

January 8, 2021

# **PUGET SOUND ENERGY**

---

## **Energize Eastside Project**

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

**PROJECT NUMBER:**

132155

**PROJECT CONTACT:**

Darrin Gilbert- Senior Visual Resource Specialist

**EMAIL:**

darrin.gilbert@powereng.com

**PHONE:**

208-288-6123



*This page intentionally left blank.*

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

**PREPARED FOR:** PUGET SOUND ENERGY  
**PREPARED BY:** DARRIN GILBERT, SENIOR VISUAL RESOURCE SPECIALIST  
208-288-6123  
DARRIN.GILBERT@POWERENG.COM

*This page intentionally left blank.*



## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION AND SUMMARY.....</b>	<b>1</b>
<b>2.0</b>	<b>METHODOLOGY .....</b>	<b>3</b>
2.1	APPROACH.....	3
2.2	POTENTIAL POLE FINISH OPTIONS.....	8
2.2.1	Galvanized Steel .....	8
2.2.2	Self-Weathering Steel .....	8
2.2.3	Powder Coated Steel.....	9
2.2.4	Painted Steel.....	9
<b>3.0</b>	<b>POLE FINISH SEGMENTS.....</b>	<b>11</b>
3.1	OVERVIEW.....	11
3.2	SEGMENT A.....	11
3.2.1	Viewing Conditions and Setting .....	11
3.2.2	Proposed Pole Finish and Rationale.....	11
3.3	SEGMENT B .....	12
3.3.1	Viewing Conditions and Setting .....	12
3.3.2	Proposed Pole Finish and Rationale.....	12
3.4	SEGMENT C .....	12
3.4.1	Viewing Conditions and Setting .....	12
3.4.2	Proposed Pole Finish and Rationale.....	13
<b>4.0</b>	<b>REFERENCES.....</b>	<b>15</b>

## TABLES:

TABLE 1	POLE FINISH SELECTION CRITERIA .....	7
TABLE 2	SUMMARY OF POLE FINISHES .....	11

## FIGURES:

FIGURE 1	STUDY AREA .....	5
FIGURE 2	POLE FINISH SEGMENTS .....	17
FIGURE 3	SEGMENT A .....	19
FIGURE 4	SEGMENT B.....	21
FIGURE 5	SEGMENT C.....	23

## APPENDICES:

APPENDIX A	CARBOLINE 8812 COLOR LOGIC
APPENDIX B	FINISHES FOR ALL STRUCTURES WITHIN BELLEVUE (NORTH)
APPENDIX C	PHOTO SIMULATIONS WITHIN BELLEVUE (NORTH)

## **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
SR-520	State Route 520

## 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 operated up to 230 kV (herein referred to as 230 kV lines) 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) dual 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 from elevated or level viewing positions.
- Naturalistic landscape settings where recreationists or traveler views would see the Project against a forested backdrop or partially skylined.
- Variable residential landscape settings that allow for partially skylined or backdropped views against a distant, light colored landscape.
- Mixed commercial/industrial landscape settings with open views of the Project seen against the sky or variably colored and textured, low-profile architectural features.

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 self-weathering steel on 25 total structures, and includes Structure 7/5 (SAM-RIC #1 & #2) to Structure 4/9 (SAM-RIC #1 & #2) from Lakeside Substation to the Bel-Red commercial area at NE 13<sup>th</sup> Street; Segment B is proposed to be finished with seven dulled galvanized steel structures, and includes 4/8 (SAM-RIC #1 & #2) to Structure 4/4 (SAM-RIC #1 & #2) between NE 13<sup>th</sup> Street and State Route-520 (SR-520); and Segment C is proposed to be finished with 19 self-weathering steel structures, and includes Structure 4/3 (SAM-RIC #1 & #2) to Structure 2/3 (SAM-RIC #1 & #2) between SR-520 and where the project intersects the City of Bellevue's northern boundary at NE 60<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 (North) 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.

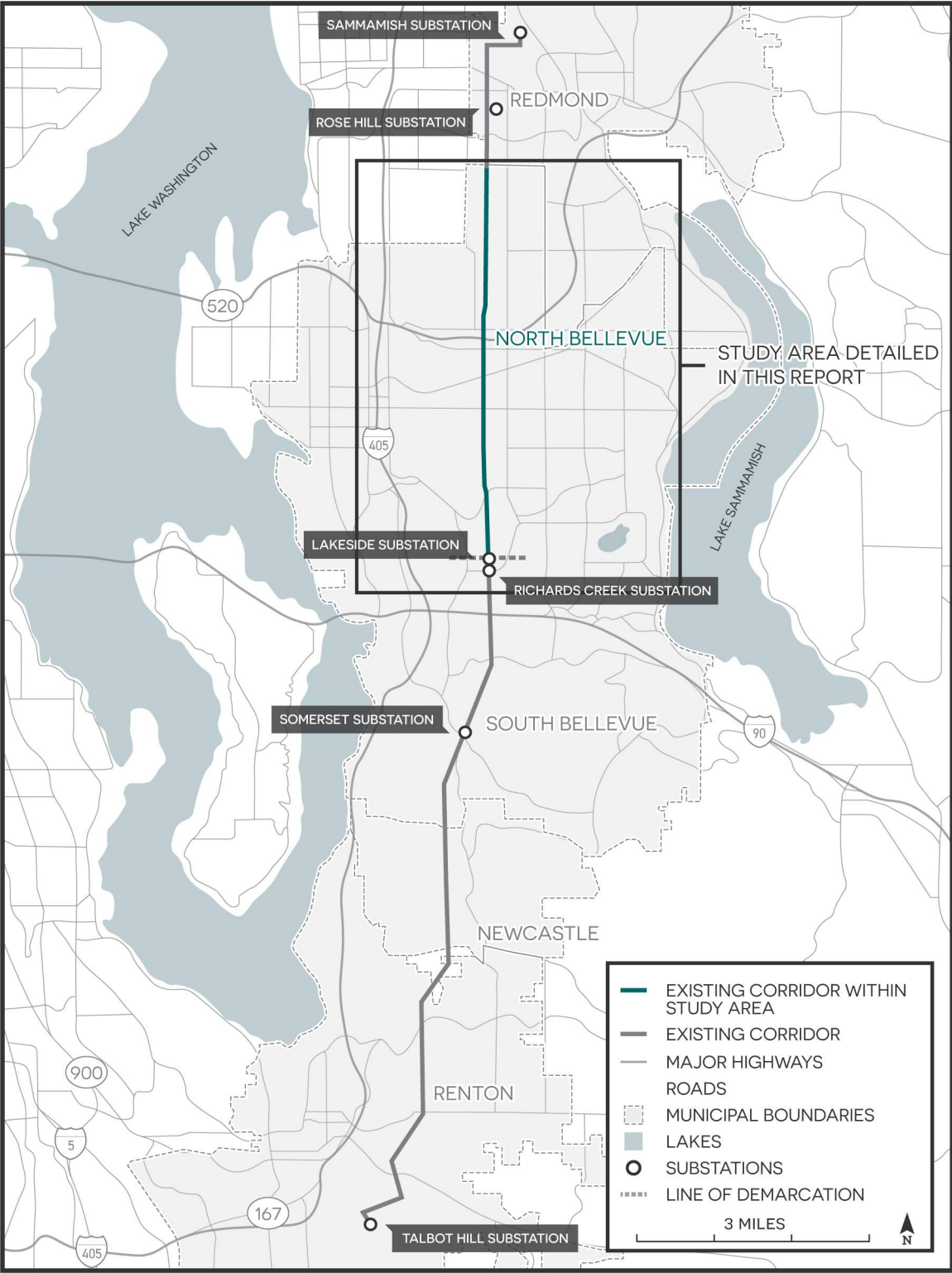
The following visual setting conditions were evaluated along the corridor to determine potential contrast and determine pole finish along Project segments (if applicable):

