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# PUGET SOUND ENERGY

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## **Energize Eastside Project**

*Pole Finishes Report-City of Bellevue (South)*

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132155

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*Pole Finishes Report-City of Bellevue (South)*

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## ACRONYMS AND ABBREVIATIONS

|         |                                      |
|---------|--------------------------------------|
| FEIS    | Final Environmental Impact Statement |
| FHWA    | Federal Highway Administration       |
| I-90    | Interstate 90                        |
| KOP     | Key Observation Point                |
| kV      | kilovolt                             |
| Project | Energize Eastside Project            |
| PSE     | Puget Sound Energy                   |
| ROW     | right-of-way                         |

## 1.0 INTRODUCTION AND SUMMARY

Puget Sound Energy (PSE) proposes to upgrade approximately 16 miles of existing transmission line in the state of Washington through the cities of Redmond, Bellevue, Newcastle, and Renton. The Energize Eastside Project (Project) will consist of the rebuilding of an existing 115 kilovolt (kV) corridor to 230 kV and includes the construction of the new Richards Creek Substation, located in central Bellevue. The Project has completed the environmental review process required under the State Environmental Policy Act, concluding with the publication of the Final Environmental Impact Statement (FEIS) in March 2018 (City of Bellevue 2018). The Project is currently in the final design and permitting stage.

In support of the Project final design and permitting, POWER Engineers, Inc. has developed this report at the request of PSE to identify proposed transmission line structure (“pole”) finishes to mitigate visual impacts created as a result of the Project, specifically, the visual contrast created by the presence of new structures. PSE has incorporated the results of the visual analysis contained in the FEIS, methodologies utilized by the Federal Highway Administration (FHWA), and industry accepted visual mitigation methodologies. The results of this study are preliminary recommendations to be reviewed and further developed with each jurisdiction and will be incorporated into the final design specifications. Final field review and refinement of pole finishes will occur that may further refine or change the results of this study.

Pole finish options reviewed for the project include those identified in the FEIS; each of these finishes exhibit a different color that would blend or contrast with the visual setting of the Project depending on the existing viewing conditions and surrounding features. Pole finishes (and associated colors) considered in this study include:

- Galvanized steel-dulled (light gray)
- Self-weathering steel (reddish-brown to brown, depending on age)
- Pigmented surface coating, consisting of either a powder coat or liquid application (variable, depending on setting and appropriate/available color)

The existing setting within the entire Project area includes the presence of a 115 kV H-frame, wood pole corridor consisting of two structures within an existing right-of-way (ROW). This existing transmission line heavily influences the visual character of the corridor. The Project would replace the H-frame, wood pole structures with a fewer number of either: 1) duel single-circuit steel structures, or 2) single double-circuit monopole steel structures. The existing setting within the study area is dominated by:

- Single family, moderate density residential land use settings and viewpoints that would have open, direct and generally unobstructed views of the Project against a lightly to moderately vegetated backdrop.
- Naturalistic landscape settings where recreationists or traveler views would see the Project against a forested backdrop.
- Variable residential landscape settings that allow for skylined or backdropped views against a distant, light colored landscape.
- Single family, moderate density residential settings that allows for Project views from elevated positions above the line and backdropped against distant, scenic views.
- Mixed commercial/industrial or residential/institutional landscape settings where views would be set against a dark, vegetated, and tall backdrop that also provides substantial screening.

All these settings currently contain views from nearby sensitive viewers of the existing 115 kV H-frame, wood pole corridor.

Pole finishes selected for this Study Area include dulled galvanized steel and self-weathering steel denoted along three segments (A through C). No powder coated or painted structures are proposed. Segment A is proposed to be finished with 20 self-weathering steel, and includes Structure 5/8 (TAL-RIC) to Structure 7/2 (TAL-RIC) from the 128<sup>th</sup> Avenue SE located to the Forest Hill Neighborhood Park; Segment B is proposed to be finished with 16 dulled galvanized steel, and includes Structure 7/3 (TAL-RIC) to Structure 8/2 (TAL-RIC) between 132<sup>nd</sup> Avenue SE and SE 43<sup>rd</sup> St.; and Segment C is proposed to be finished with 35 self-weathering steel, and includes Structure 8/3 (TAL-RIC) to Structure 7/5 (SAM-RIC) between SE 43<sup>rd</sup> St. and SE 26<sup>th</sup> Street.

## **2.0 METHODOLOGY**

### **2.1 Approach**

How structures blend with the existing visual environment, background and setting is expressed as visual contrast. Visual contrast occurs from differences in form, line, color, or texture of vegetation, landform and structural (architectural) components of the landscape, and color is accepted as the most influential visual property of surfaces. The FHWA Guidelines for the Visual Impact Assessment of Highway Projects (FHWA 2015), the system utilized in the Project FEIS to determine the potential visual impacts of the Project, measures the loss of Visual Quality resulting from a project in terms of compatibility of, degree of, and sensitivity to, a project's impact. For the purposes of selecting pole finishes, the visual setting is primarily influenced by the existing architectural features, surrounding vegetation, landscape position of the project (e.g., ridgeline crossing), existing infrastructure, and backdrop. The visual setting determines the potential for Project visual contrast and its effect on visual quality.

The Project was segmented into five "jurisdictional" segments (Study Areas) for analysis of potential contrast and visual setting: Renton, Newcastle, South Bellevue, North Bellevue, and Redmond. The City of Bellevue is broken out into two Study Areas within the municipality: North Bellevue and South Bellevue. With the exception of North Bellevue and South Bellevue, these jurisdictional segments are located exclusively within the associated city. The Study Area detailed in this report is located within the City of Bellevue (South) as shown in Figure 1.

Visual resource specialists who have visited the Project area to develop photo simulations and conduct previous visual assessments participated and conducted this study. Photography taken of the Project area for these efforts, as well as secondary data sources such as Google Earth Street View, were utilized to determine pole finishes described in this study.

