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Bridge Enhancements

Design Summary
The reconstructed OR 214/219 bridge over I-5 will be the most visually memorable aspect of the interchange. The railing design should consider what most travelers will notice from I-5 which are bold forms, colors, and attractive lighting. Decorative fencing will be designed to suggest the rolling hills that characterize much of the valley.

Design of the decorative fencing will carefully balance integration of the ODOT required protective fencing, the arches and the aesthetic lighting.

Context Sensitive and Sustainable Solutions (CS³) Design Concept
Panel System

- 12’ panel system allows for each panel to be fabricated, finished (painted or galvanized) as one piece, brought to the site and quickly installed with little on site welding.
- If a panel is damaged it can easily be removed and replaced.
- The highest point of the fence reaches 12’-8” above the top of sidewalk (10’ above the top of bridge rail).

Notes: The dimensions on the four end panels may vary once exact bridge rail dimensions are known. 36 panels per side for a total of 72 panels.
(2) 8’-6” End Panels
**Bridge Rail Modifications**

- Height extended from 2’-7” to 2’-8”
- Top widened by 3”
- Painted 1” relief stripe added

Note: These bridge rail modifications have already been accepted by ODOT.
Arches

- 3 or 4” steel or aluminum attached to barrier and connected to large vertical support.
- Galvanized, painted, or sandblasted with clear coat.
**Large Vertical Support**
- 3 or 4” steel attached to barrier plate, spaced 12’ on center.
- Galvanized, painted, or sandblasted with clear coat.

**Small Vertical Support**
- 1” steel attached to large vertical support.
- Galvanized, painted, or sandblasted with clear coat.
**Mesh Frame**
- Attaches to large vertical support.
- Removable panels for all 1x1” mesh allows for easy maintenance of lighting and electrical.
- Galvanized, painted or sandblasted with clear coat.

**Mesh Panel**
- 3x3” welded wire mesh panel attached to mesh frame.
- 1x1” welded wire mesh panel attached to mesh frame.
- Galvanized, painted or sandblasted with clear coat.
Lighting - Railing

Up Light
- Illuminates large and small vertical supports and potentially arches.
- Attached to top of bridge rail between arch and large vertical support.
- Requires approximately 4” of horizontal space between the arch and large vertical support.

Note: The lighting consultant is creating realistic graphic lighting studies with computer software programs. Once these studies are completed we will send them along as part of this concept report.

The DynaGraze Exterior is a high power, white LED, outdoor linear fixture. Available in 1’ and 4’ sections, it offers smooth linear dimming with ELV modules and 1-100% with most commercially available TRIAC dimmer. Featuring class-leading output, robust housing, LSF filter options, and a glare shield, it is the perfect option for any structure that calls for outdoor linear grazing.

Note: Preliminary lighting options are subject to change.
Spot Light

- Illuminates arches.
- Located at the base of each arch and in other key locations along the bridge.
- Attached to plate extending from top of barrier.
- Requires approximately 12” of horizontal space away from the bridge rail.

Rebel Band 300 AC is a high power linear LED wash fixture is an IP65 outdoor rated wash fixture with 36 high power Rebel LED’s, available in RGB, RGBA, RGBW or White. It’s a perfect solution for dynamic illumination of facade structures, landscapes, stage and studio applications.

Note: Preliminary lighting options are subject to change
Bridge Enhancements - Circuitry Options for Enhanced Lighting

Preferred: Raceway in External Channel

Conduit in Bridge Rail
(Modification of standard details probably required)

Conduit in Sidewalk
(Modification of standard details probably required)
**Roadway Light**

- Architectural treatment of luminaire base, two options:
  - Add 1” painted concrete relief treatment shown on the bridge rail to the luminaire base. (Preferred)
  - OR paint the stripe directly on the concrete luminaire base.
- The proposed 1x1” mesh removable panel should be sufficient for maintenance access to the luminaire base and/or metal light pole.
- The luminaire base can horizontally shift a few feet in either direction, to aesthetically align with the railing/fencing design as necessary.
**Sign Support Structures**

