



Portland General Electric
121 SW Salmon Street · Portland, Ore. 97204

TYPE III VARIANCE

***Tonquin
Substation
VAR 21-0002***

Submitted to:
**City of Tualatin
Planning Division**

Submitted on Behalf of:
Portland General Electric Company

Prepared by:

Angelo
planning **O** group

*Submitted for Completeness: March 10, 2021
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I. Proposal Summary Information

Applicant:	Portland General Electric Attn: Tina Tippin, Property Services Specialist 121 SW Salmon Street, 1WTC1302 Portland, Oregon 97204 Phone: 503-708-4386 Email: tina.tippin@pgn.com
Applicants Representative:	Angelo Planning Group Attn: Frank Angelo, Principal 921 SW Washington St., Suite 468 Portland, OR 97205 Phone: 502-227-3664 Email: fangelo@angeloplanning.com
Owner:	Portland General Electric Company Attn: Tina Tippin, Property Services Specialist Signatory: Jennifer Santhouse, Property Services Manager 121 SW Salmon Street, 1WTC1302 Portland, Oregon 97204 Phone: 503-708-4386 Email: tina.tippin@pgn.com
Request:	Major Variance, Type III
Location:	12150 Tualatin-Sherwood Road
Tax Lot ID:	2S127C000500
Zoning Designation:	Manufacturing Business Park (MBP) zone
Tax Lot Size:	43.85 acres

II. Project Team

Owner

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III. Project Description and Existing Conditions

A. Background

Portland General Electric Company (PGE) is requesting approval of a Variance from the setback standards for development of a substation at 12150 Tualatin-Sherwood Road (tax lot 2S127C000500). The proposed Tonquin Substation is located on the same site as the PGE Integrated Operations Center (IOC), previously approved by the City of Tualatin in 2019 (AR 19-0005). The IOC is an office building for PGE operations and a control center hub for PGE control and communication systems. However, this application is separate from and was not included in the IOC approval. Figure 1 shows the location of the IOC and the location of the proposed Tonquin Substation. The site is in the Manufacturing Business Park (MBP) zone, shown in Figure 2 Zoning Map. The substation is a crucial element of substation improvements across PGE's network and is needed to provide PGE's service to the growing region. The population and employment base in the region and its surrounding communities have grown significantly in recent years. The development of the substation is necessary in order to add capacity to the power delivery system, increase system reliability, meet the demands of growth, and continue to provide reliable and safe power to serve Portland and surrounding areas into the future. Additionally, the new substation is needed to support the Willamette Water Supply Project treatment plant located directly west of the site and will improve service reliability in the immediate area.¹

Electrical substations are a unique, but critical, infrastructure use. Locating a new substation usually brings challenges from a land use permitting perspective. In the instance of the proposed Tonquin Substation, PGE has taken steps to include the future substation as a part of a larger PGE facility – the IOC. This location makes sense from a number of perspectives, including minimizing potential negative impacts of a new substation on existing and future residential areas, securing a location in an area designated for future industrial and manufacturing uses, and supporting PGE's long-term plans for the provision of electrical services in this area of the region.

As noted in the following narrative, the site does have some physical challenges related to site size and shape. These challenges, however, resulted from the extension of SW Blake Street into and ultimately through the site as determined by the City of Tualatin Transportation System Plan (TSP). As a part of the approval of the IOC, PGE was required to bring SW Blake Street into the site in its current location. Construction of this portion of SW Blake Street and the ultimate extension of the street to PGE's southern property line has created the size and shape of the property the Tonquin Substation needs to work with to construct the substation. Additionally, approximately 155,000 square feet of developable land is needed to site the substation. There are no other areas on the 43-acre site that have adequate space or shape to host the proposed substation.

In order to meet operational and safety standards and design considerations, the substation fence line needs to be located based on a 10' setback as opposed to the 50' setback prescribed in the City's Zoning Ordinance. Therefore, the location of the fence requires a variance to the City's setback standards. Figure 3 and Figure 4, respectively, show the impact on substation design and

¹ The Willamette Water Treatment Plant is under construction. It is expected to be completed and operational by 2026.

construction with a 50’ setback (City standard) and a 10’ setback (PGE’s requested Variance). This application provides the findings needed to approve the setback Variance.

B. Site Context

As noted, the location of the proposed Tonquin Substation is a part of the 43 acre IOC site. Currently, the site where the substation will be located is vacant, wooded land. The new substation will be bounded by SW 124th Avenue on the west, SW Blake Street on the north and east, and a rock quarry (not owned by PGE) to the south. Access will be taken from SW Blake Street, which is a new road the City required to be constructed as a part of the IOC approval. The buildable area dimensions for the substation site were established when SW Blake Street was extended into the property creating a 173,000 SF parcel where the proposed Tonquin Substation will locate. The dimensions of the substation within the fence line are approximately 280 feet x 560 feet, or just under 155,000 SF. Given the technical and safety specifications for the new substation, the proposed Tonquin Substation will fit on the site, but will require a Variance from the City’s setback standards to enable construction to meet PGE’s and industry construction and safety specifications. Site improvements will include substation equipment, fencing, and lighting. The City’s setback standards in the MBP zone and the proposed setbacks for the Tonquin Substation are:

TDC. 64.300 – Development Standards

Table 64-2

<i>MINIMUM SETBACKS</i>		
<i>Fences</i>	<i>50 feet</i>	<i>From public right-of-way.</i>

The proposed setbacks from the public right-of-way (ROW) for the fences are:

Table 1. Proposed Setbacks

Setback From	MBP Zone Fence Setback from the ROW (per TDC 64.300)	Proposed Fence Setback	Proposed Fence Length
SW 124 th	50 ft.	10 ft.	515 ft.
SW Blake Street (North)	50 ft.	10 ft.	184 ft.
SW Blake Street (East)	50 ft.	10 ft.	515 ft.

