

Contract Documents for:
**Butte County Resource
Conservation District
Post-Camp Fire Dixie Road Sediment
Reduction Project**

Butte County Resource Conservation District Agreement # D1911433

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“Funding for this project has been provided in full or in part through an agreement with the State Water Resources Control Board and the U.S. Environmental Protection Agency under the Federal Nonpoint Source Pollution Control Program (Clean Water Act Section 319). The contents of this document do not necessarily reflect the views and policies of the State Water Resources Control Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.” I



INVITATION FOR BID

May 11, 2021

You are invited to review and respond to the attached Invitation for Bid (IFB), entitled Post-Camp Fire Dixie Road Sediment Reduction Project. The anticipated term of the resulting contract is **June 15, 2021-November 30, 2021**.

Inquiries regarding the processing of the enclosed bid package should be referred to Colin Hughes, Project Manager, (707)-839-5130.

Regards,

Project Estimate \$290,000

POST-CAMPFIRE DIXIE ROAD SEDIMENT REDUCTION PROJECT

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SECTION 1. GENERAL INFORMATION

1.1 PURPOSE AND DESCRIPTION OF SERVICES

WORK UNDER THIS SOLICITATION CONSISTS OF ROAD UPGRADING ALONG 7 MILES OF DRIVEABLE ROAD AND THEREFORE, GENERALLY PERFORMING TREATMENTS DESCRIBED IN THE “*HANDBOOK FOR FOREST, RANCH, AND RURAL ROADS*”, INCLUDING INSTALLING OR REPLACING CULVERTS AT 20 STREAM CROSSINGS (SOME MAY BE ACTIVELY FLOWING DURING EXCAVATION), PULLING BACK SIDE-CAST ROAD FILL WHERE DETERMINED, INSTALLING ROAD DRAINAGE FEATURES SUCH AS ROLLING DIPS (59) AND DRAINING ROADWAY BETWEEN WORK SITES, APPLYING ROCK SLOPE PROTECTION (RSP OR RIPRAP) TO STEEP FILLSLOPES AND OTHER AREAS (645 yd³), AND APPLYING ROAD ROCK (855 yd³) TO FINISHED ROAD SURFACES, AS STAKED IN THE FIELD AND DESCRIBED IN THE ATTACHED “ROAD LOGS” (APPENDIX B), OR AS DIRECTED BY PWA PROJECT MANAGER. ALL CULVERT, RIPRAP, AND ROAD ROCK MATERIALS WILL BE PURCHASED BY PWA AND FURNISHED AT THE COUNTY STOCKPILE LOCATION NEAR THE INTERSECTION OF CONCOW ROAD AND DIXIE ROAD. ALL DISTURBED SLOPES WITH POTENTIAL TO DELIVER SOIL TO A WATERCOURSE WILL BE SEEDED AND MULCHED BY THE CONTRACTOR, WITH MATERIALS PURCHASED BY PWA.

The site is Dixie Road and Road 23N14Y, U.S. Forest Service roads located on U.S. National Forest lands. Dixie Road is maintained by Butte County Public Works (BCPW) and open to the public. The CONTRACTOR is advised that rain, wet fog, or red flag warnings may stop the work unless the Project Manager determines that work may continue and that productive work can be accomplished.

Note: This Project is subject to prevailing wage and requires a performance bond for 100% of the contracted bid amount.

1.2 LOCATION OF THE WORK

Dixie Road is accessed from CA-99 South near Chico, California by taking CA-70 East towards Concow. Continue on CA-70 East for approximately 13 miles to the intersection with Concow Road. Turn left onto Concow Road and continue for approximately 11 miles to the intersection of Concow and Dixie Roads. Turn right onto Dixie Road for approximately 175 feet to reach the project area. The Post-Camp Fire Dixie Road Sediment Reduction Project area is shown on Appendix A: Project Maps.

1.3 TIME SCHEDULE

There will be a MANDATORY walk-through of the project on Wednesday, May 26, 2021 at 9 am. All prospective bidders or their representative are required to attend walk-through in order to bid on this project. Meet for walk-through at the staging area at the intersection of Concow and Dixie Roads, Concow, CA. The project review will require most of the day to observe all the work sites and locations. Please call Colin Hughes at (707) 839-5130 for further information.

Bidder shall adhere to the timetable noted below:

Invitation for bid (IFB) available to prospective bidders	May 13, 2021
Mandatory Pre-bid & site visit, 9:00 a.m. to 4:00 p.m.	May 26, 2021
Bid Submittal is due by 9:00 a.m.	June 14, 2021
Bid opening to be held 9:30 a.m.	June 14, 2021
Estimated Notification of Award of Agreement to successful bidder	June 15, 2021
Target date for Project Starting	July 5, 2021
Anticipated Ending Date of Agreement	November 30, 2021

Technical questions must be submitted in writing and received by Pacific Watershed Associates via email at colinh@pacificwatershed.com or fax at (707) 839-8168 on or before noon on **June 2, 2021 at 12:00 p.m.** PWA will provide written answers to all potential bidders by close of business on **June 4, 2021.**

1.4 SUBMISSION OF BIDS

Original signed documents must be received by **9:00 a.m. on June 14, 2021** at the bid address.

The bid address is:

PACIFIC WATERSHED ASSOCIATES
Post-Camp Fire Dixie Road Sediment Reduction Project
INVITATION FOR BID
Attn. Colin Hughes / Project Manager
1652 Holly Drive
McKinleyville, CA. 95519

Alternatively, scanned copies of original signed documents may be submitted by email to colinh@pacificwatershed.com and received by **9:00 a.m. on June 14, 2021.**

All bids shall include the following originally signed documents: **Bid Schedule, List of Subcontractors, Public Contract Code Section 10285.1 Statement, Non-Collusion Affidavit (see Section 5).** Bids not including the above documents may be deemed non-responsive and rejected.

- a. All bids are to be sent to **Pacific Watershed Associates (PWA)** within the time frame indicated under Section **1.3 Time Schedule**. Bids received after the due date and time will be rejected as non-responsive.
- b. All bids must be submitted under sealed cover. The sealed cover must be plainly marked with "Post-Camp Fire Dixie Road Sediment Reduction Project", must show your **firm's name and address**, and must be marked with "**TO BE OPENED BY ADDRESSEE ONLY.**" Emailed bids must have "Post-Camp Fire Dixie Road Sediment Reduction Project" in the subject line of the email
- c. PWA does not accept alternate language from a bidder. A bid with such language will be considered a counter proposal and will be rejected. PWA's General Terms and Conditions (GTC) are not negotiable.
- d. A bid may be rejected if conditional or incomplete, or if it contains any alterations of form or

- other irregularities of any kind. PWA may waive any immaterial deviation in a bid. PWA's waiver of immaterial defect shall in no way modify the Invitation for Bid (IFB) document or excuse the bidder from full compliance with the objectives if awarded the Agreement. PWA may reject all bids if deemed necessary.
- e. Costs for developing bids and preparation of award of the Agreement are entirely the responsibility of the bidder and shall not be chargeable to PWA.
 - f. This Invitation for Bid shall be signed by an individual who is authorized to bind the bidding firm contractually. The signature must indicate the title or position that the individual holds in the firm. An unsigned bid shall be rejected.
 - g. A bidder may modify a bid after its submission by withdrawal and resubmission before the bid due date. Modification of a bid offered in any other manner, oral or written, will not be considered.
 - h. A bidder may withdraw bid by submitting a written request for its withdrawal to PWA, signed by the bidder or an agent authorized in accordance with Paragraph g above. A bidder may thereafter submit a new bid before the bid submission deadline. Bids may not be withdrawn after the bid due date. Bids received after the due date and time will be rejected as non-responsive.
 - i. PWA may modify the Invitation for Bid prior to the date fixed for submission of bids by the issuance of an addendum to all parties who received a bid package.
 - j. PWA reserves the right to reject any and all bids.
 - k. Total bid cost estimates are public upon bid opening (but not unit costs).
 - l. Bidders are cautioned not to rely on PWA, during the evaluation, to discover and report to the bidder all defects and errors in the submitted documents. Bidders should carefully proof their documents for errors and adherence to the Invitation for Bid requirements before submitting them.
 - m. Where applicable, the bidder should carefully examine the worksite and specifications. Bidder shall investigate conditions, character, quality of surface, subsurface materials, or obstacles to be encountered. No additions to the Agreement amount will be made because of failure to thoroughly examine the worksite and specifications.

1.5 EVALUATION AND SELECTION PROCESS

- a. PWA will put each bid through a process of evaluation to determine the responsiveness of qualified bidders to PWA's needs. The final award will be made on the basis of the lowest responsive qualified bid meeting the specifications.
- b. The bids will be evaluated based on the bidder's experience, references, work schedule and price for each item to be delivered.
- c. Bids that contain false or misleading information or provide references that do not support an attribute or condition claimed by the bidder may be rejected. If, in the opinion of PWA,

information was intended to mislead PWA in its evaluation of the bid, and the attribute, condition, or capability is a requirement of this IFB, it will be the basis for rejection of the bid.

- d. At the time of bid opening, each bid will be checked for the presence or absence of required information in conformance with the submission requirements of this IFB.
- e. The contract will be awarded to the lowest responsible bidder after consideration of the applicable preferences listed in 5.b. above.

1.6 DISPOSITION OF BIDS

- a. All documents submitted in response to this Invitation for Bid will become the property of PWA and may be returned only at the bidder's expense.
- b. Upon bid opening, all documents submitted in response to this Invitation for Bid will become the property of PWA and will be regarded as public records under the California Public Records Act (Government Code Section 6250 et seq.), and *total bid costs* can be subject to review by the public.

1.7 STANDARD CONDITIONS OF SERVICE

- a. PWA is soliciting bids from Contractors to provide heavy equipment with operators and laborers to perform forest road upgrading by installing and replacing drainage structures at stream crossings, removing and stabilizing erosive stream banks, and hydrologically disconnecting areas of road surface runoff concentration including recontouring the original configuration of the road surfaces and land. This will include storm-proofing approximately seven (7) miles of road by installing 59 rolling dips, upgrading drainage structures at 25 stream crossings, 1 fill failure location, 3 road surface erosion features, and 1 spring feature along Dixie Road, near Concow, California. The WORK will require furnishing excavators, bulldozer tractors, dump trucks, vibratory compactor, wheel loader, and water trucks with qualified operators at prevailing wage rates. PWA's bid schedule has anticipated the type of equipment required to work the site.
- b. Service shall not commence until the Agreement is fully executed and all permits have been obtained. Should the Contractor fail to commence work within 5 days of the Notice to Proceed, PWA reserves the right to terminate the Agreement. In addition, the Contractor shall be liable to PWA for the difference between Contractor's bid price and the actual cost of performing work by the second low bidder or by another Contractor.
- c. All performance under the Agreement shall be completed on or before the termination date of the Agreement unless this Agreement is amended by PWA to extend the term.
- d. No oral understanding or agreement shall be binding on either party.
- e. CONTRACTOR shall possess a Class "A", "C12" or "C61" license or California Licensed Timber Operator License at the time this contract is bid or a combination of classes required by the categories and type of work included in this contract.
- f. Pursuant to Section 1733 of the Labor Code, the Director of California Department of

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Industrial Relations has determined the general prevailing rate of wages. Bidders should contact the Department of Industrial Relations at (415) 703-4774 for General Prevailing Wage Rates on specific job classifications. Future effective wage rates, which have been predetermined, are on file with the California Department of Industrial Relations. Bidders are advised that if they intend to use a craft or classification not on file in the general wage determinations, they may be required to pay the wage rate of that craft or classification most closely related to it as shown in the general determinations.

- g. This CONTRACT is subject to State contract non-discrimination and compliance requirements pursuant to Government Code, Section 12990. PWA hereby notifies all bidders that it will affirmatively insure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex, or national origin in consideration for an award.

SECTION 2. INSTRUCTION TO BIDDERS

2.1 BID REQUIREMENT

Bids are required for the entire WORK called for in the CONTRACT attached hereto.

The PROPOSAL shall set forth each item of WORK in clearly legible figures, an item price and a total for the item in the respective spaces provided, and shall be signed by BIDDER, who shall fill out all blanks in the proposal form as therein required.

Blank spaces in the PROPOSAL shall be properly filled in and the phraseology of the form must not be changed.

Additions must not be made to the items mentioned therein.

Any unauthorized condition, limitations or provisos, attached to a PROPOSAL will be likely to render it non-responsive and may cause its rejection. Alternation of the bid unit prices or amounts by erasure or interlineations must be explained, or noted, in the proposal over the signature of BIDDER. If the bid is made by an individual, it must be signed by the full name of BIDDER whose address must be given; if it is made by a firm, it must be signed with the co-partnership named by a member of the firm, and the name and full address of each member must be given and if it is made by a corporation, it must be signed by an officer, in the corporate name and the corporate seal must be attached to such signature.

Bids received after the specified opening time will not be considered. The bidder is solely responsible for the timely delivery of his bid.

PWA reserves the right to reject any and all bids.

2.2 AFFIDAVIT

Each PROPOSAL must have thereon or attached thereto the affidavit of BIDDERS that such PROPOSAL is genuine and not sham or collusive or made in the interest or in behalf on any person

not therein named, and that BIDDER has not directly or indirectly, induced or solicited any other BIDDER to put in a sham bid, or any other person, firm or corporation to refrain from bidding, and that BIDDER has not in any manner sought by collusion to secure for himself any advantage over any other BIDDER.

