4.0 CONSTRUCTION PROCEDURES

4.1 CONSTRUCTION OVERVIEW

The actions necessary to construct the Searchlight Wind Energy Facility are described below. This section contains a general description of the construction steps for the major components for the project. This plan discusses the general activities and design approaches as currently understood and anticipated. Catamount will remain in contact with the BLM as the project designs are finalized and specifics on construction are available. It is anticipated that construction will occur in one continuous phase, and is expected to take approximately 8 to 12 months.

Project construction will be performed in several stages and will include the following main elements and activities:

- Widening and grading of existing roads;
- General clearing and construction of access roads, crane pads and turn-around areas;
- Grading of the field construction office area (O&M building), the two electrical substation areas, the two laydown areas and the electrical interconnection facility/switchyard area;
- Construction of turbine tower foundations;
- Installation of the electrical collection system;
- Assembling and erection of the wind turbines;
- Construction and installation of the two electrical substations;
- Plant commissioning and energization;
- Final grading and drainage; and
- Restoration activities

All project construction will follow site-specific soil erosion and sediment control measures described in a Storm Water Pollution Prevention Plan (SWPPP) prepared and implemented in accordance with a Nevada Division of Environmental Protection Storm Water General Permit NVR10000.

4.2 PRE-CONSTRUCTION ACTIVITIES

Prior to the initiation of construction, Catamount will conduct numerous pre-construction activities including the aerial acquisition of two-foot contour interval topographic survey data. Before construction can commence, a site survey will be performed to stake out the exact location of the wind turbines, access roads, electrical lines, facility access entryways from U.S. Highway 95 and Nevada State Highway 164, O&M building,

laydown areas, electrical substation areas, and the electrical interconnection facility/switchyard.

Once the surveys are complete, a detailed geotechnical investigation will be performed to identify subsurface conditions which will dictate the design specifications of the access roads, foundations, underground trenching and electrical grounding systems. The geotechnical investigation involves a drill rig, which bores to the engineer's required depths (typically approximately 50 feet at each turbine location and lesser depths for the foundations for the ancillary structures). The purpose of the investigation is to identify the subsurface soil and rock types and strength properties by sampling and lab testing. Testing is also performed to measure the soil's electrical properties to ensure proper grounding system design. A geotechnical investigation is generally performed at each turbine location, at the substation and interconnection locations, along the access roads and at the O&M building site.

Using all of the data gathered for the proposed project, including geotechnical information, environmental conditions, title information, and site topography, Catamount will establish a set of site-specific construction specifications for the various portions of the proposed project. The design and construction specifications will be custom tailored for site-specific conditions by qualified technical staff and engineers. Catamount will ensure that all aspects of the specifications as well as the actual on-site construction comply with all applicable federal, state and local codes and good industry practice.

To assure compliance with various environmental protection commitments and permit conditions, Catamount will prepare a construction Environmental Compliance Plan. Prior to beginning work at the construction site, all work crews will be trained in the environmental compliance program and in the project safety rules. Prior to the commencement of construction, sensitive environmental and/or cultural resources will be flagged in the field and sediment and erosion control measures will be implemented.

About one week prior to the start of construction at any given site, an environmental inspector (if required), the contractor, and any subcontractors will conduct a walk-over of areas to be affected, or potentially affected, by proposed construction activities. These pre-construction walk-overs will occur regularly and are intended to identify sensitive resources to avoid, limits of clearing, location of drainage features (e.g., culverts, ditches), and the layout for sedimentation and erosion control measures. Upon identification of these features, specific construction procedures will be reviewed, and any modifications to construction methods or locations will be agreed upon before construction activities begin. Landowners and agency representatives will be consulted or included on these walk-overs as needed.

Prior to the start of construction, Catamount will review and document the general condition of the site, including type and abundance of vegetation and areas of existing disturbance. As previously mentioned, a licensed surveyor will survey and stake all road and turbine locations before construction begins.

