

CORNERSTONE WINTER PARK HOLDINGS, LLC

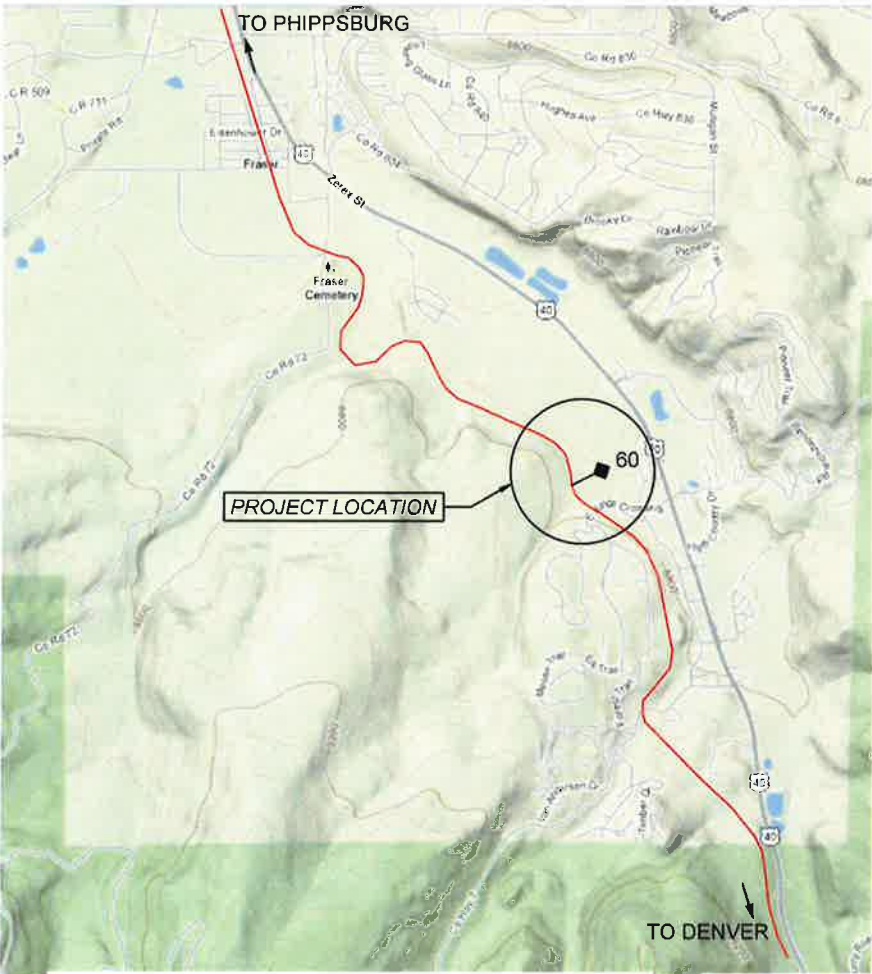
REGISTERED
PROFESSIONAL ENGINEERS



TRACK & CIVIL PAGES:
P001 - P005, T001 - T003, PST01,
X001 - X011, R001



STRUCTURES PAGES:
S001 - S030



PROJECT LOCATION MAP

HDR

HDR Engineering, Inc.

NORTH



Not to Scale

Contract Drawings For

UPRR UNDERPASS AT GRAND PARK DRIVE IN FRASER, COLORADO UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION TRACK SHOOFLY AND BRIDGE PLANS

Project No.
000000000197406

Fraser, Colorado
June 10, 2014

100% FINAL

INDEX OF DRAWINGS

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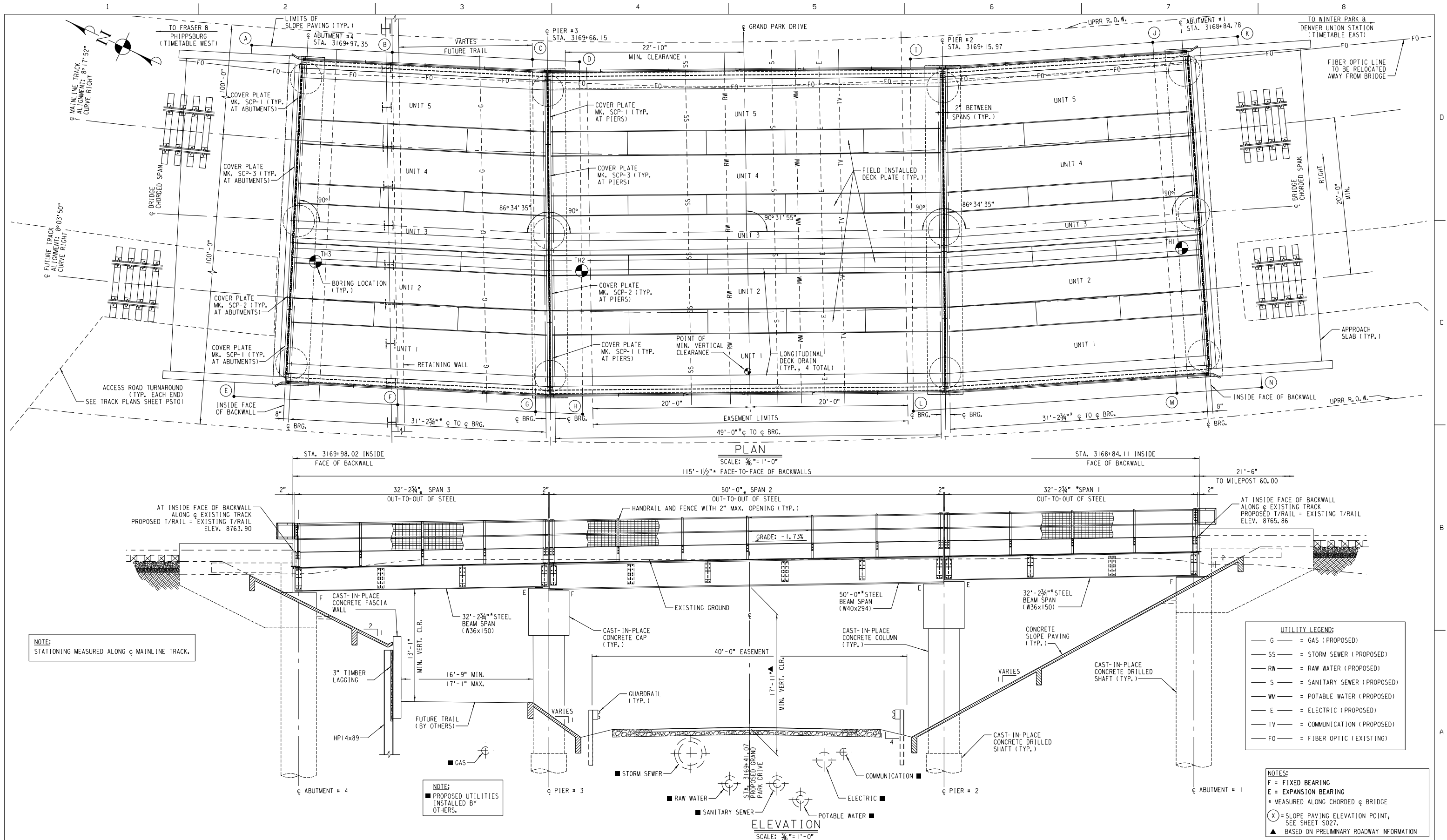
G001

			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406

CORNERSTONE WINTER PARK HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS IN FRASER, COLORADO UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION GENERAL ARRANGEMENT

FILENAME	...GDP_S001.dgn	SHEET
SCALE	AS NOTED	S001



GENERAL NOTES

1. All work requirements shown on these drawings and not otherwise detailed shall be accomplished as specified in the Project Specifications and the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering and Project Special Provisions. In the event of conflicts between specifications, the more restrictive shall apply.
2. All information shown on these drawings regarding location of the existing track and existing ground elevations is based a site location survey performed by Michael S. Kervin, PLS dated July 2013.
3. Contractor shall perform excavation as required for construction of the new structure and replace areas removed and disturbed in the course of construction to a condition equal to or better than existing.
4. At least one track is to remain in service at all times (see Proposed Construction Sequence, Sheet S003).
5. Elevations, Stationing and Right-of-Way are based on Track Plan and Top of Rail Profile (see Track Plans, this package). Stationing in track plans is based on the 48"x60" CMP at Station 3168+24.
6. Contact the Union Pacific "Call Before You Dig" number 90 days (not less than 60 days) prior to proposed construction start date. Prior to construction, confirm that all necessary relocations have been completed. The CBYD number is: 1-800-336-9193.
7. Subsurface exploration was performed by Ground Engineering, Inc.. A copy of the Subsurface Exploration Report dated 02-2014 is available from Cornerstone Winter Park Holdings, LLC.
8. Refer to the UPRR/BNSF Grade Separation Guidelines for additional requirements.

DIVISION OF RESPONSIBILITY

A. RAILROAD

1. Shift and construct track within the 13' clear point as described in the Proposed Construction Sequence on Sheet S003.
2. Furnish ballast, ties, rail, and OTM for track shift and construction performed by UPRR forces.
3. Shift crossing panels as described in the Proposed Construction Sequence on Sheet S003.
4. Relocate overhead pole line.

B. CONTRACTOR

1. Coordinate all construction activities with the Railroad.
2. Before ordering any material, the Contractor shall make a detailed field inspection of the site verifying all pertinent dimensions and elevations. Any variations in dimensions or elevations from those shown on the drawings shall be reported immediately to the Owner's Representative.
3. Any modifications to this design shall be approved by the Railroad and the Engineer of Record prior to construction.
4. Verify the location, relocation, abandonment, and/or temporary support of all utilities affected by the construction of the structure and embankment and coordinate these activities with the appropriate utility companies, agencies and/or authorities.
5. Apply for and obtain all construction permits necessary to perform the work.
6. Summary of Quantities are provided for information only. Contractor shall be responsible for providing all material, not provided by the Railroad, required to complete the work.
7. Perform all work not performed by the Railroad.
8. Provide the Owner's Representative with a detailed construction plan defining the activity, schedule and procedure for each aspect of the work. Construction shall not begin until the construction plan has been approved.
9. Provide all temporary structures (shoring, bracing and/or falsework) required to support and protect the existing embankments and structures affected by the work. Provide the Owner's Representative with details, design and procedure for all temporary structures. All temporary structures shall be designed, signed and sealed by a Professional Engineer registered in the State of Colorado. Contractor shall satisfy all requirements given in the UPRR/BNSF Guidelines for Temporary Shoring. All temporary structures shall be approved by the Railroad prior to beginning construction.
10. Provide temporary guardrail system as directed by Owner's Representative or the Railroad. Guardrails on shoring shall include but not be limited to the following:

The top edge height of the top rail shall be 42" +/- 3" above the walking/working surface.

At least one midrail shall be provided, evenly spaced between walking/working surface and top rail.

Metal or timber posts or uprights shall be spaced at maximum intervals of 10'-0".

Entire guardrail system, including anchorages, shall be capable of withstanding without failure, a force of 200 lbs. applied in any outward or downward direction at any point.

Guardrail system shall be surfaced to prevent injuries from punctures and lacerations and prevent snagging of clothing. The ends of top rails and midrails shall not extend past the posts or uprights.

If conditions warrant, i.e. pedestrian traffic/weather, additional protection shall be provided such as screens or mesh to prevent slipping between the midrail and walking/working surface.
11. Direct channel flow as required to perform work.
12. Accomplish all of the tasks described in the proposed construction sequence shown on Sheet No. S003. An alternate construction sequence may be submitted to the Owner's Representative for approval. The alternate construction sequence, if proposed, shall be approved by the Railroad prior to beginning construction.
13. Accomplish activities within the schedule specified in the approved construction plan.

CONSTRUCTION NOTES

GRADING

1. Provide and place all fill and subballast material per the Project Specifications and these Drawings. Perform grading as required to drain and match existing embankments and proposed roadway.

PROFILE

1. No grade raise. Proposed mainline top of rail profile to match existing top of rail profile. Verify existing top of rail elevations and bring any discrepancies to the attention of the Owner's Representative prior to construction.

FIELD WELDING OF STRUCTURAL STEEL

1. Welding shall be accomplished with the SMAW or FCAW Process.
2. Welding shall be in compliance with the requirements specified in AWS D1.5, except 5/16" fillet welds may be made with a single pass.
3. Welding electrodes shall be E7018 for SMAW or E70T-5 for FCAW.
4. Welders shall possess valid qualifications.

DESIGN NOTES

1. The proposed superstructure has been designed in accordance with the current AREMA Manual for Railway Engineering, Chapter 15: Steel Structures. The proposed substructure has been designed in accordance with the AREMA Manual for Railway Engineering, Chapter 8: Concrete Structures and Foundations and Chapter 9: Seismic Design for Railway Structures.
2. This structure was designed for Cooper E80 Live Load or alternate loading, where applicable, plus impact with a 30" maximum total depth of ballast.
3. Drilled Shaft Design Load (Service):

Abutment Bent: 370 Ton

Pier Bent: 538 Ton
4. This drawing was prepared using 13" (min.) of ballast under timber ties.

STRUCTURAL STEEL NOTES

1. Materials, fabrication and erection shall be in accordance with Chapter 15: Steel Structures of the AREMA Manual for Railway Engineering and the Project Specifications.
2. Fabrication of structural steel shall be performed by a Fabricator certified under AISC Quality Certification Program for Major Steel Bridges (CBR).
3. Material shall conform to the following requirements:

BeamsASTM A709 Gr. 50W T2

Deck PlatesASTM A709 Gr. 36 T2

HandrailASTM A847

Cover PlatesASTM A36

Steel PilingASTM A709 Gr. 50

Shear StudsASTM A108, Gr. 1015, 1017 or 1020

All Other Structural SteelASTM A588

Anchor RodsASTM F1554 Gr. 36

Bearing PadsCast Polyurethane (90 Durometer)

Protective PadsElastomeric Bearing Roll (60 Durometer)
4. Design stresses for the following materials are in accordance with the AREMA Manual for Railway Engineering.

ASTM A36Fy = 36,000 psi

ASTM A588Fy = 50,000 psi

ASTM A709, Gr. 50W Fy = 50,000 psi

ASTM A709, Gr. 36 Fy = 36,000 psi

ASTM A847Fy = 50,000 psi

ASTM A108Fy = 60,000 psi

MISCELLANEOUS STEEL NOTES

1. Materials, fabrication and workmanship shall be in accordance with Chapter 15: Steel Structures of the current AREMA Manual for Railway Engineering and the Project Specifications.
2. Miscellaneous steel shall conform to ASTM A36 specifications unless noted otherwise. Miscellaneous steel shall be plain unless noted otherwise.
3. Where galvanizing is indicated, miscellaneous steel shall be pickled in accordance with SSPC-SP8 and hot-dipped galvanized in accordance with ASTM A123 specifications. Coating weight shall be 2.3 oz. per sq. ft.
4. Bolts and nuts to be zinc plated in accordance with ASTM A153 specifications unless noted otherwise.
5. Welding shall be by the arc process per AREMA Manual for Railway Engineering and AWS D1.1 Structural Welding Code. Welding shall be performed by qualified welders.

CAST-IN-PLACE CONCRETE NOTES

CONCRETE

1. All concrete materials, placement and workmanship shall be in accordance with Chapter 8: Concrete Structures and Foundations of the AREMA Manual for Railway Engineering and the Project Specifications.
2. Minimum compressive strength at 28 days shall be 4000 psi.
3. Exposed concrete shall be integrally colored using RHEOCOLOR LI liquid coloring or approved alternate meeting ASTM C 979. Contractor shall coordinate with the Owner to determine final color. Contractor shall cast and cure a mock up for acceptance by the Owner prior to construction.
4. Expansion joint material shall meet the requirements of AASHTO M213.

REINFORCING STEEL

1. Reinforcing steel shall be deformed, new billet bars per ASTM A615 specifications and meet Grade 60 requirements.

WATERPROOFING NOTES

1. Spray-applied elastomer waterproofing membrane and integrated ballast protection mat shall be field applied to the proposed bridge as specified on Sheet S025 and S026.
2. Spray-applied elastomer waterproofing membrane and integrated ballast protection mat shall be furnished by Bridge Preservation L.L.C., or approved equal. Prepare surfaces and apply in accordance with the manufacturers recommendations.

Contact:

Bridge Preservation L.L.C.

Customer and Sales Support

Jonathan Haydu

913-912-3305
3. Contractor to submit material specifications and installation procedures per project specifications to the Owner's Representative and the UPRR Local Representative at least two weeks prior to beginning waterproofing installation.
4. After installation of waterproofing is complete, obtain acceptance from the Railroad.

SUMMARY OF QUANTITIES
(FOR INFORMATION ONLY)

DESCRIPTION	UNIT	QTY
Reinforced Concrete	CY	282
Structural Steel	LB	587930
Drilled Shaft	LF	215
1/2" Inch Diameter Steel Pipe	LF	992
Cross Hole Sonic Log Testing	EA	12
Reinforcing Steel	LB	52887
Waterproofing	SY	703
Deck Drain	LF	476
Galvanized Corrugated Steel Pipe (Non-perforated) (6 inch)	LF	188
Galvanized Corrugated Steel Pipe (Perforated) (6 inch)	LF	84
Granular Backfill	CY	235
Structure Excavation	CY	277
Unclassified Excavation	CY	10813
1' x 12' x 15' Nom. Polyurethane Bearing Pad	EA	6
1' x 12' x 23' Nom. Polyurethane Bearing Pad	EA	6
Temporary Shoring	LS	1
Concrete Slope Paving (Reinforced)	CY	53
Retaining Wall	SF	682
Steel Piling HP 14 x 89 (Retaining Wall)	LF	364
Fiber Optic Utility Relocation	LS	1

BRIDGE DRAWING SCHEDULE

SHEET NO.	DESCRIPTION
S001	General Arrangement
S002	General Notes and Bill of Materials
S003	Construction Phasing and Temp. Shoring (Sheet 1 of 2)
S004	Construction Phasing and Temp. Shoring (Sheet 2 of 2)
S005	Typical Sections
S006	Engineering Geology
S007	Foundation Layout
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S015	Superstructure Plan and Elevation - Span 2
S016	Superstructure Assembly Details (Sheet 1 of 3)
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S019	Handrail and Fence Details (Sheet 1 of 2)
S020	Handrail and Fence Details (Sheet 2 of 2)
S021	Superstructure Piece Mark Details (Sheet 1 of 4)
S022	Superstructure Piece Mark Details (Sheet 2 of 4)
S023	Superstructure Piece Mark Details (Sheet 3 of 4)
S024	Superstructure Piece Mark Details (Sheet 4 of 4)
S025	Drainage and Waterproofing Details (Sheet 1 of 2)
S026	Drainage and Waterproofing Details (Sheet 2 of 2)
S027	Slope Paving and Retaining Wall Details (Sheet 1 of 3)
S028	Slope Paving and Retaining Wall Details (Sheet 2 of 3)
S029	Slope Paving and Retaining Wall Details (Sheet 3 of 3)
S030	Excavation and Backfill

LETTER SERIES



SHEET NO. CUT ON SHEET NO. SHOWN ON

SECTION DESIGNATION

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
GENERAL NOTES
AND BILL OF MATERIAL

FILENAME	...\\GDP..S002.dgn	SHEET
SCALE	AS NOTED	S002

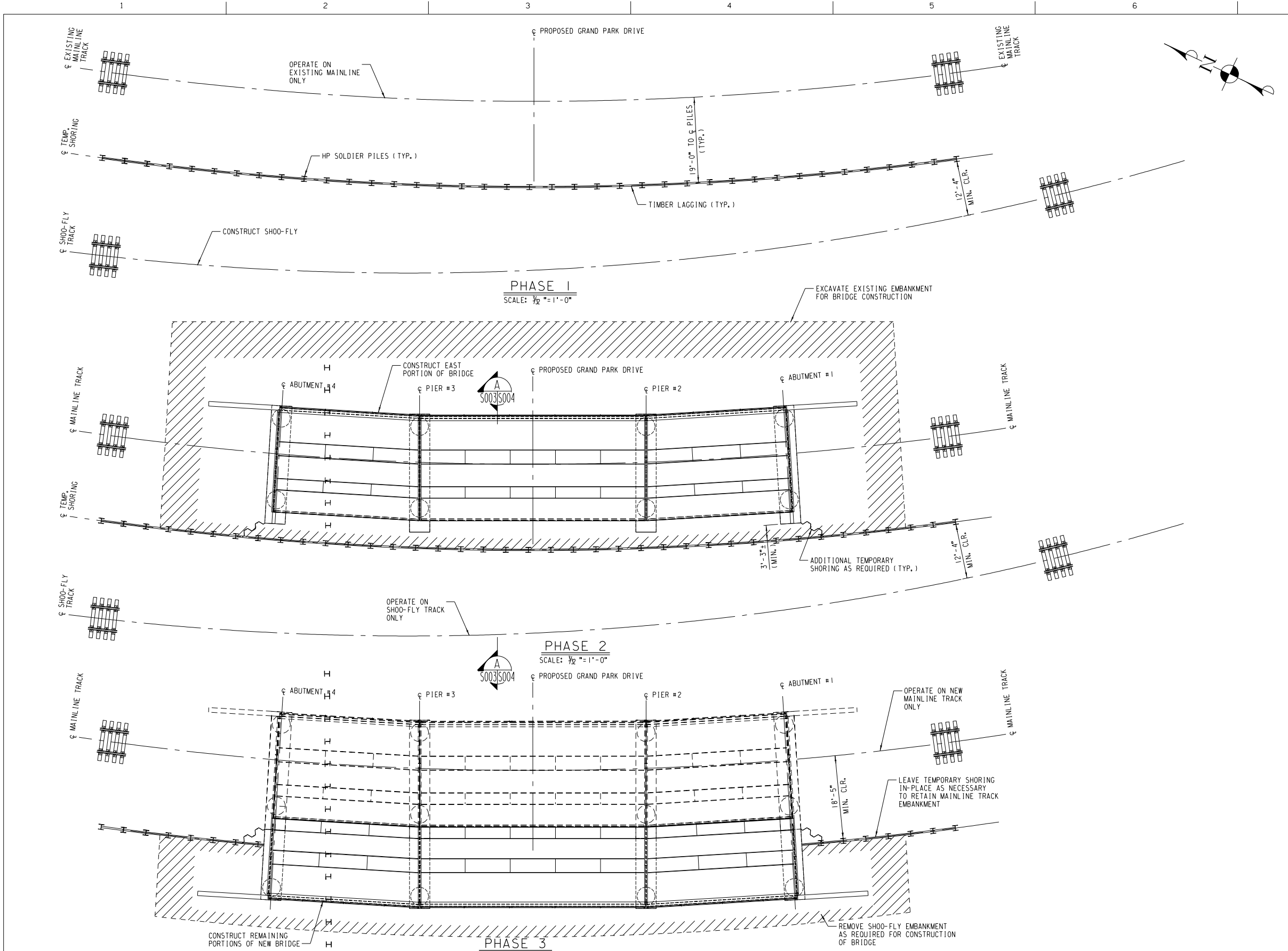
HDR

HDR Engineering, Inc.

PROJECT MANAGER	R. FERTIG
DESIGN ENGINEER	R. FERTIG
CHECK ENGINEER	R. BATEMAN
TECHNICIAN	K. CAPE
	QC R. KOTAN

PROJECT NUMBER	000000000197406
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CORNERSTONE
WINTER PARK
HOLDINGS, LLC



PROPOSED CONSTRUCTION SEQUENCE

ALL WORK TO BE PERFORMED BY THE CONTRACTOR, EXCEPT WHERE NOTED IN PARENTHESIS.

PHASE 1

1. RELOCATE FIBER OPTIC LINE AWAY FROM BRIDGE.
2. EXTEND DRAINAGE STRUCTURES BEYOND PROPOSED SHOO-FLY EMBANKMENT AND PROVIDE ADDITIONAL DRAINAGE BETWEEN SHOO-FLY AND EXISTING TRACK AS REQUIRED.
3. INSTALL TEMPORARY SHORING BETWEEN MAINLINE AND SHOO-FLY ALIGNMENTS. PILE DRIVING AND SHORING CONSTRUCTION SHALL BE COMPLETED BETWEEN PASSAGE OF TRAINS.
4. CONSTRUCT SHOO-FLY EMBANKMENT.
5. CONSTRUCT SHOO-FLY TRACK (BALLAST, TIES, RAIL AND OTM).

PHASE 2

1. SHIFT TRACK WITHIN 13' CLEAR POINT (BY RAILROAD).
2. SHIFT KING'S CROSSING PANELS (BY RAILROAD). SEE TRACK PLANS.
3. SHIFT RAIL TRAFFIC ONTO SHOO-FLY (BY RAILROAD). 12 HOUR APPROXIMATE TRACK CLOSURE WINDOW REQUIRED.
4. REMOVE BALLAST, TIES, RAIL AND OTM ON EXISTING MAINLINE AS REQUIRED FOR CONSTRUCTION OF THE NEW BRIDGE.
5. EXCAVATE AS REQUIRED FOR NEW BRIDGE CONSTRUCTION.
6. CONSTRUCT EAST PORTION OF NEW BRIDGE, INCLUDING FOUNDATIONS, PILES FOR TRAIL RETAINING WALL, SUBSTRUCTURE, DECK, AND WATERPROOFING.
7. INSTALL ADDITIONAL TEMPORARY SHORING AS REQUIRED BETWEEN END OF ABUTMENTS AND MAIN TEMPORARY SHORING.
8. INSTALL TRACK (BALLAST, TIES, RAIL AND OTM) ACROSS NEW BRIDGE.

PHASE 3

1. SHIFT TRACK WITHIN 13' CLEAR POINT (BY RAILROAD).
2. SHIFT KING'S CROSSING PANELS (BY RAILROAD). SEE TRACK PLANS.
3. SHIFT RAIL TRAFFIC BACK ONTO MAINLINE (BY RAILROAD). 12 HOUR APPROXIMATE TRACK CLOSURE WINDOW REQUIRED.
4. REMOVE SHOO-FLY TRACK (BALLAST, TIES, RAIL AND OTM).
5. REMOVE SHOO-FLY EMBANKMENT AND TEMPORARY SHORING, AS REQUIRED FOR CONSTRUCTION OF THE BRIDGE, BETWEEN PASSAGE OF TRAINS.
6. CONSTRUCT REMAINING PORTIONS OF NEW BRIDGE INCLUDING FOUNDATIONS, REMAINING PILES FOR TRAIL RETAINING WALL, SUBSTRUCTURE, DECK, AND WATERPROOFING.
7. INSTALL BALLAST ON REMAINING PORTION OF BRIDGE.

PHASE 4

1. REMOVE REMAINING TEMPORARY SHORING.
2. CONSTRUCT ACCESS ROAD TURNAROUNDS AT ENDS OF BRIDGE.
3. EXCAVATE UNDER BRIDGE TO GRAND PARK DRIVE AND FUTURE TRAIL PROFILE GRADE WITHIN LIMITS OF UPRR RIGHT OF WAY.
4. CONSTRUCT RETAINING WALL AND SLOPE PAVING.
5. CONSTRUCT NEW ROAD AND INSTALL UTILITIES UNDER NEW BRIDGE (BY OTHERS).

NOTES:
1. THE CONTRACTOR IS RESPONSIBLE FOR FINAL DESIGN OF TEMPORARY SHORING. SEE GENERAL NOTES SHEET S002.
2. THE CONTRACTOR SHALL SUBMIT A RAIL MONITORING PLAN TO THE RAILROAD FOR APPROVAL PRIOR TO SHIFTING TRAFFIC ONTO THE SHOO-FLY TRACK. THIS PLAN SHALL INCLUDE A CONTINGENCY IN THE CASE OF GROUND LOSS AND/OR RAIL DEVIATION GREATER THAN 1/4" VERTICAL OR HORIZONTAL. SEE UPRR/BNSF GUIDELINES FOR TEMP. SHORING.
3. PILES FOR TEMPORARY SHORING SHALL BE REMOVED COMPLETELY OR CUT-OFF IN PLACE A MINIMUM OF 2'-0" BELOW FINISHED GRADE.

PROJECT MANAGER	R. FERTIG
DESIGN ENGINEER	R. FERTIG
CHECK ENGINEER	R. BATEMAN
TECHNICIAN	K. CAPE
QC	R. KOTAN

CORNERSTONE
WINTER PARK
HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS IN FRASER, COLORADO UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION CONSTRUCTION PHASING AND TEMP. SHORING (SHEET 1 OF 2)	
FILENAME	...GDP_S003.dgn
SCALE	AS NOTED
SHEET S003	

ISSUE	DATE	DESCRIPTION	PROJECT NUMBER
-	-	-	00000000197406

PLOTTED: 6/9/2014

PLOTTED: 6/9/2014



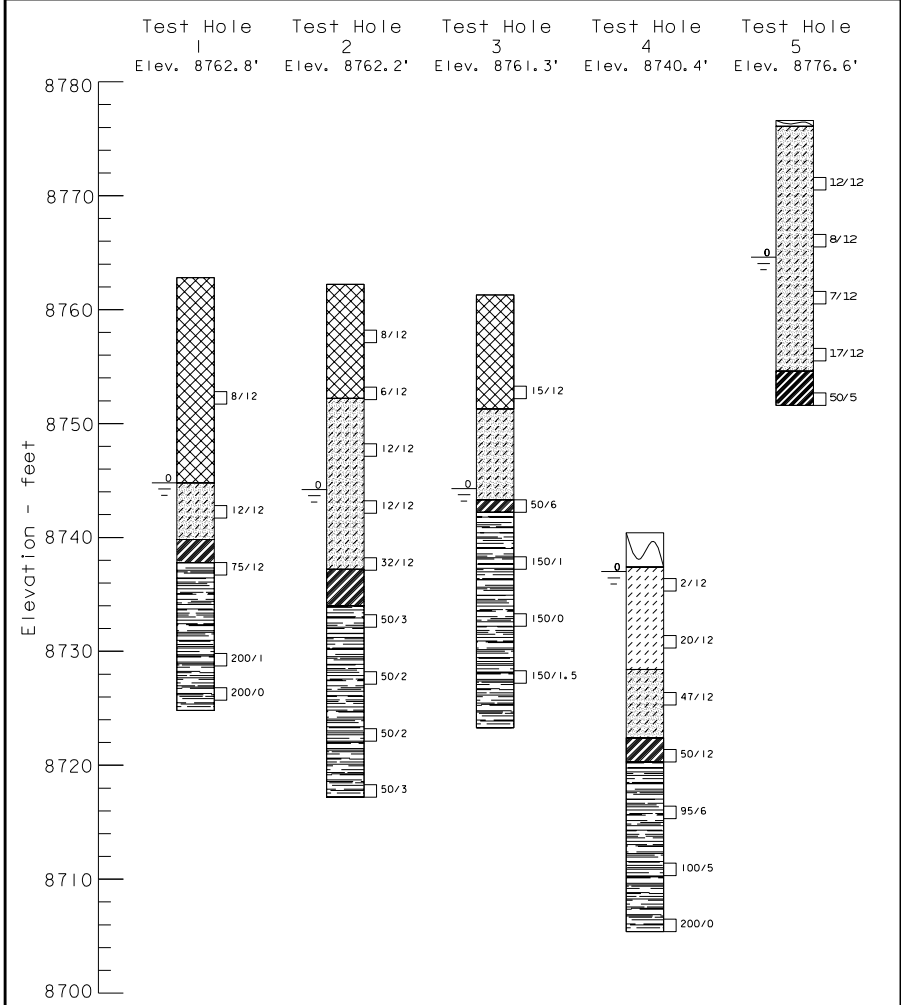
			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
-	-	-		
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

TEST HOLE LOCATIONS
NO SCALE

CORNERSTONE
WINTER PARK
HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
ENGINEERING GEOLOGY

FILENAME	... \GDP_S006.dgn	SHEET S006
SCALE	AS NOTED	

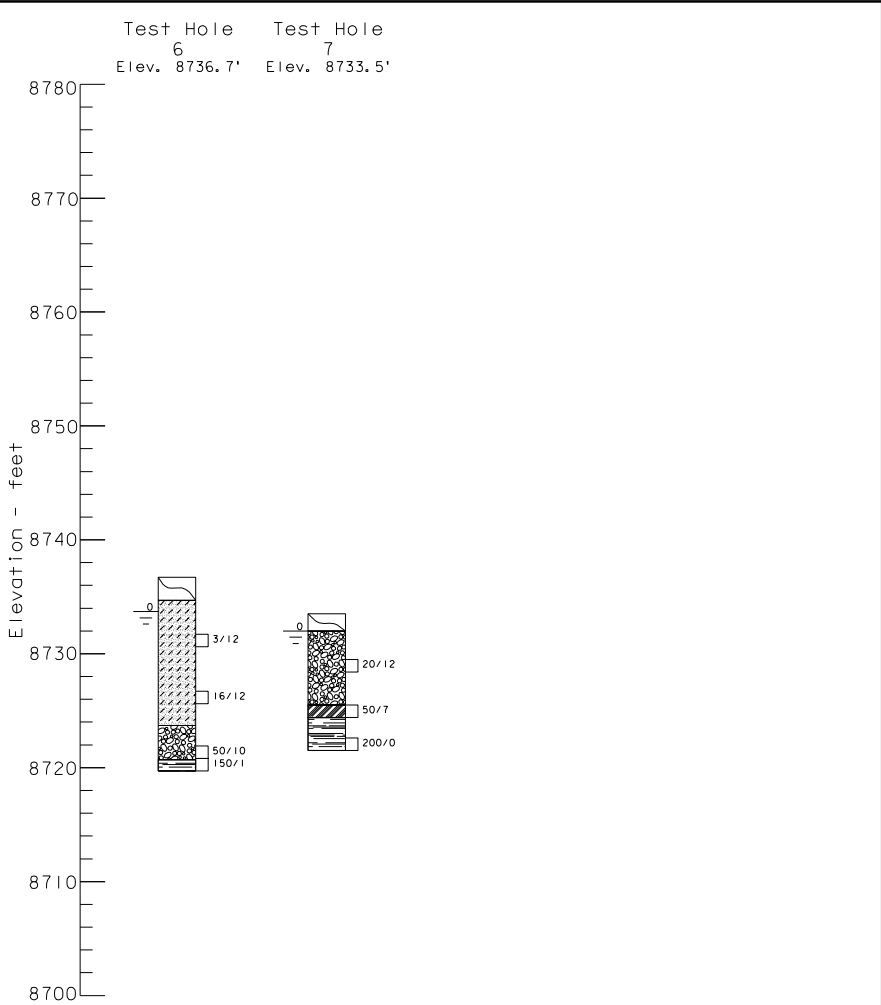


GROUND
ENGINEERING CONSULTANTS

LOGS OF TEST HOLES

JOB NO.: 11-2001 FIGURE: 2

CADFILE NAME: 2001LOG01.DWG



GROUND
ENGINEERING CONSULTANTS

LOGS OF TEST HOLES

JOB NO.: 11-2001 FIGURE: 3

CADFILE NAME: 2001LOG02.DWG

LEGEND:

- Topsoil
- Fill: Other than railroad ballast consisted of clayey sands with gravel. The sands were fine to medium to fine to coarse. They were non-plastic to low plastic, loose to compact, moist to wet, and brown to dark brown to black in color. Iron oxide staining was noted locally.
- Clay: Sandy, moist to wet, medium plastic, soft to very stiff, and gray to brown in color. The sand fractions were fine to medium.
- Sand: Fine to coarse, clayey, moist to wet, low plastic, loose to medium dense, commonly iron oxide stained, and gray to brown in color.
- Gravel: Fine to coarse with cobbles, silty, medium dense to dense, wet, and grey to brown in color. Iron oxide staining was noted locally.
- Weathered Gneiss Bedrock: Wet, low plastic, moderately hard to very hard, and grey in color.
- Gneiss Bedrock: Finely to coarsely crystalline with pegmatite intrusions locally, wet, low plastic, very hard, and gray to pink in color.

