IS REQUIRED IN ORDER TO CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL USE PARTICULAR CARE TO MINIMIZE DAMAGE TO PLANTINGS WITHIN THE PROPERTY.

LEGEND

- TOP OF CUT
- TOE OF FILL
- LIMITS OF CONCRETE SIDEWALK (6 INCH)

N

HORIZONTAL SCALE: 1"=40'

0 20 40 80

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No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK
PROPOSED
REGIONAL TRAIL PLAN

Designer:	DCS	Structure Numbers	
Detailer:	DCS		
Subset:	TRAIL	Sheets:	TP-1 of 2

Project No./Code

Sheet Number 7

PROPERTY OF
470 COMPARK LLC
C/O MPV COMPARK MANAGEMENT LLC
DENVER, CO 80206

PROPOSED WATER LINE
(BY OTHERS)

BEGIN CONSTRUCTION
CHEROKEE TRAIL
STA 51+50.00

HCL CHEROKEE TRAIL

50+00

PC 51+04.87

PT 51+50.00

RUMBLE STRIPS WITH
THICKENED EDGE
STA 52+20 TO STA 52+97
(SEE TRAIL TYPICAL
SECTIONS AND DETAILS)

51+00

52+00

53+00

10'

5'

PROPERTY OF
PLATTE VALLEY COMMERCIAL GROUP
4900 MAIN STREET
KANSAS CITY, MO 64112–2630

PROPERTY OF
COMPARK 190 LLC
4600 S ULSTER ST SUITE 1400
DENVER, CO 80237–2850

54+50

54+00

PT 54+26.80

FOR HYDRAULIC INFORMATION
(SEE CHANNEL PLANS)

PCC 53+77.99

END CONSTRUCTION
CHEROKEE TRAIL
STA 53+65.80

PC 53+65.80

MATCH EXISTING
TRAIL SLOPE

PROPERTY OF
470 COMPARK LLC
C/O MPV COMPARK MANAGEMENT LLC
DENVER, CO 80206

PT 50+63.83

27+00

MATCH EXISTING
TRAIL SLOPE

STA 52+00.00
END TRAIL CROSS
SLOPE TRANSITON

STA 53+35.00
BEGIN TRAIL CROSS
SLOPE TRANSITON

PT 26+56.29

PROPOSED BELFORD AVENUE
(BY OTHERS)

PROPOSED REGIONAL TRAIL
(SEE TP–1)

PC 25+57.35

26+00

RIPRAP
(SEE BRIDGE AND CHANNEL PLANS)

PROPOSED BELFORD
AVENUE BRIDGE
(SEE BRIDGE PLANS)

BELFORD AVE

HAPPY CANYON CREEK

PROPOSED SANITARY SEWER LINE
(BY OTHERS)

PROPERTY OF
COMPARK 190 LLC
4600 S ULSTER ST SUITE 1400
DENVER, CO 80237–2850

CHANNEL MAINTENANCE
ACCESS

PROPOSED R.O.W.
BELFORD AVENUE

PERMANENT SLOPE AND
DRAINAGE EASEMENT
BELFORD AVENUE

PROPERTY OF
COMPARK 190 LLC
4600 S ULSTER ST SUITE 1400
DENVER, CO 80237–2850

NOTES:

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.

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LEGEND

- TOP OF CUT
- TOE OF FILL
- LIMITS OF CONCRETE SIDEWALK (6 INCH)

N

HORIZONTAL SCALE: 1"=40'

0 20 40 80

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Void:

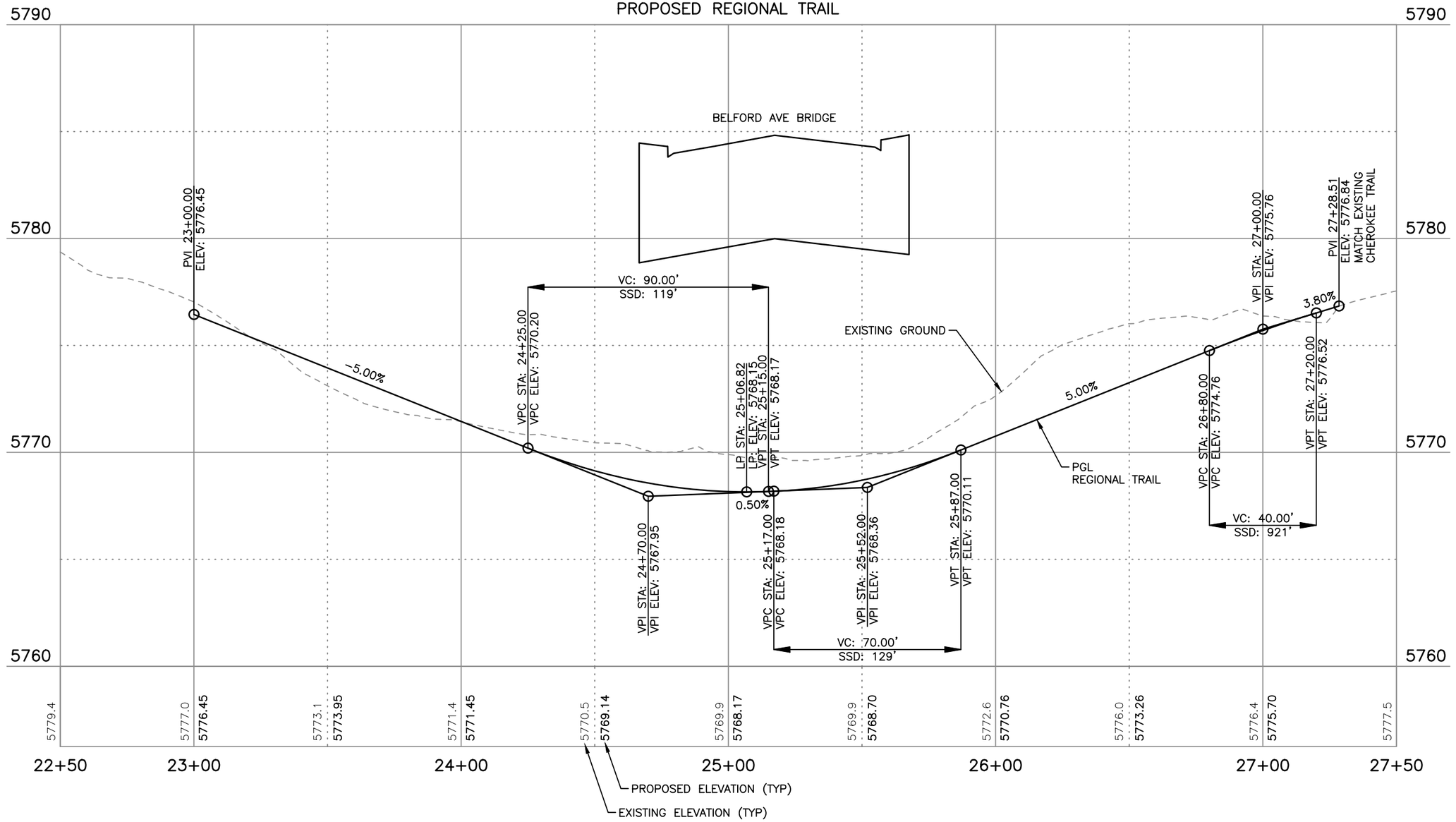
BELFORD–HAPPY CANYON CREEK
PROPOSED
CHEROKEE TRAIL PLAN

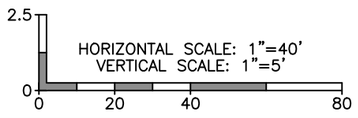
Designer:	DCS	Structure Numbers	
Detailer:	DCS		
Subset:	TRAIL	Sheets:	TP–2 of 2

Project No./Code

Sheet Number 8

PROPOSED REGIONAL TRAIL





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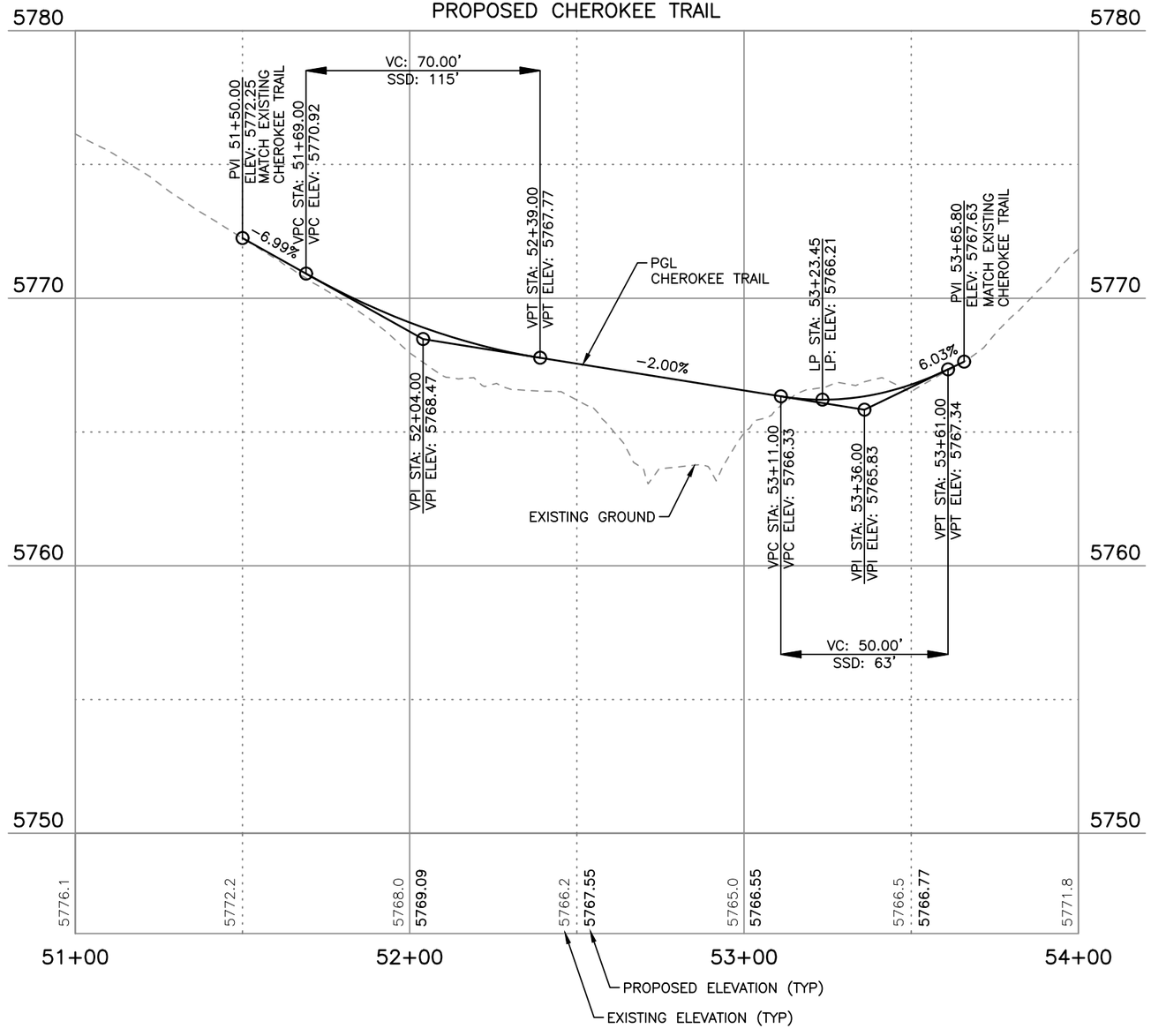
BELFORD–HAPPY CANYON CREEK
PROPOSED
REGIONAL TRAIL PROFILE

Designer:	DCS	Structure Numbers	
Detailer:	DCS		
Subset:	TRAIL	Sheets:	TR–1 of 2

Project No./Code

Sheet Number 9



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0
HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=5'
0 20 40 80

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No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK
PROPOSED
CHEROKEE TRAIL PROFILE

Designer:	DCS	Structure Numbers	
Detailer:	DCS		
Subset:	TRAIL	Sheets:	TR-2 of 2

Project No./Code

Sheet Number 10

GENERAL NOTES

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) 2005 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2011 EDITION (GREEN BOOK), APPLICABLE TO THE PROJECT.

EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH M-206-2.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M-213.

STRUCTURAL CONCRETE EXPOSED TO SOIL SHALL CONFORM TO CEMENTITIOUS MATERIALS REQUIREMENTS CLASS 0, CORRESPONDING TO SULFATE EXPOSURE CLASS 0.

ALL ELECTRICAL CONDUIT IN BRIDGE CONCRETE LESS THAN 2" IN DIAMETER SHALL BE GALVANIZED RIGID METAL CONDUIT. CONDUIT THAT RUNS IN BRIDGE RAIL SHALL INCLUDE A PULL WIRE FOR WIRING INSTALLATION. PULL WIRE SHALL BE INCIDENTAL TO COST OF CONDUIT.

COMPRESSED JOINT MATERIAL SHALL BE PRE-COMPRESSED, CHEMICALLY RESISTANT, OPEN CELL POLYURETHANE FOAM SEALANT, IMPREGNATED WITH A WATER-REPELLENT MATERIAL, WITH ADHESIVE BACKING ON BOTH SIDES. THE JOINT MATERIAL SHALL BE EPOXIED IN PLACE, AND ALL SPLICES SEALED, AS RECOMMENDED BY THE SUPPLIER OF THE JOINT MATERIAL. THE COST SHALL BE INCLUDED IN THE COST OF ITEM 601, CLASS D CONCRETE.

ACCEPTABLE COMPRESSED JOINT MATERIAL ALTERNATIVES:

- WILL-SEAL
- SEAL-MATE #517
- POLY-TITE "N"

A COLORED STRUCTURAL CONCRETE COATING WILL BE REQUIRED ON EXPOSED CONCRETE SURFACES TO 1'-0" BELOW FINISHED GRADE, AS SHOWN ON THE PLANS. THE COLOR SHALL BE DAVIS COLOR "SEQUOIA SAND" (NO. 641)

THE FINAL FINISH FOR ALL EXPOSED CONCRETE SURFACES SHALL BE CLASS 2 TO 1'-0" BELOW FINISHED GRADE.

ALL EXTERIOR CONCRETE CORNERS SHALL BE CONSTRUCTED WITH ¾" CHAMFERS, UNLESS OTHERWISE NOTED

STRUCTURAL STEEL PILING SHALL BE AASHTO M270 (ASTM A-572) GRADE 50. ALL OTHER STRUCTURAL STEEL, UNLESS NOTED OTHERWISE, SHALL BE AASHTO M270 (ASTM A-36).

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.

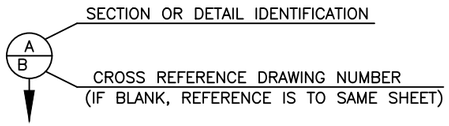
GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING STEEL SHALL HAVE 2" CONCRETE COVER UNLESS NOTED OTHERWISE.

ALL REINFORCING STEEL SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED.

Ⓝ DENOTES NON-COATED REINFORCING STEEL.

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



THE FOLLOWING TABLE GIVES THE MINIMUM CLASS B 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.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS 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 BLACK REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE AS DESCRIBED ABOVE.

THE FOLLOWING TABLE GIVES THE MINIMUM CLASS B LAP SPLICE LENGTH FOR BLACK 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.

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

PERMANENT STEEL DECK FORMS ARE REQUIRED.

PERMANENT PRECAST CONCRETE DECK FORMS ARE NOT ALLOWED.

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

B.F. = BACK FACE
E.F. = EACH FACE
HCL = HORIZONTAL CONTROL LINE
HMA = HOT MIX ASPHALT
I.D. = INSIDE DIAMETER
I.F. = INSIDE FACE
O.F. = OUTSIDE FACE
PGL = PROFILE GRADE LINE

NO EXISTING UTILITIES ARE LOCATED IN THE LIMITS OF THE BRIDGE WORK. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES WHICH ARE LOCATED OUTSIDE THE BRIDGE LIMITS, AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 OR 1-800-922-1987 AT LEAST 3 DAYS (2 DAYS NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE BASED UPON A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL. IF THERE IS A DISCREPANCY, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING WITHIN 48 HOURS.

DESIGN DATA

AASHTO, SEVENTH EDITION LRFD WITH CURRENT INTERIMS

DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN (LRFD)

SEISMIC PERFORMANCE ZONE 1

LIVE LOAD: HL-93 (DESIGN TRUCK OR TANDEM, AND DESIGN LANE LOAD)
DEAD LOAD: ASSUMES 36 LBS. PER SQ. FT. FOR 3" HMA BRIDGE DECK OVERLAY
ASSUMES 5 LBS. PER SQ. FT. FOR FUTURE UTILITIES
ASSUMES 5 LBS. PER SQ. FT. FOR PERMANENT STEEL DECK FORMS

REINFORCED CONCRETE:
CDOT CLASS D CONCRETE: f'_c = 4,500 psi
REINFORCING STEEL: f_y = 60,000 psi

STEEL PILING: AASHTO M270 (ASTM A709) GRADE 50 Fy = 50,000 psi

DIAPHRAGM STEEL: AASHTO M270 (ASTM A709) GRADE 36 Fy = 36,000 psi

PRESTRESSED CONCRETE: CLASS PS CONCRETE f'c = (SEE DETAILS)
f's = 270,000 psi

INDEX OF DRAWINGS

BRIDGE DESCRIPTION

TWO SPAN (78'-2 ½" / 78'-2 ½") BRIDGE
COMPOSITE CONCRETE SLAB AND
PRECAST/PRESTRESSED CONCRETE I GIRDERS (BT42)

BELFORD AVENUE OVER HAPPY CANYON CREEK
72°30'00" SKEW (TO LAYOUT LINE)
74'-0"" ROADWAY WIDTH, EDGE OF SIDEWALK
TO EDGE OF SIDEWALK (ULTIMATE)
8'-6" SIDEWALKS

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No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK BRIDGE
GENERAL INFORMATION

Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers:
Sheets: B1 of 32

Project No./Code

Sheet Number 11

SUMMARY OF QUANTITIES (INTERIM SECTION)

ITEM NO.	DESCRIPTION	UNIT	SUPER–SUPERSTRUCTURE	ABUTMENT 1	PIER 2	ABUTMENT 3	APPROACH SLABS	TOTALS
206	STRUCTURE EXCAVATION	CY		102	25	102		229
206	STRUCTURE BACKFILL (CLASS 1)	CY		606	15	727		1,348
206	STRUCTURE BACKFILL (CLASS 2)	CY		142		142		284
206	MECHANICAL REINFORCEMENT OF SOIL	CY		512		614		1,126
403	HOT MIX ASPHALT (GRADING ??)	TON	130				36	166
420	GEOTEXTILE (EROSION CONTROL) (CLASS1)	SY						0
503	DRILLED CAISSON (24 INCH)	LF		375		387		762
503	DRILLED CAISSON (48 INCH)	LF			279			279
506	RIPRAP (12 INCH)	CY						0
515	WATERPROOFING (MEMBRANE)	SY	800				220	1,020
519	MAUNFACTURED STONE VENEER	SF						0
601	CONCRETE CLASS D (BRIDGE)	CY	332	117	96	134	86	765
601	STRUCTURAL CONCRETE COATING	SY	497	91	191	113	43	935
602	REINFORCING STEEL	LB						0
602	REINFORCING STEEL (EPOXY COATED)	LB	84,162	20,473	23,327	22,016		149,978
606	BRIDGE RAIL (SPECIAL)	LF	158					158
606	BRIDGE RAIL TYPE 10	LF	158					158
607	FENCE CHAIN LINK (SPECIAL) (48 INCH)	LF						0
613	1 INCH ELECTRICAL CONDUIT	LF	42					42
613	2 INCH ELECRTICAL CONDUIT	LF	443					443
613	LUMINAIRE (SPECIAL)	EA	1					1
618	PRESTRESSSED CONCRETE I (BT42)	LF	1,847					1,847

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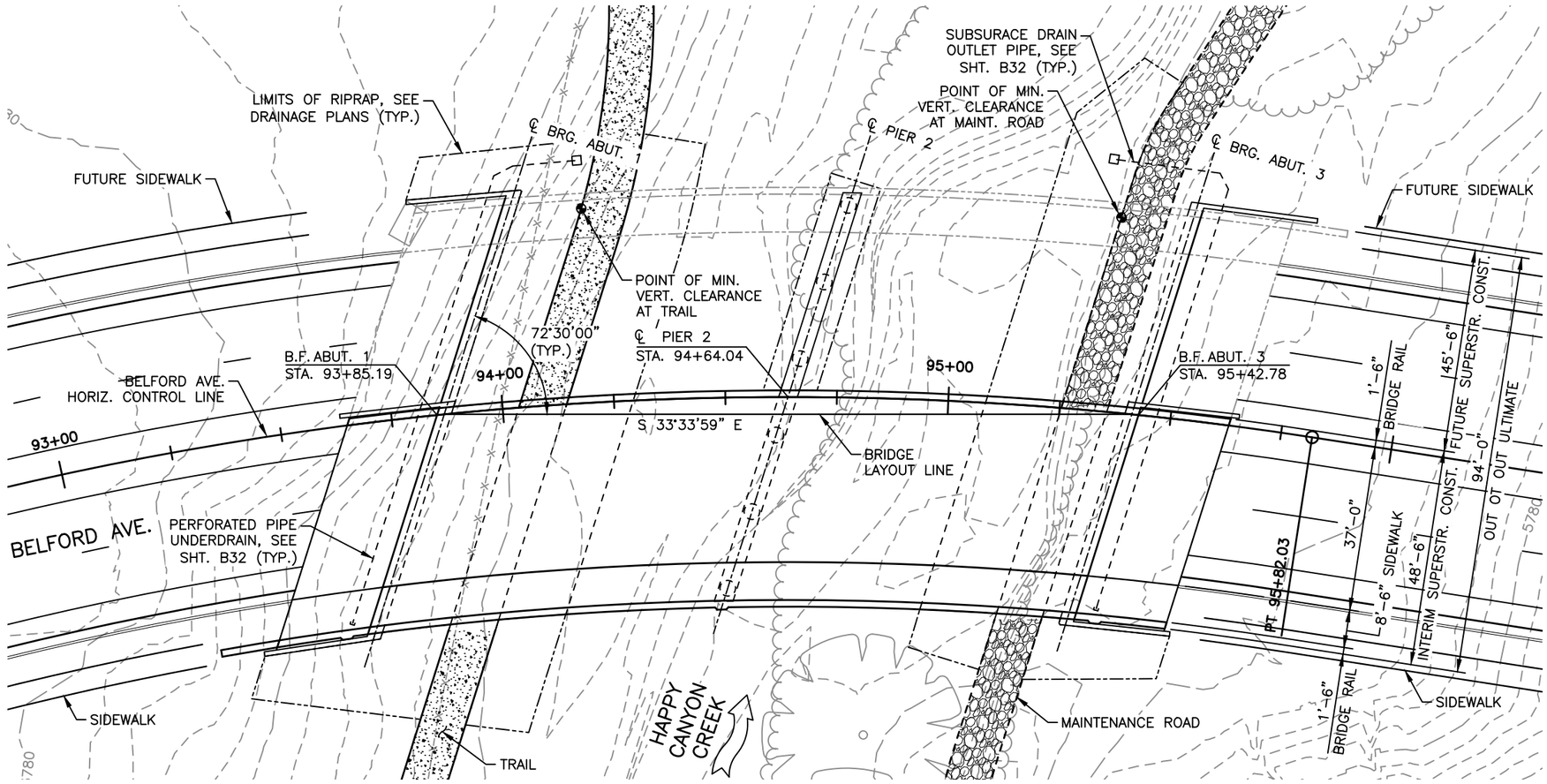
Revised:
Void:

BELFORD–HAPPY CANYON CREEK BRIDGE
SUMMARY OF QUANTITIES

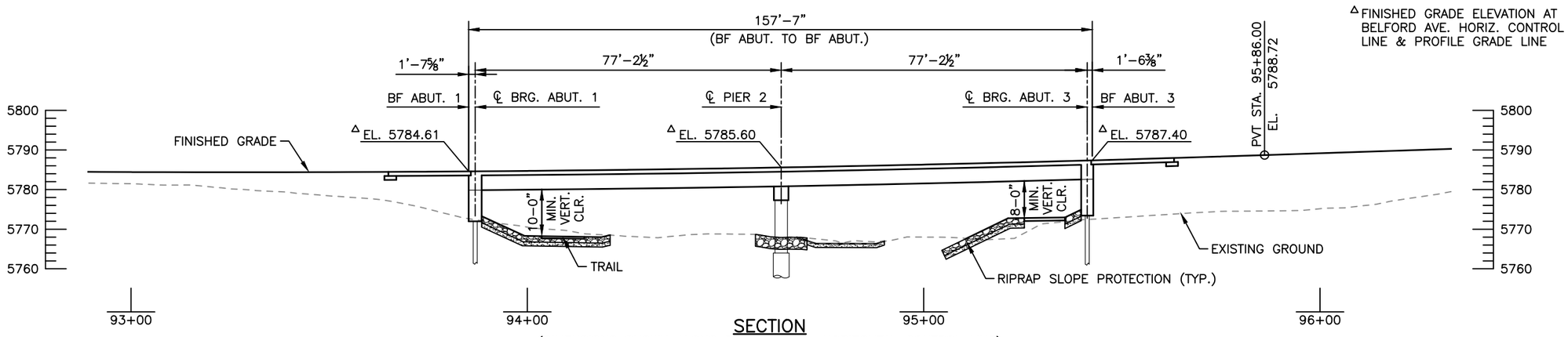
Designer: J. LYNCH
Detailer: R. DILLON
Subset: BRIDGE
Structure Numbers:
Sheets: B2 of 32

Project No./Code:
Sheet Number 12



BELFORD AVE. HCL CURVE DATA
Δ = 105°24'14"
D_c = 07°26'28"
R = 770.00'
L = 1416.53'
T = 1010.84'

PLAN
(ULTIMATE ROADWAY SHOWN)



SECTION
(DIMENSIONS SHOWN ALONG BELFORD AVE. HORIZONTAL CONTROL LINE)

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Horizontal Scale: 1"=30' Vertical Scale: 1"=30'		Revised:	Project No./Code:
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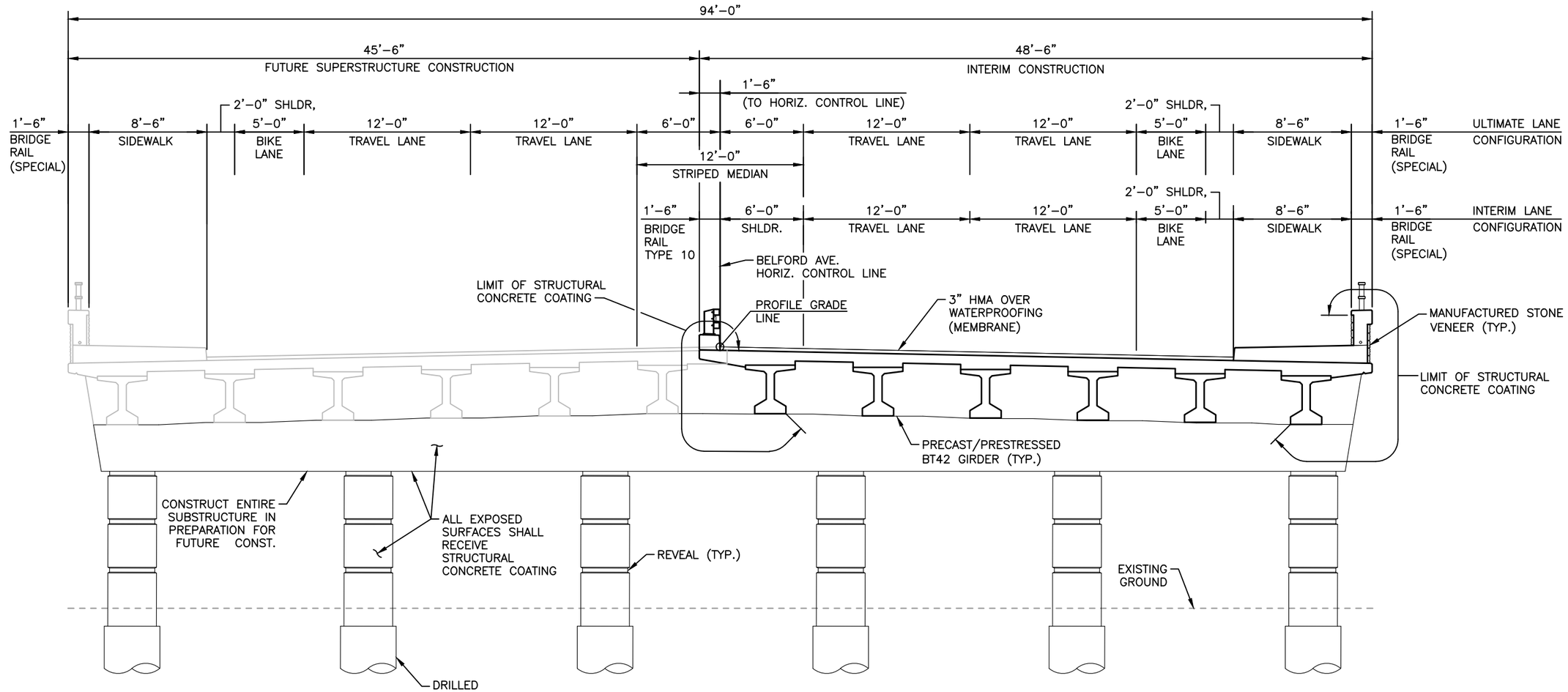
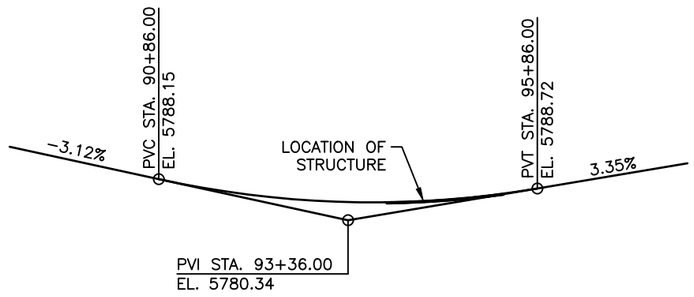


TYPICAL SECTION
(LOOKING UPSTATION)



PROFILE GRADE

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File Name: B115360-01GLA02.dwg	Date	Comments	Initials	No Revisions:	Designer: J. LYNCH
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					Structure Numbers
					Sheets: B4 of 32
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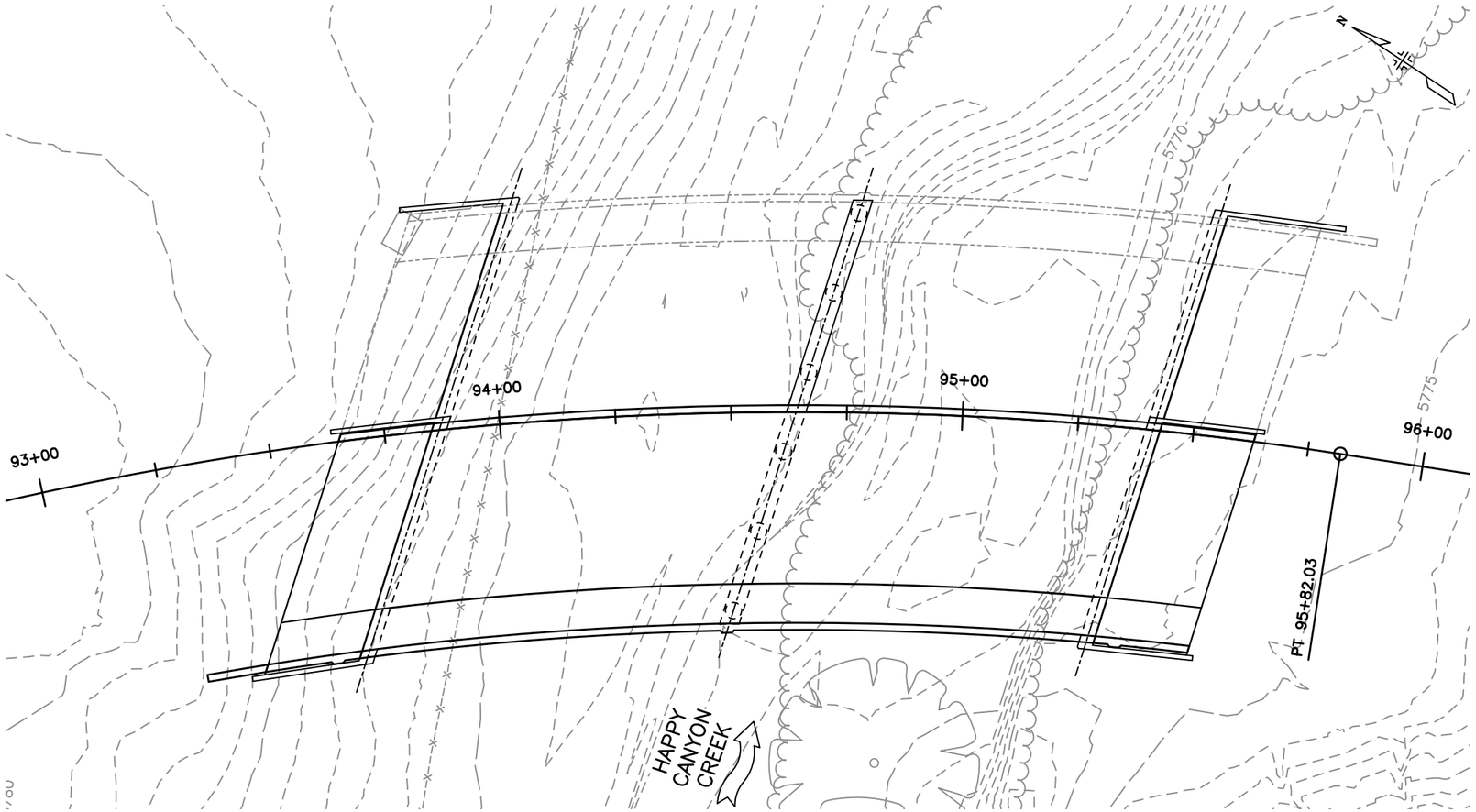
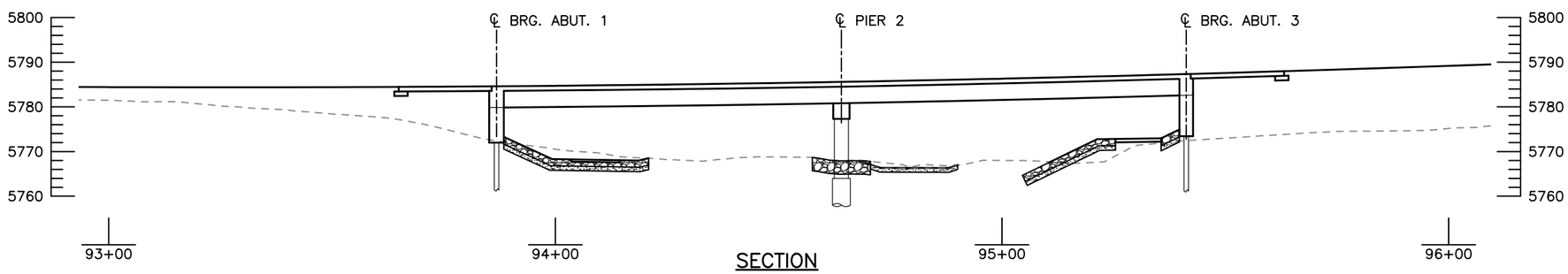
					Sheet Number 14



PLAN



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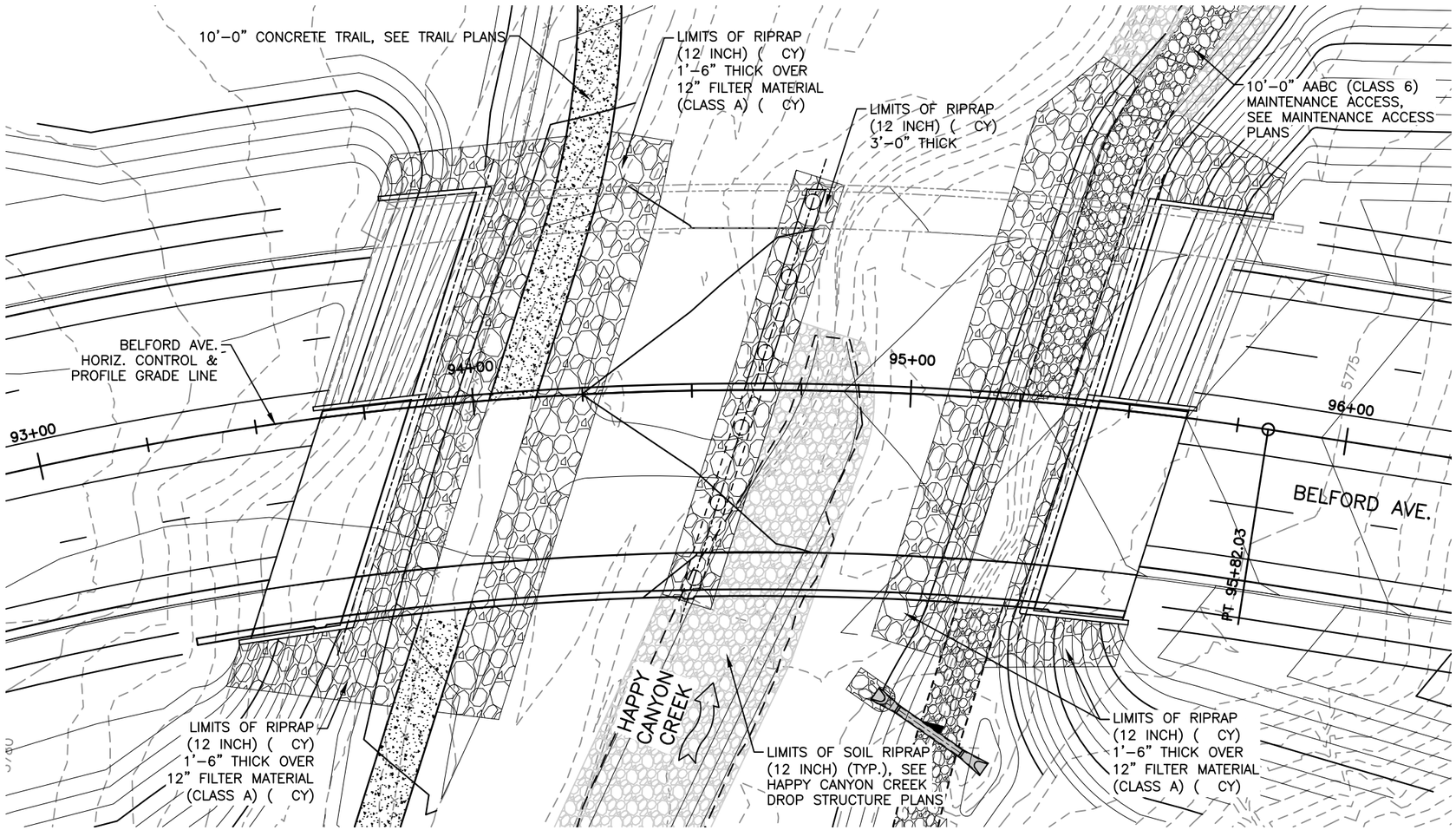
BELFORD–HAPPY CANYON CREEK BRIDGE
ENGINEERING
GEOLOGY

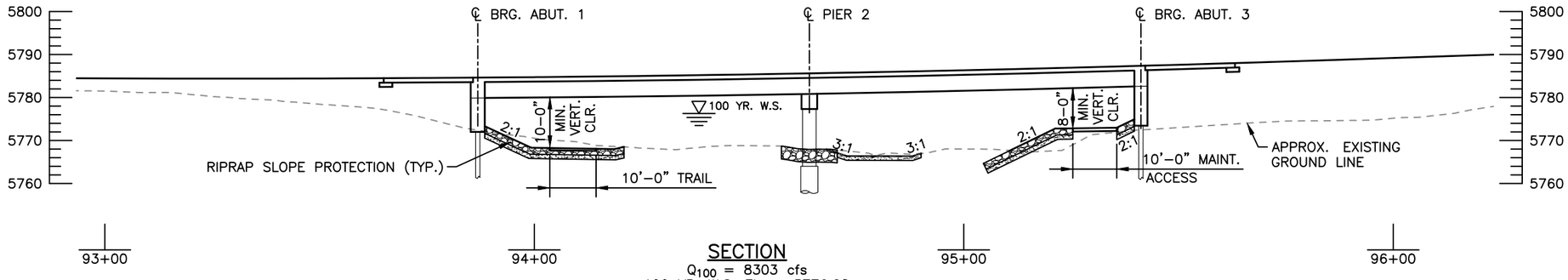
Designer:	J. LYNCH	Structure Numbers	
Detailer:	R. DILLON		
Subset:	BRIDGE	Sheets:	B5 of 32

Project No./Code

Sheet Number 15



PLAN



SECTION

Q_{100} = 8303 cfs

100 YR. W.S. EL. = 5776.28

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BELFORD–HAPPY CANYON CREEK BRIDGE
BRIDGE HYDRAULIC INFORMATION
(1 OF 2)

Designer:	C. TWISS	Structure Numbers	
Detailer:	R. FILLON		
Subset:	BRIDGE	Sheets:	B6 of 32

Project No./Code

Sheet Number 16

100–YEAR RECURRENCE INTERVAL

FLOW UPSTREAM OF BRIDGE = 8303 CFS (FHAD)

DRAINAGE AREA = 17.5± SQ. MI.

