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List of Acronyms

- AASHTO – American Association of State Highway Transportation Officials
- ASC – Aesthetic Sub Committee
- CB – Council Bluffs
- CBIS – Council Bluffs Interstate System
- DOT – Department of Transportation
- HPS – High Pressure Sodium
- LED – Light Emitting Diode
- MAC – Mid-America Center
- MAPA – Metro Area Planning Agency
- MSE – Mechanically Stabilized Earth
- SWOT – Strengths, Weaknesses, Opportunities, Threats





Introduction and Executive Summary

Council Bluffs, Iowa is a community progressively redefining itself for the 21st Century. Reconstruction of the Council Bluffs Interstate System (CBIS) is one of several planning initiatives changing the shape of the city.

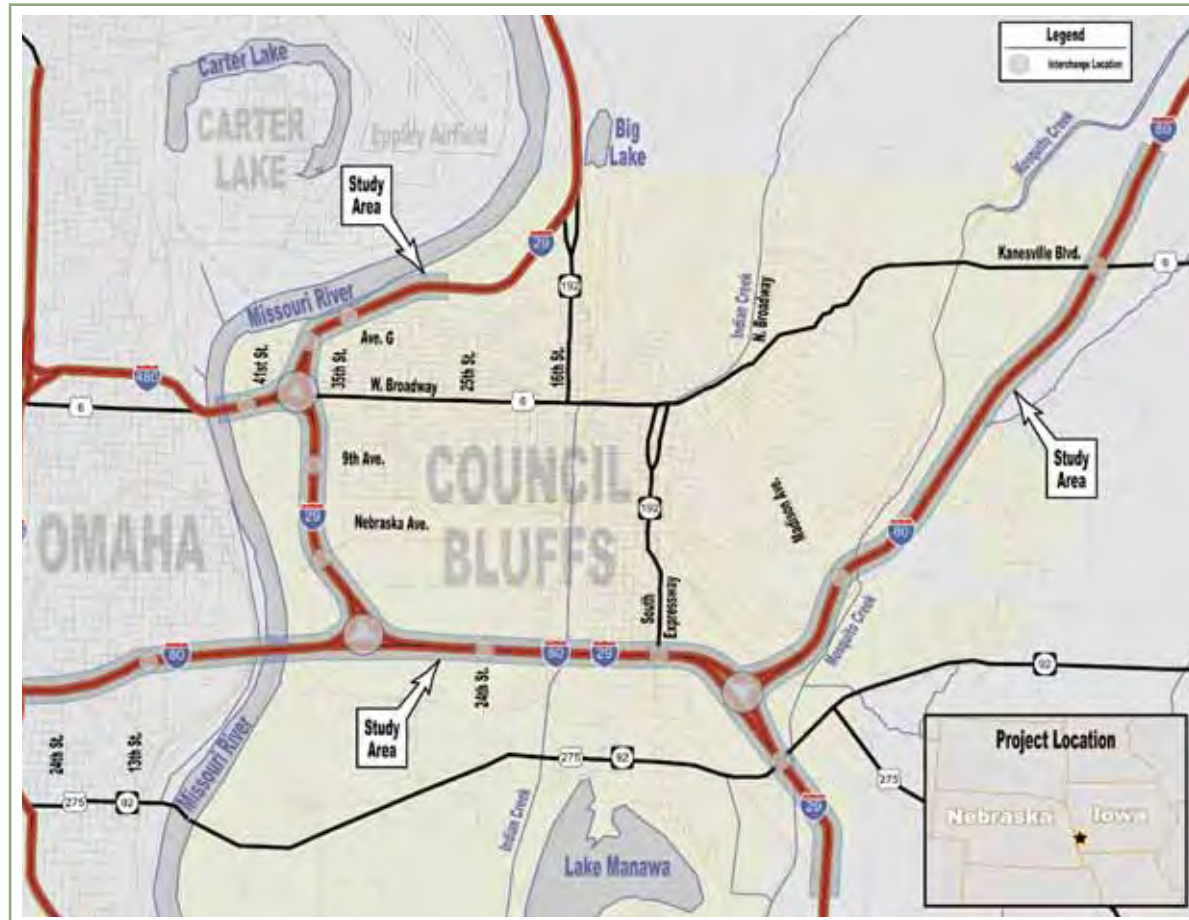
The Iowa Department of Transportation (Iowa DOT) has undertaken a multi-year reconstruction project for the I-29/I-80 corridor and has commissioned HDR to develop an aesthetics master plan to establish a consistent, attractive corridor theme that compliments the character of the existing landscape and incorporates locale-specific details. In order to develop an aesthetics plan that is fully integrated into on-going community planning initiatives and incorporates varying community interests, an Aesthetic Subcommittee (ASC) was formed. Representing key stakeholder groups in Council Bluffs and the State of Iowa, this group met several times over the course of the project to assist in formulating recommendations for aesthetic improvements. Members of the ASC and the groups they represent are shown in the table below.



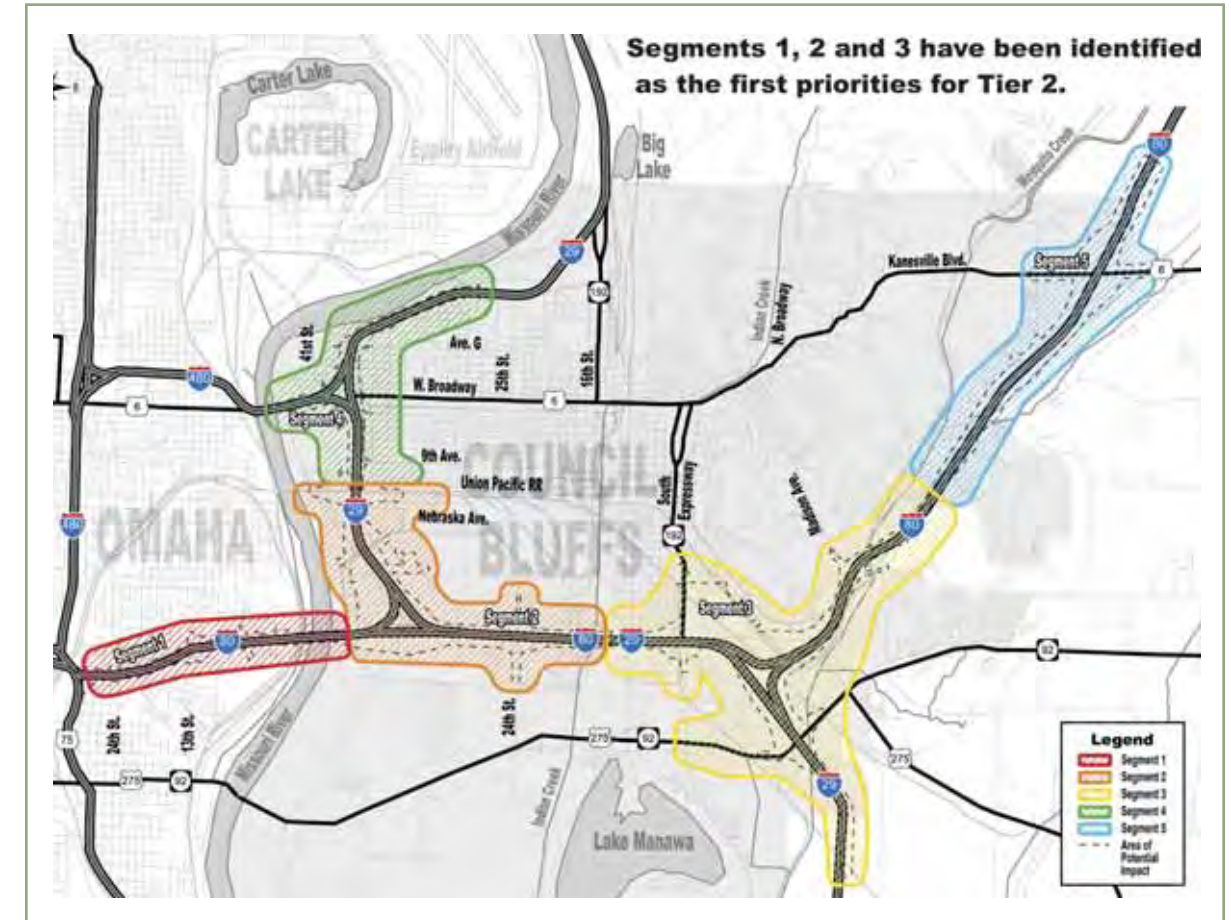
Aesthetic Subcommittee Members

- | | |
|---|---|
| <ul style="list-style-type: none"> ▪ Jane Bell, Ameristar Casino ▪ Scott Belt, Council Bluffs City Council Member ▪ Kathy Fiscus, Council Bluffs Convention and Visitors Bureau ▪ Sheryl Garst, Pottawattamie County Growth Alliance ▪ Tom Hanafan, Mayor of Council Bluffs ▪ Ron Hopp, City of Council Bluffs Parks and Recreation ▪ KC Hummel, Western Historic Trails Center ▪ Marcia Joffe-Bouska, Local Art Community ▪ Gayle Malmquist, City of Council Bluffs Community Development ▪ Shannon Meister, Iowa Department of Natural Resources ▪ Ken Milford, Council Bluffs Planning Commission | <ul style="list-style-type: none"> ▪ Bob Mundt, Council Bluffs Chamber of Commerce ▪ Terry Oswald, Loess Hills Preservation Society ▪ Greg Reeder, City of Council Bluffs Public Works ▪ Paul Romano, True Value Hardware ▪ Loral Ronk, Bluffs Arts Council ▪ Mark Shoemaker, Pottawattamie County Conservation ▪ Rich Sorich, Iowa West Foundation ▪ Mark Vacanti, Harrah's Entertainment ▪ Matt Walsh, Council Bluffs City Council Member ▪ Roger Williams, Pottawattamie County Board of Supervisors ▪ Greg Youell, Metropolitan Area Planning Agency |
|---|---|





CBIS STUDY AREA - The Aesthetics Master Plan includes only the CBIS reconstruction on the east side of the Missouri River



CBIS Study Area - Construction Segments

THE COUNCIL BLUFFS INTERSTATE SYSTEM PROJECT

In 2006, the I-29/I-80 corridor through Council Bluffs carried 20,000-75,000 vehicles per day. By 2030, traffic on I-29/I-80 between the I-29 interchanges is expected to increase to over 120,000 vehicles per day, while traffic on I-29, north and south of I-80, is expected to increase by fifty percent (50%) or more.

In 1997, the City of Council Bluffs and the Metropolitan Area Planning Agency (MAPA) conducted a study of the interstate system in Council Bluffs. This study, known as the Council Bluffs Interstate System Needs Study, showed that many of the interstate's features do not meet current design standards, guidelines or operational criteria and do not provide adequate traffic capacity. In light of the findings, the Iowa DOT initiated the Council Bluffs Interstate System (CBIS) Improvements Project in 2002 covering the area shown above.

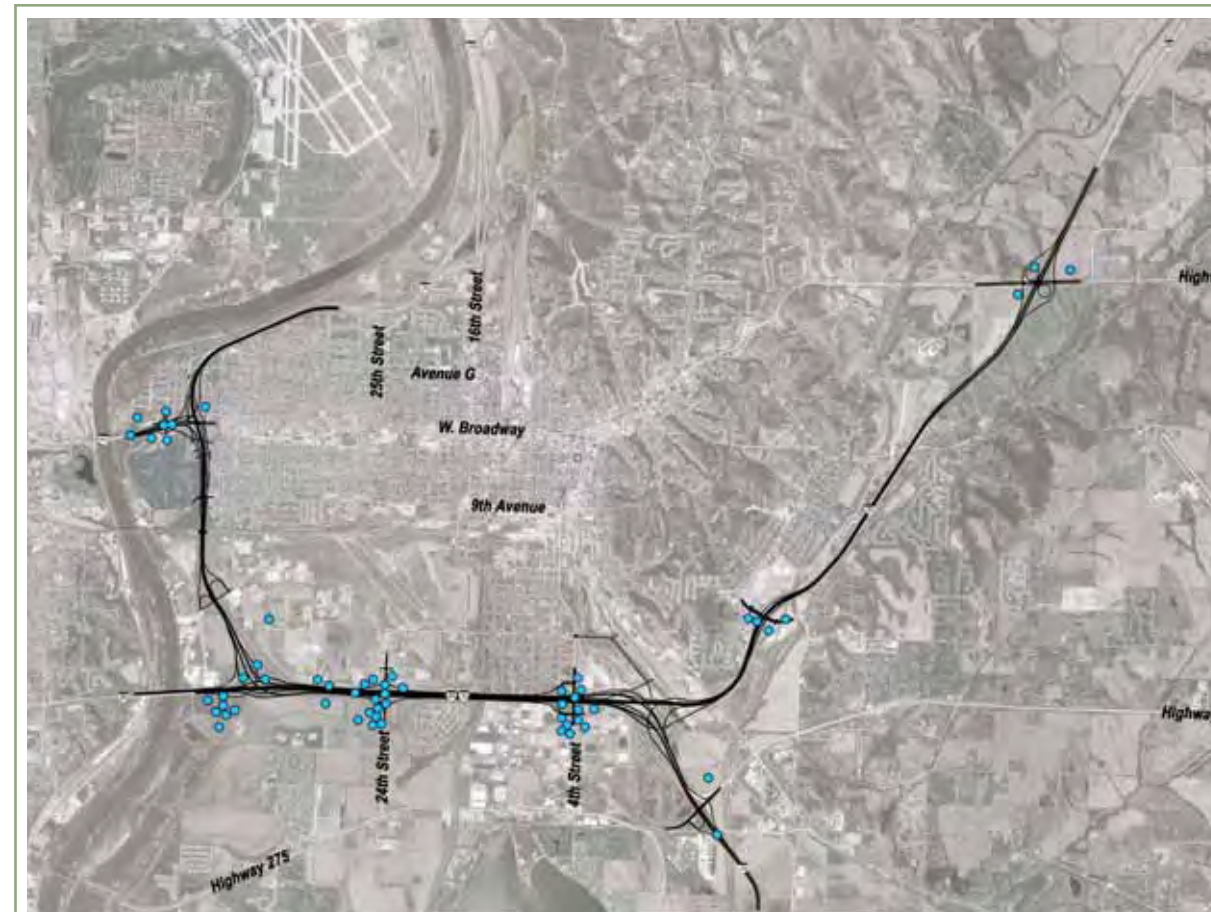
Construction on the CBIS Improvements Project will be completed in segments as indicated in the graphic above.

- The CBIS Improvements Project is a major effort focused on improving Interstates 80, 29, and 480 within the Council Bluffs metropolitan area. It is intended to improve mobility through the region by upgrading the I-80 and I-29 corridors, improving the condition of the roadways, reducing traffic congestion and crashes and adding capacity. Approximately 18 miles of mainline interstate (I-80, I-29, and I-480) and 14 interchanges (three interstate-to-interstate interchanges and 11 interstate-to-local street interchanges) are included in the study area.
- Construction of the 24th Street Bridge over I-29/I-80 will begin in 2008. Construction of the dual-divided section of I-29/I-80 is planned to begin in 2012. The northern portions of I-29, including the West Broadway system interchange, and the eastern most portions of I-80 are the final segments scheduled for reconstruction.





Aesthetic opportunities within the project area



Preferred locations for aesthetic enhancements throughout the project area



AESTHETICS MASTER PLAN PROJECT

The CBIS Aesthetics Project calls for the creation of an aesthetics master plan for the I-29/I-80 corridor. Through positive and proactive public involvement, the plan's goal is to establish an attractive and distinctive corridor. In addition to improving the appearance of the corridor, the plan will also consider the safety, ease of maintenance and economy of all aesthetic recommendations.

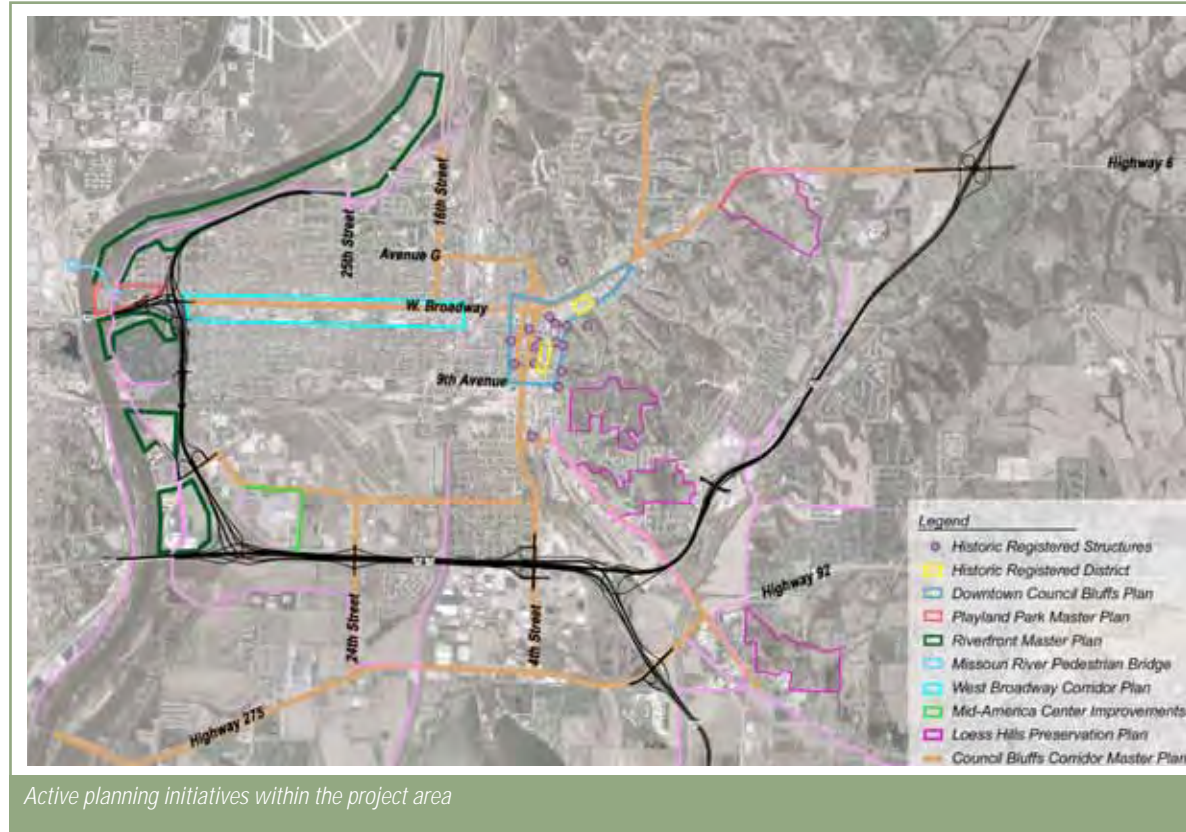
Aesthetic Opportunities

The planned reconstruction of the interstate provides many opportunities for aesthetic enhancements including, bridges, retaining walls, sound walls and areas for landscaping. The location of these opportunities is shown above.

Aesthetic enhancements can be incorporated into just about any component of the interstate design. Limited resources, however, require a targeted application of these enhancements. To focus design efforts, the Design Team asked the ASC to identify elements they believed could make the most dramatic aesthetic impact on the corridor.

The ASC identified bridges, landscape design and public spaces/community gateways as the primary elements of interest. Other features also considered were lighting, retaining walls, sound walls, system interchanges, signage and sign structures, stand alone public art pieces, barriers and fencing.

The ASC identified specific locations for aesthetic enhancements. The 24th Street Bridge and South Expressway interchange were identified as providing the best opportunities for improving the aesthetics of the corridor. Interest in other locations was dispersed among the I-80 west entrance, I-480 entrance at Broadway and the Madison Avenue interchange. The image above illustrates the ASC's location preferences for enhancements.



Active planning initiatives within the project area

“In 2015 Council Bluffs will be a prosperous urban area known for its cultural enlightenment and public art collection that is the pride of the community and draws visitors from across the country and around the world. The public art program will be an essential part of the community and a routine element for urban development and planning.”

-Council Bluffs, Iowa Public Art Master Plan 2004

Active Planning Initiatives

Several active planning initiatives in Council Bluffs helped provide a context for the development of the Aesthetic Master Plan for the corridor. The image above highlights those endeavors. The most relevant plans are briefly summarized below.

Council Bluffs, Iowa Public Art Master Plan

The Council Bluffs Public Art Master Plan calls for public art to be located at city gateways, along major transportation corridors, commercial destinations and other locations found along the interstate. Any public art installed as part of the interstate reconstruction or incorporated into the functional and landscape elements of the system will be in accordance with the style, genre and policy recommendations outlined in the Public Art Master Plan.

The plan is also relevant because two of the top ten priority sites for public art installations are within or adjacent to the CBIS project area: Mid-America Center Entry and South Expressway Viaduct.

Other potential locations identified in this plan for public art related to the interstate, include:

- Mid-America Center Gateway at the I-29/I-80 24th Street Exit
- West Iowa Gateway at the I-29/I-80 interchange
- South Expressway Corridor; and Mall of the Bluffs Entry

Mid-America Center Streetscape Improvement Conceptual Master Plan

The Mid-America Center (MAC) sits immediately to the north of the combined I-29/I-80 stretch of the corridor. The Streetscape Improvement Conceptual Master Plan intends to establish an attractive image for the MAC area and create a clear and efficient access and circulation system. To accomplish this, the plan addresses visibility and access from the interstate, lighting, way-finding, landscaping, public art and pedestrian connections.