2.3 REJECTION OF BID

Bids may, at the discretion of PWA, be rejected if they show any alteration of form, additions not called for, conditional bids, incomplete bids, erasures or irregularities of any kind. Bids not accompanied by a non-collusion affidavit may be rejected. Bids in which the price of any item appears to be abnormally high or low may also be rejected.

Bids must be received via mail or email. Telegraphic bids or a telegraphic modification of a bid, or a bid received after the ADVERTISED time for receiving bids shall be rejected.

PWA reserves the right to reject any or all bids or to waive any defect or irregularity in bidding.

2.4 CONTRACT

BIDDER to whom award is made will be required to execute a written CONTRACT with PWA, and to furnish approved bonds and insurance certificates as herein provided within five (5) CALENDAR DAYS after the date or receipt of the notice to such BIDDER that said CONTRACT is awarded to him or her (see Section 5).

2.5 PERFORMANCE BOND

The amount of the Performance Bond to be given to secure faithful performance of the CONTRACT shall be one hundred (100) percent of the CONTRACT price thereof and shall provide, in effect, that the principal shall well and truly perform the "contract" rather than "work contracted to be done" as is quite common. If the latter is used, the bond will be rejected.

The Performance Bond shall be security for all of the provisions of the CONTRACT including, but not limited to, the guaranty provisions.

All bonds shall contain the following language:

All alternations, extensions of time, extra and additional work, and other changes authorized by the SPECIFICATIONS or any part of the CONTRACT may be made without securing the consent of the SURETY or sureties on the CONTRACT bonds. SURETY waives any requirement of notice of any such alterations, extensions of time, EXTRA WORK and additional WORK or any other changes.

2.6 INSURANCE

CONTRACTOR shall obtain insurance acceptable to PWA and the Butte County Resource Conservation District (BCRCD) from a company or companies acceptable to PWA. The required documentation of such insurance shall be furnished to PWA at the time he/she returns the executed CONTRACT. The proper insurance shall be provided within five (5) WORKING DAYS, after BIDDER has received the notice that the CONTRACT has been awarded and prior to PWA executing the CONTRACT and issuing a NOTICE TO PROCEED. CONTRACTOR shall not commence WORK nor shall he allow his employees or subcontractors or anyone to commence WORK until all

insurance required hereunder has been submitted and approved and a NOTICE TO PROCEED has been issued.

With respect to performance of WORK under this CONTRACT, CONTRACTOR shall maintain and shall require all of its sub-contractors to maintain insurance as described below:

- A. Workers' compensation insurance with statutory limits as required by the Labor Code of the State of California. Said policy shall be endorsed with the following specific language:
- "This policy shall not be cancelled or materially changed without first giving thirty (30) DAYS prior written notice by certified mail return receipt requested to the PROJECT MANAGER."
- B. Commercial General Liability Insurance covering bodily injury and property damage utilizing an occurrence policy form, in an amount no less than \$1,000,000 combined single limit for each occurrence (\$1,000,000 AGGREGATE). Said commercial general liability insurance policy shall either be endorsed with the following specific language or contain equivalent language in the policy:
- 1) PWA and BCRCD: its officers, officials, employees and volunteers
 - 2) The inclusion of more than one insured shall not operate to impair the rights of one insured against another insured, and the coverage afforded shall apply as though separate policies had been issued to each insured, but the inclusion of more than one insurance shall not operate to increase the limits of the company's liability.
 - 3) The insurance provided herein is primary coverage to PWA and BCRCD with respect to any insurance or self-insurance programs maintained by PWA and BCRCD.
 - 4) This policy shall not be cancelled or materially changed without first giving thirty (30) DAYS prior written notice by certified mail return receipt requested has been given to the PWA PROJECT MANAGER, PO Box 4433, Arcata, California, 95518.
 - 5) The insurance shall be primary as respects the insured shown in the scheduled above, or if excess, shall stand in an unbroken chain of coverage excess of the Named Insured's scheduled underlying primary coverage. In either event, any other insurance maintained by the Insured scheduled above shall be in excess of this insurance and shall not be called upon to contribute with it.
- C. Automobile liability insurance covering bodily injury and property damage in an amount no less than \$1,000,000 combined single limit for each occurrence. Said insurance shall include coverage for owned, hired, and non-owned vehicles. Said policy shall be endorsed with the following language:
1. This policy shall not be cancelled or materially changed without first giving thirty (30) DAYS prior written notice by certified mail return receipt requested to the PWA Project Manager.
 2. PWA and BCRCD: its officers, officials, employees and volunteers are included as

insured with regard to damages and defense of claims arising from: the ownership, operation, maintenance, use, loading or unloading any auto owned, leased, hired or borrowed by the Named insured, or for which the named insured is responsible.

D. Documentation

The following documentation shall be submitted to PWA and BCRCD:

1. Properly executed Certificates of Insurance clearly evidencing all coverages, limits, and endorsements required above. Said certificates shall be submitted prior to the execution of this contract.
2. Signed copies of the specified endorsements for each policy. Said endorsement copies shall be submitted within ten (10) DAYS of execution of contract.
3. Upon BCRCD's written request, certified copies of insurance policies. Said policy copies shall be submitted within thirty (30) DAYS of BCRCD's request.

E. Policy Obligations

CONTRACTOR's indemnity and other obligations shall not be limited by the foregoing insurance requirements.

F. Material Breach

If CONTRACTOR, for any reason, fails to maintain insurance coverage that is required pursuant to this CONTRACT, the same shall be deemed a material breach of CONTRACT. PWA, at its sole option, may terminate this CONTRACT and obtain damages from CONTRACTOR resulting from said breach. Alternatively, PWA may purchase such required insurance coverage, and without further notice to CONTRACTOR, PWA may deduct from sums due to CONTRACTOR any premium costs advanced by PWA for such insurance. These remedies shall be in addition to any other remedies available to PWA.

2.7 EXPERIENCE

BIDDERS must, if requested by PWA, present satisfactory evidence that they are fully prepared with the necessary experience, capital, machinery and material to furnish the articles called for and to conduct the WORK as required by the specifications.

2.8 EXAMINATION OF JOB SITE AND CONTRACT DOCUMENTS

BIDDERS shall carefully examine the site of the contemplated WORK, the PLANS and SPECIFICATIONS, and the PROPOSAL and CONTRACT DOCUMENTS forms therefore and are required to personally satisfy themselves of all local conditions affecting the WORK and delivery of the articles. The accuracy of the interpretation of the facts disclosed by borings or other preliminary investigations is not guaranteed by PWA.

2.9 OPENING OF BID

BIDDERS are invited to be present at the opening of the PROPOSALS. For the purpose of comparing the

bids, total quantities (not unit bids) in the PROPOSALS will be used.

2.10 ADDENDUM

If any person contemplating submitting a bid for the proposed CONTRACT is in doubt as to the true meaning of any part of the PLANS, SPECIFICATIONS or other proposed CONTRACT DOCUMENTS, or finds discrepancies in, or omissions from the PLANS or SPECIFICATIONS, he may submit to the PWA PROJECT MANAGER a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery.

Any interpretation or correction of the proposed CONTRACT DOCUMENTS prior to bid opening will be made solely in the form of written ADDENDUM to the CONTRACT DOCUMENTS and when issued will be on file at the office of the PROJECT MANAGER before bids are opened. Interpretations, corrections, or changes in the proposed CONTRACT allegedly made in any other manner shall not be binding for any purpose and BIDDERS shall not rely on such interpretations, corrections or changes. In addition, all ADDENDA will be mailed to each person purchasing CONTRACT DOCUMENTS, but it shall be BIDDER's responsibility to make inquiry as to the ADDENDA issued. All such ADDENDA shall become part of the CONTRACT documents and all BIDDERS shall be bound by such ADDENDA, whether or not received by BIDDER.

2.11 TRADE NAMES AND ALTERNATIVES

Pursuant to the requirements of Public Contract Code Section 3400, if any provision of these CONTRACT DOCUMENTS calls for a designated material, product, thing or service by specific brand name or trade name, such designation shall be deemed to be followed by the words, "or equal" so that BIDDERS may furnish any equal material, product, thing or service; provided, however, within a period of fifteen (15) DAYS after award of contract, the successful BIDDER shall submit to the PROJECT MANAGER a request for substitution as to any item which CONTRACTOR desires to substitute "an equal" item, and if CONTRACTOR fails to file such request within said time period, he will be deemed to have waived his privilege of substitution. The PROJECT MANAGER shall within a reasonable time after having received a request for substitution, issue in writing his decision as to whether the proposed substitute item is "an equal" item. The PROJECT MANAGER's decision shall be conclusive on both parties to the contract.

SECTION 3. SPECIAL PROVISIONS

3.1 WORK COVERED BY CONTRACT DOCUMENTS

A. Description

PWA is soliciting bids from Contractors to provide heavy equipment with operators and laborers to storm-proof approximately seven (7) miles of road, upgrade drainage structures at 25 stream crossings, 2 ditch-relief culverts, 1 fill failure location, and to install 59 rolling dips along Dixie Road, near Concow, California. WORK will require furnishing excavators, bulldozer tractors, dump trucks, vibratory compactor, wheel loader, and water trucks with qualified operators at prevailing wage rates.

- 1) Dixie Road is accessed from CA-99 South near Chico, California by taking CA-70 East towards Concow. Continue on CA-70 East for approximately 13 miles to the intersection with Concow Road. Turn left onto Concow Road and continue for approximately 11 miles to the intersection of Concow and Dixie Roads. Turn right

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onto Dixie Road for approximately 175 feet to reach the project area. The Post-Camp Fire Dixie Road Sediment Reduction Project area is shown on Appendix A: Project Maps.

- 2) **Timing and hours of work:** Construction activities will only occur between **July 5th and November 30th** to avoid or minimize adversely affecting fish, bird and plant species of concern and to minimize soil compaction and sediment transport. Work can take place between **6:00 a.m. to 6:00 p.m.** Monday through Friday, except federally recognized holidays.
- 3) **Cultural Resources:** Should any paleontological, archaeological, historical or unique ethnic or sacred resources be encountered during construction or grading operations, all ground-disturbing work shall be temporarily halted on site and Contractor shall notify PWA at 707-839-5130. Work on site shall not be resumed until a qualified archeologist has evaluated the materials and offered recommendations for further action. Prehistoric materials that could be encountered includes: obsidian or chert flakes or tools, locally darkened midden soils, groundstone artifacts, deposits of shell, dietary bone, and human burials. Should human remains be uncovered, State law requires that the County Coroner be contacted immediately. Contractor shall immediately notify PWA Project Manager at 707-839-5130 and the Butte County Coroner at 530-538-7404. Should the Coroner determine that the remains are likely those of a Native American, the California Native Heritage Commission must be contacted. The Heritage Commission consults with the most likely Native American descendants to determine the appropriate treatment of the remains.
- 4) **Hazardous Materials:** If hazardous materials or what appear to be hazardous materials are encountered, stop work in the affected area immediately. Contractor must immediately notify PWA at 707-839-5130, and then contact the appropriate agency for further instruction.
- 5) **Environmental Compliance and Permits:** Contractor is responsible for complying with all project permits. PWA is responsible for obtaining and providing copies of all necessary project permits.
- 6) **PWA Approval:** All improvements shall be accomplished under the approval, inspection and to the satisfaction of PWA. Placed materials not conforming to specifications shall be removed and replaced as directed by PWA at no additional cost to PWA. PWA will be responsible for monitoring the actions of the contractor(s).
- 7) **Contractor Plan and Site Inspection:** The contractor, before submitting a bid for this project, shall visit the construction site and thoroughly familiarize themselves with all existing conditions above and below ground. Before submitting a bid, Bidders shall be satisfied as to the accuracy and completeness of these Specifications and Construction Documents regarding the nature and extent of all work described.
- 8) **Housekeeping:** Contractor shall maintain a clean and orderly work site. Because the work is on public and private property, specific attention will be paid on a daily basis by the Contractor to ensure that no litter will be left on the work site. Waste items including cigarette butts, food wrappers, food, construction debris etc. shall be

disposed of in suitable receptacles provided by the Contractor.

B. Contractor's Duties

1. Provide and pay for equipment with operator and laborers in accordance with the bid schedule.
2. Provide labor in accordance with the State of California Labor Surcharge User's Guide in effect at the date of bid award.
3. Procure and maintain all insurance and bonds required by these Contract Documents.
4. Secure and pay for, as necessary for proper execution and completion of the WORK, applicable permits not mentioned elsewhere, licenses, and agreements. Conform to the requirements of all such documents.
5. Provide PWA with weekly work schedules and heavy equipment logs as required by the contract.
6. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on the performance of the work.
7. Promptly submit written notice to the Project Manager of observed variance of Contract Documents from legal or construction requirements.
8. Enforce strict discipline and good order of the employees.
9. Coordinate work actively with Project Manager.

3.2 CONTRACTS

The WORK will be completed in its entirety under one contract.

3.3 WORK SEQUENCE

After Award of Contract and receipt of the Notice to Proceed, the CONTRACTOR and PROJECT MANAGER will meet to schedule the WORK and equipment required. The CONTRACTOR can only charge equipment and labor hours for actually used and running while completing the required WORK. If required, the CONTRACTOR and PROJECT MANAGER shall meet daily to update the WORK schedule. The sequence of WORK shall be agreed upon by the CONTRACTOR and PROJECT MANAGER in adherence to regulatory permit requirements and continue until awarded contract dollar amount is expended.

The WORK to be performed shall be controlled by site conditions. WORK shall begin five (5) working days after receipt of the Notice to Proceed. No time of completion (i.e. Working Days) has been established.

3.4 CONTRACTOR USE OF PREMISES

Contractor shall assure that the road is safe for public use and travel prior to cessation of work daily.