Drive sample, 2-inch I.D. California liner sample

23/12 Drive sample blow count, indicates 23 blows of a 140-pound hammer falling 30 inches were required to drive the sampler 12 inches.

Depth to water level and number of days after drilling that measurement was taken.

NOTES:

- Test holes were drilled on 06/21-22/2011 with 4-inch diameter continuous flight power augers.
- Locations of the test holes were surveyed by a representative of the client.
- Elevations of the test holes were provided by a surveyor and the logs of the test holes are drawn to elevation.
- The test hole locations and elevations should be considered accurate only to the degree implied by the method used.
- The lines between materials shown on the test hole logs represent the approximate boundaries between material types and the transitions may be gradual.
- Groundwater level readings shown on the logs were made at the time and under the conditions indicated. Fluctuations in the water level may occur with time.
- The material descriptions on this legend are for general classification purposes only. See the full text of this report for descriptions of the site materials and related recommendations.

GROUND
ENGINEERING CONSULTANTS

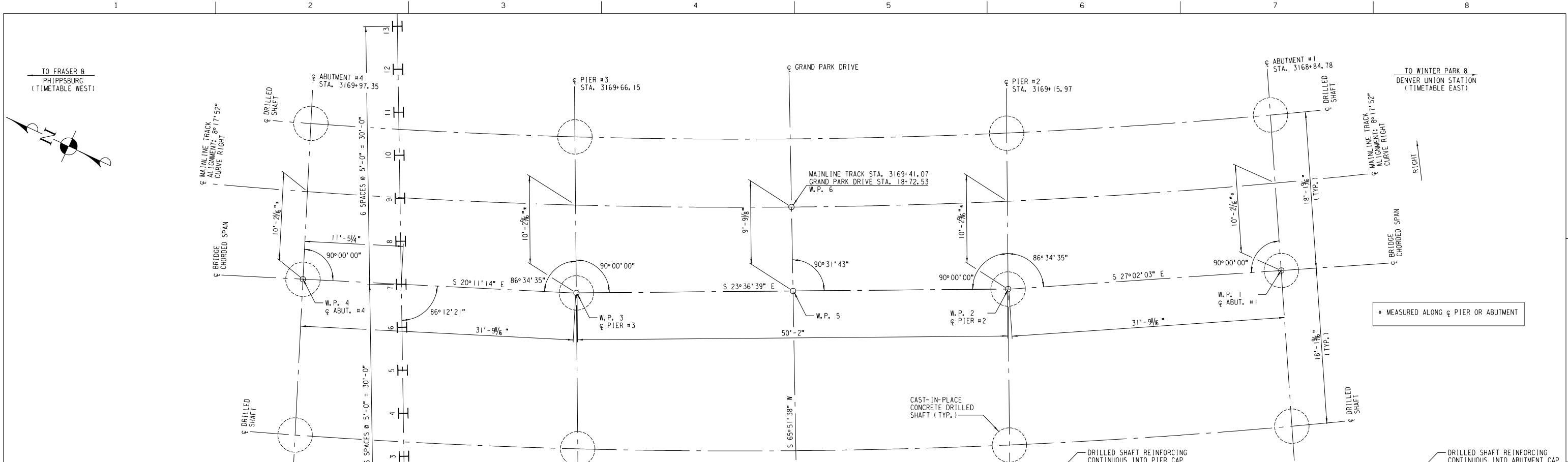
LEGEND AND NOTES

JOB NO.: 11-2001 FIGURE: 6

CADFILE NAME: 2001LEG.DWG

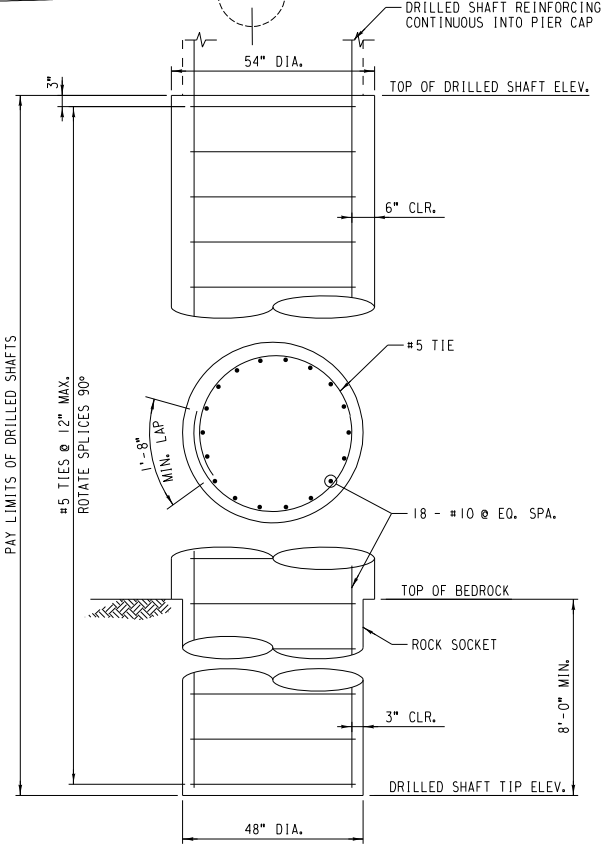
NOTES:

- SUBSURFACE INFORMATION IS PROVIDED FOR INFORMATION ONLY FROM GROUND ENGINEERING CONSULTANTS, INC. REPORT TITLED GEOTECHNICAL RECOMMENDATIONS GRAND PARK DRIVE/UPRR REVISION 1, DATED 02/2014. CONTRACTOR MAY OBTAIN A COPY OF THE REPORT FROM CORNERSTONE WINTER PARK HOLDINGS, LLC.
- FOR LOCATION OF BORINGS TH-4 THRU TH-7 SEE GEOTECHNICAL REPORT.

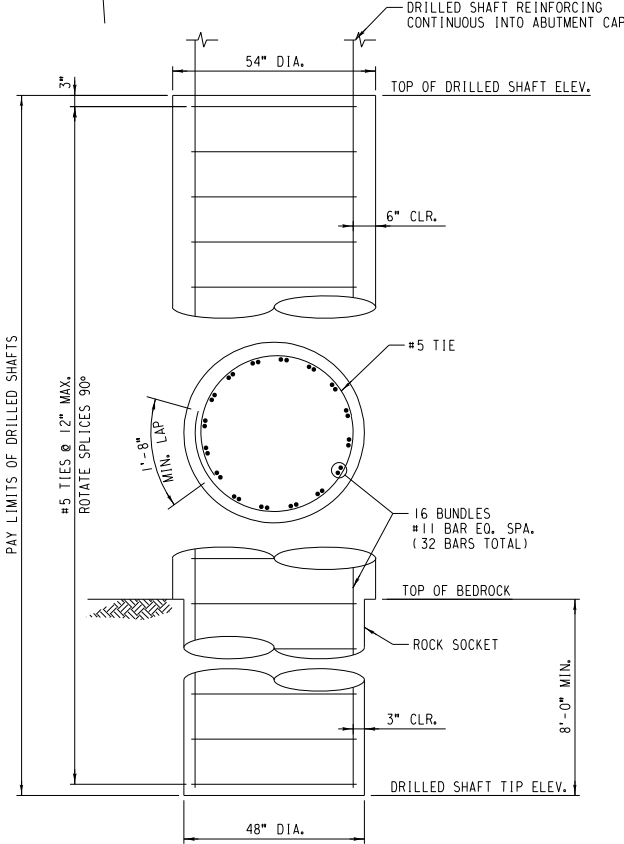


DRILLED SHAFT LAYOUT
SCALE: 3/16"=1'-0"

- NOTES:
1. DUE TO THE PRESENCE OF VERY HARD BEDROCK, DRILLING HOLES FOR THE DRILLED SHAFTS AND PILES MAY BE DIFFICULT AND REQUIRE THE USE OF SPECIAL EQUIPMENT.
 2. ESTIMATED TIP ELEVATIONS ARE APPROXIMATE. CONTRACTOR SHOULD BE PREPARED TO DRILL TO A DEPTH BELOW BEDROCK WHICH ALLOWS FOR THE REQUIRED EMBEDMENT IN BEDROCK.
 3. FOR RETAINING WALL DETAILS, SEE SHEETS S027, S028, AND S029.
 4. THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED. SEE GEOTECHNICAL REPORT.
 5. INSTALL 1 1/2" CSL TUBES IN ALL DRILLED SHAFTS PER THE SPECIAL PROVISIONS.



DRILLED SHAFT DETAIL AT PIERS
SCALE: 1/2"=1'-0"



DRILLED SHAFT DETAIL AT ABUTMENTS
SCALE: 1/2"=1'-0"

TABLE OF COORDINATES		
POINT	NORTHING	EASTING
W. P. 1	44832.90	52283.86
W. P. 2	44861.23	52269.41
W. P. 3	44907.20	52249.31
W. P. 4	44937.05	52238.34
W. P. 5	44884.14	52259.39
W. P. 6	44888.13	52268.30
BM "G360 RESET"	44581.21	52715.03

NOTE: SEE TRACK PLANS FOR ADDITIONAL CONTROL POINTS AND ELEVATIONS.

PILE SUMMARY TABLE		
PILE	ESTIMATED TIP ELEVATION	PILE CUTOFF ELEVATION
1	8724.00	8751.18
2	8724.00	8751.18
3	8724.00	8751.34
4	8724.00	8751.51
5	8724.00	8751.67
6	8724.00	8751.84
7	8724.00	8752.00
8	8724.00	8752.17
9	8724.00	8752.33
10	8724.00	8752.50
11	8724.00	8752.66
12	8724.00	8752.83
13	8724.00	8752.83

DRILLED SHAFT SUMMARY TABLE				
LOCATION	SHAFT DIA.	TOP OF SHAFT ELEVATION	ESTIMATED TIP ELEVATION	▲MAX LOAD (TONS)
ABUTMENT NO. 1	48"/54"	8755.73	8730.00	370
PIER NO. 2	48"/54"	8739.04	8725.76	538
PIER NO. 3	48"/54"	8739.00	8726.33	538
ABUTMENT NO. 4	48"/54"	8753.76	8734.00	362

▲ SERVICE LOADING, PER DRILLED SHAFT

PROJECT MANAGER R. FERTIG

DESIGN ENGINEER R. FERTIG

CHECK ENGINEER R. BATEMAN

TECHNICIAN K. CAPE

QC R. KOTAN

ISSUE

DATE

DESCRIPTION

PROJECT NUMBER

O0000000197406

CORNERSTONE

WINTER PARK

HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS

IN FRASER, COLORADO

UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION

FOUNDATION LAYOUT

FILENAME

...\\GDP..S007.dgn

SCALE

AS NOTED

SHEET

S007

DRILLED SHAFT NOTES

GENERAL

1.

Drilled shafts have been designed in accordance with the AREMA Manual for Railway Engineering, Chapter 8, Part 2: Design and Part 24: Drilled Shaft Foundations.
2.

Drilled shafts shall derive their support from side friction and end bearing in bedrock.
3.

Drilled shaft construction shall be in accordance with the AREMA Manual of Railway Engineering, Chapter 8: Concrete Structures and Foundations, Part 24: Drilled Shaft Foundations.
4.

Contractor shall submit proposed drilled shaft installation method with the bid. Installation methods shall be compatible with subsurface conditions at the site and shall be accepted by the Owner's Representative and the Railroad prior to construction. Proposed method shall include equipment and procedures for excavation in soil and rock, permanent steel casing installation, temporary steel casing installation and withdrawal, reinforcing steel and concrete placement, as applicable.
5.

If actual subsurface conditions differ substantially from those provided, notify the Owner's Representative immediately by phone, e-mail, or fax and in writing within 48 hours of such a determination.
6.

The Owner's Representative will provide observation of the drilled shaft construction, perform required testing on construction materials, and determine the acceptability of the shaft installation within the terms and conditions of these notes and the drawings.
7.

The Contractor shall:

a.

Construct drilled shafts as detailed and noted on these drawings and in accordance with these notes.

b.

Provide an on-site supervisor and drillers having a minimum of five years of acceptable experience with the installation method to be used.

c.

Develop and adhere to a program for quality control.

d.

Perform all excavation and concrete placement work in the presence of the Railroad unless otherwise permitted.

e.

Schedule and provide time and means for inspection of each drilled shaft before concrete placement.

f.

Provide the means and opportunity to inspect the operation, take samples and make tests during the steel casing withdrawal and concrete placement.
8.

The Contractor shall submit the following to the Owner's Representative for approval at least 14 days before the start of the work, if applicable:

a.

Experience record of supervisory and drilling personnel.

b.

Quality control program.

c.

Detailed description of shaft construction method.

d.

List of equipment and operating procedures.

e.

Steel casing material properties and quantities in accordance with these notes.

f.

Concrete materials and mix proportions in accordance with these notes.

g.

Shop drawings showing placement of reinforcing steel, including splice details and locations.

h.

Welding procedures for permanent steel casing and reinforcement.

i.

AWS welder certification.

j.

A test report from the slurry supplier giving the slurry type and admixtures and the physical and chemical properties of the mixed slurry.
9.

The Contractor shall submit the following to the Owner's Representative and the Railroad during construction:

a.

Notification of drilling 24 hours in advance to permit in-place inspection of the finished excavation prior to placement of reinforcing steel and concrete.

b.

Reports of material quantities including concrete, reinforcing steel, steel casing, and slurry.

c.

Certified mill test reports for reinforcing steel, including bar markings.

d.

Down-hole slurry test results in accordance with the requirements in these notes.

e.

Concrete batch-plant tickets containing the information required by ASTM C94.

f.

Reports of as-built location, alignment, elevations, and dimensions of drilled shafts, specifically identifying any shafts that are not in accordance with the notes and drawings.

g.

Graphical plot of depth or elevation vs. theoretical concrete volume and actual measured volume for each drilled shaft in accordance with these notes.

CAST-IN-PLACE CONCRETE

1.

All concrete material, placement, and workmanship shall be in accordance with Chapter 8: Concrete Structures and Foundations of the AREMA Manual for Railway Engineering and the Project Specifications.
2.

Minimum compressive strength at 28 days shall be 4000 psi.
3.

Prior to the addition of admixtures, concrete shall have a slump not greater than 4 inches. During placement, concrete shall have a slump of not less than 4 inches using the dry uncased method, 6 inches using the temporary steel casing method, or 7 inches using the slurry displacement method.
4.

Do not use calcium chloride or any admixture containing intentionally added chloride ions. Testing for chloride ions is not required.
5.

Exposed concrete shall be integrally colored in accordance with ASTM C979 as indicated in the plans and the notes on Sheet S002.

REINFORCING STEEL

1.

All reinforcing steel materials and placement shall be in accordance with Chapter 8: Concrete Structures and Foundations of the AREMA Manual for Railway Engineering and the Project Specifications.

REINFORCING STEEL, CONT.

2.

Reinforcing steel cage shall be prefabricated. Reinforcing steel is to be securely tied to prevent deformation or relative displacement of bars during handling and concrete placement. Tack welding of reinforcing is prohibited.
3.

The minimum clear distance between vertical reinforcing steel, including lapped bars, shall be 1.5 times the bar diameter or four times the maximum aggregate size, whichever is larger.
4.

Place reinforcing steel cage immediately prior to the start of concrete placement. Provide spacer rollers to maintain the reinforcing cage at the proper location. Secure the cage against displacement.
5.

Permissible reinforcing steel vertical movement during steel casing withdrawal, if any, shall be 6 inches.

STEEL CASING

1.

Installation of steel casing by driving or by vibratory hammer is prohibited.
2.

Permanent steel casing shall not be allowed unless approved by the Engineer of Record and the Railroad.
3.

Temporary steel casing shall have sufficient strength to withstand handling stresses, drilling stresses, concrete pressures, and surrounding earth and water pressures, or if required, to permit advancement of shaft through caving ground. Submit size, wall thickness, type of steel and length of temporary casing to the Railroad for acceptance.
4.

Submit the proposed method of steel casing installation and withdrawal, if any, prior to the mobilization of equipment to the site.
5.

If steel casing splices are necessary, furnish full-penetration welds meeting the requirements of "Structural Welding Code - Steel" (ANSI/AWS D1.1) of the American Welding Society requirements for joints in non-corrognated permanent steel casings. Submit any alternative splice details to the Railroad for acceptance. Welders shall be AWS certified.
6.

Deliver steel casings to site in undamaged condition. Handle and protect steel casing to maintain diameter within 2 percent.

CONTROLLED SLURRY

1.

Slurry shall consist of a stable colloidal suspension of polymers or pulverized clay minerals (bentonite/attapulgite) thoroughly mixed with water and shall meet the following specified properties at 60° F:

a.

Density of slurry at a distance of 1' from shaft bottom shall be measured by mud balance before concrete placement in accordance with ASTM D4380. For mineral slurries, maximum density shall be 70 pcf. Maximum density shall be 64 pcf for polymer slurries.

b.

Marsh funnel viscosity shall be measured per the "Standard Procedure for Field Testing Water-Based Drilling Fluids" American Petroleum Institute API-RP13B-1, Section 2. The allowable range for entry shall be 26 to 50 seconds per quart for mineral slurries. For polymer slurries, the allowable range for entry shall be 40 to 90 seconds per quart, or as recommended by manufacturer and approved by the Railroad.

c.

Sand content at a distance of 1' from shaft bottom shall be measured by sand screen set before concrete placement in accordance with ASTM D4381. For mineral slurries, maximum sand content shall be no greater than 4% by volume. Maximum sand content shall be no more than 1% by volume for polymer slurries.

d.

During excavation, the pH of the slurry shall be measured in accordance with ASTM D4972. Allowable range of pH shall be 7 to 12.
2.

Slurry shall be from sources acceptable to the Railroad. Mix, store and transport slurry using equipment made for these purposes.
3.

Water used to mix slurry shall be free from contaminants and supplied from sources acceptable to the Railroad.
4.

Required slurry properties shall be maintained before and during concrete placement to prevent settlement of soil solids and maintain a stable hole.

CONSTRUCTION

1.

Qualified construction personnel shall be present at the excavated hole at all times.
2.

Use tolerances for construction in accordance with ACI 117, except as noted.
3.

Top of drilled shafts shall be at the elevations shown in the Drilled Shaft Summary Table, Sheet S007. Drilled shaft construction is permitted to continue up to the bottom of the pier cap if the requirements for exposed concrete, including surface finish and coloring, on Sheet No. S002 are satisfied.
4.

Drilled shafts shall be advanced to bedrock and socketed at least 8' into rock. Drilled shaft tip elevations provided in the Drilled Shaft Summary Table, Sheet No. S007, are approximate and not to be used for construction.
5.

Drilled shaft construction methods shall be determined by the Contractor based on site and subsurface conditions, unless otherwise specified on the drawings. Construction methods are subject to acceptance by the Owner's Representative and the Railroad. These notes apply to the following methods, alone or in combination:

a.

Dry, Uncased or Open Hole

b.

Temporary Steel Casing

c.

Slurry Displacement
6.

Provide temporary steel casing for shaft excavation as required. Make diameter of excavation such that the annular void space outside any temporary steel casing is minimized.

CONSTRUCTION, CONT.

7.

Use excavation methods that leave the sides and bottom of the hole free of loose material that would prevent intimate contact of the concrete with firm, undisturbed soil. If loose or unacceptable material is present, re-clean hole to the satisfaction of the Owner's Representative.
8.

Remove loose material and free water from bottom of drilled shafts, as required by the Owner's Representative. Excavate the bottom of the shaft to a level plane within tolerance of 1 vertical to 12 horizontal, or as acceptable to the Owner's Representative. Provide bottom area not less than that shown on the drawings or as acceptable to the Owner's Representative. Hole shall be re-cleaned after any possible vibration of the ground or sloughing has occurred.
9.

The Geotechnical Engineer will verify actual final bearing levels and suitability of bearing stratum during excavation. Inspection and testing of the drilled shafts will be determined by the Railroad. For end-bearing shafts, explore bearing stratum with a probe hole to a minimum depth of 8 feet below the bottom of each drilled shaft, unless waived by the Railroad.
10.

Provide a safe method of access for inspection of the bottom of the drilled shaft and personnel to facilitate inspection. Alternatives to direct down-hole inspection shall be subject to the acceptance of the Owner's Representative and the Railroad. Provide all safety equipment called for by Federal, State, and Local laws for inspection and testing of drilled shafts and protection of workers during operation necessitating entry into the shaft.
11.

Excavate rock sockets as required by the drawings. Use a method that will provide the socket roughness that meets the design requirements. Rock core samples shall be handled in accordance with ASTM D5079. Bedrock is very hard, and excavation may require special equipment.
12.

Keep all soil and excavated materials away from each open shaft excavation to avoid contamination of the excavation after final clean out.
13.

Dewater drilled shaft excavation prior to placing concrete. Dewater in a manner that will not create subsidence or ground loss that might adversely affect the drilled shaft or existing adjacent structures.
14.

If water inflow or sidewall instability encountered exceeds that acceptable to the Owner's Representative, use alternative means to reduce inflow, such as extending steel casing, installing outside deep wells, grouting, or other acceptable means.
15.

Place concrete as soon as possible after completion of excavation and after acceptance. Notification of concrete placement shall be made at least 24 hours in advance unless waived by the Owner's Representative and the Railroad.
16.

Do not start concrete placement until a concrete supply adequate to fill the shaft is assured. Place concrete within the time period during which the excavation remains clean and stable and the concrete remains fluid.
17.

Complete placement of concrete in uncased excavations before the end of each work day.
18.

Concrete shall be placed in such a manner as to limit free-fall distance of concrete to 8 feet. Free-fall distances greater than 8 feet shall not be allowed unless otherwise approved by the Owner's Representative. Concrete should be directed so that the fall is vertical down the center of the shaft and the concrete does not hit sides of the hole or reinforcing steel cage.
19.

For placing concrete underwater, use tremie or concrete pumping with acceptable procedures in accordance with AREMA Manual of Railway Engineering, Chapter 8, Sections 1.14 and 1.15.
20.

Place concrete in shaft in one continuous operation unless otherwise permitted by the Owner's Representative. Level, roughen and clean surface of construction joints to the satisfaction of the Owner's Representative prior to commencement of concrete placement. Provide reinforcing dowels or shear key when required by the Owner's Representative.
21.

Theoretical concrete volume shall be computed based on actual drilled shaft dimensions as measured in the field. Actual concrete volume shall be recorded during placement at intervals not exceeding one shaft diameter and plotted on a graph vs. theoretical volume to check for proper shaft geometry.
22.

Perform concrete testing for quality control to supplement the Owner's Representative's testing, or accept the Owner's Representative's test results. The Owner's Representative will perform compression tests at 28 days.
23.

Protect tops of shafts against damage and for curing to prevent moisture loss and temperature extremes in accordance with AREMA Manual of Railway Engineering, Chapter 8, Part 1: Materials, Tests and Construction Requirements.
24.

Coordinate temporary steel casing withdrawal carefully with concrete placement. Maintain head of concrete to exceed the anticipated outside soil and water pressure above the bottom of the steel casing at all times during steel casing withdrawal.
25.

Where steel casing is withdrawn, provide concrete with a minimum slump of 6" and with a retarder to ensure minimum slump requirement during steel casing withdrawal. Check concrete level prior to, during and after withdrawal of steel casing to confirm that separation of shaft concrete has not occurred. Do not vibrate concrete internally before the steel casing is withdrawn. A steel casing vibratory extractor is permitted. Do not withdraw steel casing after concrete has attained initial set or as directed by the Railroad.

CONSTRUCTION BY SLURRY DISPLACEMENT

1.

For construction by slurry displacement, use controlled slurry to stabilize the excavation. Slurry consisting of water in combination with colloidal fines from the soil being excavated shall not be used unless the Contractor demonstrates to the satisfaction of the Railroad that the slurry adequately stabilizes the hole.
2.

Where drilled shafts are to be installed below groundwater or in caving soils, maintain the slurry level in the excavation not less than 5 feet above the groundwater level or higher if needed to provide a stable hole. Maintain the slurry level above any unstable zones a sufficient distance to prevent caving or sloughing of those zones. Demonstrate to the satisfaction of the Railroad that stable conditions are being maintained.
3.

Set temporary surface steel casing to contain the slurry, unless waived by the Railroad.
4.

Provide any physical or chemical treatment of the water or slurry that is necessary to meet the specified properties for controlled slurry required by these notes, subject to the acceptance of the Railroad.
5.

Test slurry by the methods specified in these notes. Provide all equipment required for the tests specified. A slurry sampler capable of obtaining slurry samples at any depth within the drilled shaft excavation shall be available at the site.
6.

The in-hole slurry shall meet the specified properties prior to concrete placement. Clean, re-circulate, remove sand from, or replace the slurry to maintain the required slurry properties. Recycling of slurry is permitted provided that the recycled slurry meets the specified properties. Submit a written record of results for the tests for each drilled shaft installed to the Railroad.
7.

Use drilling tools and excavation procedures that minimize negative pressure and avoid disturbance of surrounding material in the excavation. Raise and lower the drilling tool in the hole at a rate that does not swirl the slurry and affect the stability of the hole.
8.

Complete concrete placement of the drilled shaft promptly the same day that the excavation is completed. If this is not possible, redrill, clean, and test the slurry in the excavation before concrete placement.
9.

During concrete placement, pump the displaced slurry to holding tanks. Do not allow slurry to spill onto or contaminate the site. Do not use excavated slurry pits, unless accepted by the Railroad.
10.

Dispose of the slurry in a legal and acceptable manner.
11.

Place concrete by tremie methods or by pumping in accordance with AREMA Manual of Railway Engineering, Chapter 8, Section 1.14: Depositing Concrete.
12.

Embed tremie or pump pipe sufficiently in concrete to maintain seal throughout concrete placement to prevent re-entry of slurry suspension into the pipe. Provide minimum embedment of 5 feet. If the seal is lost, withdraw pipe, replace the seal and restart tremie operation using a capped tremie or a capped pump pipe.
13.

Displace out of the shaft or remove from the shaft the first portion of concrete that comes to the top of the shaft that contains concrete contaminated with slurry until acceptable concrete is visible. Add or remove concrete to reach the specified top of drilled shaft elevation.
14.

Raise or lower the tremie pipe in an acceptable manner that does not break the seal and does not cause channelization or segregation.
15.

Do not use aluminum pipe or equipment for placing concrete.

CROSS-HOLE SONIC LOG (CSL) TESTING

1.

Perform CSL testing in accordance with the Special Provisions for this project.

DRILLED SHAFT PAYMENT

1.

Drilled Shafts shall be measured by the linear foot from the elevation shown on the plans to the bottom of the hole as drilled.
2.

The contract pay item for drilled shafts shall include the cost of all excavations, hauling and disposal of excavated material, performing all necessary pumping, furnishing and placing concrete and reinforcing steel (to top of drilled shaft), all backfilling, and all labor and incidental's required for installation.
3.

The cost of furnishing, installing, and removing temporary steel casing will not be paid separately but shall be included in the work. If the Contractor elects to submit a permanent casing option, the cost of such casing will not be paid separately but shall be included in the work.

