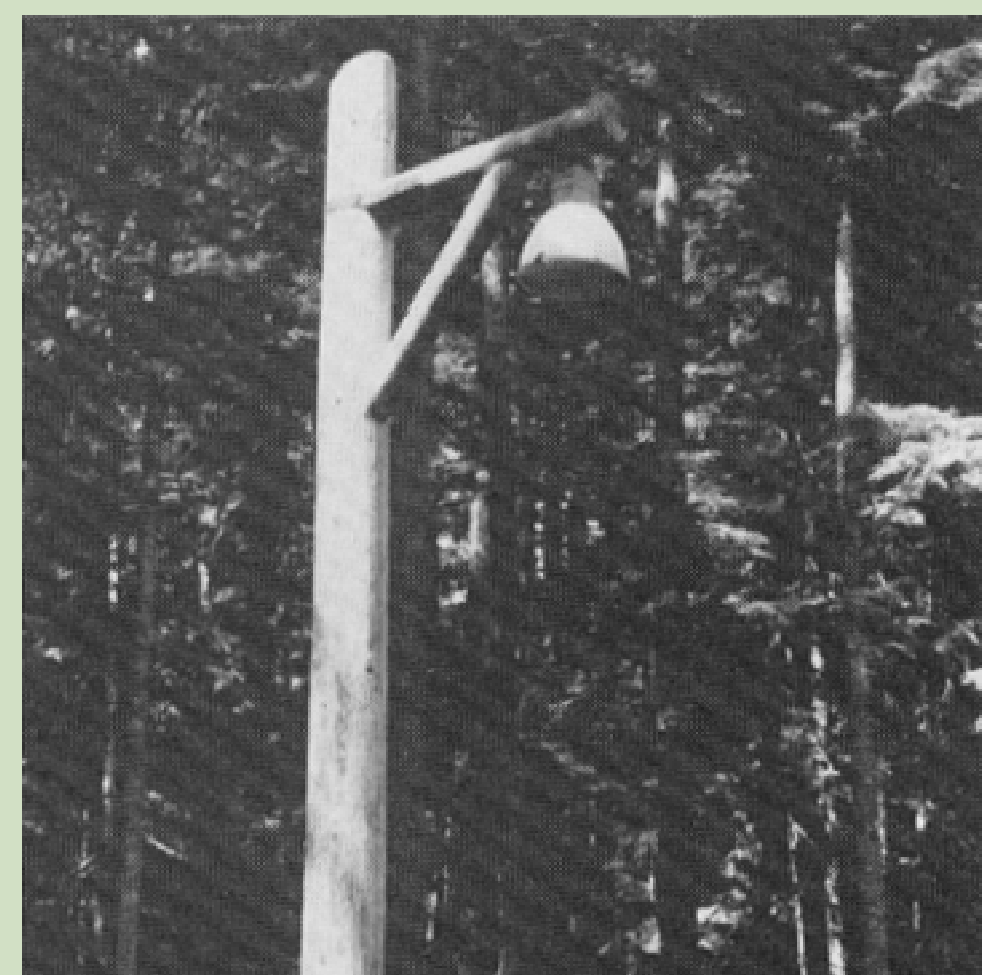
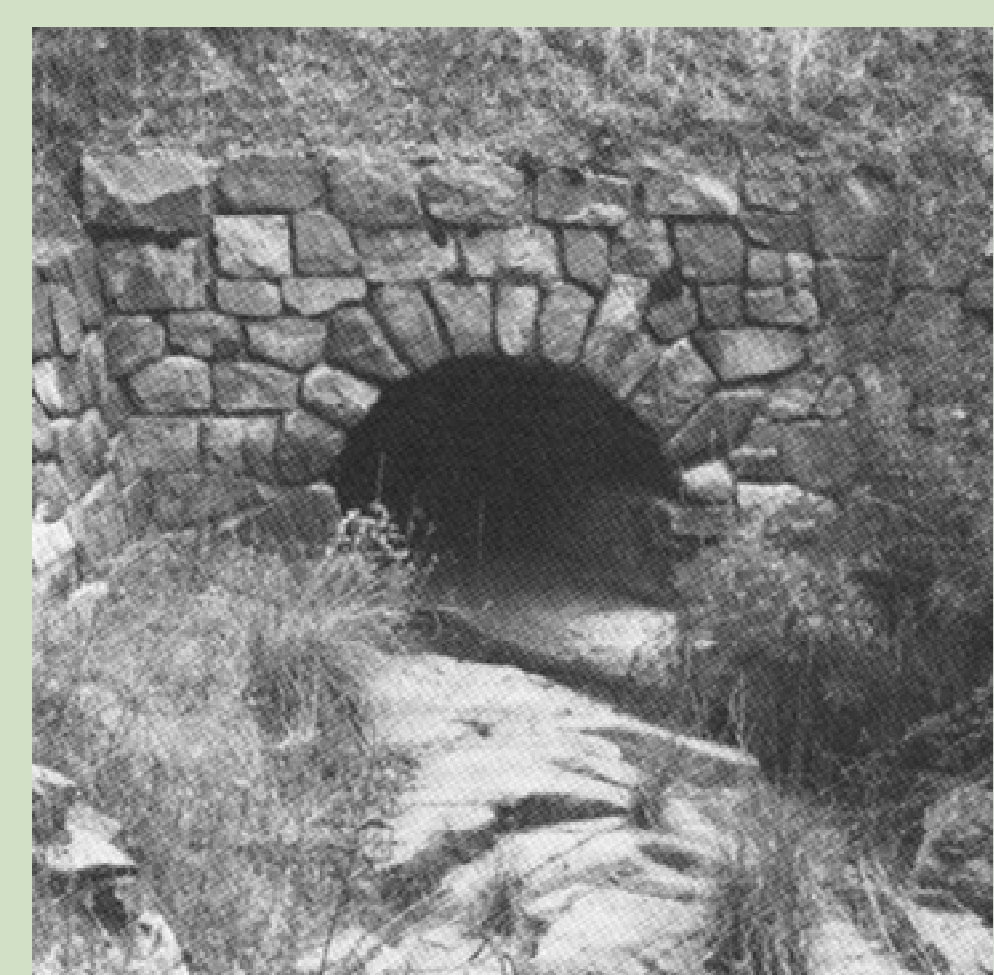
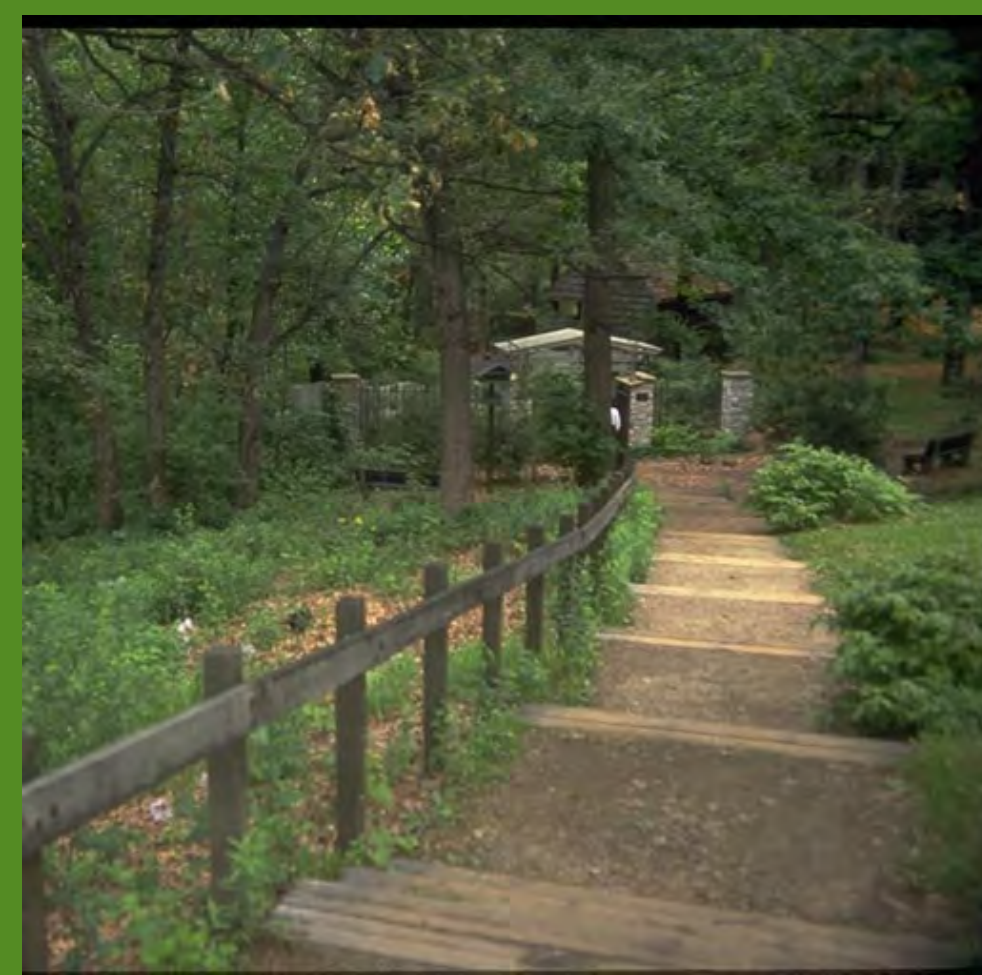




Design Guidelines & Recommendations



U.S. 93 DESIGN DISCUSSIONS

Project Committee:

Montana Department of Transportation
Federal Highway Administration

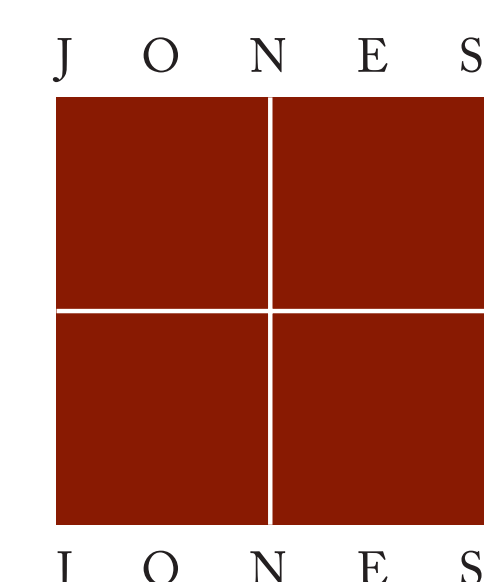
The Confederated Salish & Kootenai Tribes of the Flathead Nation

Prime Contractor: Skillings-Connolly, Inc. - Consulting Engineers

Evato to Polson, Montana



December 20, 2000



Architects & Landscape Architects

Design Guidelines and Recommendations for US 93 from Evaro to Polson, Montana

1. Introduction

2. Fundamental Design Considerations

- < Design Theme
- < Materials for New Construction
- < Signs
 - Portal/boundary signs
 - Community entry signs
 - Official Highway signs
 - Place Name signs
 - Tourist Oriented signs
 - Interpretive signs
- < Visitor Centers & Interpretive Overlooks
 - Ravalli Hill Visitor Center
 - Ninepipe Interpretive Overlook
 - Polson Hill Interpretive Overlook
- < Road Alignment & Configuration
 - Fitting Road to Landscape - Horizontal Alignment
 - Fitting Road to Landscape - Vertical Alignment
 - Divided-Independent Road Sections
 - Deviations from Right-of-Way
 - Highway Shoulders
 - Road Accessories
- < Recommended Construction & Maintenance Practices
- < Vegetation
 - Protection of Existing Vegetation
 - Revegetation of Disturbed Areas
 - Slope Construction & Preparation
 - Planting Design
 - Plant Materials
- < Pedestrian/Bicycle Access
- < Wildlife Crossing & Habitat
 - Wildlife Fencing
- < Water & Hydrology
- < Corridor Land Use
- < Environmental Restoration
- < Traffic Control Devices
- < School bus turnarounds

4. Bibliography

5. Preparers of Guidelines



1. Introduction



Historic photo of life on the Reservation.