3.5 SPECIAL PERMITS AND REQUIREMENTS

The CONTRACTOR is cautioned that all WORK must comply with existing permit requirements, CEQA exemption, and NEPA Categorical Exclusion. Cost of compliance with permit requirements shall be paid for in accordance with the bid schedule for equipment and labor.

3.6 FIRE PLAN

The Contractor shall cooperate with local fire prevention authorities in eliminating hazardous fire conditions and shall implement the following fire plan under the direction of the Project Manager:

A. The Contractor shall be responsible for:

- 1 Obtaining the phone number of the nearest fire suppression agency and providing this phone number to the Project Manager as a first order of work,
- 2 Immediately reporting to the nearest fire suppression agency fires occurring within the limits of the project,
- 3 Preventing project personnel from setting open fires not part of the work,
- 4 Preventing the escape of fires caused directly or indirectly as a result of project operations and extinguishing these fires,
- 5 Maintaining traffic control to allow for passage of residents and fire suppression vehicles/equipment at all times.

B. Except for motor trucks, truck tractors, buses and passenger vehicles, the Contractor shall equip all hydro-carbon fueled engines, both stationary and mobile, including motorcycles, with spark arresters that meet United States Forest Service Standards as specified in the Forest Service Spark Arrester Guide and shall maintain the spark arresters in good operating condition. Spark arresters are not required by the State Department of Forestry or the United States Forest Service on equipment powered by properly maintained exhaust-driven turbo-charged engines or when equipped with scrubbers with properly maintained water levels. The Forest Service Spark Arrester Guide is available at the District Offices of the Department of Transportation.

C. Equipment service areas, parking areas and gas and oil storage areas shall be located so that there is no flammable material within a radius of at least 50 feet of these areas. Small mobile or stationary engine sites shall be cleared of flammable material for a radius of at least 15 feet from the engine.

D. The areas to be cleared of vegetation shall be cleared, and kept clear of, flammable material such as dry grass, weeds, brush, downed trees, oily rags and waste, paper, cartons, and plastic waste.

E. The Contractor shall furnish each piece of equipment with the following:

- 1 One shovel and one fully charged fire extinguisher UL rated at 4 B:C or more on each truck, personnel vehicle tractor, grader or other heavy equipment.
- 2 One shovel or one chemical pressurized fire extinguisher, fully charged, for each gasoline-powered tool, including but not limited to chain saws, soil augers, rock drills, etc. The required fire tools shall, at no time, be farther than 25 feet from the point of operation of the power tool. Fire extinguishers shall be of the type and size required by the California Public Resource Code, Section 4431, and the California Administrative Code, Title 14, Section 1234.
- 3 Shovels shall be size "O" or larger and shall be not less than 46 inches in length.

F. The Contractor shall be aware of the Fire Index and conform to the following:

- 1 The Wild Land Fire Danger Rating System established by the United States Forest Service and the State of California Department of Forestry is designed to estimate the relative effect of weather on the several aspects of fire behavior, such as spread, intensity, and ignition.

The combination of these effects makes up the Fire Index, the severity of which is as follows: LOW, MEDIUM, HIGH, VERY HIGH, and EXTREME.

- 2 When the Fire Index reaches "Very High" or "Extreme", the Project Manager will determine which work activities are acceptable.

If the project is shut down or partially shut down on account of hazardous fire conditions, working days during such period will be determined in the same manner as provided in Section 8-1.06, "Time of Completion," of the Standard Specifications for shutdowns due to weather.

Full compensation for conforming to the provisions herein shall be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefore.

3.7 ACCIDENT CLEAN-UP

Description: This action includes removal of accident debris, including response to hazardous spills. The accident may be due to: a) state activity, or b) activity by non-state entity or individual, which the state is assisting in cleaning up. Emergency clean-up practices address the isolation, containment, identification, hazard assessment, proper removal, and disposal of spilled substances on highway rights-of-way. Proper containment and clean-up of spilled material, especially material that is spreading rapidly, will reduce the discharge of potential pollutants into watercourses.

Environmental Concerns:

- Discharge of hazardous materials, powder or granular materials, liquid materials, or vehicle fluids, into the watercourse or storm water drainage system.
- Potential for spilled product entering a creek or stream to contaminate entire downstream course, killing or harming aquatic animal and plant life.

- Remote locations of many county roads significantly limit response time to a major spill into the stream system, reducing the effectiveness of potential remedial measures.

Best Management Practices:

- 1 Provide proper emergency spill response equipment (such as kits, river booms, oil skimmer) at all maintenance yards and other strategic spill response sites.
- 2 For spills on roadways:
 - a) Contain spill so it does not enter flowing waters of the stream system.
 - b) Ensure that each county road project site contains spill clean-up/ emergency response kits with sufficient materials to contain at least a small to moderate spill (1-50 gallons).
 - c) Minimize further tracking of spilled material.

SECTION 4. CONSTRUCTION AND EXCAVATION STANDARDS

GENERAL CONDITIONS SHALL BE PURSUANT TO CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE SALMONID STREAM HABITAT RESTORTION MANUAL, CHAPTER 10 AND THE UPDATED HANDBOOK FOR FOREST, RANCH, AND RURAL ROADS STANDARDS, DEVELOPED BY WEAVER, WEPPNER AND HAGANS, 2015.

Equipment operators must be able to interpret written and verbal excavation details and visualize and plan all aspects of work required to ensure proper function of the constructed structures. Excavation shall be guided by PWA staking in the field, typical drawings, road logs and plan maps and this should be seen as a guide to the final excavation. The moisture content and type of material to be excavated can vary significantly from one work site to another. Ground conditions and material to be excavated can vary from dry to saturated. The type of material to be excavated can vary from fine-grained soil material to large concentrations of rock, boulders, and large woody debris. These variations in excavated material and ground conditions are inherent to the nature of this work. No larger trees shall be removed or damaged outside of designated work areas. In some cases, a narrower road may require operators to work in a somewhat confined environment, bound by vegetation, this should be expected in some instances. All trees, brush and cull logs removed during excavation and straw bale mulch shall be evenly placed on finished slopes or in the stream channels as directed by the Project Manager. An excavator, bulldozer tractor, and/or grader will grade all equipment tracks and perform the final grading on all stream crossings, spoil areas and road shaping throughout the project area. Watering of dry fills and roads as well as field compaction of fills is required as designated by the Project Manager. Development of local quarries of rock for the express purpose of this road upgrade and maintenance project is not permitted.

WATERCOURSE CROSSING UPGRADES: Any culvert that is to be removed or installed in a flowing stream shall be de-watered per the CDFW 1600 agreement. CONTRACTOR shall be responsible for all de-watering of active streams. PWA will assist CONTRACTOR in order to comply with water quality requirements.

Installing or replacing culverts. Only culverts capable of withstanding the 100-year storm flow, including expected sediment and debris in transit, will be installed or replaced at stream crossings. Culvert selection and size determination will be conducted by PWA. Culverts on non-fish-bearing streams are placed at the base of fill, in line and on grade with the natural stream channel upstream

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and downstream of the crossing site. Indicators of nearing the original (natural) stream channel will include hardness, organic soils, woody debris, stream channel rock, in-place cut stumps and bedrock outcrops. Culvert beds should be compacted prior to installation of the pipe and composed of rock-free soil or gravel, evenly distributed under the length of the pipe. Backfill material, free of woody debris, is compacted in 0.5-1.0 ft thick lifts until 1/2 of the diameter of the culvert has been covered. Water should be used as necessary to condition backfill materials for compaction. At sites where fillslopes are steeper than 2:1, or where eddying currents might erode fill on either side of the inlet, rock armor will be applied as needed. Culvert installation and replacement should be as per the typical design specifications (Appendix C) and more detailed construction standards stated in the road logs (Appendix B).

Armored Fills. Riprap armor is employed to protect the outer fill slope of an armored fill and less frequently as overflow “chutes” for culverted stream crossing fills that are prone to overtopping during flood events. Both designs require rock armor to be centered at the low point in the stream crossing fill, where the flow would overtop the fill and flow down the fill face during any storm or culvert plugging event. The spillway should be constructed with a broad overflow dip (like an armored channel; with a bed and two gently sloping banks and sufficient capacity to contain flood overflows) directly over the low point in the crossing. Riprap should be keyed into the fill slope or overflow channel to an approximate depth of 1.5x the maximum rock thickness. Riprap should be placed with a minimum of 2x the D50 thickness and extend to the top of the fill slope. In general, the width of the spillway should be at least 5x the design stream bankful stage width. A range of rock sizes should be used in order to lock the rock riprap together, and a geotextile fabric beneath to protect the underlying erodible fill.

Flared Inlets. Flared inlets are employed to increase culvert flow capacity and to provide some protection against culvert plugging. Flared inlets increase culvert capacity from 25-30% relative to a projecting barrel inlet by allowing flow to smoothly constrict into the culvert entrance, reducing plug potential in streams exhibiting high rates of sediment transport, and wedging and trapping woody debris before it can plug the inlet, or allowing longer pieces of wood to ramp up over the inlet while streamflow enters the culvert barrel.

Downspouts. If the slope of the culvert is significantly steeper than the contributing stream or ditch gradient (so they will be self-cleaning), a culvert capable of withstanding the 100-year storm flow, including expected sediment and debris in transit may be left in-place. For culverts that are installed higher than the base of fill, the emerging culvert should be fitted with an elbow and a downspout to transmit the flow to the base of the fill. Slope anchors should be installed about every 20 feet down the slope to prevent culvert separation.

Trash Racks. Trash racks will be single post, installed vertically in the stream bed, centered directly upstream from the culvert inlet, located one culvert diameter distance upstream from the inlet. The trash rack will be installed deeply enough into the channel bed and of sufficient gage to not be bent or pushed out of position by transported woody debris. Trash racks should be installed as per the typical design specifications (Appendix C) and more detailed construction standards stated in the road logs (Appendix B).

EXCAVATION OF UNSTABLE STREAMBANKS:

Streambank excavations will be described by PWA in the road logs (work plan) and well flagged in the field. Excavated material may be pushed or endhailed to a designated spoil location or worked into road shaping or road drainage treatments if the excavated material is suitably free of organic materials and large rock. In the event that further subsurface cracks, pipes, or emergent water is

observed during or after excavation of unstable banks as detailed in the road logs, the PWA project manager will be immediately notified and the site will not be mulched or finalized prior to inspection by the PWA project manager. Excavation of banks should be performed as per the typical design specifications (Appendix C) and more detailed construction standards stated in the road logs (Appendix B).

ROAD DRAINAGE TREATMENTS: Road Shaping

Rolling Dips. Rolling dips can be sloped either into the ditch or to the outside of the road edge as dictated by PWA by site flagging and on road logs. Rolling dips will not be located where road surface runoff will be discharged onto swales that show signs of instability or active landsliding. The dip excavation will begin approximately 50 to 100 feet up-road from the proposed axis of the dip, with a progressive excavation of material from the roadbed and increasing grade until reaching the axis of the dip. Depth of the dip shall be determined by the grade of the road and range from 0.9 ft to 1.3 ft below the average road grade at the discharge end of the dip trough. In all cases, rolling dip dimensions must be consistent with the type of vehicles that will be using the road. The down-road side of the dip will be a grade change to prevent runoff from continuing down the road. The rise in grade should be carried for about 15 to 25 feet and then fall back to the original road grade/slope. The axis of the dip must be a broad “U” shape to facilitate good drivability. All rolling dips must be drivable and not significantly inhibit road use while also effectively and permanently draining the road surface. Rolling dips should be installed as per the typical design specifications (Appendix C) and more detailed construction standards stated in the road logs (Appendix B).

Best Management Practices (BMPs) shall include:

- (i.) Storm water runoff diversion to be installed immediately up-gradient of excavation areas if significant rainfall that can generate runoff is predicted within 24 hours by the US Weather Service. PWA may implement a wet weather suspension based on weather conditions that result in inability to perform items of work.
- (ii.) Contractor must have erosion control materials on site for installation on any exposed mineral soil that could be washed into drainages, remnant channels or any watercourse in case of rain. Contractor must install erosion control measures if significant rainfall is predicted within 24 hours to insure that the project will not violate water quality standards or waste discharge requirements.

GENERAL PROJECT BMPs

1. Sediment control
 - a. Silt fencing, straw bales, straw wattles as deemed necessary and specified by the PWA PROJECT MANAGER.
2. Vegetation Management
 - a. No trees over 6" dbh will be removed for this project without prior approval of PWA.
3. Dewatering
 - a. The project area will be dewatered, if necessary, before project construction begins.
 - b. Pumping or gravity flow around the site shall occur as necessary to dewater the excavation during treatment of all wet stream crossings and springs.

- c. All pump intakes must be screened, per the CDFW 1600 agreement.
 - d. Pumped turbid water that collects in the excavation areas will be pumped to a flat, vegetated area at least 20 feet from the top of the bank of the streambank and will not be allowed to discharge back into the stream, but where it will infiltrate into the ground. This procedure should be regularly monitoring to prevent turbid discharges to waters of the state.
 - e. Periodically check for erosion at the discharge of the diversion, and repair or move the outfall as necessary.
 - f. Provide adequate fuel supply and backup pumps in the event of a mechanical failure.
4. Staging area
- a. All staging activities, including, but not limited to, vehicle parking, equipment and material storage, spoils and materials stockpiles, vehicle fueling and maintenance, sanitation facilities, and solid waste receptacles shall be designated staging areas approved by PWA, a minimum of 100 feet from the top of bank of any waterbody.
 - b. Any material excavated from crossings or the roadway will be temporarily stored in designated areas, in a manner to prevent sediment delivery to any waterbody.
 - c. Silt fencing will be placed between spoils/materials piles and any waterbody, if necessary and as determined by the Project Manager.
 - d. Spoils shall be end hauled to the approved off-site disposal area and treated according to the Plans and Specifications and Special Provisions at the end of the project.
 - e. Equipment will be fueled more than 100 feet from any waterbody or its adjacent riparian vegetation.
5. Spill prevention and containment
- a. An oil-trapping absorbent floating boom system will be placed immediately downstream of the project area at the start of construction, if necessary.
 - b. Containment supplies will be kept on site, sufficient to contain a spill of up to 50 gallons.