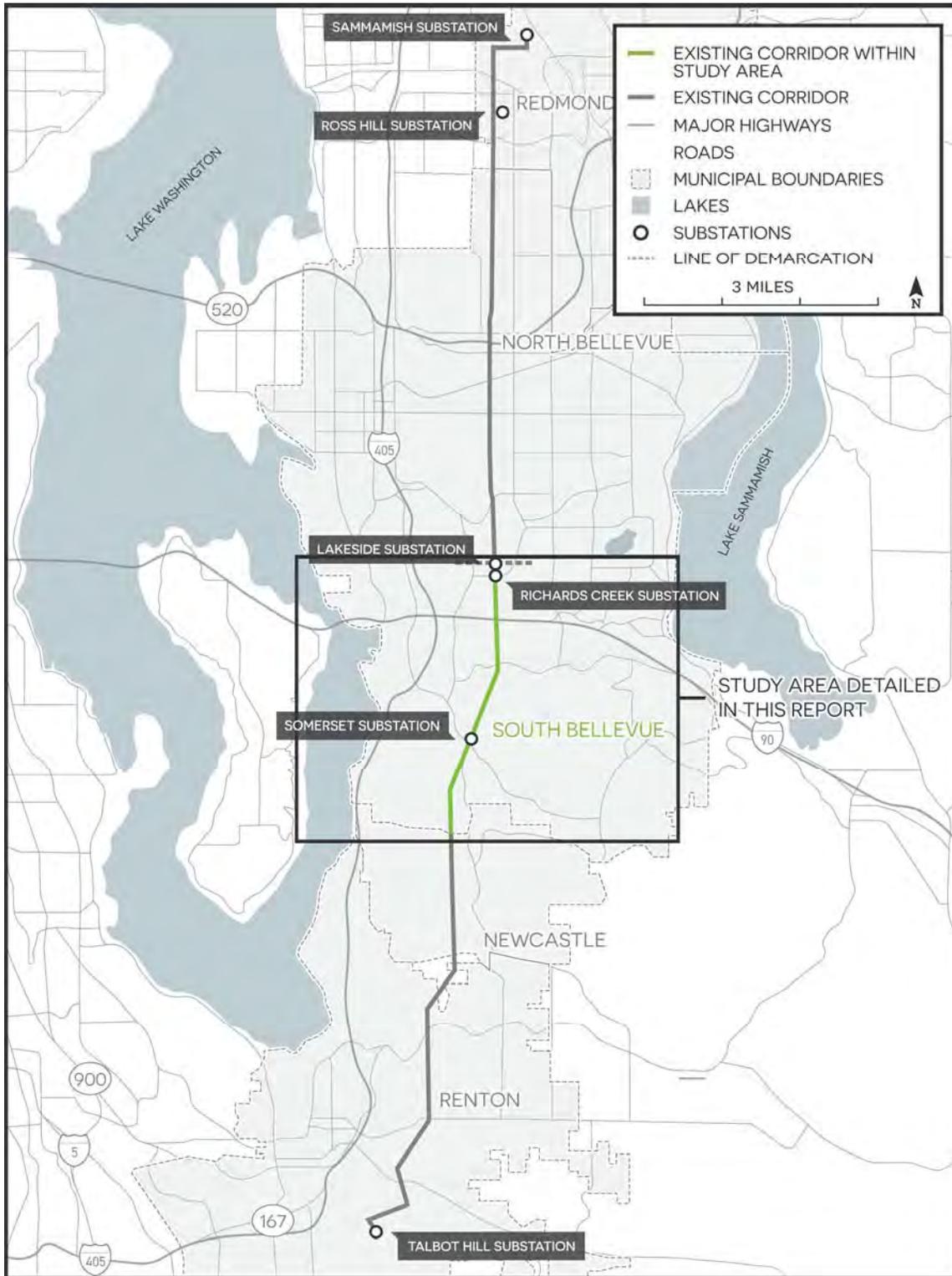
The following visual setting conditions were evaluated along the corridor to determine potential contrast and determine pole finish along Project segments (if applicable):

- Location of nearby sensitive viewers and visibility of the Project.
- Project position in the landscape.
- Background color.
- Color of surrounding features.
- Surrounding land use or land cover.

- Visual dominance of existing transmission line infrastructure remaining post-Project.

There may be differing visual settings along the corridor that may suggest conflicting potential pole finishes. For example, structures may be seen against a forested setting for some sensitive viewers adjacent to the Project but would also be seen against the skyline under some viewing conditions. In these cases, the dominant viewing condition affecting the greater number of viewers were assumed through a qualitative analysis. When viewed from a single viewpoint, variation in pole color, height and form can increase visual contrast and visual clutter in the corridor, potentially resulting in a higher visual impact in comparison to poles that are visually consistent. For this reason, changes in pole finish were proposed only where a different color would be beneficial for a lengthy segment of the proposed transmission line and the benefit of the different color outweighed the contrast created at the location where the color change is made. Changes in pole finish were not proposed for single poles or small groups of poles because the benefit of the color change would not outweigh the contrast created. Table 1 details the criteria used in the selection of final pole finishes.

**FIGURE 1     STUDY AREA**



Specific color selection for pigmented surface coating was considered only where the proposed color would differ substantially enough from a dulled-galvanized (light gray) or self-weathering (dark reddish brown to brown) finish to reduce visual (color) contrasts. The anticipated vendor, Trinity Meyer Utility Structures, utilizes the Carboline 8812 polyurethane powder coating system (Carboline 2018). The Carboline 8812 polyurethane powder coating system “Color Logic” palette (Carboline 2018), which is available in 104 colors, was reviewed and a preliminary Color Logic color was selected and compared against the existing condition in areas where dulled galvanized or weathering steel finish selection would potentially not be sufficient to minimize color contrasts. Refer to Appendix C for the Carboline Color Logic color palette.

**TABLE 1 POLE FINISH SELECTION CRITERIA**

| DOMINANT VIEWING CONDITION  | FINISH                                |
|---|---------------------------------------|
| <b>Background Color</b>   |                                       |
| Project views are dominated by a backdrop of dark color or mix of colors due to presence of vegetation or development.  | Weathering steel or powder coated*    |
| Project views are dominated by a backdrop of light color or mix of colors due to absence of vegetation or development; or views of Project would occur predominantly against the sky.   | Galvanized (dulled) or powder coated* |
| <b>Surrounding Feature Color</b>  |                                       |
| Project views are dominated by surrounding features that are a similar height or taller than the proposed structures and are darker in color.   | Weathering steel or powder coated*    |
| Project views are dominated by no surrounding features, are lighter in color, or are substantially shorter in height as the proposed structures.  | Galvanized (dulled) or powder coated* |
| <b>Surrounding Land Uses/Land Cover</b>   |                                       |
| Natural/Naturalistic -Coniferous Dominated; No Potential Skylining; Views Primarily from Adjacent Viewers.  | Weathering steel or powder coated*    |
| Natural/Naturalistic Landscape-Grass/Shrub Dominated; Direct views.   | Galvanized (dulled) or powder coated* |
| Natural/Naturalistic -Coniferous Dominated; Skylined Views Primarily from Distant Viewers.  | Galvanized (dulled) or powder coated* |
| Developed-Existing Transmission Infrastructure; Project views are dominated by a backdrop of dark color or mix of colors due to presence of vegetation or development and are dominated by surrounding features that are a similar height or taller than the proposed structures and are darker in color.   | Weathering steel or powder coated*    |
| Developed-Existing Transmission Infrastructure; Project views are dominated by a backdrop of light color or mix of colors due to absence of vegetation or development; or views of Project would occur predominantly against the sky and are dominated by no surrounding features, are lighter in color, or are substantially shorter in height as the proposed structures.         | Galvanized (dulled) or powder coated* |
| Developed-Residential-Low to Moderate Density/Low-Rise; Project views are dominated by a backdrop of dark color or mix of colors due to presence of vegetation or development and are dominated by surrounding features that are a similar height or taller than the proposed structures and are darker in color.   | Weathering steel or powder coated*    |
| Developed-Residential-Low to Moderate Density/Low-Rise; Project views are dominated by a backdrop of light color or mix of colors due to absence of vegetation or development; or views of Project would occur predominantly against the sky and are dominated by no surrounding features, are lighter in color, or are substantially shorter in height as the proposed structures. | Galvanized (dulled) or powder coated* |
| Developed-Residential-High Density/High Rise; Project views are dominated by a backdrop of dark color or mix of colors due to presence of vegetation or development and are dominated by surrounding features that are a similar height or taller than the proposed structures and are darker in color.   | Weathering steel or powder coated*    |