- 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.

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 A for the Carboline Color Logic color palette.

**FIGURE 1    STUDY AREA**



*This page intentionally left blank.*



**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*
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 than 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.

*This page intentionally left blank.*

## 3.0 POLE FINISH SEGMENTS

### 3.1 Overview

This Section discusses each Pole Finish Segment proposed within the City of Bellevue (North). 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 (North) is detailed in Appendix B. The table contained within Appendix B generally progresses from south to north, starting from the Lakeside Substation located approximately 0.5 mile north of Interstate-90 (I-90) to the City's northern boundary at NE 60<sup>th</sup> Street. A summary of pole finishes is provided in Table 2.

**TABLE 2 SUMMARY OF POLE FINISHES**

POLE FINISH SEGMENT	STRUCTURE # RANGE	PROPOSED FINISH	NO. OF STRUCTURES WITH FINISH
A- N. Bellevue	7/5 (SAM-RIC #1 & #2) though 4/9 (SAM-RIC #1 & #2)	Self-Weathering	25
B- N. Bellevue	4/8 (SAM-RIC #1 & #2) though 4/4 (SAM-RIC #1 & #2)	Dulled Galvanized	7
C- N. Bellevue	4/3 (SAM-RIC #1 & #2) though 2/3 (SAM-RIC #1 & #2)	Self-Weathering	19

### 3.2 Segment A

#### 3.2.1 Viewing Conditions and Setting

Segment A begins at the Lakeside Substation and extends to just south of the Bel-Red retail and commercial area south of SR-520 (see Figure 3 at the end of this report). This section of the Project is dominated by moderate to low density single-family land use where the highest impacts of the Project would result from direct, adjacent, largely unobstructed views of the structures seen against other residences and surrounding landscape vegetation (see Appendix C - Key Observation Point [KOP] Central 31 at the end of this report). Other views of the Project would occur from recreation areas such as from the Glendale Country Club and Kelsey Creek Park area (see Appendix C - KOP Central 3 and Central 20). These views are typically from the same elevation or from slightly elevated positions. Some skyline viewing of the structure would occur, such as from the Glendale Country Club from viewpoints that have open views from below the Project. 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 setting by introducing industrialized features into the landscape.

#### 3.2.2 Proposed Pole Finish and Rationale

Because dominant views are seen against a moderately vegetated backdrop 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 colored (Benicia Green #1315) 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 structure contrasts for adjacent sensitive viewers. A total of 25 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 the Bel-Red retail and commercial area south of SR-520 and extends to the SR-520 Project crossing (see Figure 4 at the end of this report). This section of the Project is dominated by low profile (single or two-story) commercial land use with structures with variably colored and textured finishes that are individually simple and uniform in character, and lighter in color hue. Open vista of the structures within parking areas that are minimally punctuated with landscape trees allow for views of the Project against the sky or within the context of the simple architectural features. Segment B would also be viewed from the SR-520 corridor set against the open sky as a dominant viewing condition when not screened by vegetation along the highway. Currently, the existing 115 kV H-frame, wood pole structures influences the character of the area, and does not deviate substantially from commercial setting of the area.

#### **3.3.2 Proposed Pole Finish and Rationale**

Because dominant views would be against the sky for adjacent and distant viewers and because of the low-profile, simple, light colored architectural character, 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 seven structures would be finished with dulled galvanized steel. Changing from self-weathering steel structures to dulled galvanized structures on the north and south sides of SR-520 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 (4/9 SAM-RIC) within Segment A would be viewed primarily from sensitive locations adjacent to the corridor (e.g., residential areas). Views of the first dulled galvanized structure (4/8 SAM-RIC) within Segment B would primarily occur from positions where the structured would be viewed from within the corridor against the sky and commercial structures for a majority of viewers.

### **3.4 Segment C**

#### **3.4.1 Viewing Conditions and Setting**

Segment C begins at the at the SR-520 crossing and extends to the City of Bellevue's northern boundary at NE 60<sup>th</sup> Street (see Figure 5 at the end of this report). This segment of the Project is dominated by low density residential development with various densities of vegetation screening and backdropping, with substantial opportunity for direct views and some skylining, but minimal views from elevated positions (see Appendix C - KOP North 3). The southern portion of this segment has a somewhat lower vegetation backdrop and screening density, and the opportunity for views of the Project expanded in the northern area. Overall, this section is fairly uniform in terms of Project visibility, Project backdrop, and overall viewing context. Residential viewers, the primary sensitive viewing group, are typically located directly adjacent to the Project corridor that is moderately to highly backdropped by dark, tall, mixed forested or otherwise substantially vegetated.

### **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 19 structures are proposed to be finished with self-weathering steel.

