

VISUAL QUALITY MANUAL



US 63 RIVER BRIDGE AND APPROACH ROADWAY PROJECT



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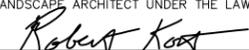
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The Visual Quality Manual (VQM) provides guidance on the aesthetic design intent and requirements for the project.

The project includes three major components:

- *Construction of a new bridge over the Mississippi River between Red Wing, MN and the Town of Trenton, WI --immediately upstream of the existing bridge that will be removed*
- *Reconstruction of the Wisconsin approach area with a new jug-handle configuration*
- *Reconstruction of the Minnesota approach area with a new buttonhook configuration*

1.1 PURPOSE OF THE VISUAL QUALITY MANUAL

The purpose of this Visual Quality Manual (VQM) is to establish visual quality requirements for the Red Wing Bridge and Approach Roadways Project. The components of the planned project will establish a new US 63 bridge crossing over the Mississippi River between Red Wing, Minnesota and Town of Trenton, Wisconsin. The project also includes construction and reconstruction of connecting roadways, intersections and supporting elements at the Minnesota and Wisconsin approach areas as described in more detail throughout this document.

This VQM is written as guidance for professionals engaged in final project design and construction, and as a reference document for all project managers and stakeholders. All information presented in the VQM is preliminary in nature, and as such, dimensions and details are approximate and may change as the design progresses through final design.

Organizationally, the VQM serves two main purposes:

- 1) Provides background on visual quality goals, planning process and project area context settings (Chapter 1)
- 2) Identifies the minimum design requirements and guidance for the project associated with visual quality goals, including guidance on how to proceed through final design and construction (Chapter 2, with some procedural guidance also found in Chapter 1)

Therefore, this VQM contains criteria and objectives that will be used to determine compliance with Project requirements as the process moves into final design and construction. Because of the visual nature of most of the requirements and recommendations, this VQM includes significant graphic material. The VQM has two chapters:

1. Introduction and Project Context: Chapter 1 describes the procedural history and the physical context for the project, along with basic definitions. It includes some procedural guidance, but does not address technical design requirements. The project components are described in Section 1.4. The design elements addressed are listed in Section 1.5.
2. Design Requirements for Visual Quality Elements: Chapter 2 establishes the project requirements for the design of visual quality elements. Chapter 2 is organized by the project components described in Section 1.4.

1.1.1 Project Overview

Completion of all project components will improve the US 63 bridge crossing and approach roadway corridors for all users – residents, businesses, motorists, bicyclists and pedestrians. Accordingly, the planning and design has been a cooperative effort among the Minnesota Department of Transportation (MnDOT), the Wisconsin Department of Transportation (WisDOT), Federal Highway Administration (FHWA), the City of Red Wing, Town of Trenton, Goodhue County and Pierce County. The detailed background and project engineering design has been established through project documents and design plans while this VQM addresses the aesthetic design intent and requirements.

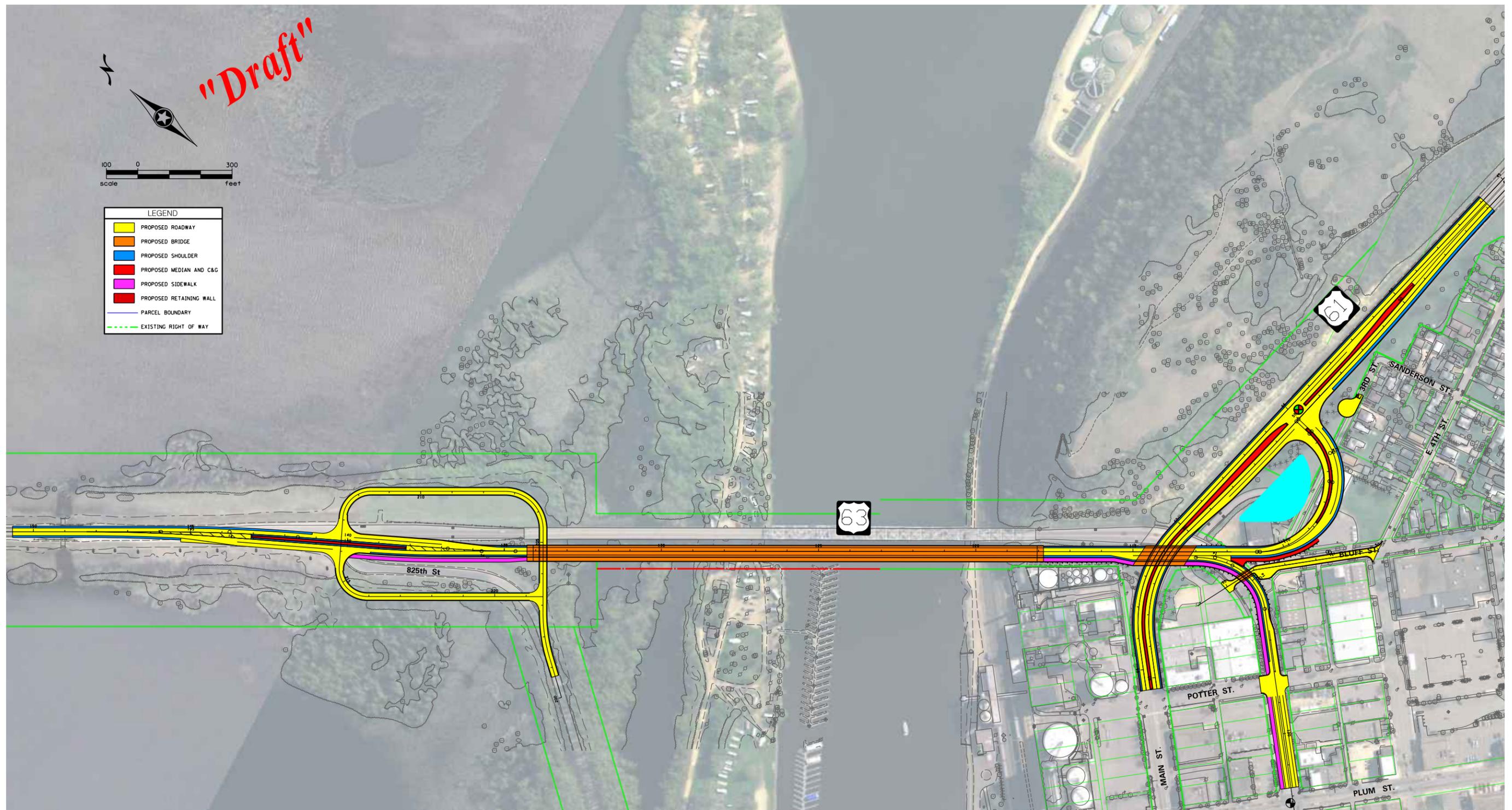
Exhibit 1.1 – Illustrates an overview of the US 63 and US 61 project area addressed in this VQM which includes:

- Construction of “jug handle” 825th Street roadways
- Construction of US 63 Wisconsin approach roadways
- Construction of the US 63 river crossing bridge over the Mississippi River (replacing MN Bridge 9040/WI Bridge B470024)
- Construction of US 63 bridge over US 61/63 (replacing MN Bridge 9103)
- Construction of “buttonhook” on the Minnesota approach roadways. (Includes a new signalized intersection at US 61/63)
- New slip ramp bridge over Bluff Street
- Reconstruction of West 3rd St. between Plum St. and Potter St.
- Retaining walls and noise walls (pending neighborhood vote)
- Stormwater best management practices
- Reconstruction of a portion of Bluff St.
- New cul-de-sac on East 3rd St.
- Landscaping restoration and enhancements
- Addition of a multi-use trail across the Mississippi River and an on-street cycle track on portions of 3rd Street

Introduction & Project Context

Exhibit 1.1.1 Preliminary Project Layout

The preliminary project layout is shown below. Proposed roadways are shown in yellow, bridges in orange, shoulders in blue, medians and curb & gutter in red, and sidewalks and trails in purple.



The Visual Quality Advisory Committee included representatives from a range of interest groups and perspectives, including:

- *Photographer, Red Wing Arts Association*
- *Sargent's Nursery and Red Wing Advisory Planning Commission*
- *Red Wing Heritage Preservation Commission*
- *Studio Artist, Transportation Committee, Red Wing 2020*
- *SHIP Coordinator (Health Improvement), Goodhue County HHS*
- *Planning Director, City of Red Wing*
- *Prairie Island Indian Community*
- *Pierce County Board*
- *Artist, Town of Trenton*
- *Student, Planning Intern*

The visual quality aesthetic design intent for the project was developed during the preliminary engineering phase with input from the Visual Quality Advisory Committee (VQAC) and guidance from the design consultant team. Working closely with the VQAC was important to ensure that community values were reflected in the process by including a cross section of resident, community, business, and government organizations. The visual quality process was conducted in parallel with the environmental reviews and agency coordination carried out during the ongoing development of the Environmental Assessment (EA). Because there are more than one dozen historic properties in and near the project area, these reviews included compliance with the Minnesota Historic Sites Act, Section 106 of the National Historic Preservation Act, and Section 4(f) of the Transportation Act.

1.1.2 Preliminary Design and Environmental Assessment

Preliminary planning and design work for the Red Wing Bridge and Approach Roadways Project began prior to the development of the VQM. This work involved exploration and evaluation of alternative alignments and structure types and is summarized in the New Bridge Location Feasibility Assessment memo dated July 2nd, 2012 and Red Wing Bridge Project Bridge Concept Report dated January 2014. Ultimately, it was determined that replacing the existing river bridge in its current location with new approach roadways was the most appropriate alternative for the project. Of the bridge types considered, the steel box girder was selected as the preferred alternative. This is because it offers a lower construction cost than the tied arch, shallower profile than the concrete segmental box girder (which reduces the approach grades), and aesthetic qualities that reflect stakeholder values. Throughout the public involvement process, community stakeholders repeatedly noted the importance of building a bridge that acknowledges and protects the historic character of the project area.

The Environmental Assessment (EA) was developed in parallel with the preliminary design work and provides the process for making formal project decisions. The EA and related studies addressed potential project impacts on surrounding properties including natural and historic resources, and increases in noise levels. In many cases the potential for impacts has influenced visual quality issues. One of the design goals for bridge architecture, surface treatments for retaining walls, lighting, and other project elements has been to minimize disruption to the integrity of historic and natural resources. At this point, the preliminary design and environmental processes have advanced sufficiently to support and complement this VQM. Consultation on ways to reduce impacts to historic properties will continue into final design.



Photo of the Visual Quality Advisory Committee during a Design Workshop.

1.1.3 Public and Agency Involvement

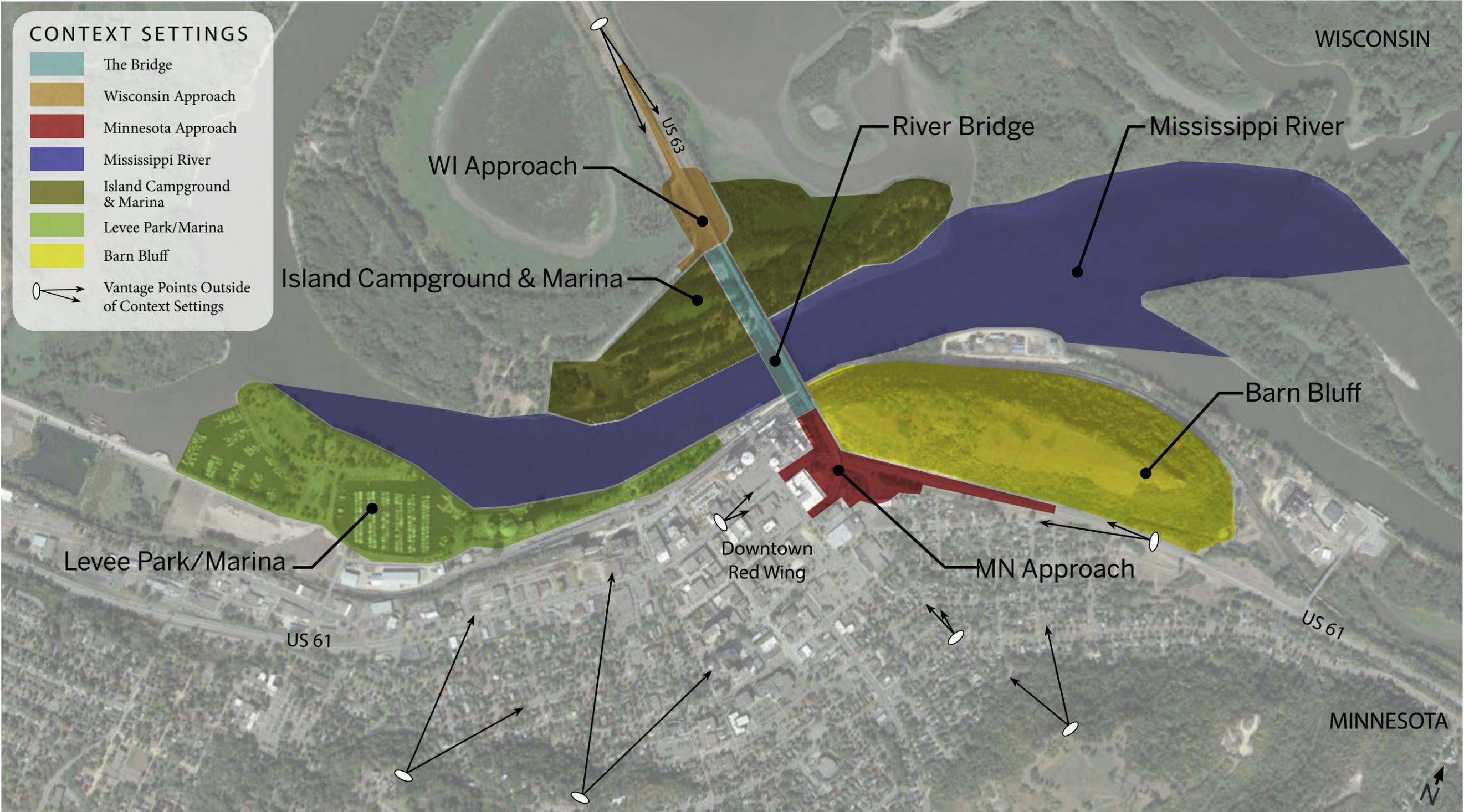
The Context Sensitive Solutions (CSS) technique is an interdisciplinary design process and was the foundation for community outreach and involvement. A variety of CSS-based methods were used to guide the project through design, principally meetings with stakeholders, project owners/partners, and agencies. The input received through meetings and other communications (such as email, website, and correspondence) was important to establish the design goals, understand community design preferences and develop evaluation criteria reflected in this VQM. Continued work with all stakeholders will be required as well throughout final design and construction. The main element of the outreach work during development of the VQM included:

Visual Quality Advisory Committee (VQAC) meetings – The VQAC was created to provide a representative range of local stakeholders from both Minnesota and Wisconsin the opportunity to meet regularly and provide input on project aesthetics during the preliminary design phase. The VQAC included representatives from the local art and historic preservation community, businesses and residents, tribal community, and stakeholders from all age ranges and abilities. Nine VQAC meetings were conducted between January 2014 and April 2015. Meeting activities included a visual preference survey, photo sharing, a ¼ day hands-on planning workshop and extensive discussions regarding preliminary design options.

Introduction & Project Context

Exhibit 1.2.1 - Context Settings

Seven unique geographic settings that provide context for the project improvements were identified: The River Bridge, Wisconsin Approach, Minnesota Approach, Mississippi River, Island Campground and Marina, Levee Park/Marina, and Barn Bluff. Vantage points that are outside of the identified context settings are also indicated. Historic properties are identified in Exhibit 1.2.2.



Introduction & Project Context

Exhibit 1.2.2 - Photos of Historic Properties

Bridge 9103 (top left) is eligible for the National Register and will be demolished as part of the project.

The Red Wing Shoe Company building (top right) sits immediately adjacent to the project and Bridge 9103. This image shows the 1950s addition which housed the factory and shipping.

The Red Wing Shoe Company's original plant (bottom left) was constructed from 1905 to 1908.

Photo (bottom right) from the Burdick Grain property with the existing bridge and Barn Bluff in the background.



Introduction & Project Context

Exhibit 1.2.3 - Historic Properties Map

There is a dense concentration of more than one dozen historic sites and districts that are listed on, or eligible for, the National Register of Historic Places within and near the project. Three of the historic districts are also City of Red Wing heritage preservation sites. The properties include Barn Bluff; facilities related to river, rail, and road transport; and industries and businesses that formed the backbone of the local economy. One of the properties, Bridge 9103, will be demolished. Others will be affected by new construction immediately adjacent, or within their viewshed. The VQM includes some measures designed to reduce the magnitude of these effects.



Introduction & Project Context

Exhibit 1.3.1 - Mississippi River

A defining feature of the context for the replacement of Bridge 9040 is the Mississippi River, which flows between Minnesota and Wisconsin.

Upstream of the bridge on the Minnesota side is fully developed with the ADM facility, Canadian Pacific rail corridor, and downtown Red Wing. Barn Bluff is immediately downstream of the bridge.

The Wisconsin side is more park-like with Island Campground and Marina's boat slips and launch upstream of the bridge and a more natural shoreline downstream.

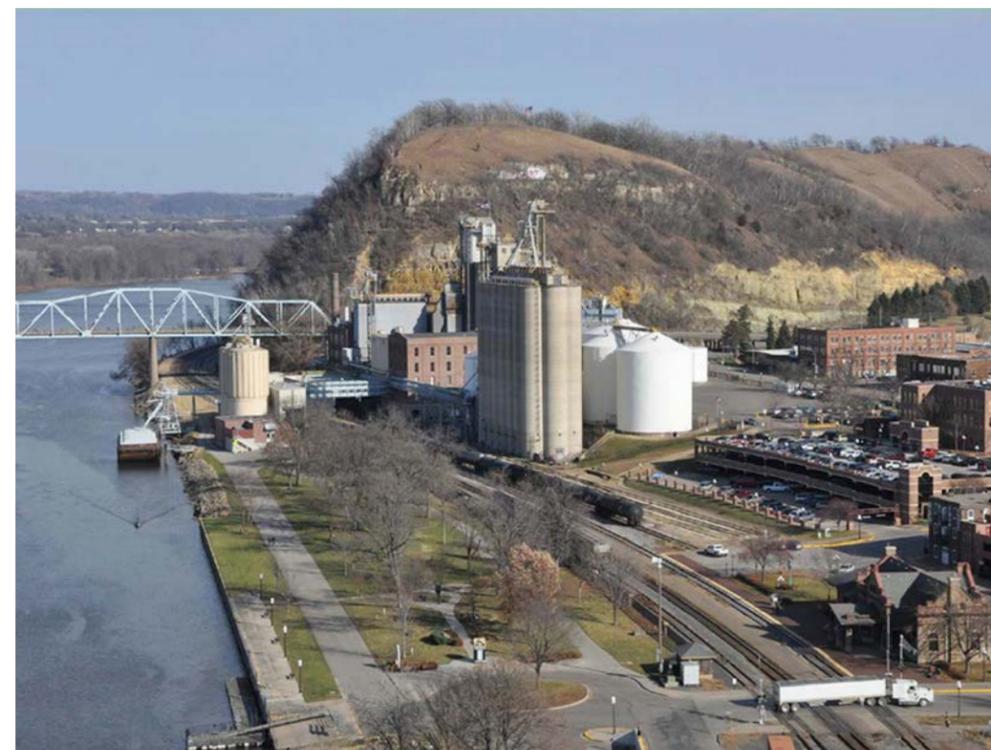
This setting provides a variety of viewing opportunities while on the river and along the shore including framing views of the river channel, views of the underside of the bridge, overlooks and piers.



Introduction & Project Context

Exhibit 1.3.2 - Levee Park

The Red Wing Levee comprises the northern end of the Mall Historic District, which is listed on the National Register and is a Red Wing heritage preservation district. Beginning in the 1850s, the Levee served as Red Wing's principal steamboat landing. The Levee and the adjacent railroad depot, also in the historic district, served as Red Wing's "front door" in the pre-automobile era. In 1903 the Levee was landscaped as a city park and the depot was replaced with a much more expensive version. Today Levee Park and the depot grounds include large trees, benches, historical monuments, and expansive views of the Mississippi River and Bridge 9040. The new bridge will be a significant new element in the setting and its piers will frame distant views down the river corridor.



Introduction & Project Context

Exhibit 1.3.3 - Minnesota Approach

The Minnesota approach includes two distinct environments. At the center is Bridge 9103, which is eligible for the National Register and will be razed. The area north and west of the bridge is largely industrial and includes the Red Wing Shoe Company, also National Register-eligible. The area to the east of Bridge 9103 is more varied. It includes the existing public works facility, modest, older single family homes in the East Red Wing neighborhood, the US 61 corridor and the south flank of historic Barn Bluff. The visual character of US 61 transitions from urban to rural as one travels to the east away from downtown Red Wing.





Barn Bluff, which is immediately adjacent to US 63 on the Minnesota approach to the bridge, is also listed on the National Register of Historic Places. Rising almost 300 feet above the downtown, Barn Bluff plays a significant role in defining Red Wing's visual character and cultural history. It is significant for its geology and its association with prehistoric and native peoples. It is also significant for its association with the exploration of the Upper Mississippi in the early nineteenth century, and for its mid-nineteenth century through present day association with travel, industry, tourism, and recreation. A many-layered interpretation of the feature is evident in local legend, as well as in published historical and scientific accounts, works of art, and photography. As one of Red Wing's most heavily visited parks, Barn Bluff Park provides a variety of trails, including the Kiwanis Stairway, parking, overlooks, interpretive displays, eagle watching and space for active and passive recreational activities. The park also affords sweeping views of the Mississippi River (including the new bridge) as well as views of the city.

Introduction & Project Context

Exhibit 1.3.5 - River Bridge

The bridge deck provides a unique setting where travelers and recreators can enjoy views of the Mississippi River corridor, Levee Park, boat and barge traffic, bald eagles and a variety of other local and migrating bird species. Additionally, there are opportunities to view downtown Red Wing, Barn Bluff and activities at Island Campground and Marina.



Introduction & Project Context

Exhibit 1.3.6 - Island Campground & Marina

Located on Trenton Island across from downtown Red Wing, the Island Campground and Marina provides an informal landscape setting with shoreline dockage, a boat launch, trailer camp sites, large shade trees and open space. The Harbor Bar and Restaurant draws patrons from the area throughout the year for dining and entertainment. The bridge looms large in this setting, framing downriver views, creating an overhead structure within parts of the campground and allowing close interaction with the base of land side bridge piers.



Introduction & Project Context

Exhibit 1.3.7 - Wisconsin Approach

The undeveloped, natural landscape character of the Wisconsin approach to Bridge 9040 provides a more subtle transition to the river corridor and bridge as compared to the more eclectic urban character of the Minnesota approach. As one travels US 63, there are extensive views of the area's natural scenery and wildlife through Trenton Island approaching the Mississippi River.



1.4 PROJECT CHARACTERISTICS AND OBJECTIVES

The project consists of three primary components: the Wisconsin approach to the US 63 river bridge; the Minnesota approach to the US 63 river bridge; and the US 63 Bridge 9040 itself. See 1.1.1.

1. Currently the Wisconsin approach to the US 63 bridge offers unrestricted access to the south onto 825th St. This will be removed and reconstructed as a jug handle four-legged intersection with a center median on US 63. Parallel parking may be provided along the shoulder portions of the “jug handle” roadways to support activities such as hiking out to the new bridge or cycling through the project area. A multiuse trail segment may also be located within the western side of the jug handle to provide more convenient access to the Island Campground and Marina via 825th St. New facilities are intended to blend into the surrounding naturalistic landscape using moderate height native grasses and overstory trees.

2. The Minnesota approach to the US 63 bridge will be constructed as a buttonhook intersection with a slip ramp. This preferred alternative replaces Bridge 9103 over US 61 with a single span prestressed concrete girder bridge and creates a new at-grade intersection of US 63 and US 61 east of downtown Red Wing. Bridge 9103, an historic property, will be removed as part of the project. The concept allows southbound US 63 traffic to access downtown Red Wing and MN 58 along a new one-way slip ramp to 3rd Street. Visual quality objectives in this segment include minimizing impacts of the new facilities on the Red Wing Shoe Company building, also an historic property, and blending landscape and stormwater management best practices within the button hook into the visual character of the US 61 corridor.

3. The existing US 63 Bridge 9040 will be replaced by a new steel box girder structure. The existing structure will be replaced due to a variety of factors including its lack of structural redundancy, low sufficiency ratings due to uneven foundation settlement, excessive longitudinal movement, and poor deck condition. The new US 63 river bridge will be located immediately upstream of the in-place river bridge. The proposed new structure will include two 12 feet wide lanes, two 6 feet shoulders, and a 12 feet wide trail on the bridge’s west side (upstream side) for a total width of 52 feet and 4 inches. The bridge is being planned with two potential overlook features, located along the upstream side adjacent to the multiuse trail. Visual quality objectives in this segment focus on developing a structure that fits harmoniously into the river corridor as well as minimizing impacts to historic properties.



View looking northeast toward Wisconsin Approach



View looking northeast toward Minnesota Approach



View on new river bridge with new multi use trail and overlook

1.5 Visual Quality Design Elements and Next Steps

1.5.1 Visual Quality Design Elements. The VQM addresses design aspects of the following project elements:

- a) Roadway
- b) Multi-purpose Trail
- c) Bridges
- d) Retaining Walls
- e) Noise Walls
- f) Slope Protection
- g) Vegetation / Landscaping
- h) Lighting

1.5.2 Next Steps

Chapter 2 provides varied levels of guidance on visual quality elements for the segments previously described. The scope of the VQM is focused on structures and civil elements and is fairly detailed for some project components and is more general for others. For example, the shape and proportions of bridge piers are illustrated and dimensioned to serve as the fundamental pier shape and proportion, while their exact sizing and location will be determined through the final engineering design process.

The anticipated next steps for project development include the detailed engineering design that will incorporate the guidance provided in this VQM.



The Proposed River Bridge

River Bridge

Exhibit 2.1.1 - Bridge Plan View

The replacement river crossing bridge will become the latest addition to the family of new bridges crossing the Mississippi River. It uses simple and elegant design elements to create a memorable crossing over this remarkable waterway.

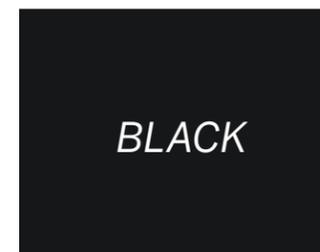


Proposed River Bridge Plan

Project Components

Exhibit 2.1.2 - Component Colors

See the chart below for colors of project components.

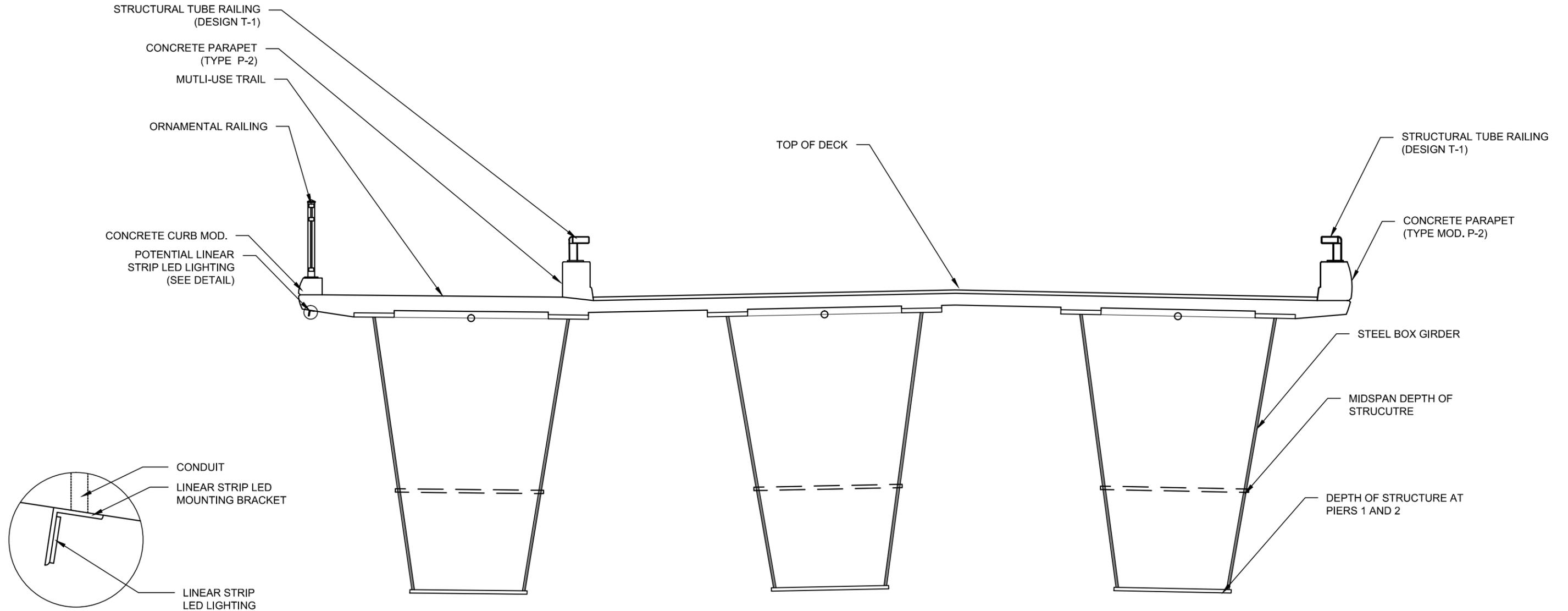


Color	Component
<p><i>"Light Buff"</i> Federal Standard 595C, Color #33522</p>	Piers
	US 61 Pre-stressed Concrete Girders - outer face and bottom flange
	Slip Ramp Concrete Box Girders - outer face and bottom
	Bridge Deck Edge
	Bridge Copings
	Concrete Barriers
	Pilasters
	Abutments
	Retaining Walls
<p><i>"Taupe"</i> Federal Standard 595C, Color #26306</p>	Wing Walls
	Gateway Spires
	Pier Plinths
<p><i>"Medium Gray"</i> Federal Standard 595C, Color #26152</p>	River Bridge Steel Box Girders
	River Bridge Pre-stressed Girders - outer face and bottom flange
	Overlook Supports
<p><i>"Black"</i> Federal Standard 595C, Color # 27038</p>	Ornamental Railing System
	Structural Tube Railings
	Light Poles
	Light Fixtures

River Bridge

Exhibit 2.1.3 - Bridge Section (Deck, Girders) Spans 1-3

The section shape of the bridge is both visually light and structurally efficient. Three trapezoid shaped steel box girders between spans 1-3 will form the structural ribs carrying the entire deck load above. The upriver side of the box girders may be illuminated with a subtle wash of light by a linear strip LED lighting system.