| DOMINANT VIEWING CONDITION  | FINISH                                |
|---|---------------------------------------|
| Developed-Residential-High Density/High Rise; Project views are dominated by a backdrop of light color or mix of colors due to absence of vegetation or development; or views of Project would occur predominantly against the sky and are dominated by no surrounding features, are lighter in color, or are substantially shorter in height as the proposed structures. | Galvanized (dulled) or powder coated* |
| Developed-Commercial or Industrial; Project views are dominated by a backdrop of dark color or mix of colors due to presence of vegetation or development and are dominated by surrounding features that are a similar height or taller than the proposed structures and are darker in color.   | Weathering steel or powder coated*    |
| Developed-Commercial or Industrial; Project views are dominated by a backdrop of light color or mix of colors due to absence of vegetation or development; or views of Project would occur predominantly against the sky and are dominated by no surrounding features, are lighter in color, or are substantially shorter in height as the proposed structures.           | Galvanized (dulled) or powder coated* |

\*See powder coating discussion below. Powder coated poles are proposed only where the proposed color would differ enough from dulled galvanized or weathering steel to substantially reduce color contrast.

## 2.2 Potential Pole Finish Options

Finishes have been specified by location to better blend with the surrounding environment using the methodology discussed above. In some areas, where there are few trees as tall as the transmission line poles (and therefore the poles would be mostly viewed against the sky), or where the background is otherwise light in color, dulled galvanized poles could have lower contrast than poles with self-weathering finish.

### 2.2.1 Galvanized Steel

Hot-dip galvanizing is the process of coating fabricated steel by immersing it in a bath of molten zinc to create a zinc barrier that will protect the underlying base steel. Benefits of hot-dip galvanizing include corrosion protection, durability, abrasion resistance, longevity in varied environments and aesthetics. Hot-dip galvanizing is a total immersion process meaning the steel is fully submerged into cleaning solutions and the molten zinc coating all interior and exterior surfaces. This complete coverage ensures even the insides of hollow and tubular structures and the threads of fasteners are coated. As corrosion tends to occur at an increased rate on the inside of hollow structures where humidity and condensation occur, interior coverage is very beneficial. Hollow structures that are painted have no corrosion protection on the inside. Hot-dip galvanizing produces a gray finish. As the galvanized steel weathers and the zinc patina forms, the coating becomes a uniform matte gray. Galvanized steel is initially very shiny and will dull with age. However, the poles can be “dulled” to be non-reflective and contrast less with their surroundings. Dulled, galvanized steel typically results in a lower level of contrast with the sky or lighter backgrounds than darker finish options.

In harsh environments where there is a lot of moisture mixed with pollutants such as salts, the zinc can be consumed quickly leaving the steel unprotected. In these situations, some type of barrier coating applied over the zinc is needed.

### 2.2.2 Self-Weathering Steel

Weathering steels are formulated, using alloying metals such as nickel, copper and molybdenum to create a steel that will oxidize and create its own barrier coating. Unlike regular carbon steels that can rust and flake away until nothing is left, weathering steels rust to a point and stop. The oxide that is formed by the rusting process adheres tightly to the underlying steel, forming a patina that seals the pole against further

moisture penetration that can cause further rusting. Self-weathering steel poles start out with the expected gray coloring. As the steel poles oxidize, they progress to an orange coloring and eventually to a deep dark brown coloring. The time it takes for this color transition is dependent on the climate where the poles are installed. In warm, humid climates the process may take a year or less, but in cold, dry climates it may take many years. Any incidental damage to this oxide coating heals itself, reducing the need for any type of maintenance.

Self-weathering steel provides a more organic look that galvanized steel that helps poles to blend into wooded areas. It has been proposed for sections of this project where forested conditions occur, and the deep brown coloring would blend well with the surrounding vegetation and background.

Self-weathering steel does not perform well in areas that would keep the steel continuously wet or where there are a lot of pollutants such as salts. Self-weathering steel should not be buried in soil without some type of barrier coating.

### **2.2.3 Powder Coated Steel**

A pigmented surface coating could potentially be used on structures under certain circumstances where the contrasts created by a dulled galvanized structure or self-weathering steel structure could be substantially decreased. Currently, the standard practice for applying color to the surfaces of tubular steel transmission poles at the factory is a process known as powder coating. In this process, a fine, granular material containing binders, resins, pigments, fillers and additives is electrostatically applied to the surface of the steel. The steel is then baked, during which time the powder melts and flows, eventually fusing to the metal and creating a hard and non-porous coating. Powder coating can be applied on galvanized surfaces or can be used on ungalvanized steel.

Advantages of powder coating are that finishes are available in a variety of colors, it provides barrier to protect from corrosion, and it is chemical and abrasion resistant. Disadvantages include fading due to sun exposure as the ultraviolet rays break down the color pigments. Powder coating offers barrier protection, but if the finish is scratched, punctured or otherwise compromised, corrosion will occur.

Application of powder coating over galvanized steel can extend corrosion protection longer than either process used independently. As previously noted, the anticipated vendor, Trinity Meyer Utility Structures, utilizes Carboline 8812 polyurethane powder coating system (Carboline 2018) for their colorized transmission structures.

### **2.2.4 Painted Steel**

There are a variety of paint systems that can be used on steel poles. Most are multi-coat systems using a zinc-rich primer and a barrier topcoat. Paint systems are generally chosen to provide a choice of color. Paint is typically the least durable finish option with the shortest corrosion protection life span. Paint will eventually degrade, resulting in fading and potentially flaking from the poles, resulting in a potentially unsightly finish and requiring reapplication of paint in the field. Painted structures pose additional challenges from a maintenance perspective, such as potential line operation “outages” during periodic repainting and the presence of maintenance vehicles within the ROW during repainting for extended periods of time.

Due to the lower level of durability and long-term corrosion protection in comparison to the other pole finish options, painted steel was eliminated from consideration and powder coating was carried forward as a colorized surface coating option along with the galvanized steel finish and self-weathering steel options.

## **3.0 POLE FINISH SEGMENTS**

### **3.1 Overview**

This Section discusses each Pole Finish Segment proposed within the City of Bellevue (South). There is a total of three Pole Finish Segments: Segment A, Segment B, and Segment C (see Figure 2 at the end of this report). Proposed pole finishes, dominant viewing condition, and associated reference points for each structure within the City of Bellevue (South) is detailed in Appendix A. The table contained within Appendix A generally progresses from south to north, starting from the City's southern border.