The south property line does not abut public ROW, and therefore is not subject to the 50-foot fence setback requirement.

C. Requested Approvals

PGE is requesting the approval of a Variance to the fence setback standards for the Manufacturing Business Park (MBP) zone found in Tualatin Development Code (TDC) 64.300. The requested Variance is to reduce the 50-foot fencing setback required for the north, west, and east property lines to allow a perimeter fence around the substation in a location that is a safe distance from the

substation electrical equipment in a manner that will permit safe internal access to the substation equipment and meet industry safety standards.

This application is only for the Variance application. An Architectural Review application for construction of the Tonquin Substation will follow approval of the Variance.

Figure 1. Site Aerial Image



- City Limits
- - - Substation Site
- ▭ Tax lot
- - - Blake Rd. Extension (Conceptual)

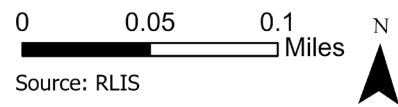


Figure 2. Zoning Map

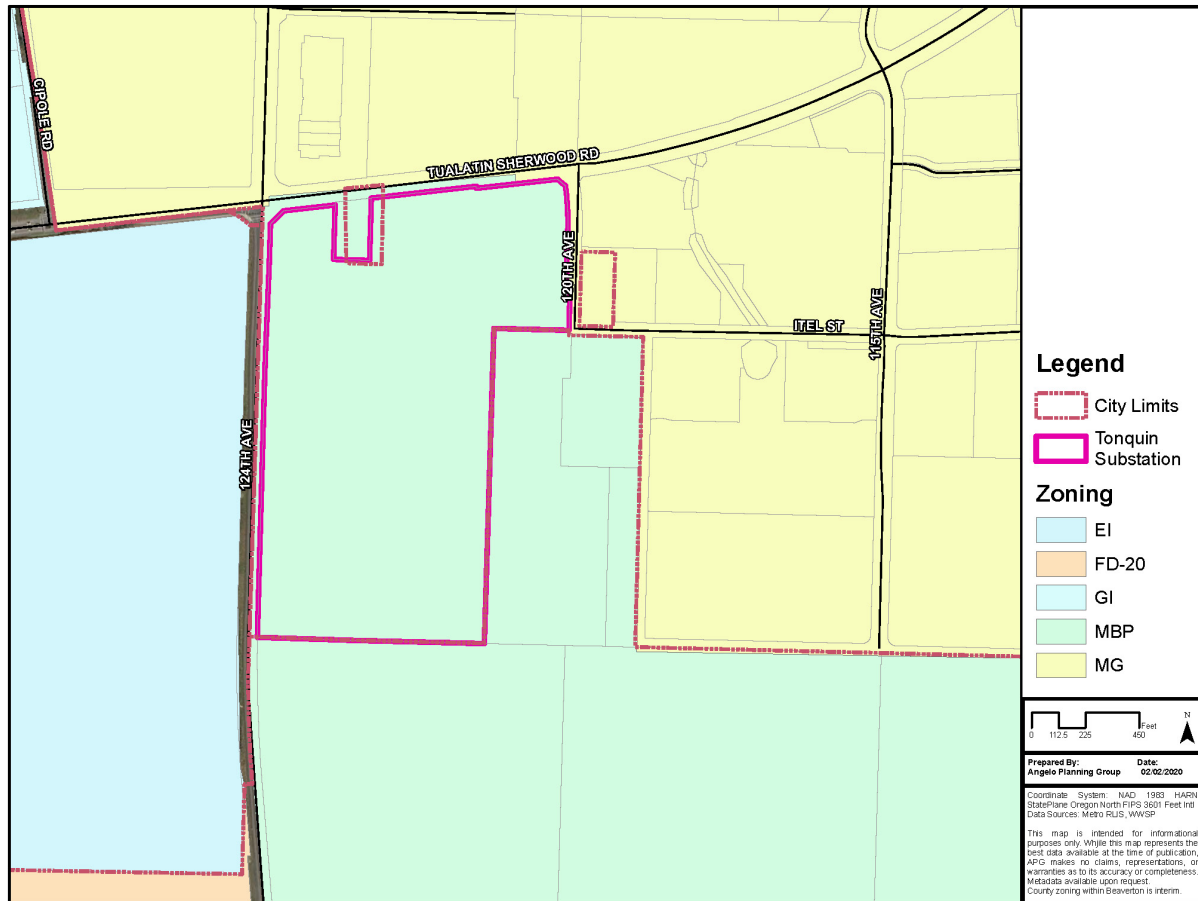


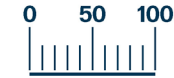
Figure 3. Site Plan Showing 50' Setback