The Flathead Indian Reservation was established by the terms of the Hellgate Treaty entered into by the United States and the Confederated Salish and Kootenai Tribes on July 16, 1855. U.S. Highway 93 traverses the Flathead Indian Reservation between its north and south boundaries for a distance of approximately 80 miles. The Montana Department of Transportation has proposed a reconstruction project for a 56-mile segment of the highway. In support of that proposed project, the U.S. Department of Transportation - Federal Highway Administration, the Montana Department of Transportation, and the Confederated Salish and Kootenai Tribes jointly endeavor to develop guidelines for the design, construction, operation, and maintenance of U.S. Highway 93 which recognize and protect the Flathead Indian Reservation as the permanent homeland of the Salish, Kootenai, and Pend d'Oreille people. This endeavor will require a unified approach to design, detailing, maintenance, and interpretation. The following guidelines are the initial results of this endeavor.

The Design Guidelines and Recommendations define a collective vision of how the US 93 corridor from Evaro to Polson, Montana will be experienced by both locals and visitors.

2. Fundamental Design Considerations

The guiding philosophy for modification of U.S. Highway 93 is to protect cultural, aesthetic, recreational, and natural resources located along the highway corridor and to communicate the respect and value that is commonly held for these resources pursuant to traditional ways of the Tribes. The following objectives will be emphasized:

- Safely accommodate the present and future transportation needs of the citizens of Montana.
- Limit highway-related growth and development outside of established communities.
- Avoid construction in areas of traditional cultural and spiritual significance.



Aerial photo of the potholes in the Ninepipe Wildlife Refuge.



- Minimize intrusion and damage to natural resources located adjacent to the roadway.
- Enhance and restore natural resources that have been injured and/or disconnected by the existence of U.S. Highway 93, including:
 - ≤ hydrologic, lacustrine, riparian, and wetlands resources;
 - ≤ natural landforms and geologic features;
 - ≤ native vegetation and natural vegetative patterns; and
 - ≤ fish and wildlife habitat and migratory corridors.
- Provide safe and functional visitor use facilities at several locations along the highway.
- Develop guidelines for integrated roadside detailing, maintenance, signs, and interpretive concepts.

This document is intended to provide a foundation for the development of a unified and unique identity for U.S. Highway 93 on the Flathead Indian Reservation from Evaro to Polson, MT. The document primarily gives guidance at a conceptual level. It is a starting point for the development of final design details. Although safety and design standards will change over time, every reasonable effort should be made to assure that the spirit of the concepts presented here are manifest in the final design.

3. Design Guidelines

The intent of these guidelines is to provide designers, planners, engineers, and others involved with transportation-related activities on the Flathead Indian Reservation with a consistent design philosophy and design style. These recommendations are not intended to be rigid standards that limit creativity or produce standard one-size-fits-all details.

Design Theme

The design theme established for U.S. Highway 93 (US 93) on the Flathead Indian Reservation (Reservation) is “homeland of the *Sqélix*” “*Aq Ismakniké*” (traditional words in Salish and Kootenai for “the people”). This design theme is to be represented by an artistic logo depiction of Coyote. Coyote is a legendary hero in Salish, Kootenai, and Pend d’Oreille culture who prepared this landscape for inhabitation by all creatures and who continues to guide Salish, Kootenai, and Pend d’Oreilles people on their journey through this world. Accordingly, Coyote is a link between people and the Natural and Spiritual worlds in which this highway is being constructed and therefore represents the spirit of this place. The design theme is characterized by large-scale design elements of native materials, primarily contoured earth, quarried stone, and rough sawn timber and by small-scale design elements of Salish and Kootenai traditional beadwork patterns. This theme should continue to be the guide for modifications of site and architectural detailing and new construction throughout the length of the highway corridor.

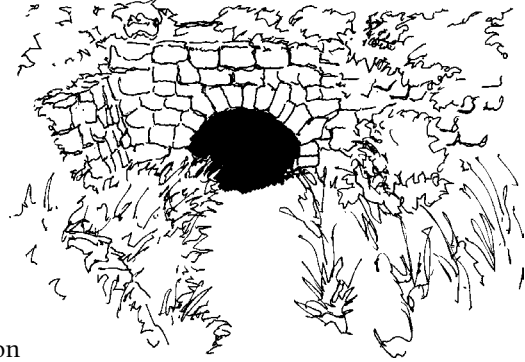


Graphic logo depicting Coyote, legendary hero of the Salish, Kootenai, and Pend d’Oreille people.

Materials For New Construction

Guidelines for materials are intended to help identify the types of materials that will best articulate the defined design theme.

- For new construction, use natural materials found in the area to the greatest extent possible.
- Ensure construction is done at a scale that does not overpower the natural elements of a specific site, and that all details complement their sites, not intrude upon them.
- Use natural or man-made landforms wherever possible for keying road accessories into the land, for controlling access, and for capturing run off.
- Use native quarried stone, or a veneer which emulates native quarried stone, wherever possible for visual surfaces of above-grade road structures. Avoid using rounded river rocks in the visual surfaces of all road structures because such rock appears decorative and creates an impression of instability.
- Use wood wherever possible for signs, signposts, site delineators, milepost markers, benches, fencing, and similar site details. A treated or natural appearance is preferable to painting.
- Use native vegetation wherever possible to cover exposed earth surfaces, to provide visual screening, and wildlife cover, to prevent erosion, and to integrate the road into the adjacent habitat.



Use native vegetation and materials to help maintain the visual character of the Reservation.

Signs

The Montana Department of Transportation (MDT), Missoula County, Lake County, and the Confederated Salish and Kootenai Tribes (CSKT) need to develop a coordinated approach to signage for the Reservation, which expresses a unique identity for the US 93 corridor. Promoting continuity and a sense of unity throughout the Reservation should be a major objective. The consistent and systematic use of signage and details should permit visitors to identify individual functions and services and to differentiate between them. These guidelines are intended to be the first step in this coordinated approach, with the final color, size, font, text, mounting height and style, materials, and locations to be developed for each sign type.

- Keep the message of a sign simple enough to serve its purpose, which is to provide direction and to let travelers know where they are and what they are seeing. Because the majority of roads on the Reservation have speed limits higher than 45 miles per hour, the traveler has about 3 seconds to grasp the message on the sign. If the sign's intent is to provide travelers with a sense of the Reservation's character, it needs to be simple enough for people to quickly identify the design. Use only a minimal amount of text with bold and simple lettering and a large clean design that is not too busy or complex. Avoid using script because it is usually difficult to read. Contrasting colors with light images on dark background and vice-versa make signs easier to read.
- Trademark any new logos, shapes, or symbols developed specifically for signs in order to limit usage.
- Allow on-premise signage to continue in accordance with governing regulations.

Establish a recognizable hierarchy of signage to distinguish subtle differences between similar functions. Consistently use a hierarchy of sign types in order to give visitors the necessary visual cues. For this project, 6 basic types of signage are identified: (1) portal/boundary signs, (2) community entry signs, (3) official highway signs, (4) place name signs, (5) tourist oriented signs, and (6) interpretive signs.

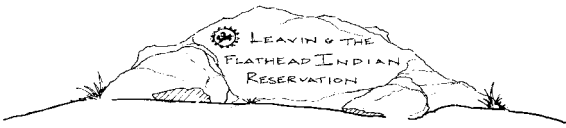


Graphic logos -- such as the one depicting Coyote, legendary hero of the Salish, Kootenai, and Pend d'Oreille people -- should be trademarked.

Portal/boundary signs

Portal/boundary signs are intended to mark the transition to and from the Reservation.

- Make travelers aware on entering the Reservation that he or she is entering the homeland of the *Sqélix* "Aq Smaknik". This basically functions as a "welcome to" sign.
- Make each traveler aware that they are leaving the Reservation. This basically functions as a "thank you for visiting" sign.
- Develop a uniquely designed entrance or identification sign that is simple yet expressive of the place and its spirit, and in character with its architecture and landscape.
- Include a logo illustrating the Coyote theme on all portal/boundary signs.
- Write all portal/boundary signs in English.



A smaller portal/boundary sign would inform visitors that they are leaving the Reservation.



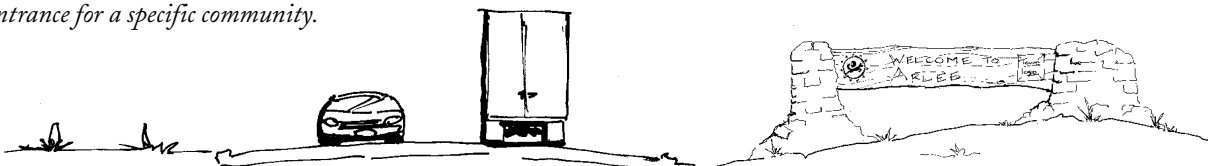
A large portal/boundary sign would inform visitors they are entering the Reservation.

Community entry signs

Community entry signs serve as "welcome" signs for developed communities.

- Construct community entry signs at the entry to the communities of Arlee, Ravalli, St. Ignatius, Ronan, Pablo, and Polson.
- Include a logo illustrating the Coyote theme on all entry signs.
- Use a similar style and design for all entry signs that includes similar colors, letter sizes, styles, and provide space (i.e. 24" x 24") for inclusion of a large graphic logo depiction of the Coyote theme with smaller graphic depictions of the official logos of MDT, and the appropriate county and community.

Community entry signs help identify the entrance for a specific community.



Official Highway signs

Official highway signs are those signs which are required pursuant to the standards of the Manual on Uniform Traffic Control Devices (MUTCD) in order to provide necessary information about the road to drivers and are standard components of US 93. Examples of this type of signage are yield signs, mileage markers, sharp curves, passing lanes, steep hills, and other similar regulatory traffic control and location information.

- Limit text on official highway signs to English only.
- Where MUTCD requires signs of standard metal signboards with reflective lettering, mount signs on metal or wood posts. Paint the backs of all metal sign boards a brown color that blends with the local environment.



A traditional beadwork border will be used on all place name signs. Salish place names have a different beadwork border than do Kootenai place names.



An example of TODS signage.

Place Name signs

Place name signs are intended to identify important cultural and/or natural landscape features.

- Write all place names in Salish, Kootenai, and English. Use a unique color and background to make it visually different than other signage.
- Avoid using graphic images of individual wildlife species for wildlife crossing signs because of concern that such signs will be vandalized.
- Mount place name signs on separate posts and avoid combining with other signs on existing posts.
- Include a beadwork border on all place name signs.

Tourist Oriented Directional signs

Tourist oriented signs are intended to provide information about area attractions and goods and services available to travelers, such as restaurants, recreation activities, gas, food, lodging, hospitals, and other related activities.