			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
				QC R. KOTAN
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ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406

PLOTTED: 6/9/2014



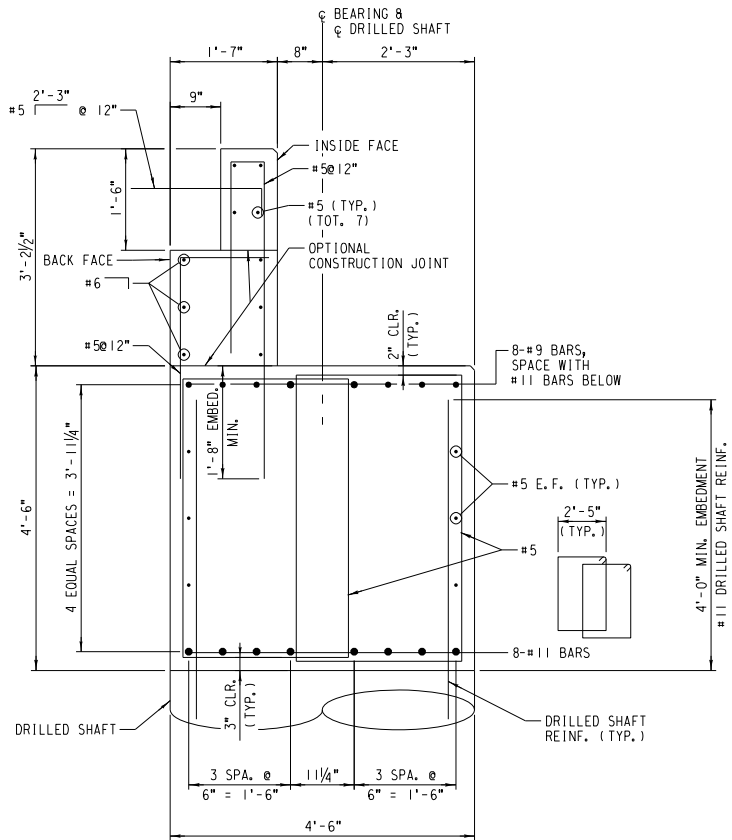
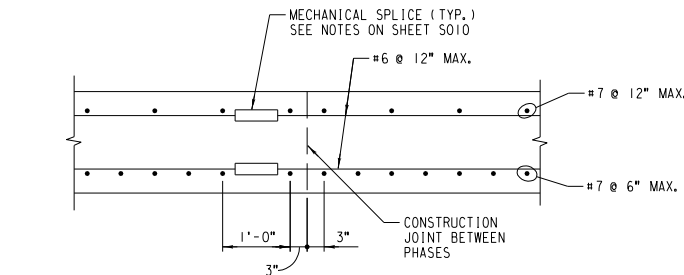
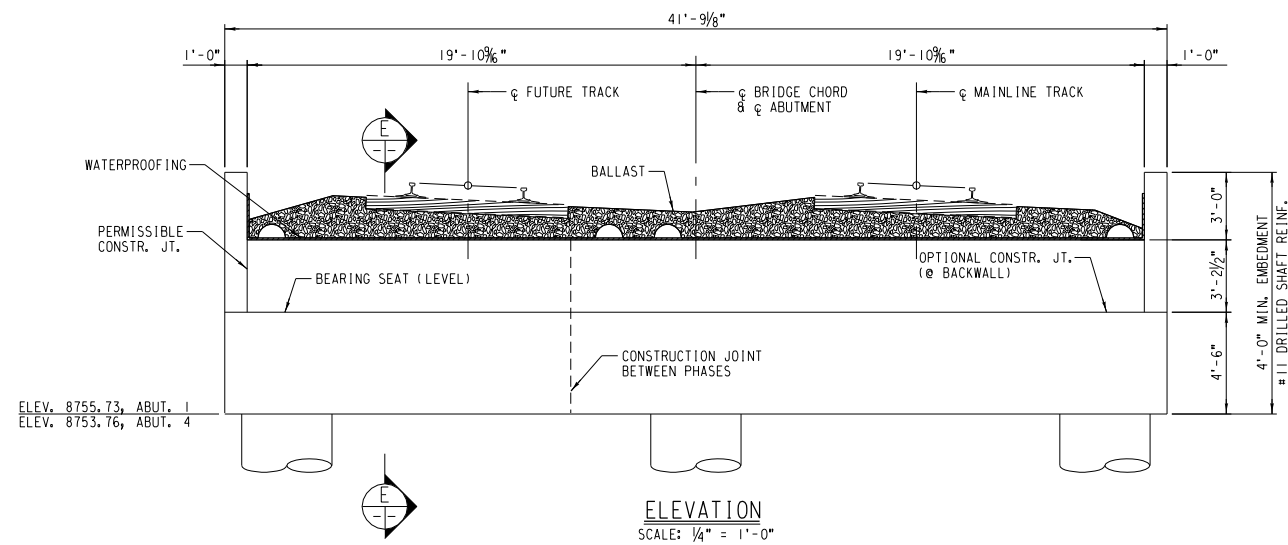
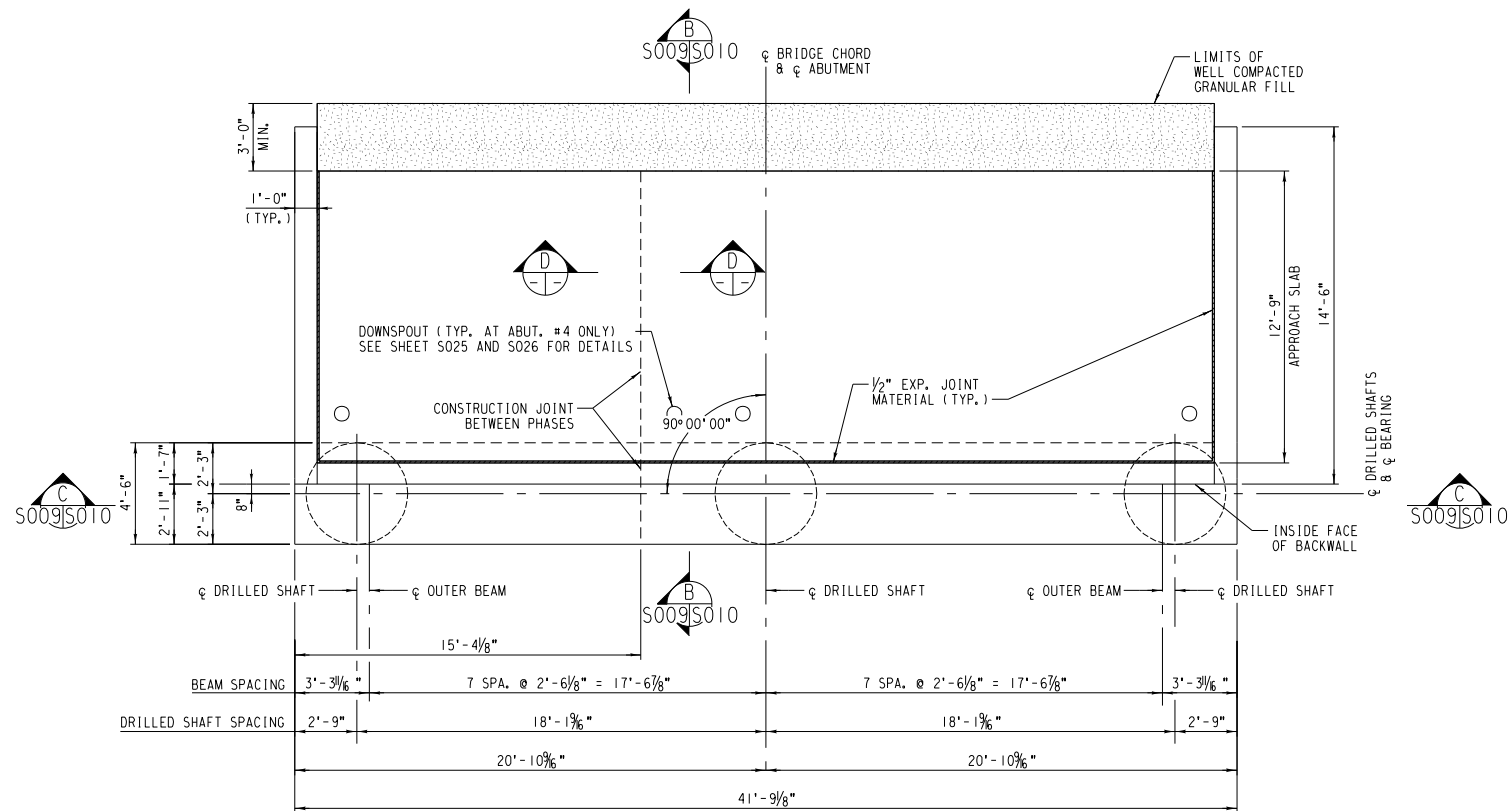
			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

CORNERSTONE
WINTER PARK
HOLDINGS, LLC

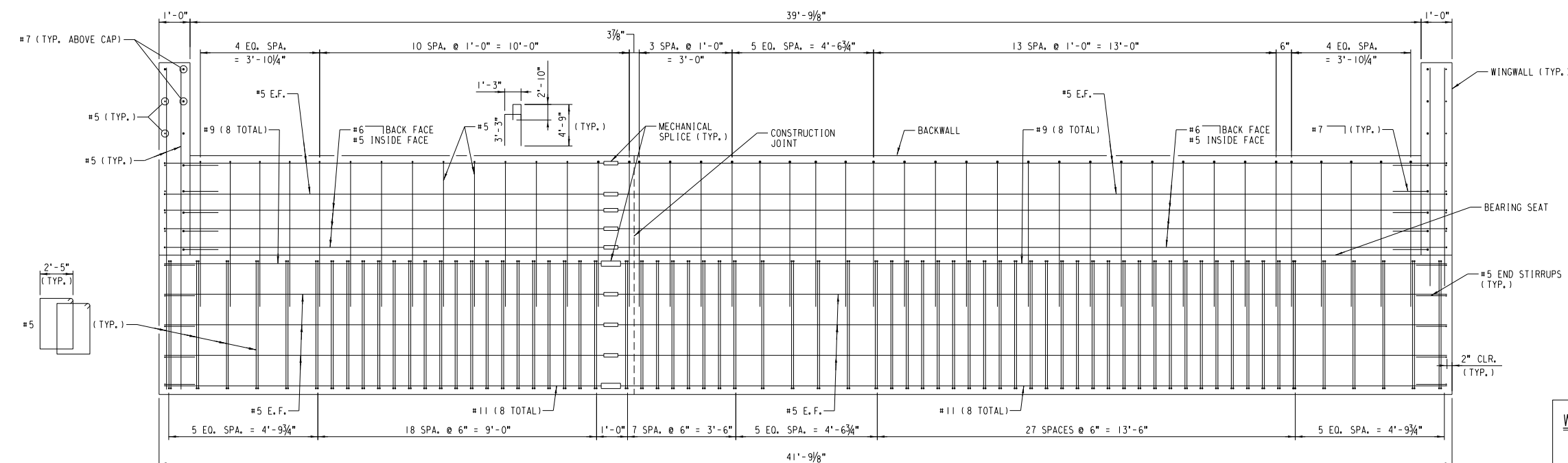
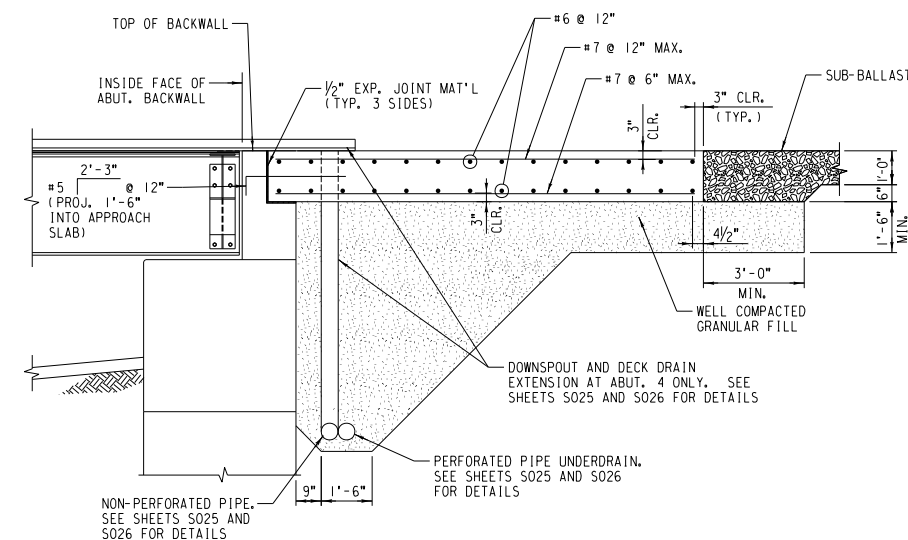
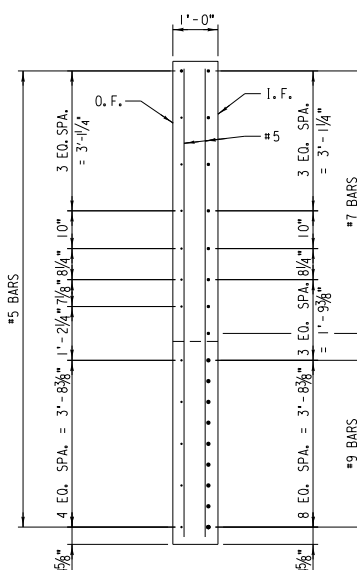
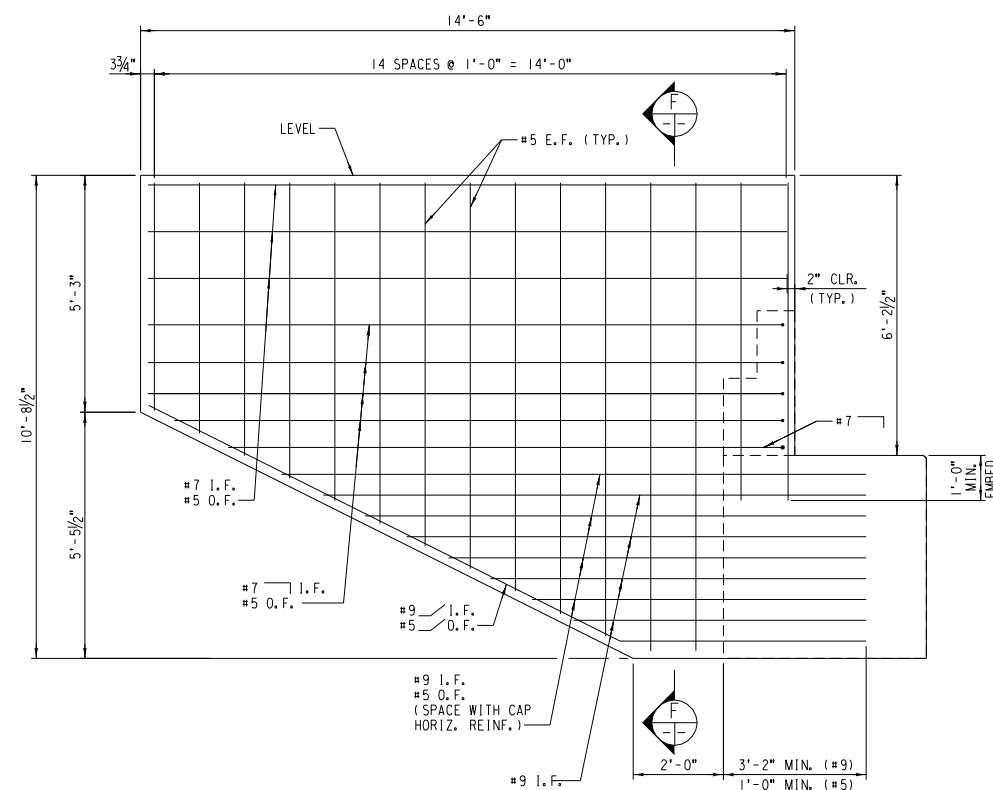
GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
ABUTMENT NO. 1 AND NO. 4

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SCALE	AS NOTED

SHEET
S009



NOTE:
1. FOR NOTES, SEE SHEET S010.



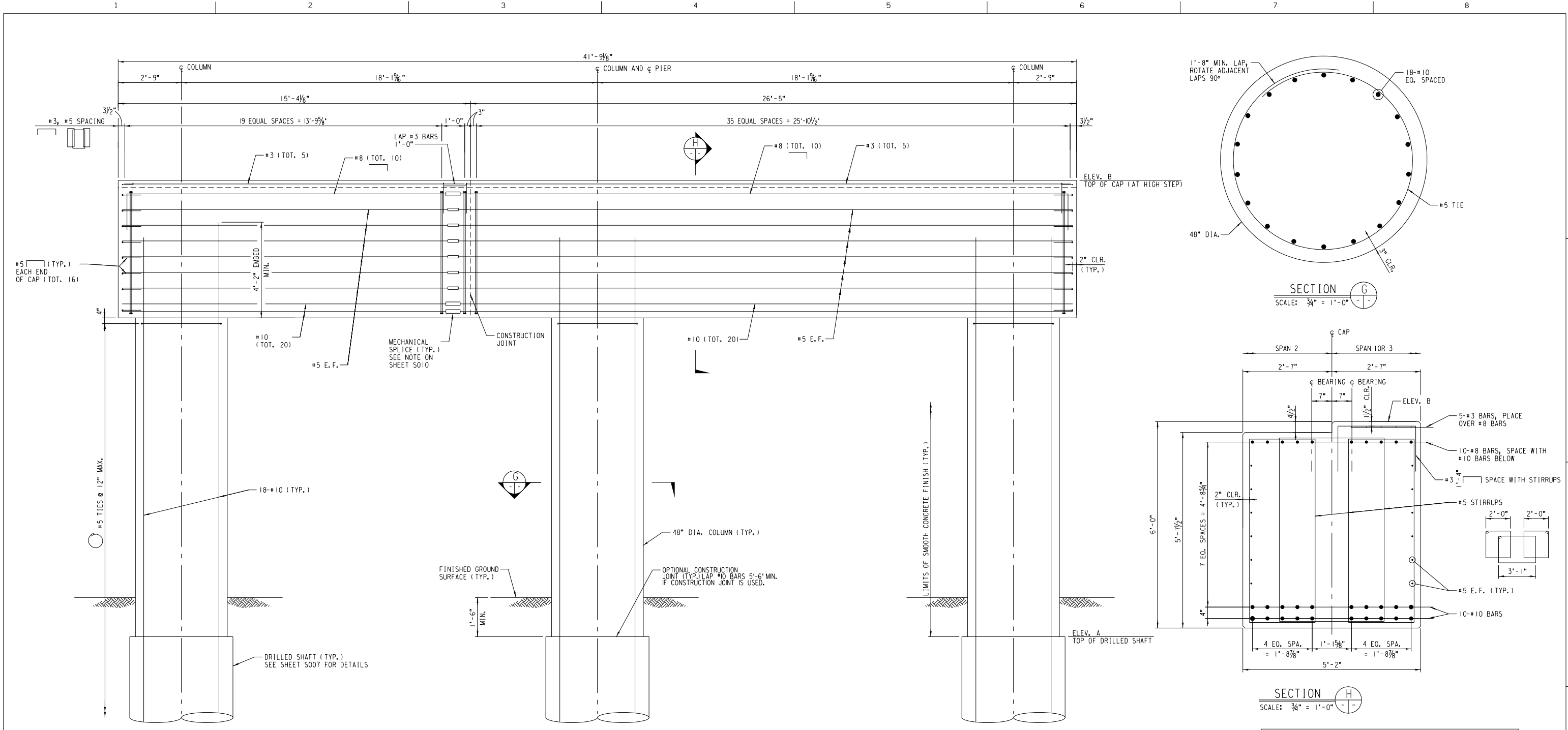
- NOTES:**
1. FOR DRAINAGE AND BACKFILL DETAILS SEE SHEET S025 AND S026.
 2. MECHANICAL SPLICES SHALL BE A COMMERCIAL PRODUCT CAPABLE OF DEVELOPING THE FULL YIELD STRENGTH OF THE REBAR. SPLICES SHALL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
 3. BEFORE PLACING NEW CONCRETE AGAINST HARDENED CONCRETE SURFACES, APPLY THOROC EPOXY ADHESIVE 24 LPL OR APPROVED ALTERNATE TO THE HARDENED CONCRETE SURFACE, THE COST OF THE ADHESIVE SHALL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
 4. FOR ANCHOR BOLT LAYOUT SEE SHEET S018.

WELL-COMPACTED GRANULAR FILL

1. BACKFILL BEHIND ABUTMENTS WITH WELL-GRADED MATERIAL TO THE LIMITS SHOWN ON THIS SHEET. MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM C33 SPECIFICATIONS AND SHALL BE A WELL-GRADED MIXTURE OF SAND AND GRAVEL WITH THE FOLLOWING GRADATIONS.
- 100% PASSING THE 1" SIEVE
60% PASSING THE #4 SIEVE
5% PASSING THE #200 SIEVE
2. SEE SPECIFICATIONS FOR COMPACTION REQUIREMENTS.

			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
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ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

FILENAME	...\GDP_S010.dgn	SHEET S010
SCALE	AS NOTED	



PIER ELEVATION
(PIER #2 SHOWN, PIER #3 SIMILAR, LOOKING AHEAD STATION)
SCALE: 1/2" = 1'-0"

ELEVATION TABLE		
PIER	ELEV. A	ELEV. B
2	8739.04	8759.74
3	8739.00	8758.85

- NOTES:
- ADJUST REINFORCING IN CAP TO AVOID ANCHOR BOLTS AS REQ'D.
 - CONCRETE ABOVE ELEVATION "A" SHALL HAVE A SMOOTH FINISH AND BE INTEGRALLY COLORED AS DESCRIBED ON SHEET S002.
 - IF THE CONTRACTOR PREFERS TO CONSTRUCT THE PIERS USING PERMANENT STEEL CASING AND/OR 48 INCH CONSTANT DIAMETER DRILLED SHAFTS, A REQUEST MAY BE SUBMITTED TO THE ENGINEER AND THE RAILROAD FOR APPROVAL. THE COST OF PERMANENT CASING AND ADDITIONAL ENGINEERING REQUIRED SHALL BE BORNE BY THE CONTRACTOR.
 - BEFORE PLACING NEW CONCRETE AGAINST HARDENED CONCRETE SURFACES, APPLY THOROC EPOXY ADHESIVE 24PL OR APPROVED ALTERNATE TO THE HARDENED CONCRETE SURFACE. THE COST OF THE ADHESIVE WILL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
 - FOR ANCHOR BOLT LAYOUT SEE SHEET S018.

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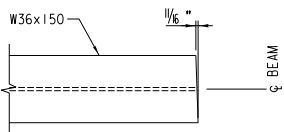
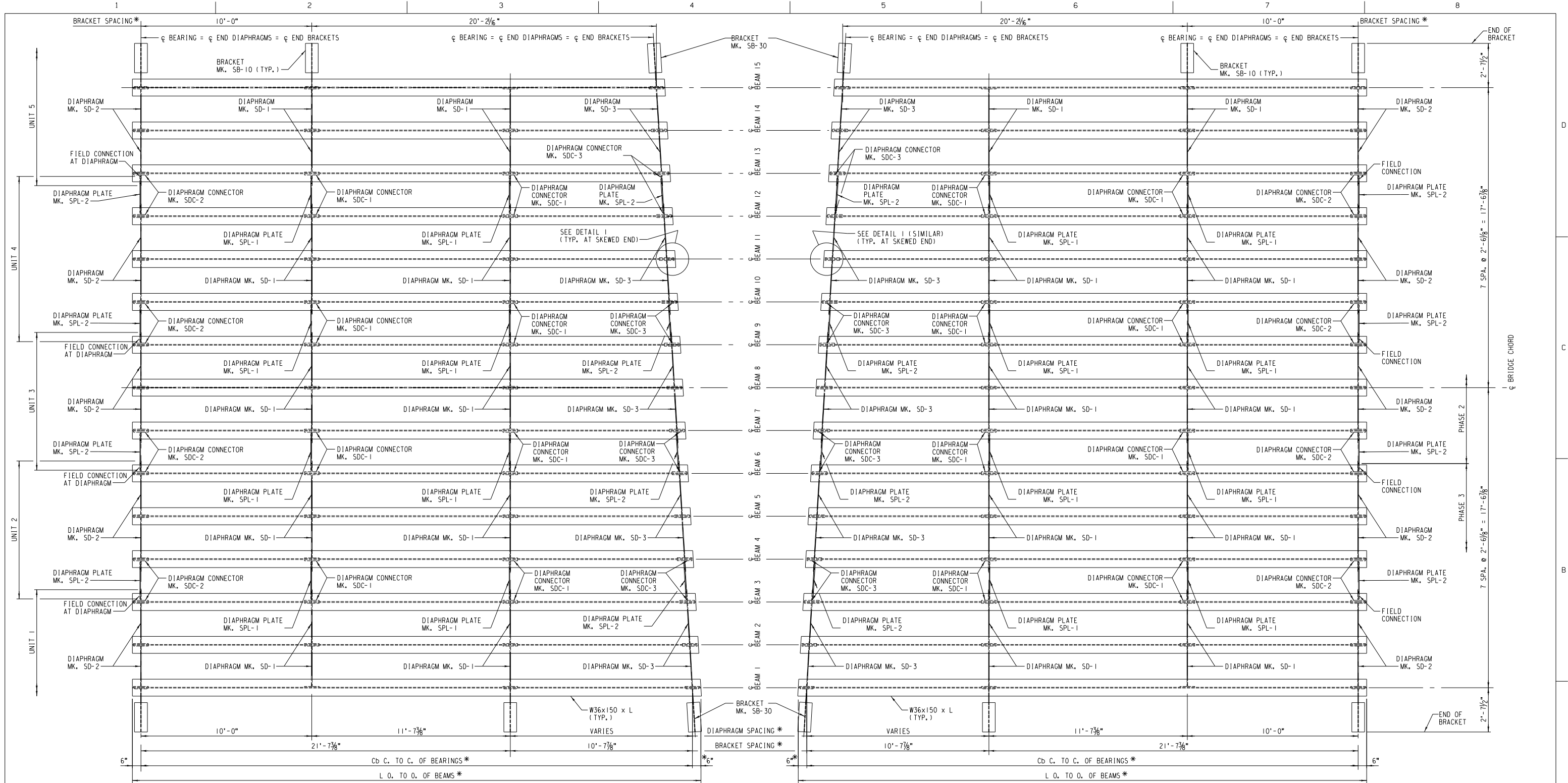
HDR
HDR Engineering, Inc.

			PROJECT MANAGER	R. FERTIG
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			CHECK ENGINEER	R. BATEMAN
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			QC	R. KOTAN
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**CORNERSTONE
WINTER PARK
HOLDINGS, LLC**

**GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
PIER NO. 2 AND NO. 3**

FILENAME	...GDP.S011.dgn	SHEET
SCALE	AS NOTED	S011



DETAIL 1
SCALE: 1"=1'-0"

FRAMING PLAN (SPAN 3)
SCALE: 3/8" = 1'-0"

* MEASURED ALONG C.B. BEAM

FRAMING PLAN (SPAN 1)
SCALE: 3/8" = 1'-0"

DIMENSION TABLE - SPAN 1 & 3

BEAM	L	Cb	BEAM	L	Cb
15	31'-2 1/8"	30'-2 1/8"	7	32'-4 1/2"	31'-4 1/2"
14	31'-3 3/8"	30'-3 3/8"	6	32'-6 1/4"	31'-6 1/4"
13	31'-5 1/8"	30'-5 1/8"	5	32'-8 1/8"	31'-8 1/8"
12	31'-7 1/2"	30'-7 1/2"	4	32'-9 3/8"	31'-9 3/8"
11	31'-9 1/4"	30'-9 1/4"	3	32'-11 1/8"	31'-11 1/8"
10	31'-11 1/8"	30'-11 1/8"	2	33'-1 1/2"	32'-1 1/2"
9	32'-0 3/8"	31'-0 3/8"	1	33'-3 1/4"	32'-3 1/4"
8	32'-2 1/8"	31'-2 1/8"			

HDR
HDR Engineering, Inc.

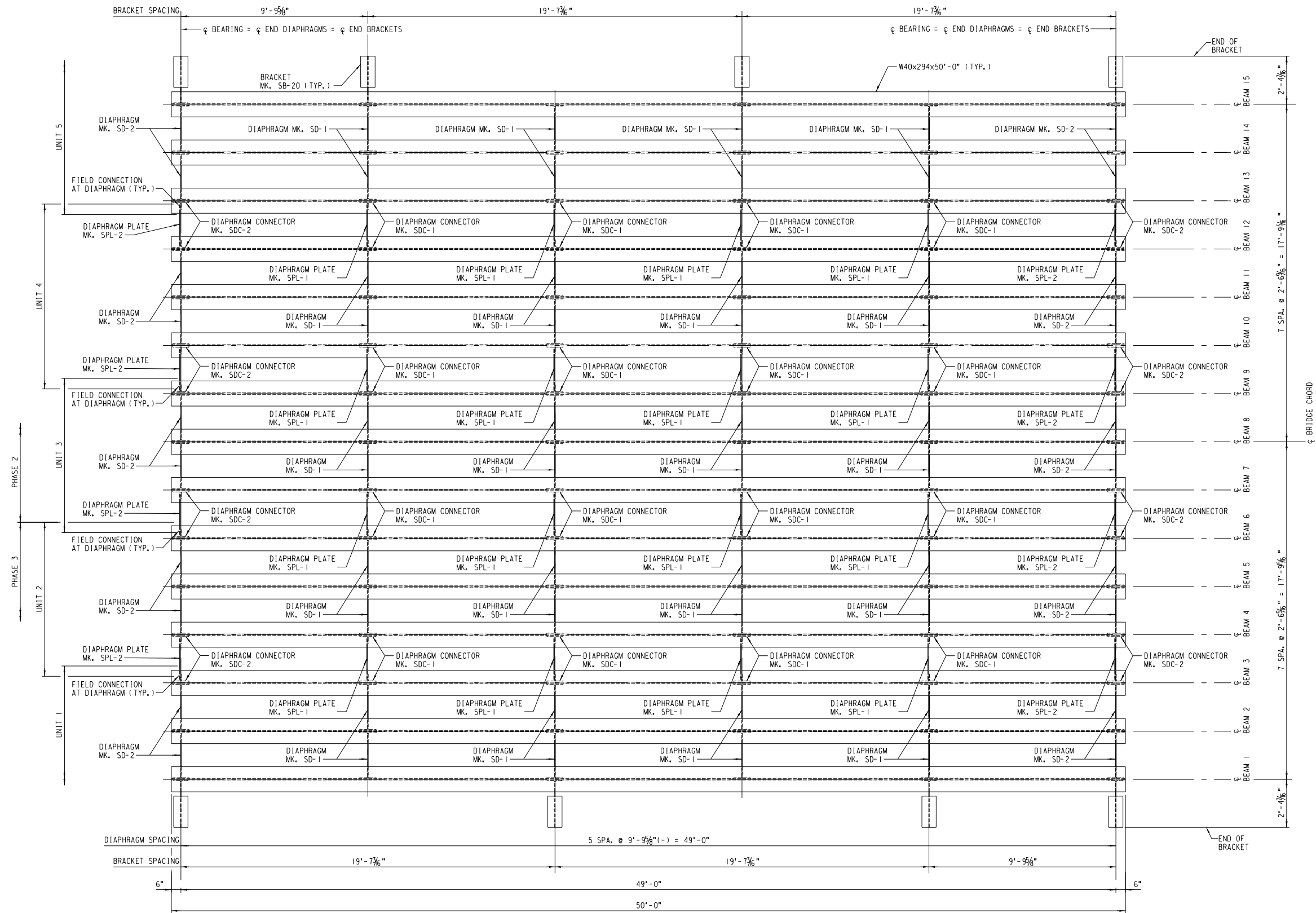
PROJECT MANAGER R. FERTIG
DESIGN ENGINEER R. FERTIG
CHECK ENGINEER R. BATEMAN
TECHNICIAN K. CAPE
QC R. KOTAN

PROJECT NUMBER 00000000197406

CORNERSTONE
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GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SUPERSTRUCTURE FRAMING PLAN
(SHEET 1 OF 2)

FILENAME ...GDP.S012.dgn
SCALE AS NOTED
SHEET S012



FRAMING PLAN (SPAN 2)
SCALE: 3/8" = 1'-0"

PLOTTED: 6/9/2014



HDR Engineering, Inc.

