UTAH
DEPARTMENT OF TRANSPORTATION

SEE SHEET 1A FOR INDEX TO PLAN

SHEET NO.
1

U.S. Standard Units
(Inch-Pound Units)

ALL UNITS IN FEET UNLESS OTHERWISE NOTED

PLANS OF PROPOSED STATE ROAD

FEDERAL AID PROJECT

BRF-0191(58)129

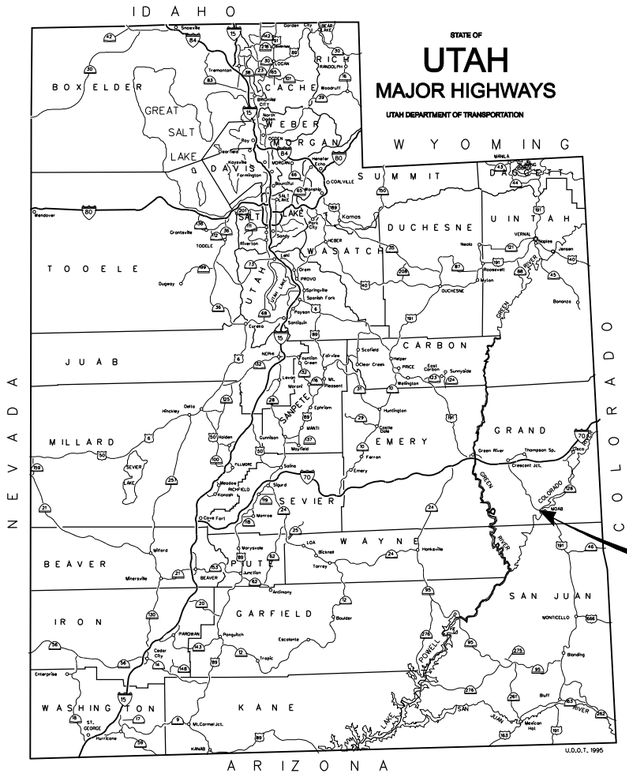
US-191: OVER COLORADO RIVER BRIDGE

BRIDGE REPLACEMENT

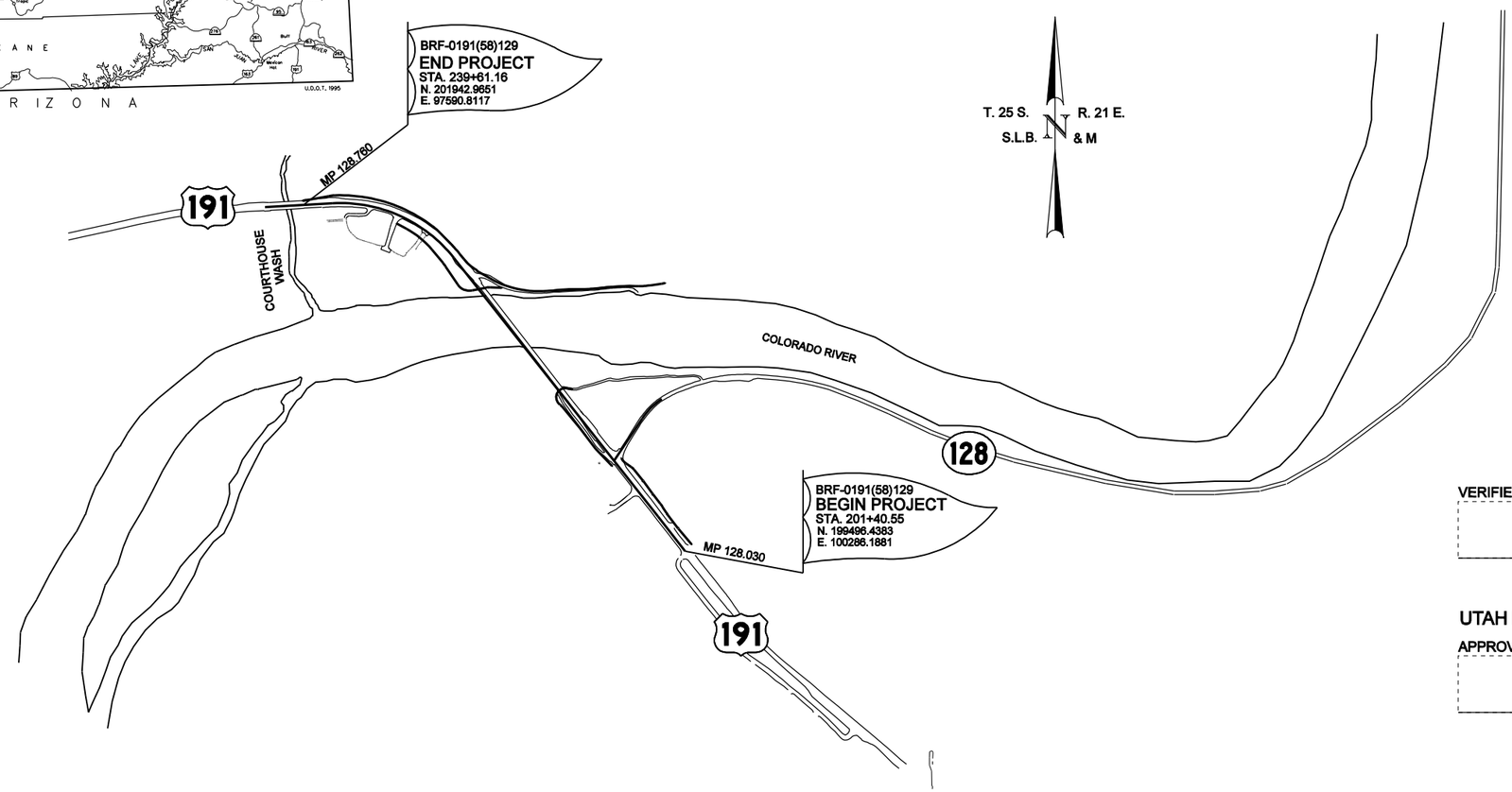
GRAND COUNTY

LENGTH 0.716 MILES

MP 128.030 TO MP 128.760



BRF-0191(58)129



THIS SEAL APPLIES TO ALL SHEETS CONTAINING THIS SIGNATURE

VERIFIED FOR SUBMISSION FOR ADVERTISEMENT

DESIGN ENGINEER

UTAH DEPARTMENT OF TRANSPORTATION

APPROVED FOR USE BY UDOT

REGION 4 PRECONSTRUCTION ENGINEER

5/6/2008 \\fasic03\2507-slc-colorado_bridge\5365_07\sheet_files\Title_Index\5365_TitleSheet.dgn

INDEX TO SHEETS

ROADWAY DRAWINGS

SHEET NO.	NUMBER OF SHEETS	DESCRIPTION
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1B	1	CROSS REFERENCE SHEET
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TS-01 to TS-02	2	ROADWAY TYPICAL SECTIONS SHEETS
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SDT-01 to SDT-02	2	SIDE SLOPE DETAILS SHEETS
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RM-01 to RM-07	7	REMOVAL PLAN SHEETS
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F-763	BRIDGE PLANS	178
F-763	SOIL DATA SHEETS	9
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-	-	-
-	-	-
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-	-	-

WALL DRAWINGS

SHEET NO.	DESCRIPTION	SHEETS
R-XXX	MSE WALL R-XXX PLANS	12
R-XXX	SOIL DATA SHEETS	2
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

PRELIMINARY:
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
APPROVED
MM/DD/YY
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
PROJECT NUMBER: BRF0191(85)129
INDEX TO SHEETS

SHEET NO. 1A

5/7/2008
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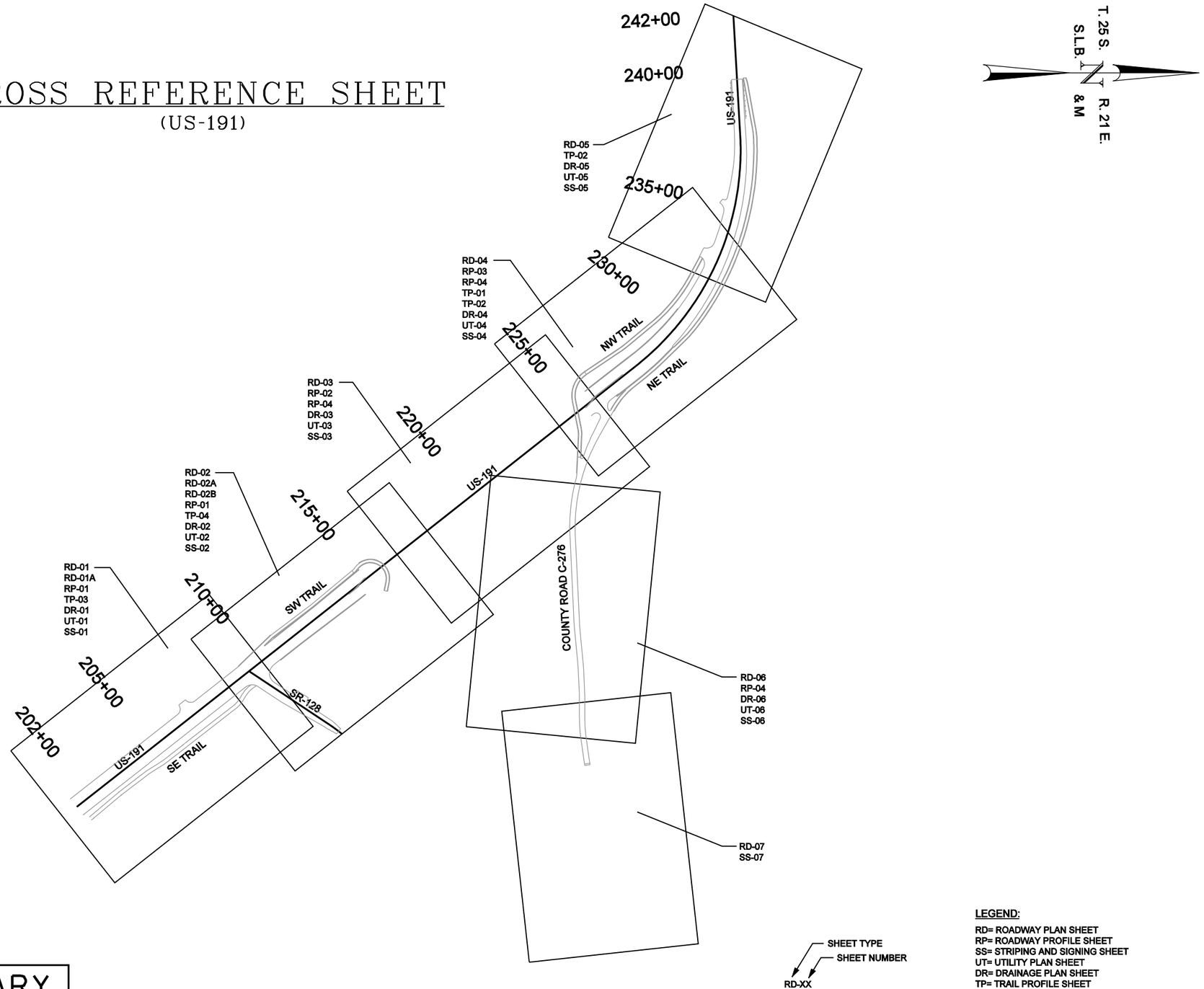
CROSS REFERENCE SHEET

(US-191)



LEGEND:

RD= ROADWAY PLAN SHEET
RP= ROADWAY PROFILE SHEET
SS= STRIPING AND SIGNING SHEET
UT= UTILITY PLAN SHEET
DR= DRAINAGE PLAN SHEET
TP= TRAIL PROFILE SHEET

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

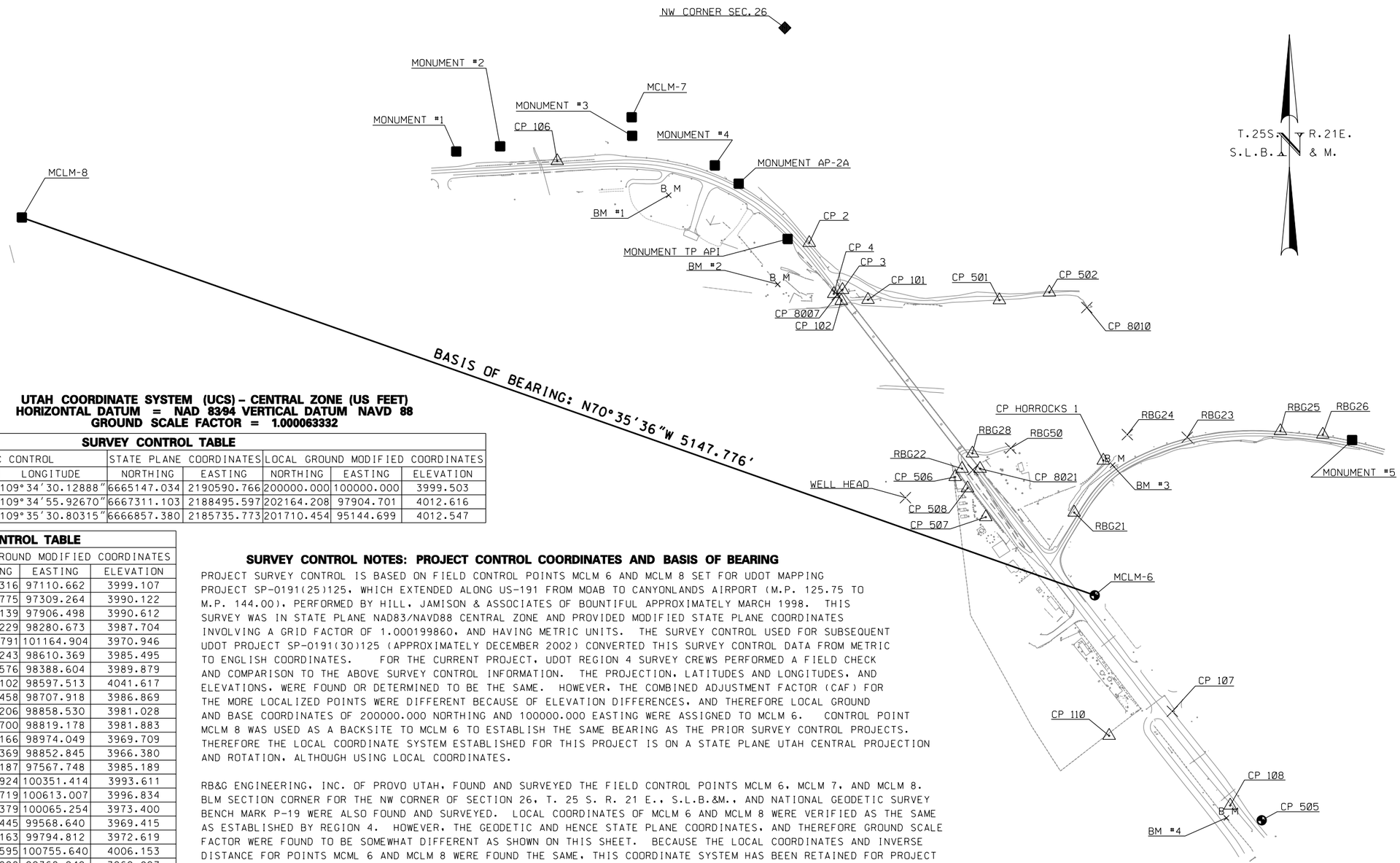
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
CROSS REFERENCE SHEET

SHEET NO. 1B

5/6/2008 \\fsslc03\02507-slc-colorado_bridge\5365_07\sheet_files\Title_Index\5365_1c-CrossReferenceSheet.dgn



UTAH COORDINATE SYSTEM (UCS) – CENTRAL ZONE (US FEET)
HORIZONTAL DATUM = NAD 83/94 VERTICAL DATUM NAVD 88
GROUND SCALE FACTOR = 1.000063332

SURVEY CONTROL TABLE

	GEODETIC CONTROL		STATE PLANE COORDINATES		LOCAL GROUND MODIFIED COORDINATES		
POINTS	LATITUDE	LONGITUDE	NORTHING	EASTING	NORTHING	EASTING	ELEVATION
MCLM-6	38°36'04.19912"	109°34'30.12888"	6665147.034	2190590.766	200000.000	100000.000	3999.503
MCLM-7	38°36'26.02746"	109°34'55.92670"	6667311.103	2188495.597	202164.208	97904.701	4012.616
MCLM-8	38°36'22.12746'	109°35'30.80315"	6666857.380	2185735.773	201710.454	95144.699	4012.547

SURVEY CONTROL TABLE

	LOCAL GROUND MODIFIED COORDINATES		
POINTS	NORTHING	EASTING	ELEVATION
MONUMENT #1	202009.316	97110.662	3999.107
MONUMENT #2	202032.775	97309.264	3990.122
MONUMENT #3	202080.139	97906.498	3990.612
MONUMENT #4	201946.229	98280.673	3987.704
MONUMENT #5	200702.791	101164.904	3970.946
MONUMENT TP API	201613.243	98610.369	3985.495
MONUMENT AP-2A	201863.576	98388.604	3989.879
NW CORNER SEC. 26	202569.102	98597.513	4041.617
CP 2	201595.458	98707.918	3986.869
CP 3	201383.206	98858.530	3981.028
CP 4	201364.700	98819.178	3981.883
CP 101	201338.166	98974.049	3969.709
CP 102	201333.369	98852.845	3966.380
CP 106	201966.187	97567.748	3985.189
CP 107	199474.924	100351.414	3993.611
CP 108	199048.719	100613.007	3996.834
CP 110	199364.379	100065.254	3973.400
CP 501	201336.445	99568.640	3969.415
CP 502	201371.163	99794.812	3972.619
CP 505	198981.595	100755.640	4006.153
CP 506	200535.898	99368.249	3969.097
CP 507	200354.221	99507.088	3968.958
CP 508	200484.985	99424.374	3968.515
CP 8007	201360.640	98834.526	3985.470
CP 8010	201302.719	99964.332	3973.943
CP 8021	200573.307	99481.071	3986.246
BM #1	201811.657	98070.909	3987.930
BM #2	201408.662	98564.636	3968.570
BM #3	200589.714	100079.894	3976.778
BM #4	198992.672	100595.437	3986.984
RBG21	200375.023	99906.989	3983.247
RBG22	200573.405	99399.797	3975.074
RBG23	200715.865	100418.525	3973.970
RBG24	200727.744	100147.691	3971.181
RBG25	200743.901	100840.164	3969.566
RBG26	200727.895	101032.212	3970.361
RBG28	200642.591	99446.431	3968.238
RBG50	200665.955	99619.617	3972.851
CP HORROCKS 1	200610.251	100038.818	3971.940
WELL HEAD	200442.292	99143.329	3963.306

SURVEY CONTROL NOTES: PROJECT CONTROL COORDINATES AND BASIS OF BEARING

PROJECT SURVEY CONTROL IS BASED ON FIELD CONTROL POINTS MCLM 6 AND MCLM 8 SET FOR UDOT MAPPING PROJECT SP-0191(25)125, WHICH EXTENDED ALONG US-191 FROM MOAB TO CANYONLANDS AIRPORT (M.P. 125.75 TO M.P. 144.00), PERFORMED BY HILL, JAMISON & ASSOCIATES OF BOUNTIFUL APPROXIMATELY MARCH 1998. THIS SURVEY WAS IN STATE PLANE NAD83/NAVD88 CENTRAL ZONE AND PROVIDED MODIFIED STATE PLANE COORDINATES INVOLVING A GRID FACTOR OF 1.000199860, AND HAVING METRIC UNITS. THE SURVEY CONTROL USED FOR SUBSEQUENT UDOT PROJECT SP-0191(30)125 (APPROXIMATELY DECEMBER 2002) CONVERTED THIS SURVEY CONTROL DATA FROM METRIC TO ENGLISH COORDINATES. FOR THE CURRENT PROJECT, UDOT REGION 4 SURVEY CREWS PERFORMED A FIELD CHECK AND COMPARISON TO THE ABOVE SURVEY CONTROL INFORMATION. THE PROJECTION, LATITUDES AND LONGITUDES, AND ELEVATIONS, WERE FOUND OR DETERMINED TO BE THE SAME. HOWEVER, THE COMBINED ADJUSTMENT FACTOR (CAF) FOR THE MORE LOCALIZED POINTS WERE DIFFERENT BECAUSE OF ELEVATION DIFFERENCES, AND THEREFORE LOCAL GROUND AND BASE COORDINATES OF 200000.000 NORTHING AND 100000.000 EASTING WERE ASSIGNED TO MCLM 6. CONTROL POINT MCLM 8 WAS USED AS A BACKSITE TO MCLM 6 TO ESTABLISH THE SAME BEARING AS THE PRIOR SURVEY CONTROL PROJECTS. THEREFORE THE LOCAL COORDINATE SYSTEM ESTABLISHED FOR THIS PROJECT IS ON A STATE PLANE UTAH CENTRAL PROJECTION AND ROTATION, ALTHOUGH USING LOCAL COORDINATES.

RB&G ENGINEERING, INC. OF PROVO UTAH, FOUND AND SURVEYED THE FIELD CONTROL POINTS MCLM 6, MCLM 7, AND MCLM 8. BLM SECTION CORNER FOR THE NW CORNER OF SECTION 26, T. 25 S. R. 21 E., S.L.B.&M., AND NATIONAL GEODETIC SURVEY BENCH MARK P-19 WERE ALSO FOUND AND SURVEYED. LOCAL COORDINATES OF MCLM 6 AND MCLM 8 WERE VERIFIED AS THE SAME AS ESTABLISHED BY REGION 4. HOWEVER, THE GEODETIC AND HENCE STATE PLANE COORDINATES, AND THEREFORE GROUND SCALE FACTOR WERE FOUND TO BE SOMEWHAT DIFFERENT AS SHOWN ON THIS SHEET. BECAUSE THE LOCAL COORDINATES AND INVERSE DISTANCE FOR POINTS MCML 6 AND MCLM 8 WERE FOUND THE SAME, THIS COORDINATE SYSTEM HAS BEEN RETAINED FOR PROJECT CONSTRUCTION AS SHOWN ON THIS SHEET. THE SURVEYED GEODETIC, AND STATE PLANE COORDINATES, FOR POINTS MCLM 6, MCLM 7, AND MCLM 8 ARE SHOWN FOR INFORMATION ONLY.

BASED ON THE RECORDED NAVD 88 BENCHMARK ELEVATION OF 4027.89 FEET FOR POINT P-19 (LOCATED 12,197 FEET SOUTHERLY FROM MCLM 6), THE SURVEYED ELEVATION FOR POINT MCLM 6 IS 3999.50 FEET. THIS ALSO AGREES WITH THE PRIOR SURVEY CONTROL PROJECTS AND IS RETAINED FOR CURRENT PROJECT CONTROL PRIMARY BENCHMARK. THE ELEVATION SURVEYED FOR POINT MCLM 8 WAS FOUND TO BE SLIGHTLY DIFFERENT AS NOTED ON THIS SHEET.

IT IS OBSERVED THE NAVD 88 ELEVATION FOR POINT P-19 IS 3.3 FEET ABOVE THE NGVD 29 ELEVATION LISTED FOR THE POINT AND ALSO STAMPED ON THE CAP.
(NOTE - WHEN USING THE NGVD 29 ELEVATION, RESULTING PROJECT SURVEYED GROUND POINTS APPEAR TO CLOSELY AGREE WITH THE 1951 BRIDGE PLAN ELEVATIONS, AND THE APPLICABLE USGS QUAD MAP.)

REGISTERED LAND SURVEYOR NO. 162870 ROBERT D. GUNDELL State of Utah 5/5/08

SCALE
0 250 500 750 1000

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	5-2-08	SAH	CORRECTED STATE PLANE COORDINATES

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY JBR
QC CHECKED BY SAH
DATE 01/16/08
APPROVED
PROFESSIONAL ENGINEER

US-191;
OVER COLORADO RIVER BRIDGE

PROJECT
PROJECT NUMBER BRF-0191(58)129

SURVEY CONTROL

SHEET NO. SC-01

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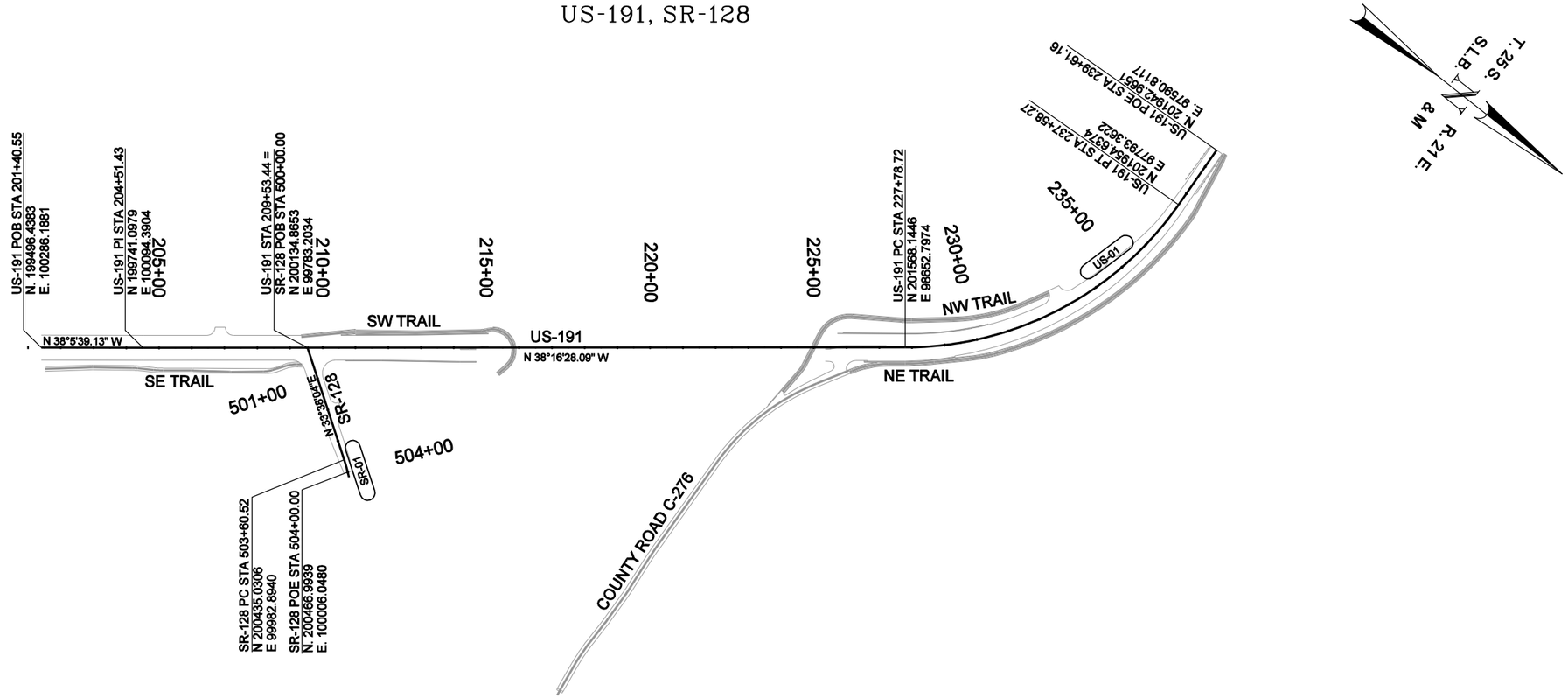
5/7/2008

HORIZONTAL CONTROL

US-191, SR-128



TRAIL CURVE DATA TABLE															
	HORIZONTAL CURVE DATA				PI COORDINATES			PC COORDINATES			PT COORDINATES			BEARING	
CURVE ID	Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING	STATION	NORTHING	EASTING	STATION	NORTHING	EASTING	IN	OUT
SR-01	22°33'30"	495.000	194.890	98.723	504+59.245	200517.227	100037.576	503+60.521	200435.031	99982.894	505+55.411	300572.156	100119.607	N 33°38'04" E	N 56°11'34" E
US-01	55°010'25	1020.000	979.550	531.246	223+09.966	201985.200	98323.728	227+78.720	201568.145	98652.797	237+58.271	201954.637	97793.362	N 38°16'28" W	S 86°42'07" W

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NO.	DATE	APPROVED BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

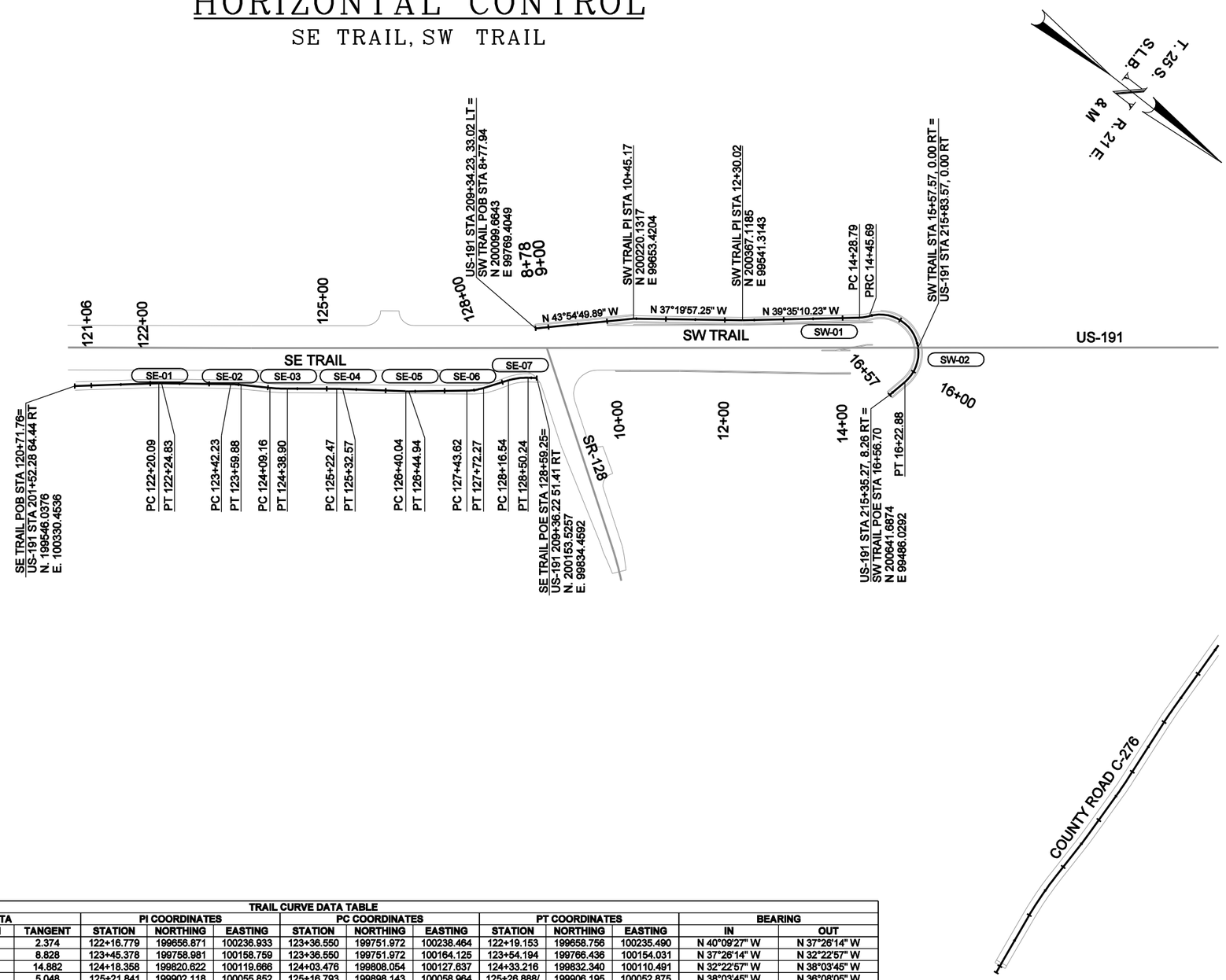
HORIZONTAL ALIGNMENT CONTROL SHEET

SHEET NO. CT-01

5/6/2008 \\fsslc03\02507-slc-colorado_bridge\5365_07\sheet_files\Title_Index\5365_CT-01.dgn

HORIZONTAL CONTROL

SE TRAIL, SW TRAIL



TRAIL CURVE DATA TABLE

	HORIZONTAL CURVE DATA				PI COORDINATES			PC COORDINATES			PT COORDINATES			BEARING	
CURVE ID	Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING	STATION	NORTHING	EASTING	STATION	NORTHING	EASTING	IN	OUT
SE-01	2°43'13"	100.000	4.748	2.374	122+16.779	199656.871	100236.933	123+36.550	199751.972	100238.464	122+19.153	199658.756	100235.490	N 40°09'27" W	N 37°26'14" W
SE-02	5°03'16	200.000	17.644	8.828	123+45.378	199758.981	100158.759	123+36.550	199751.972	100164.125	123+54.194	199766.436	100154.031	N 37°26'14" W	N 32°22'57" W
SE-03	5°40'48	300.000	29.741	14.882	124+18.358	199820.622	100119.666	124+03.476	199808.054	100127.637	124+33.216	199832.340	100110.491	N 32°22'57" W	N 38°03'45" W
SE-04	1°55'41	300.000	10.095	5.048	125+21.841	199902.118	100055.852	125+16.793	199898.143	100058.964	125+26.888/	199906.195	100052.875	N 38°03'45" W	N 36°08'05" W
SE-05	2°48'32	100.000	4.902	2.452	126+36.809	199994.971	99988.056	126+34.358	199992.991	99989.502	126+39.260	199996.878	99986.515	N 36°08'05" W	N 38°56'36" W
SE-06	16°25'10	100.000	28.658	14.428	127+52.362	200084.844	99915.425	127+37.934	200073.623	99924.494	127+66.591	200093.044	99903.555	N 38°56'36" W	N 55°21'47" W
SE-07	19°18'22	100.000	33.695	17.009	128+27.872	200127.875	99853.135	128+10.863	200118.207	99867.129	128+44.559	200141.625	99843.123	N 55°21'47" W	N 36°03'25" W
SW-01	14°53'31	65.000	16.894	8.495	14+37.289	200526.833	99409.218	14+28.794	200520.303	99414.651	14+45.688	200531.749	99402.289	N 39°45'42" W	N 54°39'13" W
SW-02	156°11'36	65.000	177.196	308.356	17+54.044	200710.138	99150.772	14+45.688	200531.748	99402.289	16+22.884	200648.452	99452.895	N 54°39'13" W	S 78°27'37" E

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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
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PROFESSIONAL ENGINEER

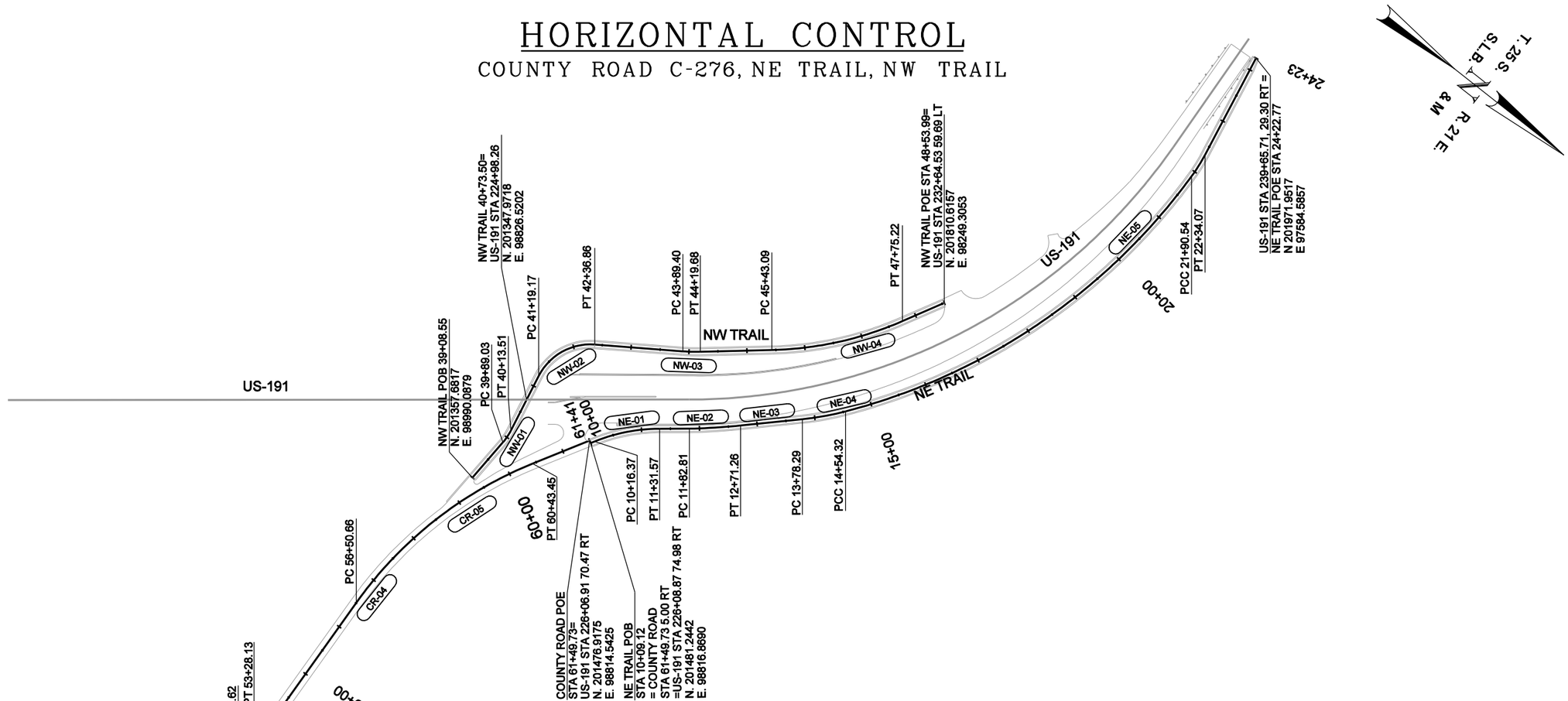
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
HORIZONTAL ALIGNMENT CONTROL SHEET

SHEET NO. CT-02

5/6/2008 \\fselc03\02507-slc-colorado_bridge\5365_07\sheet_files\Title_Index\5365_CT-02.dgn

HORIZONTAL CONTROL

COUNTY ROAD C-276, NE TRAIL, NW TRAIL



TRAIL CURVE DATA TABLE																
	HORIZONTAL CURVE DATA				PI COORDINATES			PC COORDINATES			PT COORDINATES			BEARING	
CURVE ID	Δ	RADIUS	LENGTH	TANGENT	STATION	NORTHING	EASTING	STATION	NORTHING	EASTING	STATION	NORTHING	EASTING	IN	OUT
CR-01	8°07'47"	600.000	85.136	42.639	49+36.614	201369.148	9996.850	48+93.975	201375.223	100039.054	49+79.110	201369.102	99954.211	S 81°48'30" W	S 89°56'17" W
CR-02	2°26'46	600.000	25.615	12.809	50+56.907	201369.018	99876.414	50+44.098	201369.032	99889.224	50+69.713	201368.457	99863.617	S 89°56'17" W	S 87°29'31" W
CR-03	3°02'28	600.000	31.848	15.928	51+68.359	201364.141	99765.065	51+52.431	201364.838	99780.978	50+69.713	201368.457	99863.617	S 87°29'31" W	S 84°27'03" W
CR-04	2°49'04	600.000	29.508	14.757	53+13.382	201350.116	99620.715	52+98.625	201351.543	99635.402	53+28.133	201349.413	99605.974	S 84°27'03" W	S 87°16'07" W
CR-05	32°23'54	695.000	392.994	201.906	58+52.456	201324.426	99082.246	56+50.551	201334.048	99233.048	60+43.545	201424.361	98906.807	S 87°16'07" W	N 60°19'59" W
NE-01	22°00'05	300.000	115.198	58.318	10+74.686	201513.678	98759.891	10+16.368	201484.828	98810.573	11+31.567	201559.414	98723.709	N 60°20'58" W	N 38°20'54" W
NE-02	4°44'44	1067.983	88.455	44.253	12+27.060	201633.814	98663.852	11+82.807	201599.599	98691.917	12+71.262	201665.590	98633.053	N 39°21'39" W	N 44°06'23" W
NE-03	8°42'46	500.000	76.034	38.091	14+16.380	201769.792	98532.052	13+78.290	201742.441	98558.563	14+54.324	201792.812	98501.704	N 44°06'22" W	N 52°49'08" W
NE-04	39°14'21	1075.000	736.215	383.204	18+37.528	200710.138	99150.772	14+45.688	202024.395	98196.394	21+90.539	202010.633	97813.438	N 52°49'08" W	S 87°56'31" W
NE-05	8°18'50	300.000	43.532	21.804	22+12.343	202009.850	97791.648	21+90.539	202010.633	97813.438	22+34.071	202005.925	97770.200	S 87°56'31" W	S 79°37'41" W
NW-01	14°01'26	100.000	24.476	12.300	40+01.331	201362.117	98897.415	39+89.031	201361.529	98909.700	40+13.507	201359.710	98885.353	N 87°15'36" W	S 78°42'59" W
NW-02	67°25'38	100.000	117.683	66.726	41+85.900	201325.979	98716.292	41+19.174	201339.035	98781.729	42+36.856	201381.390	98679.118	S 78°42'59" W	N 33°51'23" W
NW-03	5°46'56	300.000	30.275	15.151	44+041.552	201520.651	98585.693	43+89.402	201508.069	98594.133	44+19.677	201532.318	98576.027	N 33°51'23" W	N 39°38'19" W
NW-04	22°10'01	600.000	232.130	117.535	46+60.629	201717.871	98422.313	45+43.094	201627.359	98497.294	47+75.225	201773.402	98318.724	N 39°38'19" W	N 61°48'20" W

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NOT FOR CONSTRUCTION

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NO.	DATE	APPROVED BY	REMARKS

REVISIONS

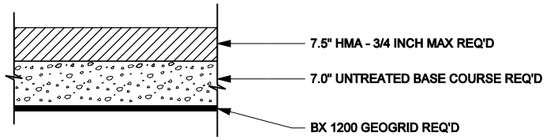
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

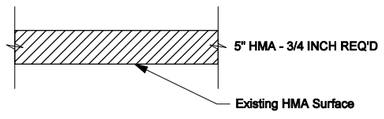
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
HORIZONTAL ALIGNMENT CONTROL SHEET

SHEET NO. CT-03

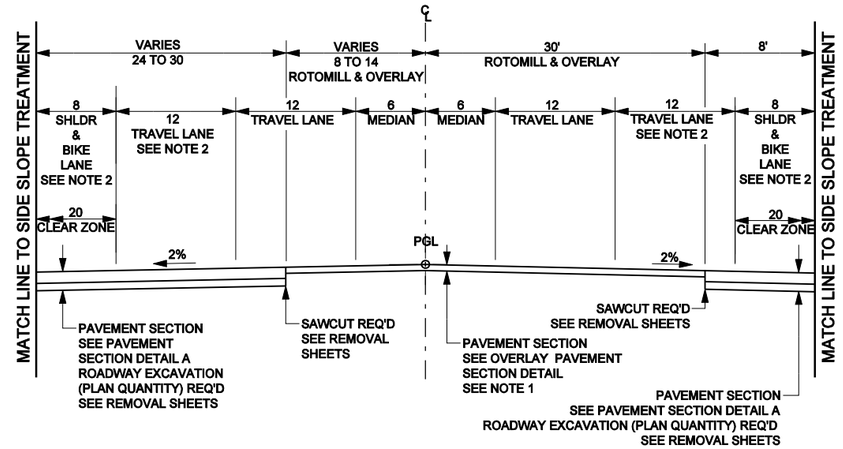
SIDE SLOPE TREATMENT TABLE			
ALIGNMENT	STATION RANGE	SIDESLOPE TREATMENT	SIDE APPLIED
US-191	201+80.50 TO 205+10.00	SIDESLOPE DETAIL F	LEFT
US-191	205+10.00 TO 206+57.13	SIDESLOPE DETAIL E	LEFT
US-191	206+57.13 TO 207+15.80	SIDESLOPE DETAIL K	LEFT
US-191	207+15.80 TO 209+33.74	SIDESLOPE DETAIL C	LEFT
US-191	209+33.74 TO 211+00.44	TRAIL TYPICAL SECTION NO. 2	LEFT
US-191	211+00.44 TO 214+83.65	TRAIL TYPICAL SECTION NO. 3	LEFT
US-191	214+83.65 TO 215+36.77	TRAIL TYPICAL SECTION NO. 4	LEFT
US-191	201+80.50 TO 209+36.21	TRAIL TYPICAL SECTION NO. 1	RIGHT
US-191	209+40.10 TO 210+03.67	SIDESLOPE DETAIL L	RIGHT
US-191	210+03.67 TO 211+79.05	SIDESLOPE DETAIL F	RIGHT
US-191	211+79.05 TO 214+68.77	SIDESLOPE DETAIL J	RIGHT



PAVEMENT SECTION DETAIL A

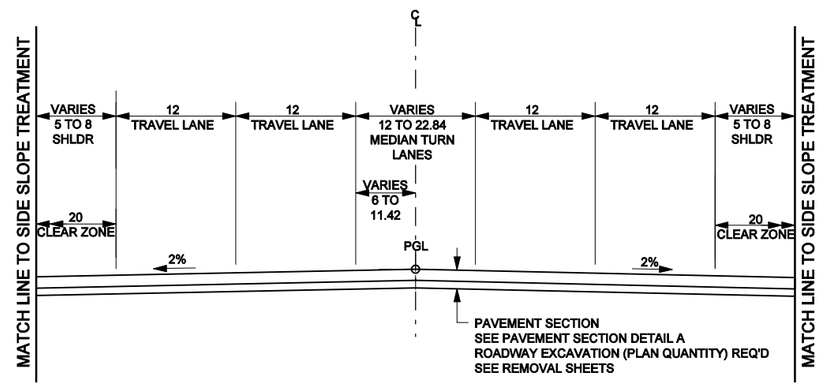


OVERLAY PAVEMENT SECTION DETAIL



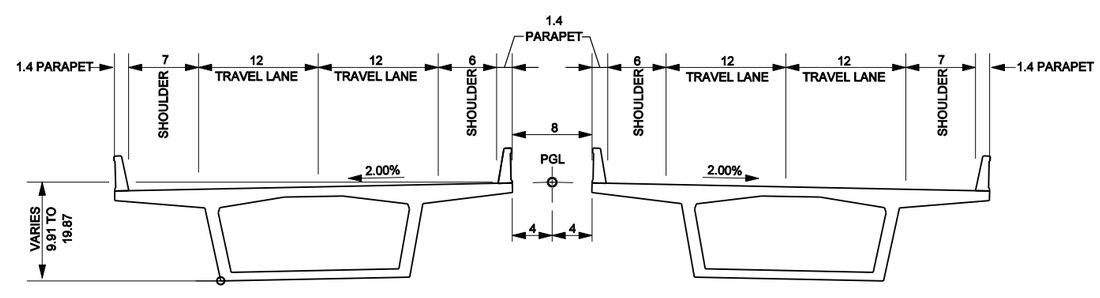
US-191 TYPICAL SECTION NO.1

NTS
US-191 STA. 201+80.50 TO STA. 210+13.26
DESIGN SPEED 50 MPH



US-191 TYPICAL SECTION NO.2

NTS
US-191 STA. 210+13.26 LT TO STA. 215+06.77 LT
US-191 STA. 210+13.26 RT TO STA. 214+68.77 RT
US-191 STA. 225+72.74 LT TO STA. 230+13.30 LT
US-191 STA. 225+34.74 RT TO STA. 230+13.30 RT
(FOR SIDESLOPE TREATMENT, SEE TABLE ON SHEET TS-02)
DESIGN SPEED 50 MPH



US-191 TYPICAL SECTION NO. 3

NTS
US-191 STA. 215+06.77 LT TO STA. 225+72.74 LT
US-191 STA. 214+68.77 RT TO STA. 225+34.74 RT
DESIGN SPEED 50 MPH

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:

1. ROTOMILL FROM 0" TO 1 1/2" FROM US-191 STA 201+80.50 TO 204+30.50 TO TIE IN PAVEMENT OVERLAY TO EXISTING ROADWAY.
2. SEE SS SHEETS FOR INTERUM PHASE SRIPING FOR LANE TAPER.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

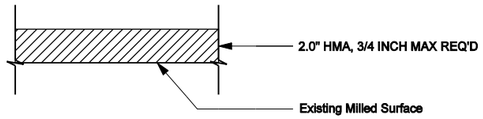
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

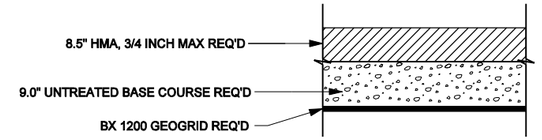
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY TYPICAL SECTIONS

SHEET NO. TS-01

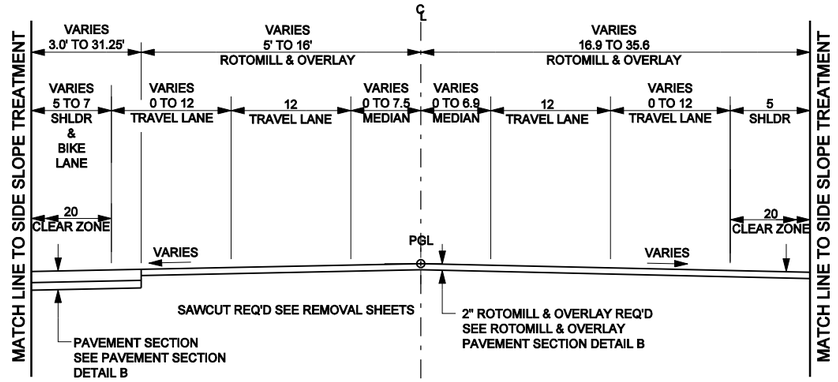
5/6/2008 \\fsslc03\25507-slc-colorado_bridge\5385_07\Sheet_Files\Typical_Sections\5385_07_Typical_Section_01.dgn



ROTOMILL & OVERLAY PAVEMENT SECTION DETAIL



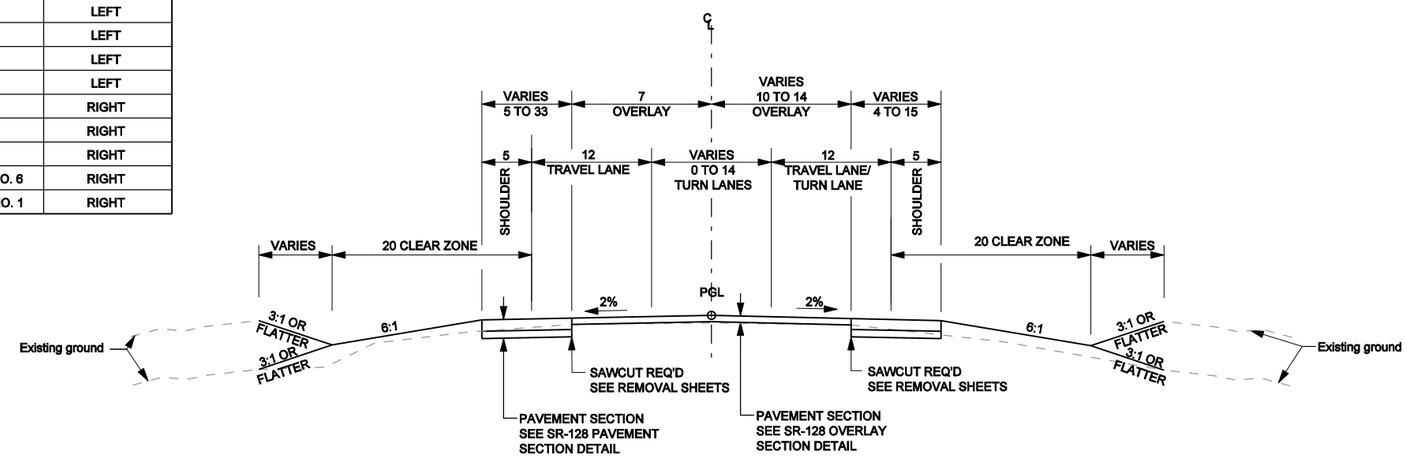
PAVEMENT SECTION DETAIL B



US-191 TYPICAL SECTION NO.4

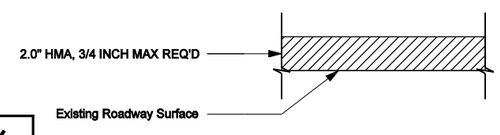
NTS
US-191 STA. 230+20.00 TO STA. 239+61.16
DESIGN SPEED 50 MPH

SIDE SLOPE TREATMENT TABLE			
ALIGNMENT	STATION RANGE	SIDESLOPE TREATMENT	SIDE APPLIED
US-191	225.72.74 TO 226+17.42	TRAIL TYPICAL SECTION NO. 7	LEFT
US-191	226+17.42 TO 227+78.72	SIDESLOPE DETAIL A	LEFT
US-191	226+78.72 TO 232+32.72	SIDESLOPE DETAIL B	LEFT
US-191	232+32.72 TO 233+35.02	SIDESLOPE DETAIL K	LEFT
US-191	233+35.03 TO 234+59.30	SIDESLOPE DETAIL F	LEFT
US-191	234+59.30 TO 235+15.29	SIDESLOPE DETAIL K	LEFT
US-191	235+15.29 TO 239+61.16	SIDESLOPE DETAIL M	LEFT
US-191	225+34.74 TO 225+47.24	SIDESLOPE DETAIL F	RIGHT
US-191	225+47.27 TO 226+27.86	SIDESLOPE DETAIL D	RIGHT
US-191	226+27.86 TO 226+63.75	SIDESLOPE DETAIL F	RIGHT
US-191	226+63.75 TO 229+25.90	TRAIL TYPICAL SECTION NO. 6	RIGHT
US-191	229+25.90 TO 239+61.16	TRAIL TYPICAL SECTION NO. 1	RIGHT

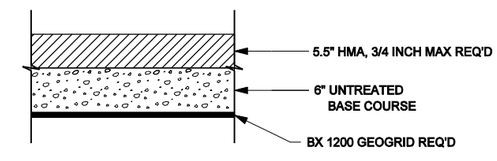


SR-128 TYPICAL SECTION NO.1

NTS
SR-128 STA. 500+40.14 TO STA. 504+00.00
DESIGN SPEED 50 MPH



SR-128 OVERLAY SECTION DETAIL



SR-128 PAVEMENT SECTION DETAIL

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

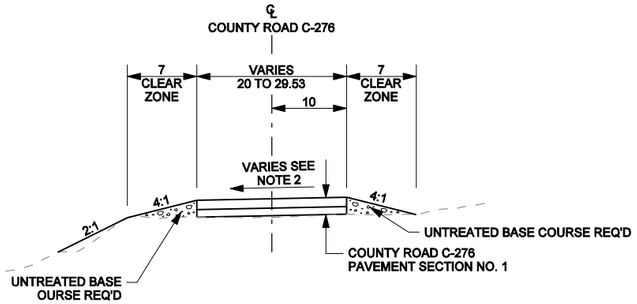
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY TYPICAL SECTIONS

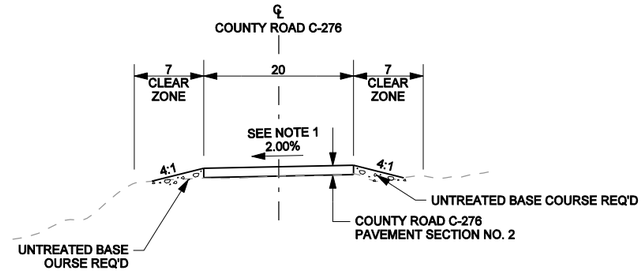
SHEET NO. TS-02

5/6/2008 \\fasicl03\25507-elc-colorado_bridge\5365_07\Sheet_Files\Typical_Sections\5365_07_Typical_Section_02.dgn



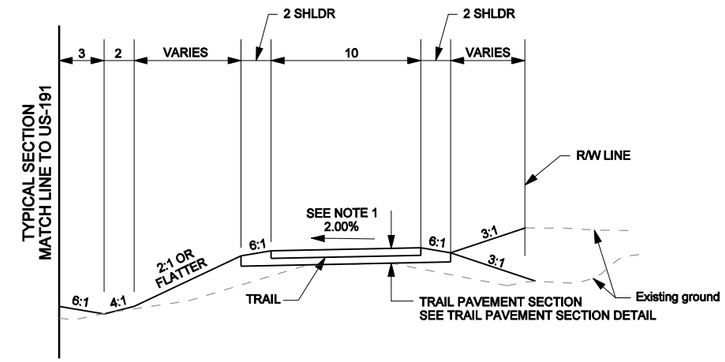
COUNTY ROAD C-276 TYPICAL SECTION NO. 1

NTS
COUNTY ROAD C-276 STA 56+53.19 TO STA 61+49.73
DESIGN SPEED 20 MPH



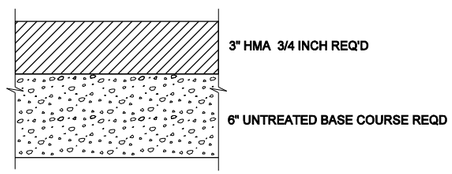
COUNTY ROAD C-276 TYPICAL SECTION NO. 2

NTS
COUNTY ROAD C-276 STA 48+06.10 TO STA 56+53.19
DESIGN SPEED 20 MPH

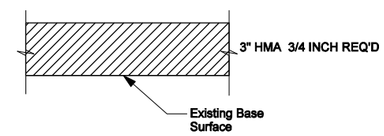


TRAIL TYPICAL SECTION NO. 1

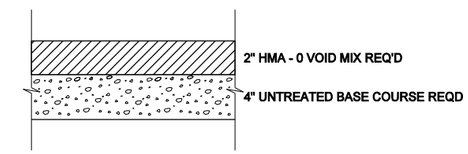
NTS
NE TRAIL STA 10+09.12 TO 10+98.08
NE TRAIL STA 13+36.43 TO 24+22.27
DESIGN SPEED 20 MPH



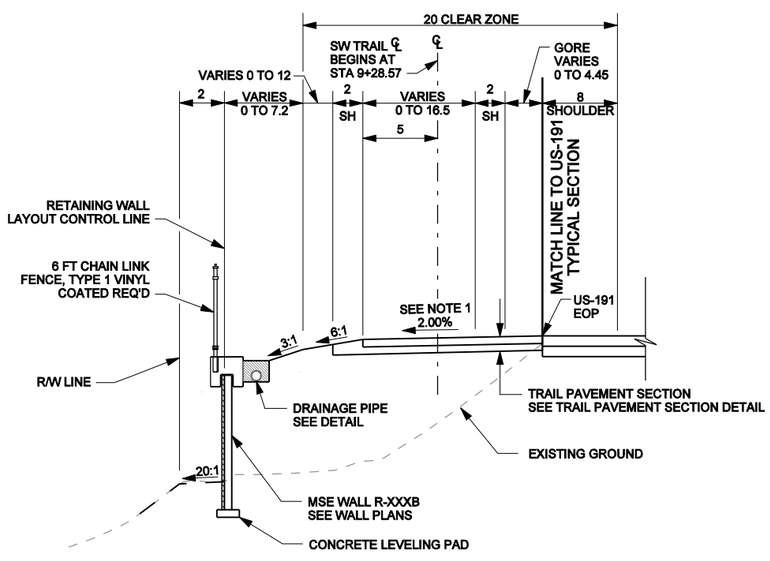
COUNTY ROAD C-276 PAVEMENT SECTION DETAIL NO. 1



COUNTY ROAD C-276 PAVEMENT SECTION DETAIL NO. 2

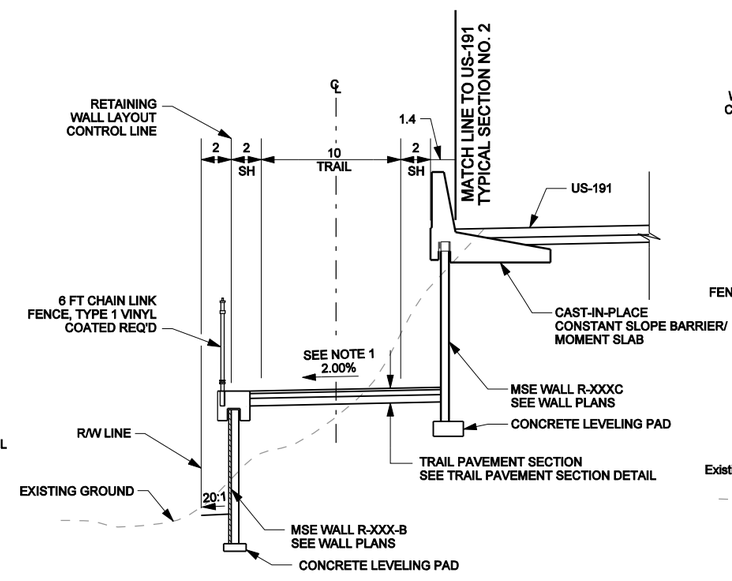


TRAIL PAVEMENT SECTION DETAIL



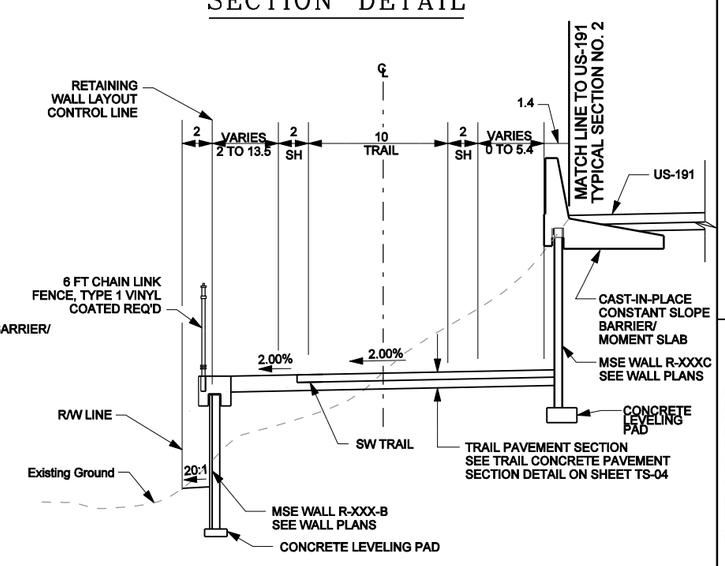
TRAIL TYPICAL SECTION NO. 2

NTS
SW TRAIL STA 8+77.94 TO 10+43.93
DESIGN SPEED 20 MPH



TRAIL TYPICAL SECTION NO. 3

NTS
SW TRAIL STA 10+43.93 TO STA 14+28.39
DESIGN SPEED 20 MPH



TRAIL TYPICAL SECTION NO. 4

NTS
SW TRAIL STA 14+28.39 TO STA 14+85.26
DESIGN SPEED 20 MPH

NOTE:
1. ARROW INDICATES DOWNWARD SLOPE
2. SEE DETAIL SHEET DT-01 FOR CROSS SLOPE DESCRIPTION

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

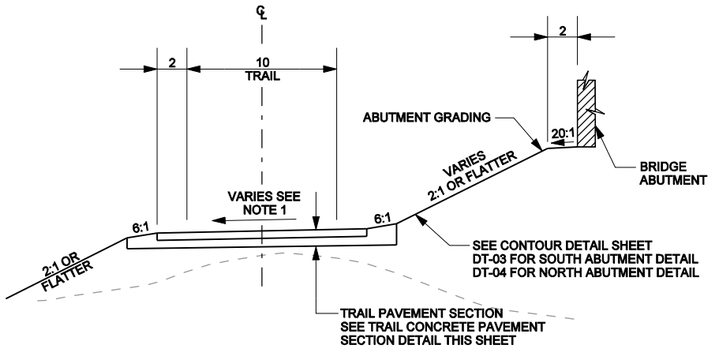
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
TRAIL TYPICAL SECTIONS

SHEET NO. TS-03

\\fasicl03\2507-elc-colorado_bridge\5365_07\Sheet_Files\Typical_Sections\5365_07_Typical_Section_03.dgn
5/6/2008

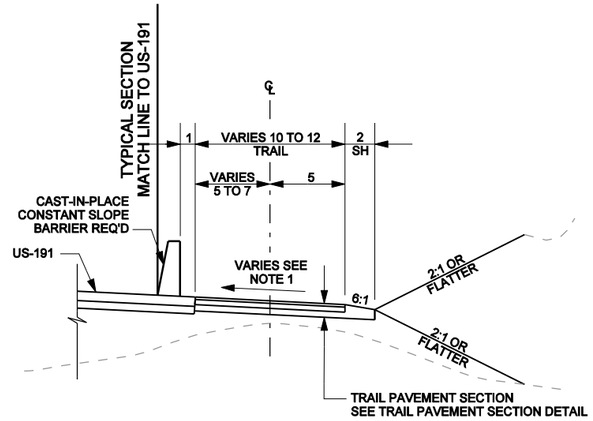


TRAIL TYPICAL SECTION NO. 5

NTS

SW TRAIL STA 14+85.26 TO 16+56.70
NW TRAIL STA 40+37.38 TO 41+19.17

DESIGN SPEED 20 MPH

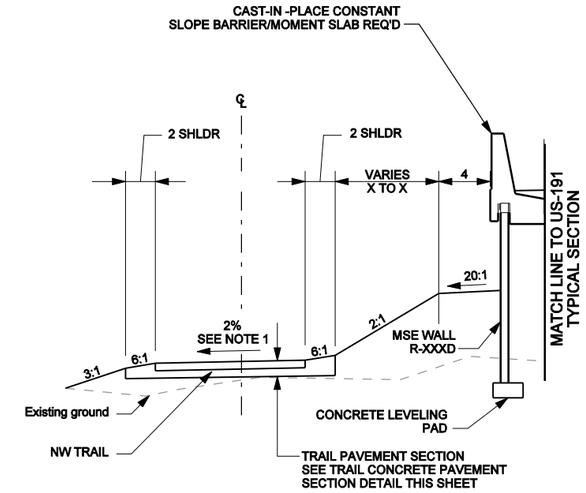


TRAIL TYPICAL SECTION NO. 6

NTS

NE TRAIL STA 10+98.08 TO 13+36.43

DESIGN SPEED 20 MPH

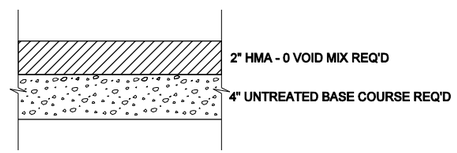


TRAIL TYPICAL SECTION NO. 7

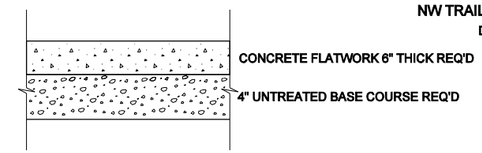
NTS

NW TRAIL STA 41+19.17 TO 42+36.86

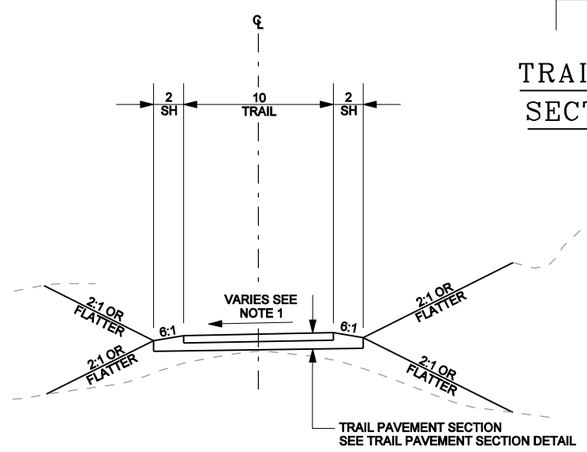
DESIGN SPEED 20 MPH



TRAIL PAVEMENT SECTION DETAIL



TRAIL CONCRETE PAVEMENT SECTION DETAIL

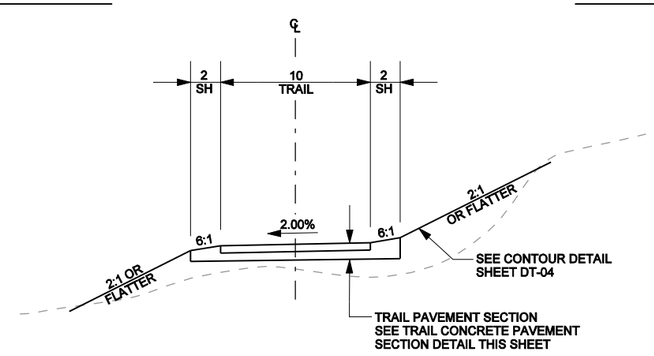


TRAIL TYPICAL SECTION NO. 8

NTS

NE TRAIL STA 10+09.12 TO 10+98.08
NE TRAIL STA 13+36.43 TO 24+22.77
NW TRAIL STA 42+36.86 TO 48+53.99

DESIGN SPEED 20 MPH

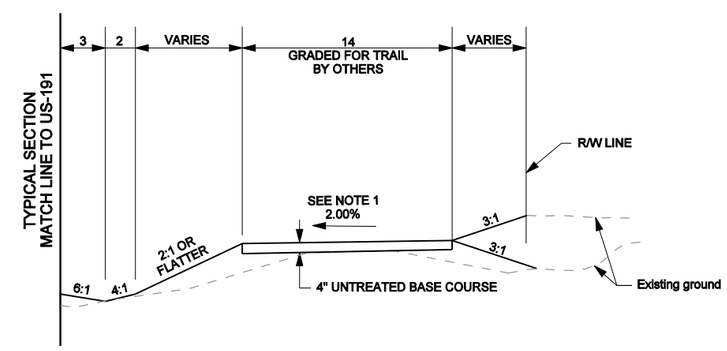


TRAIL TYPICAL SECTION NO. 9

NTS

NW TRAIL STA 39+08.55 TO 40+37.38

DESIGN SPEED 20 MPH



TRAIL TYPICAL SECTION NO. 10

NTS

SE TRAIL STA 120+71.78 TO 128+59.25

DESIGN SPEED 20 MPH

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:
1. ARROW INDICATES DOWNWARD SLOPE
2. SEE DETAIL SHEET DT-01 FOR CROSS SLOPE DESCRIPTION

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

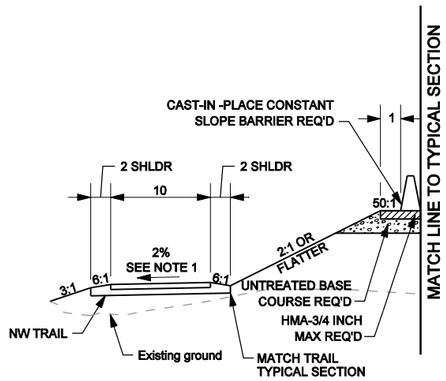
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

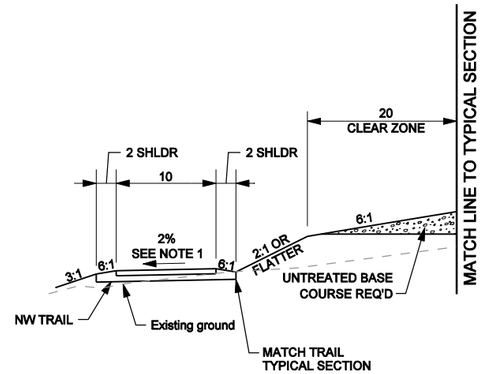
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
TRAIL TYPICAL SECTIONS

SHEET NO. TS-04

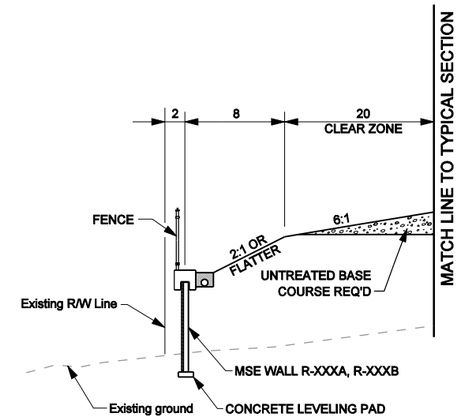
5/6/2008 \\fasla03\2507-elc-colorado_bridge\5365_07\Sheet_Files\Typical_Sections\5365_07_Typical_Section_04.dgn



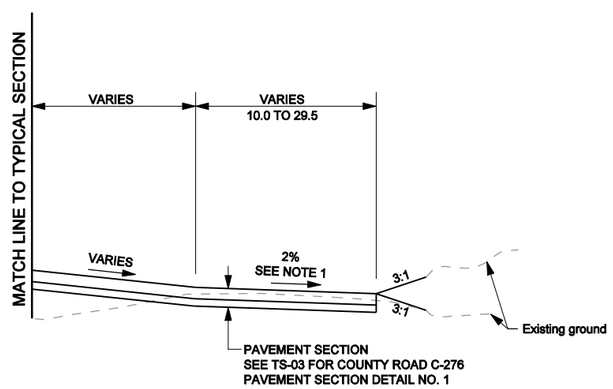
SIDE SLOPE TREATMENT A



SIDE SLOPE TREATMENT B

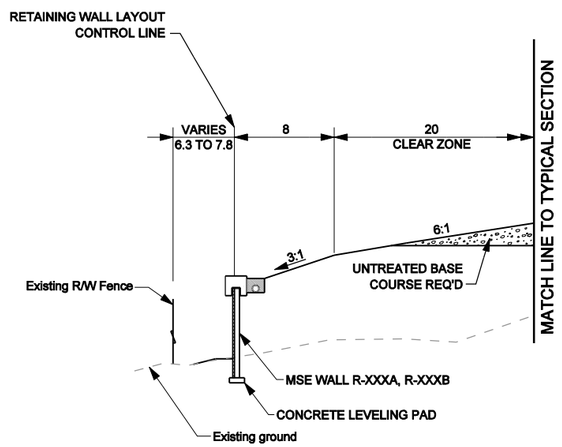


SIDE SLOPE TREATMENT C

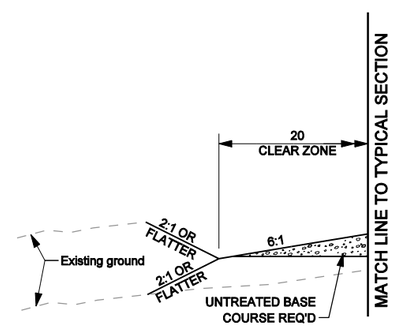


SIDE SLOPE TREATMENT D

SEE DT-01 FOR DIMENSIONS AND SLOPES



SIDE SLOPE TREATMENT E



SIDE SLOPE TREATMENT F

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:

1. ARROW INDICATES DOWNWARD SLOPE

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

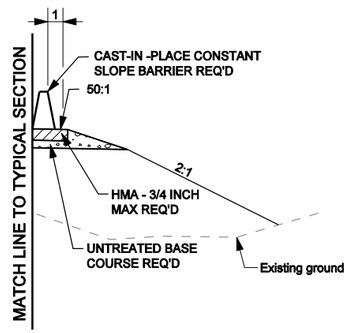
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

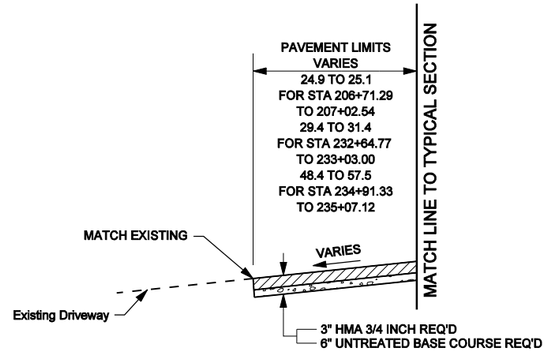
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
SIDE SLOPE DETAILS

SHEET NO. SDT-01

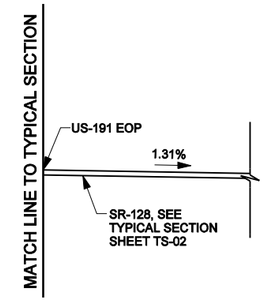
\\fsslc03\25507-slc-colorado_bridge\5365_07\Sheet_Files\Typical_Sections\5365_07_Side_Slope_01.dgn
5/6/2008



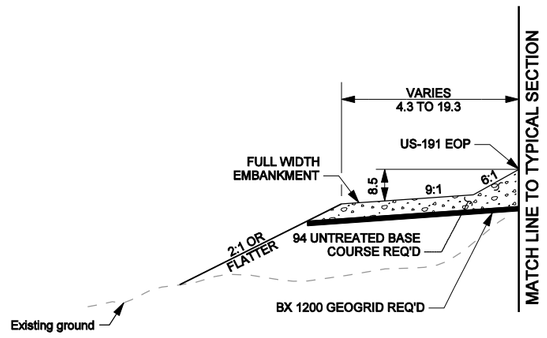
SIDE SLOPE DETAIL J



SIDE SLOPE DETAIL K



SIDE SLOPE DETAIL L



SIDE SLOPE DETAIL M

PRELIMINARY
NOT FOR CONSTRUCTION

NOTE:
1. ARROW INDICATES DOWNWARD SLOPE
2. SIDE SLOPE TREATMENT (I) DOES NOT EXIST

REVISIONS

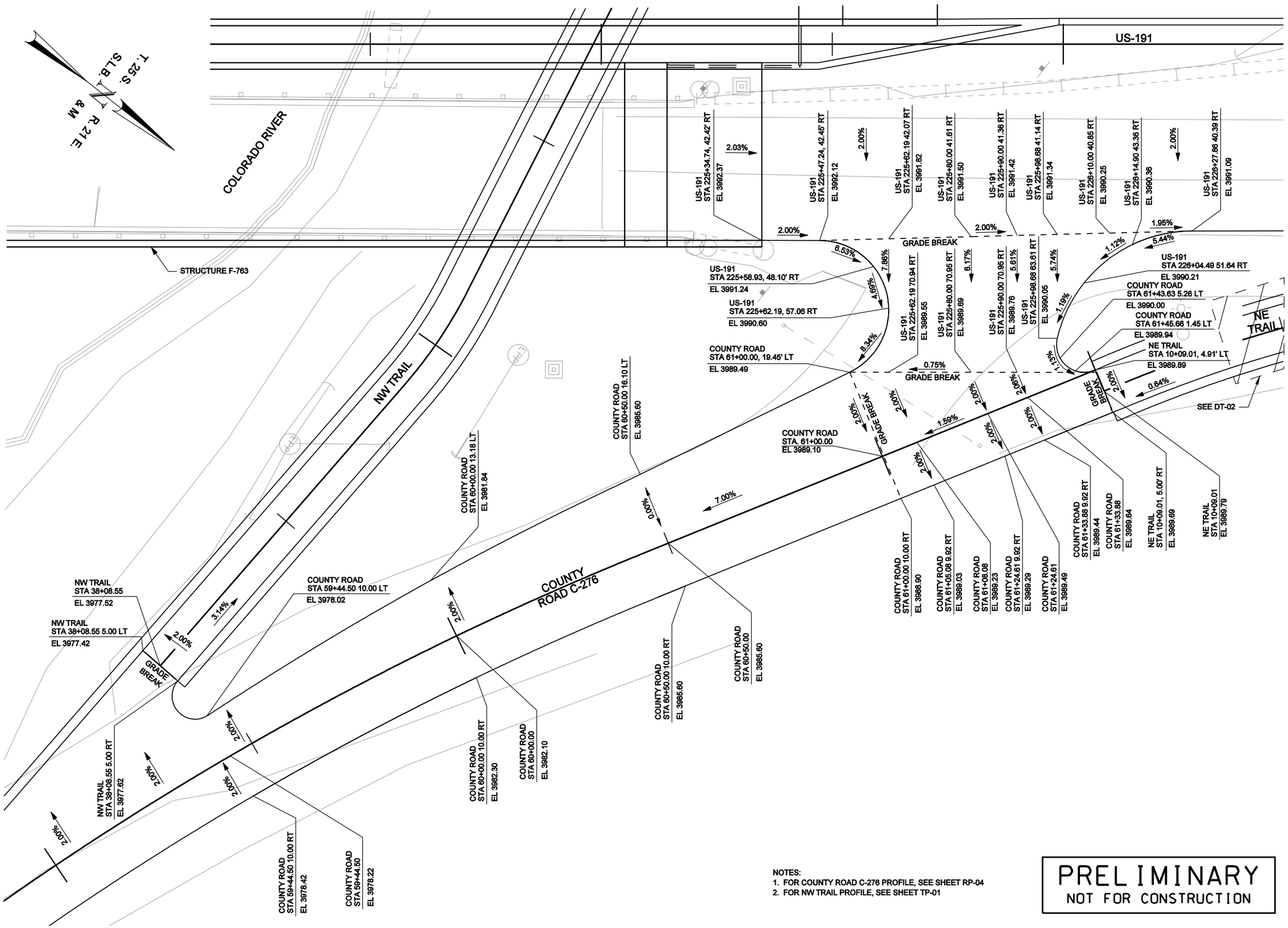
NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
SIDE SLOPE DETAILS
SHEET NO. SDT-02

5/6/2008 \\fsslc03\25507-slc-colorado_bridge\5365_07\Sheet_Files\Typical_Sections\5365_07_Side_Slope_02.dgn



NOTES:
1. FOR COUNTY ROAD C-276 PROFILE, SEE SHEET RP-04
2. FOR NW TRAIL PROFILE, SEE SHEET TP-01

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

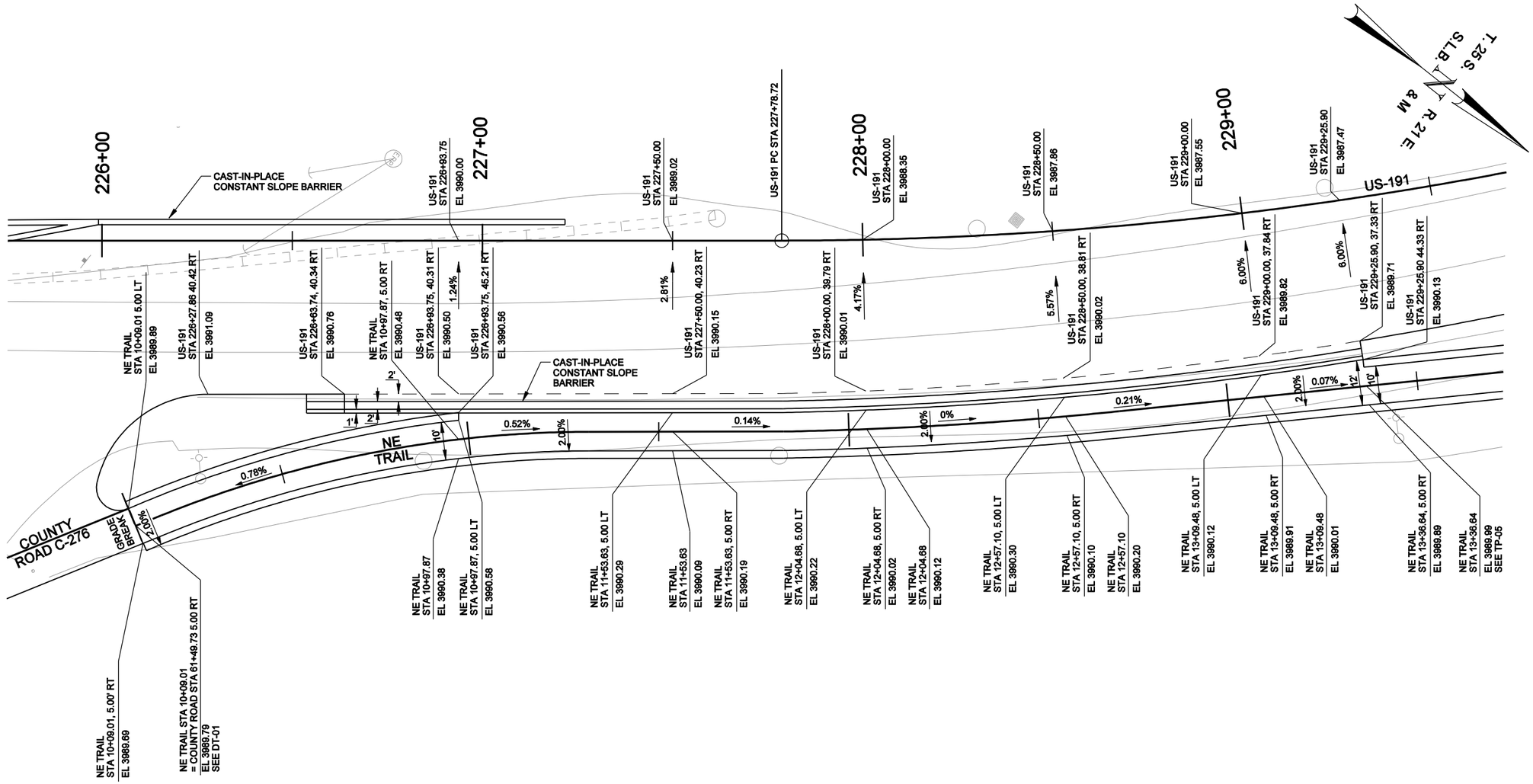
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DETAIL SHEET

SHEET NO. DT-01

5/6/2008 \\fssltc03\2507-slc-colorado_bridge\5365_07\sheet_files\Details\5365_07_DT-01.dgn



PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

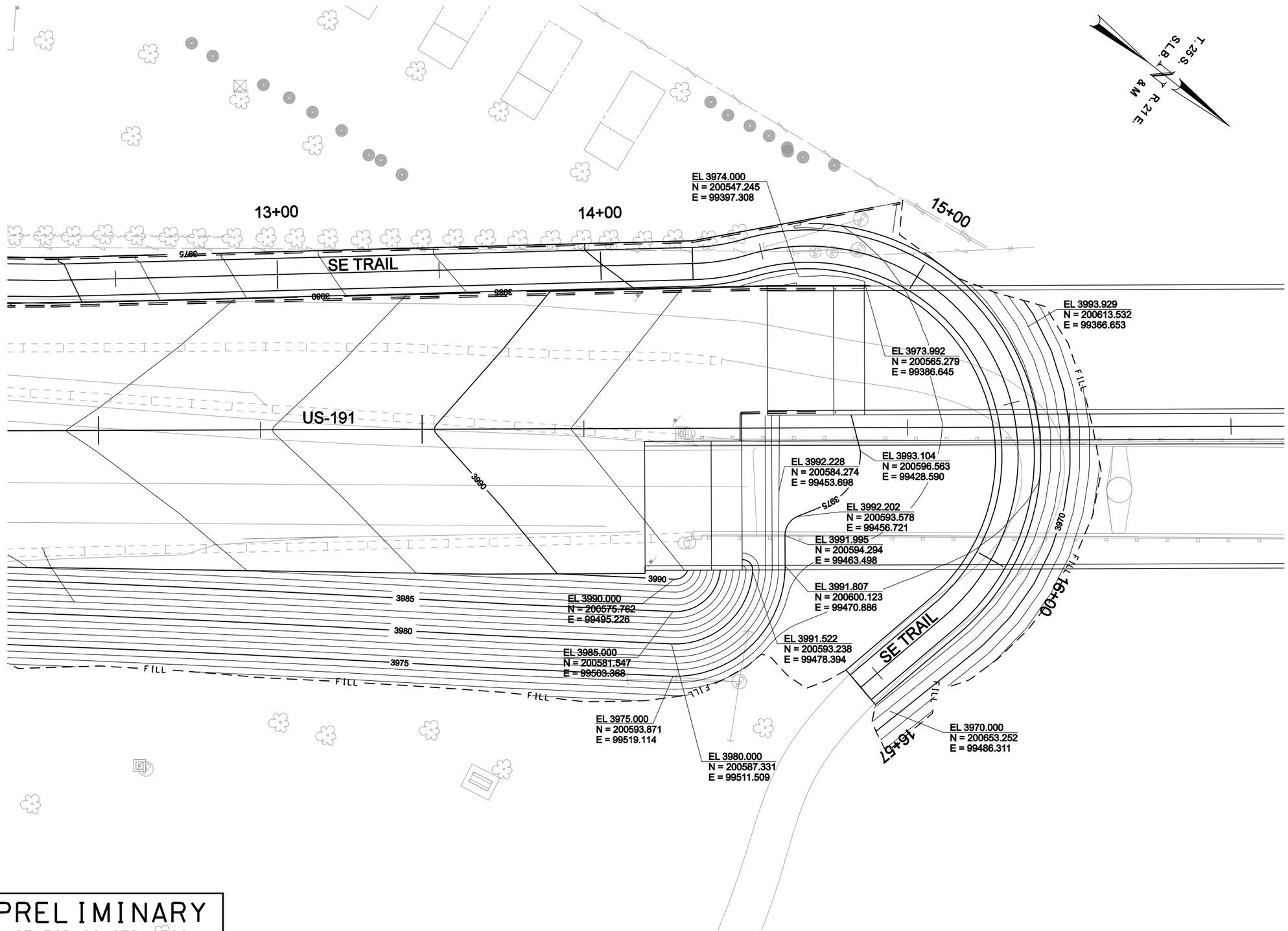
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DETAIL SHEET

SHEET NO. DT-02

5/6/2008 \\fselc03\02507-slc-colorado_bridge\15365_07\sheet_files\Details\15365_07_DT-02.dgn



PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

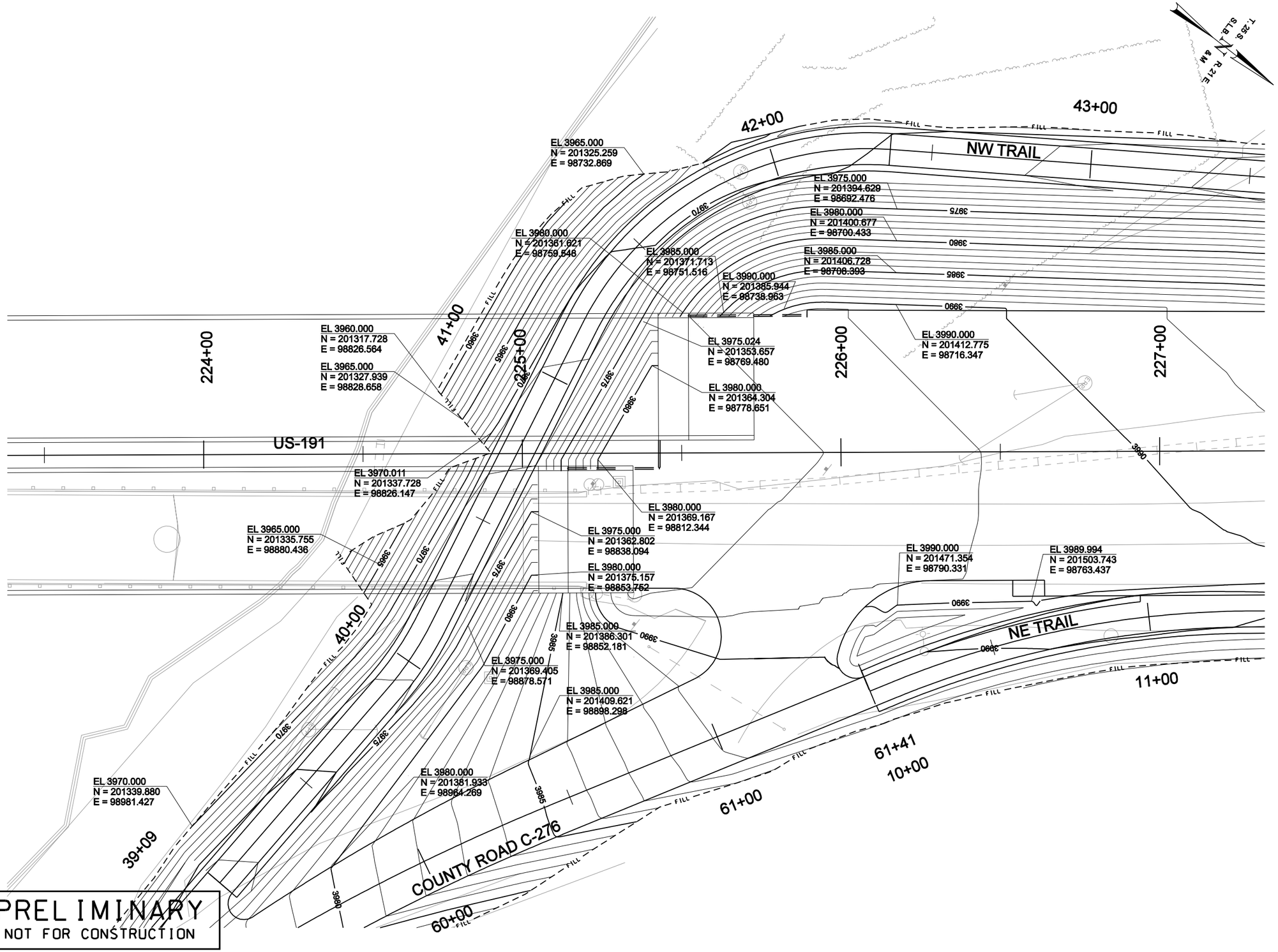
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY FJB
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
SOUTH ABUTMENT DETAIL SHEET

SHEET NO. DT-03

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Details\5365_07_DT-03.dgn



PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

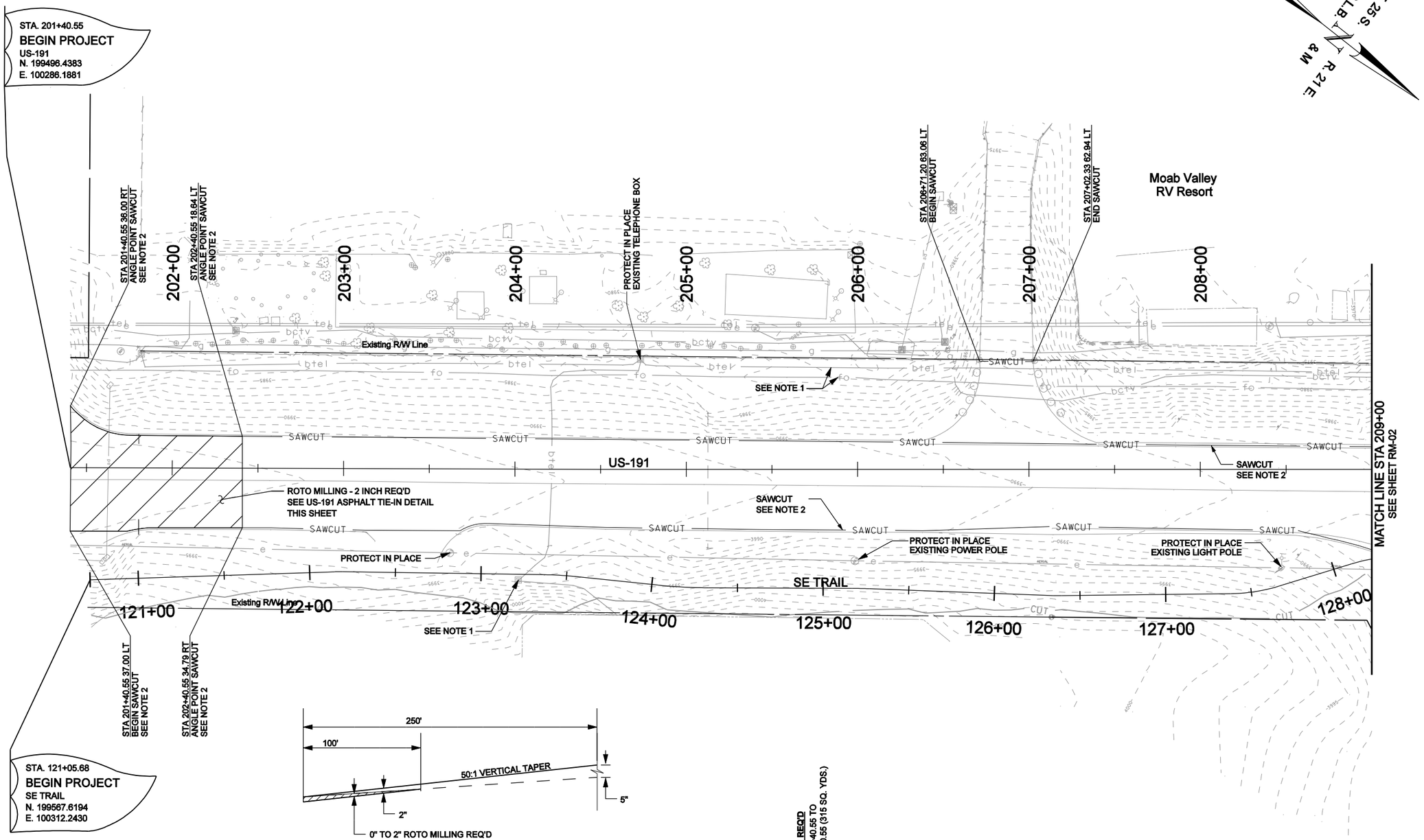
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY FJB
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
NORTH ABUTMENT DETAIL SHEET

SHEET NO. DT-04

5/6/2008 \\fselc03\02507-slc-colorado_bridge\5365_07\sheet_files\Details\5365_07_DT-04.dgn



US-191 ASPHALT TIE-IN DETAIL

ROTO MILLING - 2 INCH REQ'D
BEGIN US-191 STA 201+40.55 TO
END US-191 STA 202+40.55 (315 SQ. YDS.)

LEGEND:

ROTO MILLING - 2 INCH REQ'D

NOTE:
1. SEE UTILITY SHEETS UT-01 THROUGH UT-06 FOR ALL UTILITY REMOVALS AND RELOCATIONS.
2. SAWCUT 1-FOOT INSIDE OF US-191 EXISTING EDGE OF PAVEMENT. EXCEPT WHERE INDICATED.

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

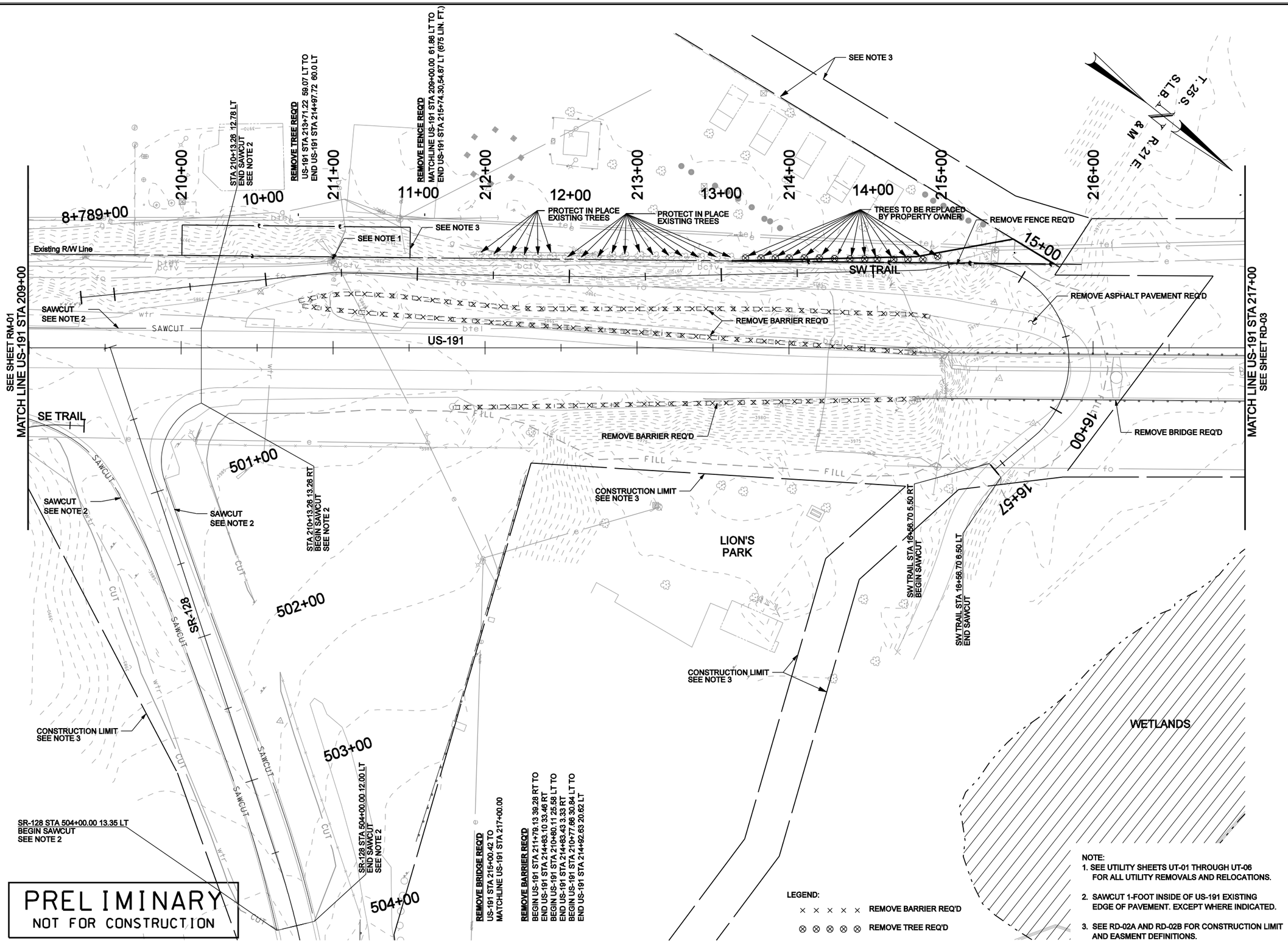
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
REMOVAL PLAN SHEET

SHEET NO. RM-01

5/6/2008 \\fssic03\2507-slc-colorado_bridge\5365_07\sheet_files\Removals\5365_07_RM-01.dgn



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NO.	DATE	APPROVED BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

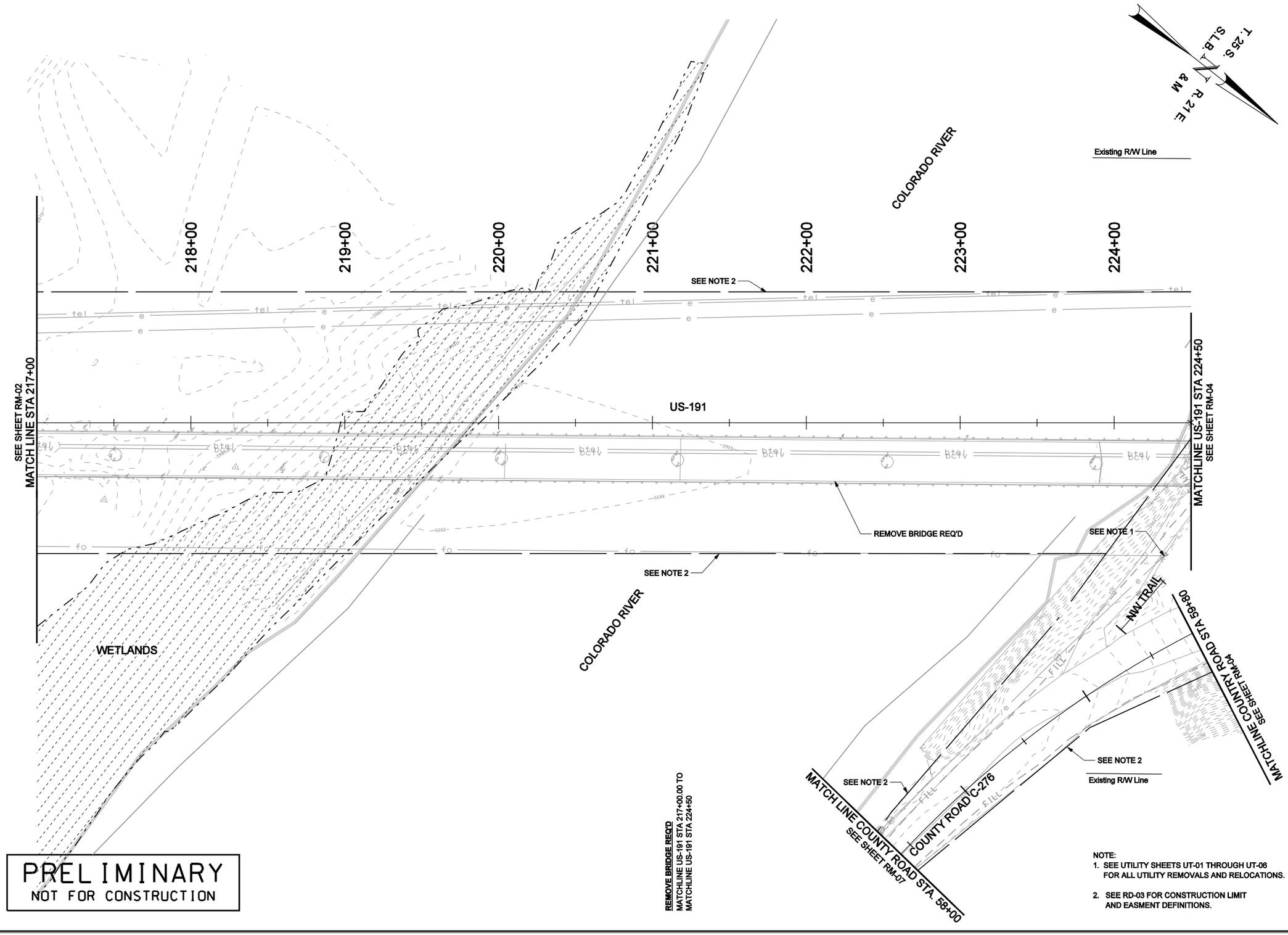
DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

REMOVAL PLAN SHEET

SHEET NO. RM-02



REMOVE BRIDGE REQ'D
MATCHLINE US-191 STA 217+00.00 TO
MATCHLINE US-191 STA 224+50

NOTE:
1. SEE UTILITY SHEETS UT-01 THROUGH UT-06 FOR ALL UTILITY REMOVALS AND RELOCATIONS.
2. SEE RD-03 FOR CONSTRUCTION LIMIT AND EASMENT DEFINITIONS.

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

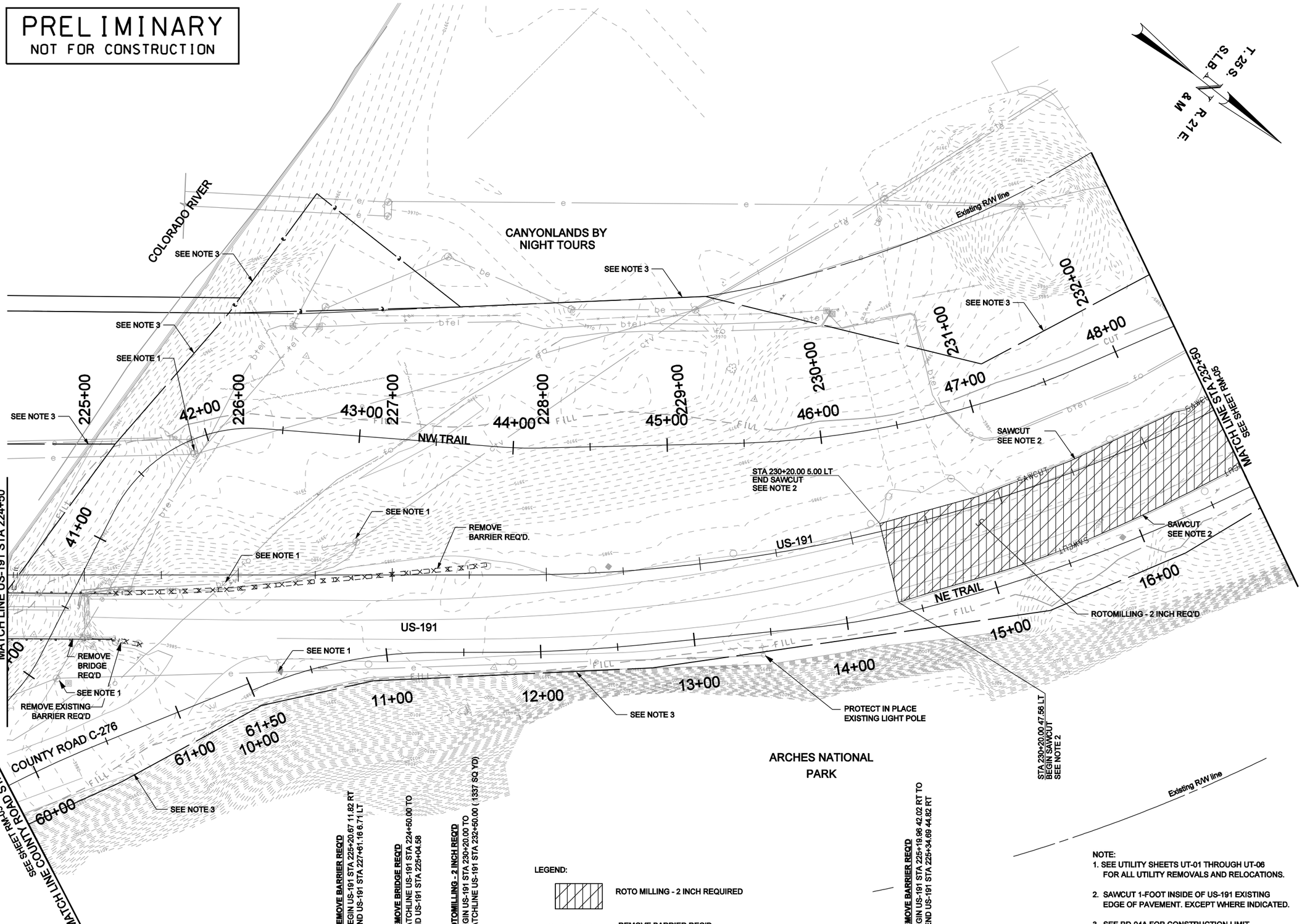
PROJECT NUMBER: BRF-0191(58)129

REMOVAL PLAN SHEET

SHEET NO. RM-03

5/6/2008 \\fsslc03\32507-slc-colorado_bridge\t5365_07\sheet_files\Removals\5365_07_RM-03.dgn

PRELIMINARY
NOT FOR CONSTRUCTION



REMOVE BARRIER REQ'D
BEGIN US-191 STA 225+20.67 11.82 RT
END US-191 STA 227+61.16 6.71 LT

REMOVE BRIDGE REQ'D
MATCHLINE US-191 STA 224+50.00 TO
END US-191 STA 225+04.58

ROTOMILLING - 2 INCH REQ'D
BEGIN US-191 STA 230+20.00 TO
MATCHLINE US-191 STA 232+50.00 (1337 SQ YD)

REMOVE BARRIER REQ'D
BEGIN US-191 STA 225+19.96 42.02 RT TO
END US-191 STA 225+34.69 44.82 RT

LEGEND:

ROTO MILLING - 2 INCH REQUIRED

× × × × × REMOVE BARRIER REQ'D

NOTE:
1. SEE UTILITY SHEETS UT-01 THROUGH UT-06 FOR ALL UTILITY REMOVALS AND RELOCATIONS.
2. SAWCUT 1-FOOT INSIDE OF US-191 EXISTING EDGE OF PAVEMENT. EXCEPT WHERE INDICATED.
3. SEE RD-04A FOR CONSTRUCTION LIMIT AND EASMENT DEFINITIONS.

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

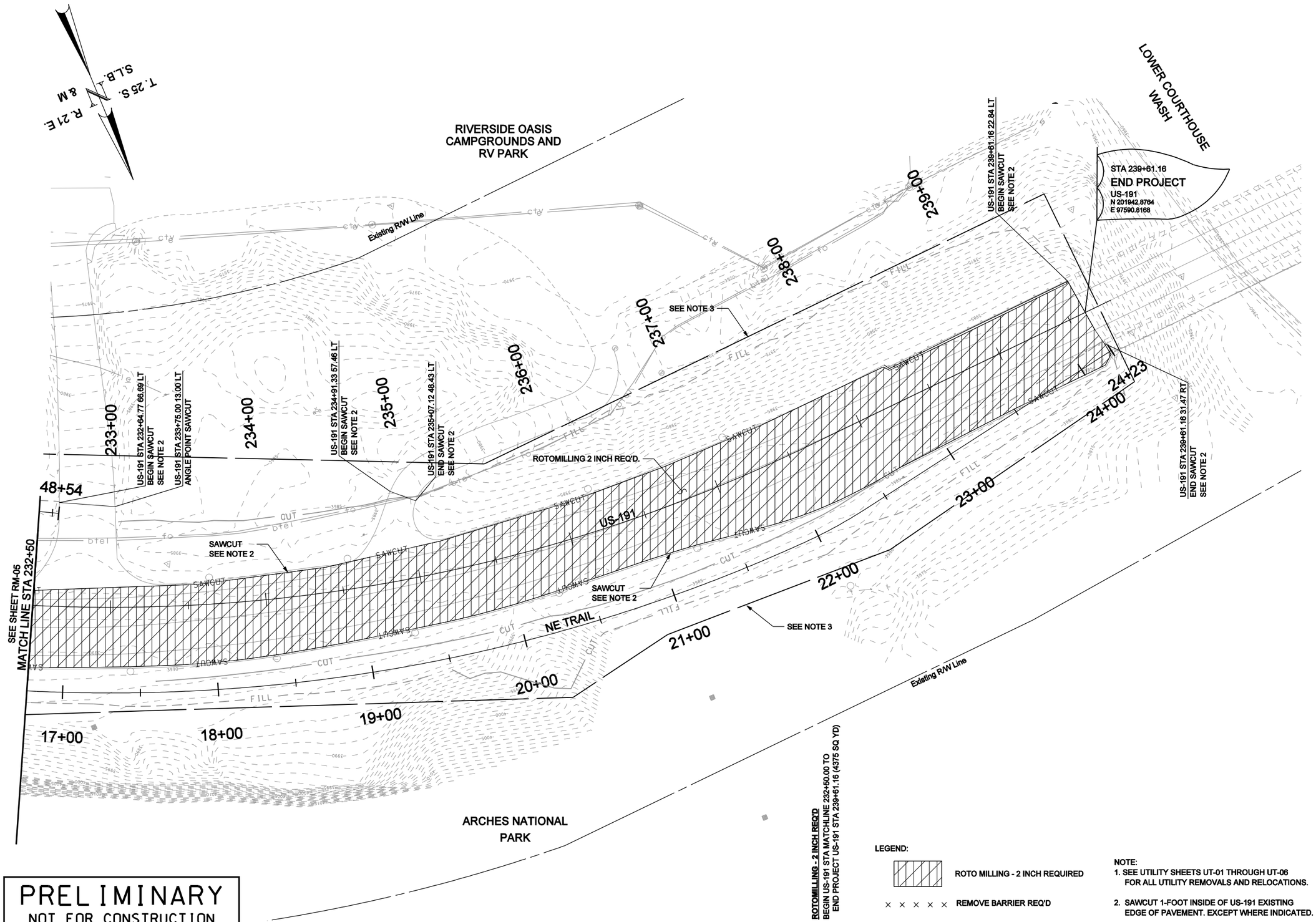
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
REMOVAL PLAN SHEET

SHEET NO. RM-04

5/6/2008 \\fssloc03\25507-slc-colorado_bridge\5365_07\sheet_files\Removals\5365_07_RM-04.dgn



ROTOMILLING - 2 INCH REQ'D
BEGIN US-191 STA MATCHLINE 232+50.00 TO
END PROJECT US-191 STA 239+61.16 (4375 SQ YD)

LEGEND:

ROTO MILLING - 2 INCH REQUIRED

× × × × × REMOVE BARRIER REQ'D

NOTE:
1. SEE UTILITY SHEETS UT-01 THROUGH UT-06 FOR ALL UTILITY REMOVALS AND RELOCATIONS.
2. SAWCUT 1-FOOT INSIDE OF US-191 EXISTING EDGE OF PAVEMENT. EXCEPT WHERE INDICATED.
3. SEE RD-05 FOR CONSTRUCTION LIMIT AND EASMENT DEFINITIONS.

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

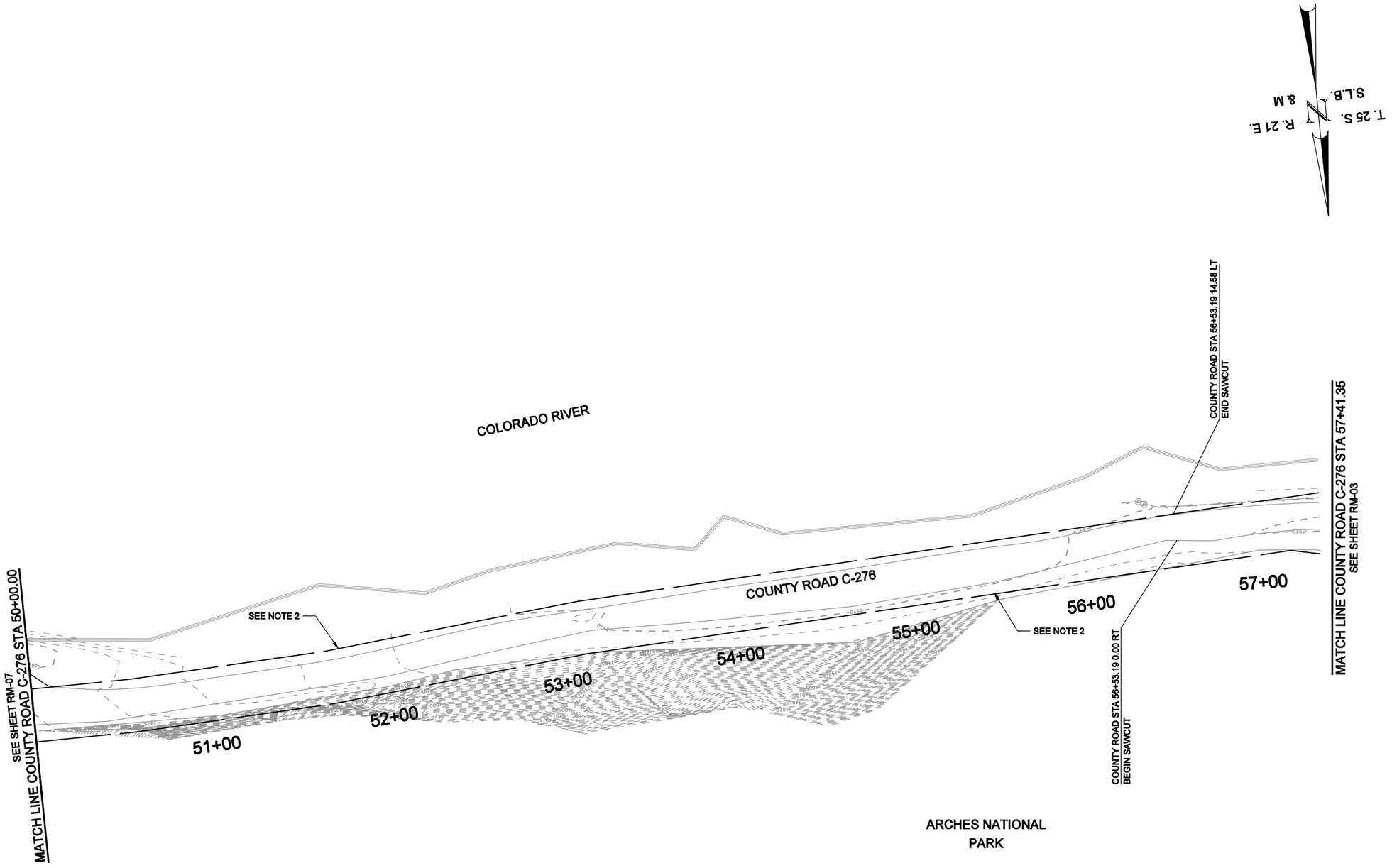
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
REMOVAL PLAN SHEET

SHEET NO. RM-05

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Removals\5365_07_RM-05.dgn



NOTE:
1. SEE UTILITY SHEETS UT-01 THROUGH UT-06 FOR ALL UTILITY REMOVALS AND RELOCATIONS.
2. SEE RD-06 FOR CONSTRUCTION LIMIT AND EASMENT DEFINITIONS.

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

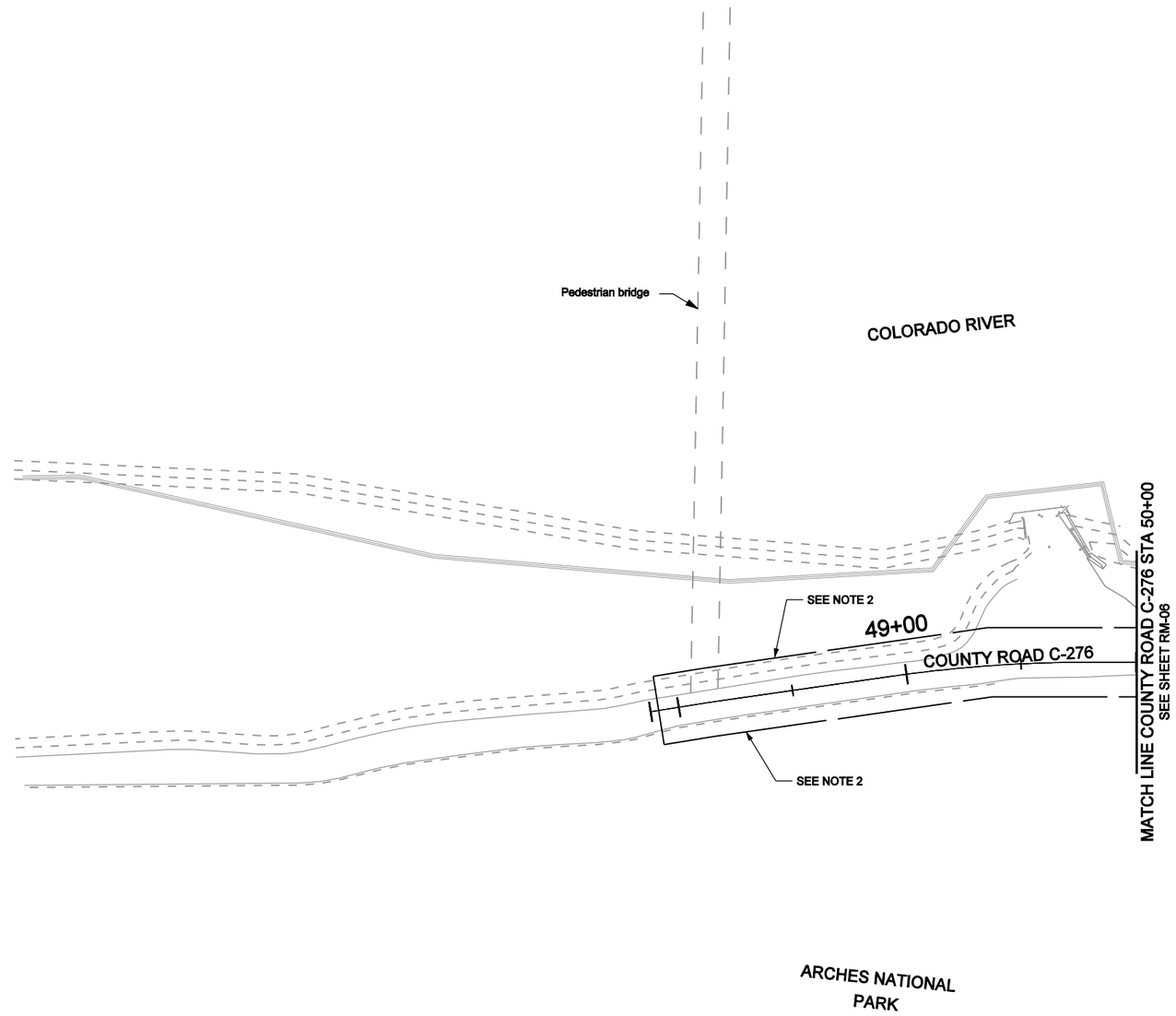
NO.	DATE	APPROVED BY	REMARKS

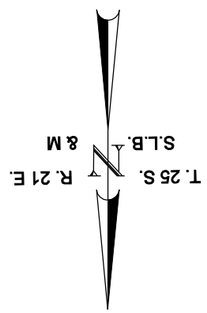
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
REMOVAL PLAN SHEET

SHEET NO. RM-06





NOTE:
1. SEE UTILITY SHEETS UT-01 THROUGH UT-06 FOR ALL UTILITY REMOVALS AND RELOCATIONS.

2. SEE RD-07 FOR CONSTRUCTION LIMIT AND EASMENT DEFINITIONS.

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

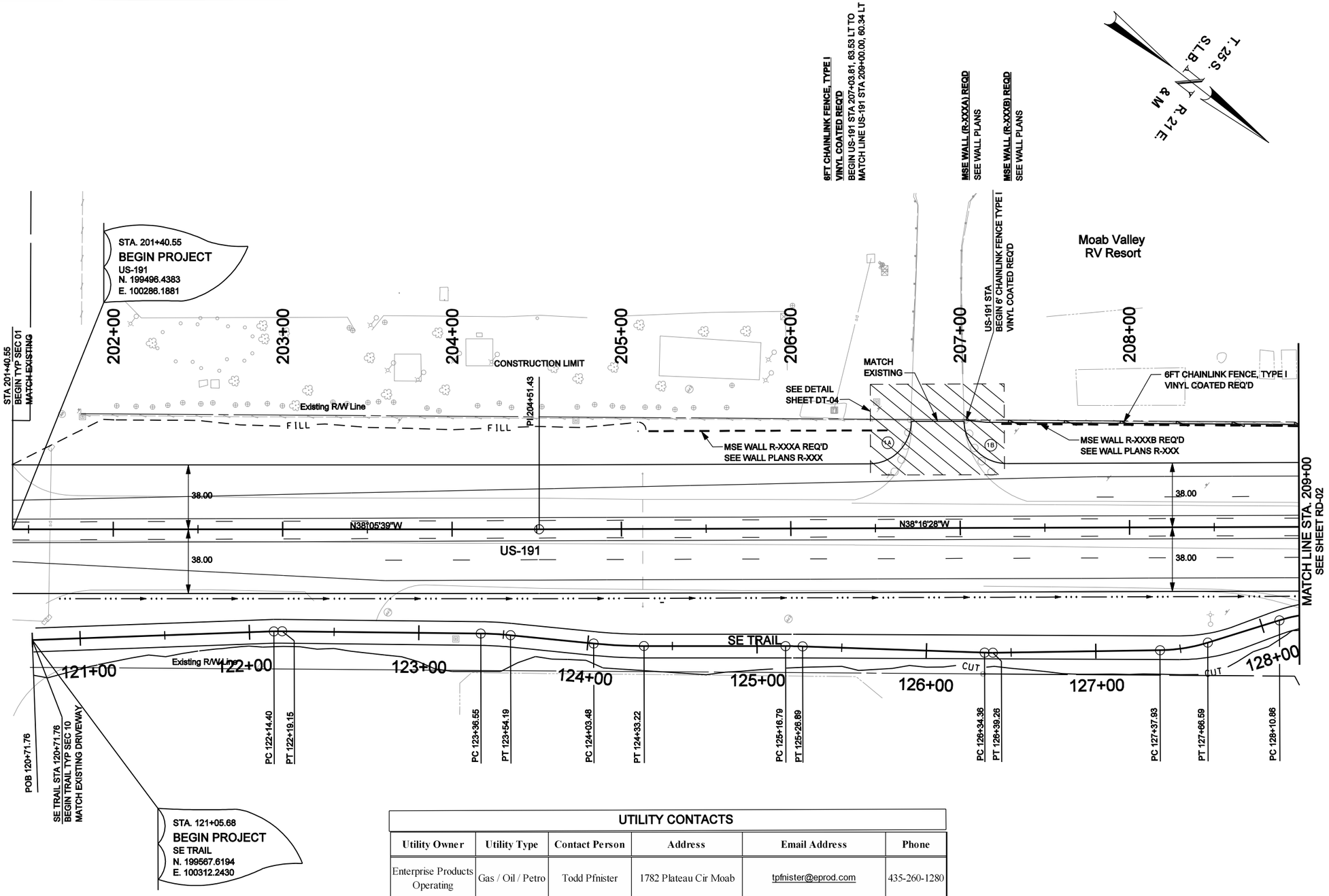
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
APPROVED
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
REMOVAL PLAN SHEET

SHEET NO. RM-07

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Removals\5365_07_RM-07.dgn



UTILITY CONTACTS

Utility Owner	Utility Type	Contact Person	Address	Email Address	Phone
Enterprise Products Operating	Gas / Oil / Petro	Todd Pfnister	1782 Plateau Cir Moab	tpfnister@eprod.com	435-260-1280
Frontier Communications	FOC / Telephone	Kim J. Healey/Bill Hull	400 West 100 North, Tremonton, UT 74337	bhull@czn.com	435-257-8125
Moab City	SD / SWR / WTR	Brent Williams	217 East Center St Moab	brent@moabcity.org	435-259-7485
Northwest Pipeline	Gas / Oil / Petro	Scott Patterson	PO box 58900 SLC	scott.c.patterson@williams.com	801-550-5047
Preciscom Cablevision	CATV	Shane Baggs	1750 South Hwy 10, Price, UT 84501	sbaggs@preciscom.com	435-820-4155
Questar	Gas	Kyle Secretan	1140 West 200 South PO Box 45360 SLC	kyle.secretan@questar.com	801-324-3970
Rocky Mountain Power	Electric	Gary Lawley	320 North 100 West Moab, UT 84532	g.lawley@pacificorp.com	435-259-3210

CURVE ID	R (EOP)	CENTER OF CURVE COORDINATES			
		STATION	OFFSET	NORTHING	EASTING
1A	25.0'	206+46.29	63.0 LT	199855.0533	99924.2265
1B	25.0'	207+27.54	63.0 LT	199918.8341	99873.9020

PRELIMINARY
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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PLAN SHEET

SHEET NO. RD-01

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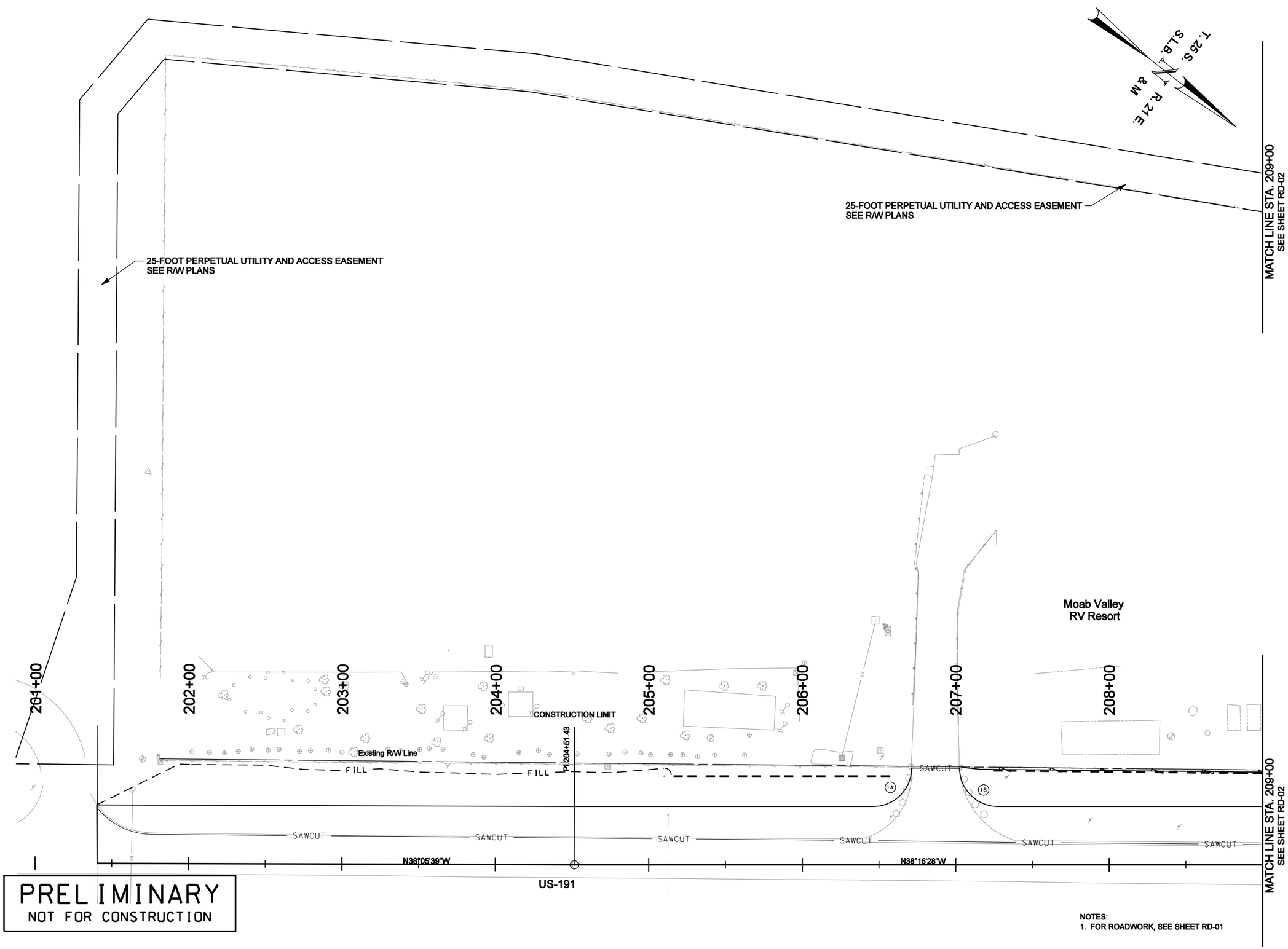

PRELIMINARY
NOT FOR CONSTRUCTION

NOTES:
1. FOR ROADWORK, SEE SHEET RD-01

REVISIONS				
NO.	DATE	APPROVED BY		REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PLAN SHEET

SHEET NO. RD-01A

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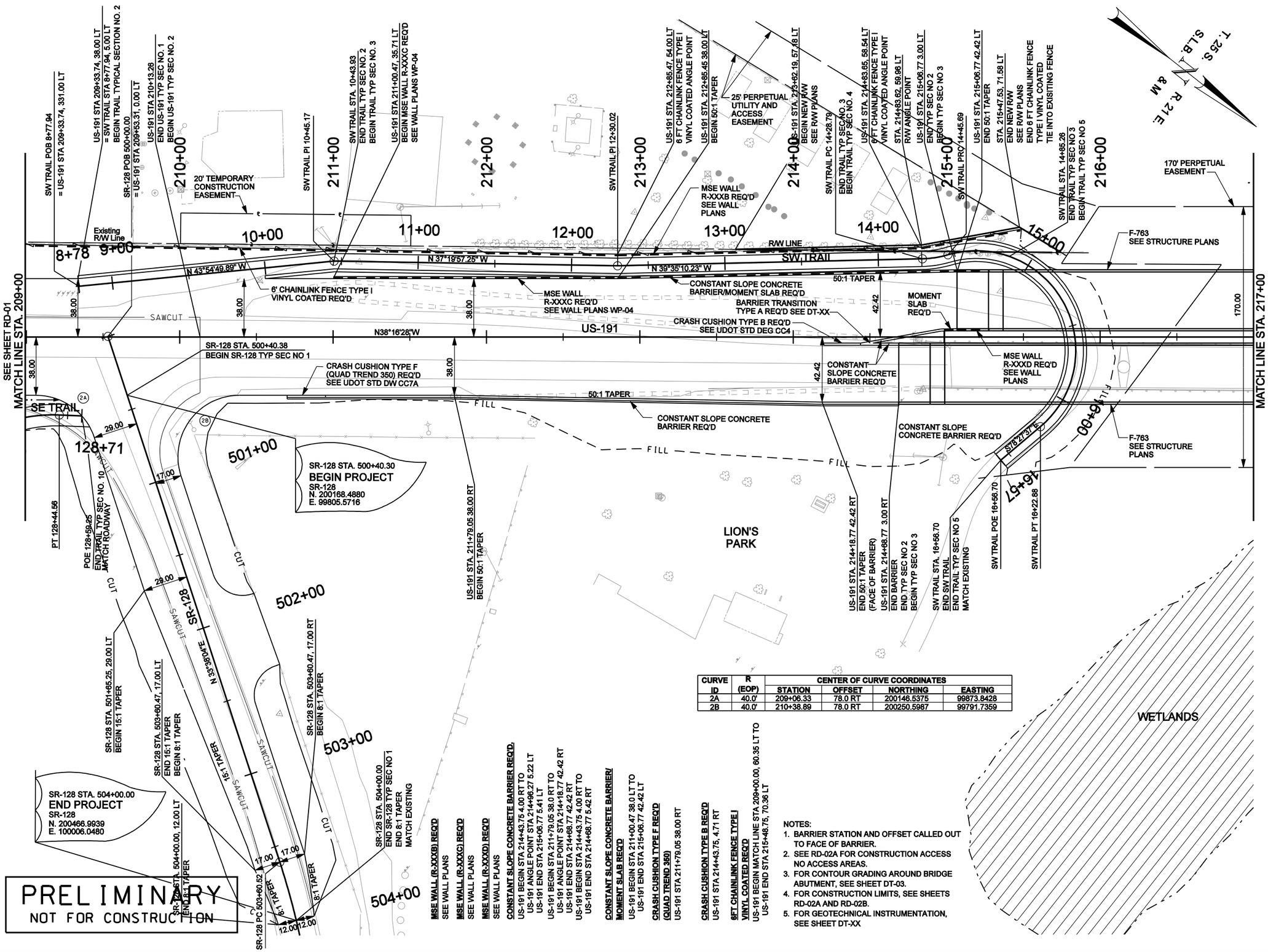
5/6/2008



CURVE ID	R (EOP)	CENTER OF CURVE COORDINATES			
		STATION	OFFSET	NORTHING	EASTING
2A	40.0'	209+06.33	78.0 RT	200146.5375	99673.8428
2B	40.0'	210+38.89	78.0 RT	200250.5987	99791.7359

MSE WALL (R-XXXB) REQ'D
SEE WALL PLANS

MSE WALL (R-XXXC) REQ'D
SEE WALL PLANS

MSE WALL (R-XXXD) REQ'D
SEE WALL PLANS

CONSTANT SLOPE CONCRETE BARRIER REQ'D.
US-191 BEGIN STA 214+43.75 4.00 RT TO
US-191 ANGLE POINT STA 214+86.27 5.22 LT
US-191 END STA 215+06.77 5.41 LT
US-191 BEGIN STA 211+79.05 38.0 RT TO
US-191 ANGLE POINT STA 214+18.77 42.42 RT
US-191 END STA 214+68.77 42.42 RT
US-191 BEGIN STA 214+43.75 4.00 RT TO
US-191 END STA 214+68.77 5.42 RT

CONSTANT SLOPE CONCRETE BARRIER/ MOMENT SLAB REQ'D
US-191 BEGIN STA 211+00.47 38.0 LT TO
US-191 END STA 215+06.77 42.42 LT

CRASH CUSHION TYPE F REQ'D (QUAD TREND 350)
US-191 STA 211+79.05 38.00 RT

CRASH CUSHION TYPE B REQ'D
US-191 STA 214+43.75, 4.71 RT

6FT CHAINLINK FENCE TYPE I VINYL COATED REQ'D
US-191 BEGIN MATCH LINE STA 209+00.00, 60.35 LT TO
US-191 END STA 215+48.75, 70.36 LT

NOTES:
1. BARRIER STATION AND OFFSET CALLED OUT TO FACE OF BARRIER.
2. SEE RD-02A FOR CONSTRUCTION ACCESS NO ACCESS AREAS.
3. FOR CONTOUR GRADING AROUND BRIDGE ABUTMENT, SEE SHEET DT-03.
4. FOR CONSTRUCTION LIMITS, SEE SHEETS RD-02A AND RD-02B.
5. FOR GEOTECHNICAL INSTRUMENTATION, SEE SHEET DT-XX

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE

APPROVED

PROFESSIONAL ENGINEER

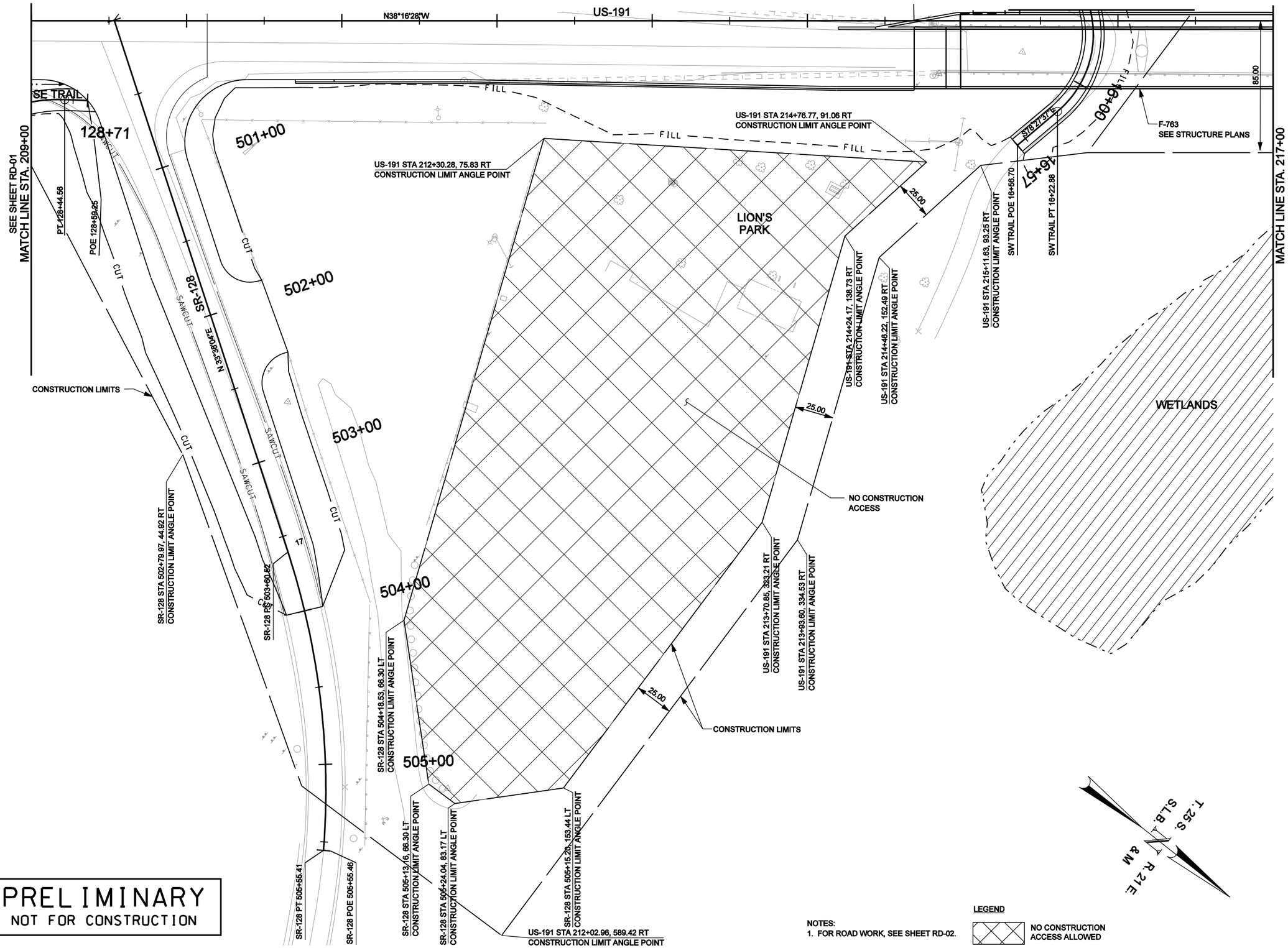
PROJECT: US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

ROADWAY PLAN SHEET

SHEET NO. RD-02

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Roadway_Design\5365_07_RD-02.dgn



NOTES:
1. FOR ROAD WORK, SEE SHEET RD-02.

LEGEND
NO CONSTRUCTION ACCESS ALLOWED

5/6/2008 \\fasic03\25507-slc-colorado_bridge\5365_07\sheet_files\Roadway_Design\5365_07_RD-02A.dgn

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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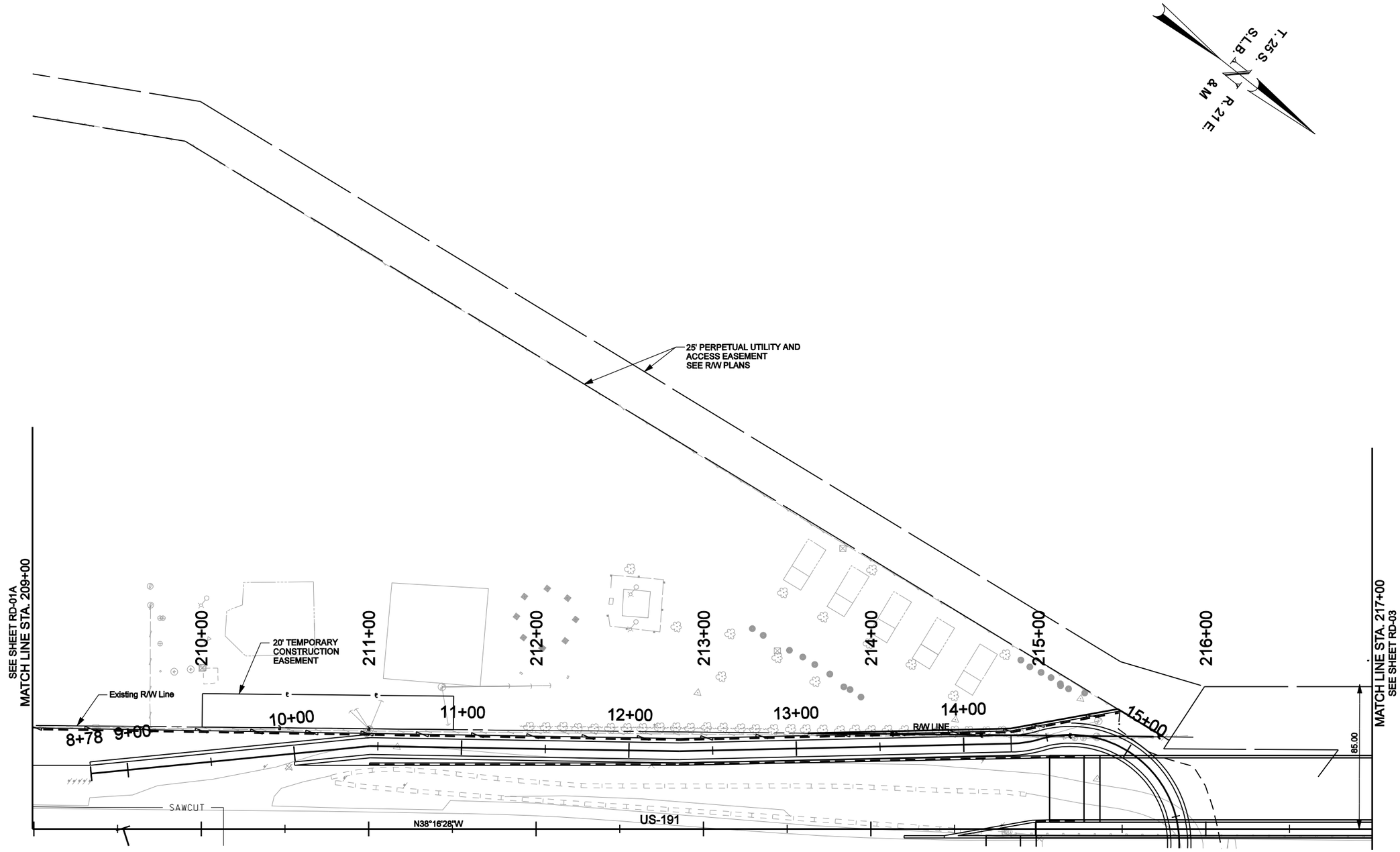
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PLAN SHEET

SHEET NO. RD-02A



PRELIMINARY
NOT FOR CONSTRUCTION

NOTES:
1. FOR ROAD WORK, SEE SHEET RD-02.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PLAN SHEET

SHEET NO. RD-02B

5/6/2008
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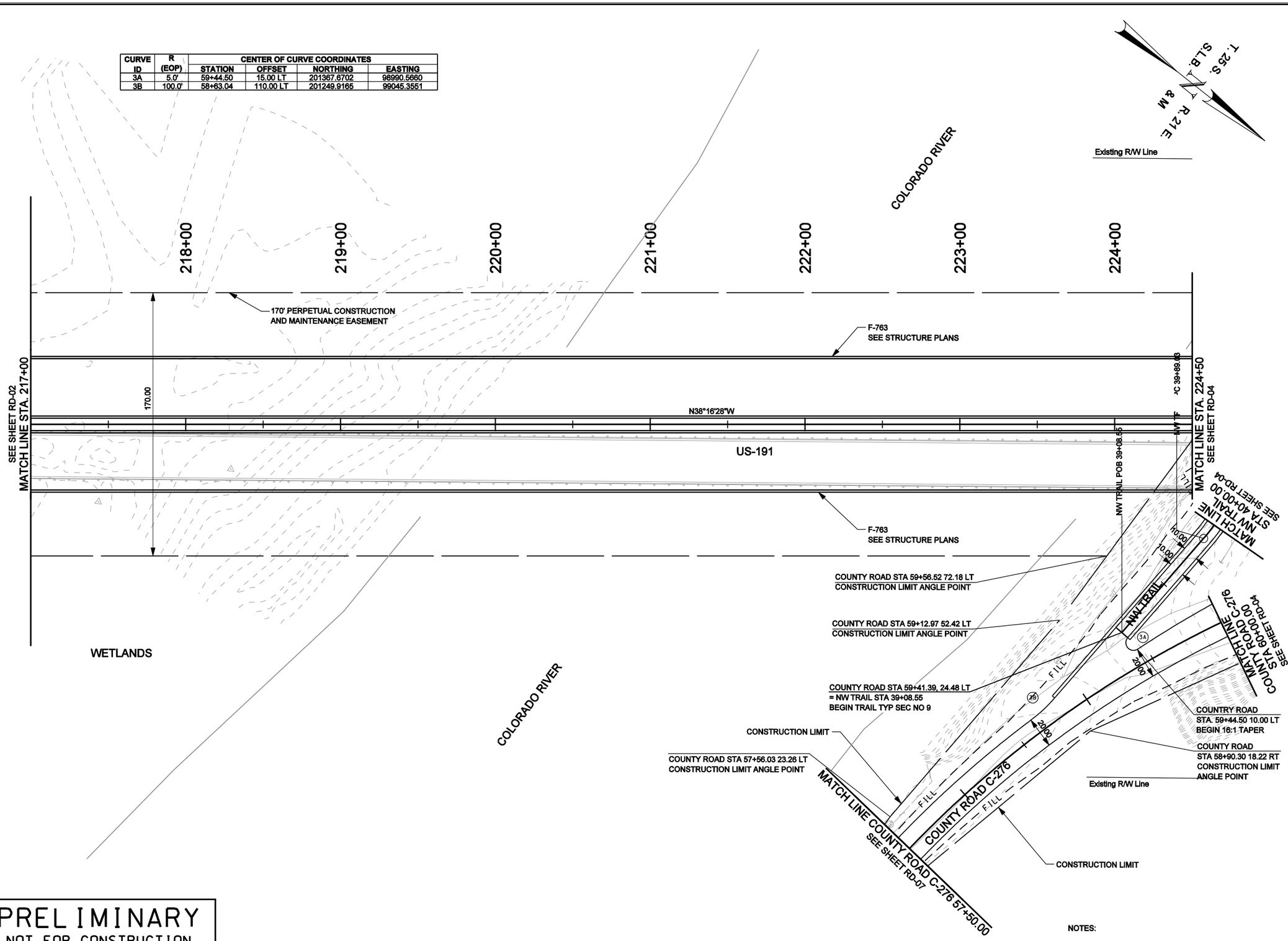
CURVE ID	R (EOP)	CENTER OF CURVE COORDINATES			
		STATION	OFFSET	NORTHING	EASTING
3A	5.0'	59+44.50	15.00 LT	201367.6702	98990.5660
3B	100.0'	58+63.04	110.00 LT	201249.9165	99045.3551



PRELIMINARY
NOT FOR CONSTRUCTION

NOTES:

1. CENTER OF CURVE COORDINATES ARE REFERENCED FROM COUNTY ROAD ALIGNMENT.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

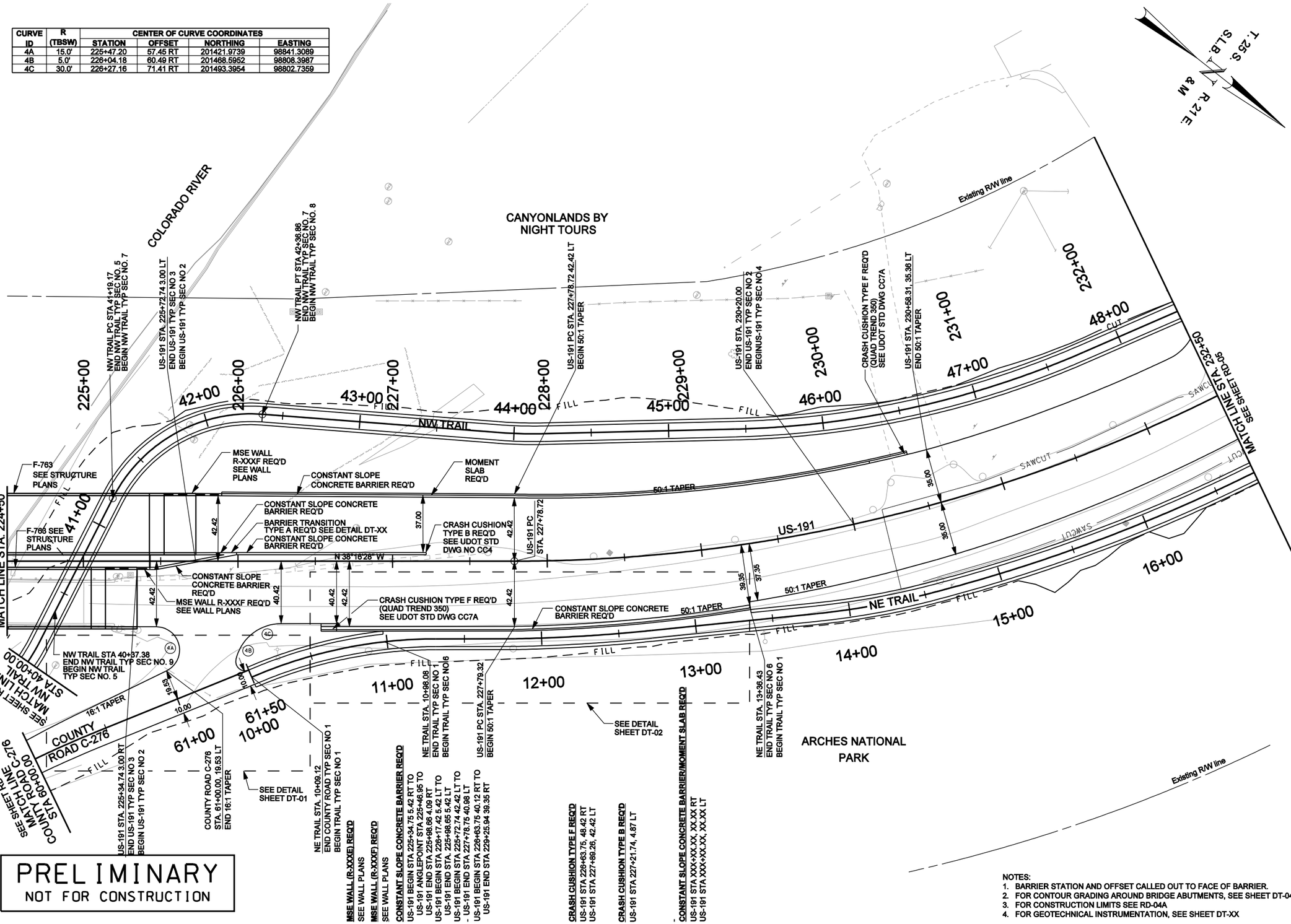
PROJECT NUMBER: BRF-0191(58)129

ROADWAY PLAN SHEET

SHEET NO. RD-03

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Roadway_Design\5365_07_RD-03.dgn

CURVE ID	R (TBSW)	CENTER OF CURVE COORDINATES			
		STATION	OFFSET	NORTHING	EASTING
4A	15.0'	225+47.20	57.45 RT	201421.9739	98841.3089
4B	5.0'	226+04.18	60.49 RT	201468.5952	98808.3987
4C	30.0'	226+27.16	71.41 RT	201493.3954	98802.7359



PRELIMINARY
NOT FOR CONSTRUCTION

NOTES:
1. BARRIER STATION AND OFFSET CALLED OUT TO FACE OF BARRIER.
2. FOR CONTOUR GRADING AROUND BRIDGE ABUTMENTS, SEE SHEET DT-04
3. FOR CONSTRUCTION LIMITS SEE RD-04A
4. FOR GEOTECHNICAL INSTRUMENTATION, SEE SHEET DT-XX

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
QC CHECKED BY
DATE
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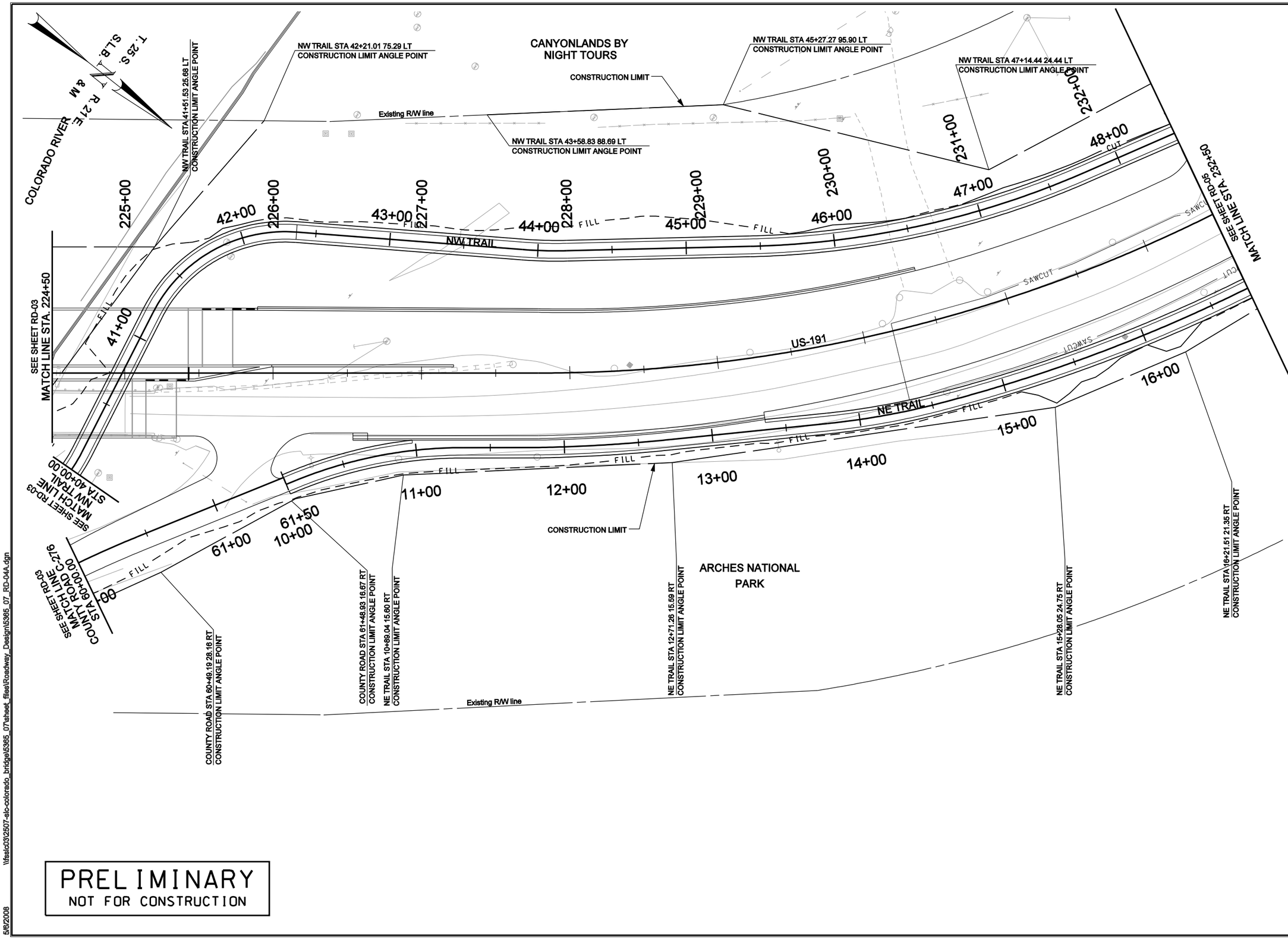
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PLAN SHEET
SHEET NO. RD-04

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Roadway_Design\5365_07_RD-04.dgn



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REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH

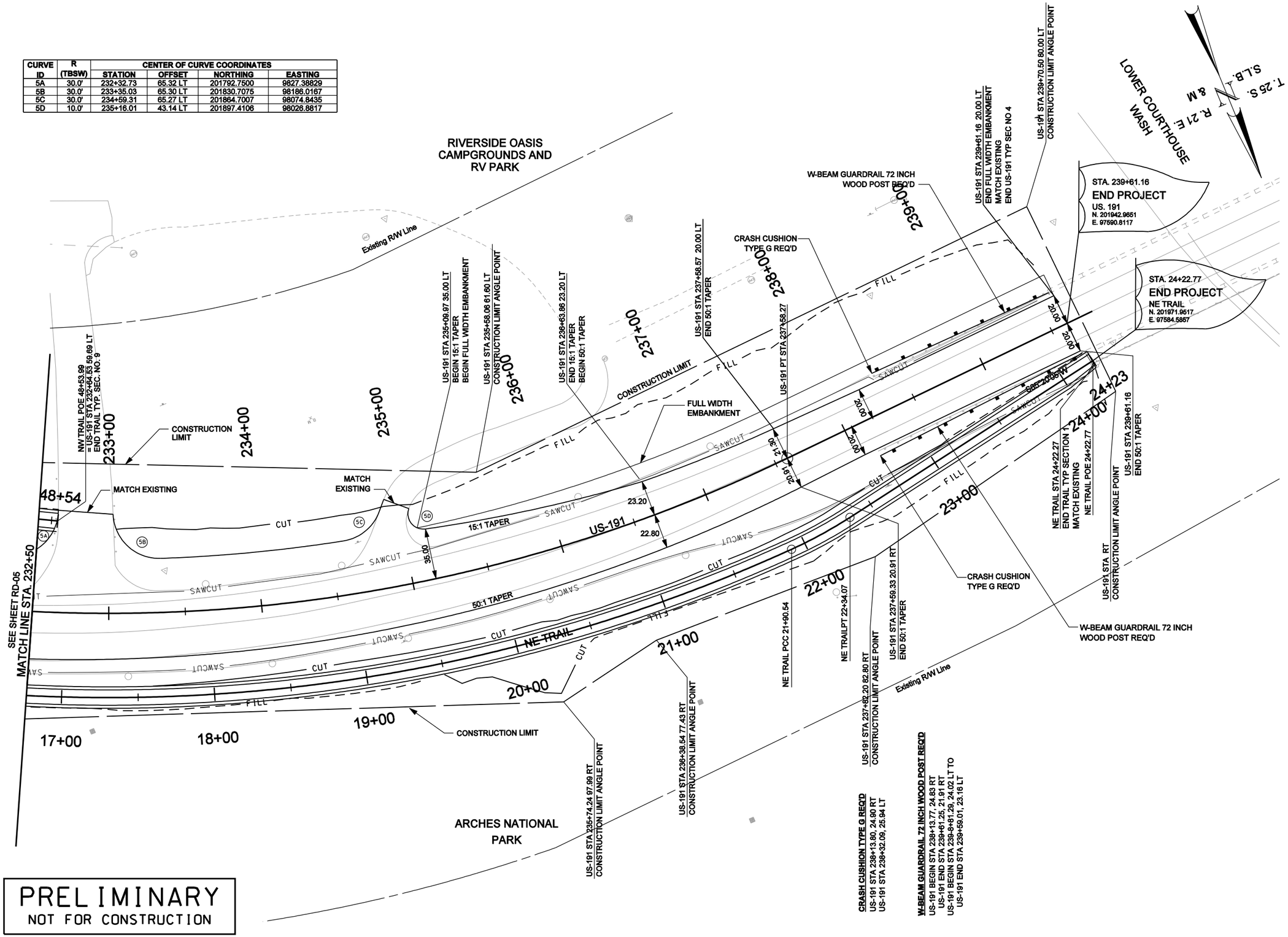
PROJECT NUMBER: BRF-0191(58)129

ROADWAY PLAN SHEET

SHEET NO. RD-04A

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Roadway_Design\5365_07_RD-04A.dgn

CURVE ID	R (TBSW)	CENTER OF CURVE COORDINATES			
		STATION	OFFSET	NORTHING	EASTING
5A	30.0'	232+32.73	65.32 LT	201792.7500	9827.38829
5B	30.0'	233+35.03	65.30 LT	201830.7075	98186.0167
5C	30.0'	234+59.31	65.27 LT	201864.7007	98074.8435
5D	10.0'	235+16.01	43.14 LT	201897.4106	98026.8817



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REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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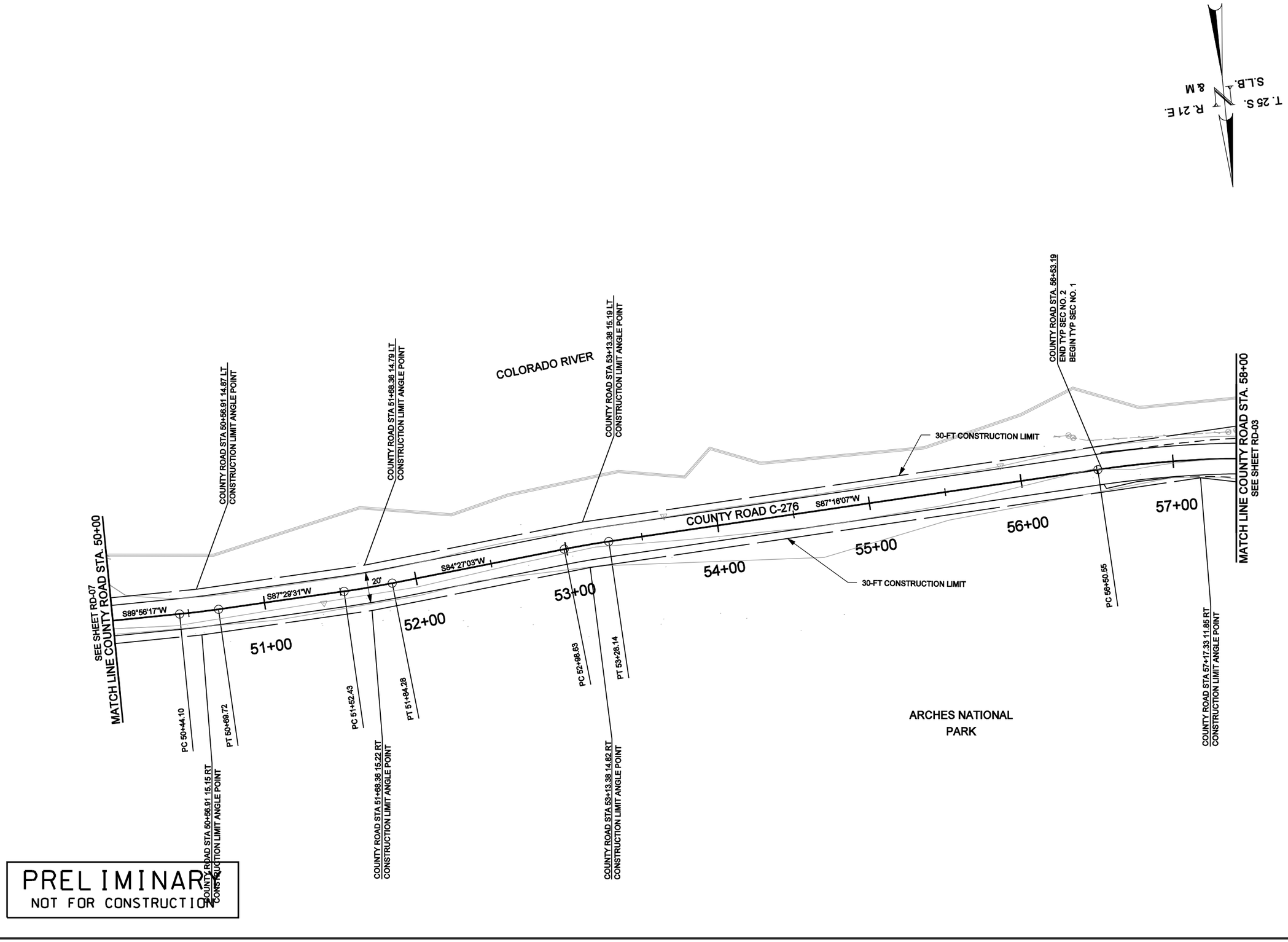
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PLAN SHEET

SHEET NO. RD-05

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Roadway_Design\5365_07_RD-05.dgn



REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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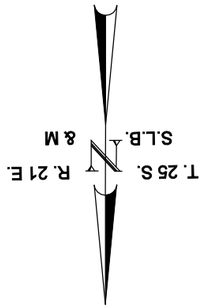
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH

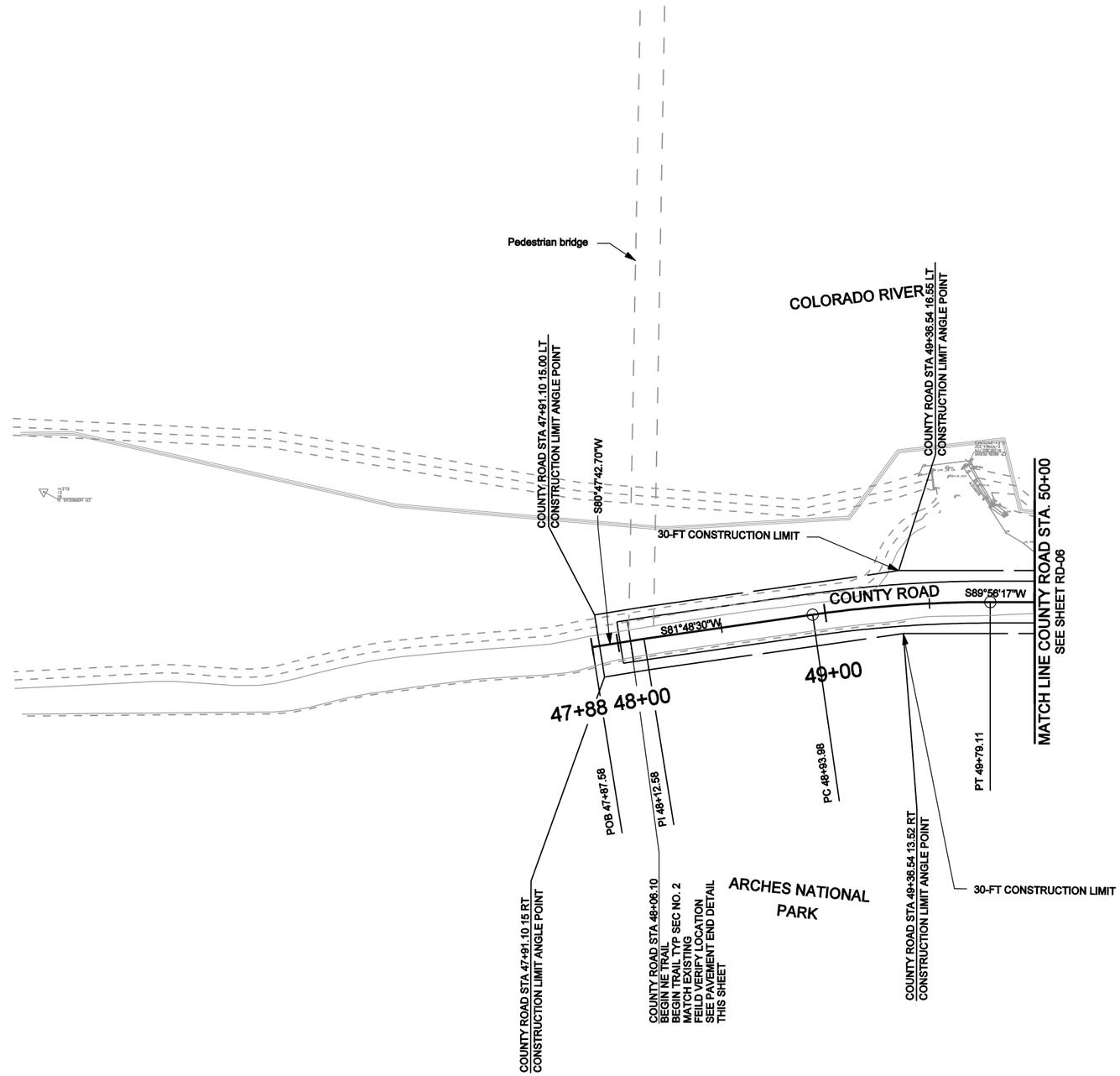
PROJECT NUMBER: BRF-0191(58)129

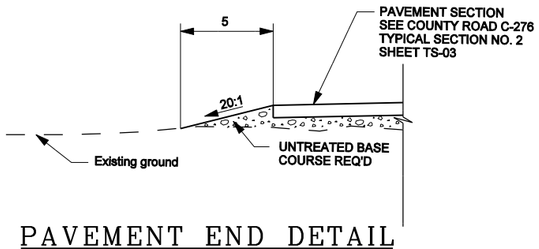
ROADWAY PLAN SHEET

SHEET NO. RD-06

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Roadway_Design\5365_07_RD-06.dgn