- Explore development of signage for the Reservation that complements state and federal Tourist-Oriented Directional Signs (TODS). TODS are official, standardized signs that provide directions to businesses, services, or activities that derive a majority of their income from tourists.
- Size, location, and appearance to be in accordance with the adopted state TODS guidelines.
- Explore utilizing CSKT radio that would include advertising opportunities for local business owners. This could be integrated with the conveyance of interpretive information about natural resources, cultural resources, historic events, and other related activities.
- Limit the number of signs, since too much signage will simply lead to visual clutter.

Interpretive signs

Interpretive signs are intended to convey information about natural resources, cultural resources, historic events, and other related activities.

- Locate interpretive signs where there is a desire to convey information to visitors about natural resources, cultural resources, historic events, and other activities. Write interpretive signs in Salish, Kootenai, and English. Incorporated interpretive signs with pull-off and turnout areas along the road since most require a visitor to stop and read the text/graphics on the sign. Locations for interpretive signs are: Flathead Reservation entrance near Evaro, Ravalli Hill site, and Polson Hill site.
- Explore utilizing CSKT radio as a means to convey information about natural resources, cultural resources, historic events, and other related activities.
- Incorporate a logo illustrating the Coyote theme into interpretive signage as appropriate.
- Information to be included on signs located at the Ravalli Hill will be developed in consultation with the Tribal Preservation Officer.
- Information to be included on signs located at the Polson Hill Interpretive Overlook will be developed in consultation with the CSKT Natural Resource Department.



Interpretive signs can convey information about a specific area, such as Ninepipe, to travelers.



Visitor Centers & Interpretive Overlooks

The primary objective of visitor centers and interpretive overlooks is to provide opportunities for travelers to find out more about the Flathead Indian Reservation, the Salish, Kootenai, and Pend d’Orielles people, and/or unique natural or cultural sites. The visitor centers and interpretive overlooks also provide an opportunity for travelers to rest and relax before continuing on their way.



Vehicle access, parking and circulation

All visitor centers and interpretive overlooks are intended to be accessed from US 93. As a result, adequate access, parking, and internal circulation is required for each site.



An example of a visitor center turnout that is clearly marked and signed, and separated from the road with a bermed island featuring indigenous plant material.

- Obliterate all informal, dirt turnouts that are not converted to formal turnouts. Construct mounds and berms as necessary to discourage use of these areas.
- Make turnouts where visitors are encouraged to get out of their vehicles wide enough for parking large recreational vehicles. Pave these turnouts and make sure they are clearly marked and signed.
- Incorporate signage, curbs, sidewalks where appropriate, and a trash receptacle for all interpretive/scenic turnouts.
- Use islands to separate turnouts from the road where there is adequate space to do so. Create a berm for the islands and vegetate with indigenous plant material.
- Remove turnouts that function as impromptu turnouts for slow moving traffic.
- At visitor centers, locate parking areas so they do not intrude upon major views and viewing areas. Parked automobiles should not dominate the view upon entering a site, nor should they detract from important views from within a building. Avoid constructing large, open parking areas that are visually obtrusive. Layout should conform to existing topography, trees, rock outcrops, and other site features. Define edges and confine pedestrian access to walkways to prevent damage to the surrounding landscape. Linear, unobstructed paths for snow removal equipment with storage areas for snow should be provided when possible. Parking areas should be designed to fit the land so that cuts and fills are minimized.
- Design ramps, railings, steps, and walkways in such a way that they are an integral part of the landscape and building.
- In parking areas, locate lighting fixtures at the entrance to the parking area. Use shielded walk lights adequate for guidance and direction to light the pedestrian path from the parking lot to the destination. Use light fixtures that are complementary to the large scale design elements of the structures and other site fixtures.
- Include a logo illustrating the Coyote theme at all visitor centers and interpretive overlooks.
- Use indigenous plant material to reinforce views, outdoor spaces, circulation, and entries, and to provide shade, shelter, and to serve as a screen/buffer for wind, sun, and views.
- Incorporate work of designated tribal artists at all visitor centers and interpretive overlooks. Appropriate artist and work will be determined by CSKT.



Building architecture

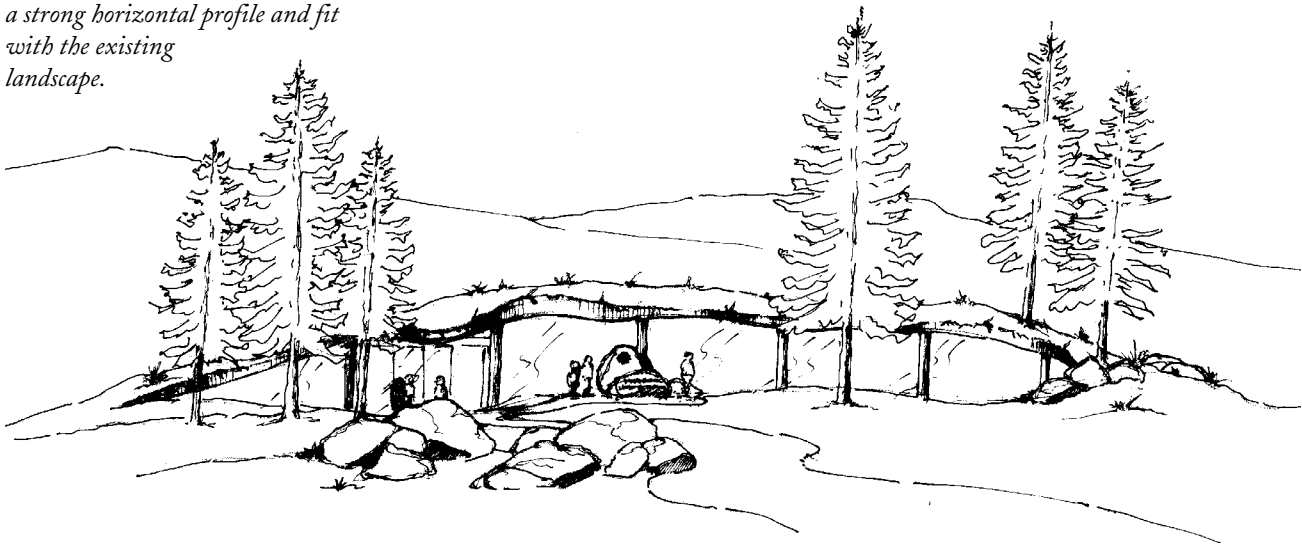
Guidelines for the building architecture are intended to help define the visual and physical character of all structures associated with visitor center and interpretive overlook sites.



Use native materials consisting primarily of stone and wood for structures.

- Place buildings in such a way as to minimize alteration of terrain or intrusion into the natural character of a site. Make buildings subordinate to nature. In a forest setting, site buildings between trees and accent spaces in the landscape.
- Use a simple and consistent palette of colors for architecture structures.
- Construct building complexes so the natural landscape continues through and is reflected in the final design.
- Create outdoor spaces to provide the transition between the activity within the building and the exterior natural environment. These outdoor spaces could be used for eating, sitting, relaxing, or waiting for others.
- Design windows and doorways to bring views, natural light, sounds, smell, and air into interior spaces.
- Design buildings to have a horizontal emphasis. Shadowed roof overhangs, horizontally patterned wall elements, and rustic lower walls following the natural grade all help achieve this goal. Use vertical elements such as masonry chimneys, structural frames, and major wall openings as secondary elements to lend visual counterpoint.
- Incorporate signage for structures as part of the facade. Construct these signs of wood, copper, bronze, stone, or other acceptable material; make sure these signs are in scale with the adjacent elements of the building and appropriate to its location.
- Limit structures to one- or two-stories in height.
- Construct facades out of materials that weather naturally. Rather than having a painted or finished exterior indifferent to the elements, weathering materials respond visibly to the effects of sun, rain, wind, and snow. Clear or semitransparent stains are preferable to opaque stains. Confine painted surfaces to trim and casings at building openings and protected locations such as galleries, porches and roof soffits.
- Use a strong, simple roof of appropriate scale and rustic materials that help give the structure a strong character and define the building entrance. Use natural roofing materials that weather where appropriate.

Visitor center structures should have a strong horizontal profile and fit with the existing landscape.

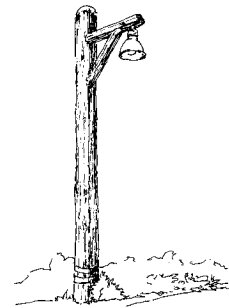


- Design architecture to emphasize simple massing and shapes. Use detail elements such as chimneys, roof framing exposed under soffits, beams and brackets, the form and profile of masonry elements size of columns and attendant connections, balcony railings, and stairs to provide visual interest.

Site landscaping, furniture, and lighting

Each visitor center and interpretive overlook is unique, but by using consistent site landscaping and furnishings, they will have a consistent character that helps travelers realize they are still on the Flathead Indian Reservation.

- Incorporate signage, curbs, sidewalks where appropriate; provide a trash receptacle for all interpretive / scenic turnouts.
- Concrete sidewalks should be colored to match the surrounding landscape.
- Incorporate stands of trees, rock outcrops, and other features into the arrival sequence and entrance into a building.
- Include site furniture such as benches, trash receptacles, bollards, gates, and construct them of natural materials that are compatible with both architecture and the site.



Use massing of rock outcroppings to help identify building entrances.

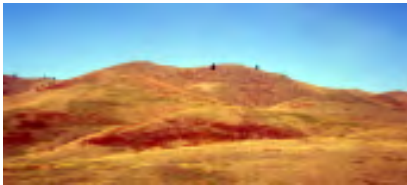


Landmarks, such as this Ponderosa pine, should be protected and incorporated as part of the final design.

Ravalli Hill Visitor Center

A new visitor center is being proposed for Ravalli Hill just west of US 93 and adjacent to the Bison Range.

- Abandon the present Ravalli Hill interpretive site and restore impacted area to its original condition.
- Design outdoor spaces created by buildings at Ravalli Hill so they direct the viewer's focus to the natural features of the area, including the Mission Range, the Mission Valley, and the Bison Range.
- Work with Mission Valley Power to relocate or bury existing overhead power lines that negatively impact views of the Mission Valley from the new visitor center.
- Provide cattle guards at the road underpass at Ravalli Hill to allow vehicles to maneuver under the bridge while at the same time preventing wildlife from using this area as a crossing.
- Construct hike and bike trails that provide access to scenic overlooks at the Ravalli Hill site and that connect to the mountains and valleys east of US 93.
- Consult with the U.S. Fish and Wildlife Service at the National Bison Range regarding:
 - Construction/relocation of a visitor facility for the National Bison Range at this site.
 - Possible modifications to existing fencing for the Bison Range in order to minimize barriers to movement of deer and other wildlife.
 - Interpretive planning options for visitors who want to view the Bison Range.



View of the Bison Range.



The proposed visitor center at Ravalli Hill will provide striking views of the Mission Range, the Mission Valley, and the Bison Range.

Ninepipe Interpretive Overlook

A new interpretive overlook is being proposed for the Ninepipe area. The site is intended to provide information to visitors about the Ninepipe wetlands complex and the wildlife found within the area.

- Construct a paved turnout to allow visitors a place to pull off US 93 and get a view of the Ninepipe Wildlife Refuge.