SECTION 5. BIDDER' S BOOK

GENERAL

- A. This is an equipment rental contract requiring operators. The method of payment will be HOURLY based on engine running time at prevailing wage rates. Equipment will only be paid for actual equipment operation. All heavy equipment must be in good condition and free from defects, any form of leakage and meet current state air quality and emission requirements.
- B. Additional equipment or materials not specified by MEASUREMENT AND PAYMENT ITEMS shall be negotiated with the successful contractor.
- C. Mobilization and Demobilization shall be included with bid items for the equipment specified in the Bid Schedule.
- D. Additional equipment ordered shall be negotiated with the successful contractor.
- E. Contractor shall possess a Class "A" ,"C12" or "C61" license or California Licensed Timber Operator License at the time this contract is bid or a combination of classes required by the categories and type of work included in this contract.
- F. All culvert, rock and seed/straw materials will be purchased by PWA and delivered to one location noted at bid tour. Contractor is responsible to mobilize culverts, rock, and seed and mulch materials to individual sites, as per the road logs (Appendix B).
- G. Contractor will draft to fill water truck at the proposed point of diversion located approximately 200 ft. west-southwest of stream crossing Site #56, from impounded water below culverted stream crossing Site #57 (Map 5).
- H. The successful contractor will work under the direct supervision of PWA and all tasks listed in the road logs (Appendix B) must be completed to our satisfaction.
- I. The estimated heavy equipment and labor costs to complete the project are **\$290,000**.

MEASUREMENT AND PAYMENT ITEMS

The measurement and payment items are listed herein below. The CONTRACTOR will be allowed to substitute similar equipment for those specified but only if that equipment can perform the WORK at a comparable or higher production rate.

The measurement and payment items are listed herein below:

Item 1 - Labor: The CONTRACTOR will be paid the cost of labor for the workers used in the actual and direct performance of the WORK. The cost of labor, whether the employer is the CONTRACTOR, subcontractor or other forces, will be the sum of the following: Actual wages and labor surcharges as defined in Department of Transportation publication Labor Surcharge and Equipment Rental Rates April 1, 2021. Only hours of actual labor will be payable.

Item 2 - 10 Cubic Yard Dump Truck: The CONTRACTOR shall be paid an hourly rate to provide ten-cubic yard dump trucks with operators. The hourly rate shall include operator, truck and all incidentals required for truck operation. Only hours of operation will be payable.

Item 3 - Bulldozer Tractor: The CONTRACTOR shall be paid an hourly rate to provide a bulldozer tractor with 6-way blade, minimum 18” multi-shank ripper attachment, and operator (Caterpillar D-5 to D-6, or equivalent). The hourly rate shall include operator, tractor and all incidentals required for tractor operation. Only hours of operation will be payable.

Item 4 - Hydraulic Excavator: The CONTRACTOR shall be paid an hourly rate to provide a hydraulic excavator (45,000lb+/-, CAT 320 or equal) with bucket and multi-finger thumb and all necessary attachments for lifting or digging or placing riprap with operator. The excavator must be capable of self operating on the site. Only hours of operation will be payable.

Item 5 - Water Truck: The CONTRACTOR shall be paid an hourly rate to provide a water truck (3,000-gallon capacity or greater) and all necessary attachments for drafting water for project utilization and dispensing water onto project roads, fills, and spoil materials for the purpose of dust abatement and moisture conditioning of soil materials. The hourly rate shall include operator, water truck, and all incidentals required for water truck operation. Only hours of operation will be payable.

Item 6 - Loader: The CONTRACTOR shall be paid an hourly rate to provide a wheel loader (CAT 950 equivalent or larger) with operator. The hourly rate shall include operator, loader, and all incidentals required for loader operation. Only hours of operation will be payable.

Item 7 - Vibratory Drum Compactor: The CONTRACTOR shall be paid an hourly rate to provide a 60” or larger diameter vibratory drum compactor with a single or double drum, or equivalent. The hourly rate shall include operator, roller/compactor, and all incidentals required for roller operation. Only hours of operation will be payable.

Item 8 - Grader: The CONTRACTOR shall be paid an hourly rate to provide a motor grader (CAT 120M series grader or equivalent) with operator. The hourly rate shall include operator, grader, and all incidentals required for grader operation. Only hours of operation will be payable.

Item 9 - Truck/trailer: The CONTRACTOR shall be paid an hourly rate to provide a full-size 4-wheel drive truck and flat-bed trailer with driver. The hourly rate shall include operator, truck/trailer, and all incidentals required for truck/trailer operation. Only hours of operation will be payable.

Item 10 - Lowboy: The CONTRACTOR shall be paid an hourly rate to provide a semi with lowboy trailer with driver. The hourly rate shall include operator, semi-truck and lowboy trailer, and all incidentals required for lowboy operation. Only hours of operation will be payable.

**Butte County Resource Conservation District
Post-Camp Fire Dixie Road Sediment Reduction Project**

BID SCHEDULE

TO: Pacific Watershed Associates
PO Box 4433, Arcata, CA
95518

The undersigned is familiar with all the conditions affecting the cost of WORK at the place where the WORK is to be done and with the PLANS and CONTRACT DOCUMENTS and addenda thereto, hereby proposes and agrees to perform everything required to be performed and to provide and furnish all required labor, materials, tools, equipment, supervision, and all utility and transportation services necessary to complete in a workmanlike manner for the **Butte County Resource Conservation District “Post-Camp Fire Dixie Road Sediment Reduction Project”** within the time set forth therein, and at the prices stated below.

BIDDER hereby agrees to coordinate and schedule work under this CONTRACT in accordance with Section 1.3, Time Schedule, and project regulatory permit requirements.

BIDDER acknowledges receipt of the following ADDENDA, dated: _____

BIDDER has read and understands the contract documents for construction:

Signature

Title

Date

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following equipment unit prices or lump sums:

NOTE: BIDS shall include sales tax and all other applicable taxes and fees.

BID SCHEDULE

Table 1. Heavy equipment rental bid summary sheet. Post-Camp Fire Dixie Road Sediment Reduction Project, Butte County, California.

Item	Type of required heavy equipment ¹	Estimated rental hours (#)	Hourly rental rate ² (\$/hr)	Cost ³ (\$)
1	Labor	200	/ hr	
2	10 yd ³ Dump Truck	290	/ hr	
3	Bulldozer	395	/ hr	
4	Hydraulic Excavator	275	/ hr	
5	Water Truck	145	/ hr	
6	Wheel Loader (loading rock)	60	/ hr	
7	Vibratory Drum compactor	150	/ hr	
8	Grader	30	/ hr	
9	Truck/trailer	80	/ hr	
10	Lowboy	75	/ hr	
Total Estimated Bid:			\$	
¹ The CONTRACTOR will be allowed to substitute similar equipment for those specified but only if that equipment can efficiently perform the WORK at the Project site. ² Hourly rental rate must include: a fueled and properly lubricated, fully functional and leak free piece of heavy equipment with a prevailing wage scale operator experienced in steep and confined mountainous terrain road upgrading. The hourly rental rate per piece of heavy equipment must also include any other administrative and overhead costs. The hourly rental rate per each piece of equipment is the only quote required. ³ Tally your total cost/equipment and provide the total estimated bid.				
Signature		Title		
Address		License Number		
City/State/Zip code		Date		

It is further agreed that:

- (a) In case of a discrepancy between words and figures, the words shall prevail, and in the case of a discrepancy between unit prices and totals, the unit price shall prevail.
- (b) PWA reserves the right to eliminate any section of this proposal from the contract without claim of the CONTRACTOR for profits lost.
- (c) No verbal agreement or conversation with any officer, agent, or employee of PWA or the BCRCD, either before or after the execution of the Agreement, shall affect or modify any of the terms or obligations of this proposal.
- (d) PWA will not be responsible for any errors or omission on the part of the undersigned in making up his/her BID, nor will the BIDDER be released on account of error.
- (e) The undersigned BIDDER is properly licensed in accordance with the State of California Act providing for the registration of Contractors.
- (f) The Undersigned BIDDER certifies that he/she has confirmed that the proposed form of contract, and the plans and specifications are complete.

NOTE: ALL PROJECTS
LIST OF SUBCONTRACTORS

In accordance with the provisions of Section 4104 to 4113, inclusive of the Government Code of the State of California, each **BIDDER** shall list below the name, location, and place of business of each subcontractor who shall perform any portion of the contract **WORK**. In each instance, the nature and extent of the work to be sublet shall be described.

Name of Subcontractor	Address of Office Mill, or Shop	Description of Work to be Performed

PUBLIC CONTRACT CODE SECTION 10285.1 STATEMENT

In accordance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury that the bidder has _____ has not _____ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1,

NOTE: The bidder must place a check mark after "has" or "has not" in one of the blank spaces provided.

The above Statement is part of the Proposal. Signing the signature portion thereof shall also constitute signature of this Statement.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

DO NOT DETACH NON-COLLUSION AFFIDAVIT

TO BE EXECUTED BY EACH AWARDEE OF A PRINCIPAL CONTRACT

STATE OF CALIFORNIA }

} ss.

COUNTY OF BUTTE }

, being first duly sworn, deposes and

says:

That she/he is _____, the party making the foregoing proposal or bid; that such proposal or bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not, in any manner, directly or indirectly, sought by agreement of collusion, or communication or conference, with any person, to fix the bid price or affiant or of any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Owner or any person interested in the proposed contract; and that all statement in said proposal or bid are true.

(Fill in description of contract)

Signature of Bidder

Business Address

Place of Residence

RELATED PROJECT EXPERIENCE

Bidder shall furnish the information requested below regarding three similar projects previously completed by the **Bidder**. List road upgrading projects related to erosion prevention and environmental restoration located in mountainous terrain.

PROJECT NAME: _____

Brief description of project: _____

Period of construction: _____ Project Cost: _____

Reference (name and phone): _____

PROJECT NAME: _____

Brief description of project: _____

Period of construction: _____ Project Cost: _____

Reference (name and phone): _____

PROJECT NAME: _____

Brief description of project: _____

Period of construction: _____ Project Cost: _____

Reference (name and phone): _____

SECTION 6. SAMPLE NOTICES AND CONTRACT

SAMPLE NOTICE OF AWARD

PROJECT DESCRIPTION:

Butte County Resource Conservation District Post-Camp Fire Dixie Road Sediment Reduction Project

TO:

PWA has considered the BID submitted by you for the above-described WORK in response to its Notice to Contractors dated _____, 2021, and Instruction to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$ _____

You are required by the Instruction to Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance Bond and certificates of insurance within five (5) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within five (5) calendar days from the date of this Notice, PWA will be entitled to consider all your rights arising out of PWA's acceptance of your BID as abandoned and as a forfeiture of your BID BOND. PWA will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to PWA.

Dated this ____ day of June, 2021.

Owner: _____

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by this on the _____ day of _____, 2021.

By: _____

Title: _____



PACIFIC WATERSHED ASSOCIATES INC.

PO Box 4433 • Arcata, CA 95518-4433
Ph 707-839-5130 • Fax 707-839-8168
www.pacificwatershed.com

SAMPLE AGREEMENT FOR SUBCONTRACTOR SERVICES

THIS AGREEMENT is made and entered into this ____ day of June, 2021, by and between **Pacific Watershed Associates Inc.** (hereinafter referred to as "PWA"), and _____ (hereinafter referred to as "Subcontractor"). PWA hereby contracts for, and Subcontractor hereby agrees to furnish products and related services in connection with PWA's Project Number 104180, which is known as Post-Camp Fire Dixie Road Sediment Reduction Project. This contract (referred to herein as "Agreement") is authorized by and funded under PWA's contract or work authorization for Butte County Resource Conservation District (BCRCD) (referred to as "Client") which also governs the conduct of the work contracted for herein to the extent not inconsistent with the terms of this Agreement.

The terms of this Agreement are as follows:

1. CONTRACTOR agrees in the performance of work, duties, and obligations devolving upon it. PWA is retaining CONTRACTOR to carry out various tasks as detailed in attached Scope of Work prepared by PWA in order to carry out the work of the Post-Camp Fire Dixie Road Sediment Reduction Project, hereinafter called "PROJECT". CONTRACTOR will implement the PROJECT as determined by PWA in accordance with the terms, conditions and specifications in the PROJECT. The attached Road Logs and typical construction drawings are hereby incorporated as a part of this Agreement. The Exhibit shall have the same force and effect as if included in the text of this Agreement. However, the Exhibit's Scope of Work may be modified without amendment of this Agreement upon the CONTRACTOR'S submission of proposed modifications and PWA's written approval of it. The Exhibit's Work Plan may be modified without amendment of this Agreement to include additional Road Logs as they are developed by PWA and approved for inclusion in the project.
2. CONTRACTOR agrees that it will at all times perform its duties under the Project to the best of its ability and in accordance with the highest scientific, professional and ethical standards of its profession. All services to be performed by CONTRACTOR pursuant to this Agreement shall be performed in accordance with all applicable federal, state, county and municipal laws, ordinances and regulations.
3. PWA has developed the Scope of Work for the PROJECT, including but not limited to: developing detailed designs and specifications for all recommended erosion control measures, provide sole day to day on-site supervision, quality control and decisions, receive and verify all invoices for work

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*Geologic and Geomorphic Studies • Wildland Hydrology • Sediment Source Assessments •
Erosion Reduction Planning/Implementation*

performed by the CONTRACTOR. CONTRACTOR and PWA agree that all designs, plans, reports, specifications, photographs, drawings, schematics, prototypes, models, inventions and all other information and items made or used during the course of implementing the Project shall be jointly owned by PWA and BCRCD. CONTRACTOR agrees to refer all outside requests for information about specific properties, restoration projects, or landowners to PWA and shall keep such information as confidential.