Tonquin Substation

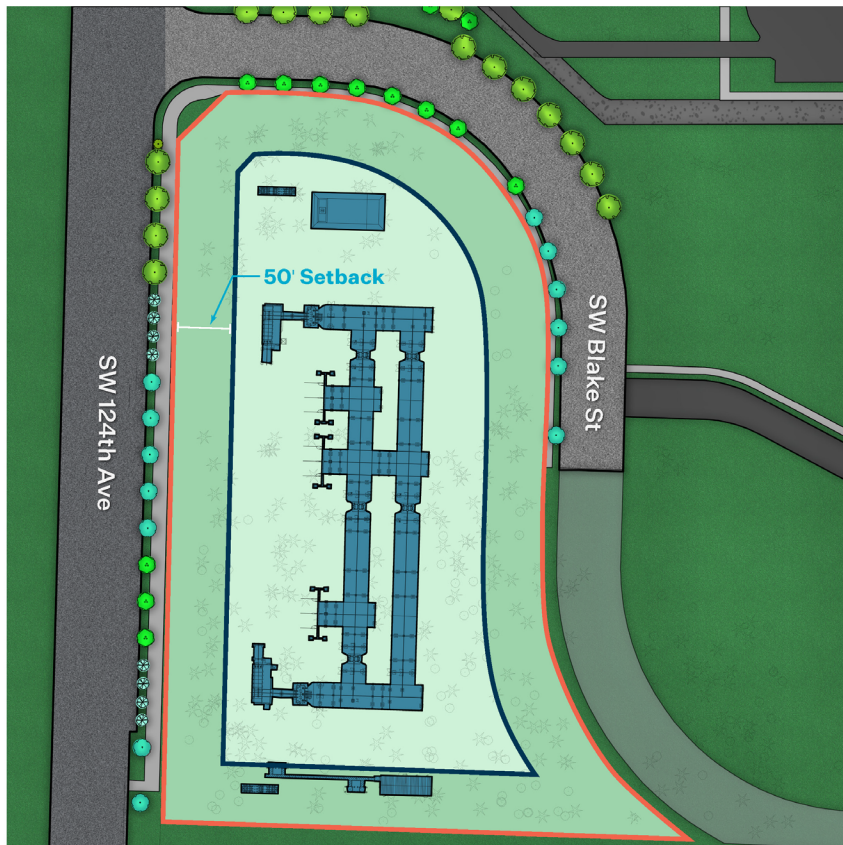
Legend

- Project Boundary
- Setback Boundary

Scale (feet)



50-Foot Setback



Comments:

- Developable Area: 95,000 s.f.
- Inadequate circulation within the substation for repairs and emergencies
- All substation equipment does not fit within the fence line
- Substation equipment is too close to fence
- Substation equipment layout would not meet requirements of the National Electric Safety Code (NESC)

Figure 4. Site Plan Showing 10' Setback

Tonquin Substation

Legend

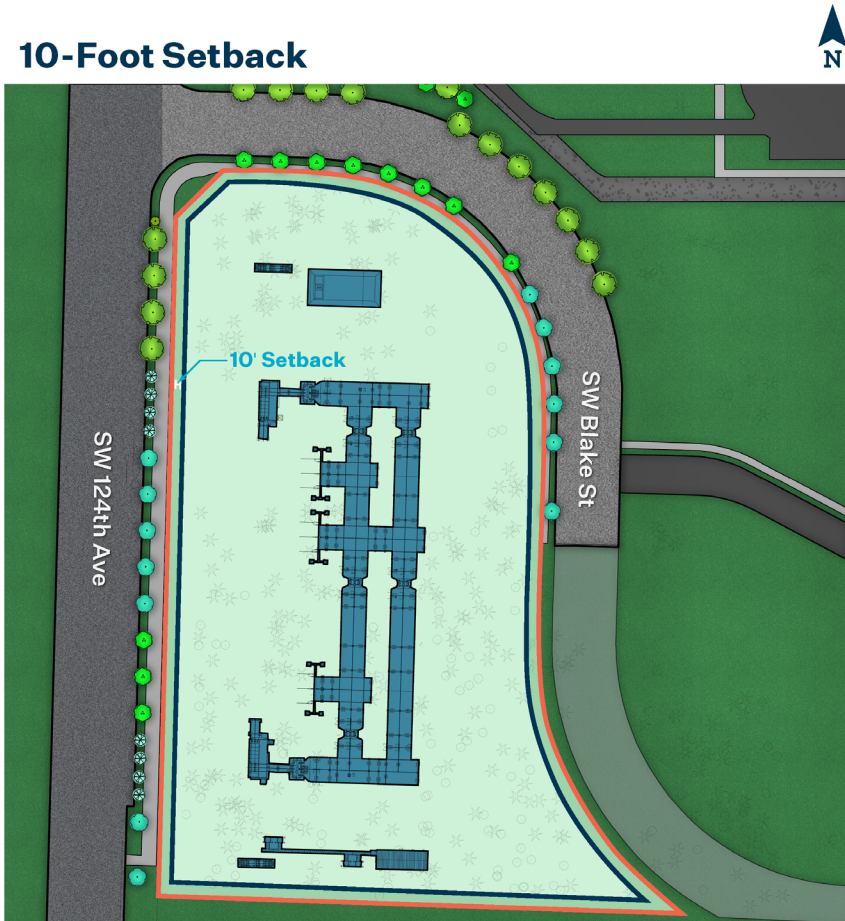
- Project Boundary
- Setback Boundary

Scale (feet)



Comments:

- Developable Area: 155,000 s.f.
- Adequate circulation within the substation for repairs and emergencies
- All substation equipment fits within the fence line
- Substation equipment is setback safe distance from fence
- Substation equipment layout and clearances meet minimum requirements of the National Electric Safety Code (NESC)



V. Conformance with Tualatin Development Code

Compliance with applicable Variance standards are described below.

TDC 33.120. - Variances and Minor Variances.