West Broadway Corridor Redevelopment Plan

The West Broadway Corridor Redevelopment Plan lays out distinctive gateway features along the corridor, making an attractive and distinctive first impression for those entering the city along Broadway.

The signature Broadway Gateway, shown to the right, is located just east of the I-480/I-29 interchange and has become a recognized icon for the City of Council Bluffs. The entry lighting, monuments and landscaping depict the bluffs and prairie and make a contemporary statement using natural colors and historical forms. Design details from the gateway are repeated along the Broadway corridor in pedestrian scale streetlights, monuments and landscaping.



West Broadway Gateway





Existing and Planned Recreational Trails in the project area

City of Council Bluffs Trail Plan

The CBIS intersects bike and pedestrian trails at several locations. The reconstruction of interstate and aesthetic enhancements presents opportunities to improve the interaction of these two important transportation systems.

Trails affected by the CBIS reconstruction are:

- Iowa Riverfront Trail - Currently runs along I-29, north of Avenue G to Roberts Park. It passes underneath I-480 and I-80, links to the Western Historic Trail and will eventually run south along the Missouri River levee to Long's Landing Park. A link from the trail, running parallel to Broadway is also planned.
- Western Historic Trail - The trail along the proposed 24th Street Bridge will link the north side of Council Bluffs to the Western Historic Trails Center.
- Indian Creek Trail - Runs under the combined I-29/I-80 portion of the Interstate at the Indian Creek bridge.

- Wabash Trace Nature Trail - Runs under I-80 adjacent to Harry Langdon Boulevard.
- Lake Manawa Trail - Runs under I-29, just south of the Hwy 275 interchange.
- Valley View Trail - Runs adjacent to I-80 and under I-80 at Valley View Drive. A link to the trail is also planned to run under I-80 at McPherson Avenue.



Proposed Aesthetics Master Plan

The Council Bluffs Interstate System Aesthetics Master Plan outlines a comprehensive design concept for the 18-mile I-29/I-80 corridor running through Council Bluffs. With participation of community representatives and Iowa DOT, the Design Team created a plan that reflects the character and values of the Council Bluffs community.

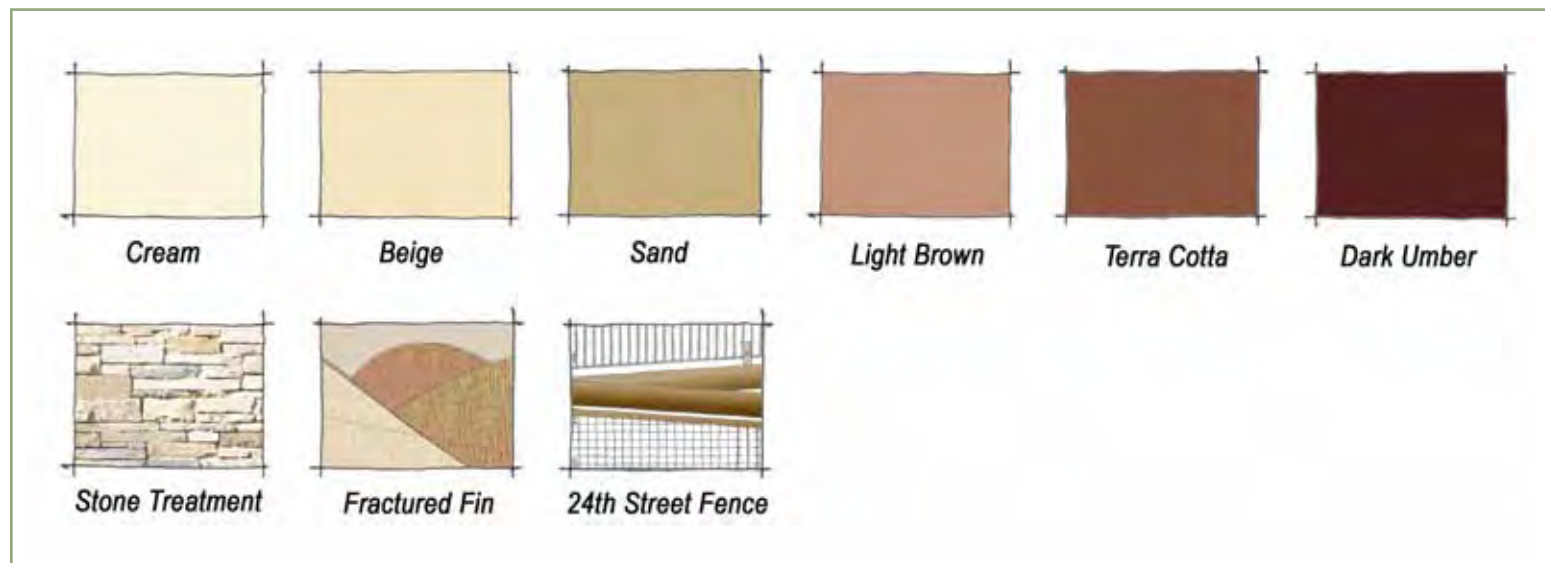
The intent of the Aesthetics Master Plan is to create a cohesive interstate corridor that is attractive and legible for daily commuters as well as first time visitors. In response to community stakeholder input, the Design Team developed a plan that draws heavily on the natural environment, incorporates public art and creates a signature community gateway. The Aesthetics Master Plan integrates these features while taking into account the financial feasibility and maintainability of all the proposed aesthetic enhancements.

The dominant forms of the aesthetic enhancements for the I-29/I-80 corridor are natural curves, intended to represent the rolling hills surrounding the city. Simple curves, in various forms are found in all aesthetic treatments, both in built elements and landscape design. Structures incorporate curved forms reminiscent of the loess hills in warm, natural earth tones to convey the idea of natural materials and to blend into the surrounding countryside. Interchange landscape design picks up the natural theme by layering native prairie grasses, shrubs and trees into a natural, flowing design.

The 24th Street Bridge is the signature element of the CBIS corridor. Its design is representative of both the natural landscape and contemporary values of the City of Council Bluffs. Opportunities for public art are prominently featured. The rolling hills are represented in the wall pier and railing. The bridge's abutments and terrace walls include a limestone treatment with a warm, natural color palette of creams and browns. The proposed landscape design blends native prairie plantings with ornamental grasses, trees and perennials to create a sculptured landscape that distinguishes the bridge as a significant entrance to the city while still reflecting the natural setting.

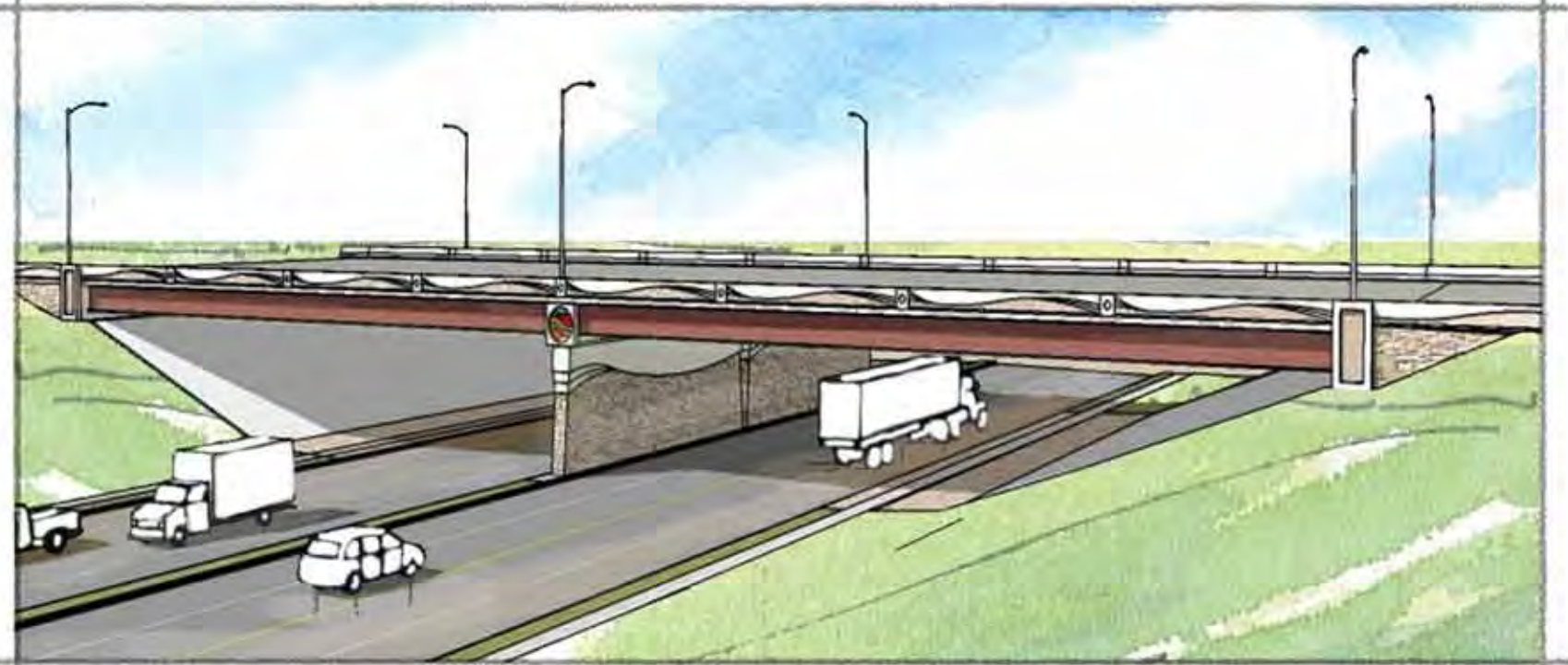
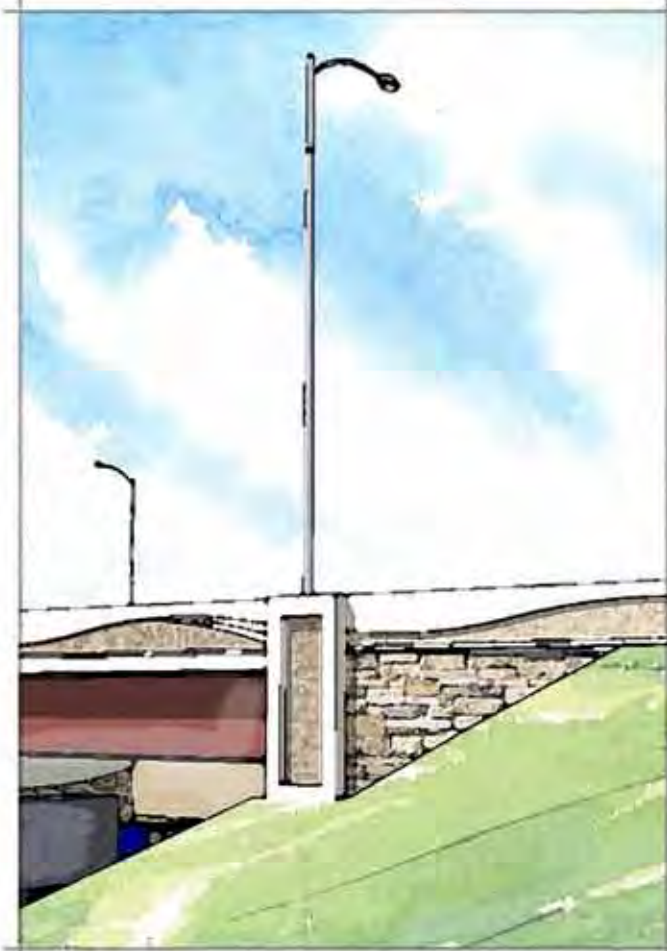
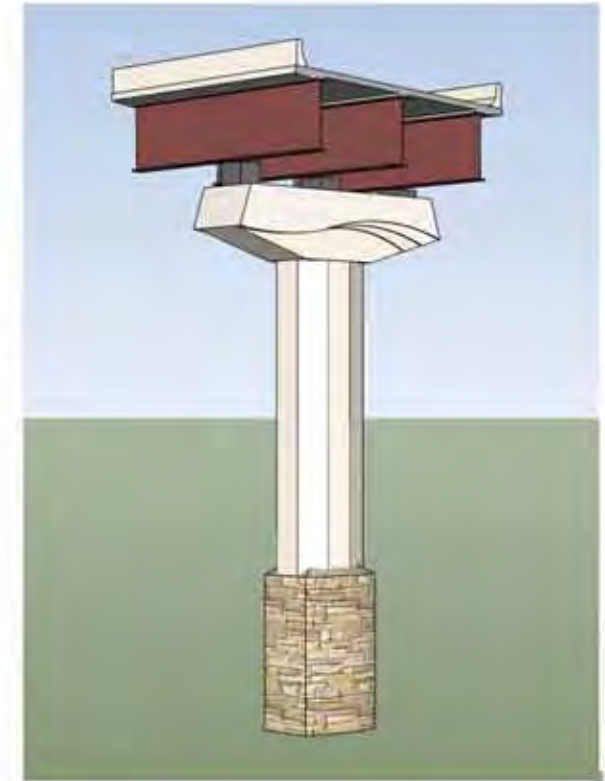
The 24th Street Bridge represents the highest level of enhancements proposed to the interstate corridor. The remainder of the corridor may incorporate the same design elements and themes in applications appropriate to their location. Other high-traffic interchanges and stretches of the corridor could have similar, but lower maintenance enhancements and fewer custom treatments. The level of enhancements step down incrementally to the rural areas at either end of the corridor which are left as improved natural landscapes.

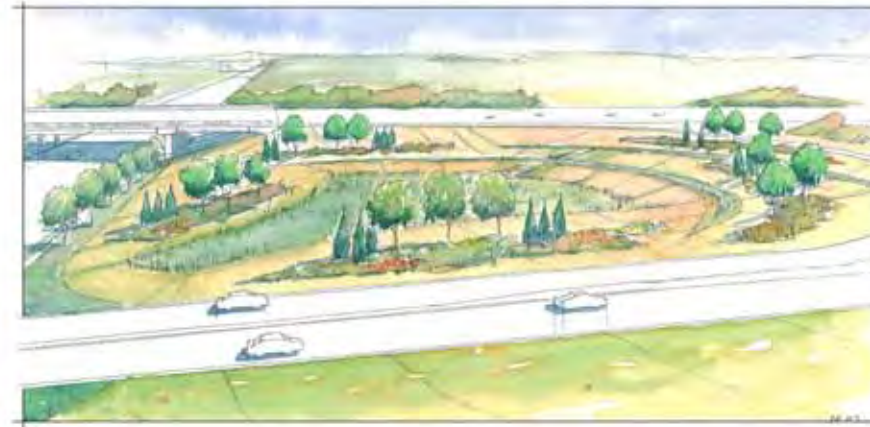
The Aesthetics Master Plan reflects both Council Bluffs' community values and natural assets to create a distinctive interstate corridor. By doing so, the Aesthetics Master Plan complements the CBIS reconstruction to preserve and enhance the distinctive features that contribute to Council Bluffs' quality of life.



Proposed color palette and texture palette for CBIS aesthetic enhancements









AESTHETIC DESIGN GUIDELINES

Goals & Objectives

The Iowa Department of Transportation is dedicated to involving the public in transportation planning decisions to ensure interstates and state highways are appropriately integrated into the surrounding community. In the case of Council Bluffs, an Aesthetic Subcommittee (ASC) was selected from Council Bluffs stakeholder groups to represent the community in aesthetic decisions. Involving the ASC in the early phases of the design process led to the concept of an interstate system that fit into Council Bluffs physical and cultural setting and preserved scenic, aesthetic, historic and environmental resources, while still enhancing safety and mobility.

Considerations

Through visioning exercises, a week-long charrette and on-going interactions with the Design Team, the ASC outlined and developed aesthetic goals for the Council Bluffs Interstate System. Helping to shape these goals were a number of external parameters including: safety, environmental constraints, financial considerations and the built environment. Those considerations are defined in the following section.

Safety

All aesthetic enhancements take into account safety regulations. It is not possible to detail all safety requirements for the CBIS in this report, however basic structural requirements such as clear zones and sight triangles often come into play when considering aesthetic improvements. Clear zones are areas parallel to the mainline and ramps where no fixed objects are allowed. They extend 34' from the mainline and 24' from ramps. Sight triangles are required where ramps merge on to the mainline or intersect with local streets to ensure visibility for merging and turning traffic.



ASC during the visioning workshop



ASC during the last day of the charrette



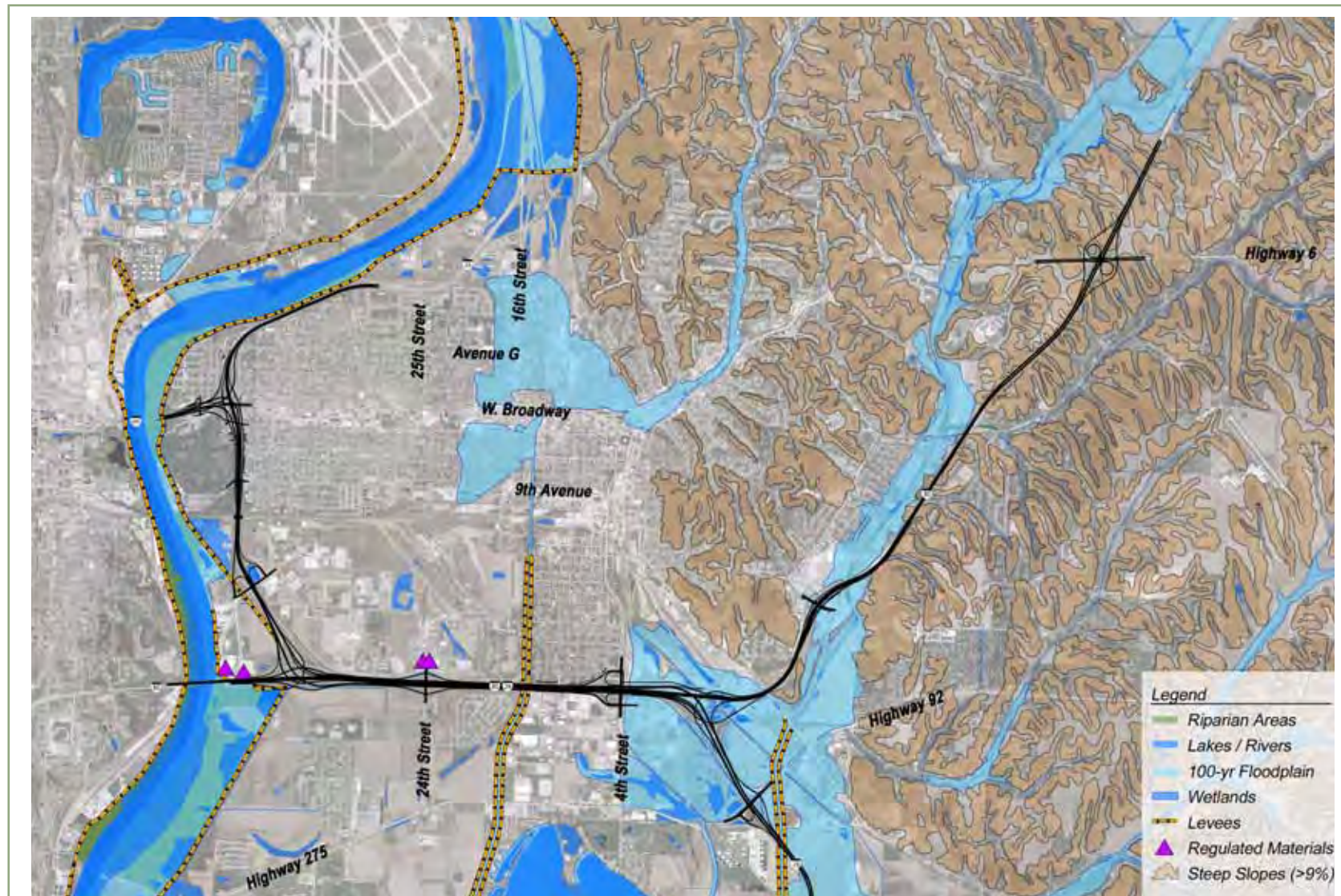


Figure 1 - Environmental Constraints
 NOTE: Map shows only moderate to high levels of regulated materials in segments 2 and 3. High to moderate levels in segments 4 and 5 have not yet been identified.

Environmental Conditions

The improvements to the CBIS require special attention be paid to environmental and natural features. Sensitive areas - floodplain, wetlands, levees, steep slopes, riparian areas, lakes and rivers, and locations containing regulated materials - were mapped as shown in Figure 1. Reconstruction of the interstate system will take these into account and efforts will be made to avoid environmentally sensitive areas and to preserve existing natural landscapes.

Built Environment

The built environment places limitations on the space available for reconstruction and aesthetic enhancements. The reconstruction of the interstate was planned to minimize the disruption to the community, adjacent private property and public infrastructure. While some private property will be purchased to provide adequate public right-of-way, all aesthetic improvements must be considered within the right-of-way and not require additional land.



Figure 2 - Existing Aesthetic Quality of Council Bluffs



Financial Considerations

Aesthetic elements are constrained by both initial construction and on-going maintenance costs. Local funding sources will be needed to supplement the cost of the construction and maintenance of the aesthetic elements identified in this plan.

The cost of constructing and maintaining recommended enhancements has been a primary concern throughout the design process. The Design Team recommended the most significant enhancements at the busiest, most visible locations along the corridor, with less traveled areas received more subtle treatment recommendations.