PAVEMENT END DETAIL

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REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PLAN SHEET

SHEET NO. RD-07

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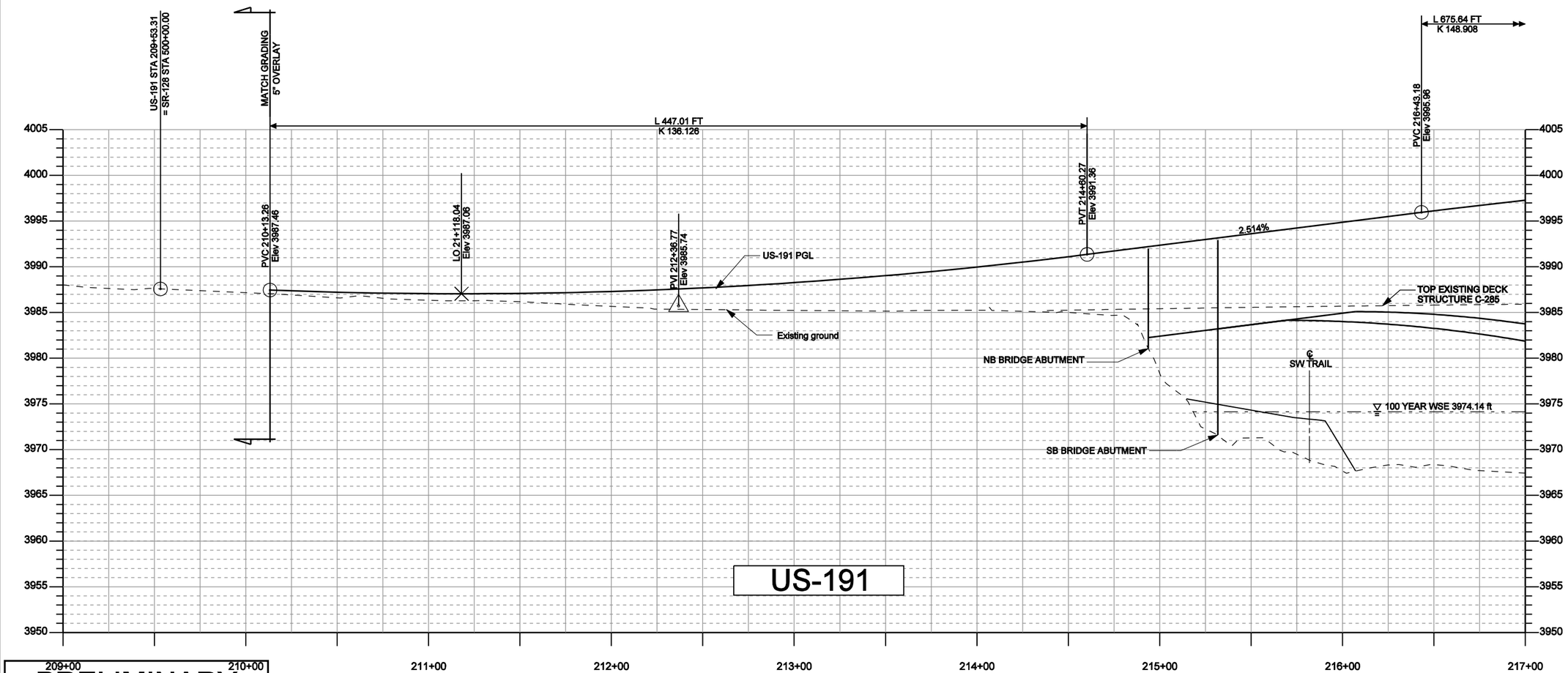
5/6/2008



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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY
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12/11/2007
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PROFILE

SHEET NO. RP-01

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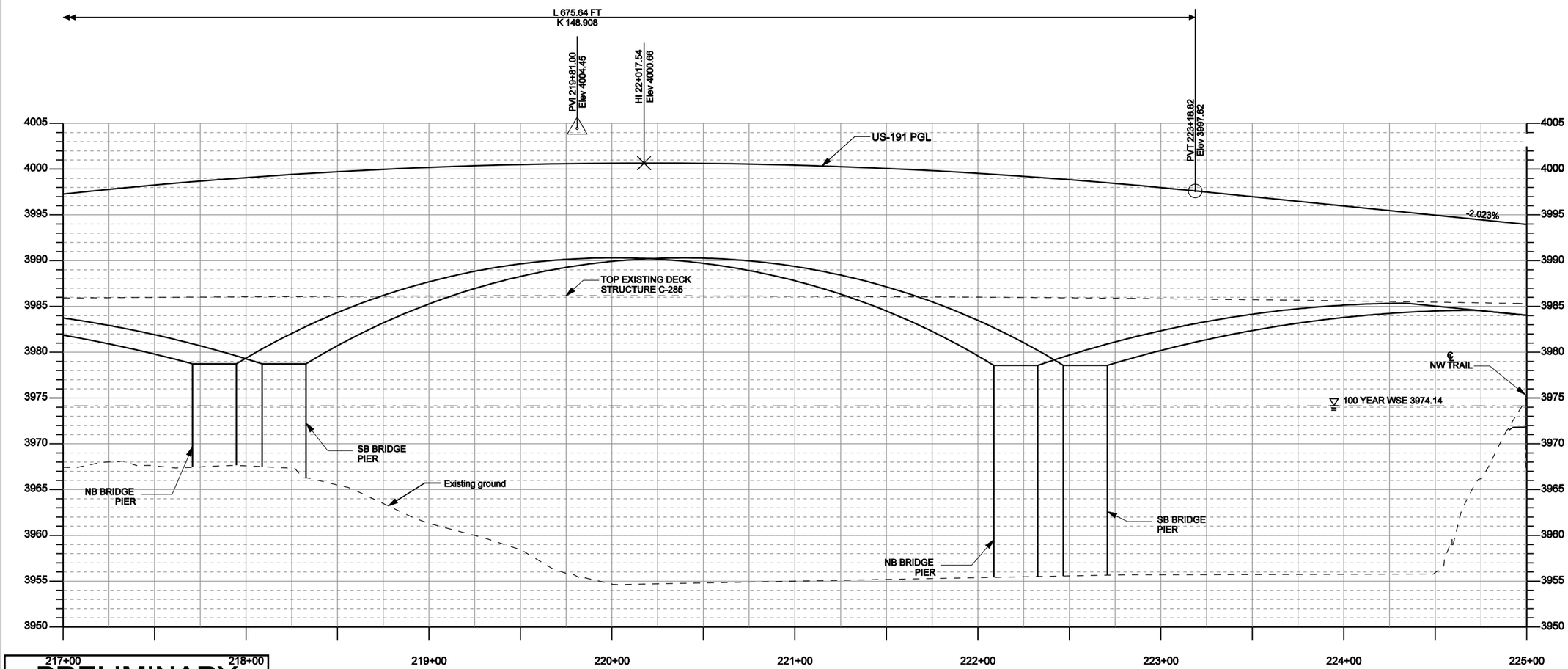

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US-191

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
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PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PROFILE

SHEET NO. RP-02

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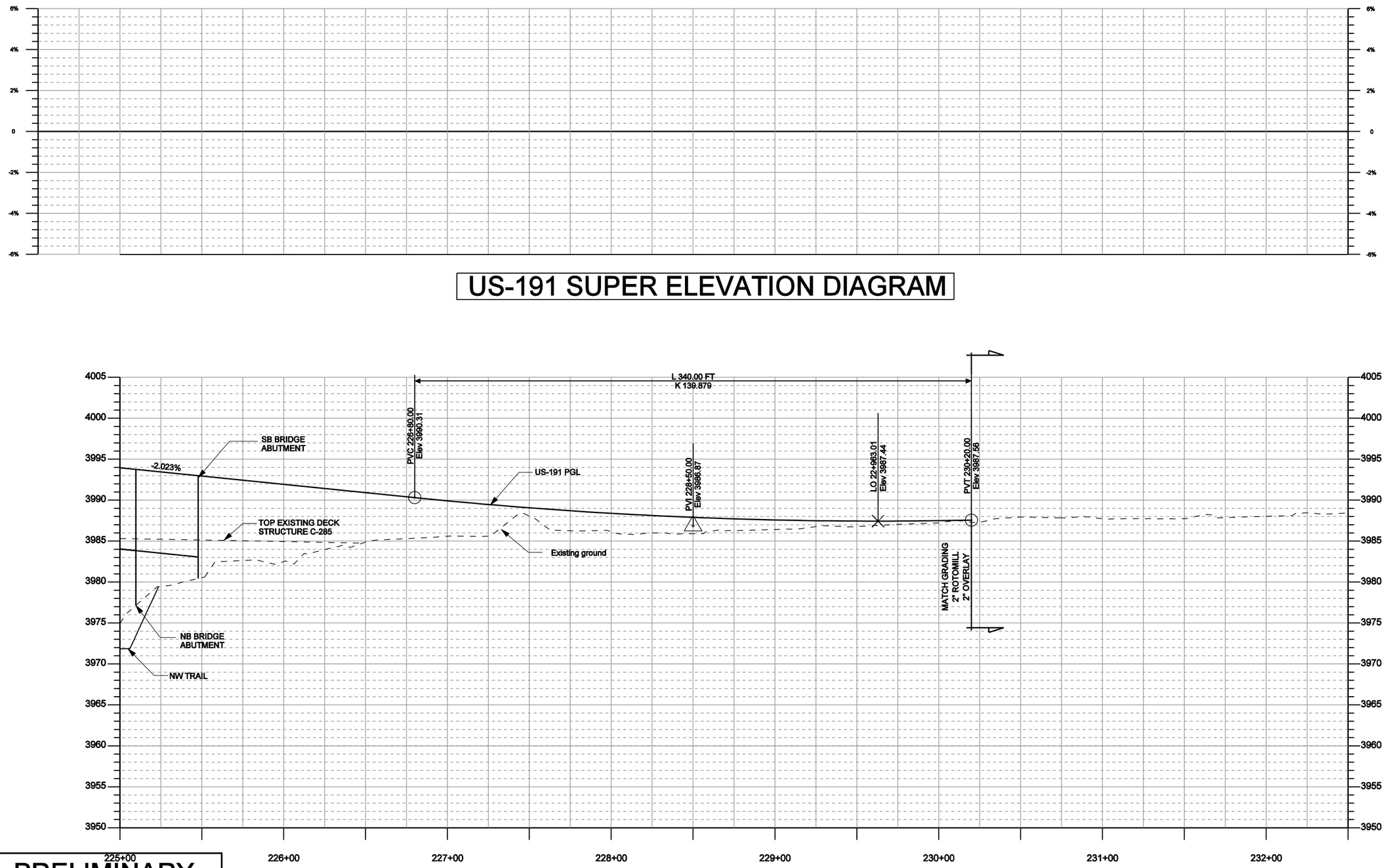
5/6/2008



US-191 SUPER ELEVATION DIAGRAM

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US-191

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
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PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PROFILE

SHEET NO. RP-03

5/6/2008
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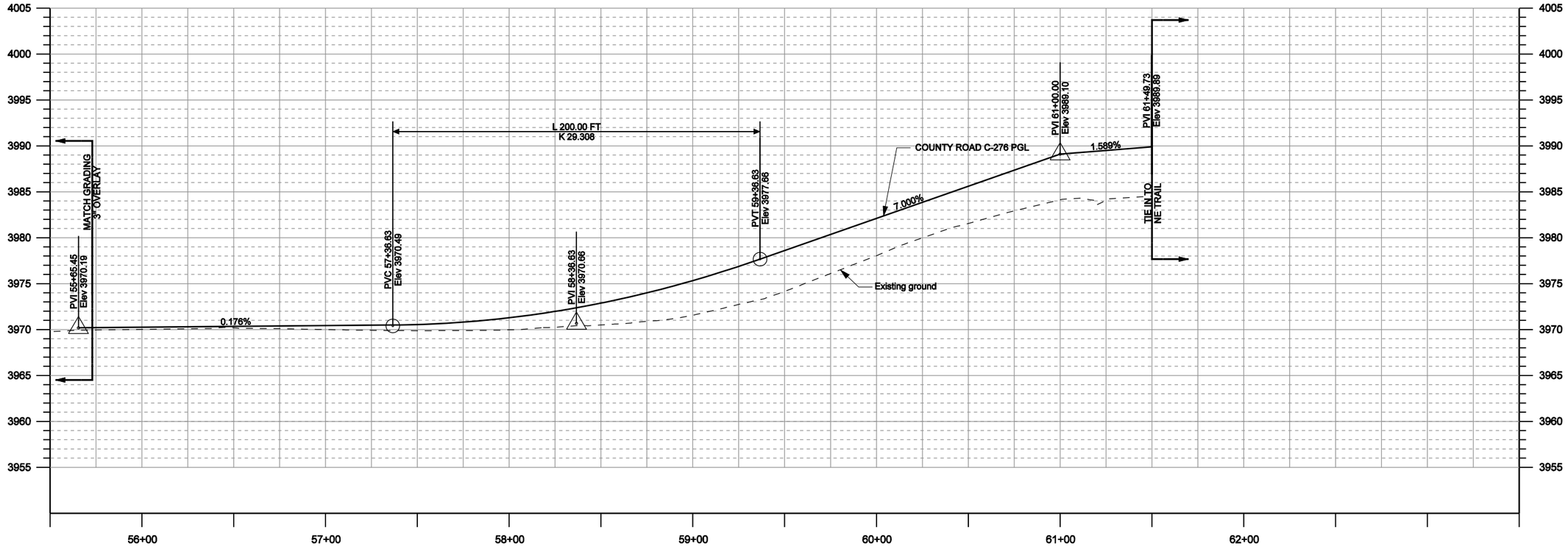

COUNTY ROAD C-276

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NO.	DATE	APPROVED BY	REMARKS

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UTAH DEPARTMENT OF TRANSPORTATION
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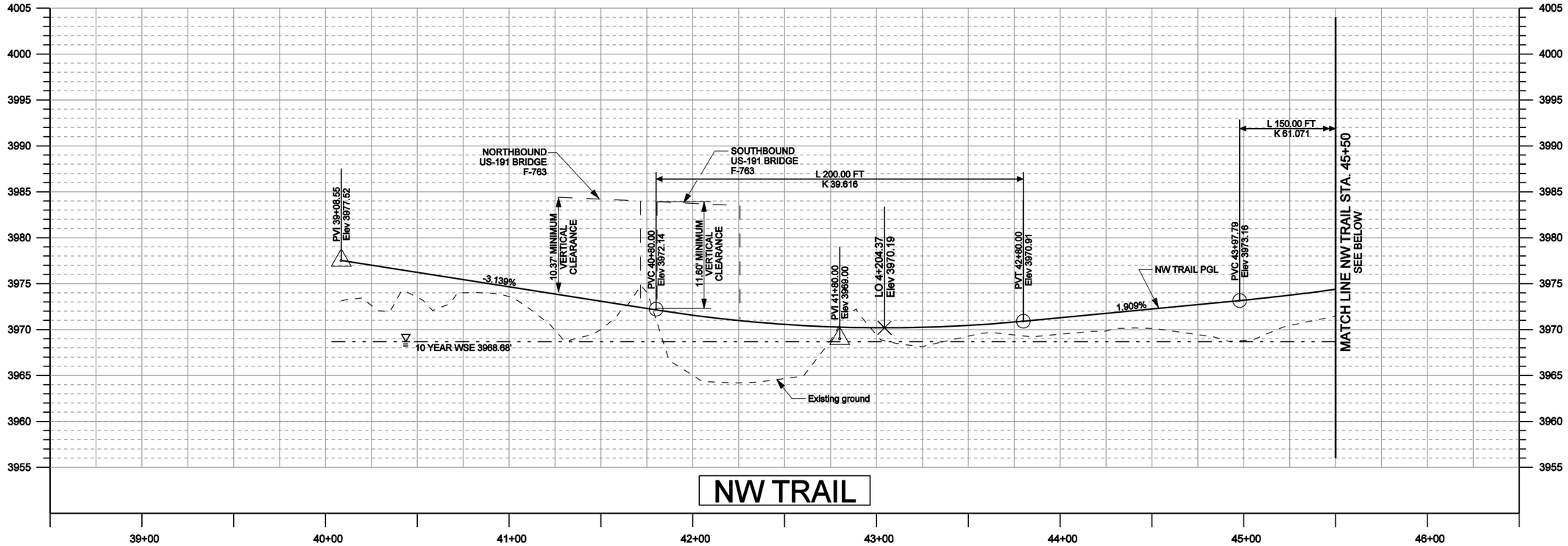
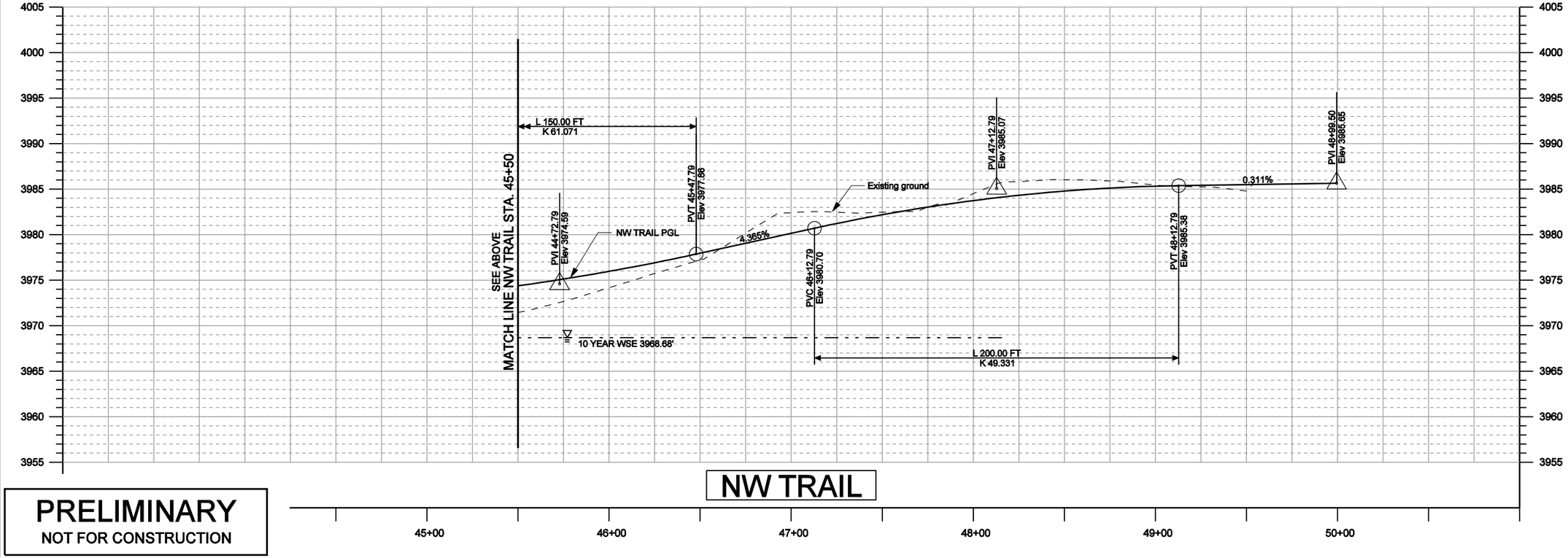
PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
ROADWAY PROFILE

SHEET NO. RP-04

5/6/2008 \\fsslc03\2507-slc-colorado-bridge\5365.07\sheet_files\Roadway_Design\5365_07_RP-04.dgn





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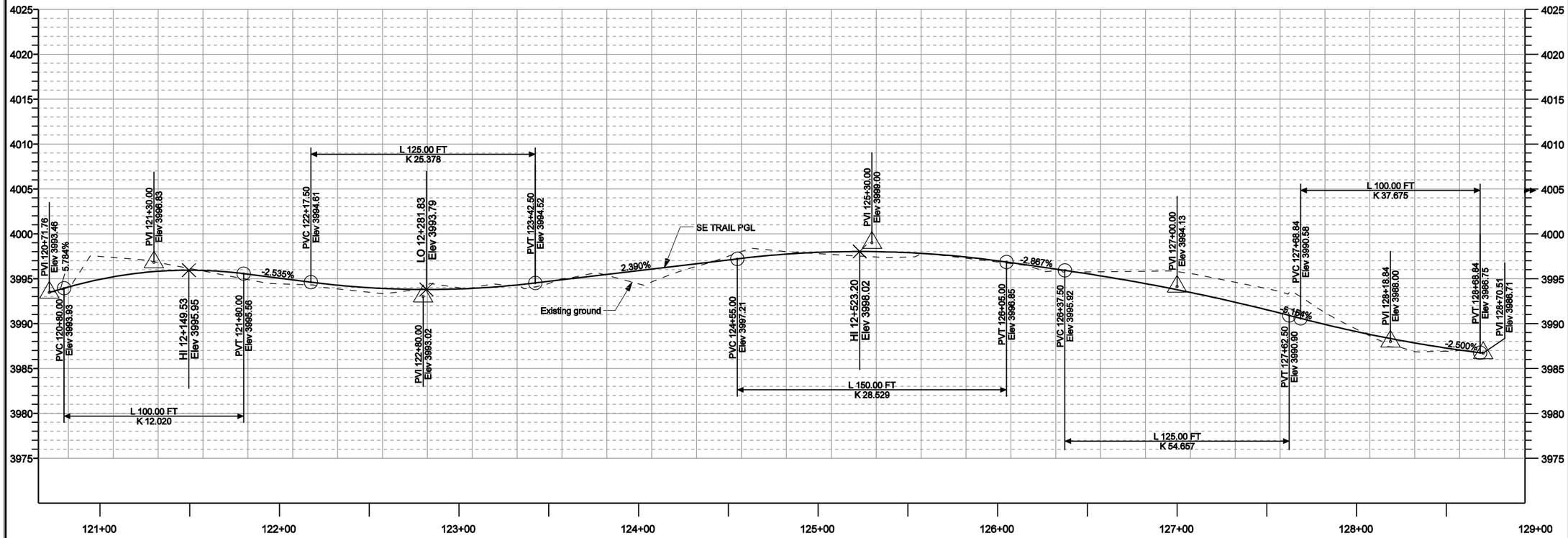
PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
TRAIL PROFILE
SHEET NO. TP-01

5/6/2008 \\fsslc03\2507-slc-colorado-bridge\5365.07\sheet_files\Roadway_Design\5365.07_TP-01.dgn



SE TRAIL

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ROADWAY DESIGN

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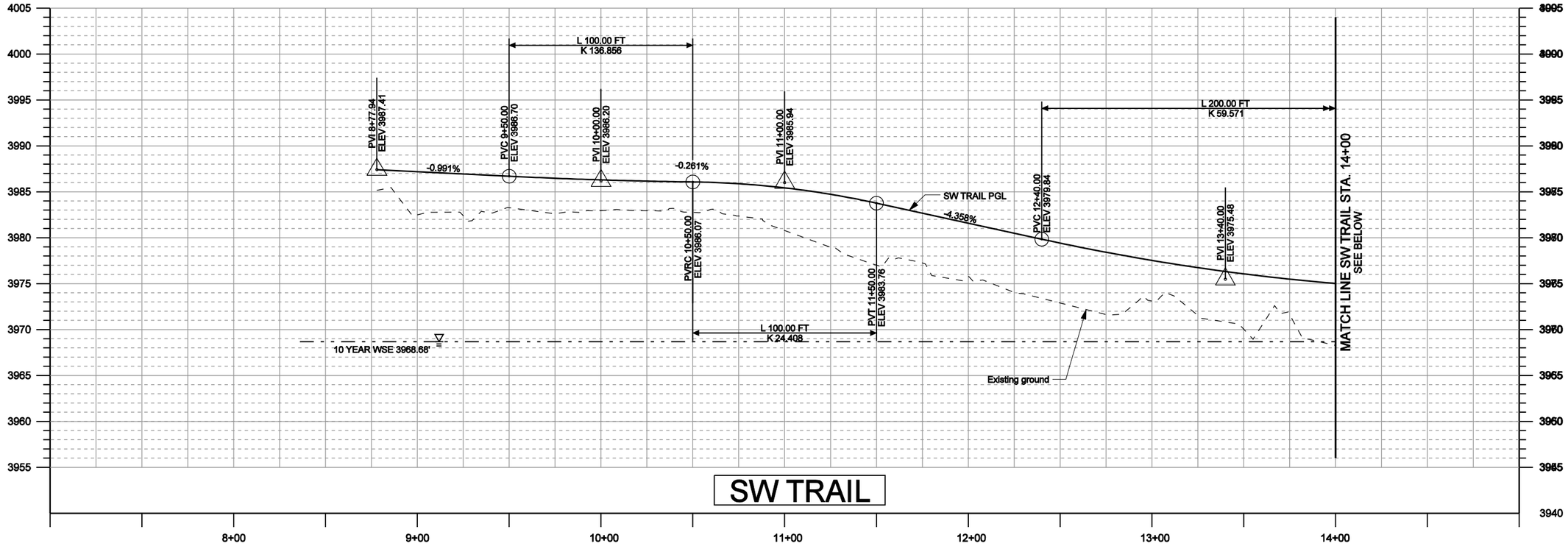
PROFESSIONAL ENGINEER

PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

TRAIL PROFILE

SHEET NO. TP-02



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ROADWAY DESIGN

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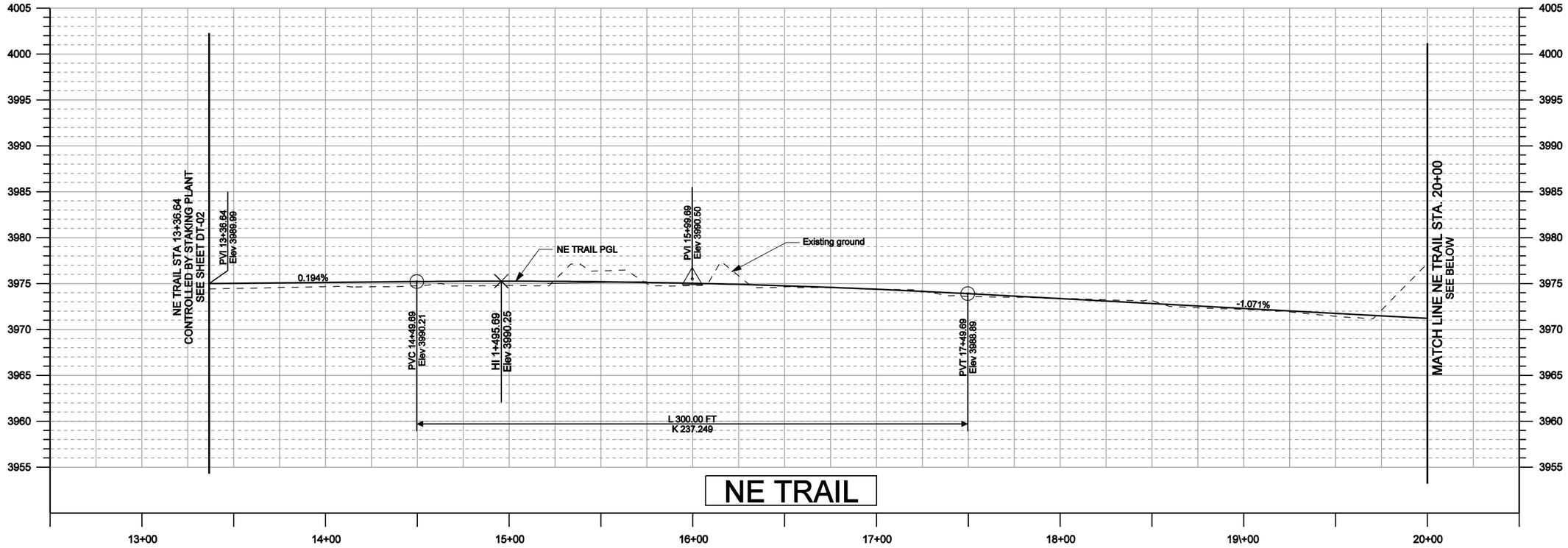
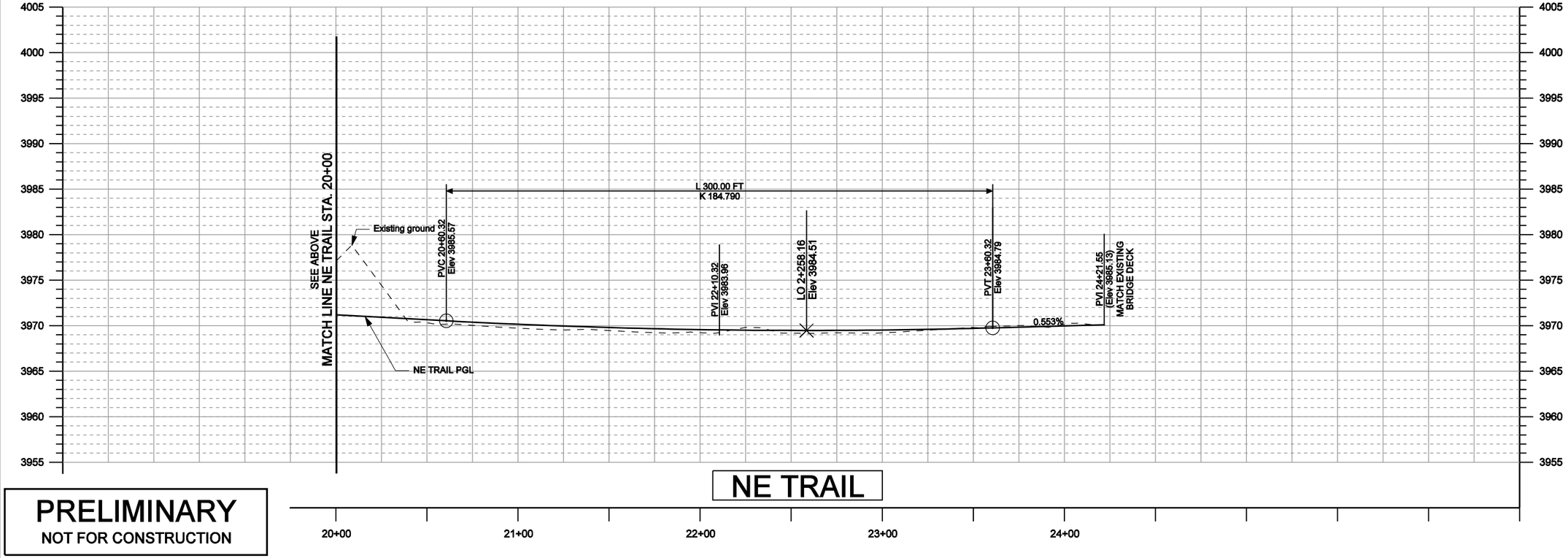
PROFESSIONAL ENGINEER

PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
TRAIL PROFILE

SHEET NO. TP-03

5/6/2008 \\fsslc03\2507-slc-colorado-bridge\5365.07\sheet_files\Roadway_Design\5365.07-TP-03.dgn





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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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PROJECT: US-191;OVER COLORADO RIVER BRIDGE-MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
TRAIL PROFILE

SHEET NO. TP-04

5/6/2008 \\fsslc03\2507-slc-colorado-bridge\5365.07\sheet_files\Roadway_Design\5365.07_TP-04.dgn

UTILITY CONTACTS

Utility Owner	Utility Type	Contact Person	Address	Email Address	Phone
Enterprise Products Operating	Gas / Oil / Petro	Todd Pfnister	1782 Plateau Cir Moab	tpfnister@eprod.com	435-260-1280
Frontier Communications	FOC / Telephone	Kim J. Healey/Bill Hull	400 West 100 North, Tremonton, UT 74337	bhull@czn.com	435-257-8125
Moab City	SD / SWR / WTR	Brent Williams	217 East Center St Moab	brent@moabcity.org	435-259-7485
Northwest Pipeline	Gas / Oil / Petro	Scott Patterson	PO box 58900 SLC	scott.c.patterson@williams.com	801-550-5047
Preciscom Cablevision	CATV	Shane Baggs	1750 South Hwy 10, Price, UT 84501	sbaggs@preciscom.com	435-820-4155
Questar	Gas	Kyle Secretan	1140 West 200 South PO Box 45360 SLC	kyle.secretan@questar.com	801-324-3970
Rocky Mountain Power	Electric	Gary Lawley	320 North 100 West Moab, UT 84532	g.lawley@pacificorp.com	435-259-3210

UTILITY LEGEND

Existing Fiber Optic	fo
Existing Telephone Buried	btel
Existing Gas	g
Existing Overhead Power	e
Existing Sewer	swr
Existing Storm Drain	sd
Existing Under Drain	ud
Existing Water	wtr
Existing Irrigation	ir

SYMBOLS LEGEND

- GAS METER
- DROP INLET
- STORM DRAIN MANHOLE
- SAN. SEWER MANHOLE
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- GUY ANCHOR
- LIGHT POLE
- POWER POLE
- POWER TRANSFORMER
- JUNCTION BOX
- SIGNAL CONTROLLER
- SIGNAL POLE
- MANHOLE WATER
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- POTHOLE LOCATION

QUALITY LEVEL DISCLAIMER

All lines that are labeled as QL-D were derived from maps that were acquired from utility companies. All QL-D labeled lines are noted with such label and are estimated as to their exact location and should be considered as such. All lines that are labeled as QL-C were derived from point to point surface features and are a direct line shot between those features.
For exact locations of all subsurface lines test holes should be performed to acquire that data. Depths shown on test holes are only accurate at that location.

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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
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PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
UTILITY CONTACT SHEET

SHEET NO. UT-00

S.U.E. TEST HOLE DATA

Test Hole Number	Location	Date	Type of Utility	Utility Size	Material of Utility	Cross Section	Utility Owner	Point ID Number	Northing	Easting	Existing Ground Elevation	Field Depth	Elevation (Top of Utility)	Surface Type Ground/Paving/Concrete	Surface Thickness	Depth of Water	General Soil Type
1	US 191	2/14/2008	Phone	3"	PVC		Frontier Communications	TBE 1	199718.525	100114.153	3991.90	6.51	3985.39	ASPHALT	6"	N/A	SANDY
2	CANCELLED PER CLIENT																
3	CANCELLED PER CLIENT																
4	DUG ON TEST HOLE AT 2 LOCATIONS - UNABLE TO LOCATE LINE DUE TO ROCKY TERRAIN																
5	US 191	2/14/2008	Phone	1"	DBC		Frontier Communications	TBE 5	201843.341	98214.169	3985.21	3.75	3981.46	NATURAL GROUND	N/A	N/A	ROCKY
6	US 191	2/14/2008	Fiber Optic	2"	PVC		Frontier Communications	TBE 6	201841.776	98213.515	3985.29	3.67	3981.62	NATURAL GROUND	N/A	N/A	ROCKY
7	US 191	2/14/2008	Fiber Optic	(1) .5" (1).25"	DBC		Frontier Communications	TBE 7	201456.967	98633.700	3970.20	3.90	3966.30	NATURAL GROUND	N/A	N/A	SOFT

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UTAH DEPARTMENT OF TRANSPORTATION
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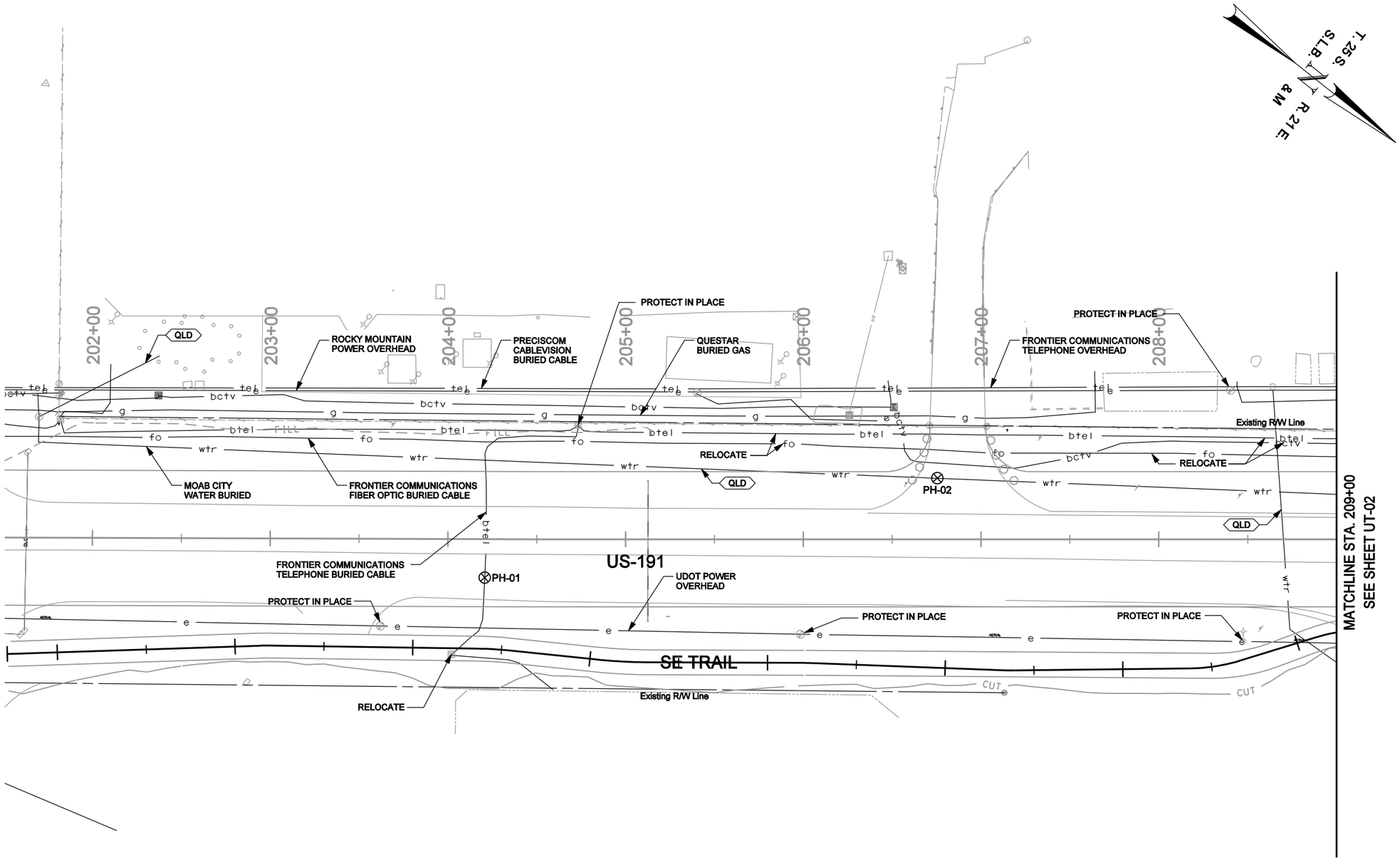
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
S.U.E. TEST HOLE DATA

SHEET NO. UT-00A



LEGEND

⊗ PH-xx	POTHOLE LOCATION AND I.D.
QLD	QUALITY LEVEL DESIGNATOR SEE NOTE 1

NOTES:

1. UTILITIES SHOWN ARE PLOTTED TO A QUALITY LEVEL B, UNLESS NOTED OTHERWISE. SEE UT-00 FOR QUALITY LEVEL DISCLAIMER. SEE UT-00A FOR S.U.E. TEST HOLE DATA.
2. SEE REMOVAL SHEETS RM-01 THROUGH RM-07 FOR ADDITIONAL REMOVAL, PROTECT-IN-PLACE AND ABANDON INFORMATION.
3. CALL BLUE STAKES AT 811 OR 800-662-4111 TWO WORKING DAYS BEFORE CONSTRUCTION IS SCHEDULED TO BEGIN.

PRELIMINARY
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REVISIONS

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APPROVED

PROFESSIONAL ENGINEER

US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

PROJECT
PROJECT NUMBER BRF-0191(58)129

UTILITY PLAN SHEET

SHEET NO. UT-01

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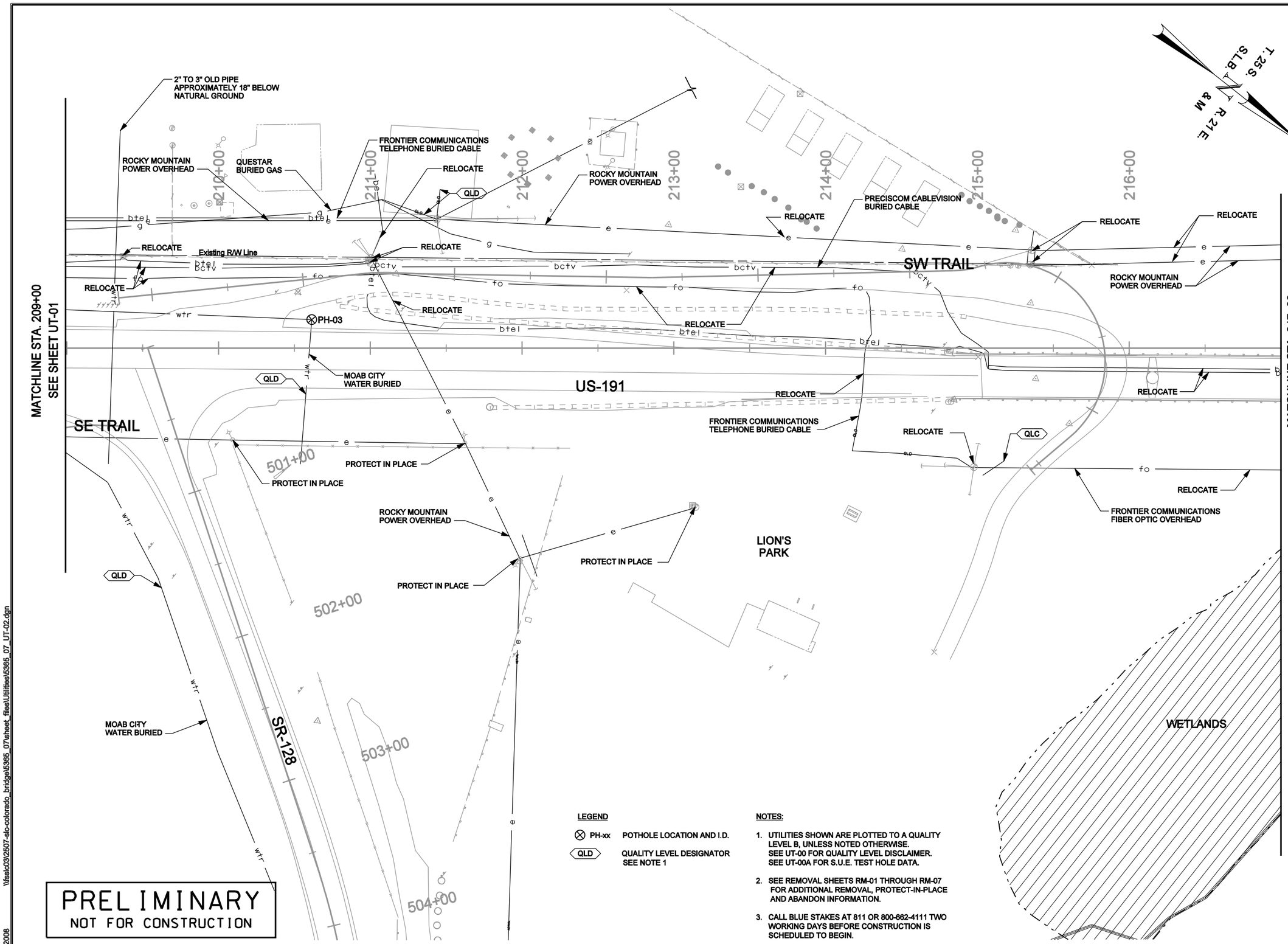
5/6/2008



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LEGEND

⊗ PH-xx	POTHOLE LOCATION AND I.D.
QLD	QUALITY LEVEL DESIGNATOR SEE NOTE 1

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PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
UTILITY PLAN SHEET

SHEET NO. UT-02

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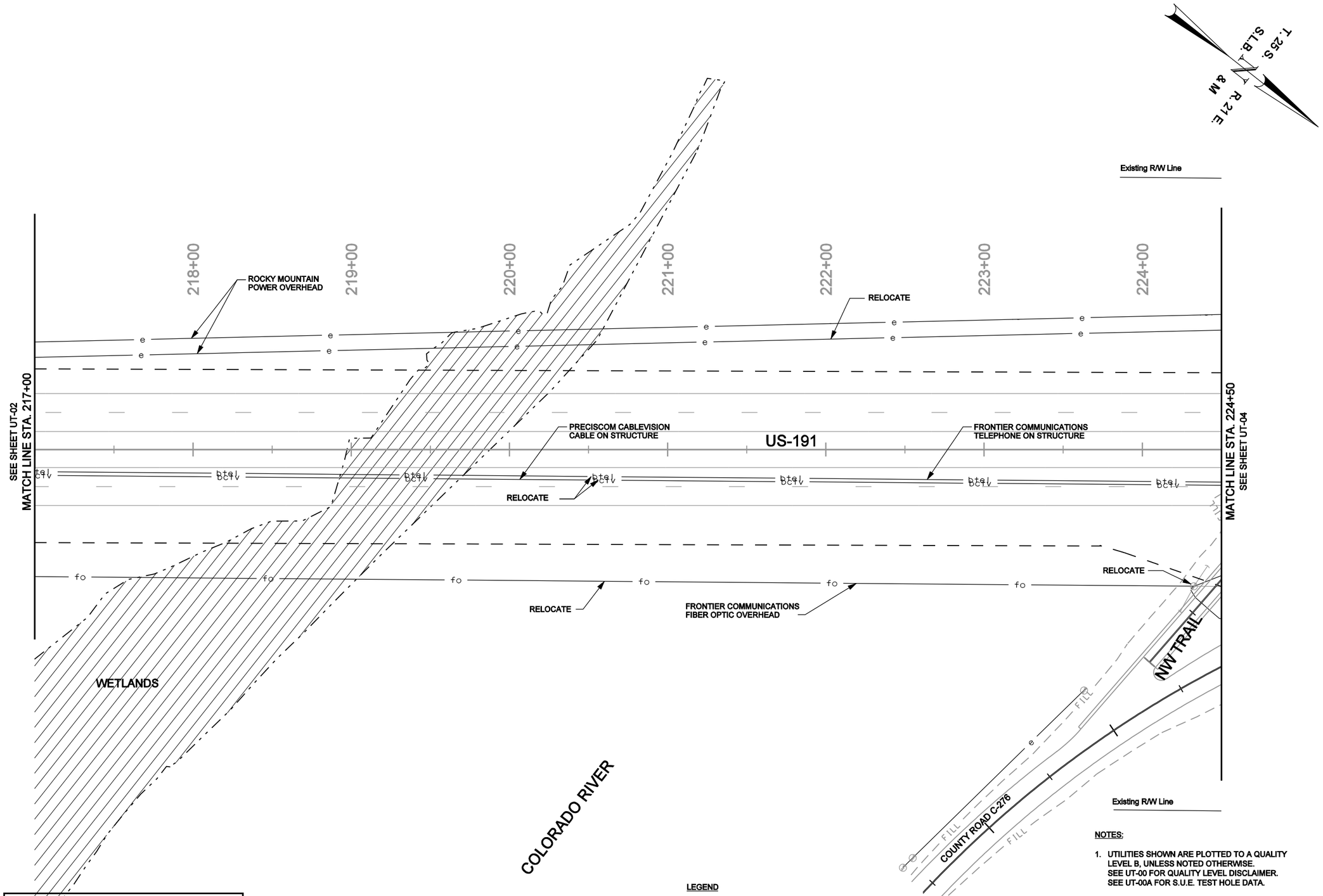

PRELIMINARY
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LEGEND

PH-xx — POTHOLE LOCATION AND I.D.

QLD — QUALITY LEVEL DESIGNATOR SEE NOTE 1

NOTES:

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PROFESSIONAL ENGINEER

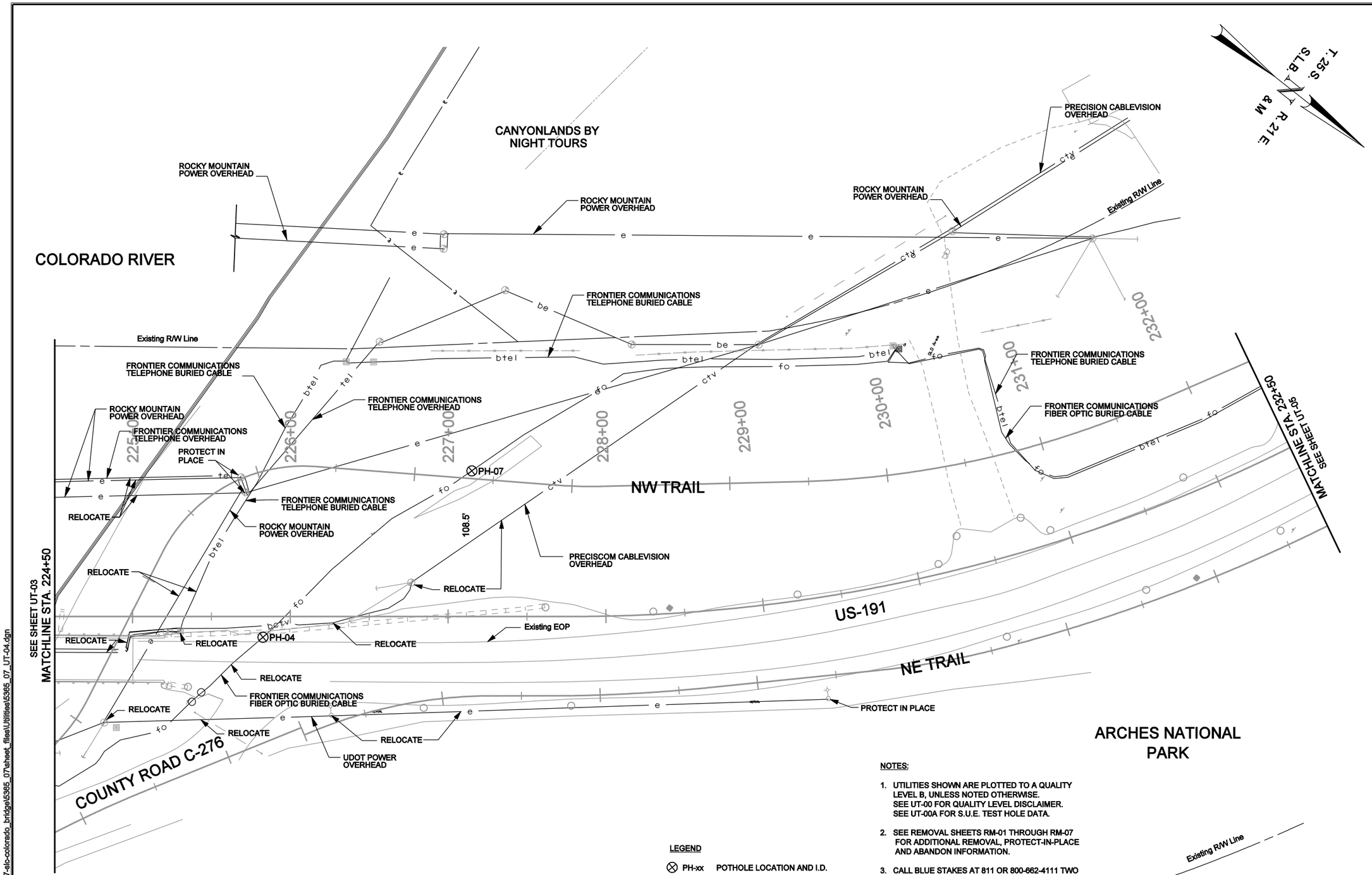
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

UTILITY PLAN SHEET

SHEET NO. UT-03

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Utilities\5365_07_UT-03.dgn



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LEGEND

PH-xx	POTHOLE LOCATION AND I.D.
QLD	QUALITY LEVEL DESIGNATOR SEE NOTE 1

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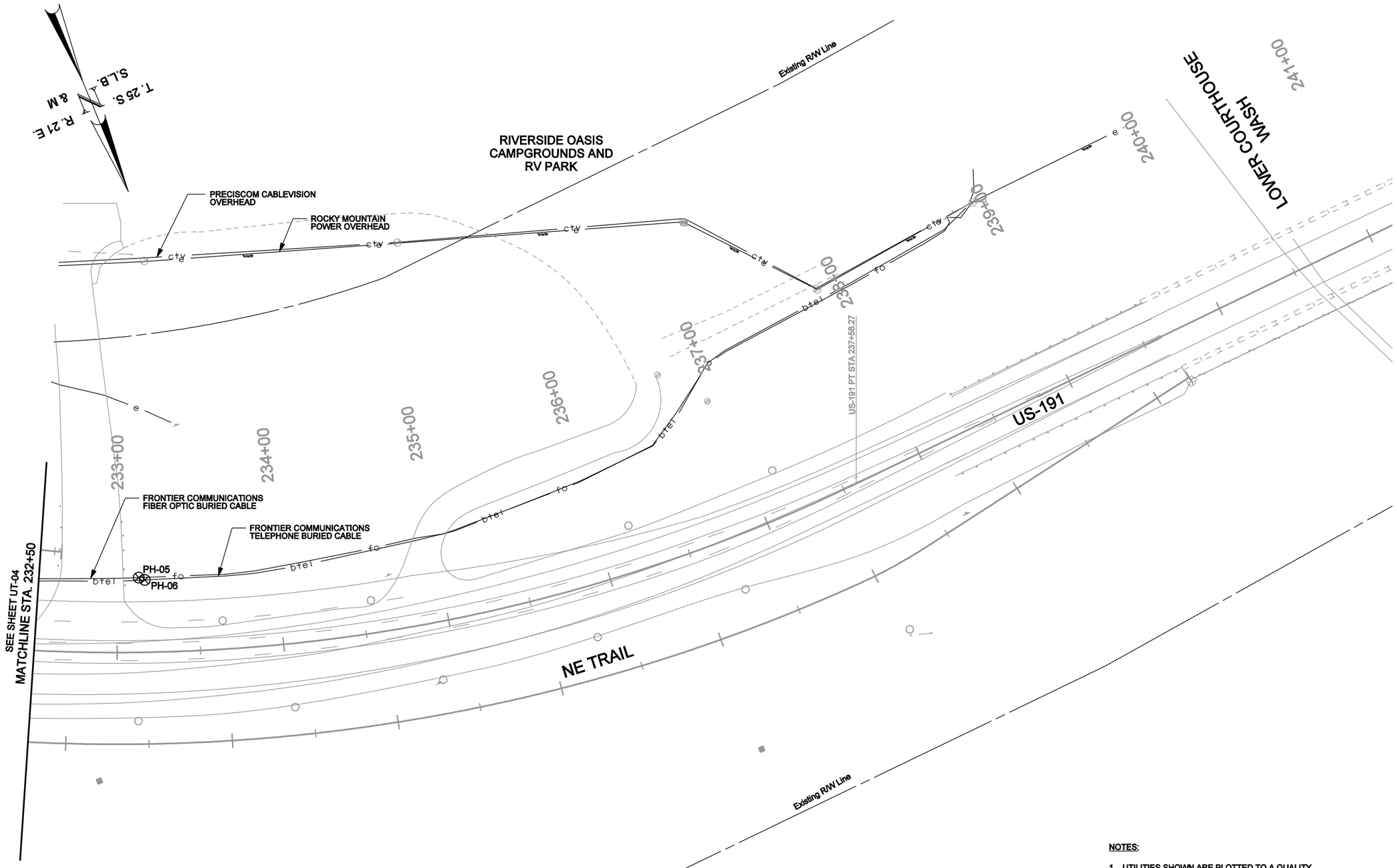
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
UTILITY PLAN SHEET

SHEET NO. UT-04

5/6/2008 \\fselc03\02507-slc-colorado_bridge\5365_07\sheet_files\Utilities\5365_07_UT-04.dgn



PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

⊗ PH-xx	POTHOLE LOCATION AND I.D.
QLD	QUALITY LEVEL DESIGNATOR SEE NOTE 1

NOTES:

1. UTILITIES SHOWN ARE PLOTTED TO A QUALITY LEVEL B, UNLESS NOTED OTHERWISE. SEE UT-00 FOR QUALITY LEVEL DISCLAIMER. SEE UT-00A FOR S.U.E. TEST HOLE DATA.
2. SEE REMOVAL SHEETS RM-01 THROUGH RM-07 FOR ADDITIONAL REMOVAL, PROTECT-IN-PLACE AND ABANDON INFORMATION.
3. CALL BLUE STAKES AT 811 OR 800-662-4111 TWO WORKING DAYS BEFORE CONSTRUCTION IS SCHEDULED TO BEGIN.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

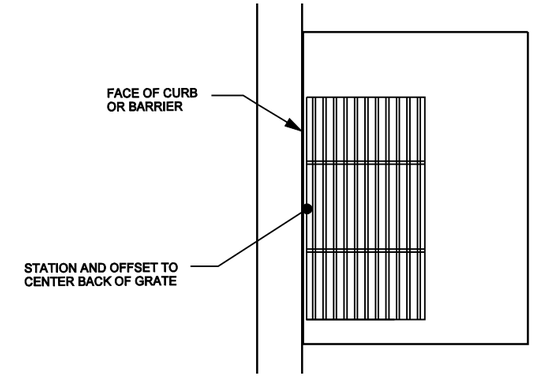
DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
UTILITY PLAN SHEET

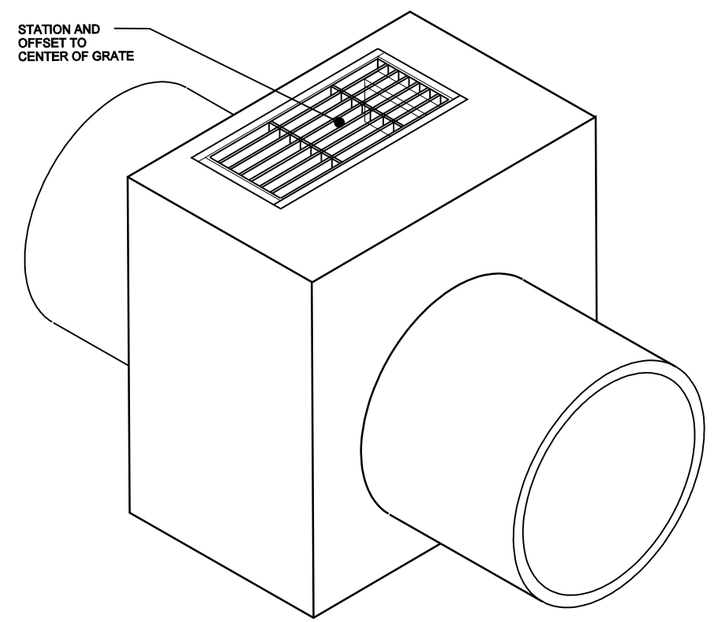
SHEET NO. UT-05

5/6/2008 \\fssltc03\2507-slc-colorado_bridge\5365_07\sheet_files\Utilities\5365_07_UT-05.dgn

GENERAL CATCH BASIN NOTE:
THE STATION AND OFFSET FOR EACH CATCH BASIN REFERS TO A CONTROL POINT AS FOLLOWS:
- IN CURB AND GUTTER: CENTER OF GRATE LOW SIDE IN GUTTER FLOW LINE
- IN SWALES, DITCHES OR PAVEMENT WITHOUT CURB OR BARRIER: CENTER OF THE GRATE
- ALONG BARRIER : CENTER OF GRATE LOW SIDE AT THE TOE OF THE BARRIER (SEE DETAIL THIS SHEET)



LAYOUT A
CURB OR BARRIER



LAYOUT B
NO CURB OR BARRIER

STATION AND OFFSET LOCATION DETAIL
N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION

5/6/2008 \\fsslc03\02507-slc-colorado_bridge\5365_07\sheet_files\hydraulics\5365_07_DD-01.dgn

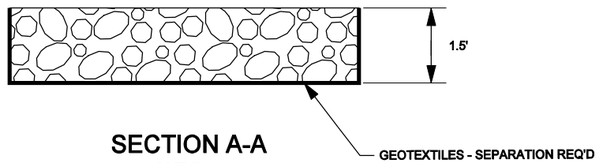
REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

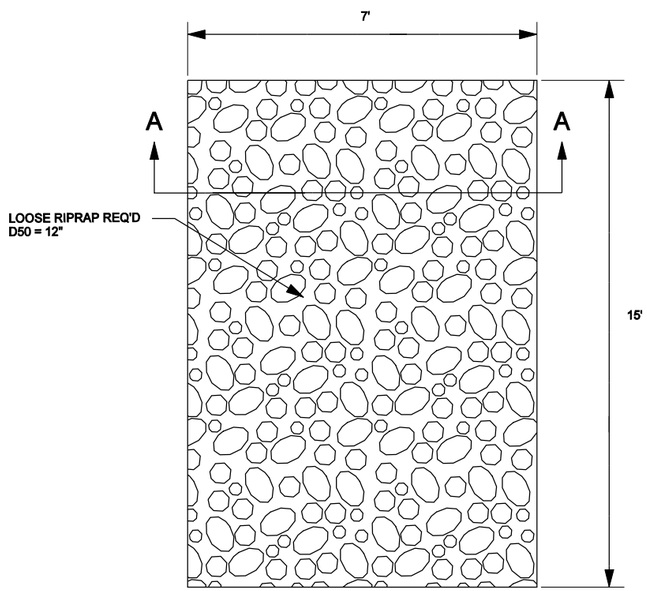
DRAWN BY XXX
QC CHECKED BY XXX
APPROVED
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE DETAIL

SHEET NO. DD-01

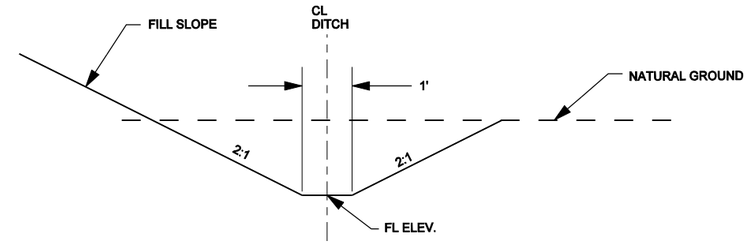


SECTION A-A
N.T.S.

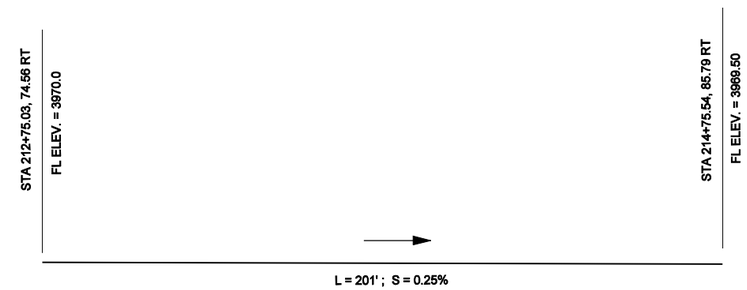


PLAN
N.T.S.

OUTLET PROTECTION DETAIL
(SEE SHEET DR-04)

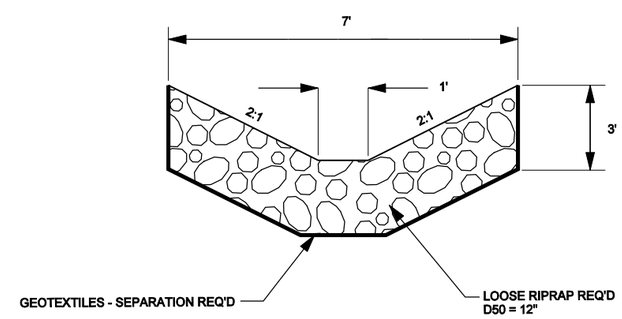


TYPICAL SECTION
N.T.S.



PROFILE

DITCH DETAIL



LOOSE RIPRAP DETAIL
(SEE SHEET DR-02)

PRELIMINARY
NOT FOR CONSTRUCTION

\\fsslc03\32507-slc-colorado_bridge\15365_07\sheet_files\\hydraulics\15365_07_DD-02.dgn
5/6/2008

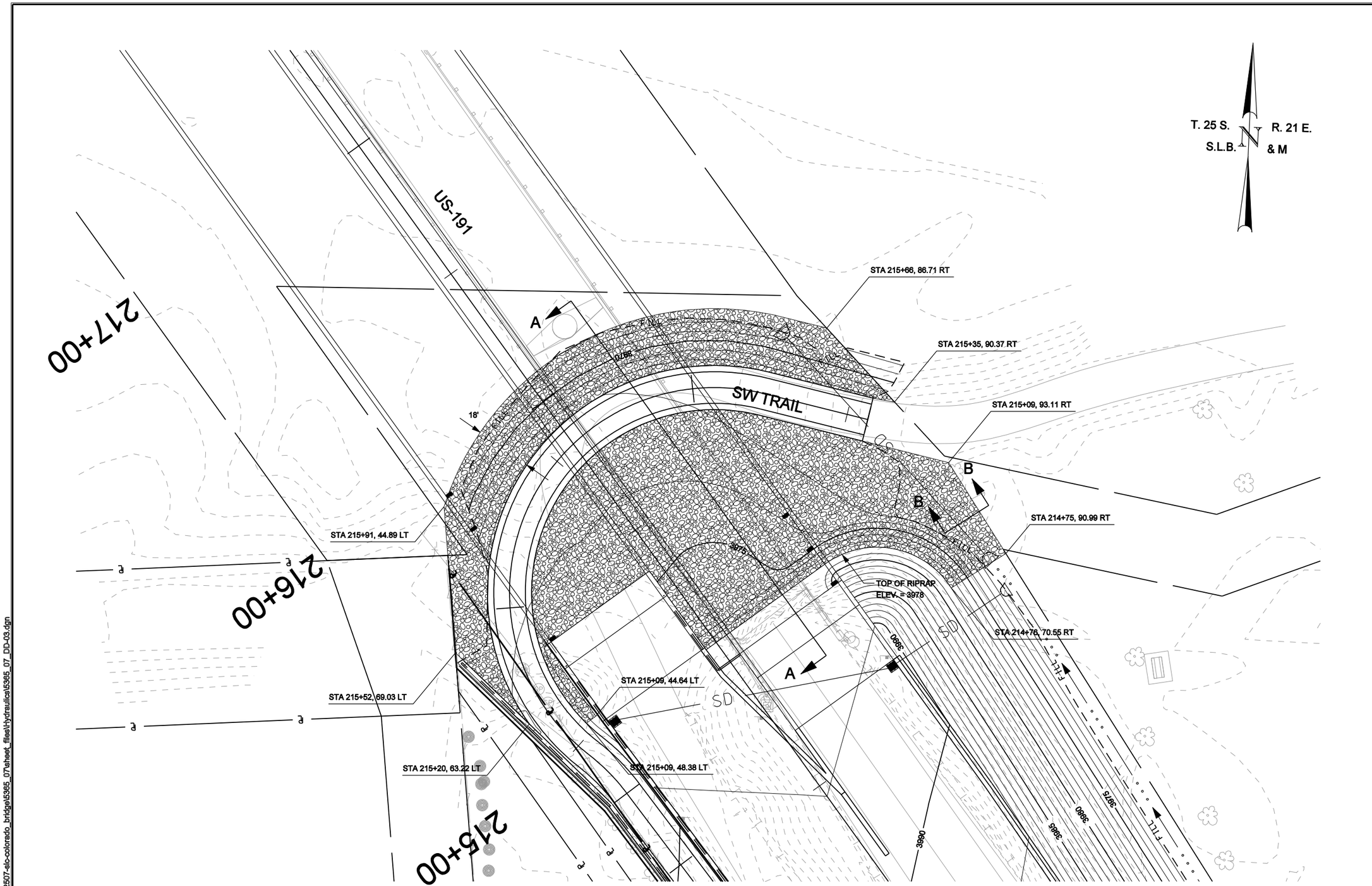
REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE DETAIL

SHEET NO. DD-02



ABUTMENT 1 RIPRAP PROTECTION

NOTE
SEE DETAIL SHEET DD-05 FOR SECTION DETAILS

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

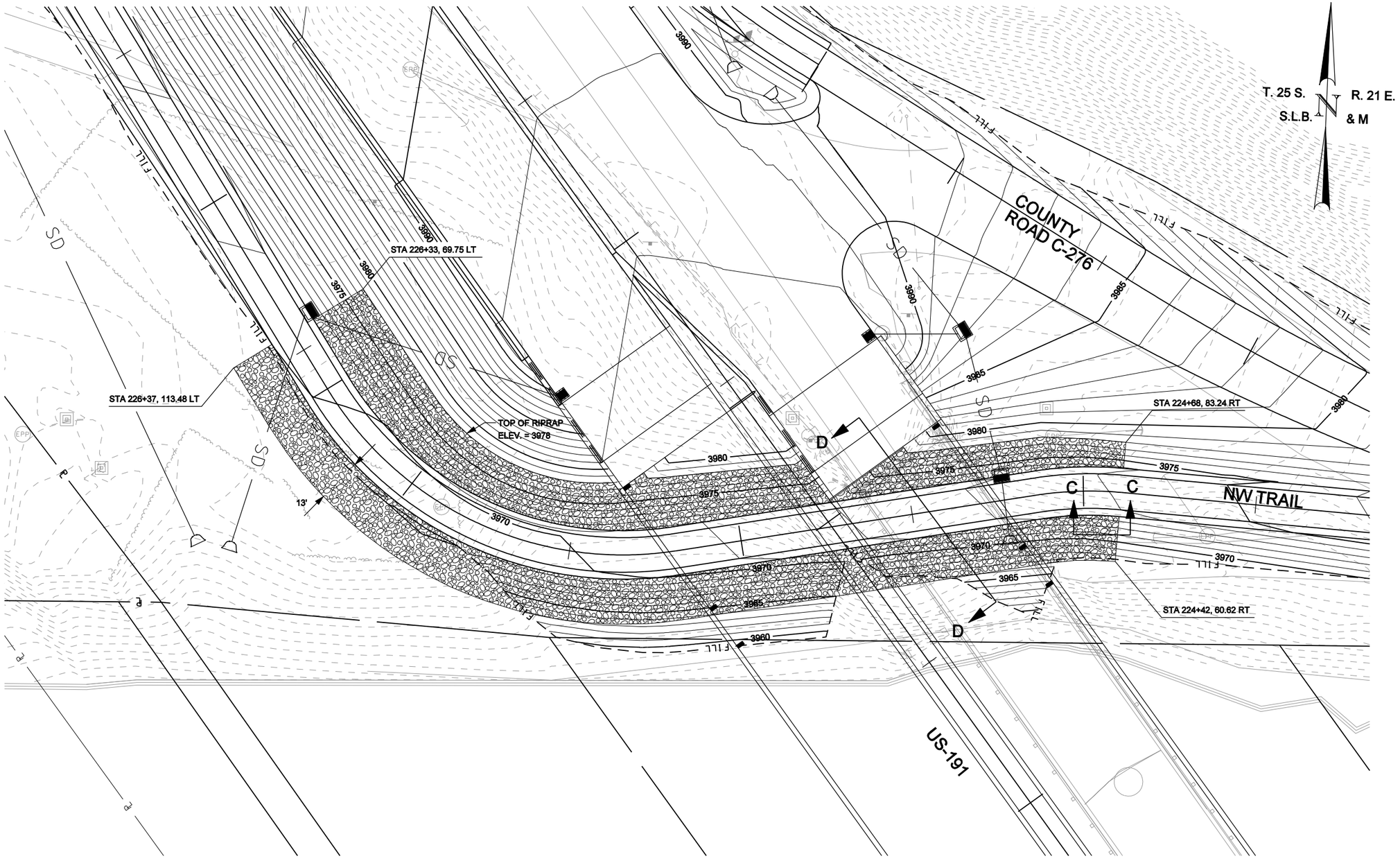
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY
APPROVED
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE DETAIL

SHEET NO. DD-03

5/6/2008 \\fsslc03\92507-slc-colorado_bridge\5365_07\sheet_files\hydraulics\5365_07_DD-03.dgn



ABUTMENT 4 RIPRAP PROTECTION

NOTE

SEE DETAIL SHEET DD-05 FOR SECTION DETAILS

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	APPROVED BY	REMARKS

REVISIONS

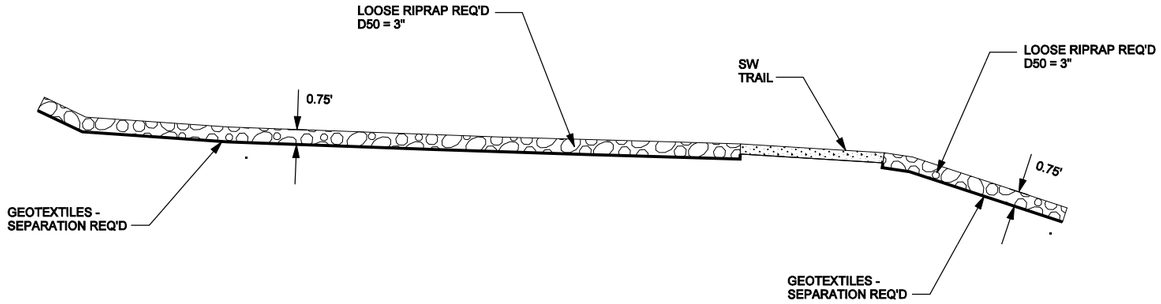
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

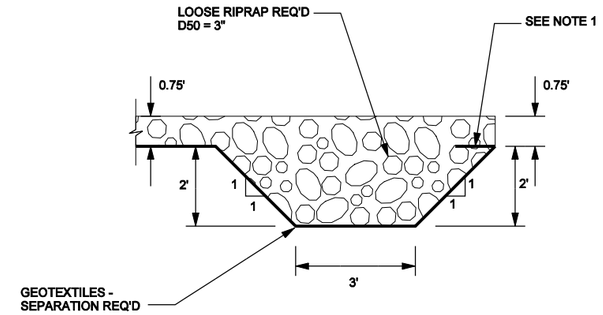
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE DETAIL

SHEET NO. DD-04

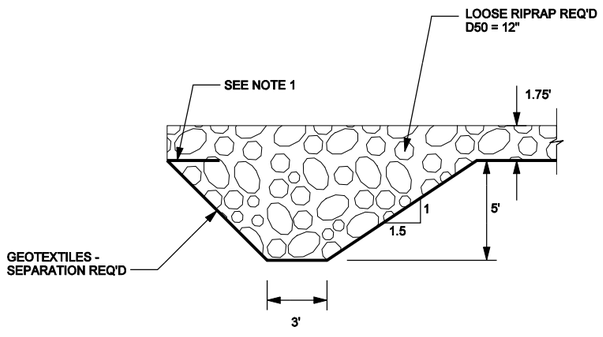
5/6/2008 \\fsslc\312507-slc-colorado_bridge\5365_07\sheet_files\\hydraulics\5365_07_DD-04.dgn



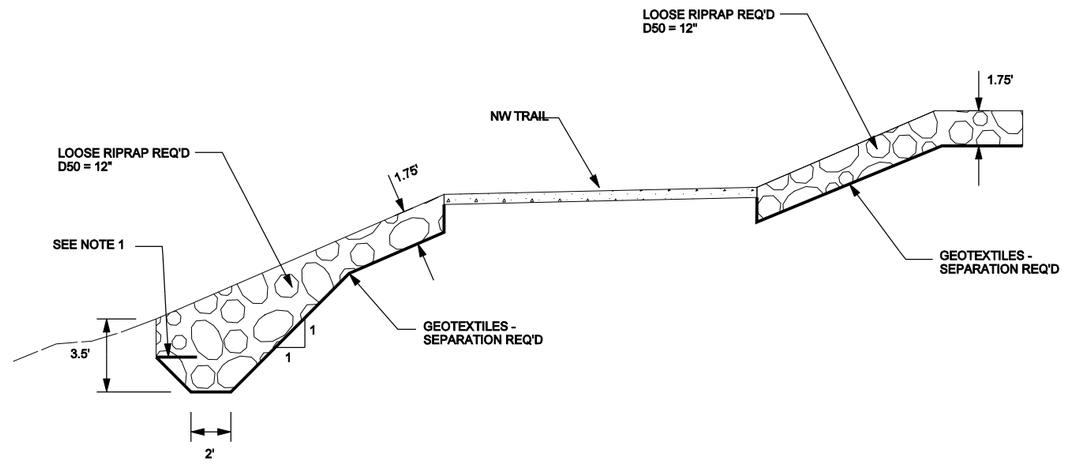
SECTION A - A



SECTION B - B



SECTION C - C



SECTION D - D

PRELIMINARY
NOT FOR CONSTRUCTION

NOTES:

1. WRAP GEOTEXTILE BACK INTO RIPRAP 1 FOOT MINIMUM.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE DETAIL

SHEET NO. DD-05

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\hydraulics\5365_07_DD-05.dgn

GENERAL DRAINAGE NOTES:

1. PAY ITEMS FOR CB 9:
   CONCRETE - SMALL STRUCTURE REQ'D
   REINFORCING STEEL - COATED REQ'D
   MANHOLE STEPS REQ'D

2. PAY ITEMS FOR GRATE/COVER AND FRAME:
   GF 3 = RECTANGULAR GRATE AND FRAME, (STANDARD GRATING) REQ'D
   GF 3 (BS) = RECTANGULAR GRATE AND FRAME, (BICYCLE SAFE GRATING) REQ'D
   GF 5 = SOLID COVER AND FRAME REQ'D

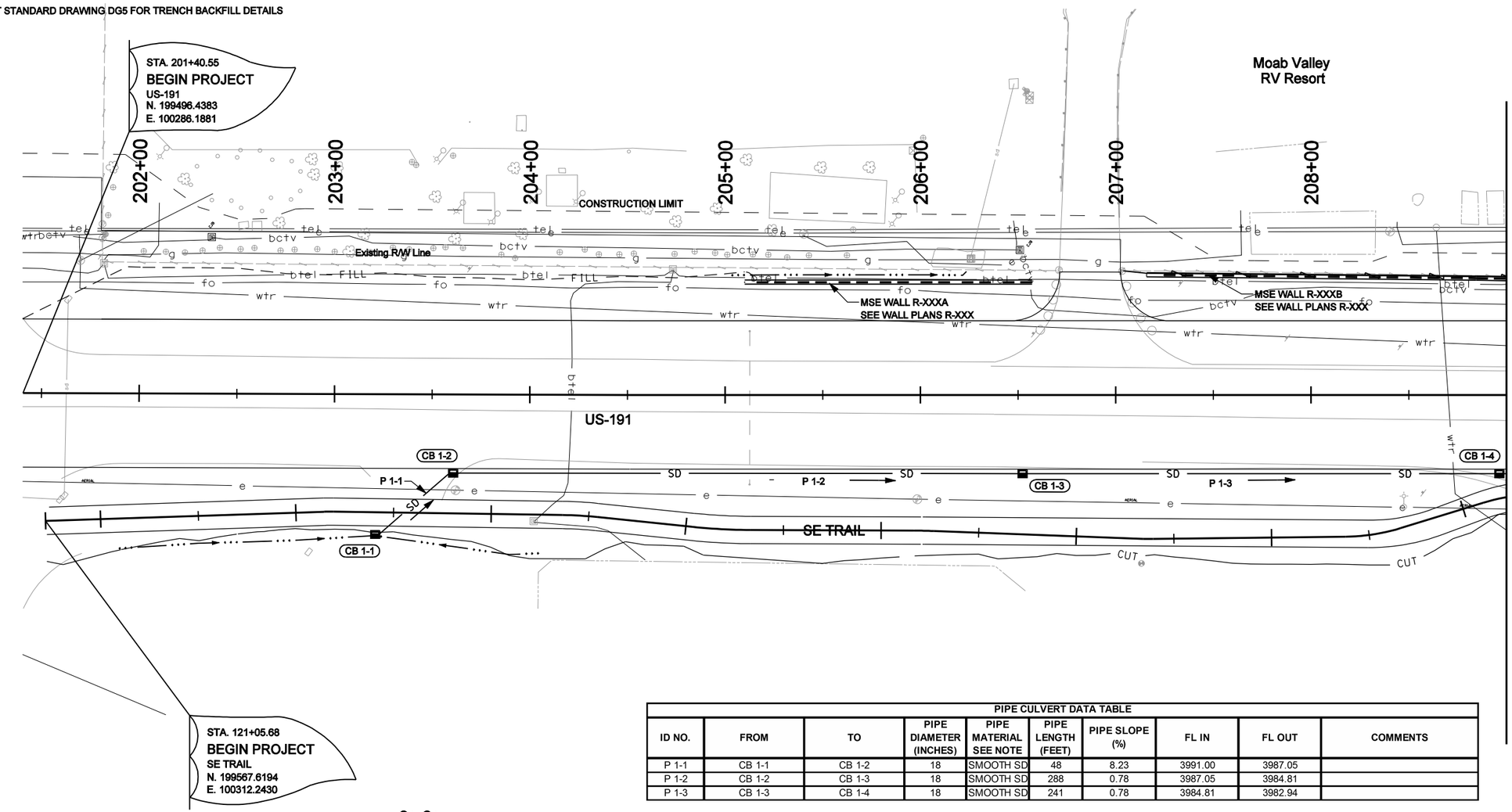
3. PAY ITEM FOR PIPE CULVERT:
   XX" SMOOTH SD = XX INCH IRRIGATION/STORM DRAIN, CLASS C, SMOOTH REQ'D
   XX" CORRUGATED = XX INCH CULVERT, CLASS B, CORRUGATED REQ'D

4. PAY ITEM FOR END SECTION:
   XX" MCES = CULVERT END SECTION XX INCH REQ'D
   (METAL - SEE UDOT STD DWG DG8)

5. SEE UDOT STANDARD DRAWING DG5 FOR TRENCH BACKFILL DETAILS

LEGEND

CB 1-1	PROPOSED DRAINAGE FEATURE NUMBER
sd	EXISTING STORM DRAIN PIPES
SD	PROPOSED STORM DRAIN PIPES
←	FLOW DIRECTION (STORM DRAIN)
■	PROPOSED DRAINAGE INLET



SURFACE DITCH REQ'D
STA 201+87.35, 79.61 RT TO
STA 203+19.66, 72.55 RT
STA 204+07.41, 81.08 RT TO
STA 203+22.10, 72.60 RT

PRELIMINARY
NOT FOR CONSTRUCTION

PIPE CULVERT DATA TABLE

ID NO.	FROM	TO	PIPE DIAMETER (INCHES)	PIPE MATERIAL SEE NOTE	PIPE LENGTH (FEET)	PIPE SLOPE (%)	FL IN	FL OUT	COMMENTS
P 1-1	CB 1-1	CB 1-2	18	SMOOTH SD	48	8.23	3991.00	3987.05	
P 1-2	CB 1-2	CB 1-3	18	SMOOTH SD	288	0.78	3987.05	3984.81	
P 1-3	CB 1-3	CB 1-4	18	SMOOTH SD	241	0.78	3984.81	3982.94	

CATCH BASIN DATA TABLE

ID NO.	STA	OFFSET	BOX STD. DWG NO.	COL.	LINE	LAYOUT SEE DD-01	GRATE/COVER TYPE SEE NOTE	GRATE/ COVER EL.	COMMENTS
CB 1-1	203+21.08	72.54 RT	CB 9	A	2	B	GF 3	3994.75	
CB 1-2	203+60.85	41.00 RT	CB 9	A	2	B	GF 3 (BS)	3991.10	
CB 1-3	206+52.31	41.00 RT	CB 9	A	2	B	GF 3 (BS)	3988.98	
CB 1-4	208+96.43	41.00 RT	CB 9	A	2	B	GF 3 (BS)	3987.10	

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE

APPROVED

PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

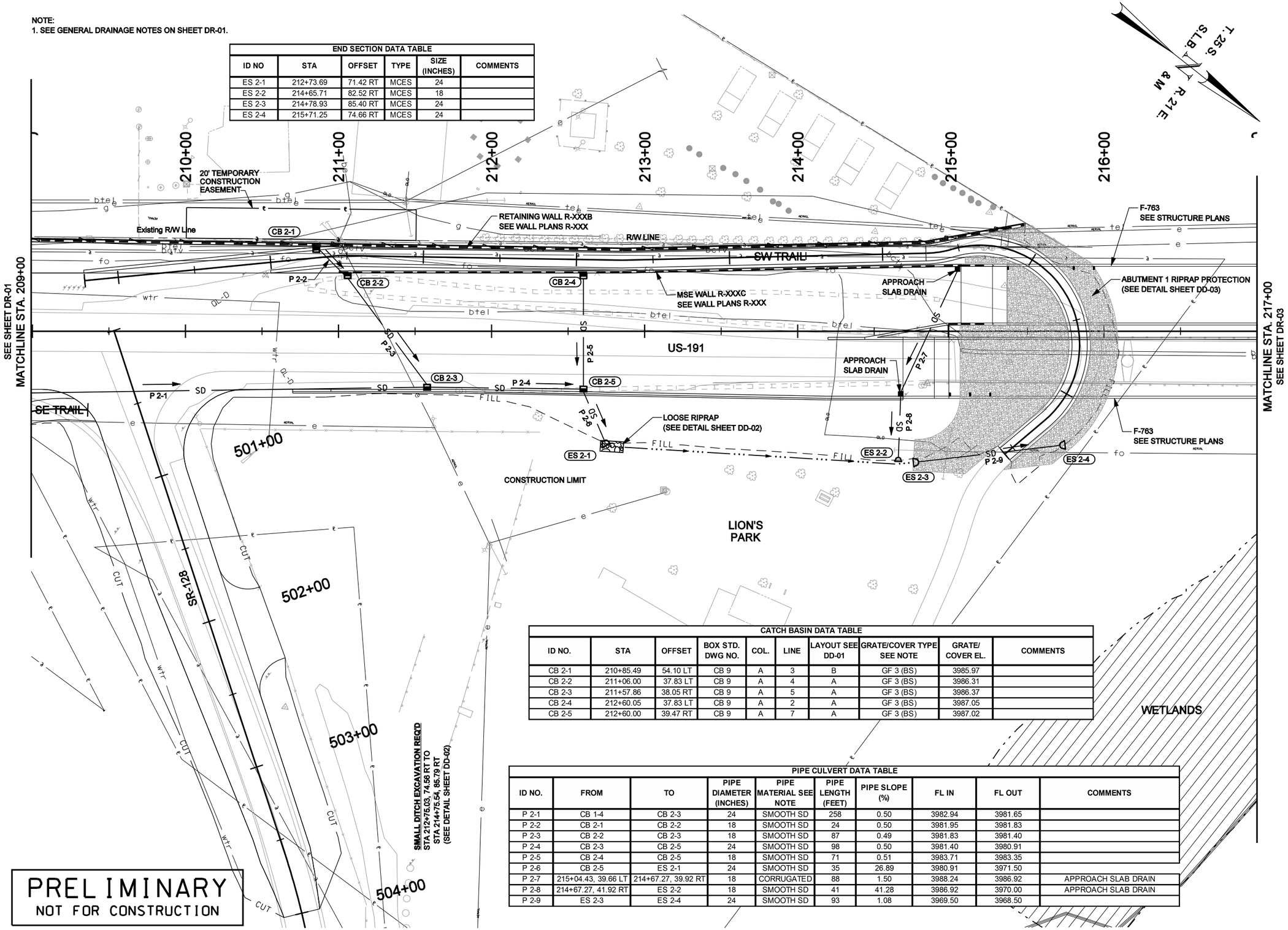
DRAINAGE PLAN SHEET

SHEET NO. DR-01

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Hydraulics\5365_07_DR-01.dgn

NOTE:
1. SEE GENERAL DRAINAGE NOTES ON SHEET DR-01.

END SECTION DATA TABLE					
ID NO	STA	OFFSET	TYPE	SIZE (INCHES)	COMMENTS
ES 2-1	212+73.69	71.42 RT	MCES	24	
ES 2-2	214+65.71	82.52 RT	MCES	18	
ES 2-3	214+78.93	85.40 RT	MCES	24	
ES 2-4	215+71.25	74.66 RT	MCES	24	



CATCH BASIN DATA TABLE									
ID NO.	STA	OFFSET	BOX STD. DWG NO.	COL.	LINE	LAYOUT SEE DD-01	GRATE/COVER TYPE SEE NOTE	GRATE/ COVER EL.	COMMENTS
CB 2-1	210+85.49	54.10 LT	CB 9	A	3	B	GF 3 (BS)	3985.97	
CB 2-2	211+06.00	37.83 LT	CB 9	A	4	A	GF 3 (BS)	3986.31	
CB 2-3	211+57.86	38.05 RT	CB 9	A	5	A	GF 3 (BS)	3986.37	
CB 2-4	212+60.05	37.83 LT	CB 9	A	2	A	GF 3 (BS)	3987.05	
CB 2-5	212+60.00	39.47 RT	CB 9	A	7	A	GF 3 (BS)	3987.02	

PIPE CULVERT DATA TABLE									
ID NO.	FROM	TO	PIPE DIAMETER (INCHES)	PIPE MATERIAL SEE NOTE	PIPE LENGTH (FEET)	PIPE SLOPE (%)	FL IN	FL OUT	COMMENTS
P 2-1	CB 1-4	CB 2-3	24	SMOOTH SD	258	0.50	3982.94	3981.65	
P 2-2	CB 2-1	CB 2-2	18	SMOOTH SD	24	0.50	3981.95	3981.83	
P 2-3	CB 2-2	CB 2-3	18	SMOOTH SD	87	0.49	3981.83	3981.40	
P 2-4	CB 2-3	CB 2-5	24	SMOOTH SD	98	0.50	3981.40	3980.91	
P 2-5	CB 2-4	CB 2-5	18	SMOOTH SD	71	0.51	3983.71	3983.35	
P 2-6	CB 2-5	ES 2-1	24	SMOOTH SD	35	26.89	3980.91	3971.50	
P 2-7	215+04.43, 39.66 LT	214+67.27, 39.92 RT	18	CORRUGATED	88	1.50	3988.24	3986.92	APPROACH SLAB DRAIN
P 2-8	214+67.27, 41.92 RT	ES 2-2	18	SMOOTH SD	41	41.28	3986.92	3970.00	APPROACH SLAB DRAIN
P 2-9	ES 2-3	ES 2-4	24	SMOOTH SD	93	1.08	3969.50	3968.50	

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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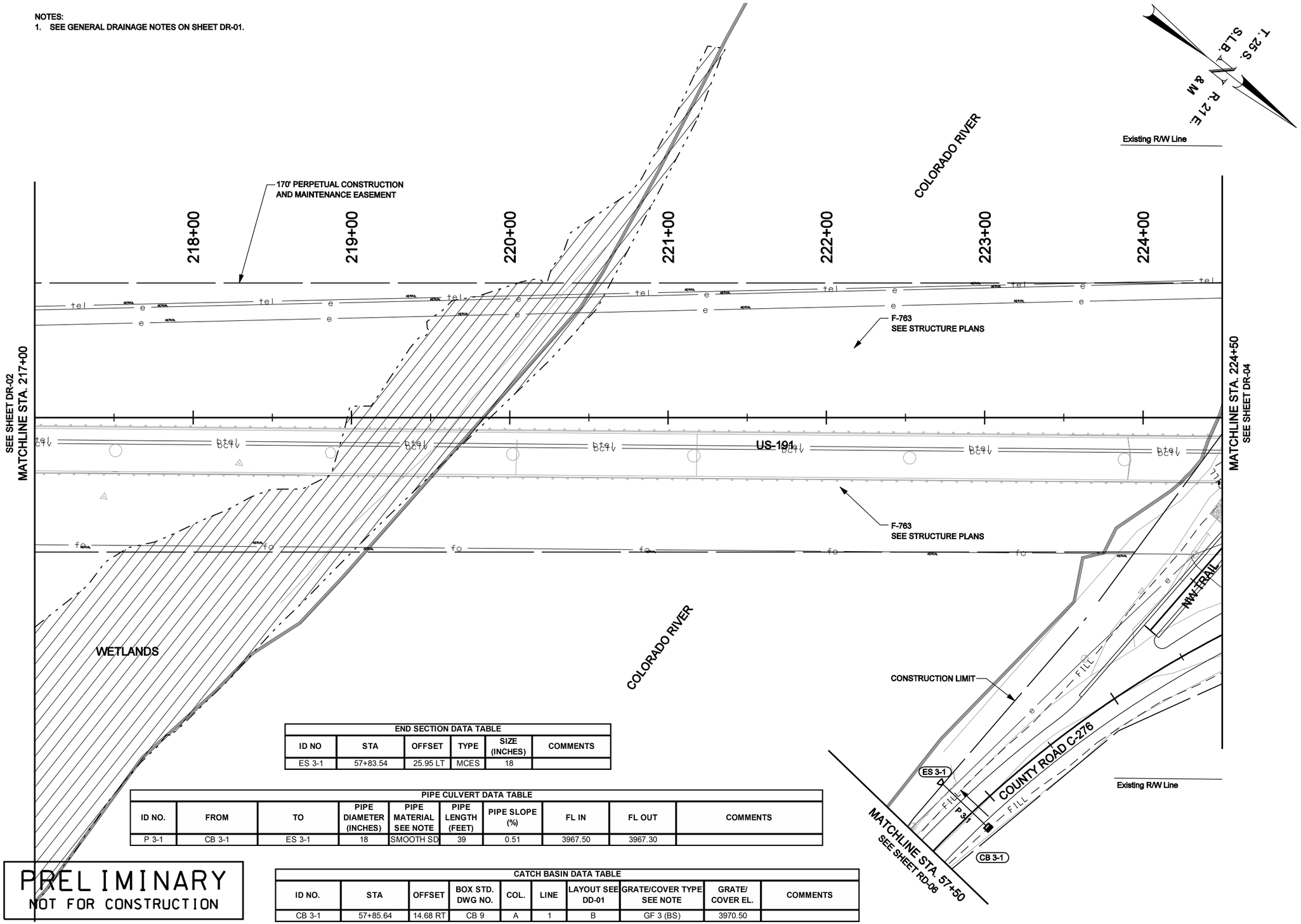
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE PLAN SHEET

SHEET NO. DR-02

5/6/2008 \\fselc03\32507-slc-colorado_bridge\5365_07\sheet_files\1-hydraulics\5365_07_DR-02.dgn

NOTES:
1. SEE GENERAL DRAINAGE NOTES ON SHEET DR-01.



END SECTION DATA TABLE					
ID NO	STA	OFFSET	TYPE	SIZE (INCHES)	COMMENTS
ES 3-1	57+83.54	25.95 LT	MCES	18	

PIPE CULVERT DATA TABLE									
ID NO.	FROM	TO	PIPE DIAMETER (INCHES)	PIPE MATERIAL SEE NOTE	PIPE LENGTH (FEET)	PIPE SLOPE (%)	FL IN	FL OUT	COMMENTS
P 3-1	CB 3-1	ES 3-1	18	SMOOTH SD	39	0.51	3967.50	3967.30	

CATCH BASIN DATA TABLE									
ID NO.	STA	OFFSET	BOX STD. DWG NO.	COL.	LINE	LAYOUT SEE DD-01	GRATE/COVER TYPE SEE NOTE	GRATE/ COVER EL.	COMMENTS
CB 3-1	57+85.64	14.68 RT	CB 9	A	1	B	GF 3 (BS)	3970.50	

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

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DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE PLAN SHEET

SHEET NO. DR-03

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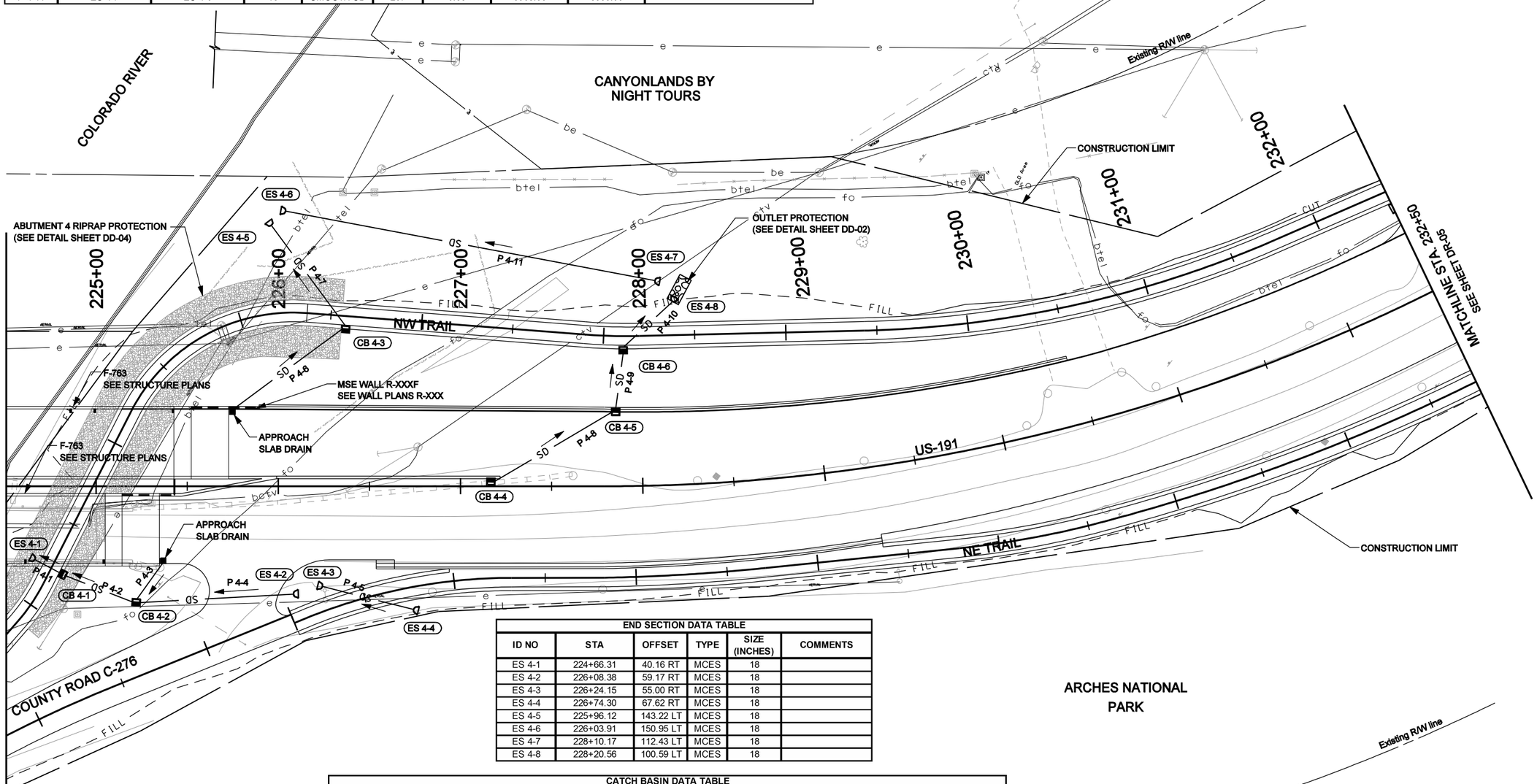
5/6/2008

PIPE CULVERT DATA TABLE									
ID NO.	FROM	TO	PIPE DIAMETER (INCHES)	PIPE MATERIAL SEE NOTE	PIPE LENGTH (FEET)	PIPE SLOPE (%)	FL IN	FL OUT	COMMENTS
P 4-1	CB 4-1	ES 4-1	18	SMOOTH SD	16	0.31	3970.00	3969.95	
P 4-2	CB 4-2	CB 4-1	18	SMOOTH SD	40	36.25	3984.50	3970.00	
P 4-3	225+36.73, 40.88 RT	CB 4-2	18	SMOOTH SD	25	13.69	3987.92	3984.50	APPROACH SLAB DRAIN
P 4-4	ES 4-2	CB 4-2	18	SMOOTH SD	85	2.75	3986.84	3984.50	
P 4-5	ES 4-4	ES 4-3	18	SMOOTH SD	52	0.31	3987.00	3986.84	
P 4-6	225+74.77, 40.93 LT	CB 4-3	18	SMOOTH SD	75	27.50	3987.72	3967.10	APPROACH SLAB DRAIN
P 4-7	CB 4-3	ES 4-5	18	SMOOTH SD	69	0.29	3967.10	3966.90	
P 4-8	CB 4-4	CB 4-5	18	SMOOTH SD	76	3.30	3985.74	3983.23	
P 4-9	CB 4-5	CB 4-6	18	SMOOTH SD	32	41.75	3983.23	3969.87	
P 4-10	CB 4-6	ES 4-8	18	CORRUGATED	37	6.41	3969.87	3967.50	
P 4-11	ES 4-7	ES 4-6	18	SMOOTH SD	207	0.53	3968.00	3966.90	



END SECTION DATA TABLE					
ID NO	STA	OFFSET	TYPE	SIZE (INCHES)	COMMENTS
ES 4-1	224+66.31	40.16 RT	MCES	18	
ES 4-2	226+08.38	59.17 RT	MCES	18	
ES 4-3	226+24.15	55.00 RT	MCES	18	
ES 4-4	226+74.30	67.62 RT	MCES	18	
ES 4-5	225+96.12	143.22 LT	MCES	18	
ES 4-6	226+03.91	150.95 LT	MCES	18	
ES 4-7	228+10.17	112.43 LT	MCES	18	
ES 4-8	228+20.56	100.59 LT	MCES	18	

CATCH BASIN DATA TABLE									
ID NO.	STA	OFFSET	BOX STD. DWG NO.	COL.	LINE	LAYOUT SEE DD-01	GRATE/COVER TYPE SEE NOTE	GRATE/ COVER EL.	COMMENTS
CB 4-1	224+81.03	48.03 RT	CB 9	A	1	B	GF 3 (BS)	3973.00	
CB 4-2	225+21.96	64.40 RT	CB 9	A	1	B	GF 3	3987.50	
CB 4-3	226+36.87	85.52 LT	CB 9	A	1	B	GF 3 (BS)	3970.10	
CB 4-4	227+16.64	3.99 LT	CB 9	A	3	A	GF 3 (BS)	3989.49	
CB 4-5	227+85.38	42.22 LT	CB 9	A	3	A	GF 3 (BS)	3986.98	
CB 4-6	227+90.05	73.93 LT	CB 9	A	1	B	GF 3 (BS)	3972.87	

PRELIMINARY
NOT FOR CONSTRUCTION

NOTES:
1. SEE GENERAL DRAINAGE NOTES ON SHEET DR-01.

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
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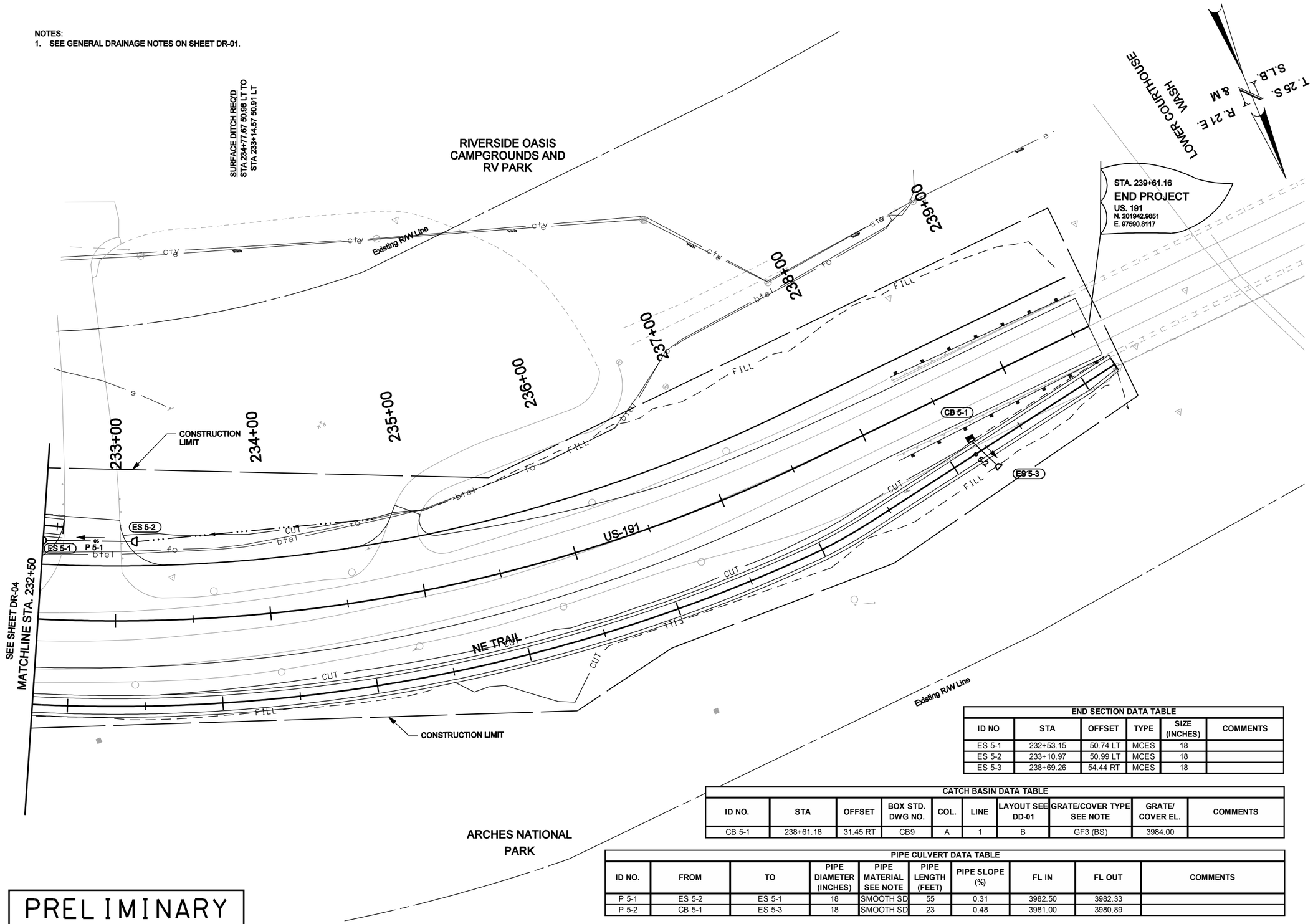
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE PLAN SHEET

SHEET NO. DR-04

5/6/2008 \\fssloc03\2507-slc-colorado_bridge\5365_07\sheet_files\hydraulics\5365_07_DR-04.dgn

NOTES:
1. SEE GENERAL DRAINAGE NOTES ON SHEET DR-01.



END SECTION DATA TABLE					
ID NO	STA	OFFSET	TYPE	SIZE (INCHES)	COMMENTS
ES 5-1	232+53.15	50.74 LT	MCES	18	
ES 5-2	233+10.97	50.99 LT	MCES	18	
ES 5-3	238+69.26	54.44 RT	MCES	18	

CATCH BASIN DATA TABLE									
ID NO.	STA	OFFSET	BOX STD. DWG NO.	COL.	LINE	LAYOUT SEE DD-01	GRATE/COVER TYPE SEE NOTE	GRATE/ COVER EL.	COMMENTS
CB 5-1	238+61.18	31.45 RT	CB9	A	1	B	GF3 (BS)	3984.00	

PIPE CULVERT DATA TABLE									
ID NO.	FROM	TO	PIPE DIAMETER (INCHES)	PIPE MATERIAL SEE NOTE	PIPE LENGTH (FEET)	PIPE SLOPE (%)	FL IN	FL OUT	COMMENTS
P 5-1	ES 5-2	ES 5-1	18	SMOOTH SD	55	0.31	3982.50	3982.33	
P 5-2	CB 5-1	ES 5-3	18	SMOOTH SD	23	0.48	3981.00	3980.89	

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

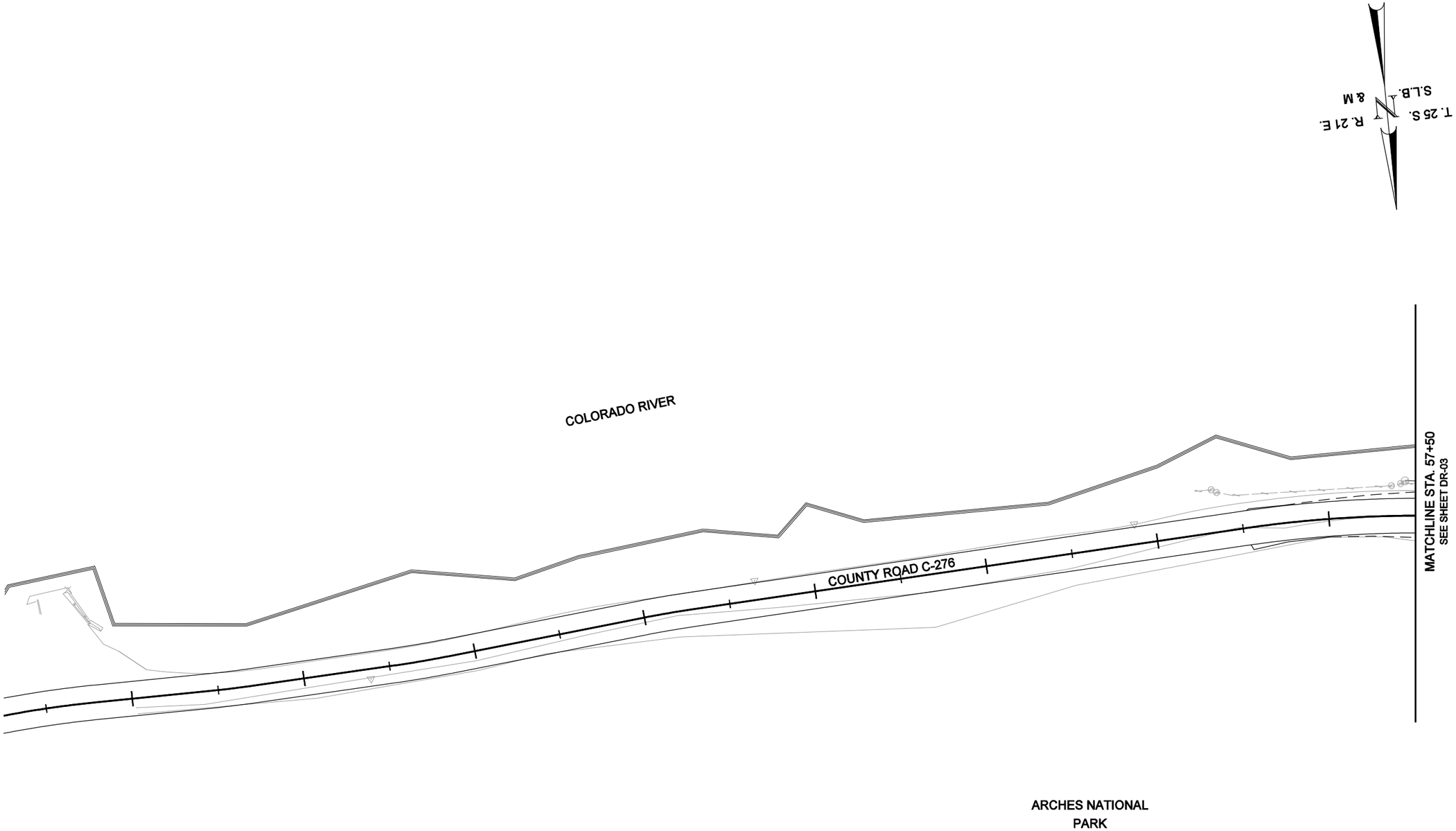
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
DRAINAGE PLAN SHEET

SHEET NO. DR-05

5/6/2008 \\fselc03\32507-slc-colorado_bridge\15365_07\sheet_files\1-hydraulics\15365_07_DR-05.dgn



NO DRAINAGE WORK THIS SHEET

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX

APPROVED
PROFESSIONAL ENGINEER
DATE

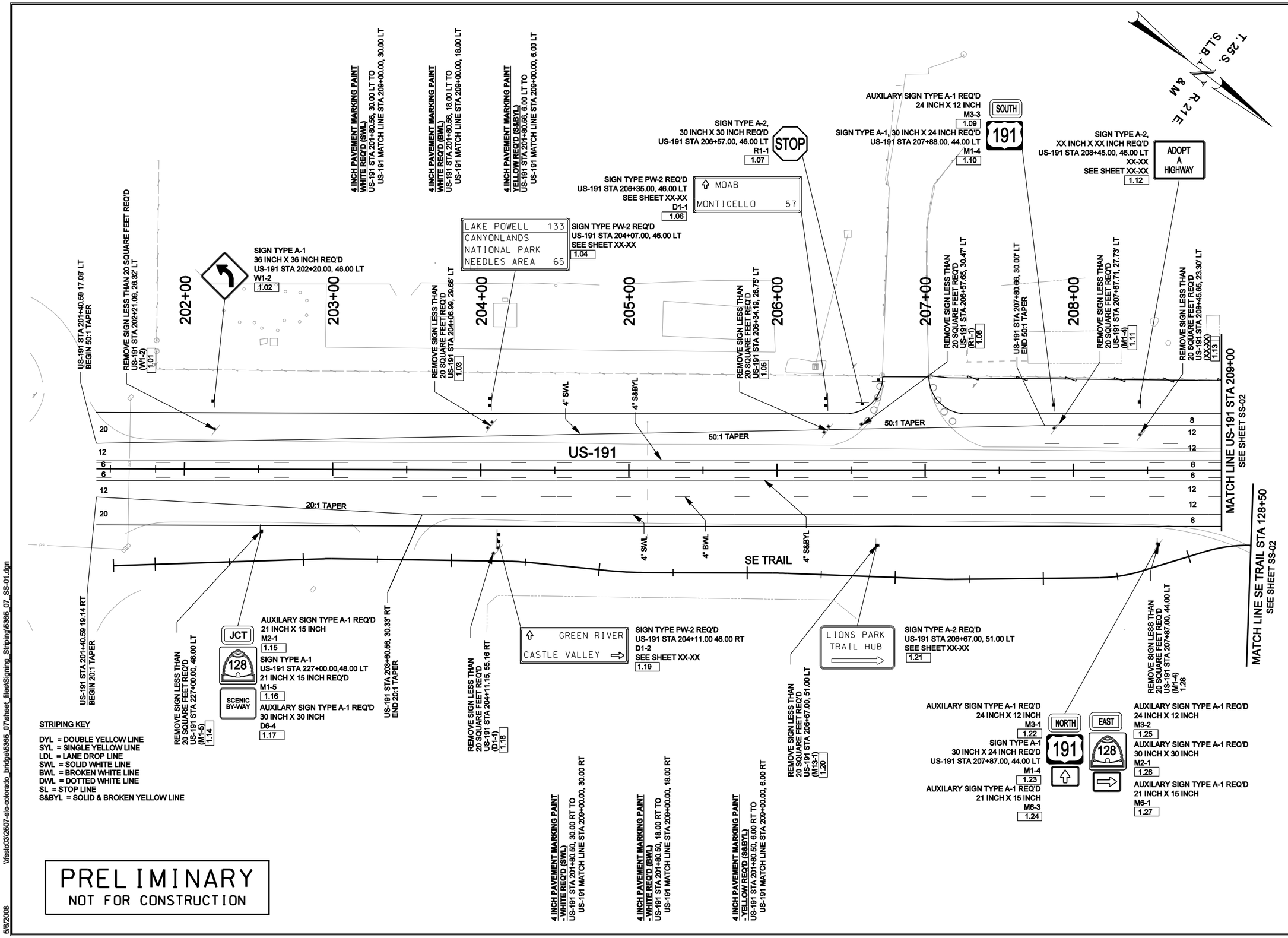
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

DRAINAGE PLAN SHEET

SHEET NO. DR-06

5/6/2008 \\fssic03\2507-slc-colorado_bridge\5365_07\sheet_files\Hydraulics\5365_07_DR-06.dgn



5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-01.dgn

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

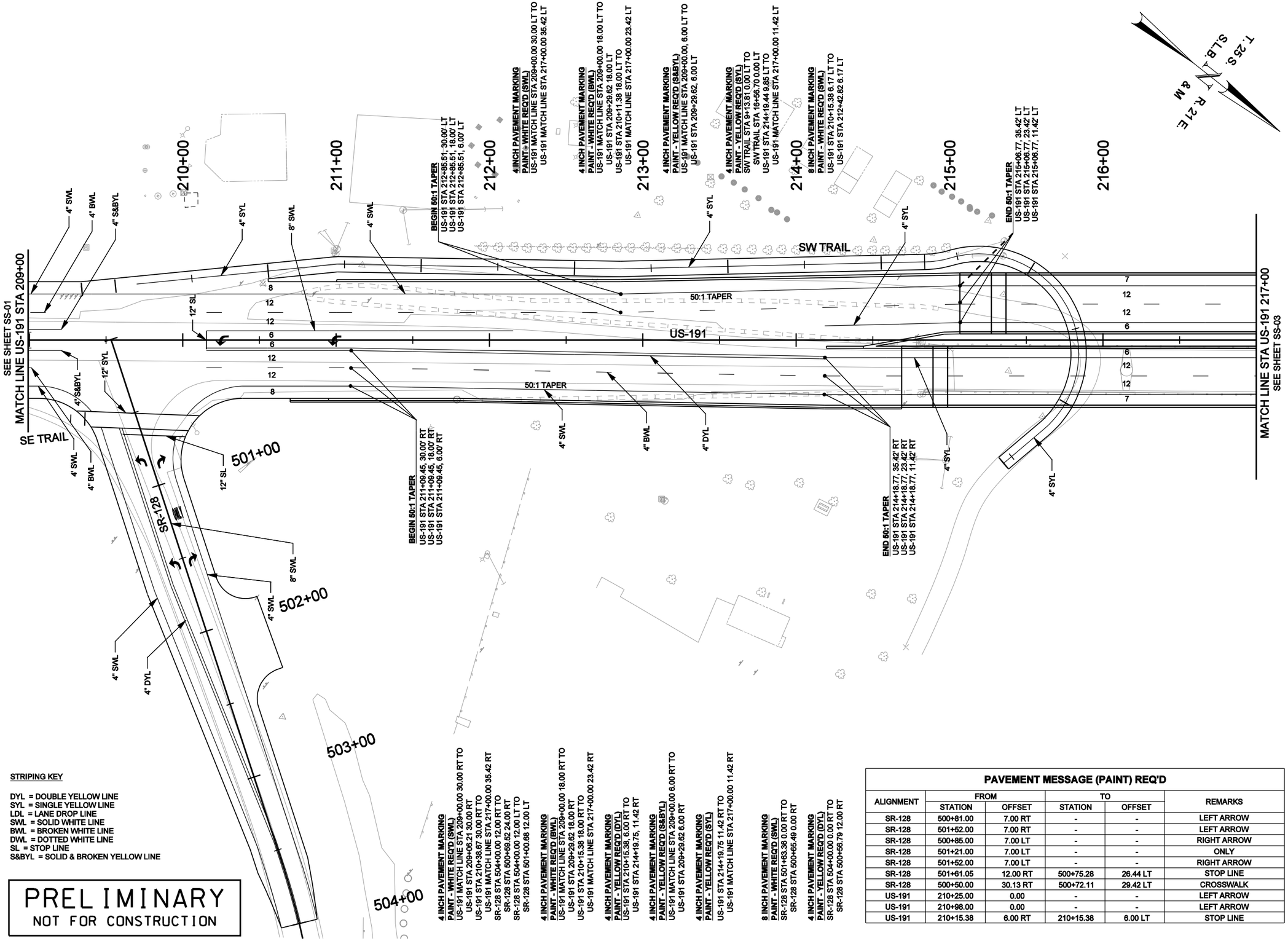
DRAWN BY FJB
QC CHECKED BY
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-01



STRIPING KEY

DYL = DOUBLE YELLOW LINE
SYL = SINGLE YELLOW LINE
LDL = LANE DROP LINE
SWL = SOLID WHITE LINE
BWL = BROKEN WHITE LINE
DWL = DOTTED WHITE LINE
SL = STOP LINE
S&BYL = SOLID & BROKEN YELLOW LINE

PRELIMINARY
NOT FOR CONSTRUCTION

PAVEMENT MESSAGE (PAINT) REQ'D

ALIGNMENT	FROM		TO		REMARKS
	STATION	OFFSET	STATION	OFFSET	
SR-128	500+81.00	7.00 RT	-	-	LEFT ARROW
SR-128	501+52.00	7.00 RT	-	-	LEFT ARROW
SR-128	500+85.00	7.00 LT	-	-	RIGHT ARROW
SR-128	501+21.00	7.00 LT	-	-	ONLY
SR-128	501+52.00	7.00 LT	-	-	RIGHT ARROW
SR-128	501+61.05	12.00 RT	500+75.28	26.44 LT	STOP LINE
SR-128	500+50.00	30.13 RT	500+72.11	29.42 LT	CROSSWALK
US-191	210+25.00	0.00	-	-	LEFT ARROW
US-191	210+98.00	0.00	-	-	LEFT ARROW
US-191	210+15.38	6.00 RT	210+15.38	6.00 LT	STOP LINE

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE

APPROVED

PROFESSIONAL ENGINEER

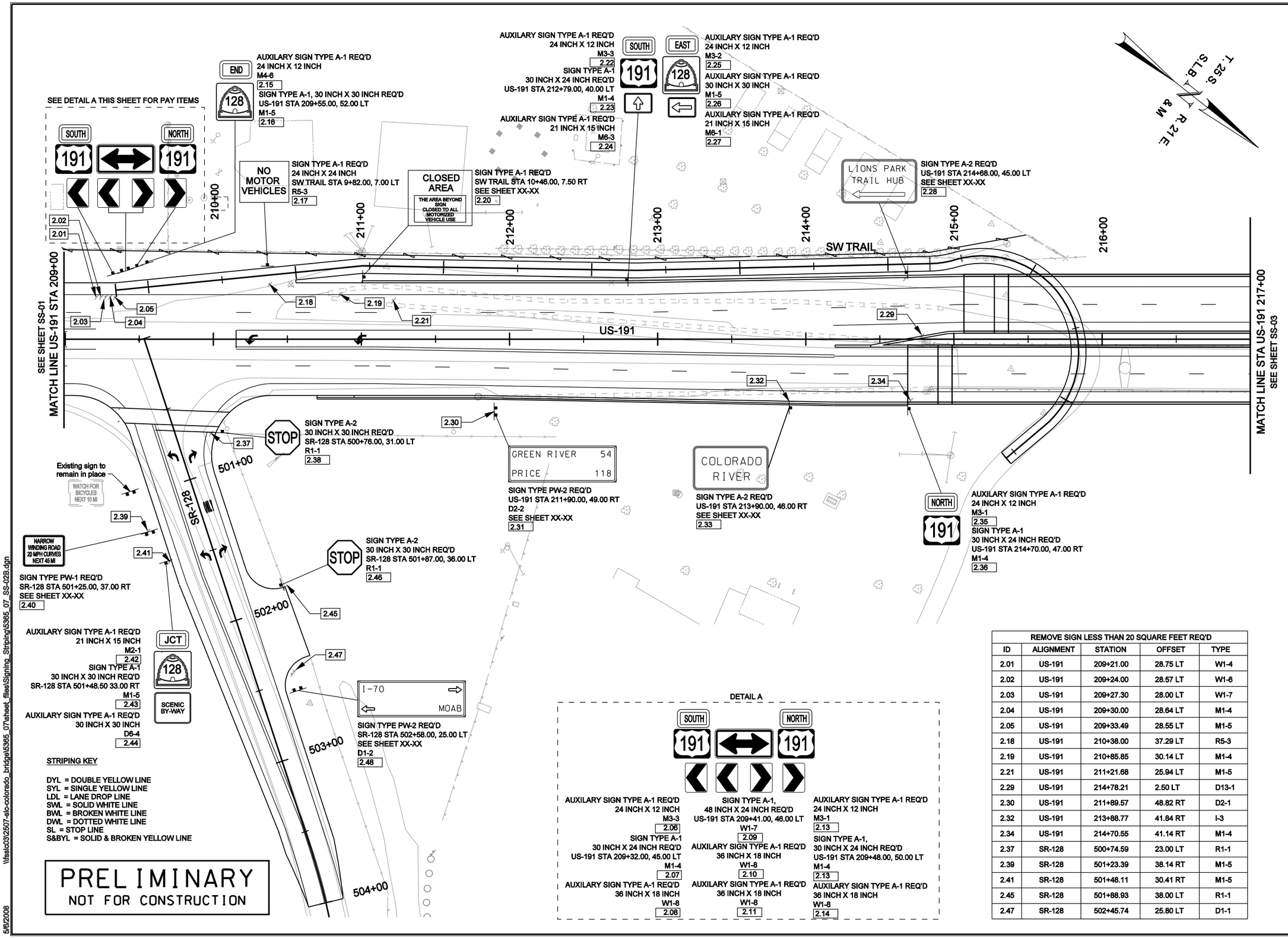
PROJECT: US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-02A

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-02A.dgn



REMOVE SIGN LESS THAN 20 SQUARE FEET REQ'D

ID	ALIGNMENT	STATION	OFFSET	TYPE
2.01	US-191	209+21.00	28.75 LT	W1-4
2.02	US-191	209+24.00	28.57 LT	W1-6
2.03	US-191	209+27.30	28.00 LT	W1-7
2.04	US-191	209+30.00	28.64 LT	M1-4
2.05	US-191	209+33.49	28.55 LT	M1-5
2.18	US-191	210+38.00	37.29 LT	R5-3
2.19	US-191	210+85.85	30.14 LT	M1-4
2.21	US-191	211+21.68	25.94 LT	M1-5
2.29	US-191	214+78.21	2.50 LT	D13-1
2.30	US-191	211+89.57	48.82 RT	D2-1
2.32	US-191	213+88.77	41.84 RT	I-3
2.34	US-191	214+70.55	41.14 RT	M1-4
2.37	SR-128	500+74.59	23.00 LT	R1-1
2.39	SR-128	501+23.39	38.14 RT	M1-5
2.41	SR-128	501+48.11	30.41 RT	M1-5
2.45	SR-128	501+88.93	38.00 LT	R1-1
2.47	SR-128	502+45.74	25.80 LT	D1-1

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE

APPROVED

PROFESSIONAL ENGINEER

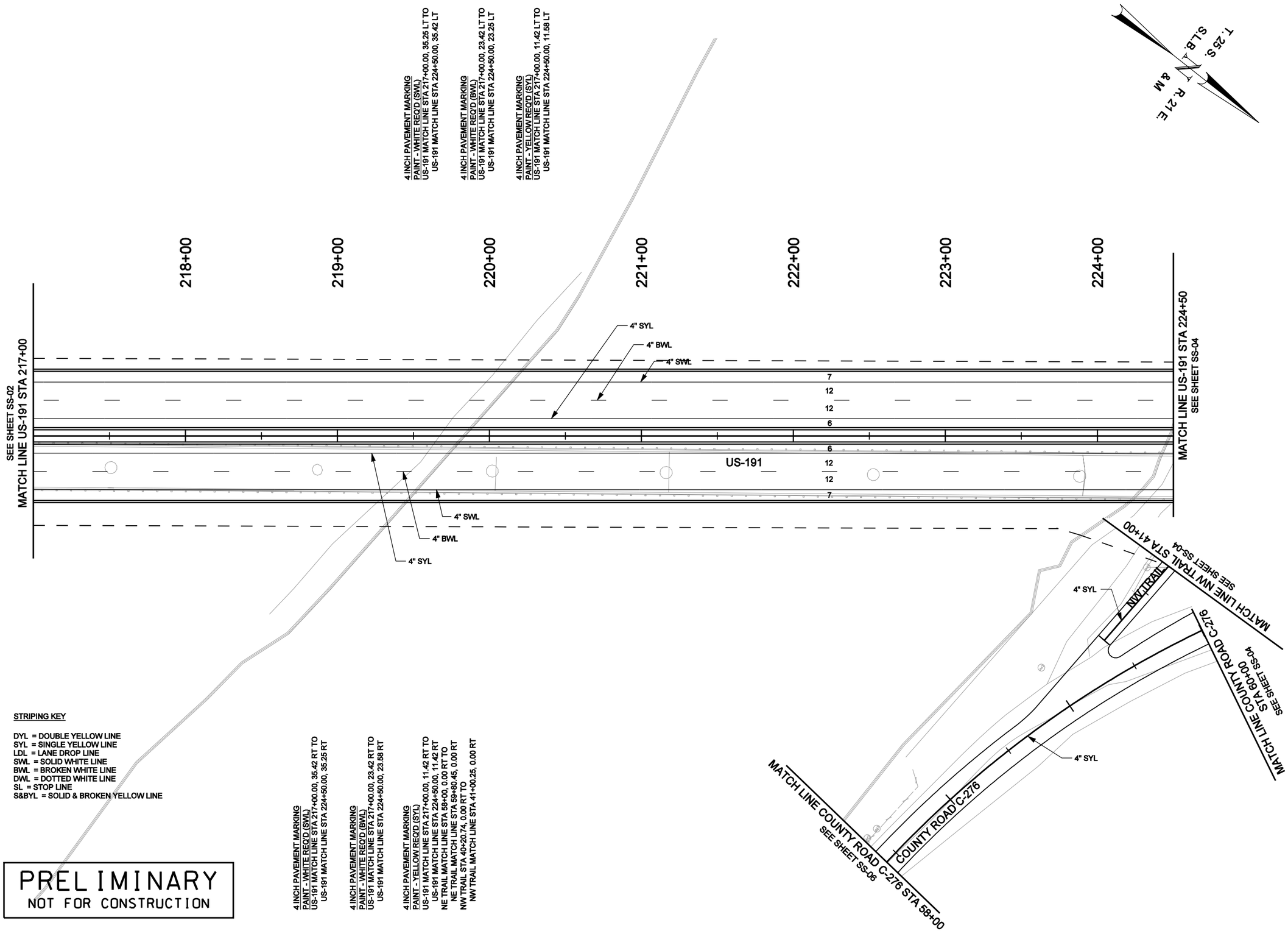
US-191; OVER COLORADO
RIVER BRIDGE - MOAB, UTAH

PROJECT
PROJECT NUMBER BRF-0191(58)129

SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-02B

5/6/2008 \\fasla2\32507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-02B.dgn



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SL = STOP LINE
S&BYL = SOLID & BROKEN YELLOW LINE

4 INCH PAVEMENT MARKING
PAINT - WHITE REQ'D (SWL)
US-191 MATCH LINE STA 217+00.00, 35.42 RT TO
US-191 MATCH LINE STA 224+50.00, 35.25 RT

4 INCH PAVEMENT MARKING
PAINT - WHITE REQ'D (BWL)
US-191 MATCH LINE STA 217+00.00, 23.42 RT TO
US-191 MATCH LINE STA 224+50.00, 23.58 RT

4 INCH PAVEMENT MARKING
PAINT - YELLOW REQ'D (SYL)
US-191 MATCH LINE STA 217+00.00, 11.42 RT TO
US-191 MATCH LINE STA 224+50.00, 11.42 RT
NE TRAIL MATCH LINE STA 58+00, 0.00 RT TO
NE TRAIL MATCH LINE STA 59+80.45, 0.00 RT
NW TRAIL STA 40+20.74, 0.00 RT TO
NW TRAIL MATCH LINE STA 41+00.25, 0.00 RT

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	APPROVED BY	REMARKS

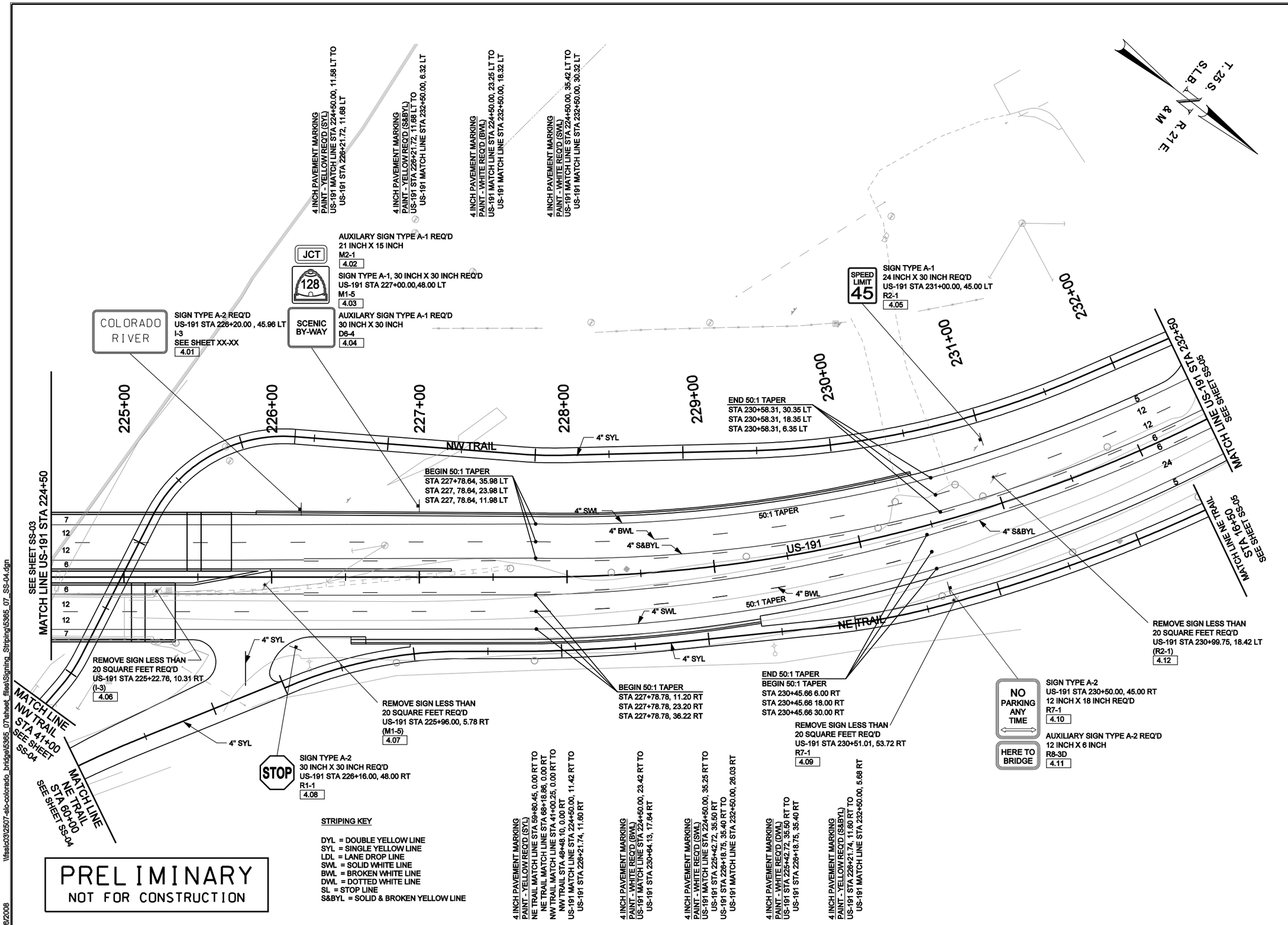
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-03

5/6/2008 \\fselc03\02507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-03.dgn



REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE

APPROVED

PROFESSIONAL ENGINEER

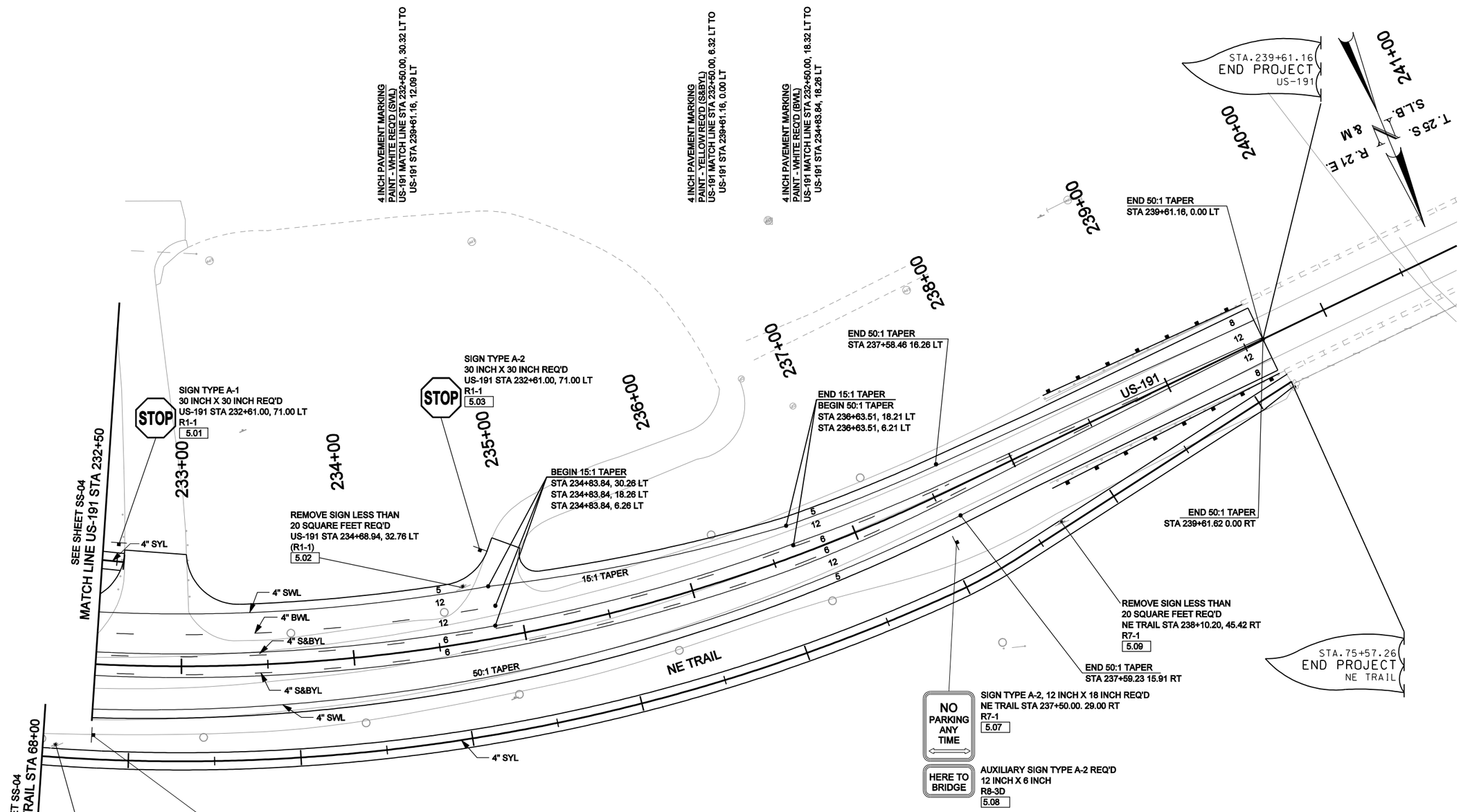
PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH

PROJECT NUMBER: BRF-0191(58)129

SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-04

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-04.dgn



PRELIMINARY
NOT FOR CONSTRUCTION

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S&BYL = SOLID & BROKEN YELLOW LINE

REVISIONS				
NO.	DATE	APPROVED BY	REMARKS	

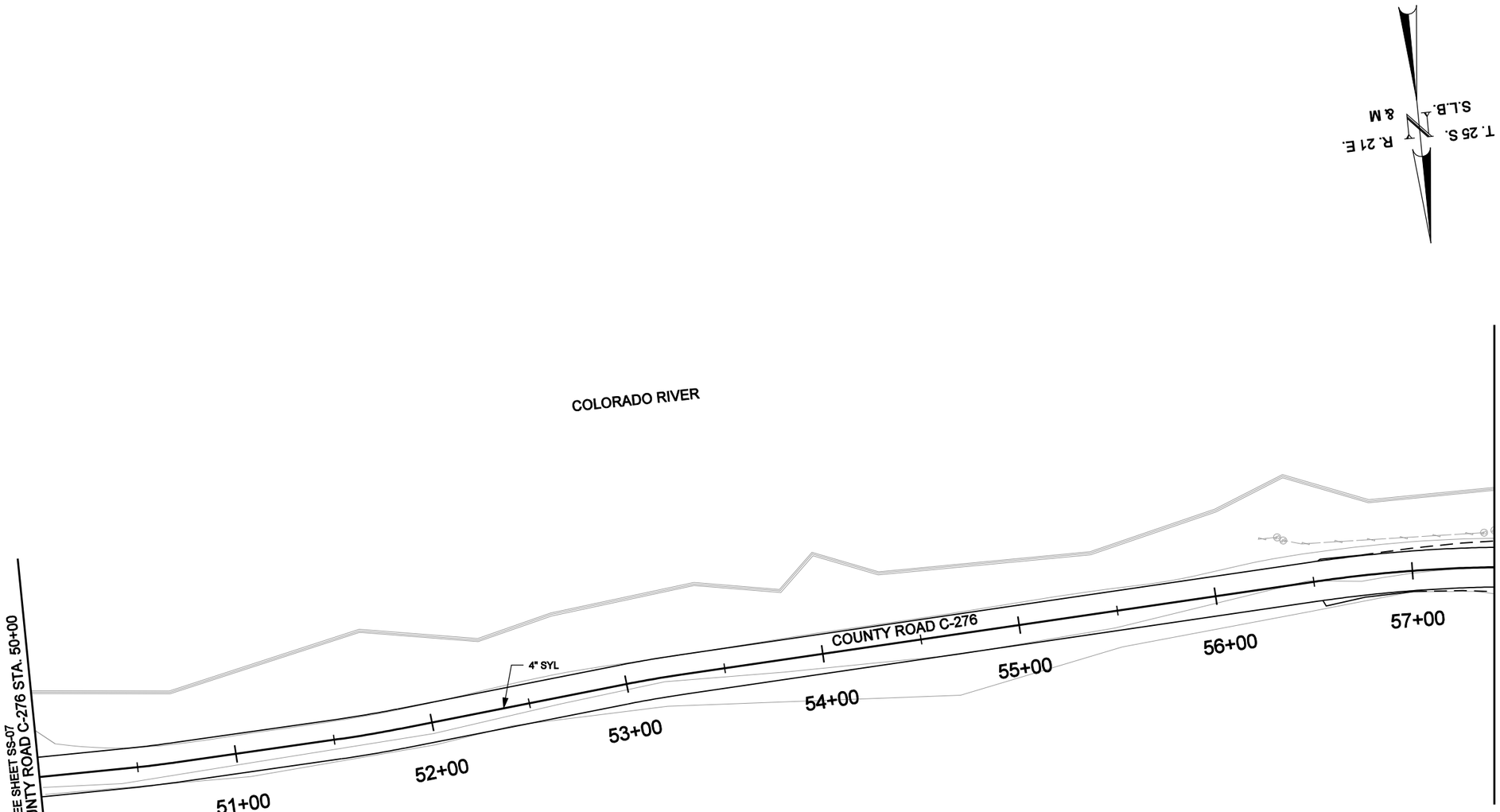
UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
DATE
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-05

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-05.dgn



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DWL = DOTTED WHITE LINE
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S&BYL = SOLID & BROKEN YELLOW LINE

4 INCH PAVEMENT MARKING
PAINT - YELLOW REQ'D (SYL)
COUNTY ROAD C-276 STA 50+00.00, 0.00 RT TO
COUNTY ROAD C-276 MATCH LINE STA 58+00.00, 0.00 RT

PRELIMINARY
NOT FOR CONSTRUCTION

5/6/2008 \\fsslc03\12507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-06.dgn

REVISIONS

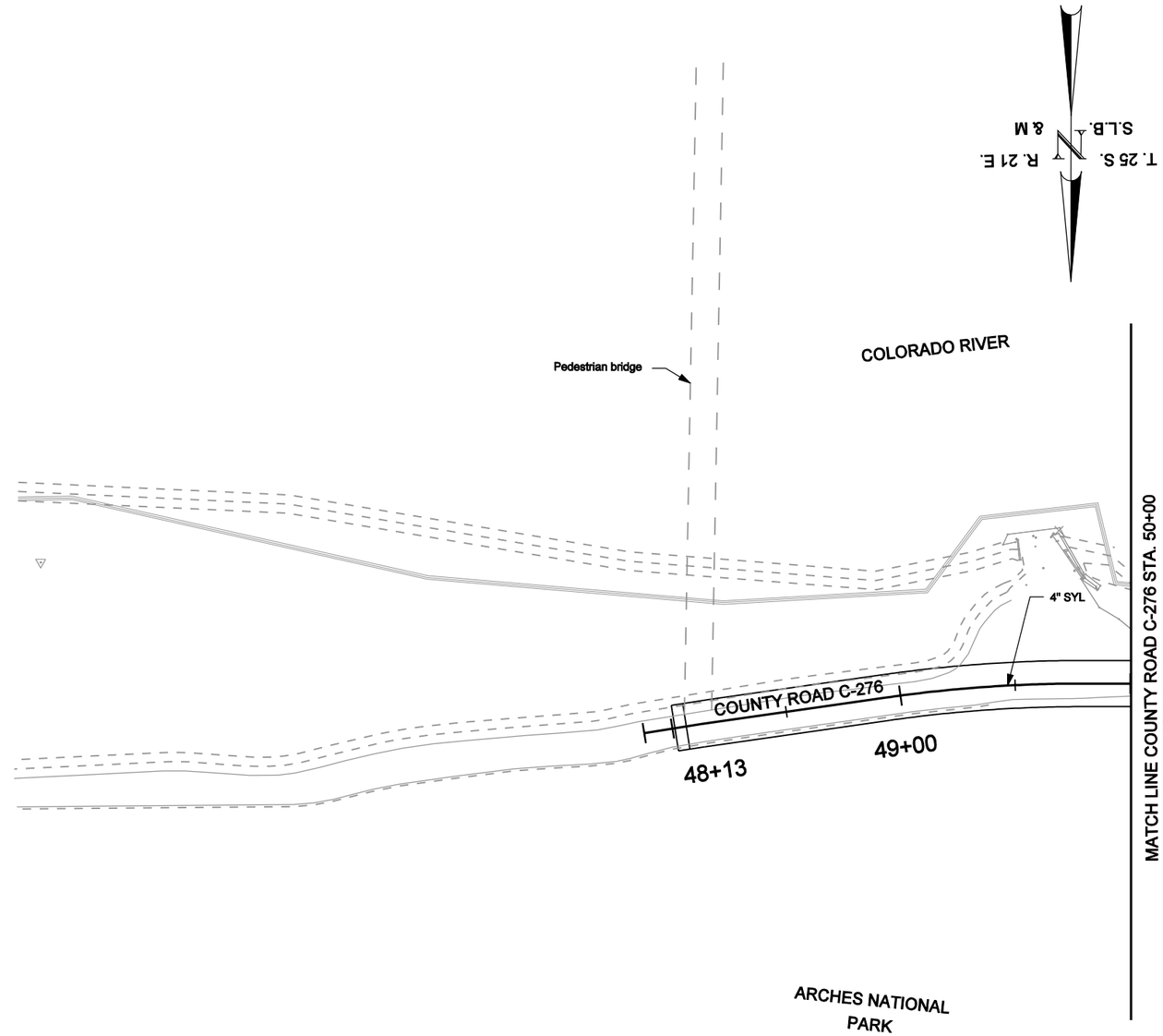
NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
APPROVED
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-06



4 INCH PAVEMENT MARKING
PAINT - YELLOW REQD (SYL)
BEGIN COUNTY ROAD C-276 STA 48+13.00, 0.00 RT TO
MATCHLINE COUNTY ROAD C-276 STA 50+00.00, 0.00 RT

STRIPING KEY

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DWL = DOTTED WHITE LINE
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PRELIMINARY
NOT FOR CONSTRUCTION

5/6/2008 \\fsslc03\32507-slc-colorado_bridge\5365_07\sheet_files\Signing_Striping\5365_07_SS-07.dgn

REVISIONS

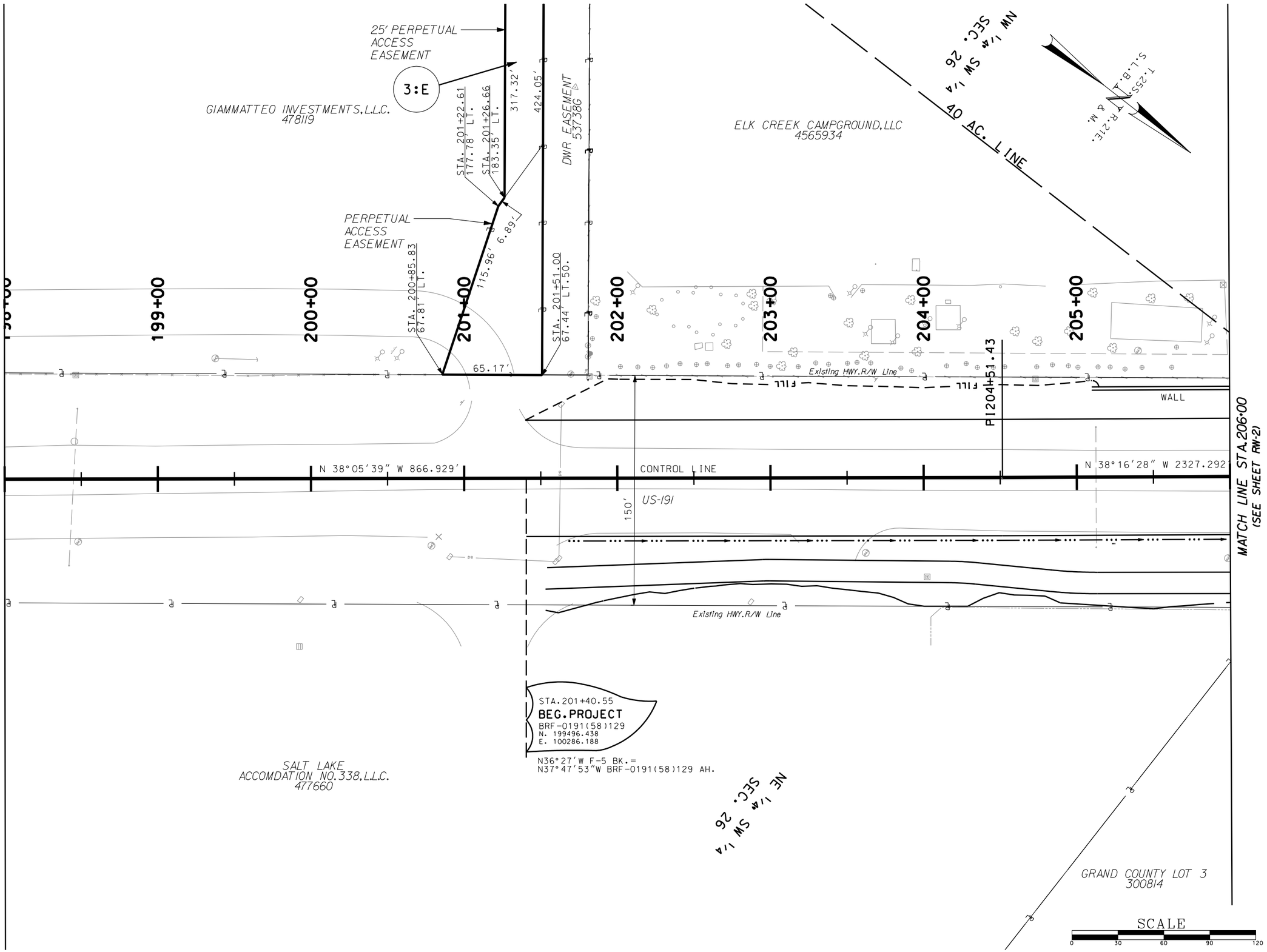
NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY XXX
QC CHECKED BY XXX
APPROVED
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE - MOAB, UTAH
PROJECT NUMBER: BRF-0191(58)129
SIGNING & STRIPING PLAN SHEET

SHEET NO. SS-07



REVISIONS

NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY JBR
QC CHECKED BY SAH

APPROVED

01/16/08
DATE

PROFESSIONAL ENGINEER

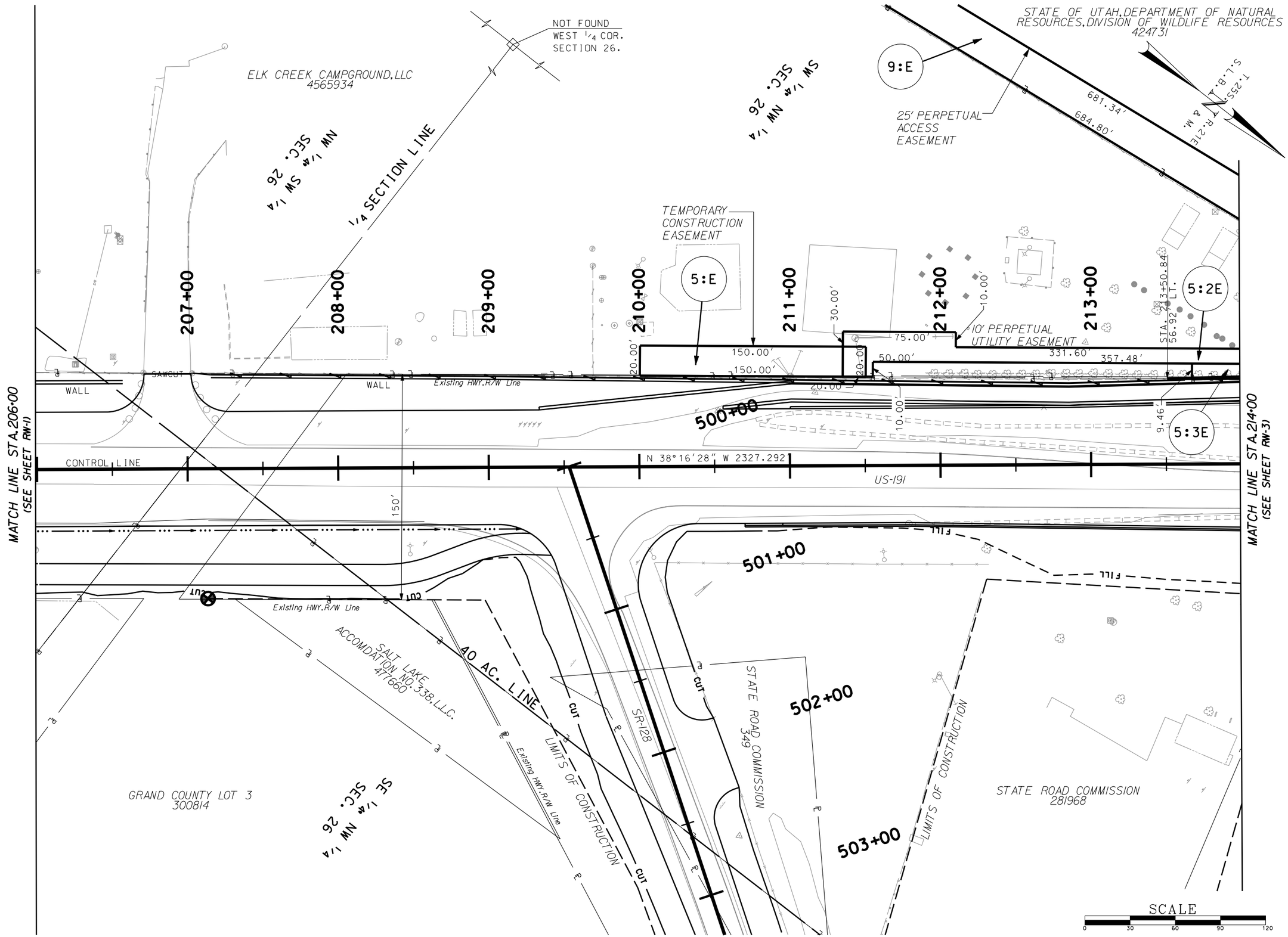
PROJECT: US-191; OVER COLORADO RIVER BRIDGE

PROJECT NUMBER: BRF-0191(58)129

RIGHT OF WAY

SHEET NO. RW-1

5/7/2008 H:\2007\200_ColoradoRiverBridge\Cad\Sheet_Files\Right_of_Way\5365_07_RW_1.dgn



REVISIONS			
NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY: JBR
QC CHECKED BY: SAH
DATE: 01/16/08
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE
PROJECT NUMBER: BRF-0191(58)129
RIGHT OF WAY

SHEET NO. RW-2

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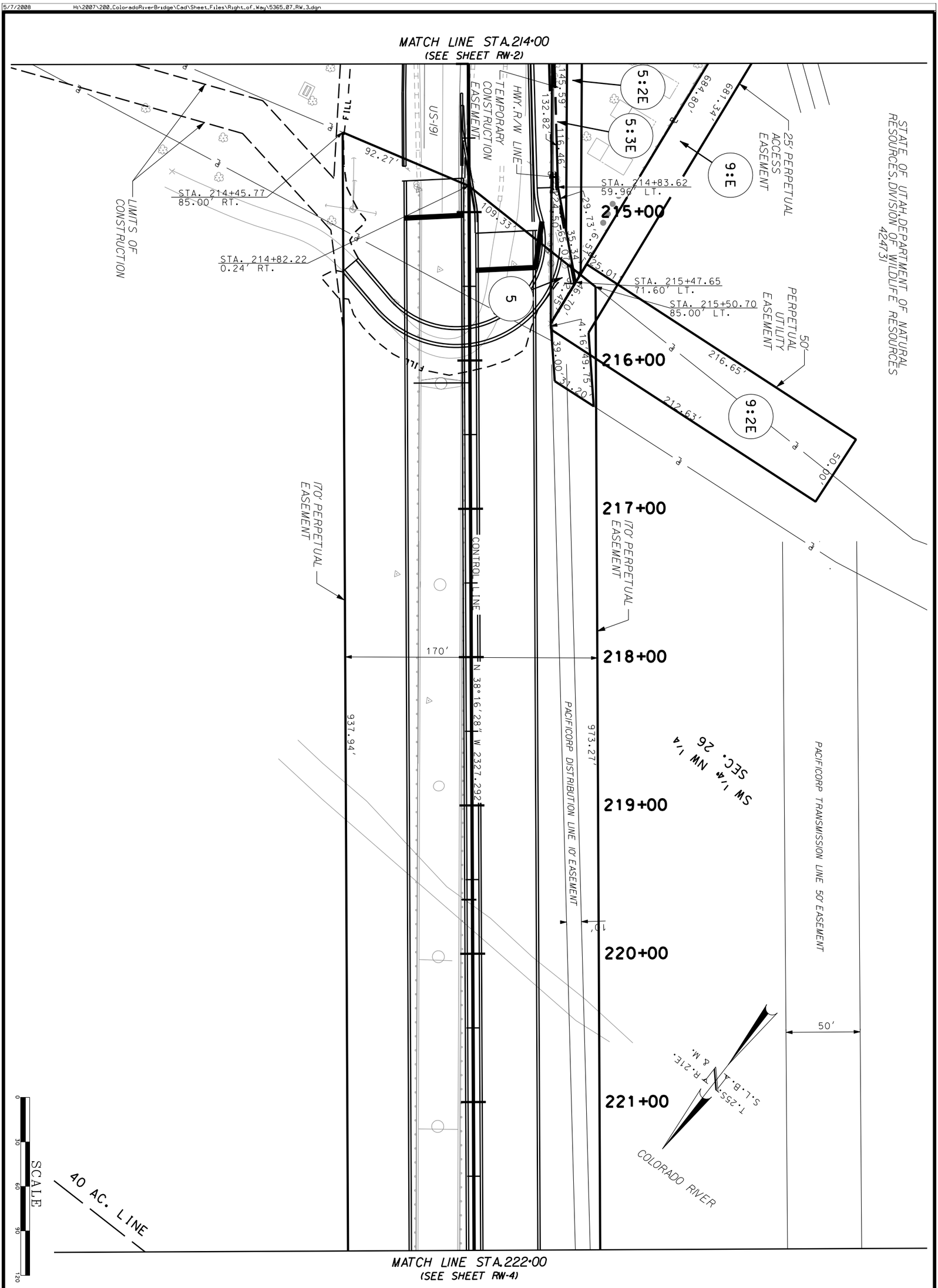
5/7/2008

5/7/2008 H:\2007\200_ColoradoRiverBridge\Cad\Sheet_Files\Right_of_Way\5365_07_RW_3.dgn



SHEET NO. RW-3	PROJECT	US-191; OVER COLORADO RIVER BRIDGE	UTAH DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN		
	PROJECT NUMBER	BRF-0191(58)129	APPROVED	DRAWN BY	JBR
		RIGHT OF WAY	PROFESSIONAL ENGINEER 01/16/08 DATE	QC CHECKED BY	SAH

REVISIONS

NO.	DATE	APPROVED BY	REMARKS
1	1-28-08	SAH	ADDED POWER LINE EASEMENTS

NOT FOUND
WEST 1/4 COR.
SECTION 26.

SECTION LINE S0°2'1.25"W 2635.33'

PACIFICORP TRANSMISSION LINE 50' EASEMENT

50'

STA. 226+51.01
247.62' LT.

STA. 226+82.33
222.90' LT.

50' PERPETUAL UTILITY EASEMENT

TRAPAX
477246

DELTA = 55°00'02"
D.O.C. = 5°37'02"
R = 1020.000'
L = 979.141'
T = 530.985'
P.I. STA. 233+09.768
N 201984.805
E 98323.547

STA. 227+47.93
171.15' LT.

71.02'

39.90'

83.56'

11:E

STA. 226+10.18
189.50' LT.

STA. 225+96.74
172.40' LT.

21.75'

151.20'

LIMITS OF CONSTRUCTION

Existing HWY.R/W Line

NE 1/4 NE 1/4
SEC. 27

T.25S. R.21E.
S.L.B.& M.

SW 1/4 NW 1/4
SEC. 26

COLORADO RIVER

170' PERPETUAL EASEMENT

10'

223+00

224+00

225+00

STA. 225+23.96
85.00' LT.

226+00

227+00

228+00

229+00

973.27'

PACIFICORP DISTRIBUTION LINE 10' EASEMENT

FILL

220.39'

PC 227+78.72

STA. 228+68.62 3.975' RT.
(MEASURED ALONG TANGENT)

MATCH LINE STA.222+00
(SEE SHEET RW-3)

N 38°16'28" W 2327.292' CONTROL LINE

170'

US-191

141°41'31"

MATCH LINE STA.230+00
(SEE SHEET RW-5)

937.94'

170' PERPETUAL EASEMENT

40 AC. LINE

STA. 223+83.70
85.00' RT.

N59°59'26"W
124.99'

400'

200'

PT 60+77.60

PC 62+02.60

62+00

61+00

60+00

59+00

63+00
PT 63+21.35

PC 63+82.79

64+00

65+00

66+00

S0°2'1.25"W
936.557'

LIMITS OF CONSTRUCTION

NW 1/4 NW 1/4
SEC. 26

FOUND
NORTHWEST COR.
SECTION 26.
N. 202569.102
E. 98597.513

Existing HWY.R/W Line

MATCH LINE STA.58+00
(SEE SHEET RW-8)

DELTA = 33°08'41"
D.O.C. = 9°32'57"
R = 600.000'
L = 347.09'
T = 178.55'
P.I. STA. 59+09.06
N 201320.725
E 99084.142

GRAND COUNTY LOT 8
300814

DELTA = 22°40'47"
D.O.C. = 19°05'55"
R = 300.000'
L = 118.75'
T = 60.16'
P.I. STA. 62+62.76
N 201502.633
E 98769.189

DELTA = 56°26'40"
D.O.C. = 5°43'46"
R = 1000.00'
L = 985.14'
T = 536.70'
P.I. STA. 69+19.49
N 202026.224
E 98370.165

SCALE
0 30 60 90 120

REVISIONS			
NO.	DATE	APPROVED BY	REMARKS
1	1-28-08	SAH	ADDED POWER LINE EASEMENTS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY JBR
QC CHECKED BY SAH
APPROVED
01/16/08
DATE
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE
PROJECT NUMBER: BRF-0191(58)129
RIGHT OF WAY

SHEET NO. RW-4

5/7/2008
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TRAPAX
477246

DELTA = 55°00'02"
D.O.C. = 5°37'02"
R = 1020.000'
L = 979.141'
T = 530.985'
P.I. STA. 233+09.768
N 201984.805
E 98323.547

T.25S. R.21E.
S.L.B. & M.