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			TECHNICIAN	K. CAPE
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ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406

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GRAND PARK DRIVE UPRR UNDERPASS
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SUPERSTRUCTURE FRAMING PLAN
(SHEET 2 OF 2)

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SCALE	AS NOTED	S013

PLOTTED: 6/9/2014

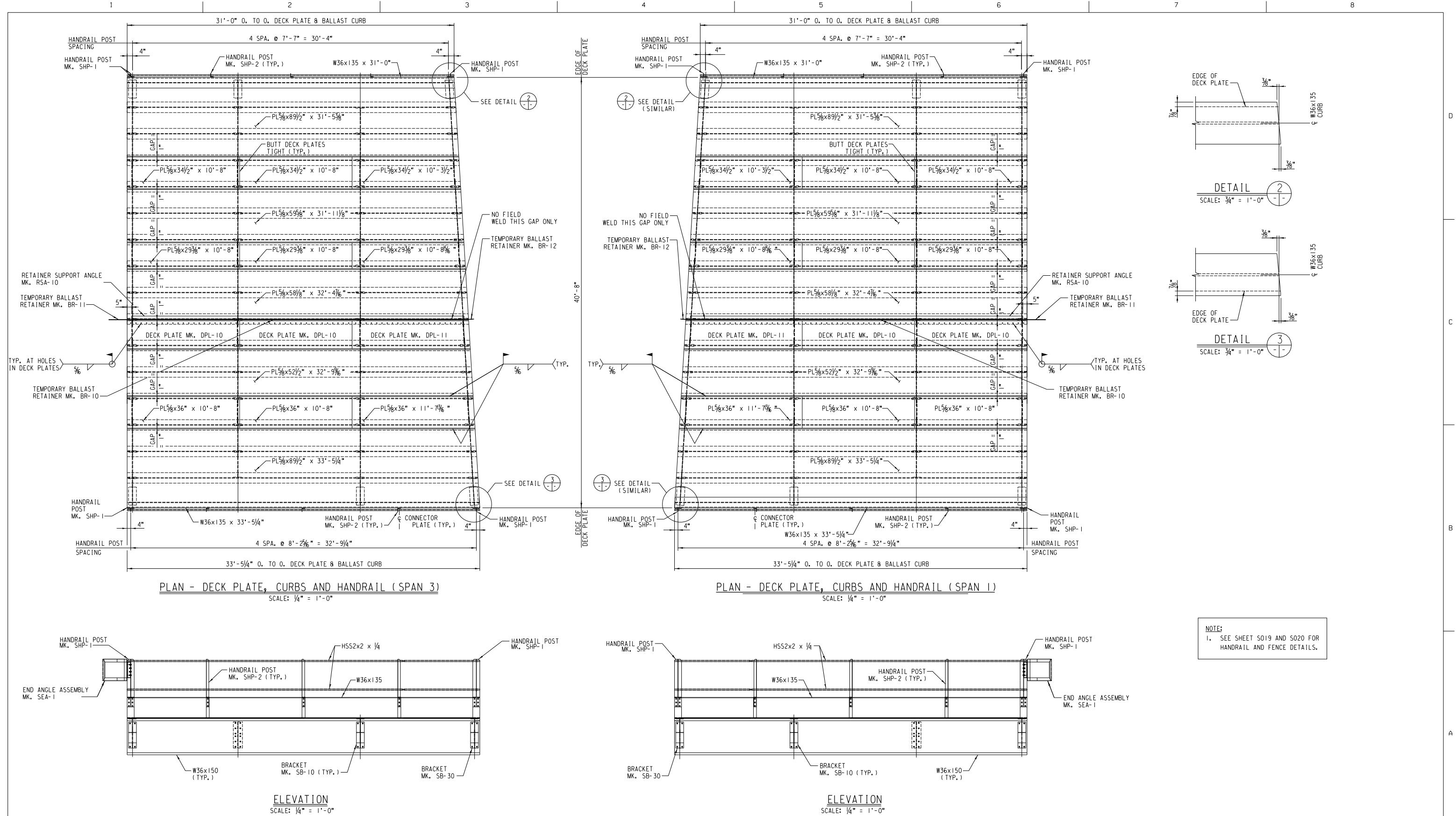


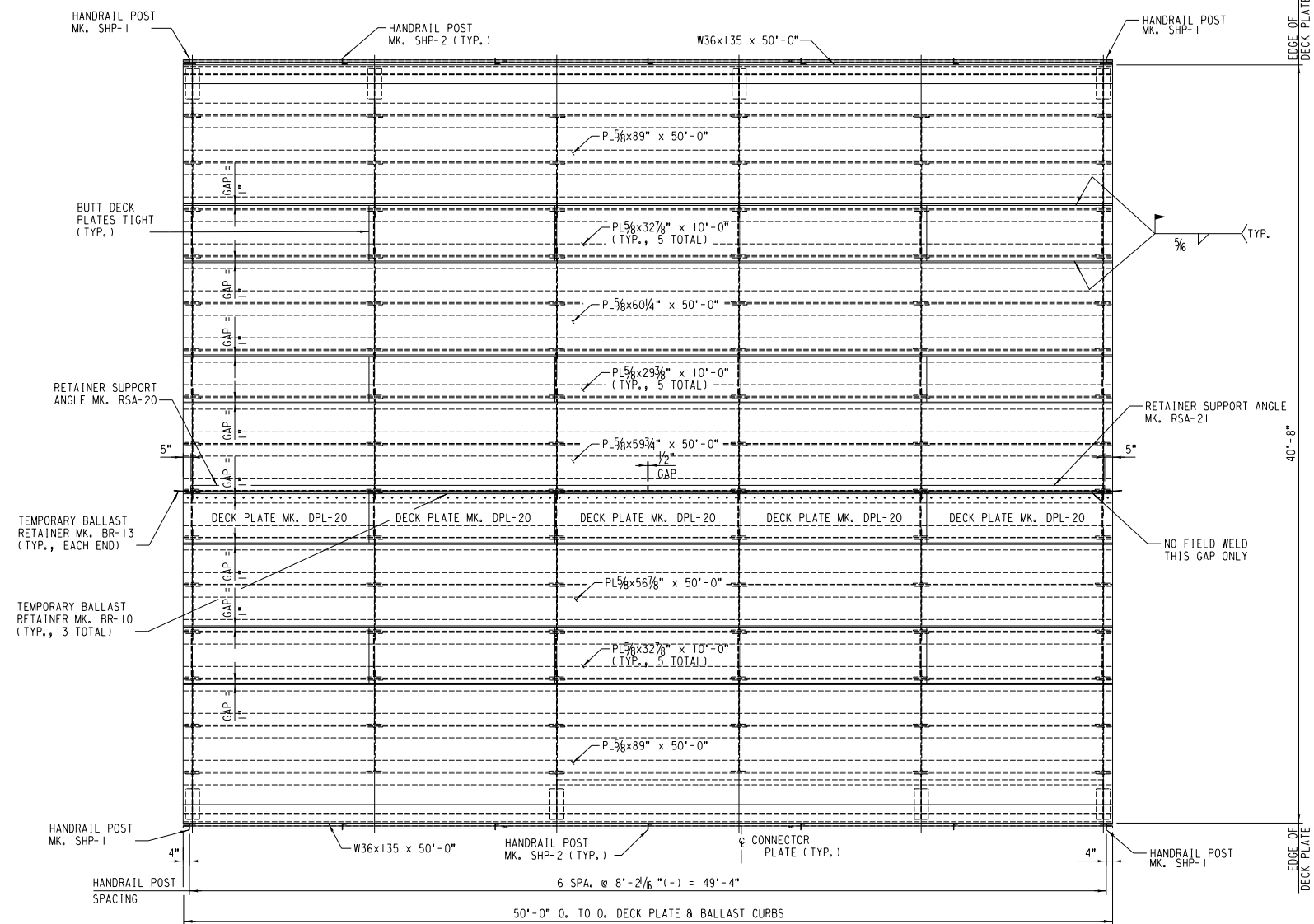
			PROJECT MANAGER	R. FERTIG
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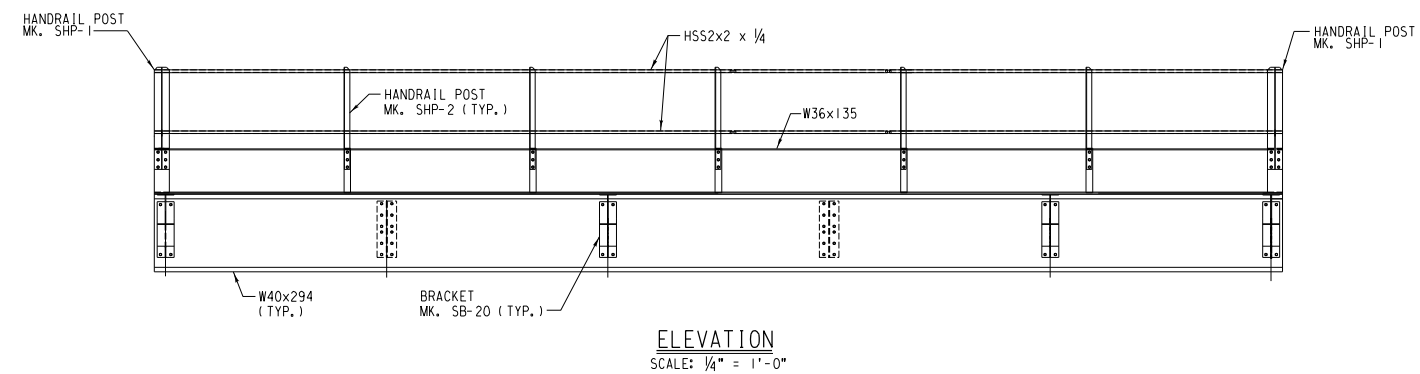
**GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SUPERSTRUCTURE PLAN AND ELEVATION
SPANS 1 & 3**

FILENAME	...GDP_S014.dgn	SHEET
SCALE	AS NOTED	S014





PLAN - DECK PLATE, CURBS, AND HANDRAIL (SPAN 2)
SCALE: $\frac{1}{4}" = 1'-0"$



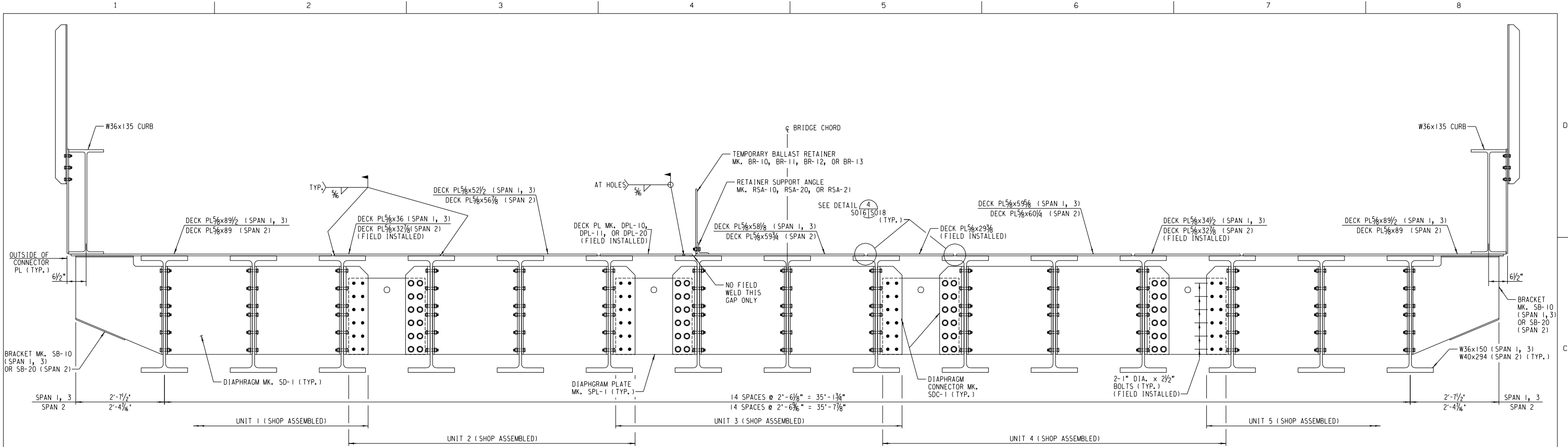
ELEVATION
SCALE: 1/4" = 1'-0"

			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
-	-	-		
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406

**CORNERSTONE
WINTER PARK
HOLDINGS, LLC**

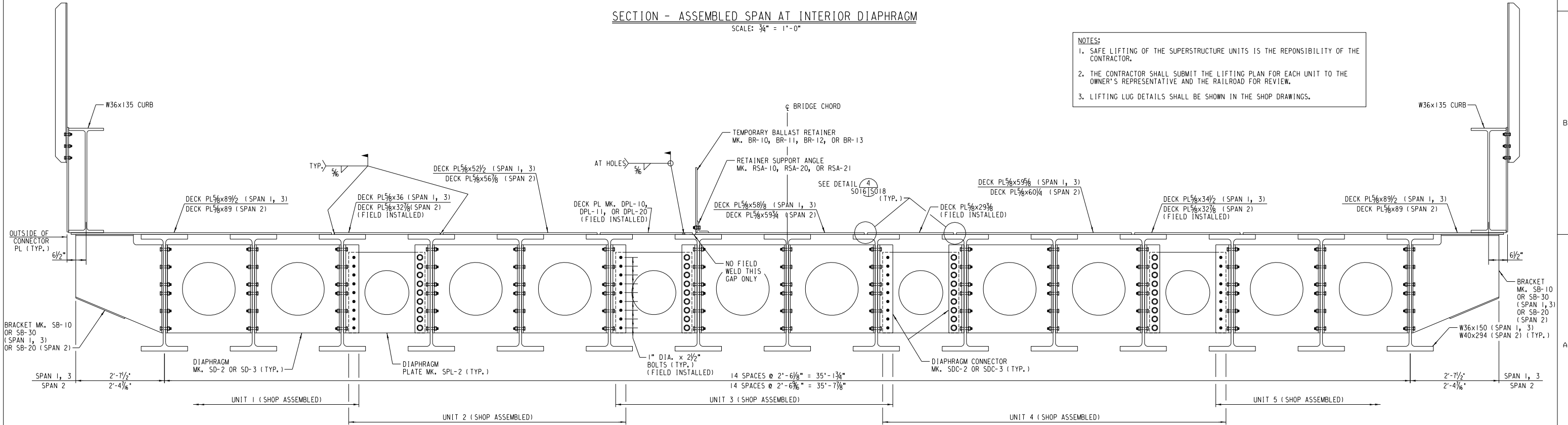
**GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SUPERSTRUCTURE PLAN AND ELEVATION
SPAN 2**

FILENAME	... \GDP_S015.dgn	SHEET S015
SCALE	AS NOTED	



SECTION - ASSEMBLED SPAN AT INTERIOR DIAPHRAGM
SCALE: 3/4" = 1'-0"

- NOTES:
1. SAFE LIFTING OF THE SUPERSTRUCTURE UNITS IS THE RESPONSIBILITY OF THE CONTRACTOR.
 2. THE CONTRACTOR SHALL SUBMIT THE LIFTING PLAN FOR EACH UNIT TO THE OWNER'S REPRESENTATIVE AND THE RAILROAD FOR REVIEW.
 3. LIFTING LUG DETAILS SHALL BE SHOWN IN THE SHOP DRAWINGS.



SECTION - ASSEMBLED SPAN AT END DIAPHRAGM
SCALE: 3/4" = 1'-0"

<div><div>HDR</div><div>HDR Engineering, Inc.</div></div>				PROJECT MANAGER R. FERTIG	<div>CORNERSTONE WINTER PARK HOLDINGS, LLC</div>	GRAND PARK DRIVE UPRR UNDERPASS IN FRASER, COLORADO UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION SUPERSTRUCTURE ASSEMBLY DETAILS (SHEET 1 OF 3)		
				DESIGN ENGINEER R. FERTIG				
				CHECK ENGINEER R. BATEMAN				
				TECHNICIAN K. CAPE				
				QC R. KOTAN				
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406		FILENAME	...GDP_S016.dgn	SHEET S016
						SCALE	AS NOTED	

PLOTTED: 6/9/2014

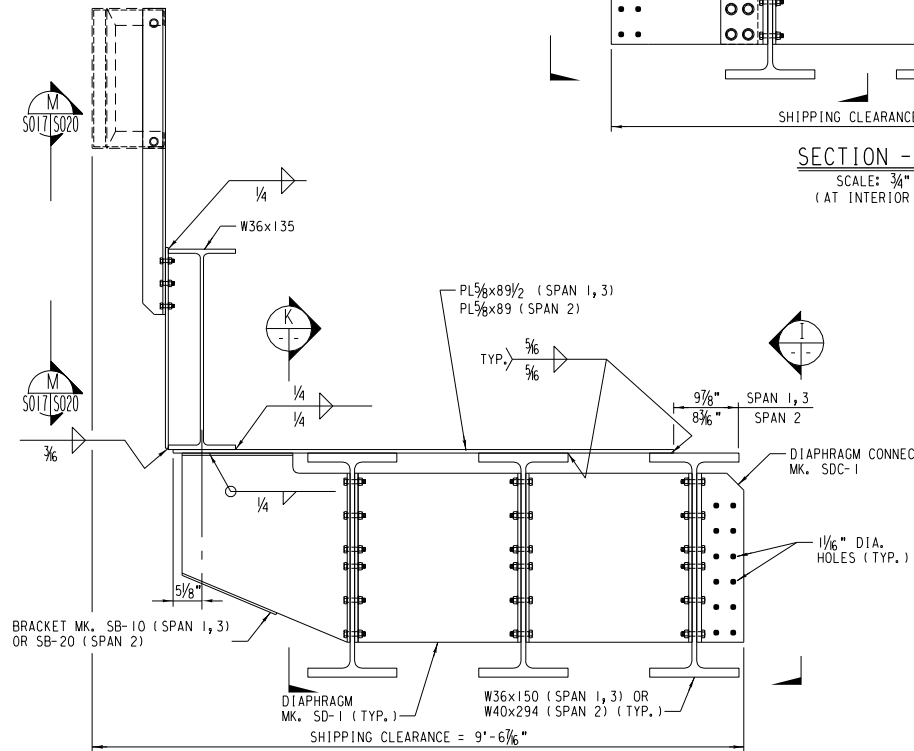
HDR
HDR Engineering, Inc.

			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406

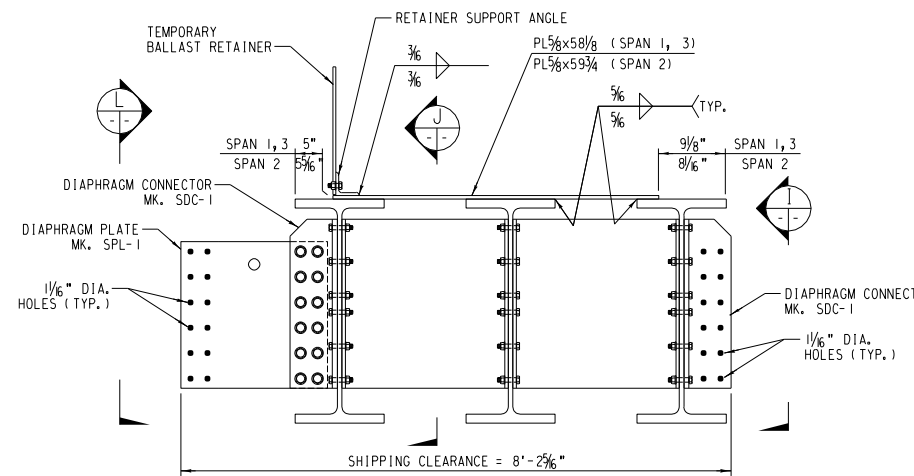
**CORNERSTONE
WINTER PARK
HOLDINGS, LLC**

**GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SUPERSTRUCTURE ASSEMBLY DETAILS
(SHEET 2 OF 3)**

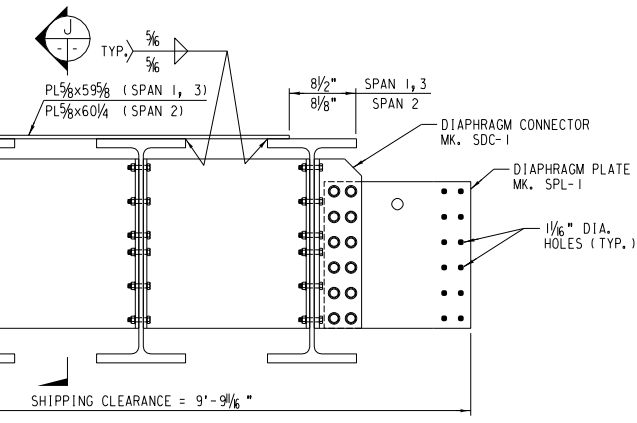
FILENAME	...GDP_S017.dgn	SHEET
SCALE	AS NOTED	S017



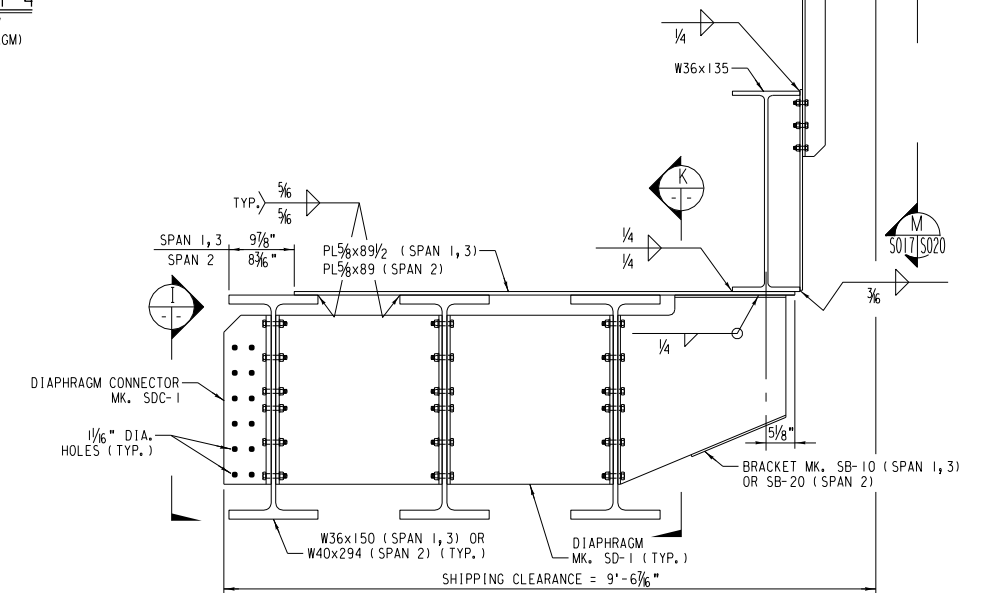
SECTION - UNIT 1
SCALE: 3/4" = 1'-0"
(AT INTERIOR DIAPHRAGM)



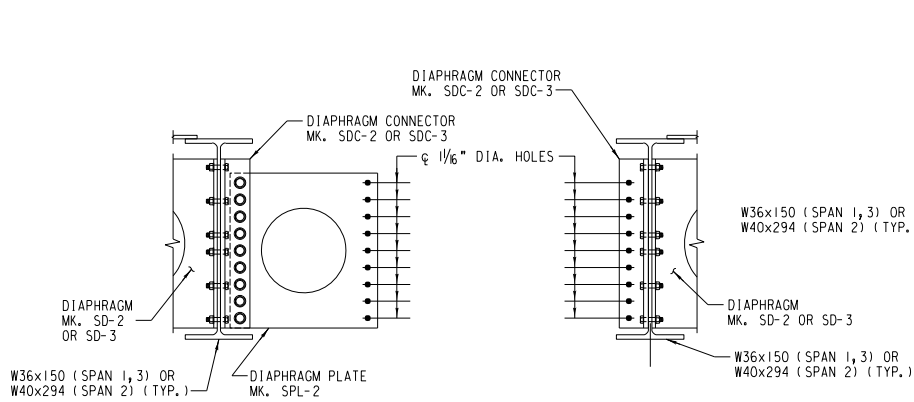
SECTION - UNIT 3
SCALE: 3/4" = 1'-0"
(AT INTERIOR DIAPHRAGM)



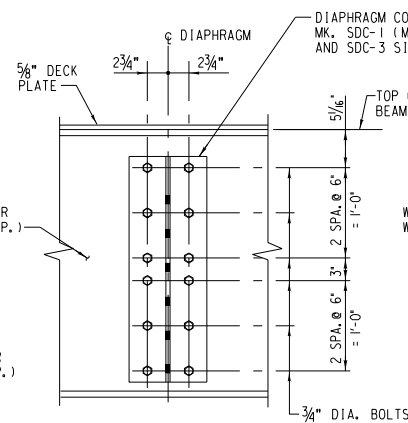
SECTION - UNIT 4
SCALE: 3/4" = 1'-0"
(AT INTERIOR DIAPHRAGM)



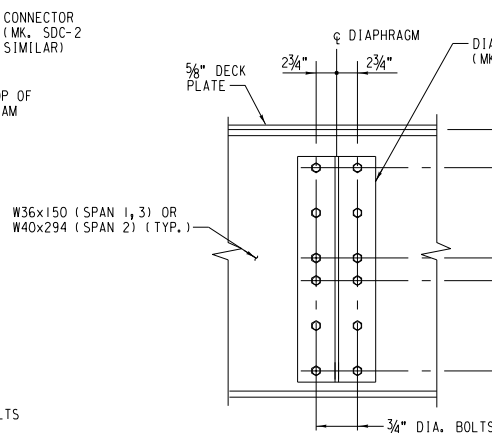
SECTION - UNIT 5
SCALE: 3/4" = 1'-0"
(AT INTERIOR DIAPHRAGM)



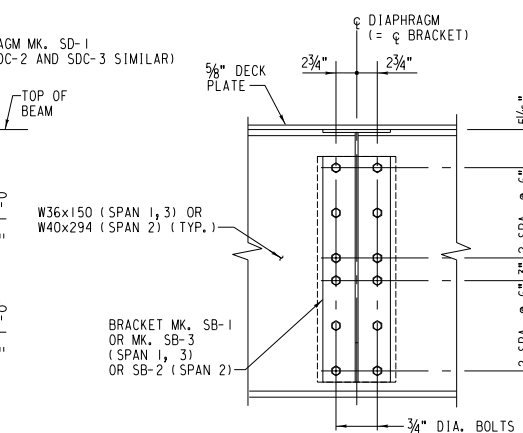
SECTION - UNIT 1 (PARTIAL SECTION SHOWN)



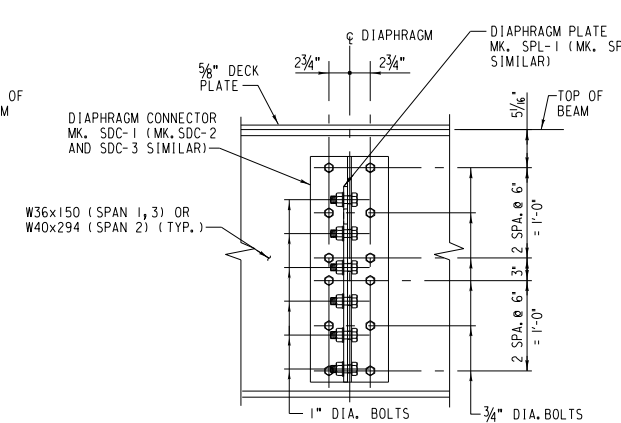
SECTION - UNIT 3
SCALE: 1" = 1'-0"



SECTION - UNIT 4
SCALE: 1" = 1'-0"



SECTION - UNIT 5
SCALE: 1" = 1'-0"



SECTION - UNIT 5
SCALE: 1" = 1'-0"

PLOTTED: 6/9/2014

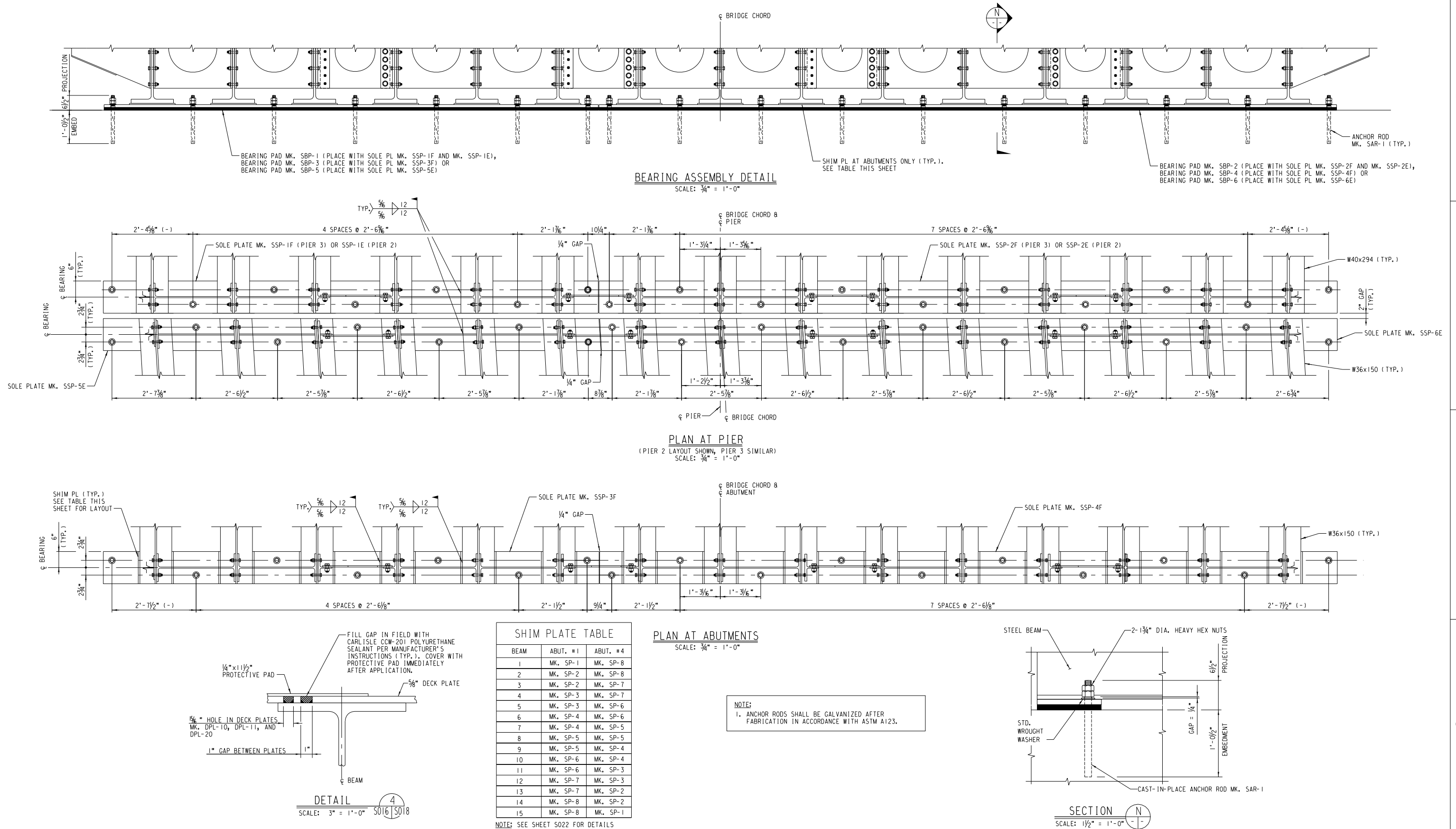


			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406

CORNERSTONE
WINTER PARK
HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SUPERSTRUCTURE ASSEMBLY DETAILS
(SHEET 3 OF 3)

FILENAME	...GDP_S018.dgn	SHEET	S018
SCALE	AS NOTED		



PLOTTED: 6/10/2014

HDR

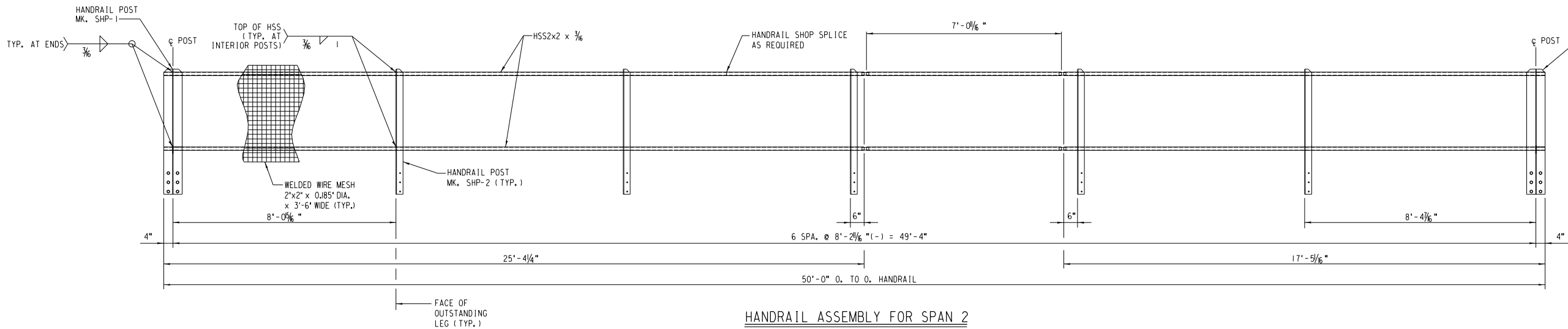
HDR Engineering, Inc.

