
3.0 FACILITY DESIGN FACTORS

3.1 SITE LAYOUT

Catamount is planning to place up to 156 Siemens 2.3 MW or similar wind turbines in the Searchlight vicinity within the area currently under combination of a ROW Grant from the BLM (for wind energy monitoring and testing and exclusive ROW) and private land (see Tables 3-1 and 3-2). The proposed project will have a nameplate capacity of up to 359 MW. Of the 156 wind turbines, 137 wind turbines are proposed on BLM administered land and 19 are proposed on private land.

The wind turbines are proposed to run in arrays generally oriented in an east-to-west direction on flat lands and ridgelines in order to maximize the flow of the prevailing southerly and southwesterly winds in the area. In addition to the erection of wind turbines, the proposed project will require the construction of new access roads, an overhead transmission line, two electrical substations, an electrical interconnection facility/switchyard, an O&M building, and laydown areas that may also serve as batch plant locations during construction. Each wind turbine will have a pad-mounted transformer located at the base of the wind turbine tower and an underground electrical and communication line. Five permanent meteorological masts will be installed to measure the wind speed and direction across the site to compare turbine performance to measured wind speeds over the life of the project. The Site Layout Map in Figure 3-1 shows the location of each turbine, substation, road, and ancillary project facilities.

Based on the layout of project components in Figure 3-1, construction activities will encompass approximately 600 acres of disturbance, which includes approximately 120 acres of permanent disturbance and approximately 480 net acres of temporary disturbance. Table 3-3 identifies the permanent and temporary construction-related disturbance areas by project facility. It should be noted that the exact areas of each component are subject to change as the project design develops. Also, the net acres of temporary disturbance are less than the approximately 553 acres listed in Table 3-3 because the permanently disturbed area for the roads and turbines is a subset of the temporary construction disturbance. Unlike the roads and turbines, the permanently disturbed area for the other infrastructure facilities is not included in the temporary category since the whole area will be permanently disturbed from the inception of the construction process.

The lands covered by the Wind Monitoring ROW and the privately held lands within the ROW boundary cover 26,000 acres or approximately 40 square miles. The total area estimated to be utilized by the wind energy facility (all facilities and temporary disturbance) is approximately 0.87 square miles, or approximately 2.1% of the total ROW. The permanent footprint of the wind energy facility will only comprise 0.5% of the ROW.

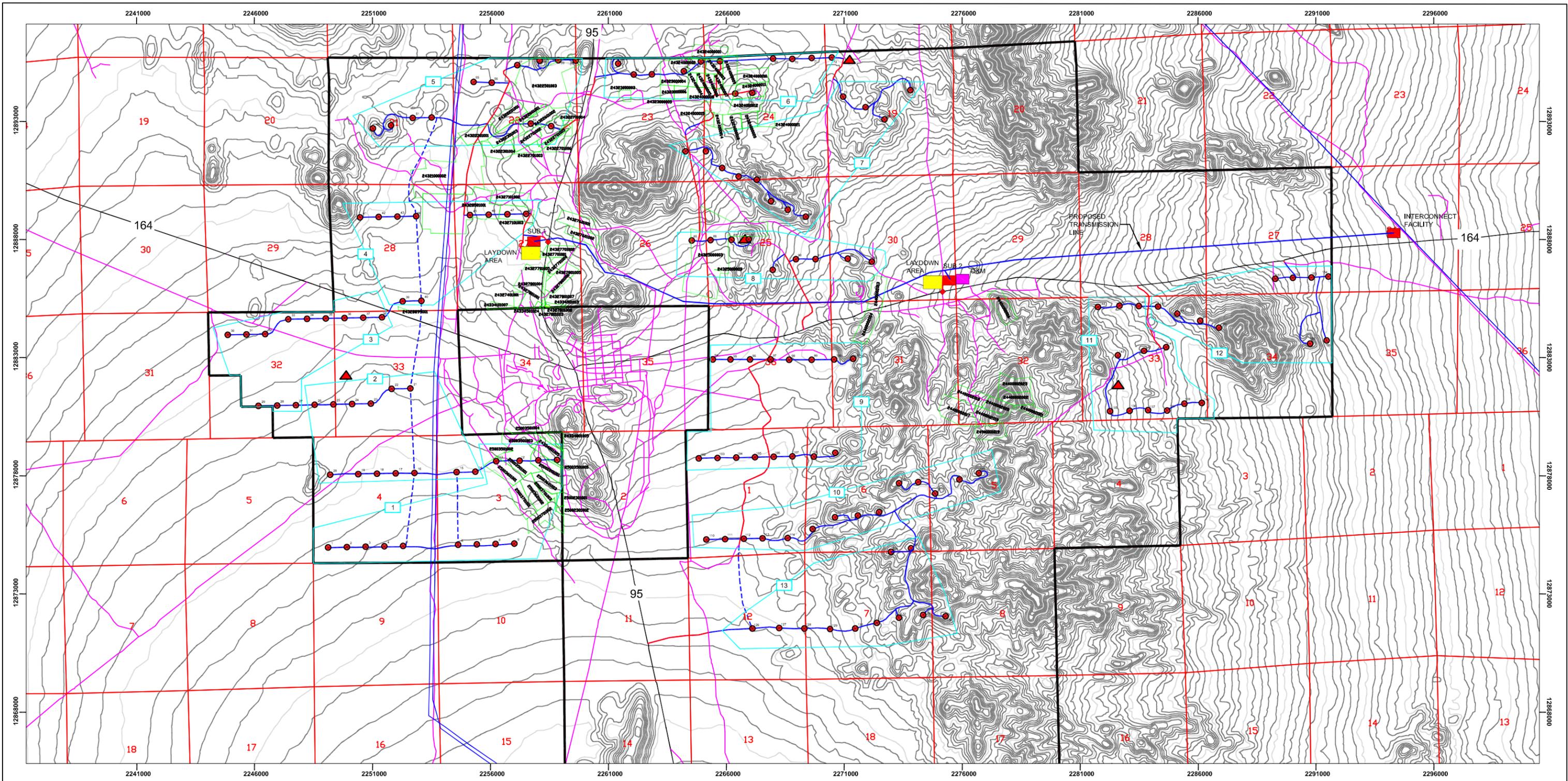
Table 3-1. Proposed Turbine Locations by Section and Part