Whenever possible, cost savings have been applied. All aesthetic treatments proposed in the Aesthetics Master Plan repeat to provide economies of scale, utilize standard construction techniques, and call for durable materials to provide long lasting aesthetic enhancements. Uniform pier shapes can be used throughout the corridor to reduce the number of specialized or custom construction forms needed. Likewise, wall patterns have been planned to minimize the numbers of custom panels needed to achieve the design.

Design Concepts Guiding Themes

The Design Team relied on the ASC and Iowa DOT to guide the design process. From this guidance the Design Team developed the Aesthetics Master Plan for the I-29/I-80 corridor that reflects the following themes.

Timeless Design

The existing interstate is more than 30 years old. The proposed reconstruction schedule could span more than 20 years. The aesthetic elements of the interstate reconstruction should be considered with this long-term view in mind. A timeless design makes it more likely that improvements will fit into the existing and future built environment. It also allows for the representation of historic precedents and contemporary values without looking dated or futuristic. Timelessness is a difficult concept to describe but the use of durable materials, natural colors and simple forms can contribute to a more universal appeal.

Locale Specific Details

Characteristic details of Council Bluffs can be incorporated into the design of the interstate to create an interstate that accurately and uniquely represents Council Bluffs. Figure 2 represents some architectural and natural images from Council Bluffs that inspired the Aesthetics Master Plan. These local details are unique to Council Bluffs and distinguish this section of I-29/I-80 from other interstate corridors.



Figure 3 - Details of natural curve design elements proposed in the corridor

Natural Environment

The Council Bluffs community is proud of the rolling loess hills and the bluffs that present a dramatic backdrop for the city. Agricultural land and native prairie also exist in close proximity to the urban area. These natural precedents inspire the colors, textures and forms of the aesthetic enhancements proposed for the Council Bluffs Interstate System. The proposed enhancements are not intended to detract from the natural environment or further disrupt it. Rather they soften the interstate’s intrusion into the environment, complement the distinctive features in the area and, where appropriate and possible, restore a more natural environment through native plantings.

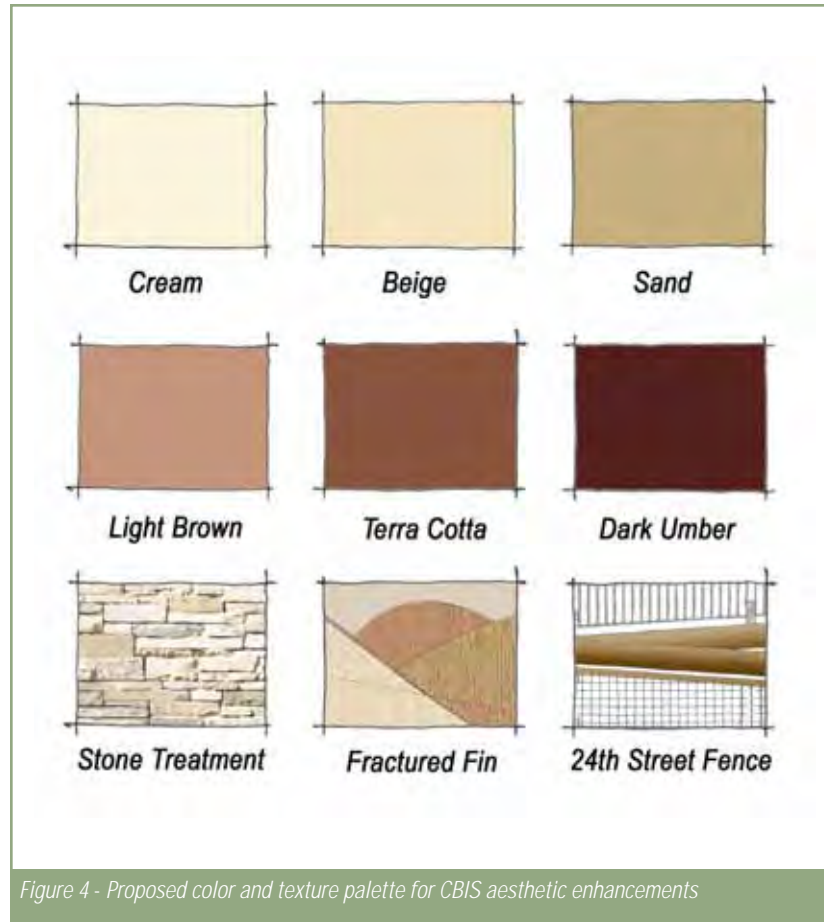
Cohesive Appearance

Over its 18 miles, the I-29/I-80 corridor cuts through residential, industrial, commercial and rural areas. While the scenery along the interstate is constantly changing, aesthetic enhancements can help pull the entire corridor together. The use of complementary materials and a repeated design theme in the piers, walls and barriers can create a consistency throughout the corridor.

Design Elements

Form

Proposed aesthetic enhancements throughout the corridor incorporate natural curves and lines taken from the rolling hills of the surrounding countryside. The lines are represented figuratively and literally on railings, pier caps, barriers, bridge abutments, sound walls, retaining walls and in the landscape design. They vary in form and representation but convey the overall theme of the loess hills. The details shown in Figure 3 shows an example of natural curves that could be used throughout the CBIS corridor.



Color

The proposed color palette for the corridor is made up of warm, natural tones – colors drawn from the surrounding countryside and the natural limestone and brick used on the 24th Street Bridge. The color palette is appropriate for depicting the rolling hill theme. It provides a neutral canvas for more colorful landscaping or public art pieces. The natural palette will not appear dated in 20 or 30 years.

Texture

A prominent texture that could be used on structures throughout the corridor is a natural limestone laid in an ashlar pattern. This texture can be reproduced on wall piers, pier bases and abutment walls using concrete form liners and a four color staining process.

Finer textures can be used within aesthetic elements to delineate designs. Texturing concrete, such as the fractured fin pattern shown in Figure 4, can give the appearance of a change of color from one element to the next by creating shadows that amplify the lines. It also accentuates patterns if more than one color is used.





Landscape

Landscaping is an important element of the CBIS reconstruction. The landscape is the most continuous visual element throughout the corridor. The Aesthetics Master Plan integrates landscaping considerations into the design of the interstate from the initial design phases through the construction of the project.

There are three primary objectives for interstate highway landscape design:

- Aid to aesthetics and safety
- Lower construction and maintenance costs
- Create interest, usefulness and beauty for the pleasure and satisfaction of highway users

The American Association of State Highway Transportation Officials (AASHTO)

Iowa DOT practice typically calls for the use of plant species native to Iowa along the roadsides. The benefits of native species are many. Native species are well adapted to the Iowa environment, tolerate drought and withstand both the hot summers and cold winters. The benefit of this practice is lower maintenance and/or replacement costs.

The landscape goals of the ASC are easily achieved within the parameters set by these objectives and practices. The ASC believed the landscape for the I-29/I-80 corridor should greatly enhance visitors' and residents' perceptions of the city by reflecting the natural environment of Council Bluffs and the surrounding countryside. By incorporating prairie plant species, the landscape can both reflect local character and reduce maintenance cost.

As with built elements of the interstate reconstruction, the landscape is designed with the intent of maximizing impact of investment. Higher visibility local interchanges could have a more developed landscape than open right-of-ways or high-speed system interchanges.

Lighting

Functional lighting requirements for interstates are very specific. To maintain the correct light levels throughout the corridor, a combination of lighting types could be used.

South 24th Street is the only local road spanning the interstate where decorative, pedestrian scale light poles and luminaires would be visible to interstate drivers. In response to the ASC's preference for a clean, natural design for the bridge, the Design Team decided not to use decorative light poles and luminaires. Instead lighting enhancements to the bridge could be made by using lighting to highlight design features for visual effect.

Public Art

The community commitment to public art described in the Council Bluffs Public Art Master Plan was echoed by the ASC. Public art is seen as a way to improve the overall appearance for the corridor; represent community history and values; and distinguish the corridor as uniquely Council Bluffs. The Design Team incorporated opportunities to include public art on the 24th Street Bridge and local overpasses throughout the corridor.

BRIDGES

As primary structural elements in the CBIS reconstruction, bridges provide many opportunities for aesthetic enhancements. Each bridge in the system will be unique in terms of the roads and ramps carried, but there are still common elements that can be addressed by the Aesthetics Master Plan. Applying common forms, colors and textures to the piers, abutments and barrier rails of the 51 bridges in the corridor establishes a system-wide design theme.

The bridge structures for the CBIS reconstruction must first fulfill their functional requirements in the transportation system. When considering possible aesthetic treatments to be incorporated into bridges, the proposed treatments must be evaluated in terms of initial cost, required maintenance and safety impacts. Modifications to the bridges to incorporate aesthetic features can often be applied without adding substantial cost.

Piers

The current design for the CBIS reconstruction will require rebuilding or constructing approximately 37 bridges at local roads or streams. These bridges are one, two or three span bridges with variations of pier forms. At the three system interchanges an additional 14 multi-span bridges carry various ramp and mainline movements. The system interchanges have multiple levels using very tall single-column piers for the ramp structures as well as multi-column piers to carry the wider mainline roadways. All of these bridges will have numerous supporting piers that vary in configuration depending on the specific constraints of the structure.

Figure 5, on the next page, shows the pier family that may be used in the reconstruction. The pier family shows an octagonal column shape and distinctive pier cap. The pier cap is the distinguishing element of the pier family and would be unique to the Council Bluffs corridor. The pier caps incorporate a simple reverse curve relief that peels to a three layered reveal. The relief creates a shadow line to emphasize the curve while color and texture articulate each layer. The design represents the rolling curves of the natural landforms evident in the surrounding loess hills and is similar to the abutment details on the 24th Street Bridge. With simple variations, the pier cap can be used on all but the straddle bent piers in the CBIS reconstruction.

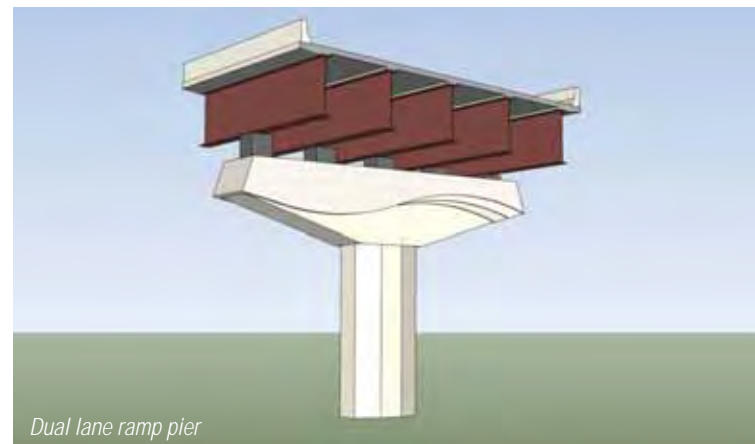
Bridge piers are formed utilizing reinforced concrete. Where the bridge piers consist of single or multiple column configurations, the proposed design will incorporate octagonal shaped columns treated with a light colored concrete stain. Piers will range from 20' to 70' in height. Piers over 30' may have a simulated stone base applied with a form liner. The base element will extend approximately 1/3 the total height of the pier and the stone texture will be stained with a four-color staining process to replicate the look of natural stone. These bases serve functional and aesthetic purposes. Structurally, the wider base accommodates the increased loads acting upon the additional height, while visually, the base 'shortens' the appearance of very tall piers by breaking them into sections.

The Design Team recommends the use of wall piers instead of multi-column piers for wide bridge applications, particularly at many of the local road crossings. Proportionally, wall piers have a more slender appearance than multi-column piers. The wall piers could use the same simulated stone form liner and staining as used on the base sections of tall octagonal piers.





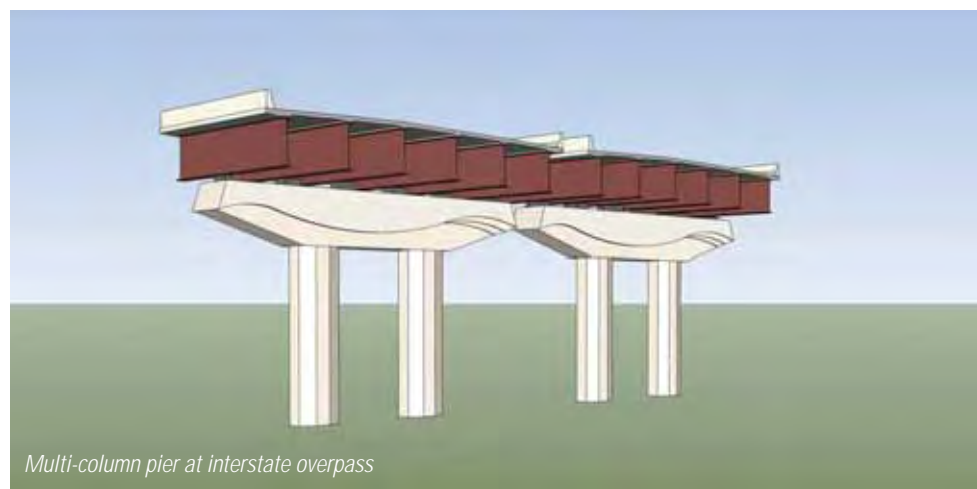
Wall pier at Madison Avenue



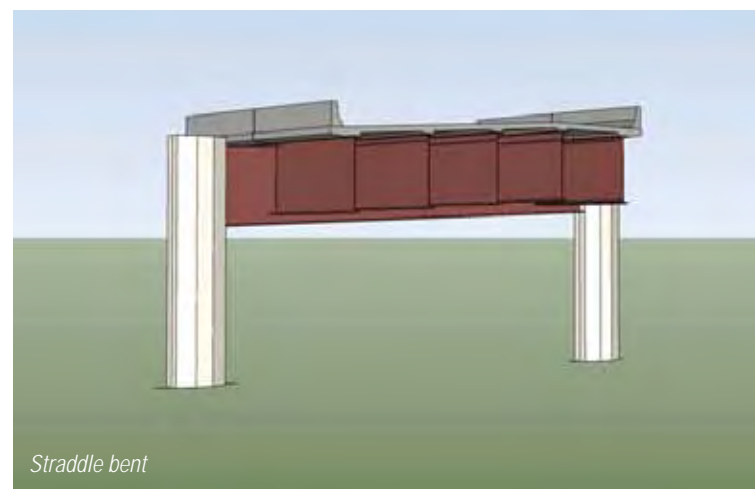
Dual lane ramp pier



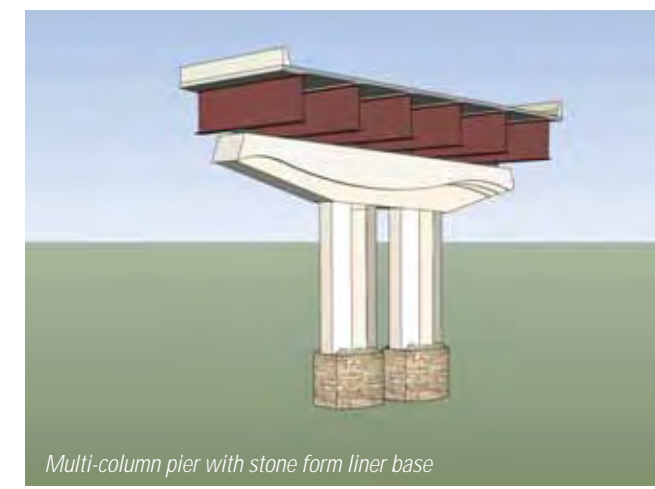
Single lane ramp pier with stone form liner base



Multi-column pier at interstate overpass



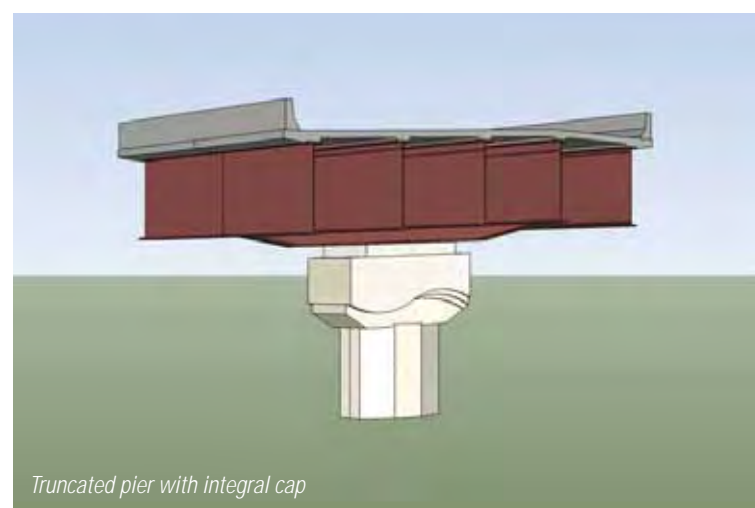
Straddle bent



Multi-column pier with stone form liner base



Pier cap detail



Truncated pier with integral cap

Figure 5 - Proposed family of piers



Figure 6 - Typical proposed abutment

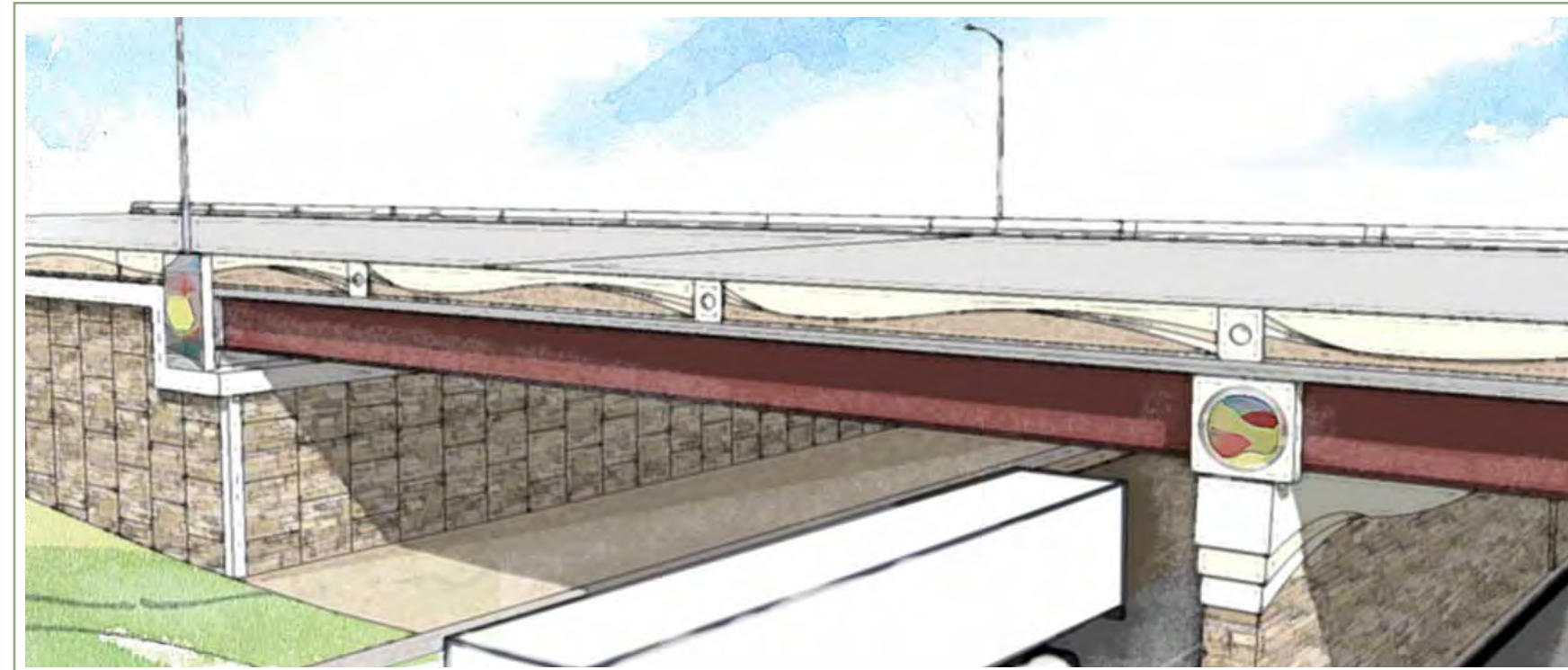


Figure 7 - Abutment concept with opportunity for public art



Abutments

Abutments occur at each end of a bridge. Their size and configuration vary based on the constraints of the location, but the sides of the abutments are usually defined by a wing wall parallel to the road above, with the grade directly below the abutment sloping to the roadway. Steeply sloped abutments are paved or protected to prevent erosion. Figure 6 illustrates the proposed abutment treatment.

In cases where right-of-way is limited, the grade surrounding the abutment may need to be retained with walls. Abutment retaining walls run parallel to the road below the bridge in place of slope paving.

Aesthetic treatment levels for abutments can vary based on their visibility. The simplest level of aesthetic treatment is a stone form liner with the four-color staining process used on wall piers and pier bases. Where an abutment is more visible, as shown in Figure 7, there are additional opportunities for aesthetic treatments.



Figure 8 - Proposed Vehicle Barriers

Vehicle Barrier

Vehicle barriers are required on all bridge applications and some retaining walls. Enhanced barrier rails can be used at select locations throughout the corridor to communicate the unique rolling hills theme.