CHANNEL DESCRIPTION

BOTTOM MATERIAL: COHESIVE ☐ NONCOHESIVE ☒

BOTTOM MAT. SIZE: CLAY ☐ SILT ☐ SAND ☒ GRAVEL ☐ COBBLES ☐ OTHERS ____

STREAM FORM: STRAIGHT ☐ MEANDERING ☒ BRAIDED ☐

MANNING'S "n" FOR DESIGN: CHANNEL 0.030 OVERBANK 0.035

DEBRIS -- BRUSH ☒ TREES/LOGS ☒ ICE ☐ OTHER ____

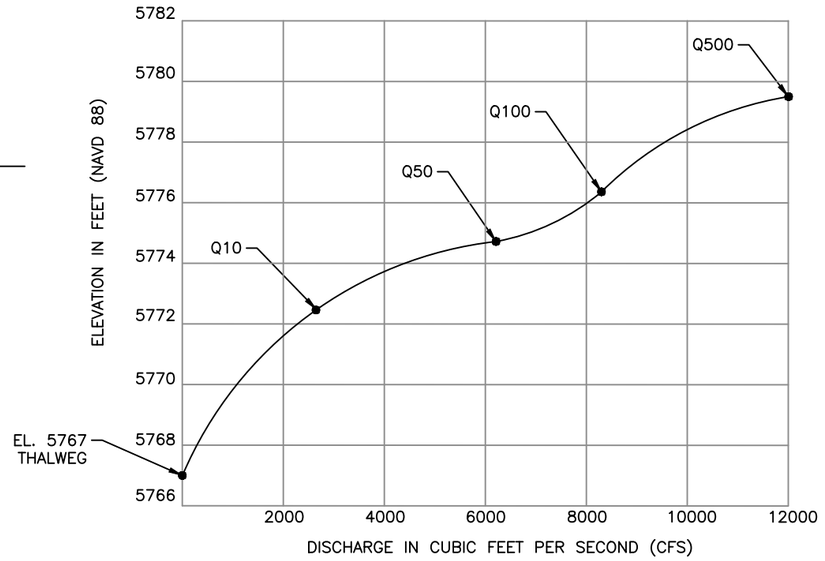
COMPARISON HYDRAULICS (100 YEAR EVENT)

(AT SECTION LOCATED 32 FEET UPSTREAM OF BRIDGE)

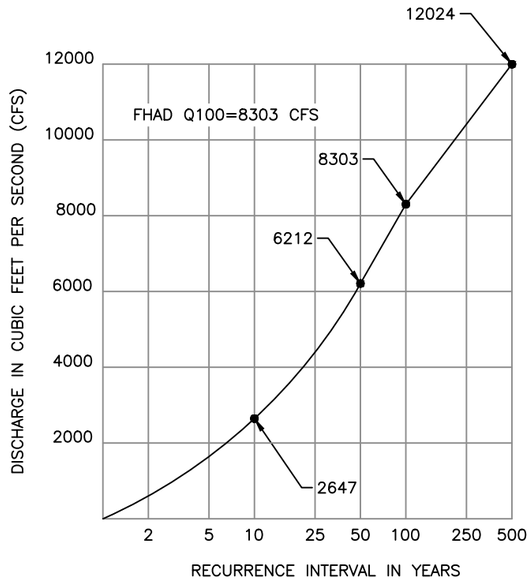
	VELOCITY (FT./SEC)		WS EL. (FT.)	MAX. BACKWATER (FT.)	FROUDE NO.
	AVERAGE	CHANNEL			
EXISTING CONDITIONS	9.81	13.59	5775.57	–	0.89
PROPOSED CONDITIONS	8.24	10.51	5776.36	–	0.62

HYDRAULIC DATA

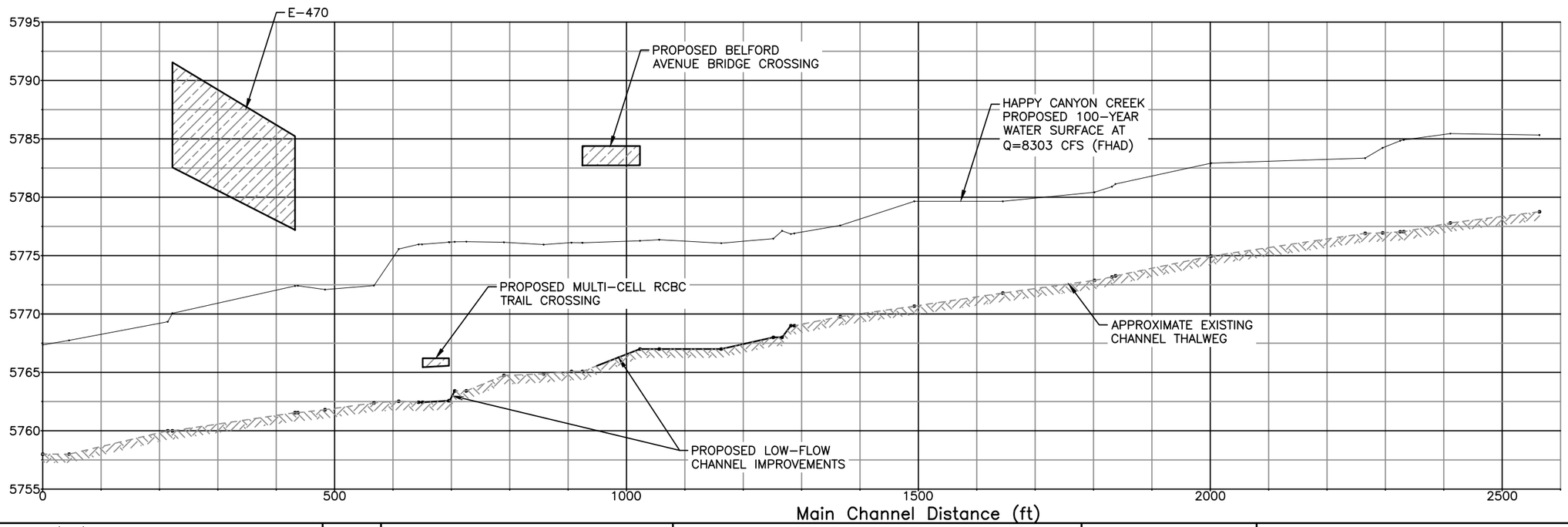
LOCATION	LOW CHORD ELEVATION AT ABUT. FRONT FACE		100–YEAR WATER SURFACE ELEVATION
	ABUT. 1	ABUT. 2	
S. SIDE (UPSTREAM)	5780.07	5782.73	5776.27
N. SIDE (DOWNSTREAM)	5780.07	5782.73	5776.10



STAGE–DISCHARGE CURVE AT UPSTREAM FACE OF BELFORD AVENUE



DISCHARGE–FREQUENCY CURVE



HORIZ. SCALE: 1"=200'
VERT. SCALE: 1"=10'

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BELFORD–HAPPY CANYON CREEK BRIDGE
BRIDGE HYDRAULIC INFORMATION
(2 OF 2)

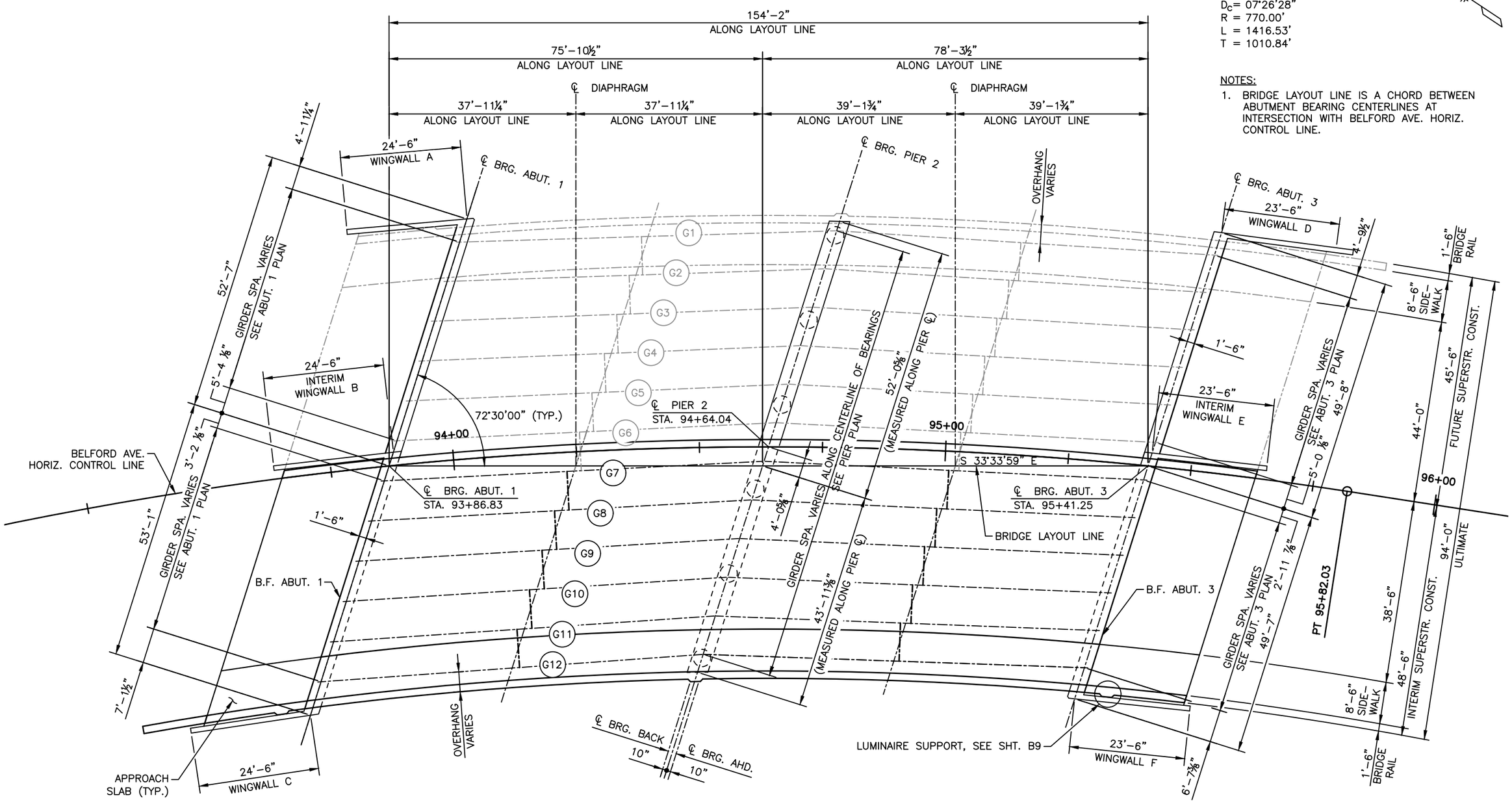
Designer:	C. TWISS	Structure Numbers	
Detailer:	K. TURNER		
Subset:	BRIDGE	Sheets:	B7 of 32

Project No./Code

Sheet Number 17

BELFORD AVE. HCL
CURVE DATA
Δ = 105°24'14"
D_c = 07°26'28"
R = 770.00'
L = 1416.53'
T = 1010.84'

NOTES:
1. BRIDGE LAYOUT LINE IS A CHORD BETWEEN ABUTMENT BEARING CENTERLINES AT INTERSECTION WITH BELFORD AVE. HORIZ. CONTROL LINE.



CONSTRUCTION LAYOUT

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No Revisions:				
Revised:	Designer: J. LYNCH	Structure Numbers		
Void:	Detailer: C. MIYAMOTO			
	Subset: BRIDGE	Sheets: B8 of 32		Sheet Number 18

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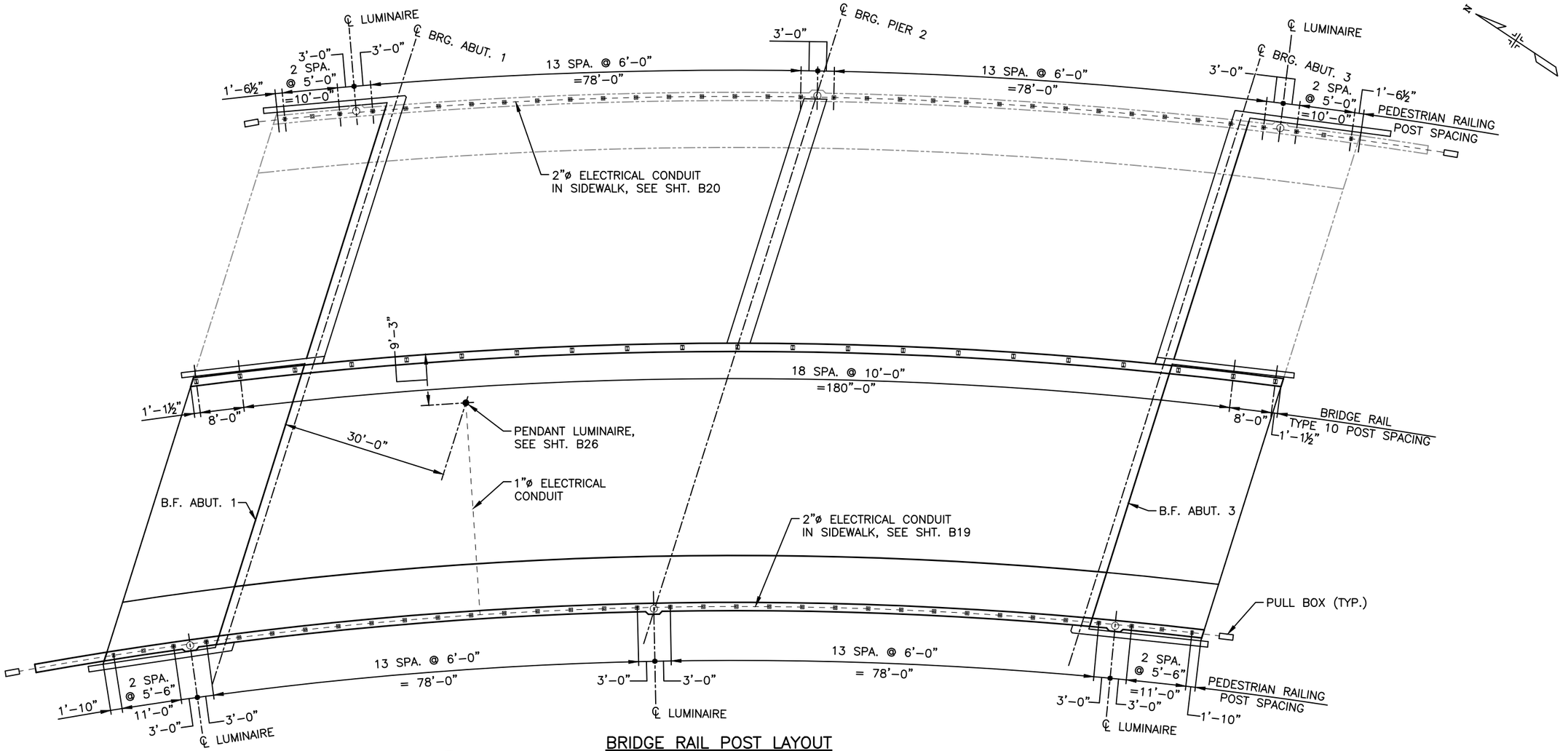
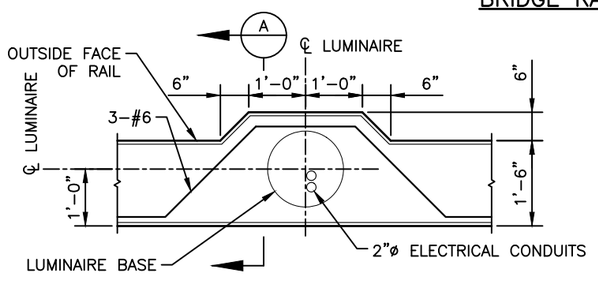
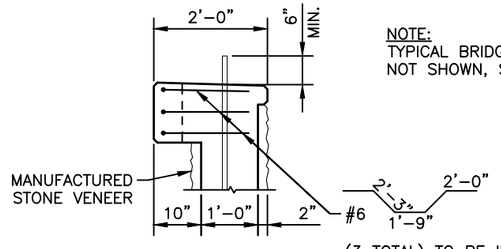


BRIDGE RAIL POST LAYOUT



PLAN–LUMINAIRE SUPPORT DETAIL

ANCHOR BOLTS FOR LUMINAIRES TO BE PROVIDED AND PLACED PER LUMINAIRE MANUFACTURERS DRAWINGS



NOTE:
TYPICAL BRIDGE RAIL REINF. NOT SHOWN, SEE SHT. B27.

SECTION A

(3 TOTAL) TO BE INCLUDED IN THE COST OF BRIDGE RAIL (SPECIAL)

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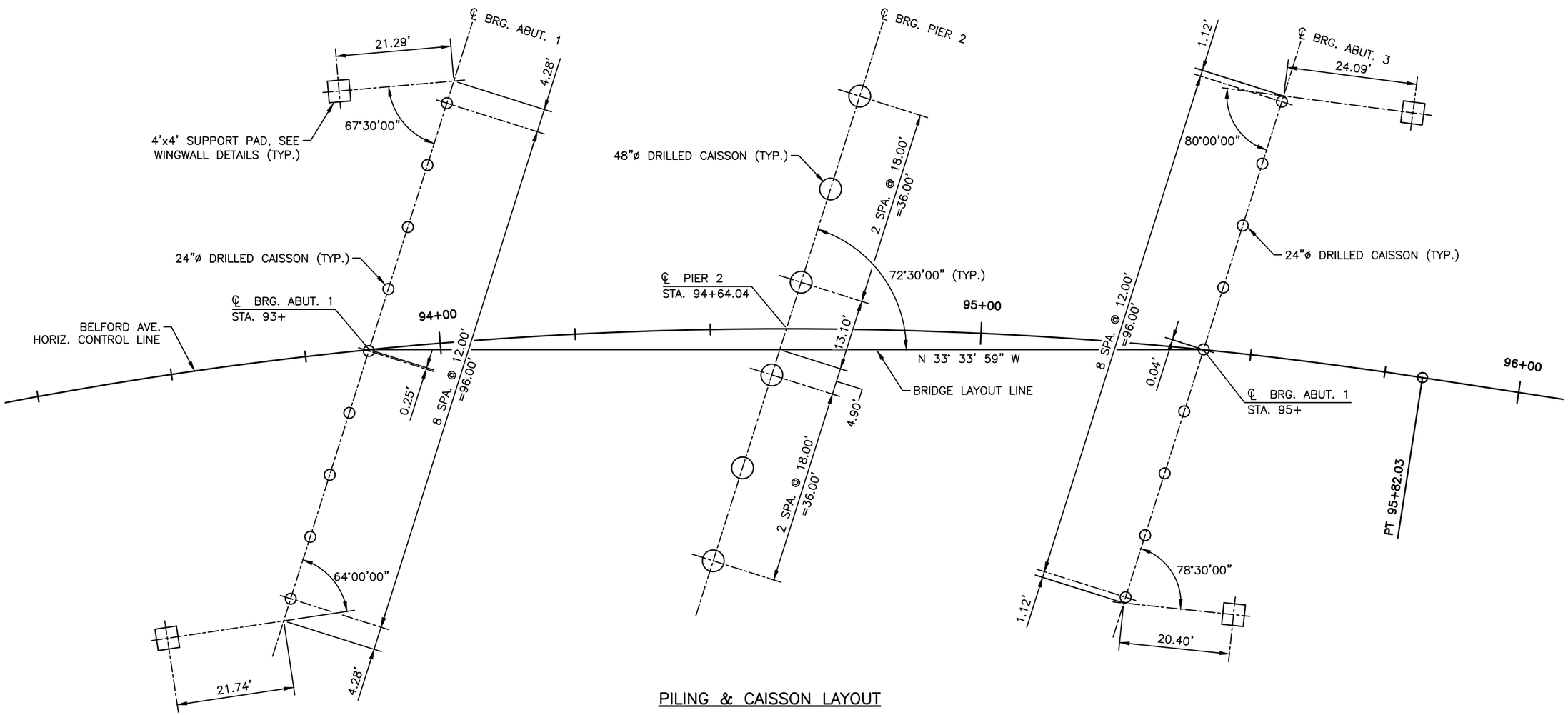
BELFORD–HAPPY CANYON CREEK BRIDGE
BRIDGE RAIL POST LAYOUT

Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers:
Sheets: B9 of 32

Project No./Code:

Sheet Number 19

BELFORD AVE. HCL
CURVE DATA
Δ = 105°24'14"
D_c = 07°26'28"
R = 770.00'
L = 1416.53'
T = 1010.84'



PILING & CAISSON LAYOUT

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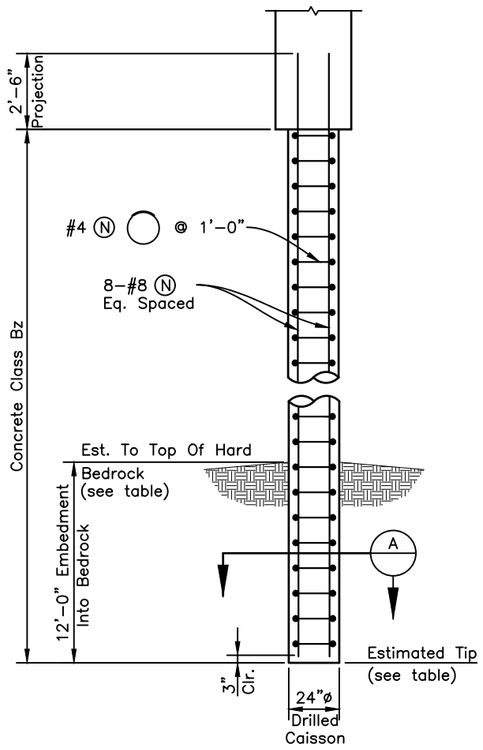
BELFORD–HAPPY CANYON CREEK BRIDGE
CAISSON
LAYOUT

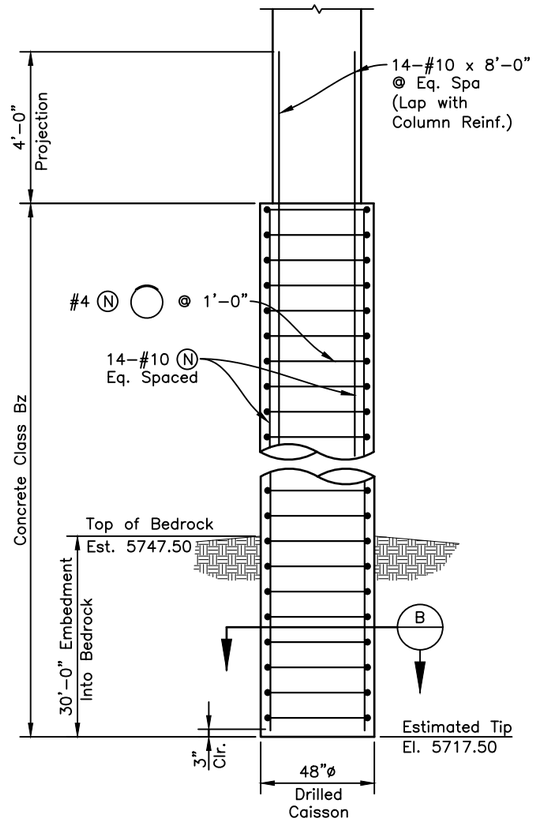
Designer: J. LYNCH
Detailer: R. DILLON
Subset: BRIDGE
Structure Numbers:
Sheets: B10 of 32

Project No./Code:

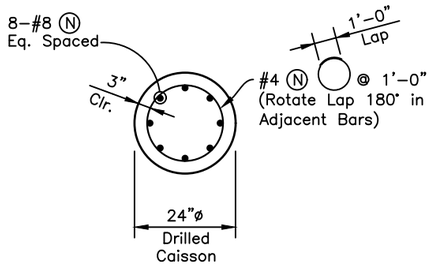
Sheet Number 20



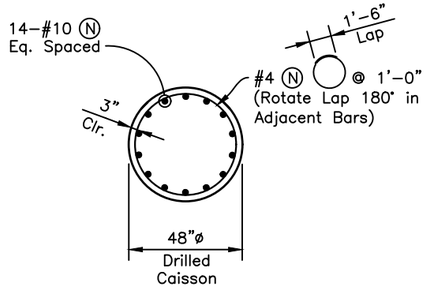
24" CAISSON DETAIL



48" CAISSON DETAIL



SECTION (A)



SECTION (B)

	MAX. LOAD (unfactored) (kips)	MAX. LOAD (factored) (kips)	TOP OF CAISSON ELEVATION	EST. TOP OF BEDROCK ELEVATION	EST. TIP ELEVATION
ABUTMENT 1	321	447	5771.70	5749.80	5737.80
ABUTMENT 3	321	447	5773.00	5747.30	5735.30

RESISTANCE TYPE	ALLOWABLE RESISTANCE
Side Resistance In Bedrock	3.6 ksf
Base Resistance In Bedrock	40 ksf

CAISSON NOTES:

1. Caissons shall extend at least to the estimated tip elevation. Caissons shall be further advanced into the hard bedrock if necessary to obtain the specified minimum embedment below the estimated top of hard bedrock as determined in the field by the Engineer.
2. Top of hard bedrock elevation shall be verified at time of construction by the Engineer.
3. The use of temporary casing & dewatering during drilling caissons may be required. The cost of temporary casing & dewatering shall be included in the cost of item 503 – Drilled Caisson (54 inch).

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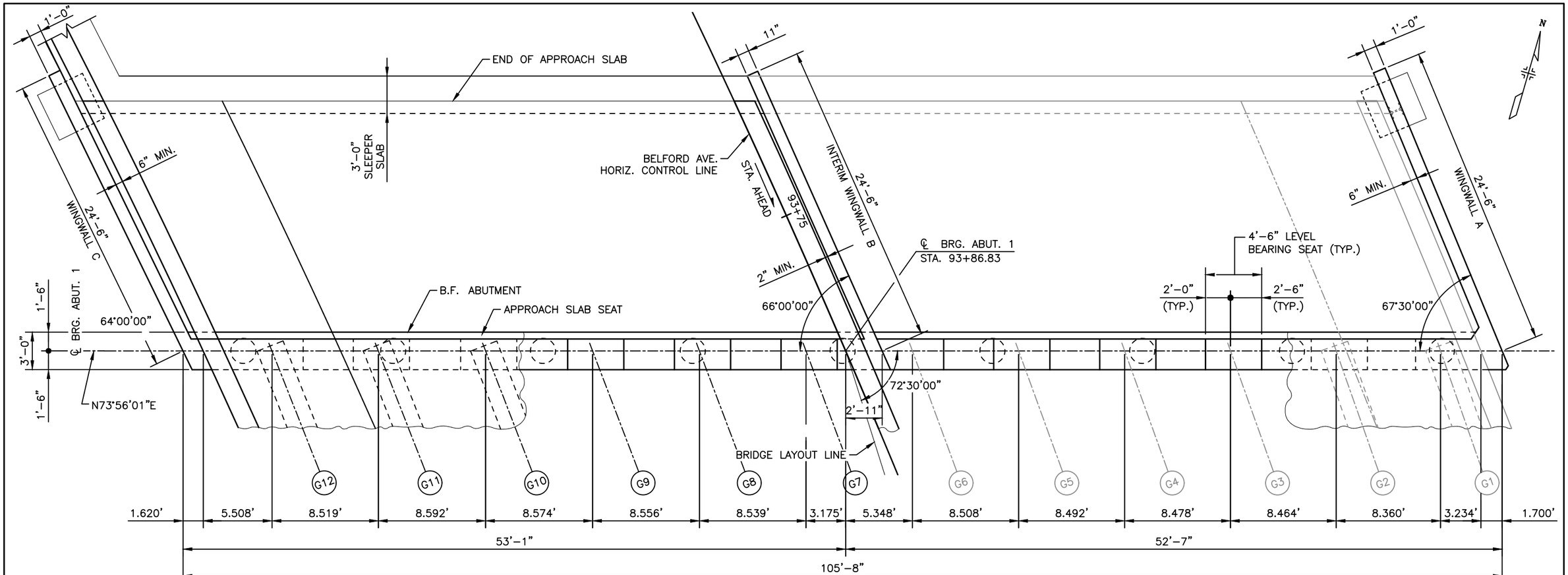
BELFORD-HAPPY CANYON CREEK BRIDGE
PILING & CAISSON
DETAILS

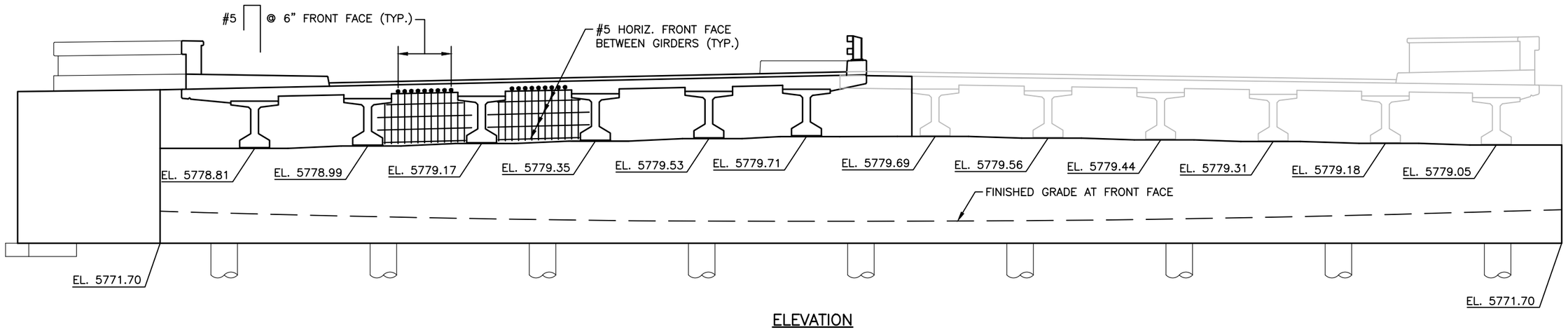
Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers:
Sheets: B11 of 32

Project No./Code

Sheet Number 21



PLAN



ELEVATION

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File Name: B115360-01ABT01.dwg	Date	Comments	Initials	No Revisions:	
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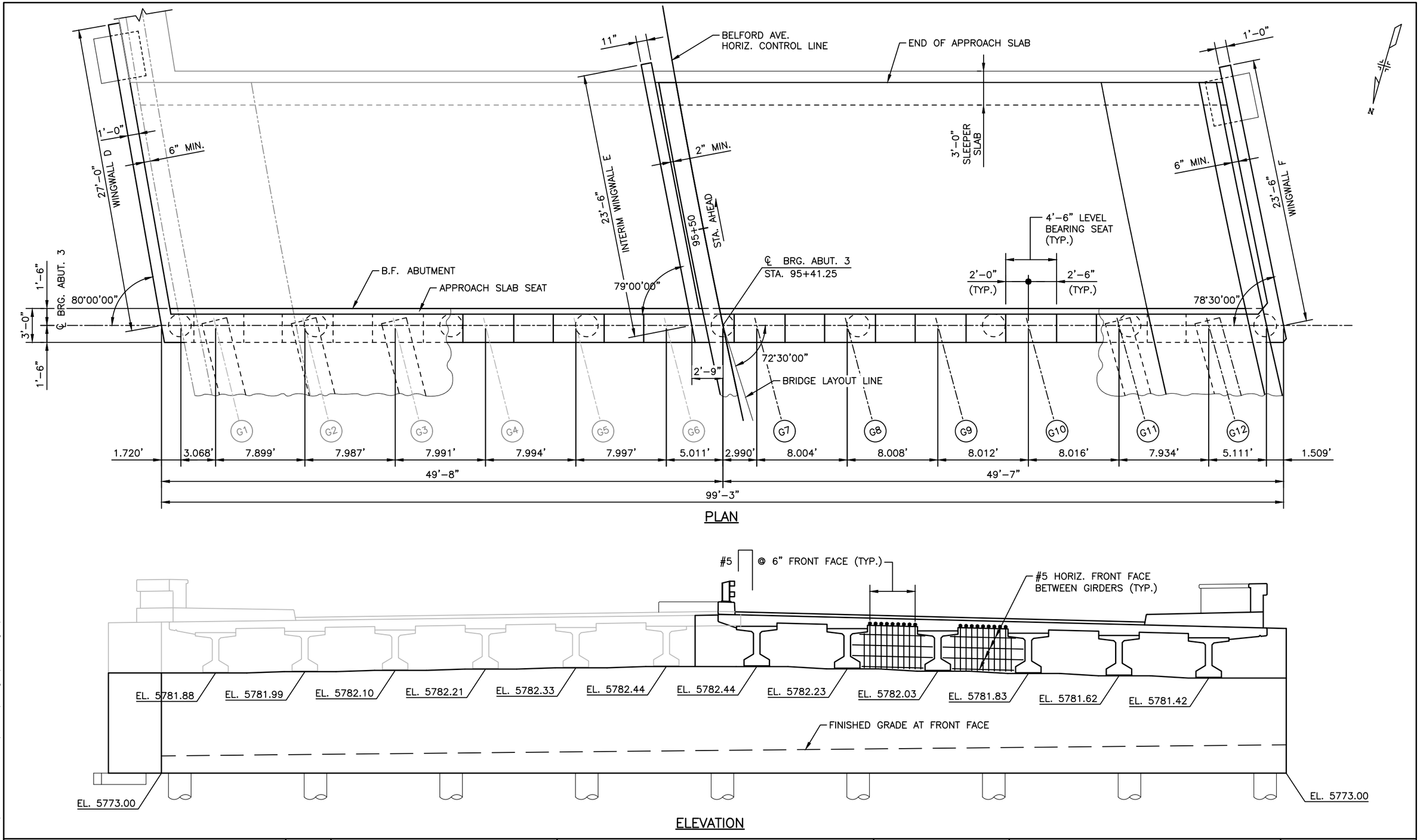

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File Name: B115360-01ABT02.dwg	Date / Comments / Initials	No Revisions:	Designer: J. LYNCH — Structure Numbers:
Horizontal Scale: 1/8"=1'-0" Vertical Scale:		Revised:	Detailer: R. DILLON
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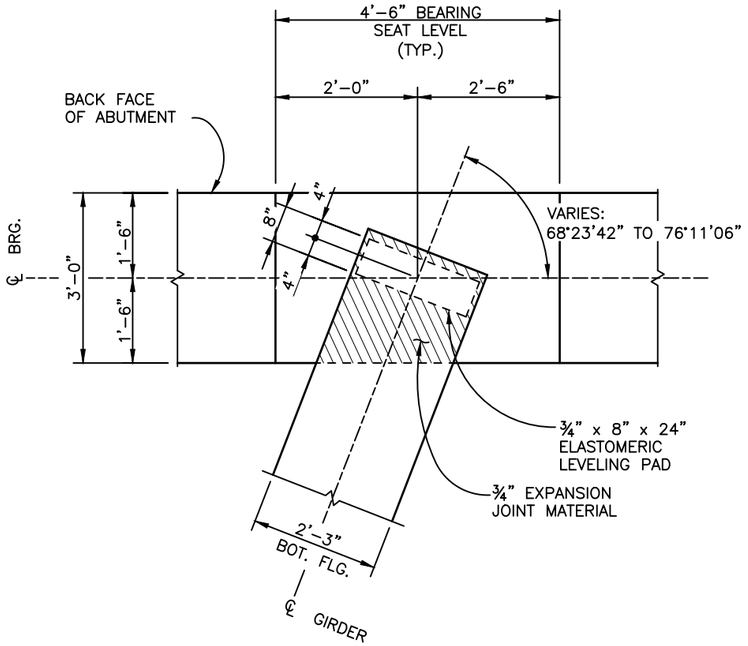
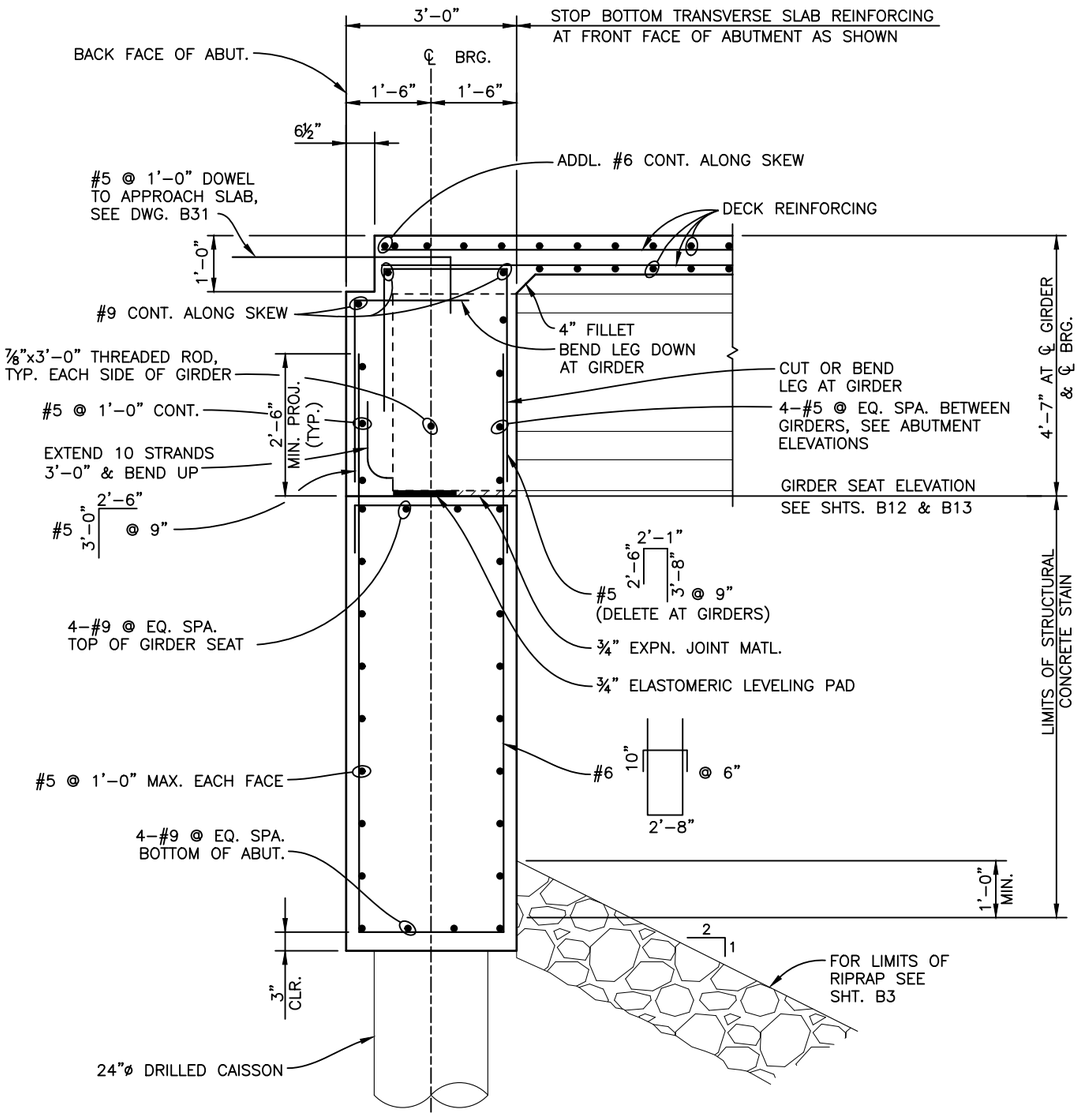
Project No./Code

