# 2 Proposed Action and Alternatives

Development of the alternatives for this project was aided by BPA's participation in the Infrastructure Technical Review Committee (ITRC). This committee was formed in the summer of 2001, at the request of Northwest utilities, to consider how BPA might provide the most cost-effective, reliable service for the region's consumers. The ITRC included individuals from BPA, the Northwest Power Pool (NWPP) Transmission Planning Committee, Operating Committee, and the Northwest Regional Transmission Association (NRTA) Planning Committee. The ITRC evaluated and prioritized transmission projects throughout the Northwest based on whether they would provide appropriate business, technical, and cost-effective solutions to identified problems, and as though only one utility operated the entire system ("single utility" planning concept). In August 2001, the committee released its report, entitled *Upgrading the Capacity and Reliability of the BPA Transmission System*, which is incorporated by reference in this EIS. The report provides the ITRC's conclusions regarding various potential transmission projects throughout the region (including the proposed action and alternatives to it), and identified nine transmission projects (among them the proposed action) as high priority.

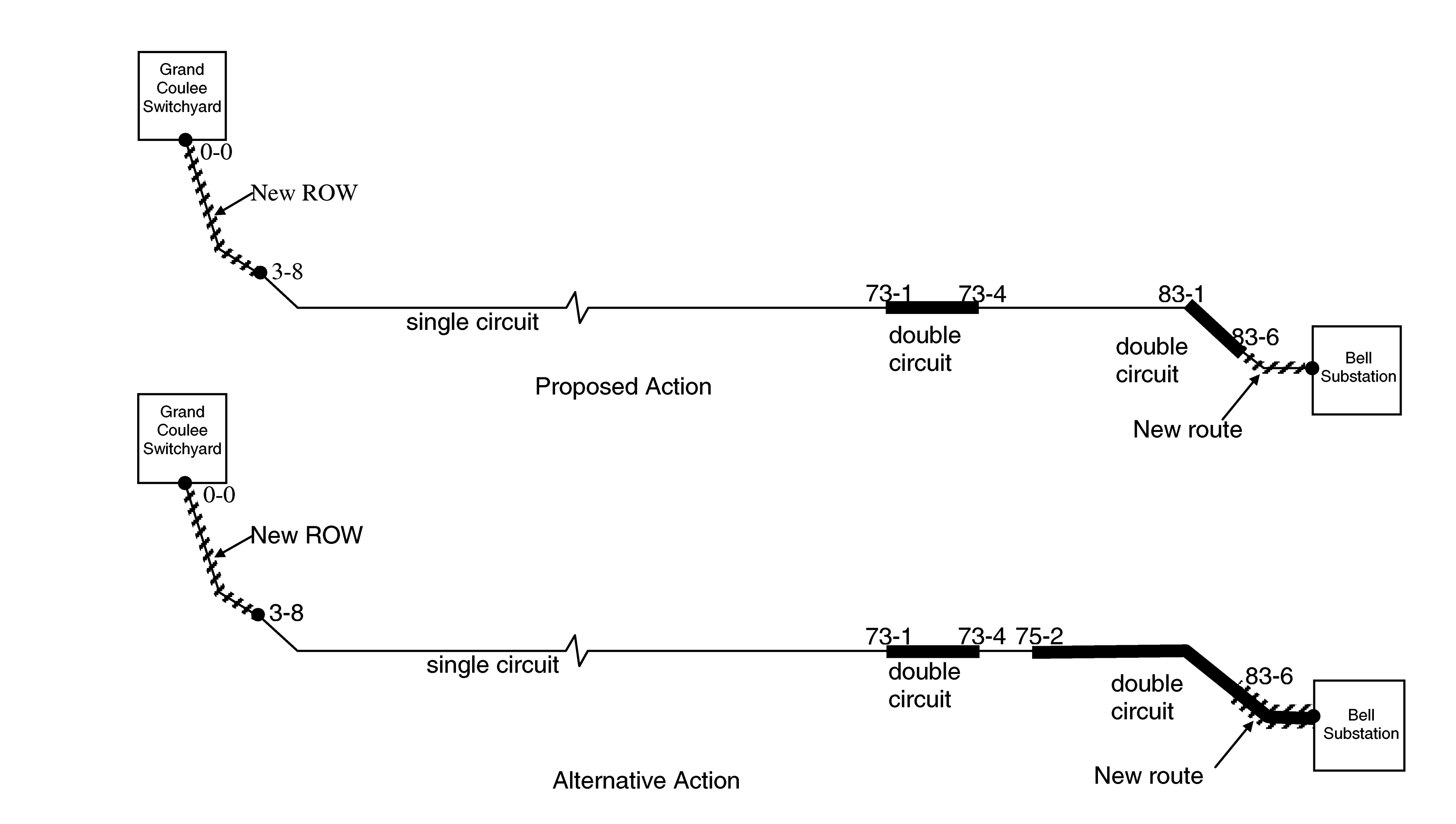
In establishing the range of reasonable alternatives to be evaluated in detail in this EIS, BPA assessed whether the alternative solved the problem as identified under Need for Action in Chapter 1, and how well it met other key objectives (listed under Purposes in Chapter 1). Those alternatives that solved the problem and achieved the objectives are evaluated in detail in this EIS. Alternatives considered unreasonable (e.g., those that cost substantially more or had much higher environmental impacts) were eliminated from detailed evaluation.

The remainder of this chapter describes the alternatives that are evaluated in detail, as well as those that were eliminated and why.

## Agency Proposed Action

### Location

The proposed action involves removing an existing 115-kV transmission line (Grand Coulee – Bell No. 1 line) and replacing it with a 500-kV transmission line. BPA would construct a single-circuit 500-kV transmission line over most of the route between the terminal at the Bureau of Reclamation's existing Grand Coulee Switchyard and BPA's existing Bell Substation. A double-circuit transmission line would be constructed for short distances where the right-of-way is constrained between corridor mile 73/1 (mile 73, structure 1) and corridor mile 73/4, and between corridor mile 83/1 and corridor mile 83/6 just northwest of Hawthorne Road in the north Spokane area (see Figures 2-1 and 2-2). Combined, the two double-circuit segments amount to slightly less than one mile of transmission line. The Agency Proposed Action would cost about $152 million (2002 dollars).




| | |
|---|---|
| **Bonneville Power Administration<br>Grand Coulee-Bell 500-kV<br>Transmission Line Project** | **Figure 2-1**<br>**Diagram of Transmission System Alternatives (not to scale)** |