The O&M building, laydown areas, substations and interconnection area will be fenced and gated for security. Because of the existing road and trail network and the open accessibility to public land, it will not be possible to prevent access to the ROW. However, during construction, warning signs, flaggers in high traffic areas and security personnel at turbine sites under construction will be employed for the safety of the public and construction workers and for security at active work areas.

4.3 CLEARING AND GRADING

No clearing and grading activities will occur until sediment and erosion control measures have been installed in accordance with the SWPPP. Clearing and grading will occur at existing roads, access roads, temporary staging areas (laydown yards), turbine and other facility locations, electrical substation locations, electrical interconnection facility/switchyard locations, and the transmission line corridor, as necessary.

Clearing and disposing of trash, debris and scrub on those portions of the site where construction will occur will be performed in the initial stages of construction. The clearing of existing vegetation will be performed only where necessary. All excavations made by clearing activities will be backfilled with compacted earth/aggregate available on site. Disposal of cuttings and debris will be in an approved facility designed to handle such waste or at the direction of the BLM Authorized Officer.

Figure 4-1 illustrates a cleared and graded road suitable for facility component transport including turbine parts.

Figure 4-1. Cleared and Graded Path for Road

4.4 BLASTING

In order to construct the project access roads in the steeper and more topographically dissected lands in the northern and eastern portions of the ROW, it may be necessary to conduct blasting of rock to reach the minimum slope and gradient required for the transportation of turbine components and the crane(s). Blasting may also be required for foundation construction in areas where bedrock exists above the foundation grade level. Each location will be assessed with regard to apparatus or structures in the vicinity, and a determination made of the suitability of that location for blasting. Any foundation or road excavation deemed to be unsafe to blast will be excavated by alternative means, such as a rock-hammer.

Based on industry best management practices, Catamount will carry out controlled blasting operations no closer than 200 feet to any buried pipeline or any above ground structures. Prior to controlled blasting around structures, the owners that can be identified, will be notified, such that any concerns can be addressed prior to blasting.

All blasting will be conducted in accordance with a Blasting Control Plan. All blasting shall be designed and carried out by a specialist contractor who has significant experience and expertise in this field and is licensed in the State of Nevada to carry out such work. A blast pattern and shot design will be prepared by the contractor and reviewed and approved by Catamount prior to each blast being made. Periodic seismograph monitoring of blasts shall be conducted as deemed appropriate. Blasting will be limited to the hours of 8 am to 5 pm. Additionally, the issue of flyrock will be considered. Catamount will ensure that the shot design will be structured with proper placement and stemming of explosive and use of blast blankets where applicable so as to minimize flyrock occurrence. Generally speaking, Catamount will instigate a minimum clearance distance of 500 feet from any turbine foundation blasting operation and 1,500 feet from a major blast, such as at deep cuts on the proposed access roads.

4.5 ROAD CONSTRUCTION

Sediment and erosion control measures will be in place prior to commencement of road construction activities. Please refer to section 3.2.7 for the main details of the road. Road construction can be described as a 3 step process:

1) Clear and grade (section 4.3),
2) Lay down aggregate base (gravel) with a dump truck or live bottom truck, and
3) Proof roll and compact gravel.

Any material placed in the areas of the roads or foundations will be compacted to at least 90 percent of the maximum Proctor density or greater as required for road structural integrity and foundation design.

Figure 4-2 illustrates the stages of road construction.

Figure 4-2. Stages of Road Construction

Top Right	Clearing and Grading
Main Photo:	Loading trucks from gravel stock pile
Bottom Left:	Transporting gravel
Top Left:	Dump truck about to lay down gravel
Bottom Right:	Compaction

4.6 FOUNDATION CONSTRUCTION AND TOWER ERECTION

The foundation will be a spread foot design or equivalent, as specified by the project geotechnical/civil engineer. Please refer to Figure 3-3 for illustrations of the proposed foundation type under construction. Excavation of each foundation will be to a depth of approximately 10 feet and a width of 50 to 60 feet.