Sheet Number 23



BEARING DETAIL



TYPICAL ABUTMENT SECTION

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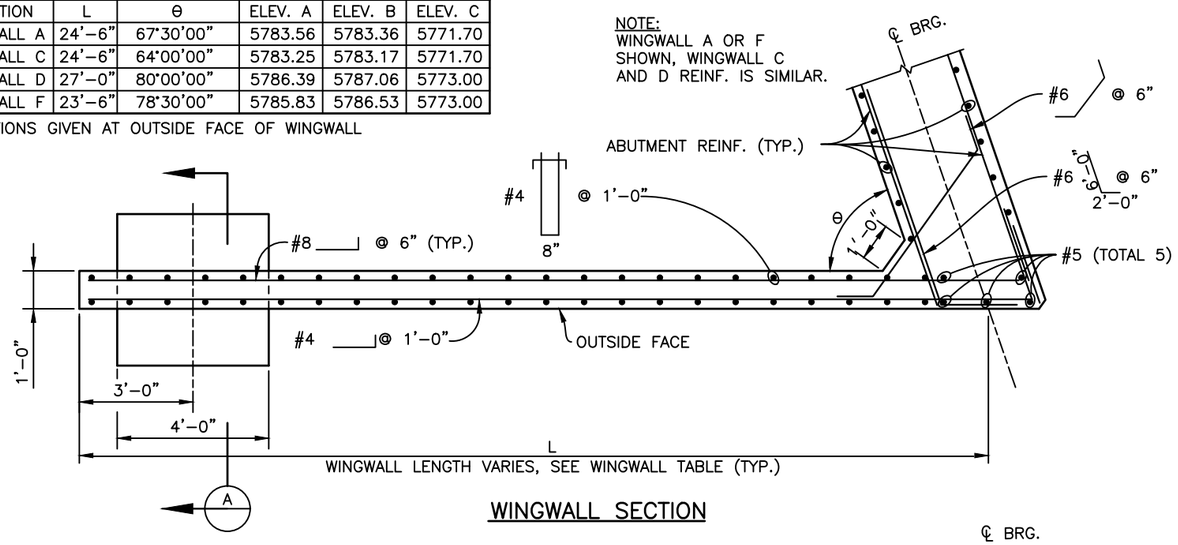
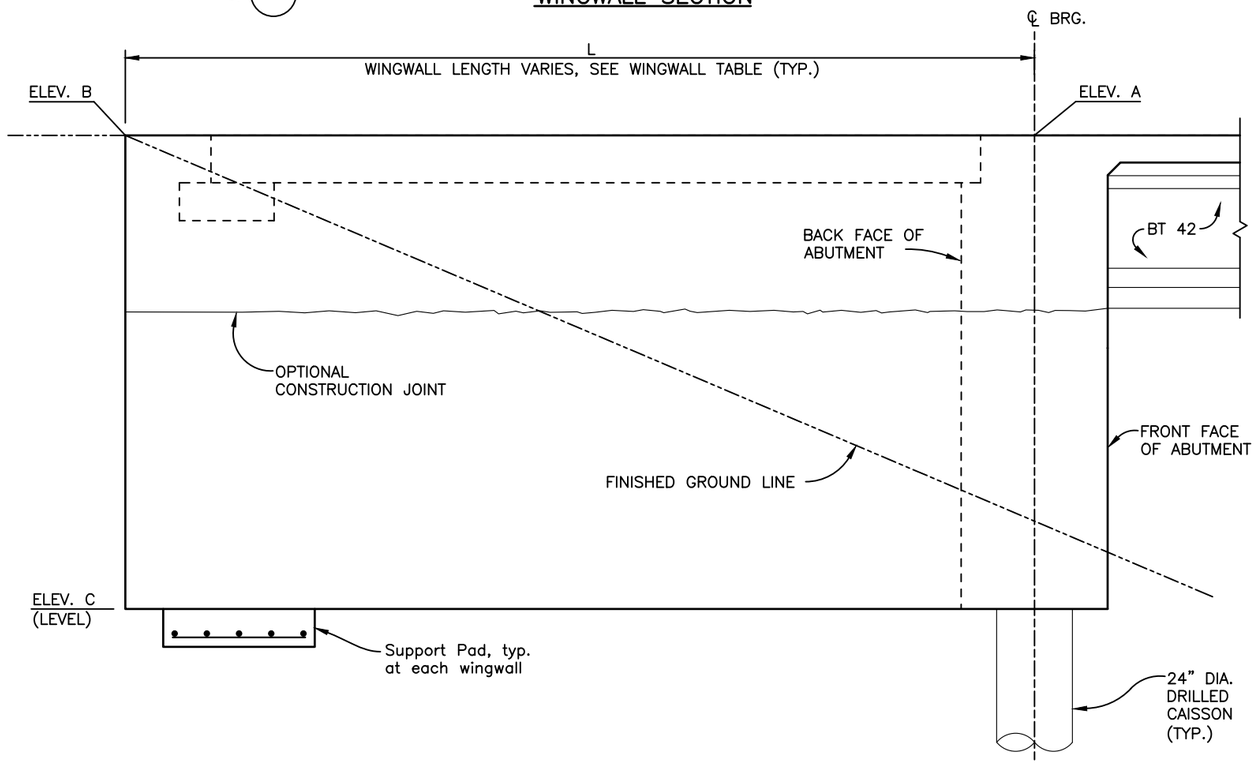
WINGWALL TABLE					
LOCATION	L	Θ	ELEV. A	ELEV. B	ELEV. C
WINGWALL A	24'–6"	67°30'00"	5783.56	5783.36	5771.70
WINGWALL C	24'–6"	64°00'00"	5783.25	5783.17	5771.70
WINGWALL D	27'–0"	80°00'00"	5786.39	5787.06	5773.00
WINGWALL F	23'–6"	78°30'00"	5785.83	5786.53	5773.00

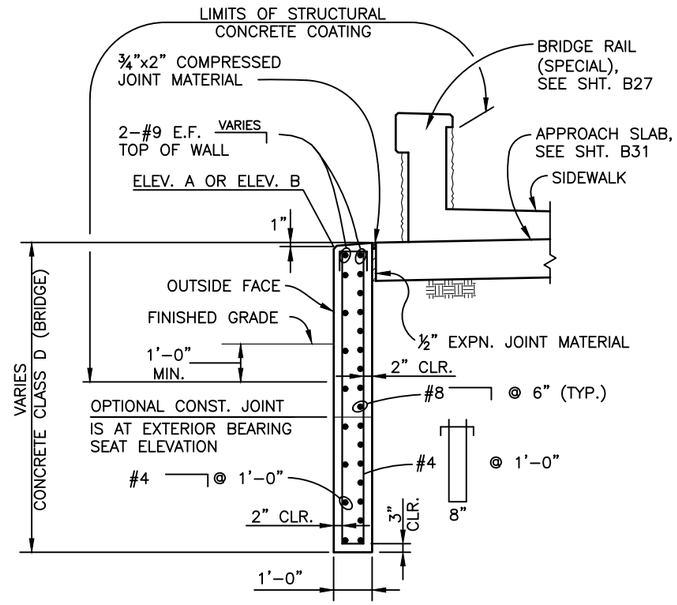
ELEVATIONS GIVEN AT OUTSIDE FACE OF WINGWALL



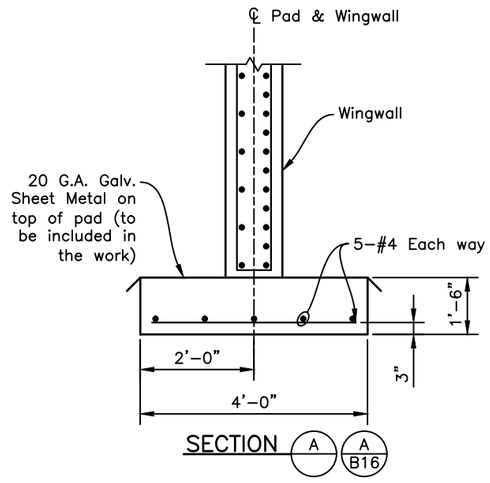
WINGWALL SECTION



ELEVATION



TYPICAL WINGWALL SECTION



NOTES:

1. ELEVATIONS A & B ARE AT THE INSIDE FACE OF THE WINGWALL AS SHOWN IN TYPICAL WINGWALL SECTION.
2. BACKFILL AT THE OUTSIDE FACE OF WINGWALLS SHALL BE PLACED CONCURRENTLY WITH BACKFILL BEHIND THE WALLS.

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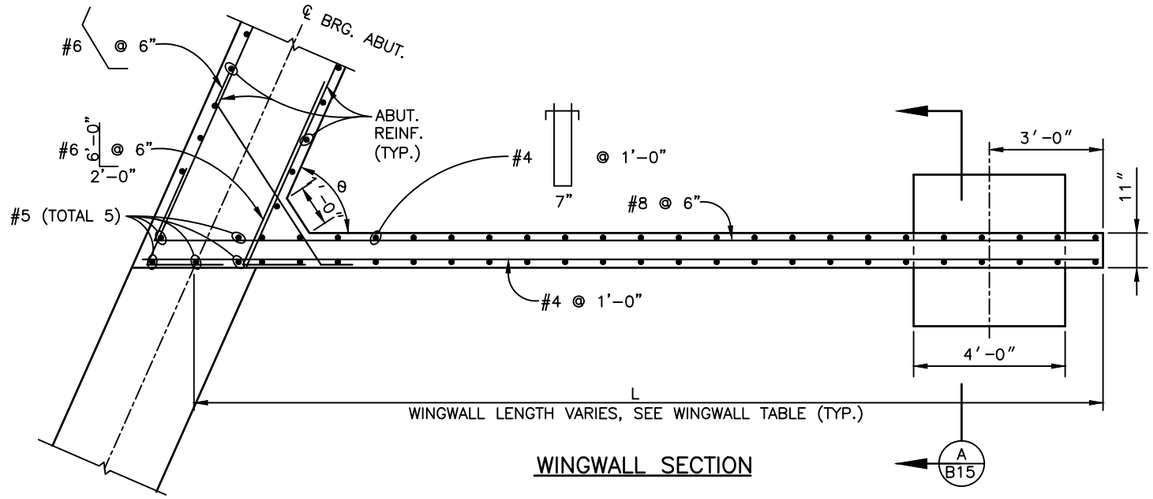
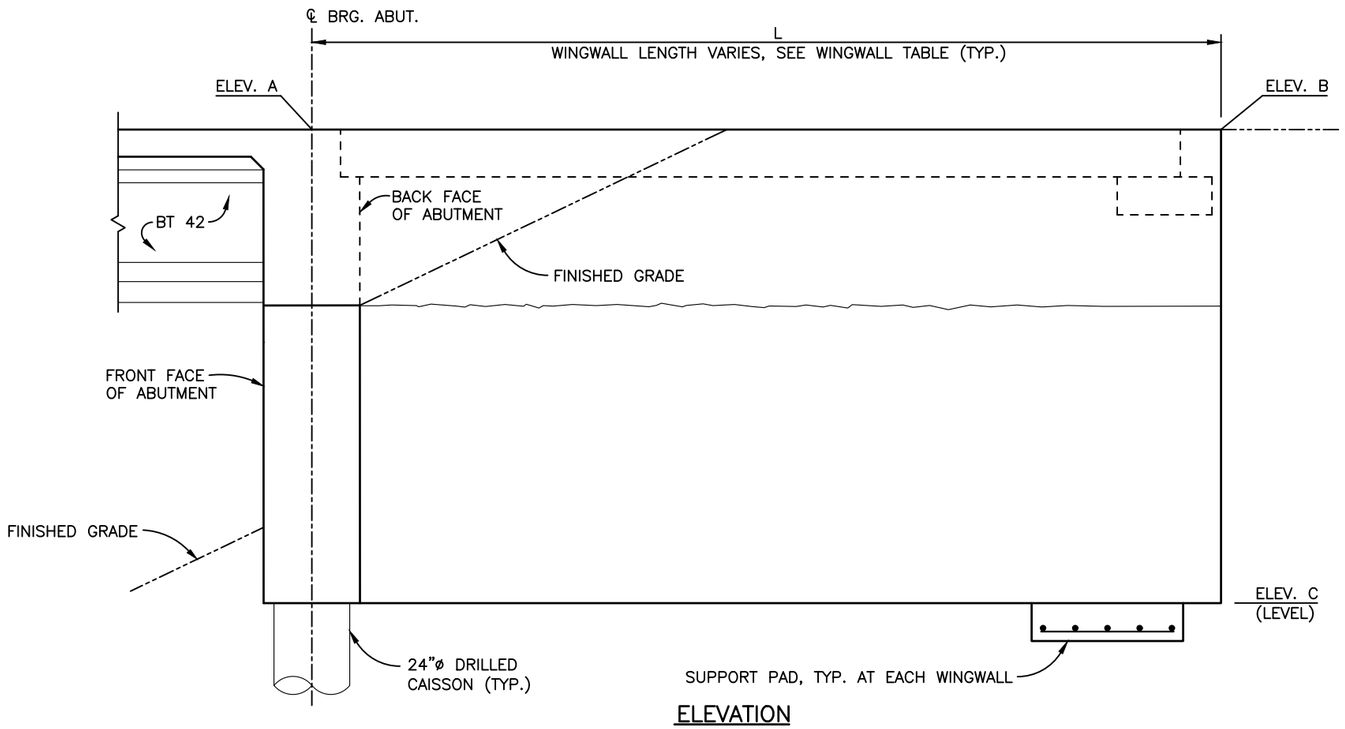
No Revisions:				
Revised:	Designer: J. LYNCH	Structure Numbers		
Void:	Detailer: C. MIYAMOTO			
	Subset: BRIDGE	Sheets: B15 of 32		Sheet Number 25



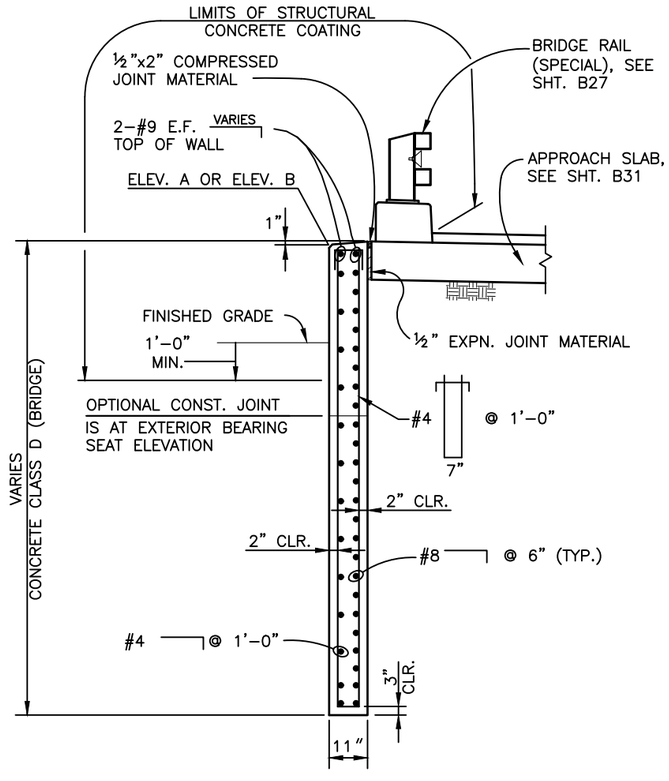
WINGWALL SECTION

INTERIM WINGWALL TABLE					
LOCATION	L	θ	ELEV. A	ELEV. B	ELEV. C
WINGWALL B	24'–6"	66°00'00"	5784.31	5784.16	5771.70
WINGWALL E	23'–6"	79°00'00"	5787.06	5787.68	5773.00

ELEVATIONS GIVEN AT OUTSIDE FACE OF WINGWALL



ELEVATION



TYPICAL INTERIM WINGWALL SECTION

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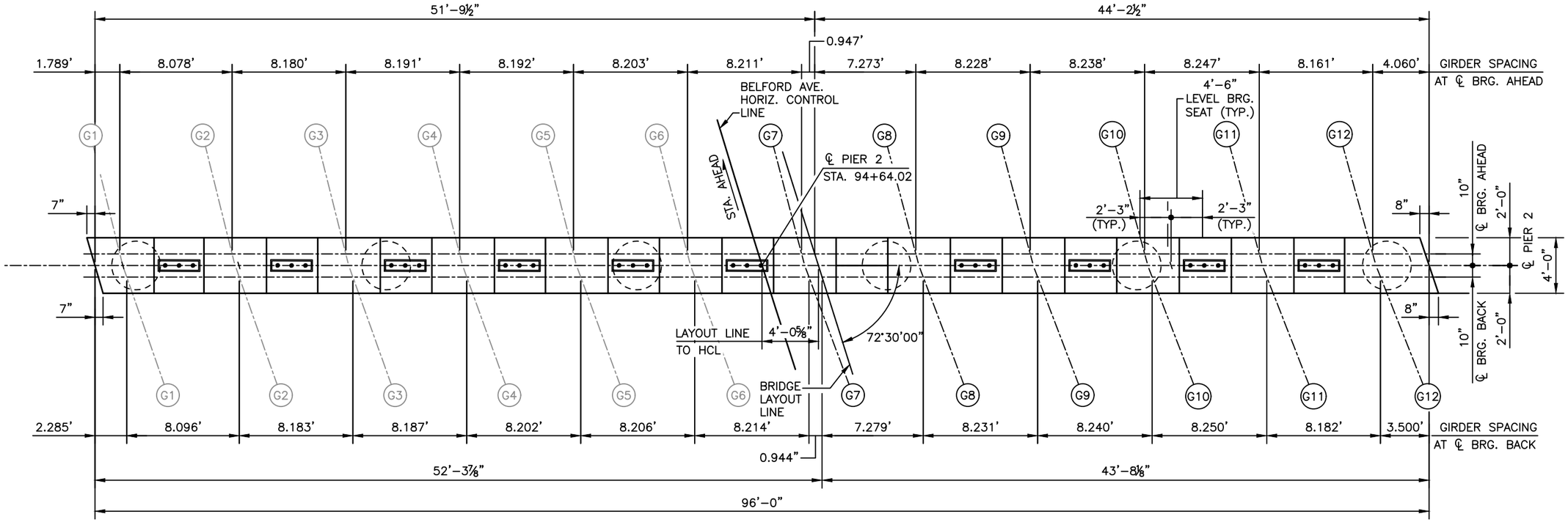
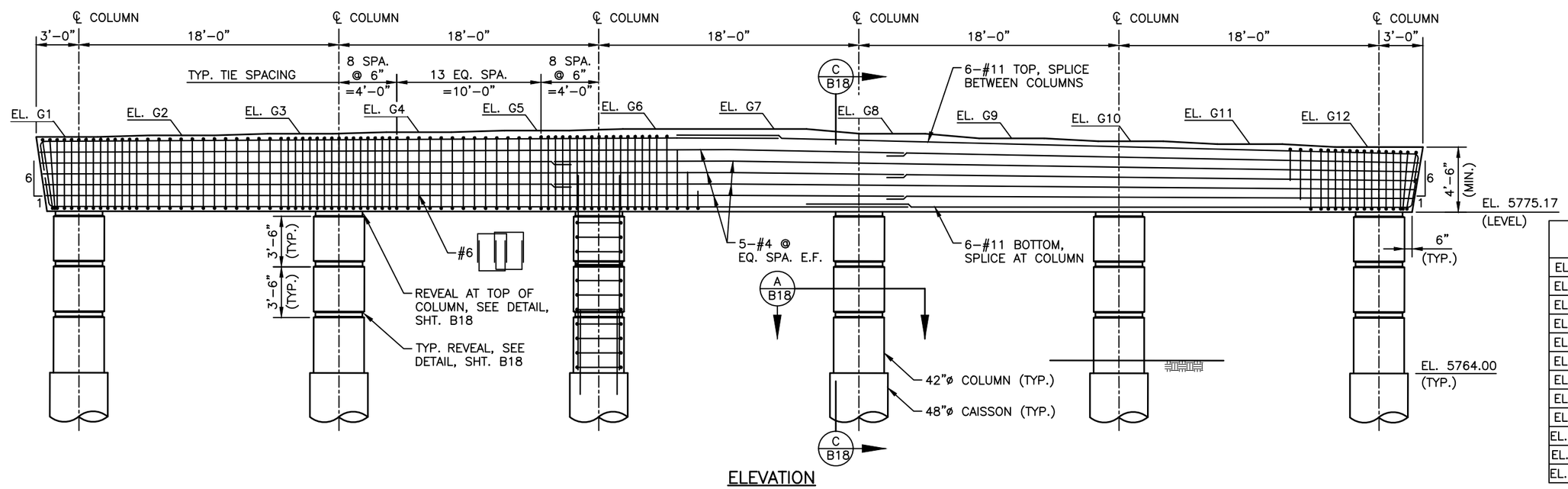
BELFORD–HAPPY CANYON CREEK BRIDGE
INTERIM WINGWALL DETAILS

Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers:
Sheets: B16 of 32

Project No./Code:
Sheet Number 26



PLAN



ELEVATION

BEARING SEAT ELEVATIONS	
EL. G1	5780.11
EL. G2	5780.22
EL. G3	5780.33
EL. G4	5780.45
EL. G5	5780.56
EL. G6	5780.67
EL. G7	5780.67
EL. G8	5780.47
EL. G9	5780.27
EL. G10	5780.07
EL. G11	5779.87
EL. G12	5779.67

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BELFORD–HAPPY CANYON CREEK BRIDGE
PIER 2
PLAN & ELEVATION

Designer:	J. LYNCH	Structure Numbers	
Detailer:	R. DILLON		
Subset:	BRIDGE	Sheets:	B17 of 32

Project No./Code

Sheet Number 27

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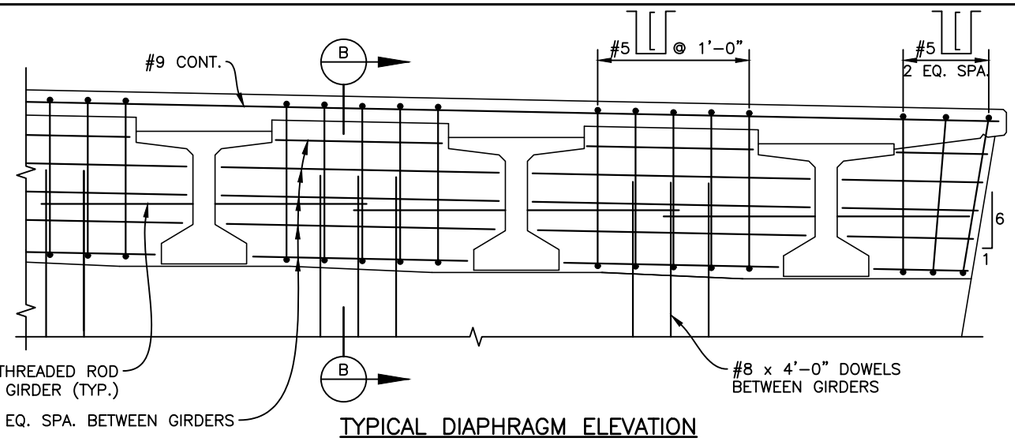
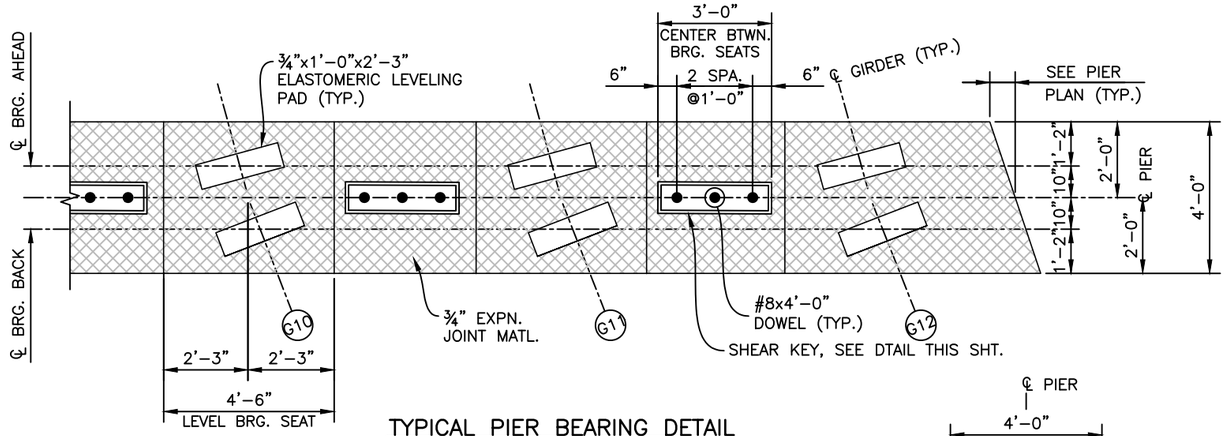
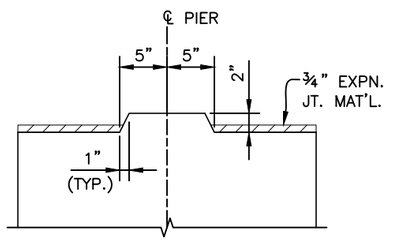


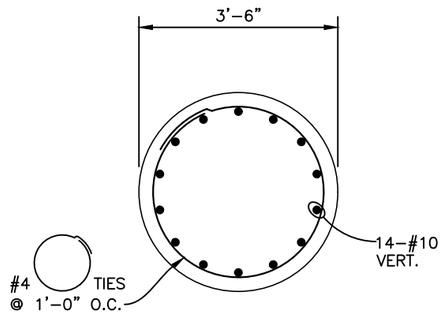
TYPICAL DIAPHRAGM ELEVATION



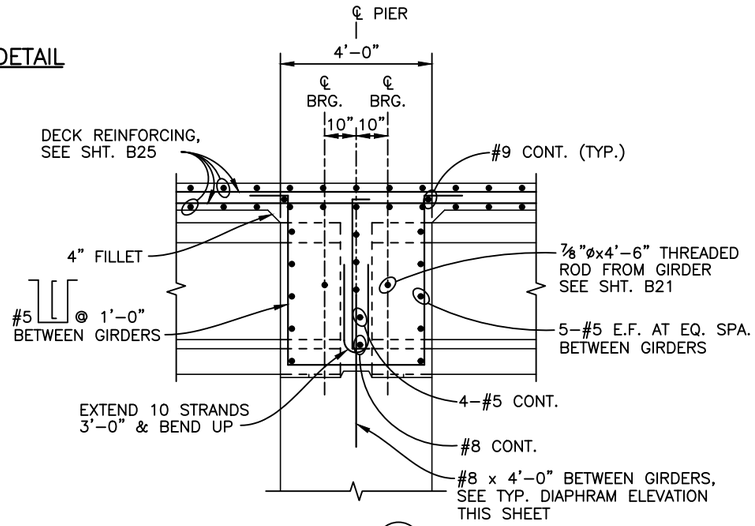
TYPICAL PIER BEARING DETAIL



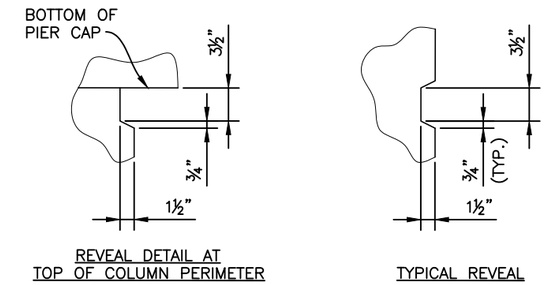
PIER CAP SHEAR KEY DETAIL



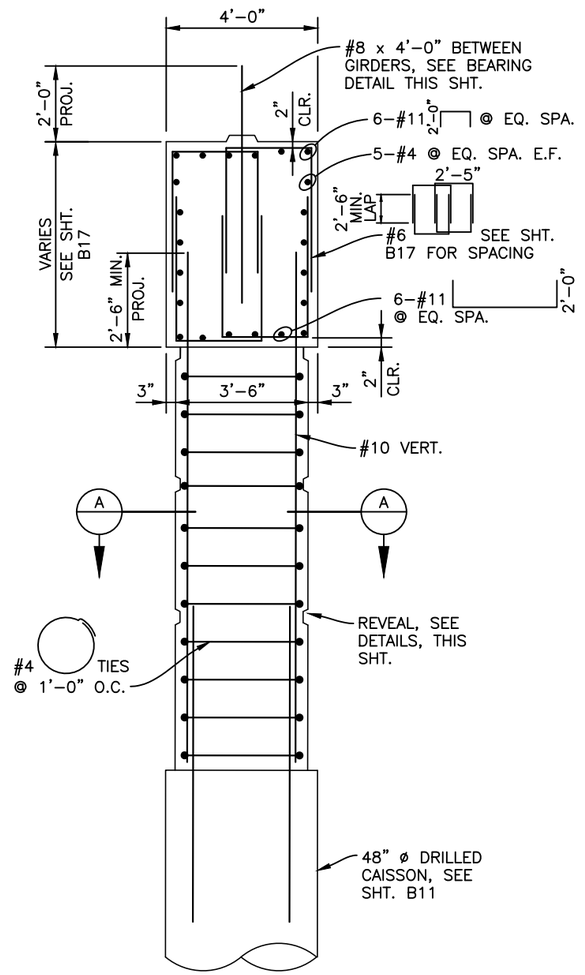
COLUMN SECTION (A) (A B17)



SECTION (B B17)



REVEAL DETAILS



SECTION (C B17)

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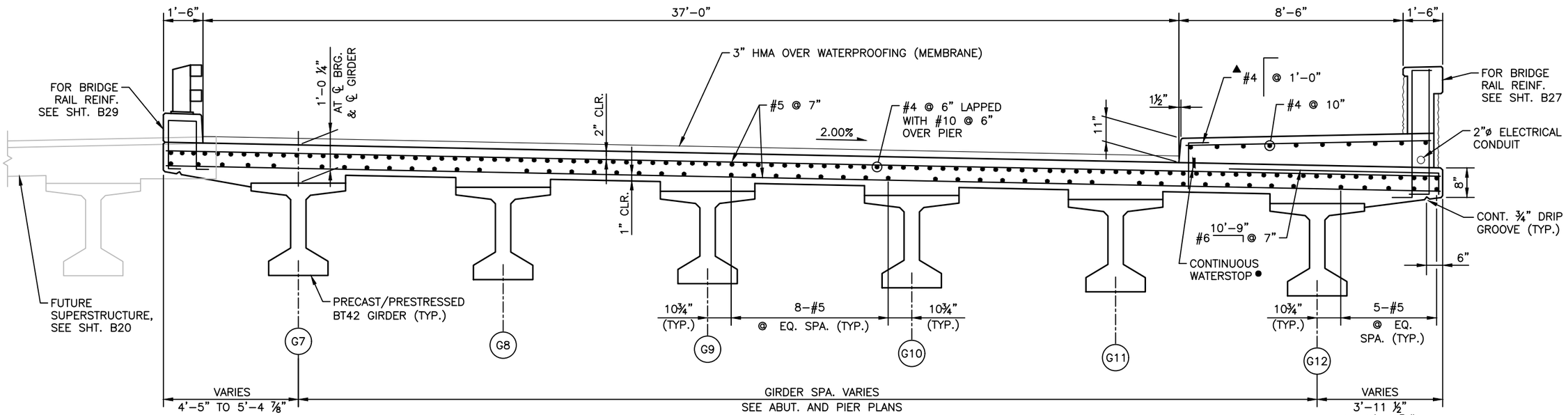
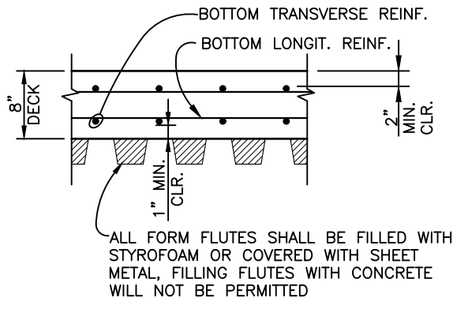
			Structure Numbers
			Sheets: B18 of 32
			Project No./Code
			Sheet Number 28



TYPICAL INTERIM SECTION
(LOOKING SOUTH)



PERMANENT STEEL DECK FORM DETAIL

NOTES:

1. DECK & SIDEWALK CONCRETE SHALL BE CLASS D (BRIDGE).
2. PROVIDE TRANSVERSE RAKE FINISH (¼"± AMPLITUDE) ON THE BRIDGE DECK IN THE AREAS WHERE SIDEWALK IS TO BE PLACED, CLEAN PRIOR TO PLACING SIDEWALK CONCRETE.

▲ DRILL & EPOXY GROUT DOWELS INTO DECK AFTER SLAB HAS BEEN POURED, USE HILTI HIT HY–150 EPOXY ADHESIVE, 6" MIN. EMBEDMENT DEPTH. THE COST OF DRILLING & EPOXY WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (BRIDGE).

● PROVIDE CONTINUOUS BENTONITE/BUTYL RUBBER BASED WATERSTOP (CARLISLE MIRASTOP OR APPROVED EQUAL). THE COST OF THE WATERSTOP WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (BRIDGE).

3. CONCRETE SEALER SHALL BE APPLIED TO CONCRETE SIDEWALK, CURBS AND FACE OF BRIDGE RAIL 6" ABOVE SIDEWALK.
4. STAGGER ALL LONGITUDINAL REINFORCING BAR SPLICES.

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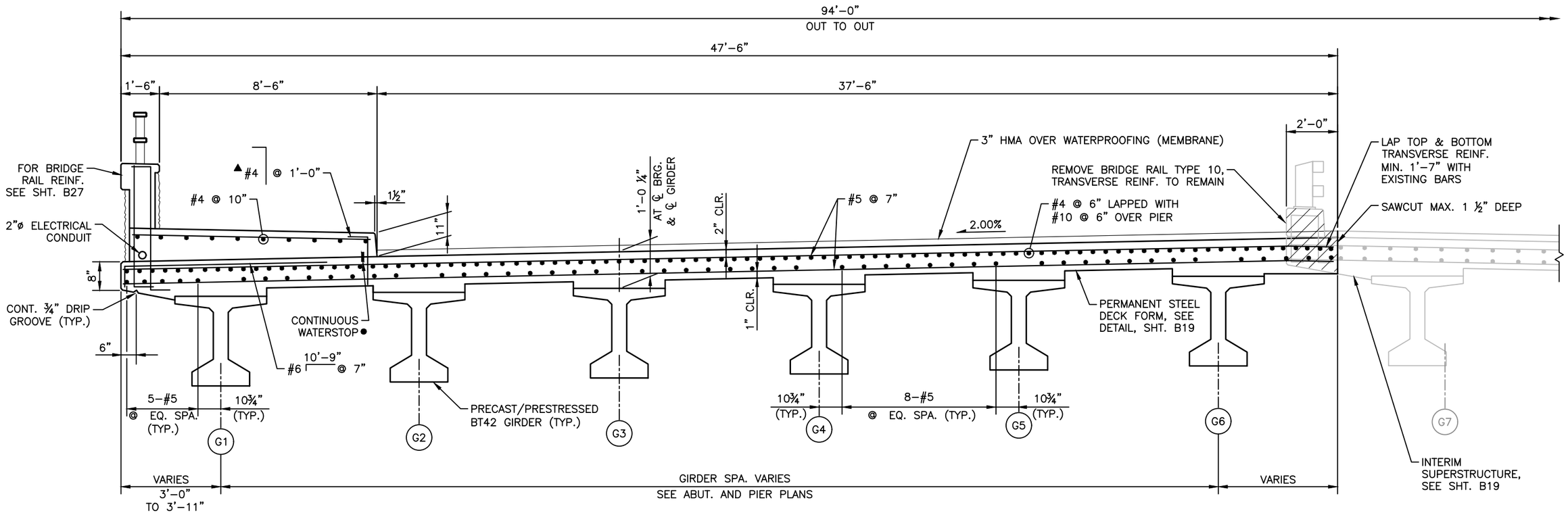
BELFORD–HAPPY CANYON CREEK BRIDGE INTERIM SUPERSTRUCTION SECTION			
Designer: J. LYNCH	Structure Numbers		Project No./Code
Detailer: C. MIYAMOTO			
Subset: BRIDGE	Sheets: B19 of 32		Sheet Number 29



TYPICAL FUTURE SECTION
(LOOKING SOUTH)

NOTES:

1. DECK & SIDEWALK CONCRETE SHALL BE CLASS D (BRIDGE).
2. PROVIDE TRANSVERSE RAKE FINISH (¼"± AMPLITUDE) ON THE BRIDGE DECK IN THE AREAS WHERE SIDEWALK IS TO BE PLACED, CLEAN PRIOR TO PLACING SIDEWALK CONCRETE.

▲ DRILL & EPOXY GROUT DOWELS INTO DECK AFTER SLAB HAS BEEN POURED, USE HILTI HIT HY–150 EPOXY ADHESIVE, 6" MIN. EMBEDMENT DEPTH. THE COST OF DRILLING & EPOXY WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (BRIDGE).

● PROVIDE CONTINUOUS BENTONITE/BUTYL RUBBER BASED WATERSTOP (CARLISLE MIRASTOP OR APPROVED EQUAL). THE COST OF THE WATERSTOP WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 601, CONCRETE CLASS D (BRIDGE).

3. CONCRETE SEALER SHALL BE APPLIED TO CONCRETE SIDEWALK, CURBS AND FACE OF BRIDGE RAIL 6" ABOVE SIDEWALK.
4. STAGGER ALL LONGITUDINAL REINFORCING BAR SPLICES.

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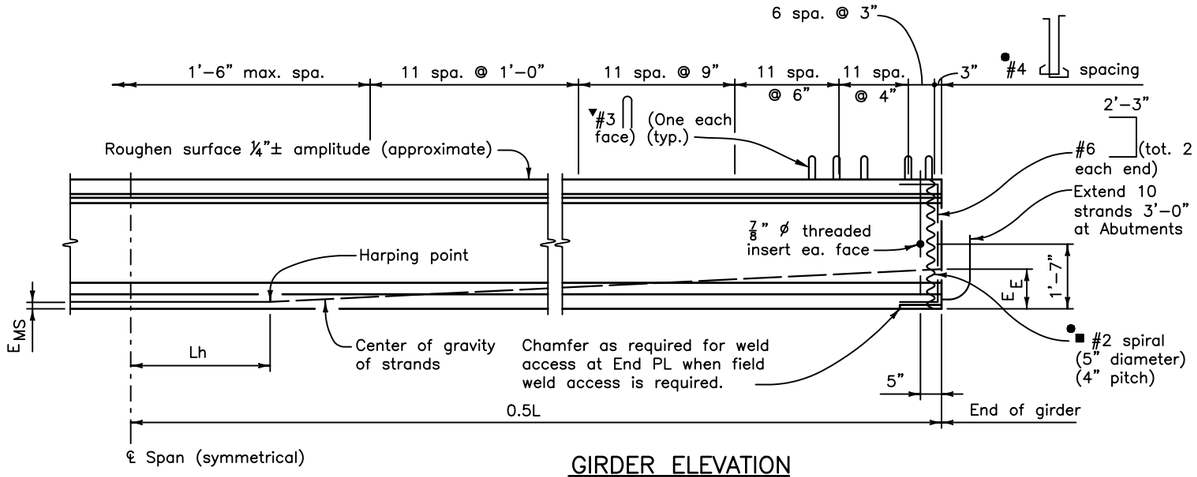
BELFORD–HAPPY CANYON CREEK BRIDGE
FUTURE
SUPERSTRUCTION SECTION

Designer:	J. LYNCH	Structure Numbers	
Detailer:	C. MIYAMOTO		
Subset:	BRIDGE	Sheets:	B20 of 32

Project No./Code

Sheet Number 30

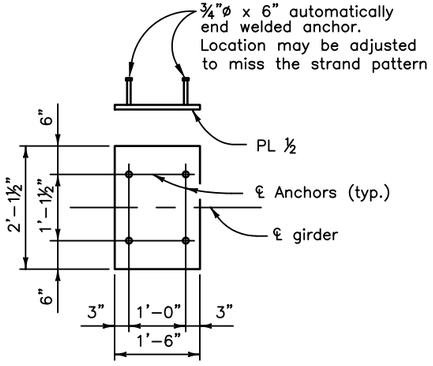


GIRDER ELEVATION

■ The Contractor may submit an alternate cross tie arrangement, at the end of the web, for approval by the Engineer.

