Supplement 03 to

Final Mitigated Negative Declaration

BIG RIVER WATERSHED RESTORATION PROPOSITION 40 – RIVER PARKWAYS GRANT PROJECT State Clearinghouse # 2006072012

California Department of Parks and Recreation
California State Parks
Mendocino District
12301 North Highway 1 - Box 1
Mendocino, CA 95460

SUPPLEMENT TO A MITIGATED NEGATIVE DECLARATION

PROJECT; Big River Watershed Restoration, Proposition 40 – River Parkways Grant Project [Original State Clearinghouse # 2006072012 (October 2006)]

LEAD AGENCY: California Department of Parks & Recreation (California State Parks)

INTRODUCTION AND REGULATORY INFORMATION

This Supplement to the Final Mitigated Declaration (MND) for the Big River Watershed Restoration, Proposition 40 – River Parkways Grant Project (the Project), will be implemented at the Big River unit of Mendocino Headlands State Park, has been prepared by California State Parks (CSP).

This Supplement discloses a newly proposed project area that is within the scope of the MND's final project description and may collectively require preparation of a subsequent MND (California Code of Regulations (CCR) §15162). However, under CCR §15163(a)(1 & 2), the existing MND can be revised and rendered adequate for the altered project, provided minor changes and additions are specified, and none are deemed significant in their potential impacts to the environment. This supplement provides the details of the proposed project changes and an assessment of potential environmental impacts only for new project areas, in order to render the existing Final MND for the Project adequate (CCR §15163(b)).

This document has been prepared to comply with provisions of the California Environmental Quality Act (CEQA), the California Public Resources Code sections §21000 *et seq*., and the CEQA Guidelines (CCR §15000 *et seq*.). This Supplement to the Final MND will be subject to the same public notice and review requirements as a draft MND (CCR §15087 *et seq*.), with filing subsequent to public review and comment period with the State Office of Planning and Research, State Clearinghouse.

LEAD AGENCY

Under CEQA Guidelines §15051(b)(1), "the lead agency will normally be an agency with general governmental powers, such as a city or county, rather than an agency with a single or limited purpose." The lead agency assumes responsibility for and primary approval authority for a proposed project. For this project, the lead agency is California State Parks.

SUMMARY OF FINDINGS

Based on the revisions to the proposed project and the resulting changes and additions to its scope, including project requirements, as addressed in this document, findings have been made for each significant effect included in the previously certified MND as revised in this document. Findings are noted following the descriptions of each revision, where applicable.

AVAILABILITY OF DOCUMENTS

This Supplement to the Mitigated Negative Declaration for the Big River Watershed Restoration, Proposition 40 – River Parkways Grant Project will be available throughout the 30-day public review period at the following locations:

- California State Parks
  Mendocino District
  12301 North Highway One – Box 1
  Mendocino, CA 95460
  (707) 937-5804

- California State Parks website https://www.parks.ca.gov/?page_id=981

- CEQAnet Web Portal https://ceqanet.opr.ca.gov/

The Notice of Determination (NOD) for the originally certified MND on this project was filed on October 31, 2006 (SCH#2006072012). This Supplement will be appended to the originally certified Final MND following the filing of the NOD and will be available by request, along with all supporting materials, at the Sonoma-Mendocino District Headquarters office.

PROJECT DESCRIPTION:

This section includes the original summary project description, with annotations following for project scope elements that have been altered since the certification of the original MND.

California State Parks (CSP) proposes to correct erosion and sedimentation problems, improve stream crossings along roads, remove logging roads that contribute sediment to Big River and tributaries, convert roads to trails, restore predisturbance hydrologic processes, delineate parking areas, construct a restroom building, and improve public information within the Big River unit of Mendocino Headlands State Park. Goals of this project include road de-commissioning and conversion into recreational trails, stabilizing or removing skid trails and landings to restore riverine functions, improving fish passage and opening up new habitat for spawning and rearing, resurfacing and delineating parking locations, and constructing public toilets. Work related to these efforts will

include:

- Excavation and removal of road fill from stream channels to re-establish historical width, depth, alignment, and gradient;
- Removal of sidecast fill material along roadsides;
- Decompaction of road surfaces to facilitate revegetation by native plants;
- Retrieval and removal of debris (culverts, cable, concrete foundations, etc.) that negatively affect hydrologic processes and natural habitats;
- Restoration of the natural topography and hydrology of the land (ridges, stream valleys, and swales) along roadway corridors;
- Removal of non-native invasive plant species;
- Mulching and implementation of other stabilization techniques in disturbed sites using woody debris recovered from excavations;
- Monitoring and maintenance of disturbed areas to improve conditions for either human-assisted or natural revegetation with native species;
- Delineation of beach parking areas with boulders, logs, or other natural material;
- Resurfacing of the beach parking areas and primary road with compacted road base;
- Installation of a vault restroom facility outside the 100-year floodplain;
- Installing regulatory, informational, and interpretive signs pertaining to restoration efforts.

Specific watershed restoration activities will focus on ~~eleven~~ sixteen sites scattered throughout the Big River unit, with the parking area and restroom work comprising a ~~twelfth~~ seventeenth site.

CORRECTIONS AND ADDITIONS

This Supplement to the Big River Watershed Restoration, Proposition 40 – River Parkways Grant Project includes changes of scope in the Project that could result in substantial changes in Project circumstances, including newly identified significant effects or an increase in the environmental impacts of previously identified significant Project effects, as identified in CCR §15162, et seq., thereby requiring the preparation of a subsequent MND. However, in accordance with CCR §15163(a)(1 & 2), the lead agency may prepare a supplement to the original MND if only minor additions or changes would be necessary to make the previous environmental compliance document adequately applicable to the changes in project circumstances. Therefore, CSP has determined this Supplement to the original MND to be sufficient to identify the changed circumstances and subsequent revisions in the scope of the Project and pertinent Project requirements, and the preparation of a subsequent MND is not required.

The following corrections, additions, and deletions supplement, supersede, or otherwise inform applicable sections of the previously certified Final MND for the Project. Additions and corrections are underlined; a strike-through line indicates a deletion. In some cases, in areas where there were many individual changes, an

entire paragraph or section was deleted and re-written, even if portions of the narrative remained the same in both versions. This was done for ease of presentation and public review. Minor punctuation, spelling, and grammatical corrections that contribute to ease of understanding, but have no significant impact on the content, have not been included in this document. Throughout this document, references to the lead agency may be either California State Parks (CSP) or California Department of Parks and Recreation (DPR).

Project Description, p. 3 of Final MND
Modify the text on p.3 of Final MND as stated below:

Specific watershed restoration activities will focus on sixteen ~~fourteen~~ project ~~eleven~~ sites scattered throughout the Big River unit including ~~with~~ the parking area and restroom work comprising a ~~twelfth s~~eventeenth site.

Summary of change and impact on significance
This insertion clarifies the total number of project sites from the original Final MND, to include both Supplement 01, Supplement 02, and Supplement 03.

Findings
The addition of the M1 Crossing Upgrades and the F1 Road Decommissioning project activities could result in significant impacts to one or more environmental conditions. All prior mitigation measures, best management practices, permitting requirements, monitoring, and maintenance activities, as specified in the original MND, continue to apply for the entirety of the Project, including the additional sites described in the Supplement. The inclusion of the mitigation summarized in Chapter 5 in the original MND, in conjunction with stipulations included within a streambed alteration agreement by the Department of Fish and Wildlife for these Project activities, will reduce potentially significant impacts to a “less than significant” level.

Questions or comments regarding this Supplement to the Final Mitigated Negative Declaration may be addressed to:

California State Parks

Pursuant to Section 21082.1 of the California Environmental Quality Act, California State Parks (CSP) has independently reviewed and analyzed the Initial Study and Negative Declaration for the proposed project and finds that these documents reflect the independent judgment of CSP. CSP, as lead agency, also confirms that the project requirements detailed in these documents are feasible and will be implemented as stated in the Negative Declaration.

ORIGINAL SIGNATURE ON FILE

Date 6/18/2021

Terry Bertels, District Superintendent

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ORIGINAL SIGNATURE ON FILE

Date 6/17/2021

Terra Fuller, Senior Environmental Scientist

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CHAPTER 2
PROJECT DESCRIPTION

2.1 INTRODUCTION

Supplement 03 is needed to incorporate additional sites to the MND. During the original submittal, the Big River acquisition was new to the Mendocino Headlands State Park and the original scope was limited due to funding, staffing and immediate needs. Follow up road assessments have found high priority and maintenance sites requiring work to prevent sedimentation to Big River, restore watershed and wildlife functions and allow for critical ingress and egress into the park. The addition of Site M1-0 Crossing Upgrades adds specific treatment language for upgrading failing stream crossings and road drainage. Two sites (M1- 0.64, M1-1.85) originally proposed for bridges will be replaced with appropriately sized culverts at stream grade. Culverts were determined to be adequate for these areas since streams are lacking fish habitat. Culvert diameters were included in the original MND (See 2.3.1). Supplement 03 adds Site F1 Road Decommissioning, restoring seventeen Class II and Class III streams. All additional sites included in this Supplement are consistent with the purpose and objectives of the original Big River Watershed Restoration MND by replacing failing crossings, restoring historic topography, revegetating former logging roads and reducing sedimentation to Big River.

In addition, this Supplement will include evaluation of recent legislative mandated environmental issues originally not analyzed in the MND for Energy, Greenhouse Gas Emissions, Tribal Cultural Resources and Wildfire.

2.2 PROJECT LOCATION

This project will be implemented ~~completely~~ within the boundaries of the Big River unit of the Mendocino Headlands State Park (Appendix A – Map 2).This project incorporates a total of ~~12~~ 16 sub-project sites scattered throughout the unit; these sites occur in Section 6, Township 16N, Range 16W; Section 1, Township 16N, Range 17W; Sections 18, 19, 20, 31, Township 17N, Range 16W; and in Sections 24, 25, 26, 28, 29, 30, 34, 35 and 36, Township 17N, Range 17W. Table 1: below provides site locations based on land grant coordinates for each sub-project.

Site Number Designations

Road Number (or Area)	Mileage from Road Origin	Site Designation	Township, Range, Section, Quarter-Section
M1	0.64	M1-0.64	T17N, R17W, Sec. 29, SE¼
M1	0.70	M1-0.7	T17N, R17W, Sec. 29, SE ¼
M1	1.85	M1-1.85	T17N, R17W, Sec. 28, SE ¼

M1	2.06	M1-2.06	T17N, R17W, Sec. 28, SE ¼
M1	2.08-2.19	M1-2.08	T17N, R17W, Sec. 28, SE ¼, & Sec. 27, SW¼
M1	4.78	M1-4.78	T17N, R17W, Sec. 35, NE ¼
M1	5.63	M1-5.63	T17N, R17W, Sec. 35, SE ¼
M9	0.00-0.53	M9	T17N, R17W, Sec. 35, NE ¼
M14	0.00-2.08	M14	T17N, R16W, Sec. 31, SW ¼, NW ¼ ; T 17N, R 17W, Sec. 36, NE ¼ ; Sec. 25. SE, NE, NW ¼; Sec. 24, SW ¼
S22	0.44-0.88	S22	T16N, R16W, Sec. 6, SW, NW ¼
M1 - Quarry	0.75	Q	T17N, R17W, Sec. 29, SE ¼
Public Entry Area*	N/A	P1 and P2	T17N, R17W, Sec. 29, SW ¼; T17N, R17W, Sec. 30, SE ¼
M1	0.0-6.0	M1-0	T17N, R16W, Sec. 1, NW ¼; T17N, R17W, Sec. 25, 26, 27, 28, 29, 34, 35, 36
M2	0.36	M2-0.36	T17N, R17W, Sec. 28, SW ¼, Sec. 29 SE1/4, SW1/4
M1 – Crossing Upgrades	-.02 -7.7	M1-0	T17N, R16W, Sec. 1, NW ¼; T17N, R17W, Sec. 25, 26, 27, 28, 29, 34, 35, 36
F1	0.43-1.13	F1-0	T17N, R16W, Sec. 19, 20

2.3 BACKGROUND AND NEED FOR PROJECT

2.3.15 Site M1 Crossing Upgrades

The M1 haul road is the primary access for personnel and emergency vehicles into the Big River unit. The M1 road is also the main multi-use trail into the park unit. The existing road infrastructure was developed when the area was actively logged and is now aging and failing, contributing to erosion and in need of maintenance. The project will upgrade existing stream crossings and ditch relief culverts with the appropriate structure to convey the 100-flood flow while reducing erosion and sedimentation to Big River. Please refer to Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc.

- ***Summary of changes and impacts on significance***
  The geographical scope (extent) of the Project is amended to include associated road activities along the M1 from mile -02. to 7.7 for crossing upgrades at site numbers .1- 48.

- ***Findings***
  The addition of the M1 Crossing Upgrades work will not individually or in total result in a change in the nature of the remedial actions proposed, nor will they accrue to pose cumulative impacts not specified within the original MND. All prior mitigation measures, best management practices, permitting requirements, monitoring, and maintenance activities, as specified in the original mitigated negative declaration, continue to apply for the entirety of the Project, including the additional sites described in the Supplement.

2.3.16 F1 Road Decommissioning

This project addresses a high priority old logging spur road located along the eastern section of park unit between the Jackson Demonstration Forest and the Conservation Fund properties. This primary purpose of this road was to remove trees from the Filling Shed Gulch subwatershed during logging. This road does not connect with any roads, serves no purpose for ingress or egress and is currently in disrepair. Culverted stream crossings are clogged, undersized, failing and causing landslides and stream erosion. Twelve stream crossings on this road will be restored with remediation activities to include removal of culverts, road fill and any upslope sediment within the stream channel. Historical channel width, depth, alignment and gradient will be restored. The road prism will be ripped with cross-drains installed allowing for re-vegetation and reducing any road related surface water run-off and sediment from entering a stream. Please refer to Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc.

- ***Summary of changes and impacts on significance***
  The geographical scope (extent) of the Project is amended to include road decommission along the F1 from mile 0.43. to 1.13 at site numbers 100-119.

- ***Findings***
  The addition of the F1 Road Decommissioning work will not individually or in total result in a change in the nature of the remedial actions proposed, nor will they accrue to pose cumulative impacts not specified within the original MND. All prior mitigation measures, best management practices, permitting requirements, monitoring, and maintenance activities, as specified in the original mitigated negative declaration, continue to apply for the entirety of the Project, including the additional sites described in the Supplement.

2.4 PROJECT OBJECTIVES

2.4.15 Site M1 Crossing Upgrades Objectives

Project objectives include the following:

- Construction of environmentally sound and safe stream crossing to allow for continued recreational, official and emergency use;

- repair and upgrade failing stream crossings and ditch relief crossings;
- remove large volumes of stored sediment in stream basins;
- improve road drainage;
- adequately size culverts for the passage of the 100-year flood flows;
- reduce sedimentation to Big River.

Please refer to Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc. for further details on existing conditions and the remedial needs for this proposed project site.

- ***Summary of changes and impacts on significance***
  The objectives articulated for these Project sites are consistent with those articulated in the original mitigated negative declaration and are consistent with the broader management goals for the Big River unit.

- ***Findings***
  Not applicable. The articulation of Project objectives alone does not constitute an environmental impact.

2.4.16 F1 Road Decommissioning Objects

Project objectives for Road F1 from mileage 0.43 through mileage 1.13 includes the following:

Wherever feasible, based upon existing geology, surface conditions, and drainage regimes;

- removal of outside (downslope-side) berms along unstable road areas;
- deposition of removed berm and other fill material against upslope road edges to create low-angle, outsloped road surfaces that will disperse surface runoff across roads;
- elimination or drain inboard ditches and roads (through ripping, deposition of fill, re-contouring and installation of cross-drains);
- removal of culverts and associated fill material;
- restore historic stream channel;
- treatment with appropriate erosion control materials and methods;
- site monitoring and maintenance of erosion controls and invasive plant species;
- re-vegetation, as necessary, with native plants.

Please refer to Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc. for further details on existing conditions and the remedial needs for this proposed project site.

- ***Summary of changes and impacts on significance***
  The geographical scope (extent) of the Project is extended to include Road M2 from mileage 0.0 to 1.62. The scope of potential Project activities in this extended area will be the same as that for the originally designated area.

- ***Findings***
  Not applicable. The articulation of Project objectives alone does not constitute an environmental impact.

2.5 PROJECT DESCRIPTION

This section provides a site-by-site summary of the proposed activities. Detailed project designs are provided in the Appendices. For the purposes of the Supplement 03, detailed project design information is provided in Appendix B Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc. for further details on existing conditions and the remedial needs for this proposed project site. In general, these measures are intended to rehabilitate stream corridors, reduce erosive potential of roadbed-stream crossings through the replacement of existing culverts with those of improved design or with bridges, partially restore the historical topographical contours to existing roadbeds, convert existing roads to trails, restore native vegetation to rehabilitated stream corridors and fill-slope failures, partially restore the historical topography to the Big River Rock Quarry pit, improve parking and define vehicular access in the entry area, and provide a restroom facility for the Big River unit of Mendocino Headlands State Park. Site-specific project activity details for project sites M1-0.64, M1-0.7, M1-1.85, M1-2.06, M1-2.08, M1-4.05, M1-4.78, M1-5.63, M1-6.49 - -7.78, M2-0-1.62, M9, M14, and S22 have been based upon technical assessments, rehabilitative measures, and construction designs provided by the California Department of Conservation, California Geological Survey (CGS). The CGS information has been augmented by the California Department of Parks and Recreation in order to provide details for Site Q and Site P, as well as to articulate and address site-specific design features, such as bridge construction specifications, and environmental concerns, such as reduction of impacts to a less-than-significant level or elimination of impacts on sensitive wildlife and plant habitats and existing visitor use patterns. Site M1 Crossing Upgrades and F1 Road Decommission conceptual treatment data was based on technical assessments and provide by Pacific Watershed Associates, Inc. DPR has also added information on required or recommended remediation practices, restoration techniques, and monitoring and maintenance protocols.

- ***Summary of changes and impacts on significance***
  The project design information articulated for this Project is consistent with the original mitigated negative declaration for the remediation of

culverted stream crossings, and is consistent with the broader management goals for the Big River unit. Mitigation measures specified in Chapter 5 of the original mitigated negative declaration, where applicable to additional Project areas described here, shall be implemented as Project requirements.