(1) *Purpose. To establish a procedure for the granting of Variance and Minor Variances to the standards of the Tualatin Development Code. Exceptions:*

- (a) *Variances to the requirements of TDC Chapter 70 (Floodplain District) must be in accordance with TDC Chapter 70.*
- (b) *Sign variances must be in accordance with Section 33.080.*

Response: The requested Variances is from the fence setback standards, not development in the Floodplain District or a Sign Variance. The criteria are applicable.

(2) *Applicability. Variances may be granted to the requirements of the TDC as provided in this Section when it can be shown that, owing to special and unusual circumstances related to a specific piece of property, the literal interpretation of the TDC would cause an undue or unnecessary hardship.*

- (a) *Variances may be requested for the following:*
 - (i) *Standards in TDC Chapters 40-69 and 71-73A through 73F.*

Response: The requested Variance is to the fence setback standard in TDC 62.300, Development Standards for the MBP zone. The criterion is met.

- (b) *Minor variances may be requested for the following:*
 - (i) *In Residential Low Density Zone (RL) except for Small Lot Subdivisions:*
 - (A) *Up to a ten percent variation from the required lot area, and/or*
 - (B) *Up to a 20 percent variation from the required lot width, building coverage, setbacks, projections into required yards and structure height development standards for permitted uses.*
 - (ii) *For single family dwellings in Small Lot Subdivisions in Residential Low Density (RL) and Residential Medium to Low Density Zone (RML):*
 - A. *Up to a ten percent variation from the required lot area; and/or*
 - B. *Up to a 20 percent variation from the required lot width, building coverage, setbacks, projections into required yards and structure height development standards.*
- (c) *Prohibited. Variances and minor variances are not allowed:*
 - (i) *To permit a use of land that is not permitted or conditionally permitted in a zone.*
 - (ii) *For Level I (Clear and Objective) Single-family Architectural Review standards referenced in TDC 40.140 and 41.130 and set forth in TDC 73A.110.*

Response: The requested Variance does not meet the criteria for minor or prohibited Variances. The standards are not applicable.

(3) *Procedure Type.*

- (a) *Applications for a Minor Variance are subject to Type II review in accordance with TDC Chapter 32.*
- (b) *Applications for a Variance are subject to Type III review in accordance with TDC Chapter 32.*

Response: The requested application is a Variance, subject to a Type III review.

(4) *Specific Submittal Requirements. In addition to the general submittal requirements in TDC 32.140 (Application Submittal), an applicant must submit the following additional information:*

- (a) *The name, addresses and telephone numbers of the architect, landscape architect and engineer; and*
- (b) *If requesting a variance to lot width, building coverage, setbacks, projections into required yards and structure height then a property survey stamped by a qualified professional is required.*

Response: The project team contacts are found on Page v of this application. Additionally, for the requested setback Variance, the property survey is attached in Exhibit A.

(5) *Approval Criteria for Granting a Minor Variance. A minor variance must not be granted unless the application shows the following approval criteria are met:*

- (a) *A hardship is created by an unusual situation that is the result of lot size, lot shape, topography, development circumstances or being able to use the land or public infrastructure more efficiently;*
- (b) *The hardship does not result from regional economic conditions;*
- (c) *The minor variance will not be injurious to property abutting the subject property; and*
- (d) *The minor variance is the minimum remedy necessary to alleviate the hardship.*

Response: The requested Variance does not meet the criteria for a Minor Variance. The criteria are not applicable.

(6) *Approval Criteria for Granting a Variance that is not a Minor Variance or for a Wireless Communication Facility. A variance must not be granted unless it can be shown that criterion (a) is met and three of the four approval criteria (b)-(e) are met for non-sign requests:*

The requested Variance is not a Minor Variance or for a Wireless Communication Facility. The requested Variance is from the fence setback requirements, specifically the setback standards in TDC 64.300, requiring a 50-foot setback for fences in the MBP zone.

TDC. 64.300 – Development Standards

Table 64-2

MINIMUM SETBACKS		
Fences	50 feet	From public right-of-way.

PGE provides electrical service, a basic utility in Tualatin², to the City of Tualatin and areas across the Portland Metro region. The Tonquin substation is a crucial element of substation improvements across PGE’s network to improve PGE’s service to the growing region.

The proposed fence setback Variance is to allow the perimeter security fence to be located up to 10 feet from the right-of-way on SW Blake Street and SW 124th Avenue. SW 124th Avenue is along the west property line and SW Blake Street follows the north and east property lines. This is a setback requirement specific to fences in the MBP zone, which must be 50 feet “from public right of way” per Table 64-2 in TDC 64.300.

In the MBP zone there are setbacks for each property line that generally apply to all structures. No buildings are a part of the proposed development, only electrical equipment and security fencing is proposed. Since a perimeter fence is proposed, the 50-foot fence setback applies to the east, west, and north property lines. The south property line is not subject to fence setback standards since it does not border public right-of-way. However, it is subject to a minimum setback for structures, which will be determined through the Architectural Review application.

The City’s setback standards in the MBP zone and the proposed setbacks for the Tonquin Substation are shown in Table I, along with the proposed setbacks.

Table 2. Proposed Setbacks

Setback From	MBP Zone Fence Setback from ROW	Proposed Fence Setback	Proposed Fence Length
SW 124 th	50 ft.	10 ft.	577 ft.
SW Blake Street (North)	50 ft.	10 ft.	754 ft.
SW Blake Street (East)	50 ft.	10 ft.	