Once the foundation concrete is cured, it is buried and backfilled with the excavated on-site material compacted to design criteria. The top of the foundation is a pedestal that may be either flush with the ground surface or may extend 6 to 8 inches above grade. At the base of each tower, a rectangular area approximately 100 feet by 60 feet will be developed as a gravel crane pad. The tower sections, rotor components, and nacelle for each turbine will then be delivered to each site and unloaded by crane. A large erection crane will set the tower segments on the foundation, place the nacelle on top of the tower, and following ground assembly, place the rotor onto the nacelle.

The towers will be delivered in three or four sections. The first section for each tower will be hoisted into place on top of the foundation pedestal by cranes and bolted to it. The other tower sections will then be installed by crane and bolted together. The nacelle

(which includes the generator and gearbox) will be hoisted by crane and set into place on top of the tower. The blades will be attached to the rotor hub while on the ground and the entire rotor hub will be hoisted by crane up to the nacelle height and bolted to it. Crane crews will erect the turbines soon after all components arrive to minimize the amount of time the equipment is on the ground. Figure 4-3 illustrates the turbine erection process.

4.7 TRENCHING FOR UNDERGROUND LINES

Open trenching is necessary for the placement of electrical collection system cables and fiber optic communication lines. The collection and communications systems will be constructed parallel to the roads running from and between the wind turbines to the project substations and O&M building and will be excavated by a "Trenching Machine" to a depth of 4 feet and width of 2 feet (Figure 4-4). An excavator with a rock hammer attachment or even blasting may be required in areas where rock is at or near the ground surface.

The extent of the open trench at any given time will be minimized to only those distances necessary to conduct work. Once the electric cables and fiber optic communications cable have been placed into the trench (Figure 4-5) and connected to the wind turbines and transformers (as applicable), the trench will be backfilled with the excavated trench material. In some areas depending upon the thermal resistivity of the excavated soils as determined during the geotechnical investigations, select backfill may be placed around the electric cables to facilitate heat dissipation. In either case backfilling will occur as soon as cable integrity has been tested and confirmed.

Buried underground infrastructure associated with the project will be installed with safety markings as required by law and the locations of the facilities will be on file with the Underground Service Alert of Central/Northern California and Nevada.

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.

Figure 4-3. Tower Base Section, Nacelle and Rotor Being Lifted Into Place

Figure 4-4. Trenching Machine Excavating a Trench for Cables

Figure 4-5. Laying Cable in the Trench

4.8 OVERHEAD DISTRIBUTION/TRANSMISSION LINES

An above-ground 230 kV overhead transmission line is planned to be routed between the project electrical substations and to the electrical interconnection facility/switchyard to connect with the Western Area Power Administration's 230 kV Mead – Davis transmission line located southeast of the ROW. The project overhead transmission line will be 7.3 miles in length and will be routed primarily across Federal lands administered by the BLM. The route to be followed by the transmission line is shown on the Site Layout Map in Figure 3-1 and the line will run from east-to-west through the following sections:

- T28S, R63E, Sections 27, 26, 25
- T28S, R64E, Sections 30, 29, 28, 27, 26

The overhead transmission line will comprise electric cable strung from poles or lattice towers (Figure 4-6) and the transmission line and poles will include devices to prevent raptor perching. The overhead transmission line will be accessed and installed by truck. A temporary at grade road that will be restored upon completion of the transmission line construction, will be constructed parallel to the transmission line.

Figure 4-6. Stringing the Wires on the Indicative Transmission Poles

4.9 ELECTRIC SUBSTATION

The energy generated by the wind turbines will be delivered to the two project electrical substations via the underground collection system. At the substation a transformer will increase the voltage of the energy from the collection system level of 34.5 kV to the transmission level of 230 kV. Capacitor banks and other equipment may be installed at the substation to provide the voltage support necessary to meet the interconnection requirements for the project (as yet unknown). A small control building will exist within the substation for electrical metering equipment.