- ***Findings***
  The description of the Project has not been altered to add new activities that were not addressed in the original mitigated negative declaration. Mitigation measures and Project requirements applicable under the original description, as summarized in Chapter 5 of the original mitigated negative declaration, shall apply to all Project activities implemented in these additional areas and will reduce potentially significant impacts to a "less than significant" level.

2.5.15 Site M1 Crossing Upgrades Project Description

State Parks proposes improving drainage and road conditions by upgrading numerous culverts in need of ongoing maintenance and repairs along Road M1, from mile -.02 -7.7. The M1 Road is the main access road into the Big River unit and provides recreational pedestrian and bicycle access to the public. The M1 Road is maintained as travelable by authorized automobiles to facilitate maintenance and restoration projects conducted by DPR staff and facilitation of emergency access. Fifty-two stream and ditch relief crossings will be addressed, when funding is available, focusing on the highest priority road sites. Road related drainage will also be addressed. Improperly sized, failing, and eroding culverts can deliver large quantities of sediment to Big River. Stream crossing upgrades will consist of either culvert replacements or rock armored fill crossing installations with specific prescriptions for soil excavation at stream crossings, potential fillslope failures, culvert replacement, critical dip installation, armored fill installation, riprap buttressing of fillslopes, and mulching. All treatments will prevent future episodic erosion at treatment features from entering the stream system.

Please refer to sites 02- 37 in Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc.

- ***Summary of changes and impacts on significance***
  The design information articulated for this Project site is consistent to the description provided in the original mitigated negative declaration, other than its application to an additional Project site area, as described Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc.

- ***Findings***
  Addition of Project activities along mile -.02 -7.7 could result in potentially significant impacts to one or more environmental conditions. All prior mitigation measures, best management practices, permitting requirements, monitoring, and maintenance activities, as specified in the original mitigated negative declaration, continue to apply for the entirety of the Project, including the additional sites described in the Supplement. Therefore, with the inclusion of the mitigations summarized in Chapter 5 of the original mitigated negative declaration and Supplement, impacts are "less than significant with mitigation".

2.5.16 F1 Road Decommissioning Project Description

State Parks proposes removing eighteen existing culverts and road associated fill material along 3.3 miles of road; thereby, restoring watercourse channels to historical width, depth, and alignment. Treatments for decommissioning roads and landings included in the F1 project description involve: full road decommissioning and incorporation of outsloping, berm removal, cross road drain installation, excavation of unstable sidecast materials, road ripping, and the complete removal of all stream crossing fills. The expected benefit of completing the erosion control and erosion prevention remediation proposed in this project is the reduction of long-term sediment delivery and normalization of hillslope and channel hydrology within the Filling Shed Gulch subwatershed.

Please refer to sites 100-117 in Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc.

- ***Summary of changes and impacts on significance***
  The design information articulated for this Project site is consistent with the description provided in the original mitigated negative declaration, other than its application to an additional Project site area, as described Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates

- ***Findings***
  Addition of Project activities along F1 road could result in potentially significant impacts to one or more environmental conditions. All prior mitigation measures, best management practices, permitting requirements, monitoring, and maintenance activities, as specified in the original mitigated negative declaration, continue to apply for the entirety of the Project, including the additional sites described in the Supplement. Therefore, with the inclusion of the mitigations summarized in Chapter 5 of the original mitigated negative declaration and Supplement, impacts are "less than significant with mitigation".

2.6 PROJECT IMPLEMENTATION

In general, project implementation will include all the activities performed within the Big River unit that are directly related to the site-specific road, riparian corridor, and public entry work areas described above. Implementation includes on-site preparatory measures, such as delineations of active work zones, staging areas, and travel corridors, the posting of safety or educational information and signs, construction and ground-disturbing activities, erosion-control and restoration, monitoring, and maintenance necessary to accomplish project objectives.

Section 2.6.3, Site-Specific Construction Activities, provides brief descriptions of the general construction activities pertinent to each of the ~~12~~ 19Project sites. However, greater detail for each site is provided diagrammatically in Appendix B, Project Plan Sheets ~~and Design Memoranda~~. More specific technical information on the various stages of streambed and road remediation is located in Appendix C**,** Standard Specifications & Best Management Practices for Disturbed Lands Remediation ("Specifications"). This appendix provides further detail to explain the work proposed.

- ***Summary of changes and impacts on significance***
  The number of Project sites has been revised to include the M1- .02 -7.7 road section and the F1 road and with design details and supplemental information specified in this Supplement added to Appendix B.

- ***Findings***
  Not applicable.

2.6.3 Site-Specific Construction and Ground-Disturbing Activities

2.6.3p Site M1 Crossing Upgrades Project

For M1 road sites 02- 37 along mile -.02 -7.7 please refer to Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc. and to Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, for technical information on site remediation.

- ***Summary of changes and impacts on significance***
  The number of Project sites has been revised to include the M1 road section and watercourse crossings with design details and supplemental information specified in this Supplement added to Appendix B.

- ***Findings***
  Not applicable.

2.6.3q Site F1 Road Decommissioning Project

For F1 road sites please refer to Appendix B: Conceptual Treatment Data and Plan Sheets, Pacific Watershed Associates, Inc. and to Appendix C, Standard Specifications & Best Management Practices for Disturbed Lands Remediation, for technical information on site remediation.

- ***Summary of changes and impacts on significance***
  The number of Project sites has been revised to include the F1 road section and watercourse crossings with design details and supplemental information specified in this Supplement added to Appendix B.

- ***Findings***
  Not applicable.

CHAPTER 3

1. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact", as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agricultural Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Energy	☐ Greenhouse Gas Emissions	☐ Transportation/Traffic
☐ Public Services	☐ Recreation	☐ Utilities/Service Systems
☐ Tribal Cultural Resources	☐ Wildfire	
☐ Mandatory Findings of Significance	☒ None	

DETERMINATION

On the basis of this initial evaluation:

I find that the proposed project **COULD NOT** have a significant effect on the environment and a **NEGATIVE DECLARATION** will be prepared. ☐

I find that, although the original scope of the proposed project **COULD** have had a significant effect on the environment, there **WILL NOT** be a significant effect because revisions/mitigations to the project have been made by or agreed to by the applicant. A **MITIGATED NEGATIVE DECLARATION** will be prepared. ☒

I find that the proposed project **MAY** have a significant effect on the environment and an **ENVIRONMENTAL IMPACT REPORT** or its functional equivalent will be prepared. ☐

I find that the proposed project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated impact" on the environment. However, at least one impact has been adequately analyzed in an earlier document, pursuant to applicable legal standards, and has been addressed by mitigation measures based on the earlier analysis, as described in the report's attachments. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the impacts not sufficiently addressed in previous documents. ☐

I find that, although the proposed project could have had a significant effect on the environment, because all potentially significant effects have been adequately analyzed in an earlier EIR or Negative Declaration, pursuant to applicable standards, and have been avoided or mitigated, pursuant to an earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project, all impacts have been avoided or mitigated to a less-than-significant level and no further action is required. ☐

DocuSigned by:
Terra Fuller
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Terra Fuller
Environmental Coordinator

6/17/2021
Date

ENVIRONMENTAL ISSUES

IV. BIOLOGICAL RESOURCES.

SENSITIVE PLANTS

STANDARD PROJECT REQUIREMENT

In April, May, June, and July 2005, ecologists with DPR, Mendocino District, conducted CNPS protocol-level plant surveys in areas potentially affected by proposed project activities. An initial plant list compiled during these surveys is available in Appendix A. The Big River unit supports several rare plants and a diversity of habitats that are described below. A list of these species potentially occurring within the project area and an assessment of their habitat is presented in Appendix D. An updated rare plant species search will be updated prior to completing surveys.

Prior to implementation, all project areas shall be surveyed for rare plant species using methodology that follows California Department of Fish and Wildlife's "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities" (DFG 2009). Plant surveys will be repeated in all areas where the previous survey was conducted greater than two years prior to project implementation.

V. CULTURAL RESOURCES.

STANDARD PROJECT REQUIREMENT

A pedestrian archaeological survey of the project area was conducted on May 6th and 7th 2021 by Associate State Archaeologist Chris Kimsey. This survey followed a record search at the Northwest Information Center of the California Historical Resource Information System. The records search identified two previously recorded cultural resources within the project area:

P-23-002649/MEN-3299- Big River Railroad. Recorded as segments of grade, trestle remnants, and associated features. Described in detail in Big River Was Damned (Jackson 1975). Record updated and various features tied together in this site by Van Bueren (2006). Alignment cross Big River multiple times as it travels up the watershed and to Little North Fork.

P-23-003760/MEN-3131- This site is a heavily disturbed shell midden within a rock/gravel quarry used of logging/road construction in the Big River area. The site has been further disturbed since it was originally recorded by the quarry operator during a reclamation project.

The pedestrian survey relocated the previously recorded cultural resources but did not identify any new cultural resources. The project will not cause a substantial adverse change in the significance of these cultural resources:

P-23-002649/MEN-3299- A small portion of this long linear resource (the Big River Railroad) was within the project area. This consisted of the remains of the "First Bridge" (C-1484) on the west (north) bank of the big river. The remains are lumber pilings within the river itself. This is close to the location of a culvert install (location 23). To avoid impacts to this resource, the discharge of the culvert will be more than 10ft from these features.

P-23-003760/MEN-3131- The project work is limited to moderate road grading and berm removal. These activities will not impact this resource. The resource has been heavily disturbed previously and the only shell midden observed during the survey was outside of the road prism in the quarry area.

XVII. ENERGY.

Environmental Setting

The Big River unit contains no infrastructure that uses energy. Only non-motorized multi-use recreation occurs within the park unit. The M1, M9 and High Chute are currently the only accessible roads where emergency and facility access can occur. This project will not create any new infrastructure requiring future energy consumption. Short-term gas and diesel fuel consumption will occur for equipment use during project implementation.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project	☐	☐	☒	☐

construction or operation?				
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

DISCUSSION

a) Construction activities are short term 5- 8 months with the minimal amount of necessary fuel consumption occurring to complete the project. This amount will not individually or cumulatively result in wasteful or unnecessary consumption of energy. Less than significant.

b) The plan does not conflict with state or local plan for renewable energy or efficiency. No impact.

XVIII. GREENHOUSE GAS EMISSIONS.

ENVIRONMENTAL SETTING

The Big River unit of the Mendocino Headlands State Park was historically logged for over 150 years. This activity resulted in the harvesting of large trees, installation of roads and landings and extensive soil disturbance. These activities can significantly reduce carbon sequestration. The Big River State Park unit encompasses approximately 6% of the watershed with the remaining area comprised primarily of working landscapes of logging and ranching. The goals of the park are to preserve and protect the estuary, wetlands, wildlife resources and develop late seral forest characteristics. Preservation and restoration of the Big River Park unit over the long-term will increase carbon sequestration by reducing soil disturbance, increasing tree growth and other objectives outlined in the California Forest Carbon Plan, California Natural Resources Agency, May 2018.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Generate greenhouse gas emissions, either directly or	☐	☐	☒	☐

indirectly, that may have a significant impact on the environment?				
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

DISCUSSION

a) Construction work will occur on existing roads and landings currently compacted from years of timber hauling with many areas extensively covered by invasive jubata grass inhibiting native shrub and tree growth. Road decommissioning activities result in project-related soil disturbance, resulting in short-term removal of carbon sequestration in the surface soil for these areas. Road rehabilitation by ripping the road surface decreases compaction, promoting tree and shrub growth in the long-term. Restoring stream banks currently covered by the road prism will restore riparian forbs, shrubs, and tree habitat. Rehabilitation of the roads and streams will increase long-term carbon sequestration in the soil, litter, and vegetation.

   The main source of greenhouse gas emission (GHG) associated with the proposed project are short-term combustion of fossil fuels during construction activities from the use of heavy equipment. There are currently no GHG thresholds developed by the Mendocino County Air Quality Management District; however, the State California Air Pollution Control Officers Association (CAPCOA) states a 900-metric ton per year (MT/yr) of CO2e screening threshold for the California Environmental Quality Act. Using a similar CAL Fire restoration project methodology and adjusting for scale, this project will generate an estimated 69.72 CO2e MT/yr. for heavy equipment and personal vehicle use. Therefore, the project is significantly under the CAPCOA threshold and will not result in any long-term operational emissions. Less than significant impact.

b) The project does not conflict with any applicable plan or policy. No impact.

XIX. TRIBAL CULTURAL RESOURCES.

ENVIRONMENTAL SETTING

Tribal consolation was conducted to identify any potential tribal cultural resources within the project area. A Native American Heritage Commission list was obtained on March 25th 2021. Notice letters were sent to seven tribal entities from the list on May 14th, 2021. Follow up with phone calls were done on June 9th, 2021. Messages were left with four individuals (one listing had no phone number or email address). The project was discussed with one Tribal Historic Preservation Officer and no concerns were expressed with the project. Letters and consultation logs are archived with the District Tribal Liaison.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LESS THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	☐	☐	☐	☒
b.) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
c.) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

DISCUSSION

a.) Survey results, record search and tribal consultation found no tribal cultural resources or concerns with project. No Impact.

b.) Survey results, record search and tribal consultation found no tribal cultural resources or concerns with project. No Impact.

c.) Survey results, record search and tribal consultation found no tribal cultural resources or concerns with project. No Impact.

XX. WILDIFIRE.

ENVIRONMENTAL SETTING

The Big River unit of the Mendocino Headlands contains over 94 miles of old logging roads that are failing, unmaintained and were installed for the primary purpose of harvesting timber from the watershed. The M1 road was the main haul road to the coastal mills during periods of active timber harvesting. The M1 is now the primary road into the park for authorized automobiles to facilitate maintenance, restoration, and emergency access. For park visitors this road serves as a multi-use trail.

The F1 road is an old logging spur road located along the eastern section of the park unit between Jackson Demonstration Forest and the Conservation Fund. This primary purpose of this road was to log trees from the Filling Shed Gulch subwatershed. This road does not connect with any roads, serves no purpose for ingress or egress and is currently in disrepair. The F1 road and stream restoration will remove failing infrastructure, restore stream hydrology, and reduce future landslide potential.

WOULD THE PROJECT:	POTENTIALLY SIGNIFICANT IMPACT	LES S THAN SIGNIFICANT WITH MITIGATION	LESS THAN SIGNIFICANT IMPACT	NO IMPACT
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and	☐	☐	☐	☒

	thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				
c)	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d)	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

DISCUSSION

a) The project does not impair an emergency access or response plan. No impact.

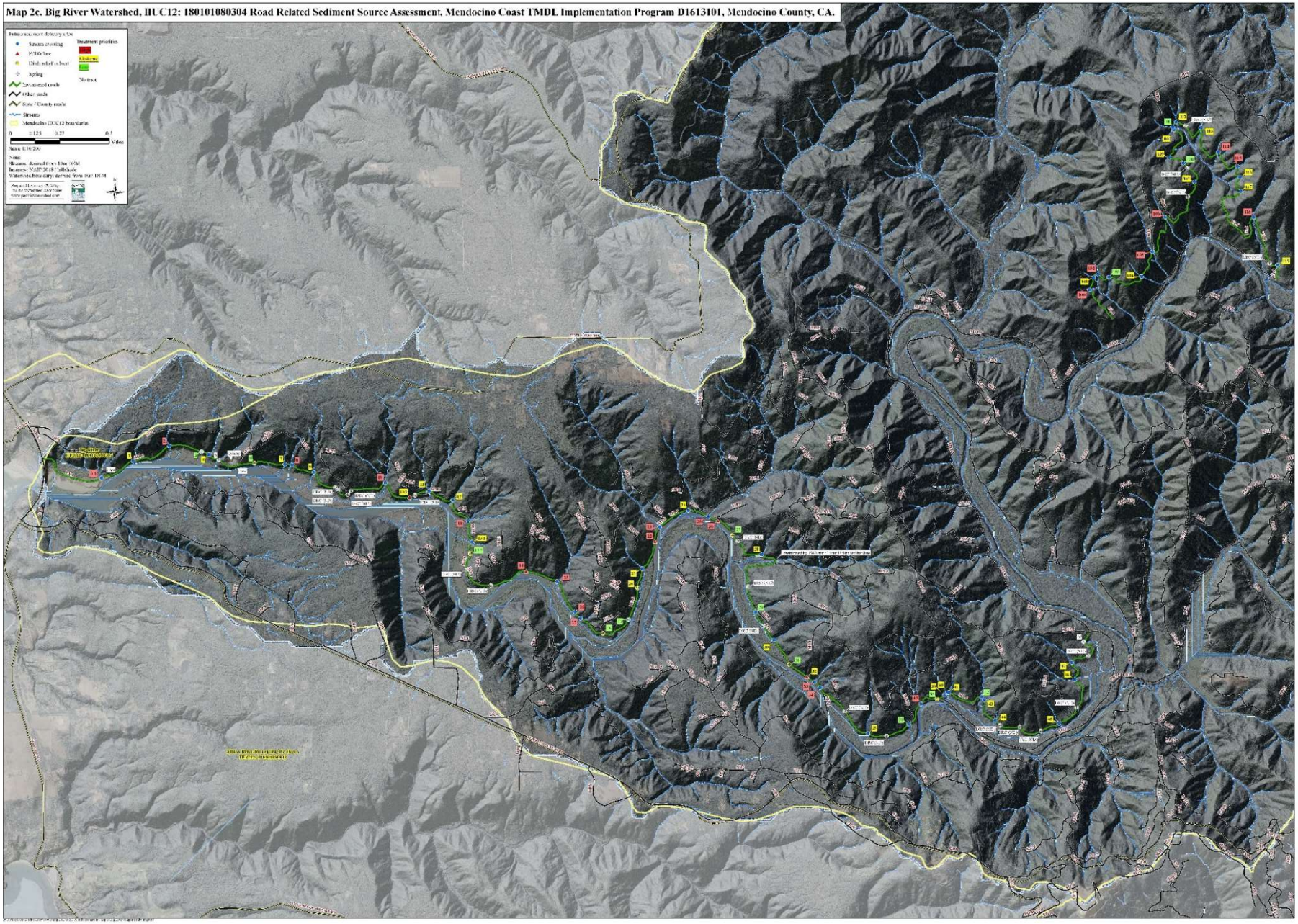
b) The project does not exacerbate wildlife risks. No impact.

c) The project will upgrade critical infrastructure for the main access road into the park. Replacing and storm proofing culverts and road improvements will maintain and enhance emergency access. No Impact.

d) There are no permeant structures or infrastructure downslope or downstream other than a vault toilet managed by State Parks. The project by upgrading road and stream crossings and restoring watercourses will reduce landslides and drainage impacts associated with a wildfires or other weather-related events, such as, floods. No impact.