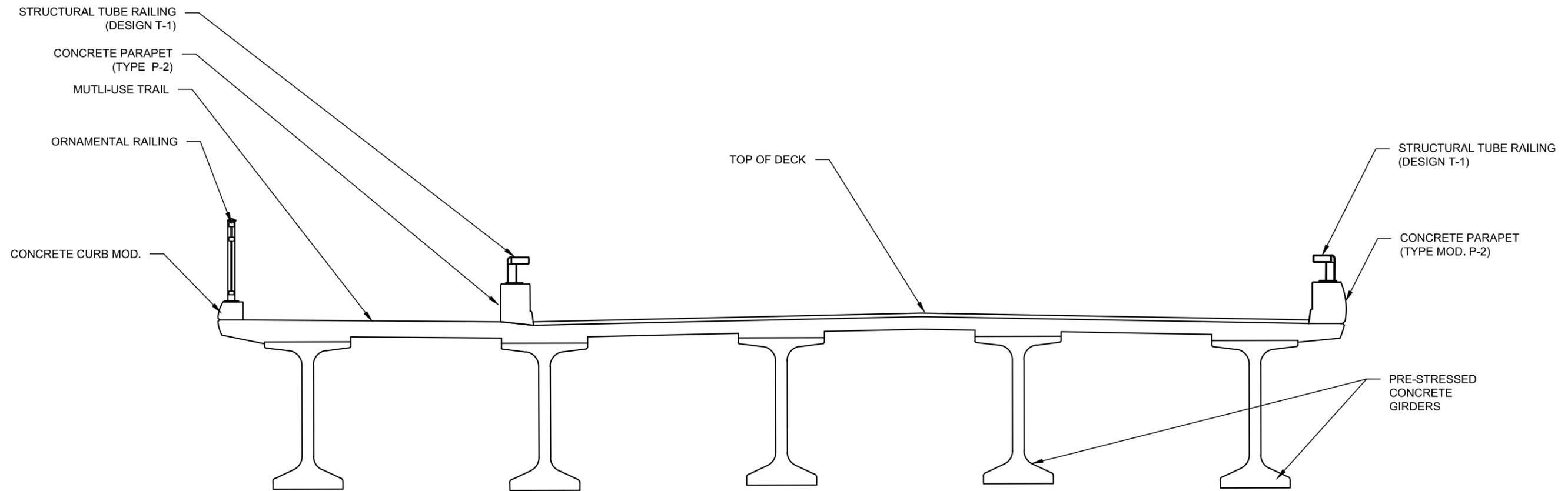
Potential Linear LED Strip Lighting Detail

Section of Bridge Deck and Girders

River Bridge

Exhibit 2.1.4 - Bridge Section (Deck and Girders) Spans 4-7

Spans 4-7 use pre-stressed concrete girders.

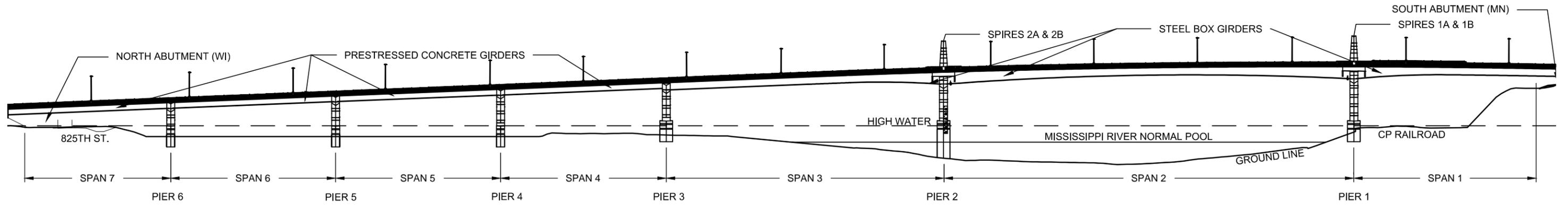


Section of Bridge Deck and Girders

River Bridge

Exhibit 2.1.5 - Bridge Elevation

The bridge as a whole will have a slim profile across the river, opening views along the river previously obstructed with the old truss structure. The seven span structure will be carried by six piers - one pier placed at the Minnesota shoreline (Pier 1), one pier in the river (Pier 2) and four piers (Piers 3 through 6) supporting the structure over the Wisconsin approach, touching down at an abutment approximately 12 feet tall. The abutment height accommodates for the passage of 825th Street underneath the approach as well as water and debris to flow-free during flood events.

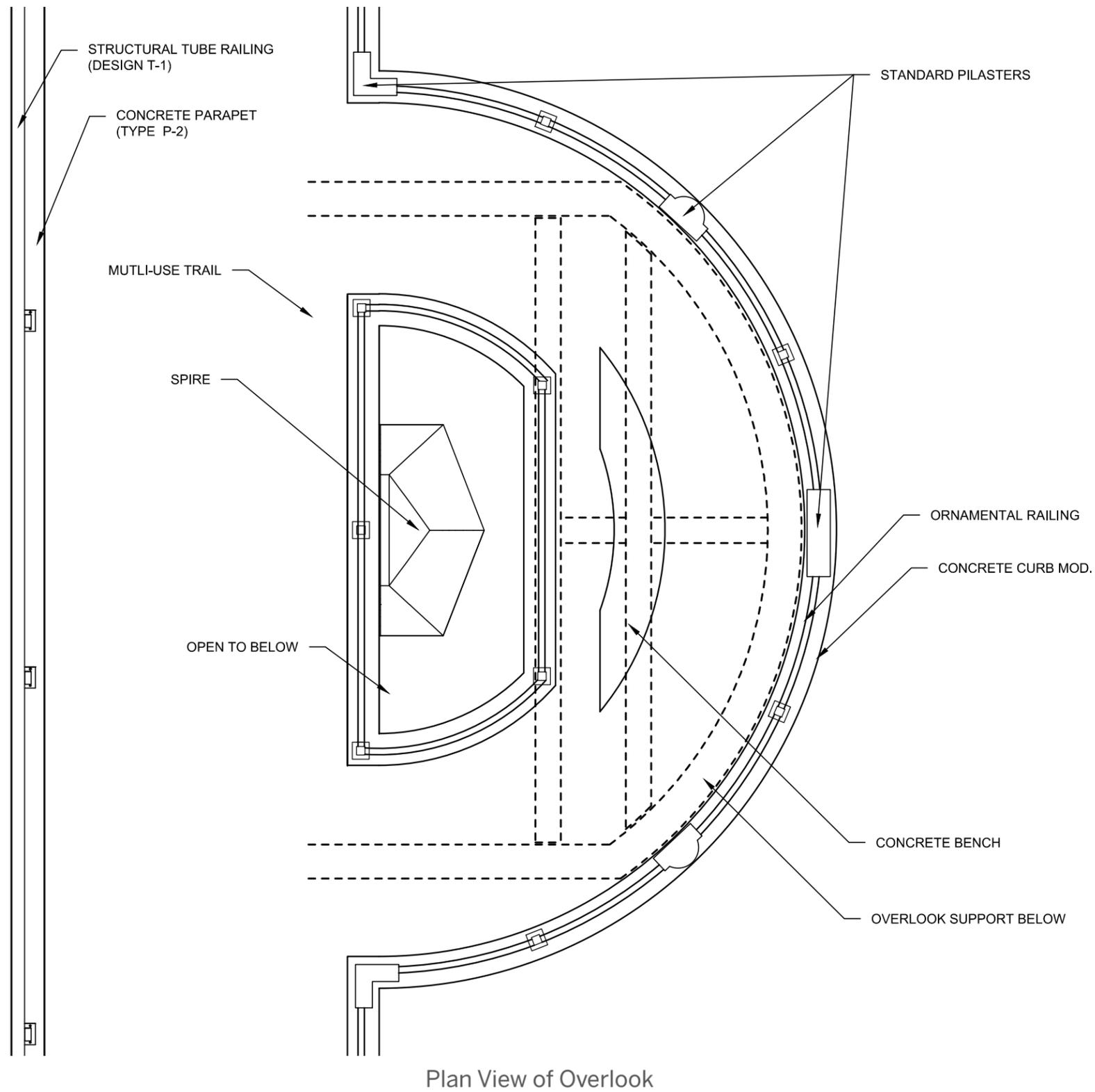


Elevation of River Bridge

River Bridge

Exhibit 2.1.6 - Overlook Plan

Circular overlooks are created at piers 1 and 2 enhance the user experience by providing a place to rest and enjoy views of the Mississippi River and surroundings. The two overlooks are pierced by the spires, creating an opening to allow users to visibly experience the piers and the water below, connecting the bridge from water level to deck level both visibly and physically. The design intent for user experience is to balance safety, operational and on-going maintenance considerations.



Perspective view of Overlook at Pier 2

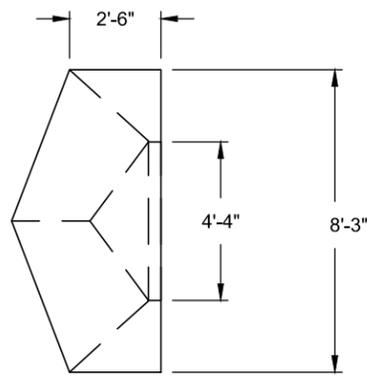
River Bridge

Exhibit 2.1.7 - Overlook Section

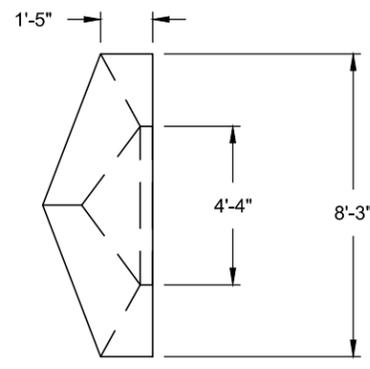
The overlook design features a variable width semicircular path around an opening for the gateway spire, a bench seat, a gathering area, and areas for integrating public art or interpretive plaques within the concrete railing pilasters. The path width will be no less than 6 feet wide between the face of the concrete bench and the coping to allow for the unimpeded passage of a wheel chair while someone is either standing at the outer railing or sitting on the bench, and to allow for plowing equipment. Steel brackets and plates carry the load of the overlook back to the pier.



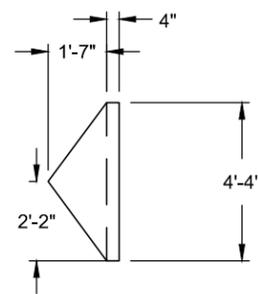
Perspective view of Overlook at Pier 2



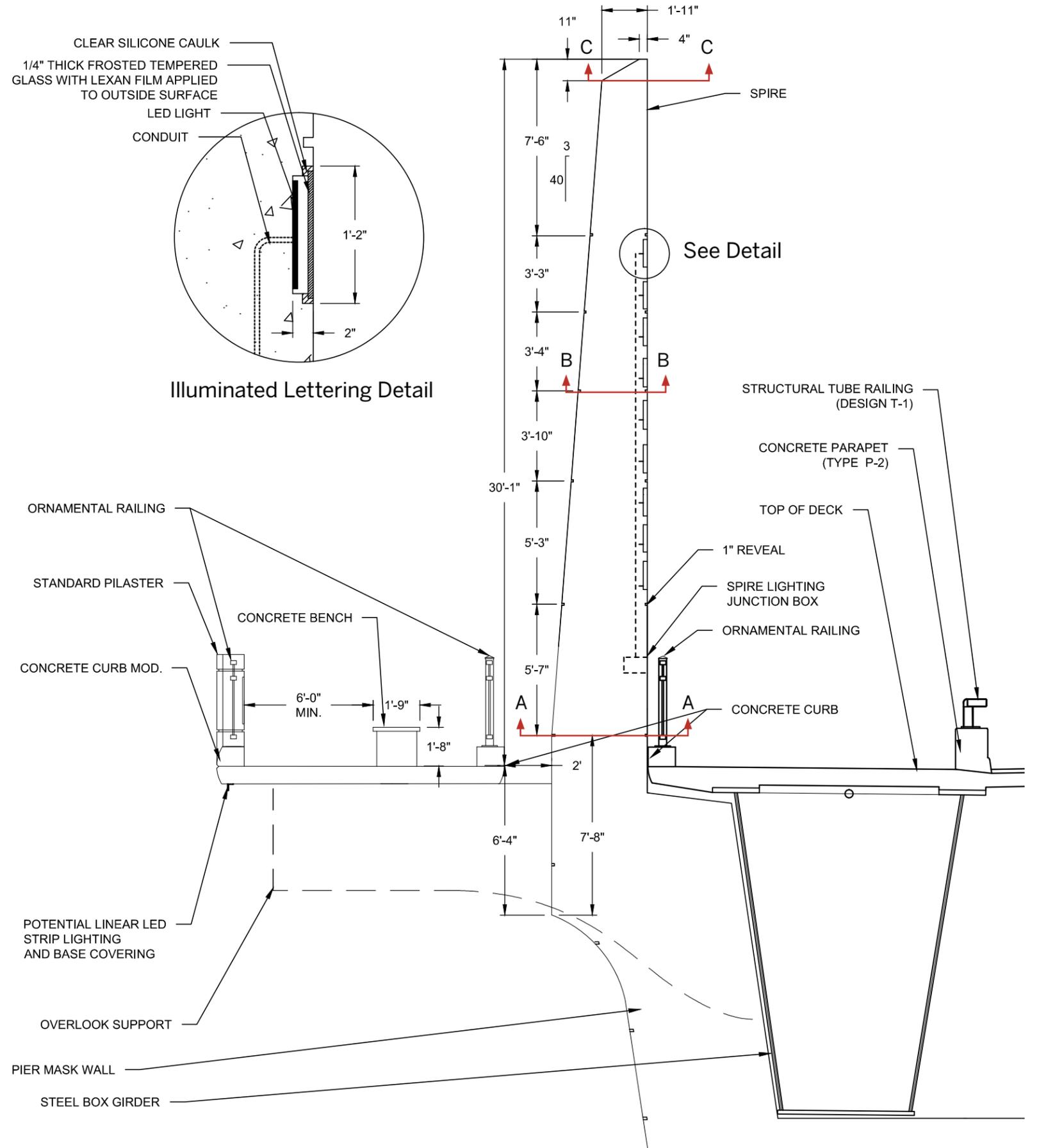
Section A-A



Section B-B



Section C-C



Section of Overlook and Partial Bridge

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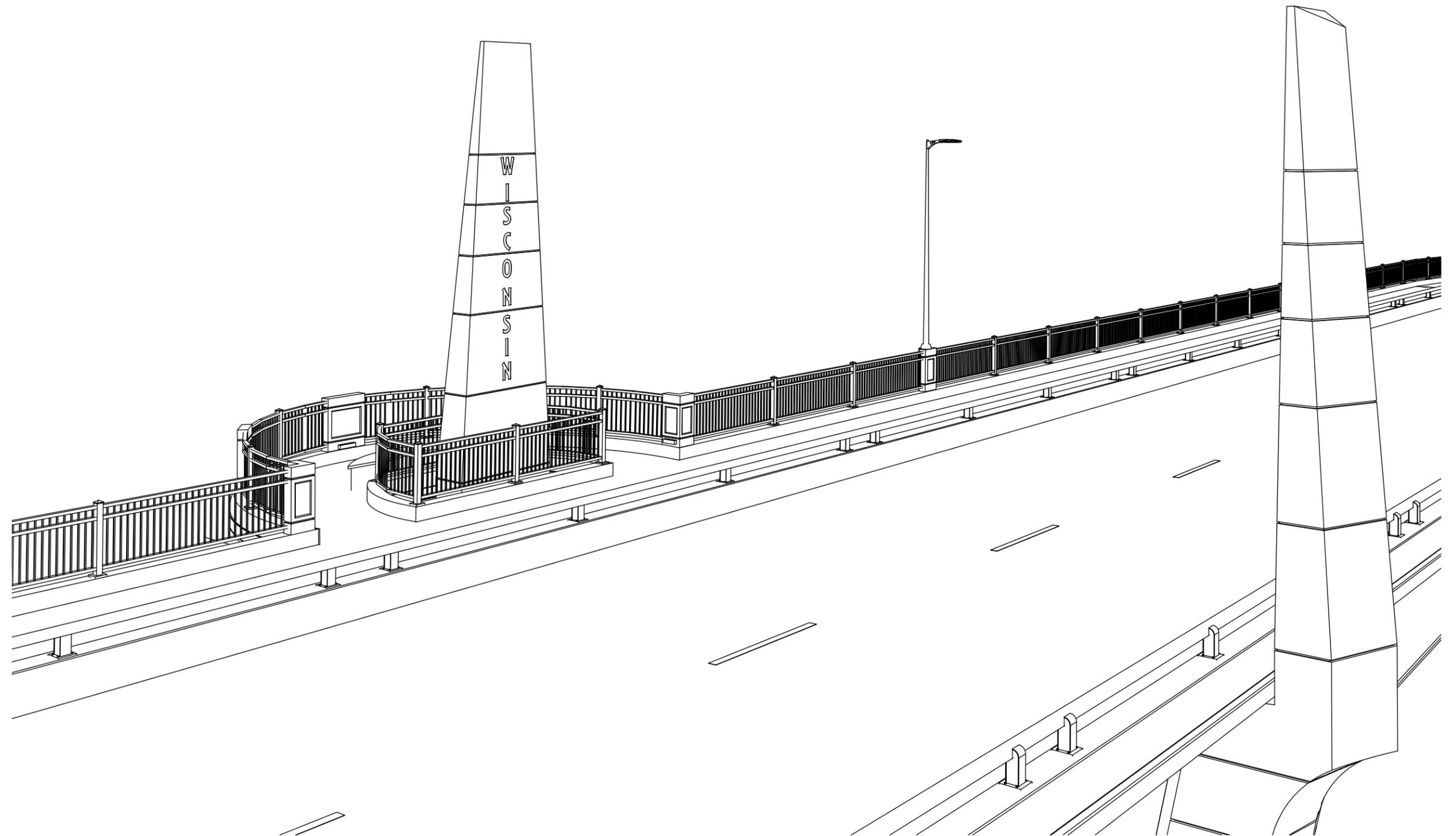
River Bridge

Exhibit 2.1.8 - Gateway Spire Axon

Piers 1 and 2 each incorporate a pair of vertical spires to create a perceptible “welcoming gateway” over the Mississippi River for pedestrians, cyclists, and motorists traveling between the states. Piers 1 and 2 also include circular overlooks surrounding the upstream spires, where people can directly interact with the vertical feature and experience views of the surrounding context. The downstream spires sit

outside of the deck level barrier. In addition to the bridge, the spires are visible from several vantage points throughout the area. The spire form is a direct result of the continuation of formal lines of the piers extending upward past the bridge deck. The surface treatment of the concrete will be smooth, broken by reveals to simulate “grout lines.”

See exhibit 2.1.2 for component colors.



Perspective view of Spire 2A at Overlook and Spire 2B at Pier 2

River Bridge

Exhibit 2.1.9 - Pier 1 Elevations

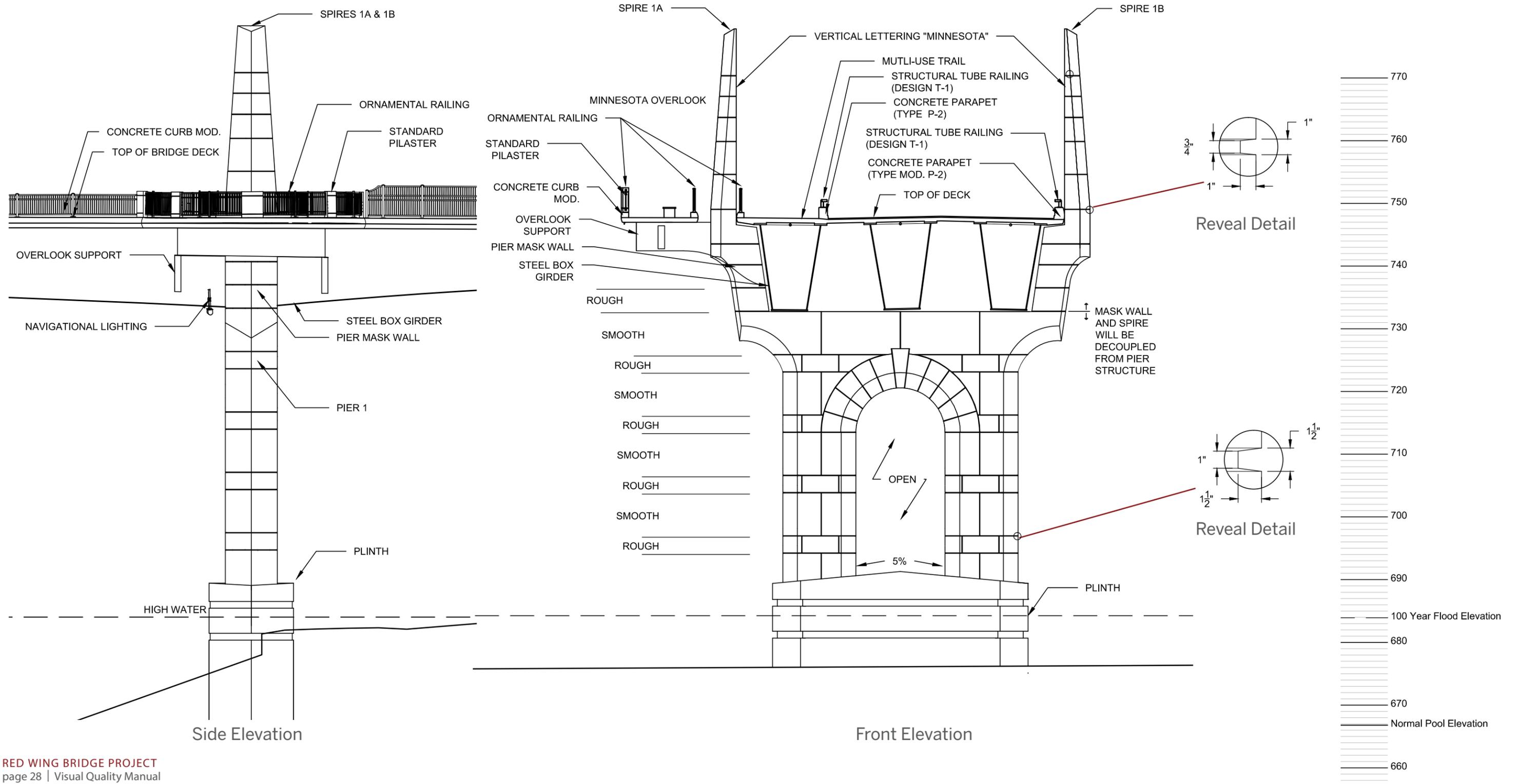
Viewed from water level or from either shore, the piers are inspired by Red Wing's heritage of traditional building material, techniques and elements such as native limestone, arch forms, and corbelling. The piers are grounded on a plinth, extending up past the water level, giving the bridge a solid, monumental expression. Pier 1 is located on land at the Minnesota riverbank edge. During flood stage, the pier base may be submerged under water. The first of two overlooks is located directly above

Pier 1 on the upstream side of the bridge. This location will afford good views of Red Wing, the railroad activity at the ADM milling facility, Levee Park and Barn Bluff across the bridge deck. Early design exploration considered more streamlined, stylized and modern shapes, but the design process led to a more traditional pier form – incorporating an efficient semi-circular arch with a center keystone. The ratio of mass to void is symmetrical and balanced, reflecting a more subtle visual aesthetic.

bridge piers built in previous centuries. In a gesture to the past, the concrete surfaces will be laid out with bands of alternating smooth and rusticated finishes. Pier detailing will use horizontal and vertical reveals simulating grout lines. Additional shaping is established through the use of faceted shapes and curves. Vertical spires are introduced at piers 1 & 2 to create a more significant gateway effect when crossing between Wisconsin and Minnesota.

The final pier design acknowledges the robust proportions and massing of stone

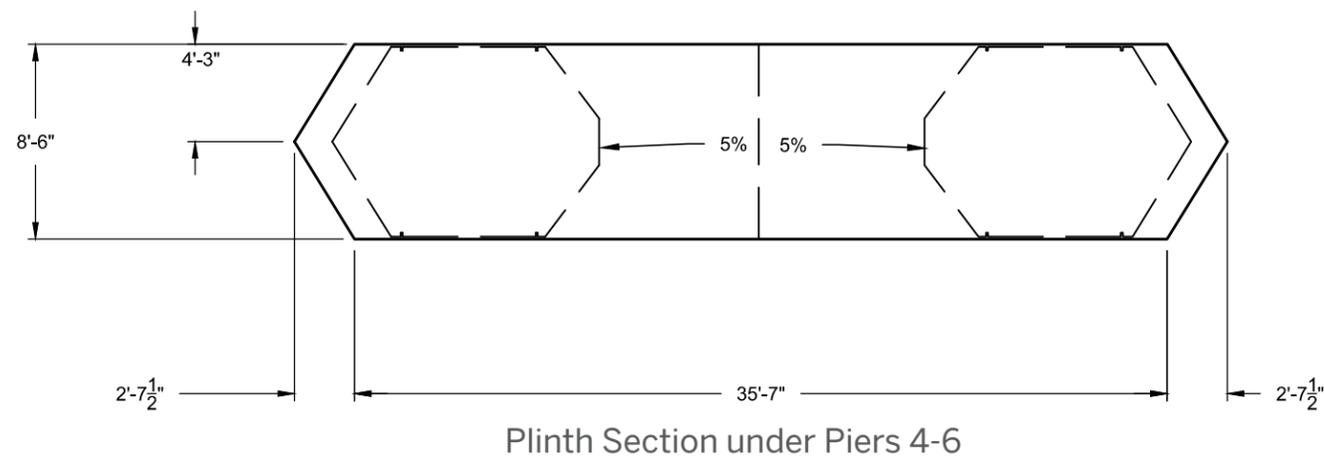
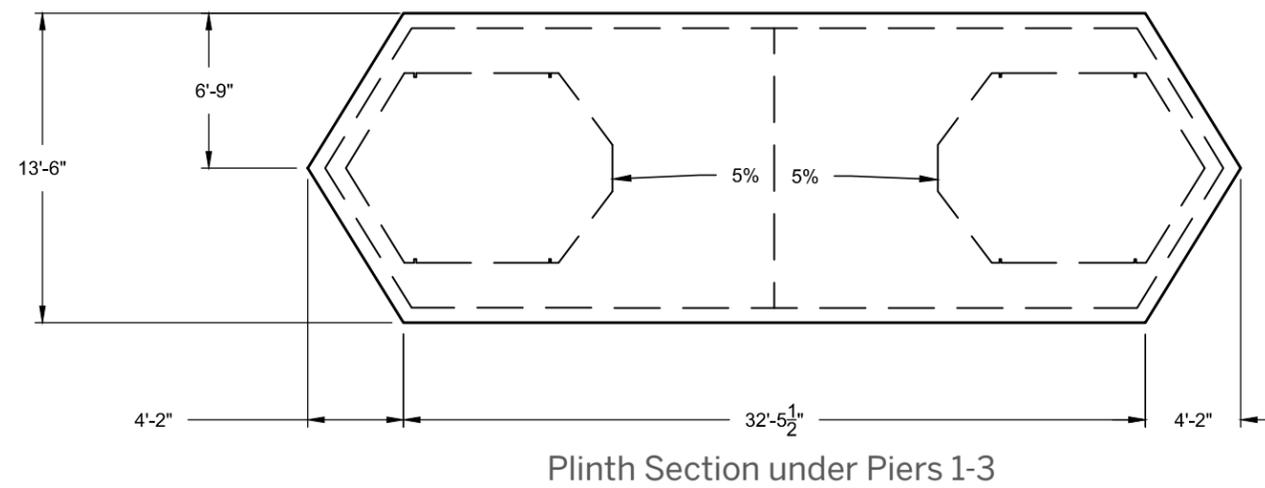
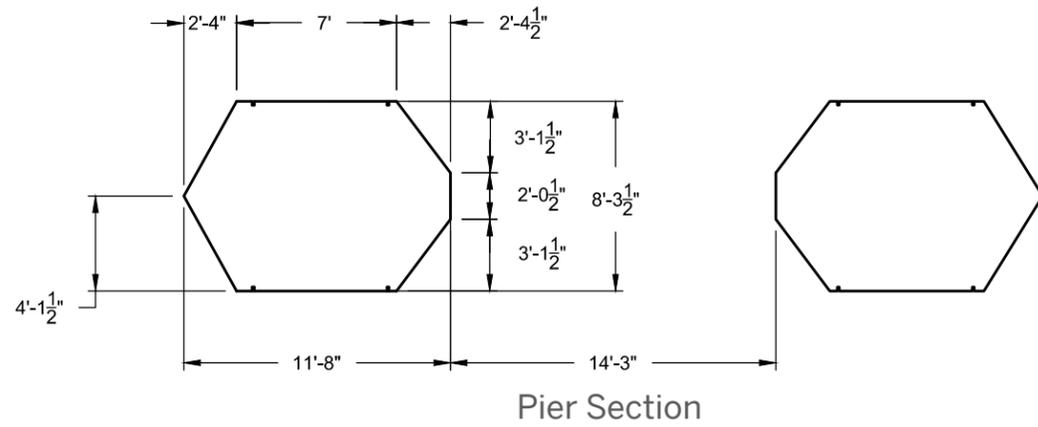
See exhibit 2.1.2 for component colors.



River Bridge

Exhibit 2.1.10 - Pier and Plinth Sections

Pier legs are formed as a multifaceted, seven sided shape as illustrated in the drawings below. Pier legs rest upon a hexagonally shaped plinth.