# GRAND COULEE - BELL 500-kV TRANSMISSION LINE PROJECT

**LOCATION MAP**

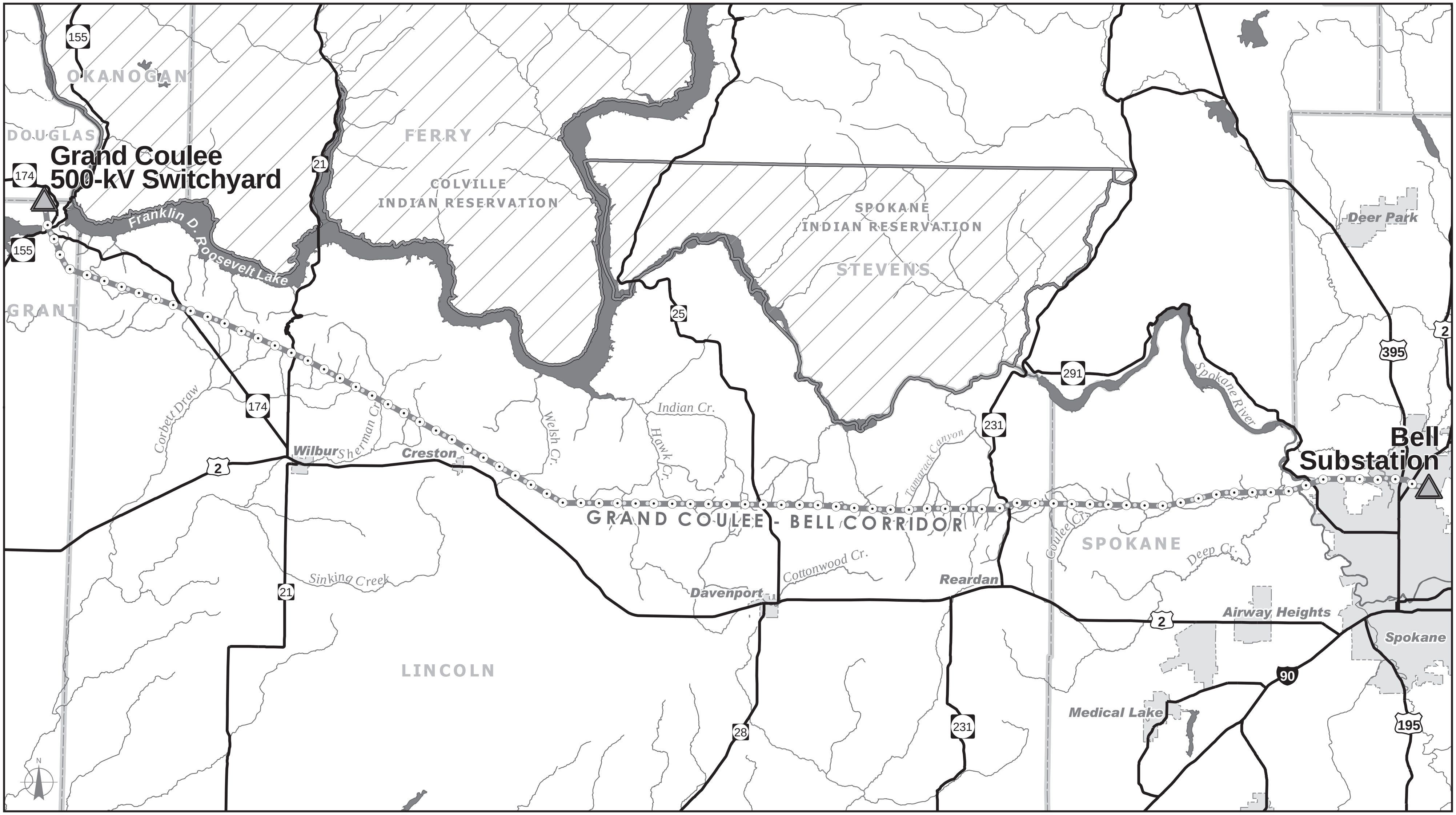
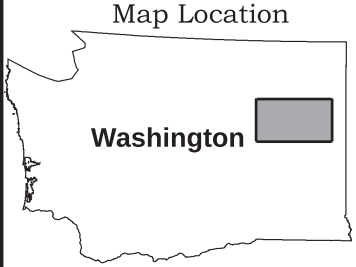



FIGURE 2-2

Map Location




- Grand Coulee-Bell Corridor
- Mile Marker
- Substation or Switchyard
- Major Road
- COUNTY BOUNDARY
- Indian Reservation
- *City or Town*

0 2 4 8 12 16 Miles

0 3 6 12 18 Kilometers

***SCALE 1:485,000***

Data Source: U.S.G.S Digital Line Graphs,
Bonneville Power Administration Regional GIS Database.

BONNEVILLE POWER ADMINISTRATION
GEOGRAPHIC INFORMATION SYSTEM

Please note: The nomenclature of corridor miles refers to structures in existing transmission line corridors that the new 500-kV line would parallel, with mile 1 starting at Grand Coulee Switchyard, and ending with mile 84 at Bell Substation in Spokane. Up to corridor mile 3/1, this document refers to structures in the Grand Coulee-Hanford No. 1 500-kV line. Starting at corridor mile 3/8, the reference is to the Grand Coulee-Bell No. 1 115-kV wood pole transmission line that would be replaced.

The new transmission line would be primarily located in an existing BPA corridor. The existing corridor, over most of its length, has five transmission lines on four sets of structures. From the north to the south side of the corridor, they are a single-circuit 230-kV line on ***lattice steel towers***, a double-circuit 230-kV line on lattice steel towers, and two single-circuit 115-kV lines on wood pole structures. To make room for the new transmission line, BPA would remove its Grand Coulee-Bell No. 1 115-kV wood pole transmission line, which currently extends from the 115-kV Switchyard at Grand Coulee substation to Bell Substation, and replace it with the 500-kV line on new lattice steel towers. The Grand Coulee-Bell No. 1 115-kV transmission line is the northerly of the two 115-kV lines. The new line would be built in the existing corridor over most of its length. There are two exceptions:

1. The new line would require about 3.5 miles of new right-of-way from the Grand Coulee 500-kV Switchyard to corridor mile 3/8 (see Figure 2-3). The new right-of-way would be about 150 feet wide and BPA would acquire new ***easements***. About 3 miles of the new right-of-way would parallel BPA's existing Grand Coulee-Hanford No. 1 500-kV line on the east side (to corridor mile 3/1). From corridor mile 3/1 to 3/8, the new line would extend southeasterly in a new corridor. The space in the existing Grand Coulee-Bell No. 1 115-kV transmission line corridor from the 115-kV Switchyard to corridor mile 3/8 would then be vacated or reconfigured to take advantage of better access for the remaining No. 2 line.