			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	D. ALLARD
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
-	-	-		
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

**CORNERSTONE
WINTER PARK
HOLDINGS, LLC**

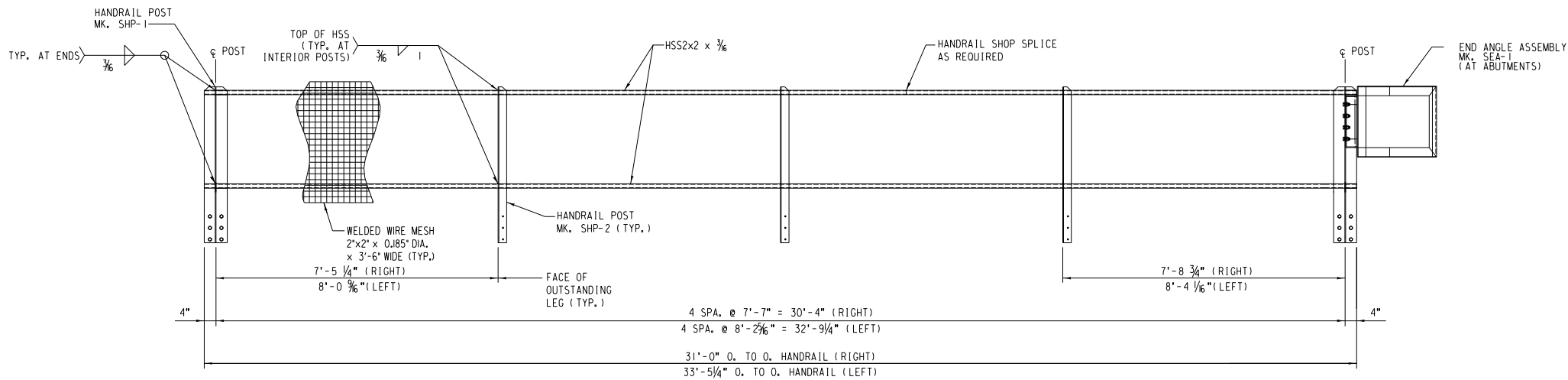
**GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
HANDRAIL AND FENCE DETAILS
(SHEET 1 OF 2)**

FILENAME	...GDP_S019.dgn	SHEET
SCALE	AS NOTED	S019



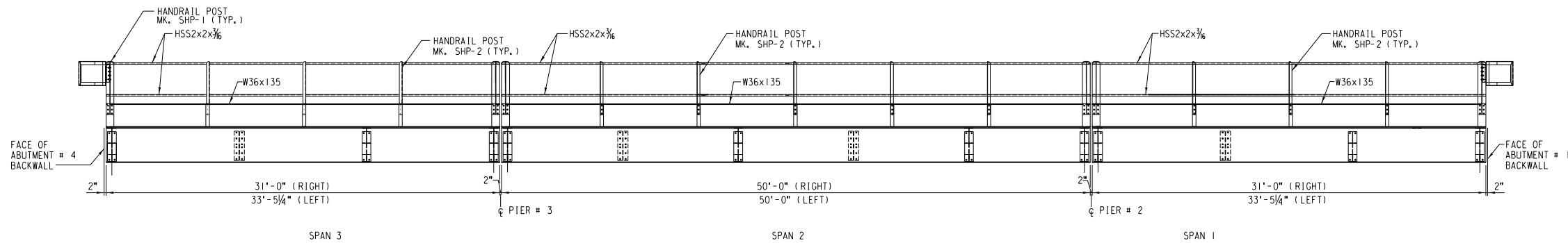
HANDRAIL ASSEMBLY FOR SPAN 2

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



HANDRAIL ASSEMBLY FOR SPAN 1 & SPAN 3

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



HANDRAIL LAYOUT

SCALE: 3/8" = 1'-0"

- NOTES:**
- TWO FIELD SPLICES PER HANDRAIL REQUIRED FOR SPAN 2.
 - FOR HANDRAIL MATERIAL SPECIFICATIONS, SEE GENERAL NOTES, SHEET S002.
 - WELDED WIRE MESH SHALL CONFORM TO ASTM F2453 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - AFTER WELDING THE WIRE MESH TO THE MESH ATTACHMENT BAR, RESTORE GALVANIZING IN ACCORDANCE WITH ASTM A780.
 - THE MESH SHALL BE PAINTED A COLOR ACCEPTABLE TO THE OWNER. A MOCK-UP SHALL BE PROVIDED TO THE OWNER FOR APPROVAL.
 - LEAVE THE MESH UNPAINTED WHERE WELDS WILL BE REQUIRED, AND PAINT THOSE AREAS AFTER WELDING.
 - PREPARATION OF THE SURFACES TO BE PAINTED SHALL BE ACCORDING TO THE PAINT MANUFACTURER'S RECOMMENDATIONS.
 - PRIOR TO FABRICATION OF THE HANDRAIL AND WIRE MESH, THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE TO THE PAINTED MESH SHOWN USING SELF WEATHERING STEEL MATERIAL. CONTRACTOR SHALL SUBMIT PROPOSED DETAILS AND MATERIAL SPECIFICATIONS. FINAL ACCEPTANCE IS SUBJECT TO REVIEW AND APPROVAL BY THE OWNER.

PLOTTED: 6/9/2014

HDR

HDR Engineering, Inc.

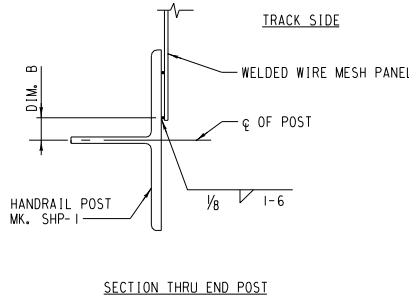
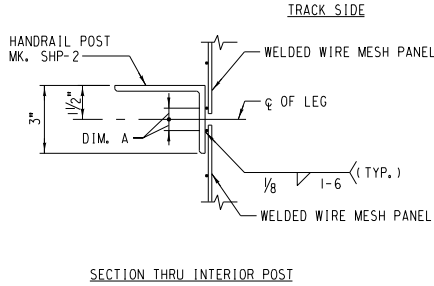
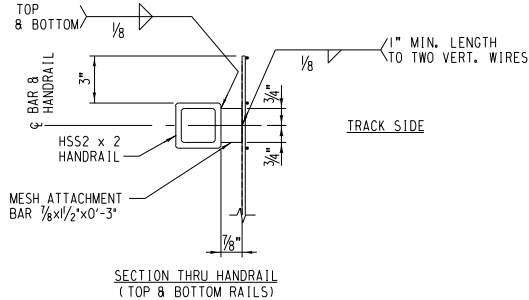
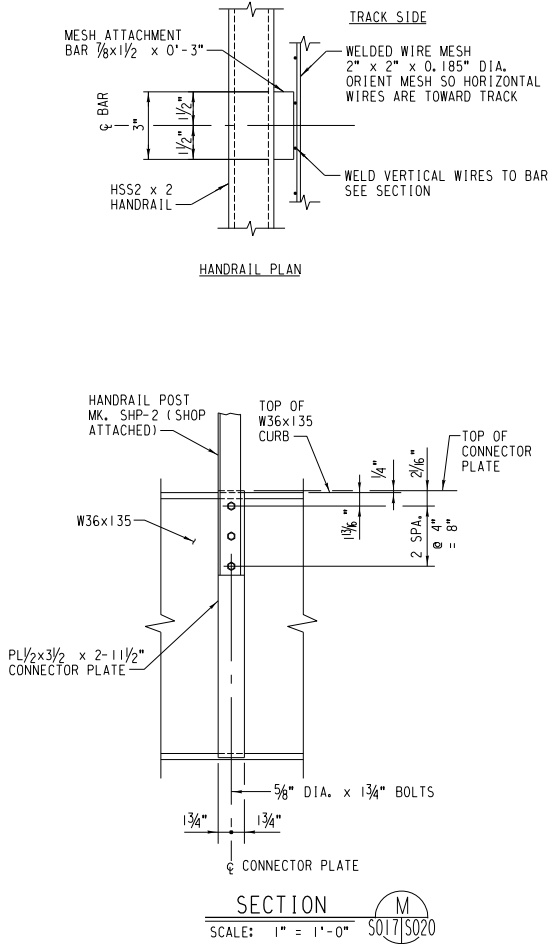
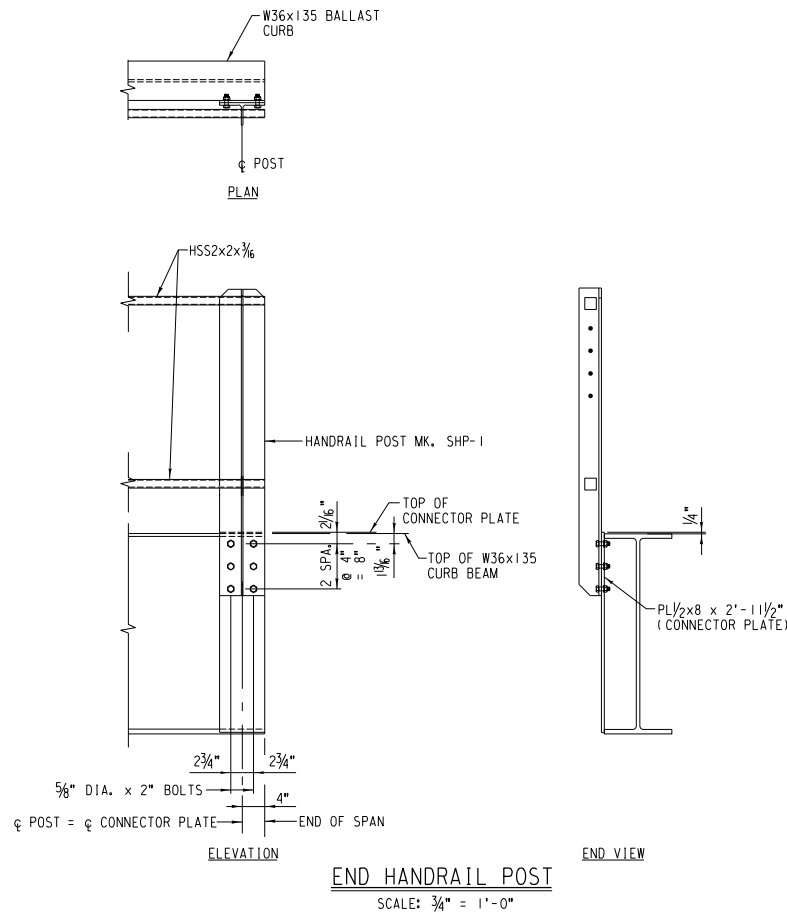
			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	D. ALLARD
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
-	-	-		
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	00000000197406

**CORNERSTONE
WINTER PARK
HOLDINGS, LLC**

**GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
HANDRAIL AND FENCE DETAILS
(SHEET 2 OF 2)**

FILENAME	... \GDP_S020.dgn
SCALE	AS NOTED

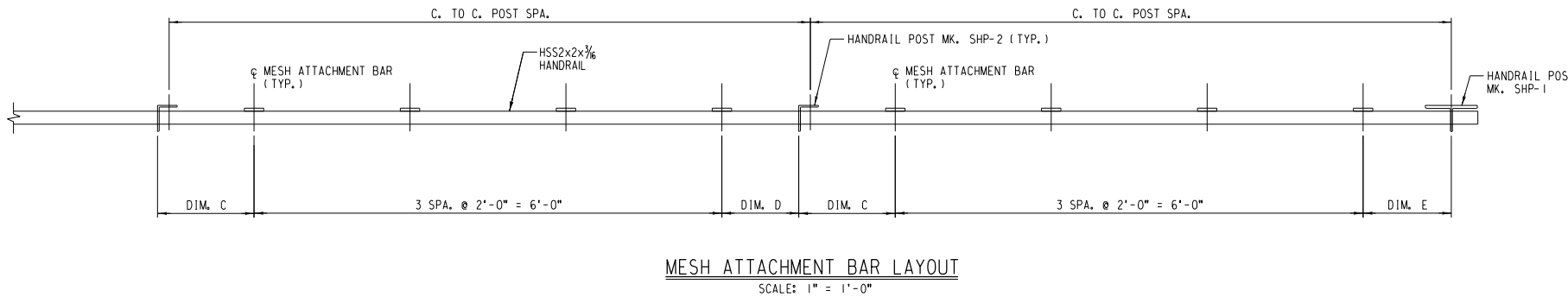
SHEET
S020



MESH ATTACHMENT DETAILS
SCALE: 3" = 1'-0"

HANDRAIL DIMENSION TABLE						
LOCATION	MESH * PANEL LENGTH	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
SPAN 1 & 3, RT.	7'-6"	1/2"	3/4"	11"	8"	9 3/4"
SPAN 1 & 3, LT.	8'-2"	3/8"	3/8"	1'-2 1/8"	11 5/8"	1'-13 3/8"
SPAN 2, RT. & LT.	8'-2"	5/8"	5/8"	1'-2 3/8"	11 7/8"	1'-15 1/8"

* MESH PANEL LENGTH IS THE DISTANCE BETWEEN EXTERIOR VERTICAL WIRES (CENTER TO CENTER)

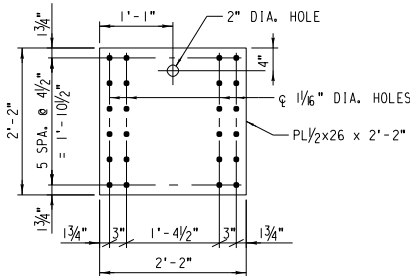


PROJECT MANAGER	R. FERTIG
DESIGN ENGINEER	R. FERTIG
CHECK ENGINEER	R. BATEMAN
TECHNICIAN	K. CAPE
QC	R. KOTAN
PROJECT NUMBER	00000000197406

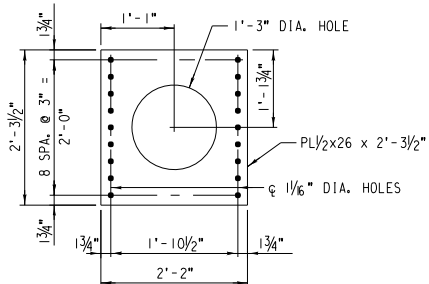
**CORNERSTONE
WINTER PARK
HOLDINGS, LLC**

**GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SUPERSTRUCTURE PIECE MARK DETAILS
(SHEET 1 OF 4)**

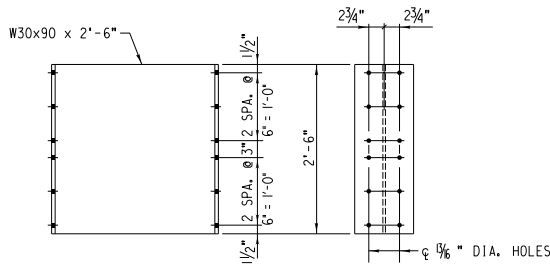
FILENAME	...GDP_S021.dgn	SHEET	S021
SCALE	AS NOTED		



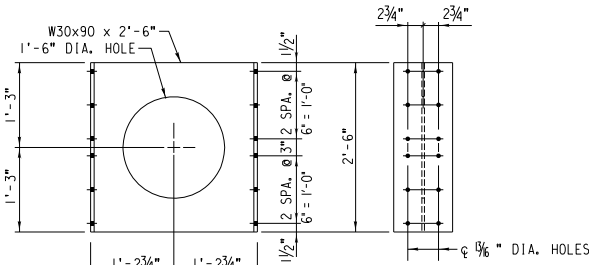
DIAPHRAGM PLATE MK. SPL-1
SCALE: 3/4" = 1'-0"



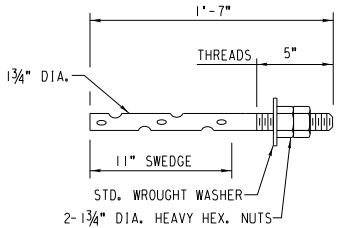
DIAPHRAGM PLATE MK. SPL-2
SCALE: 3/4" = 1'-0"



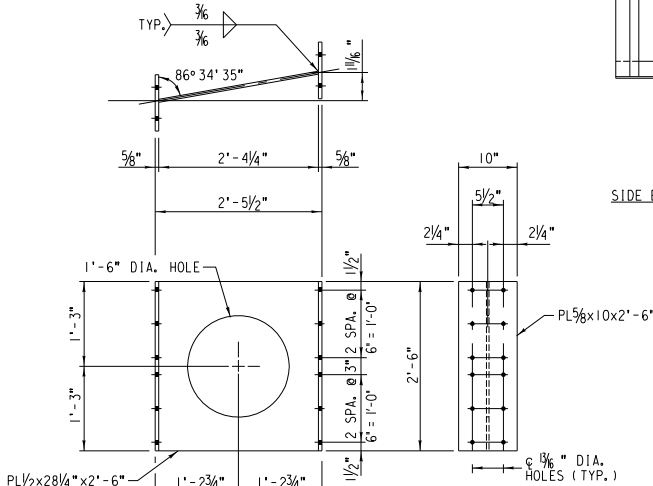
DIAPHRAGM MK. SD-1
SCALE: 3/4" = 1'-0"



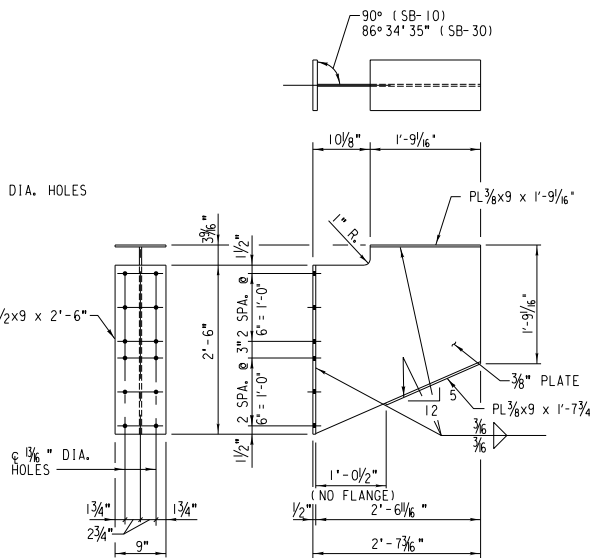
DIAPHRAGM MK. SD-2
SCALE: 3/4" = 1'-0"



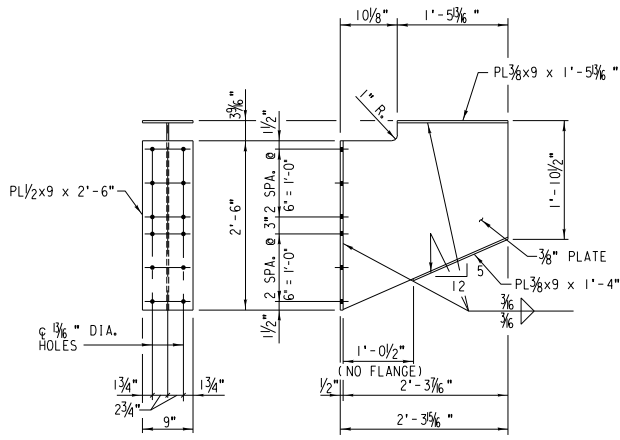
ANCHOR ROD MK. SAR-1
(GALVANIZE AFTER FABRICATION)
NO SCALE



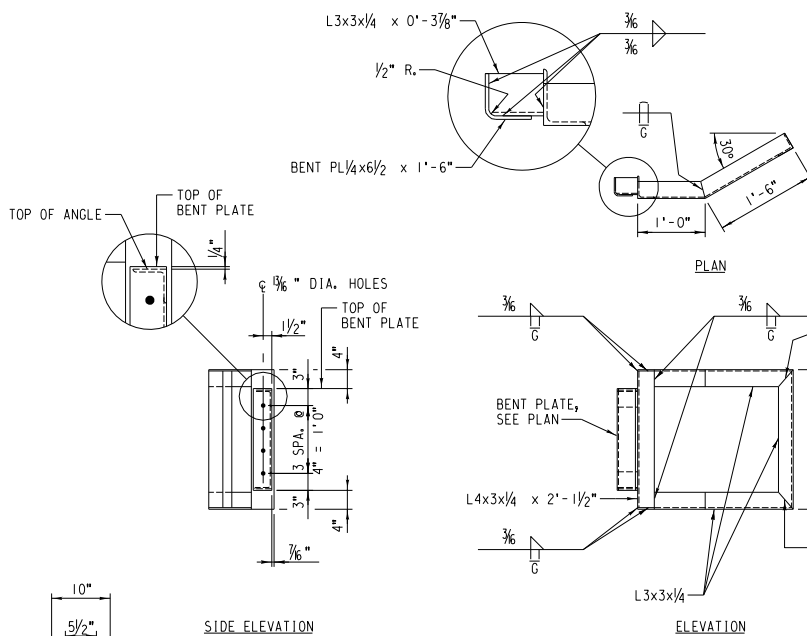
DIAPHRAGM MK. SD-3
SCALE: 3/4" = 1'-0"



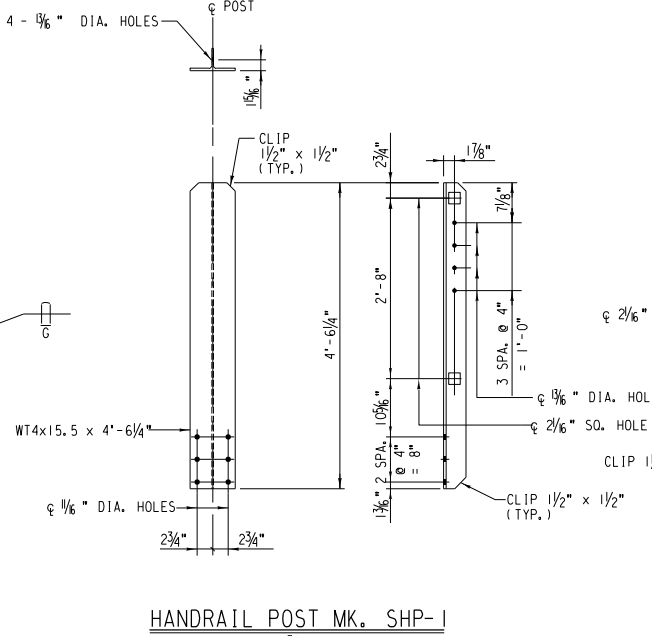
BRACKET MK. SB-10 AND SB-30
SCALE: 3/4" = 1'-0"



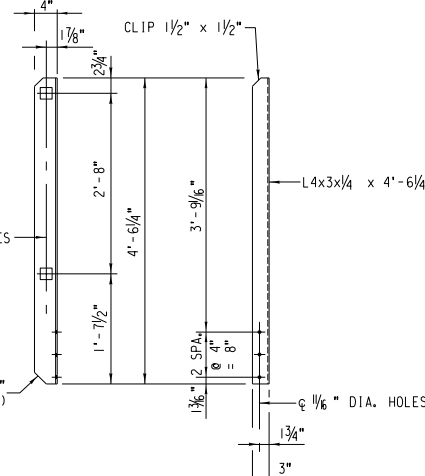
BRACKET MK. SB-20
SCALE: 3/4" = 1'-0"



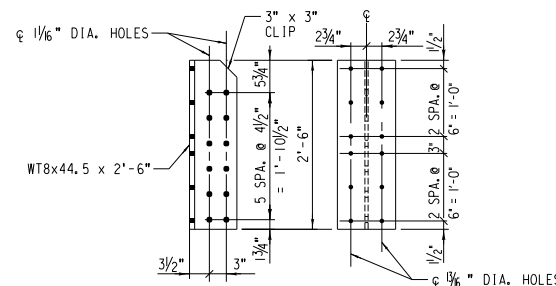
END ANGLE ASSEMBLY MK. SEA-1
SCALE: 3/4" = 1'-0"



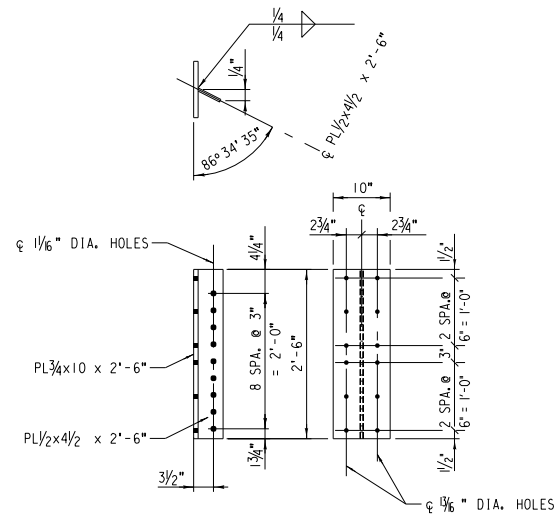
HANDRAIL POST MK. SHP-1
SCALE: 3/4" = 1'-0"



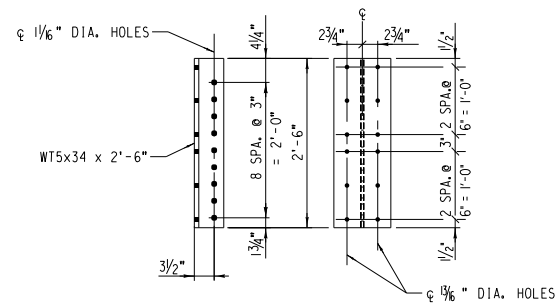
HANDRAIL POST MK. SHP-2
SCALE: 3/4" = 1'-0"



DIAPHRAGM CONNECTOR MK. SDC-1
SCALE: 3/4" = 1'-0"



DIAPHRAGM CONNECTOR MK. SDC-3
SCALE: 3/4" = 1'-0"



DIAPHRAGM CONNECTOR MK. SDC-2
SCALE: 3/4" = 1'-0"

PLOTTED: 6/9/2014

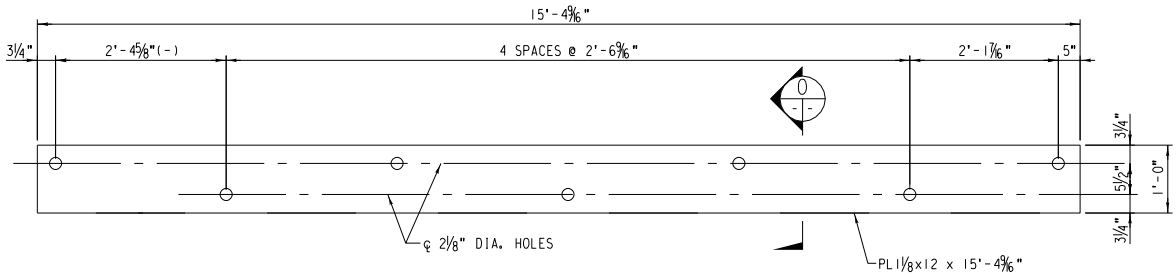
HDR
 HDR Engineering, Inc.

