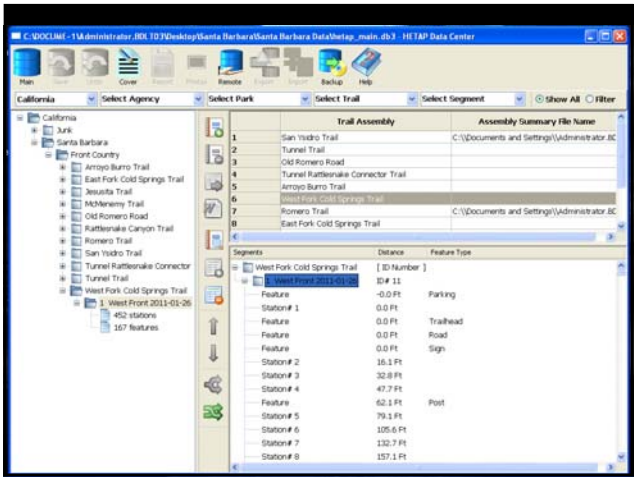
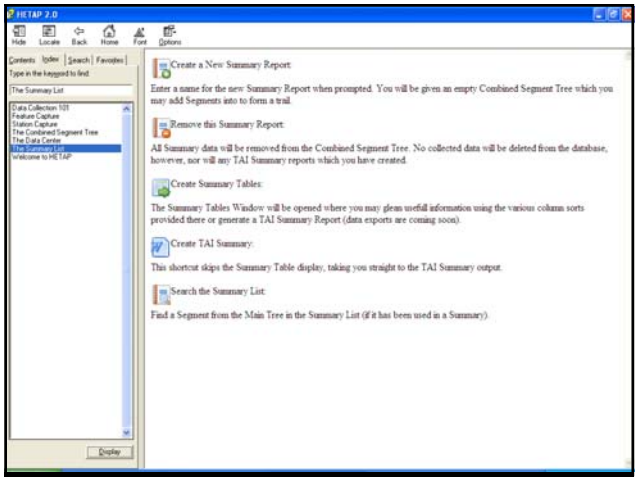
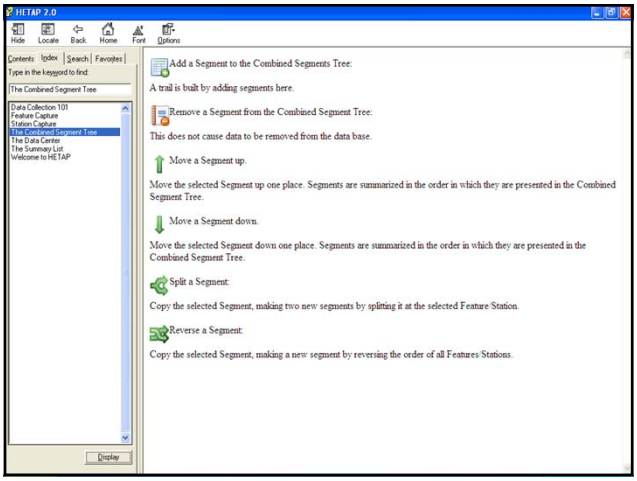
4-HETAP Data Management Visuals

Data Management Using the High Efficiency Trail Assessment Process-HETAP

- **American Trails**
- **Beneficial Designs, Inc.**







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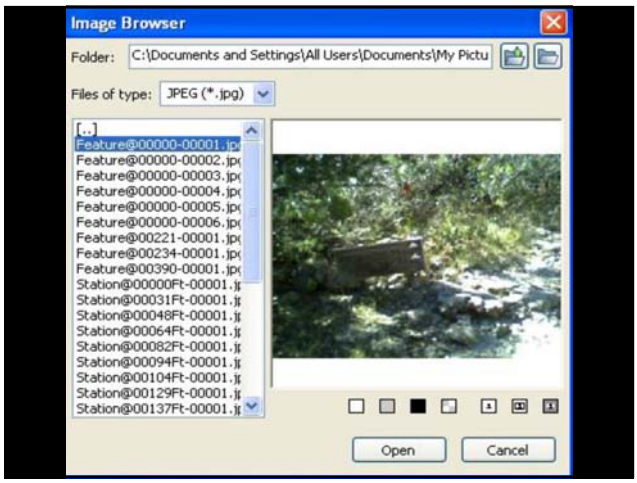
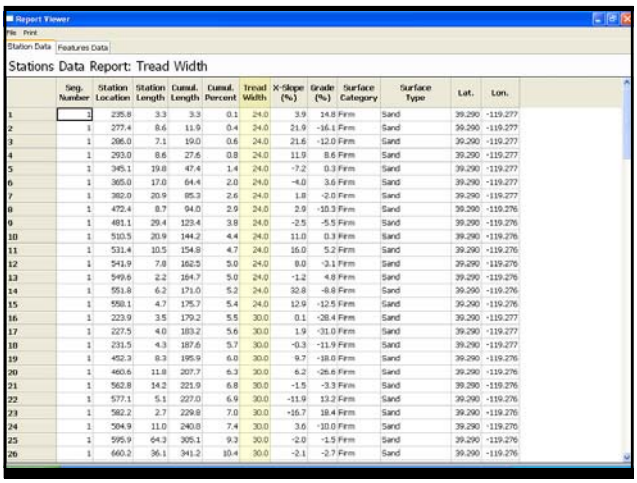
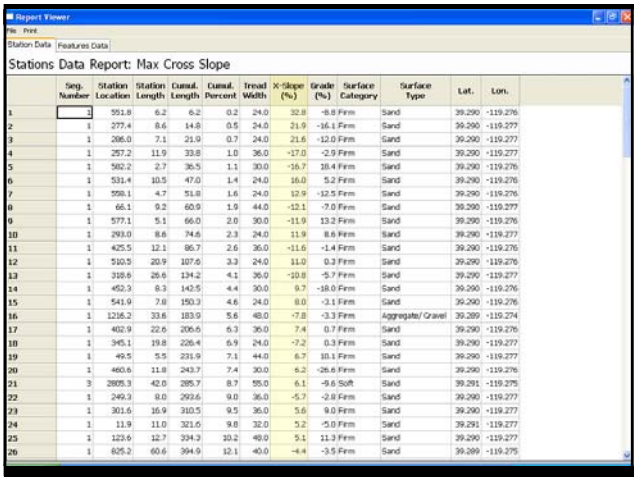
4-HETAP Data Management Visuals