Appendix A

Project Location Map



Appendix B

Project Plan Sheets

Site #	Treatment Immediacy	Problem	Lat/Lon	Episodic Erosion (yd^3)	Chronic Erosion (yd^3)	Comment on Problem	Comment on treatment	Rock Materials	Culvert Materials
[1]AR = Rock armor; RR = Road rock; XRD = Cross-road drain; TOP = The upstream extent of excavation; BOT = The downstream extent of the excavation; CMP = Culvert; TR = Trash rack; CD = Critical dip.									
Site specific treatments include: 215 yd AR; 385 yd RR; 470 linear ft. CMP; 18 CMP couplers, 1 TR. **Road drainage treatments include:** 210 yd^3 RR; 33 RD; 1,040 linear ft. outsloping; 1,280 linear ft. berm removal; 207 XRD; 12,518 linear ft. road ripping. **Total episodic erosion:** 7,176 yd^3; Total chronic erosion: 2,382 yd^3.									
02	HM	Stream crossing	39.305, -123.779	249	77	An 8 ft. long wedge of sediment and colluvial material is stored above the crossing with a 4 ft. deep incision stretching above the excavation top for 8 ft. An old steel culvert remains in the fill, visible at the excavation bottom, and is rusty and crushed. Stream is near origin and naturally steep. Ditch from the left road is bermed with signs of recent maintenance. The road is outsloped through the crossing. Hydrologically connected road segments feature a rocky cutbank. The culvert is installed high in the fillslope. Vegetation threatens to plug the culvert inlet. Water plunges 12 ft. from the culvert outlet to a small scour pool.	1. Excavate fill from TOP to BOT flag. Lay back stream banks above the road 2:1 and establish a 5 ft. wide channel bottom. 2. Replace culvert with a 30 in. diameter x 80 ft. long culvert at the base of fill. 3. Install 45 yd^3 of 0.5-2.0 ft. diameter rip rap to 75% of the outboard fillslope. 4. Install a critical dip to the right hingeline of the crossing. 5. Resurface the stream crossing drive surface with 20 yd^3 of road rock. 6. Spoil locally.	45 yd^3 AR 20 yd^3 RR	30” x 80’ CMP 3 coupler
08	HM	Stream crossing	39.303, -123.768	221	25	Two streams meet in confluence above the stream crossing culvert inlet. A park trail is present along the ridge between the two streams above the road. Inboard ditches connected to the crossing are heavily vegetated. Spring flow is present along the right road. An old gully along the outboard fillslope is present above the culvert outlet. Culvert is installed high and short in the fillslope, shotgunned for 5 ft. A boulder is present below the culvert outlet acting as energy dissipation. Wood is buried within the fill of the outboard fillslope. An old culvert (18 in. diameter aluminum) is buried along the inboard road but flowing at the outlet. A large old growth redwood is present near the culvert outlet. The newer culvert is out of alignment with the stream channel.	1. Excavate fill from TOP to BOT flag. Establish a 4 ft. wide channel bottom with 2:1 sideslopes above the road. 2. Replace culvert with a 42 in. diameter x 70 ft. long culvert at the base of fill. 3. Install 25 yd^3 of 0.5-2.0 ft. diameter riprap to 75% of the outboard fillslope. 4. Remove outboard berm to the right for 180 ft. 5. Resurface the stream crossing drive surface with 20 yd^3 of road rock.	25 yd^3 AR 20 yd^3 RR	42” x 70’ CMP 3 coupler
10	H	Stream crossing	39.302, -123.759	197	32	Road is outsloped through the crossing. 5 ft. diameter crib logs brace the nearly vertical outboard fillslope. Culvert has been damaged and has holes throughout the interior. A 12 in. diameter aluminum critical pipe is installed to the left and is plugged at the inlet. A 0.5 ft. wide x 1 ft. deep x 15 ft. long gully is present in the fillslope below the critical pipe outlet. The culvert inlet is partially plugged with woody debris. The right road has a single functional rolling dip installed.	1. Excavate fill from TOP to BOT flag. Establish a 5 ft. wide channel bottom with 2:1 sideslopes above the road. 2. Replace culvert with a 60 in. diameter x 70 ft. long culvert at the base of fill. 3. Install 25 yd^3 of 0.5-2.0 ft. diameter riprap to 75% of the inboard fillslope and 25 yd^3 to 75% of the outboard fillslope. 4. Remove outboard road berm for 450 ft. to the left. 5. Remove outboard road berm for 450 ft. to the right. 6. Resurface the stream crossing drive surface with 20 yd^3 of road rock. 7. Endhaul spoils 4,700 ft. to the old quarry along the right road.	50 yd^3 AR 10 yd^3 RR	60” x 70’ CMP 3 coupler

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Site #	Treatment Immediacy	Problem	Lat/Lon	Episodic Erosion (yd^3)	Chronic Erosion (yd^3)	Comment on Problem	Comment on treatment	Rock Materials	Culvert Materials
22	HM	Landslide	39.298, -123.733	667	43	A long stretch of very steep (100% + grade) road along Big River with an inboard ditch and two visible past failures. More recent failure features long tension cracks 3 ft. into the road base with 1-2 in. of lateral separation. A section of road toward the left end has been rebuilt with 3 ft.-minus diameter riprap along 100% of the outboard fillslope and has failed in the past.	1. Excavate material from the outboard fillslope from left to right flag: 300 ft. wide x 3 ft. deep x 20 ft. long. 2. Utilize spoils to outslope road and fill ditch for 300 ft. 3. Endhaul remaining spoils 3 miles to the old quarry to the right. 4. Resurface the drive surface of the outsloped road with 50 yd^3 road rock.	50 yd^3 RR	-
23	H	Stream crossing	39.299, -123.733	0	23	Class I stream with a recent culvert upgrade. Pipe arch dimensions are 11 ft. wide x 15 ft. tall by 60 ft. long. Stream is incised 5-7 ft. There are skid roads along both banks above the road. The deeply incised stream channel and near vertical channel side walls are likely to erode during high flows. Inboard and outboard fillslopes are armored 25% with riprap. A 4 ft. deep wedge of sediment has aggraded within the culvert of this crossing, incised by recent flows. This stream crossing culvert is directly influenced by Big River during high flows. Juvenile fish and large woody debris observed at the confluence, and a sediment fan has developed near the pipe outlet. The left road shows signs of past failure.	1. Outslope the left road and fill in the ditch for 365 ft. 2. Resurface the drive surface of the outsloped road with 60 yd^3 road rock.	60 yd^3 RR	-
26	HM	Landslide	39.299, -123.727	200	8	Past outboard fillslope failure; slumped road fill and debris overhangs Big River below and has delivered coarse and fine sediment. Tension cracks with 3 in. lateral separation 6 ft. back into road base. A 5 in. scarp associated with the slump is present 4 ft. into the road base. The outboard road is bermed along most of its length. The ditch along the road inboard is also bermed from recent grading.	1. Excavate material from the outboard fillslope from left to right flag: 90 ft. wide x 3 ft. deep x 20 ft. long 2. Spoil locally: integrate spoils into road fill. 3. Outslope the road and fill in the ditch for 200 ft. to the drainage break on the right. 4. Resurface the drive surface of the outsloped road with 60 yd^3 road rock.	30 yd^3 RR	-
34	H	Stream crossing	39.287, -123.717	2	56	A type 3 fill crossing with little erosion evident due to recent grading of road surfaces along the M1 road. Large gully along the lower hillslope below the road and erosion of road surfaces evident on LiDAR maps provided for the assessment indicate ongoing sediment delivery to Big River below associated with this stream crossing.	1. Install an armored fill at the crossing: A. Excavate a broad dip through the road prism. Outslope the trough of the dip at 10%. B. Excavate a keyway: 15 ft. wide at the top x 5 ft. wide at the base x 2 ft. deep x 30 ft. long. C. Install 25 yd^3 of 0.5-2.0 ft. diameter riprap to the keyway. 2. Integrate spoils generated from keyway excavation into the road prism and for localized road shaping. 3. Resurface the stream crossing road approaches with 15 yd^3 of road rock.	25 yd^3 AR 15 yd^3 RR	-

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37	H	Stream crossing	39.286, -123.708	396	45	Stream is incised 1.5 ft. along its visible extent. Channel is steep. Culvert is plugged and undersized. Spring macropore present 110 ft. to the right of the crossing has caused outboard fillslope failure in the past; the road has been regraded, insloped, and rock has been installed (0.5 ft. diameter-minus) to the ditch. Spring now flows to the culvert inlet. Old outboard fillslope failure not repaired. The outboard fillslope of the crossing features past gully erosion. Large wood embedded within the fill and is visible below road may indicate a Humboldt crossing. Riprap placed along the outboard fillslope (100% cover) recently. Large berm along the outboard road and recent road grading has bermed the inboard road as well, like much of the M1 road.	1. Excavate fill from TOP to BOT flag. 2. Replace culvert with a 54 in. diameter x 60 ft. long culvert at the base of fill. 3. Install 30 yd^3 of 0.5-2.0 ft. diameter riprap to 75% of the outboard fillslope. 4. Outslope the road and retain the ditch to the right for 475 ft. 5. Remove berm to the left for 200 ft. 6. Install a 24 in. diameter x 50 ft. long ditch relief culvert adjacent to the rolling dip at the spring location. Ensure sufficient culvert grade for self-cleaning. 7. Resurface the stream crossing drive surface with 20 yd^3 of road rock. 8. Resurface the outsloped road drive surface with 80 yd^3 road rock. 9. Resurface the ditch relief culvert installation drive surface with 20 yd^3 of road rock. 10. Endhaul 190 yd^3 of spoils 5.6 miles to the right, at the old quarry location.	30 yd^3 AR 100 yd^3 RR	54" x 60' CMP 2 coupler
100	HM	Stream crossing	39.317, -123.692	175	202	Culvert is installed short and high in the fillslope, outside of natural stream alignment. Tension cracks present 3 ft. into the road base from the outboard fillslope with 2-3 in. lateral separation along the road low spot. Long gully (2 ft. wide x 1 ft. deep) runs from the culvert outlet along the outboard fillslope to the stream channel below the road. Spring flow is present above the road at the low spot.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Transition swale and spring flow to the right of the stream into the excavation. 4. Spoil locally in the throughcut portion of the road to the right. 5. Rip and drain the right road for 1,100 ft.: install 20 cross-road drains. 6. Rip and drain the left road for 385 ft.: install 7 cross-road drains.	-	-
101	M	Stream crossing	39.318, -123.691	200	6	A small Class III stream that is bifurcated above the main failure and goes sub-surface. There is an old 18 in. diameter plugged culvert on the right hinge of the site with an old gully leading down to it, which appears inactive now.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom and lay back sideslopes 2:1 or to natural grade throughout the crossing. 3. Rip and drain the left road for 125 ft.: Install 1 cross-road drain. 4. Spoil locally.	-	-

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102	HM	Stream crossing	39.319, -123.691	197	30	Undersized culvert rusted out with 15 yd^3 past erosion from outlet scour and fines winnowed from within the road along failed culvert. Culvert installed short and high in the fillslope. Another skid road prism straddles the channel below this crossing.	1. Excavate fill from TOP to BOT flag. 2. Establish a 5 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 363 ft.: install 7 cross-road drains.	-	-
103	L	Stream crossing	39.318, -123.690	106	91	Culvert conveys stream and spring flow through the road, but culvert has plugged and stream has diverted to the right in the past. Culvert is set high and short in the fillslope and there is a failure along the outboard fillslope on the right hingeline of the crossing, potentially a result of overtopping in the past. 45 ft. of left road drains spring flow to this site. A long reach of hydrologically connected left road with several rill complexes and old gully incisions along the outboard fillslope no longer appears active.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 950 ft.: install 19 cross-road drains.	-	-
104	M	Stream crossing	39.318, -123.687	152	74	Culvert rusted out at the outlet: shotgunned, short and high in the fillslope. Wet creek will need to be dewatered prior to excavation. 60 ft. long half-round downspout is installed at a skewed angle to the crossing culvert. Downspout is rusted through.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes through the crossing. 3. Spoil locally. 4. Rip and drain the left road for 275 ft.: install 5 cross-road drains. 5. Rip and drain the right road for 105 ft.: install 1 cross-road drains.	-	-
105	H	Stream crossing	39.320, -123.686	476	49	Stream goes sub-surface above the road and flows through the fill. The culvert inlet is completely buried and during storm events the inlet area ponds and flows over the road surface, where it discharges over the outboard fillslope. A large failure is present along the outboard fillslope (70 yd^3 past erosion), with exposed bedrock in some areas. The old culvert emerges from the outboard fillslope, where Humboldt logs are protruding out of the fill as well. Flow emerges 60 ft. below the base of fill. The channel is highly disturbed with lots of wood and stumps left from past timber operations.	1. Excavate fill from TOP to BOT flag. 2. Establish a 6 ft. wide channel bottom with 2:1 sideslopes. 3. Spoil locally. 4. Rip and drain the right road for 480 ft.: Install 9 cross-road drains. One of these cross-road drains should be placed 240 ft. to the right of the crossing at the swale.	-	-

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Site #	Treatment Immediacy	Problem	Lat/Lon	Episodic Erosion (yd^3)	Chronic Erosion (yd^3)	Comment on Problem	Comment on treatment	Rock Materials	Culvert Materials
106	HM	Stream crossing	39.322, -123.685	632	51	Culvert is installed high in the fillslope with a 20 ft. long rusted out half-round downspout. ASG redwood is present at the profile bottom flag. The true base of fill is at the emergent flow 15 ft. beyond. Past erosion along the left hingeline of the crossing from concentrated road surface runoff or culvert plugging and associated stream overtopping. Stream flow is winnowing fines from within the fill prism due to rusted out and compromised culvert. Long aggraded sediment wedge above the road and stream was bulldozed and driven on in the past. Old duffy tension cracks are present near the gully along the left hingeline of the crossing displaying 4 in. lateral separation 3 ft. into the road base.	1. Excavate fill from TOP to BOT flag. 2. Establish a 5 ft. wide channel bottom with 2:1 sideslopes. 3. Spoil locally. 4. Rip and drain the left road for 200 ft.: install 3 cross-road drains. 5. Rip and drain the right road for 200 ft.: install 3 cross-road drains.	-	-
107	ML	Stream crossing	39.325, -123.682	256	30	Culvert is installed high and short in the fillslope. There is a 40 ft. long half-round downspout attached to the outlet, which extends to the base of fill. There is not much erosion at the site, but the culvert is likely undersized.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the right road for 460 ft.: install 9 cross-road drains.	-	-
108	L	Stream crossing	39.326, -123.683	66	76	Low power class II stream with intermittent flow ponds up a bit at the culvert inlet. Channel below the road looks like it was relatively dry during the recent wet winter. Very little erosion potential at this site.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the right road for 700 ft.: install 13 cross-road drains.	-	-
109	M	Stream crossing	39.327, -123.684	189	26	Culvert is set short and high in the fillslope. Sediment has aggraded above the inlet of the crossing and stream flow appears to have diverted along the left road in the past. The channel below the outlet is duff covered and doesn't exhibit much incision despite the culvert being set shallow within the fill prism.	1. Excavate fill from TOP to BOT flag. 2. Establish a 6 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the right road for 500 ft.: install 10 crossroad drains.	-	-

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Site #	Treatment Immediacy	Problem	Lat/Lon	Episodic Erosion (yd^3)	Chronic Erosion (yd^3)	Comment on Problem	Comment on treatment	Rock Materials	Culvert Materials
110	M	Stream crossing	39.329, -123.684	221	147	Culvert installed near the base of fill, just shy of true stream gradient. A wedge of sediment has still aggraded above the road. Long uncontrolled length of hydrologically connected right road is heavily vegetated with minimal surface erosion. Left road is similar.	1. Excavate fill from TOP to BOT flag. 2. Establish a 6 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the right road for 985 ft.: install 19 cross-road drains. 5. Rip and drain the left road for 70 ft.: install 1 cross-road drain.	-	-
111	L	Stream crossing	39.329, -123.684	86	10	Culvert is set near actual stream grade, at the base of fill. Despite diversion potential at this crossing, culvert sizing is probably adequate and erosion potential of crossing fill prism and heavily vegetated right road is minimal.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 150 ft.: install 2 cross-road drains.	-	-
112	M	Stream crossing	39.329, -123.684	164	25	Culvert installed near the base of fill, close to actual stream grade. Low erosion potential at this crossing. Culvert is in good condition. Small sediment wedge has aggraded above the road.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the right road for 150 ft.: install 2 cross-road drains. 5. Rip the road to the left for 50 ft.	-	-
113	M	Stream crossing	39.329, -123.681	270	67	Above the crossing, two stream channels coalesce before passing through an aluminum culvert here. The pipe is set slightly high in the fillslope with a small scour hole at the outlet.	1. Excavate fill from TOP to BOT flag. 2. Establish a 6 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 920 ft.: install 18 cross-road drains. 5. Rip and drain the right road for 300 ft.: install 6 cross-road drains.	-	-
114	H	Stream crossing	39.327, -123.680	205	153	Lots of wood buried within the fillslope may lower production rate during excavation at this crossing. Culvert is installed close to natural stream grade. Stream may divert to the right for 185 ft. to a large landing if the culvert plugs. Very large rocks present at the base of fill along the left bank below the outlet. Right bank is being scoured by stream flow above the road.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 800 ft.: install 16 cross-road drains.	-	-