Photographs of the Ninepipe area.

Polson Hill Interpretive Overlook

A new interpretive overlook is being proposed for Polson Hill. The site would be developed at or near the crest of the hill near the location of the existing pull-offs, and is intended to provide visitors a view of Flathead Lake.

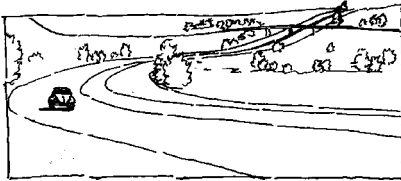
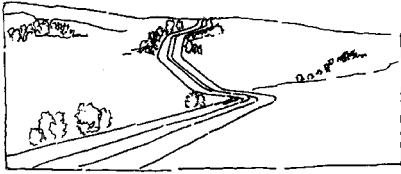
- Explore shifting the US 93 horizontal alignment to the west to allow for additional room for development of the interpretive overlook.
- Include interpretive signage that tells the story of Flathead Lake and the surrounding countryside, and which informs the public regarding Tribal management of natural resources on the Reservation.



An interpretive overlook at Polson Hill would provide visitors a good location to view Flathead Lake.

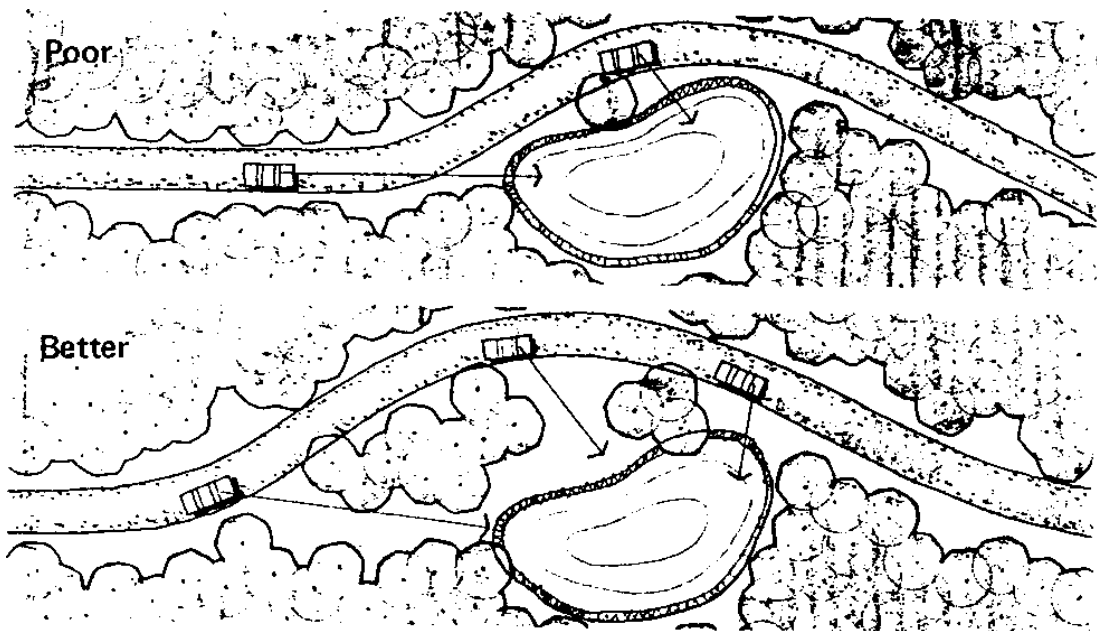
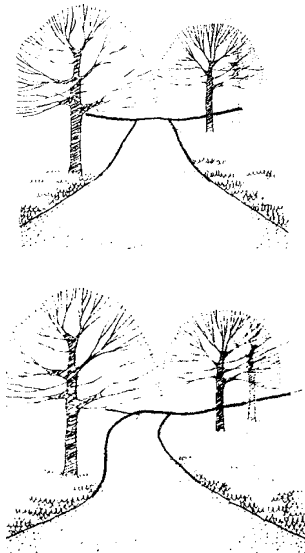
Road Alignment & Configuration

Fitting Road to Landscape - Horizontal Alignment



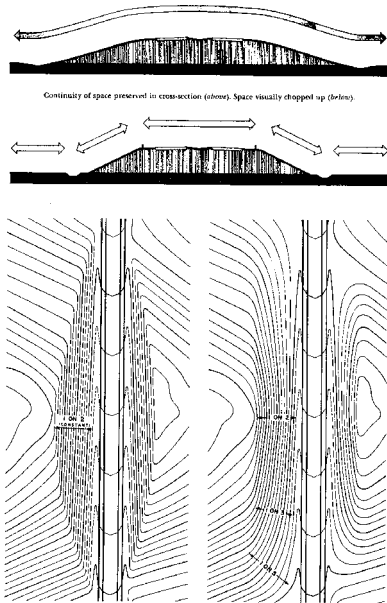
Avoid using curves separated by long, straight tangents. Instead of tangents, incorporate spiral or transition curves to achieve a continuous, curvilinear road that molds with the rolling terrain features.

- In limited areas where realignment may be feasible, realign the road in a curvilinear manner so views of the surrounding landscape will be enhanced for highway travelers. These subtle meanders or curves in horizontal alignment will allow the road to better fit the landscape. All horizontal curves will meet or exceed AASHTO standards. For the most part, this curvilinear realignment can occur within the right-of-way established by the Access Control and Corridor Preservation project.
- Avoid long, straight stretches of road where the road becomes the dominant visual element. Long, straight sections are also conducive to boredom and increased travel speeds.
- Use the design of the road to enhance views of significant landscape features and vistas of water bodies, valleys, mountain ranges, etc. by altering the orientation of the road so it is directed toward the landscape feature. Conversely, care should be taken to not block scenic views and vistas.



Horizontal alignment should react to existing landscape features.

- Avoid using curves separated by long, straight tangents. Instead of tangents, incorporate spirals or transition curves to achieve a continuous, curvilinear road that molds with the rolling terrain features.
- Explore using a reddish aggregate for travelway pavement similar to that already in place north of Elmo. The reddish aggregate helps create a distinctive visual appearance for the road within the Reservation. Differentiation of the travelway from the shoulder will help to decrease the scale and visual impact of the road.



This is an example of how the transition between cut /fill slopes and existing landforms should be handled to insure continuity.

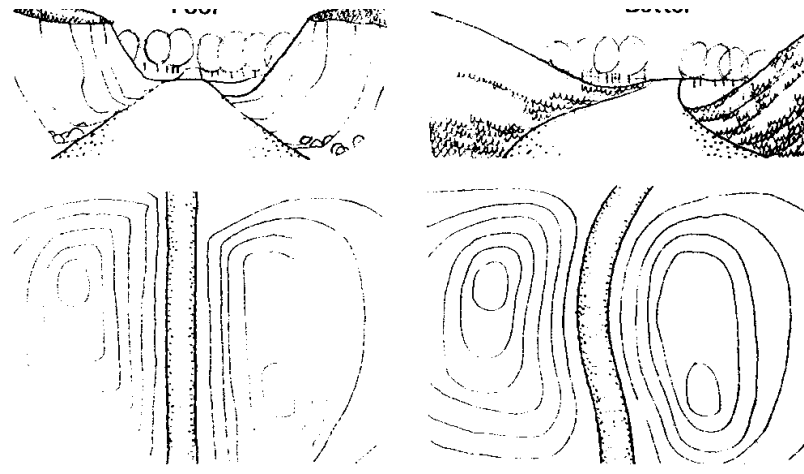
In Pablo, the road cross-section is reduced to allow for berms planted with native pines separating the roads.



Fitting Road to Landscape - Vertical Alignment

- Design roads so they respond to the landscape, blend in with the environment, and follow contours to avoid large cuts and fills.
- Develop vertical curvature that reflects the rolling movement of the landscape. All vertical curve data will meet or exceed AASHTO standards.
- Wherever possible, the new roadbed should be close to the existing ground to keep from creating a dam-like effect that splits the landscape. Cut and fill slopes should be kept to a minimum, with edges rounded to match the existing landforms. Surfaces of graded slopes should be left with a rough texture to promote vegetative growth.
- Where applicable, remove the existing road structure and lower the new roadbed to an elevation more in keeping with the existing grade in areas where the finished grade of the existing road is considerably higher than the surrounding ground plane. This will prevent the new road from creating a dam-like effect that splits the landscape, disrupts normal hydrologic flow under the road, and is a barrier for wildlife movement. In areas where wildlife crossings are required, however, the road may need to be raised instead.





The preferred horizontal alignment follows the landform, minimizing cut and fill.

Divided Independent Road Sections

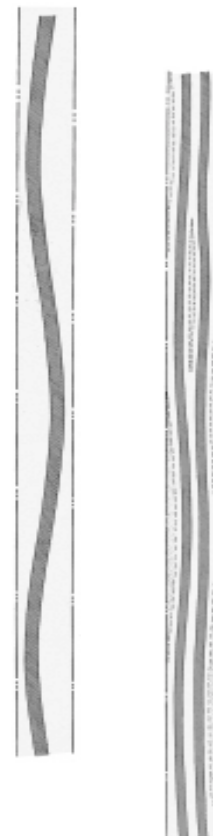
- Minimize the impact of the road on the landscape in areas with a four-lane divided configuration, such as north and south of Arlee and between Ronan and Polson, and allow the landscape character to cross the road with native landforms, rocks, and plant material up to the shoulder margins and across the land in the median strip between the roads.

Deviations from Right-of-Way

This section of the guidelines is intended to address issues related to relocating the road outside of the right-of-way.

In most locations, new alignments for US 93 shall be designed to fit within *the* right-of-way as established by the Access Control and Corridor Preservation project. Areas where a new alignment goes outside of the right-of-way includes, but is not limited to:

- (1) Parcel 5-133 (parcel numbering is in accordance with the Access Control and Corridor Preservation plan), which is west of US 93 and is located approximately 1.5 mile



Examples of curvilinear alignments within the right-of-way.



south of Pablo. This parcel is Tribally owned.

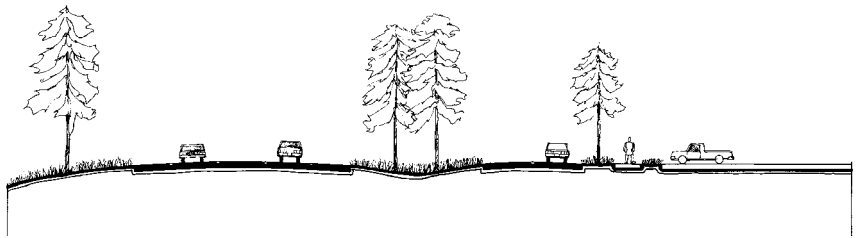
- (2) Parcel 5-34, which is east of US 93 and is located just south of the Pablo city limit. The realignment is intended to emphasize the dunes and pines as you enter Pablo. This parcel is Tribally owned.
- (3) Parcel 5-82, which is west of US 93 and is located just north of the Tribal housing center at the north end of Pablo. The realignment is intended to emphasize the dunes and pines as you enter Pablo.

Highway Shoulders

This section of the guidelines is intended to address issues related to the use of shoulders along US 93.

- Provide paved shoulders along the majority of the road. The width of the shoulders should meet AASHTO/State standards.
- Use rumble strips per MDT policy at edge of road to help separate the road from the shoulder.