*This page intentionally left blank.*



## **4.0 REFERENCES**

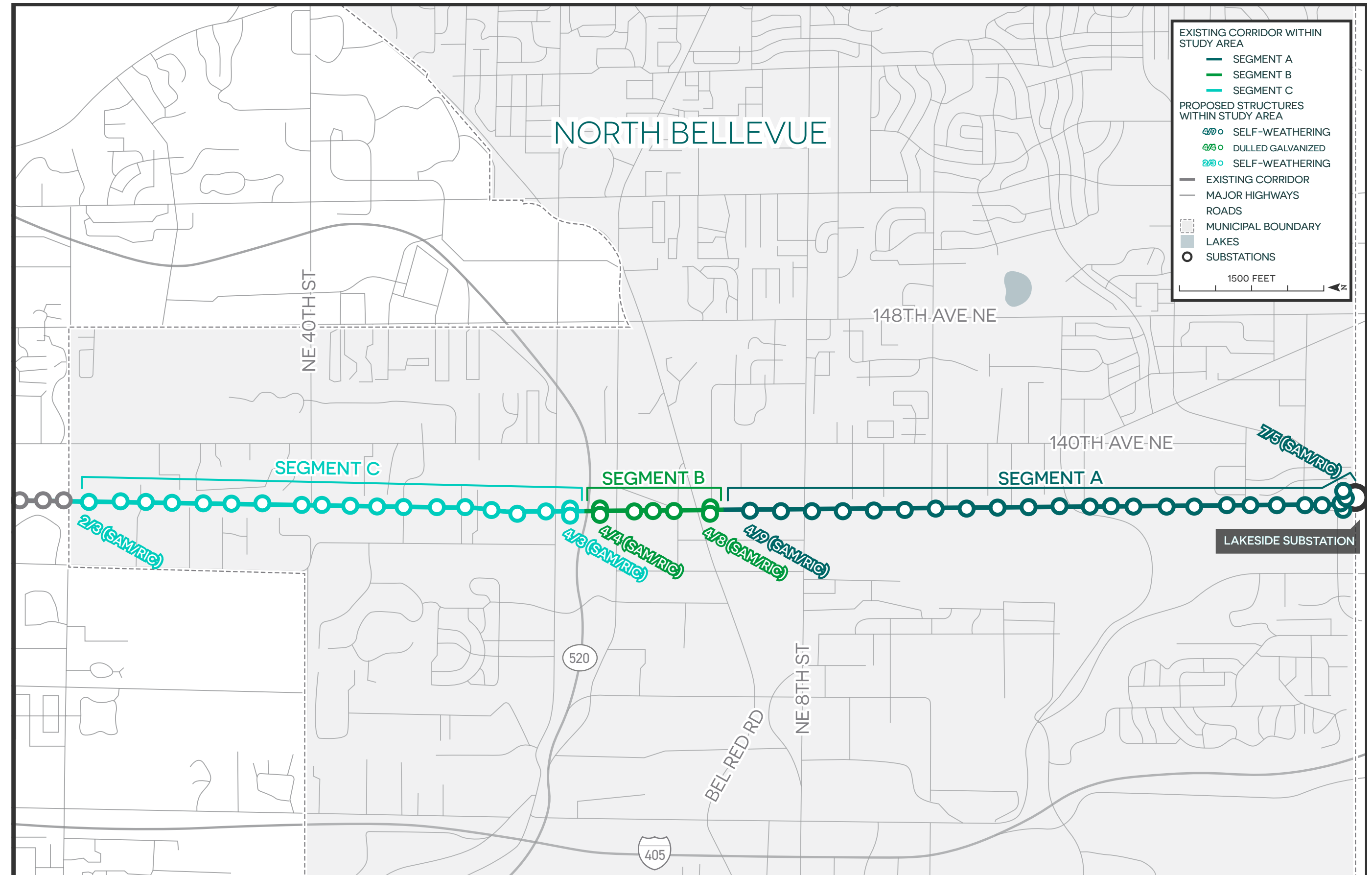
Carboline Paint System. 2018. <http://www.carboline.com/products/product-details/?prod=8812>. Accessed multiple occasions, September 2019.

City of Bellevue. 2018. Energize Eastside Project Final Environmental Impact Statement. Volume 1 through 4. March 2018.

Federal Highway Administration (FHWA). 2015. Visual Impact Assessment for Highway Projects.

*This page intentionally left blank.*

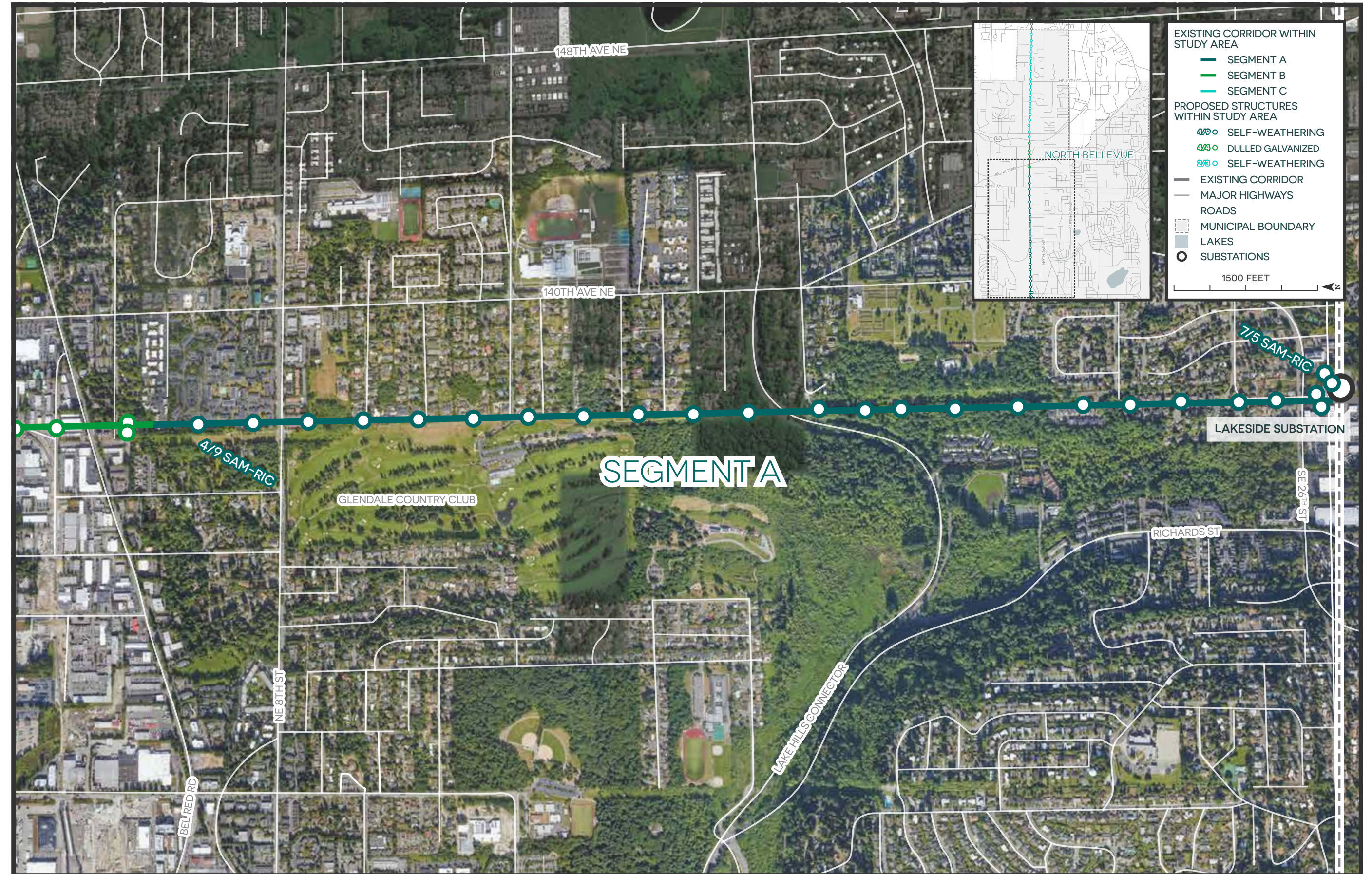
**FIGURE 2**      **POLE FINISH SEGMENTS**



