United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

National Register of Historic Places
Date Listed: April 14, 2025
NRIS No. MP100011672
Oregon State Historic Preservation Office

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. Name of Property

historic name Salem Substation, Bonneville Power Administration

other names/site number

Name of Multiple Property Listing Bonneville Power Administration (BPA) Pacific Northwest Transmission System
(Enter "N/A" if property is not part of a multiple property listing)

2. Location

street & number 3105 Dallas Highway (OR 22) ☐ not for publication

city or town Salem ☒ vicinity

state Oregon code OR county Polk code 053 zip code 97304

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _X_ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _X_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance: ___ **national** ___ **statewide** _X_ **local**

Applicable National Register Criteria: _X_ **A** ___ **B** _X_ **C** ___ **D**

SUNSHINE SCHMIDT Digitally signed by SUNSHINE SCHMIDT Date: 2025.02.25 16:01:21 -08'00'

Signature of certifying official/Title: Federal Preservation Officer Date

Bonneville Power Administration
State or Federal agency/bureau or Tribal Government

In my opinion, the property ☑ meets ☐ does not meet the National Register criteria.

Signature of commenting official 04/14/25
Date

Deputy State Historic Preservation Officer Oregon State Historic Preservation Office
Title State or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register ___ determined eligible for the National Register

___ determined not eligible for the National Register ___ removed from the National Register

___ other (explain:)

Signature of the Keeper Date of Action

United States Department of the Interior
National Park Service

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Signature of the Keeper Date of Action

Salem Substation, Bonneville Power Administration | Polk Co., OR
Name of Property | County and State

5. Classification

Ownership of Property
(Check as many boxes as apply.)

- [ ] private
- [ ] public - Local
- [ ] public - State
- [X] public - Federal

Category of Property
(Check only **one** box.)

- [ ] building(s)
- [X] district
- [ ] site
- [ ] structure
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
1	3	buildings
1		site
1		structure
		object
3	3	**Total**

Number of contributing resources previously listed in the National Register

N/A

6. Function or Use

Historic Functions
(Enter categories from instructions.)

GOVERNMENT: public works
INDUSTRY/PROCESSING/EXTRACTION:
energy facility

Current Functions
(Enter categories from instructions.)

GOVERNMENT: public works
INDUSTRY/PROCESSING/EXTRACTION:
energy facility

7. Description

Architectural Classification
(Enter categories from instructions.)

MODERN MOVEMENT: Moderne

Materials
(Enter categories from instructions.)

foundation: CONCRETE
walls: CONCRETE
STUCCO
roof: CONCRETE
METAL
other: WOOD

Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity).

Summary Paragraph

The Salem Substation Historic District, constructed between 1939 and 1942, is located at 3105 Dallas Highway (OR 22), Salem, Polk County, on an 8.53-acre four-sided parcel. The Substation consists of six resources: Control House, Switchyard, Transfer Track, Maintenance Building, Engine Generator Building, and Storage Shed. Three of these resources were built during the Salem Substation Historic District's period of significance (1940-1942) and are all contributing: the Control House, Switchyard, and Transfer Track. The Salem Substation features resources that typify the operational functions of BPA substations erected in the early 1940s, including the use of the architectural Streamline Moderne style that is reflected in the design of the Control House. There are also three non-contributing resources within the district boundary: the Maintenance Building, Engine Generator Building, and Storage Shed – all built outside the period of significance. The Salem Substation remains in use today as a functioning substation that provides power to customers throughout the Willamette Valley. The district retains an excellent level of integrity of location, setting, design, materials, workmanship, feeling, and association per the registration requirements of the *BPA Pacific Northwest Transmission System* MPD.

Narrative Description

There are six resources within the Salem Substation Historic District property boundary (Table 1).

Salem Substation				
Name	**BPA Building Number**	**Resource Type**	**Construction Date**	**Eligibility**
Switchyard	N/A	Site	1940	Contributing
Control House	Z-936	Building	1942	Contributing
Transfer Track	Z-8175	Structure	1942	Contributing
Maintenance Building	Z-816	Building	1956	Non-contributing
Storage Shed	Z-4491	Building	1986	Non-contributing
Engine Generator Building	N/A	Building	2014	Non-contributing

Table 1: Salem Substation Resources

Setting and Location

The Salem Substation is bounded by a steep hill to the north, a forested area to the east and west, and the Dallas Highway (OR 22) to the south.[1] The Willamette River can be seen looking south across Dallas Highway (Photo 6). The primary entrance to the substation is along the Dallas Highway, which opens to an asphalt parking lot (Photo 1). This parking lot sits approximately 15ft above the Dallas Highway. The 8.53-acre substation includes six resources: the Control House, Maintenance Building, Storage Shed, Engine Generator Building, Switchyard, and Transfer Track (Figure 4).[2] The substation property slopes upwards towards the northern property line, with an increase in grade of 8%.[3] The property is enclosed by a chain link fence for both the safety of the transmission system, as well as the safety of the general public. There are 12 transmission lines that run north and south through the Switchyard; five of which are operated by BPA (Table 2).[4] Gravel utility-access roads extend from the Substation to adjacent transmission towers but are outside the historic district boundary.

Control House (1942; Contributing)

Construction on the Salem Substation Control House began in 1940, soon after the temporary switchyard was energized, and was completed in 1942.[5] The Control House is built in the Streamline Moderne architectural style with its concrete asymmetrical footprint, flat roof, smooth concrete surfaces, simple geometric motifs, and multi-light steel windows. It contains the principal operational and monitoring equipment related to the substation facility. Unlike other control houses built by BPA from 1938-1945, the Salem Substation Control House is the first instance of BPA combining a control house and untanking tower into a single building (Figure 9). The control house references the one-story space that houses system operations (Photo 8). The untanking tower refers to the three-story portion of the building used for maintenance activities (Photo 6). Untanking towers, also called condenser buildings, were a key component of BPA's early Master Grid-era substations and were only built during BPA's Master Grid period of significance (1938-1945). Untanking towers were used to conduct routine transformer maintenance and repairs. They were connected to the switchyard by wide-gauge rail line that allowed large transformers to be moved relatively easily around the substation.[6] The Salem Substation Control House is the only remaining example of BPA's Standard Type 105 design in the system.[7]

The Salem Substation Control House (15,692 sq. ft.) sits on a concrete foundation and has a poured concrete exterior with a concrete stucco finish.[8] The building's flat roof is finished with a single-ply

[1] Located just outside the northern boundary of the Salem Substation Historic District, the large hill tops out at 105ft above the Dallas Highway.

[2] The Switchyard is centrally located on the property, with the Transfer Track running through the yard on an east-west axis. The Engine Generator Building and Storage Shed are positioned south of these features and sit near the fence line. The Control House is located in the southwest corner of the property, with the Maintenance Building just north of the Control House in the northwest corner.

[3] BPA, *Facility Database*.

[4] The other seven transmission lines are operated by Salem Electric.

[5] BPA, *Facility Database*.

[6] Though the control house and untanking tower are one resource, due to their difference in function and appearance, this narrative will refer to the control house and untanking tower as two individual features.

[7] BPA's "Standard Type 105" is one of many standardized architectural designs used throughout the Master Grid and System Expansion periods. Exterior characteristics of this type include a tall central untanking tower with symmetrical wings, concrete construction, flat roof with concrete parapet, projecting entrance, corbeled corners, concrete dentils, and steel multi-purpose windows and transoms. Almost all BPA control houses were based on BPA standardized designs. These designs illustrate the original appearance of control houses, and in some cases indicate how BPA planned for anticipated design modifications (BPA's Manual for Built Resources, 2021).

[8] The exterior of the control house is painted "Engineers Light Gray" (FS-26555) with "Maritime Engine Gray" (FS-26306) trim. Though the control house was constructed in 1942, these colors are characteristic of BPA's 1950 paint scheme. By 1950, BPA had incorporated the Federal Standard Paint Color (FSPC) into its substation paint schemes. Both "Engineers Light Gray" and "Maritime Engine Gray" were discontinued for use on new construction by 1956 (BPA's Manual for Built Resources, 2021).

membrane and features a concrete parapet with metal flashing and square-shaped flood lights.[9] A curved concrete path leads from the parking lot to the main entrance on the south elevation (Photo 3). Landscaping features include several bushes that flank either side of the main entrance, on the east and west wing. There are two large tree stumps located just south of the concrete front sidewalk.[10] The main entrance to the Control House is located on the south elevation and is a shortened one-story entryway that protrudes between the two wings in front of the tower (Photo 8). A small horizontal three-light window with vent opening are located on the east and west elevations of the protruding entrance. This entrance is accessed by concrete steps and an open porch with a short concrete wall (Photo 10). Corbeled corners and concrete dentil trim frame the entryway and two windows that flank either side. The recessed single-door opening is a single-light, flush-paneled steel door, that is located under a four-light steel transom (Photo 11). The two rectangular 16-light fixed steel sash windows are located directly under four-light steel transom. Within the 16-light steel sash is a four-light awning style sash. The south façade of the 46-foot tall untanking tower projects above the main entrance. The façade showcases a grouping of three tall recessed rectangular multi-light steel windows, with pairs of lower center awning sashes. The tower is flanked by the two wings of the control house, each wing with a grouping of three recessed rectangular-shaped, 24- light, multi-style steel sash.[11]

The west elevation is asymmetrical and includes the projecting west wing of the control house, and the recessed elevation of the untanking tower to the north (Photo 6). The west wing includes four rectangular, 24-light steel sash windows on the west elevation; and a double and single door opening with multi-light steel doors that are located under a concrete canopy to the north (Photo 5). Two multi-light steel transoms are located above each respective door. A single 24-light steel sash is located to the left of the doors. The west wing also includes one microwave dish antennae above the fenestration on the north elevation, and an air intake on the roof.

The west elevation of the recessed untanking tower includes a grouping of three tall recessed rectangular multi-light steel windows with center awning sashes below a grouping of three recessed rectangular multi-light steel windows with center awning sashes. From south to north there are a pair of fixed square-shaped multi-light steel windows with a concrete sill, two fixed rectangular multi-light steel windows, a roll-up garage style metal door (Photo 22), and a tall rectangular multi-light steel window with pairs of awning sashes. Two paired and five single rectangular multi-light steel windows with center awning sashes and concrete sills are located above the fenestration above the wing and at the ground level.

The north elevation of the Control House is asymmetrical and includes the projecting east and west wing. The untanking tower projects northward and includes a grouping of three tall recessed rectangular multi-light steel windows with center awning sashes below a grouping of three recessed rectangular multi-light steel windows with center awning sashes (Photo 6). The east elevation of the untanking tower largely mirrors that of the west elevation. In place of a roll-up metal garage door, there is a large multi-light sliding metal door (24'x 20') with a smaller inlaid door (approximately 7'x 4.5') (Photo 19).[12] This large sliding door is original to the building.

The east wing of the control house includes two window openings on the north elevation. A large HVAC unit has been installed on the leftmost opening, with a single 24-light steel sash window to the right (Photo

[9] BPA, *2016 Facilities Assessment*.
[10] Three large deciduous trees, situated to the south of the Control House, were removed between 2019 and 2022. They were likely planted in the late 1950s/early 1960s.
[11] Unless otherwise indicated, all windows that are 24-light steel sash, have a four-light awning sash (top-center), and a two-light hopper sash (bottom-center) within the fixed sash design.
[12] The large sliding door on the east side of the tower moves horizontally on a track from south to north. It is free hanging and is opened manually. When opened completely the door hovers over the transformer pit from the track (Photo 26).

6). The east elevation of the east wing includes four rectangular, 24-light steel sash windows; and one window well on the left side of the east wing, that partly exposed an egress style window (Photo 7).

Interior

The main entryway to the Control House opens to a small room with a horizontal bay of glass block windows directly in front, looking north into the untanking tower.[13] This entry room features a small closet, the original brass registers (Photo 12), ceramic tile windowsills (Photo 13), and the original light green-colored Venetian-style blinds (Photo 15). A schoolhouse-style light fixture hangs from the center of the room.[14] A short hallway to the right leads to the untanking tower door, as well as a bathroom (south) and the control room (east), which make up the east wing of the Control House. The doors and door hardware are original to the control room and tower; they have three horizontal windows, and a half-moon shaped design around the doorknob (Photo 14). The control room features the original control equipment that regulates the Switchyard equipment. It has boxed linear fluorescent lighting, as well as the original Venetian style window blinds, and a horizontal bay of glass block windows, similar to the entryway (Photo 16). The entryway and control room feature 8" asbestos composition gray tile (ACT) flooring, rubber baseboards, plaster covered reinforced concrete walls with rounded corners, and acoustic ceiling panels.

A secondary door on the west side of the control room opens up the three-story untanking tower. The untanking tower features: painted concrete floors, painted concrete walls with rounded edges (Photo 23), original ceiling light fixtures, a transfer track embedded into the concrete (Photo 20), a metal ladder to access the transformer pit, a large horizontal sliding metal door (east elevation), a roll-up garage style metal door (west elevation), and a 15 and 60-ton crane (Photo 21).[15] On the south side of the tower is a staircase that leads to the basement and transformer put. The pit is largely empty and serves mainly as storage for miscellaneous items (Photo 26). There are three metal cranks in the pit that control the operation of the awning style sash on the west, north, and east facing sides of the tower via long metal rods that extend upwards: connecting all operational sash on that respective side (Photo 25). There is a total of 24 operating awning style sashes on the tower: six on both the west and east elevations, and 12 on the north elevation.

The main floor of the west wing features a hallway that leads to the maintenance, storage, and communication rooms (Photo 29). All three rooms are located on the south facing side of the west wing.[16] A door at the end of the west facing hallway leads to another staircase that accesses the basement. The staircase opens to a basement storage room that contains a small rack of backup batteries (Photo 29). The basement has finished concrete floors, painted concrete walls with curved edges, and suspended circular metal lighting (Photo 28). The west wing features two doorways that lead to the transformer pit, more storage space, rows of empty shelving, an air intake chamber, the condenser foundation, and a stairway that leads upstairs to the untanking tower. The east wing of the basement has a battery room, and two communication equipment rooms. The basement is primarily used for storage, though it is sparsely filled. Outside of a few office desks and chairs, a majority of the rooms contain merely a handful of papers and miscellaneous sundries.

[13] This entryway was originally used as an office for Salem Substation staff to engage with the public.
[14] Though this fixture is not original to the entryway space, it likely came from another part of the Control House.
[15] These cranes were used to move the transformers that came in from the switchyard from the transformer track over to the transformer pit for maintenance. Though the cranes are no longer in use today, they are still operational.
[16] The communication room includes communication equipment actively in use (Photo 30). The maintenance room includes several built-ins, shop and safety equipment, a ladder that leads up to a crawl space, and various sundries located throughout the room (Photo 31).

Alterations[17]

There have been several alterations to the exterior and interior of the Control House since construction was completed in 1942. Changes to the exterior can be seen from BPA aerials and include: the addition of metal flashing to the concrete parapet (1962); a new aluminum metal door (c.1965); the installation of two HVAC units within existing window openings (2009); the addition of new flood lighting (date unknown); and two microwave dish antennae to the north-façade of the west wing (1974 and 2011).[18] The most significant alteration to the exterior of the Substation was the removal of the original folding shop door on the untanking tower's west elevation in 1981.[19] The project included the removal of a portion of the concrete wall on the west elevation of the untanking tower, as well as three of the multi-light steel windows to enlarge the opening.[20] It was replaced with the current electrically operated steel roll-up garage door.

Changes to the interior include the addition of the glass-block bay of horizontal windows in the entryway in 1945 that replaced a three-light fixed sash; the removal of the original condenser from the untanking tower (date unknown); the addition of acoustic ceiling panels (date unknown); the replacement of the original black and white ACT flooring (date unknown); and the removal of most of the equipment outside of the control room.[21] The lighting in the control room has been changed twice, and includes the removal and replacement of the original inverted aluminum dome pendant light fixtures with circular Streamline Moderne style pendant fixtures (late-1940s) (Figure 40); and the removal and replacement of the Streamline Moderne style fixtures with fluorescent lighting (date unknown). The most significant change to the interior of the building was partitioning off of the west wing into a separate communications room, storage, maintenance room, and hall.

Integrity

The Control House remains in its original location and setting: prominently facing the Dallas Highway and Willamette River, thus retaining its "public 'face'… when viewed from the right of way."[22] The building has also retained the original design in relation to its period of significance; retaining substantial integrity of its Streamline Moderne style, the materials used, and the workmanship on the exterior of the structure. The untanking tower remains a prominent element that reinforces the buildings' specific nature within the period of significance (1940-1942) and relationship to the Switchyard. The Control House continues to play a crucial role within the BPA Transmission System, as well as retaining its original visual role as a public focal point. Changes to the exterior have been discrete and have maintained its design as built.[23] Despite changes, the Control House retains integrity of location, design, setting, materials, workmanship, feeling, and association. The building contributes to the historic character and significance of the Salem Substation and is a contributing resource to the Salem Substation Historic District.