Report: Tread Width

Station Location	Station Length	Cumul. Length	Cumul. Percent	Tread Width	X-Slope (%)	Grade (%)	Surface Category
235.8	3.3	3.3	0.1	24.0	3.9	14.8	Firm
277.4	8.6	11.9	0.4	24.0	21.9	-16.1	Firm
286.0	7.1	19.0	0.6	24.0	21.6	-12.0	Firm
293.0	8.6	27.6	0.8	24.0	11.9	8.6	Firm
345.1	19.8	47.4	1.4	24.0	-7.2	0.3	Firm
365.0	17.0	64.4	2.0	24.0	-4.0	3.6	Firm
382.0	20.9	85.3	2.6	24.0	1.8	-2.0	Firm
472.4	8.7	94.0	2.9	24.0	2.9	-10.3	Firm
481.1	29.4	123.4	3.8	24.0	-2.5	-5.5	Firm
510.5	20.9	144.2	4.4	24.0	11.0	0.3	Firm
531.4	10.5	154.8	4.7	24.0	16.0	5.2	Firm
541.9	7.8	162.5	5.0	24.0	8.0	-3.1	Firm
549.6	2.2	164.7	5.0	24.0	-1.2	4.8	Firm
551.8	6.2	171.0	5.2	24.0	32.8	-8.8	Firm
558.1	4.7	175.7	5.4	24.0	12.9	-12.5	Firm
223.9	3.5	179.2	5.5	30.0	0.1	-28.4	Firm



May 18-20, 2010

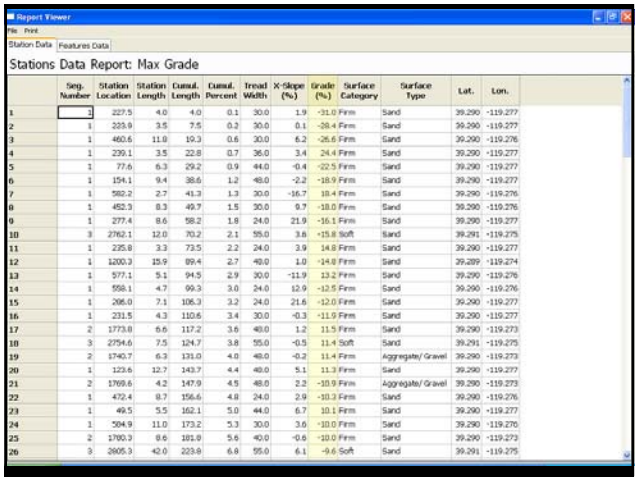
4-HETAP Data Management Visuals

Report: Max Cross Slope

Station Location	Station Length	Cumul. Length	Cumul. Percent	Tread Width	X-Slope (%)	Grade (%)	Surface Category
551.8	6.2	6.2	0.2	24.0	32.8	-8.8	Firm
277.4	8.6	14.8	0.5	24.0	21.9	-16.1	Firm
286.0	7.1	21.9	0.7	24.0	21.6	-12.0	Firm
257.2	11.9	33.8	1.0	36.0	-17.0	-2.9	Firm
582.2	2.7	36.5	1.1	30.0	-16.7	18.4	Firm
531.4	10.5	47.0	1.4	24.0	16.0	5.2	Firm
558.1	4.7	51.8	1.6	24.0	12.9	-12.5	Firm
66.1	9.2	60.9	1.9	44.0	-12.1	-7.0	Firm
577.1	5.1	66.0	2.0	30.0	-11.9	13.2	Firm
293.0	8.6	74.6	2.3	24.0	11.9	8.6	Firm
425.5	12.1	86.7	2.6	36.0	-11.6	-1.4	Firm