MATCH LINE STA.230+00
(SEE SHEET RW-4)

231+00
232+00
233+00
234+00
235+00
236+00
237+00
PT 237+58.27

Existing HWY.R/W Line

LIMITS OF CONSTRUCTION

CUT
FILL

MATCH LINE STA.238+00
(SEE SHEET RW-6)

S86°14'41"W
82.06'

CONTROL LINE

US-191

PT 73+67.94

74+00
74+50
73+00
72+00
71+00
70+00
69+00
68+00
67+00

400'

NE 1/4 NE 1/4
SEC. 27

DELTA = 56°26'40"
D.O.C. = 5°43'46"
R = 1000.00'
L = 985.14'
T = 536.70'
P.I. STA. 69+19.49
N 202026.224
E 98370.165

Existing HWY.R/W Line

SCALE
0 30 60 90 120

5/7/2008 H:\2007\200.ColoradoRiver-Bridge\Cad\Sheet.Files\Right.of.Way\5265_07_RW_5.dgn

REVISIONS			
NO.	DATE	APPROVED BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

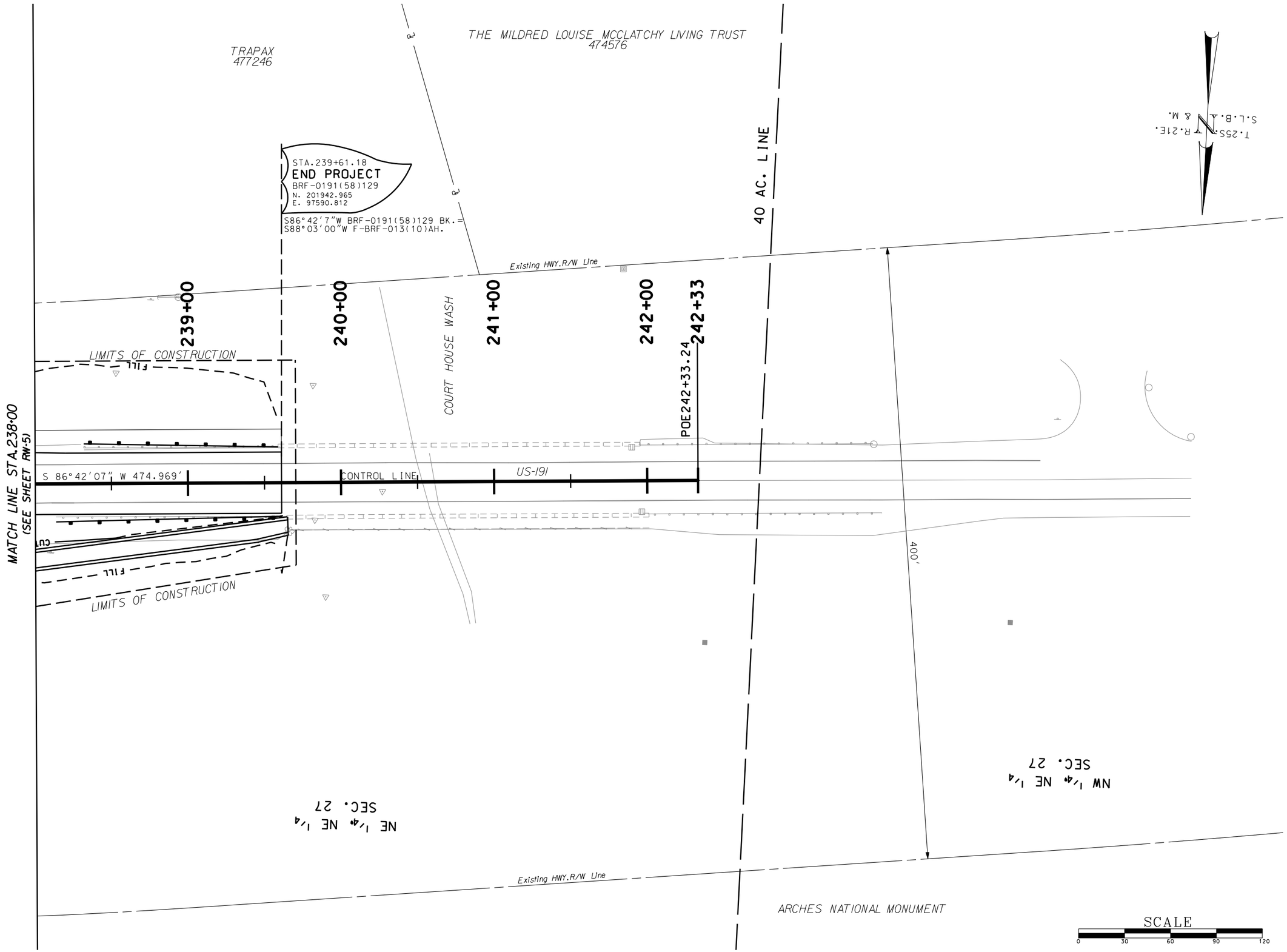
DRAWN BY JBR
QC CHECKED BY SAH
01/16/08
DATE

APPROVED

PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE
PROJECT NUMBER: BRF-0191(58)129
RIGHT OF WAY

SHEET NO. RW-5



NO.	DATE	APPROVED BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY JBR
QC CHECKED BY SAH
DATE 01/16/08
APPROVED
PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE
PROJECT NUMBER: BRF-0191(58)129
RIGHT OF WAY

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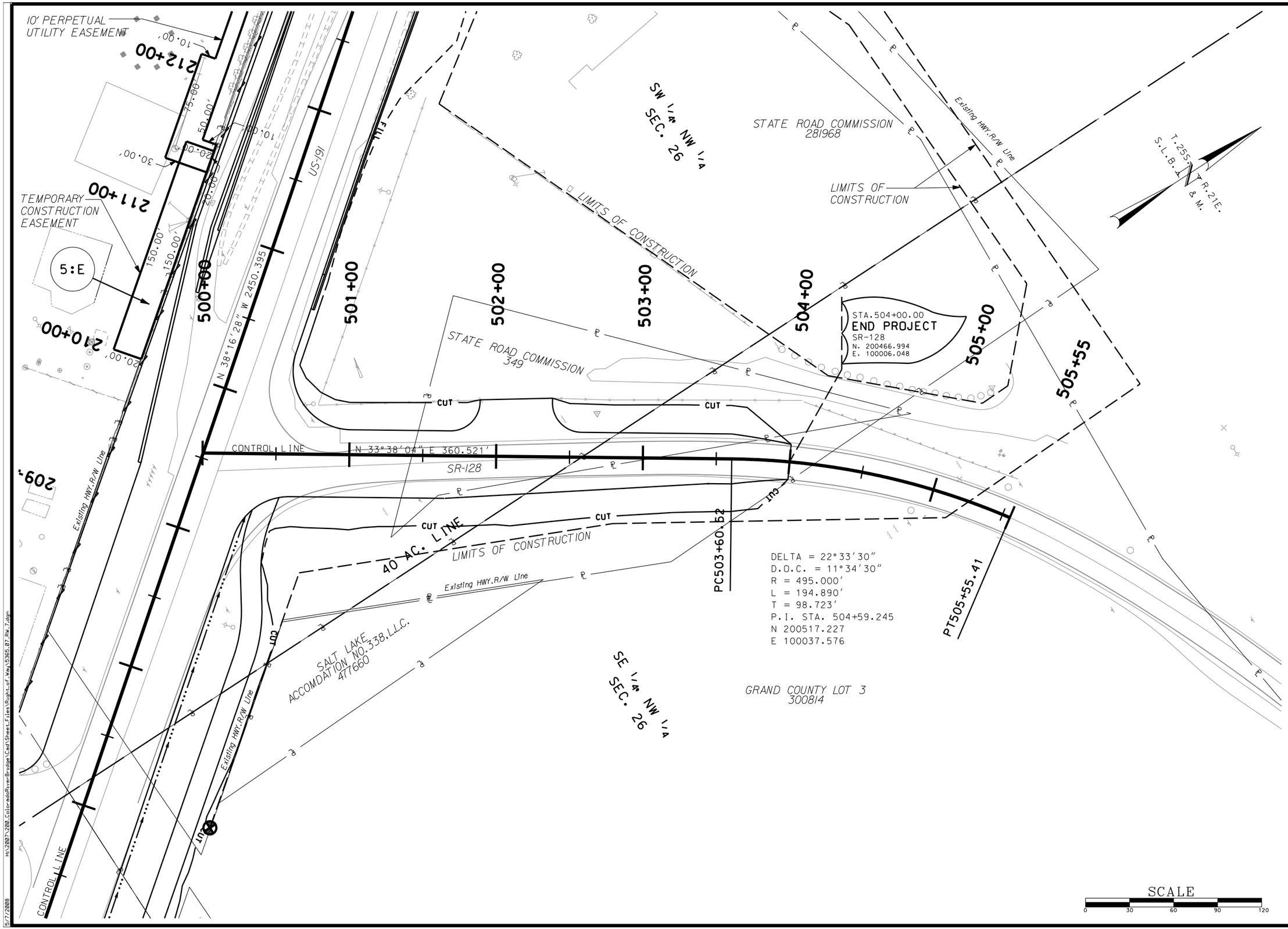

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UTAH DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN

DRAWN BY: JBR
QC CHECKED BY: SAH
DATE: 01/16/08
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PROFESSIONAL ENGINEER

PROJECT: US-191; OVER COLORADO RIVER BRIDGE
PROJECT NUMBER: BRF-0191(58)129
RIGHT OF WAY

SHEET NO. RW-7

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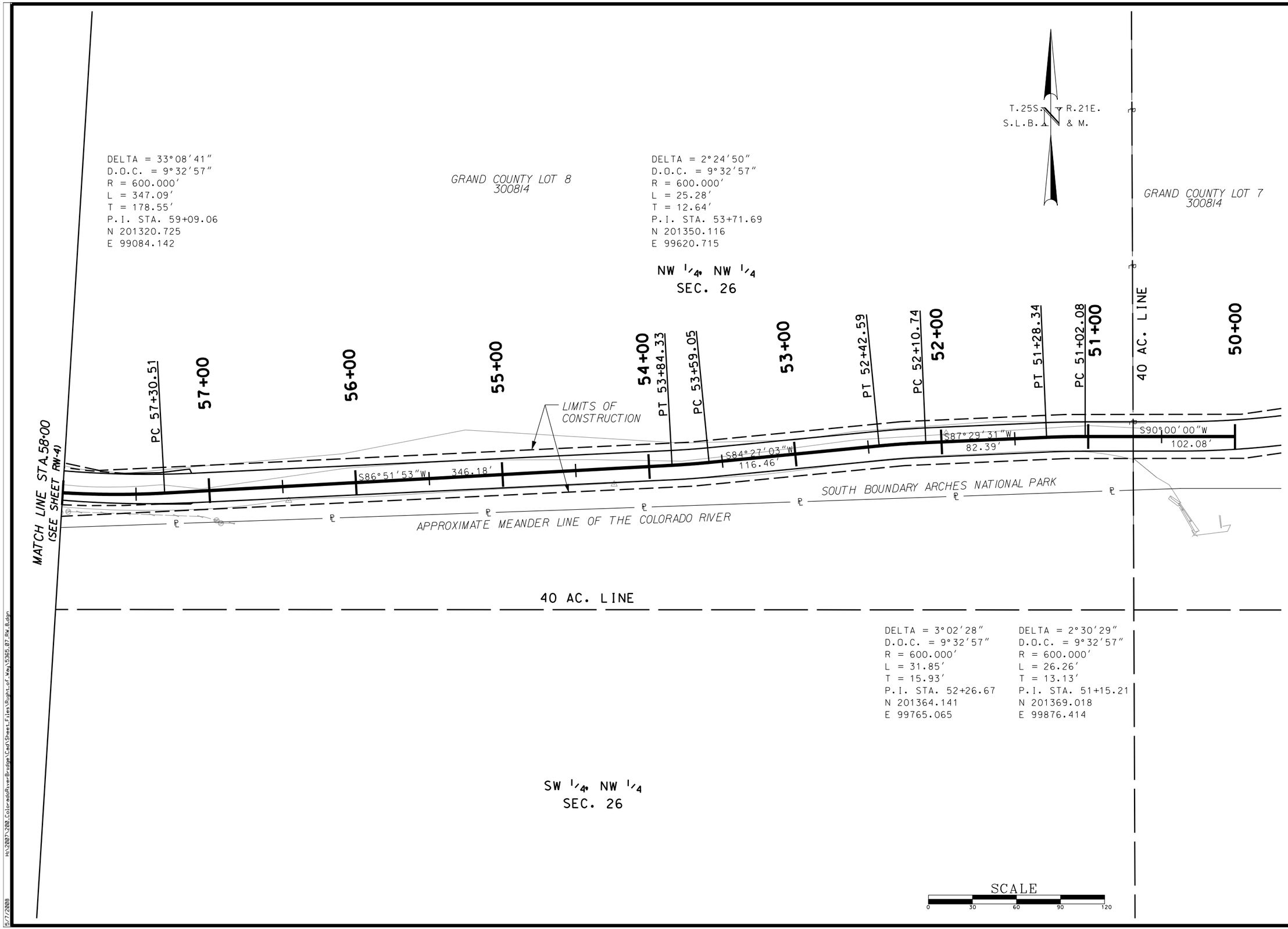

REVISIONS

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DRAWN BY JBR
QC CHECKED BY SAH
DATE 01/16/08
APPROVED
PROFESSIONAL ENGINEER

US-191;
OVER COLORADO RIVER BRIDGE

PROJECT
PROJECT NUMBER BRF-0191(58)129

RIGHT OF WAY

SHEET NO. RW-8

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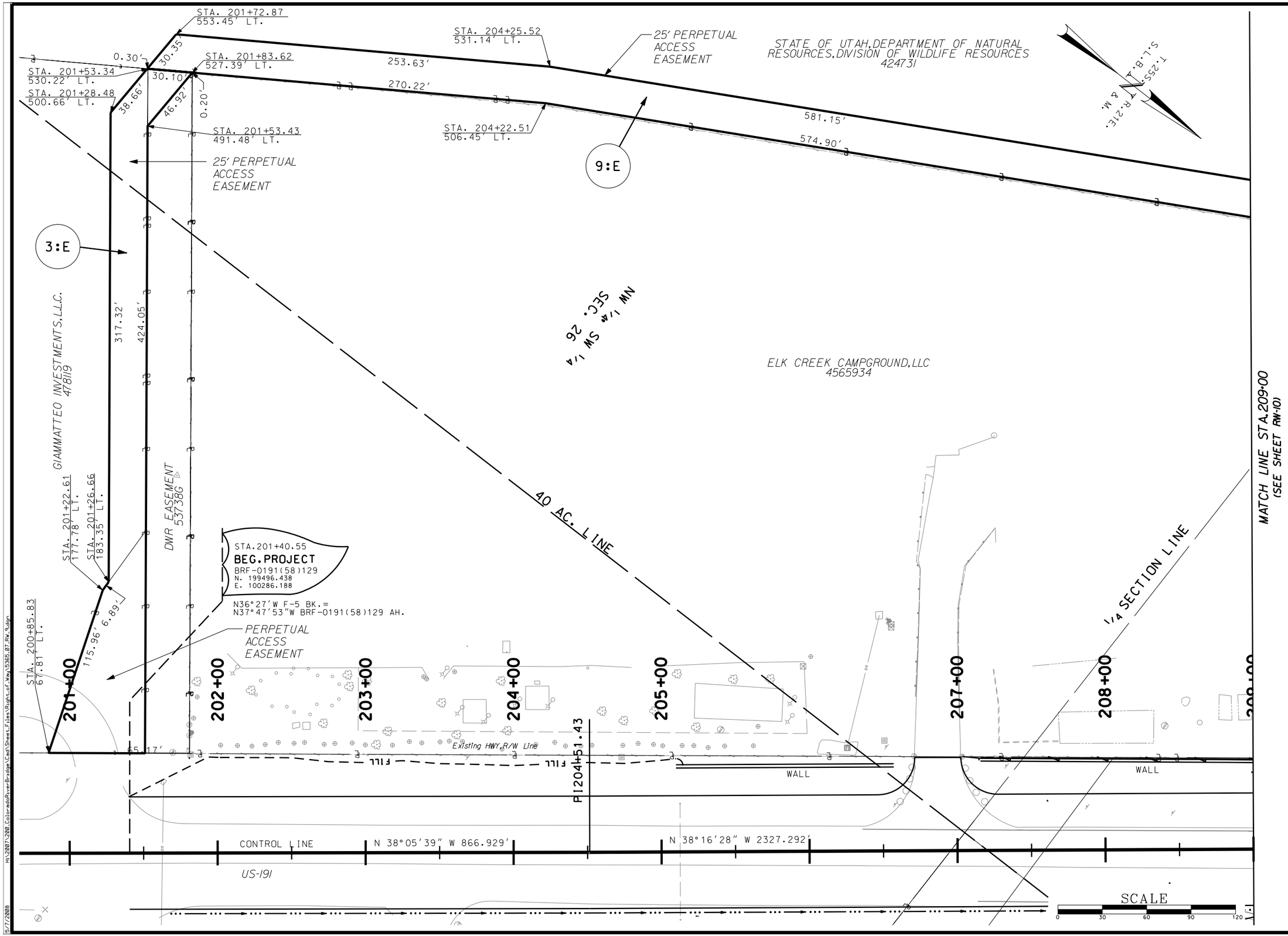

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US-191;
OVER COLORADO RIVER BRIDGE
BRF-0191(58)129
RIGHT OF WAY

PROJECT
PROJECT NUMBER

SHEET NO. RW-9

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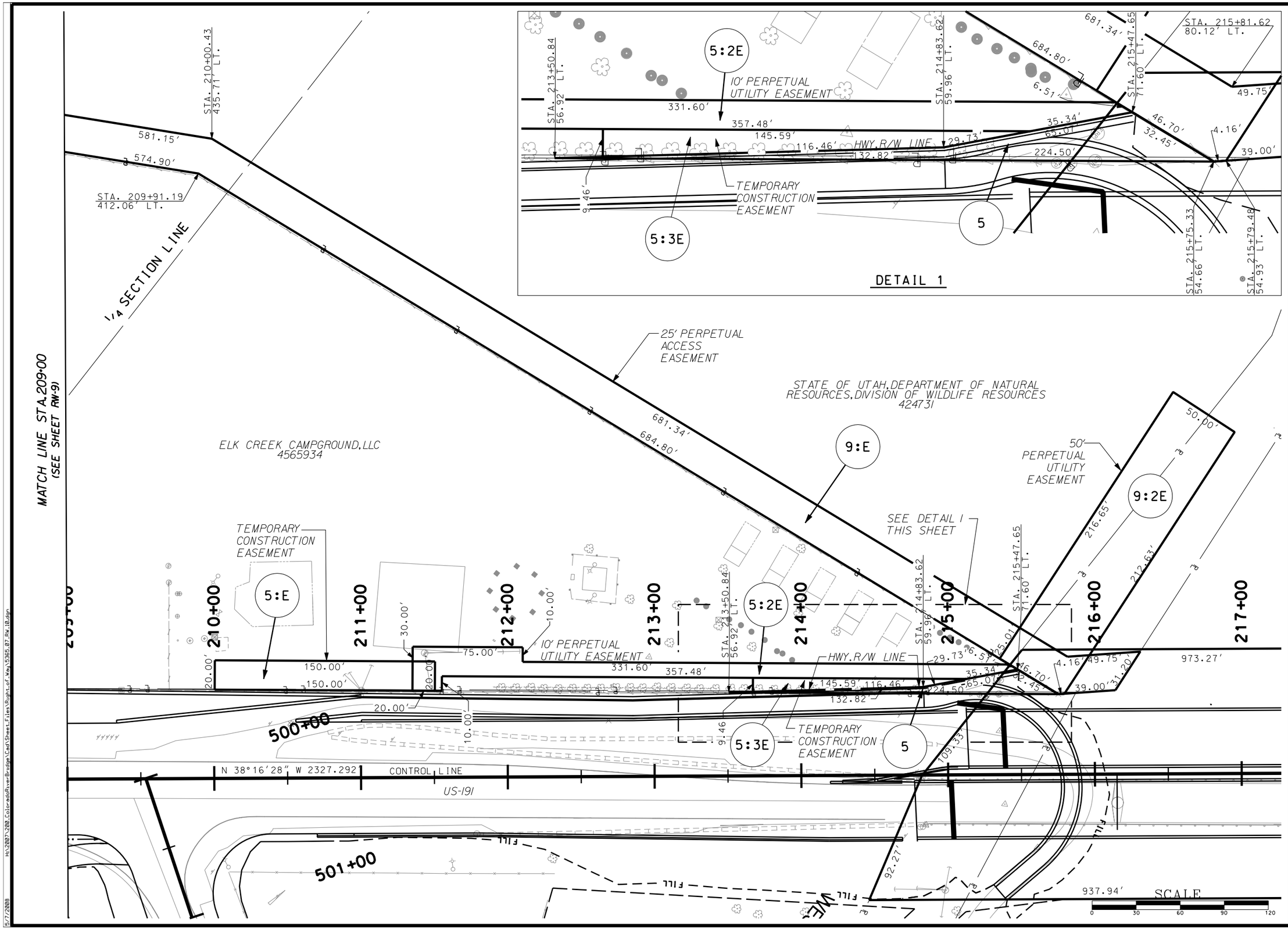

NO.	DATE	APPROVED BY	REMARKS

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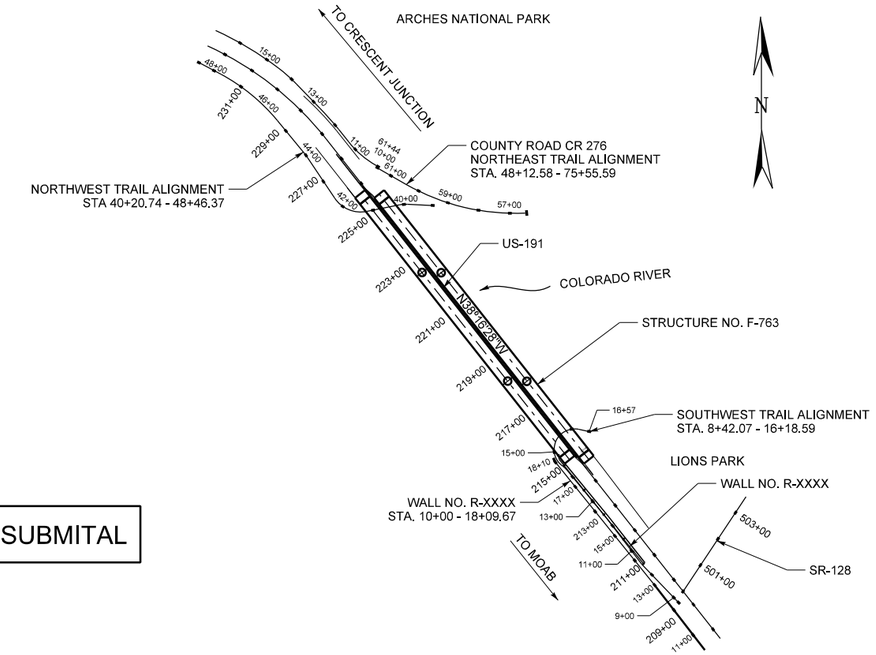
QUANTITIES

ITEM	ESTIMATED	UNIT	AS CONSTRUCTED
GRANULAR BACKFILL BORROW (PLAN QUANTITY)	1,012	CY	-
DRILLED CAISSON (60" DIAMETER)	651	LF	-
DRILLED CAISSON (84" DIAMETER)	1,944	LF	-
BRIDGE BEARING DEVICE (DISK)	24	EA	-
FLOWABLE FILL	709	CY	-
SUPERSTRUCTURE STRUCTURAL CONCRETE (6000 PSI)	7,911	CY	-
STRUCTURAL CONCRETE (AA) (AE) (4000 PSI)	2,772	CY	-
CAST IN PLACE CONSTANT SLOPE BARRIER (A)	4,308	LF	-
REINFORCING STEEL (COATED)	1,919,708	LB	-
POST-TENSIONING STEEL STRAND (LONGITUDINAL)	740,205	LB	-
POST-TENSIONING STEEL STRAND (TRANSVERSE)	72,220	LB	-
POST-TENSIONING STEEL BARS	4,172	LB	-
STRUCTURAL CONCRETE STAIN	147,732	SF	-
MODULAR EXPANSION JOINT (0-6")	74	LF	-
MODULAR EXPANSION JOINT (0-12")	74	LF	-
BRIDGE DRAIN	12	EA	-
EQUIPMENT (FORM TRAVELERS)	1	LS	-

* INCLUDED IN 60% SUBMITAL

PRELIMINARY:
NOT FOR CONSTRUCTION



LOCATION PLAN

(EXISTING STRUCTURE C-285
NOT SHOWN FOR CLARITY)

GENERAL NOTES

1. ALL REINFORCING STEEL SHALL BE EPOXY-CAOTED DEFORMED BILLET STEEL BARS CONFORMING TO AASHTO M 284 AND AASHTO M 31 GRADE 60, RESPECTIVELY.
2. ALL POST-TENSIONING STEEL SHALL BE SEVEN WIRE, 0.6" DIAMETER LOW RELAXATION STRAND AND CONFORM TO ASTM A-416, GRADE 270.
3. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾" EXCEPT WHERE NOTED OTHERWISE.
4. COVER TO REINFORCING STEEL SHALL BE:
   - SUPERSTRUCTURE:
     - TOP OF INTEGRAL WEARING SURFACE: 4 ½"
     - ALL OTHER SURFACES: 1 ½"
   - SUBSTRUCTURE:
     - SURFACES CAST AGAINST FORMS: 2"
     - SURFACES CAST AGAINST EARTH: 3"
5. CAST-IN-PLACE CONCRETE SHALL BE CLASS:
   - SUPERSTRUCTURE: SUPERSTRUCTURE CONCRETE (6000 PSI)
   - SUBSTRUCTURE: AA (AE) (4000 PSI)
   - DRILLED SHAFTS: XXXXXX (4000 PSI)

DESIGN DATA

HL-93 WITH IMPACT (DESIGN TRUCK OR TANDEM WITH CONCURRENT DESIGN LANE LOAD) IN ACCORDANCE WITH CURRENT AASHTO LRFD AND INTERIM SPECIFICATIONS.

CAST-IN-PLACE CONCRETE: f'c = 6000 PSI FOR SUPERSTRUCTURE
f'c = 4000 PSI FOR SUBSTRUCTURE
fy = 60 KSI FOR MILD REINFORCING STEEL
fu = 270 KSI FOR POST-TENSIONING STRAND

WEARING SURFACE: 2 ½" CONCRETE WEARING SURFACE CAST WITH GIRDER, WITH ALLOWANCE FOR ½" SURFACE GRINDING TO ACHIEVE ACCEPTABLE RIDING SURFACE (30 psf).

DESIGN SPEED: US191 50 MPH

SEISMIC DESIGN DATA: MAY 2007 AASHTO "GUIDE SPECIFICATIONS FOR LRFD SEISMIC BRIDGE DESIGN CRITERIA" 1033 YEAR DESIGN RETURN PERIOD, SITE CLASS 'C' F_vS_1 = 0.07g; OPERATIONAL PERFORMANCE OBJECTIVE.

NOTES

1. FOR PLAN AND ELEVATION VIEWS, SEE SITUATION & LAYOUT IV THROUGH VI SHEETS.
2. FOR TYPICAL SECTIONS, SEE SITUATION & LAYOUT VII SHEET.
3. FOR DESIGN CRITERIA, SEE SITUATION & LAYOUT II SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SITUATION & LAYOUT I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 1 OF 187

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5/7/2008

A. DESIGN SPECIFICATIONS:

1. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS,"FOURTH EDITION, 2007.
2. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "GUIDE SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF SEGMENTAL CONCRETE BRIDGES," SECOND EDITION, 1999, WITH 2003 REVISIONS, EXCEPT SECTION 28 OF DIVISION I IS WAIVED FOR THIS CONTRACT. THE LEVEL OF DETAIL AND SUBMITTAL REQUIREMENTS IS AS SHOWN IN THE PLANS AND SPECIFICATIONS.
3. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS," SECOND EDITION, 2004, WITH INTERIMS THROUGH 2005.
4. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS," 1995.
5. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS "AASHTO GUIDE MANUAL FOR CONDITION EVALUATION AND LOAD AND RESISTANCE FACTOR RATING (LRFR) OF HIGHWAY BRIDGES," FIRST EDITION, 2003, WITH INTERIMS THROUGH 2005.
6. MCEER/ATC-49 "RECOMMENDED LRFD GUIDELINES FOR THE SEISMIC DESIGN OF HIGHWAY BRIDGES."
7. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "STRUCTURES DESIGN AND DETAILING MANUAL,"2008.
8. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "STANDARD AND SUPPLEMENTAL SPECIFICATIONS,"2008.
9. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "STANDARD AND SUPPLEMENTAL DRAWINGS,"2008.
10. UTAH DEPARTMENT OF TRANSPORTATION (UDOT) "SPECIAL PROVISIONS," 2008.
11. CEB-FIP "MODEL CODE,"1978, THIRD EDITION, FOR CONCRETE TIME-DEPENDENT PROPERTIES ONLY.

B. DESIGN LOADING:

1. PERMANENT LOADS (DC, DW, EH, EV, ES, EL):
   - A. UNIT WEIGHT OF POST-TENSIONED AND REINFORCED CONCRETE: 150 pcf
   - B. BARRIER: 42" HIGH, UDOT SINGLE SLOPE: 570 plf.
   - C. UTILITY ALLOWANCE: 100 plf
   - D. WEARING SURFACE TYPE: INTEGRAL CONCRETE 2 ½"(4 ½"COVER): 30 psf
   - E. UNIT WEIGHT OF FILL SOIL: 150 pcf
   - F. HORIZONTAL EARTH PRESSURE: 42 pcf/ft
2. LIVE LOADS (LL, IM, PL, CE, BR, LS):
   HL-93 WITH IMPACT
   (DESIGN TRUCK OR TANDEM AND DESIGN LANE LOAD).
3. WIND LOADS (WS, WL):
   AS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" WITH "OPEN COUNTRY" SURFACE CONDITION USED FOR DESIGN.
4. THERMAL FORCES (TU, TG, FR):
   - A. MEAN TEMPERATURE: 50º F
   - B. THERMAL COEFFICIENT: 0.000006/ º F
   - C. SEASONAL VARIATION:
     - TEMPERATURE RISE: 60º F
     - TEMPERATURE FALL: 60º F
   - D. TEMPERATURE GRADIENT:
     AS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS", ZONE 1.
5. CREEP AND SHRINKAGE (CR, SH, FR):
   STRAINS ARE CALCULATED IN ACCORDANCE WITH "CEB-FIP MODEL CODE", 1978, WITH A RELATIVE HUMIDITY OF 50%.
6. EXTREME EVENTS (EQ, CT):
   - A. EARTHQUAKE: MAY 2007 AASHTO "GUIDE SPECIFICATIONS FOR LRFD SEISMIC BRIDGE DESIGN CRITERIA", SITE CLASS "C", WITH A 1033-YEAR DESIGN RETURN PERIOD FOR THE MAXIMUM CONSIDERED EARTHQUAKE, 0.07g (F_vS_1). OPERATIONAL PERFORMANCE OBJECTIVE UTILIZED FOR DESIGN.
   - B. VEHICULAR COLLISION FORCES IN ACCORDANCE WITH "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS."
7. LOAD COMBINATIONS
   AS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS"
   $\eta_i = 1.0$, $\eta_D = 1.0$, $\eta_R = 1.05$

C. MATERIALS:

1. CONCRETE (28-DAY CYLINDER STRENGTH AS NOTED):
   - A. SUPERSTRUCTURE: * , f'c = 6000 psi
   - B. SUPERSTRUCTURE (BARRIERS, APPROACH SLABS): * , f'c = 4000 psi
   - C. SUBSTRUCTURE (ABUTMENT, PIERS, FOOTINGS): * , f'c = 4000 psi
   - D. DRILLED SHAFTS: * , f'c = 4000 psi

   * MIX DESIGN PARAMETERS ARE SPECIFIED IN THE PROJECT SPECIAL PROVISIONS
2. REINFORCING STEEL:
   - A. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615, GRADE 60
   - B. ALL BARS SHALL BE EPOXY COATED
   - C. CONCRETE COVER (UNLESS SHOWN OTHERWISE IN THE PLANS):
     - SUPERSTRUCTURE:
       1. TOP OF INTEGRAL WEARING SURFACE 4 1/2 IN.
       2. ALL OTHER SURFACES 1 1/2 IN.
     - SUBSTRUCTURE:
       1. SURFACES CAST AGAINST FORMS 2 IN.
       2. SURFACES CAST AGAINST EARTH 3 IN.
3. POST-TENSIONING STEEL:
   - A. STRAND: ASTM A-416, SEVEN-WIRE GRADE 270, LOW RELAXATION
     - STRAND SIZE 0.6"DIAMETER
     - APPARENT MODULUS 28,500 KSI
     - MAXIMUM JACKING STRESS 203 KSI (75% OF ULTIMATE)
     - MAXIMUM ANCHORING STRESS 189 KSI (70% OF ULTIMATE)
     - ANCHOR SET 3/8 IN.
     - FRICTION COEFFICIENT 0.25
     - WOBBLE COEFFICIENT 0.0 (EXTERNAL TENDONS)
       0.0002 (INTERNAL TENDONS)
   - B. BARS:
     - ASTM A722, GRADE 150
     - MAXIMUM JACKING STRESS 120 KSI (80% OF ULTIMATE)
     - MAXIMUM ANCHORING STRESS 105 KSI (70% OF ULTIMATE)

D. ALLOWABLE STRESSES/LOADS:

1. DESIGN METHOD:
   THE SUPERSTRUCTURE SHALL BE DESIGNED FOR APPLICABLE SERVICE AND STRENGTH LIMIT STATES AS DEFINED BY THE LOAD GROUPS IN THE LRFD SPECIFICATIONS. THE SUBSTRUCTURE SHALL BE DESIGNED FOR THE APPLICABLE STRENGTH AND EXTREME EVENT LIMIT STATES AS DEFINED BY THE LOAD GROUPS IN THE LRFD SPECIFICATIONS AND CHECKED FOR THE CRACK CONTROL PROVISIONS IN SECTION 5.7.3.4 OF THE SPECIFICATIONS.
2. SUPERSTRUCTURE CONCRETE STRESSES (SERVICE CRITERIA):
   - TENSION: $3\sqrt{f'c}$ psi ($0.0949\sqrt{f'c}$ ksi) (CAST-IN-PLACE)
   - COMPRESSION: 0.45f'c psi (DUE TO POST-TENSIONING AND PERMANENT LOADS)
     Φ_w0.6f'c psi (ALL OTHER LOAD CASES)
     Φ_w PER AASHTO LRFD SECTION 5.7.4.7
3. SUPERSTRUCTURE CONCRETE STRESSES (TEMPORARY STRESS CRITERIA):
   - TENSION: $3\sqrt{f'c}$ psi ($0.09491\sqrt{f'c}$ ksi) (CAST-IN-PLACE)
   - COMPRESSION: 0.55f'ci psi, NOT TO EXCEED Φ_w0.6f'ci psi
4. SUPERSTRUCTURE CONCRETE STRESSES (CONSTRUCTION CRITERIA):
   - TENSION: PER AASHTO LRFD TABLE 5.14.2.3.3-1 (CAST-IN-PLACE)
   - COMPRESSION: 0.50f'ci psi, NOT TO EXCEED Φ_w0.6f'ci psi
5. SEGMENT CASTING AND ERECTION:
   - A. MINIMUM CONCRETE STRENGTH BEFORE STRESSING LONGITUDINAL AND TRANSVERSE POST-TENSIONING, RELEASING FORMWORK, AND ADVANCING TRAVELERS: 4000 psi
   - B. FOR PURPOSES OF DESIGN, AVERAGE AGE OF SEGMENTS FOR ADVANCEMENT OF FORM TRAVELERS ASSUMED TO BE: 1 DAY
   - C. FOR PURPOSES OF DESIGN, AVERAGE CASTING CYCLE FOR A PAIR OF SEGMENTS ASSUMED TO BE: 1 WEEK
   - D. CONSTRUCTION LOAD COMBINATIONS PER "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS."

E. FOUNDATIONS:

1. FOUNDATION TYPE
   DRILLED SHAFTS IN MUDSTONE BEDROCK
   - PIER FOUNDATIONS: 84" DIAMETER
   - ABUTMENT FOUNDATIONS : 60" DIAMETER
2. DESIGN METHOD:
   ULTIMATE SIDE SHEAR RESISTANCE CALCULATED IN ACCORDANCE WITH AASHTO LRFD 2007 4th EDITION, CHAPTER 10. A RESISTANCE FACTOR OF 0.55 WAS USED FOR DESIGN. END BEARING NOT REDUCED AND IGNORED IN DESIGN. SEE DRILLED SHAFT REINFORCING SHEETS FOR PLOTS OF DRILLED SHAFT CAPACITY VERSUS DEPTH.

F. HYDRAULICS

1. DESIGN FLOOD ELEVATIONS:
   - 50 YR FLOOD + 2' FREEBOARD: 3974.78'
   - 100 YR FLOOD: 3974.14'
   - 500 YR FLOOD: 3977.02'
2. TYPICAL POOL ELEVATIONS:
   THE TABLE BELOW SHOWS THE HISTORICAL WATER ELEVATIONS IMMEDIATELY UPSTREAM OF THE PROJECT SITE FOR EACH MONTH BETWEEN THE YEARS 1913 AND 2007. ACTUAL ELEVATIONS MAY BE HIGHER OR LOWER DURING THE PROJECT DURATION.

MONTH	MEDIAN FLOWS	PEAK FLOWS
JANUARY	3954.70'	3956.91
FEBRUARY	3954.77'	3957.35
MARCH	3955.00'	3960.37
APRIL	3956.51'	3965.54
MAY	3960.44'	3971.26
JUNE	3961.15'	3971.86
JULY	3956.51'	3969.13
AUGUST	3955.09'	3961.05
SEPTEMBER	3955.02'	3961.89
OCTOBER	3955.15'	3962.07
NOVEMBER	3955.12'	3958.01
DECEMBER	3954.84'	3957.38

MEAN LOW WATER ELEVATION: TBD
NORMAL POOL ELEVATION: 3954.96'
MEAN HIGH WATER ELEVATION: 3971.86'

MEAN LOW WATER ELEVATION DENOTES THE HISTORICAL ANNUAL LOW WATER ELEVATION.
NORMAL POOL ELEVATION DENOTES THE HISTORICAL AVERAGE WATER ELEVATION DURING THE NON-RUNOFF PERIOD OF AUGUST THROUGH MARCH.
MEAN HIGH WATER ELEVATION DENOTES THE HISTORICAL ANNUAL HIGH WATER ELEVATION DURING THE RUNOFF PERIOD OF APRIL THOUGH JULY.

3. DESIGN SCOUR DATA: TBD

G. MISCELLANEOUS:

1. PROVISIONS HAVE BEEN MADE FOR JACKING OF THE SUPERSTRUCTURE FOR REPLACEMENT OF THE BEARINGS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.
3. PERMANENT STEEL DECK FORMS ARE NOT ALLOWED.
4. PERMANENT CONCRETE DECK FORMS ARE NOT ALLOWED.
5. THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AND FOR AVOIDING DAMAGE THERETO.
6. DATUM - SEE SURVEY CONTROL DRAWING.

PRELIMINARY:
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 01/08 CHECK XXX MM/YY
DRAWN SJF 01/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SITUATION & LAYOUT II

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 2 OF 187

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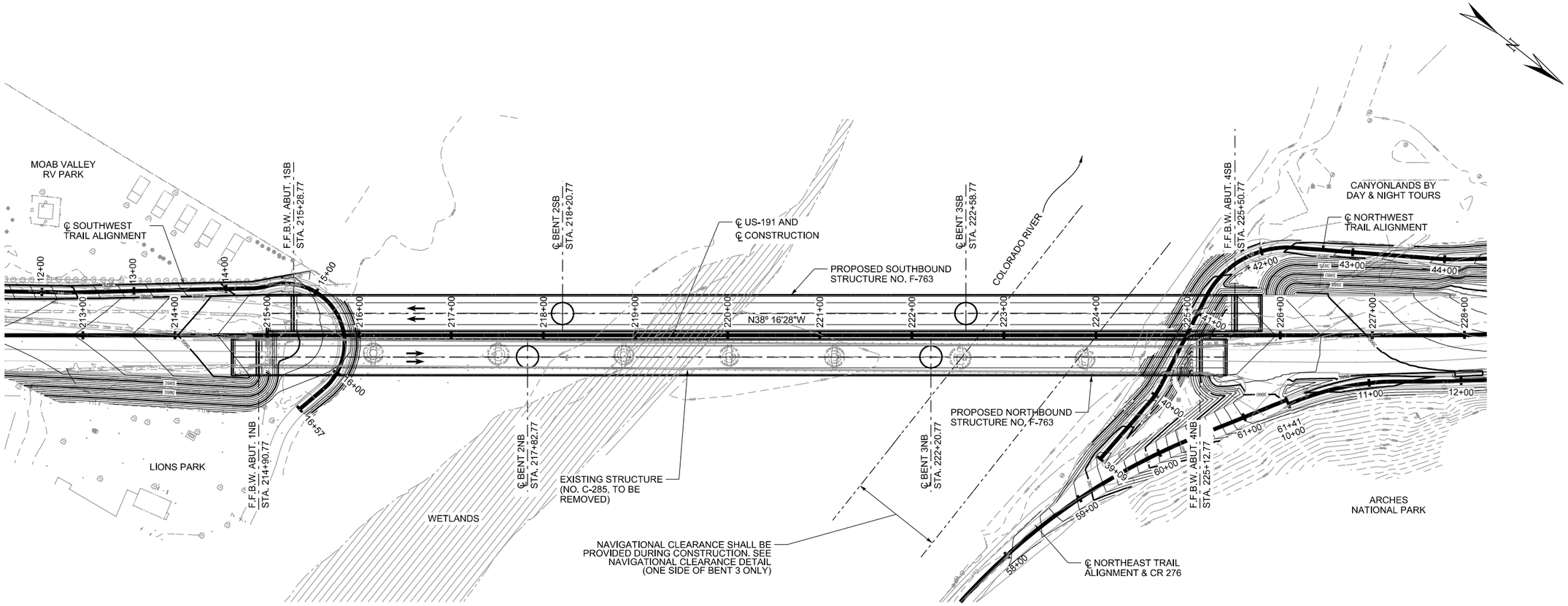
5/7/2008



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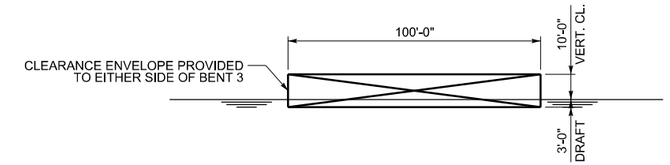
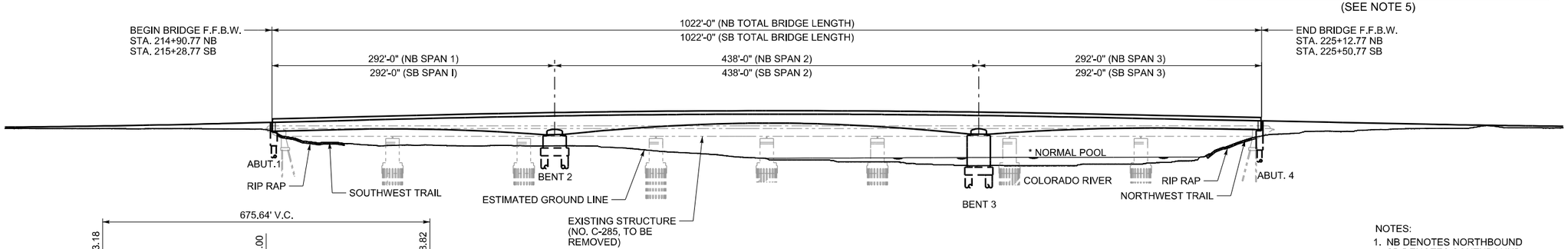
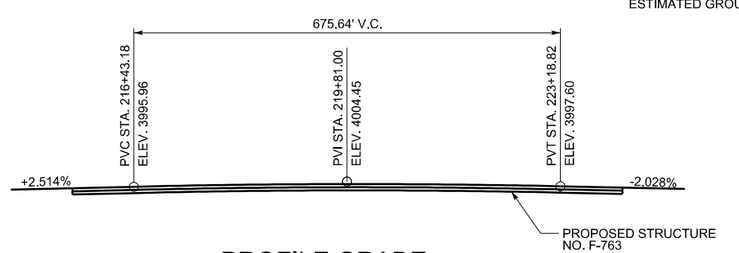


NAVIGATIONAL CLEARANCE DETAIL
(SEE NOTE 5)



ELEVATION
(NB BRIDGE SHOWN, SB SIMILAR)



PROFILE GRADE
(COINCIDENT WITH ℄ US-191)

NOTES:
1. NB DENOTES NORTHBOUND SB DENOTES SOUTHBOUND.
2. SPAN LENGTHS MEASURED ALONG ℄ US-191 AND ℄ CONSTRUCTION.
* 3. NORMAL POOL ELEVATION DENOTES THE HISTORICAL WATER ELEVATION FOR THE NON -RUNOFF PERIOD OF AUGUST THROUGH MARCH. SEE BRIDGE HYDRAULIC DATA SHEET FOR MORE INFORMATION.
4. F.F.B.W. DENOTES FRONT FACE OF BACK WALL OF THE ABUTMENT.
5. NAVIGATIONAL CLEARANCE FOR COMERCIAL BOAT TOURS SHALL BE MAINTAINED TO ONE SIDE OF PIER 3 FROM THE OPERATIONAL MONTHS OF MARCH THOUGH OCTOBER.

PRELIMINARY:
NOT FOR CONSTRUCTION

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 01/08 CHECK XXX MM/YY
DRAWN SJF 01/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SITUATION & LAYOUT III

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 3 OF 187

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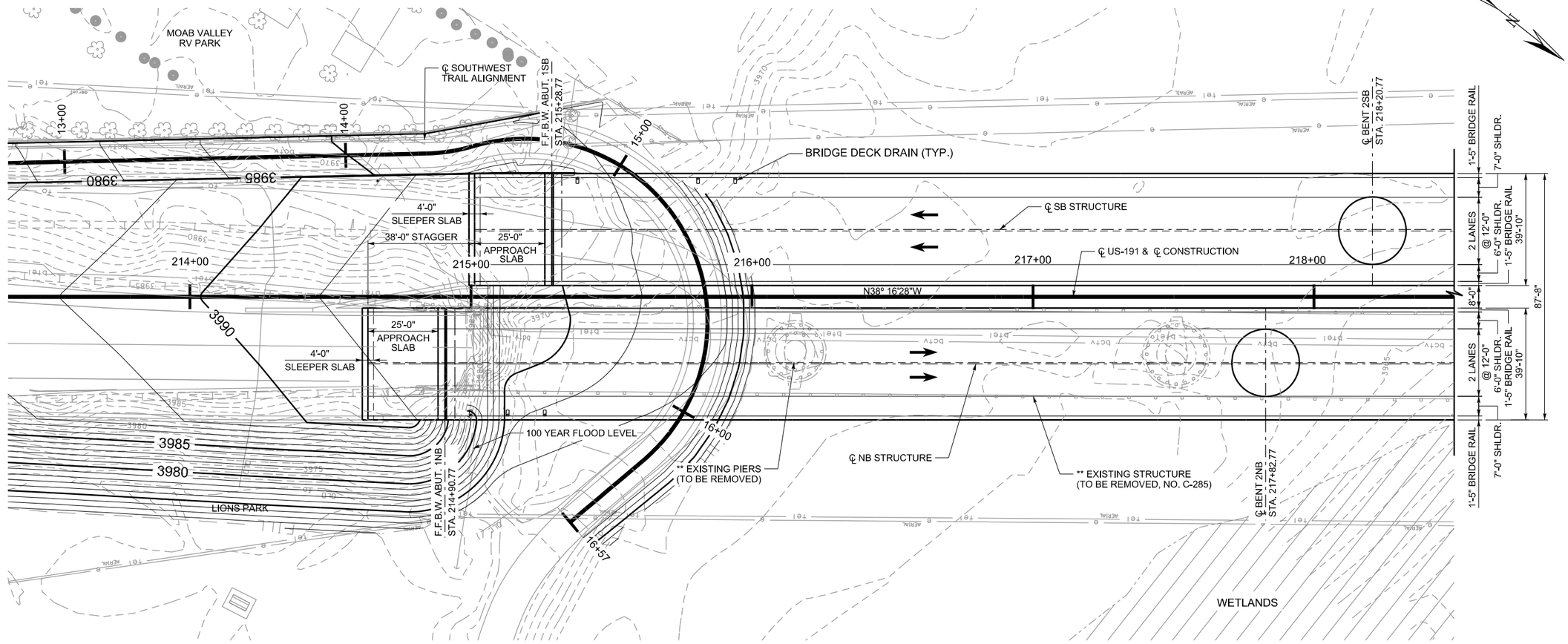

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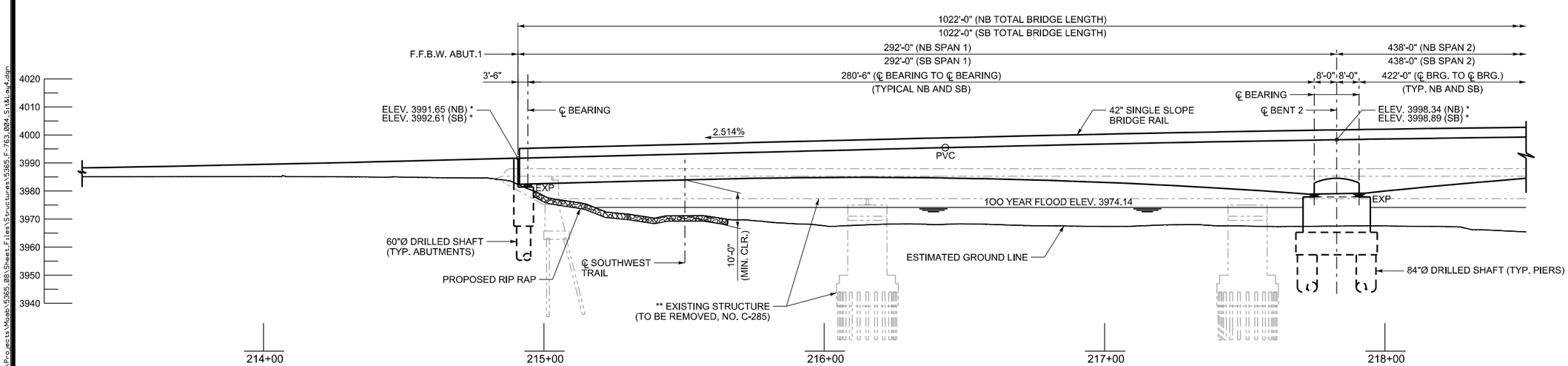

ELEVATION

(NORTHBOUND BRIDGE SHOWN, SOUTHBOUND SIMILAR)

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. SPAN LENGTHS GIVEN ALONG ℄ US-191.
* 2. ELEVATIONS GIVEN AT TOP OF FINISHED GRADE, AT ℄ GIRDER.
3. FOR PROFILE GRADE DEFINITION, SEE KEY PLAN SHEET.
4. F.F.B.W. DENOTES FRONT FACE OF BACK WALL OF THE ABUTMENT.
** 5. FOR LIMITS OF REMOVAL, SEE BRIDGE REMOVAL SHEETS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 01/08 CHECK XXX MM/YY
DRAWN SJF 01/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SITUATION & LAYOUT IV

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 4 OF 187

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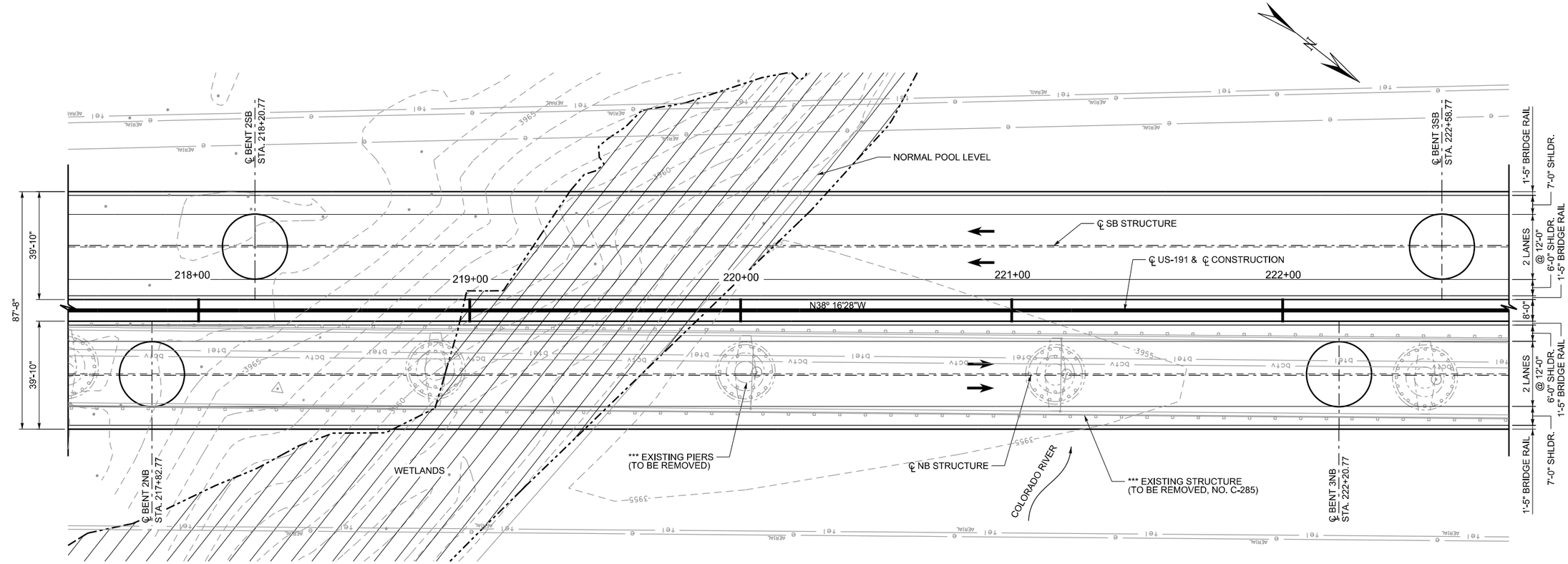

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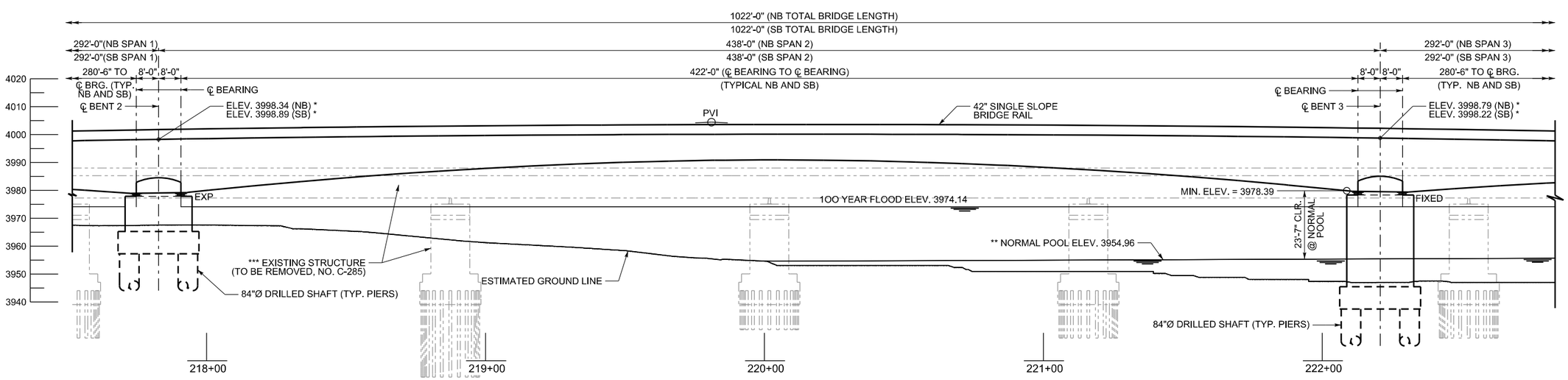

ELEVATION
(NORTHBOUND BRIDGE SHOWN, SOUTHBOUND SIMILAR)

NOTES:
1. SPAN LENGTHS GIVEN ALONG ℄ US-191.
* 2. ELEVATIONS GIVEN AT TOP OF FINISHED GRADE, AT ℄ GIRDER.
3. FOR PROFILE GRADE DEFINITION, SEE KEY PLAN SHEET.
** 4. NORMAL POOL ELEVATION DENOTES THE HISTORICAL WATER ELEVATION FOR THE NON -RUNOFF PERIOD OF AUGUST THROUGH MARCH. SEE BRIDGE HYDRAULIC DATA SHEET FOR MORE INFORMATION.
*** 5. FOR LIMITS OF REMOVAL, SEE BRIDGE REMOVAL SHEETS.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 01/08 CHECK XXX MM/YY
DRAWN SJF 01/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SITUATION & LAYOUT V

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 5 OF 187

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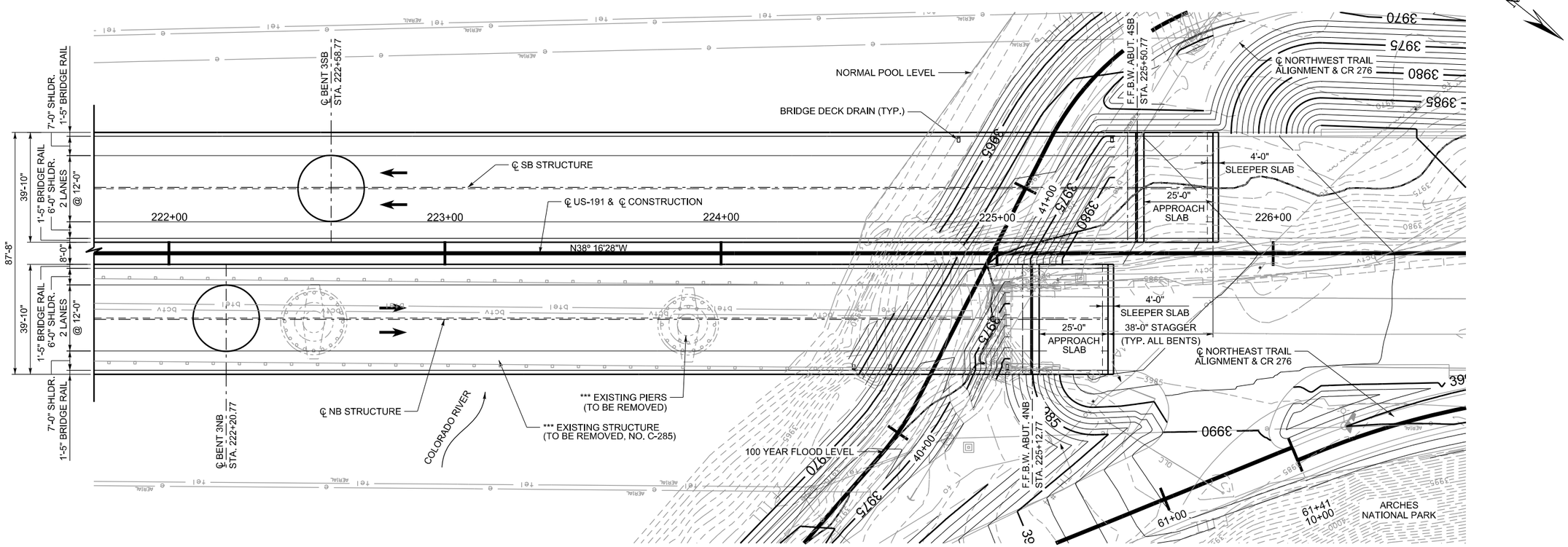

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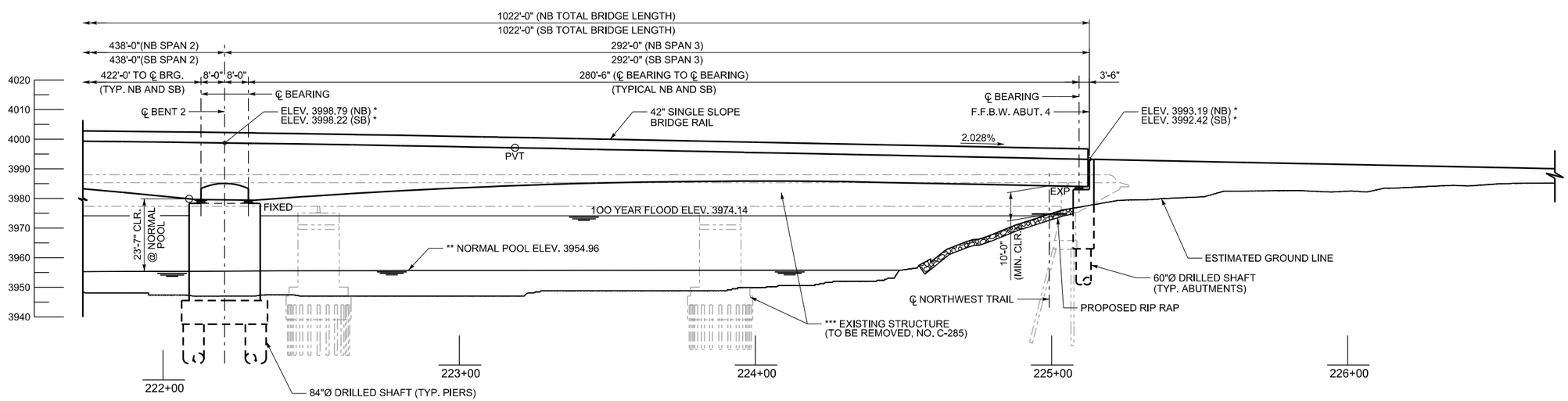

ELEVATION
(NORTHBOUND BRIDGE SHOWN, SOUTHBOUND SIMILAR)

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. SPAN LENGTHS GIVEN ALONG ℄ US-191.
* 2. ELEVATIONS GIVEN AT TOP OF FINISHED GRADE, AT ℄ GIRDER.
3. FOR PROFILE GRADE DEFINITION, SEE KEY PLAN SHEET.
** 4. NORMAL POOL ELEVATION DENOTES THE HISTORICAL WATER ELEVATION FOR THE NON-RUNOFF PERIOD OF AUGUST THROUGH MARCH. SEE BRIDGE HYDRAULIC DATA SHEET FOR MORE INFORMATION.
5. F.F.B.W. DENOTES FRONT FACE OF BACK WALL OF THE ABUTMENT.
*** 6. FOR LIMITS OF REMOVAL, SEE BRIDGE REMOVAL SHEETS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 01/08 CHECK XXX MM/YY
DRAWN SJF 01/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SITUATION & LAYOUT VI

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 6 OF 187

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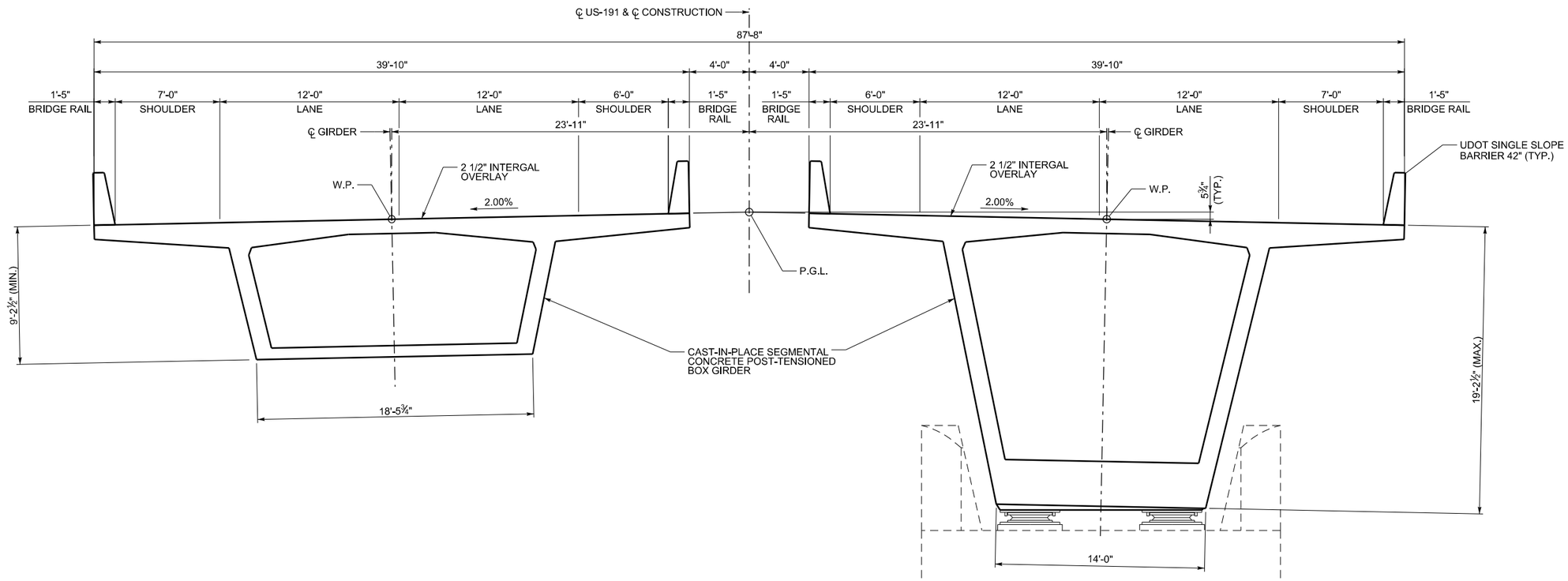
5/7/2008



SECTION AT MINIMUM DEPTH

SECTION AT MAXIMUM DEPTH

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THE PROFILE GRADE LINE (PGL) RUNS ALONG ℄ CONSTRUCTION. FINISHED GRADE ELEVATIONS ARE A CONSTANT 2.00% SUPERELEVATION FROM THE PGL, TAKEN PERPENDICULAR TO ℄ CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 01/08 CHECK XXX MM/YY
DRAWN SJF 01/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SITUATION & LAYOUT VII

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 7 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-01

SHEET 1 OF 1

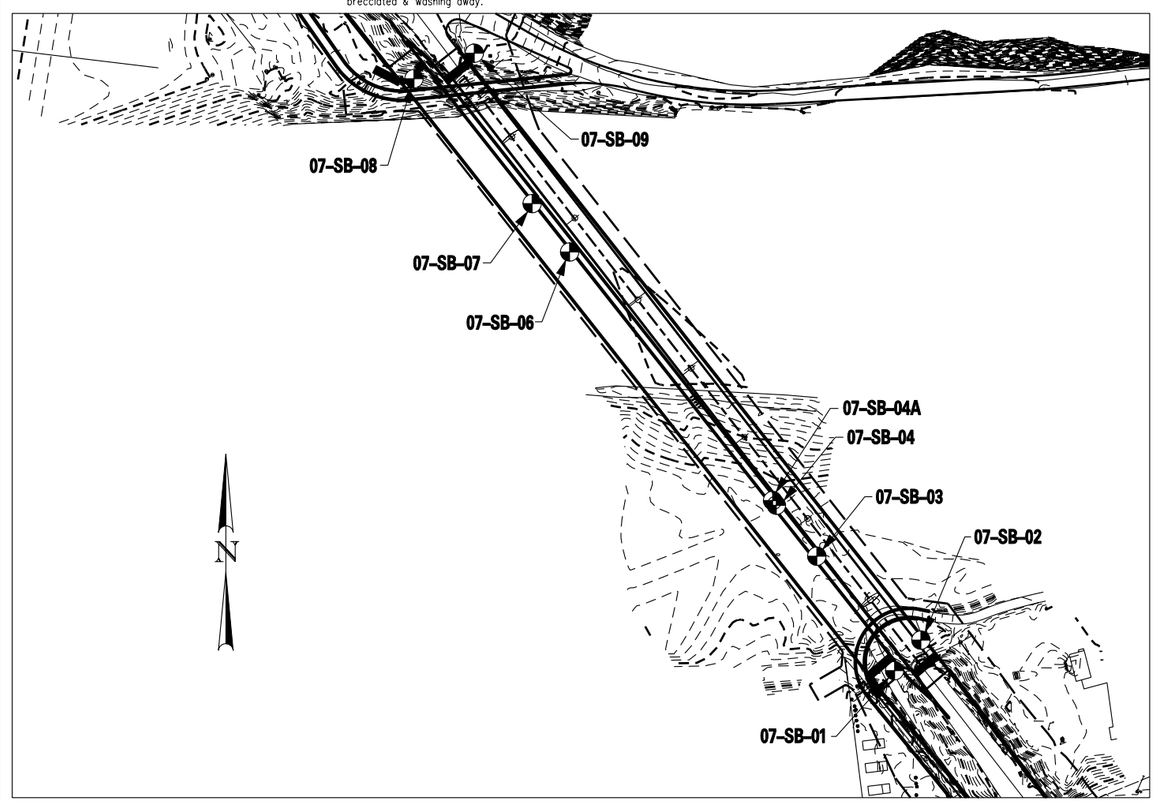
PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 215+22, 13' LT. / N:200,574 E:99,421
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & H.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 19.0' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200701.200
DATE STARTED: 10/23/07
DATE COMPLETED: 10/25/07
GROUND ELEVATION: 3974.6'
LOGGED BY: M.H., J.L., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
			18	5,6,6,(26)	CL-ML (A-4(2))	brown, slightly moist, stiff			12.5	26	5	0	22	78	
3970	5						SANDY SILTY CLAY								
			16	1,1,1,(4)	CL-ML	brown, slightly moist, soft									
3965	10		10	10,11,5,(26)	SM	brown, moist, med. dense									
3960	15		18	3,2,1,(4)	SM (A-2-4(0))	brown, very moist, very loose	SILTY SAND W/GRAVEL 2" clay layer at 15.5'		17.3		NP	17	56	27	
3955	20		14	1,2,4,(7)	SM	brown, wet, loose									
3950	25		8	29,10,13,(26)	GP-GM	brown, wet, loose	GRAVEL W/SILT & SAND								
3945	30		9	30,69/5"	GP-GM	red-brown, slightly moist, ex. soft rock	MUDSTONE very highly weathered								
3940	35		32	Core 54,44	CL (A-4(4))	red-brown, moist, very soft rock			140.2	5.4	21	7	0	8	92	140
3935	40		26	Core 44,14	-	red, moist, ex. soft rock to soft rock									
3930	45		20	Core 68,48	-	red, soft rock	MUDSTONE some fractured zones		152.3	2.6					300
			23	Core 36,0	-	red, ex. soft rock									
3925	50		13	Core 44,16	-	red, very soft rock									
			14	Core 48,20	-	red, very soft rock									
3920	55		12	Core 40,16	-	red, soft rock			157.4	2					2010
			16	Core 52,0	-	red, soft rock	MUDSTONE slaking, green on joints								
3915	60		13	Core 44,32	-	red, soft rock									
			19	Core 64,0	-	red, very soft rock	SILTY CLAYEY MUDSTONE								
3910	65				-	red-brown, soft rock	SILTSTONE		159	2	NP				1980
			13	Core 42,20	-	red-brown, very soft rock									
3905			19	Core 64,16	-	red-brown, very soft rock	MUDSTONE very highly fractured & broken, some harder very silty mudstone layers								
3900	75		12	Core 40,0	-	red-brown, very soft rock	MUDSTONE very highly fractured & broken, some harder very silty mudstone layers								
			14	Core 48,16	-	red-brown, very soft rock									
			12	Core 40,0	-	red-brown, very soft rock									
			22	Core 72,0	-	red-brown, very soft rock									
3895	80		30	Core 100,80	- CL (A-4(3))	red-brown, very soft rock			131	9.9	21	7	0	12	88	190
			26	Core 44,24	-	red-brown, ex. soft rock	CLAYEY MUDSTONE								
3890	85		10	Core 50,32	-	red-brown, ex. soft rock									
			10	Core 16,0	-	lt. green	SILTSTONE sample is rubble								
3885	90				-	red-brown, ex. soft rock	MUDSTONE								
					-	lt. green	SILTY MUDSTONE								
			40	Core 66,36		red-brown, ex. soft rock			139.1	4.8					90
3880	95						CLAYEY & SILTY MUDSTONE								
3875	100		16	Core 26,0	-	red-brown, ex. soft rock									

Geologist Note: Missing core zones may be extremely soft rock or highly brecciated & washing away.

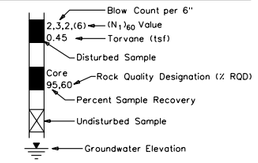
PRELIMINARY PLAN
NOT FINAL



EXPLORATION LOCATION PLAN

KEY TO BORING LOG

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 10-23-07 AND 10-25-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN, HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 10/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191;
OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
F-763 DRG. NO.
SHT. 8 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-02

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 215+32, 39' RT. / N:200,614 E:99,455
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & H.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 12.0' AFTER 24 HOURS: ▼ N.M.

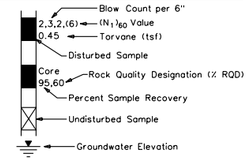
PROJECT NUMBER: 200701.200
DATE STARTED: 10/26/07
DATE COMPLETED: 10/31/07
GROUND ELEVATION: 3967.9'
LOGGED BY: M.H., J.L., J.B.

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
				8	3,3,4,(15)	ML	lt. brown, slightly moist, loose								
3965				9	3,2,4,(13)	ML	lt. brown, moist, loose								
	5						SANDY SILT								
				17	3,4,3,(14)	ML	lt. brown, wet, loose								
3960				16	3,2/12",(3)	ML (A-4(0))	lt. brown, wet, very loose		29.3	26	3	0	30	70	
	10														
3955				22	0/15",1,(2)	SM	brown, wet, very loose								
							SILTY SAND								
	15			14	1/12",3,(4)	SM	dk. brown, wet, very loose								
3950															
	20			7	22,38,24,(82)	GP-GM	brown, wet, dense GRAVEL W/SILT & SAND								
3945				8	47/2"	-	lt. brown								
	25			34	Core 76,40	-	lt. brown, avg. hard rock								
3940							SANDSTONE some broken & missing zones	148.4	4.5		NP				2460
	30			64	Core 100,49	-	lt. brown, avg. hard rock								
3935								153.5	1.4						4770
						-	lt. brown, avg. hard rock								
	35			28	Core 46,12	CL (A-4(7))	gray-green, ex. soft rock CLAYSTONE some sandstone layers	137.1	2.9	25	9	0	3	97	
3930						-	CORE MISSING								
	40			23	Core 38,13	-	purple / yellow-brown / SILTSTONE / lt. brown / lt. brown								
3925						-	lt. brown								
	45			60	Core 100,66	-	lt. brown, avg. hard rock CONGLOMERATE W/SILTSTONE MATRIX								
						-	very lt. brown, avg. hard rock SANDY SILTSTONE								
3920						-	very lt. brown, avg. hard rock CONGLOMERATE W/SILTSTONE MATRIX	163.1	0.9						8810 7540
	50					-	green, ex. soft rock CLAYSTONE								
				30	Core 50,0	CL-ML (A-4(2))	purple to red-brown, very soft rock SILTY CLAYEY MUDSTONE very highly fractured	156.3	3.2	20	5	0	6	94
3915															
	55			44	Core 74,0	CL-ML (A-4(3))	red-brown, soft rock SILTY CLAYEY MUDSTONE very highly fractured, green staining on fractures		2.6	20	6	0	9	91
3910															
	60			30	Core 50,0	-	red-brown, soft rock								
3905							SILTY MUDSTONE very highly fractured, some vertical fractures, green staining on fractures, predominately 0.5" to 4" segments, very soft & highly fractured material washing away								
	65			0	Core 0,0	-									
3900				30	Core 100,0	-	red-brown, soft rock								
				16	Core 26,0	-	red-brown, soft rock								
3895						-	red-brown, soft rock								
	75			13	Core 44,20	CL-ML (A-4(2))	red-brown, soft rock SILTY CLAYEY MUDSTONE highly fractured, green staining on fractures, predominately 1" to 4" segments	161.2	1.8	21	5	0	9	91	1800
				29	Core 96,60	-	red-brown, avg. hard rock CONGLOMERATE W/MUDSTONE MATRIX								
3890						-	red-brown, avg. hard rock SILTY MUDSTONE								
	80			8	Core 28,0	-	green & red-brown CONGLOMERATE W/MUDSTONE MATRIX								
3885				28	Core 92,0	-	red-brown, soft rock MUDSTONE very highly fractured								
	85			56	Core 94,16	-	red-brown, soft rock	162	1.8						3870
3880								160.9	1.9						1510
	90			59	Core 98,30		rubble zone at 91.3' to 92.3' SILTY MUDSTONE very highly fractured, some vertical fractures, green staining on fractures, clay layers								
3875						-	red-brown, soft rock	159.6	2.5						5500
	95			42	Core 88,0	-	rubble zone at 95' to 96'								
3870						-	red-brown, avg. hard rock SILTSTONE fractured								
	100			24	Core 100,55	-	red-brown, soft rock SILTY MUDSTONE very fractured	161.4	1.3						
						-	red-brown, avg. hard rock SILTSTONE 2" claystone layer								

Geologist Note: Missing core zones may be extremely soft rock or highly brecciated & washing away.

KEY TO BORING LOG

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 10-26-07 AND 10-31-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN, HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

PRELIMINARY PLAN
NOT FINAL

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 10/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE

SOIL DATA SHEET

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY

F-763 DRG. NO.

SHT. 9 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-03

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 217+04, CENTERLINE / N:200,725 E:99,318
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & N.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 12.3' AFTER 24 HOURS: ▼ 12.3'

PROJECT NUMBER: 200701.200
DATE STARTED: 11/21/07
DATE COMPLETED: 11/28/07
GROUND ELEVATION: 3967.1'
LOGGED BY: D. SAMPSON, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Rec. (in)	See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
			10	4,5,6,(23)	ML	lt. brown, slightly moist, med. dense									
3965			14	2,4,4,(17)	ML	brown, slightly moist, loose — SANDY SILT									
	5		12	3,3,3,(12)	ML (A-4(0))	brown, slightly moist, loose			11		NP	6	41	53	
3960															
	10		15	10,9,8,(29)	SM	brown, moist, med. dense — SILTY SAND									
3955			9	6,10,6,(24)	SM	brown, wet, med. dense									
	15		6	2,2,1,(4)	SP-SM	brown, wet, very loose									
3950							SAND W/SILT								
	20		10	10,11,9,(27)	SP-SM	brown, wet, med. dense									
3945			9	25,21,16,(46)	GP-GM	brown & black, wet, med. dense — GRAVEL W/SAND & SILT possible cobbles									
3940	25		6	64/6"	SM (A-1-b(0))	gray & brown, very soft rock			15.7		NP	37	43	20	
	30		36	Core 75,13	-	yellow-brown, soft rock — SILTY SANDSTONE fractured, black oxide stain on fractures									
3935					-	gray & red bands									
			56	Core 94,48	-	lt. brown — QUANTITIZED SILTSTONE CONGLOMERATE									
	35				-	lt. brown — SILTY SANDSTONE W/MUDSTONE CLASTS									
3930			56	Core 94,48	-	brown, lt. green — CLAYSTONE very highly weathered; purple-brown, ex. soft rock	129.9	11.8						224	
	40		60	Core 100,58	-	red-brown, soft rock; green & brown — MUDSTONE breaks when handled	148	4.2			NP			790	
3925															
	45		60	Core 100,80	-	gray-brown, soft rock									
3920					-	blue-gray to purple-gray, very soft rock — CLAYSTONE									
	50		54	Core 90,52	-	red-brown, very soft rock to soft rock; red-brown, soft rock; 3" septarian nodule — MUDSTONE									
3915															
	55		58	Core 96,44	-	red-brown, soft rock									
3910					-	red-brown, soft rock	147.1	4.8						1710	
	60		58	Core 96,69	-	lt. brown & brown, avg. hard rock — CONGLOMERATE W/MUDSTONE CLASTS & MUDSTONE GRAVELS									
3905					-	brown w/lt. brown & green layers, soft rock — MUDSTONE									
	65		56	Core 94,60	-	CONGLOMERATE									
					-	brown w/green layers, soft rock — MUDSTONE									
3900			19	Core 32,8	-	very lt. brown, avg. hard rock — CONGLOMERATE highly fractured	162.2	1.1						1200	
					-	red-brown, very soft rock									
3895			19	Core 32,8	-	red-brown, very soft rock — CLAYSTONE w/extremely soft layers									
	75		10	Core 32,0	-	red-brown, very soft rock									
					-	red-brown, very soft rock									
3890			18	Core 60,50	-	red-brown to brown w/green spots & layers, very soft rock	143.6	7.2							
	80		43	Core 72,12	-	red-brown to brown w/green spots & layers, very soft rock — SHALEY MUDSTONE very fractured, breaks easily when handled, unable to run unconfined compression strength tests									
3885															
	85		40	Core 66,9	GP-GM (A-1-a(0))	red-brown to brown w/green spots & layers, very soft rock	153.7	5.2			NP	67	24	9	
3880					-	green-gray, avg. hard rock — SILTSTONE claystone inclusions									
	90		53	Core 88,24	-	red-brown w/green layers, soft rock — MUDSTONE rusty coating on fractures									
3875					-	gray, avg. hard rock									
	95		30	Core 50,40	-	gray, avg. hard rock — CONGLOMERATE very highly fractured, rusty staining on fractures, some zones missing	162.5	3.1						12,110	
3870															
	100		8	Core 28,0	-	gray, avg. hard rock									
			17	Core 56,0	-	green, avg. hard rock — SILTSTONE soft claystone layers									
3865			29	Core 98,64	-	red-brown w/green layers, very soft rock — MUDSTONE	142.3	7.4						480	
	105														

Geologist Note: Missing core zones may be extremely soft rock or highly brecciated & washing away.

PRELIMINARY PLAN
NOT FINAL

KEY TO BORING LOG

SYMBOLS

- Blow Count per 6"
- 2,3,2,(6) ← $(N_1)_{60}$ Value
- 0.45 ← Torvane (tsf)
- Disturbed Sample
- Core 95,60 ← Rock Quality Designation (% RQD)
- Percent Sample Recovery
- Undisturbed Sample
- Groundwater Elevation

RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 11-21-07 AND 11-28-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN, HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN DS 11/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191;
OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
F-763 DRG. NO.
SHT. 10 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-04

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 217+90, 1' LT. / N:200,792 E:99,265
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & N.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 13.0' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200701.200
DATE STARTED: 11/19/07
DATE COMPLETED: 11/21/07
GROUND ELEVATION: 3967.3'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
3965			12	3,5,4,(19)	SM	lt. brown, slightly moist, loose	SILTY SAND organics near surface									
	5		11	3,2,2,(9)	ML	lt. brown, slightly moist, very loose	SANDY SILT occasional clay lenses									
3960			12	3,2,4,(12)	ML	lt. brown, slightly moist, loose										
	10		12	10,13,16,(50)	SM (A-2-4(0))	lt. brown, slightly moist to moist, med. dense	SILTY SAND			12.6		NP	11	77	12	
3955			9	6,8,7,(22)	SM	brown, wet, med. dense										
	15		11	6,13,17,(42)	GP-GM	brown, wet, med. dense										
3950																
	20		10	19,16,10,(34)	GP-GM	brown, wet, loose	GRAVEL W/SILT & SAND									
3945																
	25		12	22,31,40,(87)	GP-GM (A-1-a(0))	brown, wet, dense				7.4		NP	53	40	7	
3940																
	30		4	56/4"	SC-SM	red & gray-purple	SILTY CLAYEY MUDSTONE very highly fractured & broken									
3935			18	Core 55,0	SC-SM (A-1-b(0))	red & purple, soft rock				3.7	17	5	31	57	12	
	35		24	Core 40,0	ML (A-4(0))	red & purple, soft rock	SILTY MUDSTONE			8.5	18	3	0	44	56	245
3930					-		CONGLOMERATE W/MUDSTONE MATRIX									
	40		26	Core 88,52	-	red-brown, soft rock			128.7	8						
3925			18	Core 60,0	-	red-brown, soft rock										
	45		17	Core 82,38	-	red-brown, soft rock	CLAYEY MUDSTONE TO CLAYSTONE highly fractured, several zones of missing core, slaking									
3920			18	Core 45,27	-	red-brown, soft rock										
	50		34	Core 56,8	-	red-brown, soft rock			141.2	7.7						410
3915					-	lt. brown, avg. hard rock	CONGLOMERATE vuggy, open fractures w/black oxide staining									
	55		11	Core 18,8	-	red-brown, very soft rock	CLAYSTONE									
3910					-	brown, avg. hard rock	CONGLOMERATE broken zone									
	60		28	Core 46,0	-	red-brown	CLAYSTONE less broken than above									
3905					-	red-brown										
	65				-	gray-green, avg. hard rock	SILTSTONE									
			49	Core 82,50	CL-ML (A-4(0))	red-brown, soft rock	SILTY & CLAYEY MUDSTONE		139.8	7.1	19	5	1	44	55	200
3900					-	lt. brown	SILTSTONE									
3895			12	Core 20,0	-	red-brown, soft rock	SILTY & CLAYEY MUDSTONE very broken									
	75		12	Core 40,0	-	red-brown, soft rock										
3890			26	Core 88,24	CL-ML (A-4(1))	red-brown, soft rock	SILTY CLAYEY MUDSTONE		147.5	3.6	21	6	0	37	63	3100
					-	red-brown, soft rock										
	80		48	Core 80,33	-	red-brown, soft rock										
3885							SILTY MUDSTONE green coating on fractures									
	85		53	Core 88,40	-	red-brown, soft rock			152.3	5						30
3880					-	gray-green	SILTSTONE rust-yellow on fractures									
					-	red-brown	MUDSTONE									
	90		49	Core 82,48	-	lt. gray	CONGLOMERATE vuggy, rust-yellow coating on fractures									
3875					-	lt. green, very soft rock	SILTSTONE									
					-	lt. green, very soft rock										
	95		19	Core 35,0	-	red-brown, soft rock			139.7	5.4						220
3870							SILTY CLAYEY MUDSTONE									
	100				-	red-brown, very soft rock										
			58	Core 89,69	-	lt. green, soft rock	SILTSTONE									
3865																

Geologist Note: Missing core zones may be extremely soft rock or highly brecciated & washing away.

PRELIMINARY PLAN
NOT FINAL

GEOTECHNICAL ENGINEER

KEY TO BORING LOG

SYMBOLS

- Blow Count per 6"
- 2,3,2,(6) — $(N_1)_{60}$ Value
- 0.45 — Torvane (tsf)
- Disturbed Sample
- Core 95,60 — Rock Quality Designation (% RQD)
- Percent Sample Recovery
- Undisturbed Sample
- Groundwater Elevation

RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 11-19-07 AND 11-21-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
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4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 11/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET
PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
F-763 DRG. NO.
SHT. 11 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-04A

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. ~217+98, ~1' LT. / N:~200,798 E:~99,260
DRILLING METHOD: CME-55 NO. 1 / H.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 12.7' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200701.200
DATE STARTED: 1/16/08
DATE COMPLETED: 1/24/08
GROUND ELEVATION: 3968.0'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
3965	5						SILTY SAND									
3960	10						SILTY SAND W/GRAVEL									
3955	15						GRAVEL W/SILT & SAND									
3950	20															
3945	25						Note: See Boring 07-SB-04 for detailed descriptions & properties of soil above elevation 3940'.									
3940	30			16	Core 30,0	-	red & purple gray, soft rock	SILTY CLAYEY MUDSTONE very fractured, some rubble, vertical fractures, green staining on fractures								
3935	35			10	Core 32,0	-	red-brown, soft rock									
3930				24	Core 80,35	-	red-brown, soft rock									
	40			34	Core 112,43	-	red-brown, soft rock	SILTY MUDSTONE fractured zones, more competent than above								
				29	Core 96,32	-	red-brown, soft rock									
3925						-	green-gray, avg. hard rock	MUDSTONE								
	45			60	Core 100,60	-	red-brown, soft rock	SILTY MUDSTONE								113
3920				59	Core 98,50	-	green-gray, avg. hard rock									
	50			59	Core 98,50	-	green-gray, avg. hard rock	CONGLOMERATE siltstone matrix w/mudstone fragments, mudstone seams & layers								4113
3915						-	green-gray, avg. hard rock									573
	55			56	Core 94,56	-	red-brown, ext. soft rock	LEAN CLAY								
						-	red-brown, avg. hard rock	MUDSTONE extremely soft layers								
3910						-	green-gray, avg. hard rock	CONGLOMERATE siltstone matrix, mudstone seams								2315
	60			25	Core 46,11	CL (A-4)	red-brown, ext. soft rock			11.6	23	7				
3905	65			23	Core 76,0	-	red-brown, ext. soft rock	CLAYSTONE very highly fractured, horizontal & vertical fractures								
				23	Core 76,16	-	red-brown, ext. soft rock									
3900						-	green, soft rock	MUDSTONE								
	70			19	Core 64,16	-	red-brown, ext. soft rock									
3895				17	Core 56,0	-	red-brown, ext. soft rock	CLAYSTONE some zones more fractured than others								
	75			14	Core 48,0	-	red-brown, ext. soft rock									
3890				22	Core 72,24	-	red-brown, ext. soft rock									235
						-	red-brown, soft rock									
	80					-	green, avg. hard rock	SILTSTONE								
				41	Core 68,18	-	red-brown, soft rock	MUDSTONE very highly fractured								
3885	85					-	red-brown, soft rock									
				53	Core 88,13	-	gray-green	CLAYSTONE								
						-	gray-green to red-brown	SILTY MUDSTONE								
3880						-	blue-gray	CLAYSTONE W/CLAY SEAMS								
						-	gray, avg. hard rock	CONGLOMERATIC SILTSTONE clay seams to 0.5" thick								
	90			60	Core 100,76	-	blue-gray, stiff clay									
						-	blue-gray, avg. hard rock	CLAYSTONE								685
3875						-	red-brown, stiff clay to soft rock	CONGLOMERATE very highly fractured, vuggy								
	95			36	Core 60,20	CL (A-4)	red-brown, stiff clay to soft rock	CLAYSTONE clay & silt layers, fractured		9.3	22	7				42
3870				34	Core 56,12	-	blue-gray, soft clay to soft rock									
3865	105			34	Core 56,12	-	blue-gray, very soft clay to soft rock	CLAYSTONE clay & silt seams & layers both vertical & horizontal, possible fault gouge (?), very weathered (?)								
						-	red-brown, ext. soft rock									
3860				46	Core 76,36	-	red-brown, ext. soft rock	CLAYSTONE silty mudstone layers, some layers softer than others								
	110					CL (A-4)	red-brown, ext. soft rock			9.7	20	7				
				19	Core 32,0	-	red-brown	MUDSTONE RUBBLE IN CLAY MATRIX								
3855						-	blue-gray, very soft rock									
	115			50	Core 84,84	-	gray-green, ext. soft to very soft rock	CLAYSTONE red-brown mudstone inclusions								136
3850						-	lt. gray, very soft rock to soft rock	Change To Paradox Formation GYPSUM W/MUDSTONE								54
	120			55	Core 92,70	-	green-gray, very soft rock									82
3845						-	dk. gray, very soft rock	SILTY CLAYSTONE brecciated fragments/inclusions, mudstone fragments								
	125			26	Core 44,8	-	dk. gray, very stiff clay to very soft rock									
3840						GP-GM (A-1-a(0))	gray, avg. hard rock			6.6	NP	71	21	8		
	130			19	Core 32,0	-	gray, avg. hard rock	BRECCIATED SILTSTONE very highly fractured, all broken with no whole pieces, missing core possible extremely soft rock								
3835				48	Core 80,8	-	gray, avg. hard rock									
3830						-	black, very soft rock	CLAYSTONE pyrite crystals, thin gypsum lenses								
	140			48	Core 80,12	-	gray, avg. hard rock to soft rock	CLAYSTONE brecciated clay layers to 3.5" thick								
3825						CL (A-4)				7.2	22	7				
	145			50	Core 84,50	-	gray, ext. soft rock									
3820				48	Core 80,34	-	gray, ext. soft rock to avg. hard rock									
	150			48	Core 80,34	-	gray, ext. soft rock to avg. hard rock	SILTY CLAYSTONE TO CLAYSTONE brecciated layers, vertical & horizontal fractures, layers of varying hardness								
3815																
	155			55	Core 92,26	-	gray, ext. soft rock to avg. hard rock									
3810																3169
	160			13	Core 22,0	-	gray, ext. soft rock to avg. hard rock									
3805						-	dk. gray, soft rock	MUDSTONE								
	165			52	Core 86,24	CL-ML (A-4)	black, very soft rock	SILTY CLAYSTONE pyrite crystals, clayey rubble		8.3	19	4				
						-	gray, ext. soft rock to avg. hard rock									
3800				54	Core 98,15	-	gray, ext. soft rock to avg. hard rock									
3795	175			62	Core 96,44	-	gray, ext. soft rock to avg. hard rock									
3790						CL-ML (A-4)				4.2	24	5				
	180			46	Core 76,32	-	gray, ext. soft rock to avg. hard rock	SILTY CLAYSTONE very highly fractured with both vertical & horizontal fractures, brecciated layers, clay seams, rubble zones, layers of varying hardness								169
3785																
	185			53	Core 88,38	-	gray, ext. soft rock to avg. hard rock									
3780																79
	190			44	Core 74,34	-	gray, ext. soft rock to avg. hard rock									
3775						GM (A-1-b(0))				6.4	NP	62	18	20		
	195			40	Core 66,9	-	gray, ext. soft rock to avg. hard rock	SILTSTONE								
3770				31	Core 52,0	-	gray to dk. gray, ext. soft rock to avg. hard rock	SILTY CLAYSTONE very highly fractured with both vertical & horizontal fractures, brecciated layers, rubble zones, layers of varying hardness								
				31	Core 52,0	-	gray to dk. gray, ext. soft rock to avg. hard rock									
3765																

Geologist Note: Missing core zones may be extremely soft rock or highly brecciated & washing away.

PRELIMINARY PLAN
NOT FINAL

KEY TO BORING LOG

SYMBOLS

- Blow Count per 6"
- 2,3,2,(6) — $(N_1)_{60}$ Value
- 0.45 — Torvane (tsf)
- Disturbed Sample
- Core 95,60 — Rock Quality Designation (% RQD)
- Percent Sample Recovery
- Undisturbed Sample
- Groundwater Elevation

RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 00-00-08 AND 00-00-08 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN. HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 01/08 CHECK SRJ 01/08
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET
PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
F-763 DRG. NO.
SHT. 12 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-06

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 222+22.8' LT. / N:201,126 E:98,992
DRILLING METHOD: FRASTE MD-XL / H.S. AUGER & H.Q. CORE
DRILLER: J. PARKHURST (CONETEC)
DEPTH TO WATER - INITIAL: ▽ N.M. AFTER 24 HOURS: ▼ N.M.

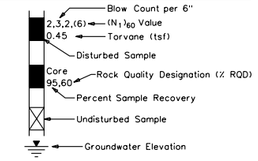
PROJECT NUMBER: 200701.200
DATE STARTED: 10/24/07
DATE COMPLETED: 10/25/07
GROUND ELEVATION: 3956.8'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
						BARGE DECK								
3955														
	5					RIVER WATER								
3950														
	10													
3945						SAND								
	15		18	2,1,5	SP (A-3(0))	gray-brown, wet, loose		19.3		NP	10	88	2	
3940														
	20		12		SP-SM (A-1-b(0))	SAND W/SILT & GRAVEL brown, wet, loose		8.3		NP	42	49	9	
3935														
	25		40	Core 82,10	SM (A-1-b(0))	lt. gray, soft rock; red-brown, soft rock; lt. gray; red-brown, soft rock	154.7	1.7		NP	6	76	18	6240
3930			60	Core 100,28		lt. gray, soft rock; red-brown, soft rock; SANDY SILTSTONE								
	30													
3925			54	Core 90,30		lt. gray, soft rock								10,160
	35		54			lt. gray, soft rock; red-brown								
3920			58	Core 96,56		lt. gray, avg. hard rock; rusty-yellow	156.5	1						9350; 10,160
	40					red-brown, avg. hard rock: CONGLOMERATE W/SILTSTONE MATRIX; lt. gray, avg. hard rock: SILTSTONE								
3915			60	Core 100,64		red-brown, hard rock: CONGLOMERATE W/SILTSTONE MATRIX; lt. red, avg. hard rock; lt. gray: SILTSTONE	159	1.3		NP				7880
	45					lt. gray, avg. hard rock: CONGLOMERATE W/SILTSTONE MATRIX; lt. gray, avg. hard rock: yellow staining on fractures, calcareous coating								
3910			59	Core 98,68		lt. gray: SANDY SILTSTONE; lt. red: CONGLOMERATE								
	50					lt. gray, avg. hard rock: SANDY SILTSTONE; lt. gray, avg. hard rock								
3905			60	Core 100,80		lt. gray w/brown, avg. hard rock: CONGLOMERATE W/QUARTZITE & MUDSTONE FRAGMENTS; lt. gray w/brown, avg. hard rock								
	55					gray & brown: SILTSTONE								
3900			49	Core 82,36		rusty-brown: CONGLOMERATE W/QUARTZITE vuggy, clay seams to 0.25" thick; rusty-brown								
	60													
3895			58	Core 96,64	CL (A-6(11))	gray-green, ex. soft rock; red-brown, soft rock: CLAYSTONE very fractured, fractures filled w/clay	136.5	2.5	31	12	0	2	98	180
	65													
3890			55	Core 92,56		red-brown, soft rock; red-brown, avg. hard rock: SILTY MUDSTONE; red-brown, soft rock								
3885			62	Core 104,63		red-brown, soft rock; red-brown, soft rock: CLAYSTONE fractures filled w/clay, clay seams & layers, some broken zones	155.4	4.1						340
	75													
3880			59	Core 98,56		red-brown; red-brown: SILTY MUDSTONE crossbedding & micro faults, white coating on fractures								
	80													
3875			50	Core 84,28		lt. green: MUDSTONE TO CONGLOMERATE; red-brown: SILTSTONE	160	1.5						7550
	85													
3870			58	Core 96,40		green: CONGLOMERATE; red-brown								
	90													
3865			49	Core 82,58		red-brown: SILTSTONE many broken zones, green coating on fractures, clay seams, clayey layers to 0.5" thick	160.4	1.7						10,940
	95													
3860			36	Core 75,21		red-brown	157.8	1.8						900
	100													
3855			58	Core 96,58		green; purple: SILTY MUDSTONE; red-brown: CONGLOMERATIC MUDSTONE green layers; red-brown: SILTY MUDSTONE broken zones								
	105		7	Core 60,40		red-brown								
3850			42	Core 86,43		red-brown: SILTY MUDSTONE broken zones								
	110													

PRELIMINARY PLAN
NOT FINAL

KEY TO BORING LOG

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 10-24-07 AND 10-25-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
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5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - FRASTE MD-XL

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 10/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET
PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
F-763 DRG. NO.
SHT. 13 OF 187

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15/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-07

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 223+02, 7' LT. / N:201,190 E:98,942
DRILLING METHOD: FRASTE MD-XL / H.S. AUGER & H.Q. CORE
DRILLER: J. PARKHURST (CONETEC)
DEPTH TO WATER - INITIAL: ▽ N.M. AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200701.200
DATE STARTED: 10/26/07
DATE COMPLETED: 10/27/07
GROUND ELEVATION: 3956.8'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
							BARGE DECK								
3955															
	5						RIVER WATER								
3950															
	10		0	1/18"	-		no recovery								
3945			18	1,1,1	SP (A-3(0))		brown, wet, very loose — SAND		26.1		NP	0	99	1	
	15		18	1/18"	SP (A-3(0))		brown, wet, very loose		22.1		NP	1	98	1	
3940							GRAVELS								
	20		46	Core 92,39	-		lt. brown w/green staining	153.6	0.8		NP				11,210
3935							SANDSTONE highly fractured zones								
			32	Core 108,84	-		lt. brown								8680
	25				-		lt. brown								
3930			35	Core 73,20	-		rust-brown — CONGLOMERATE								
					-		lt. green — SILTSTONE vertical bedding								
	30		47	Core 78,46	-		red-brown	157.7	0.8						3810
3925			12	Core 100,45	-		red-brown								
	35		62	Core 104,29	-		red-brown — SANDY SILTSTONE vertical fractures, clay seams to 1" thick, some green staining on fractures, occasional mudstone layer to 2" thick								
3920															
	40		58	Core 96,0	-		red-brown, avg. hard rock								
3915															
	45		60	Core 100,46	-		red-brown, avg. hard rock	156.1	0.9						10,480 6840
3910															
	50		64	Core 106,57	-		lt. gray, avg. hard rock — SILTY SANDSTONE many hairline fractures, micro faults, small clay seam at 55'	156.3	1		NP				2200
3905															
	55				-		lt. gray								
3900			60	Core 100,82	-		red-brown — CONGLOMERATE W/MUDSTONE MATRIX breccia								
					CL (A-4(3))		purple-gray, very soft rock	139.9	2.6	21	7	0	15	85	270
	60				-		purple-gray — CLAYSTONE CONGLOMERATE breccia								
3895			41	Core 68,20	-		red-gray — SILTY SANDSTONE highly fractured, brecciating								
					-		lt. gray — SILTSTONE highly fractured, rust colored coating on fractures								
	65				-		lt. gray								
3890			60	Core 100,41	-		lt. gray — SANDY SILTSTONE few pyrite spots								
3885			58	Core 96,52	-		lt. gray — SANDY SILTSTONE few pyrite spots; CLAY RUBBLE								
	75				-		gray								
3880			40	Core 66,20	-		gray — CONGLOMERATIC SILTSTONE brecciated, vuggy, some rubble zones, rust-yellow stain on fractures								
	80				-		red-brown — CONGLOMERATE								
3875			64	Core 106,78	-		lt. gray, hard rock — SANDY SILTSTONE	165	0.7						4560
					-		CONGLOMERATE								
					-		lt. gray — SANDY SILTSTONE vertical fractures								
					-		green — lt. gray — MUDSTONE								
	85				-		lt. green, very soft rock — SANDY SILTSTONE vertical fractures								
					-		green & brown, avg. hard rock — CLAYSTONE								
3870			49	Core 82,62	-		red-brown, very soft rock — MUDSTONE W/PYRITE								
	90														
3865			56	Core 94,60	-		red-brown — CLAYSTONE highly fractured, crumbles easily when handled, some vertical fractures								
	95				-		red-brown								
3860			53	Core 88,22											
					-		red-brown — CLAYSTONE broken/rubble, brecciated								
	100				-		SILTSTONE								
3855			41	Core 68,12	-		red-brown, soft rock — CLAYSTONE green lenses	141.9	4.7						870
					-		BRECCIATED MUDSTONE								
	105				-		red-brown, soft rock — CLAYSTONE highly fractured, sand in some fractures								
3850			58	Core 96,36	-		red-brown, soft rock — CLAYSTONE highly fractured, sand in some fractures								
	110														

PRELIMINARY PLAN
NOT FINAL

KEY TO BORING LOG

SYMBOLS

- Blow Count per 6"
- 2,3,2,(6) — $(N_1)_{60}$ Value
- 0.45 — Torvane (tsf)
- Disturbed Sample
- Core 95,60 — Rock Quality Designation (% RQD)
- Percent Sample Recovery
- Undisturbed Sample
- Groundwater Elevation

RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 10-26-07 AND 10-27-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
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5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - FRASTE MD-XL

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 10/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191;
OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY

F-763 DRG. NO.

SHT. 14 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-08

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 225+29.27' LT. / N:201,355 E:98,786
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & N.Q. CORE
DRILLER: D. SAMPSON, B. HARTLEY
DEPTH TO WATER - INITIAL: ▽ 14.0' AFTER 24 HOURS: ▼ 14.0'

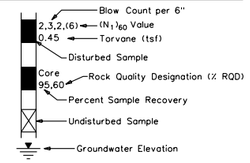
PROJECT NUMBER: 200701.200
DATE STARTED: 11/16/07
DATE COMPLETED: 11/17/07
GROUND ELEVATION: 3968.3'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Lithology	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
3965			6	1,2,2,(9)		SM	brown, slightly moist, loose								
	5		6	2,1,3,(9)		SM	brown, slightly moist, very loose								
			16	2,5,5,(21) 0.85		SM	brown, slightly moist, loose — SILTY SAND organics near surface, 3" clay layer at 6'								
3960	10		17	3,2,2,(7)		SM (A-2-4(0))	brown, moist, very loose		13.6		NP	0	67	33	
3955			4	0/15",1,(1)		ML	brown, wet, very loose								
	15		10	0/12",1/12",(1) 0.08		ML	brown, wet, very loose — SANDY SILT clay lenses & layers								
3950	20		15	4,8,47/5" 0.42		CL-ML	brown, wet, firm — SANDY SILTY CLAY								
						-	red-brown — SILTSTONE								
3945	25		50	Core 100,95		-	red-brown, soft rock	139.7	2.1		NP				8930
3940			17	Core 93,28		-	red-brown, soft rock								
	30					-	red-brown, soft rock								5830
			60	Core 100,36		-	green gray								
3935						-	red-brown, soft rock — SILTY SANDSTONE some clay in matrix, crumbles when handled, weathered, some very soft zones, cross-bedding								6840
	35		60	Core 100,87		-	red-brown, soft rock to avg. hard rock	153.7	1		NP				8160
3930	40		58	Core 96,74		-	interbedded gray & brown, avg. hard rock								
3925						-	lt. gray, avg. hard rock — SANDY SILTSTONE black oxide staining, rusty stain on fractures, few mudstone lenses								
	45		56	Core 94,48		-	lt. gray, avg. hard rock								
						-	purple-gray, avg. hard rock — SILTSTONE & SANDSTONE								
3920	50				ML (A-4(0))		red-brown, very soft rock — SILTY MUDSTONE	127.5	6.2	20	2	0	33	67	780
			47	Core 78,46		-	lt. green, avg. hard rock — SILTSTONE								
						-	red-brown, avg. hard rock — SILTY SANDSTONE								
3915						-	red-brown, avg. hard rock								
	55		48	Core 80,44			red-brown — CLAYSTONE missing zones								
						-	green-gray, avg. hard rock								
3910						- -	purple-brown to lt. red-brown green — SANDY SILTSTONE								
	60		60	Core 100,82		-	lt. red-brown, avg. hard rock	156	0.9						10,390
3905						- -	red-brown, avg. hard rock; lt. red-brown, avg. hard rock — CONGLOMERATIC SANDSTONE W/MUDSTONE & SILTSTONE FRAGMENTS								
	65		60	Core 100,86			SILTY SANDSTONE clay seam at 65'								
3900						-	lt. red-brown, avg. hard rock								
							SANDY SILTSTONE								
3895	75		54	Core 90,68		- - -	lt. gray-green, avg. hard rock; lt. red-brown, avg. hard rock; green-gray, avg. hard rock — SANDY SILTSTONE	156.2	1		NP				6830
			43	Core 72,16		-	lt. pink-brown, avg. hard rock								
3890						-	red-brown, soft rock — MUDSTONE								
	80					- -	lt. red-brown to brown, avg. hard rock — SILTY SANDSTONE; red-brown, very soft rock — CLAYSTONE								
			64	Core 106,60		- -	lt. red-brown w/green layers, avg. hard rock								
3885							SILTY SANDSTONE	153.9	1						6790
	85		60	Core 100,86		-	lt. red-brown w/green layers, avg. hard rock								
3880															
	90		60	Core 100,58		-	lt. red-brown, avg. hard rock — CONGLOMERATIC SANDSTONE W/MUDSTONE INCLUSIONS ripup clasts, soft sandstone gravels, clay layers to 2" thick								
3875						-	red-brown, soft rock — MUDSTONE highly fractured, rubble & missing zones								
	95		50	Core 84,54		-	brown, avg. hard rock								
							SILTY SANDSTONE								
3870	100		28	Core 100,78		- -	brown, avg. hard rock; green-gray	155.5	0.9						5360

PRELIMINARY PLAN
NOT FINAL

KEY TO BORING LOG

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 11-16-07 AND 11-17-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN. HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 11/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET
PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
F-763 DRG. NO.
SHT. 15 OF 187

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5/7/2008

DRILL HOLE LOG

BORING NO. 07-SB-09

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 225+06, 56' RT. / N:201,388 E:98,866
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & H.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 23.3' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200701.200
DATE STARTED: 11/13/07
DATE COMPLETED: 11/16/07
GROUND ELEVATION: 3980.7'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
3980		9	9,22,19,(87)	SM	red-brown, slightly moist, dense — SILTY SAND									
		7	12,16,10,(55)	GC (A-2-4(0))	red-brown, slightly moist, med. dense — CLAYEY GRAVEL W/SAND possible cobbles & boulders		9.8	25	10	38	28	34		
3975	5	8	5,11,14,(51)	SM	red-brown, slightly moist, med. dense — SILTY SAND									
3970	10	9	4,6,5,(19)	SM	red-brown, moist, med. dense									
		11	9,8,8,(24)	SM	red-brown & gray-brown, moist, med. dense — SILTY SAND clayey sand lenses									
3965	15	13	4,5,5,(13)	ML (A-4(0))	green-brown, very moist, loose		19.9	24	3	0	29	71		
3960	20	15	3,3,2,(6)	ML	green-brown, very moist, loose — SANDY SILT sandy clay layers, large boulder at 22.5'									
3955	25	5	4,8,5,(14)	SM	brown, wet, med. dense — SILTY SAND W/GRAVEL									
3950	30	6	8,6,6,(12)	GP-GM	brown, wet, very loose — GRAVEL W/SILT & SAND									
3945	35	4	56/4"	-	red-brown, very dense									
		34	Core 80,46	CL (A-4(8))	red-brown, soft rock — CLAYSTONE green staining on fractures, slaking		150	5.5	27	9	0	1	99	3020
3940	40	44	Core 74,28	-	red-brown, soft rock									
				-	red-brown, ex. soft rock — CLAYEY BRECCIA broken/rubble zone									
		12	Core 22,0	-	lt. red-brown, avg. hard rock — SANDY SILTSTONE		160	1.4						4520
3935	45				red-brown, avg. hard rock									
3930	50	0	Core 0,0	-	no recovery									
		17	Core 56,26	CL-ML (A-4(3))	red-brown, avg. hard rock — SILTY CLAYSTONE mudstone layers		160	1.6	21	6	0	11	89	4280
3925	55	19	Core 64,16	-	red-brown, soft rock									
		25	Core 84,0	-	red-brown, soft rock — SILTY MUDSTONE clayey layers									
3920	60	18	Core 60,0	-	red-brown, very soft rock									
		11	Core 38,24	-	red-brown, soft rock									
3915	65	28	Core 92,22	-	red-brown, avg. hard rock — CLAYEY SILTSTONE green layers		160.8	1.5						6030
		28	Core 92,0	-	red-brown, avg. hard rock									
		25	Core 95,64	-	red-brown & green, soft rock									
3910	75	31	Core 93,78	-	red-brown, avg. hard rock		159.6	1.2						8360
3905		29	Core 96,62	-	red-brown, avg. hard rock									
		20	Core 68,24	-	red-brown, avg. hard rock — SANDY SILTSTONE clayey mudstone layer at 75'									
3900	80	60	Core 100,54	-	red-brown, avg. hard rock		154.4	1.6						7910
	85			-	red-brown, avg. hard rock									
3895				-	green-gray — CLAYSTONE									
		60	Core 100,53	-	brown w/green-gray layers, avg. hard rock									
3890	90	60	Core 100,50	-	brown w/green-gray layers, avg. hard rock — SANDY SILTSTONE									
3885	95	60	Core 100,58	-	gray, avg. hard rock		151	1.3						2950
	100	24	Core 100,45	-	dk. gray, hard rock — DOLOMITIC LIMESTONE mudstone inclusions, vuggy									

KEY TO BORING LOG

SYMBOLS

- Blow Count per 6"
- 2,3,2,(6) ← $(N_1)_{60}$ Value
- 0.45 ← Torvane (tsf)
- Disturbed Sample
- Core 95,60 ← Rock Quality Designation (% RQD)
- Percent Sample Recovery
- Undisturbed Sample
- Groundwater Elevation

RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

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5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

PRELIMINARY PLAN
NOT FINAL

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 11/07 CHECK SRJ 12/07
DRAWN JPN 01/08 CHECK SRJ 01/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED AS NOTE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET
PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
F-763 DRG. NO.
SHT. 16 OF 187

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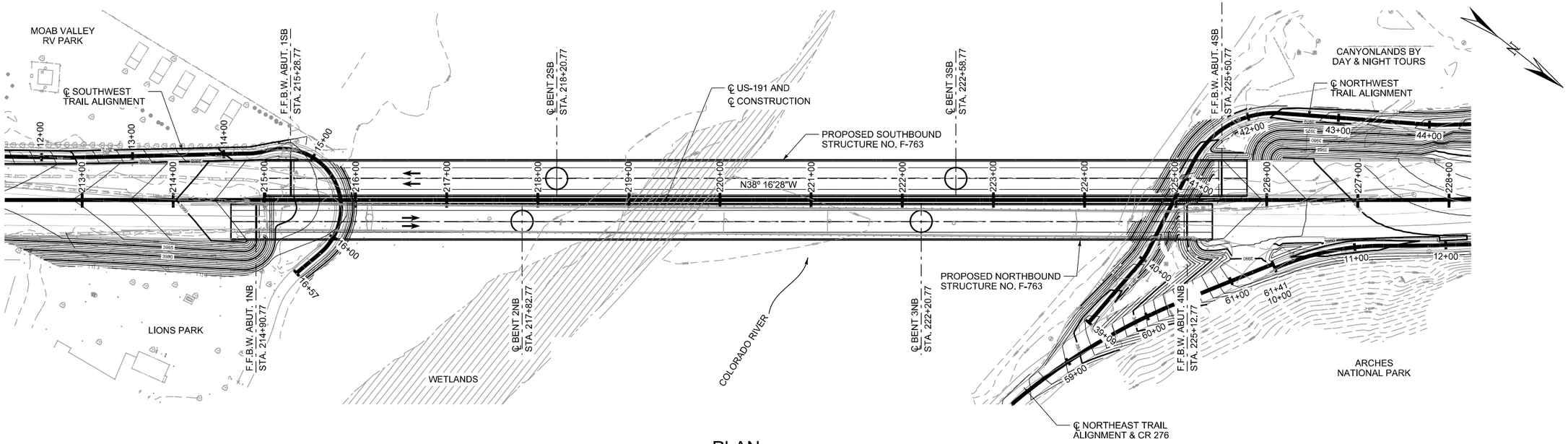
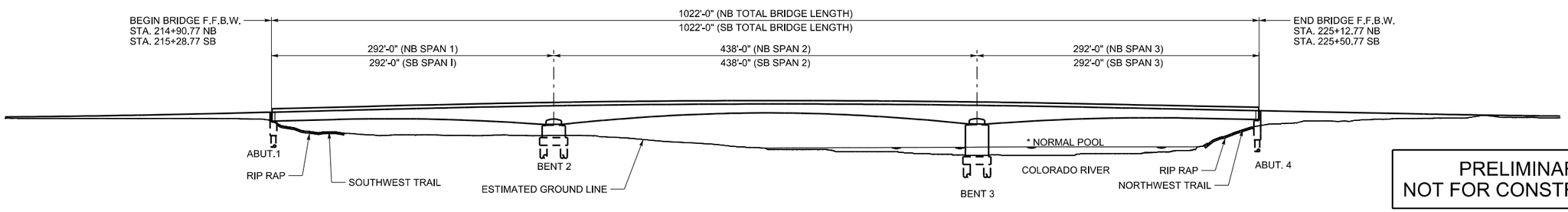
5/7/2008



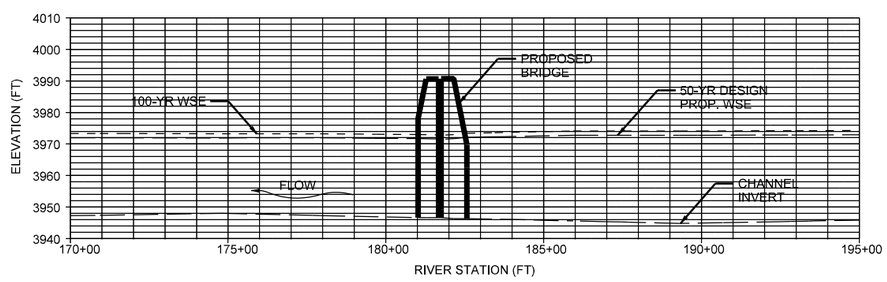
PLAN



PRELIMINARY:
NOT FOR CONSTRUCTION

ELEVATION

(NB BRIDGE SHOWN, SB SIMILAR)



CHANNEL PROFILE

THALWEG ELEVATION = 3944.86
VERTICAL DATUM: NAVD 88
ALL ELEVATIONS FROM RIVER STATION 17

HYDRAULIC DATA

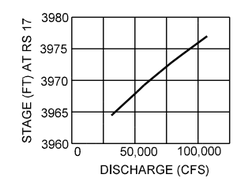
DRAINAGE AREA	= 24,100 SQ-MI
AVERAGE CHANNEL SLOPE	= 0.0002 FT/FT
MANNING'S 'N' CHANNEL	= 0.029
OVERBANK	= 0.160

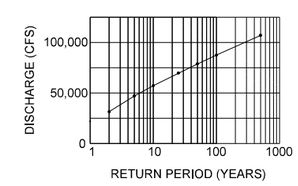
DEBRIS: ▪BRUSH ▫LOGS ▫ICE ▫_____
DESIGN FLOW: 78,742 CFS (50-YEAR)
SOURCE OF HYDROLOGY: CISCO GAGE #09180500

HYDRAULICS AT APPROACH SECTION 17

	AVERAGE VELOCITY (FT/S)	WSEL (FT)	FREEBOARD (FT)
50-YR EXIST	7.08	3972.77	5.76
50-YR PROP	7.09	3972.77	5.76
100-YR EXIST	7.40	3974.12	4.41
100-YR PROP	7.40	3974.12	4.41

RECURRENCE INTERVAL (YEARS)	DISCHARGE (CFS)	EXISTING STAGE (FT)	PROPOSED STAGE (FT)
2	31,350	3964.42	3964.41
5	47,020	3967.44	3967.43
10	57,212	3969.22	3969.21
25	69,724	3971.32	3971.31
50	78,742	3972.77	3972.77
100	87,489	3974.12	3974.12
500	107,056	3976.99	3977.00





GEOTECHNICAL DATA
BOTTOM MATERIAL: ▫COHESIVE ▪NON-COHESIVE
BOTTOM MATERIAL PARTICLE SIZE: ▪CLAY ▪SILT ▪SAND ▪GRAVEL ▫COBBLES ▪ROCK
STREAM PLANFORM: ▫STRAIGHT ▪MEANDERING ▫BRAIDED
CHANNEL STABILITY: ▪STABLE ▫AGGRADING ▫DEGRADING
ICE: ▫YES ▪NO ▫UNKNOWN

NOTES:
1. RIVER STATION 17 IS LOCATED 715 FT UPSTREAM OF THE PROPOSED UPSTREAM BRIDGE FACE.
2. SPAN LENGTHS MEASURED ALONG CL F-763 AND CL CONSTUCTION.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 01/08 CHECK XXX MM/YY
DRAWN SJF 01/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BRIDGE HYDRAULIC DAT SHEET

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 17 OF 187

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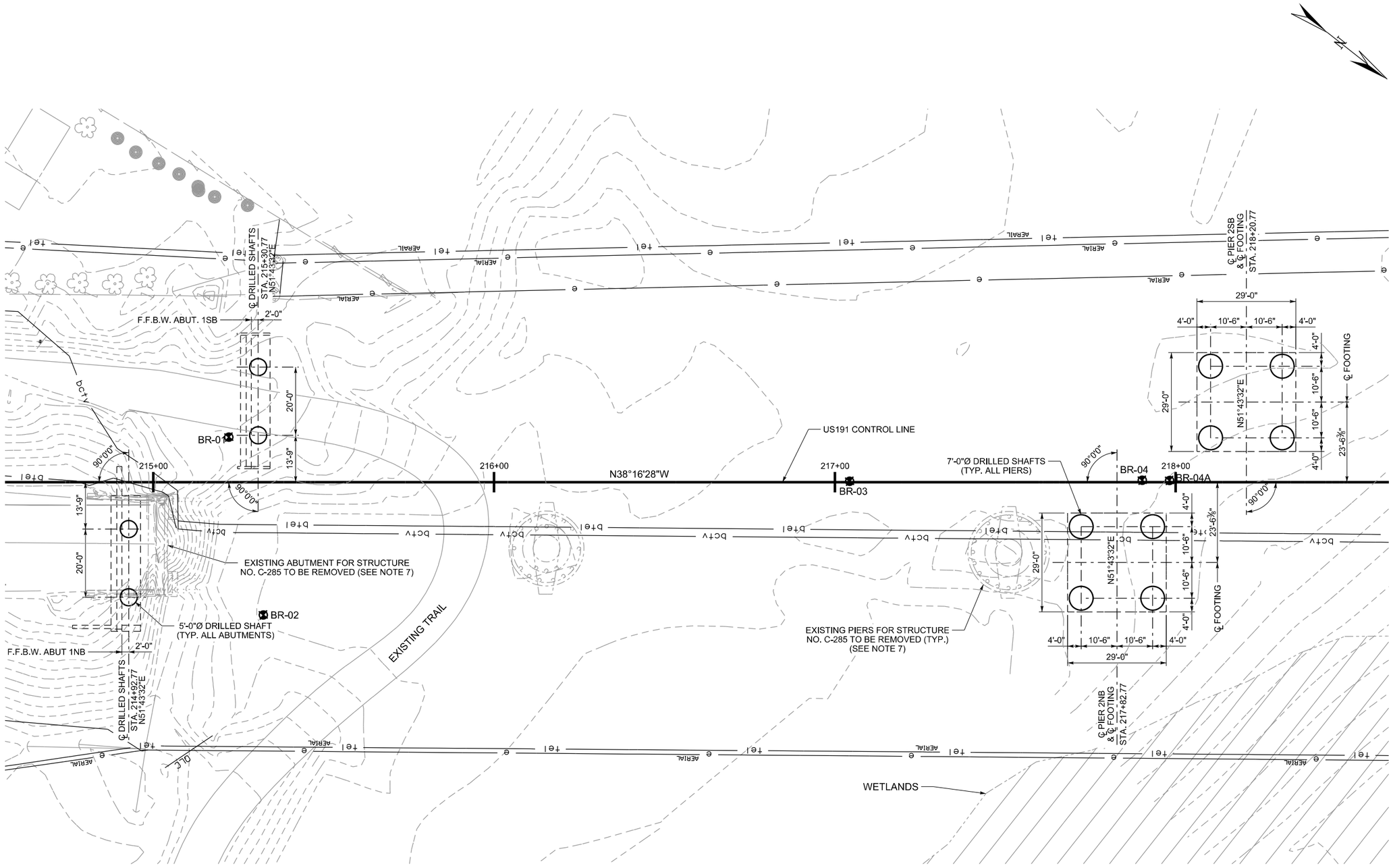
5/7/2008



NOTES:

1. FOR FOOTING DIMENSIONS, REINFORCING, AND DETAILS, SEE FOOTING DIMENSION AND REINFORCING SHEETS.
2. FOR ABUTMENT DIMENSIONS, REINFORCING AND DETAILS, SEE ABUTMENT 1NB OR 1SB DIMENSION AND REINFORCING SHEETS.
3. FOR HORIZONTAL CONTROL DATA, SEE SITUATION & LAYOUT SHEETS.
4. FOR DRILLED SHAFT ELEVATIONS AND DETAILS, SEE DRILLED SHAFT DETAILS SHEETS.
5. FOR BORING DATA AND ADDITIONAL SUBSURFACE INFORMATION, SEE GEOTECHNICAL PLANS, SOIL DATA SHEETS, AND FINAL GEOTECHNICAL REPORT.
6. UTILITIES SHOWN ARE APPROXIMATE, SEE UTILITY PLANS FOR ADDITIONAL INFORMATION.
7. FOR LIMITS OF REMOVAL OF EXISTING STRUCTURE, SEE BRIDGE REMOVAL SHEETS

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 03/08 CHECK XXX MM/YY
DRAWN SJF 03/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
FOUNDATION LAYOUT I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 18 OF 187

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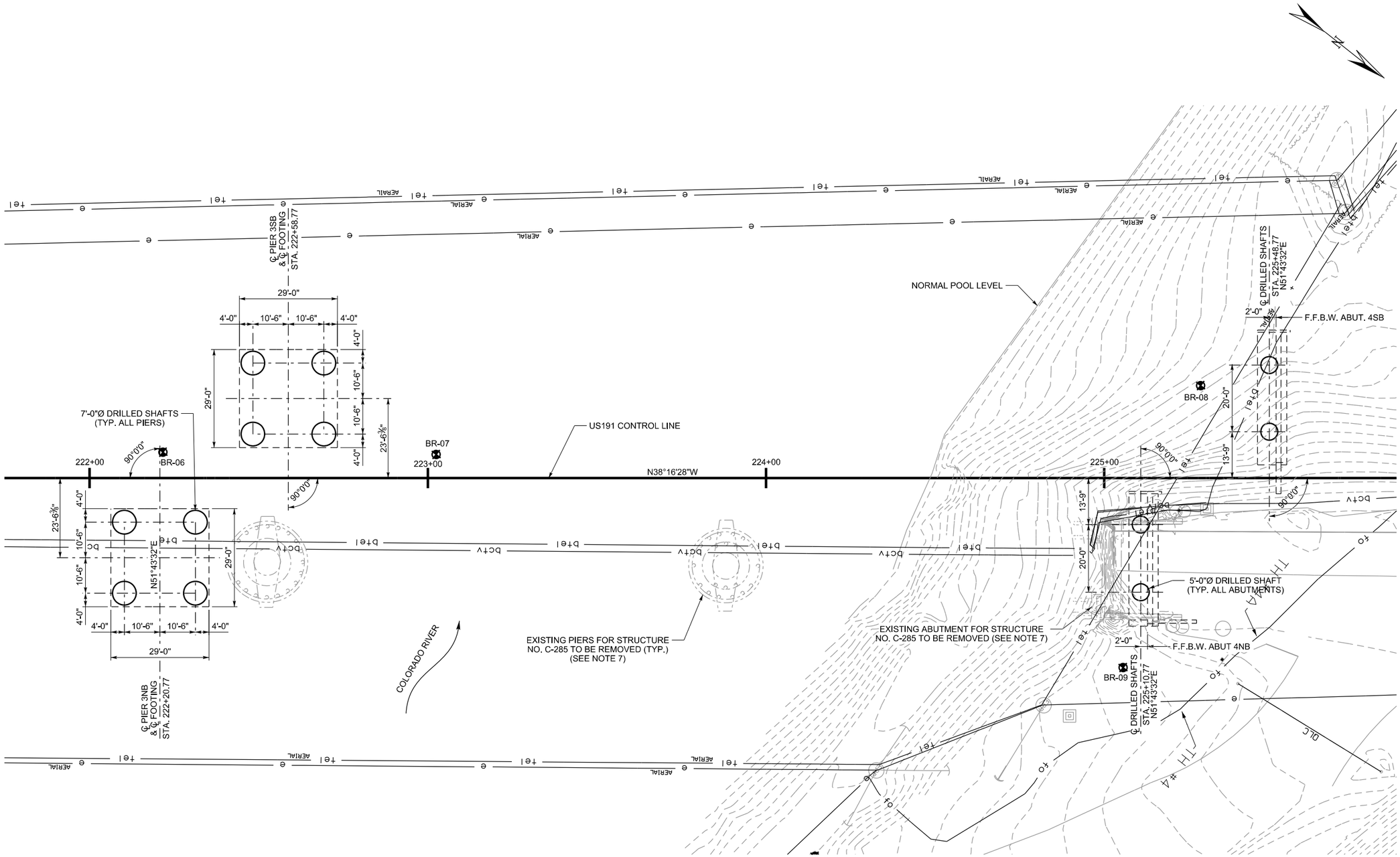
5/7/2008



NOTES:

1. FOR FOOTING DIMENSIONS, REINFORCING, AND DETAILS, SEE FOOTING DIMENSION AND REINFORCING SHEETS.
2. FOR ABUTMENT DIMENSIONS, REINFORCING AND DETAILS, SEE ABUTMENT 4NB OR 4SB DIMENSION AND REINFORCING SHEETS.
3. FOR HORIZONTAL CONTROL DATA, SEE SITUATION & LAYOUT SHEETS.
4. FOR DRILLED SHAFT ELEVATIONS AND DETAILS, SEE DRILLED SHAFT DETAILS SHEETS.
5. FOR BORING DATA AND ADDITIONAL SUBSURFACE INFORMATION, SEE GEOTECHNICAL PLANS, SOIL DATA SHEETS, AND FINAL GEOTECHNICAL REPORT.
6. UTILITIES SHOWN ARE APPROXIMATE, SEE UTILITY PLANS FOR ADDITIONAL INFORMATION.
7. FOR LIMITS OF REMOVAL OF EXISTING STRUCTURE, SEE BRIDGE REMOVAL SHEETS

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 03/08 CHECK XXX MM/YY
DRAWN SJF 03/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR ISSUE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
FOUNDATION LAYOUT II

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 19 OF 187

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5/7/2008

PRELIMINARY:
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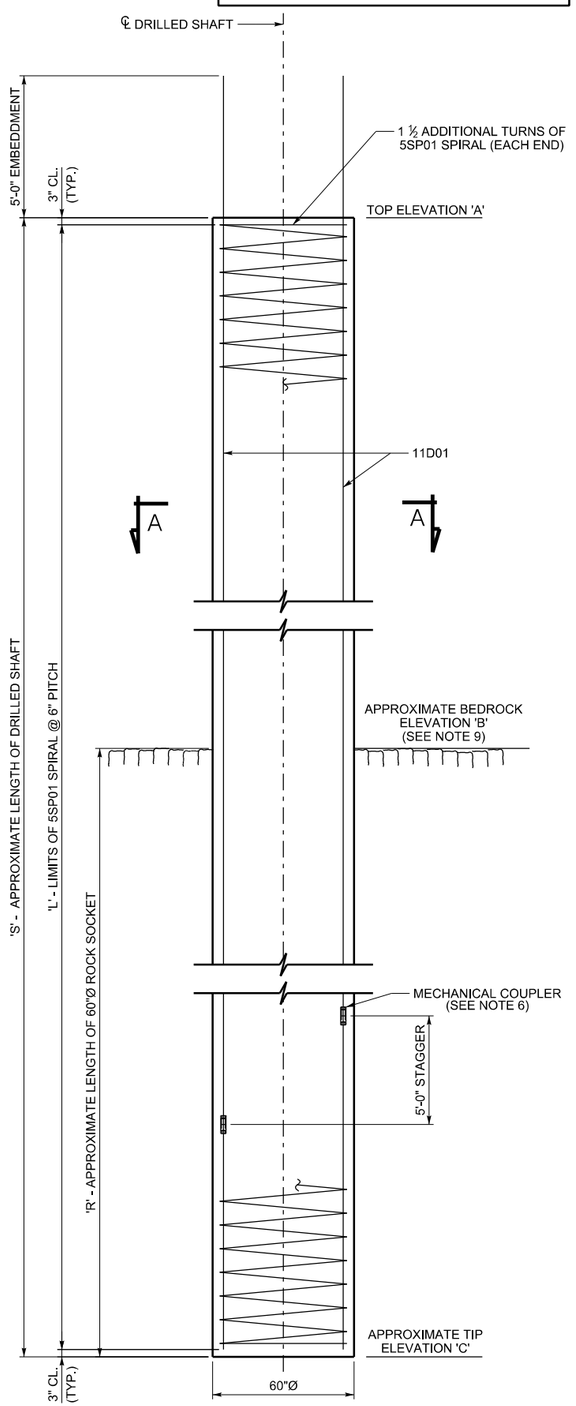
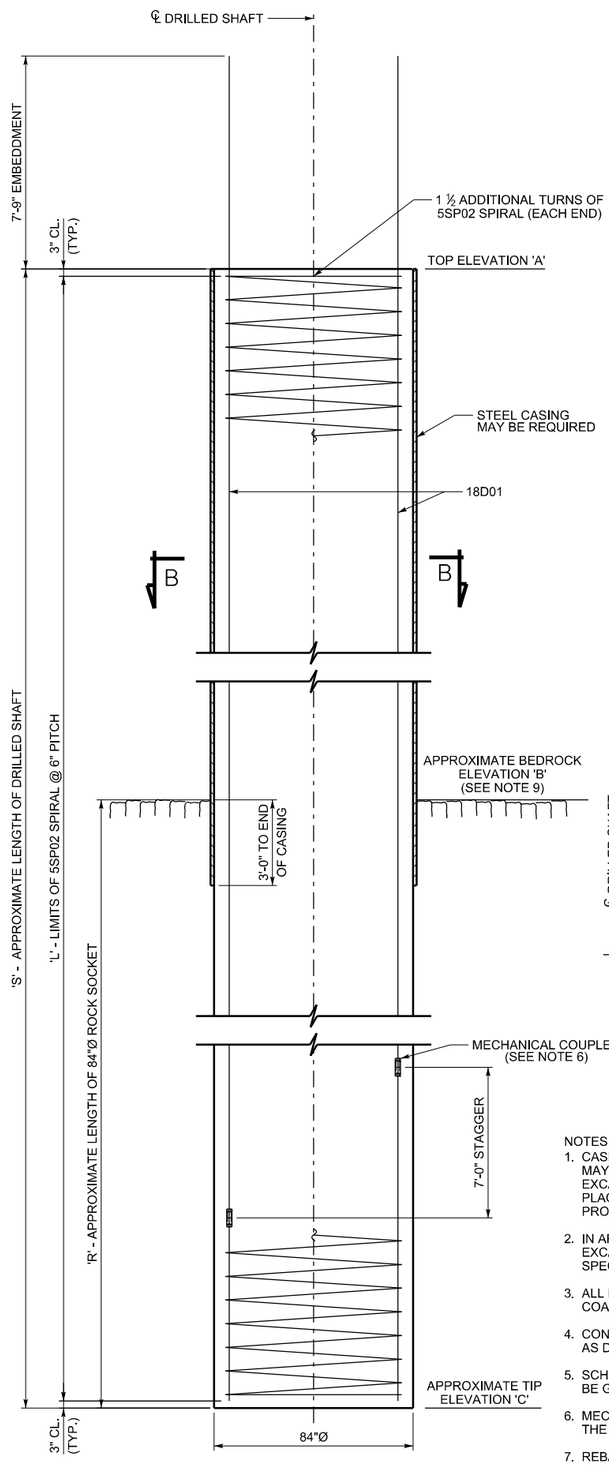


ELEVATION - ABUT. 1 & 4 SHAFTS
(DRILLED CAISSON (60" DIAMETER)



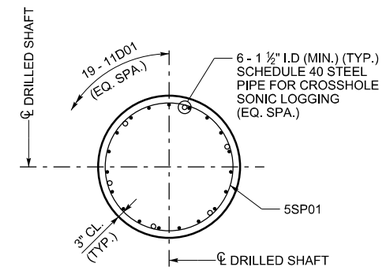
ELEVATION - PIERS 2 & 3 SHAFTS
(DRILLED CAISSON (84" DIAMETER)

DRILLED SHAFT DATA

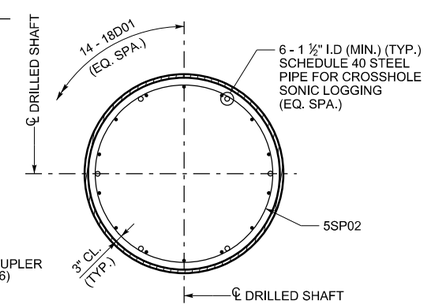
SHAFT LOCATION	NO. SHAFTS	SHAFT DIAMETER	ELEVATIONS 'A' (FT)	'B' (FT)	'C' (FT)	'L'	'S' (FT)	'R' (FT)
ABUTMENT 1NB	2	60"	3974.22	3940.00	3876.00	97'-8"	98'-2 ⅞"	64
PIER 2NB	4	84"	3957.00	3932.00	3808.00	148'-6"	149'-0"	124
PIER 3NB	4	84"	3937.00	3930.00	3843.00	93'-6"	94'-0"	87
ABUTMENT 4NB	2	60"	3969.75	3941.00	3905.00	64'-3"	64'-9"	36
ABUTMENT 1SB	2	60"	3972.17	3940.00	3876.00	95'-8"	96'-2"	64
PIER 2SB	4	84"	3957.00	3932.00	3805.00	148'-6"	149'-0"	124
PIER 3SB	4	84"	3937.00	3930.00	3843.00	93'-6"	94'-0"	87
ABUTMENT 4SB	2	60"	3971.40	3941.00	3905.00	65'-10 ¾"	66'-4 ¾"	36

ULTIMATE AXIAL LOAD CAPACITY - ONE SHAFT

SHAFT LOCATION	NOMINAL SIDE SHEAR CAPACITY (K)	NOMINAL END BEARING CAPACITY (K)	RESISTANCE FACTOR - Φ	TOTAL CAPACITY (K)
ABUTMENT 1NB	3287.7	0	0.55	1808.2
PIER 2NB	10371.3	0	0.55	5704.2
PIER 3NB	11235.3	0	0.55	6179.4
ABUTMENT 4NB	3516.6	0	0.55	1934.1
ABUTMENT 1SB	3287.7	0	0.55	1808.2
PIER 2SB	10371.3	0	0.55	5704.2
PIER 3SB	11235.3	0	0.55	6179.4
ABUTMENT 4SB	3516.6	0	0.55	1934.1

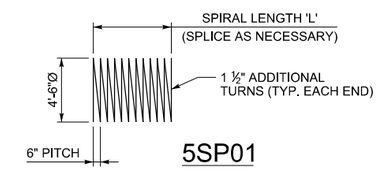


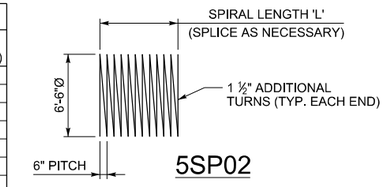
SECTION A-A
(60"Ø SHAFT)



SECTION B-B
(84"Ø SHAFT)

BAR BENDING DIAGRAMS
(ALL DIMENSIONS ARE OUT-TO-OUT)





LEGEND

6 D 01
- BAR NUMBER
- D - DRILLED SHAFT; SP - SPIRAL
- BAR SIZE

BAR LIST - ABUTMENT 1 ONE SHAFT

MARK	SIZE	NUM.	LENGTH	TOTAL
5SP01	5	1	101'-11 ⅜"	2776'-4"
11D01	11	19	1937'-0 ⅛"	2776'-4"

(AVERAGE OF ABUT. 1NB & ABUT. 1SB)

BAR LIST - PIER 3 ONE SHAFT

MARK	SIZE	NUM.	LENGTH	TOTAL
5SP02	5	1	3879'-11"	3879'-11"
18D01	18	14	101'-6"	1421'-0"

BAR LIST - PIER 2 ONE SHAFT

MARK	SIZE	NUM.	LENGTH	TOTAL
5SP02	5	1	6126'-2"	6126'-2"
18D01	18	14	156'-6"	2191'-0"

BAR LIST - ABUTMENT 4 ONE SHAFT

MARK	SIZE	NUM.	LENGTH	TOTAL
5SP01	5	1	1892'-3 ¾"	1892'-3 ¾"
11D01	11	19	70'-3 ⅞"	1336'-1 ⅝"

(AVERAGE OF ABUT. 4NB & ABUT. 4SB)

ESTIMATED PAY ITEM QUANTITIES

DESCRIPTION	UNIT	SOUTHBOUND BRIDGE	NORTHBOUND BRIDGE
DRILLED CAISSON (60" DIAMETER)	LF	326	326
DRILLED CAISSON (84" DIAMETER)	LF	972	972

FOR INFORMATION ONLY QUANTITIES

DESCRIPTION	UNIT	ABUTMENT 1 NB	ABUTMENT 1 SB	PIER 2 NB	PIER 2 SB	PIER 3 NB	PIER 3 SB	ABUTMENT 4 NB	ABUTMENT 4 SB
CONCRETE	CY	71.4	69.9	212.4	212.4	134.0	134.0	47.1	48.3
REINFORCING STEEL	LB	13321	13053	36188	36188	23373	23373	8955	9170

NOTES:

1. CASING MAY BE REQUIRED AT PIERS 2 & 3 AND MAY BE TEMPORARY OR MAY REMAIN IN PLACE. GROUNDWATER IS ANTICIPATED IN THE SHAFT EXCAVATIONS, REQUIRING DEWATERING OR TREMIE CONCRETE PLACEMENT. HOLE BOTTOMS SHALL BE CLEANED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
2. IN AREAS OF CONTAMINATION, SOIL AND GROUNDWATER FROM SHAFT EXCAVATIONS WILL REQUIRE SPECIAL HANDLING. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
3. ALL DRILLED SHAFT REINFORCING INCLUDING COUPLERS IS NON-EPOXY COATED.
4. CONCRETE FOR DRILLED SHAFTS SHALL BE PER APPROVED MIX DESIGN AS DESIGNATED IN THE PROJECT SPECIAL PROVISIONS. (f'c = 4000PSI)
5. SCHEDULE 40 STEEL PIPE FOR CROSSHOLE SONIC LOGGING SHALL NOT BE GALVANIZED.
6. MECHANICAL COUPLERS SHALL BE CAPABLE OF DEVELOPING 125% OF THE YIELD STRENGTH OF THE BAR.
7. REBAR CAGE SHALL BE 100% TIED. ROLLER SPACERS SHALL BE INSTALLED TO ENSURE COVER.
8. FOR DRILLED SHAFT LOCATIONS, SEE FOUNDATION LAYOUT I & II SHEETS.
9. "BEDROCK" AND "ROCK" REFER TO MUDSTONE OR SANDSTONE AS SHOWN IN THE FINAL GEOTECHNICAL REPORT. TOP OF ROCK AND TOP OF ROCK SOCKET SHALL BE VERIFIED BY THE GEOTECHNICAL ENGINEER.
10. CSL TUBES SHALL BE INSTALLED PER SPECIFICATIONS AND SHALL BE FITTED WITH A WATERTIGHT CAP ON BOTTOM AND REMOVABLE CAP ON TOP. TUBES SHALL NOT BE TIED ADJACENT TO VERTICAL BARS. TUBES SHALL BE VERTICAL AND EXTEND FROM 6" ABOVE THE BOTTOM OF THE SHAFT TO AT LEAST 1M (3.3') ABOVE THE SHAFT TOP. AFTER PLACEMENT OF THE REBAR CAGE AND BEFORE CONCRETE PLACEMENT, TUBES SHALL BE FILLED WITH CLEAN WATER AND CAPPED.
11. DURING THE SHAFT EXCAVATION PROCESS, THE GEOTECHNICAL ENGINEER ON SITE SHALL DETERMINE ACTUAL TOP OF ROCK SOCKET ELEVATION.
12. APPROXIMATE TIP ELEVATIONS AND SHAFT LENGTHS MAY VARY FROM WHAT IS SHOWN BASED ON ACTUAL TOP OF ROCK ELEVATIONS.
13. QUANTITIES OF CONCRETE AND REINFORCING STEEL ARE FOR INFORMATION ONLY. DRILLED SHAFTS WILL BE PAID ON THE BASIS OF THE PAY ITEM QUANTITIES. CONTRACTOR SHALL VERIFY FOR INFORMATION ONLY QUANTITIES WHEN PREPARING BID.
14. SPIRAL REINFORCEMENT LENGTHS ASSUME CONTINUOUS REINFORCEMENT WITHOUT SPLICES. NO ADDITIONAL LENGTH IS ADDED FOR LAP SPLICES, WELDS OR MECHANICAL COUPLERS REQUIRED BY NOTE 15 BELOW.
15. SPIRAL REINFORCEMENT SHALL BE SPLICED WITH A 2'-2" LAP SPLICE, A WELDING PROCEDURE APPROVED BY THE ENGINEER OR A MECHANICAL COUPLER. SPIRAL REINFORCING STEEL SHALL CONFORM TO ASTM A706 FOR ALL SPIRALS SPLICED WITH A WELD. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ASTM A706 REINFORCING STEEL.
16. REINFORCING STEEL LENGTHS SHOWN ON THIS SHEET ARE FOR THE FULL LENGTH OF THE BARS NOTED. MECHANICAL COUPLERS MAY BE NECESSARY TO ACHIEVE THESE LENGTHS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN CCB 03/08 CHECK XXX MM/YY
DRAWN SJF 03/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
DRILLED SHAFT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 20 OF 187

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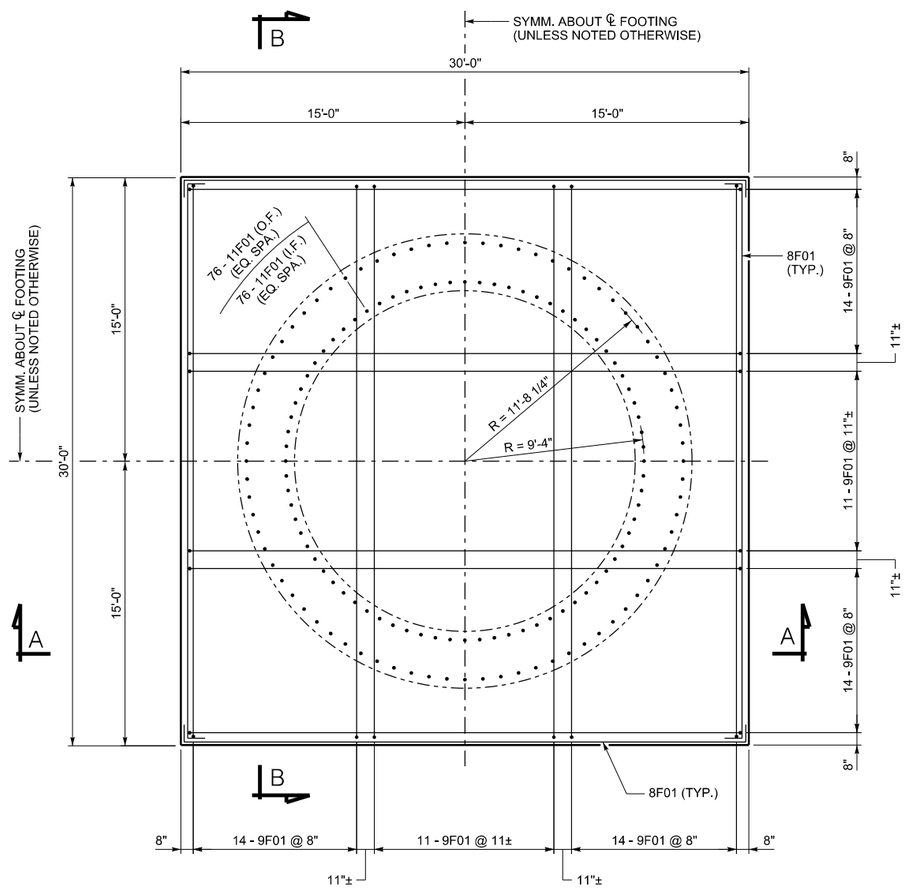
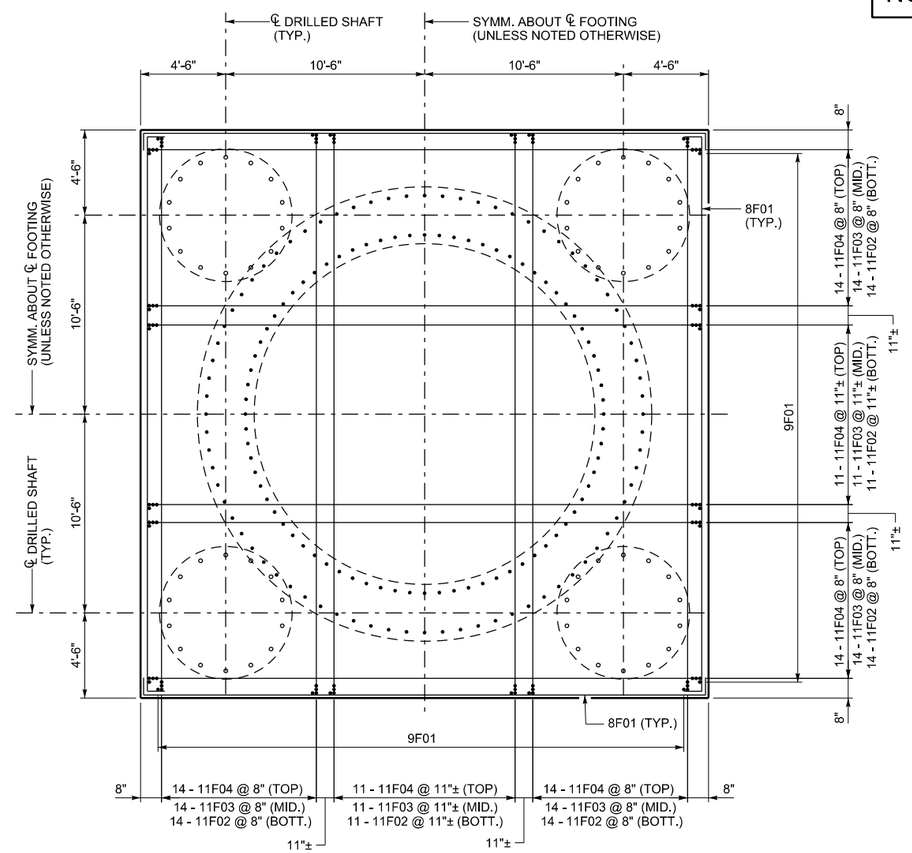
5/7/2008

PRELIMINARY:
NOT FOR CONSTRUCTION



PLAN - TOP

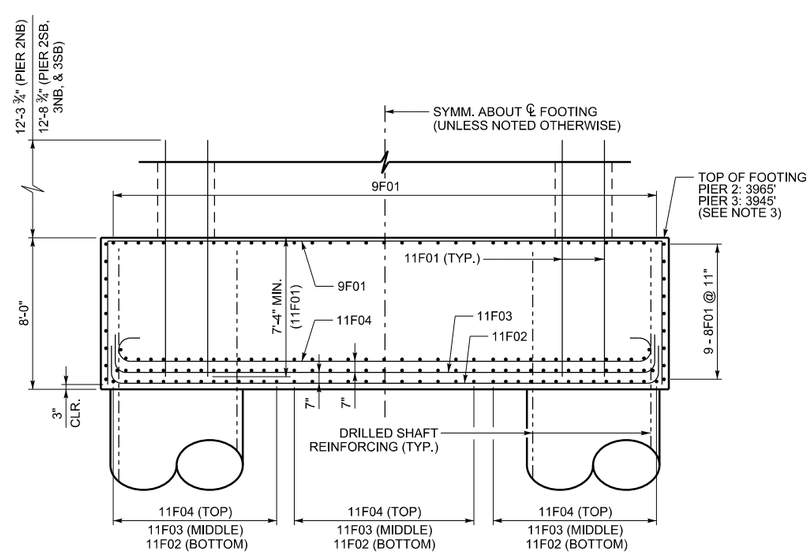


PLAN - BOTTOM

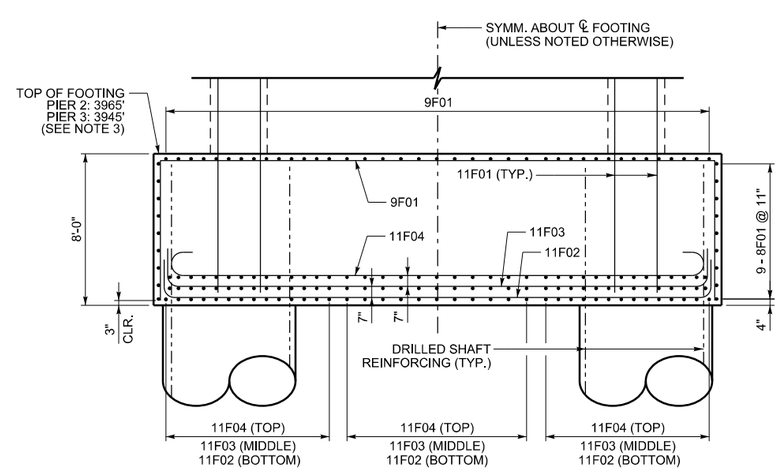
LEGEND

8 F 01

- 01 — BAR NUMBER
- F — F - FOOTING
- 8 — BAR SIZE



SECTION A-A



SECTION B-B

NOTES:

1. THIS DRAWING IS VALID FOR FOOTINGS AT PIERS 2 & 3. THESE FOOTINGS ARE CONSIDERED MASS CONCRETE. SEE PROJECT SPECIFICATIONS.
2. SEE FOUNDATION LAYOUT SHEETS FOR PLAN LOCATION OF FOOTINGS & DRILLED SHAFTS.
3. TOP OF FOOTING SHALL BE A MINIMUM OF 1'-6" BELOW GRADE. IF THE GROUND ELEVATION AT THE LOCATION OF THE FOOTING RESULTS IN THE FOOTING BEING LESS THAT 1'-6" BELOW GRADE, THE CONTRACTOR SHALL RE-GRADE AROUND THE FOOTING OR THE TOP OF FOOTING ELEVATION SHALL BE ADJUSTED TO OBTAIN THIS CRITERIA. TOP OF SHAFT & BOTTOM OF PIER COLUMN ELEVATIONS SHALL BE ADJUSTED ACCORDINGLY.
4. SEE PIERS 2 & 3 DIMENSIONS & REINFORCING SHEETS FOR PIER COLUMN DIMENSIONS.
5. CONCRETE COVER SHALL BE 2" UNLESS NOTED OTHERWISE.
6. CONCRETE SHALL BE STUCTURAL CONCRETE (AA)(AE), 4000 PSI.
7. REINFORCING IS EPOXY COATED.
8. SEE DRILLED SHAFT DETAILS SHEET FOR DETAILS OF DRILLED SHAFTS.
9. SEE SHORING DETAILS FOR DETAILS OF COFFERDAMS REQUIRED FOR PIER CONSTRUCTION.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN CCB 02/08 CHECK XXX MM/YY
DRAWN RJA 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
FOOTING DIMENSIONS & REINF. I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 21 OF 187

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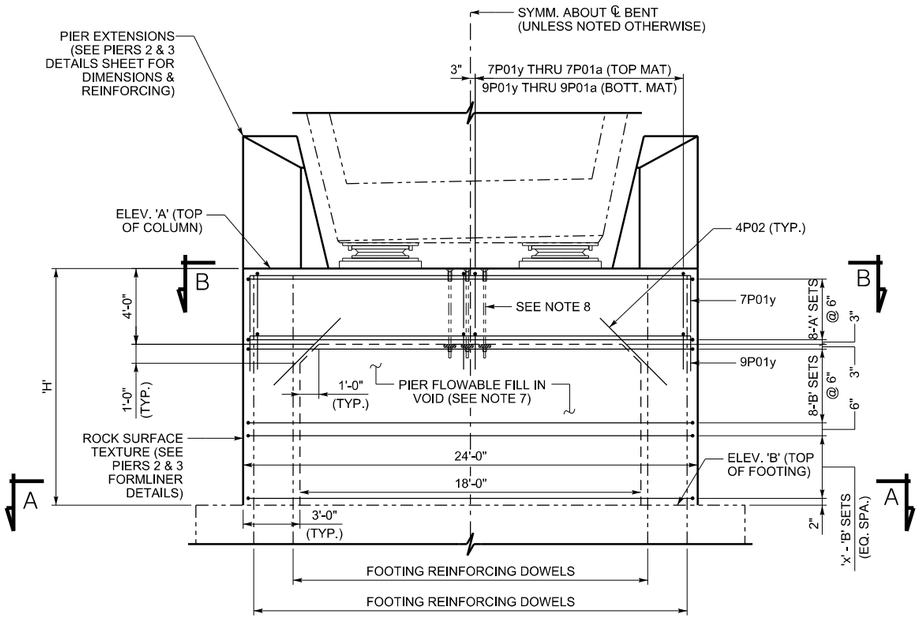
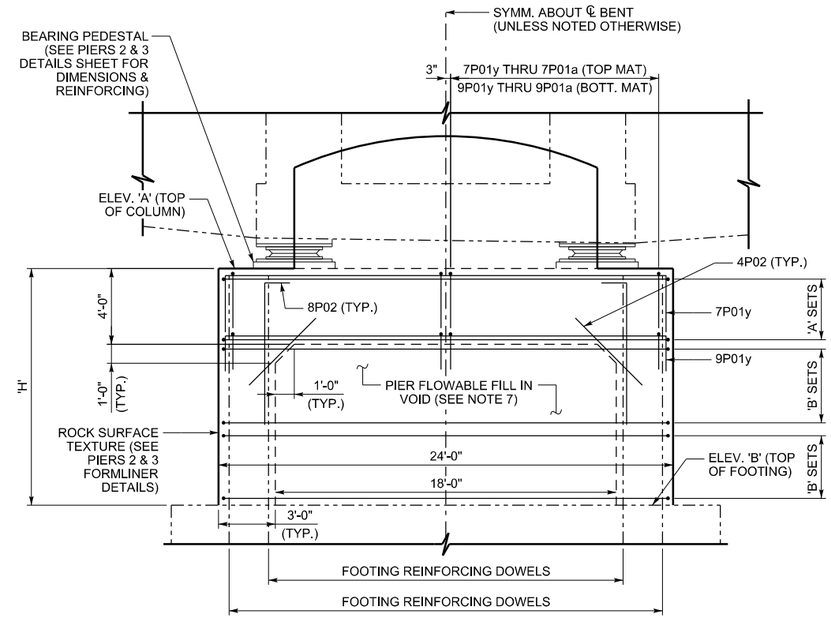
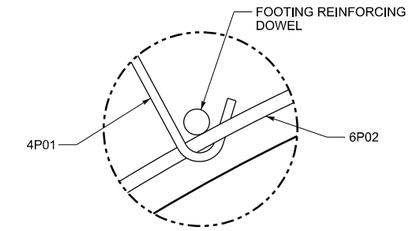
5/7/2008



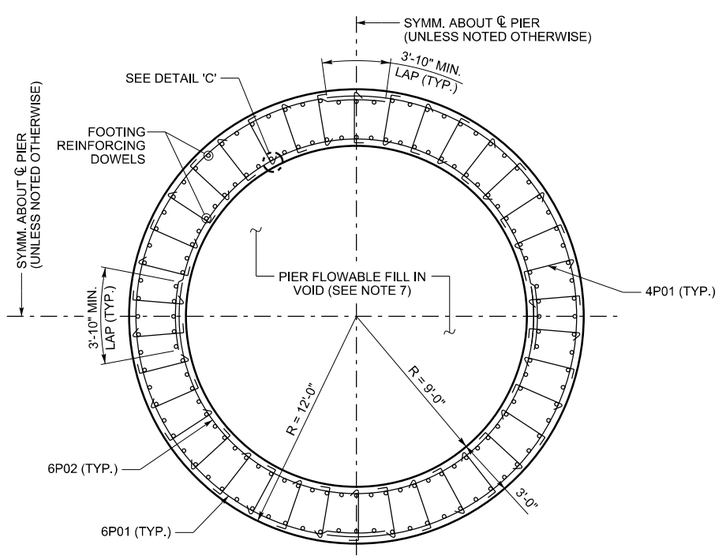
ELEVATION



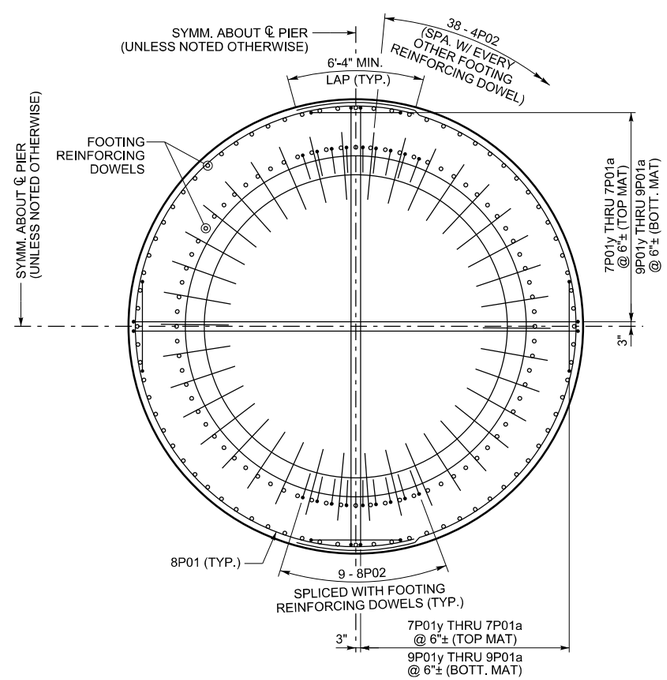
SIDE VIEW



DETAIL 'C'
(TYPICAL)



SECTION A-A
('B' SET SHOWN)



SECTION B-B

PRELIMINARY:
NOT FOR CONSTRUCTION

LEGEND

6 P 01

- BAR NUMBER
- P - PIER
- BAR SIZE

VARIABLE INFORMATION				
PIER NUM.	ELEV. 'A' (FT)	ELEV. 'B' (FT)	DIMENSION 'H'	'X'
2NB	3977.55	3965	12'-6 5/8"	6
2SB	3978.12	3965	12'-1 3/8"	6

NOTES:

1. FOR FOOTING DETAILS AND DOWEL PLACEMENT, SEE FOOTING DIMENSIONS AND REINFORCING I & II SHEETS.
2. REINFORCING COVER SHALL BE 2".
3. ALL PIER REINFORCING SHALL BE EPOXY COATED.
4. ALL PIER CONCRETE SHALL BE STRUCTURAL CONCRETE (AA)(AE) (4000 PSI.).
5. TIE SET 'A' CONSISTS OF: 2-8P01.
   TIE SET 'B' CONSISTS OF: 2-6P01, 2-6P02, & 38-4P01.
6. THE SYMBOL ± DENOTES BEING ABLE TO MOVE REINFORCING BARS ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE OR TO ACHIEVE EQUAL BAR SPACING BETWEEN THE FIRST AND LAST BAR.
7. BEFORE PIER CAP IS PLACED, VOID SHALL BE FILLED WITH FLOWABLE FILL MATERIAL PER THE PROJECT SPECIFICATIONS. SEE PIERS 2 & 3 DETAILS FOR POURING SEQUENCE.
8. SEE PIER CONNECTION DETAILS SHEET FOR TEMPORARY POST-TENSIONING BARS EMBEDDED IN THE PIER DURING CONSTRUCTION.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN CCB MM/YY CHECK XXX MM/YY
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QUANT. XXX MM/YY CHECK XXX MM/YY

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APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
PIER 2 DIMENSIONS & REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 23 OF 187

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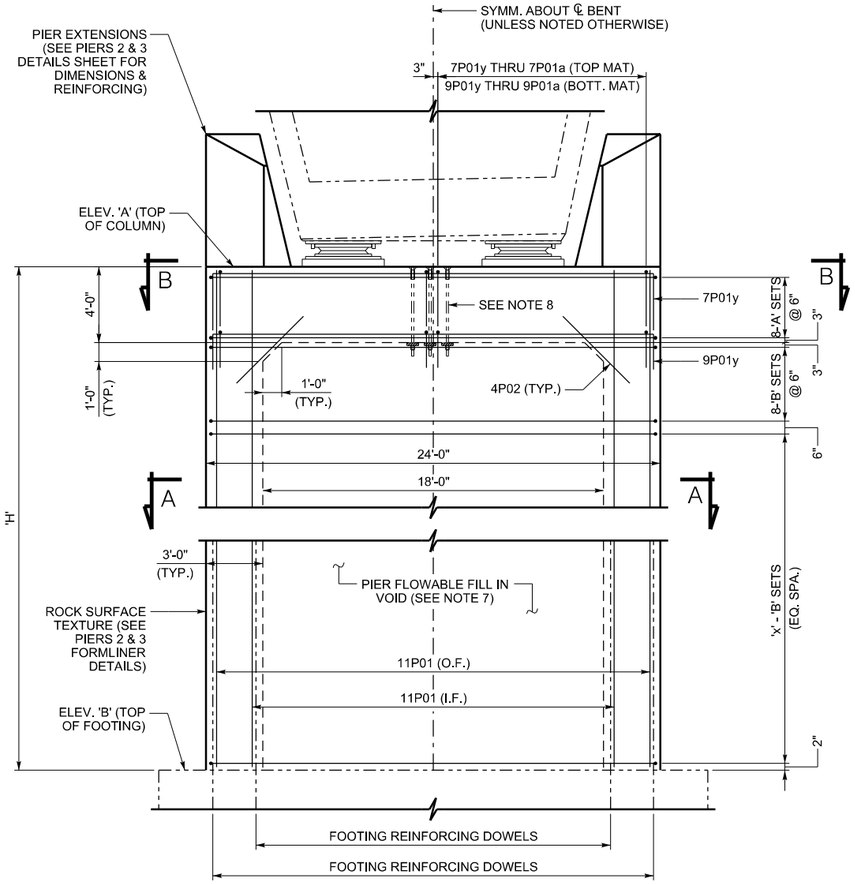
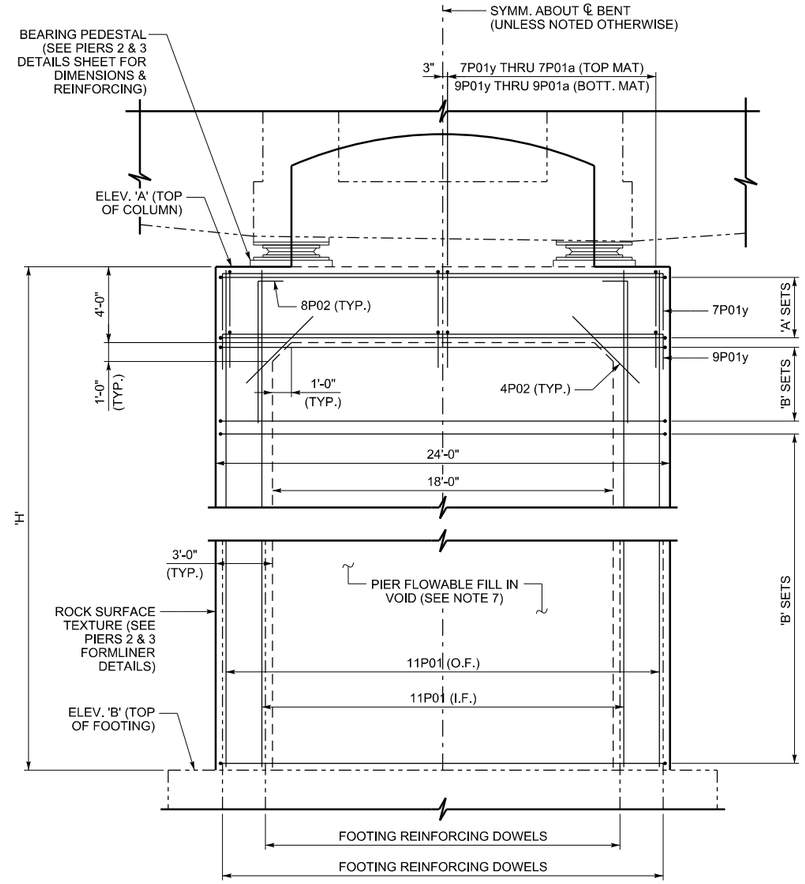
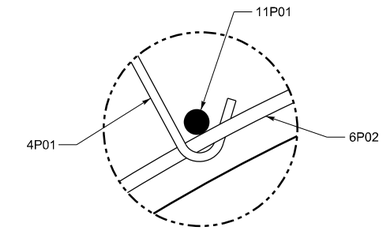
5/7/2008



ELEVATION

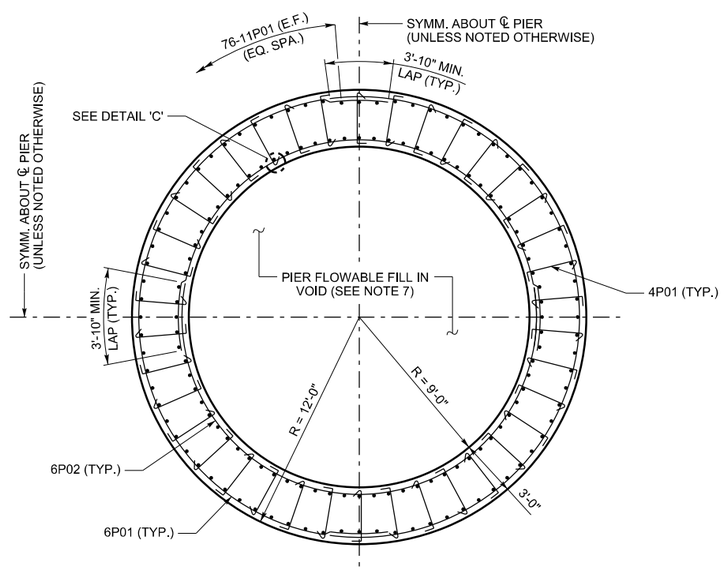


SIDE VIEW



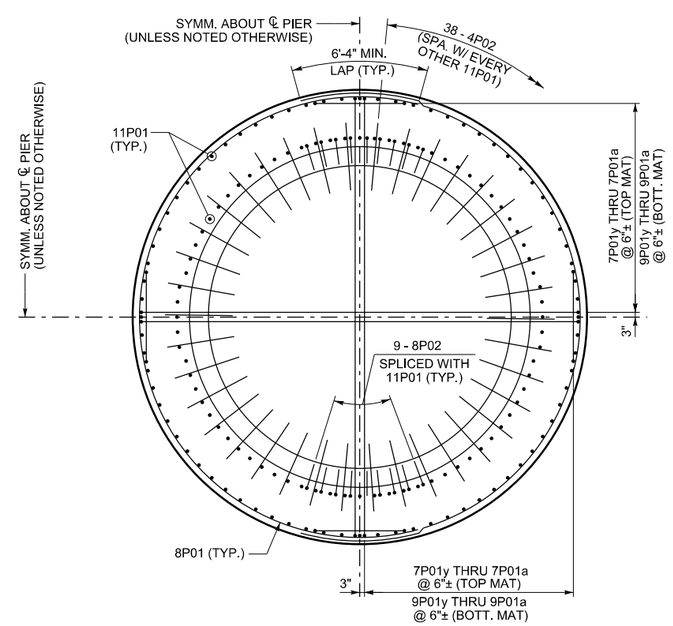
DETAIL 'C'

(TYPICAL)



SECTION A-A

('B' SET SHOWN)



SECTION B-B

PRELIMINARY:
NOT FOR CONSTRUCTION

LEGEND

6 P 01

- BAR NUMBER
- P - PIER
- BAR SIZE

VARIABLE INFORMATION				
PIER NUM.	ELEV. 'A' (FT)	ELEV. 'B' (FT)	DIMENSION 'H'	'X'
3NB	3978.07	3945	33'-0 ⅞"	26
3SB	3977.49	3945	32'-5 ⅞"	26

NOTES:

1. FOR FOOTING DETAILS AND DOWEL PLACEMENT, SEE FOOTING DIMENSIONS AND REINFORCING I & II SHEETS.
2. REINFORCING COVER SHALL BE 2".
3. ALL PIER REINFORCING SHALL BE EPOXY COATED.
4. ALL PIER CONCRETE SHALL BE STRUCTURAL CONCRETE (AA)(AE) (4000 PSI.).
5. TIE SET 'A' CONSISTS OF: 2-8P01.
   TIE SET 'B' CONSISTS OF: 2-6P01, 2-6P02, & 38-4P01.
6. THE SYMBOL ± DENOTES BEING ABLE TO MOVE REINFORCING BARS ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE OR TO ACHIEVE EQUAL BAR SPACING BETWEEN THE FIRST AND LAST BAR.
7. BEFORE PIER CAP IS PLACED, VOID SHALL BE FILLED WITH FLOWABLE FILL MATERIAL PER THE PROJECT SPECIFICATIONS. SEE PIERS 2 & 3 DETAILS FOR POURING SEQUENCE.
8. SEE PIER CONNECTION DETAILS SHEET FOR TEMPORARY POST-TENSIONING BARS EMBEDDED IN THE PIER DURING CONSTRUCTION.