The Control House is also individually eligible under Criterion C as an excellent example of a Streamline Moderne style control house constructed during BPA's Master Grid development period (1938-1945). The Control House remains consistent with its original design and material, including its stucco exterior finish, multi-light industrial windows, rounded corners, geometric detailing, and asymmetrical footprint reflecting the character-defining features of the style and time period. Unique to BPA's early design practices, the Control House is the only remaining example of BPA's Standard Type 105 design that combines the control

[17] BPA, *Facility Database*
[18] One of the microwave dish antennae was removed c.2020.
[19] Per the BPA's MPD, the replacement garage door does not affect the overall integrity of the Control House as it is not facing the public right of way and is considered "back of house."
[20] Statesman Journal, "U.S. DEPARTMENT OF ENERGY, BONNEVILLE POWR ADMINSTATION: Sealed bids for Solicitation."
[21] The date of these interior alterations is unknown.
[22] Per BPA's MPD guidelines.
[23] Kramer, *Bonneville Power Administration [BPA] Pacific Northwest Transmission System Multiple Property Documentation*, 50.

house and untanking tower into one structure and is directly related to the historic functions and technology associated with BPA's early substations.[24]

Switchyard (1940; Contributing)
Constructed in 1940, the Switchyard occupies a majority of the Salem Substation property and was the first resource built. "Switchyard sites are generally characterized by a vertical superstructure of steel, typically latticework, with conductor, circuit breakers, insulators, transmission towers, and other electrical equipment connect incoming and outgoing transmission lines to a series of grade-mounted transformers, circuit breakers, switches and other equipment… grade-mounted equipment, including transformers, breakers, bushings, shunt reactors and others, from a design standpoint, form a heterogeneous, repetitive and complex array of elements that lack individual distinction for all but the most knowledgeable of observers."[25] The Switchyard is four-tiered, with three permanent cantilevered concrete retaining walls that delineate the three separate upper levels of the Switchyard from the lower yard.[26] There are five sets of concrete stairs that allow access to each tier (Photo 39). It is covered with crushed rock and bounded by a metal chain-link fence. The Switchyard includes two power transformers, a dead-end tower, a storage shed and a generator building in the lower yard, three dead-end towers above two banks of current transformers (CT), four gas circuit breakers surrounded by buswork, and a bank of potential transformers (PT) in the switchyard. Four additional gas circuit breakers and three dead-end towers are located in the upper switchyard.

The Switchyard includes concrete paths under the buswork, as well as a segment of the original transformer track leading from the Control House to the lower level of the yard. The Switchyard is also accessible to the southwest via a dirt access road. There are 23 high-intensity discharge (HID) outdoor light poles located throughout the yard. The lower yard includes five light poles that are situated near the concrete wall on the south end of that tier. Six light poles are located in the middle yard, with three near the concrete wall on the south end of that tier, and the other three in a parallel line under the buswork. The upper yard has a total of 10 light poles, three of which are located near the southern edge of the tier near the concrete wall; four are placed in a parallel line under the buswork; and the last four sit at the northern most part of the switchyard near the fence line (Photo 43). The light fixtures themselves are industrial in style and made up of a metal post with concrete post base. The lamp base is made of aluminum, with a clear teardrop style globe.

To safely support equipment, there is an intricate system of grounding below the surface of the Switchyard (Figure 11).[27] The type of grounding varies depending on the structure it is supporting: whether it be a transformer tower or carrier capacitor, or a yard light pedestal or fencepost. The original design of the yard indicates that main ground mat cables are buried at a minimum of 15" to 21" below the finished grade, with 6" of crushed stone on top. The foundations for the original oil circuit breakers are built of wood and are located underneath the gravel. Underneath the Switchyard is a drainage system that, as of 2016, included 21 catch basins, 8,032' of storm piping of various sizes, 175' of culverts, and a ditch measuring 588' in length.[28]

[24] Per BPA's MPD guidelines, "Originally built in limited numbers, any reaming Untanking Tower that retains essential integrity to its original design and meeting all seven considerations of integrity should, by definition, be considered eligible for listing under Criterion C."
[25] Kramer, 51.
[26] The Salem Substation has a total of three concrete retaining walls in the Switchyard. Each retaining wall is a slightly different size; the lower retaining wall is 5' x 358' with two sets of concrete stairs; the middle retaining wall is 6' x 470', also with two sets of concrete stairs; the upper retaining wall is 6' x 454' with one set of concrete stairs.
[27] A grounding grid is a system of interconnected bare conductors that are arranged in a pattern or grid. Normally buried below the surface, they primarily act as a safety mechanism for workers by limiting voltage differences within a substation's perimeter to safe levels.
[28] BPA, *Facility Database Facility Assessment*.

There are five BPA owned transmission lines routed through the Salem Substation, though none are included in this nomination based on the requirements of the MPD (Table 2).[29]

Line Name	Voltage	Energized
Chemawa-Salem No. 1	230kV	1981
Chemawa-Salem No. 2[30]	115kV	1981
Salem-Albany No. 1	115kV	1940
Salem-Albany No. 2	115kV	1948
Salem-Grand Ronde No. 1[31]	115kV	1957

Table 2. BPA-owned lines routed through the Salem Substation.

Alterations

The Switchyard is a feature that expands with new equipment as needed, and contracts as equipment is removed. Significant alterations to Switchyard equipment since its original installation include: the installation of fences, a gate, and concrete walkways underneath buswork, as well as improvements to culverts and drainage facilities and switchyard regrating (1962) a small extension within the substation's southeast boundary, removal of the original "box-like" latticework, six power transformers, three capacitor houses, and one dead-end tower (date unknown); two new power transformers in the lower yard (c.1981); and the replacement of the original oil circuit breakers with gas circuit breakers between 2003 and 2011.[32] Despite these alterations and upgrades, the general arrangement of the Switchyard equipment, lighting, and concrete terraces have remained consistent.

Integrity[33]

The Switchyard remains in its original location, as designed and initially developed by BPA during the Salem Substation Historic District's period of significance (1940-1942). The overall character retains its complex arrangement of individual elements that function collectively as part of the system and has continued to function within BPA's Transmission System since it was energized in 1940. Overall, the Switchyard retains integrity of location, setting, design, materials, workmanship, feeling, and association, by continuing its essential original function within the BPA Transmission System. Modifications, upgrades, and replacements that have been made to maintain service and/or upgrade efficiency have been in-kind and compatible, and thus has not adversely impacted the Switchyard's integrity.[34] As such, the Switchyard retains sufficient integrity to be a contributing feature to the Salem Substation Historic District due to its association with BPA's Master Grid development, and the development of the original elements of the substation itself. It does not convey sufficient historic significance to be individually eligible.

[29] The Salem Substation also supports two other transmission lines that are owned by Pacificorp (115kV) and the Salem Electric Co-op (115kV).
[30] A Salem Substation Plot Plan from 1993 indicates that the original name of the Chemawa-Salem No. 2 line was formerly known as Oregon City No.1. However, there are no records of this line renaming in the Transmission Line Naming Subcommittee files.
[31] This transmission line has been renamed twice. It was originally named Salem-Tillamook No. 1 transmission line when it was energized in 1957. On June 18, 1981, it was renamed to Salem-Boyer No.1. It was then again renamed to its current, Salem-Grand Ronde No.1, on August 15, 2000.
[32] BPA Aerials.
[33] Per BPA's MPD guidelines.
[34] Generally in-kind, compatible, replacements of minor built elements such as insulators, cross-arm repairs, ground wires, guy wires, and similar features is considered part of functionality and appropriate maintenance and does not generally adversely affect integrity (Kramer, 51).

Transfer Track (1942; Contributing)
Originally installed in 1942 as part of initial site development, transfer tracks at BPA substations were used to transport power transformers and circuit breakers from their position in the switchyard to an untanking tower.[35] The Salem Substation Transfer Track in a 4' 8 ½" standard gauge rail and runs on an east-west axis from the Switchyard into the untanking tower. The track ends at the roll-up metal garage door on the west elevation of the untanking tower and is still visible. Though the portion of the track that runs through the Switchyard has mostly been covered by gravel, it remains partially visible at the ground surface in some locations (Photo 37). The Transfer Track enriches the visual complexity of the Substation by contributing to the setting and the complex arrangement of individual elements that functioned collectively during the period of significance. No transfer cart remains at the Substation that historically would have been associated with this resource.[36]

Integrity
The Transfer Track is a contributing resource to the Salem Substation Historic District for its association with BPA's Master Grid development. The structure retains integrity of location and setting through its visual connection of the Control House to the Switchyard. The design, materials, and workmanship remain intact despite the track being partially covered and no longer in use. The track was never replaced and is reflective of operations at Master-Grid era BPA Substations. The Transfer Tack also evokes a feeling and association of how maintenance was conducted at substations during the Salem Substation Historic District's period of significance (1940-1942); with the transfer track to help BPA facilitate transformer maintenance on site, and to keep power moving across the Pacific Northwest.

Maintenance Building (1956; non-contributing)
Constructed in 1956, the Salem Substation Maintenance Building served as the regional Maintenance Headquarters for several decades. It is approximately 80' x 40' (3,200 ft^2) and sits on a slab-on-grade concrete foundation (Photo 45). It is built out of vertical wood framing members and wood trusses. The building's architectural features are consistent with BPA's Standard Maintenance Headquarters Building Type-902 LS model. These types of buildings are found at many BPA substations as part of general operations during BPA's early System Expansion (1946-1974). The utilitarian building is finished with corrugated galvanized-iron sheet metal. The gabled roof is finished with corrugated aluminum roofing and features aluminum gutters with downspouts and two aluminum ventilators at the roof's ridge.

The primary elevation faces south towards the Control House. The elevation features three garage bays with overhead steel doors, with multiple oval-shaped lights to the west, and a single-door opening flanked by a pair of rectangular multi-light steel windows with center awning sashes. The garage doors are separated by square wood columns with metal wheel guards and flood lights. The single-door opening consists of a flush-paneled metal door that is located atop a concrete stoop under a suspended awning. The east elevation includes two matching windows to the south, and an elevated garage bay with a wood-paneled door, flanked by a small fixed rectangular window. The west and north elevations lack fenestration.

The interior of the Maintenance Building includes a finished concrete floor, plywood walls, and exposed vertical wood framing members and roofing structure in the shop. The office is clad in vinyl composite tile (VCT) flooring with rubber baseboards, plywood walls, and plywood ceilings with circular lighting fixtures in the office.[37]

[35] "For major repairs to transformers and circuit breakers, it was necessary to remove them from their positions in the yard, to an untanking tower, where the heavy steel jackets or 'tanks' could be removed [from the transfer carts via the untanking tower crane]" (BPA).
[36] AECOM, 17.
[37] BPA, *Facility Database Facility Assessment*.

Alterations
Moderate alterations have occurred since the building's original construction. A single-bay addition with a concrete wash slab and roof ventilator was added to the west elevation in 1965 (BPA). Other alterations include new steel overhead doors (date unknown), a new metal door to the office (date unknown), and the removal of the wash slab and loading dock on the east elevation c.2003.[38] Constructed outside the period of significance, the Maintenance Building is a non-contributing resource to the Salem Substation Historic District.

Storage Shed (c.1986; non-contributing)
The Storage Shed is a one-story wood framed structure measuring 6'x12' (Photo 46). It is located on the lower level of the Switchyard near the southernmost fence line. It is utilitarian in design with wood siding and sits on a concrete slab foundation. Though no records directly indicate when it was constructed, aerial images suggest that it was most likely built in 1986. As such the Storage Shed is a non-contributing building to the Salem Substation Historic District as it was constructed outside of the period of significance.[39]

Engine Generator Building (2014; non-contributing)
The Engine Generation Building is a one-story metal structure that sits atop a concrete slab (Photo 40). It was constructed in 2014 and is located on the lower level of the Switchyard near the southernmost fence line. Constructed outside of the period of significance, the Engine Generator Building is a non-contributing building to the Salem Substation Historic District.

Alterations to the Salem Substation
Since its inception, BPA's operations and development have been impacted by changing regional and national priorities and have expanded to take advantage of new electric distribution and management technologies. By its inherent nature and function, the BPA transmission system is dynamic; constantly being upgraded, expanded and changed in response to energy, economic, and other needs.[40] As such, there have been a number of alterations to the Salem Substation since construction began in 1939; from the renaming of transmission lines and changes in switchyard technology and equipment, to the replacement of the original untanking tower door (west elevation), and the removal of miscellaneous sheds, temporary Field Office, Engine Generator Building, Oil House, and the temporary Communications-Maintenance Building (Table 3).[41]

Name	Construction Date	Removal Date
Field Office	1939	c.1942
Oil House	1942	c.2020
Temporary Communications-Maintenance Building	1954	1998
Engine Generator Building	1962	2014 (replaced)

Table 3. Resources Removed at Salem Substation

The Field Office (1939; Figure 17) was the first structure to be constructed at the Salem Substation and was located just west of today's Switchyard. The office was a temporary structure and was only used

[38] BPA Aerial.
[39] BPA's facility database indicates the shed was constructed in 1962. However, in a comparison of BPA aerial photographs taken between 1956 and 1986, the shed does not appear visible in any photographs until 1986. Though it is possible that this building could have been relocated, there are no buildings similar to the dimensions of this shed visible in historic photographs.
[40] Kramer, 1.
[41] Prior to construction of the substation, several outbuilds including a barn, "pig house," and fencing were also removed from the property (Figure 13).

during Salem Substation's initial development. It was a small, raised rectangular wood building with one door and four windows. The plywood exterior was covered in flashing, with a buttoned-down canvas roof. Though it is unknown when the structure was removed, it was likely torn down after construction of the Control House was completed.

The Oil House (1942; Figure 34) was one of the first buildings to be constricted as part of the Salem Substation's original layout and function and was located to the north of the Control House.[42] With the change of technology, the function of the oil house would eventually become obsolete. In the early 2000s, the four oil receptacles were removed from the top of the building. In September 2014, BPA marked the structure as a "candidate for removal" due to environmental concerns. It was last assessed by BPA in February 2016.[43] Though the exact date of demolition is unknown, it was likely demolished between 2019 and 2020.[44]

The Temporary Communications Maintenance Building (1954; Figure 38) was a wood framed structure with an attached garage that sat on a slab-on-grade concrete foundation. It was located to the east of the Control House. It was divided into four rooms (from east to west): the mobile radio repair shop and garage, communications storage and workshop, a communications office, and a control office. It was demolished in 1998.

The original Engine Generator Building (1962; Figure 39) was removed in 2014 and replaced with the current engine generator that sits to the west of the storage shed on the south fence line of the property.

Conclusion

The three contributing resources that make up the Salem Substation Historic District retain a high level of integrity of location, setting, design, materials, workmanship, feeling, and association to the district's period of significance: 1940-1942. Since BPA began construction in 1939, the Salem Substation has continued operation on the same parcel of land that looks prominently out over the Dallas Highway to the Willamette River (Photo 3). Located just outside the City of Salem limits, the substation maintains a semi-rural feel that evokes its historically significant role in bringing affordable power to largely rural communities in the Willamette Valley and across the Pacific Northwest. The overall character of the Salem Substation not only provides an excellent example of BPA's use of the Streamline Moderne style in early BPA buildings but reflects the technology and industrial development associated with BPA's Master Grid period. Despite changes in technology since its energization in 1940, Salem Substation has continued to function as a provider of affordable electricity in the Willamette Valley within the BPA Transmission System.

[42] Oil Houses were used to house pumps that would empty oil-filled equipment, primarily circuit breakers, and then replace them after it had been filter and dried. They can only be found in substations constructed during BPA's Master Grid era. The Salem Substation Oil House was made of concrete and stucco and was partially buried below grade.
[43] BPA, *Facility Database*.
[44] The Oil House can last be viewed from aerial photographs taken in 2018. It is no longer present in aerials from 2020. There are no aerials from 2019.

Salem Substation, Bonneville Power Administration | Polk Co., OR
Name of Property | County and State

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [X] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

- [ ] A Owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance
(Enter categories from instructions.)

ENGINEERING
INDUSTRY
ARCHITECTURE
POLITICS/GOVERNMENT

Period of Significance

1940-1942

Significant Dates

1940: Salem Substation energized
1942: Construction of Control House completed

Significant Person
(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation (if applicable)

N/A

Architect/Builder

H. Hoffman, Builder
Bonneville Power Administration, Engineer

Period of Significance (justification)

The Salem Substation's period of significance under Criterion A is 1940-1942. This period begins with the construction of the substation's oldest extant resource and ends with the last resource to be constructed during BPA's Master Grid Development (1938-1945), as outlined in the Multiple Property Document (MPD) under which the Salem Substation is being nominated. This period focuses on the initial operation and development of the Salem Substation in its role of bringing power to the Willamette Valley's largely rural communities, as well as supporting industrial capacities during World War II. While the Salem Substation continued to operate during BPA's System Expansion Period (1946-1974), the Salem Substation does not reflect the historic significance of this period. Per the *BPA Pacific Northwest Transmission System* MPD, system expansion is marked by a period of expanding transmission lines and building new infrastructure in new areas. Despite investment in new buildings, primarily for maintenance activities, there were relatively few upgrades to the substation itself, and it remained largely unchanged in its day-to-day operations. Though the Salem Substation continues to provide power to the Willamette Valley, it is best associated with the historic themes and contexts of the Master Grid expansion era. The Control House's period of significance under Criterion C is 1942, the year construction was completed.

Criteria Considerations (explanation, if necessary): N/A

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations).

