Appendix A3
Project Construction

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Table of Contents

List of Attachments

List of Tables

List of Figures

Acronyms and Abbreviations

B2H	Boardman to Hemingway Transmission Line Project
BLM	Bureau of Land Management
CIC	Compliance Inspection Contractor
IPC	Idaho Power Company
kV	Kilovolts
NTP	Notice to Proceed
POD	Plan of Development
Project	Boardman to Hemingway Transmission Line Project
ROW	Right-of-way
SPCC	Spill Prevention, Containment, and Countermeasures
TBD	To Be Determined
USFS	United States Forest Service

APPENDIX A3 – PROJECT CONSTRUCTION

This section provides an overview of construction activities associated with the Boardman to Hemingway Transmission Line Project (Project) as well as an overview of special construction techniques.

A3.1 Construction Schedule

The Project draft duration schedule is included as Attachment A – Construction Schedule. Idaho Power Company (IPC) will further develop and provide regular updates of the construction schedule to the Compliance Inspection Contractor (CIC) on a weekly basis.

Construction activities will be scheduled to avoid environmental resource seasonal exclusionary areas. These seasonal exclusionary areas will be shown in Volume II of the Construction Plan of Development (POD) and explained further in Appendix B1 – Biological Resources Conservation Plan.

A3.2 Preconstruction Activities

A3.2.1 Resource and Preconstruction Surveys

Prior to the commencement of Project construction, including geotechnical investigations, IPC is required to conduct environmental resource surveys. The environmental resource surveys will identify the locations of environmental resources to which mitigation measures will be applied as well as be performed within a specified amount of time before ground-disturbing activities occur to ensure appropriate environmental resource clearances (preconstruction environmental resource surveys). Table A3-1 – Preconstruction Resource Surveys provides a list of environmental resource surveys to be conducted. Environmental resource surveys will be completed by qualified individuals and must be approved by the Bureau of Land Management (BLM) and/or U.S. Forest Service (USFS), as appropriate.

Table A3-1 – Preconstruction Resource Surveys identifies the corresponding environmental resource plans in the POD, which provide more detail relative to the timing and methodology of the environmental resource surveys and preconstruction environmental resource surveys as well as providing a description of the applicable mitigation measures, including avoidance techniques. Appendix D – Resource Survey Protocols provides the protocols to be used for the environmental resource surveys and preconstruction environmental resource surveys for paleontological and cultural resources. The protocol for biological resources is included in Attachment A – Biological Resources Survey Requirements of Appendix B1 – Biological Resources Conservation Plan.

The results of the environmental resource surveys and preconstruction environmental resource surveys will be included in Volume II of the POD prior to the commencement of construction activities.

Table A3-1 Preconstruction Resource Surveys			
Survey Type and Resources	**Plan Reference**	**Date Completed**	**Additional Surveys to be Completed**
Vegetation and Wetlands			
Special Status Plants	Appendix B1 – Biological Resources Conservation Plan	Geotechnical Investigations: To Be Determined (TBD) Construction: TBD	**TBD**
Wetland Delineation	Appendix B1 – Biological Resources Conservation Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**
Noxious Weeds	Appendix B1 – Biological Resources Conservation Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**
Water Resources			
Water course crossing inventory	Appendix B3 – Water Resources Protection Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**
Springs/wells	Appendix B3 – Water Resources Protection Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**
Wildlife Resources			
Washington ground squirrels	Appendix B1 – Biological Resources Conservation Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**
Raptor nests	Appendix B1 – Biological Resources Conservation Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**
Cultural Resources			
Literature Search and Class III Inventory	Appendix B5 – Historic Properties Management Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**
Paleontological resources	Appendix B6 – Paleontological Resources Treatment Plan	Geotechnical Investigations: TBD Construction: TBD	**TBD**

A3.2.1.1 Geotechnical Investigations

The purpose of the geotechnical investigations is to perform tests to collect soil resistivity properties and to collect hydrogeologic and geotechnical soil properties and geophysical data to provide information for detailed Project engineering and design. Geotechnical investigations will provide critical data that will be incorporated into the electrical and structure foundation design and the Project construction bid package. This activity is necessary to help ensure the system is designed and constructed to be safe, reliable, and cost efficient and can reduce the overall temporary and permanent land disturbance within the right-of-way during initial build and the life of the Project. The investigations are considered the first step of construction; however, because of timing of the geotechnical investigations to inform the final design, a Geotechnical Investigation POD Framework has been developed as part of this POD. The Geotechnical Investigation POD Framework is included as Appendix G of this POD and further describes the process for the investigations and reducing the impacts associated with the investigation.

A3.2.1.2 Surveying and Staking

Prior to the commencement of construction, Project features will undergo engineering survey and staking. Refer to Appendix A1 – Flagging, Fencing, and Signage Plan, which provides more specific detail relative to the field marking of Project features and environmental resources. Implementation of Appendix A1 – Flagging, Fencing, and Signage Plan is required before the commencement of construction. Any proposed new disturbance not previously identified and analyzed in the Environmental Impact Statement will require additional environmental resource surveys, as well as review and approval by the BLM and USFS prior to the commencement of construction.

A3.2.2 Right-of-Way Preparation

Right-of-way preparation includes general site preparation. General site preparation includes the implementation and approval of all applicable design features and mitigation measures in Section 4 – Environmental Setting, Issues, and Mitigation Measures, Appendix A – Construction Considerations, Appendix B – Environmental Protection Plans, Appendix C – Environmental Protection Plan Frameworks, Appendix D – Resource Survey Protocols (paleontological and cultural resources), and Attachment A – Biological Resources Survey Requirements of Appendix B1 – Biological Resources Conservation Plan of this POD.

Project construction may begin after all right-of-way preparation and preconstruction actions have been completed to the satisfaction of IPC, CIC, and agencies and will be allowed through issuance of a Notice to Proceed (NTP) by the BLM.

A3.2.3 Preconstruction Meeting

IPC will schedule and conduct a preconstruction meeting with the respective BLM and USFS Authorized Officer(s) a minimum of 14 days prior to the commencement of Project construction. As provided in Appendix A4 – Environmental and Safety Training Plan, the Construction Contractor(s) will present an environmental and safety education program training that will address how compliance with all Project-specific permitting documents will be met. The CIC will present what their role is and what key environmental issues associated with the Project they will be monitoring for compliance.

A3.2.4 Bureau of Land Management-Administered Lands Notice to Proceed

Once the BLM right-of-way grant for the Project has been issued to IPC by the BLM, actual Project construction, including all surface disturbing activities on BLM-administered lands, will only be authorized by the issuance of a written NTP by the BLM. An NTP will be issued only after completion and/or approval of all requirements of the POD, programmatic agreement, and biological opinion and receipt/approval of the cultural and reclamation bond. For example, the NTP will be issued after the POD has been completed and approved by IPC, BLM and USFS. The NTP will specify the location and timing of construction as well as which authorized activities are approved to move forward. Should noncompliance issues, environmental issues, or other problems be encountered during authorized activities, the BLM may amend or rescind the NTP previously issued as described in Appendix A5 – Environmental Compliance Management Plan.

A3.2.5 U.S. Forest Service Special-use Authorization

Receipt of the USFS special-use authorization will be permission for work to begin on USFS-administered land. The USFS authorization requires compliance with receipt of the reclamation and cultural bonds to be described in the BLM NTP. The USFS authorization will also require all contractors, inspectors, and other vehicle users associated with the work to obtain a Forest road use permit authorizing operation of commercial vehicles on Forest Roads. Use, modification of, and restoration of roads will be in accordance with the conditions of the road use permit. Payment for and disposal of timber will be negotiated with the USFS following USFS policies.

A3.2.6 Private Lands

Although the federal agencies do not have authority over state or private land, it is expected the provisions of the POD will be applied consistently to state and private land as well as federal land, unless otherwise indicated by the state and by private landowners and documentation of the state or landowner decision(s) is documented through the Level 1 Variance process, by the CIC.