To build a substation, the following tasks are required:

- Survey/Stake and Clear Site
- Install Sediment and Erosion Control Measures
- Clear Site
- Perform Site Grading
- Install Foundations

- Install Below Grade Raceway (Conduit, Ductbank, Trench, etc.)
- Install Below Grade Ground Grid
- Install Perimeter Fence
- Install a Sub-layer of Crushed Rock Surfacing
- Install Substation Steel Structures and Control Enclosures
- Install Substation Electrical Equipment
    - Circuit Breakers, Transformers, Switches, Potential Transformers, etc.
- Install Above Grade Ground Stingers
- Install Substation Bus Conductors and Jumpers
- Install Control/Relay and Communication Materials
- Install Secondary control/Power Cable and Terminations
- Install Final Layer of Crushed Rock Surfacing
- Perform Substation Testing/Commissioning Activities
- Energize Substation

Once the detailed engineering is performed, it will be determined if additional tasks would also be required. Figure 4-7 illustrates a partially completed substation.

Figure 4-7. Partially Completed Substation

Following electrical interconnection of the project's 230 kV overhead line with the Western Area Power Administration's 230 kV system, the project will be energized, tested and commissioned prior to commencing commercial operation and sale of renewable electricity.

4.10 OPERATIONS AND MAINTENANCE BUILDING

Communications between the wind turbines and centralized computers located in the O&M building for the project will be facilitated by the underground fiber optic cable system collocated with the electrical collection system (Section 4.7).

The O&M building will be a composite panel steel frame building of approximately 150 feet long by 50 feet wide. A concrete foundation approximately 1 foot to 3 feet wide (depending on the ground conditions) will be installed around the perimeter of the O&M building. A concrete slab will form the floor. The building will be located in a compound of approximately 5 acres with the rest of the area being covered with gravel.

4.11 FENCES AND SAFETY SIGNS

Where the primary project access roads commence from U.S. Highway 95 and Nevada State Highway 164, Catamount will post safety and warning signs informing the public of construction activities, and recommending the public stay off the site. Similar signage will be posted throughout active project work areas. Off-road vehicle use is likely to remain unchanged from the present situation. Since the entire area is predominantly public land with wide open access, the project will be designed and planned to co-exist with current and anticipated future land uses.

Temporary warning fences will be erected as needed in areas where public safety risks could exist and where site personnel will not be available to control public access (such as excavated foundation holes, and electrical collection system trenches). Permanent fencing will be installed around the permanent laydown area, the O&M building site, the two project electrical substations and the electrical interconnection facility/switchyard. Other areas deemed hazardous, or where issues with security or theft are of concern, may also be fenced. Catamount will coordinate the fencing with the BLM.

Temporary fencing around unfinished turbine bases and excavations are designed primarily to warn people of the potential danger, and therefore this fencing is typically a high visibility plastic mesh. Permanent fencing will be chain-link with locked gates.

4.12 CONSTRUCTION IN SENSITIVE AREAS

Catamount will generate a site-specific Environmental Compliance Plan that will incorporate standard environmental procedures or best management practices. This plan will include any requirements identified during NEPA and other environmental compliance processes to be conditions to project permits. Thus, a final plan cannot be completed until the end of the environmental review and permitting process. The final plan will be placed in a reference binder, copies of which will be given to the contractors working on site during the construction bid process and upon which project personnel must be trained prior to working on the project. Copies of the Environmental Compliance Plan will always be on hand at the project site. Contents will include, but are not limited, to the following:

- A summary of environmental permit stipulations
- Construction Mitigation and Restoration Plan

- The project Storm Water Pollution Prevention Plan
- The project Spill Prevention Control and Countermeasures Plan
- Environmental Consultants' Reports
- Environmental Complaints and Environmental Incident Reports
- Hazardous Waste Manifest Notes
- Other Environmental Documentation

Construction staff site orientation will include education on the identified environmental impacts of construction of the Searchlight Wind Energy Facility. The construction manager will establish a method for staff to formally report any issues associated with the environmental impacts, to keep management informed, and allow for rapid response. It is Catamount's intention that the mitigation measures be effective and that they keep any impacts to a minimum level. If mitigation measures are found to be ineffective, or unanticipated environmental aspects are found on the site, the mitigation and monitoring practices will be adapted to address these conditions. Any adaptations will be made with the approval of the BLM Authorized Officer.