The Salem Substation Historic District is eligible for listing in the National Register of Historic Places under the *BPA Pacific Northwest Transmission System* MPD. The Salem Substation meets the requirements for listing and is locally significant under Criterion A in the areas of Engineering, Industry, and Politics/Government, as the establishment of the Salem Substation impacted businesses, rural communities, and industrial, wartime development throughout the Willamette Valley. It includes built resources unique to BPA's Master Grid-era including the joint Control House-Untanking Tower, Switchyard, and Transfer Track. The period of significance spans from 1940 to 1942, which captures the dates of construction of the Salem Substation as a key component of BPA's Master Grid. The Salem Substation Control House is also individually eligible under Criterion C in the area of Architecture, as an exemplary of the Streamline Moderne architectural style with its smooth surfaces, small geometric embellishments, rounded edges, horizontal features, multi-light steel window sash, glass block windows, stucco, concrete, chrome, metal paneling, and aluminum. It is one of the few remaining examples of this architectural style that was used by BPA during its Master Grid Development period (1938-1945). Its period of significance is 1942 – when construction on the building was complete.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

BONNEVILLE POWER ADMINISTRATION

The Bonneville Power Administration (BPA) is a nonprofit federal power administration under the U.S. Department of Energy; marketing wholesale hydroelectric energy throughout the Pacific Northwest, and transmitting power generated by Federal, and partner hydroelectric facilities within the Columbia River Basin. BPA's Transmission System includes thousands of individual built elements and provides a majority of the region's electric power; operating primarily in Idaho, Oregon, western Montana, and Washington, as well as sections of California, Nevada, Utah and Wyoming, and interconnects with systems in British Columbia, Canada.

In 1937, BPA was established by Congress to market power from Bonneville Dam: the Columbia River's first federal dam and a key component of President Frankline Roosevelt's "New Deal." Congress appropriated $3.5 million in May of 1938 for BPA to begin Master Grid network construction. Between 1938 and 1945, BPA built 3,000 circuit miles of transmission lines and interconnected with existing public, private, and municipal

distribution systems. The system supplied inexpensive Columbia River power to rural communities and attracted major industries to the region.[45]

While still in the process of its initial development, BPA played an important role in the nation's defense preparedness before and during World War II, supplying electricity that brought massive industrial development to the region. As wartime industries were disbanded or converted to peacetime uses following the war, BPA continued to play a significant role in the development of the aluminum industry, agriculture, and the expansion and modernization of the Pacific Northwest's natural resource-based timber industry. Building upon the original development of BPA's Master Grid, the BPA transmission system was the focus of near continual expansion to meet the demands of a growing regional population and to transmit increased output from new power generation projects within the Columbia River system.[46]

The Master Grid Period (1938-1945)
This period encompasses the establishment of BPA as a Federal agency; authorized to market and transmit electricity generated at Bonneville and Grand Coulee Dams. BPA infrastructure relating to this period include the "Master Grid" transmission network that BPA built to transmit power between the generation facilities and the major load centers of the Pacific Northwest, including: Seattle, Spokane and Portland via a 230-kV "loop" with radiating 115-kV lines that served smaller loads as far south as Eugene, Oregon. The high- voltage lines of the Master Grid, along with the numerous substations and related structures that allowed the system to function effectively, played a significant role both directly and as the backbone of the Northwest Power Pool, supporting U.S. military preparedness and industrial capacity during World War II. Construction of the final elements of the Master Grid, as designed and begun in 1938, were not completed until 1945, marking the end of the Master Grid period.

BPA Substations[47]
Per the *BPA Pacific Northwest Transmission System* MPD, one of the principal property types that convey the historic significance of the BPA transmission system is substations:

> "Substations are built resource centers within the BPA Transmission system that typically serve as the start and endpoint of named transmission lines. [They] are located throughout the BPA Transmission System and are integrated with the transmission line network. Substations, as a collective term, include a wide variety of facilities that range from a simple switchyard with a small, manufactured control house, to large, multiple structure installations that serve multiple lines in association with maintenance and administration uses spread over dozens, if not hundreds, of acres. Substations are typically arrayed around a switchyard, a steel superstructure and buss-construct framing a series of large metal box-like transformers at ground level. Functionally, the primary purpose of most substations is to modulate line voltage, stepping it up or down, depending upon the need, and, in some cases, feeding distribution lines that connect to consumers (in BPA's case, other utilities or large industrial users)."[48]

[45] Curran, *A Historic Context for the Transmission of Hydroelectricity by the Bonneville Power Administration, 1939-1945*, 58.
[46] For a complete history of BPA, please consult *A Historic Context for the Transmission of Hydroelectricity by the Bonneville Power Administration, 1939*-1945, written by Christine Ann Curran (1998); Bonneville *Power Administration[BPA] Pacific Northwest Transmission System Multiple Property Documentation Form*, written by George Kramer (2012); or *Corridors of Power: The Bonneville Power Administration Transmission Network Historic Context Statement,* written by George Kramer (2010).
[47] For a complete description of the role that Salem and other BPA substations play in the operation of the BPA grid, please consult *Bonneville Power Administration[BPA] Pacific Northwest Transmission System Multiple Property Documentation Form*, written by George Kramer (2012).
[48] Kramer, 49.

BPA prepared basic substation designs by developing several standard units so "the design of a specific substation merely require[ed] the combining of the units involved into one coordinated whole."[49] The first "unit" (the control house) included "an office for public contact and separate rooms for station service and communication equipment, batteries and controls."[50] BPA selected construction materials based on durability, safety, and expense and incorporated landscaping as an integral part of substation design to "achieve natural, dignified, and pleasing structures."[51]

Many substations have expanded operations beyond their primary transmission function, providing a variety of control and support services that enable the management of BPAs multi-state system in an efficient manner. As a result of their multiple functions, multiple eras of construction, and varied modification to reflect changes over time, substations within the BPA Transmission System include a wide variety of individual or related built resources at any given site. Portions of some substations, many in continuous usage since the original construction of the Master Grid, have been expanded, modified, altered, or even partially abandoned or demolished, with activity occurring both within and beyond the period of significance. "At first glance, a substation is a bewildering array of hulking steel machines whose function is far from obvious, [but] if you look closer you will find there is a logic to this mélange of equipment."[52]

Salem Substation

The Salem Substation is part of BPA's Master Grid development, and was constructed approximately three miles west of Salem, in Polk County, Oregon. The ten-acre tract of land was acquired by BPA via condemnation, or eminent domain, from property owners Robert and Jennie Hogg,[53] who had used the land as part of their ranching operation.[54] Construction on the substation began in early December 1939 and included a temporary field office and switchyard (Figure 14). These structures would be used until the permanent substation structures were completed. Local newspapers proclaimed, "Dam Power Due At Salem Soon"[55] and "Dam Power In February."[56] BPA had initially scheduled power transmission to begin at the Salem Substation via the Portland-Eugene line, for early February 1940; however, energization of the substation was ultimately delayed.[57]

On March 16 and 17, 1940, structural engineers from BPA's Portland office, Ben Crema and Walter Kanzler, conducted final inspections and tests at the temporary Salem Substation and determined that it was ready for operation.[58] Excavation and grading for the permanent substation were the first major undertakings at the site.

[49] The multiple "units" refers to the elements that make up a substation including: a control house, a switchyard, and any other resource needed for a substation to function (BPA Second Annual Report of the Bonneville Power Administration).
[50] BPA, "Second Annual Report of the Administrator of the Bonneville Power Administration. U.S. Department of the Interior."
[51] Ibid.
[52] Hayes, 248.
[53] In March 1940, Robert and Jennie Hogg filed a petitioned for compensation for the condemnation of their ranch land. They were offered a one-time payment of $5,000 for the acreage, which they accepted. Robert and Jennie Hogg would go on to have several other parcels of their land seized via condemnation, or in right-of way easement agreements in 1948
[54] Robert William Hogg (1869-1952) was the owner and operator of R.W. Hogg & Sons Ranch ("Pigs to Power," *Statesman Journal*, December 28, 1940). Born in Pennsylvania, Hogg moved to Nebraska before eventually settling in Salem, OR with his wife Jennie, and their two sons, around 1910. Hogg was a prominent figure in Oregon's agricultural community, serving as Vice President of the Oregon Swine Breeders Association and as part of the Oregon Fruit Growers Association (Willamette Heritage, 2018). "The Hogg family business, R.W. Hogg and Sons bred and raised Poland China hogs, Angora goats, and Hampshire sheep, winning numerous awards for their high-quality livestock" (Willamette Heritage). Though it is unknown the types of fruit Hogg cultivated, it was noted that a Mrs. Edith Hyde was released from the Salem General Hospital after falling from a cherry tree on the Hogg ranch (Statesman Journal, June 24, 1956). The ranch continued operation on the remaining ranch land following the sale of ten-acres to BPA for the Salem Substation.
[55] The Oregon Daily Journal, "Dam Power At Salem Soon."
[56] The Capital Journal, "Dam Power In February."
[57] Whether the delay was due to wartime shortages, a problem with a PGE contract (The Oregon Daily Journal, 1939), or another such hold up is unknown.
[58] The Capital Journal, "Official Approval Given Sub-Station."

BPA hired Leonard and Slade Construction to complete the excavation work within 30 days.[59] In order to safely support the transformer equipment and given the site topography, the site was extensively altered before construction on the Switchyard and Control House began. According to site plans, over 44,00 cubic yards of material was cut from the site. In some locations the grade was brought from an elevation of 200' to 180' to create the stepped terraces in the Switchyard (Figure 8). At that time, a landscaping survey was already underway, with about 20 electricians, carpenters, and laborers worked on the grounds under the direction of E.P. Bergman of Salem and H.C. Deutsch, the assistant engineer in charge."[60] Excavation and grading crews began their work "with two giant bulldozers cutting into the hill on the north side of the 10-acre site."[61]

In May of that same year, BPA and Portland General Electric (PGE) engineers conducted final tests of the BPA and PGE transmission lines at the Salem Substation and soon began transmitting electricity into PGE's Salem transmission facilities, located near downtown Salem. On May 18, 1940, the *Oregon Statesman* announced that, "Regular use of the connection between [BPA and PGE] lines was inaugurated yesterday afternoon, when the last switch connecting the two systems was closed by Mayor W.W. Chadwick of Salem at the power plant of the Portland General Electric Company at Mill and Liberty streets." At that time, BPA had already ordered larger transformers for the permanent Salem Substation so as to double the capacity from 7,500 to 15,000 kilowatts, with plans to eventually increase capacity to 30,000 kilowatts.[62] From the time of its energization in 1940, Salem Substation served as the terminus for BPA's wholesale customers in Marion, Yamhill, Linn, Polk and Benton counties and enhanced service to the area's PGE customers.

During summer 1940, BPA leased a lot at Southern Pacific Siding on Second Street near McNary in Salem, where "tons of machinery and equipment [were] being unloaded from box and flat cars for transfer to the new Bonneville sub-station on the [former] Hogg ranch two miles west of the city."[63] The equipment arrived by rail from the Allis-Chalmers Company in Milwaukee, Wisconsin, the General Electric Company in Philadelphia, and Westinghouse. By late August, six large breakers had already been transported from the leased lot to the substation, while "6 mammoth oil circuit breakers and 12 of smaller size," a large rotor and condenser, each weighing 35 tons, were awaiting delivery by truck. Each large circuit breaker held 800 gallons of oil, and each smaller breaker held 400 gallons.[64] Two "synchronous 20,000 K.V.A. condensers, weighing about 75 tons," had already arrived in late July.[65] The *Daily Capital Journal* noted that work on the station was "progressing rapidly with many workmen employed and transmission lines to McMinnville area and Monmouth well under way."[66] The facility was expected to have eight to ten people assisting in its operation on a 24-hour basis when it was finally completed.[67]

In early August 1940, BPA invited bids for construction of the Control House as part of the permanent Salem Substation. The new control house was to be "a reinforced concrete building to house service and control heavy electrical equipment… [and] to measure 99 by 107 feet, and 43 feet high. A traveling crane mounted

[59] Leonard and Slade Construction Company was a local excavation and sub-contracting company that was active in the late 1930s through the 1950s.
[60] Ibid.
[61] Daily Capital Journal, "Final Power Testing Scheduled This Week."
[62] Statesman Journal, "Final Testing For Power Set."
[63] Daily Capital Journal, "Final Power Testing Scheduled This Week."
[64] Daily Capital Journal, "Oil Breakers Arrive."
[65] Daily Capital Journal, "Big Condensers Arrive."
[66] Daily Capital Journal, "Oil Breakers Arrive."
[67] AECOM, "Bonneville Power Administration: Salem Substation Historic District. Intensive Level Survey," 5.

near the roof will be used for servicing heavy transformer equipment.[68] Construction on the control house was mandated to be completed within 150 days of the contract award.[69]

> *"The substation building will house switchboards, batteries for emergency lighting and switch operation, and a large condenser unit for stabilizing voltage. The three-story section of the building will be used as an 'untanking' tower, equipped with a traveling ceiling crane, for the overhauling of transformers and circuit breakers. Combining of the control, untanking and condenser units is a departure from usual practice, being tried by the Bonneville staff here for the first time."*[70]

On August 22, 1940, H. Hoffman of Portland submitted a low bid of $59,975 to construct the Salem Substation Control House.[71] In December 1940, the *Oregon Statesman* published a drawing of the three-story "modernistic concrete building," designed by the in-house BPA Architectural Until. "BPA buildings were designed by BPA architects and built by BPA workers, giving the agency near total control of the project, from conception to completion of construction. In January 1941 the Architectural Unit was established as [a] separate unit within the Engineering Division and placed under the control of Emil Jahn, a licensed electrical engineer, with Louis E. Dielschneider as Head Clerk. By summer the unit had grown, and R(ichard). F. Stevens was made the Assistant Chief with Dean R. E. Wright as "Chief, Architectural Unit."[72] Though the Control House was designed prior to the official formation of the Architectural Unit, it was still completed by BPA under the BPA Engineering Division.

Construction of the Control House, Oil House, and Switchyard continued through 1941, and opened to little fanfare in 1942. Following the completion of the Control and Oil Houses, further additions to the Substation were approved by BPA Administer Paul J. Raver, as part of BPA's 1943 construction program. These additions included site improvements to the facilities, as well as the addition of steel structures and other necessary equipment to the PGE: Salem-Eugene 115-kV line, the Oregon City-Salem 115-kV line, the Salem-McMinnville 57-kV line, and the Salem Electric Cooperative Salem-Monmouth 12.45-kV line.[73] In June 1945, Salem Electric Cooperative contracted with BPA for the Salem Substation to serve as a secondary delivery point.[74] This new line to the substation was scheduled to begin transmitting power to the Salem Alumina plant and to the North Salem and vicinity.[75] The same transmission load would also serve the Capitol Lumber Company and a new lumber waste by-products plant.[76]

Salem Substation of the 1950s was a bustling district of engineering and industrial activity; not only was the substation providing affordable electricity to thousands of households and businesses across the region, it also served as the maintenance headquarters for the district. In 1954, a temporary Communications-Maintenance Building was constructed east of the Control House. The following year, in November 1955, BPA announced the construction of a permanent maintenance building to be constructed to the northwest of the Control House.[77]

By the 1960s, the Salem Substation had grown to include the Switchyard (1940), Control House (1942), Oil House (1942), Temporary Communications-Maintenance Building (1954), the permanent Maintenance Building

[68] Statesman Journal, "Construction of Salem Substation for Bonneville Power to Start in August; Dimensions Are Disclosed."
[69] Daily Capital Journal, "Big Condensers Arrive."
[70] Oregon Statesman, "Bonneville Substation Million Dollar Project."
[71] Medford Mail Tribune, "Gets Salem Job."
[72] Kramer, 12.
[73] Oregonian, "Raver Okehs Terminal Job."
[74] A substation that receives power at high voltage has transformers that step the voltage down to a lower voltage for distribution to serve a local load and serves as a primary distribution point. The Salem Substation has both a primary and secondary distribution point that serves customers of the local Salem Electric Coop as well as Pacificorp.
[75] The Salem Alumnia Substation is owned by Salem Electric.
[76] News-Review, "Bonneville, Salem to Sign New Contract;" Statesman Journal 1945
[77] Mann Construction Company (Redmond, OR) was the low bidder at $23,264 according to the *Statesman Journal* 1955.

(1956), an Engine Generator Building (1962) and a host of unnamed storage facilities.[78] In August 1962, BPA celebrated 25 years of the Salem Substation with an open house. The open house offered an opportunity to "inspect" substation facilities, such as the Control House and Switchyard, via "guided tours of the $2,225,000 [substation]."[79] *The Statesman Journal*, boasted:

> "*Monthly residential power bills in 39 cities of Western Oregon have decreased about 45% for loads of 500kwh during Bonneville's 25 years. In addition, over 97% of Oregon's farms are now electrified compared to less than 40% 25 years ago… most sawmills, wood product manufacturing, plants, food processing industries and other manufacturing operations in these countries are using hydroelectric power.*"[80]

As the BPA network continued to grow, a better understanding of computer technology led to the Administration's goal of a computer center that could control the entire system from a single location: a facility that would later become known as the Dittmer Control Center and located at the Ross Substation in Vancouver, Washington.[81] Following the dedication of the Dittmer Control Center in 1974, BPA succeeded in the implementation of high-efficiency computerized control of its far-flung growing network and, with the passage of the Federal Columbia River Transmission System Act, achieved a new financing method that would change the agency's operation for the future.[82] With the computerization of the system, the Salem Substation no longer needed to be monitored 24 hours a day, seven days a week. What had once been a bustling district maintenance headquarters soon grew quiet as the number of personnel stationed at the Substation eventually dwindled to a single operator.

As part of BPA's plans for fiscal year 1980, the Salem Substation was upgraded from 115kV to 230kV.[83] The removal and reconstruction of the Chemawa-Salem No.1 (230kV) and the new Chemawa-Salem No.2 (115kV) transmission lines were also included in the proposal and were energized in 1981. Outside of upgrades to Switchyard equipment, and basic substation operations, the majority of the activity taking place over the next four decades was the removal of structures.[84]

Current Usage

Since its inception in 1938, BPA has continually adapted to evolving regional and national priorities by incorporating new electric distribution and management technologies through system upgrades and expansion.[85] Though some of the historic features of Salem Substation are no longer in use today, the Salem Substation has operated continuously since its energization in 1940. It remains in use today as an important transmission terminus for supplying power in the Willamette Valley.