Report: Max Cross Slope

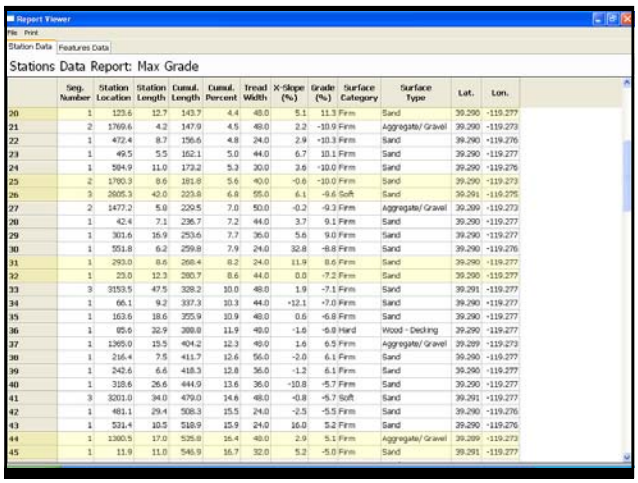
Station Location	Station Length	Cumul. Length	Cumul. Percent	Tread Width	X-Slope (%)	Grade (%)	Surface Category
1216.2	33.6	183.9	5.6	48.0	-7.8	-3.3	Firm
402.9	22.6	206.6	6.3	36.0	7.4	0.7	Firm
345.1	19.8	226.4	6.9	24.0	-7.2	0.3	Firm
49.5	5.5	231.9	7.1	44.0	6.7	10.1	Firm
460.6	11.8	243.7	7.4	30.0	6.2	-26.6	Firm
2805.3	42.0	285.7	8.7	55.0	6.1	-9.6	Soft
249.3	8.0	293.6	9.0	36.0	-5.7	-2.8	Firm
301.6	16.9	310.5	9.5	36.0	5.6	9.0	Firm
11.9	11.0	321.6	9.8	32.0	5.2	-5.0	Firm
123.6	12.7	334.3	10.2	48.0	5.1	11.3	Firm
825.2	60.6	394.9	12.1	40.0	-4.4	-3.5	Firm



Report: Max Grade

Station Location	Station Length	Cumul. Length	Cumul. Percent	Tread Width	X-Slope (%)	Grade (%)	Surface Category
558.1	4.7	99.3	3.0	24.0	12.9	-12.5	Firm
286.0	7.1	106.3	3.2	24.0	21.6	-12.0	Firm
231.5	4.3	110.6	3.4	30.0	-0.3	-11.9	Firm
1773.8	6.6	117.2	3.6	48.0	1.2	11.5	Firm
2754.6	7.5	124.7	3.8	55.0	-0.5	11.4	Soft
1740.7	6.3	131.0	4.0	48.0	-0.2	11.4	Firm
123.6	12.7	143.7	4.4	48.0	5.1	11.3	Firm
1769.6	4.2	147.9	4.5	48.0	2.2	-10.9	Firm
472.4	8.7	156.6	4.8	24.0	2.9	-10.3	Firm
49.5	5.5	162.1	5.0	44.0	6.7	10.1	Firm
584.9	11.0	173.2	5.3	30.0	3.6	-10.0	Firm