The federal agencies do have an obligation and authority to enforce the requirements of the National Historic Preservation Act and the Endangered Species Act to protect important historic properties and threatened and endangered species, respectively, regardless of land jurisdiction or ownership. Prior to issuance of an NTP for construction in an area where treatment is prescribed in a state's final Historic Properties Management Plan, the BLM will ensure that implementation of each state's final Historic Properties Treatment Plan is completed to a level acceptable to the BLM for the area requested under the NTP, in consultation with the appropriate State Historic Preservation Office and consulting parties. The implementation of the treatment prescribed in a state's final Historic Properties Management Plan will apply to all land in the treatment area regardless of ownership. Similarly, because the Project requires a federal action, all Endangered Species Act-listed species were addressed Project-wide in Section 7 consultation and the terms of the Biological Opinion are legally binding regardless of land ownership.

A3.3 Access Roads

Roads enable access to the right-of-way and tower work sites for both construction and long-term maintenance of the Project. Access roads must be sufficient to bear the weight and endure heavy construction vehicle use. All roads will be upgraded or constructed according to IPC published standards for road construction; BLM (BLM 2011), USFS, state, and/or local requirements for road construction; or private landowner agreements to be outlined in the POD. In the event IPC's published standards for road construction conflict with BLM, USFS, state, or local requirements, the Construction Contractor(s) will coordinate with the CIC (or appropriate land-management agency representative in areas where the CIC does not have authority) to resolve the conflicting standards. However, existing paved and unpaved highways and roads will be used, where possible, for the transportation of materials and equipment from the multi-use yards to the areas where they will be needed along the Project right-of-way.

The BLM considers authorized existing roads to be travel surfaces that have been modified from their natural condition specifically for access purposes. Similarly, USFS considers authorized existing roads to be those identified in their current Travel Management Plan. Unauthorized roads or two-tracks that do not meet these criteria on BLM or USFS lands will require approval from the appropriate land-management agency to be used for construction, operation, or maintenance purposes. The completion and approval by IPC, BLM, and USFS of the POD and subsequent issuance of the NTP(s) by the BLM and issuance of both a Special Use Authorization and separate Road Use permit by the USFS (required for both existing and new roads). In some cases, the BLM or USFS may prefer new access be built rather than using or improving unauthorized access routes. Requests for USFS road use permits must clearly identify all routes proposed for use, maintenance, construction, or modification and must quantify the use proposed with respect to type of vehicle, number of trips, anticipated loading, and road modifications require or proposed. Prior to any road use, road maintenance or road construction the respective federal land-management agencies' Authorized Officers or their designated representatives must be contacted to obtain approval.

Where existing roads could be used for construction, operation, and maintenance purposes, only spur roads to transmission tower sites may be needed. When use of a spur road extends beyond one-half of the distance between structure locations (one-half of the span length), constructing a new road from tower-to-tower will typically result in less ground disturbance than building spur roads from existing roads to each tower site or Project work area. The number of new spur roads will be held to a minimum, consistent with their intended use (e.g., structure construction or conductor stringing and tensioning). New roads on USFS will be authorized, constructed, and restored in accordance with a road use permit issued by the USFS. Some existing roads could require upgrading to meet IPC, BLM, or USFS published standards for road construction. All existing roads will be left in a condition equal to, or better than, their condition prior to construction, in accordance with BLM, USFS, state, and/or local road standards or private landowner agreements. All modifications to USFS roads will be in accordance with provisions of the road use permit issued by the USFS and will be subject to inspection and acceptance by USFS personnel.

Project right-of-way access will be a combination of new access, improvements to existing access, and use of existing access (see Appendix A2 – Traffic and Transportation Management Plan). New access or improvements to existing access will be constructed using a bulldozer or grader, followed by a roller, to compact and smooth the ground. Front-end loaders will be used to move the soil locally or off site. Typically, access to the Project right-of-way and structure sites requires a 16-foot-wide travel way for straight sections and a 16- to 22-foot-wide travel way at curves to facilitate safe movement of equipment and vehicles. However, in certain areas, access widths through curves occasionally may exceed 22 feet. Wherever possible, new access will be constructed within the Project right-of-way, or existing access will be used. In other cases, access will be required between the Project features and existing access. Erosion control and sedimentation measures, such as crossroad drainage, at-grade water bars, culverts, sediment basins, or perimeter control, will be installed as required to minimize erosion during and subsequent to construction of the Project. Care will be taken when utilizing erosion control and sedimentation measures to not channel or direct water onto adjacent sensitive environmental features.

After Project construction, existing and new permanent access will be used by operation and maintenance crews and vehicles for inspection and maintenance activities. New permanent access not located in steep terrain will be seeded with the approved, appropriate seed mix per Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework and allowed to revegetate. Typical operation and maintenance activities will use a 16-foot-wide portion of new permanent access for operation and maintenance vehicles. More significant operation and maintenance activities that will require access by larger vehicles will use the full width of the new permanent access. Access areas will be repaired, as necessary, but not be routinely graded.

New temporary construction access not required for operation and maintenance activities will be reclaimed after completion of Project construction, per Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework.

Gates (or other barriers) will be installed on new permanent or new temporary access, as required by IPC, BLM, USFS, or landowner to restrict unauthorized vehicular access to the right-of-way.

Cattle guards with or without access gates will be installed where permanent access roads cross fence lines as required by the BLM, USFS, or landowner and in accordance with the IPC's standards. Cattle guards will be (unless another agency and/or land owner require other standards) all steel with cleanout and wings, 16 by 8 feet, painted yellow, and set on steel reinforced precast concrete "T" bases. Material and construction shall be in accordance to standard BLM drawings.

To the maximum extent possible, drainages will be crossed at grade. Where such crossings are not feasible, culverts may be constructed (some of which may be temporary). Where a permanent crossing is not required and allowed by the canal operator, temporary crossings may be completed using a portable bridge or fill. The bridge or fill and all crossing appurtenances shall be completely removed and the embankments restored and revegetated to the satisfaction of the canal operator on completion of the construction. Whenever possible, these crossings will be done during canal off season. A culvert may be used if construction is to take place during periods where the canal is expected to be in operation. The culvert shall be sized to pass the entire capacity of the canal without obstruction. The Construction Contractor(s) shall coordinate with the canal operator to obtain required crossing permits and specific requirements.

If work is required during wet periods with saturated soil conditions, vehicles will not be allowed to travel when soils are moist enough for deep rutting (4 or more inches deep) to occur unless prefabricated equipment pads (matting) are installed over the saturated areas or other measures are implemented to prevent rutting. Equipment with low-ground-pressure tires, wide tracks, or balloon tires will be used when possible.

A3.3.1 Snow Removal

Prior to any snow removal, the respective federal land-management agencies' Authorized Officers or their designated representatives must be contacted to obtain approval. Snow removal will not be performed on overland access routes. If snow removal is authorized, at a minimum the following will be required:

- Snow will typically be bladed or pushed off the roads and construction area but within the right-of-way.
- The storage of snow will be confined to areas approved for disturbance and where appropriate surveys (e.g., biological, cultural, paleontological) have been completed. Snow removal will be done typically with a motor grader, snowplow, or dozer. Care will be taken when removing snow to minimize mixing of soil with snow. Tracked equipment used for snow removal operations shall be equipped with shoes to keep the blade 2 inches off the ground.
- The Construction Contractor(s) shall take special precautions where the surface of the ground is uneven and at drainage crossings to ensure equipment blades do not destroy vegetation.
- In areas where snow fills trenches or holes, the Construction Contractor(s) will be responsible for removing it to allow visual inspection of trenches or holes prior to installing Project facilities and backfilling.
- The Construction Contractor(s) will backfill trenches with unfrozen soils to the extent practicable to minimize the potential for ditchline settlement resulting from voids between frozen chunks of backfill.

As directed by the respective federal land-management agencies' Authorized Officers or their designated representatives, all access roads (excluding overland access routes) shall be winterized by providing a well-drained roadway. This may be achieved by using water bars, maintaining drainage, and using any additional measures necessary to minimize erosion and other damage to the roadway or the surrounding public lands.

No snow removal is to occur on overland access without the approval of the respective federal land-management agencies' Authorized Officers or their designated representatives.

A3.3.2 Bureau of Land Management and U.S. Forest Service Access Road Requirements

The BLM and USFS will require the following for access to and across lands they administer.