### **3.2 Segment A**

#### **3.2.1 Viewing Conditions and Setting**

Segment A begins at the City of Bellevue's southern border with the City of Newcastle and extends to the structure adjacent to Forest Hill Park Neighborhood Park (see Figure 3 [at the end of this report] and Appendix B-Key Observation Point [KOP] Central 38). This section of the Project is dominated by one of two conditions: 1) single family, moderate density residential land use that would have open, direct and generally unobstructed views of the Project against a lightly to moderately vegetated setting and not typically be skylined; or 2) views that would be seen against a forest backdrop from recreationists or travelers using Coal Creek Park and trails or Coal Creek Parkway. There would be some potential skylining of the Project along this segment by viewers that are offset from the Project, but typically only the highest portions of structures would be seen against the sky. Most of the views would be direct and adjacent from the ROW and seen against sections of landscape or against forested landscape elements that are darker in color. Currently, the existing 115 kV H-frame, wood pole structures substantially influence the character of the area, deviating from the moderate density, single family and naturalistic landscape settings by introducing industrialized features into the landscape.

#### **3.2.2 Proposed Pole Finish and Rationale**

Because dominant views are against a mixed forested or highly vegetated backdrop with taller, darker landscape elements, and because there is limited opportunity for skylined views, self-weathering steel would help blend the structures against the backdrop while minimizing potential contrasts. Optionally, the use of a powder coated structure, may further reduce contrasts with the surrounding landscape, but opinions expressed by the municipality and general public makes this option less desirable and would not significantly reduce impacts. Dulled galvanized structures would minimize contrasts for skylined views under some viewing conditions, but the use of this finish would create stronger structural contrasts for adjacent sensitive viewers. A total of 20 structures are proposed to be finished with self-weathering steel.

### **3.3 Segment B**

#### **3.3.1 Viewing Conditions and Setting**

Segment B begins at Forest Hill Park Neighborhood Park and extends to SE 43<sup>rd</sup> Street, and would be seen from moderate density, single family residences and by public and private recreational viewers (see Figure 4 at the end of this report). The vicinity of the ROW typically has low to moderate densities of landscape vegetation, and the vegetation that does occur is dominated by lower growing trees and shrubs that do not provide significant backdrop.

**TABLE 2 SUMMARY OF POLE FINISHES**

| POLE FINISH SEGMENT | STRUCTURE # RANGE                  | PROPOSED FINISH   | NO. OF STRUCTURES WITH FINISH |
|---------------------|------------------------------------|-------------------|-------------------------------|
| A- S. Bellevue      | 5/8 (TAL-RIC) though 7/2 (TAL-RIC) | Self-Weathering   | 20                            |
| B- S. Bellevue      | 7/3 (TAL-RIC) though 8/2 (TAL-RIC) | Dulled Galvanized | 16                            |
| C- S. Bellevue      | 8/3 (TAL-RIC) though 7/5(SAM-RIC)  | Self-Weathering   | 35                            |

The topography in the area allows for skylined (see Appendix B, KOP Central 15, KOP Central 18, KOP Central 30, KOP Central 39 and KOP Central 40) or backdropped views against a distant, lighter colored landscape. The Project would be elevated in the landscape and would be seen by a high number of viewers that are positioned above the line (e.g., superior views) backdropped against views of Lake Washington, the downtown Bellevue skyline, the downtown Seattle skyline, and Puget Sound in the distance. Currently, the existing 115 kV H-frame, wood pole structures substantially influence the character of the area, deviating from the moderate density, single family setting by introducing industrialized features into the landscape.

### 3.3.2 Proposed Pole Finish and Rationale

Because dominant views would be against the sky for adjacent and distant viewers and because there is minimal tall, dark adjacent vegetative backdrop, a dulled-galvanized steel structure is proposed. This finish would be lighter in color and would typically create weaker contrasts than darker colored structures with a self-weathering steel finish. A total of 16 structures would be finished with dulled galvanized steel. Changing from self-weathering steel structures to dulled galvanized structures would cause minimal visual impacts because views of the two differing structures finish at the transition area between Segment A and Segment B and would not typically occur within the same viewshed. The last self-weathering structure (7/2 TAL-RIC) within Segment A would be viewed primarily from sensitive locations adjacent to the corridor (e.g. Forest Hill Park Neighborhood Park). Views of the first dulled galvanized structure (7/3 TAL-RIC) within Segment B would primarily occur from positions where the structured would be viewed against the sky for a majority of viewers.

## 3.4 Segment C

### 3.4.1 Viewing Conditions and Setting

This segment begins north of SE 43<sup>rd</sup> Street and extends to the Lakeside Substation, crossing an area of moderate density single family residential and institutional land use south of Interstate 90 (I-90) (see Figure 5 at the end of this report). North of I-90, the corridor becomes mixed commercial and industrial in character. Topography flattens as compared to Segment B, and the opportunity for skyline views of structures minimizes. Much of the landscape surrounding the ROW corridor has substantial tall vegetation. Views of the project, such as those from Tyee Middle School (see Appendix B- KOP South 24 and KOP South 25), would be set against this darker vegetated backdrop, and some skylining of the Project may occur. However, views such as the one shown in Appendix B- KOP South 25 would be the dominant condition. North of I-90, direct, but partially screened views from the commercial and industrial area would be seen against a substantially forested landscape. Currently, the existing 115 kV H-frame, wood pole structures substantially influence the character of the area, deviating from the single-family residential setting by introducing industrialized features into the landscape south of the I-90 corridor. The

existing transmission lines substantially contribute to the industrial character of the area in the vicinity of the Lakeside and Richards Creek Substations.

### **3.4.2 Proposed Pole Finish and Rationale**

Because the Project would typically be viewed against a taller, darker backdrop, because sensitive viewers would directly see the structures, and because there would be minimal skylining occurring along the Segment, self-weathering steel structures are the most appropriate finish for Segment C. Galvanized structures would minimize contrasts for skylined views but would create stronger color contrasts for adjacent sensitive viewers. A total of 35 structures are proposed to be finished with self-weathering steel. Changing from dulled galvanized structures to self-weathering steel structures would cause minor visual impacts because views of the two differing structures at the structure finish transition area between Segment B and Segment C could occur within the same viewshed for nearby sensitive viewers. However, the selection of the structure finishes within the two Segments mitigates impacts for viewers that would have the highest visibility and that would potentially be impacted to the greatest extent.