Township	Range	Section	Part	Number of Turbines	Township	Range	Section	Part	Number of Turbines	
T28S	R63E	21	NESW	2	T29S	R63E	1	Lot 1	1	
			SENE	1				Lot 2	2	
			SWNE	1				Lot 3	1	
		22	Lot 3	1				Lot 4	2	
			Lot 4	1				SESE	1	
			Lot 5	1				SESW	2	
			Min. Surv. 2060	1				SWSE	1	
			Min. Surv. 2094	1				SWSW	1	
			Min. Surv. 2409	2				3	Lot 1	1
		NWNW	1	Lot 2					1	
		Lot 1	1	Lot 3					1	
		Min. Surv. 3510	2	Min. Surv. 1959					1	
		NENW	2	SENEW			1			
		SESE	2	SESW			2			
		24	Lot 1	2			SWNW	1		
			Min. Surv. 3304	2			SWSE	1		
			Min. Surv. 3510	1			SWSW	1		
			NENE	1			4	SENE	1	
		SESW	1	SENEW				2		
		SWSW	1	SESW				2		
		Lot 2	2	SWNE				1		
		Min. Surv. 1957	1	SWNW				1		
		NENW	1	SWSE				2		
		25	NESE	1			SWSW	1		
			NWNE	1			12	NESE	1	
			NWSE	2				NWSE	2	
			SENE	1				NWSW	1	
			SWNE	1				5	SENEW	1
			26	Min. Surv. 1957				1	SWNW	1
		Min. Surv. 2798		2				6	Lot 4	2
		Min. Surv. 4057		2			Lot 6		1	
		28	Lot 1	1			Lot 7		1	
			Lot 2	1			NESW		1	
			SENEW	1			NWSE		1	
		SWNW	1	7			SENE		1	
		SWSE	2				SESE	1		
	32	NENE	2		SWNE	1				
		NENW	2		Lot 3	1				
		NESE	2		NESE	1				
		NESW	1		NESW	1				
		NWNE	1	NWNE	1					
		NWNW	1	NWSE	2					
	NWSE	2	8	NWSW	1					
	33	NENW		1	R64E	7	8	NWSW	1	
		NESW		2						
		NWNW	2							
		NWSE	1							
	NWSW	1								
	36	SENE	2							
		SENEW	2							
		SWNE	1							
	SWNW	2								
	R64E	19	Lot 1	1						
			Lot 2	1						
			NESW	1						
			SENEW	1						
			SWNE	1						
			SESE	2						
		27	SWSE	2						
			30	Lot 3	1					
NESW				1						
33		Lot 2		1						
		NENE	2							
		NENW	2							
		NWNE	1							
		NWNW	1							
		SENEW	2							
34		SESE	2							
		SESW	1							
		SWNE	1							
	SWSE	2								
	SWSW	1								
	SENE	2								
SWNW	1									