- Existing paved highways and improved unpaved roads, where possible, will be used for the transportation of materials and equipment from the storage yards to the areas where they will be needed along the Project right-of-way. These improved roads are better suited to the transportation of large construction vehicles and heavy equipment.
- In areas where no grading will be needed to access work areas, the Construction Contractor(s) will use the overland drive-and-crush method to access the site in areas that are relatively level and that have low growing grasses and shrubs to the greatest extent possible. Drive-and-crush is vehicular travel to access a site without significantly modifying the landscape. Vegetation is crushed but not cropped. Soil is compacted, but no surface soil is removed.
- In areas where no grading will be needed to access work areas, but vegetation is large and/or dense, the Construction Contractor(s) will use the overland clear-and-cut method to provide access along the approved construction zone to the greatest extent possible. Clear-and-cut is the removal of vegetation to improve or provide suitable access for equipment. Methods for removal of vegetation will include mowing (brush hog flail-type mower); hand clearing with small tools,

such as loppers and chain saws; and back dragging a cat blade above the surface of the soil to remove surface vegetation. Soil is compacted, but no surface soil is removed.

- In areas where road improvement/construction is needed due to topography and slope considerations, the Construction Contractor(s) will make any such improvements according to BLM's requirements for road construction as contained in BLM Manual 9113 or USFS road construction requirements in accordance with Forest Service handbooks 7709.56 – Road Preconstruction Handbook, 7709.57 – Road Construction Handbook, and 7709.58 – Transportation System Maintenance Handbook. The BLM and USFS will determine which temporary access roads will be fully reclaimed on federal lands. In certain areas, it could be necessary to close roads after construction to restrict future access for general and undesired use. Such areas will be identified through negotiations with the land-management agency. Methods for road closure or management may include implementing physical barriers, such as locking gates, obstructing the path with earthen berms or boulders, ripping the road bed, or depositing construction material on the road surface, in a manner consistent with reclamation practices per Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework. Closed access routes will have to be reopened where right-of-access is impeded for operation and maintenance activities.

A3.4 Transmission Line Construction

The following sections describe the transmission-line construction activities and procedures for the Project. Station construction is described in Section A3.5 – Station Construction. Various construction activities will occur during the construction process, with several construction crews operating simultaneously at different locations on two transmission line segments (spreads).

A3.4.1 Geotechnical Investigations and Soil Boring

As discussed in Section A3.2 – Geotechnical Investigations, the Geotechnical Investigations POD Framework is included as Appendix G of this POD and further describes the process for the investigations and reducing the impacts associated with the investigation.

A3.4.2 Multi-Use Areas

Construction of the Project will begin with the establishment of multi-use areas. The multi-use areas will serve as field offices; reporting locations for workers; parking space for vehicles and equipment; and sites for material delivery and storage, fabrication assembly of towers, cross arms and other hardware, concrete batch plants, and stations for equipment maintenance (see Figure A3-1 for complete list of potential activities). Multi-use areas, each of which is about 30 acres in size, will be located approximately every 15 miles along the corridor. Lighting in the multi-use areas will be the minimum required to meet safety and security standards.

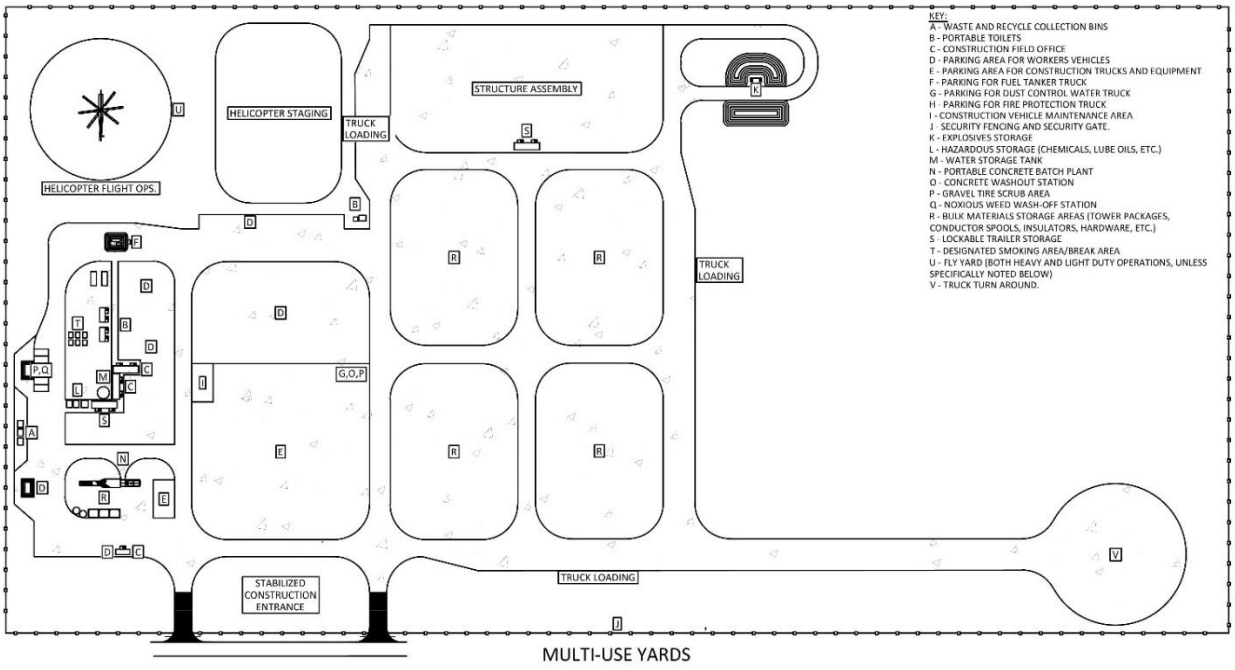

Figure A3-1. Multi-use Area Layout

Helicopter operations may be staged out of multi-use areas. Project construction activities potentially facilitated by helicopters may include delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire stringing operations. Helicopters may also be used to support the administration and management of the Project by IPC, the Construction Contractor, or both. Where construction access by truck is not practical due to steep terrain, all-terrain vehicle trails may be utilized to support maintenance activities. The use of helicopter construction methods for this Project will not change the length of the access road system required for operating the Project because vehicle access is required to each tower site regardless of the construction method employed

During construction, gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents will be stored at multi-use areas. These products will be used to fuel, lubricate, and clean vehicles and equipment and will be transported to the multi-use sites in containerized trucks or in other federal and state approved containers. Enclosed containment will be provided for petroleum products and wastes and petroleum-related construction waste will be removed to a disposal facility authorized to accept such materials. Fuel and chemicals will be properly stored to prevent drainage or accidents. Where required, preventive measures such as the use of vehicle drip pans for overnight parking areas may be implemented. Routine visual inspection for presence of petroleum leaks will be required for vehicles. Diesel fuel tanks will be located at the multi-use areas for vehicle and equipment fueling. Each fuel tank will be located within secondary containment and each station will be equipped with a spill kit. When on right-of-way (ROW) refueling is necessary, it will be done away from waterways. Accidental releases of hazardous materials will be prevented or minimized through proper containment of these substances during use and transportation to the site. A Spill Prevention, Containment, and Countermeasures (SPCC) Plan Framework is located in POD Appendix A3, a complete SPCC Plan will be prepared for all hazardous materials for the Construction POD. All hazardous and dangerous materials will be stored and secured in accordance with the appropriate regulations.

During operations, no fuels or potentially hazardous materials such as general lubricants, general cleaners, ethylene glycol (antifreeze), vehicle fuel, and herbicides for weed control will be stored on the ROW.

When used, they will be transported and disposed of in accordance with applicable local, state, federal environmental laws and regulations, and product labels as appropriate. At the communication stations, liquid propane will be stored in approved tanks.

Multi-use areas will be fenced, have locked gates, and have security guards stationed where needed. Multi-use area locations will be finalized following negotiations with landowners. In some areas, the multi-use areas may need to be scraped by a bulldozer and a temporary layer of rock laid to provide an all-weather surface. Unless otherwise directed by the land-management agency or landowner, the rock will be removed from the multi-use areas upon completion of construction and the area will be restored using reclamation measures identified in Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework.

Since the exact location of multi-use areas has yet to be determined, they will need to be surveyed for environmental resources prior to ground-disturbing activities.

All required cultural resource work will be conducted pursuant to the requirements of the Programmatic Agreement for the Project in compliance with Section 106 of the National Historic Preservation Act. The BLM will ensure that all work undertaken to satisfy the terms of the Programmatic Agreement meets the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716) (Federal Register, September 29, 1983) and is in compliance with BLM Manual 8110 and Forest Service Manual 2360, as required.