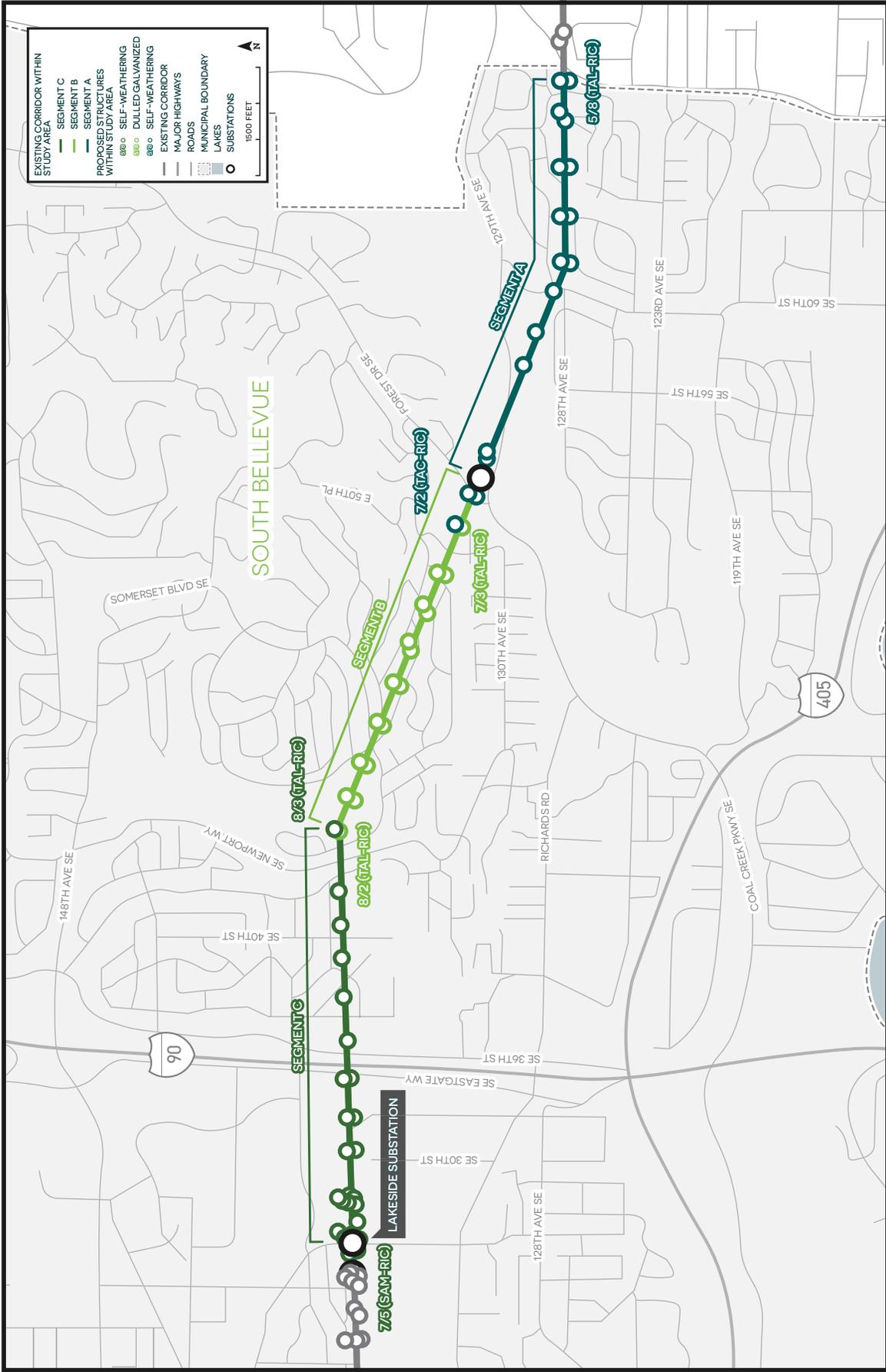
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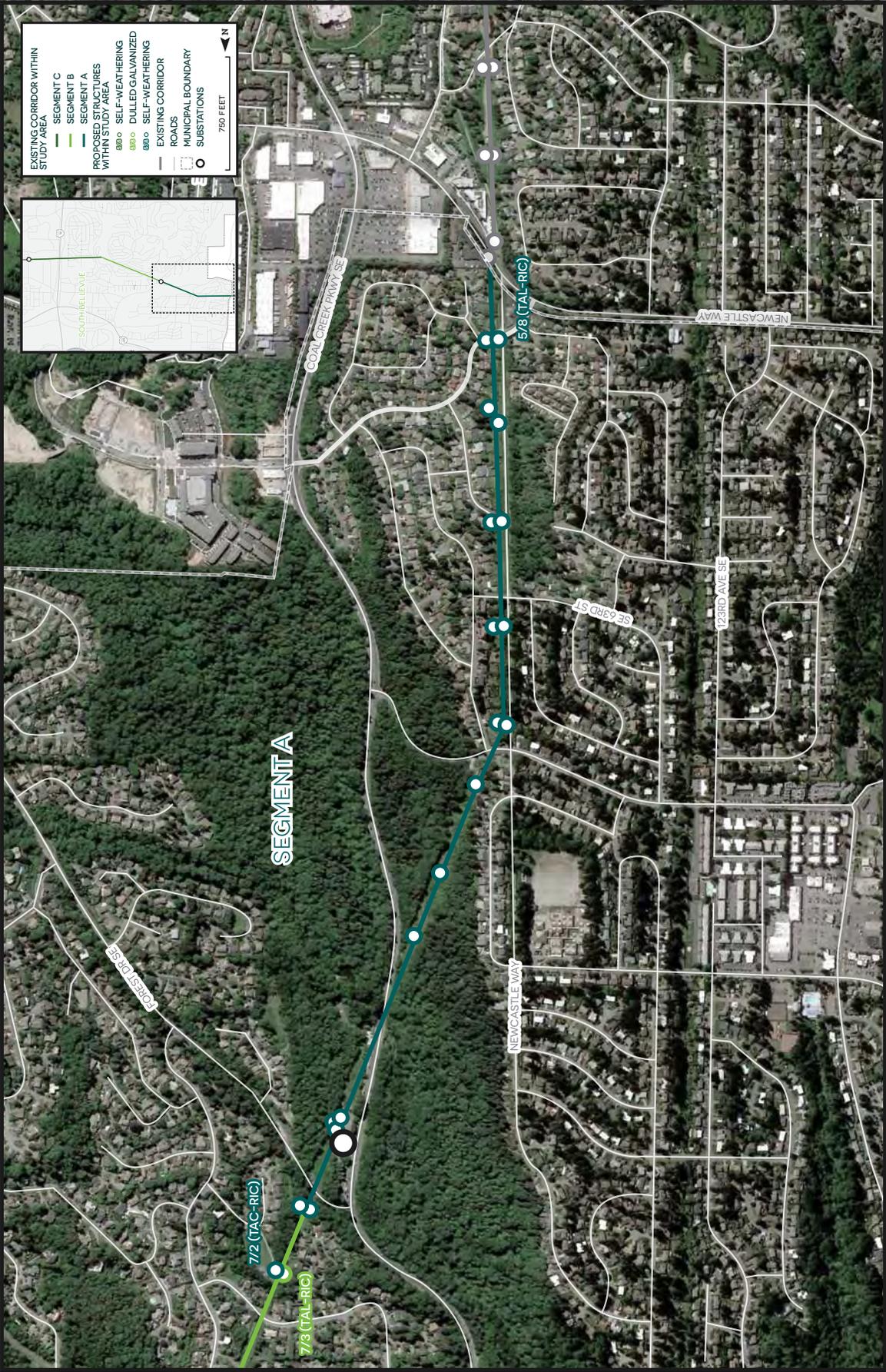
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**FIGURE 2 POLE FINISH SEGMENTS**



