Description	Station	Elevation	Northing	Easting
PC	112+00.88	7104.08	256584.9622	25504.3874
PT	112+27.88	7103.10	256580.0621	25530.6034
PC	112+96.21	7100.63	256585.8688	25598.6843
PT	113+24.57	7099.60	256581.5506	25626.4459
PC	113+82.91	7097.49	256559.1703	25680.3237
PT	114+71.24	7094.30	256557.1784	25766.6178
PC	115+19.98	7092.53	256573.7781	25812.4414
PT	115+51.25	7091.40	256574.8538	25843.1848
PC	116+15.49	7088.55	256557.2473	25904.9709
PT	116+42.24	7087.37	256552.9878	25931.3138
PC	116+94.02	7085.07	256550.7609	25983.0449
PT	117+20.54	7083.90	256552.1957	26009.4844
PC	117+74.39	7081.51	256560.3212	26062.7248
PT	117+91.31	7080.76	256565.1316	26078.8911
PC	118+24.73	7079.28	256578.9713	26109.3100
PT	118+57.85	7077.81	256582.0861	26141.6749
PC	118+93.36	7076.24	256573.8137	26176.2119
PT	119+30.43	7074.59	256578.7062	26212.1071

Description	Station	Elevation	Northing	Easting
PC	119+59.11	7073.32	256592.6032	26237.1851
PT	119+92.36	7071.85	256598.2421	26269.3399
PC	120+23.53	7070.47	256593.3130	26300.1146
PT	120+51.87	7069.21	256601.6470	26326.1331
PC	120+72.53	7068.29	256616.1564	26340.8355
PT	120+98.61	7067.14	256626.7467	26364.0791
PC	121+41.96	7065.22	256630.0487	26407.3024
PT	121+71.66	7063.90	256629.4445	26436.9584
PC	122+67.41	7061.90	256618.2690	26532.0479
PT	122+93.99	7060.99	256616.6965	26558.5639
PC	123+43.43	7059.31	256616.6235	26608.0064
PT	123+75.00	7058.23	256611.1760	26638.9493
PC	124+37.00	7056.11	256590.0888	26697.2505
PT	124+75.51	7054.80	256586.6494	26735.1819
PC	125+39.58	7052.62	256597.2487	26798.3683
PT	125+77.96	7051.31	256606.4542	26835.5857

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138366	10

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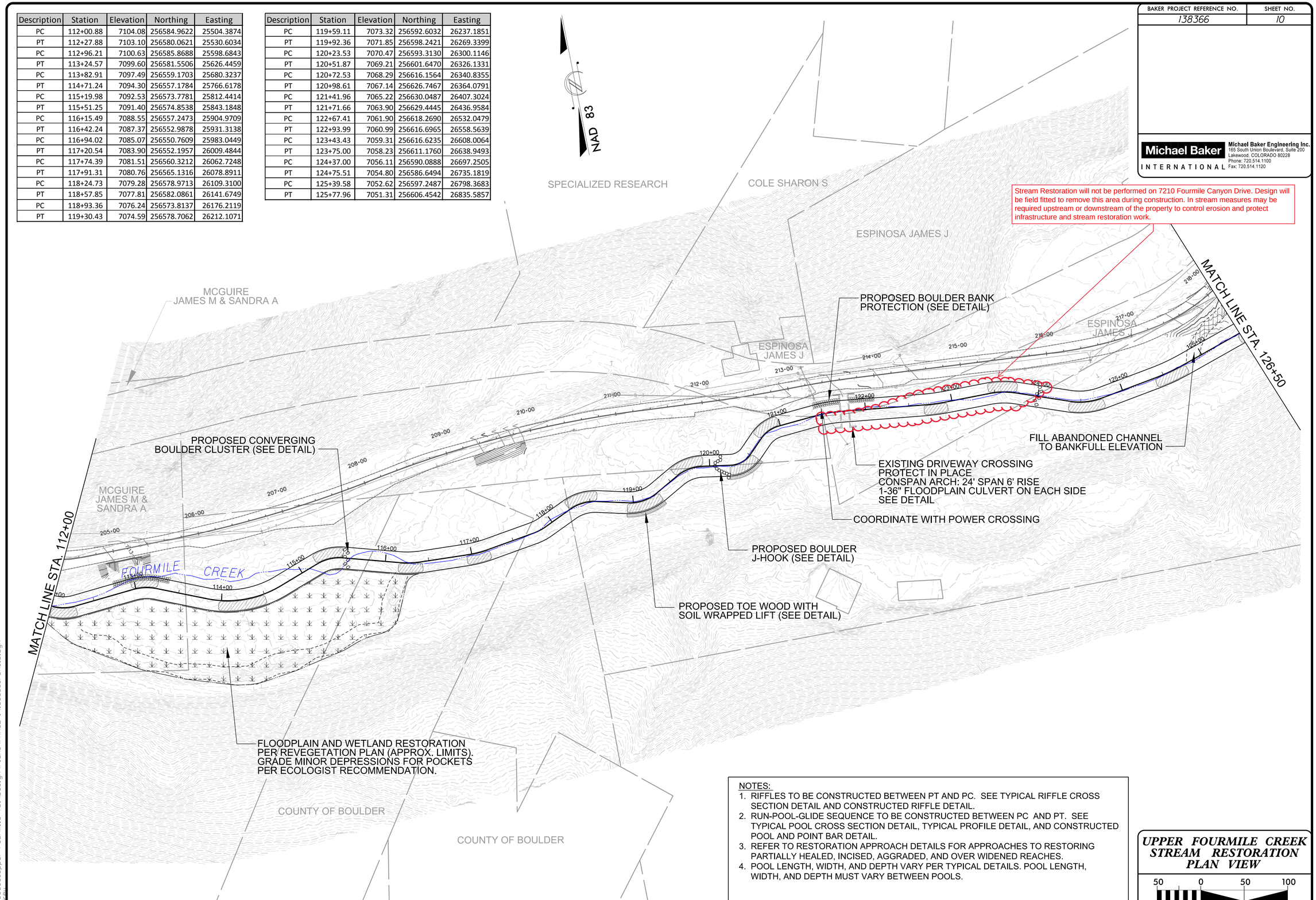

NOTES:
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3. REFER TO RESTORATION APPROACH DETAILS FOR APPROACHES TO RESTORING PARTIALLY HEALED, INCISED, AGGRADED, AND OVER WIDENED REACHES.
4. POOL LENGTH, WIDTH, AND DEPTH VARY PER TYPICAL DETAILS. POOL LENGTH, WIDTH, AND DEPTH MUST VARY BETWEEN POOLS.

UPPER FOURMILE CREEK STREAM RESTORATION PLAN VIEW

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SCALE (FT)

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BAKER PROJECT REFERENCE NO.	SHEET NO.
138366	11

NOTES:
1. RIFFLES TO BE CONSTRUCTED BETWEEN PT AND PC. SEE TYPICAL RIFFLE CROSS SECTION DETAIL AND CONSTRUCTED RIFFLE DETAIL.
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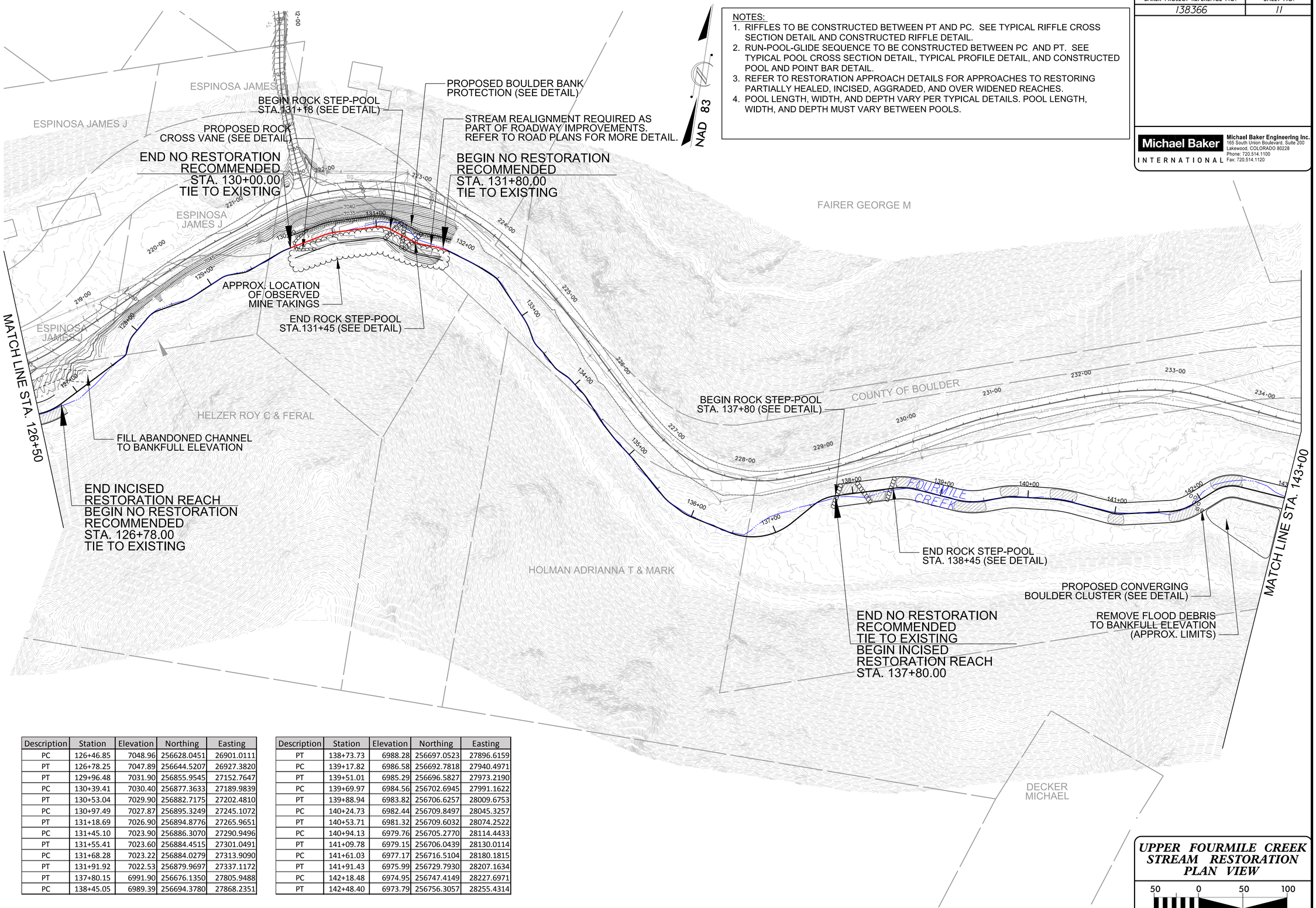

Description	Station	Elevation	Northing	Easting
PC	126+46.85	7048.96	256628.0451	26901.0111
PT	126+78.25	7047.89	256644.5207	26927.3820
PT	129+96.48	7031.90	256855.9545	27152.7647
PC	130+39.41	7030.40	256877.3633	27189.9839
PT	130+53.04	7029.90	256882.7175	27202.4810
PC	130+97.49	7027.87	256895.3249	27245.1072
PT	131+18.69	7026.90	256894.8776	27265.9651
PC	131+45.10	7023.90	256886.3070	27290.9496
PT	131+55.41	7023.60	256884.4515	27301.0491
PC	131+68.28	7023.22	256884.0279	27313.9090
PT	131+91.92	7022.53	256879.9697	27337.1172
PT	137+80.15	6991.90	256676.1350	27805.9488
PC	138+45.05	6989.39	256694.3780	27868.2351

Description	Station	Elevation	Northing	Easting
PT	138+73.73	6988.28	256697.0523	27896.6159
PC	139+17.82	6986.58	256692.7818	27940.4971
PT	139+51.01	6985.29	256696.5827	27973.2190
PC	139+69.97	6984.56	256702.6945	27991.1622
PT	139+88.94	6983.82	256706.6257	28009.6753
PC	140+24.73	6982.44	256709.8497	28045.3257
PT	140+53.71	6981.32	256709.6032	28074.2522
PC	140+94.13	6979.76	256705.2770	28114.4433
PT	141+09.78	6979.15	256706.0439	28130.0114
PC	141+61.03	6977.17	256716.5104	28180.1815
PT	141+91.43	6975.99	256729.7930	28207.1634
PC	142+18.48	6974.95	256747.4149	28227.6971
PT	142+48.40	6973.79	256756.3057	28255.4314

UPPER FOURMILE CREEK STREAM RESTORATION PLAN VIEW

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SCALE (FT)

9/21/2016
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Description	Station	Elevation	Northing	Easting
PC	143+08.47	6971.47	256750.9787	28315.2690
PT	143+33.49	6970.50	256752.6271	28340.1366
PC	143+87.77	6968.40	256764.5343	28393.0930
PT	144+28.70	6966.20	256767.7083	28433.7545
PC	144+61.94	6964.91	256765.5369	28466.9219
PT	144+84.37	6964.04	256769.0584	28488.8924
PC	145+24.04	6962.50	256783.8897	28525.6795
PT	145+41.59	6961.81	256793.1458	28540.4863
PC	145+89.03	6959.97	256824.9284	28575.7066
PT	146+20.45	6958.65	256840.5778	28602.6936
PC	146+46.83	6957.63	256848.7968	28627.7587
PT	146+62.58	6957.01	256854.5470	28642.4107
PC	147+39.37	6954.03	256886.6332	28712.1705
PT	147+57.08	6953.34	256897.0926	28726.3138
PC	147+91.54	6952.00	256922.8113	28749.2539
PT	148+15.89	6951.06	256939.8238	28766.6373
PC	148+88.40	6948.24	256986.9134	28821.7801
PT	149+14.15	6947.24	256999.1168	28844.2423
PC	149+97.07	6944.02	257022.7128	28923.7311
PT	150+28.40	6942.80	257023.0841	28954.6613
PC	150+79.30	6940.96	257009.7746	29003.7906
PT	151+02.58	6940.12	257001.4533	29025.4948

Description	Station	Elevation	Northing	Easting
PC	151+34.67	6938.96	256986.9907	29054.1324
PT	151+54.01	6938.26	256981.7834	29072.6420
PC	152+16.76	6935.99	256976.7170	29135.1852
PT	152+32.76	6935.41	256976.2232	29151.1669
PC	153+04.03	6932.83	256977.5810	29222.4289
PT	153+24.56	6932.09	256984.3437	29241.4287
PC	153+85.62	6929.88	257022.0201	29289.4903
PT	154+31.13	6928.23	257061.5757	29308.6496
PC	154+60.56	6927.17	257091.0041	29308.5374
PT	154+87.49	6926.19	257115.9606	29317.2150
PC	155+07.15	6925.48	257131.3316	29329.4698
PT	155+27.91	6924.73	257142.8111	29346.3861
PC	155+54.37	6923.78	257150.4992	29371.7125
PT	155+75.41	6923.01	257160.2877	29390.1833
PC	155+92.61	6922.39	257171.1025	29403.5597
PT	156+10.81	6921.73	257180.1203	29419.2787
PC	156+35.15	6920.85	257188.7361	29442.0447
PT	156+48.35	6920.38	257195.6140	29453.2150
PC	156+77.30	6919.33	257215.1782	29474.5541
PT	156+94.51	6918.71	257221.7173	29490.1145
PC	157+45.82	6916.85	257224.4672	29541.3426
PT	157+71.40	6915.93	257223.9690	29566.9035

