

TABULATION OF LENGTH

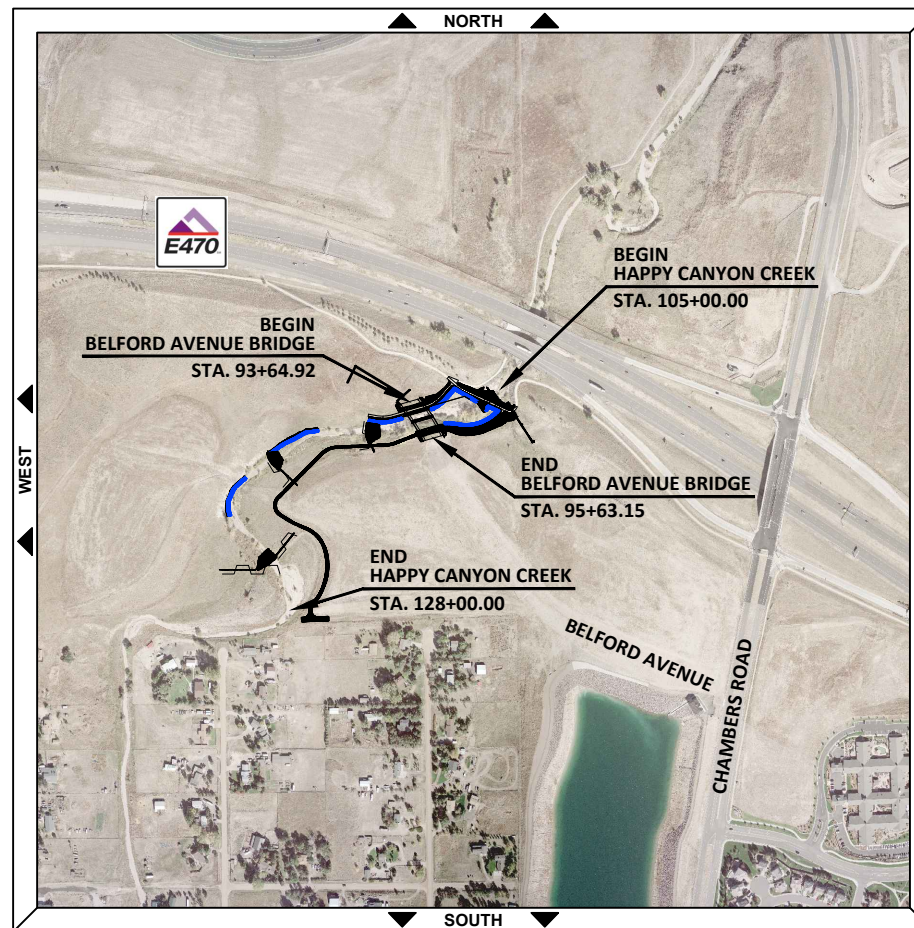
STATION	LINEAR FEET	
	CIVIL	MAJOR STRUCTURE
HAPPY CANYON CREEK 105+00.00 BEGIN CHANNEL 128+00.00 END CHANNEL	2,300.00	
HAPPY CANYON CREEK BOX CULVERT 107+74.75 BEGIN BOX CULVERT 108+21.13 END BOX CULVERT		46.38
MAINTENANCE ACCESS 70+00.00 BEGIN ACCESS 88+51.74 END ACCESS	1,851.74	
REGIONAL TRAIL 23+00.00 BEGIN TRAIL 27+28.51 END TRAIL	428.51	
CHEROKEE TRAIL 51+50.00 BEGIN TRAIL 53+90.00 END TRAIL	240.00	
BELFORD AVENUE BRIDGE 93+64.92 BEGIN BRIDGE 95+63.15 END BRIDGE		198.23
<b>TOTALS</b>	<b>4,820.25</b>	<b>244.61</b>
<b>SUMMARY</b>	<b>LIN. FT.</b>	<b>MILES</b>
Channel	2,300.00	0.44
Trail & Access	2,520.25	0.48
Major Structures	244.61	0.05
<b>GROSS AND NET LENGTH</b>	<b>5,064.86</b>	<b>0.97</b>
<b>BELFORD AVENUE DESIGN DATA</b>		
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	



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

SCALE OF ORIGINAL DRAWINGS

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



INDEX OF SHEETS

SHEET NO.	SUBSET SHEETS	DESCRIPTION
1	T-1	TITLE SHEET
2	SP-1	STANDARD PLANS LIST
3	GN-1	GENERAL NOTES
4 - 5	SM-1 TO SM-2	SUMMARY OF APPROXIMATE QUANTITIES
6	TB-1	TABULATION OF TRAIL QUANTITIES
7 - 8	RM-1 TO RM-2	REMOVAL AND RESET PLANS
9 - 10	TY-1 TO TY-2	TRAIL TYPICAL SECTIONS
11 - 13	TD-1 TO TD-3	TRAIL DETAILS
14 - 15	TG-1 TO TG-2	TRAIL GEOMETRIC LAYOUT
16 - 27	TP-1 TO TP-12	TRAIL PLANS AND PROFILES
28 - 29	TS-1 TO TS-2	TRAIL SIGNS AND DETAILS
30	CS-1	TRAIL CROSS SECTIONS
31 - 63	B-1 TO B-33	BRIDGE PLANS
64 - 86	DD-1 TO DD-23	HAPPY CANYON CHANNEL PLANS
87	EL-1	CBMP TITLE SHEET
88	ET-1	TABULATION OF EROSION CONTROL QUANTITIES
89 - 90	EI-1 TO EI-2	INITIAL CBMP PLAN
91 - 92	EN-1 TO EN-2	INTERIM CBMP PLAN
93 - 94	EF-1 TO EF-2	FINAL CBMP PLAN
95 - 129	ED-1 TO ED-35	CBMP STANDARD NOTES & DETAILS

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



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.

TOM WILLIAMS, P.E., DIRECTOR OF ENGINEERING & PUBLIC WORKS	DATE
CHRIS HUDSON, P.E., PUBLIC WORKS MANAGER	DATE
JACOB JAMES, P.E., STORMWATER MANAGER	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.

Print Date: 6/18/2021 8:45:47 AM  
 File Name: A115360-01TTL01.dwg  
 Horizontal Scale: NTS Vertical Scale: NTS

	6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com
--	--

Sheet Revisions			
Date	Comments	Initials	
			(R-X)



As Constructed	BELFORD-HAPPY CANYON CREEK TITLE SHEET			Project No./Code
No Revisions:	Designer:	DCS	Structure	
Revised:	Detailer:	DCS	Numbers	
Void:	Subset:	Title	Sheets:	T-1 of 1
				Sheet Number 1

I:\115360-01 - Compark at Belford\CADD\Drawings\BelfordHCC\ - Chase.Miyamoto

I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring

PLAN NUMBER	M STANDARD TITLE	PAGE NUMBER
<input type="checkbox"/> M-100-1	STANDARD SYMBOLS (3 SHEETS).....	1-3
<input type="checkbox"/> M-100-2	ACRONYMS AND ABBREVIATIONS (4 SHEETS).....	4-7
<input type="checkbox"/> M-203-1	APPROACH ROADS.....	8
<input type="checkbox"/> M-203-2	DITCH TYPES.....	9
<input type="checkbox"/> M-203-11	SUPERELEVATION CROWNED AND DIVIDED HIGHWAYS (3 SHEETS).....	10-12
<input type="checkbox"/> M-203-12	SUPERELEVATION STREETS (2 SHEETS).....	13-14
<input checked="" type="checkbox"/> M-206-1	EXCAVATION AND BACKFILL FOR STRUCTURES (2 SHEETS).....	15-16
<input checked="" type="checkbox"/> M-206-2	EXCAVATION AND BACKFILL FOR BRIDGES (2 SHEETS).....	17-18
<input checked="" type="checkbox"/> M-208-1	TEMPORARY EROSION CONTROL (11 SHEETS).....	19-29
<input type="checkbox"/> M-210-1	MAILBOX SUPPORTS (2 SHEETS).....	30-31
<input type="checkbox"/> M-214-1	NURSERY STOCK DETAILS.....	32
<input checked="" type="checkbox"/> M-216-1	SOIL RETENTION COVERING (2 SHEETS).....	33-34
<input checked="" type="checkbox"/> M-412-1	CONCRETE PAVEMENT JOINTS (5 SHEETS).....	35-39
<input type="checkbox"/> M-412-2	CONCRETE PAVEMENT CRACK REPAIR (4 SHEETS) (NEW, ISSUED ON OCTOBER 7, 2019)	
<input type="checkbox"/> M-510-1	STRUCTURAL PLATE PIPE H-20 LOADING.....	40
<input type="checkbox"/> M-601-1	SINGLE CONCRETE BOX CULVERT (CAST-IN-PLACE) (2 SHEETS).....	41-42
<input checked="" type="checkbox"/> M-601-2	DOUBLE CONCRETE BOX CULVERT (CAST-IN-PLACE) (2 SHEETS).....	43-44
<input type="checkbox"/> M-601-3	TRIPLE CONCRETE BOX CULVERT (CAST-IN-PLACE) (2 SHEETS).....	45-46
<input type="checkbox"/> M-601-10	HEADWALL FOR PIPES.....	47
<input type="checkbox"/> M-601-11	TYPE "S" SADDLE HEADWALLS FOR PIPE.....	48
<input type="checkbox"/> M-601-12	HEADWALLS AND PIPE OUTLET PAVING.....	49
<input checked="" type="checkbox"/> M-601-20	WINGWALLS FOR PIPE OR BOX CULVERTS (2 SHEETS).....	50-51
<input type="checkbox"/> M-603-1	METAL PIPE (4 SHEETS).....	52-55
<input checked="" type="checkbox"/> M-603-2	REINFORCED CONCRETE PIPE.....	56
<input checked="" type="checkbox"/> M-603-3	PRECAST CONCRETE BOX CULVERT (REVISED ON SEPTEMBER 10, 2020)	57
<input type="checkbox"/> M-603-4	CORRUGATED POLYETHYLENE PIPE (AASHTO M294) AND POLYPROPYLENE PIPE (AASHTO M330).....	58
<input checked="" type="checkbox"/> M-603-5	POLYVINYL CHLORIDE (PVC) PIPE (AASHTO M304).....	59
<input type="checkbox"/> M-603-6	STEEL REINFORCED POLYETHYLENE RIBBED PIPE (AASHTO MP 20).....	60
<input checked="" type="checkbox"/> M-603-10	CONCRETE AND METAL END SECTIONS.....	61
<input type="checkbox"/> M-603-12	TRAVERSABLE END SECTIONS AND SAFETY GRATES (3 SHEETS).....	62-64
<input type="checkbox"/> M-604-10	INLET, TYPE C.....	65
<input checked="" type="checkbox"/> M-604-11	INLET, TYPE D.....	66
<input type="checkbox"/> M-604-12	CURB INLET TYPE R (2 SHEETS).....	67-68
<input type="checkbox"/> M-604-13	CONCRETE INLET TYPE 13.....	69
<input type="checkbox"/> M-604-20	MANHOLES (3 SHEETS).....	70-72
<input checked="" type="checkbox"/> M-604-25	VANE GRATE INLET (5 SHEETS).....	73-77
<input checked="" type="checkbox"/> M-605-1	SUBSURFACE DRAINS.....	78


PLAN NUMBER	M STANDARD TITLE	PAGE NUMBER
<input checked="" type="checkbox"/> M-606-1	MIDWEST GUARDRAIL SYSTEM TYPE 3 W-BEAM 31 INCHES (19 SHEETS) (REVISED ON MARCH 5, 2020)	79-97
<input type="checkbox"/> M-606-13	GUARDRAIL TYPE 7 F-SHAPE BARRIER (4 SHEETS).....	98-101
<input type="checkbox"/> M-606-14	PRECAST TYPE 7 CONCRETE BARRIER (4 SHEETS) (REVISED ON AUGUST 21, 2020)	102-104
<input type="checkbox"/> M-606-15	GUARDRAIL TYPE 9 SINGLE SLOPE BARRIER (11 SHEETS) (REVISED ON MARCH 5, 2020)	105-115
<input type="checkbox"/> M-607-1	WIRE FENCES AND GATES (3 SHEETS).....	116-118
<input type="checkbox"/> M-607-2	CHAIN LINK FENCE (3 SHEETS).....	119-121
<input type="checkbox"/> M-607-3	BARRIER FENCE.....	122
<input type="checkbox"/> M-607-4	DEER FENCE, GATES, AND GAME RAMPS (7 SHEETS) (REVISED ON JULY 13, 2020)	123-127
<input type="checkbox"/> M-607-10	PICKET SNOW FENCE.....	128
<input type="checkbox"/> M-607-15	ROAD CLOSURE GATE (9 SHEETS).....	129-137
<input type="checkbox"/> M-608-1	CURB RAMPS (10 SHEETS).....	138-147
<input type="checkbox"/> M-609-1	CURBS, GUTTERS, AND SIDEWALKS (4 SHEETS).....	148-151
<input type="checkbox"/> M-611-1	CATTLE GUARD (2 SHEETS).....	152-153
<input type="checkbox"/> M-611-2	DEER GUARD (2 SHEETS).....	154-155
<input type="checkbox"/> M-614-1	RUMBLE STRIPS (3 SHEETS).....	156-158
<input type="checkbox"/> M-614-2	SAND BARREL ARRAYS (2 SHEETS).....	159-160
<input type="checkbox"/> M-615-1	EMBANKMENT PROTECTOR TYPE 3.....	161
<input type="checkbox"/> M-615-2	EMBANKMENT PROTECTOR TYPE 5.....	162
<input type="checkbox"/> M-616-1	INVERTED SIPHON.....	163
<input type="checkbox"/> M-620-1	FIELD LABORATORY CLASS 1.....	164
<input type="checkbox"/> M-620-2	FIELD LABORATORY CLASS 2 (2 SHEETS).....	165-166
<input type="checkbox"/> M-620-11	FIELD OFFICE CLASS 1.....	167
<input type="checkbox"/> M-620-12	FIELD OFFICE CLASS 2.....	168
<input type="checkbox"/> M-629-1	SURVEY MONUMENTS (2 SHEETS).....	169-170

PLAN NUMBER	S STANDARD TITLE	PAGE NUMBER
<input type="checkbox"/> S-612-1	DELINEATOR INSTALLATIONS (8 SHEETS).....	171-178
<input checked="" type="checkbox"/> S-613-1	ROADWAY LIGHTING (6 SHEETS) (REVISED ON SEPTEMBER 30, 2020)	179-186
<input type="checkbox"/> S-613-2	ALTERNATIVE ROADWAY LIGHTING (4 SHEETS) (NEW, ISSUED ON SEPTEMBER 30, 2020)	
<input checked="" type="checkbox"/> S-614-1	GROUND SIGN PLACEMENT (2 SHEETS).....	187-188
<input type="checkbox"/> S-614-2	CLASS I SIGNS.....	189
<input checked="" type="checkbox"/> S-614-3	CLASS II SIGNS.....	190
<input type="checkbox"/> S-614-4	CLASS III SIGNS (3 SHEETS).....	191-193
<input type="checkbox"/> S-614-5	BREAK-AWAY SIGN SUPPORT DETAILS FOR CLASS III SIGNS (2 SHEETS).....	194-195
<input type="checkbox"/> S-614-6	CONCRETE FOOTINGS AND SIGN ISLANDS FOR CLASS III SIGNS (2 SHEETS).....	196-197
<input checked="" type="checkbox"/> S-614-8	TUBULAR STEEL SIGN SUPPORT DETAILS (7 SHEETS) (REVISED ON DECEMBER 31, 2020)	198-204
<del>S-614-9</del>	<del>PEDESTRIAN PUSH BUTTON POST ASSEMBLY (2 SHEETS) (SUPERSEDED ON JANUARY 23, 2020 BY S-614-45)</del>	<del>205-206</del>
<input type="checkbox"/> S-614-10	MARKER ASSEMBLY INSTALLATIONS.....	207
<input type="checkbox"/> S-614-11	MILEPOST SIGN DETAIL FOR HIGH SNOW AREAS.....	208
<input type="checkbox"/> S-614-12	STRUCTURE NUMBER INSTALLATION (2 SHEETS).....	209-210
<input type="checkbox"/> S-614-14	FLASHING BEACON AND SIGN INSTALLATIONS (4 SHEETS).....	211-214
<input type="checkbox"/> S-614-20	TYPICAL POLE MOUNT SIGN INSTALLATIONS.....	215
<input type="checkbox"/> S-614-21	CONCRETE BARRIER SIGN POST INSTALLATIONS (2 SHEETS) (REVISED ON SEPTEMBER 21, 2020)	216-217
<input type="checkbox"/> S-614-22	TYPICAL MULTI-SIGN INSTALLATIONS.....	218
<input type="checkbox"/> S-614-40	TYPICAL TRAFFIC SIGNAL 30'-75' DOUBLE MAST ARMS 65'-75' SINGLE MAST ARMS (5 SHEETS)	219-223
<input type="checkbox"/> S-614-40A	ALTERNATIVE TRAFFIC SIGNAL 25'-55' SINGLE MAST ARMS (4 SHEETS)	224-227
<input type="checkbox"/> S-614-41	TEMPORARY SPAN WIRE SIGNALS (13 SHEETS).....	228-240
<input type="checkbox"/> S-614-42	CABINET FOUNDATION DETAIL (4 SHEETS).....	241-244
<input type="checkbox"/> S-614-43	TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS (8 SHEETS)	245-252
<input type="checkbox"/> S-614-44	PEDESTAL POLE SIGNALS (2 SHEETS).....	253-254
<input type="checkbox"/> S-614-45	PEDESTRIAN PUSH BUTTON POST ASSEMBLY DETAILS (6 SHEETS) (REVISED ON DECEMBER 3, 2020)	
<input type="checkbox"/> S-614-50	STATIC SIGN MONOTUBE STRUCTURES (12 SHEETS).....	255-266
<input type="checkbox"/> S-614-60	DYNAMIC SIGN MONOTUBE STRUCTURES (14 SHEETS).....	267-280
<input checked="" type="checkbox"/> S-627-1	PAVEMENT MARKINGS (9 SHEETS) (REVISED ON FEBRUARY 16, 2021)	281-289
<input type="checkbox"/> S-630-1	TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION (24 SHEETS)	290-313
<input type="checkbox"/> S-630-2	BARRICADES, DRUMS, CONCRETE BARRIERS (TEMP.) AND VERTICAL PANELS	314
<input type="checkbox"/> S-630-3	FLASHING BEACON (PORTABLE) DETAILS.....	315
<input type="checkbox"/> S-630-4	STEEL SIGN SUPPORT (TEMPORARY) INSTALLATION DETAILS (2 SHEETS)	316-317
<input type="checkbox"/> S-630-5	PORTABLE RUMBLE STRIPS (TEMPORARY) (2 SHEETS).....	318-319
<input type="checkbox"/> S-630-6	EMERGENCY PULL-OFF AREA (TEMPORARY).....	320
<input type="checkbox"/> S-630-7	ROLLING ROADBLOCKS FOR TRAFFIC CONTROL (3 SHEETS)	321-323

COLORADO  
 DEPARTMENT OF TRANSPORTATION  
**M&S STANDARDS PLANS LIST**  
 July 31, 2019  
 Revised on February 16, 2021

ALL OF THE M&S STANDARD PLANS, AS SUPPLEMENTED AND REVISED, APPLY TO THIS PROJECT WHEN USED BY DESIGNATED PAY ITEM OR SUBSIDIARY ITEM.

THE M&S STANDARD PLANS USED TO DESIGN THIS PROJECT ARE INDICATED BY A MARKED BOX , AND WILL BE ATTACHED TO THE PLANS. ALL THE OTHER M&S STANDARD PLANS ARE STILL ELIGIBLE FOR CONSTRUCTION IF APPROVED BY AN APPROPRIATE CDOT ENGINEER.

Print Date: 6/17/2021 8:43:03 PM
File Name: G115360-01SPL01.dwg
Horizontal Scale: NTS Vertical Scale: NTS
 6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com

Sheet Revisions			
Date	Comments	Initials	



8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 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 STANDARD PLANS LIST			
Designer:	SED	Structure	
Detailer:	SED	Numbers	
Subset:	General	Sheets:	SP-1 of 1

Project No./Code
Sheet Number
2

**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 MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE TOWN OF PARKER PUBLIC WORKS DEPARTMENT. THE TOWN RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS 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.

A PRECONSTRUCTION MEETING SHALL BE SCHEDULED A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. A PRECONSTRUCTION MEETING WILL NOT BE SCHEDULED UNTIL THE GRADING PERMIT AND ALL OTHER NECESSARY PERMITS HAVE BEEN OBTAINED.

ALL WORK SHALL BE DONE IN ACCORDANCE WITH TOWN OF PARKER DEPARTMENT OF ENGINEERING/PUBLIC WORKS STANDARD CONSTRUCTION NOTES.

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.



IT IS ESTIMATED THAT TWENTY (20) 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.

A TYPICAL 1.5% CROSS SLOPE (2% MAX.) ON ALL SIDEWALKS SHALL BE USED.

ALL TRENCHES SHALL BE ADEQUATELY SUPPORTED AND THE SAFETY OF WORKERS PROVIDED FOR AS REQUIRED BY THE MOST RECENT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION."

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.

THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT WILL CONDUCT SITE VISITS DURING THE PROJECT CONSTRUCTION WITHIN OR NEAR THE CHANNEL TO OBSERVE CONSTRUCTION FOR CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS. PLEASE CONTACT MIKE SARMENTO, UDFCD CONSTRUCTION MANAGER (303-455-6277), MSARMENTO@UDFCD.ORG TO SCHEDULE A PRECONSTRUCTION MEETING. ALL STRUCTURAL AND GROUTED BOULDER WORK REQUIRE 48-HOURS PRIOR NOTICE TO ANY CONSTRUCTION OR CONCRETE PLACEMENT. STANDARDS AND SPECIFICATIONS FOR ALL OUTFALL AND CHANNEL WORK CAN BE ACCESSED AT WWW.UDFCD.ORG UNDER THE REFERENCES SECTION. FAILURE TO NOTIFY MAY RESULT IN PROJECT INELIGIBILITY.

FOR THE REGIONAL TRAIL AND CHEROKEE TRAIL, CONTROL (CONTRACTION) JOINTS SHALL BE SAWCUT (OR OTHER APPROVED METHODS) TO A DEPTH OF 1½" AND SHALL BE ½" WIDE. TOOLING OF CONTROL JOINTS WILL NOT BE ACCEPTED.

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:



BROOKS KAUFMAN (303) 688-3100 PHONE



WILLIAM BENSON (303) 792-6069 PHONE



COLORADO DEPARTMENT OF HEALTH (303) 320-8333 PHONE



KEVIN YOUNG (720) 490-3867 PHONE



MICHELLE O'NAN (303) 329-1618 PHONE



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
- PL – PROPERTY LINE

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\Scott.Dankenbring

Print Date: 6/17/2021 8:43:37 PM	
File Name: T115360-01GNR01.dwg	
Horizontal Scale: NTS	Vertical Scale: NTS
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

Sheet Revisions			
Date	Comments	Initials	

8008 E. Arapahoe Court, Suite 110, Denver, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
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 GENERAL NOTES			
Designer:	DCS	Structure	
Detailer:	DCS	Numbers	
Subset:	General	Sheets:	GN-1 of 1

Project No./Code
Sheet Number 3

Index			Contract Item No.	Contract Item	Unit	General		Roadway		Bridge		Drainage		Erosion				Project Totals		
Book	Page	Sheet				Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan
			201	CLEARING AND GRUBBING	LS	1													1	
			202	REMOVAL OF PIPE	EACH			3											3	
			202	REMOVAL OF SIDEWALK	SY			457											457	
			202	REMOVAL OF FENCE	LF			2012											2012	
			203	EMBANKMENT MATERIAL (COMPLETE IN PLACE)	CY			2995											2995	
			203	POTHOLING	HOUR	20													20	
			206	STRUCTURE EXCAVATION	CY					261		130							391	
			206	STRUCTURE BACKFILL (CLASS 1)	CY					1475		118							1593	
			206	MECHANICAL REINFORCEMENT OF SOIL	CY					1144									1144	
			206	FILTER MATERIAL (CLASS A)	CY					397		1690							2087	
			206	FILTER MATERIAL (CLASS C)	CY							61							61	
			207	TOPSOIL	CY							832							832	
			208	INLET PROTECTION	EACH									1					1	
			208	AGGREGATE BAG	LF									480					480	
			208	CONCRETE WASHOUT STRUCTURE	EACH									2					2	
			208	VEHICLE TRACKING CONTROL	EACH									2					2	
			208	STABILIZED STAGING AREA	SY									2300					2300	
			208	SILT FENCE	LF									1361					1361	
			208	CULVERT PROTECTION	LF									100					100	
			208	CHECK DAM	LF									275					275	
			208	SEDIMENT CONTROL LOG (12 INCH)	LF									3683					3683	
			208	SEDIMENT REMOVAL AND DISPOSAL	HR									40					40	
			208	EROSION CONTROL MANAGEMENT	DAY									30					30	
			208	DIVERSION DITCH	LF									312					312	
			208	TEMPORARY STREAM CROSSING	EACH									4					4	
			208	TEMPORARY SEDIMENT BASIN	EACH									2					2	
			208	PORTABLE TOILET PROTECTION	EACH									1					1	
			211	DEWATERING	LS									1					1	
			212	SEEDING (NATIVE)	ACRE									6.3					6.3	
			213	MULCHING (WEED FREE STRAW)	ACRE									6.3					6.3	
			216	EROSION CONTROL BLANKET (STRAW/COCONUT)	SY									6180					6180	
			304	AGGREGATE BASE COURSE (CLASS 6)	CY			386											386	
			403	HOT MIX ASPHALT	TON					270									270	
			501	STEEL SHEET PILING (TYPE II)	SF							11710							11710	
			503	DRILLED CAISSON (24 INCH)	LF					753									753	
			503	DRILLED CAISSON (48 INCH)	LF					240									240	
			506	RIPRAP (12 INCH)	CY							76							76	
			506	RIPRAP (18 INCH)	CY					1184									1184	
			506	SOIL RIPRAP (12 INCH)	CY							2884							2884	
			506	SOIL RIPRAP (18 INCH)	CY							977							977	
			506	24 INCH GROUTED BOULDERS	CY							602							602	
			514	PIPE RAILING	LF							107							107	
			514	PEDESTRIAN RAILING (STEEL)	LF					386									386	
			515	WATERPROOFING (MEMBRANE)	SY					1631									1631	


I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\ Chase.Miyamoto

Print Date: 6/18/2021 9:00:19 AM		<b>Sheet Revisions</b> <table border="1"> <thead> <tr> <th>Date</th> <th>Comments</th> <th>Initials</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			Date	Comments	Initials										<b>As Constructed</b> No Revisions:		<b>BELFORD – HAPPY CANYON CREEK</b> <b>SUMMARY OF APPROXIMATE QUANTITIES</b>				Project No./Code	
Date	Comments				Initials																			
File Name: G115360-01SAQ01.dwg		<input checked="" type="checkbox"/> (R-X) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Revised:		Designer: SED Detailer: SED		Structure Numbers																
Horizontal Scale: NTS      Vertical Scale: NTS		 6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com		 <small>8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112    ph:303.708.0900    fax:303.708.0400    manhard.com          Civil Engineers • Surveyors • Water Resource Engineers • Water &amp; Wastewater Engineers          Construction Managers • Environmental Scientists • Landscape Architects • Planners</small>		Void:		Subset: General      Sheets: SM-1 of 2		Sheet Number 4														

Index			Contract Item No.	Contract Item	Unit	General		Roadway		Bridge		Drainage		Erosion				Project Totals		
Book	Page	Sheet				Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan	As Const.	Plan
			515	CONCRETE SEALER	SY					402									402	
			601	CONCRETE CLASS D (BOX CULVERT)	CY							47							47	
			601	CONCRETE CLASS D (BRIDGE)	CY					1074									1074	
			601	STRUCTURAL CONCRETE COATING	SY					1228									1228	
			601	HAND STAINED STONE FORMLINER	SF					2200									2200	
			602	REINFORCING STEEL	LB					17634		2352							19986	
			602	REINFORCING STEEL (EPOXY COATED)	LB					241455		740							242195	
			603	18 INCH REINFORCED CONCRETE PIPE (CIP)	LF					40									40	
			603	48 INCH REINFORCED CONCRETE PIPE (CIP)	LF							187							187	
			603	48 INCH REINFORCED CONCRETE END SECTION	EACH							1							1	
			603	10X3 FOOT CONCRETE BOX CULVERT (PRECAST)	LF							90							90	
			604	INLET TYPE D (10 FOOT)	EACH							1							1	
			604	INLET SPECIAL	EACH							1							1	
			604	VANE GRATE INLET (SPECIAL)	EACH					2									2	
			606	BRIDGE RAIL (SPECIAL)	LF					388									388	
			607	CONSTRUCTION FENCE	LF									8838					8838	
			608	CONCRETE SIDEWALK (6 INCH)	SY			728											728	
			608	CONCRETE SIDEWALK (SPECIAL)	SY			433											433	
			613	1 INCH ELECTRICAL CONDUIT	LF					62									62	
			613	2 INCH ELECTRICAL CONDUIT	LF					958									958	
			613	LUMINAIRE (SPECIAL)	LF					6									6	
			614	SIGN PANEL (CLASS I)	SF			27											27	
			614	TIMBER SIGN POST 6x6 INCH	LF			90											90	
			618	PRESTRESSED CONCRETE I (BT42)	LF					1852									1852	
			619	8 INCH PLASTIC PIPE	LF							268							268	
			620	FIELD OFFICE (CLASS 2)	EACH	1													1	
			620	FIELD LAB (CLASS 2)	EACH	1													1	
			620	SANITARY FACILITY	EACH	1													1	
			625	CONSTRUCTION SURVEYING	LS	1													1	
			626	MOBILIZATION	LS	1													1	
			630	CONSTRUCTION TRAFFIC CONTROL	LS	1													1	
			700	F/A MINOR CONTRACT REVISIONS	FA	1													1	
			700	F/A EROSION CONTROL	FA									1					1	

I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\ Chase.Miyamoto

Print Date: 6/18/2021 9:00:23 AM  
File Name: G115360-01SAQ01.dwg  
Horizontal Scale: NTS Vertical Scale: NTS



6400 South Fiddlers Green Circle, Suite 1500  
Greenwood Village, CO 80111  
Phone: 303.721.1440  
www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials



8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0100 manhard.com  
Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD – HAPPY CANYON CREEK SUMMARY OF APPROXIMATE QUANTITIES		Project No./Code
No Revisions:	Designer: SED	Structure Numbers	
Revised:	Detailer: SED		
Void:	Subset: General	Sheets: SM-2 of 2	Sheet Number 5

TABULATION OF REMOVAL AND RESET QUANTITIES

STATION/LOCATION	REMOVAL OF PIPE	REMOVAL OF SIDEWALK	REMOVAL OF FENCE
	EACH	SY	LF
SHEET RM-1	3	457	1228
SHEET RM-2			784
PROJECT TOTALS	3	457	2012

TABULATION OF TRAIL QUANTITIES

STATION/LOCATION	AGGREGATE BASE COURSE (CLASS 6)	CONCRETE SIDEWALK (6 INCH)	CONCRETE SIDEWALK (SPECIAL)
	CY	SY	SY
MAINTENANCE ACCESS	386	40	
REGIONAL TRAIL		205	433
CHEROKEE TRAIL		483	
PROJECT TOTALS	386	728	433

TABULATION OF EARTHWORK

INDEX			ITEM	PROJECT TOTALS	
BOOK	PAGE	SHEET		CU. YDS.	
			EMBANKMENT MATERIAL (FOR INFO. ONLY) ROADWAY (FROM SURFACE COMPARISON)	0	
			HAPPY CANYON CREEK MAINTENANCE ACCESS	493	
			REGIONAL TRAIL CHEROKEE TRAIL	73	
			HAPPY CANYON CREEK FLOODPLAIN GRADING	408	
			TOTAL FOR PAY QUANTITY	2,021	
				2,995	

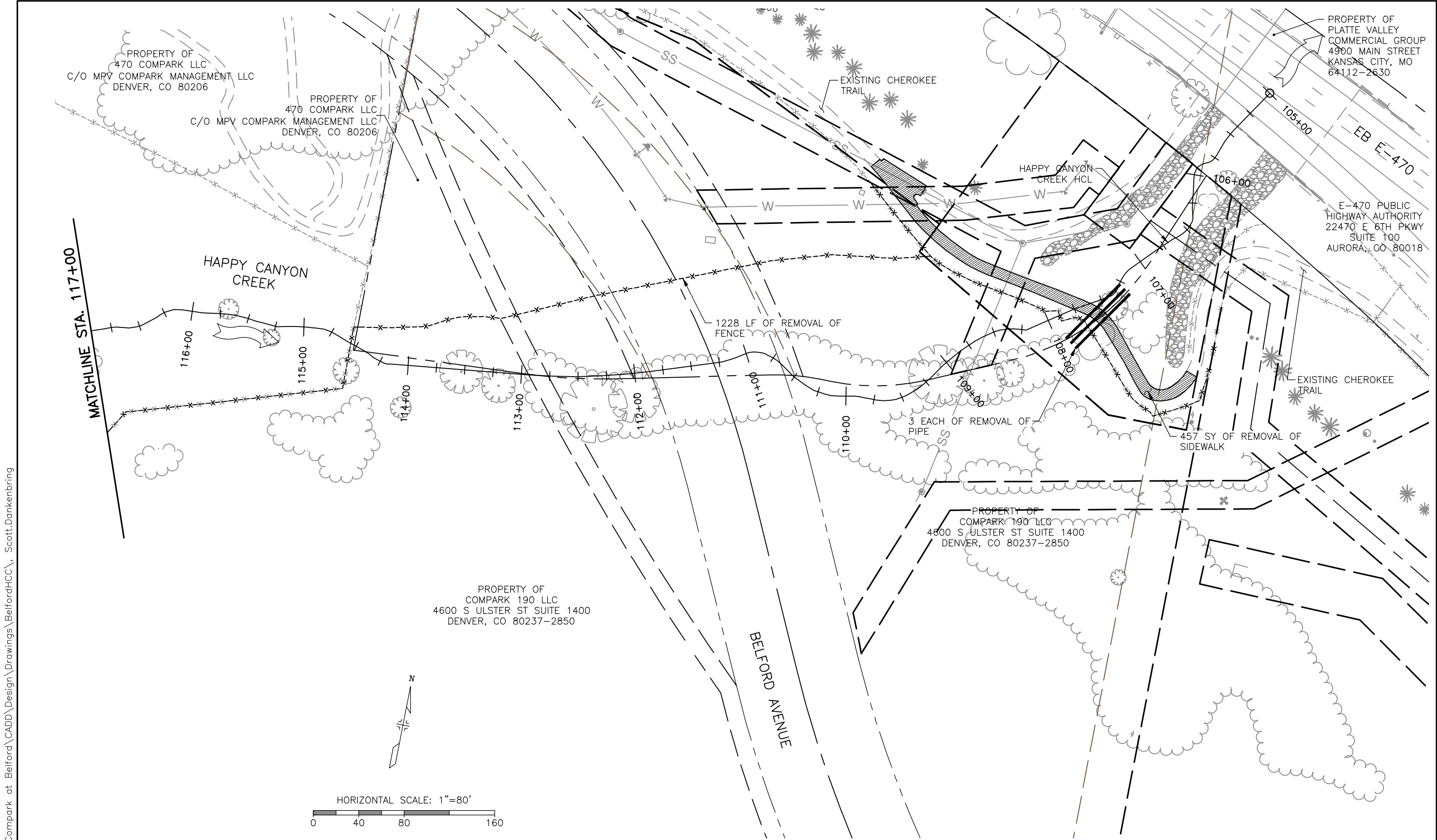
			UNCLASSIFIED EXCAVATION (FOR INFO. ONLY) ROADWAY (FROM SURFACE COMPARISON)	611	
			HAPPY CANYON CREEK MAINTENANCE ACCESS	493	
			REGIONAL TRAIL CHEROKEE TRAIL	476	
			HAPPY CANYON CREEK FLOODPLAIN GRADING	1	
			TOTAL	376	
				1,957	

			COMPACTION (MOISTURE & DENSITY CONTROL) EMBANKMENT (NET) BASES OF CUTS & FILLS (8 INCHES)	2,995	
			TOTAL	0	
				2,995	

			WETTING QUANTITIES COMPACTION (2995 x 0.040 M. GAL./yd)	120	
			TOTAL	120	

			ROADWAY QUANTITIES BALANCE	2,995	
			EMBANKMENT (NET)	3,444	
			EMBANKMENT X FACTOR (1.15)	0	
			EMBANKMENT REQUIRED FOR SHRINKAGE BASES OF CUTS & FILLS	3,444	
			BALANCE TOTAL (EMBANKMENT)	1,957	
			UNCLASSIFIED EXCAVATION	1,487	
			TO BE IMPORTED BY CONTRACTOR	3,444	
			BALANCE TOTAL		

I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring



I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\ - Scott.Dankenbring

Print Date: 6/17/2021 8:30:42 PM  
 File Name: T115360-01REM01.dwg  
 Horizontal Scale: 1"=80' Vertical Scale: NTS



6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions			
Date	Comments	Initials	

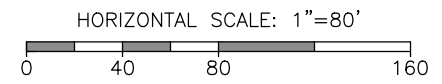
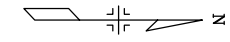
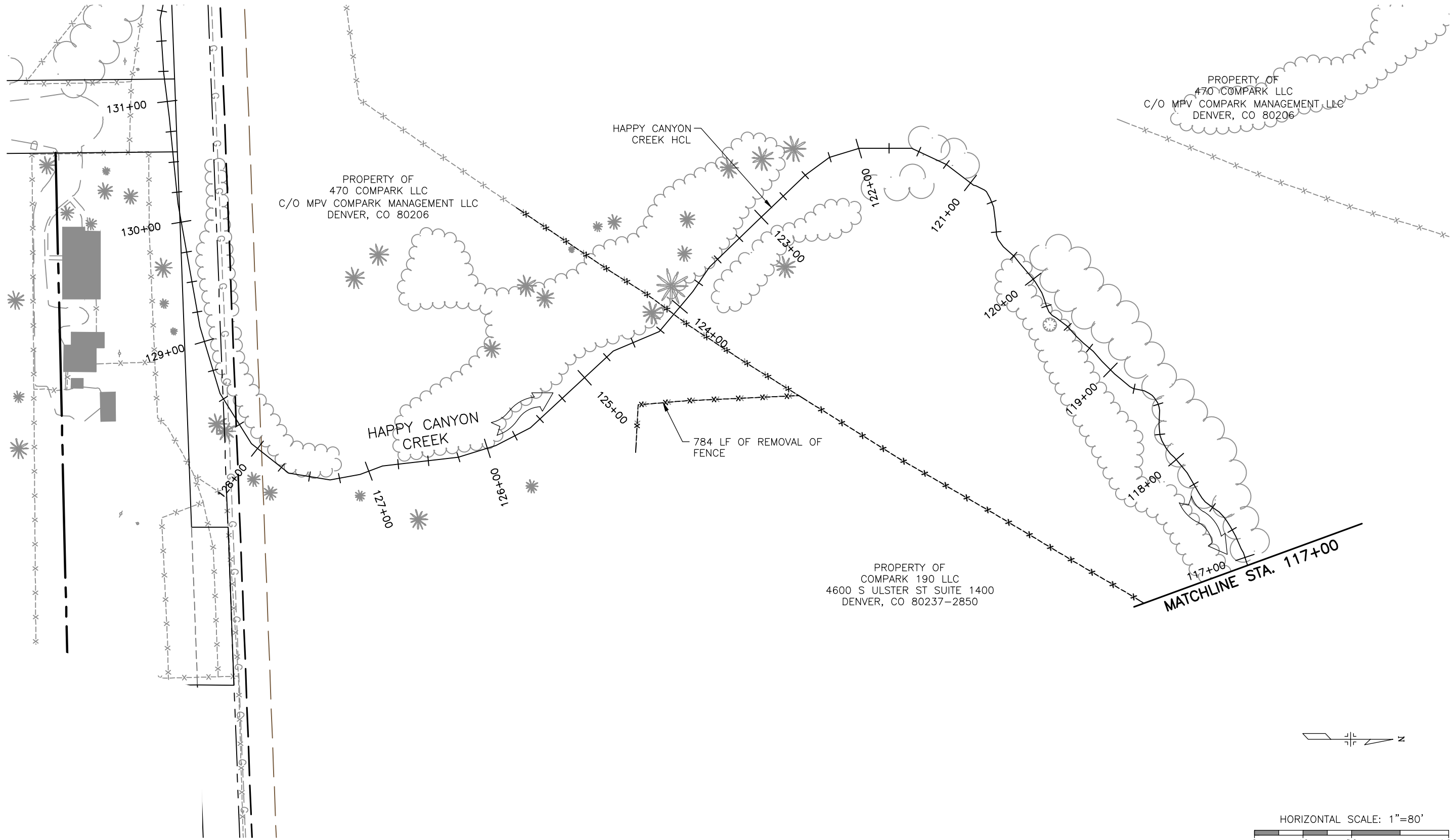


As Constructed	No Revisions:
Revised:	
Void:	

BELFORD-HAPPY CANYON CREEK REMOVAL AND RESET PLANS			
Designer:	SED	Structure	
Detailer:	SED	Numbers	
Subset:	Trail	Sheets:	RM-1 of 2

Project No./Code	
Sheet Number	7

I:\115360-01 - Compark at Belford\CADD\Drawings\BelfordHCC\ Scott.Dankenbring



Print Date: 6/17/2021 8:31:20 PM  
 File Name: T115360-01REM02.dwg  
 Horizontal Scale: 1"=80' Vertical Scale: NTS

**FELSBURG  
HOLT &  
ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

**Manhard CONSULTING LTD**

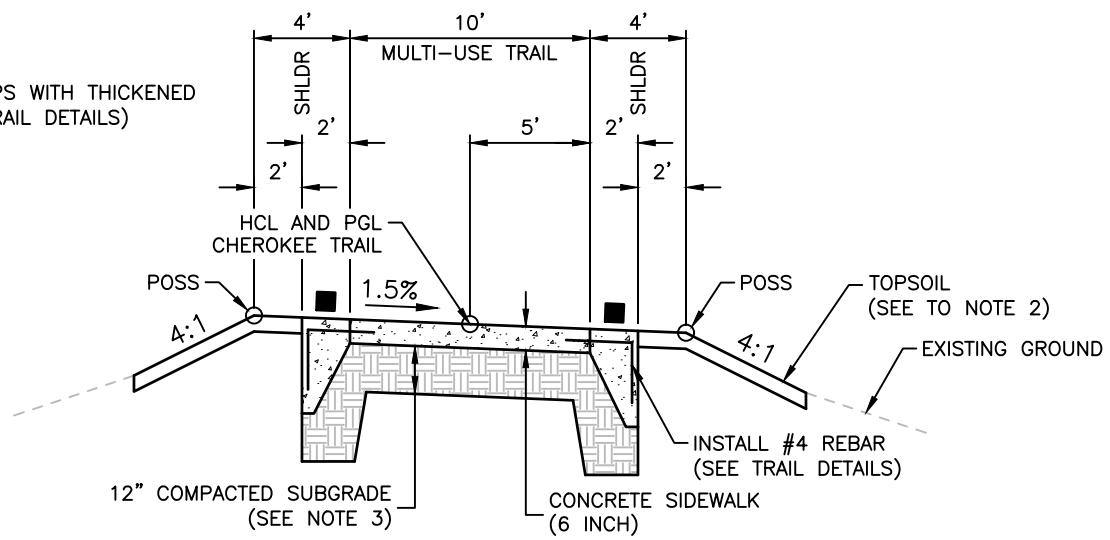
8008 E. Arapahoe Court, Suite 110, Denver, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed
No Revisions:
Revised:
Void:

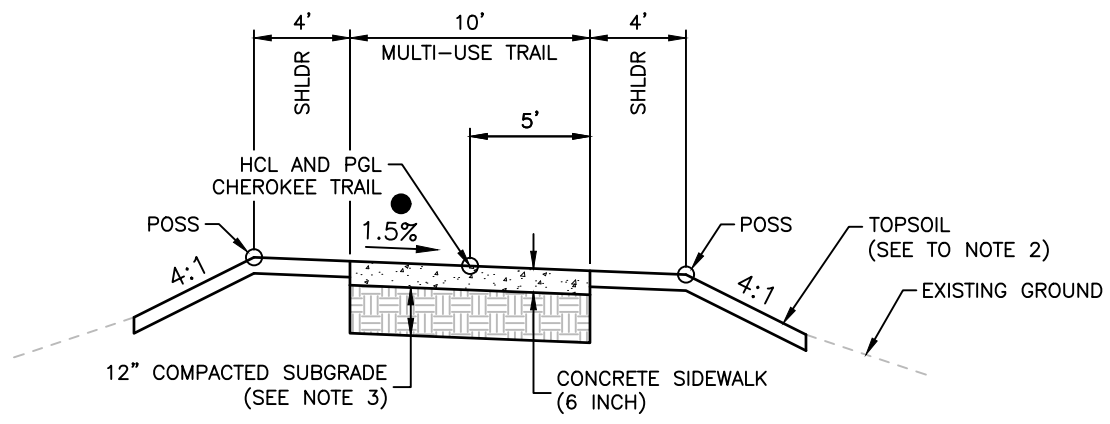
BELFORD-HAPPY CANYON CREEK REMOVAL AND RESET PLANS		
Designer:	SED	Structure
Detailer:	SED	Numbers
Subset:	Trail	Sheets: RM-2 of 2

Project No./Code
Sheet Number 8

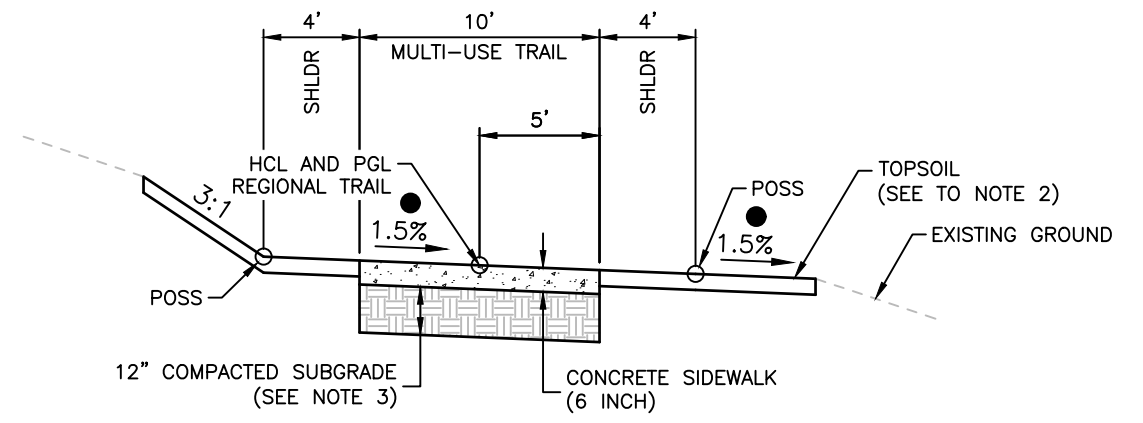
■ RUMBLE STRIPS WITH THICKENED EDGE (SEE TRAIL DETAILS)



**CHEROKEE TRAIL**  
 STA 52+20.00 TO STA 52+97.00  
 (REMOVE THICKENED EDGE AND JUST CONSTRUCT RUMBLE STRIP OVER CULVERT)

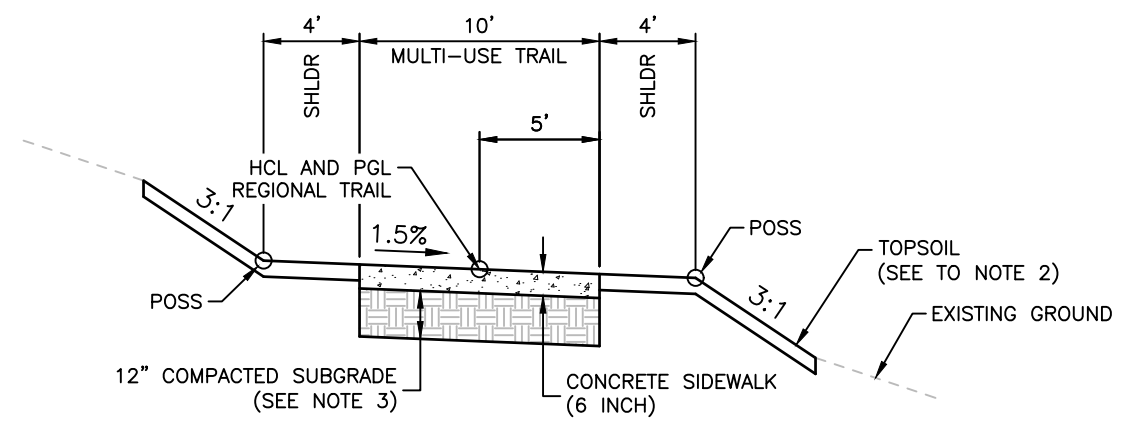


**CHEROKEE TRAIL**  
 STA 50+50.00 TO STA 52+20.00  
 STA 52+97.00 TO STA 54+10.80



**REGIONAL TRAIL**  
 STA 26+26.94 TO STA 27+13.41

**REGIONAL TRAIL**  
 STA 23+66.96 TO STA 26+26.94  
 SEE TRAIL DETAILS FOR CONCRETE SIDEWALK (SPECIAL)



**REGIONAL TRAIL**  
 STA 23+00.00 TO STA 23+66.96

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

- NOTES:
- 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.
  - 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.
  - THE SUBGRADE SHALL BE THOROUGHLY COMPACTED TO NINETY-FIVE PERCENT (95%) MODIFIED PROCTER DENSITY AT ± TWO PERCENT (2%) OF OPTIMUM MOISTURE.

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\, Chase.Miyamoto

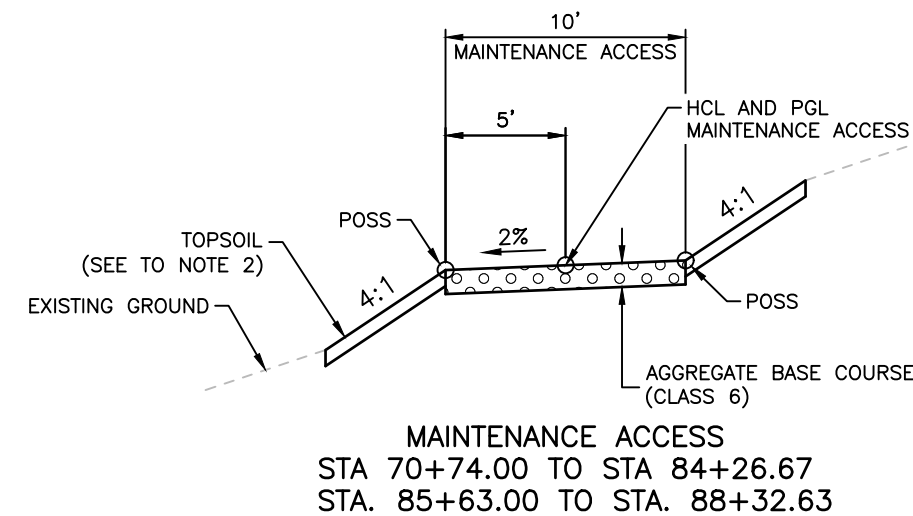
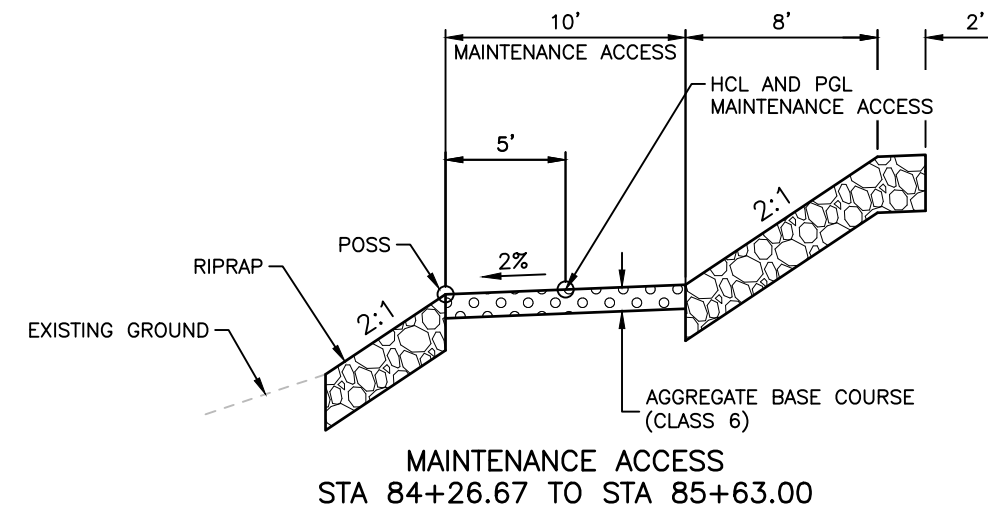
Print Date: 6/18/2021 9:33:20 AM	
File Name: T115360-01TYP01.dwg	
Horizontal Scale: NTS	Vertical Scale: NTS
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

Sheet Revisions			
Date	Comments	Initials	
			(R-X)

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK TRAIL			Project No./Code
No Revisions:	TYPICAL SECTIONS			
Revised:	Designer: DCS	Structure		
	Detailer: DCS	Numbers		
Void:	Subset: Trail	Sheets: TY-1 of 2		Sheet Number 9

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\ Chase.Miyamoto



NOTES:

- 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.
- 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.
- THE SUBGRADE SHALL BE THOROUGHLY COMPACTED TO NINETY-FIVE PERCENT (95%) MODIFIED PROCTER DENSITY AT ± TWO PERCENT (2%) OF OPTIMUM MOISTURE.