A3.4.3 Pulling and Tensioning Sites

Pulling and tensioning sites will be required approximately every 1.5 to 2 miles along the ROW and at angle points greater than 30 degrees and will require approximately 5 acres at each end of the wire section to accommodate required equipment. Equipment at sites required for pulling and tensioning activities will include tractors and trailers with spooled reels that hold the conductors and trucks with the tensioning equipment.

A few pulling and tensioning sites are designated as light-duty fly yards. Light-duty fly yards are similar to the fly yards located in the multi-use areas but are smaller in size. All of the equipment and activities that occur at a multi-use area may also occur at a light-duty fly yard (Figure A3-2). The exception will be that no oil and gas or explosive storage will occur and no batch plants will be located at the light-duty fly yards within the pulling and tensioning sites. The light-duty fly yards will be located within specific pulling and tensioning sites along the Project where the spacing between multi-use areas is too great. The light-duty fly yards will be approximately 5-acre sites spaced about 15 miles apart.

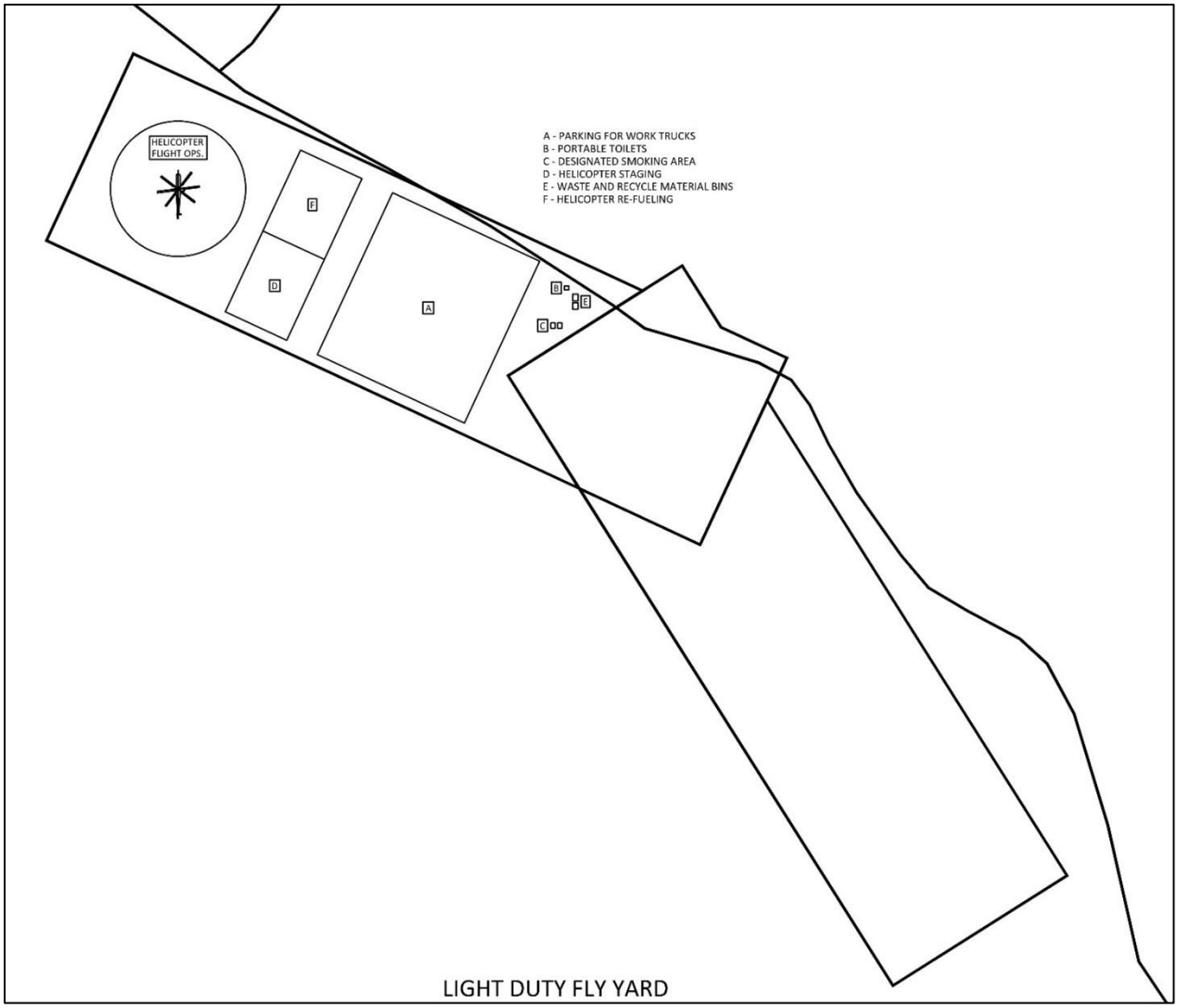

Figure A3-2. Light-duty Fly Yard on Pulling and Tensioning Site Layout

A3.4.4 Site Access and Preparation

Construction of the Project will require vehicle, truck, and crane access to each new structure site for construction crews, materials, and equipment. Similarly, construction of other Project components, such as staging yards and substation sites, will require vehicle access.

Individual structure work areas will be bladed, as necessary, to allow for the safe installation of the transmission line structures and to facilitate access for future operation and maintenance activities. As necessary, the blading of individual structure work areas will be done using a bulldozer to blade only the minimum required area, and to the extent practical, blading of native plant communities will be minimized. For all structure types, the structure work area will be cleared of vegetation only to the extent necessary and any removed topsoil will be stockpiled and stabilized to limit erosion. Upon completion of construction, all areas not needed for typical Project operation and maintenance activities, including fire and personnel safety clearance areas, will be graded to blend as near as possible with the natural contours and topsoil will be replaced and reseeded per the requirements of Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework.

At each single-circuit 500-kV structure location, an area approximately 250 by 250 feet will be needed for construction laydown, structure assembly, and erection, depending on slope. This area will provide a safe working space for placing equipment, vehicles, and materials.

Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock. Excess rock that is too large in size or volume to be spread at the individual structure sites will be hauled away and disposed of at approved locations or at a location specified by the landowner or land-management agency.

A3.4.5 Bureau of Land Management and U.S. Forest Service Site Preparation Requirements (all jurisdictions)

On BLM and USFS-administered lands, the BLM and USFS will require the following for site preparation. In addition, Section A3.3.2 – Bureau of Land Management and U.S. Forest Service Access Road Requirements identifies the requirements for site access across BLM- and USFS-administered lands.

- In areas where no grading will be needed to prepare the sites, the Construction Contractor(s) will use the overland drive-and-crush method to prepare the site in areas that are relatively level and that have low growing grasses and shrubs to the greatest extent possible. Vegetation is crushed but not cropped. Soil is compacted, but no surface soil is removed except for foundation preparation.
- In areas where no grading will be needed to prepare the site but vegetation is large and/or dense, the Construction Contractor(s) will use the overland clear-and-cut method to prepare the site to the greatest extent possible. Clear-and-cut is the removal of vegetation to improve or provide suitable access for equipment. Vegetation is removed using aboveground cutting methods that leave the root crown intact, such as with a brush hog or hand tools. Soil is compacted, but no surface soil is removed except for foundation preparation.
- In areas where structure sites must be graded to provide a safe, level working space for structure installation, the Construction Contractor(s) will segregate topsoil and then spread the topsoil back over the site to provide a suitable seedbed for reclamation efforts. Excess soil from foundation hole excavation will be placed around the base of each structure to provide positive drainage away from the structure. The BLM and USFS require that where possible, structure sites on BLM- and USFS-administered lands be reclaimed per Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework.
- In areas where topography and slope require cut and fill methods to provide a safe, level working space for structure installation, the Construction Contractor(s) will limit disturbance to the smallest possible area through the application of engineering alternatives and by planning to safely work with minimal equipment and equipment movements. Upon construction completion, the size of the structure work area will be reduced as much as possible. The structure work area will be recontoured to the greatest extent possible to soften the appearance of the structure work area and will be reclaimed per Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework.