4-HETAP Data Management Visuals



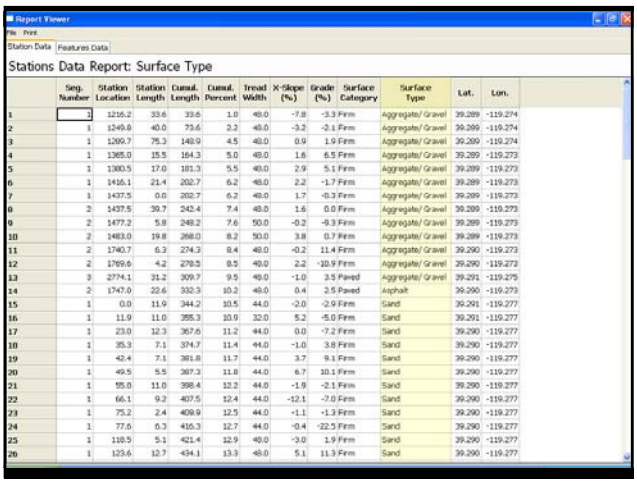
Report Viewer

File Print

Station Data | Features Data

Stations Data Report: Max Grade

	Seg. Number	Station Location	Station Length	Cumul. Length	Cumul. Percent	Tread Width	X-Slope (%)	Grade (%)	Surface Category	Surface Type	Lat.	Lon.
20	1	123.6	12.7	143.7	4.4	48.0	5.1	11.3	Firm	Sand	39.290	-119.277
21	2	1769.6	4.2	147.9	4.5	48.0	2.2	-10.9	Firm	Aggregate/ Gravel	39.290	-119.273
22	1	472.4	8.7	156.6	4.8	24.0	2.9	+10.3	Firm	Sand	39.290	-119.276
23	1	49.5	5.5	162.1	5.0	44.0	6.7	10.1	Firm	Sand	39.290	-119.277
24	1	584.9	11.0	173.2	5.3	20.0	2.6	-10.0	Firm	Sand	39.290	-119.276
25	2	1780.3	8.6	181.8	5.6	40.0	-0.6	-10.0	Firm	Sand	39.290	-119.273
26	3	2605.3	42.0	223.8	6.8	55.0	6.1	-9.6	Soft	Sand	39.291	-119.275
27	2	1477.2	5.0	229.5	7.0	50.0	-0.2	-9.3	Firm	Aggregate/ Gravel	39.289	-119.273
28	1	42.4	7.1	236.7	7.2	44.0	3.7	9.1	Firm	Sand	39.290	-119.277
29	1	301.6	16.9	253.6	7.7	36.0	5.6	9.0	Firm	Sand	39.290	-119.277
30	1	551.8	6.2	259.8	7.9	24.0	32.8	-8.8	Firm	Sand	39.290	-119.276
31	1	293.0	8.6	268.4	8.2	24.0	11.9	8.6	Firm	Sand	39.290	-119.277
32	1	23.0	12.3	280.7	8.6	44.0	0.0	-7.2	Firm	Sand	39.290	-119.277
33	3	3153.5	47.5	328.2	10.0	48.0	1.9	-7.1	Firm	Sand	39.291	-119.277
34	1	66.1	9.2	337.3	10.3	44.0	+12.1	+7.0	Firm	Sand	39.290	-119.277
35	1	163.6	18.6	355.9	10.9	48.0	0.6	-6.8	Firm	Sand	39.290	-119.277
36	1	85.6	32.9	388.8	11.9	48.0	-1.6	-6.8	Hard	Wood - Decking	39.290	-119.277
37	1	1365.0	15.5	404.2	12.3	48.0	1.6	6.5	Firm	Aggregate/ Gravel	39.289	-119.273
38	1	216.4	7.5	411.7	12.6	56.0	-2.0	6.1	Firm	Sand	39.290	-119.277
39	1	242.6	6.6	418.3	12.8	56.0	-1.2	6.1	Firm	Sand	39.290	-119.277
40	1	318.6	26.6	444.9	13.6	36.0	-10.8	-5.7	Firm	Sand	39.290	-119.277
41	3	3201.0	34.0	479.0	14.6	48.0	-0.8	-5.7	Soft	Sand	39.291	-119.277
42	1	481.1	29.4	508.3	15.5	24.0	-2.5	-5.5	Firm	Sand	39.290	-119.276
43	1	531.4	10.5	518.9	15.9	24.0	16.0	5.2	Firm	Sand	39.290	-119.276
44	1	1360.5	17.0	535.8	16.4	48.0	2.9	5.1	Firm	Aggregate/ Gravel	39.289	-119.273
45	1	11.9	11.0	546.9	16.7	32.0	5.2	-5.0	Firm	Sand	39.291	-119.277



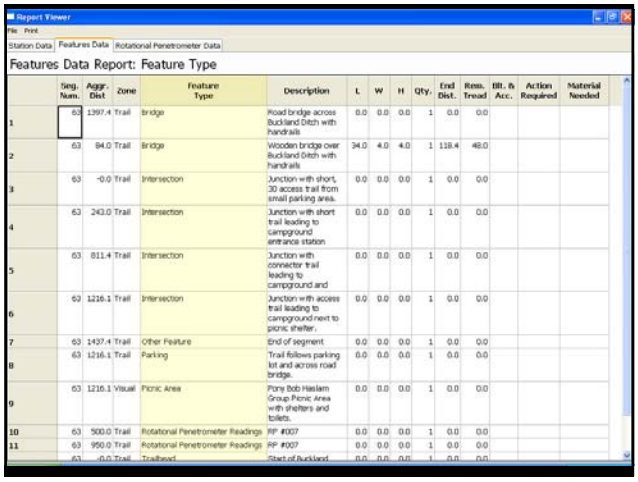
Report Viewer

File Print

Station Data | Features Data

Stations Data Report: Surface Type

	Seg. Number	Station Location	Station Length	Cumul. Length	Cumul. Percent	Tread Width	X-Slope (%)	Grade (%)	Surface Category	Surface Type	Lat.	Lon.
1	1	1216.2	33.6	33.6	1.0	48.0	-7.8	-3.3	Firm	Aggregate/ Gravel	39.289	-119.274
2	1	1249.8	40.0	73.6	2.2	48.0	-3.2	-2.1	Firm	Aggregate/ Gravel	39.289	-119.274
3	1	1289.7	75.3	148.9	4.5	48.0	0.9	1.9	Firm	Aggregate/ Gravel	39.289	-119.274
4	1	1365.0	15.5	164.3	5.0	48.0	1.6	6.5	Firm	Aggregate/ Gravel	39.289	-119.273
5	1	1380.5	17.0	181.3	5.5	48.0	2.9	5.1	Firm	Aggregate/ Gravel	39.289	-119.273
6	1	1416.1	21.4	202.7	6.2	48.0	2.2	-1.7	Firm	Aggregate/ Gravel	39.289	-119.273
7	1	1437.5	0.0	202.7	6.2	48.0	1.7	-0.3	Firm	Aggregate/ Gravel	39.289	-119.273
8	2	1437.5	39.7	242.4	7.4	48.0	1.6	0.0	Firm	Aggregate/ Gravel	39.289	-119.273
9	2	1477.2	5.8	248.2	7.6	50.0	-0.2	-9.3	Firm	Aggregate/ Gravel	39.289	-119.273
10	2	1483.0	19.8	268.0	8.2	50.0	3.8	0.7	Firm	Aggregate/ Gravel	39.289	-119.273
11	2	1740.7	6.3	274.3	8.4	48.0	-0.2	11.4	Firm	Aggregate/ Gravel	39.290	-119.273
12	2	1769.6	4.2	278.5	8.5	48.0	2.2	-10.9	Firm	Aggregate/ Gravel	39.290	-119.273
13	3	2774.1	31.2	309.7	9.5	48.0	-1.0	3.5	Paved	Aggregate/ Gravel	39.291	-119.275
14	2	1747.0	22.6	332.3	10.2	48.0	0.4	2.5	Paved	Asphalt	39.290	-119.273
15	1	0.0	11.9	344.2	10.5	44.0	-2.0	-2.9	Firm	Sand	39.291	-119.277
16	1	11.9	11.0	355.3	10.9	32.0	5.2	-5.0	Firm	Sand	39.291	-119.277
17	1	23.0	12.3	367.6	11.2	44.0	0.0	-7.2	Firm	Sand	39.290	-119.277
18	1	35.3	7.1	374.7	11.4	44.0	-1.0	3.8	Firm	Sand	39.290	-119.277
19	1	42.4	7.1	381.8	11.7	44.0	3.7	9.1	Firm	Sand	39.290	-119.277
20	1	49.5	5.5	387.3	11.8	44.0	6.7	10.1	Firm	Sand	39.290	-119.277
21	1	55.0	11.0	398.4	12.2	44.0	-1.9	-2.1	Firm	Sand	39.290	-119.277
22	1	66.1	9.2	407.5	12.4	44.0	-12.1	-7.0	Firm	Sand	39.290	-119.277
23	1	75.2	2.4	409.9	12.5	44.0	-1.1	-1.3	Firm	Sand	39.290	-119.277
24	1	77.6	6.3	416.3	12.7	44.0	-0.4	-22.5	Firm	Sand	39.290	-119.277
25	1	110.5	5.1	421.4	12.9	40.0	-3.0	1.9	Firm	Sand	39.290	-119.277
26	1	123.6	12.7	434.1	13.3	48.0	5.1	11.3	Firm	Sand	39.290	-119.277