Wisconsin
Overlook

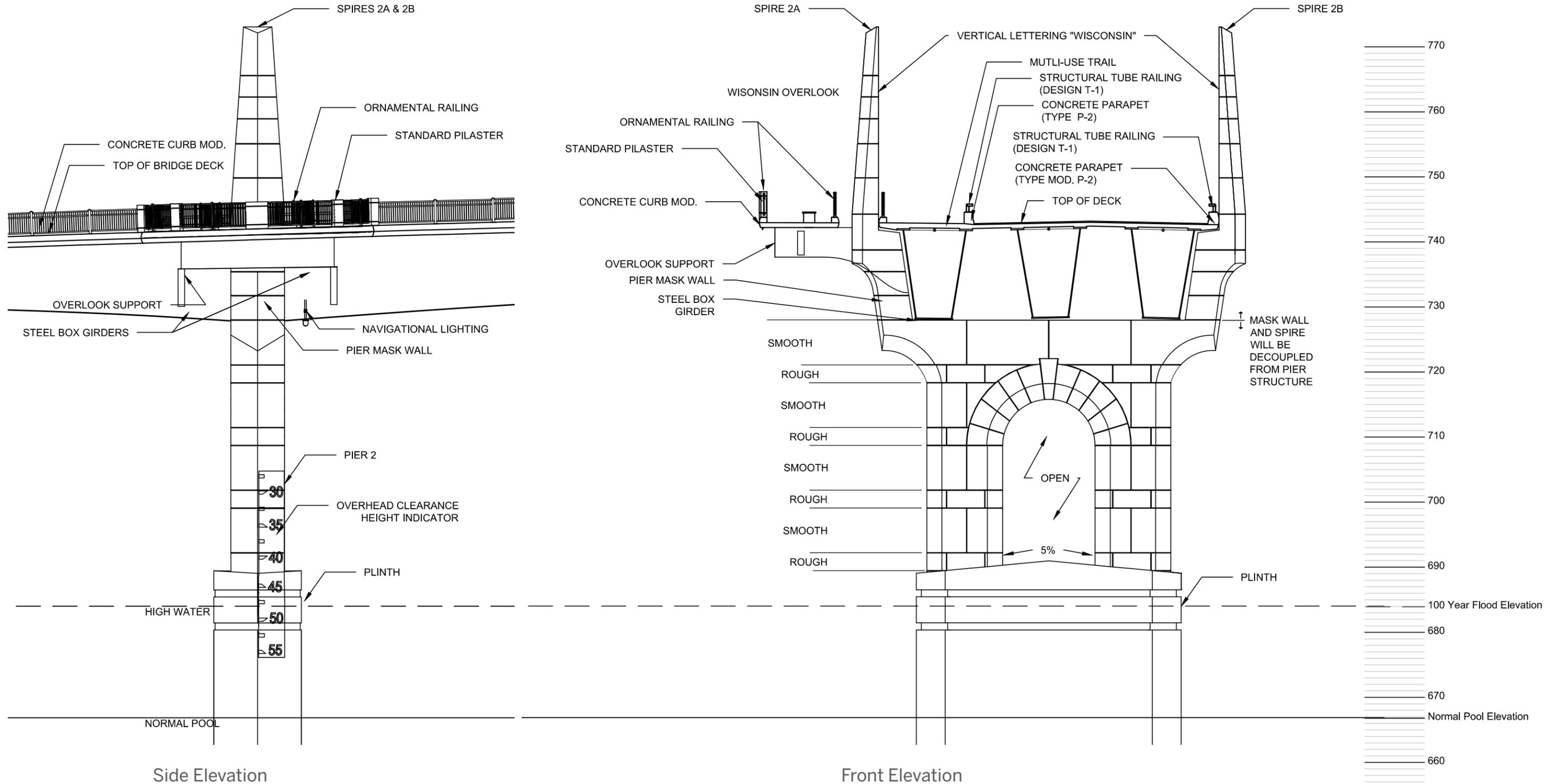


Pier Elevation of Piers 2 through 6

River Bridge

Exhibit 2.1.11 - Pier 2 Elevations

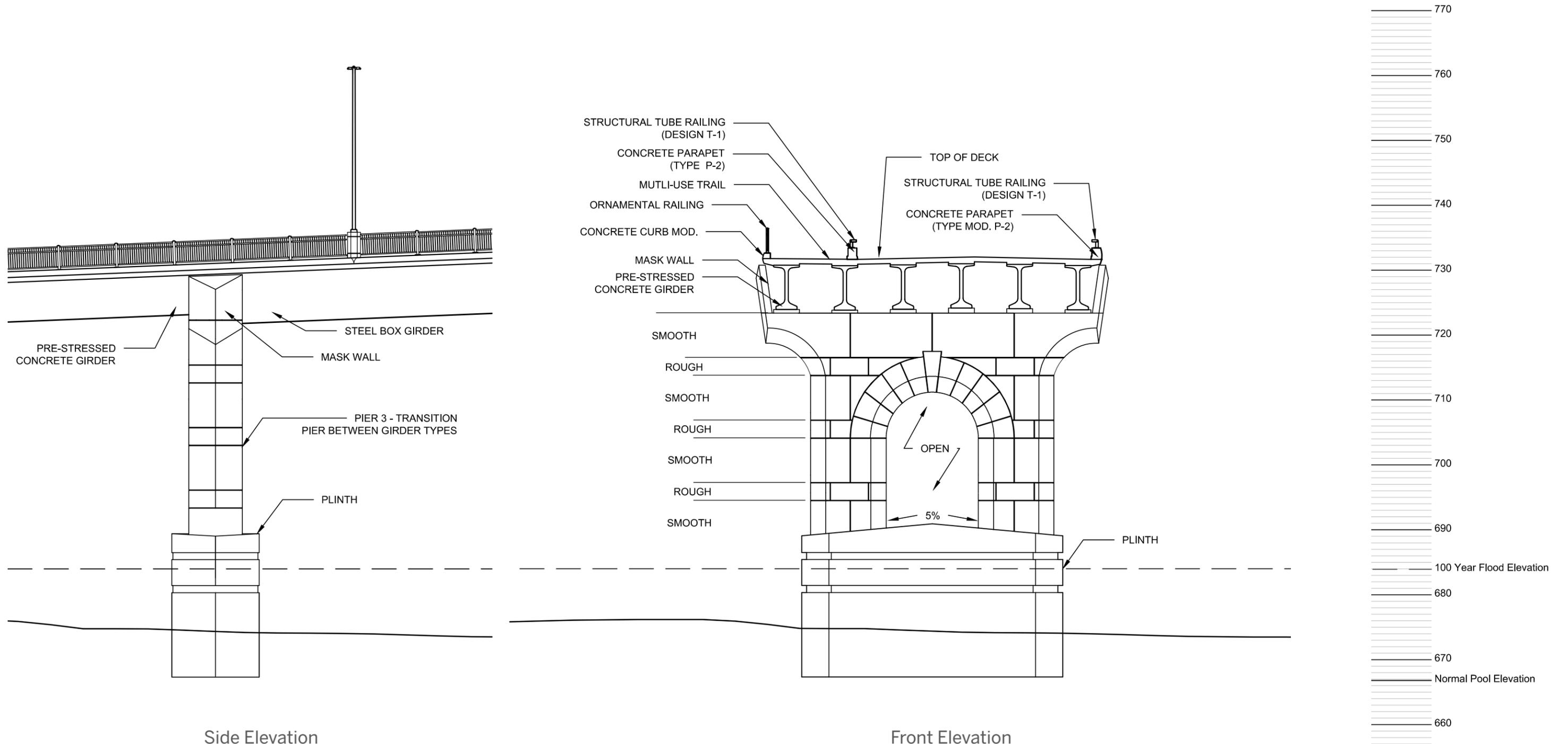
Pier 2 is located in the river, approximately 950 feet from the Wisconsin shoreline. Above this pier, the second overlook will give the viewer more of a serene river experience. The pier legs/columns are designed as perpendicular (completely vertical), rather than tapered, in order to keep a consistent cross section. Having consistent geometry and cross section dimensions will improve construction efficiency and affordability by allowing concrete formwork to be reused from pier to pier.



River Bridge

Exhibit 2.1.12 - Pier 3 Elevations

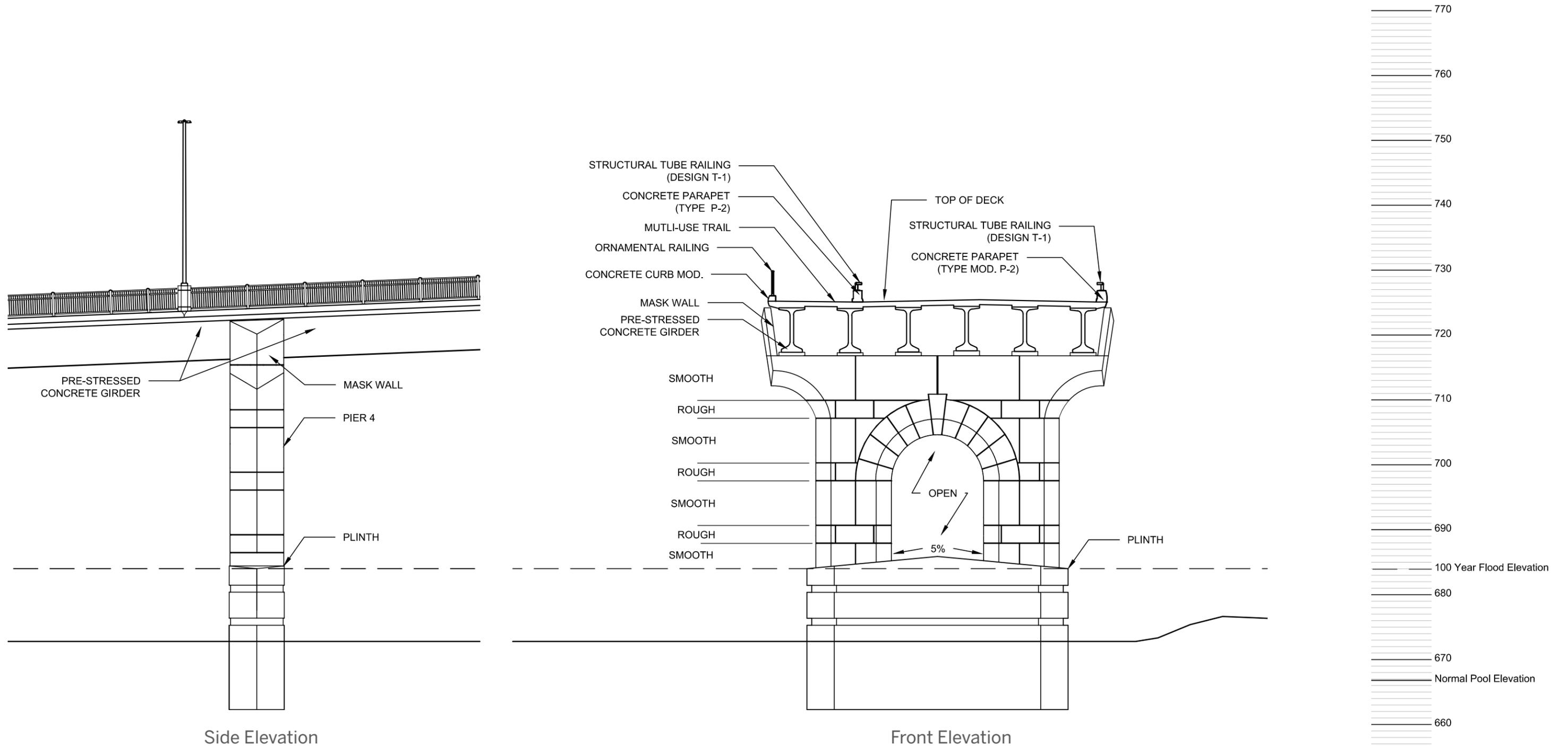
Starting with Pier 3, all subsequent piers to the north will be grounded on land (Wisconsin segment). Pier 3 is the transition point from the river crossing steel box girders to pre-stressed concrete girders spanning the Wisconsin segment. Mask walls will be used on all piers as a transition “embracing and holding” the girder above the pier cap. The mask wall surface treatment will be smooth with reveal grout lines matching the other pier structure reveals. At Pier 3, the mask wall is especially important to cover and transition the change of girder materials and the difference of bridge structure height.



River Bridge

Exhibit 2.1.13 - Pier 4 Elevations

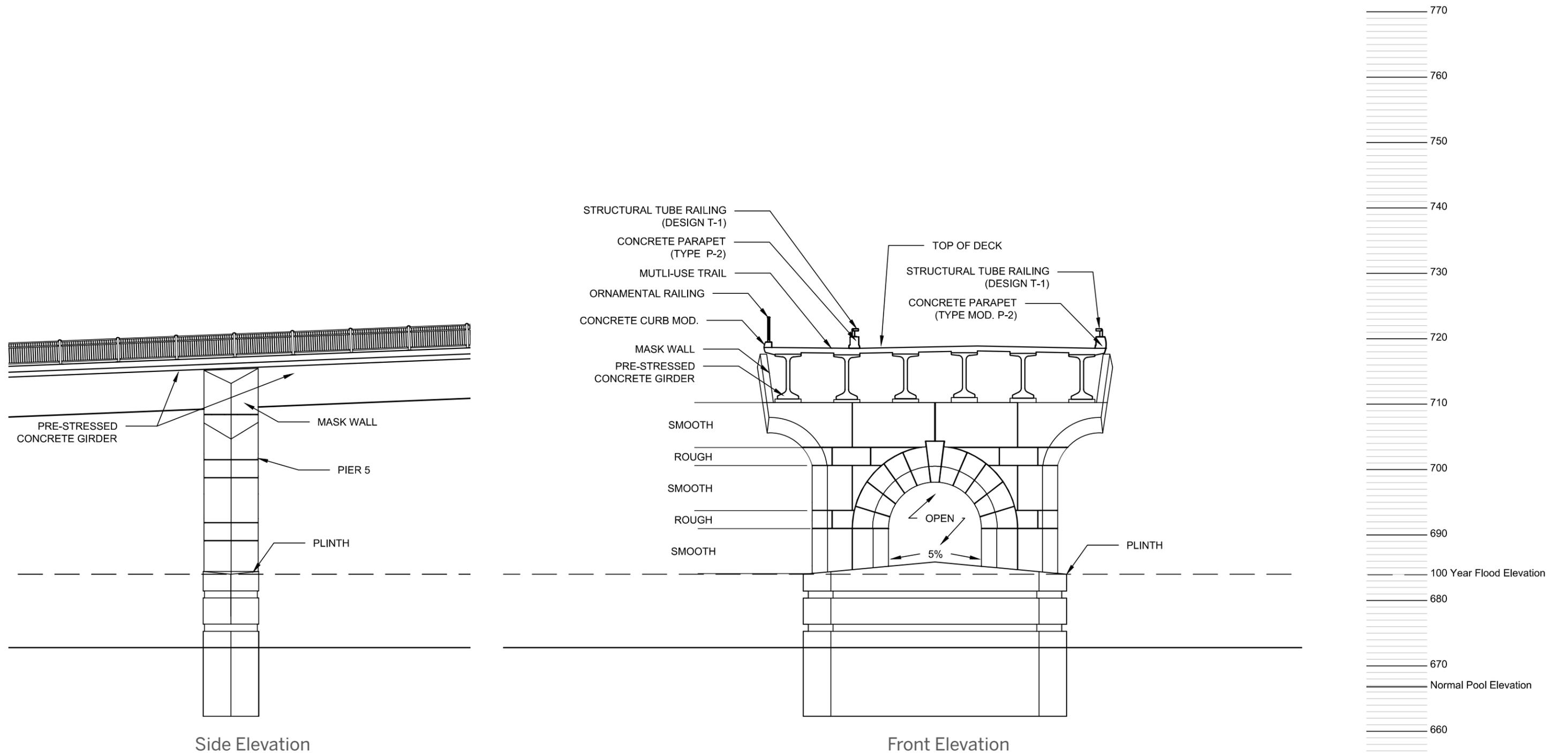
As viewed across all piers, the plinths will be a set consistent top elevation – visually this will read as one set consistent height (set to approximate the 100-year flood elevation). Each plinth is sloped outward at 5% from a centerline, creating both visual interest and functioning to wash-clean the top. The continuous solid plinth base (verses individual pier legs entering the water) will aid in reducing ice build-up and debris catching points during spring melting and flood events.



River Bridge

Exhibit 2.1.14 - Pier 5 Elevations

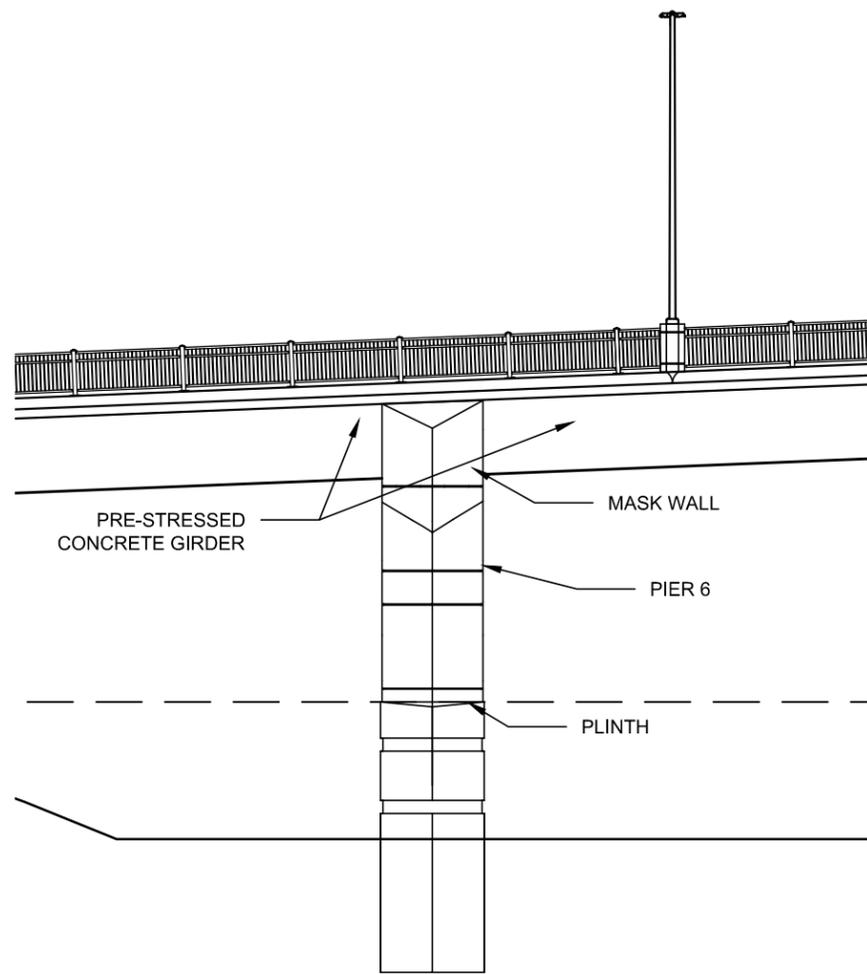
The overall pier design accommodates reductions in pier height as the bridge progresses from the river towards land.



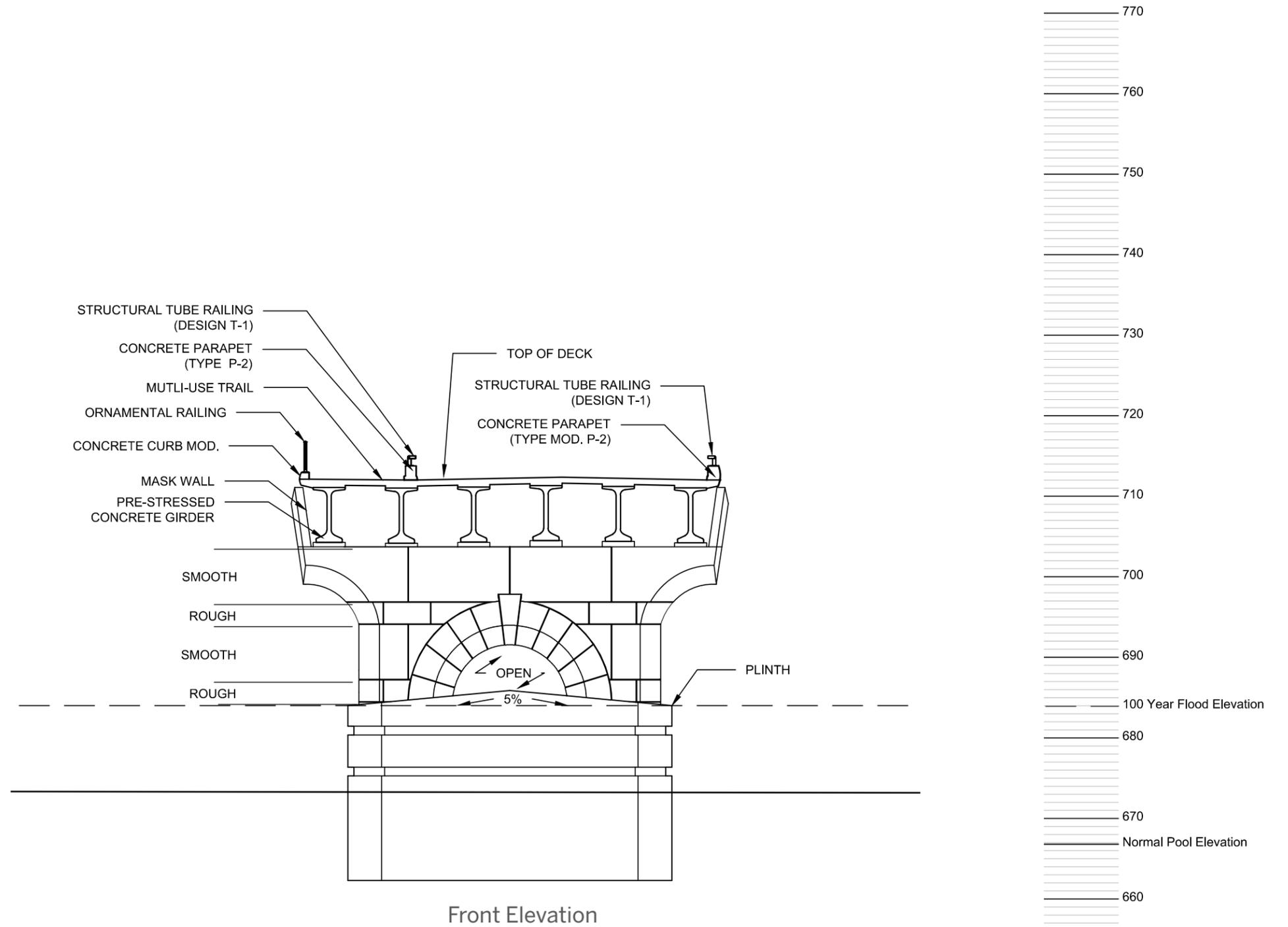
River Bridge

Exhibit 2.1.15 - Pier 6 Elevations

Pier 6, the shortest pier, maintains the same plinth elevation and design character of the taller piers.



Side Elevation



Front Elevation

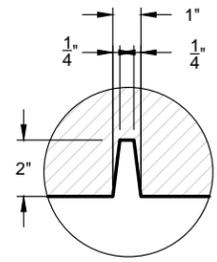
River Bridge

Exhibit 2.1.16 - Rustication Patterns for Abutments & Retaining Walls

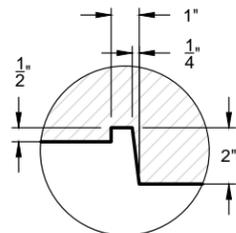
The outer face of abutments and retaining walls will incorporate an "ABC" pattern of three repeating column widths and varying horizontal breaks that create rectangular panels / surfaces that protrude and recede, and are separated by horizontal and vertical reveals simulating "grout lines." The pattern will be laid out starting at the top of the structure to provide the most varied and visually pleasing result. Adjustments to the layout of horizontal reveals at the bottom of the pattern may be necessary to prevent surface panels of less than 6 inches in height.

The surface texture of abutments and walls was examined during the design process and it was determined that, for areas within and adjacent to historic properties, the pattern and texture should be as simple as possible to avoid visual distraction. Consequently surface texture treatments for abutments and retaining walls are not recommended in this Visual Quality Manual.

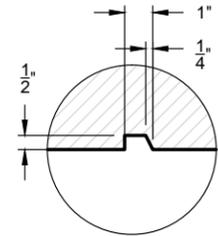
See exhibit 2.1.2 for component colors.



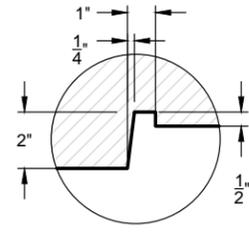
Section A-A



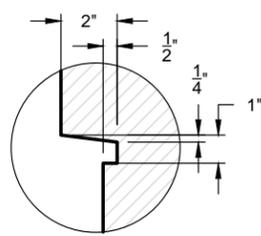
Section B-B



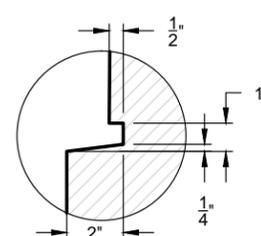
Section C-C



Section D-D

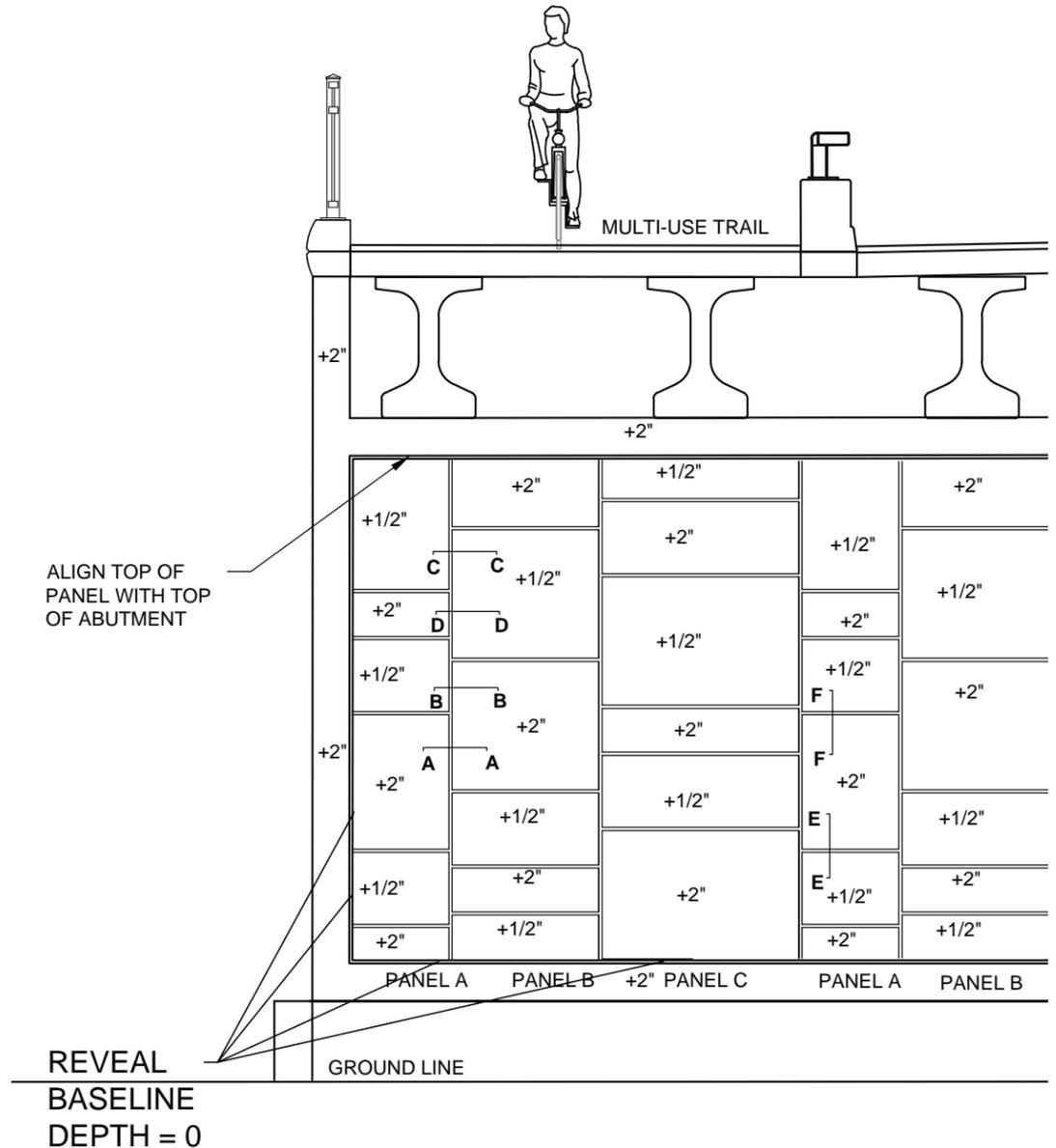
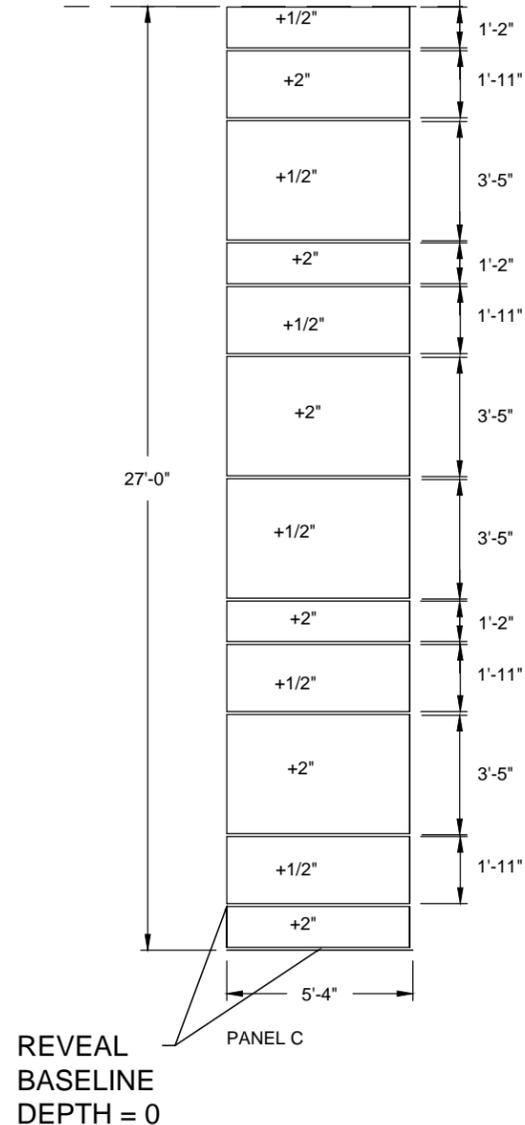
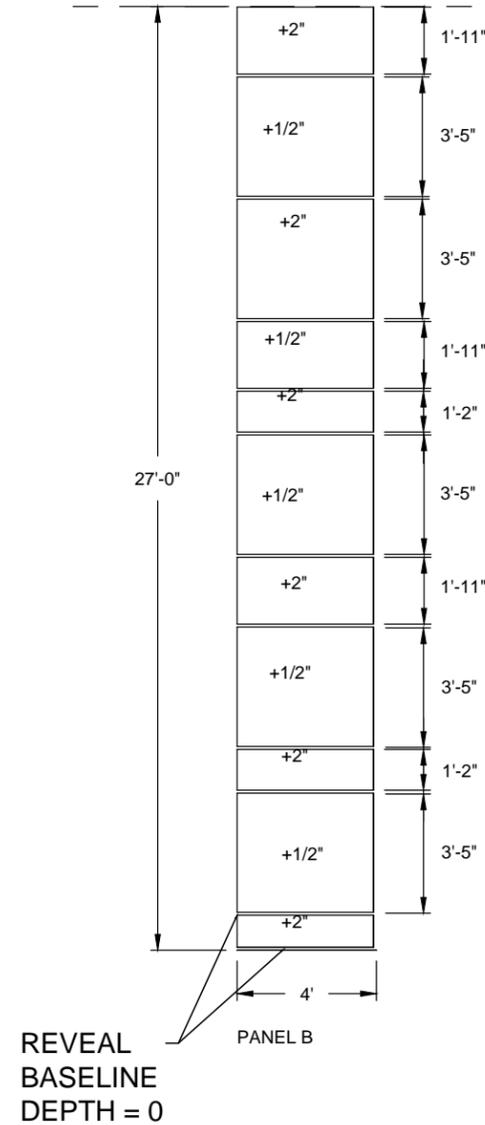
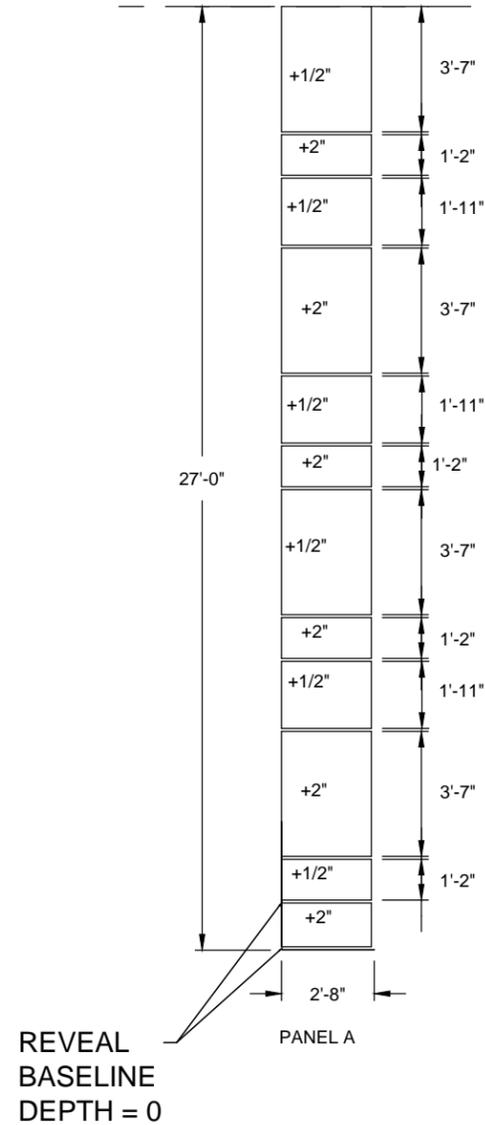