2. The new transmission line would diverge from the existing corridor at corridor mile 83/6 and would be routed across BPA property to the ***terminus*** in the expanded 500-kV yard at Bell Substation (Figure 2-4). In addition, at corridor mile 83/1 the remaining 115-kV transmission line (Grand Coulee – Bell No. 2) would cross over and connect to the Grand Coulee – Bell No. 1 line. From this point to a point just a short distance before the termination at Bell Substation, the Grand Coulee – Bell No. 1 line would be operated as the Grand Coulee – Bell No. 2 line. The remaining de-energized section of the Grand Coulee Bell No. 2 line would be left in place to support the existing ***fiber optic*** cable.

Where double-circuit line would be constructed between corridor mile 73/1 and 73/4 (Coulee Hite Road area), the conductors on the second 115-kV line (Grand Coulee-Bell No. 2) would be removed and replaced by new conductors on the new double-circuit towers. This is necessary to avoid expanding the right-of-way because there is insufficient room to accommodate the new 500-kV transmission line and leave the No. 2 line on existing structures. Thus, the structures in this section would carry two circuits: one to be operated at 500-kV and one to be operated at 115-kV. 115-kV dead-end structures would replace existing suspension structures at each end (near structures 72/7 and 73/5) to accommodate the transition from single circuit to double circuit. Expansion of the right-of-way is not considered feasible because additional right-of-way in this area is unavailable.

In addition, the existing corridor may need to be widened by approximately 75 feet in a few isolated areas along its length. Safety standards require that some extra-long 500-kV spans have more right-of-way to allow for lateral movement or swing in the conductors. The expanded right-of-way may also be used for access.

## Towers

Most of the existing transmission corridor is about 400 feet wide. As noted, it has three 230-kV lines on two steel towers (one double-circuit and one single-circuit), and two 115-kV lines on two wood pole structures. In most cases, the new lattice steel towers would be placed adjacent to the existing double-circuit 230-kV steel towers in the corridor.

A new single-circuit tower design would be used for the project. The new design is shown in Figure 2-5. The typical height of this tower would be 125 to 150 feet although the height of each tower would vary depending on characteristics of the location and surrounding landforms. The towers would generally not require a bigger base and, in most cases, would be about the same height as the existing double-circuit 230-kV towers.

The tower design for the double-circuit towers proposed for the short sections in the Coulee Hite Road area (corridor mile 73/2 to 73/5) and northwest of the Bell Substation (corridor mile 83/1 to 83/6) is shown in Figure 2-6. Their height would typically be 175 feet. In the Coulee Hite Road area, the 500-kV conductors would be strung on the left (northerly) side of the towers and the remaining 115-kV transmission line (Grand Coulee – Bell No. 2) would be strung on the right (south) side. In the section northwest of Bell Substation, both sides of the towers would be strung with conductors and connected to operate as a single-circuit line; it would be available for a second circuit at some unknown future date. These configurations are necessary in order to accommodate the uniquely narrow right-of-way in these areas.

About five structures per mile would be used to match the spans of the existing 230-kV steel towers in the right-of-way. A combination of about 420 single- and double-circuit towers would be needed.

The single- and double-circuit towers shown in Figures 2-5 and 2-6 are "tangent" or "suspension" towers. Most towers used on the proposed line would be this kind of tower. Other towers, called "dead-end" towers, would be needed every few miles and where the transmission line changes direction, has an excessively long span, crosses extremely steep or rugged terrain,