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138366	12

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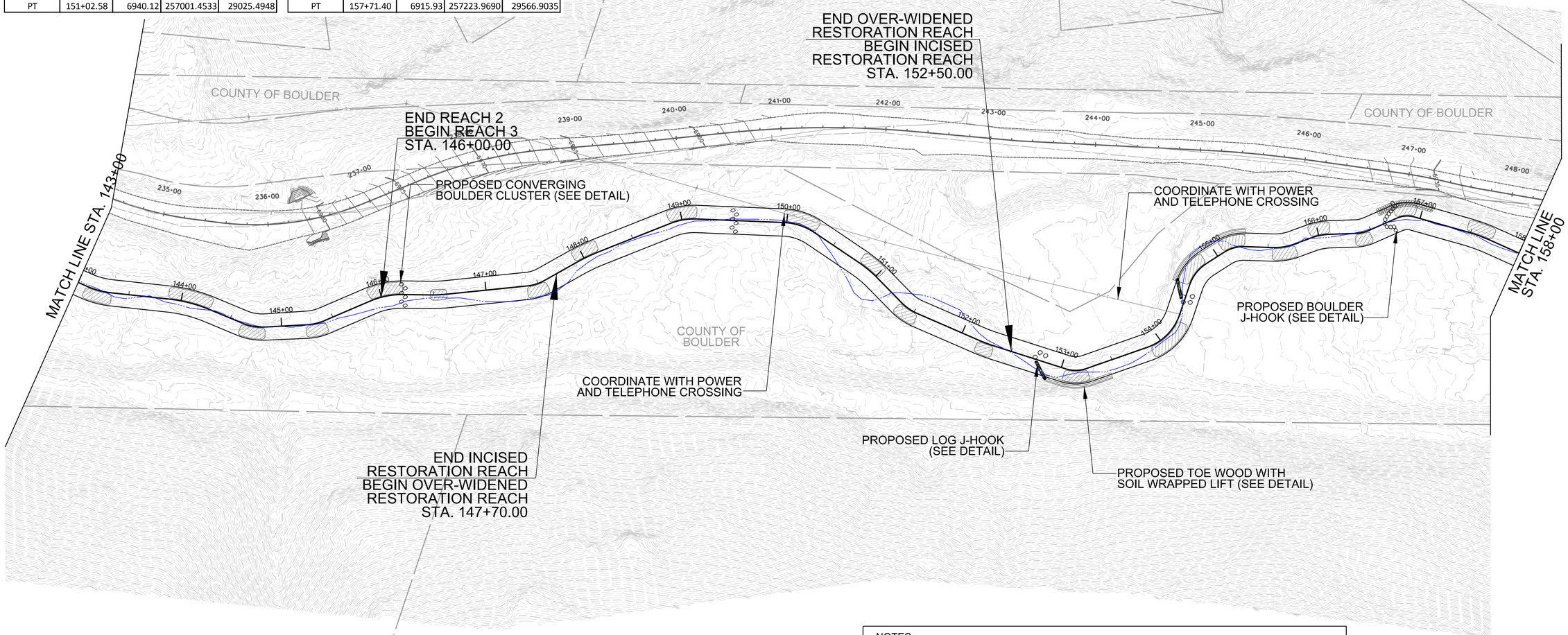

NOTES:
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UPPER FOURMILE CREEK STREAM RESTORATION PLAN VIEW

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SCALE (FT)

9/15/2016
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BAKER PROJECT REFERENCE NO.	SHEET NO.
138366	13

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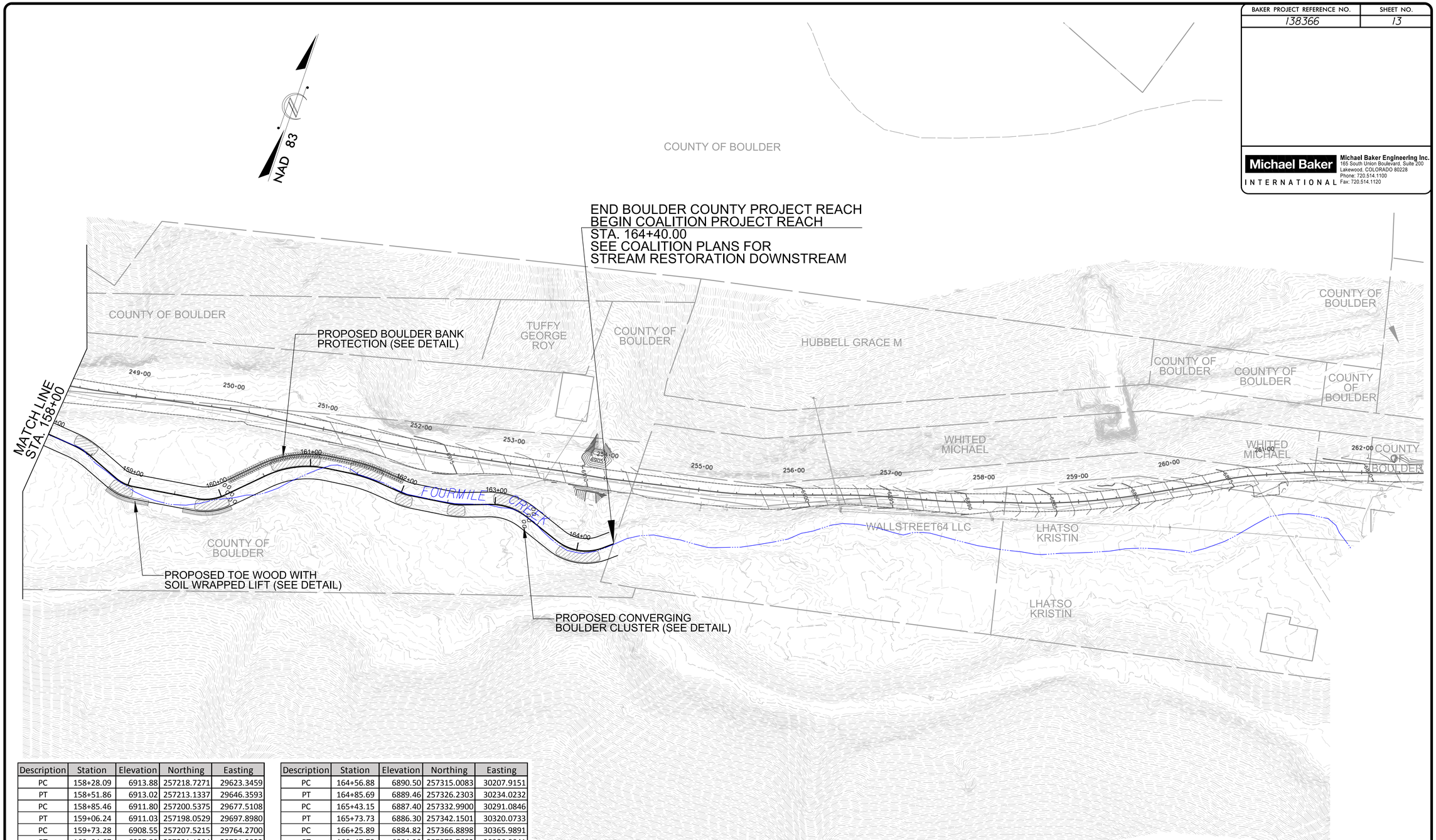

Description	Station	Elevation	Northing	Easting
PC	158+28.09	6913.88	257218.7271	29623.3459
PT	158+51.86	6913.02	257213.1337	29646.3593
PC	158+85.46	6911.80	257200.5375	29677.5108
PT	159+06.24	6911.03	257198.0529	29697.8980
PC	159+73.28	6908.55	257207.5215	29764.2700
PT	160+04.67	6907.39	257221.1204	29791.9922
PC	160+51.13	6905.67	257253.4757	29825.3329
PT	161+18.61	6903.18	257282.0656	29885.1535
PC	161+41.54	6902.33	257284.8396	29907.9152
PT	161+74.90	6901.10	257285.3419	29941.2023
PC	161+97.23	6900.27	257283.3105	29963.4421
PT	162+13.13	6899.65	257283.6196	29979.3036
PC	162+51.39	6898.15	257288.5827	30017.2489
PT	162+68.40	6897.49	257292.5721	30033.7433
PC	162+93.88	6896.49	257301.1808	30057.7324
PT	163+37.17	6894.80	257301.2142	30100.1670
PC	163+76.37	6893.39	257288.0316	30137.0838
PT	164+28.23	6891.53	257296.6877	30185.8968

Description	Station	Elevation	Northing	Easting
PC	164+56.88	6890.50	257315.0083	30207.9151
PT	164+85.69	6889.46	257326.2303	30234.0232
PC	165+43.15	6887.40	257332.9900	30291.0846
PT	165+73.73	6886.30	257342.1501	30320.0733
PC	166+25.89	6884.82	257366.8898	30365.9891
PT	166+47.79	6884.20	257372.7682	30386.9041
PC	167+52.79	6881.22	257378.4122	30491.7459
PT	167+91.39	6880.12	257391.5002	30527.4597
PC	168+43.29	6878.65	257422.8582	30568.8156
PT	168+73.13	6877.80	257432.9523	30596.4318
PC	169+14.22	6876.58	257435.0920	30637.4617
PT	169+28.41	6876.16	257439.3726	30650.8271
PC	169+76.48	6874.74	257465.2250	30691.3563
PT	170+03.54	6873.94	257476.4784	30715.8662
PC	170+45.27	6872.70	257488.5334	30755.8181
PT	171+00.26	6871.07	257515.8327	30802.9914
PC	171+48.79	6869.64	257549.1272	30838.2913
PT	172+37.17	6867.02	257557.4912	30920.0791

NOTES:
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UPPER FOURMILE CREEK STREAM RESTORATION PLAN VIEW

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SCALE (FT)

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BAKER PROJ. REFERENCE NO.	SHEET NO.
138366	P-1

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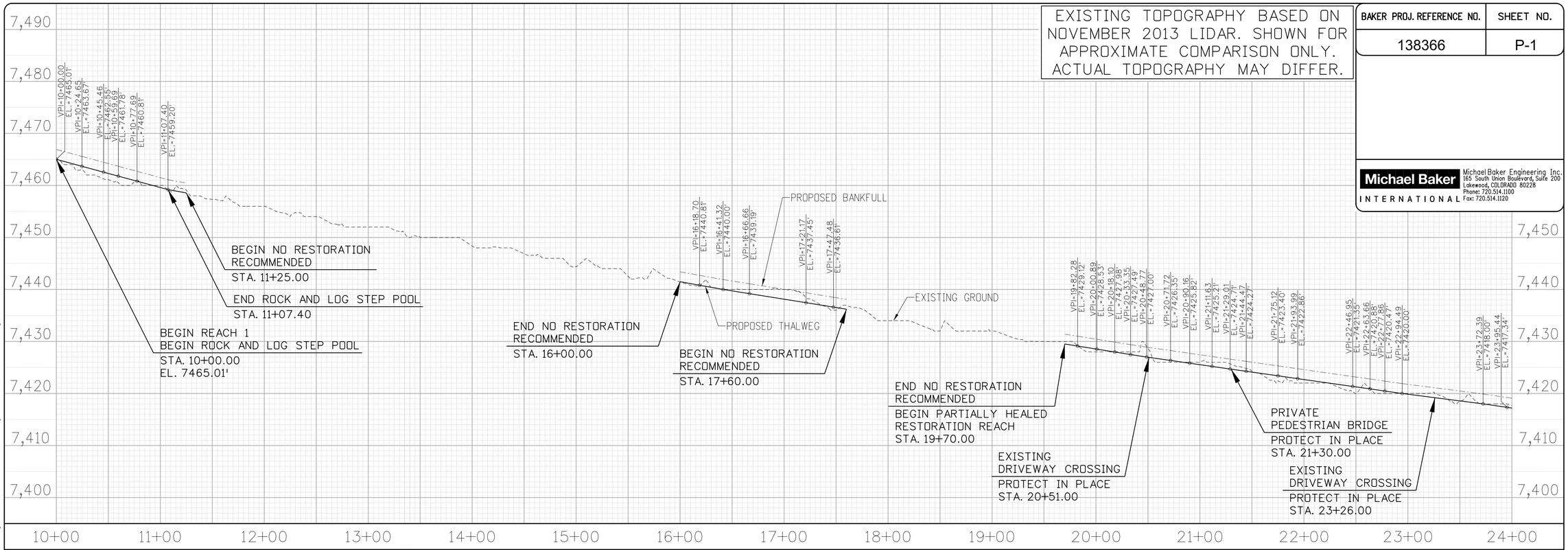