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Site #	Treatment Immediacy	Problem	Lat/Lon	Episodic Erosion (yd^3)	Chronic Erosion (yd^3)	Comment on Problem	Comment on treatment	Rock Materials	Culvert Materials
115	HM	Stream crossing	39.326, -123.678	323	44	Culvert is set short and high in the fillslope. There is a full round downspout attached at the culvert outlet that extends for 30 ft. and is 10 ft. short of the base of fill. There is 0.5-2.0 ft. diameter riprap placed at the base of fill for energy dissipation. There is a large redwood projecting out of the outboard fillslope acting as a crib log for the left sideslope. There is also diversion potential along the right road. There could be a lot of wood buried within the fillslope.	1. Excavate fill from TOP to BOT flag. 2. Establish a 6 ft. channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 340 ft.: install 6 cross-road drains.	-	-
116	M	Stream crossing	39.325, -123.678	241	68	Skid crossing fill prism present above this road. Duffy, buried channel with little sign of recent stream flow despite a wet winter. Old aluminum culvert placed at the base of fill. 15 ft. DBH redwood trees grow in-line with the channel. Skid road runs up the stream channel left bank. Stream does not appear to divert right at the skid fill crossing upstream.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 460 ft.: install 8 cross-road drains.	-	-
117	M	Stream crossing	39.324, -123.677	207	70	Culvert outlet is bent upwards where it projects out of the fillslope. At the base of fill is an old skid road fill crossing representing 20-30 yd^3 of fill.	1. Excavate fill from TOP to BOT flag. 2. Establish a 4 ft. wide channel bottom with 2:1 sideslopes throughout the crossing. 3. Spoil locally. 4. Rip and drain the left road for 650 ft.: install 12 cross-road drains.	-	-

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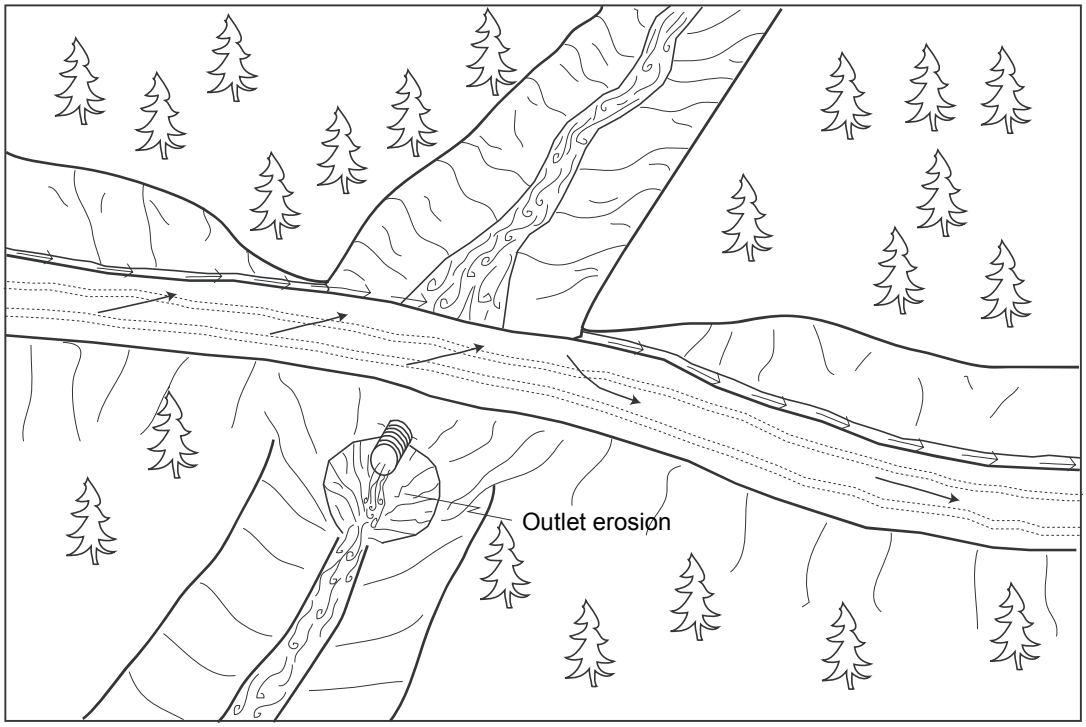

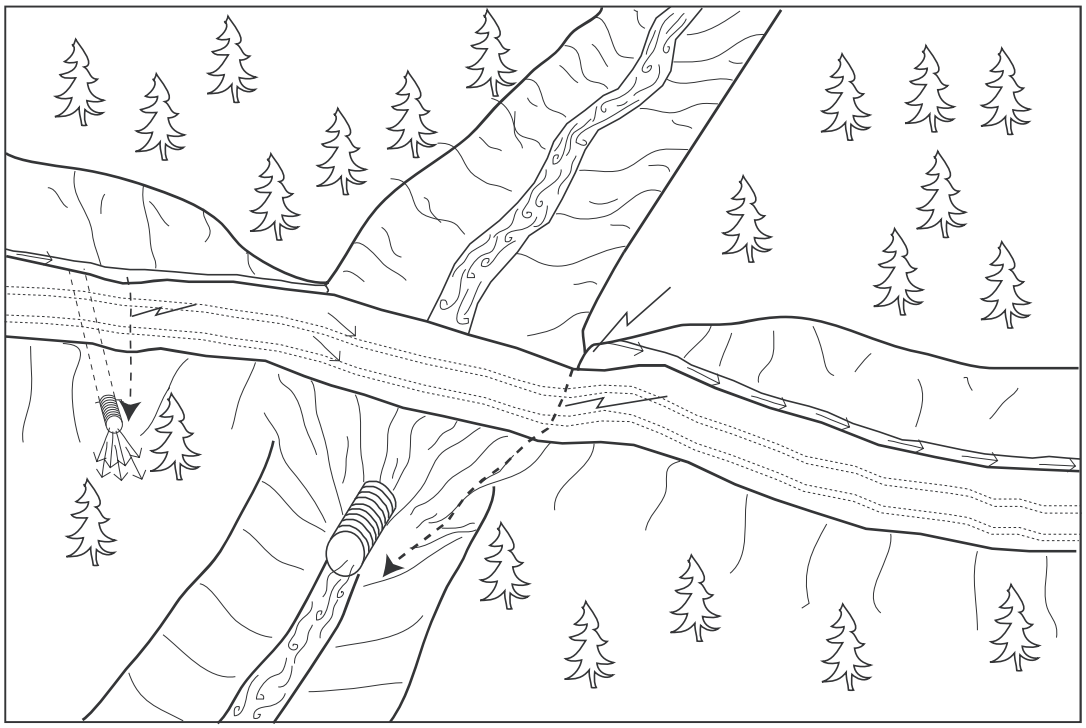

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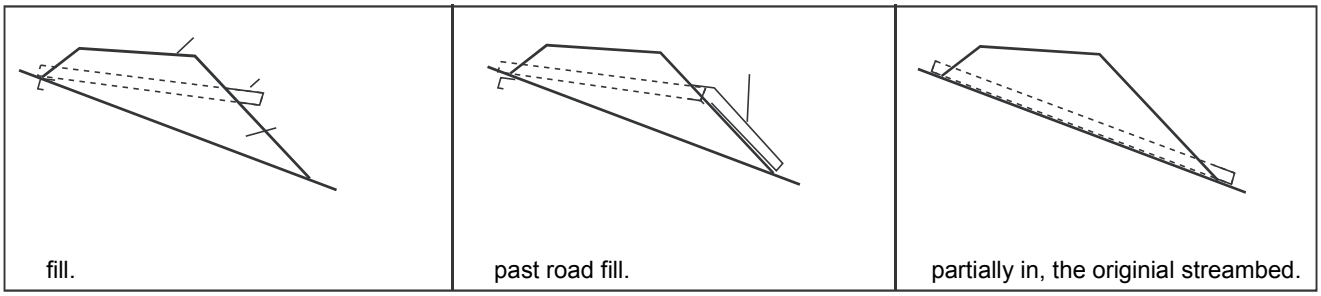
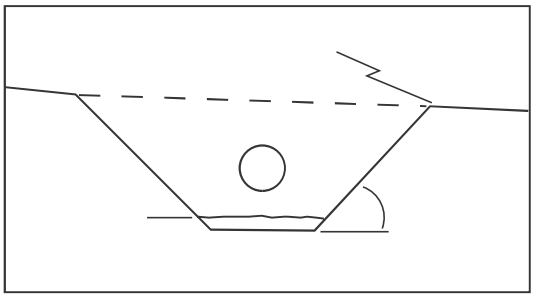
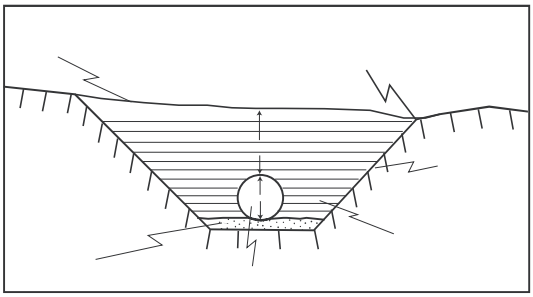
Typical Drawing #1



fill. past road fill. partially in, the originial streambed.





Note:
Road upgrading tasks typically include upgrading stream crossings by installing larger culverts and inlet protection (trash barriers) to prevent plugging. Culvert sizing for the 100-year peak storm flow should be determined by both field observation and calulations using a procedure such as the Rational Formula.

Stream crossing culvert Installation

1. Culverts shall be aligned with natural stream channels to ensure proper function, and prevent bank erosion and plugging by debris.
2. Culverts shall be placed at the base of the fill and the grade of the original streambed, or downspouted past the base of the fill.
3. Culverts shall be set slightly below the original stream grade so that the water drops several inches as it enters the pipe.
5. To allow for sagging after burial, a camber shall be between 1.5 to 3 incher per 10 feet culvert pipe length.
6. Backfill material shall be free of rocks, limbs or other debris that could dent or puncture the pipe or allow water to seep around pipe.
7. First one end then the other end of the culvert shall be covered and secured. The center is covered last.
8. Backfill material shall be tamped and compacted throughout the entire process:
   - Base and side wall material will be compacted before the pipe is placed in its bed.
   - Backfill compacting will be done in 0.5 - 1 foot lifts until 1/3 of the diameter of the culvert has been covered. A gas powered tamper can be used for this work.
9. Inlets and outlets shall be armored with rock or mulched and seeded with grass as needed.
10. Trash protectors shall be installed just upstream from the culvert where there is a hazard of floating debris plugging the culvert.
11. Layers of fill will be pushed over the crossing until the final designed road grade is achieved, at a minimum of 1/3 to 1/2 the culvert diameter.

Erosion control measures for culvert replacement

Both mechanical and vegetative measures will be employed to minimize accelerated erosion from stream crossing and ditch relief culvert upgrading. Erosion control measures implemented will be evaluated on a site by site basis. Erosion control measures include but are not limited to:

1. Minimizing soil exposure by limiting excavation areas and heavy equipment distrubance.
2. Installing filter windrows of slash at the base of the road fill to minimize the movement of eroded soil to downslope areas and stream channels.
3. Retaining rooted trees and shrubs at the base of the fill as “anchor” for the fill and filter windrows.
4. Bare slopes created by construction operations will be protected until vegetation can stabilize the surface. Surface erosion on exposed cuts and fills will be minimized by mulching, seeding, planting, compacting, armoring, and/or benching prior to the first rains.
5. Excess or unusable soil will be stored in long term spoil disposal locations that are not limited by factors such as excessive moisture, steep slopes greater than 10%, archeology potential, or proximity to a watercourse.
6. On running streams, water will be pumped or diverted past the crossing and into the downstream channel during the construction process.
7. Straw bales and/or silt fencing will be employed where necessary to control runoff within the construction zone.

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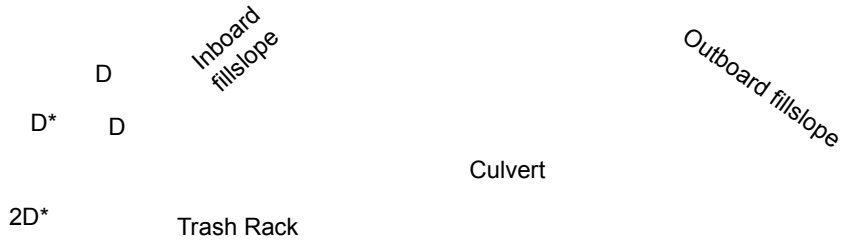
Typical Drawing #2

Typical Design of a Single-post Culvert Inlet Trash Rack

Cross section view

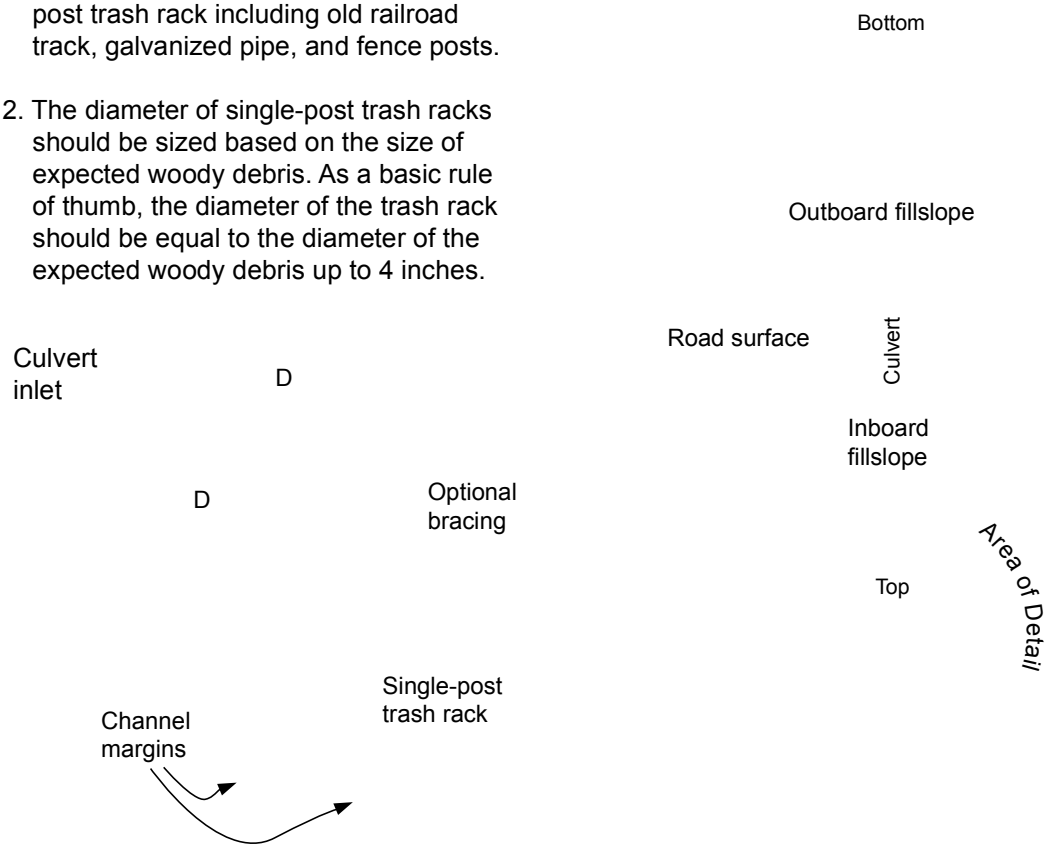


D - Culvert diameter
D* - If the culvert is designed for the 100-year peak storm flow, the trash rack height above the streambed should equal D.
If the culvert is undersized, then the trash rack needs to be extended vertically above the streambed to match or exceed the expected headwall height.

Plan view

Notes:
1. Many materials can be used for a single-post trash rack including old railroad track, galvanized pipe, and fence posts.

2. The diameter of single-post trash racks should be sized based on the size of expected woody debris. As a basic rule of thumb, the diameter of the trash rack should be equal to the diameter of the expected woody debris up to 4 inches.



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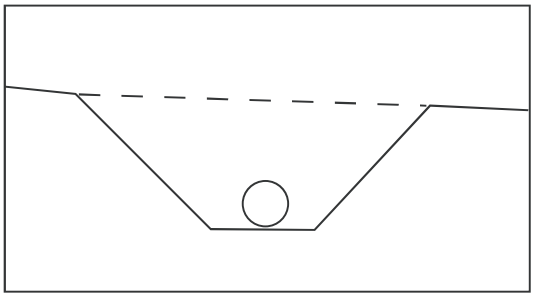
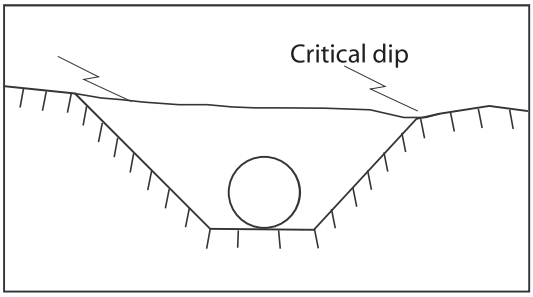
Typical Drawing #3





Stream crossing culvert Installation

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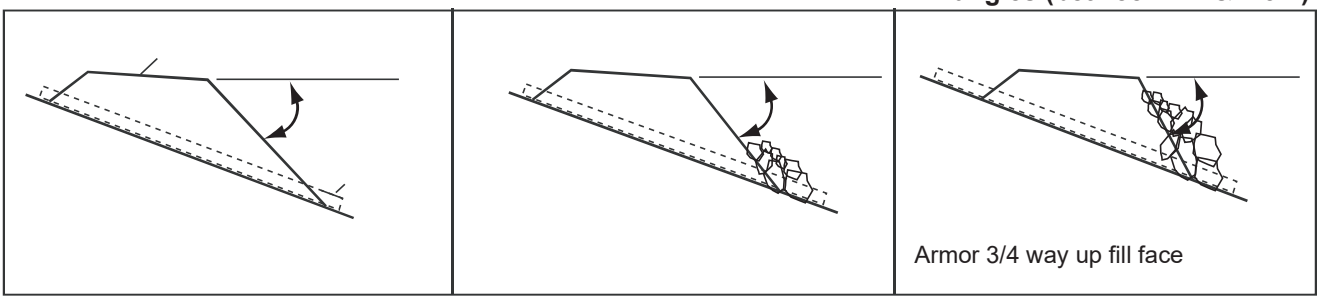
Note:
Road upgrading tasks typically include upgrading stream crossings by installing larger culverts and inlet protection (trash barriers) to prevent plugging. Culvert sizing for the 100-year peak storm flow should be determined by both field observation and calculations using a procedure such as the Rational Formula.