A3.4.6 Install Structure Foundations

The 500-kV single-circuit lattice steel structures each require four foundations, one on each of the four corners of the lattice towers. The foundation style, diameter, and depth will be determined during final design and are dependent on structure loading conditions and the type of soil or rock present at each specific site. The preliminary design indicates the foundations for the single-circuit tangent lattice towers will be composed of steel-reinforced concrete drilled piers with a typical diameter of 4 feet and a depth of

approximately 15 feet. For the 500-kV H-frame structures, each tangent structure will require two foundations, one for each pole that comprises the H-frame structure. Angle and dead-end structures will use a three-pole structure, each with its own foundation. They will be steel-reinforced drilled piers with a typical diameter of 6 to 8 feet and a depth of approximately 25 to 40 feet. For the 230-kV H-frame structures, each of the two poles for tangent structures will be direct-embedded. Each of the three poles that make up the angle and dead-end structures will be direct-embedded and guyed. Typical direct-embedded foundations sizes will be 5 feet in diameter and 12 feet deep.

A3.4.7 Erect Support Structures

The 500-kV self-supporting lattice-steel and H-frame structures will be assembled on site, except where helicopter delivery is employed. Steel members for each structure will be delivered to the site by flatbed truck. Assembly will be facilitated on site by a truck-mounted crane. Subsequent to assembly, the structures will be lifted onto foundations using a large crane designed for erecting structures. The crane will move along the right-of-way from structure site to structure site erecting the structures (Figure A3-3 – Transmission Line Construction Sequence).

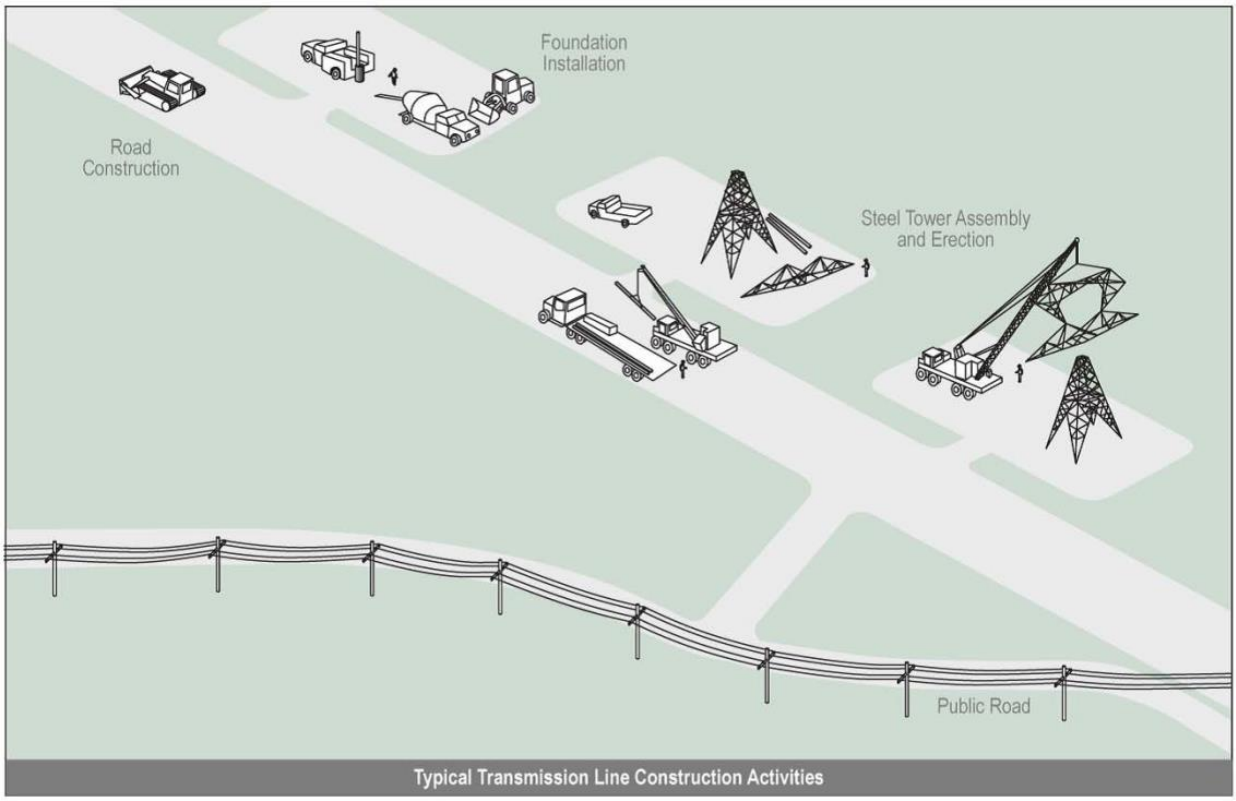

Figure A3-3. Transmission Line Construction Sequence

A3.4.8 String Conductors, Shield Wire, and Fiber Optic Ground Wire

Conductor, shield wire, and overhead optical ground wire will be placed on the transmission line support structures by a process called stringing. The first step to wire stringing will be to install insulators (if not already installed on the structures during ground assembly) and stringing sheaves. Stringing sheaves are rollers that are attached temporarily to the lower portion of the insulators at each transmission line support structure to allow conductors to be pulled along the line. These sheaves will each have two or three rollers corresponding to the number of conductors designated as a "bundle" at each phase location. All

conductors of one phase will be pulled in together. Figure A3-4 – Conductor Installation illustrates the setup in installing conductors.

Additionally, temporary clearance structures (also called guard structures) will be erected where required prior to stringing any transmission lines. The temporary clearance structures typically are vertical wood poles with cross arms and are erected at road crossings or crossings with other energized electric and communication lines to prevent the wires being pulled in from accidental contact with other lines, vehicles, buildings, or the ground during stringing activities. Bucket trucks also may be used to provide temporary clearance. Bucket trucks are trucks fitted with a hinged arm ending in an enclosed platform called a bucket, which can be raised to let the worker in the bucket service portions of the transmission structure as well as the insulators and conductors without climbing the structure.

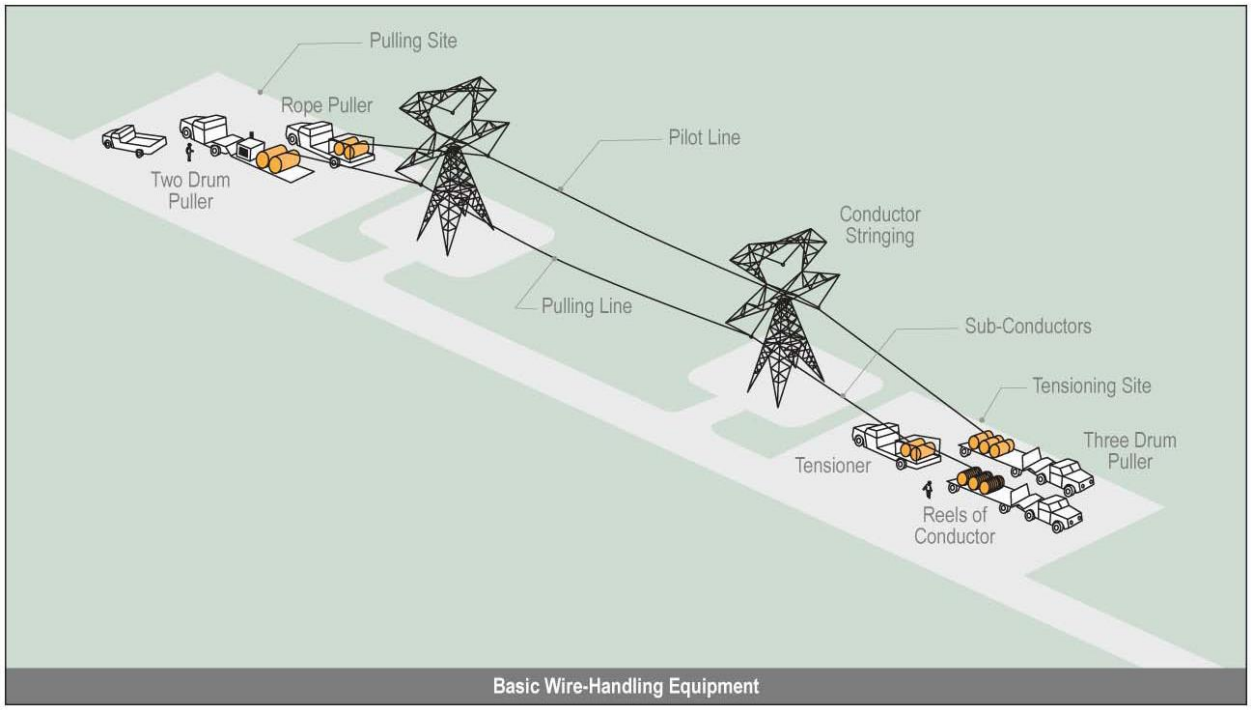

Figure A3-4. Conductor Installation

A3.4.9 Site Reclamation

Disturbed areas will be reclaimed and reseeded per Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework. All practical means will be made to reclaim the land outside the minimum areas needed for safe operation to its original contour and to restore natural drainage patterns along the right-of-way. All temporary features required to support construction activities, such as culverts or safety berms, will be removed, unless approved by IPC, land-management agency, or landowner. All permanent features required to support construction activities, such as water bars and culverts, will remain and will meet IPC construction standards per Appendix F – Company Transmission Construction Standards (to be completed as part of the construction POD).