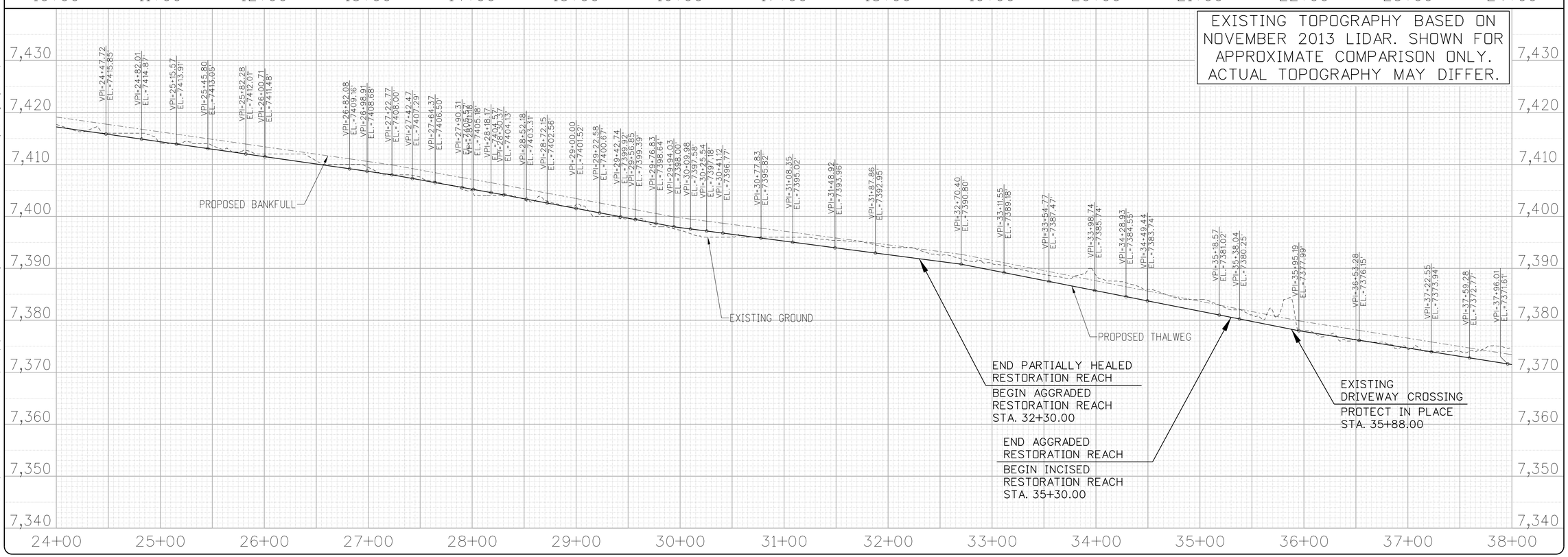

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138366	P-2

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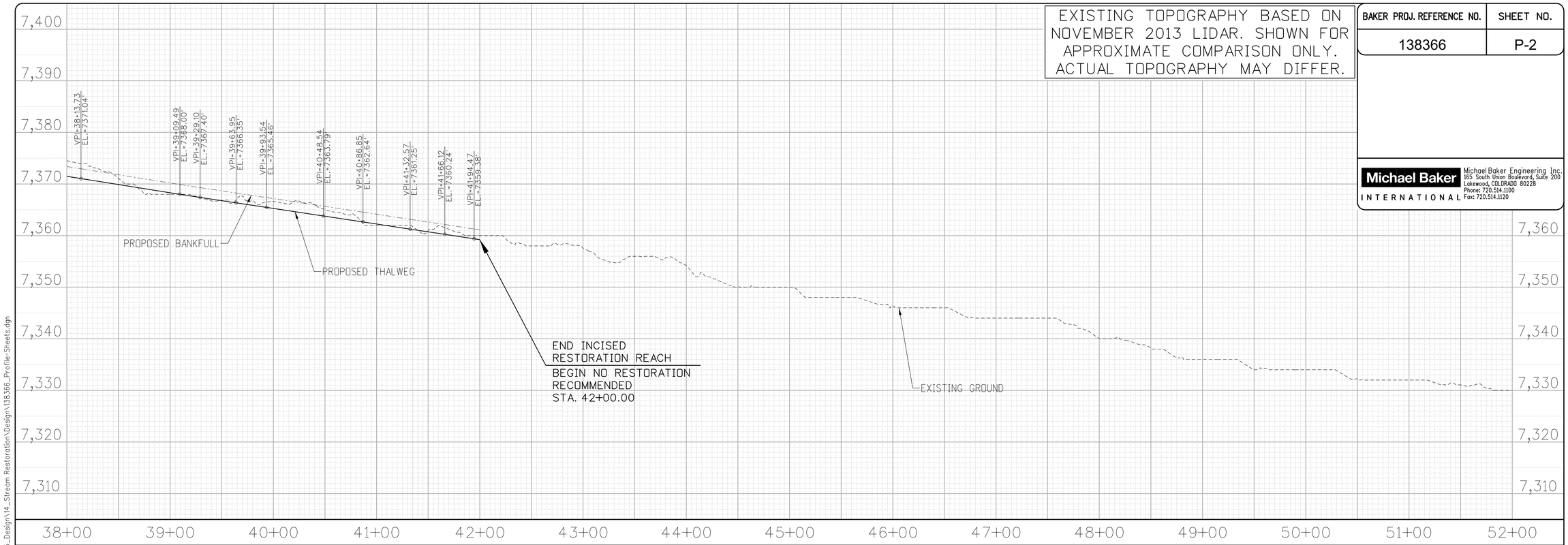

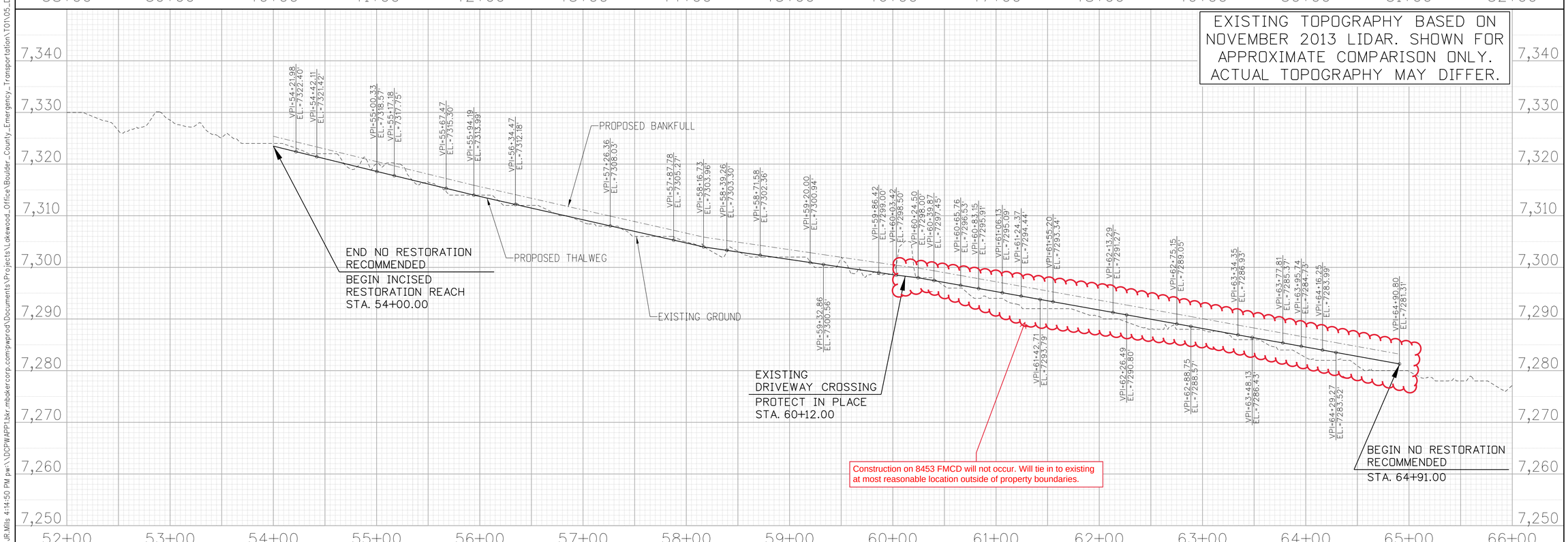

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138366	P-3

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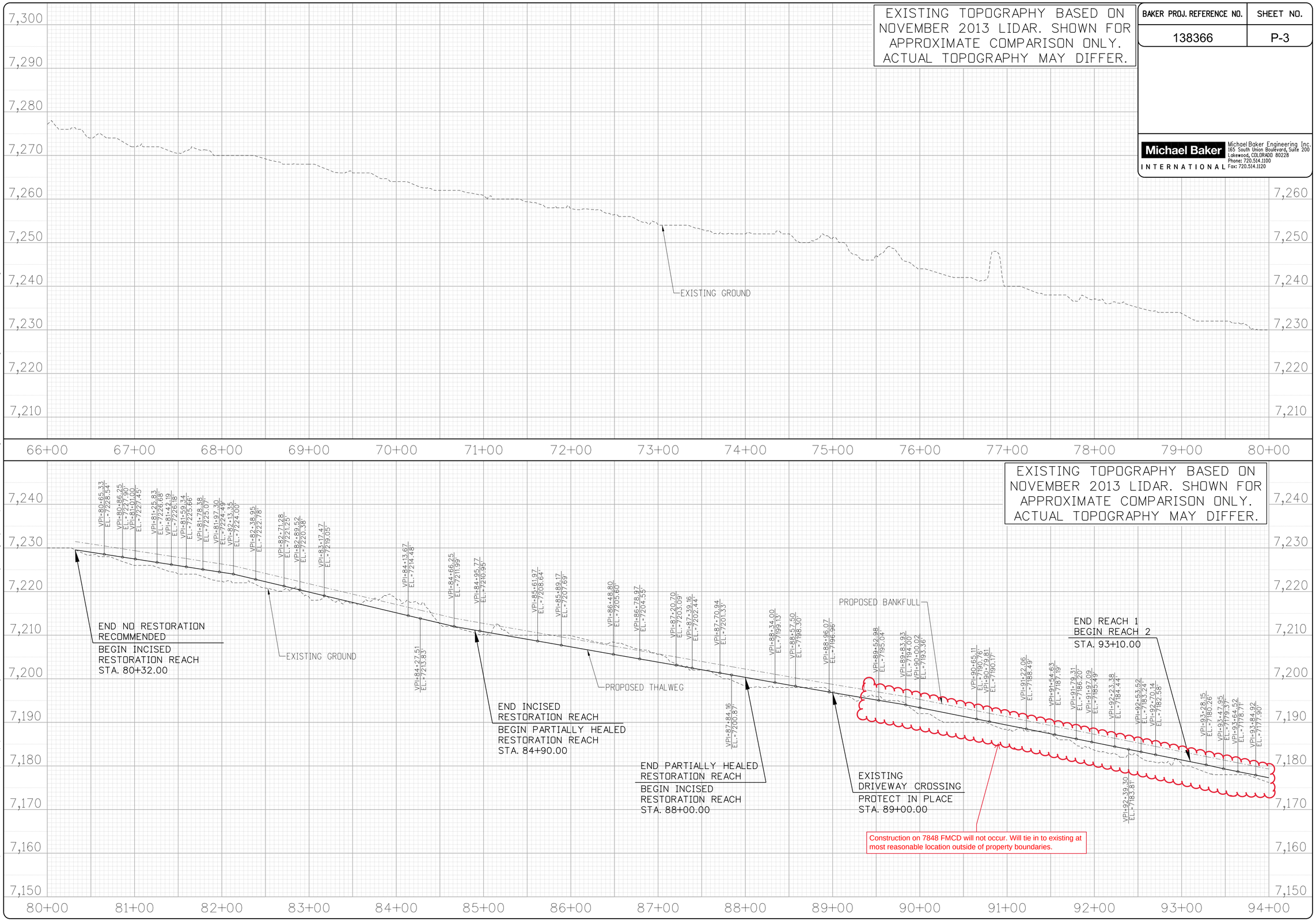

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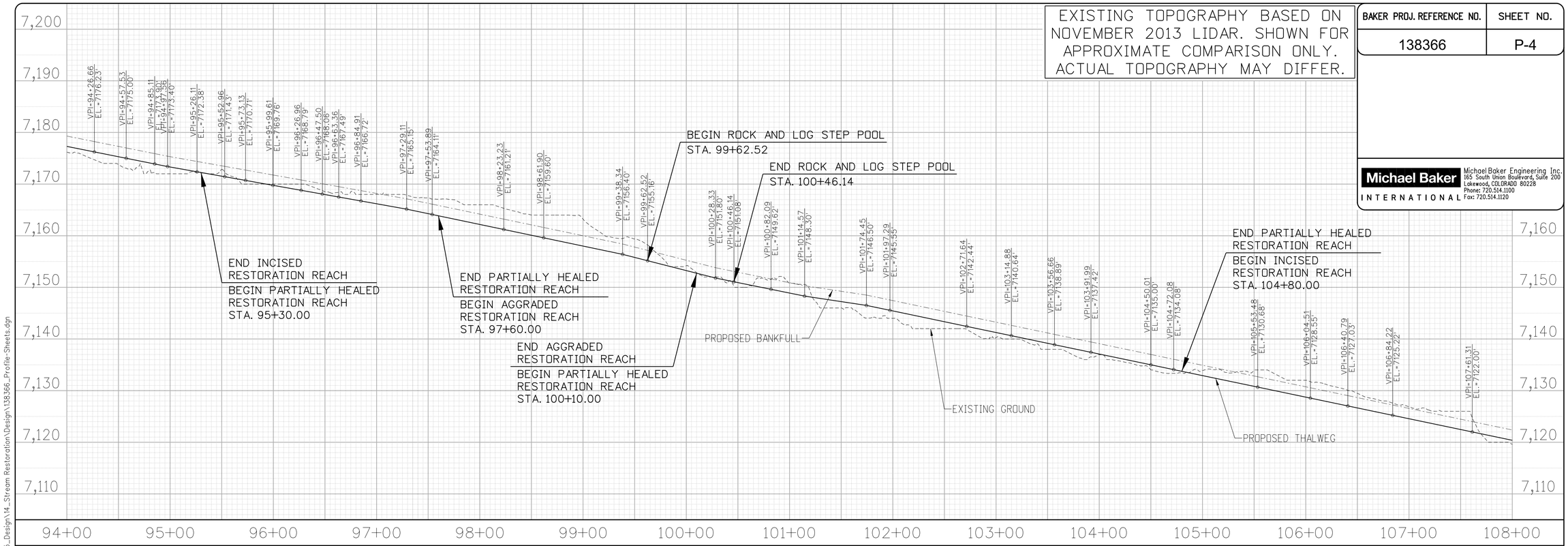