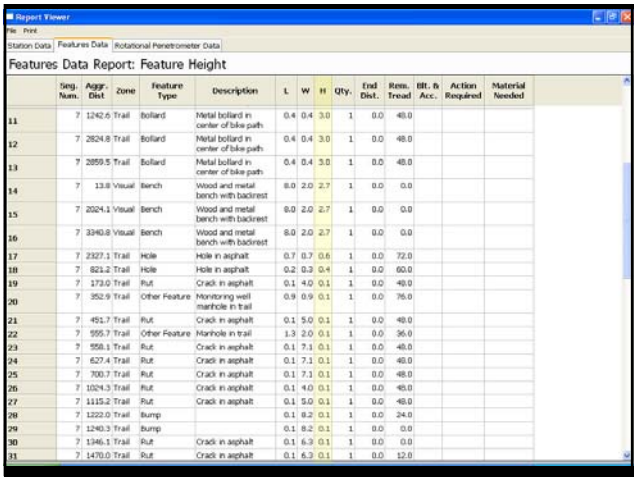
Report Viewer

File Print

Station Data | Features Data | Rotational Penetrometer Data

Features Data Report: Feature Type

	Seg. Num.	Aggr. Dist	Zone	Feature Type	Description	L	W	H	Qty.	End Dist.	Rem. Tread	Blt. & Acc.	Action Required	Material Needed
1	63	1397.4	Trail	Bridge	Road bridge across Buckland Ditch with handrails	0.0	0.0	0.0	1	0.0	0.0			
2	63	84.0	Trail	Bridge	Wooden bridge over Buckland Ditch with handrails	34.0	4.0	4.0	1	118.4	48.0			
3	63	-0.0	Trail	Intersection	Junction with short, 30 access trail from small parking area.	0.0	0.0	0.0	1	0.0	0.0			
4	63	243.0	Trail	Intersection	Junction with short trail leading to campground entrance station	0.0	0.0	0.0	1	0.0	0.0			
5	63	811.4	Trail	Intersection	Junction with connector trail leading to campground and	0.0	0.0	0.0	1	0.0	0.0			
6	63	1216.1	Trail	Intersection	Junction with access trail leading to campground next to picnic shelter.	0.0	0.0	0.0	1	0.0	0.0			
7	63	1437.4	Trail	Other Feature	End of segment	0.0	0.0	0.0	1	0.0	0.0			
8	63	1216.1	Trail	Parking	Trail follows parking lot and across road bridge.	0.0	0.0	0.0	1	0.0	0.0			
9	63	1216.1	Visual	Picnic Area	Pony Bob Haslam Group Picnic Area with shelters and toilets.	0.0	0.0	0.0	1	0.0	0.0			
10	63	500.0	Trail	Rotational Penetrometer Readings	RP #007	0.0	0.0	0.0	1	0.0	0.0			
11	63	950.0	Trail	Rotational Penetrometer Readings	RP #007	0.0	0.0	0.0	1	0.0	0.0			
63	-0.0	Trail	Trailhead	Start of Buckland	0.0	0.0	0.0	1	0.0	0.0			