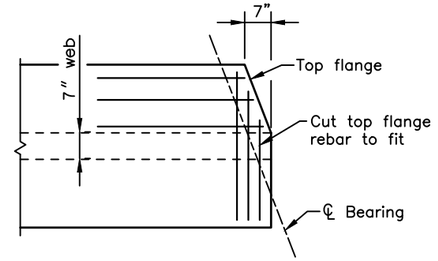
▼ Space with #4 ● for stirrup spacings of 9" or more. Space at 1'–0" for stirrup spacings less than 9".

● D20 wires may be used in lieu of #4.
2 – D20 wires may be used in lieu of #6.
D11 or W10.9 wires may be used in lieu of #3.
W5 wires my be used in lieu of #2.



END PLATE DETAIL

Galvanize after fabrication

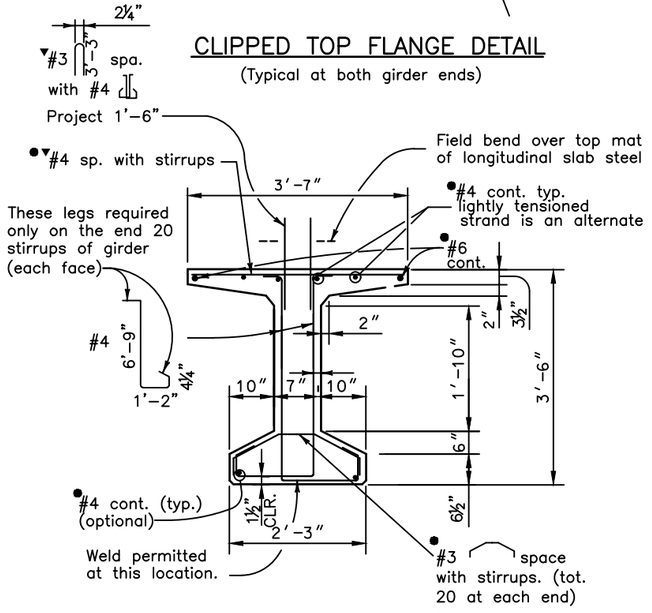


CLIPPED TOP FLANGE DETAIL

(Typical at both girder ends)

GIRDER SCHEDULE – INTERIM GIRDERS														
Girder Type	Span No.	Girder No.	L (ft)	Lh (ft)	A_s (in^2)	E_{MS} (in)	E_E (in)	F_j (kips)	F_f (kips)	f'_{ci} (psi)	f'_c (psi)	Δ (in)	Predicted Release Camber (in)	Predicted camber (in)
BT42	1	G7	77.10	7.71	6.08	14.86	4.14	1230	1020	6000	8000	1.17	1.81	3.55
BT42	1	G8–G9	77.10	7.71	6.08	14.86	4.14	1230	1004	6000	8000	1.04	1.96	3.56
BT42	1	G10–G11	77.46	7.75	6.08	14.86	4.14	1230	1004	6000	8000	1.05	1.96	3.57
BT42	1	G12	77.46	7.75	6.08	14.86	4.14	1230	1010	6000	8000	1.10	1.91	3.58
BT42	2	G7	77.06	7.71	6.08	14.86	4.14	1230	1021	6000	8000	1.18	1.81	3.55
BT42	2	G8–G9	77.06	7.71	6.08	14.86	4.14	1230	1004	6000	8000	1.03	1.96	3.55
BT42	2	G10–G11	77.23	7.72	6.08	14.86	4.14	1230	1004	6000	8000	1.04	1.96	3.56
BT42	2	G12	77.23	7.72	6.08	14.86	4.14	1230	1010	6000	8000	1.10	1.90	3.56

GIRDER SCHEDULE – FUTURE GIRDERS														
Girder Type	Span No.	Girder No.	L (ft)	Lh (ft)	A_s (in^2)	E_{MS} (in)	E_E (in)	F_j (kips)	F_f (kips)	f'_{ci} (psi)	f'_c (psi)	Δ (in)	Predicted Release Camber (in)	Predicted camber (in)
BT42	1	G1	76.48	7.65	6.08	14.86	4.14	1230	1021	6000	8000	1.14	1.82	3.52
BT42	1	G2–G3	76.48	7.65	6.08	14.86	4.14	1230	1016	6000	8000	1.15	1.82	3.52
BT42	1	G4	76.78	7.68	6.08	14.86	4.14	1230	1016	6000	8000	1.16	1.82	3.53
BT42	1	G5–G6	76.78	7.68	6.08	14.86	4.14	1230	1016	6000	8000	1.17	1.82	3.54
BT42	2	G1	76.75	7.68	6.08	14.86	4.14	1230	1022	6000	8000	1.18	1.80	3.53
BT42	2	G2–G3	76.75	7.68	6.08	14.86	4.14	1230	1016	6000	8000	1.16	1.82	3.54
BT42	2	G4	76.90	7.69	6.08	14.86	4.14	1230	1016	6000	8000	1.17	1.82	3.54
BT42	2	G5–G6	76.90	7.69	6.08	14.86	4.14	1230	1016	6000	8000	1.17	1.82	3.54



TYPICAL GIRDER SECTION

NOTES:

All work necessary to fabricate and install the integral parts of the girder (including the intermediate diaphragms, ⅞"ø threaded rods, and leveling pads), as shown on the plans, shall be included in the bid price for Item No. 618, Prestressed Concrete I (BT42), with a pay unit of LF which shall be measured by dimension L.

When approved by the Engineer, a minimum of tack welding will be permitted on ASTM A706 uncoated reinforcing steel.

Reinforcing projecting from the top of the girder and reinforcing within eight feet of an expansion device in the bridge deck shall be epoxy coated. Damaged coating on girder reinforcing within the girder need not be repaired. the minimum cover for reinforcing steel is 1".

At girder ends not embedded in concrete diaphragms, cut strands off 1" below the surface of the concrete and finish with an approved epoxy grout. At girder ends embedded in concrete diaphragms, cut strands to project 3", except as shown. Do not make cosmetic repairs (damage less than 1½" 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 1¼". The minimum cover for prestressing steel is 1½".

A minimum of two harping points shall be used per girder. Harped strands shall be well distributed at the girder ends, starting within 4" of the top of the girder and distributed such that there is no space between strands greater than 1'–0" at the end of the girder. As an alternate the Contractor may place #4 ● x 10'–0" in the sides of the end of the web parallel to the harped strands such that there is no space greater than 1'–0".

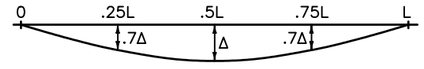
A_s* = minimum area of the prestressing steel.
d_s = nominal strand diameter.
f'_s = ultimate strength of prestressing steel.
F_j = jacking force per girder.
F_f = final force per girder after all losses.
f'_{ci} = required concrete strength at release of prestress force.
f'_c = required concrete strength at 28 days of age.
L = length of girder along the grade of the girder.
Δ = deflection at centerline of span due to cast–in–place slab,
= diaphragms, asphalt, curbs, rails, and walks.

Concrete shall be Class PS.

Entrained air is not required for girder concrete.

Use ½" chamfer on all corners, except as noted.

Predicted camber is the camber for the girder alone at 60 days. Acceptable camber variability is limited to 20% over the predicted camber and 50% under the predicted camber or ± 1 inch, whichever is greater. The contractor shall report to the Engineer values of camber which require remedial measures. The remedial measures shall be reviewed and approved by the Engineer. The costs associated with all remedial measures shall be borne by the Contractor.



DEAD LOAD DEFLECTION DIAGRAM

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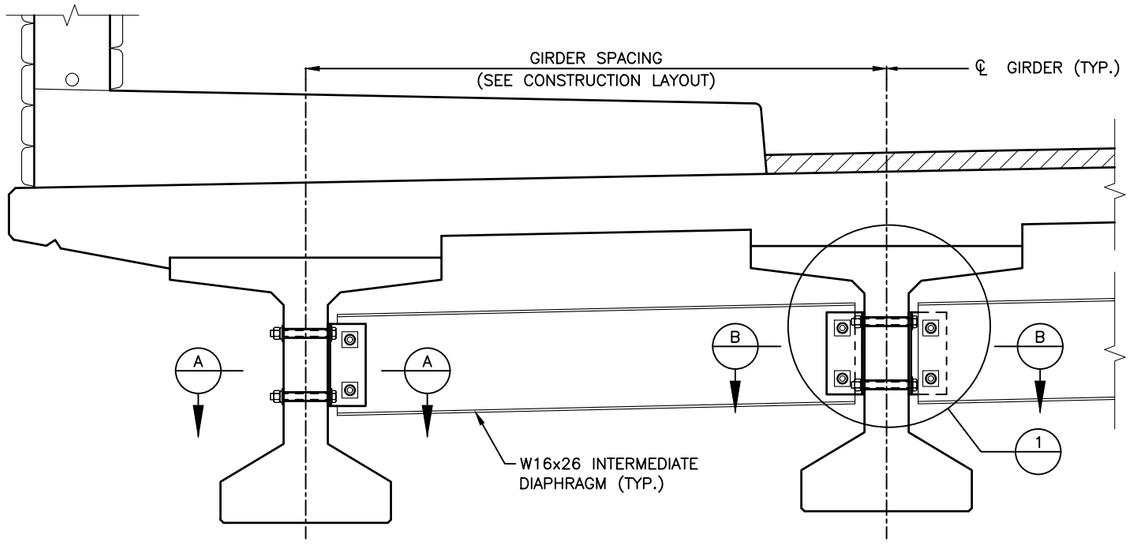
Void:

BELFORD–HAPPY CANYON CREEK BRIDGE
PRECAST CONCRETE I GIRDER

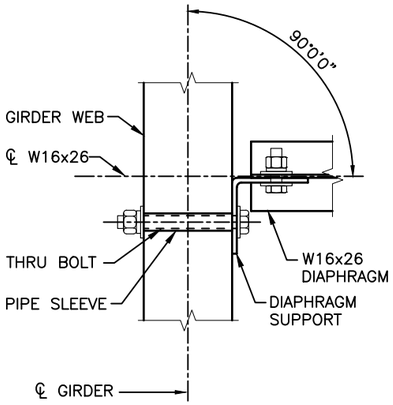
Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers:
Sheets: B21 of 32

Project No./Code:

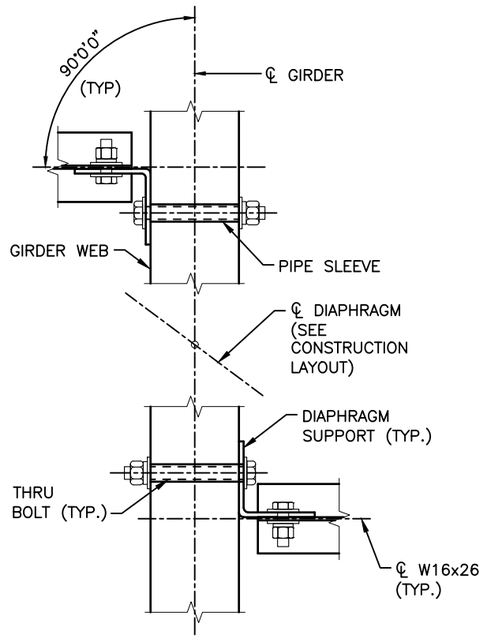
Sheet Number 31



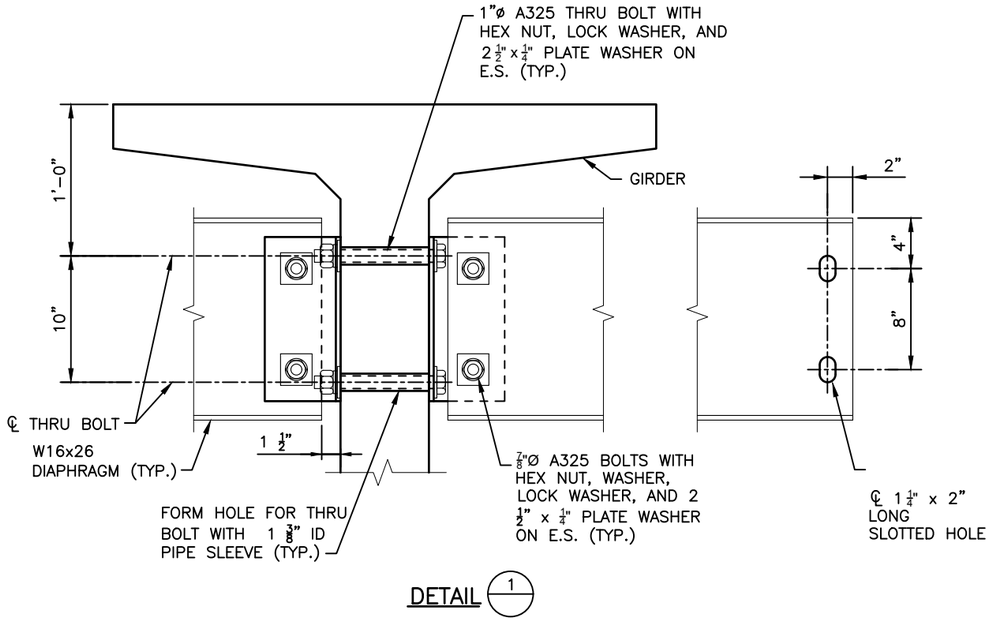
PARTIAL ELEVATION AT DIAPHRAGM
(TAKEN NORMAL TO GIRDER)



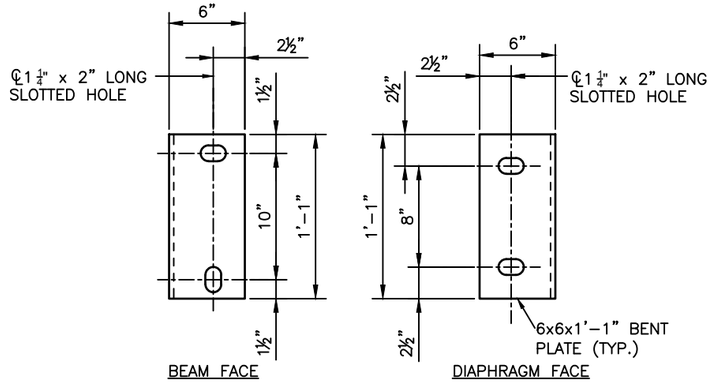
SECTION A



SECTION B



DETAIL 1



DIAPHRAGM SUPPORT DETAIL

NOTES:

1. SEE CONSTRUCTION LAYOUT FOR INTERMEDIATE DIAPHRAGM LOCATIONS.
2. ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED. GALVANIZE AFTER FABRICATION.
3. BOLTS, NUTS AND LOCK WASHERS MAY BE ZINC PLATED IN LIEU OF BEING GALVANIZED.
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.
5. WHEN BRACING OR DIAPHRAGMS ARE REQUIRED, NO GIRDERS SHALL BE ERECTED AND LEFT UNBRACED. THE INTERMEDIATE DIAPHRAGMS (WHEN USED) SHALL BE CONNECTED TO THE ADJACENT GIRDERS SIMULTANEOUSLY WITH THE ERECTION OF THE GIRDERS.
6. USE AND INSTALLATION OF THE INTERMEDIATE DIAPHRAGMS SHALL NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY TO CONSTRUCT THE WORK IN A MANNER WHICH PROVIDES ALL NECESSARY RIGIDITY, SUPPORTS ALL LOADS IMPOSED, AND PROVIDES IN THE FINISHED STRUCTURE THE LINES AND GRADES INDICATED ON THE PLANS.
7. THE COST OF THE DIAPHRAMS SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE GIRDER.

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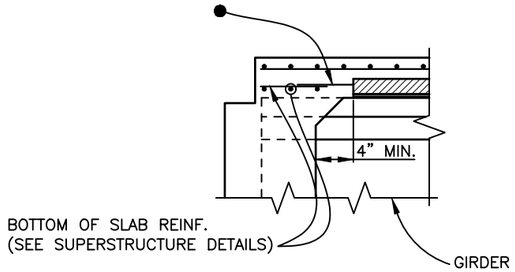
BELFORD–HAPPY CANYON CREEK BRIDGE
GIRDER DIAPHRAGM
DETAILS

Designer:	J. LYNCH	Structure Numbers	
Detailer:	R. DILLON		
Subset:	BRIDGE	Sheets:	B22 of 32

Project No./Code

Sheet Number 32



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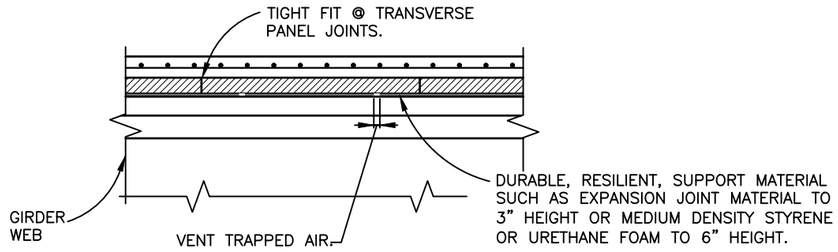
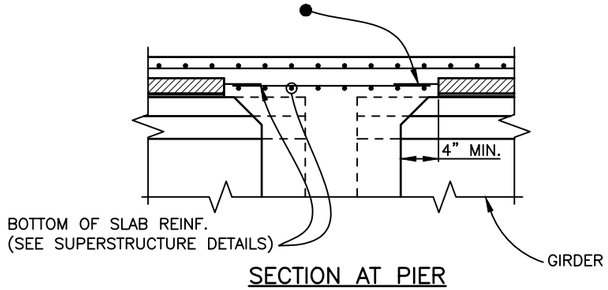


SECTION THRU TRANSVERSE
PANEL JOINTS



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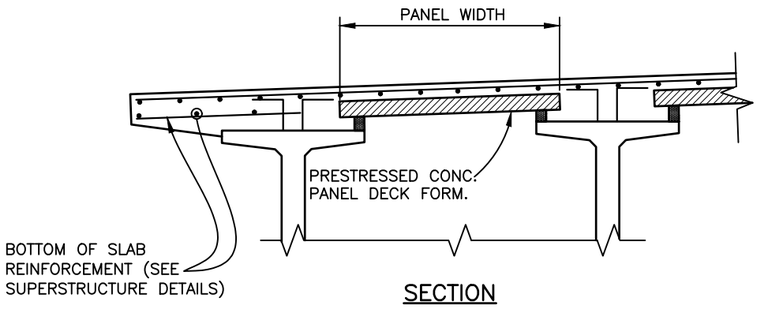

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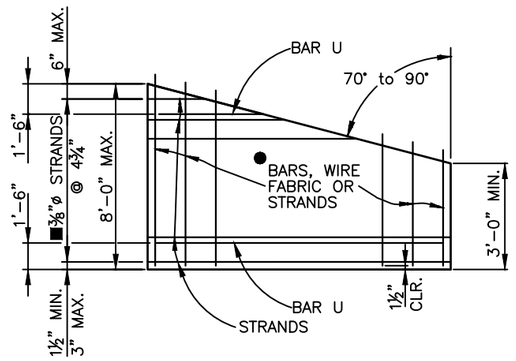
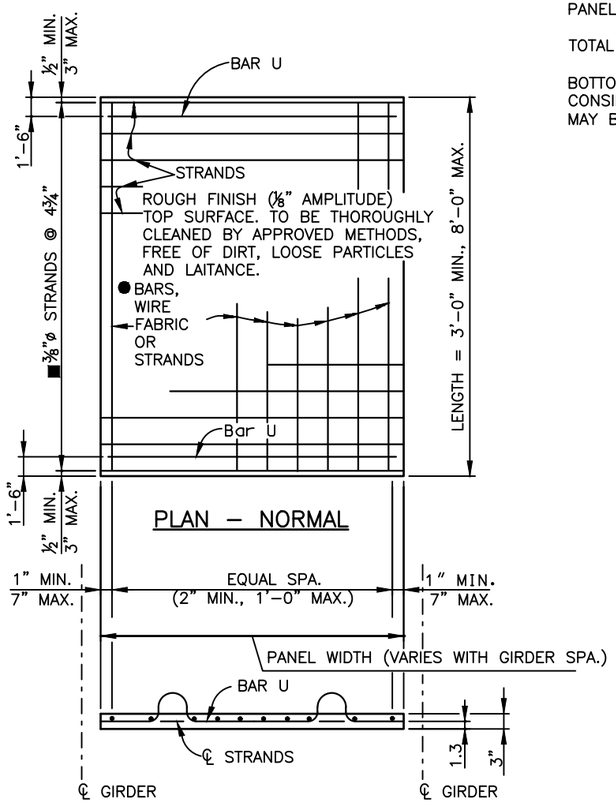


PLAN – SKEWS 70°TO 90°
OPTIONAL END PANEL



PRESTRESSED PANEL DETAILS

NOTES:

SAWING OF PANELS IS ACCEPTABLE IN AREAS WHERE PROJECTING REINFORCEMENT IS NOT REQUIRED. IT IS DESIRABLE TO HAVE THE PRESTRESSING STRANDS PROJECT FROM THE PANELS AS LONG AS THE PROJECTING STRANDS DO NOT INTERFERE WITH OTHER BRIDGE COMPONENTS.

● REINFORCING PERPENDICULAR TO STRANDS MAY BE DEFORMED REINF. BARS, WELDED WIRE FABRIC, OR WELDED DEFORMED BAR MATS, AND SHALL BE PLACED DIRECTLY ABOVE THE STRANDS. MINIMUM AREA OF REINFORCING PERPENDICULAR TO STRANDS SHALL BE 0.11 SQ. IN. PER FT. TENSIONED OR UNTENSIONED STRANDS MAY ALSO BE USED. THESE INDIVIDUAL BARS OR WIRES SHALL BE NO LARGER THAN .375" DIAMETER. FOR LOCATION OF LONGITUDINAL BAR EXTENSIONS, SEE PRECAST PANEL DECK FORM SHEET.

■ MAY BE REDUCED TO ⅜"ø STRANDS AT 9½" WHEN THE PANEL WIDTH IS LESS THAN 5'–7" AND THE DESIGN SPAN IS LESS THAN 7'–7".

THE LONGITUDINAL REINFORCING STEEL IN THE CAST–IN–PLACE PORTION OF THE DECK MAY REST DIRECTLY ON THE PANELS AS NECESSARY TO OBTAIN CLEARANCES AT THE TOP OF DECK, UNLESS OTHERWISE NOTED.

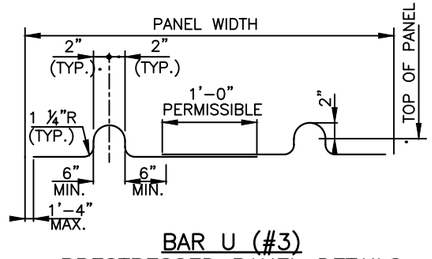
THE TOLERANCE ON STRAND PLACEMENT SHALL NOT EXCEED ± ¼".

THE TOLERANCE ON PANEL THICKNESS SHALL NOT EXCEED ± ¼".

CONCENTRATED CONSTRUCTION LOADS SHALL NOT EXCEED 500 LB FOR 3" PANELS, 700 LB FOR 3.5" PANELS, NOR 1100 LB FOR 4" PANELS UNLESS THE LOAD IS DISTRIBUTED TO LESS THAN 117 PSF.

TOTAL LOADS APPLIED TO ANY PANEL DURING CONSTRUCTION SHALL NOT EXCEED 117 PSF.

BOTTOM FLEXURAL CRACKS, SAGS GREATER THAN ½", OR CAMBERS GREATER THAN ½",WILL BE CONSIDERED EVIDENCE OF MISHANDLING, OVERLOADING, OR EXCEEDING ALLOWABLE TOLERANCES, AND MAY BE CAUSE FOR REJECTING PANELS AT THE ENGINEER'S DISCRETION.



BAR U (#3)
PRESTRESSED PANEL DETAILS

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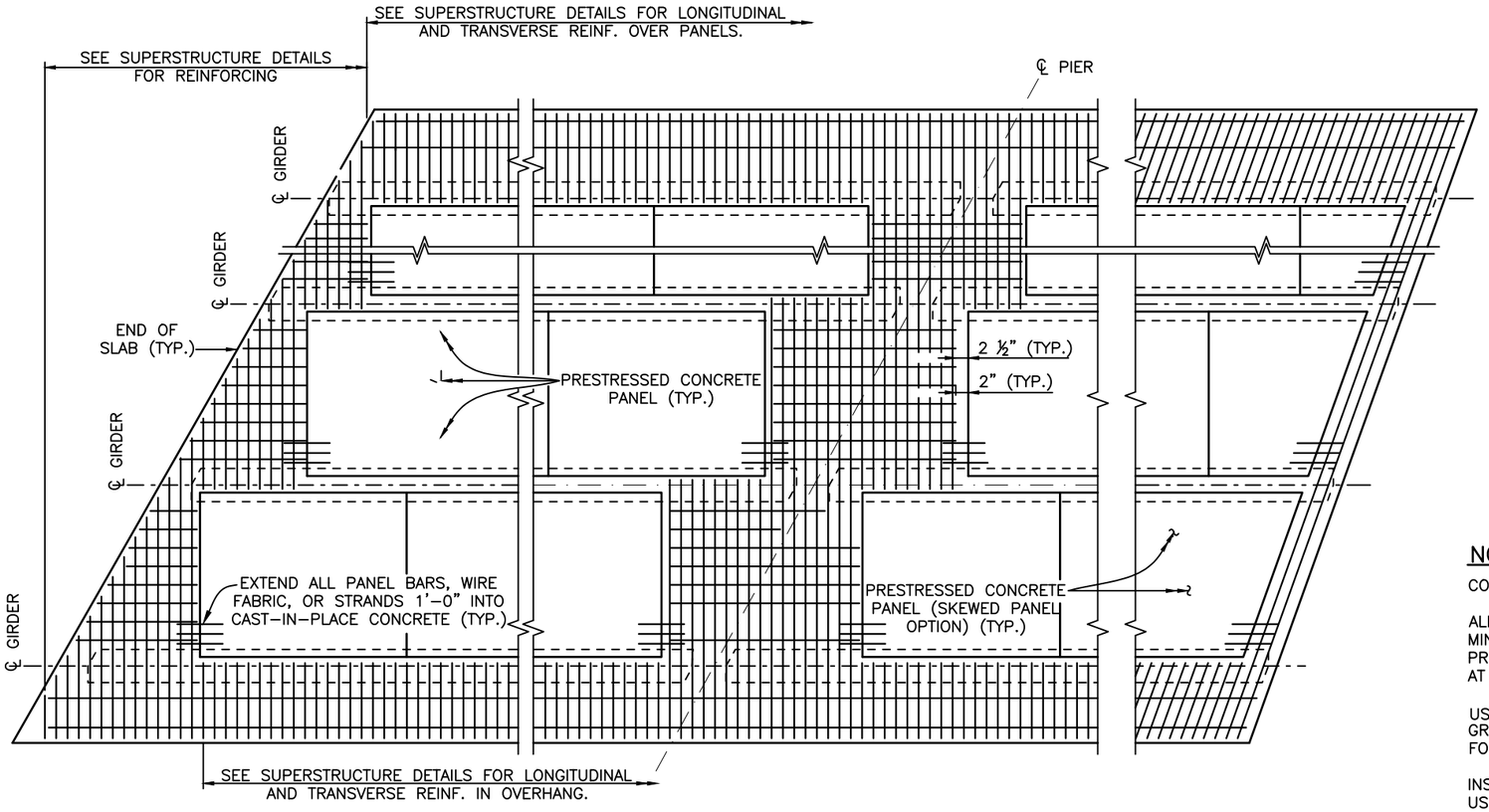
BELFORD–HAPPY CANYON CREEK BRIDGE
OPTIONAL PRECAST PANEL
DECK FORM (1 OF 2)

Designer:	J. LYNCH	Structure Numbers	
Detailer:	C. MIYAMOTO		
Subset:	BRIDGE	Sheets:	B23 of 32

Project No./Code

Sheet Number 33



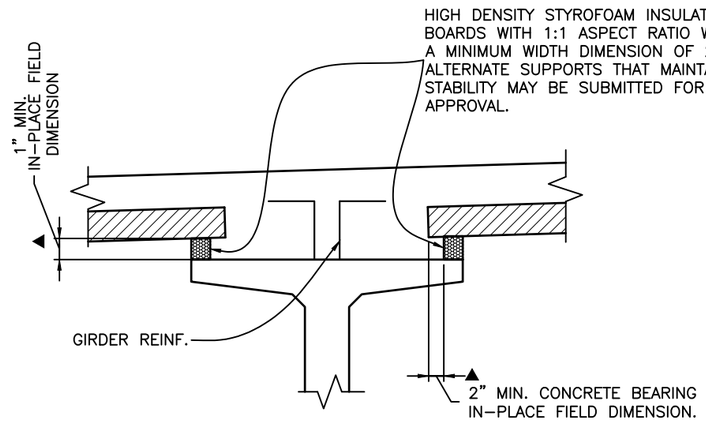
END OF SLAB RECTANGULAR PANEL OPTION AND SKEWS LESS THAN 70°

RECTANGULAR PANEL OPTION SHALL BE USED FOR SKEWS LESS THAN 70°.

CONTINUOUS SLAB OVER PIER

END OF SLAB SKEWED PANEL OPTION FOR SKEWS 70° to 90°

PART PLAN



SUPPORT DETAIL

NOTES:

COMPOSITE TOTAL SLAB DESIGNED FOR HS 25–44 AND ALTERNATE MILITARY LOADING.

ALL CONCRETE SHALL BE CLASS PS WITH RELEASE STRENGTH f'_{ci} = 4500 PSI AND MINIMUM 28 DAY STRENGTH f'_c = 6000 PSI. ENTRAINED AIR IS NOT REQUIRED FOR PRECAST PANEL DECK FORM CONCRETE. THE STRENGTH SHALL BE AT LEAST 5000 PSI AT THE TIME OF THE DECK POUR.

USE ⅜"ø LOW RELAXATION STRANDS MEETING THE REQUIREMENTS OF ASTM A416 GRADE 270. JACKING FORCE PER STRAND (f'_i) SHALL BE AT LEAST 17.2 KIPS. FINAL FORCE PER STRAND (F_f) IS ESTIMATED TO BE 14.2 KIPS.

INSTALLATION OF BAR MU (#3) IS MANDATORY. ALL FOUR BAR U (#3) LOOPS SHALL BE USED SIMULTANEOUSLY FOR LIFTING THE PANELS.

CARE MUST BE TAKEN TO ENSURE PROPER CLEANING OF CONSTRUCTION DEBRIS OFF THE TOPS OF THE PANELS AND CONSOLIDATION OF CONCRETE MORTAR UNDER THE EDGES OF THE PANELS. WATER, DIRT OR OTHER DEBRIS ON TOP OF THE PANELS WILL INHIBIT THE BOND OF THE CAST–IN–PLACE CONCRETE. IT IS ALSO IMPORTANT THAT ADEQUATE SPACE (▲ MIN. 1" X 2") IS PROVIDED FOR THE CONCRETE TO FILL THE SPACE UNDER THE PANEL AS THE SLAB CONCRETE IS PLACED. PANEL LENGTHS AND WIDTH SHALL BE DETERMINED BY THE CONTRACTOR AND SHOWN ON THE SHOP PLANS.

THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE PANELS ON THE GIRDERS. ERECTED PANELS SHALL BE UNIFORMLY SUPPORTED ALONG THE LENGTH OF THE PANEL. THE CONTRACTOR IS RESPONSIBLE FOR MEETING THE TOTAL SLAB THICKNESS SHOWN ON THE SUPERSTRUCTURE DETAILS.

ALL PLANES OF REINFORCING STEEL SHOWN IN THE SUPERSTRUCTURE DETAILS ARE REQUIRED FOR AREAS NOT FORMED WITH PRECAST PANELS.

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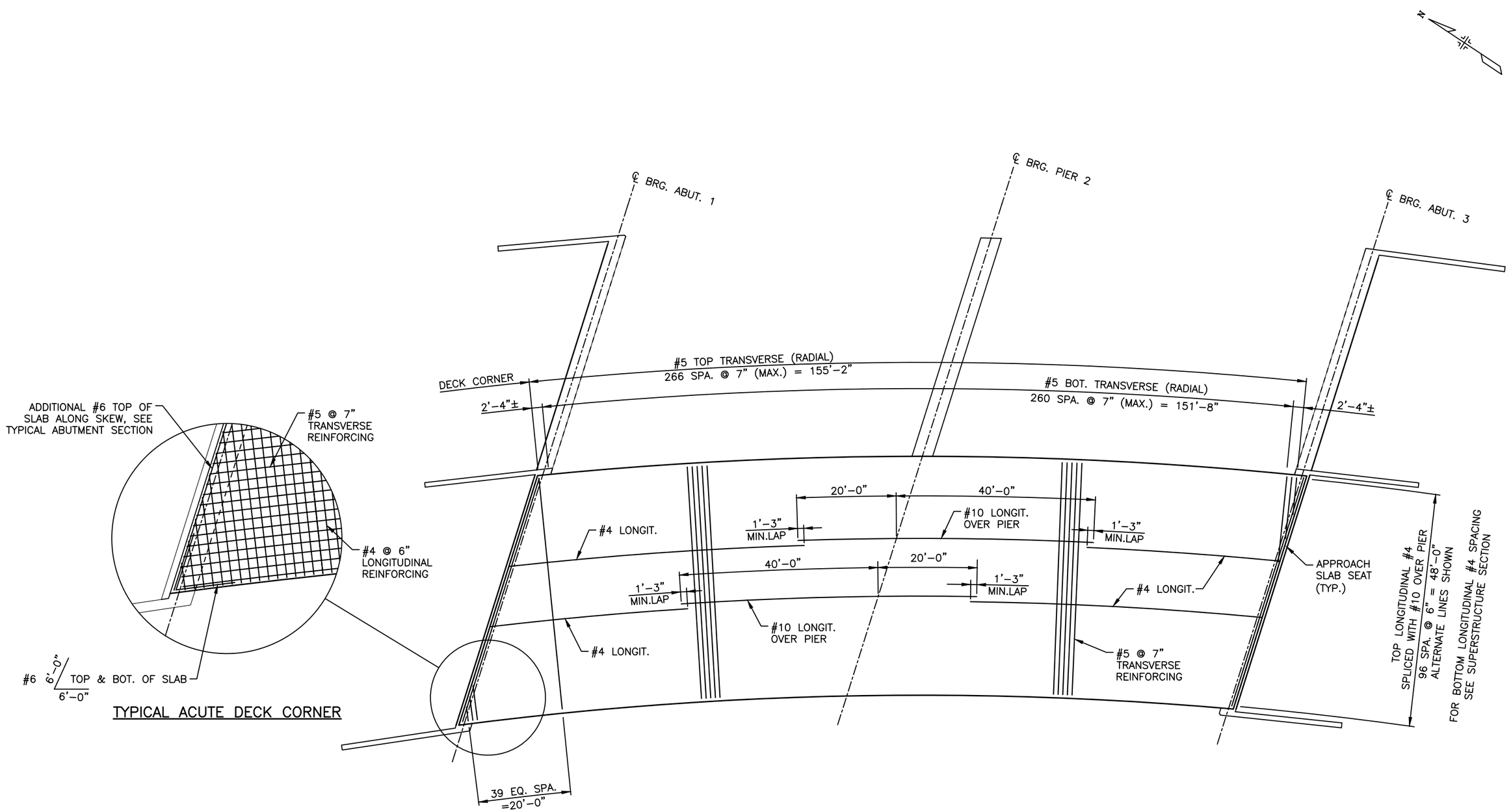
BELFORD–HAPPY CANYON CREEK BRIDGE
OPTIONAL PRECAST PANEL
DECK FORM (2 OF 2)

Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers:
Sheets: B24 of 32

Project No./Code:
Sheet Number 34



TYPICAL ACUTE DECK CORNER

REINFORCING PLAN

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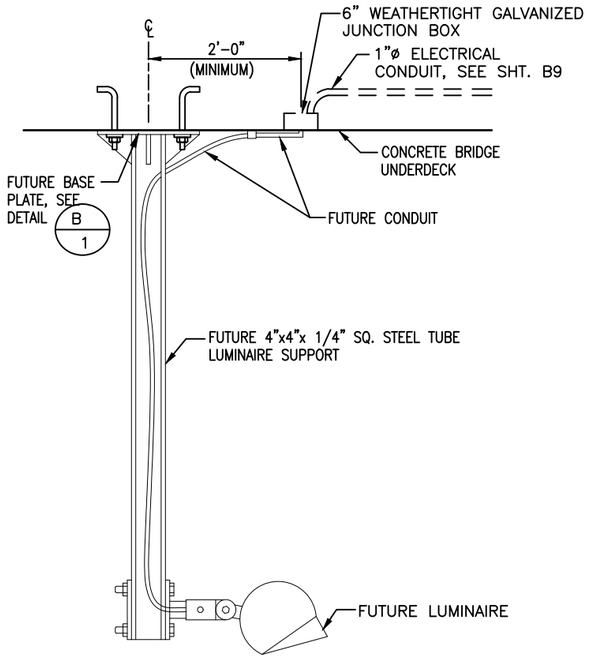
BELFORD-HAPPY CANYON CREEK BRIDGE
DECK REINFORCING PLAN

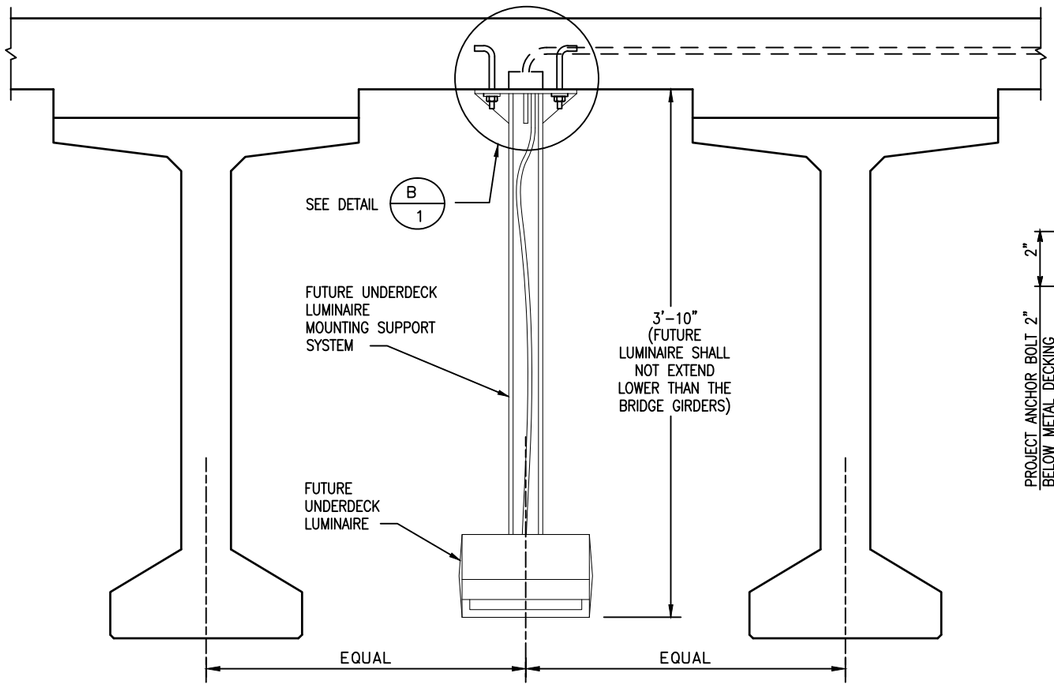
Designer: J. LYNCH
Detailer: MIYAMOTO/DILLON
Subset: BRIDGE
Structure Numbers
Sheets: B25 of 32

Project No./Code

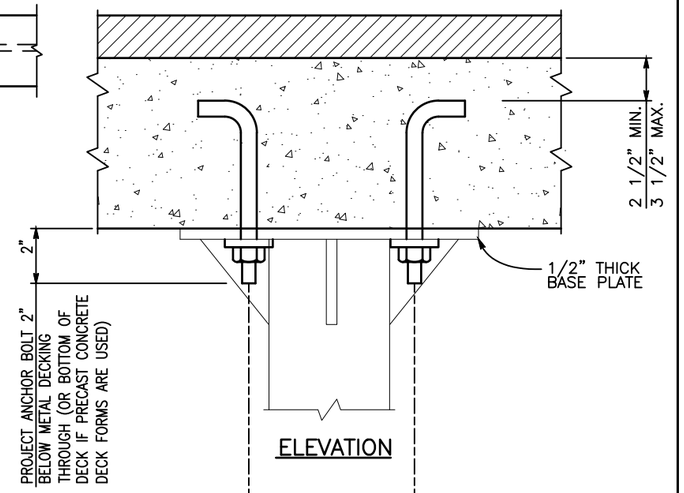
Sheet Number 35



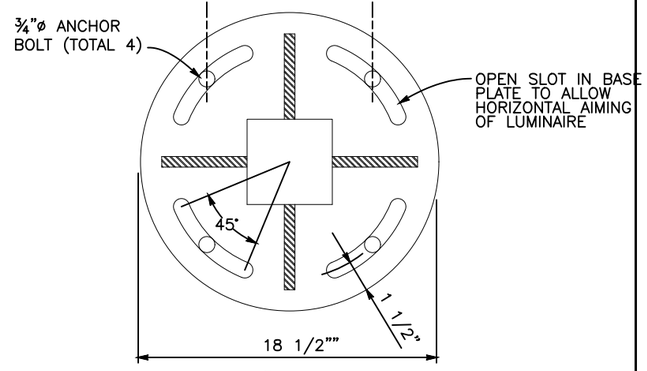
SECTION VIEW
FUTURE UNDERDECK LUMINAIRE SUPPORT



FRONT VIEW

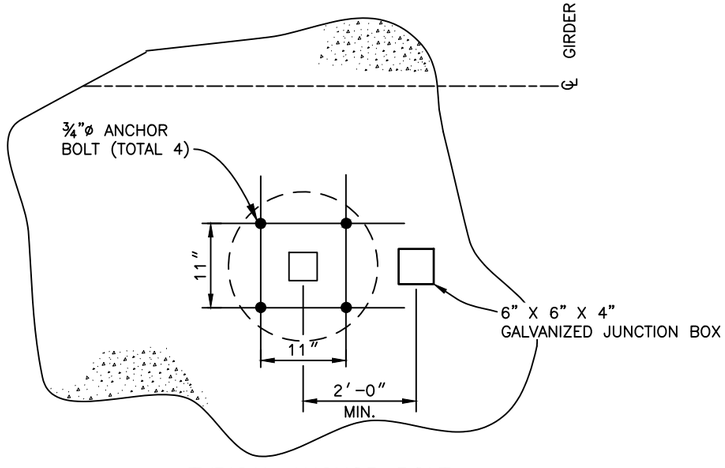


ELEVATION

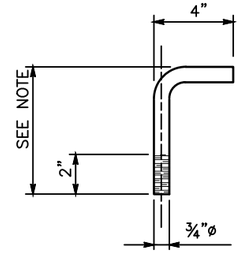


PLAN
FUTURE BASE PLATE

DETAIL B 1



TYPICAL ANCHOR BOLT
PLACEMENT DIAGRAM



ANCHOR BOLT DETAIL

ANCHOR BOLT LENGTH SHALL BE DETERMINED BY CONTRACTOR BASED ON DECK THICKNESS & METAL DECKING DEPTH. (OR ON DECK THICKNESS ONLY IF OPTIONAL PRECAST CONCRETE DECK FORMS ARE USED)

NOTE:

CONTRACTOR SHALL PROVIDE AND INSTALL ONLY THE ANCHOR BOLTS, JUNCTION BOXES, AND CONDUIT WITHIN THE CONCRETE BRIDGE DECK AS PART OF THIS CONTRACT. ALL OTHER ITEMS SHOWN ON THIS SHEET (STEEL PENDANTS AND LUMINAIRES) ARE FUTURE WORK AND NOT PART OF THIS CONTRACT. COST FOR JUNCTION BOXES AND ANCHOR BOLTS WILL NOT BE PAID FOR SEPERATELY, BUT SHALL BE INCLUDED IN THE COST OF ITEM 613, 1 INCH ELECTRICAL CONDUIT.