4. CONTRACTOR shall provide the following:
 - a) Close coordination with PWA staff and other involved entities, including local, state and federal agencies, as well as, the local landowner and participation in meetings and other communications as necessary to ensure coordination.
 - b) A written copy of any proposed subcontracts, in whole or in part, contemplated by the CONTRACTOR prior to initiation for review, action and approval by PWA.
 - c) A written daily and weekly heavy equipment log will be maintained by the CONTRACTOR, and submitted to PWA on a weekly basis, and when invoices are submitted to PWA. This log shall be available for inspection at all times.
 - i. Equipment Log

List all equipment time expended during each day and the operator using each piece of equipment daily. When a specific site is being treated, list that site along with the hours spent on that site by each piece of equipment. When time is spent on road drainage work between sites, briefly describe what type of work is being done. Data shall be filled out on the equipment log provided by PWA.
 - d) Compliance with all provisions of state labor code regarding prevailing wages, including the submission of all necessary documentation and maintenance of all required records by California labor code.
 - i. Contract Award Information

Submit form DAS 140 for every trade to be used on the project to every applicable local apprenticeship committee in the area of work prior to construction. Provide a copy of each submitted DAS 140 to PWA, the California Apprenticeship Council (P.O. Box 420603, San Francisco, CA 94142).
 - ii. California Apprenticeship Council (CAC) Contribution

Submit monthly, form CAC-2, to the CAC and contribute the appropriate funds to the CAC at P.O. Box 420603, San Francisco, CA 94142.
 - iii. Payment of Prevailing Wage Rates

Pay all project workers no less than the applicable general prevailing wage rates for the state of California.
 - e) Proof that the CONTRACTOR has secured a valid performance bond for the PROJECT guaranteeing the faithful performance of the contract and payment of all labor and materials to all subcontractors and material suppliers. The value of the bond shall be for 100% of the compensation value agreed upon in this contract.
5. This Agreement shall commence upon signing of both parties and shall continue in effect until November 30, 2021. This Agreement may be amended upon mutual written consent of PWA and the CONTRACTOR.
6. This Agreement is expressly made contingent upon the execution of the above-described agreement. Upon termination of the above document for any cause whatsoever, PWA shall notify CONTRACTOR and this Agreement shall terminate upon PWA's written notice. PWA shall pay all amounts to the CONTRACTOR for work already accomplished and properly invoiced for.

7. This Agreement may be terminated for other causes by either party by furnishing the other party with written notice at least thirty (30) days prior to such termination. If PWA terminates this Agreement, the CONTRACTOR shall take all reasonable measures to prevent further costs to PWA under this Agreement, and PWA shall be responsible for any reasonable and non-cancelable obligations incurred by the CONTRACTOR in the performance of this Agreement prior to the date of the notice to terminate, but only up to the undisbursed balance of funding authorized in this Agreement. Payments made to CONTRACTOR or recovered by PWA under a termination for cause shall be in accordance with the legal rights and liabilities of the CONTRACTOR and PWA. If any action of law is brought by either party to enforce or interpret the terms of this Agreement, the prevailing party shall be entitled to reasonable attorney's fees and costs.
8. This Agreement is for services and may not be assigned, in whole or in part, by CONTRACTOR without PWA's prior written consent, which consent shall not be unreasonably withheld. Any assignment in violation of this section shall be null and void. Further, PWA may terminate this Agreement effective immediately if CONTRACTOR assigns any responsibility under this contract without PWA's consent.
9. The maximum compensation to CONTRACTOR, its employees and sub-contractors, for services under this Agreement shall not exceed **\$290,000 (two hundred and ninety thousand dollars and zero cents)** as outlined and directly related to CONTRACTOR's portion of the contract BUDGET specified for the PROJECT. Payments not to exceed amounts for actual costs of time and materials shall be made incrementally and periodically as the CONTRACTOR'S services are provided and approved by PWA over the lifetime of this Agreement. CONTRACTOR may submit invoices no more frequently than monthly. Invoices must be received by PWA prior to the 25th of any month the CONTRACTOR is submitting an invoice. All payment requests must be submitted with a daily equipment log itemizing equipment hours spent on each work site or road reach within the Project. Invoices shall describe the nature and extent of the services actually performed and completed during the covered period stated on the invoice. Invoices are subject to approval by PWA. CONTRACTOR agrees to provide such additional documentation as may be required by PWA regarding CONTRACTOR'S request for payment. Any payments under this Agreement shall be due and payable to the CONTRACTOR only following receipt by PWA of funds from the BCRCD funding source. PWA shall have no liability for payment unless and until said funds are received by PWA. Typically, it takes 60 to 90 days from the date the CONTRACTOR'S invoice is received by PWA for other funding sources to pay PWA.
10. All work initiated hereunder by the CONTRACTOR shall be subject at all times to inspection by authorized representatives of PWA and shall be accomplished to the satisfaction of PWA.
11. CONTRACTOR is an independent contractor. No relationship of employer/employee exists between the parties hereto. Performance of services under this Agreement shall be in an independent capacity. Because of its status as an independent contractor, CONTRACTOR waives any and all employment benefits available to PWA employees. It is the CONTRACTOR'S responsibility to provide workers compensation and payroll deductions and contributions to its employees for any worker benefits or tax purposes as provided for by law.
12. During the performance of this Agreement, the CONTRACTOR and its sub-contractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, age, sex, or sexual orientation. The CONTRACTOR and its sub-contractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free of such

discrimination. The CONTRACTOR and its subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.) and the applicable regulations promulgated thereunder (California Administrative Code, Title 2, Section 7285.0 et seq.). The CONTRACTOR and its sub-contractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. This nondiscrimination clause shall be included in all contracts entered into by the CONTRACTOR to perform work provided for under this Agreement.

13. CONTRACTOR shall maintain acceptable financial management systems during the term of this Agreement. Such systems shall provide accurate, current and complete disclosure of the financial activity under this Agreement.

CONTRACTOR shall maintain standard financial accounts, documents, and records that relate to the services it performs under this Agreement. The CONTRACTOR shall retain these records for three years following the date of final disbursement by PWA under this Agreement, regardless of the termination date. The documents shall be subject to examination and audit by PWA during CONTRACTOR'S normal business hours and upon reasonable advance written notice. The CONTRACTOR may use any accounting system which follows the guidelines of "Generally Accepted Accounting Principles" published by the American Institute of Certified Public Accountants.

14. CONTRACTOR agrees to defend, indemnify and save harmless 1) PACIFIC WATERSHED ASSOCIATES, Inc., 2) Butte County Resource Conservation District, their officers, agents and employees against any and all claims, damages, costs, losses and expenses, in any manner resulting from, arising out of or in connection with claims brought against the INDEMNIFIED PARTIES in connection with the CONTRACTOR'S negligence or willful misconduct in performing its obligations under this Agreement.
15. CONTRACTOR further agrees to obtain at CONTRACTOR'S expense and keep in full force and effect throughout this Agreement a policy or policies of comprehensive public liability insurance. Such policy or policies shall provide for a minimum coverage limit of \$1,000,000 combined bodily injury and property damage liability, or its equivalent, and shall further provide that such policy is subject to cancellation only upon 30 days prior written notice delivered to PWA. Such insurance shall be issued by a company or companies admitted to transact business in the State of California.

Contractor shall, prior to commencement of this Project, furnish to PWA a certificate evidencing that such insurance has been procured and is in full force and effect, together with a copy of an endorsement confirming coverage of the above named additional insured.

16. CONTRACTOR shall comply with all federal, state and local safety and health laws, regulations and standards, including California Labor Code sections 6400, et seq., related provisions of the California Code of Regulations and standards of the California Occupational Safety and Health Board, all as amended from time to time and if applicable shall operate under a current Injury and Illness Prevention Plan that complies with section 3203 of Title 8 of the California Code of Regulations. Failure of Contractor to comply with all federal, state and local health and safety laws, rules and regulations is grounds for immediate revocation of this contract.

CONTRACTOR is responsible for safety and health conditions in connection with all activities included in this agreement. CONTRACTOR has primary and ultimate responsibility for instructing and supervising its employees on safe work practices. It is the CONTRACTOR'S responsibility to

protect its own and others' employees from such hazards. CONTRACTOR is responsible for identifying existing on-site hazards in its area of activities and for taking appropriate actions to inform its employees how to recognize and avoid hazards and to protect its own and others' employees from those hazards. If CONTRACTOR creates or causes a hazard in the course of the project activities, CONTRACTOR is responsible for correcting the hazard. CONTRACTOR has an obligation to immediately notify PWA and others at the property whenever CONTRACTOR becomes aware of a hazard that CONTRACTOR cannot remove or correct immediately.

17. CONTRACTOR shall indemnify PWA and BCRCD, and hold harmless from and against any and all loss, cost, damage, expense or claim any kind and nature (including, without limitation, court costs, expenses and attorney's fee) paid, incurred or suffered by, or asserted against, PWA or BCRCD as a direct or indirect result of the presence on or under, or the escape, seepage, leakage, spillage, discharge, emission or release from, the project area, of any Hazardous Materials arising out of, in connection with, or in any manner related to the project activities or any actions or omissions of the CONTRACTOR. The provisions of this paragraph shall survive the expiration or termination of this contract.
18. Venue and jurisdiction for any dispute arising between the parties regarding the Agreement shall be in the County of Humboldt.

The Effective Date of this Agreement is: May _____, 2021.

By: _____

Danny Hagans
VP, CFO, Pacific Watershed Associates
PO Box 4433, Arcata, CA 95518
Tax Payer ID#: 43-2036432

Contractor: _____

Name:
Address:
Phone:
email:

Lic# and Type _____

Tax Payer ID# _____

(DO NOT DETACH)

SAMPLE PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That WHEREAS, Pacific Watershed Associates, Inc. has awarded to: _____

hereinafter designated as the "Contractor," a contract for the:

Post-Camp Fire Dixie Road Sediment Reduction Project

WHEREAS, said "Contractor" is required under the terms of said contract to furnish a bond for the faithful performance of said contract,

NOW THEREFORE, we _____ as

"Contractor and _____ as surety are held and firmly bound unto PWA, hereinafter called the "Owner," in the penal sum of

_____ Dollars and duly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the hereby bonded CONTRACTOR, his or its heirs, executors, administrators, successors or assigns shall in all things stand to and abide by and well and truly keep and perform all the undertakings, terms, covenants, conditions and agreements in the said contract and any alteration thereof, made as therein provided, all within the time and in the manner therein designated and in all respects according to their true intent and meaning, then this obligation shall become null and void; otherwise it shall remain in full force and effect.

FURTHER, THE SAID SURETY, FOR VALUE RECEIVED, HEREBY STIPULATES AND AGREES that no change, extension of time, alteration or modification of the Contract Documents or of the work to be performed there under, shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or modification of the Contract Documents or of the work performed there under.

IN WITNESS WHEREOF, four (4) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the CONTRACTOR and Surety herein named, on the _____ day of _____, 2021, the name and corporate seal of each corporate party affixed, and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

Contractor

By

Title

Seal

Surety

By

Address of Surety

City State Zip

**Butte County Resource Conservation District
Post-Camp Fire Dixie Road Sediment Reduction Project**

**SAMPLE NOTICE TO PROCEED
IN 5 WORKING DAYS**

You are hereby informed that all contract and construction documents have been executed and are given **notice to proceed within 5 WORKING DAYS.**

I hereby acknowledge receipt of this notice:

Pacific Watershed Associates
OWNER

Date _____

CONTRACTOR

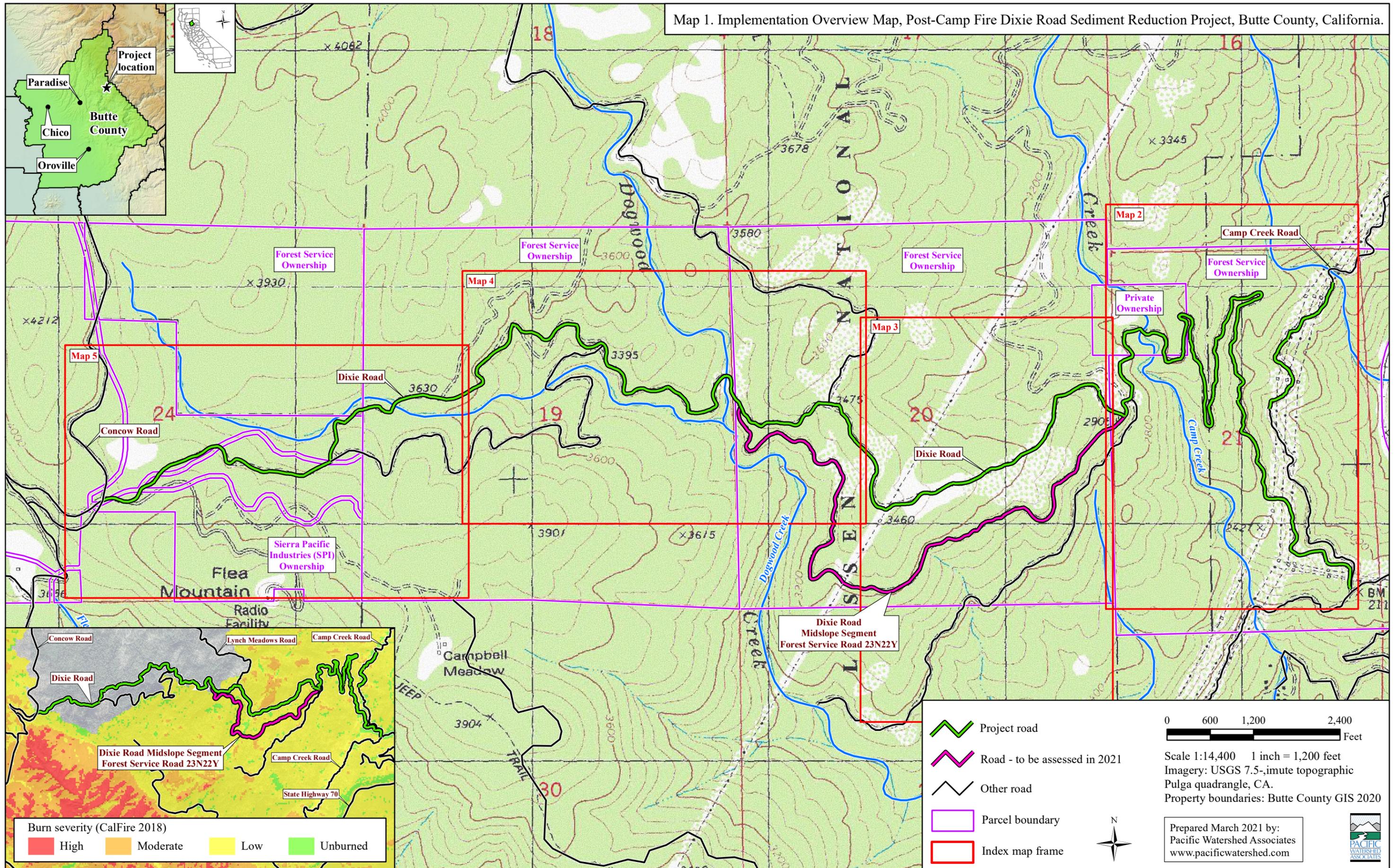
Date _____

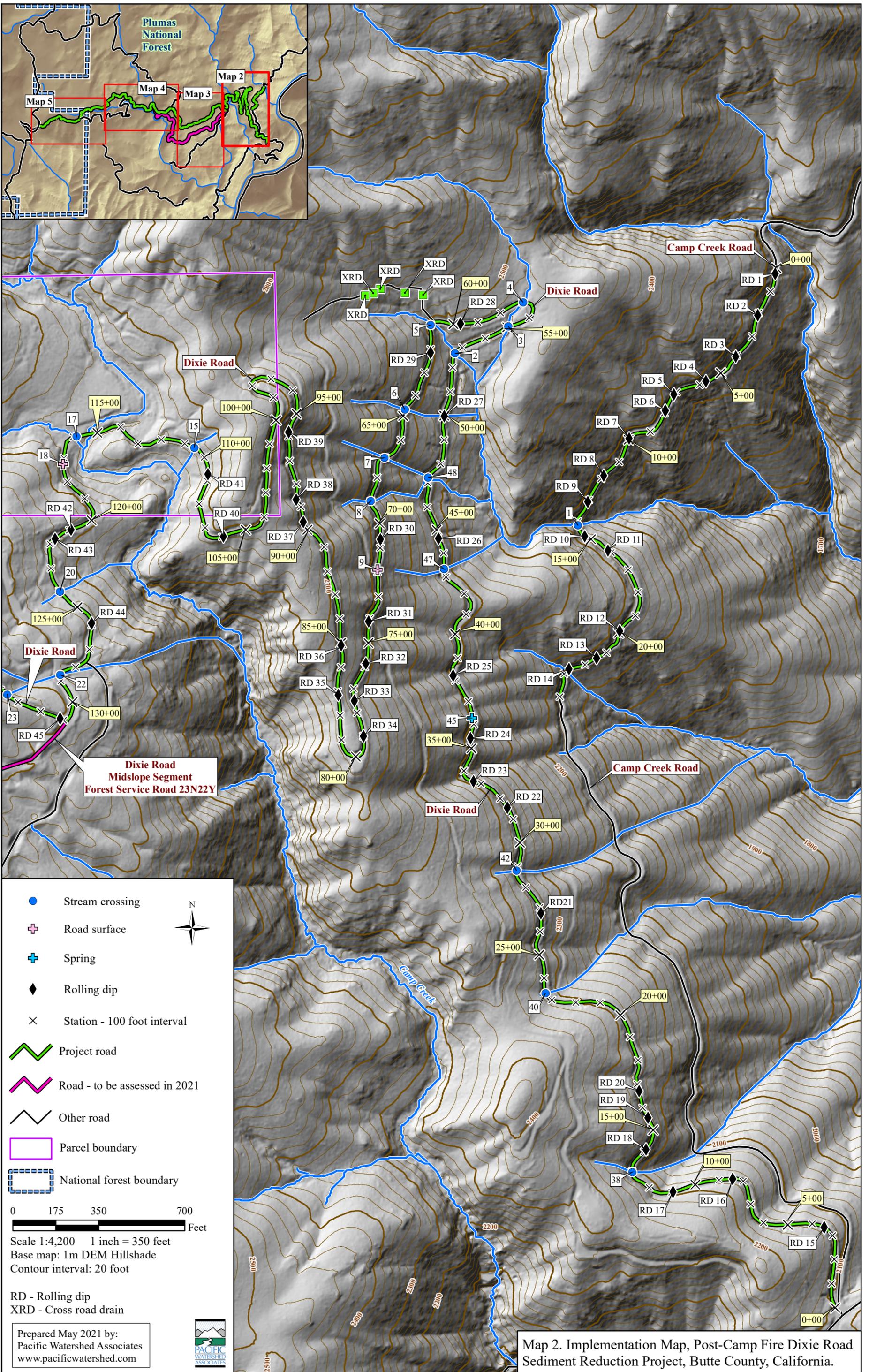
APPENDIX A

Butte County Resource Conservation District Post-Camp Fire Dixie Road Sediment Reduction Project

Project Maps

Map 1. Implementation Overview Map, Post-Camp Fire Dixie Road Sediment Reduction Project, Butte County, California.





**Dixie Road
Midslope Segment
Forest Service Road 23N22Y**

Map 2. Implementation Map, Post-Camp Fire Dixie Road Sediment Reduction Project, Butte County, California.

Prepared May 2021 by:
Pacific Watershed Associates
www.pacificwatershed.com

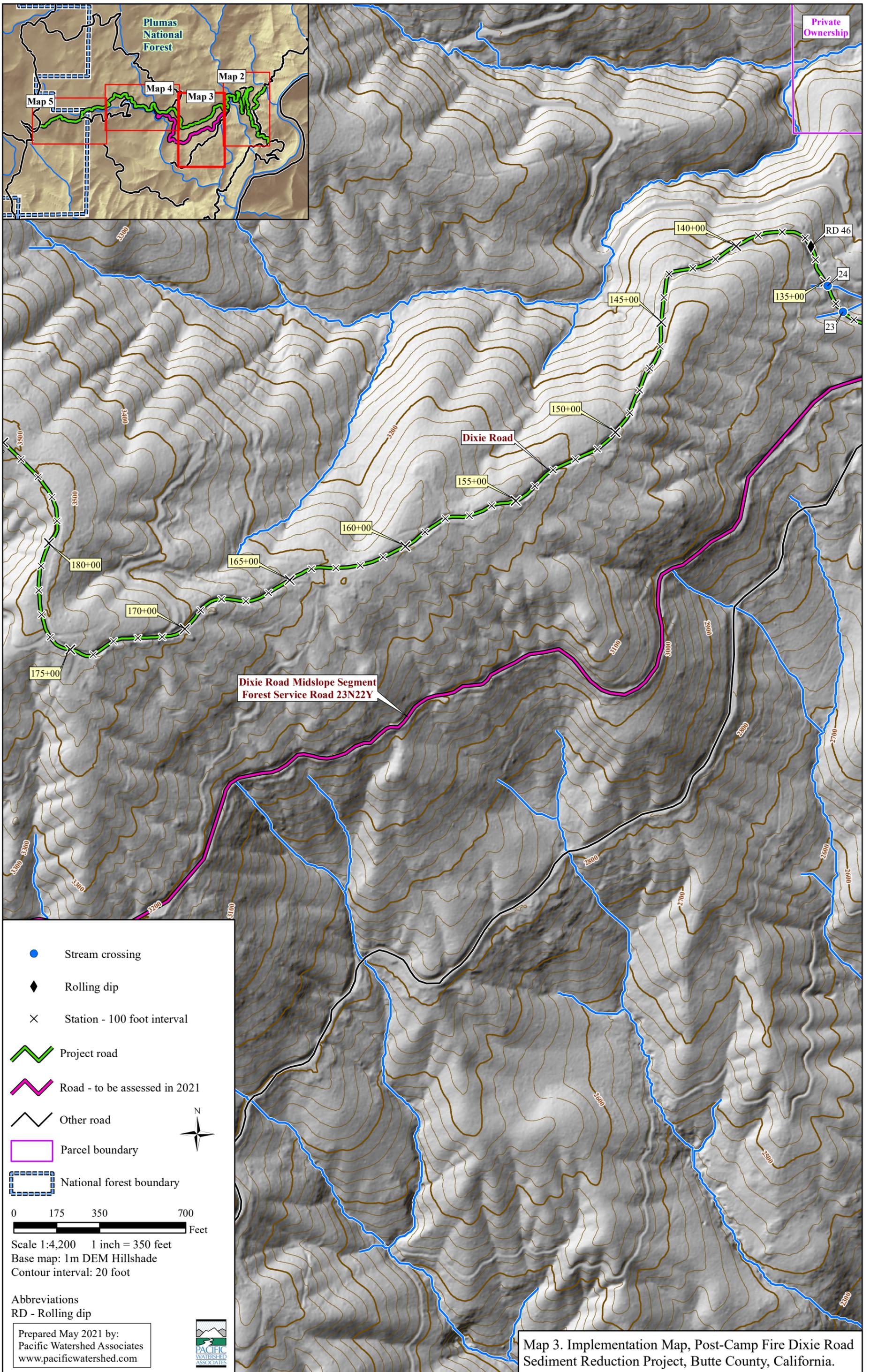


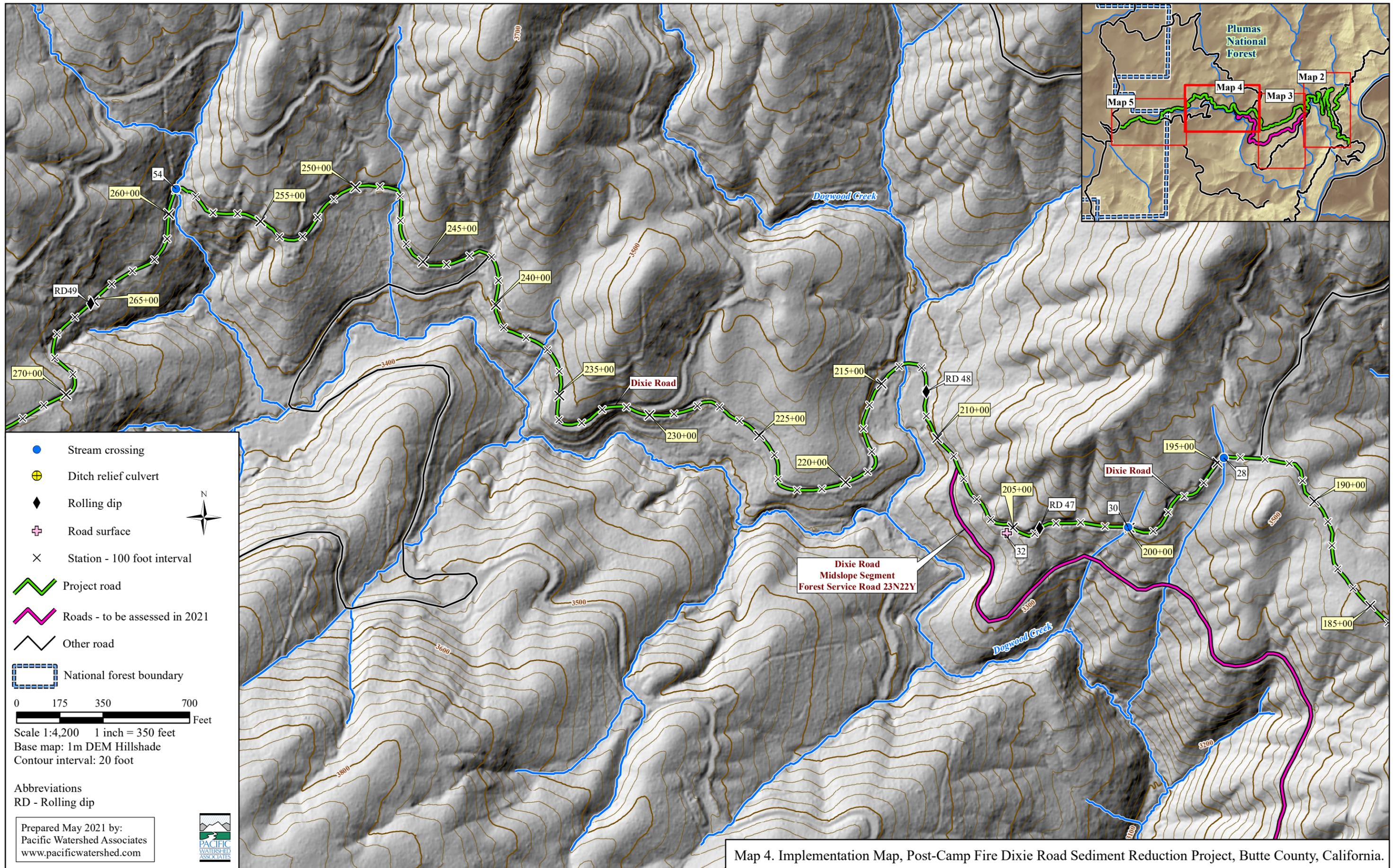
- Stream crossing
- + Road surface
- + Spring
- ◆ Rolling dip
- × Station - 100 foot interval
- Project road
- Road - to be assessed in 2021
- Other road
- Parcel boundary
- National forest boundary