Print Date: 6/18/2021 9:36:06 AM	
File Name: T115360-01TYP02.dwg	
Horizontal Scale: NTS	Vertical Scale: NTS
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

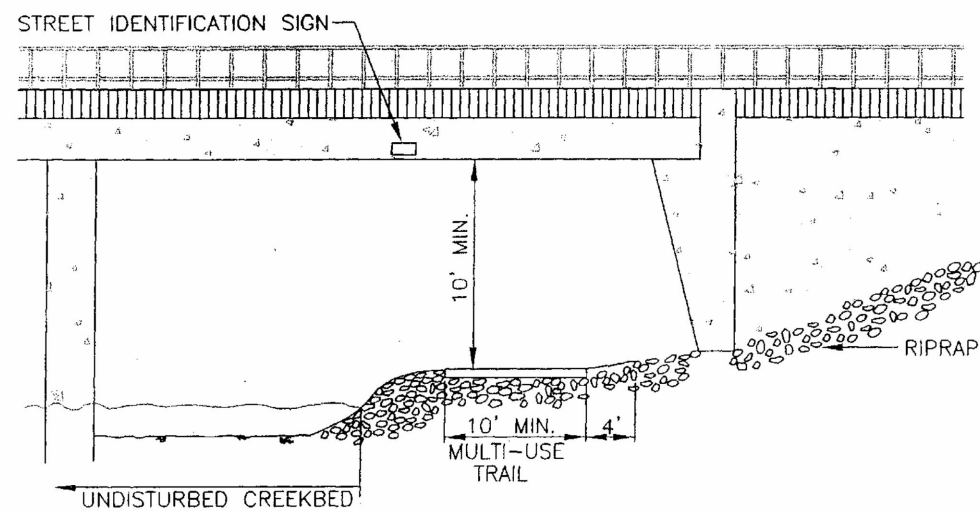
Sheet Revisions			
(R-X)	Date	Comments	Initials



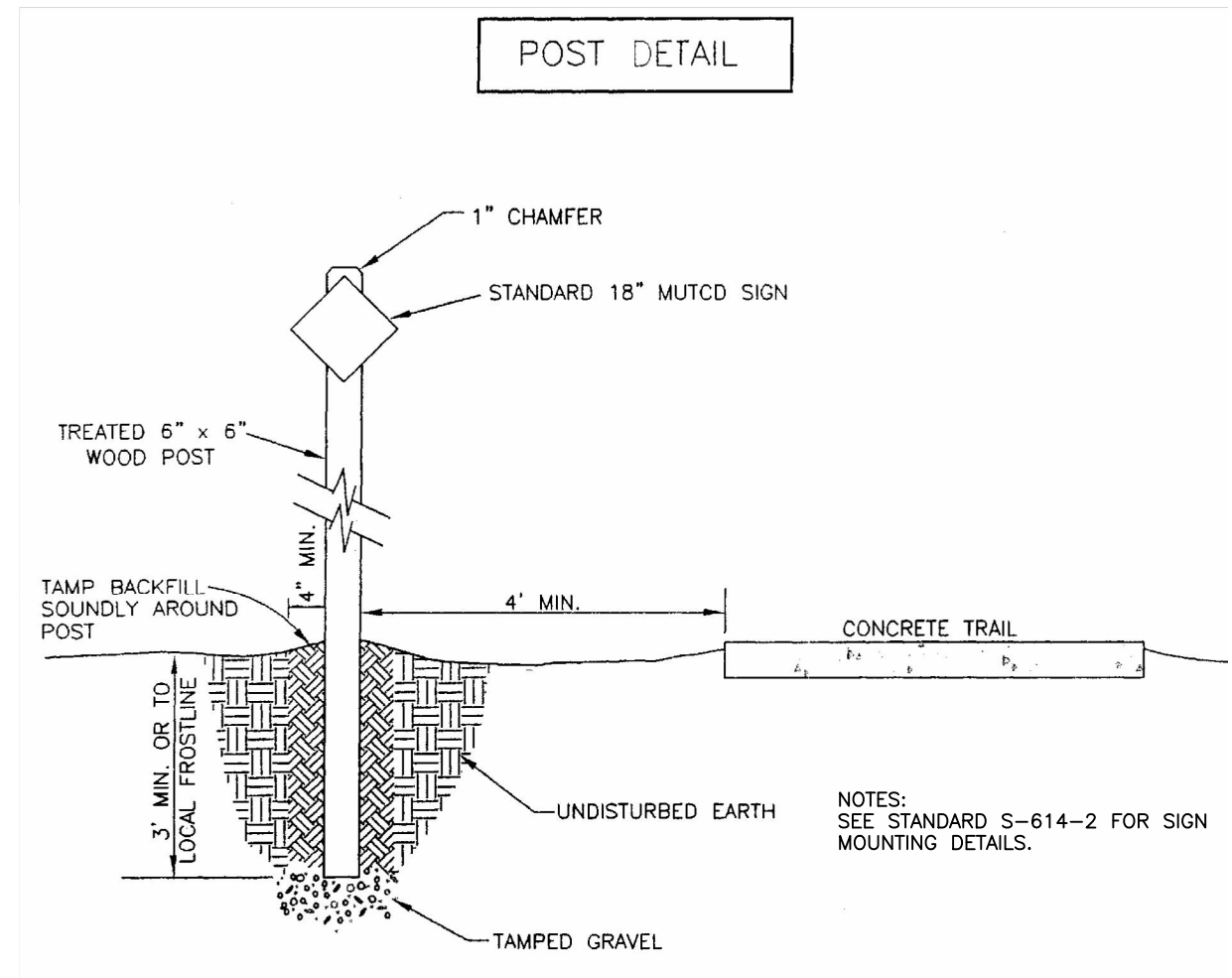
As Constructed	BELFORD-HAPPY CANYON CREEK TRAIL			Project No./Code
No Revisions:	TYPICAL SECTIONS			
Revised:	Designer: DCS	Structure		
	Detailer: DCS	Numbers		
Void:	Subset: Trail	Sheets: TY-2 of 2		Sheet Number 10

I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\ Chase.Miyamoto

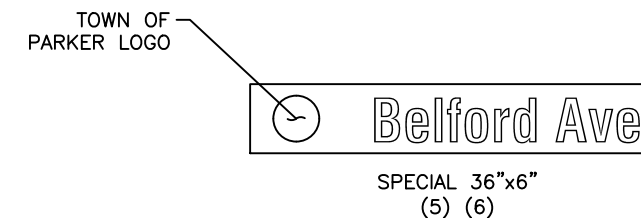
**BRIDGE UNDERPASS**



**TOWN OF PARKER BRIDGE UNDERPASS TRAIL STANDARD**



**TOWN OF PARKER POST DETAIL AT TRAIL STANDARD**



NOTE:  
THE BELFORD AVE SIGN PANELS SHALL BE MOUNTED ABOVE THE TRAIL ON THE FACE OF THE BRIDGE DECK OVERHANG.

**PROPOSED UNDERPASS SIGNS**

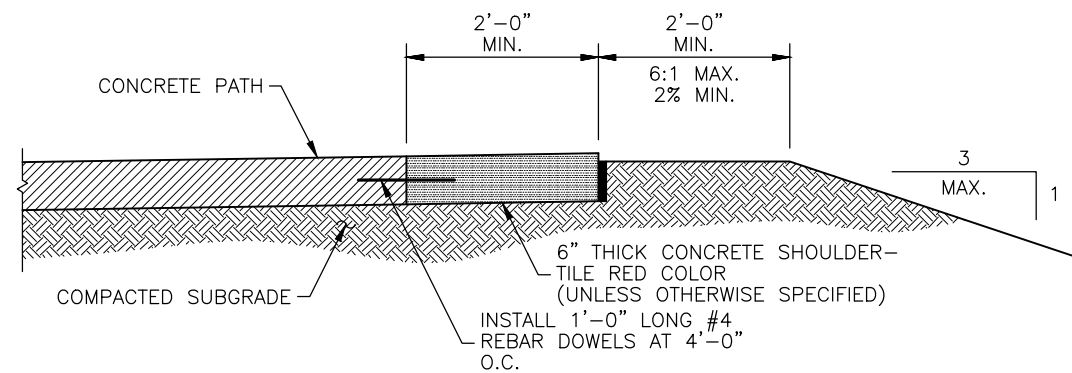
Print Date: 6/18/2021 9:14:41 AM	
File Name: T115360-01DET01.dwg	
Horizontal Scale: NTS	Vertical Scale: NTS
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

Sheet Revisions			
(R-X)	Date	Comments	Initials

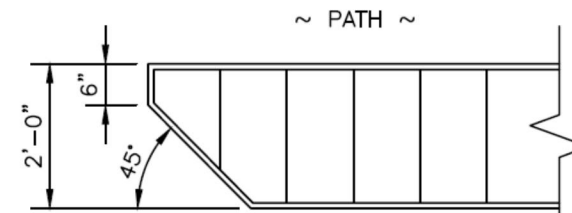


As Constructed	BELFORD-HAPPY CANYON CREEK TRAIL DETAILS			Project No./Code
No Revisions:				
Revised:	Designer: DCS	Structure		
	Detailer: DCS	Numbers		
Void:	Subset: Trail	Sheets: TD-1 of 3		Sheet Number 11

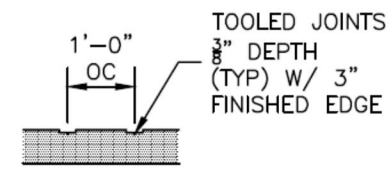
I:\115360-01 - Compare at Belford\CADD\Design\Drawings\Belford\CC\, Scott.Dankenbring



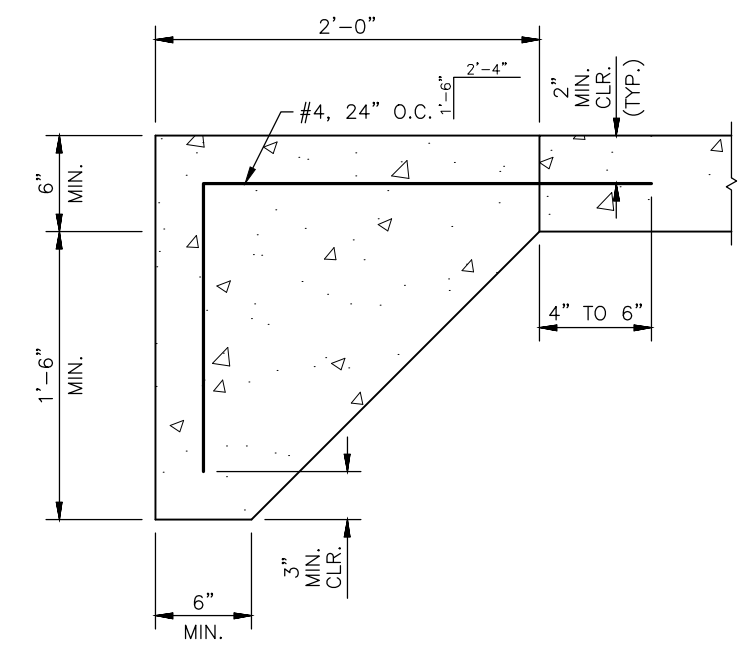
SECTION  
RUMBLE STRIP



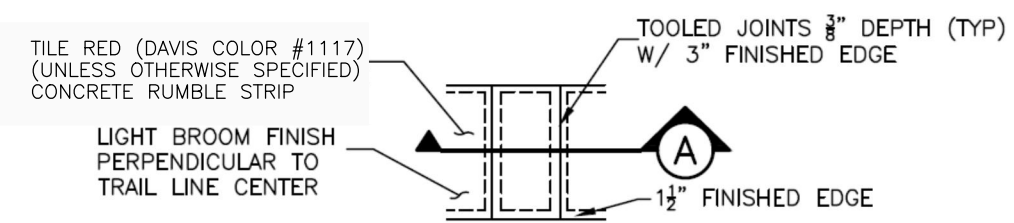
TYPICAL RETURN PLAN



SECTION A



THICKENED EDGE



TYPICAL SCORING PLAN

RUMBLE STRIPS WITH THICKENED EDGE DETAILS

NOTES:

1. CONCRETE SHALL BE CLASS B.
2. REINFORCING SHALL BE GRADE 60.
3. COST OF CONCRETE, REINFORCING, STAIN, RUMBLE STRIP SCORING, AND ALL MISCELLANEOUS MATERIALS AND LABOR SHALL BE INCLUDED IN ITEM 608, CONCRETE SIDEWALK (6 INCH).

Print Date: 6/17/2021 8:42:24 PM	
File Name: T115360-01DET01.dwg	
Horizontal Scale: NTS	Vertical Scale: NTS
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

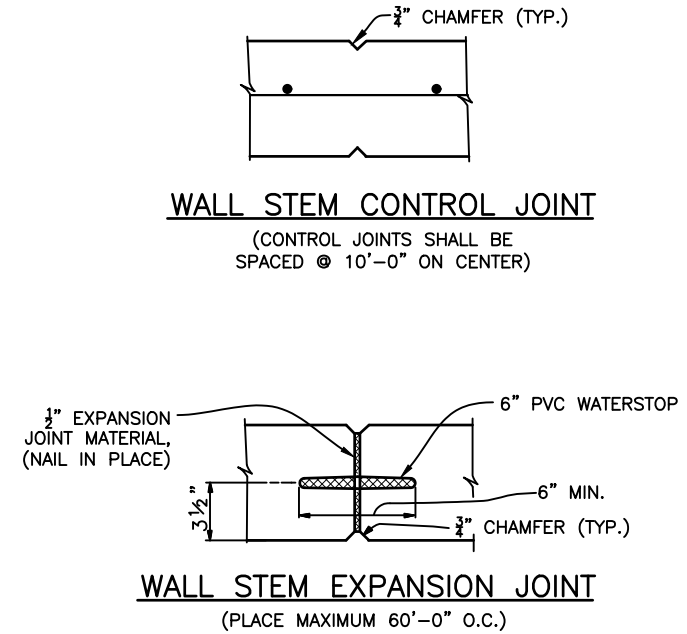
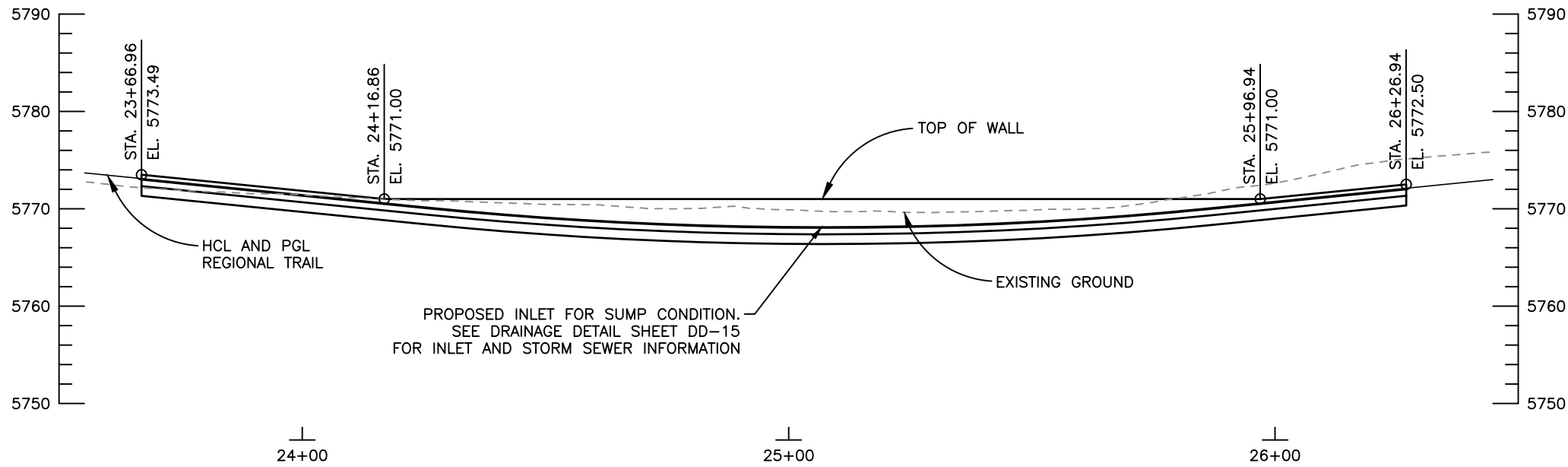
Sheet Revisions		
Date	Comments	Initials

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph: 303.708.0900 fax: 303.708.0400 manhard.com  
Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
Construction Managers • Environmental Scientists • Landscape Architects • Planners

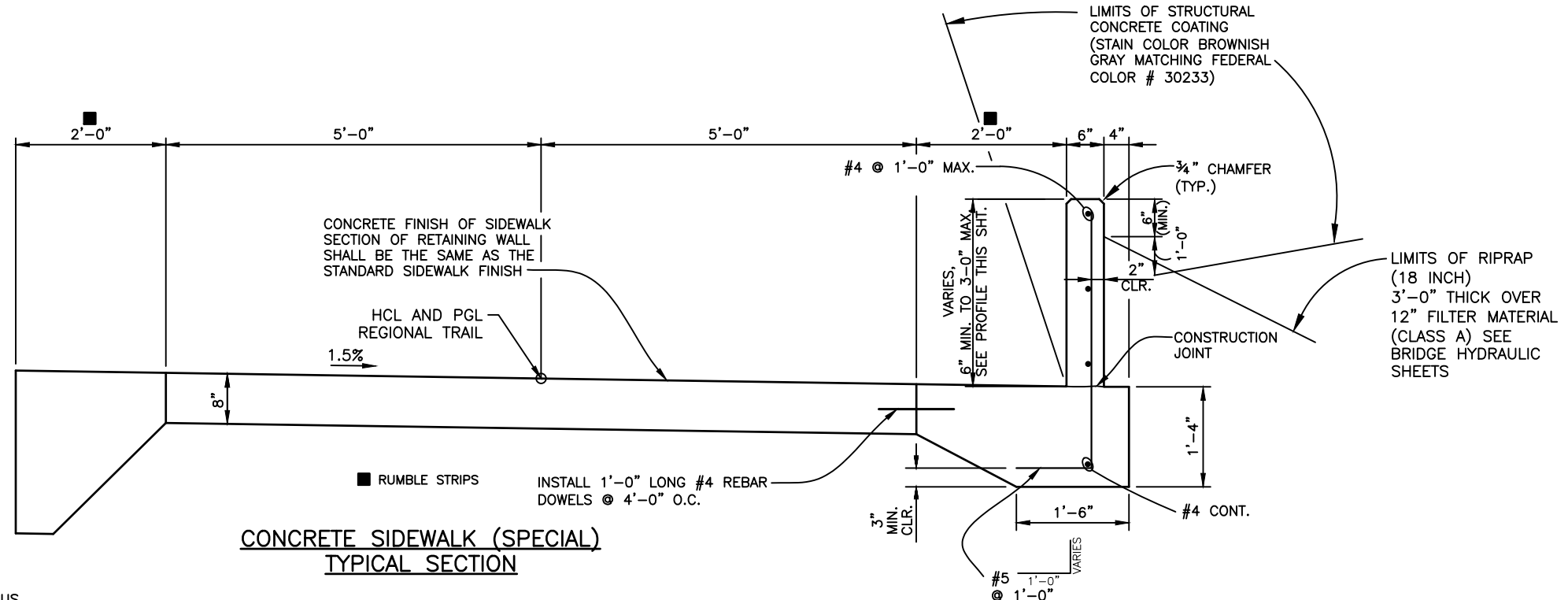
As Constructed	
No Revisions:	
Revised:	
Void:	

BELFORD-HAPPY CANYON CREEK TRAIL DETAILS		
Designer:	DCS	Structure
Detailer:	DCS	Numbers
Subset:	Trail	Sheets: TD-2 of 3

Project No./Code	
Sheet Number	12



**CONCRETE SIDEWALK (SPECIAL)  
PROFILE**



**CONCRETE SIDEWALK (SPECIAL)  
TYPICAL SECTION**

- NOTES:**
1. CONCRETE SHALL BE CLASS B.
  2. REINFORCING SHALL BE GRADE 60.
  3. COST OF CONCRETE, REINFORCING, STAIN, AND ALL MISCELLANEOUS MATERIALS AND LABOR SHALL BE INCLUDED IN ITEM 608, CONCRETE SIDEWALK SPECIAL.
  4. SEE SHEET TD-2 FOR THICKENED EDGE REINFORCING DETAIL AND RUMBLE STRIP SCORING PLAN.

STA. 24+39.74 TO STA. 25+80.93  
 STA. 23+66.96 TO STA. 24+39.74 (OMITS THE 2' RUMBLE STRIPS ON THE LEFT SIDE OF THE REGIONAL TRAIL)  
 STA. 25+80.93 TO STA. 26+26.94

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\, Chase.Miyamoto

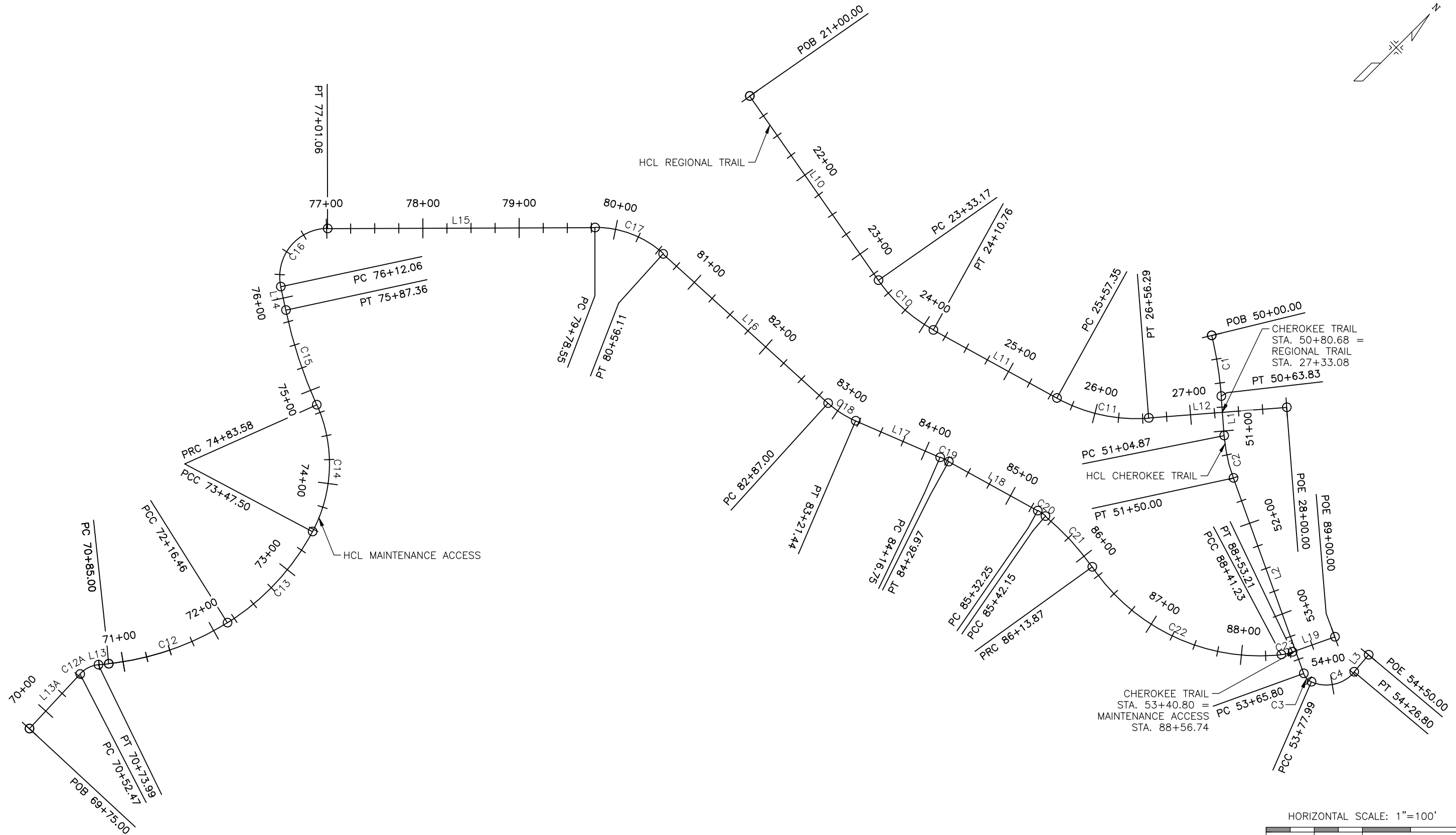
Print Date: 6/18/2021 9:18:10 AM	
File Name: T115360-01DET02.dwg	
Horizontal Scale: NTS	Vertical Scale: NTS
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

Sheet Revisions			
Date	Comments	Initials	

6008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 phone: 303.708.0800 fax: 303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK TRAIL DETAILS		Project No./Code
No Revisions:	Designer: SED	Structure Numbers	
Revised:	Detailer: SED	Sheets: TD-3 of 3	Sheet Number 13
Void:	Subset: Trail		

I:\115360-01 - Compare at Belford\CADD\Drawings\BelfordHCC\, Scott.Dankenbring



Print Date: 6/17/2021 9:24:54 PM  
 File Name: T115360-01GEM01.dwg  
 Horizontal Scale: 1"=100' Vertical Scale: NTS

Sheet Revisions		
Date	Comments	Initials



As Constructed  
 No Revisions:  
 Revised:  
 Void:

**BELFORD-HAPPY CANYON CREEK TRAIL GEOMETRIC LAYOUT**

Designer: DCS Structure  
 Detailer: DCS Numbers  
 Subset: Trail Sheets: TG-1 of 2

Project No./Code  
 Sheet Number 14

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring

HCL - MAINTENANCE ACCESS									
NO.		STATION	NORTHING	EASTING	LENGTH	LINE/CHORD BEARING	DELTA	TANGENT	RADIUS
L13A		69+75.00 70+52.47	26883.1452 26960.5544	93997.7018 93994.7576	77.47'	N02°10'41.36"W			
C12A	PC= PI= PT=	70+52.47 70+63.71 70+73.99	26960.5544 26971.7953 26980.5460	93994.7576 93994.3301 94001.3988	21.52'	N18°22'34.90"E	041°06'32.53"	11.25'	30.00'
L13		70+73.99 70+85.00	26980.5460 26989.1109	94001.3988 94008.3174	11.01'	N38°55'51.17"E			
C12	PC= PI= PT=	70+85.00 71+51.88 72+16.46	26989.1109 27041.1372 27106.3141	94008.3174 94050.3436 94065.3404	131.46'	N25°56'39.65"E	025°58'23.04"	66.88'	290.00'
C13	PC= PI= PT=	72+16.46 72+83.52 73+47.50	27106.3141 27171.6693 27235.7763	94065.3404 94080.3781 94060.6874	131.04'	N02°03'30.08"W	030°01'56.41"	67.06'	250.00'
C14	PC= PI= PT=	73+47.50 74+20.62 74+83.58	27235.7763 27305.6744 27331.8184	94060.6874 94039.2180 93970.9305	136.07'	N43°03'45.13"W	051°58'33.70"	73.12'	150.00'
C15	PC= PI= PT=	74+83.58 75+35.65 75+87.36	27331.8184 27350.4384 27378.6811	93970.9305 93922.2956 93878.5416	103.78'	N63°06'15.69"W	011°53'32.59"	52.08'	500.00'
L14		75+87.36 76+12.06	27378.6811 27392.0795	93878.5416 93857.7847	24.71'	N57°09'29.39"W			
C16	PC= PI= PT=	76+12.06 76+73.79 77+01.06	27392.0795 27425.5586 27469.3389	93857.7847 93805.9186 93849.4413	89.00'	N06°09'49.02"W	101°59'20.74"	61.73'	50.00'
L15		77+01.06 79+78.55	27469.3389 27666.1304	93849.4413 94045.0747	277.49'	N44°49'51.35"E			
C17	PC= PI= PT=	79+78.55 80+19.20 80+56.11	27666.1304 27694.9549 27696.9739	94045.0747 94073.7296 94114.3237	77.56'	N65°59'30.30"E	042°19'17.90"	40.64'	105.00'
L16		80+56.11 82+87.00	27696.9739 27708.4437	94114.3237 94344.9273	230.89'	N87°09'09.25"E			
C18	PC= PI= PT=	82+87.00 83+04.38 83+21.44	27708.4437 27709.3070 27715.7163	94344.9273 94362.2840 94378.4370	34.44'	N77°45'17.89"E	018°47'42.71"	17.38'	105.00'
L17		83+21.44 84+16.75	27715.7163 27750.8672	94378.4370 94467.0254	95.31'	N68°21'26.54"E			
C19	PC= PI= PT=	84+16.75 84+21.86 84+26.97	27750.8672 27752.7535 27754.1689	94467.0254 94471.7794 94476.6941	10.22'	N71°08'45.70"E	005°34'38.33"	5.11'	105.00'
L18		84+26.97 85+32.25	27754.1689 27783.3026	94476.6941 94577.8602	105.28'	N73°56'04.87"E			
C20	PC= PI= PT=	85+32.25 85+37.22 85+42.15	27783.3026 27784.6778 27785.0862	94577.8602 94582.6354 94587.5878	9.91'	N79°36'37.39"E	011°21'05.04"	4.97'	50.00'
C21	PC= PI= PT=	85+42.15 85+78.19 86+13.87	27785.0862 27788.0475 27782.2772	94587.5878 94623.5004 94659.0698	71.71'	S87°44'58.92"E	013°55'42.35"	36.03'	295.00'
C22	PC= PI= PT=	86+13.87 87+40.13 88+41.23	27782.2772 27758.2863 27856.5176	94659.0698 94783.0299 94862.3537	227.36'	N69°56'15.11"E	062°01'54.83"	126.26'	210.00'
C23	PC= PI= PT=	88+41.23 88+47.24 88+53.21	27856.5176 27861.2000 27866.6458	94862.3537 94866.1348 94868.6967	11.98'	N32°03'28.98"E	013°43'37.43"	6.02'	50.00'
L19		88+53.21 89+00.00	27866.6458 27908.9885	94868.6967 94888.6167	46.79'	N25°11'40.26"E			

HCL - CHEROKEE 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			

HCL - REGIONAL 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			

Print Date: 6/17/2021 9:26:03 PM  
 File Name: T115360-01GEM01.dwg  
 Horizontal Scale: 1"=60' Vertical Scale: NTS  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials



As Constructed	BELFORD-HAPPY CANYON CREEK T115360-01GEM01 - TG-2		Project No./Code
No Revisions:	Designer: DCS	Structure	
Revised:	Detailer: DCS	Numbers	
Void:	Subset: Trail	Sheets: TG-2 of 2	Sheet Number 15



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

PROPOSED INLET FOR SUMP CONDITION  
SEE DRAINAGE DETAIL SHEET DD-15  
FOR INLET AND STORM SEWER INFORMATION

PROPOSED SANITARY  
SEWER LINE  
(BY OTHERS)

POINT DATA			
POINT	STATION	OFFSET	ELEVATION
PT-01	27+28.08	20.00' RT.	5776.04
PT-02	27+26.08	20.00' RT.	5776.01
PT-03	27+11.08	5.00' RT.	5776.14
PT-04	27+11.07	5.00' LT.	5776.48
PT-05	27+26.07	20.13' LT.	5777.65
PT-06	27+28.07	20.14' LT.	5777.68

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

BEGIN CONSTRUCTION  
REGIONAL TRAIL  
STA 23+00.00

END CONSTRUCTION  
REGIONAL TRAIL  
STA 27+28.08

DROP STRUCTURE (TYP)  
(SEE CHANNEL PLANS)

HCL REGIONAL TRAIL

CONCRETE SIDEWALK  
(SPECIAL)  
(SEE TD-3)

STA 26+31.00  
BEGIN TRAIL CROSS  
SLOPE TRANSITION

HAPPY CANYON CREEK

HCL CHEROKEE TRAIL

CHEROKEE TRAIL  
(SEE TP-3)

MAINTENANCE ACCESS  
(SEE TP-5, TP-7,  
TP-9, TP-11)

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

FOR HYDRAULIC INFORMATION  
(SEE CHANNEL PLANS)

NOTES:

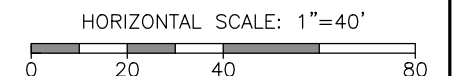
- UTILITY INFORMATION SHOWN IS PLOTTED FROM THE BEST AVAILABLE DATA. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 FOR UTILITY LOCATIONS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

PROPOSED BELFORD AVENUE  
(BY OTHERS)

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

LEGEND

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



I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\ - Scott.Dankenbring

Print Date: 6/17/2021 8:09:01 PM  
File Name: T115360-01PLN01.dwg  
Horizontal Scale: 1"=40' Vertical Scale: NTS

**FELSBURG  
HOLT &  
ULLEVIG**  
6400 South Fiddlers Green Circle, Suite 1500  
Greenwood Village, CO 80111  
Phone: 303.721.1440  
www.FHUENG.com

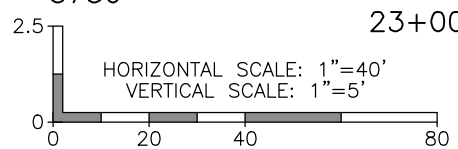
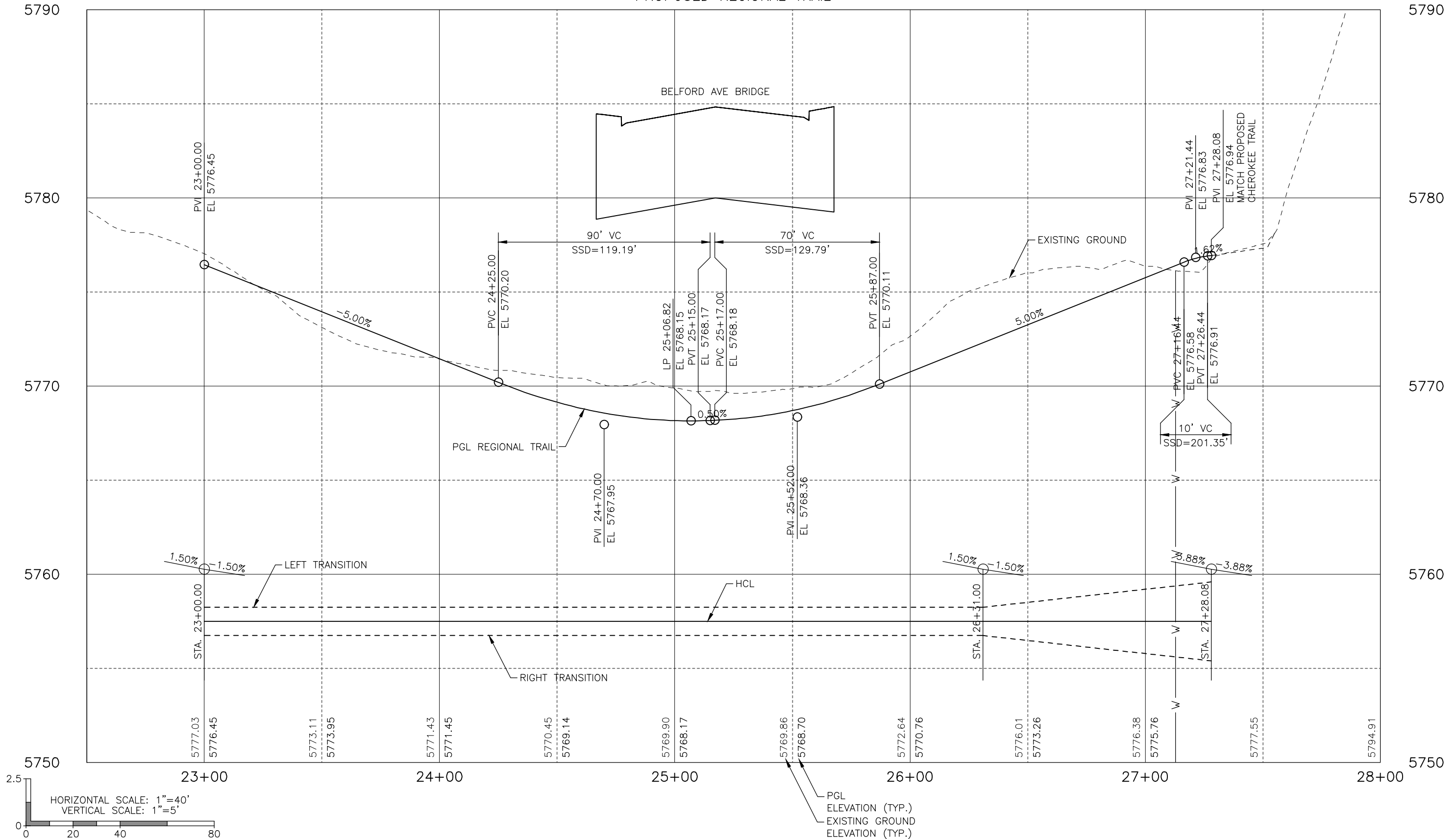
Sheet Revisions			
Date	Comments	Initials	

**Manhard  
CONSULTING LTD**

8008 E. Arapahoe Court, Suite 110, Denver, CO 80112 ph:303.708.0900 f:303.708.0400 manhard.com  
Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK REGIONAL TRAIL PLAN		Project No./Code
No Revisions:	Designer: DCS	Structure Numbers	
Revised:	Detailer: DCS	Trail Sheets:	TP-1 of 12
Void:	Subset:		Sheet Number 16

PROPOSED REGIONAL TRAIL



I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring

Print Date: 6/17/2021 4:46:01 PM  
 File Name: R115360-01PRO01.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: 1"=5'

Sheet Revisions		
Date	Comments	Initials



As Constructed
No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK REGIONAL TRAIL PROFILE		
Designer:	DCS	Structure
Detailer:	DCS	Numbers
Subset:	Trail	Sheets: TP-2 of 12

Project No./Code
Sheet Number 17

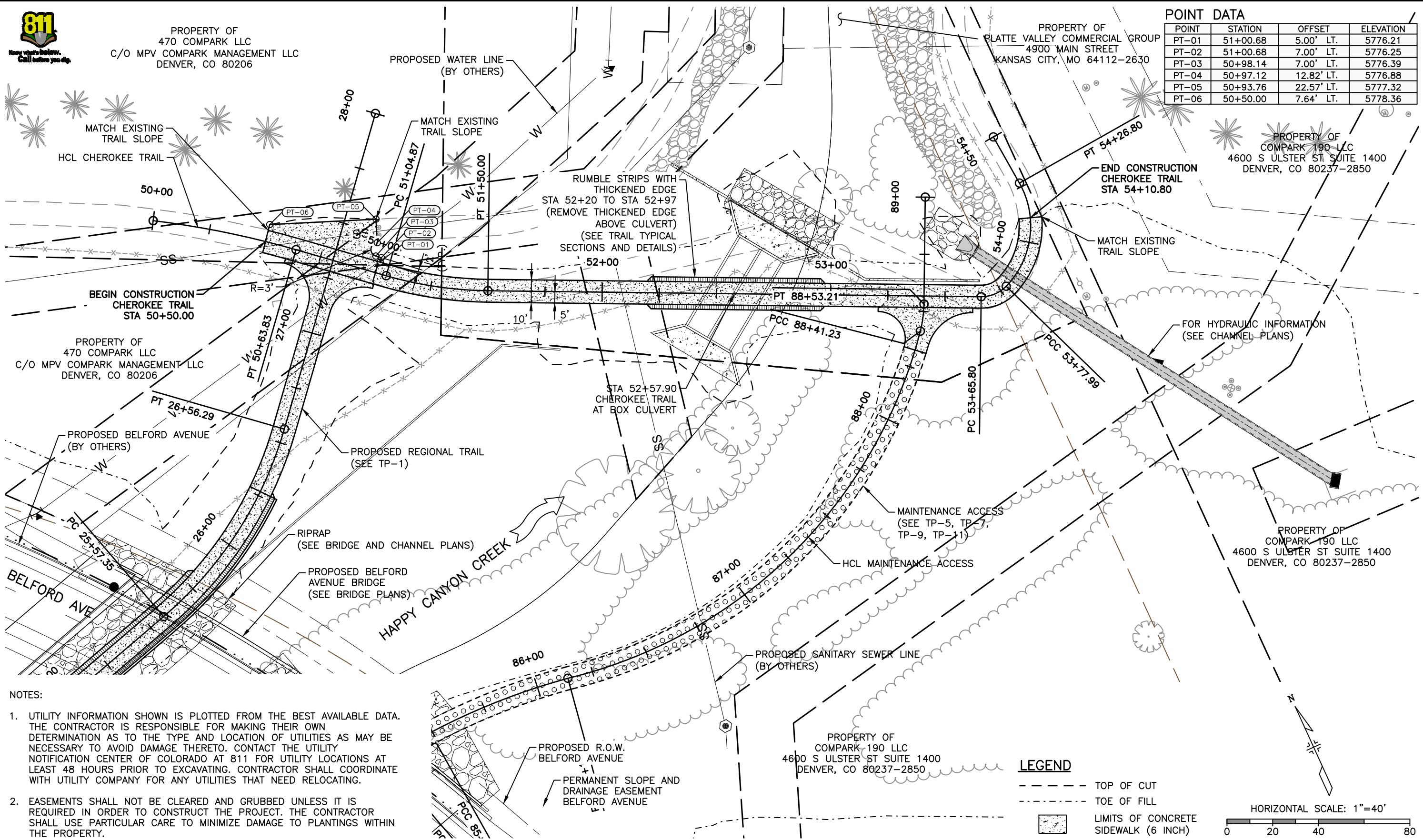


PROPERTY OF  
470 COMPARK LLC  
C/O MPV COMPARK MANAGEMENT LLC  
DENVER, CO 80206

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

POINT	STATION	OFFSET	ELEVATION
PT-01	51+00.68	5.00' LT.	5776.21
PT-02	51+00.68	7.00' LT.	5776.25
PT-03	50+98.14	7.00' LT.	5776.39
PT-04	50+97.12	12.82' LT.	5776.88
PT-05	50+93.76	22.57' LT.	5777.32
PT-06	50+50.00	7.64' LT.	5778.36

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



- NOTES:
- 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.
  - 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
- [Pattern] LIMITS OF CONCRETE SIDEWALK (6 INCH)

HORIZONTAL SCALE: 1"=40'

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\ - Chase.Miyamoto

Print Date: 6/18/2021 9:25:24 AM  
File Name: T115360-01PLN01.dwg  
Horizontal Scale: 1"=40' Vertical Scale: NTS

Sheet Revisions			
Date	Comments	Initials	

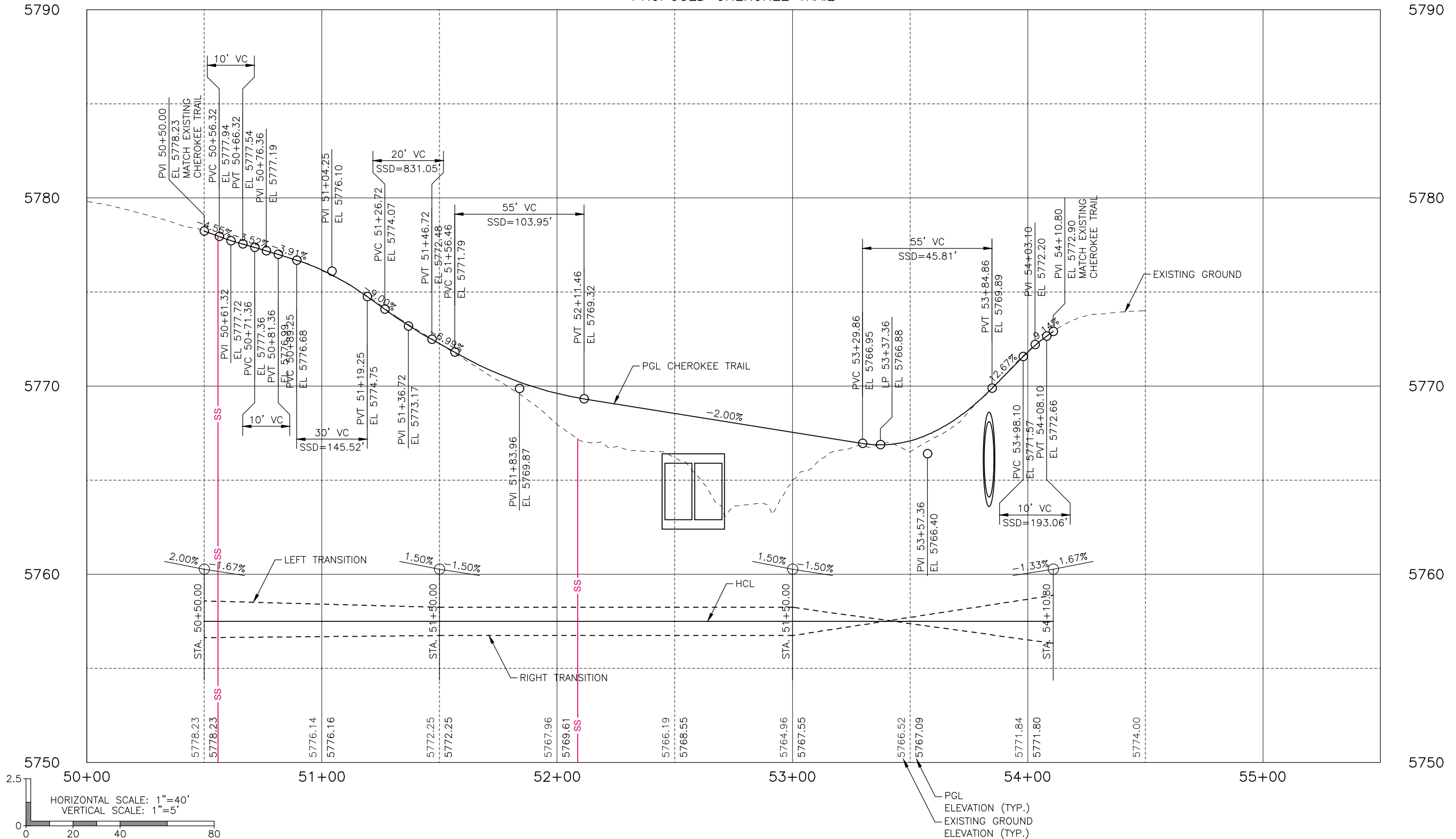


As Constructed	BELFORD-HAPPY CANYON CREEK CHEROKEE TRAIL PLAN		Project No./Code
No Revisions:	Designer: DCS	Structure	
Revised:	Detailer: DCS	Numbers	
Void:	Subset: Trail	Sheets: TP-3 of 12	Sheet Number 18



6400 South Fiddlers Green Circle, Suite 1500  
Greenwood Village, CO 80111  
Phone: 303.721.1440  
www.FHUENG.com

PROPOSED CHEROKEE TRAIL



Print Date: 6/17/2021 4:46:19 PM  
 File Name: R115360-01PRO01.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: 1"=5'

Sheet Revisions		
Date	Comments	Initials

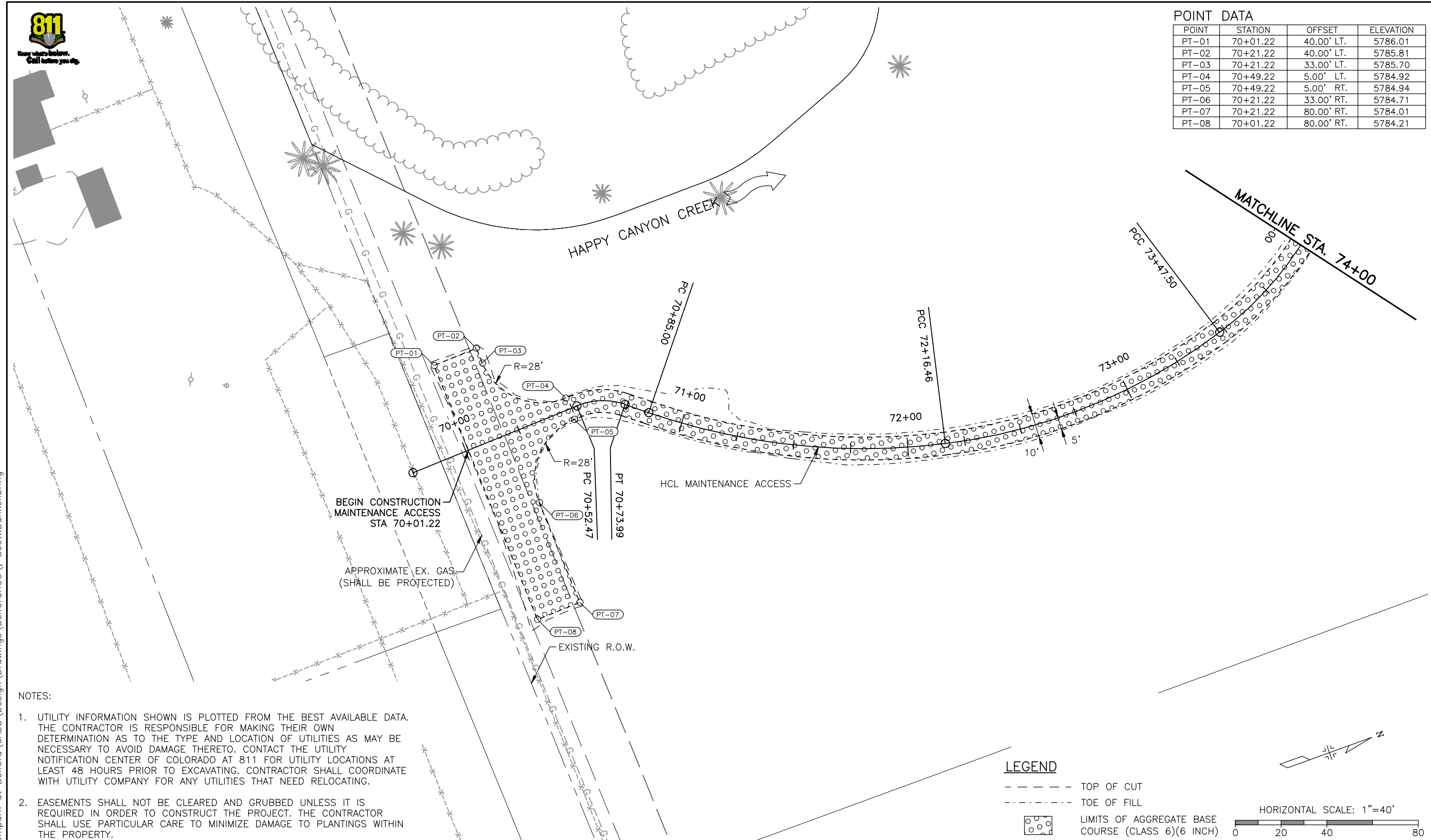


As Constructed	BELFORD-HAPPY CANYON CREEK CHEROKEE TRAIL PROFILE		Project No./Code
No Revisions:	Designer: DCS	Structure	
Revised:	Detailer: DCS	Numbers	
Void:	Subset: Trail	Sheets: TP-4 of 12	Sheet Number 19

I:\115360-01 - Compare at Belford\CADD\Drawings\BelfordHCC\, Scott.Dankenbring



POINT	STATION	OFFSET	ELEVATION
PT-01	70+01.22	40.00' LT.	5786.01
PT-02	70+21.22	40.00' LT.	5785.81
PT-03	70+21.22	33.00' LT.	5785.70
PT-04	70+49.22	5.00' LT.	5784.92
PT-05	70+49.22	5.00' RT.	5784.94
PT-06	70+21.22	33.00' RT.	5784.71
PT-07	70+21.22	80.00' RT.	5784.01
PT-08	70+01.22	80.00' RT.	5784.21



**NOTES:**

- 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.
- 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
  - [Hatched Box] LIMITS OF AGGREGATE BASE COURSE (CLASS 6) (6 INCH)
- HORIZONTAL SCALE: 1"=40'
- 

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring

Print Date: 6/17/2021 7:58:15 PM  
 File Name: T115360-01PLN10.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: NTS

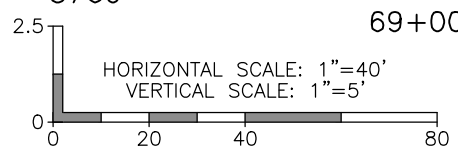
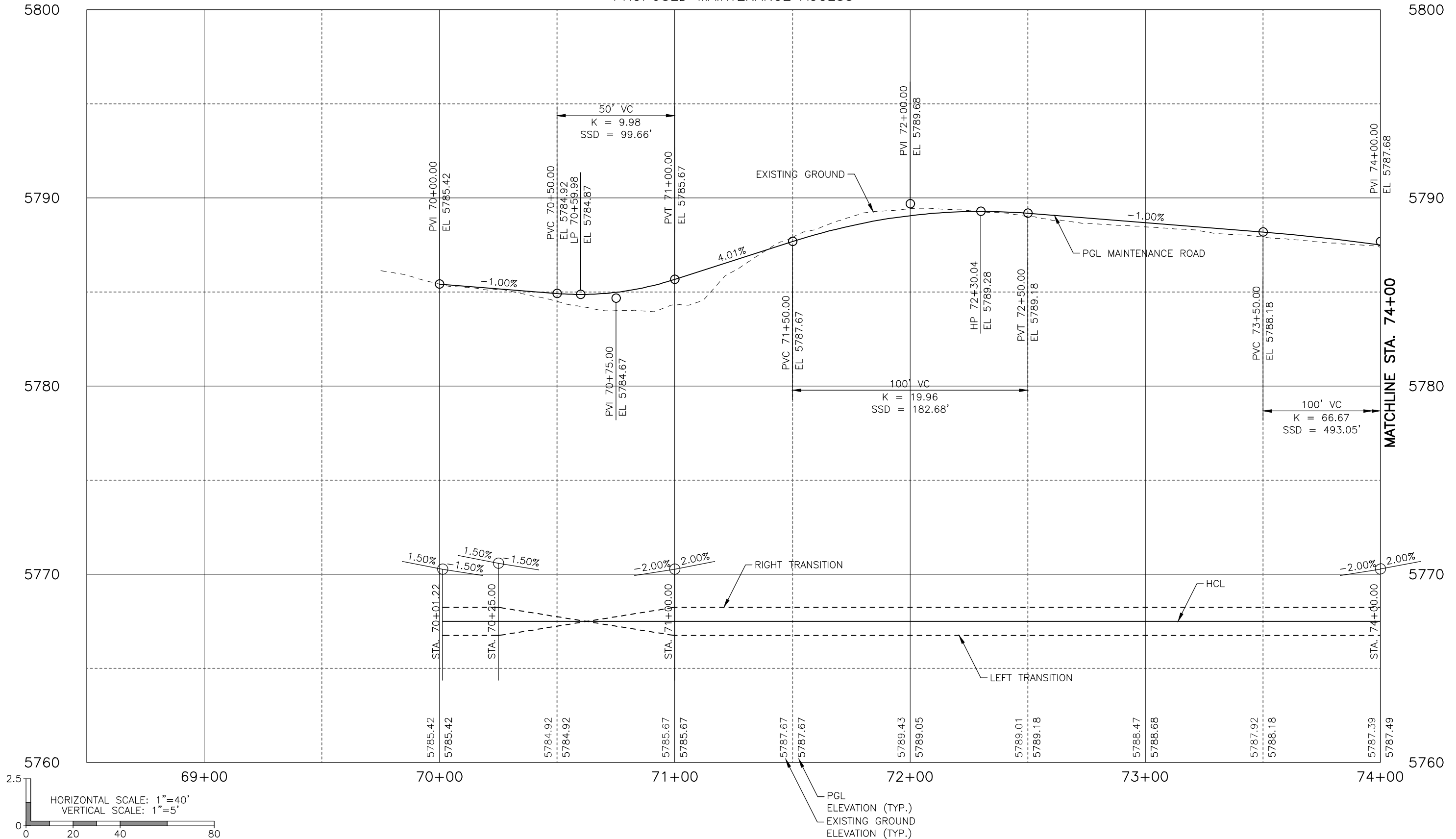
6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions			
Date	Comments	Initials	

**Manhard CONSULTING LTD**  
 8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK MAINTENANCE ACCESS PLAN			Project No./Code
No Revisions:	Designer:	DCS	Structure	
Revised:	Detailer:	DCS	Numbers	
Void:	Subset:	Trail	Sheets:	TP-5 of 12
				Sheet Number 20

PROPOSED MAINTENANCE ACCESS



I:\115360-01 - Compare at Belford\CADD\Drawings\BelfordHCC\, Scott.Dankenbring

Print Date: 6/17/2021 4:40:19 PM  
 File Name: R115360-01PRO10.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: 1"=5'