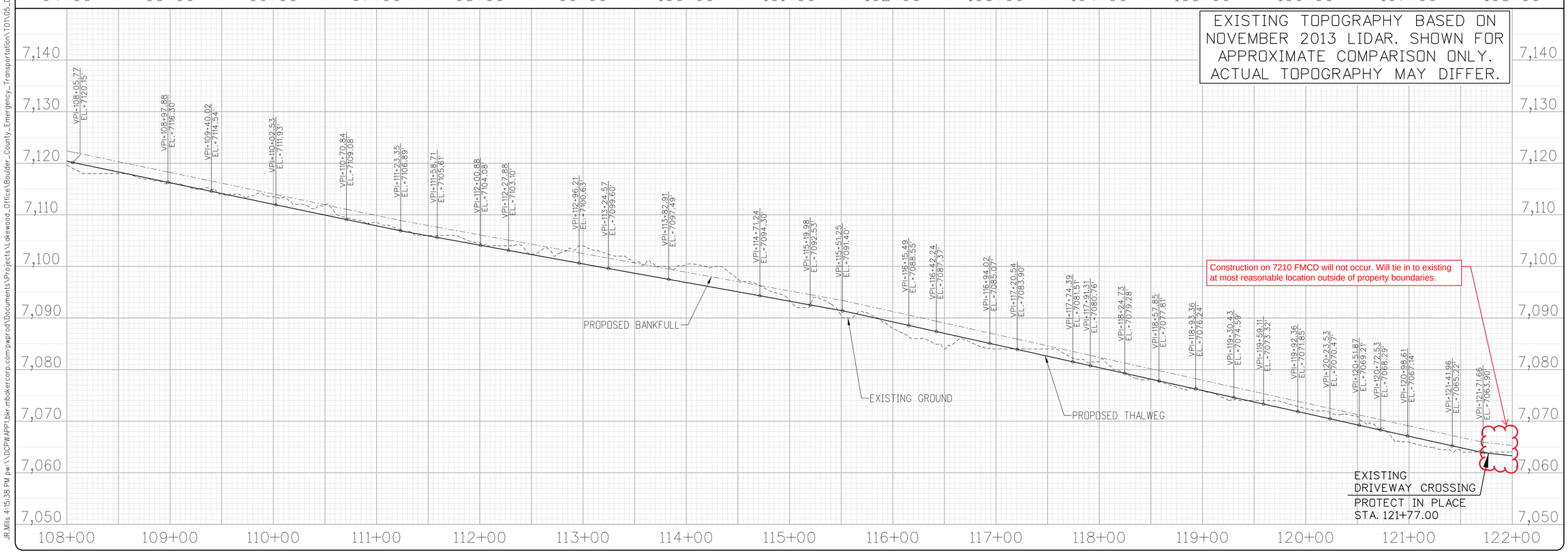

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138366	P-5

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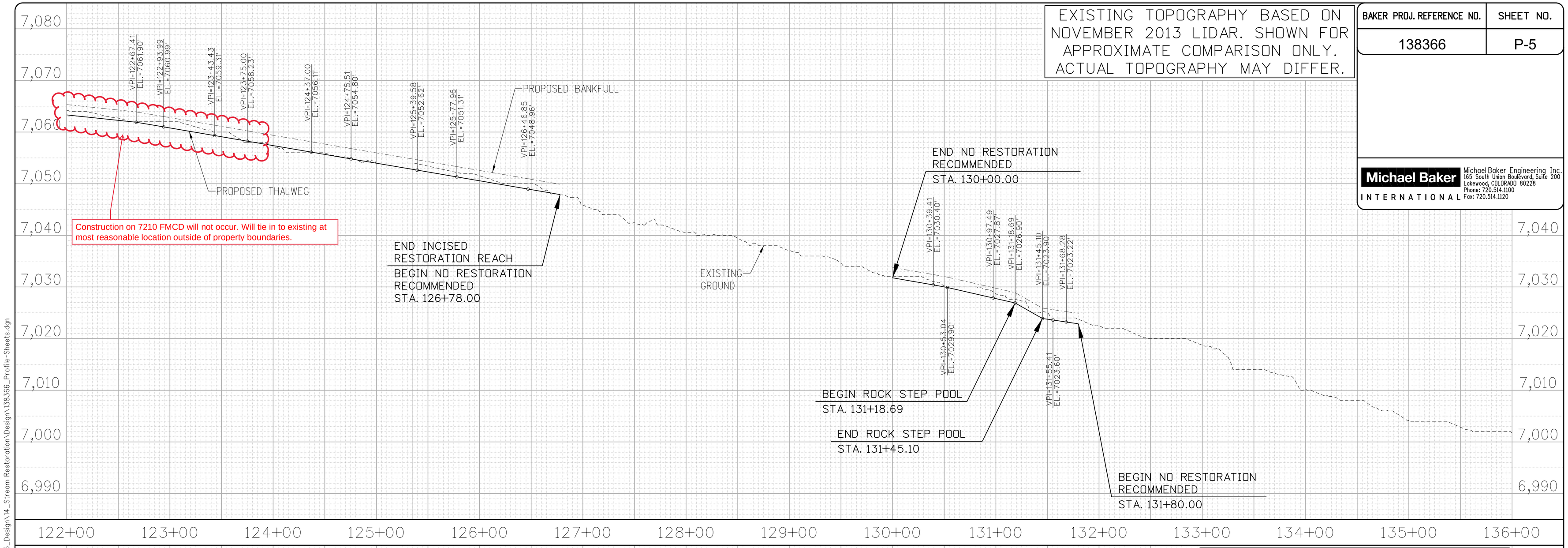

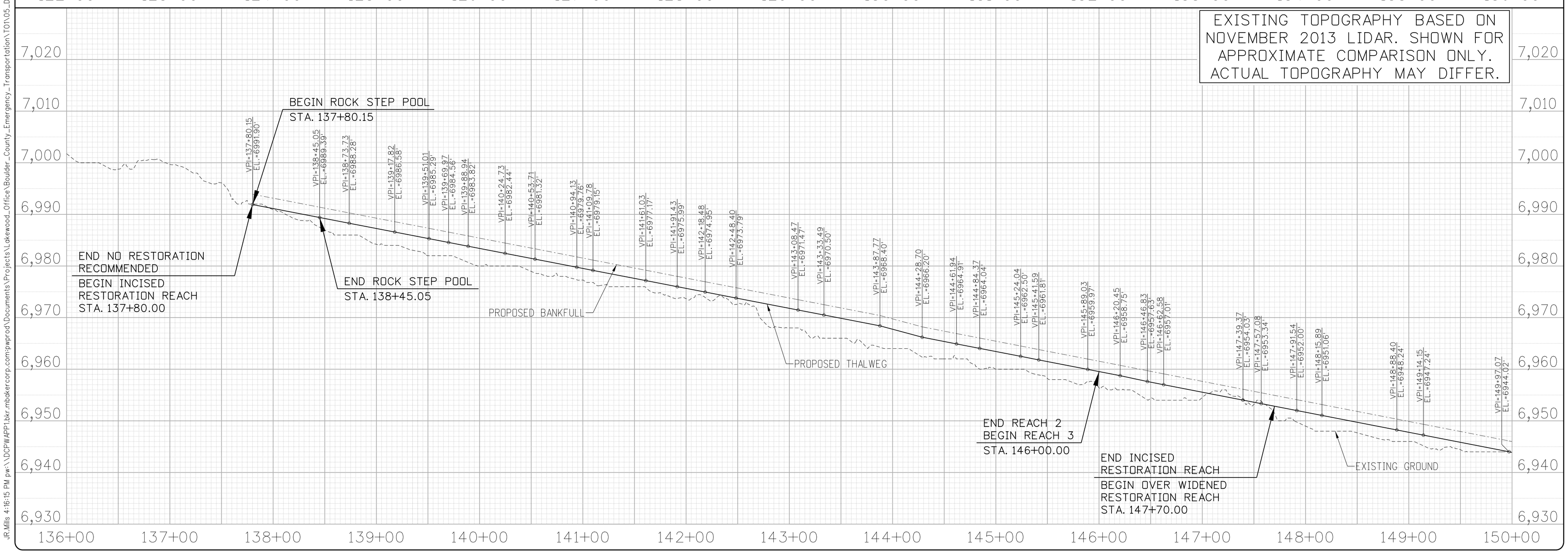

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138366	P-6

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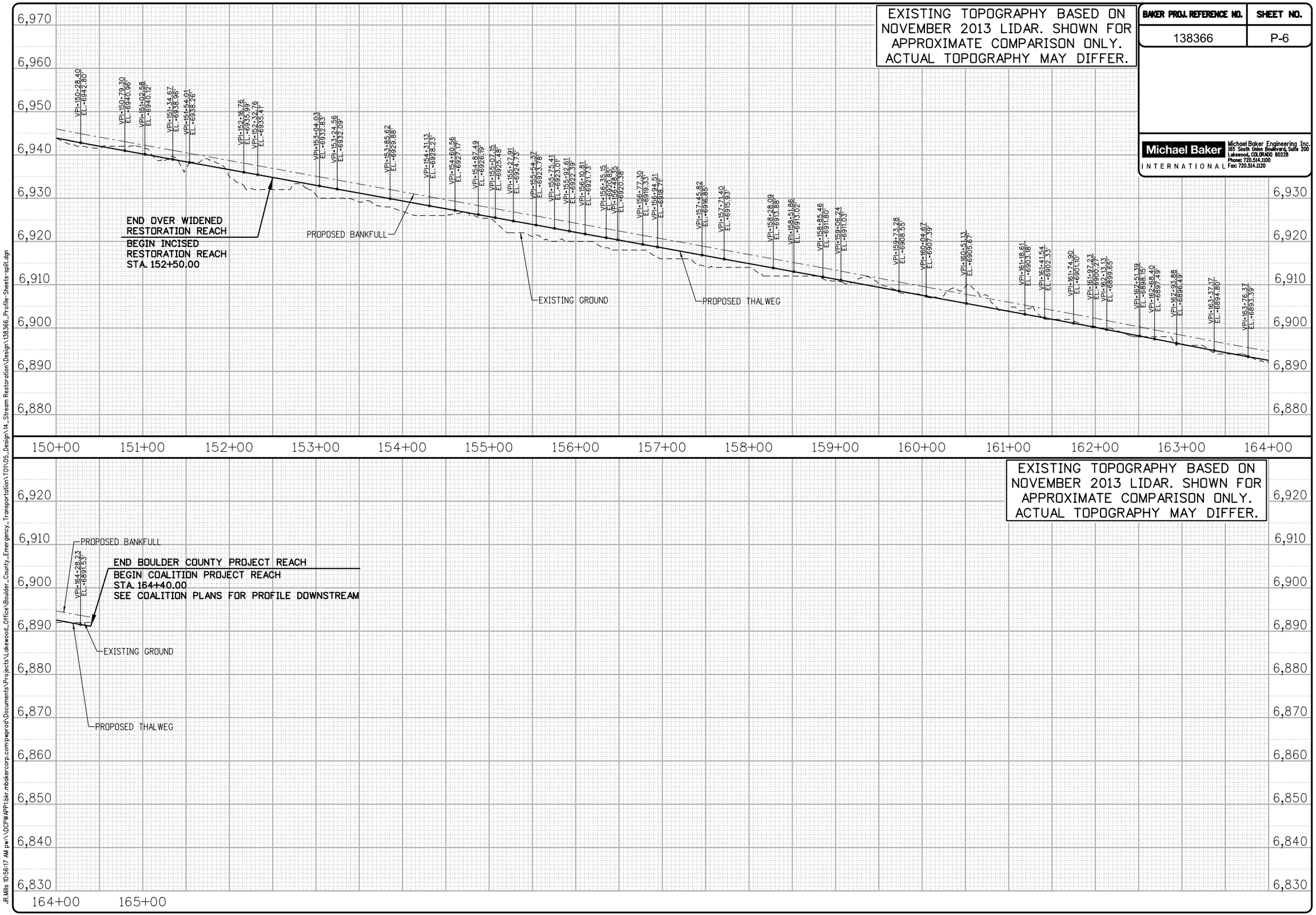

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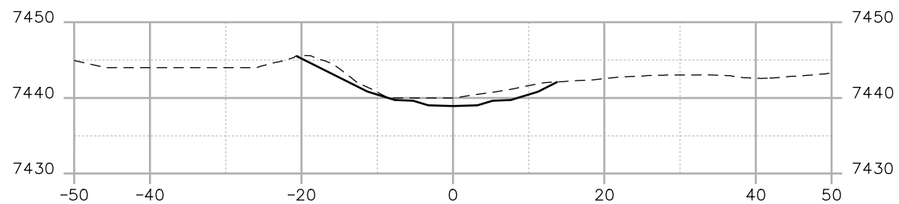
NOTE: CROSS SECTION VIEWS SHOW APPROXIMATE GRADING REQUIRED TO TIE-IN TO EXISTING GROUND ELEVATIONS. REFER TO TYPICAL RIFFLE, POOL AND BANKFULL BENCH CROSS SECTIONS DETAIL FOR DETAILED CHANNEL DIMENSIONS.

BAKER PROJ. REFERENCE NO.	SHEET NO.
138366	X-1



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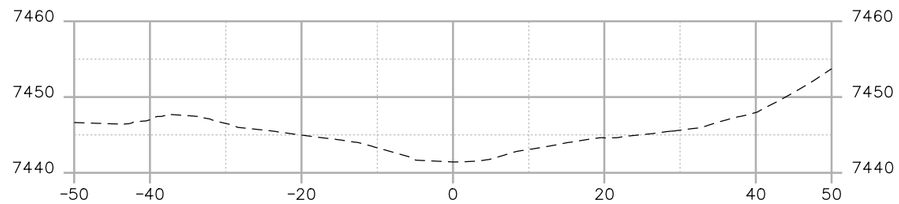

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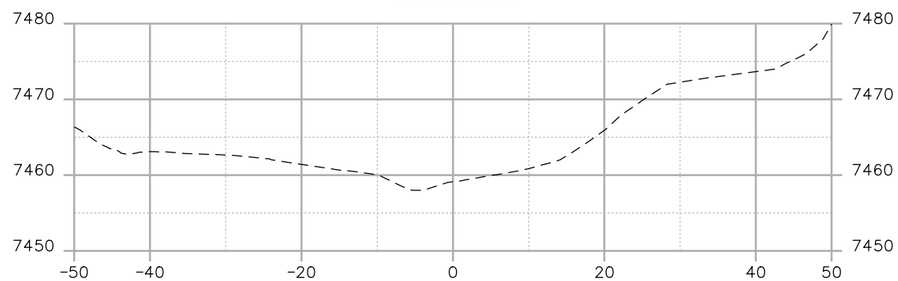

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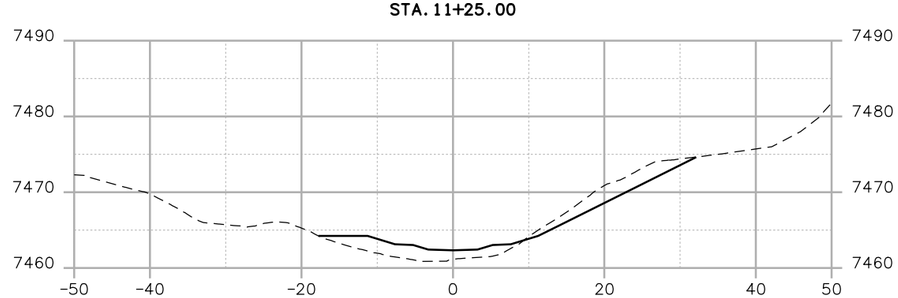

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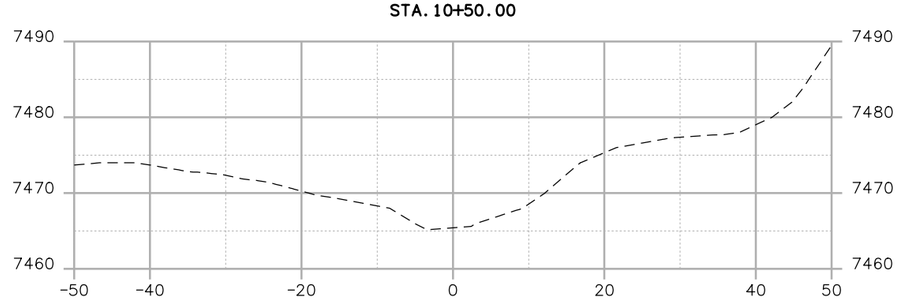