0 175 350 700 Feet

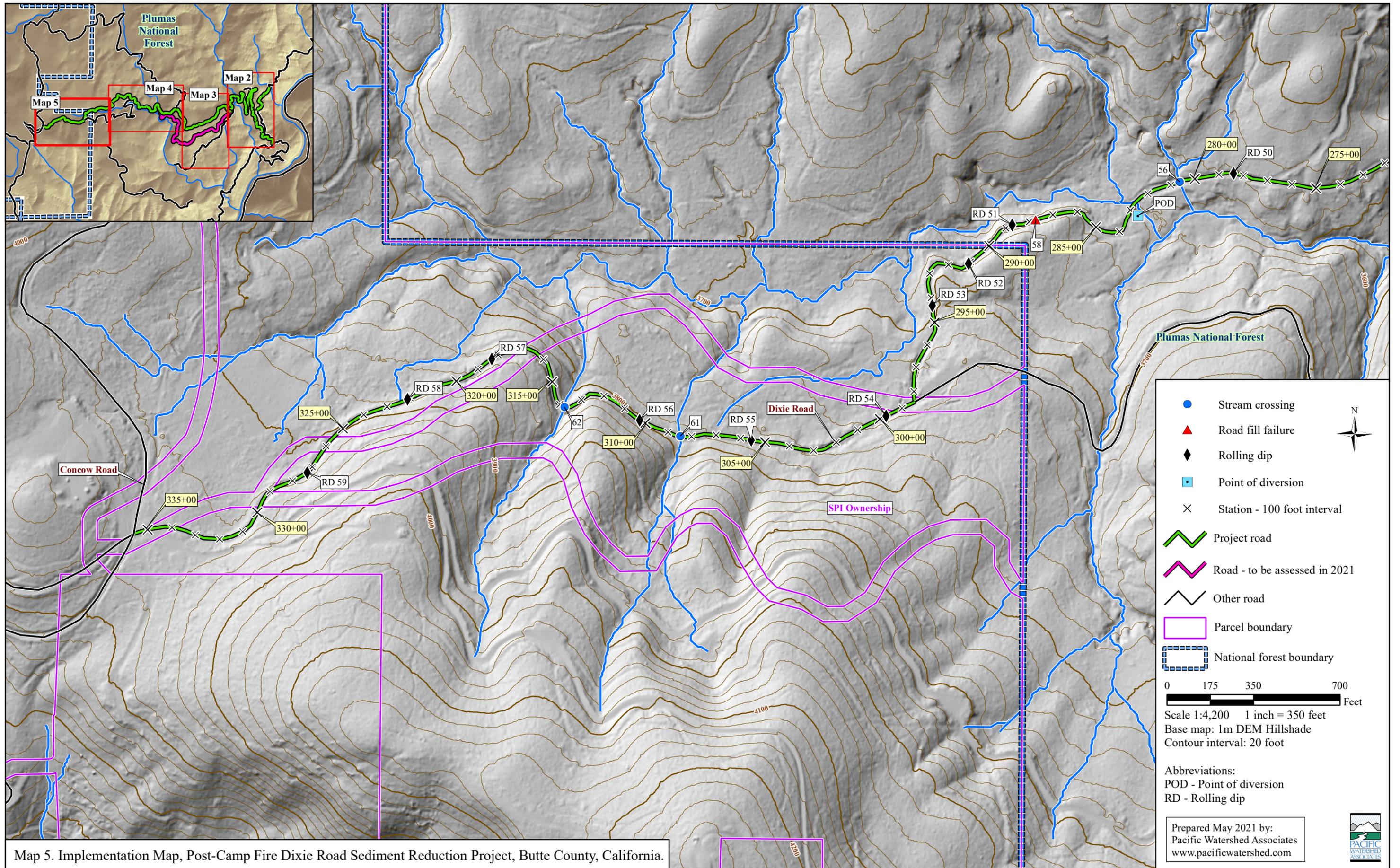
Scale 1:4,200 1 inch = 350 feet
Base map: 1m DEM Hillshade
Contour interval: 20 foot

RD - Rolling dip
XRD - Cross road drain





Map 4. Implementation Map, Post-Camp Fire Dixie Road Sediment Reduction Project, Butte County, California.



APPENDIX B

Butte County Resource Conservation District Post-Camp Fire Dixie Road Sediment Reduction Project

Draft Road Logs

Implementation Road Log for <u>Camp Creek/Pulga Road</u>, #104180 Post Camp Fire Dixie Road Sediment Reduction Project, Butte County, CA					
Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	CMP Needs
¹ SOS = Start of survey; EOS = End of survey; DRC = Ditch relief culvert; AR = Rock armor; RR = RR; XRD = Crossroad drain; TOP = The upstream extent of excavation; BOT = The downstream extent of the excavation; BOF = Base of fill; IBR = Inboard edge of road; OBR = Outboard edge of road; IBF = Inboard edge of fillslope; OBF = Outboard edge of fillslope; CMP = Culvert; TR = Trash rack.					
0+00	SOS	-	Road log of road upgrading treatment starts at the location of rolling dip #1 on Camp Creek/Pulga Road.	-	-
0+24	-	RD #1	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
2+10	-	RD #2	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
4+07	-	RD #3	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
5+71	-	RD #4	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Install 10 yd ³ of 0.5-1.0' diameter riprap to the dip spillway as energy dissipation.	10 yd ³ AR	-
7+14	-	RD #5	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Install 10 yd ³ of 0.5-1.0' diameter riprap to the dip spillway as energy dissipation.	10 yd ³ AR	-
7+89	-	RD #6	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
9+94	-	RD #7	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
11+84	-	RD #8	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
13+09	-	RD #9	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-

**Implementation Road Log for Camp Creek/Pulga Road,
#104180 Post Camp Fire Dixie Road Sediment Reduction Project,
Butte County, CA**

Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	CMP Needs
14+16	1	Stream crossing	<p>A large Class II stream cascades down bedrock at the cutbank to the inlet of a plugged 36 in. diameter CMP. Stream flow currently overtops the road, actively eroding the OBR with progressive gully incision. The CMP is installed at a shallow grade and is undersized. There is approximately 20 yd³ of 2.0-3.0 ft. diameter riprap installed along the OBF. Shallow bedrock constrains excavation depth at the crossing.</p> <p>1. Replace the existing undersized CMP with a vented armored fill.</p> <p>a. Excavate from TOP to BOT and install a 60 in. diameter x 40 ft. long CMP near the BOF where it will discharge onto rock. This CMP will convey low flow discharge through the crossing.</p> <p>b. Import 100 yd³ of clean fill material to build up road approaches and accommodate the larger culvert size here.</p> <p>c. Define a broad dip through the road surface: High volume stream flow should be conveyed through the crossing along the axis of the dip during storms.</p> <p>d. Excavate a keyway 35 ft. wide at the top x 16 ft. wide at the base x 6 ft. deep x 18 ft. long.</p> <p>e. Armor the keyway with 20 yd³ of onsite armor and an additional 80 yd³ of 0.5-3.0 ft. diameter AR.</p> <p>4. Install 70 yd³ of well-graded, angular RR to the drive surface of the crossing.</p>	<p>80yd³ AR</p> <p>70 yd³ RR</p>	<p>60"x40' CMP</p> <p>1 coupler</p>
14+72	-	RD #10	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
15+85	-	RD #11	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
19+91	-	RD #12	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
21+45	-	RD #13	1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-

**Implementation Road Log for Camp Creek/Pulga Road,
#104180 Post Camp Fire Dixie Road Sediment Reduction Project,
Butte County, CA**

Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	CMP Needs
22+69	-	RD #14	<p>This dip will be installed along this stream crossing's drive surface. Lower the stream crossing to prevent diversion potential. Be careful not to disturb the concrete crib wall along the outboard fillslope nearby.</p> <p>1. Install a Type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.</p>	-	-
24+01	EOS	-	Road log ends after rolling dip #16 on Camp Creek/Pulga Road.	-	-

Implementation Road Log for <u>Dixie Road</u>, #104180 Post Camp Fire Dixie Road Sediment Reduction Project, Butte County, CA					
Station	Site #	Road Tmt¹	Comments/Treatment	Rock Needs	Materials Needs
¹ SOS = Start of survey; EOS = End of survey; DRC = Ditch relief culvert; AR = Rock armor; RR = Rip road; XRD = Crossroad drain; TOP = The upstream extent of excavation; BOT = The downstream extent of the excavation; BOF = Base of fill; IBR = Inboard edge of road; OBR = Outboard edge of road; IBF = Inboard edge of fillslope; OBF = Outboard edge of fillslope; CMP = Culvert; TR = Trash rack; RSDP = Road surface discharge point; SB = Sediment basin.					
0+00	SOS	-	Road log of road upgrading treatment starts at the intersection of Camp and Dixie roads.	-	-
3+49	-	RD #15	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd ³ RR.	10 yd ³ RR	-
8+45	-	RD #16	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd ³ RR.	10 yd ³ RR	-
10+96	-	RD #17	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd ³ RR.	10 yd ³ RR	-
12+98	38	Stream Crossing	A near origin Class III stream is conveyed through an undersized rusty CMP. The CMP is installed short and high in the fillslope. There is a wedge of sediment aggraded below the outlet in the channel. There is a functional critical dip on the right hingeline and a rolling dip up the left road that is semi-functional. 1. Excavate fill from top to bottom flag. 2. Replace undersized CMP with 24 in. diameter x 60 ft. long CMP at the BOF. 3. Install 2 yd ³ of 0.5-1.5 ft. diameter AR as energy dissipation below the CMP outlet. 4. Install 8 yd ³ of 0.5-2.0 ft. diameter AR to the OBF slope. 5. Resurface the stream crossing road surface with 20 yd ³ of RR.	10 yd ³ AR 20 yd ³ RR	24"x60' CMP 2 coupler
14+12	-	RD #18	Rolling dip construction must take bedrock visible within the road surface here into account. 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd ³ RR.	10 yd ³ RR	-

**Implementation Road Log for Dixie Road,
#104180 Post Camp Fire Dixie Road Sediment Reduction Project,
Butte County, CA**

Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
15+55	-	RD #19	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
16+70	-	RD #20	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
23+37	40	Stream crossing	<p>An at origin Class III stream is conveyed through the crossing via a plugged CMP. The CMP is installed short and high in the fillslope. Combined left road surface runoff, inboard ditch flow and stream flow have bypassed the critical dip along the right hingeline of the crossing, with a gully forming where a rolling dip has intercepted runoff.</p> <ol style="list-style-type: none"> 1. Excavate fill from top to bottom flag. 2. Replace undersized CMP with new 24 in. diameter x 60 ft. long CMP at the BOF. 3. Install 5 yd³ of 0.5-2.0 ft. diameter AR as energy dissipation below the CMP outlet. 4. Resurface the stream crossing road surface with 20 yd³ of RR. 	<p>5 yd³ AR</p> <p>20 yd³ RR</p>	<p>24"x60' CMP</p> <p>2 coupler</p>
26+75	-	RD #21	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
28+83	42	Stream Crossing Critical Dip #1 TR #1	<p>A near origin Class III stream with a plugged, buried and burnt CMP that is installed high in the fillslope. 85 ft. left of the crossing is a weak but functional rolling dip.</p> <ol style="list-style-type: none"> 1. Excavate fill from top to bottom flag. 2. Replace undersized CMP with a 24 in. diameter x 60 ft. long CMP at the BOF. 3. Install 2 yd³ of 0.5-1.0 ft. diameter AR as energy dissipation below the CMP outlet. 4. Install 18 yd³ of 0.5-2.0 ft. diameter AR to the OBF slope. 5. Install a critical dip to the right hingeline of the crossing. 6. Install a single-post TR 24 in. above the CMP inlet. 7. Resurface the stream crossing road surface with 20 yd³ of RR. 	<p>20 yd³ AR</p> <p>20 yd³ RR</p>	<p>24"x60' CMP</p> <p>2 coupler</p> <p>1 TR</p>
31+52	-	RD #22	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-

**Implementation Road Log for Dixie Road,
#104180 Post Camp Fire Dixie Road Sediment Reduction Project,
Butte County, CA**