*This page intentionally left blank.*



FIGURE 3      SEGMENT A

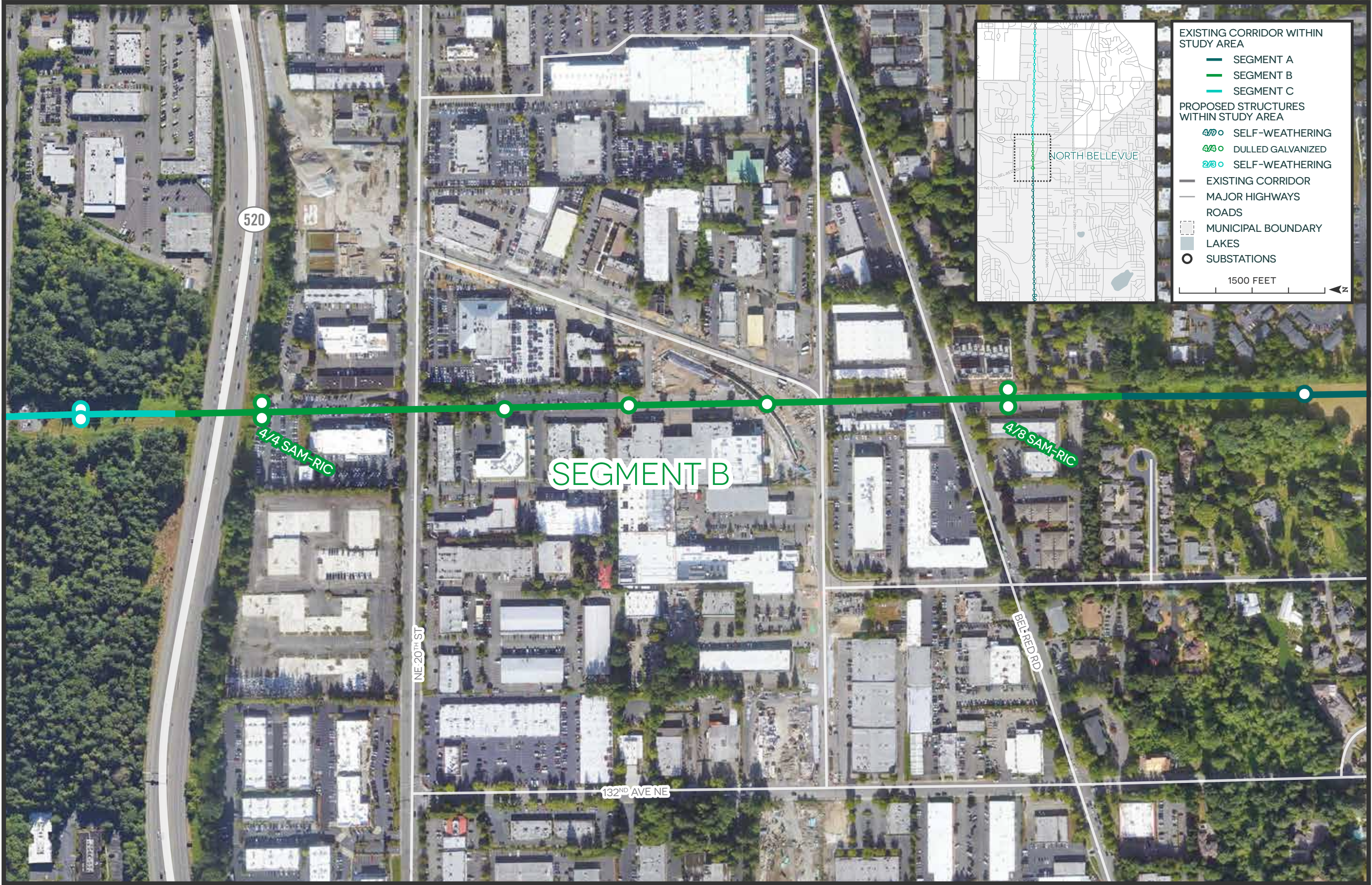




*This page intentionally left blank.*



FIGURE 4      SEGMENT B



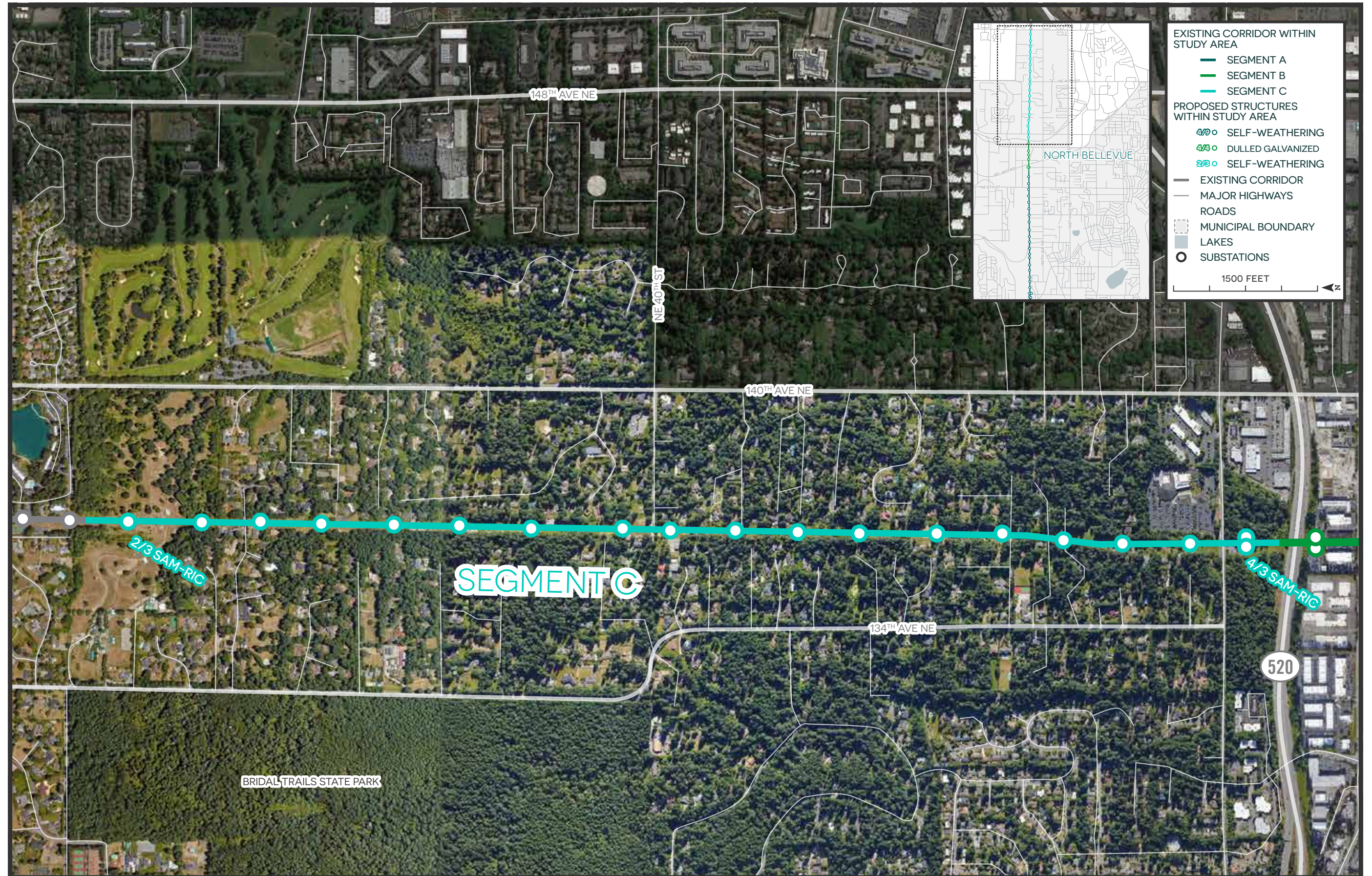


*This page intentionally left blank.*



FIGURE 5

SEGMENT C





*This page intentionally left blank.*

## **APPENDIX A    CARBOLINE 8812 COLOR LOGIC**

*This page intentionally left blank.*

# Color Logic

## Intelligent Color Selection



# directions

## new color developments and trends

				
1864 Vestal White	0832 Aviation White	0820 Carrera White	A882 Daybreak	C132 Blue Ice
				
G248 Sandcastle	8525 Classical	G171 Stratus Blue	G170 Viola	G169 Lapis Blue
				
7801 Constitution	G760 Grey Fog	J749 Louisiana Gray	4755 Pearl Gray	6225 Dark Beige
				
5255 Basket Weave	0855 Bamboo	0217 Desert Tan	B223 Cinnamon Kiss	7594 Merlot
				
F186 Window Pane	0381 Aleutian Green	4372 Hunter Green	F304 Wimbledon Green	2380 Rain Forest Green
				
1143 Nautilus	2127 Cyanine Blue	F193 Engine Blue	F140 Sapphire Blue	A700 Past Midnight

# utility toolbox

## maintenance and safety standards

				
A826 White Lotus	S800 Safety White	2133 Aquarius Blue	5141 Open Sky	S150 Safety Blue
				
C705 Light Gray	2716 Edison Gray	2713 Gull Gray	C703 Medium Gray	0754 Machine Gray
				
1675 Ignition Yellow	N625 Sun Yellow	6666 Safety Yellow	4444 Safety Orange	5555 Safety Red
				
1898 Aden White	9225 Cashew	G245 Dunes Tan	G250 Weathered Copper	F235 Dark Bronze
				
2394 Green Back	2383 Safety Green	D337 Offshore Green	C900 Black	

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

				
A881 Veil White	A825 Haze White	3848 Eggshell	5803 Parchment	0808 Medium Buff
				