Architecture: Streamline Moderne

The Salem Substation Control House is an excellent example of the Streamline Moderne style common in the late 1920s through the 1940s.[86] Streamline Moderne is a simplified version of its style predecessor, the more opulent Art Deco style, and influenced architecture, transportation, and household items. "Art Deco first received widespread notice in 1922, when the Chicago Tribune held a world-wide competition for the design of its new headquarters building. Although Finnish architect Eliel Saarinen received second prize, his innovative Art Deco design drew significantly more acclaim than the winning design."[87] Streamline Moderne is considered

[78] Historic aerials and substation plot plans indicate the presence of many different sheds that were scattered throughout the Substation since 1940.

[79] Statesman Journal, "BPA Sets Open House To Observe 25th Year."

[80] Ibid.

[81] The Dittmer Control Center was named after BPA's Power Manager William Dittmer, who served from 1946-1953.

[82] Kramer, 37.

[83] BPA Memorandum, 2000.

[84] Noted in Section 7.

[85] Kramer, 1.

[86] Also referred to as Moderne or Art Moderne.

[87] Trieschmann, "Streamline Moderne Houses in Arlington County, Virginia: 1936-1945," 4.

the last phase of Art Deco: foregoing the more luxurious intricacies of the early architectural movement in favor of a more fluid and aerodynamic utilitarian design. This style became synonymous with modernization and the concept of movement; *streamlining* as "functionality, speed, efficiency, simplicity, and cleanliness."[88] "It is considered a direct economic and stylistic response to the Great Depression (1929-1941), when building materials were scarce and owners were reluctant to spend money on mere applied ornamentation, which was the hallmark of Art Deco."[89] This style is largely associated with commercial and industrial buildings, as well as modes of transportation, including airplanes, automobiles, and ships.

"Streamline Moderne is a common style in BPA's early administrative offices, control houses, untanking towers, and other specialized designs. BPA's designs, at least partially due to wartime materials shortages, includes structures of varied materials included stucco over concrete, stucco over wood frame, and brick, but all in one way or another generally fit within the *Moderne* idiom no matter the material or detailing."[90] Features characteristic of this machine-age aesthetic include smooth surfaces and small geometric embellishments (Photo 11), rounded edges (Photo 23), horizontal features (Photo 3), multi-light steel window sash (Photo 32), and glass block windows (Photo 16); all of which can be found throughout the Salem Substation Control House. Stucco, concrete, chrome, metal paneling, and aluminum are characteristic of Streamline Moderne style materials, and are also reflected in the Control House's construction.

Significance
The Salem Substation Historic District embodies the distinctive characteristics of substations built during the Master Grid-era development of BPA's Transmission System; and represents a significant and distinguishable entity as a district.[91] The Salem Substation Historic District is significant under Criterion A in the areas of Engineering, Industry, and Politics/Government.[92] The establishment of the Substation impacted business and industrial development throughout the region, contributing to the development of the surrounding communities upon the arrival of electricity, as well as contributing to the design and function within the early development of BPA's network. The Control House is significant under Criterion C in the area of Architecture.[93] The Control House is one of the last remaining examples of the Streamline Moderne architectural style that influenced BPAs early architectural designs for its control houses built during the Master Grid period of significance (1938-1945).

Following 1942, the Salem Substation continued to operate and evolve with the change in technology. Structures were built and torn down over the decades, but the three principal features of the Salem Substation Historic District (the Control House, Switchyard, and Transfer Track) continue to contribute to our present day understanding of the impact that the BPA network had on government, engineering, industrial, and community development during its period of significance (1940-1942). With its continuous operation in supplying power to the Willamette Valley region, the Salem Substation Historic District is intrinsically tied to the development and operation of the BPA network and continues to serve as a visible example of the region's history, as well as an integral part of day-to-day operation.

Multiple Property Document Registration Requirements
The BPA's Salem Substation meets the registration requirements of the *BPA Pacific Northwest Transmission System* MPD including:

- Designed by or purchased at the direction of the BPA;
- Owned and operated all or in part by the BPA during some portion of the period of significance;
- Energization prior to 1975; and
- Continued and demonstrated original function.

[88] Bush, "Streamlining and American Industrial Design," 316.
[89] Trieschmann, 6.
[90] Kramer, 11.
[91] AECOM, 2.
[92] NPS, "How to Apply the National Register Criteria for Evaluation," 12.
[93] NPS, 17-20.

Designed at the direction of BPA in 1940, the Salem Substation would be energized later that year; with the construction of permanent facilities supporting operation in 1942. The Substation continued operating throughout the Historic District's period of significance (1940-1942) into today, where it continues to operate in its original function relative to the transmission of electricity. The Salem Substation has not been altered to meet a function other than use as a transmission facility. Its elements retain sufficient historical integrity to convey its significance under Criterion A in association with Engineering, Industry, and Politics/Government.

Despite the replacement of the original untanking tower door on the west elevation, the Control House retains sufficient historical integrity to convey its significance under Criterion C, for its distinctive Streamline Moderne style of construction. Per the registration requirements of the MPD for a Control House and Untanking Tower, the Salem Substation Control House meets the following standards, including:

Control House

- Structures that are especially exemplary of BPA standardized design, retaining high integrity in use of materials…true for period-typical elements associated [with] the initial Master Grid development period: Streamlined Moderne details such as glass block windows, multi-light industrial windows, portal windows, stucco exterior surface with rounded corners, period signage, etc.
- Additions and modifications either during or after the periods of significance do not inherently eliminate Criterion C significance provided; they are accomplished in a *highly* compatible fashion. Additions to rear and side (secondary) elevations that retain the primacy of the main entry character meet this standard.
- Uniquely designed properties, either through experimental design or, through attrition, that represent rare examples of once typical elements of the BPA Transmission Network

Untanking Tower

- Untanking towers are, by definition, visually prominent and increasingly rare elements of BPA substations through attrition and technological obsolescence. Uniformly designed within BPA's early "Master Grid" style, these resources are directly related to the historic (now outdated) technology associated with oil-filled transformer maintenance of the late-1930s/1940s period. Originally built in limited numbers, any remaining Untanking Tower that retains essential integrity to its original design and meets the above requirements should, by definition, be considered eligible for listing under Criterion C.

As such, the Salem Substation meets the minimum eligibility requirements of the MPD for listing in the National Register of Historic Places under Criterion A, and the Control House meets the requirements for listing under Criterion C.

9. Major Bibliographical References

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Salem Substation, Bonneville Power Administration | Polk Co., OR
Name of Property | County and State

Previous documentation on file (NPS):

____preliminary determination of individual listing (36 CFR 67 has been requested)
____previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____recorded by Historic American Buildings Survey #_____
____recorded by Historic American Engineering Record # _____
____recorded by Historic American Landscape Survey # _____

Primary location of additional data:

____State Historic Preservation Office
____Other State agency
__X__Federal agency
____Local government
____University
____Other
Name of repository: _____

Historic Resources Survey Number (if assigned): N/A

Salem Substation, Bonneville Power Administration | Polk Co., OR
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10. Geographical Data

Acreage of Property 8.53
(Do not include previously listed resource acreage; enter "Less than one" if the acreage is .99 or less)

Latitude/Longitude Coordinates
Datum if other than WGS84:
(enter coordinates to 6 decimal places)

1	44.932229°	-123.08449°		3	44.930433°	-123.087481°	
	Latitude	Longitude			Latitude	Longitude	
2	44.931351°	-123.090514°		4	44.931965°	-123.090524°	
	Latitude	Longitude			Latitude	Longitude	

Verbal Boundary Description (Describe the boundaries of the property.)
The Salem Substation is bounded by the Dallas Highway (OR 22) to the south, forested areas to the east and west, and an open field on a steep hill to the north. The boundary includes all property owned by BPA and included within the substation fence.

Boundary Justification (Explain why the boundaries were selected.)
The Salem Substation Historic District boundary encompasses the 8.53 acres that were purchased during the period of significance (1940-1942) and includes all six contributing and non-contributing resources. Per the *BPA Pacific Northwest Transmission System* MPD, the boundary of a substation should include "the entire property boundary." In the case of the Salem Substation, all federally owned property within the substation fence is included.

11. Form Prepared By

name/title Olivia Schiffman / Contract Historian date December 3, 2024
organization Bonneville Power Administration telephone (503) 230-5139
street & number 905 NE 11th Ave email osschiffman@bpa.gov
city or town Portland state OR zip code 97232

Additional Documentation

Submit the following items with the completed form:

- **Regional Location Map**
- **Local Location Map**
- **Tax Lot Map**
- **Site Plan**
- **Floor Plans (As Applicable)**
- **Photo Location Map** (Include for historic districts and properties having large acreage or numerous resources. Key all photographs to this map and insert immediately after the photo log and before the list of figures).

Salem Substation, Bonneville Power Administration | Polk Co., OR
Name of Property | County and State

Photographs:

Submit clear and descriptive photographs. The size of each image must be 3000x2000 pixels, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered, and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property: Salem Substation

City or Vicinity: Salem

County: Polk County **State:** OR

Photographer: AECOM, BPA Facility Database, BPA Historian Tracy Schwartz, BPA Contract Historian Olivia Schiffman

Date Photographed: 2016*, December 2017*, February and October 2024

Description of Photograph(s) and number, include description of view indicating direction of camera:

* 2016 and 2017 photographs accurately depict the property as of late 2024.

Photograph 1 of 46: **OR_PolkCounty_SalemSubstation_0001**
Entrance to Salem Substation, looking northeast (2024)

Photograph 2 of 46: **OR_PolkCounty_SalemSubstation_0002**
Switchyard, looking northeast from parking lot (2024)

Photograph 3 of 46: **OR_PolkCounty_SalemSubstation_0003**
South elevation of Control House, looking northeast (2024)

Photograph 4 of 46: **OR_PolkCounty_SalemSubstation_0004**
West elevation of Control House, looking northeast (2024)

Photograph 5 of 46: **OR_PolkCounty_SalemSubstation_0005**
West elevation of Control House, looking east (2024)

Photograph 6 of 46: **OR_PolkCounty_SalemSubstation_0006**
North elevation of Control House, looking southwest (2017)

Photograph 7 of 46: **OR_PolkCounty_SalemSubstation_0007**
East elevation of Control House, looking west (2017)

Photograph 8 of 46: **OR_PolkCounty_SalemSubstation_0008**
South elevation of Control House, looking northwest (2024)

Photograph 9 of 46: **OR_PolkCounty_SalemSubstation_0009**
View of Dallas Highway (OR 22) & Willamette River from the main entrance of Control House, looking south (2024)

Photograph 10 of 46: **OR_PolkCounty_SalemSubstation_0010**
Detail on east side of Control House entrance, looking north (2024)

Photograph 11 of 46: **OR_PolkCounty_SalemSubstation_0011**
Detail on west side of Control House entrance, looking northwest (2024)

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Heater in front entry, looking west (2024)

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Windowsill tile and heater in front entry, looking south (2017)

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Control room, looking south (2017)

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Untanking tower crane (2017)

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Untanking tower sliding door and Transfer Track, looking northeast (2024)

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Example of rounded corners typical throughout the Control House, looking northwest towards Maintenance Building (2024)

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View of sliding untanking tower door from transformer pit, looking northeast (2024)

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Salem Substation, looking southeast (2024)

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Maintenance Building, looking northwest (2024)

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Maintenance Building, looking north from parking lot (2024)

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Figure 3: Tax Lot Map

Figure 4: Site Plan

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Figure 1: Regional Vicinity Map
Source: USGS Salem West Quadrangle, 7.5 series

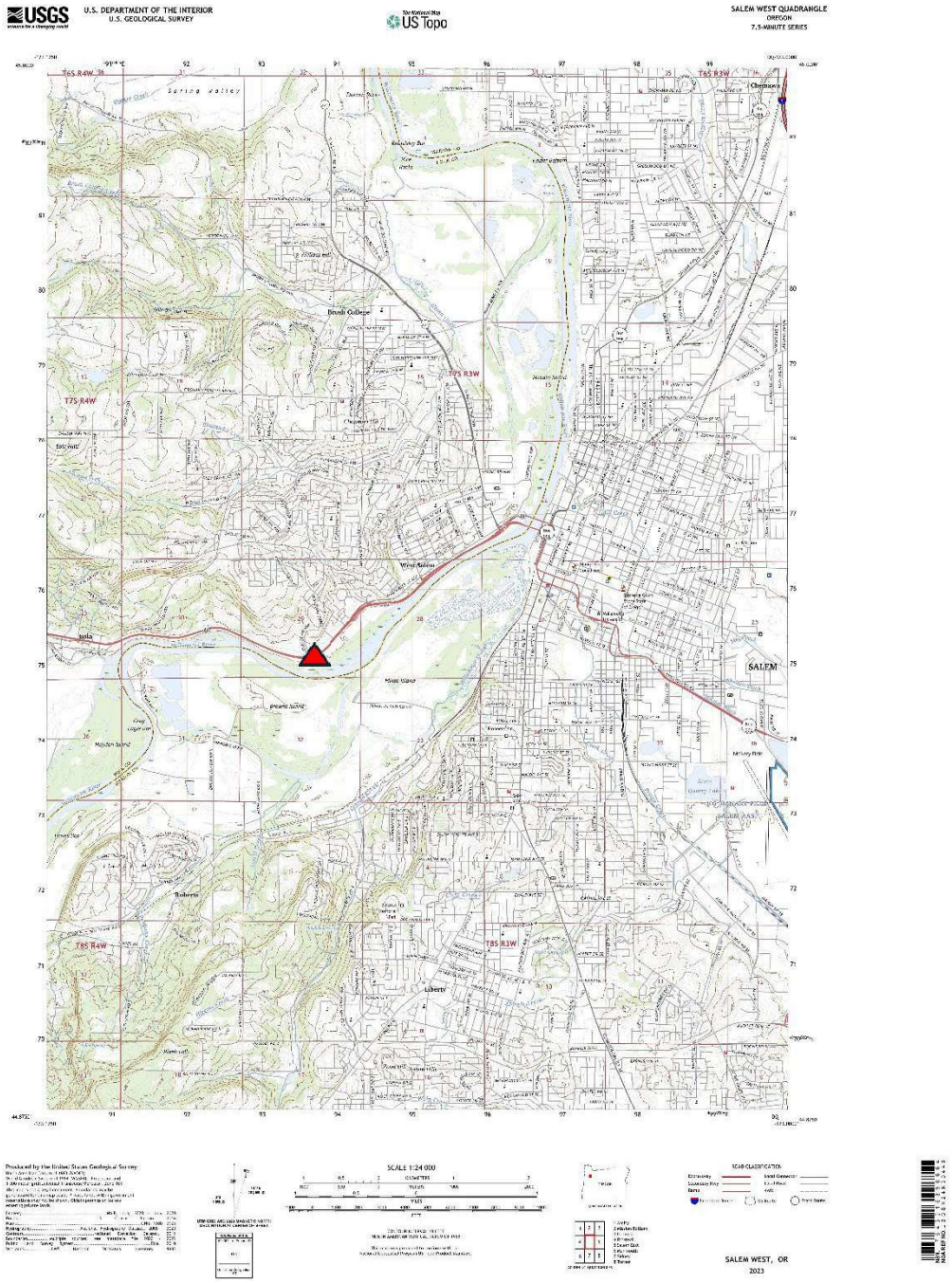

Figure 2: Local Location Map
Source: Bonneville Power Administration

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Figure 3: Tax Lot Map
Source: Oregon Map (ORMAP)

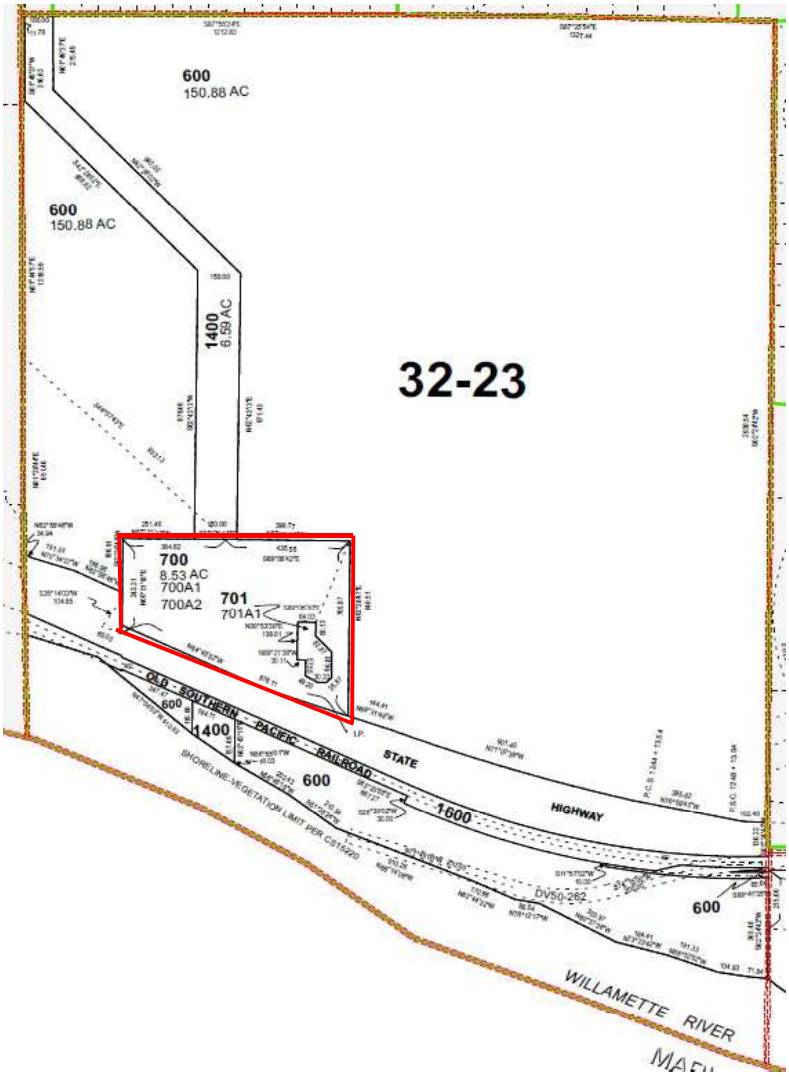

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Figure 4: Site Plan
Source: Bonneville Power Administration