Table 3-2. NAD83 Lat/Long and UTM Coordinates of Proposed Turbine Locations

Turbine	Latitude	Longitude	X meters	Y meters	Turbine	Latitude	Longitude	X meters	Y meters
1	35° 26' 41.580" N	114° 57' 21.000" W	685531	3924301	79	35° 29' 16.903" N	114° 53' 55.070" W	690622	3929196
2	35° 26' 41.580" N	114° 57' 11.400" W	685773	3924306	80	35° 29' 13.195" N	114° 53' 46.721" W	690835	3929086
3	35° 26' 41.580" N	114° 57' 1.800" W	686015	3924311	81	35° 29' 11.650" N	114° 53' 37.425" W	691070	3929043
4	35° 26' 41.580" N	114° 56' 52.200" W	686258	3924316	82	35° 29' 2.535" N	114° 53' 30.405" W	691253	3928766
5	35° 26' 41.580" N	114° 56' 42.600" W	686500	3924321	83	35° 28' 58.827" N	114° 53' 21.867" W	691471	3928656
6	35° 26' 41.580" N	114° 56' 14.400" W	687211	3924335	84	35° 28' 55.737" N	114° 53' 12.760" W	691702	3928566
7	35° 26' 41.580" N	114° 56' 4.800" W	687453	3924341	85	35° 28' 46.800" N	114° 54' 11.400" W	690230	3928259
8	35° 26' 41.580" N	114° 55' 55.200" W	687695	3924346	86	35° 28' 46.800" N	114° 54' 1.800" W	690472	3928264
9	35° 26' 41.580" N	114° 55' 45.600" W	687937	3924351	87	35° 28' 46.776" N	114° 53' 51.081" W	690742	3928269
10	35° 27' 16.200" N	114° 55' 22.800" W	688489	3925429	88	35° 28' 46.853" N	114° 53' 42.164" W	690967	3928277
11	35° 27' 16.200" N	114° 55' 32.400" W	688247	3925424	89	35° 28' 33.799" N	114° 53' 28.600" W	691318	3927882
12	35° 27' 16.200" N	114° 55' 42.000" W	688005	3925419	90	35° 28' 38.047" N	114° 53' 18.260" W	691575	3928018
13	35° 27' 16.200" N	114° 55' 54.000" W	687703	3925413	91	35° 28' 37.893" N	114° 53' 8.205" W	691829	3928019
14	35° 27' 12.000" N	114° 56' 4.800" W	687433	3925278	92	35° 28' 37.815" N	114° 52' 51.700" W	692245	3928025
15	35° 27' 12.000" N	114° 56' 14.400" W	687191	3925273	93	35° 28' 36.348" N	114° 52' 39.369" W	692557	3927987
16	35° 27' 12.000" N	114° 56' 36.000" W	686647	3925261	94	35° 27' 56.863" N	114° 54' 1.939" W	690501	3926726
17	35° 27' 12.000" N	114° 56' 45.600" W	686404	3925256	95	35° 27' 56.706" N	114° 53' 52.898" W	690729	3926726
18	35° 27' 12.000" N	114° 56' 55.200" W	686162	3925251	96	35° 27' 56.531" N	114° 53' 42.870" W	690982	3926726
19	35° 27' 12.000" N	114° 57' 4.800" W	685920	3925246	97	35° 27' 56.347" N	114° 53' 32.349" W	691248	3926726
20	35° 27' 12.000" N	114° 57' 19.200" W	685557	3925239	98	35° 27' 56.046" N	114° 53' 22.817" W	691488	3926721
21	35° 27' 47.400" N	114° 56' 37.200" W	686594	3926352	99	35° 27' 55.845" N	114° 53' 11.310" W	691778	3926721
22	35° 27' 47.400" N	114° 56' 46.800" W	686352	3926347	100	35° 27' 55.777" N	114° 52' 59.799" W	692069	3926726
23	35° 27' 41.400" N	114° 56' 57.600" W	686083	3926156	101	35° 27' 55.876" N	114° 52' 50.093" W	692313	3926734
24	35° 27' 41.400" N	114° 57' 7.200" W	685841	3926151	102	35° 27' 15.600" N	114° 54' 10.200" W	690320	3925450
25	35° 27' 41.400" N	114° 57' 16.800" W	685599	3926146	103	35° 27' 15.600" N	114° 54' 0.600" W	690562	3925455
26	35° 27' 41.400" N	114° 57' 26.400" W	685357	3926141	104	35° 27' 15.600" N	114° 53' 51.000" W	690804	3925460
27	35° 27' 41.400" N	114° 57' 36.000" W	685115	3926136	105	35° 27' 15.600" N	114° 53' 41.400" W	691046	3925465
28	35° 27' 41.400" N	114° 57' 45.600" W	684873	3926131	106	35° 27' 15.600" N	114° 53' 31.800" W	691288	3925470
29	35° 27' 41.400" N	114° 57' 55.200" W	684631	3926126	107	35° 27' 15.600" N	114° 53' 22.200" W	691530	3925475
30	35° 28' 11.400" N	114° 58' 10.200" W	684234	3927043	108	35° 27' 15.315" N	114° 53' 11.207" W	691808	3925473
31	35° 28' 11.400" N	114° 58' 0.600" W	684476	3927048	109	35° 27' 16.705" N	114° 53' 0.207" W	692084	3925521
32	35° 28' 11.400" N	114° 57' 51.000" W	684718	3927053	110	35° 26' 41.580" N	114° 54' 7.200" W	690418	3924403
33	35° 28' 17.400" N	114° 57' 39.000" W	685017	3927244	111	35° 26' 41.580" N	114° 53' 57.600" W	690660	3924408
34	35° 28' 17.400" N	114° 57' 29.400" W	685258	3927249	112	35° 26' 41.580" N	114° 53' 48.000" W	690902	3924413
35	35° 28' 17.400" N	114° 57' 19.800" W	685500	3927254	113	35° 26' 41.580" N	114° 53' 38.400" W	691144	3924418
36	35° 28' 17.400" N	114° 57' 10.200" W	685742	3927259	114	35° 26' 41.480" N	114° 53' 25.529" W	691469	3924422
37	35° 28' 17.400" N	114° 57' 0.600" W	685984	3927264	115	35° 26' 45.034" N	114° 53' 12.631" W	691792	3924539
38	35° 28' 17.400" N	114° 56' 51.000" W	686226	3927269	116	35° 26' 49.746" N	114° 53' 1.093" W	692080	3924690