Because the substation is critical infrastructure that requires protection, increased security measures, such as a secure perimeter fence, are needed. The proposed substation includes a perimeter fence located 10 feet from public right-of-way. The perimeter fence will be eight feet tall with an additional 1 foot (3 strands) of barbed wire. A 10-foot setback allows the substation to fit within the oddly shaped southwest corner of the site between SW Blake Street and SW 124th Avenue

The placement of Tonquin Substation at the proposed site is essential to supporting the Willamette Water Supply water treatment plant located directly west of the site and to improve reliability of PGE service to the area. In addition, locating the substation will provide essential service to the IOC, which is critical to PGE’s overall system resiliency and reliability improvements. The adjacent siting of the substation to the operations center will offer more reliable service due to the short length of service lines into the IOC building, which will allow undergrounding of these specific service lines. This will minimize the potential for interference resulting from downed power lines.

The applicable criteria for the fence setback variance are listed below. Since only three of four criteria are needed for approval, the applicant chooses not to respond to criterion (c).

² Consistent with the definition of basic utilities in TDC 39.620.

- (a) *A hardship is created by exceptional or extraordinary conditions applying to the property that do not apply generally to other properties in the same zone or vicinity and the conditions are a result of lot size or shape, topography, or other physical circumstances applying to the property over which the applicant or owner has no control.*

Response: The physical conditions of the site and unique design requirements of substation development are hardships for the site. The site consists of the small, oddly shaped section, separated from the IOC, and established by construction of the extension of SW Blake Street required of PGE to implement the City’s Transportation System Plan (TSP - Figure 4). The new street connects from SW 124th and goes through the southwest corner of the tax lot, then straightens out along the property line on the southeast corner of the site. This creates a defined space for the substation to be developed. Additionally, in developing a substation PGE has standards to meet safety best practices that are used throughout the industry. Those standard safety requirements include maintaining minimum clearances around all electrical equipment based on the voltage and function as set forth by the National Electrical Safety Code (NESC), in addition to providing sufficient clearance for vehicles to enter the site.

There are other pockets of developable area around the 43-acre IOC site; however, they are not adequate to host the substation due to shape and/or size. For the substation equipment and their required clearances, per the National Electrical Safety Code, approximately 150,000 square feet of unobstructed developable space is needed. (Note: The developable area needed does not account for space needed for required setbacks.) Generally, for substations, square or slightly rectangular shaped sites are the most efficient use of land. Based on these criteria for substation siting, no other space on the IOC meets this size or shape requirement. The area of available spaces on the site are shown in Figure 5a. and 5b. One section of available area abutting SW Tualatin-Sherwood Road is slightly too small to accommodate the substation. Regardless, given the nature the development forms surrounding the site, the substation is more compatible with the area along SW 124th Avenue compared to SW Tualatin-Sherwood Road. Ultimately, these design realities are beyond PGE’s control.

Considering existing site conditions (shape) and the unique requirements of an electrical substation that are out of the applicant’s control, a hardship would be incurred if the 50-foot standard setback along SW Blake Street and SW 124th Avenue was strictly applied.

The IOC received a variance to reduce the required setback on SW 124th Avenue to 20 feet, 10 feet more than the requested setback for the substation. The differential in setbacks for the IOC and substation frontage on SW 124th Avenue are primarily due to the different purposes they serve and operating voltages. The IOC is primarily an office building and control center that will be the hub of our control and communications systems, but it still operates at “normal” voltages, similar to any other office building. Meanwhile, the Tonquin Substation is a facility that converts high voltage (115,000 volts) transmission level electricity travelling on high voltage lines down to a lower voltage (13,000 volts) so that it can be distributed out to neighborhoods for power supply to homes and businesses via local distribution lines.

At the Tonquin Substation, the high voltage of the equipment in the substation drives the need for more space between each individual piece of equipment, in addition to the clearance required for safe travel by workers and vehicles within the station while it is energized. It also dictates the

distances needed between the equipment and other metal objects (fences) and trees, which can conduct electricity and cause arcing. This prevents accidental electrical arcing between equipment and either other equipment or people, which would cause safety concerns for workers and nearby residents/pedestrians and electrical service reliability issues. Therefore, due to higher voltages, the fence setback from the Tonquin Substation equipment is more than that of IOC, which results in different fence setbacks along the tax lot’s frontage on SW 124th Avenue.

Also note that the resulting reduced setback proposed for SW Blake and part of SW 124th is equal to the setback requirement of the city’s General Manufacturing Zone (MG), which abuts the site (tax lot) to the north and east. In that zone, fences are only required to be set back 10 feet from the right-of-way.

Figure 4. Blake Street Extension Proposed Alignment (Source: IOC (AR 19-0005) – Civil Site Plan)