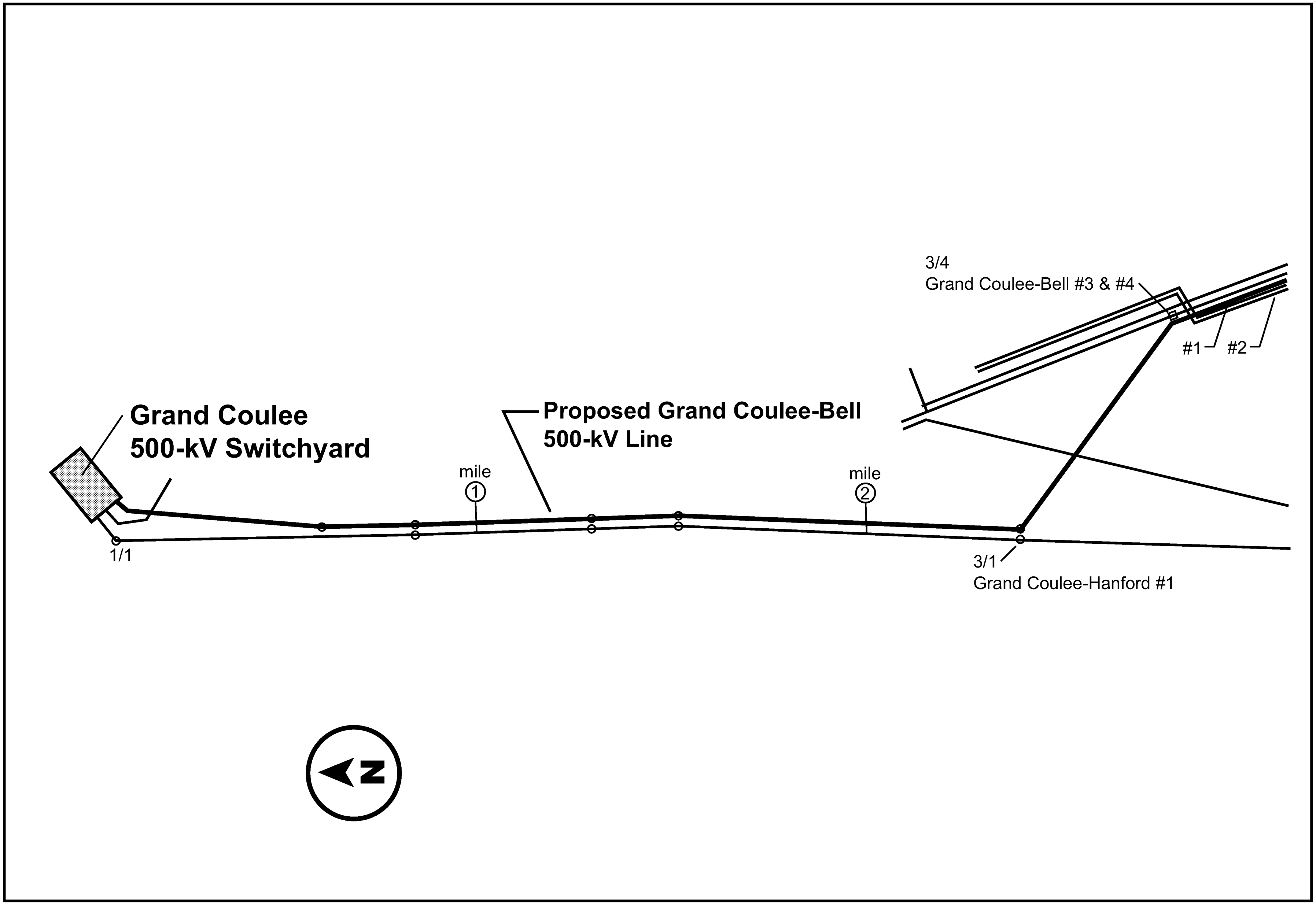



**Figure 2-3**

**Proposed Grand Coulee-Bell 500-kV Transmission Line**

**& 500-kV Switchyard Expansion**

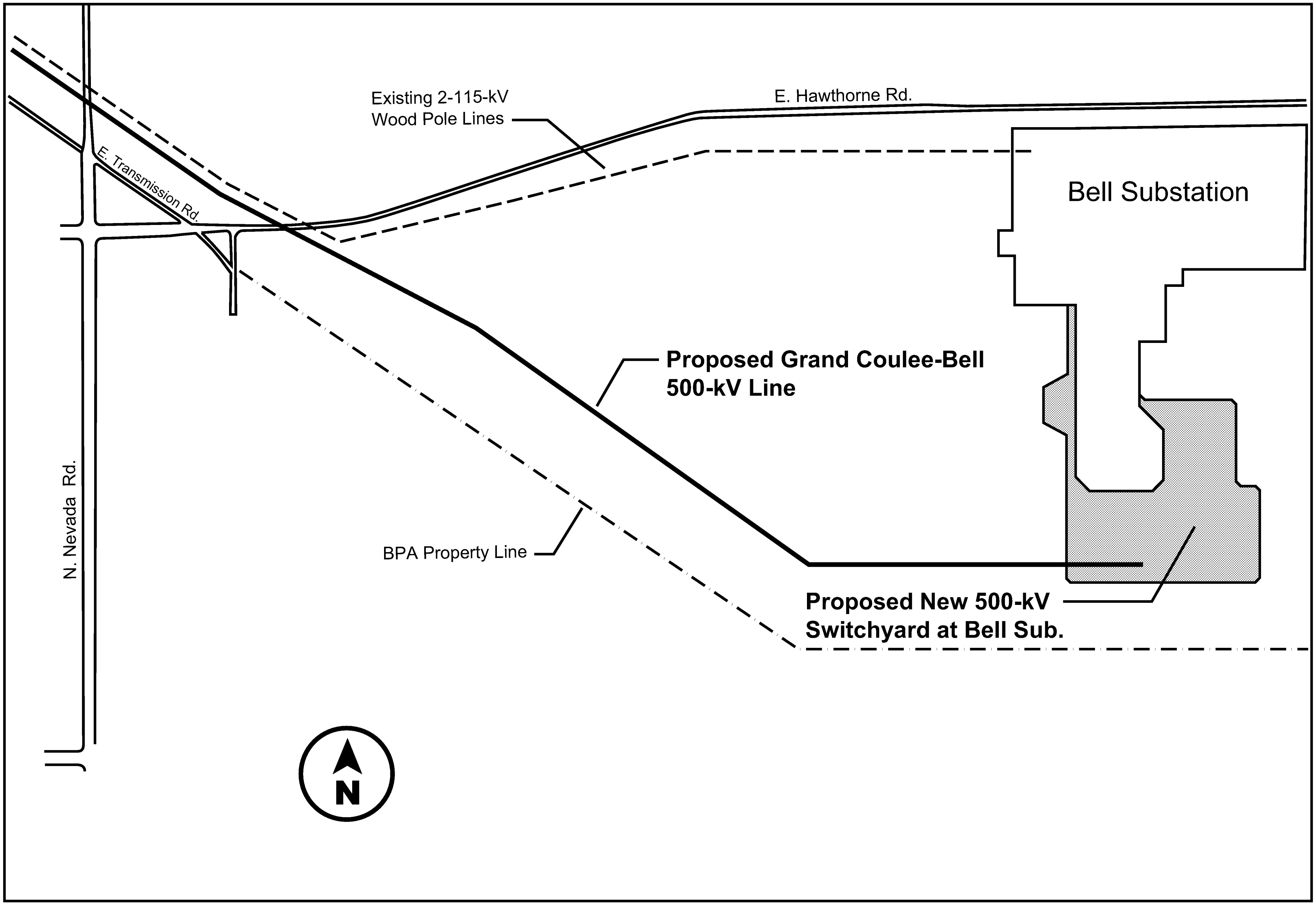



**Figure 2-4**

**Proposed Grand Coulee-Bell 500-kV Transmission Line**
**& 500-kV Switchyard at Bell Substation**

## Grand Coulee - Bell Project

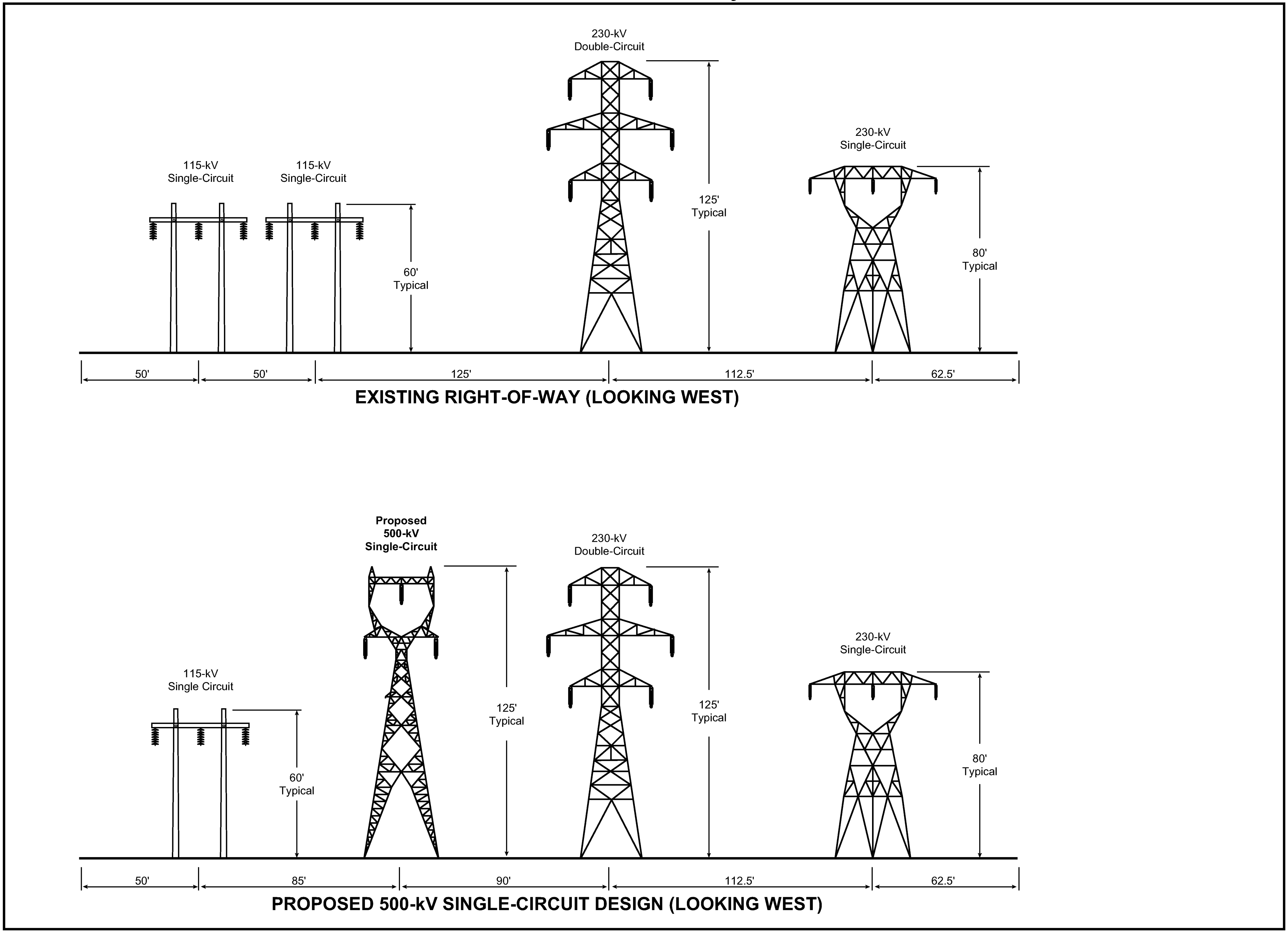



Figure 2-5
Tower Configurations
Proposed Action

## Grand Coulee - Bell Project

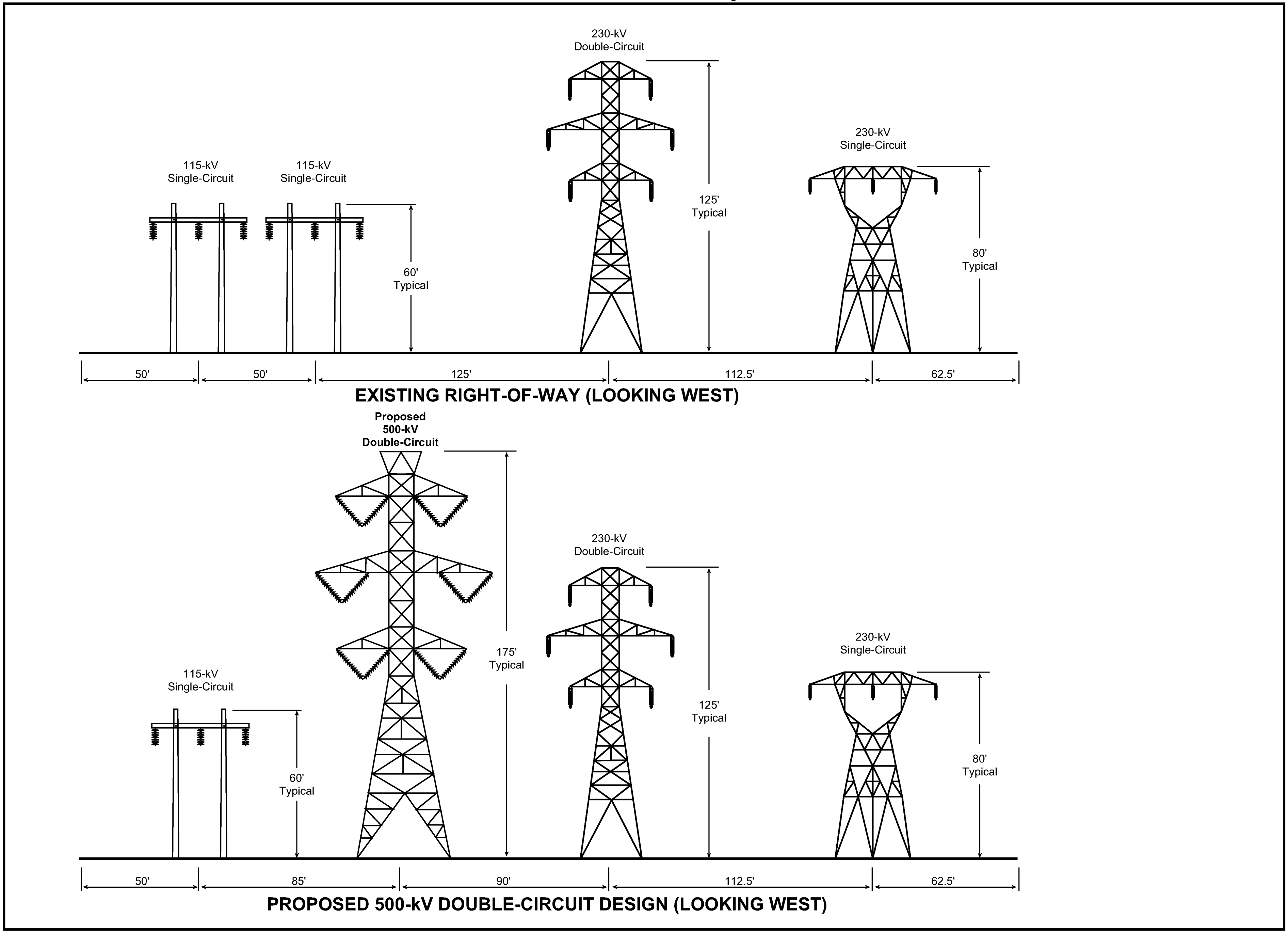



Figure 2-6
Tower Configurations
Alternative Action

or crosses highways or rivers. Dead-end towers equalize stresses on the conductors in these situations. Dead-end towers use more ***insulators*** and heavier steel than the other kind of tower, which makes them more visible. Dead-end towers also are more expensive than other towers.

## Conductors

The wires or lines that carry the electrical current in a transmission line are called conductors (see Figure 2-7). ***Alternating current*** transmission lines, like the proposed line, require three sets of conductors to make up a circuit. For a single-circuit 500-kV transmission line, there would be three sets of conductors and for a double-circuit line, six sets of conductors. Each set of conductors consists of three conductor wires that are each 1.3 inches in diameter. Conductors are attached to the tower using glass, porcelain, or fiberglass insulators. Insulators prevent the electricity in the conductors from moving to other conductors, the tower and the ground. Conductors are not covered with insulating material, but use the air for insulation instead. Each ***bundle*** of conductors is physically separated on the transmission tower.