39	35° 28' 23.911" N	114° 56' 40.220" W	686494	3927475	117	35° 26' 50.287" N	114° 52' 49.335" W	692376	3924713
40	35° 28' 23.940" N	114° 56' 30.600" W	686736	3927481	118	35° 26' 51.445" N	114° 52' 38.430" W	692650	3924755
41	35° 28' 59.400" N	114° 57' 1.200" W	685942	3928558	119	35° 27' 3.419" N	114° 52' 27.905" W	692907	3925130
42	35° 28' 59.400" N	114° 56' 51.600" W	686184	3928563	120	35° 27' 3.728" N	114° 52' 18.043" W	693156	3925144
43	35° 28' 59.400" N	114° 56' 42.000" W	686426	3928568	121	35° 26' 58.784" N	114° 52' 9.508" W	693374	3924997
44	35° 28' 59.400" N	114° 56' 32.400" W	686668	3928573	122	35° 27' 4.423" N	114° 51' 56.896" W	693689	3925177
45	35° 28' 59.400" N	114° 56' 4.800" W	687364	3928587	123	35° 27' 6.895" N	114° 51' 46.939" W	693938	3925259
46	35° 28' 59.400" N	114° 55' 55.200" W	687606	3928592	124	35° 26' 34.760" N	114° 52' 32.740" W	692804	3924244
47	35° 28' 59.400" N	114° 55' 45.600" W	687848	3928597	125	35° 26' 36.073" N	114° 52' 22.500" W	693062	3924290
48	35° 28' 59.400" N	114° 55' 36.000" W	688090	3928602	126	35° 26' 3.939" N	114° 53' 44.571" W	691013	3923255
49	35° 29' 36.524" N	114° 56' 53.607" W	686110	3929705	127	35° 26' 3.916" N	114° 53' 30.874" W	691359	3923262
50	35° 29' 37.605" N	114° 56' 44.309" W	686344	3929744	128	35° 26' 3.475" N	114° 53' 17.978" W	691684	3923255
51	35° 29' 40.540" N	114° 56' 33.114" W	686624	3929840	129	35° 26' 3.029" N	114° 53' 4.819" W	692016	3923249
52	35° 29' 40.560" N	114° 56' 23.400" W	686869	3929846	130	35° 26' 3.018" N	114° 52' 51.911" W	692342	3923255
53	35° 29' 37.142" N	114° 55' 32.674" W	688149	3929767	131	35° 26' 5.194" N	114° 52' 40.791" W	692621	3923328
54	35° 29' 35.906" N	114° 55' 22.238" W	688413	3929735	132	35° 26' 7.150" N	114° 52' 29.412" W	692907	3923395
55	35° 29' 55.063" N	114° 56' 1.516" W	687411	3930304	133	35° 26' 8.110" N	114° 52' 17.002" W	693219	3923431
56	35° 29' 54.600" N	114° 55' 52.218" W	687645	3930295	134	35° 26' 7.337" N	114° 52' 5.529" W	693509	3923414
57	35° 30' 1.706" N	114° 55' 38.935" W	687975	3930521	135	35° 27' 31.614" N	114° 50' 39.038" W	695633	3926058
58	35° 30' 3.406" N	114° 55' 27.456" W	688264	3930579	136	35° 27' 31.614" N	114° 50' 28.985" W	695887	3926063
59	35° 30' 3.406" N	114° 55' 17.873" W	688505	3930584	137	35° 27' 31.691" N	114° 50' 19.501" W	696126	3926071
60	35° 30' 3.097" N	114° 55' 8.953" W	688730	3930580	138	35° 27' 31.382" N	114° 50' 9.733" W	696372	3926067
61	35° 30' 1.475" N	114° 54' 47.224" W	689279	3930541	139	35° 27' 34.086" N	114° 50' 0.818" W	696595	3926155
62	35° 29' 56.762" N	114° 54' 39.349" W	689480	3930400	140	35° 27' 34.241" N	114° 49' 51.903" W	696820	3926165
63	35° 29' 56.685" N	114° 54' 30.050" W	689714	3930403	141	35° 27' 57.878" N	114° 50' 9.541" W	696359	3926883
64	35° 29' 57.689" N	114° 54' 13.635" W	690127	3930442	142	35° 27' 56.565" N	114° 50' 20.922" W	696073	3926837
65	35° 30' 1.629" N	114° 54' 4.810" W	690347	3930569	143	35° 27' 54.943" N	114° 50' 34.389" W	695735	3926779
66	35° 30' 1.552" N	114° 53' 55.037" W	690594	3930571	144	35° 28' 15.336" N	114° 50' 44.066" W	695477	3927402
67	35° 29' 47.879" N	114° 53' 47.530" W	690792	3930154	145	35° 28' 15.645" N	114° 50' 32.968" W	695757	3927418
68	35° 29' 48.033" N	114° 53' 38.801" W	691012	3930164	146	35° 28' 15.336" N	114° 50' 23.104" W	696006	3927414
69	35° 30' 2.170" N	114° 53' 27.805" W	691279	3930605	147	35° 28' 14.950" N	114° 50' 13.240" W	696254	3927407
70	35° 30' 1.861" N	114° 53' 17.939" W	691528	3930601	148	35° 28' 11.783" N	114° 50' 3.470" W	696503	3927315
71	35° 30' 2.093" N	114° 53' 7.976" W	691779	3930613	149	35° 28' 8.616" N	114° 49' 51.804" W	696799	3927224
72	35° 30' 2.093" N	114° 52' 57.633" W	692040	3930619	150	35° 28' 5.526" N	114° 49' 42.319" W	697040	3927134
73	35° 29' 45.639" N	114° 52' 52.309" W	692185	3930115	151	35° 28' 25.500" N	114° 49' 12.856" W	697769	3927766
74	35° 29' 41.004" N	114° 52' 40.923" W	692475	3929978	152	35° 28' 25.717" N	114° 49' 3.863" W	697996	3927778
75	35° 29' 35.751" N	114° 52' 31.341" W	692720	3929822	153	35° 28' 25.679" N	114° 48' 54.325" W	698236	3927782
76	35° 29' 47.724" N	114° 52' 17.773" W	693054	3930198	154	35° 28' 25.925" N	114° 48' 45.600" W	698456	3927794
77	35° 29' 24.164" N	114° 54' 13.663" W	690149	3929409	155	35° 27' 58.035" N	114° 48' 55.753" W	698219	3926929
78	35° 29' 24.009" N	114° 54' 3.228" W	690412	3929410	156	35° 27' 59.212" N	114° 48' 47.251" W	698433	3926970