In Ravalli, a reduced cross-section allows for planted buffers between the highway, frontage road, and pedestrians.

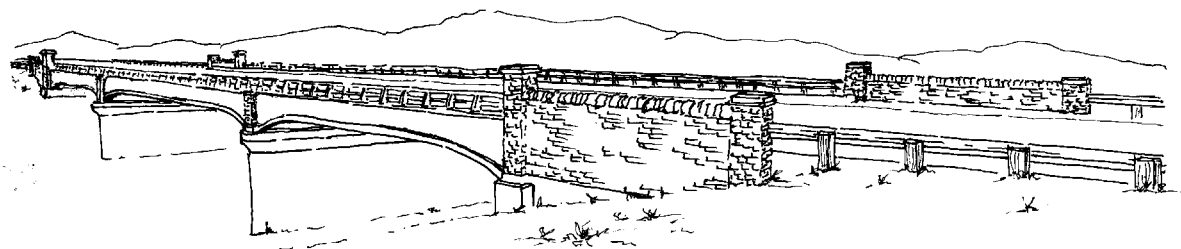


Road Accessories

This section of the guidelines is intended to address issues related to guardrails, bridges, culverts, ramps, walls, or other elements located adjacent to US 93.

- To help delineate special locations such as scenic overlooks, interpretive sites, and portals, guardrails should be constructed of steel-backed timber beams and posts and left natural or stained, not painted. In other locations, guardrails could be cor-ten or weathering steel w-beams on wood posts. Design guardrails and bridge rails to be crashworthy and to meet or exceed all AASHTO standards.
- Construct all bridge railing walls, headwalls, and wing walls of reinforced concrete and finished with a veneer. Fabricated stone

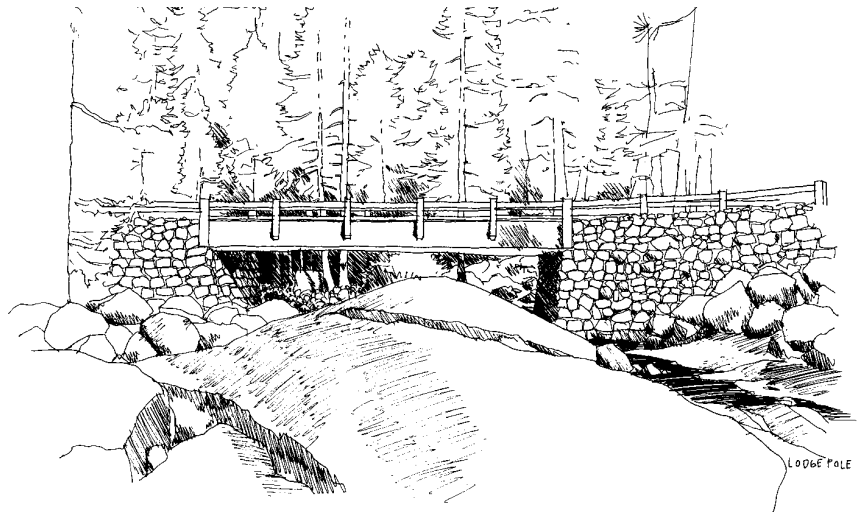
Use a stone veneer for visible sections of major road structures.



vener may be acceptable if the visual quality is indistinguishable from natural stone.

- Because the intent of a veneer wall is to look like a solid stone wall, it is important that the end, top, and back of the stem wall (if it will be exposed to viewing) also be veneered. Individual stones on the veneer should be staggered so joints do not line up. Vary individual stone sizes to avoid the look of uniform courses of stone and to help stagger the joints. Construct walls with a maximum space between contiguous stones of 3 to 4 inches, joints between the planes of two adjacent stones at a minimum of 1/2 and a maximum of 2 inches, and all joints raked deep enough to give the appearance of a dry-laid wall.
- Avoid constructing retaining walls or other structures if a desired

A finish using natural materials will help fit road structures into the existing character of the landscape.



effect or function can be attained through grading and revegetation with little or no site disturbance.

- Step or terrace high walls to create planting pockets or ledges for native vegetation in order to soften the appearance on any new or reconstructed walls.
- Terminate guardrails at natural or man-made landforms.

Recommended Construction & Maintenance Practices

This section of the guidelines looks at issues relating to construction and maintenance, and ways that design can minimize and eliminate potential problems.

- Preserve existing natural and cultural settings before, during and after site and building construction.
- Confine construction zones, material stockpiling areas, and construction vehicle access and parking areas to fixed, designated areas. Use temporary barricades or continuous barriers to protect trees, plants, landscape features, and cultural resources to be preserved.
- Design the road, shoulders, and surrounding landscape in such a way as to minimize mowing and spraying along the road corridor. Use permanent features that will protect sensitive natural areas from

sanding material, chemicals, plowed snow, or other runoff from the roadway. Sensitive natural areas are wetlands, riparian areas, wildlife habitat, restored ecological sites, stream crossings, cultural sites, or other designated areas. Design features may include, but are not limited to: berms, catch basins, gravel filters, sediment ponds, vegetation buffers, headwalls, intercept ditches, barriers, slope grading, filtering systems, and swales.

- There will be and no spraying in or near wetlands, stream crossings, restored ecological sites, wildlife crossing structures, or other sensitive natural or cultural areas.
- Design the road, shoulders, and surrounding landscape in such a way as to minimize the migration of gravel, sand, chemicals, and other materials typically applied for winter driving conditions in or near wetlands, stream crossings, wildlife habitat areas, restored ecological sites, wildlife crossing structures, or other sensitive natural or cultural areas.



Vegetation

This section of the guidelines is intended to address issues related to vegetation. It covers the protection of existing vegetation, revegetation of disturbed vegetation, slope construction and preparation, planting design, and a list of recommended plant material.

Protection of Existing Vegetation

The objective of vegetation protection is to preserve the scenic and environmental values of the road corridor.

- Provide CSKT with an opportunity to identify and/or collect plants located within the construction limits prior to initiating construction.
- Do not clear or grub vegetation beyond the staked construction limits of the roadway.
- Preserve large trees wherever possible. All conifers 50 years and older (i.e. 18" d.b.h. or larger) are candidates for preservation. Each tree that meets this criterion will be evaluated individually.
- Preserve shrubs and trees at or near stream crossings, wildlife crossing structures, and at jump-outs in areas of continuous fencing. Refer to the US 93 Wildlife Crossings Workbook for recommendations on specific types, locations, and details of individual wildlife crossings.
- Premark vegetation that needs to be protected prior to any construction activity. Show the vegetation to be protected on plans, flag the vegetation on site, and verify that the vegetation has been protected as specified. Use continuous construction fencing to cordon off areas to be protected.
- Protect native seedling and sampling trees.
- Use barricades, barriers and fencing to protect existing vegetation during the construction process.
- Areas of special concern for protection of existing vegetation include:
 - Frog Creek to East Fork Finley Creek
 - Jocko River Fish and Wildlife Crossing



- Jocko Spring Creek to Copper Creek
- Mission Creek Crossing
- Post Creek Drainage #3 Fish and Wildlife Crossing
- Post Creek Drainage #4 Fish and Wildlife Crossing
- Post Creek Fish and Wildlife Crossing
- Ninepipe Wetlands Complex
- Crow Creek Fish and Wildlife Crossing
- Dunes between Ronan and Pablo
- Incorporate these protective measures into MDT's construction contract, plans, and specifications when possible in the form of a vegetation protection/preservation plan.

Revegetation of Disturbed Areas

The objective of revegetation is to stabilize disturbed soils to prevent erosion and sedimentation and to reestablish indigenous vegetation for habitat and scenic value.

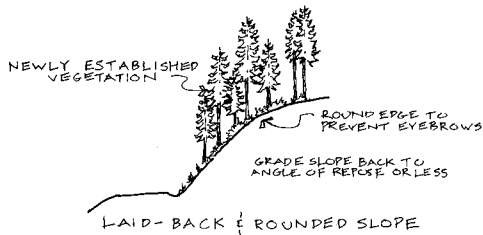
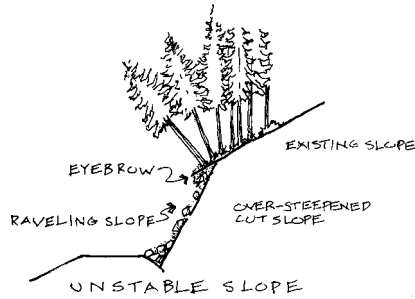
- Develop detailed revegetation plans for areas of special concern, including stream crossings; wetland crossings; wildlife crossings and jump-outs where continuous fencing is required. Refer to the US 93 Wildlife Crossings Workbook for recommendations on specific types, locations, and details of individual wildlife crossings.
- Use only indigenous plant materials for revegetation of disturbed areas. Species considered indigenous for purposes of the project are identified in the following plant list.
- Develop a seed mix composed of indigenous pioneer species. Use this mix for erosion control on large open slopes and in disturbed areas along the roadway to prevent the establishment of noxious and invasive species.
- Make special effort to salvage and reuse topsoil, plant materials, duff and litter taken from areas within the construction limits.
- Use a mix of successional stage species to leave the disturbed area looking much like the adjacent natural environment.
- Preserve the genetic purity of the local biotic community. This means using only plants descended from those in the vicinity for revegetation projects, whenever possible.
- From Frog Creek to East Fork Finley Creek – Salvage and replace dead and downed logs, duff, and litter on the site. These materials will give the rehabilitated site a more natural appearance, encourage use of wildlife crossings, and accelerate the reestablishment of native forest edge species.

MDT may use federal funds for environmental restoration and pollution abatement projects to address water pollution or environmental degradation caused or contributed to by transportation facilities at the time of reconstruction. With such funding, MDT shall repair and restore historic impacts that remain from abandoned US 93 facilities in the corridor.

Slope Construction & Preparation



This section of the guidelines is intended to address issues related to the construction and preparation of slopes adjacent to the road.



Grade slopes back to the angle of repose or flatter. Round top of cut bank to create a natural appearance and to prevent an “eyebrow” that would be unstable.

- Grade slopes back to the angle of repose or flatter. Round top of cut bank to create a natural appearance and to prevent an “eyebrow” that would be unstable. This technique may not be appropriate if the slopes in question are extremely high.
- Avoid cutting rock faces if possible. If a cut must be made, remove the excess rock along natural fracture planes. Avoid visible drill marks. Explore opportunities for creating planting pockets. Treat raw faces with some type of accelerated weathering agent that gives the rock a natural weathered look.
- New grading should blend with and preserve the natural landforms and features of the area. Avoid grading and construction practices that disturb natural features and would promote erosion and require extensive revegetation.
- Minimize grading and excavation by the careful fitting of roads, parking, and buildings to sites. Limit cut and fills and use naturally rounded tops and toes of slopes to diminish erosion. Avoid any grade changes within the drip line of any trees to be preserved.
- Avoid improper drainage practices that would have a strong negative impact not only on the site where the work is done, but also on land downstream. Preserve the natural drainage pattern of a site, which is the result primarily of its topography and vegetation.
- Ensure the surface of graded slopes is rough, not smooth and even. Rough slopes are easier to revegetate because the rough texture provides better seed establishment sites.
- Salvage and replace topsoil. This practice improves the planting medium and restores the native seed bank and soil microbiota.