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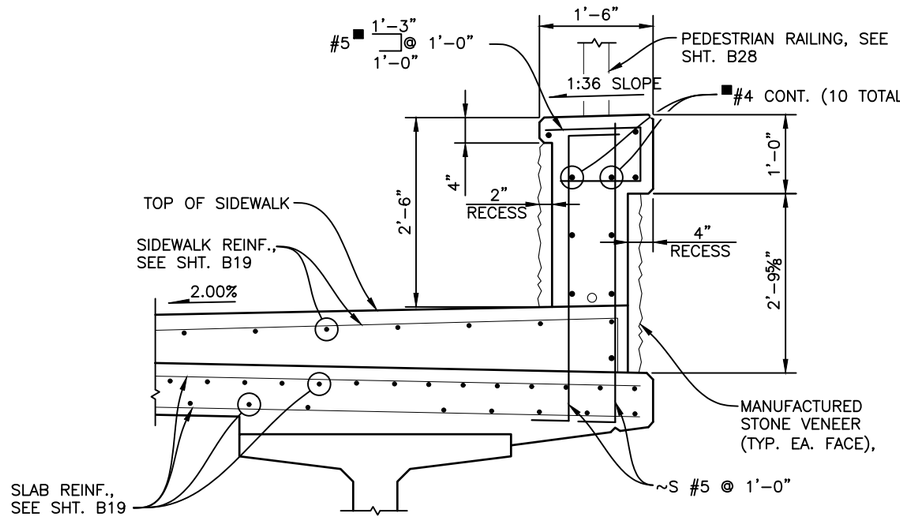
BELFORD-HAPPY CANYON CREEK BRIDGE
PENDANT LUMINAIRE
DETAILS (FUTURE)

Designer: J. LYNCH
Detailer: R. DILLON
Subset: BRIDGE
Structure Numbers:
Sheets: B26 of 32

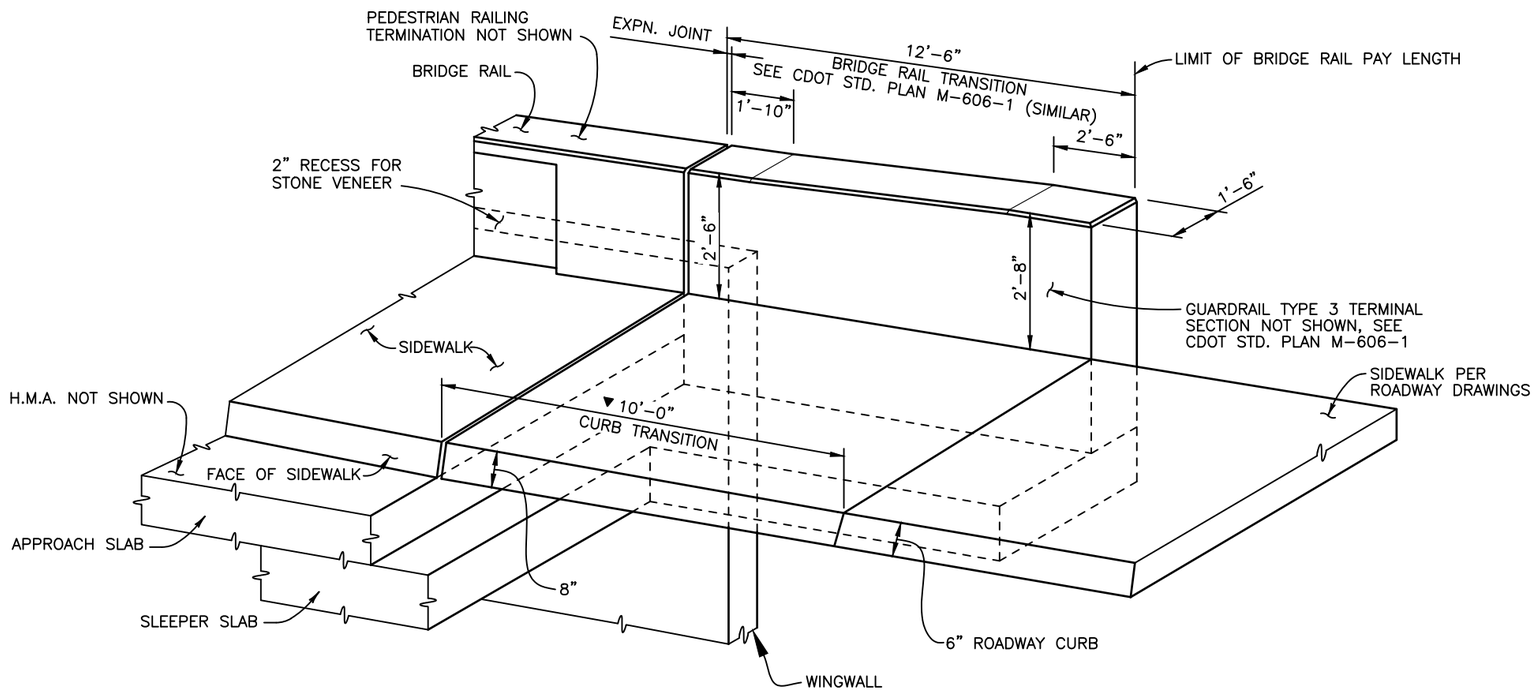
Project No./Code:

Sheet Number 36



TYPICAL SECTION

■ REINFORCEMENT SHALL BE INCLUDED IN ITEM 606, BRIDGE RAIL (SPECIAL)



RAIL ISOMETRIC

BRIDGE RAIL (SPECIAL) NOTES

CONCRETE & REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATION SECTIONS 601 & 602, RESPECTIVELY.

ALL BRIDGE RAIL & SIDEWALK CONCRETE SHALL BE CONCRETE CLASS D (BRIDGE).

PEDESTRIAN RAILING (STEEL) NOTES

SEE PROJECT SPECIAL PROVISION, REVISION OF SECTION 514 PEDESTRIAN RAILING (STEEL).

STRUCTURAL STEEL ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF SPECIFICATION SECTION 509.

ALL TUBES SHALL BE ASTM A-500 GRADE B.
ALL OTHER STEEL SHALL BE ASTM A-36 UNLESS OTHERWISE NOTED.

STRUCTURAL STEEL:
AASHTO M-183 (ASTM A-36) F_Y = 36,000 PSI
COLD FORMED ASTM A-500 GRADE B F_Y = 46,000 PSI

PEDESTRIAN RAILING (STEEL) SHALL BE FABRICATED IN ACCORDANCE WITH REVISION OF SECTION 514 OF THE STANDARD SPECIFICATIONS. STEEL POSTS, PLATES, TUBE EXPANSION JOINTS AND DEFORMED ANCHOR STUDS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF ITEM 606-BRIDGE RAIL (SPECIAL).

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.

THE TUBES SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVES.

TUBES SHALL BE CONTINUOUS OVER NOT LESS THAN TWO POSTS OR MORE THAN 3 POSTS. NO WELDED BUTT SPLICES WILL BE ALLOWED IN THE TUBE SECTIONS.

THE CENTERLINE OF THE TUBE SPLICE SHALL BE CENTERED BETWEEN POSTS.

ALL EXPOSED WELDS SHALL BE GROUND SMOOTH.

ALL PEDESTRIAN RAILING COMPONENTS SHALL BE FABRICATED AND INSTALLED WITH POSTS PLUMB AND RAILS TRUE TO LINE IN ACCORDANCE WITH THE PLANS.
STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH REVISION OF SECTION 514, AND SECTION 509 AS APPLICABLE, OF THE STANDARD SPECIFICATIONS. COLOR SHALL BE "PARKER BROWN".

BRIDGE RAIL (SPECIAL) FOR INFORMATION ONLY		
DESCRIPTION	UNIT	PER LIN. FT.
CONCRETE CLASS D	CY	0.106
REINFORCING STEEL (EPOXY COATED)	LB	17.6

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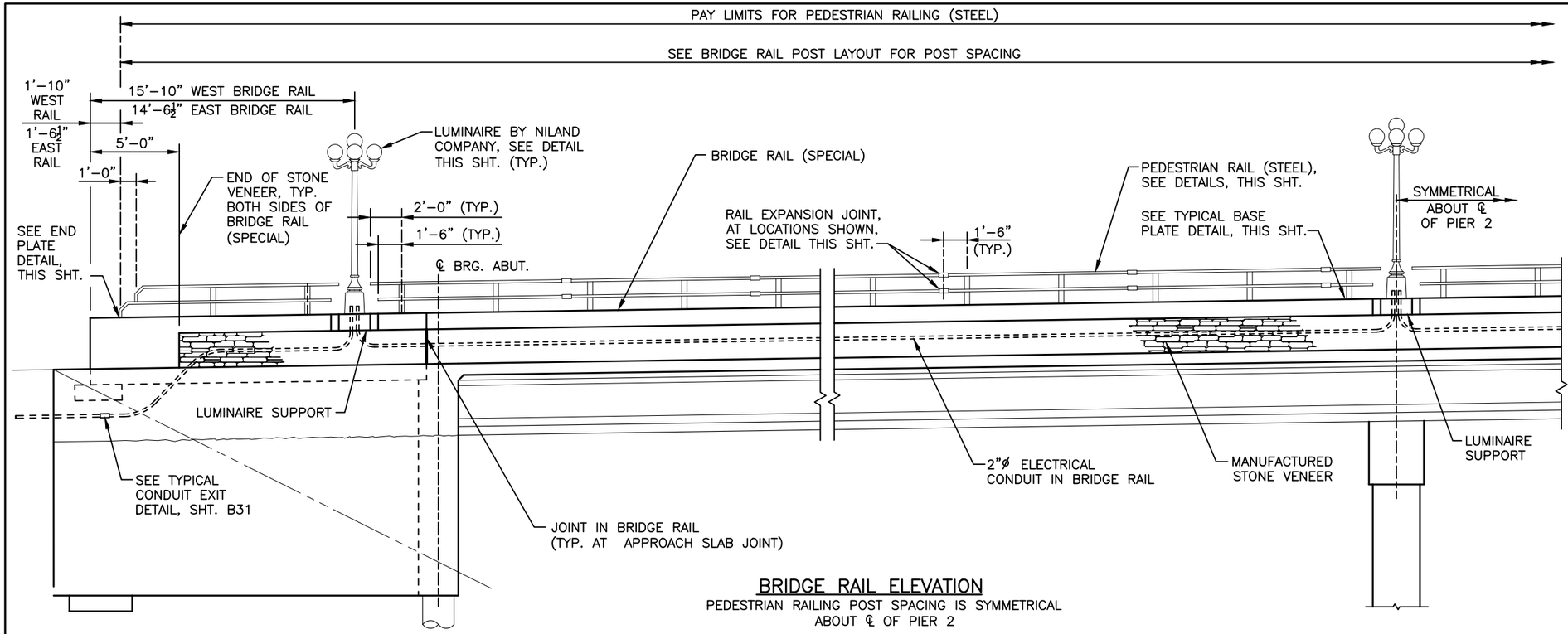
BELFORD-HAPPY CANYON CREEK BRIDGE
BRIDGE RAIL (SPECIAL) DETAILS

Designer: J. LYNCH
Detailer: R. DILLON
Subset: BRIDGE
Structure Numbers:
Sheets: B27 of 32

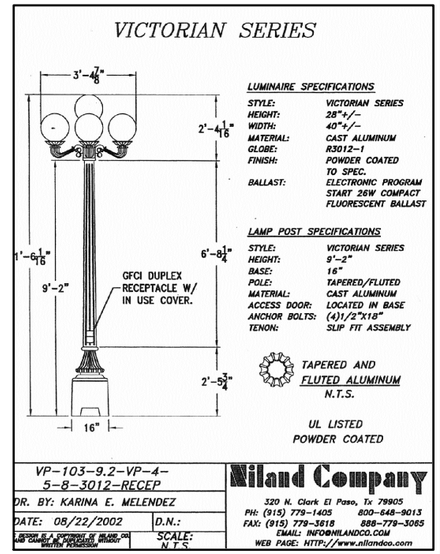
Project No./Code:

Sheet Number 37

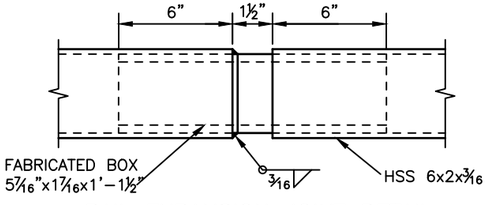


BRIDGE RAIL ELEVATION

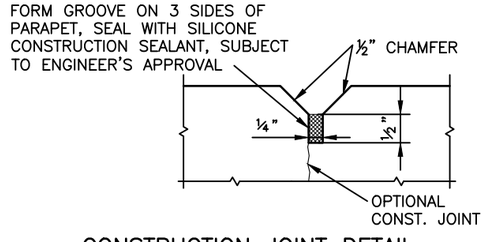
PEDESTRIAN RAILING POST SPACING IS SYMMETRICAL ABOUT ℄ OF PIER 2



LUMINAIRE DETAIL

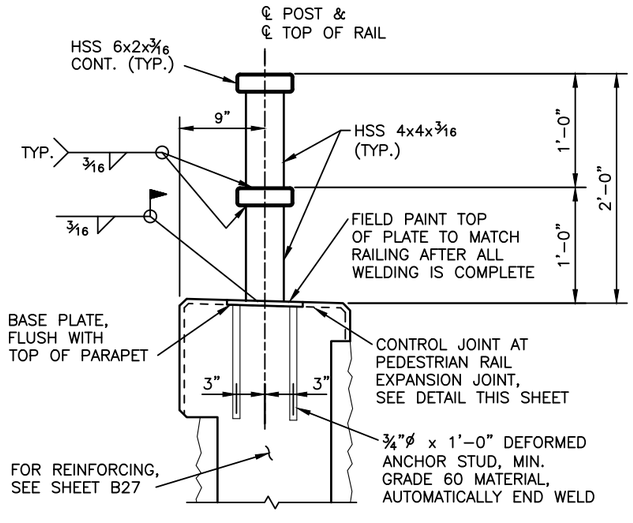


RAIL EXPANSION JOINT DETAIL

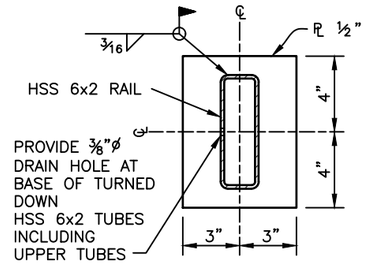


CONSTRUCTION JOINT DETAIL

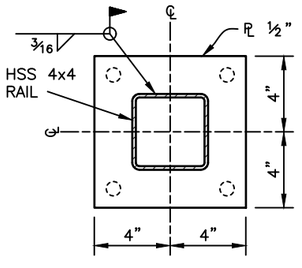
LOCATIONS TO COINCIDE WITH RAIL EXPANSION JOINT LOCATIONS



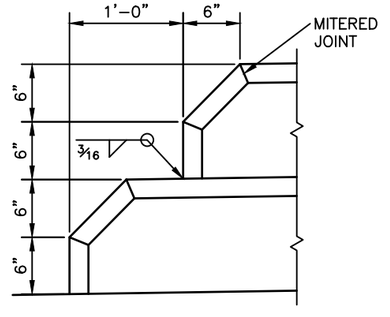
TYPICAL PEDESTRIAN RAILING SECTION



END PLATE DETAIL



TYPICAL BASE PLATE DETAIL



PEDESTRIAN RAIL END DETAIL

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As Constructed	BELFORD–HAPPY CANYON CREEK BRIDGE BRIDGE RAIL ELEVATION & PEDESTRIAN RAILING DETAILS		Project No./Code
No Revisions:			
Revised:	Designer: J. LYNCH	Structure Numbers	
Detailer: R. DILLON			
Void:	Subset: BRIDGE	Sheets: B28 of 32	Sheet Number 38

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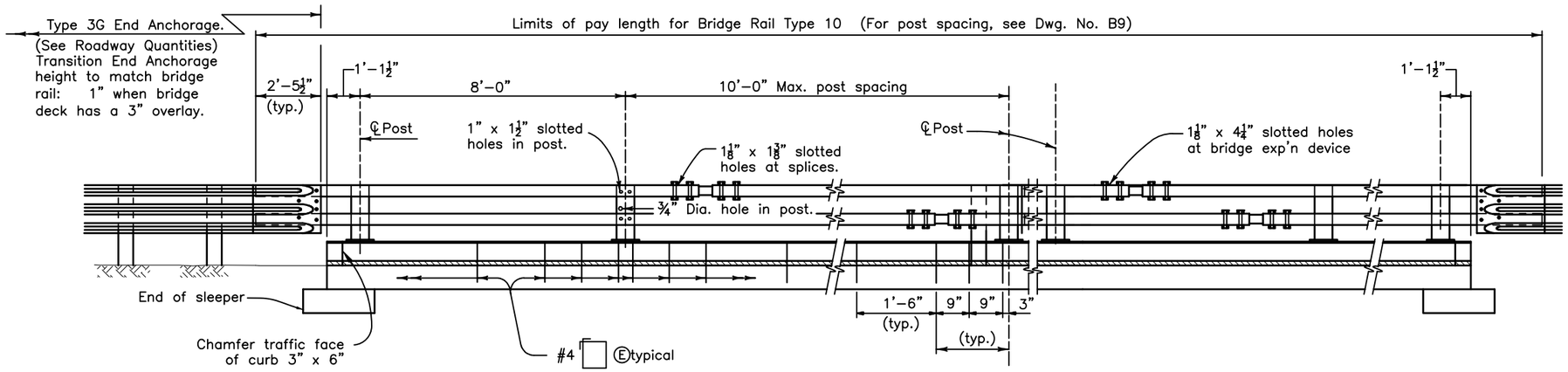


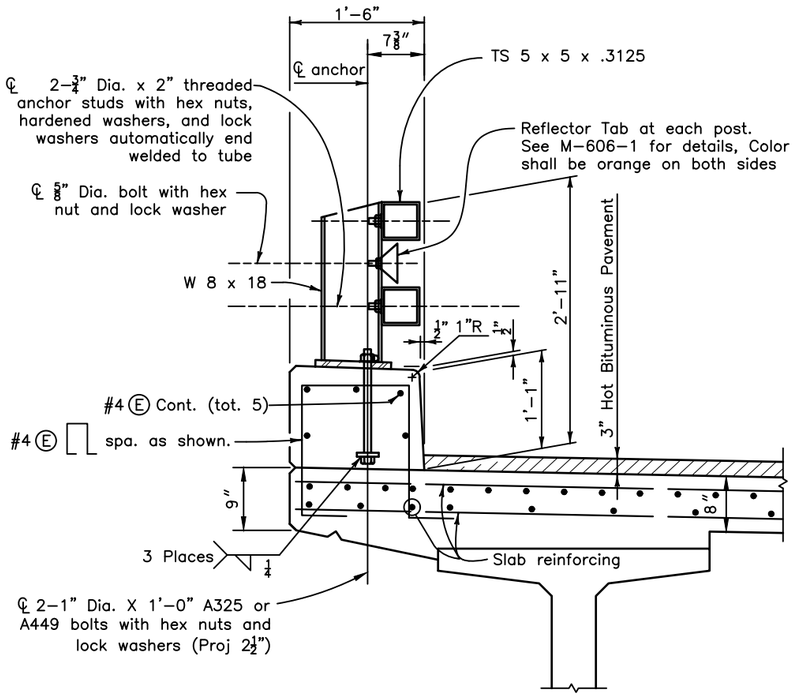
INFORMATION ONLY

Description	Unit	Per Lin. Ft.
Structural Steel (Galvanized)	Lb.	45.1
Concrete Class D (Bridge)	Cu.Yd.	.06
Reinforcing Steel (Epoxy Coated)	Lb.	8.0

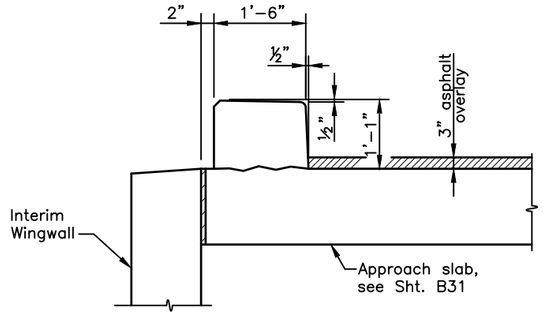
RAIL PANEL AT TRANSITION SECTION

(See roadway plans for ends requiring attachment to guard rail.)

BRIDGE RAIL ELEVATION TRAFFIC SIDE



TYPICAL SECTION



TYPICAL BRIDGE RAIL CURB SECTION ON APPROACH SLAB

NOTES

All tubes shall be ASTM A–500 Grade B.
All posts and base plates shall be ASTM A–572 Grade 50.
All other steel shall be ASTM A–36 unless otherwise noted.

The above material and all anchor bolts, bolts, nuts, and washers shall be galvanized in accordance with Section 509. Concrete, Reinforcing Steel, and Structural Steel Elements shall conform to the requirements of Sections 601, 602 and 509, repectively.

Post anchor, encased in concrete, shall be ASTM A–36 (AASHTO M–183) steel and need not be galvanized.

The tubes shall be shop bent or fabricated to fit horizontal curve when radius is less than 1,500 feet.

Tubes shall be continuous over not less than two posts. No welded butt splices will be allowed in the tube sections.

The centerline of the tube splice shall be 1'–8" minimum and 2'–6" maximum from the centerline of the posts.

All bolts that have lock washers shall be tightened to snug only.

Posts shall be perpendicular to the longitudinal roadway grade.

One or more 10'–0" post spacings may be reduced (6'–8" min.) in order to maintain dimensions from the end of the rail and expansion joints.

Payment will be made under Item 606, Bridge Rail Type 10 for all posts, post anchors, base plates, backing plates, anchor bolts, miscellaneous bolts, nuts, washers, tubes, tube expansion devices, tube splices, end plates, curb concrete (Class D), curb reinforcing steel, and reflector tabs.

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.

Structural Steel:

AASHTO M–183 (ASTM A–36)	f_y = 36,000 psi
AASHTO M–223 (ASTM A–572) Grade 50	f_y = 50,000 psi
Cold formed ASTM A–500 Grade B	f_y = 46,000 psi

For additional details see next rail sheets.

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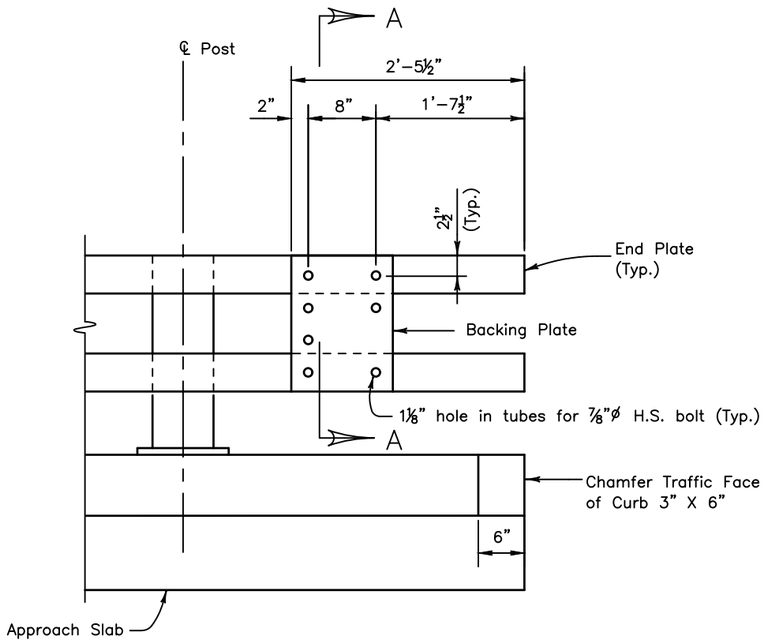
BELFORD–HAPPY CANYON CREEK BRIDGE
BRIDGE RAIL TYPE 10
(1 OF 2)

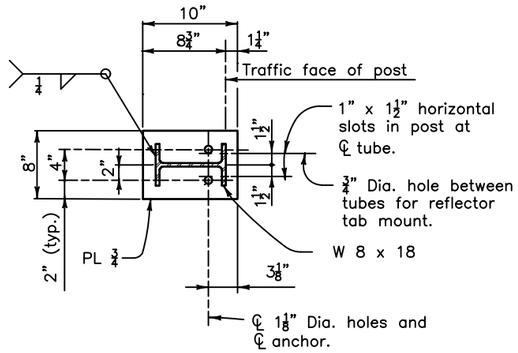
Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers
Sheets: B29 of 32

Project No./Code

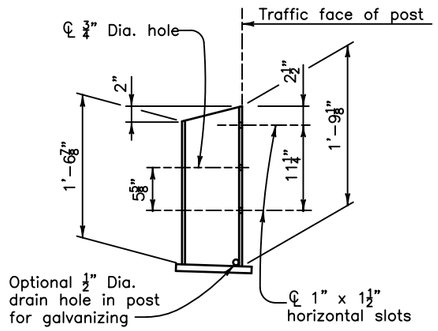
Sheet Number 39



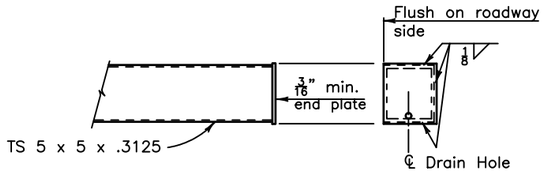
RAIL TUBE DETAILS
Thrie Beam not Shown



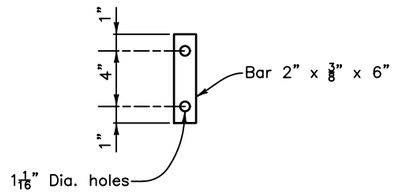
PLAN – POST DETAIL



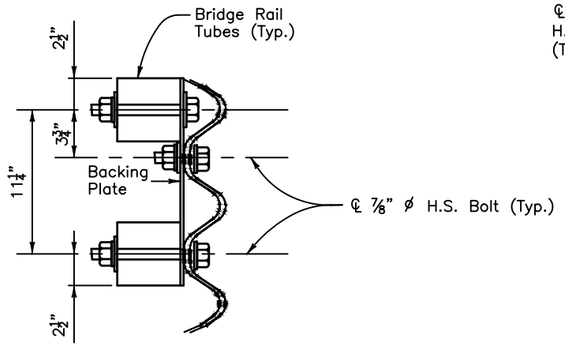
POST ELEVATION



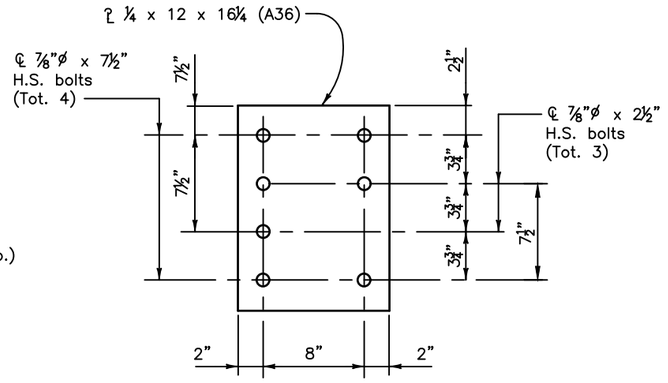
END PLATE DETAIL



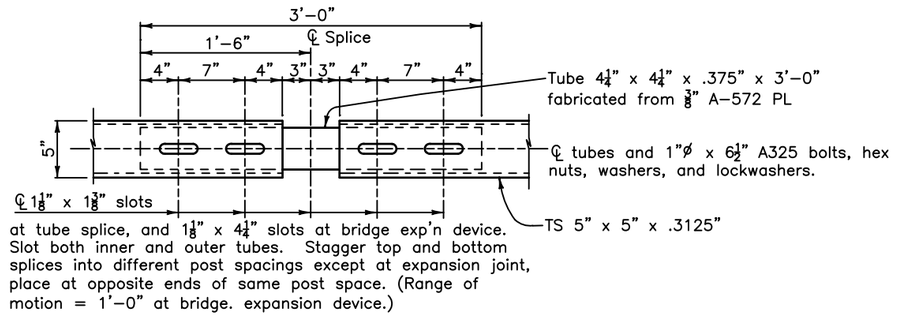
ANCHOR DETAIL



SECTION A–A



BACKING PLATE
Holes are 1⅛" for ⅞"ø H.S. Bolts with Hex Nuts, 2 ℄ Washers, and 1 Lock Washer



PLAN – TUBE SPLICE

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File Name: B115360-01RAL04.dwg	Date	Comments	Initials	No Revisions:		
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					Subset: BRIDGE	Sheets: B30 of 32
						Sheet Number 40

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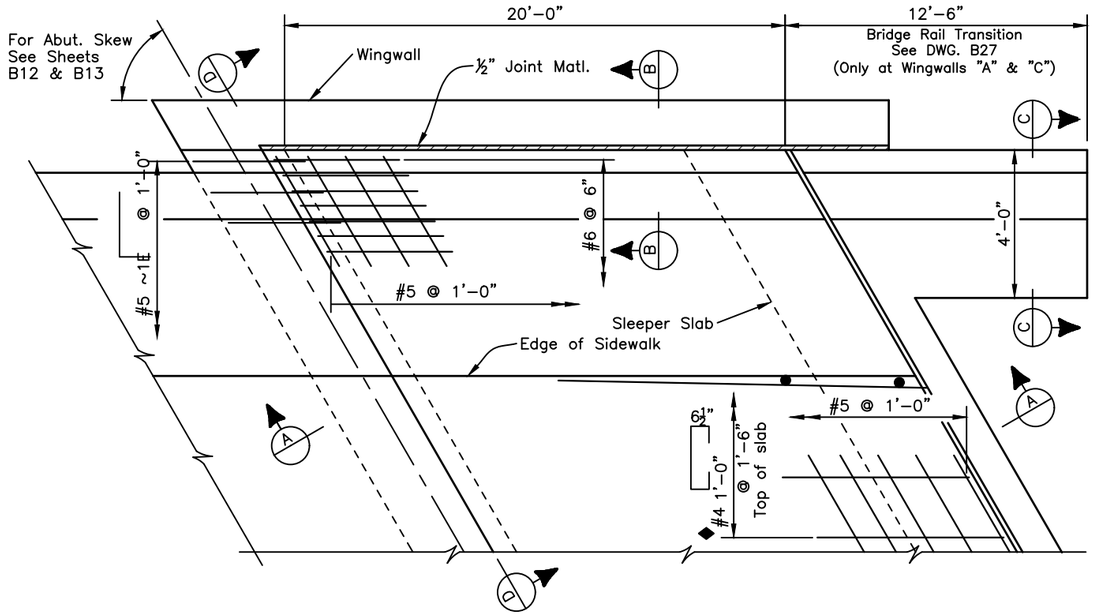
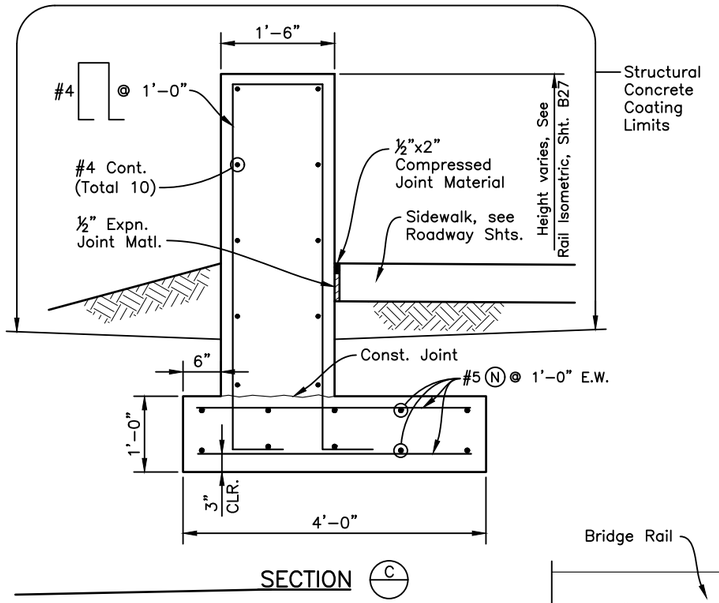
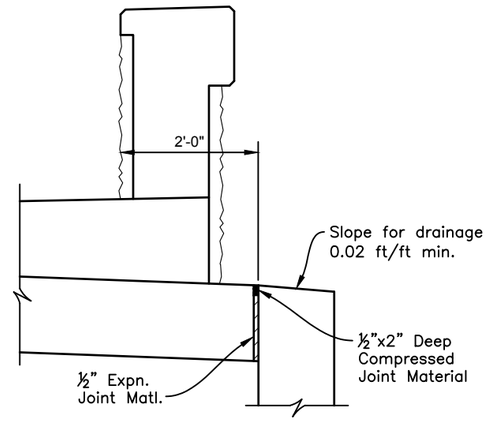
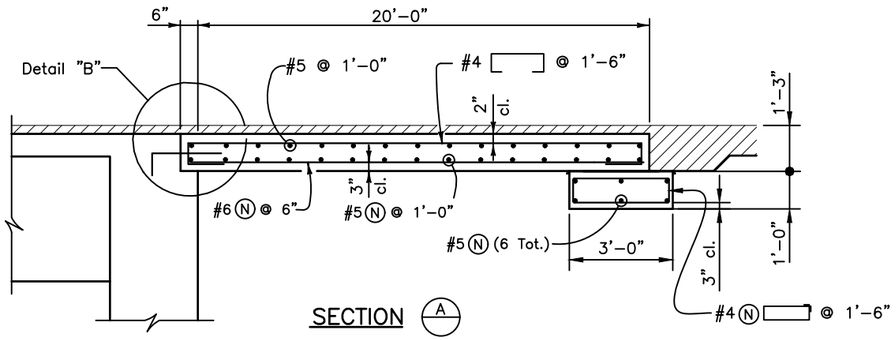




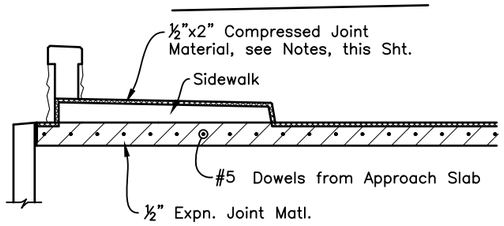
SECTION (C)



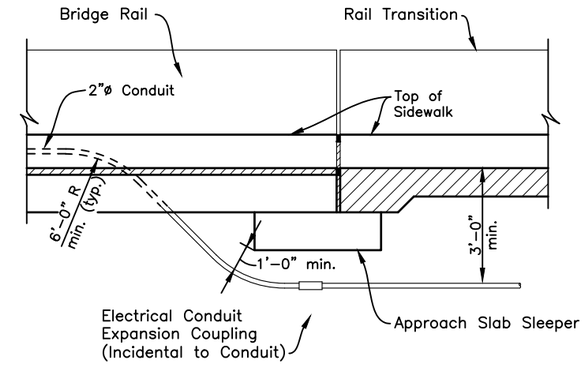
SECTION (B)



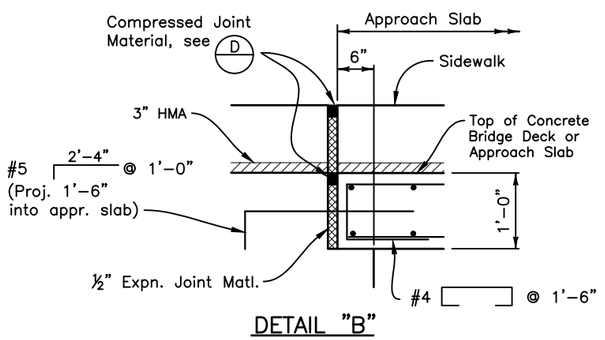
SECTION (A)



SECTION (D)



TYPICAL CONDUIT EXIT DETAIL



DETAIL "B"

NOTES:

CONCRETE CLASS D (BRIDGE) SHALL BE USED FOR APPROACH SLABS.

½" EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPEC. M213.

FOR BRIDGE RAIL DETAILS SEE SHT. B27.

COMPRESSED JOINT MATERIAL

COMPRESSED JOINT MATERIAL SHALL BE PRE–COMPRESSED, CHEMICALLY RESISTANT, OPEN CELL POLYURETHANE FOAM SEALANT, IMPREGNATED WITH A WATER–REPELLANT MATERIAL, WITH ADHESIVE BACKING ON BOTH SIDES. THE JOINT MATERIAL SHALL BE EPOXIED IN PLACE, AND ALL SPLICES SEALED, AS RECOMMENDED BY THE SUPPLIER OF THE COMPRESSED JOINT MATERIAL. THE COST SHALL BE INCLUDED IN TH COST OF ITEM 601 CLASS D CONCRETE.

ACCEPABLE COMPRESSED JOINT MATERIAL ALTERNATES

WILL–SEAL
SEAL–MATE #517
POLY–TITE "N"

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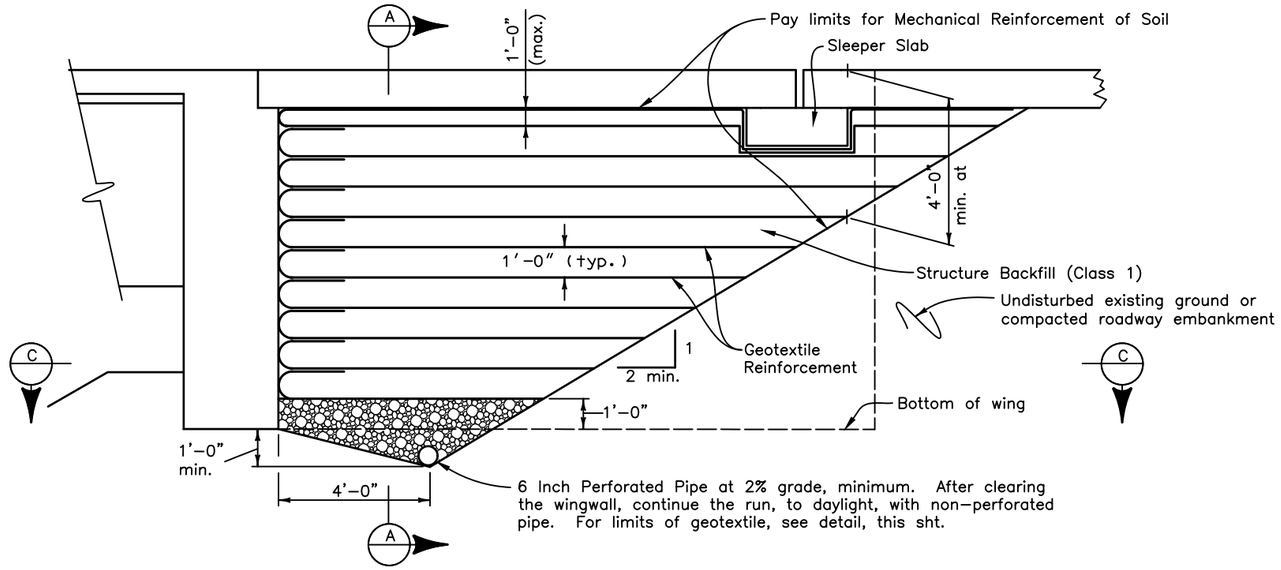
BELFORD–HAPPY CANYON CREEK BRIDGE
APPROACH SLAB
DETAILS

Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Structure Numbers:
Sheets: B31 of 32

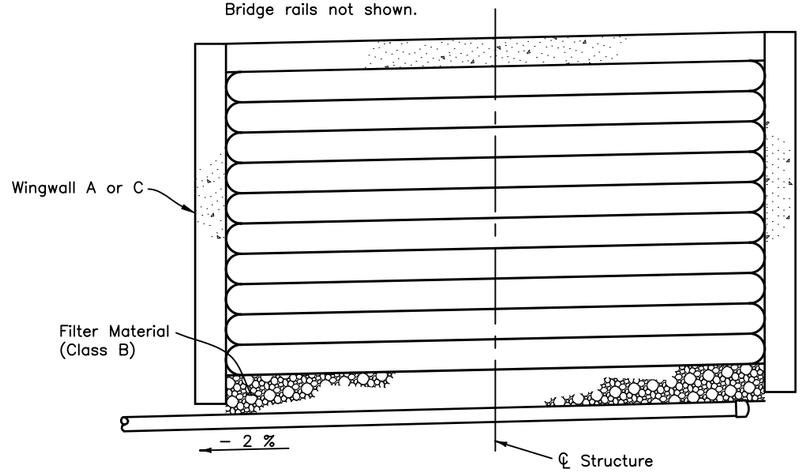
Project No./Code

Sheet Number 41

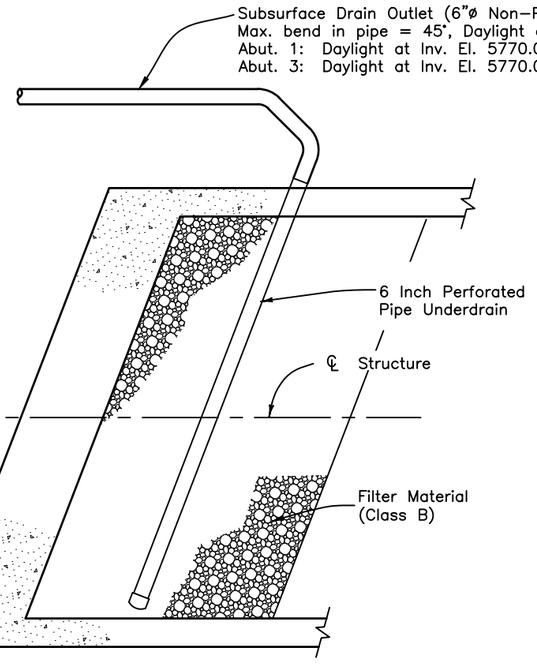


SECTION PERPENDICULAR TO ABUTMENT

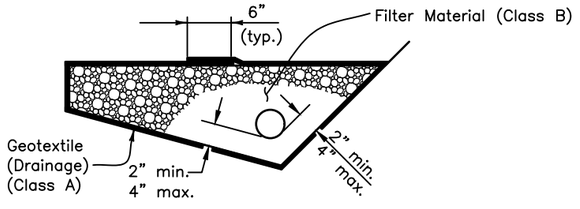
Note:
Bridge rails not shown.



SECTION A

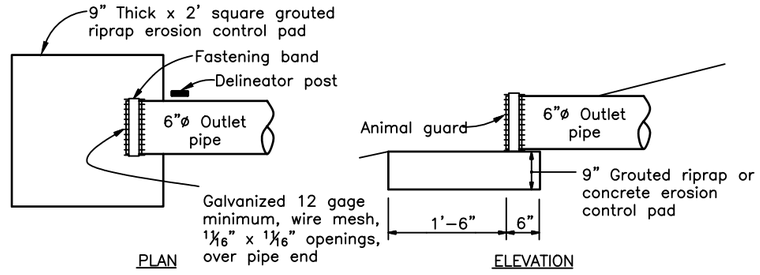


SECTION C



6 INCH PERFORATED PIPE UNDERDRAIN

6 Inch Perforated Pipe Underdrain includes all Filter Material (Class B) and Geotextile (Drainage) (Class A) surrounding the Filter Material (Class B)



OUTLET PIPE END TREATMENT

Notes:

Geotextile Reinforcement shall be woven fabric with a Minimum Average Roll Value of 4800 lb/ft for installations with a gap and 2400 lb/ft for installations without a gap based on ASTM D4595.

Geotextile Reinforcement shall be placed by alternating Machine Direction (MD) with Cross Machine Direction (XD) from layer to layer.

The Geotextile Reinforcement wrap at Back Face of Abutment shall be pulled back slack free with its end anchored to soil underneath with staples or pins.

Minimum splice of all Geofabric shall consist of 12" of overlap.

Payment will be made under Item 206 Structure Backfill (Class 1) (cu.yd.) and shall include the cost for 6 Inch Perforated Pipe Underdrain, Subsurface Drain Outlet (6"ø Non-Perforated Pipe) and Outlet Pipe End Treatment.

Installation of Pipe Underdrain and Subsurface Drain Outlet will conform to the Construction requirements of section 605.03 and 605.06, respectively.

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					Subset: BRIDGE / Sheets: B32 of 32	

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DROP STRUCTURE TABULATION

INDEX			ITEM NO.	CONTRACT ITEM	UNIT	GSB	
BOOK	PAGE	SHEET				PLAN	AS CONST.
			207	STOCKPILE TOPSOIL	CY	XX	
			420	GEOTEXTILE (EROSION CONTROL) (CLASS 1)	SY	XX	
			501	STEEL SHEET PILING	SF	XX	
			506	RIPRAP (12 INCH)	CY	XX	
			506	SOIL RIPRAP (12 INCH)	CY	XX	
			506	18 INCH GROUTED BOULDERS	CY	XX	

18 INCH GROUTED BOULDERS SHALL BE PAID FOR AS GROUTED RIPRAP (18 INCH)

SEE EROSION CONTROL PLANS FOR TABULATION OF EROSION CONTROL ITEMS.

FOR UNCLASSIFIED EXCAVATION SEE EARTHWORK SUMMARY. COST OF EXCAVATION FOR ALL GROUTED RIPRAP AND SOIL RIPRAP IS INCLUDED IN THE COST OF THE BID ITEM.

DROP STRUCTURE TABULATION QUANTITIES HAVE BEEN CARRIED FORWARD TO THE SUMMARY OF APPROXIMATE QUANTITIES SHEETS

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BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE TABULATION

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-01 of 18

Project No./Code

Sheet Number 43

HAPPY CANYON CREEK DROP STRUCTURE GRADING POINT DATA

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
G1				FINISHED GRADE
G2				FINISHED GRADE
G3				FINISHED GRADE
G4				FINISHED GRADE
G5				FINISHED GRADE
G6				FINISHED GRADE
G7				FINISHED GRADE
G8				FINISHED GRADE
G9				FINISHED GRADE
G10				FINISHED GRADE
G11				FINISHED GRADE
G12				FINISHED GRADE
G13				FINISHED GRADE
G14				FINISHED GRADE
G15				FINISHED GRADE
G16				FINISHED GRADE
G17				FINISHED GRADE
G18				FINISHED GRADE
G19				FINISHED GRADE
G20				FINISHED GRADE
G21				FINISHED GRADE
G22				FINISHED GRADE
G23				FINISHED GRADE
G24				FINISHED GRADE
G25				FINISHED GRADE
G26				FINISHED GRADE
G27				FINISHED GRADE
G28				FINISHED GRADE
G29				FINISHED GRADE
G30				FINISHED GRADE
G31				FINISHED GRADE
G32				FINISHED GRADE
G33				FINISHED GRADE
G34				FINISHED GRADE
G35				FINISHED GRADE

HAPPY CANYON CREEK DROP STRUCTURE SOIL RIPRAP (12 INCH) POINT DATA

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
SR1				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR2				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR3				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR4				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR5				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR6				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR7				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR8				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR9				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR10				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR11				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR12				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR13				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR14				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR15				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR16				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR17				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR18				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR19				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR20				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR21				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR22				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR23				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.
SR24				LIMITS OF SOIL RIPRAP (12 INCH) – FINISHED GRADE EL.

HAPPY CANYON CREEK DROP STRUCTURE STEEL SHEET PILE CUTOFF WALL POINT DATA

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
W1				SHEET PILE CUTOFF WALL – FINISHED GRADE EL.
W2				SHEET PILE CUTOFF WALL – FINISHED GRADE EL.
W3				SHEET PILE CUTOFF WALL – FINISHED GRADE EL.
W4				SHEET PILE CUTOFF WALL – FINISHED GRADE EL.
W5				SHEET PILE CUTOFF WALL – FINISHED GRADE EL.

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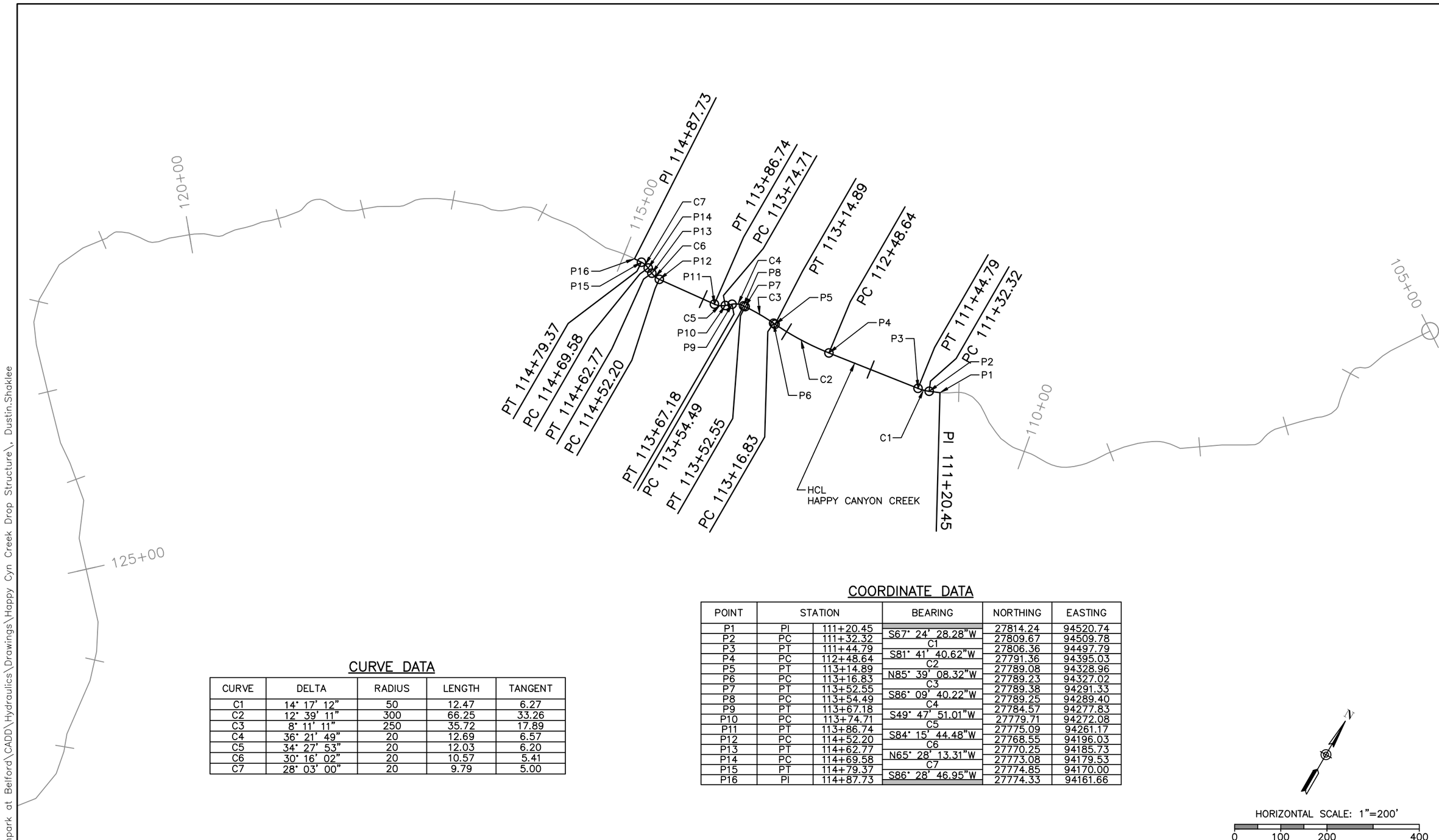
No Revisions:
Revised:
Void:

BELFORD–HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
POINT DATA DETAIL

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD–02 of 18

Project No./Code:

Sheet Number 44



CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT
C1	14° 17' 12"	50	12.47	6.27
C2	12° 39' 11"	300	66.25	33.26
C3	8° 11' 11"	250	35.72	17.89
C4	36° 21' 49"	20	12.69	6.57
C5	34° 27' 53"	20	12.03	6.20
C6	30° 16' 02"	20	10.57	5.41
C7	28° 03' 00"	20	9.79	5.00

COORDINATE DATA

POINT	STATION		BEARING	NORTHING	EASTING
P1	PI	111+20.45		27814.24	94520.74
P2	PC	111+32.32	S67° 24' 28.28"W	27809.67	94509.78
P3	PT	111+44.79	C1	27806.36	94497.79
P4	PC	112+48.64	S81° 41' 40.62"W	27791.36	94395.03
P5	PT	113+14.89	C2	27789.08	94328.96
P6	PC	113+16.83	N85° 39' 08.32"W	27789.23	94327.02
P7	PT	113+52.55	C3	27789.38	94291.33
P8	PC	113+54.49	S86° 09' 40.22"W	27789.25	94289.40
P9	PT	113+67.18	C4	27784.57	94277.83
P10	PC	113+74.71	S49° 47' 51.01"W	27779.71	94272.08
P11	PT	113+86.74	C5	27775.09	94261.17
P12	PC	114+52.20	S84° 15' 44.48"W	27768.55	94196.03
P13	PT	114+62.77	C6	27770.25	94185.73
P14	PC	114+69.58	N65° 28' 13.31"W	27773.08	94179.53
P15	PT	114+79.37	C7	27774.85	94170.00
P16	PI	114+87.73	S86° 28' 46.95"W	27774.33	94161.66

N

HORIZONTAL SCALE: 1"=200'

0 100 200 400

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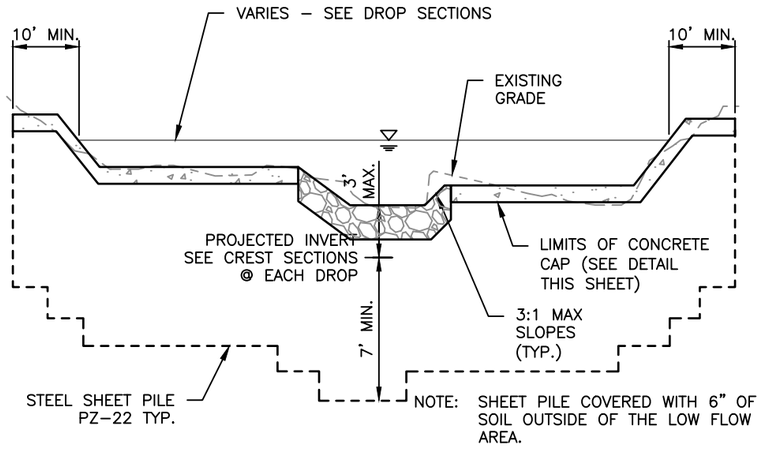
BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
HCL GEOMETRY LAYOUT

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-03 of 18

Project No./Code:

Sheet Number 45



SHEET PILE SECTION
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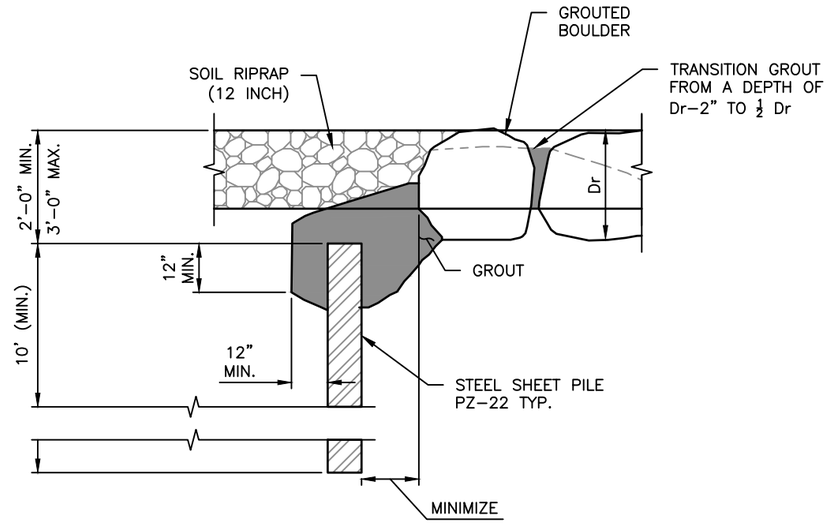

SHEET PILE CUTOFF CONNECTION (GSB)
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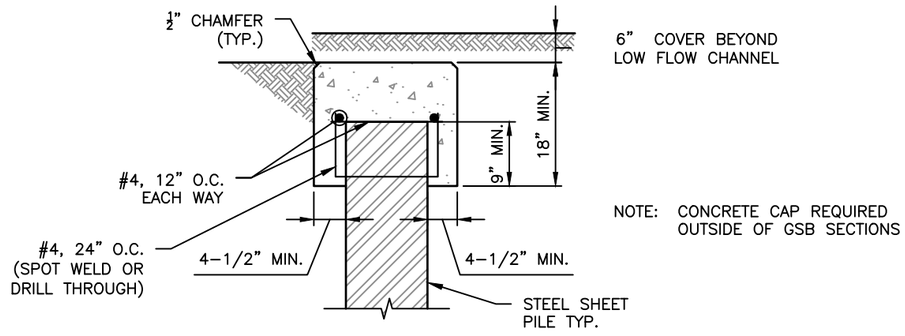

CONCRETE SHEET PILE CAP DETAIL
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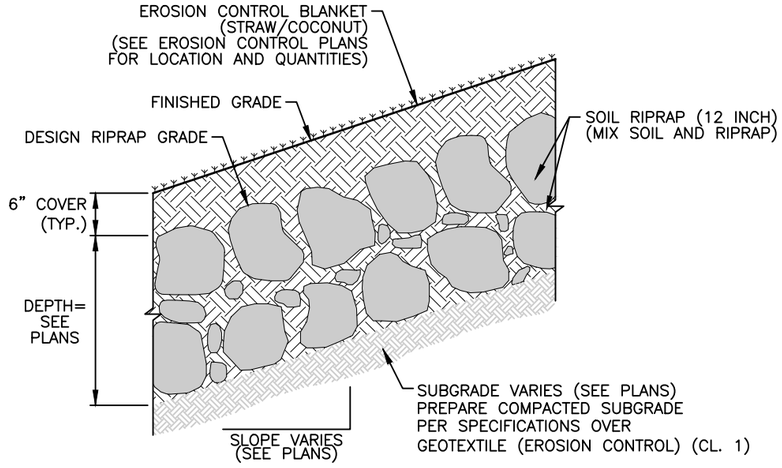
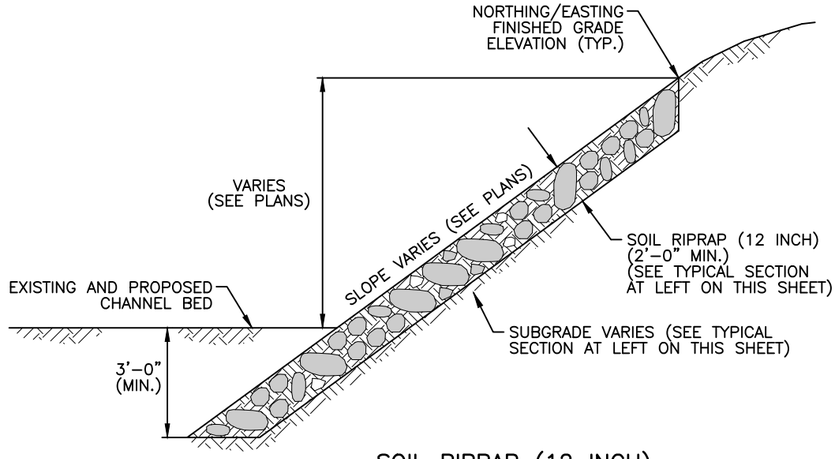
As Constructed	BELFORD–HAPPY CANYON CREEK HAPPY CANYON CREEK DROP STRUCTURE SHEET PILE DETAILS			Project No./Code
No Revisions:				
Revised:	Designer: CDT	Structure Numbers		
Void:	Detailer: KLT			
	Subset: Drainage	Sheets: DD–04 of 18		Sheet Number 46

Know what's below. Call before you dig.



SOIL RIPRAP (12 INCH)
TYPICAL SECTION
N.T.S.



SOIL RIPRAP (12 INCH)
CHANNEL BANKS
TYPICAL SECTION
N.T.S.

SOIL RIPRAP (12 INCH) NOTES:

(1) SOIL RIPRAP DETAILS ARE APPLICABLE TO SLOPED AREAS REFER TO THE SITE PLAN FOR ACTUAL LOCATION AND LIMITS.

(2) MIX UNIFORMALLY 70% RIPRAP BY VOLUME WITH 30% OF APPROVED SOIL BY VOLUME FROM THE ENGINEER PRIOR TO PLACEMENT.

(3) 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 DESIGN RIPRAP TOP GRADE.

(4) CRIMP MULCH AS CALLED FOR IN THE PLANS AND SPECIFICATIONS.

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Void:

BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
DETAILS

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-05 of 18

Project No./Code:

Sheet Number 47

Know what's below. Call before you dig.

GROUT NOTES

BOULDER PLACEMENT NOTES:

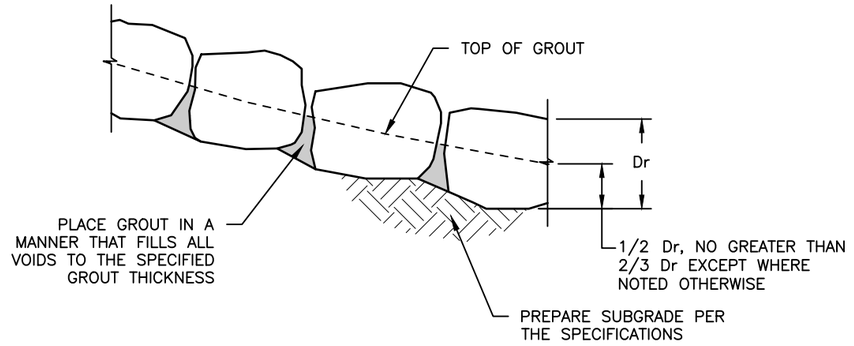
1. PLACE BOULDERS WITH THE REQUIRED BOULDER HEIGHT VERTICAL. PLACE BOULDERS AS TIGHTLY TOGETHER AS POSSIBLE (WITHOUT TOUCHING) WHILE PROVIDING ENOUGH ROOM BETWEEN THEM TO THOROUGHLY VIBRATE THE GROUT AND TO ENSURE NO GAPS IN THE GROUT. THE SMALL DIMENSION OF A 2X4 CAN BE USED AS A GUIDE TO CHECK MINIMUM SPACING.
2. BEFORE GROUTING, CLEAN ALL DIRT AND MATERIAL FROM ROCK THAT COULD PREVENT THE GROUT FROM BINDING TO THE ROCK. KEEP BOULDERS FROM TOUCHING. AVOID SLIDING BOULDERS AGAINST SUBGRADE TO PROPERLY POSITION.

MATERIAL SPECIFICATIONS:

1. ALL GROUT SHALL HAVE A MINIMUM 28–DAY COMPRESSIVE STRENGTH EQUAL TO 3200 PSI.
2. ONE CUBIC YARD OF GROUT SHALL HAVE A MINIMUM OF SIX (6) SACKS OF TYPE II PORTLAND CEMENT.
3. A MAXIMUM OF 25% TYPE F FLY ASH MAY BE SUBSTITUTED FOR THE PORTLAND CEMENT.
4. THE AGGREGATE SHALL BE COMPRISED OF 70% NATURAL SAND (FINES) AND 30% 3/8–INCH ROCK (COARSE).
5. THE GROUT SLUMP SHALL BE BETWEEN 4–INCHES TO 6–INCHES.
6. AIR ENTRAINMENT SHALL BE BETWEEN 5.5% AND 7.5%.
7. TO CONTROL SHRINKAGE AND CRACKING, 1.5 POUNDS OF FIBERMESH, OR EQUIVALENT, SHALL BE USED PER CUBIC YARD OF GROUT.
8. COLOR ADDITIVE IN REQUIRED AMOUNTS SHALL BE USED WHEN SO SPECIFIED BY CONTRACT.

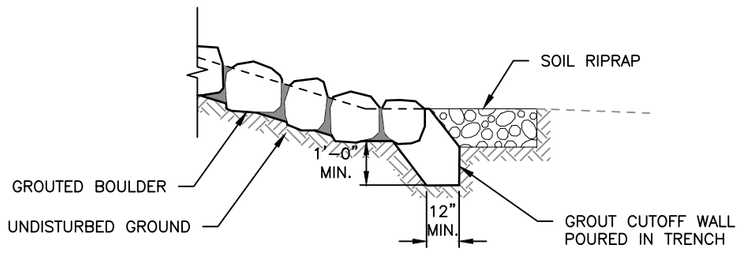
GROUT PLACEMENT SPECIFICATIONS:

1. SPECIAL PROCEDURES SHALL BE REQUIRED FOR GROUT PLACEMENT WHEN THE AIR TEMPERATURES ARE LESS THAN 40°F OR GREATER THAN 90°F. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE DESIGN ENGINEER OF THE PROCEDURES TO BE USED FOR PROTECTING THE GROUT.
2. GROUT SHALL BE DELIVERED BY MEANS OF A LOW PRESSURE (LESS THAN 10 PSI) GROUT PUMP USING A 2–INCH DIAMETER (MAXIMUM) NOZZLE.
3. FULL DEPTH PENETRATION OF THE GROUT INTO THE BOULDER VOIDS SHALL BE ACHIEVED BY INJECTING GROUT STARTING WITH THE NOZZLE NEAR THE BOTTOM AND RAISING IT AS THE GROUT FILLS, WHILE VIBRATING GROUT INTO PLACE USING A PENCIL VIBRATOR.
4. ALL GROUT BETWEEN BOULDERS SHALL BE TREATED WITH A BROOM FINISH.
5. AFTER GROUT PLACEMENT, EXPOSED BOULDER FACES SHALL BE CLEANED AND FREE OF GROUT.
6. ALL FINISHED GROUT SURFACES SHALL BE SPRAYED WITH A CLEAR LIQUID MEMBRANE CURING COMPOUND AS SPECIFIED IN ASTM C309.



GROUTED BOULDER PLACEMENT DETAIL

N.T.S.



STRUCTURE EDGE WALL DETAIL

N.T.S.

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Print Date: 11/18/2016 8:37:15 AM File Name: H115360-01DROP06Grouted Boulder Det.dwg Horizontal Scale: N.T.S Vertical Scale: N.T.S	(R-X)	Sheet Revisions Date / Comments / Initials	Manhard CONSULTING LTD 8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0500 fx:303.708.0400 manhardcon Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers Construction Managers • Environmental Scientists • Landscape Architects • Planners	As Constructed No Revisions: Revised: Void:	BELFORD–HAPPY CANYON CREEK HAPPY CANYON CREEK DROP STRUCTURE DETAIL Designer: CDT Detailer: KLT Subset: Drainage Structure Numbers Sheets: DD–06 of 18	Project No./Code Sheet Number 48
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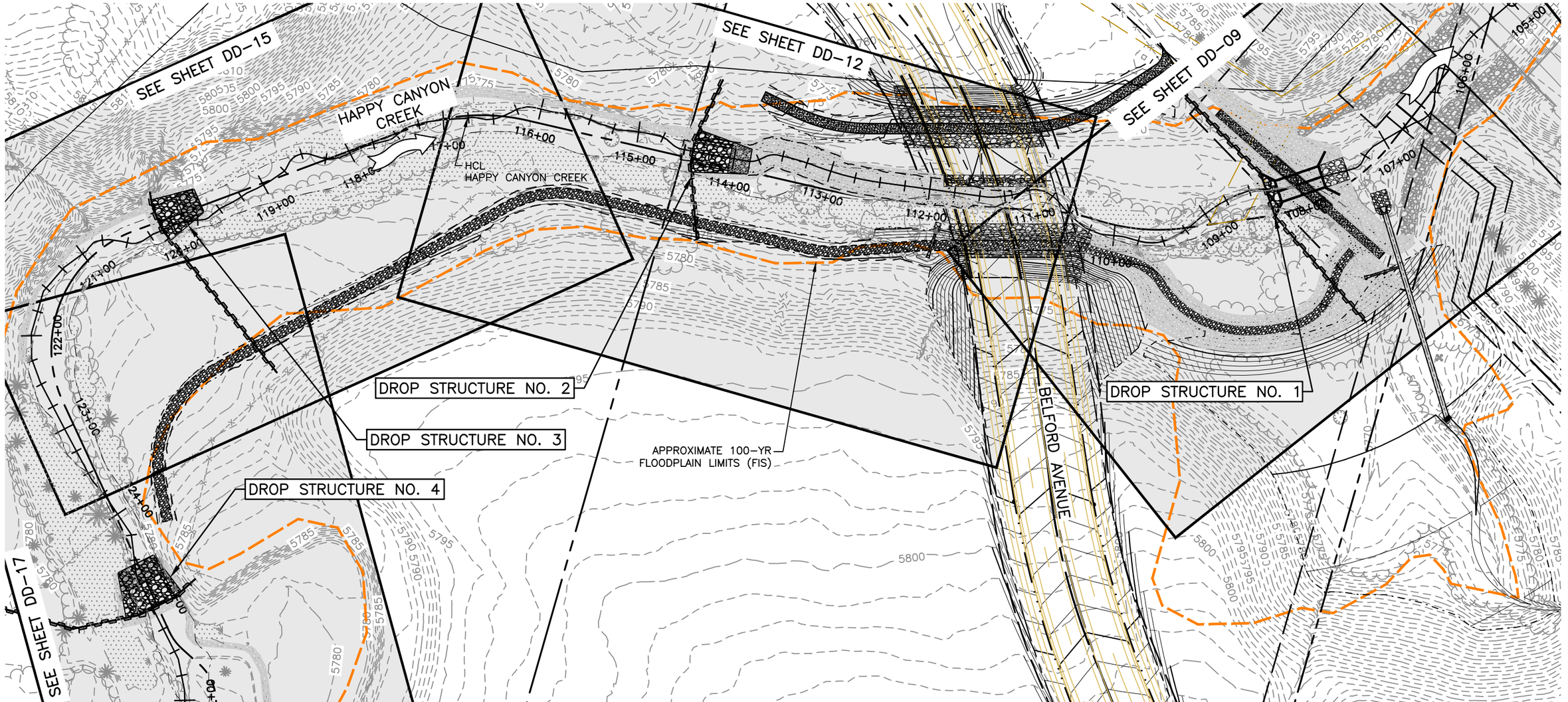

NOTES:

1. SEE SHEET _____ FOR POINT DATA.
2. SEE SHEET _____ FOR SECTIONS A, B & C.
3. SEE SHEET _____ FOR SOIL RIPRAP (12 INCH) DETAILS.
4. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION
5. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.

LEGEND

- TOP OF CUT
- TOE OF FILL
- WETLANDS
- SOIL RIPRAP (12 INCH)
- RIPRAP (12 INCH)
- 18" GROUTED BOULDERS

N

HORIZONTAL SCALE: 1"=100'

0 50 100 200

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BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
PLAN

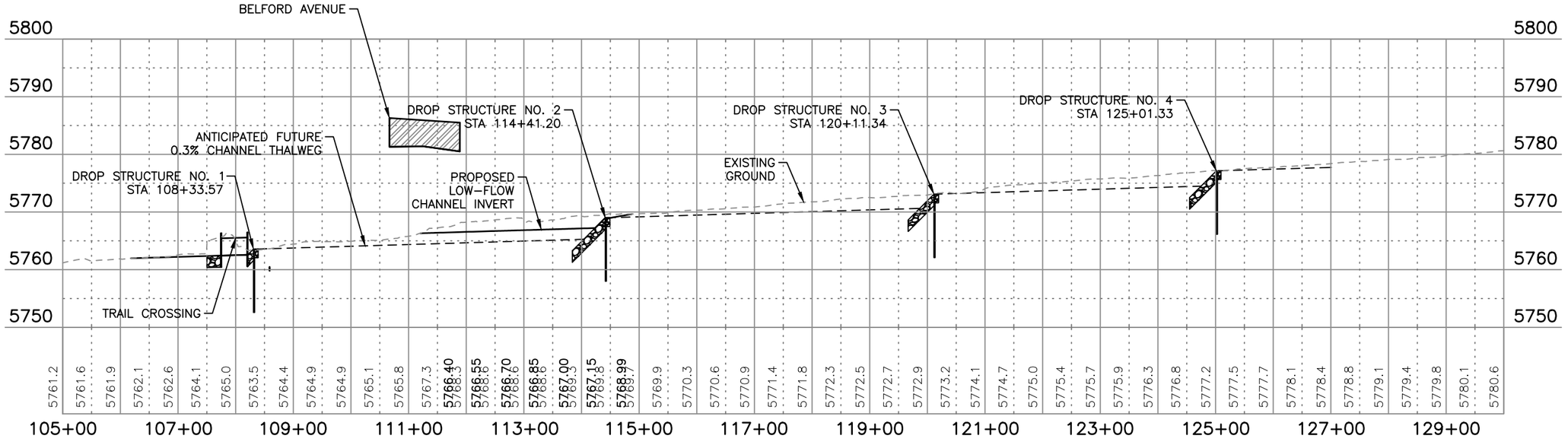
Designer:	CDT	Structure Numbers	
Detailer:	KLT		
Subset:	Drainage	Sheets:	DD-07 of 18

Project No./Code

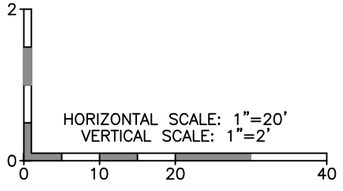
Sheet Number 49

NOTES

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.
2. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION.



HAPPY CANYON CREEK PROFILE



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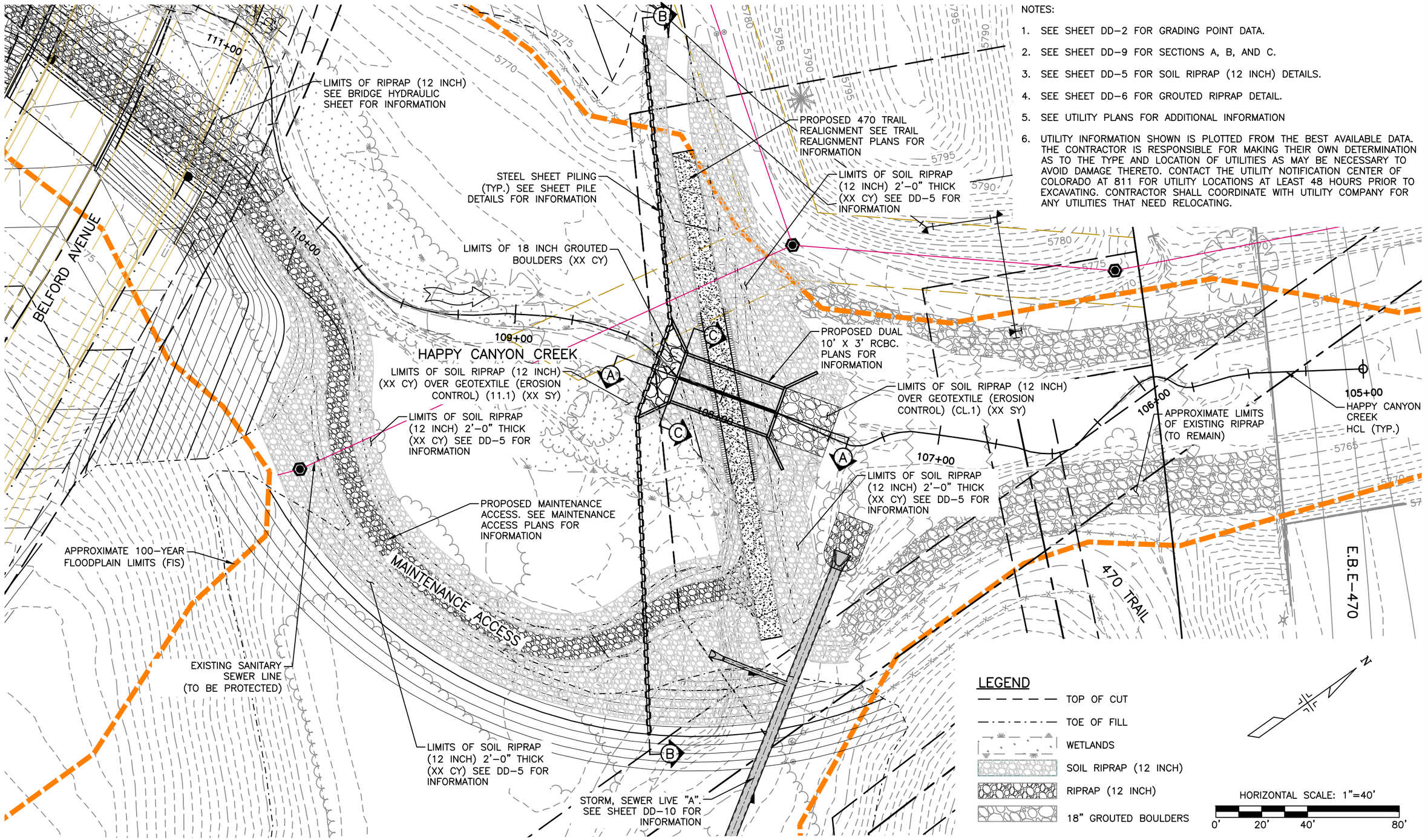
BELFORD-HAPPY CANYON CREEK			Project No./Code
PROFILE			
Designer: CDT	Structure Numbers		
Detailer: KLT			
Subset: Drainage	Sheets: DD-08 of 18		Sheet Number 50



NOTES:

1. SEE SHEET DD-2 FOR GRADING POINT DATA.
2. SEE SHEET DD-9 FOR SECTIONS A, B, AND C.
3. SEE SHEET DD-5 FOR SOIL RIPRAP (12 INCH) DETAILS.
4. SEE SHEET DD-6 FOR GROUTED RIPRAP DETAIL.
5. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION
6. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.