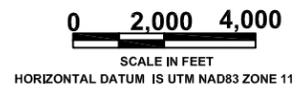
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LEGEND

- 158 ● SIEMENS 2.3 TURBINE
- EXISTING ROAD
- PROPOSED WTG ROAD
- UPGRADE EXISTING ROAD
- PROPOSED CRANE TRACK
- MINOR CONTOURS - 20 FT
- MAJOR CONTOURS - 100 FT
- PROJECT AREA BOUNDARY
- ▲ MET TOWER
- EXISTING TRANSMISSION LINE
- Parcel #
- CIRCUIT
- STATE OR FEDERAL HIGHWAY
- SUBSTATION OR INTERCONNECT FACILITY
- O&M BUILDING (5 ACRES)
- LAYDOWN AREA (10 ACRES)
- ◆ HIGHWAY ACCESS FOR SUBSTATION, O&M, LAYDOWN

1:24,000



**FIGURE 3-1
SITE LAYOUT MAP**

REVISIONS	
DATE	BY



TETRA TECH EC, INC.

Table 3-3. Calculated Disturbance for the Searchlight Wind Energy Facility

Road Lengths (feet)			
Road Type	Private Land	Public Land	Total Length
Possible Crane Track	0	25,250	25,250
Upgrade Existing Road	9,629	29,585	39,214
New WTG Access Road	16,286	140,991	157,277
Totals	25,915	195,826	221,741

Road Lengths (miles)			
Road Type	Private Land	Public Land	Total Length
Possible Crane Track	0.00	4.78	4.78
Upgrade Existing Road	1.82	5.60	7.43
New WTG Access Road	3.08	26.70	29.79
Totals	4.91	37.09	42.00

Roads on Private Land (No crane track disturbance)			
Road Lengths	Length (mi)	Type	Disturbed Area (ac)
Upgraded Existing Roads	1.8	Permanent*	3.5
	1.8	Temporary**	7.8
New Turbine Access Roads	3.1	Permanent*	6.0
	3.1	Temporary**	20.3
Transmission Line Road	0.2	Temporary**	0.4
Total Disturbance (ac)		Permanent	9.5
		Temporary	28.5

*Permanent road width = 16 feet. Side slopes restored.

**Side slope variable from flat to 2H:1V (44 ft to 156 ft corresponding temporary disturbance width)

Roads and Crane Tracks on Public Land			
Road Lengths	Length (mi)	Type	Disturbed Area (ac)
Crane Track Roads	4.3	Permanent*	8.3
	4.8	Temporary**	25.5
Upgraded Existing Roads	5.6	Permanent*	10.9
	5.6	Temporary**	31.8
New Turbine Access Roads	26.7	Permanent*	51.8
	26.7	Temporary**	191.0
Transmission Line Road	7.1	Temporary**	13.8
Total Disturbance (ac)		Permanent	71.0
		Temporary	262.1

*Permanent road width = 16 feet. Side slopes restored.

**Side slope variable from flat to 2H:1V (44 ft to 156 ft corresponding temporary disturbance width)

Infrastructure on Private Land	Quantity	Type	Acres per Unit	Total Area (acres)
Turbine Sites	19	Permanent	0.09	1.71
Turbine Sites	19	Temporary	1.62	30.78

Infrastructure on Public Land	Quantity	Type	Acres per Unit	Total Area (acres)
Turbine Sites	137	Permanent	0.09	12.33
Turbine Sites	137	Temporary	1.62	221.94
Interconnect Facility	1	Permanent	5	5
Substations	2	Permanent	5	10
Laydown Area - West	1	Temporary	10	10
Laydown Area - East	1	Permanent	10	10
O & M Facility	1	Permanent	5	5
Met Towers	5	Permanent	0.03	0.15
TOTAL DISTURBANCE (ac)		Permanent		42.48
		Temporary		231.94

Total Disturbance on Private Land	Area (acres)
Permanent	11.2
Temporary	59.3

Total Disturbance on Public Land	Area (acres)
Permanent	113.5
Temporary	494.0

3.2 PROJECT COMPONENTS

3.2.1 Wind Turbine Generators

The proposed wind turbine generators will be the latest generation of three-bladed, upwind, variable speed Siemens 2.3 MW or similar models. The blades, with a 93-meter rotor diameter, will be made of glass-reinforced fiber with steel internal components. The nacelle (or main turbine body), which contains the generator, gearbox, main shaft, bearings, yaw mechanism and various safety systems, will be fully enclosed with a steel chassis and fiberglass covering. Each wind turbine is fully automatic and self-regulating, and has been designed to operate in the high winds and hot conditions of the site. Fully enclosed conical steel tubular towers 80-meters tall will support the turbines and will contain the electronic power and control systems. The wind turbines will be painted a matte, light off-white color, as required by the Federal Aviation Administration (FAA) [4]. Figure 3-2 shows a photograph and dimensions of the Siemens SWT-2.3-93 turbine.