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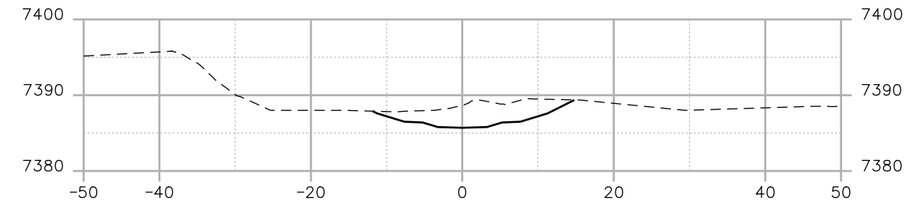

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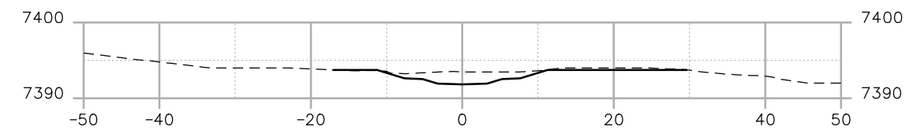

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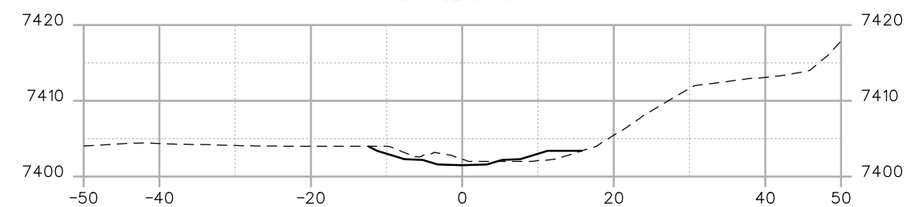

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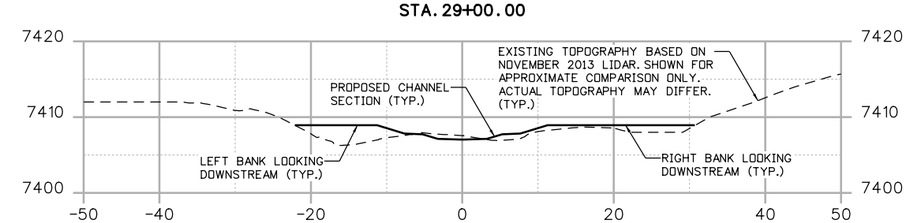

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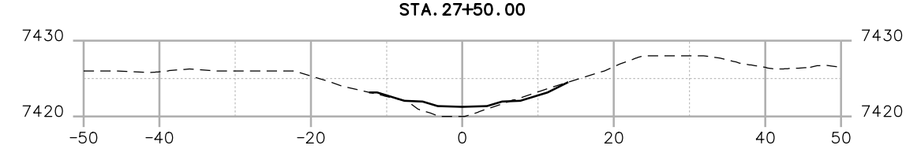

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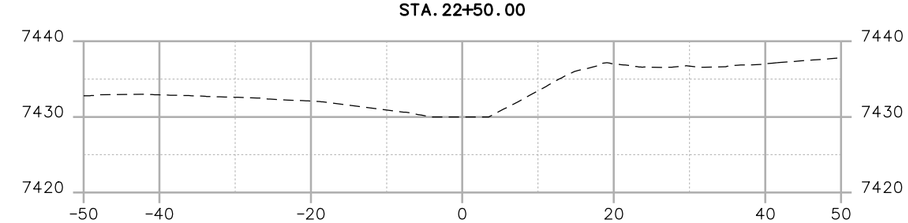

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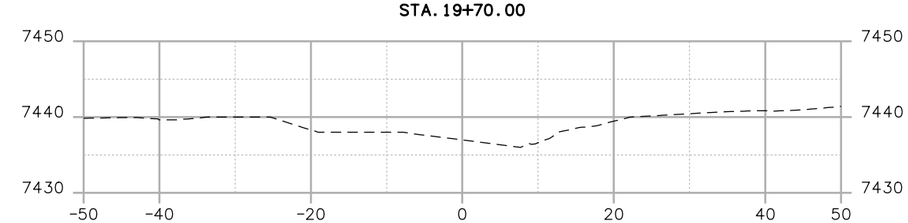

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BAKER PROJ. REFERENCE NO.	SHEET NO.
138366	X-2

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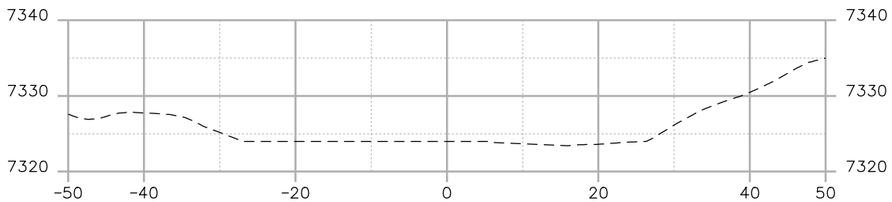
NOTE: CROSS SECTION VIEWS SHOW APPROXIMATE GRADING REQUIRED TO TIE-IN TO EXISTING GROUND ELEVATIONS. REFER TO TYPICAL RIFFLE, POOL AND BANKFULL BENCH CROSS SECTIONS DETAIL FOR DETAILED CHANNEL DIMENSIONS.



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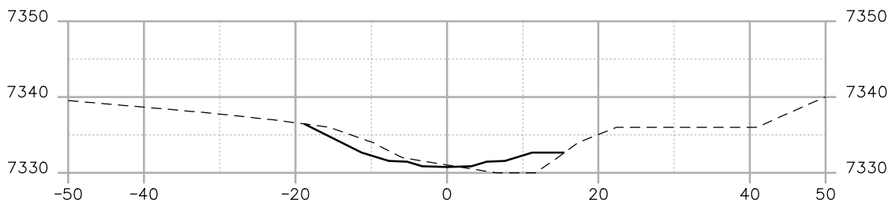

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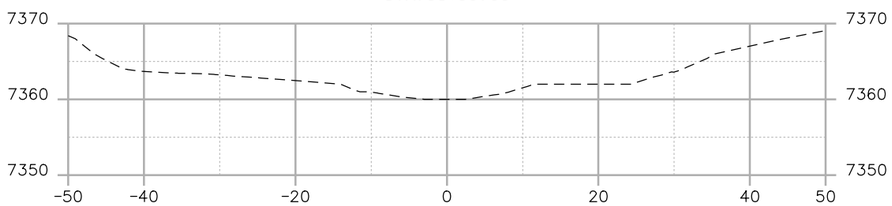

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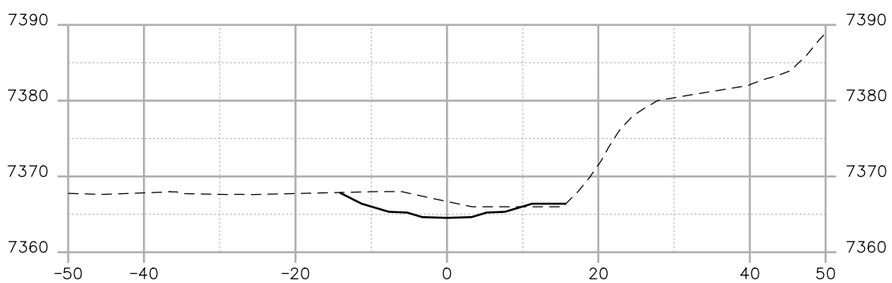

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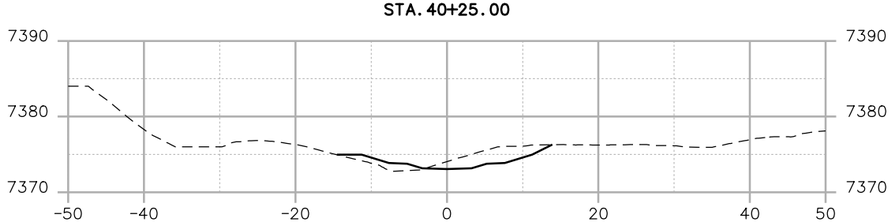

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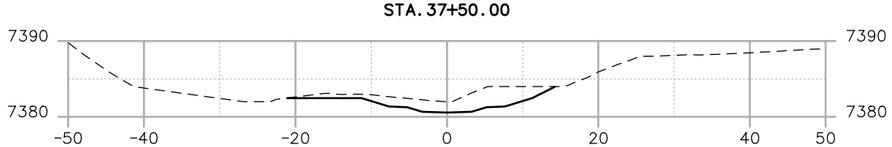

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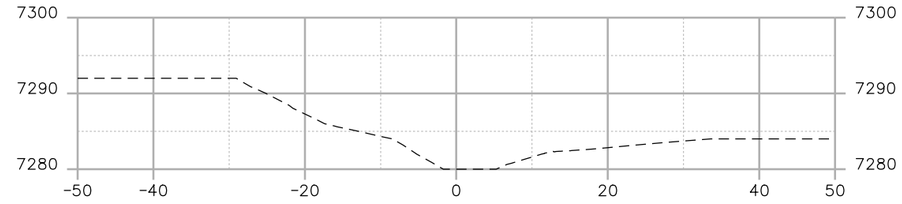

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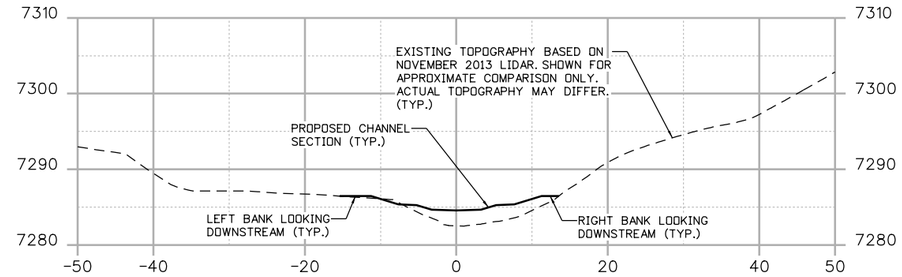

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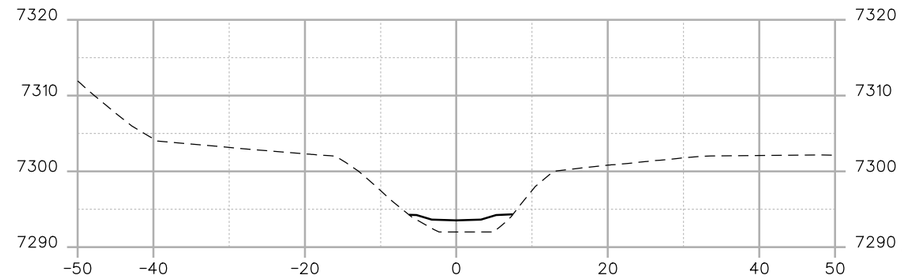

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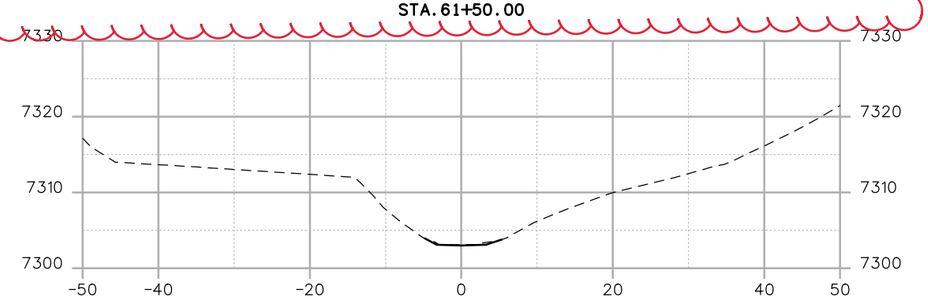

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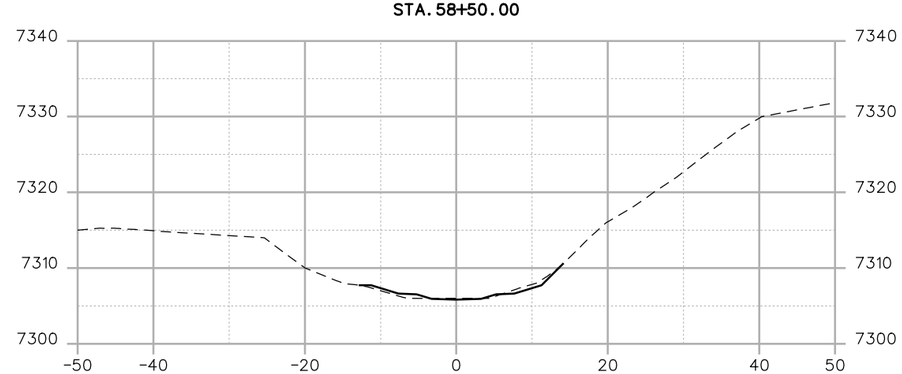