Figure 8 shows two barrier types that may be used in the I-29/I-80 corridor. The Type A barrier rail can be used on system interchanges and retaining walls. Its simple curve is defined by a proposed relief and texture on the bottom half of the curve. The Type A segments can be used to form a continuous uninterrupted curving pattern.

To accentuate the presence of a local road crossing, a variation of the curve, Type B, could be used. Two additional layers are added to the end of each curved section, reminiscent of the layered curve on the system pier caps. This pattern would repeat for the length of the local bridge to define the limits of the bridge. Beyond the bridge abutments, the simple curve pattern resumes. This feature is an added detail for slower, local traffic. Like the Type A barrier, the curve is defined in relief and texture, with color added to distinguish the added curves.

Vehicle rails must accommodate varying lengths of bridges, both Type A and B are designed in workable 30' modules. Since overall barrier lengths along a bridge will not always break down into 30' increments, the modules can be cut or spaced with panels. The panels are a single color concrete with a recessed central circle. Panels serve as transitions between barrier types, at barrier ends, key visual points (like above piers) or to meet the required length. The panels can also accommodate light poles and sign trusses where a widened barrier is needed.

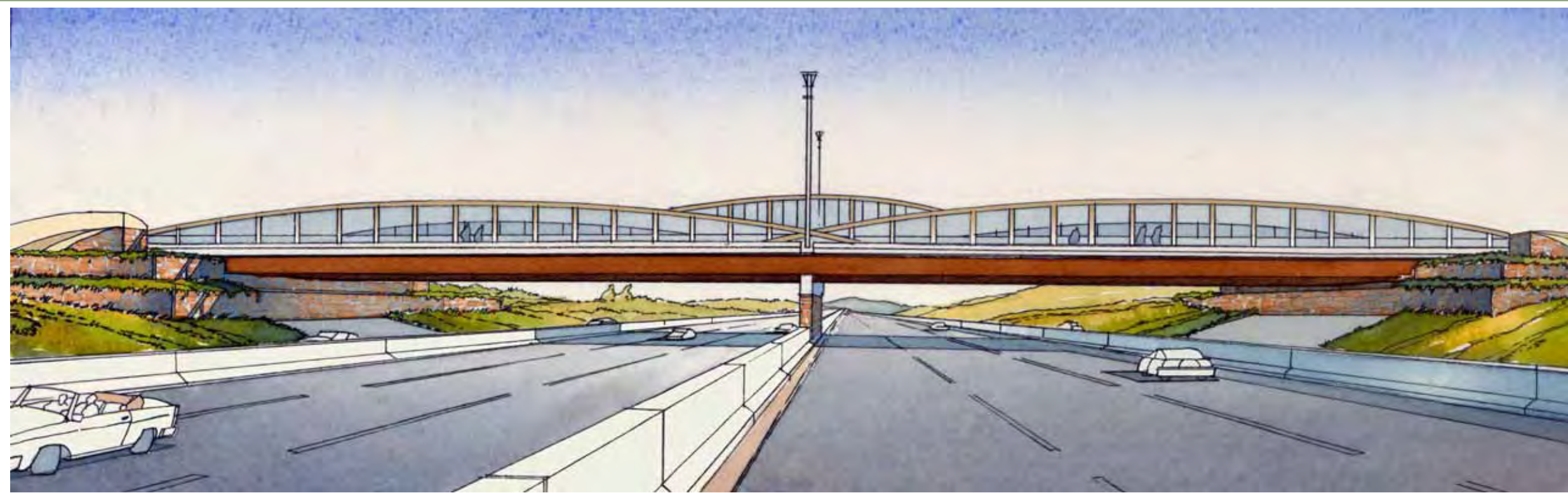


Figure 9 - 24th Street Bridge Concept



Bridge Applications

24th Street Bridge

The 24th Street Bridge was given special consideration in the Aesthetics Master Plan because of its prominence in the corridor. The ASC believed the 24th Street Bridge should serve as the signature gateway feature for the interstate system and the City of Council Bluffs.

Bridge Superstructure

- Curved fencing spanning the entire 353' length will be the primary design feature of the 24th Street Bridge. The fencing will consist of segmented portions to approximate the curved shapes and facilitate fabrication, as shown in Figure 10 on the following page. Fence posts and primary tubular steel arching elements will be painted bronze over galvanized steel. Two complementary fencing types will be used to define the arches. The two major arches will be fabricated with wire mesh fastened to a structural steel frame, all of galvanized steel. The center arch will be formed with vertical pickets and individual horizontal spacer bars. All center arch fencing material will be painted bronze.
- The underside of the deck cantilevers, sidewalk separation barriers, and external parapets will use color sealed concrete in a light color to compliment the natural stone treatment used on the terrace walls and bridge plazas. Weathering steel bridge girders will develop a complimentary rust/dark brown patina.

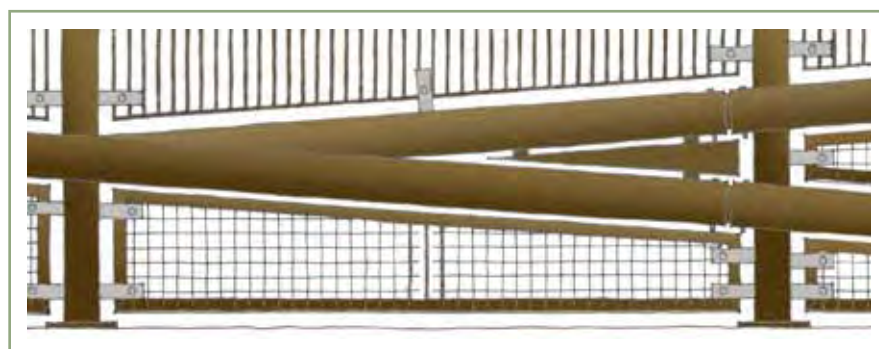


Figure 10 - 24th Street Bridge fence detail

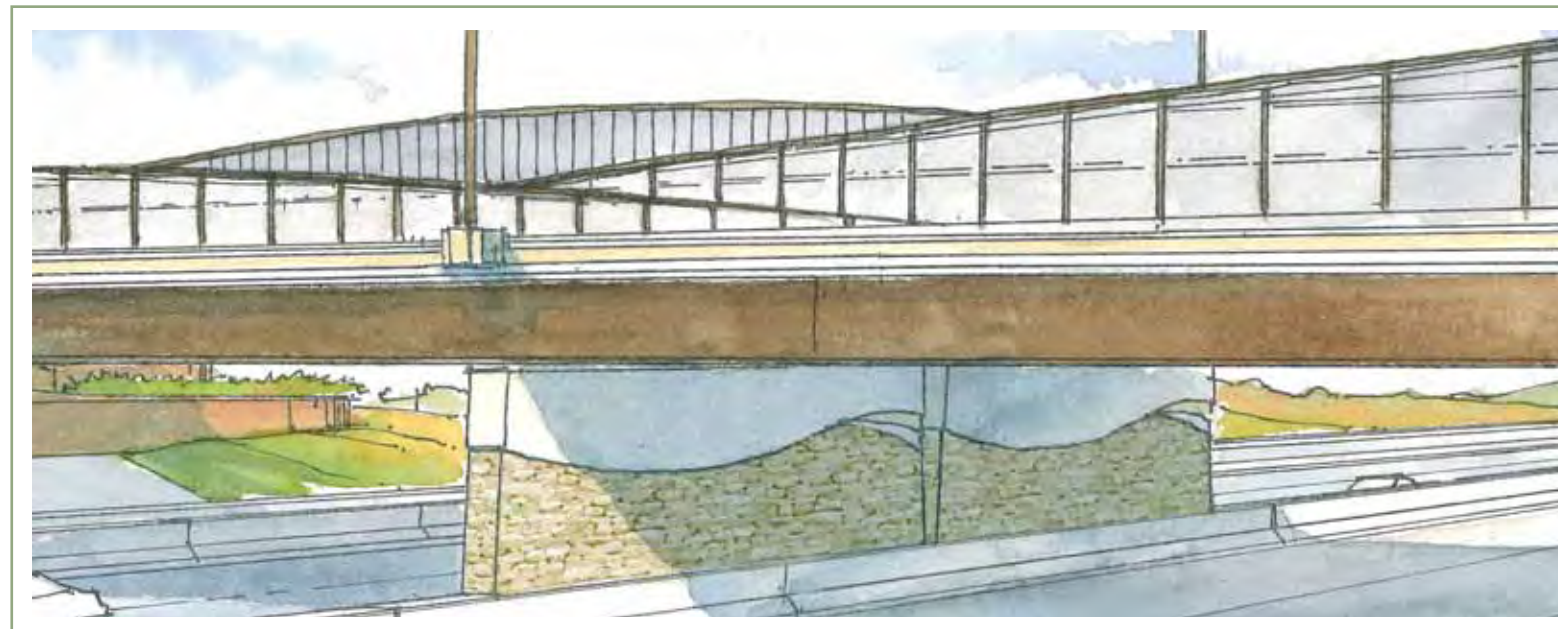


Figure 11 - Wall Pier concept at the 24th Street Bridge

Pier Treatment

- The center wall pier will be constructed using a stone form liner to simulate a natural stone veneer. A four-color stain application can create the stone-like appearance.
- The top, curved cap section can be color sealed to compliment the stone color scheme.
- A concrete barrier will run along the base of the pier to protect it from traffic and accommodate lighting to accentuate the design details.

Abutment

- The abutment wing walls extend beyond the normal edges of the bridge deck and are taller than conventional abutment wings to provide the desired massing elements at the end of the bridge. The lower portion of the abutment wings and interior wing walls facing the pedestrian plaza will be constructed of dry stack limestone. The cap of the wings will be color sealed concrete.
- To add massing at the bridge abutments, short terrace walls and bermed slopes sit in front of the abutments. The exposed front face of the terrace walls use formlined concrete with a four-color stain application. The terrace walls extend through the slope protection pavement under the bridge to visually tie the abutments on either side of the bridge together.

Plaza Features

- The brick and limestone towers initially proposed at the bridge abutments shown in this report were created to replicate the West Broadway Gateway. The bridge will be built with no tower or aesthetic feature included. The bridge will however, be built to accommodate a future aesthetic element that could include the tower or some other feature of the community's choice. Whatever feature is selected will be funded by the local community.
- The community has expressed interest in allowing the features at the plazas to be designed by an artist, rather than replicating the Broadway Gateway towers. Any concept that is pursued for the plaza areas will be required to follow certain structural criteria based on assumed weight, height, and other characteristics of the original design will need to be maintained in the final design.

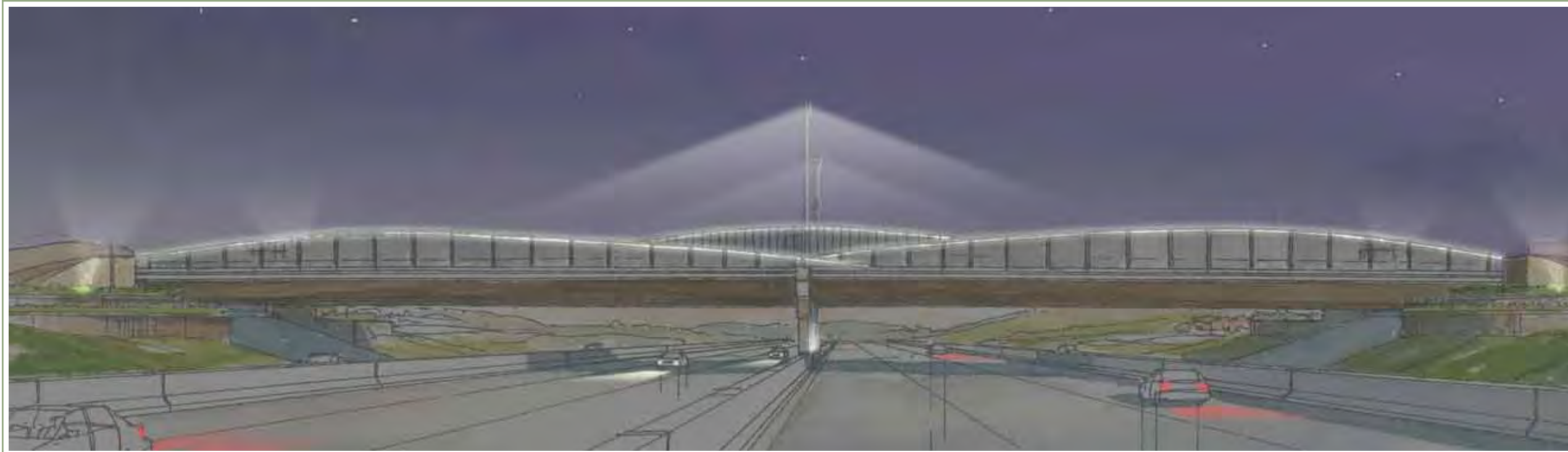


Figure 12 - Night view of the 24th Street Bridge



Lighting

- The Design Team recommends using four high mast lighting elements in the ramp area of the 24th Street interchange. This will eliminate the need for light poles at the ends of the bridge which might detract from future enhancements at the plazas.
- 40' high pressure sodium (HPS) street lights will be placed at the center bridge pier. The round, tapered poles will have an anodized bronze finish.
- HPS lights mounted to the girder cross frames will serve as the functional under-bridge lighting.
- The primary decorative lighting feature will be white LED strip lighting along the curves of bridge fence to illuminate the curves of the railing.
- Recessed metal halide lights along the barrier at the base of the center pier illuminates the wall pier with white light to accentuate the stone treatment.
- There is also the potential for bollard lights along the sidewalks leading up to bridge plazas.

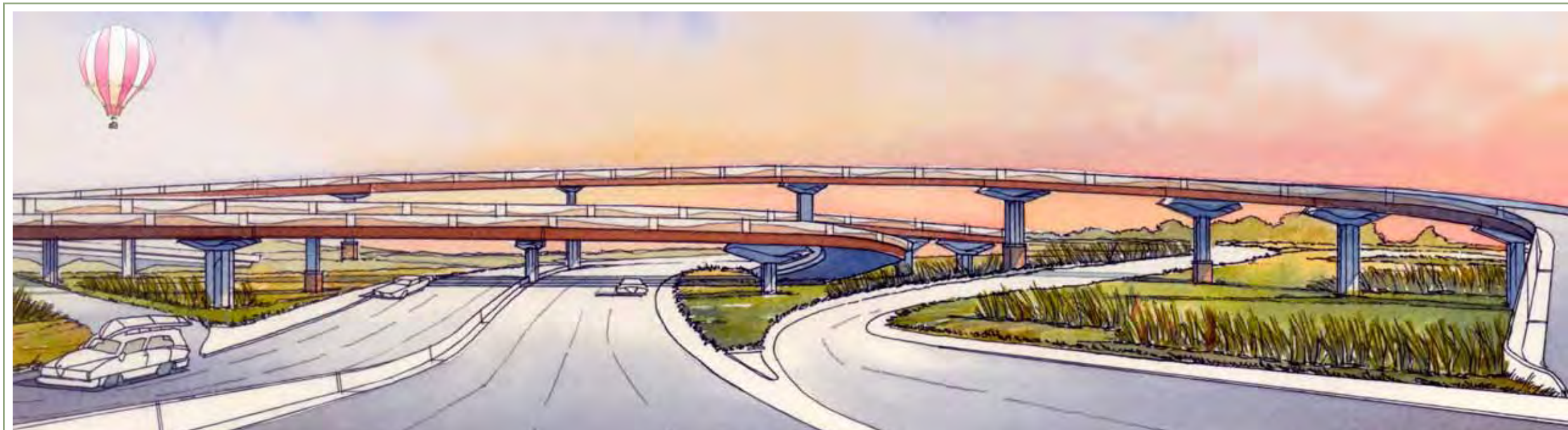


Figure 13 - System Interchange concept showing vehicle barrier and pier detail

System Interchanges

The system interchanges are characterized by relatively narrow access ramps and somewhat wider mainline bridges. In general, hammerhead piers (otherwise referred to as "T" shaped piers) provide a sound structural solution to support these bridges. Pier heights can range from 20' to 70' tall. For the wider mainline structures, two or more columns may be required to accommodate the bridge cross section.

All system interchanges in the CBIS incorporate a free flowing layout using high speed ramp connections to the various interstate legs. With these free flowing ramps, the interchanges are stacked in multiple levels that often result in tall supporting piers.

The piers, barriers and abutments are predominant visual elements in each system interchange and can incorporate the standard forms, colors and textures of the corridor's theme.

Taller piers in system interchanges may have the stone base treatment. This base treatment will be visible to motorist using the lower ramps and the at-grade users. It will also visually tie the piers and abutments together, since the abutment wing walls will have the stone form liner treatment.

Where an abutment occurs in areas inaccessible to pedestrians or cyclists, the slope protection below the abutment will be large stone. Large stone is less likely to be removed from its setting, has a coarser texture, and evokes a natural appearance. Where it will be seen from a distance, recycled concrete pieces could be mixed in with the stone.

West System Interchange

The west system interchange is a major visual element in the corridor where I-80 and I-29 converge, just east of the I-80 Missouri River Bridge. In this area driver decisions are made quickly, so clear views of signage is essential. To limit distractions, proposed aesthetic treatments in this area are more subtle than other points along the interstate but still maintain the consistent forms, colors and textures that tie the entire corridor together.

East System Interchange

The east system interchange is where I-80 and I-29 meet southeast of the City of Council Bluffs. The views from the ramps are the primary features of the interchange. The higher bluffs and upland prairies are visible to the north while the rail yard is below. Similar to the west system interchange, subtle aesthetic treatments are proposed.

West Broadway System Interchange

Unlike the west and east system interchanges, the West Broadway system interchange has features of both a system interchange and local interchange. Several local roads intertwine beneath the interchange ramps. Pedestrians and cyclists use the at-grade roadways and trails. The multi-modal activity results in a unique hardscape environment and aesthetic opportunities. Materials, patterns, colors and textures used for paving of walks, medians, slope protection and other under-bridge areas should complement the interchange structures as well as the Broadway Gateway Monuments and Missouri River Pedestrian Bridge.





Figure 14 - Local road Aesthetic concepts



Local Roads

Most of the bridges in CBIS allow the interstate to cross over local roads and railroad tracks. These bridges vary in length, vertical clearance, span arrangements and abutment configurations. They are, however, wide enough to accommodate up to 12 lanes of interstate traffic and sometimes have a constrained right-of-way that may require the use of wall piers.

At local roads, aesthetic enhancements are added for the benefit of local motorists and the surrounding neighborhood. The slower speed of local motorists, cyclists and pedestrians allow the viewer to recognize more detail and variations in color and texture. Figures 14 and 15 show local overpass configurations that could be used in the corridor.

The most distinguishing local bridge feature is the abutments. Abutments vary according to site and right-of-way constraints. As already discussed, most abutments will have a wing wall that can be finished with a stone textured form liner and stained to match the stone finish used throughout the corridor. This treatment is proposed especially where it will serve as a simple, natural background for landscaping. Where slope protection is required below the abutment, a change in pavement finishes, incorporation of stone or stylized joint design could create added visual interest.

Some local bridges have a retaining wall as support at the abutment. The South Expressway interchange is shown in Figure 15 on the following page. The retaining wall wraps around the abutment forming a wall between the abutment structure and local road below.

Local bridges can be designed to hold public art on the center pier medallion and abutment wall panels. The wall panels and medallions present opportunities to represent the neighborhoods around the local road or carry on the theme of the entire corridor.

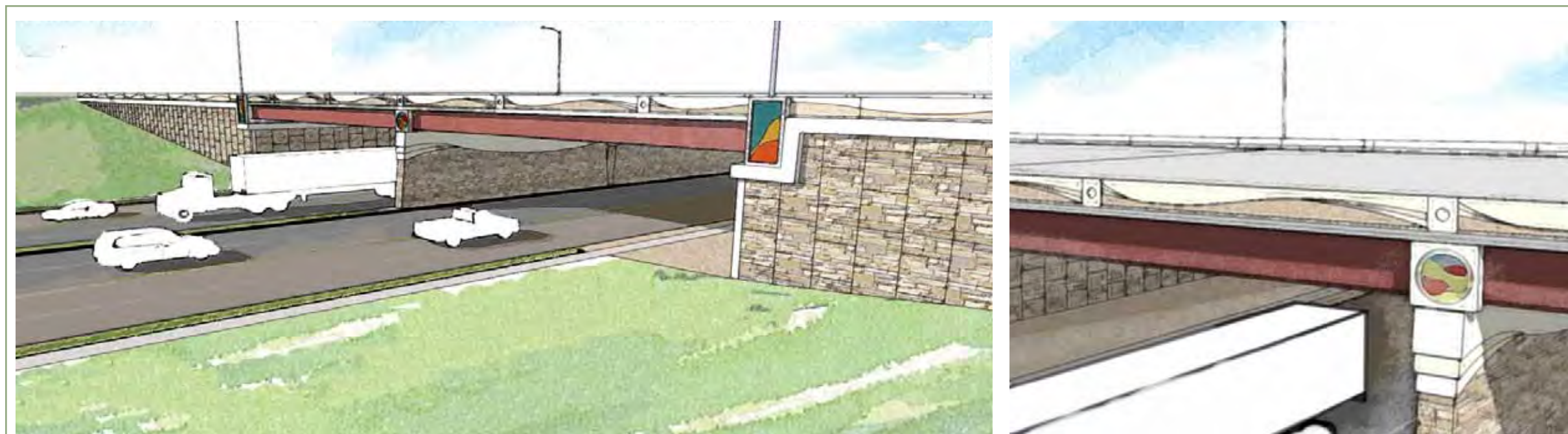


Figure 15 - South Expressway interchange concept

Overpass Bridges

Other than bridges in the system interchanges, only three bridges in the entire CBIS project cross over the mainline interstate. These bridges are:

- The 24th Street bridge over I-80 and I-29
- The U.S. 275 bridge over I-29
- The Union Pacific Railroad bridge over I-29 north of Nebraska Avenue

As the interstate corridor's signature structure, the 24th Street Bridge establishes the key design elements within the aesthetic palette.