Report Viewer

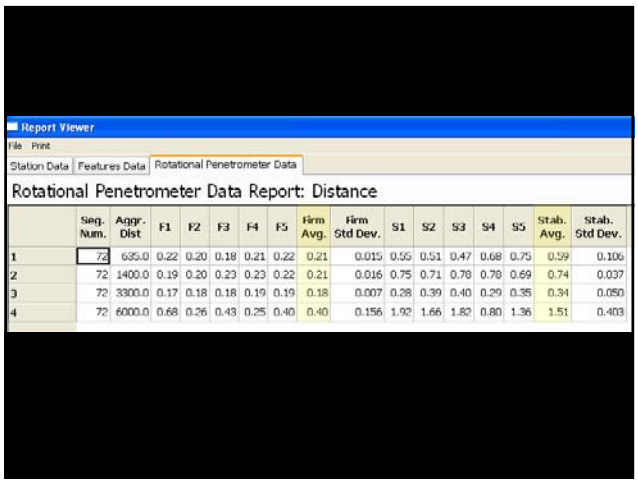
File Print

Station Data | Features Data | Rotational Penetrometer Data

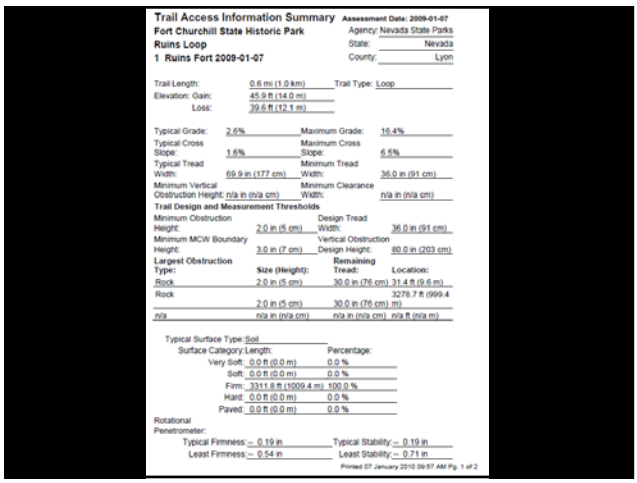
Features Data Report: Feature Height

	Seg. Num.	Aggr. Dist	Zone	Feature Type	Description	L	W	H	Qty.	End Dist.	Rem. Tread	Blt. & Acc.	Action Required	Material Needed
11	7	1242.6	Trail	Bollard	Metal bollard in center of bike path	0.4	0.4	3.0	1	0.0	48.0			
12	7	2824.8	Trail	Bollard	Metal bollard in center of bike path	0.4	0.4	3.0	1	0.0	48.0			
13	7	2859.5	Trail	Bollard	Metal bollard in center of bike path	0.4	0.4	3.0	1	0.0	48.0			
14	7	13.8	Visual	Bench	Wood and metal bench with backrest	8.0	2.0	2.7	1	0.0	0.0			
15	7	2024.1	Visual	Bench	Wood and metal bench with backrest	8.0	2.0	2.7	1	0.0	0.0			
16	7	3340.8	Visual	Bench	Wood and metal bench with backrest	8.0	2.0	2.7	1	0.0	0.0			
17	7	2327.1	Trail	Hole	Hole in asphalt	0.7	0.7	0.6	1	0.0	72.0			
18	7	821.2	Trail	Hole	Hole in asphalt	0.2	0.3	0.4	1	0.0	60.0			
19	7	173.0	Trail	Rut	Crack in asphalt	0.1	4.0	0.1	1	0.0	48.0			
20	7	352.9	Trail	Other Feature	Monitoring well manhole in trail	0.9	0.9	0.1	1	0.0	76.0			
21	7	451.7	Trail	Rut	Crack in asphalt	0.1	5.0	0.1	1	0.0	48.0			
22	7	555.7	Trail	Other Feature	Manhole in trail	1.3	2.0	0.1	1	0.0	36.0			
23	7	558.1	Trail	Rut	Crack in asphalt	0.1	7.1	0.1	1	0.0	48.0			
24	7	627.4	Trail	Rut	Crack in asphalt	0.1	7.1	0.1	1	0.0	48.0			
25	7	700.7	Trail	Rut	Crack in asphalt	0.1	7.1	0.1	1	0.0	48.0			
26	7	1024.3	Trail	Rut	Crack in asphalt	0.1	4.0	0.1	1	0.0	48.0			
27	7	1115.2	Trail	Rut	Crack in asphalt	0.1	5.0	0.1	1	0.0	48.0			
28	7	1222.0	Trail	Bump		0.1	8.2	0.1	1	0.0	24.0			
29	7	1240.3	Trail	Bump		0.1	8.2	0.1	1	0.0	0.0			
30	7	1346.1	Trail	Rut	Crack in asphalt	0.1	6.3	0.1	1	0.0	0.0			
31	7	1470.0	Trail	Rut	Crack in asphalt	0.1	6.3	0.1	1	0.0	12.0			

4-HETAP Data Management Visuals



	Seq. Num.	Aggr. Dist	F1	F2	F3	F4	F5	Firm Avg.	Firm Std Dev.	S1	S2	S3	S4	S5	Stab. Avg.	Stab. Std Dev.
1	72	685.0	0.22	0.20	0.18	0.21	0.22	0.21	0.015	0.55	0.51	0.47	0.68	0.75	0.59	0.109
2	72	1400.0	0.19	0.20	0.23	0.23	0.22	0.21	0.016	0.75	0.71	0.78	0.78	0.69	0.74	0.037
3	72	3300.0	0.17	0.18	0.18	0.19	0.19	0.18	0.007	0.28	0.39	0.40	0.29	0.35	0.34	0.050
4	72	6000.0	0.68	0.26	0.43	0.25	0.40	0.40	0.156	1.92	1.66	1.82	0.80	1.36	1.51	0.403