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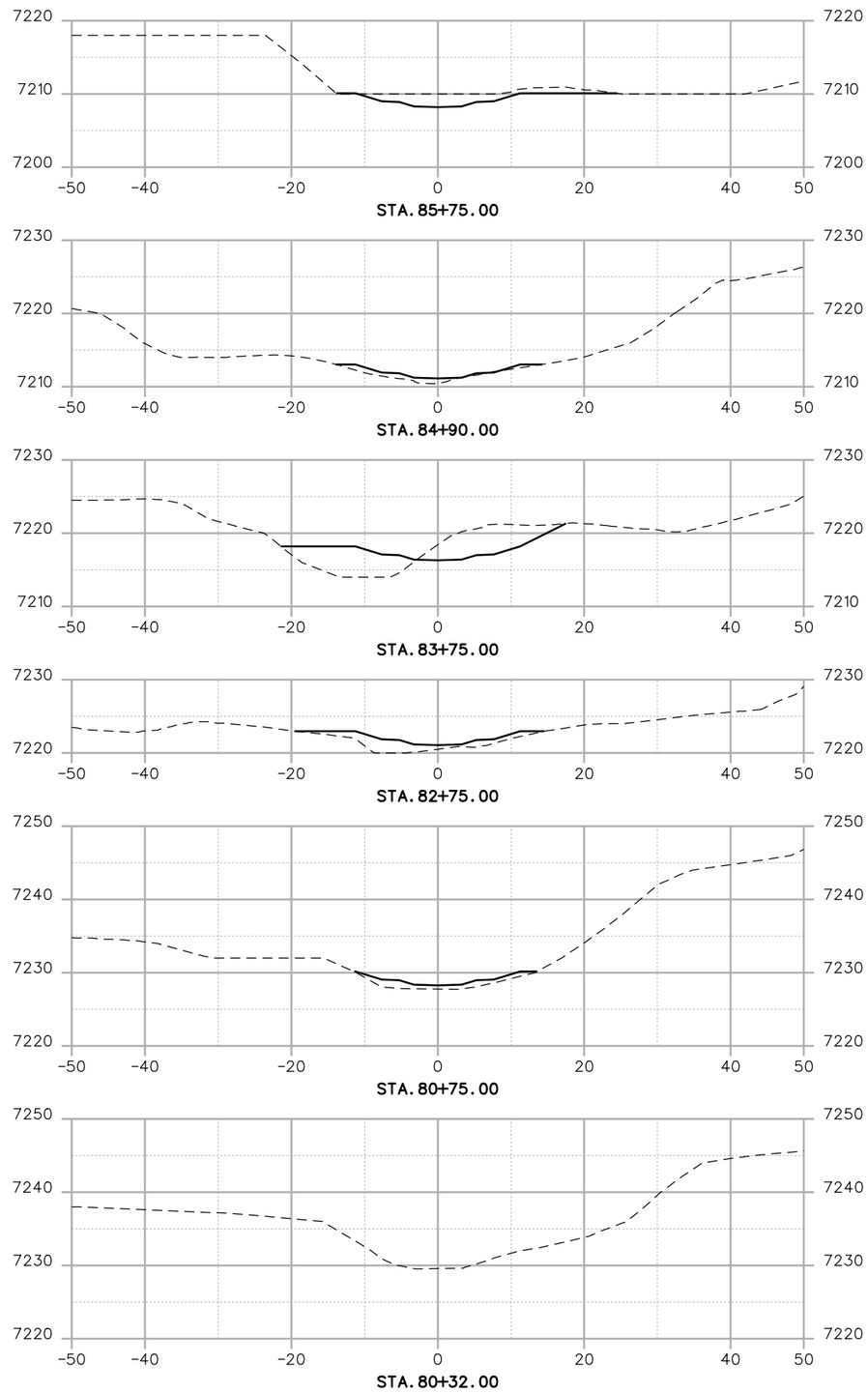
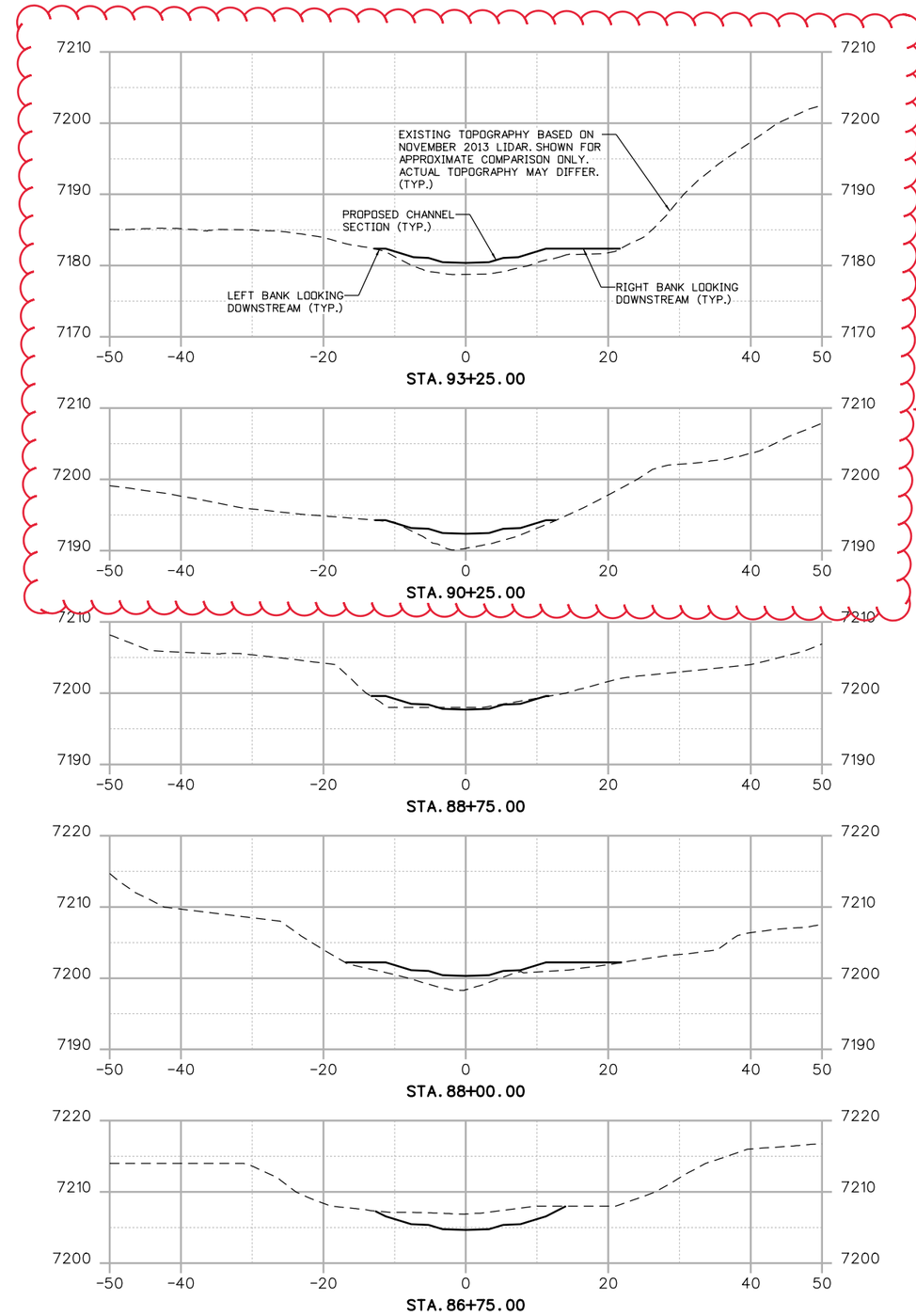
BAKER PROJ. REFERENCE NO.	SHEET NO.
138366	X-3

NOTE: CROSS SECTION VIEWS SHOW APPROXIMATE GRADING REQUIRED TO TIE-IN TO EXISTING GROUND ELEVATIONS. REFER TO TYPICAL RIFFLE, POOL AND BANKFULL BENCH CROSS SECTIONS DETAIL FOR DETAILED CHANNEL DIMENSIONS.





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BAKER PROJ. REFERENCE NO.	SHEET NO.
138366	X-4

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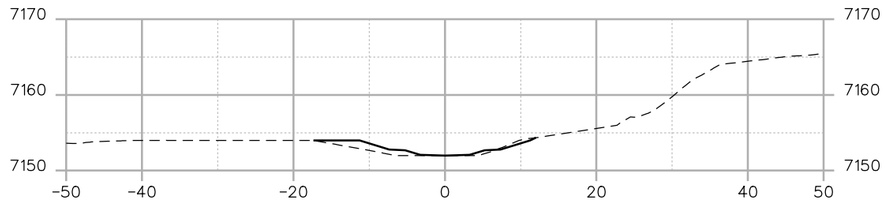
NOTE: CROSS SECTION VIEWS SHOW APPROXIMATE GRADING REQUIRED TO TIE-IN TO EXISTING GROUND ELEVATIONS. REFER TO TYPICAL RIFFLE, POOL AND BANKFULL BENCH CROSS SECTIONS DETAIL FOR DETAILED CHANNEL DIMENSIONS.



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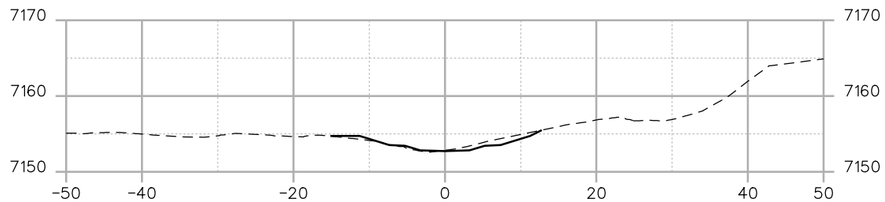

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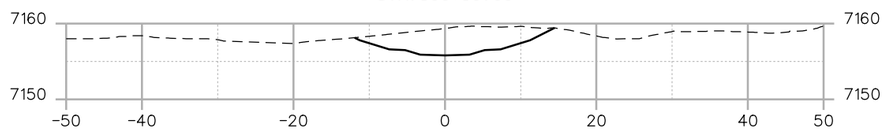

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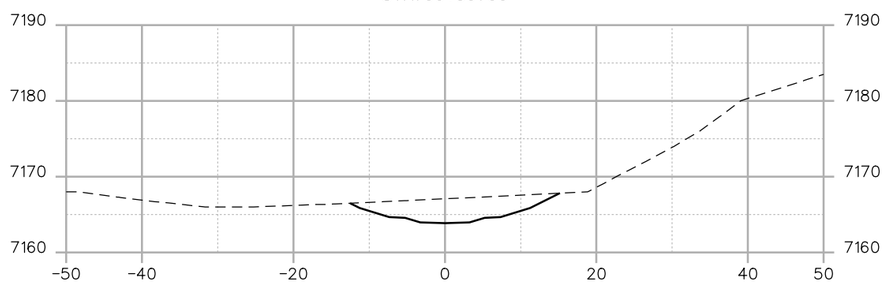

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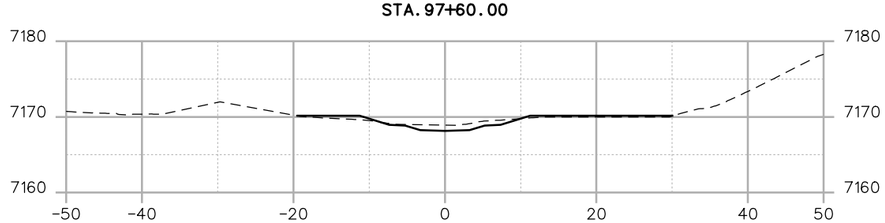

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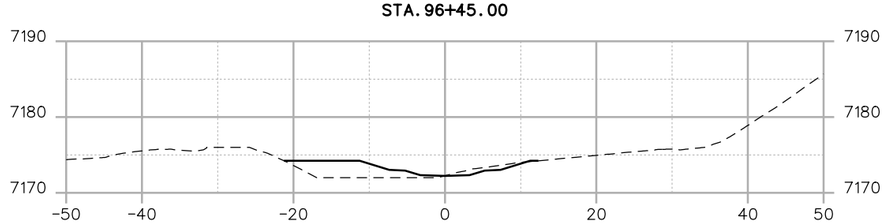

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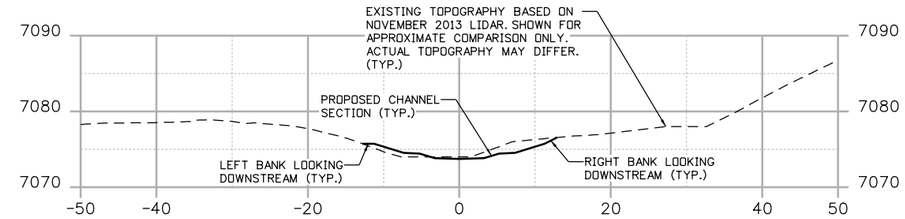

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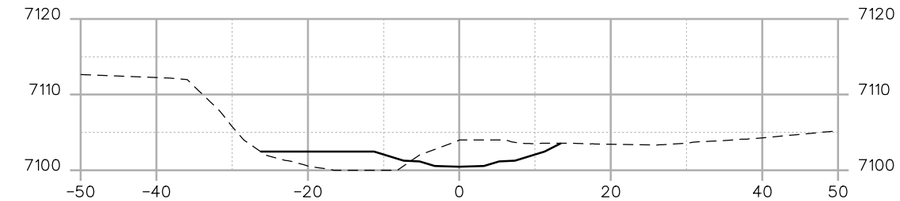
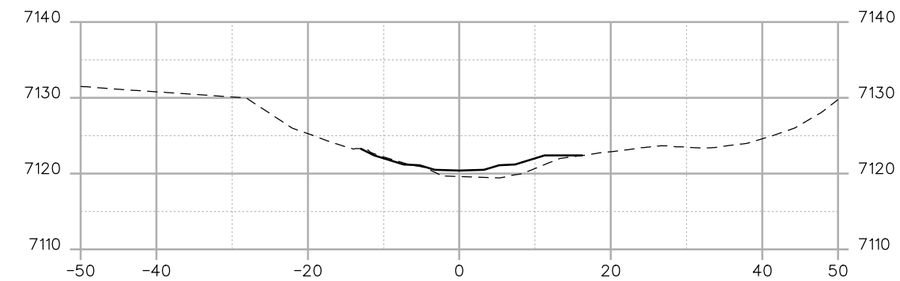


STA. 113+00.00



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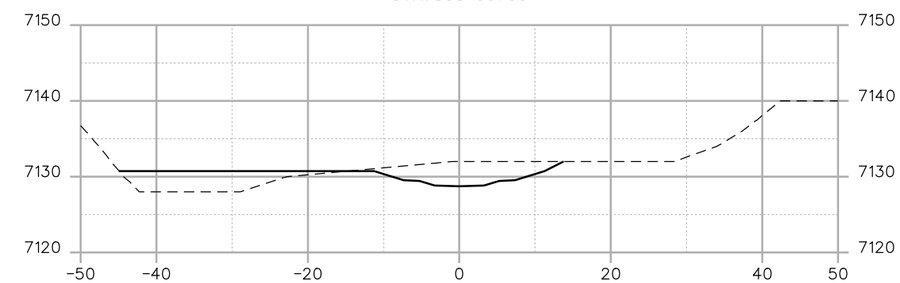

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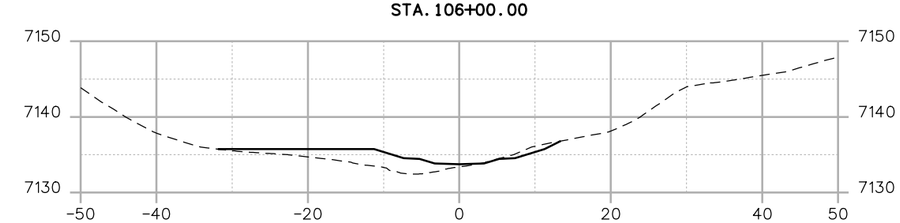

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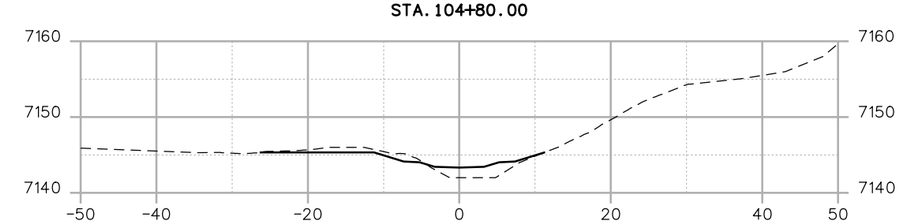