The U.S. 275 Bridge over I-29 is a major interchange, providing access to Lake Manawa and the Iowa School for the Deaf. The design of the bridge may incorporate 24th Street Bridge design treatments, but to a lesser degree. The abutment treatment can include a parapet or extended wall with a form and color to repeat the rolling hill theme. There is no pedestrian traffic along the U.S. 275 Bridge, so fencing, which is a key aesthetic feature of the 24th Street Bridge, will not be used.

The Union Pacific Railroad Bridge will have structural elements unique to its functional needs. Any fencing will be minimal and for the safety of railroad workers. The fence can be made of galvanized mesh similar to the fabric used for 24th Street, but in a more simple application. Stone texture on the abutments can help to visually relate this bridge with the other bridges along the corridor.



Figure 16 - Long view of a sound wall concept



Figure 17 - Drivers' view of a sound wall concept



Wall Applications

Three wall types could be used along the I-29/I-80 corridor: panelized sound walls, mechanically stabilized earth (MSE) retaining walls, and a cast-in-place concrete cut wall. All concrete can be treated with a colored stain in accordance with the color scheme for the entire corridor and treated with anti-graffiti sealant where appropriate.

The proposed walls are to be simple in design and construction and reflect the rolling hill corridor theme. Both color and texture will be used to create the designs and give the design depth and readability. Texture and relief will differentiate the pattern from the background, and color allows the design to more clearly reflect the unique nature of the loess hills and makes the pattern distinguishable from the angled view of the driver.

Sound Walls

Interstate View

Sound walls, if required, may be constructed of H-shaped columns and concrete panels. Sound walls along the corridor are proposed to have a simple rolling hill pattern. The length of the pattern allows for a continuous, repeating, but not monotonous appearance along the corridor. The rolling hill pattern was chosen for its simplicity and effect. The pattern reads well both from straight on and from the angled drivers' view. Figure 16 shows a straight on view of the simple rolling hill pattern.

At high speeds and at an angle, a more complex or shorter pattern would become condensed to the point that it is difficult to read. The proposed pattern ensures that, even at the sharp angle of the drivers' view, the hills are still legible. Figure 17 shows how an angled view changes the perception of the pattern.

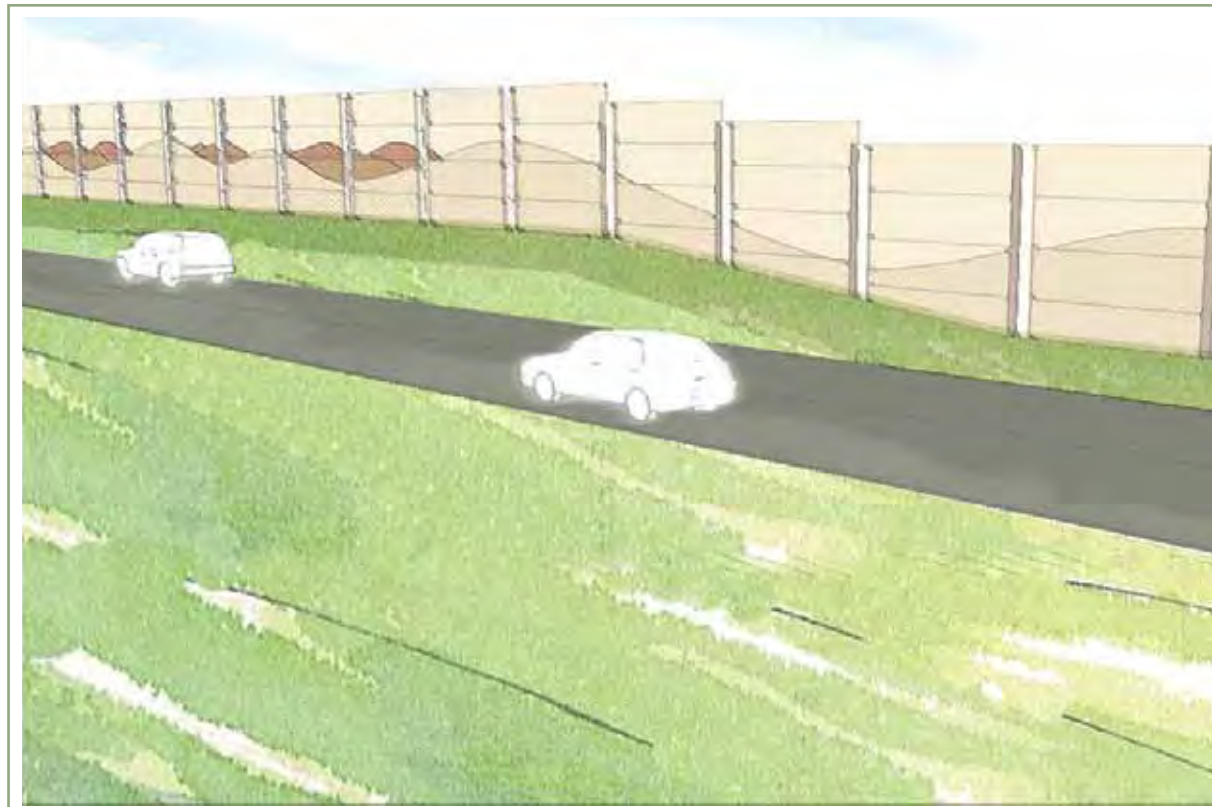


Figure 18 - Sound wall concept with stepped panels

With its organic design, the sound wall pattern can be modified to accommodate changing topography. When stepped in 2' increments, a single line can connect the hill pattern over a change in grade. Figure 18 illustrates how the sound wall pattern transitions over a change in grade.

The pattern is applied only to the two center panels, the top and bottom panels are solid, single color and texture. Restricting the rolling hills pattern to the two middle panels limits the number of patterned panels needed and keeps costs lower while still creating a custom look.



Figure 19 - Examples of sound walls used along other Iowa interstates

Adjacent Property View

The back side of sound walls, where required, can be designed for simplicity and continuity. In locations where sound walls are required, the Iowa DOT will work with the neighborhoods and adjacent property owners to determine how the neighborhood side view of the walls will look. Figure 19 shows examples of other projects within Iowa.



Figure 20 - MSE retaining wall concept with simple rolling hills pattern



Figure 21 - MSE retaining wall concept with Grant Wood inspired pattern



Retaining Walls

MSE walls are proposed to be constructed of concrete panels with concrete coping. Similar to the sound walls, the underlying goal in designing the retaining walls was the creation of a simple, natural, and continuous pattern. Two potential retaining wall options are shown for the CBIS corridor.

In areas where retaining walls abut sound walls, a pattern similar to the sound wall can be applied to the retaining wall. Figure 20 shows the simple rolling hill pattern applied to a retaining wall.

The second retaining wall option uses a more complex hill pattern. In areas where retaining walls will be the primary aesthetic feature, a more complex design may be more appropriate. The proposed design runs approximately 150' and is abstracted from Grant Wood's representation of the Iowa landscape in his paintings. The pattern is not a literal interpretation, but rather a subtle interpretation of his landscape conventions. Even for those interstate users not familiar with Grant Wood's art, the representation of the cultivated landscape is a theme relevant to the surrounding countryside. Figure 21 illustrates the Grant Wood inspired wall.



Grant Wood (1891-1942) was born in Anamosa, Iowa and is best known for his work *American Gothic*, as well as other depictions of rural Midwest life. His style, known as American Regionalism, often showed Iowa through its landscapes of rolling hills, winding roads and fields. Using his work to inspire the design allowed us to both pay homage to a great American artist and have the design be rooted in something that was truly unique to Iowa.

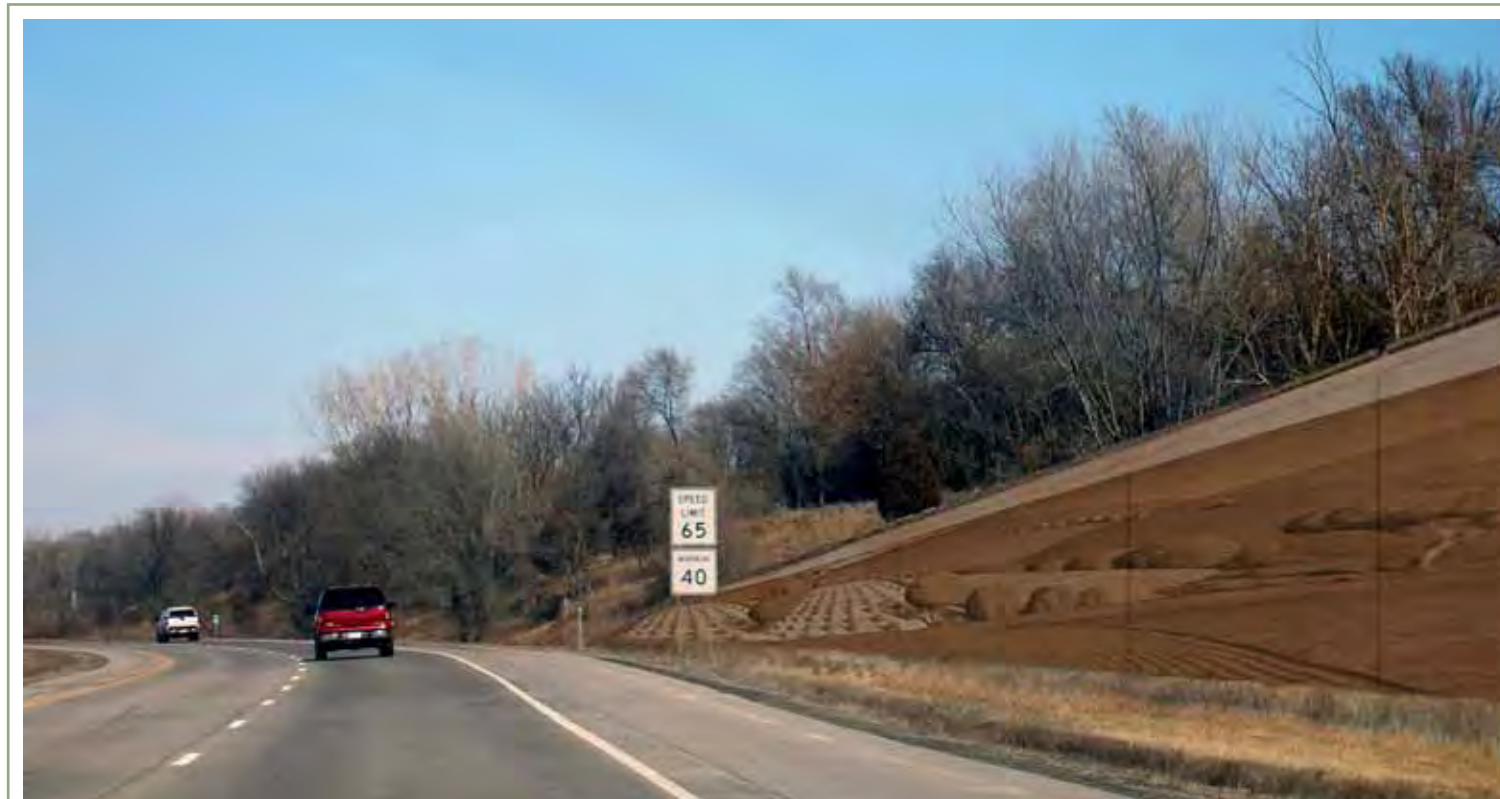


Figure 22 - Grant Wood inspired cut wall concept

Cut Wall

Cut walls, if required, are proposed to be constructed with cast-in-place concrete. Only one location along the I-29/I-80 corridor may need a cut wall. It will be along I-80 east of the Mall of the Bluffs, on the east side of the interstate. The potential size and placement of the wall allows for visibility from a great distance, especially for eastbound traffic. The high visibility of the location is an opportunity for a memorable feature.

Cast in place concrete allows for flexibility in the design, so the design of the cut wall has intentionally been left open ended. The wall presents an opportunity for a unique art piece, a more standard pattern, or even text.

Figure 22 shows how a simplified image of a Grant Wood painting could be applied as a relief. Relief patterns can be created relatively easily with custom form liners. Even using a single color, relief patterns are legible because the shadow of the relief defines the pattern.

Due to the irregular shape of the wall, a central pattern may be more attractive than filling the entire wall.

LANDSCAPE DESIGN GUIDELINES

Goals and Objectives

The ASC identified landscape design as a key way to make a significant visual impact in the corridor. They selected the distinctive natural environment of the loess hills, bluffs, prairie, wetlands, fields and river form natural lines that became a preferred landscape template.

The landscape design goals include:

- using native materials where possible to increase sustainability and reduce maintenance
- enhance views through framing and buffering that emphasize Council Bluff's unique natural environment; recognize visual and clear zone restrictions
- provide visual interest that blends with the natural design theme of the corridor

Considerations

Site Analysis

To specifically address aesthetic issues, the Design Team created a large scale working site analysis map that graphically compiled all available data to allow for the synthesis of the following information: aerial photography of the entire corridor; natural physical features; environmentally sensitive areas; prevailing winter winds; summer sun exposure; existing structures; critical views; points of human and cultural importance; and sites for future development. Mapping these conditions clarified issues and opportunities as well as safety and engineering concerns, and led to the formulation of a landscape plan that has the greatest likelihood of implementation.

Safety

As a component of the interstate system, landscape design should compliment the safety considerations of the interstate. To preserve visibility, all landscape components, whether plantings, berms or structures over 24", must be set back from intersections or turn lanes. Similarly, no trees or shrubs can be planted in the clear zone, 34' from the roadway for mainline interstate and 24' from the roadway for interstate ramps.

Speed and Distance

Speed and distance affect the perception of the landscape in ways similar to the perception of aesthetic details on built elements. Subtle color changes, fine textures and smaller scale features will not be perceived at high speeds. Landscape features must be larger and plantings must be massed. On the other hand the openness of the interstate corridor requires that elements be seen at great distances and for a relatively long period of time, so there is also the opportunity to make a dramatic impact on the corridor with prominent vistas or views.

Seasonal Variation

The changing seasons add a dynamic component to the aesthetic quality of the corridor. A landscape design with a good balance of seasonal color can give interstate users a sense of each season. Spring offers a variety of different colors from emerging leaves and flowering trees and shrubs. The green leaves of summer can be diversified by mixing plants with purple or yellow leaves and summer flowering species. Autumn changes often add striking color opportunities, especially against farm fields and prairies. Evergreens, bark color and grass stands provide winter color.



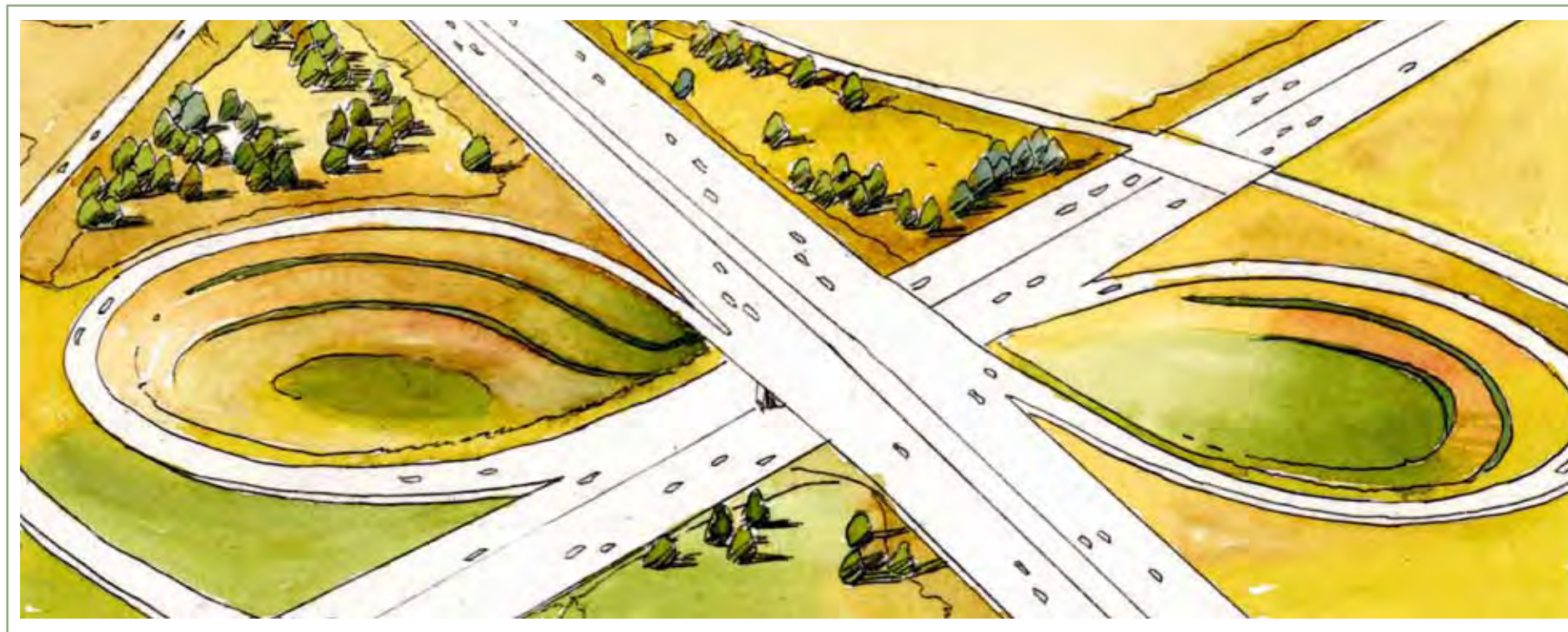


Figure 23 - Aesthetic grading concept at the U.S. 6 interchange

Grading

Grading for an interstate landscape is dictated by standard road plans and templates to accommodate safety, drainage and operational restrictions. Areas outside these standards, beyond the 34 foot clear zone, are often graded at constant slopes to limit needed right-of-way or meet existing conditions. To add visual interest to the corridor, the constant slope can be modified to form terraces or berms. These modified landforms, coordinated with landscaping, can enhance the visual experience and can set this corridor apart from others throughout the state.

Figure 23 illustrates an example of a unique grading treatment at the U.S. 6 interchange. The loop ramps form a circular interior. By interrupting the constant straight slope with terraces parallel to the ramp alignment, an interesting landform is achieved. These landforms visually guide the driver around the ramp. They also serve to slow down runoff from the slope, which aids in erosion control, and form a more level platform for plant material.

Drainage

Drainage is extremely important in the functional and aesthetic considerations of the interstate system. Drainage for the CBIS must accommodate the runoff generated by the roads and bridges within the interstate system while addressing the additional challenge of building in the floodplain.

Interstate drainage can be handled in an open or enclosed system. The CBIS project could potentially use both types of systems. In most areas, an open system of ditches is appropriate. However, in high visibility areas, like the 24th Street Bridge, an open system may interrupt the overall appearance of the area, so selective use of the enclosed system may be considered.

Even in open systems, aesthetic enhancement opportunities exist. Ditches can be configured with a meandering alignment with slightly varying side slopes to give a more natural appearance and integrate well with the natural landscape concept. Along with the use of plant materials that thrive in wetter conditions, this meandering will slow the runoff velocity and allow for further percolation of runoff for a groundwater recharge effect.

Storage of runoff in the form of detention or retention areas is an important consideration in the design of drainage systems. The edges of detention and retention areas can be configured to fit a more natural scheme. Combined with the grading strategy of using terraces and berms, the detention quality can be increased by storing runoff in swales behind the terraces as shown in Figure 23. This provides additional storage along the drainage path before it is collected in the main detention area, slowing down the water to decrease erosion and sedimentation concerns. The use of filtering plant materials within these detention areas can also contribute to improved water quality.



Figure 24 - Use of landscaping to delineate interstate alignment



Figure 25 - Framed view of Omaha skyline



Function

Delineation

Landscaping can help to delineate curves or other changes in the highway alignment. A right-of-way or massing of plantings can provide a more prominent roadway edge to guide motorists. In the CBIS, landscaping may be used to delineate roadway curves, especially at exit ramps. Figure 24 shows how this is accomplished.

Framing Views

Preserved prairie, bluffs, Omaha skyline, and areas designated for major public art installations should be enhanced or framed. At these locations, landscaping can be designed to enhance the existing view rather than compete with it. Figure 25 illustrates landscaping used to frame a view.

Buffering/Screening

Landscape can be used to screen views for the driver and adjacent residents and businesses. Adjacent to residential areas, landscaping should provide as much screening as possible to maximize privacy and reduce headlight glare. In commercial and industrial areas, landscaping should be used to shield unsightly views and reduce visual clutter with the understanding that retailers prize visibility from the interstate.

Blend with Existing

At the northern and eastern ends of the corridor, the interstate enters more rural, undeveloped areas. In these areas, the goal of the landscape design changes. Rather than adding interest or screening development, the goal is to blend in to the existing environment. Landscape application in these areas can serve to soften the transition from the urban to rural environment. At these edges, it may even be possible to enhance areas by replanting with native grasses and forbs to return the area to a more natural, prairie look.