**Background**

As part of the CSS aesthetics enhancements for the I-5 Woodburn Interchange Project, the Aesthetic Advisory Panel for the City of Woodburn asked if the required bridge type sign supports at each end of the highway over crossing could be fabricated with designs more complementary to the themes developed for other elements of the project. The proposed design provides a simple configuration, utilizing special finishes for the steel, while still striving to meeting technical and structural requirements. Our intent is not to mimic or duplicate elements of the decorative fencing or landscaped areas. Those are the primary design elements. Our intent is to complement those elements without drawing attention away from them. Sign bridge structures are inherently limited with regard to size, scale and visual appeal. This memo presents the results of an initial investigation into alternative structure configurations, and the related technical issues.

**Baseline Design Conditions**

Reconstruction and widening of the existing highway bridge will require two new bridge sign support structures at the interchange over crossing (there is another to the east of the interchange). The structures are located near the ends of the highway bridge and will support signage over the through lanes and left hand turn lanes. Location of the west sign structure is restricted by the required clearances for the BPA high voltage transmission line that runs parallel to the I-5 corridor. It will be positioned about 25 feet to the east of and parallel to the west bridge abutment. The structure must be placed on a skew to be placed outside the BPA envelope, and be as far west as possible to keep the signs correctly located for motorists, while also avoiding conflicts with the southbound entrance ramp below the bridge. To span the widened bridge on a skew, the west sign support bridge will be about 144 feet between the end posts. The end posts will be supported on the sloping fill in front of the bridge abutment. The mountings attaching the signs must accommodate the skew with additional framing to hold the signs perpendicular to the roadway.

By contrast, the east sign bridge is oriented perpendicular to the over crossing. The north end post is located just west of the highway bridge east abutment, and the south post is located behind an on-grade sidewalk and guardrail. These conditions result in a span between the end posts of about 118 feet.

**Proposed Sign Support Enhancements**

The proposed aesthetic enhancements include an alternative configuration for the bridge type sign supports and special finishes for the steel tubing (illustrated graphically below). Both aspects of the design are intended to complement other aesthetic elements on or near the bridge. The configuration has a span consisting of two curved rectangular steel tubes, one above the other and connected by vertical posts. The curved tubes of the span are complementary to the graceful arches of the bridge fence and have a simple, uncluttered appearance. They will be finished with a visually unobtrusive coating. The end posts are square or rectangular tapered steel tubes. They will be fabricated using the same uncoated weathering steel that will be used in the landscaped areas adjacent to the bridge abutments. This weathering steel may also be one of the materials used in the decorative bridge fencing. However, final determination of that will result from on-going studies of nighttime lighting and weight for the fencing.

The span and post tubes are fabricated steel sections similar to the fabricated steel tubes used in the ODOT Standard Monotube Cantilever Sign Supports. The radius of the curved tubes is flat enough that forming of the steel to the curve is not needed. They can be flexed to the curved shapes without introducing excessive stress into the members.
Sign Support Structures

View Looking West

View Looking North
Loop Ramp Landscape Enhancements

Design Summary

The landscape areas enclosed by the new ramp system provide over three acres of opportunity for landscape enhancements. Gently curved lengths of corten steel or similar material will form low terrace walls, planted with hardy and drought tolerant trees, shrubs and groundcover.

The landscape areas respond to the safety and operational needs of the roadway identified through ODOT technical review including; maintaining clear sight lines by limiting the number of fixed objects which could be struck by vehicles, integrating stormwater swale locations and size, and finally planting modifications that respond to the terrace walls, sign bridge footings and the BPA corridor.