Planting Design

This section of the guidelines addresses issues related to planting design and the introduction of new vegetation.

- Develop planting designs that replicate the patterns of naturally occurring plant communities.
- Ensure new plantings of trees, shrubs and groundcover are in groups of similar species, rather than alone or with a number of other species.
- Plant in clusters or with random spacing, rather than straight rows.
- Soften edges between existing vegetative patterns and road construction areas by using undulating clearing limits.
- Use indigenous low-growing shrubs and grasses within the clear zone width as established by MDT.
- Provide vegetation through riparian areas to provide cover for wildlife.
- Plant trees and shrubs at or near entrances to wildlife crossings to provide cover for wildlife and encourage use of the crossings. Provide trees and shrubs at all jump-outs where continuous fencing is required.
- Use vegetation in selected areas to screen undesirable views. Landscape planting for function and form can be an effective means of facilitating traffic and screening selected areas.
- Where horizontal changes in road alignment have been



incorporated, explore adding indigenous vegetation to help block glare of lights from oncoming traffic and control/enhance views.

- Blend new plantings into the existing landscape so that all traces of construction-wrought damage will vanish in a few years.
- Ensure new plantings receive appropriate care and maintenance through the plant establishment period, which is usually one to two years after planting.

Plant Materials

Use only indigenous plant materials. Species considered indigenous for purposes of the project are identified in the following plant list.

Riparian Areas

Trees

- *Betula papyrifera* (Paper Birch)
- *Picea engelmannii* (Engleman Spruce)
- *Populus trichocarpa* (Black Cottonwood)
- *Populus tremuloides* (Quacking Aspen)

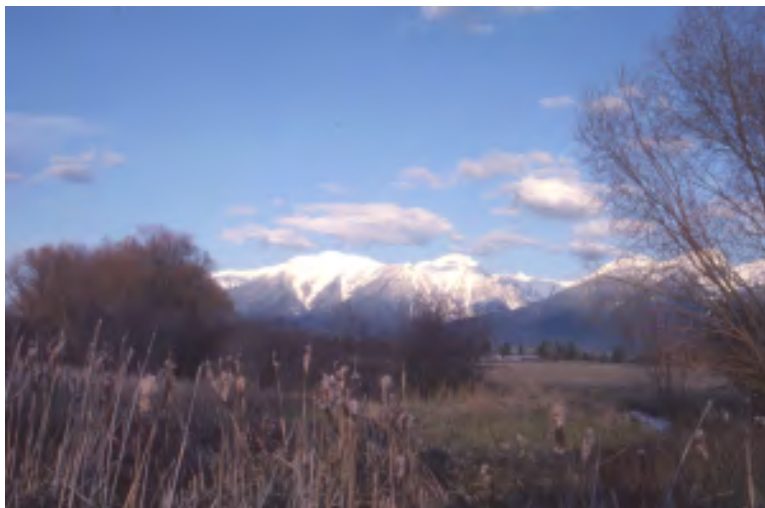
Shrubs

- *Acer glabrum* (Rocky Mountain Maple)
- *Alnus incana* (Mountain Alder)
- *Amelanchier alnifolia* (Western Serviceberry)
- *Betula occidentalis* (Water Birch)
- *Clematis ligusticifolia* (Western Virgins-bower)
- *Crateagus douglassi* (Black Hawthorn)
- *Crataegus columbiana* (Columbia Hawthorn)
- *Cornus stolonifera* (Red-osier Dogwood)
- *Linnaea borealis* (Twinflower)
- *Lonicera involucrata* (Black Twin-berry)
- *Prunus virginiana* (Common Chokeberry)
- *Ribes americana* (Black Currant)
- *Rubus parviflorus* (Thimbleberry)
- *Salix bebbiana* (Bebb Willow)
- *Salix boothii* (Booth Willow)
- *Salix drummondiana* (Drummond Willow)



Paper Birch

Wetland at Ninepipe showing cattails, reeds and willows.





Cattails



Red-osier Dogwood



Quaking Aspen

- *Symphoricarpos occidentalis* (Western Snowberry)

Gramminoids

- *Agrostis stolonifera* (Redtop)
- *Carex aquatilis* (Water Sedge)
- *Carex bebbii* (Bebb's Sedge)
- *Carex laniginosa* (Woolly Sedge)
- *Carex rostrata* (Beaked Sedge)
- *Deschampsia cespitosa* (Tufted Hairgrass)
- *Glyceria grandis* (American Mannagrass)
- *Juncus balticus* (Baltic Rush)

Ninepipe Wetlands Complex

Wetland Gramminoids

- *Agropyron trachyaulum* (Slender Wheatgrass)
- *Carex nebraskensis* (Nebraska Sedge)
- *Calamagrostis canadensis* (Bluejoint Reedgrass)
- *Deschampsia cespitosa* (Tufted Hairgrass)
- *Juncus balticus* (Baltic Rush)
- *Poa compressa* (Canada bluegrass)
- *Poa ampla* (Big Bluegrass)
- *Scirpus acutus* (Hardstem Bullrush)
- *Typha latifolia* (Common Cattail)

Upland Gramminoids

- *Agropyron dasystachyum* (Thickspike Wheatgrass)
- *Agropyron spicatum* (Blue Bunch Wheatgrass)
- *Festuca idahoensis* (Idaho Fescue)
- *Festuca scabrella* (Rough Fescue)
- *Koeleria cristata* (June Grass)
- *Poa sandbergii* (Sandberg's bluegrass)

Uplands

Trees

- *Pinus ponderosa* (Ponderosa Pine)
- *Juniperus communis* (Common Juniper)
- *Juniperus scopulorum* (Rocky Mountain Juniper)
- *Juniperus occidentalis* (Western Juniper)
- *Populus tremuloides* (Quaking Aspen)
- *Populus trichocarpa* (Black Cottonwood)

Shrubs

- *Amelanchier alnifolia* (Western Serviceberry)
- *Cornus stolonifera* (Red-osier Dogwood)
- *Crataegus douglassii* (Black Hawthorn)
- *Rosa woodsii/acicularis* (Prickly and Woods Rose)
- *Potentilla fruticosa* (Shrubby Cinquefoil)
- *Prunus virginiana* (Chokecherry)
- *Rhus glabra* (Smooth Sumac)
- *Sorbus scopulina* (Mountain Ash)
- *Salix spp* (Willow)

Forbs/Gramminoids

- *Achillea millefolium* (Western White Yarrow)



- Agropyron dasystachyum (Thickspike Wheatgrass)
- Agropyron spicatum (Blue Bunch Wheatgrass)
- Artemisia frigida (Fringed Sage)
- Artemisia tridentata (Sagebrush)
- Artemisia ludoviciana (Prairie Sage)
- Aster chilensis (Pacific Aster)
- Calamagrostis canadensis (Bluejoint Reedgrass)
- Cleome serrulata (Rock Mountain Beeplant)
- Elymus glaucus (Blue Wildrye)
- Elymus lanceolatus (Thickspike Wheatgrass)
- Elymus trachycaulus (Slender Wheatgrass)
- Festuca idahoensis (Idaho Fescue)
- Festuca ovina (Sheep Fescue)
- Festuca scabrella (Rough Fescue)
- Koeleria cristata (June Grass)
- Lupinus argenteus (Silverleaf Lupine)
- Poa ampla (Big Bluegrass)
- Poa sandbergii (Sandberg’s Bluegrass)

Pedestrian/Bicycle Access

This section of the guidelines refers to pedestrian-oriented facilities, such as walks, trails, paths, and crosswalks.

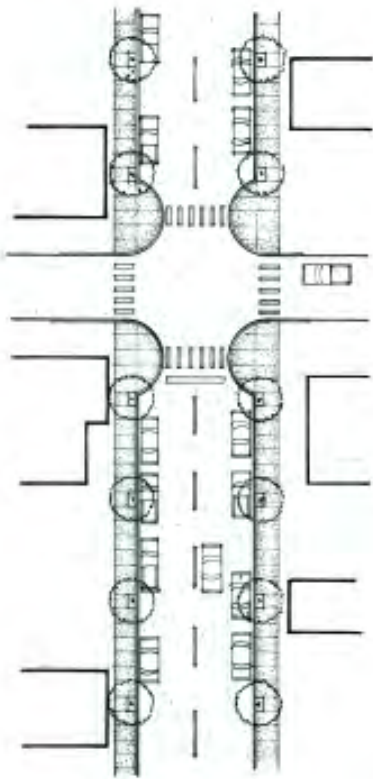
- In general, pedestrian walkways should be considered for linking towns and communities.
- Construct pedestrian walks within the right-of-way of US 93 within towns and communities that have a reduced speed limit. In particular, add pedestrian crosswalks in selected locations in Arlee, Pablo,



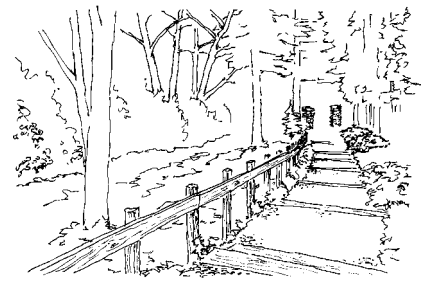
Proposed urban cross-section of US 93 through Arlee showing pedestrian areas buffered from roadway by parking and plantings.

and Ronan. In Arlee, provide sidewalks along both sides of existing US 93. Such walks should be separated from the road by road medians with plantings and berms to create a buffer. Add pedestrian “bubbles” at specific intersections that extend the sidewalk into the





Plan view of road through Arlee showing street trees, curb bump outs, and crosswalks.

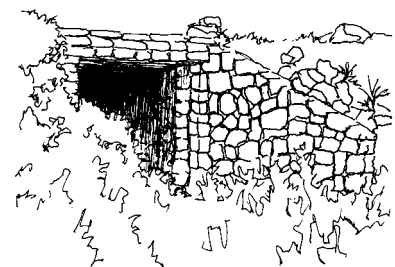


- street and reduce the distance pedestrians have to walk to cross the road.
- Construct paved shoulders along the majority of the road at a sufficient width to allow for bicycles to travel safely. Shoulder widths should comply with MDT standards.
 - If a couplet is provided in Arlee for southbound traffic, restrict pedestrian access by not allowing sidewalks on either side of the couplet and by limiting crosswalks to selected areas at the north and south end of the couplet.
 - South of Arlee, from North Couture Loop to Coombs Lane, provide a gravel or dirt pathway along west side of the road for multimodal access, including equestrian access.
 - North of Arlee, from E Street to Oxford Lane, maintain the existing paved pathway along the east side of the road for pedestrian and bicycle usage.
 - Construct sidewalks of concrete tinted to match the color of the surrounding ground in areas where visitor centers or interpretive facilities are to be developed and sidewalks are to be included.
 - Construct trails and paths so they follow existing topography and work around trees, creeks, rocks, and other natural features. Avoid interrupting natural drainage patterns when designing and constructing trails and walkways. Where a swale or creek must be crossed, use a raised bridge structure to minimize potential impact.

Wildlife Crossing & Habitat

This section of the guidelines addresses issues related to the design, construction, maintenance, and monitoring of proposed wildlife crossings for US 93.