Transmission towers elevate conductors to provide safety within the right-of-way for people and vehicles. Minimum conductor-to-ground clearance for a 500-kV line is 29 feet. Greater clearance would be provided over highway, railroad, and river crossings.

One or two smaller wires, called overhead ***ground wires***, are attached to the top of transmission towers for the entire length of the line to protect the transmission line against lightning damage. The ground wires are strung from the top of one structure to the next. To disseminate the electrical power from lightning, the ground wires are connected to wires called ***counterpoise***, which route the lightning energy to the ground. BPA could use fiber optic cable as the overhead ground wire to also provide a communication link, or a fiber optic cable could be attached elsewhere on the tower.

## Line Termination Facilities

A substation contains different kinds of equipment to carry out electrical operations and maintenance, and to minimize risks to workers. At Bell Substation, BPA would expand the existing fenced yard to make room for the new line termination facilities and other equipment. The expansion would encompass about 11.7 acres at the south end of the substation that would include three bays with six ***circuit breakers***, one group of ***series capacitors***, a new control house, and associated equipment. Existing BPA property would be used. The Grand Coulee Switchyard would not need to be expanded because there is space within the existing fenced yard to accommodate a new bay with two circuit breakers, a ***shunt reactor*** and breaker, and associated equipment. The following equipment would be installed at Grand Coulee Switchyard and Bell Substation:

**Power Circuit Breakers — Breakers** automatically interrupt power flow on a transmission line at the time of a fault. Faults are caused by lightning, trees falling into the line and other unusual events. Several kinds of breakers have been used in substations. The breakers planned for this project, called gas breakers, are insulated by special non-conducting gas (sulfur hexafluoride). Small amounts of hydraulic fluids are used to open and close the electrical contacts within gas insulated breakers. The hydraulic fluid is the only toxic or hazardous material that would be used. In addition to the new 500-kV breakers at Grand Coulee Switchyard and Bell Substation, some existing 115-kV breakers at Bell Substation would be replaced.

**Switches — Switches** are devices used to mechanically disconnect or isolate equipment. Switches are normally on both sides of circuit breakers.

**Bus Tubing, Bus Pedestals** — Power moves within a substation and between breakers and other equipment on ridged aluminum pipes called bus tubing. ***Bus tubing*** is elevated by supports called ***bus pedestal***s.

**Substation Dead Ends — *Dead ends*** are towers within the confines of the substation where incoming and outgoing transmission lines end. Dead ends are typically the tallest structures in a substation.

**Transmission Dead End Towers** — The last transmission line towers on both the incoming and outgoing sides of the substation are called dead end towers. These towers are built extra strong to reduce conductor tension on substation dead ends and provide added reliability to the substation.

**Substation Fence**— This chain-link fence with barbed wire on top provides security and safety. Space to maneuver construction and maintenance vehicles is provided between the fence and electrical equipment.

**Substation Rock Surfacing**— A 3-inch layer of rock selected for its insulating properties is placed on the ground within the substation to protect operations and maintenance personnel from electrical danger during substation electrical failures.

**Shunt Reactors** — Shunt reactors are electrical devices that reduce voltage on a line if it is too high. Shunt reactors are oil-filled to reduce their size.

**Oil Spill Containment**—Oil spill containment would be installed at Grand Coulee Switchyard and at Bell Substation to collect any oil spilled from the shunt reactors.

In addition, the Proposed Action would require series capacitors and related equipment. Series capacitors are electrical devices that can increase loading on a transmission line. Series capacitors and related equipment would be placed on platforms near the line termination facilities at Bell Substation.

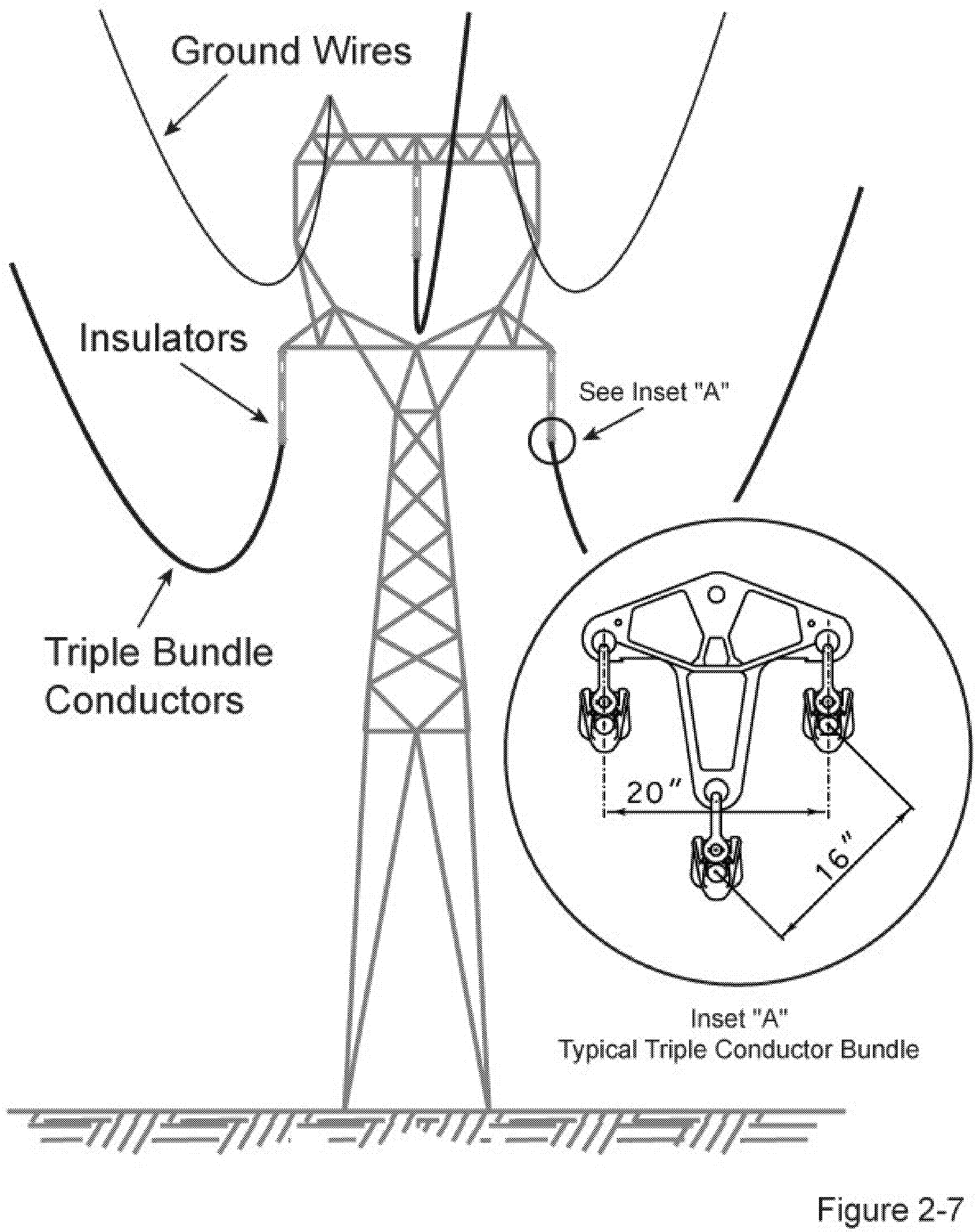



Figure 2-7
Conductors, Insulators, & Ground Wires
for a Typical Single-Circuit Lattice Tower