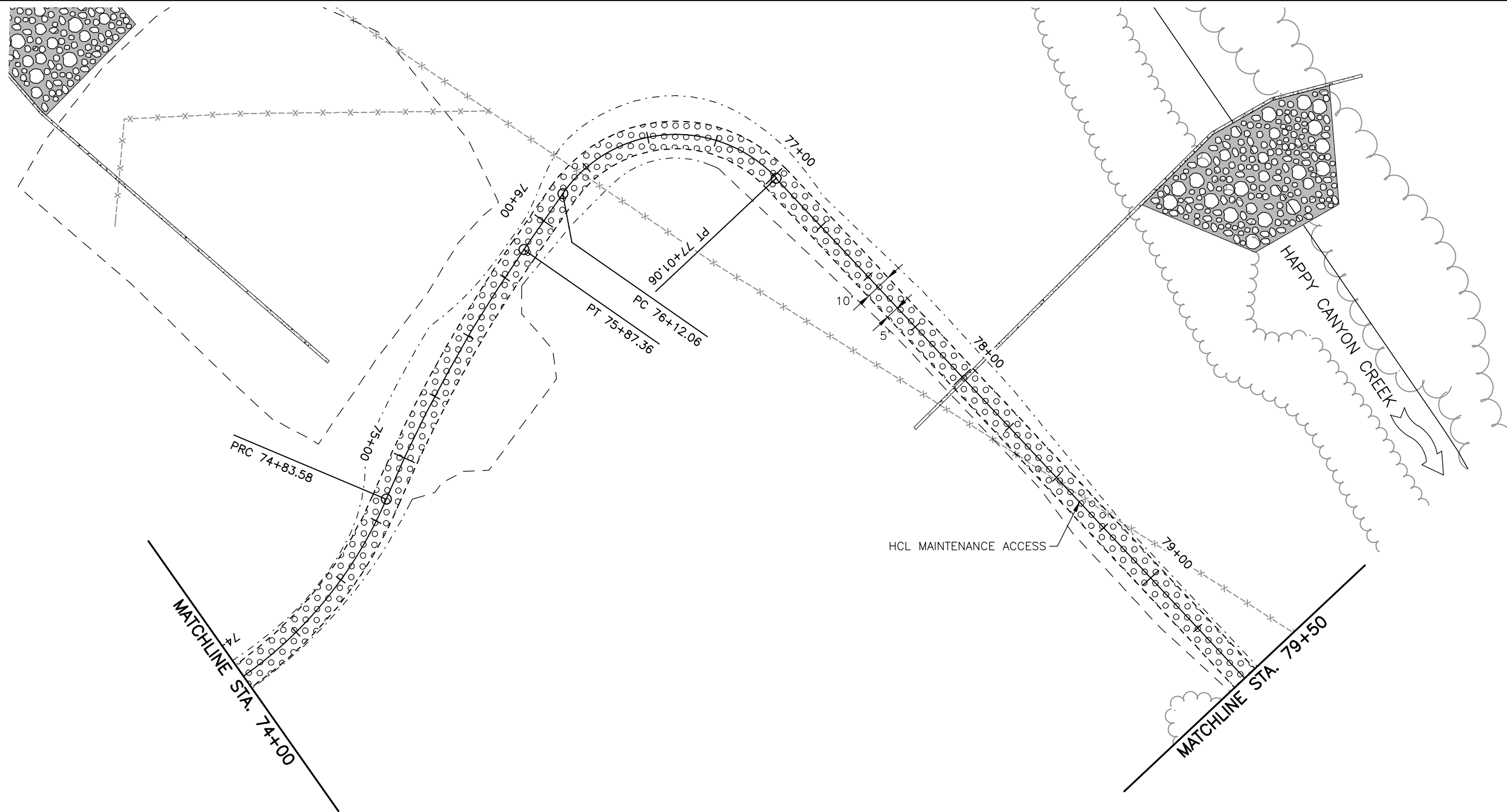
Sheet Revisions		
Date	Comments	Initials



As Constructed
No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK MAINTENANCE ACCESS PROFILE		
Designer:	DCS	Structure
Detailer:	DCS	Numbers
Subset:	Trail	Sheets: TP-6 of 12

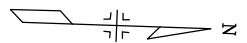
Project No./Code
Sheet Number 21



**LEGEND**

- - - - - TOP OF CUT  
 - - - - - TOE OF FILL  
 LIMITS OF AGGREGATE BASE COURSE (CLASS 6)(6 INCH)

HORIZONTAL SCALE: 1"=40'



I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring

Print Date: 6/17/2021 4:52:49 PM  
 File Name: T115360-01PLN10.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: NTS

6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions			
Date	Comments	Initials	

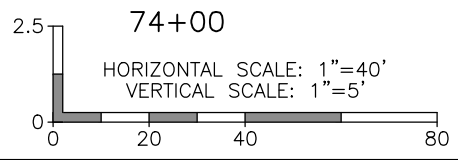
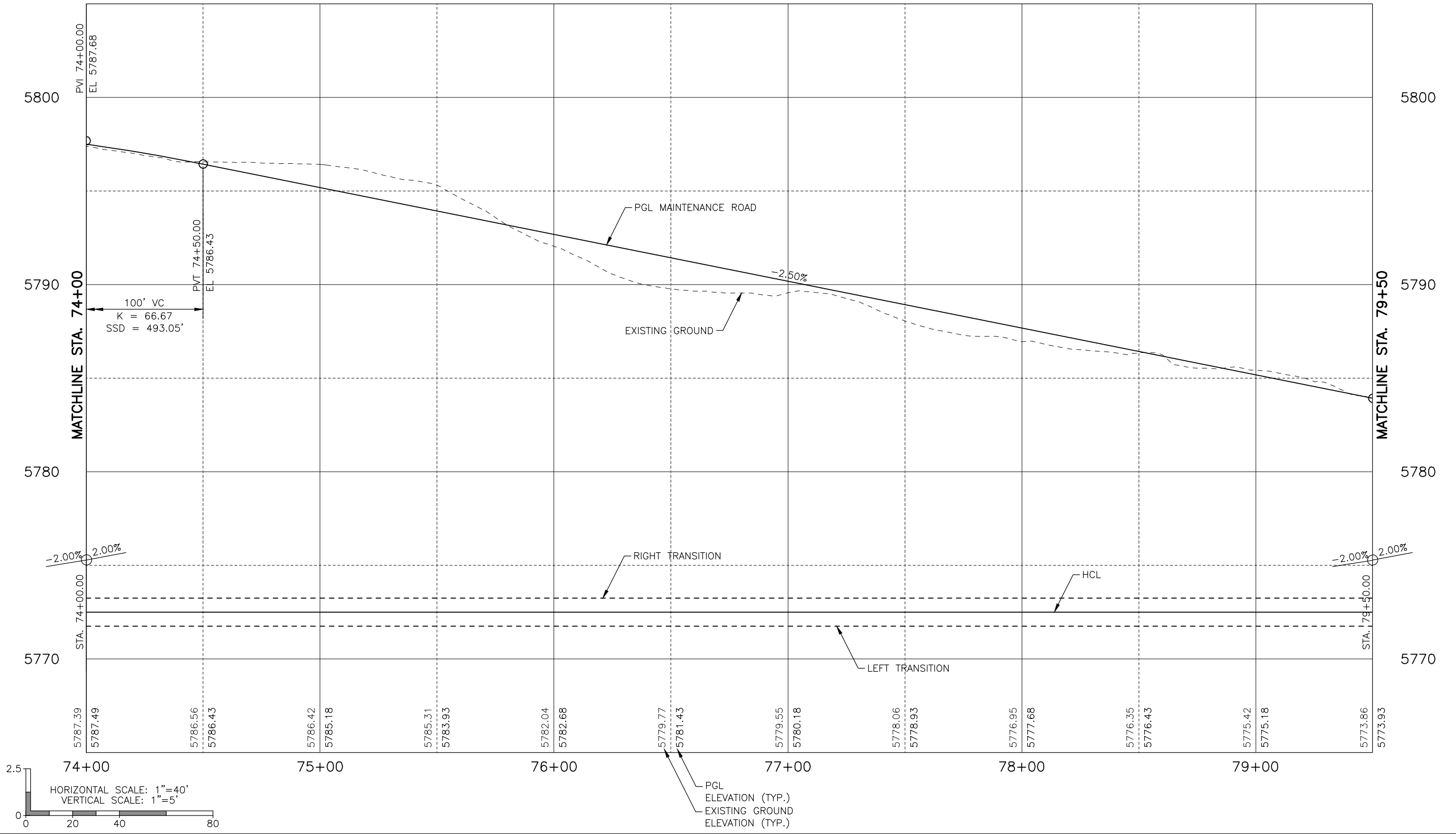
8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	No Revisions:	Revised:	Void:
----------------	---------------	----------	-------

BELFORD-HAPPY CANYON CREEK MAINTENANCE ACCESS PLAN			
Designer:	DCS	Structure	
Detailer:	DCS	Numbers	
Subset:	Trail	Sheets:	TP-7 of 12

Project No./Code	
Sheet Number	22

PROPOSED MAINTENANCE ACCESS



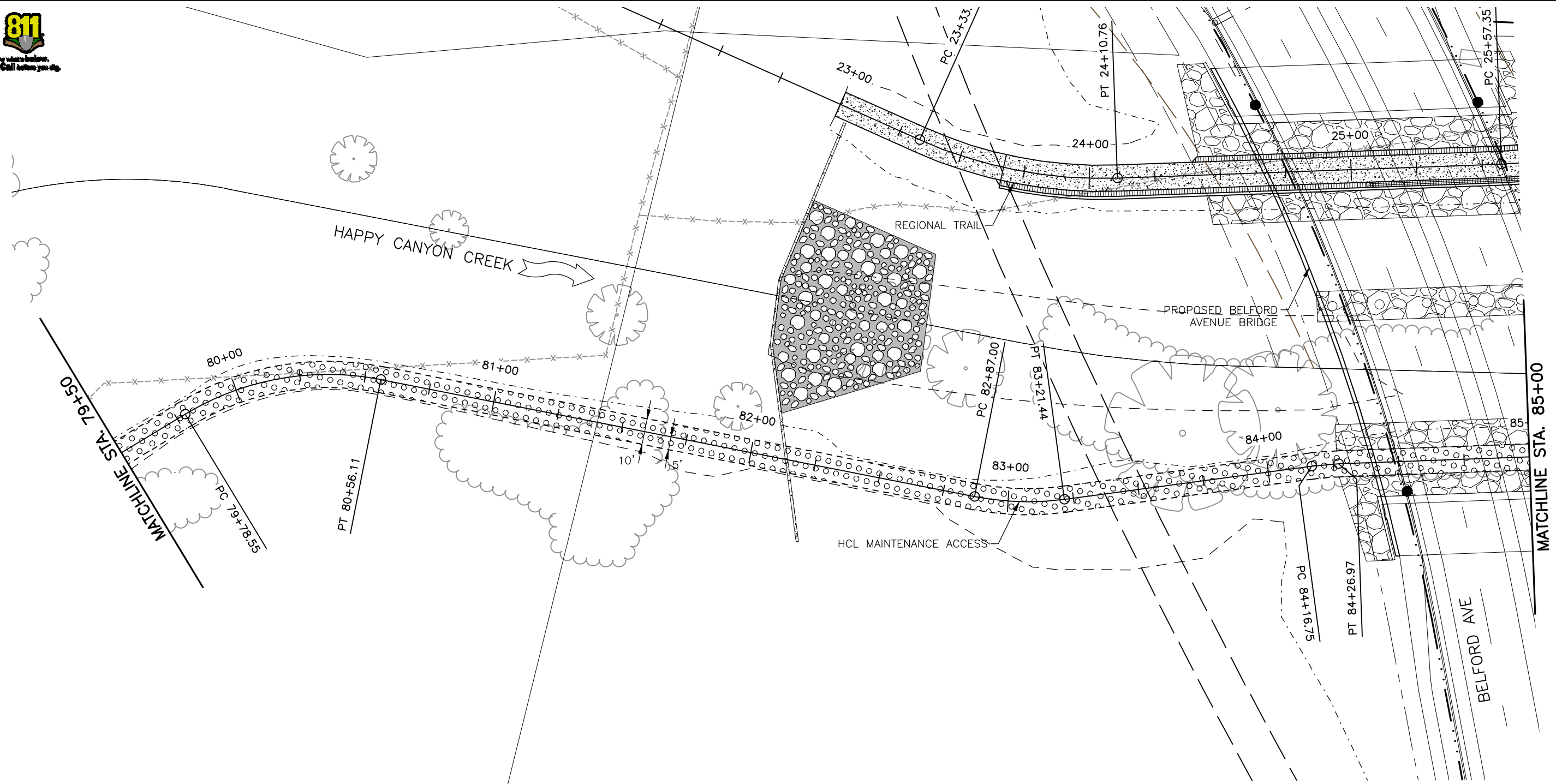
I:\115360-01 - Compare at Belford\CADD\Drawings\Belford\CC\, Scott.Dankenbring

Print Date: 6/17/2021 4:40:31 PM  
File Name: R115360-01PRO10.dwg  
Horizontal Scale: 1"=40' Vertical Scale: 1"=5'

Sheet Revisions		
Date	Comments	Initials



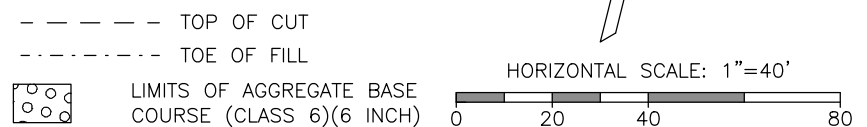
As Constructed	BELFORD-HAPPY CANYON CREEK MAINTENANCE ACCESS PROFILE			Project No./Code
No Revisions:	Designer: DCS	Structure		
Revised:	Detailer: DCS	Numbers		
Void:	Subset: Trail	Sheets: TP-8 of 12		Sheet Number 23



NOTES:

- 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.
- 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



I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\ Scott.Dankenbring

Print Date: 6/17/2021 4:53:45 PM  
 File Name: T115360-01PLN10.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: NTS

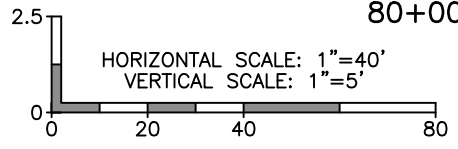
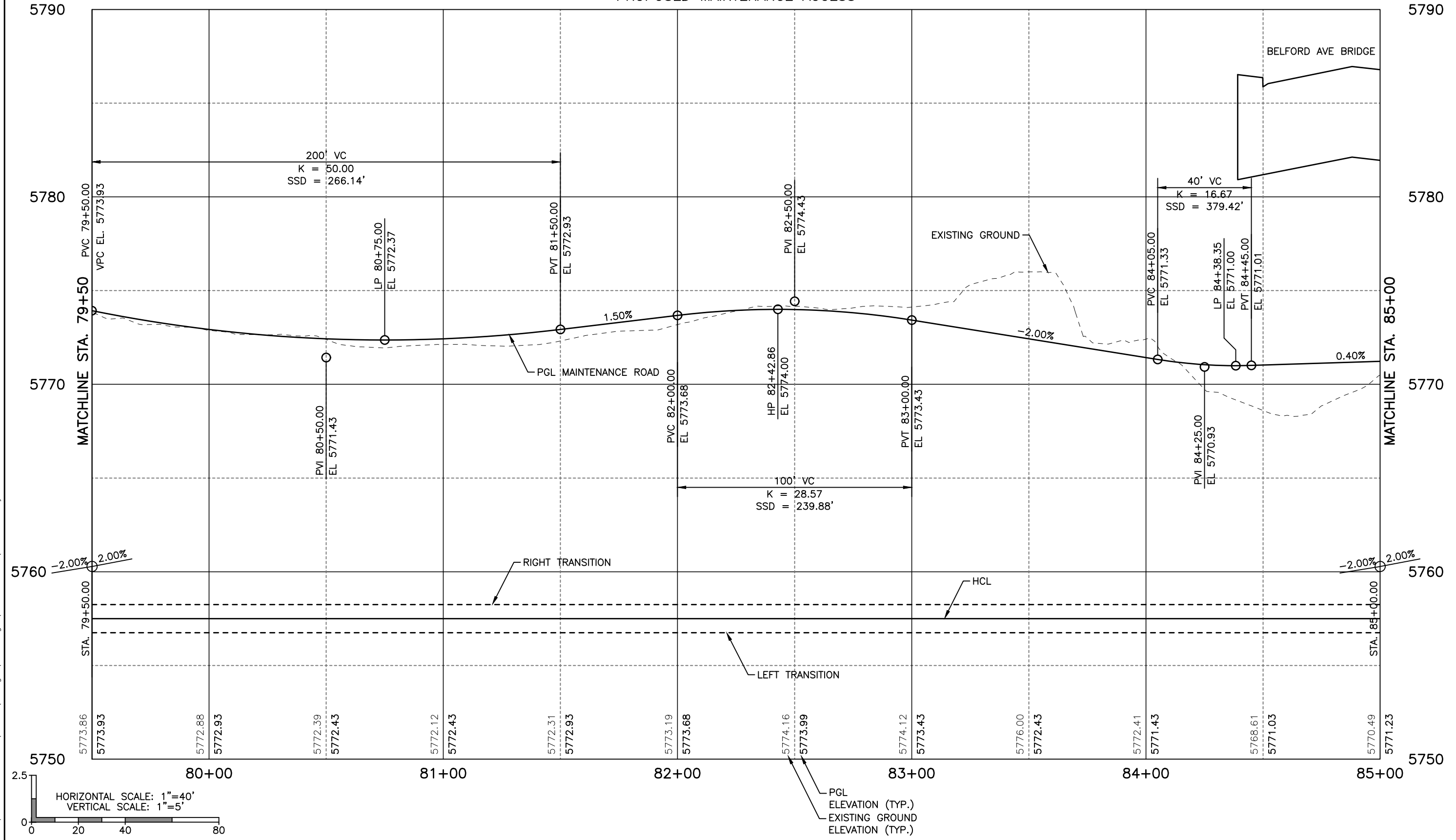
Sheet Revisions			
Date	Comments	Initials	

**Manhard**  
CONSULTING LTD

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 f:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK MAINTENANCE ACCESS PLAN			Project No./Code
No Revisions:	Designer:	DCS	Structure	
Revised:	Detailer:	DCS	Numbers	
Void:	Subset:	Trail	Sheets:	TP-9 of 12
				Sheet Number 24

PROPOSED MAINTENANCE ACCESS



Print Date: 6/18/2021 9:11:44 AM  
 File Name: R115360-01PRO10.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: 1"=5'

Sheet Revisions			
Date	Comments	Initials	



As Constructed  
 No Revisions:  
 Revised:  
 Void:

BELFORD-HAPPY CANYON CREEK  
 MAINTENANCE ACCESS PROFILE

Designer: DCS  
 Detailer: DCS  
 Subset: Trail

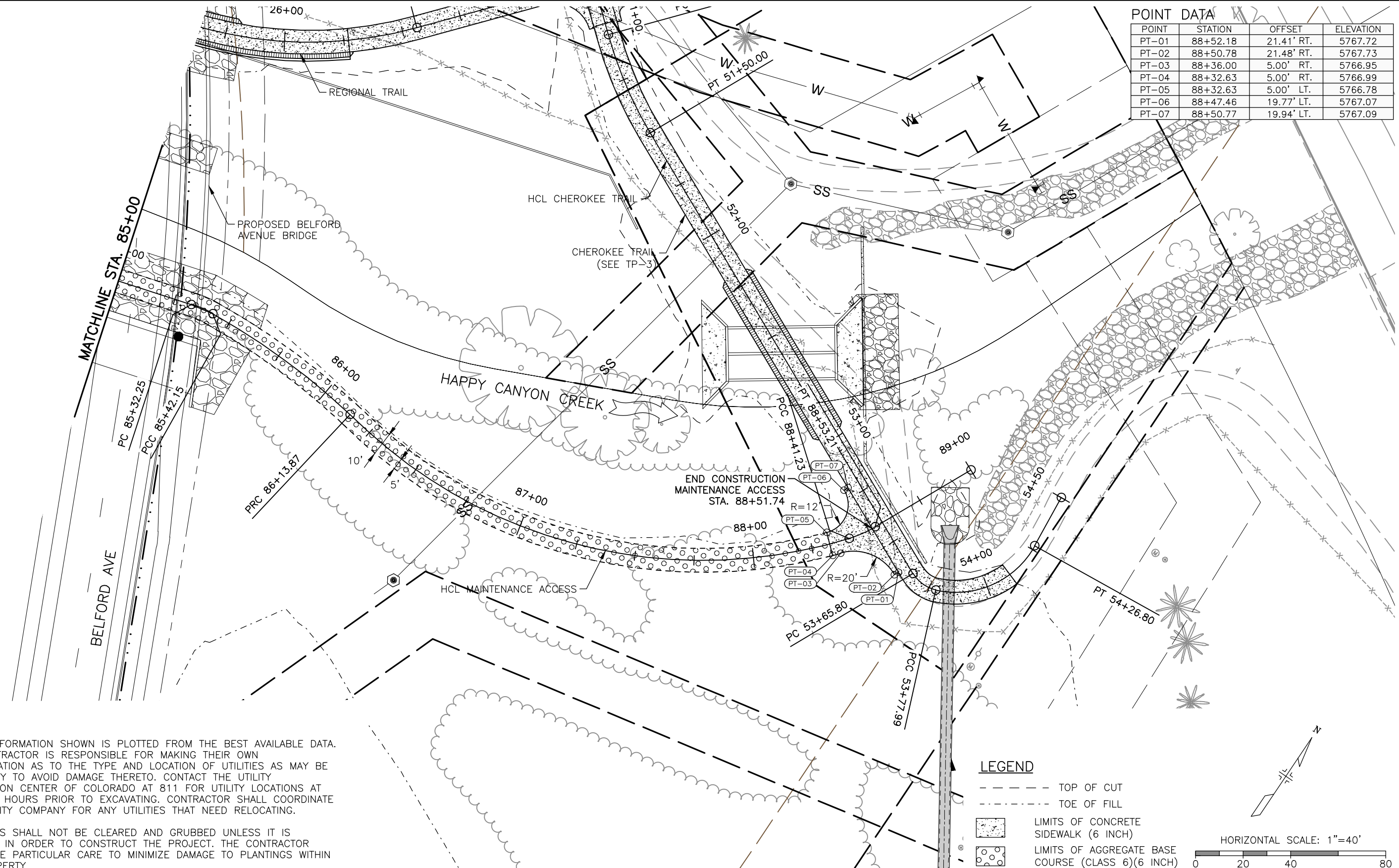
Structure Numbers  
 Sheets: TP-10 of 12

Project No./Code  
 Sheet Number 25

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\ Chase.Miyamoto



POINT DATA			
POINT	STATION	OFFSET	ELEVATION
PT-01	88+52.18	21.41' RT.	5767.72
PT-02	88+50.78	21.48' RT.	5767.73
PT-03	88+36.00	5.00' RT.	5766.95
PT-04	88+32.63	5.00' RT.	5766.99
PT-05	88+32.63	5.00' LT.	5766.78
PT-06	88+47.46	19.77' LT.	5767.07
PT-07	88+50.77	19.94' LT.	5767.09



- NOTES:
- 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.
  - 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
- [Pattern] LIMITS OF CONCRETE SIDEWALK (6 INCH)
- [Pattern] LIMITS OF AGGREGATE BASE COURSE (CLASS 6)(6 INCH)

HORIZONTAL SCALE: 1"=40'

I:\115360-01 - Compark at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring

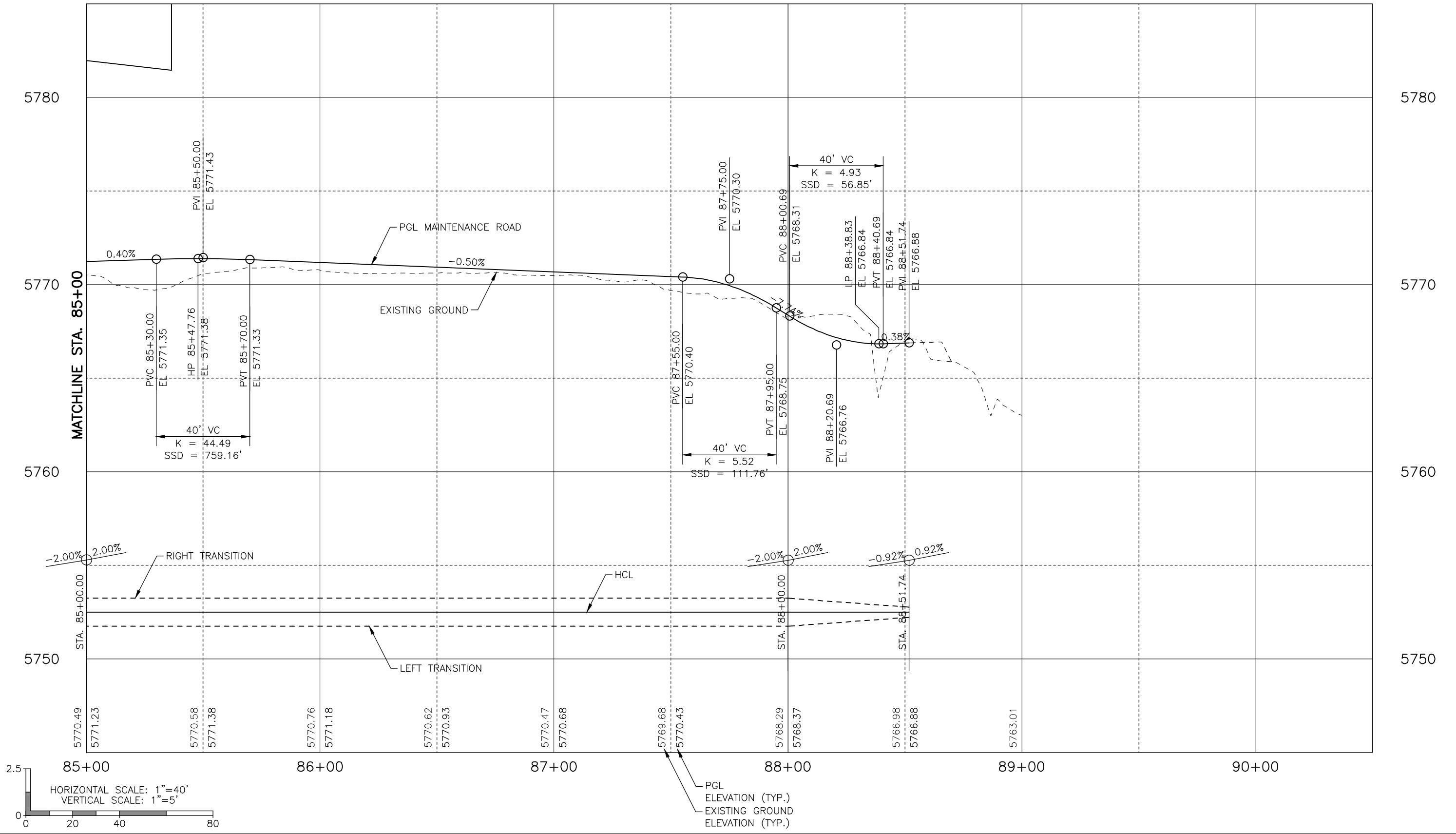
Print Date: 6/17/2021 7:57:41 PM  
 File Name: T115360-01PLN10.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: NTS

Sheet Revisions			
Date	Comments	Initials	



As Constructed	BELFORD-HAPPY CANYON CREEK MAINTENANCE ACCESS PLAN			Project No./Code
No Revisions:	Designer:	DCS	Structure	
Revised:	Detailer:	DCS	Numbers	
Void:	Subset:	Trail	Sheets:	TP-11 of 12
				Sheet Number 26

PROPOSED MAINTENANCE ACCESS



I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring

Print Date: 6/17/2021 4:51:13 PM  
 File Name: R115360-01PRO10.dwg  
 Horizontal Scale: 1"=40' Vertical Scale: 1"=5'

Sheet Revisions		
Date	Comments	Initials

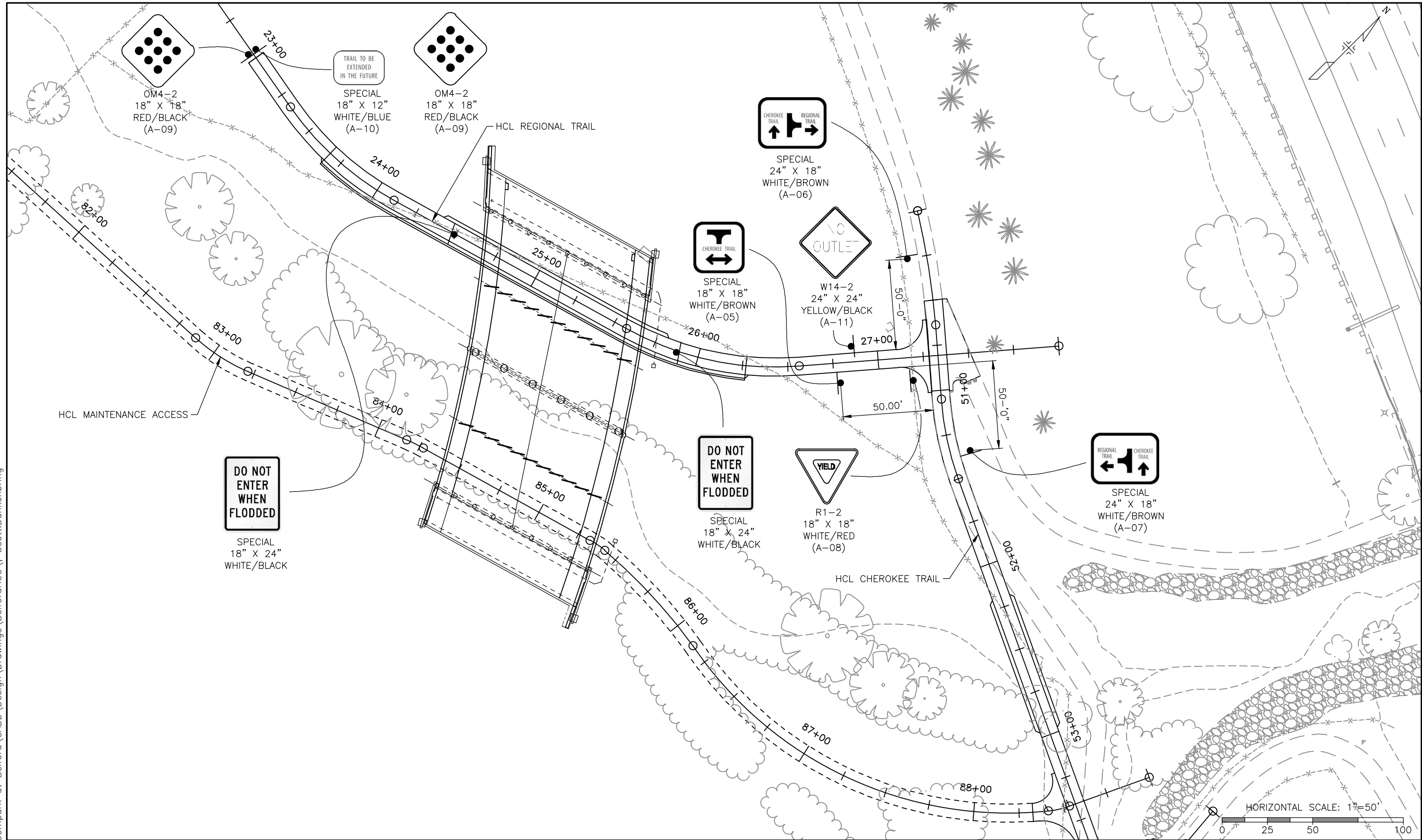
**Manhard**  
CONSULTING LTD

8008 E. Arapahoe Court, Suite 110, Denver, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
 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 MAINTENANCE ACCESS PROFILE			
Designer:	DCS	Structure	
Detailer:	DCS	Numbers	
Subset:	Trail	Sheets:	TP-12 of 12

Project No./Code
Sheet Number 27



I:\115360-01 - Compare at Belford\CADD\Drawings\BelfordHCC\, Scott.Dankenbring

Print Date: 6/17/2021 8:46:22 PM  
 File Name: S115360-01SignStrip01.dwg  
 Horizontal Scale: 1"=100' Vertical Scale: NTS

Sheet Revisions		
Date	Comments	Initials

**Manhard**  
CONSULTING LTD

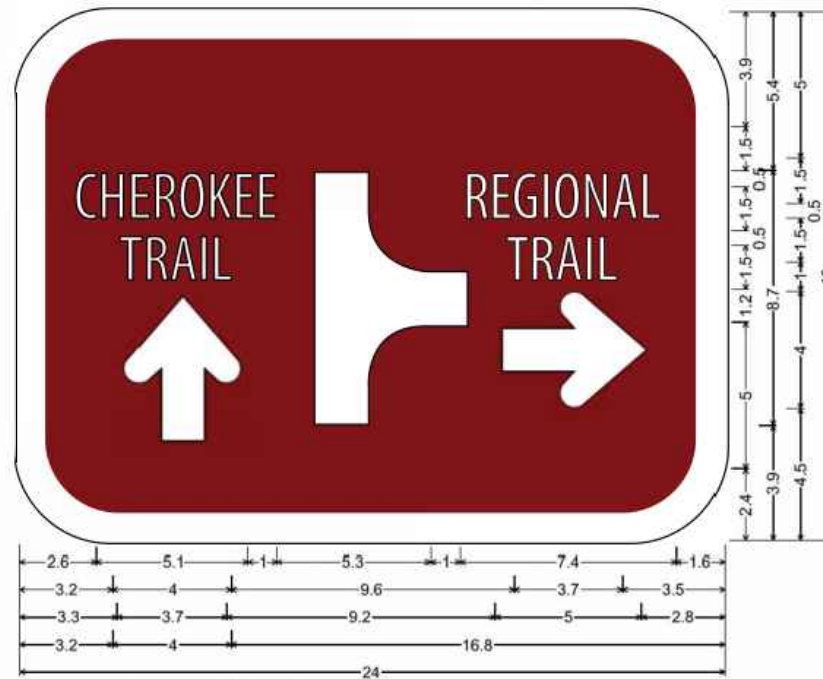
8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed
No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK SIGNING AND STRIPING PLAN		
Designer:	AJP	Structure
Detailer:	VM	Numbers
Subset:	Trail	Sheets: TS-1 of 2

Project No./Code
Sheet Number 28

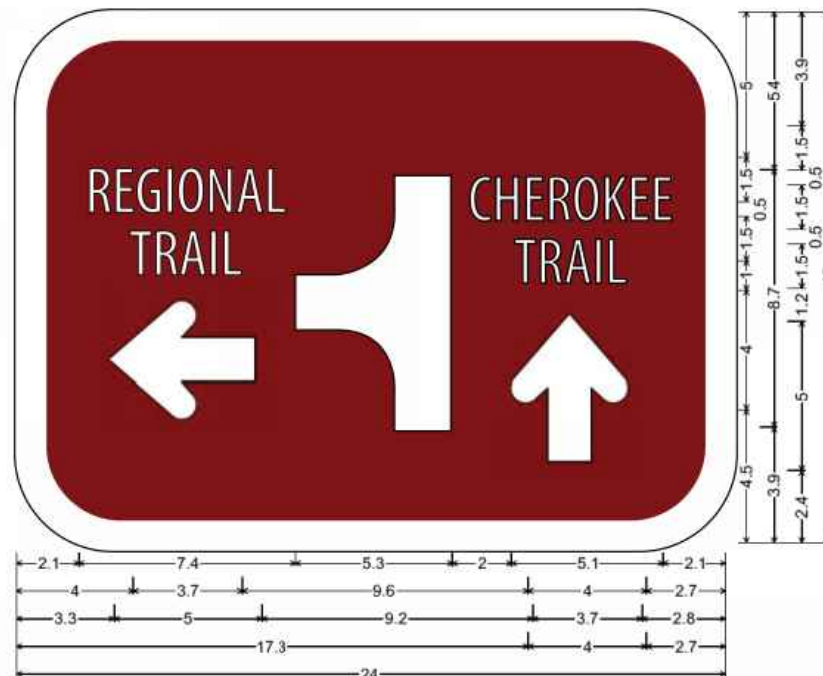
I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring



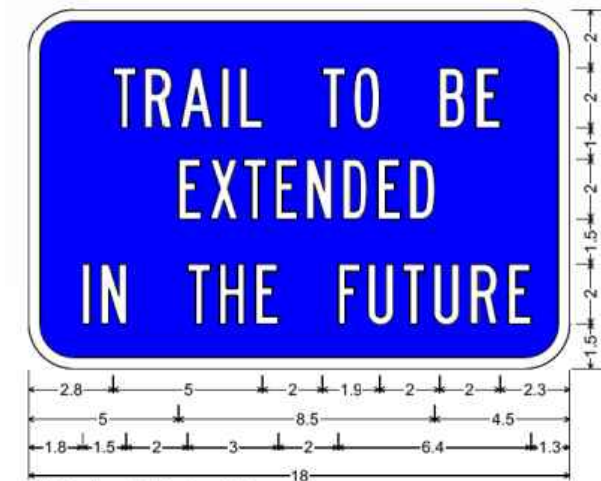
3.0" Radius, 1.0" Border, White on Brown;  
 "CHERRY" B; "CREEK" B; "TRAIL" B; Arrow Custom - 5.0" 90"; sign int shape;  
 "EAST-WEST" B; "TRAIL" B; Arrow Custom - 5.0" 0";



3.0" Radius, 1.0" Border, White on Brown;  
 sign int shape; "CHERRY CREEK TRAIL" B specified length;  
 Double Headed Arrow Custom - 12.0" 0";



3.0" Radius, 1.0" Border, White on Brown;  
 "EAST-WEST" B; "TRAIL" B; Arrow Custom - 5.0" 180"; sign int shape; "CHERRY" B;  
 "CREEK" B; "TRAIL" B; Arrow Custom - 5.0" 90";



1.5" Radius, 0.4" Border, White on Blue;  
 "TRAIL TO BE" B; "EXTENDED" B; "IN THE FUTURE" B;

Print Date: 6/17/2021 8:46:47 PM  
 File Name: S115360-01SIGNET01.dwg  
 Horizontal Scale: VARIES Vertical Scale: X

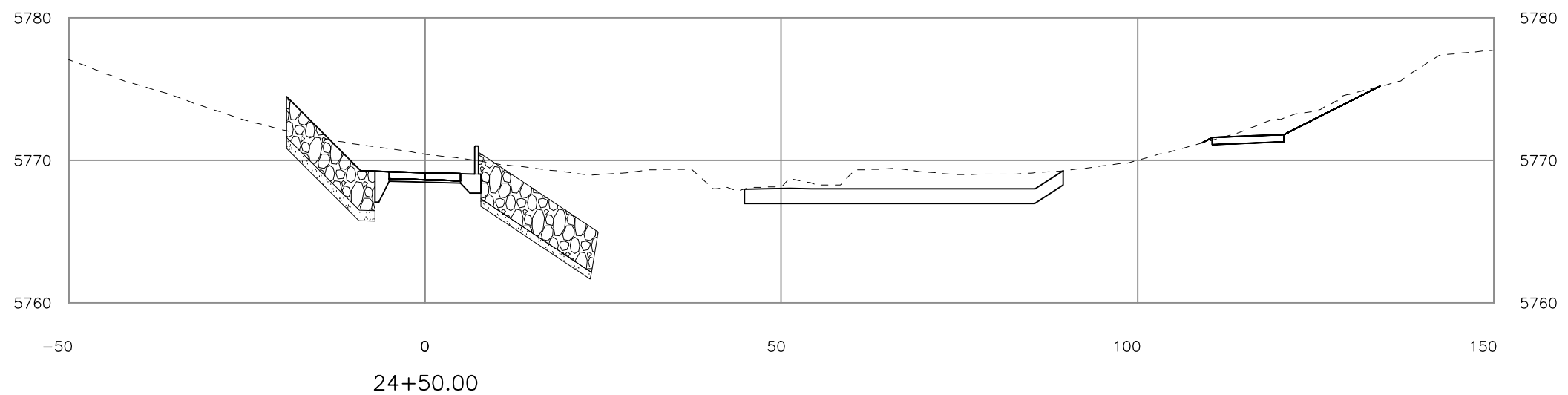
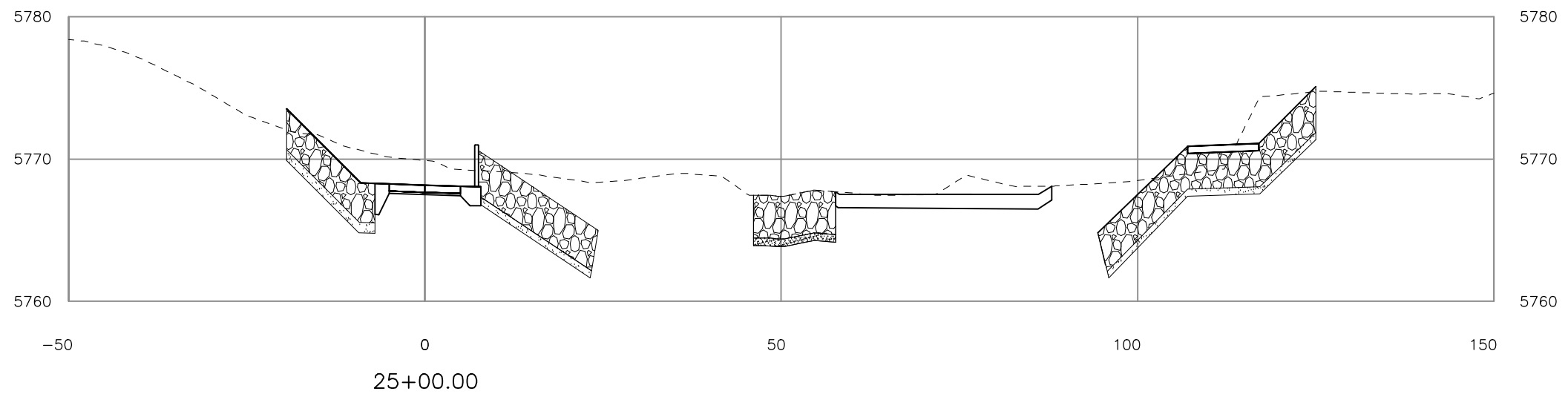
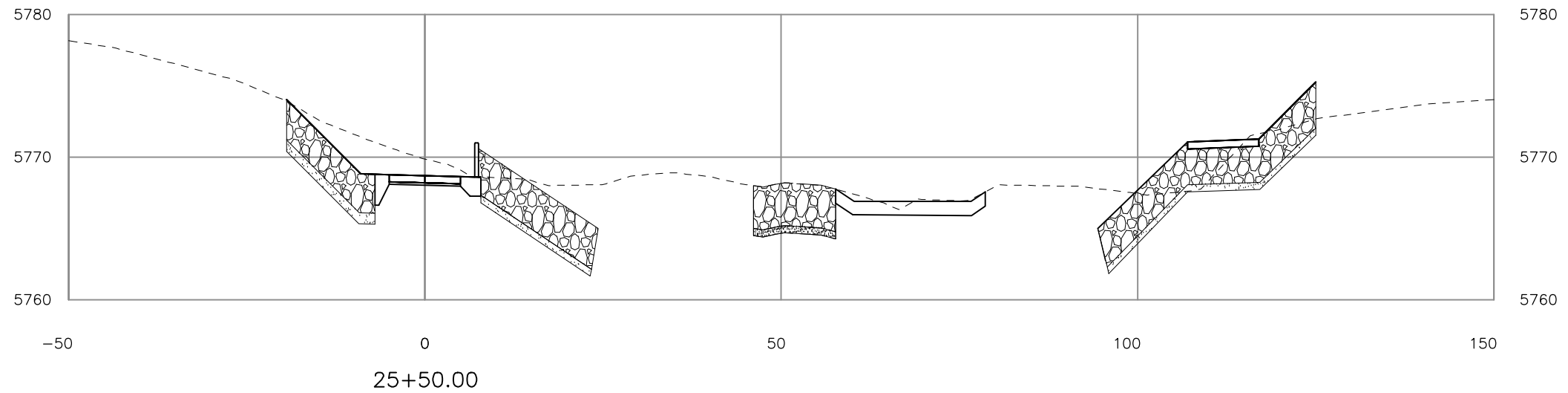
6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

8008 E. Arapahoe Court, Suite 110, Denver, CO 80112 ph:303.708.0900 f:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE SIGN LAYOUT DETAILS		Project No./Code
No Revisions:	Designer: AJP	Structure Numbers	
Revised:	Detailer: VM		
Void:	Subset: Trail	Sheets: TS-2 of 2	Sheet Number 29

I:\115360-01 - Compare at Belford\CADD\Design\Drawings\BelfordHCC\, Scott.Dankenbring



Print Date: 6/17/2021 7:29:22 PM  
 File Name: T115360-01TYP03.dwg  
 Horizontal Scale: NTS Vertical Scale: NTS

**FELSBURG  
 HOLT &  
 ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials



As Constructed	BELFORD-HAPPY CANYON CREEK TRAIL CROSS SECTIONS		Project No./Code
No Revisions:			
Revised:	Designer: SED	Structure Numbers	
Void:	Detailer: SED	Trail Sheets:	CS-1 of 1
			Sheet Number 30

**GENERAL NOTES**

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2019 EDITION, 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 SEMIRIGID PLASTIC ELECTRICAL CONDUIT, SCHEDULE 80. 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 3/4" CHAMFERS, UNLESS OTHERWISE NOTED

ALL STRUCTURAL STEEL, UNLESS NOTED OTHERWISE, SHALL BE AASHTO M270 GRADE 36 (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.

(N) DENOTES NON-COATED REINFORCING STEEL.

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

AN EMERGENCY DECK CONSTRUCTION JOINT MAY BE LOCATED AT THE ONE QUARTER SPAN POINT BACK FROM A PIER OR ABUTMENT WITH RESPECT TO THE DIRECTION OF THE DECK PLACEMENT.

PERMANENT DECK FORMS ARE ALLOWED AND SHALL BE EITHER PRECAST CONCRETE DECK FORMS OR STEEL DECK FORMS.

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

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

NO EXISTING UTILITIES ARE KNOWN TO BE 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, NINTH EDITION LRFD

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  
 ASSUMES 500 LBS FOR EACH LUMINAIRE

REINFORCED CONCRETE:

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

CAISSON CONCRETE:

CLASS BZ CONCRETE:  $f'_c = 4,000$  psi  
 REINFORCING STEEL:  $f_y = 60,000$  psi

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

PRESTRESSED CONCRETE: CLASS PS CONCRETE  $f'_c =$  (SEE DETAILS)  
 $f'_s = 270,000$  psi

**SEISMIC DESIGN DATA**

EARTHQUAKE DESIGN METHOD: FORCE BASED (GENERAL PROCEDURE PER LRFD 3.10.2.1)

LATITUDE N 39° 33' 12"  
 LONGITUDE W 104° 48' 49"

AASHTO SPECTRUM FOR 7% FOR PE IN 75 YEARS (1000 YEAR RETURN PERIOD)

PERIOD (sec)	SA (g)	
0	0.056	PGA - SITE CLASS E
0.2	0.120	S <sub>s</sub> - SITE CLASS E
1.0	0.033	S <sub>1</sub> - SITE CLASS E

SPECTRAL RESPONSE ACCELERATIONS:

$A_s = F_{PGA} \times PGA$ ,  $S_{DS} = F_A S_s$  AND  $S_{D1} = F_v S_1$   
 $F_{PGA} = 2.5$ ,  $F_A = 2.5$ ,  $F_v = 3.5$

PERIOD (sec)	SA (g)	
0	0.140	A <sub>s</sub> - SITE CLASS E
0.2	0.300	S <sub>ps</sub> - SITE CLASS E
1.0	0.116	S <sub>D1</sub> - SITE CLASS E

OPERATIONAL CLASS:

SEISMIC ZONE: ZONE 1

RESPONSE MODIFICATION FACTORS:

- R-FACTOR: 1.5 (RC PILE BENTS)
- R-FACTOR: 1.0 (PILE BENTS TO CAP BEAM, COLUMNS TO CAP BEAM & FOUNDATION)
- R-FACTOR: 0.8 (SUPERSTRUCTURE TO FOUNDATION)

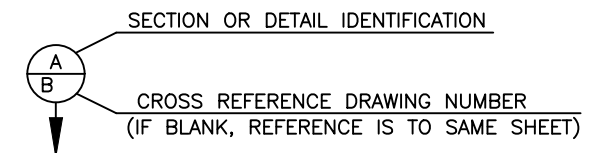
**INDEX OF DRAWINGS**

- B1 GENERAL INFORMATION
- B2 SUMMARY OF QUANTITIES
- B3 GENERAL LAYOUT
- B4 TYPICAL SECTION
- B5 ENGINEERING GEOLOGY
- B6 BRIDGE HYDRAULIC INFORMATION (1 OF 2)
- B7 BRIDGE HYDRAULIC INFORMATION (2 OF 2)
- B8 CONSTRUCTION LAYOUT (1 OF 2)
- B9 CONSTRUCTION LAYOUT (2 OF 2)
- B10 CAISSON LAYOUT
- B11 CAISSON DETAILS
- B12 ABUTMENT 1 PLAN & ELEVATION
- B13 ABUTMENT 3 PLAN & ELEVATION
- B14 ABUTMENT SECTIONS & DETAILS
- B15 WINGWALL DETAILS
- B16 PIER 2 PLAN & ELEVATION
- B17 PIER 2 SECTIONS & DETAILS
- B18 SUPERSTRUCTURE SECTION
- B19 DECK REINFORCING PLAN
- B20 PRECAST CONCRETE I GIRDER
- B21 GIRDER DIAPHRAGM DETAILS
- B22 OPTIONAL PRECAST PANEL DECK FORM (1 OF 2)
- B23 OPTIONAL PRECAST PANEL DECK FORM (2 OF 2)
- B24 PENDANT LUMINAIRE DETAILS
- B25 BRIDGE RAIL ELEVATION & PEDESTRIAN RAILING DETAILS
- B26 BRIDGE RAIL PLAN & SECTIONS
- B27 BRIDGE RAIL (SPECIAL) DETAILS
- B28 APPROACH SLAB DETAILS
- B29 APPROACH SLAB INLET DETAILS
- B30 STRUCTURAL BACKFILL
- B31 DECK GEOMETRY (1 OF 3)
- B32 DECK GEOMETRY (2 OF 3)
- B33 DECK GEOMETRY (3 OF 3)

**BRIDGE DESCRIPTION**

TWO SPAN (77'-2 1/2" / 77'-2 1/2") 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, CURB TO CURB  
 8'-6" SIDEWALKS, 1'-6" BRIDGE RAILS



		Shear LLLDF		Positive Moment LLLDF		Negative Moment LLLDF	
		1 Lane	2+ Lanes	1 Lane	2+ Lanes	1 Lane	2+ Lanes
Span 1	G1	0.912	0.749	0.856	0.711	0.856	0.711
	G2-G3; G10-G11	0.718	0.855	0.476	0.663	0.476	0.663
	G4-G5; G8-G9	0.673	0.803	0.476	0.663	0.476	0.663
	G6-G7	0.675	0.806	0.477	0.664	0.477	0.664
	G12	0.791	0.685	0.742	0.656	0.742	0.656
Span 2	G1	0.871	0.723	0.832	0.701	0.832	0.701
	G2-G3; G10-G11	0.842	0.706	0.477	0.665	0.477	0.665
	G4-G5; G8-G9	0.675	0.805	0.477	0.665	0.477	0.665
	G6-G7	0.675	0.806	0.478	0.665	0.478	0.665
	G12	0.802	0.685	0.767	0.666	0.767	0.666

Print Date: 6/17/2021 10:33:23 AM

File Name: B115360-01INF01.dwg

Horizontal Scale: VARIES Vertical Scale:



6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
[www.FHUENG.com](http://www.FHUENG.com)

Sheet Revisions		
Date	Comments	Initials

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0100 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners


As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE GENERAL INFORMATION		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B1 of 33	Sheet Number 31

I:\115360-01 - Compare at Belford\CADD\Bridges\Drawings\Chase.Miyamoto

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	SUPERSTRUCTURE	ABUTMENT 1	PIER 2	ABUTMENT 3	APPROACH SLABS	TOTALS
206	STRUCTURE EXCAVATION	CY		64	183	14		261
206	STRUCTURE BACKFILL (CLASS 1)	CY		623	116	736		1,475
206	MECHANICAL REINFORCEMENT OF SOIL	CY		532		612		1,144
206	FILTER MATERIAL (CLASS A)	CY		189	42	166		397
403	HOT MIX ASPHALT (GRADING SX)(75)(PG 64-22)	TON	214				56	270
503	DRILLED CAISSON (24 INCH)	LF		360		393		753
503	DRILLED CAISSON (48 INCH)	LF			240			240
506	RIPRAP (18 INCH)	CY		564	124	496		1,184
514	PEDESTRIAN RAILING (STEEL)	LF	306				80	386
515	WATERPROOFING (MEMBRANE)	SY	1,296				335	1,631
515	CONCRETE SEALER	SY	321				81	402
601	CONCRETE CLASS D (BRIDGE)	CY	1074	156	212	167	167	1,776
601	STRUCTURAL CONCRETE COATING	SY	745	141	152	141	49	1,228
601	HAND STAINED STONE FORMLINER	SF	1,942				278	2,220
602	REINFORCING STEEL	LB		3,040	1,470	3,040	10,084	17,634
602	REINFORCING STEEL (EPOXY COATED)	LB	169,020	22,605	10,920	32,445	6,465	241,455
603	18 INCH REINFORCED CONCRETE PIPE	LF		40				40
604	VANE GRATE INLET (SPECIAL)	EA		2				2
606	BRIDGE RAIL (SPECIAL)	LF	306				82	388
613	1 INCH ELECTRICAL CONDUIT	LF	62					62
613	2 INCH ELECTRICAL CONDUIT	LF	794				164	958
613	LUMINAIRE (SPECIAL)	EA	2				4	6
618	PRESTRESSED CONCRETE I (BT42)	LF	1,852					1,852

I:\115360-01 - Compark at Belford\CADD\Bridge\Drawings\ Chase.Miyamoto

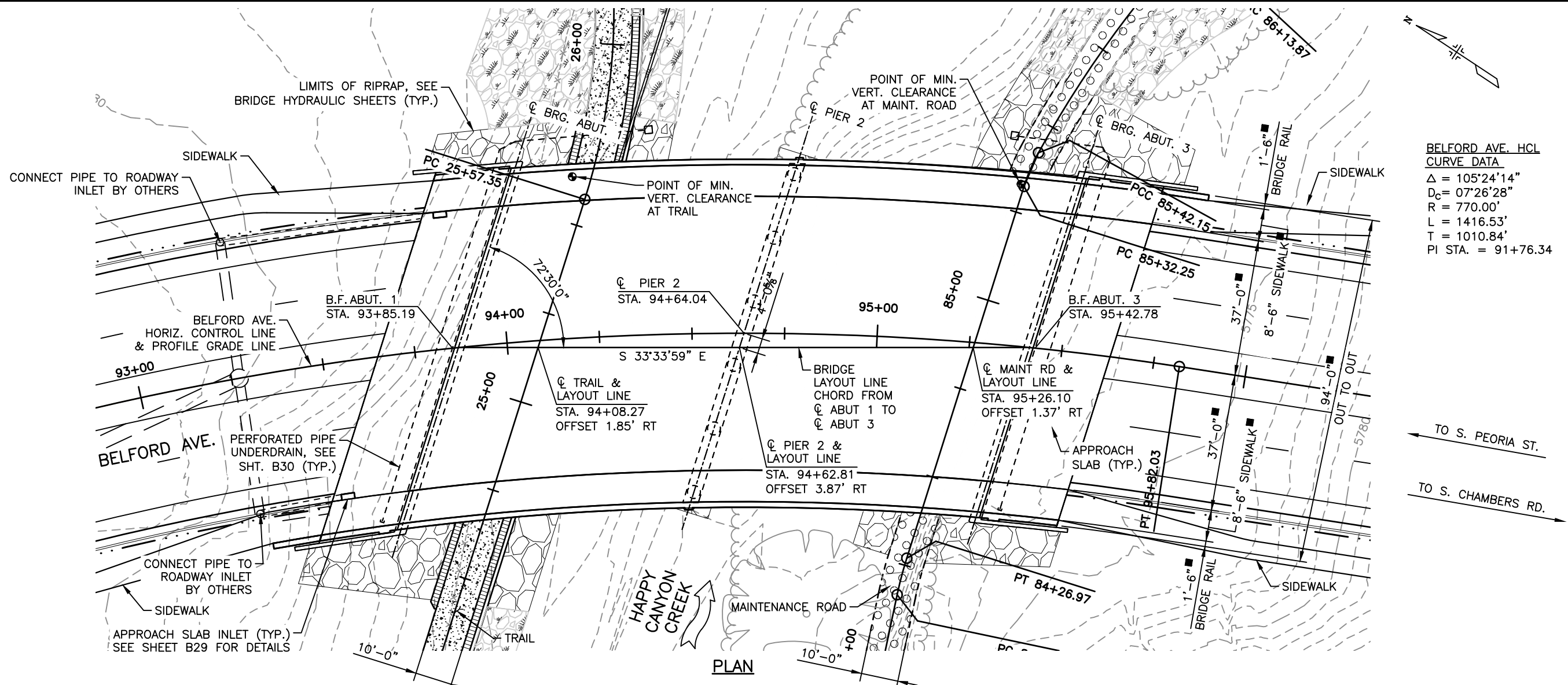
Print Date: 6/17/2021 10:33:30 AM  
 File Name: B115360-01SUM01.dwg  
 Horizontal Scale: Vertical Scale:  