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FIGURE 3 SEGMENT A



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FIGURE 4 SEGMENT B



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## **APPENDIX A FINISHES FOR ALL STRUCTURES WITHIN BELLEVUE (SOUTH)**

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| STRUCTURE #                  | REFERENCE POINT                                  | DOMINANT VIEWING CONDITION  | PROPOSED FINISH   |
|------------------------------|--|---|-------------------|
| <b>Pole Finish Segment A</b> |  |   |                   |
| 5/8 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately to highly vegetated right-of-way (ROW) edge/residential structure.       | Self-Weathering   |
| 5/9 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately to highly vegetated ROW edge/residential structure.                      | Self-Weathering   |
| 6/1 (TAL-RIC #1 & #2)        | SE 63 <sup>rd</sup> St Crossing                  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately to highly vegetated ROW edge/residential structure.                      | Self-Weathering   |
| 6/2 (TAL-RIC #1 & #2)        | SE 63 <sup>rd</sup> St Crossing                  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately to highly vegetated ROW edge/residential structure.                      | Self-Weathering   |
| 6/3 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately to highly vegetated ROW edge/residential structure.                      | Self-Weathering   |
| 6/4 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately to highly vegetated ROW edge/residential structure.                      | Self-Weathering   |
| 6/5 (TAL-RIC #1 & #2)        |  | Heavily forested landscape, direct views from travel corridor and recreationists; minimal or no skylining.  | Self-Weathering   |
| 6/6 (TAL-RIC #1 & #2)        | Coal Creek Parkway Crossing                      | Heavily forested landscape, direct views from travel corridor and recreationists; minimal or no skylining.  | Self-Weathering   |
| 6/7 (TAL-RIC #1 & #2)        | Coal Creek Parkway Crossing; Somerset Substation | Heavily forested landscape, direct views from travel corridor and recreationists; minimal or no skylining.  | Self-Weathering   |
| 7/1 (TAL-RIC #1 & #2)        |  | Heavily forested landscape, direct views from travel corridor and recreationists; minimal or no skylining.  | Self-Weathering   |
| 7/2 (TAL-RIC #1 & #2)        | Forest Hill Neighborhood Park                    | Moderate-heavily vegetated landscape, direct views from travel corridor and recreationists; minimal or no skylining.  | Self-Weathering   |
| <b>Pole Finish Segment B</b> |  |   |                   |
| 7/3 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW | Dulled Galvanized |

| STRUCTURE #                  | REFERENCE POINT                        | DOMINANT VIEWING CONDITION   | PROPOSED FINISH   |
|------------------------------|--|--|-------------------|
| 7/4 (TAL-RIC #1 & #2)        | Somerset Dr. SE Crossing               | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW. | Dulled Galvanized |
| 7/5 (TAL-RIC #1 & #2)        | Somerset Dr. SE Crossing               | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW. | Dulled Galvanized |
| 7/6 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW. | Dulled Galvanized |
| 7/7 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW. | Dulled Galvanized |
| 7/8 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW. | Dulled Galvanized |
| 8/1 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW. | Dulled Galvanized |
| 8/2 (TAL-RIC #1 & #2)        | Sumerset Blvd./SE Newport Way Crossing | Adjacent to moderate density residential; to minimal vegetative screening; partial to full structure potentially visible against sky for adjacent and distant viewers; moderately vegetated, low vegetation along ROW. | Dulled Galvanized |
| <b>Pole Finish Segment C</b> |  |  |                   |
| 8/3 (TAL-RIC #1 & #2)        | Sumerset Blvd./SE Newport Way Crossing | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately vegetated ROW edge/residential structures; minimal skylining.             | Self-Weathering   |
| 8/4 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately vegetated ROW edge/residential structures; minimal skylining.             | Self-Weathering   |
| 8/5 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately vegetated ROW edge/residential structures; minimal skylining.             | Self-Weathering   |
| 8/6 (TAL-RIC #1 & #2)        |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full  | Self-Weathering   |

| STRUCTURE #                           | REFERENCE POINT                                    | DOMINANT VIEWING CONDITION   | PROPOSED FINISH |
|---------------------------------------|--|--|-----------------|
|                                       |  | structure potentially backdropped against moderately vegetated ROW edge/residential structures; minimal skylining.   |                 |
| 8/7 (TAL-RIC #1 & #2)                 |  | Adjacent to moderate density residential; minimal vegetative screening; partial to full structure potentially backdropped against moderately vegetated ROW edge/residential structures; minimal skylining.                         | Self-Weathering |
| 8/8 (TAL-RIC #1 & #2)                 | I-90 crossing                                      | Adjacent to transportation/commercial; minimal vegetative screening; partial to full structure potentially backdropped against moderately vegetated ROW edge.  | Self-Weathering |
| 8/9 (TAL-RIC #1 & #2) 0/5B (LAK-GOO)  | I-90 crossing                                      | Adjacent to transportation/commercial; minimal vegetative screening; partial to full structure potentially backdropped against moderately vegetated ROW edge.  | Self-Weathering |
| 8/10 (TAL-RIC #1 & #2) 0/5A (LAK-GOO) |  | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 9/1 (TAL-RIC #1 & #2)                 | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 9/2 (TAL-RIC #1 & #2)                 | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 0/5C (LAK-GOO)                        | I-90 crossing                                      | Adjacent to commercial/industrial and existing transmission infrastructure (light color/galvanized); minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge. | Self-Weathering |
| 0/5 (LAK-GOO)                         | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 0/4 (LAK-GOO)                         | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 0/3 (LAK-GOO)                         | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 0/2 (LAK-GOO)                         | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 0/1 (LAK-GOO)                         | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial and existing transmission infrastructure (light color/galvanized); minimal vegetative  | Self-Weathering |

| STRUCTURE #                               | REFERENCE POINT                                    | DOMINANT VIEWING CONDITION   | PROPOSED FINISH |
|---|--|--|-----------------|
|   |  | screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   |                 |
| 7/9 (SAM-RIC #2)                          | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 7/8 (SAM-RIC #1 & #2)                     | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 7/7 (SAM-RIC #1 & #2)<br>0/1 (RIC-LAK #1) | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 7/6 (SAM-RIC #1&#2)                       | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 7/5 (SAM-RIC #1&#2)                       | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial and existing transmission infrastructure (light color/galvanized); minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge. | Self-Weathering |
| 0/2 (RIC-LAK#1)                           | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial; minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge.   | Self-Weathering |
| 8/7 (SHU-LAK)                             | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial and existing transmission infrastructure (light color/galvanized); minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge. | Self-Weathering |
| 8/8 (SHU-LAK)                             | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial and existing transmission infrastructure (light color/galvanized); minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge. | Self-Weathering |
| 8/9 (SHU-LAK)                             | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial and existing transmission infrastructure (light color/galvanized); minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge. | Self-Weathering |
| 8/10 (SHU-LAK)                            | Richards Creek Substation/Lakeside Substation Area | Adjacent to commercial/industrial and existing transmission infrastructure (light color/galvanized); minimal vegetative screening; partial to full structure potentially backdropped against moderately-highly vegetated ROW edge. | Self-Weathering |