Armoring fill faces

Fill angles (between 2:1 & 1.5:1)



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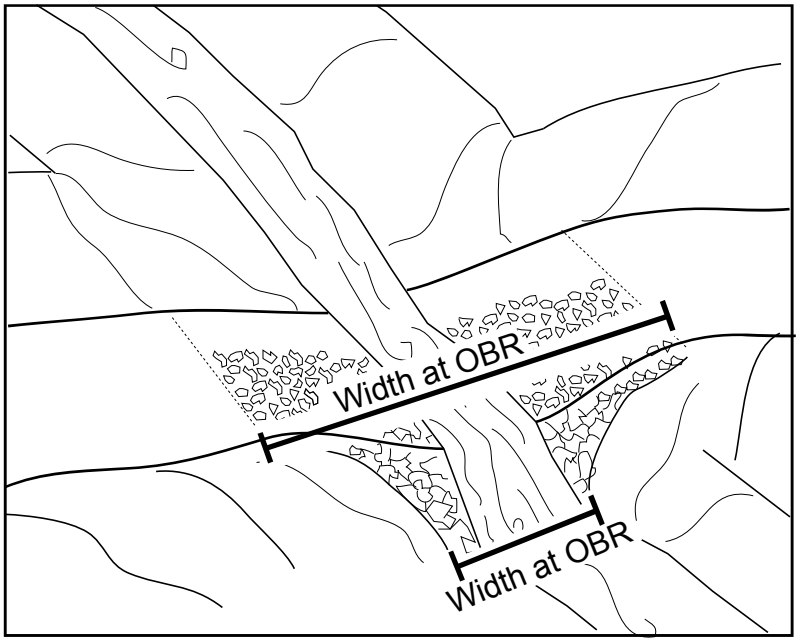
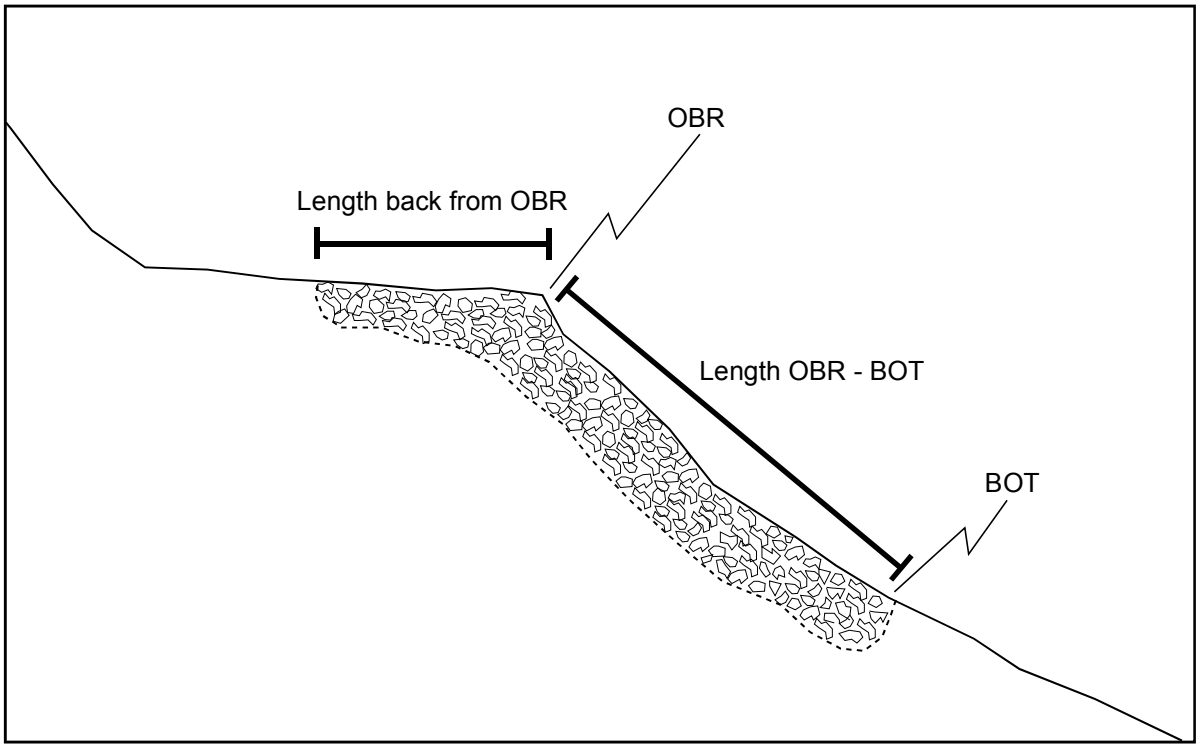
PWA Typical Drawing #4

Widths in oblique view



OBR - Outboard edge of road

Lengths in profile view



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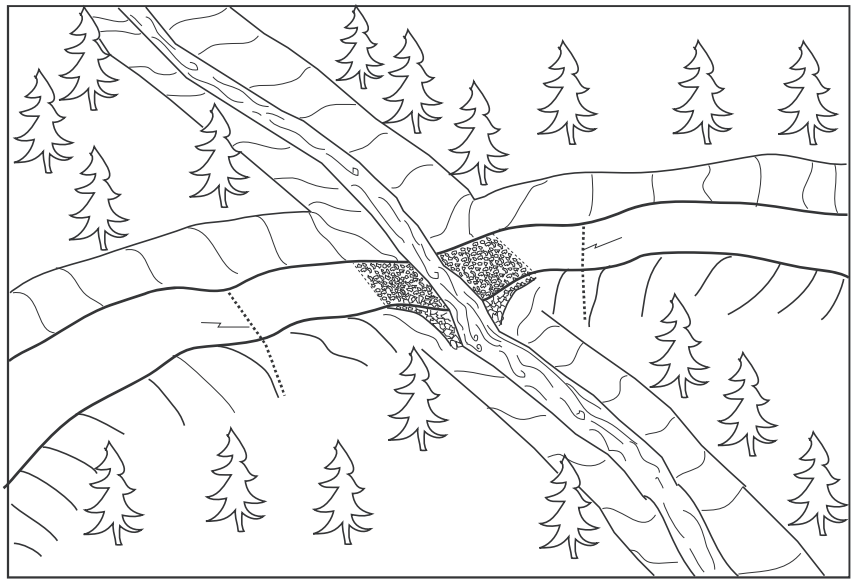
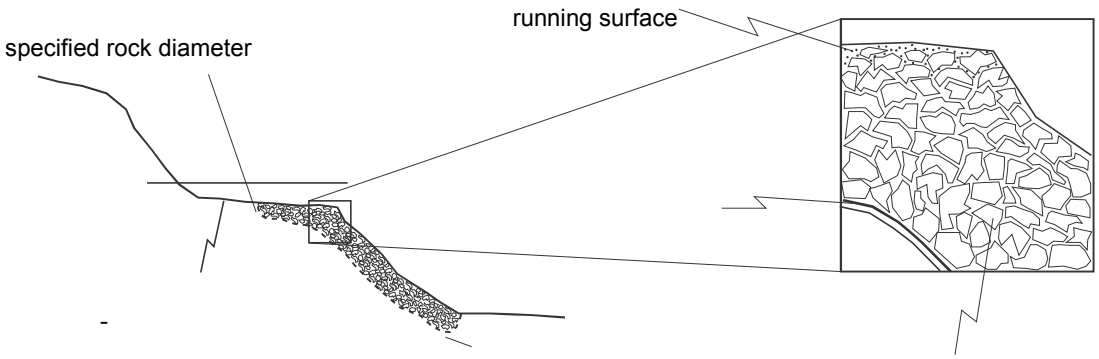
Typical Drawing #5





existing rocks found up or downstream from crossing. Armor extends to 100 year flood level.

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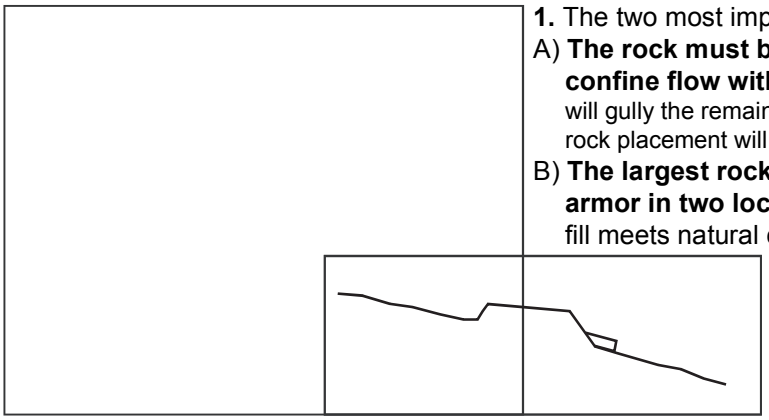
Typical Drawing #6

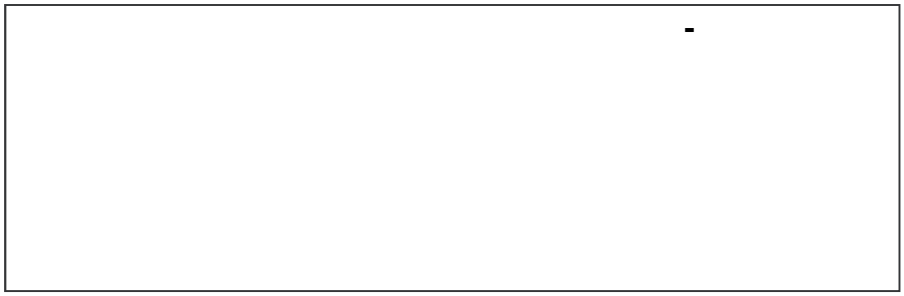
Ten Steps for Constructing a Typical Armored Fill Stream Crossing



1. The two most important points are:

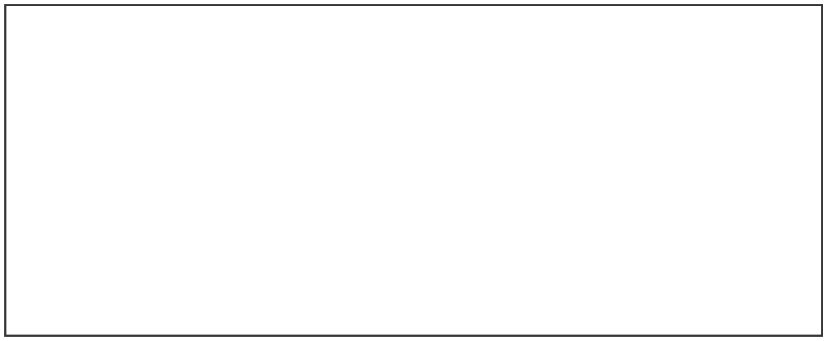
A) **The rock must be placed in a "U" shape across the channel to confine flow within the armored area.** (Flow around the rock armor will gully the remaining fill. Proper shape of surrounding road fill and good rock placement will reduce the likelihood of crossing failure).

B) **The largest rocks must be used to buttress the rest of the armor in two locations:** (i) The base of the armored fill where the fill meets natural channel. (This will butress the armor placed on the outboard fill face and reduce the likelihood of it washing downslope). (ii) The break in slope from the road tread to the outer fill face. (This will butress the fill placed on the outer road tread and will determine the "base level" of the creek as it crosses the road surface).



2. Remove any existing drainage structures including culverts and Humboldt logs.

3. Construct a dip centered at the crossing that is large enough to accomodate the 100-year peak storm flow and prevent diversion (C-D, E-F).



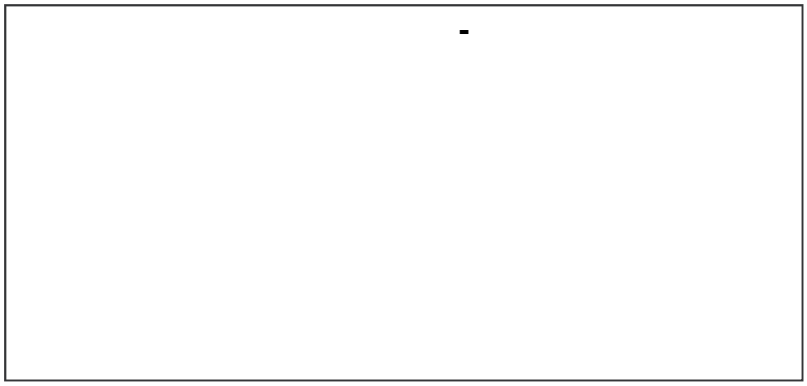
4. Dig a keyway (to place rock in) that extends from the outer 1/3 of the road tread down the outboard road fill to the point where outbaord fill meets natural channel (up to 3 feet into the channel bed depending on site specifics) (G-H, I-J).

5. Install geofabric (optional) within keyway to support rock in wet areas and to prevent winnowing of the crossing at low flows.

6. Put aside the largest rock armoring to create 2 buttresses in the next step.

7. Create a buttress using the largest rock (as described in the site treatments specifications) at the base of fill. (This should have a "U" shape to it and will define the outlet of the armored fill.)

8. Backfill the fill face with remaining rock armor making sure the final armored area has "U" shape that will accomodate the largest expected flow (K-L).



9. Install a second buttress at the break in slope between the outboard road and the outboard fill face. (This should define the base level of the stream and determine how deep the stream will backfill after construction). (M-N)

10. Back fill the rest of the keyway with the unsorted rock armor making sure the final armored area has a "U" shape that will accommodate the largest expected flow (O-P).

Typical Drawing #7

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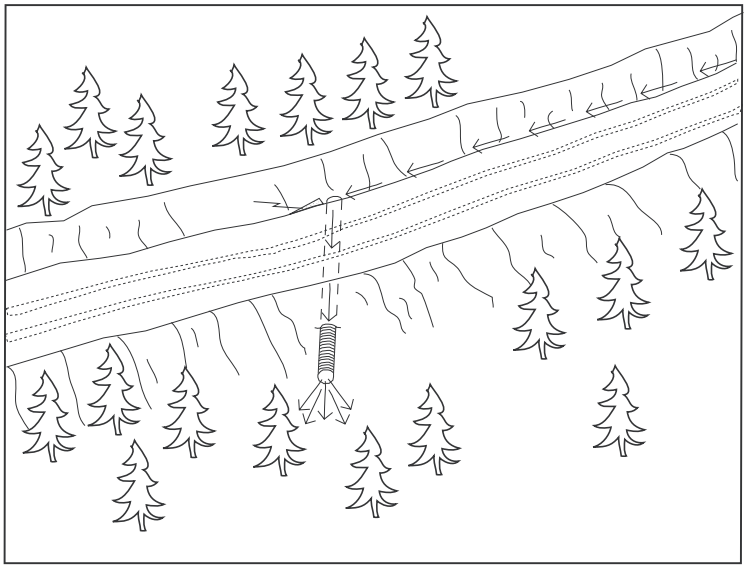

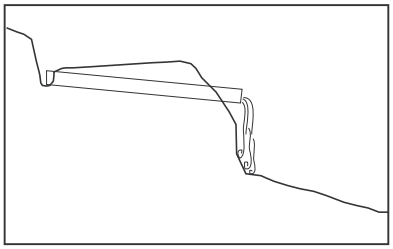

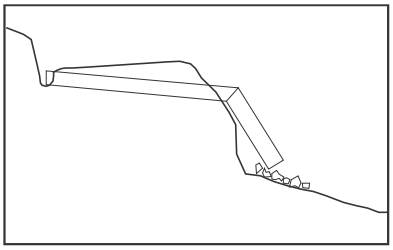

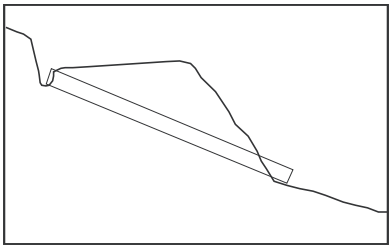

5) Backfill shall be compacted from the bed to a depth of 1 foot or 1/3 of the culvert diameter, which

6) Culvert outlets shall extend beyond the base of the road fill (or a flume downspout will be used). Culverts will be seated on the natural slope or at a depth of 5 feet at the outside edge of the road,

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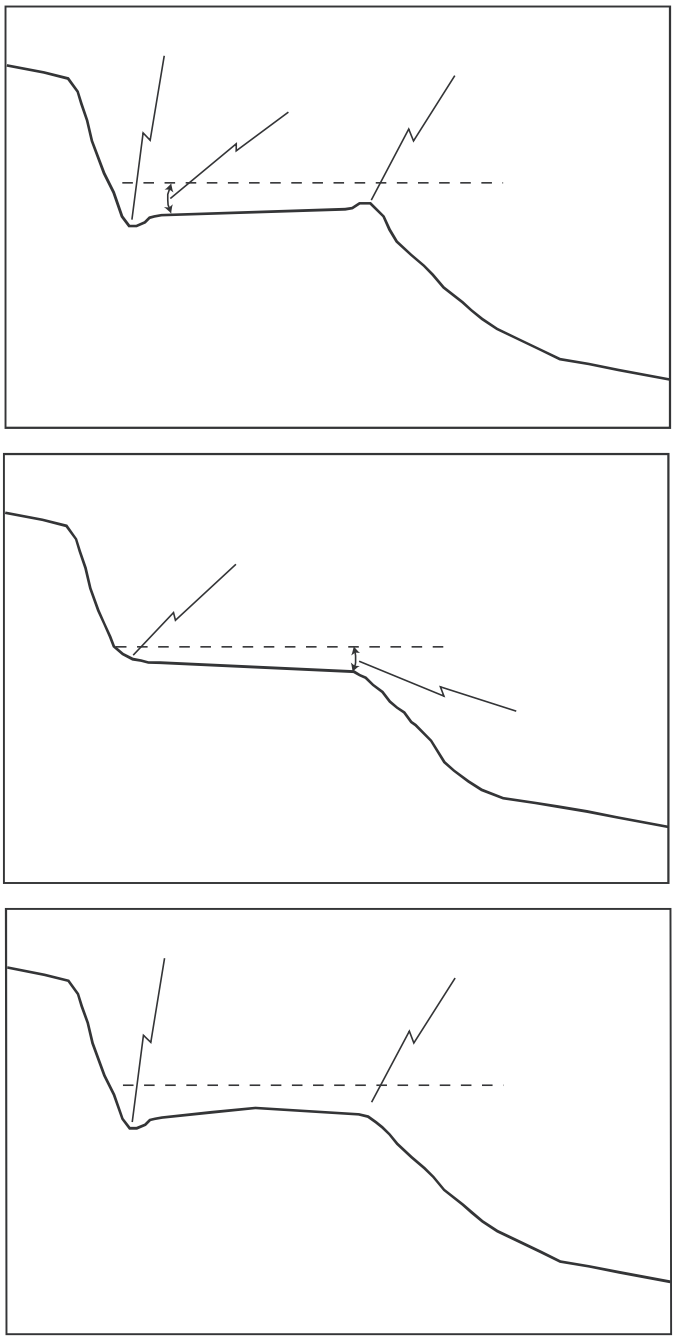
Typical Drawing #8