Each electric ***phase*** on the transmission line would require one platform. Each platform would be about 38 feet x 38 feet and 38 feet high. The platforms would contain capacitors and related equipment such as ***metal oxide varistors*** and a ***discharge reactor***. Bus, breakers and disconnect switches would surround each platform. Grading and excavation would be required to mount and secure the electrical equipment. Surface rock would be used to insulate and protect workers.

## Additional Features of the Proposed Action

### 115-kV System and Tap Point/Substation Changes

In general, removing the Grand Coulee-Bell No. 1 115-kV line would entail removing structures and conductors over the 84-mile route, with some line reconfiguration as noted previously. Additional reconfiguration would be required for the section of line taken out of service between the Grand Coulee 115-kV Substation and corridor mile 3/8. This would involve reconfiguring conductors to use a combination of existing double and single-circuit structures on the two 115-kV lines, and stringing some new spans between existing structures.

Customers currently tap off of both of BPA's existing 115-kV lines at four locations. Making room for the new 500-kV line by removing the Grand Coulee – Bell No. 1 115-kV line would make electrical changes necessary along the right-of-way at the four ***tap points*** on the remaining No. 2 115-kV line. Electrical changes at tap points and substations that would be necessary along the right-of-way are as follows:

- Grand Coulee 115-kV Substation: Replace ***relays***.

- Wagner Lake Substation (corridor mile 19/3): Disconnect tap from Grand Coulee – Bell No. 1 115-kV line, modify existing three-pole dead-end structure (19/3) to a three-pole dead end for a switch, install switch, and install new two-pole guyed dead end and line disconnect switch just east of structure 19/3.

- Creston Substation (corridor mile 30/1): Disconnect tap from Grand Coulee – Bell No. 1 115-kV line. The tap of the remaining Grand Coulee – Bell No. 2 115-kV line will be isolated; i.e., it will be dead-ended from both directions. Three-pole guyed dead-end structures will be added just outside the substation in both directions. Structures would be modified and overhead ground wire installed on the 115-kV line one-half mile in each direction from the substation. In addition, other changes at the substation would be a new bus, disconnect switches, circuit breakers, and control house. All changes would be within the existing substation or right-of-way. The Grand Coulee – Bell No. 2 115-kV line would then become the Grand Coulee – Creston No. 1 115-kV line and the Creston – Bell No. 1 115-kV line.

- Larene Substation (corridor mile 46/8): Disconnect tap from Grand Coulee – Bell No. 1 115-kV line and install new switches.

- Springhill Substation (corridor mile 74/5): Disconnect tap from Grand Coulee – Bell No. 1 115-kV line and install two line disconnect switches with two-pole guyed dead ends.

- Bell 115-kV Substation: Replace relays.

Outside of the project area, one group of series capacitors would need to be installed on an expanded site at the Dworshak 500-kV Substation, and existing series capacitors would need to be replaced within the current boundary of the Garrison 500-kV Substation. A separate environmental review under NEPA was completed for the site preparation work at Dworshak Substation. The work consists of civil work to expand the yard and fenced area to prepare for future equipment installation. The area of expansion was filled and leveled for future use when the substation was constructed in 1972-73. Some reconfiguring of access roads will occur on previously disturbed areas. The site preparation work will have no adverse environmental impact, will not limit the choice of reasonable alternatives, and is not considered an excessive waste of resources if BPA decides on the No Action alternative under this EIS. The replacement of series capacitors at Garrison Substation is an action included in this EIS.

### Communication Facilities

BPA would install new communication equipment at the affected facilities and at other existing remote facilities using existing communication pathways. The communications equipment would be used to monitor the performance of and control the transmission system.

## Construction

BPA would follow its existing practices for removing and replacing the transmission line. When BPA removes old structures and conductors (wires), any material that can be recycled or salvaged is saved. Other materials are disposed of according to law. BPA would build or upgrade existing permanent ***access road***s as necessary. If additional easements for right-of-way or permanent access roads are needed, additional rights would be obtained from landowners. Usually BPA/BPA's contractor clears an area, called a ***staging area***, to store and assemble materials or structures. After structures are in place and conductors are strung between the structures, the areas disturbed by construction are restored to original conditions, if possible, and revegetated.

Construction of the transmission line (and its later operation) requires land for various purposes (the corridor, tower sites, access roads, etc.) Some requirements are temporary and some permanent; some temporary disturbances could result in long-term effects. A summary of some of the characteristics of the proposed action is provided below.

| | |
|---|---|
| Corridor length | 84 miles |
| Single circuit | 83.1 miles |
| Double circuit | 0.9 miles |
| New corridor or right-of-way | 4.2 miles |
| Land occupied by: | |
| Corridor (150-foot width) | 1,528 acres |
| Tower construction (1/2 acre each) | 210 acres |
| Tower clearing (100 feet x 100 feet) | 97 acres |
| Towers (2,500 sq. ft. each) | 24 acres |
| Staging areas (4 at 2 acres each) | 8 acres |
| Pulling/tensioning sites (1 site every 2.5 miles, 1 acre each) | 34 acres |
| Access roads: | |
| New roads | 15.6 acres |
| Access road improvements | 52.5 acres |
| Permanent access road spurs | 6.3 acres |
| Temporary access road spurs | 6.3 acres |
| Land area "reclaimed" with removal of wood pole structures (1,000 sq. ft. per structure) | 17.4 acres |

## Construction Schedule

Construction is scheduled to begin in January 2003 and to be complete by November 2004.

## Staging Areas

Temporary staging areas would be needed along or near the proposed transmission line for construction crews to store materials and trucks. The contractors hired to construct the transmission line would be responsible for determining appropriate staging area locations and for obtaining any required permits or environmental reviews for staging areas. It is estimated that four 2-acre staging areas would be needed.