## **APPENDIX B PHOTO SIMULATIONS WITHIN BELLEVUE (SOUTH)**



Existing Conditions



Conceptual Project

POWER ENGINEERS  
8/4/2017

Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review

|                       |                                   |
|-----------------------|-----------------------------------|
| Address               | <b>13233 SE 51st PI, Bellevue</b> |
| Date                  | <b>7/24/2017</b>                  |
| Time                  | <b>2:21 PM</b>                    |
| Viewing Direction     | <b>Northwest</b>                  |
| Existing Pole Heights | <b>~55 feet</b>                   |
| Proposed Pole Heights | <b>~65 feet</b>                   |

# KOP CENTRAL 38 SEGMENT 2



Existing Conditions



Conceptual Project

 PSE POWER SYSTEMS

7/6/2017

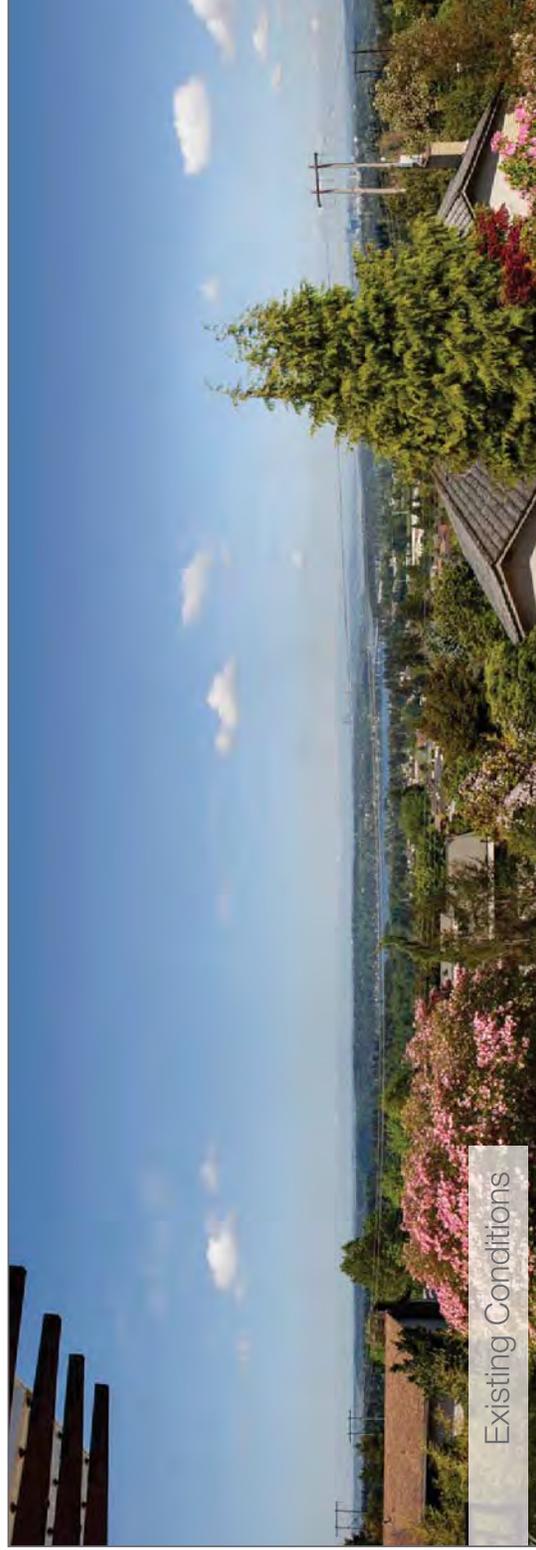
Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review

|                       |                                    |
|-----------------------|------------------------------------|
| Address               | <b>4489 137th Ave SE, Bellevue</b> |
| Date                  | <b>4/10/2014</b>                   |
| Time                  | <b>9:32 AM</b>                     |
| Viewing Direction     | <b>North</b>                       |
| Existing Pole Heights | <b>~55 feet</b>                    |
| Proposed Pole Heights | <b>~80 feet</b>                    |

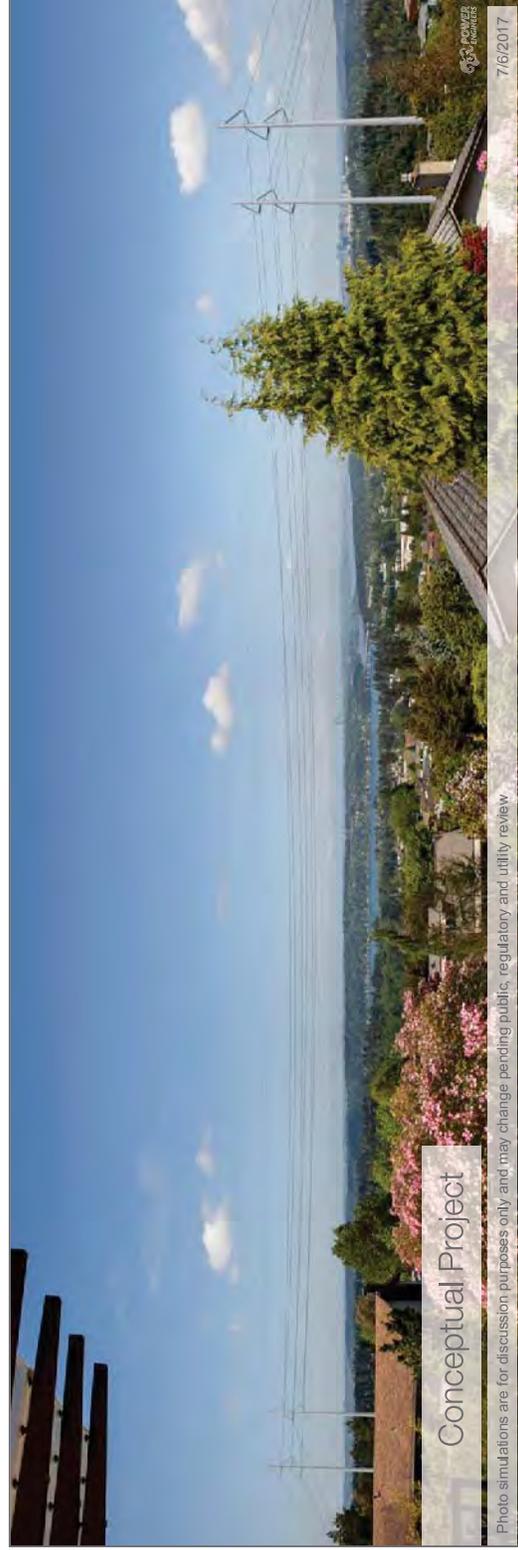
# KOP CENTRAL 15 SEGMENT 2

# KOP CENTRAL 18 SEGMENT 2

|                       |                             |
|-----------------------|-----------------------------|
| Address               | 4411 137th Ave SE, Bellevue |
| Date                  | 5/7/2014                    |
| Time                  | 10:53 AM                    |
| Viewing Direction     | Northwest                   |
| Existing Pole Heights | ~55 feet                    |
| Proposed Pole Heights | ~80 feet                    |



Existing Conditions



Conceptual Project

Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review.