8882 Tank White	1867 Oyster Glow	0780 Neutral Gray	0794 Meridian Gray	2761 Mist Gray
				
6731 Sterling Gray	2758 Granite Gray	9750 Confederate Gray	0746 Midway Gray	4753 Gray Flannel
				
J343 Spring Green	J359 Greenhouse	5384 Patio Green	E369 Green Briar	0388 Vernal Green
				
0110 Silver Blue	1192 Blue Mist	4169 Atomic Blue	4184 Caribbean Blue	6164 National Blue
				
B775 Prestige	8285 Mobile Beige	2248 Walnut Grove	2277 Falcon Brown	0516 Tile Red

# earthscapes

reflections of nature's own palette

				
G185 Skyward	G186 Cirrus Cloud	1315 Benicia Green	2332 Courtyard	9341 Lancaster Green
				
0895 River Reed	3216 Alpaca	K349 New Leaf	6797 French Gray	9218 Cocoa Brown
				
1606 Autumn Peak	8516 Copper Smith	8517 Potter's Clay	8528 Walnut Burl	3157 Moon Water

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.

# GLOBAL COATINGS LEADERS™

RIGHT PEOPLE • RIGHT PRODUCTS • RIGHT LOCATIONS



## GLOBAL MANUFACTURING PLANTS

**CARBOLINE COMPANY**  
GLOBAL HEADQUARTERS  
2150 SCHUETZ ROAD  
ST. LOUIS, MO 63146 USA  
PH: +1-314-644-1000  
WWW.CARBOLINE.COM

**ARGENTINA – BUENOS AIRES**  
EINSTEIN 1095  
PARQUE INDUSTRIAL OKS  
GARÍN PROV. DE BUENOS  
AIRES, ARGENTINA  
PHONE: 54-3327-44-2222  
FAX: 54-3327-44-2223

**AUSTRALIA – BRISBANE**  
7 PRODUCTION AVE  
ERNEST JUNCTION  
QUEENSLAND 4214  
AUSTRALIA  
PHONE: +61 7 3287 0222  
FAX: +61 7 5594 9093

**CANADA – ONTARIO**  
95 SUNRAY STREET  
WHITBY, ONTARIO L1N9C9,  
CANADA  
PHONE: 905-430-3333  
FAX: 905-430-3056

**CHINA – DALIAN**  
HOU SHI CUN, DA WEI JIA  
ZHEN  
JIN ZHOU DISTRICT  
DALIAN, CHINA 116110  
PHONE: 86-411-8789-8441,  
8442, 8443, 8444  
FAX: 86-411-8789-8445