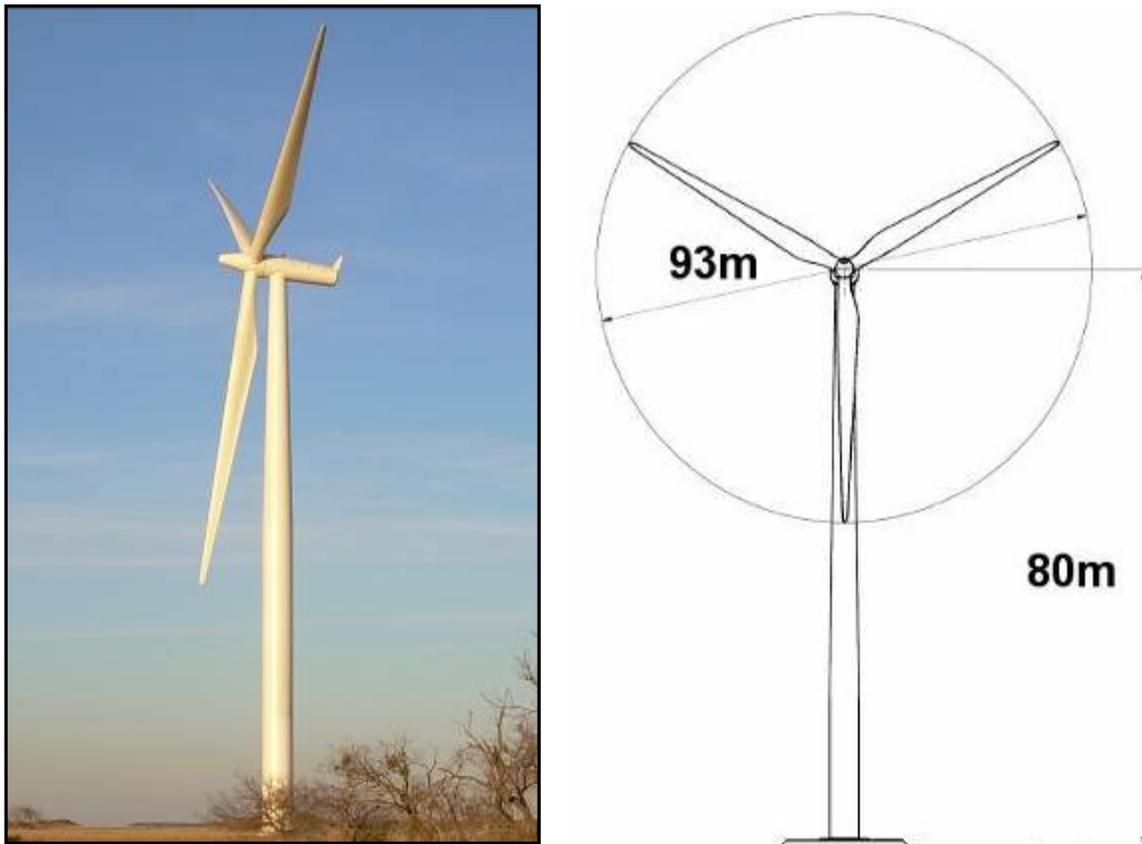


Figure 3-2 - Photograph and Dimensions of the Siemens SWT-2.3-93 Turbine
(Sketch is not to scale)

The wind turbines are equipped with sensors which continuously monitor the wind speed and direction. Once the wind reaches a pre-determined wind speed (approximately 9 mph), the wind turbine rotor and blades will begin to turn and the generator will produce alternating current electricity synchronized with the electric grid frequency at a voltage which can be stepped up to transmission level voltages. As the wind changes direction, the turbines will rotate to face the prevailing wind in order to maximize energy production. The turbines are pitch regulated which means that the angle of the blades adjusts once maximum power output is reached at around 33 mph (they do not adjust at wind speeds below maximum output). At a pre-determined maximum wind speed (approximately 55 mph), the wind turbines will shut down in order to limit the stresses on the turbine.

Each wind turbine also contains a safety system which ensures automatic shut down of the turbine in the event of any mechanical disorders, excessive vibration, grid electrical faults or loss of grid power. If grid electrical faults or loss of grid power occurs, the turbines will automatically be brought back to service when the disorder has been remedied. For mechanical disorders, the turbines will remain shut down until the cause of the disorder has been identified and resolved by the project operations and maintenance team.

The wind turbines have been spaced on the Project site in order to maximize the flow of wind across the project site to each wind turbine from the prevailing southerly and southwesterly winds believed to dominate the wind regime in the Searchlight vicinity. Spacing between the turbines minimizes inefficiencies associated with the wake effects each turbine creates in its immediate vicinity.

The project will require a Determination of No Hazard to Air Navigation from the Federal Aviation Administration (FAA) for each wind turbine. Catamount will file a Form 7460-1 Notification of Proposed Construction or Alteration with the FAA for the wind turbines in order to obtain FAA approval for the wind turbines and determine lighting requirements.

3.2.2 Foundations

The wind turbine foundation designs will be based on the load information provided by the wind turbine manufacturer and the load bearing soil characteristics that are measured by geotechnical investigations at each wind turbine location. The typical foundation for this type of wind turbine is a reinforced concrete spread foundation directly resting on the soil at a depth of approximately ten feet below ground. The foundation is generally an octagon shape having dimensions ranging from 40 feet to 60 feet wide and a concrete pier on the top of the mat extending to the ground level. Each foundation will have approximately 300 cubic yards of concrete. Figure 3-3 shows some photographs of a foundation under construction and Figure 3-4 shows the dimensions of a typical foundation.