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN CCB MM/YY CHECK XXX MM/YY
DRAWN RJA MM/YY CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
PIER 3 DIMENSIONS & REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 25 OF 187

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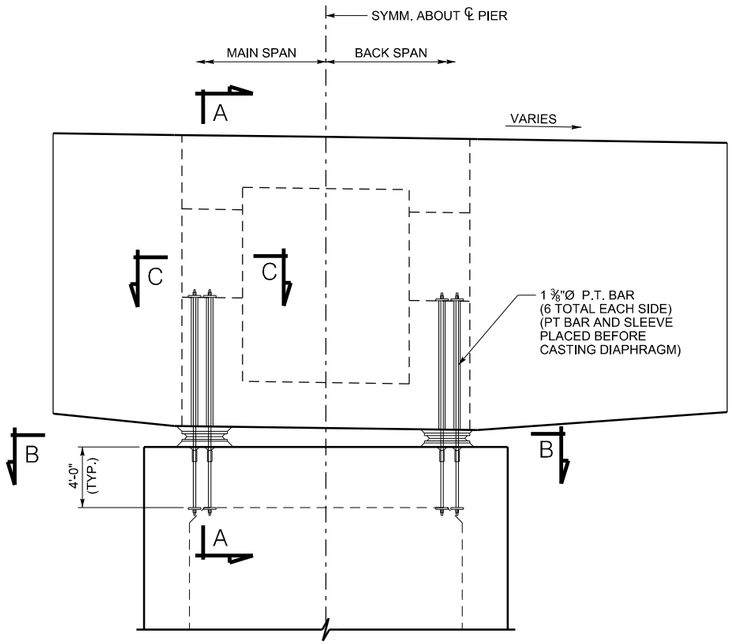
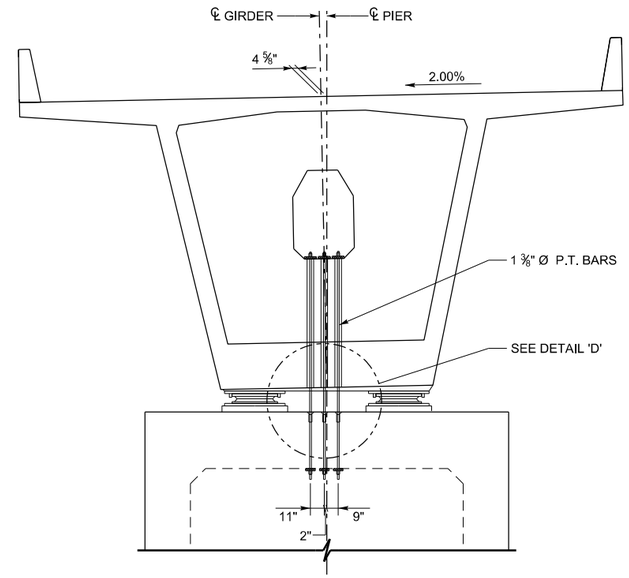
5/7/2008

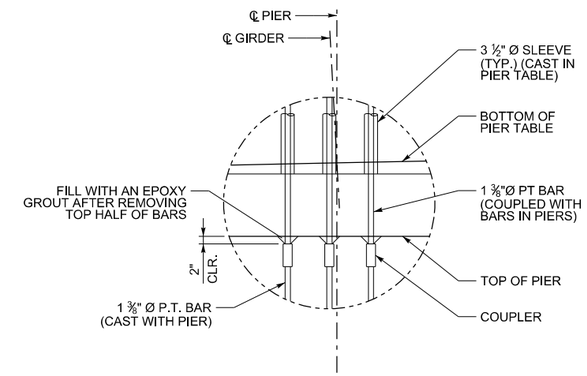


ELEVATION

(PIER 3SB SHOWN,
2NB, 2SB, & 3NB SIMILAR)

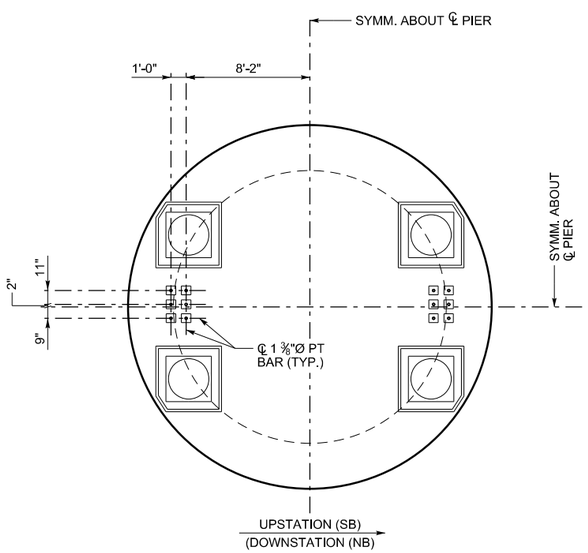


SECTION A-A

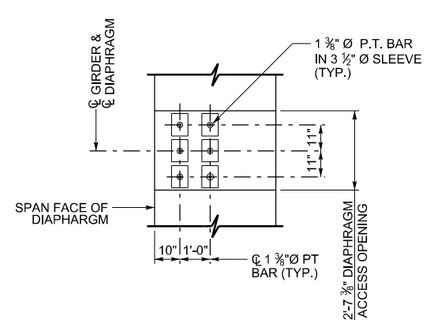


DETAIL 'D'

(SEE NOTE 1)



SECTION B-B



SECTION C-C

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. VERTICAL P.T. BARS SHOWN ARE TEMPORARY AND SHALL REMAIN IN PLACE FROM PRIOR TO CASTING THE FIRST SEGMENT TO AFTER BACK SPAN CLOSURE IS MADE IN AN ADJACENT SPAN. BARS SHALL BE STRESSED TO A FORCE OF 50 KIPS EACH, AFTER SEATING.
2. COST OF TEMPORARY P.T. BARS IS INCIDENTAL TO THE COST OF SUPERSTRUCTURE CONCRETE
3. BEARING PLATES SHALL BE PERPENDICULAR TO THE P.T. BARS AND SHALL BE CENTERED OVER THE 3 ½" SLEEVES IN DIAPHRAGMS.
4. PT BAR COUPLERS MUST BE CAPABLE OF DEVELOPING 125% OF PT BAR ULTIMATE STRENGTH.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN	BTL 04/008	CHECK	XXX MM/YY
DRAWN	RJA 04/08	CHECK	XXX MM/YY
QUANT.	XXX MM/YY	CHECK	XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
PIER CONNECTION DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 28 OF 187

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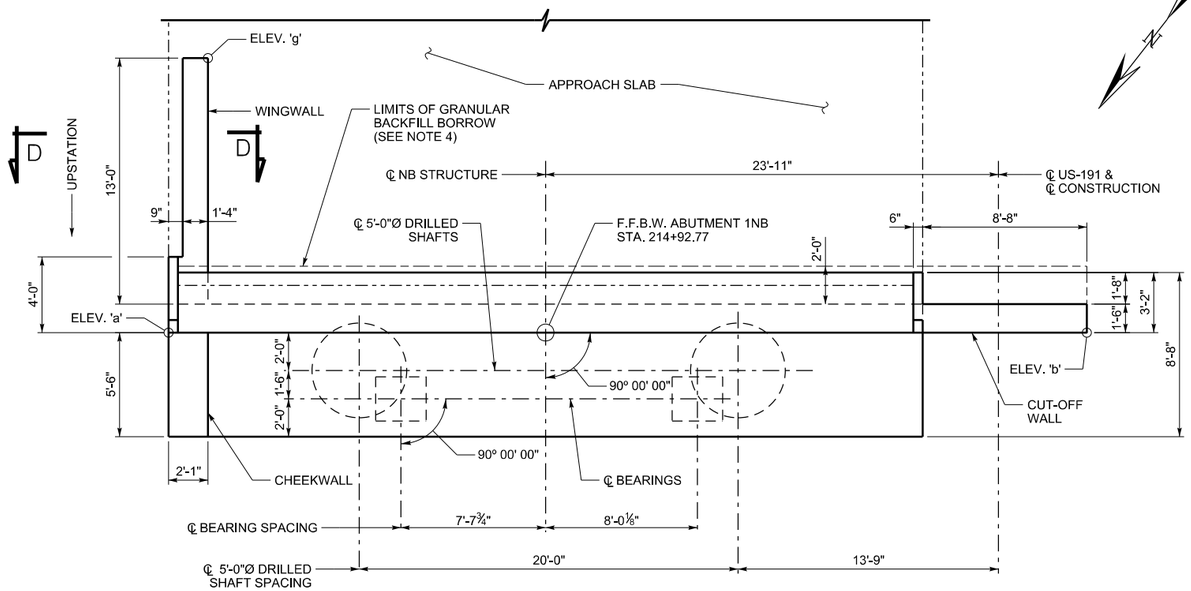
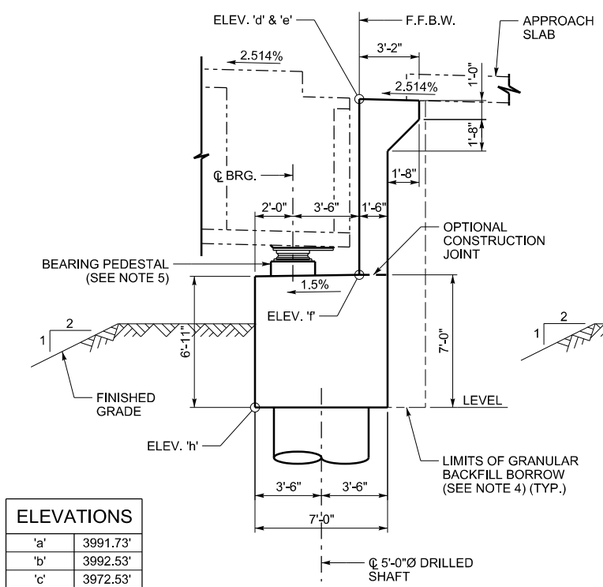
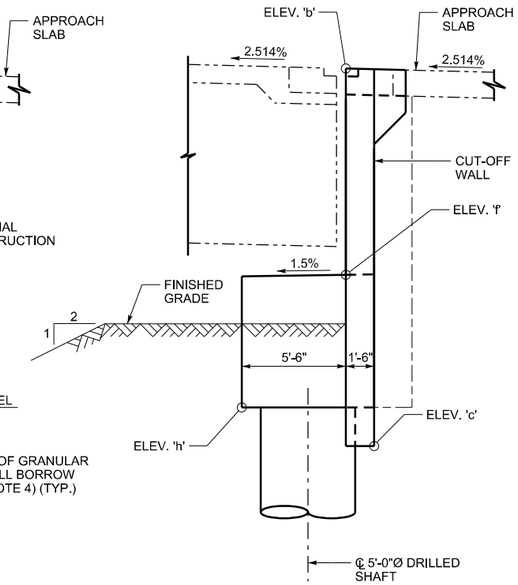
5/7/2008



PLAN
(ABUTMENT 1NB)

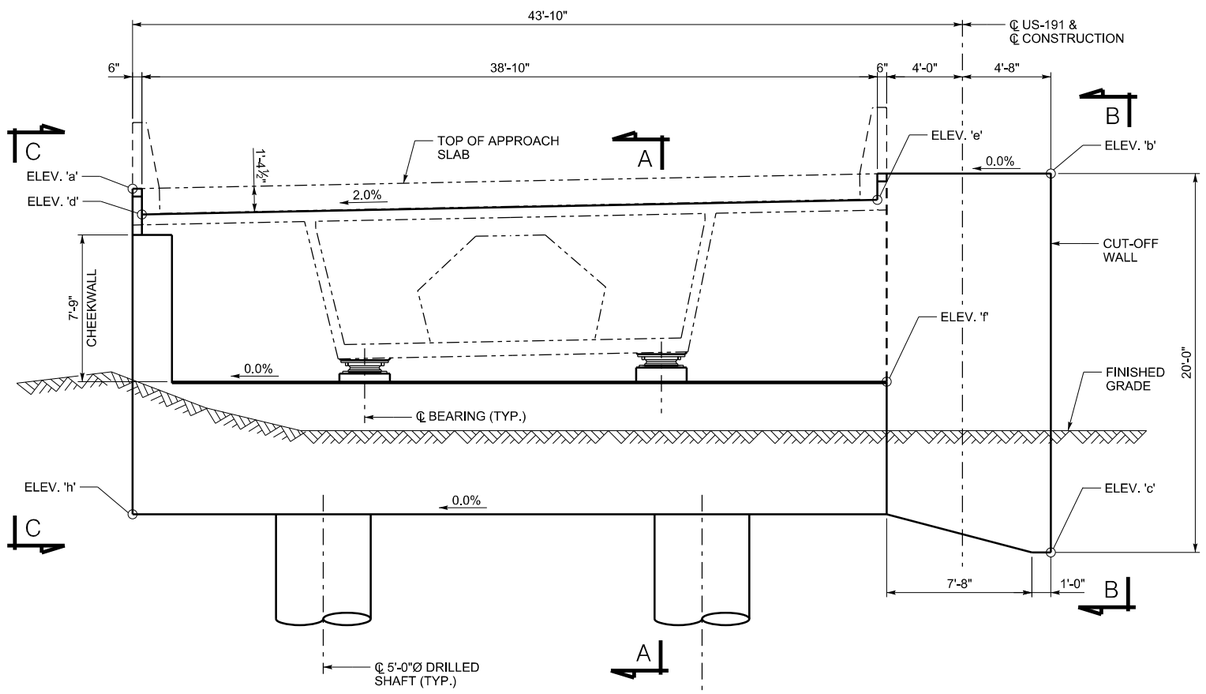


SECTION A-A



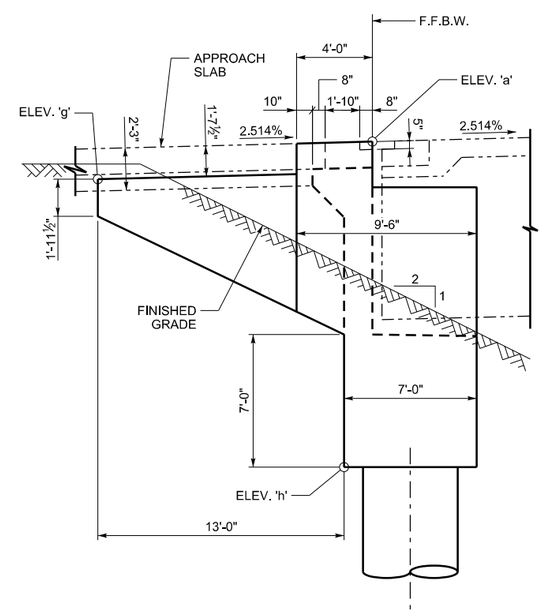
VIEW B-B

ELEVATIONS	
'a'	3991.73'
'b'	3992.53'
'c'	3972.53'
'd'	3990.36'
'e'	3991.15'
'f'	3981.22'
'g'	3989.74'
'h'	3974.22'

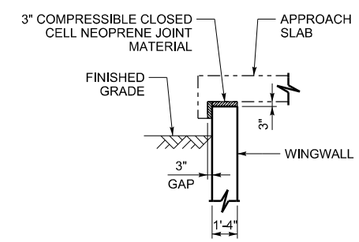


ELEVATION
(LOOKING DOWNSTATION)

PRELIMINARY:
NOT FOR CONSTRUCTION



VIEW C-C



SECTION D-D

NOTES:

1. BEARING SEAT ELEVATIONS ALLOW FOR AN 8 ½" TOTAL BEARING ELEMENT HEIGHT INCLUDING SOLE AND MASONRY PLATE. ABUTMENT SEAT ELEVATIONS DO NOT NEED TO BE ADJUSTED TO ACCOUNT FOR ACTUAL BEARING THICKNESS. DIFFERENCES IN BEARING ELEMENT HEIGHT CAN BE TAKEN UP IN THE BEARING PEDESTAL.
2. OPTIONAL CONSTRUCTION JOINTS ARE ALLOWED AS SHOWN. WINGWALL SHALL NOT BE PLACED WITHOUT BACKWALL AND CHEEKWALL. ALTERNATE CONSTRUCTION JOINTS MAY BE USED AS APPROVED BY THE ENGINEER.
3. FOR DRILLED SHAFT DETAILS AND REINFORCING, SEE DRILLED SHAFT DETAILS SHEET.
4. GRANULAR BACKFILL BORROW SHALL BE PROVIDED FOR 2'-0" BEHIND THE ABUTMENT BACK WALL AND CUT-OFF WALL FOR THE FULL WIDTH OF THE ABUTMENT. SEE PROJECT SPECIFICATIONS FOR MORE INFORMATION.
5. SIZE AND HEIGHT OF BEARING PEDESTAL IS DEPENDANT ON SIZE AND HEIGHT OF BEARING DEVICE SUPPLIED. PLAN DIMENSIONS OF BEARING PEDESTAL SHALL BE AT LEAST 4" LONGER THAN THE MASONRY PLATE ALONG EACH SIDE. SEE BEARING DETAILS SHEETS FOR DETAILS OF BEARING DEVICES, APPROXIMATE DIMENSIONS, AND TOP OF BEARING ELEVATIONS.
6. ABUTMENT SHALL BE BACKFILLED TO THE TOP OF THE BEARING SEAT PRIOR TO CASTING CAST-IN-PLACE ON FALSEWORK PORTION OF STRUCTURE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN RDA MM/YY CHECK XXX MM/YY
DRAWN RJA MM/YY CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
UDOT BRIDGE ENGR. DATE
APPROVAL RECOMM. DATE
APPROVED FOR USE BY UDOT DATE

US-191; OVER COLORADO RIVER
BRIDGE - MOAB UTAH
ABUTMENT 1NB DIMENSIONS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 30 OF 187

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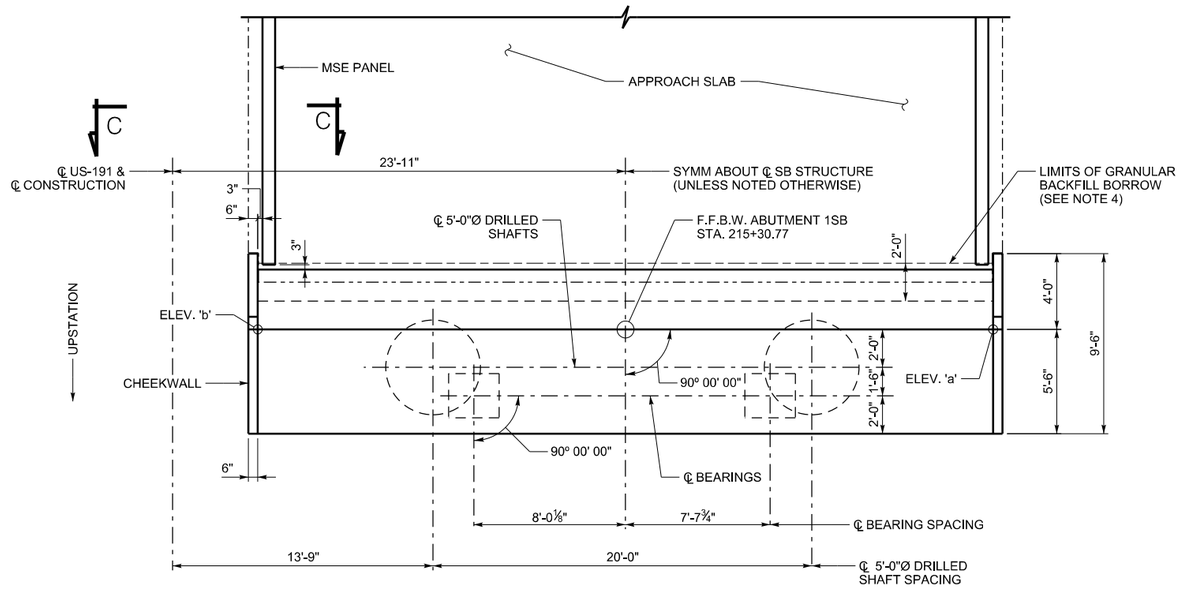
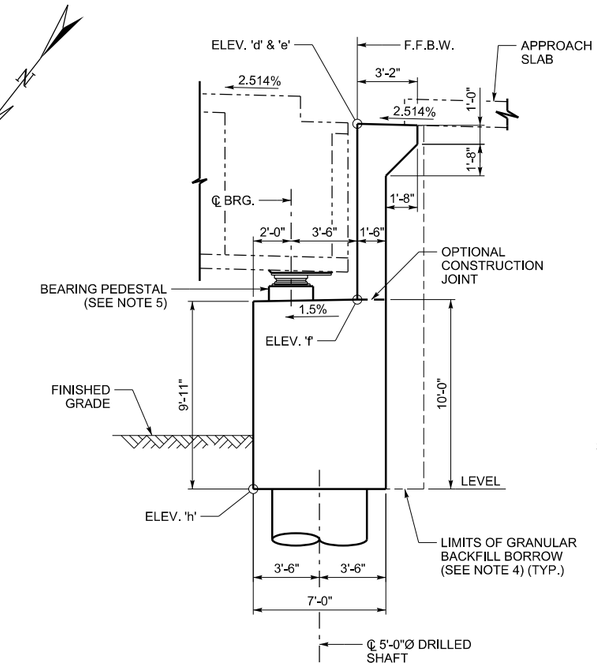
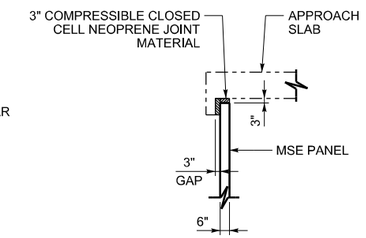


PLAN
(ABUTMENT 1SB)

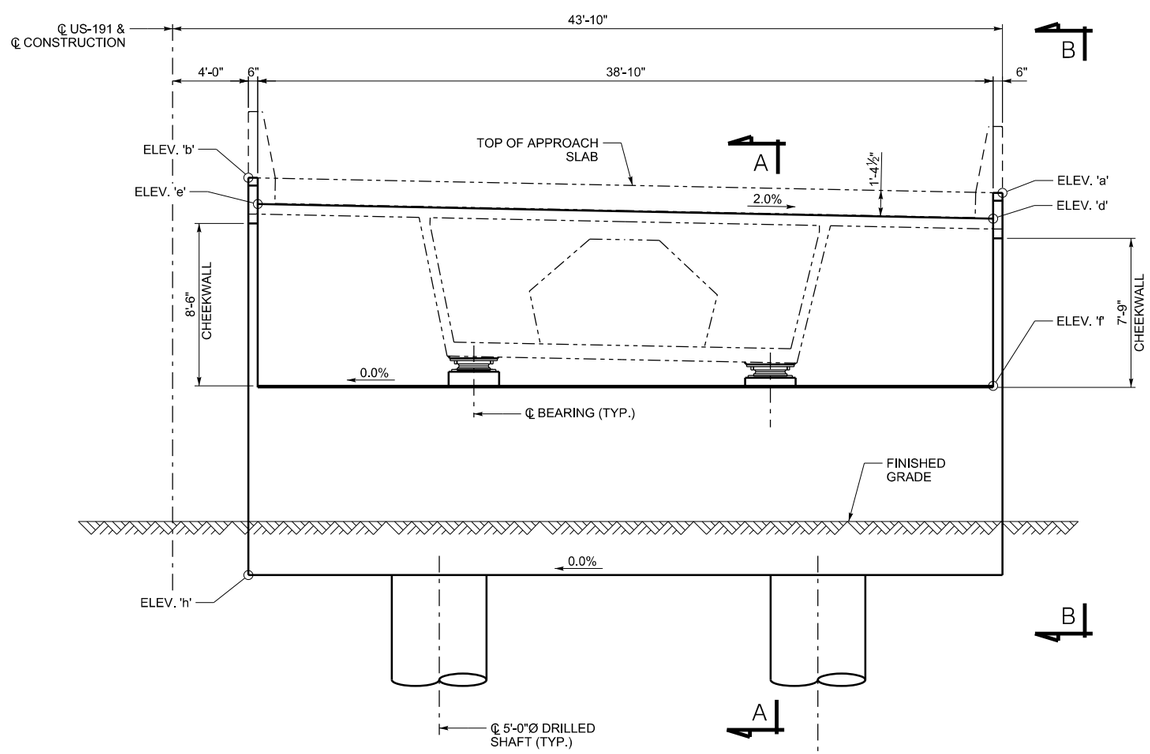


SECTION A-A

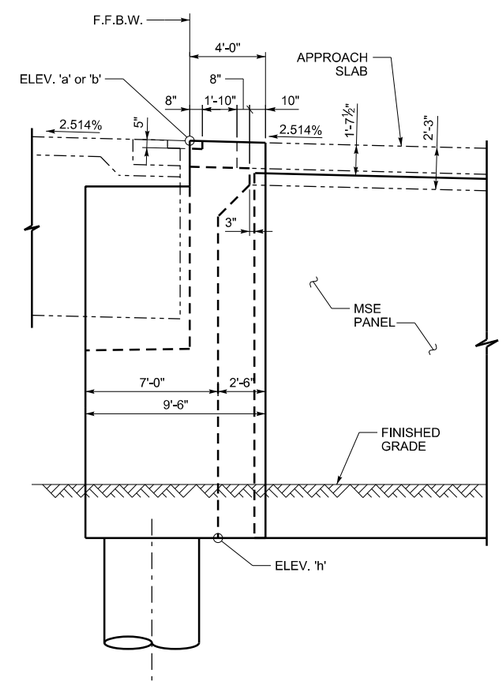
ELEVATIONS	
'a'	3992.69'
'b'	3993.49'
'd'	3991.32'
'e'	3992.11'
'f'	3982.17'
'h'	3972.17'



SECTION C-C



ELEVATION
(LOOKING DOWNSTATION)



VIEW B-B
(TYPICAL BOTH SIDES)

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. BEARING SEAT ELEVATIONS ALLOW FOR AN 8 ½" TOTAL BEARING ELEMENT HEIGHT INCLUDING SOLE AND MASONRY PLATE. ABUTMENT SEAT ELEVATIONS DO NOT NEED TO BE ADJUSTED TO ACCOUNT FOR ACTUAL BEARING THICKNESS. DIFFERENCES IN BEARING ELEMENT HEIGHT CAN BE TAKEN UP IN THE BEARING PEDESTAL.
2. OPTIONAL CONSTRUCTION JOINTS ARE ALLOWED AS SHOWN. ALTERNATE CONSTRUCTION JOINTS MAY BE USED AS APPROVED BY THE ENGINEER.
3. FOR DRILLED SHAFT DETAILS AND REINFORCING, SEE DRILLED SHAFT DETAILS SHEET.
4. GRANULAR BACKFILL BORROW SHALL BE PROVIDED FOR 2'-0" BEHIND THE ABUTMENT BACK WALL AND CUT-OFF WALL FOR THE FULL WIDTH OF THE ABUTMENT. SEE PROJECT SPECIFICATIONS FOR MORE INFORMATION.
5. SIZE AND HEIGHT OF BEARING PEDESTAL IS DEPENDANT ON SIZE AND HEIGHT OF BEARING DEVICE SUPPLIED. PLAN DIMENSIONS OF BEARING PEDESTAL SHALL BE AT LEAST 4" LONGER THAN THE MASONRY PLATE ALONG EACH SIDE. SEE BEARING DETAILS SHEETS FOR DETAILS OF BEARING DEVICES, APPROXIMATE DIMENSIONS, AND TOP OF BEARING ELEVATIONS.
6. ABUTMENT SHALL BE BACKFILLED TO THE TOP OF THE BEARING SEAT PRIOR TO CASTING CAST-IN-PLACE ON FALSEWORK PORTION OF STRUCTURE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN RDA 04/08 CHECK XXX MM/YY
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QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
ABUTMENT 1SB DIMENSIONS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 34 OF 187

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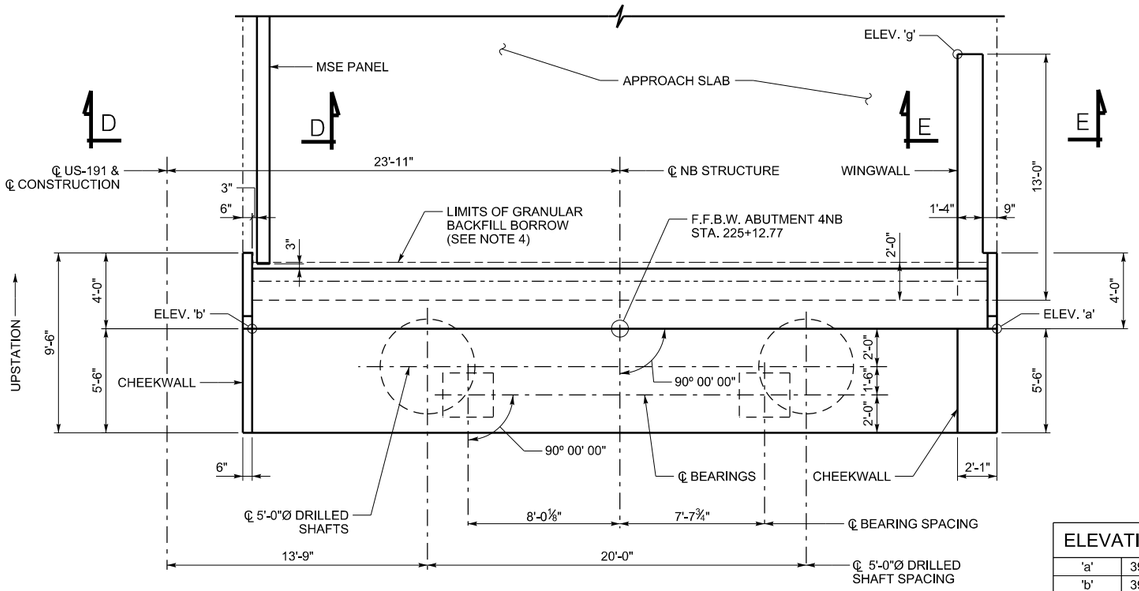
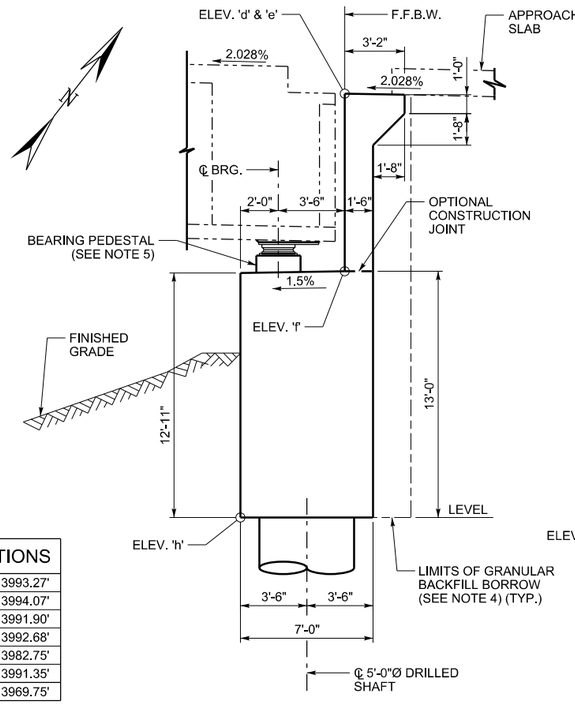
5/7/2008

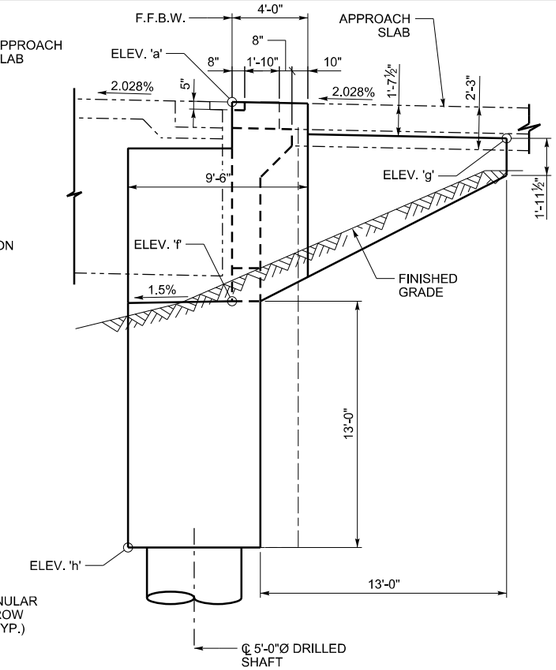


PLAN
(ABUTMENT 4NB)

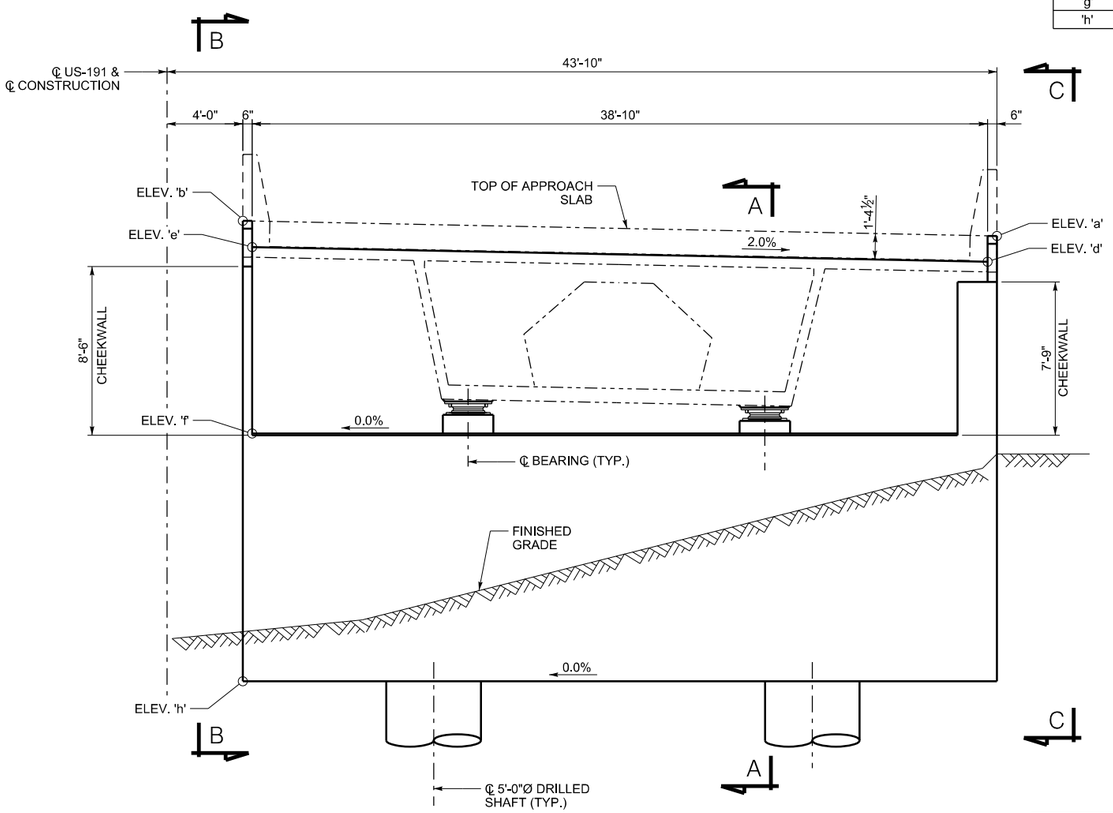
ELEVATIONS	
'a'	3993.27'
'b'	3994.07'
'd'	3991.90'
'e'	3992.68'
'f'	3982.75'
'g'	3991.35'
'h'	3969.75'



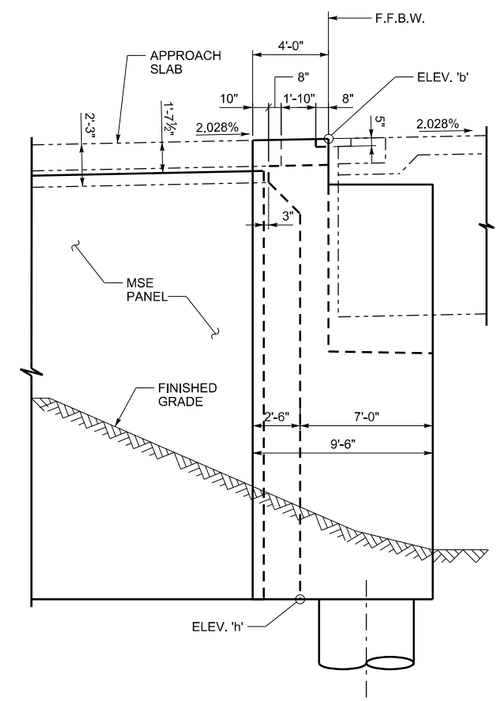
SECTION A-A



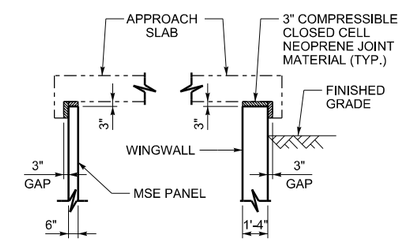
VIEW C-C



ELEVATION
(LOOKING UPSTATION)



VIEW B-B



SECTION D-D SECTION E-E

NOTES:

1. BEARING SEAT ELEVATIONS ALLOW FOR AN 8 ½" TOTAL BEARING ELEMENT HEIGHT INCLUDING SOLE AND MASONRY PLATE. ABUTMENT SEAT ELEVATIONS DO NOT NEED TO BE ADJUSTED TO ACCOUNT FOR ACTUAL BEARING THICKNESS. DIFFERENCES IN BEARING ELEMENT HEIGHT CAN BE TAKEN UP IN THE BEARING PEDESTAL.
2. OPTIONAL CONSTRUCTION JOINTS ARE ALLOWED AS SHOWN. WINGWALL SHALL NOT BE PLACED WITHOUT BACKWALL AND CHEEKWALL. ALTERNATE CONSTRUCTION JOINTS MAY BE USED AS APPROVED BY THE ENGINEER.
3. FOR DRILLED SHAFT DETAILS AND REINFORCING, SEE DRILLED SHAFT DETAILS SHEET.
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6. ABUTMENT SHALL BE BACKFILLED TO THE TOP OF THE BEARING SEAT PRIOR TO CASTING CAST-IN-PLACE ON FALSEWORK PORTION OF STRUCTURE.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN RDA 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
ABUTMENT 4NB DIMENSIONS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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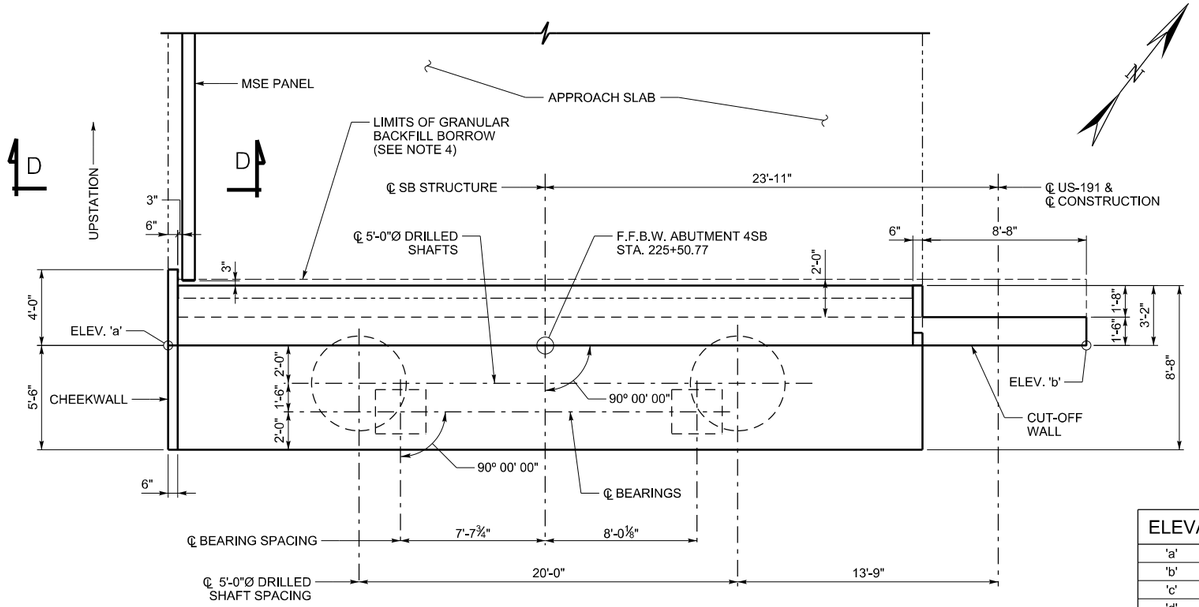
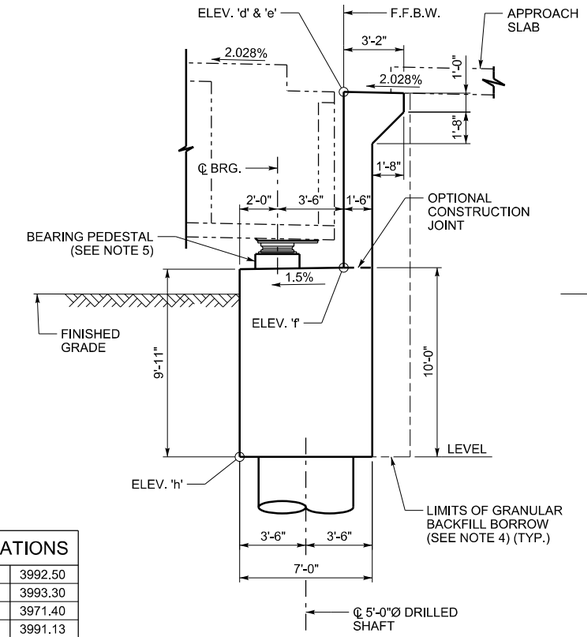
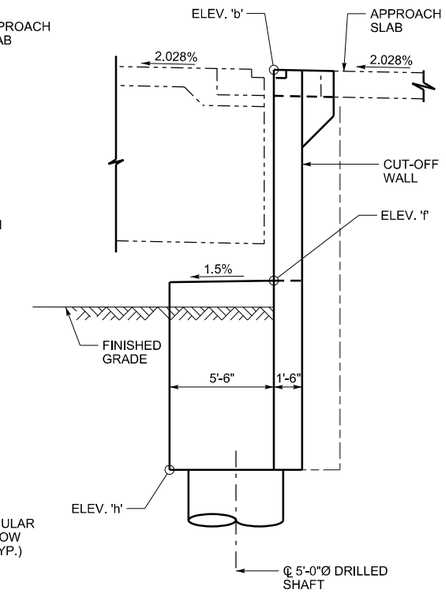


PLAN
(ABUTMENT 4SB)

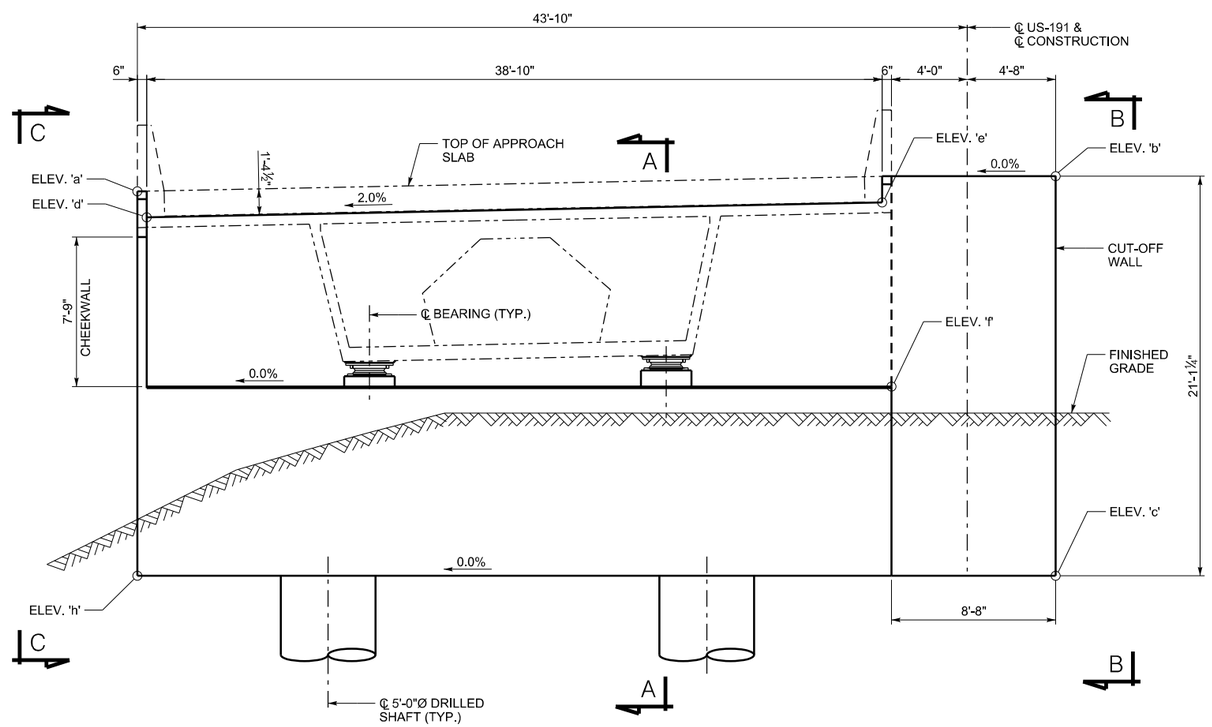
ELEVATIONS	
'a'	3992.50
'b'	3993.30
'c'	3971.40
'd'	3991.13
'e'	3991.91
'f'	3981.40
'h'	3971.40



SECTION A-A

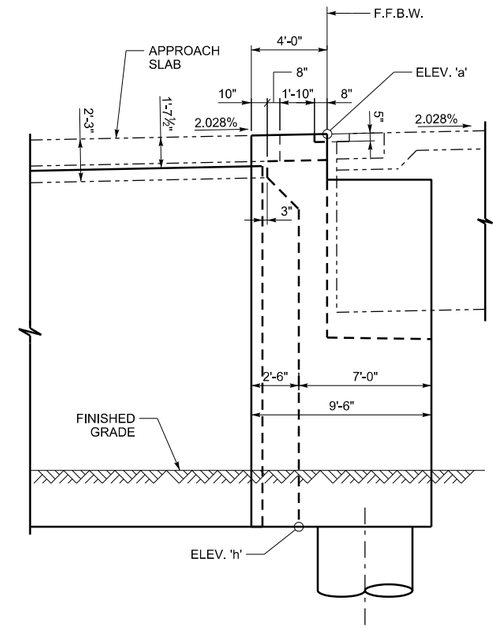


VIEW B-B

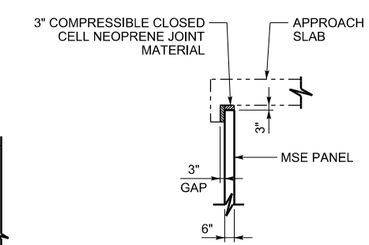


ELEVATION
(LOOKING UPSTATION)

PRELIMINARY:
NOT FOR CONSTRUCTION



VIEW C-C



SECTION D-D

NOTES:

1. BEARING SEAT ELEVATIONS ALLOW FOR AN 8 ½" TOTAL BEARING ELEMENT HEIGHT INCLUDING SOLE AND MASONRY PLATE. ABUTMENT SEAT ELEVATIONS DO NOT NEED TO BE ADJUSTED TO ACCOUNT FOR ACTUAL BEARING THICKNESS. DIFFERENCES IN BEARING ELEMENT HEIGHT CAN BE TAKEN UP IN THE BEARING PEDESTAL.
2. OPTIONAL CONSTRUCTION JOINTS ARE ALLOWED AS SHOWN. ALTERNATE CONSTRUCTION JOINTS MAY BE USED AS APPROVED BY THE ENGINEER.
3. FOR DRILLED SHAFT DETAILS AND REINFORCING, SEE DRILLED SHAFT DETAILS SHEET.
4. GRANULAR BACKFILL BORROW SHALL BE PROVIDED FOR 2'-0" BEHIND THE ABUTMENT BACK WALL AND CUT-OFF WALL FOR THE FULL WIDTH OF THE ABUTMENT. SEE PROJECT SPECIFICATIONS FOR MORE INFORMATION.
5. SIZE AND HEIGHT OF BEARING PEDESTAL IS DEPENDANT ON SIZE AND HEIGHT OF BEARING DEVICE SUPPLIED. PLAN DIMENSIONS OF BEARING PEDESTAL SHALL BE AT LEAST 4" LONGER THAN THE MASONRY PLATE ALONG EACH SIDE. SEE BEARING DETAILS SHEETS FOR DETAILS OF BEARING DEVICES, APPROXIMATE DIMENSIONS, AND TOP OF BEARING ELEVATIONS.
6. ABUTMENT SHALL BE BACKFILLED TO THE TOP OF THE BEARING SEAT PRIOR TO CASTING CAST-IN-PLACE ON FALSEWORK PORTION OF STRUCTURE.

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN RDA 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
ABUTMENT 4SB DIMENSIONS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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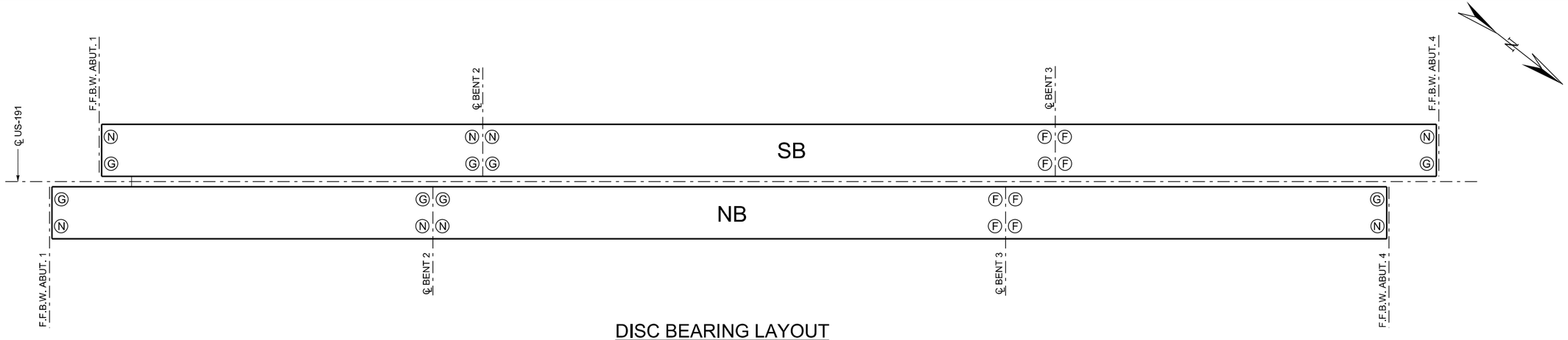
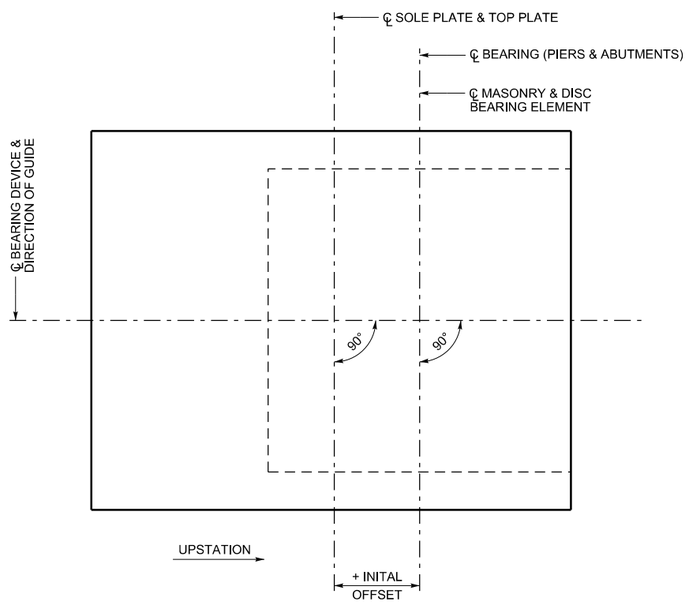


DISC BEARING LAYOUT

(F) DENOTES FIXED BEARING
(G) DENOTES LONGITUDINALLY GUIDED BEARING
(N) DENOTES NON-GUIDED BEARING



INITIAL OFFSET DETAIL

INITIAL OFFSET GIVEN IN BEARING TABLE IS FOR 50º F. ADJUST FOR CORRECTION SHOWN IN TABLE FOR EACH 10º F INCREMENT DEPARTURE FROM 50º F. TEMPERATURE TO BE USED SHALL BE ANTICIPATED AVERAGE CONCRETE SUBSTRATE TEMPERATURE AT THE TIME OF CASTING CLOSURE SEGMENTS. IN SPAN 1 (ABUT. 1), SPAN 2 (PIER 2) OR SPAN 3 (ABUT. 4) POSITIVE TEMPERATURE CORRECTION DENOTES AN INCREASE IN THE INITIAL OFFSET (TOTAL POTENTIAL CONTRACTION INCREASING).

BEARING QUANTITIES		
ITEM DESCRIPTION	UNIT	QUANTITY
BRIDGE BEARING DEVICE	EA.	24

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING IS A SCHEMATIC OF THE REQUIRED DISC BEARINGS. MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE BEARING DEVICES, INCLUDING THE SOLE AND MASONRY PLATES AND REQUIRED SHEAR CONNECTORS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
2. BEARING ASSEMBLIES SHALL BE CONSTRUCTED TO PERMIT REMOVAL OF BEARING ELEMENTS AND SLIDING SURFACES FOR REPAIR OR REPLACEMENT. SUGGESTED DETAILS FOR THIS ALLOWANCE HAVE BEEN PROVIDED BUT THE MANUFACTURER MAY SUBMIT ALTERNATE DETAILS. REPAIR OR REPLACEMENT OF THE BEARINGS IS ACCOMPLISHED BY VERTICALLY JACKING THE BRIDGE NO MORE THAN 3/8"AT EACH PIER OR ABUTMENT. SEE BEARING REPLACEMENT DETAILS SHEET FOR MORE INFORMATION.
3. BEARING PEDESTALS AND GROUT USED TO CAST TOP AND BOTTOM PLATES SHALL BE COMPRISED OF PORTLAND CEMENT AND SILICA SAND. MINIMUM COMPRESSIVE STRENGTH SHALL BE 6000 PSI AFTER 28 DAYS.
4. NUMBER, SIZE AND SPACING OF SHEAR CONNECTORS SHALL BE DETERMINED BY THE BEARING MANUFACTURER.
5. PTFE DENOTES POLYTERTAFLOUROETHELYNE
   G DENOTES GUIDED EXPANSION BEARING
   N DENOTES NON-GUIDED EXPANSION BEARING
   F DENOTES FIXED BEARING
6. LOADS ARE PER AASHTO LRFD LOAD COMBINATIONS.
7. TOTAL CONTRACTION AND EXPANSION MOVEMENTS INCLUDE 1.2 FACTOR PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
8. THE TOP PLATE, SOLE PLATE AND STAINLESS STEEL SLIDING PLATE SHALL ACCOMMODATE THE CONTRACTION AND EXPANSION MOVEMENTS SHOWN. THE SHOP DRAWINGS SHALL SHOW THE PROPER INSTALLED POSITION OF THESE PLATES WITH RESPECT TO THE DISC ELEMENT AND PER THE INITIAL OFFSET DETAIL.
9. THE BEARING HEIGHTS ASSUMED FOR DETAILING PURPOSES, MEASURED FROM THE TOP OF THE TOP PLATE TO THE BOTTOM OF THE MASONRY PLATE, ARE 8 ½"AT ABUTMENTS 1 & 4 AND 11"AT PIERS 2 & 3. SMALL DIFFERENCES IN FABRICATED HEIGHTS (+/- 1") CAN BE TAKEN UP IN THE BEARING PEDESTALS, WHILE LARGE DIFFERENCE MAY REQUIRE ADJUSTMENT OF THE BEARING SEAT OR TOP OF PIER ELEVATIONS.
10. PLATE DIMENSIONS GIVEN ARE MAXIMUM PERMISSIBLE TO ALLOW THE BEARINGS TO FIT WITHIN THE CONCRETE DIMENSIONS SHOWN IN THE PLANS.
11. BEARINGS ARE TO BE SET LEVEL. LONGITUDINAL GRADE IS GIVEN AS INFORMATION TO FACILITATE THE FORMING OF THE BEARING PLINTHS. BOTTOM SOFFIT IS SUPERELEVATED 2.0%.
12. ABUTMENT BEARINGS SHALL PROVIDE A TOTAL ROTATIONAL CAPACITY OF 0.015 RADIANS. PIER BEARINGS SHALL PROVIDE A TOTAL ROTATIONAL CAPACITY OF 0.007 RADIANS. THESE CAPACITIES INCLUDED A FACTORED BEARING ROTATION PLUS AN ALLOWANCE FOR UNCERTAINTIES OF 0.005 RADIANS.
13. BEARINGS SHALL CONFORM TO THE PROJECT SPECIFICATIONS.
14. BEARING RETENTION BAR IS DESIGNED TO HOLD THE DISC ELEMENT IN PLACE DURING SERVICE AND TO BE REMOVED SO THE BEARING DEVICE CAN SLIDE TOWARDS THE FACE OF THE ABUTMENT OR PIER TO FACILITATE REPAIR OR REPLACEMENT. MASONRY PLATE MUST BE CAST INTO BEARING PEDESTAL SUCH THAT THE RETENTION BAR IS ORIENTED FACING OUT.
15. TOP OF BEARING ELEVATIONS SHOWN ARE GIVEN AT THE TOP OF TOP PLATE AND ARE DEPENDANT ON THE BEARING PLINTH DETAILS SHOWN ON THE ABUTMENT DIAPHRAGM DIMENSIONS AND PT SHEETS AND THE PIER TABLE DIMENSIONS AND PT DETAILS SHEETS.

			SERVICE LOAD COMBINATIONS (SEE NOTE 6)			FACTORED LOAD COMBINATIONS (SEE NOTE 6)			LRFD 14.7.9.2		MAXIMUM PLATE DIMENSIONS (IN) (SEE NOTE 10)			LONGITUDINAL RANGE OF STRUCTURE MOVEMENT (IN) (+ DENOTES UPSTATION MOVEMENT)					BEARING PLACEMENT - TEMPERATURE ADJUSTMENTS (IN)		
LOCATION	DISK BEARING TYPE	NO.	MINIMUM VERTICAL LOAD PER BEARING (KIPS)	MAXIMUM VERTICAL LOAD PER BEARING (KIPS)	MAXIMUM LATERAL LOAD PER GUIDED BEARING (KIPS)	MINIMUM VERTICAL LOAD PER BEARING (KIPS)	MAXIMUM VERTICAL LOAD PER BEARING (KIPS)	MAXIMUM LATERAL LOAD PER GUIDED BEARING (KIPS)	0.10X FACTORED BENT REACTION LATERAL LOAD PER BEARING (KIPS)	DESIGN FACTORED LATERAL LOAD PER BEARING (KIPS)	'C'	'D'	'E'	CREEP & SHRINKAGE	60º F TEMP. FALL	TOTAL CONTRACTION (SEE NOTE 7)	60º F TEMP. RISE	TOTAL EXPANSION (SEE NOTE 7)	SOLE PLATE INITAL OFFSET 'B' @ 50º	OFFSET CORRECTION (PER ± 10º F CHANGE)	LONGITUDINAL GRADE (SEE NOTE 11)
ABUT. 1	G	2	433	938	18	232	1278	130	233	233	24	30	38	+9.1	+3.16	+14.71	-0.67	-0.80	+6.75	± 0.625	2.514%
ABUT. 1	N	2	433	938	-	232	1278	-	-	-	24	30	38	+9.1	+3.16	+14.71	-0.67	-0.80	+6.75	± 0.625	2.514%
PIER 2	G	4	597	3394	78	71	4556	254	595	595	39	46	47	+5.35	+1.90	+8.70	-1.02	-1.22	+3.75	± 0.375	1.592% (NB), 1.309% (SB)
PIER 2	N	4	597	3394	-	71	4556	-	-	-	39	46	47	+5.35	+1.90	+8.70	-1.02	-1.22	+3.75	± 0.375	1.592% (NB), 1.309% (SB)
PIER 3	F	8	745	3287	240	227	4432	307	595	595	39	39	39	-	-	-	-	-	-	-	1.374% (NB), 1.653% (SB)
ABUT. 4	G	2	406	942	20	204	1282	130	233	233	24	30	30	-3.86	-1.26	-6.14	+0.50	+0.60	-2.75	± 0.250	2.028%
ABUT. 4	N	2	406	942	-	204	1282	-	-	-	24	30	30	-3.86	-1.26	-6.14	+0.50	+0.60	-2.75	± 0.250	2.028%

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BEARING DETAILS I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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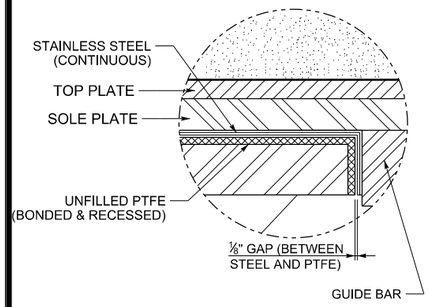
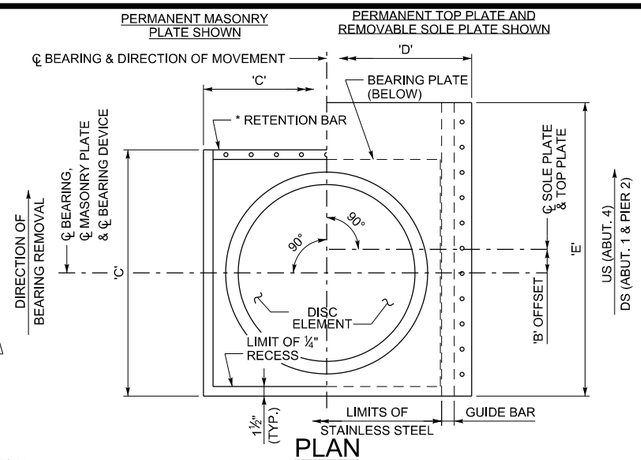
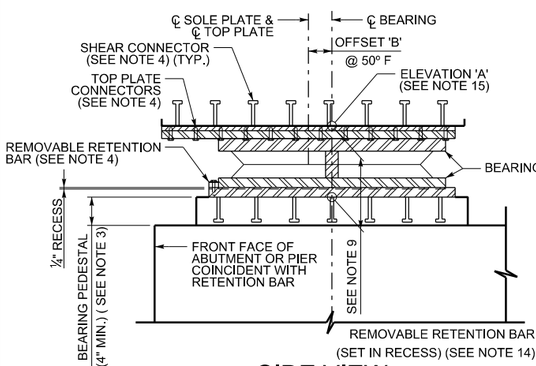


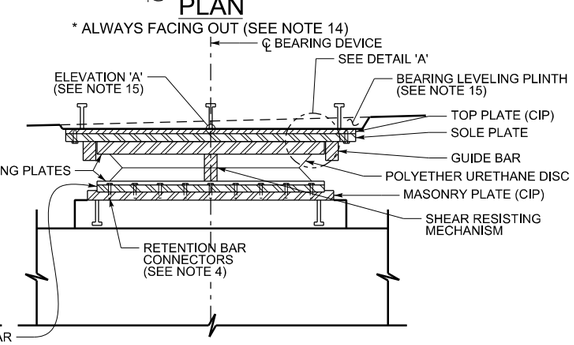
DETAIL 'A'
(TYPICAL)



PLAN
* ALWAYS FACING OUT (SEE NOTE 14)

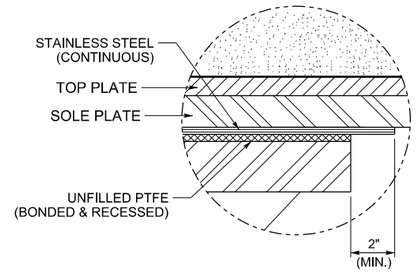


SIDE VIEW

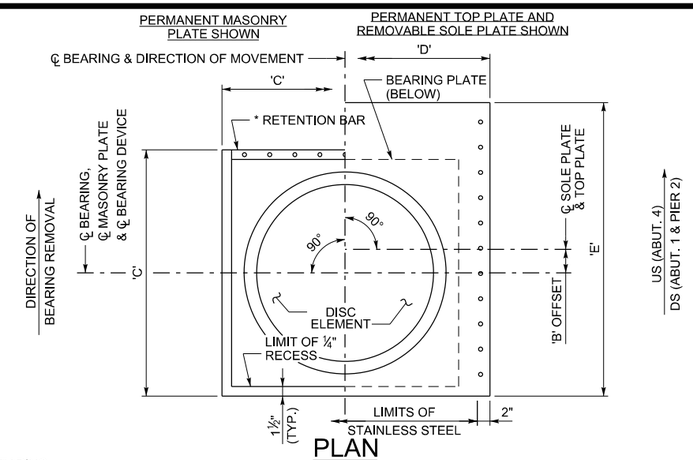


TYPICAL SECTION

GUIDED BEARING (G) DETAILS



DETAIL 'B'
(TYPICAL)



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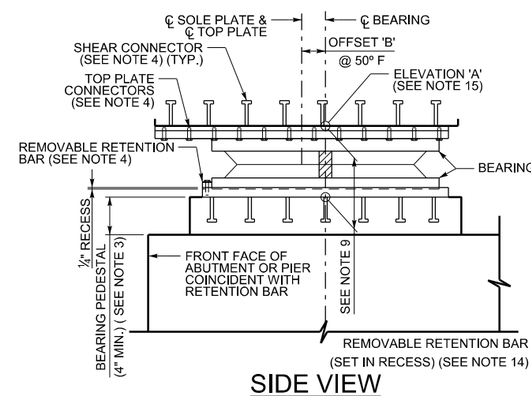
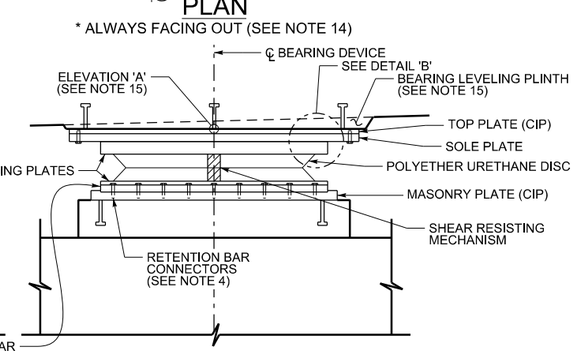
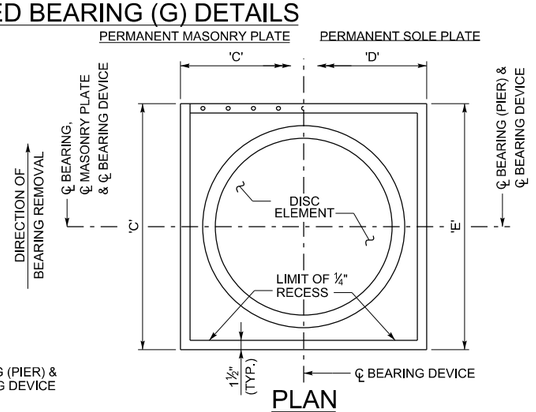


SIDE VIEW

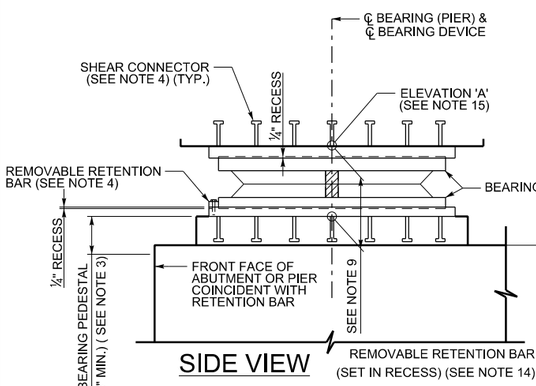


TYPICAL SECTION

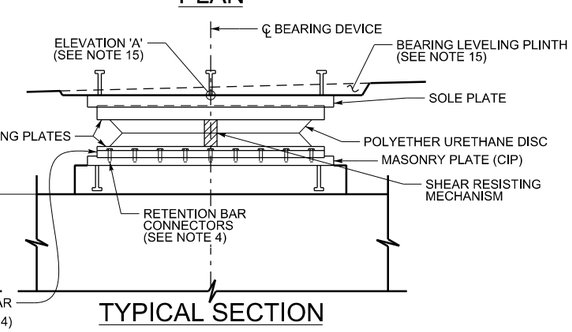
NON-GUIDED BEARING (N) DETAILS



PLAN



SIDE VIEW



TYPICAL SECTION

FIXED BEARING (F) DETAILS

TOP OF BEARING ELEVATIONS	
BEARING	ELEVATION 'A'
ABUT. 1 NB Ⓖ	3982.57
ABUT. 1 NB Ⓝ	3982.26
ABUT. 1 SB Ⓖ	3983.53
ABUT. 1 SB Ⓝ	3983.21
PIER 2 NB - DS Ⓖ	3978.83
PIER 2 NB - DS Ⓝ	3978.83
PIER 2 NB - US Ⓖ	3979.08
PIER 2 NB - US Ⓝ	3979.08
PIER 2 SB - DS Ⓖ	3979.41
PIER 2 SB - DS Ⓝ	3979.41
PIER 2 SB - US Ⓖ	3979.62
PIER 2 SB - US Ⓝ	3979.62
PIER 3 NB - DS Ⓕ	3979.58
PIER 3 NB - US Ⓕ	3979.36
PIER 3 SB -DS Ⓕ	3979.03
PIER 3 SB - US Ⓕ	3978.77
ABUT. 4 NB Ⓖ	3984.10
ABUT. 4 NB Ⓝ	3983.79
ABUT. 4 SB Ⓖ	3983.33
ABUT. 4 SB Ⓝ	3983.02

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. THIS DRAWING IS A SCHEMATIC OF THE REQUIRED DISC BEARINGS. MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE BEARING DEVICES, INCLUDING THE SOLE AND MASONRY PLATES AND REQUIRED SHEAR CONNECTORS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
2. BEARING ASSEMBLIES SHALL BE CONSTRUCTED TO PERMIT REMOVAL OF BEARING ELEMENTS AND SLIDING SURFACES FOR REPAIR OR REPLACEMENT. SUGGESTED DETAILS FOR THIS ALLOWANCE HAVE BEEN PROVIDED BUT THE MANUFACTURER MAY SUBMIT ALTERNATE DETAILS. REPAIR OR REPLACEMENT OF THE BEARINGS IS ACCOMPLISHED BY VERTICALLY JACKING THE BRIDGE NO MORE THAN 3/8"AT EACH PIER OR ABUTMENT. SEE BEARING REPLACEMENT DETAILS SHEET FOR MORE INFORMATION.
3. BEARING PEDESTALS AND GROUT USED TO CAST TOP AND BOTTOM PLATES SHALL BE COMPRISED OF PORTLAND CEMENT AND SILICA SAND. MINIMUM COMPRESSIVE STRENGTH SHALL BE 6000 PSI AFTER 28 DAYS.
4. NUMBER, SIZE AND SPACING OF SHEAR CONNECTORS SHALL BE DETERMINED BY THE BEARING MANUFACTURER.
5. PTFE DENOTES POLYTERTAFLOUROETHELYNE
   G DENOTES GUIDED EXPANSION BEARING
   N DENOTES NON-GUIDED EXPANSION BEARING
   F DENOTES FIXED BEARING
6. LOADS ARE PER AASHTO LRFD LOAD COMBINATIONS.
7. TOTAL CONTRACTION AND EXPANSION MOVEMENTS INCLUDE 1.2 FACTOR PER AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
8. THE TOP PLATE, SOLE PLATE AND STAINLESS STEEL SLIDING PLATE SHALL ACCOMMODATE THE CONTRACTION AND EXPANSION MOVEMENTS SHOWN. THE SHOP DRAWINGS SHALL SHOW THE PROPER INSTALLED POSITION OF THESE PLATES WITH RESPECT TO THE DISC ELEMENT AND PER THE INITIAL OFFSET DETAIL.
9. THE BEARING HEIGHTS ASSUMED FOR DETAILING PURPOSES, MEASURED FROM THE TOP OF THE TOP PLATE TO THE BOTTOM OF THE MASONRY PLATE, ARE 8 ½"AT ABUTMENTS 1 & 4 AND 11"AT PIERS 2 & 3. SMALL DIFFERENCES IN FABRICATED HEIGHTS (+/- 1") CAN BE TAKEN UP IN THE BEARING PEDESTALS, WHILE LARGE DIFFERENCE MAY REQUIRE ADJUSTMENT OF THE BEARING SEAT OR TOP OF PIER ELEVATIONS.
10. PLATE DIMENSIONS GIVEN ARE MAXIMUM PERMISSIBLE TO ALLOW THE BEARINGS TO FIT WITHIN THE CONCRETE DIMENSIONS SHOWN IN THE PLANS.
11. BEARINGS ARE TO BE SET LEVEL. LONGITUDINAL GRADE IS GIVEN AS INFORMATION TO FACILITATE THE FORMING OF THE BEARING PLINTHS. BOTTOM SOFFIT IS SUPERELEVATED 2.0%.
12. ABUTMENT BEARINGS SHALL PROVIDE A TOTAL ROTATIONAL CAPACITY OF 0.015 RADIANS. PIER BEARINGS SHALL PROVIDE A TOTAL ROTATIONAL CAPACITY OF 0.007 RADIANS. THESE CAPACITIES INCLUDED A FACTORED BEARING ROTATION PLUS AN ALLOWANCE FOR UNCERTAINTIES OF 0.005 RADIANS.
13. BEARINGS SHALL CONFORM TO THE PROJECT SPECIFICATIONS.
14. BEARING RETENTION BAR IS DESIGNED TO HOLD THE DISC ELEMENT IN PLACE DURING SERVICE AND TO BE REMOVED SO THE BEARING DEVICE CAN SLIDE TOWARDS THE FACE OF THE ABUTMENT OR PIER TO FACILITATE REPAIR OR REPLACEMENT. MASONRY PLATE MUST BE CAST INTO BEARING PEDESTAL SUCH THAT THE RETENTION BAR IS ORIENTED FACING OUT.
15. TOP OF BEARING ELEVATIONS SHOWN ARE GIVEN AT THE TOP OF TOP PLATE AND ARE DEPENDANT ON THE BEARING PLINTH DETAILS SHOWN ON THE ABUTMENT DIAPHRAGM DIMENSIONS AND PT SHEETS AND THE PIER TABLE DIMENSIONS AND PT DETAILS SHEETS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BEARING DETAILS II

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

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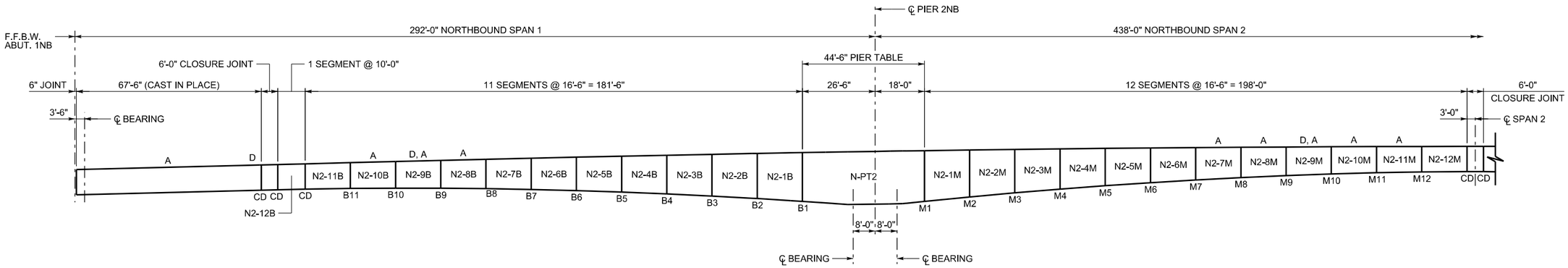
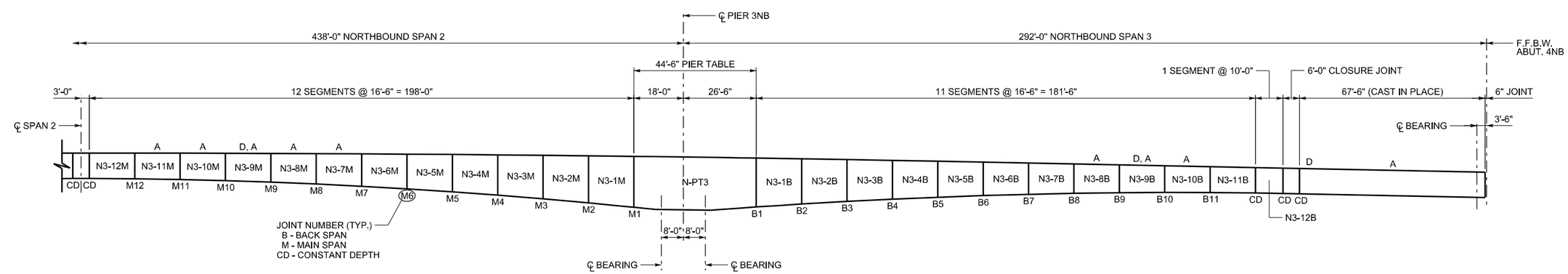


ELEVATION - PIER 2 NORTHBOUND



ELEVATION - PIER 3 NORTHBOUND

SEGMENT LEGENDS

N 3 - 5 B
- B - BACK SPAN / M - MAIN SPAN
- SEGMENT NUMBER
- PIER & CANTILEVER NUMBER
- N - NORTHBOUND / S - SOUTHBOUND

N - PT 3
- PIER & CANTILEVER NUMBER
- PIER TABLE
- N - NORTHBOUND / S - SOUTHBOUND

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. DIMENSIONS ARE GIVEN TRUE HORIZONTAL ALONG ℄ GIRDER.
2. JOINTS ARE TRUE VERTICAL.
3. SEE VARIABLE DEPTH, CONSTANT DEPTH AND CLOSURE SEGMENT DIMENSION SHEETS FOR SEGMENT DIMENSIONS.
4. SEE PIER TABLE DIMENSIONS AND PT DETAILS SHEET FOR PIER TABLE DIMENSIONS.
5. SEE C.I.P. CONSTRUCTION LAYOUT SHEETS FOR DIMENSIONS OF C.I.P. PORTIONS OF SPANS 1 AND 3.
6. D - DENOTES DEVIATION SEGMENT
   A - DENOTES ANCHOR BLOCK SEGMENT

NO.	DATE	BY	REMARKS

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UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
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QUANT. XXX MM/YY CHECK XXX MM/YY

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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
NB SEGMENT DESIGNATION
PROJECT NUMBER BRF-0191(58)129

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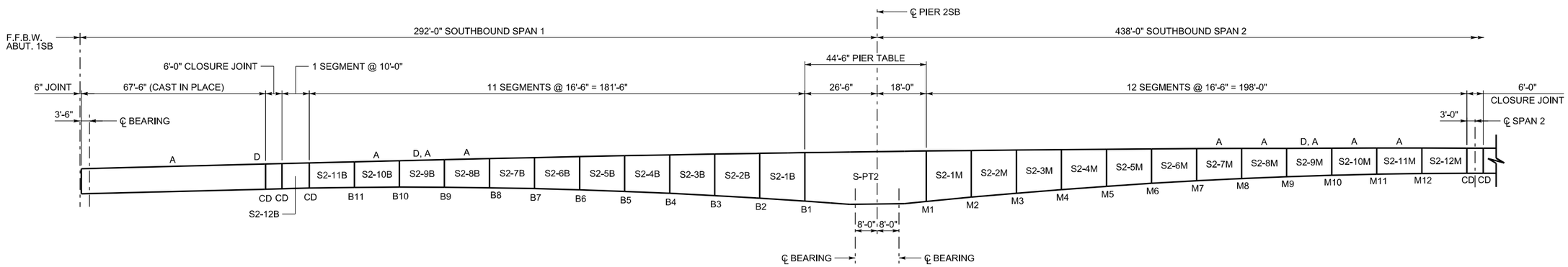
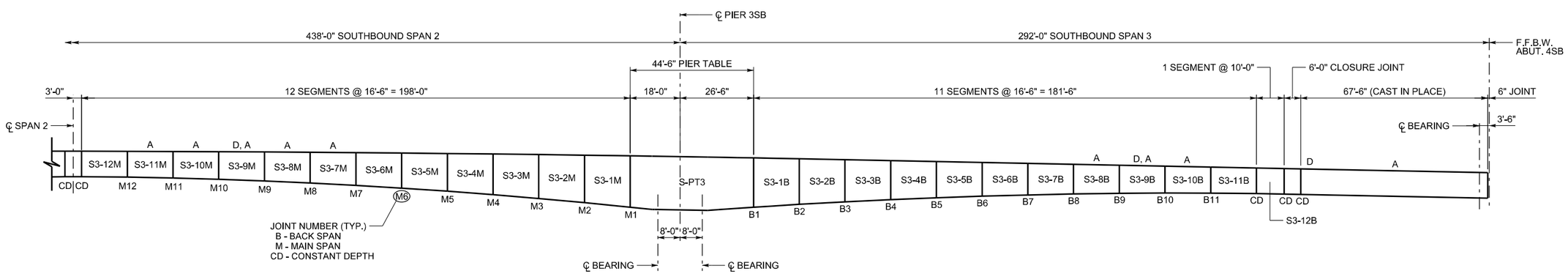


ELEVATION - PIER 2 SOUTHBOUND



ELEVATION - PIER 3 SOUTHBOUND

SEGMENT LEGENDS

S 3 - 5 B
- B - BACK SPAN / M - MAIN SPAN
- SEGMENT NUMBER
- PIER & CANTILEVER NUMBER
- N - NORTHBOUND / S - SOUTHBOUND

S - PT 3
- PIER & CANTILEVER NUMBER
- PIER TABLE
- N - NORTHBOUND / S - SOUTHBOUND

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. DIMENSIONS ARE GIVEN TRUE HORIZONTAL ALONG ℄ GIRDER.
2. JOINTS ARE TRUE VERTICAL.
3. SEE VARIABLE DEPTH, CONSTANT DEPTH AND CLOSURE SEGMENT DIMENSION SHEETS FOR SEGMENT DIMENSIONS.
4. SEE PIER TABLE DIMENSIONS AND PT DETAILS SHEET FOR PIER TABLE DIMENSIONS.
5. SEE C.I.P. CONSTRUCTION LAYOUT SHEETS FOR DIMENSIONS OF C.I.P. PORTIONS OF SPANS 1 AND 3.
6. D - DENOTES DEVIATION SEGMENT
   A - DENOTES ANCHOR BLOCK SEGMENT

NO.	DATE	BY	REMARKS

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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SB SEGMENT DESIGNATION
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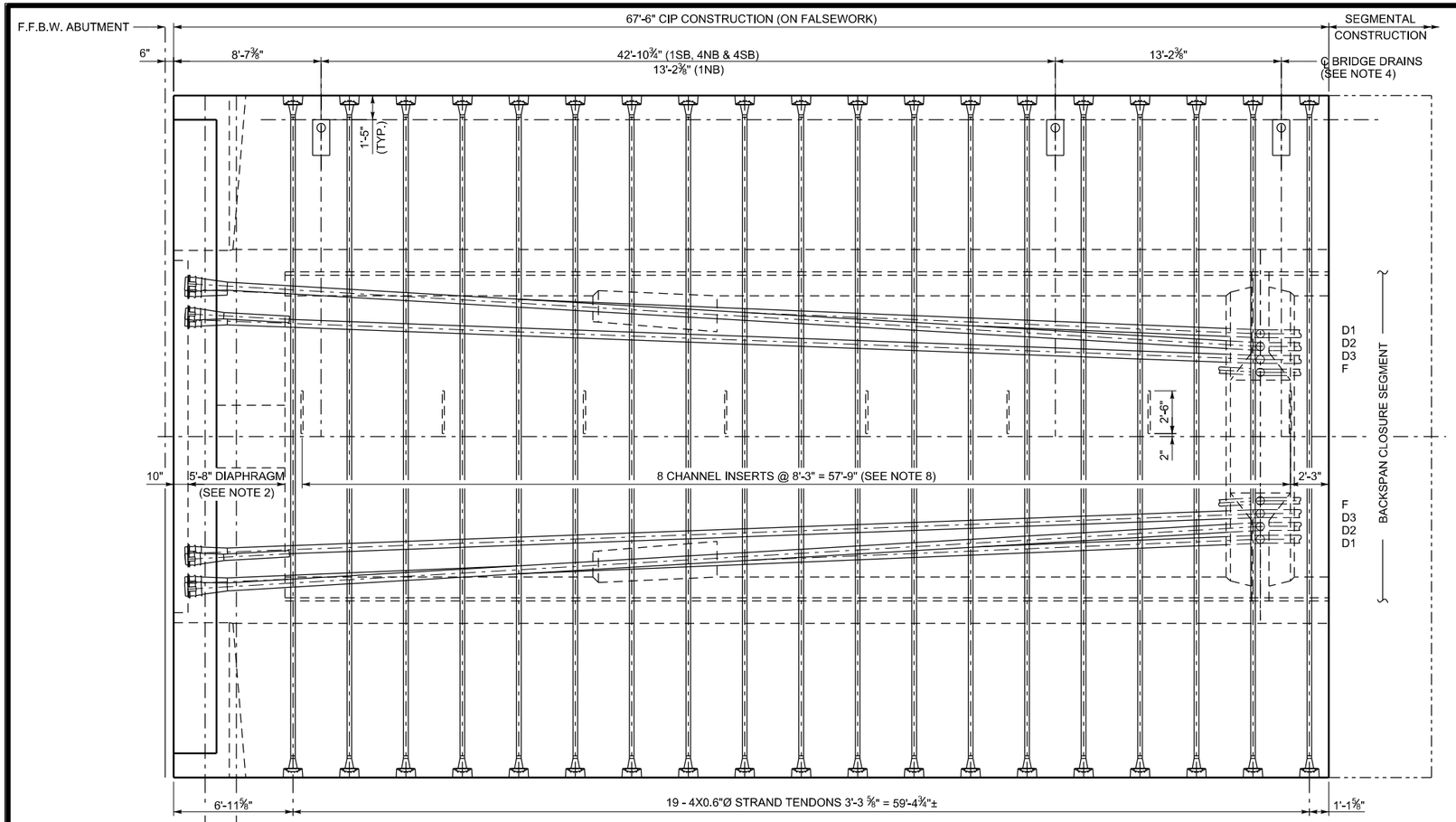
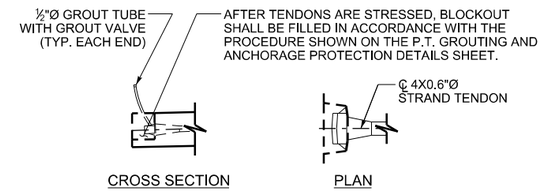


PLAN - TOP SLAB

(SPANS 1SB OR 3NB SHOWN, SPANS 1NB & 3SB SIMILAR. SEE NOTE 1)

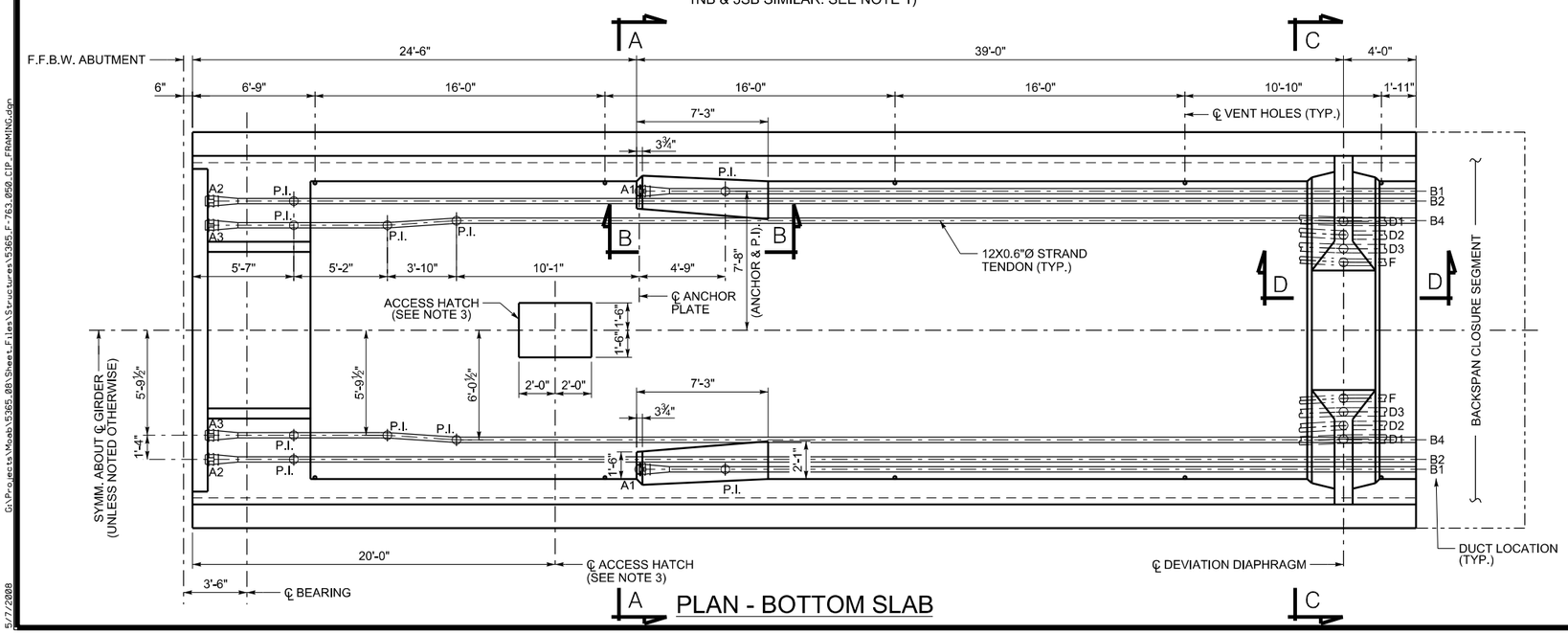


TRANSVERSE TENDON BLOCKOUT DETAIL

LEGEND

2 - C 2

- TENDON NUMBER
- C - CANTILEVER TENDON
  D - DRAPED TENDON
  B - BOTTOM SLAB TENDON
  F - FUTURE TENDON
- CANTILEVER OR SPAN NUMBER



PLAN - BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THESE CIP DIMENSIONS AND REINFORCING SHEETS ARE APPLICABLE TO ALL FOUR CIP ON FALSEWORK PORTIONS LOCATED IN SPANS 1NB, 3NB, 1SB AND 3SB. CIP PORTION 1SB OR 3NB IS SHOWN. CIP PORTIONS 1NB AND 3SB ARE IDENTICAL EXCEPT THAT THE BRIDGE DRAINS ARE ON THE OPPOSITE, DOWN SLOPE WING.
2. FOR ABUTMENT DIAPHRAGM DETAILS SEE ABUTMENT DIAPHRAGM DIMENSIONS AND PT DETAILS SHEETS.
3. FOR ACCESS HATCH DETAILS SEE ACCESS HATCH DETAILS SHEET.
4. FOR BRIDGE DRAIN DETAILS SEE BRIDGE DRAINAGE DETAILS SHEETS.
5. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
6. CONCRETE SHALL BE SUPERSTRUCTURE STRUCTURAL CONCRETE (6000 PSI).
7. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AND PRIOR TO RELEASING THE FORMWORK SUPPORTING THE TOP SLAB, THE TRANSVERSE 0.6"DIAMETER STRANDS SHALL BE STRESSED TO 44 KIPS EACH . THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDES OF THE DECK.
8. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
9. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEETS.
10. ALL BOTTOM SLAB TENDONS ARE 12X0.6" DIAMETER STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

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US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
CIP CONSTRUCTION FRAMING PLAN

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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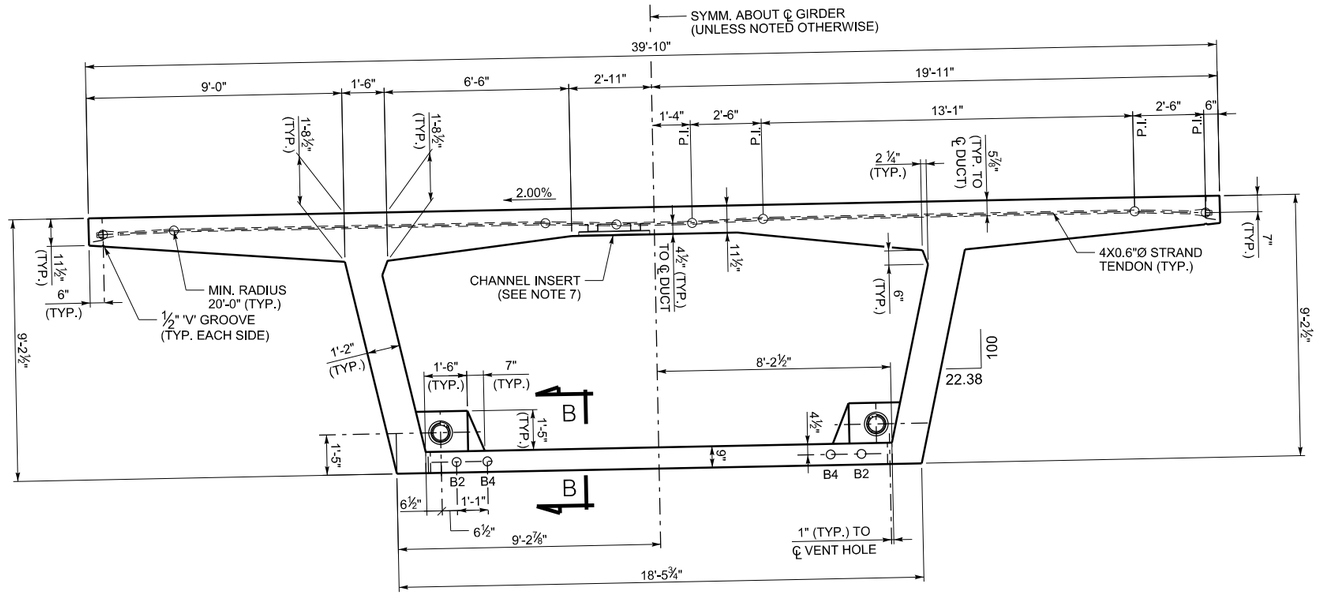
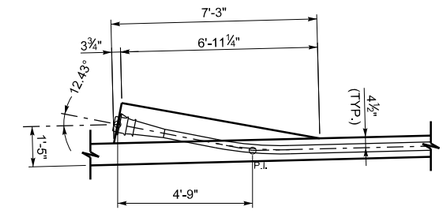


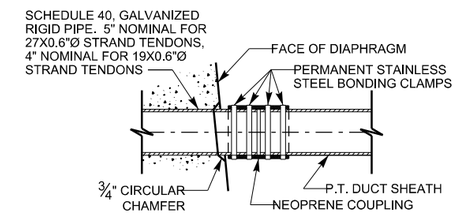
SECTION A-A

(LOOKING UPSTATION - SB BRIDGE)
(LOOKING DOWNSTATION -NB BRIDGE)



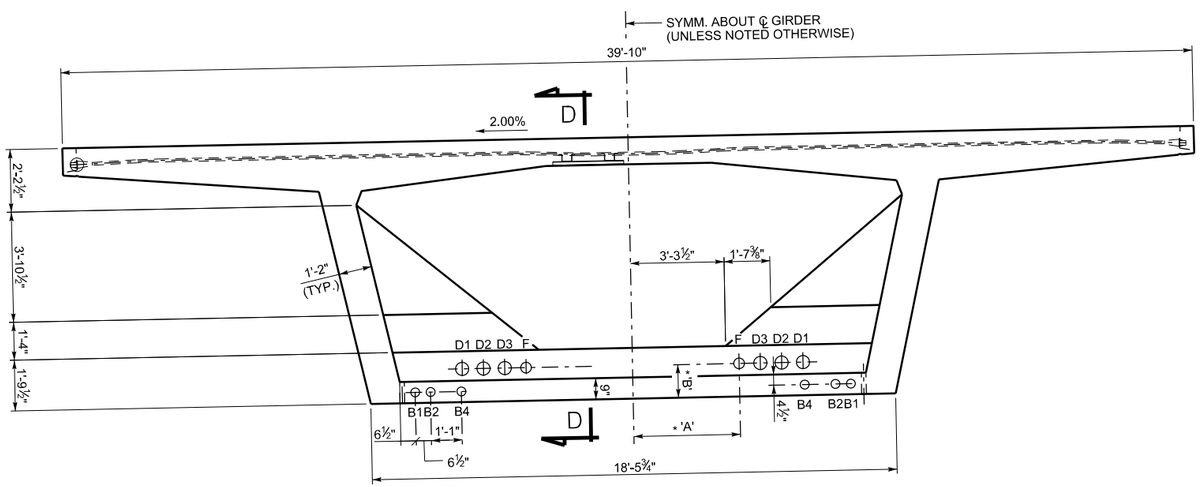
SECTION B-B

(BOTTOM SLAB ANCHOR BLOCK)



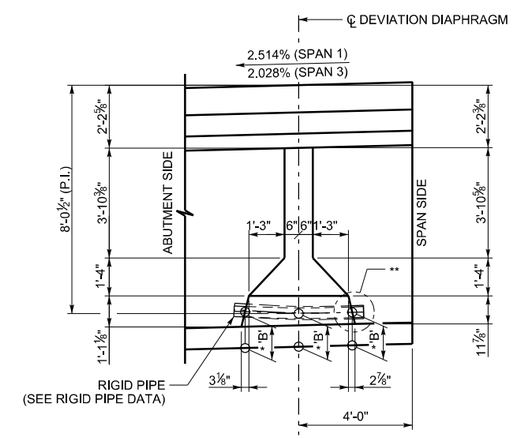
P.T. DUCT CONNECTION DETAIL

(EXTERNAL DRAPED TENDONS ONLY)



SECTION C-C

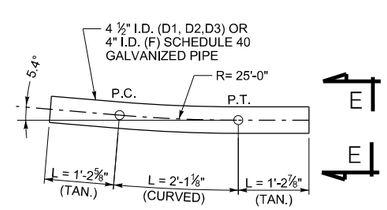
(TYPICAL DIMENSIONS NOT SHOWN FOR CLARITY)
(LOOKING UPSTATION - SB BRIDGE)
(LOOKING DOWNSTATION -NB BRIDGE)



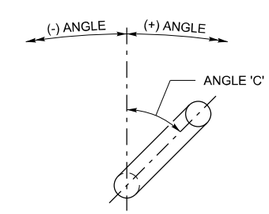
SECTION D-D

(DEVIATION DIAPHRAGM)
(** SEE PT DUCT CONNECTION DETAIL)

* DRAPED TENDON VARIABLE DIMENSIONS										
TENDON	EXIT POINT (ABUTMENT SIDE)		P.I.		EXIT POINT (SPAN SIDE)		PIPE ROTATION ANGLE 'C' (DEVIATOR IN SPAN)		RIGID PIPE	
	'A'	'B'	'A'	'B'	'A'	'B'	LEFT SIDE	RIGHT SIDE	DESIGNATION	NO. REQ.'D
D1	-	-	6'-0"	1'-2"	6'-0"	1'-2"	-	-	-	-
D2			5'-3"	1'-2"	5'-3"	1'-2"				
D3			4'-6"	1'-2"	4'-6"	1'-2"				
F			3'-9"	1'-2"	3'-9"	1'-2"				



RIGID PIPE DATA



VIEW E-E

(LOOKING TOWARDS ABUTMENT)

PRELIMINARY: NOT FOR CONSTRUCTION

NOTES:

1. THESE CIP DIMENSIONS AND REINFORCING SHEETS ARE APPLICABLE TO ALL FOUR CIP ON FALSEWORK PORTIONS LOCATED IN SPANS 1NB, 3NB, 1SB AND 3SB.
2. FOR ACCESS HATCH DETAILS SEE ACCESS HATCH DETAILS SHEET.
3. FOR BRIDGE DRAIN DETAILS SEE BRIDGE DRAINAGE DETAILS SHEETS.
4. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
5. CONCRETE SHALL BE SUPERSTRUCTURE STRUCTURAL CONCRETE (6000 PSI).
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AND PRIOR TO RELEASING THE FORMWORK SUPPORTING THE TOP SLAB, THE TRANSVERSE 0.6"DIAMETER STRANDS SHALL BE STRESSED TO 44 KIPS EACH . THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDES OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEETS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN SJF 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
CIP CONSTR. DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 51 OF 187

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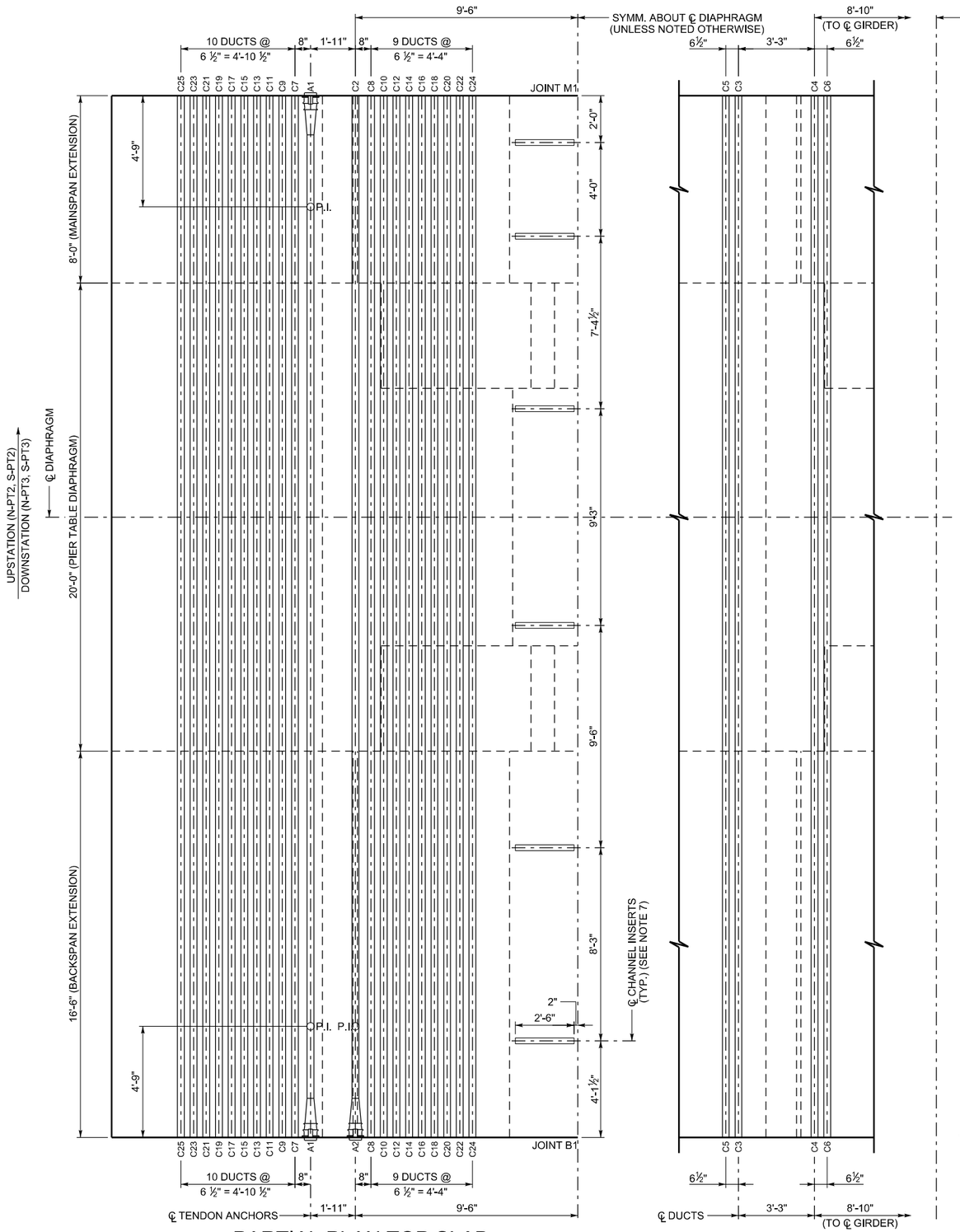
5/7/2008



PARTIAL PLAN TOP SLAB

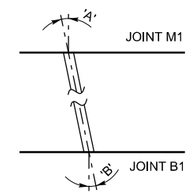
(TRANSVERSE TENDONS NOT SHOWN FOR CLARITY, SEE PIER TABLE DIMENSION & P.T. DETAILS II, III & IV)

LOWER DUCT DETAIL

C 23

- 23 — JOINT FACE DUCT POSITION
- C — C - CANTILEVER DUCT; B - BOTTOM SLAB DUCT

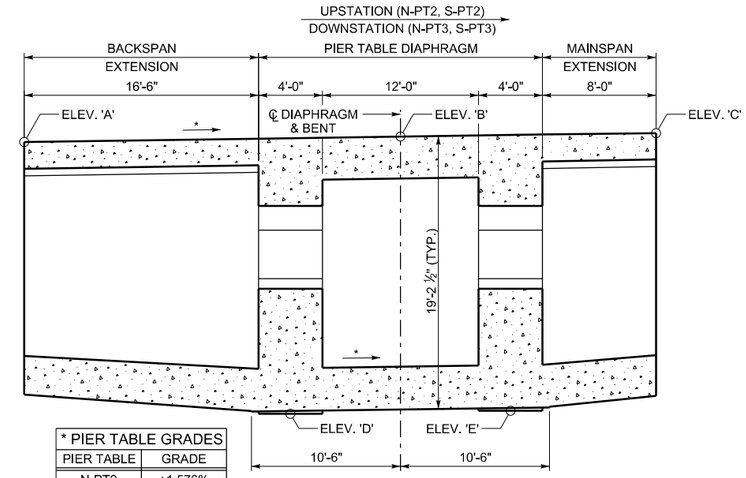
DUCT LEGEND



DUCT DEVIATION SCHEMATIC

(ANGLES SHOWN ARE IN PLANE PARALLEL TO TOP SLAB)

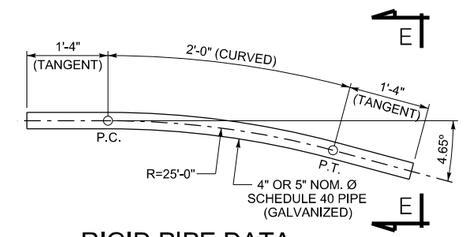
DUCT DEVIATIONS			
JOINT M1 DUCT POSITION	'A'	JOINT B1 DUCT POSITION	'B'
A1	0°	A1	0°
A2	0°	C2	0°
C3-C25	0°	C3-C25	0°



* PIER TABLE GRADES	
PIER TABLE	GRADE
N-PT2	+1.576%
S-PT2	+1.320%
N-PT3	-1.369%
S-PT3	-1.624%

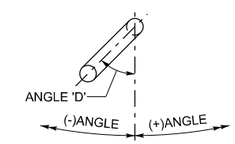
PIER TABLE OVERVIEW

(ELEVATIONS SHOWN @ ℄ GIRDER)



RIGID PIPE DATA

(TRUE 3D CURVE SHOWN)

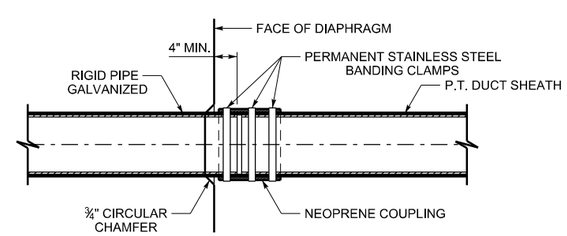


VIEW E-E

(LOOKING AT RIGHT SIDE OF DIAPHRAGM FACE) (SYMM. ABOUT ℄ GIRDER)

PRELIMINARY: NOT FOR CONSTRUCTION

PIER TABLE ELEVATIONS					
PIER TABLE	ELEVATION				
	'A'	'B'	'C'	'D'	'E'
N-PT2	3997.89'	3998.33'	3998.61'	3978.83'	3979.08'
S-PT2	3998.51'	3998.88'	3999.11'	3979.41'	3979.62'
N-PT3	3999.02'	3998.79'	3998.40'	3979.36'	3979.58'
S-PT3	3998.50'	3998.22'	3997.76'	3978.77'	3979.03'



P.T. DUCT CONNECTION DETAIL

(TYP. ALL RIGID PIPE TO DUCT CONNECTIONS)

NOTES:

1. THIS DRAWING VALID FOR PIER TABLES N-PT2, S-PT2, N-PT3 AND S-PT3.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. MAINSPAN EXTENSION IS ALWAYS UP-GRADE RELATIVE TO PIER TABLE. POSITIVE GRADE DENOTES INCREASING STATION IS UP-GRADE.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.
10. THE ANCHORAGE HARDWARE, LOCAL ZONE REINFORCING, AND RIGIG PIPE DUCT SHALL BE INSTALLED FOR THE FUTURE TENDONS. FUTURE TENDONS ARE NOT INSTALLED. FOR TREATMENT OF EMPTY FUTURE TENDON ANCHORAGES, SEE POST-TENSIONING GROUTING AND ANCHORAGE PROTECTION DETAILS SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
UDOT BRIDGE ENGR. DATE
APPROVAL RECOMM.
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
PIER TABLE DIMS & PT DETAILS I

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY

F-763 DRG. NO.

SHT. 57 OF 187

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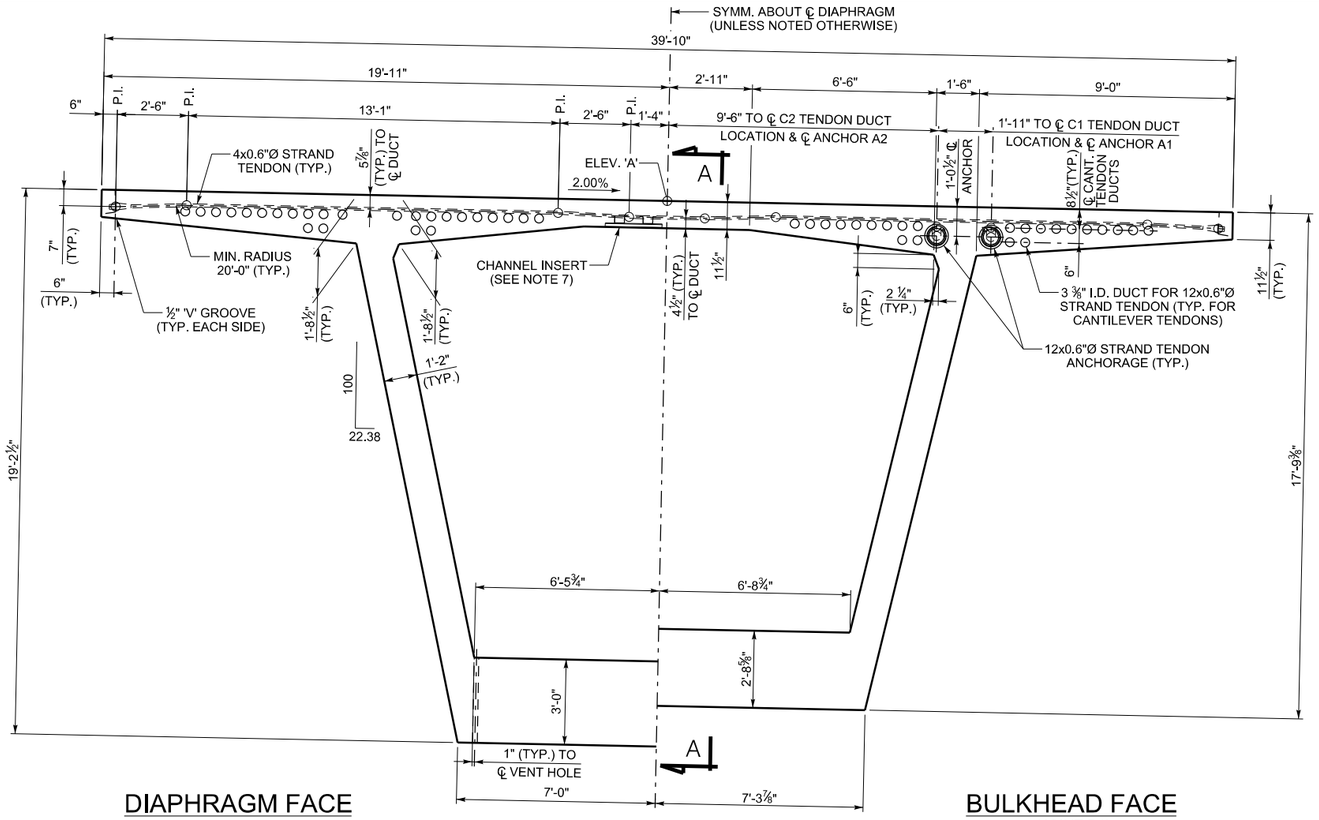


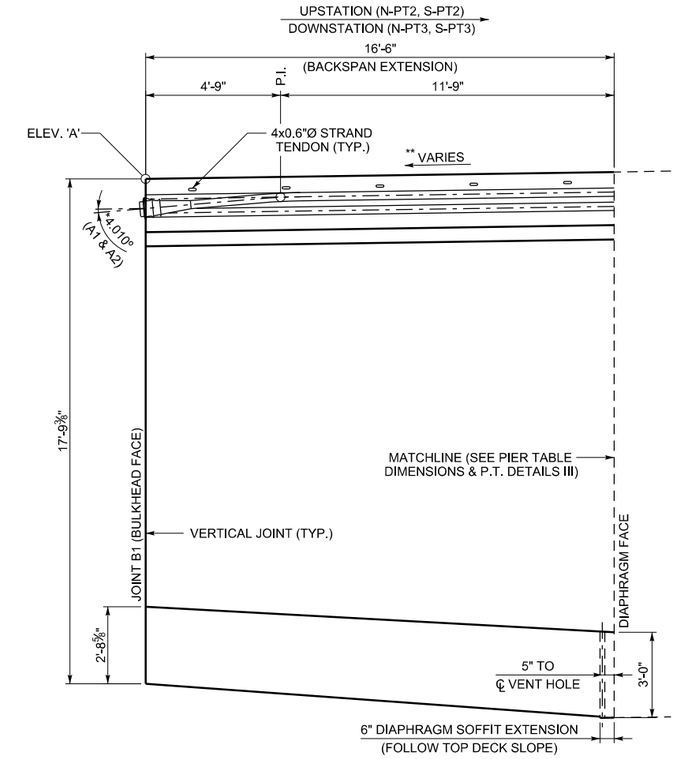
DIAPHRAGM FACE

CROSS SECTION

(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

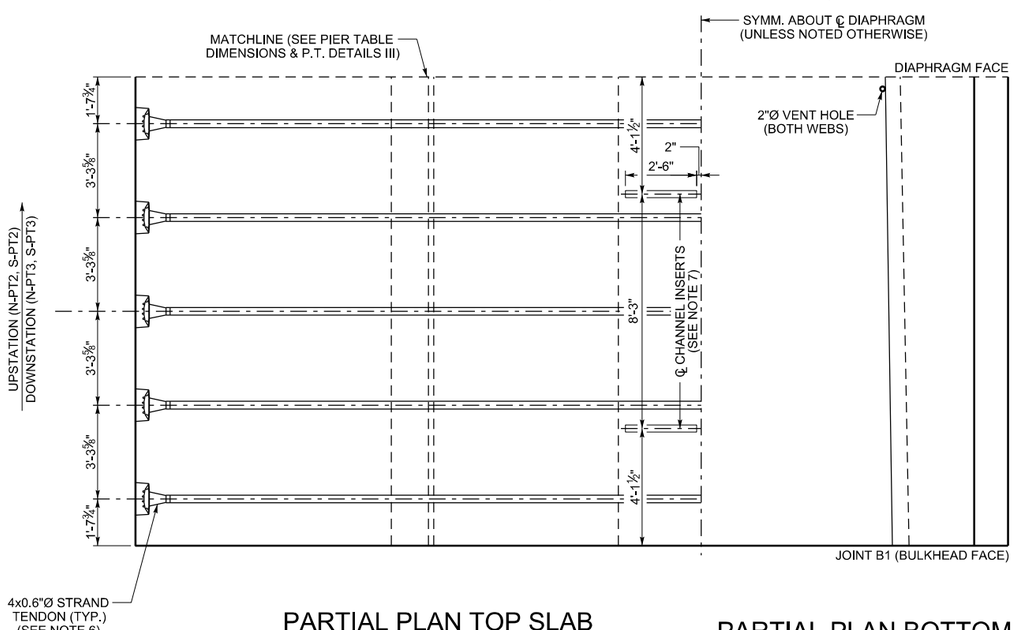
BULKHEAD FACE

(JOINT B1)



SECTION A-A

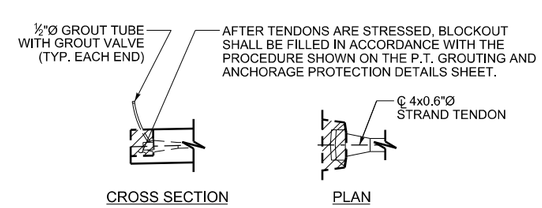
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



PARTIAL PLAN TOP SLAB

(CANTILEVER TENDONS NOT SHOWN FOR CLARITY.
SEE PIER TABLE DIMENSIONS & P.T. DETAILS I)

PARTIAL PLAN BOTTOM SLAB



TRANSVERSE TENDON BLOCKOUT DETAIL

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR PIER TABLES N-PT2, S-PT2, N-PT3 AND S-PT3.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

**10. FOR VARIABLE GRADES AND ELEVATIONS, SEE PIER TABLE DIMENSIONS & P.T. DETAILS I SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
PIER TABLE DIMS & PT DETAILS II
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 58 OF 187

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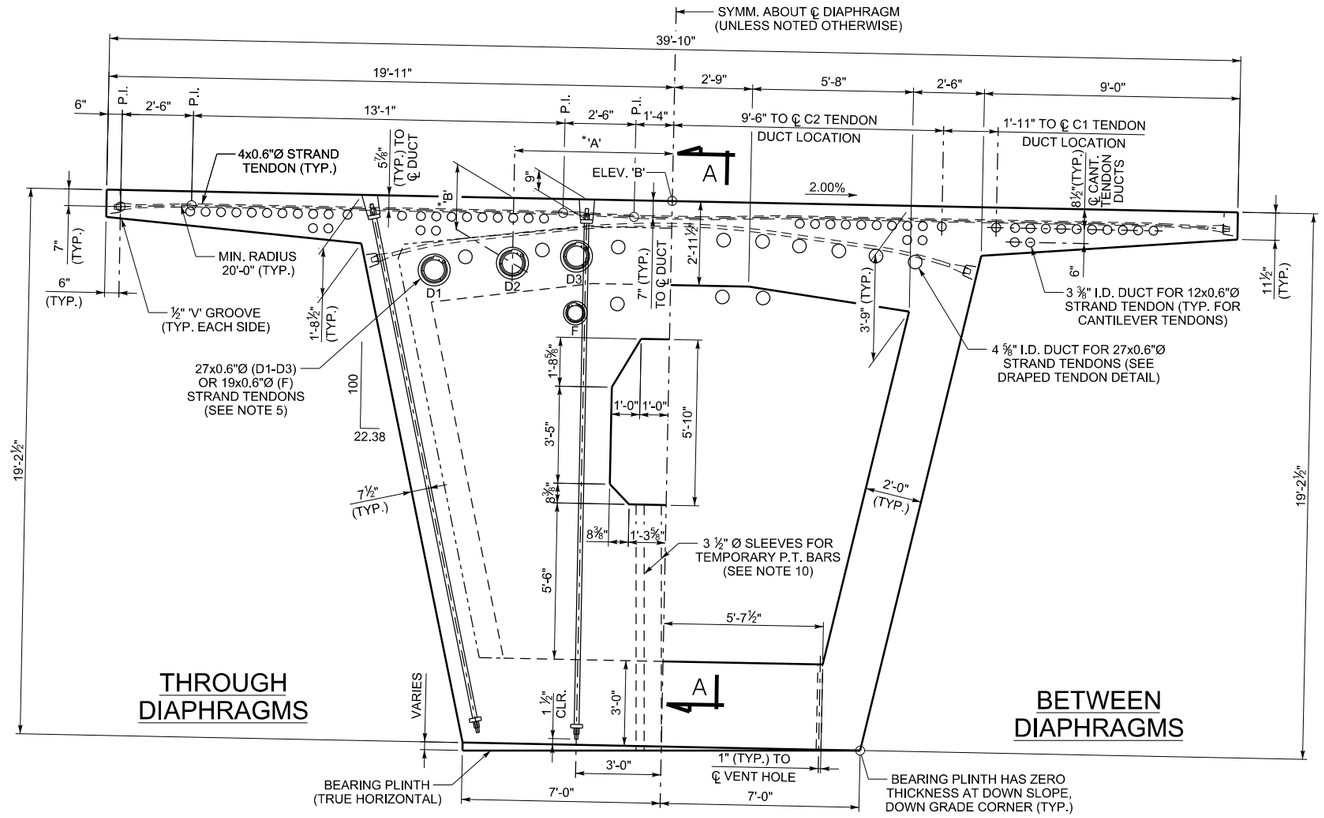
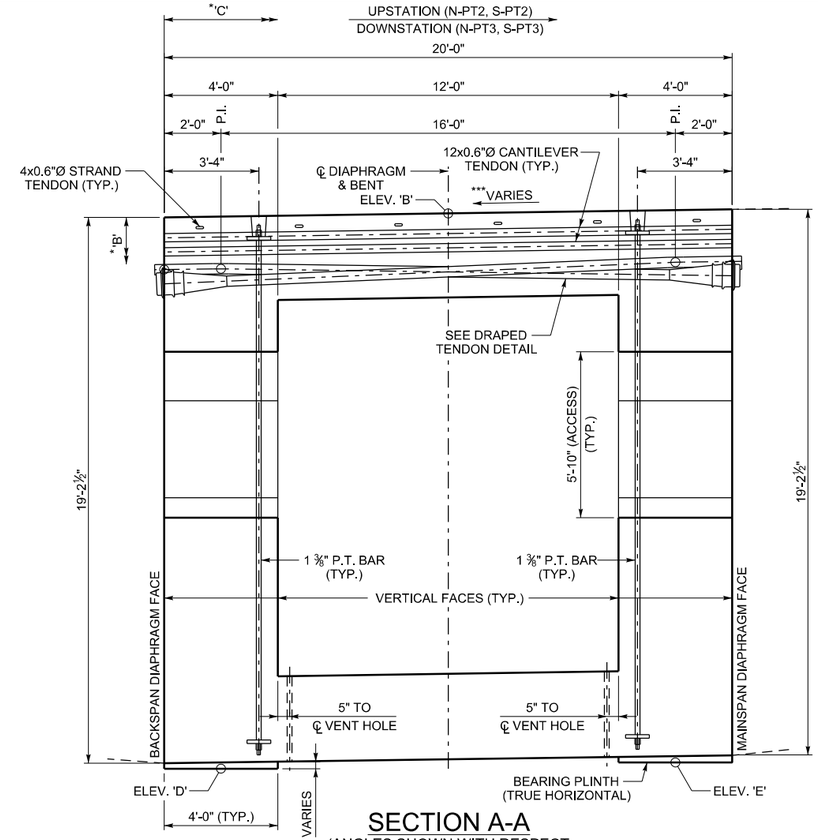
5/7/2008



CROSS SECTION

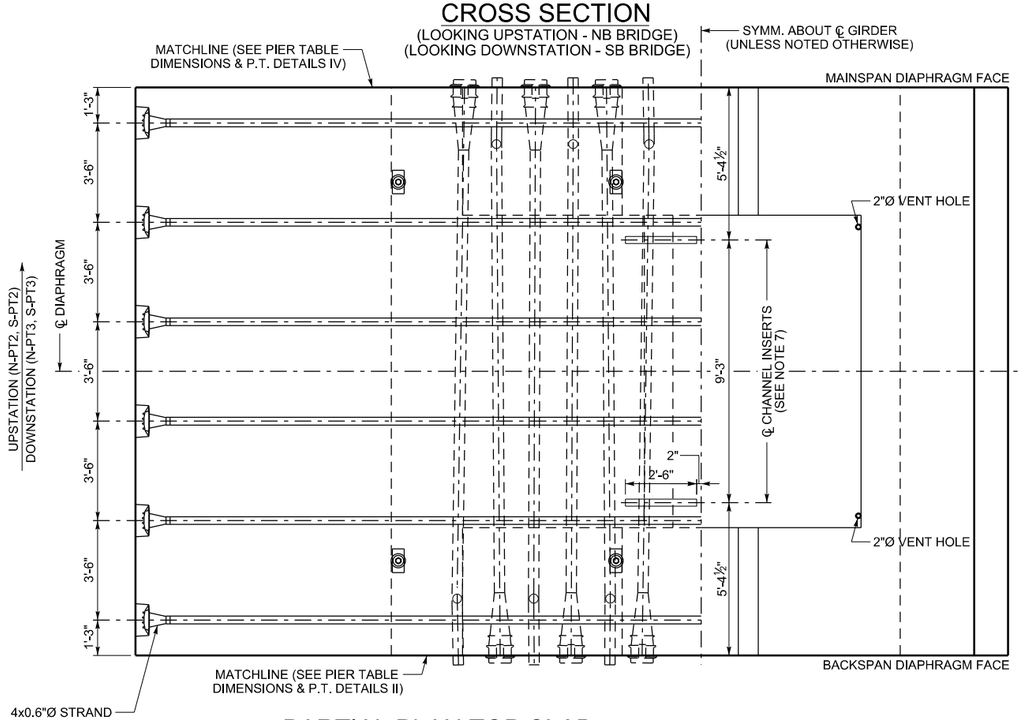
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)



SECTION A-A

(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

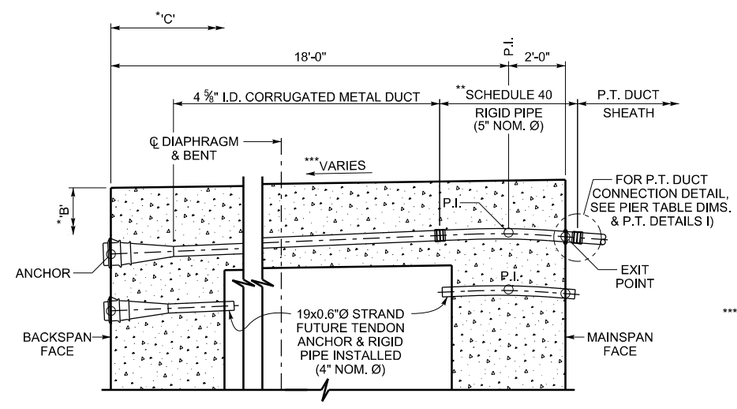
	TENDON	DRAPED TENDON DATA									
		ANCHOR			P.I.			EXIT POINT			ANGLE
		'A'	'B'	'C'	'A'	'B'	'C'	'A'	'B'	'C'	'D'
BACKSPAN TENDONS	D1	8'-4"	2'-7 1/8"	20'-0"	8'-7 1/8"	1'-11 3/4"	2'-0"	-	-	0"	-
	D2	5'-7"	2'-3 5/8"	20'-0"	5'-10 3/4"	1'-7 5/8"	2'-0"	-	-	0"	-
	D3	3'-4"	2'-0 1/8"	20'-0"	3'-2 1/2"	1'-4 1/4"	2'-0"	-	-	0"	-
	F	3'-4"	4'-0 1/8"	20'-0"	3'-3 1/8"	3'-4 1/4"	2'-0"	-	-	0"	-
MAINSPAN TENDONS	D1	7'-1"	2'-5 3/8"	0"	7'-2 1/2"	1'-9 1/2"	18'-0"	-	-	20'-0"	-
	D2	4'-7"	2'-1 7/8"	0"	4'-6 1/8"	1'-6"	18'-0"	-	-	20'-0"	-
	D3	2'-1"	1'-11 1/2"	0"	1'-10"	1'-4"	18'-0"	-	-	20'-0"	-
	F	2'-1"	3'-11 1/2"	0"	1'-10"	3'-4 1/8"	18'-0"	-	-	20'-0"	-



PARTIAL PLAN TOP SLAB

(CANTILEVER TENDONS NOT SHOWN FOR CLARITY.
SEE PIER TABLE DIMENSIONS & P.T. DETAILS I)

PARTIAL PLAN BOTTOM SLAB



DRAPED TENDON DETAIL

(ONLY MAINSPAN TENDON SHOWN FOR CLARITY,
BACKSPAN TENDON OPPOSITE HAND)

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR PIER TABLES N-PT2, S-PT2, N-PT3 AND S-PT3.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. SEE DRAPED TENDON DATA FOR DRAPED TENDON ANCHORS P.I. AND EXIT POINT GEOMETRY.

**6. SEE RIGID PIPE DATA FOR RIGID PIPE BEND GEOMETRY.

7. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
8. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
9. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
10. FOR LOCATION OF 3 ½" Ø SLEEVES IN DIAPHRAMS AND TEMPORARY P.T. BARS, SEE PIER CONNECTION DETAILS.

***11. FOR VARIABLE GRADES AND ELEVATIONS, SEE PIER TABLE DIMENSIONS & P.T. DETAILS I.

12. PT BARS SHALL BE STRESSED TO A FORCE OF 166 KIPS (MIN.) AFTER SEATING. FORCE SHALL BE VERIFIED AFTER LIFTOFF. PT BARS SHALL BE STRESSED AFTER THE DIAPHRAGM CONCRETE ACHIEVES A COMPRESSIVE STRESS OF 4000 PSI.
13. ALL PT BARS SHALL BE STRESSED, GROUTED AND HAVE BLOCKOUTS POURED BACK PRIOR TO STRESSING ANY LONGITUDINAL TENDONS.
14. FOR TRANSVERSE TENDON BLOCKOUT DETAIL, SEE PIER TABLE DIMENSIONS & P.T. DETAILS II OR IV SHEETS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER
BRIDGE - MOAB UTAH
PIER TABLE DIMS & PT DETAILS III

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 59 OF 187

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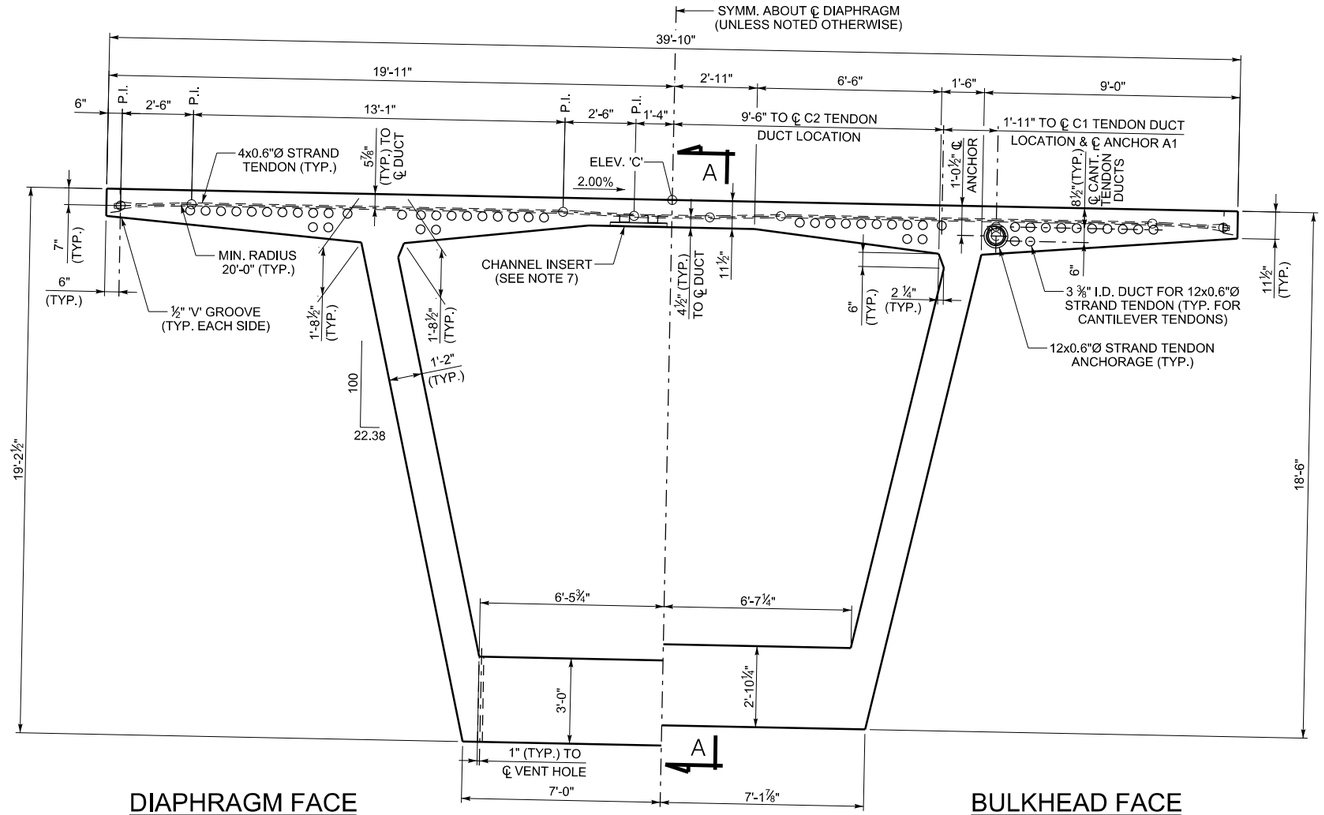
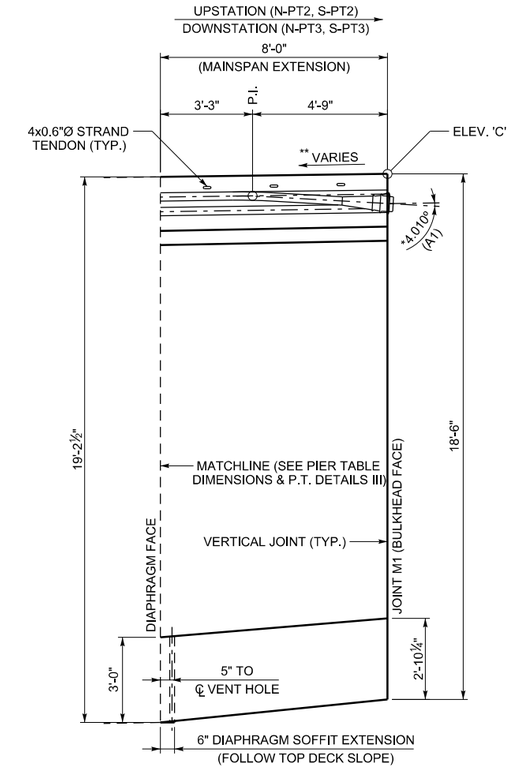
5/7/2008



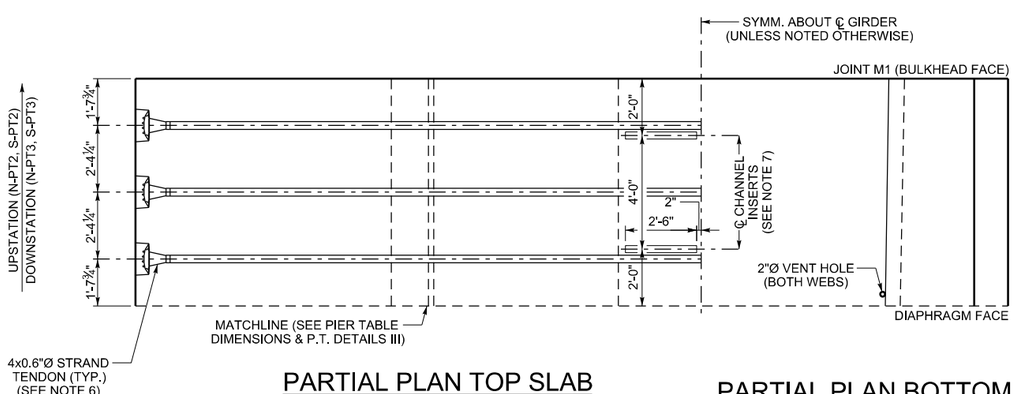
DIAPHRAGM FACE

BULKHEAD FACE
(JOINT M1)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

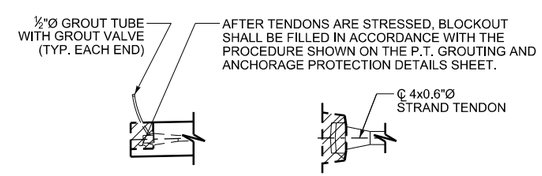


SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



PARTIAL PLAN TOP SLAB
(CANTILEVER TENDONS NOT SHOWN FOR CLARITY.
SEE PIER TABLE DIMENSIONS & P.T. DETAILS I)

PARTIAL PLAN BOTTOM SLAB



CROSS SECTION PLAN

TRANSVERSE TENDON
BLOCKOUT DETAIL

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR PIER TABLES N-PT2, S-PT2, N-PT3 AND S-PT3.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

**10. FOR VARIABLE GRADES AND ELEVATIONS, SEE PIER TABLE DIMENSIONS & P.T. DETAILS I SHEET.

NO.	DATE	BY	REMARKS

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UTAH DEPARTMENT OF TRANSPORTATION
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
PIER TABLE DIMS & PT DETAILS IV

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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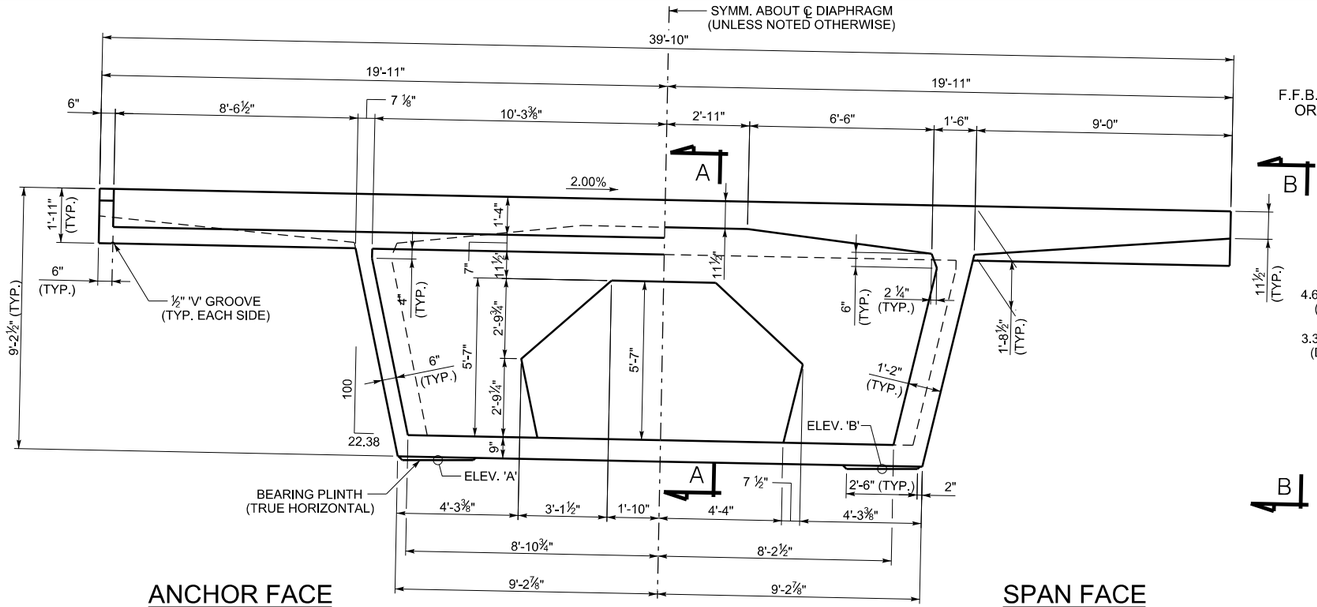
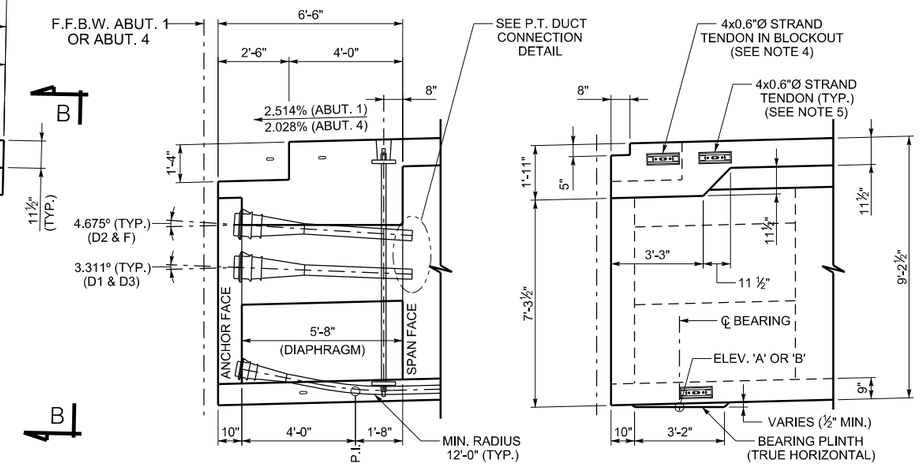


ANCHOR FACE

SPAN FACE

CROSS SECTION

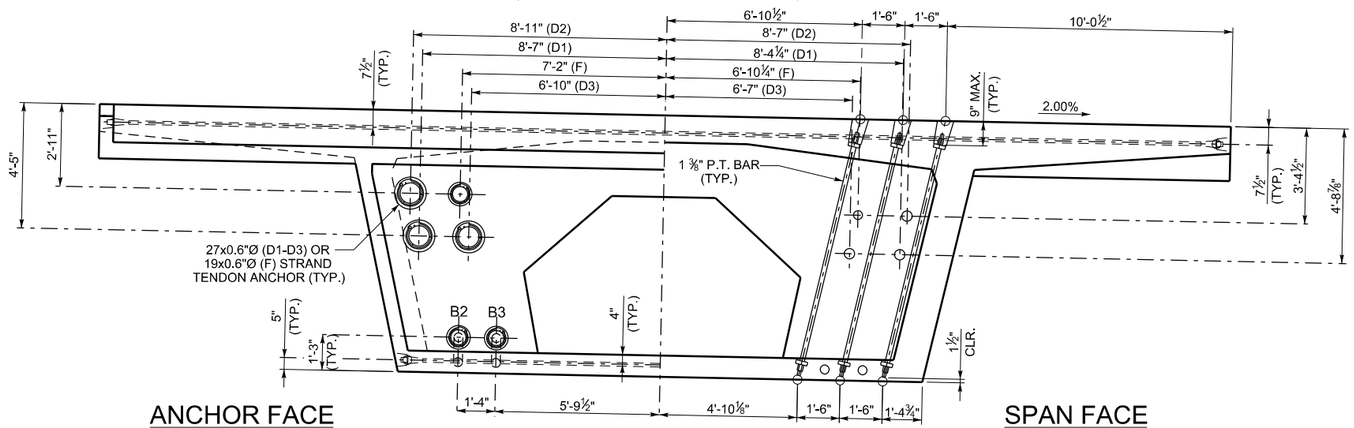
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)



SECTION A-A

(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

SECTION B-B



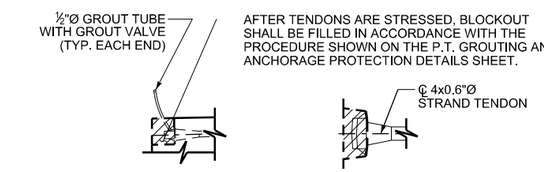
ANCHOR FACE
(ANCHOR SHOWN)

POST-TENSIONING DIMENSIONS

(TENDONS RUN IN A STRAIGHT LINE
FROM ANCHOR TO EXIT POINT)

SPAN FACE
(EXIT POINTS SHOWN)

BEARING PLINTH ELEVATIONS		
ABUTMENT	ELEVATION	
	'A'	'B'
1 NB	3982.57'	3982.26'
1 SB	3983.53'	3983.21'
4 NB	3984.10'	3983.79'
4 SB	3983.33'	3983.02'



CROSS SECTION PLAN

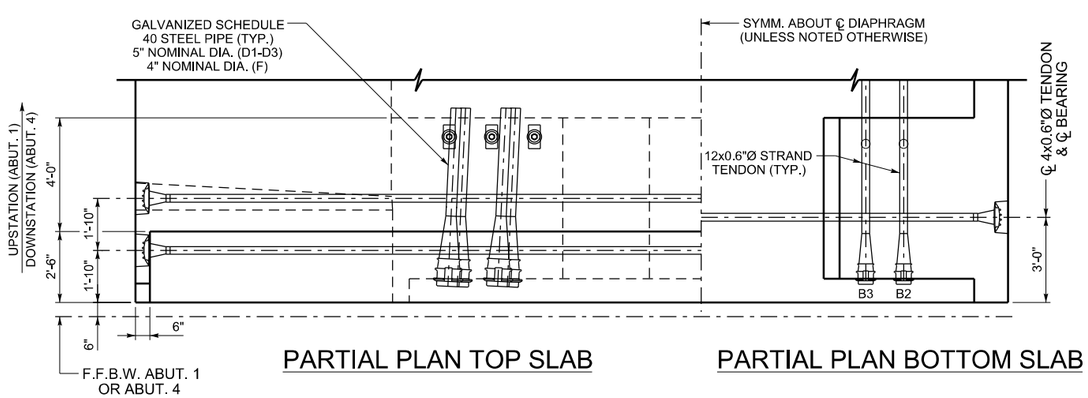
TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR DIAPHRAGMS AT ABUT. 1 NB & SB AND ABUT. 4 NB & SB.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. DIAPHRAGM CONCRETE SHALL BE 6000 PSI.
4. TRANSVERSE TENDON IN BLOCKOUT SHALL BE CAST WITH EXPANSION JOINT DEVICE AND STRESSED AFTER POUR BACK REACHES A COMPRESSIVE STRENGTH OF 4000 PSI. SEE EXPANSION JOINT DETAILS SHEET FOR MORE DETAILS.

*5. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK, THE TRANSVERSE 0.6"Ø STRANDS, NOT IN THE BLOCKOUT, SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.

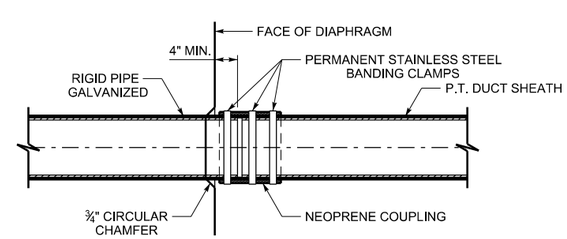
6. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
7. DRAPED TENDONS D1-D3 ARE 27x0.6"Ø STRANDS, AND DRAPED FUTURE TENDON HARDWARE IS 19x0.6"Ø STRANDS. BOTTOM SLAB TENDONS B2 & B3 ARE 12x0.6"Ø STRANDS.
8. FOR SPACING OF TRANSVERSE 4x0.6"Ø TENDONS IN CAST-IN-PLACE PORTION OF STRUCTURE BEYOND THE DIAPHRAGM SEE CIP CONSTRUCTION FRAMING PLAN SHEET.
9. DIMENSIONS SHOWN ARE FOR PROFILE OF TRANSVERSE 4x0.6"Ø TENDONS IN DIAPHRAGM ONLY. DIMENSIONS SHOWN ARE TO CENTERLINE OF DUCT.
10. THE ANCHORAGE HARDWARE, LOCAL ZONE REINFORCING, AND RIGID PIPE DUCT SHALL BE INSTALLED FOR THE FUTURE TENDONS. FUTURE TENDONS ARE NOT INSTALLED. FOR TREATMENT OF EMPTY FUTURE TENDON ANCHORAGES, SEE POST-TENSIONING GROUTING AND ANCHORAGE PROTECTION DETAILS SHEET.
11. PT BARS SHALL BE STRESSED TO A FORCE OF 166 KIPS (MIN) AFTER SEATING. FORCE SHALL BE VERIFIED AFTER LIFTOFF. PT BARS SHALL BE STRESSED AFTER THE DIAPHRAGM CONCRETE ACHIEVES A COMPRESSIVE STRESS OF 4000 PSI.
12. ALL PT BARS SHALL BE STRESSED, GROUTED AND HAVE BLOCKOUTS POURED BACK PRIOR TO STRESSING ANY LONGITUDINAL TENDONS.



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION



P.T. DUCT CONNECTION DETAIL

(TYP. ALL RIGID PIPE TO DUCT CONNECTIONS)

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
ABUT DIAPHRAGM DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
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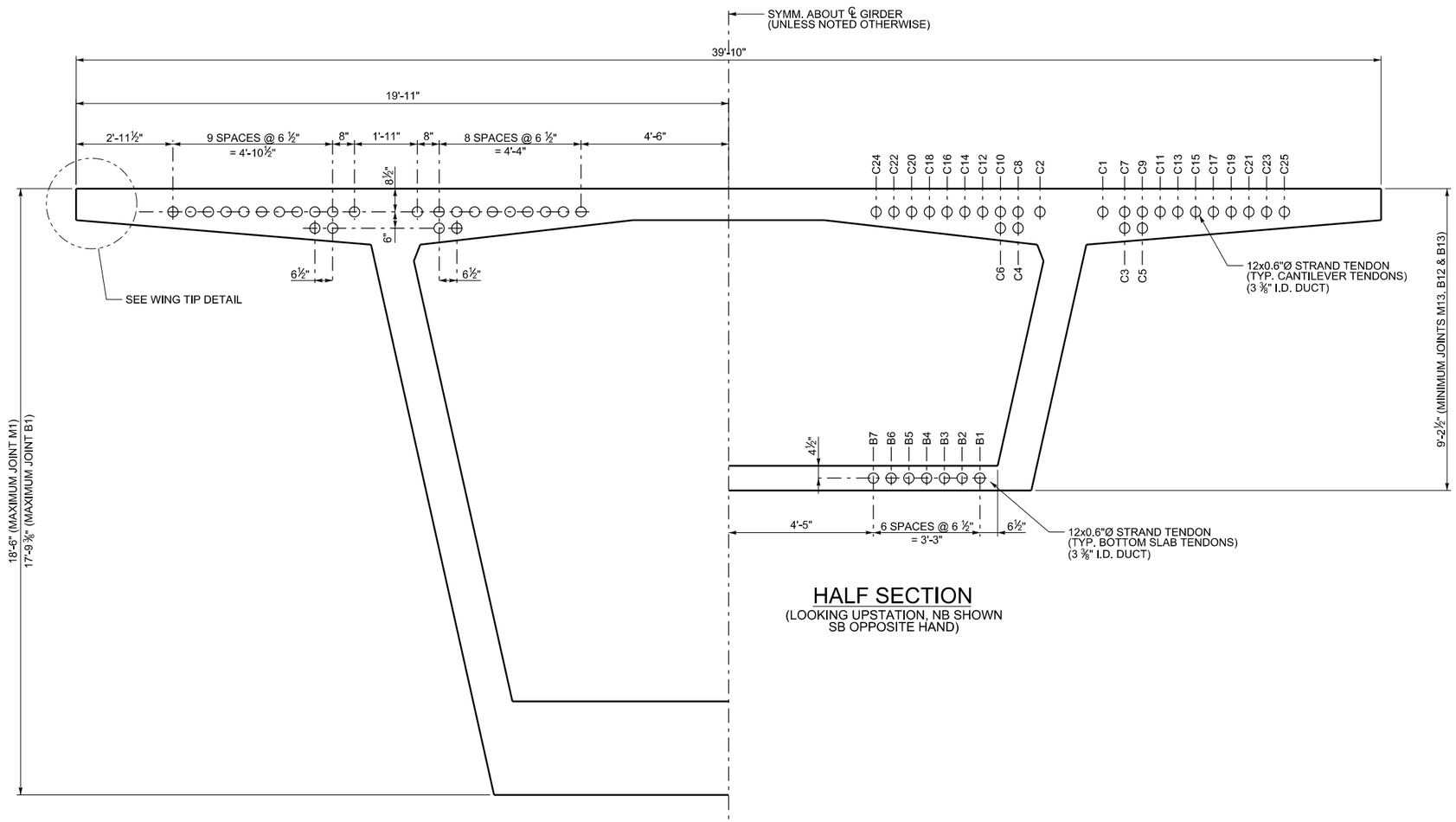
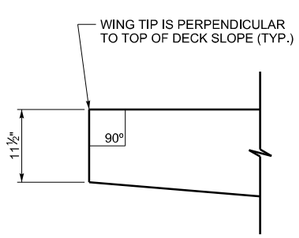


HALF SECTION
(LOOKING UPSTATION, NB SHOWN
SB OPPOSITE HAND)

HALF SECTION
(LOOKING UPSTATION, NB SHOWN
SB OPPOSITE HAND)



WING TIP DETAIL

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. SEE SEGMENT DIMENSION AND PT DETAILS SHEETS FOR SEGMENT DIMENSIONS AND PT DETAILS.
2. SEE PROJECT SPECIFICATIONS FOR TREATMENT OF BULKHEAD FACE CONCRETE AFTER REMOVING BULKHEAD AND BEFORE MATCH CASTING NEXT SEGMENT.

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BULKHEAD DETAILS

PROJECT NUMBER BRF-0191(58)129

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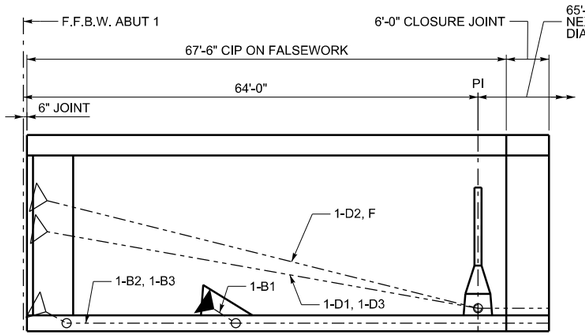
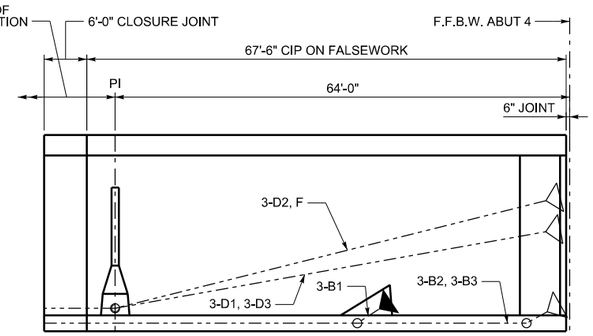


SPAN 1 (NB & SB) CIP ELEVATION - DRAPED TENDONS

(SCALE VERTICALLY EXAGGERATED)



SPAN 3 (NB & SB) CIP ELEVATION - DRAPED TENDONS

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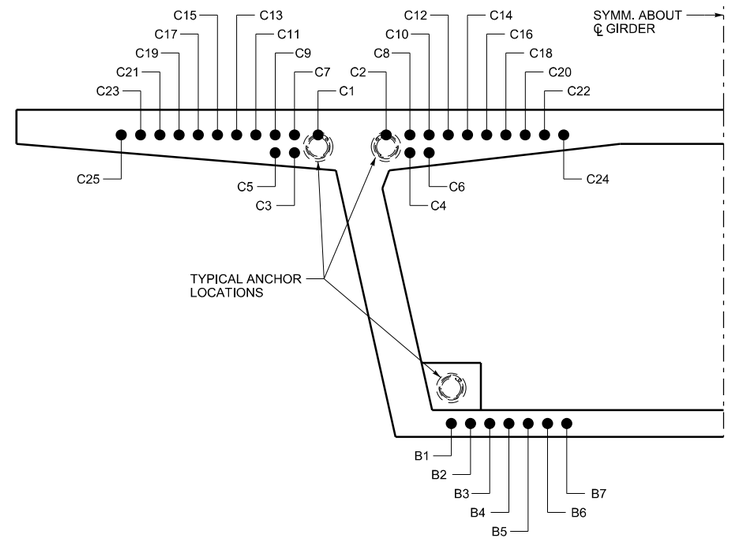
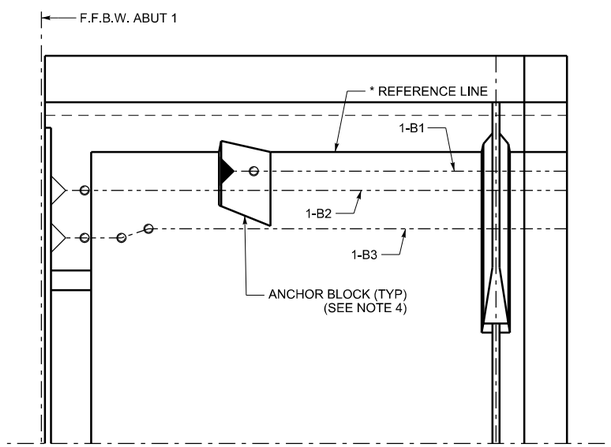


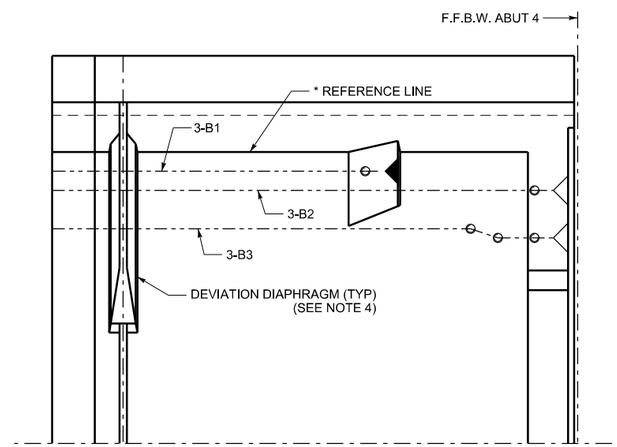
DUCT LOCATIONS

(SEE NOTE 3)



SPAN 1 (NB & SB) CIP BOTTOM SLAB PARTIAL PLAN - BOTTOM SLAB TENDONS

(SCALE TRANSVERSELY EXAGGERATED)



SPAN 3 (NB & SB) CIP BOTTOM SLAB PARTIAL PLAN - BOTTOM SLAB TENDONS

(SCALE TRANSVERSELY EXAGGERATED)

LEGEND

2 - C 2

- TENDON NUMBER
- C - CANTILEVER TENDON
  D - DRAPED TENDON
  B - BOTTOM SLAB TENDON
  F - FUTURE TENDON
- CANTILEVER OR SPAN NUMBER

LEGEND

- STRAND TENDON
- STRESSING ANCHORAGE
- NON-STRESSING ANCHORAGE
- TENDON PATH P.I.

NOTES:

1. ALL CANTILEVER AND BOTTOM SLAB TENDONS ARE 12 X 0.6" DIAMETER STRAND TENDONS. ALL FUTURE DRAPED TENDONS ARE 19 X 0.6" DIAMETER STRAND TENDONS. ALL OTHER DRAPED TENDONS ARE 27 X 0.6" DIAMETER STRAND TENDONS.
2. THE ANCHORAGE HARDWARE, LOCAL ZONE REINFORCING AND RIGID PIPE DUCT SHALL BE INSTALLED FOR THE FUTURE TENDONS. FUTURE TENDON STRANDS ARE NOT INSTALLED. SEE POST-TENSIONING GROUTING AND ANCHORAGE PROTECTION DETAILS SHEET FOR TREATMENT OF EMPTY FUTURE TENDON ANCHORAGES AT ABUTMENT DIAPHRAGMS.
3. TENDON NUMBER REFLECTS THE DUCT LOCATION A GIVEN TENDON RUNS THROUGH IN THE CENTRAL, NON-DEVIATING LENGTH OF THE TENDON.
4. ALL DIMENSIONS ARE TRUE HORIZONTAL MEASURED ALONG CENTERLINE GIRDER.
5. FOR DEVIATION DIAPHRAGM OR ANCHOR BLOCK DETAILS, SEE APPROPRIATE SEGMENT DIMENSIONS AND REINFORCING SHEETS.
6. FOR PT DETAILS IN TYPICAL SEGMENTS AND CIP ON FALSEWORK SECTIONS, SEE APPROPRIATE SEGMENT DIMENSIONS SHEETS AND CIP CONSTRUCTION FRAMING PLAN.
7. FOR PT DETAILS IN PIER TABLES AND ABUTMENT DIAPHRAGMS, SEE PIER TABLE AND ABUTMENT DIAPHRAGM DIMENSIONS AND PT DETAILS SHEETS.
8. FOR STRESSING SEQUENCE DURING ERECTION, SEE CONSTRUCTION SCHEMATIC I THROUGH III SHEETS.

*9. REFERENCE LINE REFERS TO THE LINE FORMED BY THE INTERSECTION OF THE WEB AND BOTTOM SLAB ON THE INTERIOR OF THE SEGMENT. ALL BOTTOM SLAB TENDONS RUN PARALLEL TO THIS LINE WHEN NOT DEVIATING DUCT POSITIONS.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
LONGITUDINAL P.T. LAYOUT I

PROJECT NUMBER BRF-0191(58)129

GRAND
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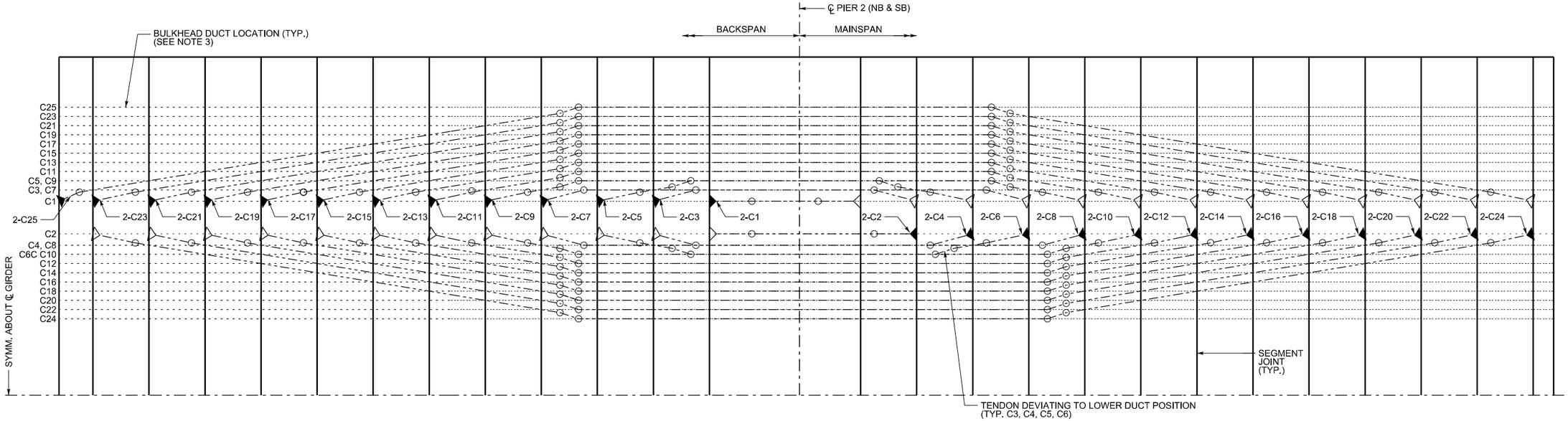
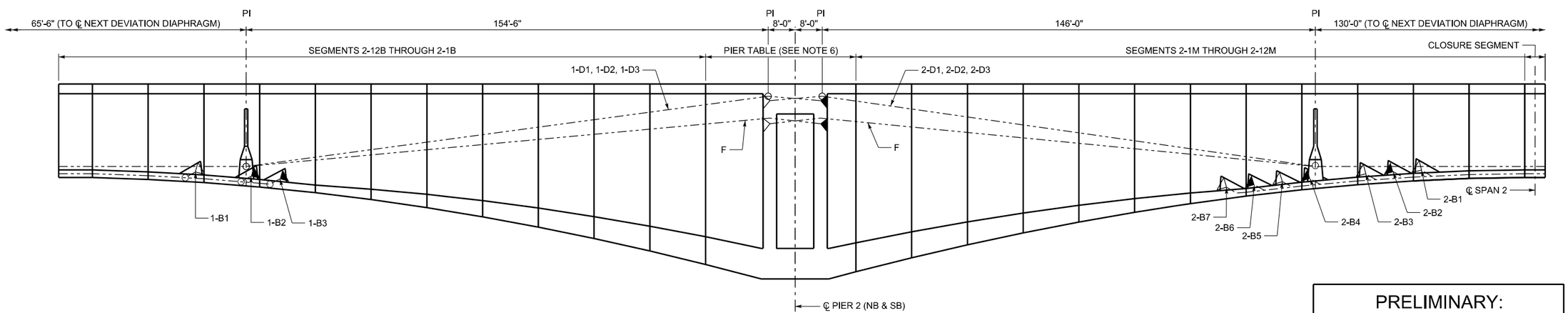


CANTILEVER 2 (NB & SB) TOP SLAB PARTIAL PLAN - CANTILEVER TENDONS

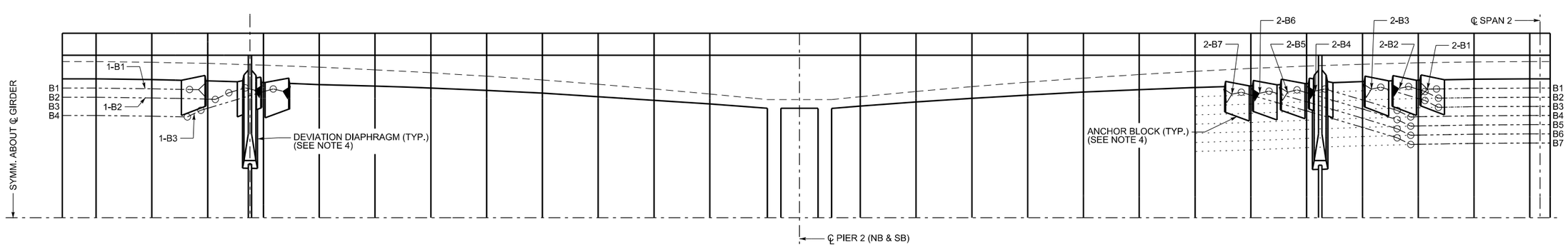
(SCALE TRANSVERSELY EXAGGERATED)



PRELIMINARY:
NOT FOR CONSTRUCTION

CANTILEVER 2 (NB & SB) ELEVATION - DRAPED TENDONS

(SCALE VERTICALLY EXAGGERATED)



CANTILEVER 2 (NB & SB) BOTTOM SLAB PARTIAL PLAN - BOTTOM SLAB TENDONS

(SCALE TRANSVERSELY EXAGGERATED)

NOTES:
FOR NOTES AND LEGENDS, SEE LONGITUDINAL P.T. LAYOUT I SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

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QUANT. XXX MM/YY CHECK XXX MM/YY

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UDOT BRIDGE ENGR. DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
LONGITUDINAL P.T. LAYOUT II

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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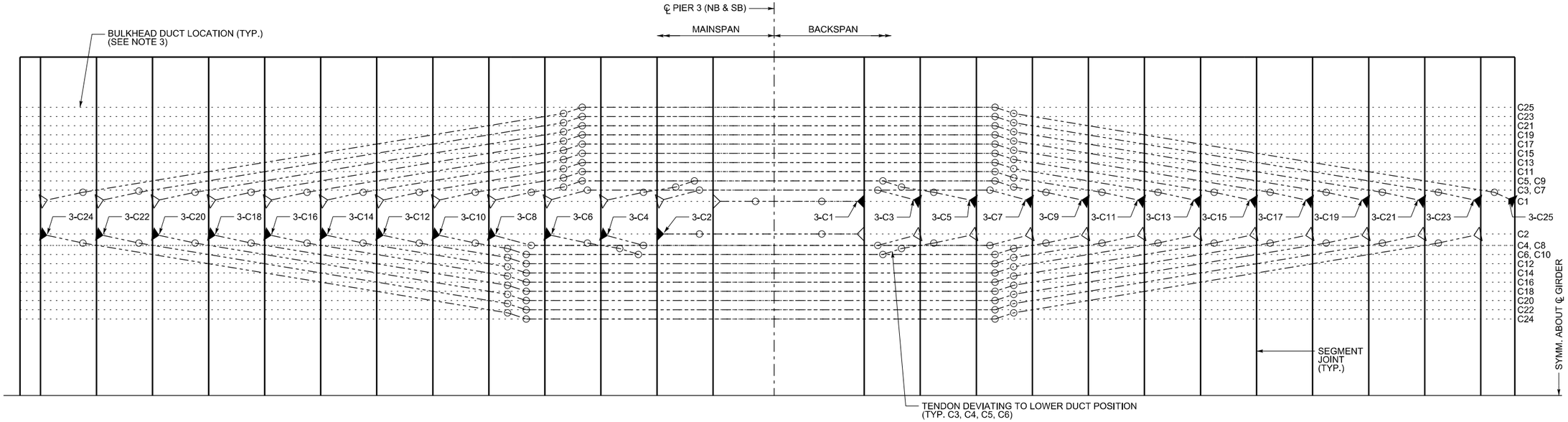
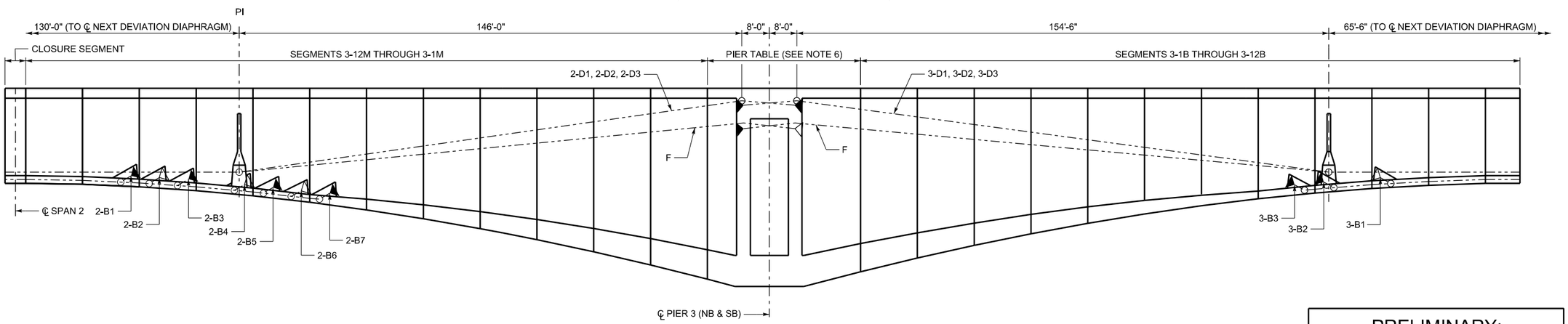


CANTILEVER 3 (NB & SB) TOP SLAB PARTIAL PLAN - CANTILEVER TENDONS

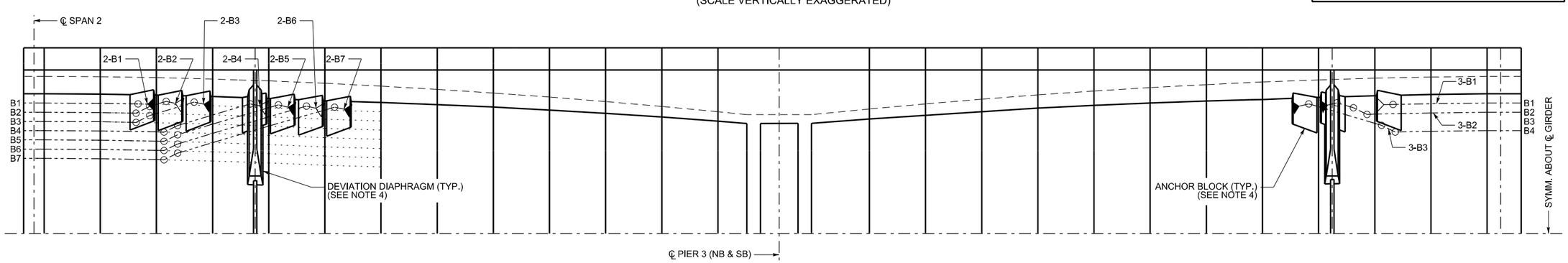
(SCALE TRANSVERSELY EXAGGERATED)



CANTILEVER 3 (NB & SB) ELEVATION - DRAPED TENDONS

(SCALE VERTICALLY EXAGGERATED)

PRELIMINARY:
NOT FOR CONSTRUCTION



CANTILEVER 3 (NB & SB) BOTTOM SLAB PARTIAL PLAN - BOTTOM SLAB TENDONS

(SCALE TRANSVERSELY EXAGGERATED)

NOTES:
FOR NOTES AND LEGENDS, SEE LONGITUDINAL P.T. LAYOUT I SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

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QUANT. XXX MM/YY CHECK XXX MM/YY

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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
LONGITUDINAL P.T. LAYOUT III

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

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DRG. NO.