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7/6/2017

energizeEASTSIDE





Existing Conditions



Conceptual Project

Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review

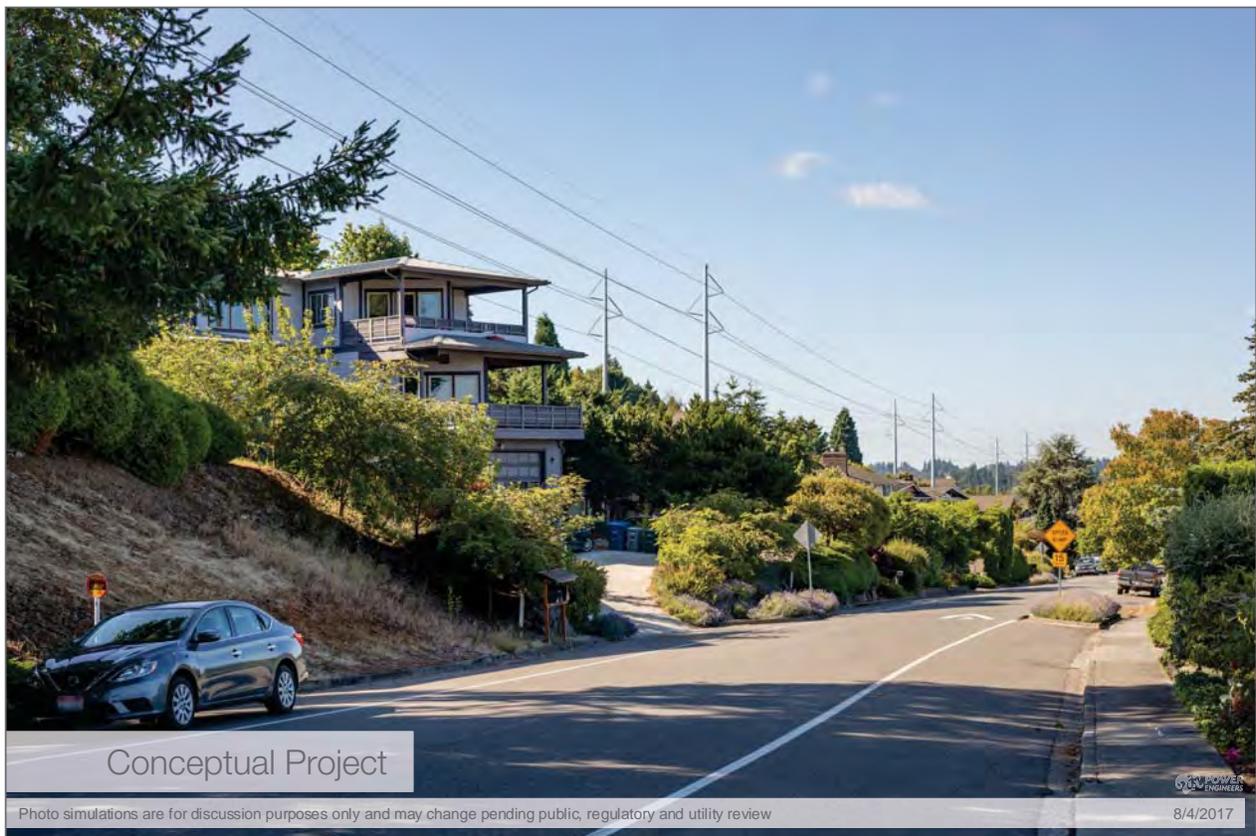
7/13/2017

|                       |                                      |
|-----------------------|--------------------------------------|
| Address               | <b>4730 134th Place SE, Bellevue</b> |
| Date                  | <b>8/24/2016</b>                     |
| Time                  | <b>3:28 PM</b>                       |
| Viewing Direction     | <b>West</b>                          |
| Existing Pole Heights | <b>~44 feet</b>                      |
| Proposed Pole Heights | <b>~75 feet</b>                      |

# KOP CENTRAL 30 SEGMENT 2



Existing Conditions



Conceptual Project

Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review

8/4/2017

|                       |                                      |
|-----------------------|--------------------------------------|
| Address               | <b>4411 Somerset Dr SE, Bellevue</b> |
| Date                  | <b>7/24/2017</b>                     |
| Time                  | <b>9:26 AM</b>                       |
| Viewing Direction     | <b>South</b>                         |
| Existing Pole Heights | <b>~55 feet</b>                      |
| Proposed Pole Heights | <b>~75 feet</b>                      |

# KOP CENTRAL 39 SEGMENT 2



Existing Conditions



Conceptual Project

Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review

8/4/2017

|                       |                                   |
|-----------------------|-----------------------------------|
| Address               | <b>13300 SE 44th Pl, Bellevue</b> |
| Date                  | <b>7/24/2017</b>                  |
| Time                  | <b>2:05 PM</b>                    |
| Viewing Direction     | <b>East</b>                       |
| Existing Pole Heights | <b>~55 feet</b>                   |
| Proposed Pole Heights | <b>~75 feet</b>                   |

# KOP CENTRAL 40 SEGMENT 2



Existing Conditions



Conceptual Project

Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review

7/13/2017

|                       |                                    |
|-----------------------|------------------------------------|
| Address               | <b>13630 SE Allen Rd, Bellevue</b> |
| Date                  | <b>3/30/2016</b>                   |
| Time                  | <b>1:44 PM</b>                     |
| Viewing Direction     | <b>Northeast</b>                   |
| Existing Pole Heights | <b>~60 feet</b>                    |
| Proposed Pole Heights | <b>~95 feet</b>                    |

# KOP SOUTH 24 SEGMENT 2



Existing Conditions



Conceptual Project

Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review

7/13/2017

|                       |                                    |
|-----------------------|------------------------------------|
| Address               | <b>13744 SE Allen Rd, Bellevue</b> |
| Date                  | <b>3/30/2016</b>                   |
| Time                  | <b>1:42 PM</b>                     |
| Viewing Direction     | <b>Northeast</b>                   |
| Existing Pole Heights | <b>~65 feet</b>                    |
| Proposed Pole Heights | <b>~90 feet</b>                    |

# KOP SOUTH 25 SEGMENT 2

## **APPENDIX C    CARBOLINE 8812 COLOR LOGIC**

# Color Logic

## Intelligent Color Selection



# directions

## new color developments and trends



# utility toolbox

## maintenance and safety standards



Colors shown are ink representation of actual color standards. Actual product appearance may vary slightly due to product, gloss, surface texture or method of application. Vibrant colors may require additional coats or a primer similar in color to the finish coat for optimum color rendition.

# ovations

historical mainstays and timeless classics



# earthscapes

reflections of nature's own palette



# GLOBAL COATINGS LEADERS™

RIGHT PEOPLE • RIGHT PRODUCTS • RIGHT LOCATIONS



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