Figure 3-3. Photographs of a Foundation Under Construction

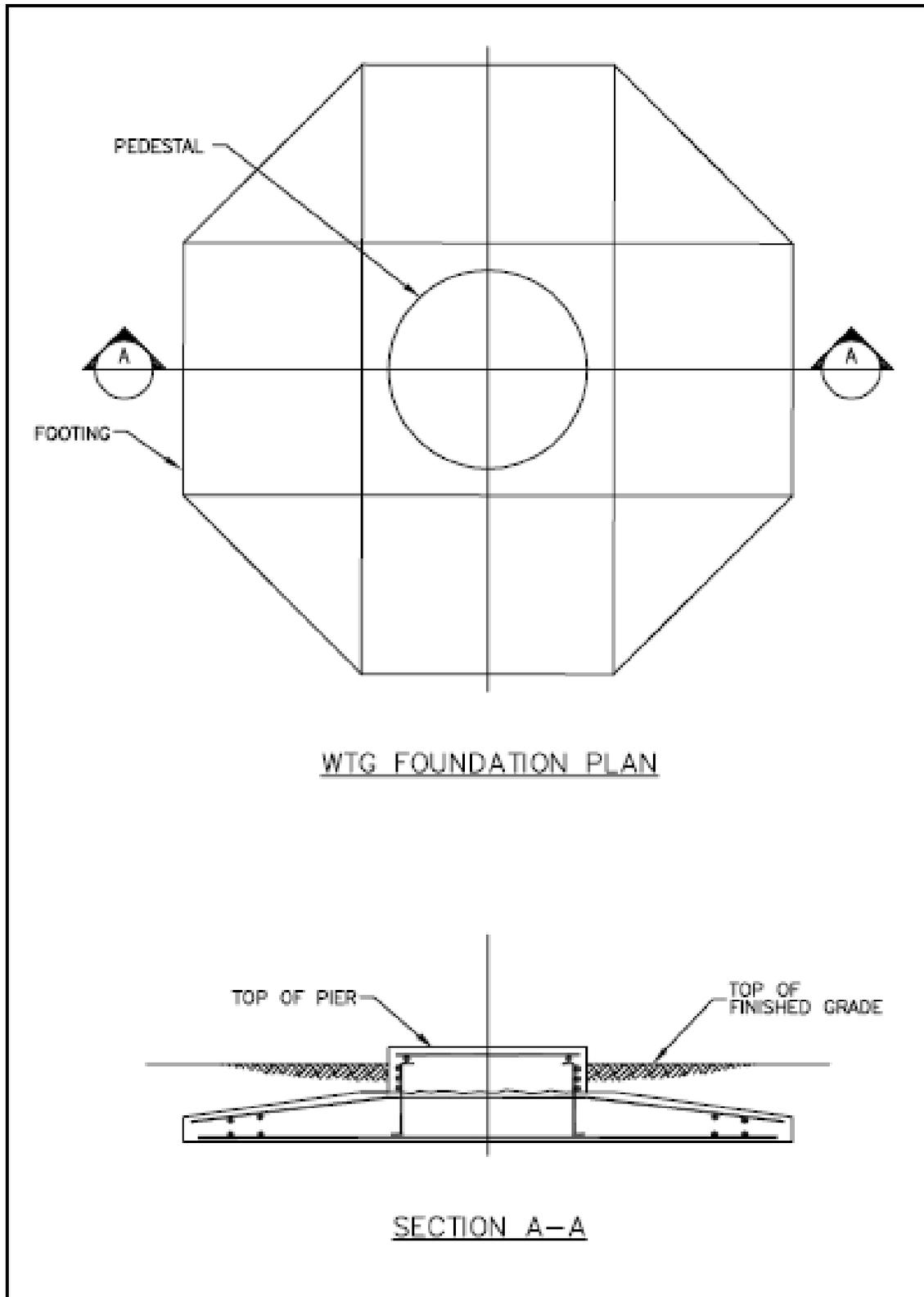


Figure 3-4. Typical Foundation

3.2.3 Pad-Mounted Transformers

A 34.5 kV pad-mounted transformer is required adjacent to the concrete pad of the turbine foundation to step up the voltage from the wind turbine at 690 Volts to the 34.5 kV electrical collection system for the project. The transformer foundation will be a concrete slab placed over compacted soil or granular material. It will be 2 feet or more below the ground elevation at the turbine pad and will be approximately 7 feet wide by 10 feet long (Figure 3-5). Containment and countermeasures for site management employed by Catamount in the unlikely event that oil be spilled from the transformer are included in Attachment X, an indicative Spill Prevention Control and Countermeasures Plan from another Catamount wind energy facility.



Figure 3-5. Photograph of a Typical Pad-Mount Transformer Prior to Backfill

3.2.4 Electrical Collection and Distribution System

Each pad-mount transformer described above is then connected together in a 34.5 kV underground collection system, which is connected to the project substation facility. Depending on final design, one to three separate parallel trenches will be required. Each trench is typically 2 feet wide and 4 feet deep. In some locations, topographic or geologic constraints may necessitate the use of overhead collection lines on single wood poles. The locations where overhead collection lines will be employed will be determined after a geotechnical has been conducted and a more detailed project design has been determined.

The project substation steps up the voltage from 34.5 kV to 230 kV and will contain a large transformer, metering equipment, circuit breakers, poles and disconnects and other devices to regulate the flow of electrical power. A new 230 kV above-ground overhead transmission line is planned to be constructed between the two electrical substations and the electrical interconnection facility/switchyard. From project substation 2, as indicated

on the Site Layout Map in Figure 3-1, the above-ground transmission line will be routed on poles or lattice towers approximately 7.3 miles across federal lands administered by the BLM to connect with the Western Area Power Administration's 230 kV line located on federal land administered by the BLM in Section 26, T28S, R64E. The transmission line can be accessed during construction using all-terrain or off-road vehicles to carry equipment and the poles or towers to their place of erection.

3.2.5 Laydown Yards

Two staging areas, commonly referred to as laydown yards, will be required near the proposed electrical substation locations as shown on the site plan in Figure 3-1. Access to the laydown areas will be via existing but upgraded roads leading from U.S. Highway 95 north of the town of Searchlight and State Highway 164 east of the town of Searchlight. The locations of the two access points are shown on Figure 3-1. The laydown area near substation 1 will be temporary and used during construction only. The laydown area near substation 2 will also be used for extra storage, spare parts during the life of the project. Each laydown area will be approximately 10 acres in size and fenced for security for the duration of its use.

3.2.6 Underground Communication Lines

The wind turbines will be operated by means of a Supervisory Control and Data Acquisition (SCADA) system located in the control panel inside the tower of each wind turbine. Each turbine is connected via fiber optic cable to a centralized computer located in the project's O&M building. Data can be accessed and the wind turbines can be controlled on-site or remotely. The fiber optic communications cable will be collocated with the electrical collection system to reduce environmental impacts. Where feasible, collection cabling and communication lines will be collocated with roads to further reduce environmental impacts.