A3.4.10 Communications System

Overhead optical ground wire for the internal communications system will be installed at the same time as the conductors on each of the transmission line structures. It will be tensioned in the same way.

As the data signal is passed through the optical fiber cable, the signal degrades with distance. Consequently, signal communication station sites are required to amplify the signals if the distance between communication station sites exceeds approximately 40 miles. Communication station sites will be located on private lands; IPC has located the communication station sites within the ROW for the transmission line.

Facility service power will be required at each of the eight communication station sites ultimately selected for development. Typically, facility service power is provided from a local electric distribution line located in proximity to the station communication station site. The voltage of the distribution supply line is typically 34.5-kV or lower and carried on wood poles. Distribution lines will be developed by local electric service providers; the local electric service providers will be responsible for any additional permitting required to develop distribution lines.

The typical communication station site will be 100 feet by 100 feet, with a fenced area of 75 feet by 75 feet. A prefabricated concrete communications shelter with dimensions of approximately 11.5-foot by 32-foot by 12-foot-tall will be placed on the site and access roads to the site and power from the local electric distribution circuits will be required. An emergency generator with a liquefied propane gas tank will be installed at the site inside the fenced area. Two separate conduit or aerial cable routes will be used for each fiber optic cable bundle between the transmission line and communication station. Figure A3-5 illustrates the plan arrangement of a typical communications station site layout.

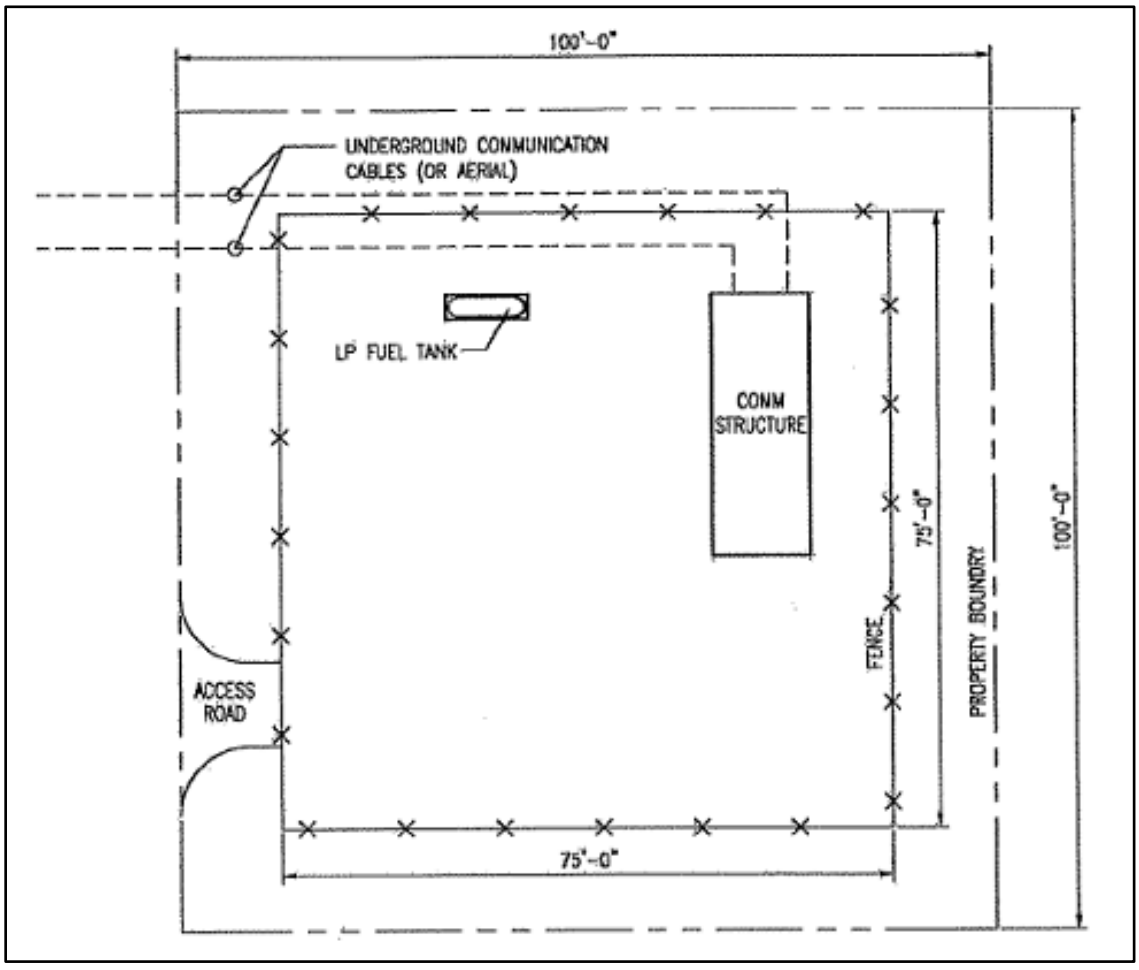

Figure A3-5. Typical Communication Station Site Layout

A3.4.11 Access Roads

Communication station roads will be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders will be used to move the soil locally or off site. Either gravel or asphalt will be applied to the prepared base layer. The all-weather road surface will be graveled and will have crossroad drainage where applicable.

A3.5 Station Construction

IPC proposes to build the 20-acre Longhorn switching station (station) located near the Port of Morrow, Oregon. A switching station provides a combination of switching, protection, and control equipment arranged to provide circuit protection and system switching flexibility for the transfer of electric power, but does not incorporate step-down or step-up voltage equipment. The proposed station will serve to connect the Project to other 500-kV transmission lines and the Pacific Northwest power market.

A typical construction sequence for stations is described below. All equipment and materials will be hauled to the site via truck.

The first activity is grading of the site and access road. The amount of equipment and manpower will vary depending on the size of the site and the terrain. However, large earth moving equipment will be used, including dump trucks, water trucks, graders, back hoes and dozers. Dump trucks will be used to haul away unsuitable materials and to bring in fill materials if necessary and access road surfacing.

The earth moving equipment will be used to grade the site relatively flat with a small slope for drainage and depending on site design, drainage features and/or retention ponds. The water trucks will be used to control dust from site work activities.

The perimeter fence will then be constructed to provide site security and control access.

Foundations will then be installed. There are typically two types of foundations: drilled piers and slabs. Foundations are excavated using a large drill rig or backhoe depending on the type of foundation. Reinforcing steel and/or anchor bolts are placed in the excavation and forms are placed to form the sides of the top portion of the foundation. The entire excavation is then filled with concrete. The spoils from the excavations are hauled from the site and disposed of or spread on the site if the material is suitable. On a large site, multiple crews will be used.

The remaining below-grade construction is then completed, including grounding conductors and ground rods, conduit, and concrete cable trench. Excavations are made with trenchers and backhoes, the conductor or conduit is placed in the excavation, connections are made, and then the excavation is backfilled. In some cases, bedding material, such as sand, is placed in the excavation prior to backfilling.