 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

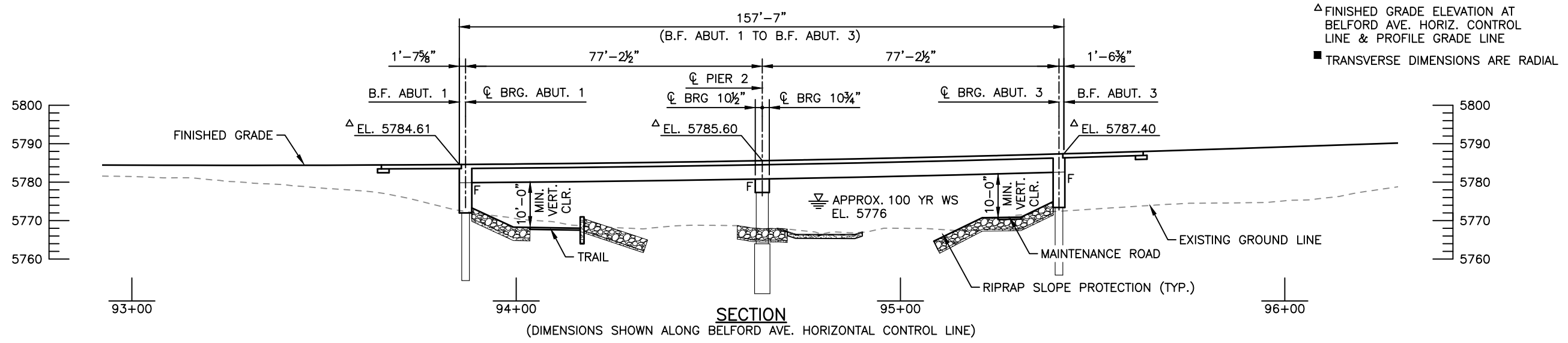


8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0100 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE		Project No./Code
No Revisions:	SUMMARY OF QUANTITIES		
Revised:	Designer: J. LYNCH	Structure Numbers	
Void:	Detailer: R. DILLON		
	Subset: BRIDGE	Sheets: B2 of 33	Sheet Number 32



PLAN



SECTION

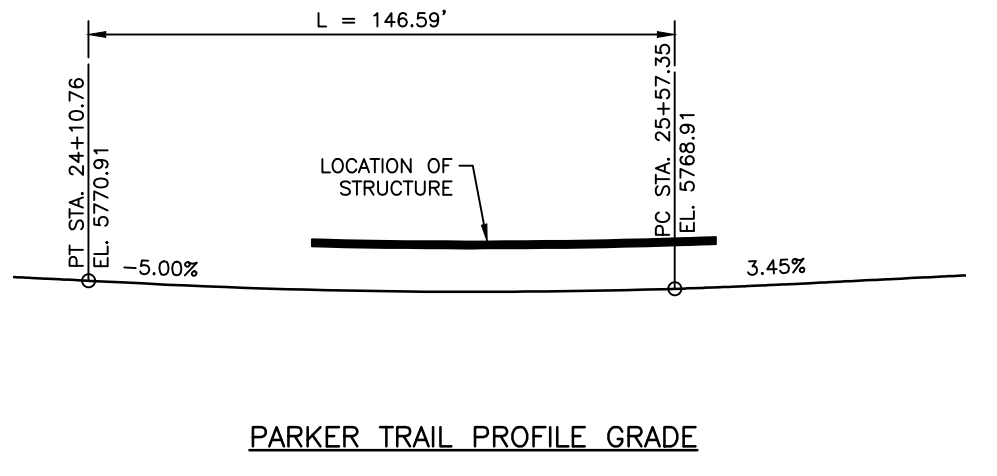
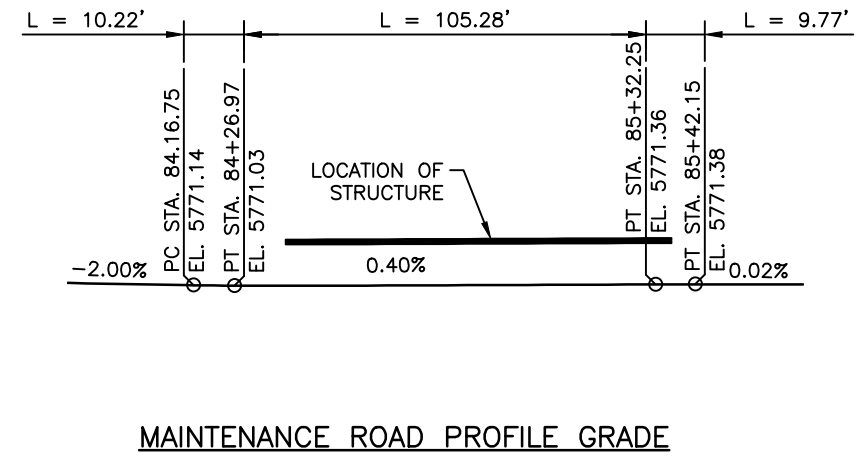
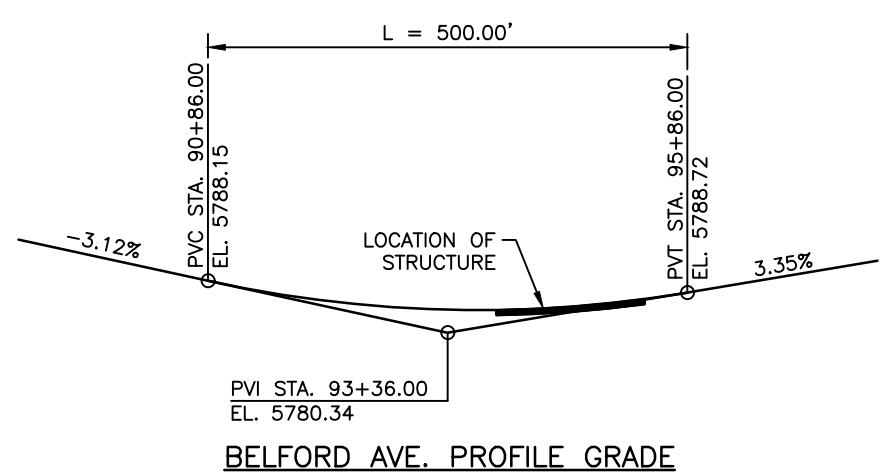
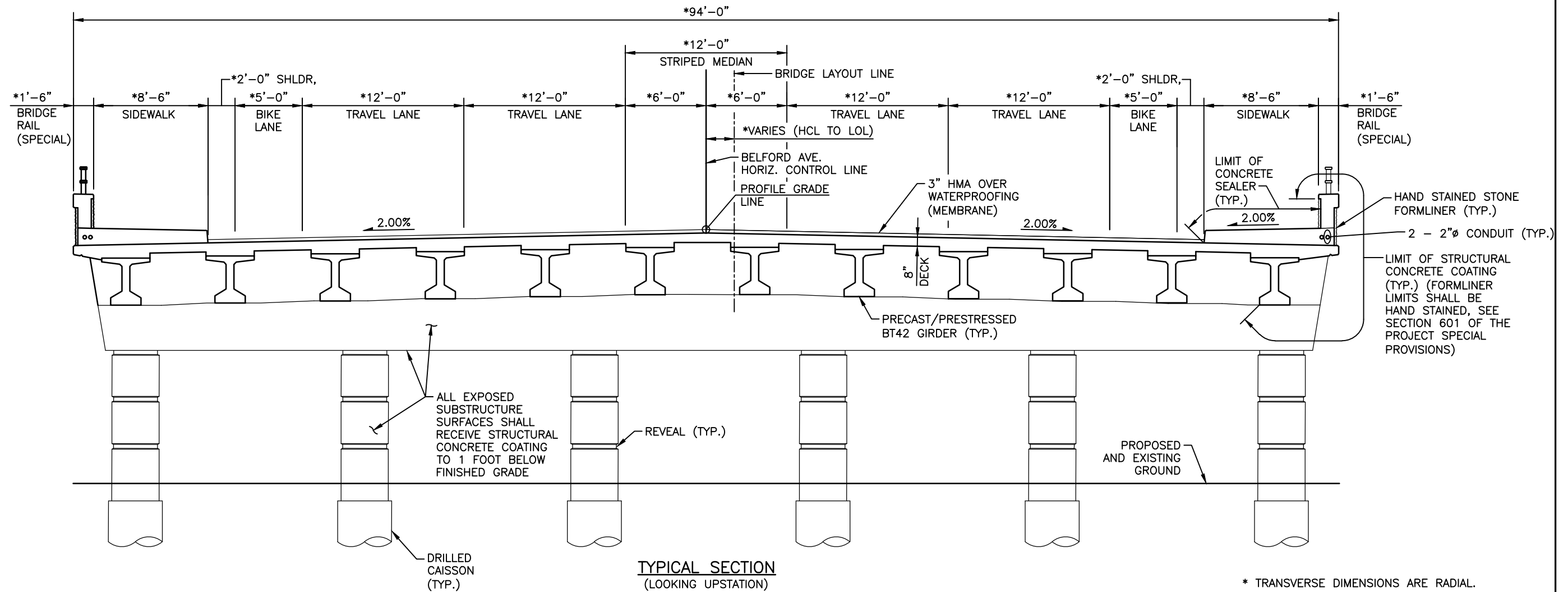
I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

Print Date: 6/18/2021 9:53:57 AM  
 File Name: B115360-01GLA01.dwg  
 Horizontal Scale: 1"=30' Vertical Scale: 1"=30'  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

**Manhard CONSULTING LTD**  
8008 E. Arapahoe Court, Suite 110, Denver, CO 80112 ph:303.708.0800 fx:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE GENERAL LAYOUT		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: R. DILLON		
Void:	Subset: BRIDGE	Sheets: B3 of 33	Sheet Number 33



I:\115360-01 - Compark at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

Print Date: 6/17/2021 10:36:52 AM  
 File Name: B115360-01GLA02.dwg  
 Horizontal Scale: VARIES Vertical Scale: X

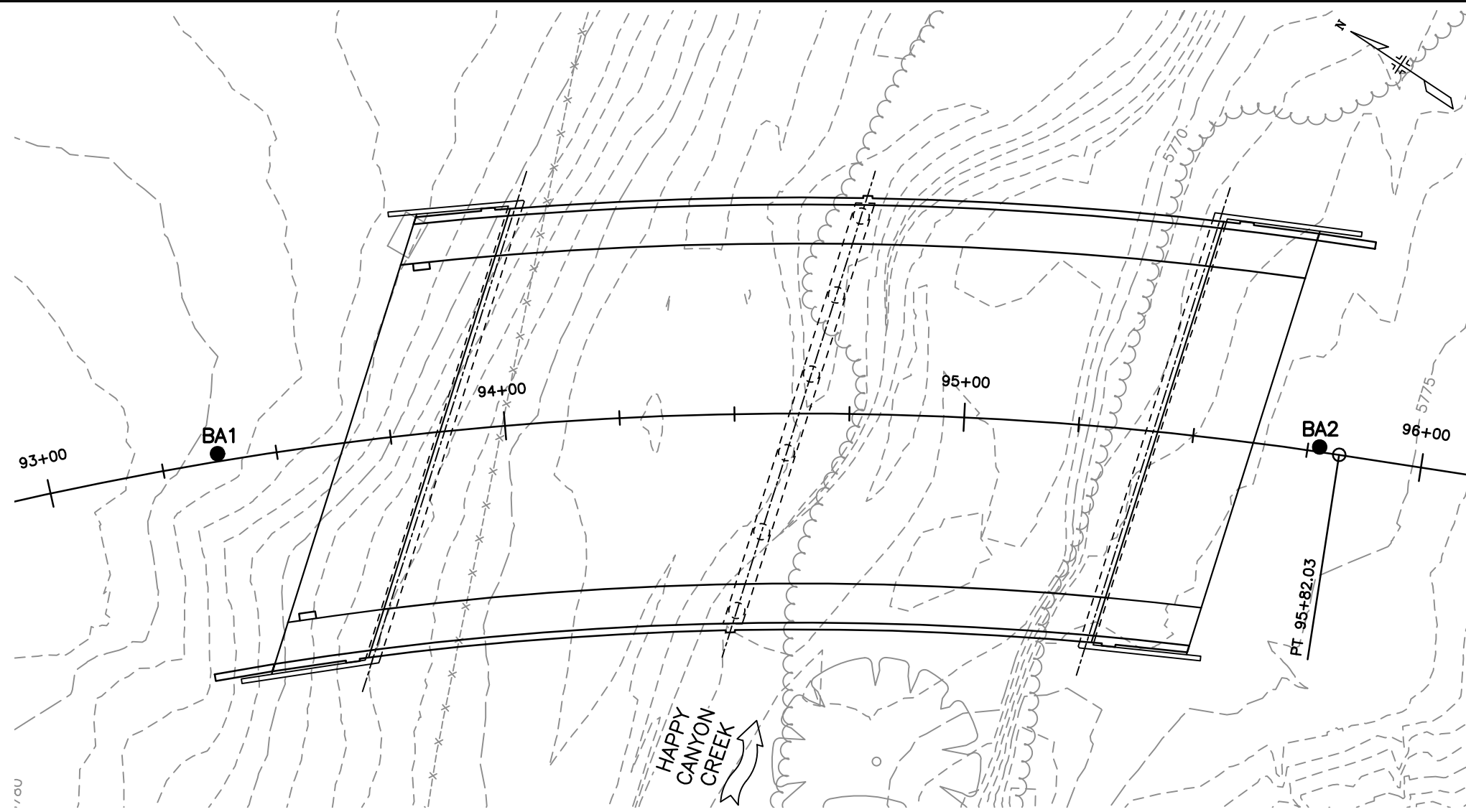
<b>FELSBURG HOLT &amp; ULLEVIG</b>	6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com
--	--

Sheet Revisions		
Date	Comments	Initials

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0100 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE TYPICAL SECTION		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: R. DILLON		
Void:	Subset: BRIDGE	Sheets: B4 of 33	Sheet Number 34

I:\115360-01 - Compare at Belford\CADD\Bridges\Drawings\Chase.Miyamoto

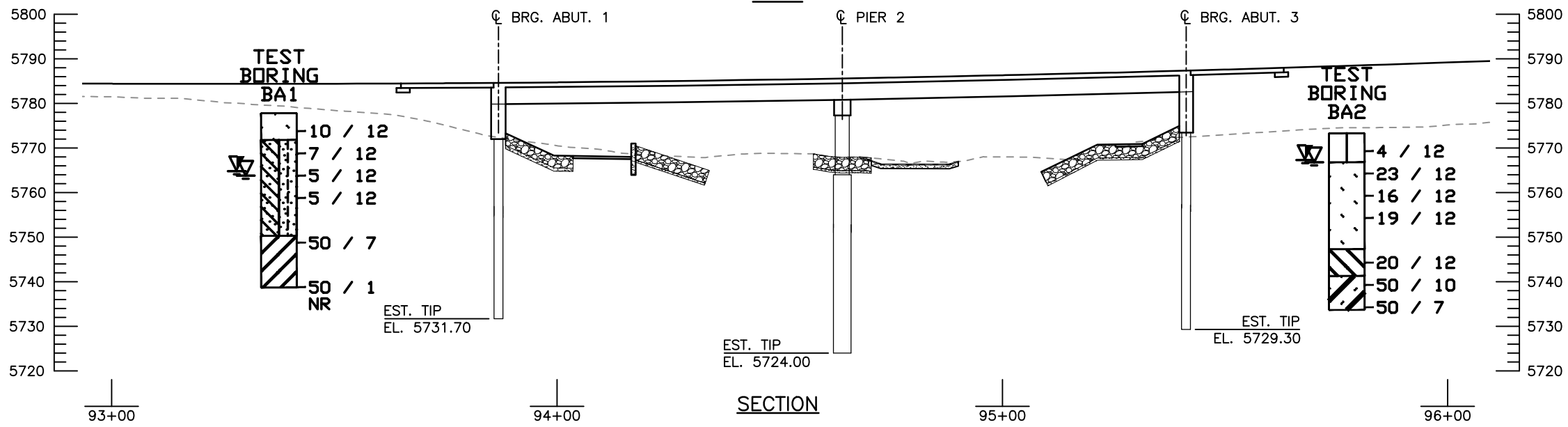


PLAN

- ### SOIL DESCRIPTIONS
- Clay, soft
  - Sand, medium dense, silty
  - Clay/sand, interbedded, medium stiff/loose to medium dense
  - Claystone (Bedrock), firm to medium hard
  - Claystone (Bedrock), hard to very hard
  - Sandstone (Bedrock), hard to very hard
  - Water level at time of drilling
  - Water level 4 to 71 days after drilling

- Notes:**
1. Test borings were drilled December 1, 2015 with a 4-inch diameter, continuous flight power auger.
  2. Location of the test borings were staked by others at locations chosen by this firm, unless noted otherwise.
  3. The horizontal lines shown on the logs are to differentiate materials and represent the approximate boundaries between materials. The transitions between materials may be gradual.
  4. Elevations were obtained from staking provided by others and have been rounded to the nearest foot, unless noted otherwise.
  5. Boring logs shown in this report are subject to the limitations, explanations, and conclusions of this report.

**A.G. Wassenaar Inc.**  
Geotechnical and Environmental Consulting



SECTION

Print Date: 6/17/2021 10:38:52 AM  
 File Name: B115360-01GEO01.dwg  
 Horizontal Scale: 1"=30' Vertical Scale:  
  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

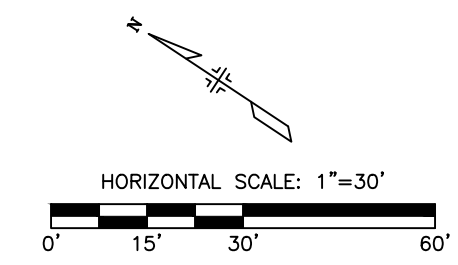
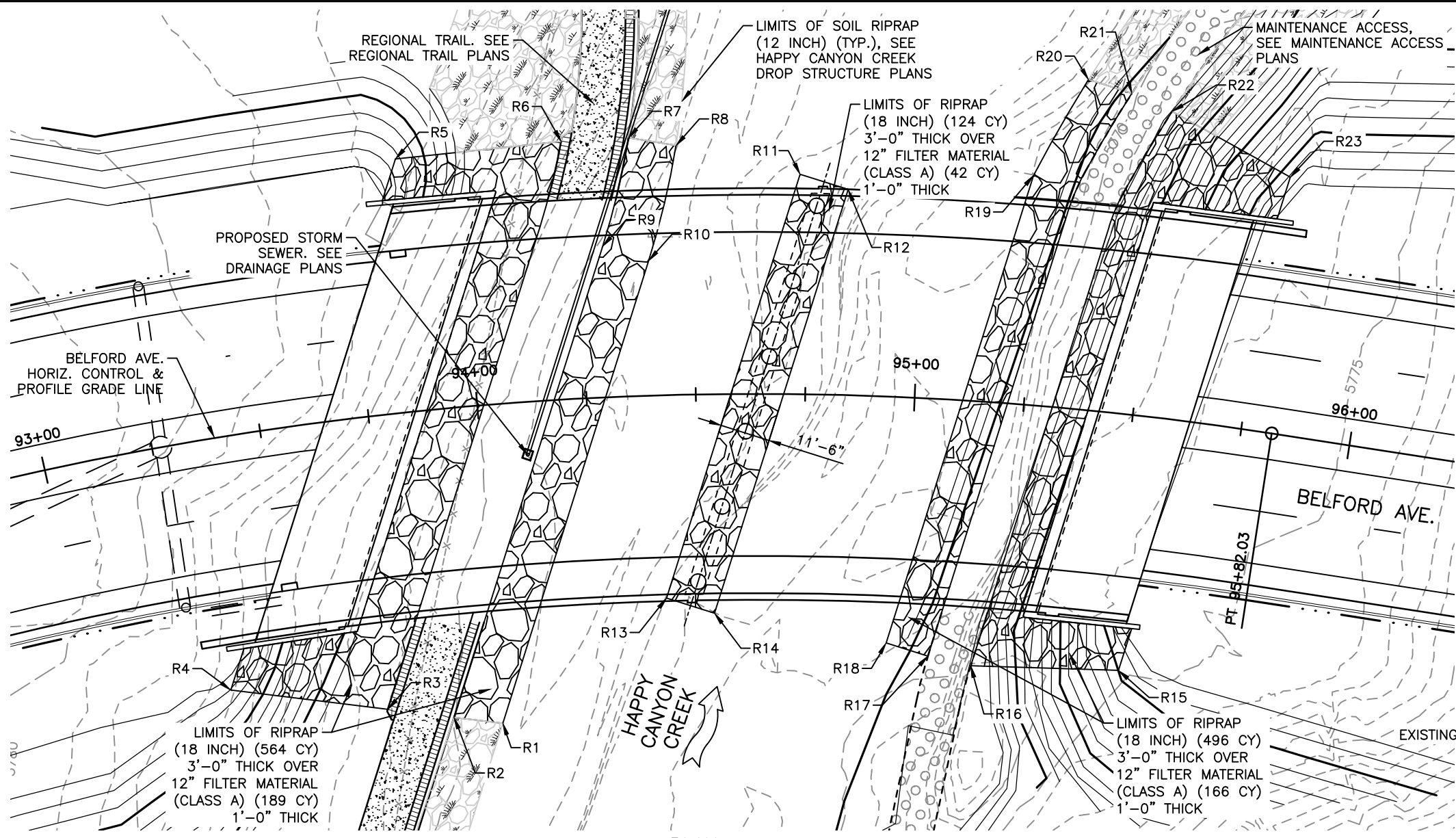
  
 8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
 Civil Engineers - Surveyors - Water Resource Engineers - Water & Wastewater Engineers  
 Construction Managers - Environmental Scientists - Landscape Architects - Planners

As Constructed
No Revisions:
Revised:
Void:

BELFORD-HAPPY CANYON CREEK BRIDGE	
ENGINEERING	
GEOLOGY	
Designer:	A.McDaniels
Detailer:	V.Miranda
Subset:	BRIDGE

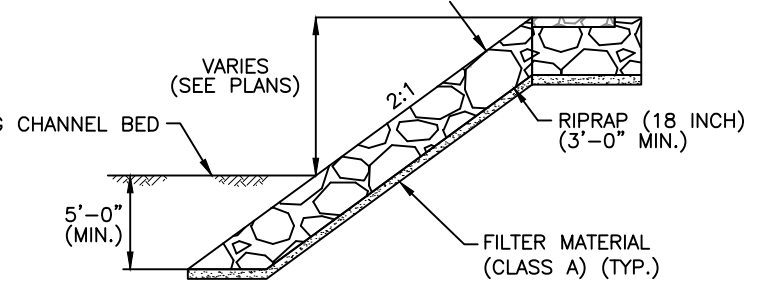
Project No./Code
Sheet Number
35

Structure Numbers:      Sheets: B5 of 33

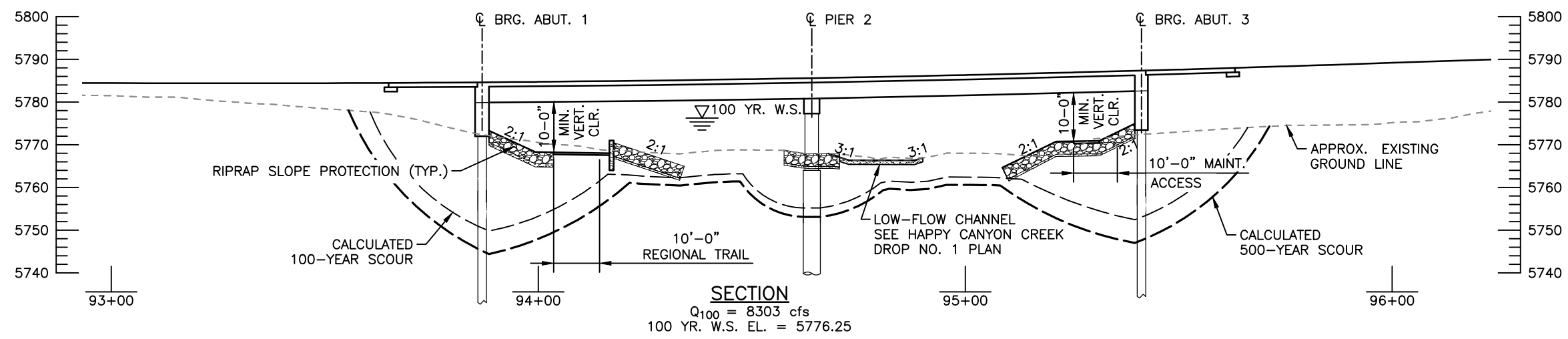


RIPRAP (18 INCH) POINT DATA

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
R1	27831.26	94408.21	5769.24	FINISHED GRADE
R2	27841.26	94403.19	5769.22	FINISHED GRADE
R3	27854.90	94396.36	5769.55	FINISHED GRADE
R4	27887.20	94380.16	5782.92	FINISHED GRADE
R5	27922.95	94502.06	5781.50	FINISHED GRADE
R6	27893.61	94526.31	5769.80	FINISHED GRADE
R7	27881.26	94535.51	5769.73	FINISHED GRADE
R8	27871.26	94540.03	5768.10	FINISHED GRADE
R9	27872.48	94511.60	5768.79	FINISHED GRADE
R10	27861.91	94514.64	5768.02	FINISHED GRADE
R11	27843.96	94550.26	5768.19	FINISHED GRADE
R12	27832.91	94553.44	5767.38	FINISHED GRADE
R13	27815.87	94452.72	5767.63	FINISHED GRADE
R14	27804.82	94455.90	5768.01	FINISHED GRADE
R15	27720.69	94496.05	5785.18	FINISHED GRADE
R16	27749.41	94478.25	5771.13	FINISHED GRADE
R17	27758.80	94474.71	5770.94	FINISHED GRADE
R18	27768.40	94471.94	5768.80	FINISHED GRADE
R19	27799.40	94579.55	5768.14	FINISHED GRADE
R20	27801.00	94604.71	5766.27	FINISHED GRADE
R21	27791.05	94607.58	5771.26	FINISHED GRADE
R22	27781.07	94609.21	5771.45	FINISHED GRADE
R23	27750.27	94611.63	5786.40	FINISHED GRADE



RIPRAP (18 INCH) TYPICAL SLOPE SECTION @ BRIDGE N.T.S.



SECTION Q<sub>100</sub> = 8303 cfs 100 YR. W.S. EL. = 5776.25

I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:41:21 AM  
 File Name: B115360-01HYD01.dwg  
 Horizontal Scale: 1"=30' Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials



As Constructed  
 No Revisions:  
 Revised:  
 Void:

**BELFORD-HAPPY CANYON CREEK BRIDGE BRIDGE HYDRAULIC INFORMATION (1 OF 2)**  
 Designer: C. TWISS  
 Detailer: R. DILLON  
 Subset: BRIDGE  
 Sheets: B6 of 33

Project No./Code  
 Sheet Number 36

**100-YEAR RECURRENCE INTERVAL**

FLOW UPSTREAM OF BRIDGE = 8303 CFS (FHAD)  
 DRAINAGE AREA = 17.5± SQ. MI.

**CHANNEL DESCRIPTION**

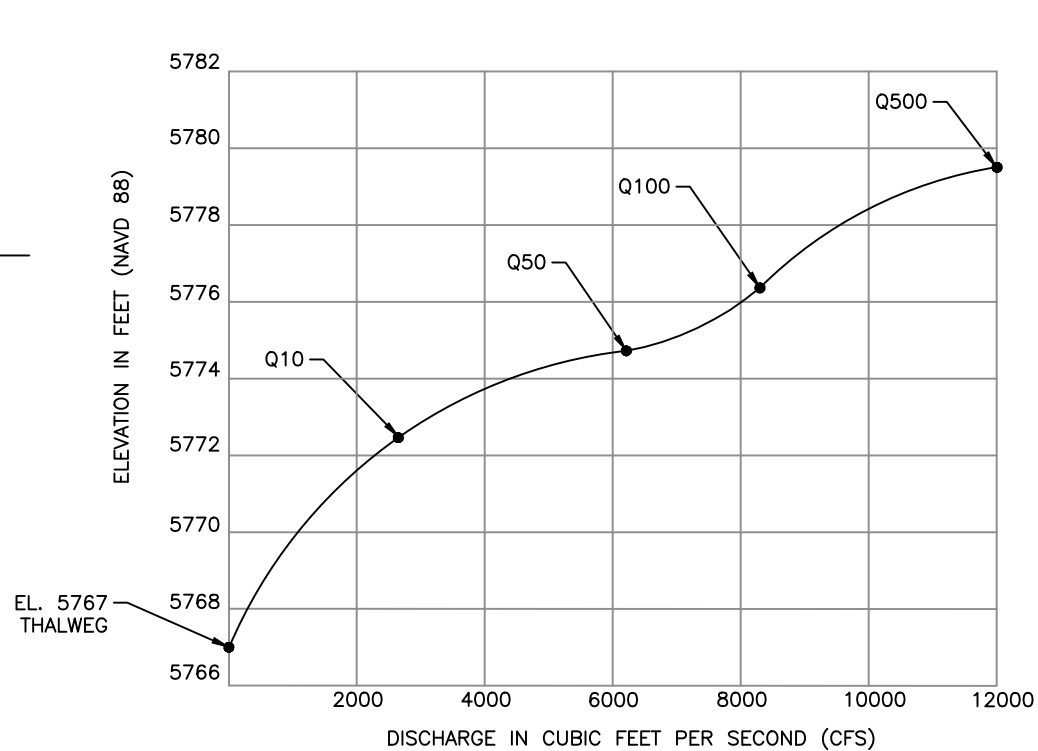
BOTTOM MATERIAL: COHESIVE  NONCOHESIVE   
 BOTTOM MAT. SIZE: CLAY  SILT  SAND  GRAVEL  COBBLES  OTHERS \_\_\_\_\_  
 STREAM FORM: STRAIGHT  MEANDERING  BRAIDED   
 MANNING'S "n" FOR DESIGN: CHANNEL 0.030 OVERBANK 0.035  
 DEBRIS -- BRUSH  TREES/LOGS  ICE  OTHER \_\_\_\_\_

**COMPARISON HYDRAULICS (100 YEAR EVENT)**  
 (AT SECTION LOCATED 32 FEET UPSTREAM OF BRIDGE)

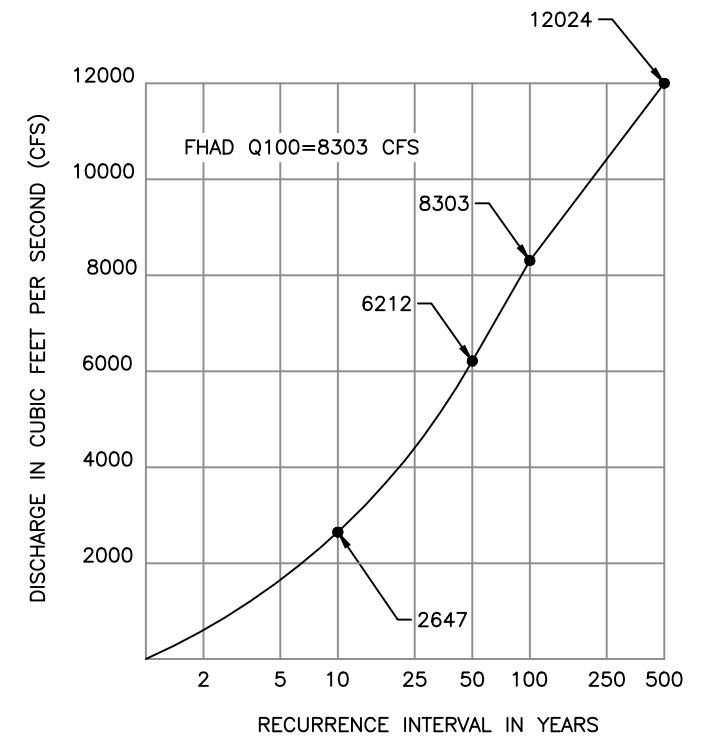
	VELOCITY (FT./SEC)		WS EL. (FT.)	MAX. BACKWATER (FT.)	FROUDE NO.
	AVERAGE	CHANNEL			
EXISTING CONDITIONS	9.90	13.70	5775.53	-	0.90
PROPOSED CONDITIONS	8.19	10.21	5776.35	-	0.63

**HYDRAULIC DATA**

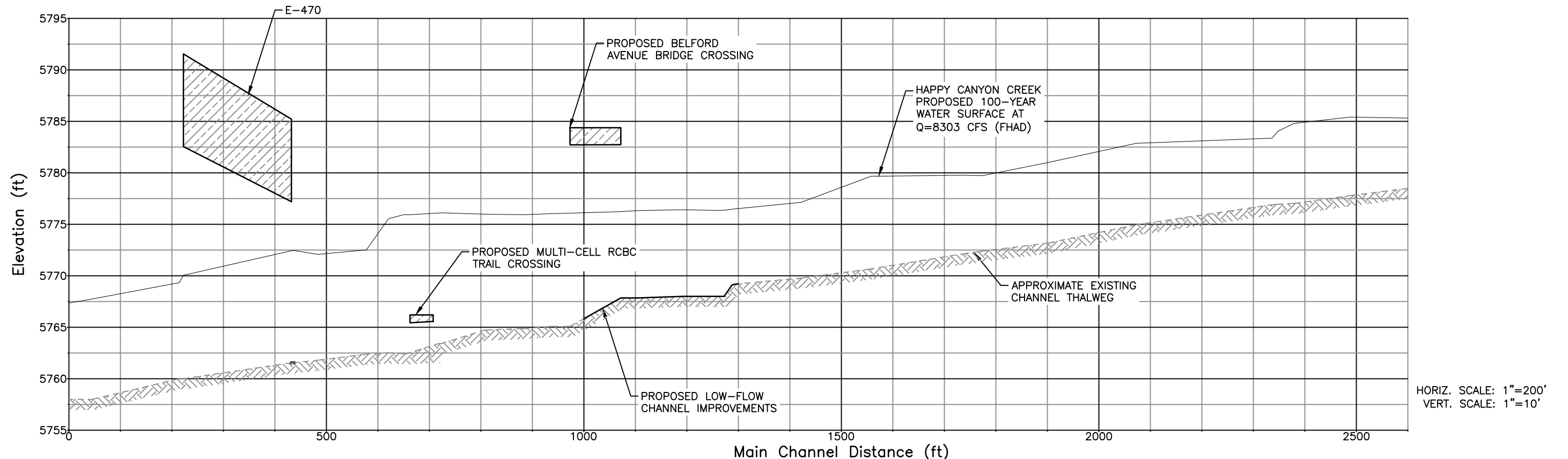
LOCATION	LOW CHORD ELEVATION AT ABUT. FRONT FACE		100-YEAR WATER SURFACE ELEVATION
	ABUT. 1	ABUT. 2	
S. SIDE (UPSTREAM)	5780.07	5782.73	5776.25
N. SIDE (DOWNSTREAM)	5780.07	5782.73	5776.10



**STAGE-DISCHARGE CURVE AT UPSTREAM FACE OF BELFORD AVENUE**



**DISCHARGE-FREQUENCY CURVE**



Print Date: 6/17/2021 10:41:32 AM  
 File Name: B115360-01HYD02.dwg  
 Horizontal Scale: VARIES Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

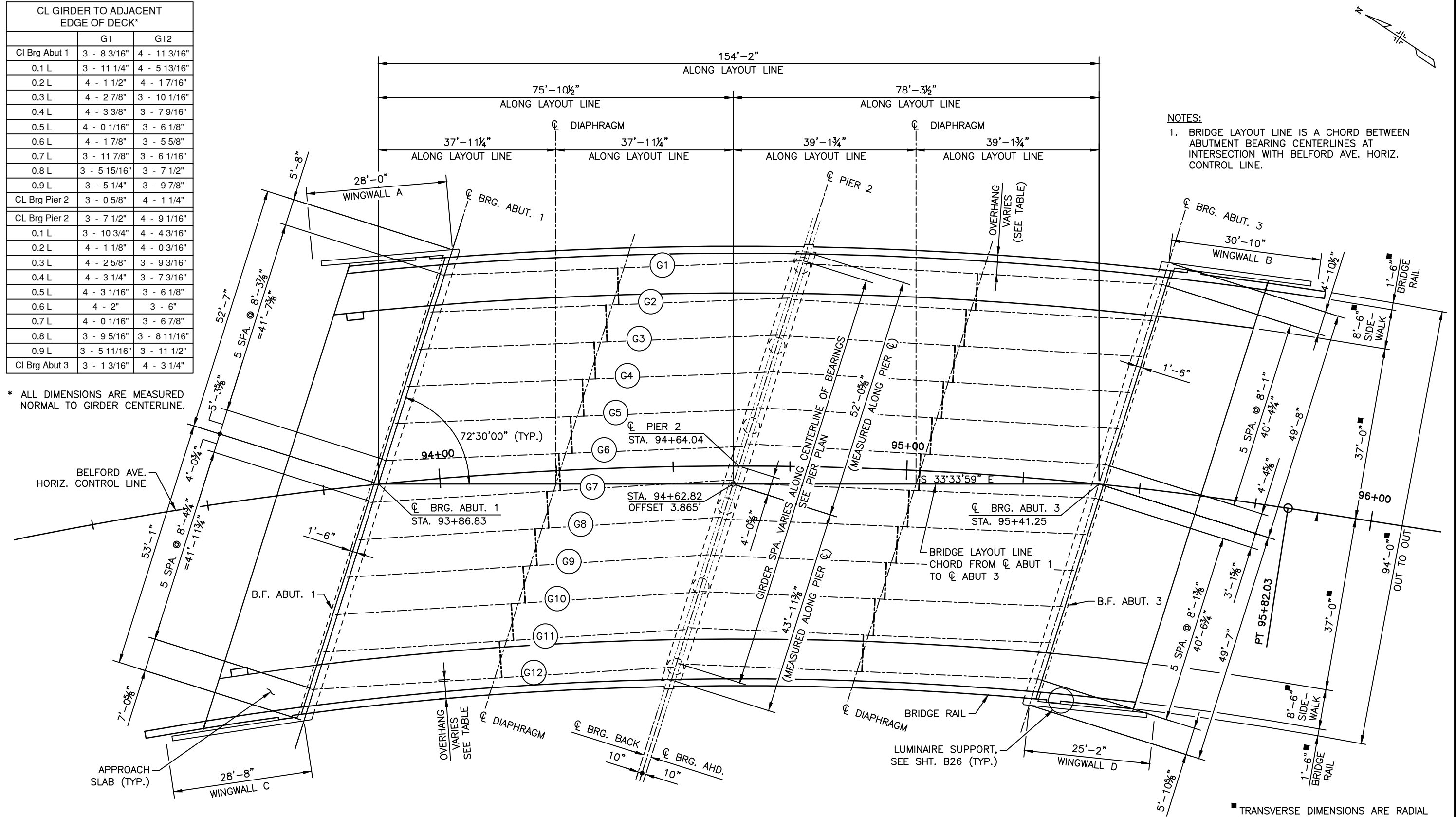


As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE BRIDGE HYDRAULIC INFORMATION (2 OF 2)		Project No./Code
No Revisions:	Designer: C. TWISS	Structure Numbers	
Revised:	Detailer: K. TURNER		
Void:	Subset: BRIDGE	Sheets: B7 of 37	Sheet Number 37

I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

CL GIRDER TO ADJACENT EDGE OF DECK*		
	G1	G12
Cl Brg Abut 1	3 - 8 3/16"	4 - 11 3/16"
0.1 L	3 - 11 1/4"	4 - 5 13/16"
0.2 L	4 - 1 1/2"	4 - 1 7/16"
0.3 L	4 - 2 7/8"	3 - 10 1/16"
0.4 L	4 - 3 3/8"	3 - 7 9/16"
0.5 L	4 - 0 1/16"	3 - 6 1/8"
0.6 L	4 - 1 7/8"	3 - 5 5/8"
0.7 L	3 - 11 7/8"	3 - 6 1/16"
0.8 L	3 - 5 15/16"	3 - 7 1/2"
0.9 L	3 - 5 1/4"	3 - 9 7/8"
CL Brg Pier 2	3 - 0 5/8"	4 - 1 1/4"
CL Brg Pier 3	3 - 7 1/2"	4 - 9 1/16"
0.1 L	3 - 10 3/4"	4 - 4 3/16"
0.2 L	4 - 1 1/8"	4 - 0 3/16"
0.3 L	4 - 2 5/8"	3 - 9 3/16"
0.4 L	4 - 3 1/4"	3 - 7 3/16"
0.5 L	4 - 3 1/16"	3 - 6 1/8"
0.6 L	4 - 2"	3 - 6"
0.7 L	4 - 0 1/16"	3 - 6 7/8"
0.8 L	3 - 9 5/16"	3 - 8 11/16"
0.9 L	3 - 5 11/16"	3 - 11 1/2"
Cl Brg Abut 3	3 - 1 3/16"	4 - 3 1/4"

\* ALL DIMENSIONS ARE MEASURED NORMAL TO GIRDER CENTERLINE.



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

CONSTRUCTION LAYOUT

I:\115360-01 - Compark at Belford\CADD\Bridge Drawings\Chase.Miyamoto

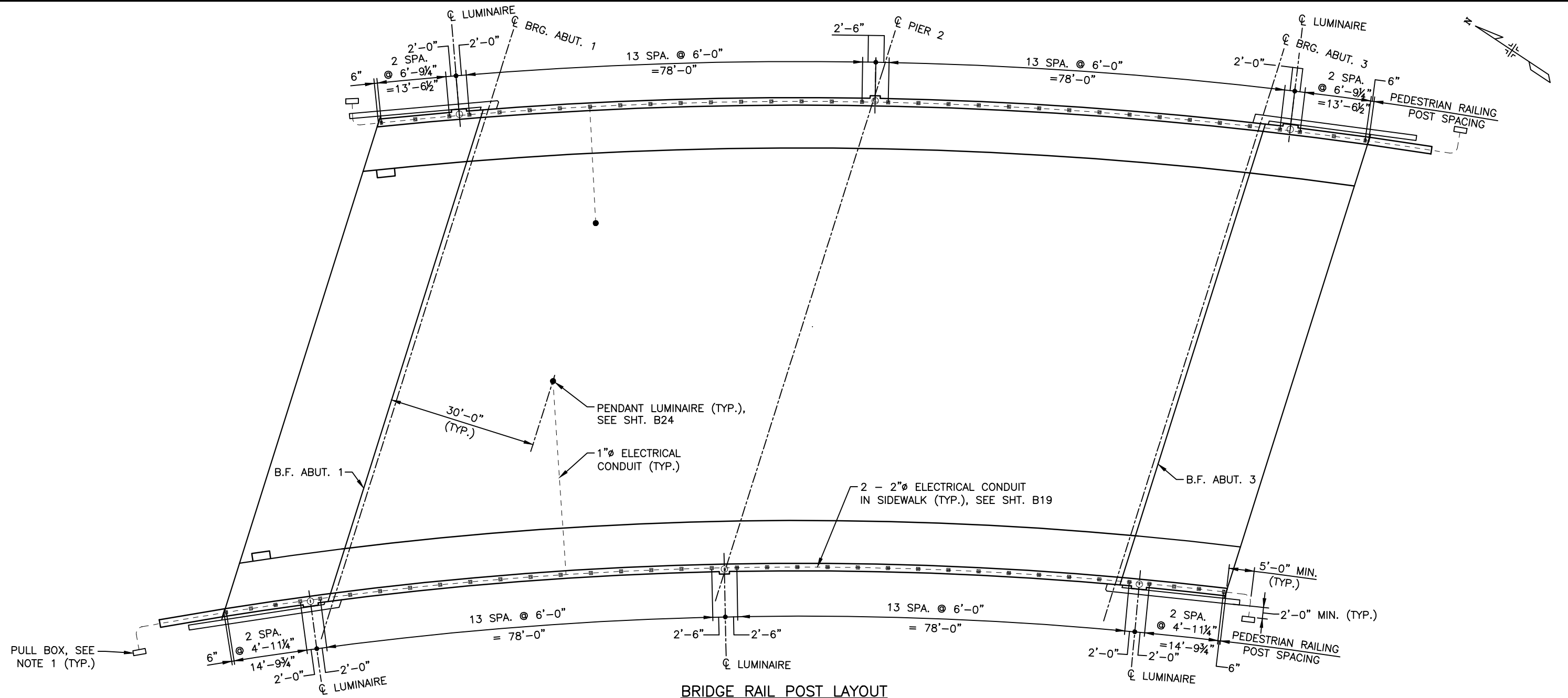
Print Date: 6/17/2021 10:41:53 AM
File Name: B115360-01CLA01.dwg
Horizontal Scale: 1"=20' Vertical Scale:
<b>FELSBURG HOLT &amp; ULLEVIG</b>
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials



As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE CONSTRUCTION LAYOUT (1 OF 2)		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	Sheet Number 38
Revised:	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B8 of 33	

I:\115360-01 - Compark at Belford\CADD\Bridge\Drawings\ Chase.Miyamoto



BRIDGE RAIL POST LAYOUT

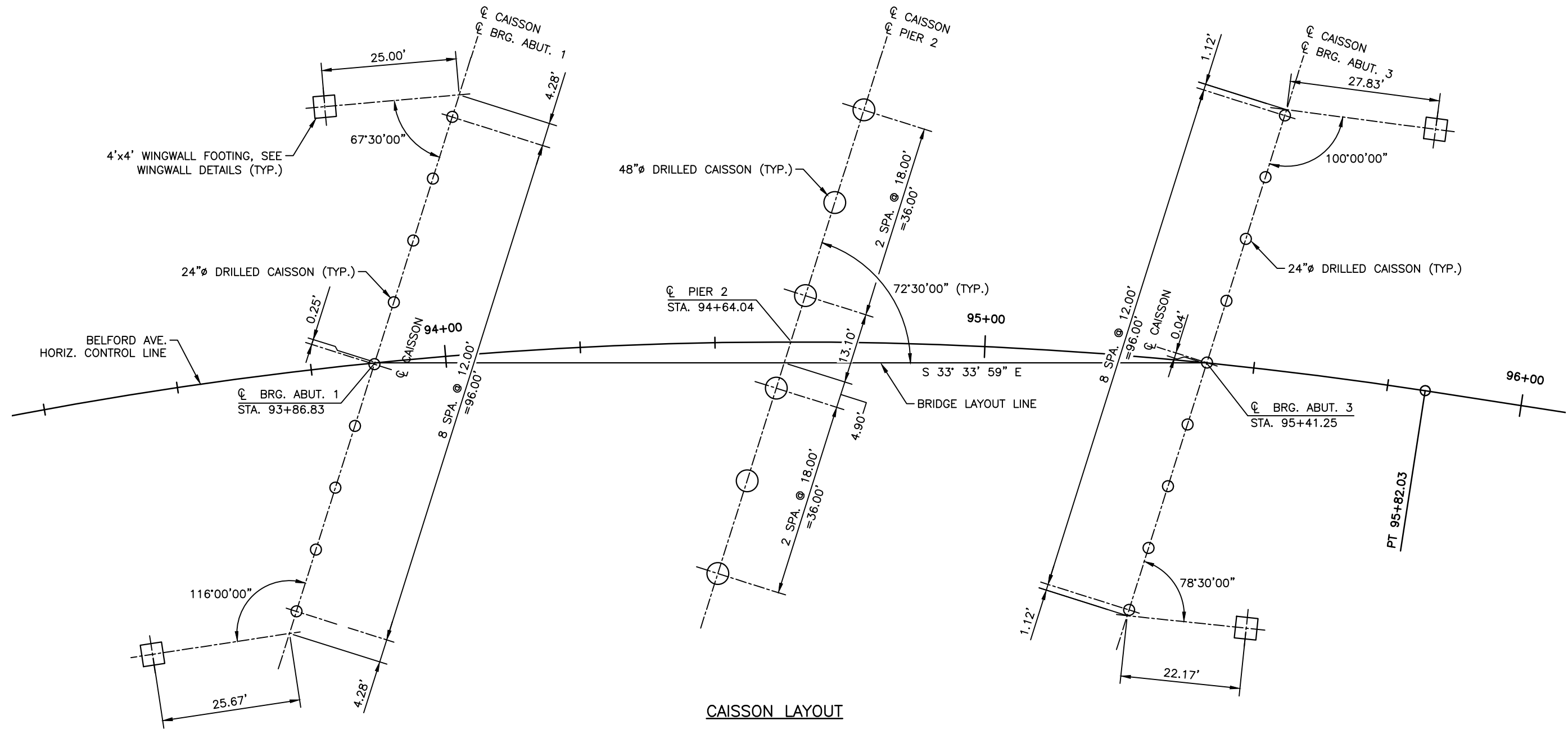
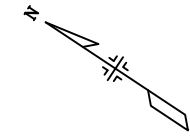
- NOTES:**
- PULL BOXES WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF ITEM 613 - 2 INCH ELECTRICAL CONDUIT. SEE CDOT S-613-1, SHT. NO. 4 OF 6 FOR TYPICAL DETAIL AND NOTES.