Section E-E



Section F-F

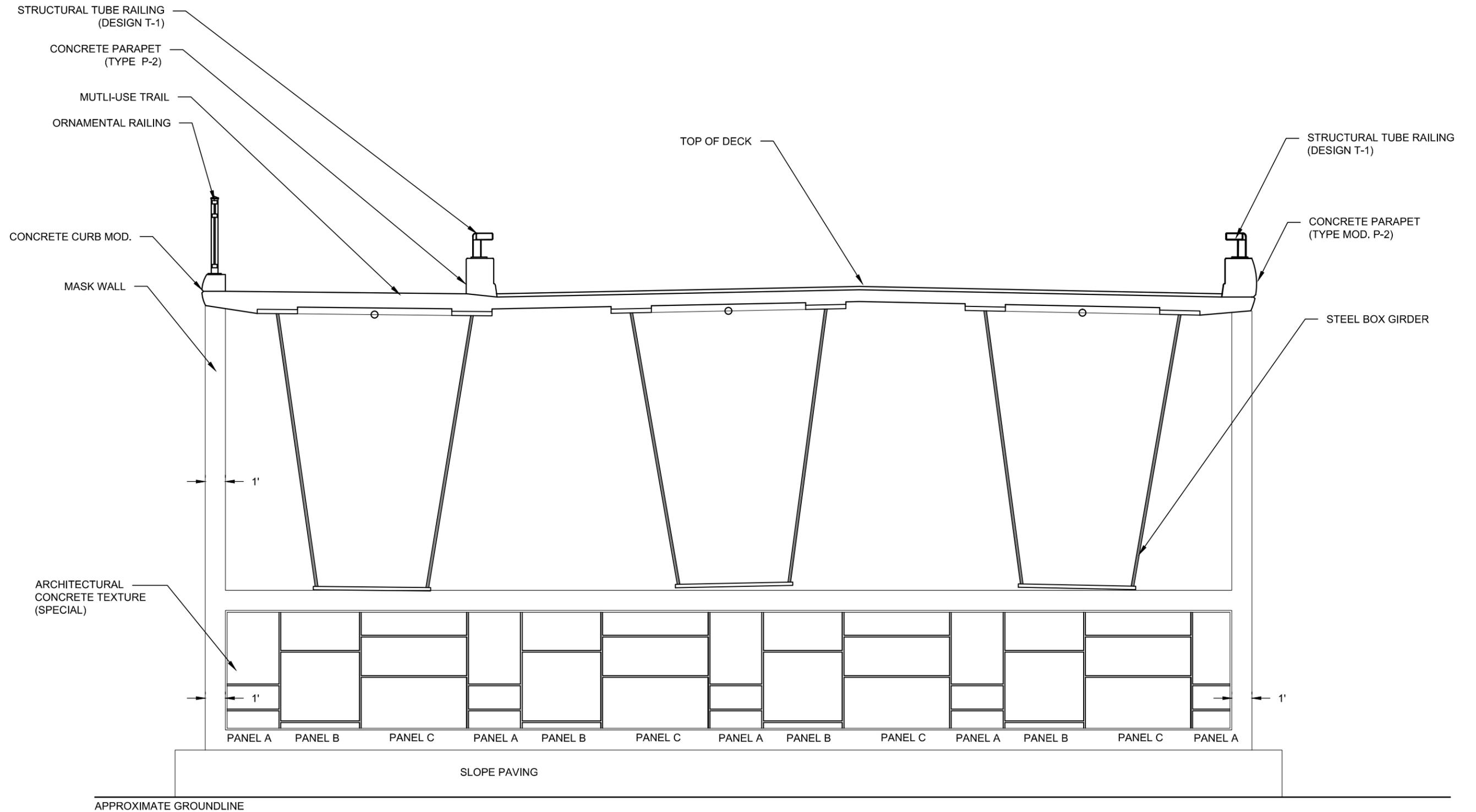
FULL PATTERN LAYOUT BEGINS AT TOP OF PANEL



River Bridge

Exhibit 2.1.17 - South Abutment Elevation

As it is perched on a rock outcropping above the railroad, the Minnesota abutment will be less visible, but identical in surface treatment and patterning to the Wisconsin abutment.

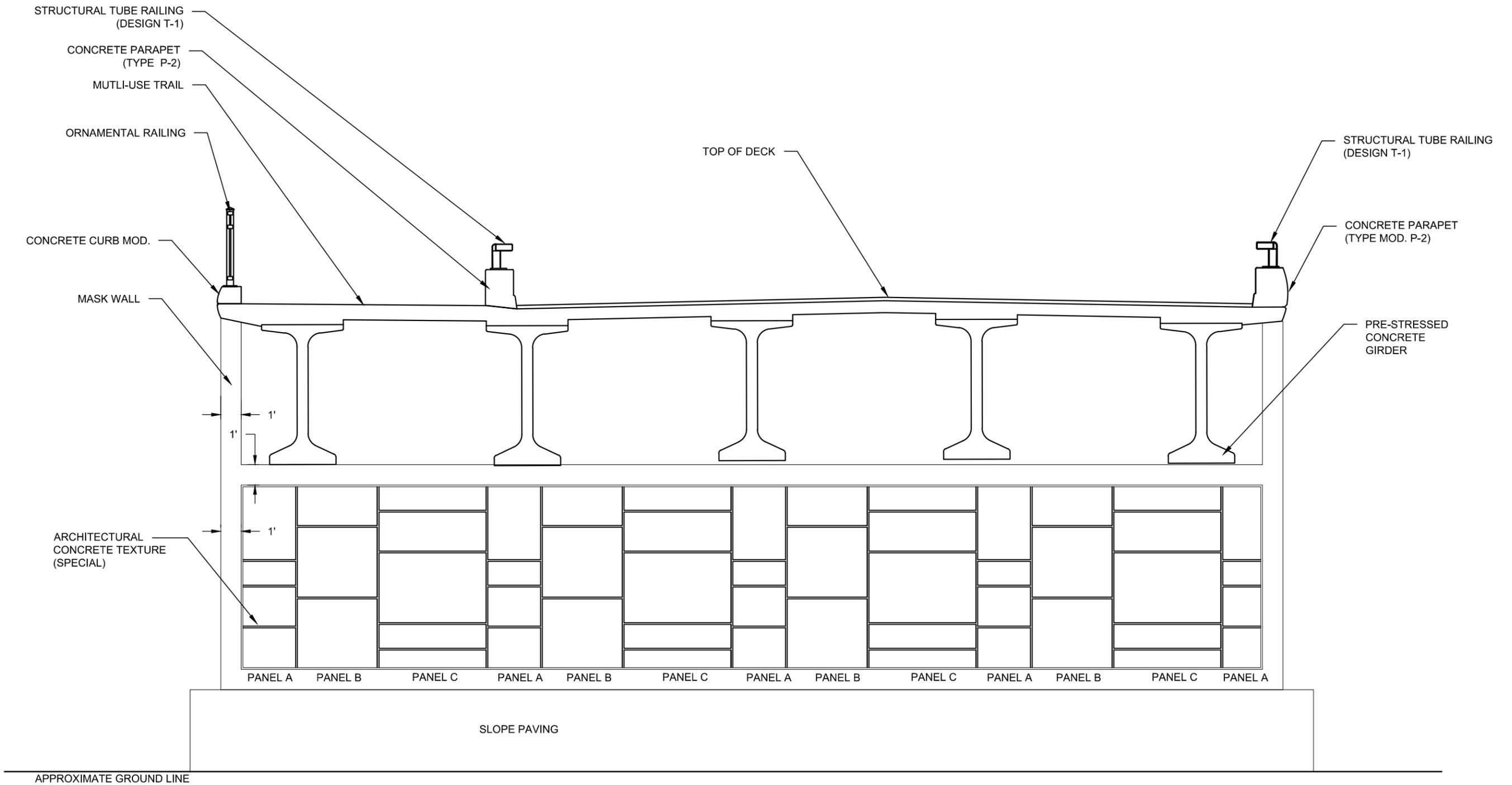


Elevation of South Abutment

River Bridge

Exhibit 2.1.18 - North Abutment Elevation

The Wisconsin abutment will be visible to travelers due to the underpass roadway connections of 825th Street – connecting back to the mainline roadway through the Jug-handle intersection.



Elevation of North Abutment

River Bridge

Exhibit 2.1.19 - Accent Lighting on Steel Box Girders and Overlooks

The upstream side of the bridge may be accented with a soft, subtle linear LED lighting strip to enhance views of the new structure. The lighting design should be subdued and follow dark sky principles to protect the integrity of natural and historic resources. See exhibit 2.1.3 for detail.



Perspective View of Accent Lighting on Haunched Steel Box Girders

River Bridge

Exhibit 2.1.20 - Illuminated Spire Lettering

Each pair of spires contains inset letters (which may be back-lit) spelling out Minnesota and Wisconsin.



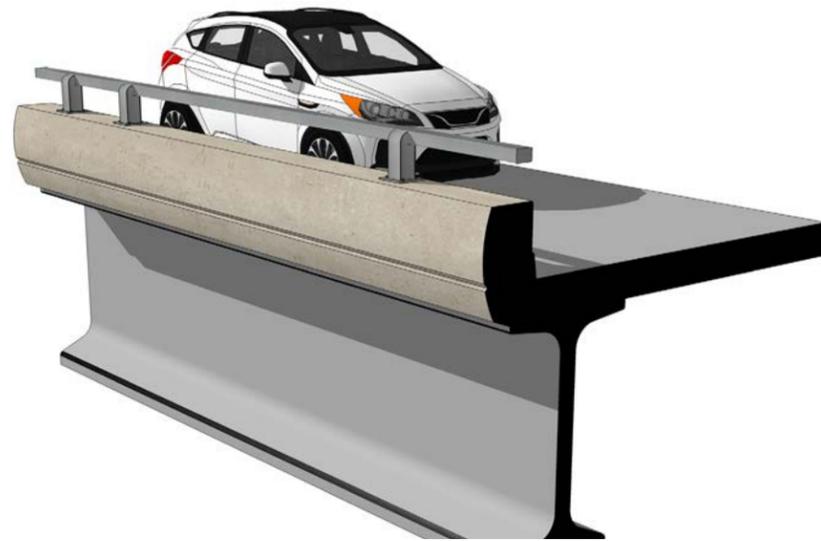
Perspective View of Accent Lighting on Spires

Bridge Deck

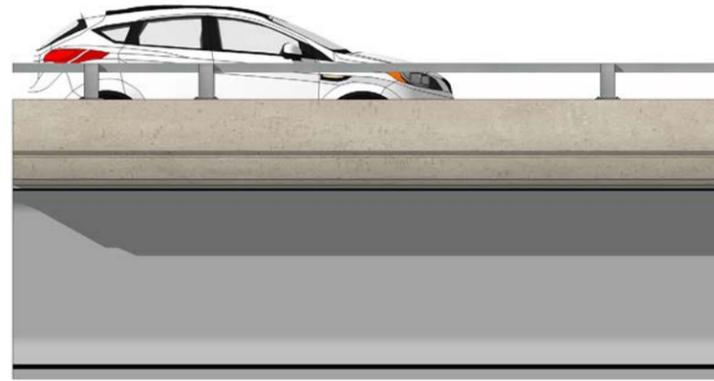
Exhibit 2.2.2 - Barrier Transition Detail

Where the Type-2 combination barrier terminates at the beginning of the slip ramp bridge, a transitional barrier of solid concrete will be used to taper from 3 feet down to the Type-P4 barrier height of 2 feet 8 inches.

See exhibit 2.1.2 for component colors.



Perspective View of Structural Tube Railing (Design T-1) and Concrete Parapet (Type Modified P-2)

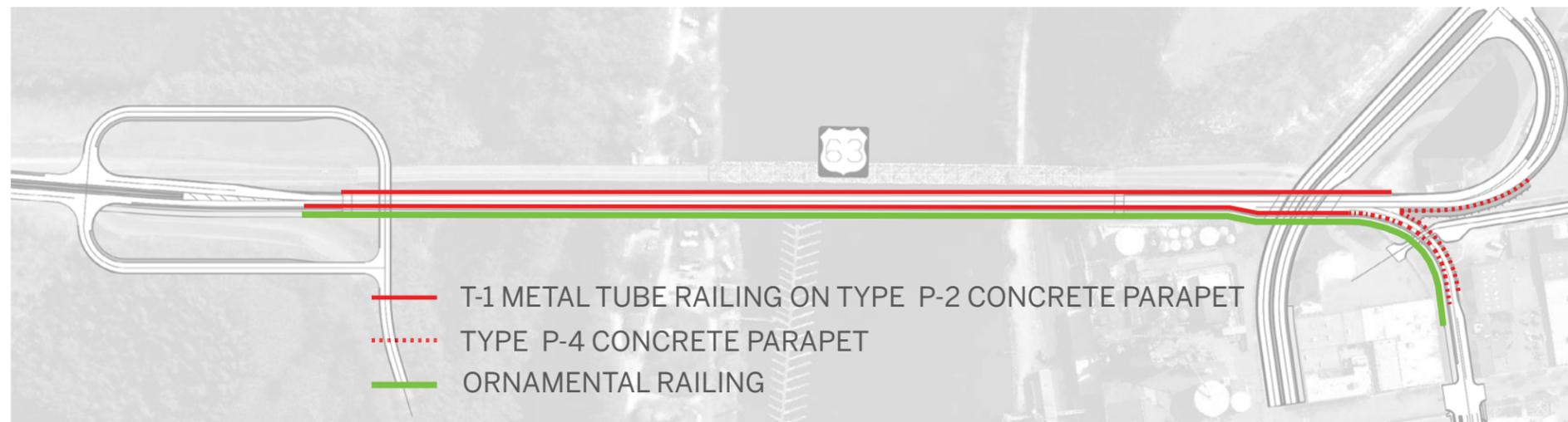


Side View of Structural Tube Railing (Design T-1) and Concrete Parapet (Type Modified P-2)

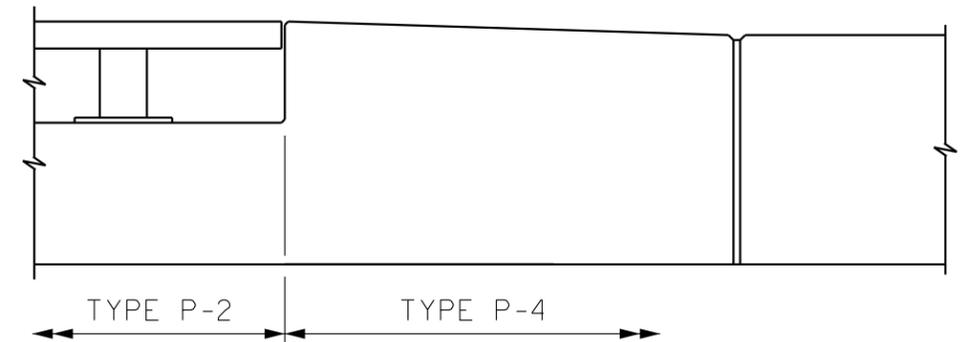


Perspective View of Barrier Transition

Barrier Plan



- T-1 METAL TUBE RAILING ON TYPE P-2 CONCRETE PARAPET
- TYPE P-4 CONCRETE PARAPET
- ORNAMENTAL RAILING



Elevation View of Barrier Transition

Bridge Deck

Exhibit 2.2.3 - Coping Detail

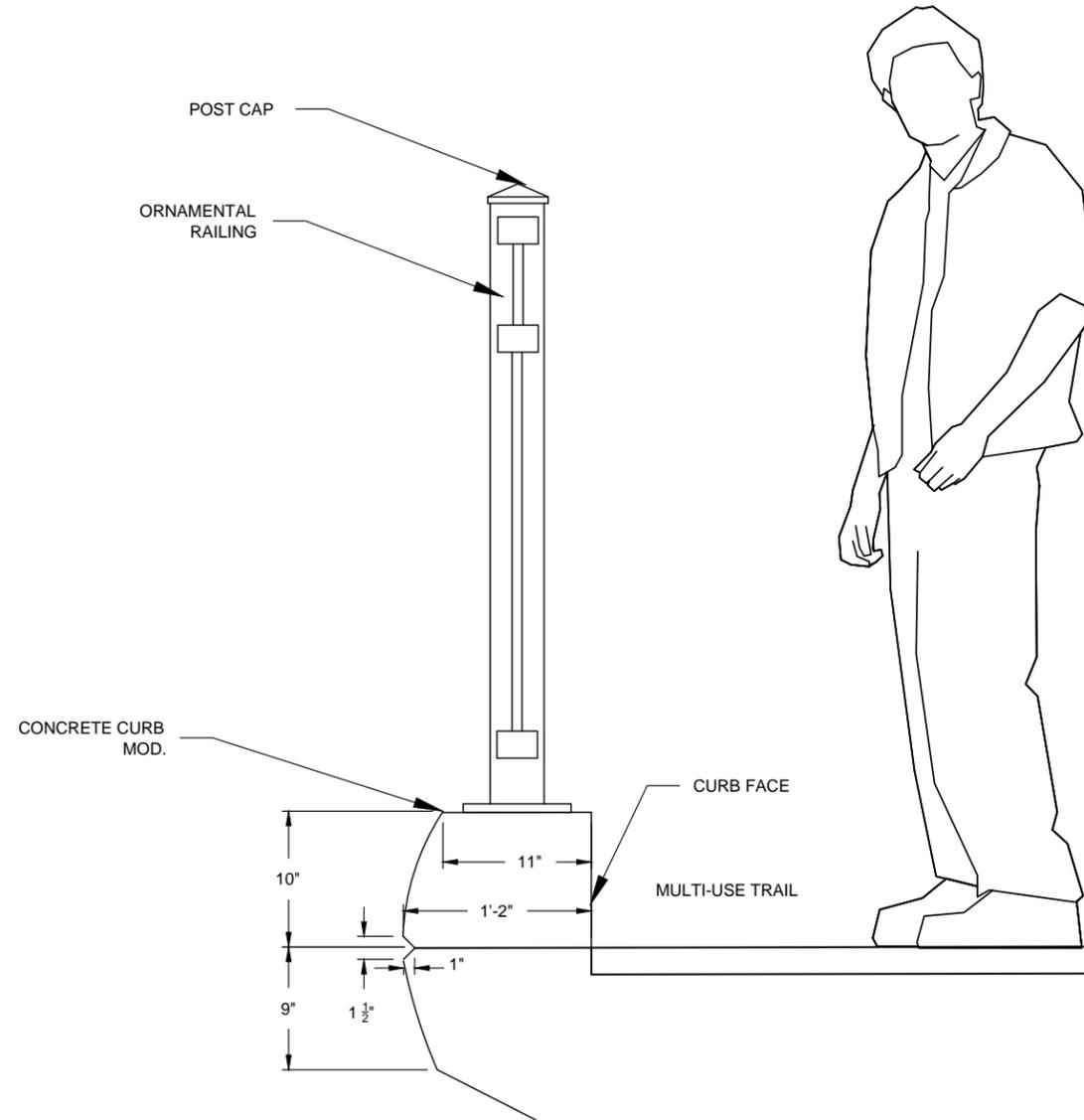
A "full bull-nose" coping – and Paint Colors for concrete surface finishes. At each overlook the bullnose is eliminated within the spire opening to minimize complex forms.



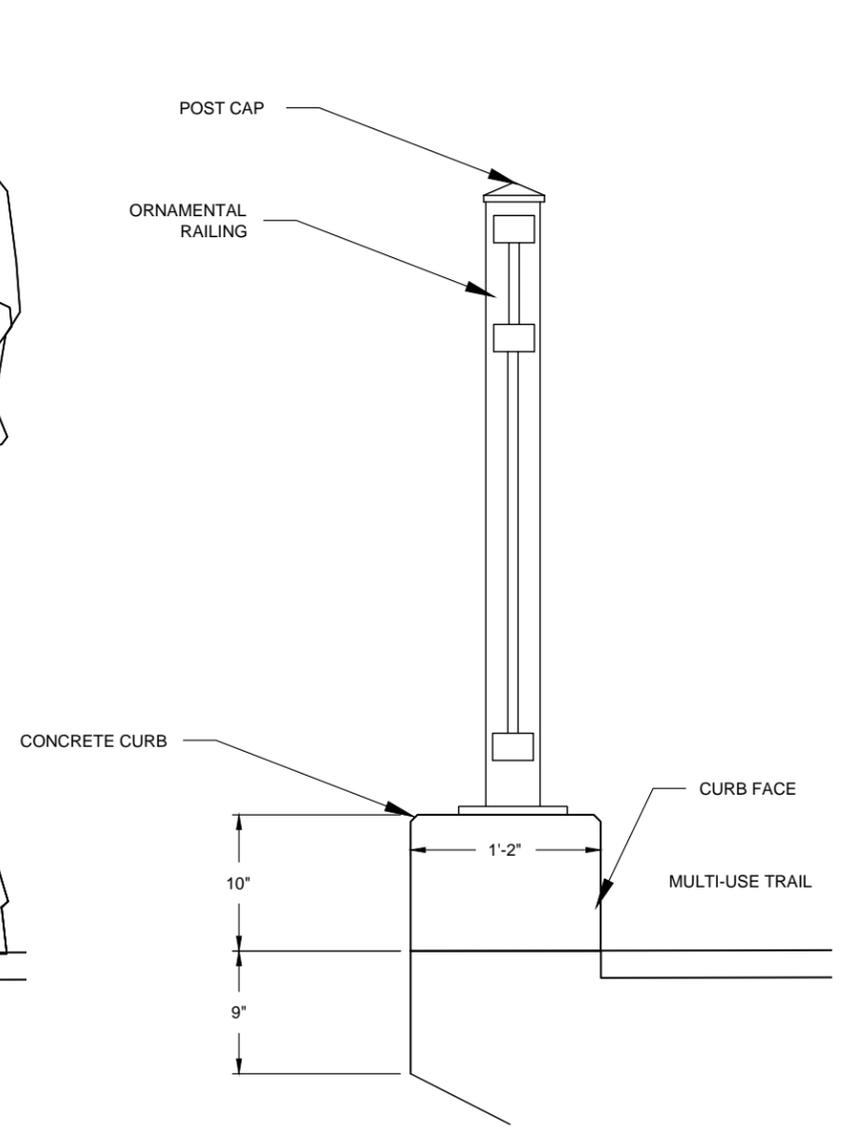
Perspective View of Concrete Curb Modified



Elevation View of Concrete Curb Modified



Section of Concrete Curb Modified and Ornamental Railing



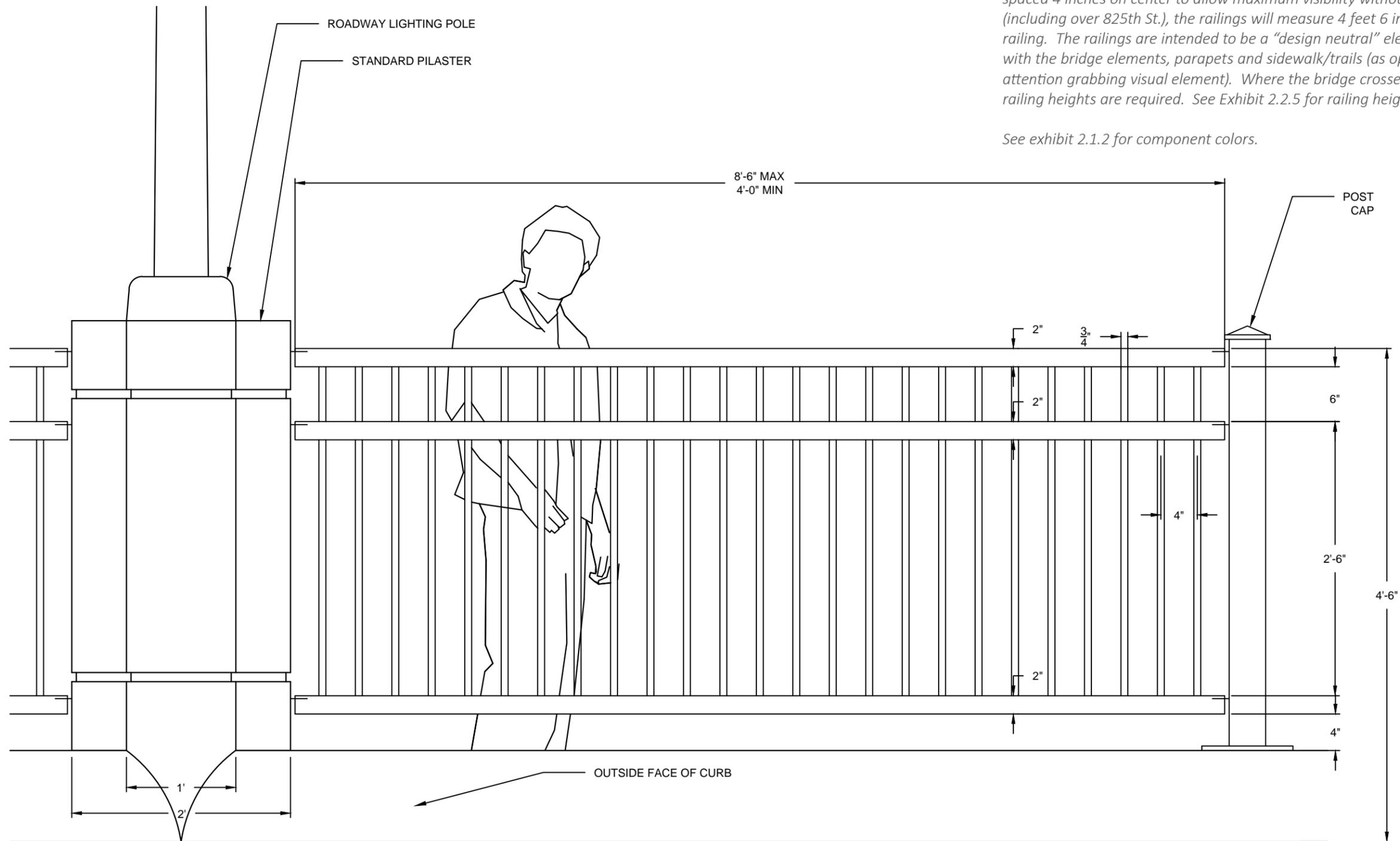
Section of Concrete Curb and Ornamental Railing

Bridge Deck

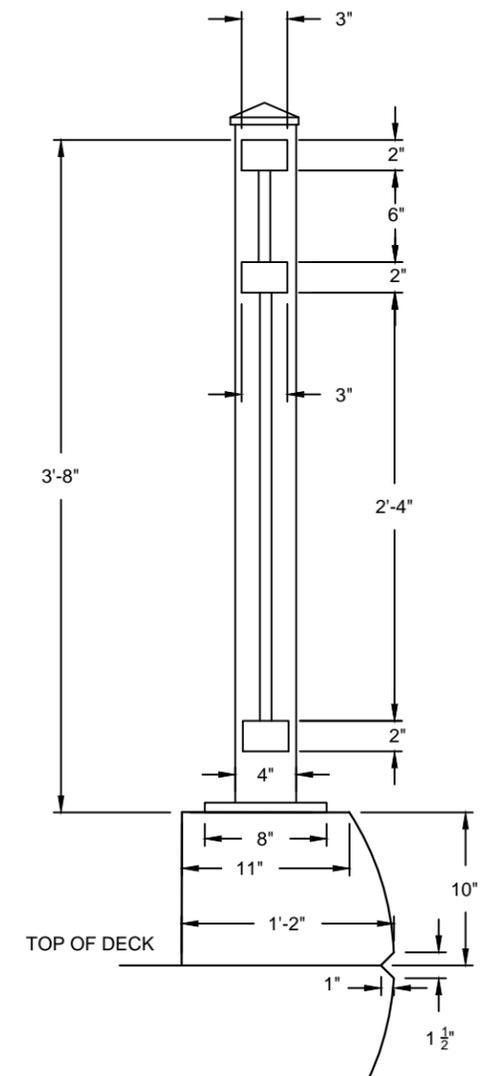
Exhibit 2.2.4 - Ornamental Railing Detail

The ornamental metal railing system utilizes a simple pattern of horizontal rails with continuous vertical pickets, spaced 4 inches on center to allow maximum visibility without compromising safety. Over the river spans (including over 825th St.), the railings will measure 4 feet 6 inches from the top of bridge deck to the top of railing. The railings are intended to be a "design neutral" element where they seamlessly integrate and blend with the bridge elements, parapets and sidewalk/trails (as opposed to a significant competing/contrasting or attention grabbing visual element). Where the bridge crosses over other roadways (US 61) or Railroads, higher railing heights are required. See Exhibit 2.2.5 for railing height transition details.

See exhibit 2.1.2 for component colors.