3.2.7 Operations and Maintenance Building

There will be a small Operations and Maintenance (O&M) building, similar to but smaller than the building illustrated in Figure 3-6. This building will contain offices and will house the control system for the wind turbines, spare parts, consumables and tools. It will also contain parking for maintenance trucks. The O&M building will be approximately 150 feet by 50 feet inside a compound of approximately 5 acres. The building will be constructed from composite panels. Portable water supplies will be used in the building and sewage disposal will be by means of an on-site septic tank. Telecommunications lines and the SCADA system will also be installed.



Figure 3-6. Typical ‘Look’ of an O&M Building

(This particular one is much larger than that being proposed.)

3.2.8 Meteorological Stations

Five permanent meteorological masts will be installed to measure the wind speed and direction across the site to compare turbine performance to measured wind speeds over the life of the project. The five positions, displayed on the Site Layout Map in Figure 3-1, are the same as those currently being used for temporary meteorological monitoring under the short term ROW grant that Catamount has with the Las Vegas Field Office. However, alternate locations may be established if new locations are determined to better suit the project design after initial meteorological data testing has been completed. The permanent stations will constantly measure the flow of wind (including wind speed and direction) across the site. The data from the meteorological stations will be used to forecast the energy anticipated from the project (based on the prevailing wind speeds). The meteorological stations will be comprised of a free-standing (i.e., will not have guy wires) lattice steel tower of up to 80 meters tall. There will be a small foundation (3 feet diameter and 6 feet deep) for each of the three feet of the tower, with each side of the triangular structure being approximately 30 feet in length. The area disturbed will be approximately 36 feet by 36 feet.

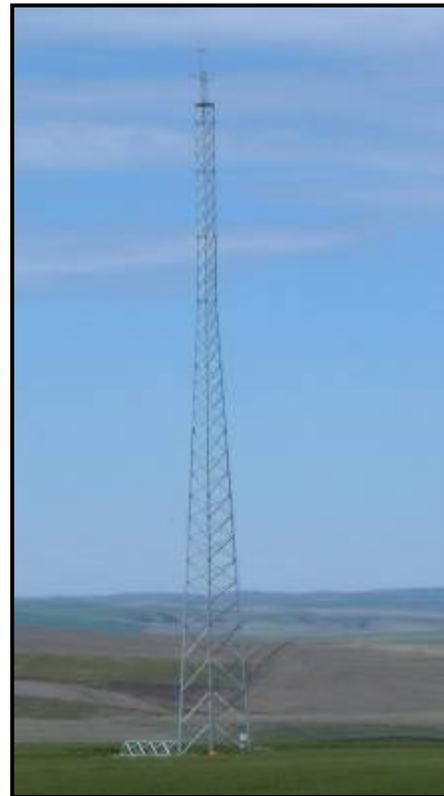


Figure 3-7. Example of a Meteorological Station

3.2.9 Roads

The project will utilize a mixture of existing federal, state and county and local public roads, as well as new roads constructed for the project. The Site Layout Map in Figure 3-1 identifies existing roads proposed to be upgraded to support the transport of project facility components, as well as new roads proposed for turbine access and long term operations and maintenance. Primary access to the project will be via U.S. Highway 95 and Nevada State Highway 164. Once off of the primary access routes, the turbines and other facilities will be accessed via upgraded existing roads and new access roads. The project will require upgrades to existing roads across approximately 5.6 miles of BLM land and 1.8 miles of private land. Also, the project will require new roads or crane tracks across approximately 43.7 miles of BLM land and 3.3 miles of private land. An additional 0.5 mile segment of crane track will also be required across BLM land, but will be decommissioned after facility construction is complete. The proposed road network including the two primary access points are shown on the Site Layout Map in Figure 3-1.

Existing roads will be upgraded, and new roads constructed, to a width of 36 feet so that the turbine erection crane can crawl to each turbine location. The crane will crawl between turbine locations after each turbine is erected. It is likely that multiple cranes will be used to expedite facility construction. Regardless of the number of cranes employed, each will be broken down for transport across U.S. Highway 95 and State Highway 164 and to cross under the transmission lines west of US Highway 95.

Roads will be rough graded and will consist of approximately six inches of aggregate road base over compacted native material. Culverts will be installed in areas where water may move to wash out roads. Upon completion of construction, roads will be left in place to provide access for O&M purposes. However, the road width will be reduced to 16 feet and the remainder of the 36 foot wide road will be restored to reduce the permanent impact area.

During the Operation Phase, roads will be inspected at least twice annually. Periodic grading and placement of aggregate base may be required to maintain road quality. Road maintenance will be scheduled during times of low or no wind to minimize airborne dust. Speed limits of 20 mph will be posted and enforced and required of all O&M vehicles to minimize airborne dust and erosion.

3.2.10 Laydown Areas/Concrete Batch Plants

The wind turbine towers, nacelles and blades will be transported to the project site on specialized trucks as illustrated in Figure 3-8. Pad-mounted transformers, electrical infrastructure, substation components, the meteorological masts and other construction materials will be transported to the site on flat-bed and regular trucks. The wind turbines, foundations, electrical infrastructure, O&M building and meteorological masts will be assembled and constructed at each individual site.



Figure 3-8. Specialized Truck Transporting a Wind Turbine Nacelle

During construction, construction equipment, cable, foundation parts, components, towers, blades, nacelles, etc., will be temporarily stored either at one of the two laydown areas each approximately 10 acres in size as shown on the Site Layout Map in Figure 3-1, or at the base of each wind turbine location. The equipment will be supported on wooden frames, pallets, or straw bales, which will be placed on the ground while turbine components are loaded, pre-assembled, and await installation. Areas of sensitive habitat will be fenced off with caution tape to prevent damage.

Unless a local concrete batch plant is available during construction, concrete for foundations will be mixed at mobile batch plants that will be located within the laydown areas shown on Figure 3-1. In this situation cement, water and aggregate will also be staged in the laydown areas.