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Source: Bonneville Power Administration

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Source: Bonneville Power Administration

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Figure 7: Control House Photo Location, Basement
Source: Bonneville Power Administration

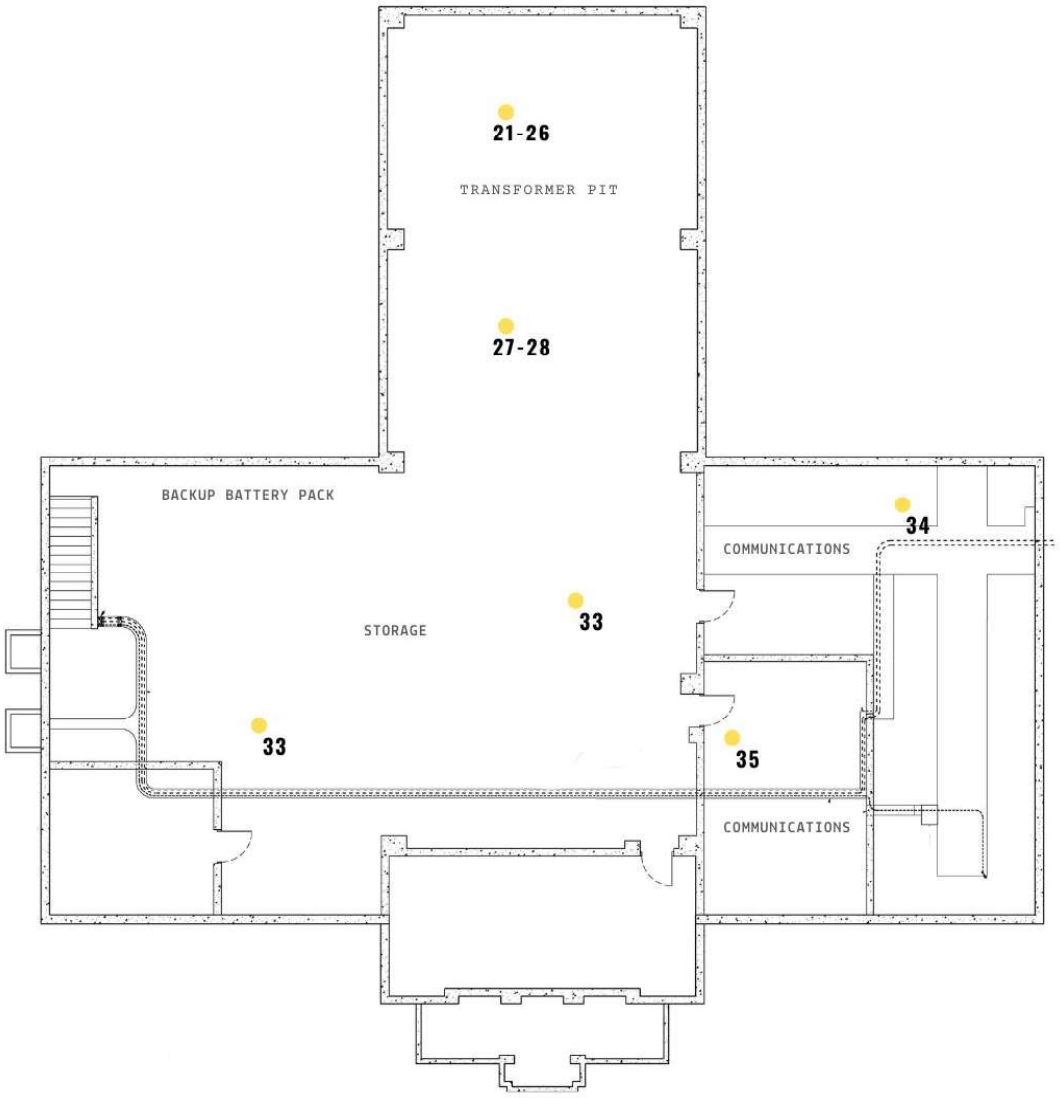

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Figure 8: Salem Substation Site Cross Sections for Grading (1940)
Source: Bonneville Power Administration

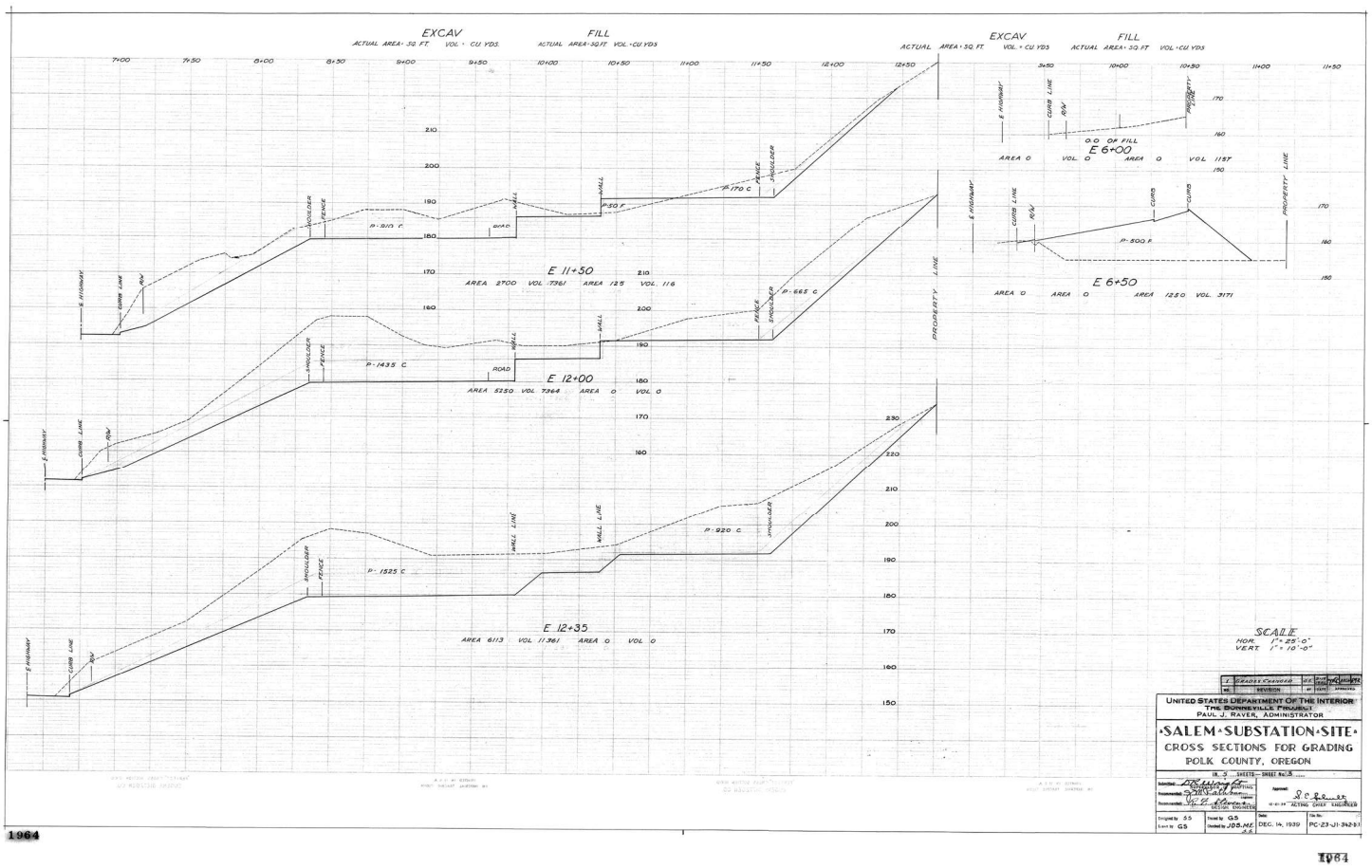

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Figure 9: Mechanical Basement & 1st Floor Plans, Control & Condenser Building (1940)
Source: Bonneville Power Administration

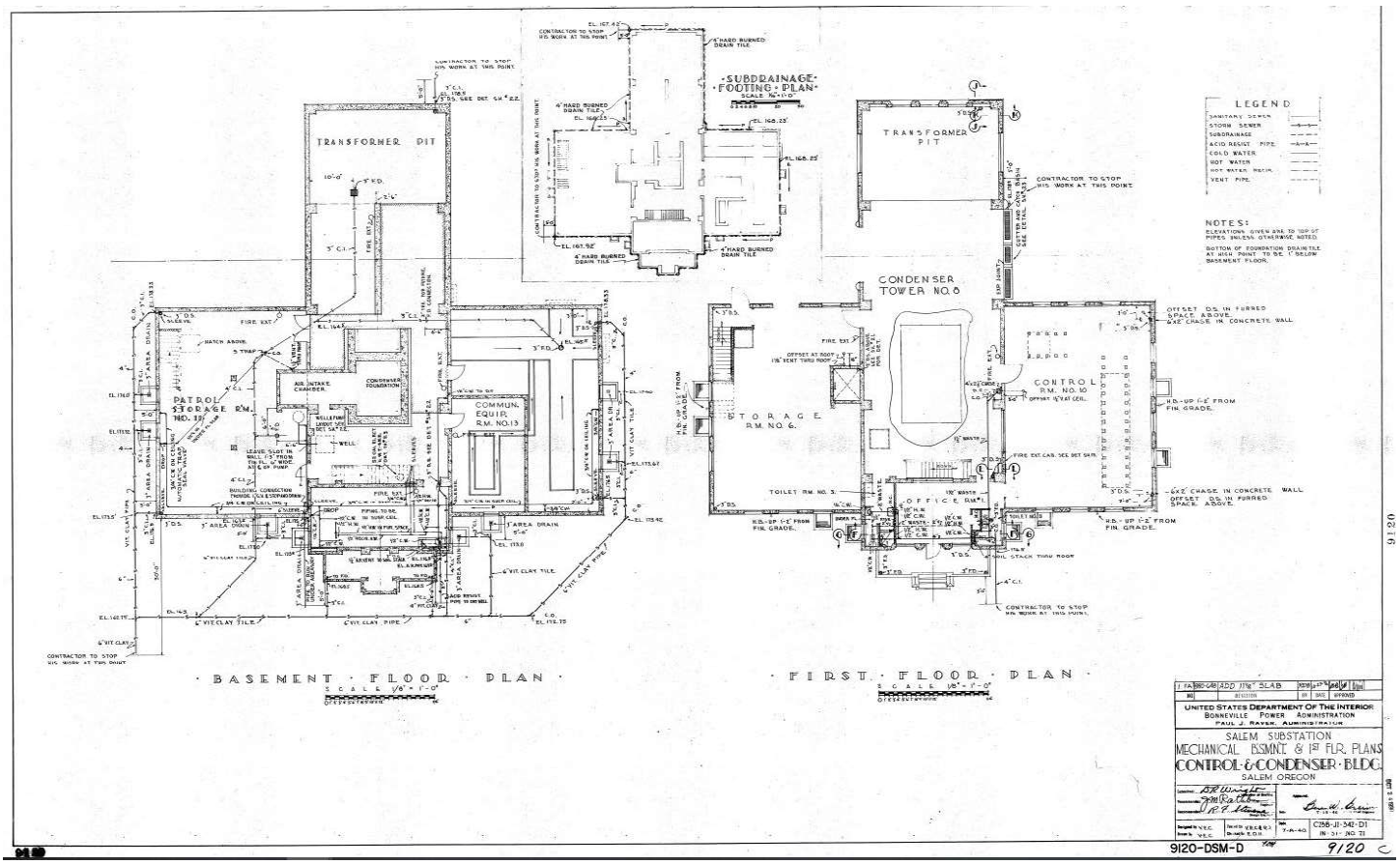

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Figure 10: Salem Substation Section "A-A" & "B-B", Control & Condenser Building (1940)
Source: Bonneville Power Administration

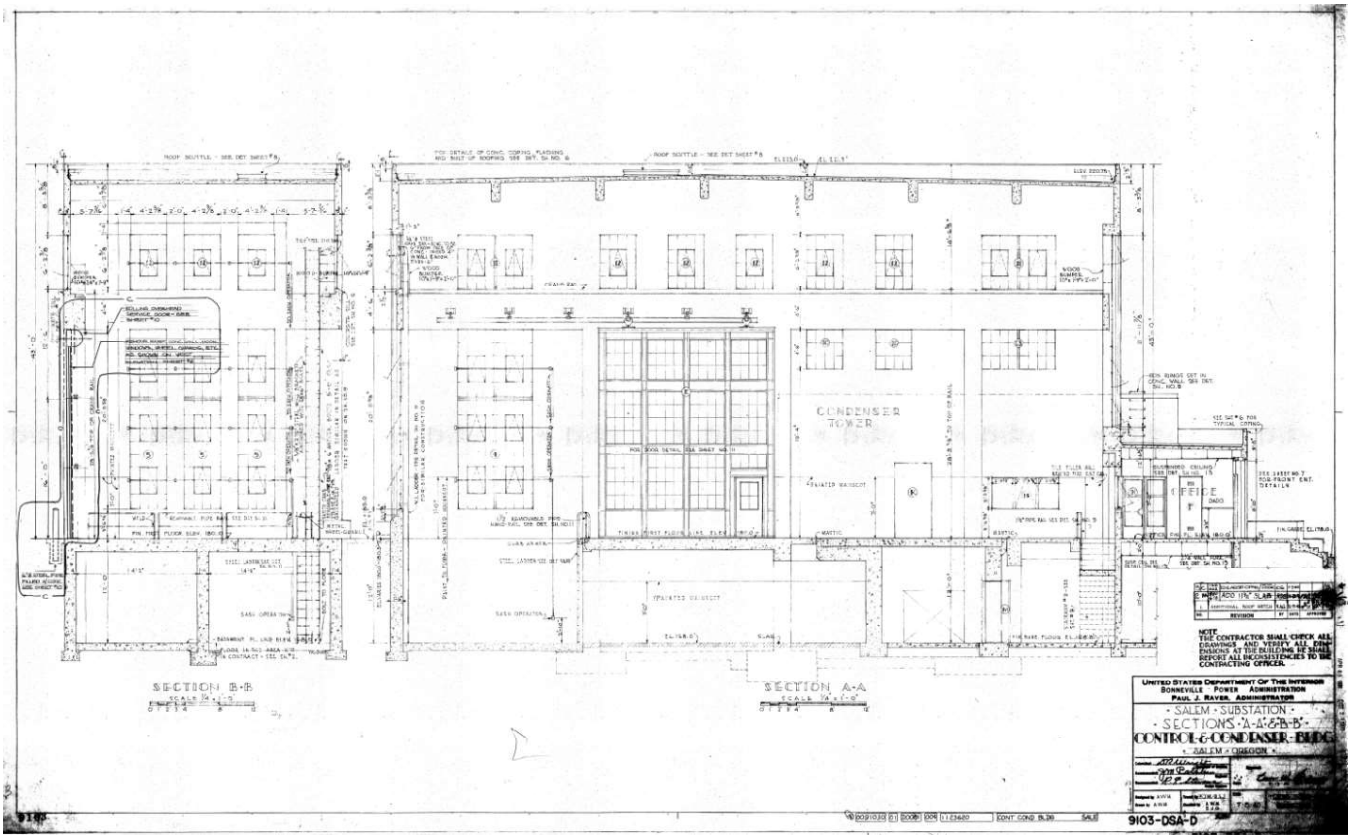

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Figure 11: Salem Substation Grounding Typical Details (1980)
Source: Bonneville Power Administration