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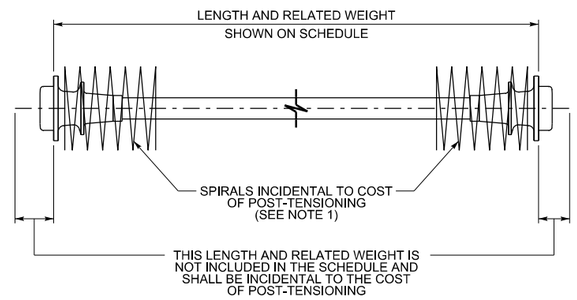
5/7/2008

LONGITUDINAL POST-TENSIONING STRAND QUANTITIES								
	TENDON NUMBER	TENDON SIZE	TENDON LENGTH (FT)	TENDON WEIGHT (LBS)	NUMBER OF TENDONS	TOTAL WEIGHT (LBS)	STRESSING FORCE (KIPS)	ELONGATION (IN)
CANTILEVER TENDONS	C1	12x0.6"Ø	44.51	394	8	3153	528	3.51
	C2	12x0.6"Ø	61.01	540	8	4322	528	4.96
	C3	12x0.6"Ø	77.55	687	8	5494	528	6.48
	C4	12x0.6"Ø	94.05	833	8	6663	528	7.94
	C5	12x0.6"Ø	110.52	979	8	7830	528	9.28
	C6	12x0.6"Ø	127.02	1125	8	8999	528	10.64
	C7	12x0.6"Ø	143.55	1271	8	10170	528	12.21
	C8	12x0.6"Ø	160.05	1417	8	11339	528	13.56
	C9	12x0.6"Ø	176.55	1564	8	12508	528	14.70
	C10	12x0.6"Ø	193.05	1710	8	13677	528	16.00
	C11	12x0.6"Ø	209.55	1856	8	14846	528	17.40
	C12	12x0.6"Ø	226.05	2002	8	16015	528	18.69
	C13	12x0.6"Ø	242.55	2148	8	17184	528	20.07
	C14	12x0.6"Ø	259.05	2294	8	18353	528	21.34
	C15	12x0.6"Ø	275.55	2440	8	19522	528	22.72
	C16	12x0.6"Ø	292.05	2586	8	20691	528	23.97
	C17	12x0.6"Ø	308.55	2733	8	21860	528	25.39
	C18	12x0.6"Ø	325.05	2879	8	23029	528	26.64
	C19	12x0.6"Ø	341.55	3025	8	24198	528	28.02
	C20	12x0.6"Ø	358.05	3171	8	25367	528	29.15
	C21	12x0.6"Ø	374.55	3317	8	26536	528	30.61
	C22	12x0.6"Ø	391.05	3463	8	27705	528	31.81
	C23	12x0.6"Ø	407.55	3609	8	28874	528	33.19
	C24	12x0.6"Ø	424.05	3755	8	30043	528	34.36
	C25	12x0.6"Ø	434.08	3844	8	30754	528	35.12
DRAPED TENDONS	1-D1 OR 3-D1	27x0.6"Ø	300.58	5989	8	47915	1186	25.42
	1-D2 OR 3-D2	27x0.6"Ø	300.50	5988	8	47902	1186	25.43
	1-D3 OR 3-D3	27x0.6"Ø	300.59	5990	8	47916	1186	25.39
	2D1	27x0.6"Ø	457.27	9112	4	36446	1186	38.64
	2D2	27x0.6"Ø	457.27	9112	4	36446	1186	38.64
	2D3	27x0.6"Ø	457.29	9112	4	36448	1186	38.64
BOTTOM SLAB TENDONS	1-B1 OR 3-B1	12x0.6"Ø	91.43	810	8	6478	528	7.46
	1-B2 OR 3-B2	12x0.6"Ø	131.85	1168	8	9341	528	10.47
	1-B3 OR 3-B3	12x0.6"Ø	140.35	1243	8	9944	528	11.08
	2-B1	12x0.6"Ø	70.92	628	4	2512	528	5.74
	2-B2	12x0.6"Ø	87.81	778	4	3111	528	7.11
	2-B3	12x0.6"Ø	104.00	921	4	3684	528	8.25
	2-B4	12x0.6"Ø	136.72	1211	4	4843	528	10.87
	2-B5	12x0.6"Ø	153.73	1361	4	5446	528	12.14
	2-B6	12x0.6"Ø	169.74	1503	4	6013	528	13.43
	2-B7	12x0.6"Ø	186.76	1654	4	6616	528	14.66

TYPICAL TRANSVERSE P.T. STRAND STRESSING SCHEDULE		
TENDON SIZE	STRESSING FORCE (KIPS)	ELONGATION (IN)
4x0.6"Ø	176	3 ¼"

(DECK TENDONS ONLY)

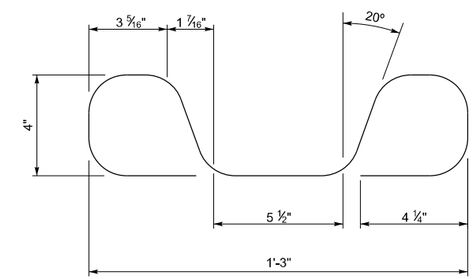


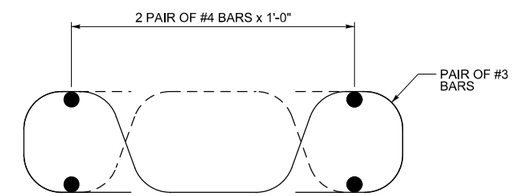
LONGITUDINAL STRAND TENDON

(QUANTITIES SHOWN IN TABLE ON THIS SHEET)

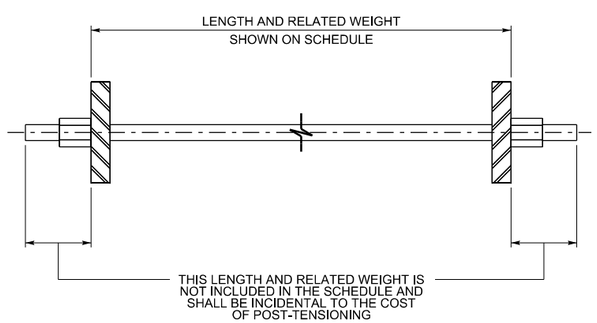
BENDING DIAGRAMS

(ALL DIMENSIONS ARE OUT TO OUT)



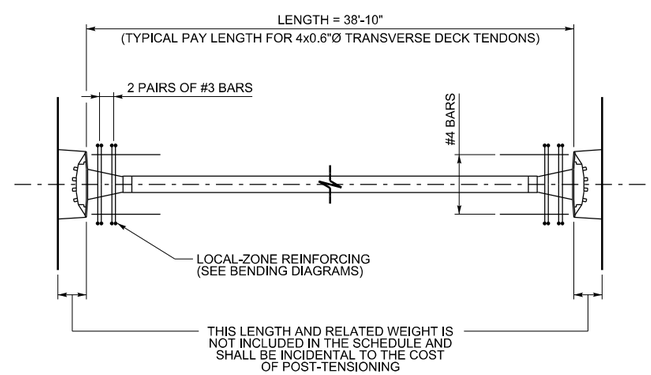


ESTIMATED PAY ITEM QUANTITIES		
ITEM DESCRIPTION	UNIT	QUANTITY
POST-TENSIONING STEEL STRAND (SUPERSTRUCTURE LONGITUDINAL)	LB	740,197



POST-TENSIONING BAR

(QUANTITIES SHOWN ON INDIVIDUAL ELEMENT REINFORCING SHEETS)



TRANSVERSE STRAND TENDON

(QUANTITIES SHOWN ON INDIVIDUAL SEGMENT OR ELEMENT REINFORCING SHEETS)

NOTES:

1. LOCAL ZONE REINFORCING AT ANCHORAGES IS THE RESPONSIBILITY OF THE POST-TENSIONING SYSTEM SUPPLIER. MAXIMUM SPIRAL SIZES WILL BE REQUIRED AS FOLLOWS:

   27x0.6"Ø STRAND TENDON - 17" O.D. (MAX.) SPIRAL
   19x0.6"Ø STRAND TENDON - 14 ½" O.D. (MAX.) SPIRAL
   12x0.6"Ø STRAND TENDON - 11 ½" O.D. (MAX.) SPIRAL

2. POST-TENSIONING STRANDS LISTED ON THIS SHEET WILL BE PAID UNDER POST-TENSIONING STEEL STRAND (LONGITUDINAL).
3. SEE CONSTRUCTION SCHEMATICS FOR P.T. STRAND TENDON AND P.T BAR STESSING ORDER.
4. FOR TRANSVERSE TENDON QUANTITIES, SEE SEGMENT DIMENSIONS AND P.T. DETIALS SHEETS AND CIP CONSTRUCTION FRAMING PLAN.
5. FOR VERTICAL P.T. BAR QUANTITIES IN PIER TABLES AND ABUTMENT DIAPHRAGMS, SEE PIER TABLE AND ABUTMENT DIAPHRAGM DIMENSIONS AND P.T. DETAILS.
6. BARS SHOWN ARE PROVIDED AS MINIMUM LOCAL ZONE REINFORCING STEEL AND MAY NOT BE AN IDEAL FIT FOR ALL TYPES OF 4x0.6"Ø TENDON ANCHORAGES. THE POST-TENSIONING SUPPLIER SHALL VERIFY THE ADEQUACY OF THE LOCAL ZONE REINFORCING SHOWN AND ADJUST AS NECESSARY TO MEET THE POST-TENSIONING SYSTEM REQUIREMENTS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 05/08 CHECK XXX MM/YY
DRAWN RJA 05/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
P.T. QUANT. & STRESSING SCHEDULE

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 81 OF 187

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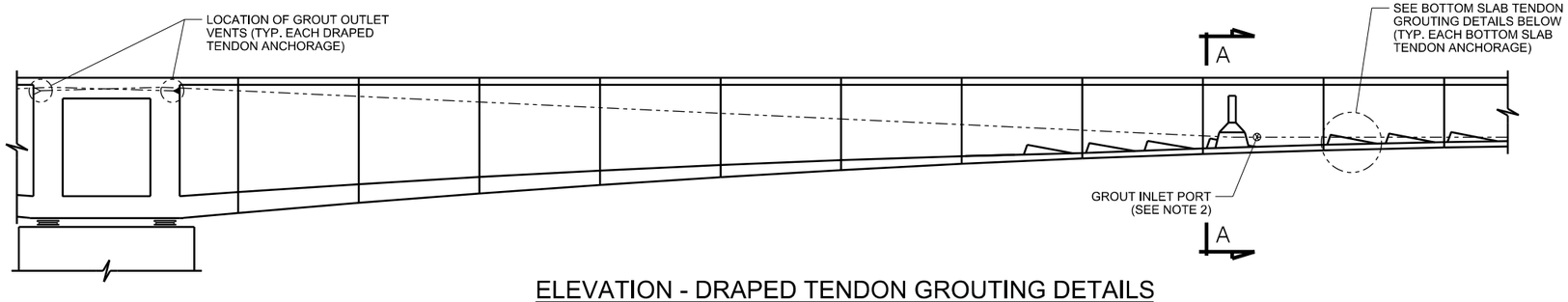
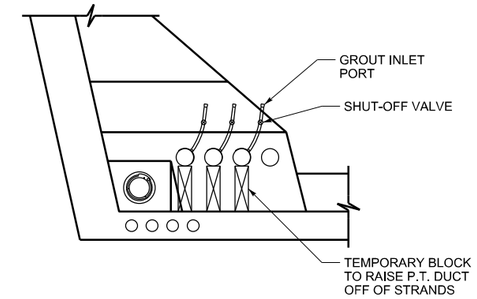
5/7/2008

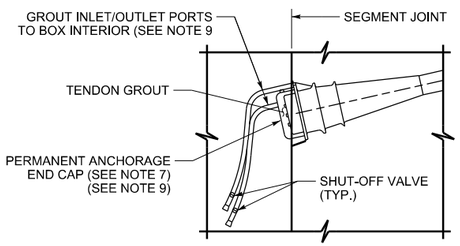


ELEVATION - DRAPED TENDON GROUTING DETAILS

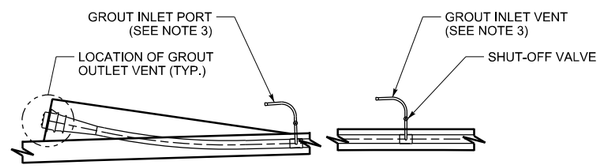
(SPAN 2 SHOWN, OTHER SPANS SIMILAR)



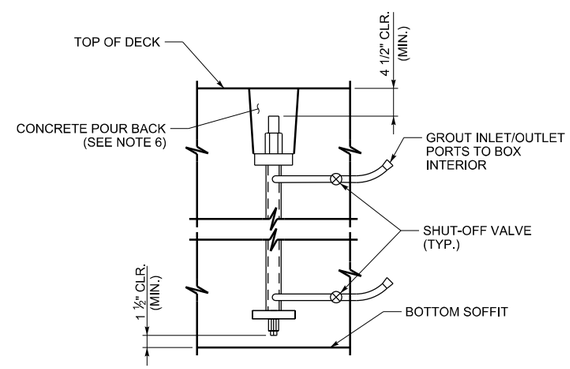
SECTION A-A



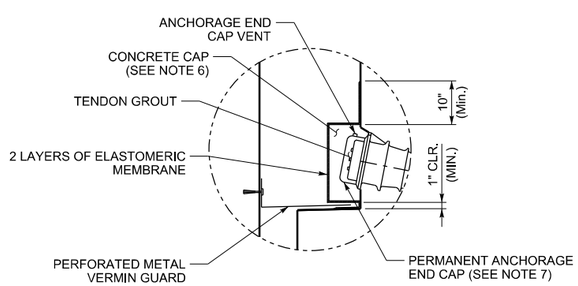
CANTILEVER TENDON ANCHORAGE DETAIL



BOTTOM SLAB TENDON GROUTING DETAILS

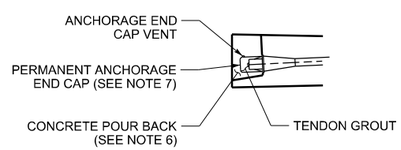


POST-TENSIONING BAR DETAIL

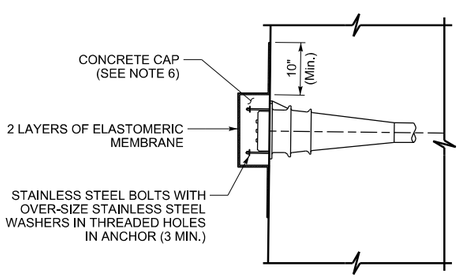


ANCHORAGE PROTECTION AT ABUTMENT DIAPHRAGM DETAIL

(VALID FOR BOTTOM SLAB TENDONS ANCHORING ON ABUTMENT DIAPHRAGM FACES WHEN PERFORATED METAL VERMIN GUARD IS REQUIRED)

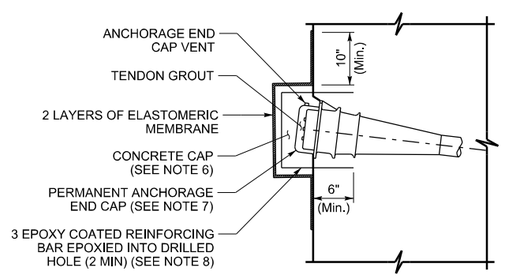


TRANSVERSE TENDON ANCHORAGE DETAIL



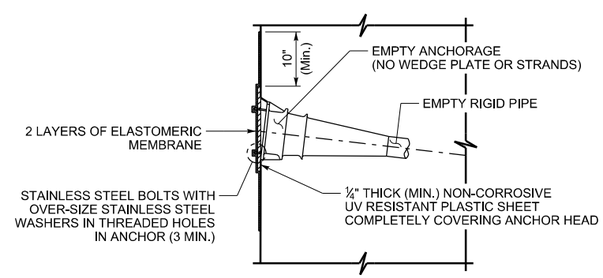
ANCHORAGE PROTECTION DETAIL TYPE A

(VALID FOR BOTTOM SLAB TENDONS ANCHORING IN INTERIOR BLOCKS AND DRAPED TENDONS ANCHORING ON INTERIOR PIER TABLE DIAPHRAGM) (CONCRETE CAPS MAY BE FOR INDIVIDUAL TENDONS OR GROUPS OF TENDONS)



ANCHORAGE PROTECTION DETAIL TYPE B

(VALID FOR DRAPED TENDONS ANCHORING ON ABUTMENT DIAPHRAGM) (CONCRETE CAPS MAY BE FOR INDIVIDUAL TENDONS OR GROUPS OF TENDONS)



ANCHORAGE PROTECTION DETAIL TYPE C

(VALID FOR DRAPED FUTURE POST-TENSIONING ANCHORS ON ABUTMENT DIAPHRAGMS ONLY)

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING IS A SCHEMATIC OF THE GROUTING AND ANCHORAGE PROTECTION DETAILS REQUIRED FOR THIS PROJECT. SEE THE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
2. THE GROUT INLET PORT FOR THE DRAPED TENDONS SHALL BE LOCATED BETWEEN THE TWO DEVIATION DIAPHRAGMS IN A GIVEN SPAN AT THE LOW POINT OF THE TENDONS ACCOUNTING FOR THE GLOBAL BRIDGE GEOMETRY. GROUT OUTLET VENTS SHALL BE LOCATED AT EACH ANCHORAGE.
3. THE GROUT INLET PORT FOR THE BOTTOM SLAB TENDONS SHALL BE LOCATED JUST OUTSIDE OF THE ANCHOR BLOCK AT THE LOW END OF THE TENDONS ACCOUNTING FOR GLOBAL BRIDGE GEOMETRY. GROUT OUTLET VENTS SHALL BE LOCATED AT EACH ANCHORAGE, AT THE TENDON HIGH POINT (NEAR MIDSPAN) ACCOUNTING FOR GLOBAL BRIDGE GEOMETRY, AND APPROXIMATELY 3'-0" FROM EACH HIGH POINT IN THE DIRECTION OF GROUT FLOW.
4. GROUT INLET PORTS AND OUTLET VENTS FOR THE CANTILEVER TENDONS AND TRANSVERSE TENDONS SHALL BE LOCATED AT EACH ANCHORAGE. INLET AND OUTLET PORTS SHALL NEVER EXTEND TO THE TOP DECK.
5. POSITIVE MECHANICAL SHUT-OFF VALVES ARE REQUIRED AT ALL GROUT INLET PORTS AND OUTLET VENTS.
6. THE CONCRETE CAPS AND CONCRETE POUR BACKS AT THE ANCHORAGES SHALL BE OF A MIX APPROVED BY THE ENGINEER PRIOR TO USE. AN EPOXY BONDING AGENT, USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, SHALL THOROUGHLY COAT ALL MATING SURFACES FOR THE BLOCK OR POUR BACK. EPOXY BONDING COMPOUND SHALL BE APPROVED BY THE ENGINEER PRIOR TO USE. WHERE PERMANENT ANCHORAGE END CAPS ARE NOT PRESENT, STRAND TAILS OR P.T. BARS SHALL HAVE 2" MIN. CLEARANCE FROM THE SURFACE OF THE CONCRETE BLOCK. WHERE PERMANENT ANCHORAGE END CAPS ARE PRESENT, THE CONCRETE BLOCK SHALL PROVIDE 2" MIN. COVER OVER THE END CAPS.
7. THE PERMANENT ANCHORAGE END CAP SHALL BE NON-CORROSIVE (PLASTIC), UV RESISTANT, AND ATTACH DIRECTLY TO THE ANCHORAGE PLATES. THEY SHALL COMPLETELY ENCAPSULATE THE STRAND TAILS AND, WHERE APPLICABLE, THE WEDGE PLATE. THEY SHALL PROVIDE 1" MIN. CLEARANCE FROM THE CAP TO THE STRAND TAILS AND BE COMPLETELY FILLED WITH GROUT. EXCEPT FOR CANTILEVER TENDONS, THE END CAP VENT SHALL BE CUT OFF AND THE EXPOSED GROUT THOROUGHLY COATED WITH AN ELASTOMERIC MEMBRANE PRIOR TO POURING THE BLOCK OR POUR BACK.
8. ALL HOLES FOR THE #3 BARS SHALL BE DRILLED PRIOR TO STRESSING ANY TENDONS IN THE DIAPHRAGM. THE BARS SHALL BE EPOXIED INTO THE HOLES USING AN EPOXY APPROVED BY THE ENGINEER AND USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE ANNULAR SPACE BETWEEN THE BARS AND THE HOLE SHALL BE COMPLETELY FILLED WITH NO VOIDS.
9. CANTILEVER TENDON PERMANENT ANCHORAGE END CAPS AND GROUT INLET/OUTLET PORTS SHALL BE INSTALLED PRIOR TO CASTING THE NEXT CANTILEVER OR CLOSURE SEGMENT.
10. THE ELASTOMERIC WATERPROOFING MEMBRANE SHALL CONSIST OF A SINGLE COMPONENT, HOT OR COLD APPLIED, ELASTOMERIC MEMBRANE. HOT APPLIED ELASTOMERIC MEMBRANES SHALL CONFORM TO THE REQUIREMENTS OF ASTM D 3405, EXCEPT THAT THE BLOCKS FOR THE BOND TEST SHALL BE AS DESCRIBED IN ASTM D 1191. COLD APPLIED ELASTOMERIC MEMBRANES SHALL BE ONE OF THE FOLLOWING PRODUCTS OR AN APPROVED EQUAL: BOSCOSEAL PU FROM BOSTIK FIDLEY, EPOXYSYSTEMS PRODUCT #417 OR SONOSHIELD HLM 5000 FROM DEGUSSA CONSTRUCTION CHEMICALS.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
P.T. GROUTING & PROTECTION DET.

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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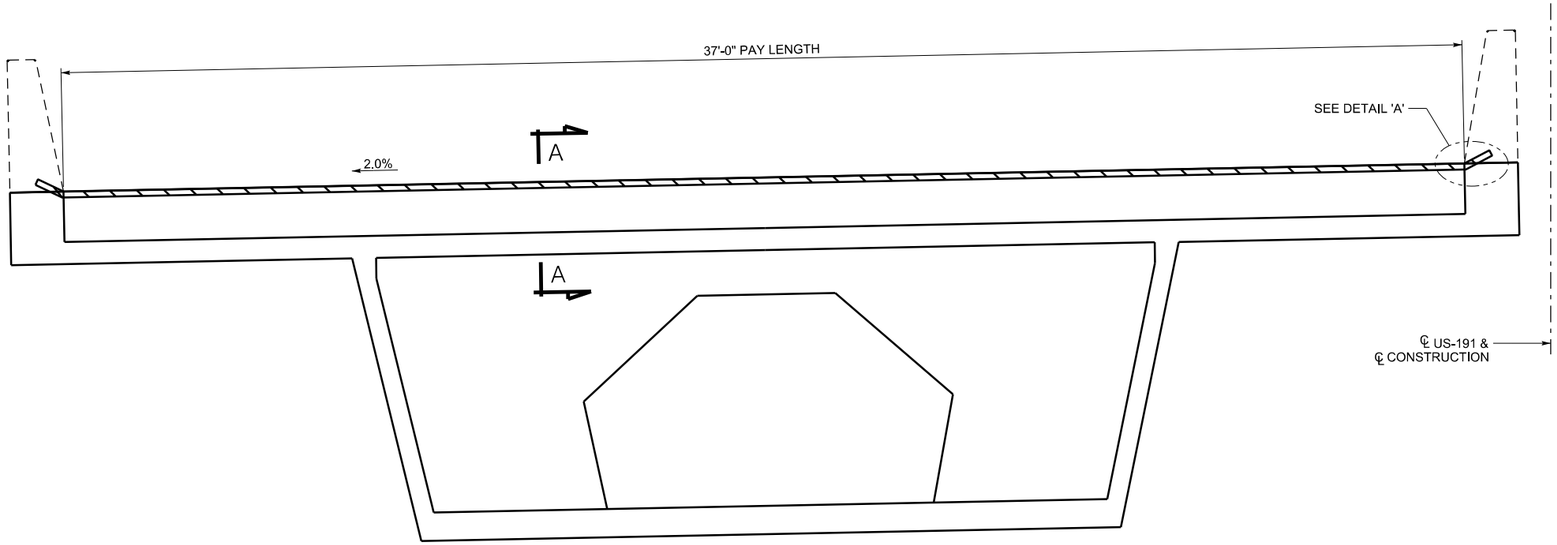
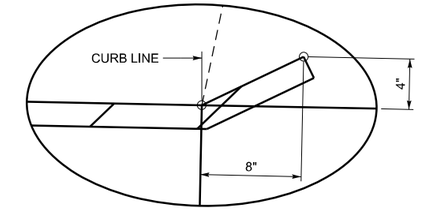


ABUTMENT 1 - SECTION AT JOINT

(LOOKING UPSTATION)
(SB GIRDER SHOWN, NB GIRDER OPPOSITE HAND)

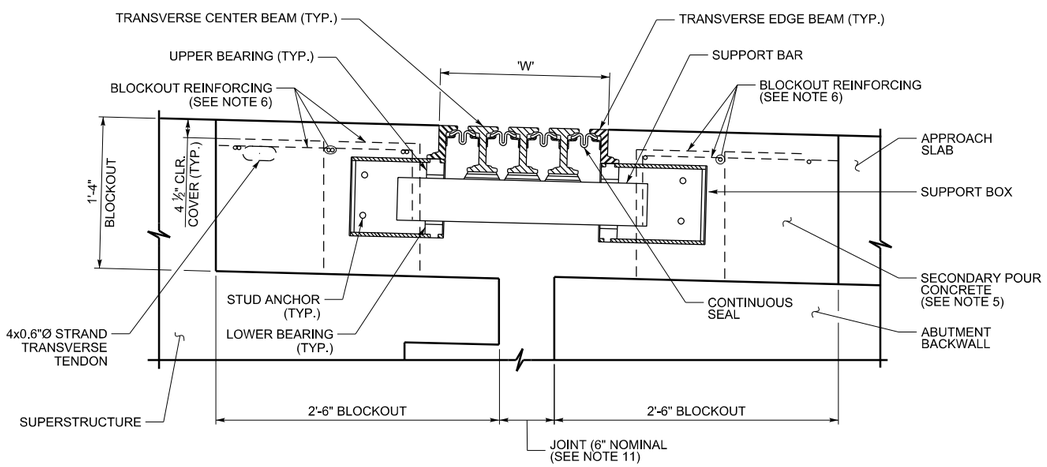


DETAIL 'A'

TEMPERATURE SETTING TABLE

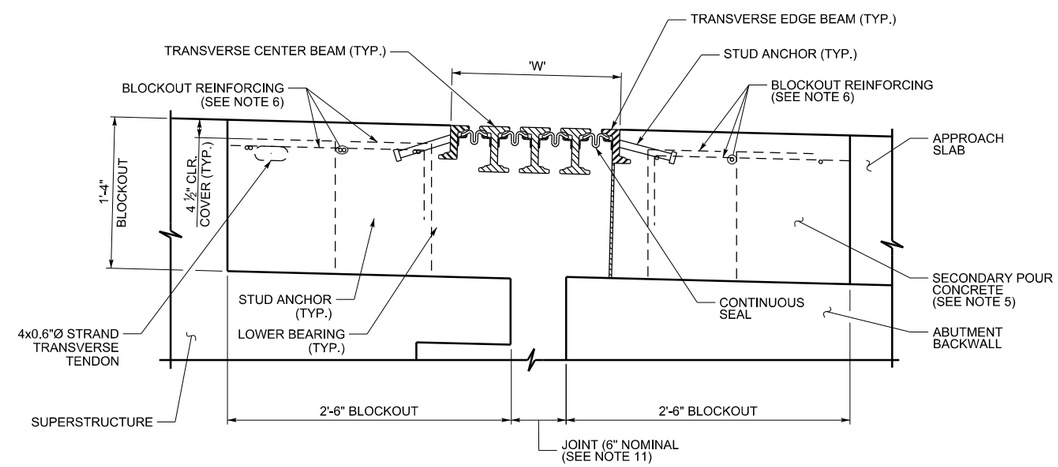
TEMPERATURE (DEG. F)	TOTAL CONTRACTION (IN) 'W' INCREASING	TOTAL CONTRACTION (IN) 'W' DECREASING
0	-	-
10	-	-
20	-	-
30	-	-
40	-	-
50	-	-
60	-	-
70	-	-
80	-	-

(SEE NOTE 10)



SECTION A-A

(SECTION THROUGH SUPPORT BOXES)



SECTION A-A

(SECTION BETWEEN SUPPORT BOXES)

NOTES:

1. THIS DRAWING IS A SCHEMATIC OF 0-12" JOINT DEVICES REQUIRED AT ABUTMENT 1. MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE JOINT DEVICES. THE JOINT DEVICES SHALL BE CAPABLE OF MAINTAINING EQUAL DISTANCE BETWEEN ALL TRANSVERSE BEAMS. ACCEPTABLE ALTERNATES FOR EXPANSION DEVICES ARE D.S. BROWN STEELFLEX EXPANSION JOINT SYSTEM AND WATSON BOWMAN ACME WABO MODULAR EXPANSION JOINT SYSTEM.
2. DESIGN LIVE LOAD IS HL-93 WITH IMPACT. SEE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL DESIGN AND SHOP DRAWING SUBMITTAL REQUIREMENTS. SHOP DRAWINGS SHALL INCLUDE EXPANSION DEVICES, BARRIER RAIL COVER PLATES, METHOD OF SUPPORT DURING INSTALLATION, AS WELL AS THE INSTALLATION PROCEDURE.
3. THE INSTALLED EXPANSION JOINT DEVICE SHALL CONFORM TO THE GRADES AND SUPERELEVATIONS AT THE JOINT LOCATIONS AND PROVIDE A SMOOTH SURFACE. RAILS SHALL BE INSTALLED ¼" BELOW FINAL GRADE. EDGE BEAMS OF EXPANSION DEVICE AND THE TOPS OF THE FORMS THAT ESTABLISH THE GRADES FOR THE POURBACKS OF THE BLOCKOUTS SHALL BE SURVEYED TO VERIFY THAT THE FINAL INSTALLED JOINTS WILL CONFORM TO THE FINAL ELEVATIONS AND PROVIDE A SMOOTH RIDING SURFACE. SURVEY ELEVATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE BLOCKOUT CONCRETE SHALL NOT BE PLACED UNTIL THE ELEVATIONS ARE ACCEPTED BY THE ENGINEER.
4. ALL STEEL SHALL MEET THE REQUIREMENTS OF AASHTO M270 GRADE 36 OR GRADE 50. ALL STEEL THAT WILL BE EXPOSED IN THE PERMANENTLY INSTALLED CONDITION SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123.
5. CONCRETE FOR THE SECONDARY POURS OF THE EXPANSION JOINT BLOCKOUTS SHALL BE SUPERSTRUCTURE STRUCTURAL CONCRETE, 6000 PSI. SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT CONCRETE COMPLETELY SUPPORTS SUPPORT BOXES AND IS WELL CONSOLIDATED.
6. SEE THE ABUTMENT REINFORCING DRAWINGS AND THE ABUTMENT DIAPHRAGM REINFORCING DRAWINGS FOR THE REINFORCING TO BE PLACED IN THE PRIMARY ELEMENT POURS THAT EXTEND INTO THE EXPANSION JOINT BLOCKOUTS, AS WELL AS REINFORCING IN THE BLOCKOUTS. REINFORCING BARS SHALL BE CUT AND BENT INTO THE APPROXIMATE CONFIGURATIONS SHOWN.
7. THE TRANSVERSE BEAMS SHALL BE TURNED UP PAST THE GUTTER LINES SUCH THAT A MINIMUM RISE ABOVE THE GUTTER LINES OF 4" IS ACHIEVED. THE RAILS AND SEALS SHALL BE CONTINUOUS ACROSS THE WIDTH OF THE JOINTS, INCLUDING TURN UPS.
8. EXPANSION JOINT DEVICES SHALL NOT BE INSTALLED UNTIL THE ENTIRE STRUCTURE HAS BEEN CONSTRUCTED, ALL LONGITUDINAL TENDONS STRESSED, AND ANY MILLING OF INTEGRAL WEARING SURFACE COMPLETE.
9. SEE ABUTMENT AND ABUTMENT DIAPHRAGM DRAWINGS FOR ADDITIONAL BLOCKOUT DIMENSIONS.
10. SET EXPANSION JOINT SUCH THAT IT CAN ACCOMMODATE THE MOVEMENTS SHOWN AT THE LISTED TEMPERATURES. TEMPERATURE IS THE AVERAGE CONCRETE SUBSTRATE TEMPERATURE AT THE TIME OF JOINT INSTALLATION, MEASURED AS THE SURFACE TEMPERATURE AT THE MID HEIGHT OF THE WEB INSIDE THE BOX GIRDER. TOTAL MOVEMENTS INCLUDE 1.2 FACTOR OF SAFETY AS PER AASHTO, "LRFD BRIDGE DESIGN SPECIFICATIONS".
11. JOINTS SHALL BE FORMED AT 6" WHEN CASTING SUPERSTRUCTURE, BUT WILL CHANGE WITH TIME AND TEMPERATURE.
12. THE EXPANSION JOINTS SHOWN ON THIS SHEET WILL BE PAID FOR UNDER BRIDGE EXPANSION DEVICE (0-12 INCH). COST SHALL INCLUDE ALL MATERIALS AND ALL LABOR FOR INSTALLATION.
13. MAINTAIN MINIMUM 4 ½" CLEAR COVER FROM SECONDARY POUR REINFORCING TO TOP SURFACE OF SECONDARY POUR.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
EXPANSION JOINT DETAILS I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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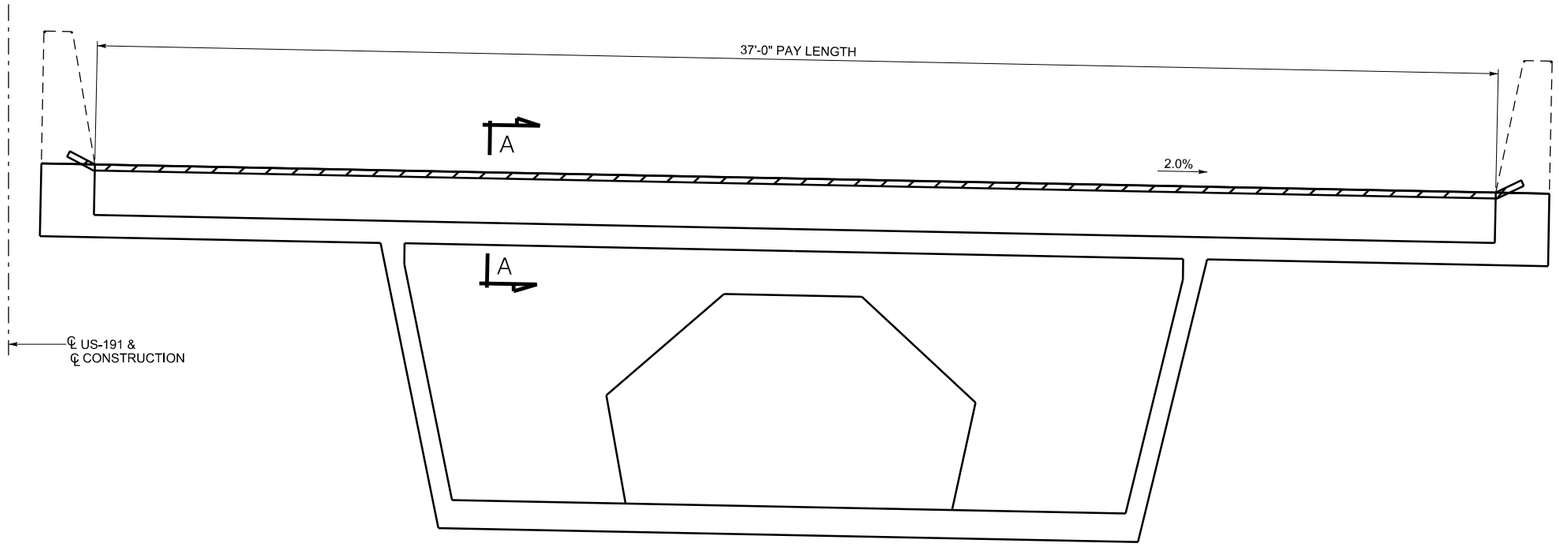
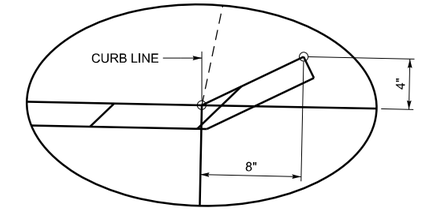


ABUTMENT 4 - SECTION AT JOINT

(LOOKING DOWNSTATION)
(SB GIRDER SHOWN, NB GIRDER OPPOSITE HAND)

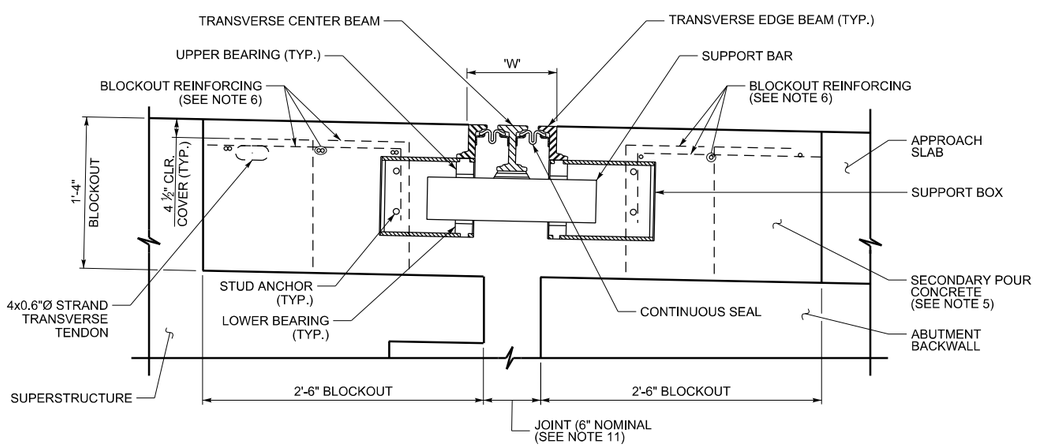


DETAIL 'A'

TEMPERATURE SETTING TABLE

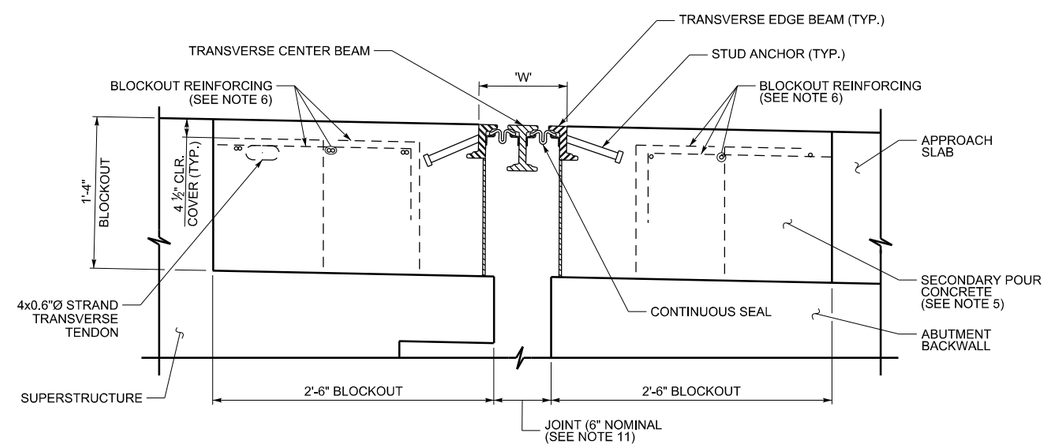
TEMPERATURE (DEG. F)	TOTAL CONTRACTION (IN) 'W' INCREASING	TOTAL CONTRACTION (IN) 'W' DECREASING
0	-	-
10	-	-
20	-	-
30	-	-
40	-	-
50	-	-
60	-	-
70	-	-
80	-	-

(SEE NOTE 10)



SECTION A-A

(SECTION THROUGH SUPPORT BOXES)



SECTION A-A

(SECTION BETWEEN SUPPORT BOXES)

NOTES:

1. THIS DRAWING IS A SCHEMATIC OF 0-6" JOINT DEVICES REQUIRED AT ABUTMENT 4. MANUFACTURER IS RESPONSIBLE FOR THE DESIGN OF THE JOINT DEVICES. THE JOINT DEVICES SHALL BE CAPABLE OF MAINTAINING EQUAL DISTANCE BETWEEN ALL TRANSVERSE BEAMS. ACCEPTABLE ALTERNATES FOR EXPANSION DEVICES ARE D.S. BROWN STEELFLEX EXPANSION JOINT SYSTEM AND WATSON BOWMAN ACME WABO MODULAR EXPANSION JOINT SYSTEM.
2. DESIGN LIVE LOAD IS HL-93 WITH IMPACT. SEE PROJECT SPECIAL PROVISIONS FOR ADDITIONAL DESIGN AND SHOP DRAWING SUBMITTAL REQUIREMENTS. SHOP DRAWINGS SHALL INCLUDE EXPANSION DEVICES, BARRIER RAIL COVER PLATES, METHOD OF SUPPORT DURING INSTALLATION, AS WELL AS THE INSTALLATION PROCEDURE.
3. THE INSTALLED EXPANSION JOINT DEVICE SHALL CONFORM TO THE GRADES AND SUPERELEVATIONS AT THE JOINT LOCATIONS AND PROVIDE A SMOOTH SURFACE. RAILS SHALL BE INSTALLED ¼" BELOW FINAL GRADE. EDGE BEAMS OF EXPANSION DEVICE AND THE TOPS OF THE FORMS THAT ESTABLISH THE GRADES FOR THE POURBACKS OF THE BLOCKOUTS SHALL BE SURVEYED TO VERIFY THAT THE FINAL INSTALLED JOINTS WILL CONFORM TO THE FINAL ELEVATIONS AND PROVIDE A SMOOTH RIDING SURFACE. SURVEY ELEVATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE BLOCKOUT CONCRETE SHALL NOT BE PLACED UNTIL THE ELEVATIONS ARE ACCEPTED BY THE ENGINEER.
4. ALL STEEL SHALL MEET THE REQUIREMENTS OF AASHTO M270 GRADE 36 OR GRADE 50. ALL STEEL THAT WILL BE EXPOSED IN THE PERMANENTLY INSTALLED CONDITION SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 123.
5. CONCRETE FOR THE SECONDARY POURS OF THE EXPANSION JOINT BLOCKOUTS SHALL BE SUPERSTRUCTURE STRUCTURAL CONCRETE, 6000 PSI. SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT CONCRETE COMPLETELY SUPPORTS SUPPORT BOXES AND IS WELL CONSOLIDATED.
6. SEE THE ABUTMENT REINFORCING DRAWINGS AND THE ABUTMENT DIAPHRAGM REINFORCING DRAWINGS FOR THE REINFORCING TO BE PLACED IN THE PRIMARY ELEMENT POURS THAT EXTEND INTO THE EXPANSION JOINT BLOCKOUTS, AS WELL AS REINFORCING IN THE BLOCKOUTS. REINFORCING BARS SHALL BE CUT AND BENT INTO THE APPROXIMATE CONFIGURATIONS SHOWN.
7. THE TRANSVERSE BEAMS SHALL BE TURNED UP PAST THE GUTTER LINES SUCH THAT A MINIMUM RISE ABOVE THE GUTTER LINES OF 4" IS ACHIEVED. THE RAILS AND SEALS SHALL BE CONTINUOUS ACROSS THE WIDTH OF THE JOINTS, INCLUDING TURN UPS.
8. EXPANSION JOINT DEVICES SHALL NOT BE INSTALLED UNTIL THE ENTIRE STRUCTURE HAS BEEN CONSTRUCTED, ALL LONGITUDINAL TENDONS STRESSED, AND ANY MILLING OF INTEGRAL WEARING SURFACE COMPLETE.
9. SEE ABUTMENT AND ABUTMENT DIAPHRAGM DRAWINGS FOR ADDITIONAL BLOCKOUT DIMENSIONS.
10. SET EXPANSION JOINT SUCH THAT IT CAN ACCOMMODATE THE MOVEMENTS SHOWN AT THE LISTED TEMPERATURES. TEMPERATURE IS THE AVERAGE CONCRETE SUBSTRATE TEMPERATURE AT THE TIME OF JOINT INSTALLATION, MEASURED AS THE SURFACE TEMPERATURE AT THE MID HEIGHT OF THE WEB INSIDE THE BOX GIRDER. TOTAL MOVEMENTS INCLUDE 1.2 FACTOR OF SAFETY AS PER AASHTO, "LRFD BRIDGE DESIGN SPECIFICATIONS".
11. JOINTS SHALL BE FORMED AT 6" WHEN CASTING SUPERSTRUCTURE, BUT WILL CHANGE WITH TIME AND TEMPERATURE.
12. THE EXPANSION JOINTS SHOWN ON THIS SHEET WILL BE PAID FOR UNDER BRIDGE EXPANSION DEVICE (0-12 INCH). COST SHALL INCLUDE ALL MATERIALS AND ALL LABOR FOR INSTALLATION.
13. MAINTAIN MINIMUM 4 ½" CLEAR COVER FROM SECONDARY POUR REINFORCING TO TOP SURFACE OF SECONDARY POUR.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
EXPANSION JOINT DETAILS II

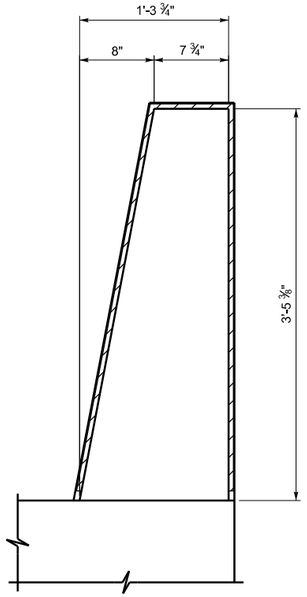
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

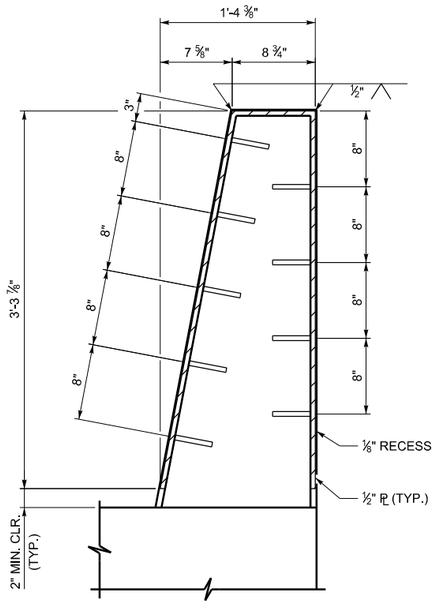
F-763
DRG. NO.

SHT. 84 OF 187

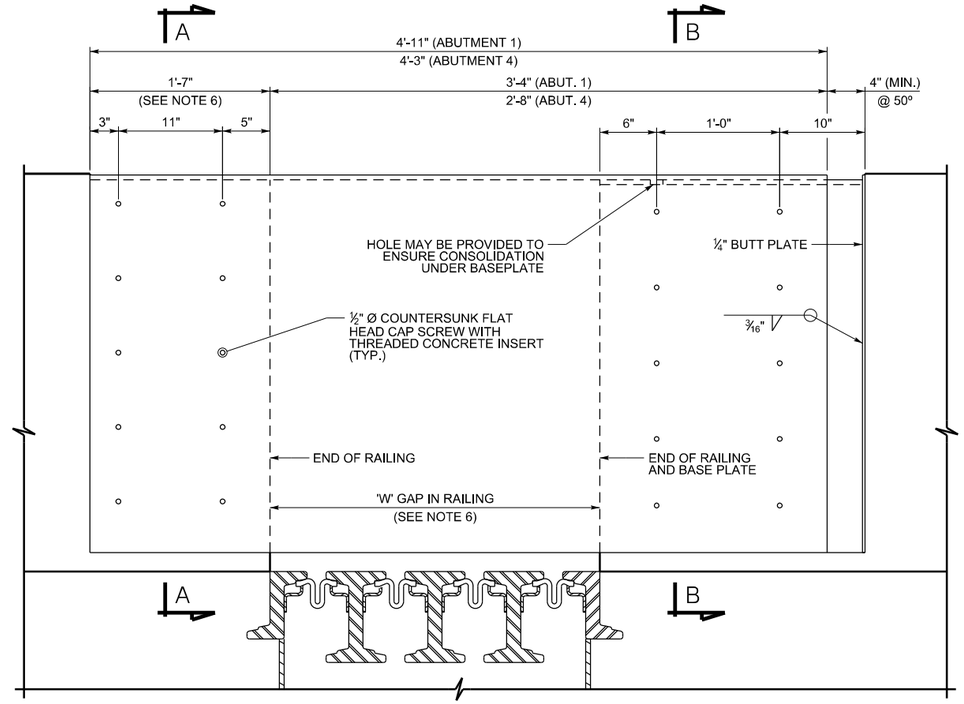
5/7/2008 G:\Projects\Moab\5365.08\Sheet Files\Structures\5365_F-763_084_EXP_JT_DETAILS_II.dgn



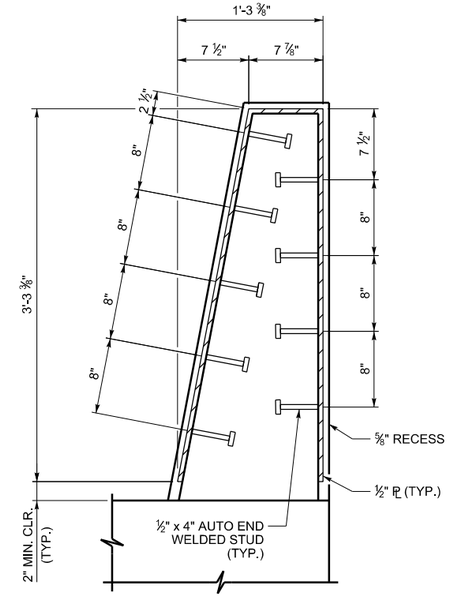
SECTION A-A
(BRIDGE RAIL DIMENSIONS SHOWN)



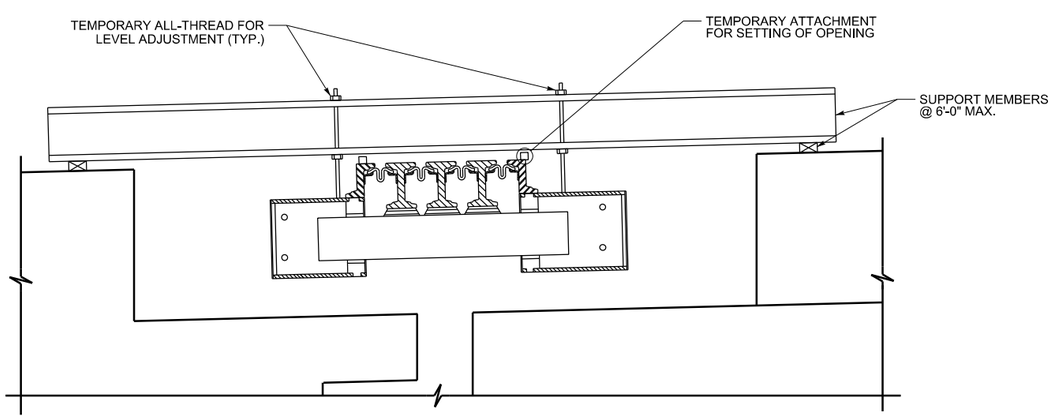
SECTION A-A
(COVER PLATE DIMENSIONS SHOWN)
(DIMENSIONS ARE TO OUTSIDE OF PLATE)



BRIDGE RAIL ELEVATION
(ABUTMENT 1 SHOWN, ABUTMENT 4 SIMILAR)



SECTION B-B
(BASE PLATE DIMENSIONS SHOWN)
(DIMENSIONS ARE TO OUTSIDE OF PLATE)



MODULAR JOINT INSTALLATION DETAIL

INSTALLATION SEQUENCE:

1. SET THE EXPANSION JOINT IN PLACE AND ADJUST TO PROPER SETTING.
2. PLACE THE EXPANSION JOINT REINFORCING AND TRANSVERSE POST-TENSIONING TENDON.
3. CAST THE SECONDARY POUR CONCRETE AFTER ENGINEER APPROVAL.
4. AFTER CONCRETE REACHES INITIAL SET, OR PER DIRECTION OF EXPANSION JOINT MANUFACTURER, RELEASE JOINT FROM ANY TEMPORARY SUPPORTS AND ATTACHMENTS.
5. AFTER CONCRETE ACHIEVES A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI, STRESS TRANSVERSE POST-TENSIONING TENDON.

PRELIMINARY:
NOT FOR CONSTRUCTION

ESTIMATED QUANTITIES

ITEM DESCRIPTION	UNIT	QUANTITY
MODULAR EXPANSION JOINT DEVICE (0-6 IN)	LF	74
MODULAR EXPANSION JOINT DEVICE (0-12 IN)	LF	74

NOTES:

1. STEEL FOR THE COVER PLATES SHALL CONFORM TO AASHTO M270, GRADE 36 OR GRADE 50.
2. THE COVER PLATES SHALL BE GALVANIZED, FOLLOWED BY PAINTING WITH TWO COATS OF A ZINC RICH INORGANIC PAINT MATCHING FEDERAL STANDARD 595B, COLOR NO. TBD (DEC. 1989).
3. SHOP DRAWINGS FOR THE COVER PLATES SHALL BE SUBMITTED ALONG WITH THE SHOP DRAWINGS FOR THE EXPANSION JOINT DEVICES.
4. THE COST OF THE COVER PLATES SHALL BE INCLUDED IN THE BID PRICE FOR THE EXPANSION DEVICES.
5. SEE THE BRIDGE RAIL SHEETS FOR BRIDGE RAIL REINFORCING.
6. 'W' GAP IS SET WHEN CASTING EXPANSION JOINT AND MAY BE DIFFERENT AT THE TIME OF COVER PLATE INSTALLATION. MAINTAIN THE 1'-7" DIMENSION TO THE FIXED SIDE OF THE COVER PLATE.

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
EXPANSION JOINT DETAILS III

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 85 OF 187

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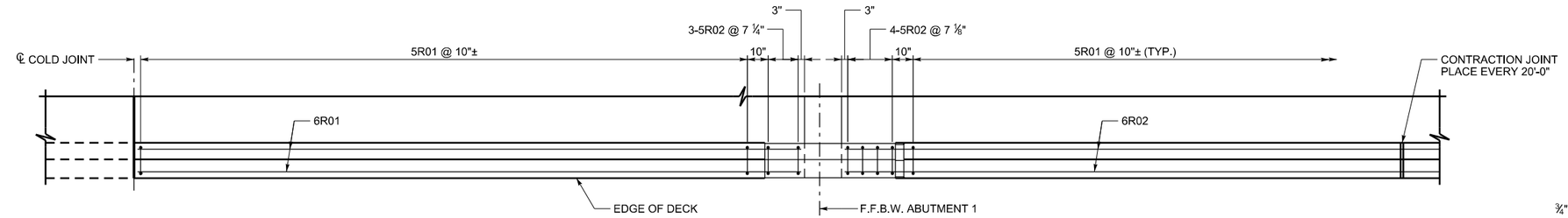
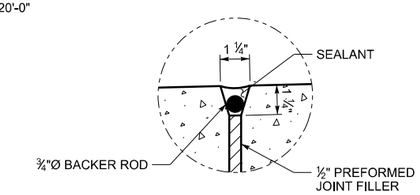
5/7/2008

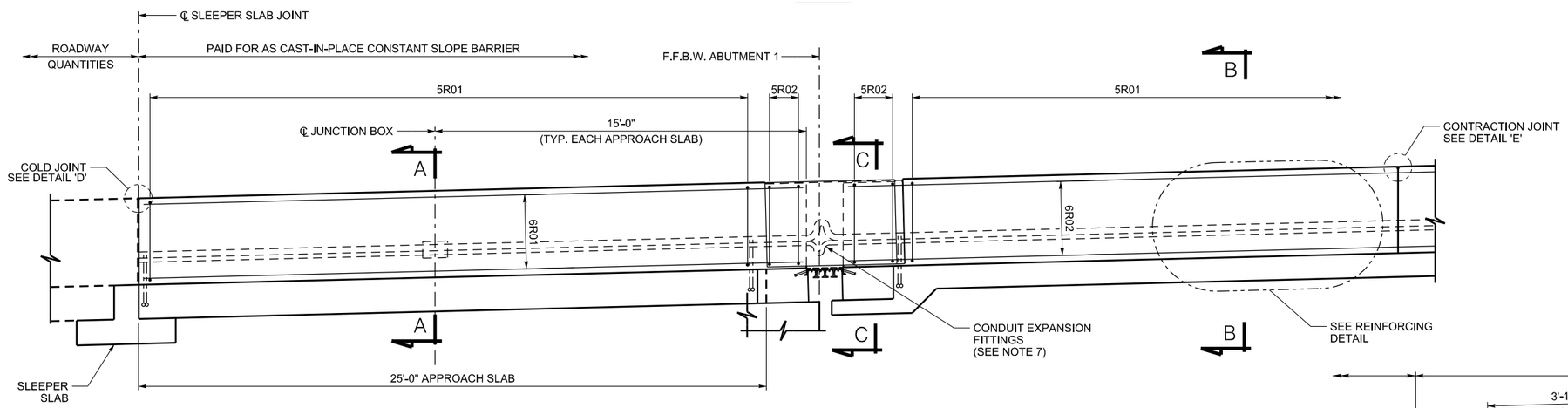


PLAN



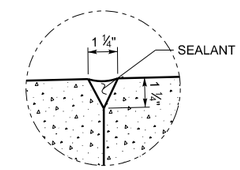
DETAIL 'D'

(PLACED AT SLEEPER SLAB JOINTS)

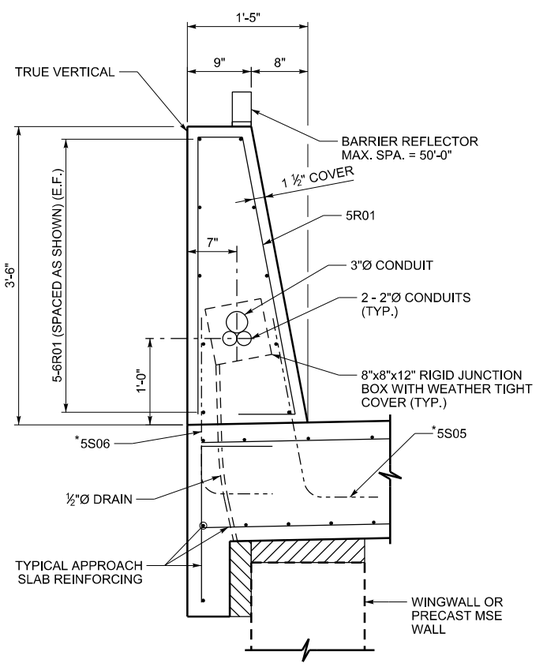


ELEVATION

(ABUT. 1 SHOWN, ABUTMENT 4
OPPOSITE HAND)

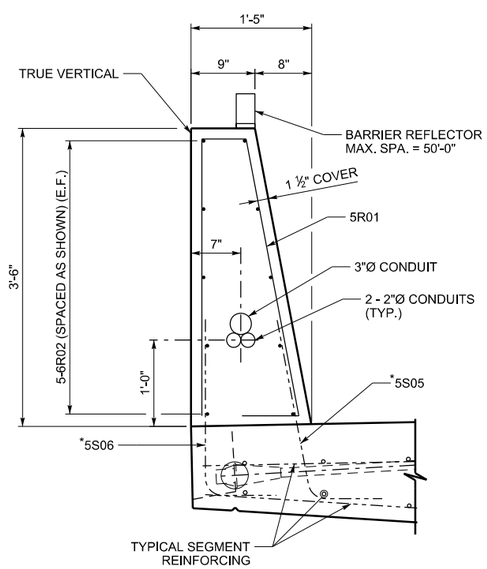


DETAIL 'E'



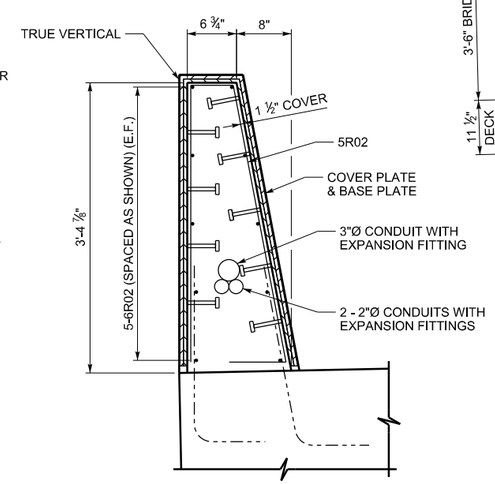
SECTION A-A

(APPROACH SLAB)



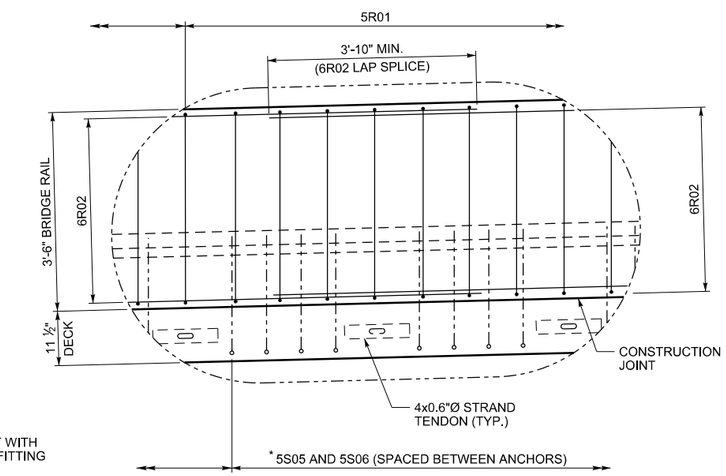
SECTION B-B

(TYPICAL)



SECTION C-C

(SLIDING PLATES)



REINFORCING DETAIL

NOTES:

1. ALTERNATE ALL REINFORCING STEEL SPLICES.
2. PROVIDE 1 ½" MIN. COVER TO REINFORCING STEEL UNLESS OTHERWISE NOTED.
3. PLACE CONTRACTION JOINT ON SIDES AND TOP OF PARPET.
4. EXTEND SEALANT AND FOAM BACKER ROD FROM DECK TO TOP OF PARPET ON THE INSIDE PARPET FACE AND ACROSS TOP OF PARPET.
5. BRIDGE RAIL CONCRETE SHALL BE SUPERSTRUCTURE CONCRETE (AA)(AE) 4000 PSI.
6. ALL REINFORCING SHALL BE EPOXY COATED.
7. EXPANSION FITTINGS SHALL BE SIZED TO ACCOMODATE MOVEMENTS LISTED ON THE EXPANSION JOINT DETAILS SHEETS.
8. * FOR PLACEMENT OF 5S05 AND 5S06 BARS SEE SEGMENT AND CAST-IN-PLACE REINFORCING SHEEETS.
9. 2" AND 3" CONDUIT SHALL BE SCHEDULE 40 PVC PIPE. CONDUIT TO TERMINATE IN JUNCTION BOXES IN EACH APPROACH SLAB BARRIER WITH DOUBLE LOCK NUTS.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
CONSTANT SLOPE BARRIER DET. I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 86 OF 187

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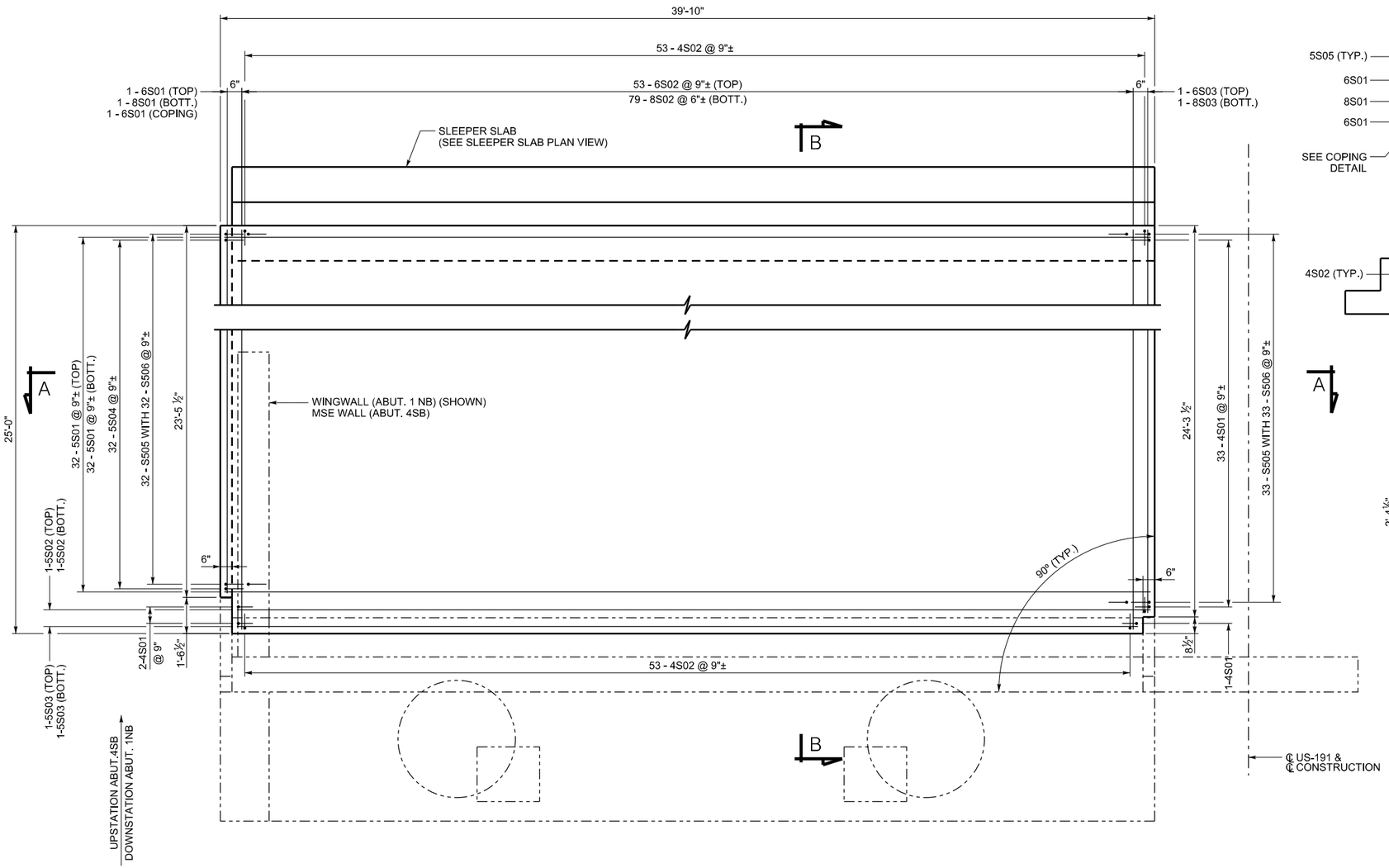
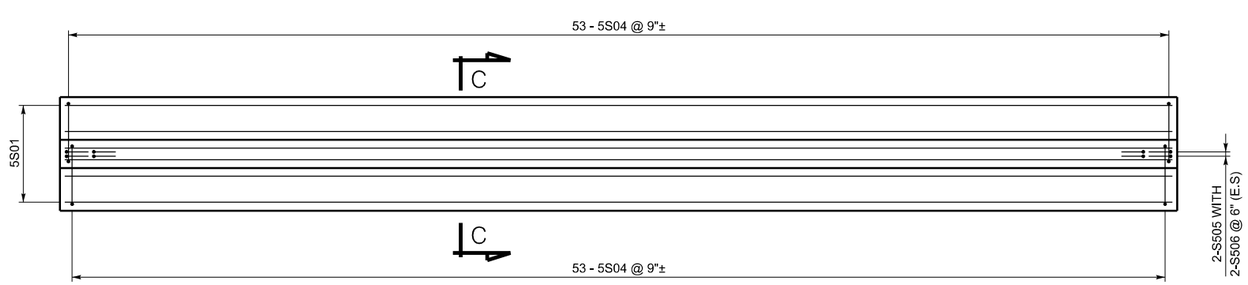
5/7/2008

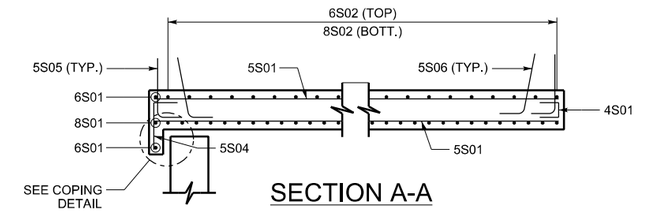


PLAN VIEW - APPROACH SLAB

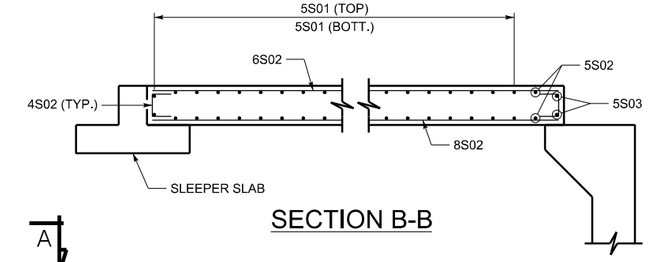
(ABUTMENT 1NB SHOWN, ABUTMENT 4SB SIMILAR)



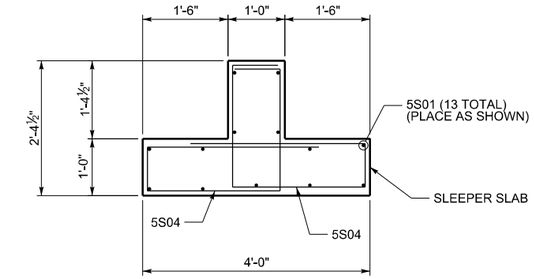
PLAN VIEW - SLEEPER SLAB



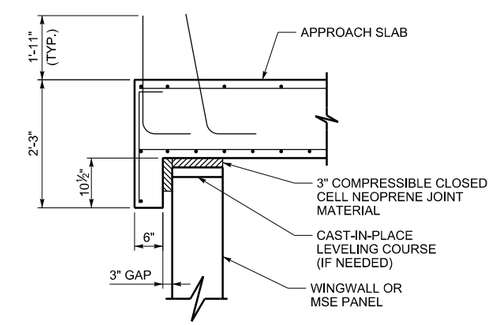
SECTION A-A



SECTION B-B



SECTION C-C



COPING DETAIL

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING IS VALID FOR APPROACH SLABS AT ABUTMENT 1NB AND ABUTMENT 4SB.
2. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
3. ALL BAR BENDS SHALL BE IN ACCORDANCE WITH CRSI.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
UDOT BRIDGE ENGR. DATE
APPROVAL RECOMM. DATE
APPROVED FOR ISSUE BY UDOT DATE

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
APPROACH SLAB DETAILS I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 89 OF 187

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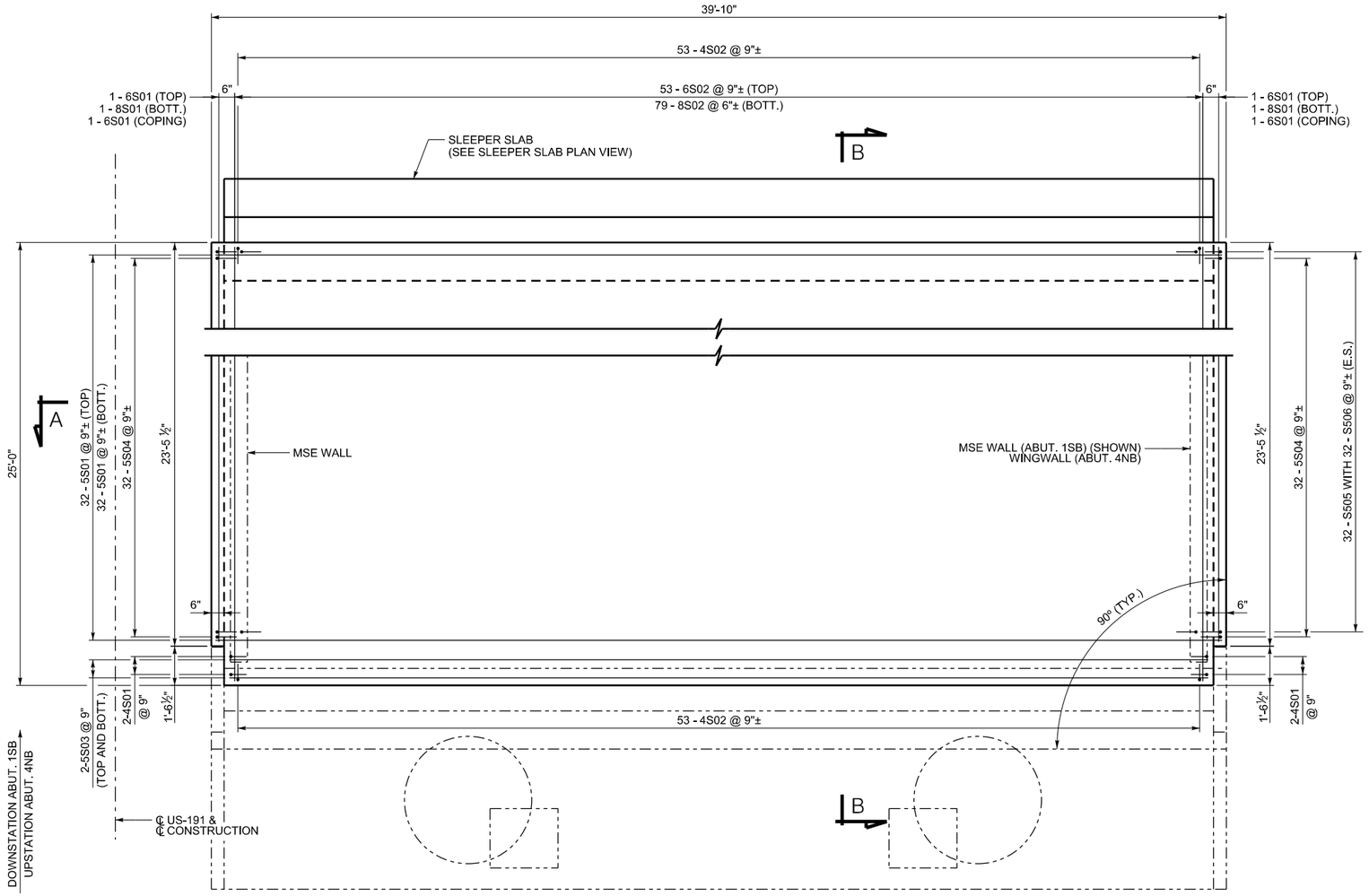
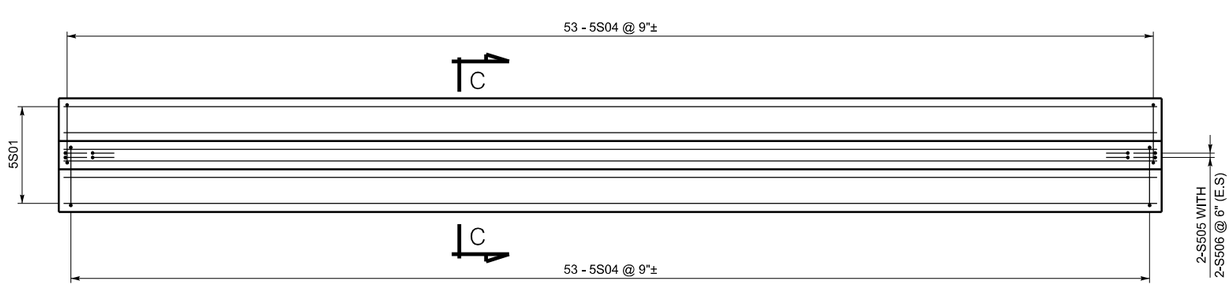
5/7/2008

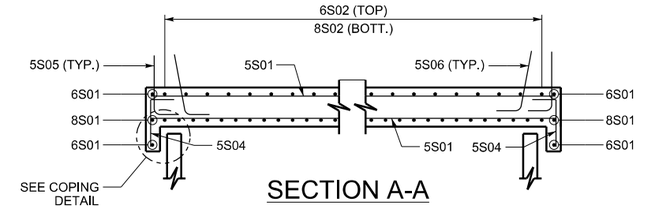


PLAN VIEW - APPROACH SLAB

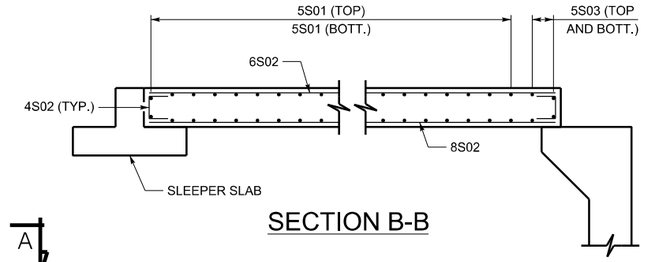
(ABUTMENT 1SB SHOWN, ABUTMENT 4NB SIMILAR)



PLAN VIEW - SLEEPER SLAB



SECTION A-A



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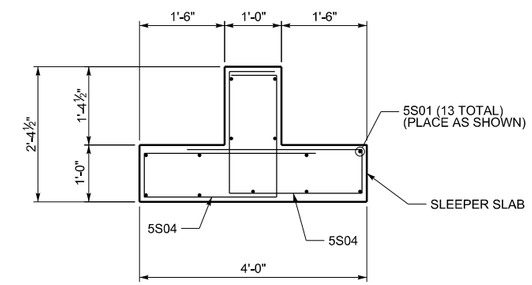

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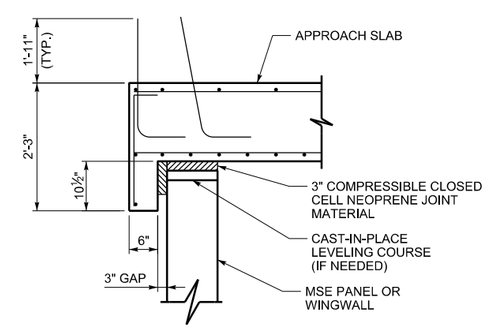

COPING DETAIL

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING IS VALID FOR APPROACH SLABS AT ABUTMENT 1SB AND ABUTMENT 4NB.
2. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
3. ALL BAR BENDS SHALL BE IN ACCORDANCE WITH CRSI.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08	CHECK XXX MM/YY		
DRAWN RJA 04/08	CHECK XXX MM/YY		
QUANT. XXX MM/YY	CHECK XXX MM/YY		

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR RELEASE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
APPROACH SLAB DETAILS II

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 90 OF 187

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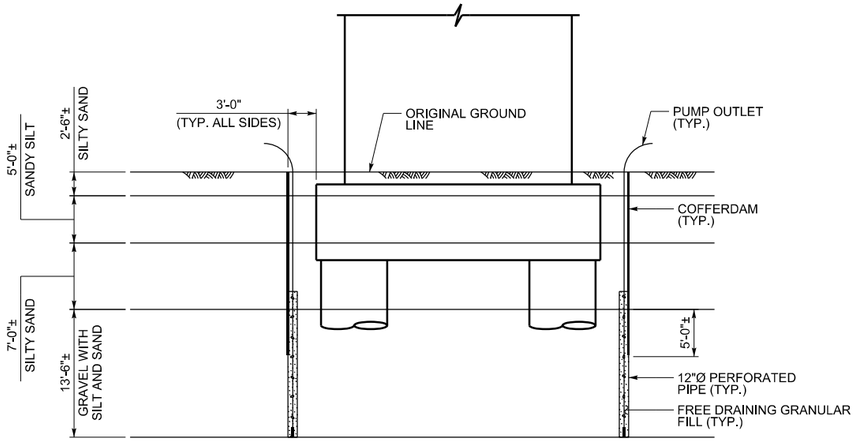
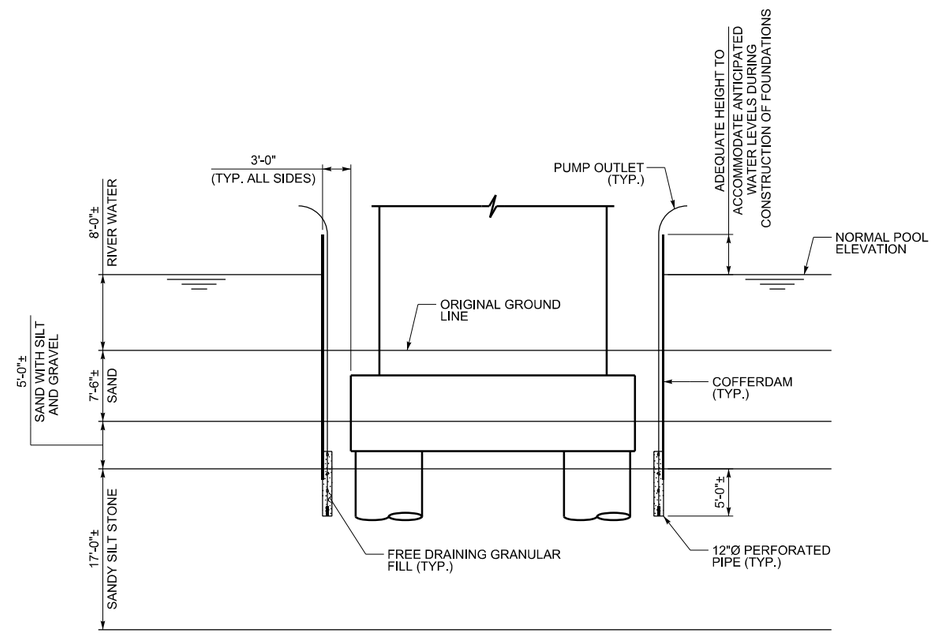
5/7/2009

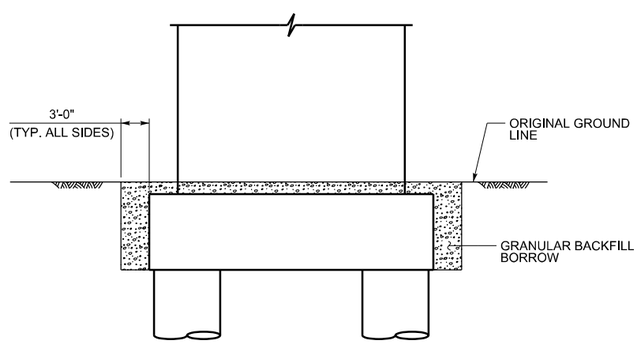


SHORING PIER 2



SHORING PIER 3

ESTIMATED QUANTITIES					
DESCRIPTION	UNIT	PIER 2NB	PIER 2SB	PIER 3NB	PIER 3SB
GRANULAR BACKFILL BORROW	CY	189.2	189.2	179.8	179.8



BACKFILL
(PIER 2 SHOWN, PIER 3 SIMILAR)

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR DEWATERING OPERATIONS.
2. THE MEANS AND METHODS OF PROVIDING SHORING AND DEWATERING THE EXCAVATION TO CONSTRUCT FOOTINGS IN THE DRY IS THE RESPONSIBILITY OF THE CONTRACTOR. SEAL POURS ARE NOT ANTICIPATED, BUT MAY BE USED WITH APPROVAL BY THE ENGINEER TO ACHIEVE DRY FOOTING CONSTRUCTION.
3. FOR ADDITIONAL SHORING INFORMATION, SEE SPECIAL PROVISIONS.
4. THE COST OF COFFERDAMS INCLUDING ALL EXCAVATION, PERFORATED PIPES, SUMP PUMPS, FREE DRAINING GRANULAR FILL, AND ALL OTHER ITEMS NECESSARY FOR THE DEWATERING AND COFFERDAM CONSTRUCTION SHALL NOT BE PAID FOR SEPERATELY AND SHALL BE CONSIDERED INCIDENTAL TO THE WORK.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN CCB 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
COFFERDAM DETAILS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 92 OF 187

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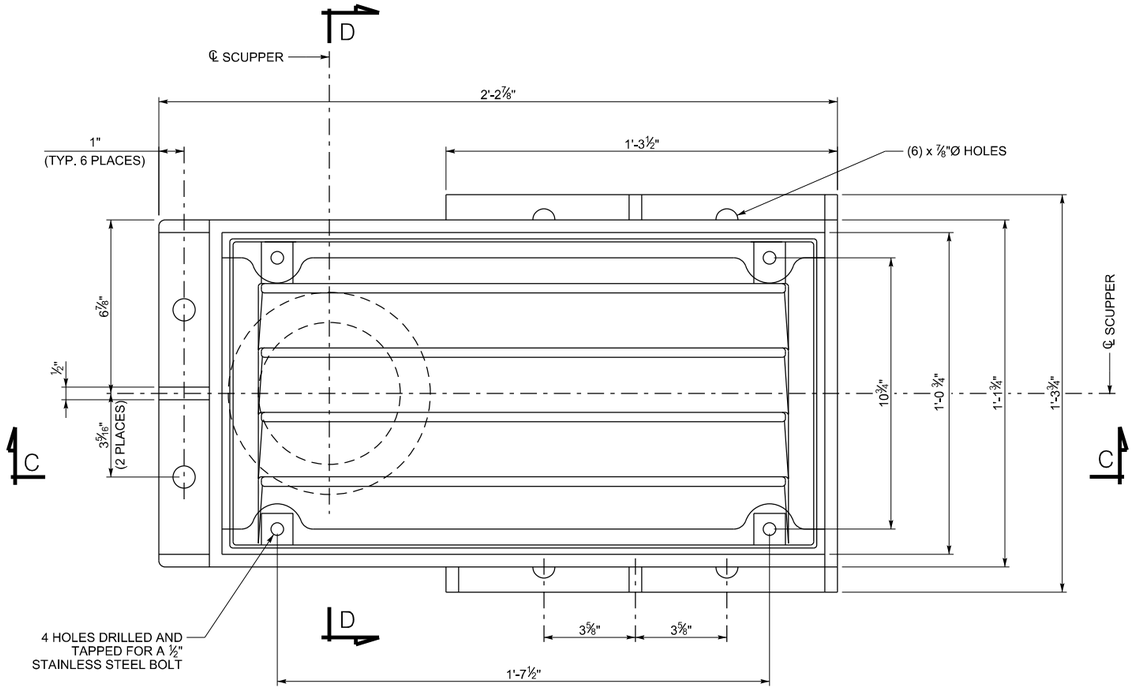
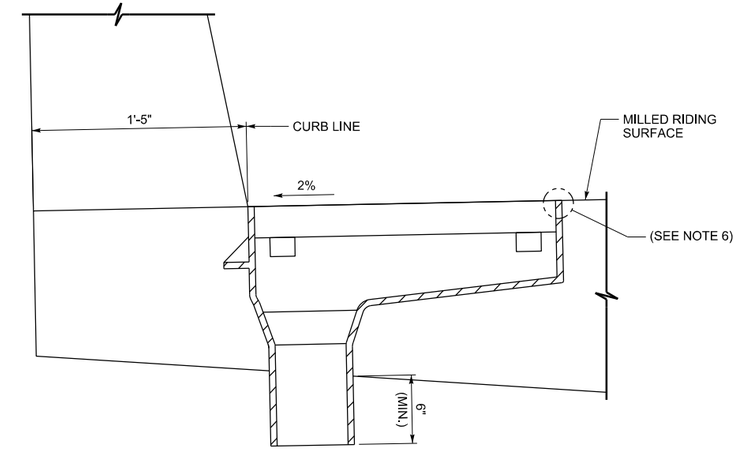
5/7/2008



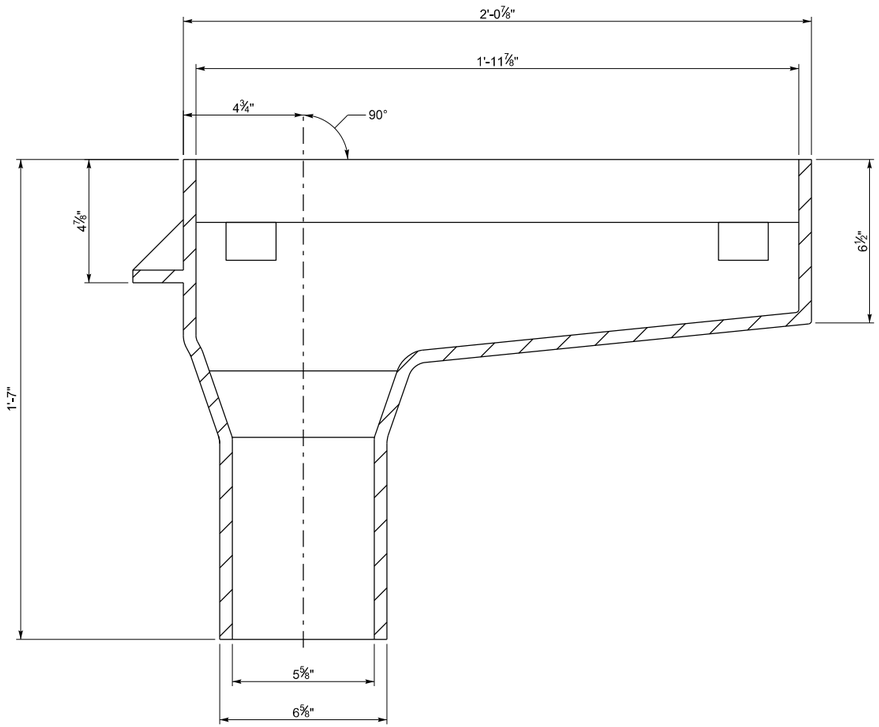
SCUPPER PLAN

(NEENAH 3922)

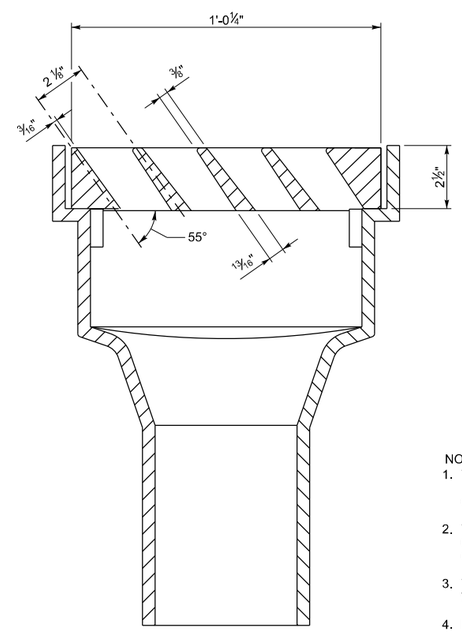


WING DETAIL

(TYP. ALL BRIDGE DRAINS)



SECTION C-C



SECTION D-D

PRELIMINARY:
NOT FOR CONSTRUCTION

ESTIMATED QUANTITIES		
DESCRIPTION	UNIT	QUANTITY
BRIDGE DRAIN	EA	12

NOTES:

1. THIS DRAWING SHOWS A SCHEMATIC OF THE DRAINAGE DETAILS. PRIOR TO FABRICATION AND INSTALLATION, WORKING DRAWINGS, WHICH COMPLY WITH THE REQUIREMENTS OF SECTION 727M OF THE SPECIFICATIONS, SHALL BE SUBMITTED.
2. THE BRIDGE DRAINS SHALL BE OF THE TYPE AND SIZE SHOWN AND SHALL BE MADE OF DUCTILE IRON CONFORMING TO ASTM A536-80, GRADE 65-45-12. BOLTS FOR THE ATTACHMENT OF THE GRATING SHALL BE STAINLESS STEEL. GRATING SHALL HAVE FULL AND EVEN SEATING.
3. THE PIPE FOR THE BRIDGE DRAINS SHALL CONFORM TO ASTM A53. ALL CONNECTIONS SHALL BE WELDED OR FITTED. FLANGED CONNECTIONS WILL NOT BE ALLOWED.
4. BRIDGE DRAINS SHALL BE PLACED AND SECURED AT THE POSITIONS SHOWN ON THE PLANS PRIOR TO PLACEMENT OF CONCRETE.
5. A MAXIMUM OF 3 TOP LONGITUDINAL BARS MAY BE CUT TO WITHIN 2" OF DRAINS. ALL OTHER LONGITUDINAL BARS SHALL BE SPACED TO AVOID DRAINS.
6. CONSIDERATION SHOULD BE GIVEN TO SETTING THE BRIDGE DRAIN ¼" TO ½" BELOW FINISHED GRADE SO THAT THE DRAIN DOES NOT PROTRUDE FROM THE DECK AFTER THE MAX. ALLOWED ½" MILLING TO OBTAIN RIDING SURFACE.

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BRIDGE DRAINAGE DETAILS I

PROJECT NUMBER BRF-0191(58)129

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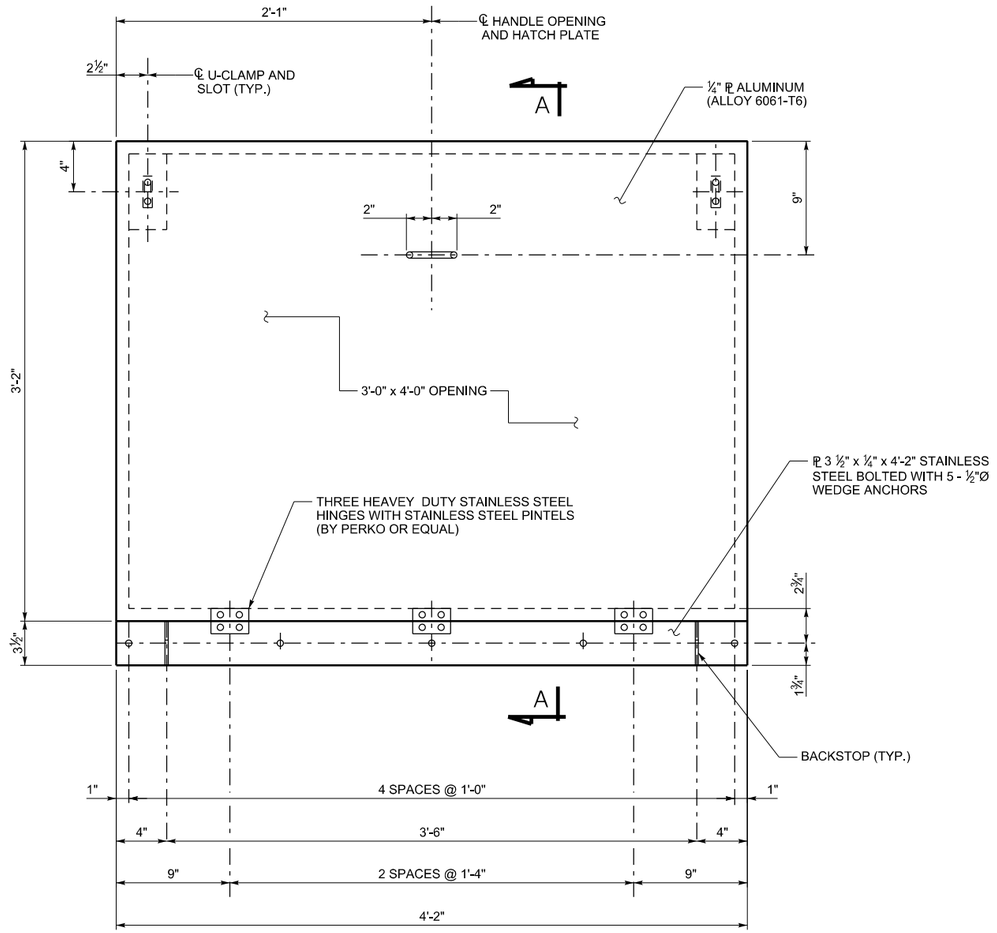
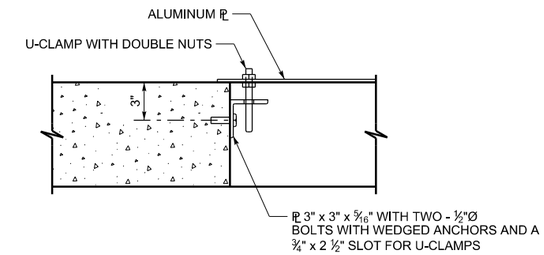
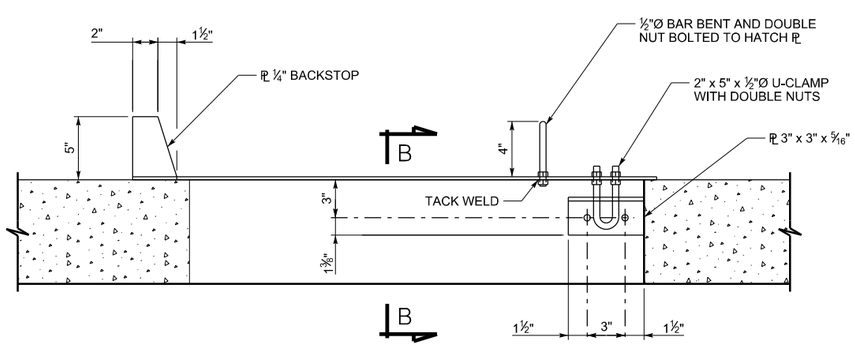


PLAN - ACCESS HOLE HATCH DOOR



SECTION B-B
(PADLOCK MECHANISM)



SECTION A-A

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:
1. ALL HATCHES TO BE SECURED THROUGH U-CLAMP BY HEAVY DUTY CORROSION RESISTANT PADLOCK. KEYS TO BE FURNISHED TO ENGINEER UPON ACCEPTANCE OF THE PROJECT.
2. ALL ITEMS, INCLUDING MATERIAL AND LABOR ASSOCIATED WITH SEGMENT ACCESS DETAILS, SHALL BE INCIDENTAL TO THE COST OF THE SUPERSTRUCTURE.
3. ALL ACCESS HATCH COMPONETS SHALL BE STAINLESS STEEL OR GALVANIZED, UNLESS OTHERWISE NOTED.

NO.	DATE	BY	REMARKS

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UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
ACCESS HATCH DETAILS

PROJECT NUMBER BRF-0191(58)129

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COUNTY

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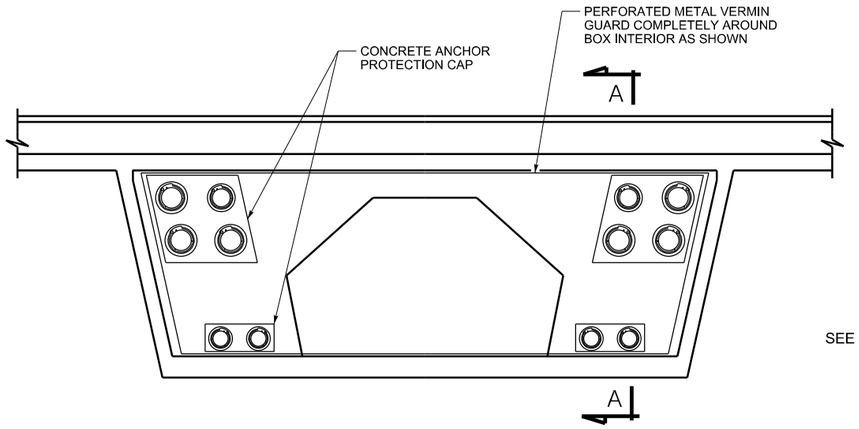
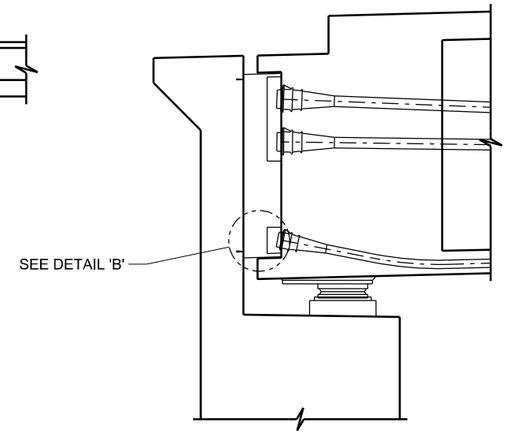
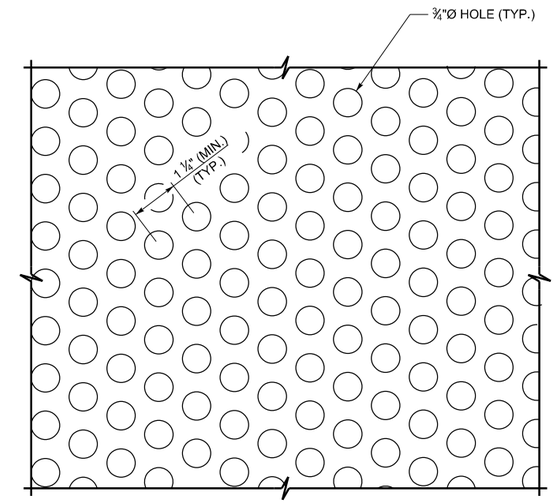


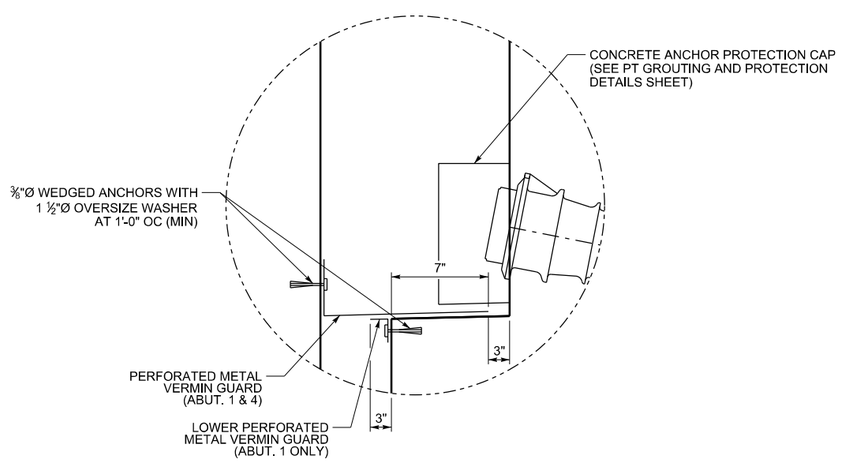
END VIEW
(BOX GIRDER AT ABUTMENTS)



SECTION A-A



PERFORATED PLATE DETAIL



DETAIL 'B'

NOTES:
1. THIS DRAWING SHOWS VERMIN GUARD DETAILS TO BE INSTALLED IN BOTH BOX GIRDER BRIDGES AT BOTH ABUTMENTS.
2. PERFORATED PLATES SHALL BE MANUFACTURED FROM 11 GUAGE MINIMUM THICKNESS PLATE. ALL SHARP EDGES AND BURRS SHALL BE GROUND SMOOTH. PLATES SHALL BE GALVANIZED AFTER FABRICATION. FIELD CUTS SHALL BE GROUND SMOOTH & TOUCHED UP WITH GALVANIZING PAINT.
3. WEDGED ANCHORS AND WASHERS SHALL BE STAINLESS STEEL.
4. COST FOR INSTALLED VERMIN GUARD DETAILS IS INCIDENTAL TO THE COST OF THE SUPERSTRUCTURE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
VERMIN GUARD DETAILS
PROJECT NUMBER BRF-0191(58)129

GRAND
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NOTES:

1. THE NOTES ON THIS DRAWING ARE APPLICABLE TO THE CONSTRUCTION SCHEMATIC DRAWINGS THAT FOLLOW.

2. THE INFORMATION SHOWN ON CONSTRUCTION SCHEMATIC DRAWINGS I THROUGH III ILLUSTRATE THE ASSUMPTIONS MADE BY THE ENGINEER OF RECORD DURING DESIGN OF THE STRUCTURE. INFORMATION IS FOR INFORMATION ONLY. THE CONTRACTOR IS RESPONSIBLE FOR SELECTING THE MEANS AND METHODS OF CONSTRUCTION AND SHALL SUBMIT DETAILS OF THESE MEANS AND METHODS TO THE ENGINEER FOR REVIEW. THIS SHALL INCLUDE DETAILS OF THE CONSTRUCTION SEQUENCE AS WELL AS SUPPORTING CALCULATIONS SHOWING THE INFLUENCE OF THE SELECTED SEQUENCE, LOADS AND DETAILS ON THE STRUCTURE, IN ACCORDANCE WITH THE CONTRACT PLANS AND PROJECT SPECIFICATIONS.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION WITH DUE CONSIDERATION OF THE CONSTRUCTION SEQUENCE ASSUMED IN DESIGN AND HIS SELECTED MEANS AND METHODS.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE FALSEWORK, FORMWORK, WORK PLATFORMS AND OTHER TEMPORARY WORKS IN CONFORMANCE WITH AASHTO AND THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.

5. THE BRIDGE PIERS, FOOTINGS AND DRILLED SHAFT FOUNDATIONS HAVE BEEN DESIGNED TO RESIST THE OUT-OF-BALANCE LOADS DURING CANTILEVER CONSTRUCTION AS DEFINED BY THE AASHTO LRFD DESIGN SPECIFICATIONS. IT WAS THE INTENT OF THE DESIGNER AND THE ASSUMED ERECTION SCHEME TO ALLOW CANTILEVER CONSTRUCTION FROM THE PIERS WITH NO REQUIREMENT FOR TEMPORARY SUPPORTS. GIVEN THE ASSUMED CONSTRUCTION SCHEME SHOWN IN THE CONSTRUCTION SCHEMATIC DRAWINGS, THE AASHTO SPECIFIED MINIMUM FACTOR OF SAFETY OF 1.5 FOR OVERTURNING HAS BEEN SATISFIED FOR ALL ANTICIPATED LOADS DURING CONSTRUCTION WITHOUT TEMPORARY WORKS. HOWEVER, TEMPORARY POST-TENSIONING BAR TIE-DOWNS ARE REQUIRED BETWEEN THE SUPERSTRUCTURE AND PIERS AS SHOWN ON THE PIER CONNECTION DETAILS SHEET AND THE CONSTRUCTION SEQUENCE SHEETS TO SATISFY GLOBAL STABILITY FOR THE AASHTO SEGMENT CONCRETE DROP CASE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE DESIGN OF THE PIERS, FOOTINGS AND DRILLED SHAFT FOUNDATIONS AND THE GLOBAL STABILITY OF THE SUPERSTRUCTURE FOR HIS SELECTED MEANS AND METHODS.

6. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING THE ADEQUACY OF THE STRUCTURE AND PROVIDING ANY ADDITIONAL REINFORCING AND/OR OTHER MODIFICATIONS NEEDED TO RESIST THE CONSTRUCTION LOADS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS ADDITIONAL REINFORCING AND/OR OTHER MODIFICATIONS TO THE STRUCTURE. THE COST OF ANY ADDITIONAL REINFORCING AND/OR OTHER MODIFICATIONS TO THE STRUCTURE TO ACCOMMODATE THE CONTRACTORS SELECTED MEANS AND METHODS SHALL BE INCLUDED IN THE CONTRACT BID PRICE.

7. THE ASSUMED CONSTRUCTION SEQUENCE SHOWN ON THE CONSTRUCTION SCHEMATIC DRAWINGS SHOWS THE CONSTRUCTION OF THE CANTILEVERS PROGRESSING IN A LINEAR FASHION SO THAT A SINGLE PAIR OF FORM-TRAVELERS MAY BE USED. FALSEWORK SECTION MAY BE CONSTRUCTED SIMULTANEOUSLY. IF THE CONTRACTOR CHOOSES TO USE TWO PAIRS OF FORM TRAVELERS, CONSTRUCTION OF CANTILEVERS 2 AND 3 MAY PROGRESS SIMULTANEOUSLY, EXCEPT THAT END SPAN AND MAIN SPAN CLOSURE SEGMENTS MUST STILL BE PLACED IN THE FOLLOWING ORDER: SPAN 1, SPAN 3, THEN SPAN 2.

8. POST-TENSIONING TENDONS SHALL BE STRESSED IN THE SEQUENCE AND CONSTRUCTION STEP SHOWN IN THE CONSTRUCTION SCHEMATIC DRAWINGS.

9. THE MINIMUM NAVIGATIONAL CLEARANCE ENVELOPE IN THE RIVER SHOWN ON CONSTRUCTION SCHEMATIC III DRAWING, MAY BE PROVIDED TO EITHER SIDE OF BENT 3, AND SHALL BE MAINTAINED BETWEEN THE MONTHS OF MARCH AND OCTOBER TO ALLOW BOAT ACCESS UPSTREAM FOR COMMERCIAL BOAT TOURS. LIGHTING SHALL BE PROVIDED ON ANY TEMPORARY WORKS ADJACENT TO THE WATERWAY, INCLUDING BUT NOT LIMITED TO WORK PLATFORMS AND FORM TRAVELERS, SO THAT THEY CAN BE CLEARLY SEEN AT NIGHT FROM THE WATERWAY.

10. CONSTRUCTION WORK TIME LIMITATIONS AND SITE ACCESS REQUIREMENTS SHALL BE IN ACCORDANCE WITH PROJECT SPECIAL SPECIFICATION 00555M.

11. UTILITIES SHOWN ON THE CONSTRUCTION SCHEMATIC DRAWINGS ARE NOT INTENDED TO BE ALL INCLUSIVE OF UTILITIES WITHIN THE PROJECT LIMITS. SEE UTILITIES PLANS FOR MORE INFORMATION.

12. IN THE FINAL CONFIGURATION, BEARINGS AT BENT 2 ALLOW LONGITUDINAL TRANSLATION OF THE SUPERSTRUCTURE. THEREFORE, DURING CONSTRUCTION, THESE BEARINGS MUST BE TEMPORARILY FIXED TO PREVENT TRANSLATION DURING CANTILEVER CONSTRUCTION AND CAN BE RELEASED AFTER MAKING MAIN SPAN CLOSURE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE METHOD BY WHICH THE BEARINGS WILL BE TEMPORARILY FIXED, AND SHALL SUBMIT DETAILS TO THE ENGINEER FOR REVIEW AND APPROVAL.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

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UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
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US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
CONSTRUCTION SCHEMATIC I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 100 OF 187

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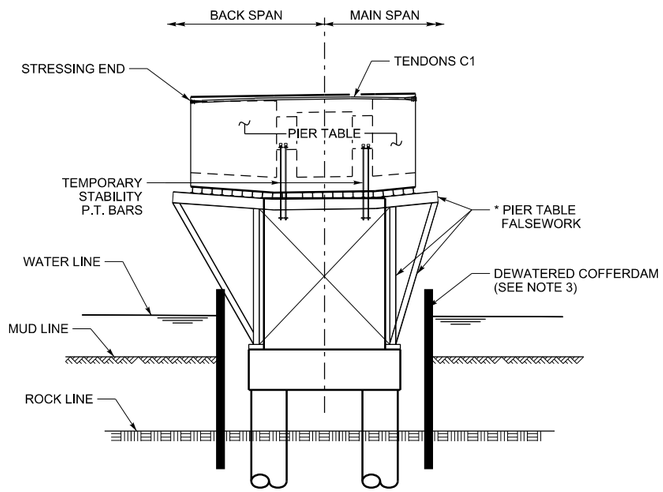


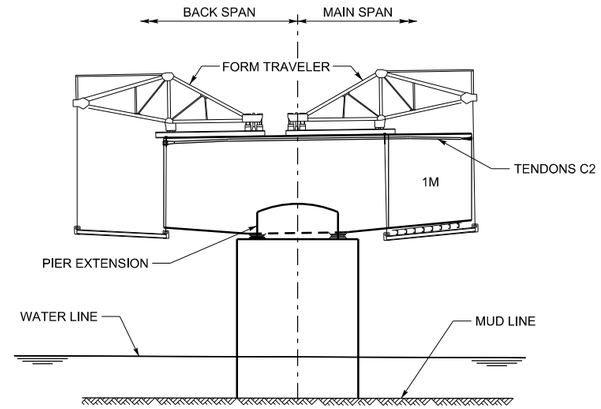
STEP 1

a. CAST-IN-PLACE PIER TABLE ON FALSEWORK SUPPORTED FROM PIER FOOTING AFTER PIER IS CONSTRUCTED AND BEARING PEDESTAL CONCRETE REACHES 4000 PSI.

** b. STRESS TRANSVERSE PIER TABLE TENDONS FOLLOWED BY CANTILEVER TENDONS C1.

c. LOWER PIER TABLE FALSEWORK SO PIER TABLE IS SUPPORTED BY BEARINGS. BEARINGS SHALL BE TEMPORARY FIXED TO PREVENT LONGITUDINAL TRANSLATION (PIER 2 ONLY).

d. STRESS PERMANENT VERTICAL P.T. BARS IN PIER TABLE DIAPHRAGM THEN STRESS THE TEMPORARY STABILITY P.T. BARS. SEE PIER CONNECTION DETAILS FOR DETAILS OF TEMPORARY P.T. BARS.



STEP 2

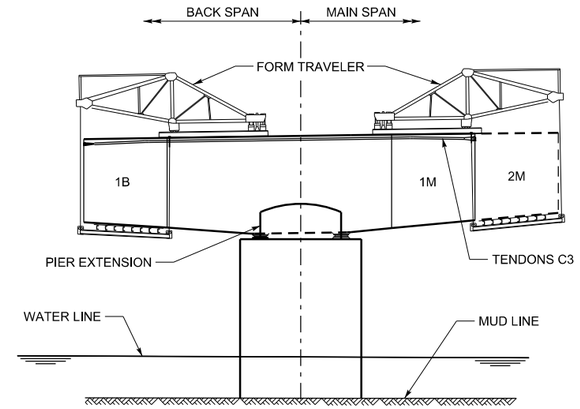
a. CAST PIER EXTENSIONS. (PIER EXTENSIONS CAN BE CAST ANYTIME AFTER COMPLETEING THE PIER TABLE)

b. ERECT FORM TRAVELERS.

c. CAST SEGMENT 1M.

** d. STRESS TRANSVERSE TENDONS IN SEGMENT 1M FOLLOWED BY CANTILEVER TENDONS C2.

e. ADVANCE FORM TRAVELER INTO 2M POSITION.

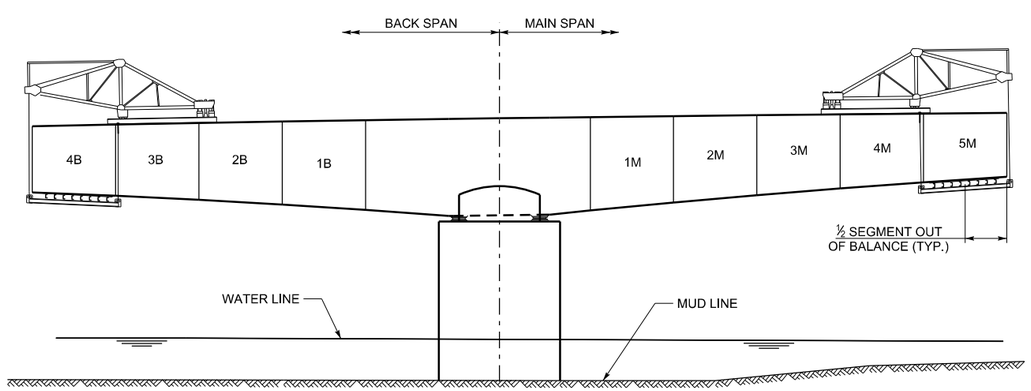


STEP 2

a. CAST SEGMENT 1B.

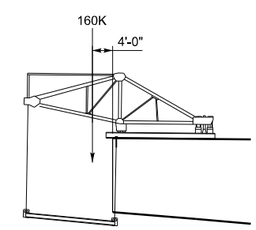
** b. STRESS TRANSVERSE TENDONS IN SEGMENT 1B FOLLOWED BY CANTILEVER TENDON C3.

c. ADVANCE FORM TRAVELER INTO 2B POSITION.



STEP 4

** a. CONTINUE CASTING SEGMENT PAIRS, ALWAYS CASTING SEGMENT TYPE M FIRST, SUCH THAT CANTILEVER IS NEVER MORE THAN ONE HALF OF A SEGMENT WEIGHT OUT OF BALANCE. CANTILEVER TNEDONS ARE STRESSED IN SEQUENCE AS CASTING PROGRESSES.



FORM TRAVELER WEIGHT

(ASSUMED FOR DESIGN)

NOTES:

1. THIS DRAWING IS A SCHEMATIC OF THE CAST-IN-PLACE SEGMENTAL CONSTRUCTION OF EACH CANTILEVER. SEE CONSTRUCTION SCHEMATIC III SHEET FOR MORE INFORMATION.

** 2. UNLESS NOTED OTHERWISE, CONCRETE SHALL ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI PRIOR TO STRESSING ANY POST-TENSIONING STRAND OR BARS ANCHORING IN THAT SEGMENT OR ELEMENT. THE TRANSVERSE TENDONS SHALL BE STRESSED FIRST, FOLLOWED BY CANTILEVER TENDONS. ALL TENDONS ANCHORING IN AN ELEMENT OR SEGMENT SHALL BE STRESSED PRIOR TO LOWERING THE FORMS AND ADVANCING THE FORM TRAVELER.

3. DRY COFFERDAMS ARE ANTICIPATED FOR THE CONSTRUCTION OF THE FOOTINGS AND PIERS AT BENT 3, AND MAY BE REQUIRED AT BENT 2 DEPENDING ON THE ANTICIPATED WATER LEVEL DURING FOOTING AND PIER CONSTRUCTION. THE COFFERDAMS MAY BE FLOODED AFTER BACKFILLING THE FOOTING AND PIER EXCAVATIONS AND AFTER THE PIER SHELL HAS BEEN FILLED WITH FLOWABLE FILL CONCRETE AS SHOWN ON THE PIER 2&3 DETAILS SHEET. COFFERDAMS AND PIER TABLE FALSEWORK MAY BE REMOVED AFTER THE PIER TABLE IS CAST AND ALL PIER TABLE POST-TENSIONING IS STRESSED. SEE SHORING DETAILS SHEET.

* 4. FOR ADDITIONAL INFORMATION, SEE CONSTRUCTION SCHEMATIC I SHEET.

PRELIMINARY:
NOT FOR CONSTRUCTION

REVISIONS

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RIVER BRIDGE - MOAB UTAH
CONSTRUCTION SCHEMATIC II

PROJECT NUMBER BRF-0191(58)129

GRAND
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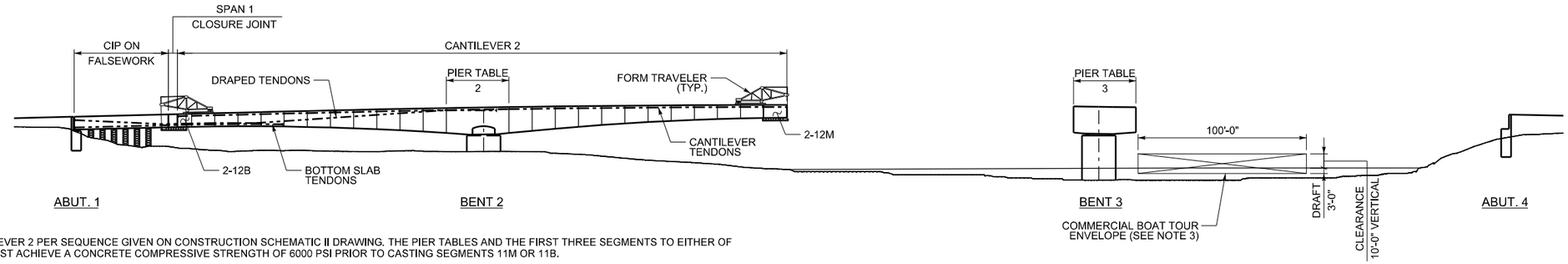
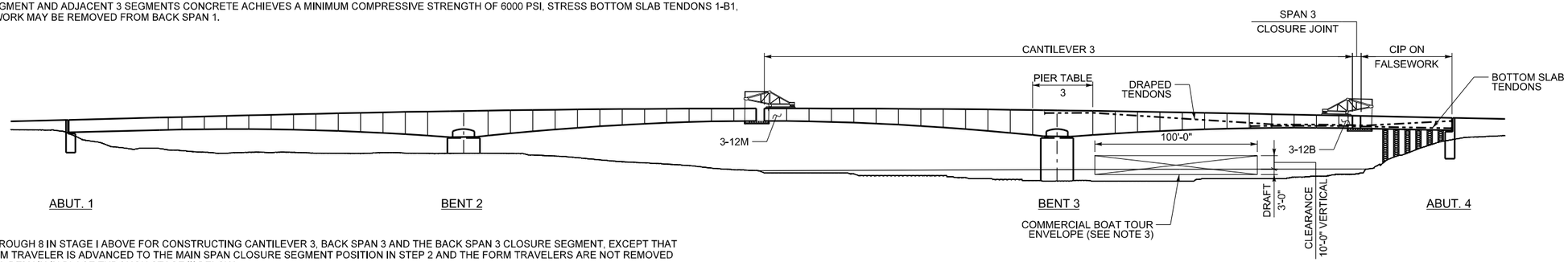


STAGE 1

1. CONSTRUCT CANTILEVER 2 PER SEQUENCE GIVEN ON CONSTRUCTION SCHEMATIC II DRAWING. THE PIER TABLES AND THE FIRST THREE SEGMENTS TO EITHER OF THE CANTILEVER MUST ACHIEVE A CONCRETE COMPRESSIVE STRENGTH OF 6000 PSI PRIOR TO CASTING SEGMENTS 11M OR 11B.
2. CONSTRUCT CIP PORTION OF BACK SPAN 1 ON FALSEWORK AFTER ABUTMENT 1 IS CONSTRUCTED. STRESS TRANSVERSE TENDONS IN CIP PORTION OF BACKSPAN 1 AFTER CONCRETE ACHIEVES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI.
3. AFTER CASTING SEGMENT 12M THE MAIN SPAN FORM TRAVELER NEED NOT BE LAUNCHED TO THE NEXT POSITION BUT SHALL REMAIN IN PLACE UNTIL STEP 7 BELOW.
4. AFTER CASTING SEGMENT 12B AND STRESSING TENDONS C25, THE BACK SPAN FORM TRAVELER IS LAUNCHED AND USED TO ALIGN THE CANTILEVER TIPS AND CAST THE BACK SPAN 1 CLOSURE SEGMENT. THE ALIGNMENT FORCE SHALL ONLY ACT DOWN ON THE CIP ON FALSEWORK CONSTRUCTION SO THAT LOAD IS NOT ADDED TO THE CANTILEVER TIP. THE MAGNITUDE OF FORCE REQUIRED TO ALIGN THE TIPS IS DEPENDENT ON THE DEGREE OF MISALIGNMENT AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO ALIGNING THE CANTILEVER TIPS.
5. AFTER CLOSURE SEGMENTS ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI AND NOT MORE THAN 8 HOURS AFTER POURING CLOSURE, STRESS DRAPED TENDON 1-D3.
6. AFTER CLOSURE SEGMENT ACHIEVES A CONCRETE MINIMUM COMPRESSIVE STRESS OF 2500 PSI, STRESS REMAINING DRAPED TENDONS 1-D1 AND 1-D2. FORM TRAVELER ALIGNMENT FORCE MAY NOW BE REMOVED.
7. AFTER CLOSURE SEGMENT CONCRETE ACHIEVES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, STRESS TRANSVERSE TENDONS IN CLOSURE SEGMENT. BOTH FORM TRAVELERS MAY BE REMOVED FROM CANTILEVER 2 AND MOVED TO CANTILEVER 3.
8. AFTER CLOSURE SEGMENT AND ADJACENT 3 SEGMENTS CONCRETE ACHIEVES A MINIMUM COMPRESSIVE STRENGTH OF 6000 PSI, STRESS BOTTOM SLAB TENDONS 1-B1, 1-B2 & 1-B3. FALSEWORK MAY BE REMOVED FROM BACK SPAN 1.



STAGE 2

1. REPEAT STEPS 1 THROUGH 8 IN STAGE I ABOVE FOR CONSTRUCTING CANTILEVER 3, BACK SPAN 3 AND THE BACK SPAN 3 CLOSURE SEGMENT, EXCEPT THAT THE MAIN SPAN FORM TRAVELER IS ADVANCED TO THE MAIN SPAN CLOSURE SEGMENT POSITION IN STEP 2 AND THE FORM TRAVELERS ARE NOT REMOVED IN STEP 7, BUT SHALL REMAIN IN PLACE THROUGH STAGE III BELOW.

PRELIMINARY:
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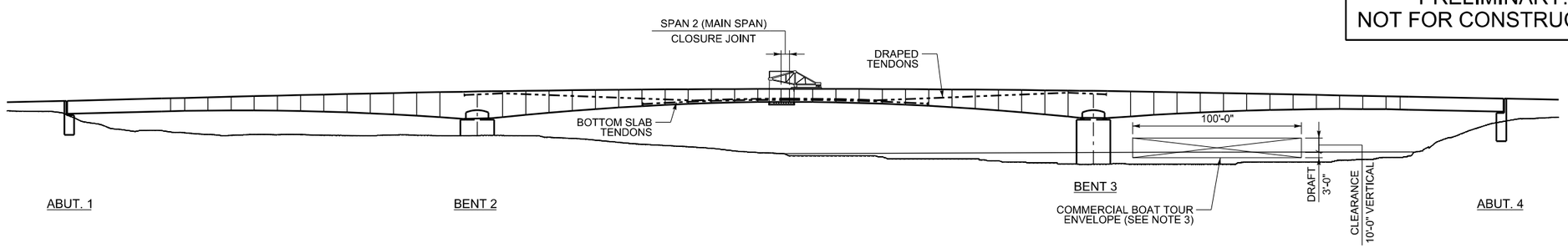

STAGE 3

1. THE MAIN SPAN FORM TRAVELER USED TO ALIGN THE CANTILEVER TIPS AND CAST THE MAIN SPAN 2 CLOSURE SEGMENT. THE ALIGNMENT FORCE SHALL ONLY ACT DOWN ON CANTILEVER 2 SO THAT LOAD IS NOT ADDED TO THE CANTILEVER 3 TIP. THE MAGNITUDE OF FORCE REQUIRED TO ALIGN THE TIPS IS DEPENDENT ON THE DEGREE OF MISALIGNMENT AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO ALIGNING THE CANTILEVER TIPS.
2. AFTER CLOSURE SEGMENTS ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI AND NOT MORE THAN 8 HOURS AFTER POURING CLOSURE, STRESS DRAPED TENDON 2-D1. RELEASE TEMPORARY LONGITUDINAL RESTRAINT AT PIER 2.
3. AFTER CLOSURE SEGMENT ACHIEVES A CONCRETE MINIMUM COMPRESSIVE STRESS OF 3000 PSI, STRESS REMAINING DRAPED TENDONS 2-D2 AND 2-D3. FORM TRAVELER ALIGNMENT FORCE MAY NOW BE REMOVED.
4. AFTER CLOSURE SEGMENT CONCRETE ACHIEVES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, STRESS TRANSVERSE TENDONS IN CLOSURE SEGMENT. BOTH FORM TRAVELERS MAY BE REMOVED FROM CANTILEVER 3.
5. AFTER CLOSURE SEGMENT AND ADJACENT 3 SEGMENTS CONCRETE ACHIEVES A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI, STRESS BOTTOM SLAB TENDONS 2-B1, 2-B2, 2-B3 & 2-B4.
6. AFTER CLOSURE SEGMENT AND ADJACENT 3 SEGMENTS CONCRETE ACHIEVES A MINIMUM COMPRESSIVE STRENGTH OF 6000 PSI, STRESS BOTTOM SLAB TENDONS 2-B5, 2-B6 & 2-B7.
7. CAST BARRIERS, MILL INTEGRAL WEARING SURFACE TO ACHIEVE RIDING SURFACE AS SPECIFIED IN THE PROJECT SPECIFICATIONS AND PLACE EXPANSION JOINTS. EXPANSION JOINTS SHALL NOT BE PLACED UNTIL MILLING OPERATION IS COMPLETE TO ENSURE JOINTS ARE SET AT THE PROPER ELEVATION.

NOTES:

1. THE ASSUMED CONSTRUCTION SEQUENCE SHOWN ON THE CONSTRUCTION SCHEMATIC DRAWINGS SHOWS THE CONSTRUCTION OF THE CANTILEVERS PROGRESSING IN A LINEAR FASHION SO THAT A SINGLE PAIR OF FORM-TRAVELERS MAY BE USED. FALSEWORK SECTION MAY BE CONSTRUCTED SIMULTANEOUSLY. IF THE CONTRACTOR CHOOSES TO USE TWO PAIRS OF FORM TRAVELERS, CONSTRUCTION OF CANTILEVERS 2 AND 3 MAY PROGRESS SIMULTANEOUSLY, EXCEPT THAT END SPAN AND MAIN SPAN CLOSURE SEGMENTS MUST STILL BE PLACED IN THE FOLLOWING ORDER: SPAN 1, SPAN 3, THEN SPAN 2.
2. UNLESS NOTED OTHERWISE, CONCRETE SHALL ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI PRIOR TO STRESSING ANY POST-TENSIONING STRAND OR BARS ANCHORING IN THAT SEGMENT OR ELEMENT. THE TRANSVERSE TENDONS SHALL BE STRESSED FIRST, FOLLOWED BY CANTILEVER TENDONS. ALL TENDONS ANCHORING IN AN ELEMENT OR SEGMENT SHALL BE STRESSED PRIOR TO LOWERING THE FORMS AND ADVANCING THE FORM TRAVELER.
3. THE MINIMUM NAVIGATIONAL CLEARANCE ENVELOPE IN THE RIVER SHOWN ON CONSTRUCTION SCHEMATIC III DRAWING, MAY BE PROVIDED TO EITHER SIDE OF BENT 3, AND SHALL BE MAINTAINED BETWEEN THE MONTHS OF MARCH AND OCTOBER TO ALLOW BOAT ACCESS UPSTREAM FOR COMMERCIAL BOAT TOURS. LIGHTING SHALL BE PROVIDED ON ANY TEMPORARY WORKS ADJACENT TO THE WATERWAY, INCLUDING BUT NOT LIMITED TO WORK PLATFORMS AND FORM TRAVELERS, SO THAT THEY CAN BE CLEARLY SEEN AT NIGHT FROM THE WATERWAY.
4. FOR ADDITIONAL INFORMATION, SEE CONSTRUCTION SCHEMATIC I SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
CONSRTUCTION SCHEMATIC III

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 102 OF 187

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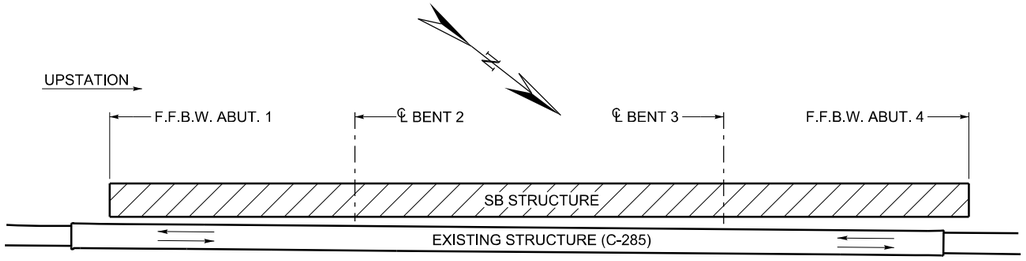
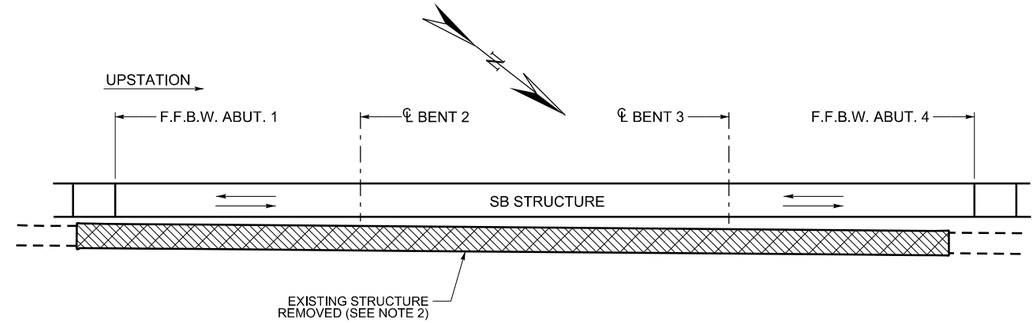
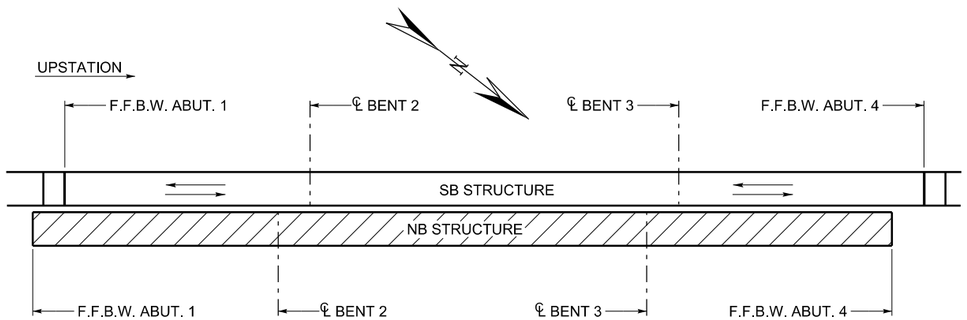
5/27/2008



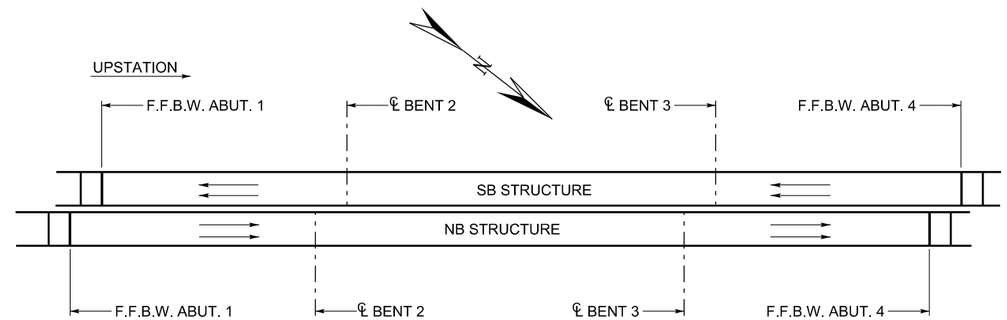
PHASE 1
(CONSTRUCT SB STRUCTURE)



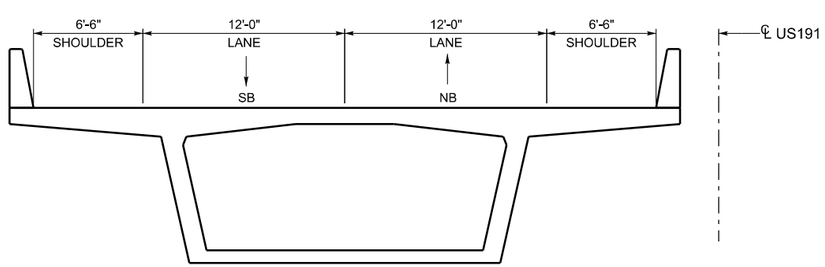
PHASE 2
(REMOVE EXISTING
STRUCTURE C-285)



PHASE 3
(CONSTRUCT NB STRUCTURE)



PHASE 4
(FINAL CONFIGURATION)



TEMPORARY SB SECTION
(PHASES 1-3)
(LOOKING UPSTATION)

LEGEND

- COMPLETED CONSTRUCTION
- NEW CONSTRUCTION
- STRUCTURE REMOVAL

NOTES:
1. THIS DRAWING SHOWS BRIDGE CONSTRUCTION PHASING TO ACCOMMODATE TRAFFIC PHASING ON THE BRIDGE STRUCTURES IN ACCORDANCE WITH THE OVERALL TRAFFIC CONTROL PLAN. SEE CONSTRUCTION SCHEMATIC II & III DRAWINGS FOR CONSTRUCTION SEQUENCE.
2. FOR LIMITS AND DETAILS OF REMOVALS OF THE EXISTING STRUCTURE NO. C-285, SEE BRIDGE REMOVAL I & II DRAWINGS.
3. FOR TEMPORARY STRIPING ON SOUTHBOUND STRUCTURE AND DETAILS OF TRAFFIC PHASING ON THE BRIDGE APPROACHES SEE CONSTRUCTION PHASING AND TRAFFIC CONTROL PLANS.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN RJA 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BRIDGE CONSTRUCTION STAGING
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 103 OF 187

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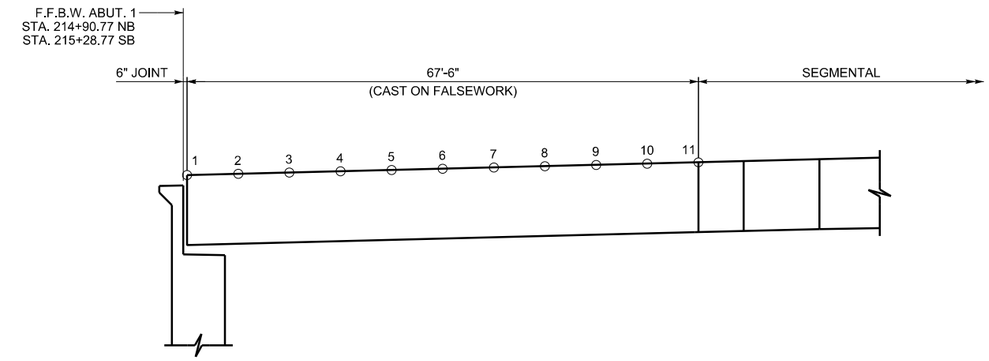
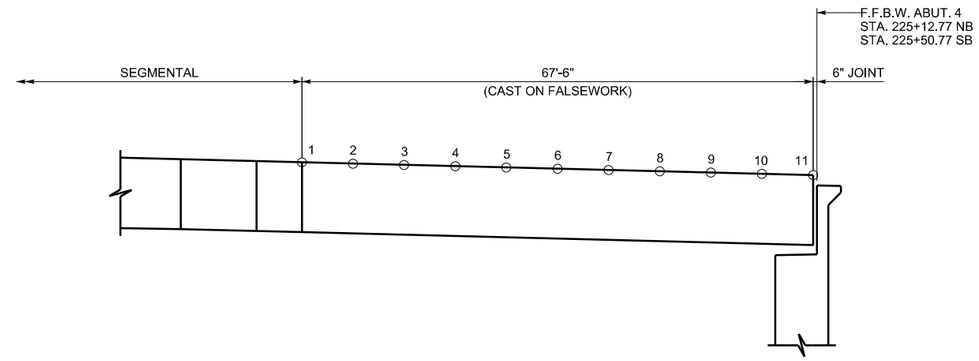
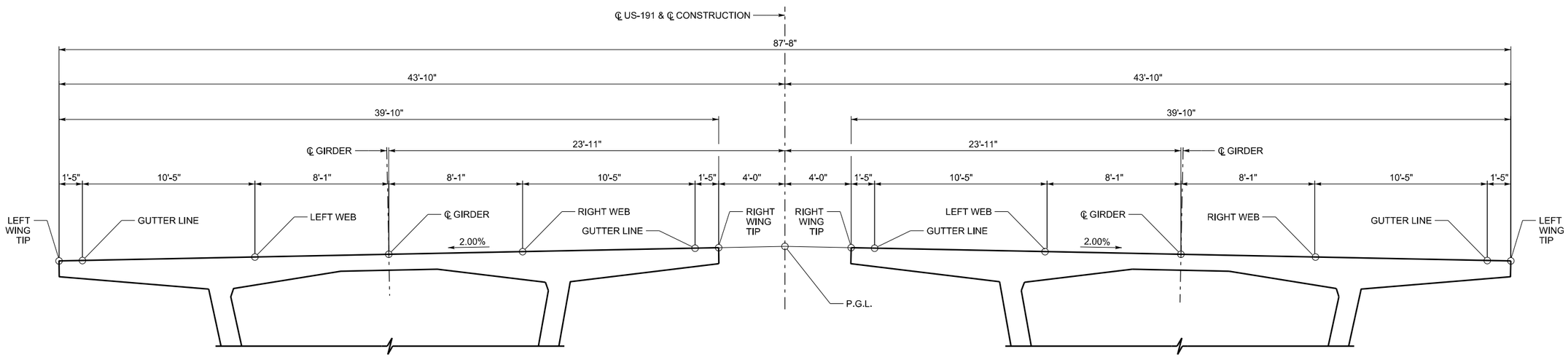
5/7/2008



SPAN 1



SPAN 3



NORTH BOUND 10TH POINT DECK ELEVATIONS

	POINT	STATION	LEFT WING	LEFT GUTTER	LEFT WEB	℄ GIRDER	RIGHT WEB	RIGHT GUTTER	RIGHT WING
SPAN 1	1	214+91.270	3992.058	3992.030	3991.821	3991.660	3991.498	3991.290	3991.261
	2	214+98.020	3992.228	3992.199	3991.991	3991.829	3991.668	3991.459	3991.431
	3	215+04.770	3992.397	3992.369	3992.161	3991.999	3991.837	3991.629	3991.601
	4	215+11.520	3992.567	3992.539	3992.330	3992.169	3992.007	3991.799	3991.770
	5	215+18.270	3992.737	3992.708	3992.500	3992.338	3992.177	3991.968	3991.940
	6	215+25.020	3992.907	3992.878	3992.670	3992.508	3992.347	3992.138	3992.110
	7	215+31.770	3993.076	3993.048	3992.840	3992.678	3992.516	3992.308	3992.280
	8	215+38.520	3993.246	3993.218	3993.009	3992.848	3992.686	3992.478	3992.449
	9	215+45.270	3993.416	3993.387	3993.179	3993.017	3992.856	3992.647	3992.619
	10	215+52.020	3993.585	3993.557	3993.349	3993.187	3993.025	3992.817	3992.789
	11	215+58.770	3993.755	3993.727	3993.518	3993.357	3993.195	3992.987	3992.958
SPAN 3	1	224+44.770	3994.963	3994.934	3994.726	3994.564	3994.403	3994.194	3994.166
	2	224+51.520	3994.826	3994.798	3994.589	3994.428	3994.266	3994.058	3994.029
	3	224+58.270	3994.689	3994.661	3994.452	3994.291	3994.129	3993.921	3993.892
	4	224+65.020	3994.552	3994.524	3994.315	3994.154	3993.992	3993.784	3993.755
	5	224+71.770	3994.415	3994.387	3994.179	3994.017	3993.855	3993.647	3993.619
	6	224+78.520	3994.278	3994.250	3994.042	3993.880	3993.718	3993.510	3993.482
	7	224+85.270	3994.141	3994.113	3993.905	3993.743	3993.581	3993.373	3993.345
	8	224+92.020	3994.005	3993.976	3993.768	3993.606	3993.445	3993.236	3993.208
	9	224+98.770	3993.868	3993.839	3993.631	3993.469	3993.308	3993.099	3993.071
	10	225+05.520	3993.731	3993.702	3993.494	3993.332	3993.171	3992.962	3992.934
	11	225+12.270	3993.594	3993.566	3993.357	3993.196	3993.034	3992.826	3992.797

SOUTH BOUND 10TH POINT DECK ELEVATIONS

	POINT	STATION	LEFT WING	LEFT GUTTER	LEFT WEB	℄ GIRDER	RIGHT WEB	RIGHT GUTTER	RIGHT WING
SPAN 1	1	215+29.270	3992.217	3992.245	3992.453	3992.615	3992.777	3992.985	3993.013
	2	215+36.020	3992.386	3992.415	3992.623	3992.785	3992.946	3993.155	3993.183
	3	215+42.770	3992.556	3992.584	3992.793	3992.954	3993.116	3993.324	3993.353
	4	215+49.520	3992.726	3992.754	3992.962	3993.124	3993.286	3993.494	3993.522
	5	215+56.270	3992.895	3992.924	3993.132	3993.294	3993.455	3993.664	3993.692
	6	215+63.020	3993.065	3993.093	3993.302	3993.463	3993.625	3993.833	3993.862
	7	215+69.770	3993.235	3993.263	3993.472	3993.633	3993.795	3994.003	3994.032
	8	215+76.520	3993.405	3993.433	3993.641	3993.803	3993.965	3994.173	3994.201
	9	215+83.270	3993.574	3993.603	3993.811	3993.973	3994.134	3994.343	3994.371
	10	215+90.020	3993.744	3993.772	3993.981	3994.142	3994.304	3994.512	3994.541
	11	215+96.770	3993.914	3993.942	3994.150	3994.312	3994.474	3994.682	3994.710
SPAN 3	1	224+82.770	3993.395	3993.424	3993.632	3993.794	3993.955	3994.164	3994.192
	2	224+89.520	3993.259	3993.287	3993.495	3993.657	3993.819	3994.027	3994.055
	3	224+96.270	3993.122	3993.150	3993.358	3993.520	3993.682	3993.890	3993.918
	4	225+03.020	3992.985	3993.013	3993.221	3993.383	3993.545	3993.753	3993.781
	5	225+09.770	3992.848	3992.876	3993.085	3993.246	3993.408	3993.616	3993.645
	6	225+16.520	3992.711	3992.739	3992.948	3993.109	3993.271	3993.479	3993.508
	7	225+23.270	3992.574	3992.602	3992.811	3992.972	3993.134	3993.342	3993.371
	8	225+30.020	3992.437	3992.466	3992.674	3992.836	3992.997	3993.206	3993.234
	9	225+36.770	3992.300	3992.329	3992.537	3992.699	3992.860	3993.069	3993.097
	10	225+43.520	3992.163	3992.192	3992.400	3992.562	3992.723	3992.932	3992.960
	11	225+50.270	3992.027	3992.055	3992.263	3992.425	3992.587	3992.795	3992.823

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MSK MM/YY CHECK XXX MM/YY
DRAWN RJA MM/YY CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
CIP ON FALSEWORK DECK ELEV.

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 104 OF 187

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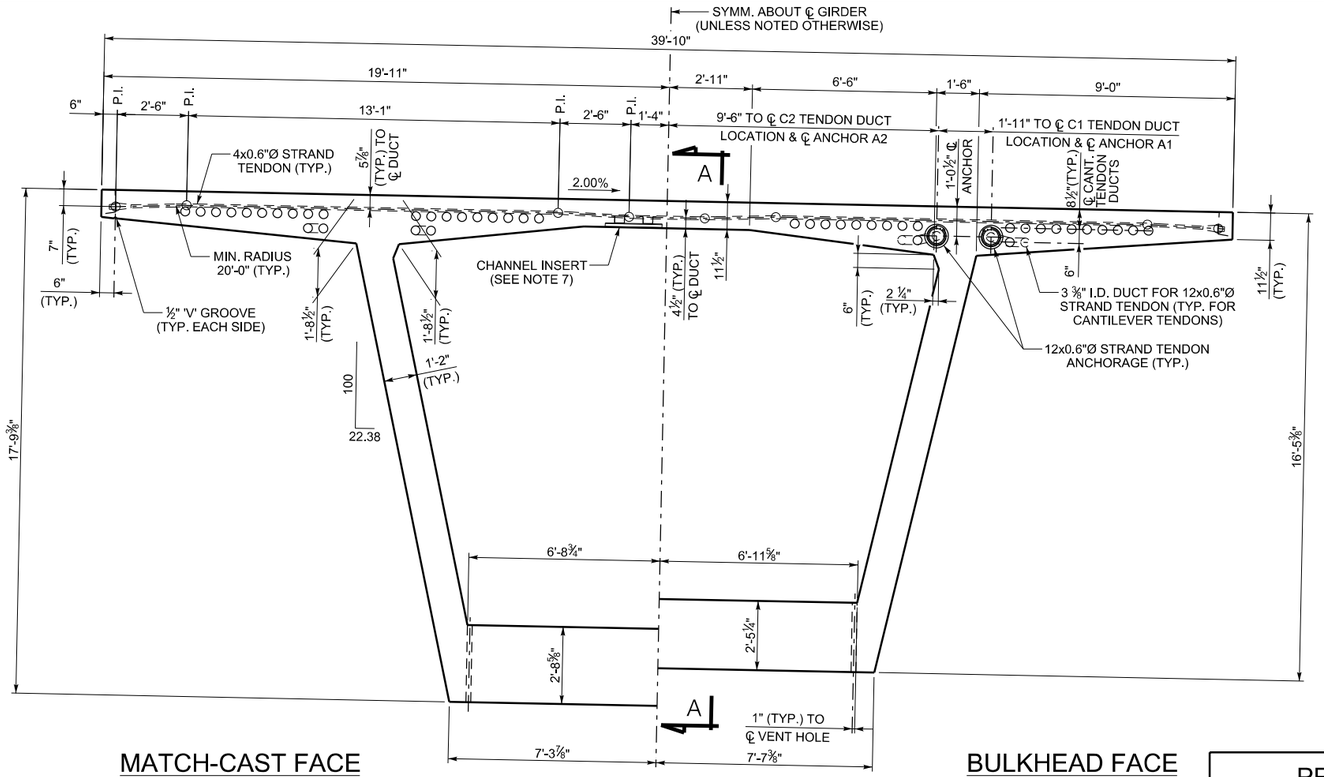
5/7/2008

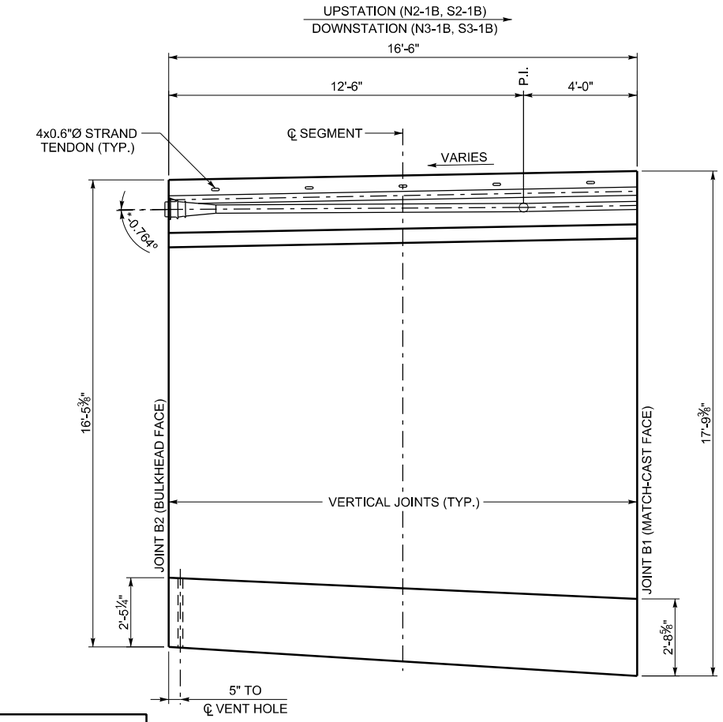


MATCH-CAST FACE
(JOINT B1)

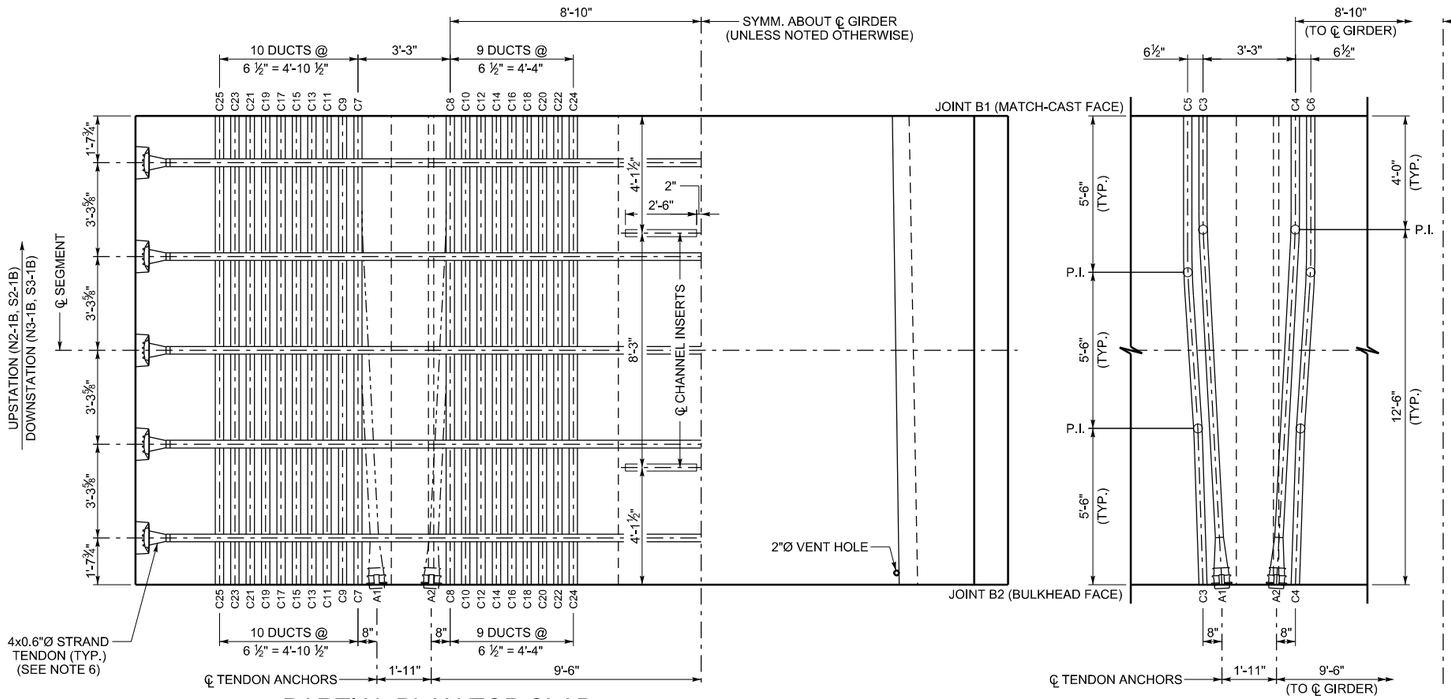
CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B2)

**PRELIMINARY:
NOT FOR CONSTRUCTION**

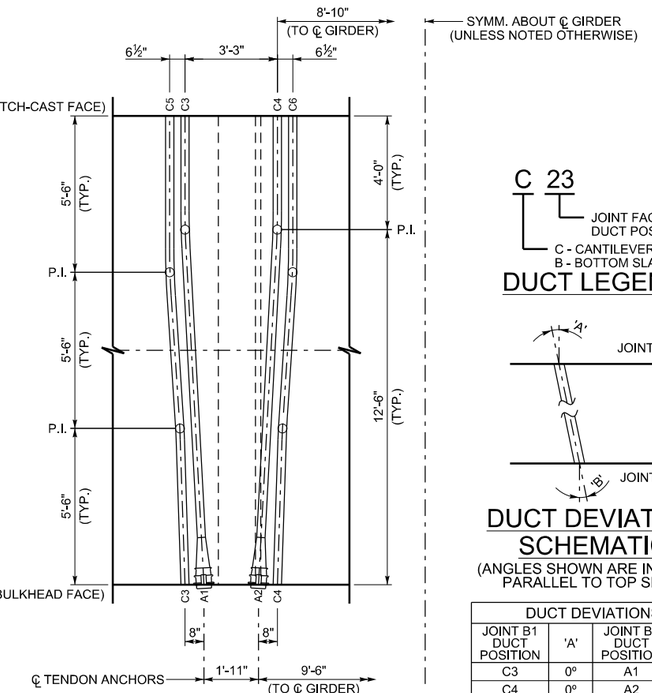


SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

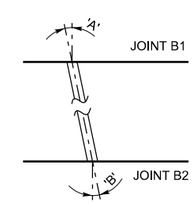
PARTIAL PLAN BOTTOM SLAB



LOWER DUCT DETAIL

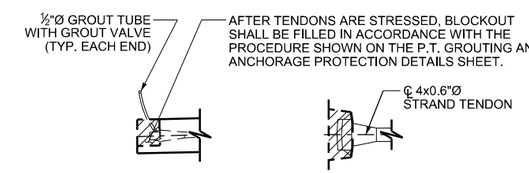
C 23
- 23 — JOINT FACE DUCT POSITION
- C — C - CANTILEVER DUCT, B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B1 DUCT POSITION	'A'	JOINT B2 DUCT POSITION	'B'
C3	0°	A1	3.054°
C4	0°	A2	3.054°
C5	0°	C3	1.880°
C6	0°	C4	1.880°
C7-C25	0°	C7-C25	0°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-1B, S2-1B, N3-1B AND S3-1B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08	CHECK XXX MM/YY	APPROVAL RECOMM. DATE	SENIOR DESIGN ENGR.
DRAWN KJM 04/08	CHECK XXX MM/YY	APPROVED FOR USE BY UDOT DATE	UDOT BRIDGE ENGR.
QUANT. XXX MM/YY	CHECK XXX MM/YY		

US-191; OVER COLORADO RIVER

RIVER BRIDGE - MOAB UTAH

SEGMENT 1B DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 108 OF 187

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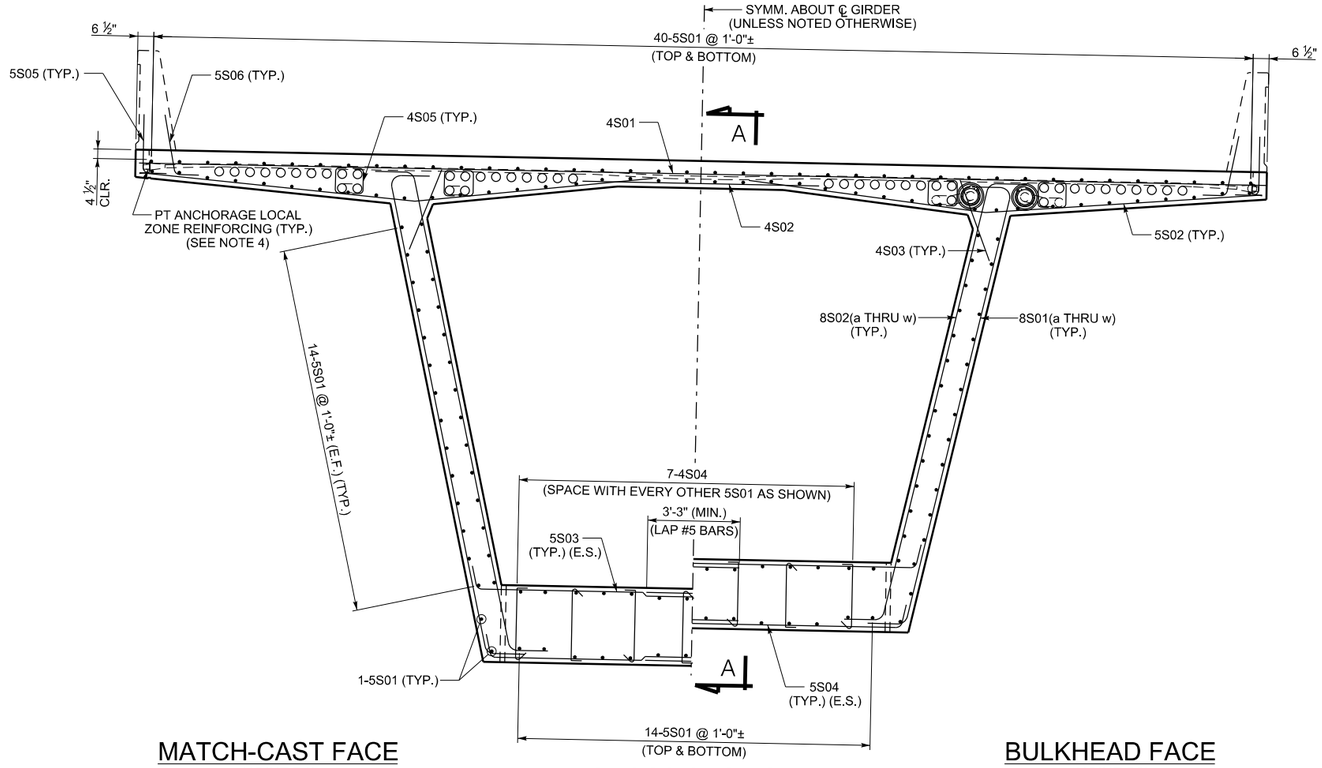
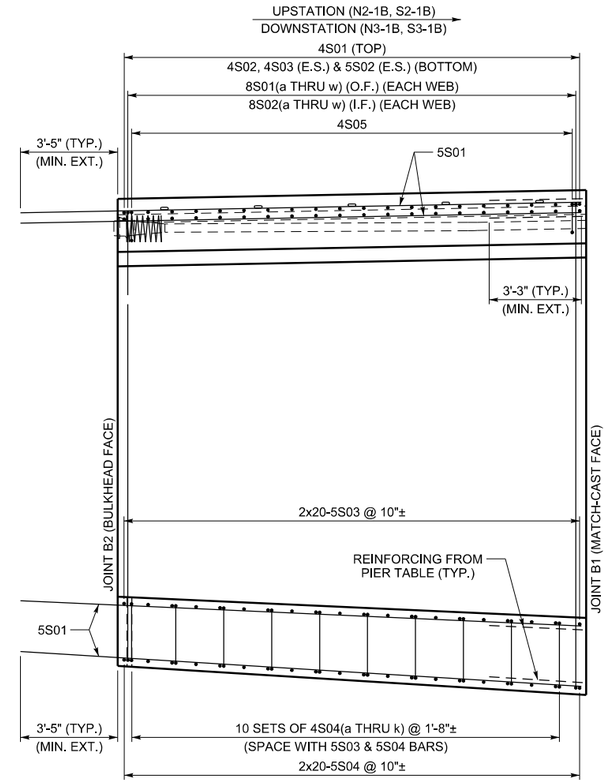
5/7/2008



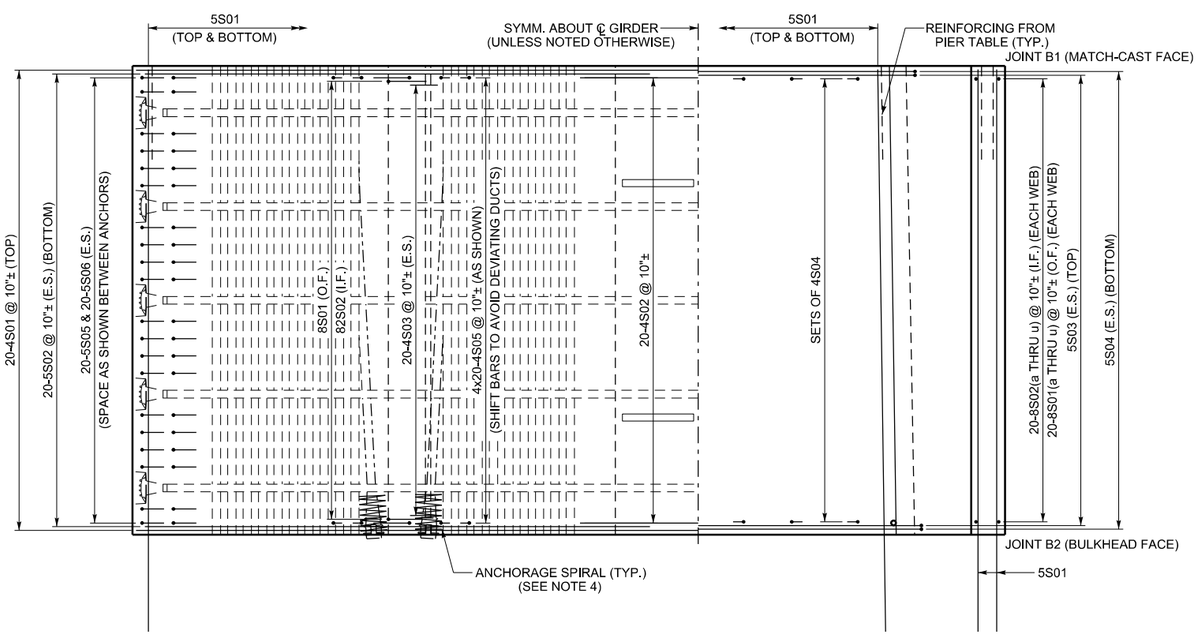
MATCH-CAST FACE
(JOINT B1)

CROSS SECTION

BULKHEAD FACE
(JOINT B2)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-1B, S2-1B, N3-1B AND S3-1B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 1B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 109 OF 187

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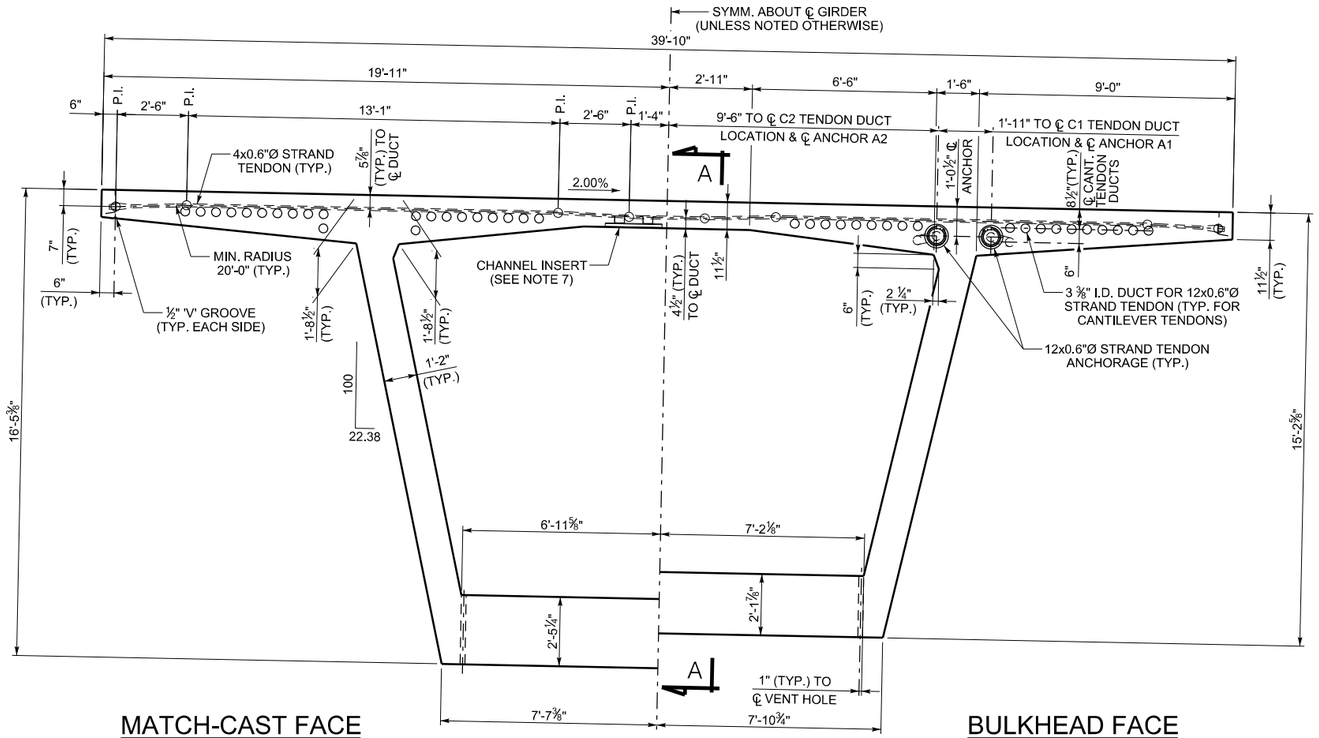
5/7/2008

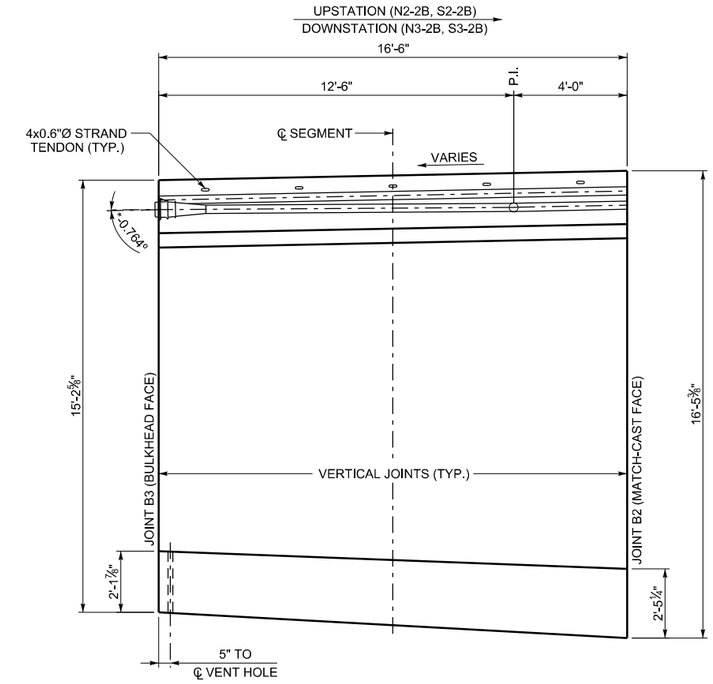


MATCH-CAST FACE
(JOINT B2)

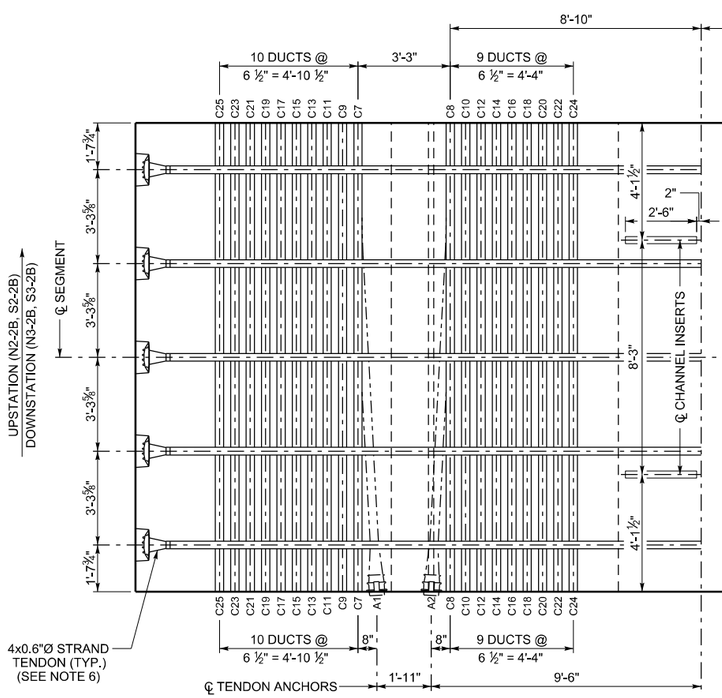
CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B3)

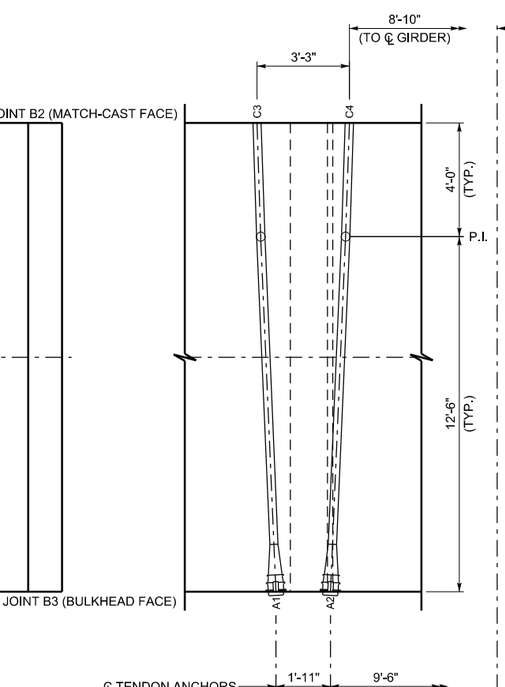
PRELIMINARY:
NOT FOR CONSTRUCTION



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

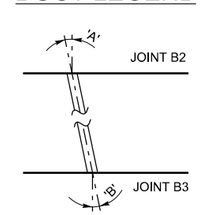


PARTIAL PLAN BOTTOM SLAB

LOWER DUCT DETAIL

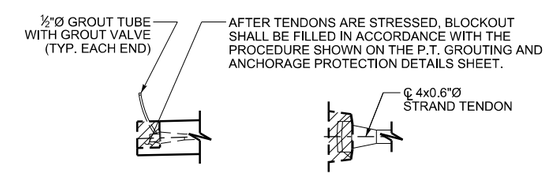
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B2 DUCT POSITION	'A'	JOINT B3 DUCT POSITION	'B'
C3	1.880°	A1	3.054°
C4	1.880°	A2	3.054°
C11-C25	0°	C7-C25	0°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-2B, S2-2B, N3-2B AND S3-2B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 2B DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 111 OF 187

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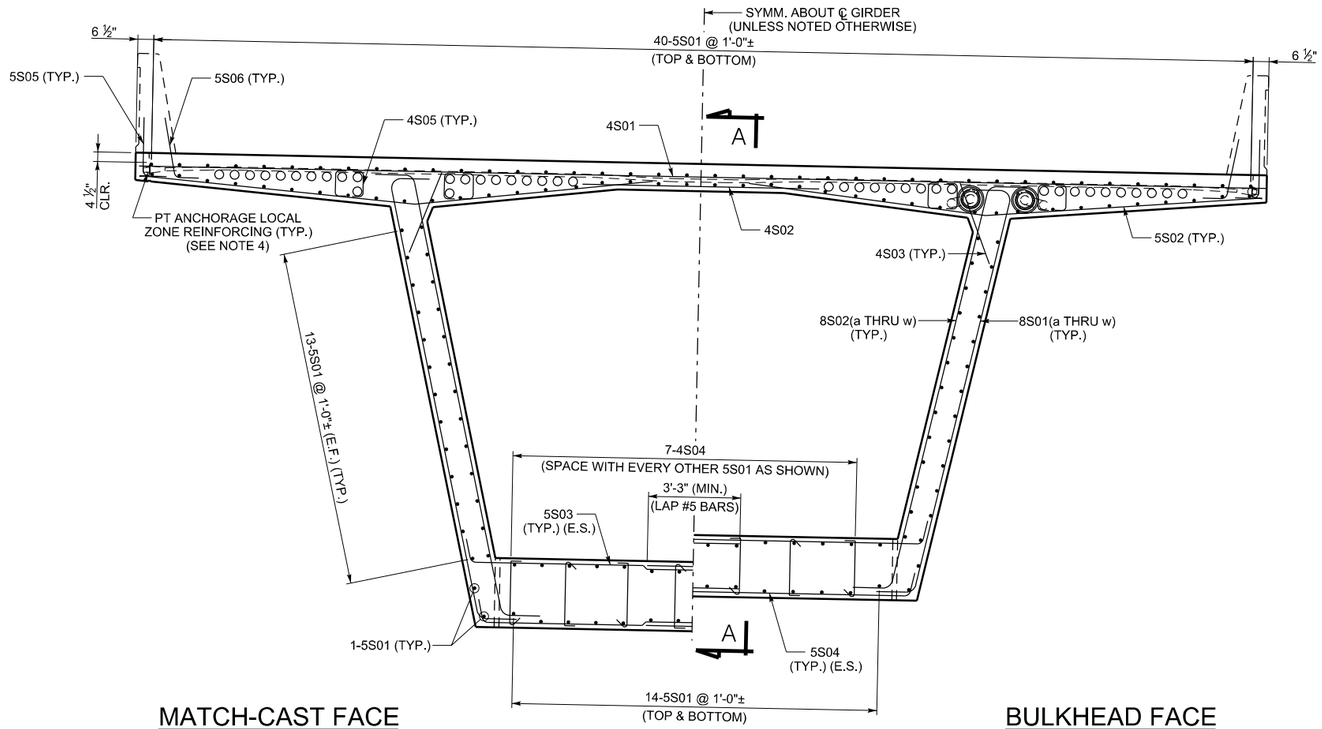
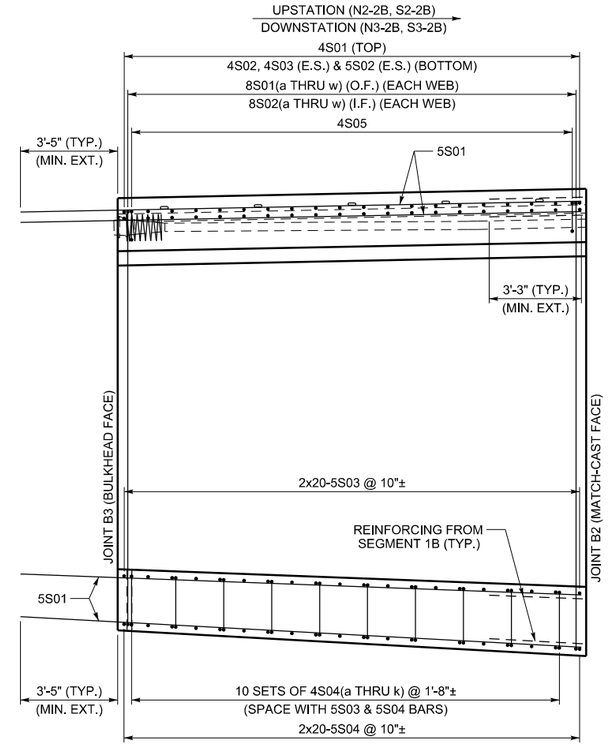
5/7/2008



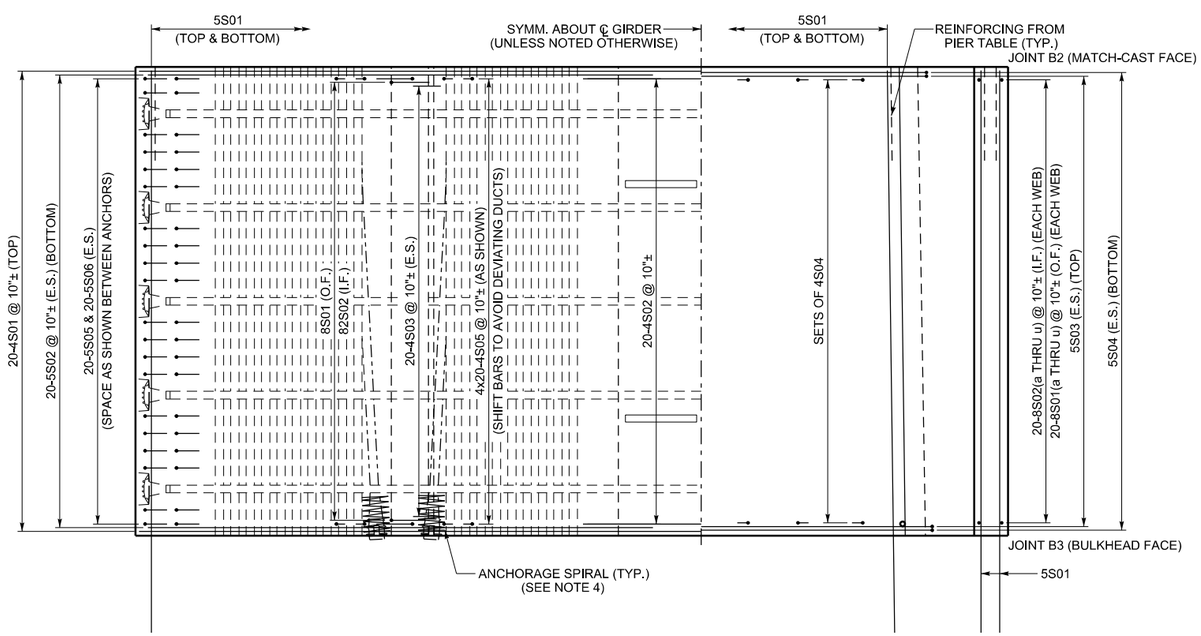
MATCH-CAST FACE
(JOINT B2)

CROSS SECTION

BULKHEAD FACE
(JOINT B3)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-2B, S2-2B, N3-2B AND S3-2B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 2B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 112 OF 187