Print Date: 6/17/2021 10:42:07 AM  
 File Name: B115360-01CLA02.dwg  
 Horizontal Scale: 1"=20' Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

**Manhard CONSULTING LTD**  
8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE CONSTRUCTION LAYOUT (2 OF 2)		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B9 of 33	Sheet Number 39



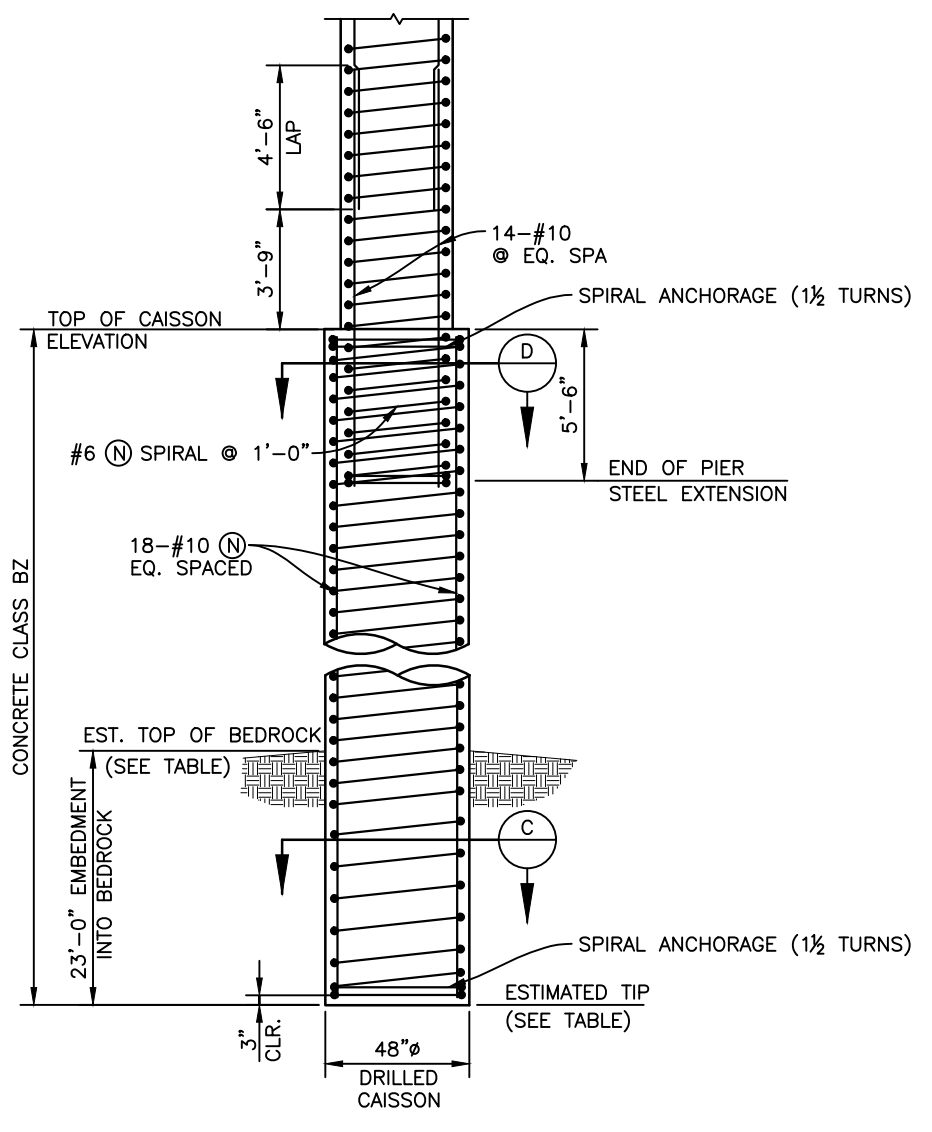
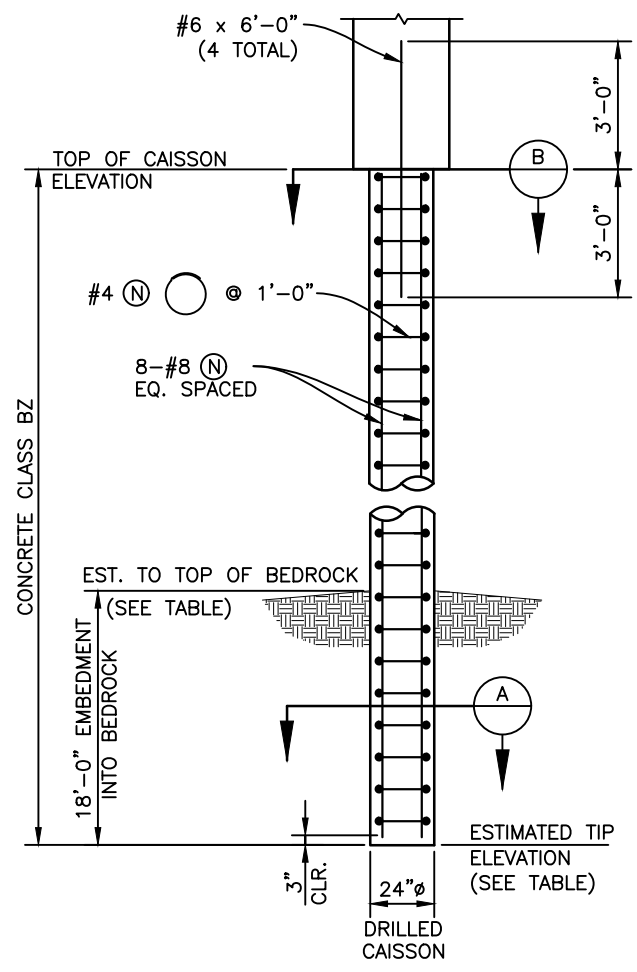
I:\115360-01 - Compark at Belford\CADD\Bridge Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:42:30 AM	
File Name: B115360-01FDN01.dwg	
Horizontal Scale: 1"=20'	Vertical Scale:
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

Sheet Revisions		
Date	Comments	Initials



As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE		Project No./Code
No Revisions:	CAISSON LAYOUT		
Revised:	Designer: J. LYNCH	Structure Numbers	Sheet Number 40
Void:	Detailer: R. DILLON	Numbers	
	Subset: BRIDGE	Sheets: B10 of 33	



	MAX. LOAD (service) (kips)	MAX. LOAD (factored) (kips)	TOP OF CAISSON ELEVATION	EST. TOP OF BEDROCK ELEVATION	EST. TIP ELEVATION
ABUTMENT 1	316	437	5771.64	5749.80	5731.70
PIER 2	729	1008	5764.00	5747.00	5724.00
ABUTMENT 3	321	442	5772.94	5747.30	5729.30

**CAISSON NOTES:**

- 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.
- TOP OF HARD BEDROCK ELEVATION SHALL BE VERIFIED AT TIME OF CONSTRUCTION BY THE GEOTECHNICAL ENGINEER.
- THE USE OF TEMPORARY CASING & DEWATERING DURING DRILLING CAISSONS WILL BE REQUIRED. THE COST OF TEMPORARY CASING & DEWATERING SHALL BE INCLUDED IN THE COST OF ITEM 503 - DRILLED CAISSON (24 INCH) AND ITEM 503 - DRILLED CAISSON (48 INCH).
- EXPANSION JOINT MATERIAL SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 503 - DRILLED CAISSON (24 INCH).
- INSIDE "HINGE REGIONS", AS DEFINED ON BA18, SPIRAL REINFORCEMENT SHALL ONLY BE SPLICED WITH WELDED OR MECHANICAL CONNECTIONS THAT ARE CAPABLE OF DEVELOPING 125% OF REINFORCING STEEL TENSILE STRENGTH. OTHERWISE, SPIRALS MAY BE LAP SPLICED WITH THE FOLLOWING LAP LENGTHS:  
 #4 SPIRALS: 3'-0" LAP LENGTH  
 #6 SPIRALS: 4'-6" LAP LENGTH

**DESIGN DATA:**

CAISSONS AND PILES ARE DESIGNED PER AASHTO LRFD

CAISSONS:

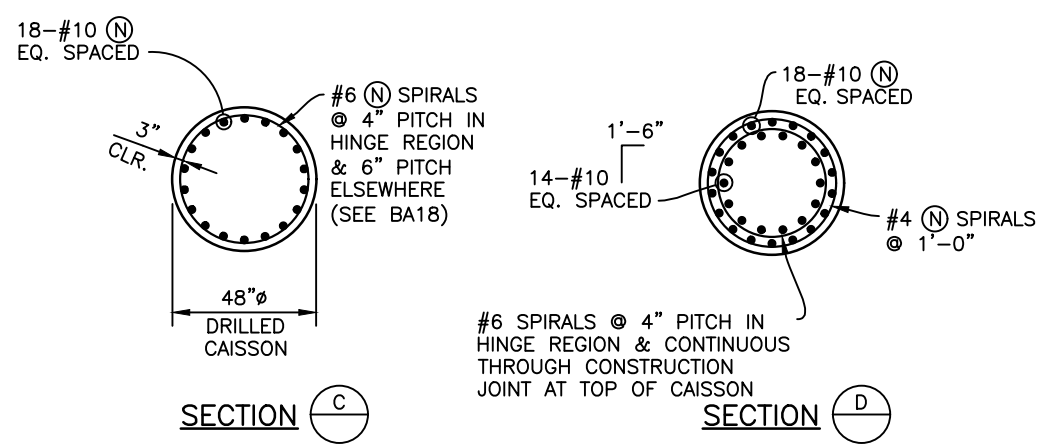
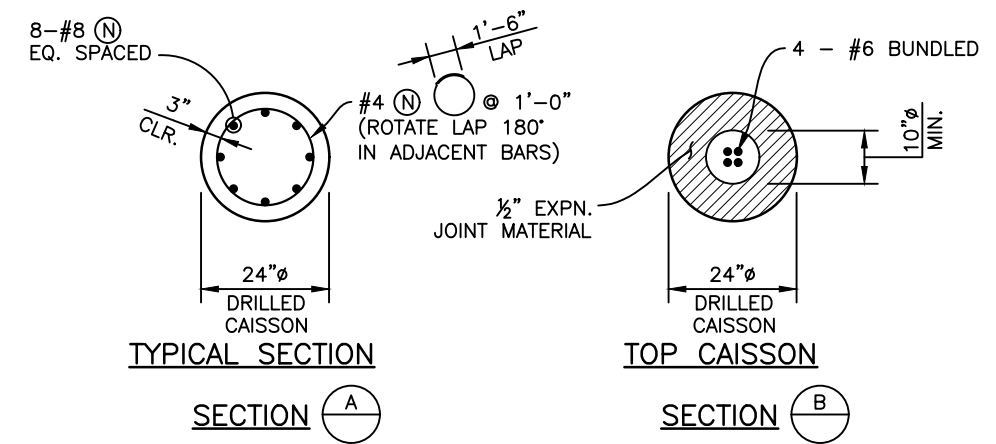
NOMINAL TIP RESISTANCE IN BEDROCK = 78.2 KSF

NOMINAL SIDE RESISTANCE IN BEDROCK = 6.37 KSF

NOMINAL UPLIFT RESISTANCE IN BEDROCK = 6.37 KSF

RESISTANCE FACTORS FOR TIP, SIDE AND UPLIFT RESISTANCE ARE 0.55, 0.60, 0.40, RESPECTIVELY.

BAR SIZE	SPLICE LENGTH
#8	3'-2"
#10	4'-10"



ABUTMENT CAISSON DETAILS

PIER CAISSON SECTION (SEE NOTES REGARDING SPIRAL LAP SPLICES)

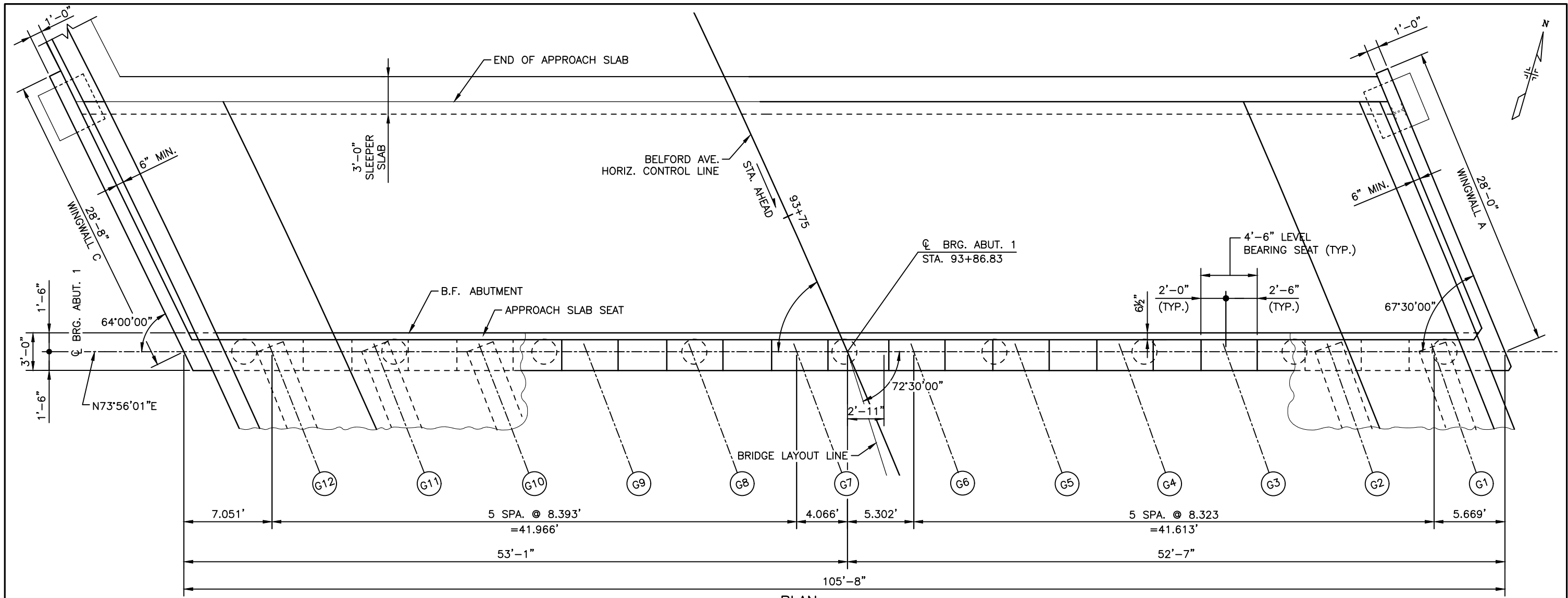
I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

Print Date: 6/17/2021 10:42:38 AM  
 File Name: B115360-01FDN02.dwg  
 Horizontal Scale: VARIES Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

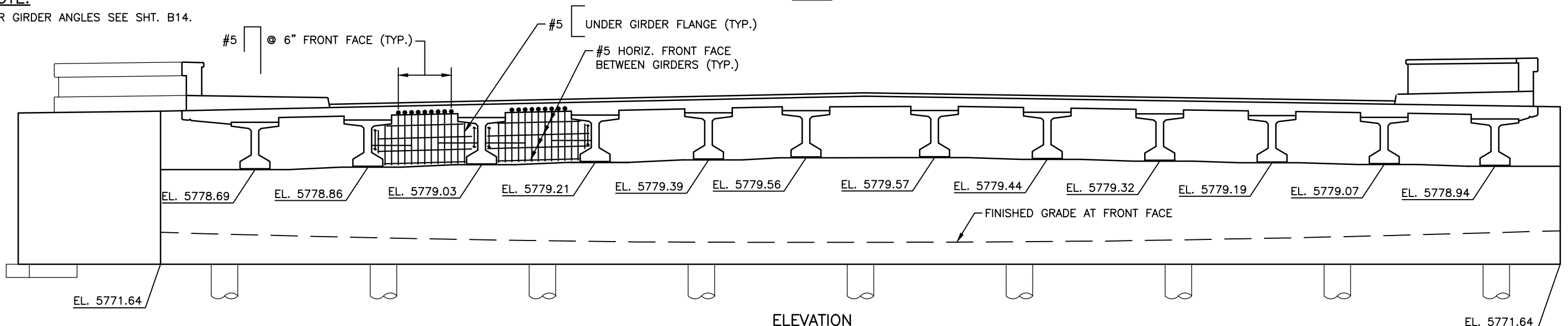
**Manhard CONSULTING LTD**  
 8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112  
 303.728.0900 303.728.0100  
 CEM Engineers - Surveyors - Water Resources Engineers - Water & Wastewater Engineers  
 Construction Managers - Environmental Scientists - Landscape Architects - Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE CAISSON DETAILS		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B11 of 33	Sheet Number 41



PLAN

**NOTE:**  
FOR GIRDER ANGLES SEE SHT. B14.



ELEVATION

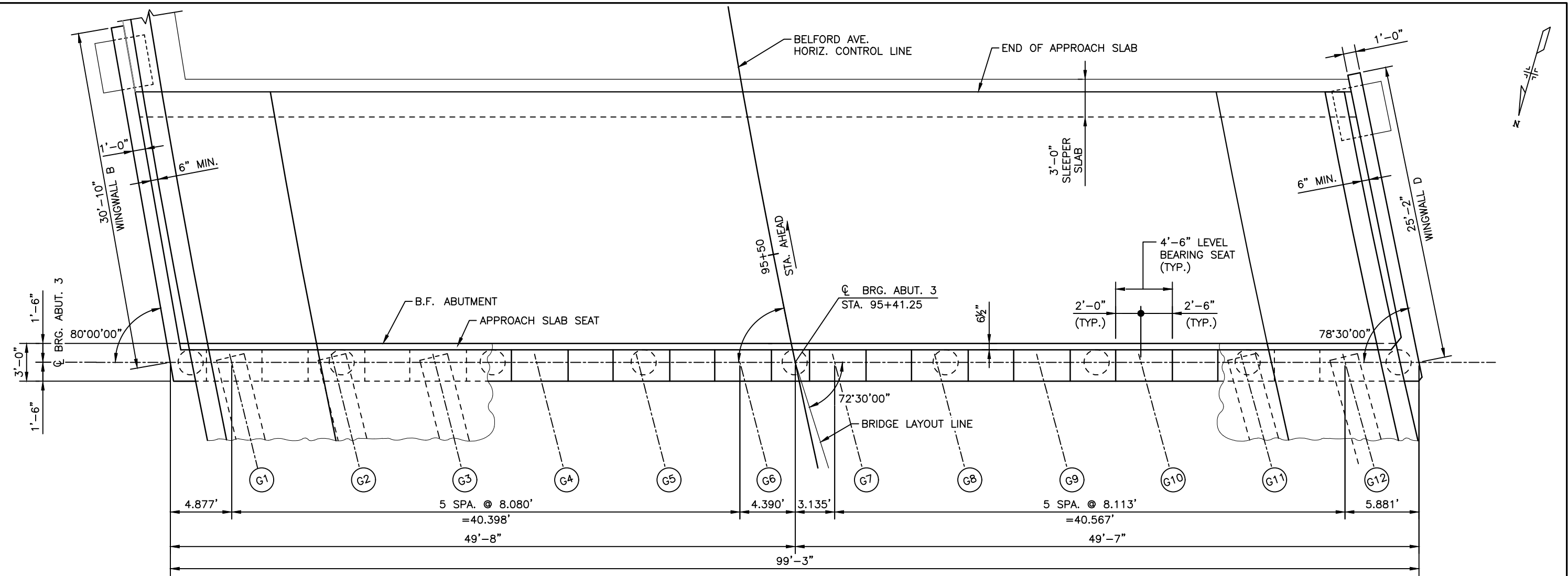
I:\115360-01 - Compark at Belford\CADD\Bridge Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:42:56 AM  
 File Name: B115360-01ABT01.dwg  
 Horizontal Scale: 1/8"=1'-0" Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

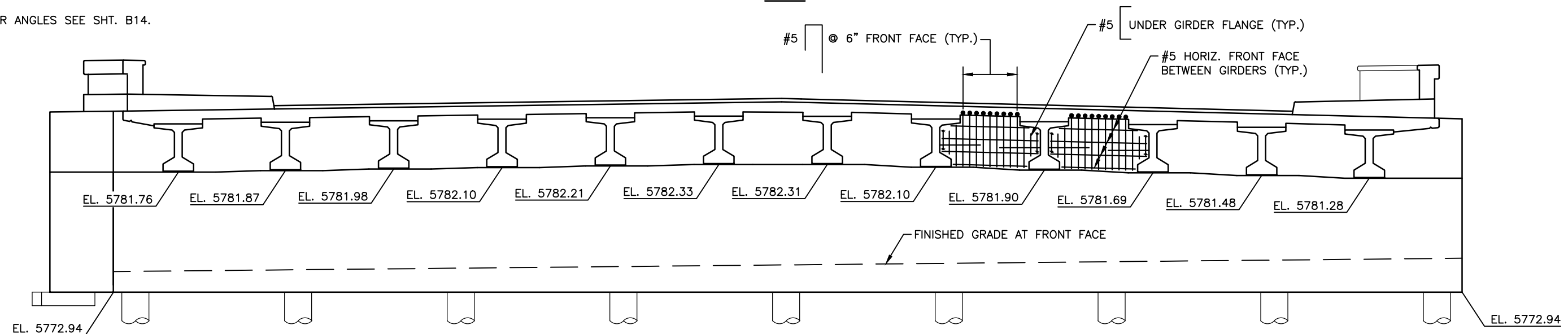


As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE ABUTMENT 1		Project No./Code
No Revisions:	PLAN & ELEVATION		
Revised:	Designer: J. LYNCH	Structure Numbers	
	Detailer: R. DILLON		
Void:	Subset: BRIDGE	Sheets: B12 of 33	Sheet Number 42



PLAN

NOTE:  
FOR GIRDER ANGLES SEE SHT. B14.



ELEVATION

I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

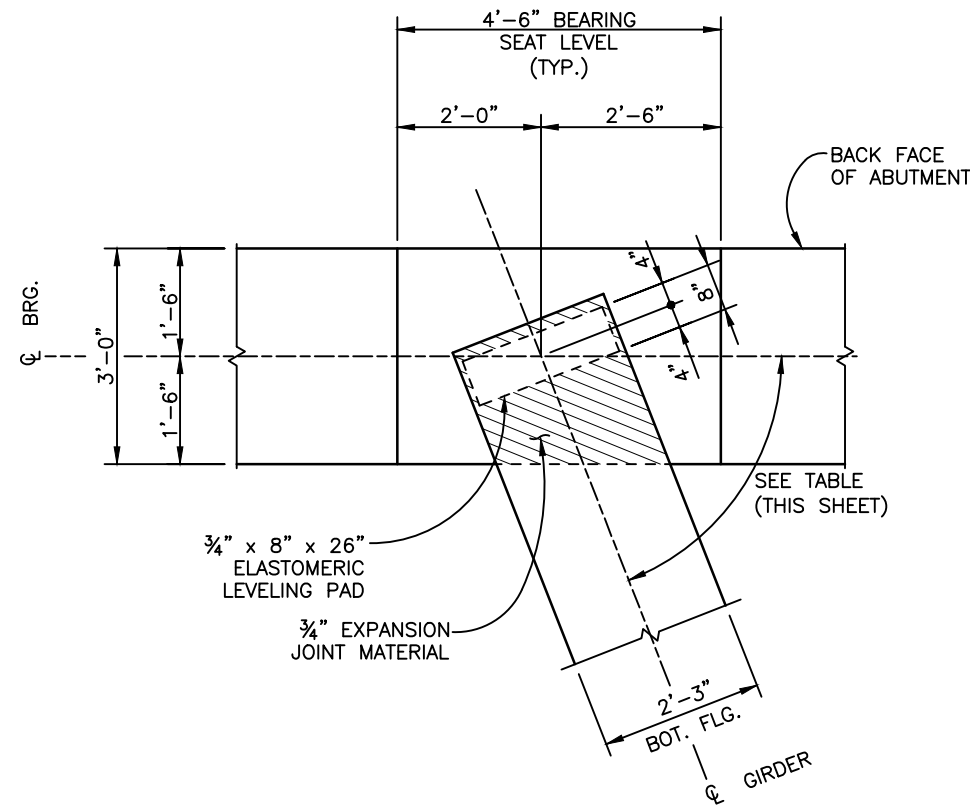
Print Date: 6/17/2021 10:43:15 AM
File Name: B115360-01ABT02.dwg
Horizontal Scale: 1/8"=1'-0" Vertical Scale:
<b>FELSBURG HOLT &amp; ULLEVIG</b>
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

**Manhard CONSULTING LTD**

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE ABUTMENT 3		Project No./Code
No Revisions:	PLAN & ELEVATION		
Revised:	Designer: J. LYNCH	Structure Numbers	
Void:	Detailer: R. DILLON	Numbers	
	Subset: BRIDGE	Sheets: B13 of 33	Sheet Number 43



**BEARING DETAIL**

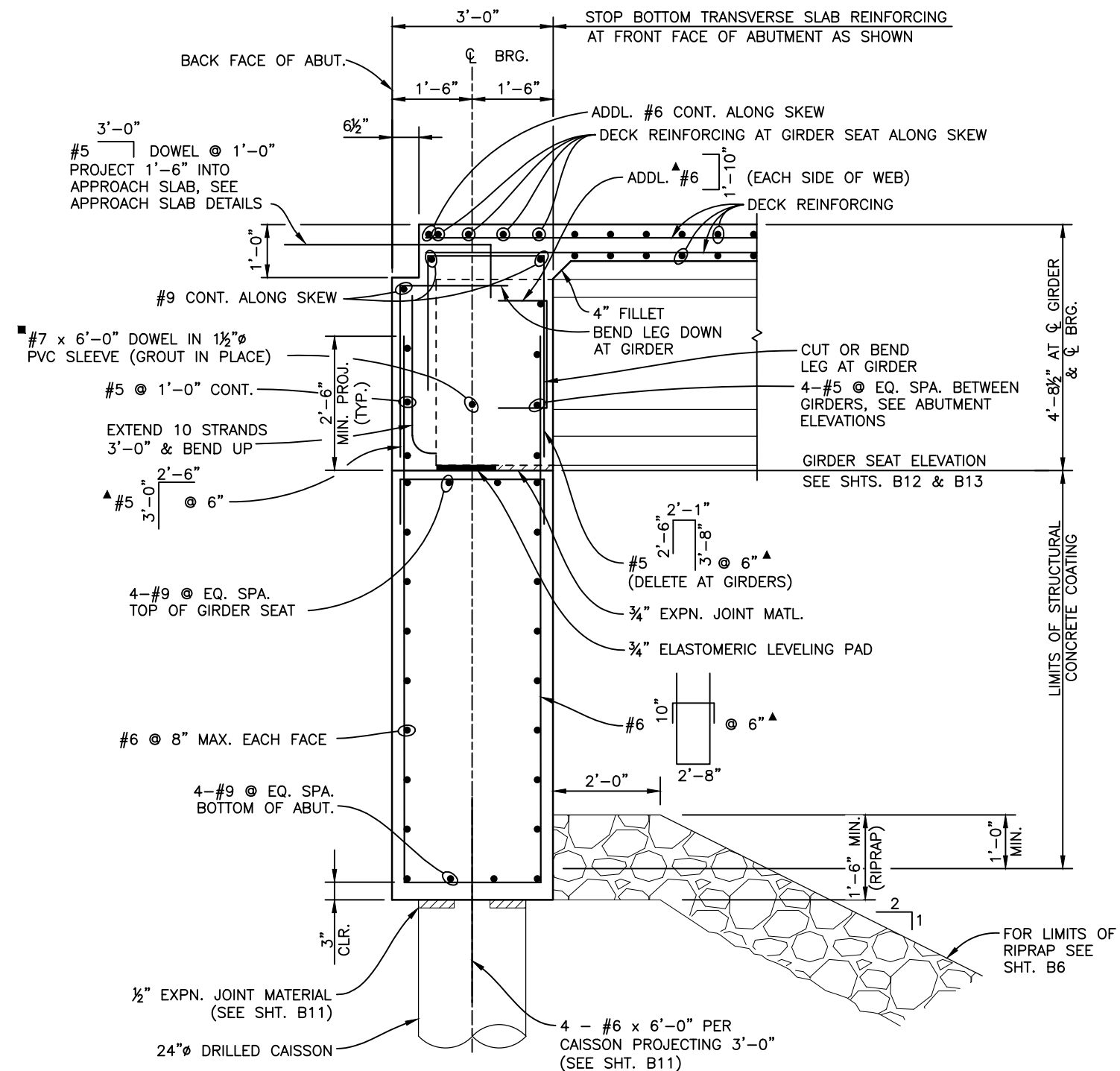
**GIRDER ANGLES**

CL GIRDER TO CL ABUT ANGLES		
GIRDER No.	ABUT. 1	ABUT. 3
G1-G6	70°15'28.35"	75°48'58.53"
G7-G12	68°57'14.35"	74°54'00.43"

LAP SPLICE TABLE	
BAR SIZE	SPLICE LENGTH
#5	2'-11"
#6	3'-6"
#9	6'-3"

**NOTES:**

1. SLAB AND PORTION OF ABUTMENT ABOVE BEARING SEAT TO BE POURED MONOLITHICALLY.
2. ELASTOMERIC LEVELING PAD AND EXPANSION JOINT MATERIAL SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN ITEM 618 - PRESTRESSED I (BT42)



**TYPICAL ABUTMENT SECTION**

■ DOWEL SHALL BE BENT IN FIELD, IF NECESSARY, TO MAINTAIN REQUIRED COVER

▲ TRANSVERSE STEEL SHALL BE ALIGNED WITH GIRDER CENTERLINE

I:\115360-01 - Compare at Belford\CADD\Bridges\Drawings\ - Chase.Miyamoto

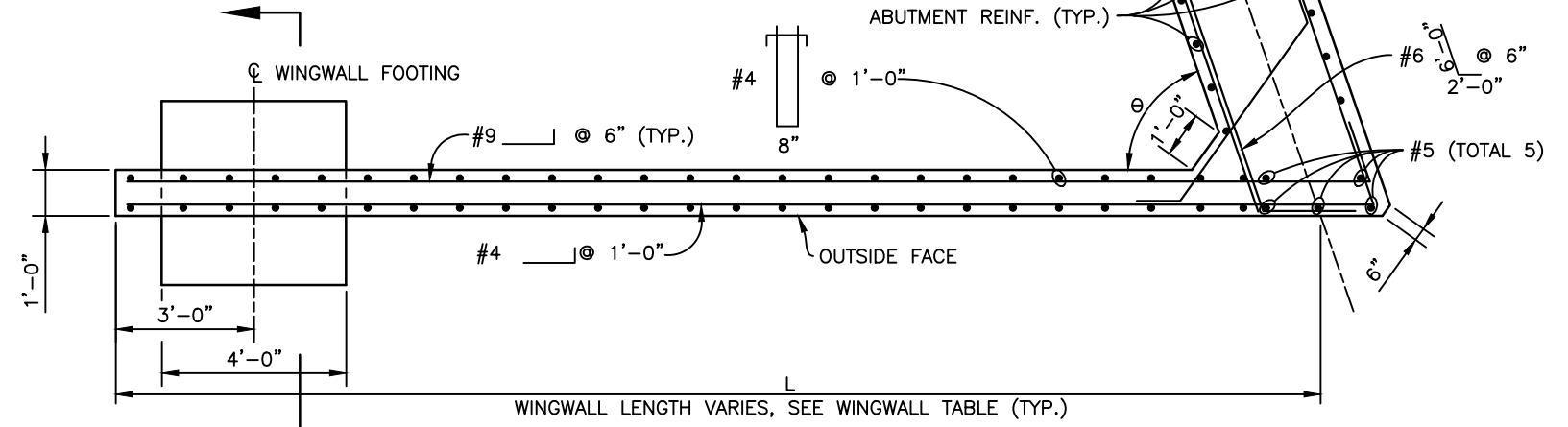
Print Date: 6/17/2021 10:43:27 AM  
 File Name: B115360-01ABT03.dwg  
 Horizontal Scale: VARIES Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions			
Date	Comments	Initials	

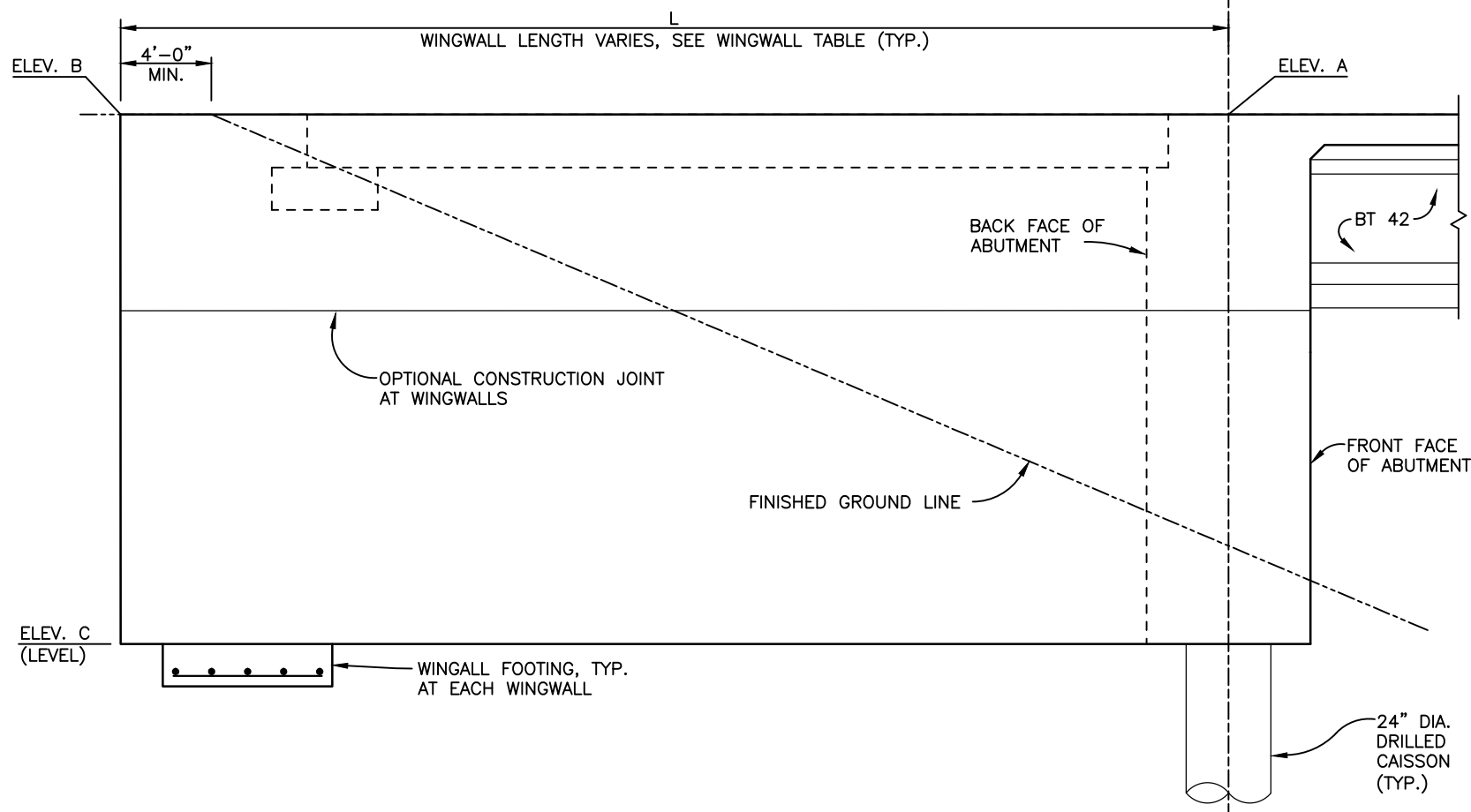
**Manhard CONSULTING LTD**  
 8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE ABUTMENT SECTIONS & DETAILS		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B14 of 33	Sheet Number 44

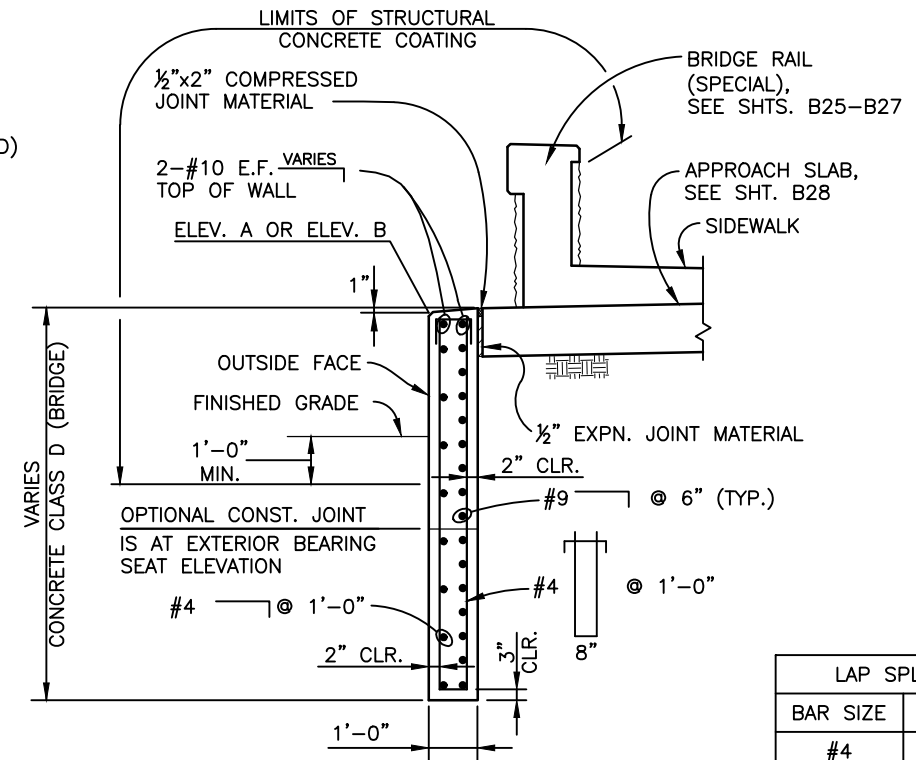
WINGWALL TABLE					
LOCATION	L	θ	ELEV. A	ELEV. B	ELEV. C
WINGWALL A	28'-0"	67°30'00"	5783.48	5783.25	5771.64
WINGWALL C	28'-8"	116°00'00"	5783.17	5783.08	5771.64
WINGWALL B	30'-10"	100°00'00"	5786.31	5787.20	5772.94
WINGWALL D	25'-2"	78°30'00"	5785.75	5786.51	5772.94



**WINGWALL SECTION**  
(WINGWALL A OR D SHOWN, WINGWALLS B & C SIMILAR)

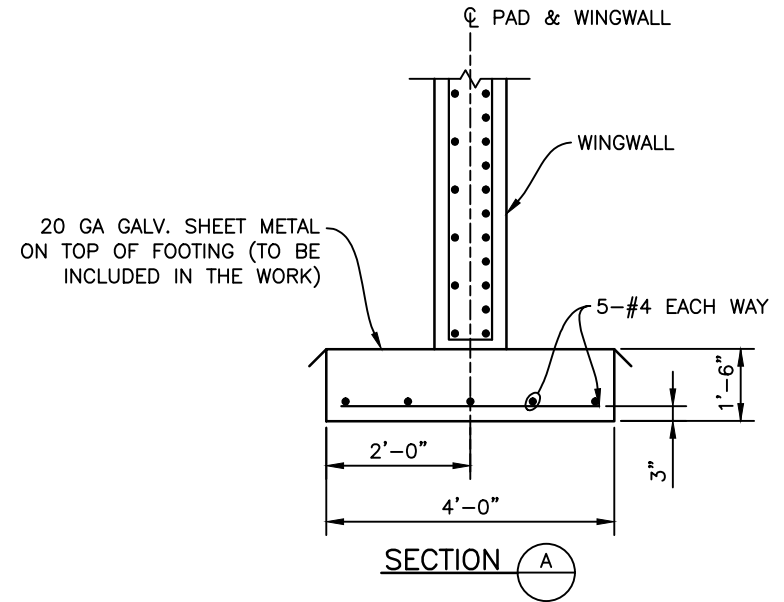


**ELEVATION**



**TYPICAL WINGWALL SECTION**

LAP SPLICE TABLE	
BAR SIZE	SPLICE LENGTH
#4	1'-10"
#9	5'-6"
#10	7'-8"



- NOTES:**
- ELEVATIONS A & B ARE AT THE OUTSIDE FACE OF THE WINGWALL AS SHOWN IN TYPICAL WINGWALL SECTION.
  - BACKFILL AT THE OUTSIDE FACE OF WINGWALLS SHALL BE PLACED CONCURRENTLY WITH BACKFILL BEHIND THE WALLS.

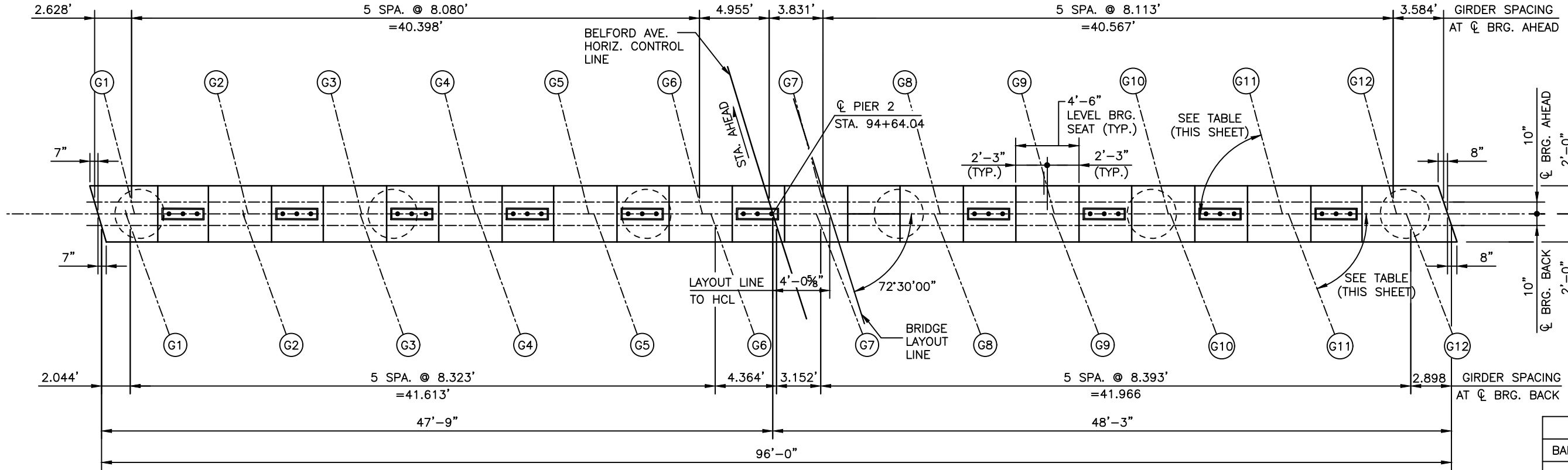
I:\115360-01 - Compark at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

Print Date: 6/17/2021 10:43:37 AM  
 File Name: B115360-01WWL01.dwg  
 Horizontal Scale: VARIES Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

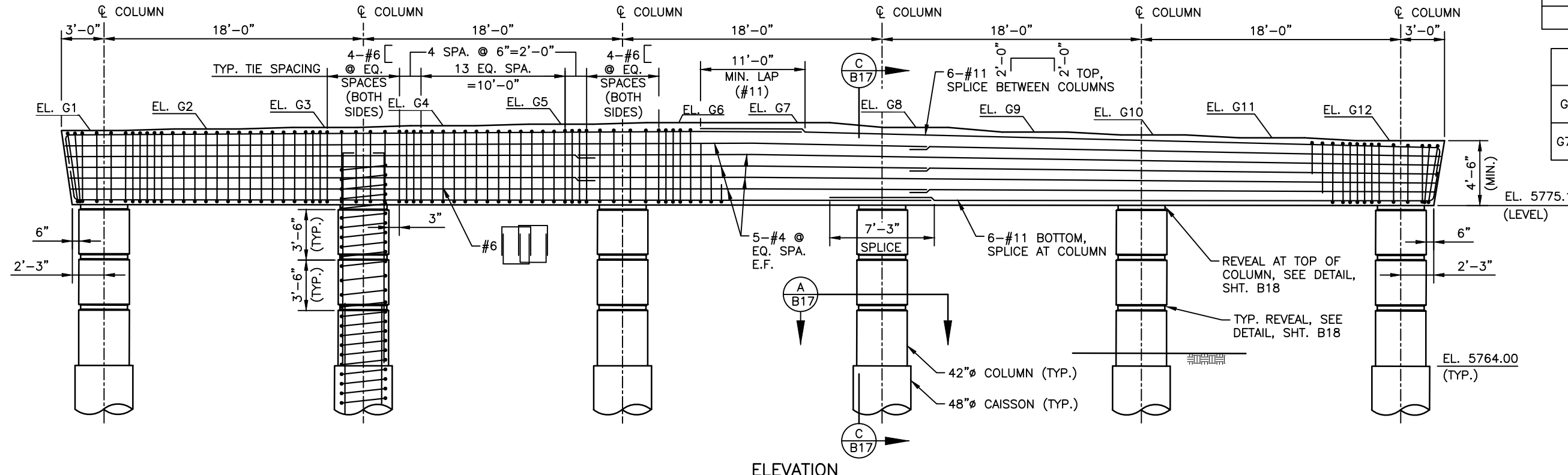
Sheet Revisions		
Date	Comments	Initials

**Manhard CONSULTING LTD**  
 8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0100 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE WINGWALL DETAILS		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B15 of 33	Sheet Number 45



PLAN



ELEVATION

LAP SPLICE TABLE	
BAR SIZE	SPLICE LENGTH
#4	1'-10"
#9	5'-6"
#11	8'-2"

GIRDER TO PIER ANGLES	
GIRDER	ANGLE
G1-G6	S 75°48'58.53"
	N 70°15'28.35"
G7-G12	S 74°54'00.43"
	N 68°57'14.35"

BEARING SEAT ELEVATIONS	
ELEVATION	VALUE
EL. G1	5780.00
EL. G2	5780.12
EL. G3	5780.23
EL. G4	5780.34
EL. G5	5780.46
EL. G6	5780.57
EL. G7	5780.55
EL. G8	5780.35
EL. G9	5780.15
EL. G10	5779.94
EL. G11	5779.74
EL. G12	5779.54

(ELEVATIONS TO TOC)

I:\115360-01 - Compare at Belford\CADD\Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:43:47 AM  
 File Name: B115360-01PIR01.dwg  
 Horizontal Scale: 1/8"=1'-0" Vertical Scale:

6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

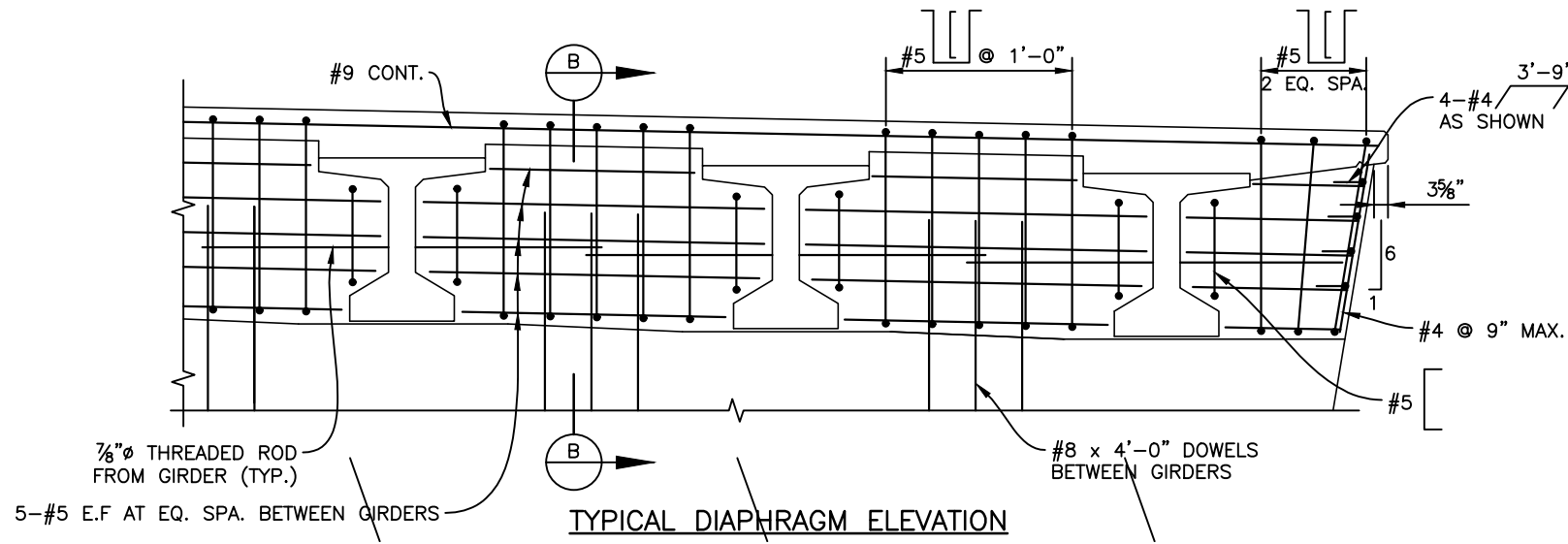
Sheet Revisions		
Date	Comments	Initials

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0100 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE PIER 2 PLAN & ELEVATION	
No Revisions:	Designer: J. LYNCH	Structure Numbers
Revised:	Detailer: R. DILLON	
Void:	Subset: BRIDGE	Sheets: B16 of 33

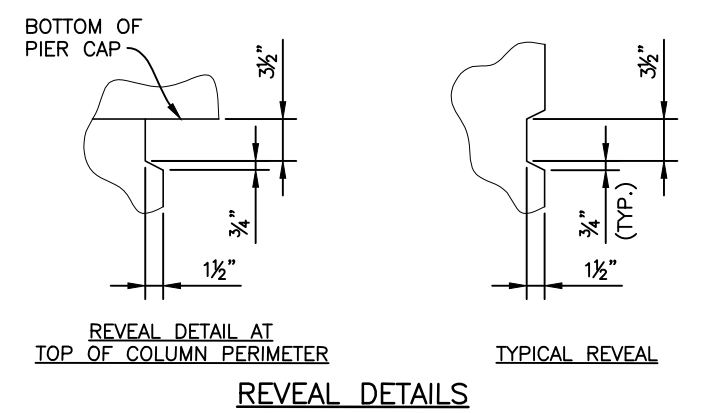
Project No./Code
Sheet Number 46

I:\115360-01 - Compare at Belford\CADD\Bridges Drawings\Chase.Miyamoto

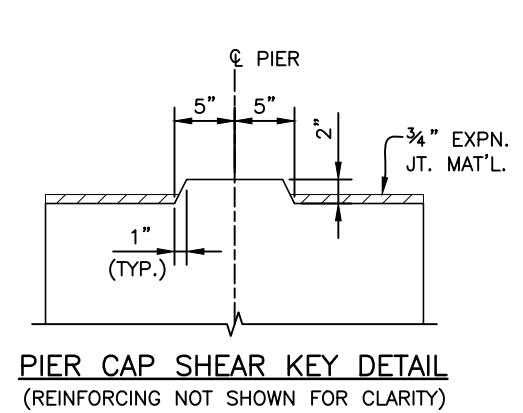


TYPICAL DIAPHRAGM ELEVATION

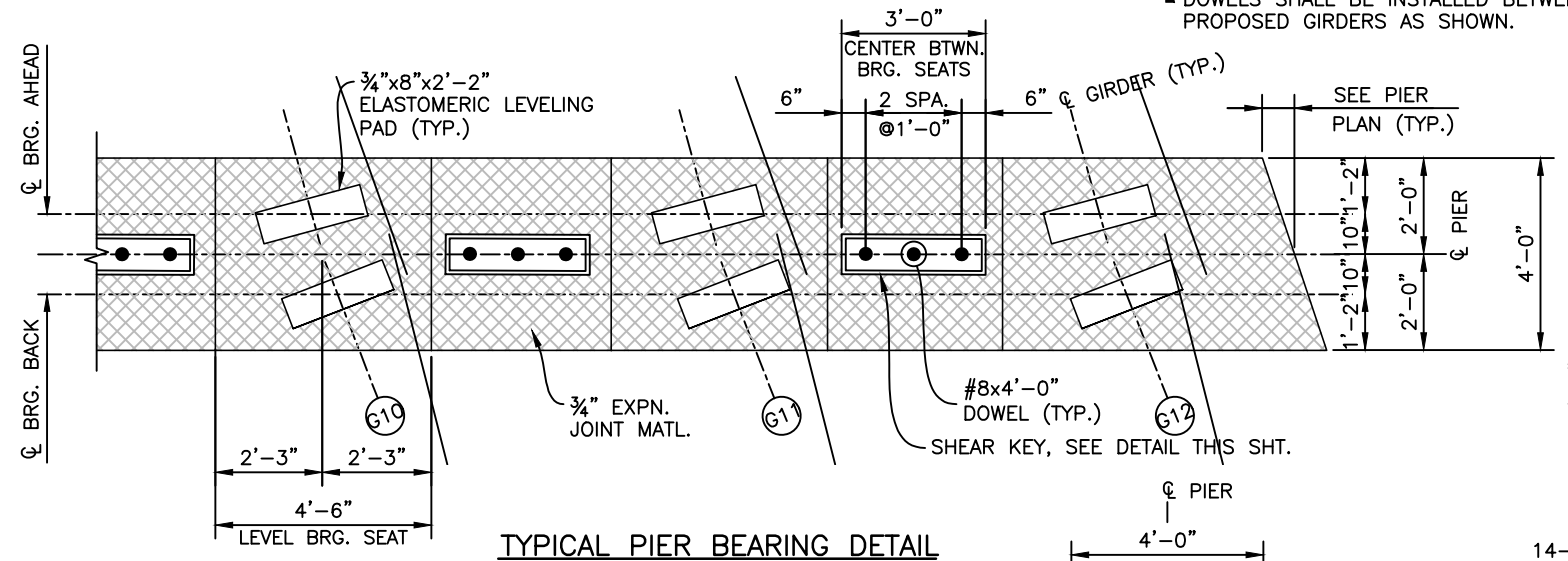
- NOTES:**
1. WITHIN "HINGE REGIONS", SPLICES IN SPIRAL REINFORCEMENT SHALL BE MADE WITH FULL-WELDED SPLICES OR FULL-MECHANICAL CONNECTIONS THAT DEVELOP 125% OF REINFORCING STEEL TENSILE STRENGTH.
  2. SPIRALS MUST COMPLETE TWO ROTATIONS BEYOND "HINGE REGION" BOUNDARY BEFORE PITCH CAN INCREASE.
  3. SEE B11 FOR LIMITS OF PIER STEEL INTO CAISSON.
  4. ALL SPIRALS SHALL BE ANCHORED BY 1½ EXTRA TURNS OF SPIRAL BAR AT EACH END.



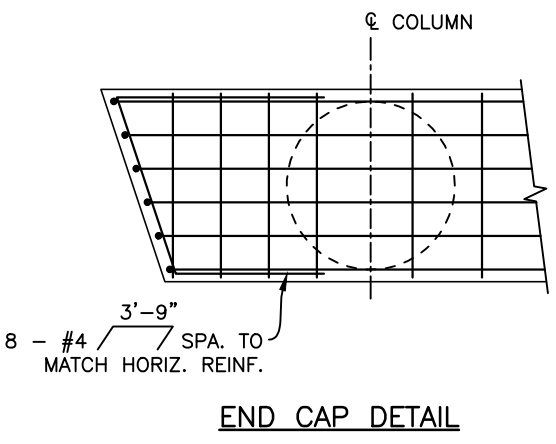
REVEAL DETAILS



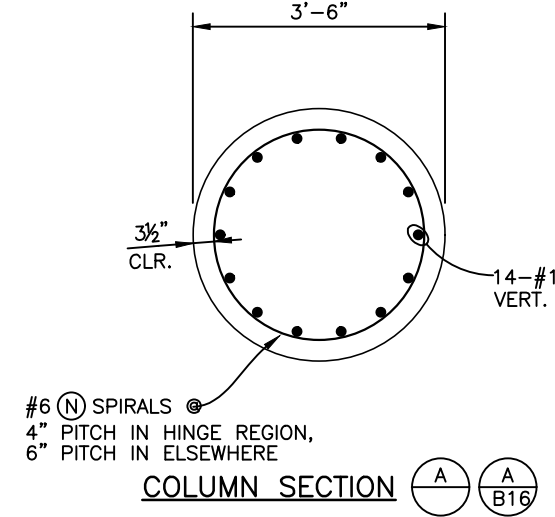
PIER CAP SHEAR KEY DETAIL (REINFORCING NOT SHOWN FOR CLARITY)



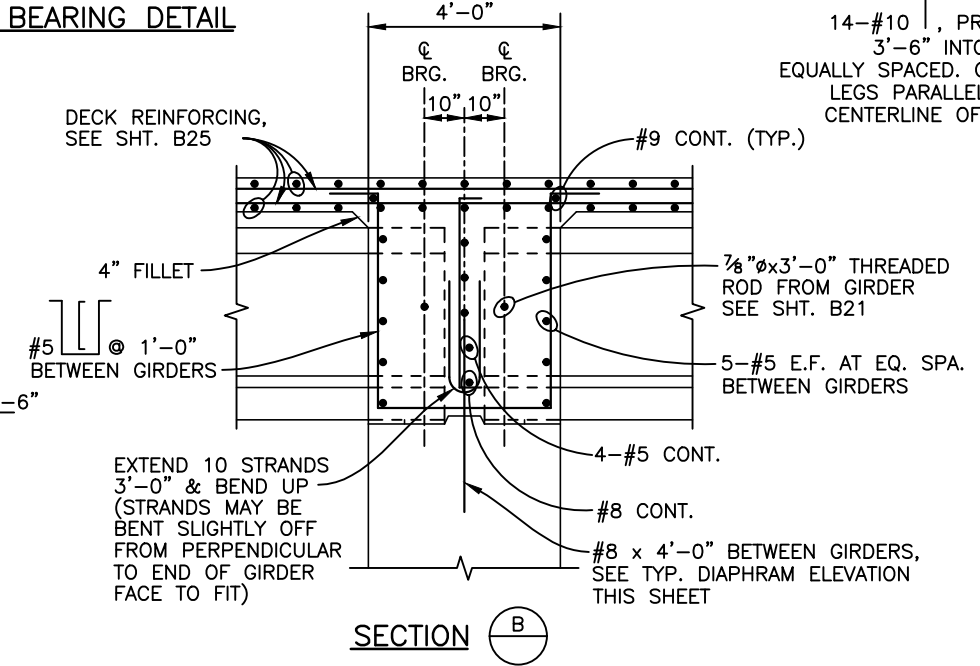
TYPICAL PIER BEARING DETAIL



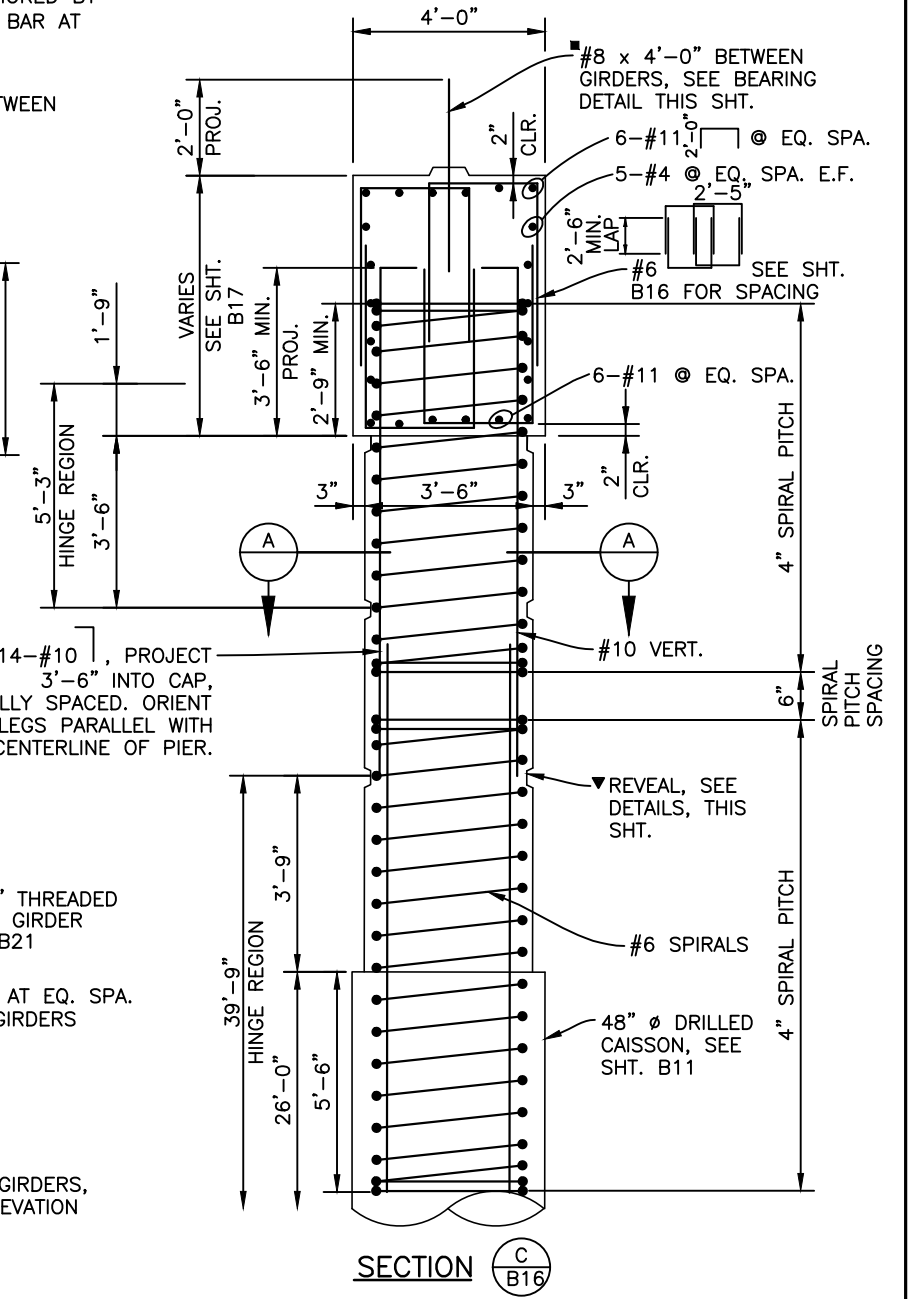
END CAP DETAIL



COLUMN SECTION



SECTION B



SECTION C

■ DOWELS SHALL BE INSTALLED BETWEEN PROPOSED GIRDERS AS SHOWN.