			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
-	-	-		
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

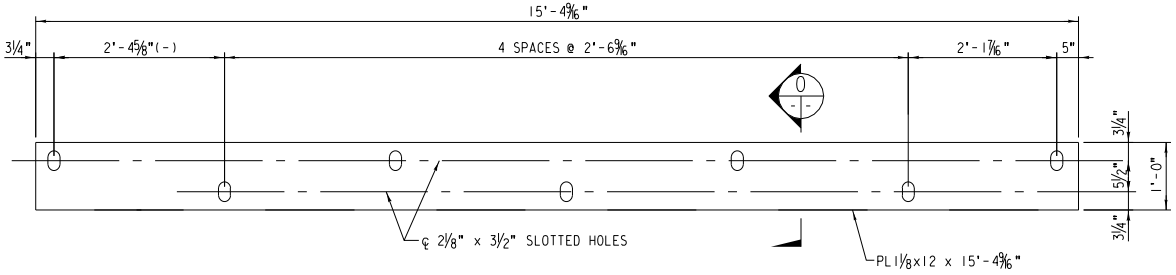
CORNERSTONE
 WINTER PARK
 HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS
 IN FRASER, COLORADO
 UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
 SUPERSTRUCTURE PIECE MARK DETAILS
 (SHEET 2 OF 4)

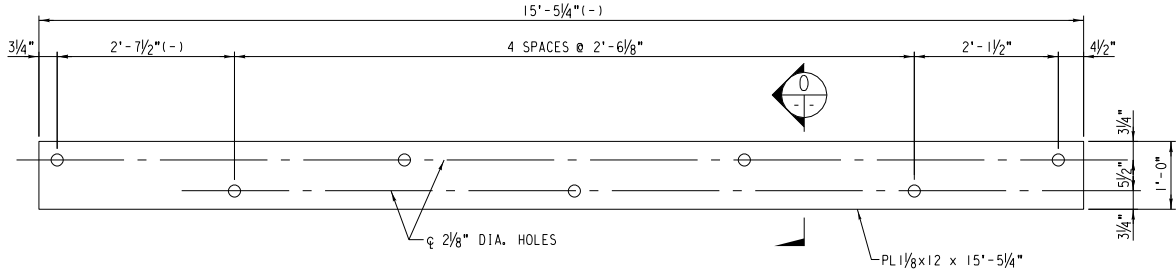
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SCALE	AS NOTED	S022



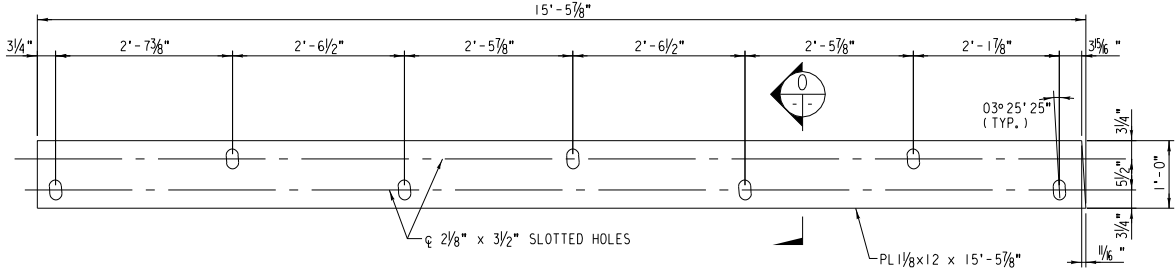
SOLE PLATE MK. SSP-1F
 SCALE: 3/4" = 1'-0"



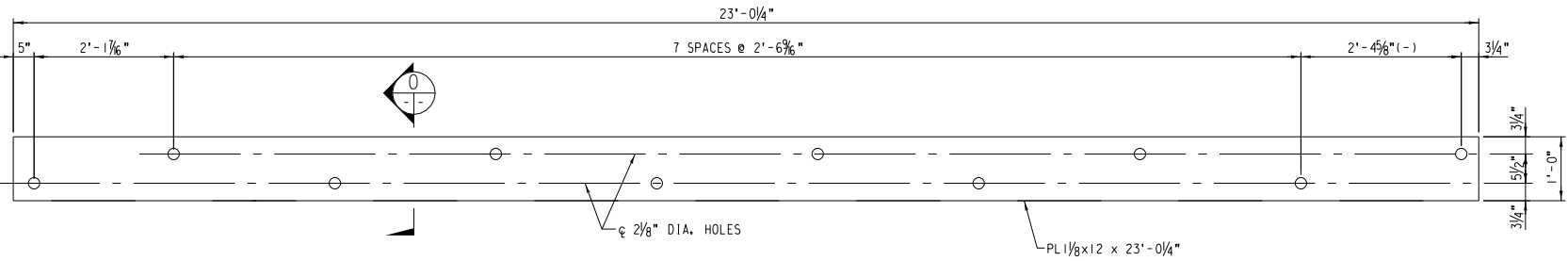
SOLE PLATE MK. SSP-1E
 SCALE: 3/4" = 1'-0"



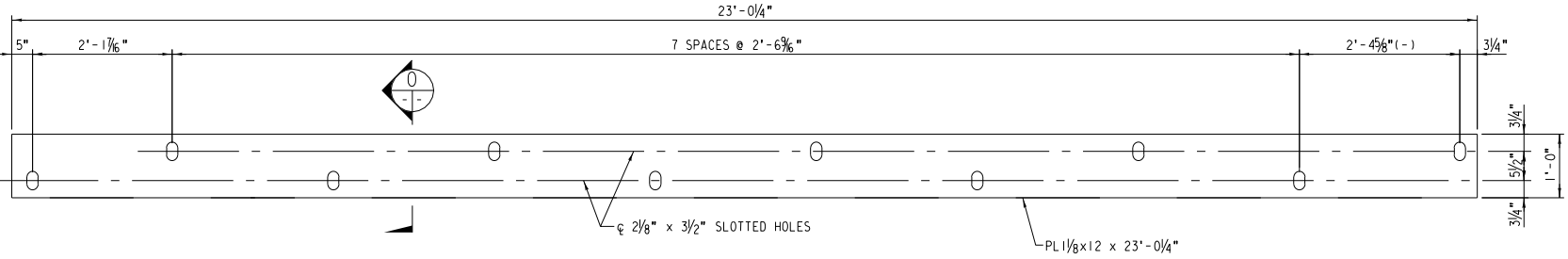
SOLE PLATE MK. SSP-3F
 SCALE: 3/4" = 1'-0"



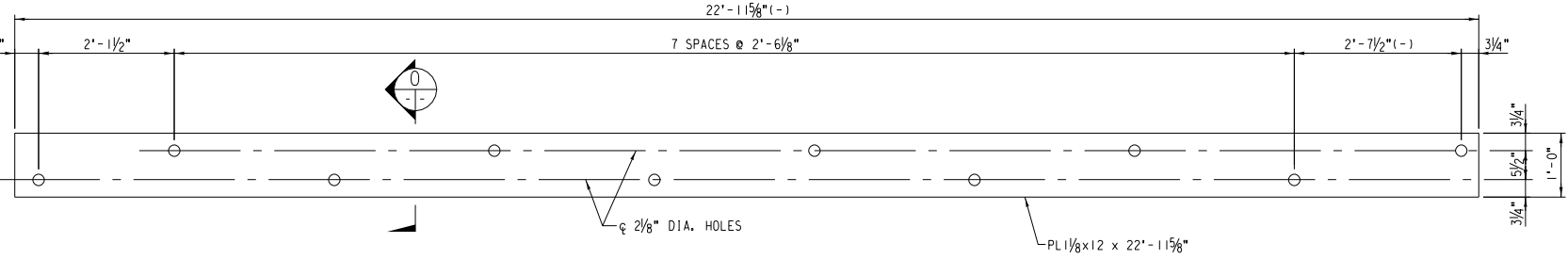
SOLE PLATE MK. SSP-5E
 SCALE: 3/4" = 1'-0"



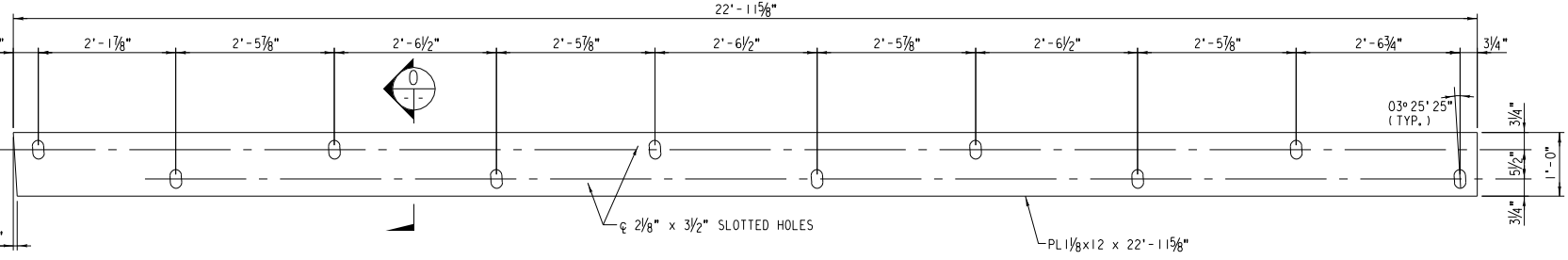
SOLE PLATE MK. SSP-2F
 SCALE: 3/4" = 1'-0"



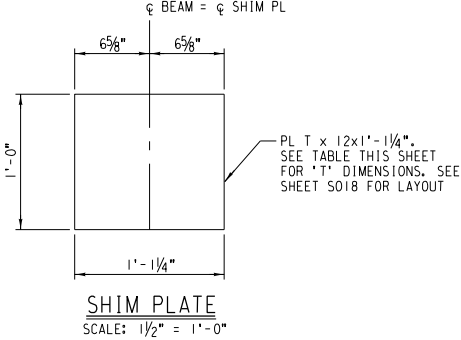
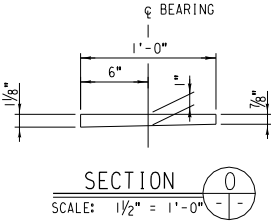
SOLE PLATE MK. SSP-2E
 SCALE: 3/4" = 1'-0"



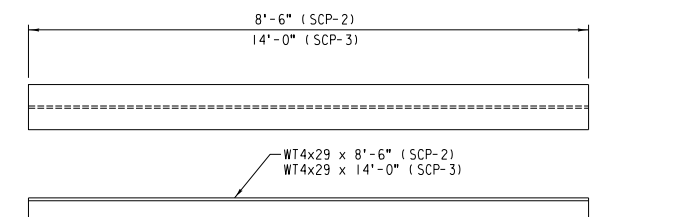
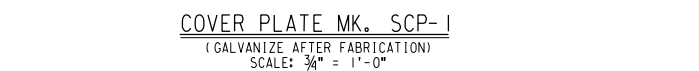
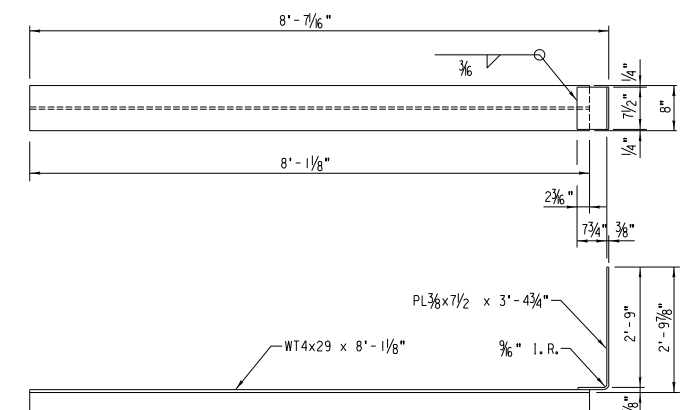
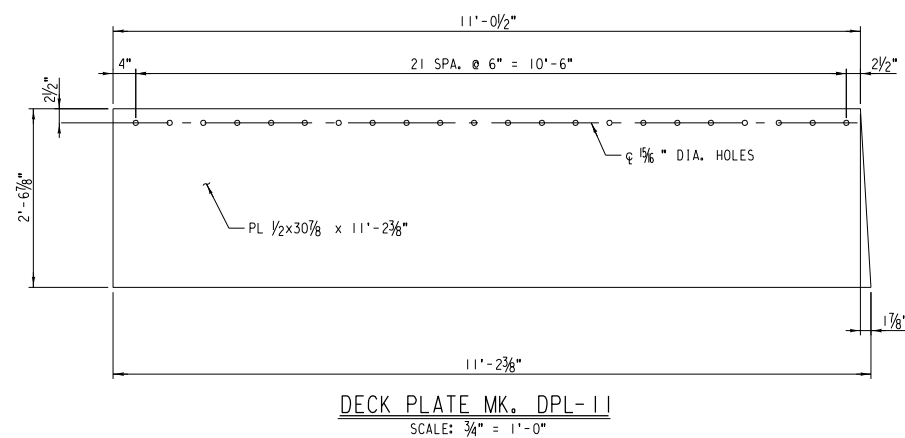
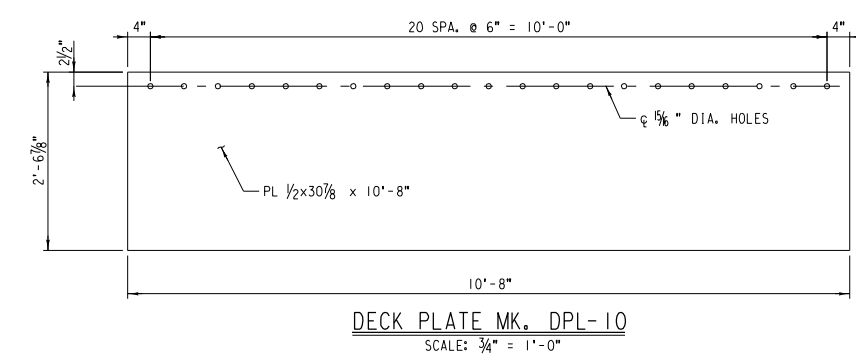
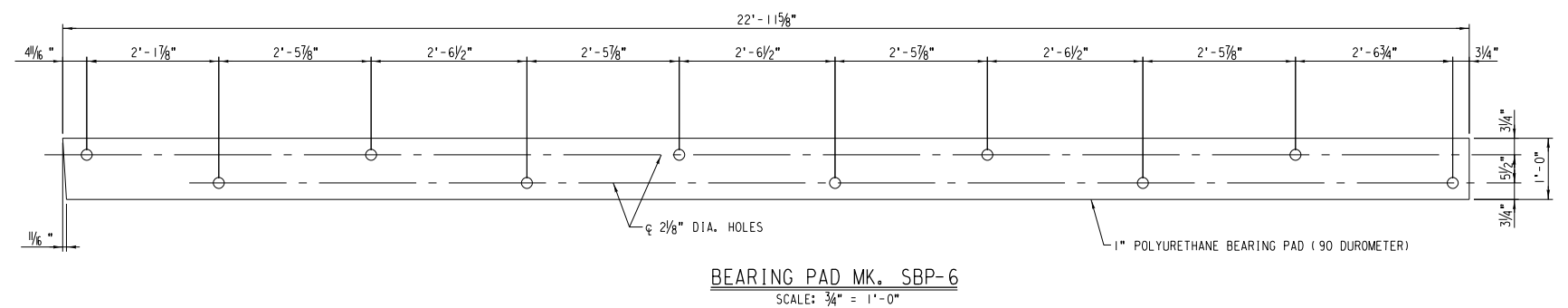
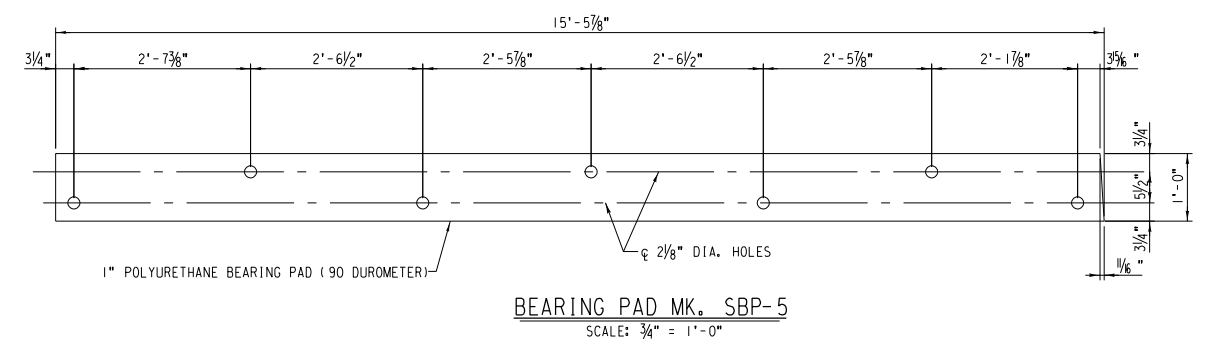
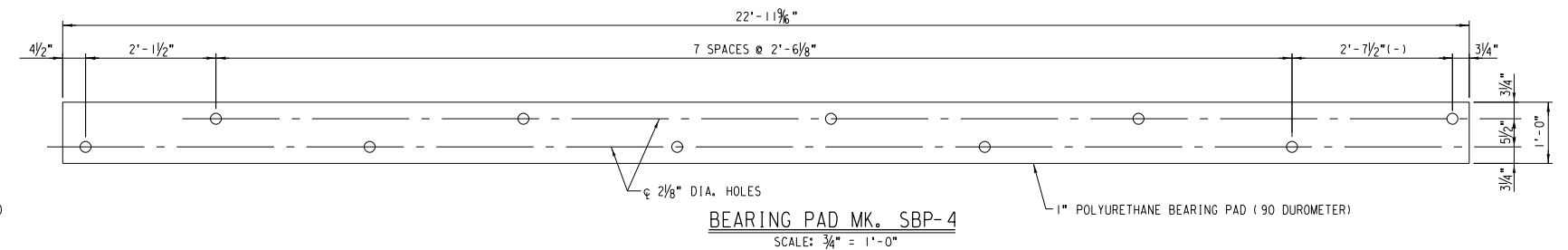
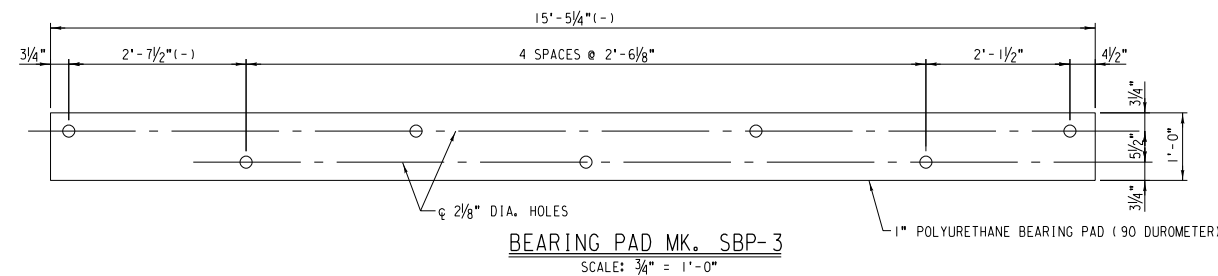
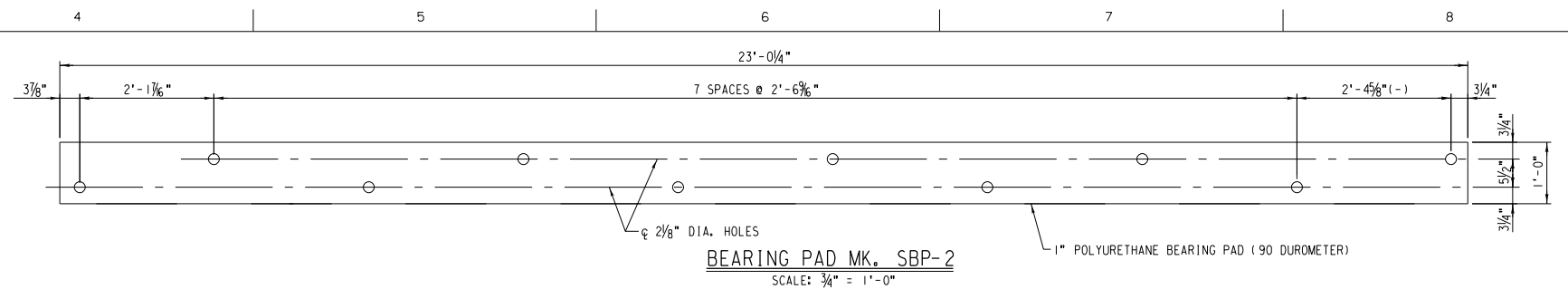
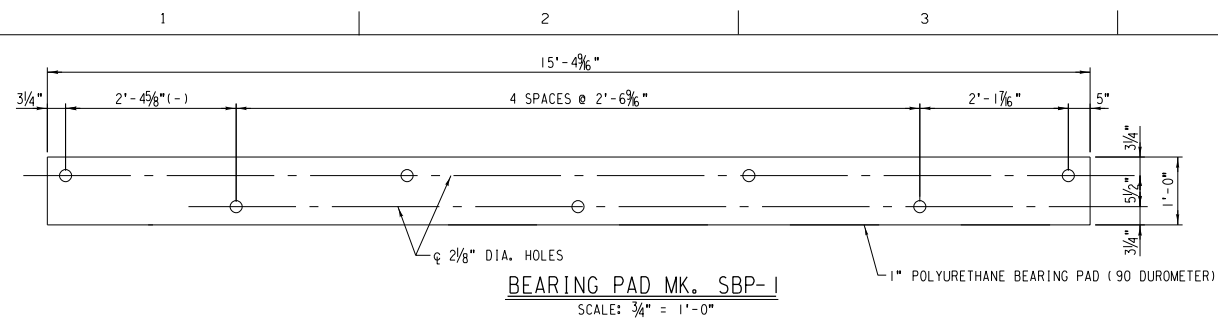
SOLE PLATE MK. SSP-4F
 SCALE: 3/4" = 1'-0"



SOLE PLATE MK. SSP-6E
 SCALE: 3/4" = 1'-0"



PIECE MARK	T
MK, SP-1	9/16"
MK, SP-2	3/4"
MK, SP-3	1 1/16"
MK, SP-4	5/8"
MK, SP-5	3/4"
MK, SP-6	1/2"
MK, SP-7	7/16"
MK, SP-8	3/8"



 HDR Engineering, Inc.				PROJECT MANAGER	R. FERTIG
				DESIGN ENGINEER	R. FERTIG
				CHECK ENGINEER	R. BATEMAN
				TECHNICIAN	K. CAPE
				QC	R. KOTAN
	ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

**CORNERSTONE
WINTER PARK
HOLDINGS, LLC**

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SUPERSTRUCTURE PIECE MARK DETAILS
(SHEET 3 OF 4)

FILENAME	... \GDP_S023.dgn	SHEET S023
SCALE	AS NOTED	

PLOTTED: 6/9/2014

HDR

HDR Engineering, Inc.

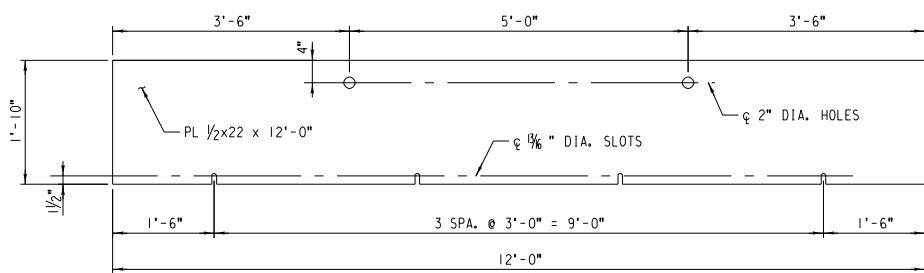
			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
-	-	-		
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

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SUPERSTRUCTURE PIECE MARK DETAILS
(SHEET 4 OF 4)**

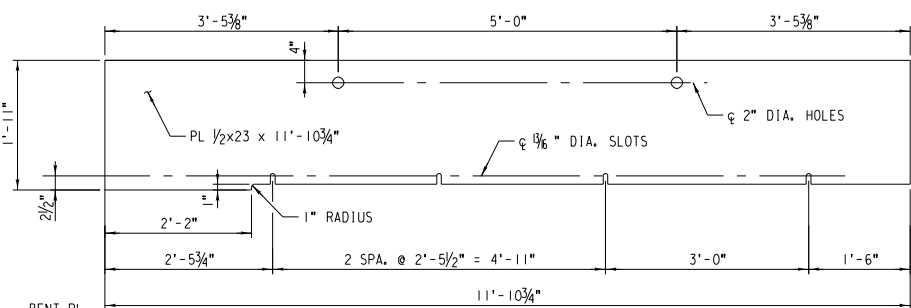
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SCALE	AS NOTED

SHEET
S024



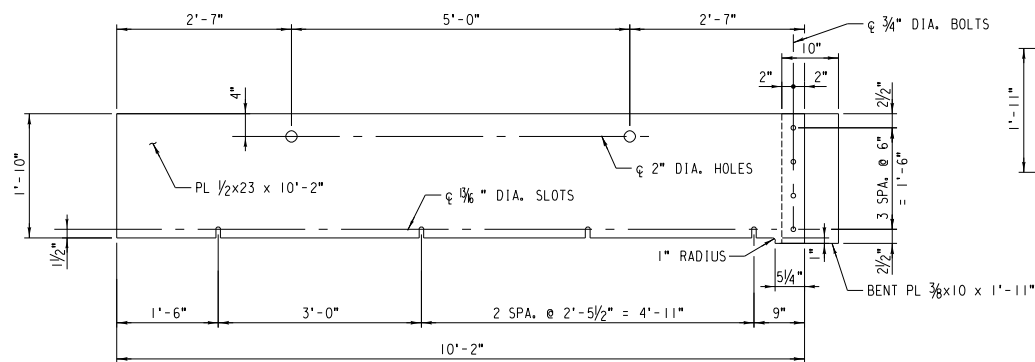
TEMPORARY BALLAST RETAINER MK. BR-10

SCALE: 3/4" = 1'-0"



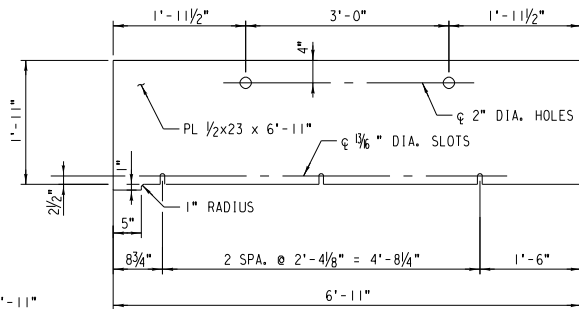
TEMPORARY BALLAST RETAINER MK. BR-11

SCALE: 3/4" = 1'-0"



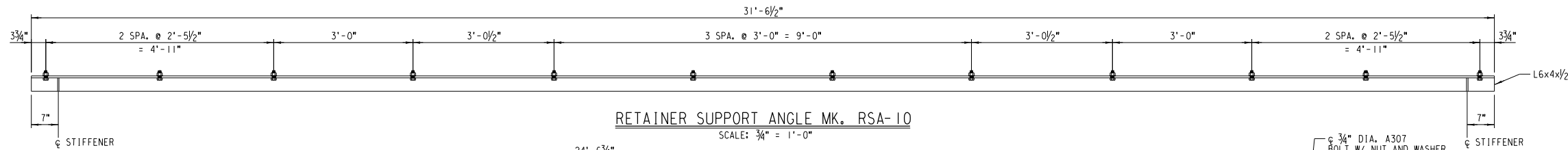
TEMPORARY BALLAST RETAINER MK. BR-12

SCALE: 3/4" = 1'-0"



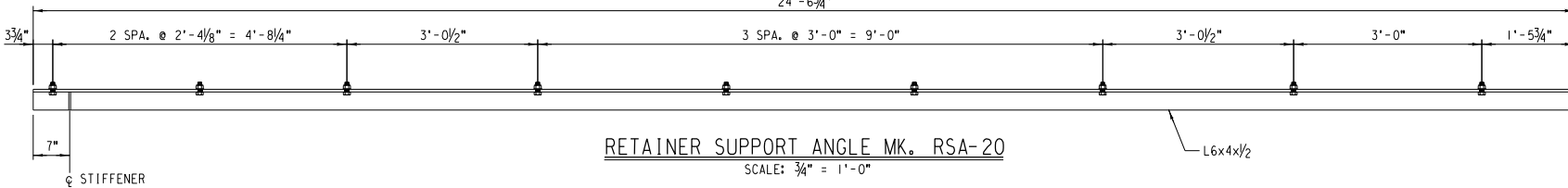
TEMPORARY BALLAST RETAINER MK. BR-13

SCALE: 3/4" = 1'-0"



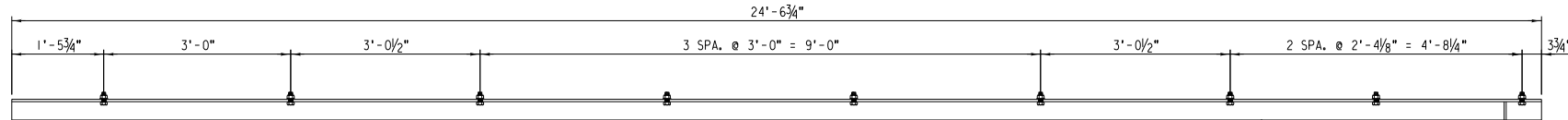
RETAINER SUPPORT ANGLE MK. RSA-10

SCALE: 3/4" = 1'-0"



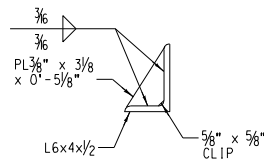
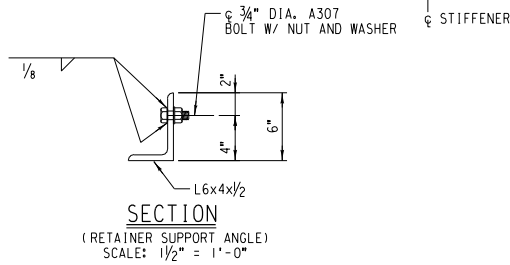
RETAINER SUPPORT ANGLE MK. RSA-20

SCALE: 3/4" = 1'-0"



RETAINER SUPPORT ANGLE MK. RSA-21

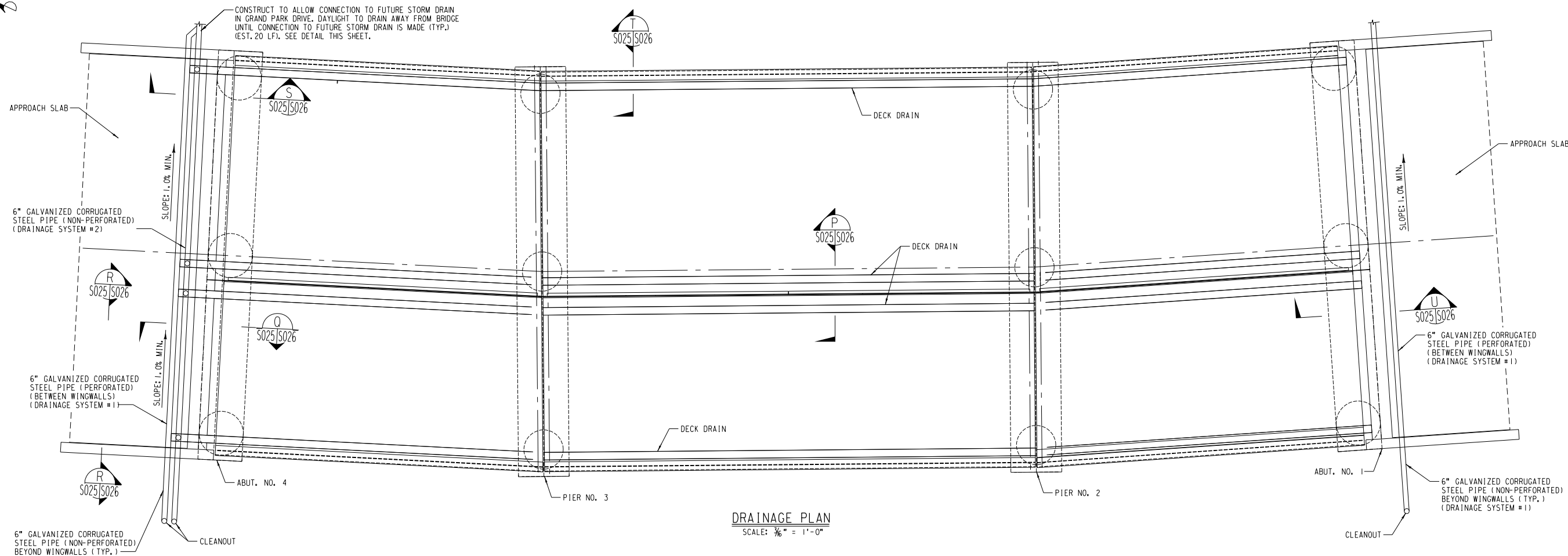
SCALE: 3/4" = 1'-0"



STIFFENER CONNECTION

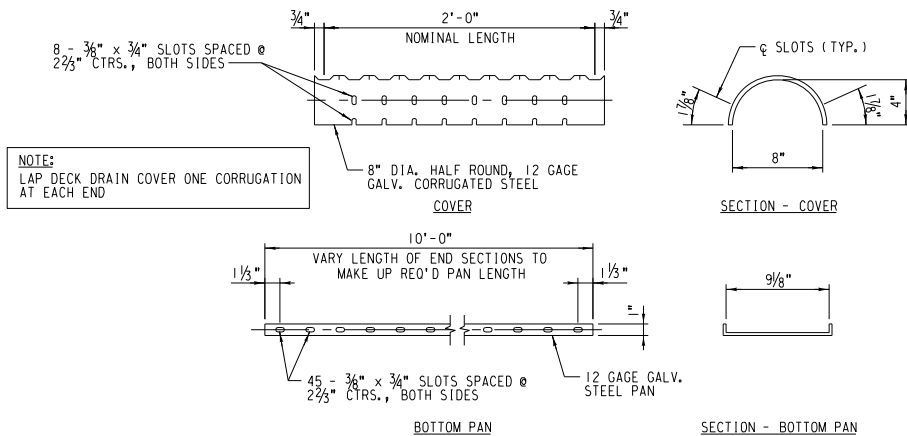
(RETAINER SUPPORT ANGLE)

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

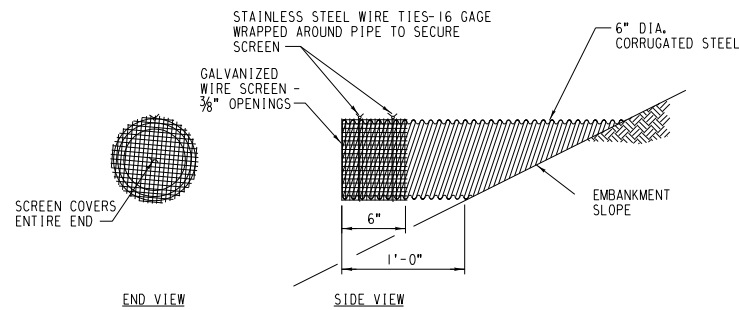


DRAINAGE PLAN
SCALE: 3/8" = 1'-0"

- NOTES:
1. GALVANIZED, CORRUGATED STEEL PIPE SHALL CONFORM TO ASTM A760.
 2. WIRE SCREEN SHALL CONFORM TO ASTM A740.