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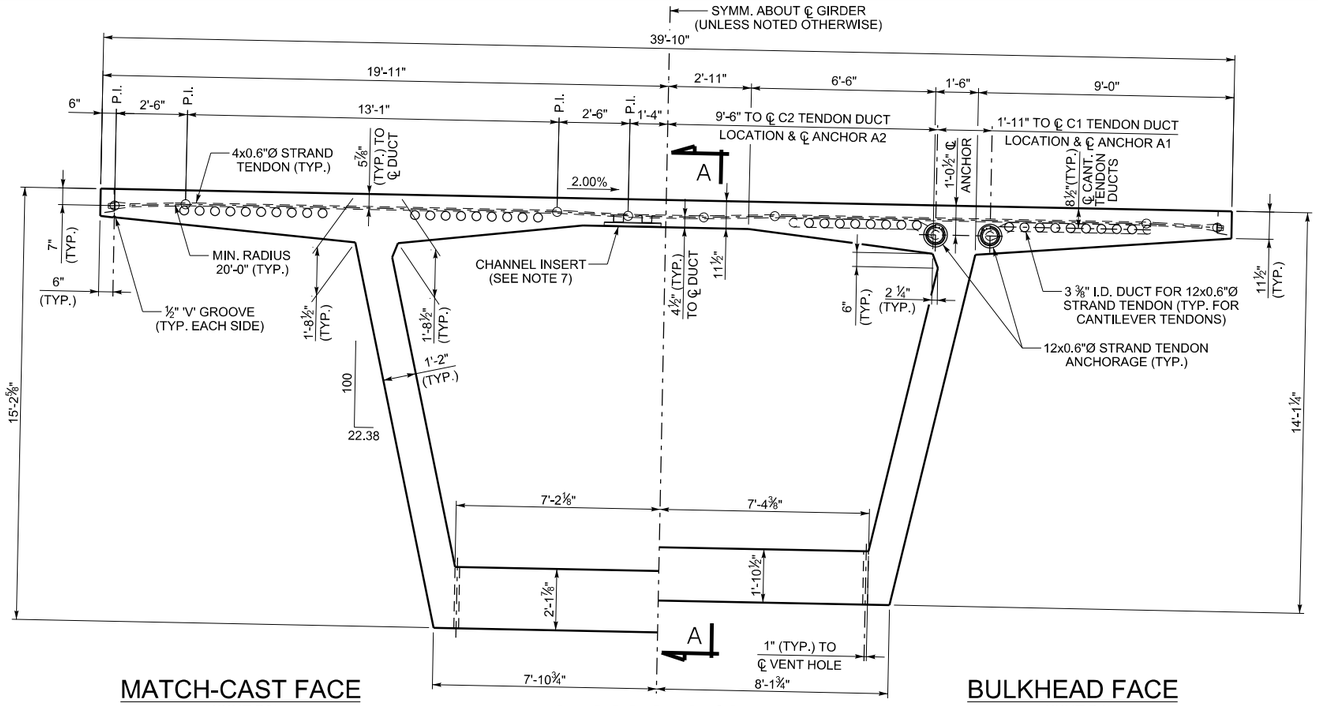
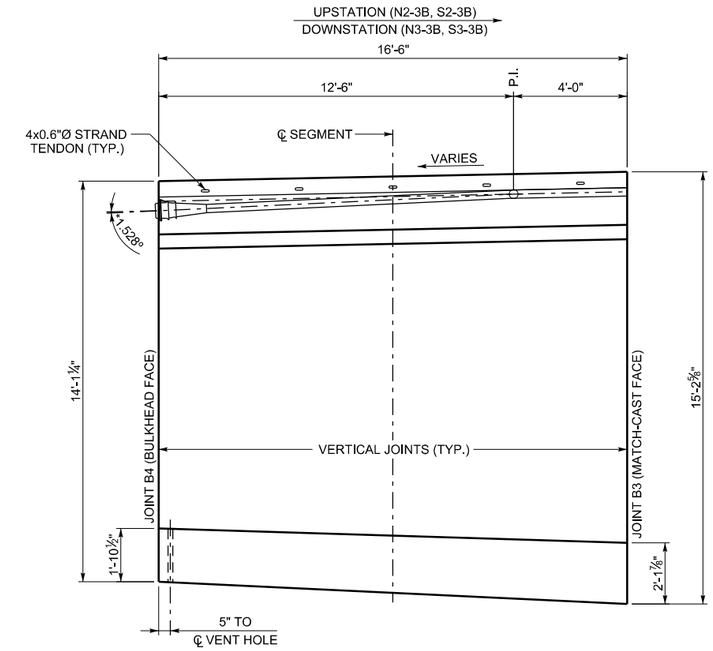
5/7/2008



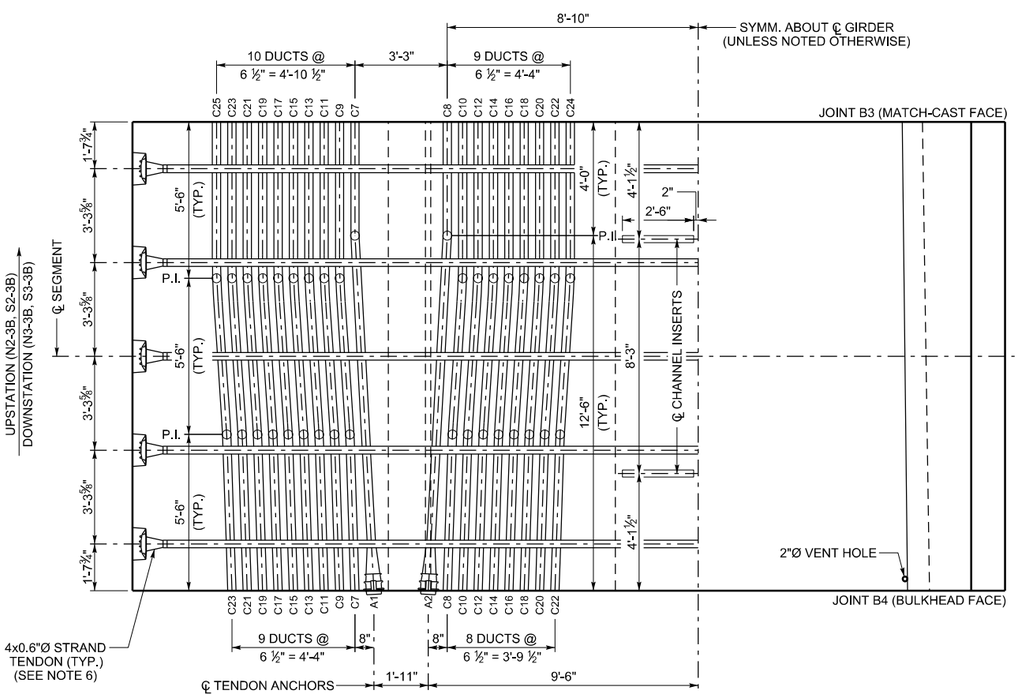
MATCH-CAST FACE
(JOINT B3)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B4)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



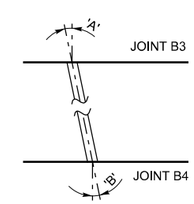
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

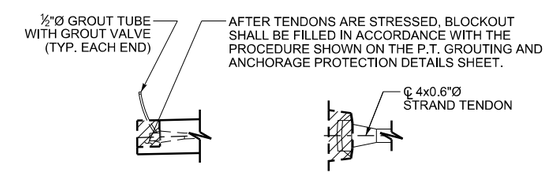
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION
SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B3 DUCT POSITION	'A'	JOINT B4 DUCT POSITION	'B'
C7	0°	A1	3.054°
C8	0°	A2	3.054°
C9-C25	0°	C7-C23	0°



CROSS SECTION PLAN

TRANSVERSE TENDON
BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-3B, S2-3B, N3-3B AND S3-3B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

REVISIONS

NO.	DATE	BY	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08	CHECK XXX MM/YY		
DRAWN KJM 04/08	CHECK XXX MM/YY		
QUANT. XXX MM/YY	CHECK XXX MM/YY		

APPROVAL RECOMM. — SENIOR DESIGN ENGR. — DATE
APPROVED FOR USE BY UDOT — UDOT BRIDGE ENGR. — DATE

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 3B DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 114 OF 187

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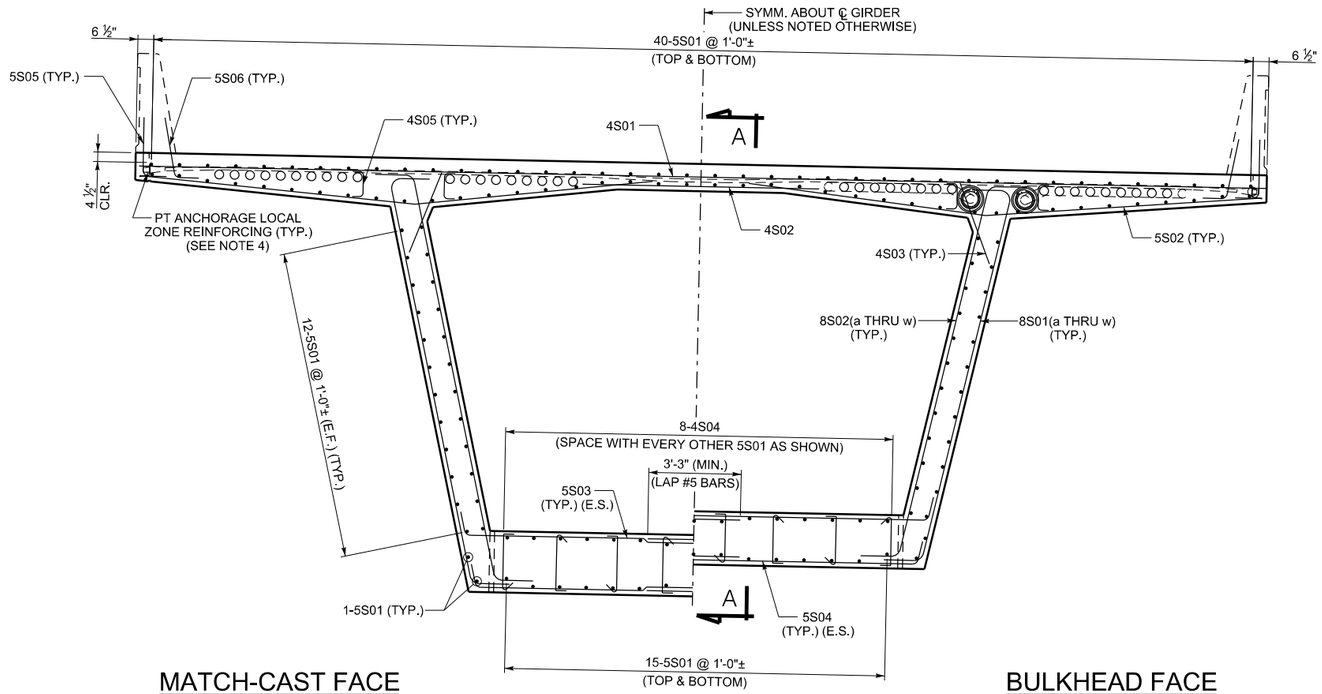
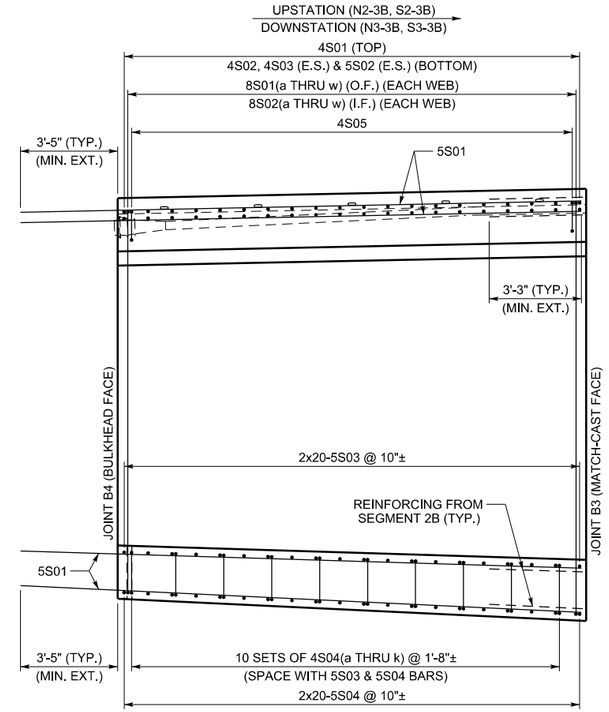
5/7/2008



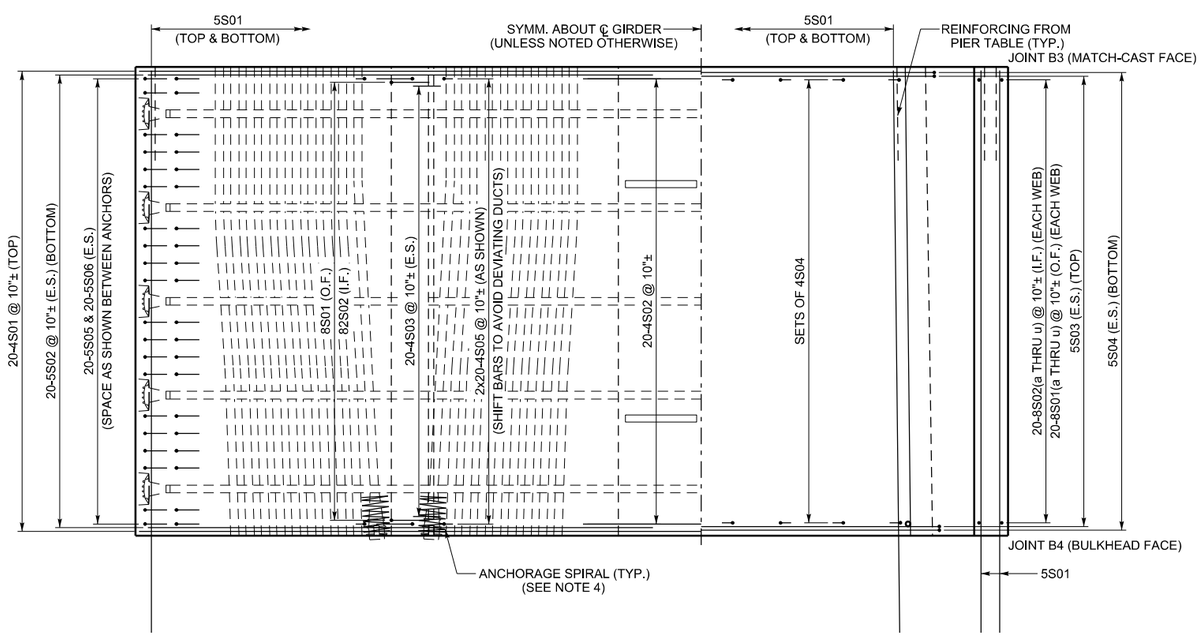
MATCH-CAST FACE
(JOINT B3)

CROSS SECTION

BULKHEAD FACE
(JOINT B4)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-3B, S2-3B, N3-3B AND S3-3B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 3B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 115 OF 187

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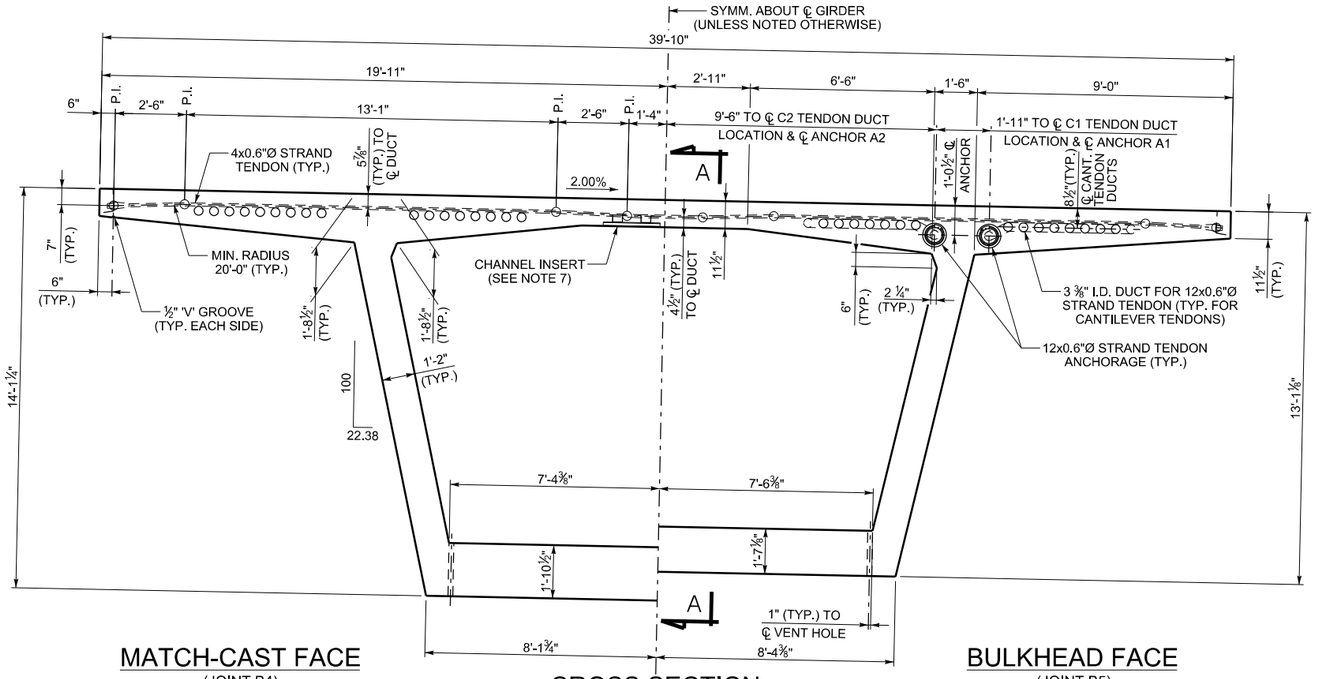
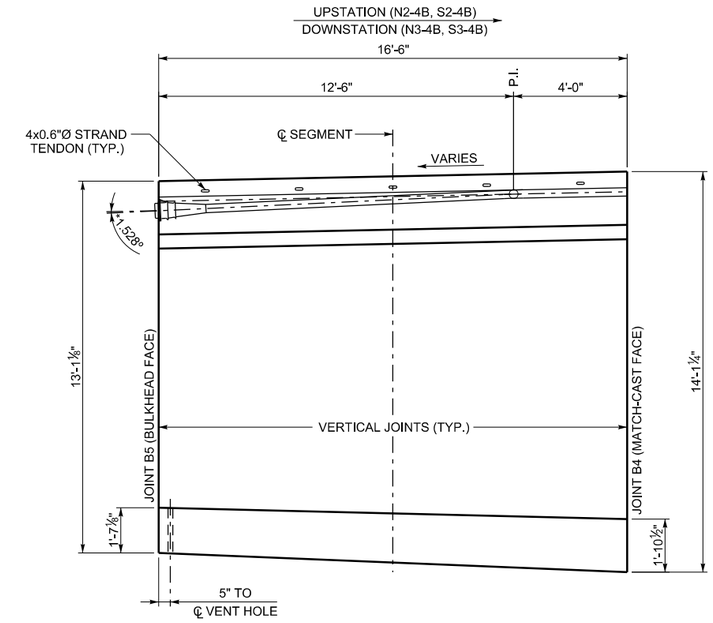
5/7/2008



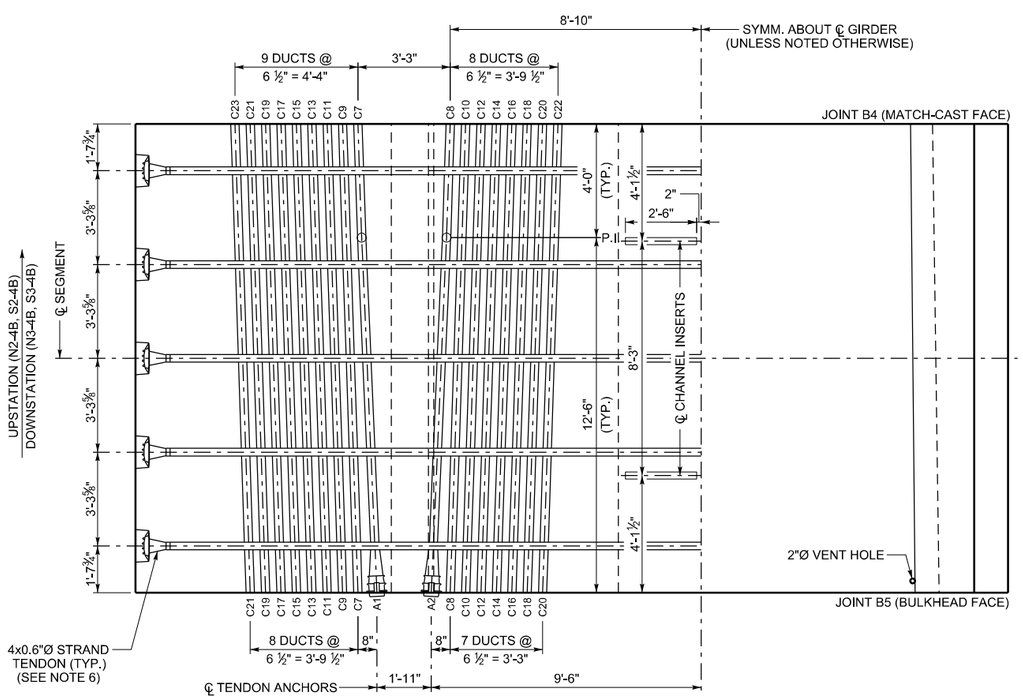
MATCH-CAST FACE
(JOINT B4)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B5)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



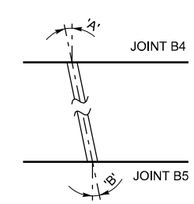
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

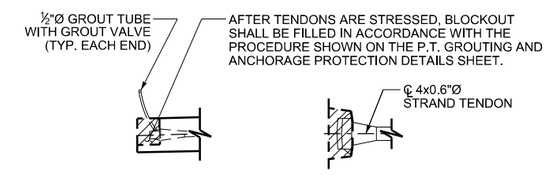
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B4 DUCT POSITION	'A'	JOINT B5 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9-C23	1.880°	C7-C21	1.880°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-4B, S2-4B, N3-4B AND S3-4B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5*. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 4B DIMS & PT DETAILS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 117 OF 187

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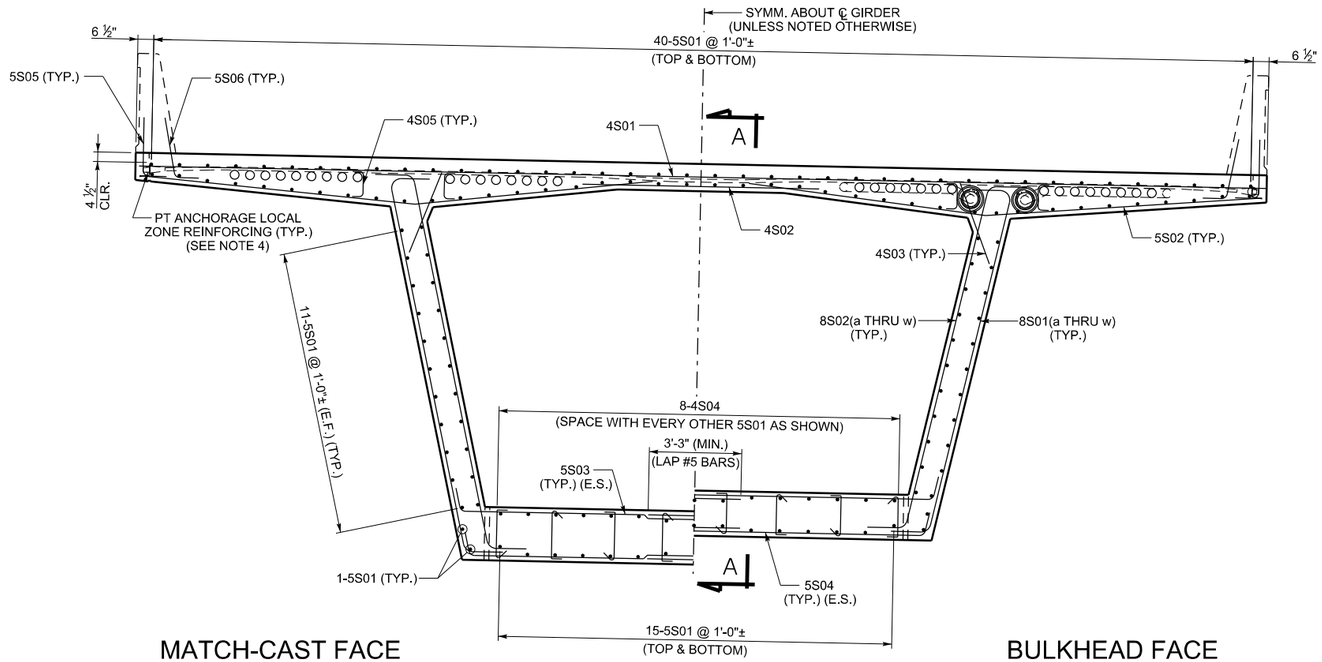
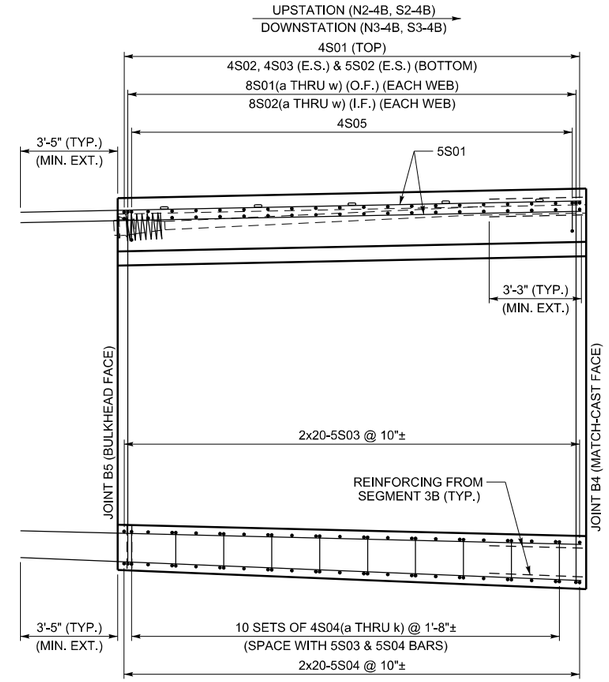
5/7/2008



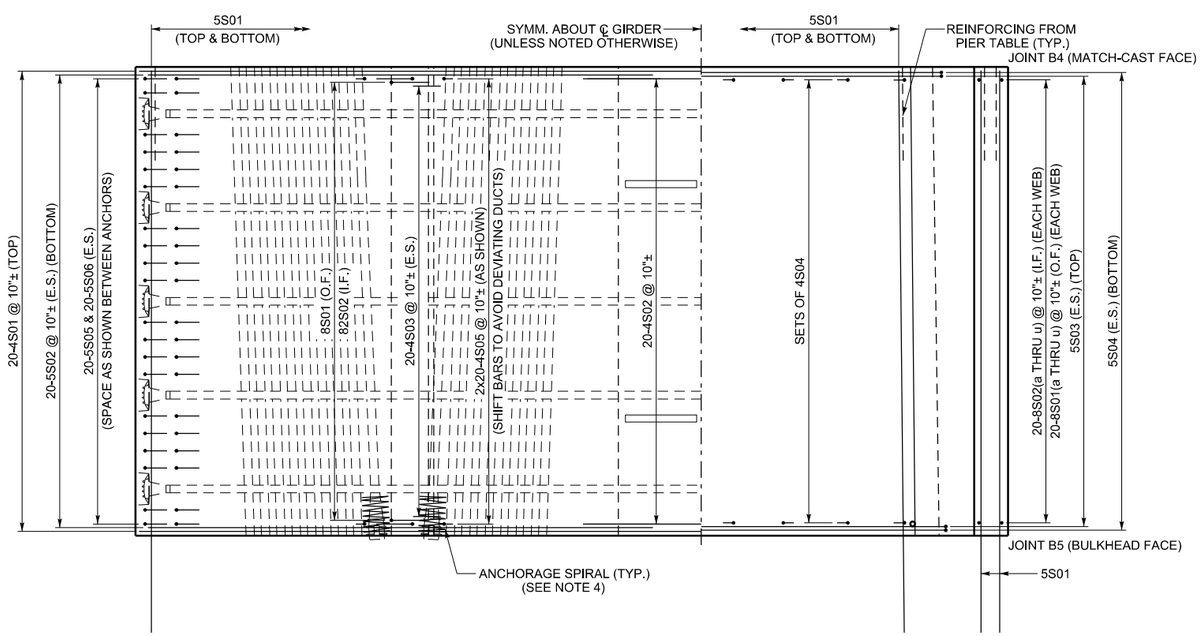
MATCH-CAST FACE
(JOINT B4)

CROSS SECTION

BULKHEAD FACE
(JOINT B5)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-4B, S2-4B, N3-4B AND S3-4B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 4B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 118 OF 187

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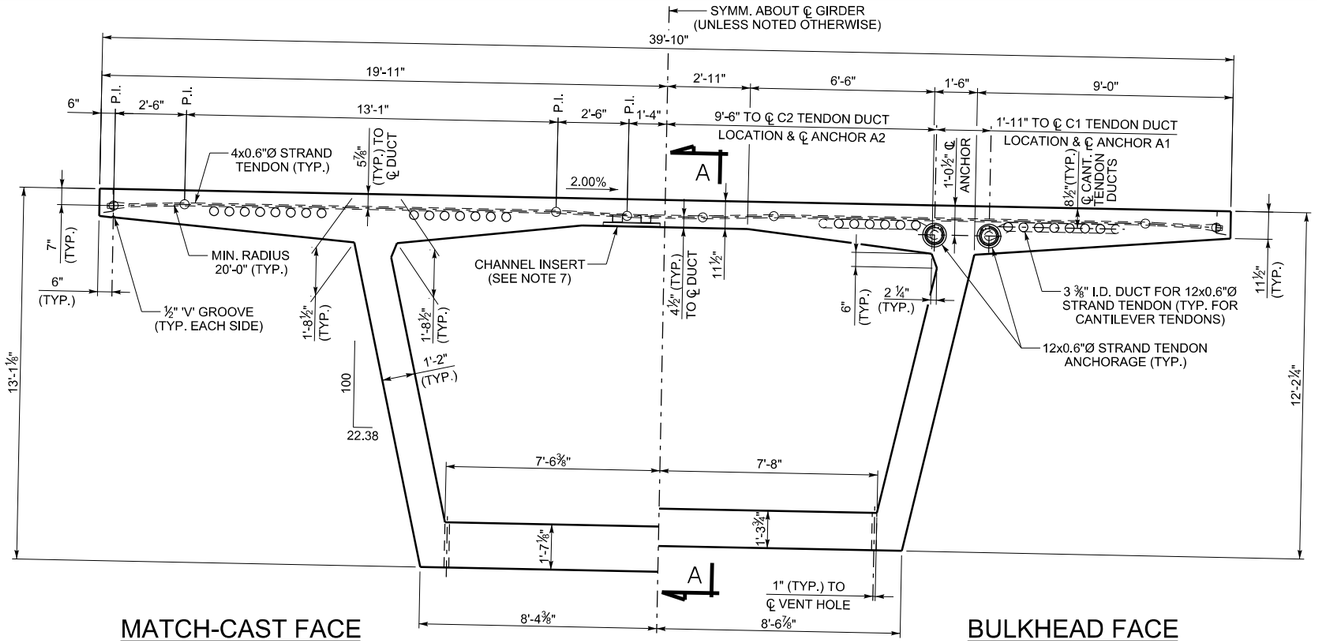
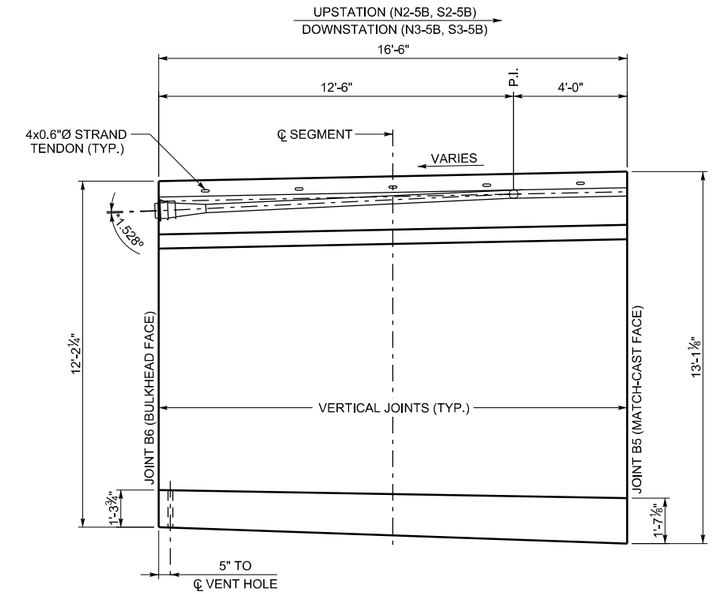
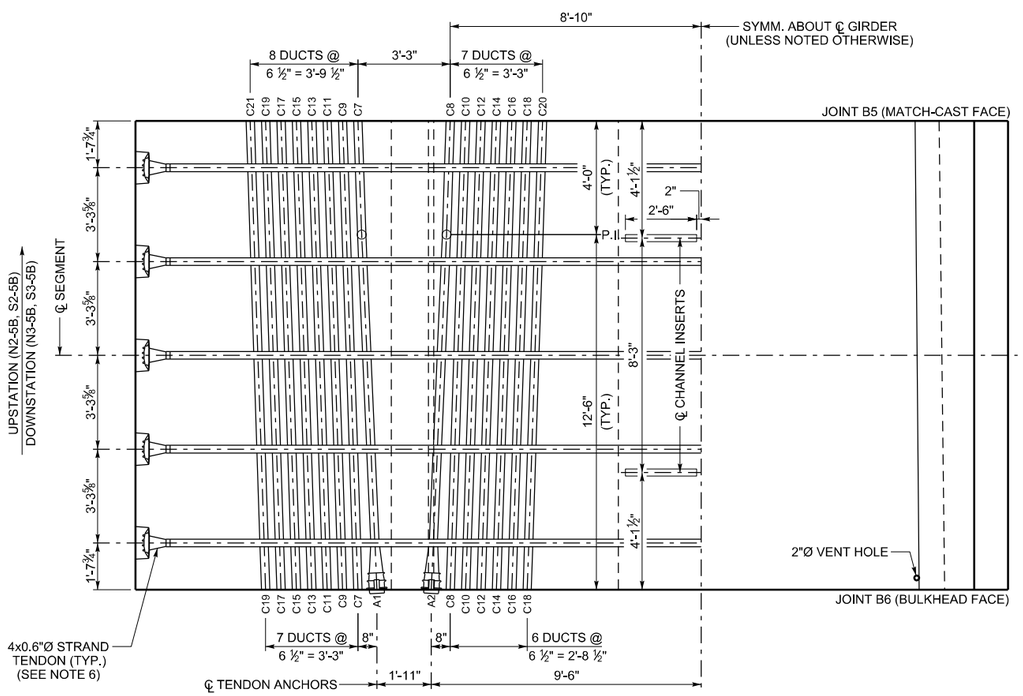
5/7/2008



CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



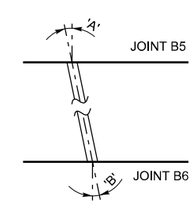
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
  B - BOTTOM SLAB DUCT

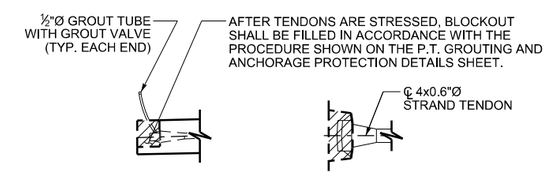
DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS

JOINT B5 DUCT POSITION	'A'	JOINT B6 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9-C21	1.880°	C7-C19	1.880°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-5B, S2-5B, N3-5B AND S3-5B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 5B DIMS & PT DETAILS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 120 OF 187

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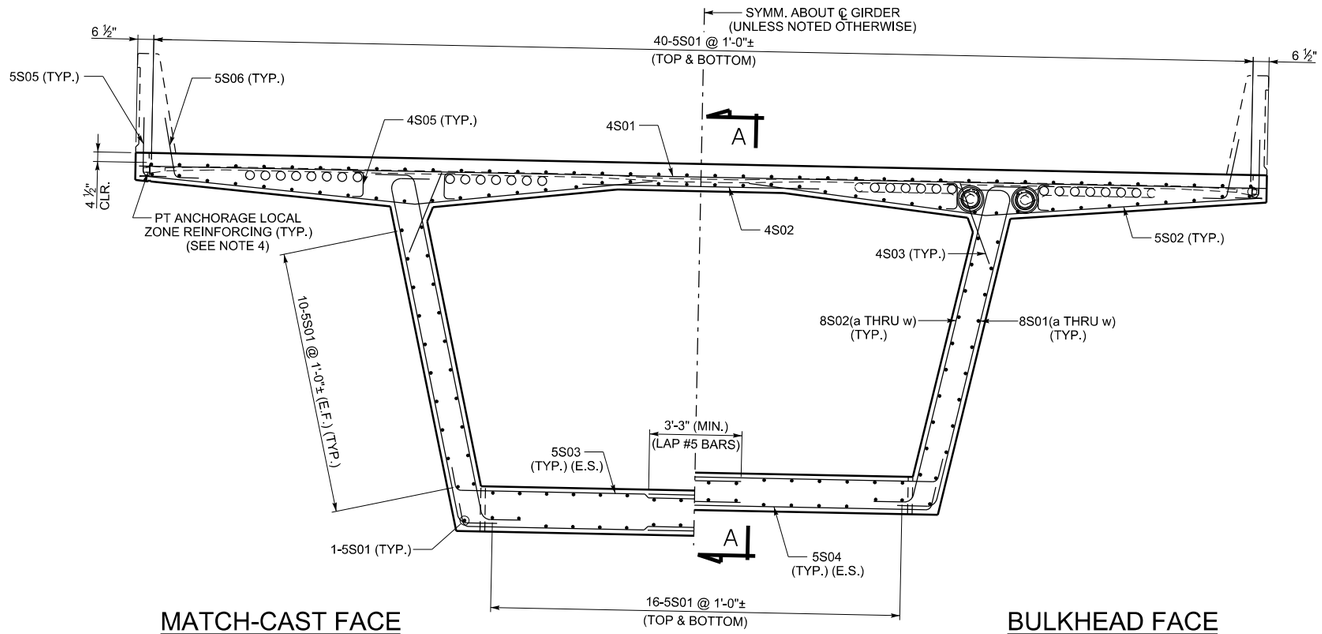
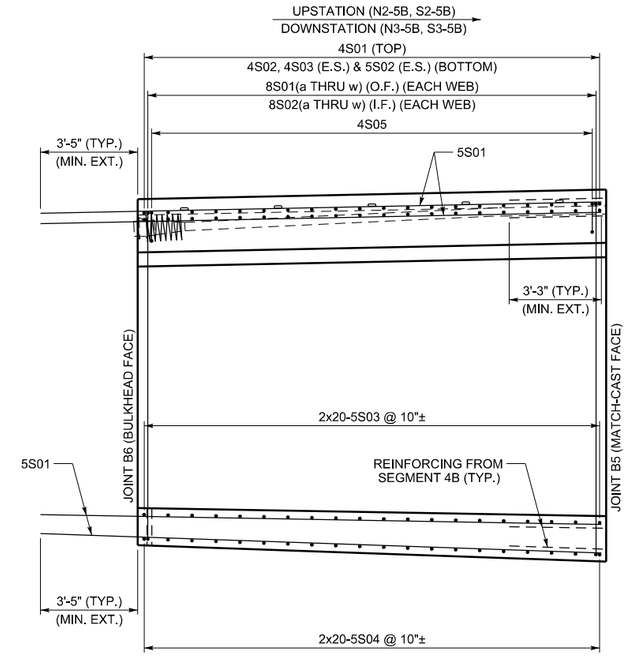
5/7/2008



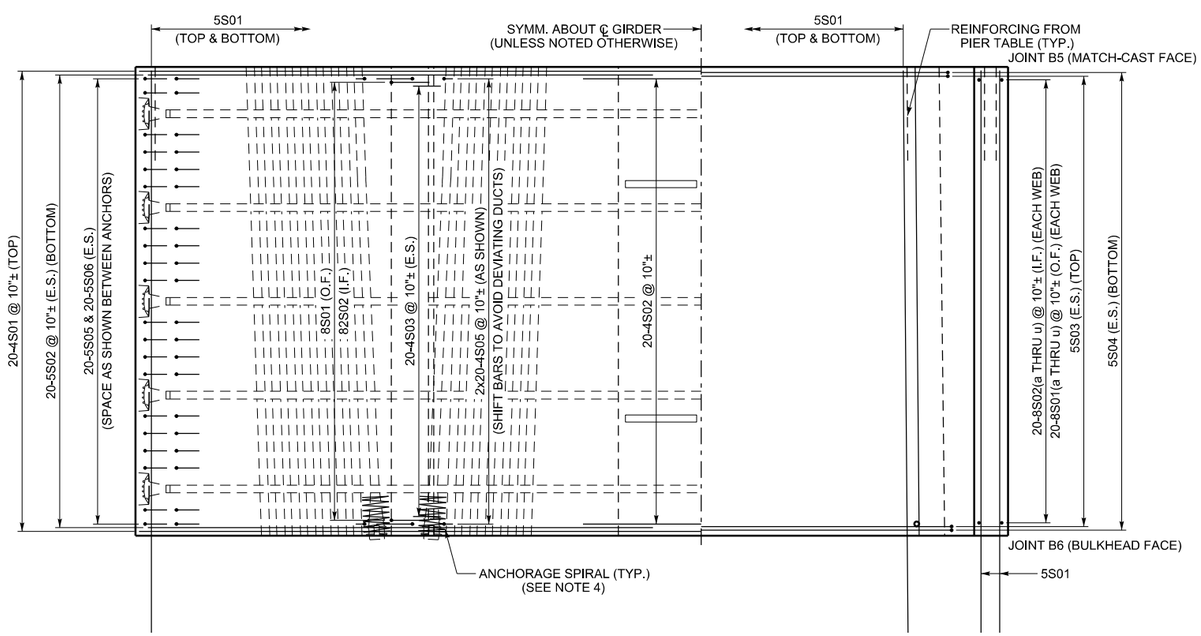
MATCH-CAST FACE
(JOINT B5)

CROSS SECTION

BULKHEAD FACE
(JOINT B6)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-5B, S2-5B, N3-5B AND S3-5B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 5B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 121 OF 187

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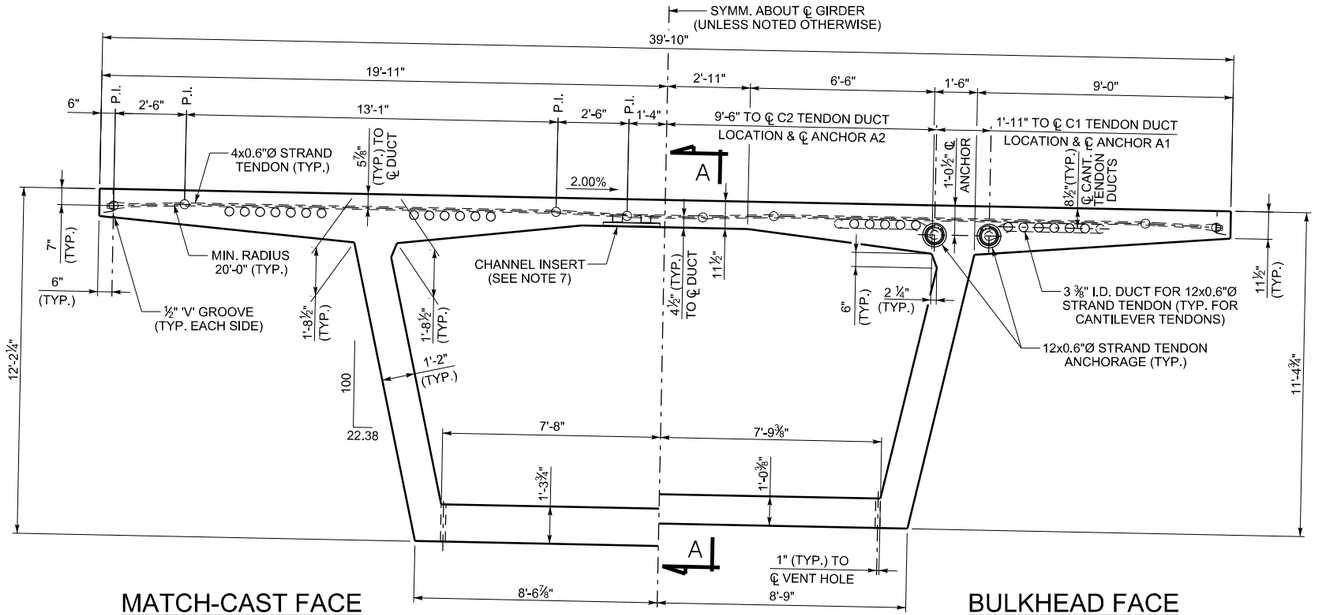
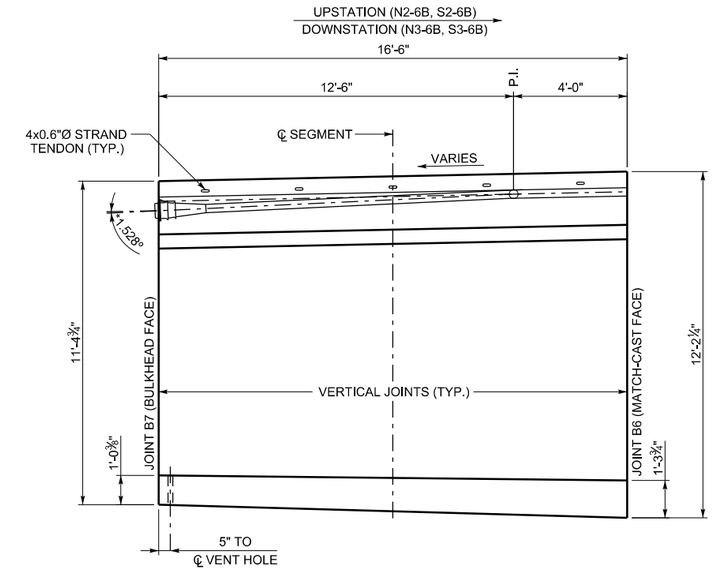
5/7/2008



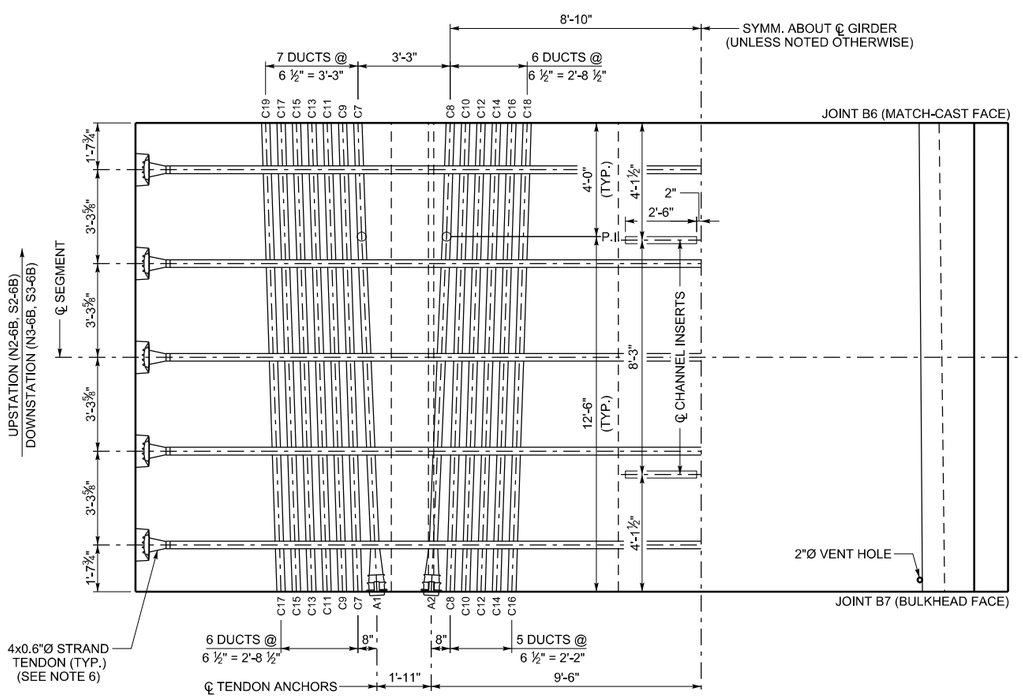
MATCH-CAST FACE
(JOINT B6)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B7)



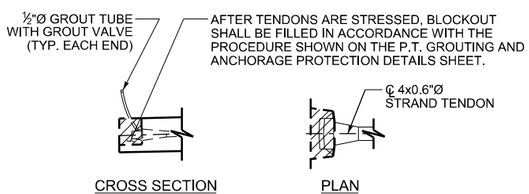
SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

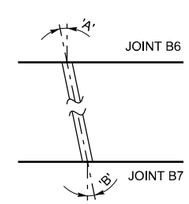
PRELIMINARY:
NOT FOR CONSTRUCTION



TRANSVERSE TENDON
BLOCKOUT DETAIL

C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
  B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION
SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B6 DUCT POSITION	'A'	JOINT B7 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9-C19	1.880°	C7-C17	1.880°

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-6B, S2-6B, N3-6B AND S3-6B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 6B DIMS & PT DETAILS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 123 OF 187

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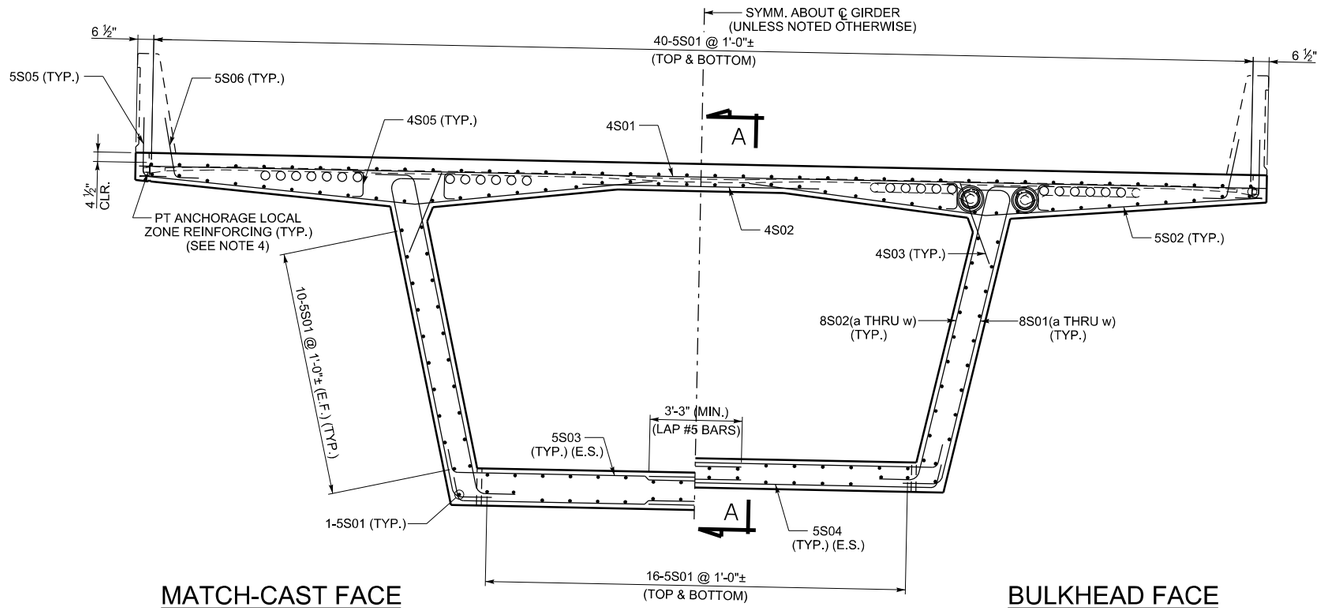
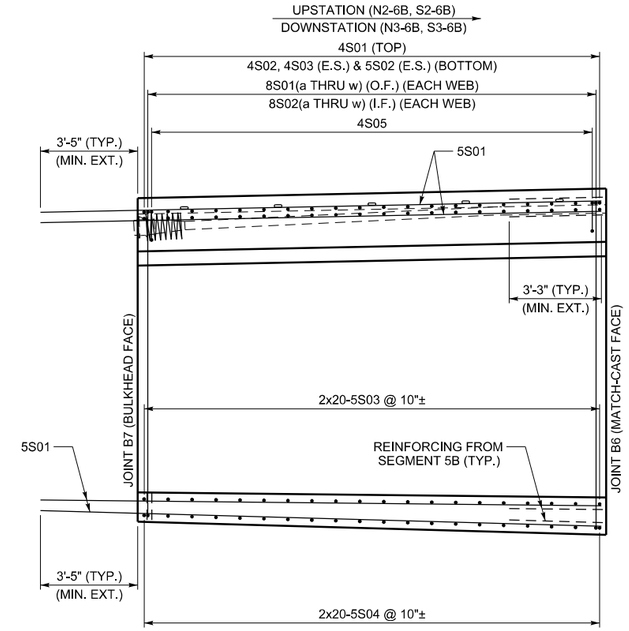
5/7/2008



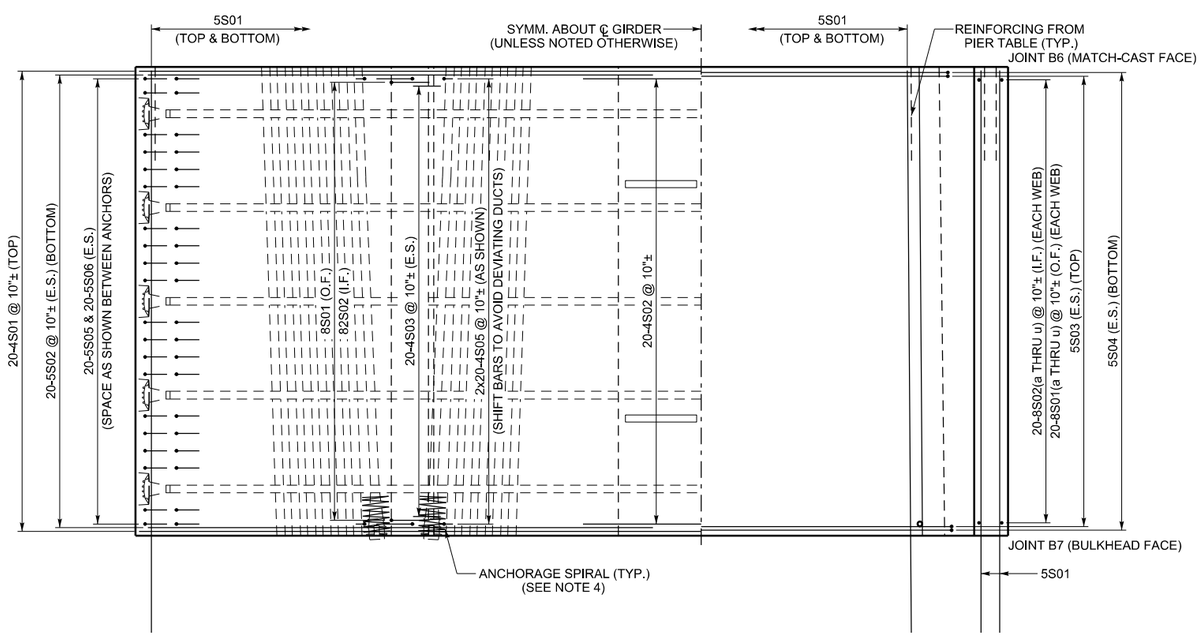
MATCH-CAST FACE
(JOINT B6)

CROSS SECTION

BULKHEAD FACE
(JOINT B7)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-6B, S2-6B, N3-6B AND S3-6B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 6B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 124 OF 187

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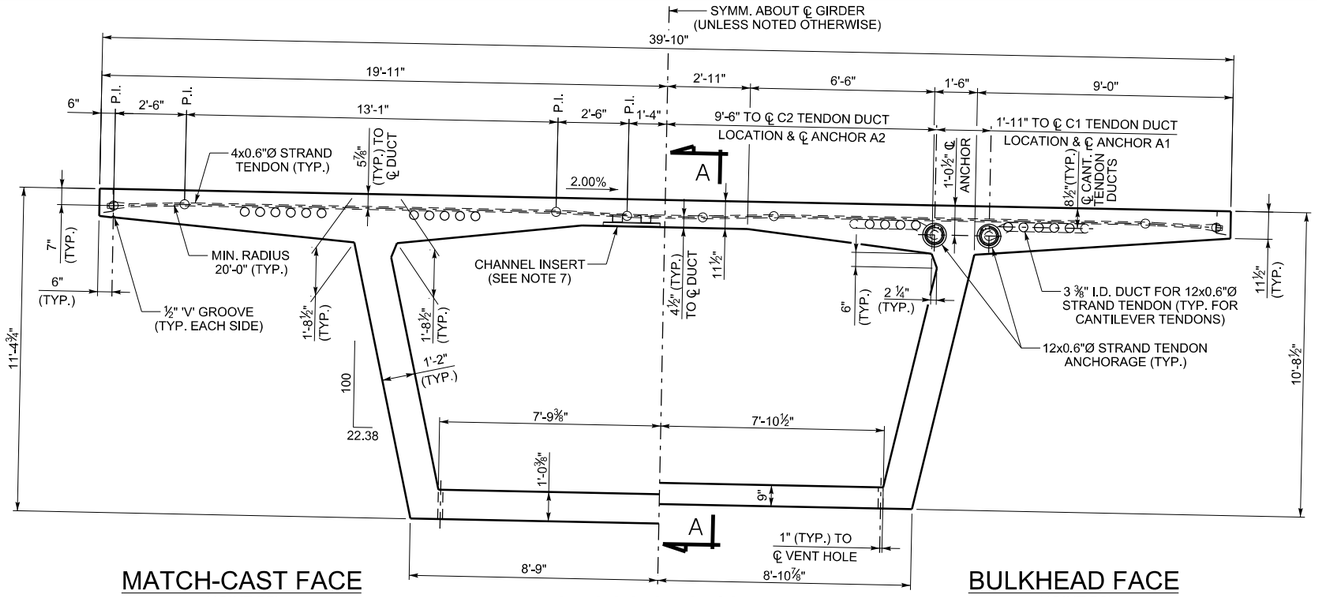
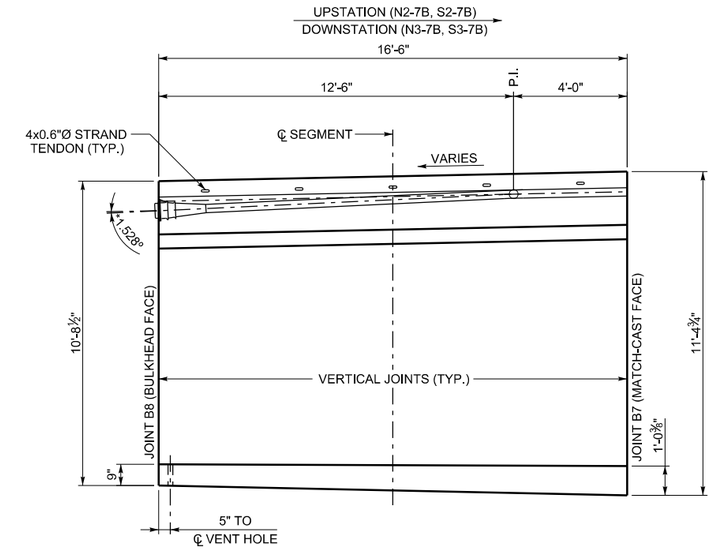
5/7/2008



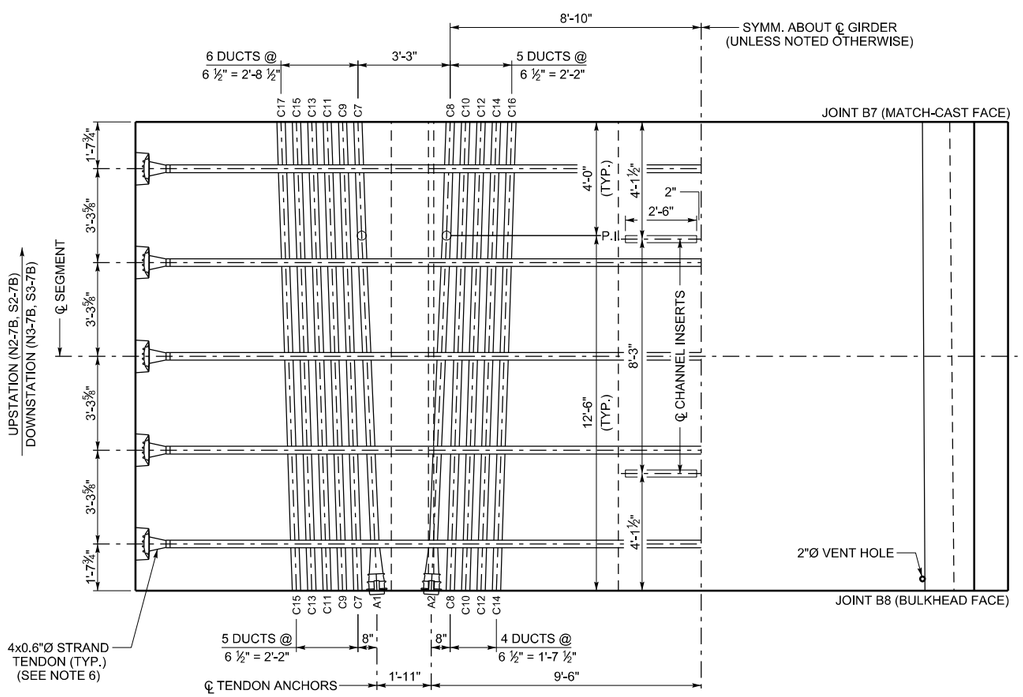
MATCH-CAST FACE
(JOINT B7)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B8)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



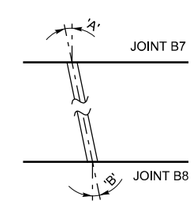
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

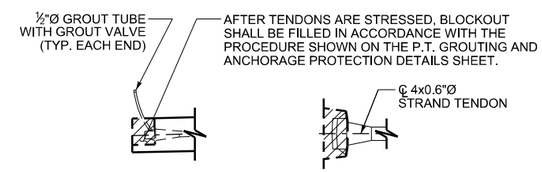
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B7 DUCT POSITION	'A'	JOINT B8 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9-C17	1.880°	C7-C15	1.880°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-7B, S2-7B, N3-7B AND S3-7B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
SEGMENT 7B DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 126 OF 187

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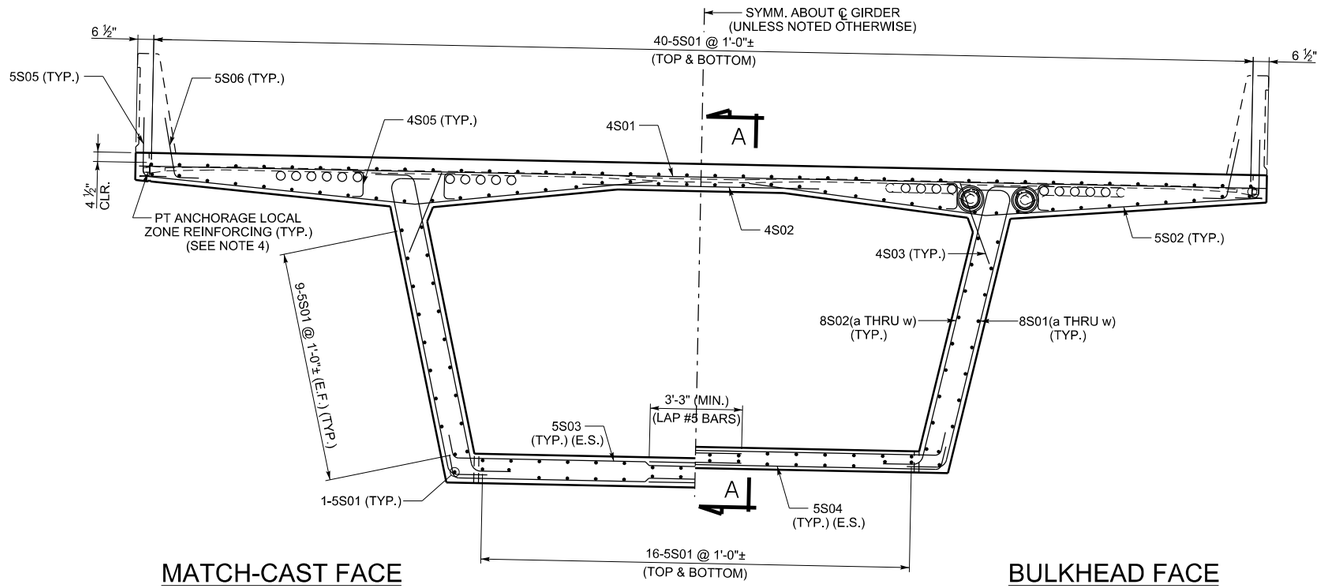
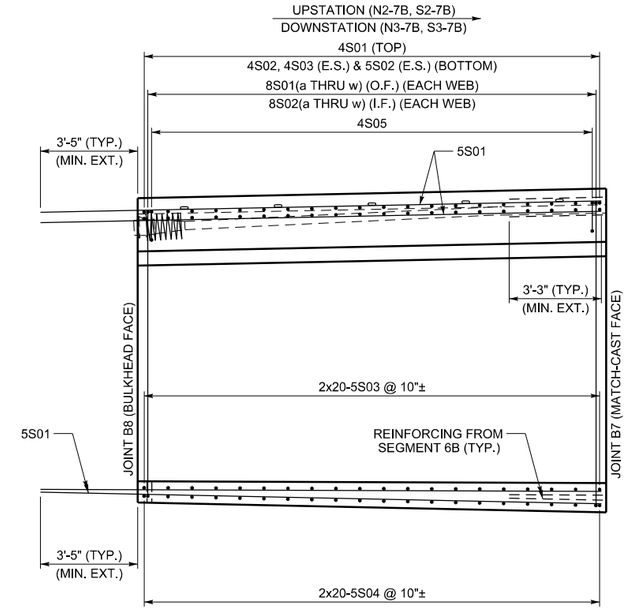
5/7/2008



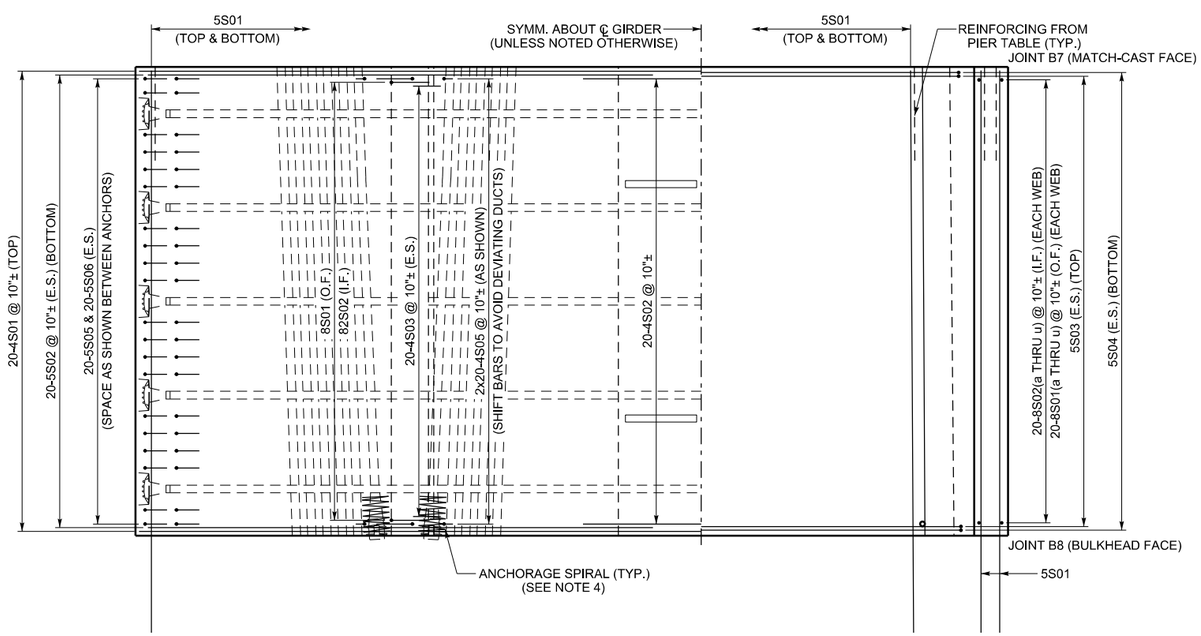
MATCH-CAST FACE
(JOINT B7)

CROSS SECTION

BULKHEAD FACE
(JOINT B8)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-7B, S2-7B, N3-7B AND S3-7B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 7B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 127 OF 187

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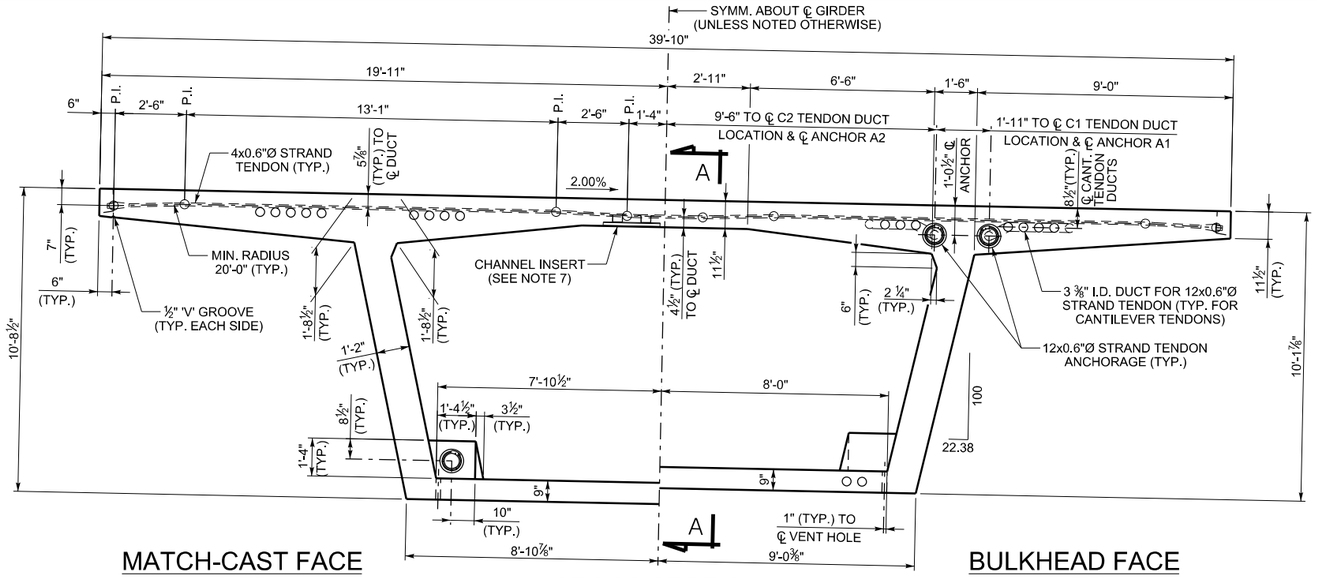
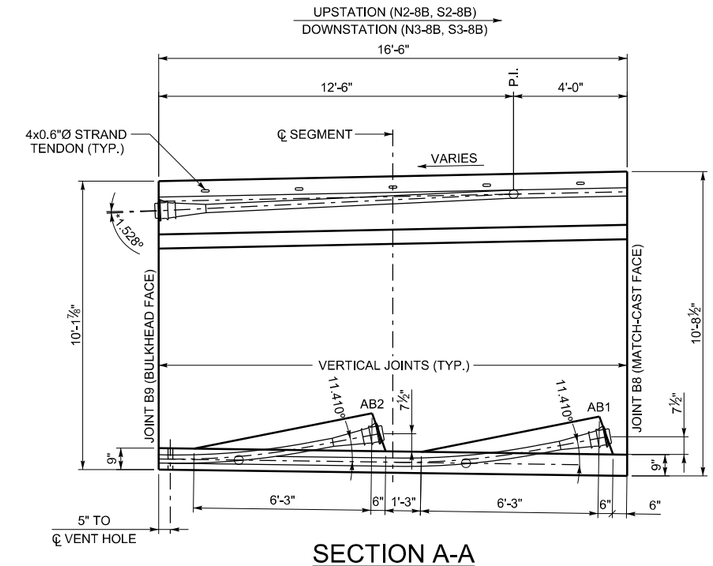
5/7/2008



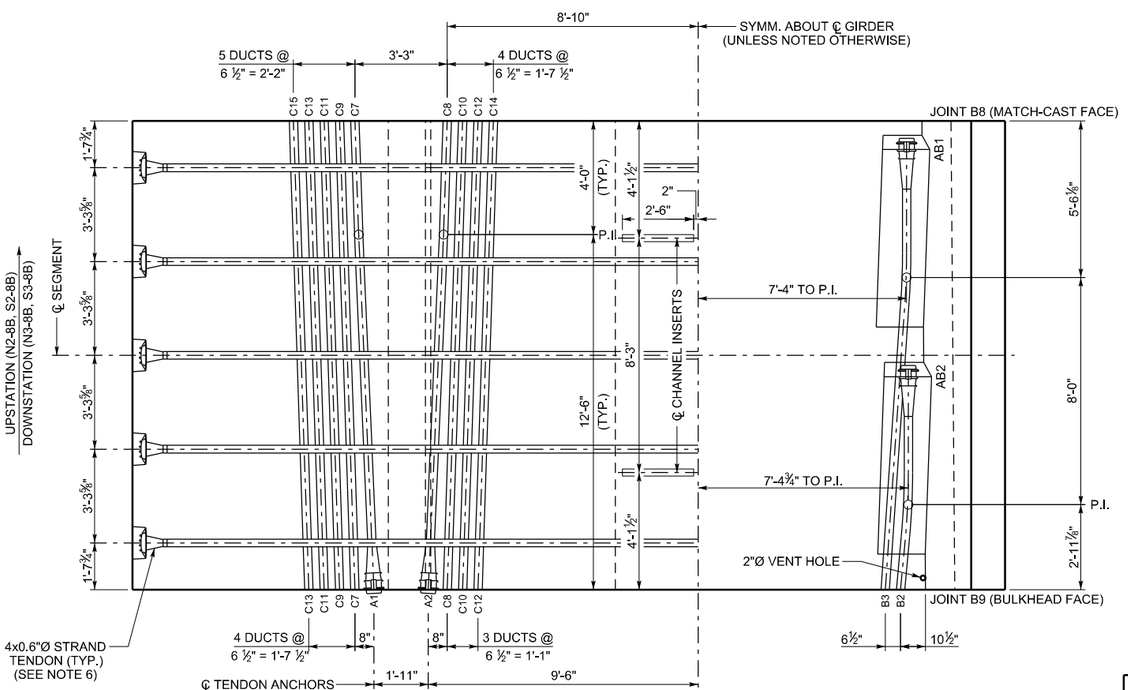
MATCH-CAST FACE
(JOINT B8)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B9)



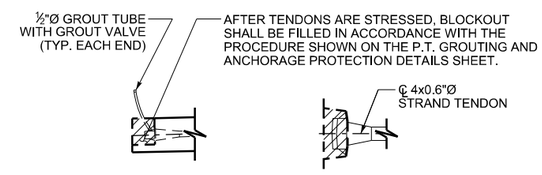
SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

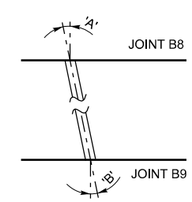


CROSS SECTION PLAN

TRANSVERSE TENDON
BLOCKOUT DETAIL

C 23
JOINT FACE
DUCT POSITION
C - CANTILEVER DUCT
B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION
SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B8 DUCT POSITION	'A'	JOINT B9 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9-C15	1.880°	C7-C13	1.880°

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-8B, S2-8B, N3-8B AND S3-8B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 8B DIMS & PT DETAILS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 129 OF 187

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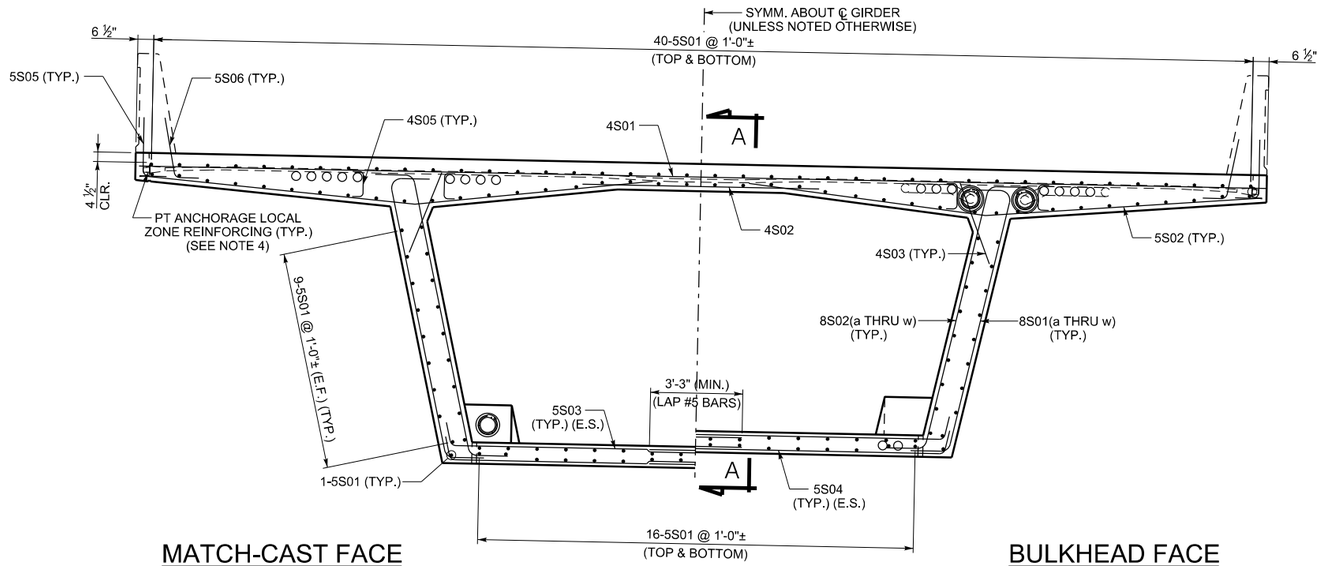
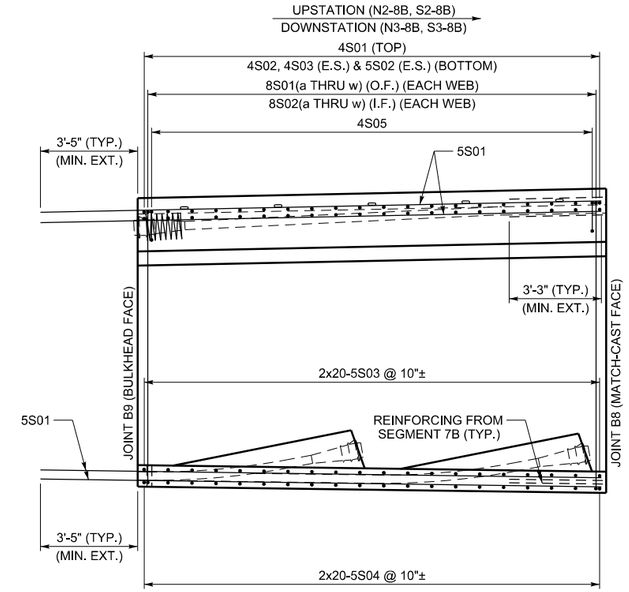
5/7/2008



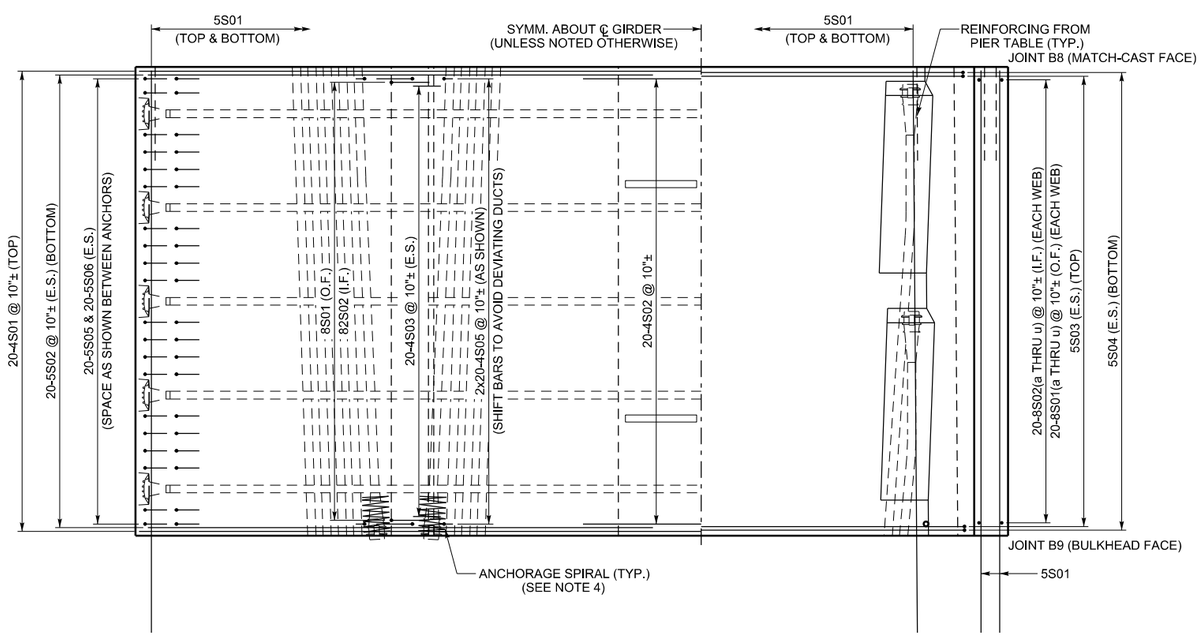
MATCH-CAST FACE
(JOINT B8)

CROSS SECTION

BULKHEAD FACE
(JOINT B9)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-8B, S2-8B, N3-8B AND S3-8B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 8B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 130 OF 187

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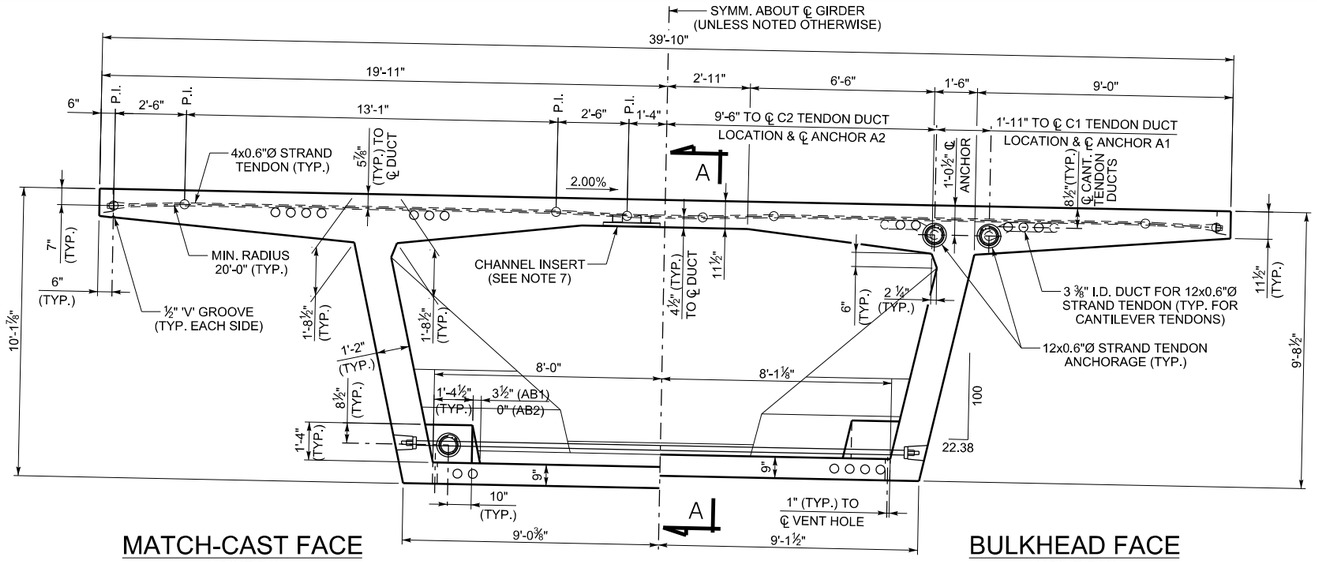
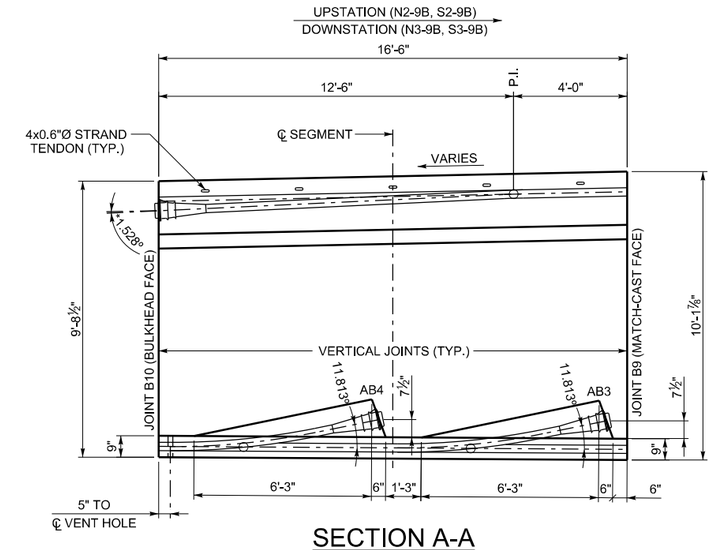
5/7/2008



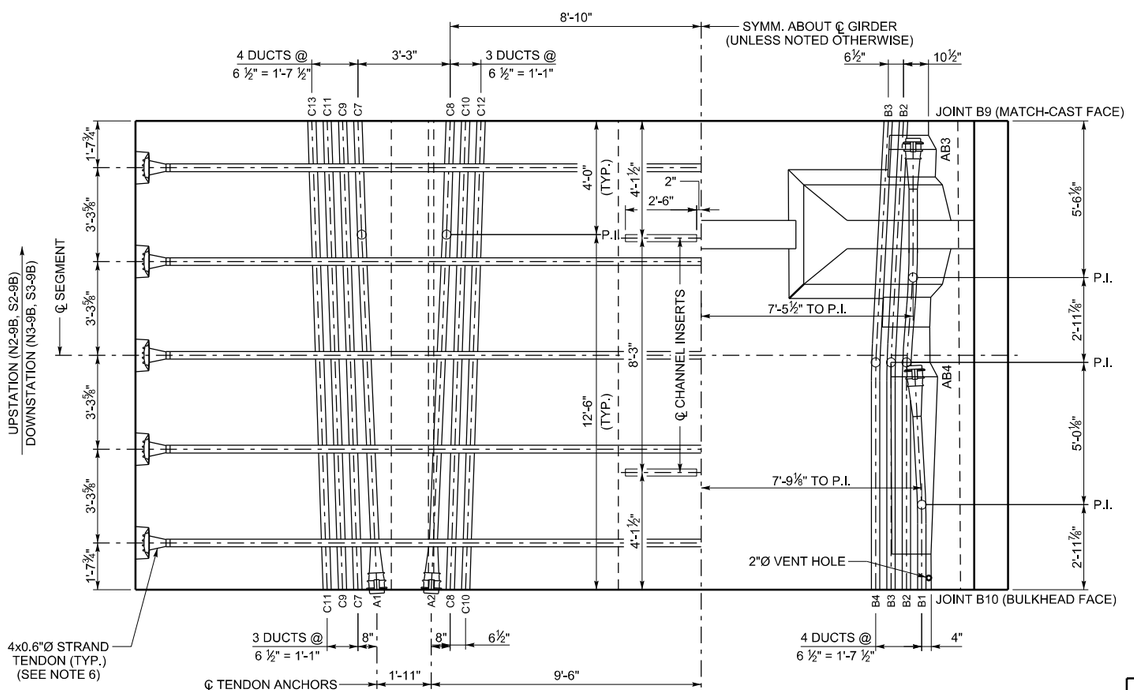
MATCH-CAST FACE
(JOINT B9)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B10)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



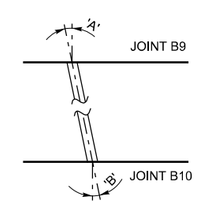
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

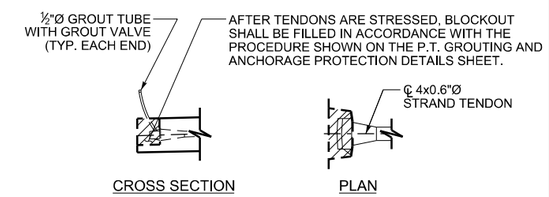
DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS

JOINT B9 DUCT POSITION	'A'	JOINT B10 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9-C13	1.880°	C7-C11	1.880°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-9B, S2-9B, N3-9B AND S3-9B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.
10. FOR DEVIATION DIAPHRAGM DETAILS, SEE SEGMENT TYPE 9B REINFORCING II SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH

SEGMENT 9B DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 132 OF 187

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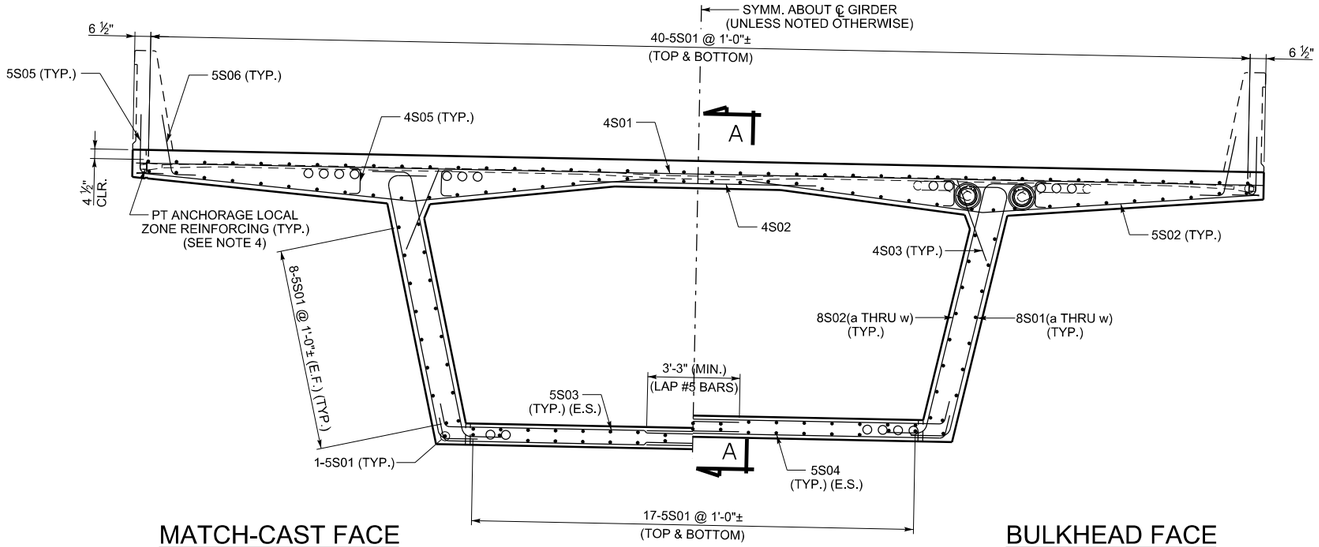
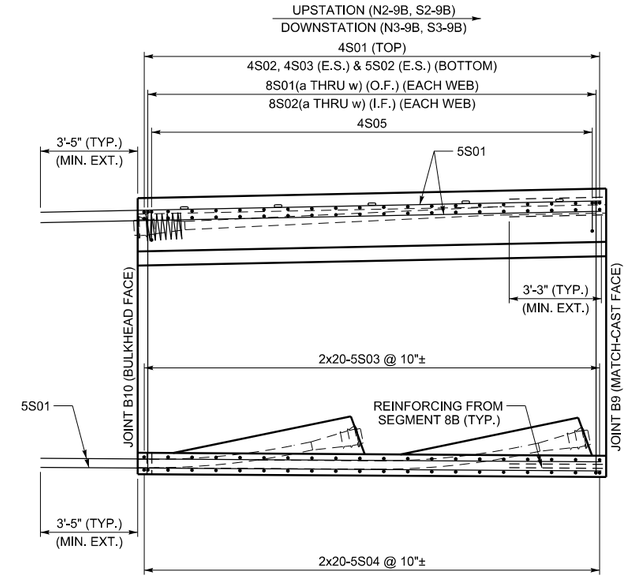
5/7/2008



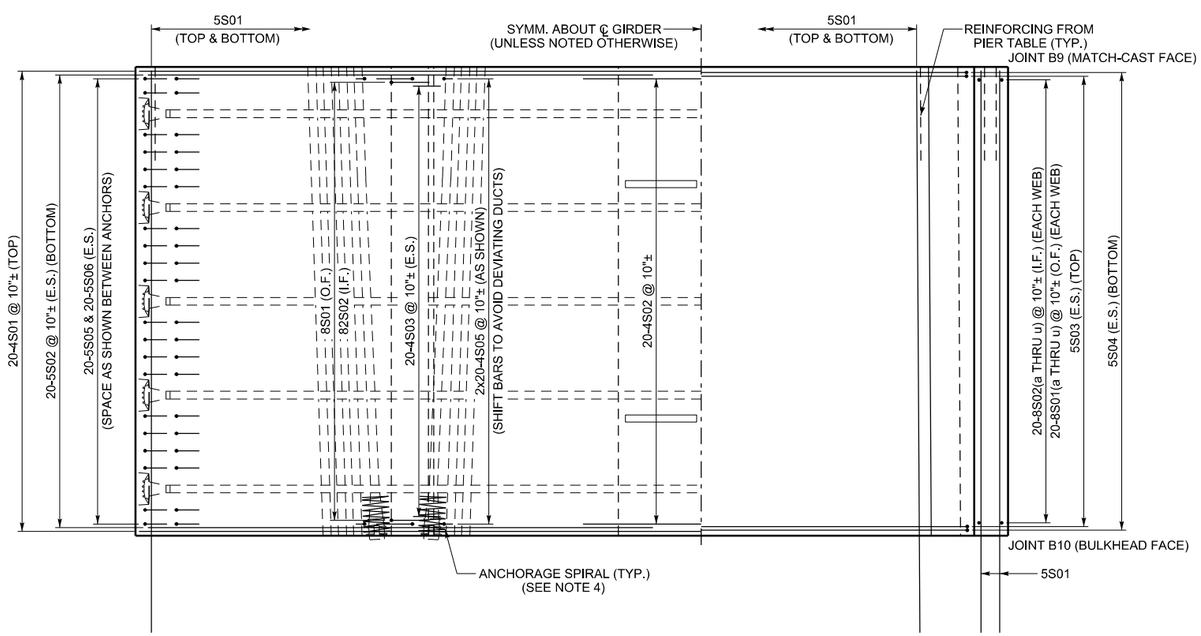
MATCH-CAST FACE
(JOINT B9)

CROSS SECTION

BULKHEAD FACE
(JOINT B10)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-9B, S2-9B, N3-9B AND S3-9B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 9B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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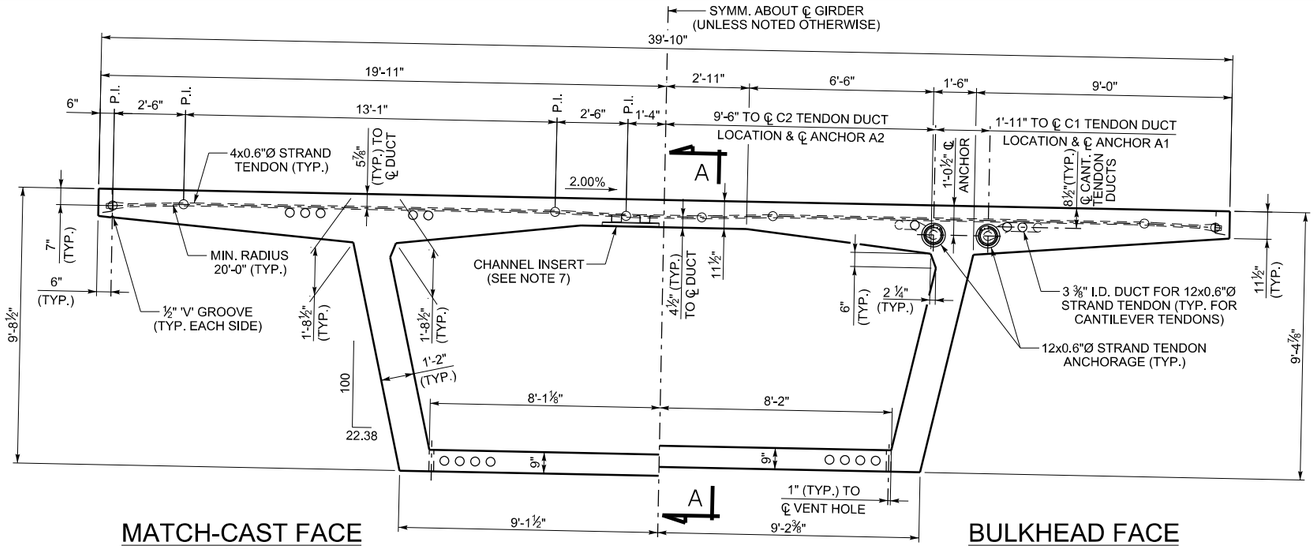
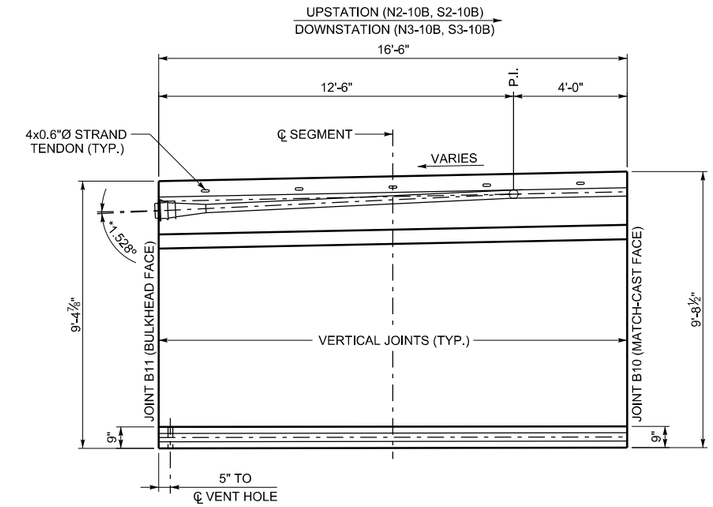
5/7/2008



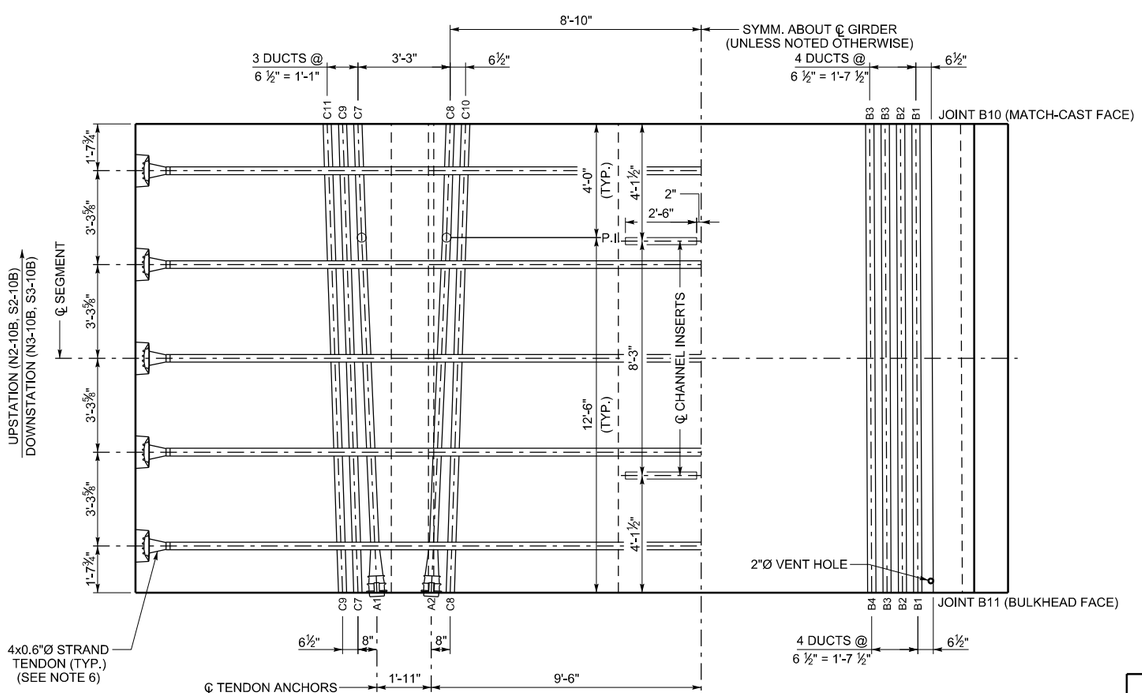
MATCH-CAST FACE
(JOINT B10)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B11)



SECTION A-A
(ANGLES SHOWN WITH RESPECT TO TOP OF DECK GRADE)



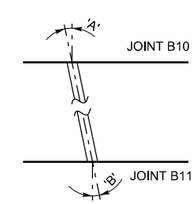
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

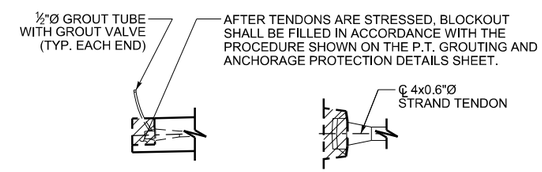
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B10 DUCT POSITION	'A'	JOINT B11 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9-C11	1.880°	C7-C9	1.880°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-10B, S2-10B, N3-10B AND S3-10B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 10B DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 136 OF 187

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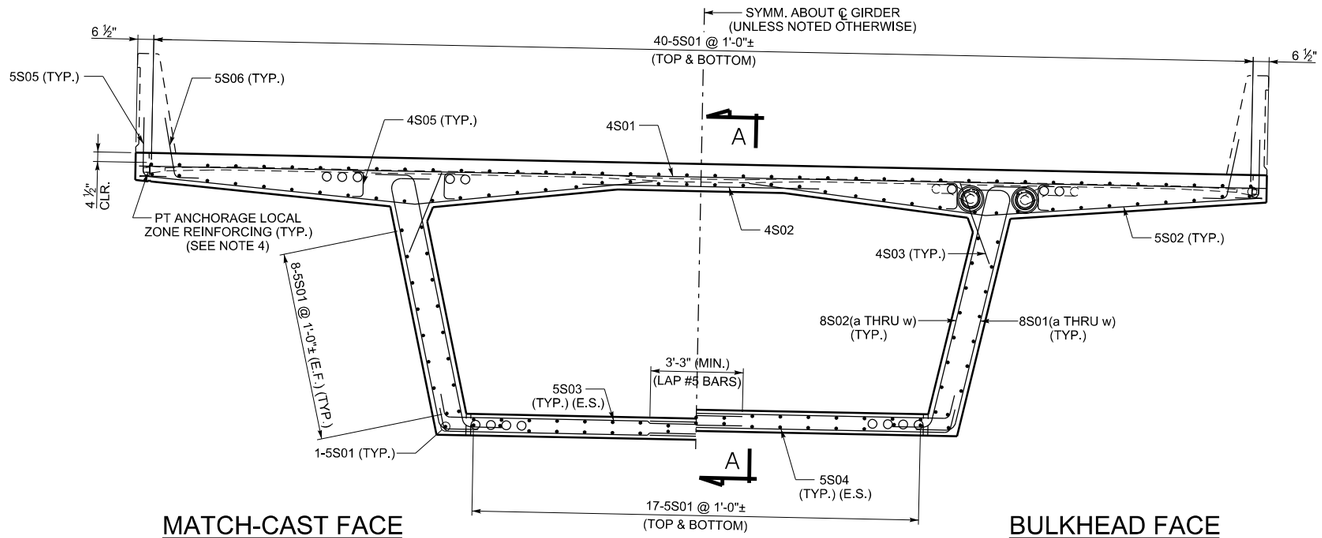
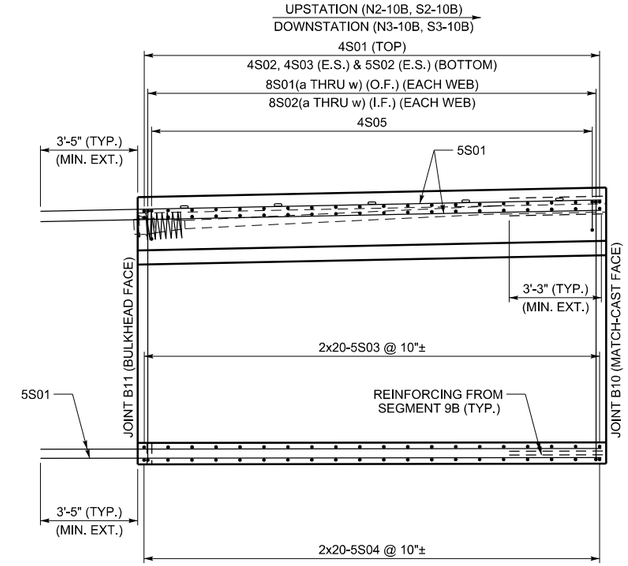
5/7/2008



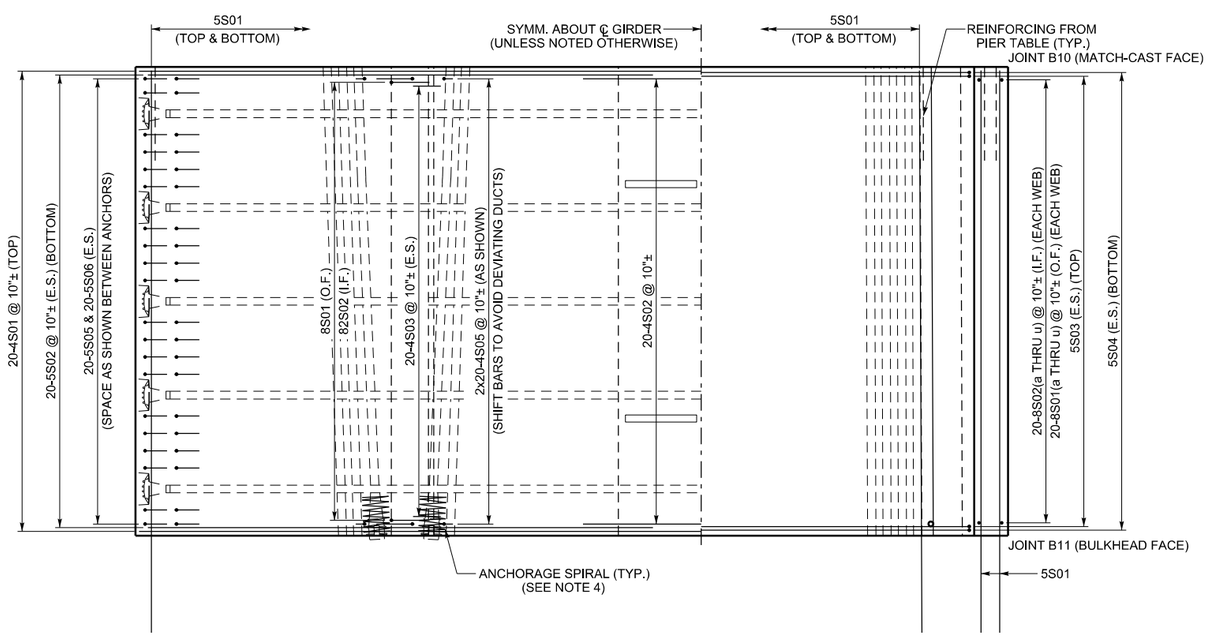
MATCH-CAST FACE
(JOINT B10)

CROSS SECTION

BULKHEAD FACE
(JOINT B11)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-10B, S2-10B, N3-10B AND S3-10B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 10B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 137 OF 187

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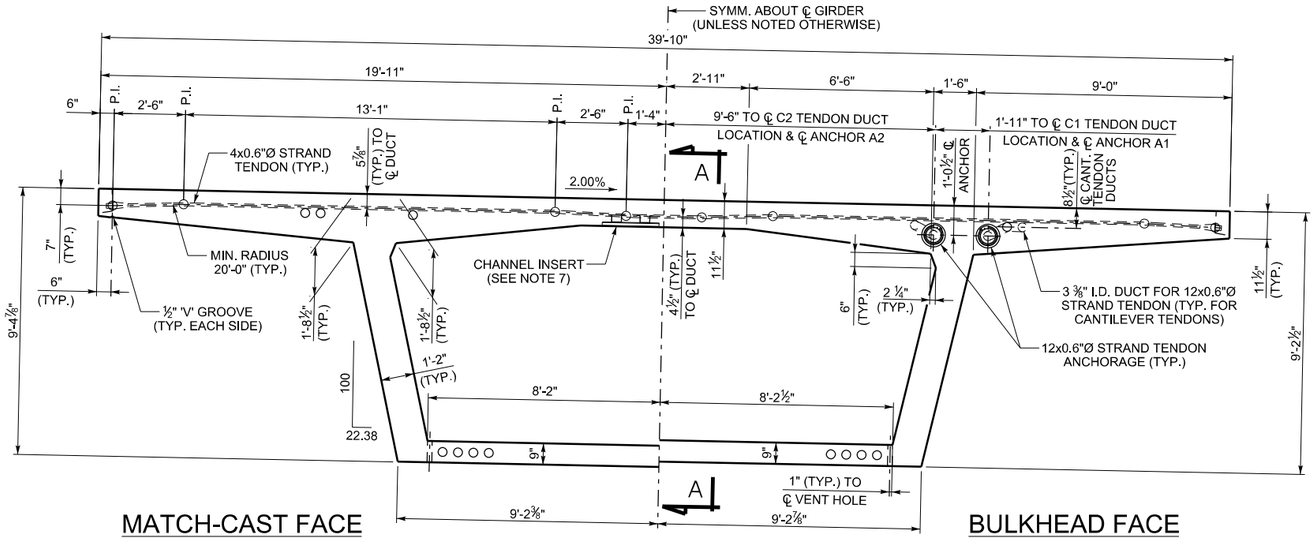
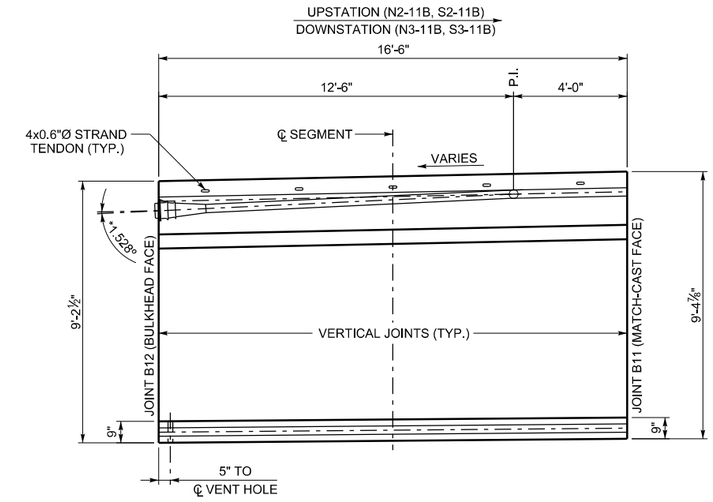
5/7/2008



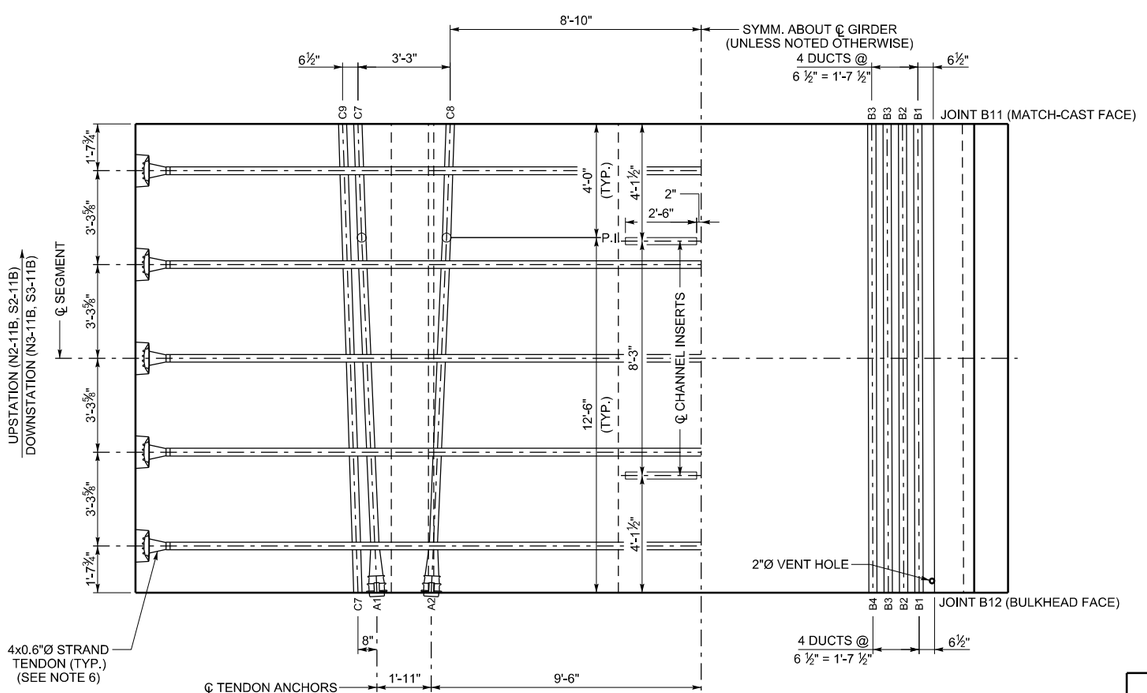
MATCH-CAST FACE
(JOINT B11)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

BULKHEAD FACE
(JOINT B12)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



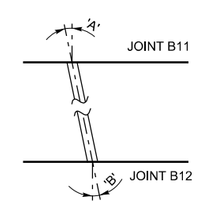
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

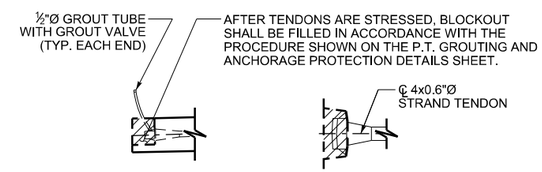
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B11 DUCT POSITION	'A'	JOINT B12 DUCT POSITION	'B'
C7	1.880°	A1	3.054°
C8	1.880°	A2	3.054°
C9	1.880°	C7	1.880°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-11B, S2-11B, N3-11B AND S3-11B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.

*5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.

6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER
RIVER BRIDGE - MOAB UTAH
SEGMENT 11B DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 139 OF 187

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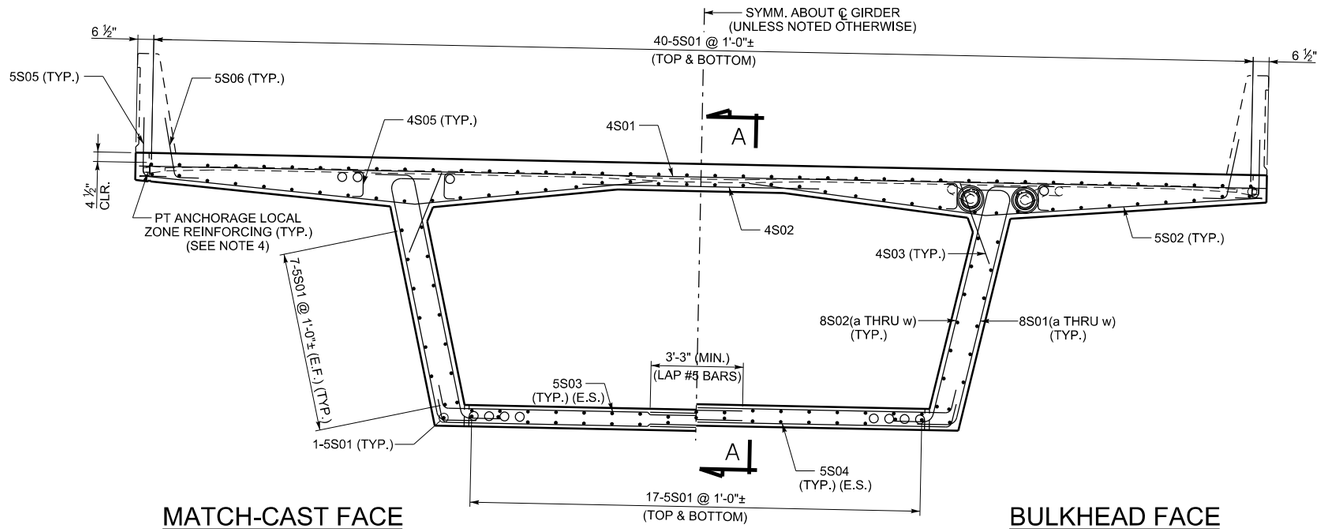
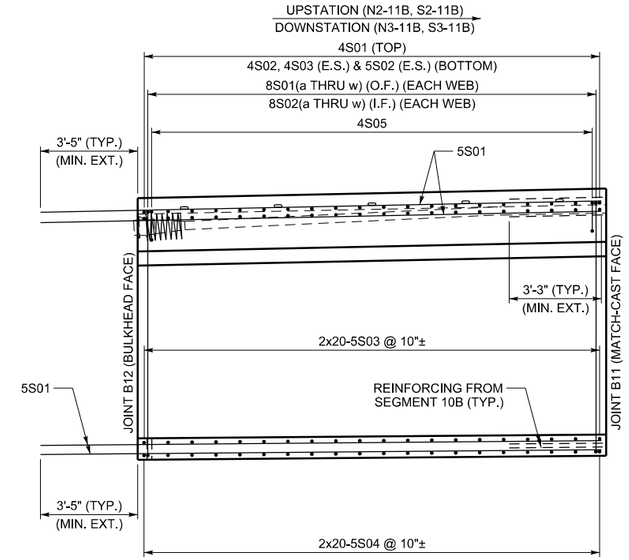
5/7/2008



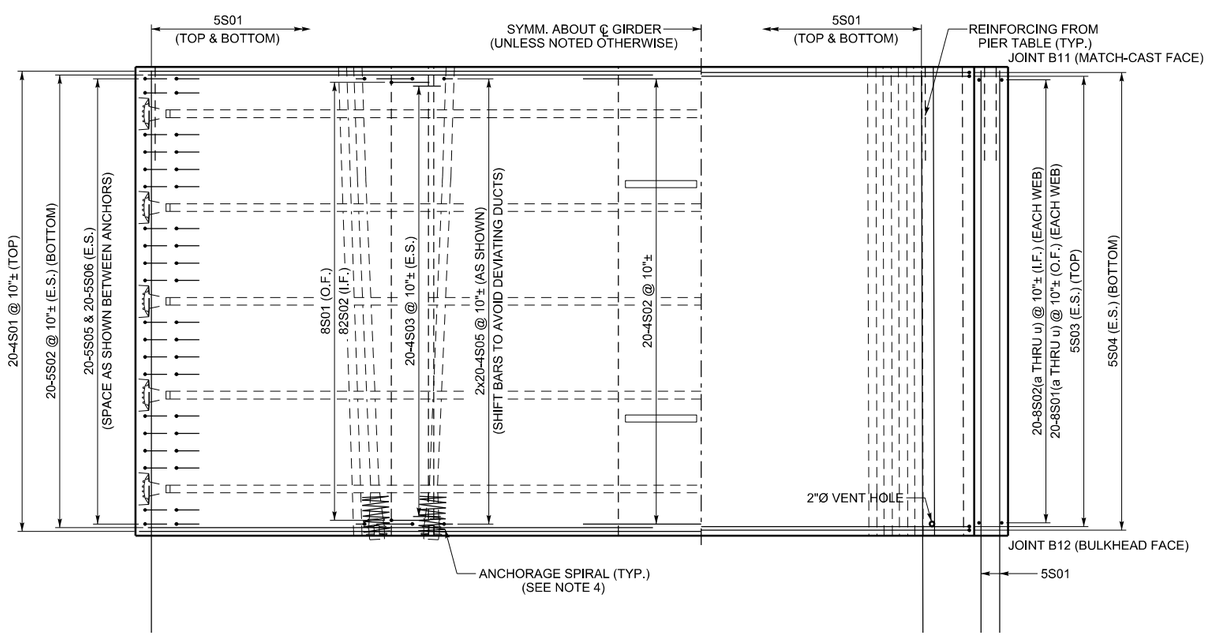
MATCH-CAST FACE
(JOINT B11)

CROSS SECTION

BULKHEAD FACE
(JOINT B12)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-11B, S2-11B, N3-11B AND S3-11B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 11B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 140 OF 187

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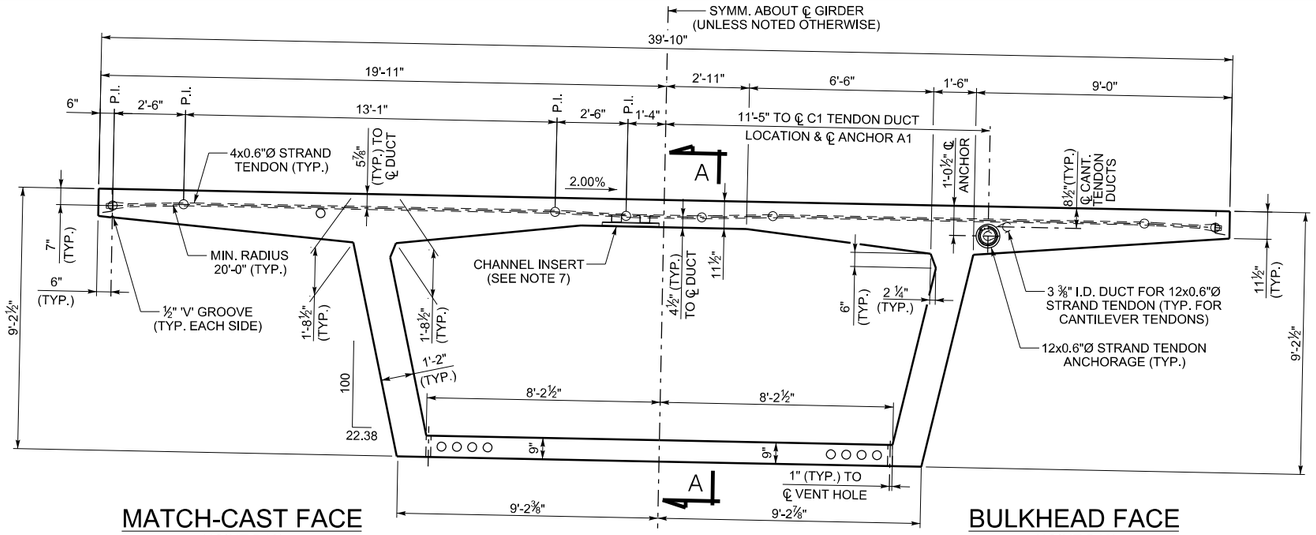
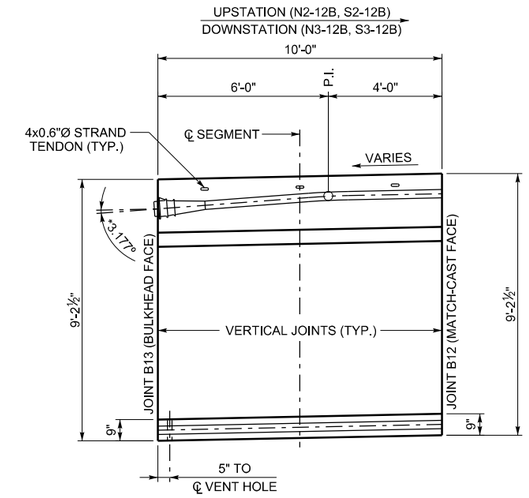
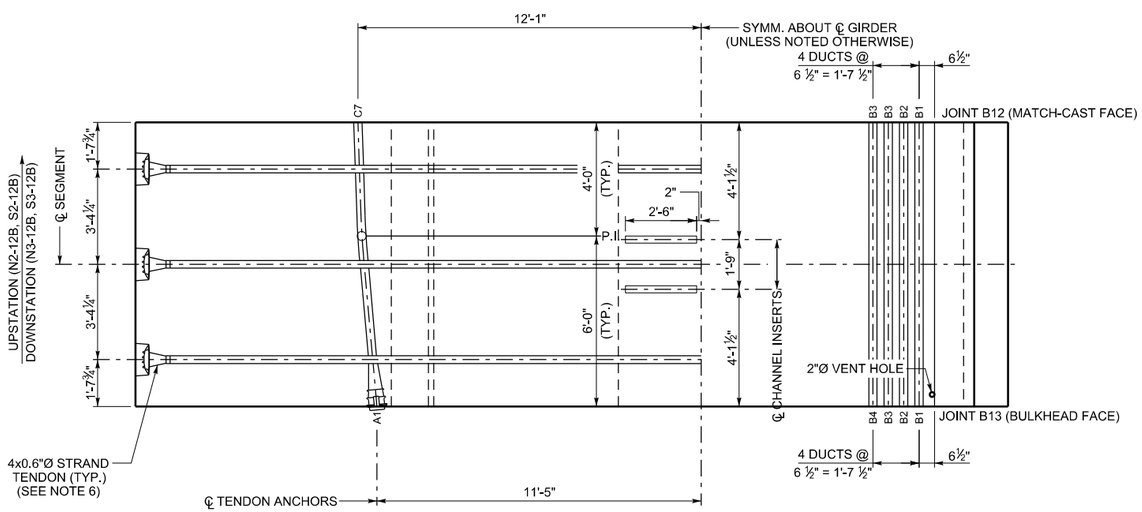
5/7/2008



CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT TO TOP OF DECK GRADE)



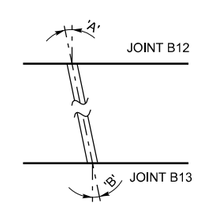
PARTIAL PLAN TOP SLAB
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

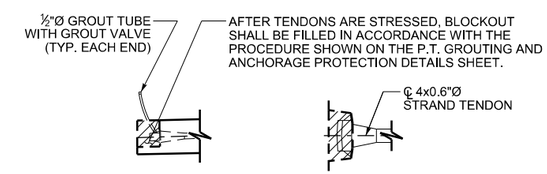
C 23
- JOINT FACE
- DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B11 DUCT POSITION	'A'	JOINT B12 DUCT POSITION	'B'
C7	1.880°	A1	3.054°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-12B, S2-12B, N3-12B AND S3-12B.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5*. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12x0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 12B DIMS & PT DETAILS
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY
F-763
DRG. NO.
SHT. 142 OF 187

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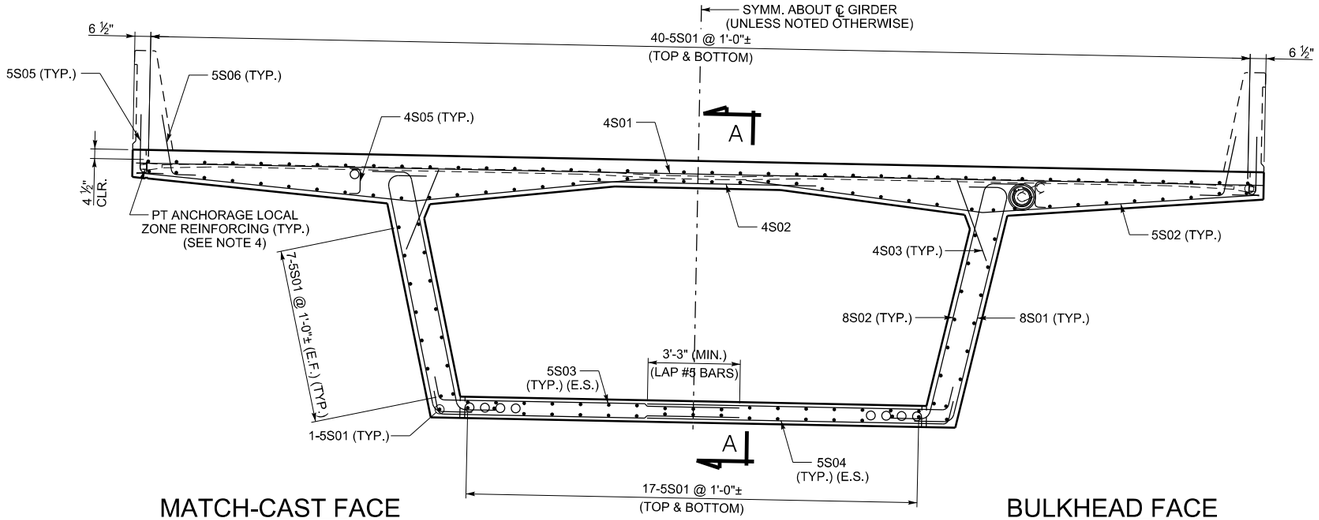
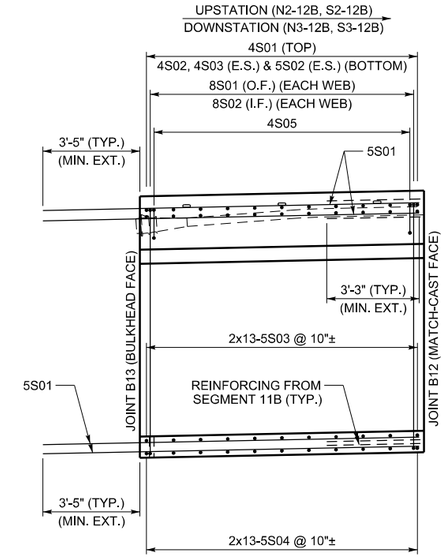
5/7/2008



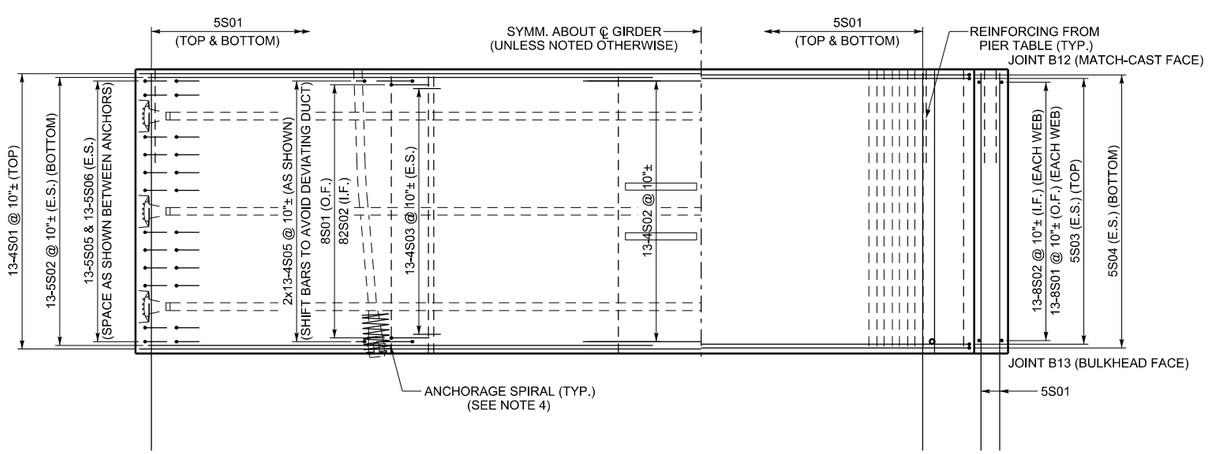
MATCH-CAST FACE
(JOINT B12)

CROSS SECTION

BULKHEAD FACE
(JOINT B13)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

NOTES:

1. THIS DRAWING VALID FOR ALL SEGMENT TYPES N2-12B, S2-12B, N3-12B AND S3-12B.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 12B REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 143 OF 187

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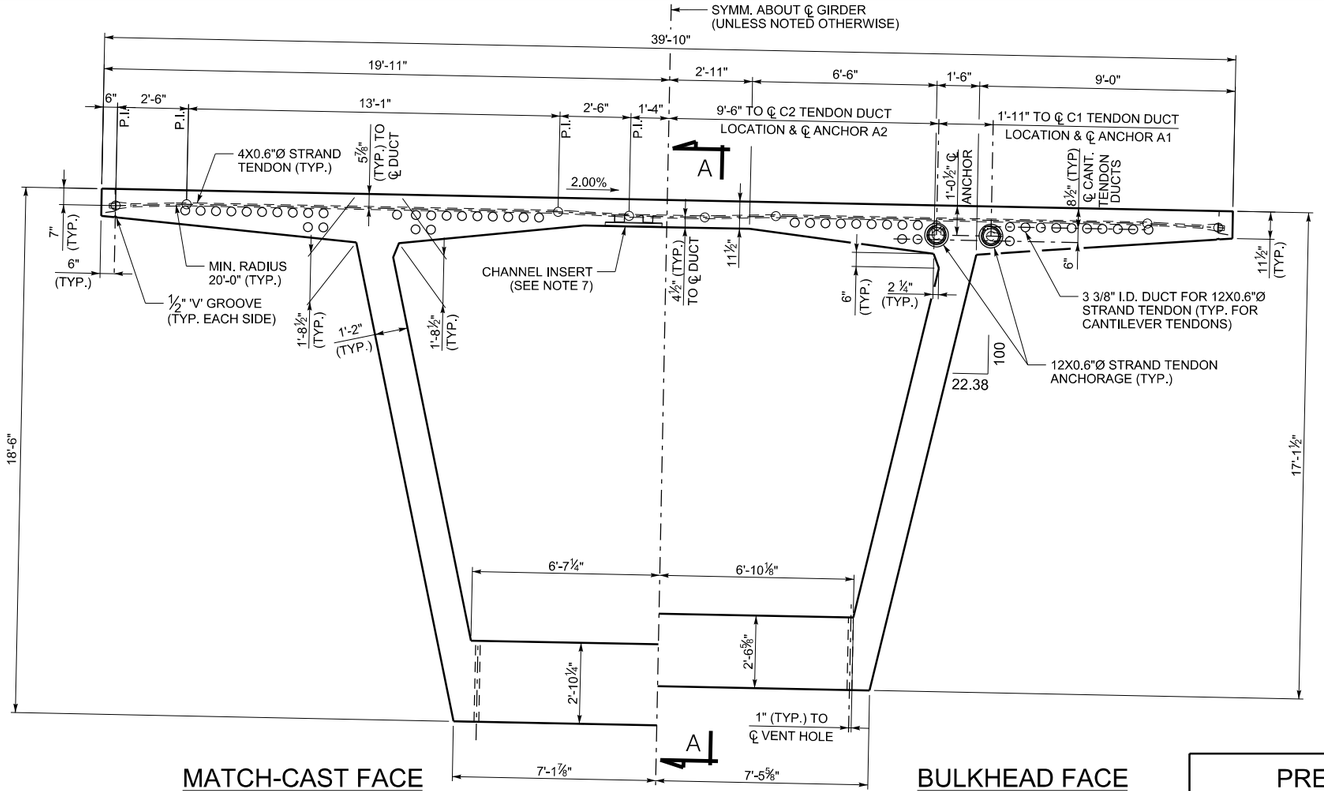
5/7/2008

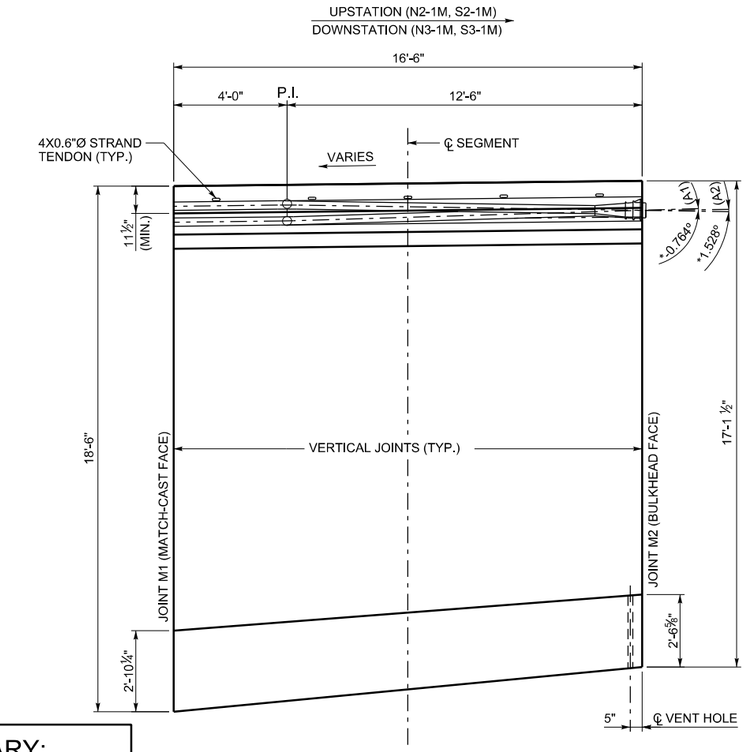


MATCH-CAST FACE
(JOINT M1)

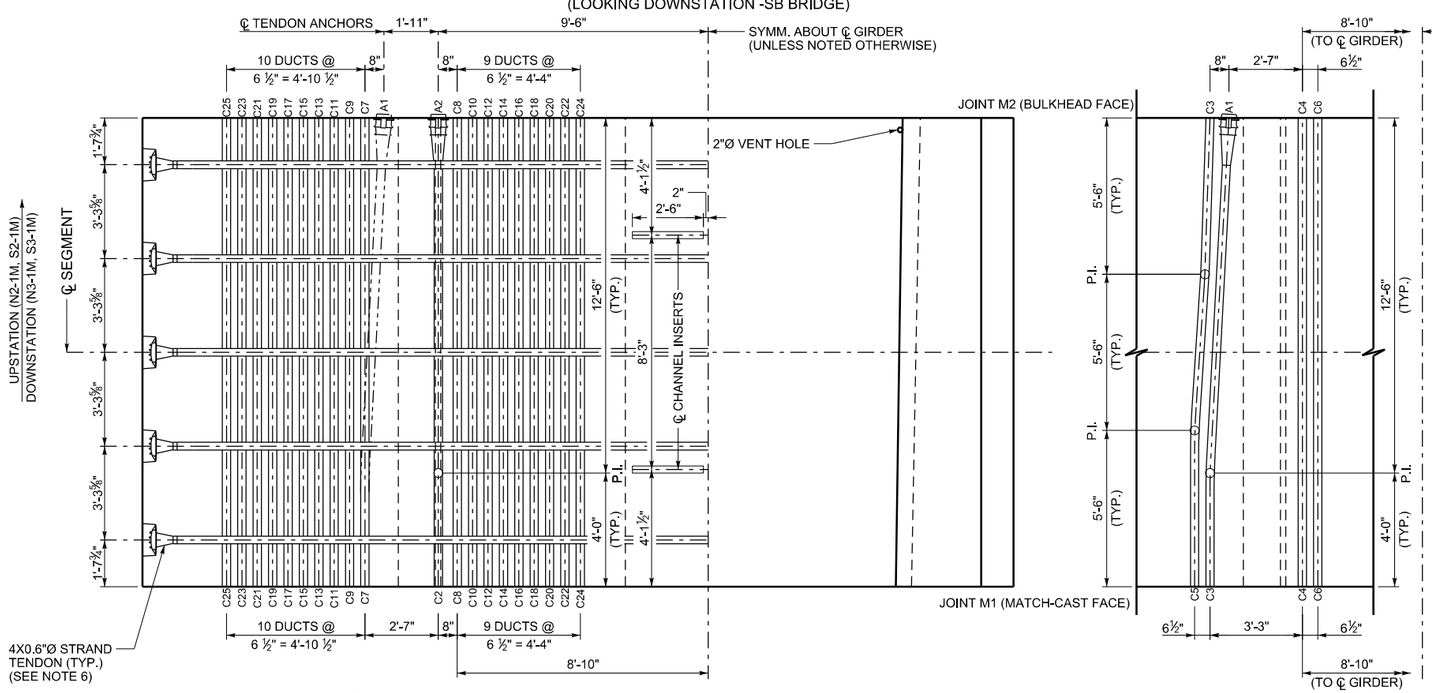
CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)

BULKHEAD FACE
(JOINT M2)

PRELIMINARY:
NOT FOR CONSTRUCTION



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



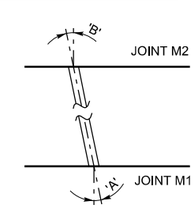
PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

LOWER DUCT DETAIL

C 23
- 23 — JOINT FACE DUCT POSITION
- C — C - CANTILEVER DUCT; B - BOTTOM SLAB DUCT

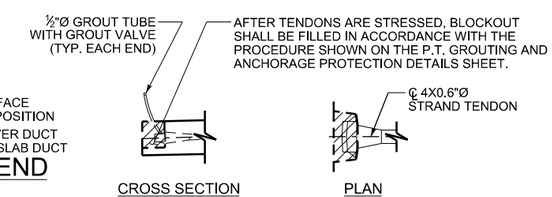
DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE
PARALLEL TO TOP SLAB)

DUCT DEVIATIONS

JOINT M1 DUCT POSITION	'A'	JOINT M2 DUCT POSITION	'B'
C2	0°	A2	0°
C3	0°	A1	3.054°
C4	0°	C4	0°
C5	0°	C3	1.880°
C6	0°	C6	0°
C7	0°	C7	0°
C8	0°	C8	0°
C9	0°	C9	0°
C10	0°	C10	0°
C11-C25	0°	C11-C25	0°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-1M, S2-1M, N3-1M AND S3-1M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 1M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 145 OF 187

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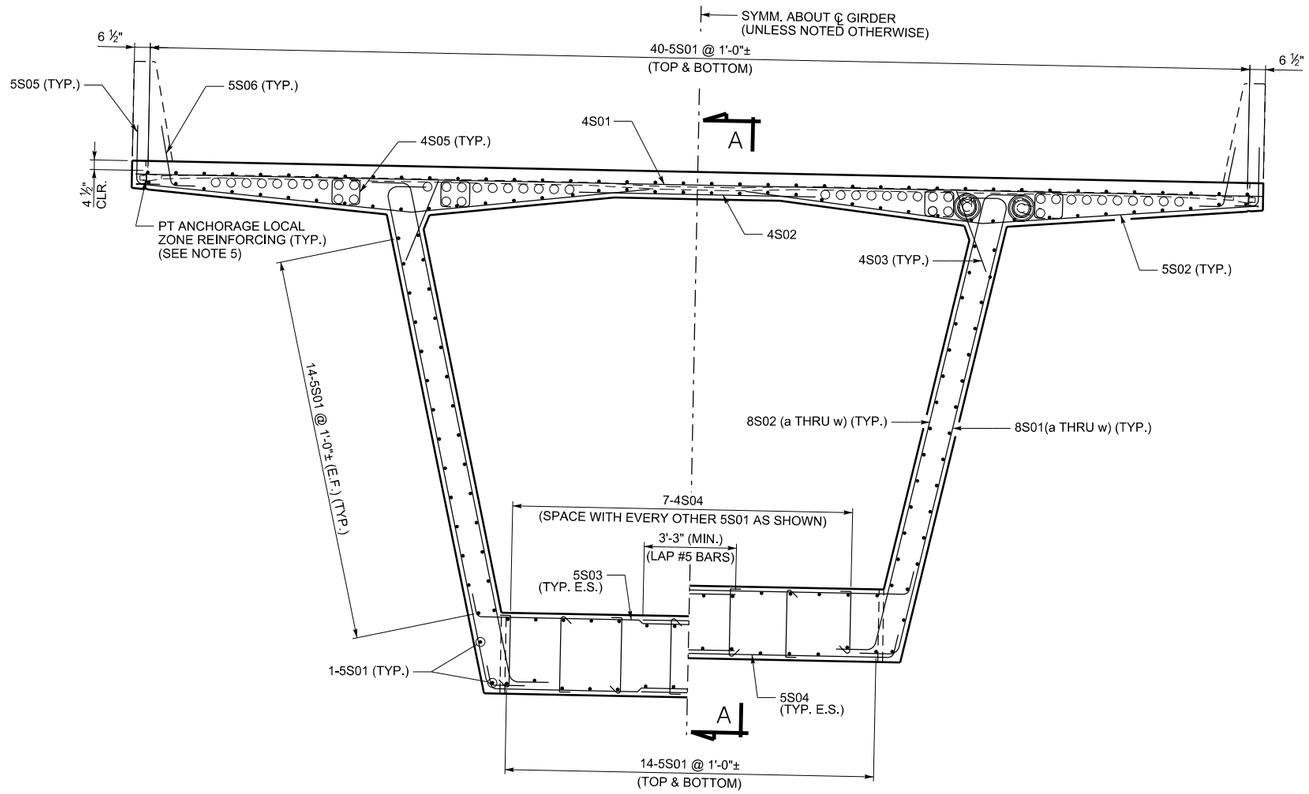
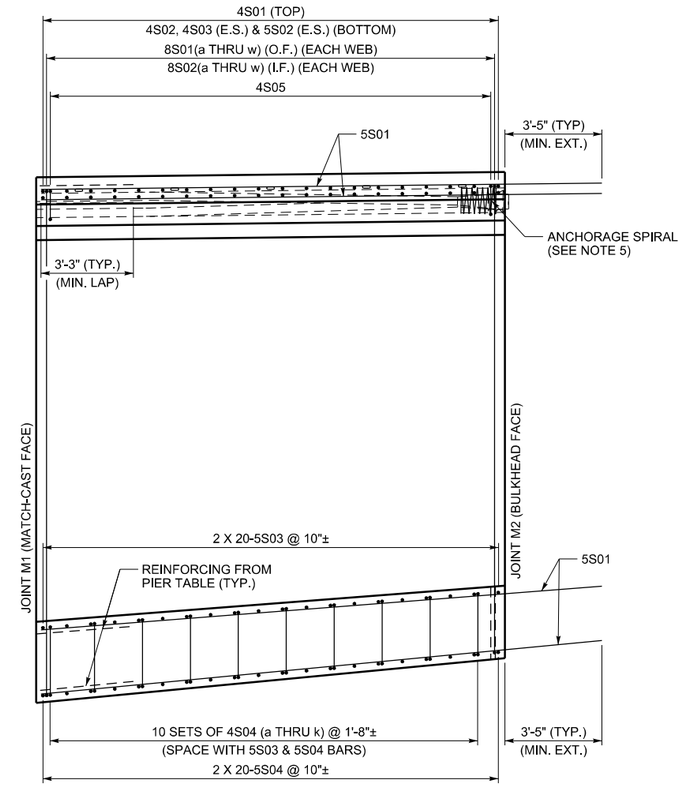
5/7/2008



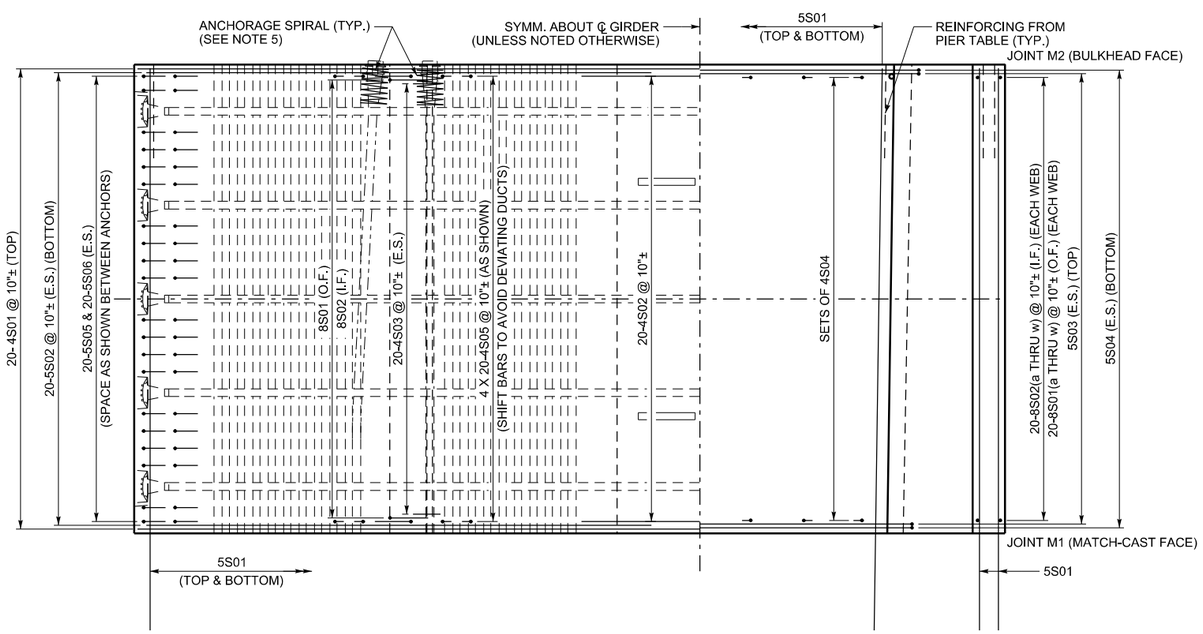
MATCH-CAST FACE
(JOINT M1)

BULKHEAD FACE
(JOINT M2)

CROSS SECTION



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-1M, S2-1M, N3-1M AND S3-1M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 1M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 146 OF 187

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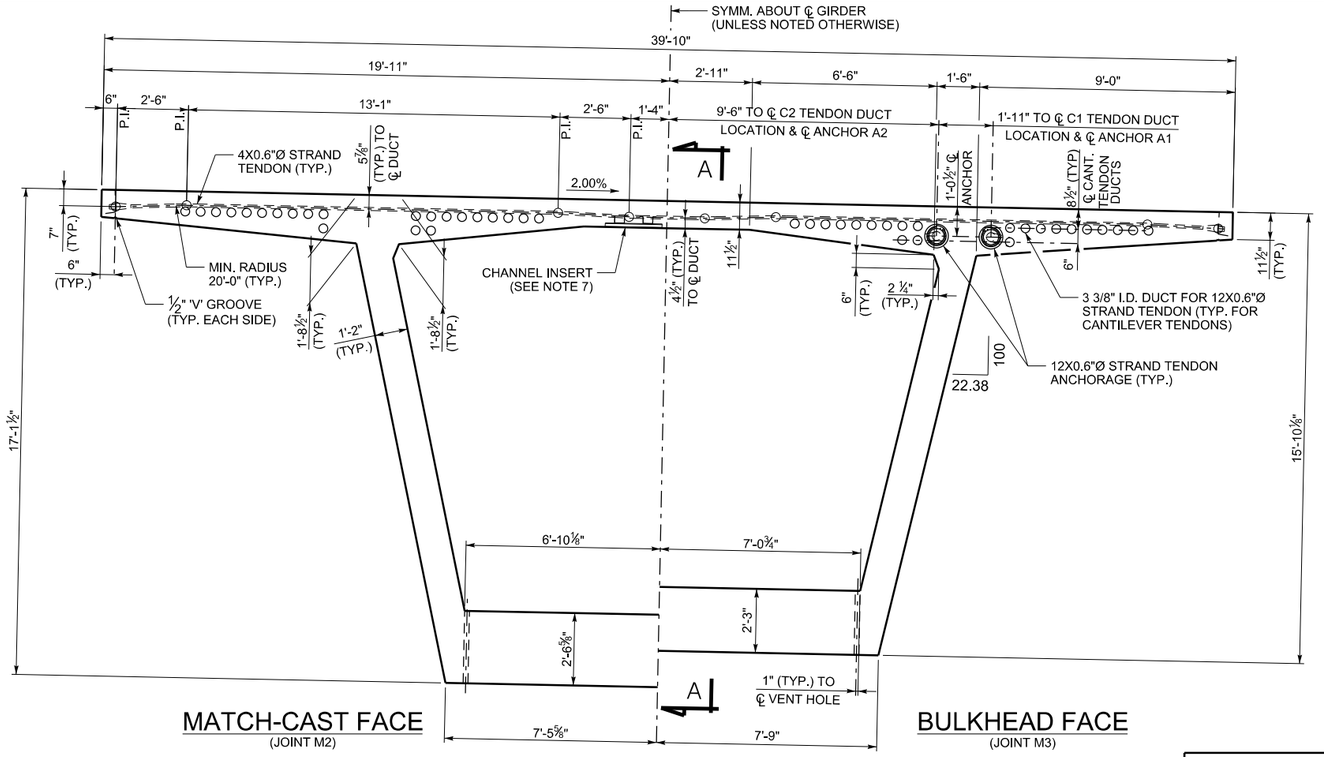
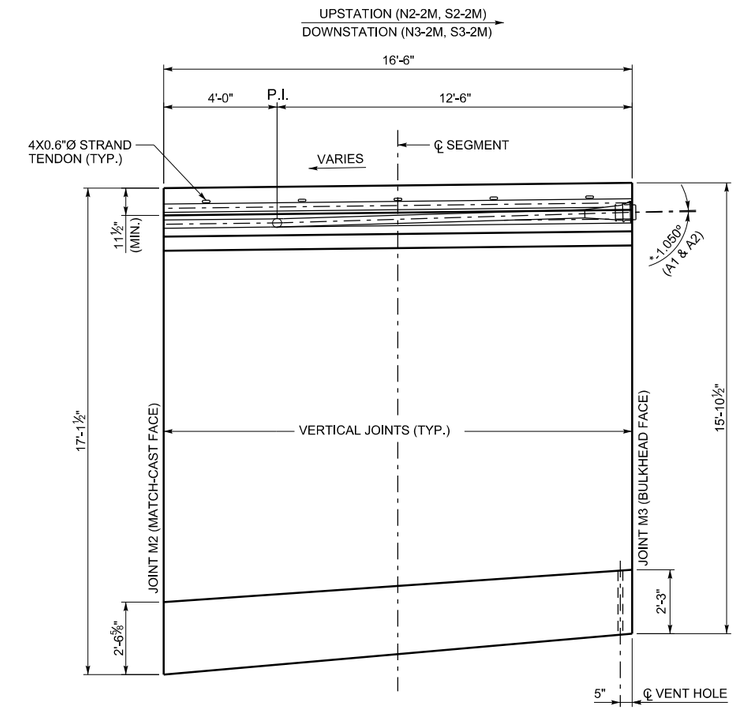
5/7/2008



MATCH-CAST FACE
(JOINT M2)

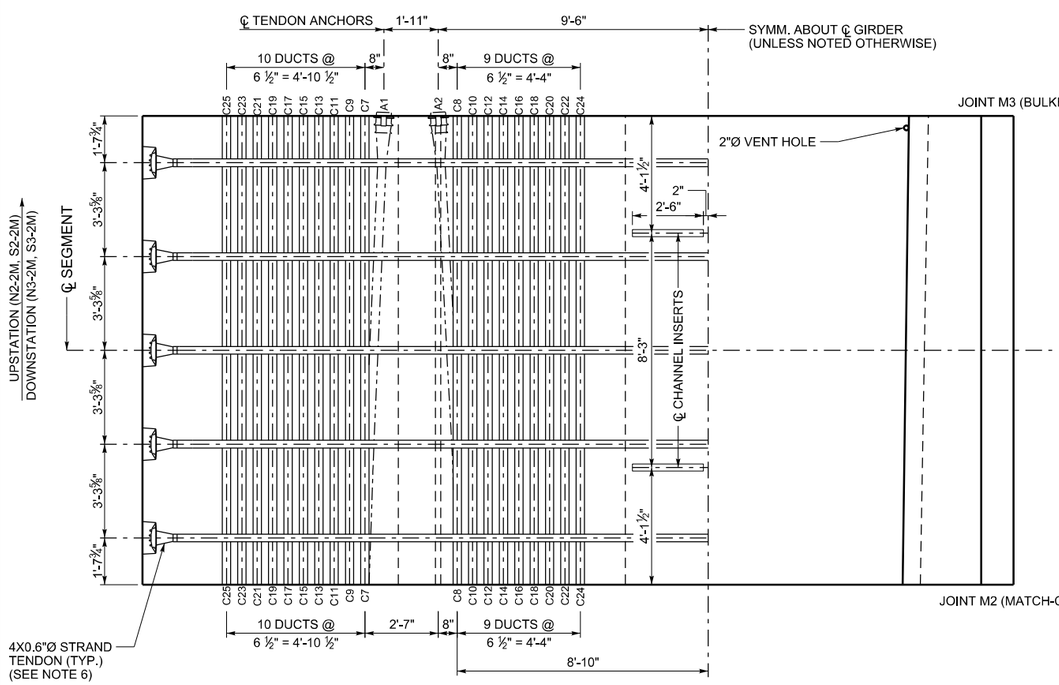
BULKHEAD FACE
(JOINT M3)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



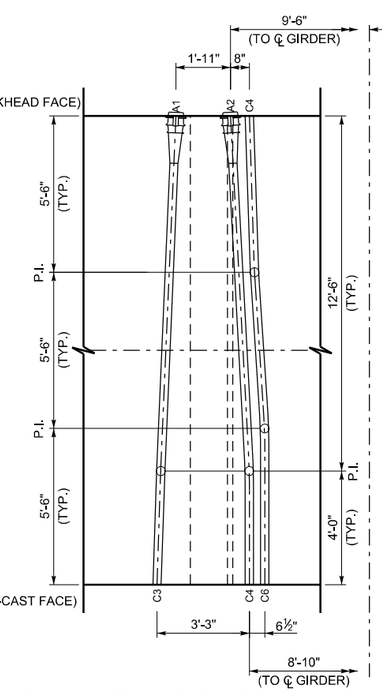
SECTION A-A
(ANGLES SHOWN WITH RESPECT TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION



PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

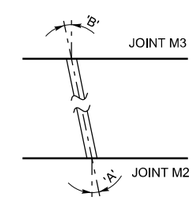
PARTIAL PLAN BOTTOM SLAB



LOWER DUCT DETAIL

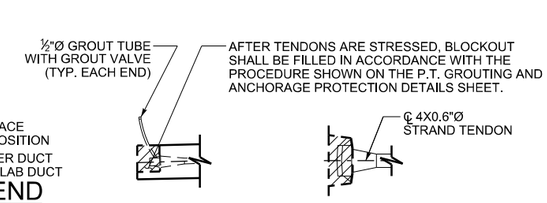
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT M2 DUCT POSITION	'A'	JOINT M3 DUCT POSITION	'B'
C4	0°	A2	3.054°
C3	1.880°	A1	2.452°
C6	0°	C4	1.880°
C7-C25	0°	C7-C25	0°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-2M, S2-2M, N3-2M AND S3-2M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER
RIVER BRIDGE - MOAB UTAH
SEGMENT 2M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 148 OF 187

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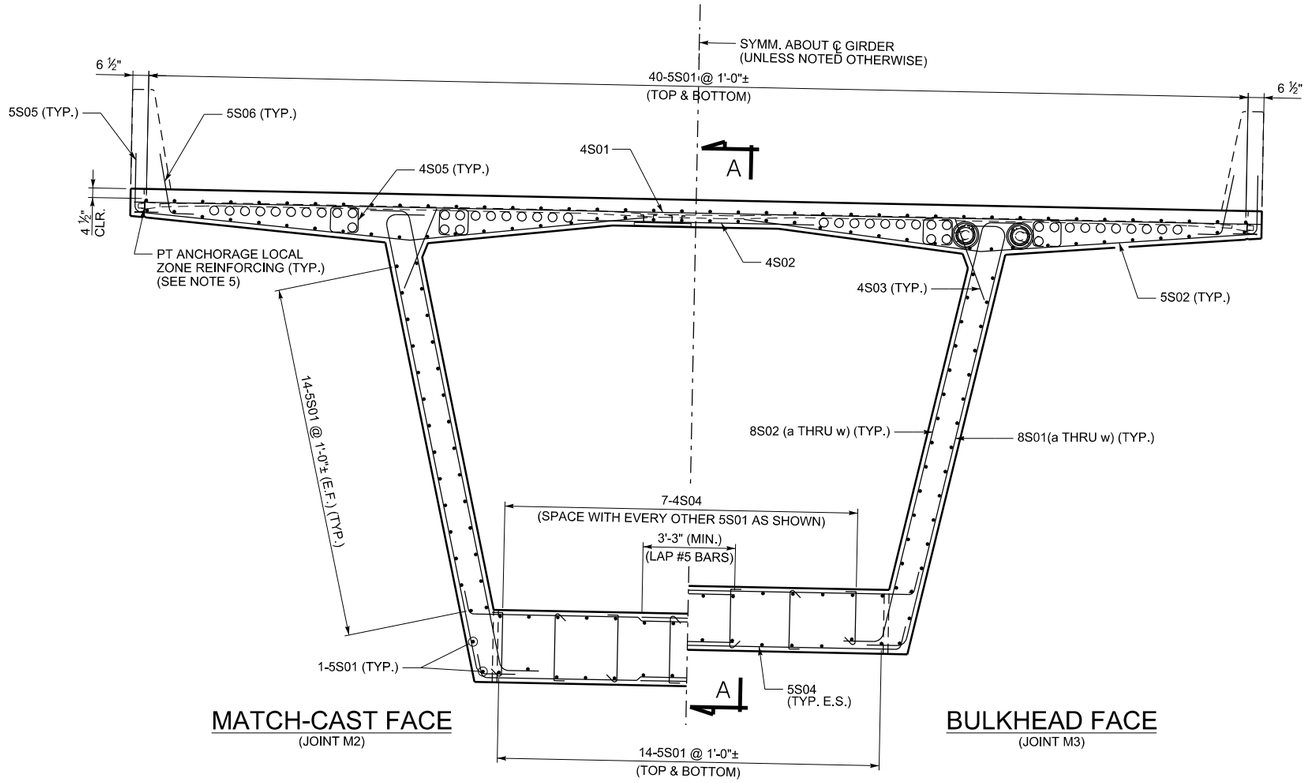
5/7/2008



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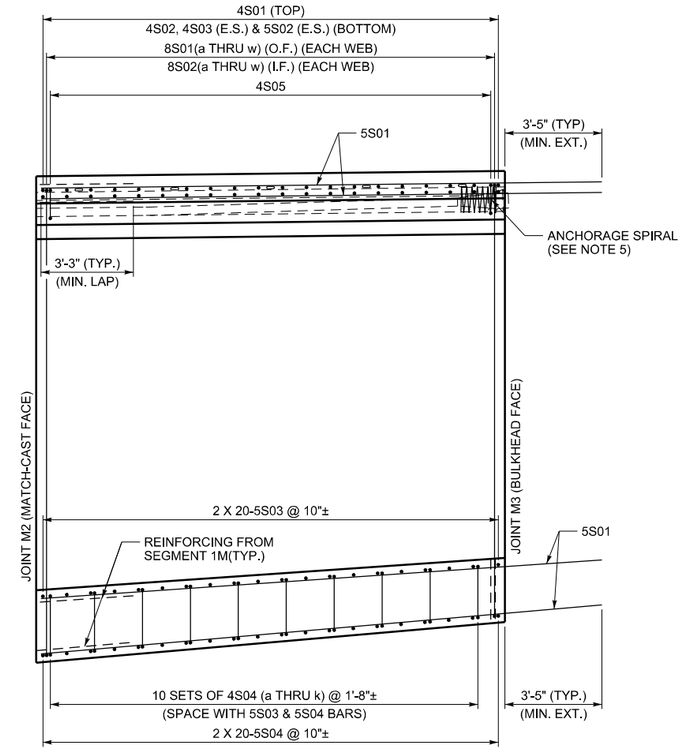
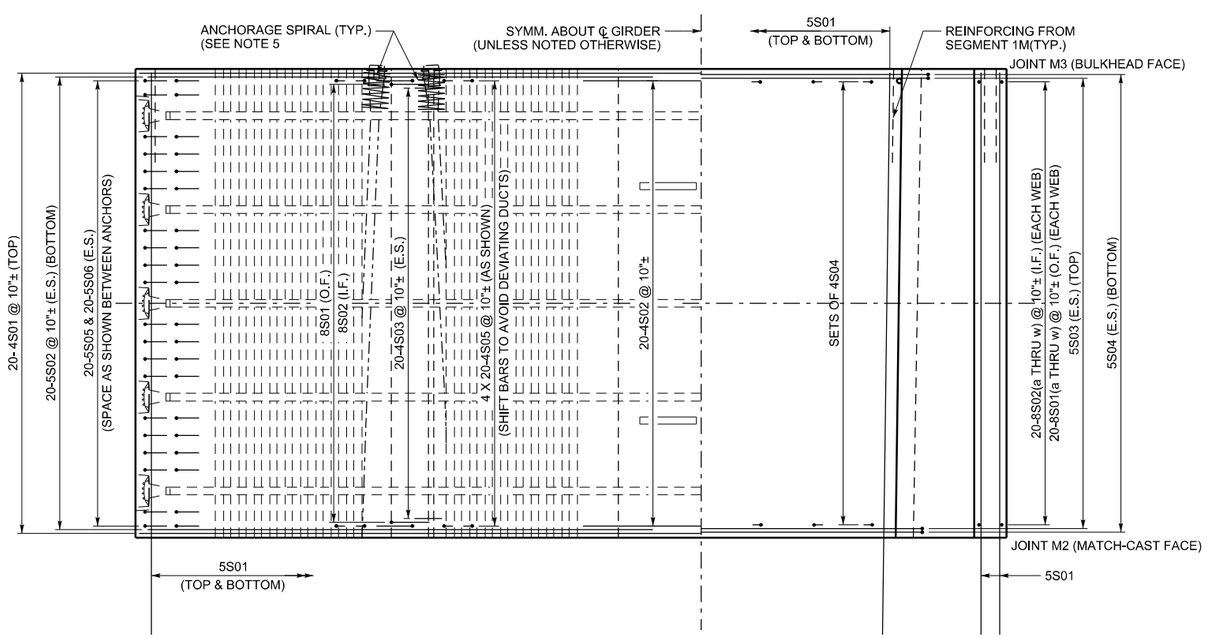


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-2M, S2-2M, N3-2M AND S3-2M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 2M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 149 OF 187

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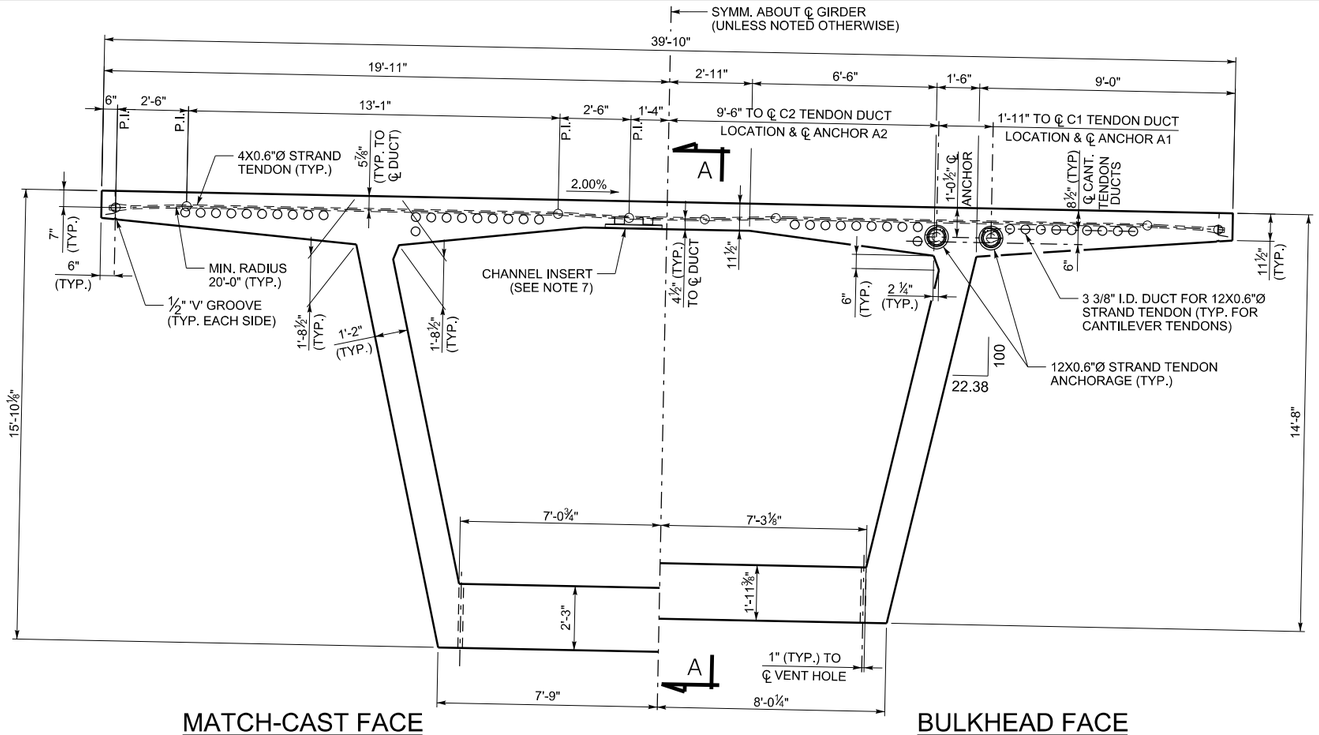
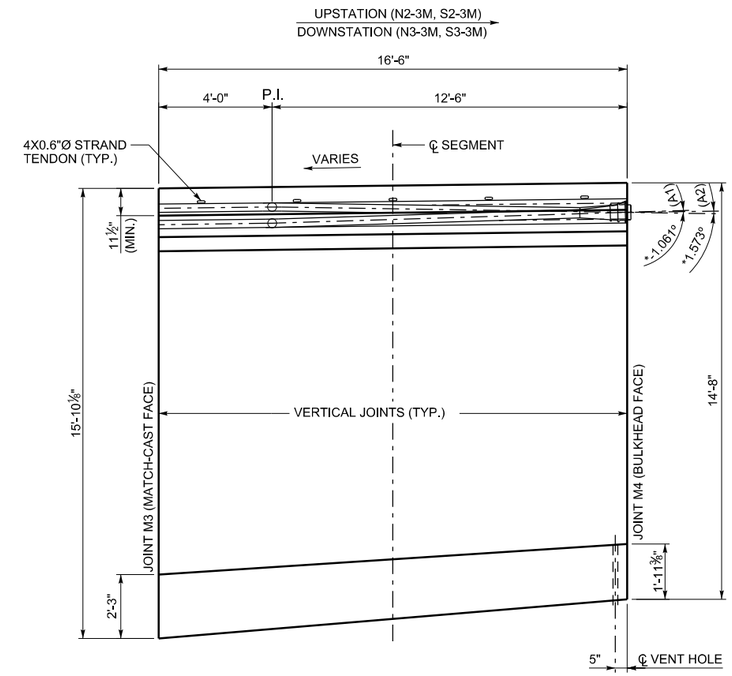
5/7/2008



CROSS SECTION

(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



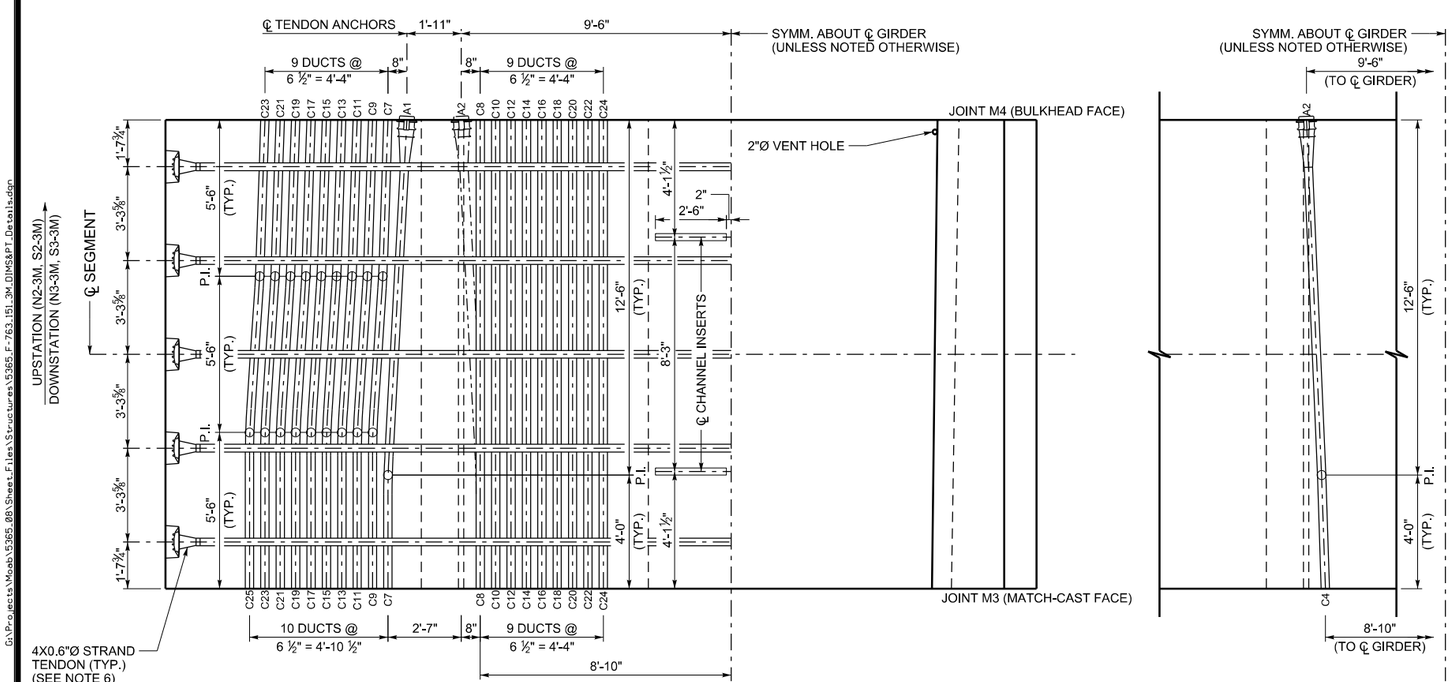
SECTION A-A

(ANGLES SHOWN WITH RESPECT TO TOP OF DECK GRADE)