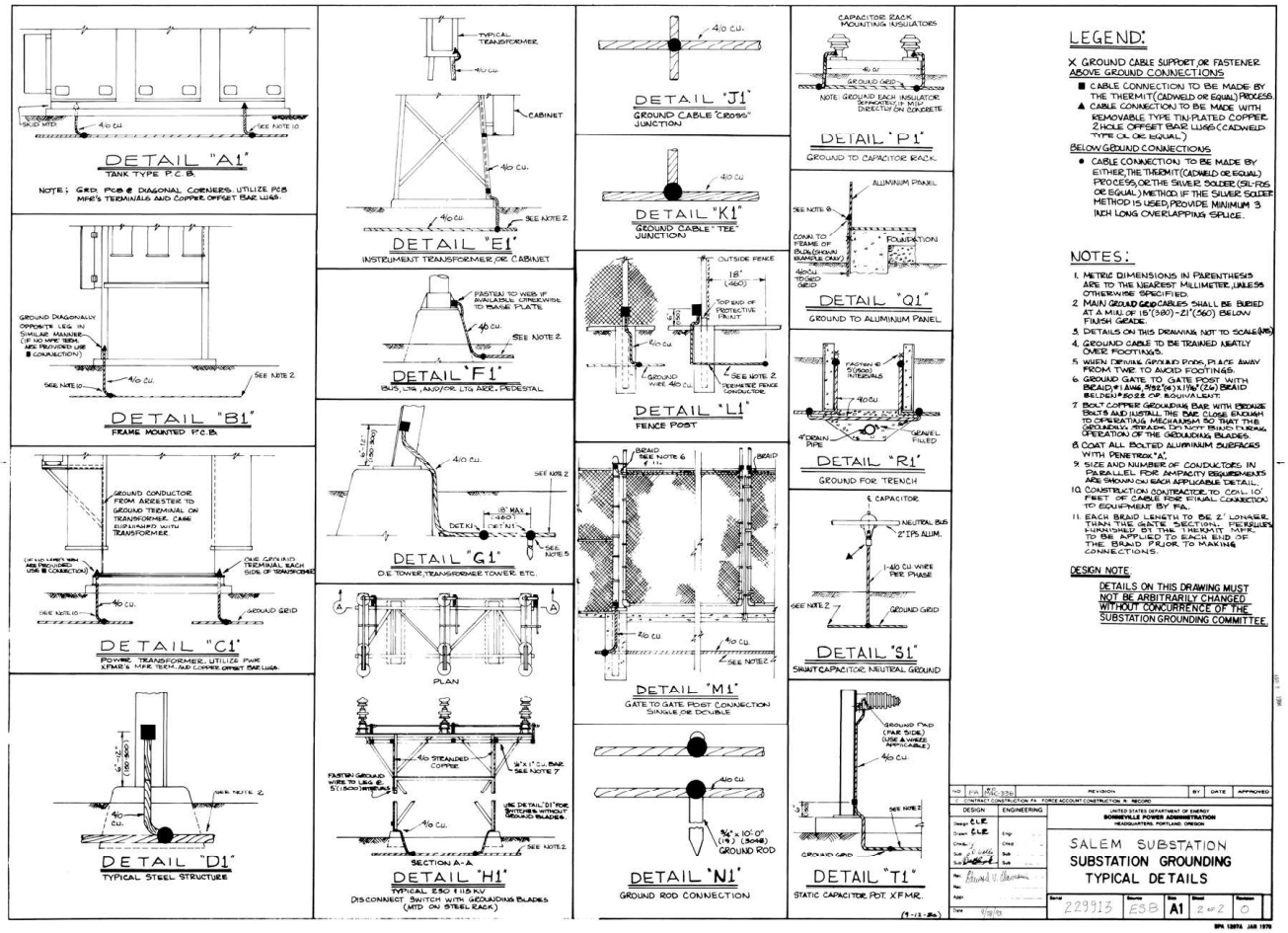

Figure 12: Transmission Line Routes and Substation Locations for Bonneville Revealed (November 2, 1938) Source: *The Oregonian*

Transmission Line Routes and Substation Locations for Bonneville Revealed

(Map on Page 3)

Route of Bonneville transmission lines which will "pipe" Columbia river power to Oregon and Washington communities was revealed Tuesday by Administrator J. D. Ross.

Administrator Ross, at the same time, announced location of the principal substations in the northwest power network and called for bids on nearly $750,000 worth of equipment to be installed at these sites.

Slapped

Story Column 5 —AP Wirephoto
THOMAS W. LAMONT
SEC scolds him in public.

EX-FBI SLEUTH IDENTIFIES CODE

Portland substation will be located in the St. Johns area, while other Oregon transformation centers will be erected at The Dalles, Hood River, Oregon City, Salem, Albany and Eugene.

Initial Washington substations will be erected at Vancouver, Aberdeen, Yakima, Kelso, Chehalis, Raymond, Cathlamet, North Bonneville and Grand Coulee.

Spur Circuits Planned

Bids on substation equipment, to be opened November 29 in the Bonneville project offices, call for huge switches designed for operation on 110,000 and 220,000-volt lines. Thirteen of the switches are to be delivered within four months after the contract is awarded.

The initial transmission lines do not constitute the entire Bonneville system, Ross pointed out. Spur circuits, bearing current at lower voltage, will be run from the substations as soon as applications are received and funds made available, he said.

Announcement of the routes and the call for bids were made after the departure of Administrator Ross for Washington, D. C., where he will confer with federal budgetary officials on the northwest power program.

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Figure 13: Bonneville Substation Million Dollar Project (December 26, 1940)
Source: *The Oregon Statesman*

IMPRESSIVE STRUCTURE TO HOUSE SUBSTATION

This imposing structure will be the mid-Willamette valley distribution point for Bonneville power when it is completed a few months from now. Now under construction, at cost of $951,320, near West Salem, it will require at least eight men for its operation.—Photo by US department of interior, Bonneville administration, Portland.

Bardia's Zero Hour Nearing

All out Attack Foreseen for Besieged Italian Base in Libya

CAIRO, Egypt, Dec. 25—(AP)—In the face of the intensified Italian air attacks, British forces besieging Bardia were reported today to be "pushing forward preparations to deal with the situation" at the fascist base in Libya.

With Bardia already under heavy artillery fire in its ninth day of siege, the British general headquarters communique which announced the preparations were interpreted as the approach of the "zero hour" for an all-out attack on the Italian garrison of 20,000.

Picked desert troops, who led in the offensive that took Sidi Barrani and pushed on 15 miles along the Libyan coast, were expected to make the assault with the support of tanks and other mechanized units.

The RAF also was active in the western desert. The middle east command's communique reported bombing attacks on the airdromes at Tmimi and Gazala, in which

(Turn to page 2, col. 8)

Two Die in Crash Of Student Plane

YOUNGSTOWN, O., Dec. 25.—(AP)—Two Youngstown steel workers were killed and a student pilot injured critically today as a New Castle (Pa.) plane crashed on the runway of the new municipal airport at Vienna, 10 miles north of here.

The dead were John Henry Fox, 25, and Eugene C. Kalucsky, 21. Alfred Rossi, 20, also of Youngstown, was hospitalized with a fractured skull, broken leg and internal injuries.

d Malta Found

Bonneville Substation Million Dollar Project

Modernistic Concrete Building to Rise Near West Salem to Cost $951,320, Most Part of Which Is Equipment

A near million dollar investment is being made in the Bonneville power substation 1.8 miles out of West Salem on the Salem-Dallas highway, according to word issued by the Bonneville administration here yesterday.

The substation, including a large, modernistic concrete building rising the equivalent of three stories high in the center, and an extensive network of transformers and switching equipment, "bus" structures, will cost $951,320. When the station is completed, it will require the services of eight to ten men to operate, on a 24-hour a day basis.

Much of the expense of this unit of the Bonneville project is entailed in providing equipment capable of handling the 115,000 volt Willamette valley transmission circuits, and stepping the power down to 57,000 volts and lower for distribution to the McMinnville and Monmouth municipal systems and the Portland General Electric company and other private utilities.

The station is located on a ten-acre tract of land on the north side of and adjacent to the highway, purchased from owners of the Hogg ranch.

The substation building will house switchboards, batteries for emergency lighting and switch operation, and a large condenser unit for stabilizing voltage. The three-story section of the building will be used as an "untanking" tower, equipped with a traveling ceiling crane, for the overhauling of transformers and circuit breakers.

Combining of the control, untanking and condenser units is a departure from usual practice, being tried by the Bonneville staff here for the first time.

The station will be completed "in the next few months," the Bonneville administration said. A temporary substation is now serving administration customers.

Windjammer Asks Aid off Flattery

Salem Man Sailed Aboard Famed Five-Master 15 Years Ago

SEATTLE, Dec. 25.—(AP)—A trouble call from the waterfront-famed five-masted schooner Vigilant, 400 miles off Cape Flattery, sent the tug Active toward her side from Seattle tonight.

The ship, renowned for its cross-Pacific sailing races, is now under Canadian ownership and is re-christened the City of Alberni.

The report to the Puget Sound Tug and Barge company was that the schooner had sprung a mizzenmast and was taking some water, Lindley Davis, tug company manager, said that the vessel was not believed to be in distress, since no further word has been heard from it since Monday night. No reply was received to a query

(Turn to page 2, col. 4)

Duds Given Needy By Ex-Immigrant

DALLAS, Tex., Dec. 25.—(AP)—Because an Austrian immigrant boy learned 44 years ago what it

English Snatch Christmas Joy

No Sirens Howl in Tacit Yuletide Truce; King Talks to Empire

LONDON, Dec. 25.—(AP)—Britons snatched a day of Christmas peace from a winter of death-dealing war today, hearing at the same time a call from King George VI and ministers of the fighting services for renewed efforts on "the path of victory."

Under a tacit Yuletide truce, no sirens sounded and no bombs fell. The nation, with the shadow lifted for this brief spell, reverted almost to the "Merrie England" of other days.

Thousands flocked to churches to pray for victory and for their loved ones with the army, the navy and the air force.

The people of London, the king and Prime Minister Winston Churchill alike spent the day quietly with their families.

In the longest speech he ever made, King George told his people in "sober confidence" that "our feet are planted on the path of victory."

For the safety and security of England's children the king gave

(Turn to page 2, col. 2)

Car-Train Crash Fatal for Woman

HILLSBORO, Dec. 25.—(AP)—An automobile-log train collision at the Tigard railroad crossing killed Mrs. Elizabeth E. Hatten, 42, of Portland this morning.

Mrs. Hatten was returning to Portland from Newberg with Chester Bradford, Portland, after exchanging Christmas gifts with Mrs. Hatten's daughters.

Bradford suffered serious internal injuries.

The train was in motion at the time and the crew remained unaware of the crash until it reached Hillsboro.

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Figure 14: Description of a substation function from BPA publication, "Why Substations?" (1940)
Source: Bonneville Power Administration via National Archives Seattle

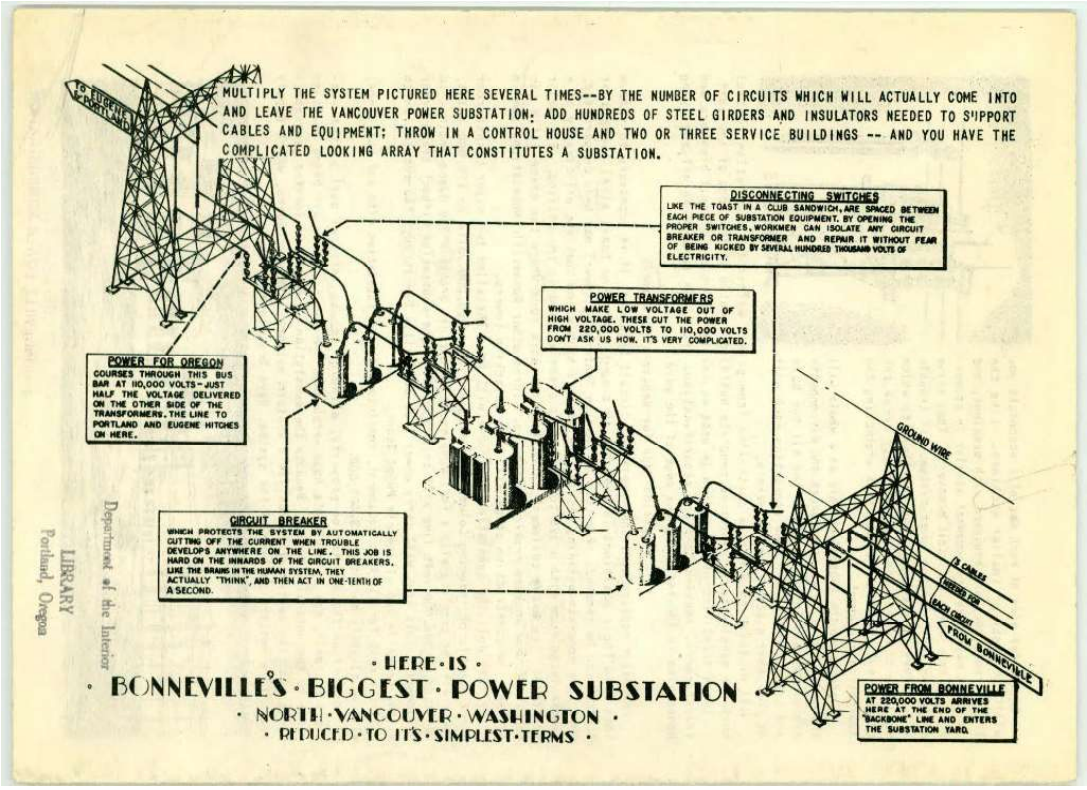

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Figure 15: R.W. Hogg & Sons Ranch prior to substation construction (1939)
Source: Bonneville Power Administration via National Archives Seattle

Figure 16: Grading of future Salem Substation site, Hogg Ranch barn in back (1939)
Source: Bonneville Power Administration via National Archives Seattle

Figure 17: Temporary Field Office & Transmission Towers (1939)
Source: Bonneville Power Administration via National Archives Seattle

Figure 18: Circuit Breakers for temporary switchyard rolled into place (1939)
Source: Bonneville Power Administration via National Archives Seattle

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Figure 19: Temporary Salem Substation (1940)
Source: Bonneville Power Administration via National Archives Seattle

Figure 20: Initial testing of equipment by BPA & PGE (1940)
Source: Bonneville Power Administration via National Archives Seattle

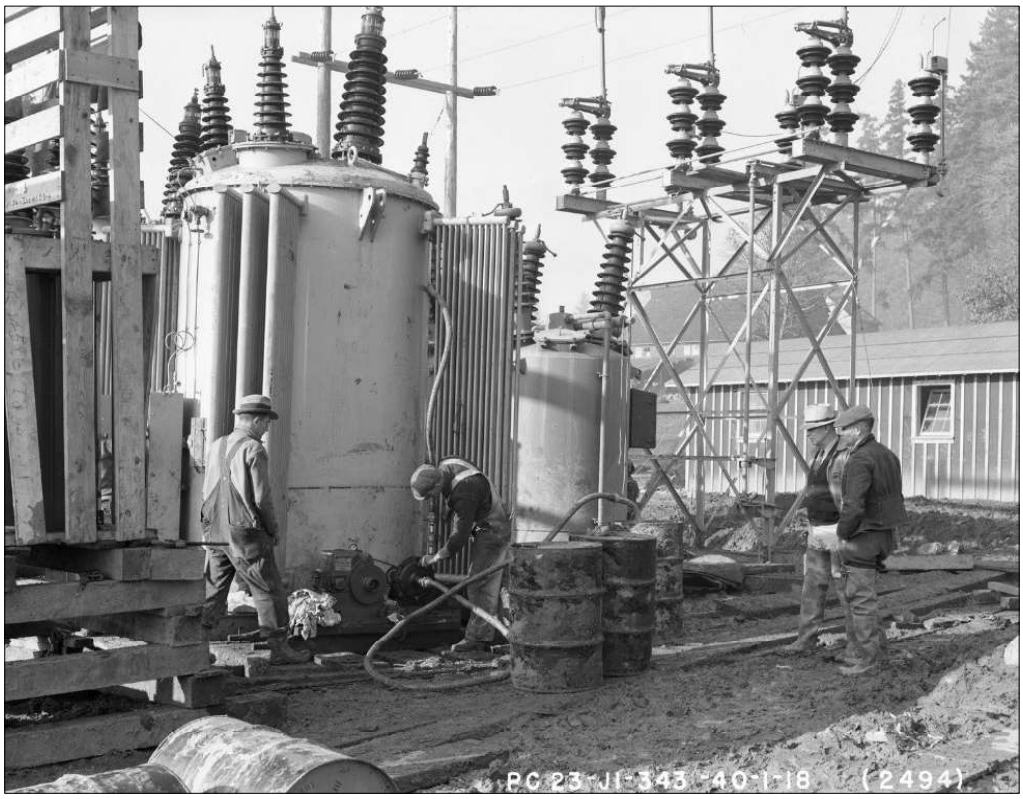

Figure 21: Testing equipment used for phasing in transformer bank (1940)
Source: Bonneville Power Administration via National Archives Seattle

Figure 22: "Salem Substation. Foundations for 115kV oil circuit breakers. Looking west." (1940)
Source: Bonneville Power Administration via National Archives Seattle

Figure 23: "Salem Substation and Radio Station. Progress of Construction, Substation." (1940)
Source: Bonneville Power Administration via National Archives Seattle

Figure 24: "Salem Substation. Progress of Construction of Control House. Looking Northwest." (1940)
Source: Bonneville Power Administration via National Archives Seattle

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Figure 25: "Salem Substation. Progress of Construction of Control House. Looking North." (1940)
Source: Bonneville Power Administration via National Archives Seattle

Figure 26: "Synchronous condenser at Salem Substation. Workman is inspecting stator to make sure there are no metal objects in the winding. Looking South." (1941).
Source: Bonneville Power Administration via National Archives Seattle