Outer Elevation of Ornamental Railing (Viewed from River)

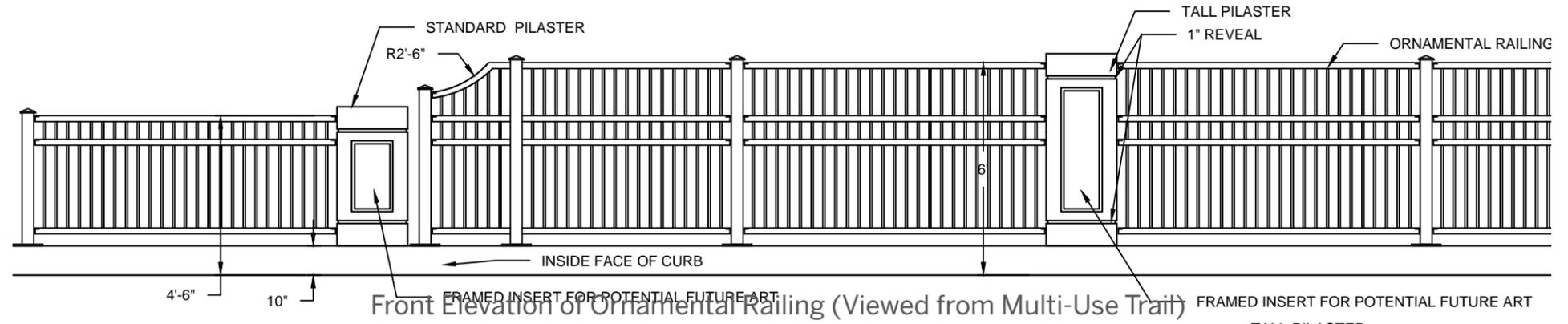


Section of Ornamental Railing

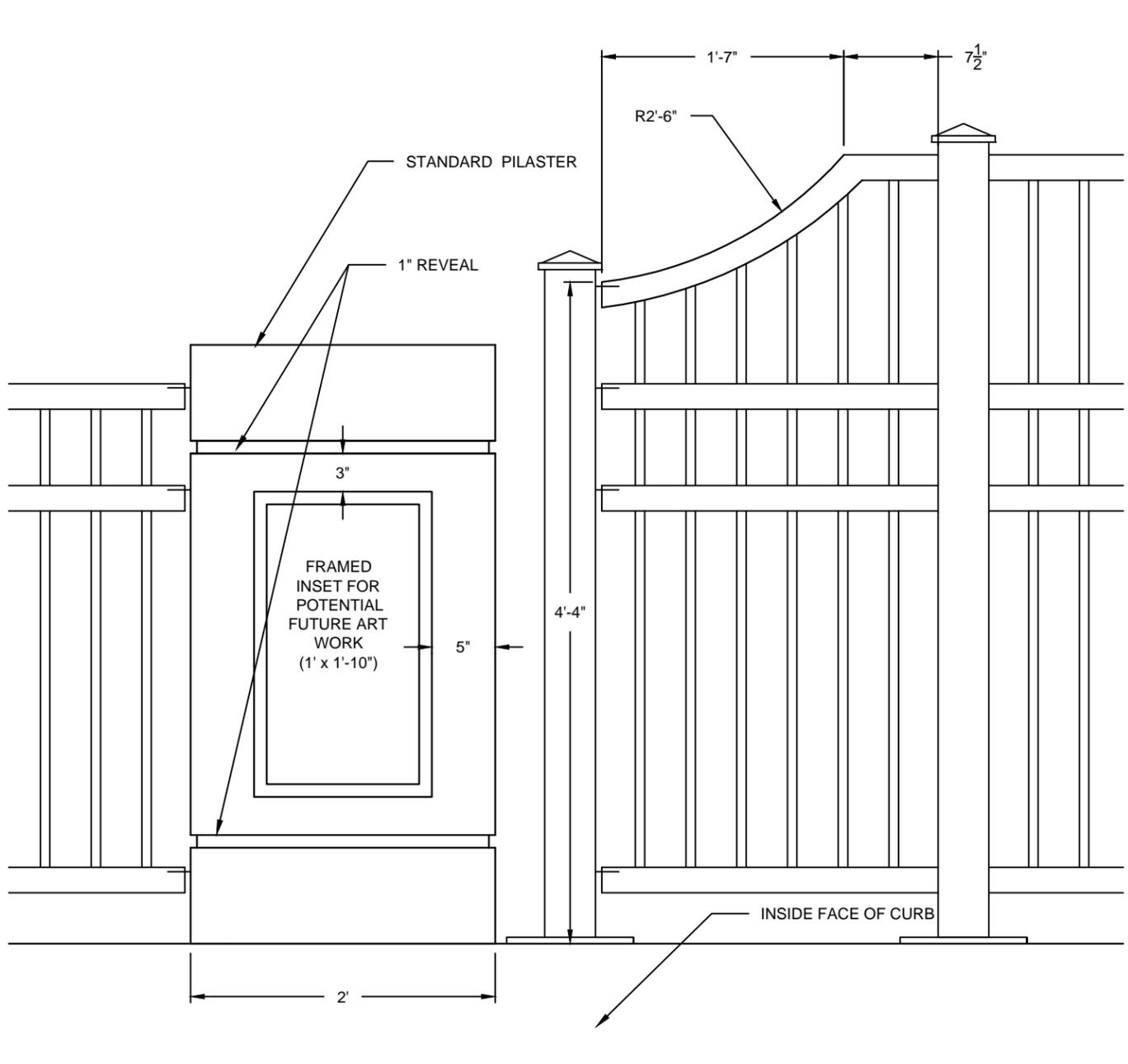
Bridge Deck

Exhibit 2.2.5 - Ornamental Railing Increased Height Details

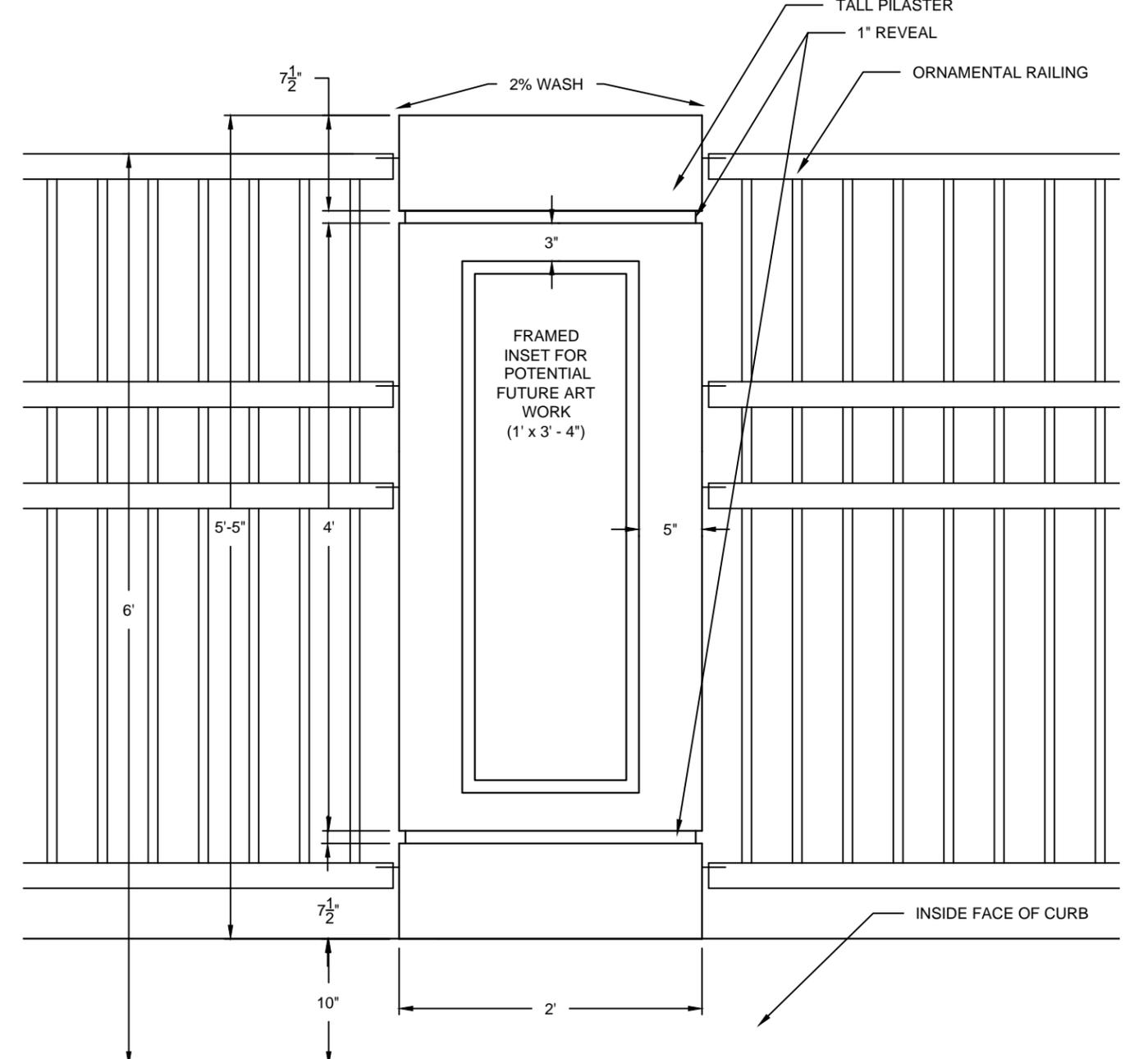
In Minnesota, guidelines call for railings over railroads to be 10 feet high and railings over other roadways to be 6 feet high. Final railing heights will be determined through agency coordination during final design. Wisconsin may also require increased height railings over 825th Street. Ornamental railing height transitions will be accomplished using a curved top rail and extending the vertical pickets as illustrated in the details below. The height of the adjacent concrete pilaster will also be increased to visually and physically support the taller railing panels.



Front Elevation of Ornamental Railing (Viewed from Multi-Use Trail)



Elevation of Ornamental Railing Transition



Elevation of Tall Pilaster

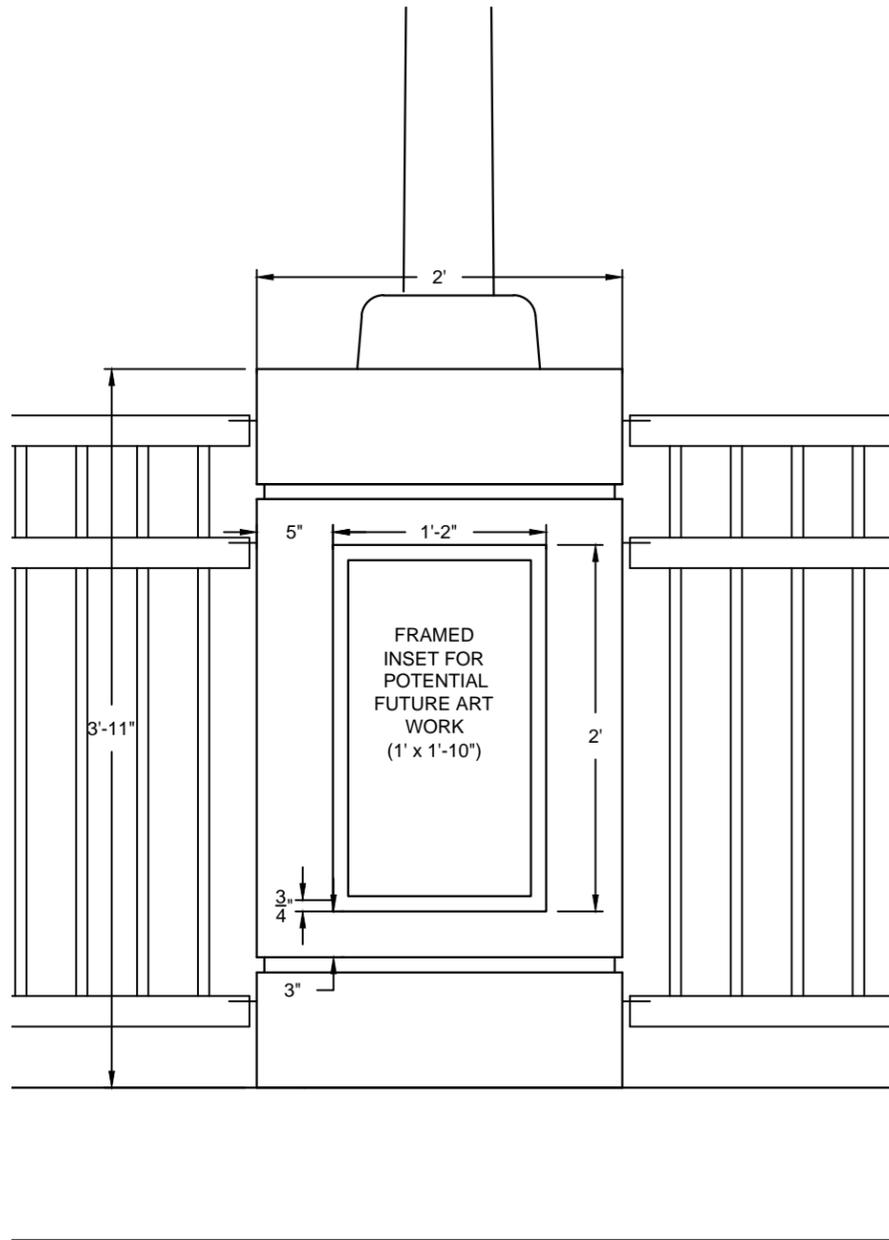
Bridge Deck

Exhibit 2.2.6 - Pilaster Details

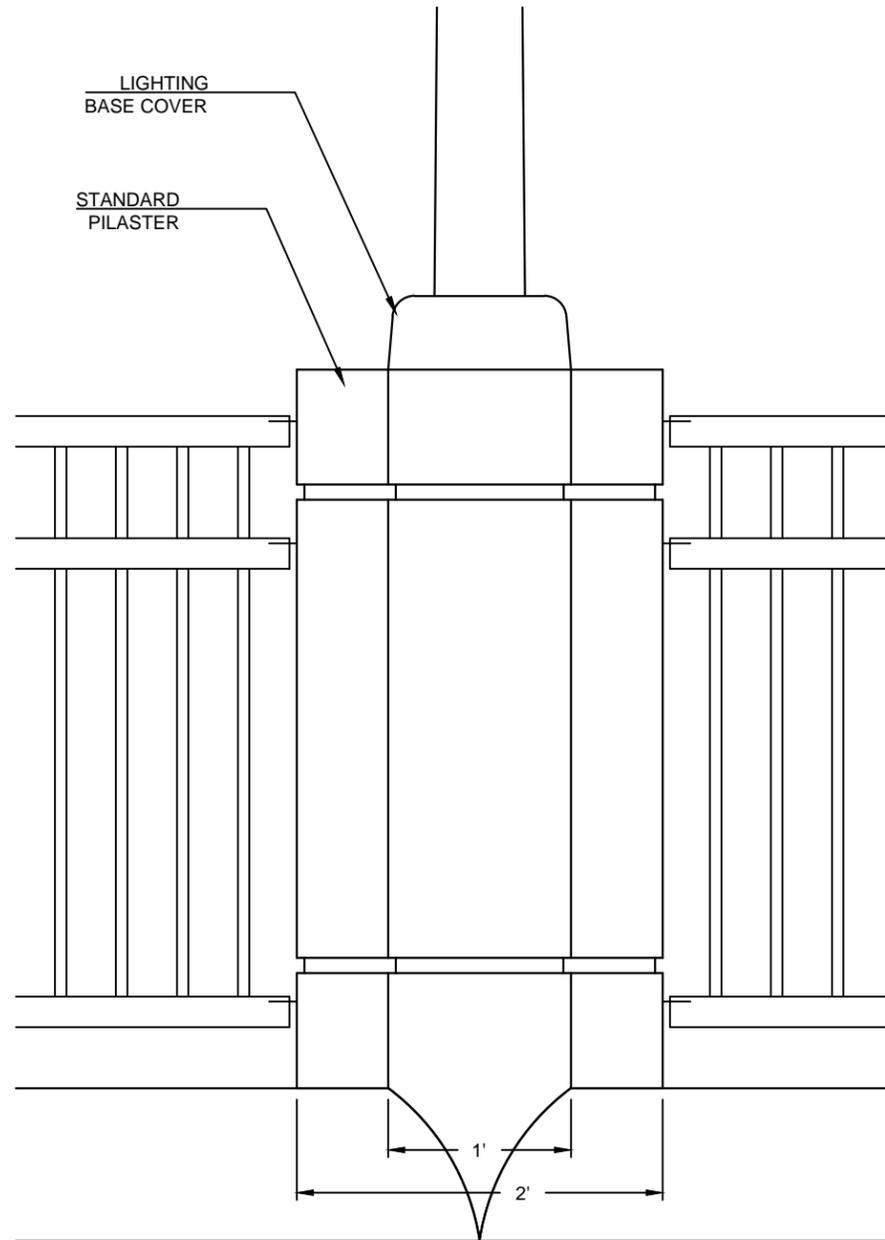
Pilasters visually replicating stone are located at every light post to create a structural rhythm along the multiuse trail. Each pilaster has similar horizontal banding as viewed on the footing cap from river level, creating a unified composition. Framed insets on the inside face of each pilaster may be designed to receive future public artwork. Further details regarding the media, type, and content of public art may be explored with the communities in the final design

stage. If the decision is made not to incorporate public art, the rectangular inset panels will serve as accent panels.

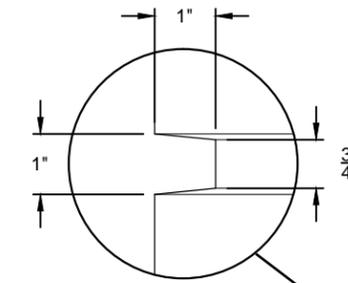
See exhibit 2.1.2 for component colors.



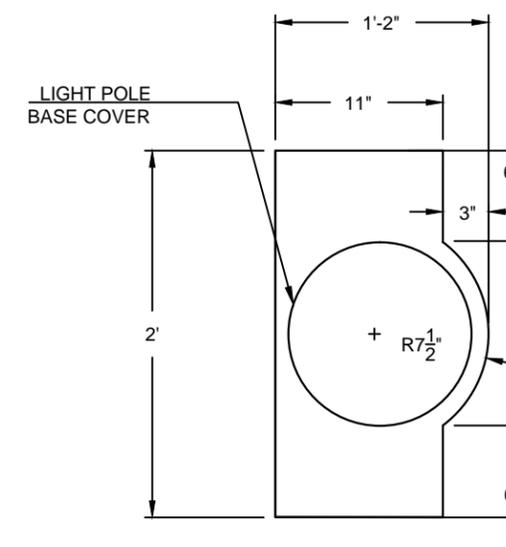
Elevation of Pilaster (Multi-Use Trail Side)



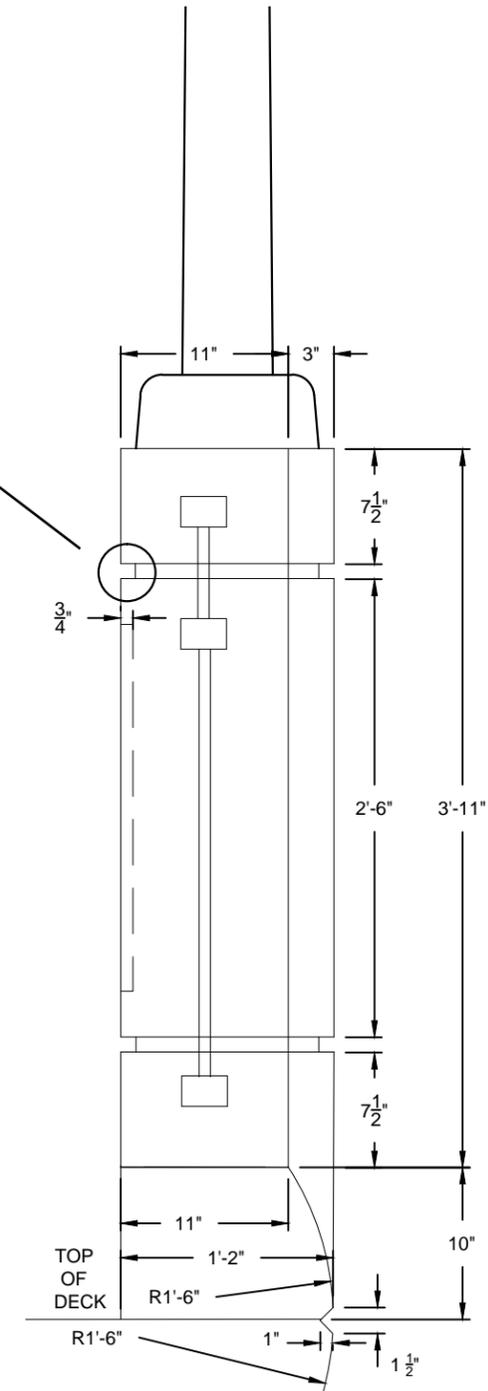
Elevation of Pilaster (River Side)



Reveal Detail



Pilaster Plan View



Section of Standard Pilaster

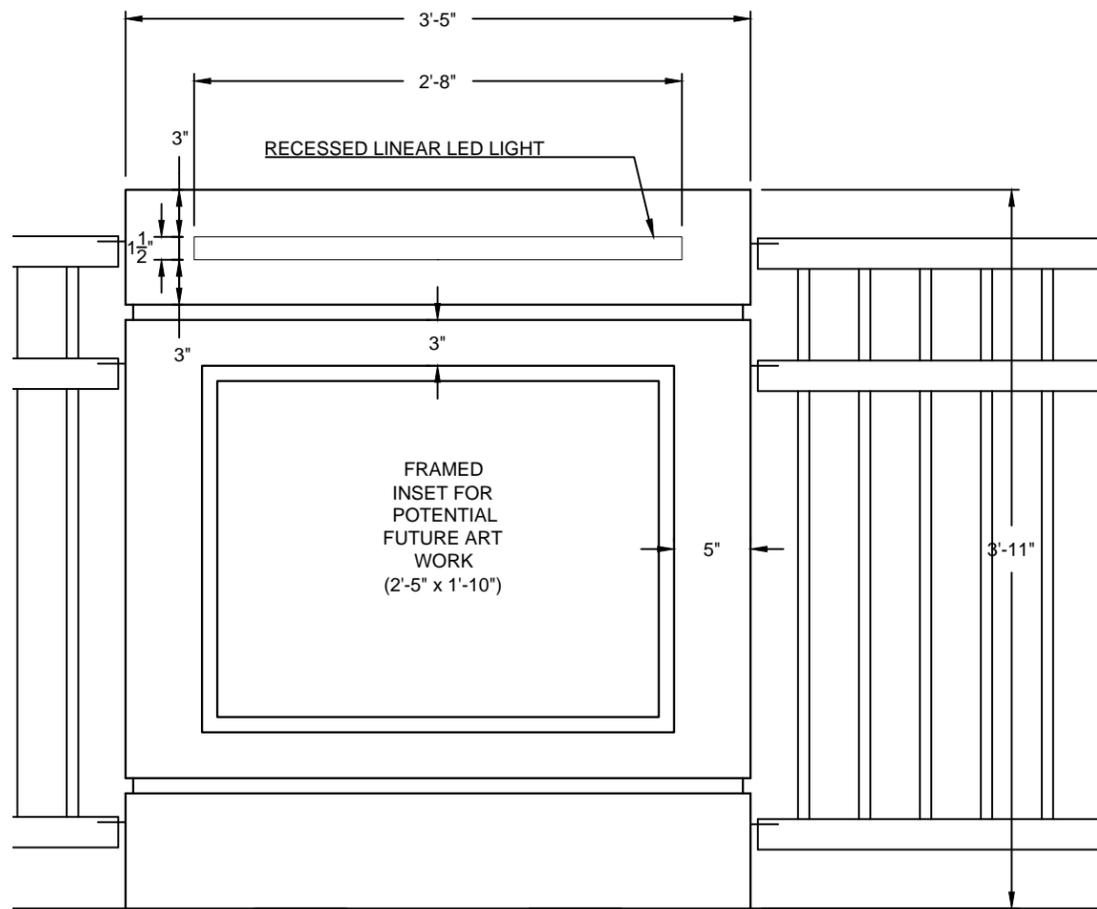
Bridge Deck

Exhibit 2.2.7 - Overlook Pilaster Details

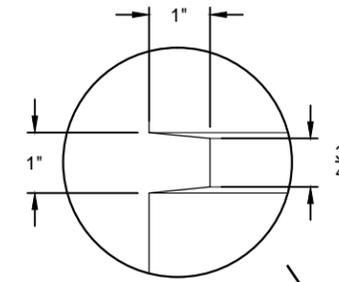
The overlook will have unique pilasters that allow pedestrian railing to make a smooth transition for the trail to the overlook area. Each overlook will have a wide pilaster at the prow that could receive a larger piece of public art or interpretive feature. Framed insets on the inside face of each pilaster may be designed to receive future public artwork. Further details regarding the media, type, and content of public art may be explored with the communities in the final design stage. If the decision is made not to incorporate public art, the rectangular inset panels will serve as accent panels. Overlook pilasters may also be illuminated using recessed linear LED lights.