C 23
- 23 — JOINT FACE DUCT POSITION
- C — C - CANTILEVER DUCT, B - BOTTOM SLAB DUCT

DUCT LEGEND

PRELIMINARY: NOT FOR CONSTRUCTION

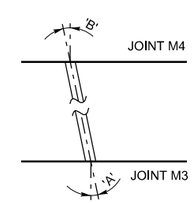


PARTIAL PLAN TOP SLAB

(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

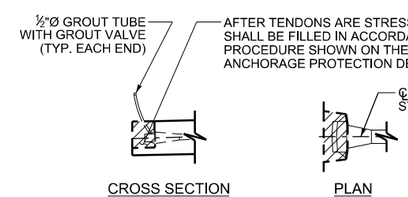
LOWER DUCT DETAIL



DUCT DEVIATION SCHEMATIC

(ANGLES SHOWN ARE IN PLANE PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT M3 DUCT POSITION	'A'	JOINT M4 DUCT POSITION	'B'
C4	1.880°	A2	3.053°
C7	0°	A1	2.452°
C9	0°	C7	1.880°
C8	0°	C8	0°
C10	0°	C10	0°
C11	0°	C9	1.880°
C12	0°	C12	0°
C13	0°	C11	1.880°
C14	0°	C14	0°
C15	0°	C13	1.880°
C16	0°	C16	0°
C17	0°	C15	1.880°
C18	0°	C18	0°
C19	0°	C17	1.880°
C20	0°	C20	0°
C21	0°	C19	1.880°
C22	0°	C22	0°
C23	0°	C21	1.880°
C24	0°	C24	0°
C25	0°	C23	1.880°



CROSS SECTION — PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-3M, S2-3M, N3-3M AND S3-3M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
APPROVAL RECOMM.
UDOT BRIDGE ENGR. DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO RIVER
BRIDGE - MOAB UTAH
SEGMENT 3M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 151 OF 187

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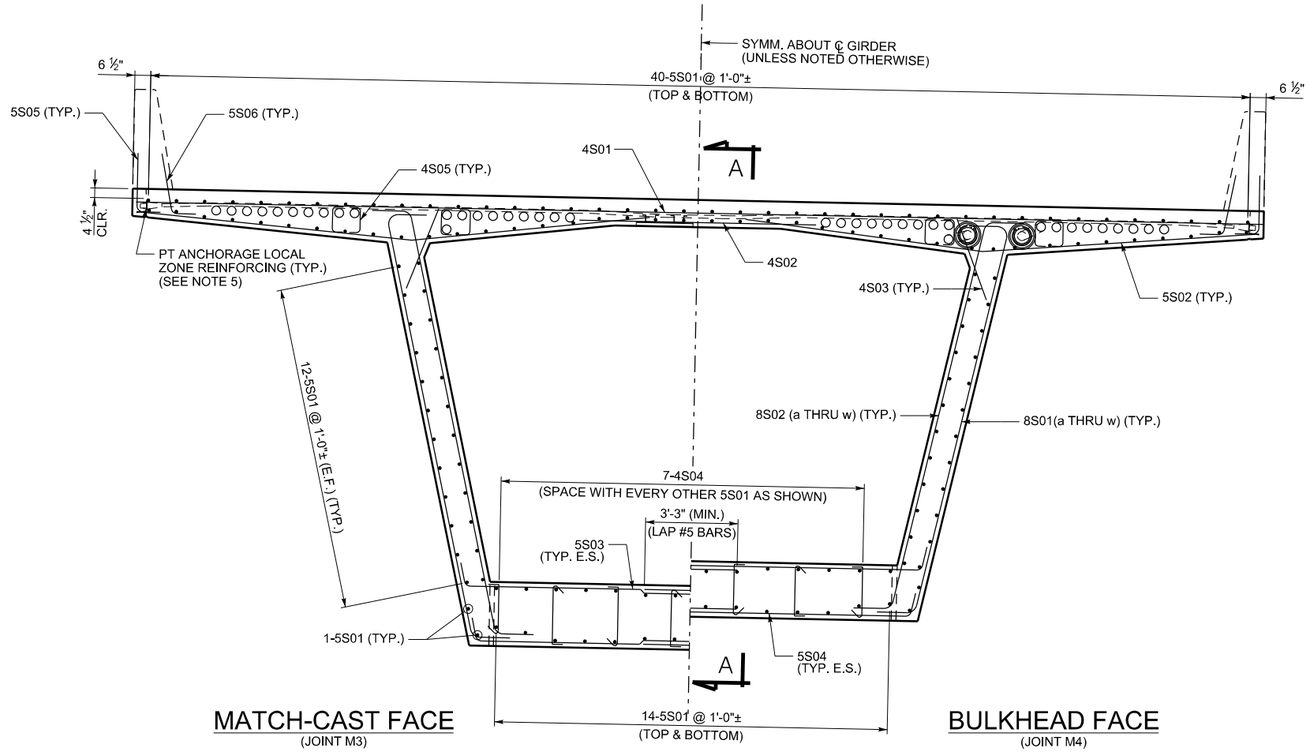
5/7/2008



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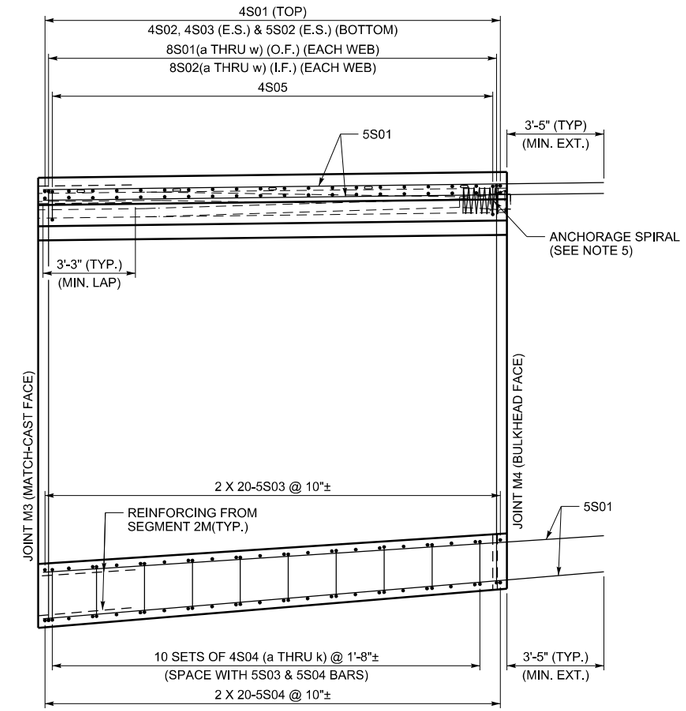
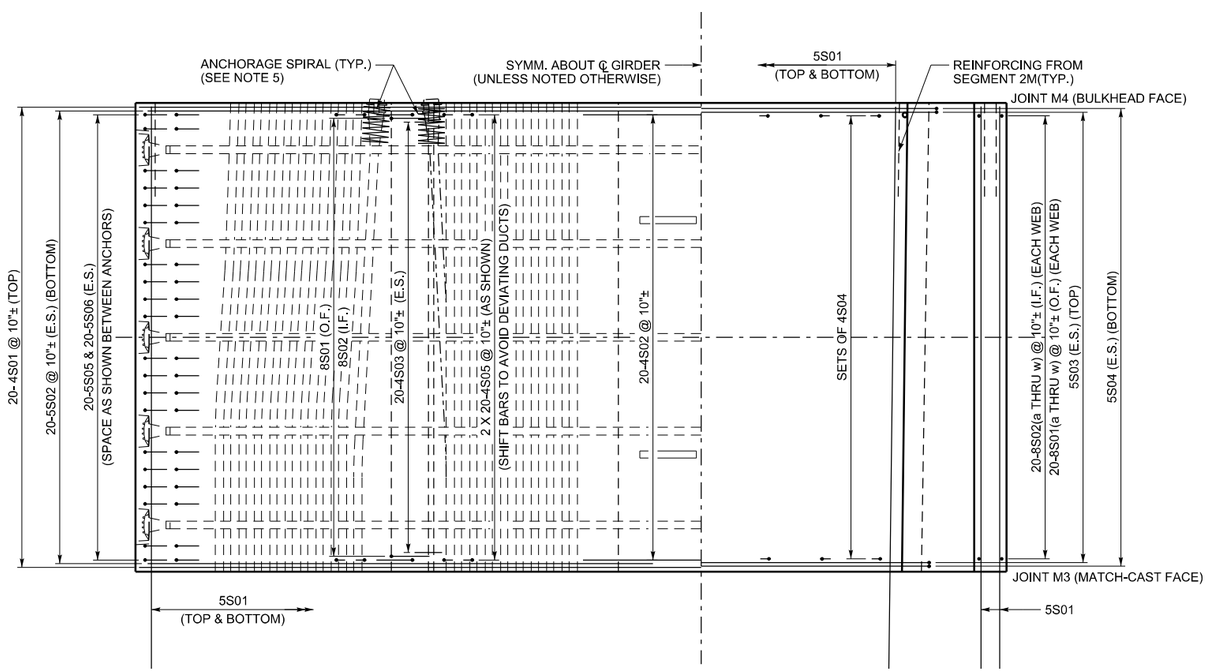


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-3M, S2-3M, N3-3M AND S3-3M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 3M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 152 OF 187

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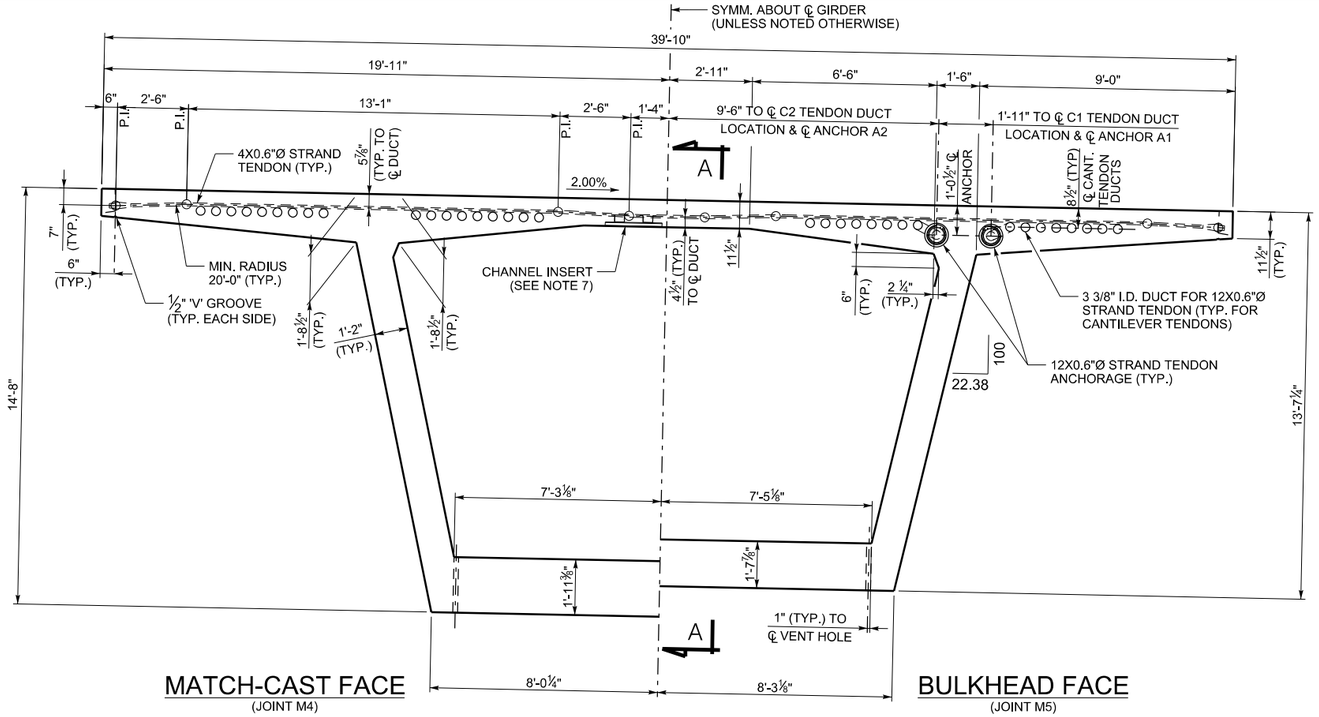
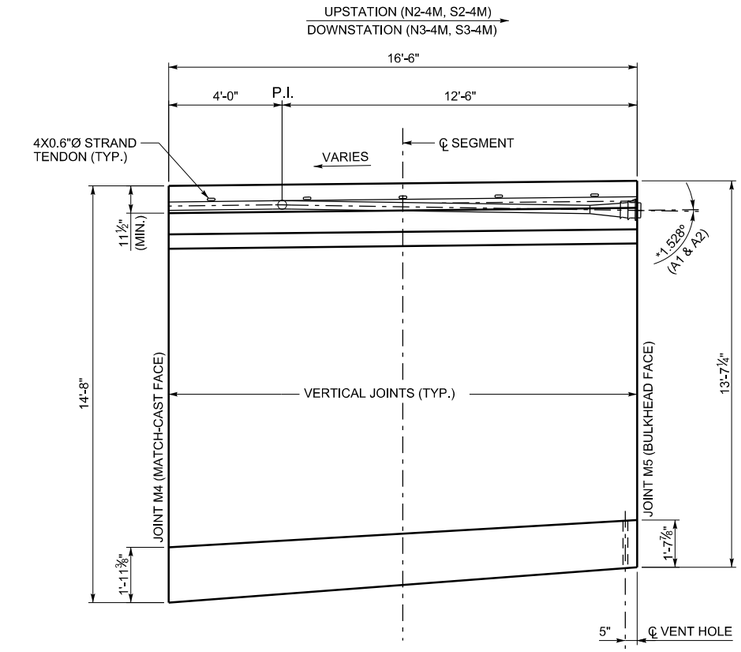
5/7/2008



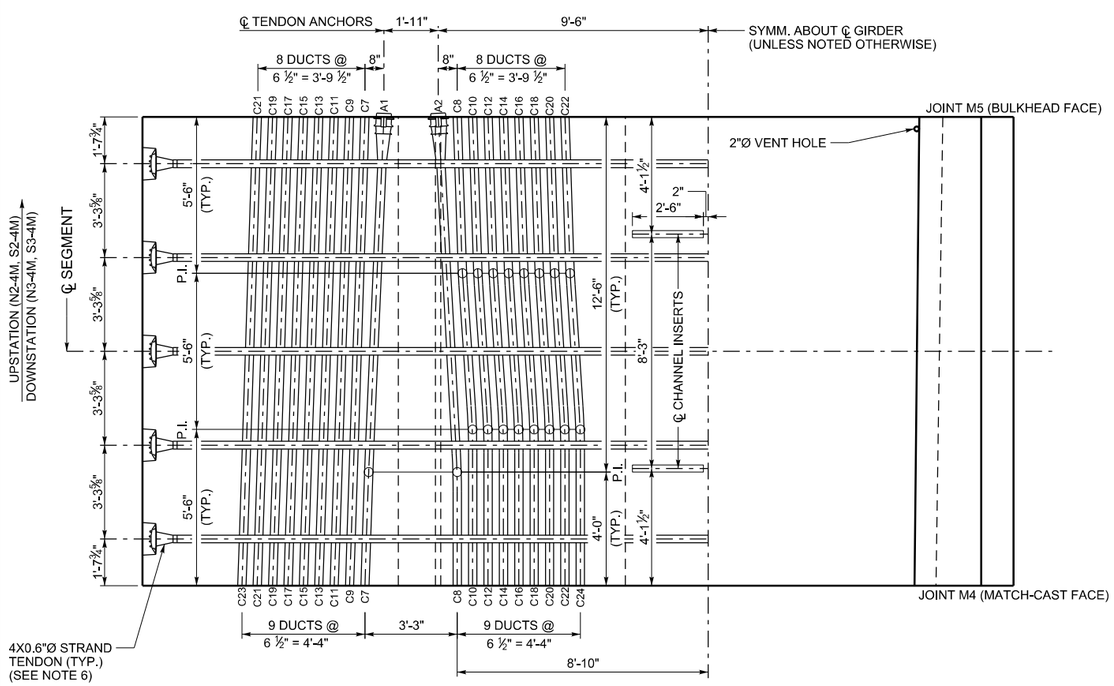
CROSS SECTION

(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A

(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)



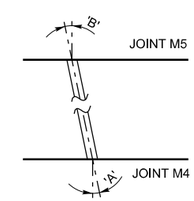
PARTIAL PLAN TOP SLAB

(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
  B - BOTTOM SLAB DUCT

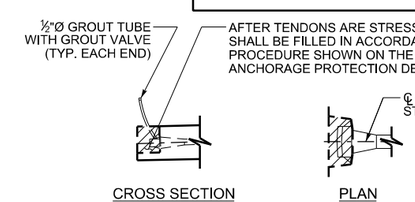
DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M4 DUCT POSITION	'A'	JOINT M5 DUCT POSITION	'B'
C8	0°	A2	3.054°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	0°	C8	1.880°
C11	1.880°	C9	1.880°
C12	0°	C10	1.880°
C13	1.880°	C11	1.880°
C14	0°	C12	1.880°
C15	1.880°	C13	1.880°
C16	0°	C14	1.880°
C17	1.880°	C15	1.880°
C18	0°	C16	1.880°
C19	1.880°	C17	1.880°
C20	0°	C18	1.880°
C21	1.880°	C19	1.880°
C22	0°	C20	1.880°
C23	1.880°	C21	1.880°
C24	0°	C22	1.880°

PRELIMINARY:
NOT FOR CONSTRUCTION



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-4M, S2-4M, N3-4M AND S3-4M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
APPROVAL RECOMM.
UDOT BRIDGE ENGR. DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 4M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 154 OF 187

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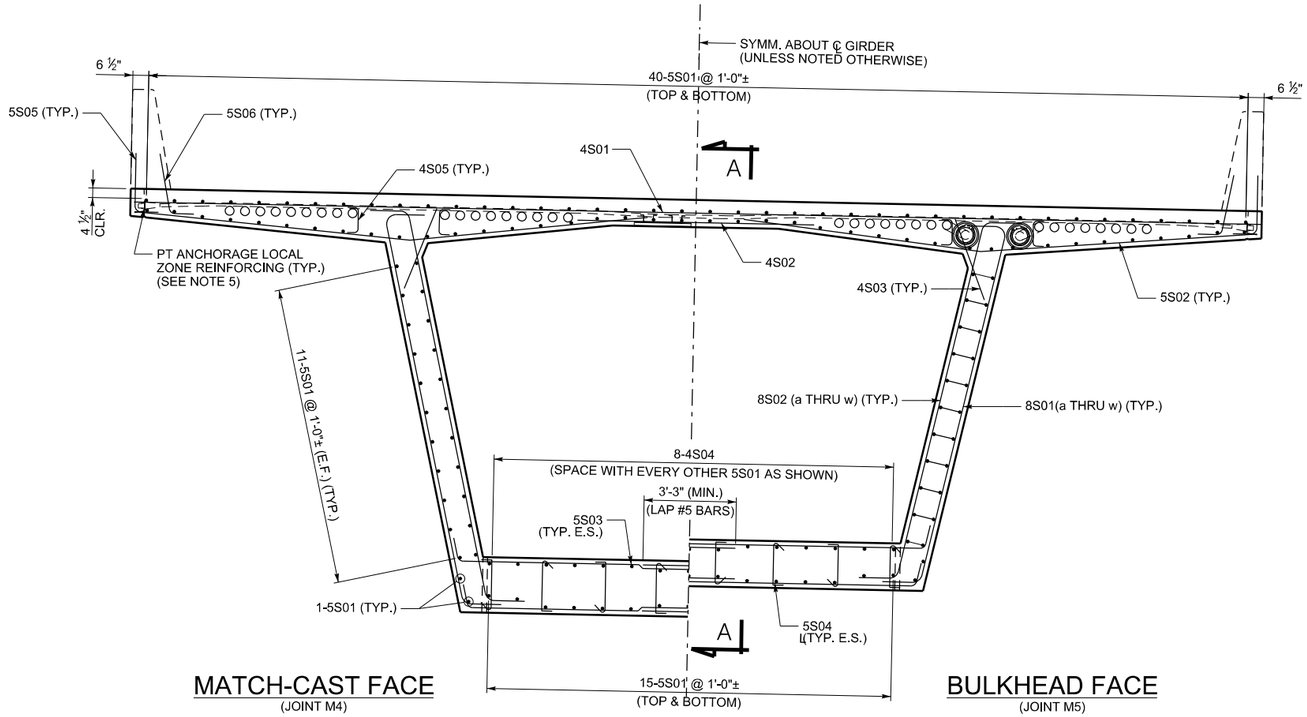
5/7/2008



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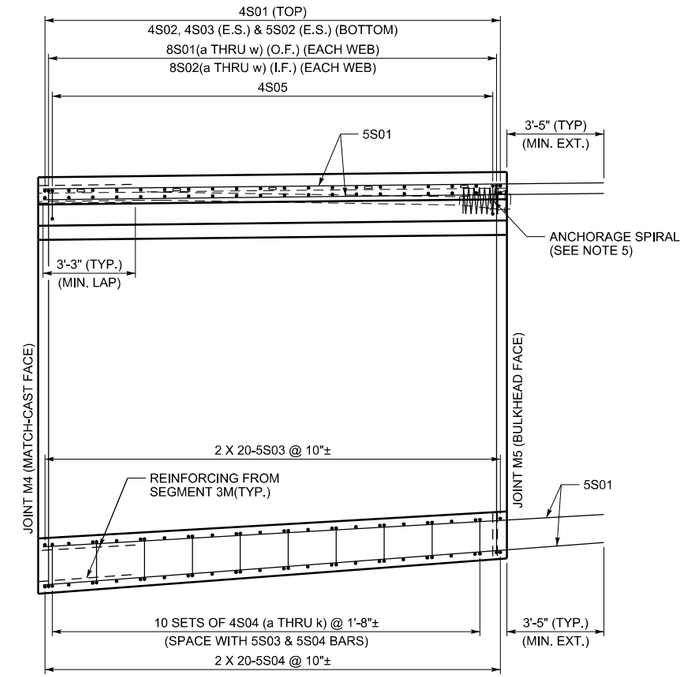
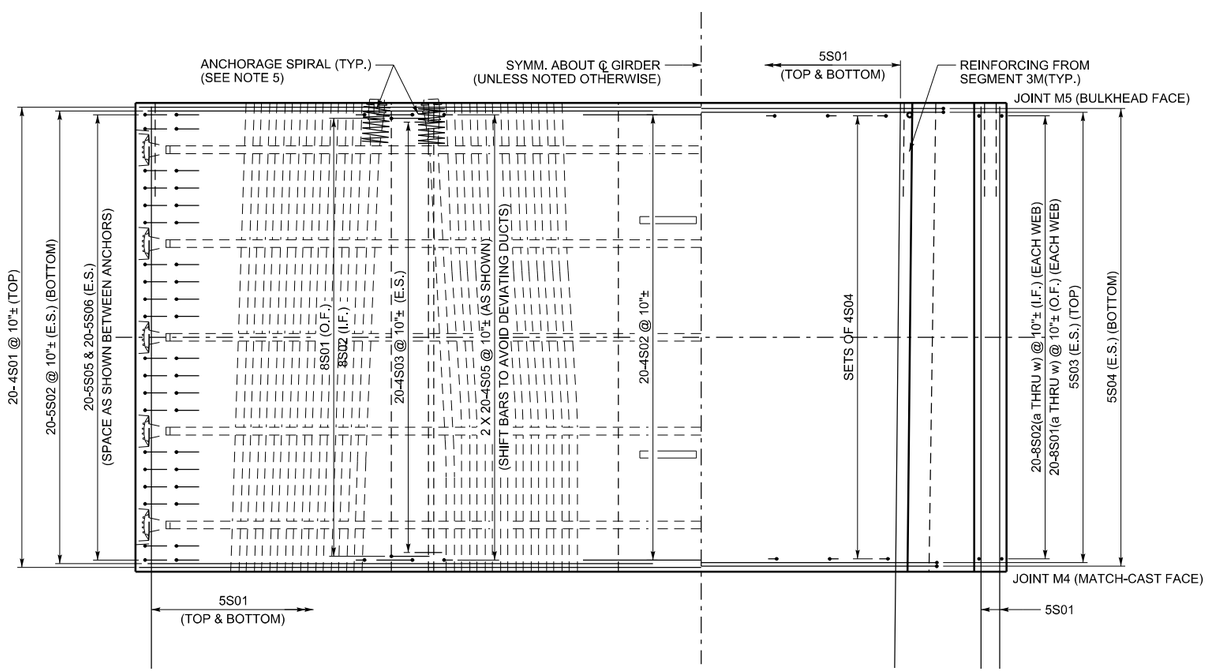


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-4M, S2-4M, N3-4M AND S3-4M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 4M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 155 OF 187

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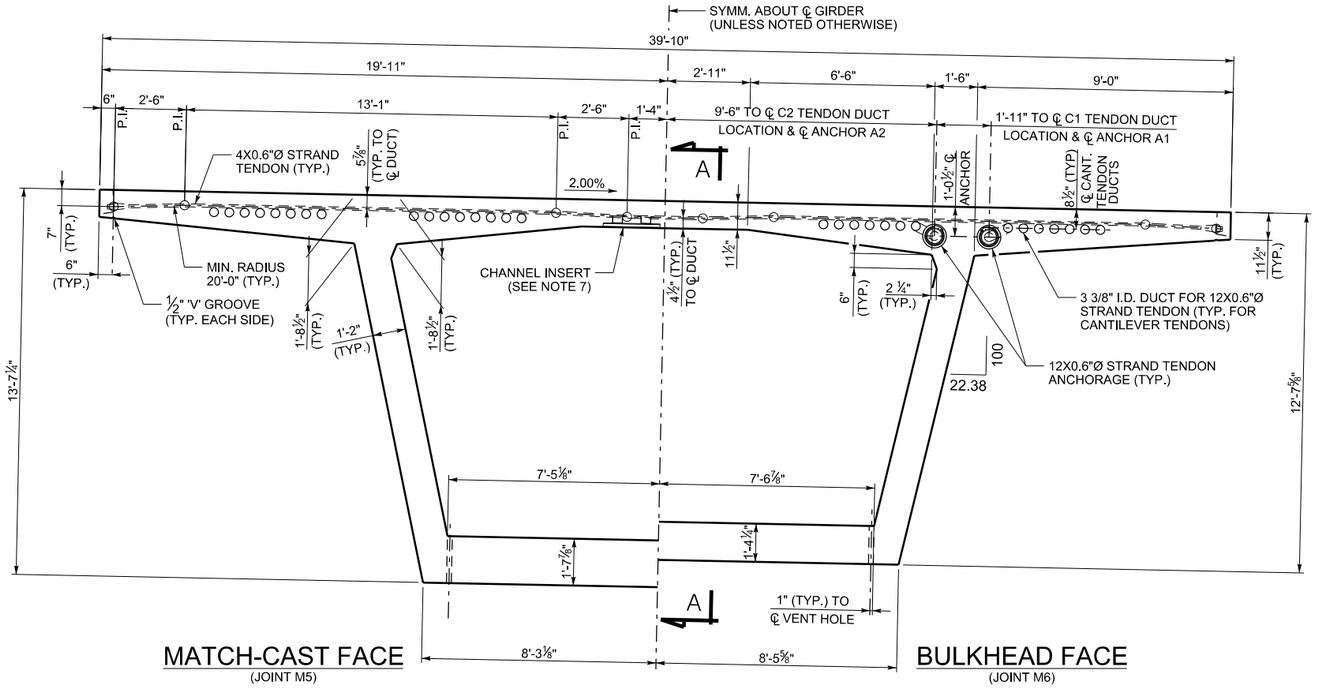
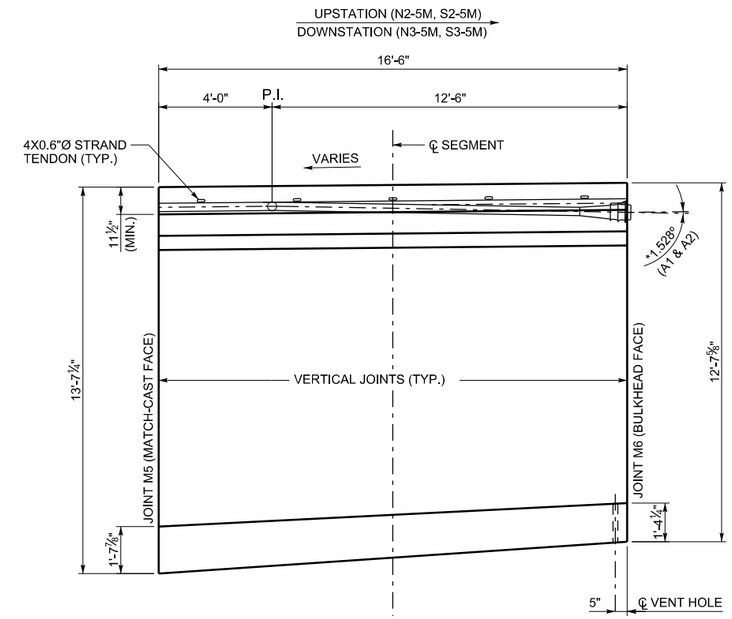
5/7/2008

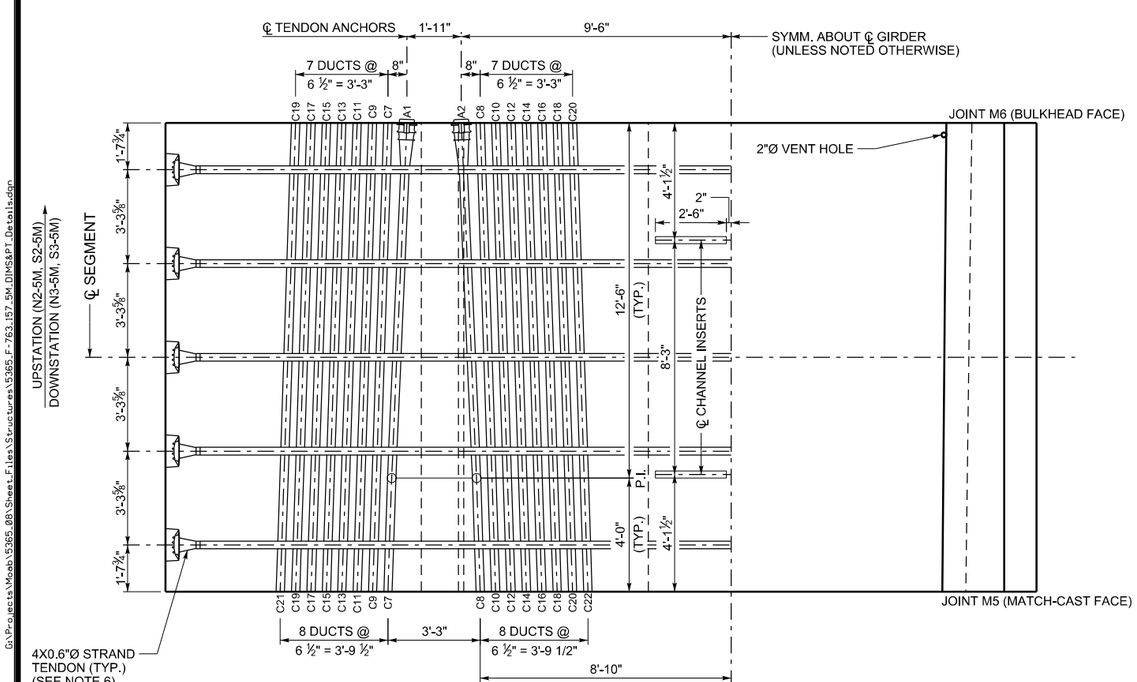


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

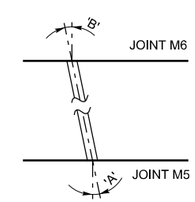


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND

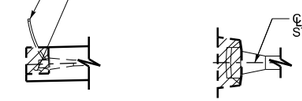


DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M5 DUCT POSITION	'A'	JOINT M6 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	1.880°	C8	1.880°
C11	1.880°	C9	1.880°
C12	1.880°	C10	1.880°
C13	1.880°	C11	1.880°
C14	1.880°	C12	1.880°
C15	1.880°	C13	1.880°
C16	1.880°	C14	1.880°
C17	1.880°	C15	1.880°
C18	1.880°	C16	1.880°
C19	1.880°	C17	1.880°
C20	1.880°	C18	1.880°
C21	1.880°	C19	1.880°
C22	1.880°	C20	1.880°

½"Ø GROUT TUBE
WITH GROUT VALVE
(TYP. EACH END)

AFTER TENDONS ARE STRESSED, BLOCKOUT SHALL BE FILLED IN ACCORDANCE WITH THE PROCEDURE SHOWN ON THE P.T. GROUTING AND ANCHORAGE PROTECTION DETAILS SHEET.



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-5M, S2-5M, N3-5M AND S3-5M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
SEGMENT 5M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 157 OF 187

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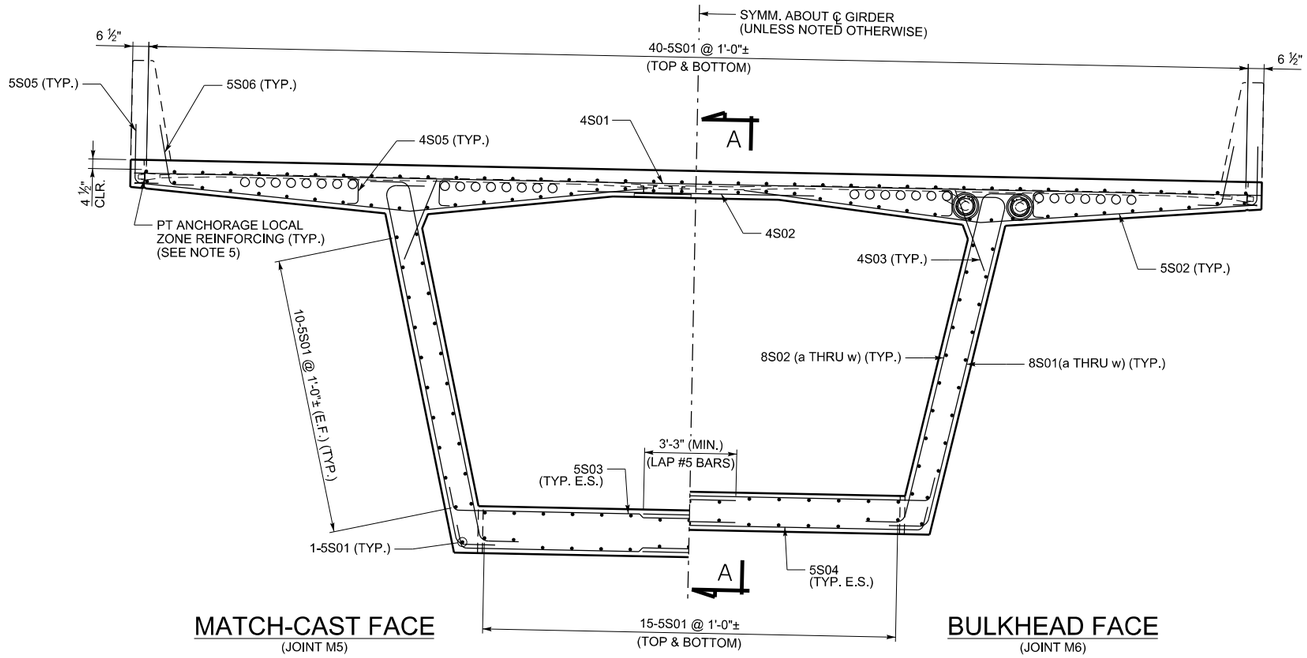
5/7/2008



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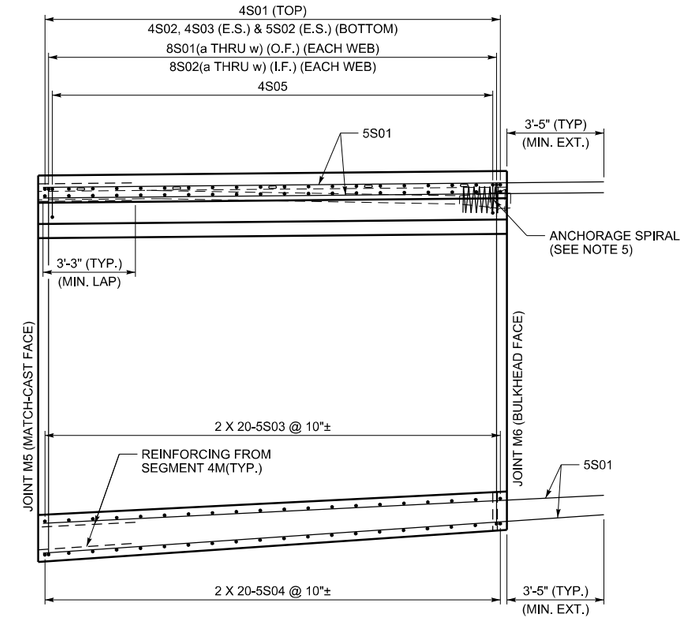
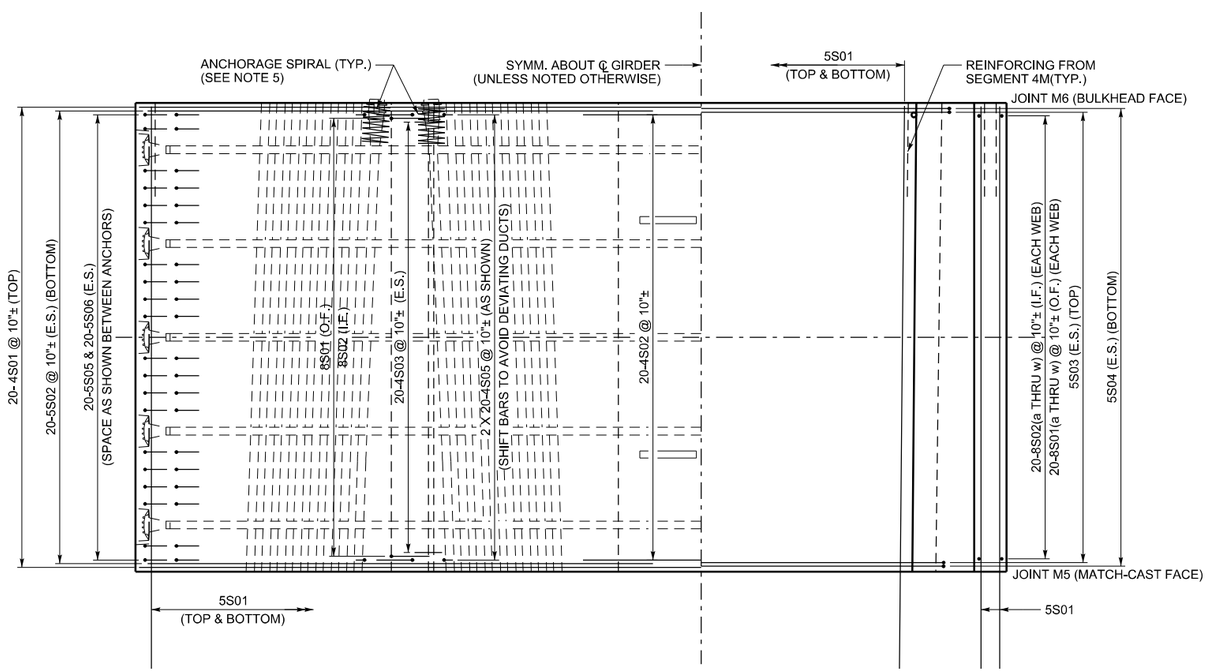


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-5M, S2-5M, N3-5M AND S3-5M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 5M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 158 OF 187

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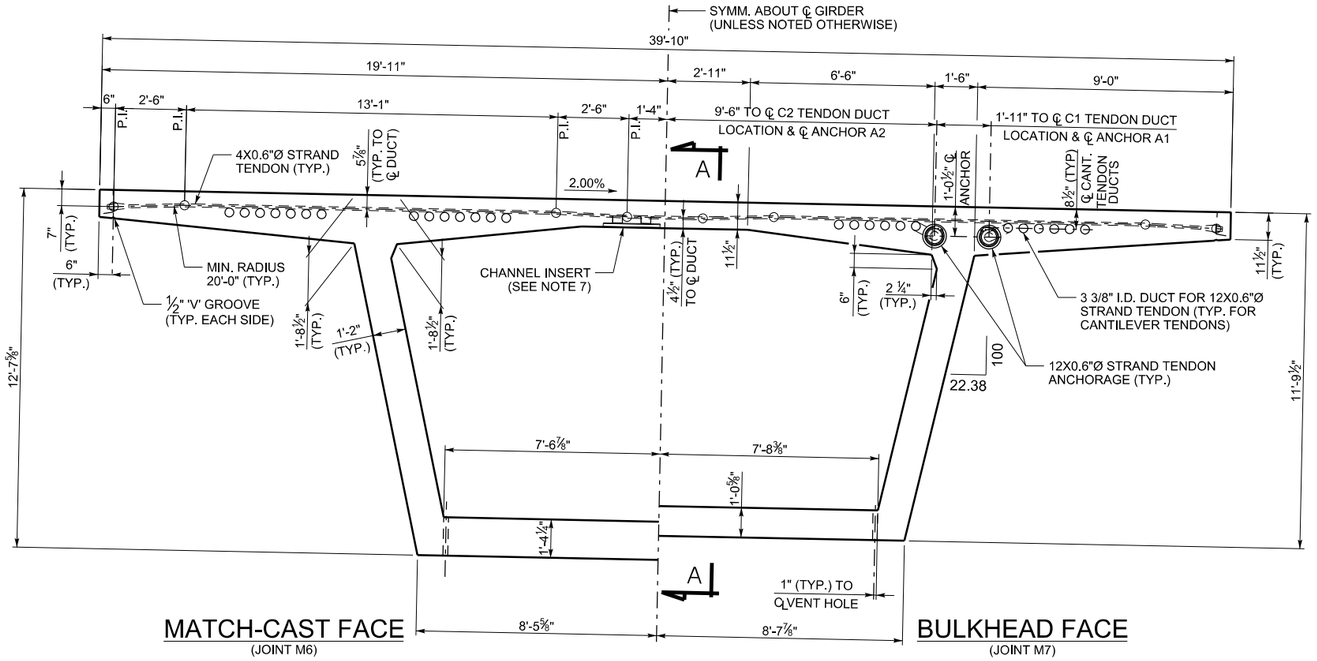
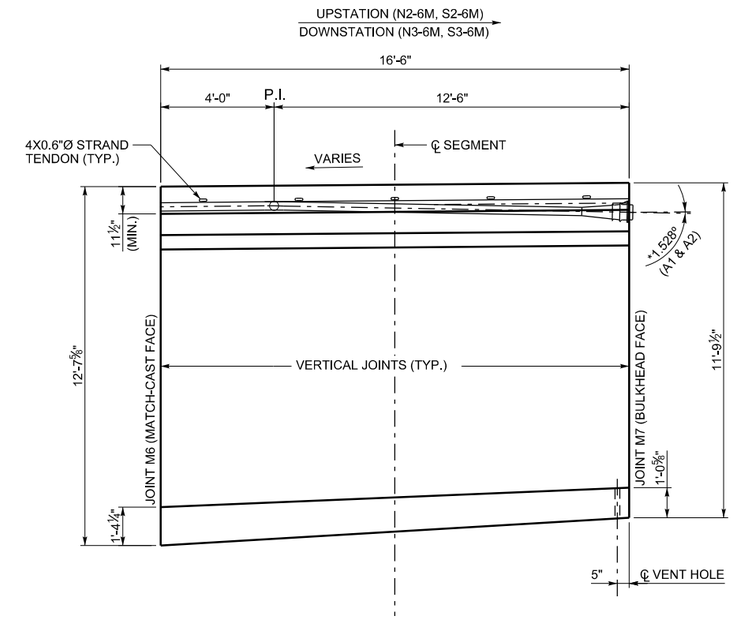
5/7/2008

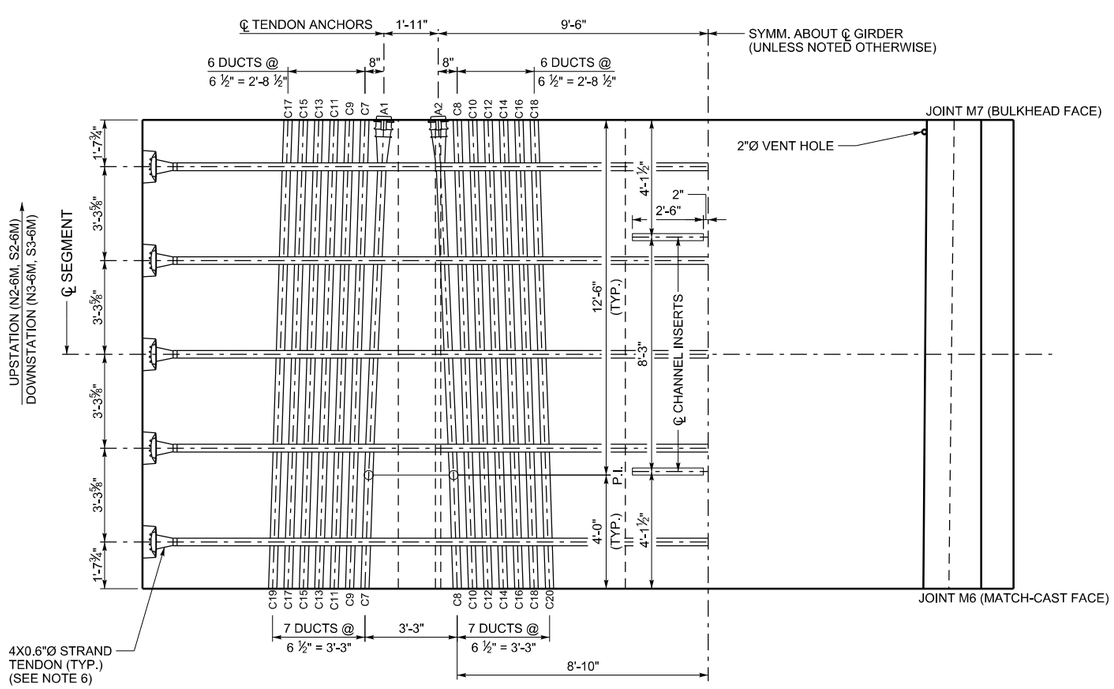


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

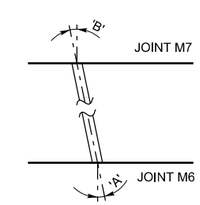


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M6 DUCT POSITION	'A'	JOINT M7 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	1.880°	C8	1.880°
C11	1.880°	C9	1.880°
C12	1.880°	C10	1.880°
C13	1.880°	C11	1.880°
C14	1.880°	C12	1.880°
C15	1.880°	C13	1.880°
C16	1.880°	C14	1.880°
C17	1.880°	C15	1.880°
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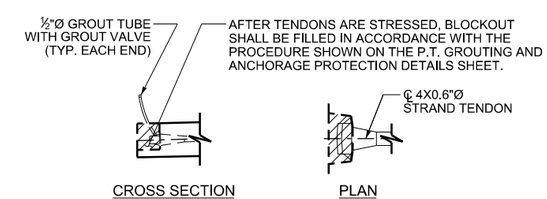
C19	1.880°	C17	1.880°
C20	1.880°	C18	1.880°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-6M, S2-6M, N3-6M AND S3-6M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
APPROVAL RECOMM.
UDOT BRIDGE ENGR. DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 6M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 160 OF 187

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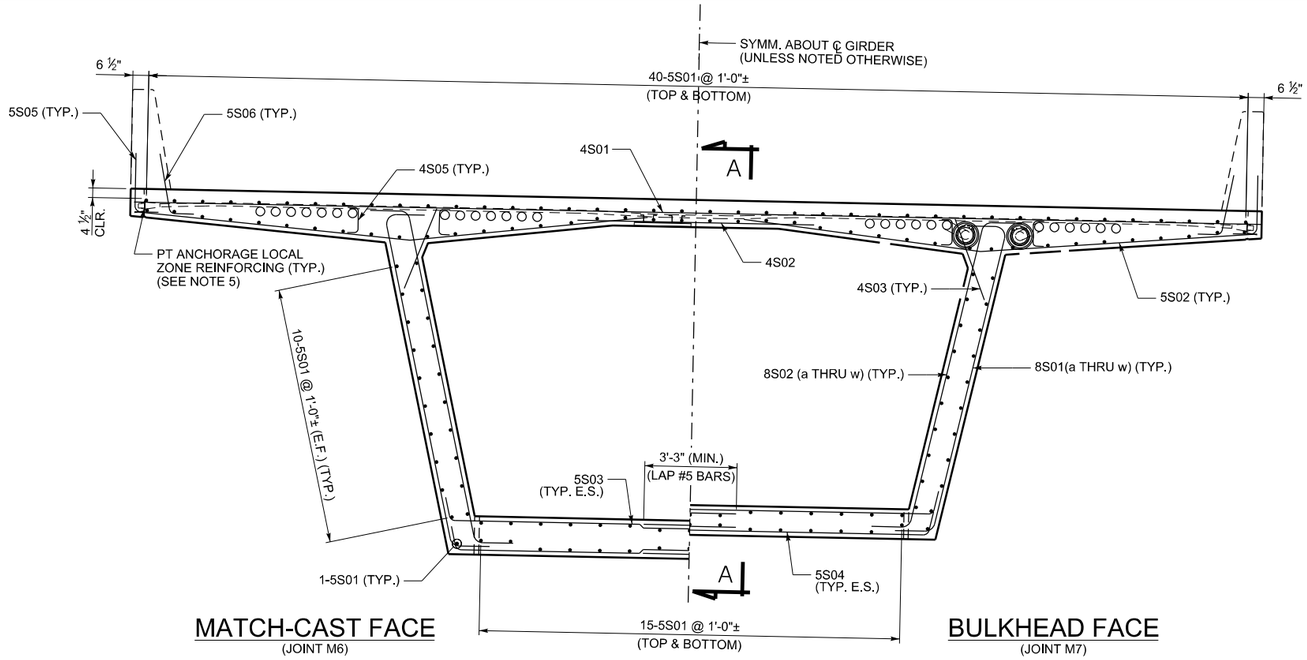
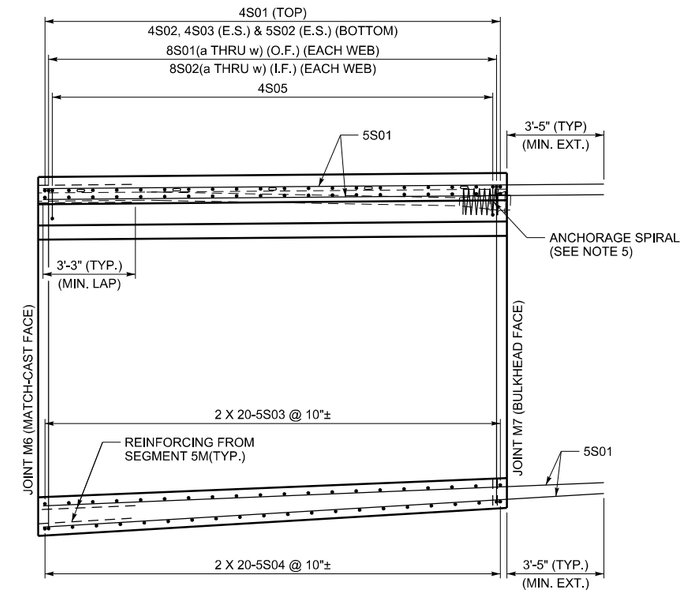
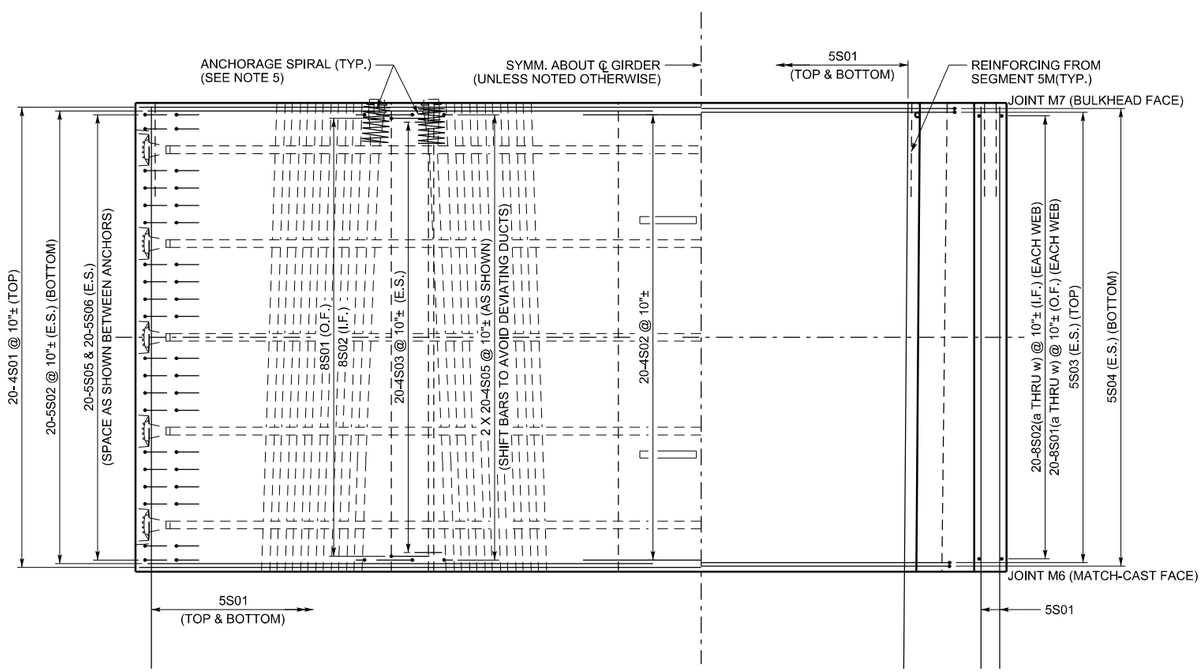
5/7/2008



CROSS SECTION



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-6M, S2-6M, N3-6M AND S3-6M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 6M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 161 OF 187

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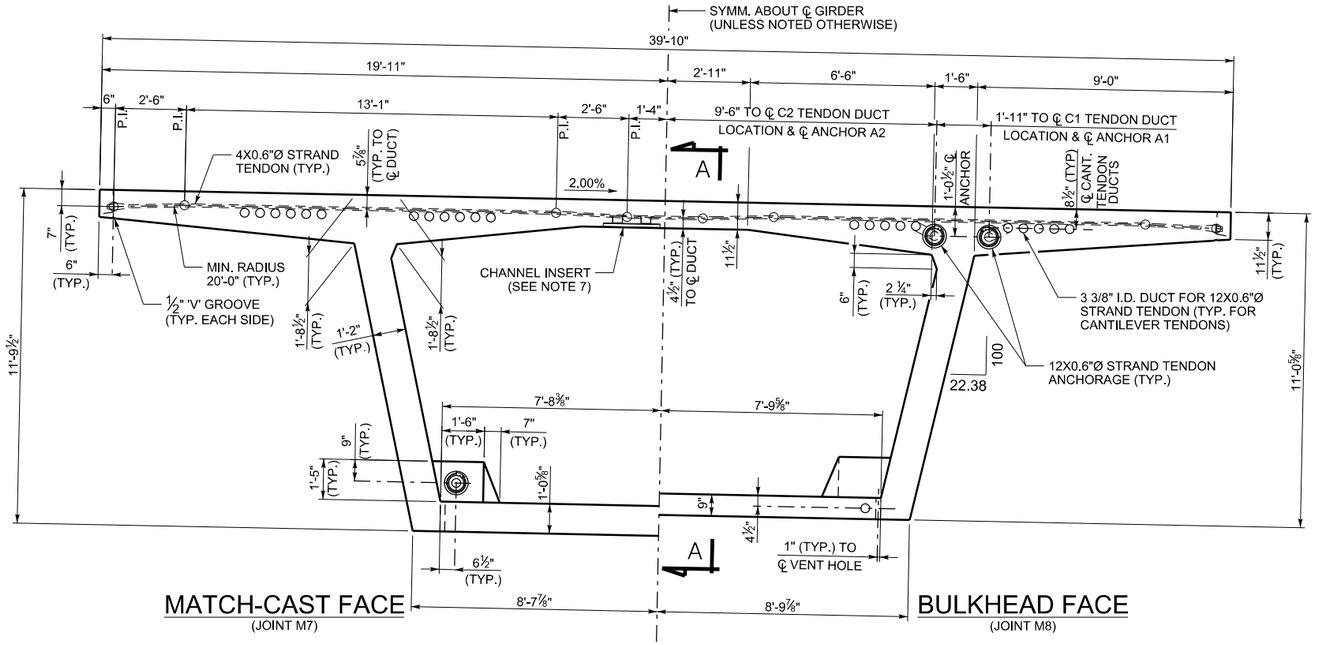
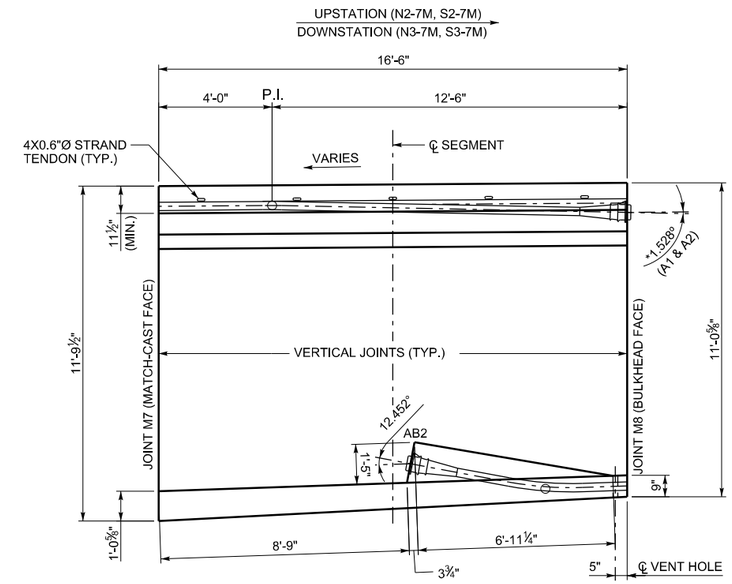
5/7/2008

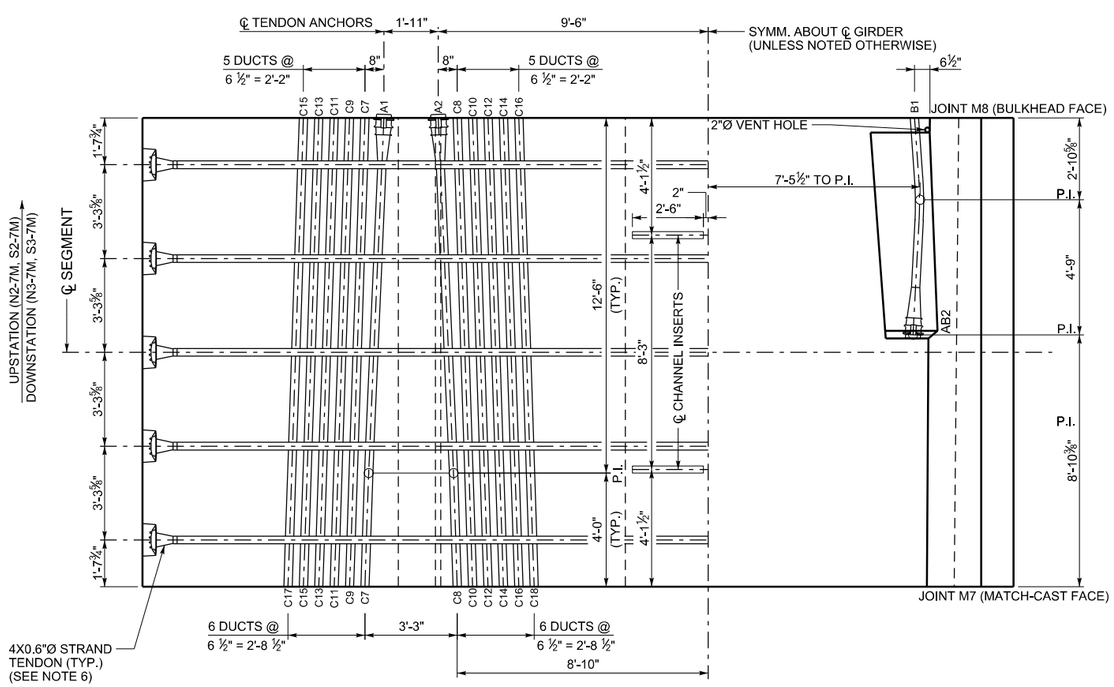


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

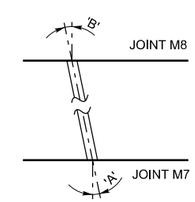


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

C 23
- 23 — JOINT FACE DUCT POSITION
- C — C - CANTILEVER DUCT; B - BOTTOM SLAB DUCT

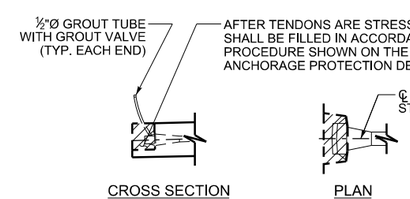
DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS

JOINT M7 DUCT POSITION	'A'	JOINT M8 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	1.880°	C8	1.880°
C11	1.880°	C9	1.880°
C12	1.880°	C10	1.880°
C13	1.880°	C11	1.880°
C14	1.880°	C12	1.880°
C15	1.880°	C13	1.880°
C16	1.880°	C14	1.880°
C17	1.880°	C15	1.880°
C18	1.880°	C16	1.880°
AB2	2.998°	B1	3.983°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-7M, S2-7M, N3-7M AND S3-7M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
APPROVAL RECOMM.
UDOT BRIDGE ENGR DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
SEGMENT 7M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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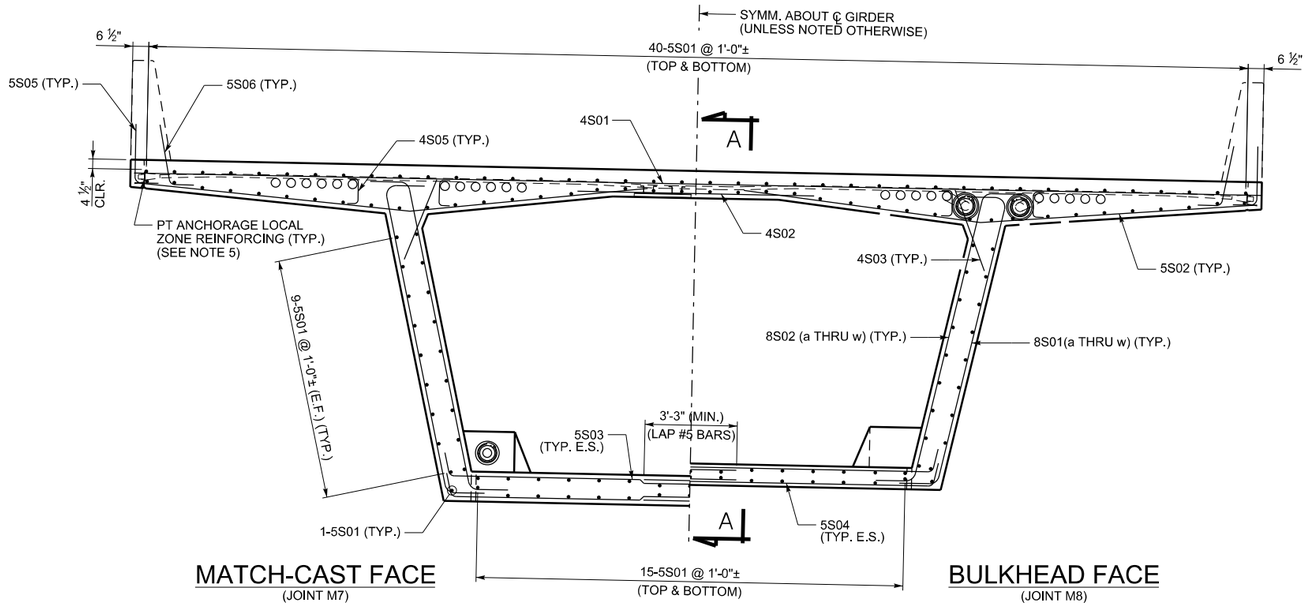
5/7/2008



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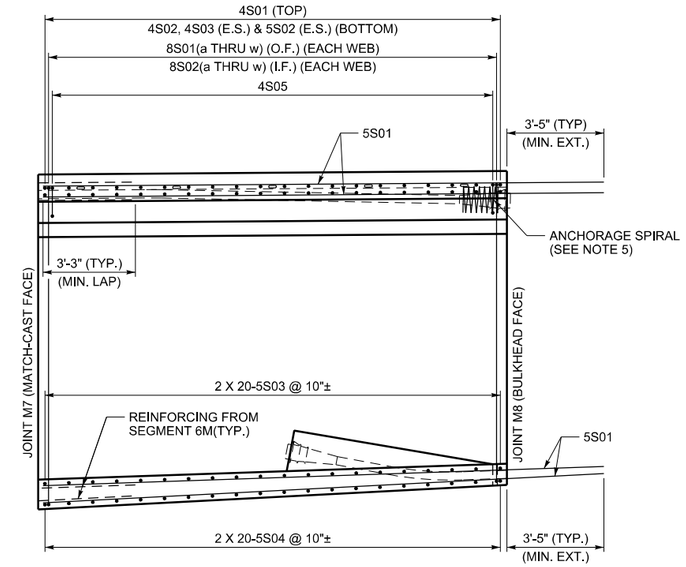
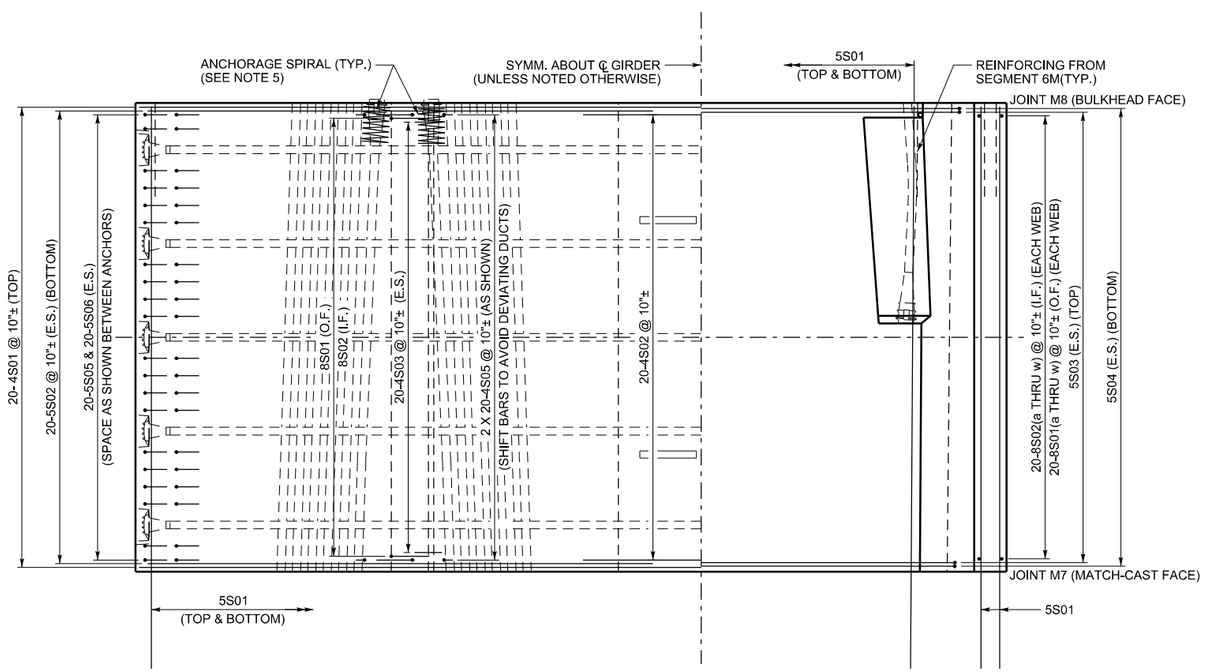


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-7M, S2-7M, N3-7M AND S3-7M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 7M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 164 OF 187

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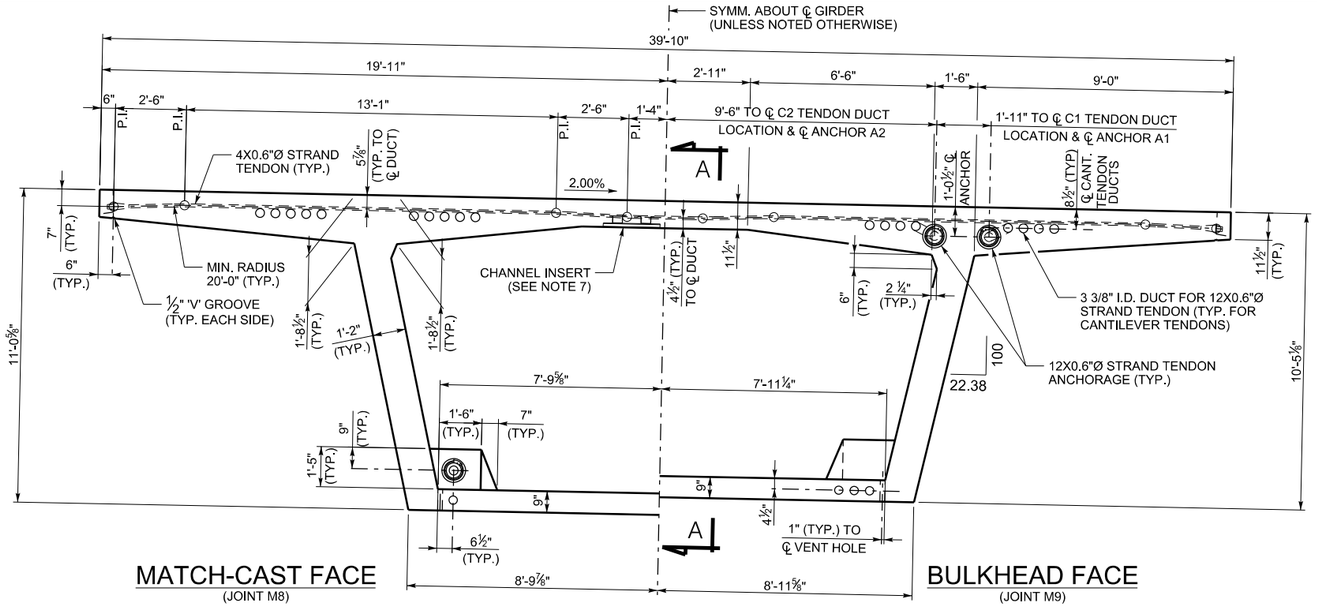
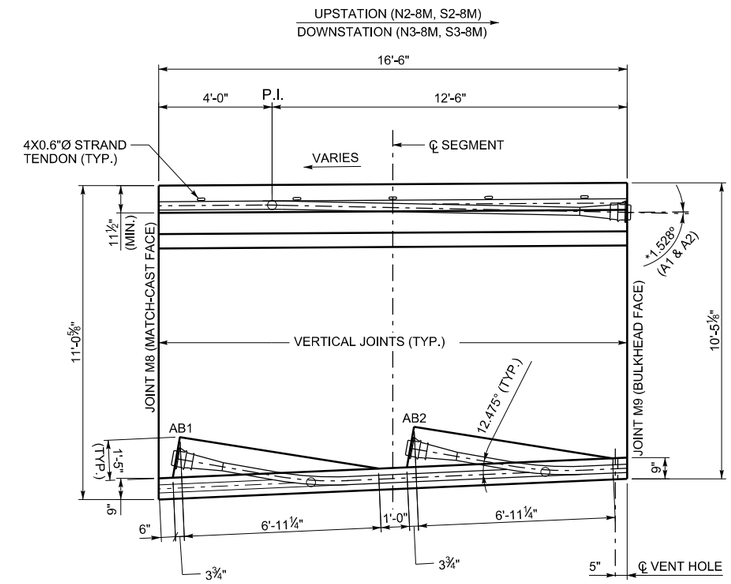
5/7/2008

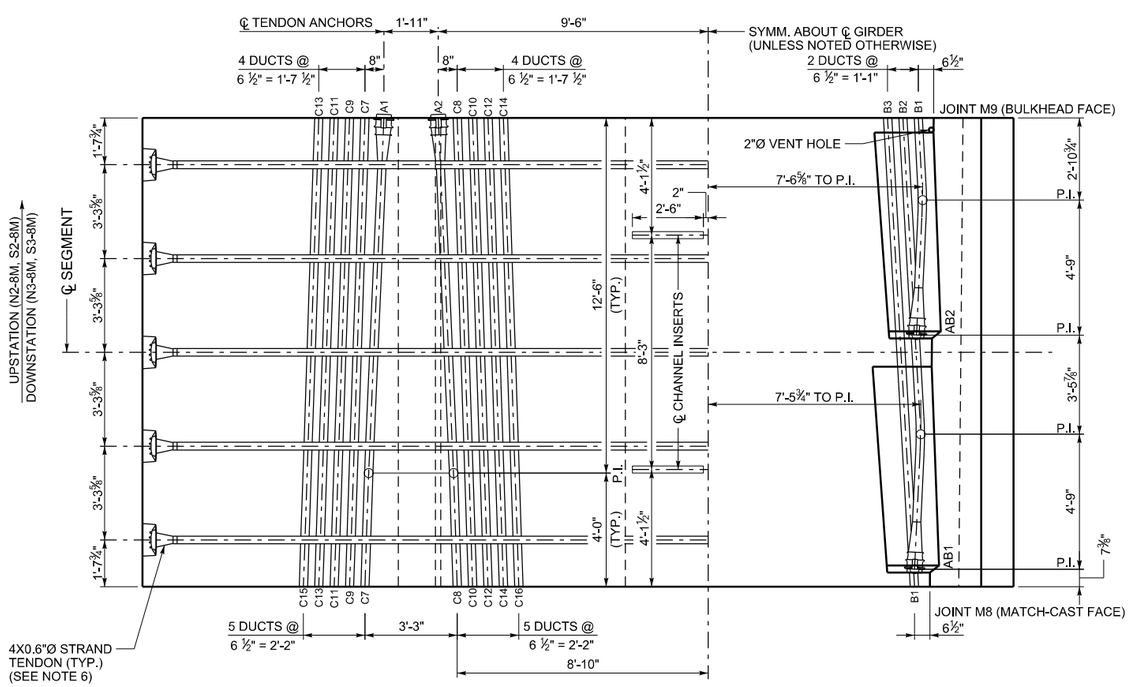


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

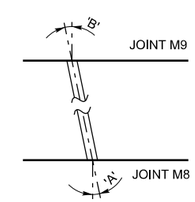


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

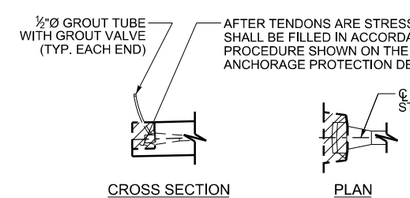
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M8 DUCT POSITION	'A'	JOINT M9 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	1.880°	C8	1.880°
C11	1.880°	C9	1.880°
C12	1.880°	C10	1.880°
C13	1.880°	C11	1.880°
C14	1.880°	C12	1.880°
C15	1.880°	C13	1.880°
C16	1.880°	C14	1.880°
AB1	2.637°	B2	3.234°
AB2	2.637°	B1	3.070°
B1	3.288°	B3	3.288°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-8M, S2-8M, N3-8M AND S3-8M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
APPROVAL RECOMM.
UDOT BRIDGE ENGR. DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
SEGMENT 8M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 166 OF 187

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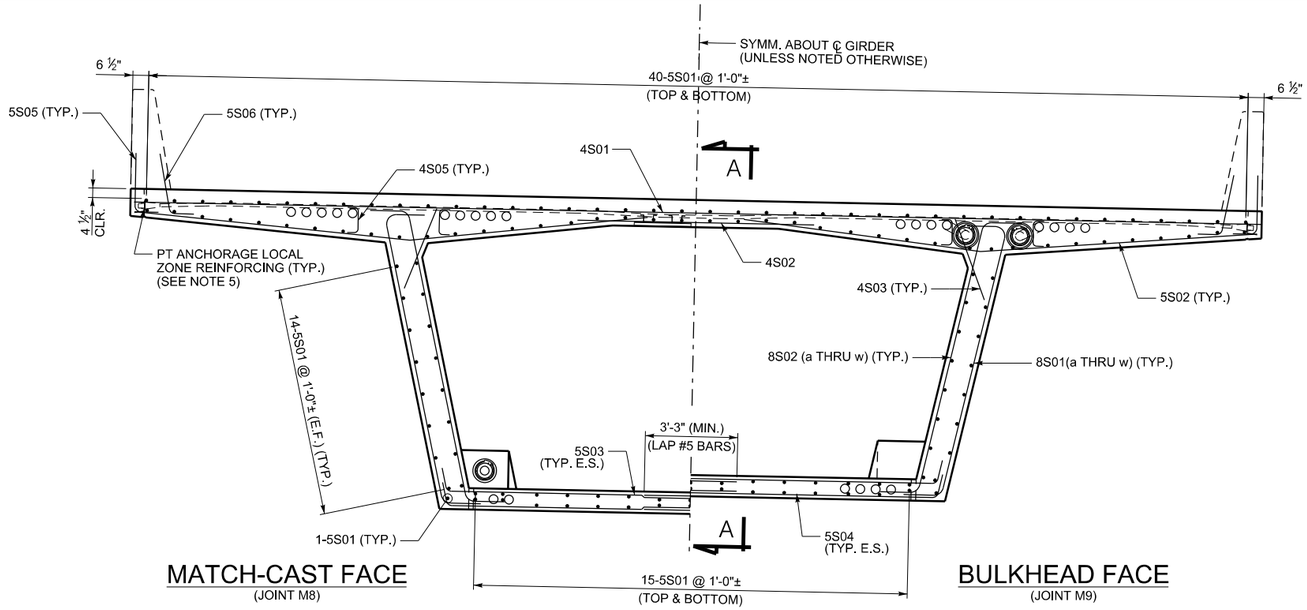
5/7/2008



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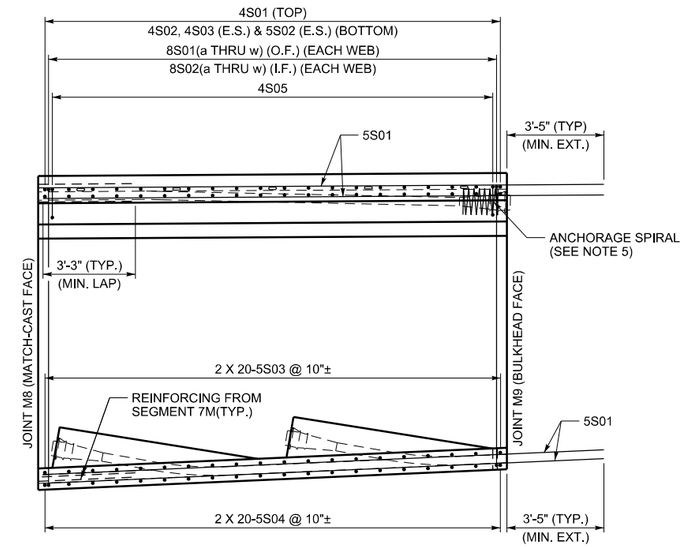
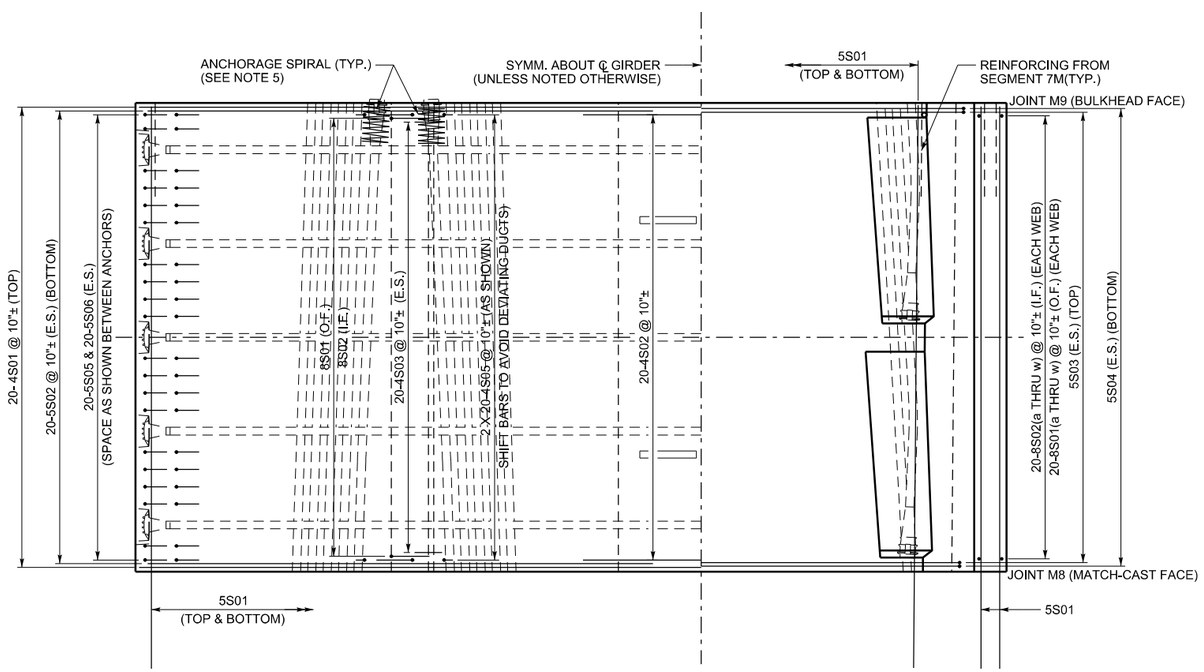


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-8M, S2-8M, N3-8M AND S3-8M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 8M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 167 OF 187

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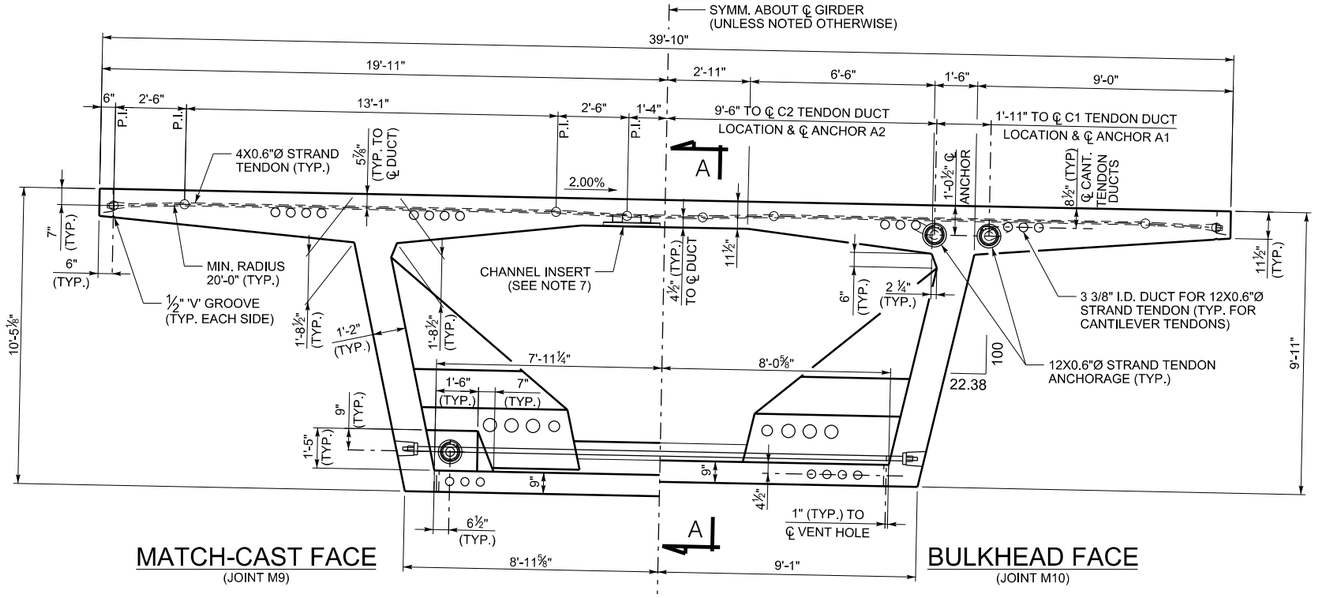
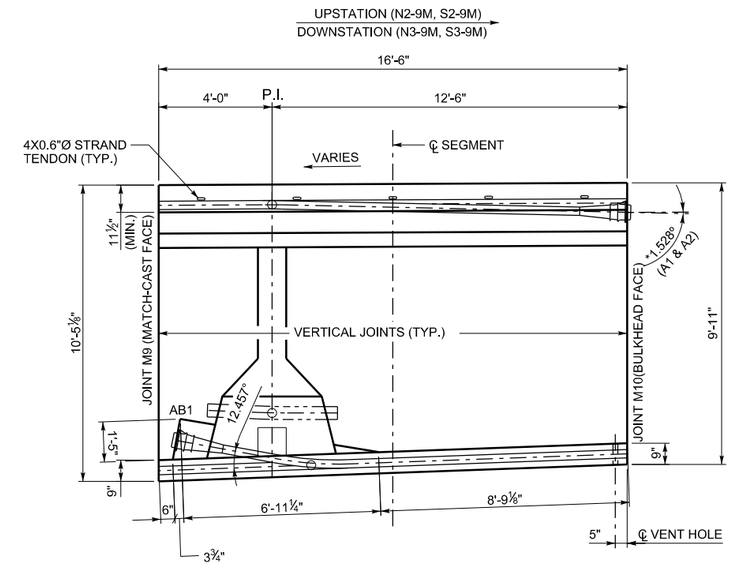
5/7/2008

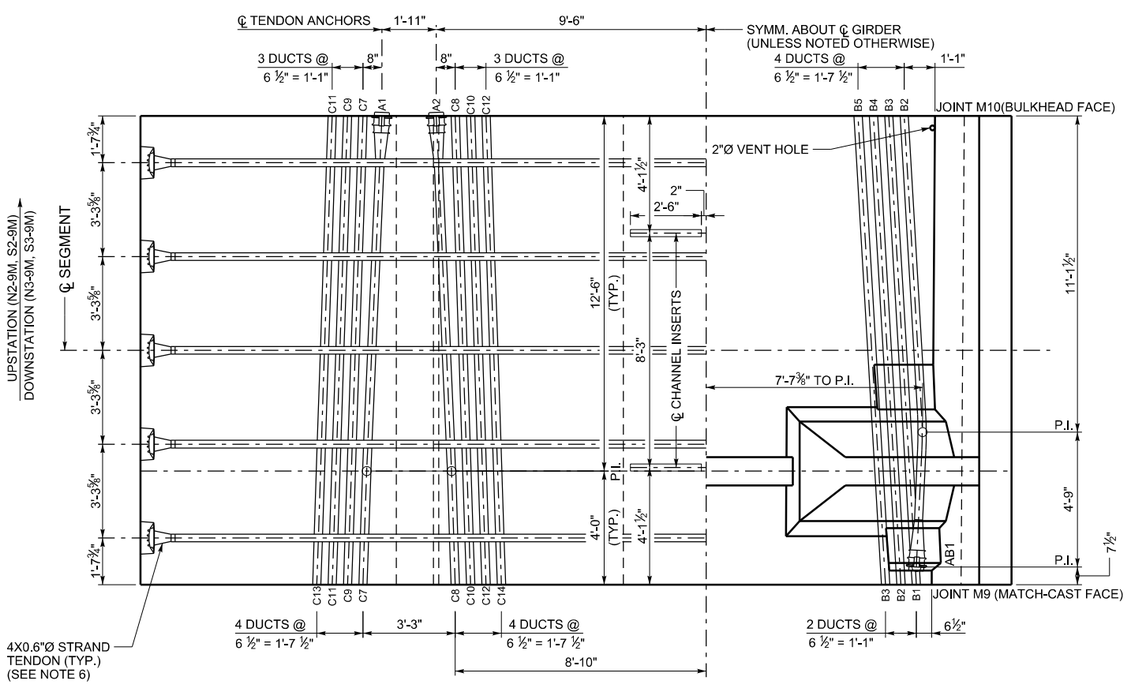


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

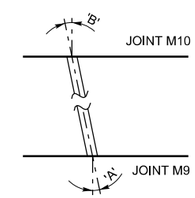


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

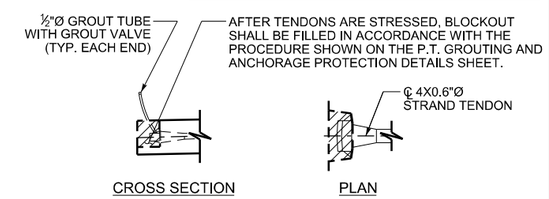
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M9 DUCT POSITION	'A'	JOINT M10 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	1.880°	C8	1.880°
C11	1.880°	C9	1.880°
C12	1.880°	C10	1.880°
C13	1.880°	C11	1.880°
C14	1.880°	C12	1.880°
AB1	2.637°	B2	3.339°
B1	3.360°	B3	3.360°
B2	3.360°	B4	3.360°
B3	3.360°	B5	3.360°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:
1. THIS DRAWING VALID FOR SEGMENT N2-9M, S2-9M, N3-9M AND S3-9M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
* 5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE.
10. FOR DEVIATION DIAPHRAGM DETAILS, SEE SEGMENT TYPE 9M REINFORCING II SHEET.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
SEGMENT 9M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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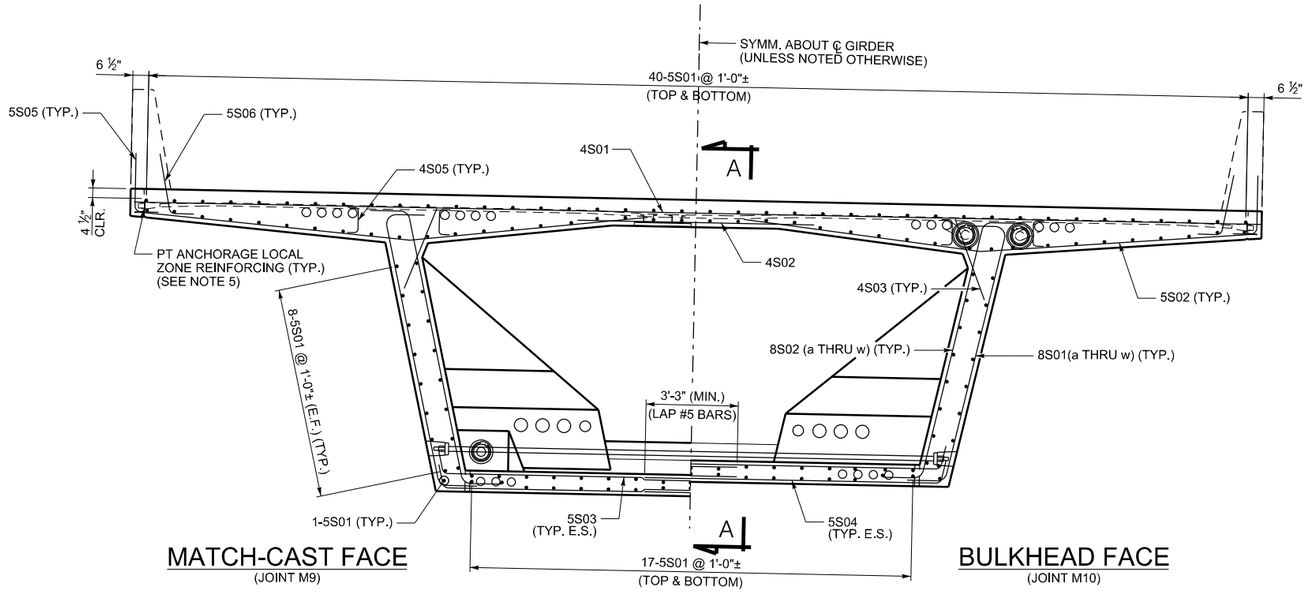
5/7/2008



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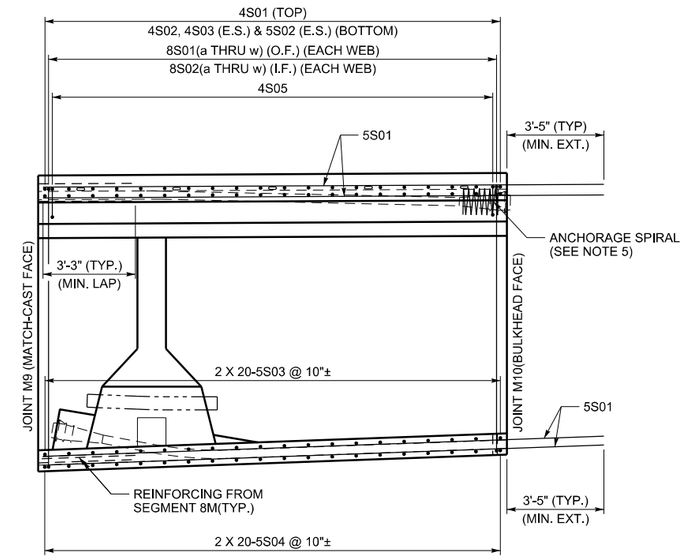
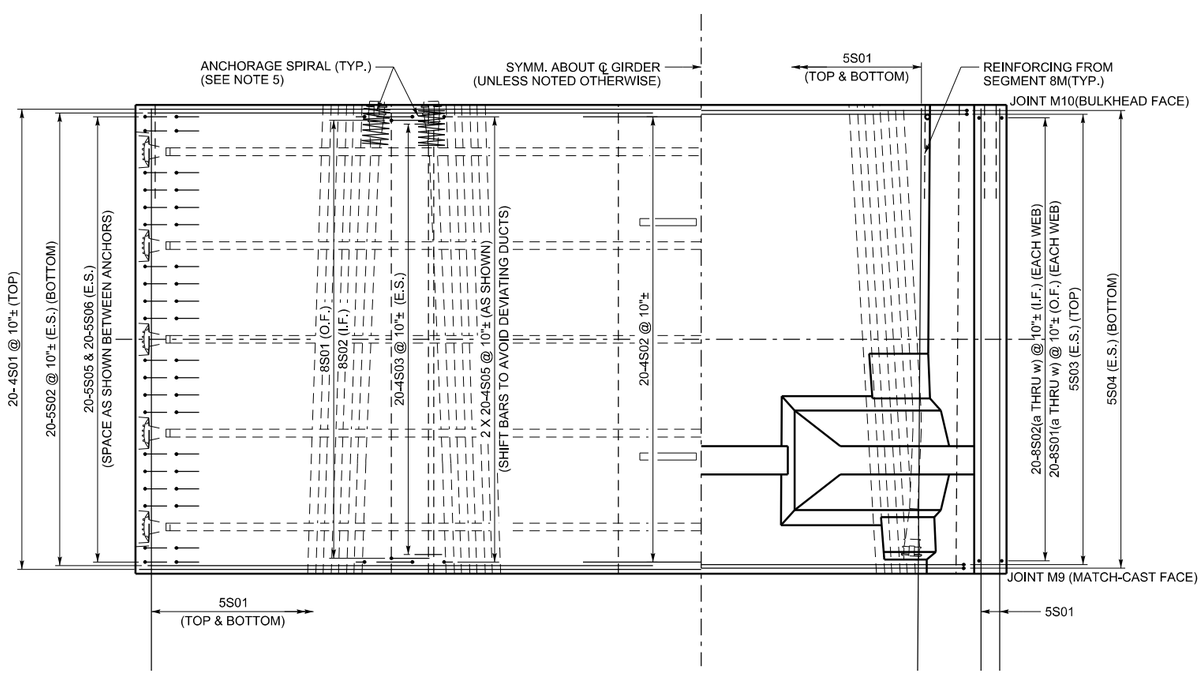


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-9M, S2-9M, N3-9M AND S3-9M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN	BTL	02/08	CHECK XXX MM/YY
DRAWN	SJF	02/08	CHECK XXX MM/YY
QUANT.	XXX	MM/YY	CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 9M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 170 OF 187

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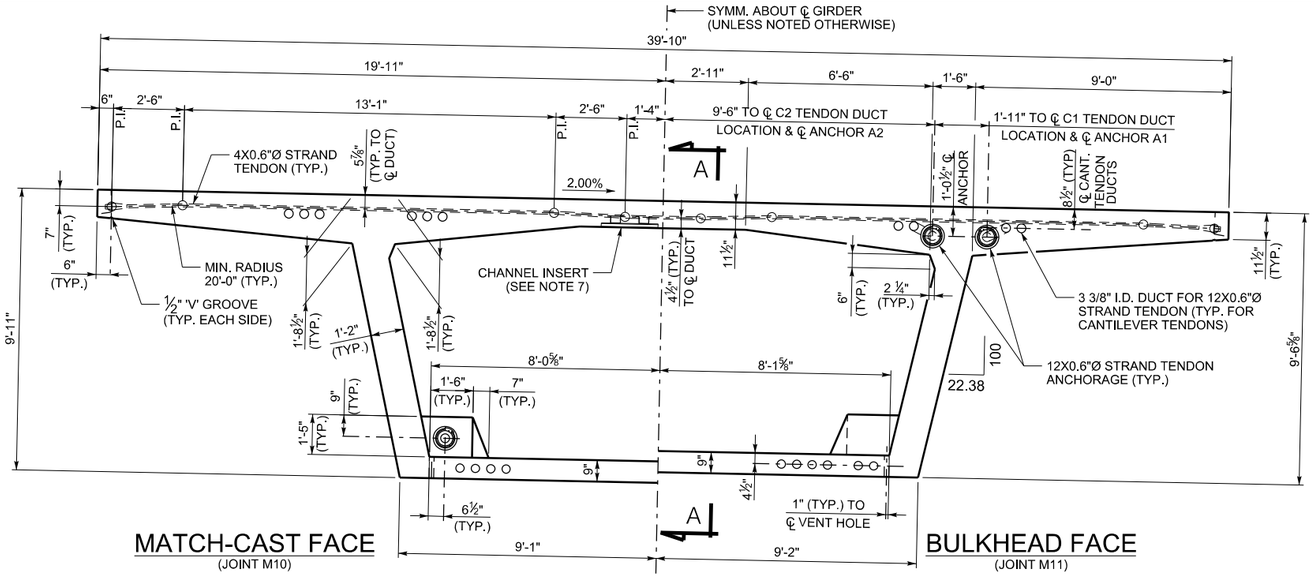
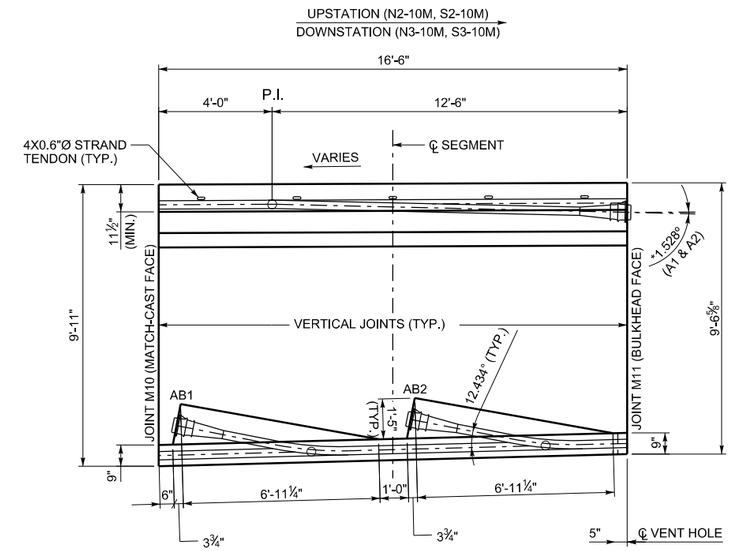
5/7/2008

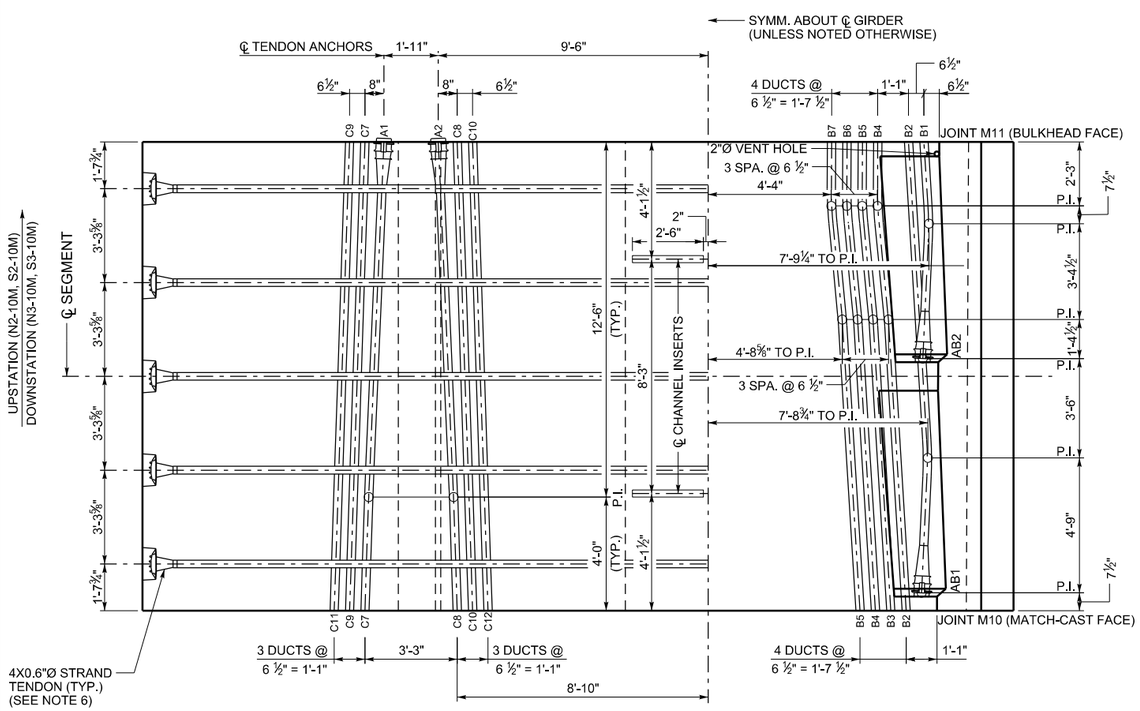


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

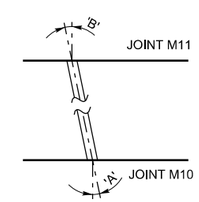


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

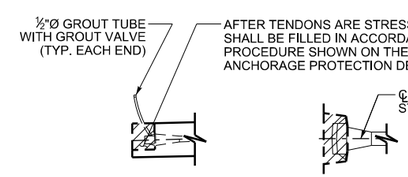
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M10 DUCT POSITION	'A'	JOINT M11 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	1.880°	C8	1.880°
C11	1.880°	C9	1.880°
C12	1.880°	C10	1.880°
AB1	2.637°	B2	3.497°
AB2	2.637°	B1	3.576°
B2	3.489°	B4	.289°
B3	3.489°	B5	.289°
B4	3.489°	B6	.289°
B5	3.489°	B7	.289°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-10M, S2-10M, N3-10M AND S3-10M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
APPROVAL RECOMM.
UDOT BRIDGE ENGR. DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 10M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

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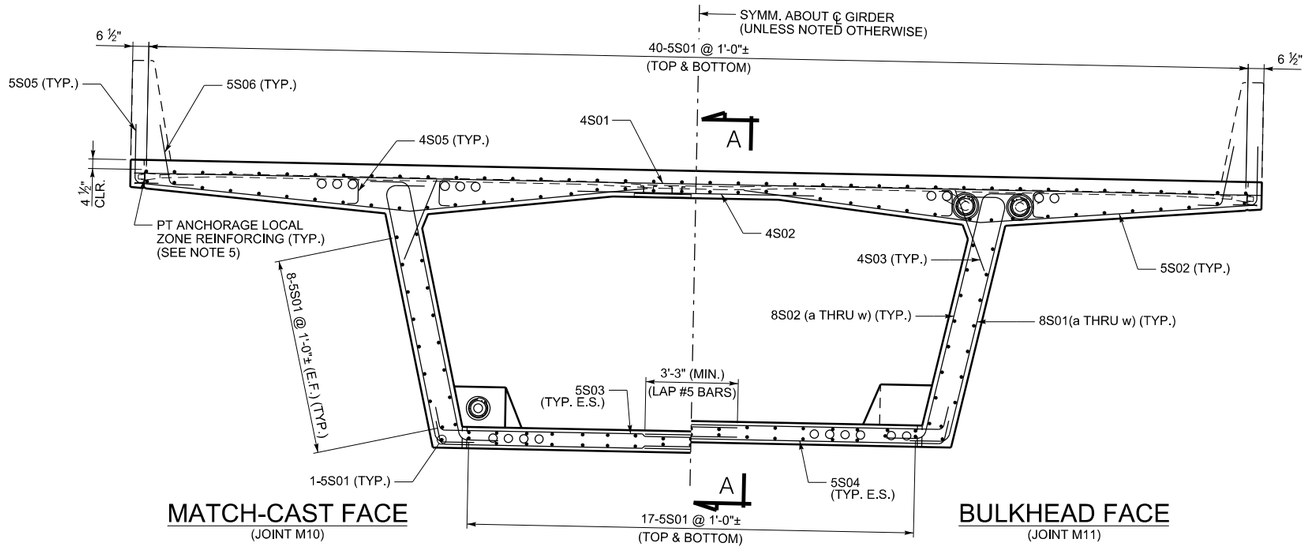
5/7/2008



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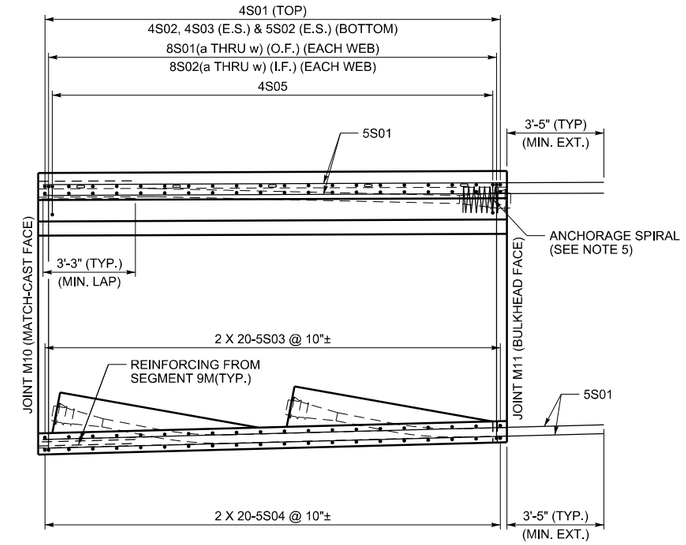
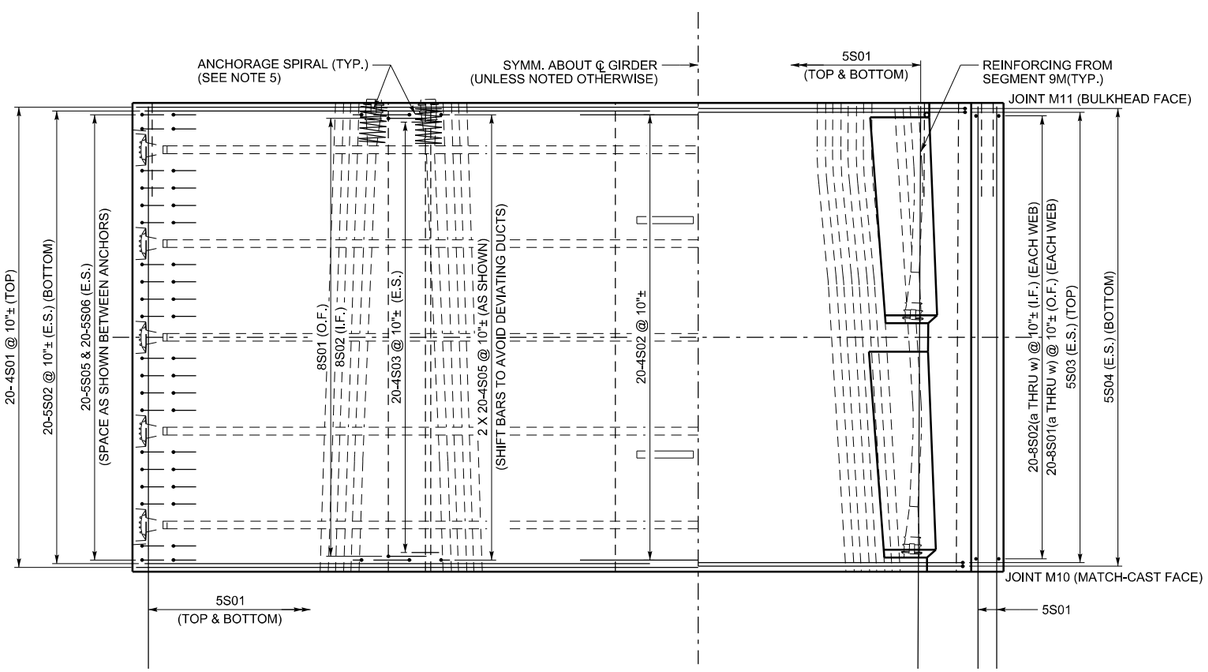


SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-10M, S2-10M, N3-10M AND S3-10M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN	BTL	02/08	CHECK XXX MM/YY
DRAWN	SJF	02/08	CHECK XXX MM/YY
QUANT.	XXX	MM/YY	CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 10M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 174 OF 187

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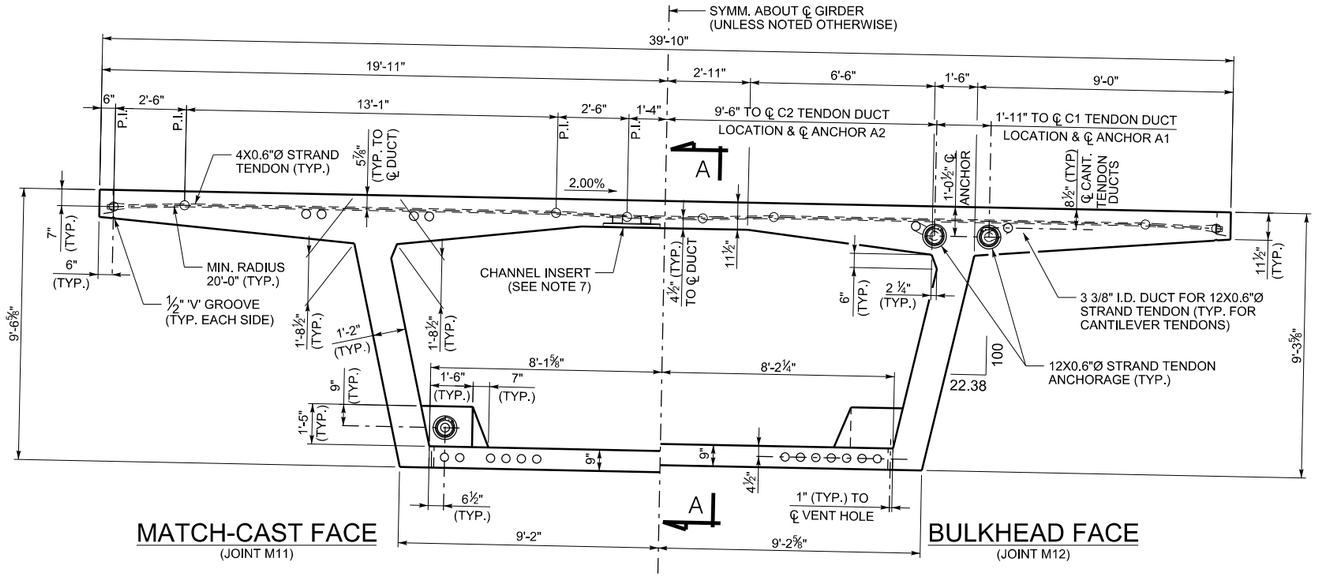
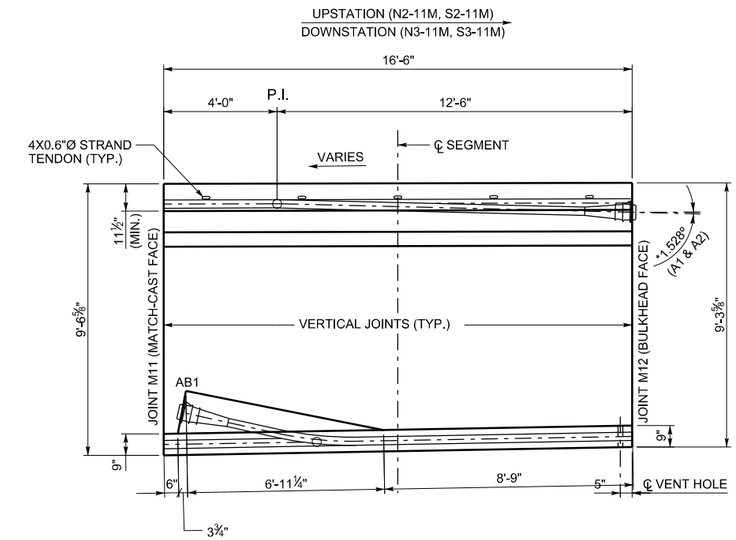
5/7/2008

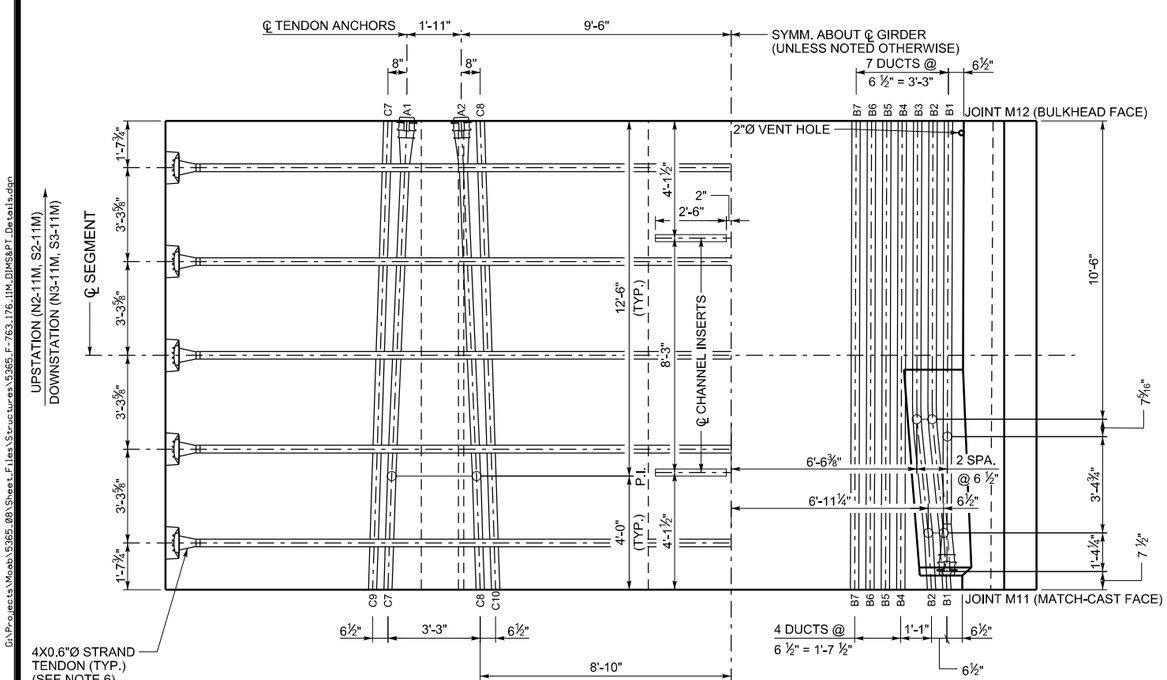


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

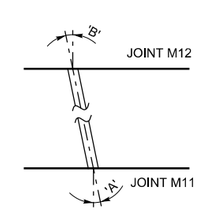


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

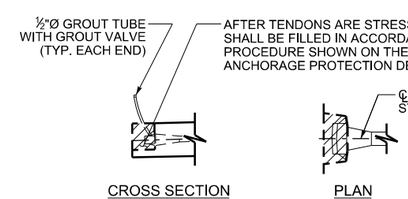
C 23
- 23 — JOINT FACE DUCT POSITION
- C — C - CANTILEVER DUCT, B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M11 DUCT POSITION	'A'	JOINT M12 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
C9	1.880°	C7	1.880°
C10	1.880°	C8	1.880°
B1 - B8	.181°	B1 - B8	.181°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SEGMENT N2-11M, S2-11M, N3-11M AND S3-11M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. * AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
SEGMENT 11M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 176 OF 187

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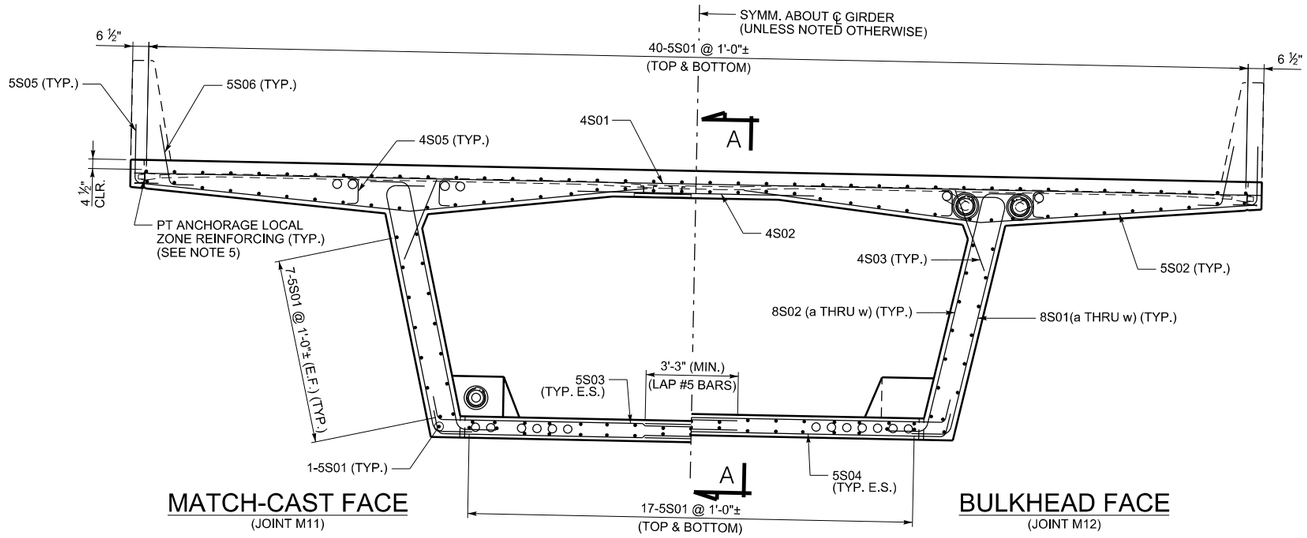
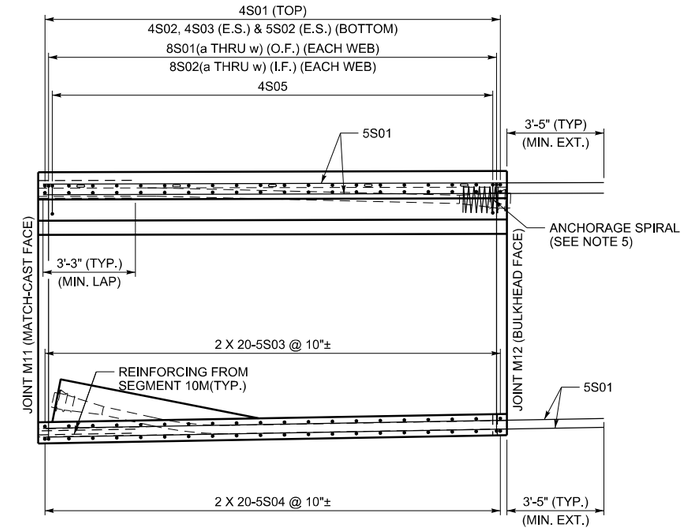
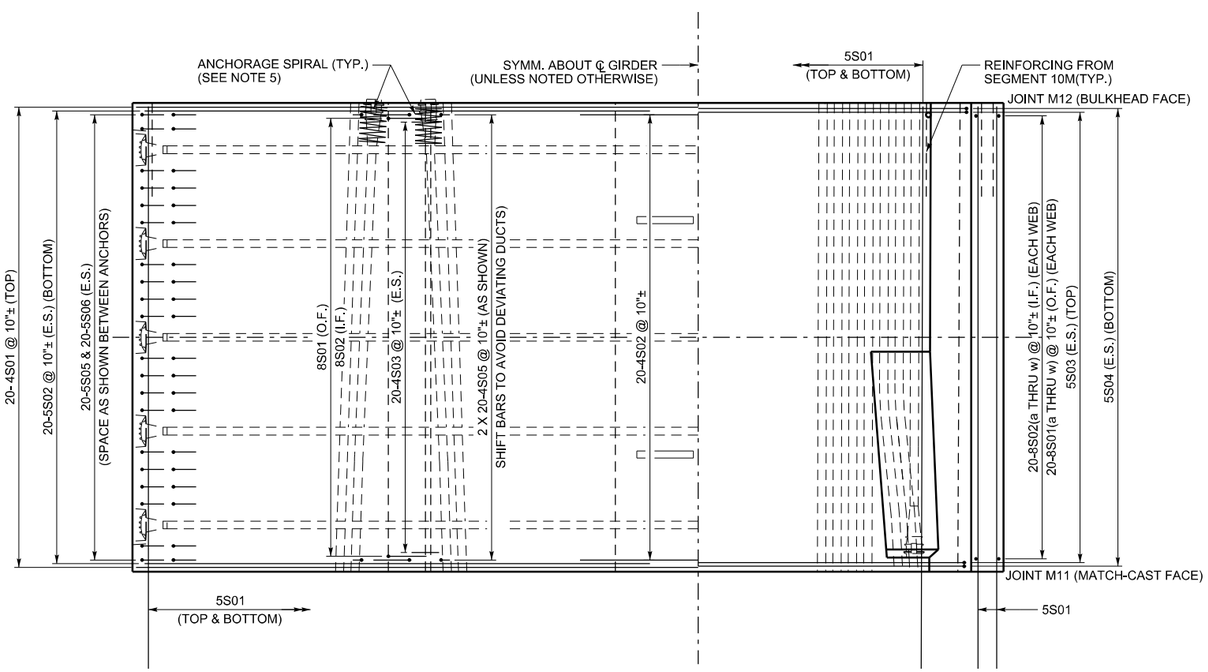
5/7/2008



CROSS SECTION



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-11M, S2-11M, N3-11M AND S3-11M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN	BTL	02/08	CHECK XXX MM/YY
DRAWN	SJF	02/08	CHECK XXX MM/YY
QUANT.	XXX	MM/YY	CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 11M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 177 OF 187

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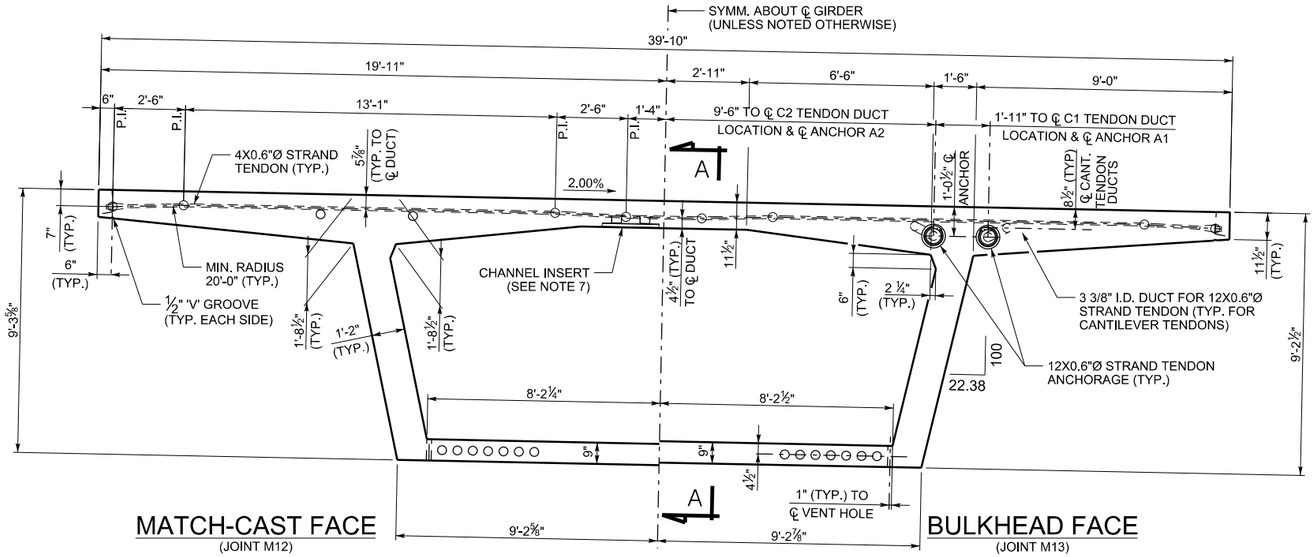
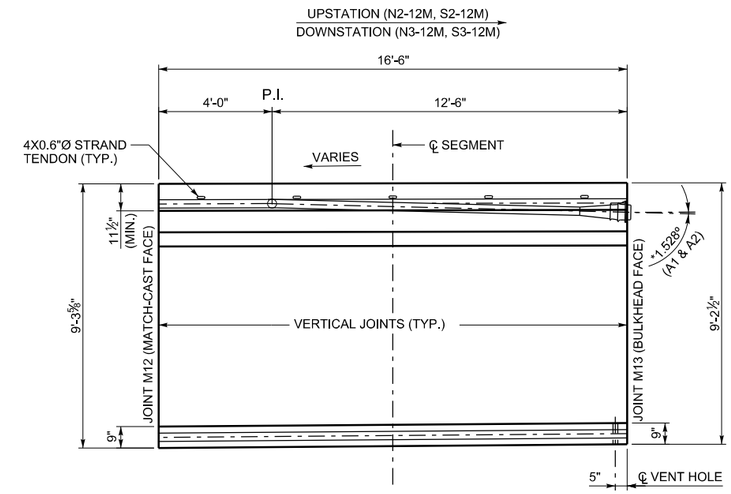
5/7/2008

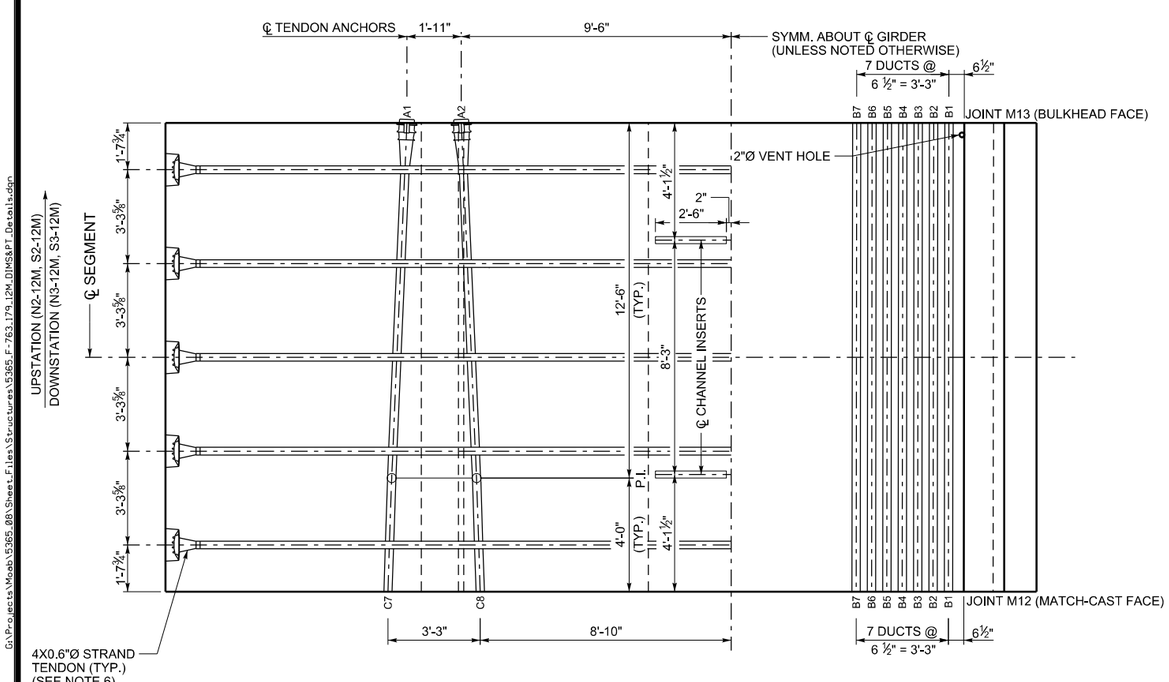


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A
(ANGLES SHOWN WITH RESPECT
TO TOP OF DECK GRADE)

PRELIMINARY:
NOT FOR CONSTRUCTION

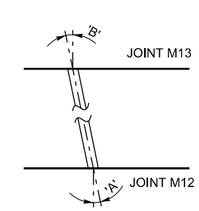


PARTIAL PLAN TOP SLAB
(ONLY UPPER CANTILEVER DUCTS SHOWN FOR CLARITY)
(SEE LOWER DUCT DETAIL FOR LOWER DUCT POSITIONS)

PARTIAL PLAN BOTTOM SLAB

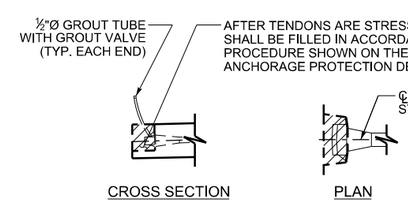
C 23
- 23 — JOINT FACE DUCT POSITION
- C — C - CANTILEVER DUCT; B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M12 DUCT POSITION	'A'	JOINT M13 DUCT POSITION	'B'
C8	1.880°	A2	2.452°
C7	1.880°	A1	2.452°
B1 - B7	.181°	B1 - B7	.181°



TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:
1. THIS DRAWING VALID FOR SEGMENT N2-12M, S2-12M, N3-12M AND S3-12M.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
* 6. AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

SENIOR DESIGN ENGR. DATE
APPROVAL RECOMM.
UDOT BRIDGE ENGR. DATE
APPROVED FOR USE BY UDOT

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
SEGMENT 12M DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 179 OF 187

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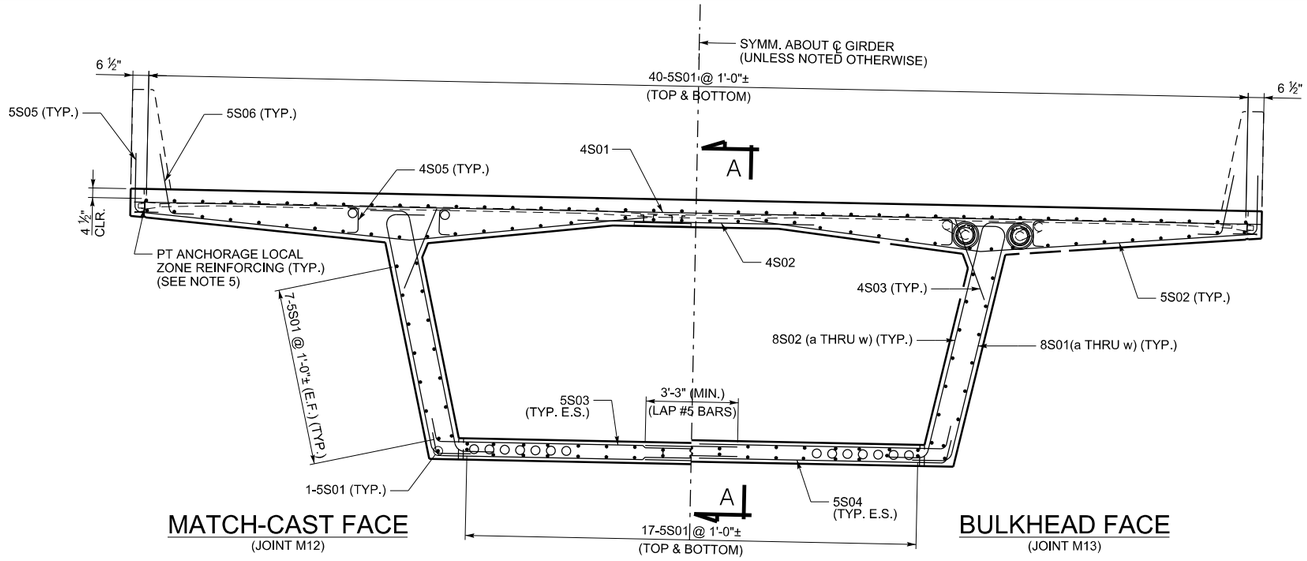
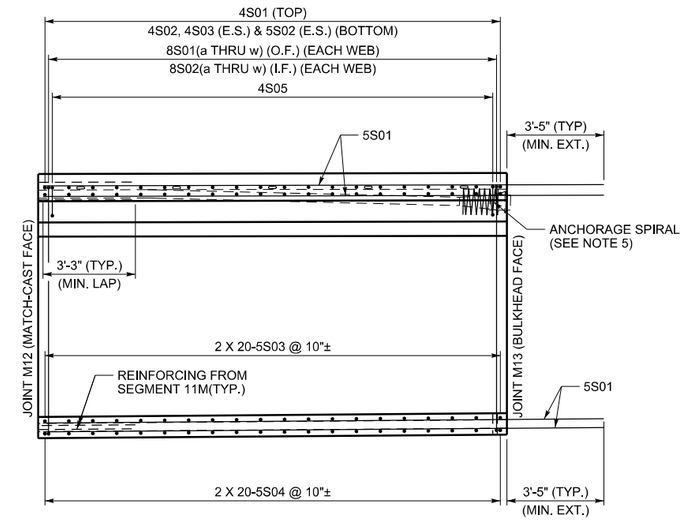
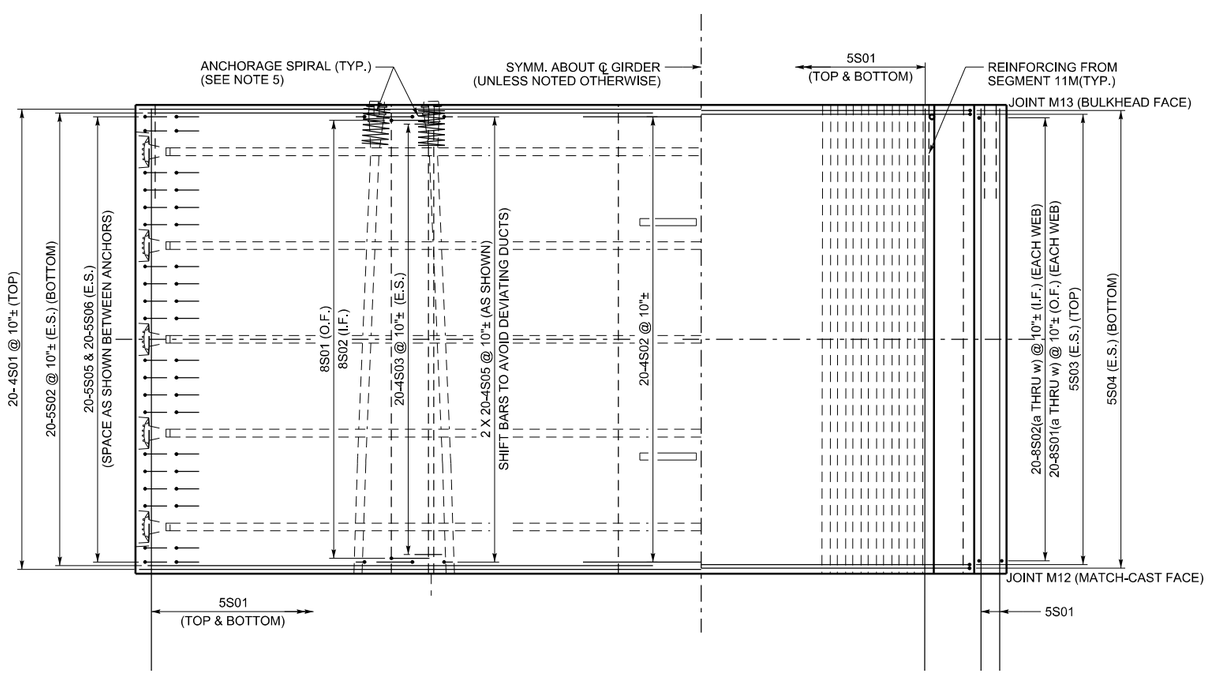
5/7/2008



CROSS SECTION



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

PRELIMINARY:
NOT FOR CONSTRUCTION

NOTES:

1. THIS DRAWING VALID FOR SEGMENTS N2-12M, S2-12M, N3-12M AND S3-12M.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN	BTL	02/08	CHECK XXX MM/YY
DRAWN	SJF	02/08	CHECK XXX MM/YY
QUANT.	XXX	MM/YY	CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
SEGMENT 12M REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 180 OF 187

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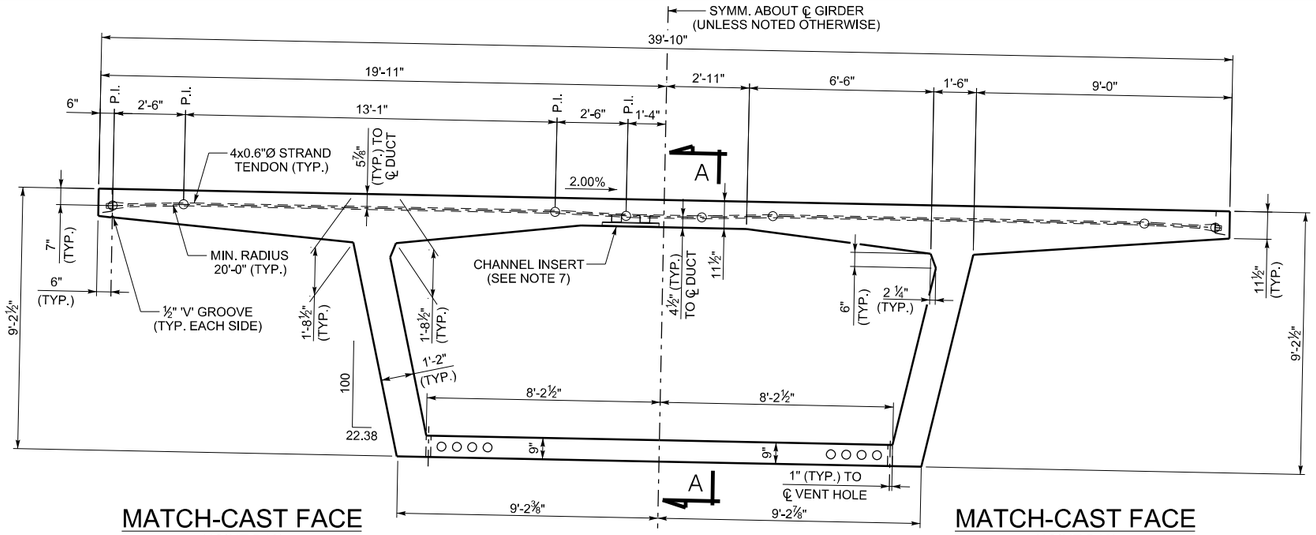
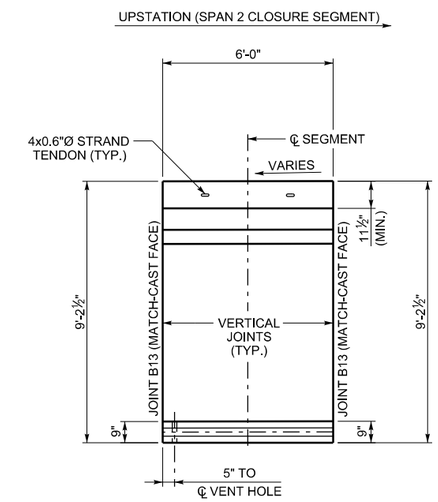
5/7/2008



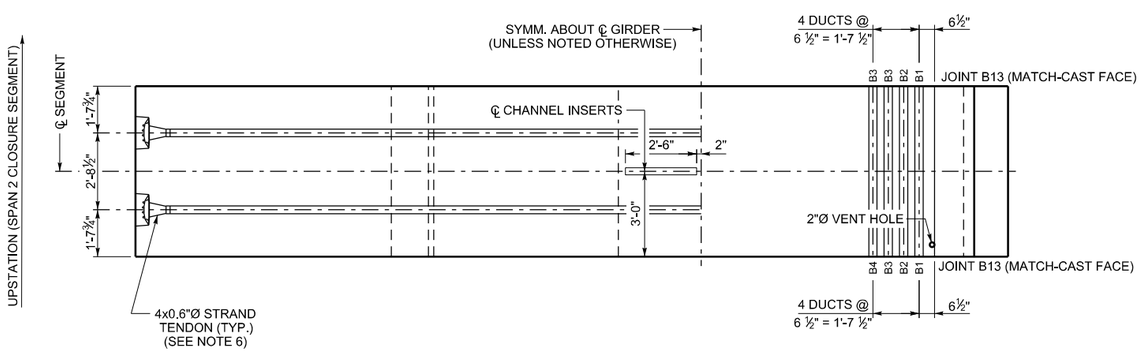
MATCH-CAST FACE
(JOINT B13)

CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION - SB BRIDGE)

MATCH-CAST FACE
(JOINT B13)



SECTION A-A

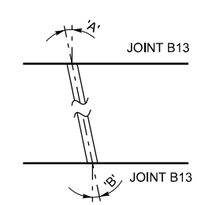


PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

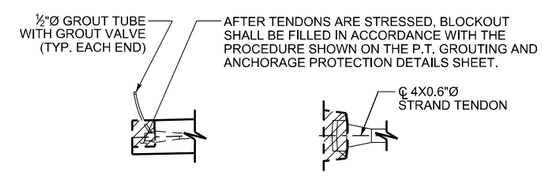
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC
(ANGLES SHOWN ARE IN PLANE PARALLEL TO TOP SLAB)

DUCT DEVIATIONS			
JOINT B11 DUCT POSITION	'A'	JOINT B12 DUCT POSITION	'B'
B1-B4	0°	B1-B4	0°



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:
1. THIS DRAWING VALID FOR SPAN 2 CLOSURE SEGMENTS.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. POSITIVE ANGLE DENOTES TENDON DEVIATING TO UPPER POSITION NEGATIVE ANGLE DENOTES TENDON DEVIATING TO LOWER POSITION.
6. * AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
7. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
8. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
9. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BS CLOSURE DIMS & PT DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 182 OF 187

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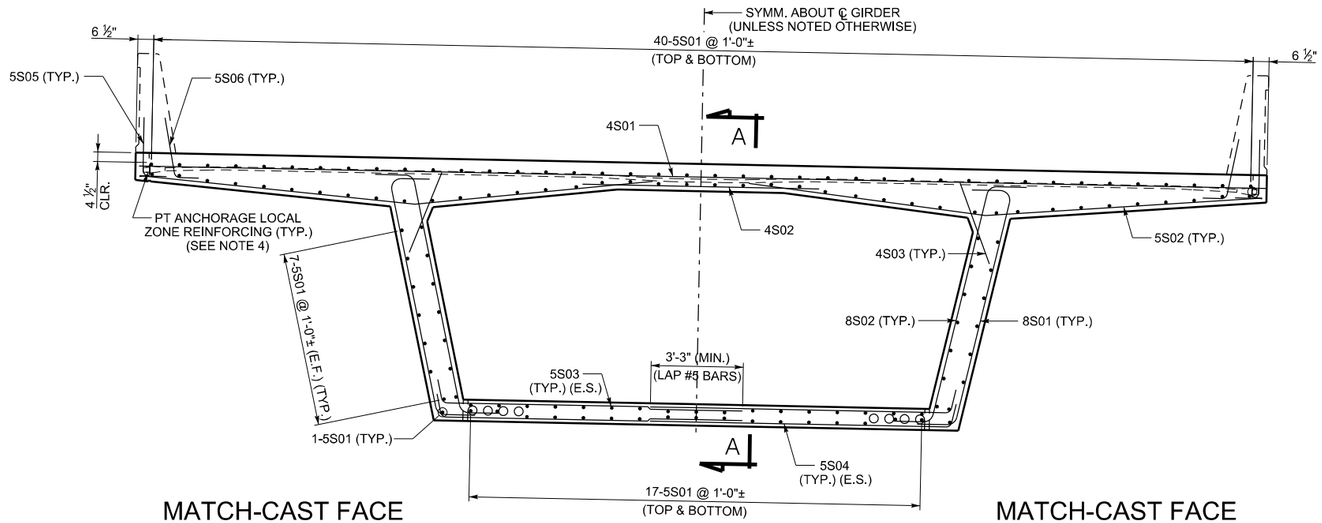
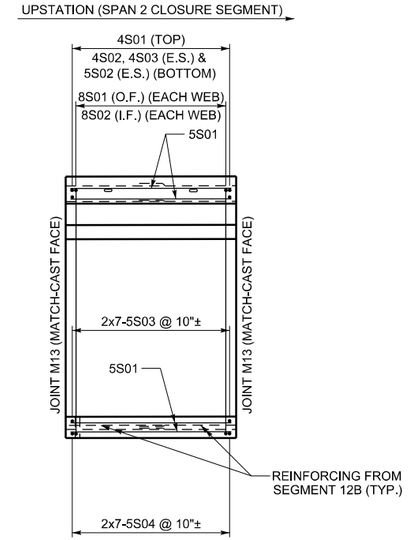
5/7/2008



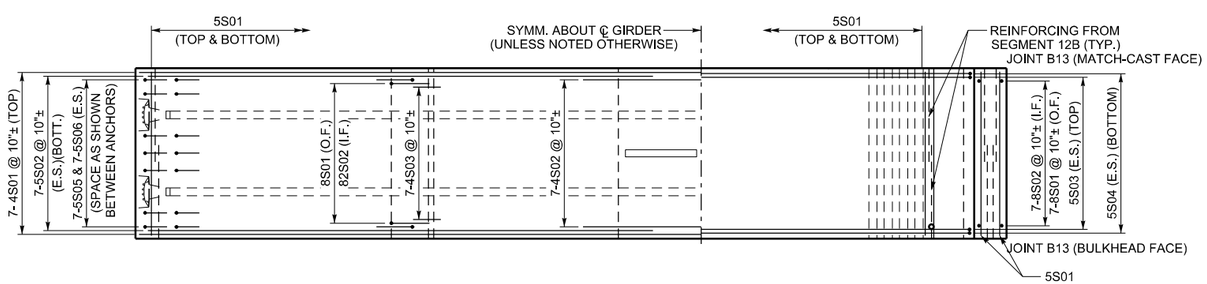
MATCH-CAST FACE
(JOINT B13)

CROSS SECTION

MATCH-CAST FACE
(JOINT B13)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

NOTES:

1. THIS DRAWING VALID FOR SPAN 2 CLOSURE SEGMENTS.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 04/08 CHECK XXX MM/YY
DRAWN KJM 04/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
BS CLOSURE REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 183 OF 187

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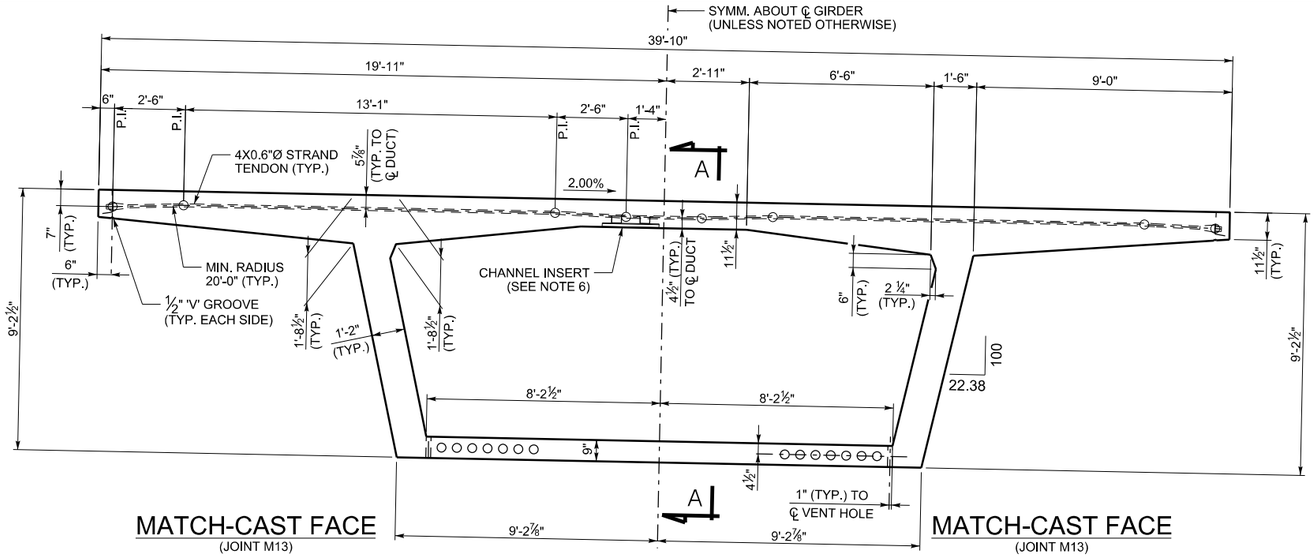
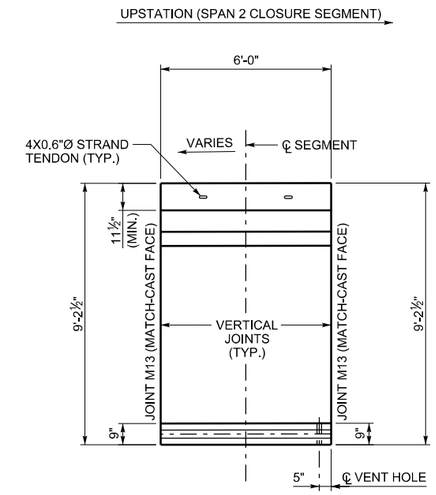
5/7/2008

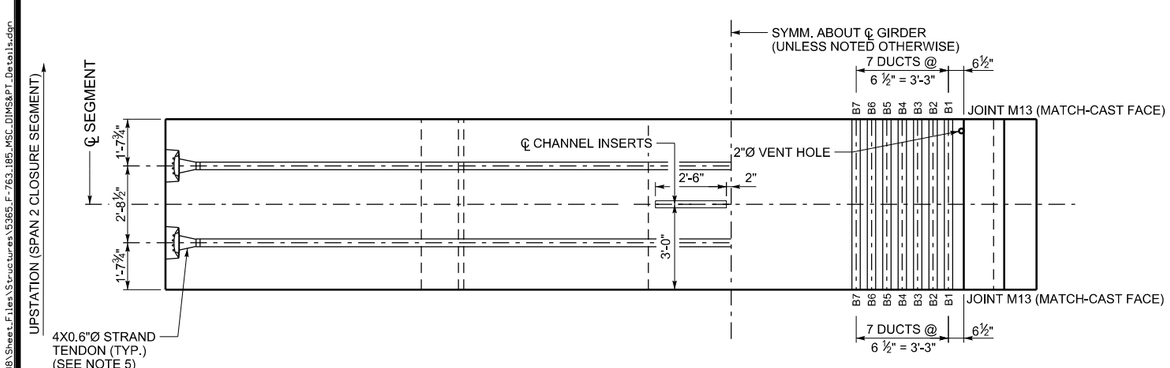


CROSS SECTION
(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A

PRELIMINARY:
NOT FOR CONSTRUCTION

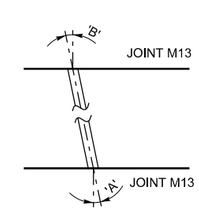


PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

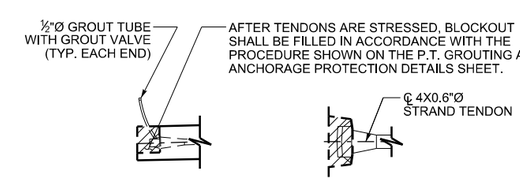
C 23
- JOINT FACE DUCT POSITION
- C - CANTILEVER DUCT
- B - BOTTOM SLAB DUCT

DUCT LEGEND



DUCT DEVIATION SCHEMATIC

DUCT DEVIATIONS			
JOINT M13 DUCT POSITION	'A'	JOINT M13 DUCT POSITION	'B'
B1 - B7	0º	B1 - B7	0º



CROSS SECTION PLAN

TRANSVERSE TENDON BLOCKOUT DETAIL

NOTES:

1. THIS DRAWING VALID FOR SPAN 2 CLOSURE SEGMENTS.
2. ALL TRANSVERSE DIMENSIONS ARE MEASURED ALONG SLOPE OF DECK.
3. FOR BULKHEAD DETAILS, SEE BULKHEAD DETAILS SHEET.
4. SEGMENT CONCRETE SHALL BE 6000 PSI.
5. * AFTER THE CONCRETE REACHES A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, AND PRIOR TO RELEASING FORMWORK OR ADVANCING FORM TRAVELER, THE TRANSVERSE 0.6"Ø STRANDS SHALL BE STRESSED TO 44 KIPS EACH. THE TENDONS SHALL BE SINGLE END STRESSED FROM ALTERNATING SIDE OF THE DECK.
6. CHANNEL INSERTS SHALL BE GALVANIZED OR STAINLESS STEEL AND SHALL HAVE AN ALLOWABLE CAPACITY OF 1500 LBS/FT. CHANNEL INSERTS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.
7. FOR LONGITUDINAL PT STRESSING AND GROUTING DETAILS, SEE LONGITUDINAL PT LAYOUT SHEETS, PT SCHEDULE SHEETS AND PT GROUTING AND ANCHORAGE PROTECTION SHEET.
8. ALL LONGITUDINAL TOP AND BOTTOM SLAB TENDONS ARE 12 X 0.6"Ø STRAND TENDONS. MINIMUM DUCT RADIUS SHALL BE 12'-0" IN THE TRUE 3D PLANE OF THE DUCT CURVE

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR

US-191; OVER COLORADO RIVER BRIDGE - MOAB UTAH
M.S. CLOSURE DIMS & P.T. DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 185 OF 187

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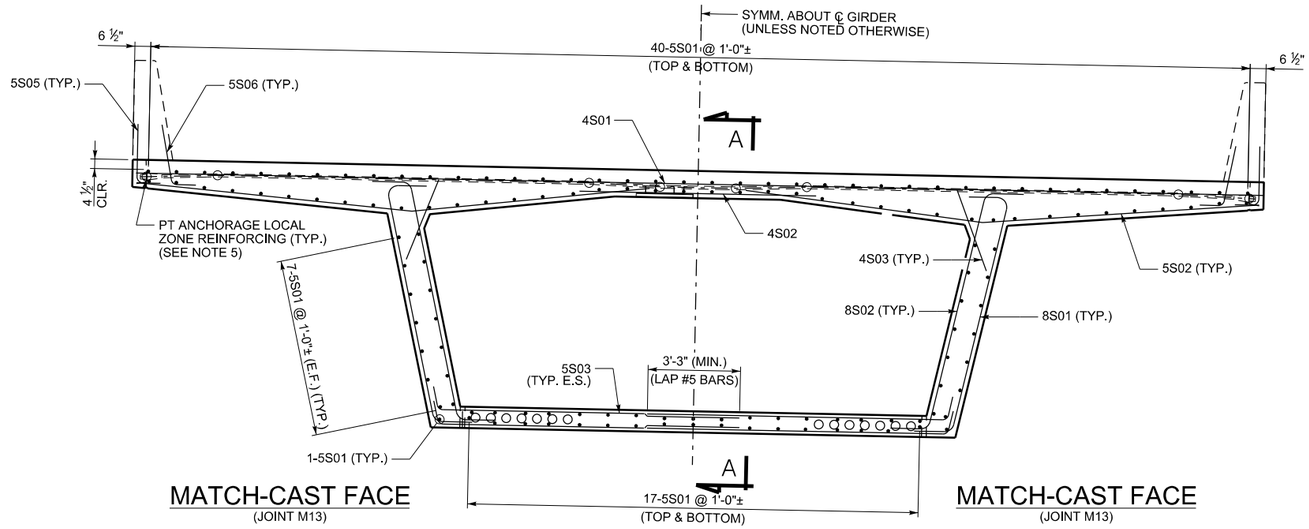
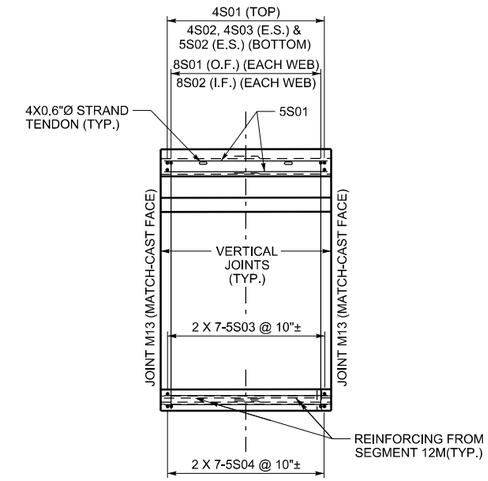
5/7/2008

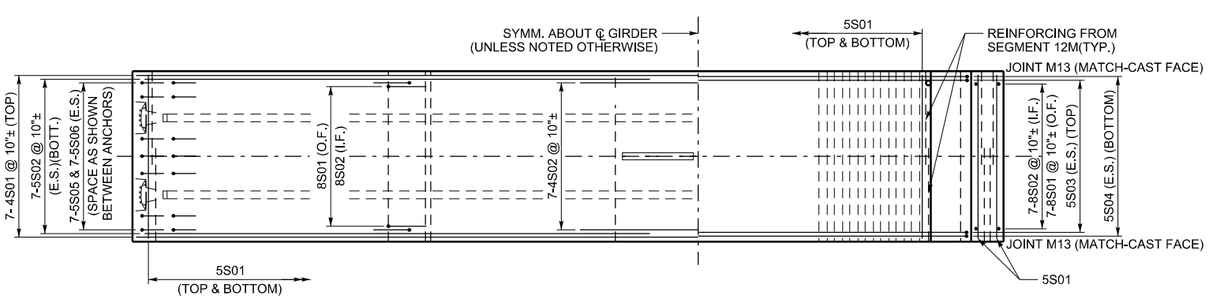


CROSS SECTION

(LOOKING UPSTATION - NB BRIDGE)
(LOOKING DOWNSTATION -SB BRIDGE)



SECTION A-A



PARTIAL PLAN TOP SLAB

PARTIAL PLAN BOTTOM SLAB

NOTES:

1. THIS DRAWING VALID FOR SPAN 2 CLOSURE SEGMENTS.
2. SPACE ALL REINFORCING BARS TO CLEAR POST-TENSIONING DUCTS.
3. CONCRETE COVER SHALL BE
   4 ½" - TOP OF DECK
   1 ½" - ALL OTHER SURFACES
4. ALL DEFORMED REINFORCING BARS SHALL BE ASTM A615 GRADE 60 AND EPOXY COATED.
5. FOR PT ANCHORAGE SPIRAL AND TRANSVERSE LOCAL ZONE REINFORCING, SEE POST-TENSIONING SCHEDULE SHEET.
6. THE SYMBOL ± DENOTES BARS THAT CAN BE SHIFTED ± 2" TO AVOID OTHER REINFORCING OR POST-TENSIONING HARDWARE, OR TO ACHEIVE EQUAL SPACING FROM FIRST TO LAST BAR.

PRELIMINARY:
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN BTL 02/08 CHECK XXX MM/YY
DRAWN SJF 02/08 CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
M.S. CLOSURE REINFORCING I

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

F-763
DRG. NO.

SHT. 186 OF 187

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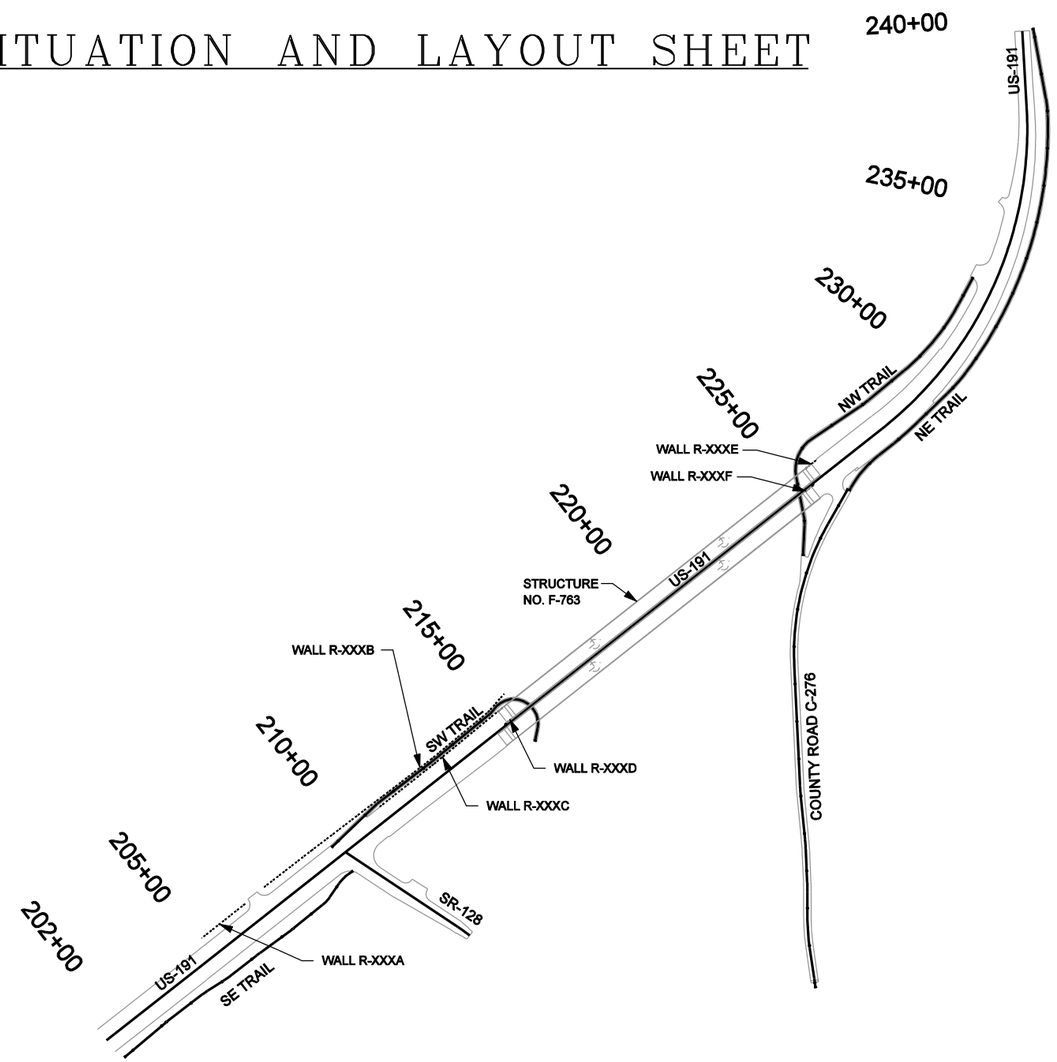
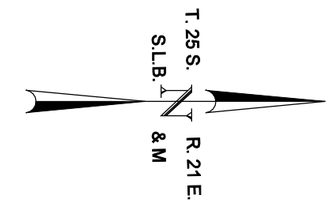
WALL SITUATION AND LAYOUT SHEET





GENERAL NOTES

1. USE COATED DEFORMED CARBON REINFORCING BARS CONFORMING TO AASHTO M284 OR M111 AND M31 GRADE 60 FOR ALL REINFORCING STEEL.
2. CHAMFER ALL EXPOSED CONCRETE CORNERS 3/4" EXCEPT WHERE NOTED OTHERWISE.
3. PROVIDE 2" OF CONCRETE COVER TO REINFORCING STEEL EXCEPT WHERE NOTED OTHERWISE.
4. USE CLASS AA(AE) CAST-IN-PLACE CONCRETE EXCEPT WHERE NOTED OTHERWISE.
5. USE CLASS 3A (AE) CONCRETE FOR WALL FACING PANELS.
6. USE CLASS B CONCRETE FOR LEVELING PAD UNLESS OTHERWISE NOTED.
7. USE MSE SELECT BACKFILL IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 02832S.
8. SUBMIT WALL FABRICATION PLANS PER SECTION 02831S. SEE WALL FABRICATION PLANS FOR ADDITIONAL WALL DETAILS.
9. SEE GEOTECHNICAL PLANS FOR SURCHARGE PRESSURES, DEPTHS AND LIMITS.

DESIGN DATA

DESIGN IN ACCORDANCE WITH CURRENT AASHTO LRFD AND INTERIM SPECIFICATIONS.

CAST-IN-PLACE CONCRETE: f'c = 4000 psi; fy (REINF.) = 60,000 psi; n = 8

WALL PANEL CONCRETE: f'c = 5000 psi; fy (REINF.) = 60,000 psi; n = 8

SEISMIC: AASHTO LRFD SEISMIC ZONE ?
A50 = 0.xx g (10% PE IN 50 YRS.) <—?
A250 = 0.xx g (10% PE IN 250 YRS.) <—?
SOIL PROFILE TYPE IV FOR WALLS LOCATED ...
SOIL PROFILE TYPE III FOR WALLS LOCATED ...

INDEX OF SHEETS

1	GENERAL NOTES/LOCATION PLAN
2-3	SOIL DATA (TO COME)
4,5,6,7	MSE WALL R-XXX TYPICAL SECTION SHEETS & DETAIL SHEETS
8	R-xxxA SITUATION & LAYOUT
9, 10	R-xxxB SITUATION & LAYOUT
11	R-xxxC SITUATION & LAYOUT
12	R-xxxD SITUATION & LAYOUT
13	R-xxxE SITUATION & LAYOUT
14	R-xxxF SITUATION & LAYOUT

QUANTITIES

ITEM	ESTIMATED	UNIT	AS CONST.
MSE WALL (R-xxxA) (EST. QTY. 654 SQ. FT.)	1	LUMP	
MSE WALL (R-xxxB) (EST. QTY. 5116 SQ. FT.)	1	LUMP	
MSE WALL (R-xxxC) (EST. QTY. 3771 SQ. FT.)	1	LUMP	
MSE WALL (R-xxxD) (EST. QTY. 643 SQ. FT.)	1	LUMP	
MSE WALL (R-xxxE) (EST. QTY. 165 SQ. FT.)	1	LUMP	
MSE WALL (R-xxxF) (EST. QTY. 364 SQ. FT.)	1	LUMP	

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN CHECK
DRAWN CHECK
QUANT. CHECK
APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
MSE WALL R-XXX LOCATION PLAN

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

R-xxx
DRG. NO.

SHT. 1 OF 14

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DRILL HOLE LOG

BORING NO. 07-W-01

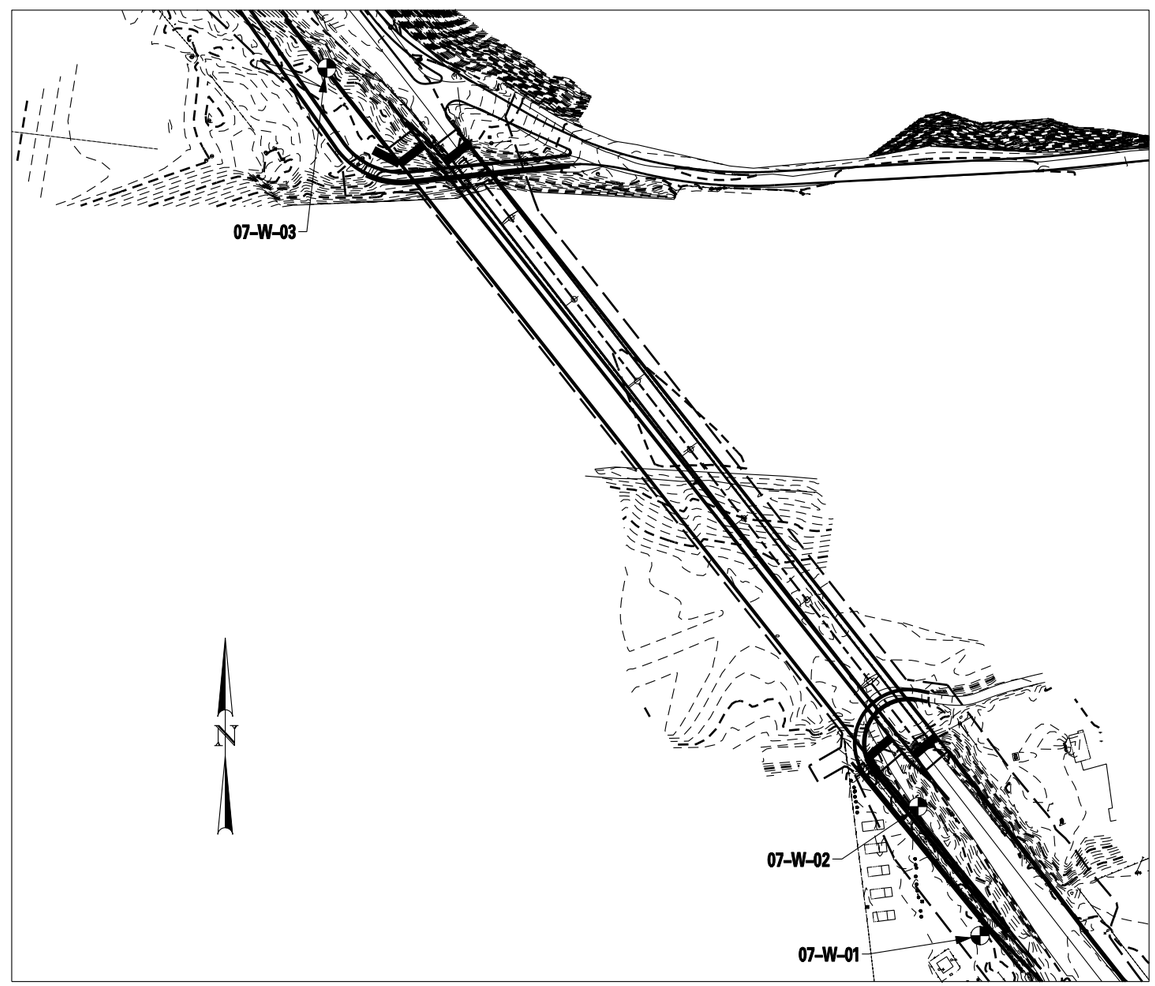
SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 212+61, 74' LT. / N:200,331 E:99,534
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & N.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 11.3' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200701.200
DATE STARTED: 11/30/07
DATE COMPLETED: 12/3/07
GROUND ELEVATION: 3972.0'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Sample Type	Sample Rec. (in)	Sample See Legend	Sample USCS (AASHTO)	Material Description		Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
		14	13,19,18,(79)		SM	brown, slightly moist, dense	SILTY SAND W/GRAVEL								
3970		13	4,4,3,(15)		SM (A-2-4(0))	red-brown, slightly moist, loose			6.3		NP	5	67	28	
	5	14	4,4,5,(19)		SM	red-brown, slightly moist, loose	SILTY SAND few random clay lenses								
3965					SM	red-brown, moist									
		6	4,2,2,(7)		CL	green-gray, moist									
	10	16	Pushed 0.14		CL (A-6(10))	brown, very moist, soft	LEAN CLAY	102	23	27	13	0	9	91	7
3960		16	Pushed 0.09		CL (A-4(6))	gray-brown, very moist, very soft	LEAN CLAY W/SAND		27	30	9	0	23	77	
	15	14	0/18",(0) 0.04		CL-ML	gray-brown, wet, very soft	SANDY SILTY CLAY								
3955		7	8,12,22,(47)		GP-GM	brown, wet, med. dense	GRAVEL W/SILT & SAND								
3950	20	11	21,19,23		CL (A-4(2))	red to purple-brown, hard	CLAYSTONE (LEAN CLAY W/GRAVEL) very highly weathered		11.8	24	8	18	23	59	
3945	25	25	Core 70,30		-	red-brown, ext. soft rock to soft rock		132.8	9.6						150
3940	30	10	Core 16,0		-	red-brown, ext. soft rock	CLAYSTONE (LEAN CLAY W/GRAVEL) highly weathered, most of sample washing away, occasional thin siltstone layers								
		13	4,8,9 0.55		CL (A-4(3))	red-brown, ext. soft rock/stiff soil			14.6	24	10	20	21	59	
3935	35	6	Core 17,0		-	red-brown, ext. soft rock/stiff soil									
		8	4,4,7		GC (A-2-4(0))	brown-purple, ext. soft rock/very loose soil			10.5	23	9	46	22	32	
3930	40	10	Core 20,0		-	red-brown, ext. soft rock	CLAYSTONE (CLAYEY GRAVEL)								
		7	7,4,5 0.65		-	brown-purple, ext. soft rock/very loose soil									
3925	45	0	Core 0,0		-	no recovery									
		6	56/6" 0.70		-	dk. gray	SHALEY MUDSTONE								

PRELIMINARY PLAN
NOT FINAL



EXPLORATION LOCATION PLAN

100' 0 100' 200'

KEY TO BORING LOG

SYMBOLS

- 2,3,2,(6) — Blow Count per 6" — $(N_1)_{60}$ Value
- 0.45 — Torvane (tsf)
- Disturbed Sample
- Core 95,60 — Rock Quality Designation (% RQD) — Percent Sample Recovery
- Undisturbed Sample
- Groundwater Elevation

RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATION SHOWN WAS CONDUCTED BETWEEN 11-30-07 AND 12-03-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN, HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 12/07 CHECK SRJ 1/08
DRAWN JPN 2/08 CHECK SRJ 2/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
R-XXX DRG. NO.
SHT. 2 OF 14

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5/7/2008

DRILL HOLE LOG — BORING NO. 07-W-02

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 214+46, 33' LT. / N:200,501 E:99,453
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & N.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 20.2' AFTER 24 HOURS: ▼ N.M.