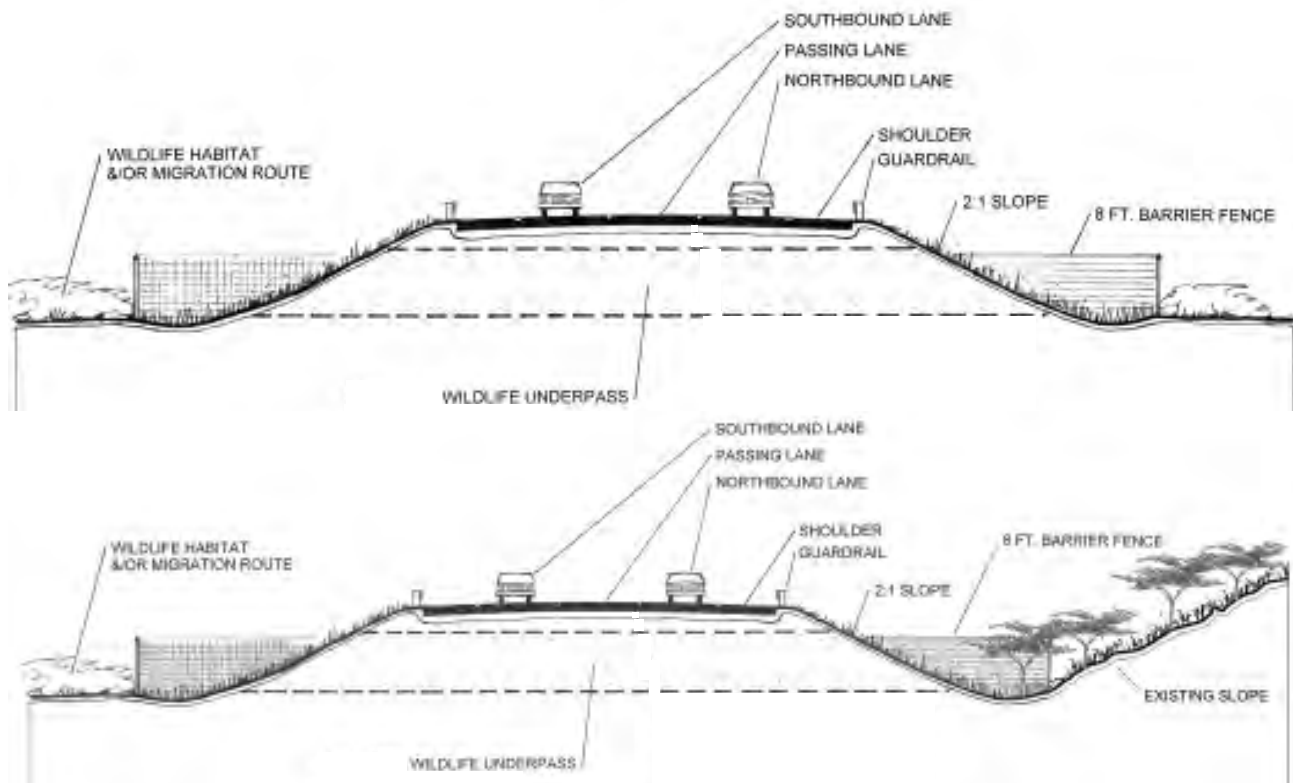
- Seek to have commercial, residential, and industrial development limited in areas adjacent to wildlife crossings.
- Refer to the US 93 Wildlife Crossing Workbook for recommendations on specific types, locations, sizes, and details of individual wildlife crossings. The wildlife crossings indicated are based upon currently available research and are intended primarily to conceptually convey the basic objective of each crossing. Many of the crossings are similar to structures used along the Trans-Canada Highway in Banff National Park.
- Determine the actual size, type of structure, and location during the design phase of the project. The total number of wildlife structures may vary depending upon analysis of specific site locations.
- Base sizes of crossings primarily on the minimum clearance required for



specific wildlife species. When multiple species are expected to use a particular crossing, design the crossing for the largest species that is expected to use a specific crossing.

- Restore vegetation along riparian zones leading up to wildlife crossings. Provide cover to shield the entrance to each wildlife crossing from the road while maintaining visibility through the crossing.
- Construct wildlife crossings at a sufficient size to allow light to be visible on the other side of the crossing; i.e. animals should be able to see through the structure to the other side.
- Develop a monitoring system for all major wildlife crossing in order to document crossing usage and to collect data that can be used for other similar projects. Identify necessary funds for the monitoring system.
- Orient wildlife undercrossings so that they are perpendicular to the road in order to reduce the overall length of the crossing and to minimize costs. This will also help improve visibility from one side of the crossing to the other.
- In areas with divided independent roads, extend wildlife crossings under or over each road, and the area between the roads will be fenced to control wildlife movement between the two. These areas should be vegetated so they serve as a safe haven for wildlife utilizing the crossings.
- Construct raised berms on wildlife overcrossings that extend the length of the crossing. Use three berms; one on each edge of the crossing structure, and one through the middle of the structure – to create artificial ridges and valleys.
- Vegetate wildlife overcrossings with a range of vegetation, including grasses, shrubs, and evergreen or deciduous trees. Include deadfall such as recycled Christmas trees or other materials that will provide temporary shelter for small animals until more permanent

Cross-section of road showing wildlife crossings.



sections – (1) the 8' fencing above ground and (2) fencing buried underground to serve as a dig barrier buried. Use a locking knot to tie the two together.

- Establish a maintenance program to ensure that any damage to the fencing is repaired in a timely manner. Identify the necessary funds for the maintenance program.
- The approximate size of the fencing is 96" high with 20 horizontal wires and vertical stays 12" apart. The wire is to be galvanized, 12 ° gauge or better.
- Use treated posts of no less than 6" in diameter. Depth of setting depends on soil types, with posts set in rocky soils to be approximately 4' in depth, and posts set in sandy soils to be approximately 6' in depth. Select treated posts preserved with a substance other than either creosote or pentachlorophenol.
- Braces are the backbone of any fence and must be built correctly. Braces may be single or double, however the width should always be 2-1/2 times the height of the fence. Cross members should be round wood posts, with lumber or landscape timbers not being acceptable. Use twitch wire, which consists of double wraps of wire, to anchor the cross members securely or the brace will fail.
- Generally, the use of 20' post centers is adequate for fencing, but place a rigid post at the lowest point of a dip and the crown of a hump. Make these posts larger than the line posts and set a little deeper. They will hold the fence up or down as required.
- Tie the wire off at both ends of the fence and tensioned to the middle of the pull to allow the fence to be tied off without being under tension.
- Use a locking knot, which locks vertical and horizontal wires



Wildlife fencing set back from road to provide safe area for animals caught on wrong side of fence.

Fence at wildlife crossing is intended to restrict animal movement across the road and to funnel wildlife toward crossing structures.



Fence detail showing 8' fencing above ground and 2' fencing buried underground to serve as a dig barrier. Use a locking knot to tie the two together.



together, so animals are not able to penetrate the fencing. The deep crimp in the horizontal wire maintains fence tension and allows the fence to follow rough terrain.

- Provide sufficient site opportunity at US 93 accesses to facilitate safe entry to US 93.

Water & Hydrology

The objective of the water runoff guidelines is to maintain the chemical, physical and biological quality of wetlands and streams, to prevent contamination of groundwater, and to provide erosion and sediment control.

- Use bioswales composed of indigenous plant materials to minimize problems with water runoff. In wetland areas, create ribbon marshes that run parallel to the road that can be used to filter runoff. Ribbon marshes would consist of cattails and other appropriate plants. Bioswales to be conducted using best management practices (BMPs).
- Fill material may be excavated from selected areas. It may be permissible to excavate down to or near high water table in order to create artificial wetlands. In particular, this could occur in Schall Flats.
- Restore streams that have been channelized due to previous road construction related to US 93. Return stream to their original channels.
- In Ninepipe, incorporate structures to maintain healthy ecological systems and to allow wildlife passage.
- Incorporate a filtering system as part of the final road design that will prevent water from running off the road into sensitive wetland and riparian areas.
- Use urban cross-sections in selected populated areas in order to control runoff. All urban cross-sections shall include a stormwater collection and treatment system utilizing BMPs.
- In wetland areas, incorporate runoff treatment facilities to ensure

high water quality. Possibilities include bioswales, natural appearing constructed treatment ponds, and impervious lined channels planted with indigenous materials. The impervious lined channels would run parallel to the highway to capture, treat, and direct the flow of road runoff.

- Minimize the area of impervious surface in order to reduce runoff.
- Use a filtering system to prevent stormwater from discharging directly into wetlands or streams.
- Use treatment wetlands and bioswales composed of indigenous plant materials to treat paved surface water runoff in rural cross-sections. Constructed wetlands treatment systems are engineered systems that have been designed and constructed to utilize the natural processes involving wetland vegetation, soils, and their associated microbial assemblages to assist in treating wastewater. They are designed to take advantage of many of the same processes that occur in natural wetlands, but do so within a more controlled environment.
- Select vegetation for constructed wetlands from hydrophytic plants that are suitable for local climatic conditions and tolerant of the concentrations of nutrients, pesticides, and other constituents in the runoff stream and selected for their treatment potential. Give preference to native wetland plants with localized genetic material.
- Maintain wetland and riparian vegetation buffers to filter sediment and chemical pollutants carried by stormwater runoff.
- Maintain cross-highway hydrologic pathways by properly locating and sizing culverts.
- Size bridges to span the stream channel and 100 year floodplain. Minimize the placement of fill material in the floodplain.
- Preserve a site's natural drainage pattern, which is the result of its topography and vegetation.
- Utilize surface drainage systems such as swales, culverts and retention basins instead of closed, underground systems. Locate release points to minimize erosion if underground systems must be used.

Guidelines will help minimize impacts to water bodies along US 93.



Corridor Land Use

This section of the guidelines is intended to address issues related to land use and development along the US 93 corridor.

- Restrict accesses along US 93 to those identified in the revised Access Control Plan. Control access along US 93 to minimize commercial development along the road.
- Improvement and expansion of US 93 will induce population growth, parcel subdivision, and development and construction in the US 93 corridor. These activities will cause habitat fragmentation, environmental impact, and significant change to the Reservation landscape. In response, MDT, FHWA, and the Tribes commit to diligently explore and apply methods for limiting and directing highway induced growth and development. As part of this exploration, FHWA, and MDT will investigate options for securing and expending Federal Highway Trust Funds toward limiting and controlling growth and development. Methods for consideration include, but are not limited to:
 - Corridor overlay zoning district in coordination with Lake and Missoula Counties
 - Development rights acquisition and/or transfer
 - Conservation Easements
 - Open space protection
 - Property acquisition
 - Access Control
- Increased traffic is anticipated on US 93 that will create a corresponding increase in the market for roadside advertising. Proliferation of billboards would create significant interruption of the visual landscape. In response, FHWA, MDT, and the Tribes commit to diligently explore and apply methods for controlling outdoor advertising throughout the US 93 corridor. As part of this exploration, FHWA and MDT will investigate options for securing and expending federal highway trust funds toward controlling outdoor advertising. Methods for consideration include, but are not limited to:
 - Institutional controls
 - Acquisition and removal of existing signs
 - Amortization of existing signs
 - Acquisition of scenic easements
 - Provide alternative signage and/or advertising kiosks under MDT ownership and control at select locations
 - Provide other advertising modes
 - Regulatory controls
 - Ban on new off-premise signs
 - Cap on the number of total signs
 - Conditional or special use permit criteria
 - Sign-free districts
 - Size, height, and spacing requirements
 - Site specific size and height restrictions
 - Annual permit fees
 - Removal for abandonment and disrepair
- Explore the acquisition of parcels that abut the highway and have land uses that are incompatible with environmentally sensitive areas



and restore those parcels in a manner that is consistent with the surrounding environment. Areas of concern include, but are not limited to, Jocko River crossing, Ravalli Canyon, and Evaro Hill, and parcels of land abutting US 93 at public road intersections.