DECK DRAIN DETAILS
SCALE: 1/2" = 1'-0"



TEMPORARY PIPE DAYLIGHTING DETAIL
SCALE: NONE

PLOTTED: 6/9/2014

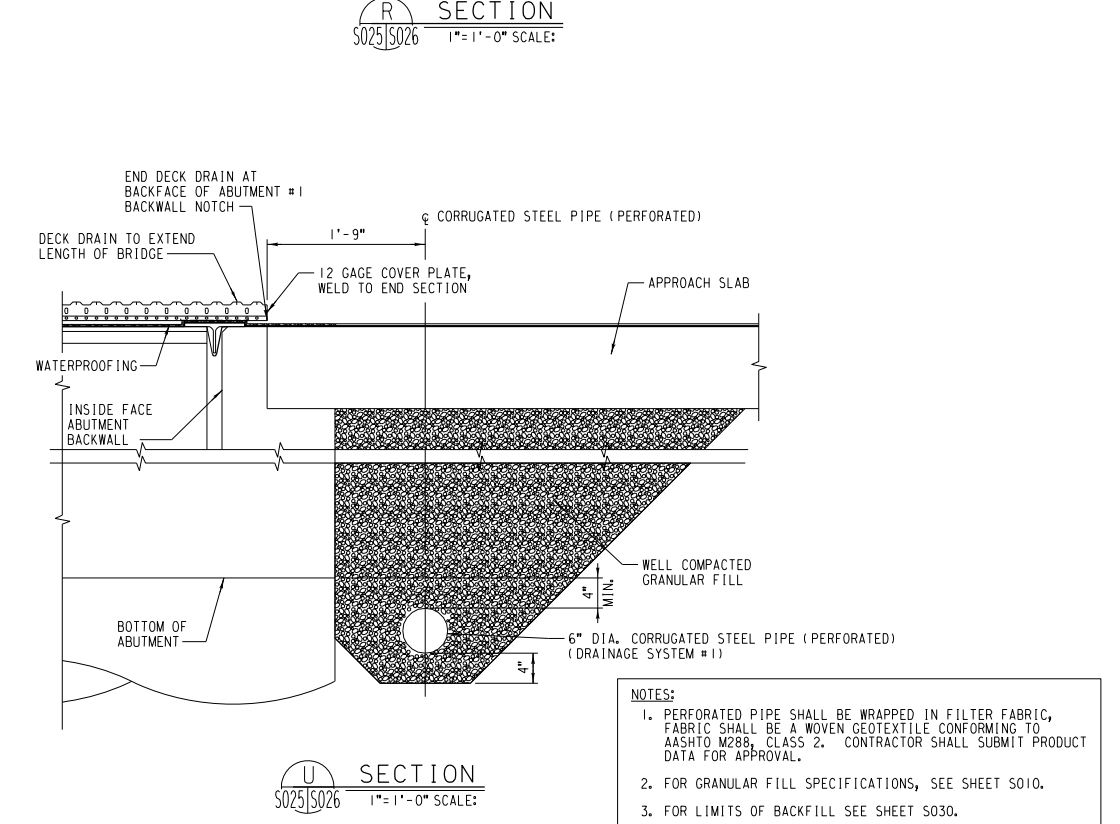
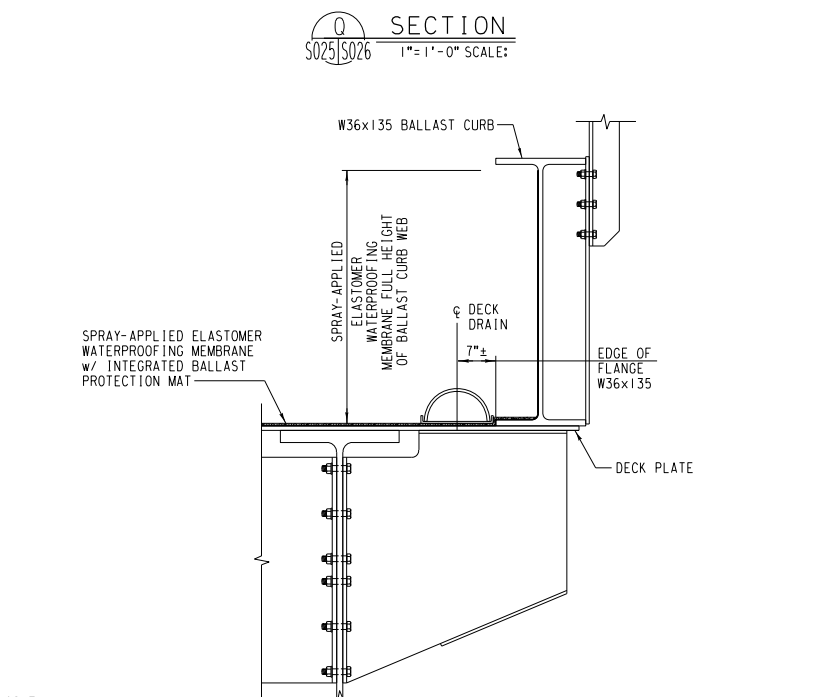
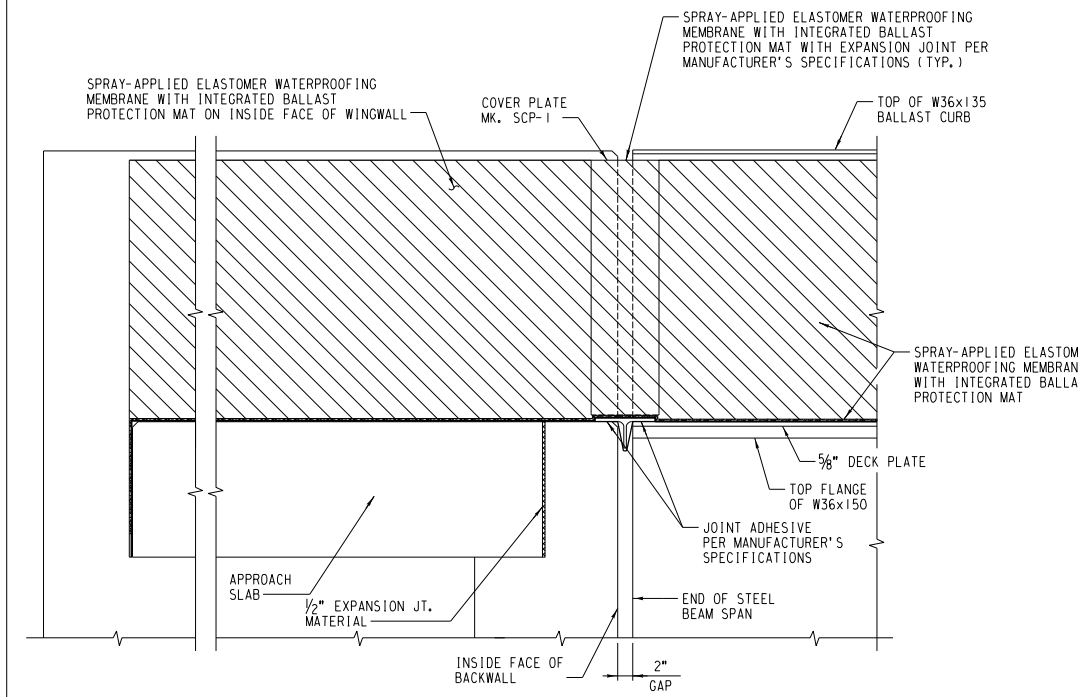
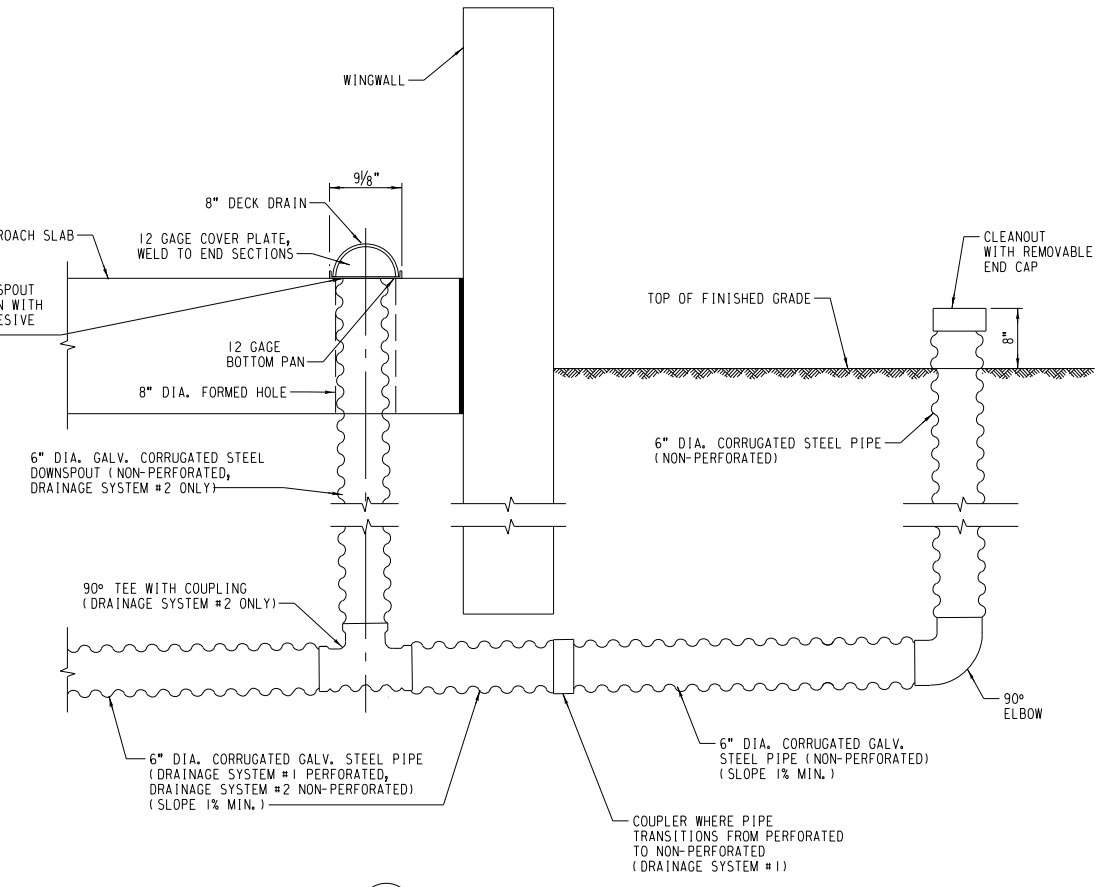
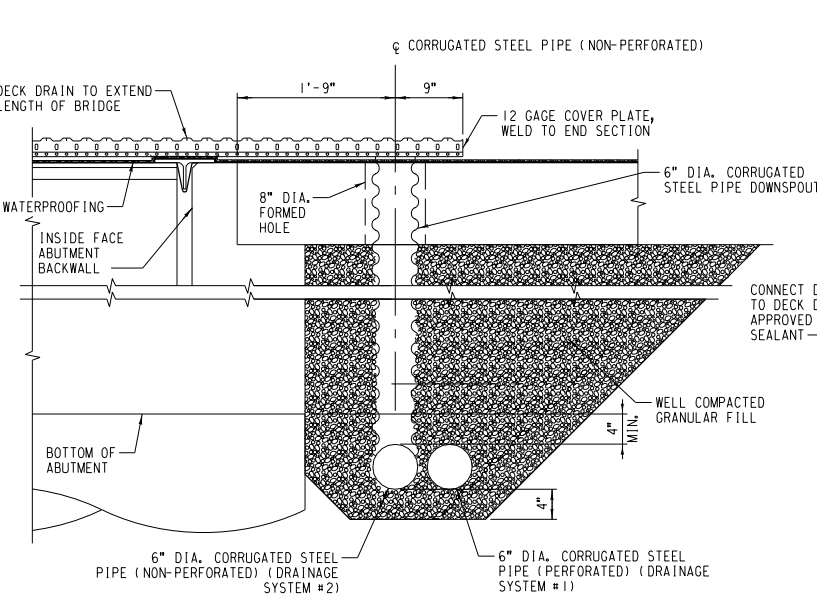
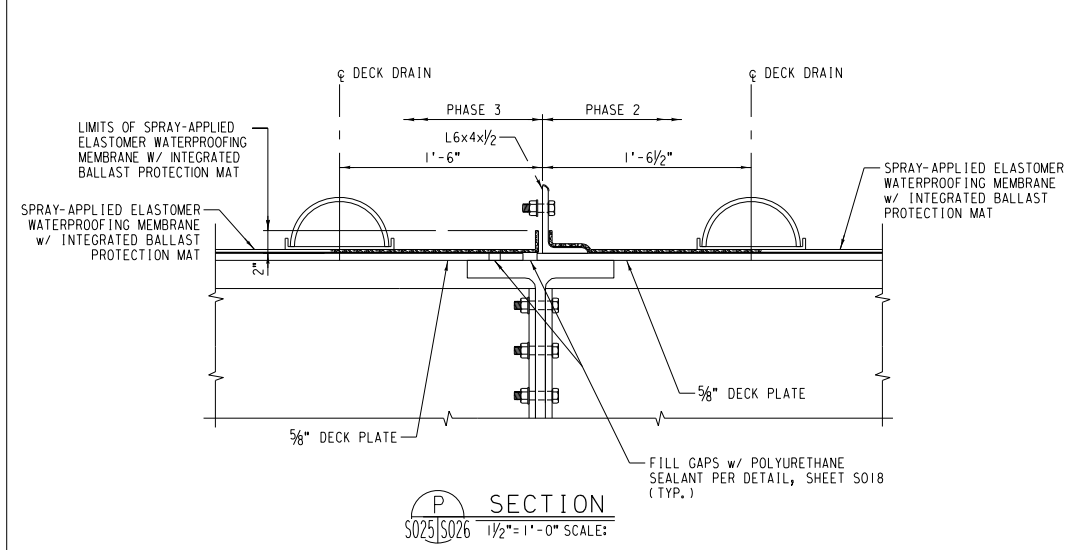


			PROJECT MANAGER	R. FERTIG
			DESIGN ENGINEER	R. FERTIG
			CHECK ENGINEER	R. BATEMAN
			TECHNICIAN	K. CAPE
			QC	R. KOTAN
ISSUE	DATE	DESCRIPTION	PROJECT NUMBER	000000000197406

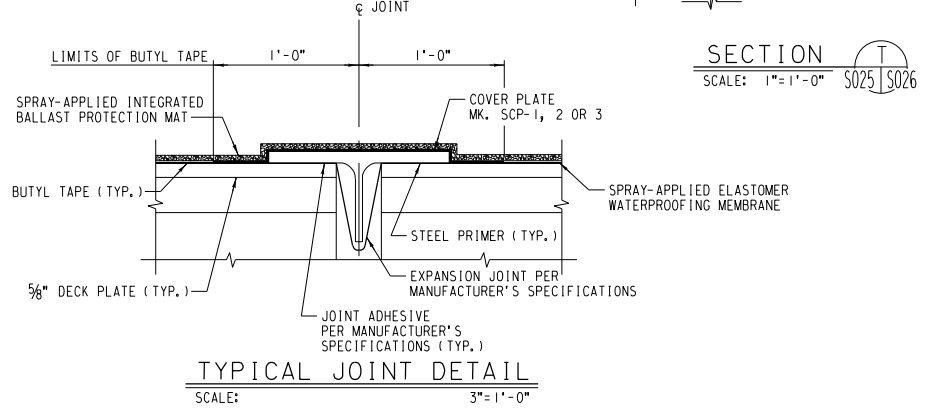
CORNERSTONE
WINTER PARK
HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
DRAINAGE AND WATERPROOFING DETAILS
(SHEET 1 OF 2)

FILENAME	... \GDP.S025.dgn	SHEET
SCALE	AS NOTED	S025



WATERPROOFING NOTE:
TYPICAL JOINT DETAIL SHOWN FOR INFORMATION ONLY. WATERPROOFING INSTALLER SHALL DETERMINE FINAL DETAILS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



- NOTES:**
1. PERFORATED PIPE SHALL BE WRAPPED IN FILTER FABRIC, FABRIC SHALL BE A WOVEN GEOTEXTILE CONFORMING TO AASHTO M288, CLASS 2. CONTRACTOR SHALL SUBMIT PRODUCT DATA FOR APPROVAL.
 2. FOR GRANULAR FILL SPECIFICATIONS, SEE SHEET S010.
 3. FOR LIMITS OF BACKFILL SEE SHEET S030.

PLOTTED: 6/9/2014

 HDR Engineering, Inc.	PROJECT MANAGER R. FERTIG		CORNERSTONE WINTER PARK HOLDINGS, LLC	GRAND PARK DRIVE UPRR UNDERPASS IN FRASER, COLORADO UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION DRAINAGE AND WATERPROOFING DETAILS (SHEET 2 OF 2)	
	DESIGN ENGINEER R. FERTIG			FILENAME ...GDP_S026.dgn	SHEET S026
	CHECK ENGINEER R. BATEMAN			SCALE AS NOTED	
TECHNICIAN K. CAPE		PROJECT NUMBER 00000000197406			
QC R. KOTAN					
ISSUE	DATE	DESCRIPTION			

SLOPE PAVING PROTECTION NOTE:

AS SOON AS POSSIBLE AFTER CONCRETE SLOPE PAVING HAS CURED, CONTRACTOR SHALL PROTECT SLOPE PAVING FROM BEING STAINED BY RUST FROM BRIDGE BEAMS. PROTECTION SHALL CONSIST OF BURLAP SACKS, CANVAS, PLASTIC SHEETING OR OTHER MEANS APPROVED BY THE OWNER. SUCH PROTECTION SHALL BE WEIGHED DOWN OR SECURED IN PLACE, SHALL REMAIN IN PLACE FOR AT LEAST SIX MONTHS AND SHALL BECOME THE PROPERTY OF THE OWNER UPON COMPLETION OF THE PROJECT. PROTECTION OF THE SLOPE PAVING FROM STAINING SHALL NOT BE PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.

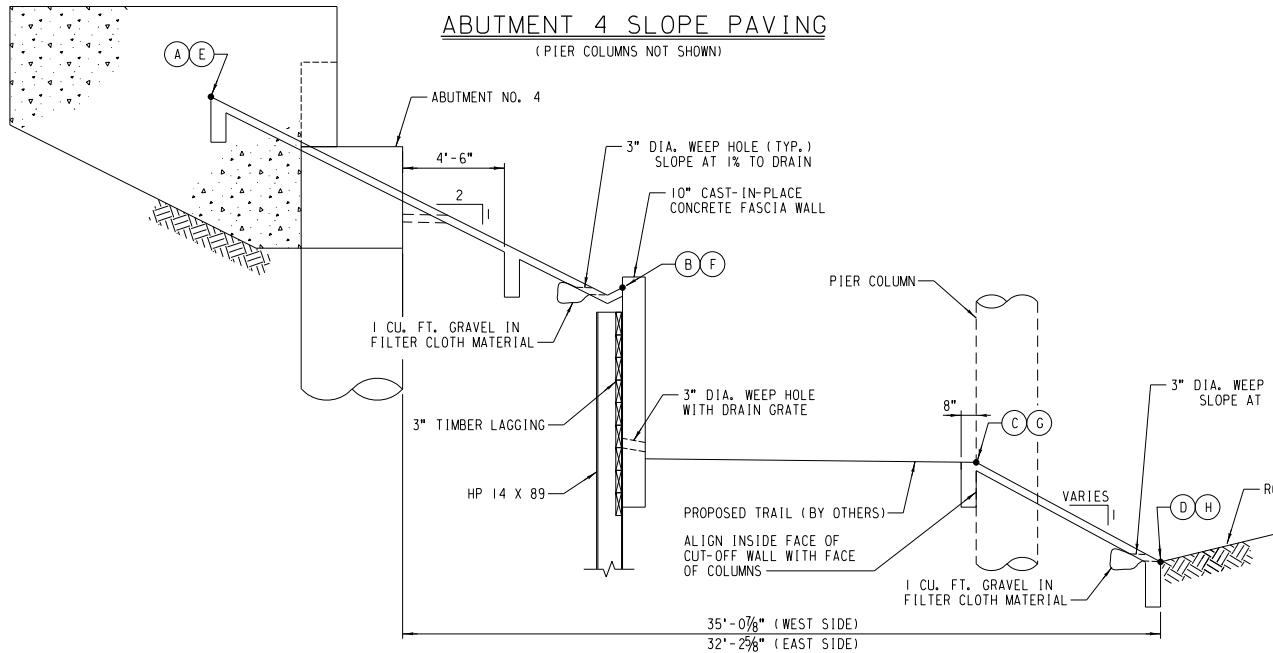
(X) SLOPE PAVING ELEVATION POINT. SEE SHEET S001 FOR PLAN LOCATION OF POINTS.

TABLE OF ELEVATIONS

POINT	ELEVATION
A	8760.60
B	8753.93
C	8743.94
D	8739.52
E	8760.60
F	8751.34
G	8744.50
H	8740.08
I	8739.56
J	8757.30
K	8762.55
L	8740.12
M	8757.30
N	8762.55

ABUTMENT 4 SLOPE PAVING

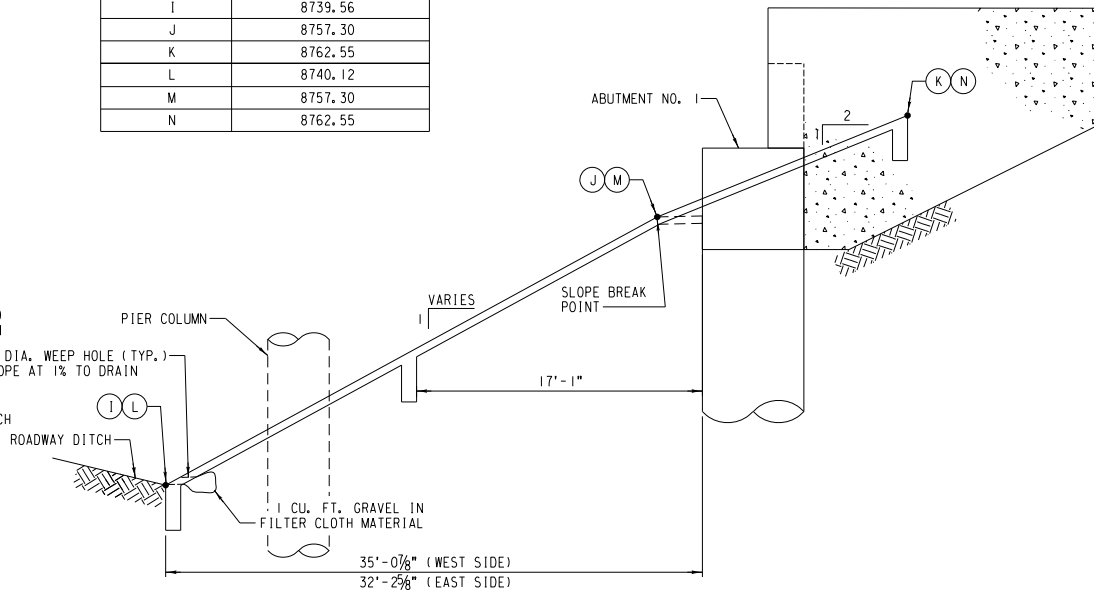
(PIER COLUMNS NOT SHOWN)



ABUTMENT 4 SLOPE PAVING - SECTION

ABUTMENT 1 SLOPE PAVING

(PIER COLUMNS NOT SHOWN)



ABUTMENT 1 SLOPE PAVING - SECTION

NOTES:

- FOR SLOPE PAVING TYPICAL SECTION, SEE SHEET S029.
- SLOPE PAVING SHALL BE POURED IN 10 FT TRANSVERSE SECTIONS WITH A TOOLED CONSTRUCTION JOINT AT EACH SECTION.
- WIRE FABRIC SHALL BE 2" FROM THE END OF JOINTS AND SHALL LAP 8" AT SPLICES.
- WHERE SLOPE PAVING BUTTS AGAINST STRUCTURAL CONCRETE, SEPARATE WITH 1/2" EXPANSION JOINT MATERIAL.
- EXPANSION JOINT MATERIAL AND WELDED WIRE FABRIC SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
- RETAINING WALL EXTENDS BEYOND SLOPE PAVING. SEE SHEET S028 FOR GEOMETRY.
- CONCRETE SLOPE PAVING AND RETAINING WALL SHALL BE INTEGRALLY COLORED. SEE NOTE ON SHEET S002.
- CONCRETE SHALL BE IN CONFORMANCE WITH THE NOTES ON SHEET S002 AND SECTION 03100.

HDR

HDR Engineering, Inc.

PROJECT MANAGER R. FERTIG
DESIGN ENGINEER R. FERTIG
CHECK ENGINEER R. BATEMAN
TECHNICIAN K. CAPE
QC R. KOTAN

PROJECT NUMBER 00000000197406

CORNERSTONE
WINTER PARK
HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SLOPE PAVING AND RETAINING WALL DETAILS
(SHEET 1 OF 3)

FILENAME ...\\GDP..S027.dgn

SCALE AS NOTED

SHEET
S027

PILE SOCKET NOTES

GENERAL

1. THE CONTRACTOR'S PROPOSED PILE SOCKET INSTALLATION PROCEDURE SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE AND THE RAILROAD FOR APPROVAL BEFORE CONSTRUCTION.
2. STEEL H-PILES SHALL BE SET AND SECURED IN PREDRILLED HOLES AND ENCASED IN GROUT IMMEDIATELY FOLLOWING THE COMPLETION OF DRILLING. DRILLED HOLES SHOULD NOT BE LEFT OPEN OVER NIGHT.
3. MINIMUM LENGTH OF PILE SOCKET IN BEDROCK SHALL BE 15'-0".
4. IN CASE OF OVERBURDEN SOILS THAT ARE SUBJECT TO SLOUGHING OR CAVING, TEMPORARY CASING MAY BE REQUIRED IN ORDER TO EXCAVATE AND DRILL OR CORE THE PILE SOCKET.
5. PERFORM FINAL CLEANOUT OF PILE SOCKET USING AN AIR-LIFT OR CLEANOUT BUCKET AFTER DRILLING IS COMPLETE AND PRIOR TO INSTALLING THE PILING. DEWATER HOLE PRIOR TO GROUT PLACEMENT.
6. ABOVE TOP OF PILE SOCKET, VOIDS AROUND PILES SHALL BE BACKFILLED WITH SAND OR CONTROLLED LOW STRENGTH MATERIAL (CLSM).
7. PILE SOCKET BORINGS SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO CONFIRM THE PRESENCE OF COMPETENT ROCK TO AT LEAST THE MINIMUM REQUIRED DEPTH OF PILE SOCKET PENETRATION.

PILE SOCKET GROUT NOTES

SUBMITTALS

1. THE CONTRACTOR SHALL PREPARE AND SUBMIT THE PROPOSED GROUTING PLAN TO THE OWNER'S REPRESENTATIVE FOR REVIEW OF COMPLETENESS. THE GROUTING PLAN SHALL INCLUDE COMPLETE DESCRIPTIONS, DETAILS, AND SUPPORTING CALCULATIONS FOR THE FOLLOWING:
 - (A) GROUT MIX DESIGN AND TYPE OF MATERIALS TO BE USED IN THE GROUT, INCLUDING CERTIFIED TEST DATA AND TRIAL BATCH REPORTS.
 - (B) METHODS AND EQUIPMENT FOR ACCURATELY MONITORING AND RECORDING THE GROUT DEPTH, GROUT VOLUME AND GROUT PRESSURE AS THE GROUT IS BEING PLACED.
 - (C) GROUTING RATE CALCULATIONS, WHEN REQUESTED BY THE ENGINEER. THE CALCULATIONS SHALL BE BASED ON THE INITIAL PUMP PRESSURES OR STATIC HEAD ON THE GROUT AND LOSSES THROUGHOUT THE PLACING SYSTEM, INCLUDING ANTICIPATED HEAD OF DRILLING FLUID (IF APPLICABLE) TO BE DISPLACED.
 - (D) ESTIMATED CURING TIME FOR GROUT TO ACHIEVE SPECIFIED STRENGTH. PREVIOUS TEST RESULTS FOR THE PROPOSED GROUT MIX COMPLETED WITHIN ONE YEAR OF THE START OF GROUTING MAY BE SUBMITTED FOR INITIAL VERIFICATION AND ACCEPTANCE AND START OF PRODUCTION WORK.
 - (E) PROCEDURE AND EQUIPMENT FOR CONTRACTOR MONITORING OF GROUT QUALITY.

MATERIALS

1. ADMIXTURES FOR GROUT: ADMIXTURES SHALL CONFORM TO THE REQUIREMENTS OF ASTM C494/AASHTO M194. ADMIXTURES THAT CONTROL BLEED, IMPROVE FLOWABILITY, REDUCE WATER CONTENT, AND RETARD SET MAY BE USED IN THE GROUT, SUBJECT TO THE REVIEW AND ACCEPTANCE OF THE OWNER'S REPRESENTATIVE AND THE RAILROAD. ADMIXTURES SHALL BE COMPATIBLE WITH THE GROUT AND MIXED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ACCELERATORS ARE NOT PERMITTED. ADMIXTURES CONTAINING CHLORIDES ARE NOT PERMITTED.
2. CEMENT: ALL CEMENT SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150/AASHTO M85, TYPES I, II, III OR V.
3. FINE AGGREGATE: IF SAND / CEMENT GROUT IS USED, SAND SHALL CONFORM TO ASTM C144 / AASHTO M45.
4. GROUT: NEAT CEMENT OR SAND / CEMENT MIXTURE WITH A MINIMUM 3-DAY COMPRESSIVE STRENGTH OF 2000 PSI AND A 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI PER AASHTO T106/ASTM C109.
5. WATER: WATER USED IN THE GROUT MIX SHALL CONFORM TO AASHTO T26 AND SHALL BE POTABLE, CLEAN, AND FREE FROM SUBSTANCES THAT MAY BE INJURIOUS TO CEMENT AND STEEL.

CONSTRUCTION REQUIREMENTS

1. PILE SOCKETS SHALL BE GROUTED THE SAME DAY THEY ARE DRILLED. ADMIXTURES, IF USED, SHALL BE MIXED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THE GROUTING EQUIPMENT USED SHALL PRODUCE A GROUT FREE OF LUMPS AND UNDISPERSED CEMENT. THE CONTRACTOR SHALL HAVE MEANS AND METHODS OF MEASURING THE GROUT QUANTITY AND PUMPING PRESSURE DURING THE GROUTING OPERATION. THE GROUT PUMP SHALL BE EQUIPPED WITH A PRESSURE GAUGE TO MONITOR GROUT PRESSURES. A SECOND PRESSURE GAUGE SHALL BE PLACED AT THE POINT OF INJECTION INTO THE PILE SOCKET. THE PRESSURE GAUGES SHALL BE CAPABLE OF MEASURING PRESSURES OF AT LEAST 150 PSI OR TWICE THE ACTUAL GROUT PRESSURES USED, WHICHEVER IS GREATER. THE GROUT SHALL BE KEPT IN AGITATION PRIOR TO PLACEMENT. GROUT SHALL BE PLACED WITHIN ONE HOUR OF MIXING. THE GROUTING EQUIPMENT SHALL BE SIZED TO ENABLE EACH PILE SOCKET TO BE GROUTED IN ONE CONTINUOUS OPERATION.
2. THE GROUT SHALL BE INJECTED FROM THE LOWEST POINT OF THE DRILLED HOLE AND INJECTION SHALL CONTINUE UNTIL UNCONTAMINATED GROUT REACHES THE TOP OF THE PILE SOCKET. THE REMAINDER OF THE DRILLED HOLE MAY BE FILLED WITH CLSM. THE GROUT MAY BE PUMPED THROUGH GROUT TUBES, CASING, HOLLOW-STEM AUGERS, OR DRILL RODS. TEMPORARY CASING, IF USED, SHALL BE EXTRACTED IN STAGES ENSURING THAT AFTER EACH LENGTH OF CASING IS REMOVED, THE GROUT LEVEL IS BROUGHT BACK UP TO THE GROUND LEVEL BEFORE THE NEXT LENGTH IS REMOVED. THE REMOVED PIPE OR CASING SHALL ALWAYS EXTEND BELOW THE LEVEL OF THE EXISTING GROUT IN THE DRILLHOLE. THE GROUT PRESSURES AND GROUT TAKES SHALL BE CONTROLLED TO PREVENT EXCESSIVE HEAVE OR FRACTURING OF ROCK OR SOIL FORMATIONS.
3. GROUT WITHIN THE PILE SOCKETS SHALL BE ALLOWED TO ATTAIN 2000 PSI STRENGTH PRIOR TO INSTALLATION OF LAGGING AND BACKFILL.

PILE SOCKET GROUT NOTES (CONT.)