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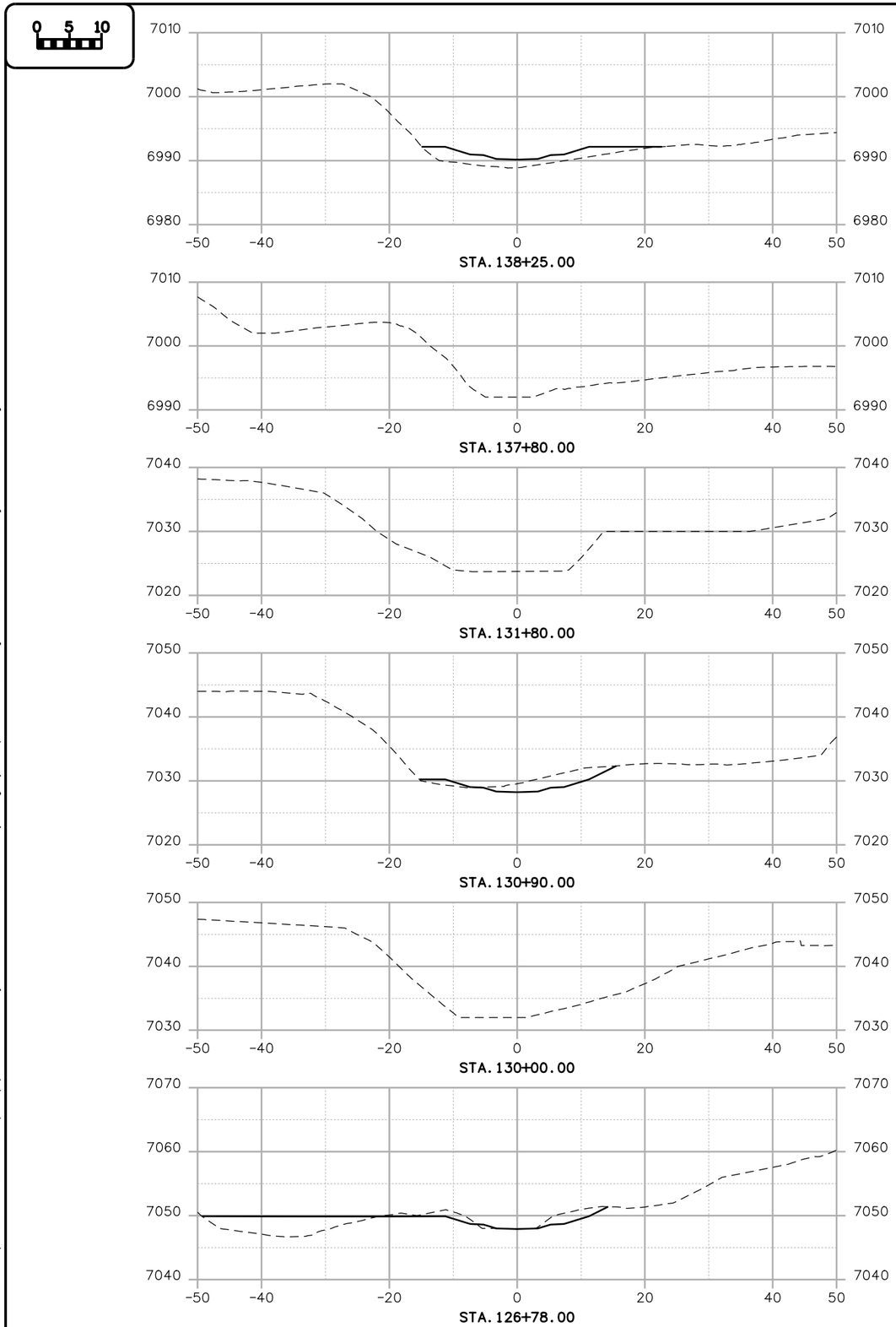
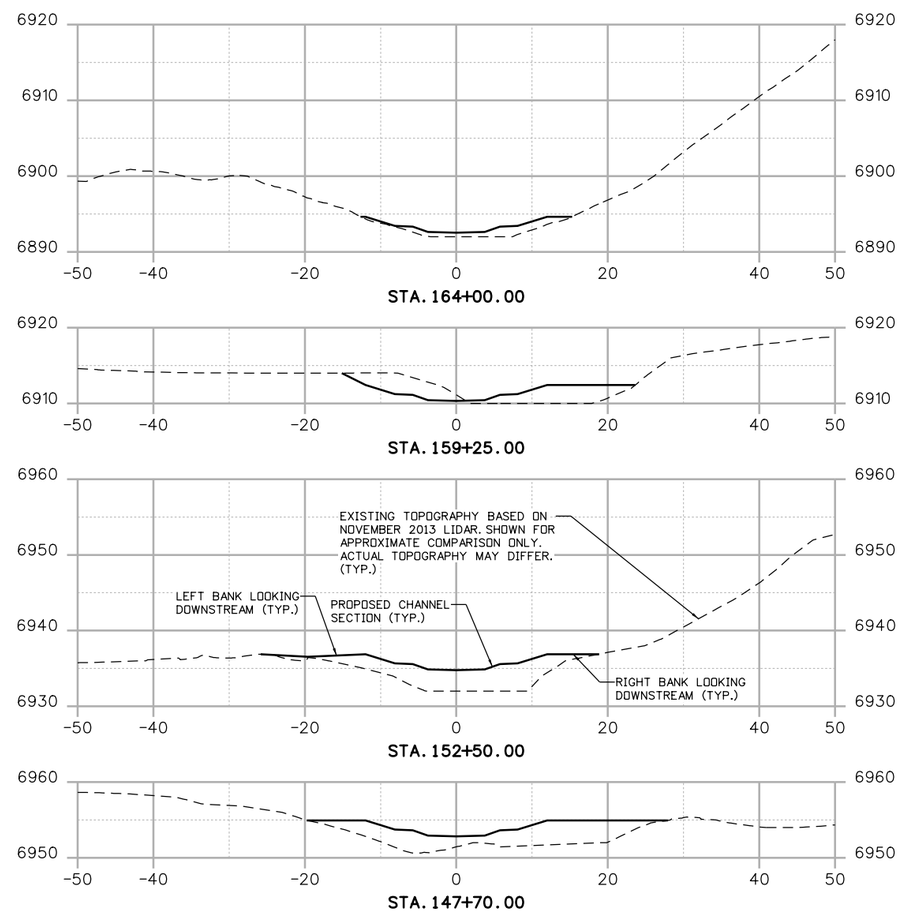
BAKER PROJ. REFERENCE NO.	SHEET NO.
138366	X-5

NOTE: CROSS SECTION VIEWS SHOW APPROXIMATE GRADING REQUIRED TO TIE-IN TO EXISTING GROUND ELEVATIONS. REFER TO TYPICAL RIFFLE, POOL AND BANKFULL BENCH CROSS SECTIONS DETAIL FOR DETAILED CHANNEL DIMENSIONS.





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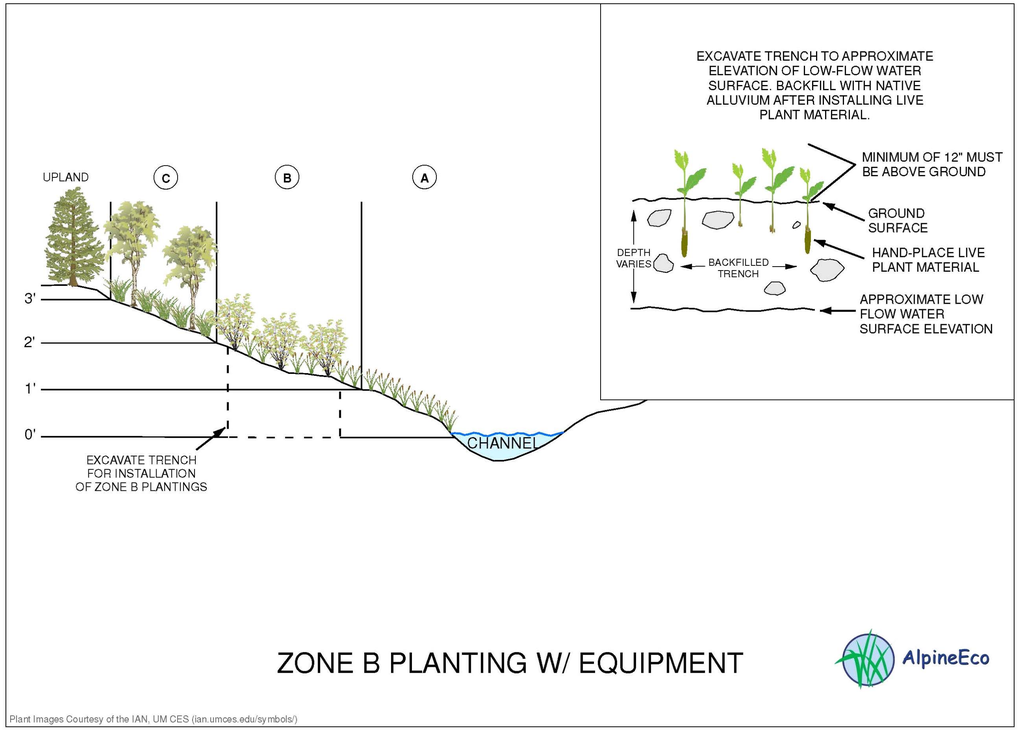
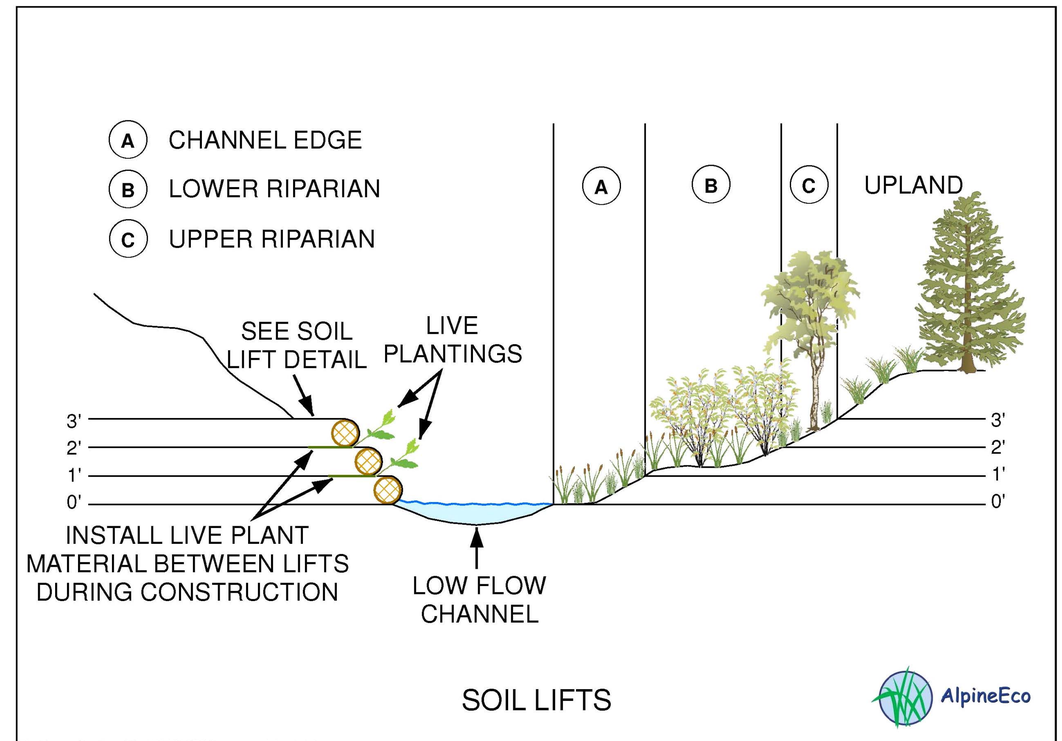
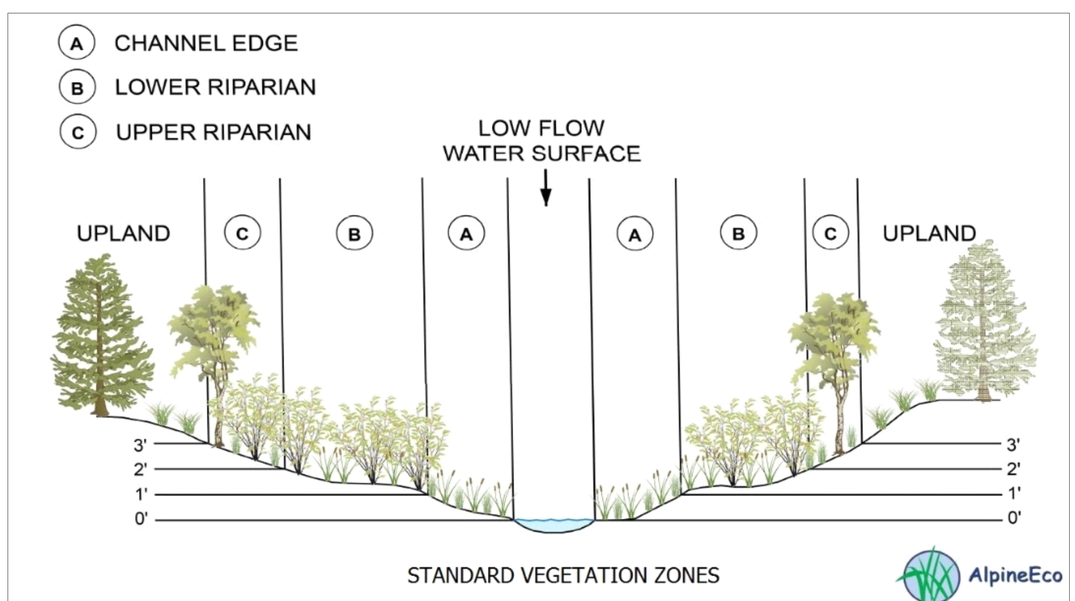
BAKER PROJECT REFERENCE NO.	SHEET NO.
138366	20

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
165 South Union Boulevard, Suite 200
Lakewood, COLORADO 80228
Phone: 720.514.1100
Fax: 720.514.1120







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UPPER FOURMILE CREEK STREAM RESTORATION REVEGETATION PLAN

Michael Baker INTERNATIONAL
Michael Baker Engineering Inc.
165 South Union Boulevard, Suite 200
Lakewood, COLORADO 80228
Phone: 720.514.1100
Fax: 720.514.1120

Table 1: Plants Needed for Standard Restoration[1]

Common Name	Scientific Name	Plant Size (cubic inch)	Plants per Acre
Zone A: Channel Edge[2]			
Bluejoint	*Calamagrostis canadensis*	10	750
Nebraska sedge	*Carex nebrascensis*	10	1,500
Woolly sedge	*Carex pellita*	10	1,000
Creeping spikerush	*Eleocharis palustris*	10	1,000
Baltic rush	*Juncus balticus*	10	1,000
Red-tinge bulrush	*Scirpus microcarpus*	10	750
		Total	**6,000**
Zone B: Lower Riparian[2]			
Thinleaf alder	*Alnus incana*	40	1,000
Water birch	*Betula occidentalis*	40	750
Redosier dogwood	*Cornus alba*	40	750
Mixed cottonwood/willow alder	*Populus/Salix/Alnus spp.*	Transplant	As available
Narrowleaf cottonwood	*Populus angustifolia*	40	1,250
Narrowleaf cottonwood	*Populus angustifolia*	5' cutting	2,000
Mixed willow	*Salix spp.*	5' cutting	2,000
Narrowleaf willow	*Salix exigua*	40	1,250
Dewystem willow	*Salix irrorata*	40	1,000
		Total	**10,000**
Zone C: Upper Riparian[3]			
Narrowleaf cottonwood	*Populus angustifolia*	40	350
Chokecherry	*Prunus virginiana*	40	250
Common snowberry	*Symphoricarpos alba*	40	250
White-stem gooseberry	*Ribes inerme*	40	200
Woods' rose	*Rosa woodsii*	40	350
		Total	**1,400**