With further understanding of all the roadway elements and boundaries, the original design concept has been refined showing conceptual terrace wall layout, grading based on existing contours, and planting designed to enhance the landscape terrace walls. The grading concept may be further refined to reduce the amount of fill material required.
Legend:

1. Line of Sight (Bridge Shadow)
2. Tall Concrete Shoulder Barrier
3. Impact Attenuator
4. Edge of Asphalt
5. Sign Bridge Footing
6. Proposed Bridge Rail Pilaster (End of Fencing)
7. Proposed Landscape Terraces
8. Concrete Sidewalk
9. Manhole/Inlet
10. Stormwater Swale (Coordinate with ODOT)
South Loop Ramp Conceptual Grading

Legend:
1. Proposed Landscape Terraces
2. Existing Grading (Dashed Line)
3. Proposed Grading (Solid Line)

Note: This conceptual grading plan is based on the DAP plans grading. The earthwork concept and grading will be updated for the Preliminary Plans when updated contour files are available.
Legends:

- 5’ or Taller Plants
- 5’ or Shorter Plants
- 2-3’ Plants
- 1-2’ Plants
- Groundcover + Shrub Groupings
- Deciduous and/or Evergreen Trees

Note: This planting scheme assumes proposed landscape walls ranging from 3-5’ tall, planting heights will be adjusted to properly show off landscape terraces as the conceptual design is refined.
Cross-section A

This cross-section shows conceptual ideas about integrating the terrace walls into the slope. The walls will be either freestanding or slightly retaining depending on grading and desired effect. Plant material size, shape, and texture will be chosen to enhance the landscape terrace walls and will include hardy trees and shrubs varying in height from groundcover to 5-feet tall.

Legend:

1. Proposed Landscape Terrace Walls
2. Potential Grading Concept (Freestanding)
3. Proposed Grading Concept (Retaining)
4. Plant Material (Trees, Shrubs & Groundcover)
5. Drainage (Pipe or Weep Hole)
1. Line of Sight (Bridge Shadow)
2. BPA Corridor
3. Tall Concrete Shoulder Barrier
4. Impact Attenuator
5. Edge of Asphalt
6. Sign Bridge Footing
7. Proposed Bridge Rail Pilaster (End of Fencing)
8. Proposed Landscape Terraces
9. Concrete Sidewalk
10. Manhole/Inlet
11. Stormwater Swale (Coordinate with ODOT)
North Loop Ramp Conceptual Grading

Legend:
1. Proposed Landscape Terraces
2. Existing Grading (Dashed Line)
3. Proposed Grading (Solid Line)

Note: This conceptual grading plan is based on the DAP plans grading. The earthwork concept and grading will be updated for the Preliminary Plans when updated contour files are available.
North Loop Ramp Conceptual Planting

Legend:

- 5' or taller plants
- 5' or shorter plants
- 2-3' plants
- 1-2' plants
- Groundcover + Shrub Groupings
- Specimen Shrub

Note: This planting scheme assumes proposed landscape walls ranging from 3-5' tall, planting heights will be adjusted to properly show off landscape walls as the conceptual design is refined.
Cross-section B

This cross-section shows conceptual ideas about integrating the terrace walls into the slope. The walls will be either freestanding or slightly retaining depending on grading and desired effect. Plant material size, shape, and texture will be chosen to enhance the landscape terrace walls and will include hardy shrubs varying in height from groundcover to 5-feet tall.

Legend:

1. Proposed Landscape Terrace Walls
2. Potential Grading Concept (Freestanding)
3. Proposed Grading Concept (Retaining)
4. Plant Material (Shrubs & Groundcover)
5. Drainage (Pipe or Weep Hole)
For the full article visit: http://www.aisc.org/WorkArea/showcontent.aspx?id=17894

**Introduction:**

The aesthetic values of this weathered and textured material, and more importantly, the practical values of Weathering Steel make this steel particularly useful for applications where strength, ease of fabrication and appearance are paramount.

**Design Considerations:**

Weathering Steel has a unique, natural oxide coating that when fully mature is dense, tightly adherent and relatively impervious to further atmospheric corrosion. Minor damage to this oxide coating heals itself, therefore, maintenance is greatly reduced.