Trail Access Information Summary Assessment Date: 2009-01-07

Fort Churchill State Historic Park Agency: Nevada State Parks

Ruins Loop State: Nevada

1 Ruins Fort 2009-01-07 County: Lyon

Trail Length: 0.6 mi (1.0 km) Trail Type: Loop

Elevation: Gain: 45.9 ft (14.0 m)

Loss: 39.6 ft (12.1 m)

Typical Grade:	2.6%	Maximum Grade:	16.4%
Typical Cross Slope:	1.6%	Maximum Cross Slope:	6.5%
Typical Tread Width:	69.9 in (177 cm)	Minimum Tread Width:	36.0 in (91 cm)
Minimum Vertical Obstruction Height:	n/a in (n/a cm)	Minimum Clearance Width:	n/a in (n/a cm)

Trail Design and Measurement Thresholds

Minimum Obstruction Height:	2.0 in (5 cm)	Design Tread Width:	36.0 in (91 cm)
Minimum MCW Boundary Height:	3.0 in (7 cm)	Vertical Obstruction Design Height:	80.0 in (203 cm)

Largest Obstruction Type:	Size (Height):	Remaining Tread:	Location:
Rock	2.0 in (5 cm)	30.0 in (76 cm)	31.4 ft (9.6 m)
Rock	2.0 in (5 cm)	30.0 in (76 cm)	3278.7 ft (999.4 m)
n/a	n/a in (n/a cm)	n/a in (n/a cm)	n/a ft (n/a m)

Typical Surface Type: Soil

Surface Category:	Length:	Percentage:
Very Soft:	0.0 ft (0.0 m)	0.0 %
Soft:	0.0 ft (0.0 m)	0.0 %
Firm:	3311.8 ft (1009.4 m)	100.0 %
Hard:	0.0 ft (0.0 m)	0.0 %
Paved:	0.0 ft (0.0 m)	0.0 %

Rotational Penetrometer:

Typical Firmness: ~ 0.19 in Typical Stability: ~ 0.19 in

Least Firmness: ~ 0.54 in Least Stability: ~ 0.71 in

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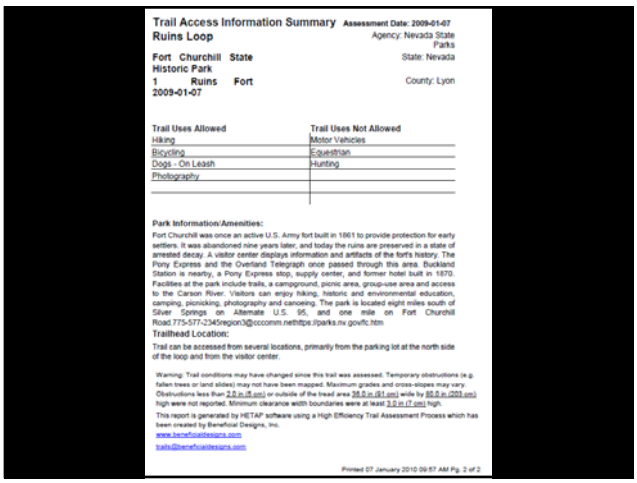

Trail Access Information Summary Assessment Date: 2009-01-07

Ruins Loop Agency: Nevada State Parks

Fort Churchill State Historic Park State: Nevada

1 Ruins Fort 2009-01-07 County: Lyon

Trail Uses Allowed	Trail Uses Not Allowed
Hiking	Motor Vehicles
Bicycling	Equestrian
Dogs - On Leash	Hunting
Photography	

Park Information/Amenities:

Fort Churchill was once an active U.S. Army fort built in 1861 to provide protection for early settlers. It was abandoned nine years later, and today the ruins are preserved in a state of arrested decay. A visitor center displays information and artifacts of the fort's history. The Pony Express and the Overland Telegraph once passed through this area. Buckland Station is nearby, a Pony Express stop, supply center, and former hotel built in 1870. Facilities at the park include trails, a campground, picnic area, group-use area and access to the Carson River. Visitors can enjoy hiking, historic and environmental education, camping, picnicking, photography and canoeing. The park is located eight miles south of Silver Springs on Alternate U.S. 95, and one mile on Fort Churchill Road.775-577-2345region3@ccomm.nethttps://parks.nv.gov/fc.htm

Trailhead Location:

Trail can be accessed from several locations, primarily from the parking lot at the north side of the loop and from the visitor center.

Warning: Trail conditions may have changed since this trail was assessed. Temporary obstructions (e.g. fallen trees or land slides) may not have been mapped. Maximum grades and cross-slopes may vary. Obstructions less than 2.0 in (5 cm) or outside of the tread area 36.0 in (91 cm) wide by 80.0 in (203 cm) high were not reported. Minimum clearance width boundaries were at least 3.0 in (7 cm) high.