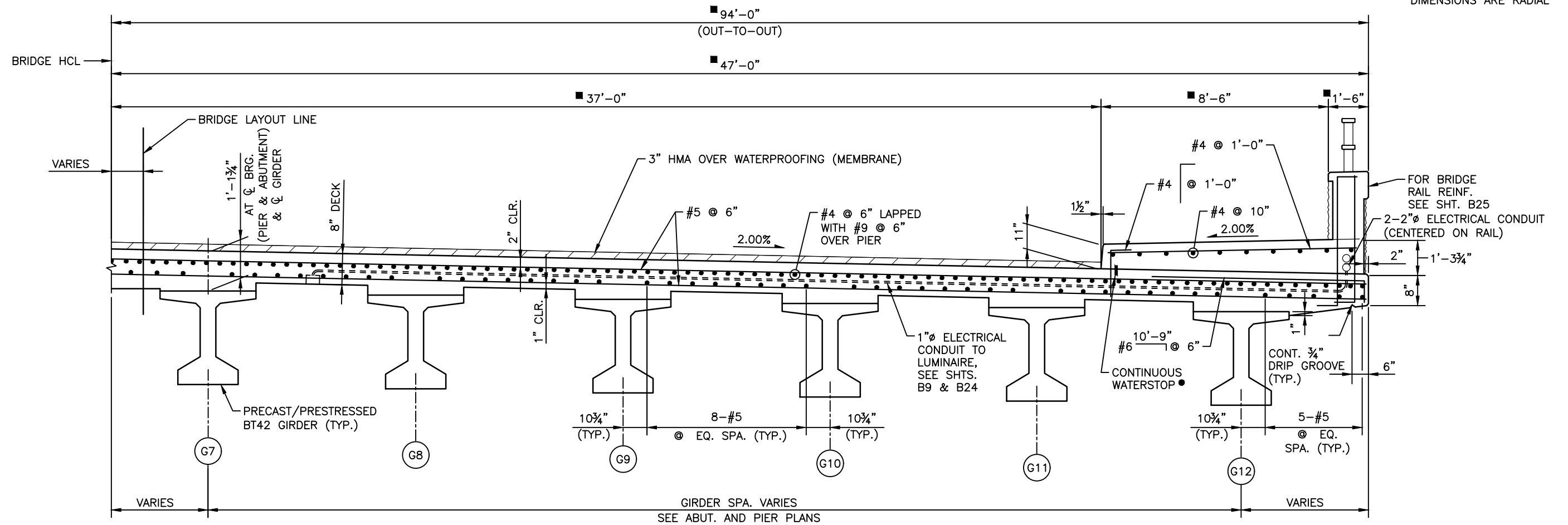
Print Date: 6/17/2021 10:44:02 AM  
 File Name: B115360-01PIR02.dwg  
 Horizontal Scale: VARIES Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

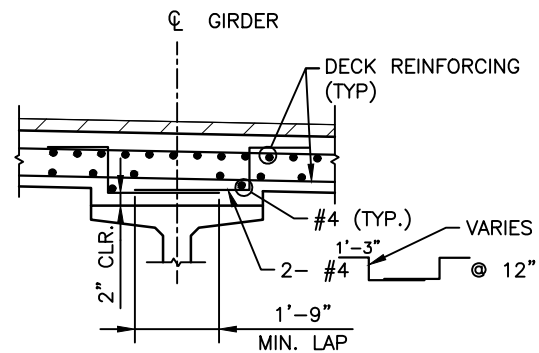


As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE PIER 2 SECTIONS & DETAILS		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: DILLON/MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B17 of 33	Sheet Number 47

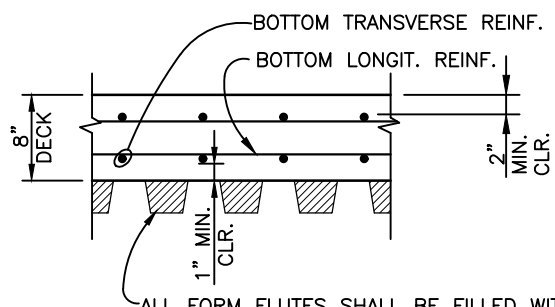
■ DIMENSIONS ARE RADIAL



**PARTIAL TYPICAL SECTION**  
(LOOKING SOUTH)  
(RIGHT SIDE SHOWN, LEFT SIMILAR)



**HAUNCH REINFORCEMENT DETAIL**  
(PROVIDE WHEN HAUNCH DEPTH EXCEEDS 4 INCHES AT  $\phi$  GIRDER)



**PERMANENT STEEL DECK FORM DETAIL**  
(DETAILS FOR CONCRETE DECK FORMS FOUND ON B22-B23)

**NOTES:**

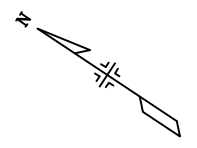
1. DECK & SIDEWALK CONCRETE SHALL BE CLASS D (BRIDGE).
2. PROVIDE TRANSVERSE RAKE FINISH ( $\frac{1}{4}$ "± AMPLITUDE) ON THE BRIDGE DECK IN THE AREAS WHERE SIDEWALK IS TO BE PLACED, CLEAN PRIOR TO PLACING SIDEWALK CONCRETE.
- ▲ BAR MAY BE STABBED INTO WET CONCRETE WITH 6" MIN. EMBEDMENT, OR DRILLED & EPOXIED INTO DECK AFTER SLAB HAS CURED. USE HILTI HIT HY-150 EPOXY ADHESIVE, OR APPROVED EQUAL, 6" MIN. EMBEDMENT DEPTH. IF DRILL AND EPOXY OPTION IS USED, 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 AND CURBS. SEALER SHALL AVOID AREAS REQUIRING STONE VENEER.
4. STAGGER ALL LONGITUDINAL REINFORCING BAR SPLICES.

I:\115360-01 - Compark at Belford\CADD\Bridge\Drawings\Chase.Miyamoto

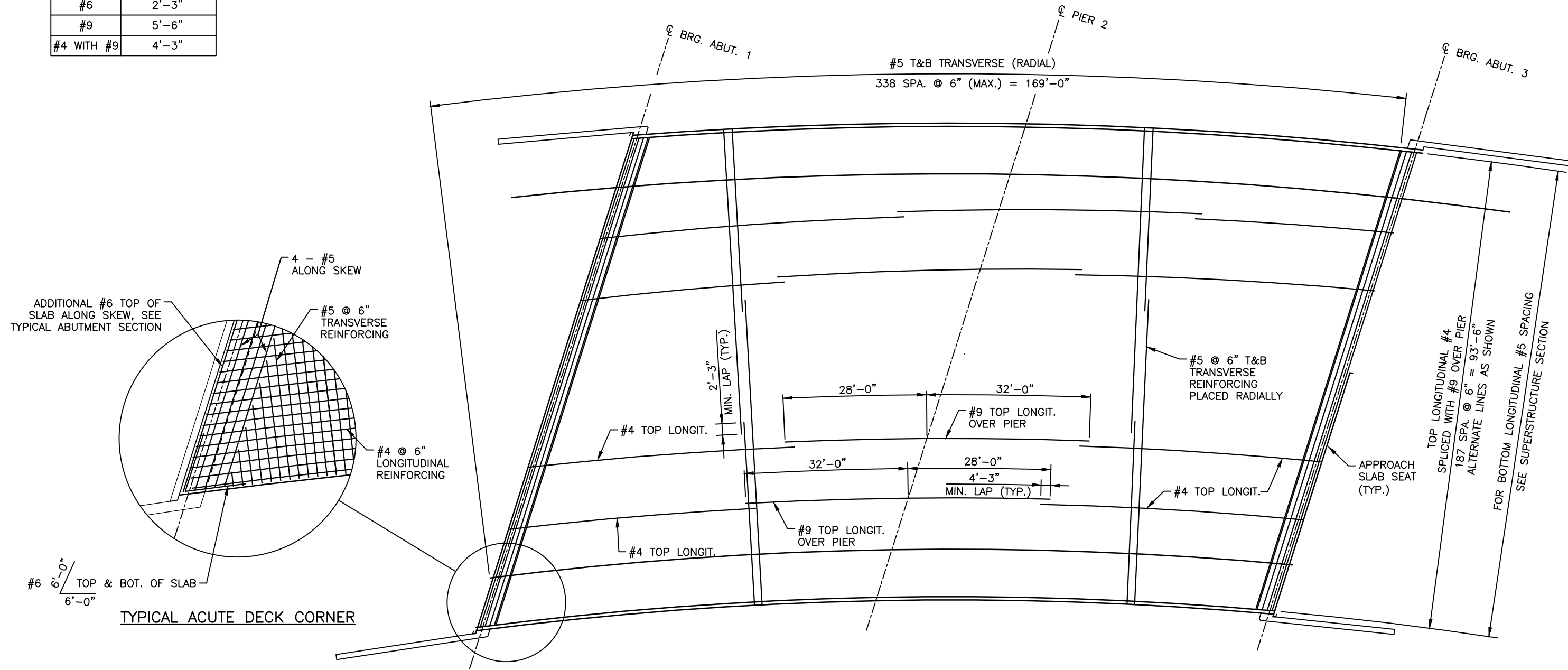
Print Date: 6/17/2021 10:44:13 AM	000
File Name: B115360-01SUP01.dwg	
Horizontal Scale: VARIES Vertical Scale:	
<b>FELSBURG HOLT &amp; ULLEVIG</b> 6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

Sheet Revisions		
Date	Comments	Initials

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE SUPERSTRUCTURE SECTION		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B18 of 33	Sheet Number 48



LAP SPLICE TABLE	
BAR SIZE	SPLICE LENGTH
#5	1'-10"
#6	2'-3"
#9	5'-6"
#4 WITH #9	4'-3"



**REINFORCING PLAN**  
(SIDEWALK REINFORCING NOT SHOWN FOR CLARITY)

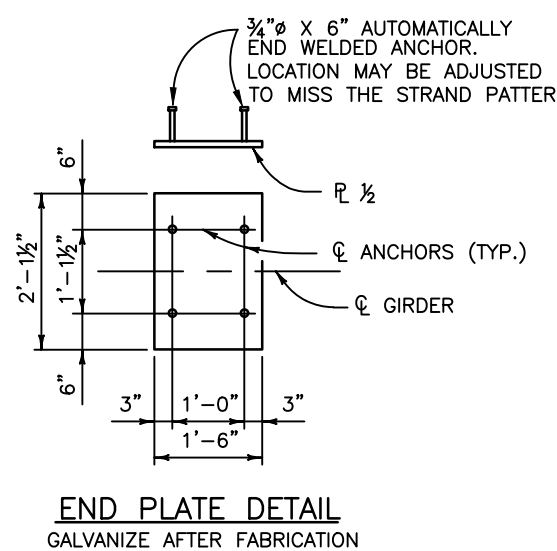
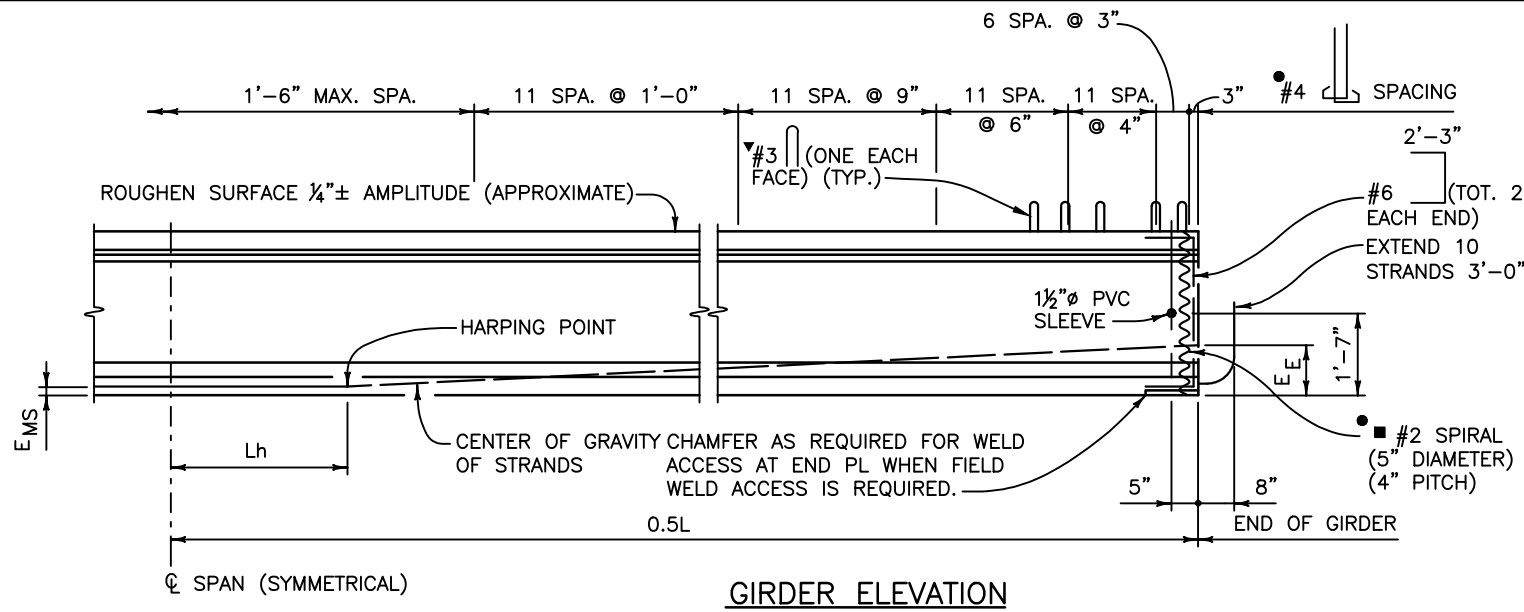
I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

Print Date: 6/17/2021 10:44:33 AM
File Name: B115360-01SUP02.dwg
Horizontal Scale: 1"=20' Vertical Scale:
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE DECK REINFORCING PLAN		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: MIYAMOTO/DILLON		
Void:	Subset: BRIDGE	Sheets: B19 of 33	Sheet Number 49



**NOTES:**

ALL WORK NECESSARY TO FABRICATE AND INSTALL THE INTEGRAL PARTS OF THE GIRDER (INCLUDING THE INTERMEDIATE DIAPHRAGMS, 7/8" 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 1/2" DEEP) TO THE PARTS OF THE GIRDERS EMBEDDED IN CONCRETE.

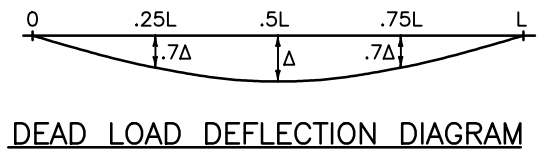
USE LOW RELAXATION STRANDS MEETING THE REQUIREMENTS OF ASTM A-416 GRADE 270. THE MINIMUM CLEAR DISTANCE BETWEEN GROUPS OR INDIVIDUAL STRANDS SHALL BE 2.3(D<sub>s</sub>) BUT NOT LESS THAN 1 1/4". THE MINIMUM COVER FOR PRESTRESSING STEEL IS 1 1/2".

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".

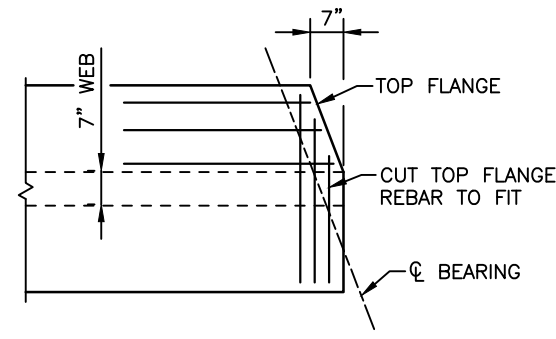
- A<sub>s</sub>\* = MINIMUM AREA OF THE PRESTRESSING STEEL.
- d<sub>s</sub> = NOMINAL STRAND DIAMETER.
- f'<sub>s</sub> = ULTIMATE STRENGTH OF PRESTRESSING STEEL.
- F<sub>j</sub> = JACKING FORCE PER GIRDER.
- F<sub>f</sub> = FINAL FORCE PER GIRDER AFTER ALL LOSSES.
- f'<sub>ci</sub> = REQUIRED CONCRETE STRENGTH AT RELEASE OF PRESTRESS FORCE.
- f'<sub>c</sub> = REQUIRED CONCRETE STRENGTH AT 28 DAYS OF AGE.
- L = LENGTH OF GIRDER ALONG THE GRADE OF THE GIRDER.
- Δ = DEFLECTION AT 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 1/2" CHAMFER ON ALL CORNERS, EXCEPT AS NOTED.

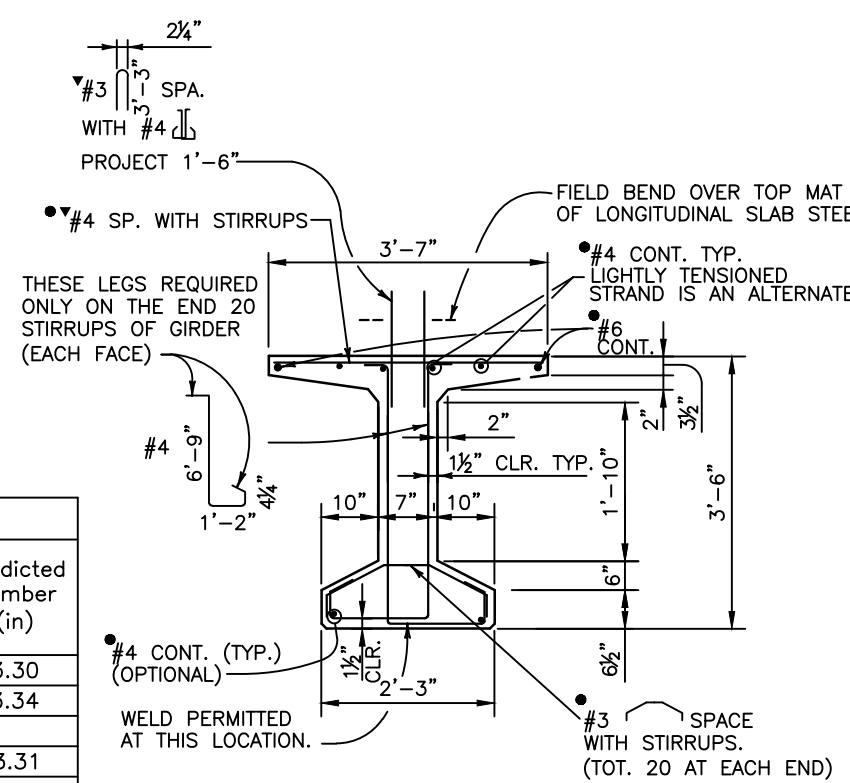
PREDICTED CAMBER IS THE CAMBER FOR THE GIRDER ALONE AT 60 DAYS. ACCEPTABLE CAMBER VARIABILITY IS LIMITED TO 20% OVER THE PREDICTED CAMBER AND 50% UNDER THE PREDICTED CAMBER OR ± 1 INCH, WHICHEVER IS GREATER. THE CONTRACTOR SHALL REPORT TO THE ENGINEER VALUES OF CAMBER WHICH REQUIRE REMEDIAL MEASURES. THE REMEDIAL MEASURES SHALL BE REVIEWED AND APPROVED BY THE ENGINEER. THE COSTS ASSOCIATED WITH ALL REMEDIAL MEASURES SHALL BE BORNE BY THE CONTRACTOR.



- 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.



**CLIPPED TOP FLANGE DETAIL**  
 (TYPICAL AT BOTH GIRDER ENDS)  
 (SEE CONSTRUCTION LAYOUT FOR ORIENTATION)

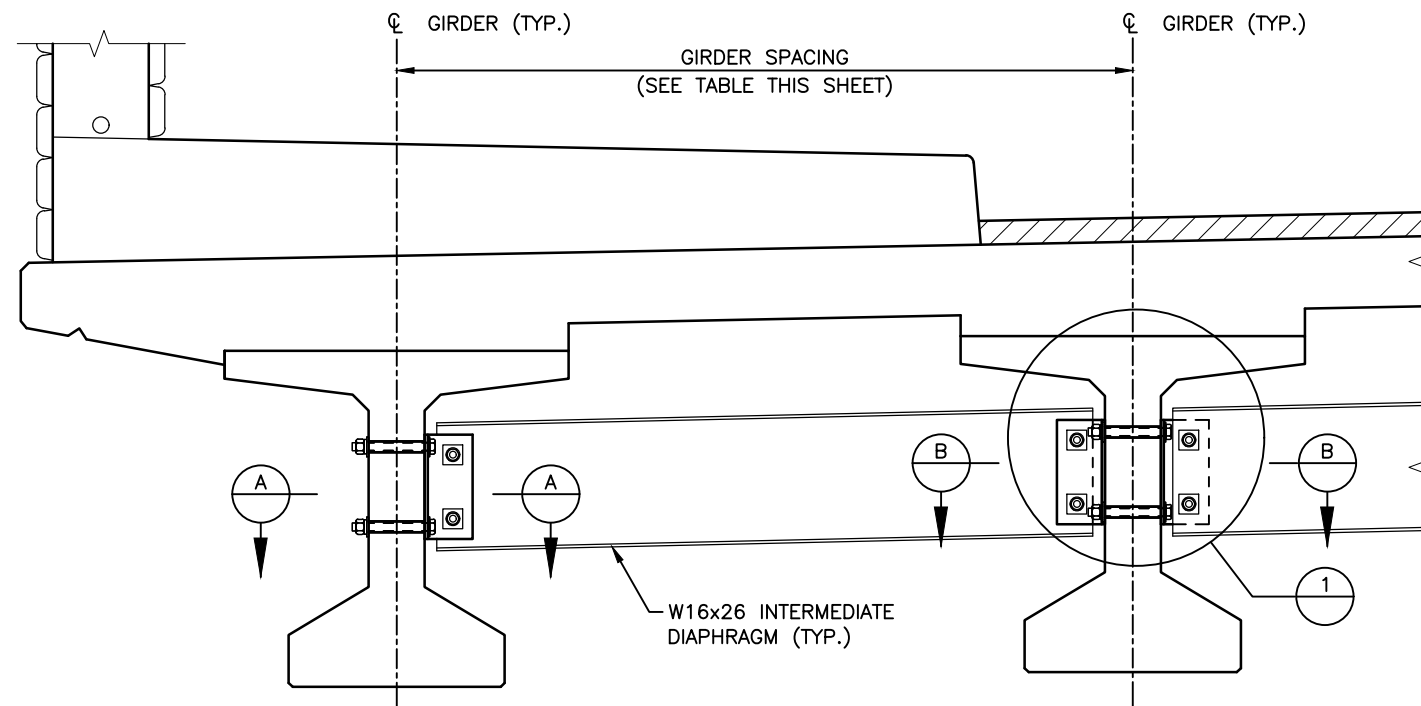


**TYPICAL GIRDER SECTION**

GIRDER SCHEDULE														
Girder Type	Span No.	Girder No.	L (ft)	Lh (ft)	A <sub>s</sub> (in <sup>2</sup> )	EMS (in)	EE (in)	F <sub>j</sub> (kips)	F <sub>f</sub> (kips)	f' <sub>ci</sub> (psi)	f' <sub>c</sub> (psi)	Δ (in)	Predicted Release Camber (in)	Predicted Camber (in)
BT42	1	G1-G6	76.82	7.68	6.08	4.14	14.14	1230	985	6000	8000	1.10	1.69	3.30
BT42	1	G7-G12	77.47	7.74	6.08	4.14	14.14	1230	985	6000	8000	1.10	1.70	3.34
BT42	2	G1-G6	77.00	7.70	6.08	4.14	14.14	1230	985	6000	8000	1.10	1.69	3.31
BT42	2	G7-G12	77.32	7.73	6.08	4.14	14.14	1230	985	6000	8000	1.10	1.70	3.33

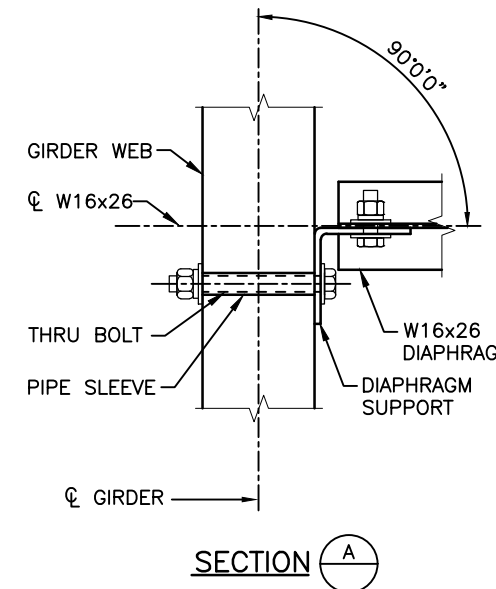
I:\115360-01 - Compare at Belford\CADD\Bridge\Drawings\ Chase.Miyamoto

Print Date: 6/17/2021 10:44:42 AM		<table border="1"> <thead> <tr> <th colspan="3">Sheet Revisions</th> </tr> <tr> <th>Date</th> <th>Comments</th> <th>Initials</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			Sheet Revisions			Date	Comments	Initials							As Constructed		BELFORD-HAPPY CANYON CREEK BRIDGE PRECAST CONCRETE I GIRDER		Project No./Code	
Sheet Revisions																						
Date	Comments	Initials																				
File Name: B115360-01GIR01.dwg		Horizontal Scale: VARIES		Vertical Scale:		No Revisions:																
		6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com				Revised:		Designer: J. LYNCH														
						Void:		Detailer: C. MIYAMOTO														
								Structure Numbers														
								Subset: BRIDGE														
								Sheets: B20 of 33														
								Sheet Number 50														

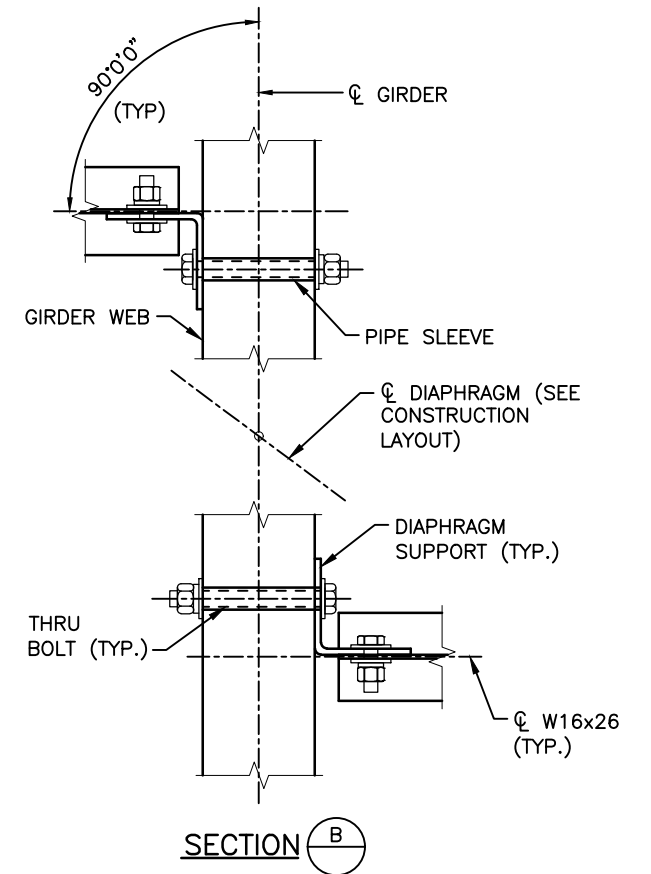


**PARTIAL ELEVATION AT DIAPHRAGM**  
(TAKEN NORMAL TO GIRDER)

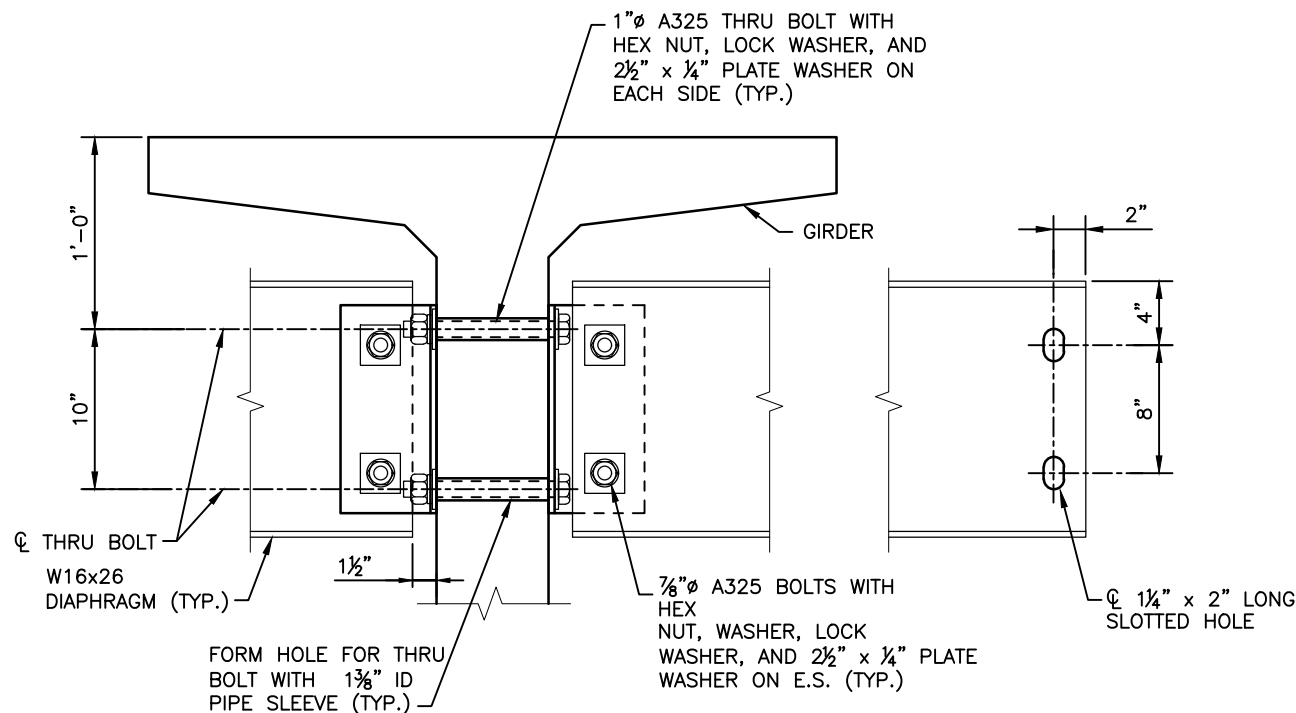
GIRDER SPACING MEASURED ALONG DIAPHRAGM CENTERLINE		
BETWEEN GIRDER CENTERLINES	SPAN 1	SPAN 2
G1-G6	8.32'	8.08'
G7-G12	8.40'	8.11'
G6-G7	8.43'	8.16'



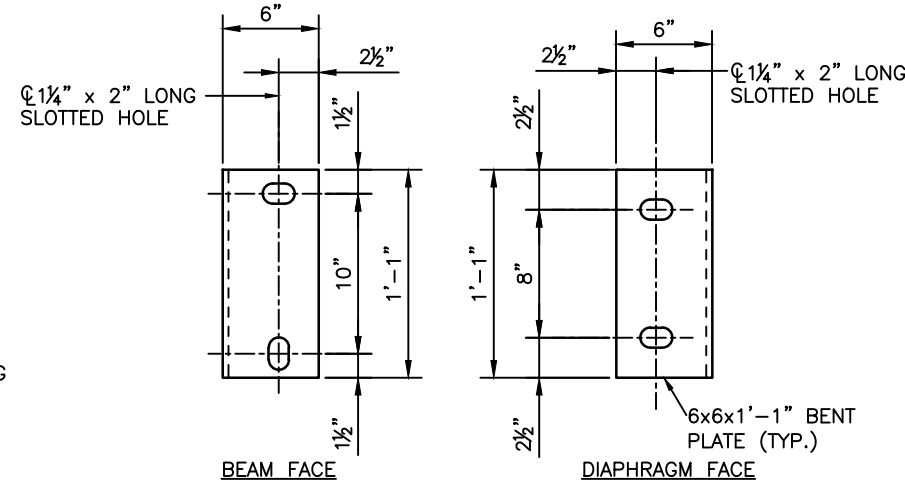
**SECTION A**



**SECTION B**



**DETAIL 1**



**DIAPHRAGM SUPPORT DETAIL**

**NOTES:**

- SEE CONSTRUCTION LAYOUT FOR INTERMEDIATE DIAPHRAGM LOCATIONS.
- ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED. GALVANIZE AFTER FABRICATION.
- BOLTS, NUTS AND LOCK WASHERS MAY BE ZINC PLATED IN LIEU OF BEING GALVANIZED.
- 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.
- 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.
- 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.
- THE COST OF THE DIAPHRAGMS SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE GIRDER.

I:\115360-01 - Compare at Belford\CADD\Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:44:51 AM

File Name: B115360-01GIR02.dwg

Horizontal Scale: VARIES Vertical Scale:



6400 South Fiddlers Green Circle, Suite 1500  
Greenwood Village, CO 80111  
Phone: 303.721.1440  
www.FHUENG.com



**Sheet Revisions**

Date	Comments	Initials



As Constructed

No Revisions:

Revised:

Void:

**BELFORD-HAPPY CANYON CREEK BRIDGE  
GIRDER DIAPHRAGM  
DETAILS**

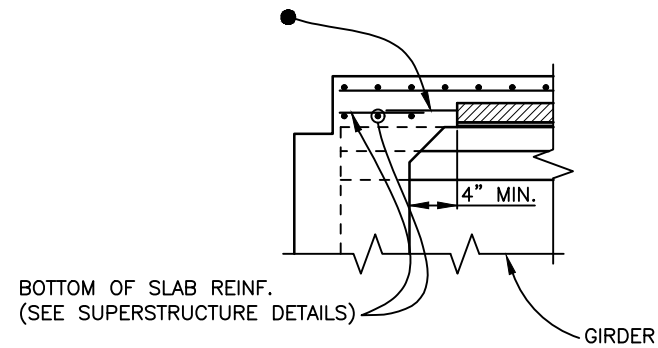
Designer: J. LYNCH  
Detailer: R. DILLON  
Subset: BRIDGE

Structure Numbers

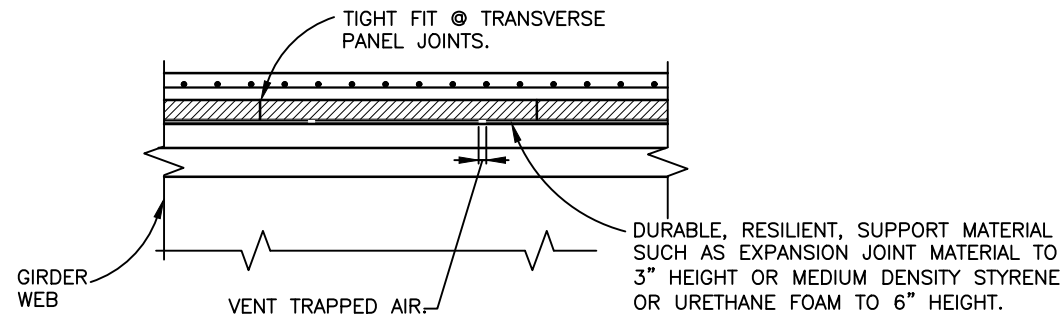
Sheets: B21 of 33

Project No./Code

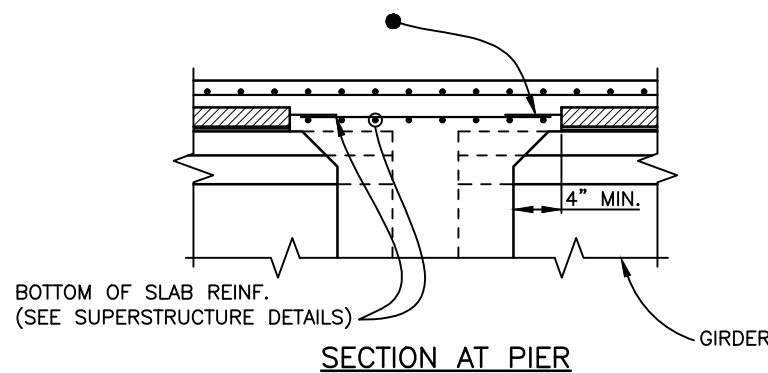
Sheet Number 51



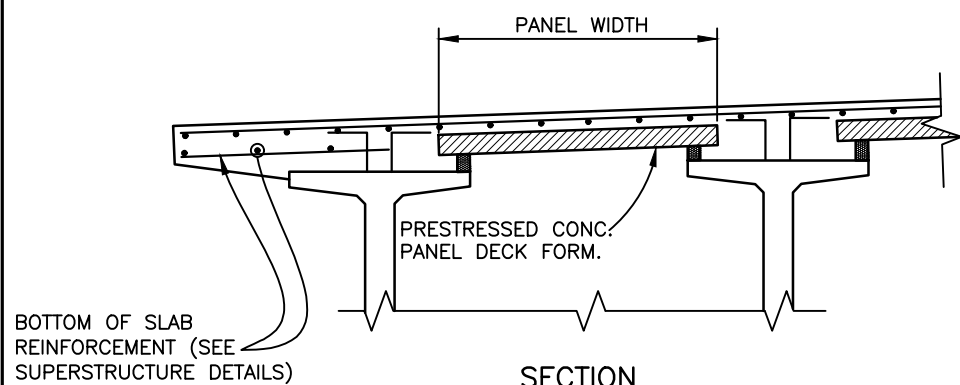
SECTION AT ABUTMENT



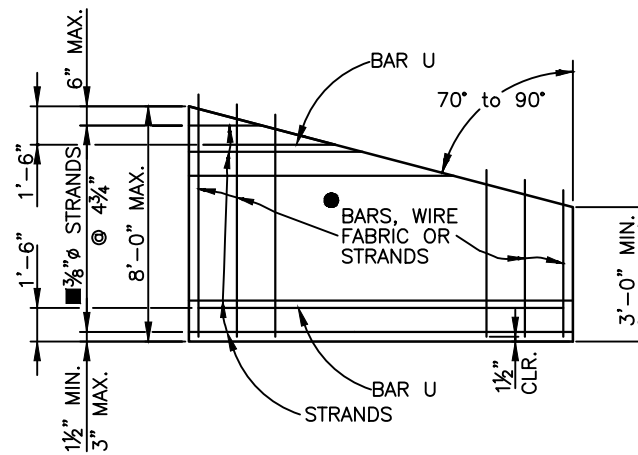
SECTION THRU TRANSVERSE PANEL JOINTS



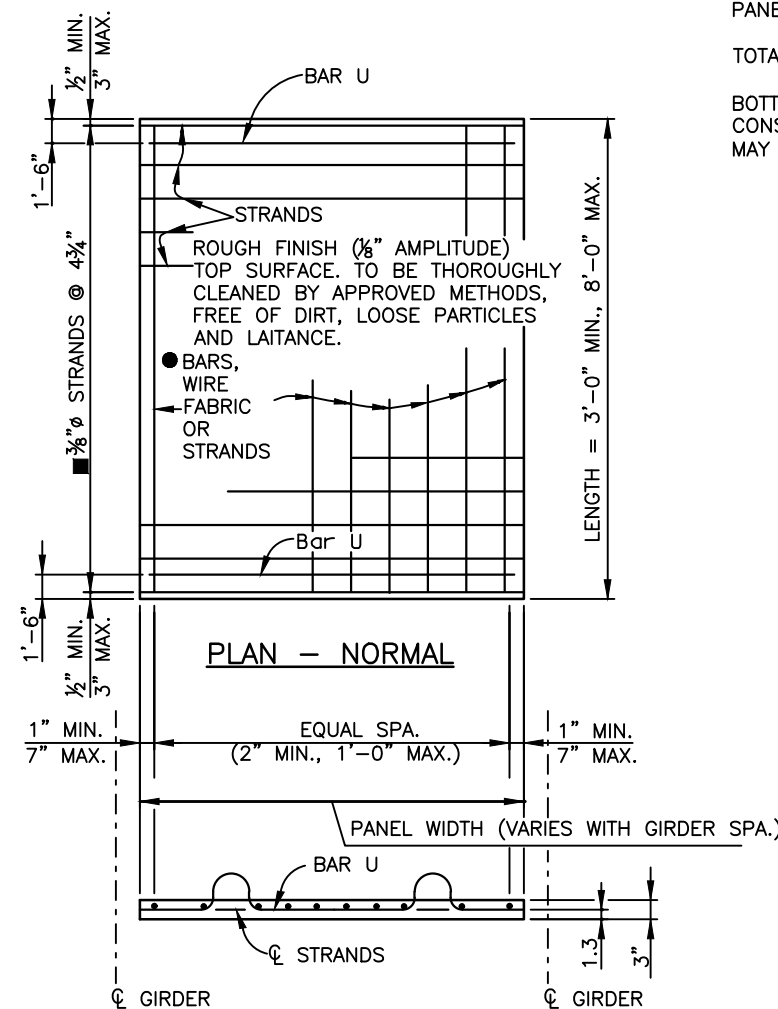
SECTION AT PIER



SECTION



PLAN - SKEWS 70° TO 90°  
OPTIONAL END PANEL



PLAN - NORMAL  
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 (2 OF 2).

MAY BE REDUCED TO 3/8" STRANDS AT 9 1/2" 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.

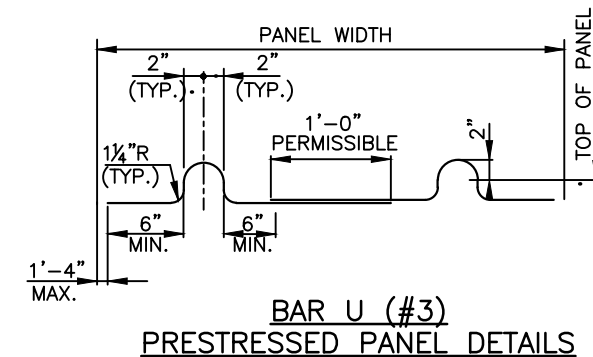
THE TOLERANCE ON STRAND PLACEMENT SHALL NOT EXCEED ± 1/4".

THE TOLERANCE ON PANEL THICKNESS SHALL NOT EXCEED ± 1/4".

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 1/2", OR CAMBERS GREATER THAN 1/2", WILL BE CONSIDERED EVIDENCE OF MISHANDLING, OVERLOADING, OR EXCEEDING ALLOWABLE TOLERANCES, AND MAY BE CAUSE FOR REJECTING PANELS AT THE ENGINEER'S DISCRETION.



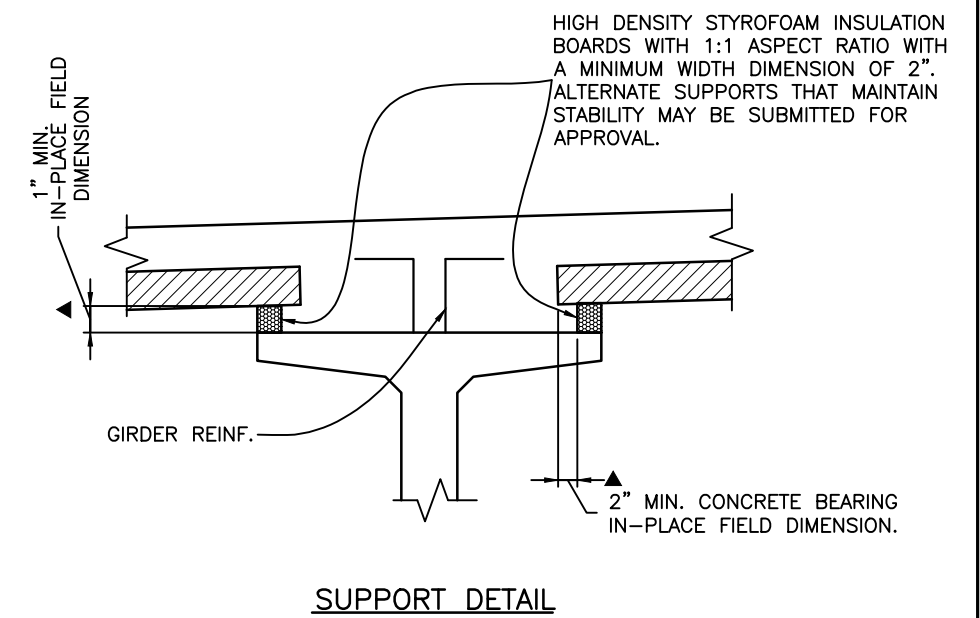
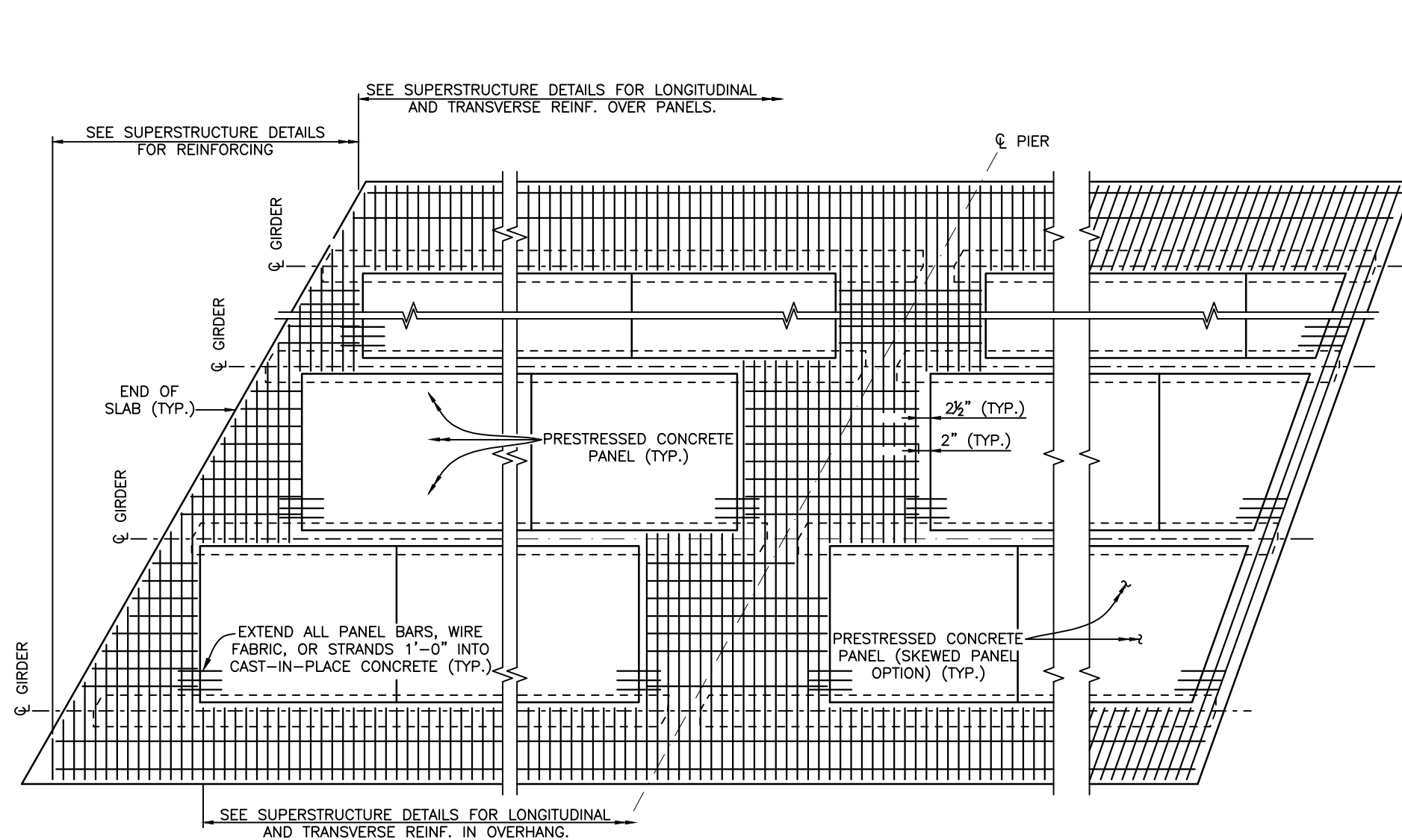
I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

Print Date: 6/17/2021 10:45:01 AM	
File Name: B115360-01DEC01.dwg	
Horizontal Scale: 100	Vertical Scale: N/A
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com	

Sheet Revisions			
Date	Comments	Initials	

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph: 303.708.0900 fax: 303.708.0100 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE OPTIONAL PRECAST PANEL DECK FORM (1 OF 2)		Project No./Code
No Revisions:			
Revised:	Designer: J. LYNCH	Structure Numbers	
	Detailer: C. MIYAMOTO		
Void:	Subset: BRIDGE	Sheets: B22 of 33	Sheet Number 52



**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  $f'_{c28} = 6000$  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  $\frac{3}{8}$ "  $\phi$  LOW RELAXATION STRANDS MEETING THE REQUIREMENTS OF ASTM A416 GRADE 270. JACKING FORCE PER STRAND ( $f_j$ ) SHALL BE AT LEAST 17.2 KIPS. FINAL FORCE PER STRAND ( $F_f$ ) IS ESTIMATED TO BE 14.2 KIPS.

INSTALLATION OF BAR U (#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 ( $\blacktriangle$  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.

SEE LUMINAIRE DETAILS FOR REQUIRED GAP IN PANELS.

**END OF SLAB RECTANGULAR PANEL OPTION AND SKEWS LESS THAN 70°**  
RECTANGULAR PANEL OPTION SHALL BE USED FOR SKEWS LESS THAN 70°.