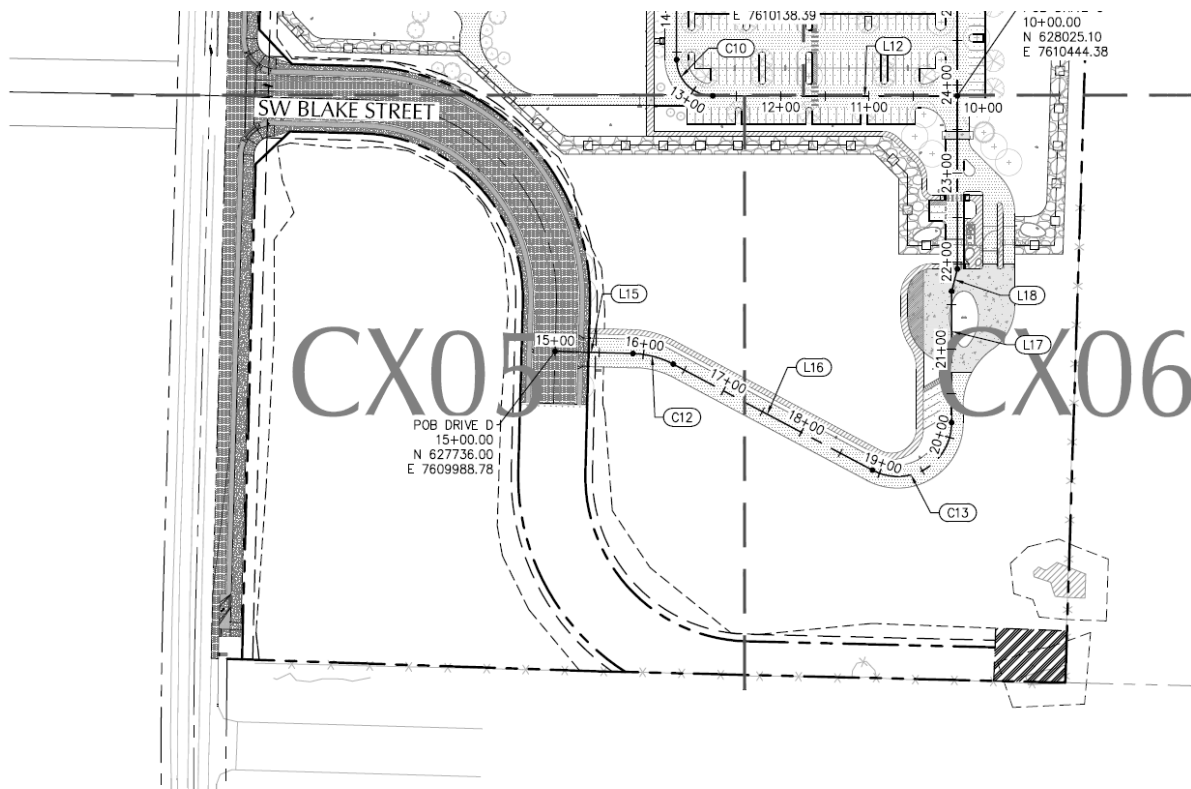


Figure 5a. Substation Siting Options (Source: IOC (AR 19-0005) – Civil Site Plan)

Note: Square footages shown are approximate values and do not account for required setbacks along right-of-ways.