The Longhorn Station will include 500-kV circuit breakers, high-voltage switches, bus supports, and transmission line termination structures, a 500-kV series capacitor bank, and 500-kV shunt reactor banks. The 500-kV transmission line termination structures are approximately 125 to 135 feet tall. A premanufactured steel control house to accommodate the necessary system communications and control equipment will be sited within the fence line of the station. A new all-weather access road will be used to reach the site, and the site will be supplied by distribution power brought in from the nearby existing system as necessary. Fiber optic signal communication equipment and a backup propane-powered generator will also be installed. Figure A3-6 is a photograph of a typical 500-kV station with multiple line connections.

Figure A3-6. Typical 500-kV Station

Construction equipment includes cranes and man lifts. On a large site, multiple crews will be used. Control and protection panels will be installed in the control building and will be connected to equipment in the yard using control and power cables installed in the cable trenches and conduits.

The final step is to cover the entire site with a crushed rock surfacing. Dump trucks will be used to haul the material to the site. Backhoes, skid steers, dozers, and graders will be used to spread and compact the material over the site.

All equipment, protection, and control systems will be tested prior to energizing.

A3.5.1 Station Roads

Station roads will be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders will be used to move the soil locally or off-site. Either gravel or asphalt will be applied to the prepared base layer and will have crossroad drainage where applicable.

A3.5.2 Geotechnical Drilling

Geotechnical evaluation is required at the Longhorn Station site to quantify subsurface conditions, determine engineering properties of soil for foundation design, and provide recommendations for site development.

A3.5.3 Clearing and Grading

Clearing of all vegetation will be required for the entire station area, including a distance of about 10 feet outside the fence. This is required for personnel safety due to grounding concerns and because of lower

clearances to energized conductors within the stations as compared to transmission lines. These lower clearances are allowed by the National Electrical Safety Code because the entire station is fenced.

An insulating layer of gravel on the surface of the substation is required to protect personnel from high currents and voltages during electrical fault conditions. Typically, vegetation is removed and a 4- to 6-inch layer of crushed rock is applied to the finished surface of the substation. Then the substation is usually treated with a soil sterilizer to prevent vegetation growth because the vegetation will degrade the insulating qualities of the crushed rock. The entire substation area will be graded essentially flat, with just enough slope to provide for runoff of precipitation. The substation will be graded to use existing drainage patterns to the extent possible. In some cases, drainage structures, such as ditches, culverts, and sumps, may be required. Clearing and grading material will be disposed of in compliance with local ordinances. Material from offsite will be obtained at existing borrow or commercial sites and will be trucked to the substation using existing roads and the substation access road.

A3.5.4 Multi-use Areas

Multi-purpose yards may be located outside the station fenced area near the station site. These multi-use areas may be part of the station property or leased by the contractor. After construction is completed, all debris and unused materials will be removed and the yards returned to preconstruction conditions by the construction contractor.

A3.5.5 Grounding

A grounding system is required in each station for detection of faults and for personnel safety. The grounding system typically consists of buried copper conductor arranged in a grid system and driven ground rods, typically 8 to 10 feet long. The ground rods and any equipment and structures are connected to the grounding conductor grid. The amount of conductor and length and number of ground rods required are calculated based on fault current and soil characteristics.

A3.5.6 Fencing

Security fencing is installed around the entire perimeter of each new or expanded station to protect sensitive equipment and prevent accidental contact with energized conductors by third parties. This fence will be constructed of chain link with steel posts. One foot of barbed wire or other similar material is installed on top of the chain link. Locked gates will be installed at appropriate locations for authorized vehicle and personnel access.

A3.5.7 Foundation Installation

Foundations for supporting structures are of two types: spread footings or drilled piers. Spread footings are placed by excavating the foundation area, placing forms and reinforced-steel and anchor bolts, and pouring concrete into the forms. After the foundation has been poured, the forms will be removed, and the surface of the foundation dressed. Pier foundations are placed in a hole generally made by a truck-mounted auger. Reinforced-steel and anchor bolts are placed into the hole using a truck-mounted crane. The portion of the foundation aboveground will be formed. The portion belowground uses the undisturbed earth of the augered hole as the form. After the foundation has been poured, the forms will be removed, the excavation will be backfilled, and the surface of the foundation dressed.

Equipment foundations for circuit breakers, high-voltage switches, and bus supports the will be slab-on-grade type. These foundations are placed by excavating the foundation area; placing forms, reinforced steel, and anchor bolts (if required); and placing concrete into the forms. After the foundations have been poured, the forms will be removed, and the surface of the foundation dressed. Where necessary, provision will be made in the design of the foundations to mitigate potential problems due to frost. Reinforced steel and anchor bolts will be transported to each site by truck, either as a prefabricated cage or loose pieces,

which will be fabricated into cages on the site. Concrete will be hauled to the site in concrete trucks. Excavated material will be spread at the site or disposed of in accordance with local ordinances. Structures and equipment will be attached to the foundations by means of threaded anchor bolts embedded in the concrete.

A3.5.8 Oil Containment

The Longhorn Station provides a combination of switching, protection, and control equipment arranged to provide circuit protection and system switching flexibility for the transfer of electric power, but does not incorporate step-down or step-up voltage equipment. Therefore, the Longhorn Station will not contain oil filled transformers and no oil containment will be necessary.

A3.5.9 Structure, Control Building, and Equipment Installation

Supporting steel structures are erected on concrete foundations as noted above. These are set with a truck-mounted crane and attached to the foundation anchor bolts by means of a steel base plate. These structures will be used to support the energized conductors and certain types of equipment. This equipment is lifted onto the structure by means of a truck-mounted crane and is bolted to the structures; electrical connections are then made. Some equipment, such as reactors, and circuit breakers, are mounted directly to the foundations without supporting structures. These are set in place by means of a truck-mounted crane. Some of this equipment requires assembly and testing on the pad. Electrical connections to the equipment are then made.

A3.5.10 Station Control Building Construction

A control buildings is required at the Longhorn Station to house protective relays, control devices, battery banks for primary control power, and remote monitoring equipment. The size and construction of the building depends on individual station requirements. Typically, the control building will be constructed of, pre-engineered metal sheathed, or composite surface materials or concrete block. Once the control house is erected, equipment is mounted and wired inside. All stand-alone communication stations and stations will require an emergency propane or diesel generator just outside the control house within the station fenced area.

A3.5.11 Conductor Installation

The two main types of high-voltage conductors used in stations are tubular aluminum for rigid bus sections and/or stranded-aluminum conductor for strain bus and connections to equipment. Rigid bus will be a minimum of 4 inches in diameter for this Project and will be supported on porcelain or polymer insulators on steel supports. The bus sections will be welded together and attached to special fittings for connection to equipment. Stranded-aluminum conductors will be used as flexible connectors between the rigid bus and the station equipment.

A3.5.12 Conduit and Control Cable Installation

Most station equipment requires low-voltage connections to protect relay and control circuits. These circuits allow metering, protective functions, and control (both remote and local) of the power system. Connections are made from the control building to the equipment through multi-conductor control cables installed in conduits and/or precast concrete cable trench system.

A3.5.13 Construction Cleanup

The cleanup operation will be performed after construction activities are completed. All waste and scrap material will be removed from the site and deposited in approved locations or local permitted landfills in

accordance with local ordinances. Ruts and holes outside the station fence due to construction activities will be regraded.

A3.5.14 Reclamation

Revegetation and restoration will be conducted as required and desired vegetation will be established to limit the spread and establishment of noxious weed species in disturbed areas.

A3.6 Special Construction Techniques

A3.6.1 Blasting

Typical 500-kV steel-lattice structure foundations normally will be installed using drilled shafts or piers and 230-kV H-frame structures will be embedded directly. If hard rock is encountered within the planned drilling depth, blasting may be required to loosen or fracture the rock to reach the required depth to install the structure foundations. Precise locations where blasting is expected will be identified based on a site-specific geotechnical study carried out as part of detailed design. The Blasting Plan Framework (Appendix C6) will be fully developed by the Construction Contractor(s) to identify site-specific blasting locations, blasting methodologies, and safety precautions. The blasting plan will be approved by IPC and the agencies as part of the POD.

A3.6.2 Helicopter Use

Helicopters may be used to construct in rough terrain where access is difficult or where access through environmentally sensitive areas cannot be avoided. The operating area of the helicopters will be limited to multi-use areas and light-duty fly yards along the Project corridors that have been previously identified and cleared for this purpose, and other safe locations for landing.