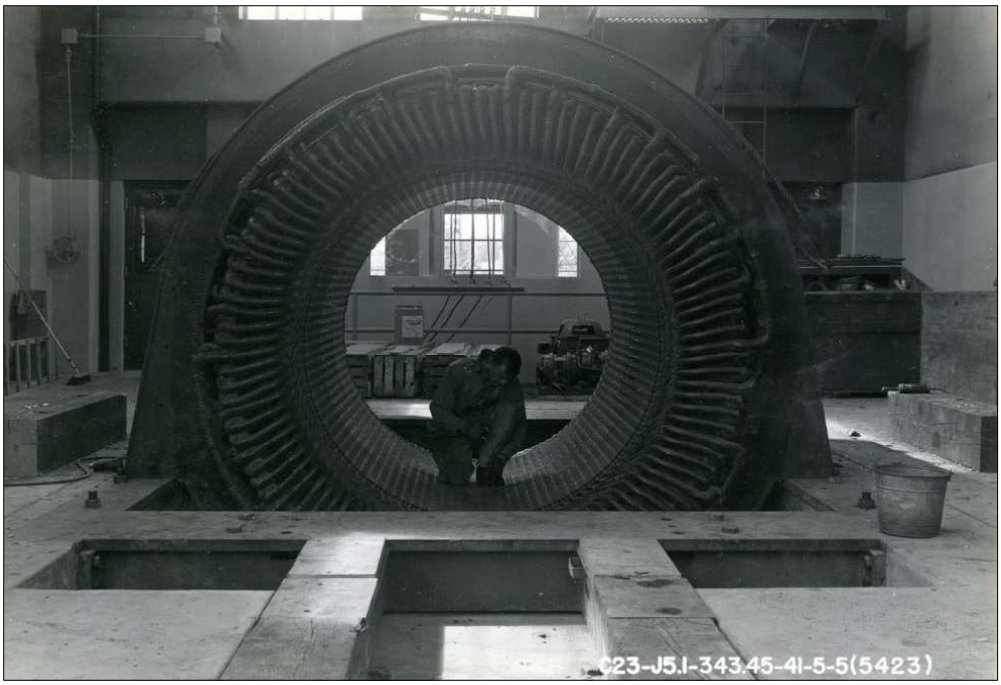

Figure 27: Construction workers at Salem Substation look over Switchyard progress, looking southeast (1941)
Source: Bonneville Power Administration via National Archives Seattle

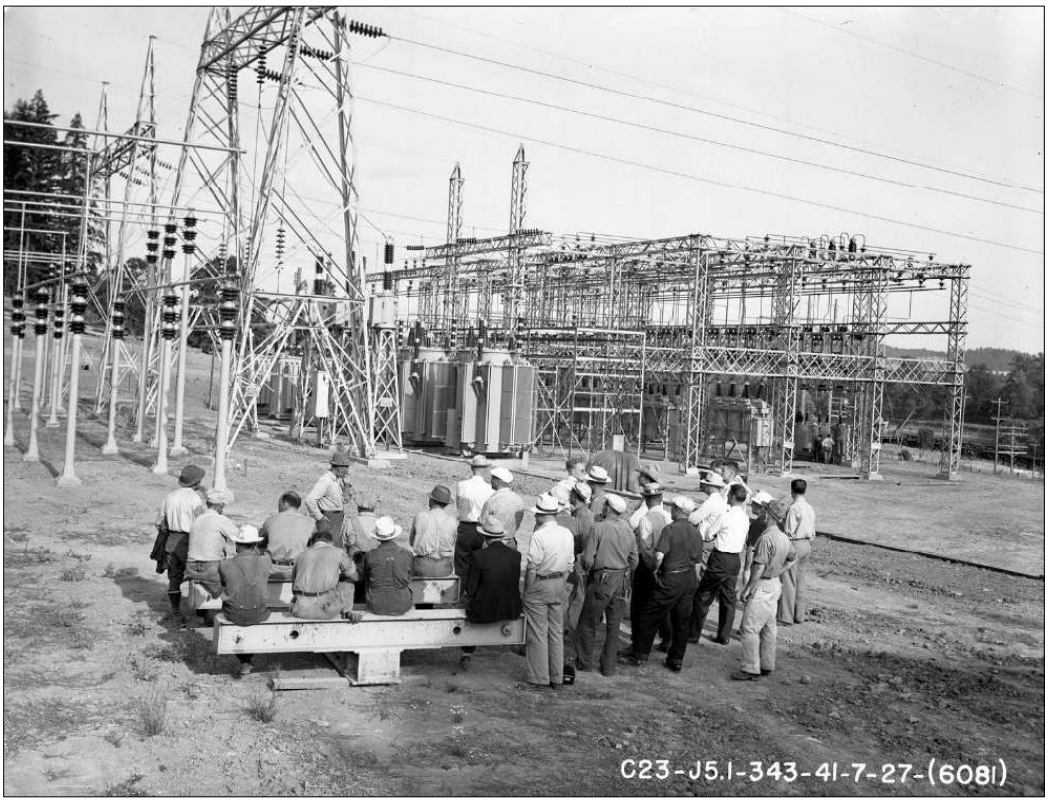

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Figure 28: Trenching of Salem Substation Switchyard for drainage (1941)
Source: Bonneville Power Administration via National Archives Seattle

Figure 29: "Salem Substation. 10,000 K.V.A. Transformer. 100-59.7-6.9 K.V., showing transformer core being lowered into transformer tanks. Direction of view, northeast." (1941).
Source: Bonneville Power Administration via National Archives Seattle

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Figure 30: "Salem Substation. Prior to Energization of Permanent Salem Substation, the Overhead Ground Wire Tip Was Installed on the Dead End Tower. Direction of view, northeast." (1941)
Source: Bonneville Power Administration via National Archives Seattle

Figure 31: "Salem Substation and Radio Station. Main Control Panel at Salem Substation. Direction of View, Southeast
Source: Bonneville Power Administration via National Archives Seattle

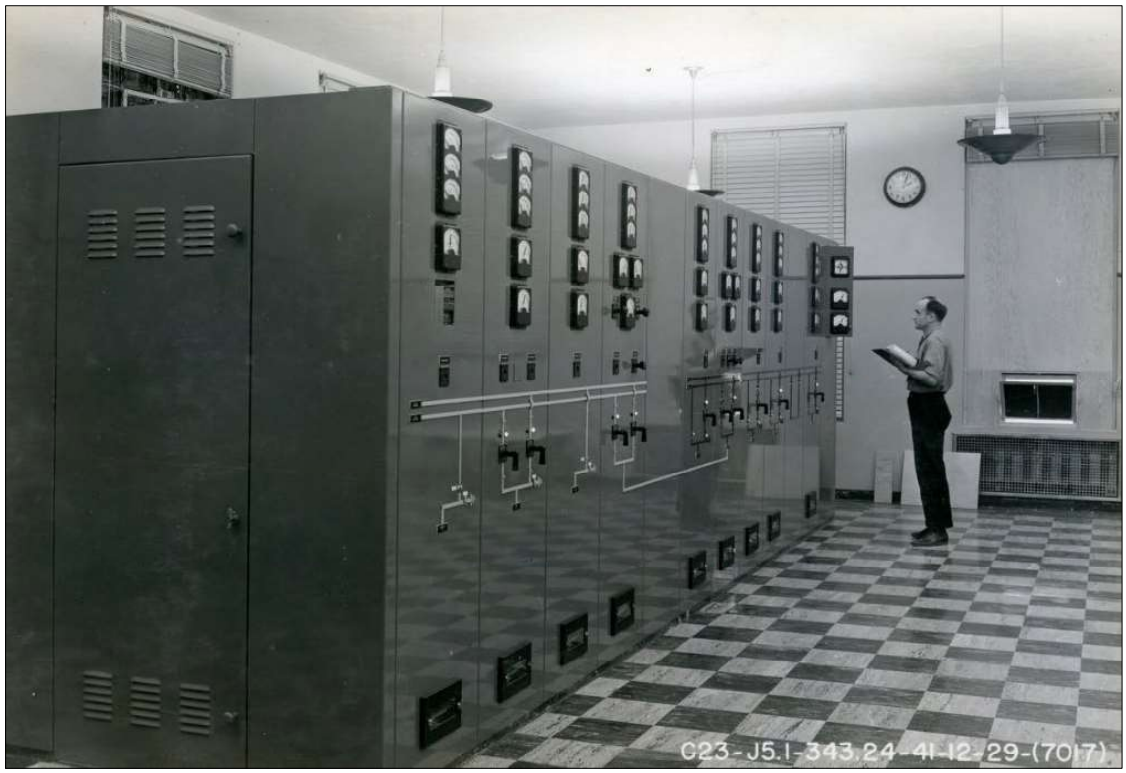

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Figure 32: Inside Salem Substation Control House Control Room, looking south (1941)
Source: Bonneville Power Administration via National Archives Seattle

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Figure 33: Salem Substation Control Room, looking north (1940)
Source: Bonneville Power Administration via National Archives Seattle

Figure 34: Salem Substation Oil House – removed c. 2020, looking west (1942)
Source: Bonneville Power Administration via National Archives Seattle

Figure 35: "Salem Substation. Interior of Control House. Direction of View, South." (1942)
Source: Bonneville Power Administration via National Archives Seattle

Figure 36: "Salem Substation. Direction of View, South." (1948)
Source: Bonneville Power Administration via National Archives Seattle

Figure 37: "Salem Substation. Untanking Tower & Control House. Taken From State Highway." (1951)
Source: Bonneville Power Administration via National Archives Seattle

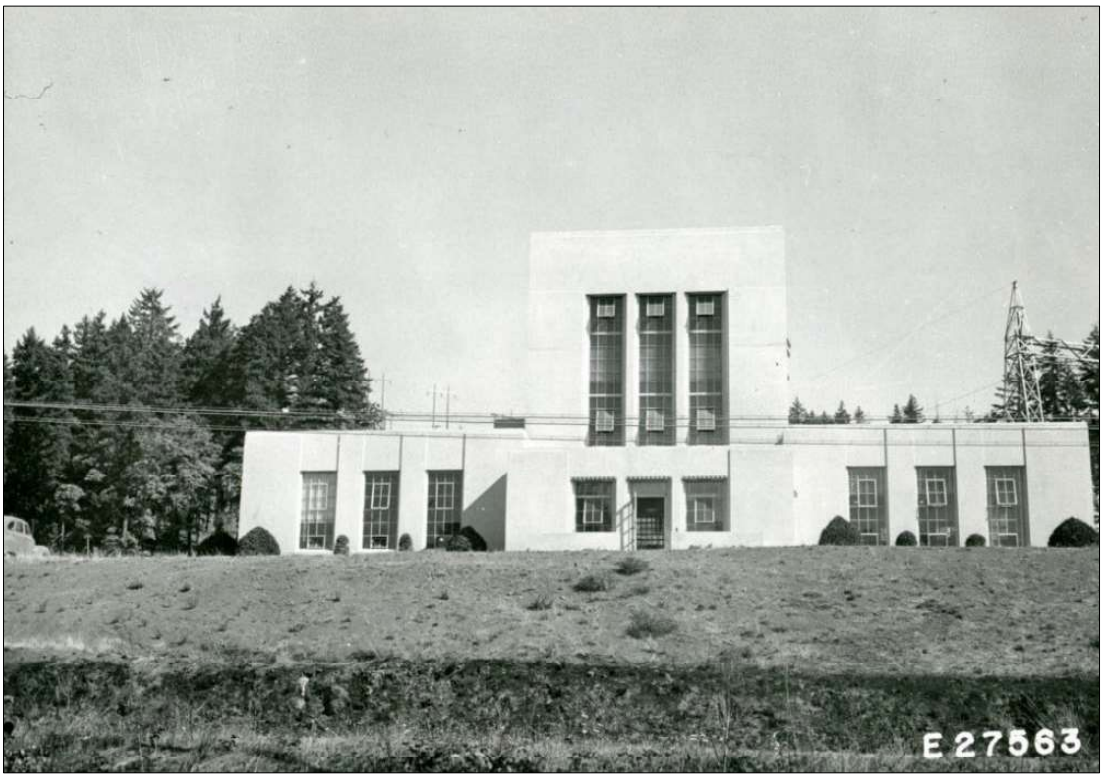


Figure 38: Temporary Communication-Maintenance Building – removed c. 1998, looking southwest (c.1960)
Source: Bonneville Power Administration via National Archives Seattle

Figure 39: Engine Generator Building - replaced 2014, looking southwest (1962)
Source: Bonneville Power Administration via National Archives Seattle

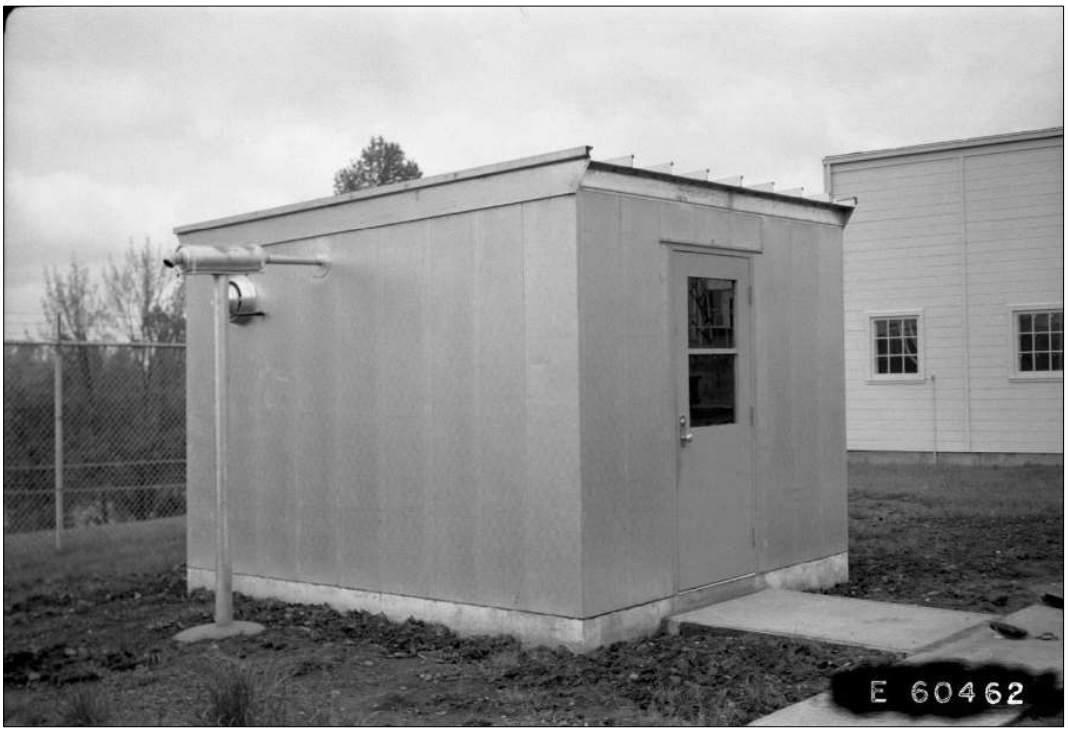


Figure 40: Example of the late-1940s replacement light fixture in Control House Office
Source: Bonneville Power Administration via National Archives Seattle

Photograph 1 of 46: OR_PolkCounty_SalemSubstation_0001
Entrance to Salem Substation, looking northeast (2024)

Photograph 2 of 46: OR_PolkCounty_SalemSubstation_0002
Switchyard, looking northeast from parking lot (2024)

Photograph 3 of 46: OR_PolkCounty_SalemSubstation_0003
South elevation of Control House, looking northeast (2024)

Photograph 4 of 46: OR_PolkCounty_SalemSubstation_0004
West elevation of Control House, looking northeast (2024)

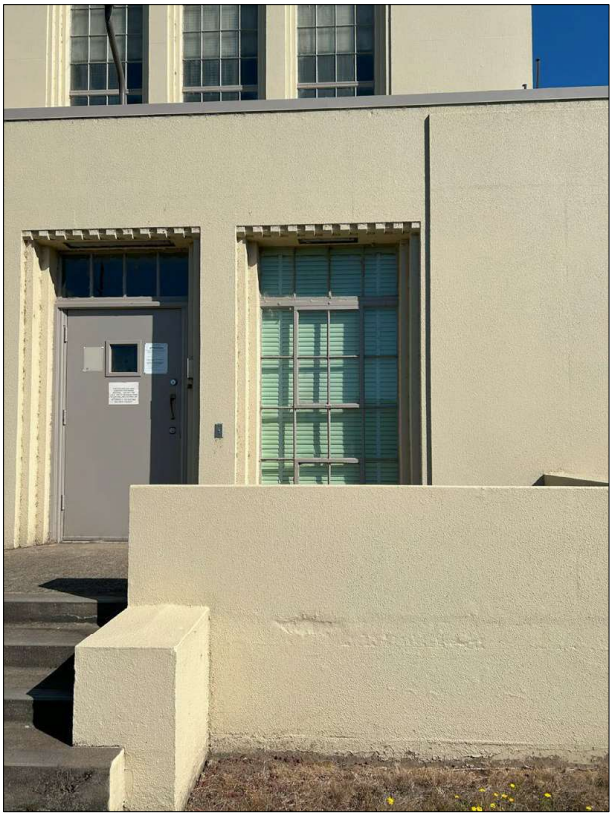
Photograph 5 of 46: OR_PolkCounty_SalemSubstation_0005
West elevation of Control House, looking east (2024)

Photograph 6 of 46: OR_PolkCounty_SalemSubstation_0006
North elevation of Control House, looking southwest (2017)

Photograph 7 of 46: OR_PolkCounty_SalemSubstation_0007
East elevation of Control House, looking west (2017)

Photograph 8 of 46: OR_PolkCounty_SalemSubstation_0008
South elevation of Control House, looking northwest (2024)

Photograph 9 of 46: OR_PolkCounty_SalemSubstation_0009
View of Dallas Highway (OR 22) & Willamette River from the main entrance of Control House, looking south (2024)