This report is generated by HETAP software using a High Efficiency Trail Assessment Process which has been created by Beneficial Designs, Inc.

www.beneficialdesigns.com

trails@beneficialdesigns.com

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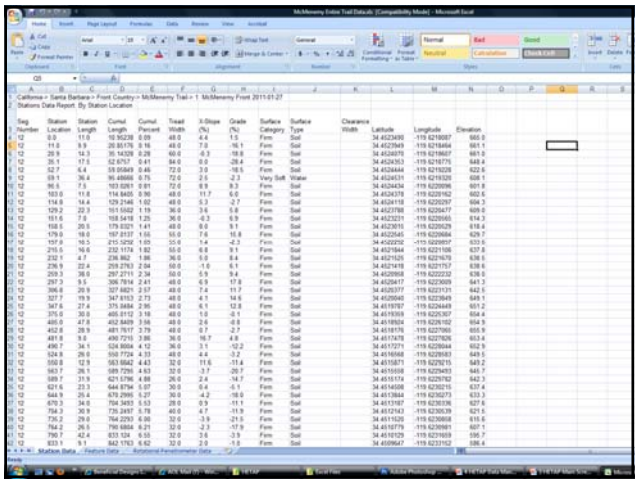
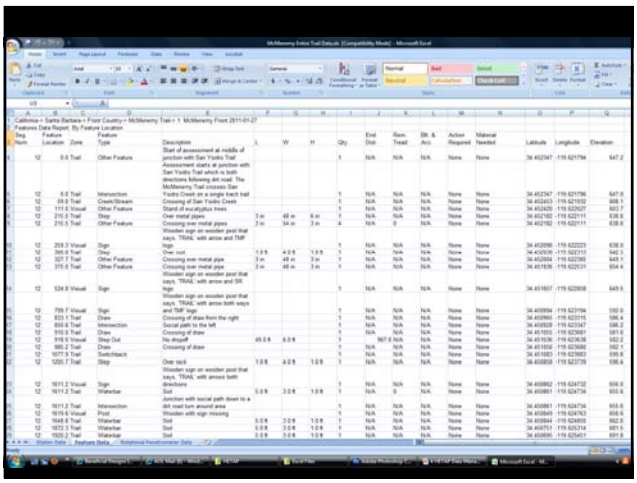
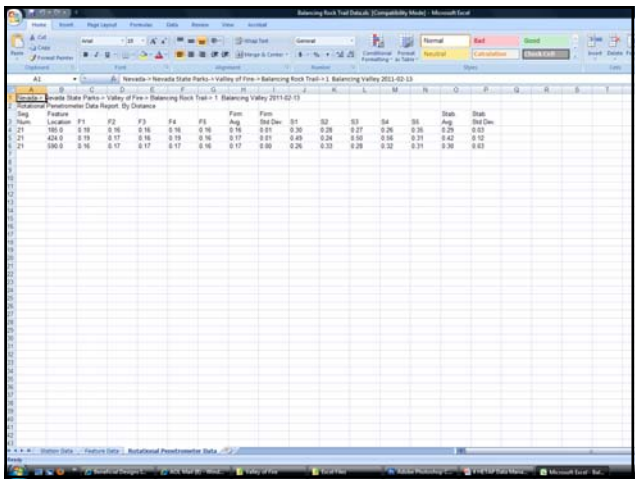
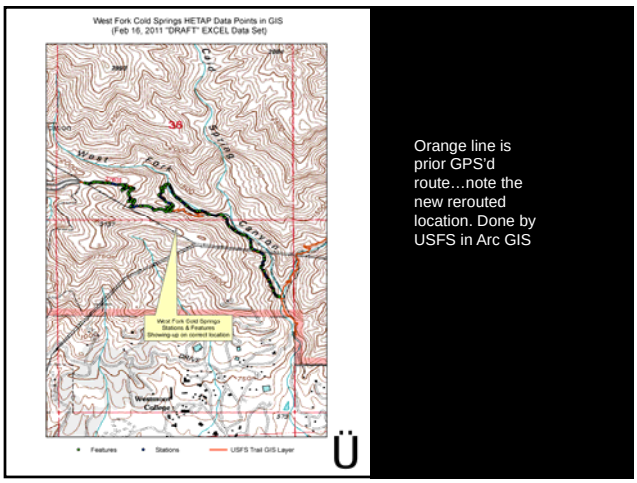
May 18-20, 2010

4-HETAP Data Management Visuals



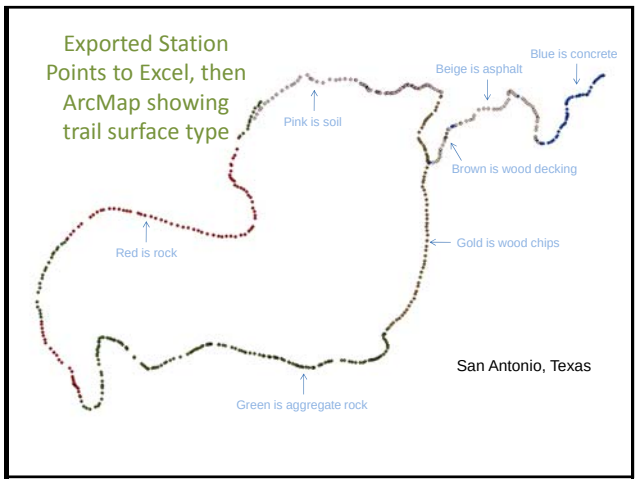






May 18-20, 2010

4-HETAP Data Management Visuals



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May 18-20, 2010