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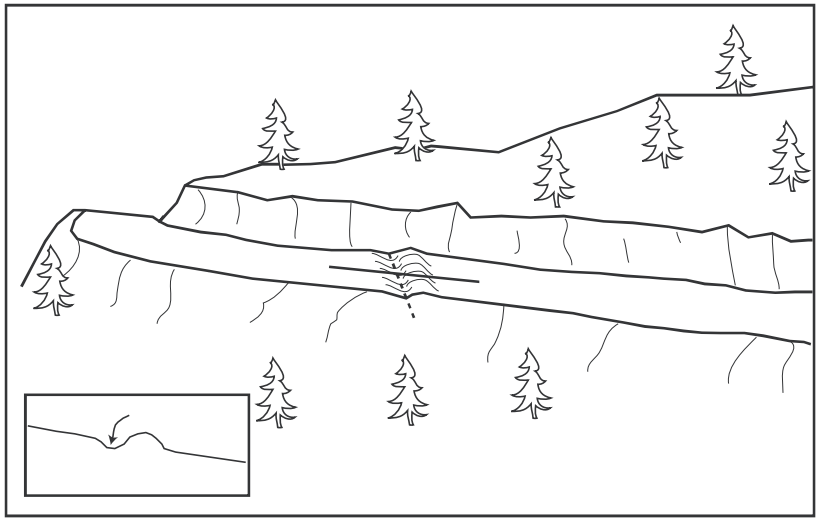
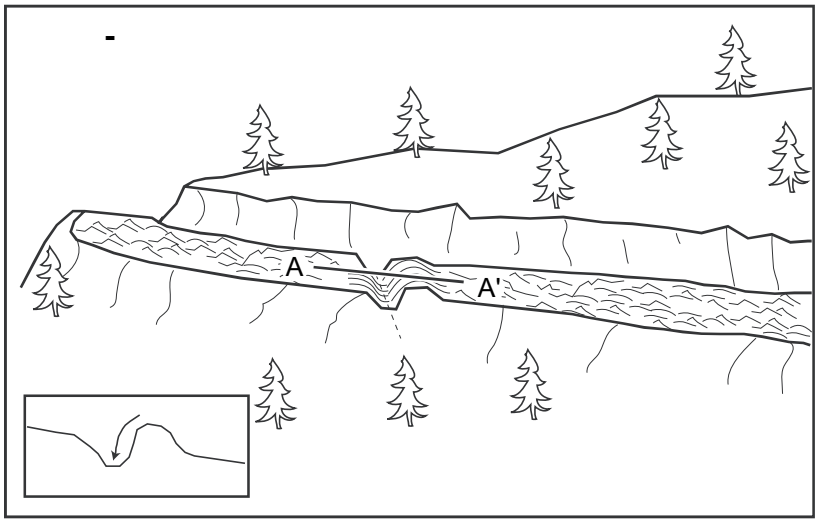
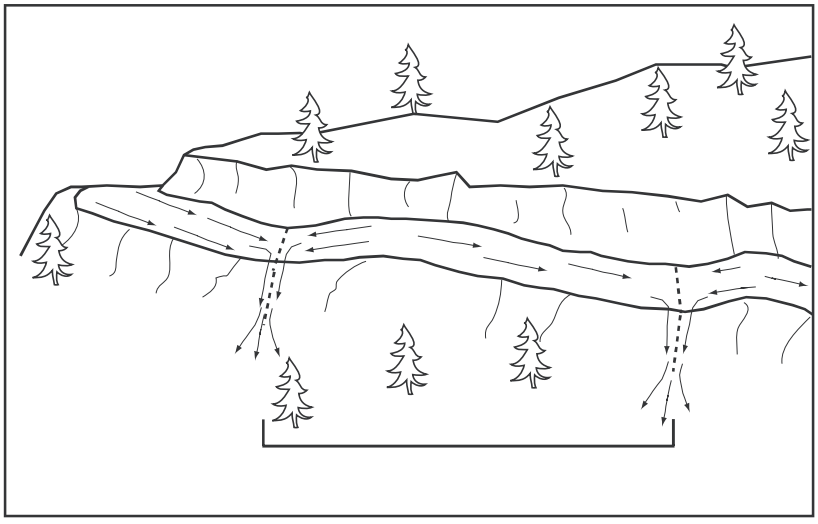
Typical Drawing #9







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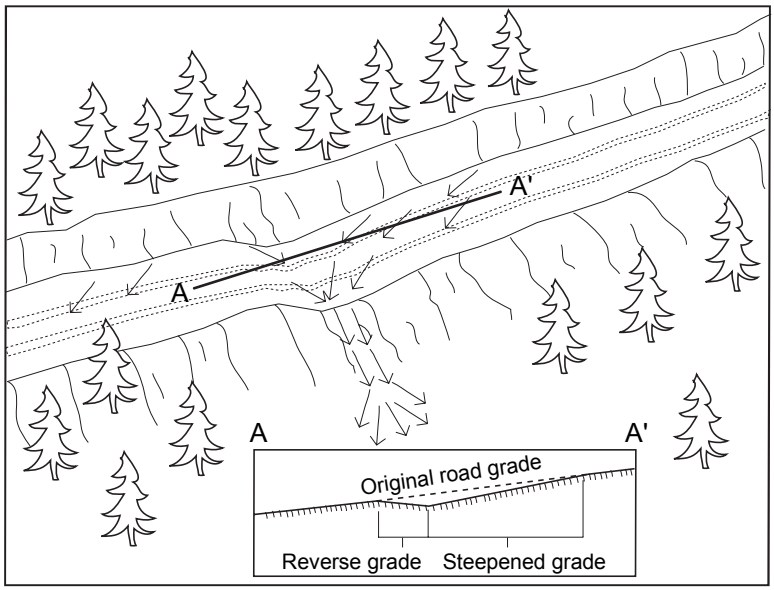
Typical Drawing #10

Typical Road Surface Drainage by Rolling Dips



Rolling dip installation:

1. Rolling dips will be installed in the roadbed as needed to drain the road surface.
2. Rolling dips will be sloped either into the ditch or to the outside of the road edge as required to properly drain the road.
3. Rolling dips are usually built at 30 to 45 degree angles to the road alignment with cross road grade of at least 1% greater than the grade of the road.
4. Excavation for the dips will be done with a medium-size bulldozer or similar equipment.
5. Excavation of the dips will begin 50 to 100 feet up road from where the axis of the dip is planned as per guidelines established in the rolling dip dimensions table.
6. Material will be progressively excavated from the roadbed, steepening the grade unitl the axis is reached.
7. The depth of the dip will be determined by the grade of the road (see table below).
8. On the down road side of the rolling dip axis, a grade change will be installed to prevent the runoff from continuing down the road (see figure above).
9. The rise in the reverse grade will be carried for about 10 to 20 feet and then return to the original slope.
10. The transition from axis to bottom, through rising grade to falling grade, will be in a road distance of at least 15 to 30 feet.

Table of rolling dip dimensions by road grade

Road grade %	**Upslope approach distance** (from up road start to trough) ft	**Reverse grade distance** (from trough to crest) ft	**Depth at trough outlet** (below average road grade) ft	**Depth at trough inlet** (below average road grade) ft
<6	55	15 - 20	0.9	0.3
8	65	15 - 20	1.0	0.2
10	75	15 - 20	1.1	0.01
12	85	20 - 25	1.2	0.01
>12	100	20 - 25	1.3	0.01

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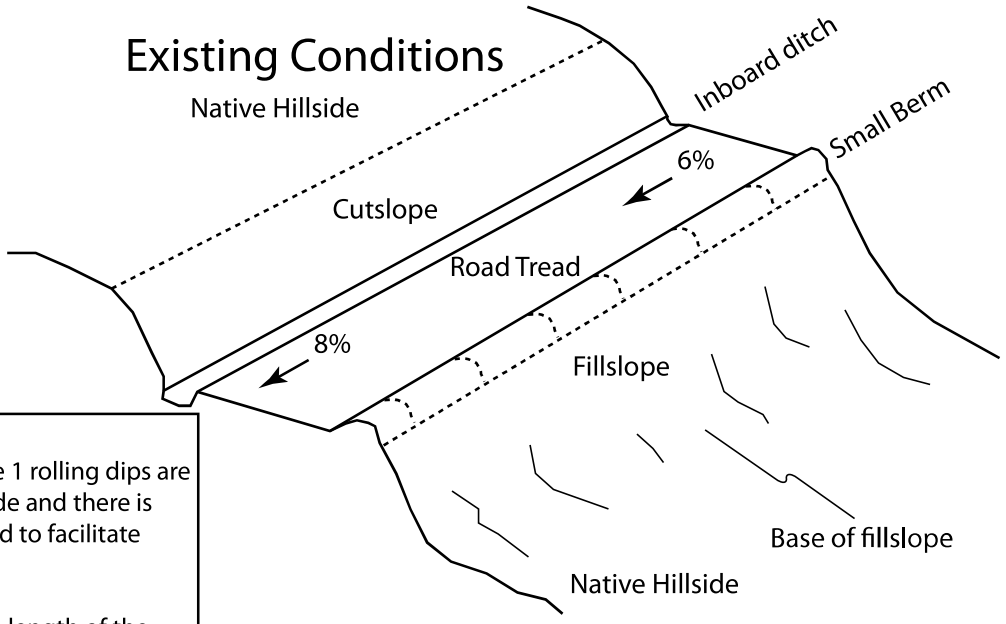
Typical Drawing #11

Standard (Type 1) Rolling Dip Construction

Existing Conditions



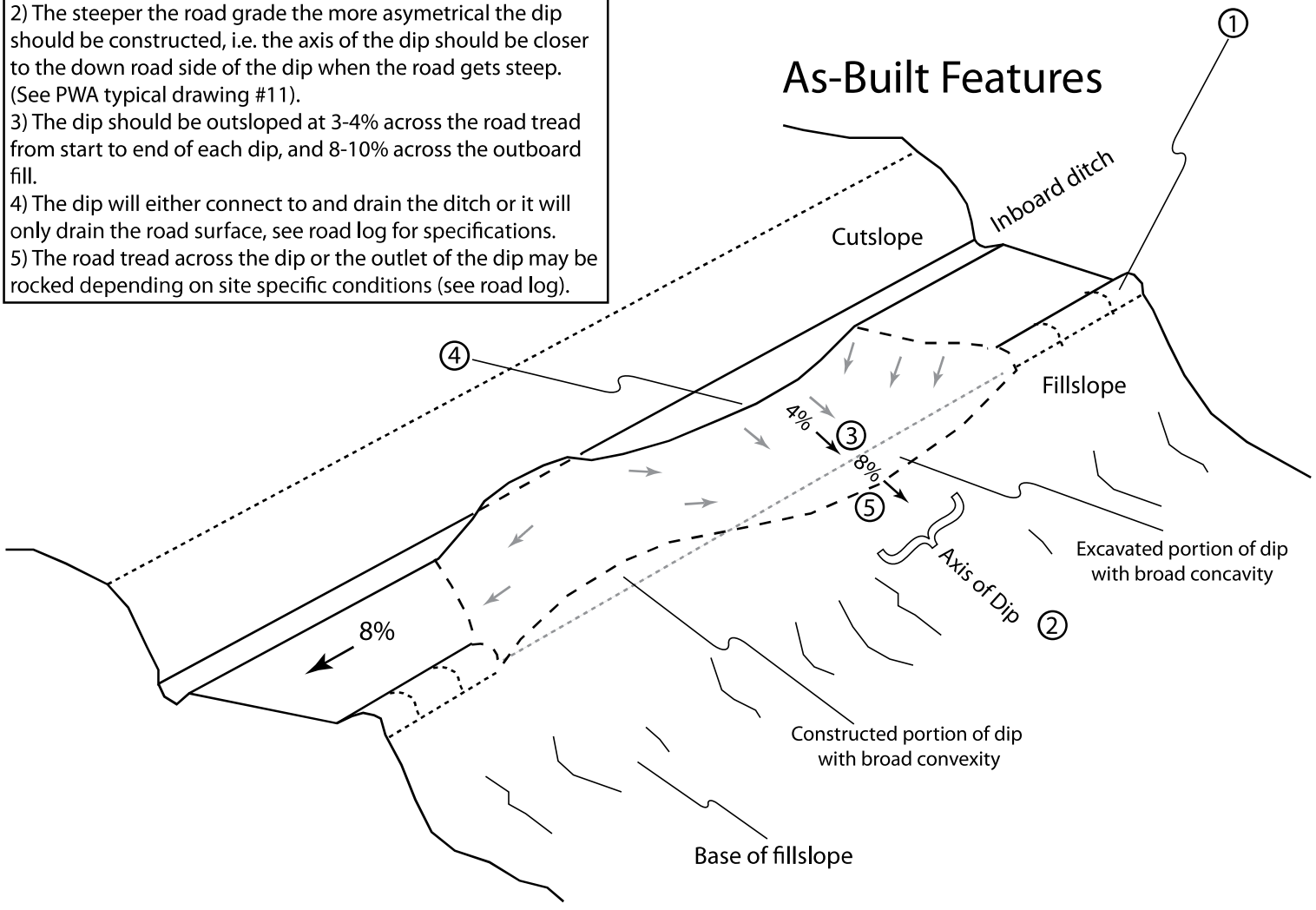
Notes

Rolling dip type 1 existing conditions: Type 1 rolling dips are utilized when roads are less than 12-14% grade and there is proximal outfall adjacent to the outboard road to facilitate road drainage.

Design Notes:

1) The berm should be removed for the entire length of the dip.
2) The steeper the road grade the more asymetrical the dip should be constructed, i.e. the axis of the dip should be closer to the down road side of the dip when the road gets steep. (See PWA typical drawing #11).
3) The dip should be outsloped at 3-4% across the road tread from start to end of each dip, and 8-10% across the outboard fill.
4) The dip will either connect to and drain the ditch or it will only drain the road surface, see road log for specifications.
5) The road tread across the dip or the outlet of the dip may be rocked depending on site specific conditions (see road log).

As-Built Features



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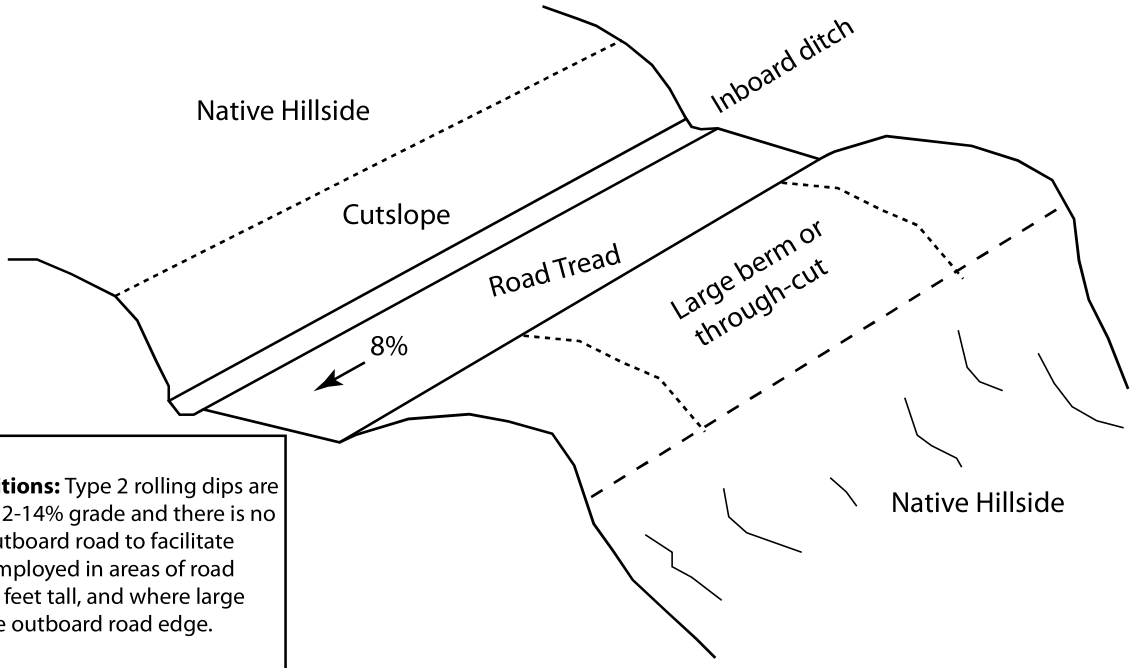
PWA Typical Drawing #19a

Type 2 Rolling Dip Construction

(Through-cut or thick berm road reaches)



Notes

Rolling dip type 2 existing conditions: Type 2 rolling dips are utilized when roads are less than 12-14% grade and there is no proximal outfall adjacent to the outboard road to facilitate road drainage. These should be employed in areas of road through-cuts generally less than 3 feet tall, and where large wide and/or tall berms exist on the outboard road edge.

Design Notes:

1) The berm or native hillside should be removed for the entire length of the excavated portion of the dip, or, at a minimuim through the axis of the dip.