**INDIA – CHENNAI**  
NO. 356 & 357 SIDCO  
INDUSTRIAL ESTATE  
AMBATTUR,  
CHENNAI 600 098  
INDIA  
PHONE: 91-22-28500321  
FAX: 91-22-28500323

**INDONESIA – JAKARTA**  
MENARA SATU, BULEVAR  
KELAPA GADING LA3 NO.1,  
7FL, SUITE 706,  
KELAPA GADING PERMAI,  
JAKARTA 1420  
INDONESIA  
PHONE: +62 21 29375692  
PHONE: +62 21 29375693  
FAX: +62 21 29375696

**ITALY – ALGHERO**  
VIA MILANO 150  
20093 COLOGNO MONZESE  
(MI), ITALY  
PHONE: 3902-25 3751  
FAX: 3902-25 37560

**JAPAN – AMAGASAKI**  
TERAMOTO UNYU SOKO CO.,  
LTD 17  
MINAMIHATSUSHIMA-CHO,  
AMAGASAKI, 660-0833 JAPAN  
PHONE: 81-3-3643-4501  
FAX: 81-3-3643-2951

**MALAYSIA – JOHOR**  
400 ORCHARD ROAD #06-15  
ORCHARD TOWERS  
SINGAPORE 238875  
PHONE: 65-6235-6001  
FAX: 65-6733-6525

**NEW ZEALAND – TAURANGA**  
91-111 OROPI ROAD  
GREERTON  
TAURANGA  
NEW ZEALAND  
PHONE: +64 7 5411 221  
FAX: +64 7 541 1310

**NORWAY – LIERSTRANDA**  
P.O. BOX 593  
3412 LIERSTRANDA, NORWAY  
PHONE: 47-32-857300  
FAX: 47-32-857301

**PUERTO RICO – SAN LORENZO**  
URB. APONTE #5  
SAN LORENZO, PUERTO RICO  
00754  
PHONE: 787-736-4221  
FAX: 787-736-53133

**SAUDI ARABIA – DAMMAM**  
1ST INDUSTRY CITY, 28TH  
STREET  
P.O. BOX 1050  
DAMMAM 31431,  
KINGDOM OF SAUDI ARABIA  
PHONE: +966 3 847 3044  
FAX: +966 3 847 3689

**SOUTH AFRICA – JOHANNESBURG**  
8 CRESSET ROAD  
MIDRAND INDUSTRIAL PARK  
JOHANNESBURG,  
SOUTH AFRICA  
PHONE: 27-11-2545500  
FAX: 27-11-310-2872

**SOUTH KOREA – BUSAN**  
43-1, JINYOUNG-RI  
JINYOUNG-EUB  
KIMHAE-CITY, 621-800  
KYOUNGSANGNAMDO, KOREA  
PHONE: 82-55-343-6441/5  
FAX: 82-55-343-6414

**THAILAND – BANGKOK**  
1/11 BANGCHAN INDUSTRIAL  
ESTATE  
SOI-SERI-THAI 54,  
KANNAYAO, BANGKOK 10230  
PHONE: +662 906 3042-3  
FAX: +662 906 3044

**TURKEY – BURSA**  
ALI OSMAN SONMES CAD.  
NO:4  
BURSA, DOSAB 16369 TURKEY  
PHONE: 90-224-261-0537

**UAE – DUBAI**  
P.O. BOX 3034  
DUBAI, UAE  
PHONE: 971-4-347-0460  
FAX: 971-4-347-0242

**USA – DAYTON**  
95 AIRPARK VISTA BLVD.  
DAYTON, NV 89403  
PHONE: 775-246-0760  
FAX: 775-230-8859

**USA – GREEN BAY**  
2122 ANGIE AVENUE,  
BUILDING 7, SECTION 2  
GREEN BAY, WI 54302  
PHONE: 920-437-6561 X4208  
FAX: 920-469-0358

**USA – LAKE CHARLES**  
2425 FRUGE STREET  
LAKE CHARLES, LA 70601  
PHONE: 337-205-8410  
FAX: 337-439-5296

**USA – LOUISA**  
321 DUKE ST.  
LOUISA VA 23093  
PHONE: 540-967-5119  
FAX: 540-967-5120

**VENEZUELA – CARACAS**  
URBANIZACION INDUSTRIAL  
"EL TIGRE"  
AVENIDA PRINCIPAL, GALPÓN "H"  
VALENCIA EDO. CARABOBO  
VENEZUELA  
PHONE: 58-245-4000400  
FAX: 58-245-5642011

**VIETNAM – HO CHI MINH CITY**  
ROOM NO. 63B,  
6 PHUNG KHAC KHOAN ST.,  
DAKAO WARD, DISTRICT 1,  
HO CHI MINH CITY, VIETNAM  
PHONE: (84) 08-3822-7684





## **APPENDIX B      FINISHES FOR ALL STRUCTURES WITHIN BELLEVUE (NORTH)**

*This page intentionally left blank.*

STRUCTURE #	REFERENCE POINT	DOMINANT VIEWING CONDITION	PROPOSED FINISH
<b>Pole Finish Segment A</b>			
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 right-of-way (ROW) edge.	Self-Weathering
7/4 (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
7/3 (SAM-RIC #1 & #2)	SE 26th St. crossing	Adjacent to moderate to low density residential; minimal vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining from the west.	Self-Weathering
7/2 (SAM-RIC #1 & #2)	SE 24th St. crossing	Adjacent to moderate to low density residential; minimal vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining from the west.	Self-Weathering
7/1 (SAM-RIC #1 & #2)		Adjacent to moderate to low density residential; minimal vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining from the west.	Self-Weathering
6/9 (SAM-RIC #1 & #2)	SE 20th St. crossing	Adjacent to moderate to low density residential; minimal vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining from the west.	Self-Weathering
6/8 (SAM-RIC #1 & #2)	SE 20th St. crossing	Adjacent to moderate to low density residential; minimal vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining from the west.	Self-Weathering
6/7 (SAM-RIC #1 & #2)		Minimal adjacent views of the project; forested setting screening ROW; views from elevated positions (superior) mostly screened from adjacent cemetery and residential; project viewed from below from transportation corridor typically screened.	Self-Weathering
6/6 (SAM-RIC #1 & #2)		Minimal adjacent views of the project; forested setting screening ROW; views from elevated positions (superior) mostly screened from adjacent cemetery and residential; project viewed from below from transportation corridor typically screened.	Self-Weathering