4.13 SITE CLEANUP AND RESTORATION

Clearing and disposing of trash, debris and scrub on those portions of the site where construction will occur will be performed at the end of each work day through all stages of construction. Vegetation clearing will be performed only where necessary, and all excavations made by clearing activities will be backfilled with compacted earth/aggregate as soon as cable infrastructure is tested. Disposal of cuttings and debris will be in an approved facility designed to handle such waste or at the direction of the BLM Authorized Officer.

Prior to completion of construction, all remaining trash and debris will be removed from the site. Site cleanup will be performed on a continuous basis. Clean up from activities during routine daily maintenance will be performed at the time maintenance is performed by the O&M provider's personnel.

All temporarily disturbed areas will be returned to their previous state, to the extent feasible, and any debris will be removed and properly disposed of off-site. Through the NEPA process, Catamount with work with BLM personnel to establish a Construction Mitigation and Restoration Plan to incorporate methods for vegetation rehabilitation in areas temporarily disturbed by project development, noxious weed management provisions, and the movement and rehabilitation of sensitive plant species, as feasible. A restoration punch-list will be developed and construction activities will not be deemed complete until the regulatory agencies with jurisdiction over the project have acknowledged that the restoration activities have been adequately implemented.

4.14 CONSTRUCTION SCHEDULE AND PERSONNEL REQUIREMENTS

Construction is anticipated to take from 8 to 12 months to complete. Table 4-1 identifies the proposed start date and duration of construction by facility. A Project milestone construction schedule will be developed as the project design is developed.

Table 4-1. Proposed Construction Schedule (Approximate)

Facility	Start	Duration
Road Construction	Week 1	12 weeks
Road Maintenance	Week 7	31 weeks
Foundation Construction	Week 7	18 weeks
Trenching and Cabling	Week 12	18 weeks
Wind Turbine Generator Installation	Week 16	18 weeks
Wind Turbine Generator Commissioning	Week 34	4 weeks
O&M Building	Week 8	16 weeks
Substation and Interconnection Facility/Switchyard Construction	Week 12	24 weeks
Transmission Line	Week 12	24 weeks
Meteorological Masts	Week 4	2 weeks
Project Substantial Completion	Week 38	Milestone
Site Restoration	Week 2	35 weeks

The number of persons on site is expected to consist of 25 to 75 (during peak construction). The construction equipment generally will consist of the following equipment during the various stages of construction:

- Road construction equipment including dozers, motor graders, compactors,
- Water trucks for dust control and compaction,
- General excavation equipment,
- Rock-drill, air compressor and explosives,
- Trenching machinery,
- Concrete batching plant(s) and concrete trucks,
- Heavy-haul trucks, and
- Heavy-lift crane(s).

Construction traffic via U.S. Highway 95 and State Highway 164 is expected to *peak* at approximately 350 one way trips per day during the construction period (based on 75 construction personnel leaving and entering the project site and 100 delivery trucks leaving and entering). This is likely to be the maximum possible amount of trips, would only occur for a short period of time, and assumes that no car-pooling takes place for construction workers. Both highways and particularly U.S. Highway 95 are currently heavily used by both personal vehicles and trucks traveling to and from Las Vegas. The construction related traffic will be turning off these highways only at designated locations. These locations will be designed in accordance with DOT regulations, include turn out lanes and merge lanes and be in areas with long site distance. Signs indicating "Caution: Trucks Turning" will be placed along each highway to alert through traffic.