Bare Weathering Steel is suitable for many atmospheric environments, including moderate industrial and select marine exposures. It is compatible with other construction materials - brick, stone and wood - when appropriate details are incorporated in the design.

**The Weathering Process:**

Alloy content and environmental condition are key factors influencing the formation of an oxide film on steel. Under appropriate atmospheric conditions, Weathering steel develops a durable, tightly adherent protective oxide coating. The appearance, texture and maturity of this coating depend on three interrelated factors: time, degree of exposure and atmospheric environment.

With time, the oxide coating changes from a “rusty” red-orange to a dark purple-brown patina. The moderately rough texture becomes more distinct as the coating thickens. The weathering process extends over a period of time.

For the full article visit: http://www.aisc.org/WorkArea/showcontent.aspx?id=17894

Corten Steel or similar material

Line of Sight

Mittal Steel USA - Plate - A technical overview of weathering steel for bridges and general construction.
Soundwall

Design Summary

Soundwalls will be constructed of colored block materials that make them more attractive, a significant enhancement for the gateway. The soundwall block color, pattern and panel variation has been further refined based on technical design review. The soundwalls may also be a unique opportunity to view public art, which may be coordinated and attached by the City of Woodburn after the walls are constructed, with ODOT approval.

**Conceptual Block Pattern per Panel:**
- 20% Terracotta
- 20% Merlot
- 20% Sable
- 40% Grey

**Conceptual Block Pattern per Pilaster:**
- 10% Terracotta
- 90% Midnight

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**Block Pattern Variation Breakdown Per Pilaster:**
- Terracotta Blocks: 2 total per pilaster
  - (1) 4”x16”x16” cap block
  - (1) 8”x16”x16” standard block
- Midnight: 20+/- 8”x16”x16” standard blocks per pilaster
Block Pattern

Block Pattern Variation Breakdown Per Panel:

- Terracotta Blocks: 42 total per panel
  - (2) 4”x8”x16” cap blocks
  - (38) 8”x8”x16” standard blocks
  - (2) 8”x8”x8” half blocks
- Merlot Blocks: 42 total per panel
  - (2) 4”x8”x16” cap blocks
  - (38) 8”x8”x16” standard blocks
  - (2) 8”x8”x8” half blocks
- Sable Blocks: 42 total per panel
  - (2) 4”x8”x16” cap blocks
  - (38) 8”x8”x16” standard blocks
  - (2) 8”x8”x8” half blocks
- Grey Blocks: 84+ per panel

Alternating Panel Variation Plan

| 2 | 1 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 3 | 2 | 1 |

12 Panel Alternation:

- Repeat this sequence of 12 block panel variations X number of times per length of soundwall.
Mural Wall Panel Addition:

- Aluminum mural panels may be fastened to the soundwall after the wall is built, subject to structural and weight limitations approved by ODOT.
- Shape, size and location will be determined by the City working with the artist.
- It is recommended that an architectural engineer be consulted when installing panels.
- Two options for installing panels to be determined by the City working with the artist:
  - For simple installs on brick, generally 1 ½ inch stainless steel flat head screws with nylon Mungo plugs are used. The screws are placed at 16” intervals around the perimeter and 32” intervals in the middle of each panel.
  - Create a framework of 16” centred steel or wooden studs that are secured to the wall by specially engineered brackets, epoxy and steel rods. The mural is then secured to the frame using appropriate stainless steel screws or rivets.

Employment Ontario Mural Project Example, funded by the Ontario Government in partnership with the City of Windsor and various local Business Improvement Associations.
Drainage Swale - Southwest Quadrant

Design Summary
Visually enhancing the look of this east-facing embankment, visible from 1-5 and the southbound off-ramp, is a part of the overall gateway design. Careful coordination between wall location, grading restraints, and limitations set by the existing stormwater swale have been considered in the design of this wall.
Drainage Swale

Proposed 2’-4’ Tall Wall

Proposed Access Fence on Wall

Ordinary High Water Line

Proposed 2’-4’ Tall Wall