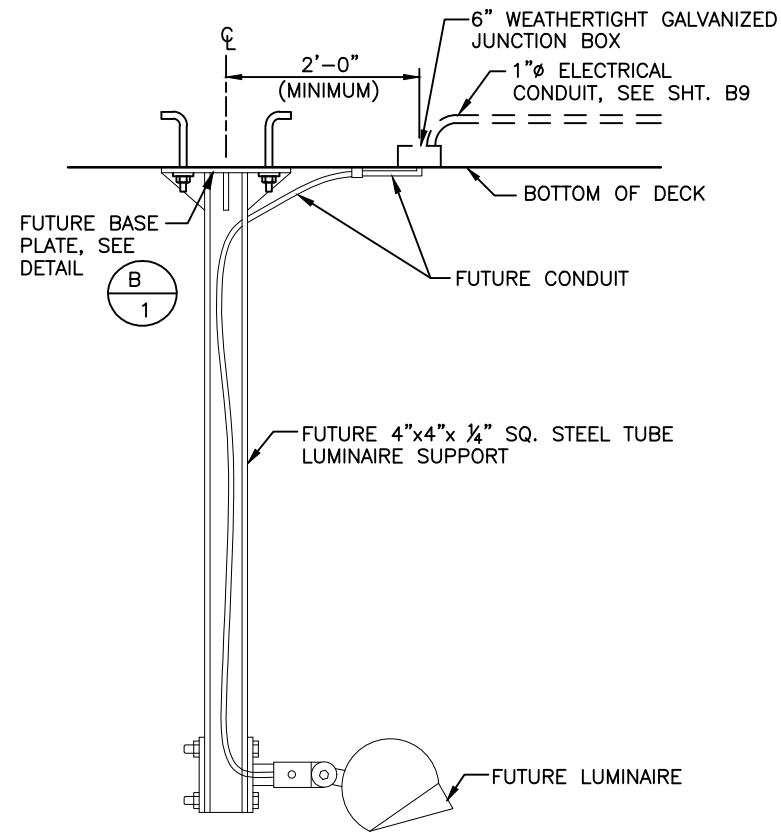
**CONTINUOUS SLAB OVER PIER**

**END OF SLAB SKEWED PANEL OPTION FOR SKEWS 70° TO 90°**

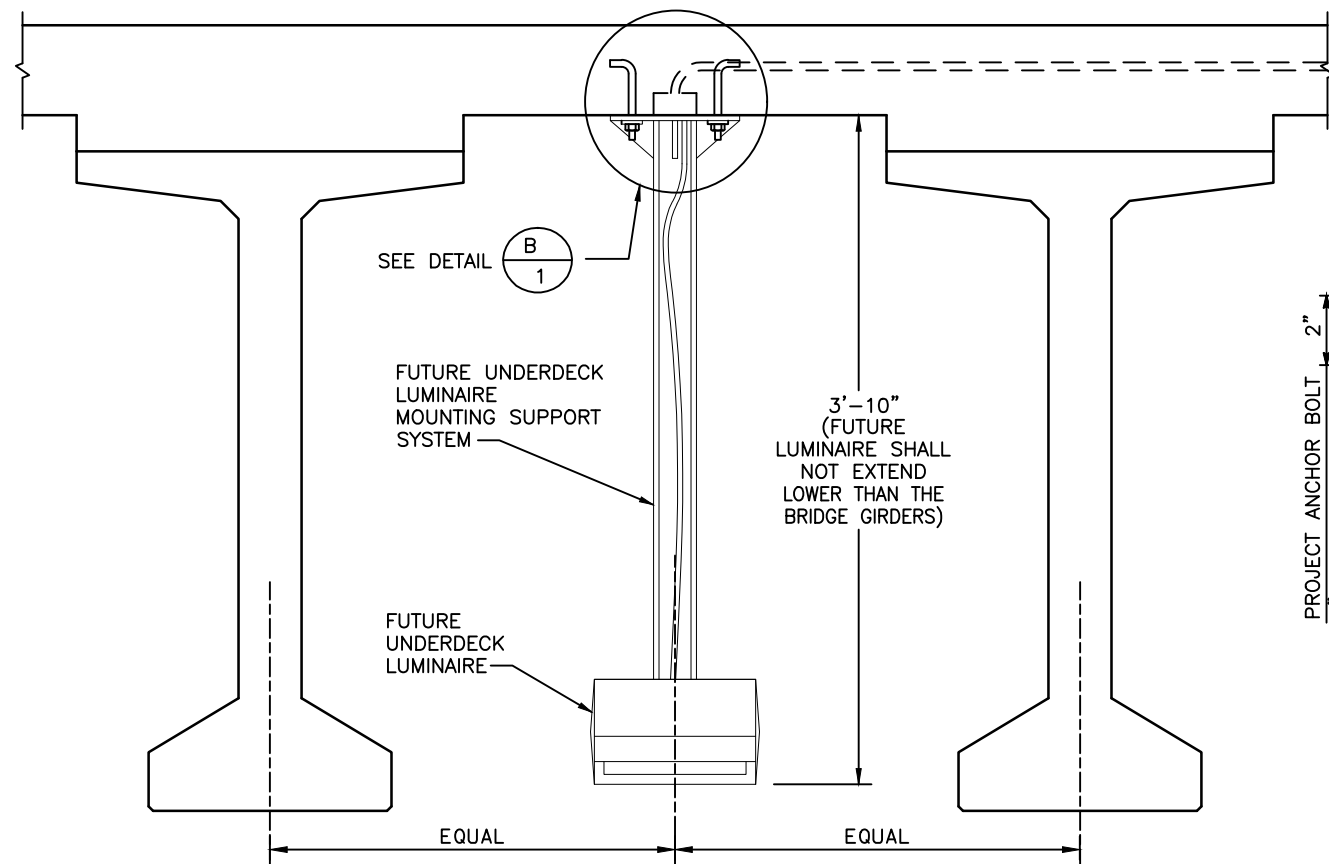
**PART PLAN**

I:\115360-01 - Compark at Belford\CADD\Drawings\Chase.Miyamoto

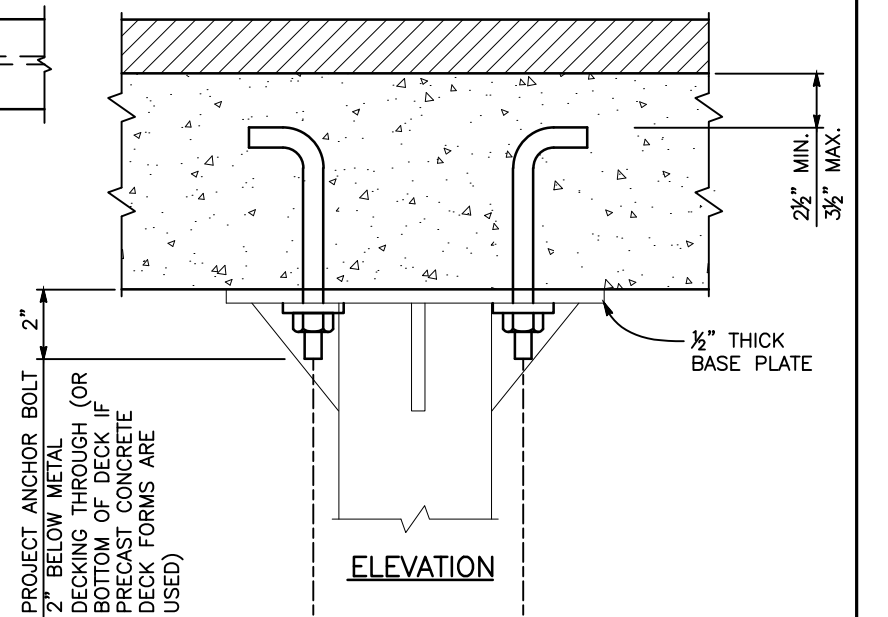
Print Date: 6/17/2021 10:45:12 AM		Sheet Revisions			As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE OPTIONAL PRECAST PANEL DECK FORM (2 OF 2)		Project No./Code
File Name: B115360-01DEC02.dwg		Date	Comments		Initials	No Revisions:		
Horizontal Scale: 100 Vertical Scale: N/A					Revised:	Designer: J. LYNCH	Structure Numbers	
					Void:	Detailer: C. MIYAMOTO		
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com						Subset: BRIDGE	Sheets: B23 of 33	Sheet Number 53



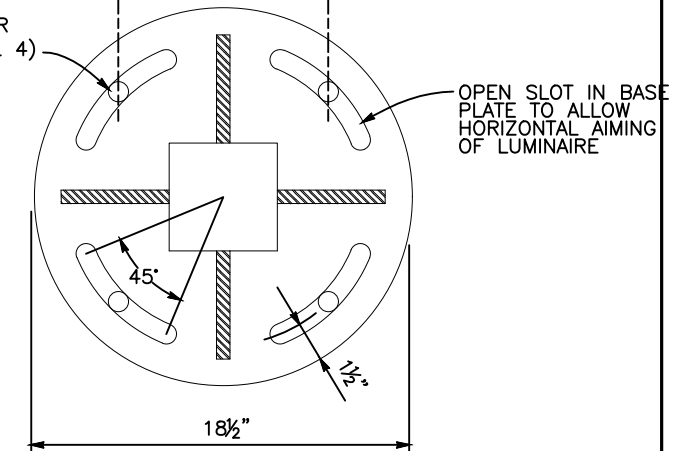
**SECTION VIEW**  
**FUTURE UNDERDECK LUMINAIRE SUPPORT**



**FRONT VIEW**

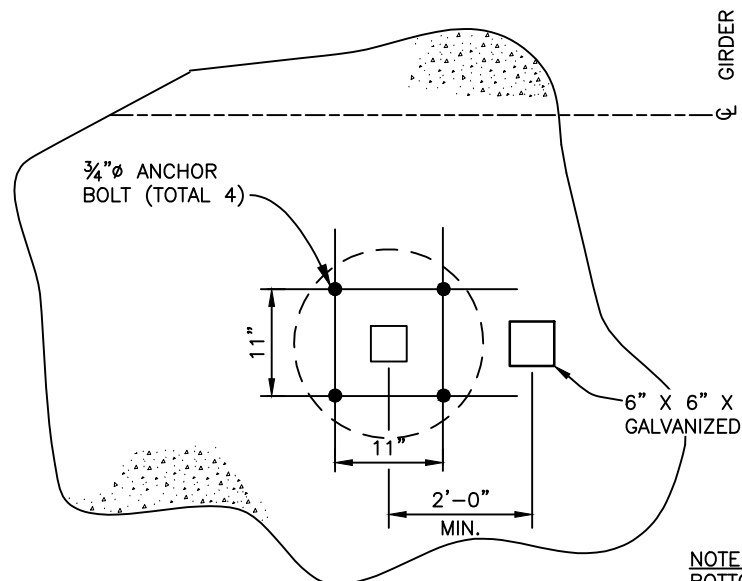


**ELEVATION**

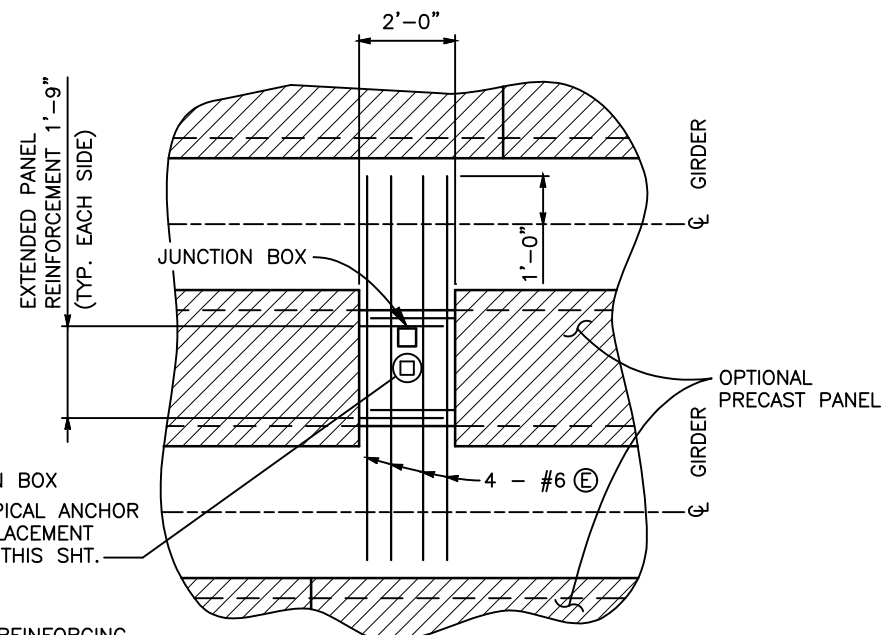


**PLAN**  
**FUTURE BASE PLATE**

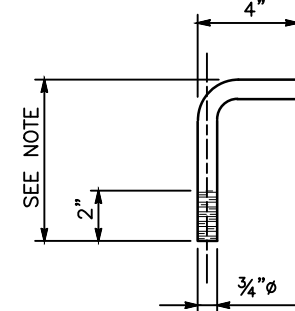
**DETAIL B 1**



**TYPICAL ANCHOR BOLT PLACEMENT DIAGRAM**



**JUNCTION BOX DETAIL**  
(OPTIONAL PRECAST CONCRETE DECK FORMS SHOWN)



**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. CONTRACTOR SHALL PROVIDE COVER PLATE AT JUNCTION BOX. 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 SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF ITEM 613, 1 INCH ELECTRICAL CONDUIT.

I:\115360-01 - Compare at Belford\CADD\Bridge Drawings\ Chase.Miyamoto

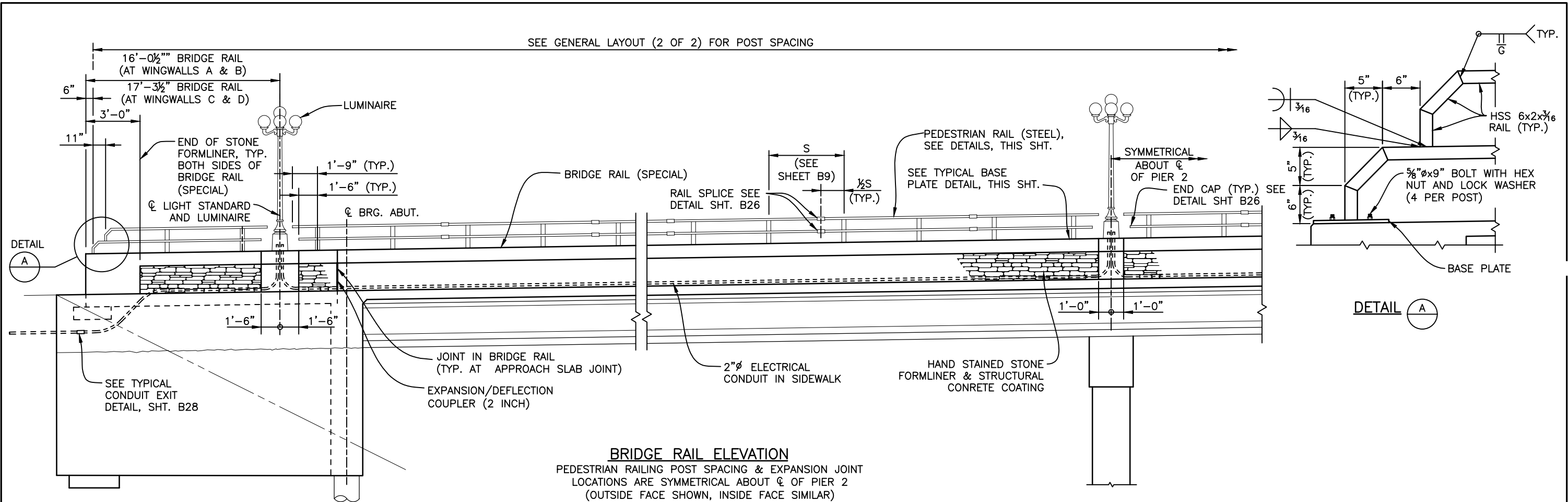
Print Date: 6/17/2021 10:45:21 AM  
File Name: B115360-01MSC01.dwg  
Horizontal Scale: VARIES Vertical Scale: X

<b>FELSBURG HOLT &amp; ULLEVIG</b>	6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com
------------------------------------	--

Sheet Revisions		
Date	Comments	Initials

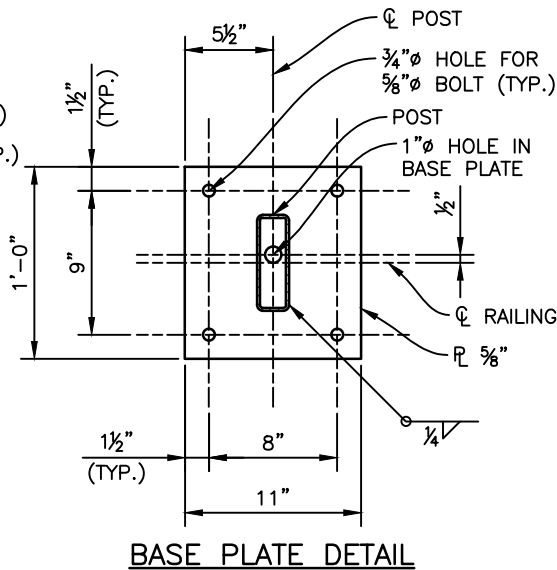
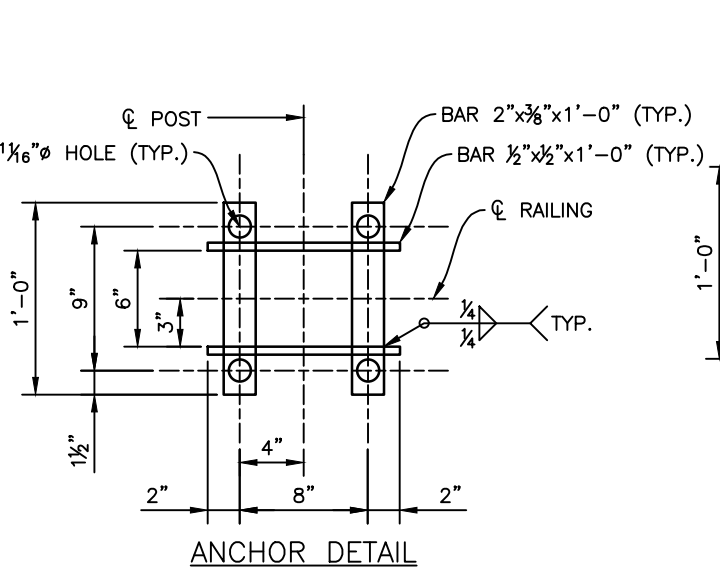
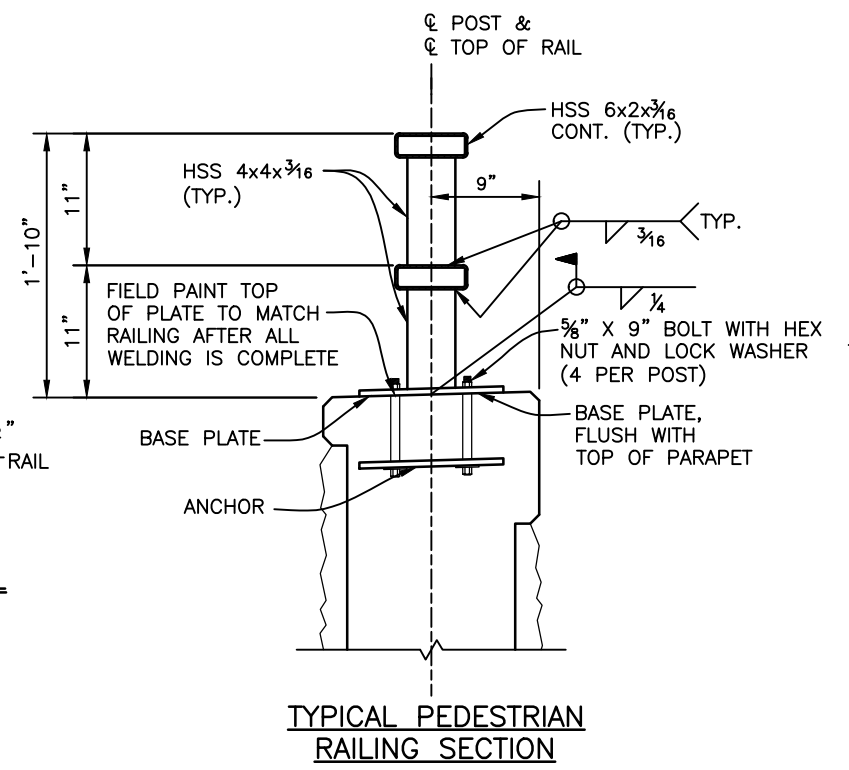
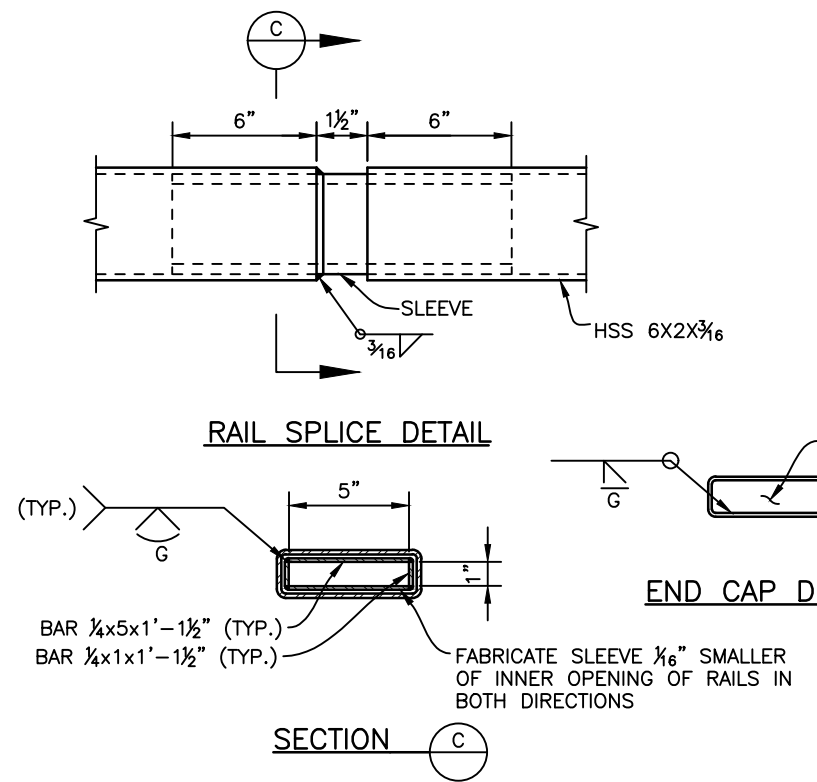
8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE PENDANT LUMINAIRE DETAILS		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: R. DILLON		
Void:	Subset: BRIDGE	Sheets: B24 of 33	Sheet Number 54



**BRIDGE RAIL ELEVATION**  
 PEDESTRIAN RAILING POST SPACING & EXPANSION JOINT  
 LOCATIONS ARE SYMMETRICAL ABOUT  $\phi$  OF PIER 2  
 (OUTSIDE FACE SHOWN, INSIDE FACE SIMILAR)

**NOTE**  
 SEE SHEET B26 AND B27 FOR ADDITIONAL NOTES



I:\115360-01 - Compare at Belford\CADD\Drawings\Chase.Miyamoto

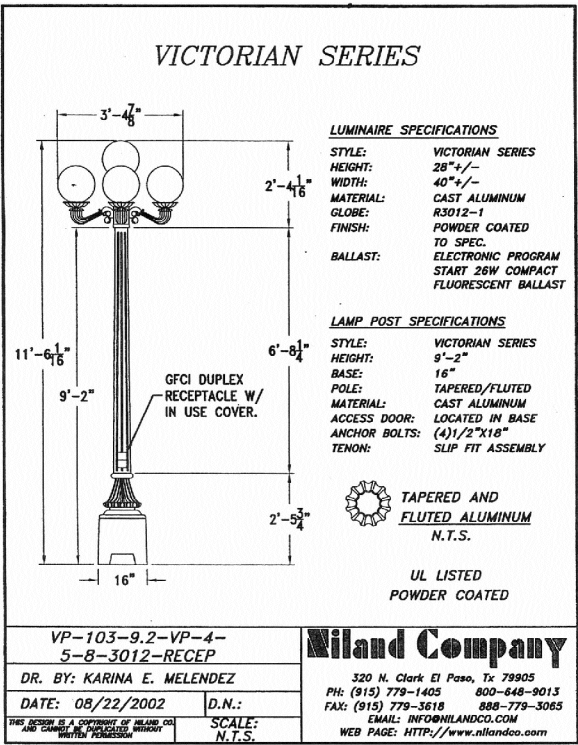
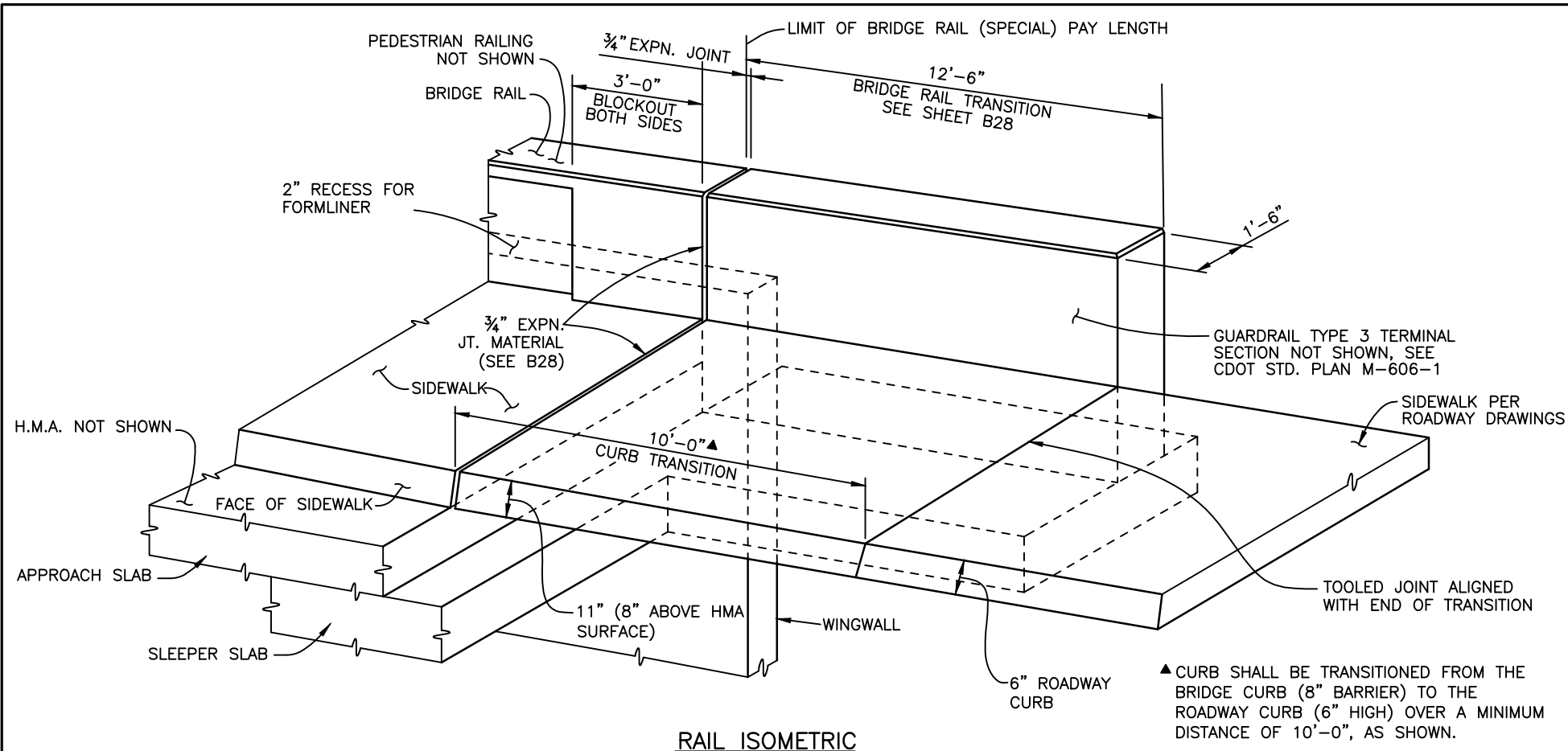
Print Date: 6/17/2021 10:45:33 AM  
 File Name: B115360-01RAL02.dwg  
 Horizontal Scale: VARIES Vertical Scale:  
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions		
Date	Comments	Initials

**Manhard CONSULTING LTD**  
 8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE BRIDGE RAIL ELEVATION & PEDESTRIAN RAILING DETAILS		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	Sheet Number 55
Revised:	Detailer: R. DILLON		
Void:	Subset: BRIDGE	Sheets: B25 of 33	





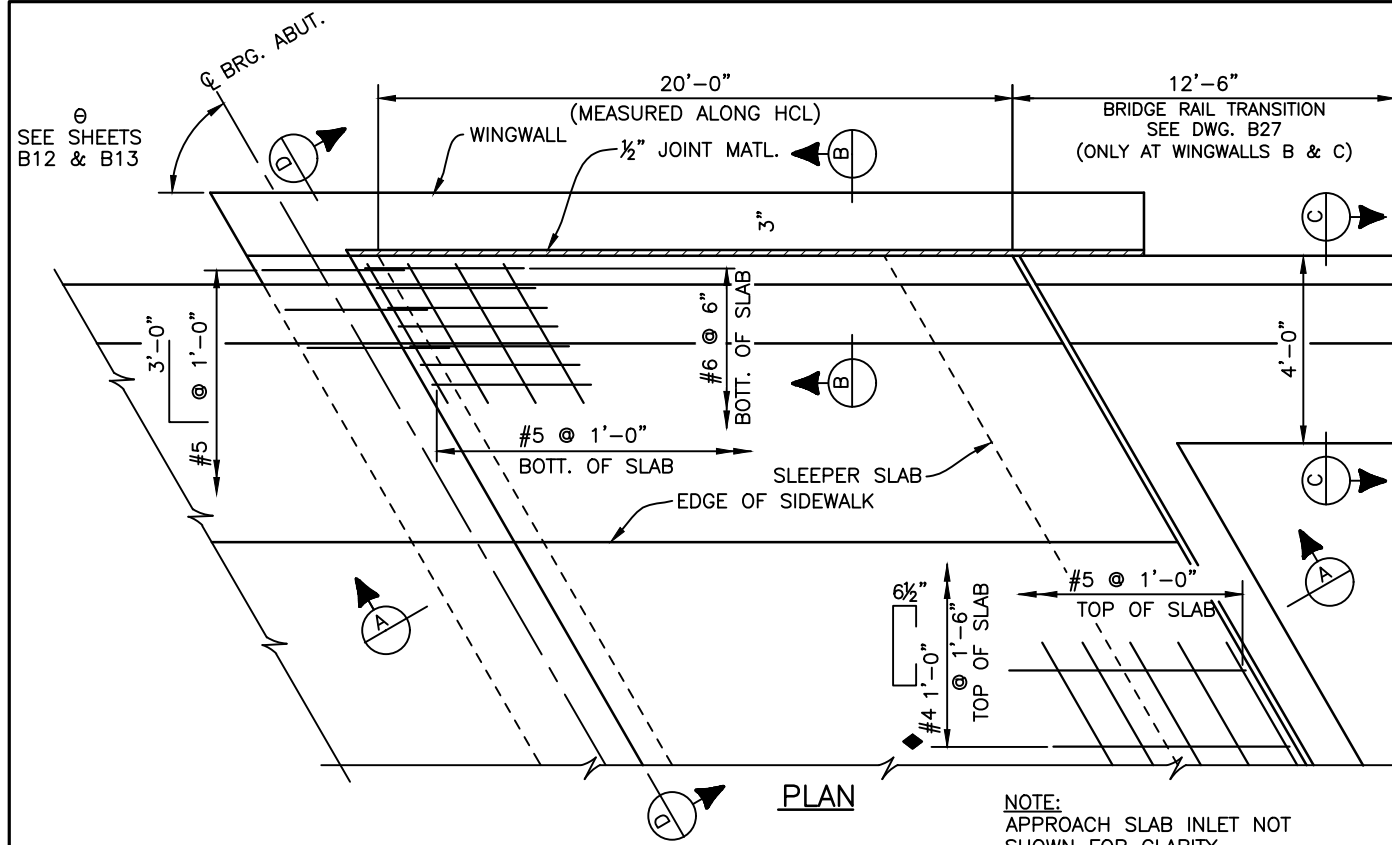
**LUMINAIRE DETAIL**

**NOTES**

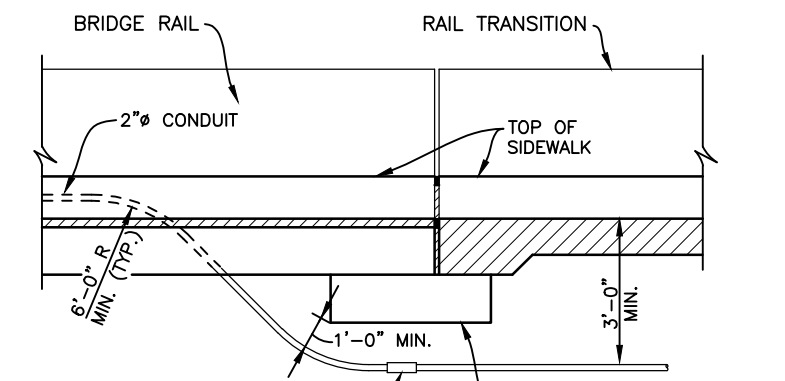
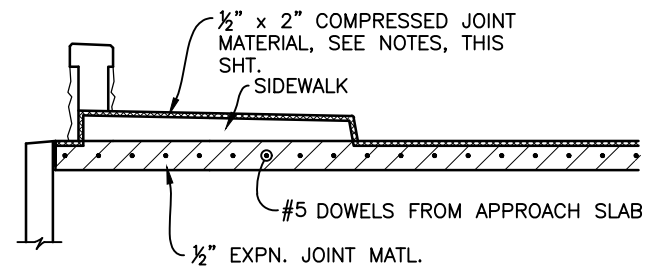
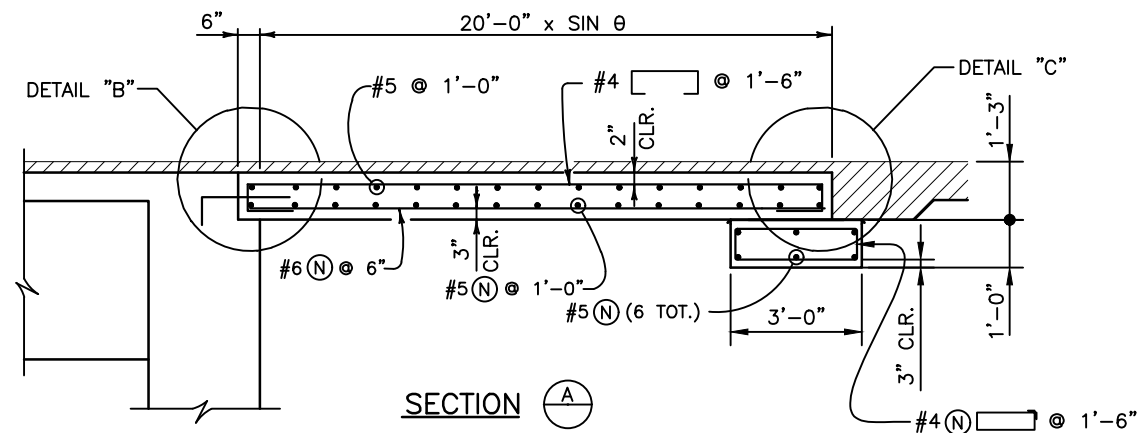
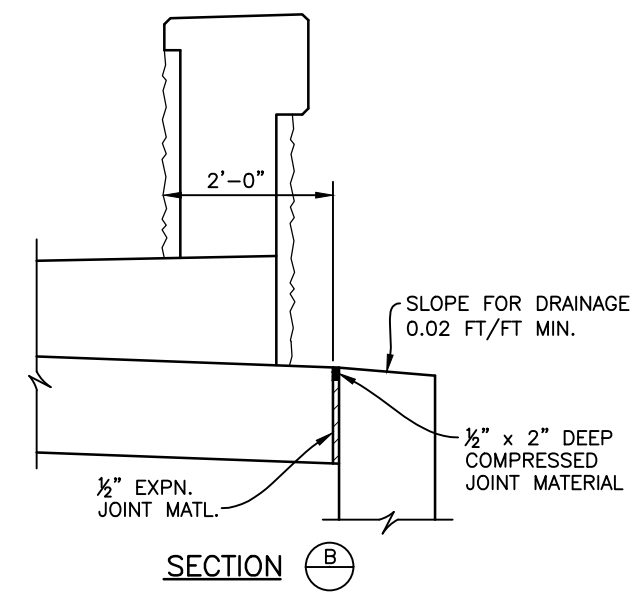
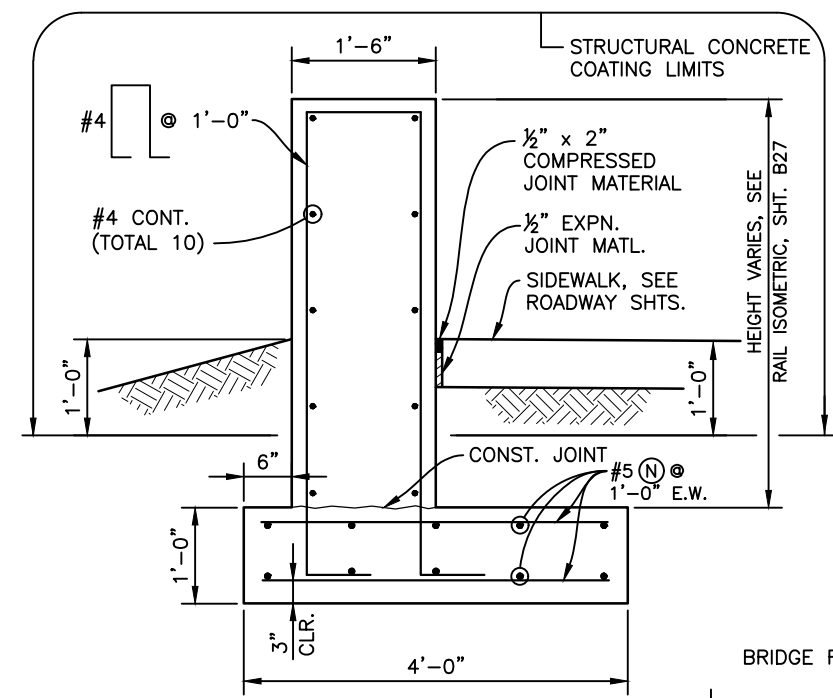
1. ALL BRIDGE RAIL CONCRETE SHALL BE CLASS D.
2. BRIDGE RAIL SHALL BE CONSTRUCTED PLUMB.
3. RAIL TUBES SHALL BE CONTINUOUS OVER NOT LESS THAN TWO POSTS. MAXIMUM SPLICE SPACING SHALL BE 24'-0". NO WELDED BUTT SPLICES WILL BE ALLOWED IN THE RAIL SECTIONS.
4. TUBES SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVES.
5. CONCRETE AND REINFORCING STEEL SHALL CONFORM TO THE CONSTRUCTION, MEASUREMENT AND PAYMENT REQUIREMENTS OF SECTIONS 601 AND 602.
6. STEEL ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 509.
7. WELDING SHALL BE IN ACCORDANCE WITH AWS D1.1. EXPOSED WELDS SHALL BE GROUND SMOOTH.
8. ALL TUBE STEEL SHALL BE ASTM A500 GRADE B. BASE PLATES SHALL BE ASTM A572 GRADE 50. ALL OTHER STEEL SHALL BE ASTM A36.
9. ANCHOR BOLTS SHALL BE A325 OR ASTM A449.
10. ALL RAILING STEEL, EXCEPT ANCHOR BOLTS, SHALL BE GALVANIZED AND POWDER COATED AFTER FABRICATION IN ACCORDANCE WITH SECTION 522 OF THE PROJECT SPECIAL PROVISIONS. COLOR SHALL BE "PARKER BROWN" EQUIVALENT TO TNEMEC ENDURA SHIELD COLOR F073D3884A.
11. ALL MATERIALS AND LABOR NECESSARY FOR FABRICATION AND ERECTION OF THE STEEL RAILING SHALL BE INCLUDED IN ITEM 514, PEDESTRIAN RAILING (STEEL).
12. PRIOR TO FABRICATION OF THIS ITEM, THREE SETS OF SHOP DRAWINGS WHICH COMPLY WITH THE REQUIREMENTS OF SECTION 105, SHALL BE SUBMITTED TO THE ENGINEER, FOR APPROVAL.
13. ALL MATERIALS AND WORKMANSHIP NECESSARY FOR CONSTRUCTION OF STONE FORMLINER SHALL BE INCLUDED IN ITEM 601, HAND STAINED FORMLINER.

I:\115360-01 - Compark at Belford\CADD\Bridge\Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:45:47 AM	Sheet Revisions			<p>8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph: 303.708.0900 fax: 303.708.0400 manhard.com        Civil Engineers • Surveyors • Water Resource Engineers • Water &amp; Wastewater Engineers        Construction Managers • Environmental Scientists • Landscape Architects • Planners</p>	As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE BRIDGE RAIL (SPECIAL) DETAILS		Project No./Code
File Name: B115360-01RAL01.dwg	Date	Comments	Initials		No Revisions:			
Horizontal Scale: VARIES Vertical Scale:				Revised:	Designer: J. LYNCH	Structure Numbers		
<p>6400 South Fiddlers Green Circle, Suite 1500        Greenwood Village, CO 80111        Phone: 303.721.1440        www.FHUENG.com</p>				Void:	Detailer: R. DILLON			
					Subset: BRIDGE	Sheets: B27 of 33	Sheet Number 57	



NOTE:  
APPROACH SLAB INLET NOT SHOWN FOR CLARITY.



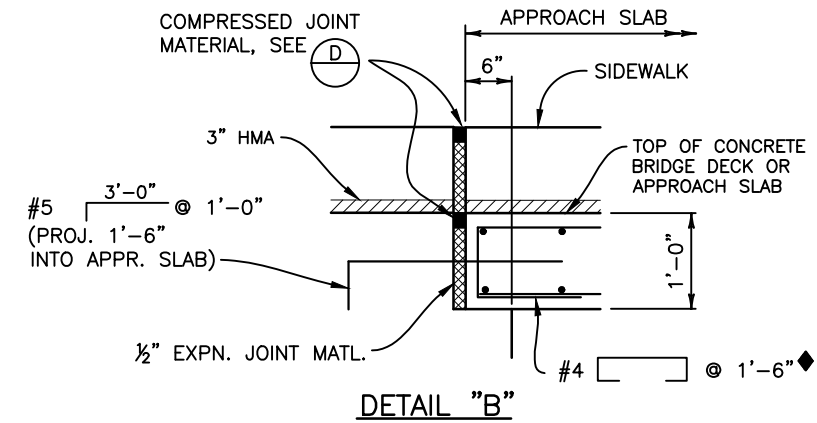
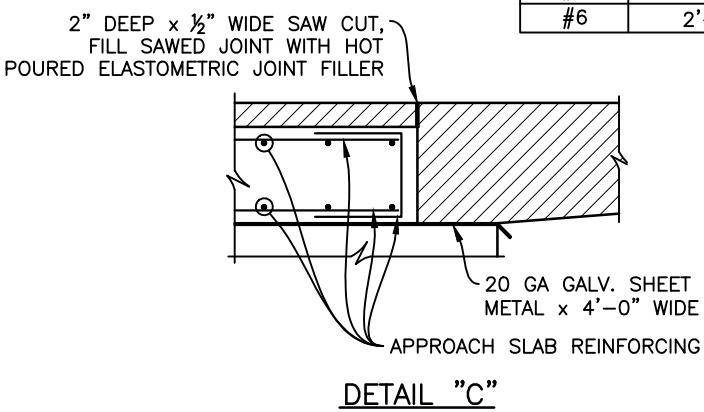
**NOTES:**

CONCRETE CLASS D (BRIDGE) SHALL BE USED FOR APPROACH SLABS.  
 APPROACH SLAB CONCRETE SHALL BE PLACED IN ACCORDANCE WITH THE SPECIFICATIONS FOR BRIDGE DECK CONCRETE IN SUBSECTION 601.  
 1/2" EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPEC. M213.  
 FOR BRIDGE RAIL DETAILS SEE SHTS. B25-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 THE COST OF ITEM 601 CLASS D CONCRETE.

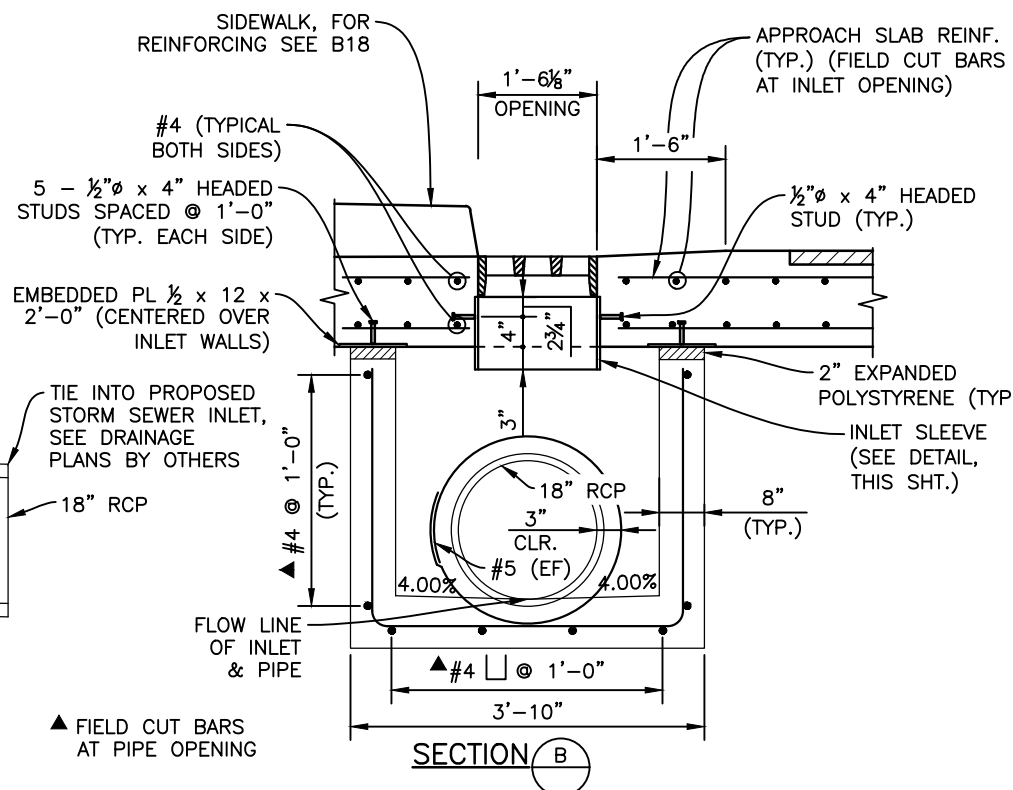
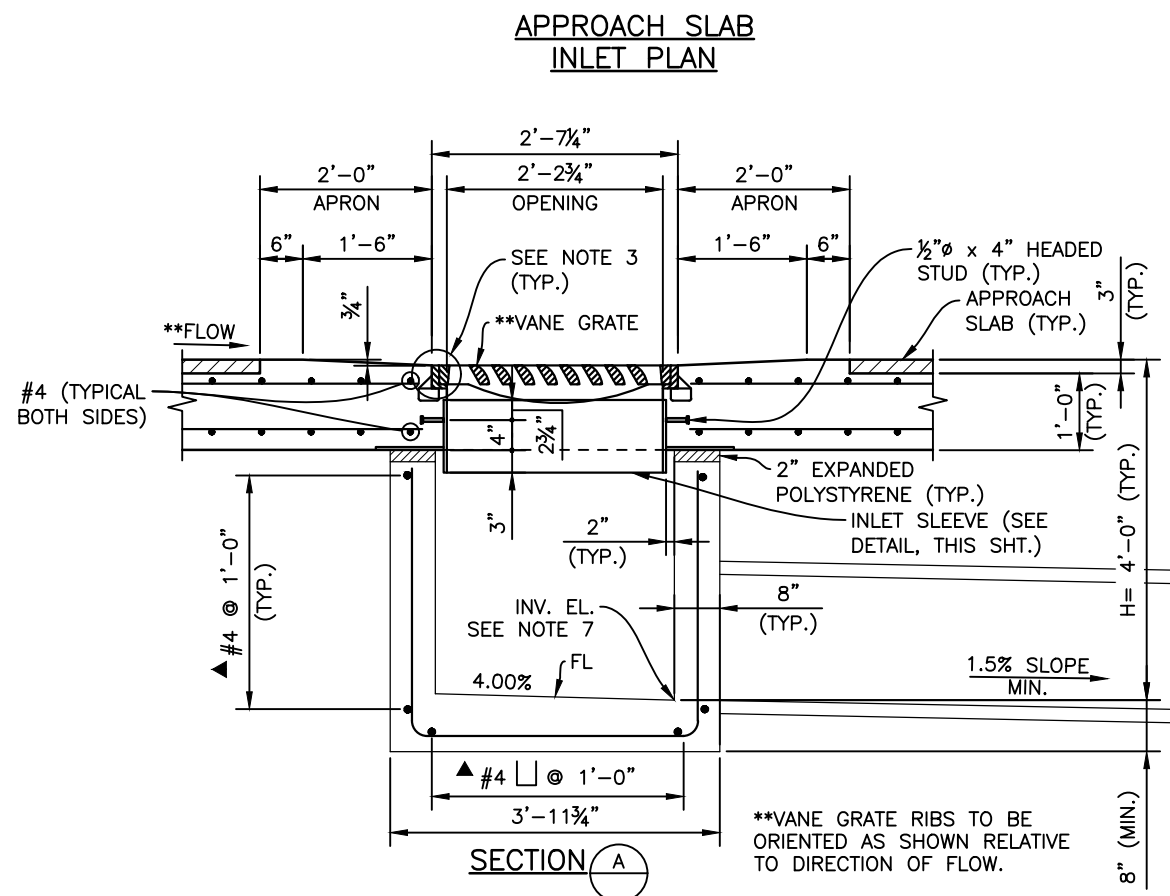
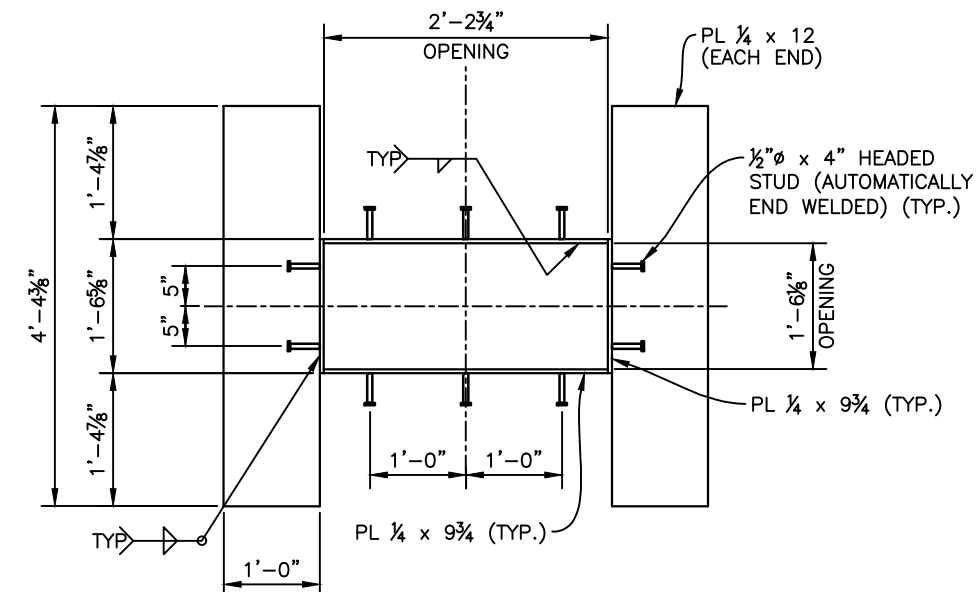
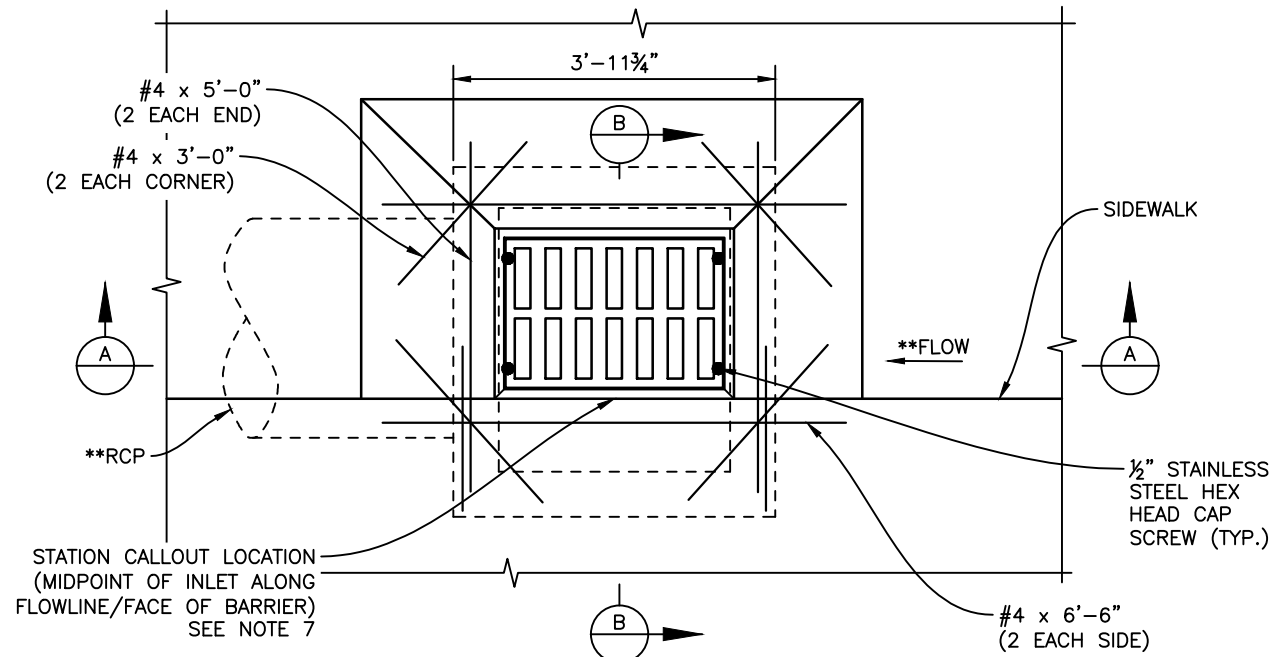
**ACCEPTABLE COMPRESSED JOINT MATERIAL ALTERNATES**  
 WILL-SEAL  
 SEAL-MATE #517  
 POLY-TITE "N"

LAP SPLICE TABLE	
BAR SIZE	SPLICE LENGTH
#5	2'-3"
#6	2'-8"



Sheet Revisions			
Date	Comments	Initials	





- NOTES:**
- CONCRETE SHALL BE CLASS D.
  - FOR VANE GRATE AND FRAME DETAILS, SEE STANDARD PLAN No. M-604-25 SHEET 4 OF 5.
  - GRATE SHALL BE INSTALLED DURING CONSTRUCTION WITH THE GRATE BOLTED IN PLACE TO THE FRAME.
  - THE COST FOR INLET, INCLUDING VANE GRATE, INLET SLEEVE, EMBEDDED PLATE, FRAME, AND ALL WORK NECESSARY TO INSTALL THESE ITEMS SHALL BE INCLUDED IN THE COST OF ITEM 604, VANE GRATE INLET SPECIAL.
  - INLET SLEEVE AND EMBEDDED PLATE SHALL BE GALVANIZED FOLLOWING FABRICATION. CONTRACTOR SHALL COORDINATE SLEEVE DIMENSIONS RELATIVE TO GRATE AND FRAME.
  - SEE DRAINAGE PLANS BY OTHERS FOR ADDITIONAL INFORMATION.
  - LOCATIONS FOR SIDEWALK APPROACH SLAB INLETS ARE AS FOLLOWS:
    - ABUTMENT 1: 93+51.49, 37.00' RT INV. EL. = 5779.69
    - 93+85.47, 37.00' LT INV. EL. = 5779.86

I:\115360-01 - Compare at Belford\CADD\Bridge\Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:46:07 AM  
 File Name: B115360-01INL01.dwg  
 Horizontal Scale: VARIES Vertical Scale: N/A

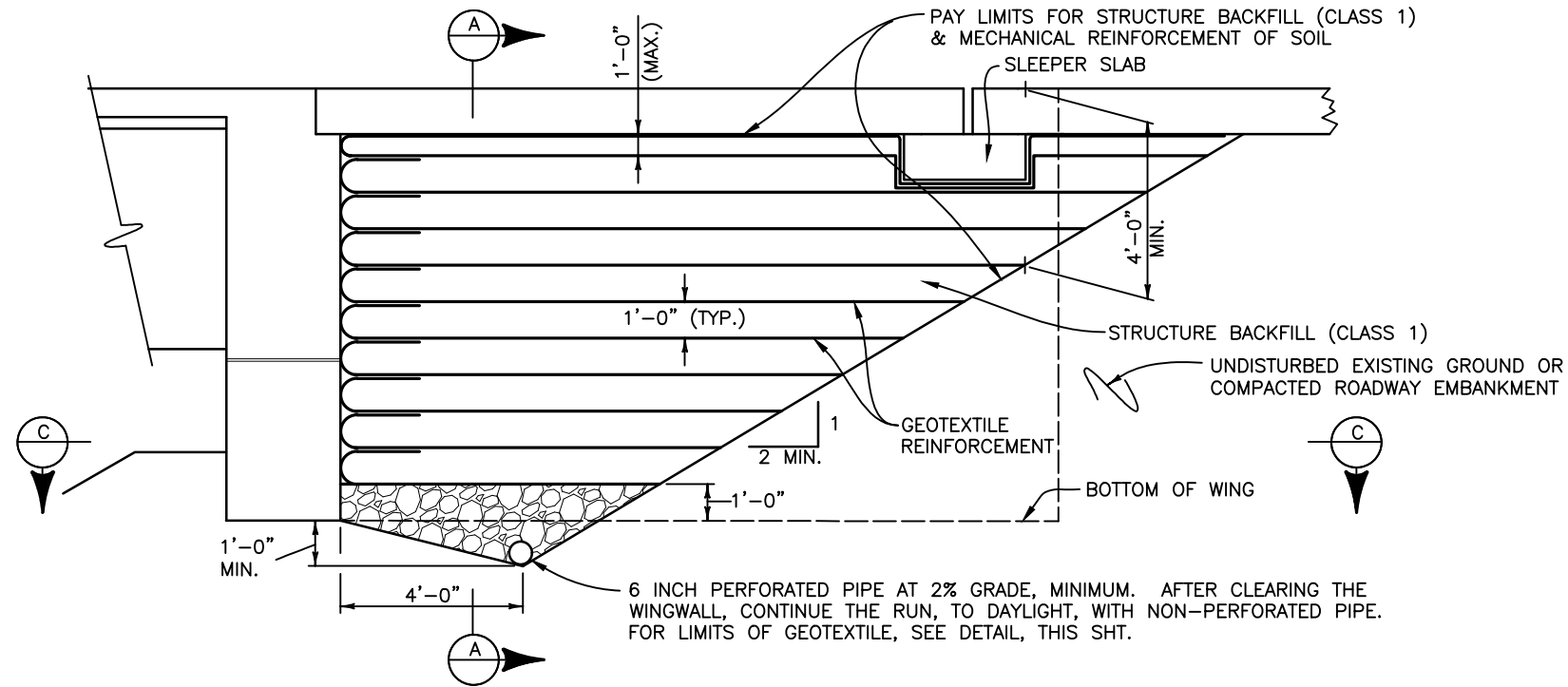
**FELSBURG HOLT & ULLEVIG**  
 6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