- Coordinate with local governments regarding multi-jurisdictional zoning and development issues.
- Evaluate the feasibility of purchasing scenic or conservation easements to protect selected critical views. Areas of concern include, but are not limited to: the view of Flathead Lake from Polson Hill, and the view of the Mission Valley from the proposed Ravalli Hill visitor center.
- Tribal traditional knowledge together with contemporary wildlife mortality data indicate that wildlife crossings are needed at the areas between stations: (1) 141.2-148 on the right (east); (2) 161-162.4 on the right (east); (3) 163-163.6 on the left and right; (4) 308-312.8 on the right (east). The success of these crossings is dependent upon preserving and restoring the habitat abutting both sides of the highway and therefore MDT will diligently seek to acquire institutional control (i.e. fee title or conservation easement) in order to protect and preserve the wildlife approaches to these crossings.
- Secure open space protection left of recommended Arlee couplet (i.e. land west of recommended couplet) opposite mainline station 288.4-296.

Traffic Control Devices

Traffic control devices includes signal lights, lighting, crosswalks, and paint markings. Use state warrants for traffic control devices.

- Ensure all traffic control devices follow the national guidelines outlined in the Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD covers all aspects of the placement, construction and maintenance of every form of approved traffic control. The guidelines prescribe five basic requirements for all devices. They must: fulfill a need; command attention; convey a clear, simple meaning; command respect of road users; and give adequate time for proper response. The MUTCD emphasizes “uniformity” of traffic control devices, meaning that the device conforms to regulations for dimensions, color, wording and graphics. A device should convey the same meaning at all times since consistent use protects the clarity of their messages.
- Mark crosswalks at intersections where there is substantial conflict between vehicle and pedestrian movements, where significant pedestrian concentrations occur, or where pedestrians could not otherwise recognize the proper place to cross. Crosswalks are marked to encourage pedestrians to use a particular crossing. Examples of such locations include, but are not limited to, the following: approved school crossings and signalized intersections where there is significant pedestrian traffic and one or more crossing locations have been prohibited.
- Encourage local school districts to utilize school-crossing guards in areas where school crossings occur instead of resorting to pedestrian-activated signals.
- Use painted crosswalks only where necessary to direct pedestrians



along the safest route.

- Utilize consistent paint striping to establish a system of traffic control information that drivers can easily understand and follow.
- Install traffic signal lights only where less restrictive signs or markings do not provide a sufficient level of control. Traffic signals are intended to facilitate the orderly movement of traffic and are the most restrictive form of traffic control. Most intersections would not necessarily be improved or made safer by installation of a signal since unnecessary signals cause hazardous and annoying delays to the flow of traffic.
- Avoid using pedestrian-activated signals. Pedestrian signals are installed for two main reasons: a high volume of foot traffic at an intersection, or the signals directing motorists don't meet the needs of pedestrians. If existing traffic signals meet the needs of people on foot - the signals are easy to see and provide plenty of time to cross safely - there is not a need for pedestrian signals.
- Avoid using flashing beacons in an effort to simply slow down traffic. The purpose of flashing lights is to attract attention to unexpected hazards. A flashing beacon is most effective as a warning of unexpected or hazardous conditions not readily visible to drivers.

School Bus Turnarounds

To improve the safety and efficiency of designated school bus routes, provide school bus turnarounds at locations selected jointly with the school districts.

4. Bibliography

Architectural Character Guidelines. Sequoia & Kings Canyon National Parks. U.S. Department of the Interior, National Park Service, Western Regional Office, 1991.

Architectural Character Guidelines, Lake Chelan National Recreation Area – Final Draft Report. Jones & Jones, in consultation with the National Park Service, Denver Service Center. September 1993.

Meier, Lauren and Nora Mitchell, “Principles for Preserving Historic Plant Material”, CRM Bulletin, no. 6, 1990.

Snow, David E. Design Guidelines. Mt. McKinley Park Headquarters Historic District, Denali National Park & Preserve. Anchorage: National Park Service, Alaska Regional Office, June 1985.

Guide to Highway Construction Permitting in Montana (Montana Department of Transportation Construction Bureau, 1999).

“Nova Scotia Highway and Off-Premise Signage.” Nova Scotia Department of Economic Development, April 2000.

Constructed Wetlands for Wastewater Treatment and Wildlife Habitat: 17 Case Studies (EPA832-R-93-005). Environmental Protection Agency's Office of Wetlands, Oceans, & Watersheds, July 2000.



Drumstad, W.E., Olson, J.D., and Forman, R.T. *Landscape Ecology Principles in Landscape Architecture and Land-Use Planning*. Island Press, 1996.

Hornbeck, Peter and Garland Okerlund, Jr. *Visual Values for the Highway User: An Engineer's Workbook*, U.S. Department of Transportation, Federal Highway Administration, 1973.

Jones & Jones. *Evaluating Scenic Resources – Scenic America Technical Information Series*. Scenic America, 1997.

Jones, Johnpaul, Jones & Jones. *Institute of American Indian and Alaska Native Culture and Arts Development*. 1993.

Federal Highway Administration. *Visual Impact Assessment for Highway Projects*. (Jones & Jones) U.S. Department of Transportation, Federal Highway Administration, Office of Environmental Policy, 1981.

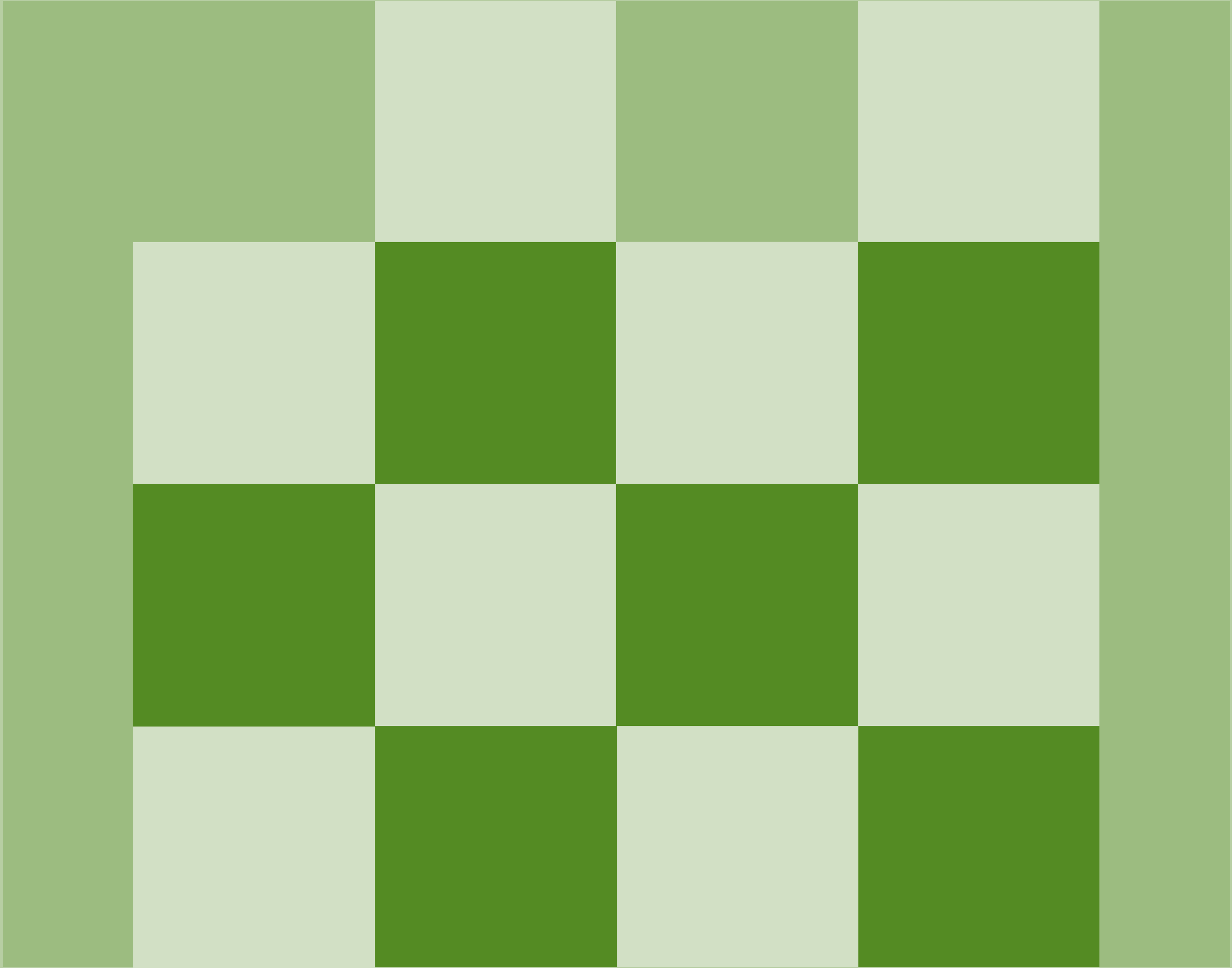
Hornbeck, Peter and Garland Okerlund, Jr., *Visual Values for the Highway User: An Engineer's Workbook*. U.S. Department of Transportation, Federal Highway Administration, 1973.

5. Preparers of Guidelines

Jones & Jones, Architects and Landscape Architects, P.S.C.
105 South Main Street
Seattle, WA 98104

with
Federal Highway Administration
Montana Department of Transportation
The Confederated Salish and Kootenai Tribes
Skillings/Connolly, Inc.





U.S. 93 DESIGN DISCUSSIONS

Project Committee:

Montana Department of Transportation

Federal Highway Administration

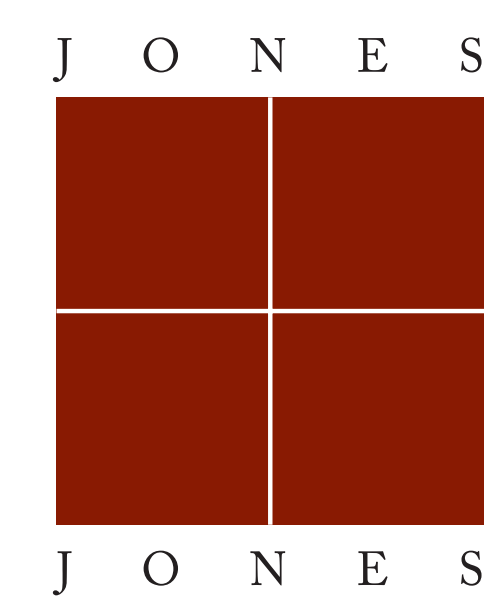
The Confederated Salish & Kootenai Tribes of the Flathead Nation

Prime Contractor: Skillings-Connolly, Inc. - Consulting Engineers

Evapo to Polson, Montana



December 20, 2000



Architects & Landscape Architects