[1]Zone A is 0-1', Zone B is 1-2', and Zone C is 2-3' above the water surface of the low-flow channel; exact planting locations will be based on final grading and directed by a qualified ecologist; plant nomenclature from Corps 2016
[2]Quantity of containerized stock based on approximately 3-foot centers. Wherever possible, Zone B plants will be installed in a trench (excavated using earthmoving equipment) parallel to the channel located at approximately the edge of the bankfull channel; the bottom of the trench will be approximately the elevation of the low-flow water surface; mixed willow will be harvested from Boulder County (or adjacent counties) within 1,000 vertical feet (see notes); all plants randomly mixed; plant nomenclature from Corps 2016
[3]Based on approximately 6-foot centers

Table 2: Plants Needed for Rootwads/Channel Blocks[1]

Common Name	Scientific Name	Plant Size (cubic inch)	Plants per Rootwad
Zone A: Channel Edge			
Nebraska sedge	*Carex nebrascensis*	10	75
Creeping spikerush	*Eleocharis palustris*	10	75
Red-tinge bulrush	*Scirpus microcarpus*	10	75
		Total	**225**
Zone B: Lower Riparian			
Thinleaf alder	*Alnus incana*	40	5
Water birch	*Betula occidentalis*	40	5
Narrowleaf cottonwood	*Populus angustifolia*	40	5
Narrowleaf cottonwood	*Populus angustifolia*	5' cutting	50
Mixed willow	*Salix spp.*	5' cutting	50
Mixed riparian shrub	--	transplant	as available
Narrowleaf willow	*Salix exigua*	40	5
Dewystem willow	*Salix irrorata*	40	5
		Total	**125**

[1]Zone A is 0-1' and Zone B is 1-2' above the water surface of the low-flow channel; exact planting locations will be based on final grading and directed by a qualified ecologist; mixed willow will be harvested from Boulder County (or adjacent counties) within 1,000 vertical feet (see notes); plant nomenclature from Corps 2016

Table 3: Plants Needed for Soil Lifts[1]

Common Name	Scientific Name	Plant Size (cubic inch)	Plants per Linear Foot
Zone A: Channel Edge[2]			
Nebraska sedge	*Carex nebrascensis*	10	3
Woolly sedge	*Carex pellita*	10	3
		Total	**6**
Zone B: Lower Riparian[3]			
Mixed willow	*Salix spp.*	5' cutting	6
		Total	**6**

[1]Plant nomenclature from Corps 2016
[2]Zone A plants only placed between lifts that are within 1 foot (vertical) of the low-flow water surface elevation; species not mixed, a minimum of 16 linear feet of each species
[3]Zone B plants only placed between lifts that are 1 to 2 feet (vertical) above the low-flow water surface elevation; mixed willow will be harvested from Boulder County (or adjacent counties) within 1,000 vertical feet (see notes).

Table 4: Riparian Seed Mix[1]

Type	Common Name	Scientific Name	Variety[2]	Seeds per Pound[2]	Seeds per Square Foot	Pounds of Pure Live Seed/Acre
Graminoids	Sideoats grama	*Bouteloua curtipendula*	Butte or Pierre	191,000	5.3	1.2
	Blue grama[3]	*Bouteloua gracilis*[3]	Birds Eye, Alma, or Lovington	825,000	11.4	0.6
	Slender wheatgrass	*Elymus trachycaulus*	White River or San Luis	159,000	4.4	1.2
	Idaho fescue[3]	*Festuca idahoensis*[3]	Winchester	450,000	8.3	0.8
	Fowl mannagrass	*Glyceria striata*	-	180,000	8.3	2.0
	Needle and thread	*Hesperostipa comata*	-	115,000	5.3	2.0
	Prairie junegrass[3]	*Koeleria macrantha*[3]	-	2.3 million	5.3	0.1
	Baltic rush[3]	*Juncus balticus*[3]	-	10.9 million	25.0	0.1
	Torrey's rush[3]	*Juncus torreyi*[3]	-	12.3 million	28.2	0.1
	Green needlegrass	*Nassella viridula*	Cucharas or Lodorm	181,000	4.2	1.0
	Western wheatgrass	*Pascopyrum smithii*	Arriba	110,000	10.1	4.0
	Fowl bluegrass[3]	*Poa palustris*[3]	-	3.2 million	7.3	0.1
	Sandberg bluegrass[3]	*Poa secunda*[3]	Sims Mesa or High Plains	1 million	6.9	0.3
	Bluebunch wheatgrass	*Pseudoroegneria spicata*	P7	140,000	6.4	2.0
	Little bluestem	*Schizachyrium scoparium*	Pastura, Cimarron, or Camper	260,000	6.0	1.0
Forbs	Common yarrow[3]	*Achillea millefolium*[3]	-	2.7 million	6.2	0.1
	Rocky Mountain bee plant	*Cleome serrulata*	-	66,000	3.0	2.0
	Golden tickseed[3]	*Coreopsis tinctoria*[3]	-	1.4 million	3.2	0.1
	Blanketflower	*Gaillardia aristata*	Meriweather	132,000	1.5	0.5
	Showy goldeneye[3]	*Heliomeris multiflora*[3]	-	1 million	2.3	0.1
	Rocky Mountain penstemon	*Penstemon strictus*	Bandera	490,000	2.2	0.2
	American vetch	*Vicia americana*	-	33,000	0.8	1.0
Bulk	Rice hulls	-	-	-	-	4.5
				Total	**16.6**	**25.0**

[1]Nomenclature follows PLANTS Database (NRCS 2016); seeding rate based on hand-broadcasting; any substitutions must be native to Colorado and from a US or Canada seed source.
[2]Sources: NRCS 2016, Granite Seed 2016, Western Native Seed 2016, NSN 2016
[3]Bag separately if drill-seeding

- Standard Revegetation (see Tables 1 and 4)
  - Standard treatment areas include the entire natural floodplain, unless otherwise noted. The standard revegetation plan includes three planting zones (A, B, and C), and seeding in all zones.
  - Planting Zone A (Channel Edge) encompasses those areas between 0 and 1 foot (vertical) above the low flow channel water surface elevation and generally in areas protected from scour/direct flow. Zone B (Lower Riparian) includes those areas between 1 and 2 feet above the low flow channel, and Zone C (Upper Riparian) includes those areas between 2 and 3 feet above. See typical cross-section.
  - All portions of the project corridor (including areas where no earthwork occurs) will be hand-seeded with the Riparian Seed Mix (Table 4) at approximately 25.0 pounds of pure live seed per acre, including rice hulls for bulk.
  - All portions of Zones B and C where earthwork occurs will be hand-mulched with excelsior (spun aspen wood) at a rate of approximately 1,800 pounds per acre (approximately 30 bales at 60 pounds each).

- Rootwads/Channel Blocks (see Table 2)
  - The treatment for Root Wads/Channel Blocks conforms with the typical detail and includes the installation of live plant material (transplants, containerized stock, and cuttings). These materials will be installed during and after the construction of the rootwads/channel blocks and placed primarily in the area downstream of the rootwad (where a back eddy may form), but will also be installed in other areas of suitable hydrology (according to the elevation above the low-flow channel water surface—see Treatment 1 typical cross-section for planting zones).
  - Willow cuttings (3-foot long) will be placed during installation of the rootwads in areas where a portion of the cutting is the elevation is between 1 and 2 feet above the low-flow water surface.
  - Containerized herbaceous plants (10 ci) will be placed after the rootwads are installed in areas protected from direct flow/scour (mainly on the downstream side of the rootwad) where the elevation is 1 foot or less above the low-flow water surface.

- Soil Lifts (see Table 3)
  - This treatment involves the installation of live plant material during the construction of the soil lifts. Containerized herbaceous plants (10 ci) will be placed in between lifts (during construction of the lifts) where the elevation is 1 foot or less above the water surface of the low-flow channel. Willow cuttings (5-foot long) will be installed between the lifts (during construction) where the elevation is between 1 and 2 feet above the low-flow water surface.
  - The lifts will be constructed with native soil mixed with compost (300 cubic yards/acre) and then hand-seeded with the Riparian Mix at approximately 25.0 pounds of pure live seed per acre (including rice hulls for bulk) before wrapping with fabric. Seed should be placed on the soil surface, just beneath the fabric.

Literature Cited

Granite Seed and Erosion Control (Granite Seed). 2016. Website: http://www.graniteseed.com/

Native Seed Network (NSN). 2016. Website: http://www.nativeseednetwork.org

Natural Resources Conservation Service (NRCS). 2016. The PLANTS Database (http://plants.usda.gov). National Plant Data Team, Greensboro, NC 27401-4901 USA.

US Army Corps of Engineers (Corps). 2016. *National Wetland Plant List*, version 3.2. Website: http://wetland_plants.usace.army.mil/. Accessed in September.

Western Native Seed. 2016. Website: http://www.westernnativeseed.com/

General Notes:

- If existing riparian shrubs or small trees (<4" diameter at breast height) are present but too high above the low-flow channel to be wetted through capillary action (because of channel degradation associated with the flood), then the banks will be laid back and the existing vegetation will be moved (transplanted) to the appropriate elevation above the water surface of the low-flow channel; 0 to 1 foot above for herbaceous wetland vegetation and 1 to 3 feet for wetland/riparian woody vegetation.
- All natural floodplain areas (including those not disturbed by restoration activities) will be hand-seeded with the Riparian Seed Mix (Table 4) at approximately 25.0 pounds of pure live seed per acre, including rice hulls for bulk. Seeding will only be performed between September 1 and when the ground freezes, and when the ground thaws and June 1, unless approved by a qualified ecologist.
- After seeding, all portions of Zone B and C disturbed by restoration activities will be hand-mulched using excelsior (spun aspen wood) mulch applied at approximately 1,800 pounds per acre (approximately 30 bales at 60 pounds each). Although floodplain areas not disturbed by restoration activities will be seeded, only those disturbed will be mulched.
- The exact locations of live plant material will be based on the final grading, as determined by a qualified ecologist.
- All areas disturbed by restoration activities, including the soil lifts, will be amended with 300 cubic yards per acre of compost. The compost will be mixed with native soil/alluvium to a depth of 12 inches. The compost will have the following characteristics:
  - pH: 5.5-8.0
  - Moisture content: 35-55 percent
  - Particle size: pass through 1-inch screen or smaller
  - Stability: stable to highly stable, providing nutrients for plant growth
  - Maturity/growth screening: demonstrate ability to enhance plant growth
  - Soluble salt concentration: 2.5 dS (mmhos/cm) or less preferred
  - Organic matter content: 30-70 percent
  - Suggested compost source: A-1 Organic, Eaton, Colorado 970-454-3492 or an approved equal.
- All willow and cottonwood cuttings will be collected on-site or from elsewhere in Boulder County (or immediately adjacent counties) within 1,000 vertical feet of near the site, as directed by a qualified ecologist. Acceptable willow species for "mixed willow" include (nomenclature from Corps 2016): *Salix exigua*, *S. interior*, *S. irrorata*, *S. bebbiana*, *S. monticola*, *S. drummondiana*, *S. ligulifolia*, *S. lasiandra*, and *S. lutea*. No one species can account for more than 70 percent of the mix.
- All willow and cottonwood cuttings will be harvested when dormant (before leaves emerge or after they are dropped) from live plants 0.5 to 1.0 inch in diameter. The stem will be stripped of all branches before cutting and then trimmed to the desired length. The lower (rooting) end of the stem will be cut at a 45 degree angle and the upper end will be cut at 90 degree angle. The cuttings will be placed into water within two minutes of cutting and soaked—completely submerged—for at least 72 hours, but not more than 14 days, prior to planting. The cuttings will be kept wet until placed into the ground and will not be allowed out of water for more than 10 minutes during planting. All cuttings will be trimmed after installation to ensure that no more than one-third of their length is left above ground.
- Whenever possible, Zone B live plant material (containerized stock and cuttings) will be installed by using equipment to excavate a trench parallel to the channel, with the bottom of the trench corresponding to the approximate elevation of the low-flow channel water surface. The plant material will be placed into the trench, backfilled, and lightly tamped. Willow and cottonwood cuttings may be completely buried (horizontally or vertically), but containerized stock and transplants will be placed upright and so that at least 1/3 of the above-ground plant mass is above the new ground surface.
- All containerized plants will be inspected by a qualified ecologist prior to planting. Any dead, dying, stressed, or badly "rootbound" plants will be rejected.
- A qualified ecologist will direct and supervise all plantings
- In an attempt to avoid the continued spreading of noxious weeds, all discrete populations of Colorado List A or B noxious weeds found in or within 100 feet of the restoration area will be sprayed with the appropriate herbicide(s) prior to construction in coordination with the Boulder County weed coordinator.
- All finish grades will be left rough and natural with no smooth surfaces, straight edges, or right angles
- All work areas (other than the immediate channel banks) will be loosened to a depth of 12 inches before planting and seeding
- No equipment will be allowed in the restoration area after seeding or planting
- Any trees to be removed for the project will be removed during the non-nesting season for migratory birds (between September 1 and March 31). If this is not possible, active nest surveys for migratory birds may be required.
- All finish grades will be left rough and natural with no smooth surfaces, straight edges, or right angles
- All work areas (other than the immediate channel banks) will be loosened to a depth of 12 inches before planting and seeding
- No equipment will be allowed in the restoration area after seeding or planting
- Any trees to be removed for the project will be removed during the non-nesting season for migratory birds (between September 1 and March 31). If this is not possible, active nest surveys for migratory birds may be required.
- All best management practices (BMPs) used shall be selected, installed, implemented, and maintained according to appropriate engineering, hydrologic and pollution control practices.
- The use of chemicals such as soil stabilizers, dust palliatives, herbicides, growth inhibitors, fertilizers, deicing salts, etc., shall be in accordance with the manufacturer's recommended application rates, frequency, and instructions. These chemicals shall not be used, stored, or stockpiled within 50 horizontal feet of the creek or other aquatic habitats.
- Construction equipment, fuels, lubricants, and other petroleum distillates shall not be stored or stockpiled within 50 horizontal feet of the creek or other aquatic habitats. Equipment fueling and servicing shall occur only within approved designated areas.

UPPER FOURMILE CREEK STREAM RESTORATION REVEGETATION PLAN

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