## Access Roads

Access to tower sites for construction and maintenance would need to be provided at several locations along the corridor. Access road construction would take place principally within the right-of-way, but also off of the right-of-way. Access road construction would consist of improvements to existing roads, development of new roads, and construction of spurs to individual tower sites. New access road requirements are summarized below:

| | Length (miles) | Area (acres) |
|---|---|---|
| Improvements | 16.6 | 52.5 |
| New access roads | 4.9 | 15.6 |
| Road spurs: | | |
| Permanent | 2.0 | 6.3 |
| Temporary | 2.0 | 6.3 |

Improvements would consist of widening existing access road surfaces from 11 feet to 16 feet (with additional road width of 20 feet for curves), improving ditches and side slopes, grading, rocking, and/or installation of ***water bars*** and ***drain dips*** as needed. In addition, some improvements would be needed at approaches to existing access roads from public roads.

Most new permanent access roads would be constructed in rangeland areas. Clearing and construction activities for new access roads would disturb a 26-foot wide area (16-foot road width plus an additional area 5 feet wide along each side of the road). Roads would be dirt or gravel. New roads would be within the right-of-way wherever possible to avoid removing vegetation, but where conditions require, roads would be constructed and used outside the right-of-way. Before the transmission line is built, dips and culverts would be installed within the roadbed to provide drainage. Fences, gates, cattle guards and additional rock would be added to access roads where necessary.

Most access roads in cultivated or fallow fields would be temporary; in only a few locations would permanent access road construction occur in these areas. Any temporary roads constructed in cropland would be removed and the ground would be restored to its original contour when the line is completed. Ground disturbed for temporary roads in other locations would be repaired and, if the land use permits, the road would be reseeded with native grass or other appropriate native seed mixtures.

Spur roads would need to be constructed between access roads and individual tower sites. Construction activities would be the same as for new access roads. It is estimated that spur roads would be 50 feet long on average.

Rights, usually easements, for access roads would be acquired from property owners as necessary. A 50-foot wide right-of-way would be acquired for new road access outside the present right-of-way and a 20-foot wide right-of-way would be acquired for existing access roads outside the right-of-way.

Access roads would also be used for line maintenance after construction. If the ground is disturbed by maintenance activities, the roadbed would be repaired and revegetated if necessary.

## Right-of-Way and Tower Site Preparation

Trees and tall brush would be selectively cut in the existing right-of-way to accommodate construction and to provide for long-term clearances between conductors and vegetation that are required to meet safety and reliability standards for 500-kV lines. Some trees also would be cut outside of the right-of-way if they are identified as "***danger trees***" (trees that, because of their height and condition, may pose a threat to the adjacent line). Trees are carefully analyzed so that only those trees that would interfere are removed. Where it does not already have rights, BPA would obtain rights to cut trees outside the right-of-way. Trees would also need to be cut in the new 500-kV line right-of-way in the first 4 miles out of Grand Coulee and on existing right-of-way or fee-owned property in the last 2 miles in to Bell Substation where no transmission line exists now. Trees would be cut (as a maintenance action) at about the same time within the right-of-way of the adjacent existing 115-kV line that will remain.

To accommodate construction activities at the structure sites, most trees and brush would be cut and removed within a one-half-acre area (total of 210 acres), with root systems being removed from a 100-by-100-foot area for the tower footings (total of 97 acres). A portion of the site would be graded to provide a relatively level work surface for the erection crane. The Proposed Action would require an estimated 97 acres to be cleared for structure footings along the 84-mile route.

Woody debris and other vegetation would either be left lopped and scattered, piled, mulched or chipped, or would be taken off-site. Burning would not be used to dispose of debris.

## Tower Footings

Steel towers would be anchored to the ground with ***footings***. Four footings would anchor each tower at four points. The design for each footing would vary based on the soil, depth to bedrock, and quality of bedrock at each site. For a typical tower site, four holes would be excavated, then steel plates or a grid of crossbeams would be placed in each hole and connected to a tower leg. The hole would then be filled up with the original excavated material, and excess material would be spread around the tower legs.

For a single-circuit tower, a hole about 30 feet in diameter at ground level and about 6 feet in diameter at the bottom (12-foot depth) typically would be excavated for each of the four footings. For a double-circuit tower, an excavated hole about 38 feet in diameter at ground level and about 10 feet in diameter at the bottom (14-foot depth) would be needed for each footing. If no bedrock is found, a hole about 12 feet deep would excavated. If bedrock is found and is adequate for using anchor borings, holes may be drilled in the bedrock and steel rods and grout would be inserted. The rods then would be attached to a concrete footing and covered with compacted soil. If the bedrock cannot support anchor rods, the bedrock may need to be blasted to reach an adequate footing depth.

### Erecting Towers

Towers would be either assembled at the tower site and lifted into place by a large crane or assembled at a staging area and set in place by a large sky-crane helicopter. The towers would be assembled in sections. Each tower would contain three components: the tower legs, the tower body, and the ***bridge***. The bridge is the uppermost portion of the tower and serves as the attachment point for the insulators, which in turn would support the conductors. The towers would be bolted to the footings after they are set in place.

### Stringing Conductors

The conductors would be strung from tower to tower through pulleys on the towers. After transmission towers are in place, workers would first attach a smaller steel cable to the towers; the cable would be attached to the conductor, then the workers would pull the conductor under tension through the towers. Conductors would be attached to the tower using glass, porcelain, or fiberglass insulators, as noted previously. As the lines are strung, the ground surface would be disturbed at the tensioning sites, and noise and dust would be generated by equipment. Tensioning sites would occupy approximately 1 acre and would be needed approximately every 2.5 miles. There would be at least 34 tensioning sites for a total of 34 acres.

### Removal of Existing Wood Pole Structures

Wood pole structures on the old Grand Coulee-Bell No. 1 line will be removed. In agricultural land wood poles would either be excavated and holes backfilled with native material, or cut off 2 feet below ground level and backfilled with native material. In non-agricultural land, wood poles would either be excavated and holes backfilled with native material, cut off at ground level, or cut off 2 feet below ground level and backfilled with native material. In sensitive areas where disturbance must be kept to a minimum, wood poles would be cut off at ground level and poles dragged out or lifted out by crane to avoid bringing in construction equipment all the way to the structure. Existing access roads would be used travel to structure sites. It is estimated that an area of about 1,000 square feet at the site of existing structures would be converted from use for transmission facilities to another use (e.g., in agricultural land, the area that was occupied by the wood pole structures would be available for cultivation).

## Vegetation Management

After construction, maintenance crews would be responsible for managing vegetation. No tall-growing vegetation would be allowed to grow inside the right-of-way except for vegetation in deep canyons when it will not interfere with the conductor. BPA would develop maintenance criteria consistent with its Transmission System Vegetation Management Program, which is incorporated by reference in this EIS. Under maintenance criteria, healthy, stable trees outside the right-of-way would be left in place. Only those trees that pose a potential threat to the line would be removed.