GROUT TESTING

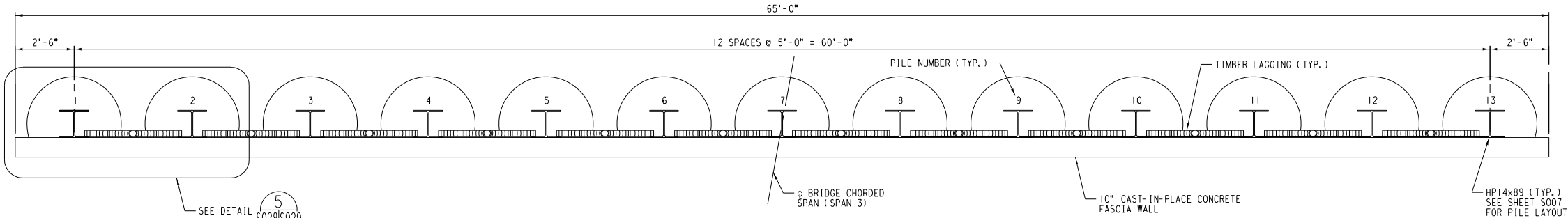
1. PREVIOUS TEST RESULTS FOR THE PROPOSED GROUT MIX COMPLETED WITHIN ONE YEAR OF THE START OF WORK MAY BE SUBMITTED FOR INITIAL VERIFICATION OF THE REQUIRED COMPRESSIVE STRENGTHS. DURING PRODUCTION, PILE SOCKET GROUT SHALL BE TESTED BY THE CONTRACTOR FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH AASHTO 106/ASTM C109 AT A FREQUENCY OF NO LESS THAN ONE SET OF THREE 2-INCH GROUT CUBES FROM EACH GROUT PLANT EACH DAY OF OPERATION OR PER EVERY 10 PILE SOCKETS, WHICHEVER OCCURS MORE FREQUENTLY. THE COMPRESSIVE STRENGTH SHALL BE THE AVERAGE OF THE 3 CUBES TESTED.
2. GROUT SAMPLES SHALL BE TAKEN DIRECTLY FROM THE GROUT PLANT. SUBMIT GROUT CUBE COMPRESSIVE STRENGTH AND GROUT DENSITY TEST RESULTS TO THE OWNER'S REPRESENTATIVE WITHIN 24 HOURS OF TESTING.

CONSTRUCTION TOLERANCE

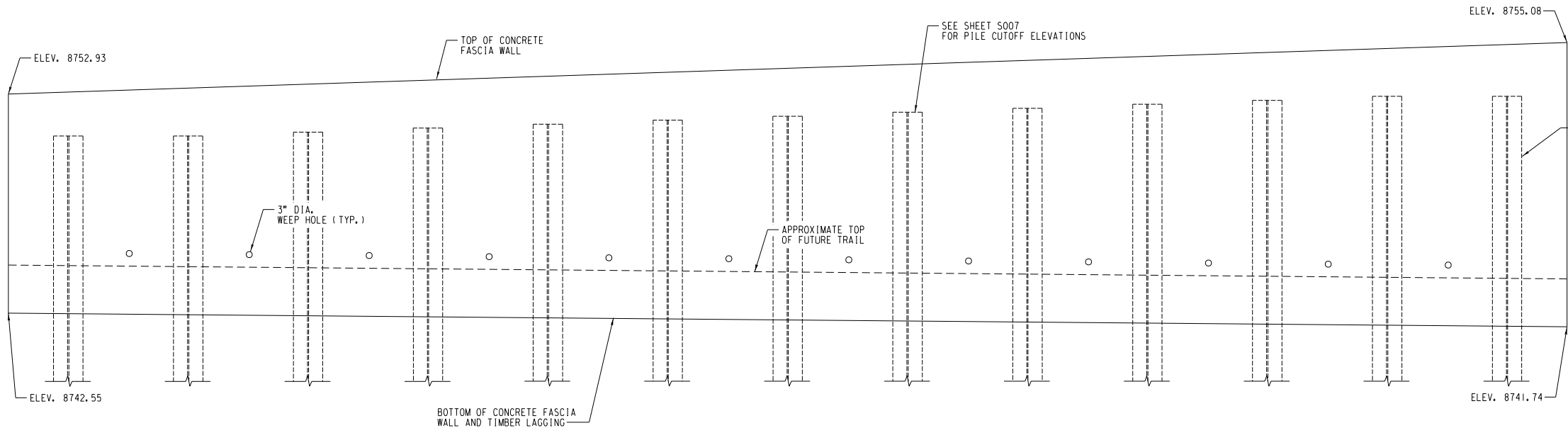
1. WALL PILES SHALL BE PLACED WITHIN 1 INCH OF THE PLAN LOCATION. VARIATIONS OF MORE THAN 0.125 INCH PER FOOT FROM THE VERTICAL MAY BE SUBJECT TO REJECTION BY THE ENGINEER.

NOTES:

1. THE CONTRACT PAY ITEM FOR STEEL PILING SHALL INCLUDE THE COST OF THE PILING, DRILLING THE SOCKET, PILE SOCKET GROUT, CLSM, PAINT, TEMPORARY CASING, AND ALL LABOR AND INCIDENTALS REQUIRED FOR INSTALLATION.
2. THE CONTRACT PAY ITEM FOR RETAINING WALL INCLUDES THE COST OF EXCAVATION, BACKFILL, FILTER MATERIAL, WEEP HOLES, TIMBER LAGGING, CONCRETE, REINFORCING STEEL, SHEAR STUDS, AND ALL LABOR AND INCIDENTALS REQUIRED FOR INSTALLATION.
3. RETAINING WALL HAS BEEN DESIGNED FOR A 235 PSF TRAIN SURCHARGE LOADING.
4. CONTRACTOR IS RESPONSIBLE FOR STABILITY DURING CONSTRUCTION.



RETAINING WALL PLAN
SCALE: 3/8"=1'-0"



RETAINING WALL PROFILE
SCALE: 3/8"=1'-0"



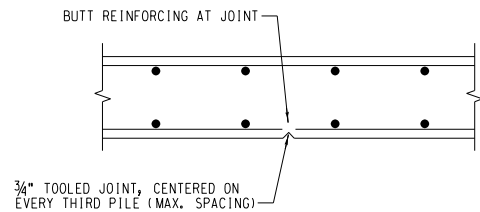
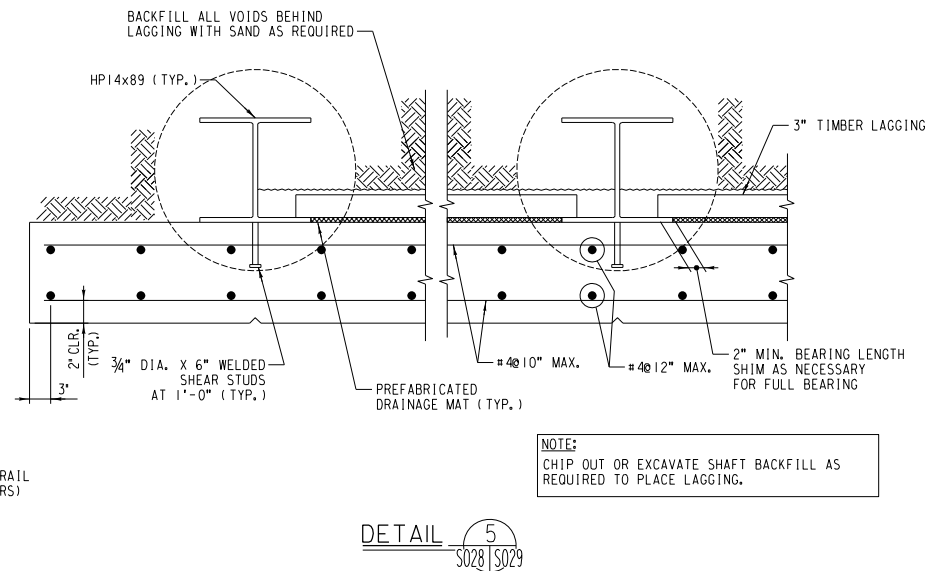
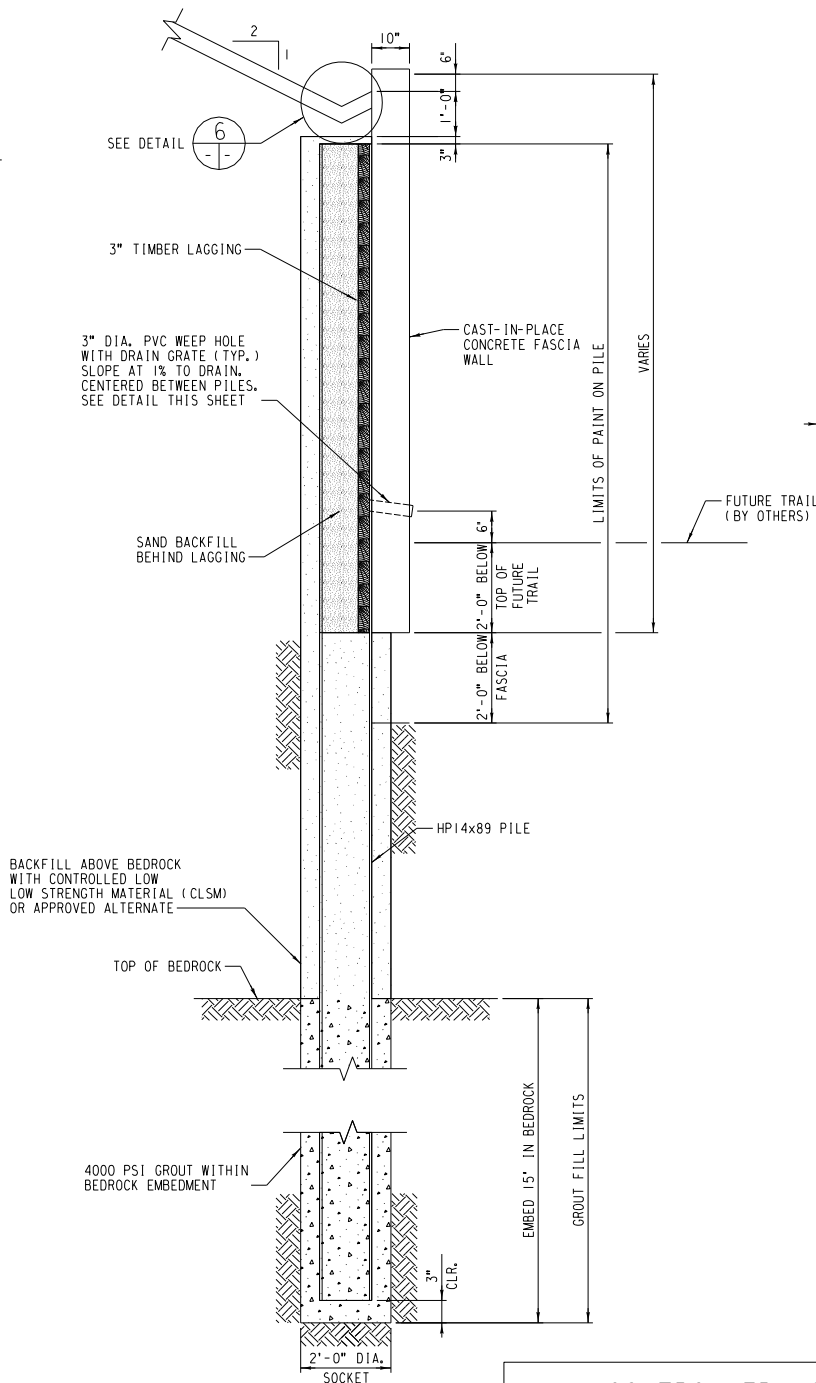
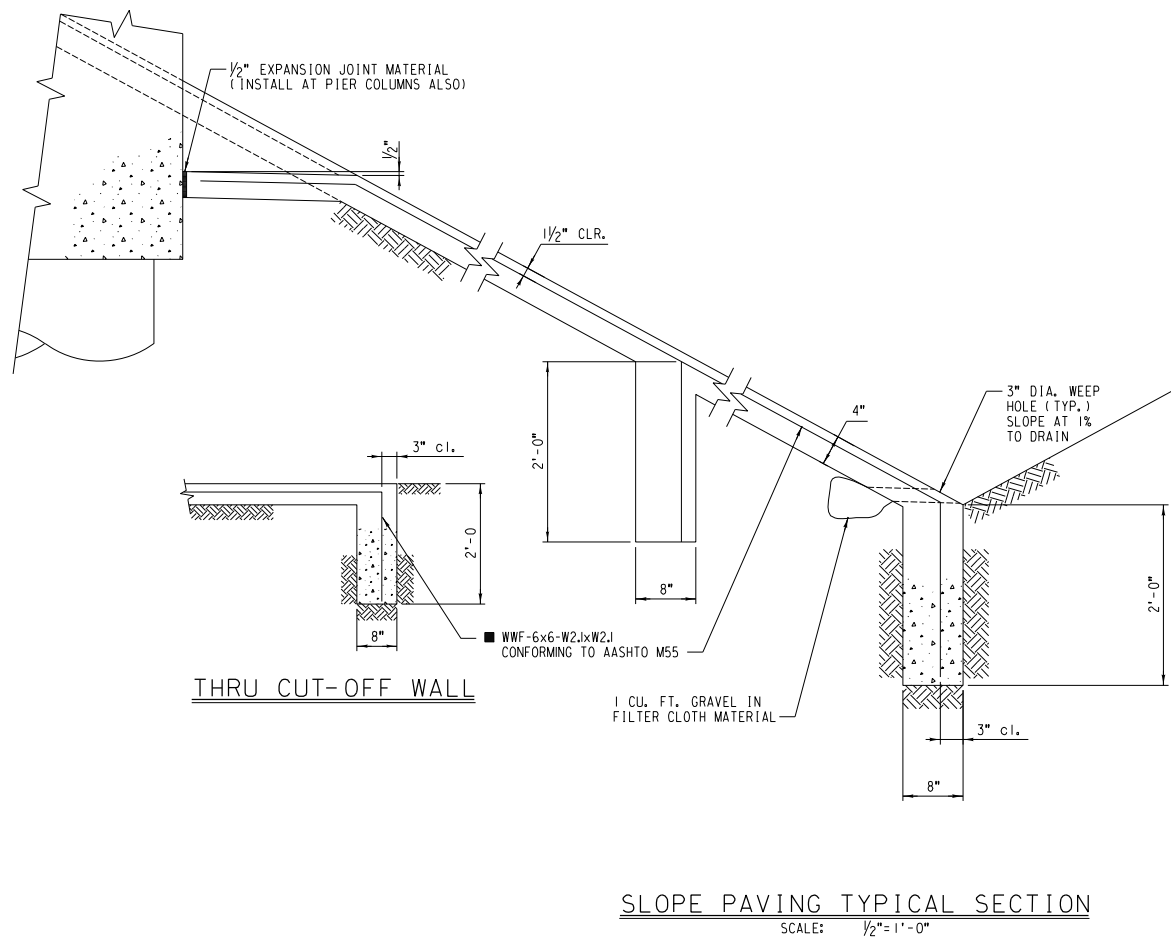
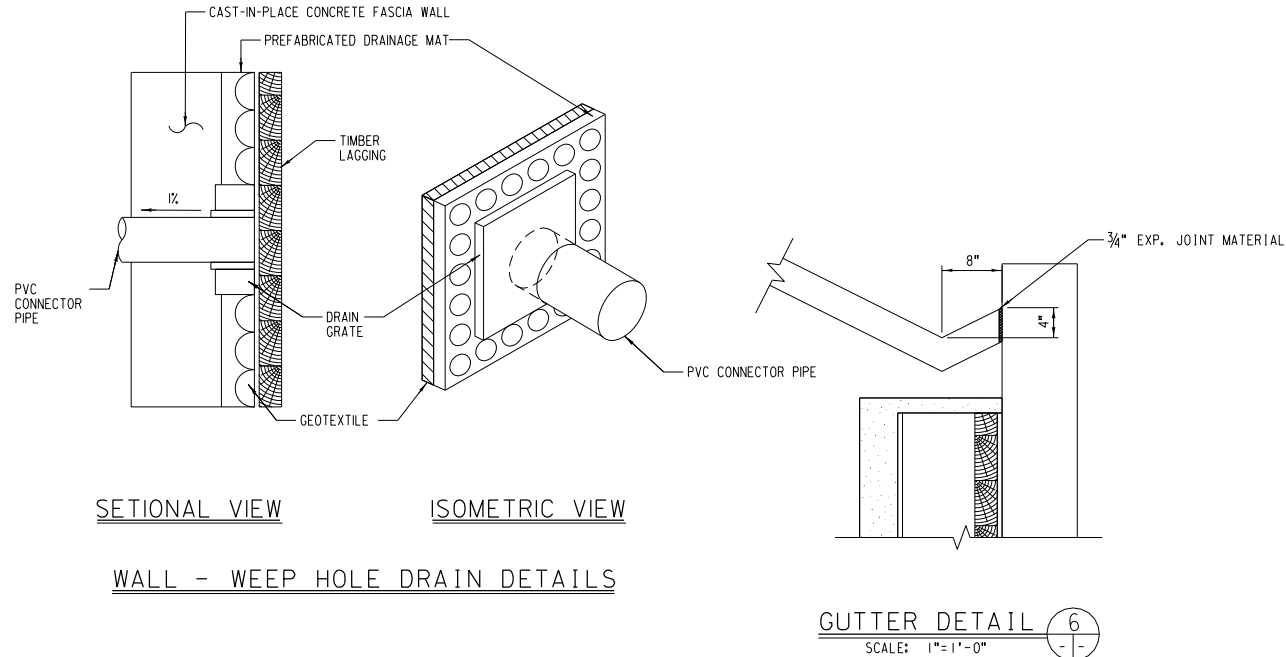
PROJECT MANAGER	R. FERTIG
DESIGN ENGINEER	R. FERTIG
CHECK ENGINEER	R. BATEMAN
TECHNICIAN	K. CAPE
QC	R. KOTAN

PROJECT NUMBER	00000000197406
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CORNERSTONE
WINTER PARK
HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
SLOPE PAVING AND RETAINING WALL DETAILS
(SHEET 2 OF 3)

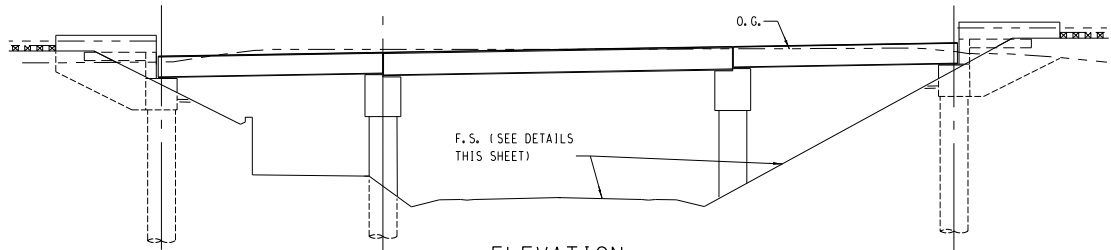
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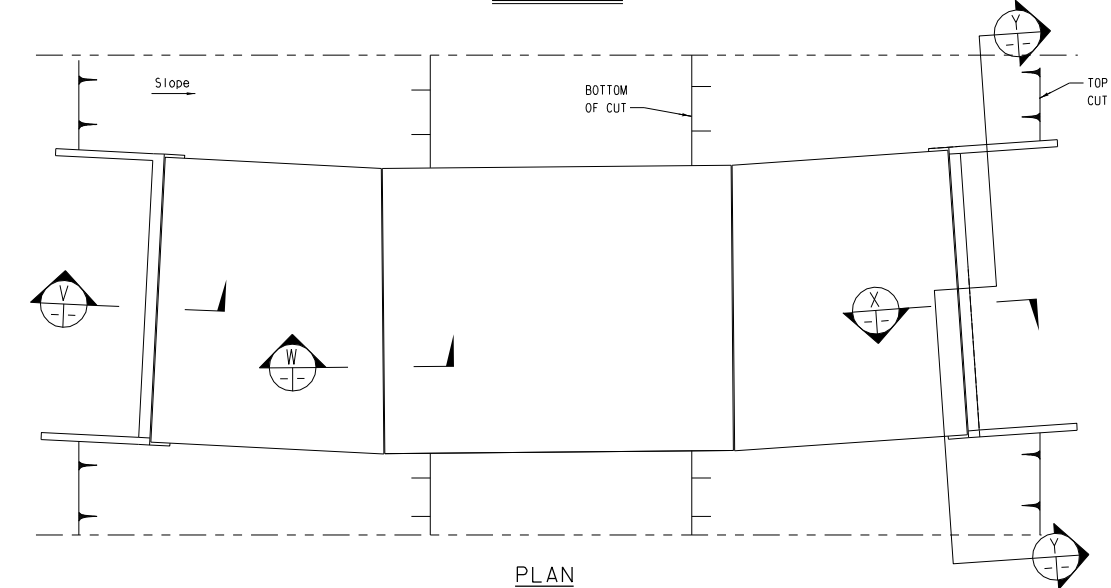
CONTROLLED LOW-STRENGTH MATERIAL (CLSM) FILL NOTES

CONTROLLED LOW-STRENGTH MATERIAL IS A SELF-COMPACTING, CEMENTITIOUS FILL MATERIAL WITH AN UNCONFINED COMPRESSIVE STRENGTH OF 50 TO 300 PSI. THE MIXTURE SHALL CONSIST OF WATER, PORTLAND CEMENT, FLY ASH AND SOUND FINE OR COARSE AGGREGATE OR BOTH. THE MIX DESIGN SHALL ALLOW ADEQUATE FLOWABILITY WITHOUT SEGREGATION OF AGGREGATES. HARDENING TIME IS OF PRIME IMPORTANCE AND CLSM SHOULD DEVELOP 50 PSI IN ABOUT ONE HOUR. THE MAXIMUM LAYER THICKNESS FOR CLSM SHALL BE THREE FEET. ADDITIONAL LAYERS SHALL NOT BE PLACED UNTIL THE CLSM HAS LOST SUFFICIENT MOISTURE TO BE WALKED ON WITHOUT INDENTING MORE THAN TWO INCHES.

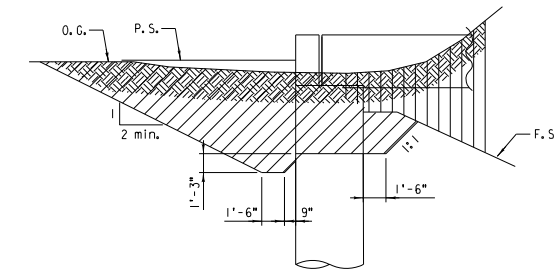
- NOTES:**
- TIMBER LAGGING SHALL BE ROUGH SAWN DOUGLAS FIR, GRADE NO. 2 OR BETTER.
 - DUE TO THE PRESENCE OF VERY HARD BEDROCK, DRILLING HOLES FOR THE PILES MAY BE DIFFICULT AND REQUIRE THE USE OF SPECIAL EQUIPMENT.
 - PILES SHALL BE PAINTED WITHIN THE LIMITS SHOWN USING AN INORGANIC ZINC-RICH PRIMER CONFORMING TO THE REQUIREMENTS OF THE STEEL STRUCTURES PAINTING COUNCIL SPECIFICATION NO. 20 (SSPC-PAINT 20) AND HAVING A DRY FILM THICKNESS OF 3.0 MILS. THE VEHICLE OF THIS PRIMER SHALL BE SSPC-PAINT 20, TYPE 1-C.



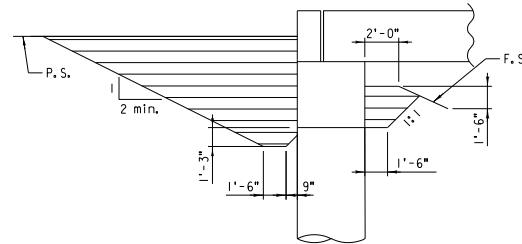
ELEVATION



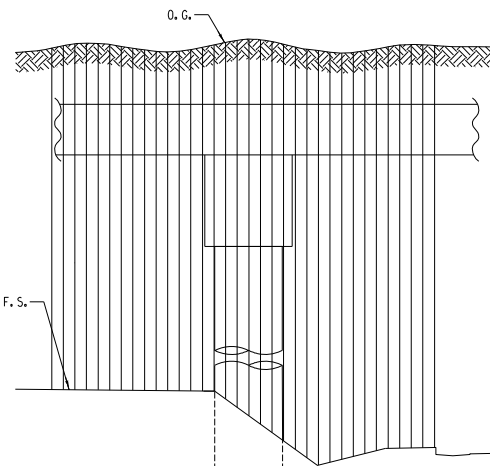
PLAN



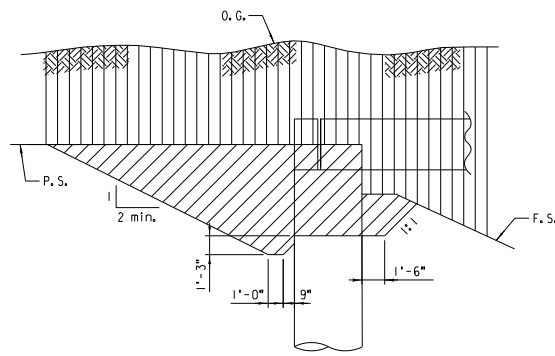
SECTION V (EXCAVATION)



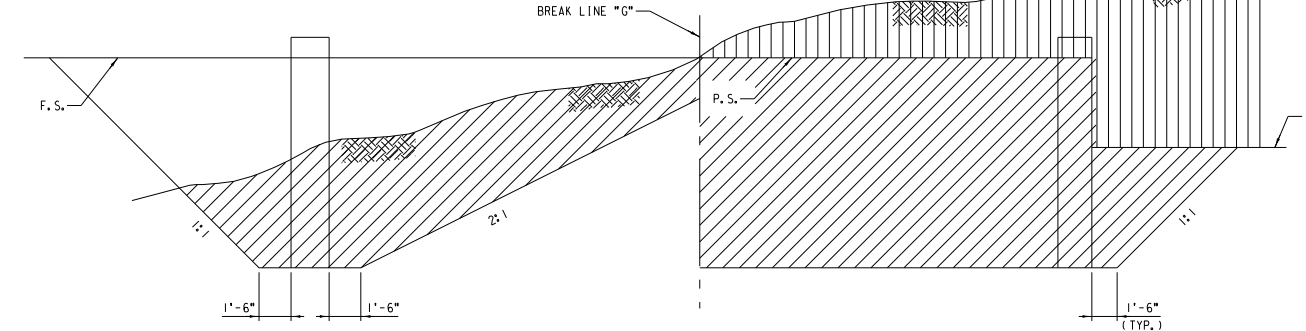
SECTION V (BACKFILL)



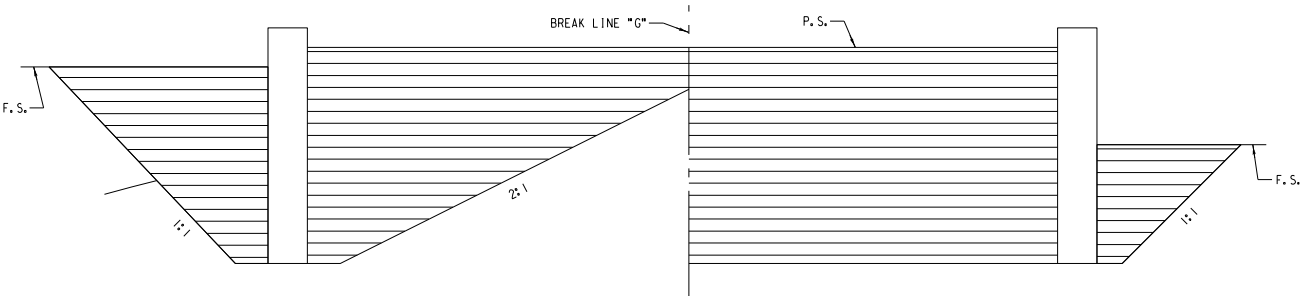
SECTION W (EXCAVATION)



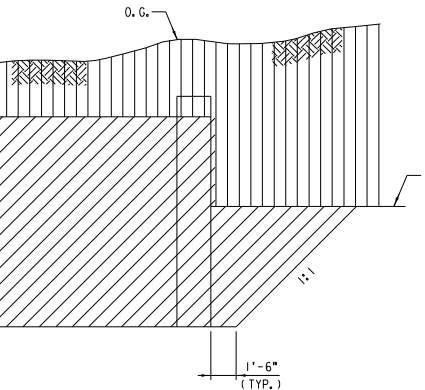
SECTION X (EXCAVATION)



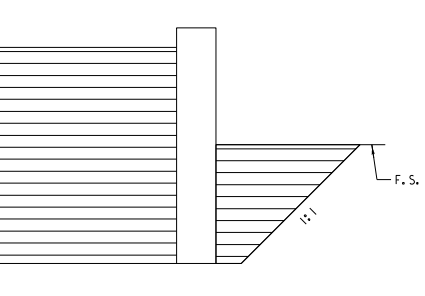
SECTION Y (EXCAVATION)



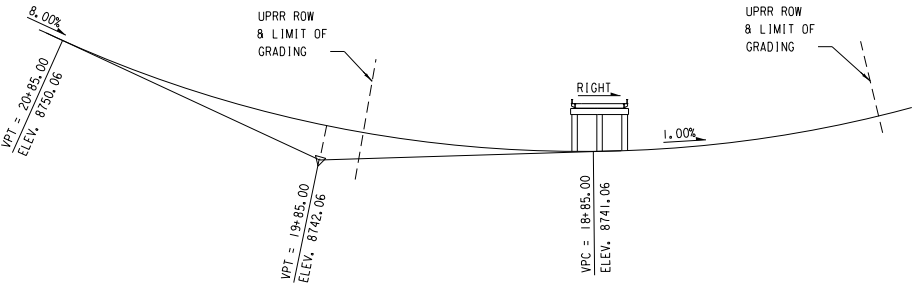
SECTION Y (BACKFILL)



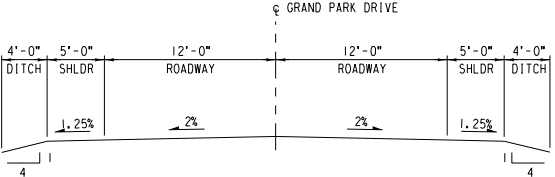
SECTION Z (EXCAVATION)



SECTION Z (BACKFILL)



VERTICAL PROFILE FOR GRAND PARK DRIVE



TYPICAL CROSS SECTION FOR GRAND PARK DRIVE

- NOTES:
1. UNLESS SHOWN OTHERWISE IN THE PLANS, THIS DRAWING GIVES THE MINIMUM EXTENT OF EXCAVATION AND BACKFILL. THE CONTRACTOR MAY ELECT TO EXTEND THE EXCAVATION AND BACKFILL BEYOND THE LIMITS SHOWN HERE. ANY ADDITIONAL EXCAVATION OR BACKFILL BEYOND THESE LIMITS WILL NOT BE MEASURED NOR PAID FOR.
 2. STRUCTURE EXCAVATION FOR SLOPE PAVING NOT SHOWN.
 3. FINE GRADING AND PAVING OF THE ROADWAY ARE NOT INCLUDED IN THE BRIDGE CONTRACT. THE BRIDGE CONTRACTOR SHALL PERFORM ROUGH GRADING IN THE AREA OF THE BRIDGE TO WITHIN 0.5 FEET OF THE PLANNED FINISHED SURFACE.
- ★ FOR PURPOSES OF QUANTITY CALCULATIONS THIS TEMPLATE APPLIES OUT TO END OF WINGWALL.
- ▲ BASED ON PRELIMINARY ROADWAY DESIGN. CONFIRM FINAL ROADWAY DESIGN WITH OWNER BEFORE CONSTRUCTION.

- LEGENDS
- Unclassified Excavation
 - Structure Excavation
 - Well Compacted Granular Fill

- ABBREVIATIONS
- O.G. Original Ground
 - P.S. Planned Subgrade
 - F.S. Planned Finished Surface

HDR

HDR Engineering, Inc.

PROJECT MANAGER R. FERTIG
DESIGN ENGINEER R. FERTIG
CHECK ENGINEER R. BATEMAN
TECHNICIAN K. CAPE
QC R. KOTAN

PROJECT NUMBER 00000000197406

CORNERSTONE
WINTER PARK
HOLDINGS, LLC

GRAND PARK DRIVE UPRR UNDERPASS
IN FRASER, COLORADO
UPRR BRIDGE 60.00 ON MOFFAT TUNNEL SUBDIVISION
EXCAVATION AND BACKFILL

FILENAME ...\\GDP..S030.dgn
SCALE AS NOTED

SHEET
S030

PLOTTED: 6/9/2014