Figure 26 - West system interchange landscape concept

Corridor Landscapes

The proposed landscape theme for the I-29/I-80 corridor uses curved masses of plantings to create a flowing effect through the landscape. These plantings weave and overlap to create a visually dynamic landscape. Native grasses can be used throughout the corridor while shade trees, evergreen trees and large shrubs can be used to create visual interest and frame views. Natural forms and plantings compliment the lines and forms used on the structural elements, and blend well with the surrounding environment.

The following discussion of key areas along the corridor explains the landscape design principles, applications, functions and environmental controls that have been

used to create the landscape guidelines. Each diagram offers a basin design concept and notes the primary factors influencing the design.

System Interchanges East and West System Interchanges

The difference between the ground plane and roadway in the west and east system interchanges presents challenges to a cohesive landscape design. Slopes lead up to bridge abutments at ramps; bridge piers at various orientations interrupt the ground view; and drainage ditches cut below the ground plane. The goal of the landscape for these interchanges is to create some natural visual order to these areas.

The proposed plantings at the east and west system interchanges include a varied selection of native grasses placed in strategic locations, as shown by Figure 26. Taller upland native grasses, are planted with mixes dominated by one or two species, on the berms, to create islands, or swaths. The arrangement of these islands may create a weaving pattern reminiscent of the braided streams along the Missouri River. Shorter upland and mesic native grasses surround these islands. Within the ditches and ditch confluences, water tolerant species can provide a definite contrast from the upland grasses. The seasonal variations of all these grasses can create blends of color, especially in autumn.

Except along the perimeter, trees are intentionally omitted in these interchange areas. Perimeter trees may be strategically planted to supplement existing natural tree groups such as those along the Western Historic Trails Center property south of the west system interchange. Trees will not be planted within the restricted levee areas

The east system interchange has additional retention and detention considerations. The detention capacity should, if possible, be configured to blend with the natural landscape theme. Rather than using constant slopes and straight line grading, a more natural variation should be considered. This grading approach is much like the approach toward wetland design, where a natural appearance is critical.

Grading can also create berms within the flat areas between ditches. The berms act as an elevated base for the native grass swaths which characterize the landscape design for these areas. Coordinated grading of berms and ditches can maintain the desired drainage patterns.





Figure 27 - West Broadway system interchange landscape concept



West Broadway System Interchange

The West Broadway system interchange has a very different character than the east and west system interchanges. It includes local roads, pedestrian trails, interstate bridge ramps and the Broadway Gateway Monument. The landscape design for this area attempts to respond to this complex environment. Figure 27 illustrates the West Broadway system interchange.

Where possible, ornamental street trees could line Broadway. The repetition of tree form, height and species can continue the pattern established at the existing gateway and frame the view down Broadway. Smaller ornamental trees better fit the constraints of the interchange bridges overhead and allow for a tighter spacing between trees to further enhance the framing effect. Other trees planted in this interchange are massed to buffer the views to the interstate from Playland Park and Dodge Riverside Golf Club. Between ramp alignments and adjacent to the other local roads, groups of canopy

and evergreen trees provide a soft transition between the perimeter plantings and the aligned planting along Broadway.

At intersections where an interstate ramp engages the Broadway alignment, a coordinated planting and hardscape indicates to the interstate user that they have arrived at a local environment. The planting design must be low and respond to the visual clearances needed to maintain safety of motorist and pedestrians. These intersections may also present opportunities for public art and additional decorative landscaping.

At the northern edge of the interchange, the existing landscape transitions from urban to rural. The river levee follows the northern right-of-way line and beyond that are the natural areas adjacent to the river. In this portion of the West Broadway interchange, the infield areas may take on the grassed island swathes characteristic of the east and west systems interchanges.

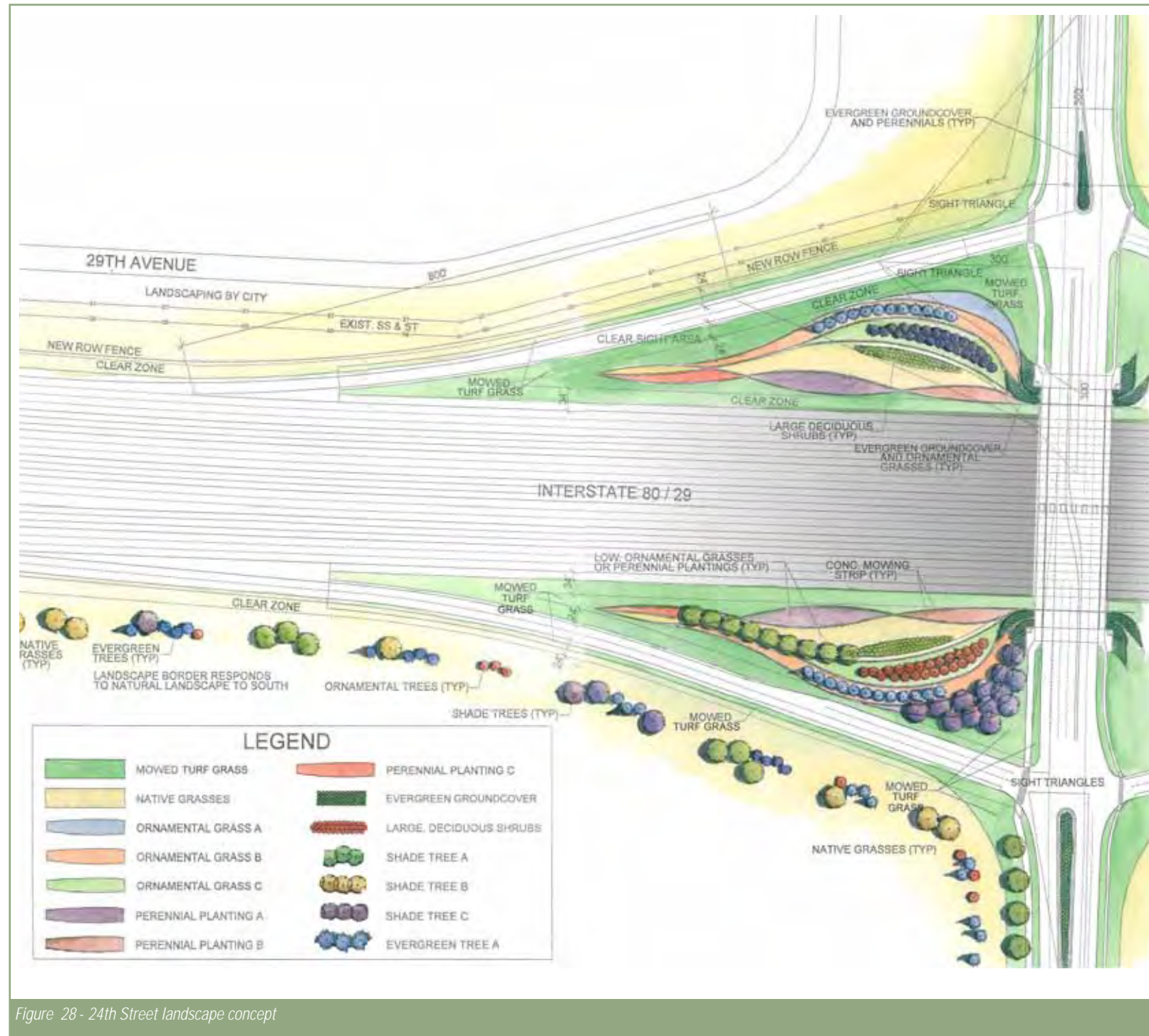


Figure 28 - 24th Street landscape concept

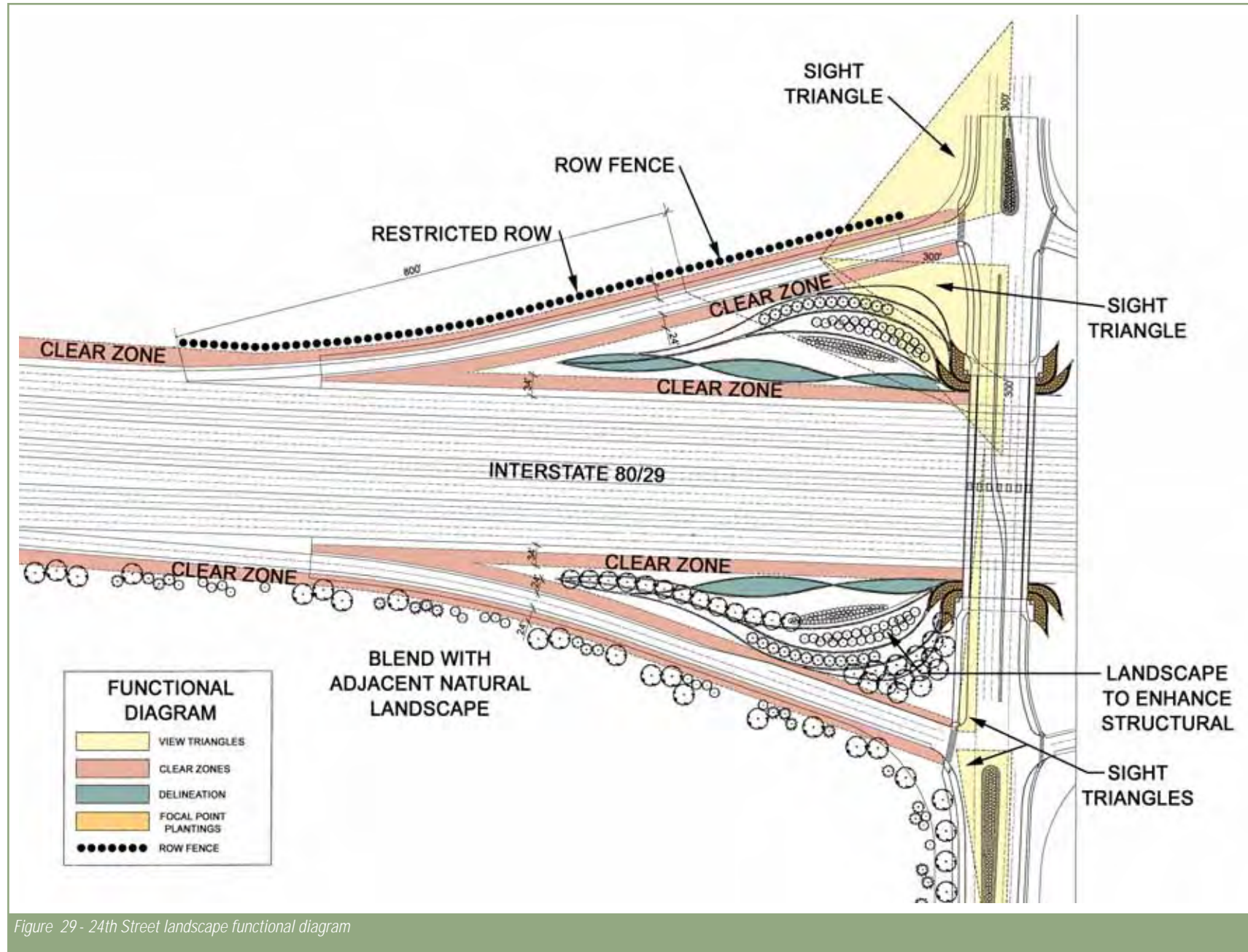
Major Urban Interchanges

24th Street

As the signature structure of the CBIS project, the 24th Street bridge and landscape are given a high level of aesthetic enhancements. Multiple sight triangles limit plant height to 24" in most areas inside the interchange. To accommodate this height limit, the proposed design uses low, ornamental grasses and perennial plantings separated by concrete mowing strips. The grasses and perennials are planted in a series of curving, overlapping bands to create a weaving effect. In areas where taller plantings are possible, large shrubs, ornamental trees, conifers, and shade trees overlap in a curvilinear pattern with the shorter shrubs in front and the tallest shade trees in the rear. Figure 28 shows the proposed concept for the 24th Street landscape. The plantings at this interchange must be dramatic enough to draw attention from the long east-west distance down the interstate alignment and across the 12 lanes of traffic. It must also compliment the bridge enhancements by serving as their foreground and visually framing the abutment treatments. The proposed landscape treatment starts at the terraces, which visually extend the structural aesthetics from the bridge level to the interstate level. These terraces can be planted with low evergreens. The plants require less maintenance and watering, provide year-round color and mass, and serve as a foreground to the stylized wing wall stone treatment.

Concrete bands extend from the end of the terrace walls and weave along the slopes to form distinct planting areas. The bands slant toward the interstate and vary from 2' to 3' in width. Grading follows the bands so that a series of terraces are formed behind them. Each area, created by the overlapping band, can contain plant masses of trees, shrubs, groundcovers or grasses. Plant selections of similar form, color and texture define each mass. The masses are then combined to emphasize the weaving effect.

This design could benefit from a departure from standard drainage practices. Because the 24th Street Bridge sets a high level of aesthetic treatment in the corridor, a closed drainage system could be used. This would allow the grade between the interstate edge and recommended terraces and landscape treatment to be mowed for a more manicured appearance.



To the southwest, where the right-of-way abuts the Western Historic Trails Center property, a mixture of shade, ornamental and evergreen trees could serve as a buffer and transition to the existing trees along this natural land use. The other corners of the interchange have fewer planting opportunities. A planned commercial development will border the southeast ramp and utility placement along the north side of the interchange limits available right-of way for planting. Landscape opportunities along the northeast edge of the interchange within the interstate right-of-way are limited. After reconstruction, the right-of-way fence will be placed just beyond the clear zone in order to allow access to a sanitary sewer line.



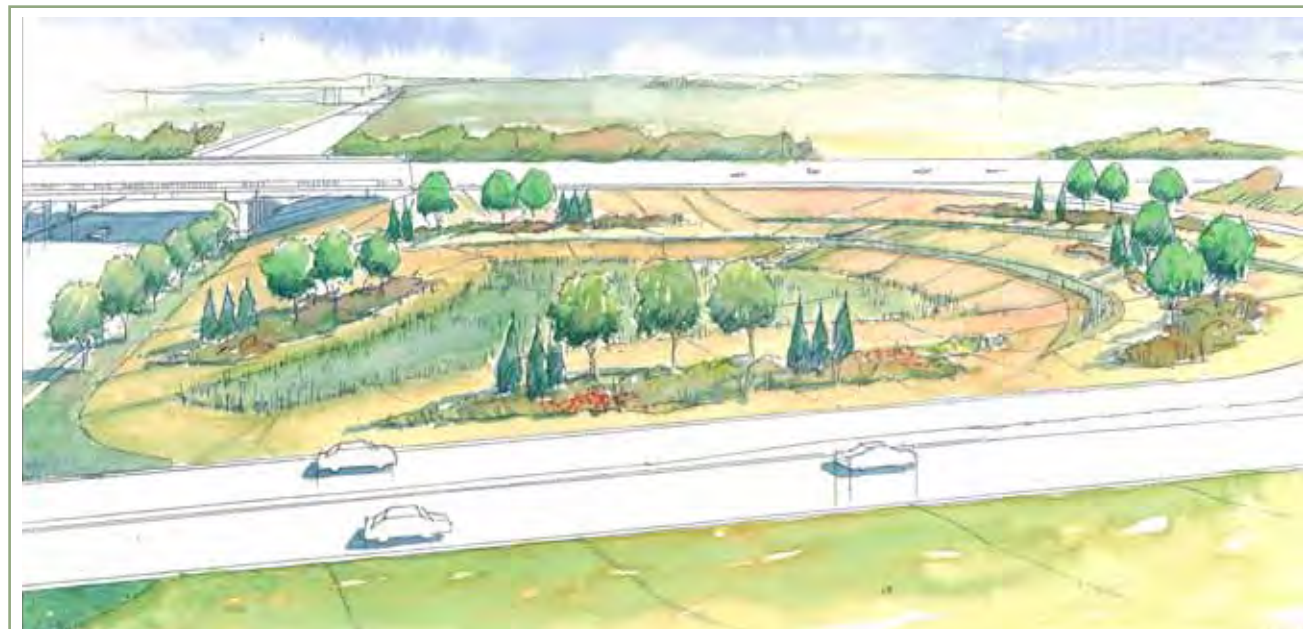


Figure 30 - South Expressway landscape

South Expressway

The ASC identified South Expressway as an important location for aesthetic enhancements. The South Expressway landscape incorporates drainage and potential detention requirements as a design feature. A series of small, crescent-shaped basins can help to clean the stormwater run-off and remove sediment prior to entering the primary detention basin. The proposed primary detention basins are configured to align with the adjoining intersections, so the view of the overall landscape is screened by plantings until reaching the intersection where the view of the entire interchange is revealed.

The proposed South Expressway landscape uses a series of large massings of shrubs, evergreens, ornamental trees and shade trees in various curving forms. These curves overlap one another and define the open space in between. Located on the edge of the on-ramps, the masses also serve as visual cues through the interchange. All tree and shrub plantings are grouped into crescent-shaped masses for a more solid appearance.

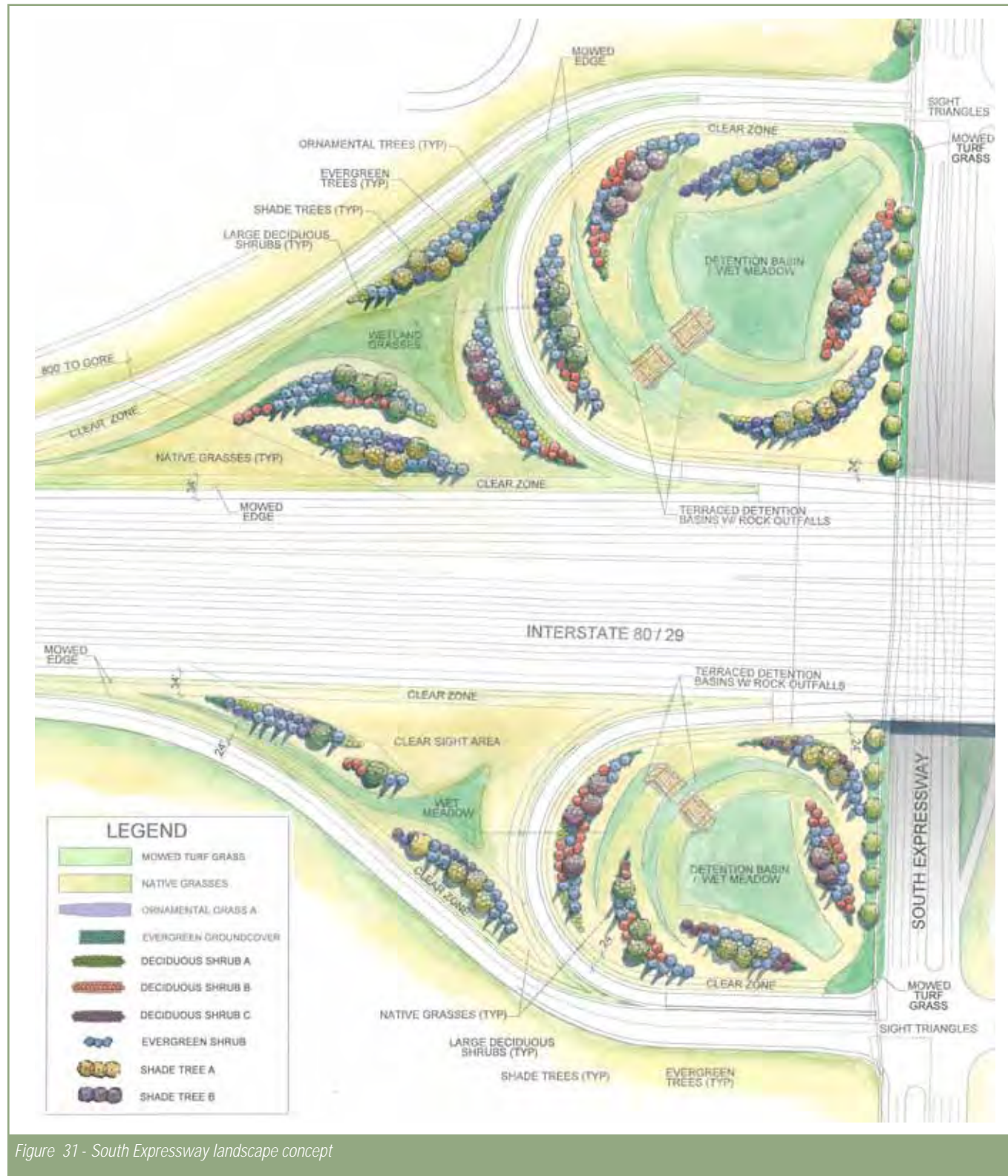


Figure 31 - South Expressway landscape concept

These crescents are located to follow and help define the terraces, to help delineate the curve of the ramps and to define the limits of each meadow and detention basin. The proposed planting design bordering the South Expressway changes to form a typical street tree pattern. This helps to integrate the planting design to the local roadway treatment.

The combination of mowed and native grasses, shrubs and trees creates a dynamic landscape design in that it provides diversity of form, texture and seasonal color and it responds to the functional needs of the space. The crescent is a strong, natural form that re-emphasizes the corridor theme of curved lines. These crescent-shaped plant masses are also reminiscent of the grass "swathes" used in the System interchanges. Repetition of this form helps carry the landscape theme through the corridor.