The multi-use areas will be temporary disturbance. When a portion of the Project requires construction using helicopter support, the multi-use areas will serve as a helicopter support yard for fueling, maintenance, and transporting both material and personnel to and from the structure site locations. The identification of and meeting of all site requirements for all multi-use areas will be completed by the Construction Contractor(s) and coordinated with affected private landowners and land-management agencies. The size of each multi-use area will be dependent on the construction-related activities that will occur within a safe flying range, as well as road access and topography. The multi-use areas will be as level as possible and be located strategically throughout the area of helicopter-supported construction activity. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and/or graded, including removal of trees in some instances. Ideally, multi-use areas will be located at a higher elevation than the structure work areas they will support, as it is safer and more fuel efficient to fly down toward the structure work areas. Additionally, the multi-use areas must be accessible by road (if allowed) to facilitate the delivery of materials.

During helicopter operations, public access to defined areas will be restricted. Temporary road closures, traffic detours, and posted notices and signs will be used to restrict public access to construction areas. This will be in addition to general public access restrictions to protect public health and safety.

The specific types of helicopters used will be based upon the Project need, the weight of the load being transported, and the altitude of the structure location. The various needs will range from light loads (crew/inspector transportation and conductor stringing) to medium-to-heavy loads (tool and material delivery/removal, and structure removal/construction activities). The specific helicopters used also will vary, depending on availability and Project schedule.

A3.6.2.1 Typical Project Helicopter Use

Typical helicopter use on the Project could include to the following:

- A small helicopter may be used to move personnel and to install pulling lines (called "socklines") to facilitate installing conductors
- Helicopter transport of construction workers and equipment that will be dropped off at work areas
- To support the administration and management of the Project

A3.6.2.2 Typical Helicopter-Assisted Construction

Construction workers and equipment will be dropped off at pulling and tensioning sites, tower locations, or other work areas previously described to receive temporary disturbance. Large heavy-lift helicopters will be used to transport a tower to a location where the ground crew is waiting to spot the structure into a pre-constructed foundation. The helicopter will fly from multi-use areas or light-duty fly yards and transport the preassembled structure sections to each tower site. Depending on the size and weight of the load, several round trips may be required from the assembly yard to fully construct each structure. Each assembly yard can support several structure sites and must be located no farther away from the structure site locations than is within the safe round-trip flight distance limitation of the helicopter(s) being used. The typical safe round-trip flight distance for a heavy lift helicopter is a 3- to 5-mile radius, depending on altitude and lift weight.

Structure locations designated as helicopter-assisted construction sites also typically will require some type of ground access using temporary roads or utility trailer vehicle roads to the tower sites. Foundation and tower leg construction will be typically accomplished using low-impact construction equipment. Low-impact construction equipment is defined as tracked vehicles that use a street-type of track and walking-type, rubber-tired, all-terrain backhoes. Street tracks have much less aggressive tread than tracks typically used for off-road travel. A walking-type backhoe uses outriggers to stabilize itself in locations too steep to provide a level surface from which to perform excavation tasks. An advantage of this type of equipment is that it is possible to traverse much steeper grades than conventional equipment. The backhoe will be used to create safe temporary access for street-tracked vehicles to follow. Therefore, the length of access and, by extension, the amount of disturbance may be expected to be much less.

All-terrain and utility trailer vehicles may be used to transport personnel and/or small materials to the tower site along the temporary access roads. Personnel may walk or be transported by light-duty helicopters into the site when required. Existing fire breaks and ridge tops will be used for temporary access, wherever possible, and approved by the land-management agencies to minimize tree removal. Some construction materials, such as rebar, stub angles, and steel for tower legs, may also be delivered on the ground by this equipment. However, the heaviest and most bulky materials will be delivered by helicopter for assembly at the site.

The following are typical activities that could take place at multi-use areas in support of helicopter-assisted construction:

- Structure steel, bolts, fittings, and blocking will be hauled and stored for use.
- Structure sections will be preassembled using a rough terrain crane.
- Rebar for assembling cages and/or preassembled rebar cages for structure foundations will be delivered then flown out of this yard to each structure site.
- Concrete will be staged by truck delivery or batch plant, which will generate the required concrete to be loaded into a concrete transport bucket that will be attached to a helicopter and flown out to the structure sites.

- Refueling the helicopter and necessary light maintenance; a fuel truck and a mechanics truck will be located at these yards.
- Transporting personnel, tools, and small equipment by helicopter to and from the yards and the construction sites.
- Temporary parking for a fuel truck, a mechanics truck, and transport vehicles for personnel.
- Yards may serve as a safe landing area for the helicopter in case of an emergency.

Helicopter-assisted construction at a typical tower site will be sequenced as follows:

1. At the structure site, a walking-type backhoe will be used to create the working pads required for construction of the tower foundation and base.
2. A track-hoe equipped with low-impact street-type track and drilling auger will be mobilized to the site via the safe temporary access created by the walking backhoe. This equipment will be used to excavate the drilled shaft or alternative foundation construction.
3. A track-mounted crane equipped with a street track and sufficient boom to safely deliver materials to the top of the tower waist will be mobilized to the site. The crane will be set up on the tower working pad.
4. Reinforcement cages, tied at the site or delivered assembled by helicopter, will be inserted into the excavation by the crane. The cage and leg stub angle will be supported by the foundation reveal forms. Foundation concrete will be delivered via heavy lift helicopter.
5. Steel for the towers will be delivered to the site. Lattice tower assembly will begin as the foundation is being constructed and cures. Assembly will be aided by the track-mounted crane and backhoe. Tower erection will begin once the foundation reaches 75 percent of the specified 28-day concrete compressive strength. Assemblies will be stacked on the foundation using the tracked crane up to the top of the tower waist.
6. Tower top sections will be preassembled at staging/assembly yards and flown complete with insulator assemblies and travelers and/or lifted into place using a heavy lift helicopter.
7. Sock lines will be installed using smaller helicopters. The sock line is used to facilitate the subsequent pulling and installing conductors.
8. On completion of the stringing operations, the temporary disturbance and access will be reclaimed as described in Appendix C1 – Reclamation, Revegetation, and Monitoring Plan Framework.

A3.6.3 Water Use

Construction of the Project will require water. Major water uses are for transmission line structure and station foundations and dust control. A minor use of water during construction will include the establishment of station landscaping where required.

The required water to construct the Project will be procured from municipal sources.

Construction of the Project will generate a temporary increase in fugitive dust. If the level of fugitive dust is too high in specific Project areas, as determined in cooperation with the landowner or land-management agency, water will be applied to disturbed areas to minimize dust.

In the construction of foundations, water is transported to the batch-plant site within the multi-use area where it will be used to produce concrete. From the batch plant, the wet concrete will be transported to

the structure site in concrete trucks for use in foundation installation. Generally, water use will be less when using guyed structures due to there being less volume of concrete used.

Water usage for series station construction is primarily for dust control during site preparation work. During this period, construction equipment will be cutting, moving, and compacting the subgrade surface. As a result, water trucks patrolling the site to control dust will make as many passes as required to suppress dust. Once site preparation work is complete, concrete for the placement of foundations becomes the largest user of water and dust control becomes minimal as the balance of the station work will be on compacted bare subgrade soil or subgrade with a thin layer of rock. Fire risk will be minimal due to the bare ground or rock surface and will be contained within the confines of station fenced area.

A3.7 Construction Workforce

The Project will be constructed primarily by contract personnel, with IPC responsible for Project administration and inspection. The construction workforce for the Project will consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel who will perform the construction tasks.

Site grading requires a small number of people, including a surveyor, heavy equipment operators, a foreman, and construction-management personnel. The Longhorn Station will require numerous concrete crews in order to complete the below grade construction and concrete placement on schedule. Other below-grade crews will be needed to install conduit, cable trench, and ground mat material. The below-grade crews will be onsite, overlapping the schedule of the concrete crew. Several three-man crews working with boom trucks and bucket trucks will erect the steel and install the physical equipment in the yard. Electrical installation will be handled by several two-man teams alternating between indoor and outdoor activity. Construction generally will occur between 7 a.m. and 7 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities.

A3.8 Literature Cited

BLM (Bureau of Land Management). 2011. Roads Manual. Bureau of Land Management Release Number 9-390. October 21, 2011.

Attachment A
Construction Schedule

(Will be provided by IPC prior to construction.)

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