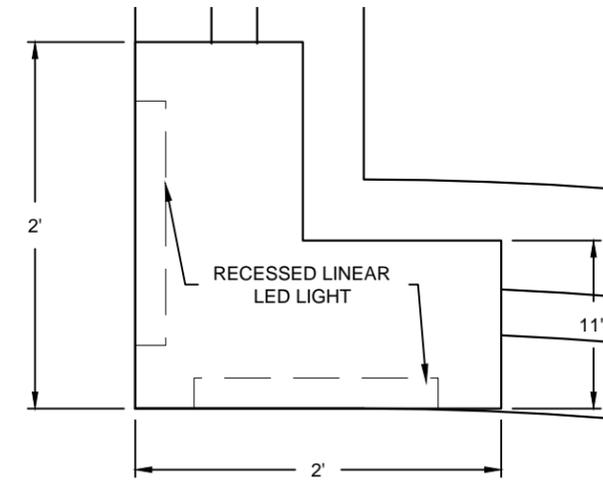
Recessed Linear LED Light



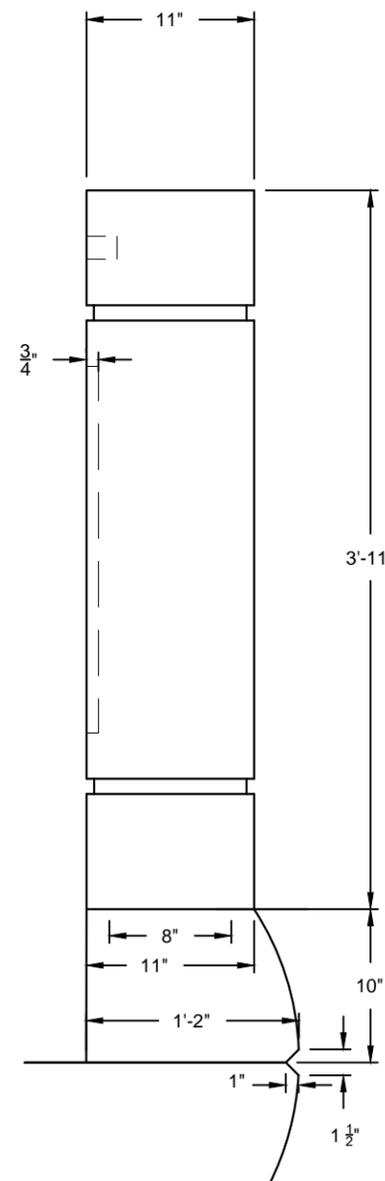
Elevation of Wide Pilaster



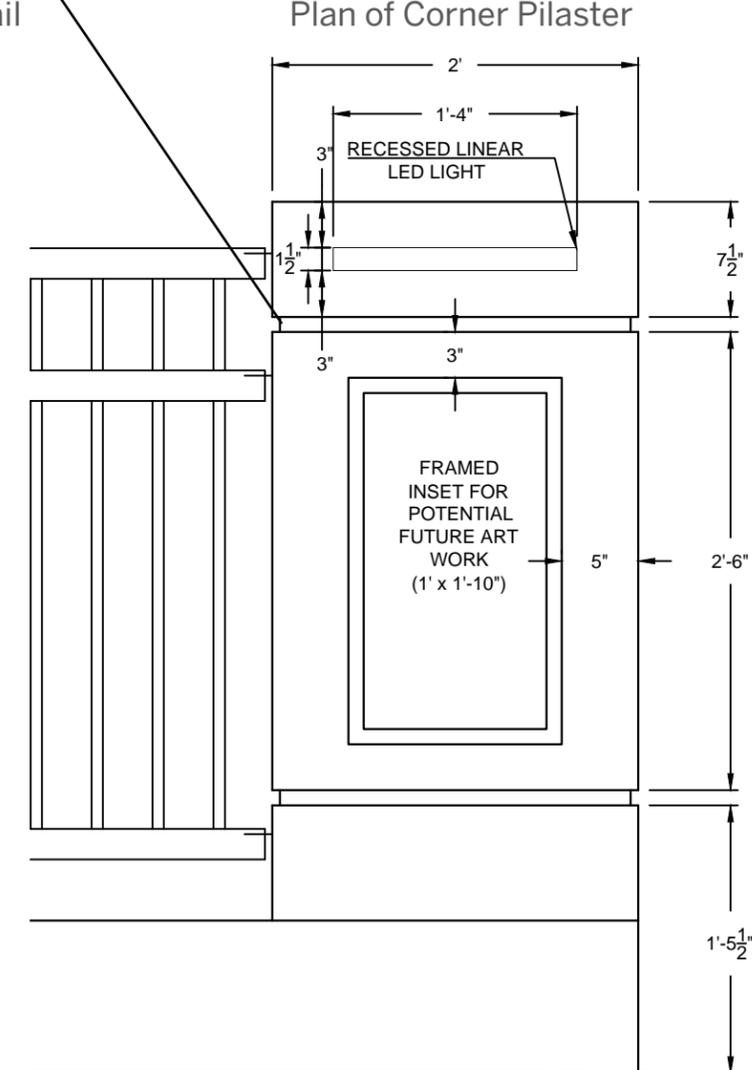
Reveal Detail



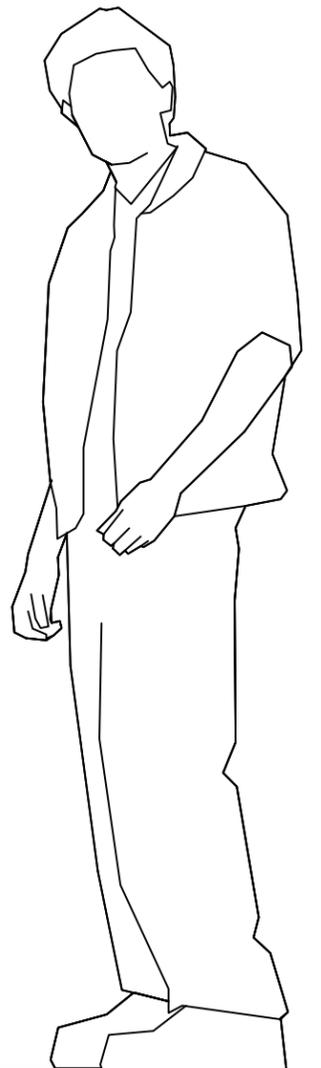
Plan of Corner Pilaster



Section of Corner Pilaster



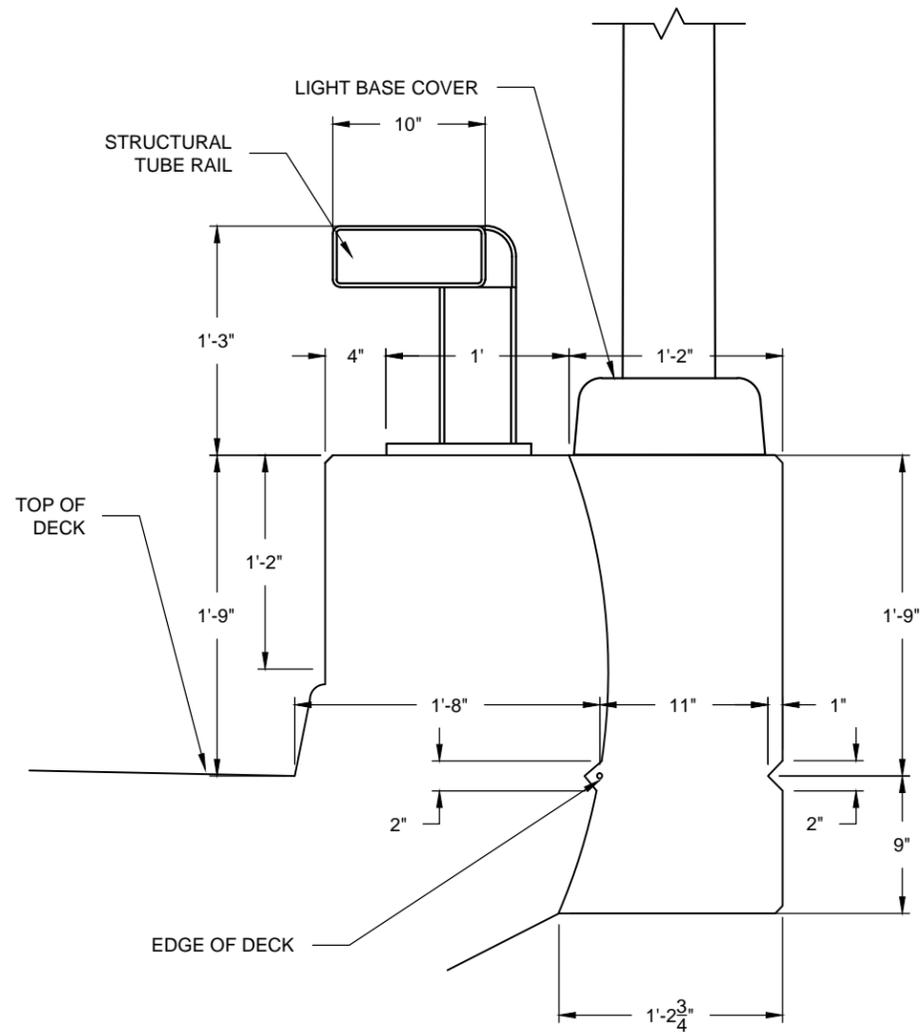
Elevation of Corner Pilaster



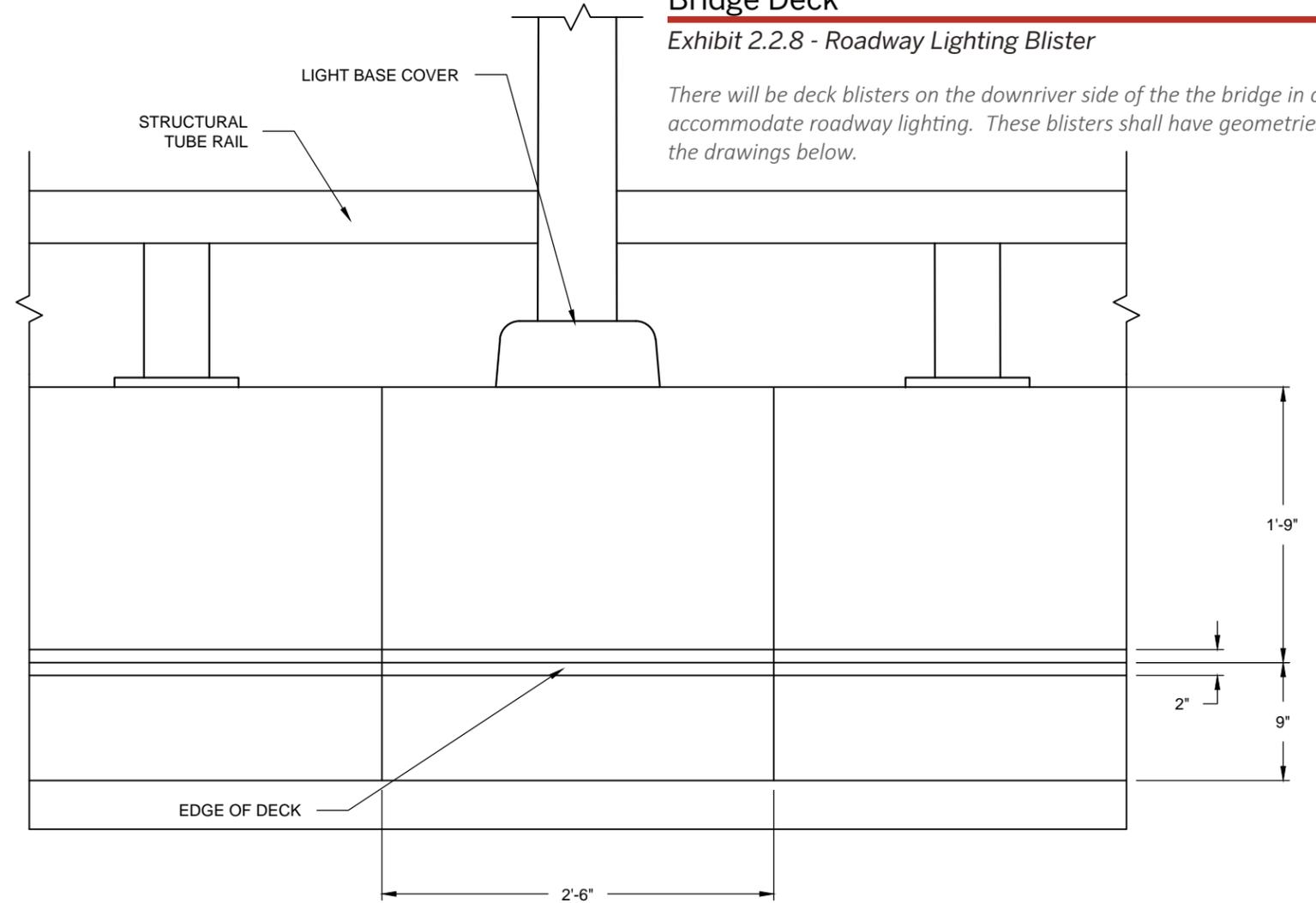
Bridge Deck

Exhibit 2.2.8 - Roadway Lighting Blister

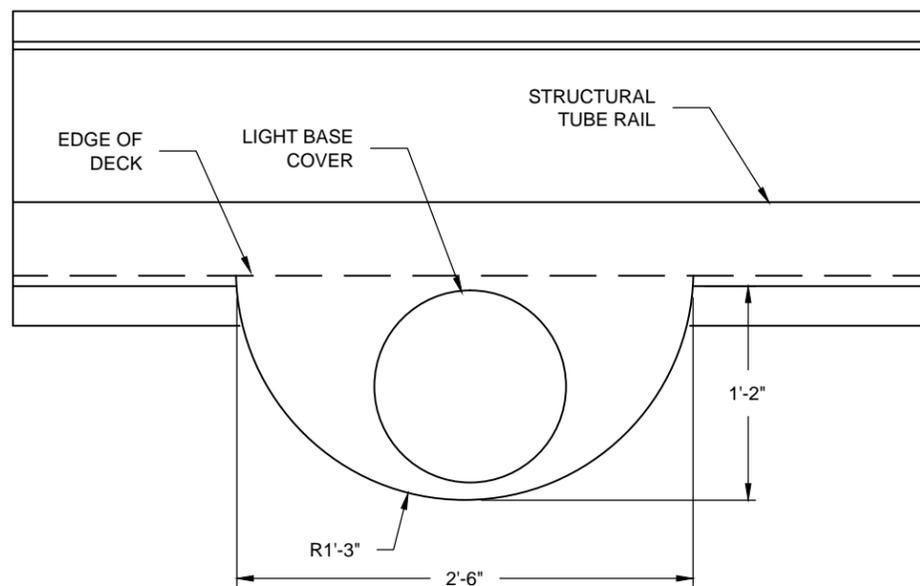
There will be deck blisters on the downriver side of the the bridge in order to accommodate roadway lighting. These blisters shall have geometries as defined by the drawings below.



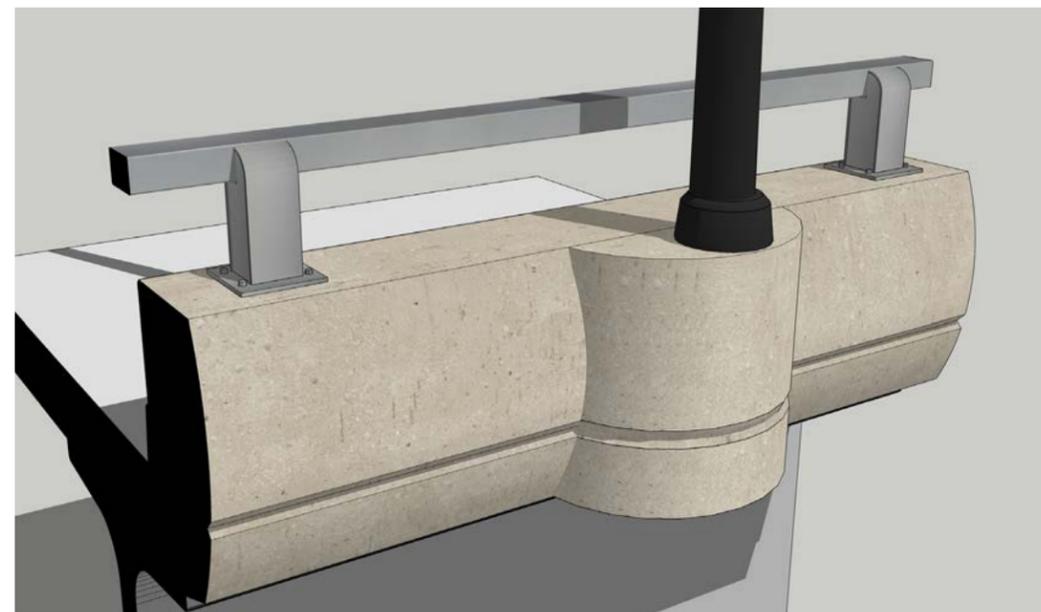
Section Elevation of Blister



Elevation of Blister (Downriver)



Plan of Blister



Perspective view of Blister

Bridge Deck

Exhibit 2.2.9 - Roadway Lighting Blisters, Continued

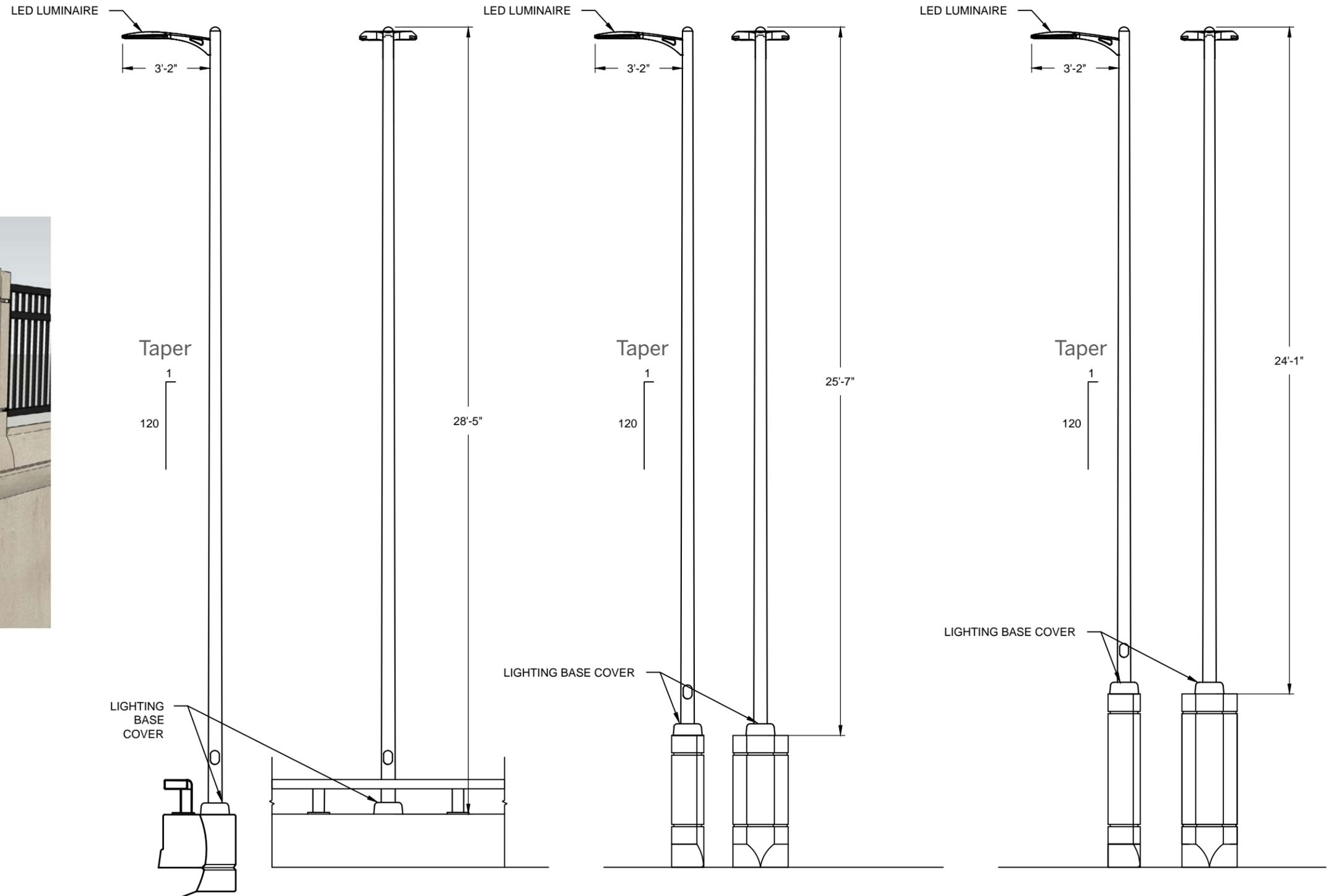
Illumination of the multiuse trail and roadway surface will be provided by LED luminaires set atop a round stainless steel pole. Roadway and multiuse trail lighting will be 24 feet tall, instead of standard 40 foot poles. Shorter height poles will create a more pedestrian friendly character. Lighting along the multiuse trail (upstream side) will be set on a decorative concrete pilaster, while lighting along the opposite side of the bridge (downstream side) will be mounted on

the concrete barrier system. Updated photometric studies will be performed in the final design phase to set the final spacing and locations of light units. Minimizing impacts to natural and historic resources and using "Dark Sky" lighting principles will be balanced with safety and environmental requirements.

See exhibit 2.1.2 for component colors.



Perspective View of Pilaster with Light



Side and Front Elevation of Roadway Lighting on Barrier

Side and Front Elevation of Roadway Lighting on Standard Pilaster

Side and Front Elevation of Roadway Lighting on Tall Pilaster

US 61 Bridge

Exhibit 2.3.1 - Bridge Plan

The Minnesota approach includes a pre-stressed concrete girder bridge carrying a 2-lane roadway and separated multi-use trail over US 61. It will replace Bridge 9103 and be adjacent to the Red Wing Shoe Company building, both historic properties.



US 61 Bridge

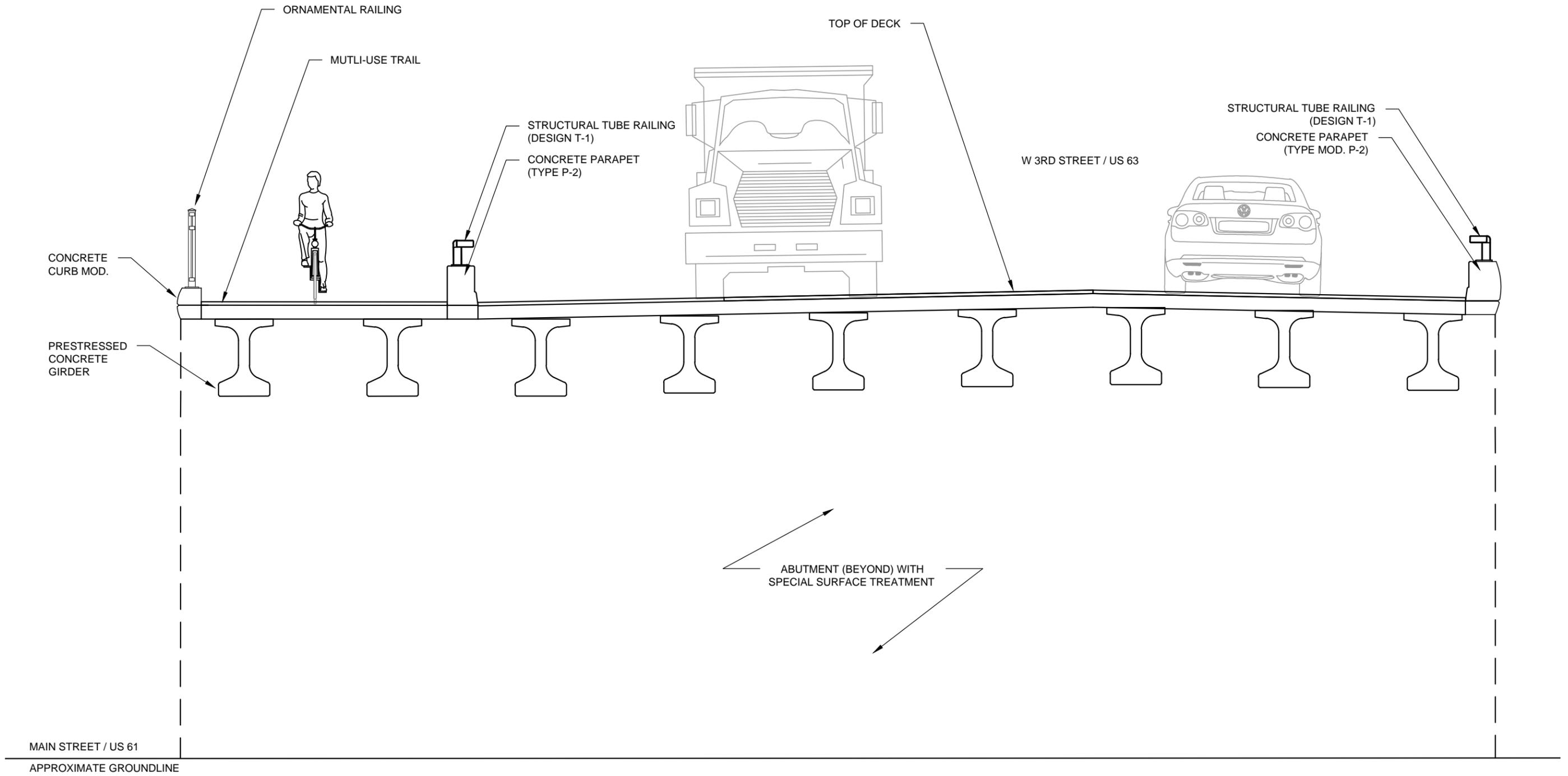
Plan View of Minnesota Approach Roadway

US 61 Bridge

Exhibit 2.3.2 - Bridge Section (Deck and Girders)

The bridge will use a P-4 concrete barrier to separate the multi-use trail from vehicular traffic. The outer edge on the west side of the bridge will feature an ornamental railing set on a raised concrete coping and the east side will feature a type modified P-2 concrete barrier.

See exhibit 2.1.2 for component colors.

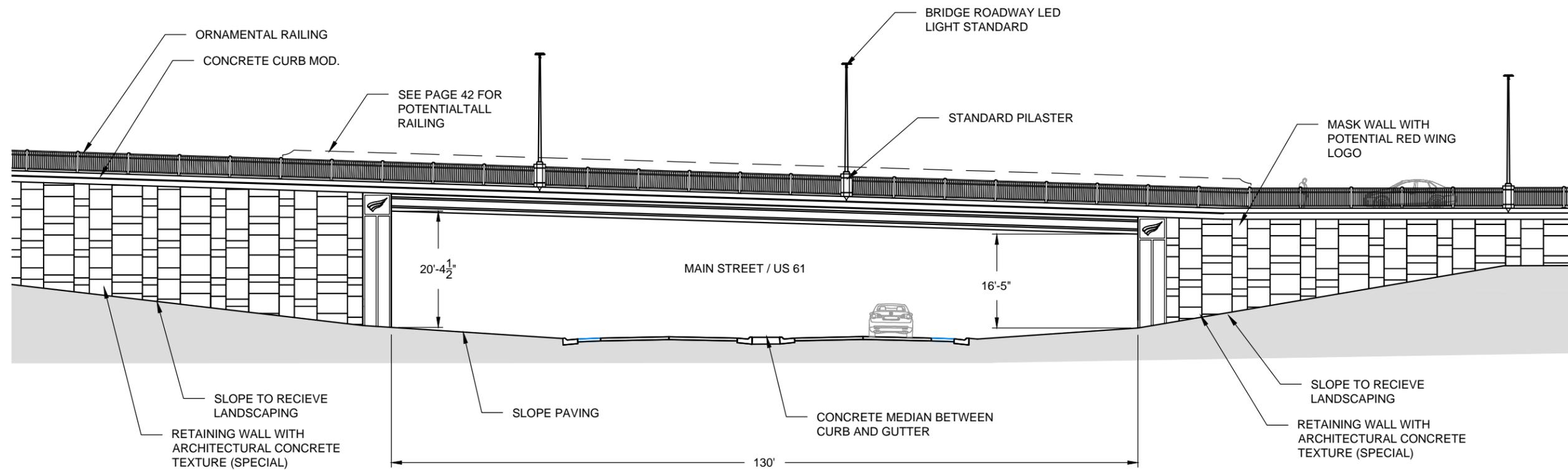


Section of Bridge Deck and Girders

US 61 Bridge

Exhibit 2.3.3 - Bridge Elevation

The bridge will cross US 61 using a single girder span with tall concrete abutments at each end. The outer corners of the abutment are defined by a design consisting of a square recessed panel featuring an iconic relief of the Red Wing logo (logo type to be confirmed by the City), set on top of twin, recessed vertical base panels to establish a gateway effect as travelers pass under the bridge.



Elevation of Retaining Walls and US 61/63 (NE of Red Wing Shoe Company Building)

US 61 Bridge

Exhibit 2.3.4 - Bridge Perspective (From Red Wing Shoe Company building)

The elevation of the ground plane adjacent to the bridge will transition in height from the base of the abutment upwards along the retaining walls in order to reduce the height and visual impact of the retaining walls on the adjacent Red Wing Shoe Company building.



Perspective View of Bridge Over US 61



Perspective View of South Abutment and Bridge Over US 61 (Prior to Landscaping)



Perspective View of South Abutment and Bridge Over US 61 (After Landscaping)

US 61 Bridge

Exhibit 2.3.5 - Bridge Perspective (North and South Abutment)

Similar to the north abutment, the ground plane adjacent to the bridge will transition in height from the base of the abutment upwards along the retaining walls. The outer corners of the abutment are defined by a design consisting of a square recessed panel featuring an iconic relief of the Red Wing logo (logo type to be confirmed by the City), set on top of twin, recessed vertical base panels to establish a gateway effect as travelers pass under the bridge.



Perspective View of North Abutment and Bridge Over US 61



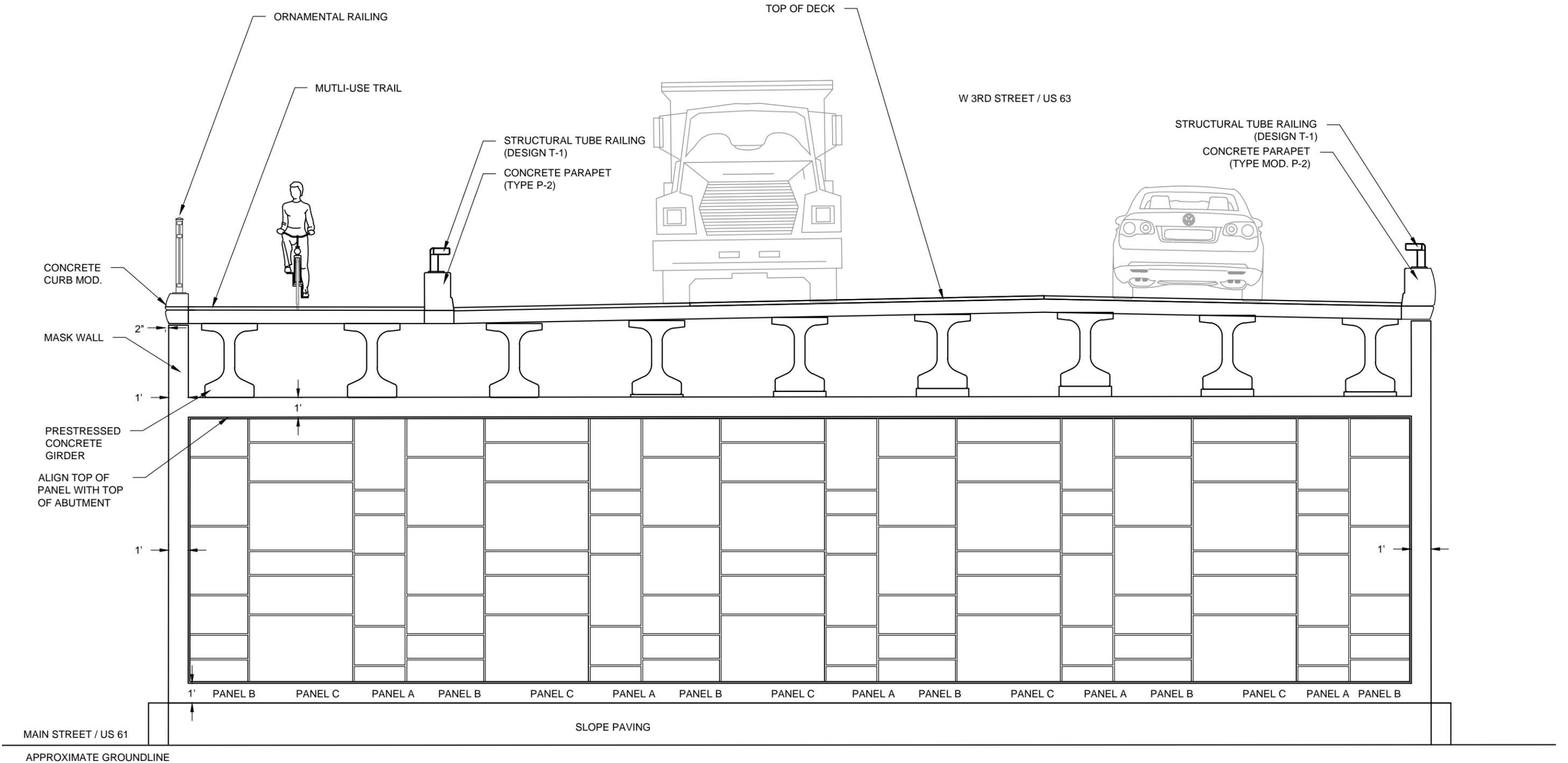
In areas adjacent to historic properties, strive for a more natural and curvilinear slope rounding (right) over the more traditional linear slope (left).

US 61 Bridge

Exhibit 2.3.6 - North Abutment Elevation

The abutment incorporates an "ABC" pattern of three repeating column widths and varying horizontal breaks to create rectangular surface panels that protrude and recede. These surface panels are further defined by horizontal and vertical reveals or "grout lines." The pattern is surrounded by a smooth concrete frame.

See exhibit 2.1.2 for component colors.

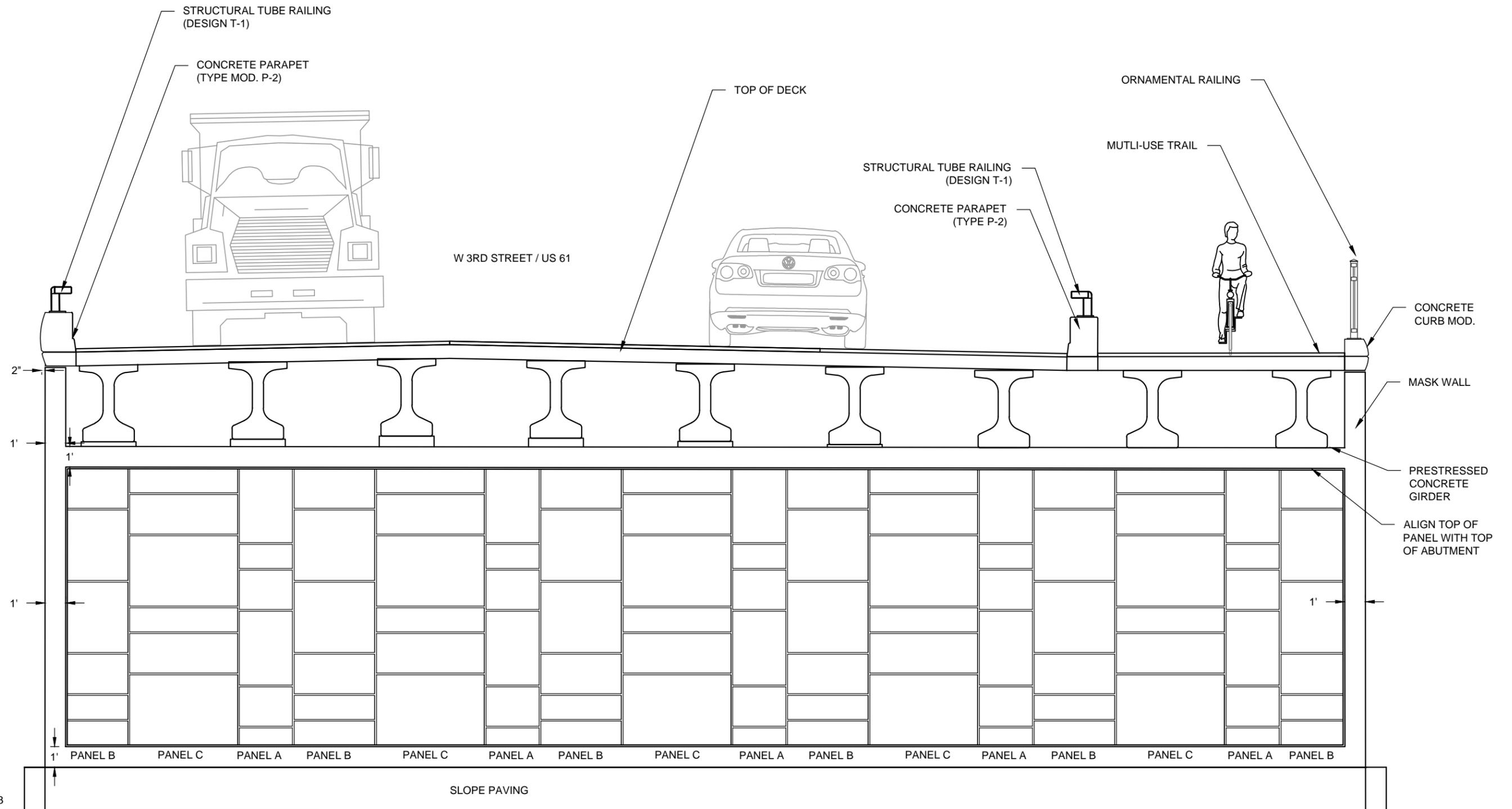


Elevation of North Abutment

US 61 Bridge

Exhibit 2.3.7 - South Abutment Elevation

Similar to the North Abutment, the South Abutment also incorporates an "ABC" pattern and a smooth surface frame.