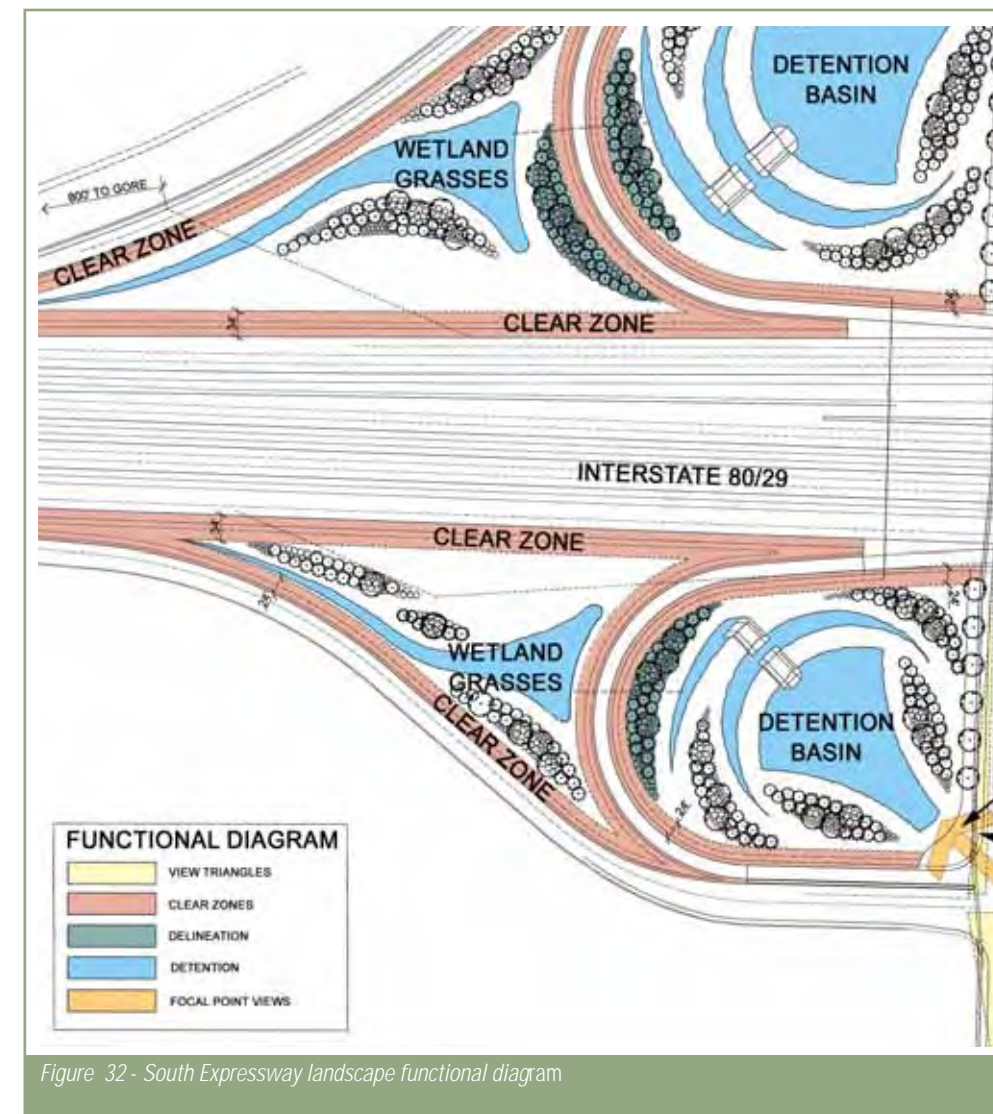


Figure 32 - South Expressway landscape functional diagram





Figure 33 - Nebraska Avenue landscape concept

Nebraska Avenue

The Nebraska Avenue interchange has a ramp alignment similar to the South Expressway, but with different environmental considerations. The levee runs through the west loop of the interchange. The grading and configuration of the levee must be respected and no tree plantings are allowed within its limits. Instead, short upland grasses can be planted on the levee to help define its limits and make maintenance easier. Grading of the interstate and ramp slopes, except where they intersect the levee, could form terraces as opposed to straight slopes. The infield drainage ditches can be reconfigured to widen and meander in areas to create a more natural form.

As shown by Figure 33 and 34, the proposed landscape design is suggestive of the South Expressway treatment, in its use of crescent-shaped mass as a landscape form. In this interchange, the content of these masses can be ornamental and evergreen trees. The masses align with the graded terraces to form an overlapping pattern. This pattern delineates the curve of the ramp and softens the view to the interstate from the neighboring land uses. Tree plantings in the right-of-way outside the ramps are also intended to buffer the interstate and neighboring land uses. The ground plane is planted in drought-tolerant native grasses in upland areas and wet-tolerant grasses and forbs in the meadow and ditch areas.

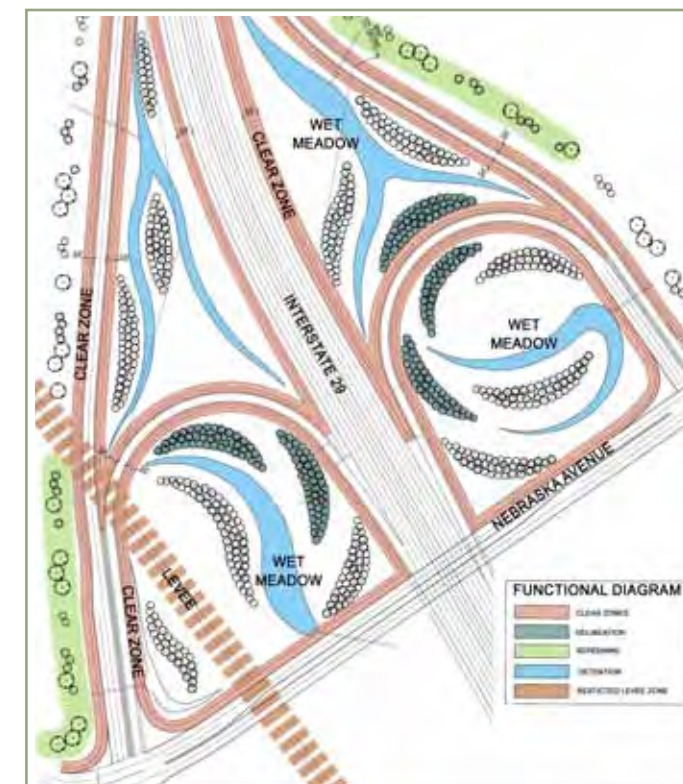


Figure 34 - Nebraska Avenue landscape concept functional diagram

Madison Avenue Interchange

The interchange at Madison Avenue is the transition between rural areas to the east and urban areas to the west. It also serves as the access point to the Mall of the Bluffs and other commercial and residential developments east of the interstate.

Landscaping in the infield area of this interchange can be used to soften the appearance of the wall and bridge or frame the aesthetic treatments on the bridge.

The roadway design re-aligns the ramps that intersect Madison Avenue, so there is additional right-of-way outside the ramps that can accommodate planting. Plantings here help screen views from the land uses adjacent to the interstate. Plantings between the interstate and views to the shopping mall are preserved to maintain retail use visibility. Planting along the local road responds to the local speed and pedestrian scale. To the west, plant masses on either side of Madison form a soft gateway into the neighborhood.

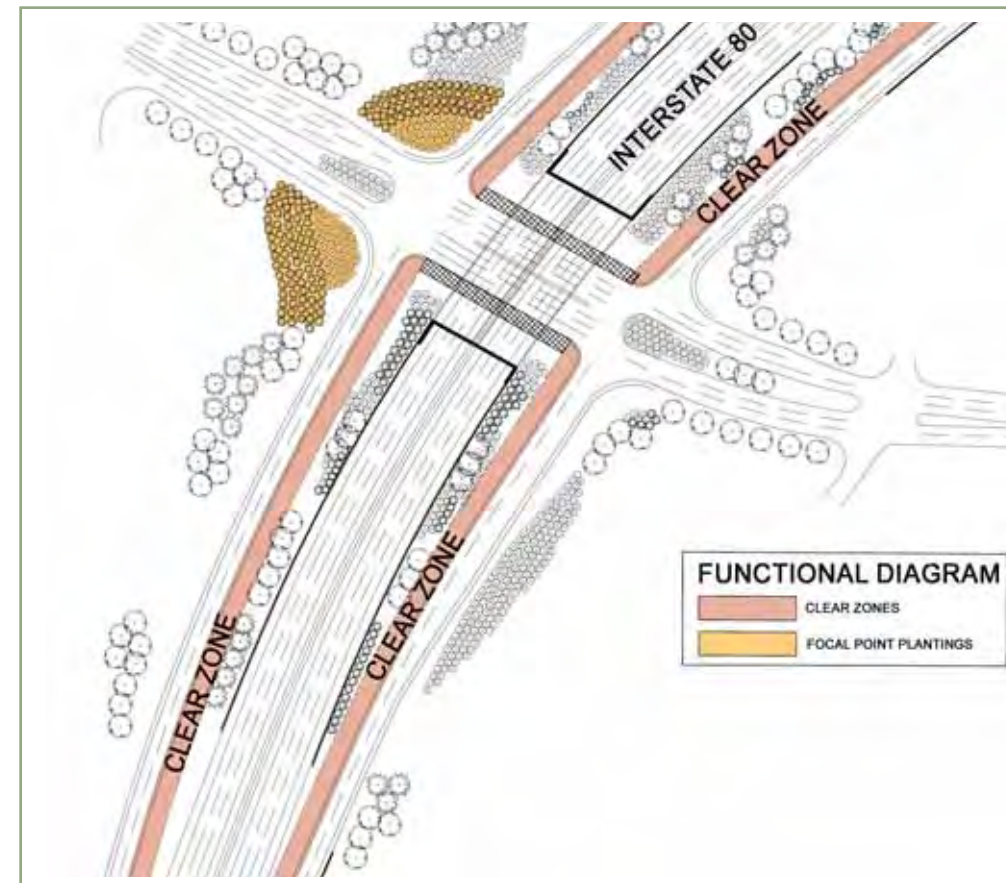


Figure 35 - Madison Avenue landscape concept

Figure 36 - Madison Avenue landscape concept functional diagram



U.S. 6

Even though the U.S. 6 interchange is rural, it provides access to urban uses with the Westfair Amphitheater to the east and Iowa Western Community College to the west. A gateway treatment, on the level of the Broadway Gateway, is being considered by the community near the interchange so the proposed landscape design takes into account both the rural and urban gateway context. Landscape treatment in this area starts with grading in terraces, which gently lower the grade down the slope, and, as shown by Figure 23, the grading forms an interesting, overlapping landform in the ramp. Plantings similar to those used at Nebraska Avenue could be located outside the clear zone to delineate the curve of the ramp loops and soften the bridge structure. Tree plantings on the outside of the ramps could also help define this curve. The effects of snow drift must be considered when determining the planting location, height and content of the tree masses. Tree plantings within the right-of-way and adjacent to U.S. 6 could reflect an urban street planting so that they will blend with the eventual improvements along this road.

U.S. 275 Interchange

This same type landscape treatment can be applied to the U.S. 275 interchange. Current and future development is rapidly increasing the use of this highway. Iowa DOT is currently reconstructing this route. Streetscape and landscape enhancements are being included as a part of the project by the Iowa West Foundation. The landscape design from the interstate still needs to tie with the overall corridor theme, but should also transition at the U.S. 275 right-of-way to match the design theme of that highway.

Rural Landscapes

On the eastern side of Council Bluffs, I-80 heads in a northeast/southwest alignment. The right-of-way along this stretch is typified by the rolling hill topography that the corridor theme emulates.

To enhance and preserve the view to this rural environment, planting design needs to respond to the natural cues. New plant masses can be placed to extend and blend with existing plantings and could provide visual diversity by adding mixed textures and drifts of seasonal color. Plantings can also frame views of Council Bluffs features, such as the upland prairies to the west and the railroad trestle to the east. The planting location, type and height should also respond to the wind and snow drifting potential in this area. The valleys between the rolling hills funnel wind and snow across the interstate; strategically placed plantings can help to mitigate these effects.

Urban Landscapes

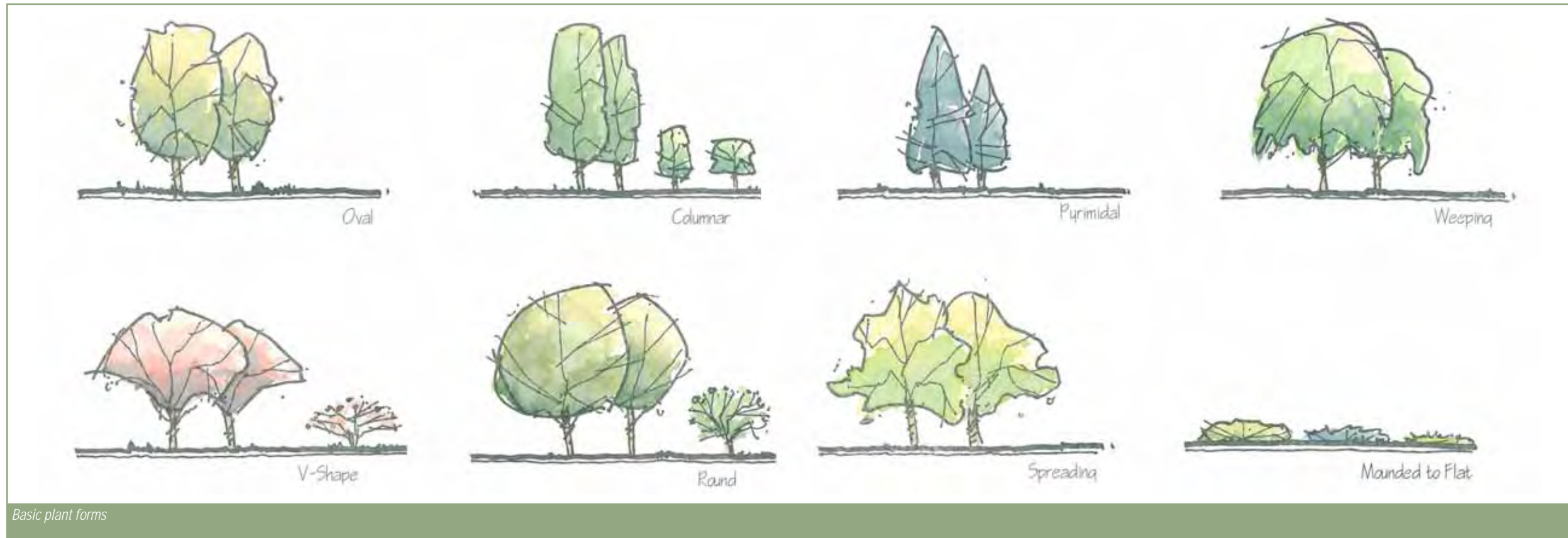
Along some portions of the interstate corridor, the right-of-way is very limited. An example of this is the length of the dual-divided interstate (I-80 & I-29) between Indian Creek and South Expressway. On the north side, the limits are defined by the potential sound wall location. On the south side, a retaining wall defines the outer limit of the ramp leading down to the South Expressway. In these areas, there is little planting opportunity other than grass cover for erosion control.

Another example of limited right-of-way is along the I-29 alignment on the western portion of the city. The north-south alignment is limited by retaining walls, whose aesthetic treatment has been earlier discussed. In some cases, a frontage road runs parallel to the interstate. The right-of-way between the frontage road and interstate may afford room for some tighter landscape plantings, such as narrow form ornamental trees or large shrubs. These plantings can provide some visual buffering between interstate and local land use and break up the expanse of wall length.

Where interstate right-of-way between major interchanges has sufficient room for tree or shrub plantings, the landscape design must respond to several considerations. It should repeat species and forms used along the interstate to strengthen the design unity. The plantings should serve to buffer land uses, screen undesirable views to or from the interstate, and frame key city features or long distance views. The plantings should also consider interstate functions such as sight distance, clear zone, drainage needs, and environmental controls.

Final decisions on these landscape concepts including plant selection and mowing patterns will depend on the local funding availability and maintenance agreements that are established as the project moves through the design development.





LANDSCAPE DESIGN CONCEPTS

The perception of an interstate landscape is very different than the perception of a park landscape, or even an urban boulevard streetscape. The same basic elements and principles of design apply to interstate landscapes, but application is adapted to address the static, high and low speed users as well as additional maintenance, safety and space constraints.

Principles

The following design principles were applied in the landscape concepts outlined in the Aesthetics Master Plan to achieve the desired effects for each location.

Form

The form or shape of a plant is defined by the branching pattern and right-of-wayth pattern. Each form has its own unique characteristics and applications in landscape design. Columnar or pyramidal forms provide height, emphasize the vertical and create a focal point or accent. Spreading and round forms give the composition a unified sense of breadth or expanse. The image above illustrates basic plant forms.

The form of individual plants is less evident for an interstate landscape than a smaller scale landscape project. Interstate plantings are grouped or massed to provide impact when viewed at high speeds or from a distance. Within masses, repetition of a specific plant form, along with the quantity of material in the mass, will translate that form's character to the grouping. Smaller groupings can still show off the form of the individual plants, while larger groupings tend to be perceived as a horizontal line.

Plant form is especially important when selecting materials for functional purposes. In a living snow fence application, the height and density of the material have a significant influence on the efficacy of the planting. A shade tree with a high branching form allows for open views below the tree canopy.



Variety of colors can be used in the proposed landscapes

Color

Color along an interstate should be considered in masses or groups or the color contrast will be lost to high speed users. At interstate speeds, color subtleties blur with surrounding plantings. Massing materials of similar color and form can accentuate the color or create a uniform canvas to allow other elements to stand out. For example, the dark green colors of evergreen trees can contrast with the surrounding deciduous materials or can serve as a backdrop for flowering trees.

Contrasting colors in the landscape draw the viewer's attention. If green is the dominant color in the surrounding landscape, red, as the color opposite green on the color wheel, provides the most contrast and should be used where it would be most effective in creating a focal point, drawing attention, and providing seasonal interest.

If the built elements use neutral tones to blend into the natural environment, there is an allowance for additional use of color in the landscape. The plant list provided later in this appendix suggests plants that could provide a variety of colors.



Texture

Texture is the surface quality of the landscape elements. Foliage and plant structure can be coarse or smooth. Texture, when viewed at a distance, is primarily defined by the density of branches, size of the leaves, and right-of-way pattern. Finely textured plants tend to lose their individual appearance and are seen more as a smooth mass. A coarse or bold texture can add interest, especially during the winter months. The image above gives examples of landscape textures.



Out of scale use of landscape



To scale use of landscape



Scale

Scale refers to the size or height of an object in relation to its surroundings. Scale in landscape design is inferred by the size relationship between adjacent objects. Like proportion, scale can relate to the size relationship between parts of the landscape design or between a part of the design and the design as a whole.

As a general rule, plants and structures in the landscape should be proportional to the human scale. Interstate scale, however, is much larger than human scale. The length of the interstate experience, height of structures, width of the roadway or right-of-way and speed of perception, requires landscape elements along the interstate to be of sufficient height and mass to be perceived as the design intends.



Formal landscaping example



Informal landscaping example

Landscape Application

Natural/Informal Landscapes

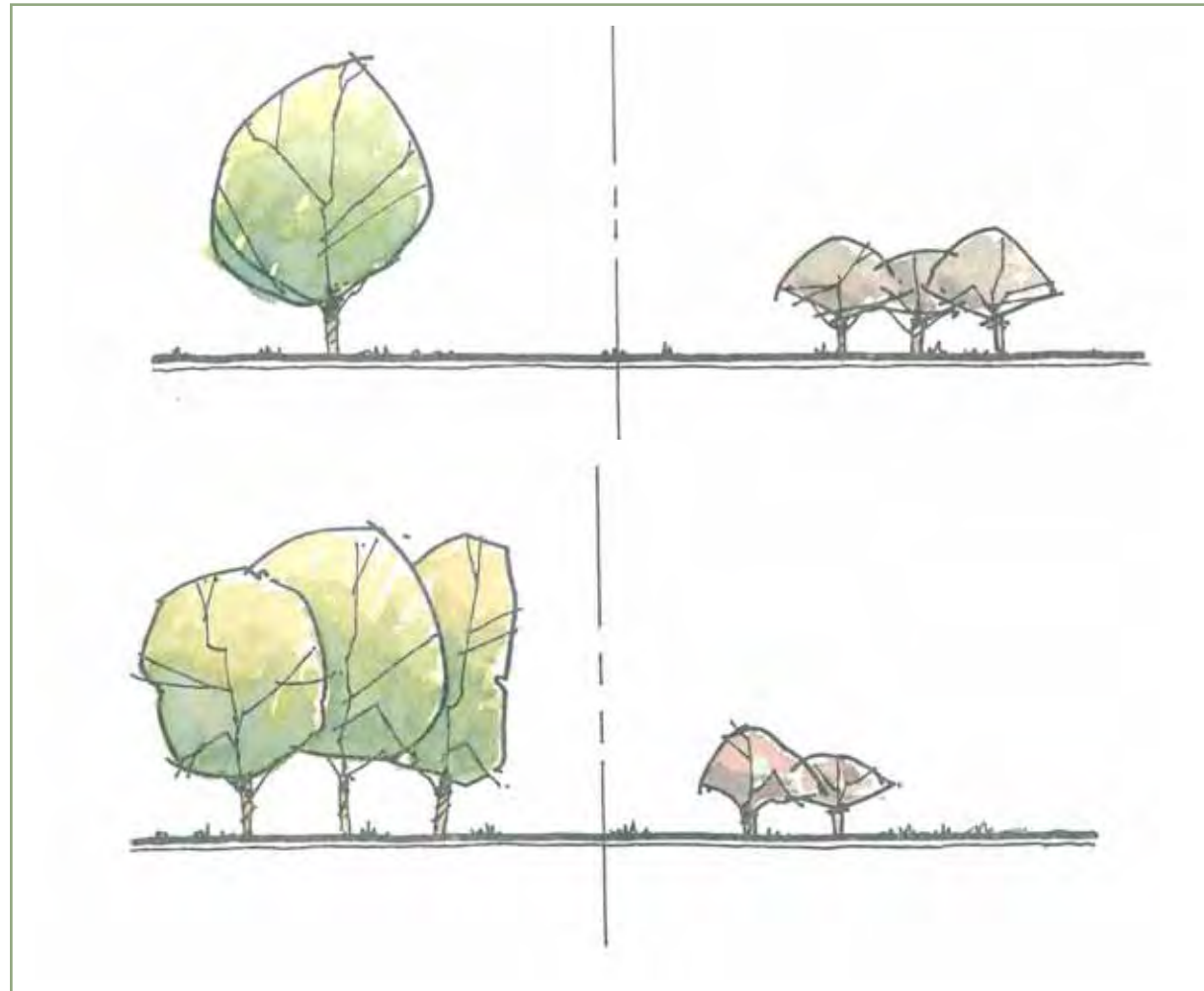
In natural settings, the landscape concepts should employ natural or informal arrangements such as curved masses, clusters and drifts that slowly transition from one species to another, similar to what is found in nature. The image on the left illustrates a formal landscape design, while the image on the right illustrates a more informal design. Both are ordered, but the natural arrangement presents a less structured appearance.