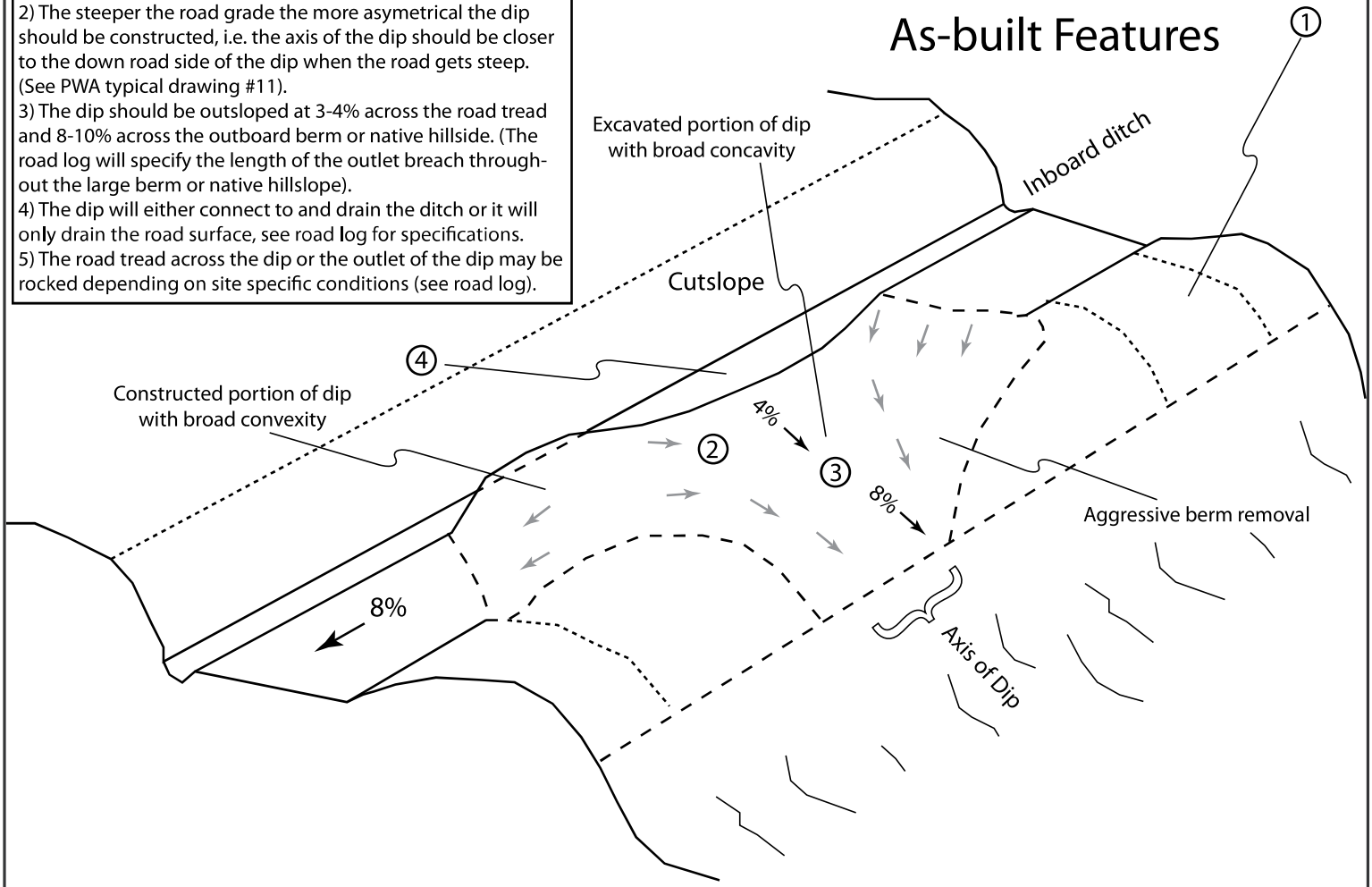
2) The steeper the road grade the more asymetrical the dip should be constructed, i.e. the axis of the dip should be closer to the down road side of the dip when the road gets steep. (See PWA typical drawing #11).

3) The dip should be outsloped at 3-4% across the road tread and 8-10% across the outboard berm or native hillside. (The road log will specify the length of the outlet breach through-out the large berm or native hillslope).

4) The dip will either connect to and drain the ditch or it will only drain the road surface, see road log for specifications.

5) The road tread across the dip or the outlet of the dip may be rocked depending on site specific conditions (see road log).

As-built Features



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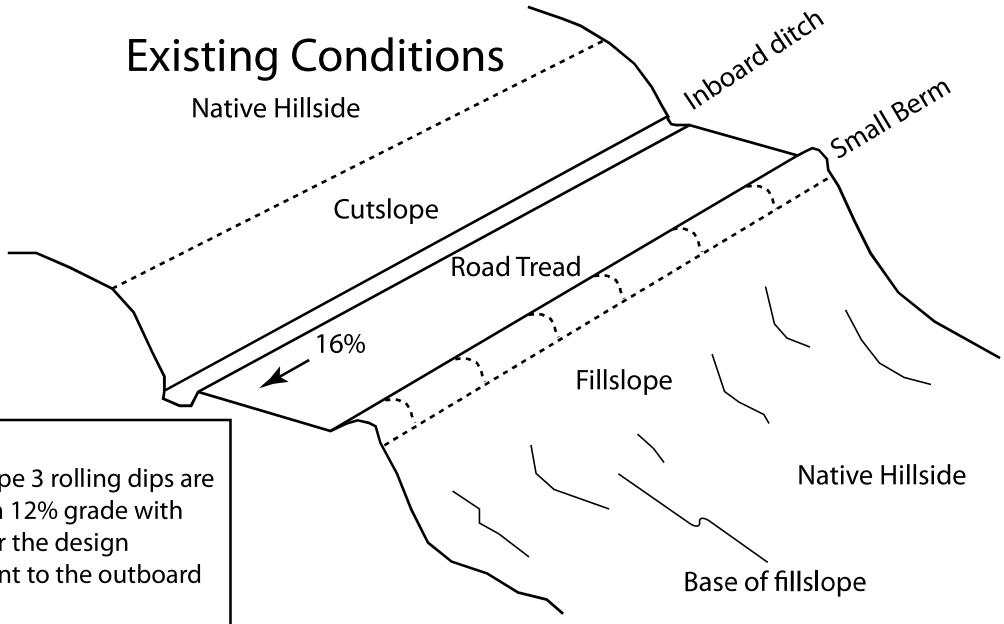
PWA Typical Drawing #19b

Type 3 Rolling Dip Construction
(steep slope outslope)



Notes

Rolling dip type 3 existing conditions: Type 3 rolling dips are utilized when roads grades are steeper than 12% grade with little opportunity to create reverse grade for the design vehicle, and there is proximal outfall adjacent to the outboard road to facilitate road drainage.

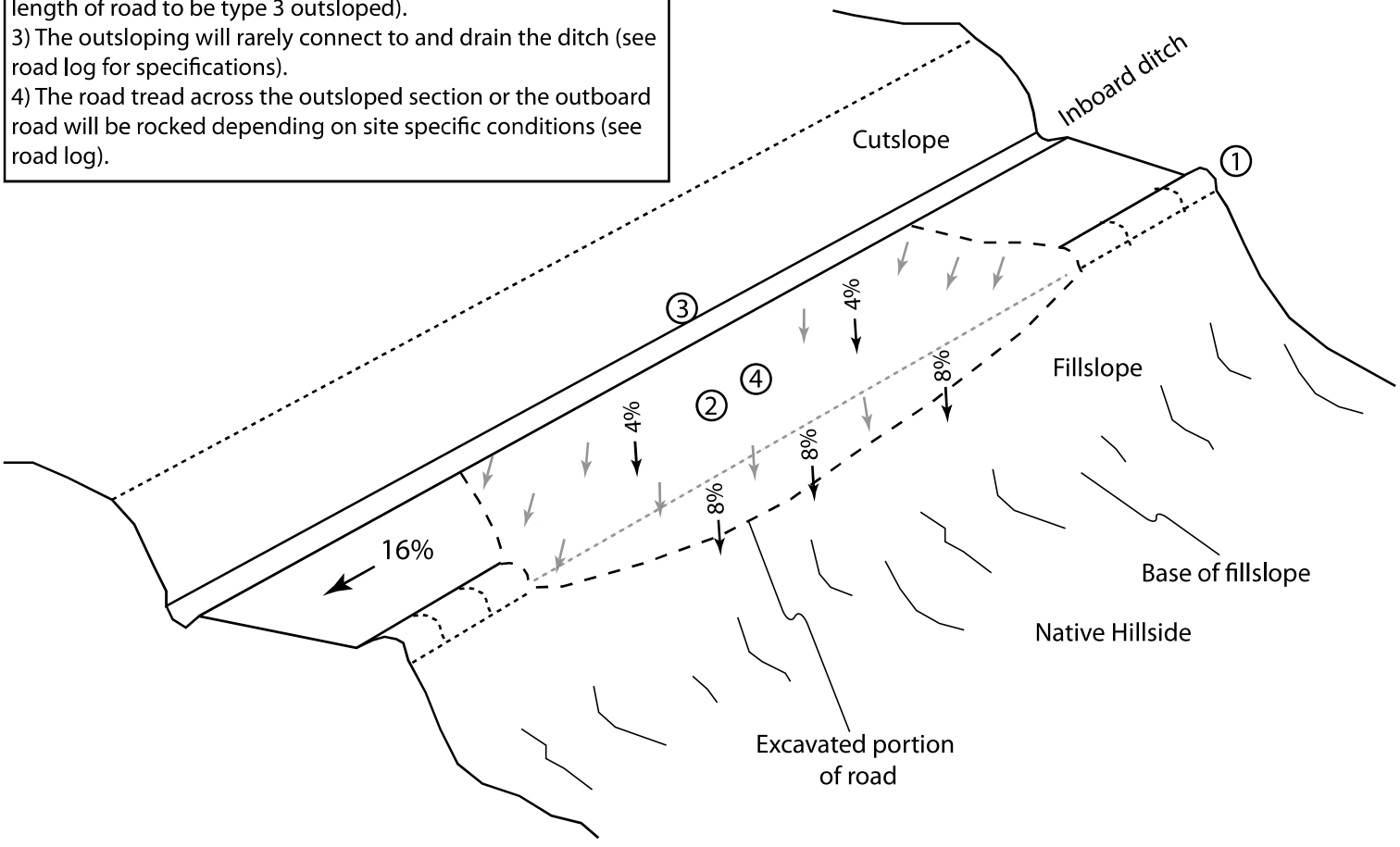
Design Notes:

1) The berm should be removed for the entire length of the outsloped section.

2) The dip should be outsloped at 2-4% across the road tread and 4-8% across the outboard fill. (The road log will specify the length of road to be type 3 outsloped).

3) The outsloping will rarely connect to and drain the ditch (see road log for specifications).

4) The road tread across the outsloped section or the outboard road will be rocked depending on site specific conditions (see road log).



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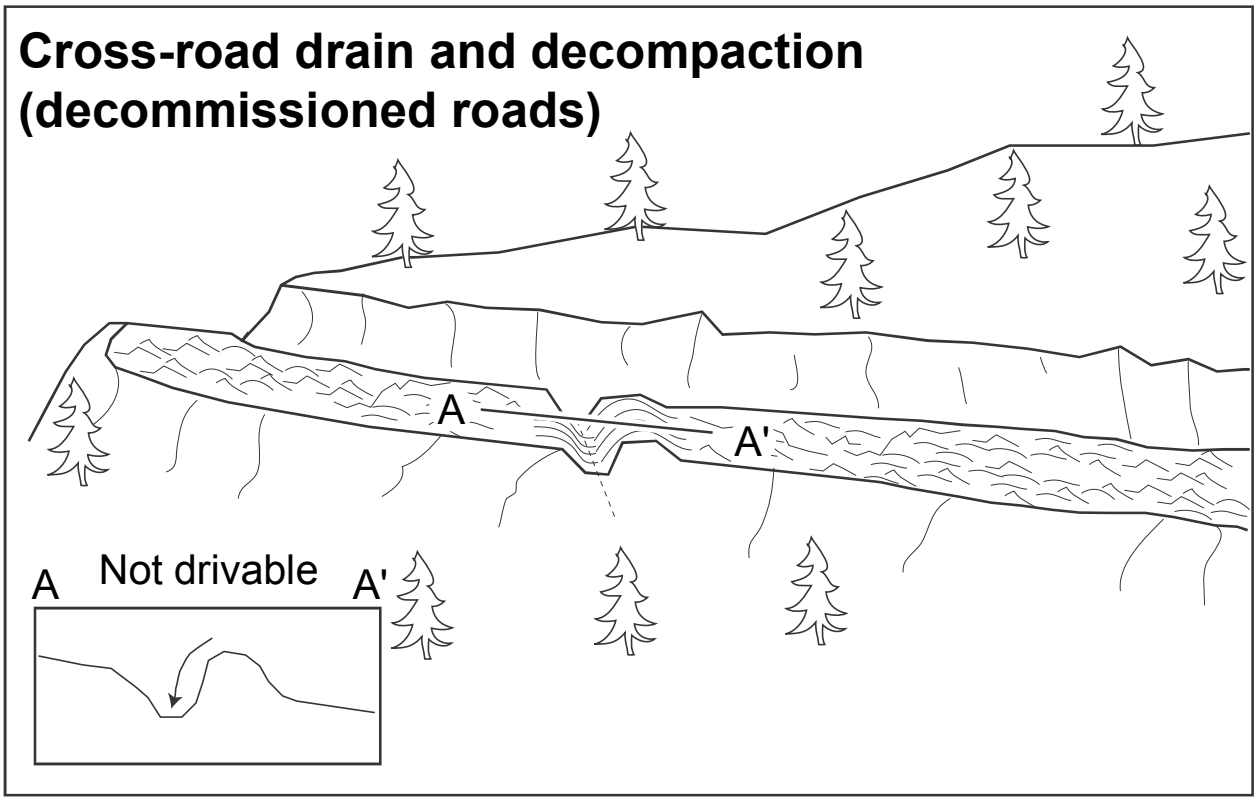
PWA Typical Drawing #19c

Cross-road drain and decompaction (decommissioned roads)



Cross road drain construction will ensure gullies, springs, road runoff and other concentrated flow will no longer collect over long lengths of road causing gully erosion and sediment delivery to streams. Cross road drains will be constructed at approximately 75 ft spacing intervals and these cross road drains will direct road surface runoff off the road onto stable hillslope locations.

Ripping the road surface 16 to 24 inches deep will increase road surface infiltration rates, decompact the road surface, and prevent concentrated runoff. Road ripping will also pulverize the compacted road surface or hardpan and allow for vegetation to establish and recover naturally.

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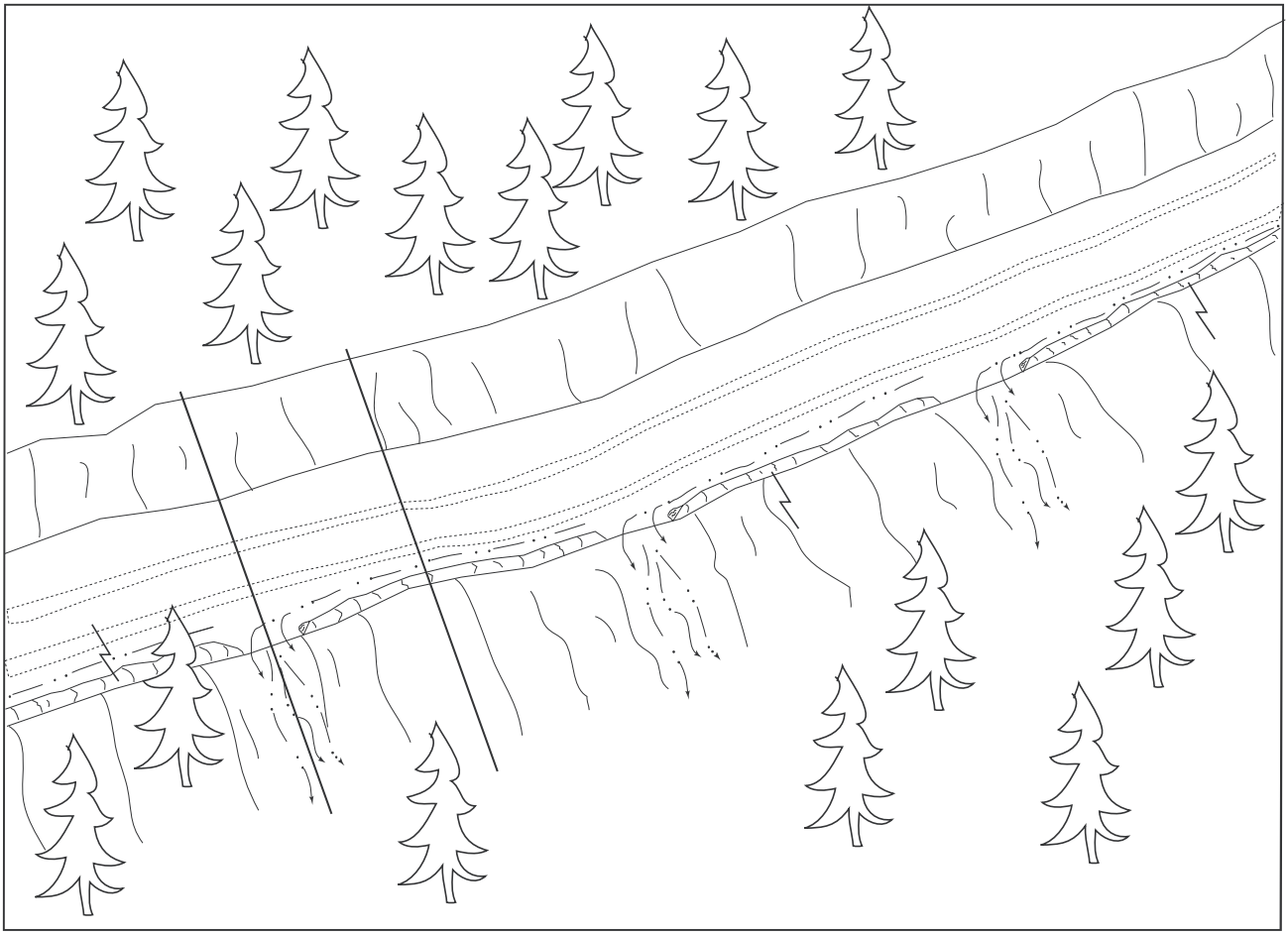
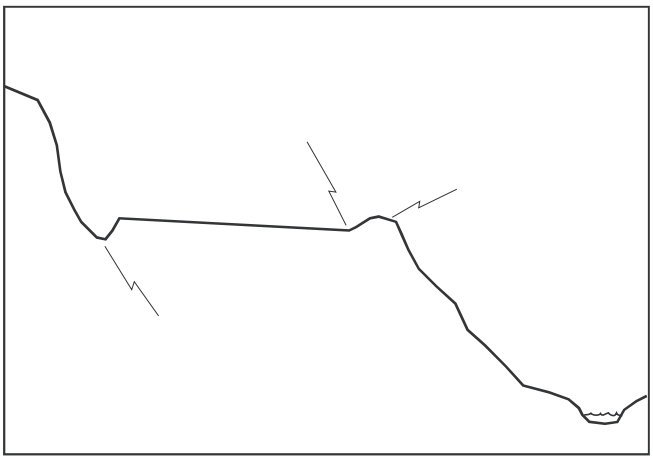
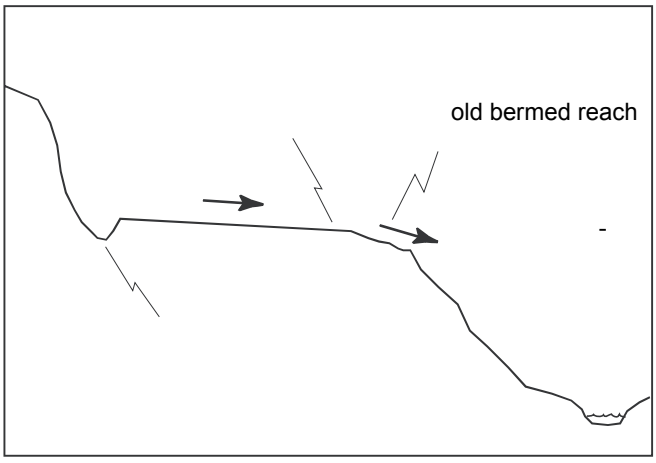
PWA Typical Drawing #17

1. On gentle road segments berms can be removed continuously (see B-B').
2. On steep road segments, where safety is a concern, the berm can be frequently breached (see A-A' & B-B')

   while maintaining a semi-continuous berm for vehicle safety.