Sheet Revisions			
Date	Comments	Initials	

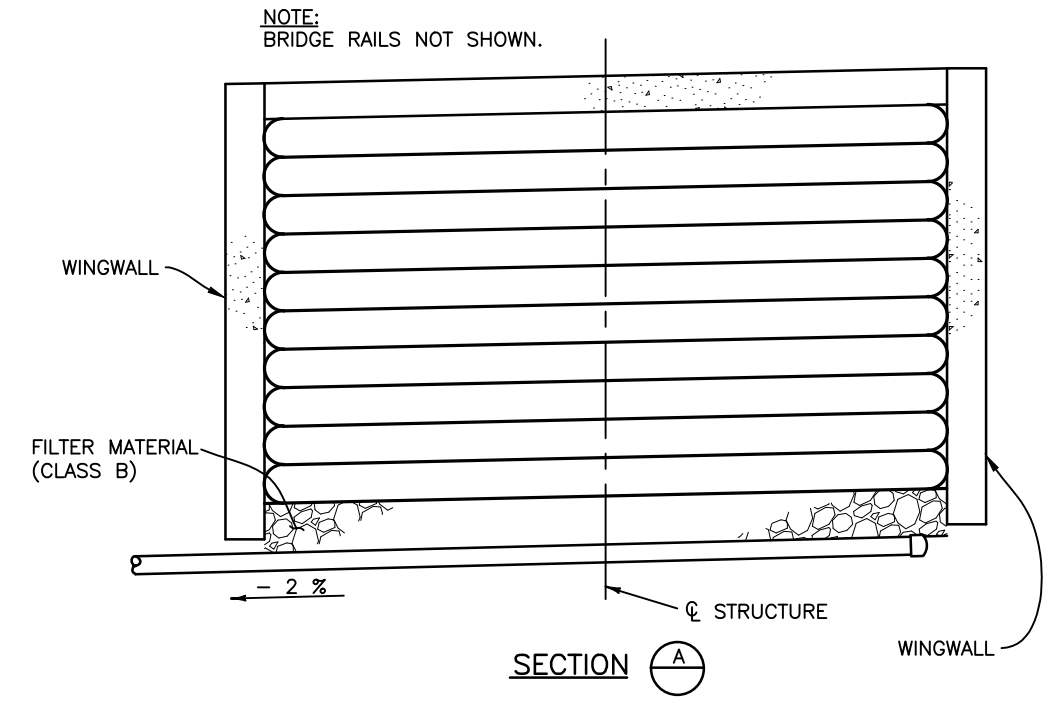
**Manhard CONSULTING LTD**

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0100 manhard.com  
 Civil Engineers - Surveyors - Water Resource Engineers - Water & Wastewater Engineers  
 Construction Managers - Environmental Scientists - Landscape Architects - Planners

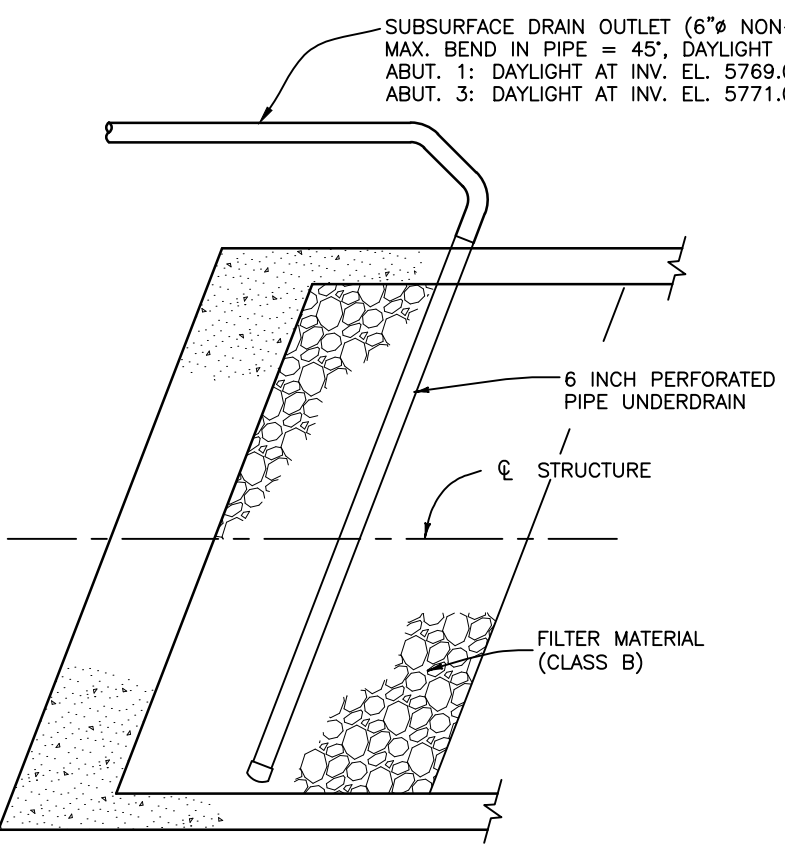
As Constructed	BELFORD-HAPPY CANYON CREEK APPROACH SLAB INLET DETAILS		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: C.MIYAMOTO	Numbers	
Void:	Subset: BRIDGE	Sheets: B29 of 33	Sheet Number 59



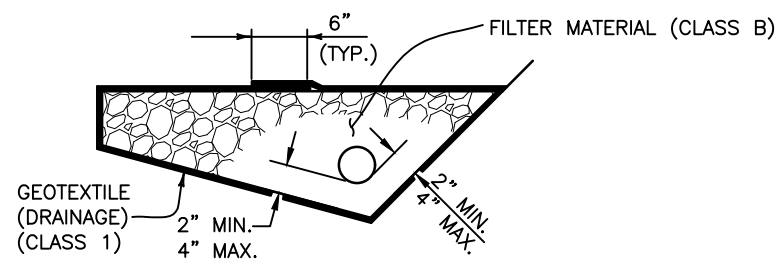
**SECTION PERPENDICULAR TO ABUTMENT**  
(PROPOSED SECTION)



**SECTION A**

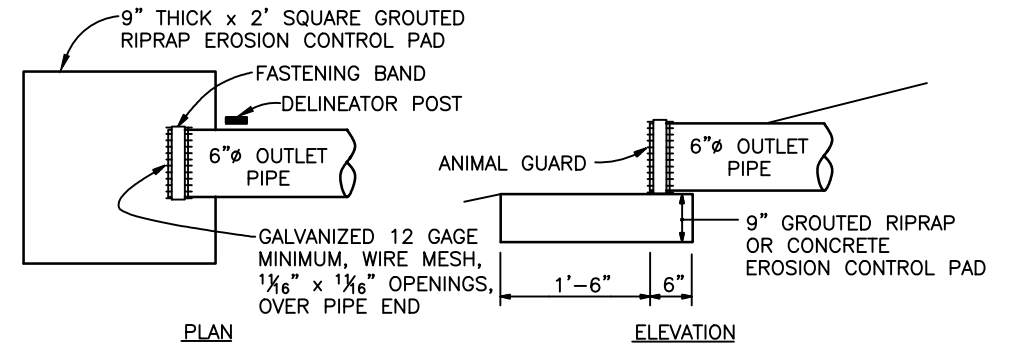


**SECTION C**



**6 INCH PERFORATED PIPE UNDERDRAIN**

6 INCH PERFORATED PIPE UNDERDRAIN INCLUDES ALL FILTER MATERIAL (CLASS B) AND GEOTEXTILE (DRAINAGE) (CLASS 1) 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 GEOTEXTILE SHALL CONSIST OF 12" OF OVERLAP.
- COST OF 6 INCH PERFORATED PIPE UNDERDRAIN, SUBSURFACE DRAIN OUTLET (6"Ø NON-PERFORATED PIPE) AND OUTLET PIPE END TREATMENT PAYMENT SHALL BE INCLUDED IN THE COST OF ITEM 206 STRUCTURE BACKFILL (CLASS 1).
- INSTALLATION OF PIPE UNDERDRAIN AND SUBSURFACE DRAIN OUTLET WILL CONFORM TO THE CONSTRUCTION REQUIREMENTS OF SECTION 605.03 AND 605.06, RESPECTIVELY.

I:\115360-01 - Compark at Belford\CADD\Bridge Drawings\Chase.Miyamoto

Print Date: 6/17/2021 10:46:18 AM
File Name: B115360-01EXC01.dwg
Horizontal Scale: VARIES Vertical Scale:
<b>FELSBURG HOLT &amp; ULLEVIG</b>
6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com

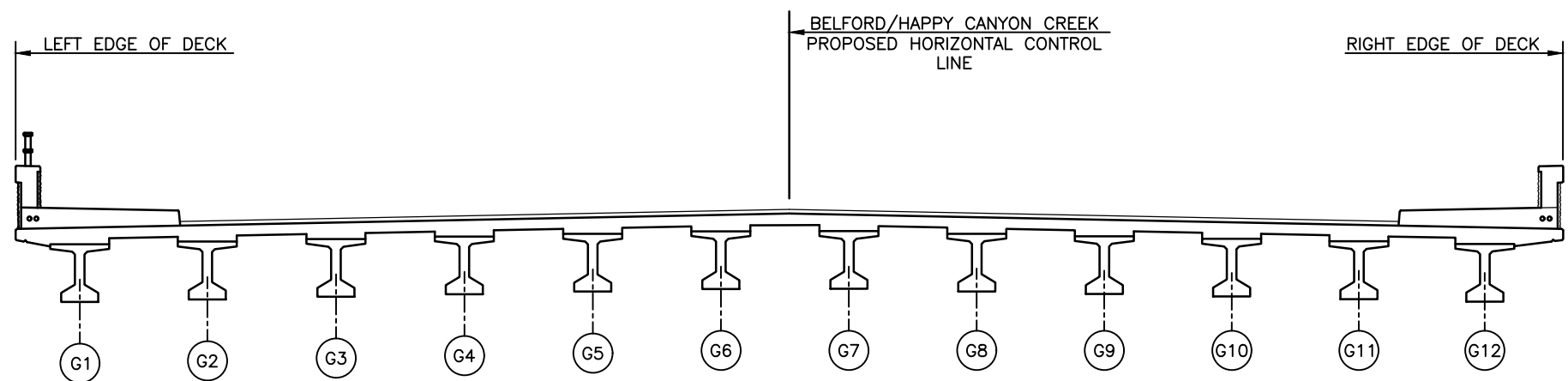
Sheet Revisions		
Date	Comments	Initials

8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0800 fax:303.708.0400 manhard.com  
Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK BRIDGE STRUCTURE BACKFILL		Project No./Code
No Revisions:	Designer: J. LYNCH	Structure Numbers	
Revised:	Detailer: R. DILLON		
Void:	Subset: BRIDGE	Sheets: B30 of 33	Sheet Number 60

LT EDGE OF DECK							GIRDER 1							RIGHT EDGE OF DECK						
BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING	BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING	BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING
END APPR	93+85.29	-47.0000	5783.4111		27917.5060	94492.5209	END APPR	93+84.25	-44.4309	5783.4546		27916.7287	94489.8330	END APPR	93+81.18	-37.0000	5783.5812		27914.4780	94482.0495
BF ABUT 1	94+04.18	-47.0000	5783.5763		27901.8728	94505.0561	BF ABUT 1	94+02.81	-43.3990	5783.6347		27900.7944	94501.3267	BF ABUT 1	94+00.34	-37.0000	5783.7390		27898.8761	94494.6927
CL BRG AB1	94+05.70	-47.0000	5783.5916	5783.5916	27900.5988	94506.0502	CL BRG AB1	94+04.32	-43.3361	5783.6509	5783.6509	27899.5024	94502.2586	CL BRG AB1	94+01.89	-37.0000	5783.7537	5783.7537	27897.6045	94495.6951
F-1	94+12.84	-47.0000	5783.6675	5783.6980	27894.6006	94510.6766	F-1	94+11.51	-43.0788	5783.7312	5783.7617	27893.3401	94506.7035	F-1	94+09.13	-37.0000	5783.8272	5783.8577	27891.6199	94500.3578
F-2	94+19.98	-47.0000	5783.7500	5783.8075	27888.5597	94515.2471	F-2	94+18.70	-42.8925	5783.8169	5783.8744	27887.1779	94511.1485	F-2	94+16.37	-37.0000	5783.9074	5783.9649	27885.5917	94504.9640
F-3	94+27.12	-47.0000	5783.8391	5783.9175	27882.4768	94519.7614	F-3	94+25.90	-42.7772	5783.9078	5783.9862	27881.0156	94515.5934	F-3	94+23.60	-37.0000	5783.9944	5784.0728	27879.5205	94509.5133
F-4	94+34.26	-47.0000	5783.9348	5784.0261	27876.3522	94524.2191	F-4	94+33.10	-42.7329	5784.0041	5784.0954	27874.8533	94520.0383	F-4	94+30.84	-37.0000	5784.0881	5784.1795	27873.4068	94514.0054
F-5	94+41.40	-47.0000	5784.0371	5784.1322	27870.1865	94528.6198	F-5	94+40.30	-42.7596	5784.1056	5784.2007	27868.6910	94524.4833	F-5	94+38.08	-37.0000	5784.1887	5784.2838	27867.2512	94518.4398
F-6	94+48.54	-47.0000	5784.1460	5784.2356	27863.9803	94532.9632	F-6	94+47.49	-42.8574	5784.2125	5784.3020	27862.5287	94528.9282	F-6	94+45.32	-37.0000	5784.2961	5784.3856	27861.0541	94522.8161
F-7	94+55.68	-47.0000	5784.2615	5784.3370	27857.7342	94537.2489	F-7	94+54.69	-43.0261	5784.3245	5784.4000	27856.3664	94533.3731	F-7	94+52.56	-37.0000	5784.4102	5784.4857	27854.8162	94527.1340
F-8	94+62.82	-47.0000	5784.3836	5784.4379	27851.4485	94541.4764	F-8	94+61.88	-43.2659	5784.4418	5784.4961	27850.2042	94537.8181	F-8	94+59.80	-37.0000	5784.5311	5784.5854	27848.5379	94531.3930
F-9	94+69.96	-47.0000	5784.5123	5784.5403	27845.1239	94545.6455	F-9	94+69.07	-43.5765	5784.5643	5784.5923	27844.0419	94542.2630	F-9	94+67.04	-37.0000	5784.6588	5784.6868	27842.2199	94535.5928
P2 BRG BK	94+77.10	-47.0000	5784.6476	5784.6476	27838.7609	94549.7558	P2 BRG BK	94+76.25	-43.9579	5784.6920	5784.6920	27837.8796	94546.7079	P2 BRG BK	94+74.28	-37.0000	5784.7933	5784.7933	27835.8627	94539.7331
CL PIER 2	94+77.92	-47.0000	5784.6636		27838.0284	94550.2237	CL PIER 2	94+76.99	-43.6721	5784.7121		27837.0644	94546.8905	CL PIER 2	94+75.11	-37.0000	5784.8092		27835.1311	94540.2041
P2 BRG AHD	94+78.74	-47.0000	5784.6796	5784.6796	27837.2953	94550.6908	P2 BRG AHD	94+77.73	-43.3870	5784.7322	5784.7322	27836.2492	94547.0731	P2 BRG AHD	94+75.94	-37.0000	5784.8252	5784.8252	27834.3989	94540.6744
F-1	94+85.90	-47.0000	5784.8236	5784.8520	27830.8608	94554.7439	F-1	94+84.94	-43.1200	5784.8815	5784.9099	27829.6706	94550.9129	F-1	94+83.20	-37.0000	5784.9685	5784.9969	27827.9741	94544.7535
F-2	94+93.07	-47.0000	5784.9742	5785.0292	27824.3889	94558.7369	F-2	94+92.15	-42.9243	5785.0361	5785.0911	27823.0921	94554.7527	F-2	94+90.46	-37.0000	5785.1186	5785.1736	27821.5112	94548.7719
F-3	95+00.24	-47.0000	5785.1316	5785.2080	27817.8801	94562.6696	F-3	94+99.37	-42.7999	5785.1961	5785.2725	27816.5135	94558.5925	F-3	94+97.72	-37.0000	5785.2755	5785.3520	27815.0106	94552.7292
F-4	95+07.40	-47.0000	5785.2955	5785.3861	27811.3349	94566.5415	F-4	95+06.58	-42.7470	5785.3614	5785.4520	27809.9350	94562.4323	F-4	95+04.98	-37.0000	5785.4393	5785.5299	27808.4730	94556.6250
F-5	95+14.57	-47.0000	5785.4661	5785.5621	27804.7540	94570.3523	F-5	95+13.80	-42.7654	5785.5321	5785.6281	27803.3564	94566.2722	F-5	95+12.24	-37.0000	5785.6100	5785.7060	27801.8990	94560.4589
F-6	95+21.74	-47.0000	5785.6434	5785.7355	27798.1379	94574.1016	F-6	95+21.01	-42.8552	5785.7081	5785.8002	27796.7779	94570.1120	F-6	95+19.50	-37.0000	5785.7874	5785.8795	27795.2890	94564.2307
F-7	95+28.91	-47.0000	5785.8273	5785.9063	27791.4872	94577.7893	F-7	95+28.23	-43.0163	5785.8893	5785.9683	27790.1993	94573.9518	F-7	95+26.77	-37.0000	5785.9717	5786.0507	27788.6439	94567.9400
F-8	95+36.07	-47.0000	5786.0179	5786.0758	27784.8025	94581.4148	F-8	95+35.44	-43.2488	5786.0757	5786.1336	27783.6207	94577.7916	F-8	95+34.03	-37.0000	5786.1628	5786.2207	27781.9640	94571.5865
F-9	95+43.24	-47.0000	5786.2151	5786.2458	27778.0843	94584.9780	F-9	95+42.64	-43.5525	5786.2673	5786.2980	27777.0422	94581.6314	F-9	95+41.29	-37.0000	5786.3607	5786.3914	27775.2500	94575.1698
CL BRG AB3	95+50.41	-47.0000	5786.4190	5786.4190	27771.3332	94588.4785	CL BRG AB3	95+49.84	-43.9274	5786.4641	5786.4641	27770.4636	94585.4713	CL BRG AB3	95+48.55	-37.0000	5786.5655	5786.5655	27768.5026	94578.6896
BF ABUT 3	95+51.85	-47.0000	5786.4607		27769.9730	94589.1742	BF ABUT 3	95+51.30	-44.0122	5786.5047		27769.1277	94586.2510	BF ABUT 3	95+50.01	-37.0000	5786.6075		27767.1433	94579.3889
END APPR	95+69.57	-47.0000	5786.9966		27753.1300	94597.5257	END APPR	95+69.29	-45.2990	5787.0221		27752.6508	94595.8684	END APPR	95+67.95	-37.0000	5787.1462		27750.3123	94587.7815

GIRDER 2						
BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING
END APPR	93+81.10	-36.7978	5783.5847		27914.4167	94481.8376
BF ABUT 1	93+99.83	-35.6878	5783.7604		27898.4824	94493.3312
CL BRG AB1	94+01.35	-35.6187	5783.7762	5783.7762	27897.1904	94494.2632
F-1	94+08.61	-35.3326	5783.8551	5783.8856	27891.0281	94498.7081
F-2	94+15.87	-35.1180	5783.9393	5783.9968	27884.8658	94503.1530
F-3	94+23.14	-34.9752	5784.0291	5784.1075	27878.7036	94507.5980
F-4	94+30.41	-34.9040	5784.1242	5784.2156	27872.5413	94512.0429
F-5	94+37.68	-34.9045	5784.2248	5784.3199	27866.3790	94516.4878
F-6	94+44.94	-34.9768	5784.3308	5784.4204	27860.2167	94520.9328
F-7	94+52.21	-35.1208	5784.4421	5784.5176	27854.0544	94525.3777
F-8	94+59.47	-35.3364	5784.5588	5784.6131	27847.8921	94529.8226
F-9	94+66.73	-35.6236	5784.6809	5784.7089	27841.7299	94534.2676
P2 BRG BK	94+73.98	-35.9824	5784.8082	5784.8082	27835.5676	94538.7125
CL PIER 2	94+74.77	-35.8107	5784.8265		27834.7861	94539.0118
P2 BRG AHD	94+75.55	-35.6398	5784.8449	5784.8449	27834.0047	94539.3111
F-1	94+82.83	-35.3512	5784.9939	5785.0223	27827.4260	94543.1506
F-2	94+90.11	-35.1347	5785.1485	5785.2035	27820.8474	94546.9901
F-3	94+97.39	-34.9902	5785.3085	5785.3849	27814.2688	94550.8297
F-4	95+04.68	-34.9177	5785.4740	5785.5646	27807.6901	94554.6692
F-5	95+11.96	-34.9173	5785.6449	5785.7409	27801.1115	94558.5087
F-6	95+19.25	-34.9890	5785.8213	5785.9134	27794.5328	94562.3483
F-7	95+26.53	-35.1327	5786.0030	5786.0820	27787.9542	94566.1878
F-8	95+33.81	-35.3485	5786.1901	5786.2480	27781.3756	94570.0273
F-9	95+41.09	-35.6362	5786.3825	5786.4132	27774.7969	94573.8669
CL BRG AB3	95+48.36	-35.9959	5786.5802	5786.5802	27768.2183	94577.7064
BF ABUT 3	95+49.84	-36.0777	5786.6209		27766.8823	94578.4861
END APPR	95+68.01	-37.3296	5787.1413		27750.4052	94588.1027



NOTE: ELEVATIONS ARE AT TOP OF CONCRETE DECK 3 INCHES BELOW FINISHED GRADE. ROADWAY CROSS SLOPE IS UPWARDS FROM THE PROFILE GRADE LINE. THESE STATIONS, COORDINATES, OFFSETS AND LENGTHS DEFINE THE LAYOUT OF THE STRUCTURE IN A TWO DIMENSIONAL HORIZONTAL PLANE. ELEVATIONS DEFINE THE FINAL GRADE OF THE FINISHED CONCRETE DECK. FABRICATION OF THE STRUCTURAL COMPONENTS THROUGH THE DIRECT USE OF THIS INFORMATION IS NOT INTENDED OR ADVISABLE.

Print Date: 6/17/2021 10:46:32 AM		Sheet Revisions			As Constructed		BELFORD-HAPPY CANYON CREEK BRIDGE		Project No./Code		
File Name: B115360-01GEM01.dwg		Date	Comments		Initials	No Revisions:		STRUCTURE PLANS			
Horizontal Scale: 100 Vertical Scale: N/A						Revised:		DECK GEOMETRY (1 OF 3)			
		6400 South Fiddlers Green Circle, Suite 1500 Greenwood Village, CO 80111 Phone: 303.721.1440 www.FHUENG.com					Designer: J. LYNCH Detailer: C. MIYAMOTO		Structure Numbers Sheets: B31 of 33		
					Void:		Subset: BRIDGE		Sheet Number 61		

I:\115360-01 - Compark at Belford\CADD\Bridge\Drawings\ - Chase.Miyamoto

i:\115360-01 - Compare at Belford\CADD\Bridges\Drawings - Chase Miyamoto

Table with columns for GIRDER 3, GIRDER 4, GIRDER 5, and GIRDER 6. Each girder section includes columns for BENT LINE, STATION, OFFSET, ELEVATION, ELEV + DL, NORTHING, and EASTING. Data rows include various bridge components like END APPR, BF ABUT, CL BRG AB1, P2 BRG BK, CL PIER, and P2 BRG AHD.

Table with columns for HCL, GIRDER 7, GIRDER 8, and GIRDER 9. Each girder section includes columns for BENT LINE, STATION, OFFSET, ELEVATION, ELEV + DL, NORTHING, and EASTING. Data rows include various bridge components like END APPR, BF ABUT, CL BRG AB1, P2 BRG BK, CL PIER, and P2 BRG AHD.

NOTE: ELEVATIONS ARE AT TOP OF CONCRETE DECK 3 INCHES BELOW FINISHED GRADE. ROADWAY CROSS SLOPE IS UPWARDS FROM THE PROFILE GRADE LINE. THESE STATIONS, COORDINATES, OFFSETS AND LENGTHS DEFINE THE LAYOUT OF THE STRUCTURE IN A TWO DIMENSIONAL HORIZONTAL PLANE. ELEVATIONS DEFINE THE FINAL GRADE OF THE FINISHED CONCRETE DECK. FABRICATION OF THE STRUCTURAL COMPONENTS THROUGH THE DIRECT USE OF THIS INFORMATION IS NOT INTENDED OR ADVISABLE.

Print Date: 6/17/2021 10:46:40 AM
File Name: B115360-01GEM01.dwg
Horizontal Scale: 100 Vertical Scale: N/A
FELSBURG HOLT & ULLEVIG
6400 South Fiddlers Green Circle, Suite 1500
Greenwood Village, CO 80111
Phone: 303.721.1440
www.FHUENG.com

Table with 3 columns: Date, Comments, Initials. Header: Sheet Revisions.

Manhard CONSULTING LTD
8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112
Civil Engineers - Surveyors - Water Resources Engineers - Water & Wastewater Engineers
Construction Managers - Environmental Scientists - Landscape Architects - Planners

As Constructed
No Revisions:
Revised:
Void:
BELFORD-HAPPY CANYON CREEK BRIDGE STRUCTURE PLANS DECK GEOMETRY (2 OF 3)
Project No./Code
Designer: J. LYNCH
Detailer: C. MIYAMOTO
Subset: BRIDGE
Sheets: B32 of 33
Sheet Number 62

GIRDER 10												GIRDER 11												RT EDGE OF SIDEWALK												RT EDGE OF SIDEWALK											
BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING	BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING	BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING	BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING																				
END APPR	93+52.78	25.3315	5783.6682		27895.4286	94416.1730	END APPR	93+48.98	32.8841	5783.5055		27893.0971	94408.1103	END APPR	93+46.87	37.0000	5783.4175		27891.8242	94403.7082	END APPR	93+46.87	37.0000	5783.4175		27891.8242	94403.7082																				
BF ABUT 1	93+73.24	26.7066	5783.7356		27879.6271	94428.1259	BF ABUT 1	93+69.64	34.3542	5783.5620		27877.2956	94420.0632	BF ABUT 1	93+68.37	37.0000	5783.5023		27876.4878	94417.2699	BF ABUT 1	93+68.37	37.0000	5783.5023		27876.4878	94417.2699																				
CL BRG AB1	93+74.90	26.7950	5783.7439	5783.7439	27878.3459	94429.0951	CL BRG AB1	93+71.32	34.4502	5783.5695	5783.5695	27876.0144	94421.0324	CL BRG AB1	93+70.10	37.0000	5783.5117	5783.5117	27875.2367	94418.3430	CL BRG AB1	93+70.10	37.0000	5783.5117	5783.5117	27875.2367	94418.3430																				
F-1	93+82.83	27.1693	5783.7895	5783.8193	27872.2349	94433.7176	F-1	93+79.33	34.8596	5783.6113	5783.6410	27869.9035	94425.6550	F-1	93+78.18	37.0000	5783.5608	5783.5906	27869.3688	94423.3117	F-1	93+78.18	37.0000	5783.5608	5783.5906	27869.3688	94423.3117																				
F-2	93+90.77	27.4646	5783.8449	5783.9010	27866.1240	94438.3402	F-2	93+87.35	35.1894	5783.6630	5783.7191	27863.7926	94430.2775	F-2	93+86.26	37.0000	5783.6184	5783.6745	27863.4490	94428.2186	F-2	93+86.26	37.0000	5783.6184	5783.6745	27863.4490	94428.2186																				
F-3	93+98.71	27.6810	5783.9101	5783.9864	27860.0131	94442.9628	F-3	93+95.38	35.4394	5783.7247	5783.8010	27857.6816	94434.9001	F-3	93+94.34	37.0000	5783.6844	5783.7607	27857.4781	94433.0631	F-3	93+94.34	37.0000	5783.6844	5783.7607	27857.4781	94433.0631																				
F-4	94+06.66	27.8184	5783.9850	5784.0737	27853.9022	94447.5853	F-4	94+03.41	35.6095	5783.7964	5783.8851	27851.5707	94439.5226	F-4	94+02.41	37.0000	5783.7589	5783.8475	27851.4567	94437.8448	F-4	94+02.41	37.0000	5783.7589	5783.8475	27851.4567	94437.8448																				
F-5	94+14.61	27.8766	5784.0698	5784.1621	27847.7913	94452.2079	F-5	94+11.44	35.6998	5783.8781	5783.9704	27845.4598	94444.1452	F-5	94+10.49	37.0000	5783.8418	5783.9341	27845.3855	94442.5629	F-5	94+10.49	37.0000	5783.8418	5783.9341	27845.3855	94442.5629																				
F-6	94+22.56	27.8557	5784.1643	5784.2512	27841.6803	94456.8304	F-6	94+19.48	35.7100	5783.9697	5784.0566	27839.3489	94448.7678	F-6	94+18.57	37.0000	5783.9331	5784.0200	27839.2652	94447.2172	F-6	94+18.57	37.0000	5783.9331	5784.0200	27839.2652	94447.2172																				
F-7	94+30.51	27.7558	5784.2686	5784.3417	27835.5694	94461.4530	F-7	94+27.51	35.6403	5784.0713	5784.1445	27833.2380	94453.3903	F-7	94+26.65	37.0000	5784.0329	5784.1061	27833.0963	94451.8070	F-7	94+26.65	37.0000	5784.0329	5784.1061	27833.0963	94451.8070																				
F-8	94+38.46	27.5767	5784.3826	5784.4351	27829.4585	94466.0755	F-8	94+35.54	35.4907	5784.1828	5784.2353	27827.1270	94458.0129	F-8	94+34.72	37.0000	5784.1412	5784.1937	27826.8796	94456.3318	F-8	94+34.72	37.0000	5784.1412	5784.1937	27826.8796	94456.3318																				
F-9	94+46.40	27.3187	5784.5062	5784.5334	27823.3476	94470.6981	F-9	94+43.57	35.2612	5784.3042	5784.3314	27821.0161	94462.6354	F-9	94+42.80	37.0000	5784.2579	5784.2851	27820.6159	94460.7912	F-9	94+42.80	37.0000	5784.2579	5784.2851	27820.6159	94460.7912																				
P2 BRG BK	94+54.33	26.9817	5784.6396	5784.6396	27817.2367	94475.3207	P2 BRG BK	94+51.59	34.9519	5784.4355	5784.4355	27814.9052	94467.2580	P2 BRG BK	94+50.88	37.0000	5784.3831	5784.3831	27814.3056	94465.1846	P2 BRG BK	94+50.88	37.0000	5784.3831	5784.3831	27814.3056	94465.1846																				
CL PIER 2	94+55.26	26.9147	5784.6563		27816.5311	94475.8822	CL PIER 2	94+52.58	34.7552	5784.4554		27814.2385	94467.9540	CL PIER 2	94+51.80	37.0000	5784.3979		27813.5817	94465.6824	CL PIER 2	94+51.80	37.0000	5784.3979		27813.5817	94465.6824																				
P2 BRG AHD	94+56.20	26.8467	5784.6732	5784.6732	27815.8255	94476.4437	P2 BRG AHD	94+53.57	34.5573	5784.4755	5784.4755	27813.5718	94468.6500	P2 BRG AHD	94+52.72	37.0000	5784.4129	5784.4129	27812.8573	94466.1792	P2 BRG AHD	94+52.72	37.0000	5784.4129	5784.4129	27812.8573	94466.1792																				
F-1	94+64.11	27.2048	5784.8024	5784.8294	27809.2813	94480.4027	F-1	94+61.57	34.9411	5784.6029	5784.6300	27807.0277	94472.6090	F-1	94+60.77	37.0000	5784.5479	5784.5750	27806.5145	94470.4752	F-1	94+60.77	37.0000	5784.5479	5784.5750	27806.5145	94470.4752																				
F-2	94+72.04	27.4843	5784.9414	5784.9937	27802.7372	94484.3617	F-2	94+69.57	35.2455	5784.7403	5784.7927	27800.4836	94476.5680	F-2	94+68.82	37.0000	5784.6913	5784.7436	27800.1272	94474.7047	F-2	94+68.82	37.0000	5784.6913	5784.7436	27800.1272	94474.7047																				
F-3	94+79.97	27.6851	5785.0902	5785.1630	27796.1931	94488.3206	F-3	94+77.59	35.4704	5784.8877	5784.9606	27793.9395	94480.5270	F-3	94+76.86	37.0000	5784.8431	5784.9159	27793.6960	94478.8671	F-3	94+76.86	37.0000	5784.8431	5784.9159	27793.6960	94478.8671																				
F-4	94+87.90	27.8072	5785.2488	5785.3351	27789.6490	94492.2796	F-4	94+85.60	35.6156	5785.0452	5785.1315	27787.3953	94484.4859	F-4	94+84.91	37.0000	5785.0033	5785.0896	27787.2217	94482.9622	F-4	94+84.91	37.0000	5785.0033	5785.0896	27787.2217	94482.9622																				
F-5	94+95.84	27.8504	5785.4172	5785.5087	27783.1049	94496.2386	F-5	94+93.62	35.6813	5785.2126	5785.3041	27780.8512	94488.4449	F-5	94+92.96	37.0000	5785.1719	5785.2634	27780.7049	94486.9893	F-5	94+92.96	37.0000	5785.1719	5785.2634	27780.7049	94486.9893																				
F-6	95+03.77	27.8148	5785.5953	5785.6831	27776.5608	94500.1975	F-6	95+01.64	35.6672	5785.3899	5785.4777	27774.3071	94492.4039	F-6	95+01.01	37.0000	5785.3488	5785.4367	27774.1465	94490.9481	F-6	95+01.01	37.0000	5785.3488	5785.4367	27774.1465	94490.9481																				
F-7	95+11.71	27.7004	5785.7831	5785.8585	27770.0167	94504.1565	F-7	95+09.66	35.5735	5785.5771	5785.6525	27767.7630	94496.3628	F-7	95+09.05	37.0000	5785.5342	5785.6096	27767.5469	94494.8382	F-7	95+09.05	37.0000	5785.5342	5785.6096	27767.5469	94494.8382																				
F-8	95+19.64	27.5073	5785.9805	5786.0359	27763.4726	94508.1155	F-8	95+17.68	35.4002	5785.7742	5785.8295	27761.2189	94500.3218	F-8	95+17.10	37.0000	5785.7279	5785.7833	27760.9071	94498.6590	F-8	95+17.10	37.0000	5785.7279	5785.7833	27760.9071	94498.6590																				
F-9	95+27.56	27.2354	5786.1876	5786.2169	27756.9285	94512.0744	F-9	95+25.69	35.1473	5785.9810	5786.0104	27754.6748	94504.2808	F-9	95+25.15	37.0000	5785.9301	5785.9594	27754.2278	94502.4103	F-9	95+25.15	37.0000	5785.9301	5785.9594	27754.2278	94502.4103																				
CL BRG AB3	95+35.48	26.8849	5786.4041	5786.4041	27750.3844	94516.0334	CL BRG AB3	95+33.70	34.8150	5786.1976	5786.1976	27748.1307	94508.2397	CL BRG AB3	95+33.20	37.0000	5786.1406	5786.1406	27747.5096	94506.0916	CL BRG AB3	95+33.20	37.0000	5786.1406	5786.1406	27747.5096	94506.0916																				
BF ABUT 3	95+37.09	26.8041	5786.4493		27749.0554	94516.8374	BF ABUT 3	95+35.32	34.7378	5786.2428		27746.8018	94509.0437	BF ABUT 3	95+34.81	37.0000	5786.1838		27746.1589	94506.8207	BF ABUT 3	95+34.81	37.0000	5786.1838		27746.1589	94506.8207																				
END APPR	95+56.87	25.5421	5787.0378		27732.6648	94526.7532	END APPR	95+55.32	33.5169	5786.8324		27730.4111	94518.9595	END APPR	95+54.64	37.0000	5786.7424		27729.4266	94515.5546	END APPR	95+54.64	37.0000	5786.7424		27729.4266	94515.5546																				

GIRDER 12												RT EDGE OF DECK											
BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING	BENT LINE	STATION	OFFSET	ELEVATION	ELEV + DL	NORTHING	EASTING										
END APPR	93+45.09	40.4183	5783.3449		27890.7657	94400.0476	END APPR	93+41.63	47.0000	5783.2060		27888.7242	94392.9877										
BF ABUT 1	93+65.96	41.9854	5783.3901		27874.9641	94412.0006	BF ABUT 1	93+63.50	47.0000	5783.2778		27873.4293	94406.6928										
CL BRG AB1	93+67.66	42.0890	5783.3967	5783.3967	27873.6829	94412.9697	CL BRG AB1	93+65.26	47.0000	5783.2863	5783.2863	27872.1813	94407.7769										
F-1	93+75.75	42.5344	5783.4345	5783.4642	27867.5720	94417.5923	F-1	93+73.47	47.0000	5783.3311	5783.3609	27866.3317	94412.7929										
F-2	93+83.86	42.8994	5783.4824	5783.5385	27861.4611	94422.2148	F-2	93+81.67	47.0000	5783.3847	5783.4407	27860.4289	94417.7461										
F-3	93+91.97	43.1837	5783.5405	5783.6168	27855.3502	94426.8374	F-3	93+89.88	47.0000	5783.4469	5783.5233	27854.4736	94422.6362										
F-4	94+00.08	43.3873	5783.6087	5783.6974	27849.2393	94431.4600	F-4	93+98.09	47.0000	5783.5179	5783.6066	27848.4666	94427.4626										
F-5	94+08.20	43.5102	5783.6872	5783.7795	27843.1283	94436.0825	F-5	94+06.29	47.0000	5783.5976	5783.6900	27842.4084	94432.2246										
F-6	94+16.32	43.5523	5783.7758	5783.8628	27837.0174	94440.7051	F-6	94+14.50	47.0000	5783.6861	5783.7730	27836.2999	94436.9218										
F-7	94+24.44	43.5135	5783.8746	5783.9478	27830.9065	94445.3276	F-7	94+22.71	47.0000	5783.7832	5783.8564	27830.1416	94441.5537										
F-8	94+32.56	43.3940	5783.9836	5784.0361	27824.7956	94449.9502																	

**STORM DRAINAGE INFRASTRUCTURE NOTES**

- ALL STORM DRAINAGE IMPROVEMENTS ARE SUBJECT TO COMPLIANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, M & S STANDARDS, AND ALL STANDARD SPECIAL PROVISIONS CURRENTLY USED BY CDOT, WITH THE MODIFICATIONS SET FORTH IN THE TOWN OF PARKER'S STORM DRAINAGE AND ENVIRONMENTAL CRITERIA MANUAL (SDECM), AS AMENDED.
- THE CONTRACTOR SHALL COMPLY WITH THE "COLORADO WATER QUALITY CONTROL ACT" (TITLE 25, ARTICLE 8 CRS), THE "PROTECTION OF FISHING STREAMS" TITLE 33, ARTICLE 5, CRS), THE "CLEAN WATER ACT" (33 USC 1344), "CHERRY CREEK RESERVOIR CONTROL REGULATION NO. 72" (5 CCR 1002-72), THE REGULATION PROMULGATED, CERTIFICATION OR PERMITS ISSUES, AND THE REQUIREMENTS PRESENTED IN THE SDECM REVISION TO SECTION 107 AND THE CONSTRUCTION BMP PLAN. IN THE EVENT OF CONFLICTS BETWEEN THESE REQUIREMENTS AND WATER QUALITY CONTROL LAWS, RULES, OR REGULATIONS OF OTHER FEDERAL, OR STATE AGENCIES, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.
- INSPECTIONS: CONSTRUCTION SHALL NOT BEGIN UNTIL A GRADING PERMIT HAS BEEN ISSUED FOR THE PROJECT. THE CONTRACTOR SHALL NOTIFY THE TOWN OF PARKER ENGINEERING DEPARTMENT (PUBLIC WORKS) TO SCHEDULE INSPECTIONS A MINIMUM OF 48 HOURS PRIOR THE CONSTRUCTION OF ALL DRAINAGE INFRASTRUCTURE (STORM SEWERS, INLETS, MANHOLES, ENERGY DISSIPATORS, RIPRAP, GROUTED BOULDERS, DETENTION POND OUTLET STRUCTURES, FOREBAYS, TRICKLE CHANNELS, ETC). FAILURE TO NOTIFY THE ENGINEERING DEPARTMENT FOR INSPECTIONS MAY RESULT IN NON-ACCEPTANCE OF THE INFRASTRUCTURE BY THE TOWN. URBAN DRAINAGE AND FLOOD CONTROL DISTRICT MUST ALSO BE NOTIFIED IN A SIMILAR MANNER FOR ALL MAINTENANCE ELIGIBLE DRAINAGE INFRASTRUCTURES (CONSULT WITH STORMWATER ENGINEERING DIVISION).
- STRUCTURAL BACKFILL (CDOT CLASS 1) SHALL BE COMPACTED TO CONFORM TO CDOT STANDARD SPECIFICATION 203.03. STRUCTURAL BACKFILL (CDOT CLASS 2) SHALL CONFORM TO CDOT STANDARD SPECIFICATION 203.07. AT THE CONTRACTOR'S OPTION, STRUCTURAL BACKFILL (SQUEEGEE) MEETING THE GRADATION REQUIREMENTS CONTAINED IN REVISION OF SECTION 206 OF THE CDOT STANDARD SPECIFICATIONS AS PRESENTED IN THE SDECM, MAY BE SUBSTITUTED FOR STRUCTURE BACKFILL (CLASS 1) OR CLASS 2) FOR BACKFILLING OF CULVERT PIPES, STORM SEWER PIPES, MANHOLES AND INLET STRUCTURES; HOWEVER, THE TOP 2 FEET BELOW SUBGRADE ELEVATION SHALL BE THE REQUIRED EMBANKMENT MATERIAL.
- ALL EXCAVATIONS SHALL MEET OSHA REQUIREMENTS.
- TESTING: PROBATIONARY ACCEPTANCE OF STORM DRAINAGE IMPROVEMENTS WILL BE CONTINGENT UPON SATISFACTORY TESTING RESULTS. IN ALL CASES WHERE TESTS INDICATE COMPACTION LESS THAN THAT REQUIRED BY TOWN SPECIFICATIONS, ADDITIONAL COMPACTION AND TESTS WILL BE REQUIRED UNTIL THE SPECIFICATIONS ARE MET. FREQUENCY OF TESTING WILL BE AS FOLLOWS:  
 1 TEST FOR SUBGRADE AND 1 TEST FOR BACKFILL AT EVERY ABOVE GROUND APPURTENANCE (MANHOLES, INLETS, ETC)  
 1 TEST EVERY 200 LF OF MAINLINE TRENCH EVERY 1 FOOT OF BACKFILL LIFT AND WITHIN 1 FOOT FROM ALL STRUCTURES.
- ALLOWABLE STORM SEWER CONDUIT MATERIAL WITHIN THE TOWN OF PARKER SHALL BE LIMITED TO REINFORCED CONCRETE PIPE (RCP) CONFORMING TO CDOT STANDARD SPECIFICATION 706.02.
- ALL RCP JOINTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C443. RUBBER GASKETS SHALL BE USED ON ALL PIPE JOINTS CONFORMING TO ASTM C443. ALL RCP SECTIONS SHALL BE JOINED IN SUCH A MANNER THAT THE ENDS ARE FULLY ENTERED AND THE INNER SURFACES ARE REASONABLE FLUSH. AVERAGE JOINT GAP THAT EXCEEDS 1/2 INCH SHALL BE FILLED WITH AN APPROVED FLEXIBLE PLASTIC SEALANT.
- JOINT RESTRAINTS AND TOE-WALLS, CONFORMING TO CDOT M&S STANDARD PLAN NO. M-601-11 SHALL BE USED ON ALL RCP FLARED END SECTION OUTFALLS.
- EPOXY COATED REBAR SHALL BE USED AS REINFORCING STEEL ON ALL STORM INLETS AND STRUCTURES. REFERENCE CDOT M&S STANDARD PLAN NO. M-604-10, 11, 12, AND 13.
- CDOT CLASS D CONCRETE SHALL BE USED FOR ALL CONCRETE DRAINAGE STRUCTURES.
- PRE-CAST INLETS AND MANHOLE BASES SHALL NOT BE USED WITHIN THE TOWN OF PARKER RIGHT-OF-WAY, WITH THE EXCEPTION OF CDOT TYPE C AND D INLETS.
- TWO- (2) MANHOLE ACCESS POINTS ARE REQUIRED ON ALL TYPE "R" CURB INLETS GREATER THAN OR EQUAL TO TEN (10) FEET IN LENGTH AS PRESENTED IN CDOT M&S STANDARD PLAN NO. M-604-12.
- ALL GROUTING (BOULDERS, RIPRAP) SHALL BE IN ACCORDANCE WITH THE REVISION OF SECTION 506 OF THE CDOT STANDARD SPECIFICATIONS AS PRESENTED IN THE SDECM.
- ALL BOULDERS AND RIPRAP SHALL BE SELECTED AND PLACED IN ACCORDANCE WITH THE REVISION OF SECTION 506 OF THE CDOT STANDARD SPECIFICATIONS AS PRESENTED IN THE SDECM.
- CONTRACTOR SHALL REFER TO THE TOWN OF PARKER'S CONSTRUCTION BEST MANAGEMENT PRACTICES DETAILS AND NOTES FOR ALL REQUIREMENTS RELATING TO RE-VEGETATION, SEDIMENT AND EROSION CONTROL REQUIREMENTS FOR CONSTRUCTION ACTIVITIES.
- PIPE BELLS SHALL NOT BE CAST INTO MANHOLE BASES OR INLETS.

**DROP STRUCTURE TABULATION**

INDEX		ITEM NO.	CONTRACT ITEM	UNIT	GSB	
BOOK	PAGE SHEET				PLAN	AS CONST.
		206	FILTER MATERIAL (CLASS A)	CY	1690	
		206	FILTER MATERIAL (CLASS C)	CY	61	
		206	STRUCTURE EXCAVATION	CY	130	
		206	STRUCTURE BACKFILL (CLASS 1)	CY	118	
		207	TOPSOIL	CY	832	
		501	STEEL SHEET PILING (TYPE II)	SF	11710	
		506	RIPRAP (12 INCH)	CY	76	
		506	SOIL RIPRAP (12 INCH)	CY	2884	
		506	SOIL RIPRAP (18 INCH)	CY	977	
		506	24 INCH GROUTED BOULDER	CY	602	
		601	CONCRETE CLASS D (BOX CULVERT)	CY	47	
		602	REINFORCING STEEL	LB	2352	
		602	REINFORCING STEEL (EPOXY COATED)	LB	740	
		603	48 INCH REINFORCED CONCRETE PIPE (CIP)	LF	187	
		603	48 INCH REINFORCED CONCRETE END SECTION	EA	1	
		603	10X3 FOOT CONCRETE BOX CULVERT (PRECAST)	LF	90	
		604	INLET TYPE D (10 FOOT)	EA	1	
		604	INLET SPECIAL	EA	1	
		619	8 INCH PLASTIC PIPE	LF	268	

NOTES:

- 24 INCH GROUTED RIPRAP SHALL BE PAID FOR AS 24 INCH GROUTED BOULDERS.
- SEE CBMP PLANS FOR TABULATION OF EROSION CONTROL ITEMS.
- FOR UNCLASSIFIED EXCAVATION SEE EARTHWORK SUMMARY. COST OF EXCAVATION FOR ALL GROUTED BOULDERS 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.
- 10X3 FOOT CONCRETE BOX CULVERT (PRECAST) QUANTITY SHOWN IS FOR THE DUAL BOX CULVERT AT CHEROKEE TRAIL.
- THE PRESENCE OF GROUNDWATER IS ANTICIPATED AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING DURING CONSTRUCTION FOR ALL STORM SEWER AND DROP STRUCTURE INFRASTRUCTURE. DEWATERING SHALL BE INCLUDED IN THE COST OF THE WORK AND NOT PAID FOR SEPARATELY.
- THE SUGGESTED SEQUENCING FOR DEWATERING WHEN CONSTRUCTING THE DROP STRUCTURES INCLUDES CONSTRUCTING THE SHEET PILE CUTOFF WALLS FIRST, THEN INSTALLING DEWATERING WELLS OR TRENCHES TO DEWATER BELOW THE PROPOSED LOWEST EXCAVATION LIMITS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL APPLICABLE DEWATERING PERMITS AND TREATMENT (AS REQUIRED) OF DISCHARGE FROM DEWATERING OPERATIONS.

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

Print Date: 6/18/2021 6:30:59 AM  
 File Name: H115360-01DROP01?ab.dwg  
 Horizontal Scale: N.T.S. Vertical Scale: N.T.S.



6400 South Fiddlers Green Circle, Suite 1500  
 Greenwood Village, CO 80111  
 Phone: 303.721.1440  
 www.FHUENG.com

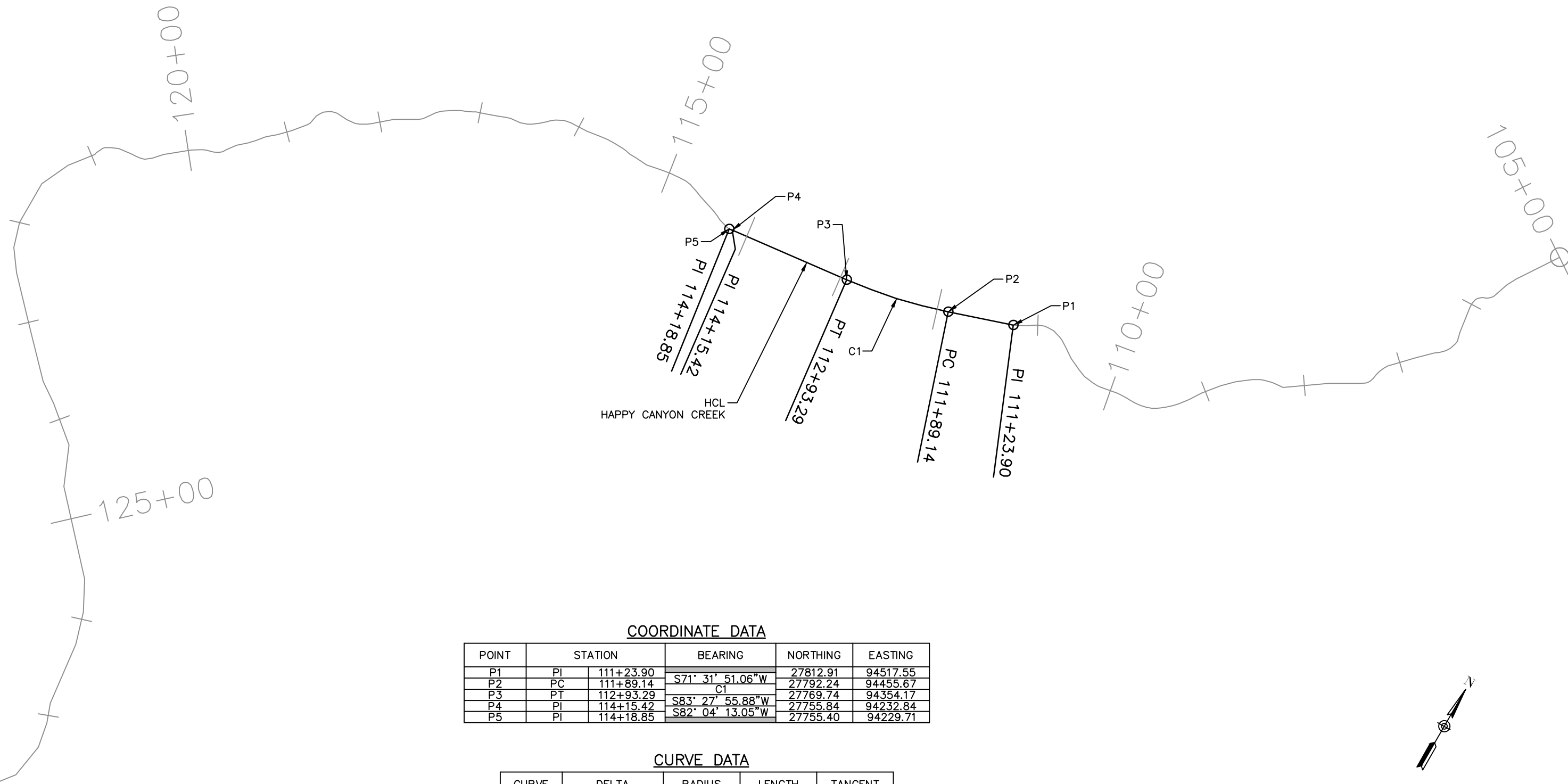
Sheet Revisions			
(R-X)	Date	Comments	Initials



8008 E. Arapahoe Court, Suite 110, Centennial, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK HAPPY CANYON CREEK DROP STRUCTURE TABULATION		Project No./Code
No Revisions:	Designer: CDT	Structure Numbers	
Revised:	Detailer: KLT		
Void:	Subset: Drainage	Sheets: DD-01 of 23	Sheet Number 64

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

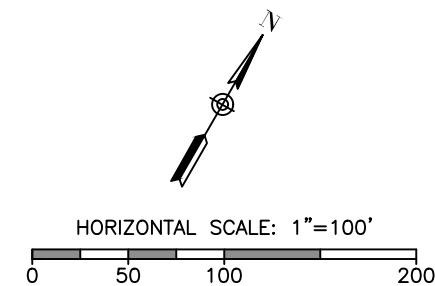


**COORDINATE DATA**

POINT	STATION	BEARING	NORTHING	EASTING
P1	PI 111+23.90		27812.91	94517.55
P2	PC 111+89.14	S71° 31' 51.06"W	27792.24	94455.67
P3	PT 112+93.29	C1	27769.74	94354.17
P4	PI 114+15.42	S83° 27' 55.88"W	27755.84	94232.84
P5	PI 114+18.85	S82° 04' 13.05"W	27755.40	94229.71

**CURVE DATA**

CURVE	DELTA	RADIUS	LENGTH	TANGENT
C1	11° 56' 4.83"	500	104.15	52.26



Print Date: 6/18/2021 7:16:43 AM  
 File Name: H115360-01DROPO2Geom.dwg  
 Horizontal Scale: 1"=100' Vertical Scale: N.T.S.

Sheet Revisions			
Date	Comments	Initials	

**Manhard CONSULTING LTD**  
 8008 E. Arapahoe Court, Suite 110, Denver, CO 80112 ph:303.708.0900 fax:303.708.0400 manhard.com  
 Civil Engineers • Surveyors • Water Resource Engineers • Water & Wastewater Engineers  
 Construction Managers • Environmental Scientists • Landscape Architects • Planners

As Constructed	BELFORD-HAPPY CANYON CREEK HAPPY CANYON CREEK DROP STRUCTURE HCL GEOMETRY LAYOUT		Project No./Code
No Revisions:	Designer: CDT	Structure Numbers	
Revised:	Detailer: KLT	Sheets: DD-02 of 23	Sheet Number 65
Void:	Subset: Drainage		