Simplicity vs. Complexity

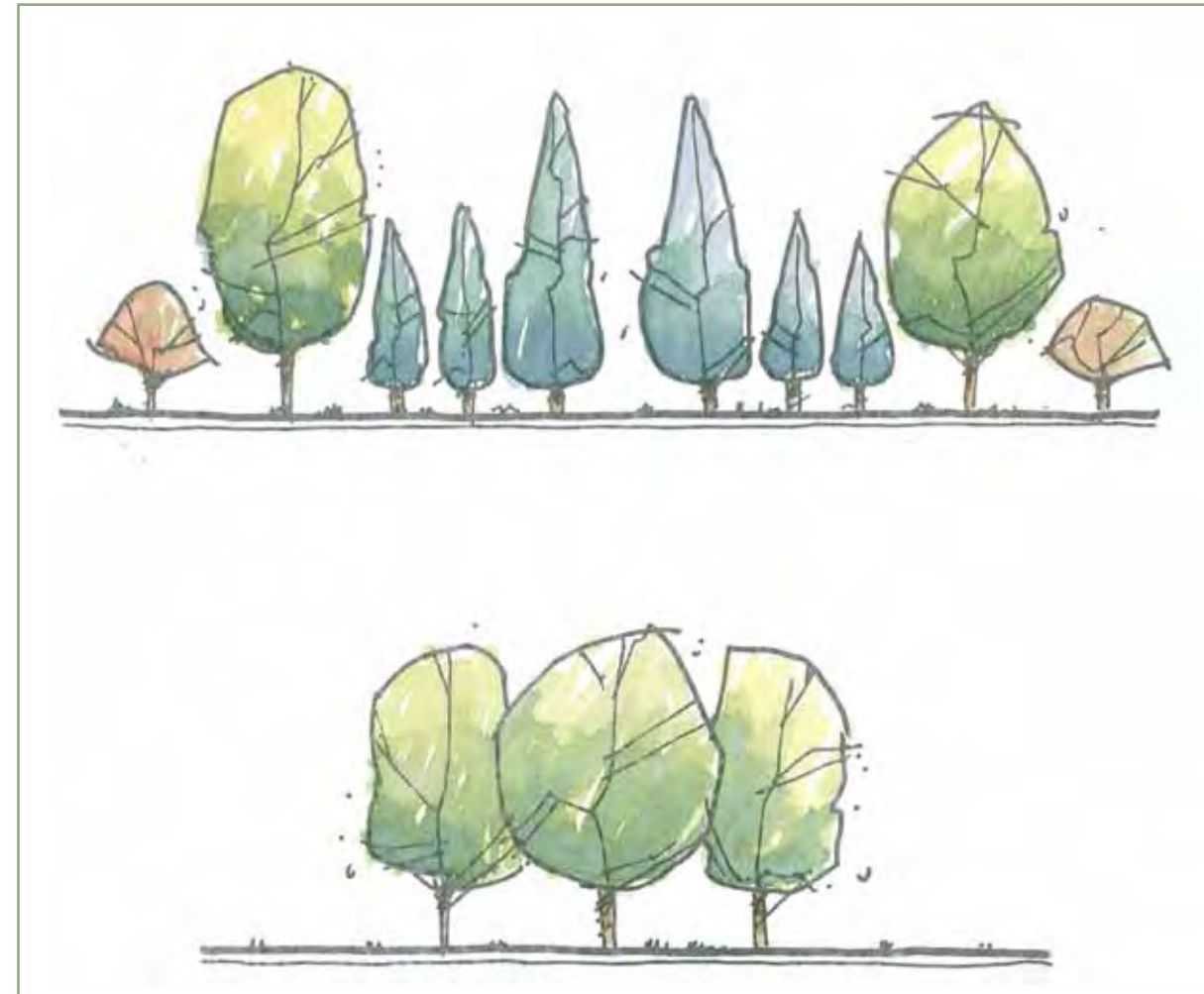
As speeds change along interstate systems, so should the corresponding level of detail. Landscape designs adjacent to high speed interstate mainlines have a simple level of detail so that they can be clearly perceived. The design will only establish continuity and unity along a corridor if it can be comprehended in the short time it is visible to

the interstate user. On entrance and exit ramps, speeds transition, so there is more time for the viewer to perceive a slightly more complex level of detail. In places where the landscape abuts local streets or static land use, the detail level can be much more complex. The complexity can be increased using more variety of form, color, texture and scale.

High visibility areas can be designed for a high level of visual interest, allowing more emphasis and complexity. Each visual unit of the design may still be simple in massing, form, color and texture, but the location of the different masses would be closer together to create a larger, more complex total design.



Landscape balance example



Landscape axis example



Balance and Axis

Balance gives the landscape design a sense of equilibrium and stability through the combination of opposing elements. Axis is the line about which the opposing elements are balanced. In landscape design, symmetrical or formal balance refers to the mass, weight, or number of objects on both sides of the landscape design being exactly the same. Balance can also be achieved by using opposing compositions on either side of the central axis, even though the compositions are not identical. Even numbers of items strengthen the perceived axis. Odd numbers diminish the axis and help to achieve a more asymmetrical or informal appearance. The image above illustrates a simplified version of an asymmetrical balance on opposite sides of a roadway or interchange to emphasize the natural theme.



Proximity

Proximity is the positioning of landscape elements that relate to one another. If the elements of similar form, color, texture and height are placed together, a relationship is implied and the viewer perceives them as a single visual unit. Logical positioning of these visual units help establish a hierarchy for the view. Focal points are established and direct the view through the space. The progression sets up a visual alignment of landscape elements, which helps create unity and balance. For interstate landscapes, these focal points help identify key intersections or points of interest and subtly assist drivers in orienting themselves along the corridor.

Massing

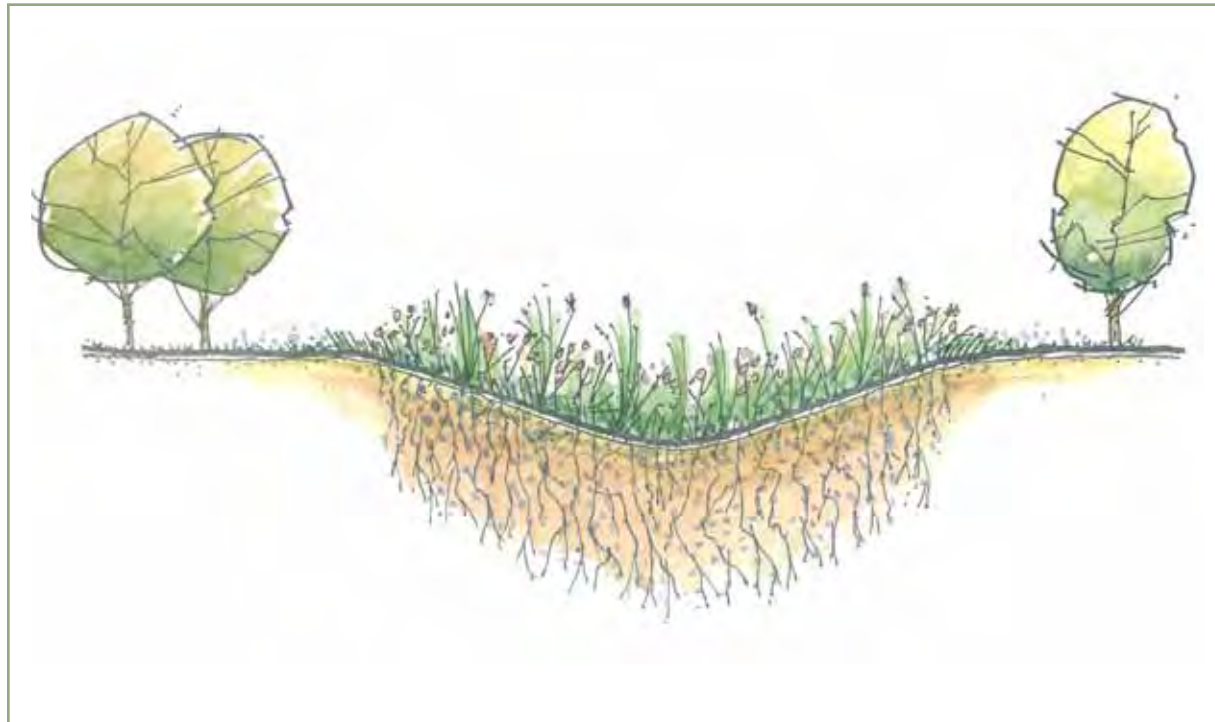
Massing uses proximity to group plantings into visual units. Interstate plantings are massed to provide impact when viewed at high speeds or from great distances. In masses, individual plant form becomes less evident and the form of the overall grouping becomes more apparent. Grouping plants also provides stronger accent points than straight lines and contributes to a sense of visual unity within a composition.

Repetition

The repeated use of objects or elements with similar shape, form, texture or color creates visual unity in landscapes, especially those that occur over long distances like interstate systems. Repetition creates rhythm and emphasis in landscape design. It provides continuity, a sense of order and what to expect. Alternately, breaking the pattern of a repeating element can signify a change in importance, creating a dramatically different element.

Emphasis

Emphasis refers to the center of interest or focal point in the design. A focal point is intended to be visually dominant and eye-catching, which also places this view high on the visual hierarchy. Emphasis is achieved by employing contrast in form, color, texture and scale. Emphasis can be accomplished by establishing repetition and then changing an element in the sequence. This will make the viewer look at the different element longer than the other elements in the sequence.



Landscape solutions for stormwater control

Environmental Controls

Stormwater

Landscape design and grading can contribute significantly to interstate water quality and control. Filter strips and/or bioswales can support water filtration. With more extensive root systems to encourage percolation and recharge ground water, planted landscapes minimize storm water run-off and reduce pollution in streams.

Drainage is an important component in the functional considerations of the interstate landscape. The aesthetic design opportunities lie in the configuration of the open drainage systems. Open ditches may be aligned differently than the standard straight ditch. A meandering alignment with slightly varying side slopes gives a more natural appearance and integrates well with the natural landscape concept. Meandering also slows the runoff to allow for further percolation and recharge effect.

The edges of detention areas can be reconfigured to fit into the natural scheme. Combined with the grading strategy of using terraces and berms, the retention quality can be increased by storing runoff in swales behind the terraces.





SUGGESTED PLANTINGS

The historic landscape of western Iowa includes tall and short grass prairies in the uplands, riparian forests and shrubs in the lowlands, and mixed trees and grasses in meadows. These plants are suited to withstand seasonal temperature variations from 100° F in the summer to -30° F in the winter. Most of the suggested plants are part of the native, historic landscape. To get the desired screening, buffering and seasonal variety, some non-native plant materials that have proven to do well in this environment have also been included.

The use of plant species native to Iowa also helps to lessen microclimate challenges for interstate landscaping. The environment adjacent to the interstate tends to be harsher than within the city. There is more wind exposure from open areas and less natural protection from denser plantings, such as those next to the river. The heat island effect from wide expanses of pavement as well as runoff of vehicular contaminants and de-icing materials have detrimental effects on plantings.

Tall Trees					
Common Name	Scientific Name	Native	Fall Color	Texture	Height
Autumn Blaze Maple	Acer freemanii 'Autumn Blaze'		Red	Medium	50'
Sugar Maple	Acer saccharum		Red	Medium	60-75'
Juneberry	Amelanchier alnifolia		Yellow	Medium	10'
Common Hackberry	Celtis occidentalis		Yellow	Medium	50'
White Ash	Fraxinus americana	X	Yellow	Medium	70-80'
Green Ash	Fraxinus pennsylvatica	X	Yellow	Medium	60'
Thornless Honeylocust	Gleditsia triacanthos var. inermis		Yellow	Fine	40-45'
Kentucky Coffee Tree	Gymnocladus dioicus		Yellow	Medium-Fine	50-70'
American Hophornbeam	Ostrya virginiana		Yellow	Medium	30-40'
Sycamore	Platanus occidentalis		Brown	Coarse	70-90'
Common Chokecherry	Prunus virginiana	X	Yellow	Medium	20-30'
Swamp White Oak	Quercus bicolor		Red	Coarse	50-60'
Northern Red Oak	Quercus borealis	X	Red	Medium	50'
Bur Oak	Quercus macrocarpa	X	Yellow	Coarse	55'
American Basswood	Tilia americana	X	Yellow-Brown	Coarse	50-70'
Littleleaf Linden	Tilia cordata		Yellow-Brown	Medium	35-50'
Ornamental Trees					
Common Name	Scientific Name	Native	Fall Color	Texture	Height
Amur Maple	Acer ginnala		Yellow-Orange	Medium	20-30'
Apple Serviceberry	Amelanchier x grandiflora 'Autumn Brilliance'		Red	Medium	20'
Redbud	Cercis canadensis	X	Yellow	Medium-Coarse	25'
Washington Hawthorn	Crataegus phaenopyrum		Red	Medium-Fine	20-25'
'Prairiefire' Crabapple	Malus 'Prairiefire'		Orange, Red	Medium-Fine	20'
American Plum	Prunus americana	X	Orange, Red	Medium-Fine	10-20'
Black Cherry	Prunus serotina		Yellow-Orange	Medium-Fine	50-80'





Evergreen Trees					
Common Name	Scientific Name	Native	Color	Texture	Height
Black Hills Spruce	<i>Picea gluaca</i> var. <i>densata</i>		Green	Fine	40-60'
White Pine	<i>Pinus strobus</i>		Green	Fine	up to 100'
Small Shrubs					
Common Name	Scientific Name	Native	Fall Color	Texture	Height
Black Chokeberry	<i>Aronia melanocarpa</i>		Red	Medium	3-6'
Redtwig Dogwood	<i>Cornus stolonifera</i>	X	Red-Purple	Medium-Fine	6-10'
Fragrant Sumac	<i>Rhus aromatica</i>	X	Red, Orange	Medium	6'
Coralberry	<i>Symphoricarpos orbiculatus</i>		Green	Medium-Fine	2-5'
Common Snowberry	<i>Symphoricarpos albus</i>		Green	Medium-Fine	3-6'
Large Shrubs					
Common Name	Scientific Name	Native	Fall Color	Texture	Height
Pagoda Dogwood	<i>Cornus alternifolia</i>		Yellow, Red	Medium	20'
Gray Dogwood	<i>Cornus racemosa</i>	X	Red	Medium	up to 6'
Cardinal Dogwood	<i>Cornus sericea</i> 'Cardinal'		Red	Medium	8-10'
American Filbert	<i>Corylus americana</i>		Orange-Red	Medium	8-15'
Eastern Wahoo	<i>Euonymus atropurpurea</i>		Pink-Red	Medium	10-15'
Common Ninebark	<i>Physocarpus opulifolius</i>		Yellow	Coarse	5-10'
Purpleleaf Sand Cherry	<i>Prunus cistena</i>		Red, Purple	Medium	
Smooth Sumac	<i>Rhus glabra</i>	X	Red, Orange	Medium-Coarse	8-15'
Staghorn Sumac	<i>Rhus typhina</i>		Red, Orange	Medium	15-25'
American Elder	<i>Sambucus canadensis</i>	X	Yellow	Medium-Coarse	12-15'
Vanhoutte Spirea	<i>Spiraea x vanhouttei</i>		Yellow	Medium-Fine	10'
Common Purple Lilac	<i>Syringa vulgaris</i>		Green	Medium-Coarse	8-15'
Arriight-of-waywood Virburnum	<i>Viburnum dentatum</i>		Red	Medium	5-9'
Wayfaringtree Viburnum	<i>Viburnum lantana</i>		Red, Purple	Medium	10-15'
Nannyberry Viburnum	<i>Viburnum lentago</i>	X	Red-Purple	Medium	15-18'
Highbush Cranberry	<i>Viburnum trilobum</i>		Red	Medium	8-12'





Grasses					
Common Name	Scientific Name	Native	Fall Color	Texture	Height
Big Bluestem	Andropogon gerardi	X	Brown	Medium	4-8'
Hairy Grama	Bouteloua hirsuta	X	Brown	Fine	1/2-2'
Sideoats Grama	Bouteloua curtipendula	X	Golden	Fine	1-2'
Blue Grama	Bouteloua gracilis	X	Brown	Fine	1-2'
Buffalo Grass	Buchloe dactyloides	X	Brown	Fine	1/2-1'
Canada Wildrye	Elymus canadensis		Brown	Fine	3-4'
Switchgrass	Panicum virgatum	X	Golden	Fine	3-4'
Little Bluestem	Schizachyrium scoparium	X	Golden	Fine	2-5'
Indiangrass	Sorghastrum nutans	X	Golden	Fine	5-7'
Prairie Dropseed	Sporobolus heterlopesis	X	Golden	Fine	2-3'
Forbs					
Common Name	Scientific Name	Native	Bloom Color	Texture	Height
Yarright-of-way	Achillea millefolium	X	White	Fine	2-3'
Leadplant	Amorpha canescens	X	Purple	Fine	40"
Prairie Sage	Artemisia ludoviciana	X	Green	Fine	2-3'
Swamp Milkweed	Asclepias incarnate	X	Pink	Fine	4-5'
Butterfly Milkweed	Asclepias tuberosa	X	Orange	Fine	2-3'
Smooth Blue Aster	Aster laevis	X	Lavender	Fine	1-3'
New England Aster	Aster novae-angliae	X	Purple	Fine	3-6'
Blue False Indigo	Baptisia australis	X	Blue	Fine	3-4'
White Wild Indigo	Baptisia lacteal	X	White	Fine	3 - 6'
Partridge Pea	Chamaecrista fasciculate	X	Yellow	Fine	20 - 36"
Plains Coreopsis	Coreopsis tinctoria		Yellow	Fine	1-3'
Pale Purple Coneflower	Echinacea pallida	X	Lavender	Fine	2-4'
Purple Prairie Coneflower	Echinacea purpurea		Purple	Fine	3-4'
Rattlesnake Master	Eryngium yuccifolium	X	Green	Fine	2-3'
Sweet Joe Pye Weed	Eupatorium purpureum	X	Pink	Fine	5-7'
White Snakeroot	Eupatorium rugosum	X	White	Fine	3-5'
Maximillian Sunflower	Helianthus maximilliani	X	Yellow	Medium-Coarse	5-10'
Oxeye Sunflower	Heliopsis helianthoides	X	Yellow	Fine	2-5'
Round-headed Bush Clover	Lespedeza capitata	X	Tan	Fine	2-4'
Prairie Blazing Star	Liatris pycnostachya	X	Purple	Fine	3-5'



<i>Forbs continued</i>					
Common Name	Scientific Name	Native	Bloom Color	Texture	Height
Wild Bergamot	Monarda fistulosa	X	Lavender	Fine	3-4'
Large-flowered Beardtongue	Penstemon grandiflorus	X	Pink	Fine	2-4'
Purple Prairie Clover	Petalostemum purpureum	X	Purple	Fine	1'-3'
Prairie Phlox	Phlox pilosa	X	Pink	Fine	1'
Longhead Coneflower	Ratibida columnifera	X	Yellow	Fine	1-3'
Grayhead Prairie Coneflower	Ratibida pinnata	X	Yellow	Fine	3-5'
Blackeyed Susan	Rudbeckia hirta	X	Yellow	Fine	1-2'
Compass Plant	Silphium laciniatum	X	Yellow	Fine	4-6'
Stiff Goldenrod	Solidago rigida	X	Yellow	Fine	3-5'
Showy Goldenrod	Solidago speciosa	X	Yellow	Fine	2-4'
Western Ironweed	Vernonia baldwinii	X	Purple	Fine	3-5'
Common Ironweed	Vernonia fasciculata	X	Purple	Fine	4-6'
Golden Alexanders	Zizia aurea	X	Yellow	Fine	1-3'