LEGEND

- TOP OF CUT
- TOE OF FILL
- WETLANDS
- SOIL RIPRAP (12 INCH)
- RIPRAP (12 INCH)
- 18" GROUTED BOULDERS

N

HORIZONTAL SCALE: 1"=40'

0' 20' 40' 80'

I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shoklee

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BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
DROP NO. 1 PLAN

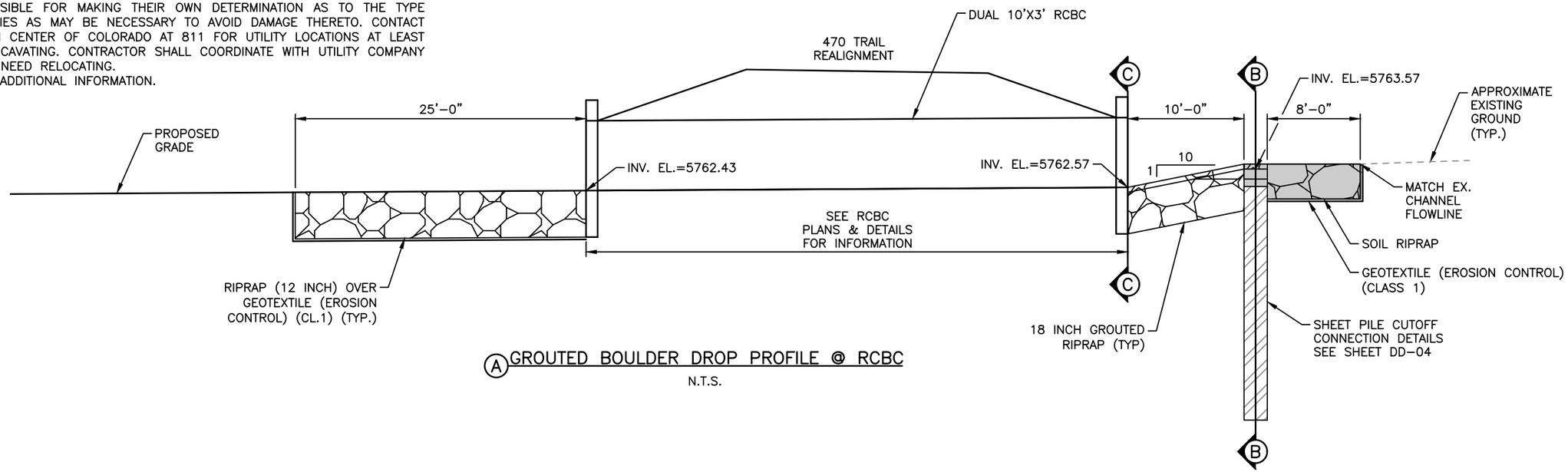
Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-09 of 18

Project No./Code

Sheet Number 51

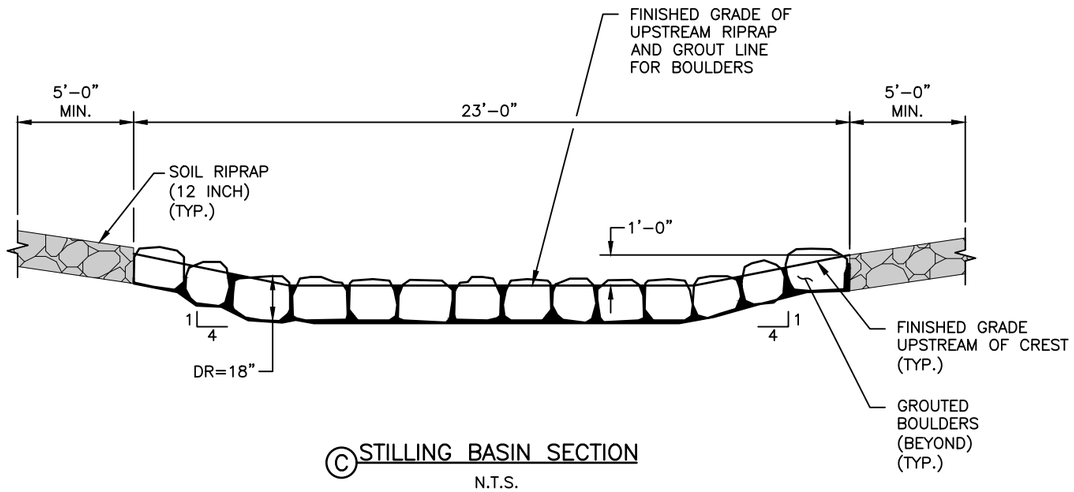
NOTES

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.
2. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION.



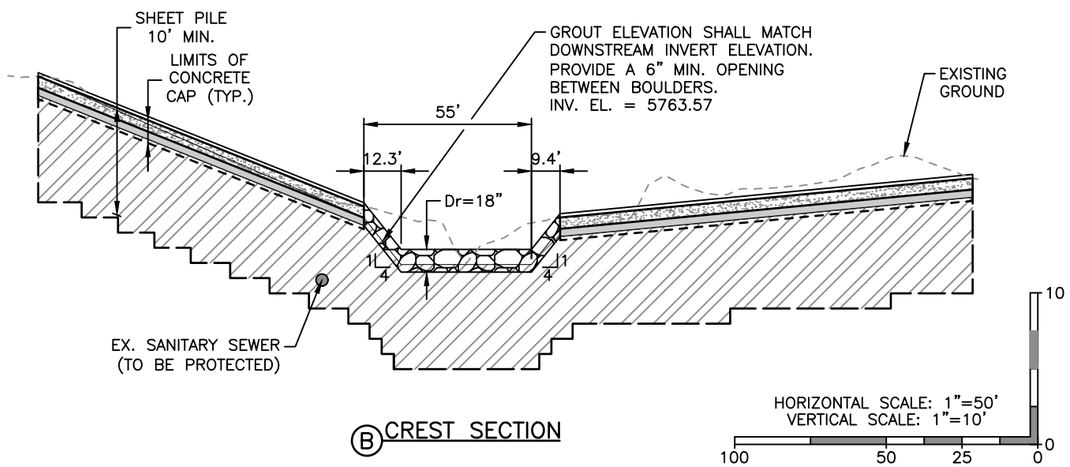
Ⓐ GROUTED BOULDER DROP PROFILE @ RCBC

N.T.S.



Ⓒ STILLING BASIN SECTION

N.T.S.



Ⓑ CREST SECTION

DROP STRUCTURE NO. 1

HAPPY CANYON CREEK HYDRAULICS
Q100= 8,303 C.F.S
Q100 VELOCITY = 5.66 F.P.S
FROUDE No.=0.30
FOR INFO ONLY

Print Date: 11/18/2016 8:42:44 AM	(R-X)	Sheet Revisions			As Constructed
File Name: H115360-01DROP10Δrop1 Prof Sect.dwg		Date	Comments	Initials	No Revisions:
Horizontal Scale: 1"=100' Vertical Scale: 1"=4'					Revised:
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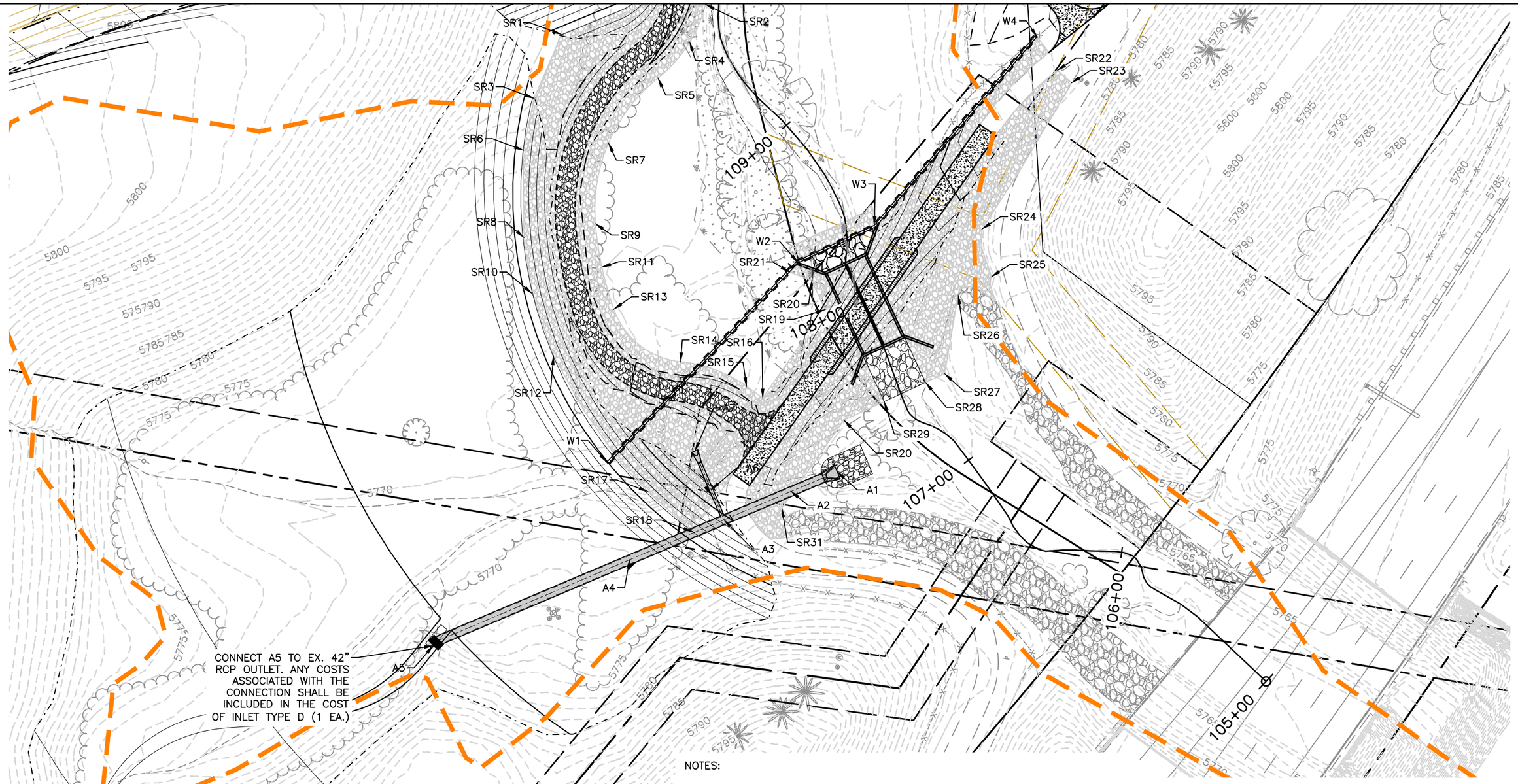
BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
DROP NO. 1 PROFILE/DETAILS

Designer:	CDT	Structure Numbers	
Detailer:	KLT		
Subset:	Drainage	Sheets:	DD-10 of 18

Project No./Code

Sheet Number 52

I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shaklee



I.D.	NORTHING & EASTING	ITEM	LENGTH	PAY DEPTH
A1	N: 27899.87, E: 94884.63	48" RCES		
A2		48" RCP	54'	
A3	N: 27854.05, E: 94914.30	MANHOLE SLAB BASE		10'
A4		48" RCP	157'	
A5	N: 27721.77, E: 95000.49	TYPE D INLET		10'
A6		18" RCP	30'	
A7	N: 27836.83 , E: 94887.70	18" RECS		

NOTES:

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.
2. SEE SHEET _____ FOR POINT DATA.

N

HORIZONTAL SCALE: 1"=50'

0 25 50 100

I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shoklee

Print Date: 11/18/2016 8:45:10 AM
File Name: H115360-01DROP11Grading Drop1.dwg
Horizontal Scale: 1"=20' Vertical Scale: N.T.S.

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R-X

Sheet Revisions

Date	Comments	Initials

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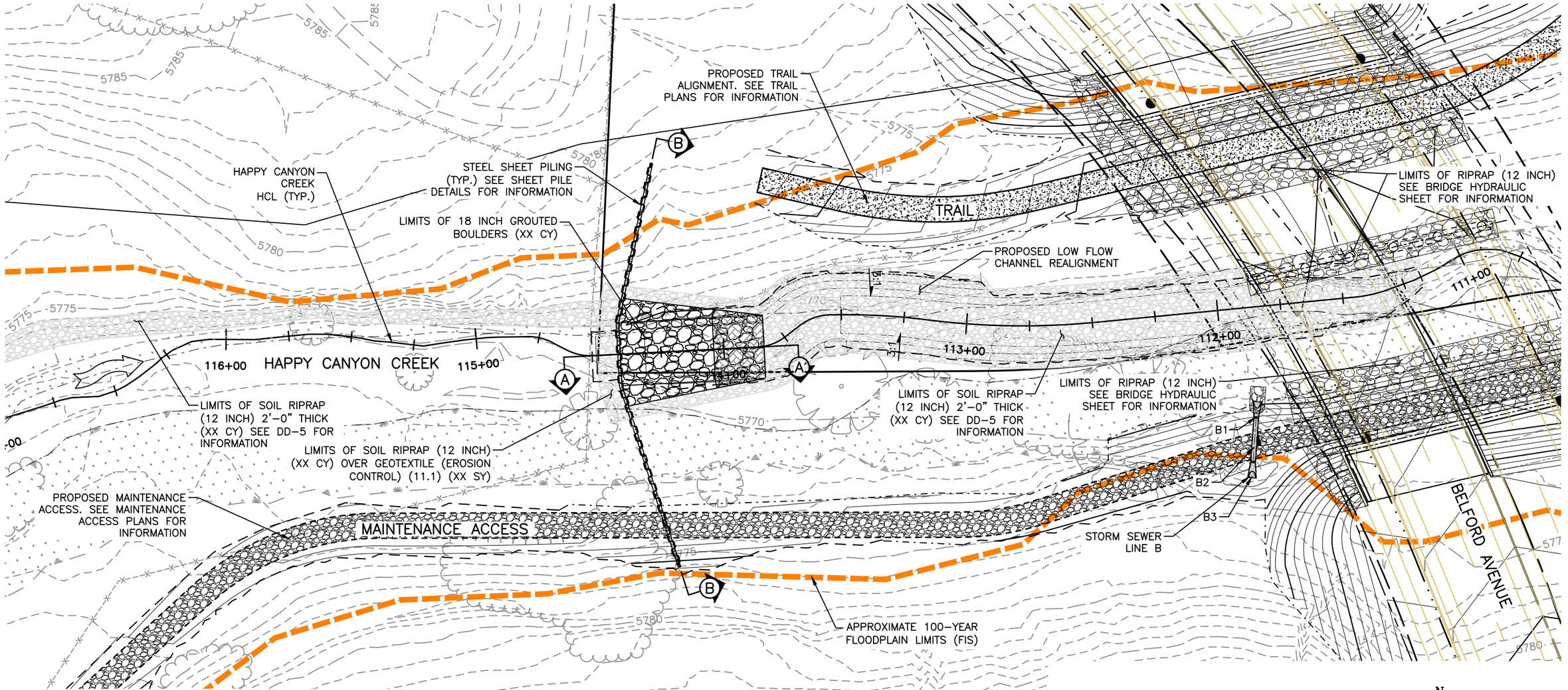
No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
GRADING DETAIL

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-11 of 18

Project No./Code

Sheet Number 53



NOTES:

1. SEE SHEET DD-2 FOR GRADING POINT DATA.
2. SEE SHEET DD-4, AND DD-5 FOR SECTIONS A, AND B.
3. SEE SHEET DD-5 FOR SOIL RIPRAP (12 INCH) DETAILS.
4. SEE SHEET DD-6 FOR GROUTED RIPRAP DETAIL.
5. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION
6. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.

I.D.	NORTHING & EASTING	ITEM	LENGTH	PAY DEPTH
B1	N: 27756.42, E: 94460.52	18" RCES		
B2		18" RCP	18'	
B3	N: 27733.11, E: 94459.99	18" RCES		

LEGEND

- TOP OF CUT
- TOE OF FILL
- WETLANDS
- SOIL RIPRAP (12 INCH)
- RIPRAP (12 INCH)
- 18" GROUTED BOULDERS

N

HORIZONTAL SCALE: 1"=40'

0' 20' 40' 80'

Print Date: 11/18/2016 8:47:16 AM
File Name: H115360-01DROP12Δrop2 Plan.dwg
Horizontal Scale: 1"=20' Vertical Scale: N.T.S.

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Revised:
Void:

BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
DROP NO. 2 PLAN

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-12 of 18

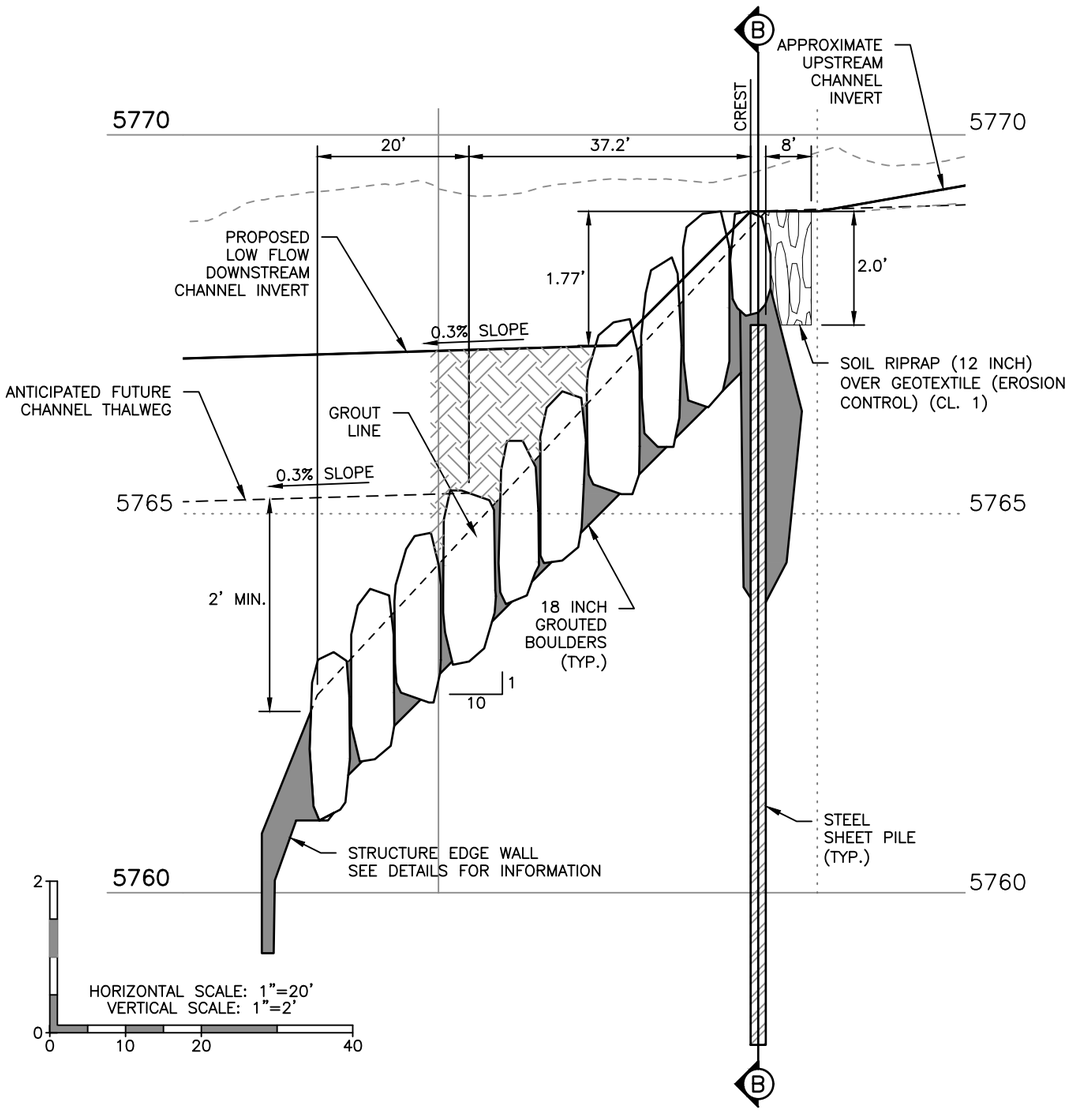
Project No./Code

Sheet Number 54

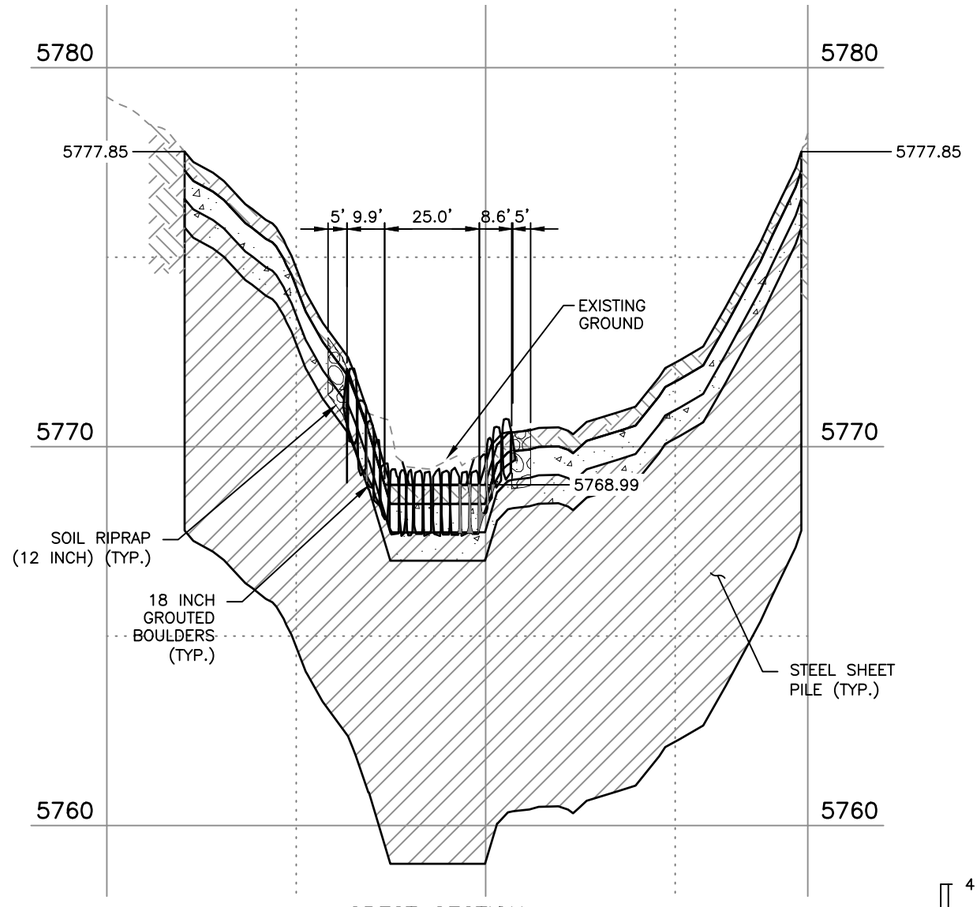
I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\... Dustin.Shoklee

NOTES

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.
2. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION.



A GROUTED BOULDER DROP PROFILE



B CREST SECTION

DROP STRUCTURE NO. 2

HAPPY CANYON CREEK HYDRAULICS

Q100= 8,303 C.F.S
Q100 VELOCITY = 14.03 F.P.S
FROUDE No.=0.95

FOR INFO ONLY

I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shoklee

Print Date: 11/18/2016 8:47:58 AM		Sheet Revisions			As Constructed
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Horizontal Scale: 1"=100' Vertical Scale: 1"=4'					Revised:
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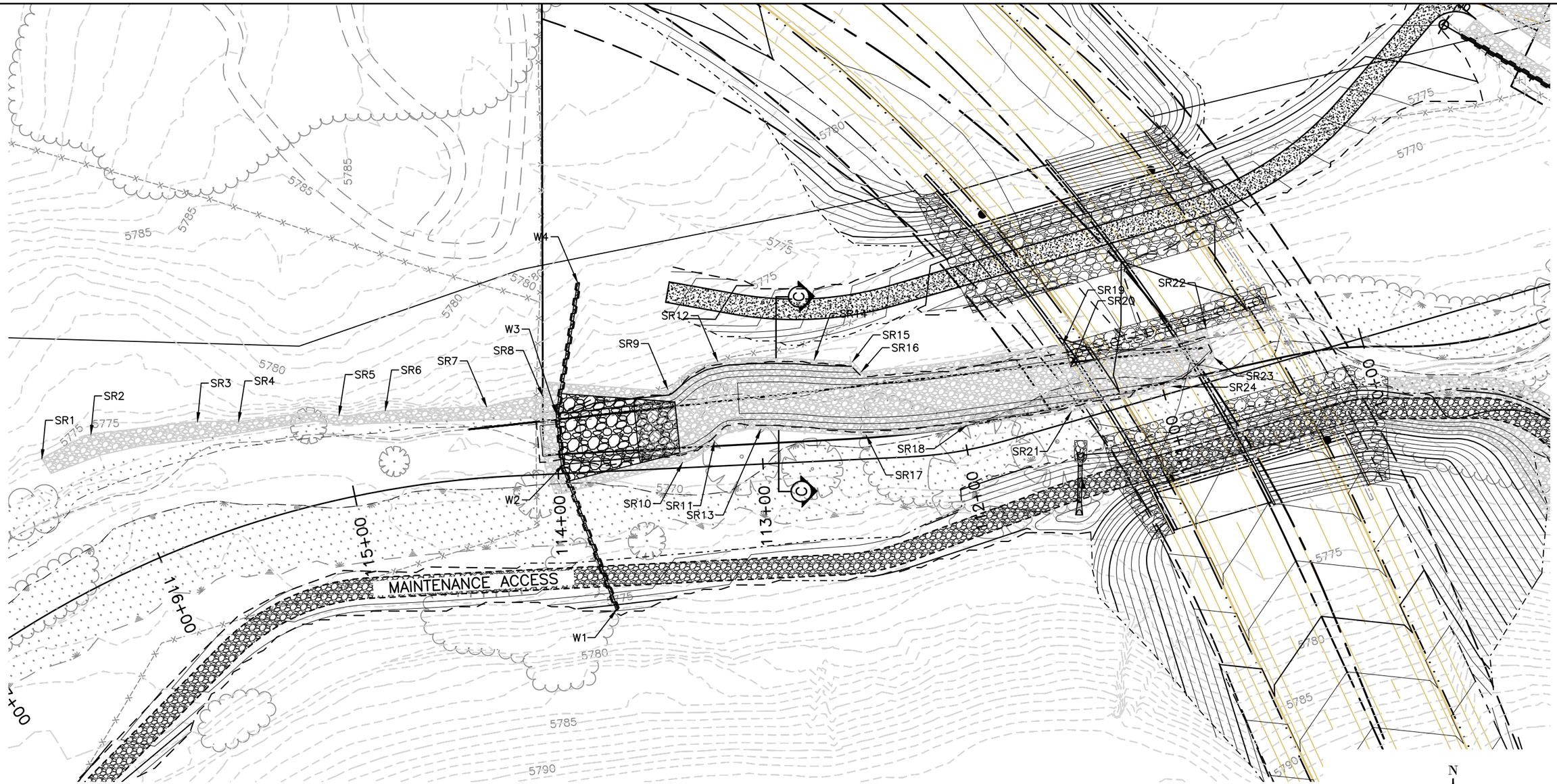
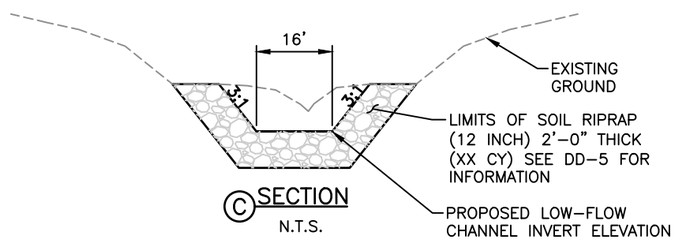
BELFORD-HAPPY CANYON CREEK DROP NO. 2 PROFILE/DETAILS				Project No./Code
Designer: CDT	Structure Numbers			
Detailer: KLT				
Subset: Drainage	Sheets: DD-13 of 18			Sheet Number 55





Ⓒ SECTION
N.T.S.

NOTES:

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.
2. SEE SHEET _____ FOR POINT DATA.

N

HORIZONTAL SCALE: 1"=20'
0 10 20 40

I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shoklee

Print Date: 11/18/2016 8:50:18 AM
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No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
GRADING DETAIL

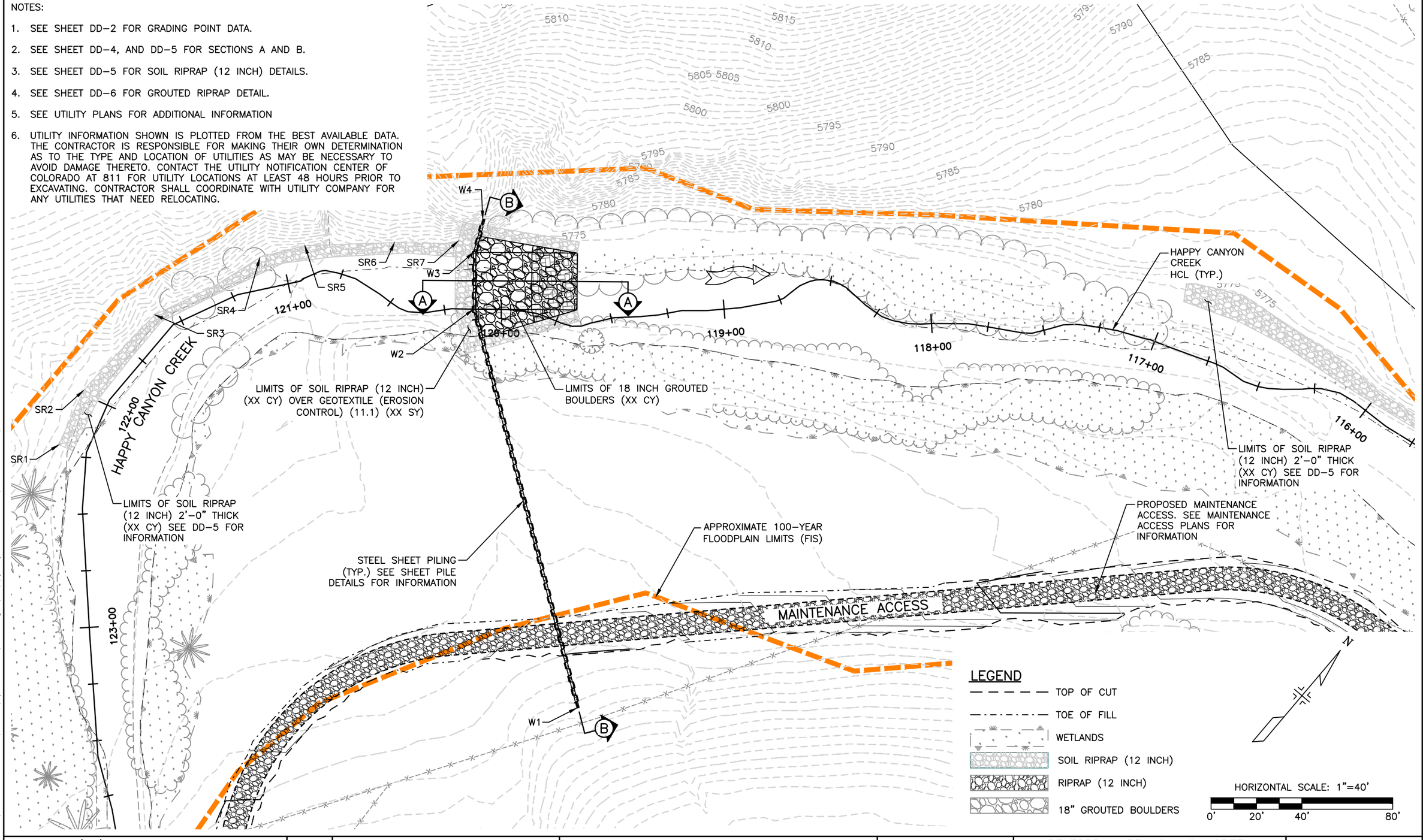
Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-14 of 18

Project No./Code

Sheet Number 56

NOTES:

1. SEE SHEET DD-2 FOR GRADING POINT DATA.
2. SEE SHEET DD-4, AND DD-5 FOR SECTIONS A AND B.
3. SEE SHEET DD-5 FOR SOIL RIPRAP (12 INCH) DETAILS.
4. SEE SHEET DD-6 FOR GROUTED RIPRAP DETAIL.
5. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION
6. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.



I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shoklee

Print Date: 11/18/2016 8:52:42 AM
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Horizontal Scale: 1"=20' Vertical Scale: N.T.S.

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No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
DROP NO. 3 PLAN

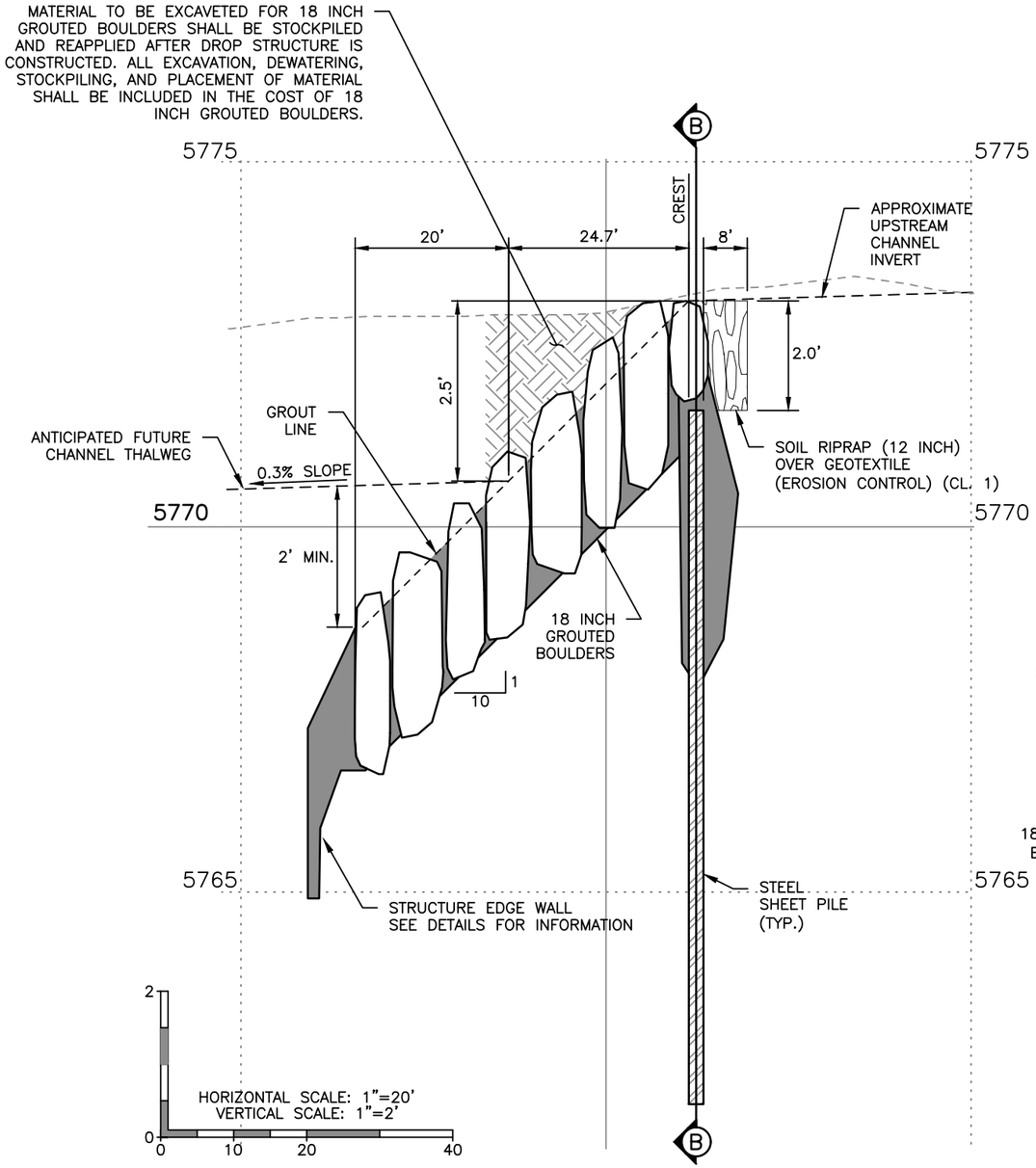
Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: DD-15 of 18

Project No./Code

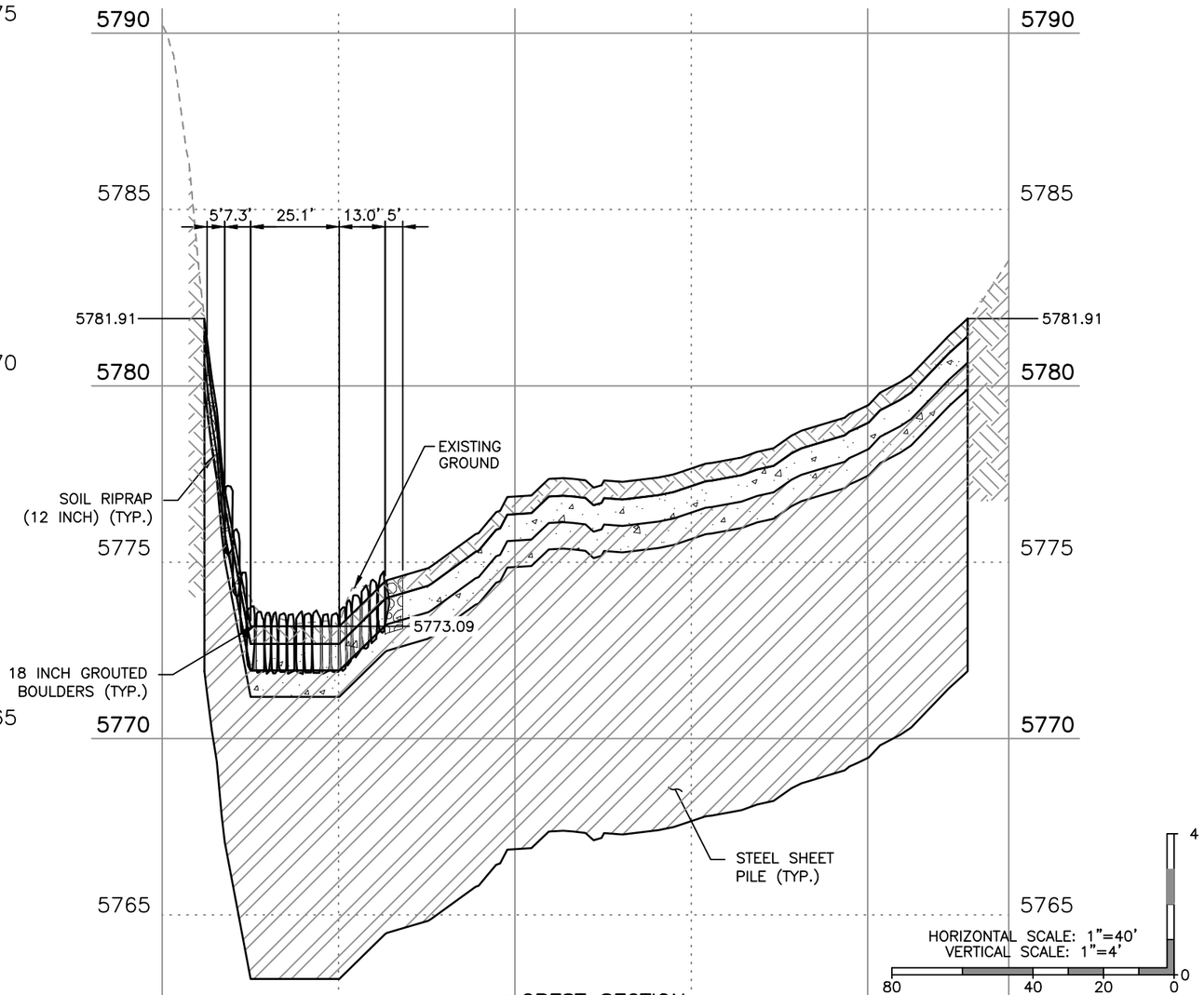
Sheet Number 57

NOTES

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.
2. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION.