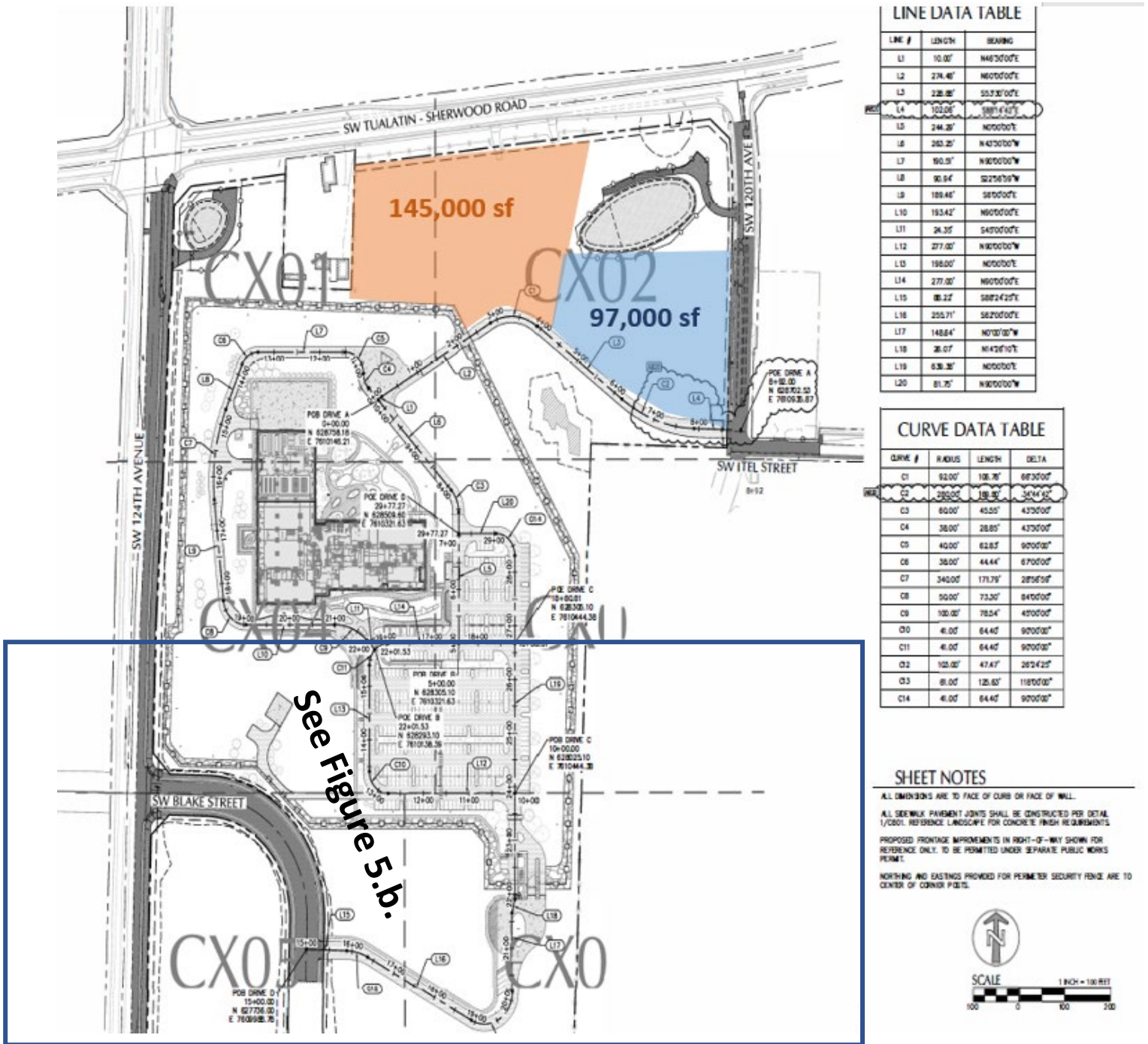
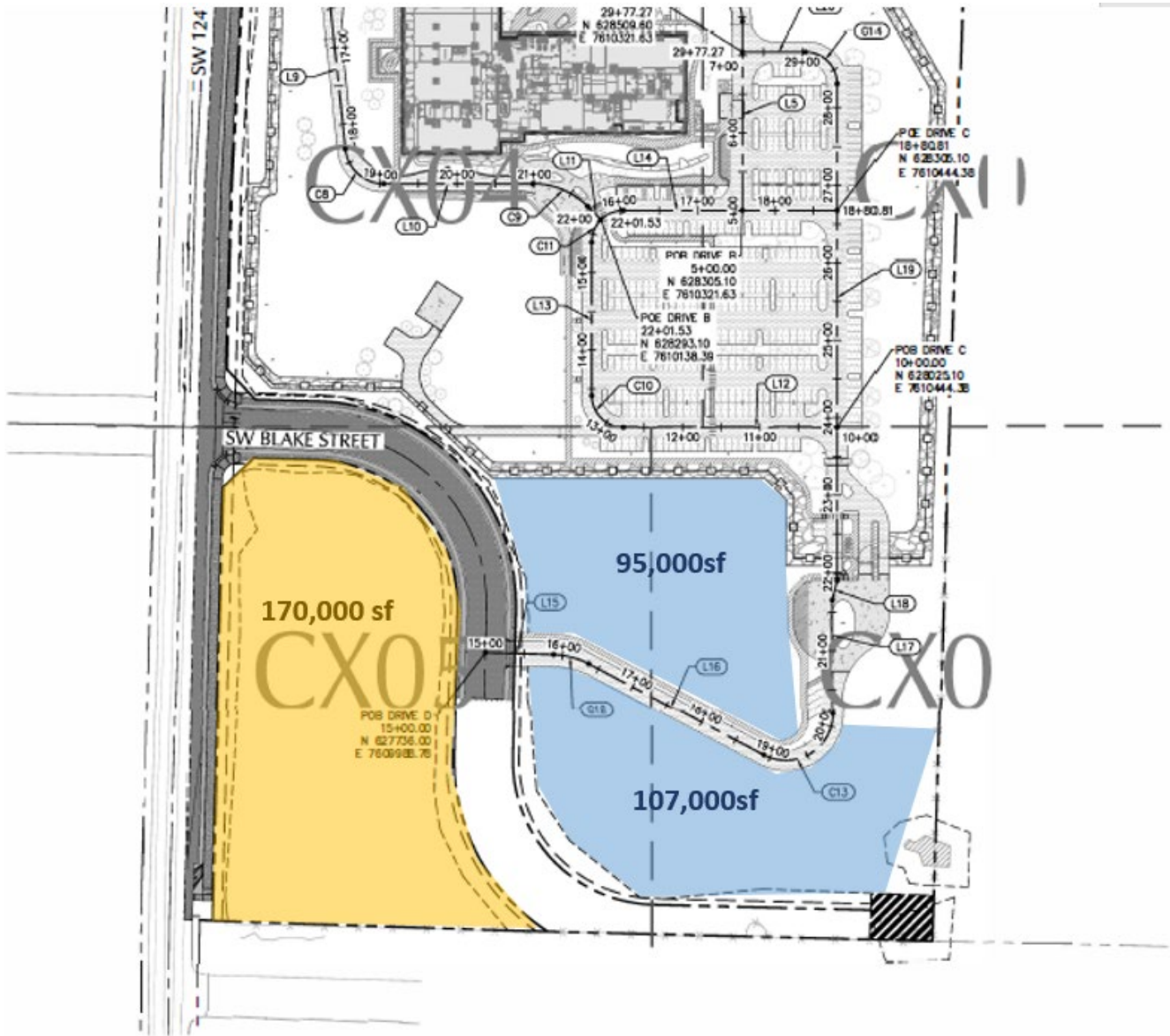


Figure 5.b. Substation Siting Options Continued (Source: IOC (AR 19-0005) – Civil Site Plan)

Note: Square footages shown are approximate values and do not account for required setbacks along right-of-ways.



- (b) *The hardship does not result from actions of the applicant, owner or previous owner, or from personal circumstances or financial situation of the applicant or owner, or from regional economic conditions.*

Response: The applicant has no control over the existing site conditions, including the location of the SW Blake Street extension. The location of the SW Blake Street extension was set by the Tualatin TSP. The hardship does not result from the actions of the applicant or their personal circumstances, rather it is a result of street location determined by the Tualatin TSP.

- (c) *The variance is necessary for the preservation of a property right of the applicant or owner substantially the same as is possessed by owners of other property in the same zone or vicinity.*

Response: The resulting reduced setback proposed from SW Blake Street and SW 124th Avenue is equal to the setback requirement of the city’s General Manufacturing Zone (MG), which abuts the site to the north and east of PGE’s property. In that zone, fences are only required to be set back 10 feet from the right-of-way. Therefore, the variance is necessary to preserve a property right for PGE that is substantially the same as is possessed by owners of other property in the vicinity of the site – namely on the property zoned MG.