STRUCTURE #	REFERENCE POINT	DOMINANT VIEWING CONDITION	PROPOSED FINISH
6/5 (SAM-RIC #1 & #2)		Minimal adjacent views of the project; forested setting screening ROW; views from elevated positions (superior) mostly screened from adjacent cemetery and residential; project viewed from below from transportation corridor typically screened.	Self-Weathering
6/4 (SAM-RIC #1 & #2)		Minimal adjacent views of the project; forested setting screening ROW; views from elevated positions (superior) mostly screened from adjacent cemetery and residential; project viewed from below from transportation corridor typically screened.	Self-Weathering
6/3 (SAM-RIC #1 & #2)	Lake Hills Connector crossing	Minimal adjacent views of the project; forested setting screening ROW; views from elevated positions (superior) mostly screened from adjacent cemetery and residential; project viewed from below from transportation corridor typically screened.	Self-Weathering
6/2 (SAM-RIC #1 & #2)	Lake Hills Connector crossing	Minimal adjacent views of the project; forested setting screening ROW; views from elevated positions (superior) mostly screened from adjacent transportation corridor; very brief skylining/backdrop from transportation corridor.	Self-Weathering
6/1 (SAM-RIC #1 & #2)	Kelsey Creek Park	Adjacent to moderate density residential; minimal vegetative screening; structure backdropped against highly vegetated backdrop residential structures; some potential skylining from the east.	Self-Weathering
5/8 (SAM-RIC #1 & #2)	Kelsey Creek Park	Adjacent to moderate density residential; minimal vegetative screening; structure backdropped against highly vegetated backdrop residential structures; some potential skylining from the east.	Self-Weathering
5/7 (SAM-RIC #1 & #2)	Glendale Country Club	Adjacent to moderate to high density residential and recreational area; some views from elevated positions (superior); minimal vegetative screening and open views; structure backdropped against moderately to minimally vegetated backdrop; some potential skylining; highly variable viewing conditions.	Self-Weathering
5/6 (SAM-RIC #1 & #2)	Glendale Country Club	Adjacent to moderate to high density residential and recreational area; some views from elevated positions (superior); minimal vegetative screening and open views; structure backdropped against moderately to minimally vegetated backdrop; some potential skylining; highly variable viewing conditions.	Self-Weathering

STRUCTURE #	REFERENCE POINT	DOMINANT VIEWING CONDITION	PROPOSED FINISH
5/5 (SAM-RIC #1 & #2)	Glendale Country Club	Adjacent to moderate to high density residential and recreational area; some views from elevated positions (superior); minimal vegetative screening and open views; structure backdropped against moderately to minimally vegetated backdrop; some potential skylining; highly variable viewing conditions.	Self-Weathering
5/4 (SAM-RIC #1 & #2)	Glendale Country Club	Adjacent to moderate to high density residential and recreational area; some views from elevated positions (superior); minimal vegetative screening and open views; structure backdropped against moderately to minimally vegetated backdrop; some potential skylining; highly variable viewing conditions.	Self-Weathering
5/3 (SAM-RIC #1 & #2)	Glendale Country Club	Adjacent to moderate to high density residential and recreational area; some views from elevated positions (superior); minimal vegetative screening and open views; structure backdropped against moderately to minimally vegetated backdrop; some potential skylining; highly variable viewing conditions.	Self-Weathering
5/2 (SAM-RIC #1 & #2)	Glendale Country Club; NE 8 <sup>th</sup> St. crossing	Adjacent views from high to moderate density residential area backdropped against heavily vegetated backdrop; minimal skylining or elevated views.	Self-Weathering
5/1 (SAM-RIC #1 & #2)	NE 8 <sup>th</sup> St. crossing	Adjacent views from high to moderate density residential area backdropped against heavily vegetated backdrop; minimal skylining or elevated views.	Self-Weathering
4/9 (SAM-RIC #1 & #2)		Adjacent views from high to moderate density residential area backdropped against heavily vegetated backdrop; minimal skylining or elevated views.	Self-Weathering
<b>Pole Finish Segment B</b>			
4/8 (SAM-RIC #1 & #2)	Bel-Red commercial area; Bel-Red Rd. crossing	Moderate to low sensitivity commercial area with generally open views; moderate to minimal vegetation screening or backdropping; direct, open views of the project set against the sky or simple, uniform low-profile architecture.	Galvanized
4/7 (SAM-RIC #1 & #2)	Bel-Red commercial area; Bel-Red Rd. crossing	Moderate to low sensitivity commercial area with generally open views; moderate to minimal vegetation screening or backdropping; direct, open views of the project set against the sky or simple, uniform low-profile architecture.	Galvanized
4/6 (SAM-RIC #1 & #2)	Bel-Red commercial area	Moderate to low sensitivity commercial area with generally open views; moderate to minimal vegetation screening or backdropping; direct, open views of the project set against the sky or simple, uniform low-profile architecture.	Galvanized

STRUCTURE #	REFERENCE POINT	DOMINANT VIEWING CONDITION	PROPOSED FINISH
4/5 (SAM-RIC #1 & #2)	Bel-Red commercial area	Moderate to low sensitivity commercial area with generally open views; moderate to minimal vegetation screening or backdropping; direct, open views of the project set against the sky or simple, uniform low-profile architecture.	Galvanized
4/4 (SAM-RIC #1 & #2)	Bel-Red commercial area; SR-520 crossing	Moderate to low sensitivity commercial area with generally open views; high use-transportation corridor with brief, open views set against sky; moderate to minimal vegetation screening or backdropping; direct, open views of the project set against the sky or simple, uniform low-profile architecture.	Galvanized
<b>Pole Finish Segment C</b>			
4/3 (SAM-RIC #1 & #2)	SR-520 crossing	Highly screened structure potentially briefly viewed from transportation corridor and institutional (church) viewer groups, primarily; backdropped against heavily forested setting.	Self-Weathering
4/2 (SAM-RIC #1 & #2)		Open view of structure from transportation corridor, institutional (church), and residential viewer groups. Mixed viewing conditions: backdropped against vegetation or partial skylining.	Self-Weathering
4/1 (SAM-RIC #1 & #2))		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/9 (SAM-RIC #1 & #2)		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/8 (SAM-RIC #1 & #2)	NE 29th Pl. crossing	Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/7 (SAM-RIC #1 & #2)	NE 29th Pl. crossing	Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/6 (SAM-RIC #1 & #2)		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/5 (SAM-RIC #1 & #2)		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/4 (SAM-RIC #1 & #2)	NE 37th Pl. crossing	Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering

STRUCTURE #	REFERENCE POINT	DOMINANT VIEWING CONDITION	PROPOSED FINISH
3/3 (SAM-RIC #1 & #2)	NE 37th Pl. crossing	Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/2 (SAM-RIC #1 & #2)	NE 40 <sup>th</sup> St. crossing	Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
3/1 (SAM-RIC #1 & #2)	NE 40 <sup>th</sup> St. crossing	Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
2/9 (SAM-RIC #1 & #2)		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
2/8 (SAM-RIC #1 & #2)		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
2/7 (SAM-RIC #1 & #2)		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
2/6 (SAM-RIC #1 & #2)		Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
2/5 (SAM-RIC #1 & #2)	NE 54 <sup>th</sup> Pl. crossing	Adjacent to low density residential; moderate vegetative screening; structure backdropped against moderately to highly vegetated and residential structure setting; minimal skylining.	Self-Weathering
2/4 (SAM-RIC #1 & #2)	NE 54 <sup>th</sup> Pl. crossing	Adjacent to low density residential; minimal vegetative screening; structure backdropped against moderately to minimally vegetated and residential structure backdrop; minimal skylining.	Self-Weathering
2/3 (SAM-RIC #1 & #2)		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

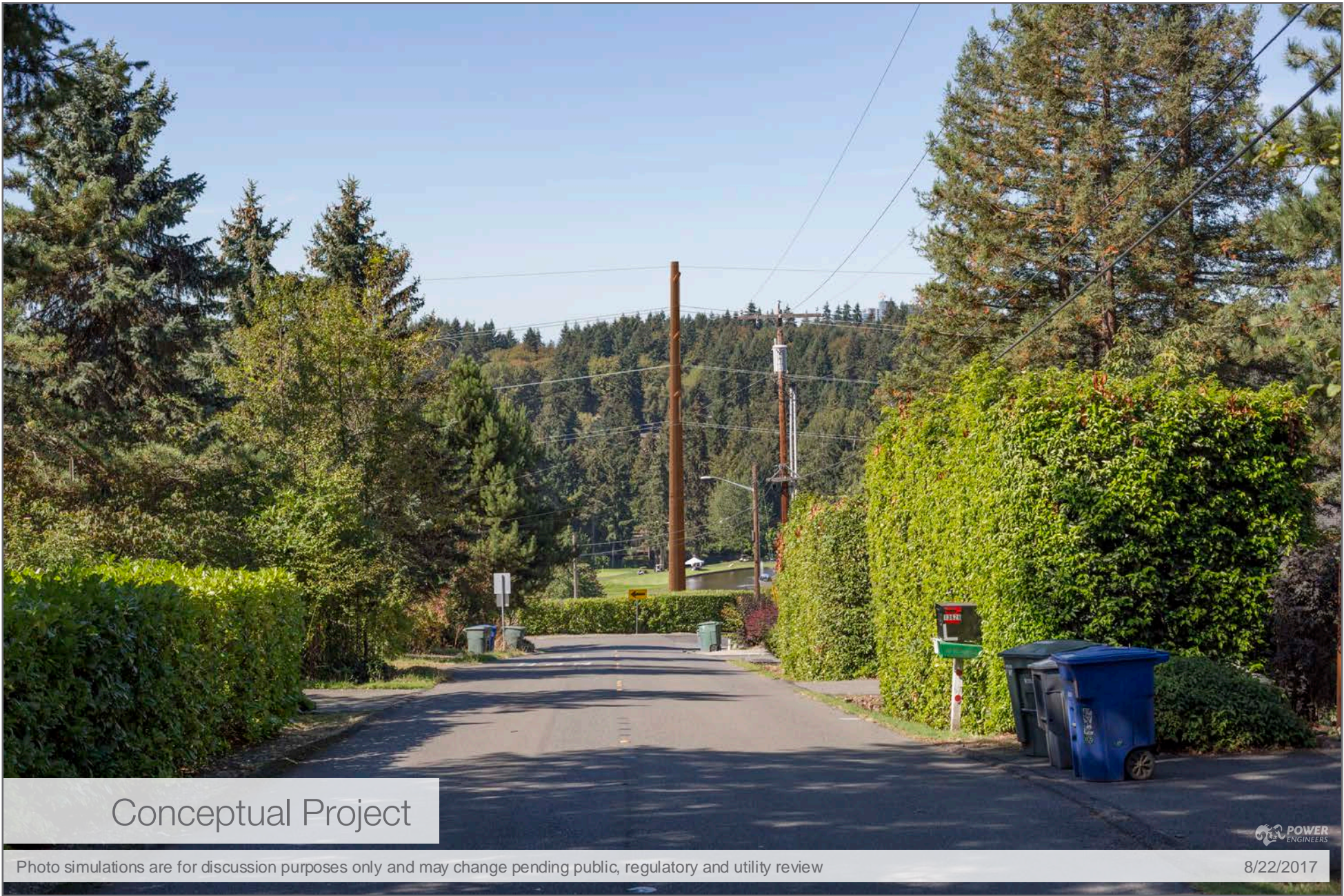
*This page intentionally left blank.*



## **APPENDIX C      PHOTO SIMULATIONS WITHIN BELLEVUE (NORTH)**

*This page intentionally left blank.*





Address	13636 Main St, Bellvue
Date	9/12/2016
Time	12:02 PM
Viewing Direction	West
Existing Pole Heights	~55 feet
Proposed Pole Heights	~95 feet

# KOP CENTRAL 31 SEGMENT 1



*This page intentionally left blank.*





Existing Conditions



Conceptual Project



Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review 7/7/2017

Address	13600 SE 5th St, Bellevue
Date	4/2/2014
Time	2:54 PM
Viewing Direction	North
Existing Pole Heights	~60 feet
Proposed Pole Heights	~100 feet

# KOP CENTRAL 3 SEGMENT 1



*This page intentionally left blank.*





Existing Conditions



Conceptual Project

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



8/22/2017

Address	13606 Main St, Bellevue
Date	3/30/2016
Time	3:52 PM
Viewing Direction	North
Existing Pole Heights	~50 feet
Proposed Pole Heights	~95 feet

# KOP CENTRAL 20 SEGMENT 1



*This page intentionally left blank.*





Existing Conditions



Conceptual Project



Photo simulations are for discussion purposes only and may change pending public, regulatory and utility review 7/7/2017

Address	13540 NE 54th Pl, Bellevue
Date	3/31/2014
Time	10:49 AM
Viewing Direction	North
Existing Pole Heights	~55 feet
Proposed Pole Heights	~90 feet

# KOP NORTH 3 SEGMENT 1