MAIN STREET / US 63
APPROXIMATE GROUNDLINE

SLOPE PAVING

W 3RD STREET / US 61

Elevation of South Abutment

Slip Ramp Bridge

Exhibit 2.4.1 - Bridge Plan

The slip ramp bridge carries a 1-lane roadway and separated multiuse trail over an extension of Bluff Street. The Bluff Street extension provides access into the service and parking area of the Red Wing Shoe Company building, replacing the original entrance under the south span of bridge 9103.



Slip Ramp Bridge

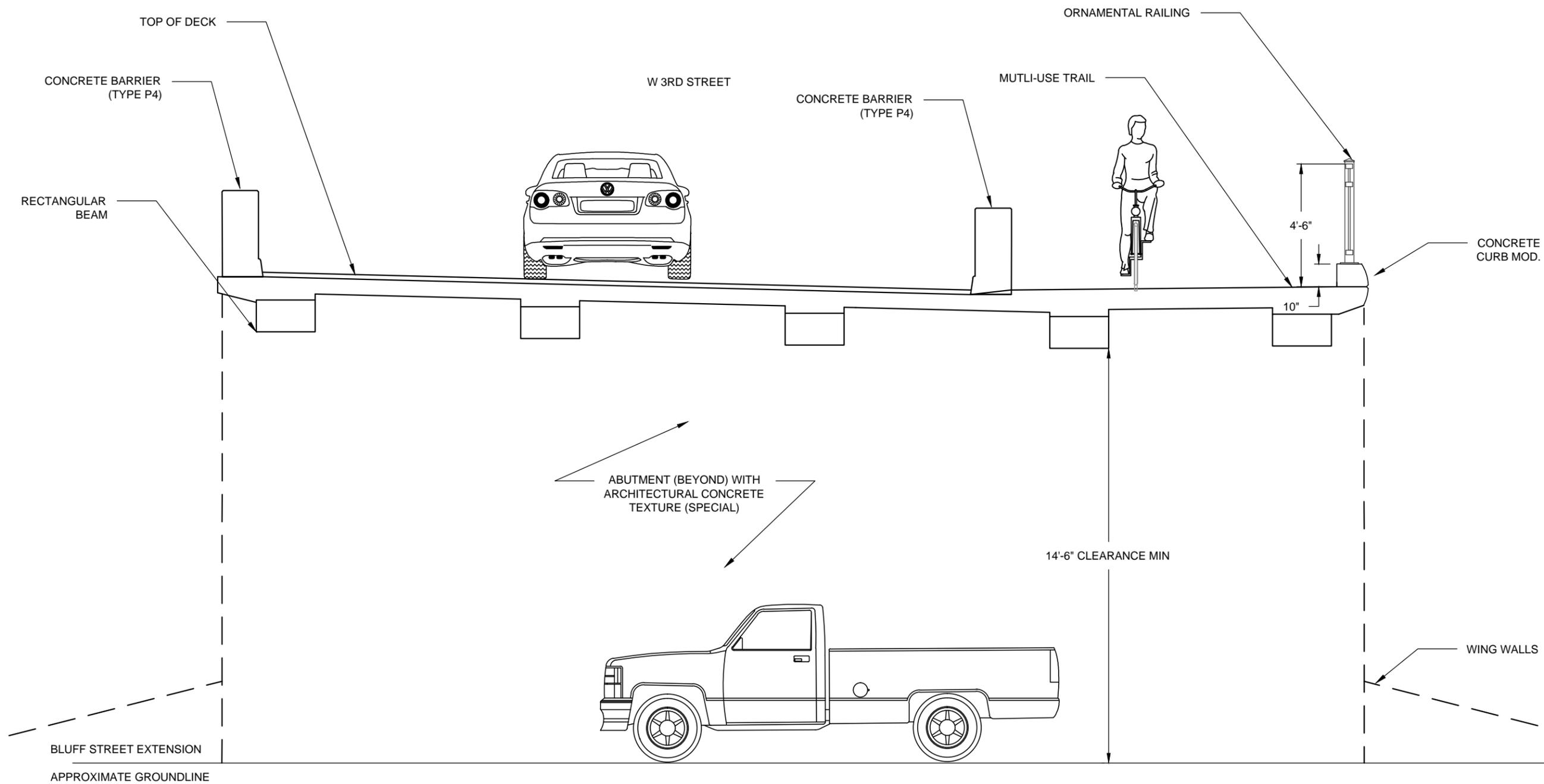
Plan View of Slip Ramp Bridge Over Bluff Street Extension

Slip Ramp Bridge

Exhibit 2.4.2 - Bridge Section (Deck and Girders)

The slip ramp bridge deck includes an ornamental metal railing system set on bull nosed concrete coping, a multiuse trail separated by a Type P-4 concrete barrier, and 1 travel lane enclosed by Type P-4 concrete barrier with a bull nosed outer profile. The deck will be supported by a set of rectangular, concrete box girders set on tall concrete abutments.

See exhibit 2.1.2 for component colors.

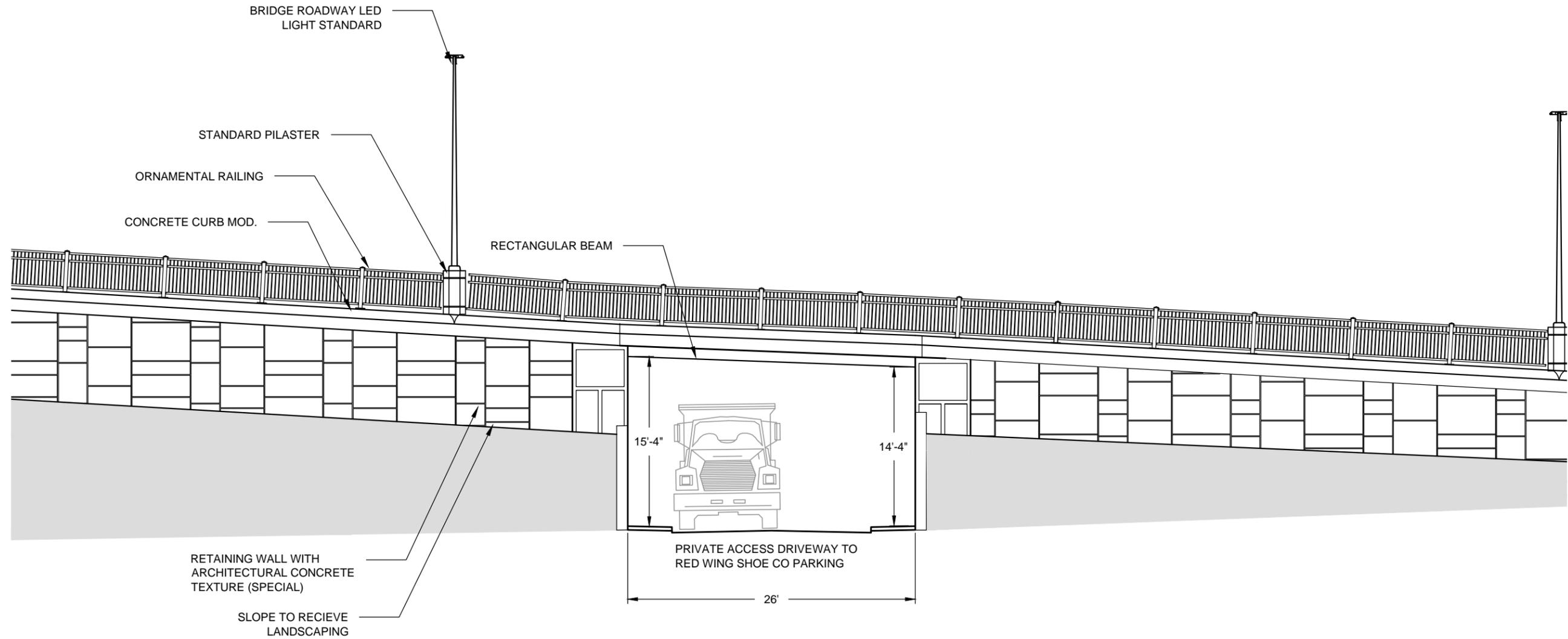


Section of Bridge over Bluff Street Extension

Slip Ramp Bridge

Exhibit 2.4.3 - Bridge Elevation

The single span of the slip ramp bridge utilizes a pair of tall abutments with gateway edge treatments similar to the US 61 Bridge. The slip ramp bridge abutments do not include the 3-D relief of the Red Wing logo (used on US 61 Bridge).



Elevation of Bridge and Retaining Walls East of the Red Wing Shoe Company Parking Lot

Slip Ramp Bridge

Exhibit 2.4.4 - Bridge Perspective - From Red Wing Shoe Company Property

The abutments also include short wing wall extensions to allow the adjacent embankments to retain their height. Substantial embankments and a dense screen of trees and shrubs, including evergreens, will help reduce the impact of this new construction on the historic Red Wing Shoe Company. Final landscape plans will be prepared in final design.



Perspective view of Slip Ramp Bridge over Bluff Street Extension - Prior to Landscaping (with limited landscaping)

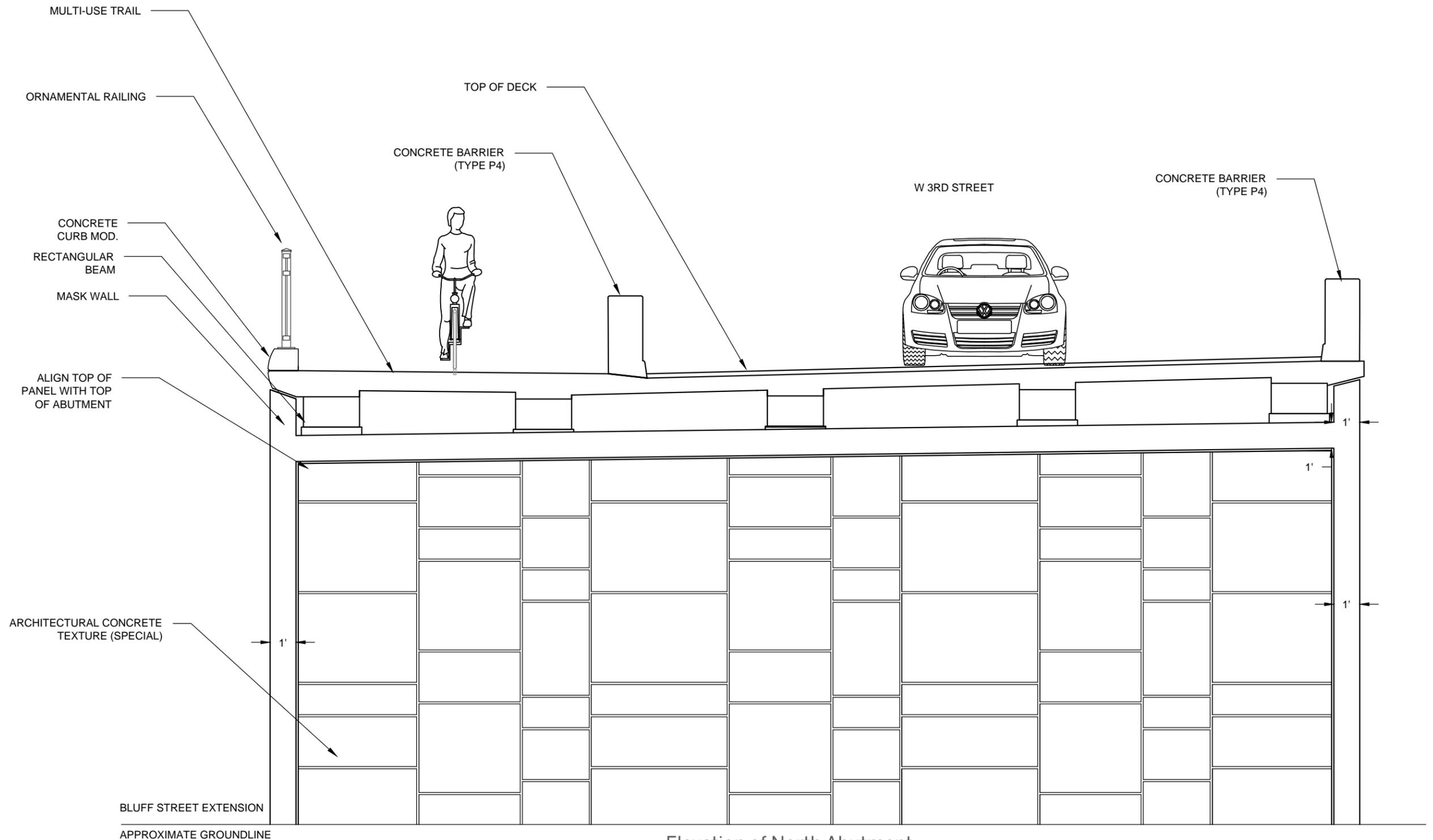
Slip Ramp Bridge

Exhibit 2.4.5 - North Abutment Elevation

The abutments incorporate an "ABC" pattern of three repeating column widths and varying horizontal breaks to create rectangular surface panels that protrude and recede. These surface panels are further defined by horizontal and vertical reveals or "grout lines." The pattern is surrounded by a smooth concrete frame.

The outer corners of the abutment are defined by a design consisting of a square recessed panel set on top of twin, recessed vertical base panels to establish a gateway effect.

See exhibit 2.1.2 for component colors.



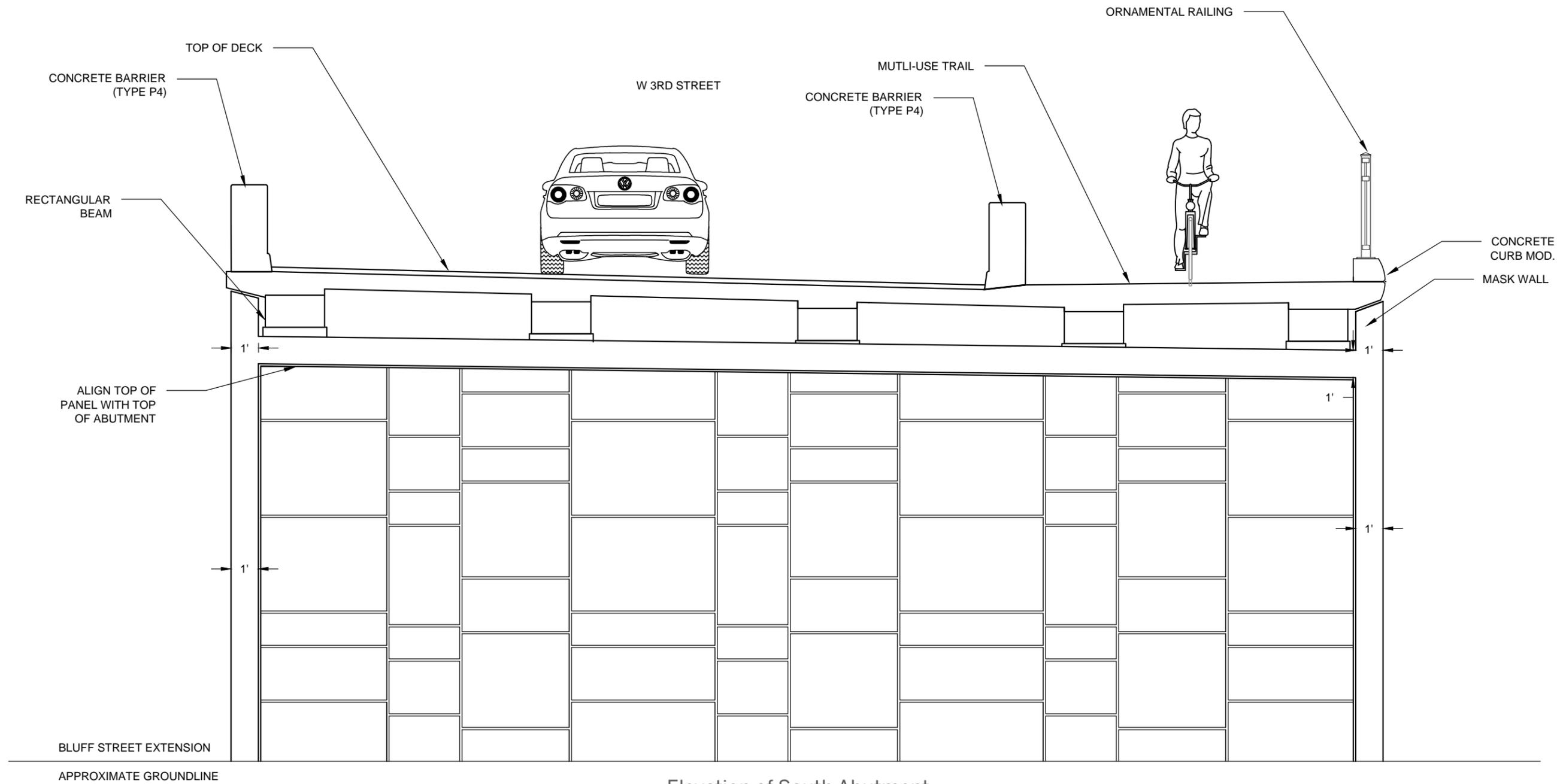
Slip Ramp Bridge

Exhibit 2.4.6 - South Abutment Elevation

The abutments incorporates an "ABC" pattern of three repeating column widths and varying horizontal breaks to create rectangular surface panels that protrude and recede. These surface panels are further defined by horizontal and vertical reveals or "grout lines." The pattern is surrounded by a smooth concrete frame.

The outer corners of the abutment are defined by a design consisting of a square recessed panel set on top of twin, recessed vertical base panels to establish a gateway effect.

See exhibit 2.1.2 for component colors.



Elevation of South Abutment

Minnesota Approach

Exhibit 2.5.1 - Plan

The Minnesota approach includes two distinct environments. The area to the west of Bridge 9103 over US 61 wraps around the historic Red Wing Shoe Company and also includes Potter Street and downtown Red Wing. The area to the east includes Bluff Street, older single family homes, and the US 61 corridor along the base of historic Barn Bluff. The area within the buttonhook will serve as a stormwater management feature.

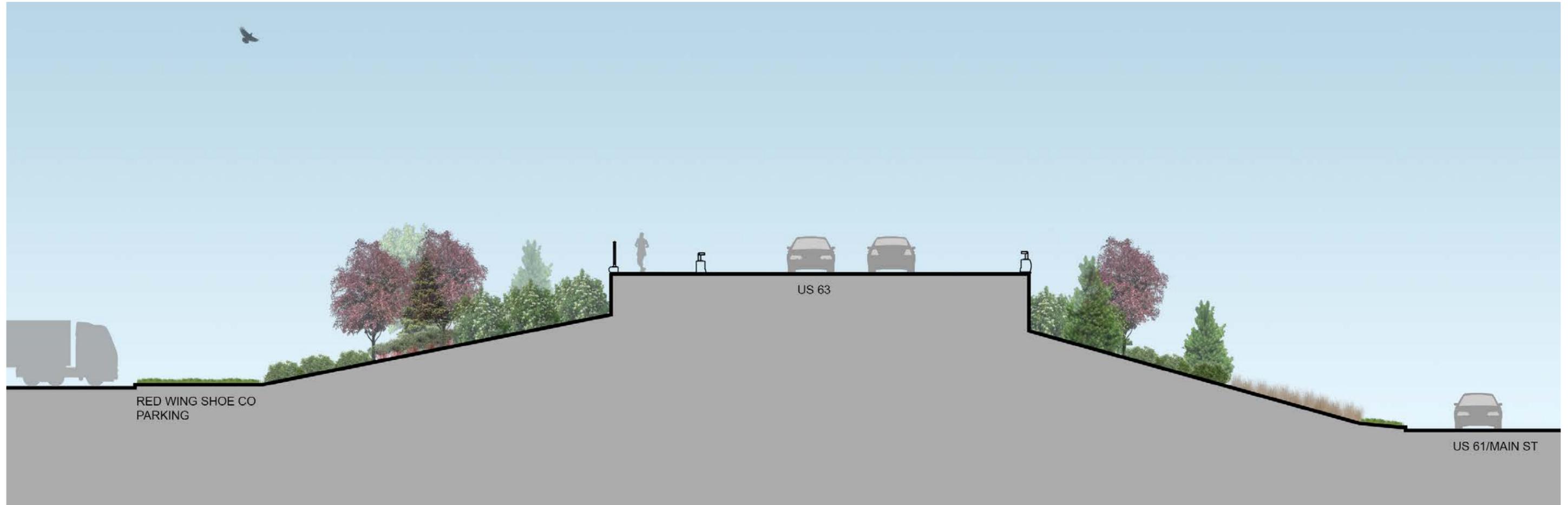


Plan View of Minnesota Approach Roadways

Minnesota Approach

Exhibit 2.5.2 - Section: Buttonhook & Red Wing Shoe Company Building

The areas adjacent to the new Slip Ramp Bridge, US 63 Bridge, retaining walls and approach roadway will range in elevation from fairly level to sloping embankments established with earthen fill. These areas will be planted with a variety of hardy, low-maintenance plantings to be determined in the final design phase.



Section from Red Wing Shoe Company Parking Lot through US 63 to US 61

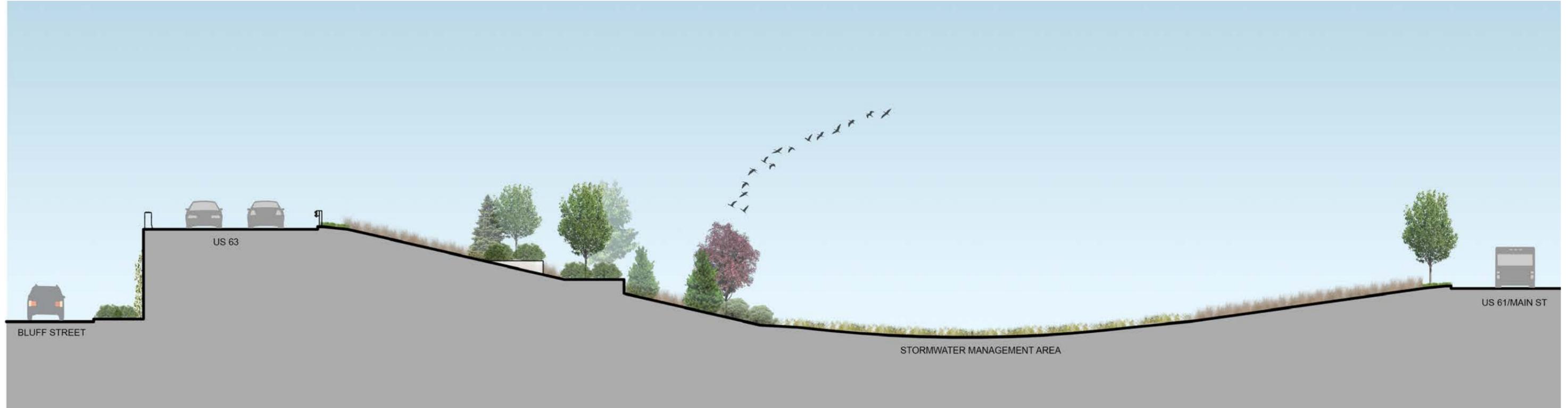


Section Key Plan

Minnesota Approach

Exhibit 2.5.3 - Section: Buttonhook & Basin

The buttonhook roadway will be defined by a concrete retaining wall to the west along Bluff Street and a landscaped embankment within the buttonhook area to the east. Native limestone landscape retaining walls will be introduced to help reduce the slope, provide seasonal interest and establish a more inform, naturalistic visual character to the setting.



Section from Bluff Street through US 63 to US 61

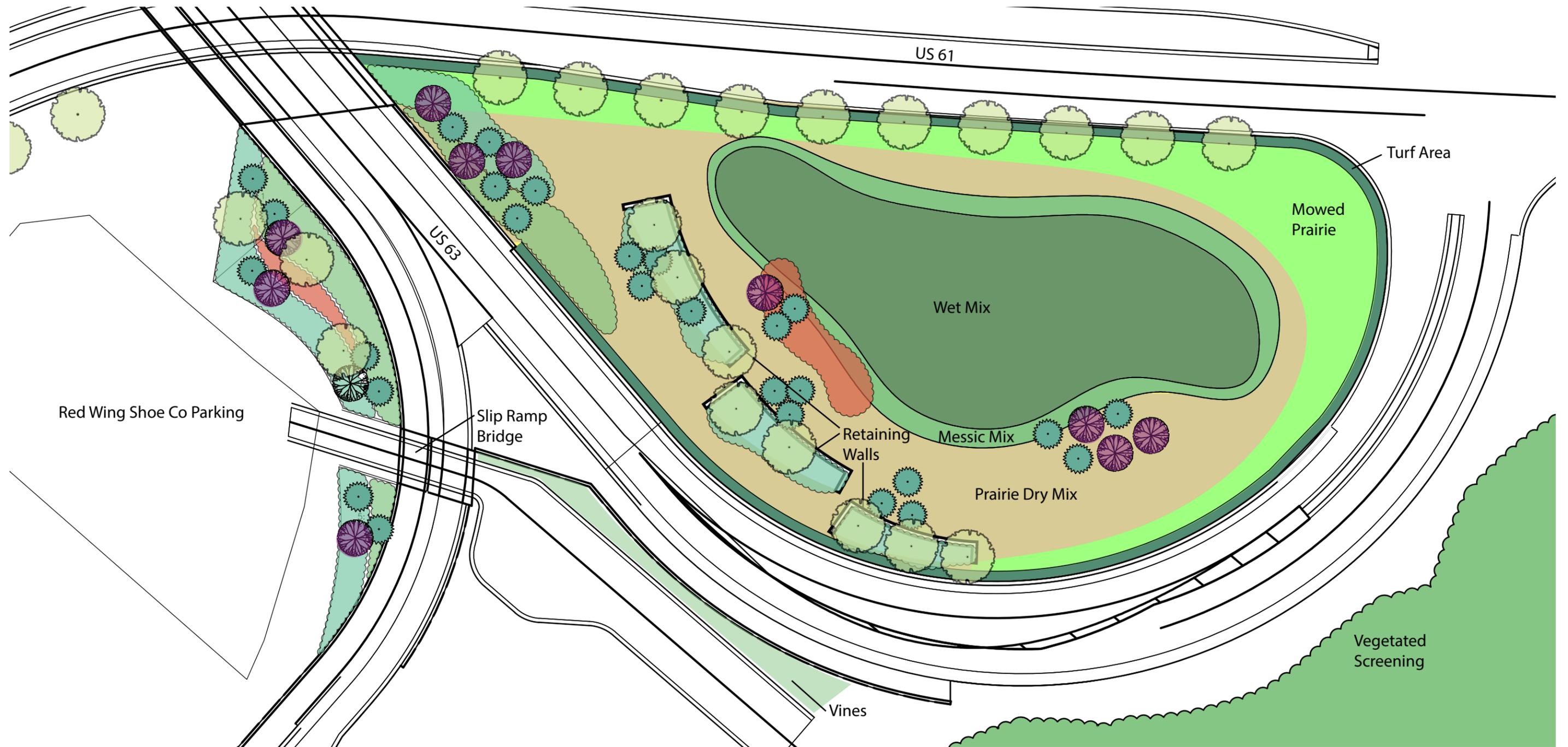


Section Key Plan

Minnesota Approach

Exhibit 2.5.4 - Conceptual Landscape Planting Plan

The conceptual planting plan for the buttonhook area illustrates an arrangement of understory plantings organized in massings with clusters of overstory shade, ornamental and coniferous trees. The majority of the ground plane will be planted as dry, mesic, and wet prairie. The streetscape along US 61 will be approached as an extension of the downtown with a formal line of street trees. The areas adjacent to US 61 will be seeded with an erosion control turf grass mix to accommodate routine mowing.



Minnesota Approach

Exhibit 2.5.5 - Landscape Concept 1

Establishing a visually appealing and functional stormwater ponding area within the buttonhook will require an integrated approach to grading and drainage, soils and planting.

Typology F: Wetland/Pond

Persistently Flooded Mix
MnDOT Mix # 34-182

Temporarily Flooded Mix
MnDOT Mix # 33-261



Perspective View of Buttonhook Intersection with US 61/63

Minnesota Approach

Exhibit 2.5.6 - Landscape Concepts 2

Selection of appropriate roadside plantings will depend a variety of conditions and desired outcomes such as aspect, orientation, soils, surrounding context, site lines, maintenance and travel speed. The Mississippi River corridor in Wisconsin and Red Wing provides an ideal setting for the use of native grasses and forbs.

Dry Prairie Mix
MnDOT Mix # 35-221



Mesic Prairie Mix
MnDOT Mix # 35-241



Typical Roadside Vegetation Showing Species Included in Specified Mixes

Minnesota Approach

Exhibit 2.5.7 - Landscape Concepts 3

Tall, native shrub species and a mix of ornamental flowering, shade and coniferous trees will be used to reduce the scale and visual impact of highway retaining walls. Climbing vines could be used where there is insufficient space to plant larger, woody vegetation.