A GROUTED BOULDER DROP PROFILE



B CREST SECTION

HAPPY CANYON CREEK HYDRAULICS

Q100= 8,303 C.F.S
Q100 VELOCITY = 12.71 F.P.S
FROUDE No.=0.87
FOR INFO ONLY

DROP STRUCTURE NO. 3

Print Date: 11/18/2016 8:53:39 AM		Sheet Revisions			As Constructed	BELFORD–HAPPY CANYON CREEK HAPPY CANYON CREEK DROP STRUCTURE DROP NO. 3 PROFILE/DETAILS	Project No./Code
File Name: H115360–01DROP16Δrop3 Prof Sect.dwg	(R–X)	Date	Comments	Initials	No Revisions:		
Horizontal Scale: 1"=50' Vertical Scale: 1"=10'					Revised:	Designer: CDT / Detailer: KLT / Subset: Drainage	Structure Numbers
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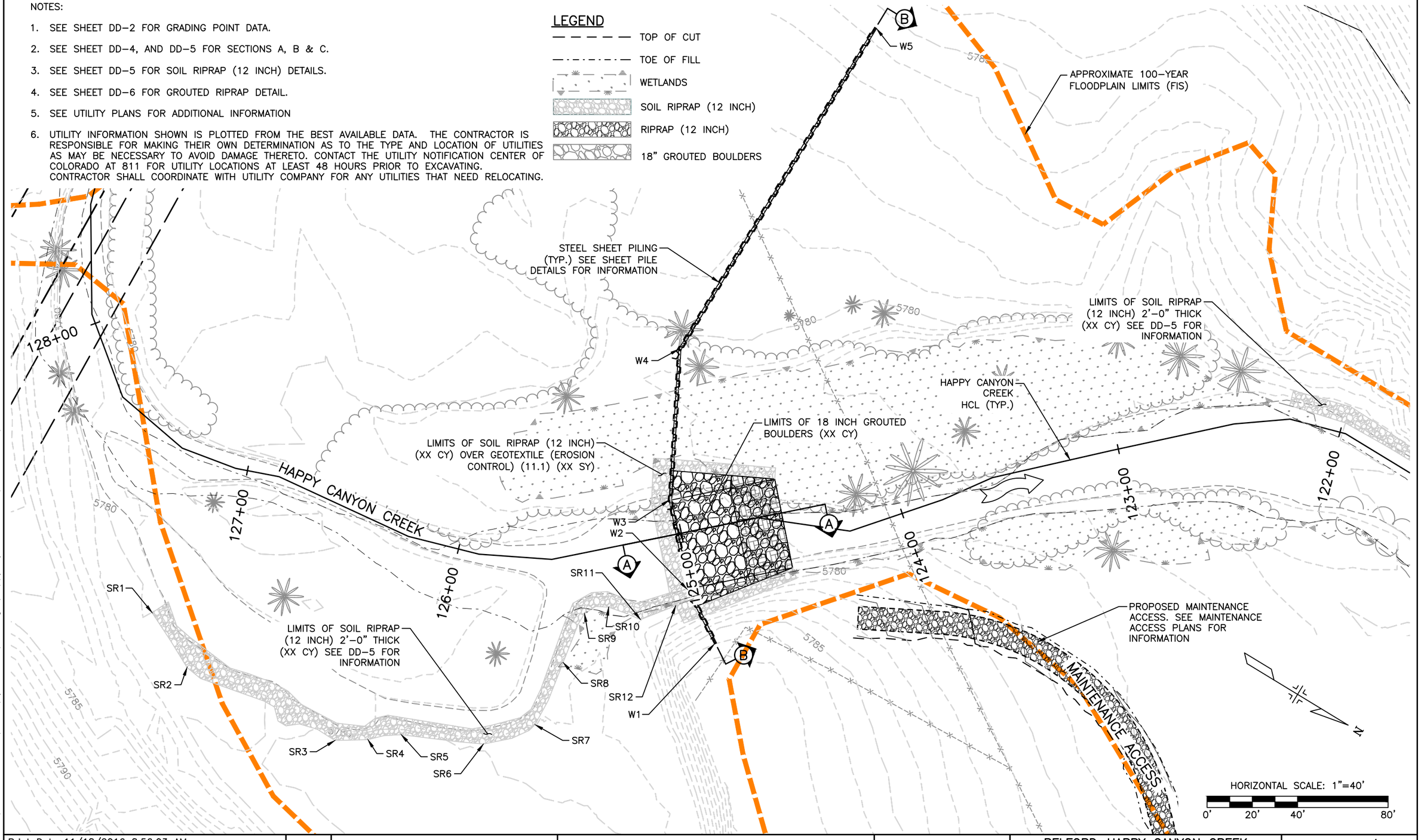
NOTES:

1. SEE SHEET DD–2 FOR GRADING POINT DATA.
2. SEE SHEET DD–4, AND DD–5 FOR SECTIONS A, B & C.
3. SEE SHEET DD–5 FOR SOIL RIPRAP (12 INCH) DETAILS.
4. SEE SHEET DD–6 FOR GROUTED RIPRAP DETAIL.
5. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION
6. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.

LEGEND

- TOP OF CUT
- TOE OF FILL
- WETLANDS
- SOIL RIPRAP (12 INCH)
- RIPRAP (12 INCH)
- 18" GROUTED BOULDERS



I:\115360-01 – Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shoklee

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BELFORD–HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
DROP NO. 4 PLAN

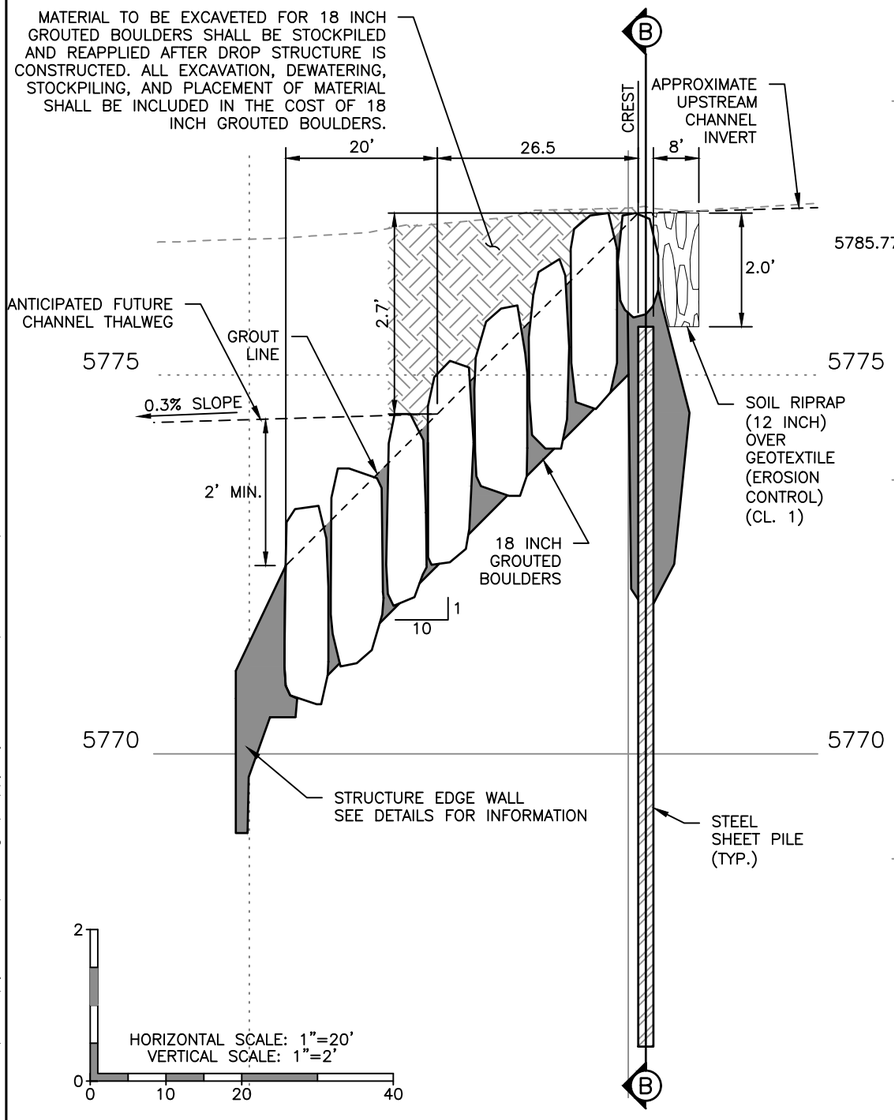
Designer:	CDT	Structure Numbers	
Detailer:	KLT		
Subset:	Drainage	Sheets:	DD–17 of 18

Project No./Code

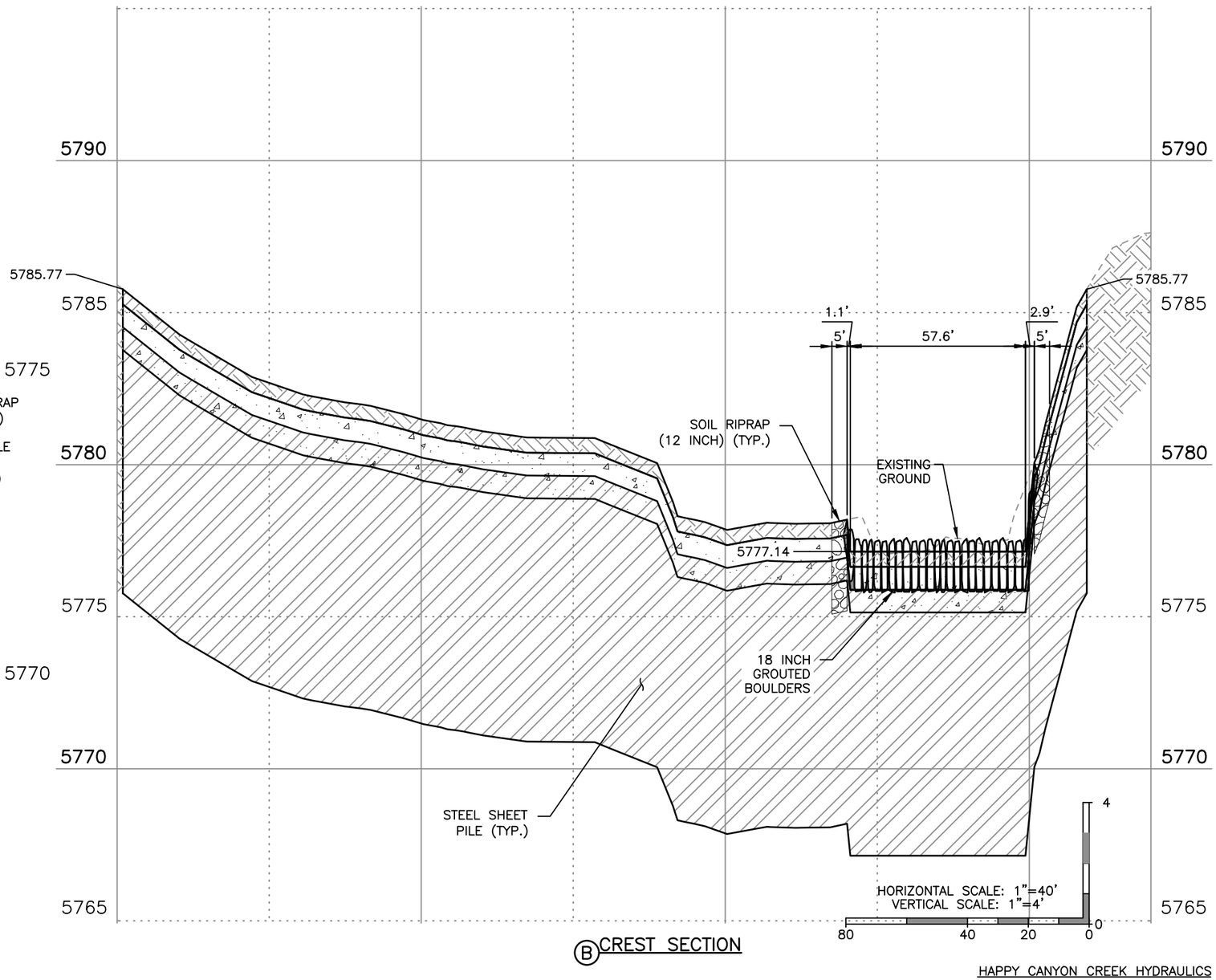
Sheet Number 59

NOTES

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.
2. SEE UTILITY PLANS FOR ADDITIONAL INFORMATION.



A GROUTED BOULDER DROP PROFILE



B CREST SECTION

HAPPY CANYON CREEK HYDRAULICS

Q100= 8,303 C.F.S
Q100 VELOCITY = 8.95 F.P.S
FROUDE No.=0.58

FOR INFO ONLY

DROP STRUCTURE NO. 4

Print Date: 11/18/2016 8:57:00 AM	(R-X)	Sheet Revisions			As Constructed
File Name: H115360-01DROP18Δrop4 Prof Sect.dwg		Date	Comments	Initials	No Revisions:
Horizontal Scale: 1"=50' Vertical Scale: 1"=10'					Revised:
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BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
DROP NO. 4 PROFILE/DETAILS

Designer:	CDT	Structure Numbers	
Detailer:	KLT		
Subset:	Drainage	Sheets:	DD-18 of 18

Project No./Code

Sheet Number 60

I:\115360-01 - Compark at Belford\CADD\Hydraulics\Drawings\Happy Cyn Creek Drop Structure\, Dustin.Shoklee

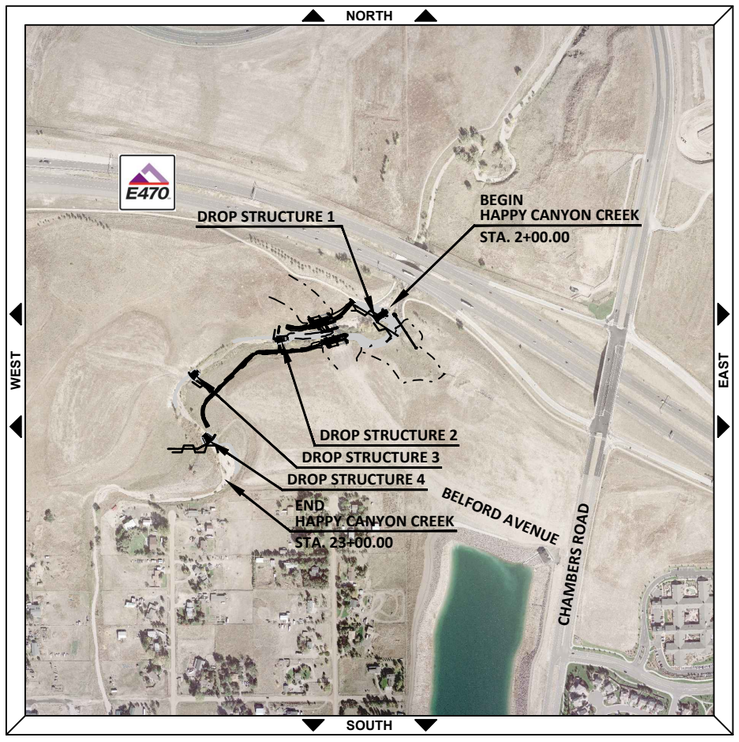
F.O.R. Set
NOVEMBER, 2016

PARKER
COLORADO

F.O.R PLANS
CONSTRUCTION BEST MANAGEMENT PRACTICES
BELFORD AVENUE BRIDGE AND HAPPY CANYON CREEK
TOWN OF PARKER, COUNTY OF DOUGLAS, STATE OF COLORADO

SCALE OF ORIGINAL DRAWINGS

ON PLAN 1" = 100'



INDEX OF SHEETS

TOWN OF PARKER APPROVALS

THE TOWN OF PARKER REVIEW CONSTITUTES GENERAL COMPLIANCE WITH THE TOWNS STANDARDS AND APPROVED VARIANCES, SUBJECT TO THESE PLANS BEING STAMPED, SIGNED, AND DATED BY THE PROFESSIONAL ENGINEER OF RECORD. REVIEW BY THE TOWN DOES NOT CONSTITUTE APPROVAL OF THE PLAN DESIGN OR ACCURACY AND CORRECTNESS OF ENGINEERING CALCULATION. ERRORS IN THE DESIGN OR CALCULATIONS REMAIN THE RESPONSIBILITY OF THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT.

THIS REVIEW DOES NOT CONSTITUTE APPROVAL OF ANY PRIVATE ON–SITE IMPROVEMENTS WHICH MAY BE SHOWN. CONSTRUCTION CANNOT COMMENCE UNTIL ALL REQUIRED DRAINAGE/TRAFFIC REPORT(S), FINAL DEVELOPMENT PLAN(S), SPECIAL REVIEW(S), GRADING PERMIT, AND/OR OTHER PERMITS ARE COMPLETE, APPROVED AND ON FILE WITH THE TOWN OF PARKER.

TOWN OF PARKER, PUBLIC WORKS DIRECTOR DATE

TOWN OF PARKER, PUBLIC WORKS MANAGER – STORMWATER DATE

TOWN OF PARKER, PUBLIC WORKS MANAGER – TRANSPORTATION DATE

BASIS OF BEARING:

THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 6, TOWNSHIP 6 SOUTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN BEING MONUMENTED AS SHOWN HEREON HAVING A BEARING OF NORTH 00°29'49" WEST, AS DETERMINED BY GPS OBSERVATION FROM NGS CONTROL POINTS IN THE COLORADO CENTRAL ZONE, STATE PLAN COORDINATE SYSTEM, TOWN OF PARKER, COUNTY OF DOUGLAS, STATE OF COLORADO.

BENCHMARKS: (COMPARK SOUTH)

SOURCE BENCHMARKS:
DOUGLAS COUNTY BM 1.115010
A DOUGLAS COUNTY GIS MONUMENT SET IN CONCRETE LOCATED APPROXIMATELY 130 FEET SOUTHWESTERLY OF THE CENTERLINE OF CHAMBERS ROAD AND 95 FEET NORTHWESTERLY OF THE CENTERLINE OF COMPARK BOULEVARD.

ELEVATION = 5752.84 (NAVD 88)

SITE BENCHMARKS:
A NO. 5 REBAR WITH 2" ALUMINUM CAP STAMPED "LS 28286, 2001" FOUND AT THE SOUTHWEST CORNER OF SECTION 6, T6S, R66W LOCATED ON THE WEST LINE OF FIRST STREET APPROXIMATELY 1000 FEET NORTH OF ELM AVENUE.

ELEVATION = 5845.51

A 2.5" IRON PIPE WITH 3.25" ALUMINUM CAP STAMPED "PLS 12405, 1997" FOUND AT THE SOUTHEAST CORNER OF SECTION 6, T6S, R66W LOCATED APPROXIMATELY 960 FEET NORTH OF THE CENTERLINE OF AVENTERRA PARKWAY AND APPROXIMATELY 1050 FEET WEST OF THE CENTERLINE OF CHAMBERS ROAD.

ELEVATION = 5808.06

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Void:

BELFORD–HAPPY CANYON CREEK
CBMP TITLE SHEET

Designer: CDT
Detailer: KLT
Subset: EROSION
Structure Numbers:
Sheets: EL–1 of 1

Project No./Code

Sheet Number 61

TABULATION OF EROSION CONTROL QUANTITIES

DRAWING NUMBER	CHECK DAM	*CONCRETE WASHOUT STRUCTURE	*VEHICLE TRACKING CONTROL	*STABILIZED STAGING AREA	SEEDING (NATIVE)	MULCHING (WEED FREE STRAW)	*REINFORCED ROCK BERM FOR CULVERT	#*REINFORCED ROCK BERM	*SEDIMENT CONTROL LOG (12 INCH)	EROSION CONTROL BLANKET (STRAW)	DIVERSION DITCH	CONSTRUCTION FENCE	SILT FENCE	INLET PROTECTION
	LF	EACH	EACH	SY	ACRE	ACRE	EACH	LF	LF	SY	LF	LF	LF	LF
INITIAL (EI–1)														
INTERIM (EN–1)														
FINAL (EF–1)														
PROJECT TOTALS	0	0	0	0	0.0	0.0	0	0	0	0	0	0	0	0

1. THESE QUANTITIES HAVE BEEN TAKEN FORWARD TO THE SUMMARY OF APPROXIMATE QUANTITIES.
2. FOR DETAILS, SEE GESC STANDARD NOTES AND DETAILS.
3. CHECK DAMS ARE NOT TO BE REMOVED UNLESS DIRECTED BY THE PROJECT ENGINEER.
4. MULCH TACKIFIER IS REQUIRED AND IS INCLUDED IN THE COST OF MULCHING.
5. PERMANENT FENCE SHALL BE PLACED ON PROPOSED R.O.W. AS INITIAL CONSTRUCTION SEQUENCE. CONSTRUCTION FENCE SHALL BE PLACED AS DIRECTED BY THE PROJECT ENGINEER.
6. SEE EROSION CONTROL PLAN SHEETS FOR ADDITIONAL PLACEMENT INFORMATION.
7. LOCATION OF STOCKPILES, INCLUDING TOPSOIL, IMPORTED AGGREGATES, EXCESS MATERIALS, STORAGE AND STAGING AREAS FOR EQUIPMENT FUEL, LUBRICANT, CHEMICAL (AND OTHER MATERIALS), WASTE STORAGE, BORROW AND DISPOSAL AREAS SHALL BE LOCATED PRIOR TO CONSTRUCTION WITH IN THE DEFINED LIMITS OF CONSTRUCTION BY THE PROJECT ENGINEER.

* THESE ITEMS SHALL BE PAID FOR AS PLACE AND REMOVE.

\# NOT ALL REINFORCED ROCK BERMS ARE TO BE REMOVED, SEE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.

ADDITIONAL SEDIMENT/EROSION CONTROL:
IT IS ESTIMATED THAT BLADING (120 HORSEPOWER), DOZING (100 HORSEPOWER), COMBINATION LOADER (125 HORSEPOWER) AND/OR BACKHOE (75 HORSEPOWER) AND/OR LABORER MAY BE REQUIRED FOR MISCELLANEOUS EROSION CONTROL WORK AS DIRECTED BY THE ENGINEER. WORK SHALL BE PAID FOR AS 208 SEDIMENT REMOVAL AND DISPOSAL (10 HRS). AN EROSION CONTROL SUPERVISOR WILL BE REQUIRED FOR THIS PROJECT AND SHALL BE PAID FOR AS 208 EROSION CONTROL SUPERVISOR (11.25 DAYS).

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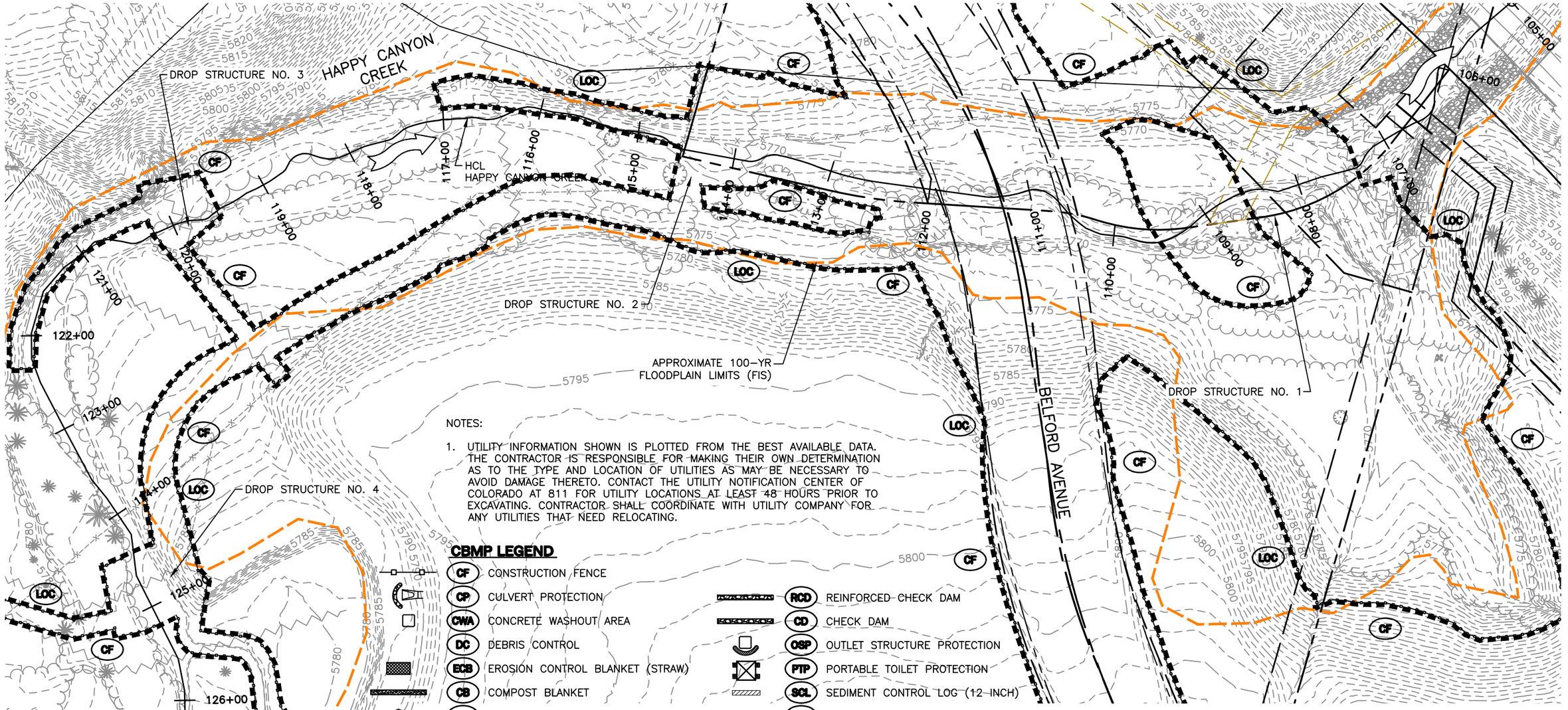
BELFORD–HAPPY CANYON CREEK
TABULATION OF
EROSION CONTROL QUANTITIES

Designer: CDT
Detailer: KLT
Subset: EROSION
Structure Numbers:
Sheets: ET–1 of 1

Project No./Code:

Sheet Number 62



NOTES:

1. UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS AT LEAST 48 HOURS PRIOR TO EXCAVATING. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR ANY UTILITIES THAT NEED RELOCATING.

CBMP LEGEND

CF	CONSTRUCTION FENCE	RCD	REINFORCED CHECK DAM
CP	CULVERT PROTECTION	CD	CHECK DAM
CWA	CONCRETE WASHOUT AREA	OSP	OUTLET STRUCTURE PROTECTION
DC	DEBRIS CONTROL	PTP	PORTABLE TOILET PROTECTION
ECB	EROSION CONTROL BLANKET (STRAW)	SCL	SEDIMENT CONTROL LOG (12 INCH)
CB	COMPOST BLANKET	SF	SILT FENCE
CFB	COMPOST FILTER BERM	SSA	STABILIZED STAGING AREA
CM	CONSTRUCTION MARKER	SMC	SEEDING MULCHING AND CRIMPING
DW	DEWATERING	VTC	VEHICLE TRACKING CONTROL
DD	DIVERSION DITCH	ST	SEDIMENT TRAP
ECB	EROSION CONTROL BLANKET	SR	SURFACE ROUGHENING
IP	INLET PROTECTION	TSD	TEMPORARY SLOPE DRAIN
RRB	REINFORCED ROCK BERM	TSC	TEMPORARY STREAM CROSSING
RRC	RRB FOR CULVERT PROTECTION	WW	VTC WITH WHEEL WASH
LOC	LIMITS OF CONSTRUCTION		

LEGEND

TOP OF CUT

TOE OF FILL

GENERAL FLOW DIRECTION

N

HORIZONTAL SCALE: 1"=100'

0 50 100 200

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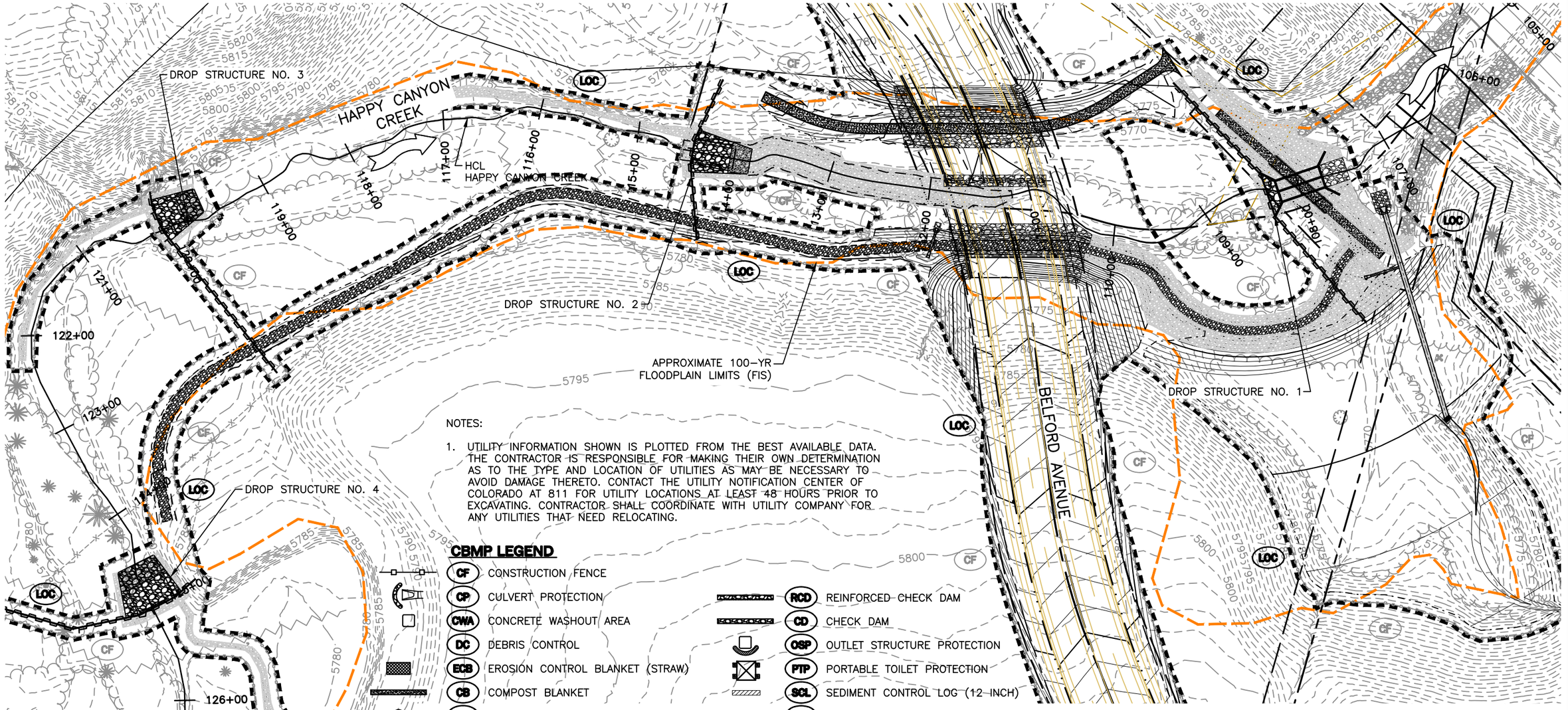
Void:

BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
INITIAL CBMP PLAN

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: EI-01 of 1

Project No./Code:

Sheet Number 63



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CBMP LEGEND

CF	CONSTRUCTION FENCE	RCD	REINFORCED CHECK DAM
CP	CULVERT PROTECTION	CD	CHECK DAM
CWA	CONCRETE WASHOUT AREA	OSP	OUTLET STRUCTURE PROTECTION
DC	DEBRIS CONTROL	PTP	PORTABLE TOILET PROTECTION
ECB	EROSION CONTROL BLANKET (STRAW)	SCL	SEDIMENT CONTROL LOG (12 INCH)
CB	COMPOST BLANKET	SF	SILT FENCE
CFB	COMPOST FILTER BERM	SSA	STABILIZED STAGING AREA
CM	CONSTRUCTION MARKER	SMC	SEEDING MULCHING AND CRIMPING
DW	DEWATERING	VTC	VEHICLE TRACKING CONTROL
DD	DIVERSION DITCH	ST	SEDIMENT TRAP
ECB	EROSION CONTROL BLANKET	SR	SURFACE ROUGHENING
IP	INLET PROTECTION	TSD	TEMPORARY SLOPE DRAIN
RRB	REINFORCED ROCK BERM	TSC	TEMPORARY STREAM CROSSING
RRC	RRB FOR CULVERT PROTECTION	WW	VTC WITH WHEEL WASH
LOC	LIMITS OF CONSTRUCTION		

LEGEND

- TOP OF CUT
- TOE OF FILL
- GENERAL FLOW DIRECTION
- LIMITS OF DISTURBANCE AREA

N

HORIZONTAL SCALE: 1"=100'

0 50 100 200

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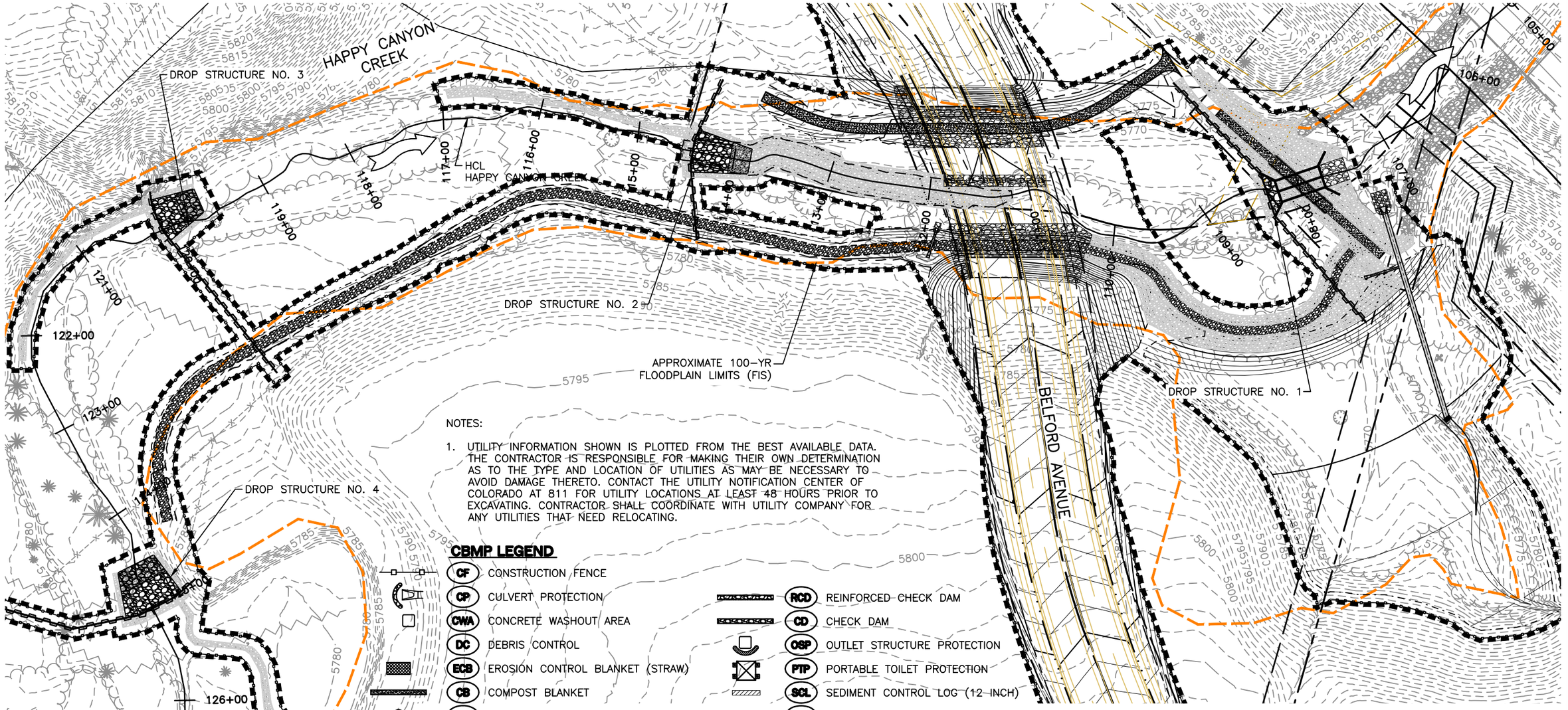
As Constructed
No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
INTERIM CBMP PLAN

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: EN-01 of 1

Project No./Code:

Sheet Number 64



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CBMP LEGEND

CF	CONSTRUCTION FENCE
CP	CULVERT PROTECTION
CWA	CONCRETE WASHOUT AREA
DC	DEBRIS CONTROL
ECB	EROSION CONTROL BLANKET (STRAW)
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DD	DIVERSION DITCH
ECB	EROSION CONTROL BLANKET
IP	INLET PROTECTION
RRB	REINFORCED ROCK BERM
RRC	RRB FOR CULVERT PROTECTION
LOC	LIMITS OF CONSTRUCTION
RCD	REINFORCED CHECK DAM
CD	CHECK DAM
OSP	OUTLET STRUCTURE PROTECTION
PTP	PORTABLE TOILET PROTECTION
SCL	SEDIMENT CONTROL LOG (12 INCH)
SF	SILT FENCE
SSA	STABILIZED STAGING AREA
SMC	SEEDING MULCHING AND CRIMPING
VTC	VEHICLE TRACKING CONTROL
ST	SEDIMENT TRAP
SR	SURFACE ROUGHENING
TSD	TEMPORARY SLOPE DRAIN
TSC	TEMPORARY STREAM CROSSING
WW	VTC WITH WHEEL WASH

LEGEND

- TOP OF CUT
- TOE OF FILL
- GENERAL FLOW DIRECTION
- LIMITS OF DISTURBANCE AREA

N

HORIZONTAL SCALE: 1"=100'
0 50 100 200

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BELFORD-HAPPY CANYON CREEK
HAPPY CANYON CREEK DROP STRUCTURE
FINAL CBMP PLAN

Designer: CDT
Detailer: KLT
Subset: Drainage
Structure Numbers:
Sheets: EF-01 of 1

Project No./Code:

Sheet Number 65