PROJECT NUMBER: 200701.200
DATE STARTED: 11/29/07
DATE COMPLETED: 11/30/07
GROUND ELEVATION: 3975.9'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Sample Type	Rec. (in)	See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
3975					GM	brown, slightly moist — 2" ASPHALT; 6" ROAD BASE								
			6	7,10,11,(45) Grab	SM	brown to red-brown, sl. moist, med. dense — SILTY SAND								
			9	9,7,6,(28)	GM (A-1-b(0))	orange-brown, slightly moist, med. dense — SILTY GRAVEL W/SAND		7.6		NP	44	43	13	
3970	5		5	19,12,6,(38)	GP-GM (A-1-a(0))	orange-brown, slightly moist, loose — GRAVEL W/SILT & SAND possible cobbles & boulders		10.5		NP	64	26	10	
			9	6,7,10,(32)	GC (A-2-4(0))	red-brown, slightly moist, loose — CLAYEY GRAVEL W/SAND possible cobbles & boulders		8.5	22	7	64	20	16	
3965	10		9	32,23,8,(50)	GP-GM	red-brown, moist, med. dense — GRAVEL W/SILT & SAND possible cobbles & boulders (fill?)								
			13	Pushed 0.46	SM (A-2-4(0))	brown, moist	98	11		NP	0	65	35	
			14	4,5,5,(14)	SM	gray-brown, moist, loose — SILTY SAND few silt layers to 3" thick								
3960	15		11	3,3,3,(8)	SM	brown, very moist, loose								
			17	2,2,5,(9)	ML (A-4(0))	brown, wet, loose — SANDY SILT		21.4		NP	7	40	53	
3955	20 ▽		11	27,42,40,(97)	GP-GM	brown, wet, dense								
						GRAVEL W/SILT & SAND cobbles & boulders (soft sandstone)								
3950	25		11	14,20,16,(40)	GP-GM (A-1-a(0))	brown, wet, med. dense		7.4		NP	67	23	10	
3945	30		12	28,22,16,(40)	GM	brown, wet, med. dense — SILTY GRAVEL W/SAND cobbles & boulders								
						MUDSTONE very highly weathered								
3940	35		10	39,56/5"	-	red-brown, hard								
			22	Core 86,62	GC (A-4(0))	red-brown, very soft rock to soft rock — CLAYEY MUDSTONE (CLAYEY GRAVEL W/SAND) very highly weathered	138.3	7.8	20	7	33	31	36	110
3935	40		18	Core 30,20	-	red-brown, very soft rock	137.9	7.9						40
						MUDSTONE highly fractured (horizontal & vertical), broken & brecciated, rubble zones, green staining on fractures								
3930	45		18	Core 30,0	-	red-brown, very soft rock								

DRILL HOLE LOG — BORING NO. 07-W-03

SHEET 1 OF 1

PROJECT: US-191: OVER COLORADO RIVER BRIDGE
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION
LOCATION: SEE SITE PLAN / STA. 226+95, 42' LT. / N:201,476 E:98,672
DRILLING METHOD: CME-55 NO. 1 / N.W. CASING & N.Q. CORE
DRILLER: D. SAMPSON
DEPTH TO WATER - INITIAL: ▽ 17.0' AFTER 24 HOURS: ▼ N.M.

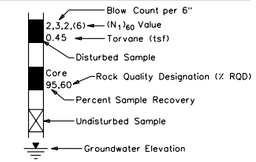
PROJECT NUMBER: 200701.200
DATE STARTED: 12/4/07
DATE COMPLETED: 12/4/07
GROUND ELEVATION: 3973.5'
LOGGED BY: M. HANSEN, J. BOONE

Elev. (ft)	Depth (ft)	Sample Type	Rec. (in)	See Legend	USCS (AASHTO)	Material Description	Dry Density (pcf)	Moisture Content (%)	Atter. Liquid Limit	Atter. Plast. Index	Gradation Gravel (%)	Gradation Sand (%)	Gradation Silt/Clay (%)	Unconfined Strength (psf)
			15	5,15,18,(70)	GM	red-brown, slightly moist, med. dense								
3970			15	10,12,24,(77)	GM (A-1-b(0))	red-brown, slightly moist, med. dense — SILTY GRAVEL W/SAND (fill?)		7.1		NP	39	37	24	
	5		3	56/4"	GM	red-brown, slightly moist, very dense								
3965			12	7,9,15,(45)	SP (A-3(0))	red-brown, moist, med. dense — SAND W/GRAVEL		16.9		NP	38	30	2	
	10		12	3,3,3,(10)	ML	red-brown to lt. brown, wet, loose								
						SANDY SILT								
3960			8	3,2,2,(6)	ML (A-4(0))	brown, wet, very loose		25		NP	0	37	63	
	15		12	Pushed	SM (A-2-4(0))	lt. brown, wet — SILTY SAND	102.3	15.6		NP	2	81	17	
			12	11,12,10,(29)	GP-GM	lt. brown, wet, loose								
3955 ▽						GRAVEL W/SILT & SAND								
	20		12	36,12,11,(29)	GP-GM	brown, wet, loose								
						MUDSTONE very highly weathered								
3950			1	47/1"	-	red-brown, very soft rock								
	25		56	Core 95,67	CL-ML (A-4(0))	red-brown, soft rock — SANDY SILTSTONE (SANDY SILTY CLAY)	153.2	3.3	22	4	0	35	65	2050
					-	red-brown, soft rock — SILTY MUDSTONE								
			56	Core 95,67	-	red-brown, soft rock								
3945						CLAYSTONE (SANDY LEAN CLAY) silty mudstone layers, some near vertical (80 33/64) fractures								
	30		58	Core 96,62	CL (A-6(5))	red-brown, soft rock	148.7	5.4	27	11	0	30	70	450
3940														

PRELIMINARY PLAN
NOT FINAL

KEY TO BORING LOG

SYMBOLS



RELATIVE DENSITY (NON-PLASTIC - SAND & SILT)

VERY LOOSE N<4
LOOSE N 4-10
MED DENSE N 10-30
DENSE N 30-50
VERY DENSE N>50

CONSISTENCY (PLASTIC - SILT & CLAY)

VERY SOFT N<2
SOFT N 2-4
MEDIUM STIFF N 4-8
STIFF N 8-15
VERY STIFF N 15-30
HARD N>30

GENERAL NOTES

1. THE SUBSURFACE EXPLORATIONS SHOWN WERE CONDUCTED BETWEEN 11-29-07 AND 12-04-07 BY RB&G ENGINEERING, INC..
2. THESE BORING LOGS REPRESENT A SYNOPSIS OF THE SOIL DEPOSITS ENCOUNTERED WITHIN EACH BORING AND ARE BASED ON SOUND GEOLOGICAL AND ENGINEERING JUDGMENT. BECAUSE SOIL IS A COMPLEX MEDIUM, THESE BORING LOGS MAY OR MAY NOT REPRESENT THE SOIL CONDITIONS AT THIS SITE. THIS SUBSURFACE INTERPRETATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATION AND JUDGEMENT OF THE CONTRACTOR.
3. THE WATER LEVELS AND CONDITIONS INDICATED ON THE BORING LOGS REPRESENT HOLE CONDITIONS ON THE DATE SHOWN, HOWEVER, IT SHOULD BE NOTED, THAT AT LOCATIONS AWAY FROM THE BORINGS OR AT ANOTHER TIME THE WATER LEVELS AND CONDITIONS MAY VARY SIGNIFICANTLY.
4. THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
5. COBBLE - A ROCK WITH AN AVERAGE DIMENSION BETWEEN 3 INCHES AND 12 INCHES
6. BOULDER - A ROCK WITH AN AVERAGE DIMENSION OF 12 INCHES OR GREATER

NOTE: DRILL RIG USED - CME-55 NO. 1
HAMMER E=0.75

GEOTECHNICAL ENGINEER

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN MNH 12/07 CHECK SRJ 1/08
DRAWN JPN 2/08 CHECK SRJ 2/08
QUANT. - - CHECK - -

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191;
OVER COLORADO RIVER BRIDGE
SOIL DATA SHEET

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY

R-XXX DRG. NO.

SHT. 3 OF 14

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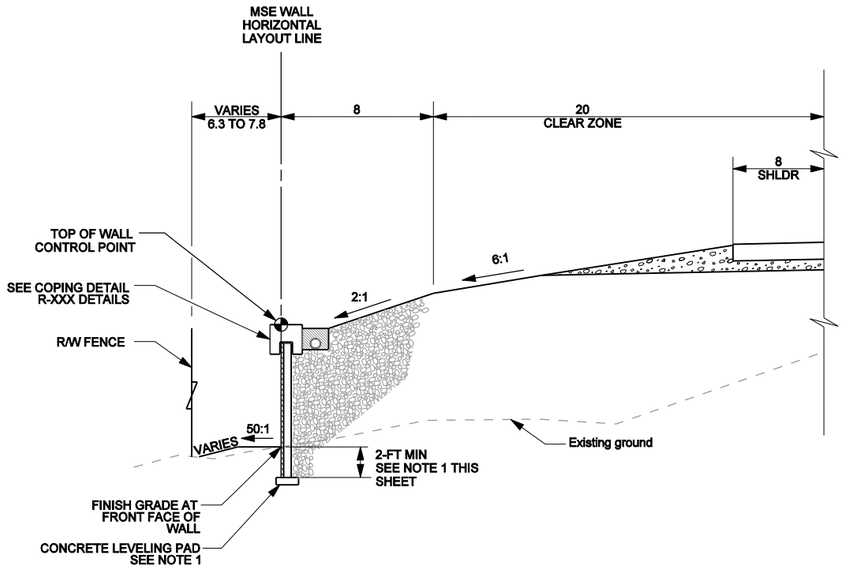
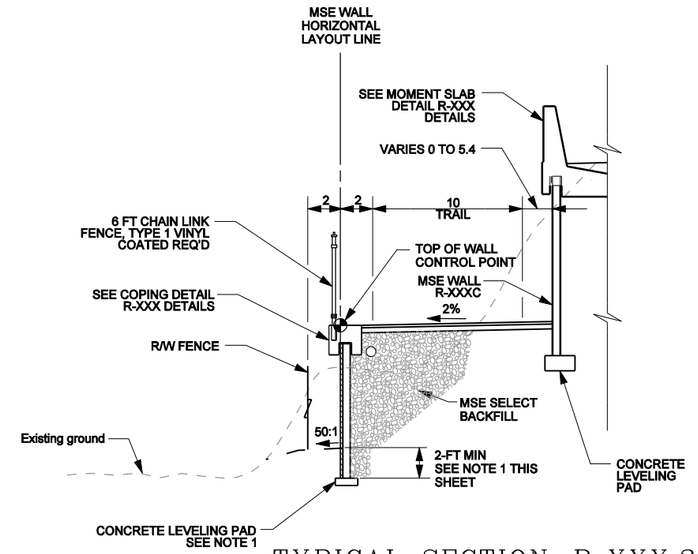
5/7/2008



TYPICAL SECTION R-XXX.1

NTS

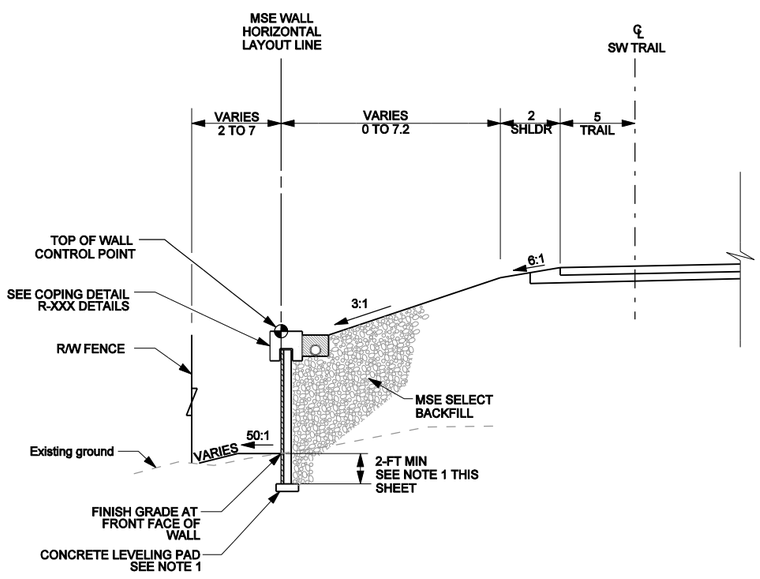
MSE WALL R-XXXA STA 10+98.50 TO STA 12+49.38
MSE WALL R-XXXB STA 14+99.64 TO STA 18+30.59



TYPICAL SECTION R-XXX.3

NTS

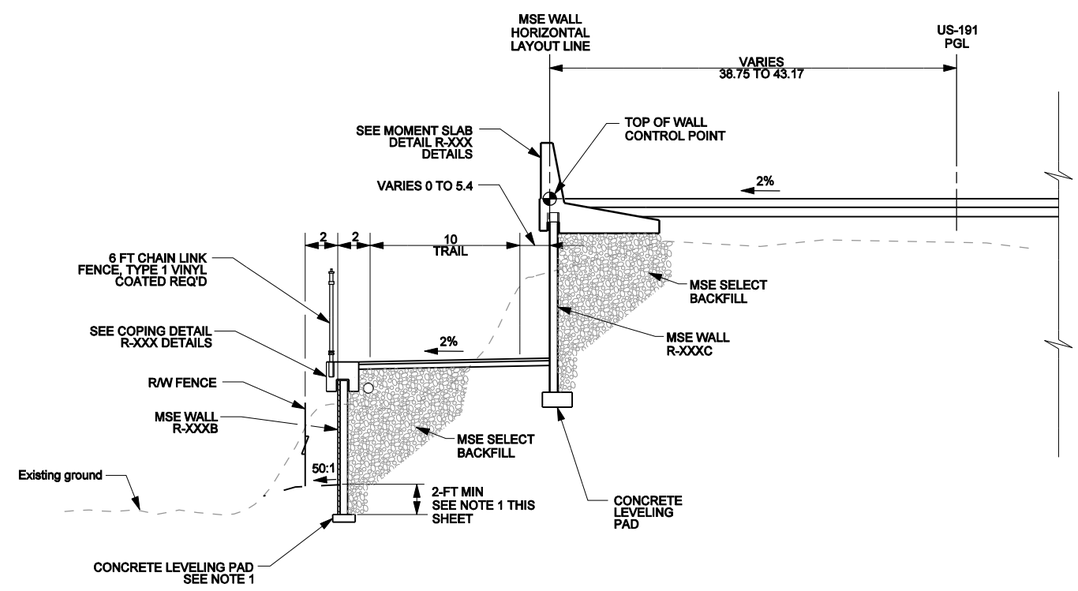
MSE WALL R-XXXB STA 18+75.78 TO STA 23+08.39



TYPICAL SECTION R-XXX.2

NTS

MSE WALL R-XXXB STA 18+30.95 TO STA 18+75.78
MSE WALL R-XXXB STA 23+08.39 TO STA 23+25.69



TYPICAL SECTION R-XXX.4

NTS

MSE WALL R-XXXC STA 0+00.00 TO STA 4+36.35

1. PROVIDE 2'-0 MIN. TOP OF LEVELING PAD EMBEDMENT DEPTH. LEVELING PAD EMBEDMENT DEPTH MAY INCREASE PER MANUFACTURES FABRICATION PLANS AND SPECIFICATIONS.
2. WALL HEIGHT MEASURED FROM WALL LAYOUT CONTROL POINT TO FINISHED GRADE AT FRONT FACE OF WALL.
3. FENCE POLE SLEEVE DIAMETER VARIES 3 1/2" TO 4". 3 1/2" SLEEVE EVERY 10-FEET. 4" SLEEVE EVERY 500-FEET OR ON FENCE CORNERS. SEE UDOT STD DWG FG 6.

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN — CHECK
DRAWN — CHECK
QUANT. — CHECK

APPROVAL RECOMM. — DATE — SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT — DATE — UDOT BRIDGE ENGR.

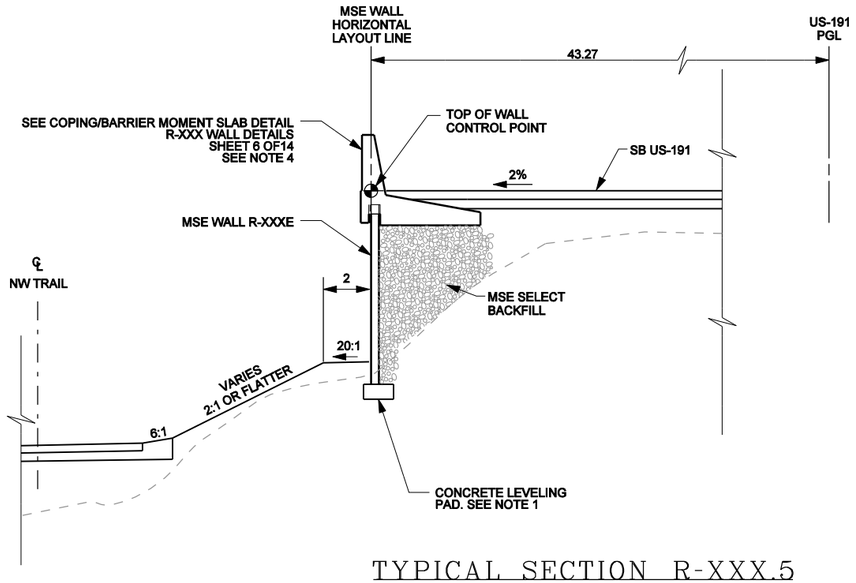
US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
MSE WALL R-xxx TYPICAL SECTIONS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

R-xxx
DRG. NO.

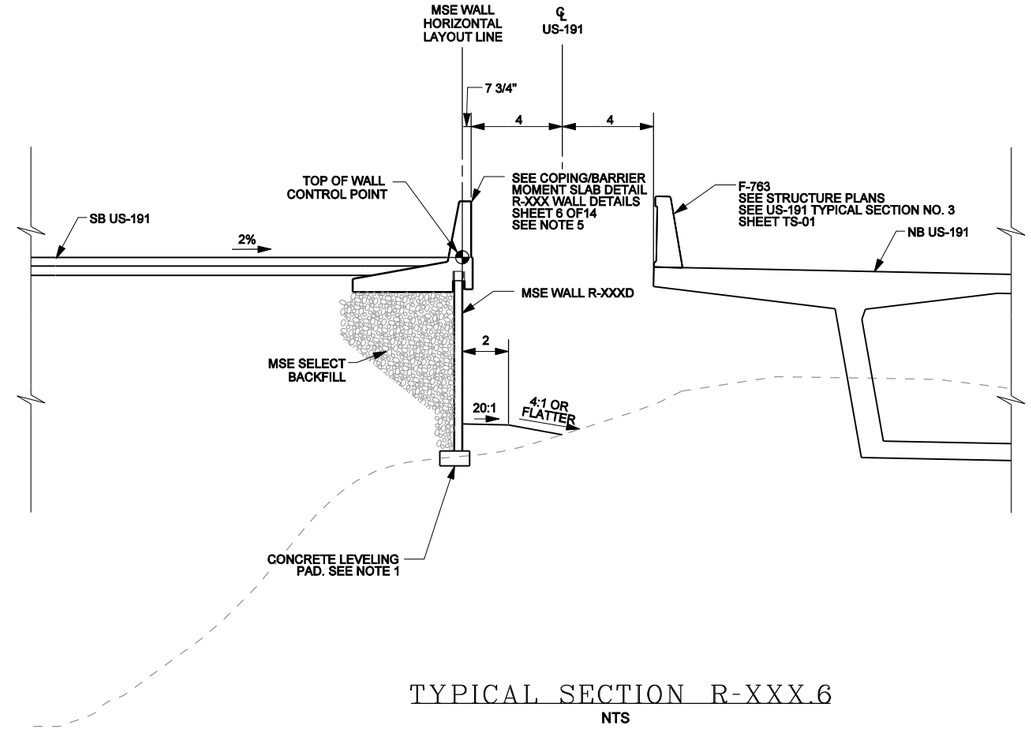
SHT. 4 OF 14



TYPICAL SECTION R-XXX.5

NTS

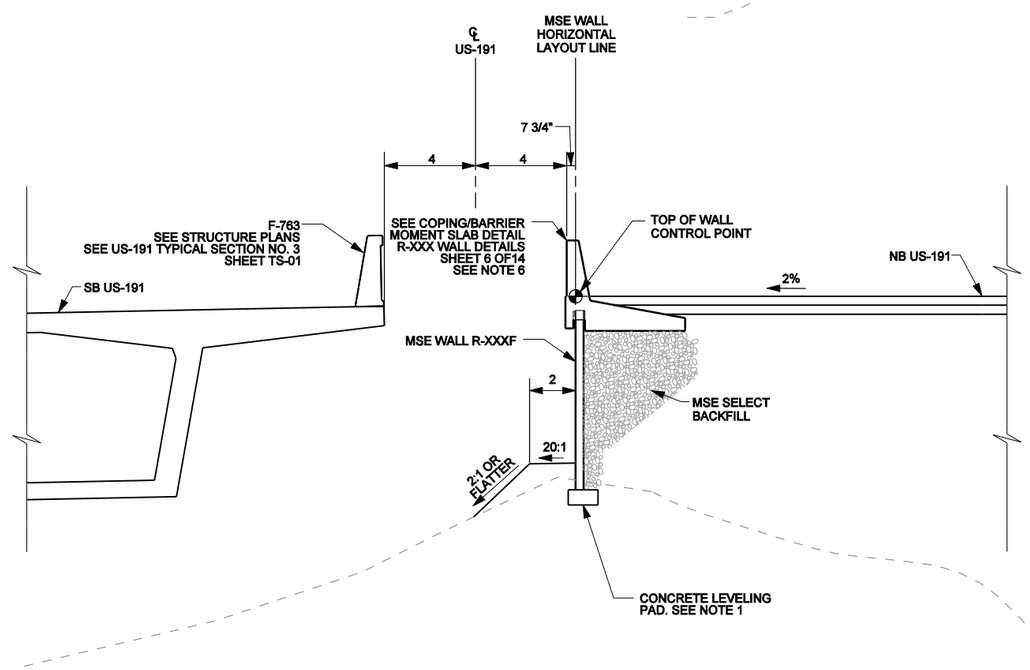
MSE WALL R-XXXE STA 0+00.00 TO STA 0+37.25



TYPICAL SECTION R-XXX.6

NTS

MSE WALL R-XXXD STA 0+00.00 TO STA 0+38.00



TYPICAL SECTION R-XXX.7

NTS

MSE WALL R-XXXF STA 0+00.00 TO STA 0+28.54

1. PROVIDE 2'-0 MIN. TOP OF LEVELING PAD EMBEDMENT DEPTH. LEVELING PAD EMBEDMENT DEPTH MAY INCREASE PER MANUFACTURES FABRICATION PLANS AND SPECIFICATIONS.
2. WALL HEIGHT MEASURED FROM WALL LAYOUT CONTROL POINT TO FINISHED GRADE AT FRONT FACE OF WALL.
3. FENCE POLE SLEEVE DIAMETER VARIES 3 1/2" TO 4". 3 1/2" SLEEVE EVERY 10-FEET. 4" SLEEVE EVERY 500-FEET OR ON FENCE CORNERS. SEE UDOT STD DWG FG 6.
4. FROM STA 225+52.24 TO STA 225+72.74 CONSTRUCT APPROACH SLAB PER BRIDGE DRAWINGS.
5. FROM STA 215+08.77 TO STA 215+36.77 CONSTRUCT APPROACH SLAB PER BRIDGE DRAWINGS.
6. FROM STA 225+14.24 TO STA 225+34.74 CONSTRUCT APPROACH SLAB PER BRIDGE DRAWINGS.

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN CHECK
DRAWN CHECK
QUANT. CHECK

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

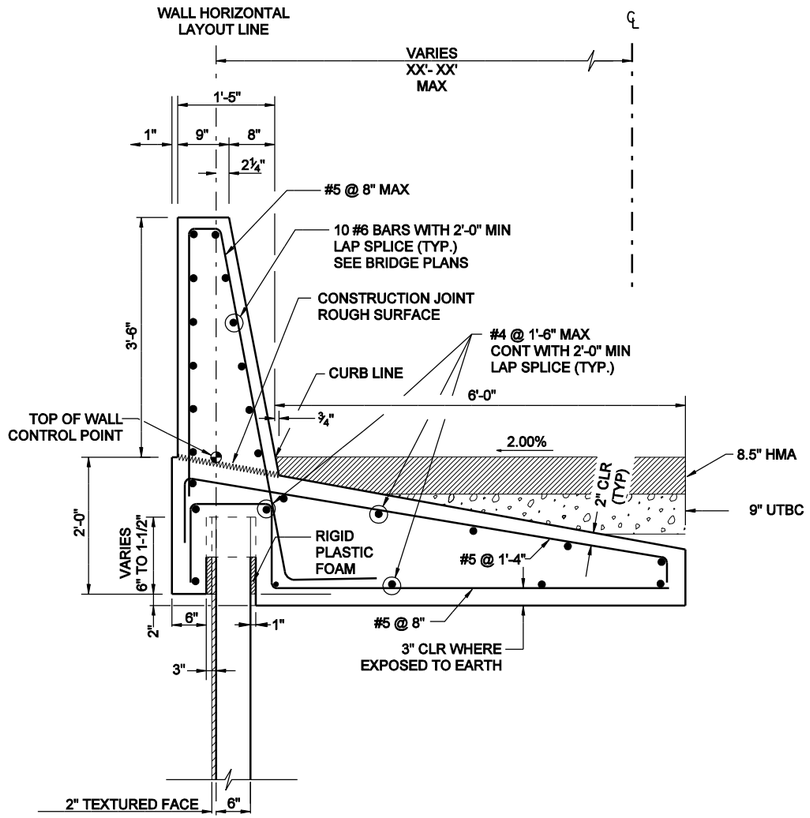
US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
MSE WALL R-xxx TYPICAL SECTIONS

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

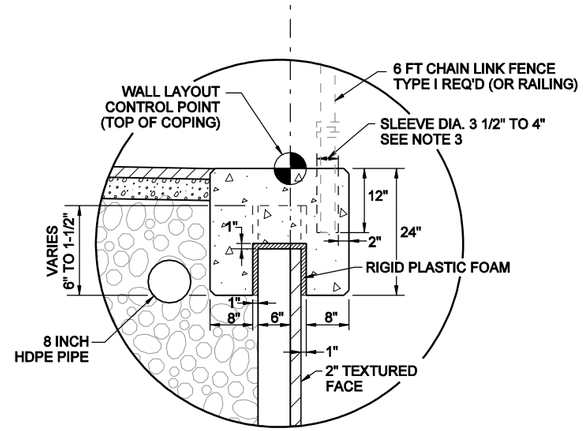
R-xxx
DRG. NO.

SHT. 5 OF 14

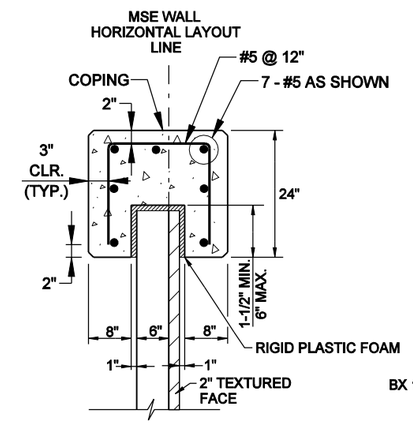


COPING/BARRIER MOMENT SLAB DETAIL

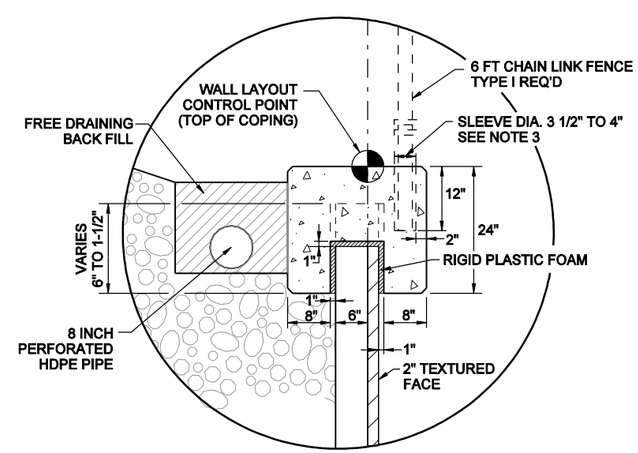
NTS
STA. xx+xx.xx TO STA. xx+xx.xx



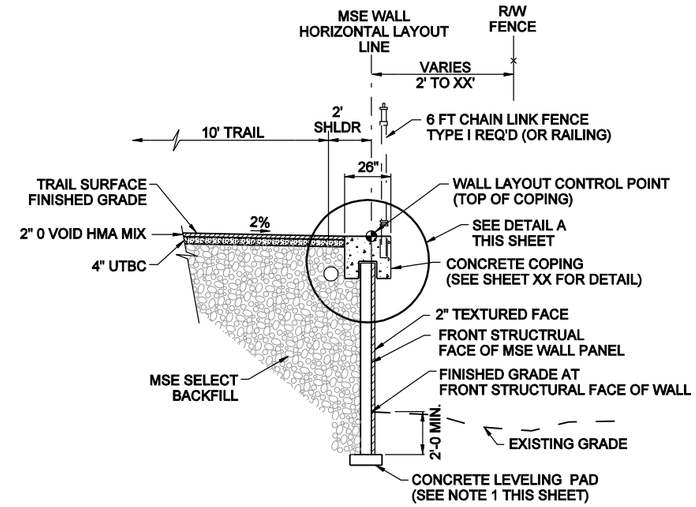
DETAIL A



DETAIL C

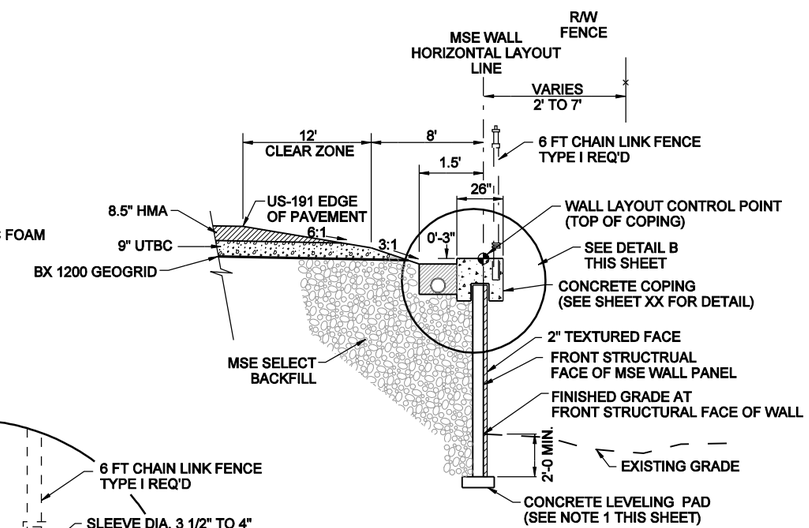


DETAIL B



MSE WALL COPING DETAIL

STA. xx+xx.xx TO STA. xx+xx.xx



MSE WALL COPING DETAIL

STA. xx+xx.xx TO STA. xx+xx.xx

1. PROVIDE 2'-0 MIN. TOP OF LEVELING PAD EMBEDMENT DEPTH. LEVELING PAD EMBEDMENT DEPTH MAY INCREASE PER MANUFACTURES FABRICATION PLANS AND SPECIFICATIONS.
2. WALL HEIGHT MEASURED FROM WALL LAYOUT CONTROL POINT TO FINISHED GRADE AT FRONT FACE OF WALL.
3. FENCE POLE SLEEVE DIAMETER VARIES 3 1/2" TO 4". 3 1/2" SLEEVE EVERY 10-FEET. 4" SLEEVE EVERY 500-FEET OR ON FENCE CORNERS. SEE UDOT STD DWG FG 6.

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN — CHECK XXX
DRAWN — CHECK
QUANT. — CHECK XXX

APPROVAL RECOMM. — SENIOR DESIGN ENGR. — DATE
APPROVED FOR USE BY UDOT — UDOT BRIDGE ENGR. — DATE

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
R-xxx WALL DETAILS

PROJECT NUMBER BRF-0191(58)129

GRAND COUNTY
R-xxx DRG. NO.
SHT. 6 OF 14

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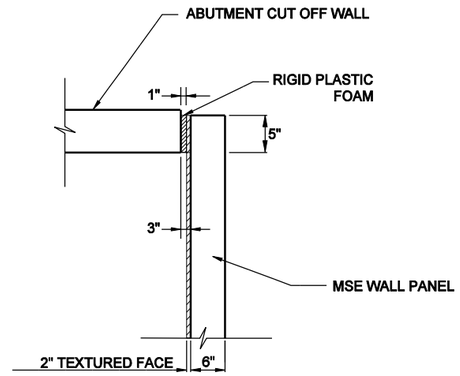
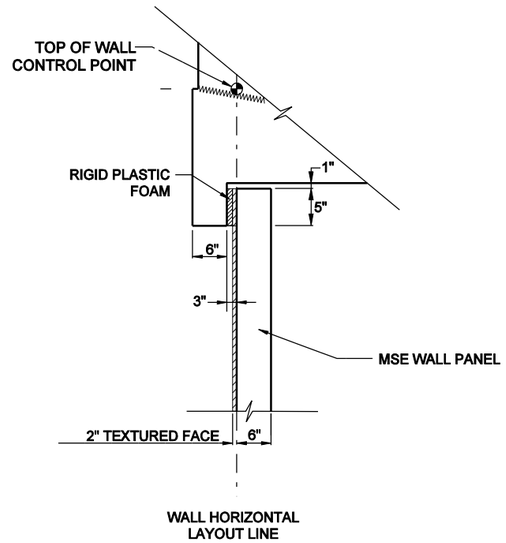
5/6/2008



ABUTMENT CUT OFF WALL TIE-IN DETAIL

NTS



BRIDGE ABUTMENT TIE-IN DETAIL

NTS

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN ____ CHECK XXX
DRAWN ____ CHECK ____
QUANT. ____ CHECK XXX

APPROVAL RECOMM. ____ DATE ____ SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT ____ DATE ____ UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
R-xxx WALL DETAILS

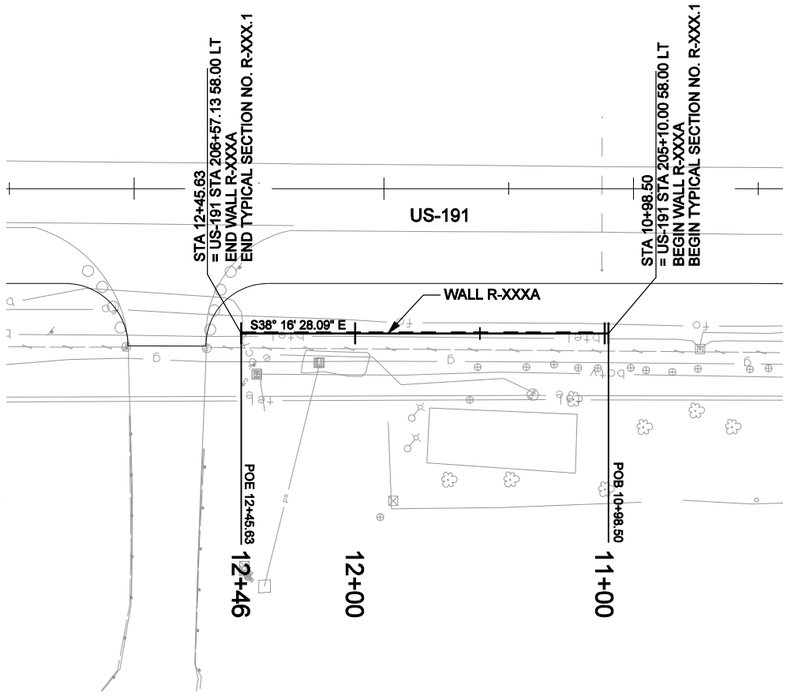
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

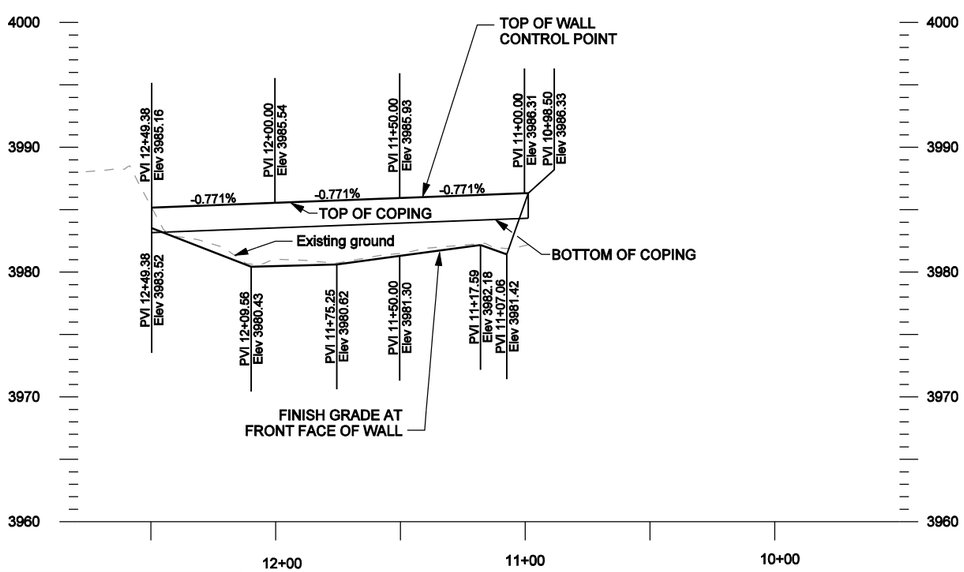
R-xxx
DRG. NO.

SHT. 7 OF 14

5/6/2008 \\fsslc03\2507-slc-colorado_bridge\5365_07\sheet_files\Structures\5365_07_R-xxx_DETAILS_02.dgn

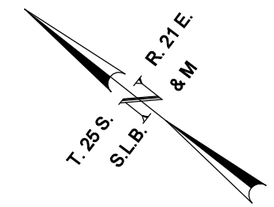


R-XXXA PLAN



R-XXXA PROFILE

PRELIMINARY
NOT FOR CONSTRUCTION



QUANTITIES

ITEM	QTY.	UNIT
RETAINING WALL (R-XXXA) (EST. QTY. 654 SQ. FT.)	1	LUMP

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN ____ CHECK ____
DRAWN ____ CHECK ____
QUANT. ____ CHECK ____

APPROVAL RECOMM. ____ DATE ____ SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT ____ DATE ____ UDOT BRIDGE ENGR.

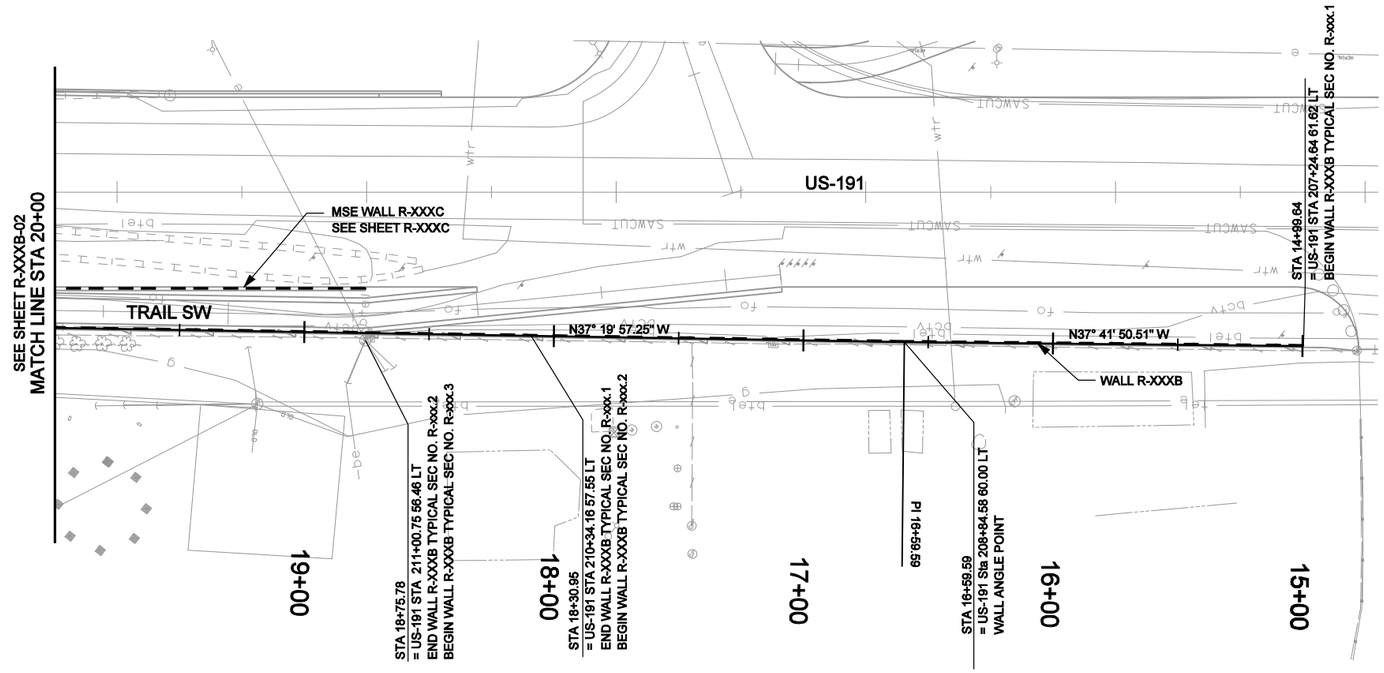
US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
WALL R-XXXA SITUATION & LAYOUT

PROJECT NUMBER BRF-0191(58)129

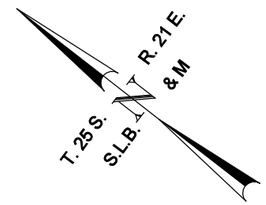
GRAND
COUNTY

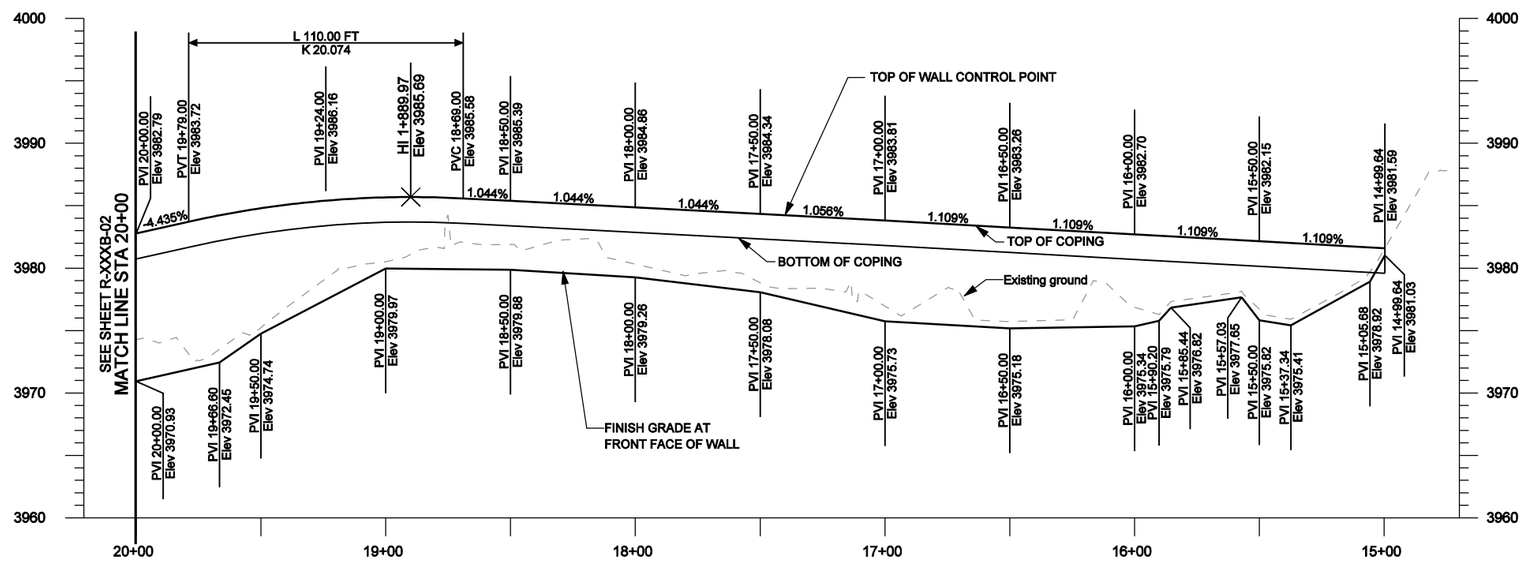
R-xxx
DRG. NO.

SHT. 8 OF 14



R-XXXB PLAN





R-XXXB PROFILE

PRELIMINARY
NOT FOR CONSTRUCTION

QUANTITIES

ITEM	QTY.	UNIT
RETAINING WALL REQ'D (R-XXXB) (EST. QTY. 4349 SQ. FT.)	1	LUMP

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN: XXX MM/YY CHECK: XXX MM/YY
DRAWN: XXX MM/YY CHECK: XXX MM/YY
QUANT.: XXX MM/YY CHECK: XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
WALL R-XXXB SITUATION & LAYOUT

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

R-xxx
DRG. NO.

SHT. 9 OF 14

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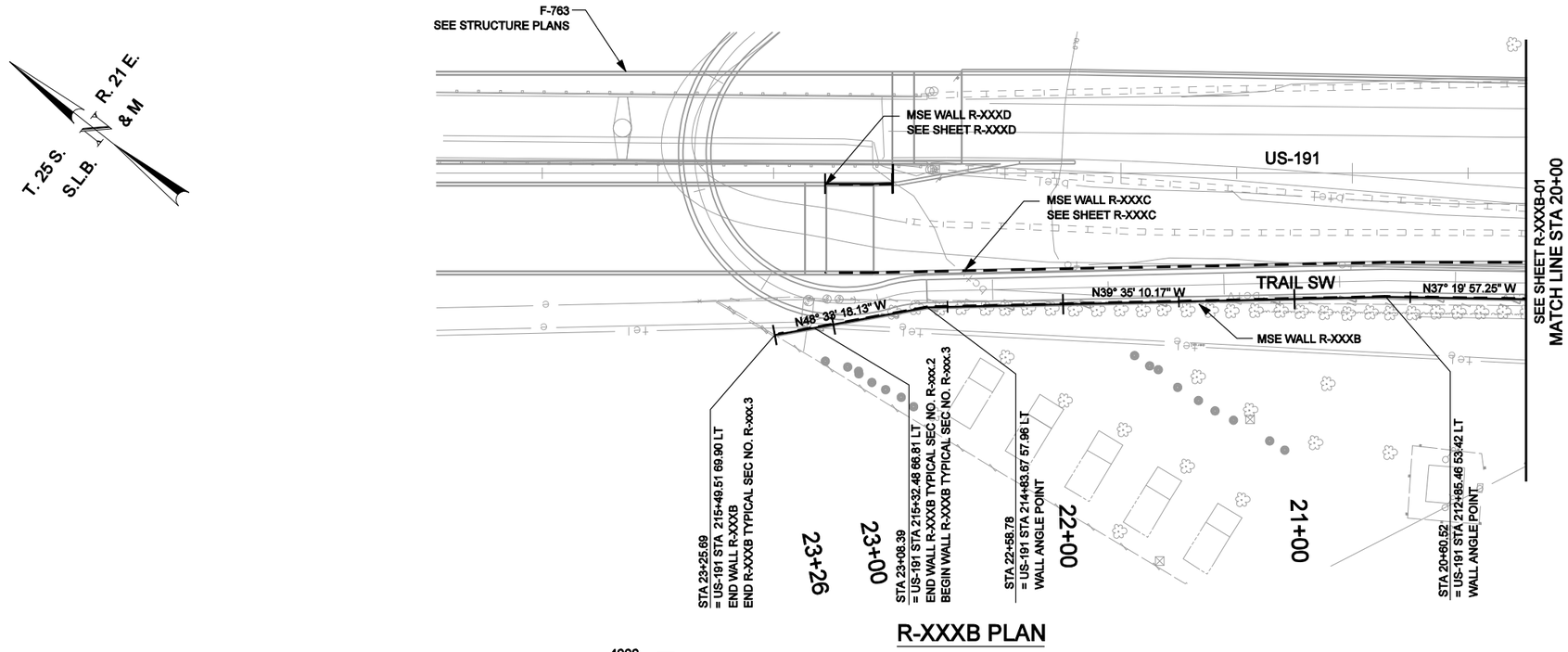
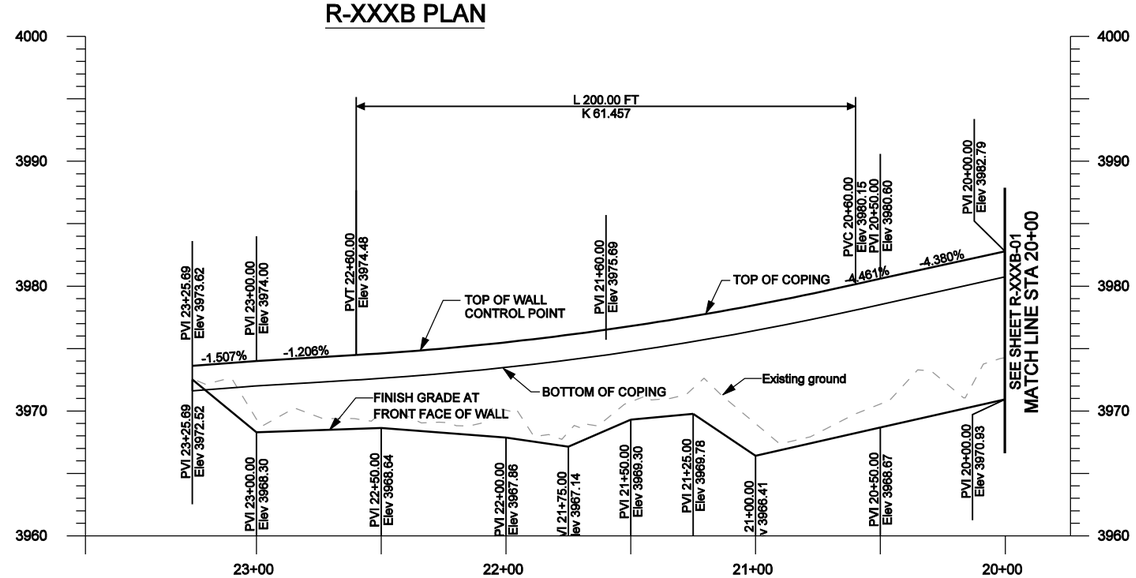
5/6/2008



R-XXXB PLAN



R-XXXB PROFILE

PRELIMINARY
NOT FOR CONSTRUCTION

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN XXX	MM/YY	CHECK XXX	MM/YY
DRAWN XXX	MM/YY	CHECK XXX	MM/YY
QUANT. XXX	MM/YY	CHECK XXX	MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
WALL R-XXXB SITUATION & LAYOUT

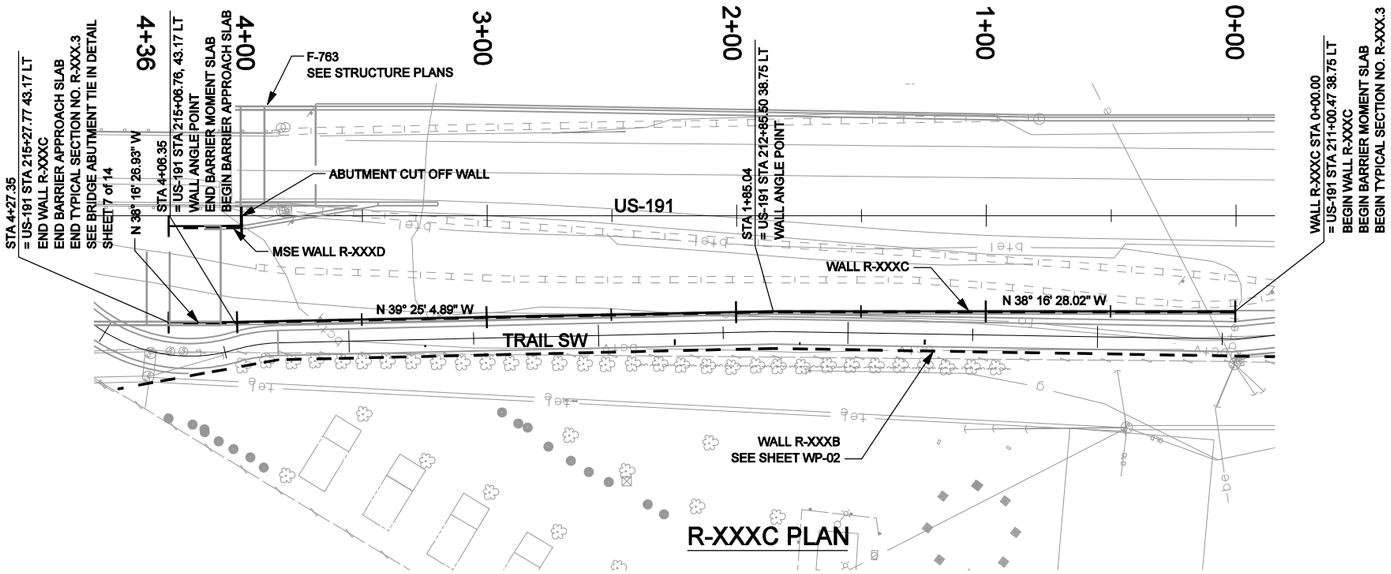
PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

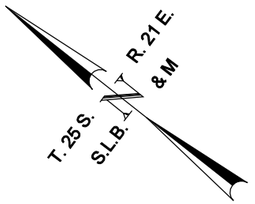
R-xxx
DRG. NO.

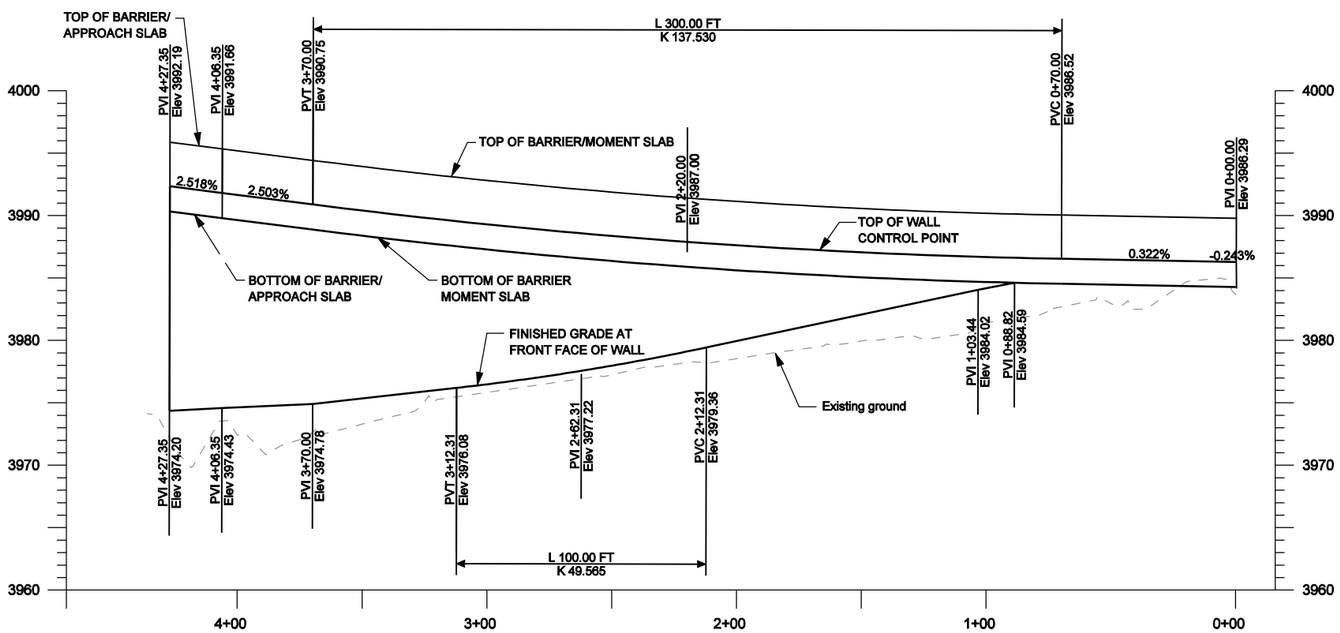
SHT. 10 OF 14

5/6/2008 \\fsslc03\2507-slc-colorado.bridge\5365_07\sheet_files\Structures\5365_07_R-xxxB-02.dgn



R-XXXC PLAN





R-XXXC PROFILE

PRELIMINARY
NOT FOR CONSTRUCTION

QUANTITIES

ITEM	QTY.	UNIT
RETAINING WALL REQ'D (R-XXXC) (EST. QTY. 3771 SQ. FT.)	1	LUMP

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN XXX MM/YY CHECK XXX MM/YY
DRAWN XXX MM/YY CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
WALL R-XXXC SITUATION & LAYOUT

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY
R-XXX
DRG. NO.

SHT. 11 OF 14

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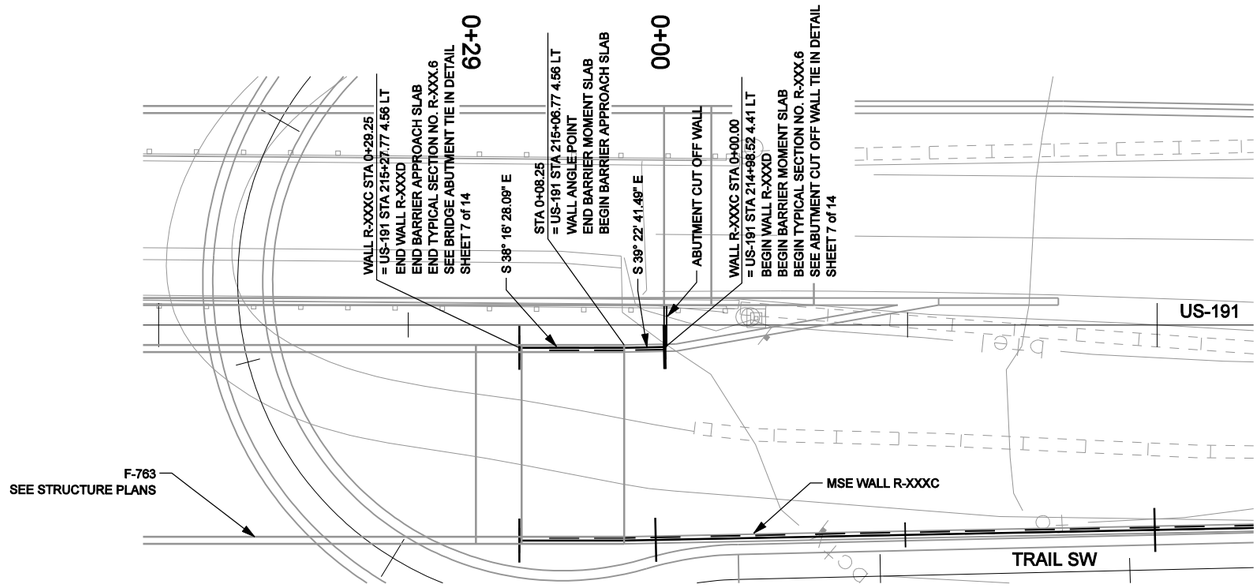
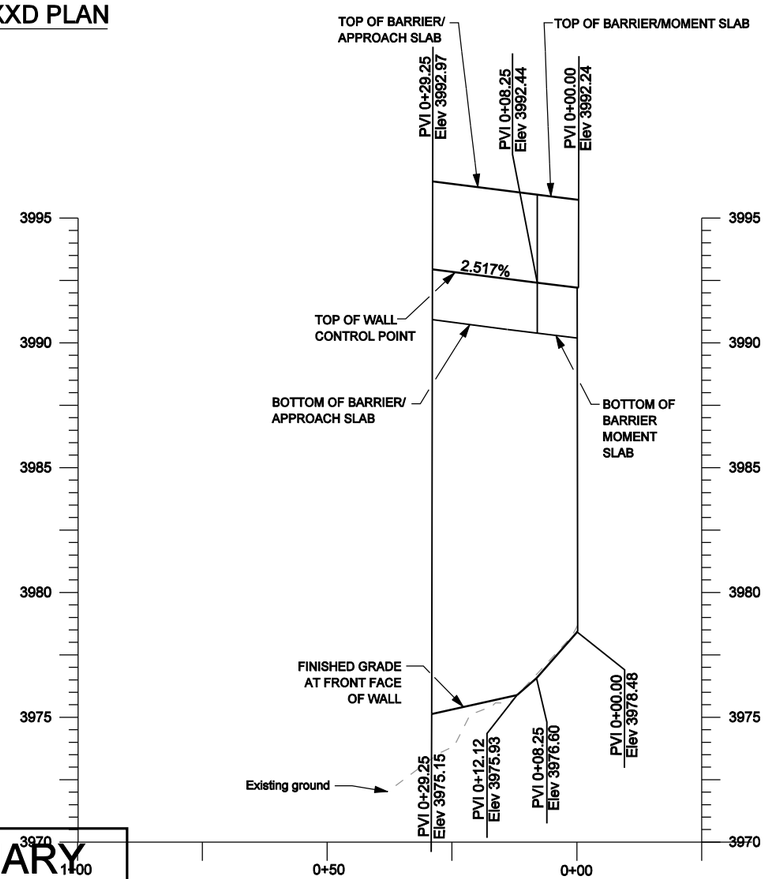
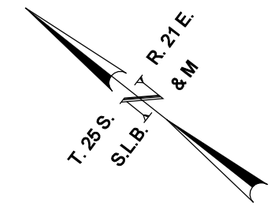
5/6/2008



R-XXXD PLAN



R-XXXD PROFILE



PRELIMINARY
NOT FOR CONSTRUCTION

QUANTITIES

ITEM	QTY.	UNIT
RETAINING WALL REQ'D (R-XXXD) (EST. QTY. 643 SQ. FT.)	1	LUMP

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN XXX MM/YY CHECK XXX MM/YY
DRAWN XXX MM/YY CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
WALL R-XXXD SITUATION & LAYOUT

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

R-XXX
DRG. NO.

SHT. 12 OF 14

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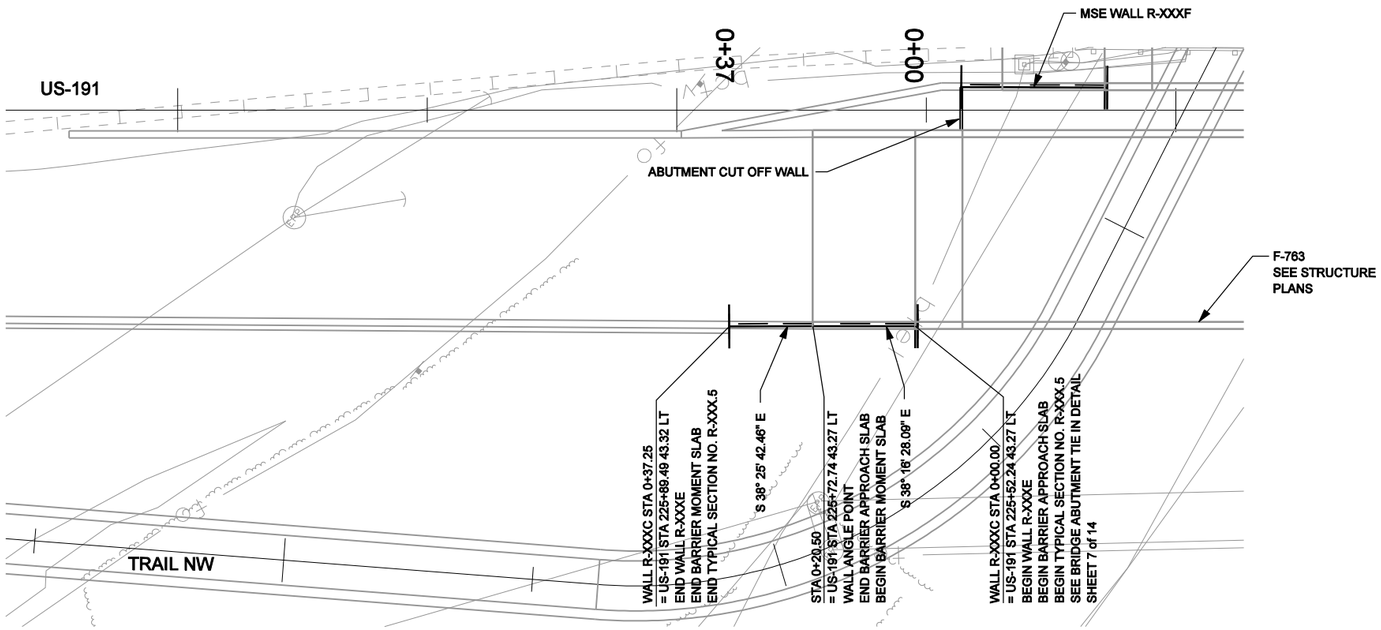
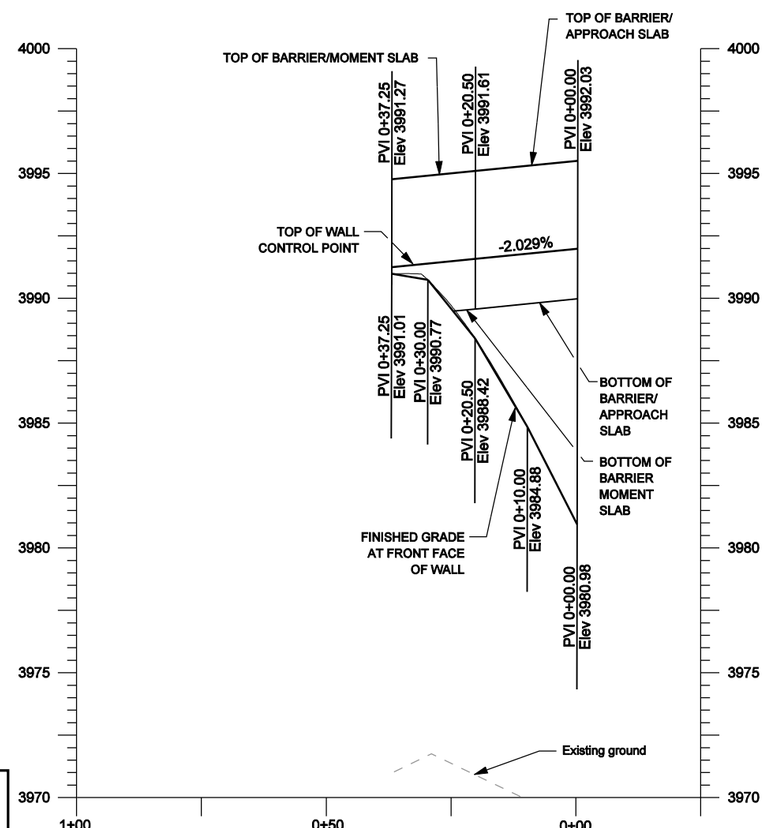
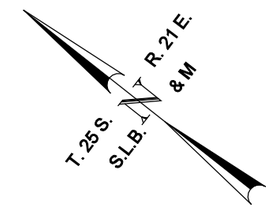
5/6/2008



R-XXXE PLAN



R-XXXE PROFILE



PRELIMINARY
NOT FOR CONSTRUCTION

QUANTITIES

ITEM	QTY.	UNIT
RETAINING WALL REQ'D (R-XXXE) (EST. QTY. 165 SQ. FT.)	1	LUMP

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGN XXX MM/YY CHECK XXX MM/YY
DRAWN XXX MM/YY CHECK XXX MM/YY
QUANT. XXX MM/YY CHECK XXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
WALL R-XXXE SITUATION & LAYOUT

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

R-XXX
DRG. NO.

SHT. 13 OF 14

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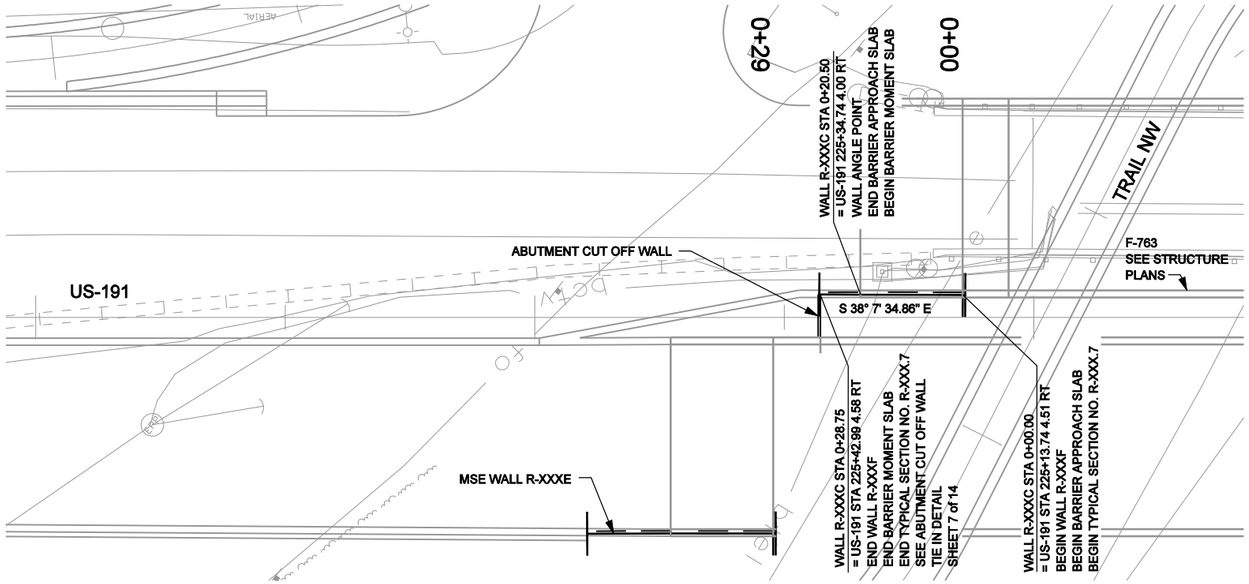
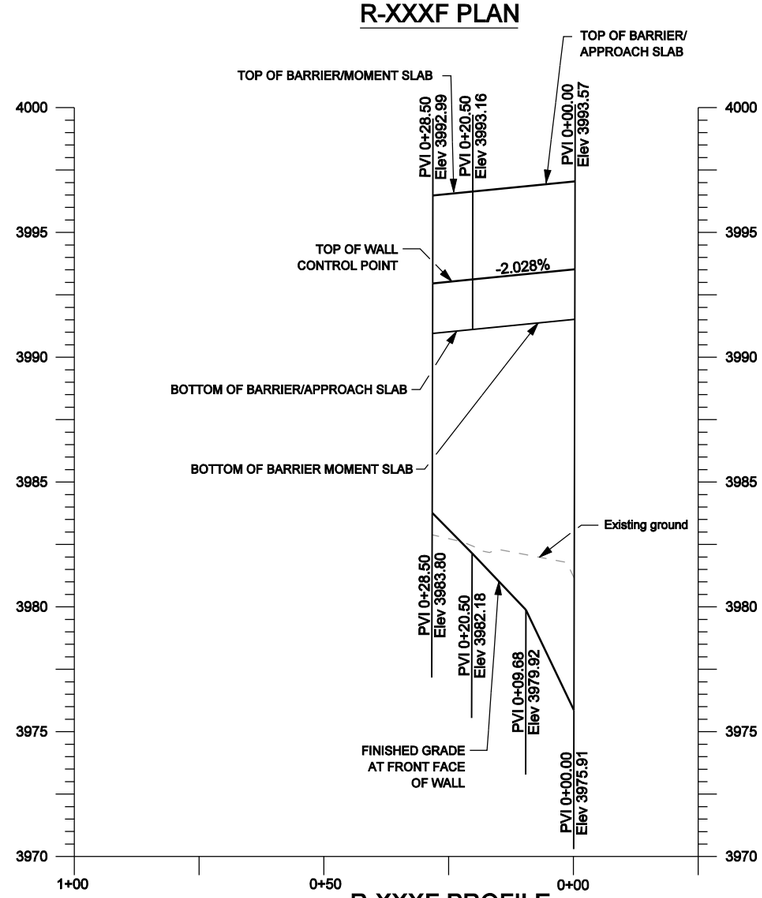
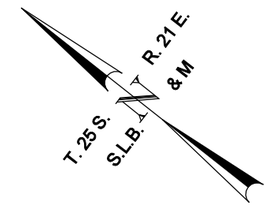
5/6/2008



R-XXXF PLAN



R-XXXF PROFILE



PRELIMINARY
NOT FOR CONSTRUCTION

QUANTITIES

ITEM	QTY.	UNIT
RETAINING WALL REQ'D (R-XXXF) (EST. QTY. 364 SQ. FT.)	1	LUMP

NO.	DATE	BY	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

DESIGNXXX MM/YY CHECKXXX MM/YY
DRAWNXXX MM/YY CHECKXXX MM/YY
QUANT.XXX MM/YY CHECKXXX MM/YY

APPROVAL RECOMM. DATE SENIOR DESIGN ENGR.
APPROVED FOR USE BY UDOT DATE UDOT BRIDGE ENGR.

US-191; OVER COLORADO
RIVER BRIDGE - MOAB UTAH
WALL R-XXXF SITUATION & LAYOUT

PROJECT NUMBER BRF-0191(58)129

GRAND
COUNTY

R-XXX
DRG. NO.

SHT. 14 OF 14

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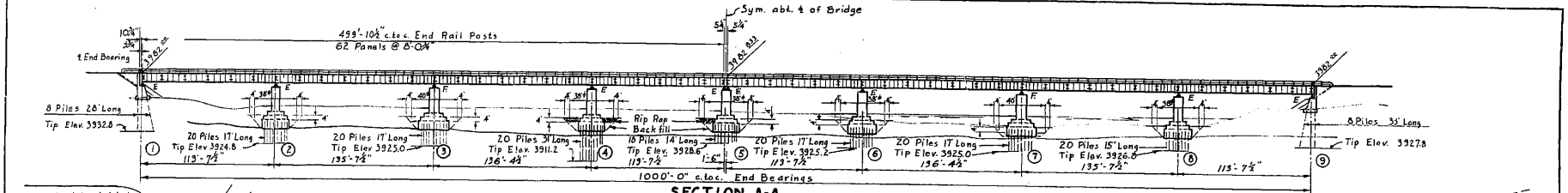
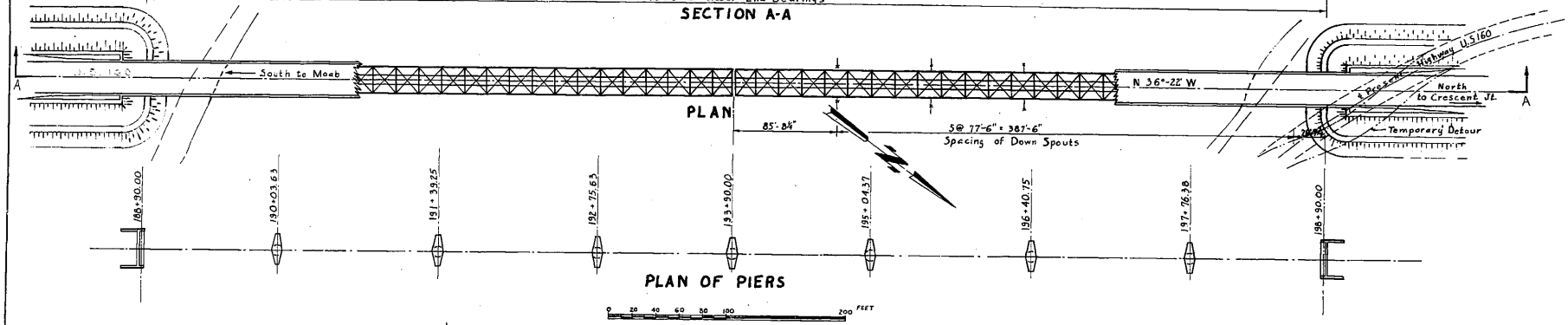
5/6/2008

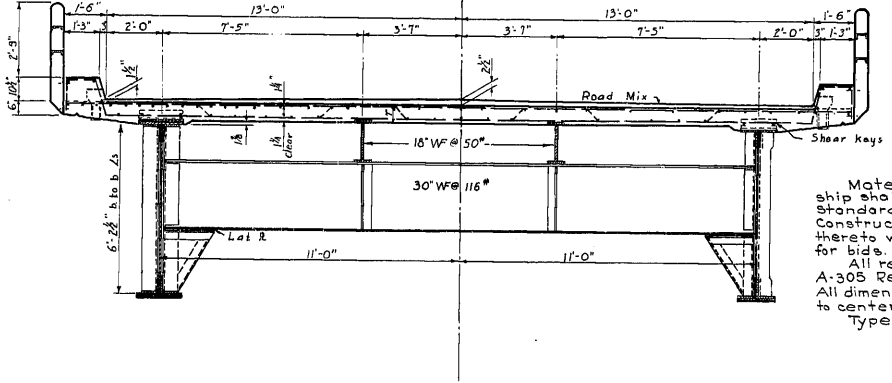


SECTION A-A



PLAN

PLAN OF PIERS



HALF SECTION AT SUPPORT

HALF SECTION AT ℄ OF SPAN

Scale: 0 5 10 FEET

Girder Sections
Web 74" × ⅜"
4 Ls 5" × 8" × ¾"
At Support
6 Covers 20" × ⅝" - 3 Top 3 Bottom 15'-10", 30'-2½", 41'-10"
At ℄ of Span
2 Covers 16" × 9/16" - Bottom only End Spans 41'-5" & 58'-7"
1 Cover 18" 9/16 - Bottom only 44-9½ Int Spans 43'-4½"

DESIGN DATA

H20-S16-44 Loading in accordance with the A.A.S.H.O. Standard Specifications of 1953 for Highway Bridges.

GENERAL NOTES

Materials, construction and workmanship shall be in accordance with the State Standard Specifications for Road and Bridge Construction, 1952 edition and supplements thereto which are in effect at date of request for bids.

All reinforcing steel shall be Standard A-305 Reinforcing Bars, Intermediate Grade. All dimensions relating to reinforcing steel are to centers of bars.

Type II cement required.

QUANTITIES

	As Const.	
Excavation for Structures Unclassified	1,480 ~~1,656~~	Cu. Yds.
Cofferdams	1	Each
Concrete - Class "A"	2,560	Cu. Yds.
Reinforcing Steel	241,000	Lbs.
Structural Steel	1,118,822 ~~1,100,000~~	Lbs.
Painting	1	Each
Steel Handrail	2,074	Lin. Ft.
Piles (other than timber)	3,017 ~~3,020~~	Lin. Ft.
Furnishing Pile Driving Equipment	1	Each
Loose Rip Rap	Piers 1114.1, Abut. 1131.3 ~~800~~	Cu. Yds.

GENERAL PLAN

SHEET 1 OF 11 SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. to O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

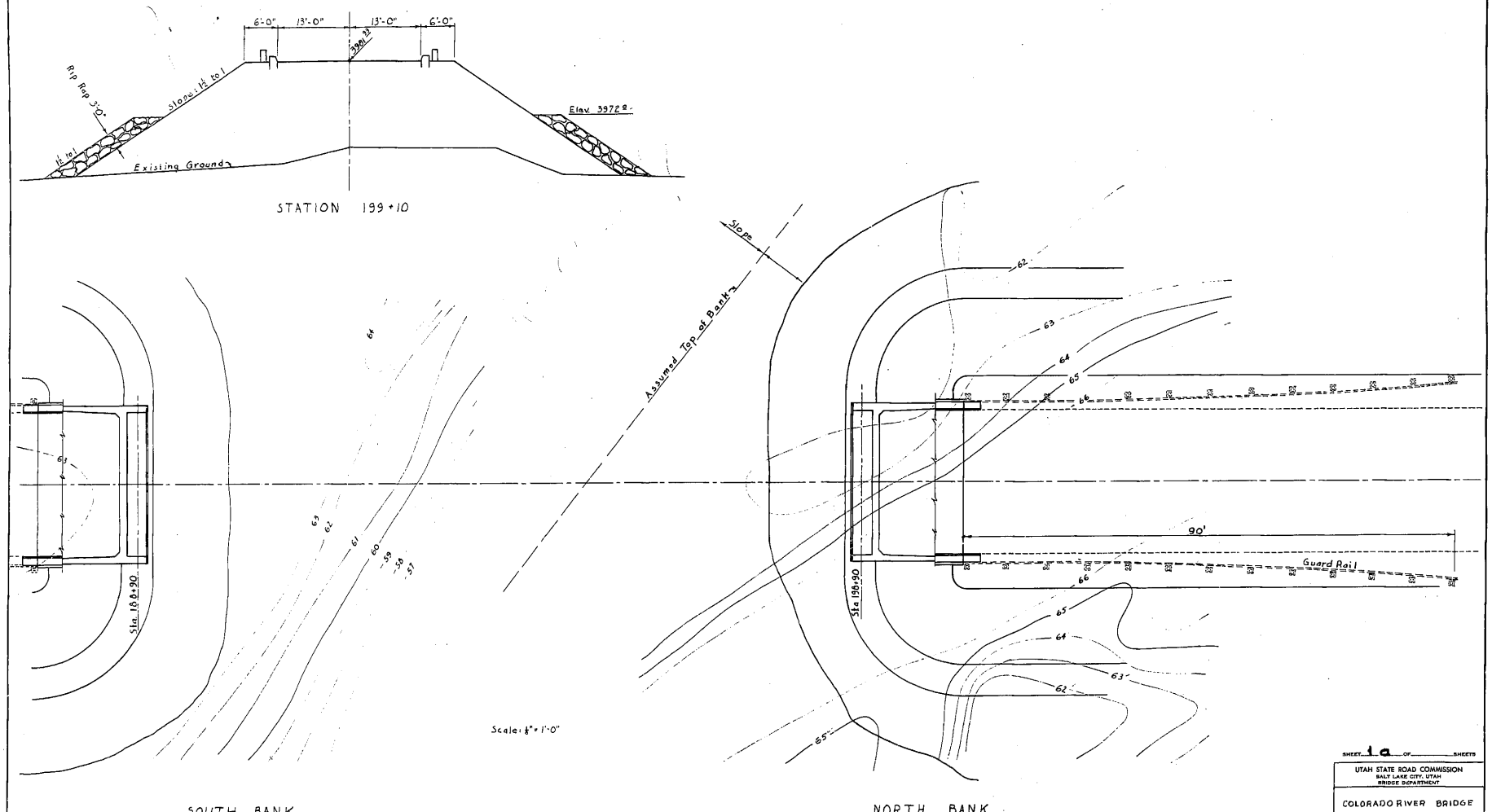
DESIGNED BY R.S. SCALE As shown
DRAWN BY C.R.D.
TRACED BY V.E.E.
CHECKED BY G.B.W.
SCALE
APPROVED
CHIEF BRIDGE ENGINEER

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

Br. No. 10-77-1-13 Dwg. No. C-285

REVISIONS

C-285 SHT. 1 of 11



REVISIONS

SHEET 1a OF SHEETS

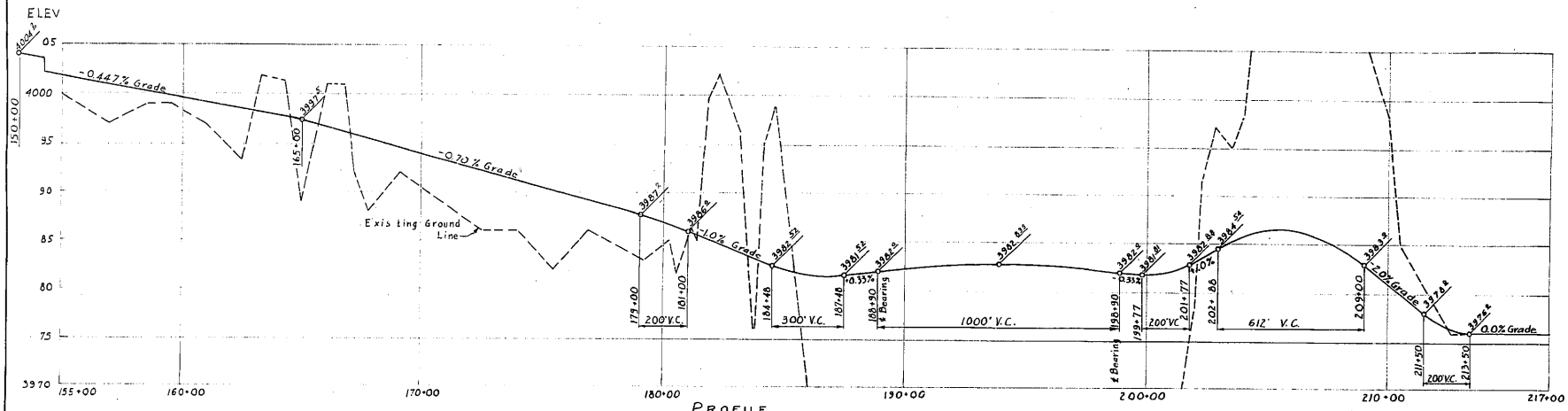
UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO RIVER BRIDGE

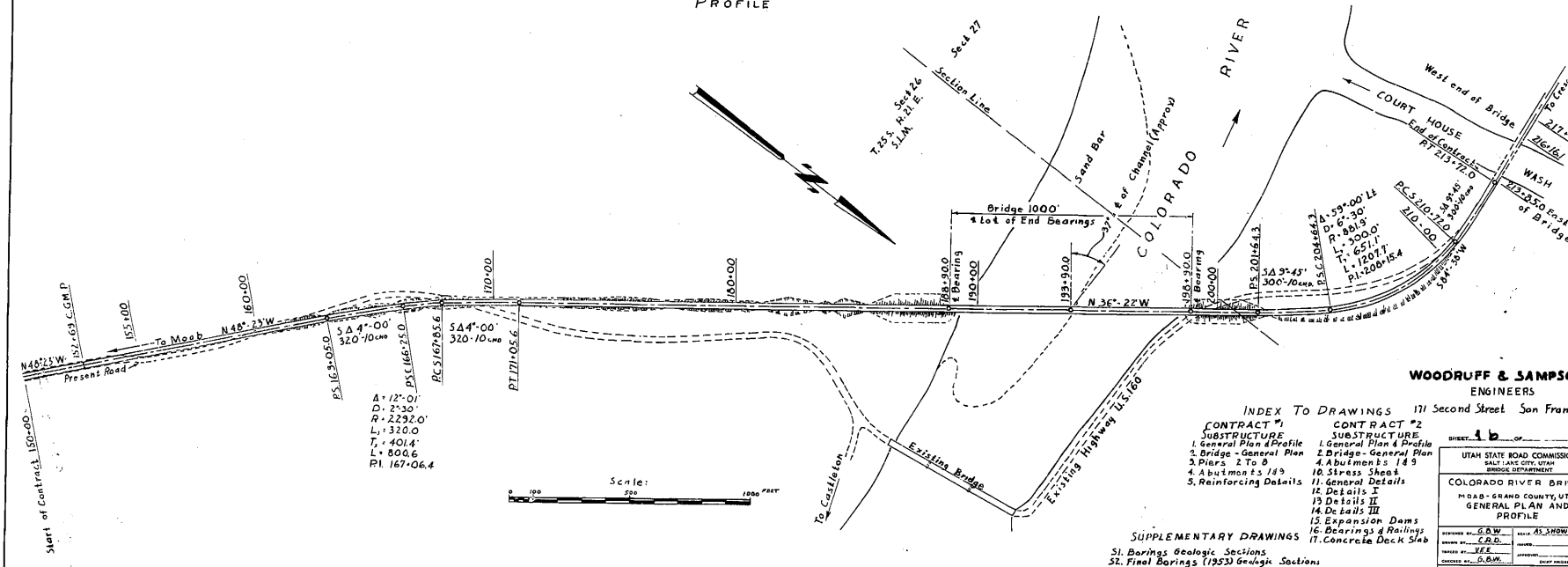
MOAB - GRAND COUNTY, UTAH

DESIGNED BY R.S. | SCALE As Shown
DRAWN BY C.R.D. | ISSUED
TRACED BY V.E.E. | APPROVED
CHECKED BY | CHIEF BRIDGE ENGINEER
BR. NO. | DWG. NO. C-285

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco



PROFILE



WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

INDEX TO DRAWINGS

CONTRACT #1
SUBSTRUCTURE
1. General Plan & Profile
2. Bridge - General Plan
3. Piers 2 To 8
4. Abutments 1 & 9
5. Reinforcing Details

CONTRACT #2
SUBSTRUCTURE
1. General Plan & Profile
2. Bridge - General Plan
4. Abutments 1 & 9
10. Stress Sheet
11. General Details
12. Details I
13. Details II
14. Details III
15. Expansion Dams
16. Bearings & Railings
17. Concrete Deck Slab

SUPPLEMENTARY DRAWINGS
51. Borings Geologic Sections
52. Final Borings (1953) Geologic Sections
53. Hydrographs

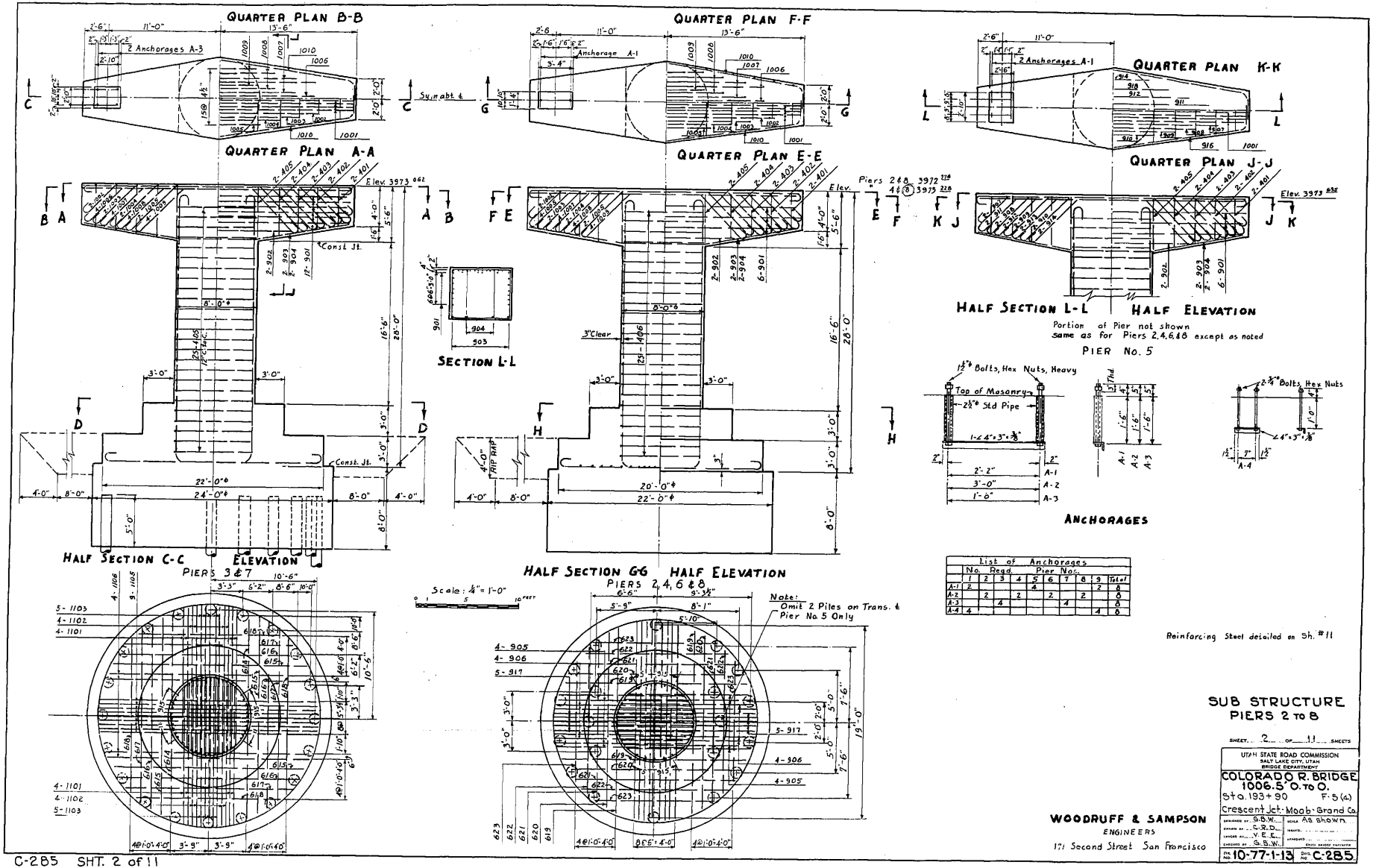
SHEET 1 b OF ____ SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

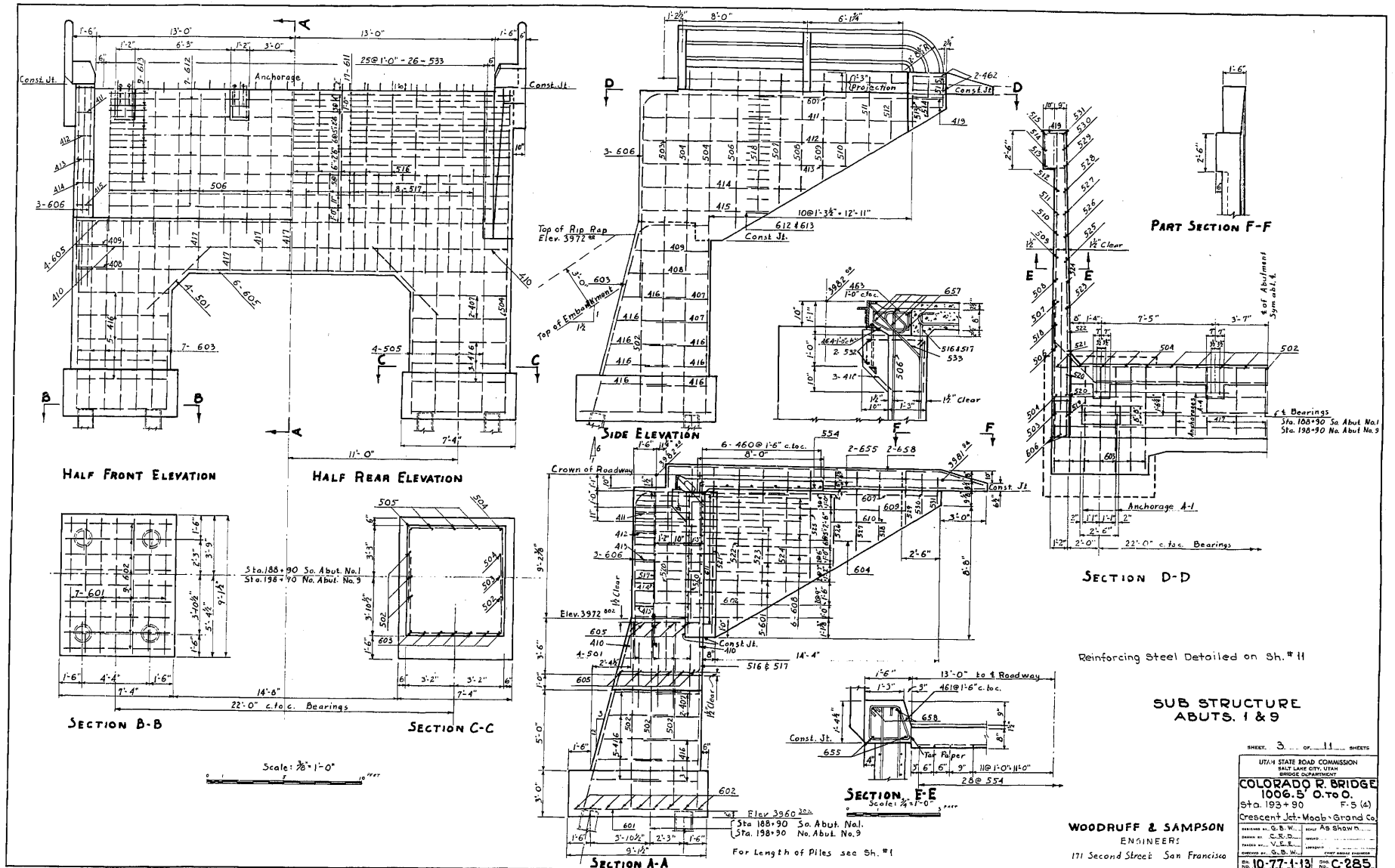
COLORADO RIVER BRIDGE
MOAB - GRAND COUNTY, UTAH
GENERAL PLAN AND PROFILE

DESIGNED BY G.B.W.	SCALE AS SHOWN
DRAWN BY C.R.D.	DRAWN
TRACED BY V.E.E.	APPROVED
CHECKED BY G.B.W.	CHIEF BRIDGE ENGINEER
BR. No.	DWG. No. C 285

REVISIONS



List of Anchorages										
	No. Reqd.				Pier Nos.					
	1	2	3	4	5	6	7	8	9	Total
A-1	2				4				2	8
A-2		2		2		2		2		8
A-3			4				4			8
A-4	4								4	8



SUB STRUCTURE
ABUTS. 1 & 9

SHEET 3 OF 11 SHEETS

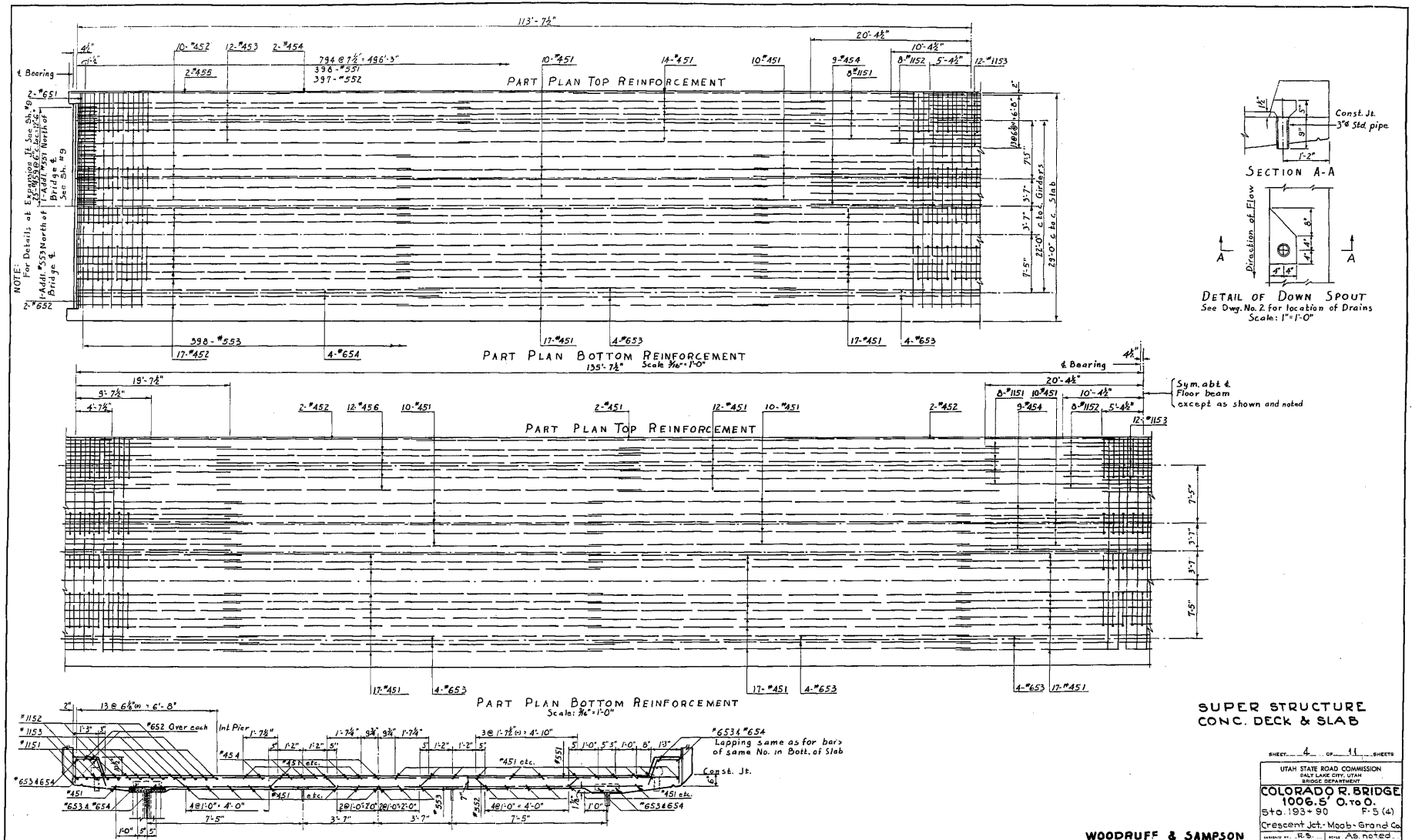
UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. TO O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

DESIGNED BY G. B. W. SCALE AS SHOWN
DRAWN BY G. B. D.
TRACED BY V. E. E.
CHECKED BY G. B. W.
CHIEF BRIDGE ENGINEER

DR. NO. 10-77-1-13 DRG. NO. C-285

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco



SUPER STRUCTURE
CONC. DECK & SLAB

SHEET 4 OF 11 SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. TO O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

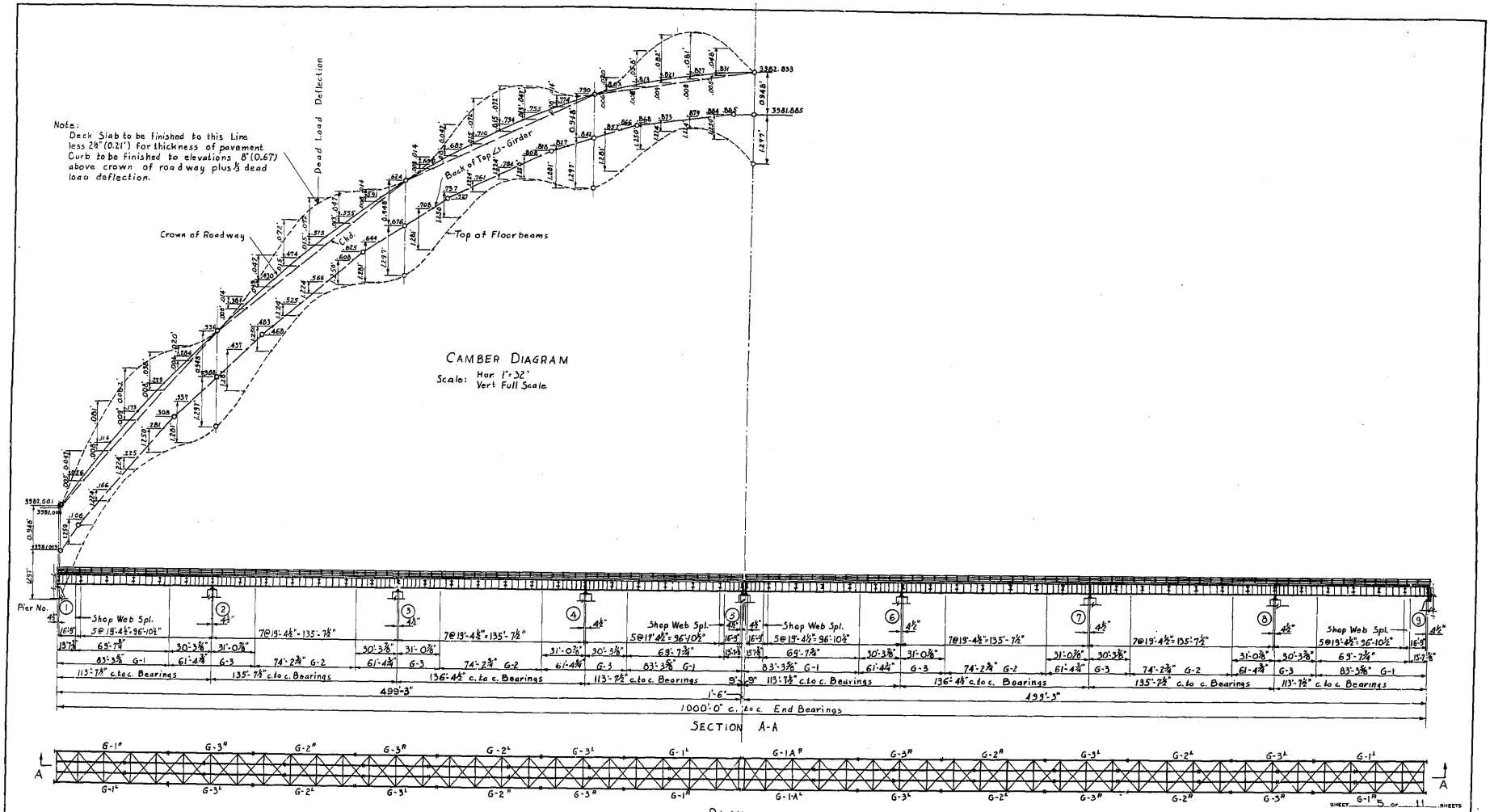
DESIGNED BY R.S. SCALE As noted
DRAWN BY C.R.D. ISSUED
CHECKED BY V.E.E. APPROVED
CHECKED BY G.B.W. CHIEF BRIDGE ENGINEER

DR. NO. 10-77-1-13 DWG. NO. C-285

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

REVISIONS

C-285 SHT. 4 of 11



SUPER STRUCTURE GENERAL DETAIL

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

SHEET 5 OF 11 SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. to O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

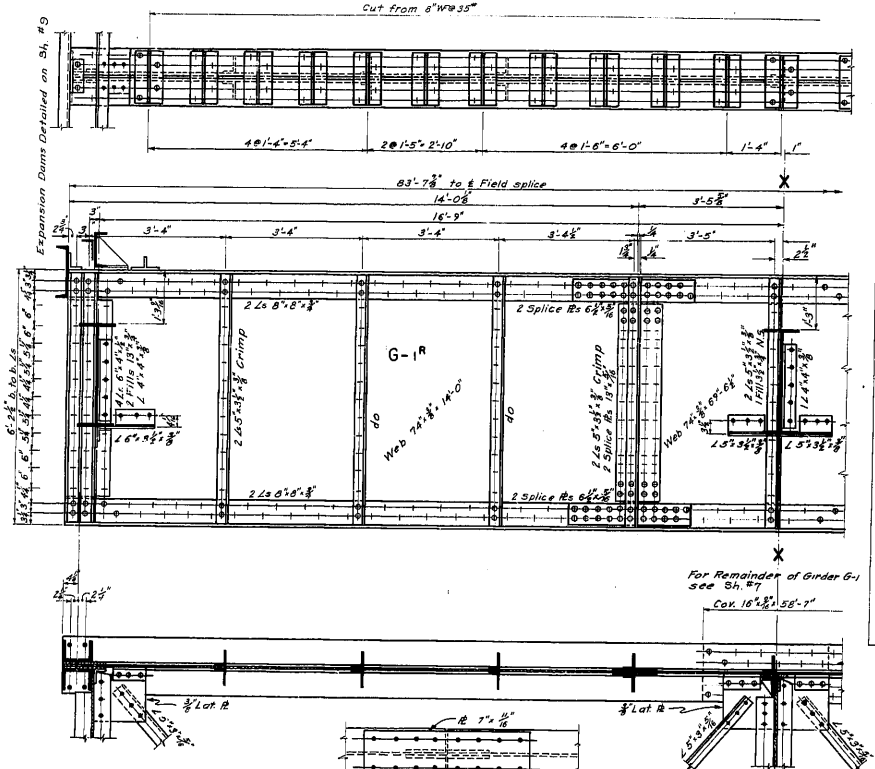
DESIGNED BY R.D. SCALE As noted
DRAWN BY C.R.D. ISSUED
TRACED BY V.E.E. APPROVED
CHECKED BY G.B.W. CHIEF ENGINEER

Br. No. 10-77-1-13 Dwg. No. C-285

REVISIONS

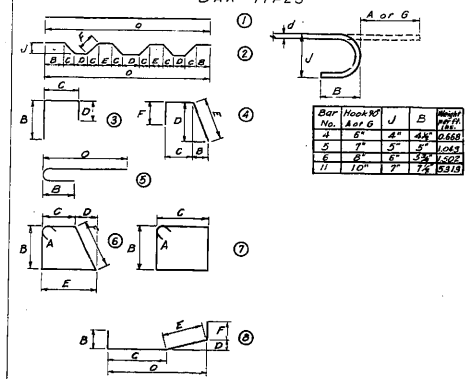
C-285 SHT. 5 of 11

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
12	UTAH				



STRINGER SPLICE
Scale: 1/2"=1'-0"

BAR TYPES



Bar No.	Hook 90° A or G	J	B	Weight per Bar lbs.
4	6"	4"	4 1/2"	0.668
5	7"	5"	5"	1.043
6	8"	6"	5 3/8"	1.502
11	10"	7"	7 1/2"	3.319

Bar No.	Type	Dimensions A	B	C	D	E	F	J	O	Length Ft. Ins.	No. Reqd.	Weight lbs.
				DECK SLAB								
				No. 4 Bars								
451	1								27'-0	27'-0"	598	1675
452	1								42'-0	42'-0"	124	347.5
453	1								50'-0	50'-0"	48	1603
454	1								39'-0	39'-0"	62	1614
455	1								27'-0	27'-0"	8	144
456	1								54'-0	54'-0"	48	1732
457	4		0'-4"	1'-0"	1'-1 1/2"	1'-2"	0'-6"			2'-8"	2000	3566
458	3		1'-1"	1'-0"						2'-7"	2000	3430
459	5	0'-6"	0'-4"					0'-4"	2'-6"	3'-0"	204	408
				No. 5 Bars							Total	34767
551	1								28'-3"	28'-3"	797	23481
552	2	3'-6 1/2"	0'-5"	4'-0"	2'-4"	0'-6 1/2"			27'-10 1/2"	28'-0"	794	23188
553	1								26'-0"		797	21613
				No. 6 Bars							Total	68285
651	1								28'-3"	28'-3"	8	340
652	1								26'-0"	26'-0"	37	1250
653	1								27'-0"	27'-0"	14.4	1016.5
654	1								46'-0"	46'-0"	32	2211
				No. 11 Bars							Total	13966
1151	1								40'-0"	40'-0"	48	10203
1152	1								20'-0"	20'-0"	48	5101
1153	1								10'-0"	10'-0"	72	3825
		COMPLETION of ABUTMENTS & CURBS									Total	19129
				No. 4 Bars								
460	1								25'-8"	25'-8"	12	206
461	6	0'-7"	1'-2"	1'-1"	0'-3"	1'-4"	1'-2 1/2"			5'-11 1/2"	52	207
462	7	0'-7"	1'-3"	2'-3"						8'-2"	8	43
463	3		0'-7"	1'-2"	0'-3"					2'-0"	42	55
464	8		0'-7"	0'-7"	0'-4"	0'-8"	0'-3"		1'-2"	2'-1"	42	58
				No. 5 Bars							Total	569
554	3		0'-7"					0'-3"	7'-8"	8'-3"	58	500
				No. 6 Bars								
655	1								20'-0"	20'-0"	8	240
656	4		3'-0"	17'-6"	0'-10"	3'-1 1/2"	0'-0"			20'-1 1/2"	8	241
657	1								28'-8"	28'-8"	12	517
658	8		0'-0"	16'-10"	0'-10"	3'-1 1/2"	0'-0"		19'-10"	20'-0"	8	240
											Total	1238

NOTES:
Material - Structural Steel ASTM: A7-50T
Rivets ASTM: A 141-39
Rivets 7/8"ϕ
Open holes 15/16"ϕ except as noted
Holes for Girder Splices Subpunched 15/16"ϕ and reamed to 1 1/16"ϕ with all parts assembled.
Holes for Floorbeam connections subpunched 15/16"ϕ and reamed to 1 1/16"ϕ to metal template.
Holes for Stringer Splices subpunched 13/16"ϕ and reamed to 15/16"ϕ to metal template.

SUMMARY OF WEIGHTS

No. 4 Bars	35336
No. 5 Bars	68785
No. 6 Bars	3206
No. 11 Bars	19129
Total	138454

SUPER STRUCTURE DETAILS I

SHEET 6 OF 11 SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. to O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

DESIGNED BY R.S.
DRAWN BY G.R.S.
CHECKED BY J.D.W.
REVIEWED BY
SCALE 3/4"=1'-0"
ISSUED
APPROVED CHIEF BRIDGE ENGINEER

DEC. NO. 10-77-1-13 DRG. NO. C-285

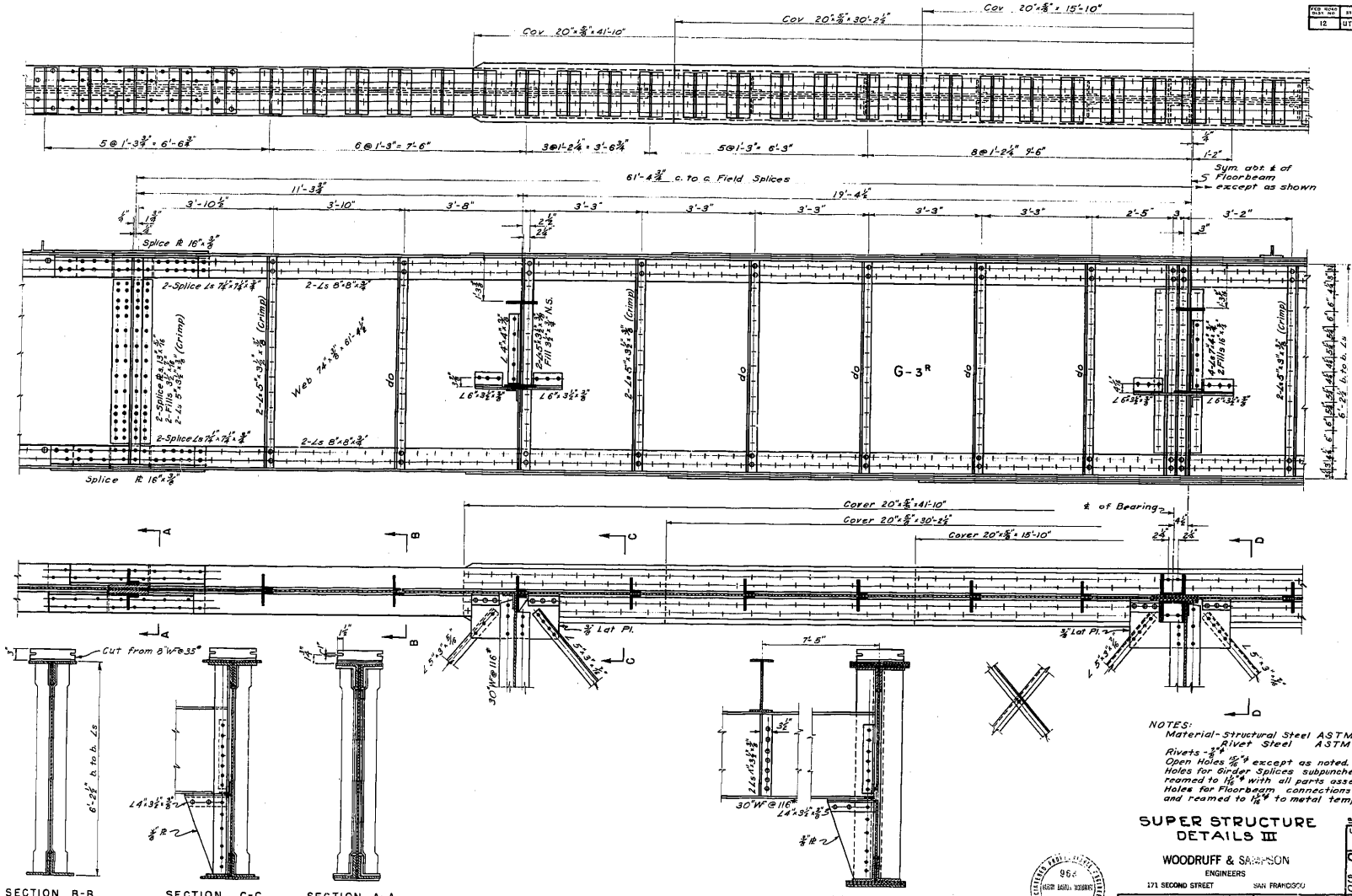
WOODRUFF & SAMPSON
ENGINEERS
171 SECOND STREET SAN FRANCISCO

REGISTERED PROFESSIONAL ENGINEER 963 JOHN DARREN WOODRUFF STATE OF UTAH

REVISIONS
DATE | DESCRIPTION | BY

C-285 SHT. 6 of 11

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
12	UTAH				



NOTES:
Material - Structural Steel ASTM: A7-50T
Rivet Steel ASTM: A141-39
Rivets - 7/8"φ
Open Holes 15/16"φ except as noted.
Holes for Girder Splices subpunched 15/16"φ and reamed to 1 1/16"φ with all parts assembled.
Holes for Floorbeam connections subpunched 15/16"φ and reamed to 1 1/16"φ to metal template.

SUPER STRUCTURE DETAILS III

WOODRUFF & SAMPSON
ENGINEERS
171 SECOND STREET SAN FRANCISCO

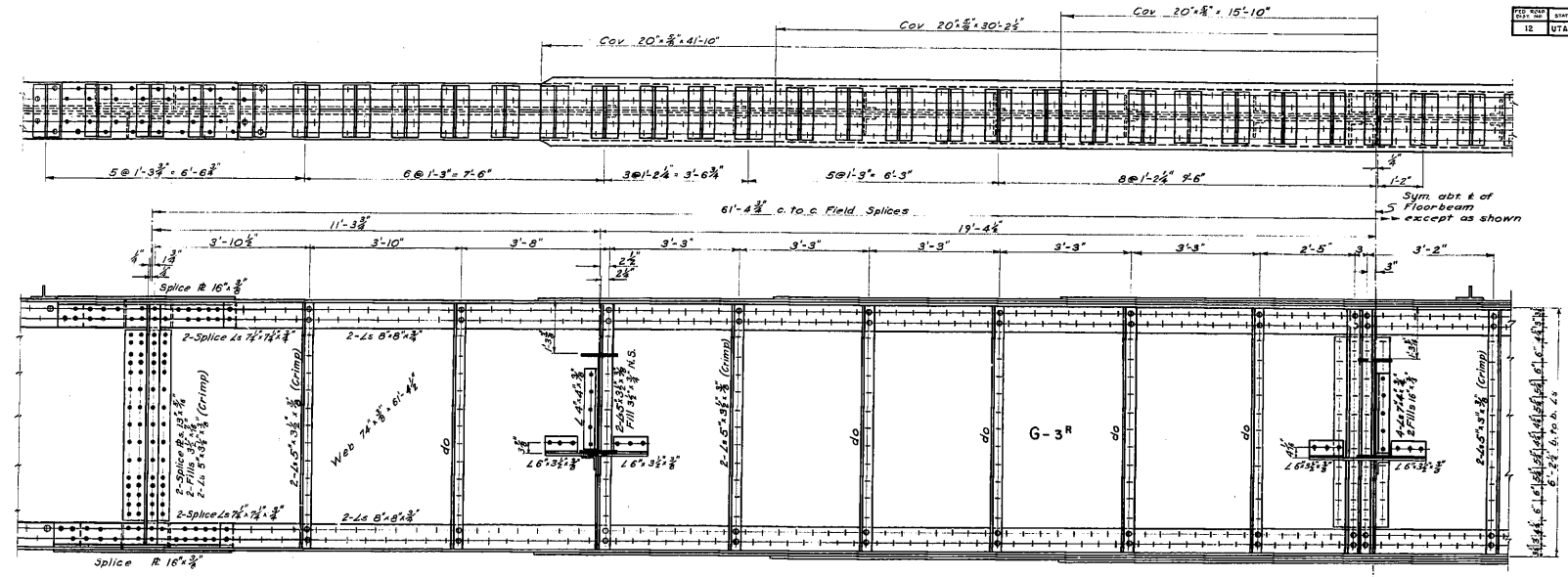
SHEET 8 OF 11 SHEETS
UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT
COLORADO R. BRIDGE
1006.5' O. TO O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

PROJECT BY R.R.	SCALE 3/8"=1'-0"
DRAWN BY C.R.D.	ISSUED
CHECKED BY G.B.W.	APPROVED
EXAMINED BY	CHIEF BRIDGE ENGINEER
DR. NO. 10-77-1-13	DWG. NO. C-285

REVISIONS

DATE	BY	DATE	BY

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
12	UTAH				



SECTION B-B

SECTION C-C

SECTION A-A

SECTION D-D

NOTES:
Material-Structural Steel ASTM: A7-50T
Rivet Steel ASTM: A141-39

Rivets - 3/4"ϕ
Open Holes 15/16"ϕ except as noted.
Holes for Girder Splices subpunched 15/16"ϕ and reamed to 1 1/16"ϕ with all parts assembled.
Holes for Floorbeam connections subpunched 15/16"ϕ and reamed to 1 1/16"ϕ to metal template.

SUPER STRUCTURE DETAILS III

WOODRUFF & SAMPSON
ENGINEERS
171 SECOND STREET SAN FRANCISCO

REGISTERED PROFESSIONAL ENGINEER 9668 KEITH BARR, ENGINEER STATE OF UTAH

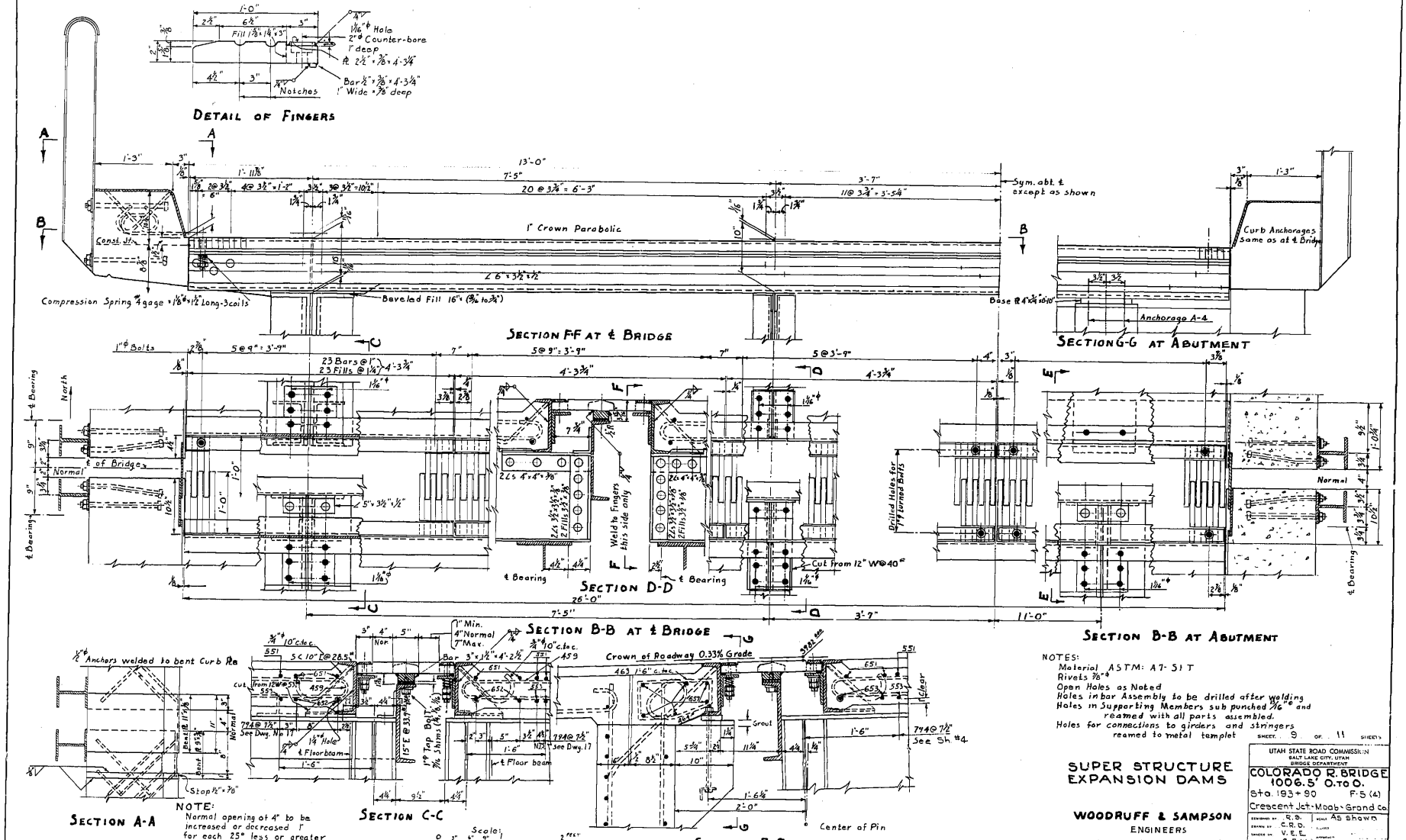
SHEET 8 OF 11 SHEETS
UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

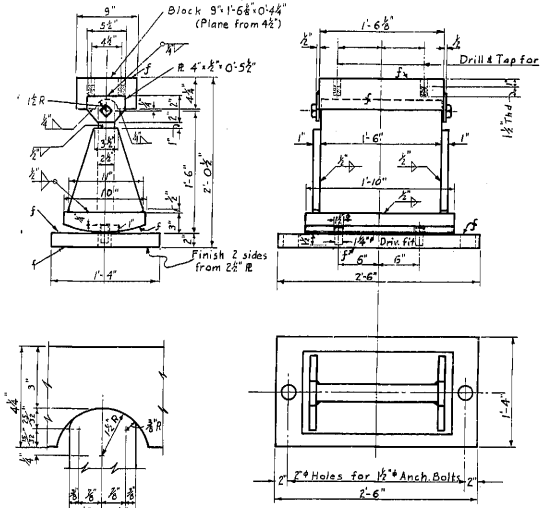
COLORADO R. BRIDGE
1006.5' O. TO O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

DESIGNED BY R.S. SCALE 3/8"=1'-0"
DRAWN BY G.R.D. ISSUED
CHECKED BY S.O.W. APPROVED CHIEF BRIDGE ENGINEER
EXAMINED BY
DR. NO. 10-77-1-13 DRG. NO. C-285

REVISIONS

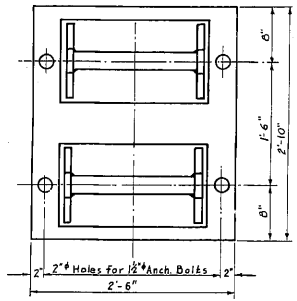
DATE	BY	DATE	BY


DETAIL OF FINGERS
Fill 1½"x1¼"x3"
1 1/16"ϕ Hole
2"ϕ Counter-bore
1" deep
at 2½"x⅞"x4'-3¼"
Bar ½"x⅜"x4'-3¼"
1" Wide x⅜" deep
Notches
SECTION F-F AT ℄ BRIDGE
1" Crown Parabolic
Compression Spring ⅞" gage x 1⅛"ϕ x 1½" Long-3 coils
Beveled Fill 16"x (⅜" to ¾")
Base PL 4"x¾"x10'-10"
Sym. abt. ℄ except as shown
SECTION G-G AT ABUTMENT
Curb Anchorages Same as at ℄ Bridge
Anchorage A-4
SECTION D-D
23 Bars @ 1" 23 Fills @ 1¼"
Weld to Fingers this side only
Cut from 12" WF 40#
Drilled Holes for 1¼" turned Bolts
SECTION B-B AT ℄ BRIDGE
SECTION B-B AT ABUTMENT
Crown of Roadway 0.33% Grade
Anchors welded to bent Curb Pl
SECTION A-A
SECTION C-C
SECTION E-E
Center of Pin
Scale:
NOTES:
Material ASTM: A7-51T
Rivets ⅞"ϕ
Open Holes as Noted
Holes in bar Assembly to be drilled after welding
Holes in Supporting Members sub punched 1/16"ϕ and reamed with all parts assembled.
Holes for connections to girders and stringers reamed to metal templet
SHEET 9 OF 11 SHEETS
NOTE:
Normal opening at 4" to be increased or decreased for each 25° less or greater Than 60° F
SUPER STRUCTURE EXPANSION DAMS
WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco
UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT
COLORADO R. BRIDGE
1006.5' O. TO O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.
DESIGNED BY R.D.
DRAWN BY C.R.D.
TRACED BY V.E.E.
CHECKED BY G.B.W.
SCALE AS SHOWN
DR. NO. 10-77-1-13
DWG. NO. C-285
REVISIONS



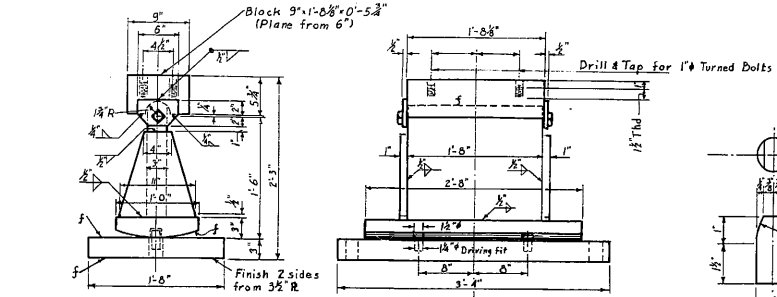
BEARING B-1

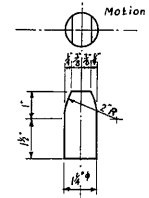
4 Reqd.
2 at Abut. 1
2 at Abut 9



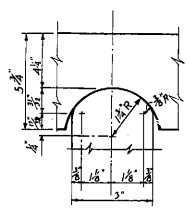
BEARING B-2

2 Reqd. Pier 5
One Bearing Consists of
1 PL 30" × 2 (Planed from 2½") × 2'-10"
2 Rockers as shown for Bearing B-1

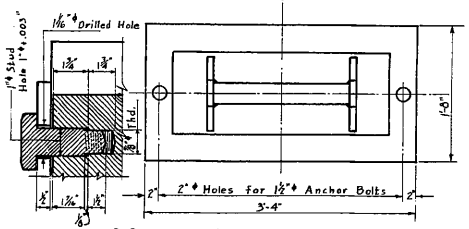




DETAIL OF DOWEL

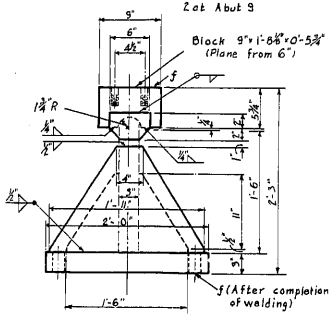


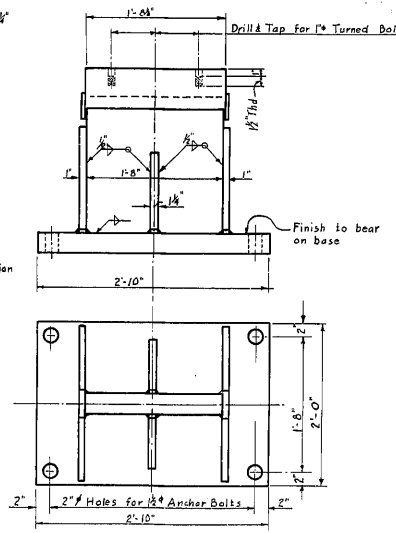
DETAIL OF PIN AND STUD



BEARING B-3

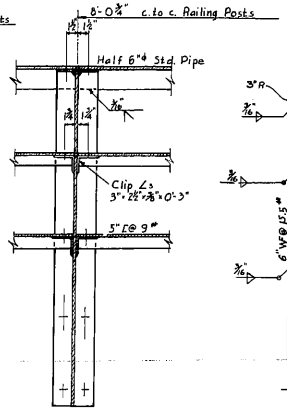
8 Reqd.
2 At Pier 2
2 At Pier 4
2 At Pier 6
2 At Pier 8

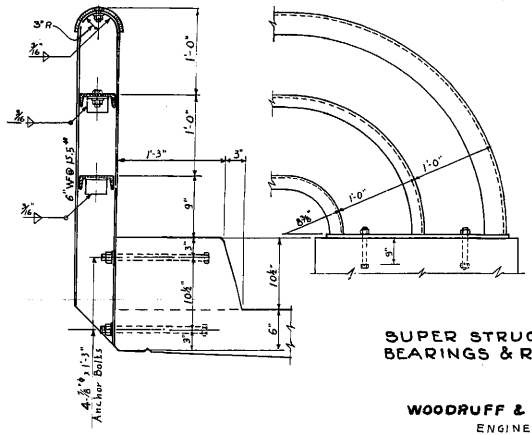




BEARING B-4

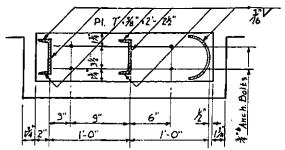
4 Reqd.
2 Pier 3
2 Pier 7





DETAIL OF RAILING

NOTES:
Material A.S.T.M: A7-50T
Shop Paint
Bearing Surfaces of Pin (1½" & 1¾" Rod)
1 Coat White Lead & Tallow
Other Machined Surfaces
1 Coat Red Lead and Linseed Oil



SUPER STRUCTURE
BEARINGS & RAILING

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

SHEET 10 OF 11 SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. TO O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

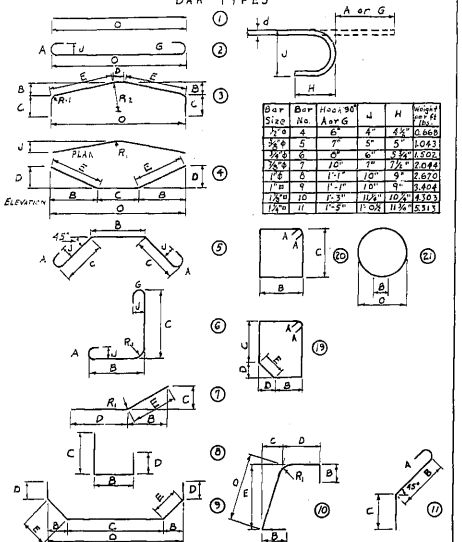
DESIGNED BY R.S. SCALE 1½" = 1'-0"
DRAWN BY C.R.D. ISSUED
CHECKED BY V.E.E. APPROVED
CHECKED BY G.B.W. CHIEF BRIDGE ENGINEER

DR. NO. 10-77-1-13 DWG. NO. C-285

REVISIONS

C-285 SHT. 10 of 11

BAR TYPES



Bar Size	Bar No.	Hook 90° A or G	J	H	Weight per ft lbs.
½"ø	4	6"	4"	4½"	0.668
¾"ø	5	7"	5"	5"	1.043
⅞"ø	6	8"	6"	5¾"	1.502
⅞"ø	7	10"	7"	7½"	2.044
1"ø	8	1'-1"	10"	9"	2.670
1⅛"ø	9	1'-1"	10"	9"	3.404
1¼"ø	10	1'-3"	10¾"	10¾"	4.303
1⅜"ø	11	1'-3"	11"	11⅝"	5.313

Bar No	Type	Dimensions A	B	C	D	E	G	J	O	R₁	R₂	Length Ft Ins	No. Required - Pier Nos. 1	2	3	4	5	6	7	8	9	Total No. Reqd	Total Weight lbs.
												BARS											
401	20	7"	3'-6"	1'-0								17'-6	4	4	4	4	4	4	4			28	393
402	20	7"	3'-10	4'-4								18'-10	4	4	4	4	4	4	4			28	378
403	20	7"	4'-2	4'-8								21'-2	4	4	4	4	4	4	4			28	355
404	20	7"	4'-6	5'-0								22'-6	4	4	4	4	4	4	4			28	336
405	20	7"	4'-9	5'-3								24'-0	2.5	2.5	2.5	2.5	2.5	2.5	2.5			19.8	291.0
406	21		1'-8					7'-9				26'-0	4									8	342
407	8		6'-1	3'-8	3'-8							13'-6		2	2							4	24
408	8		5'-1	1'-11	1'-11							9'-0		2	2							4	23
409	8		4'-10	1'-11	1'-11							8'-8		2	2							4	95
410	1								28'-0			28'-0		2	2							4	54
411	8			0'-11	1'-6	1'-7						20'-0		2	2							4	47
412	8			0'-11	1'-5	1'-7						17'-6		2	2							4	40
413	8			0'-11	1'-6	1'-7						15'-0		2	2							4	33
414	8			0'-11	1'-0	1'-7						12'-6		2	2							4	27
415	8			0'-11	1'-6	1'-7						10'-0		2	2							4	21
416	8			6'-7	4'-10	4'-10						16'-0	16	32	32							80	342
417	10			1'-0	0'-9	1'-7						9'-7	7									7	14
418	19			7'-1½	0'-9	0'-9	1'-7					7'-7	12									12	24
419	20			7'-1½	2'-5	2'-5						8'-2	4									4	44
																					Total		5670

Bar No	Type	Dimensions A	B	C	D	E	G	J	O	R₁	R₂	Length Ft Ins	No. Required - Pier Nos. 1	2	3	4	5	6	7	8	9	Total No. Reqd	Total Weight lbs.
												BARS											
501	1								6'-0			6'-0	8									8	16.1
502	1								10'-0			10'-0	8									8	20.7
503	1								16'-0			16'-0	4									4	21
504	1								22'-0			22'-0	4									4	29
505	1								20'-10			20'-10	8									8	146
506	1								10'-0			10'-0	19									19	396
507	1								8'-3"			8'-3"	2									2	34
508	1								7'-6			7'-6	2									2	31
509	1								6'-9			6'-9	2									2	28
510	1								6'-0			6'-0	2									2	25
511	1								5'-3"			5'-3"	2									2	22
512	1								4'-3			4'-3	2									2	18
513	1								3'-6"			3'-6"	2									2	14
514	1								2'-9			2'-9	2									2	11
515	1								2'-0			2'-0	2									2	8
516	6	0'-0						1'-0				17'-0	9									9	119
517	9	0'-0						1'-0				16'-0	16									16	352
518	9								9'-0			9'-0	4									4	28
519	1								11'-6			11'-6	2									2	14
520	2		7"				0'-0	1'-0				13'-7	4									4	46
521	2		7"				0'-0	0'-9				14'-1"	2									2	43
522	2		7"				0'-0	0'-9				10'-1"	2									2	31
523	2		7"				0'-0	0'-9				8'-3"	2									2	25
524	2		7"				0'-0	0'-9				7'-9"	2									2	24
525	2		7"				0'-0	0'-9				6'-9"	2									2	21
526	2		7"				0'-0	0'-9	5'-4			5'-11"	2									2	25
527	2		7"				0'-0	0'-9	4'-6			5'-7"	2									2	21
528	2		7"				0'-0	0'-9	3'-8			4'-7"	2									2	17
529	2		7"				0'-0	0'-9	2'-9			3'-7"	2									2	14
530	2		7"				0'-0	0'-9	2'-0			2'-7"	2									2	11
531	2		7"				0'-0	0'-9	1'-0			1'-7"	8									8	16
532	1								4'-0			4'-0"	26									26	52
533	11	7"	1'-10	1'-7																		26	2934
																					Total		9774

Bar No	Type	Dimensions A	B	C	D	E	G	J	O	R₁	R₂	Length Ft Ins	No. Required - Pier Nos. 1	2	3	4	5	6	7	8	9	Total No. Reqd	Total Weight lbs.
												BARS											
1001	2	1'-5							29'-0"			29'-0"	8	8	8	8	8	8	8			56	6988
1002	5	1'-5	1'-0	4'-6				11'-7		1'-0	2'-6												
1003	5	1'-5	1'-11	4'-6				14'-1				36'-8	2	2	2	2	2	2	2			12	1284
1004	5	1'-5	1'-6	4'-5	1'-7			14'-1				36'-0	2	2	2	2	2	2	2			12	1250
1005	5	1'-5	1'-2	4'-5	1'-11			14'-1				35'-6	2	2	2	2	2	2	2			12	1205
1006	5	1'-5	1'-6	4'-5	1'-11			14'-1				35'-0	2	2	2	2	2	2	2			12	1205
1007	5	1'-5	1'-2	4'-5	1'-11			14'-1				34'-6	2	2	2	2	2	2	2			12	1205
1008	5	1'-5	1'-6	4'-5	1'-11			14'-1				34'-0	2	2	2	2	2	2	2			12	1205
1009	5	1'-5	1'-2	4'-5	1'-11			14'-1				33'-6	2	2	2	2	2	2	2			12	1205
1010	3			2'-6	2'-11	1'-5	12'-9					32'-0	4	4	4	4	4	4	4			24	3216
1011	6	1'-5	1'-5	2'-6	2'-6			1'-5	1'-0			41'-11"		8								8	342
1012	6	1'-5	1'-3	2'-6	2'-6			1'-5	1'-0			42'-8		8								8	348
1013	6	1'-5	1'-5	2'-6	2'-6			1'-5	1'-0			43'-2		10								10	432
1014	5	1'-5	1'-3	2'-6	2'-6			1'-5	1'-0			43'-10			9							9	394
1015	2	1'-5						1'-5	1'-0	2'-6		23'-10			4							4	95
1016	2	1'-5						1'-5	1'-0	2'-6		22'-10			4							4	91
													FORWARD								Total		6464
BARS		6'-0							NO.	6	BARS										Sub Total		4128
614	2	0'-8										21'-4"		2								4	128
615	2	0'-8						0'-8	12'-0			20'-4"		4								8	244
616	2	0'-8						0'-8	18'-0			19'-4"		4								8	232
617	2	0'-8						0'-8	16'-0			18'-4"		4								8	218
618	2	0'-8						0'-8	6'-0			16'-4"		4								8	194
619	2	0'-8						0'-8	6'-0	17'-0		18'-2"			4		4	4				12	346
620	2	0'-8						0'-8	6'-0	19'-0		19'-2"			4		4	4	4			20	545
621	2	0'-8						0'-8	6'-0	15'-6		16'-0"			4		4	4	4			20	486
622	2	0'-8						0'-8	6'-0	13'-6		13'-4"			4		4	4	4			20	387
623	2	0'-8						0'-8	6'-0	11'-0		11'-2"			4		4	4	4			20	319
																					Total		9774

Note: All dimensions refer to centers of bars except as otherwise noted.

SUMMARY OF WEIGHTS

No. 4 Bars	5670
No. 5 Bars	2934
No. 6 Bars	9774
No. 9 Bars	40465
No. 10 Bars	2691
No. 11 Bars	15029
	100,804 lbs

Anchorages 1,731 lbs.
102,535 lbs.

SUB STRUCTURE
REINFORCING STEEL

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

SHEET 11 OF 11 SHEETS

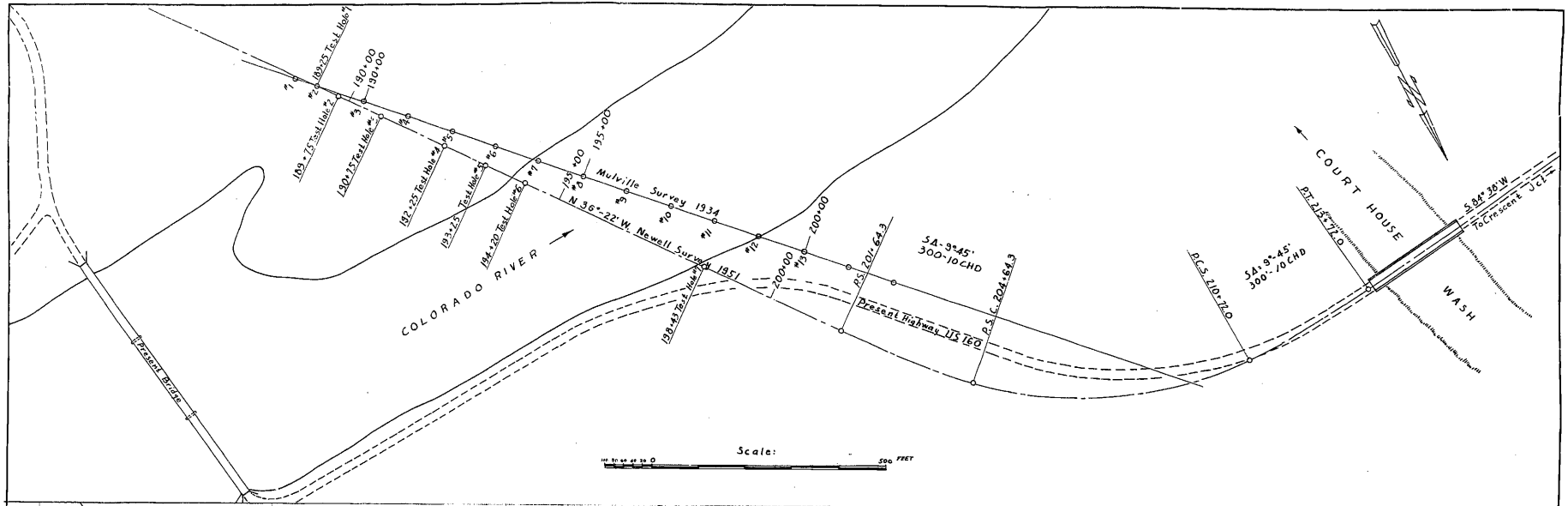
UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

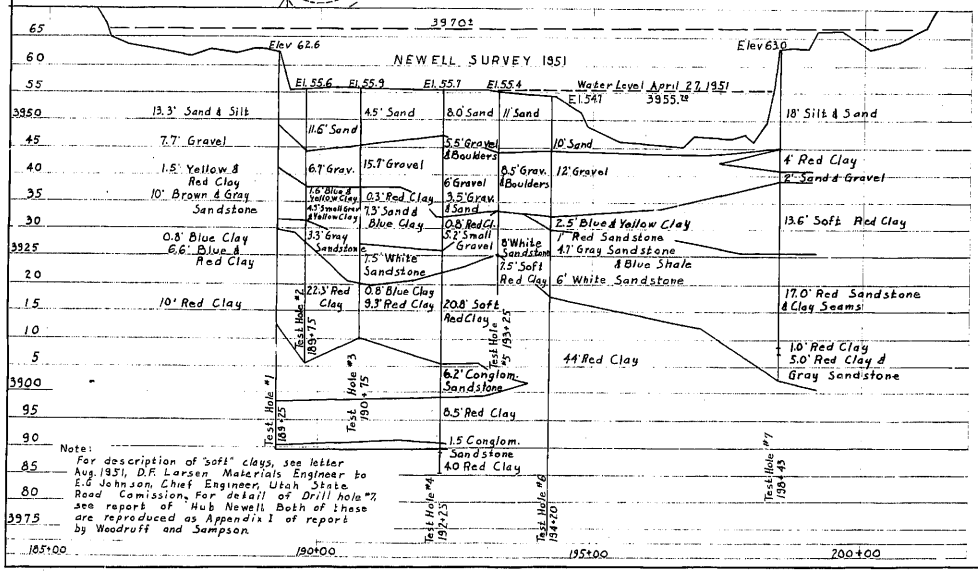
COLORADO R. BRIDGE
1006.5' O. TO O.
Sta. 193 + 90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

DESIGNED BY G.B.W. NAME None
DRAWN BY C.R.O. DESIGN
TRACED BY V.E.E. APPROVED
CHECKED BY G.B.W. CHIEF ENGINEER

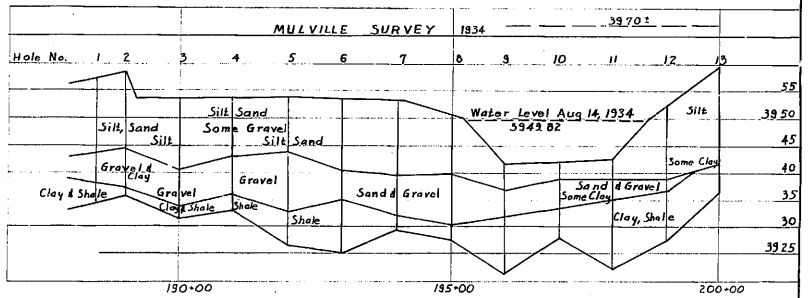
EST. NO. 10-77-1-13 DWG. NO. C-285

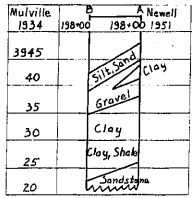
REVISIONS
DATE — DESCRIPTION





Note:
For description of "soft" clays, see letter Aug. 1951, D.F. Larsen Materials Engineer to E.G. Johnson, Chief Engineer, Utah State Road Comission. For detail of Drill hole #7, see report of Hub Newell. Both of these are reproduced as Appendix I of report by Woodruff and Sampson.





BORINGS AND GEOLOGIC SECTIONS

SHEET S1 OF ____ SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. to O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

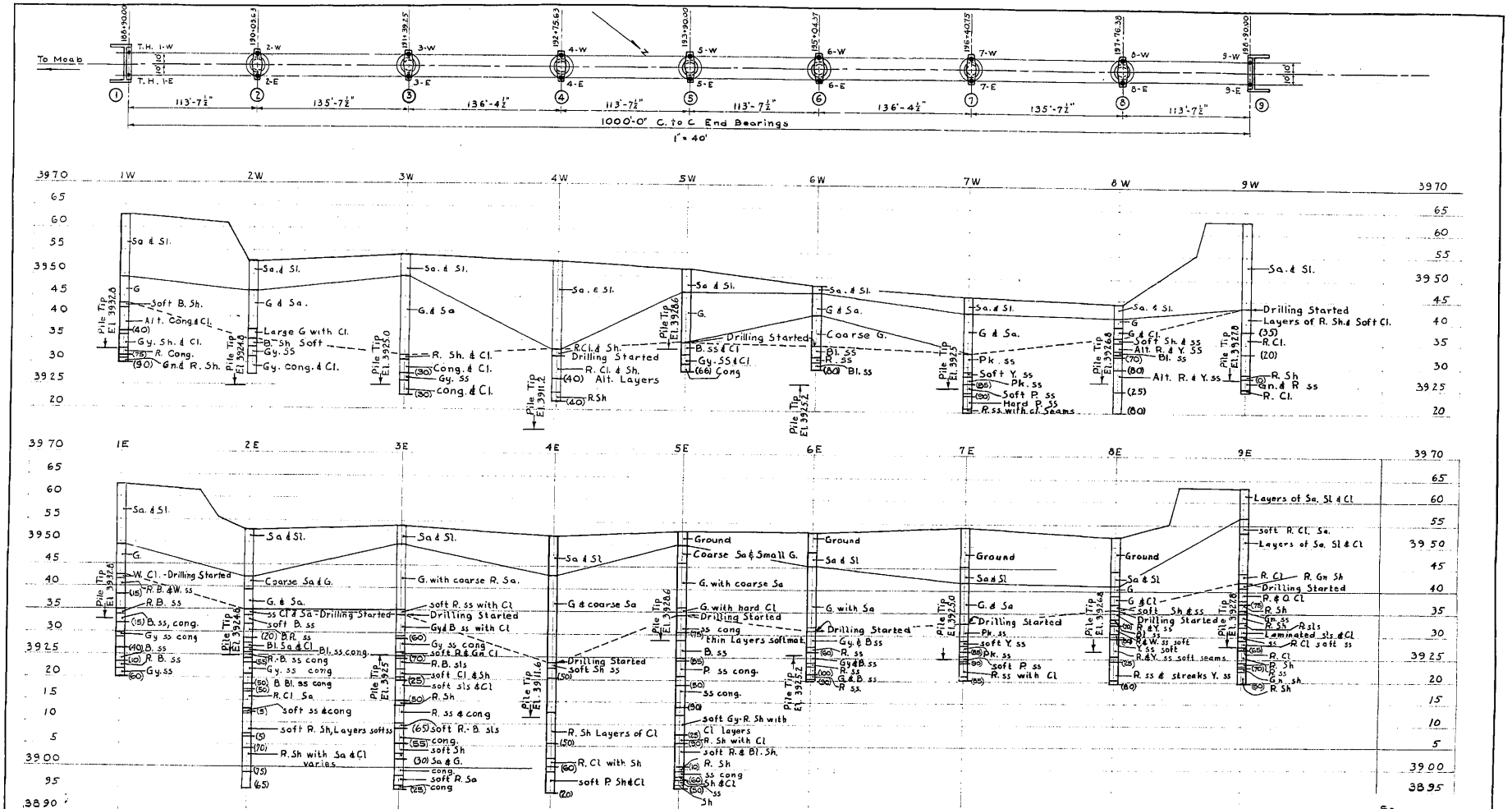
DESIGNED BY ____ SCALE ____
DRAWN BY C.R.O. ISSUED ____
TRACED BY V.E.E. APPROVED ____
CHECKED BY S.B.W. CHIEF BRIDGE ENGINEER

Dr. No. 10-77-1-13 Dwg. No. C-285

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

REVISIONS

C-285 SHT. S1



ABREVIATIONS

Sa - Sand		B. - Brown	
Sl - Silt		R. - Red	
G - Gravel		Bl - Blue	
Cl - Clay		P - Purple	
ss - Sandstone		W - White	
cong. - Conglomerate		Gy - Gray	
sls - Siltstone		Gn - Green	
Sh - Shale		Pk - Pink	
Y - Yellow		O - Orange	
(25) - % Core Recovery			

FINAL BORINGS (1953) GEOLOGIC SECTIONS

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

SHEET 52 OF ... SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. to O.
Sta. 193+90 F-5(4)
Crescent Jct.-Moab-Grand Co.

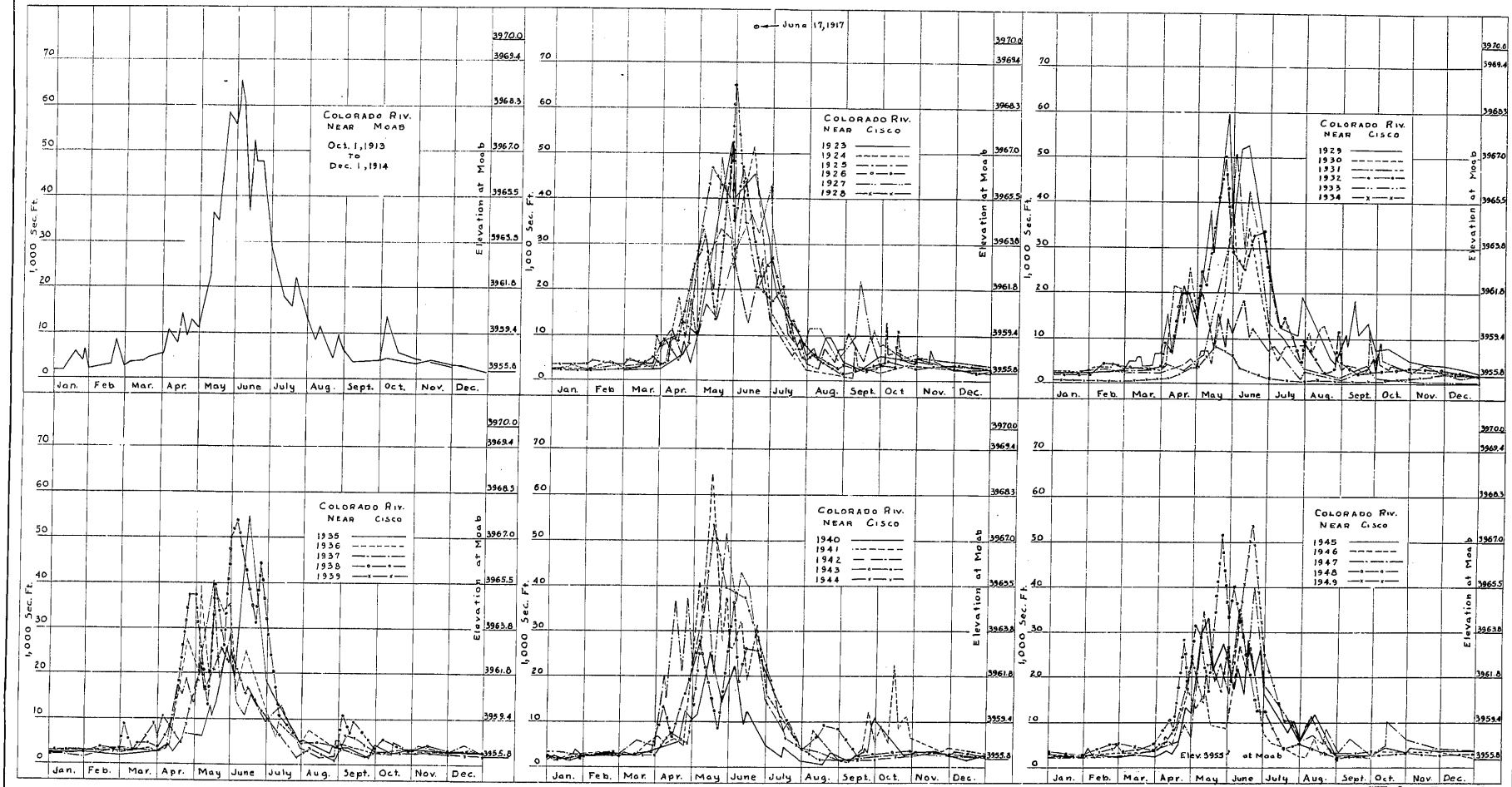
DRAWING BY ... DATE ...
DRAWN BY C.R.D. DATE ...
TRACED BY V.E.E. APPROVED ...
CHECKED BY G.B.V. CHIEF BRIDGE ENGINEER

FILE NO. 10-77-1-13 DWG. NO. C-285

REVISIONS

DATE	BY	DATE	BY

C-285 SHT. S 2



Note:- Data from U.S. Geological Survey.

HYDROGRAPHS

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

SHEET S3 OF ..... SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

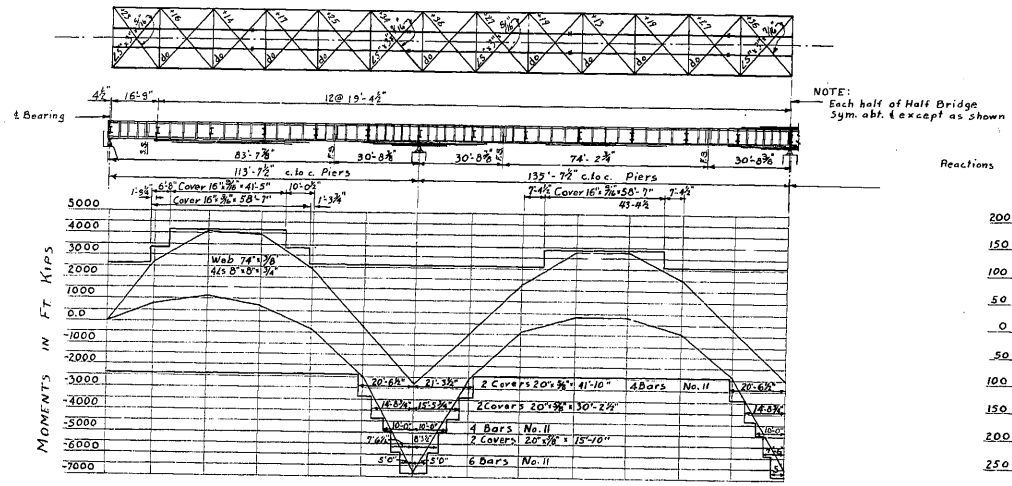
COLORADO R. BRIDGE
1006.5' O. to O.
Sta. 193+90 F-5 (4)
Crescent Jct.-Moab-Grand Co.

DESIGNED BY ..... SCALE .....
DRAWN BY C.R.D. INSPECT .....
TRACED BY V.E.E. APPROVED .....
CHIEF BRIDGE ENGINEER
ENGINEER R.S.

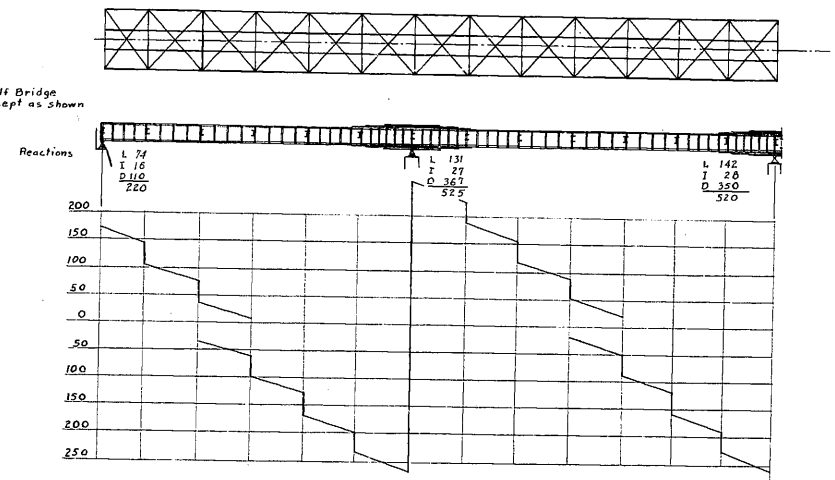
Dr. No. 10-77-1-13 Dwg. No. C-285

REVISIONS

C-285 SHT. S3



NOTE:
Each half of Half Bridge
Sym. abt. ℄ except as shown



D.L.-N.C.	+1039	+1566	+1408	+555	-980	-3208	-1105	+312	+1036	+1070	+412	-937	-2974
D.L.-C.	+446	+679	+617	+270	-370	-1297	-415	+177	+479	+490	-208	-562	-1224
Total	+1485	+2245	+2025	+825	-1350	-4505	-1520	+489	+1515	+1560	+620	-1299	-4198
70% D.L.	+1040	+1572	+1418	+578	-945	-3153	-1064	+342	+1060	+1092	+434	-910	-2940

Maximum Moments

L.L.	+998	+1547	+1605	+1277	+603	+309	+507	+1131	+1473	+1487	+1164	+575	+409
I	+208	+324	+336	+267	+126	+65	+96	+211	+282	+285	+223	+110	+78
D.L.	+1485	+2245	+2025	+825	-945	-3153	-1064	+489	+1515	+1560	+620	-910	-2940
Total	+2691	+4114	+3966	+2369	-216	-2794	-461	+1837	+3270	+3332	+2007	-215	-2453

Minimum Moments

L.L.	-170	-363	-558	-737	-964	-1918	-856	-564	-601	-636	-672	-951	-1963
I	-34	-73	-116	-147	-193	-384	-172	-113	-120	-127	-134	-190	-393
D.L.	+1040	+1870	+1418	+578	-1350	-4505	-1520	+342	+1060	+1092	+434	-1299	-4198
Total	+836	+1134	+944	-306	-2507	-6807	-2548	-335	+339	+329	-372	-2440	-6554

SHEARS

D.L.-N.C.	63	33	37	19	2	16	33	51	69	87	104	123	118	100	83	65	47	29	12	7	24	42	59	77	95	113
D.L.-C.	30	22	16	8	1	8	14	22	29	36	44	52	50	41	34	26	19	10	4	4	10	19	26	33	41	50
D.L. Total	93	75	53	27	3	24	47	73	98	123	148	175	168	141	117	91	66	39	16	11	34	61	85	110	136	163
L.L.	59	59	42	27	27	27	41	41	55	58	68	75	81	74	63	56	46	42	31	30	41	44	55	61	72	79
I	13	13	10	10	8	8	10	10	13	14	15	17	16	14	13	13	10	10	8	10	10	10	13	13	14	15
Total	71	147	105	79	38	59	98	124	166	197	231	267	265	229	193	160	122	91	55	49	85	115	153	185	222	257
V - K.S.I.	6.16	5.30	3.79	2.85	1.37	2.13	3.53	4.41	5.96	7.10	8.33	9.62	9.55	8.25	6.96	5.78	4.40	3.28	1.98	1.77	3.06	4.15	5.52	6.67	8.00	9.26
fs	74.5	72.8	66.6	53.4	32.0	46.1	59.4	66.9	77.3	84.2	91.2	98.8	97.2	90.8	83.5	75.8	66.3	57.2	44.5	42.1	55.5	64.4	74.2	81.6	88.7	96.1
d Ins.	43.0	46.4	54.8	(a)	(a)	(a)	50.5	43.7	40.0	37.0	34.8	34.2	33.2	40.4	46.5	50.9	(a)	(a)	(a)	(a)	52.4	45.5	41.3	38.1	36.0	
Top Flg. Rivets																										
s/n	.0138	.0133		.0130		.0130		.0138		.0138	.0133		.0130		.0133	.0138		.0133		.0133			.0133		.0138	.0130 .0130
Shears K/rivet	Nor	2.36	1.75	1.40	1.03	0.49	0.77	1.27	1.71	2.29	2.72	3.09	3.40	3.45	3.05	2.66	2.18	1.62	1.21	0.73	0.65	1.13	1.53	2.04	2.55	2.88 3.35
	Vert	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80 0.80
(b)	Res.	2.50	2.10	1.61	1.30	0.94	1.11	1.50	1.88	2.42	2.83	3.16	3.57	3.55	3.14	2.78	2.28	1.80	1.45	1.08	1.03	1.39	1.73	2.19	2.68	2.98 3.45
Pitch Ins. (c)		5.24	4.22	(d)	(d)	(d)	(d)	(d)	4.70	3.66	3.14	2.80	2.48	2.50	2.82	3.20	3.90	4.95	(d)	(d)	(d)	(d)	(d)	4.05	3.32	2.76 2.50
Shear Connectors																										
s/n	.0111	.0106		.0105		.0105		.0111		.0111	.0076		.0081		.0076	.0111		.0111		.0106		.0106		.0106	.0111	.0076 .0081
Shears K/in.	1.30	1.54	1.11	0.81	0.39	0.61	1.01	1.38	1.85	2.19	2.21	2.16	2.15	2.20	2.14	1.78	1.35	0.99	0.58	0.57	0.90	1.21	1.63	2.05	2.25	2.08
Spacing Ins. (e)	15.8	19.1	27.0	30.0	(g)	(g)	29.7	22.7	16.3	13.8	13.6	13.9	13.9	13.2	14.0	16.9	22.2	30.8	(g)	(g)	33.3	24.6	18.4	14.6	14.1	14.4
" (f)											52.0	26.2	12.8	13	52.4											

Concrete Floor Slab

7'-2" c. to c. Stringers $S = 6.94$

Moments

$L = .2 \times 12 \times 6.94/6.66 = 2.50$

$I = 30\%$ .75

D .56

3.81

7" Slab $d = 5.5$ $1.44 \cdot d = 7.92$

$As = 3.81/7.92 = 0.48^{\square''}$ Req'd.

No. 5 @ 7½" c. to c. = $0.49^{\square''}$ Reqd.

Longitudinal 100/$\sqrt{6.94}$ = 38%

$0.38 \times 0.49 = 0.186^{\square''}$

No. 4 @ 12" c. to c. $0.20^{\square''}$

Stringers - 0.733 Lane Loads per Stringers

	Moments. Max. Pos.	Max. Neg.	Shear
L	82.0	-76.0	18.1
I	24.6	22.8	5.4
D	20.4	33.2	9.7
	127.0	132.0	33.2

18" WF @ 50# S.M. = 89.0

f = 17.8 K.S.I.

Floorbeams

	Moments	Shear
L	255	34.4
I	76	10.3
D	153	20.7
	484	65.4

30" WF @ 116#

f = 17.7 K.S.I.

Girder Sections

Structural Steel	Area Gr	Area Net	Concrete Section	Reinforcing	Steal Area	Section Moduli Non Composite Gr.	Non Composite Net	Composite Gr. (b)	Composite Nat (c)
Web 74"×⅜"	27.75	22.13	7"×84"=588						
4Ls 8"×8"×⅜"	45.75	36.25	n = 10						
(A)	73.50	58.88		6-⅜"$^{\square}$	2.64	1850	1497	7500	1880
1 Cov. 16"×⅜" ω	9.00	7.83	do	do	do				
	82.50	66.75				1950	1965	7600	2450
1 Cov. 16"×⅜" ω	9.00	7.88	do	do	do				
	91.50	74.63				1960	2420	7650	3010
(A)	73.50	58.88	do						
2 Covs. 20"×⅝"	25.00	22.50		4-1¼"$^{\square}$×2-¾"$^{\square}$	7.12	1850	1497	1970	2070
	98.50	81.38				2753	2311	2860	2900
2 Covs. 20"×⅝"	25.00	22.50	do						
	123.50	103.88		8-1¼"$^{\square}$×2-¾"$^{\square}$	13.36	3657	3125	3750	3720
2 Covs. 20"×⅝"	25.00	22.50	do			3657	3125	3820	4260
	148.50	126.38		14-1¼"$^{\square}$×2-¾"$^{\square}$	22.72	4560	3940	4710	5070
						4560	3940	4810	5885

(a) Bolt. Flg. Only
(b) Compression Flg.
(c) Tension Flg.

Specifications for Design - A.A.S.H.O. - 1949

Live Load - H20-S16-44 1.136 Lane Loads per Girder

Dead Load - Per Lineal Foot of Bridge

	Composite	Non Composite
Railings	80	
Curbs	340	
Paving	650	
Concrete Slab		2660
Stringers		105
Floorbeams & Knees		150
Bracing		25
Girders		780
Excess	430	
	1540	3660
Total	5200	

Notes:

(a) 58½" Max.
(b) Top Flg. Full Comp. Action. Other assum. give greater spc.
(c) ⅞" Bearing ⅞" Web 627 K.s.i. = 8.86" per rivet
16" Connectors at 30 Kips
(d) 5" Max.
(e) Comp Action assuming Ten. in Conc. over Supports.
(f) Comp Action - Ten. in rein. Steel only over supports
(g) 10" Connectors - 30" max. spacing

SHEET 54 OF ... SHEETS

UTAH STATE ROAD COMMISSION
SALT LAKE CITY, UTAH
BRIDGE DEPARTMENT

COLORADO R. BRIDGE
1006.5' O. to O.
Sta. 193+90 F-5(4)
Crescent Jct.-Moab-Grand Co.

DESIGNED BY R.S. | SCALE
DRAWN BY C.R.D. | DATE
CHECKED BY V.E.E. | APPROVED
CONTACT BY S.B.W. | CHIEF BRIDGE ENGINEER

SUPER STRUCTURE
STRESS SHEET

WOODRUFF & SAMPSON
ENGINEERS
171 Second Street San Francisco

BR. NO. 10-77-1-13 DWG. NO. C-285

REVISIONS
DATE | NO. | REMARKS | BY