Typology C: Wall Screening/Embankment

Shrubs



Viburnum lentago Nannyberry



Cornus sericea Red Osier Dogwood



Rhus aromatica Grow Low Fragrant Sumac

Trees



Aesculus glabra Ohio Buckeye

Vines



Parthenocissus quinquefolia 'engelmannii'
Engleman's Ivy

Ornamental

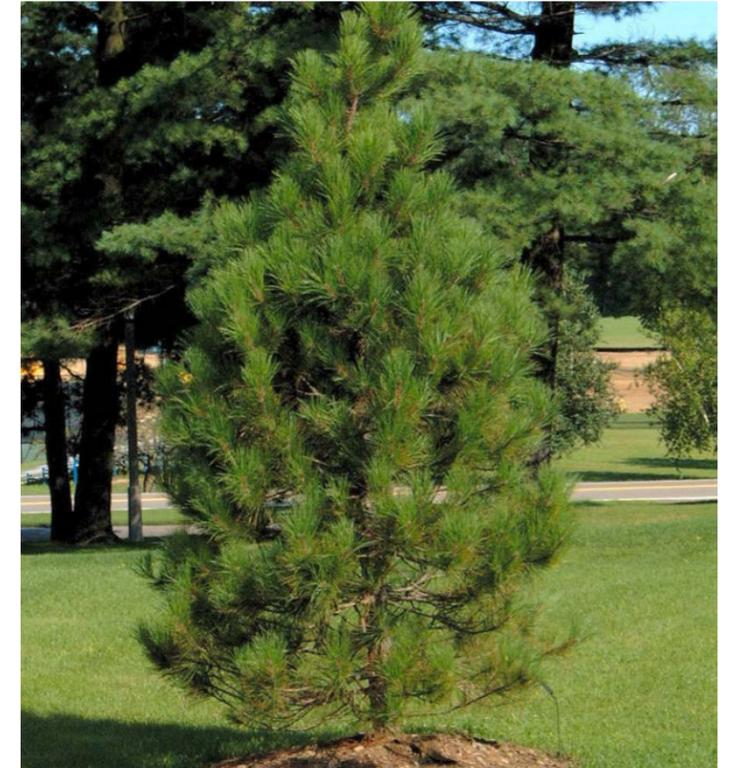


Malus 'adam' Flowering Crabapple



Malus 'Prairifire' Flowering Crabapple

Evergreens



Pinus resinosa Red Pine



Picea pungens Colorado (Green) Spruce

Shade Trees



Ulmus americana 'princeton' Princeton Elm

Minnesota Approach

Exhibit 2.5.8 - Landscape Concepts 4

The extension of the urban streetscape lends itself to using native shade trees in a more formal, linear arrangement. Selecting varieties, such as Northern Red Oak and Princeton Elm that have been found to have tolerance of roadway deicing salts, will be important to establishing a sustainable streetscape.

Typology B: Streetscape



Quercus rubra Northern Red Oak

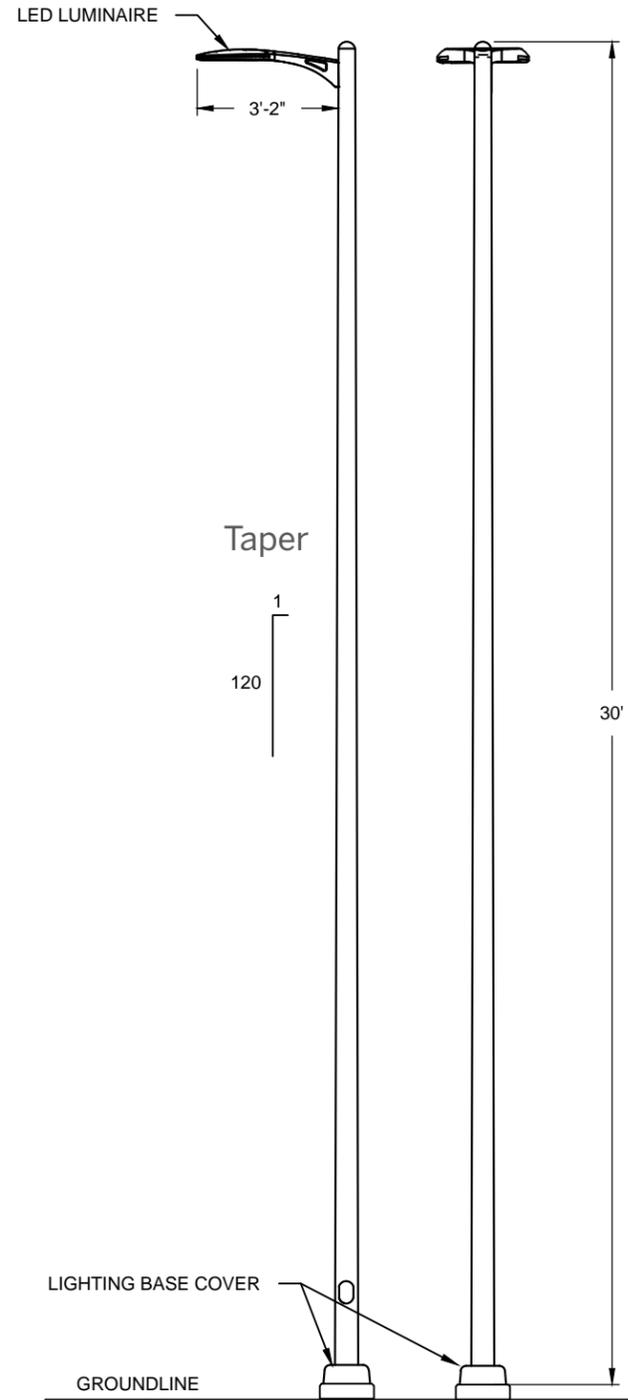
Minnesota Approach

Exhibit 2.5.9 - Lighting (Roadway)

Illumination of the multi-use trail and roadway surface will be provided by LED luminaires set atop a round stainless steel pole. Roadway and multiuse trail lighting will be 24 feet tall, instead of standard 40 foot poles. Shorter height poles will create a

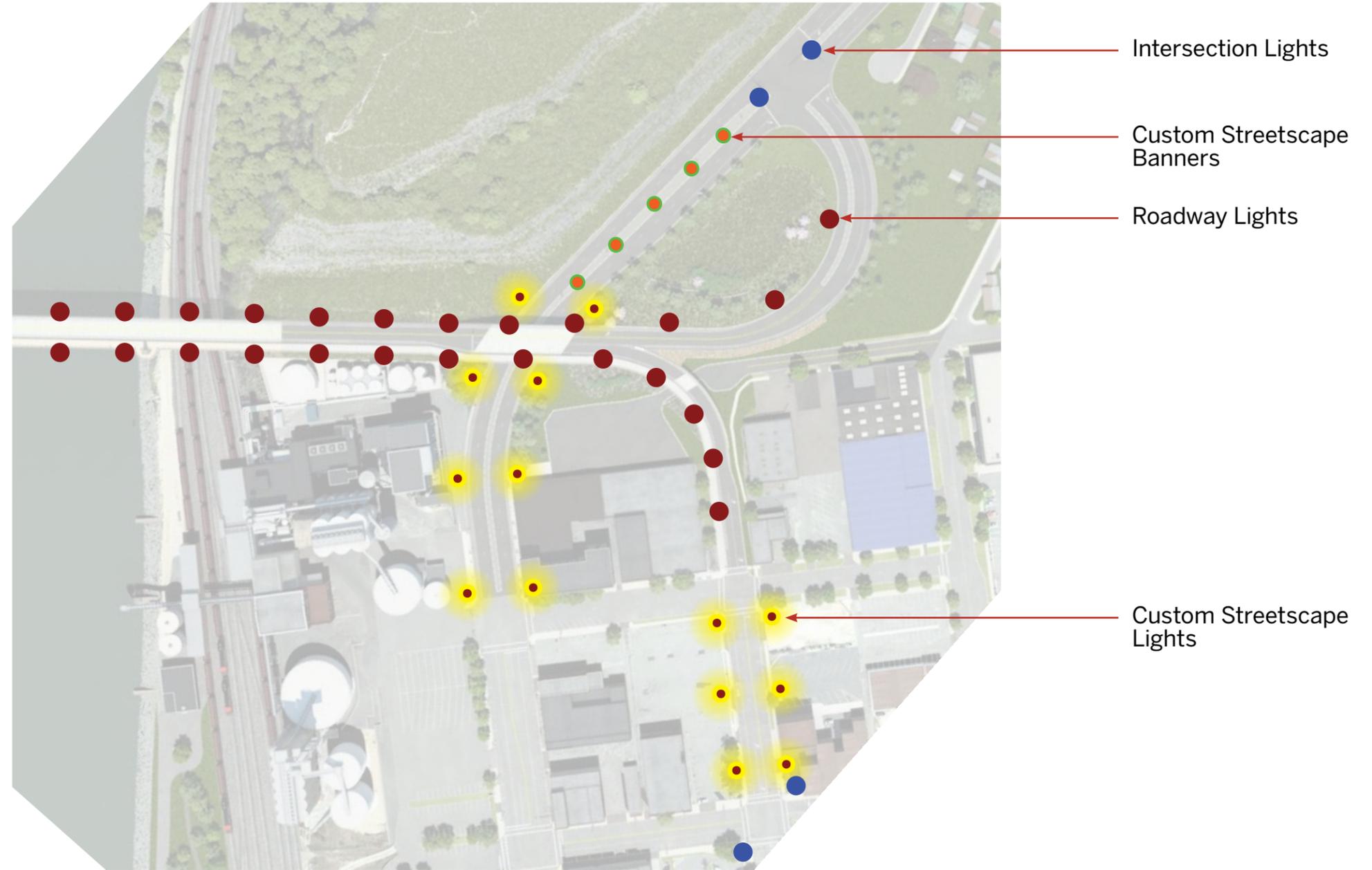
more pedestrian friendly character. Updated photometric studies will be performed in the final design phase to set the final spacing and locations of light units. "Dark Sky" lighting principles will be balanced with safety requirements.

See exhibit 2.1.2 for component colors.



Side and Front Elevation of Roadway Lighting off Bridge

Preliminary Light Locations



Intersection Lights

Custom Streetscape Banners

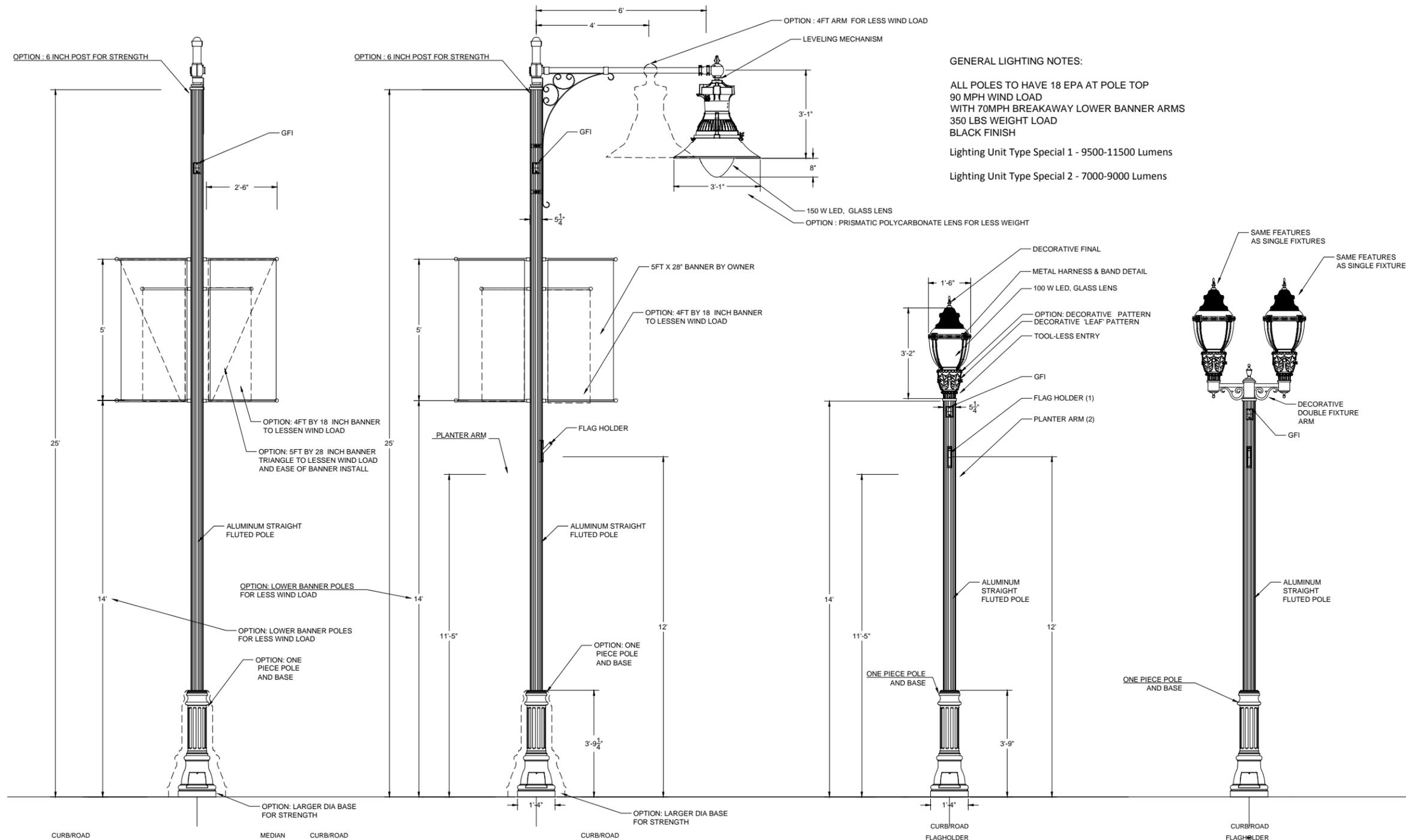
Roadway Lights

Custom Streetscape Lights

Minnesota Approach

Exhibit 2.5.10 - Lighting (Streetscape)

The City may wish to extend the use of downtown Red Wing's decorative streetscape lighting and banner poles along US 61 to help integrate the highway reconstruction into the central business district.



Side Elevation of Banner Pole

Side Elevation of Lighting Unit Type Special 1

Side Elevation of Lighting Unit Type Special 2

Side Elevation of Lighting Unit Type Special 3

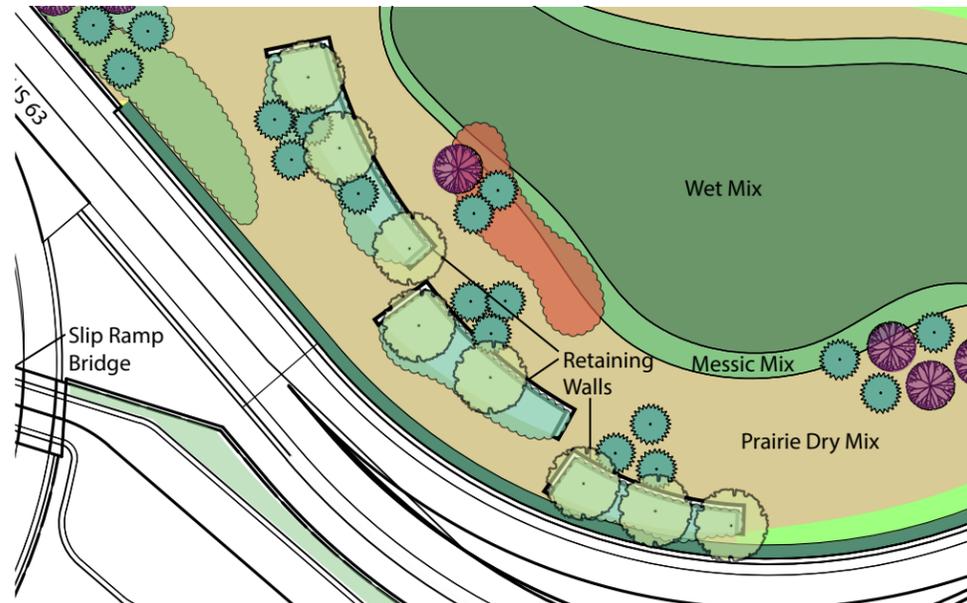
Minnesota Approach

Exhibit 2.5.11 - Landscape Retaining Wall Details

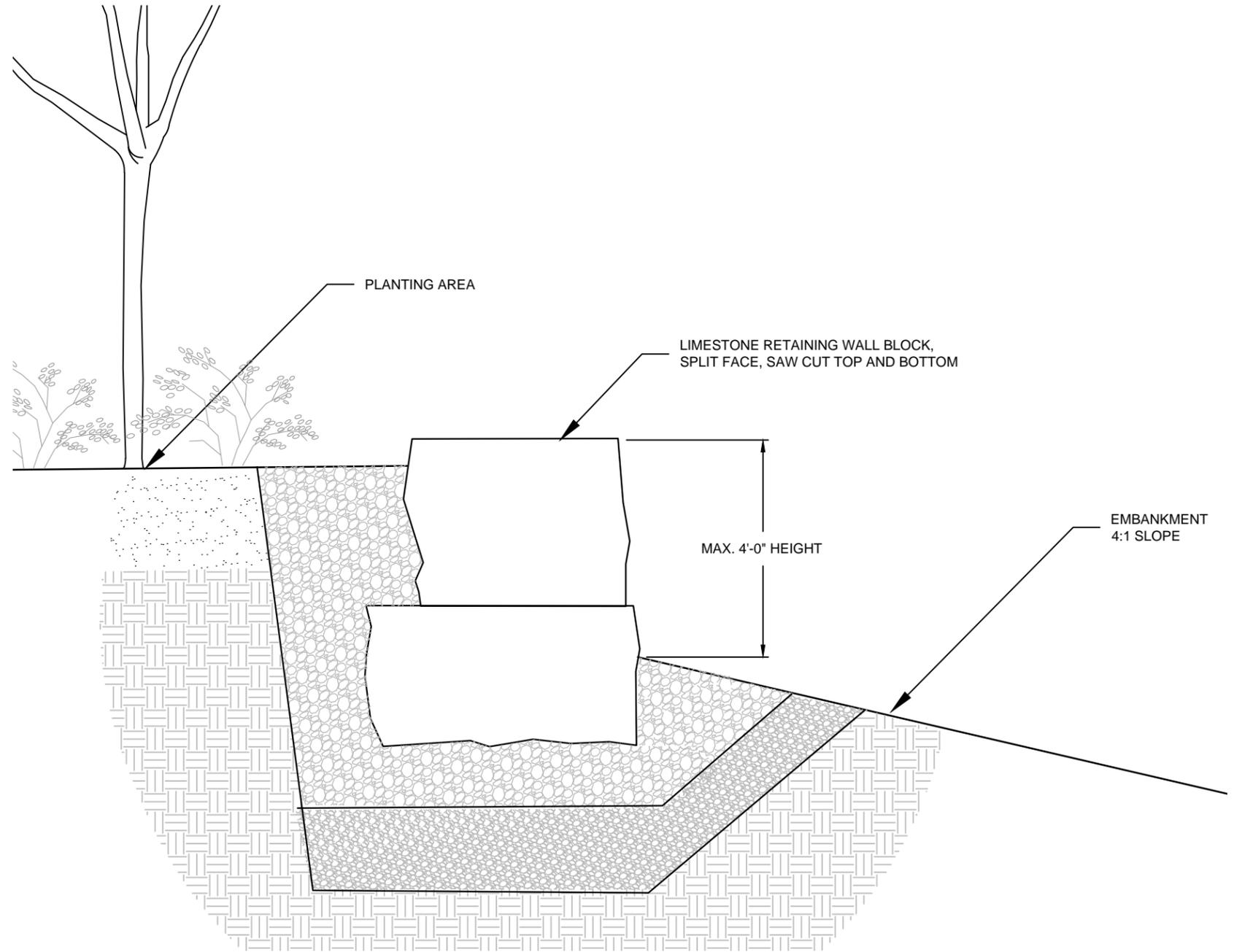
Large, native limestone blocks, either saw cut or split faced will be used as mass walls to help reduce embankment slopes in the buttonhook. Using this type of landscape retaining wall material can also provide seasonal interest and establish a more inform, naturalistic visual character to the setting.



Landscape Retaining Wall, Large Limestone Block



Plan view of retaining wall locations in Buttonhook



Section of Landscape Retaining Wall and Planting Area

Wisconsin Approach

Exhibit 2.6.1 - Plan

The Visual Quality Advisory Committee stated a desire to encourage the use and connections with the "old Hwy 63" alignment to get users to the exceptional river views, amenities, marinas, and businesses along the Wisconsin riverfront. Currently, vehicles often park along the US 63 shoulder to access the recreation river

bottomlands. This project will construct a safer alternative to that by paving wider shoulders along the inside of the jughandle roadways.



Plan View of Jug-Handled Intersection and US 63

Wisconsin Approach

Exhibit 2.6.2 - Trailhead Plan

To improve the recreational bike user experience, trail and bike amenities may be provided at a trailhead near the intersection of 825th Street and the abutment of the river bridge. Further design exploration will occur in the next phase of project development. Amenities may potentially include a bike repair station (a fix-it metal post with supporting arms and repair materials), picnic tables, benches, wayfinding signs. The features should be designed with the same palette of materials, colors and textures to be complementary with the rest of the project.



View looking northeast toward Wisconsin Approach

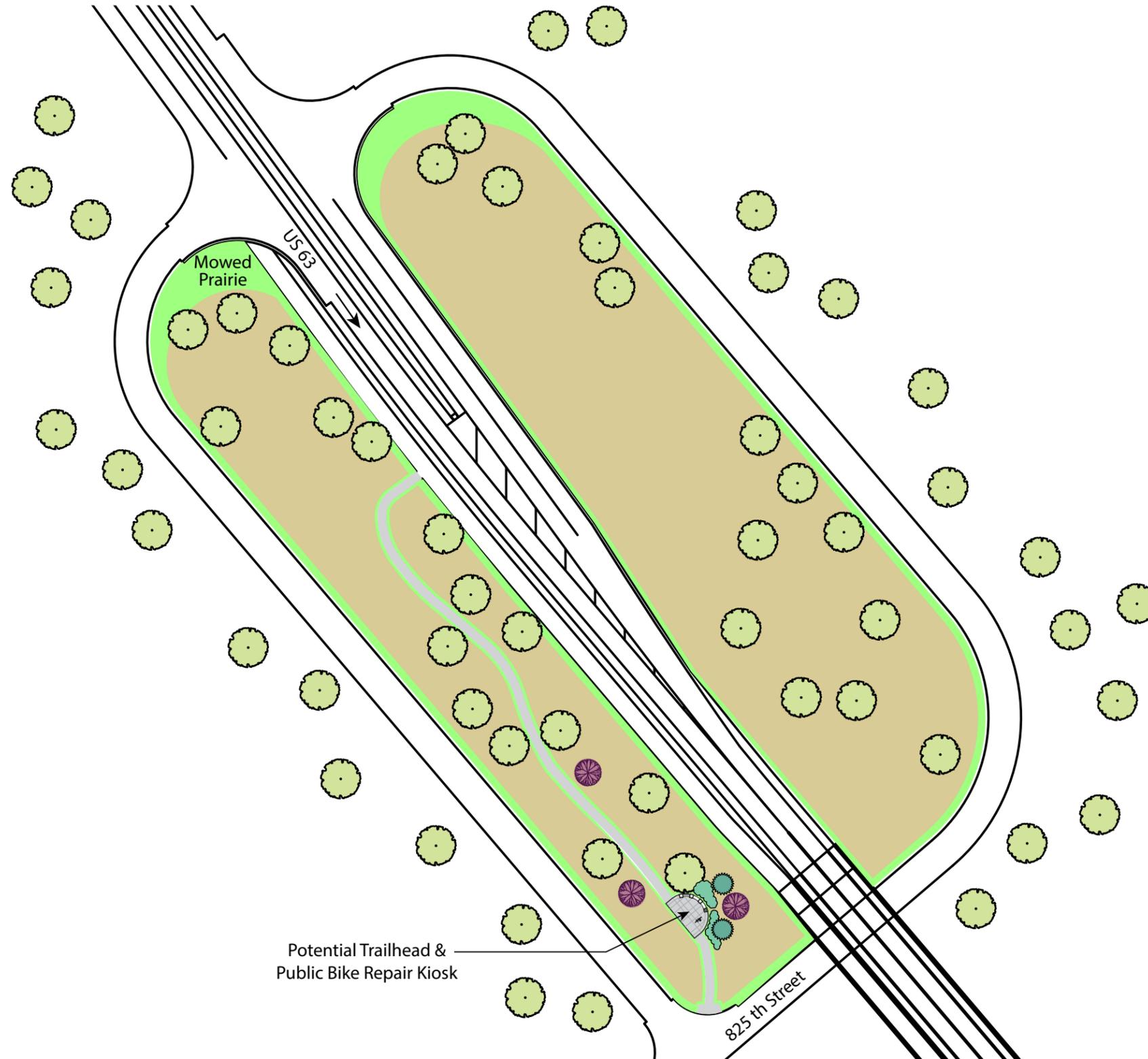


Typical Bike Repair Station

Wisconsin Approach

Exhibit 2.6.3 - Conceptual Landscape Planting Plan

The landscaping plan design intent is to combine a functional integrated approach (for grading, drainage, soils and planting) with a visually appealing naturalistic and informal approach. WisDOT ongoing maintenance practices will limit mowing of the inslopes and backslopes on right of way. The existing river bottom vegetation will provide a valuable seeding source for reestablishing native vegetation within the project limits.



Ornamental



Malus 'adam' Flowering Crabapple



Malus 'Prairifire' Flowering Crabapple

Evergreens



Pinus resinosa Red Pine



Picea pungens Colorado (Green) Spruce

Wisconsin Approach

Exhibit 2.6.4 - Landscape Concepts 1

An appropriate plant palette has been chosen to meet various conditions and outcomes such as orientation, soils, surrounding context, site lines, and future maintenance cycles. The majority of vegetation specified in Wisconsin will be for covering the roadway embankments and the flood plain. The heavy flood plain soils require seed mixes appropriate for seasonally saturate soils.

Shrubs



Viburnum lentago Nannyberry



Cornus sericea Red Osier Dogwood



Rhus aromatica Grow Low Fragrant Sumac

Trees



Aesculus glabra Ohio Buckeye

Wisconsin Approach

Exhibit 2.6.5 - Landscape Concepts 2

Identical to MnDOT seeding mixes, native grass and wildflower mixes will be specified for the approach embankment slopes. Deep-rooted native grasses and forbs provide durable erosion control measures, in addition to their strong drought and salt tolerance characteristics.

Typology E: Prairie

Dry Prairie Mix
WisDOT Mix 70

Dry Prairie Mix
WisDOT Mix 70A



Typical Roadside Vegetation Showing Species Included in Specified Mixes

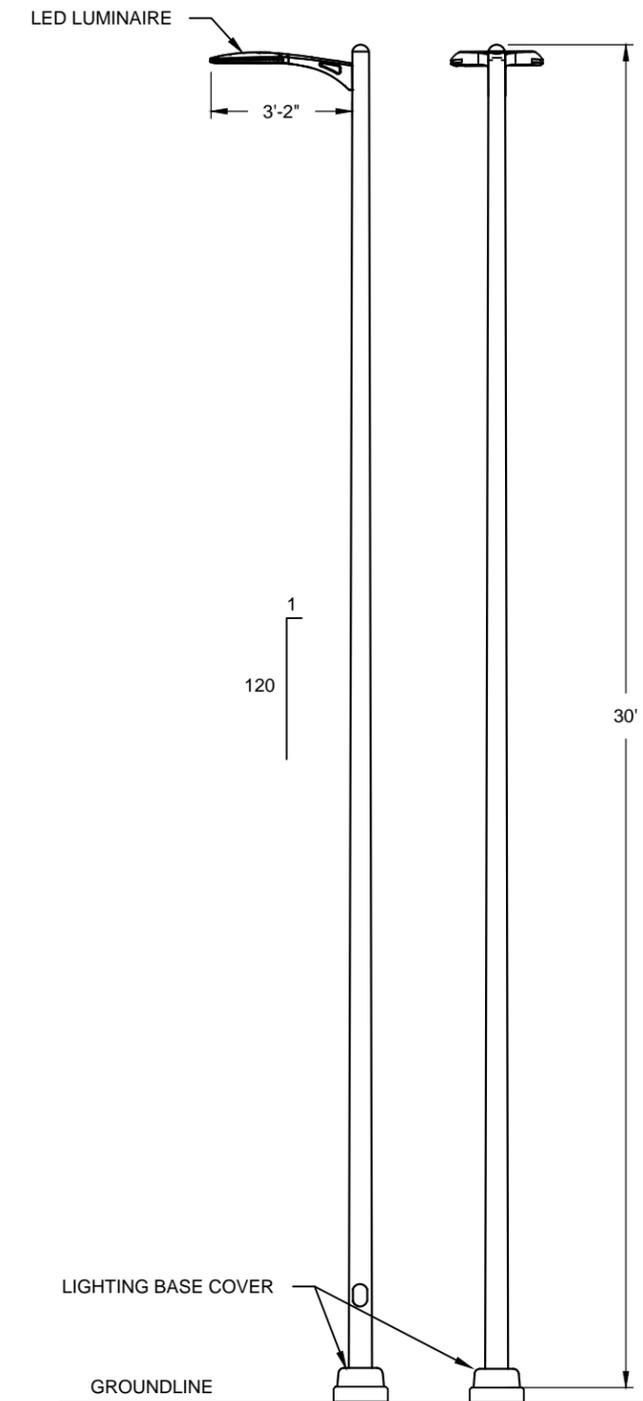
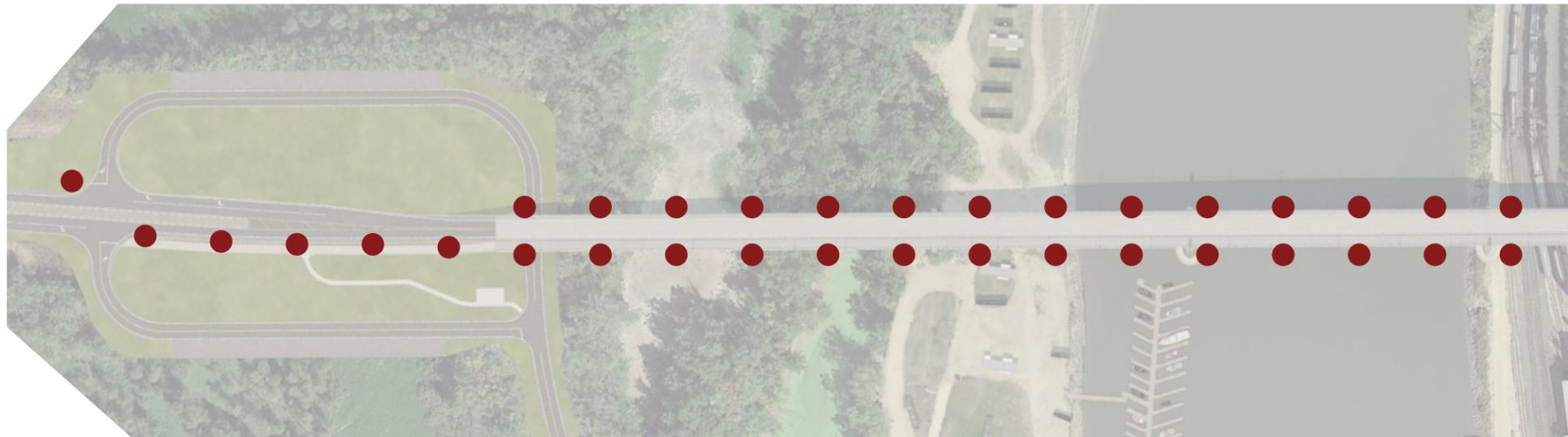
Wisconsin Approach

Exhibit 2.6.6 - Lighting

On the up river side of the bridge, lighting will continue along the US 63 mainline to the intersection with Jug-handle roadways. At the intersection, a pair of lights (most likely cobra lights) will illuminate both sides of the intersection.

See exhibit 2.1.2 for component colors.

Preliminary Roadway Light Locations



Side and Front Elevation of Roadway Lighting off Bridge