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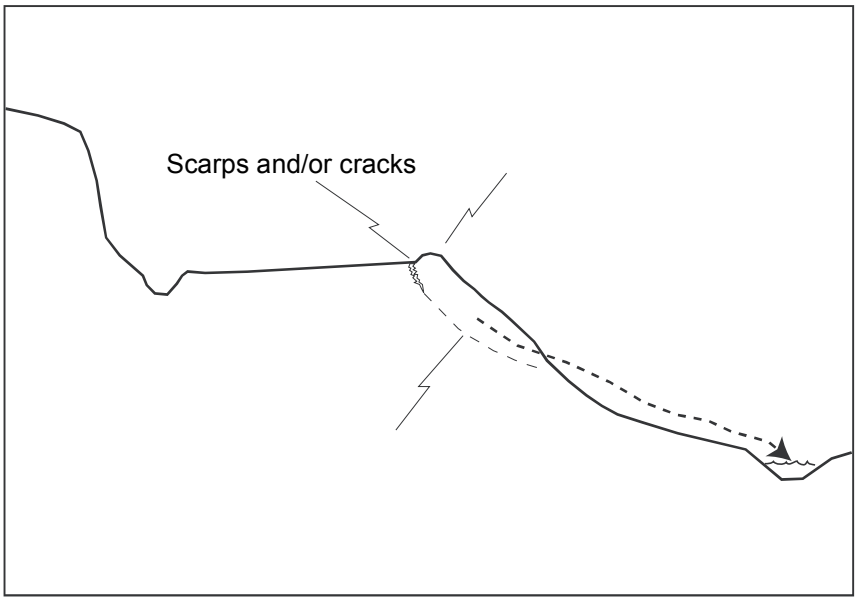
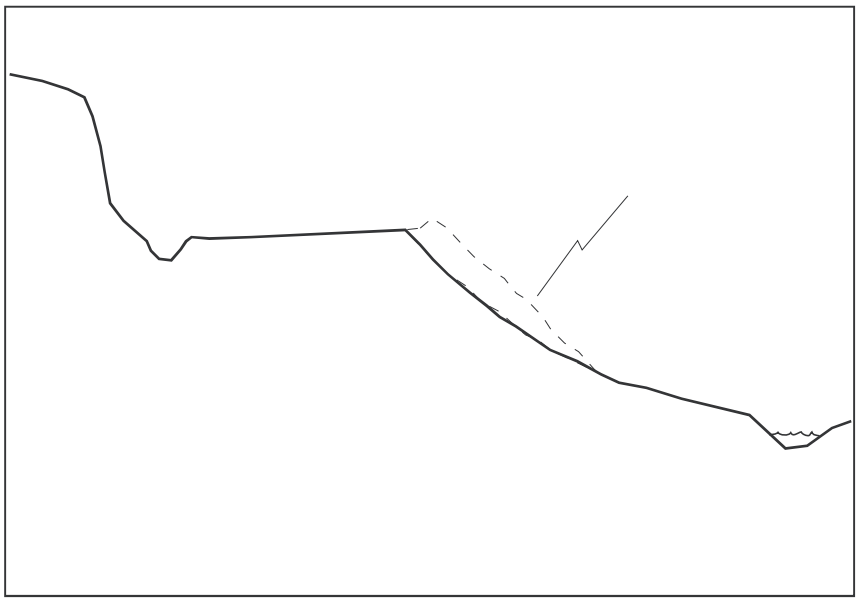
Typical Drawing #12





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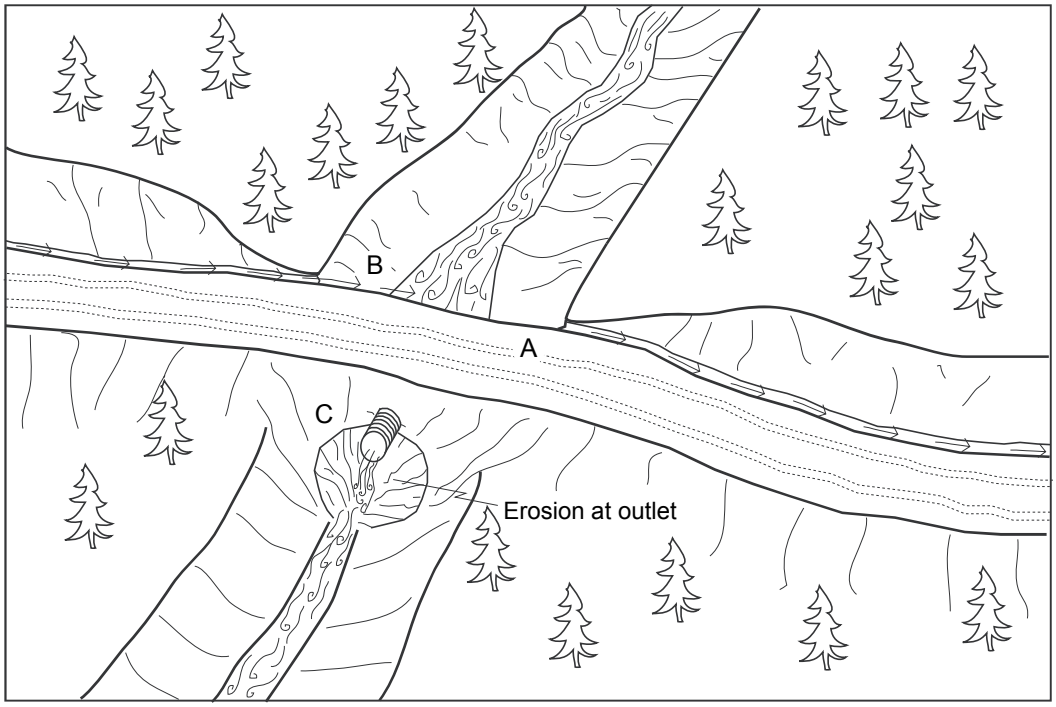
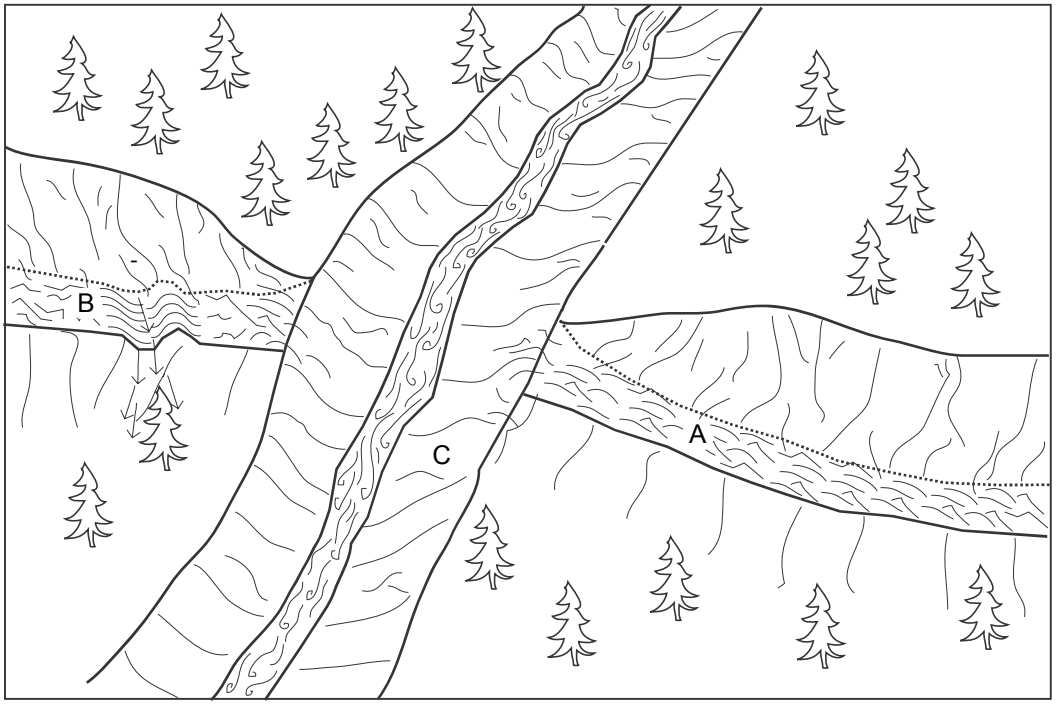
Typical Drawing #13

A - Diversion potential





from stream by road surface

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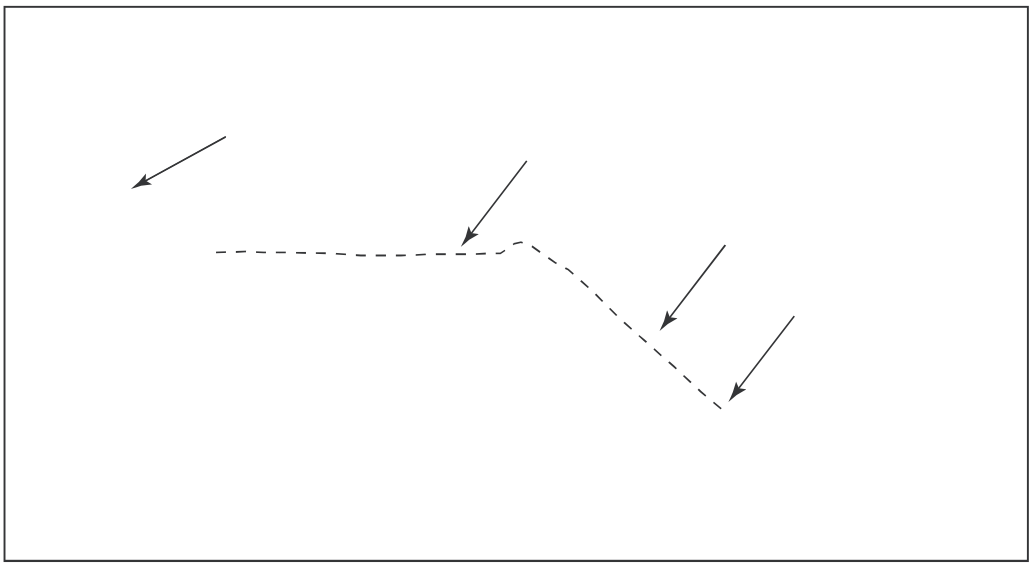
Typical Drawing #14

Typical Design for Road Decommisioning Treatments



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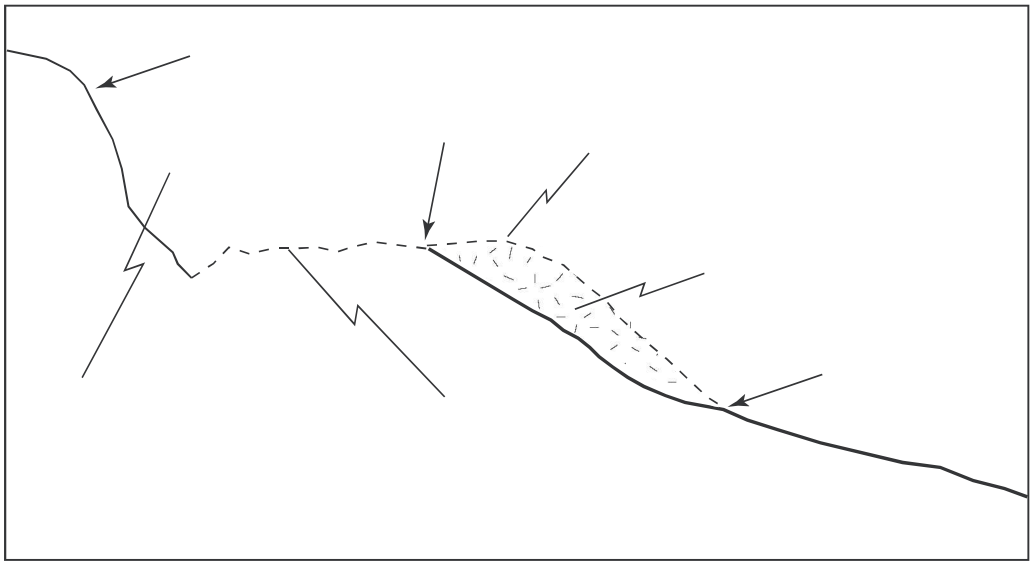

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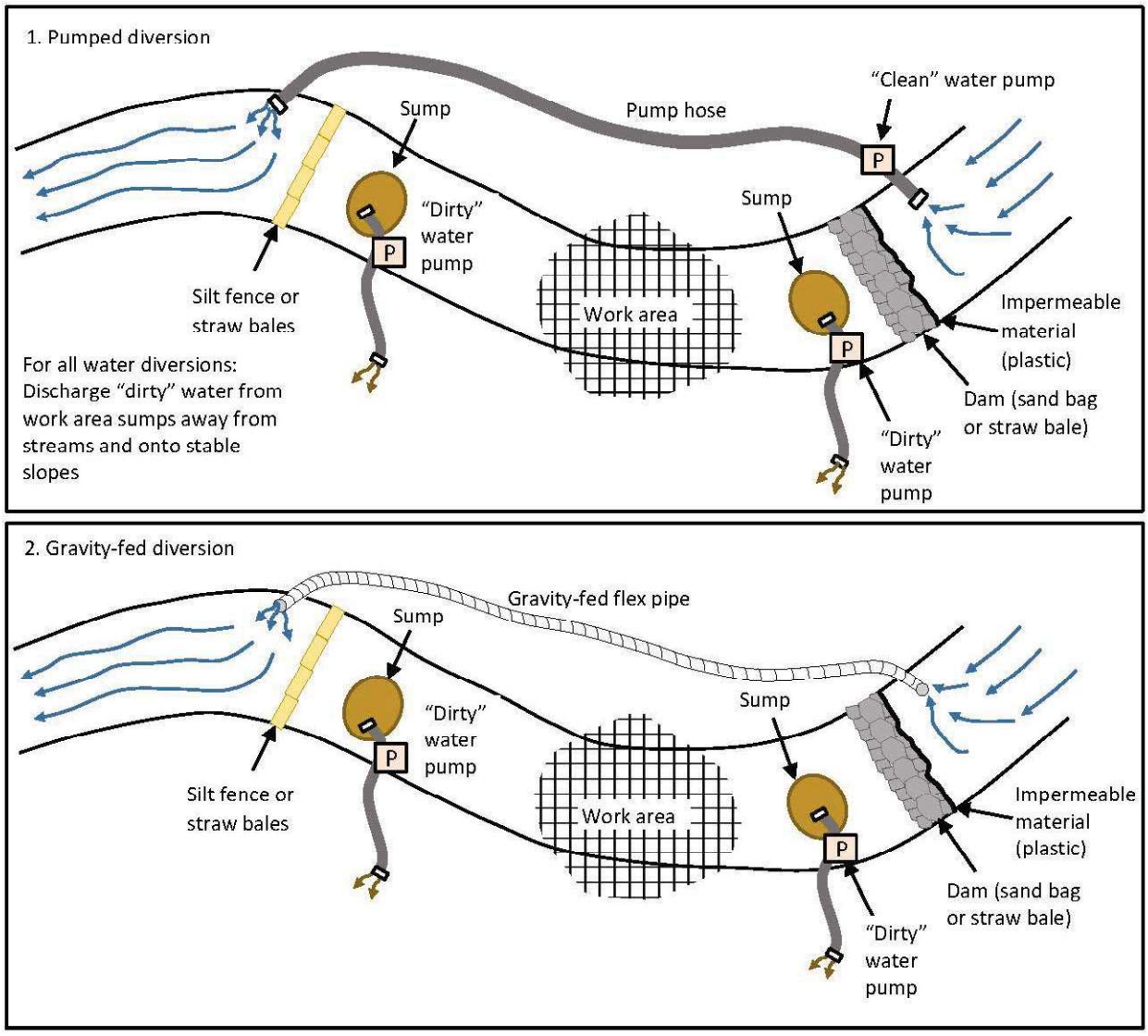
Typical Drawing #15



Stream crossing de-watering

Prior to working in and around the active stream channel, proper stream dewatering and avoidance of increasing downstream turbidity should be employed. Stream flows will be isolated upstream of the work area using cofferdams and transported downstream / around the work site through either a pumped diversion (Type 1) or by gravity diversion (Type 2) to keep the stream "live" (flowing) below the work area. An additional dam will be installed downstream of the work areas to capture any subsurface flow that might travel through the construction area. Any "dirty" water will be collected at this location and pumped away from the site where it can infiltrate into the ground without the potential to delivery to the stream and/or be used to wet fill being deposited in the spoil disposal areas.