Photograph 10 of 46: OR_PolkCounty_SalemSubstation_0010
Detail on east side of Control House entrance, looking north (2024)

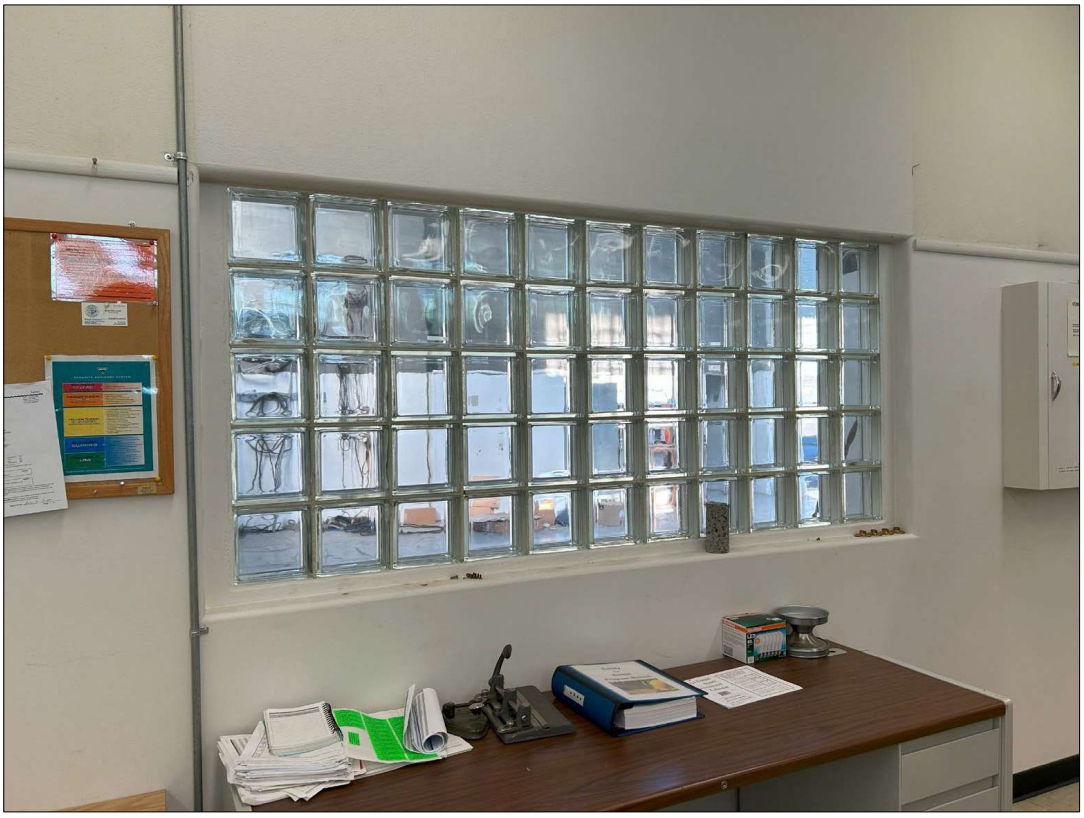
Photograph 11 of 46: OR_PolkCounty_SalemSubstation_0011
Detail on west side of Control House entrance, looking northwest (2024)

Photograph 12 of 46: OR_PolkCounty_SalemSubstation_0012
Heater in front entry, looking west (2024)

Photograph 13 of 46: OR_PolkCounty_SalemSubstation_0013
Windowsill tile and heater in front entry, looking south (2017)

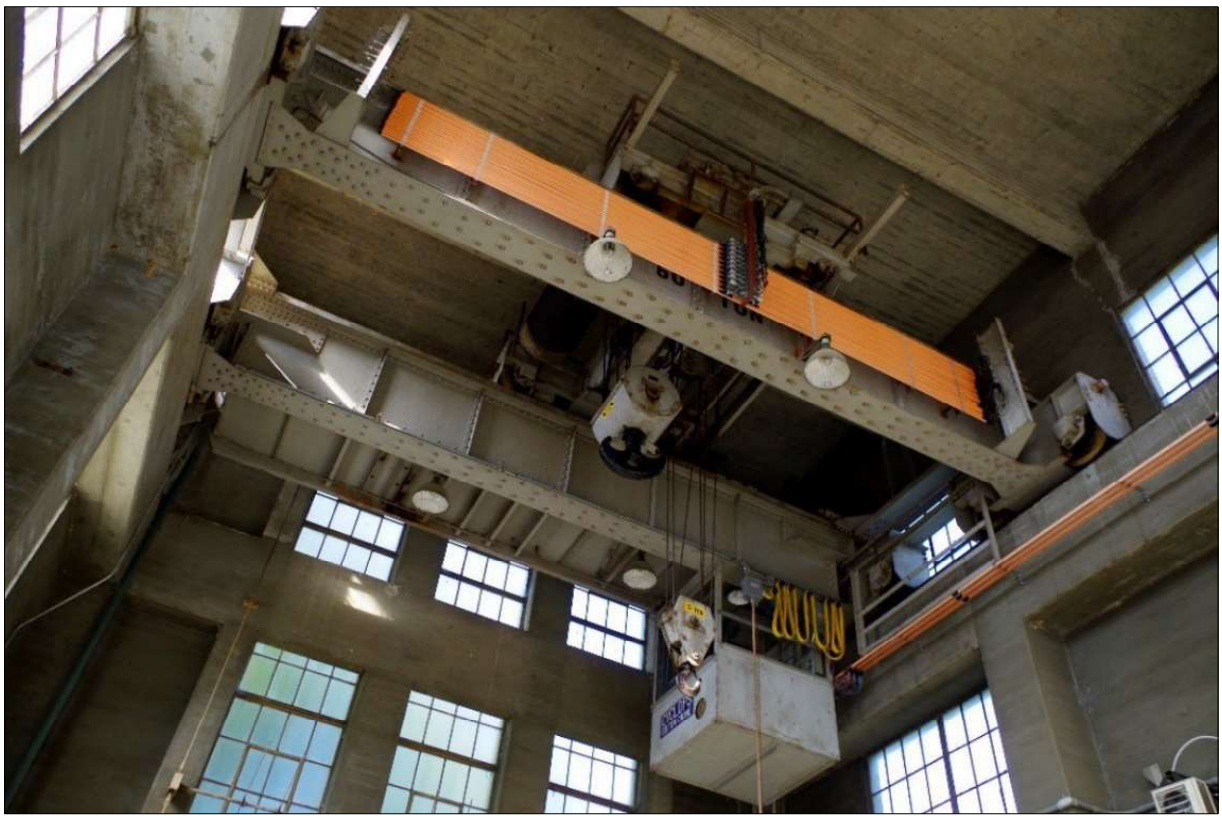
Photograph 14 of 46: OR_PolkCounty_SalemSubstation_0014
Control room door, looking north (2024)

Photograph 15 of 46: OR_PolkCounty_SalemSubstation_0015
Control room, looking south (2017)

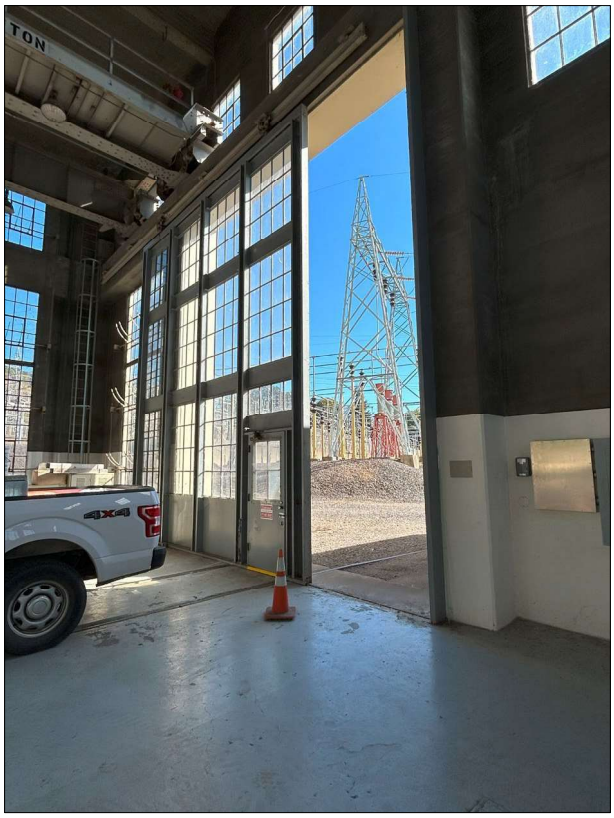


Photograph 16 of 46: OR_PolkCounty_SalemSubstation_0016
Glass block windows in control room, looking west into untanking tower (2024)

Photograph 17 of 46: OR_PolkCounty_SalemSubstation_0017
Untanking tower, looking south (2017)

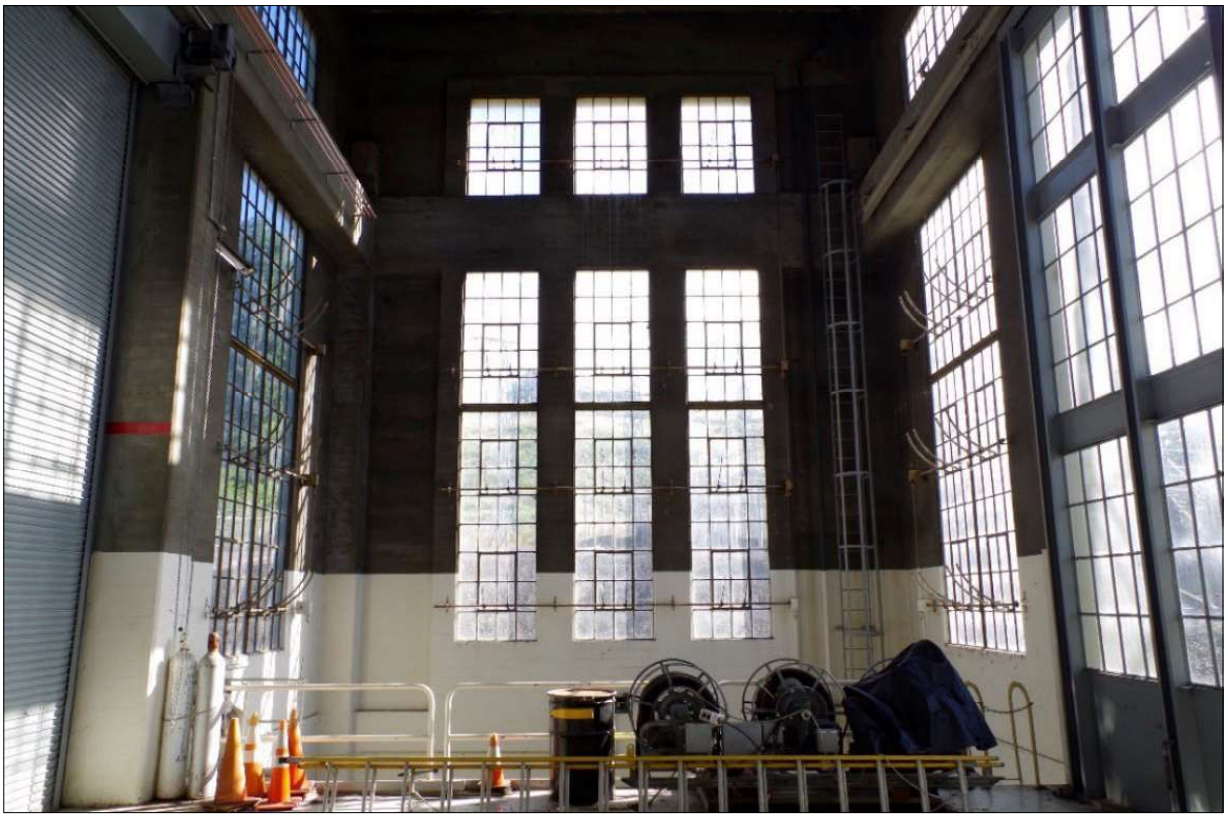


Photograph 18 of 46: OR_PolkCounty_SalemSubstation_0018
Untanking tower crane (2017)



Photograph 19 of 46: OR_PolkCounty_SalemSubstation_0019
Untanking tower sliding door and Transfer Track, looking northeast (2024)

Photograph 20 of 46: OR_PolkCounty_SalemSubstation_0020
Transfer Track, looking west (2017)

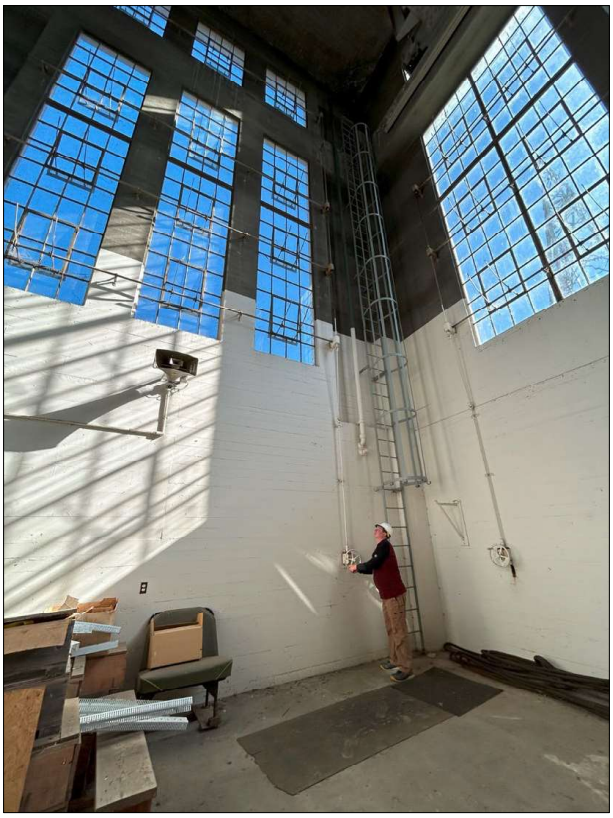


Photograph 21 of 46: OR_PolkCounty_SalemSubstation_0021
Untanking tower, looking north (2017)

Photograph 22 of 46: OR_PolkCounty_SalemSubstation_0022
Roll-up metal door in untanking tower, looking northwest (2017)

Photograph 23 of 46: OR_PolkCounty_SalemSubstation_0023
Example of rounded corners typical throughout the Control House, looking northwest towards Maintenance Building (2024)

Photograph 24 of 46: OR_PolkCounty_SalemSubstation_0024
View of sliding untanking tower door from transformer pit, looking northeast (2024)



Photograph 25 of 46: OR_PolkCounty_SalemSubstation_0025
Transformer pit, note operational steel windows, looking northeast (2024)

Photograph 26 of 46: OR_PolkCounty_SalemSubstation_0026
Transfer pit, looking southwest (2024)

Photograph 27 of 46: OR_PolkCounty_SalemSubstation_0027
Basement hallway leading to transformer pit with original light fixtures, looking northeast (2024)

Photograph 28 of 46: OR_PolkCounty_SalemSubstation_0028
Original basement light fixture and curved ceiling detail (2024)

Photograph 29 of 46: OR_PolkCounty_SalemSubstation_0029
West wing hallway leading to the communications room, maintenance shop, and basement staircase, looking west (2024)

Photograph 30 of 46: OR_PolkCounty_SalemSubstation_0030
Communications room, looking south (2024)

Photograph 31 of 46: OR_PolkCounty_SalemSubstation_0031
Maintenance shop, looking south (2024)

Photograph 32 of 46: OR_PolkCounty_SalemSubstation_0032
Close-up of 24-light fixed steel sash with hopper and awning features typical of Control House, looking south (2024)

Photograph 33 of 46: OR_PolkCounty_SalemSubstation_0033
Storage Room with stairs (left) leading up to the west wing, looking northeast (2024)

Photograph 34 of 46: OR_PolkCounty_SalemSubstation_0034
Basement cable room, looking southeast (2017)

Photograph 35 of 46: OR_PolkCounty_SalemSubstation_0035
Basement communication equipment room, looking southeast (2024)

Photograph 36 of 46: OR_PolkCounty_SalemSubstation_0036
9in cored portion of reinforced Control House wall (2024)

Photograph 37 of 46: OR_PolkCounty_SalemSubstation_0037
Partially buried Transfer Track, looking east towards the lower tier of the Switchyard (2024)

Photograph 38 of 46: OR_PolkCounty_SalemSubstation_0038
Lower tier of Switchyard, looking northwest (2017)

Photograph 39 of 46: OR_PolkCounty_SalemSubstation_0039
Concrete staircase in Switchyard, looking north toward middle and upper tier (2016)

Photograph 40 of 46: OR_PolkCounty_SalemSubstation_0040
Storage Shed and Engine Generator Building on the south end of Switchyard, looking southwest (2017)

Photograph 41 of 46: OR_PolkCounty_SalemSubstation_0041
Middle tier of Switchyard, looking southeast (2017)

Photograph 42 of 46: OR_PolkCounty_SalemSubstation_0042
Upper tier of Switchyard, looking east (2017)

Photograph 43 of 46: OR_PolkCounty_SalemSubstation_0043
Switchyard light fixture on upper tier, looking west (2024)

Photograph 44 of 46: OR_PolkCounty_SalemSubstation_0044
Salem Substation, looking southeast (2024)

Photograph 45 of 46: OR_PolkCounty_SalemSubstation_0045
Maintenance Building, looking northwest (2024)

Photograph 46 of 46: OR_PolkCounty_SalemSubstation_0046
Maintenance Building, looking north from parking lot (2024)