- (d) *The variance must not be detrimental to the applicable objectives of the Tualatin Community Plan and must not be injurious to property in the zone or vicinity in which the property is located.*

Response: The request for relief from the setback requirement along SW Blake Street and SW 124th Avenue is not detrimental to the applicable objectives of the Tualatin Comprehensive Plan (TCP). [Note: The Tualatin Community Plan was recently updated and is now known as the Tualatin Comprehensive Plan.] It supports the following TCP goals and policies.

TCP Goal 5.1 Location of public services and utilities. Locate public services and utilities in a manner that minimizes negative impacts and enhances public benefits.

- *Policy 5.1.1 Government Services. Locate government offices in a central location that serves the public, except operations functions, which may be appropriately located in the industrial districts.*
- *Policy 5.1.2 Public safety. Locate facilities such as utilities and other critical infrastructure to minimize the risk of hazards the facility may pose to surrounding uses, or risks that natural or other hazards may pose to the facility and surrounding uses alike.*

The proposed use is a utility, which is located in an appropriate location considering surrounding uses. Its location in an industrial district (MBP zone) avoids any potential impacts to existing or future residential areas. While no future building will be provided, the substation equipment will be consistent with the industrial and manufacturing characteristics of the area. The requested variance would minimize impacts of the utility through its location in an industrial area and will enhance broad public benefits by improving the reliability and safety of the electrical service associated with PGE in Tualatin and its service area.

Chapter 10- Land Use

Manufacturing Business Park Planning District (MBP).

The MBP Planning District will be a mix of light industrial and high-tech uses in a corporate campus setting, consistent with MBP Planning District development standards... The district is intended to provide for an esthetically attractive working environment with campus-like grounds, attractive buildings, ample employee parking and other amenities appropriate to an employee oriented activity. It also is intended to protect existing and future sites for such uses by maintaining large lot configurations, a cohesive planned-development design and limiting uses to those that are of a nature that will not conflict with other industrial uses or nearby residential areas of the City.

The substation use is consistent with the objectives of the MBP district. The use is part of the larger IOC planned development owned and operated by PGE on the same site. Figure 1 shows the location of the IOC and the location of the proposed Tonquin Substation within the overall site. The substation has obvious industrial characteristics and is a crucial element of PGE’s electrical service network. The proposed improvements are needed to provide PGE’s service to the growing region and to the Willamette Water Supply project. The development of the substation is necessary in order to add capacity to the power delivery system, increase system reliability, meet the demands of growth, and continue to provide reliable and safe power to serve Portland and surrounding areas into the future.

(e) *The variance is the minimum remedy necessary to alleviate the hardship.*

Response: Electrical substation design and construction is unique because of the operational and safety elements that need to be included with the development. The site needs to be flat, free of obstructions that would interfere with operations or create a safety hazard, be secure from an access perspective (i.e., not general public access) and, in addition to the electrical equipment, be designed to allow on-site circulation internal to the fence line to allow for emergency access for repairs. As described above, there are no other areas of the 43-acre tax lot that provide adequate space or shape for siting the Tonquin substation.

The central portion of the substation is typically where the electrical equipment is located. Clearance around the equipment is needed for the reasons noted. Consistent with the National Electrical Safety Code (NESC) and PGE standards, fencing must be located a sufficient distance from the electrical equipment based on voltage and operational parameters. Given the design and safety constraints noted and the size and configuration of the site, the fencing needs to be located 10 feet from the property line as shown on the site plan to satisfy the minimum spacing and clearance requirements for substation design as set forth by the NESC. The Site Plan (shown in Figures 3 and 4) show the most compact design layout based on the NESC standards. Therefore, the Variance is the minimum remedy necessary to alleviate the hardship.

(7) *Approval Criteria for Granting a Variance for a Wireless Communication Facility. A variance to the separation or height requirements for wireless communication facilities must not be granted unless it can be shown that the following criteria are met. The criteria for granting a variance to the separation or height requirements for wireless communication facilities is limited to this section, and does not include the standard variance criteria of Section TDC 33.120(6), Approval Criteria for Granting a Variance that is not for a Wireless Communication Facility...*

Response: The proposed development does not include a Wireless Communication Facility. The criteria are not applicable.

VI. Conclusion

As noted at the beginning of this application, electrical substations are a unique, but critical, infrastructure use. Locating a new substation usually brings challenges from a land use permitting perspective. In the instance of the proposed Tonquin Substation, PGE has taken steps to include the future substation as a part of a larger PGE facility – the Integrated Operations Center. This location makes sense from a number of perspectives, including minimizing potential negative impacts of a new substation on existing and future residential areas, securing a location in an area

designated for future industrial and manufacturing uses, and supporting PGE’s long-term plans for the provision of electrical services in this area of the region.

As noted, the site does have some physical challenges related to site size and shape. These challenges, however, resulted from the extension of SW Blake Street into and ultimately through the site as determined by the City of Tualatin TSP. As a part of the approval of the IOC, PGE was required to bring SW Blake Street into the site in its current location. Construction of this portion of SW Blake Street and the ultimate extension of the street to PGE’s southern property line has created the size and shape of the property the Tonquin Substation needs to work with to construct the substation. In order to meet operational and safety standards and design considerations, the substation fence line needs to be located as shown in the proposed site plan (10’ setback). The location of the fence requires a Variance to the City’s setback standards. This application provides the findings needed to approve the setback Variance.