Station	Site #	Road Tmt¹	Comments/Treatment	Rock Needs	Materials Needs
33+32	-	RD #23	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
35+42	-	RD #24	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
36+30	45	Spring	<p>Road fill is saturated at a weak rolling dip. Headwall swale spring flow has caused a large gully to form along the OBF with formation of a 4 ft. tall headcut at the OBR. Spring flow 100 ft. up the left road contributes flow and has deposited fine sediment along the road surface.</p> <ol style="list-style-type: none"> 1. Regrade existing rolling dip at the site location to enhance reverse grade and outsloping of the dip trough. 2. Excavate a keyway trench near the base of the headcut/OBF slope to hold riprap. 3. Install 30 yd³ of 0.5-2.0 ft. diameter AR to the OBF as energy dissipation at the rolling dip outlet. Ensure a U-shaped structure to constrain flow. 4. Utilize spoils for localized road shaping to the left and right. 5. Resurface the drive surface of the rolling dip with 10 yd³ RR. 6. Clean the inlet of the DRC at this location. 	<p>30 yd³ AR</p> <p>10 yd³ RR</p>	-
38+22	-	RD #25	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Install 5 yd³ of 0.5-1.0 ft. diameter riprap to the dip spillway as energy dissipation. 3. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	<p>5 yd³ AR</p> <p>10 yd³ RR</p>	-

**Implementation Road Log for Dixie Road,
#104180 Post Camp Fire Dixie Road Sediment Reduction Project,
Butte County, CA**

Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
43+35	47	Stream crossing Critical Dip #2	<p>A near origin, steep Class III stream flows along a bedrock cutbank. Approximately 5 yd³ of fill material has been cleaned from the CMP outlet with a backhoe or excavator, forming a steep headcut with a gully incised at the base and progressing down the hillslope. Another 4 ft. tall headcut has formed in the gully near the base of the fillslope, with further associated erosion downslope.</p> <ol style="list-style-type: none"> 1. Excavate fill from top to bottom flag 2. Armor the headcut near the base of fill with 10 yd³ of 0.5-2.0 ft diameter AR. 3. Replace undersized CMP with a 24 in. diameter x 60 ft. long CMP at the BOF. 4. Install 5 yd³ of 0.5-2.0 ft. diameter AR to stabilize the BOF and act as energy dissipation around the CMP outlet. 5. Install 25 yd³ of 0.5-2.0 ft. diameter AR the OBF slope. 6. Install a critical dip to the right hingeline of the crossing. 7. Resurface the stream crossing road surface with 20 yd³ of RR. 	40 yd ³ AR 20 yd ³ RR	24"x60' CMP 2 coupler
44+64	-	RD #26	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
47+22	48	Stream crossing Critical Dip #3 TR #2	<p>A near origin Class III stream flows along a steep bedrock cutbank. An 18 in. diameter CMP is installed adjacent to a 12 in. diameter CMP that is buried in the fillslope. Gullies have developed along old tire ruts in the left road approach and along the left berm, discharging over the OBR edge in line with the CMP outlet. The left hingeline of the crossing and OBF is occupied by a gully leading to a headcut along the base of the fillslope.</p> <ol style="list-style-type: none"> 1. Excavate fill from top to bottom flag. 2. Excavate near the BOF, laying back the steep headcut sidewalls to 2:1 or to natural grade. 3. Replace undersized CMP with a 30 in. diameter x 50 ft. long CMP at the BOF. 4. Install 5 yd³ of 0.5-2.0 ft. diameter AR to stabilize the BOF and act as energy dissipation around the CMP outlet. 5. Install 25 yd³ of 0.5-2.0 ft. diameter AR to the OBF slope. 6. Install a critical dip to the right hingeline of the crossing. 7. Install a single-post TR 30 in. above the CMP inlet. 8. Utilize spoils from the cutbank failure left of the crossing for localized road shaping. 	30 yd ³ AR	30"x50' CMP 2 coupler 1 TR

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Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
49+97	-	RD #27	<p>A DRC is installed here to convey flow from the stream headwall swale through the road.</p> <ol style="list-style-type: none"> Excavate to shape the bowl around the DRC outlet below the road to constrain and direct flow downslope. Install 10 yd³ of 0.5-1.0 ft. diameter riprap to the excavation around the DRC outlet as energy dissipation. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	<p>10 yd³ AR</p> <p>10 yd³ RR</p>	-
52+60	2	<p>Stream crossing</p> <p>TR #3</p> <p>Flared inlet #1</p>	<p>Flow from a Class II stream is conveyed through the stream crossing via a 36 in. diameter x 35 ft. long CMP installed near the BOF.</p> <ol style="list-style-type: none"> Install a 36 in. diameter flared inlet at the CMP inlet to increase culvert efficiency. Install a single-post TR 36 in. above the CMP inlet. Lay back perched OBF material around the culvert outlet to 2:1 or to stable native gradient as feasible. Install 2 yd³ of 0.5-1.0 ft. diameter AR as energy dissipation below the CMP outlet. Install 13 yd³ of 0.5-2.0 ft. diameter AR to the OBF. 	15 yd ³ AR	<p>36" diameter flared inlet</p> <p>1 TR</p>
55+06	3	<p>Stream crossing</p> <p>Critical dip #4</p> <p>TR #4</p>	<p>An 18 in. diameter CMP is installed short and high in the fillslope. A concrete apron along the outboard fillslope will need to be removed during excavation.</p> <ol style="list-style-type: none"> Excavate from TOP to BOT. Lay back sideslopes 2:1 or to stable native material from TOP to the IBF, and from the OBF to the BOT and 1:1 through the remainder of the fill. Separate concrete from fill material for disposal. Install a 48 in. diameter x 50 ft. long CMP at the BOF. Angle the pipe away from the left sidewall of the stream channel below the road to prevent scour. Install 2 yd³ of 0.5-1.0 ft. diameter AR as energy dissipation below the CMP outlet. Install a single-post TR 48 in. above the CMP inlet. Construct a critical dip on the right hingeline of the crossing to prevent stream diversion. Spoil locally. Integrate spoils into the road prism for localized road shaping. 	2 yd ³ AR	<p>48"x50' CMP</p> <p>2 coupler</p> <p>1 TR</p>
55+30	-	<p>RD #27.1</p> <p>SB #1</p>	<ol style="list-style-type: none"> Construct SB #1 at the outlet of RD #27.1: 12 ft. wide x 3 ft. deep x 10 ft. long with 3:1 sideslopes. Regrade existing rolling dip to enhance reverse grade of the constructed portion of the dip and improve outslipping through the dip trough. 	-	-

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Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
56+96	4	Stream crossing TR #5	<p>A Class II stream is conveyed through this crossing via a partially plugged 18 in. diameter CMP. This stream crossing receives diverted stream flow from stream crossing Site #5 up the right road. The CMP is undersized and installed high in the fillslope.</p> <ol style="list-style-type: none"> Excavate from TOP to BOT. Lay back sideslopes 2:1 or to stable native material from TOP to the IBF, and from the OBF to the BOT and 1:1 through the remainder of the fill. Install a 48 in. diameter x 40 in. long CMP at the BOF. Install 2 yd³ of 0.5-1.5 ft. diameter AR as energy dissipation below the CMP outlet. Construct a critical dip in line with the newly installed culvert at this crossing. Install a single-post TR 48 in. above the CMP inlet. 	2 yd ³ AR	<p>48"x40' CMP</p> <p>1 coupler</p> <p>1 TR</p>
57+20	-	RD #27.2	<ol style="list-style-type: none"> Install a type 1 rolling dip, NOT connected to the ditch. Outslope the trough of the dip at 8%. 	-	-
59+70	-	RD #28	<ol style="list-style-type: none"> Install a type 2 rolling dip, NOT connected to the ditch. Outslope the trough of the dip at 8%. Breach the outboard berm 15 ft. wide x 10 ft. long x 1.5 ft. deep. 	-	-
61+00	5	Stream crossing Critical dip #5 TR #6 XRD #1	<p>A Class II stream crossing. The CMP is undersized and installed high in the fill at a shallow angle. There is AR visible along the OBF, however much of the OBF failed when stream flow overtopping the crossing in the past.</p> <p>An old skid trail above this crossing is diverting flow from the stream headwall swale into the inboard ditch of the road. Hand labor will be used to construct 5 crossroad drains along the skid trail at flagged locations, directing flow into the stream crossing.</p> <ol style="list-style-type: none"> Excavate from TOP to BOT. Install a 36 in. diameter x 60 ft. long CMP at the BOF. Install a 36 in. diameter flared inlet to the CMP to increase culvert efficiency. Install 5 yd³ of 0.5-2.0 ft. diameter AR as energy dissipation below the CMP outlet. Install 25 yd³ of 0.5-3.0 ft. diameter AR to the OBF slope. Construct a critical dip on the left hingeline of the crossing to prevent stream diversion. Install a single-post TR 36 in. above the CMP inlet. Excavate perched unstable OBF material near the right hingeline of the crossing to prevent OBF failure and sediment delivery to the stream below: 30 ft. wide x 2 ft. deep x 10 ft. long. Use hand labor to construct 5 crossroad drains at flagged locations along the skid trail above the stream crossing. 	30 yd ³ AR	<p>36"x60' CMP</p> <p>2 coupler</p> <p>36" diameter flared inlet</p> <p>1 TR</p>

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Station	Site #	Road Tmt¹	Comments/Treatment	Rock Needs	Materials Needs
62+13	-	RD #29	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
64+73	6	Stream crossing Critical dip #6	A near origin Class III stream has diverted down the left inboard ditch for 125 ft. to a functional rolling dip. Large boulders are exposed upstream. The OBF is steep. Rolling dip to the right delivers 90 ft. of concentrated road runoff to the stream below the fillslope. 1. Excavate fill from top to bottom flag. 2. Install a 24 in. x 50 ft. long CMP at the BOF. 3. Install 19 yd ³ of 0.5-2.0 ft. diameter AR to the OBF slope. 4. Install 1 yd ³ of 0.5-1.0 ft. diameter AR as energy dissipation below the CMP outlet. 5. Install a critical dip to the left hingeline of the crossing.	20 yd ³ AR	24"x50' CMP 2 coupler
67+02	7	Stream crossing	Class III stream flow and right road drainage are conveyed across the road via a rolling dip on the left hingeline of this stream crossing. There is a large tree on the center line of the profile at the OBF that should be retained. The new CMP can be set along the left hingeline where the inlet basin for the pipe will be offset ~20' left of the swale centerline. 1. Excavate fill from top to bottom flag. 2. Install a 24 in. x 50 ft. long CMP at the BOF offset to the left of the center line of the profile approximately 27 ft. 3. Install 10 yd ³ of 0.5-2.0 ft. diameter AR to the OBF slope. 4. Install 1 yd ³ of 0.5-1.0 ft. diameter AR as energy dissipation below the CMP outlet. 5. Install a single post TR 24 in. above the CMP inlet.	20 yd ³ AR	24"x50' CMP 2 coupler

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Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
69+00	8	Stream crossing Critical dip #7	<p>A near origin Class III stream flows along a fill crossing. There is diversion potential on the OBR through an ineffective critical dip. Lower outboard fill is long and exposed to erosion if outlet is installed short of the base of the slumped material. There is a plugged and buried DRC on the right hingeline of the crossing.</p> <ol style="list-style-type: none"> 1. Excavate fill from top to bottom flag. 2. Install 24 in. diameter x 50 ft. long CMP at the BOF. 3. Install a 24 in. diameter x 40 ft. long downspout with a 30-degree elbow coupler to the CMP outlet. 4. Install 29 yd³ of 1.0-3.0 ft. diameter AR to 75% of the OBF. 5. Install 1 yd³ of 0.5-1.0 ft. diameter AR as energy dissipation below the CMP outlet. 6. Install a critical dip to the left hingeline of the crossing. 7. Install a single-post track rack 24 in. above the CMP inlet. 	30 yd ³ AR	<p>24"x50' CMP</p> <p>24"x40' DS</p> <p>1 30° elbow</p> <p>5 coupler</p>
70+65	-	RD #30	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-
71+89	9	RSDP #1 RD #34	<p>Combined swale and road surface runoff deliver fine sediment to a Class III stream 120 ft. below the road. Flow is discharged from the road via a rolling dip. The right road is insloped. The swale upslope is rilling due to sheet flow erosion and contributing flow from a road surface discharge point on the road above. The right road has two semi-functional rolling dips and a plugged DRC.</p> <ol style="list-style-type: none"> 1. Rebuild the outer portion of the rolling dip. 2. Excavate a keyway: 15 ft. wide on top x 4 ft. wide at the base x 2 ft. deep x 20 ft. long. 3. Install 20 yd³ of 0.5-2.0 ft. diameter AR to the keyway. 	20 yd ³ AR	-
74+12	-	RD #31	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-
75+84	-	RD #32	<p>Build the constructed portion of the rolling dip over the existing DRC.</p> <ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-
77+51	-	RD #33	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-
79+00	-	RD #34	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-

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82+84	-	RD #35	Angle the outsloped spillway of this rolling dip to the west side of the road. 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
84+90	-	RD #36	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
90+37	-	RD #37	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
91+36	-	RD #38	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
94+17	-	RD #39	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
105+95	-	RD #40	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
109+28	-	RD #41	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
110+58	15	Stream crossing Critical dip #8	A confined, near origin Class III stream and 475 ft. of left road runoff flow through a 12 in. diameter CMP. There is a small swale 35 ft. up the left road delivering fine sediment to the inboard ditch. Road sediment is visible in transport to a Class I stream approximately 100 ft. below the crossing. The CMP outlet projects 2 ft. above the fillslope. 1. Excavate fill from top to bottom flag. 2. Replace undersized CMP with a 24 in. x 40 ft. long CMP at the BOF. 3. Install a critical dip to the right hingeline of the crossing.	-	24"x40' CMP 1 coupler

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115+87	17	Stream crossing Critical dip #9	<p>An undersized CMP conveys stream flow through this crossing during low flows. The crossing overtops during high flow events and diverts down the left road to the stream crossing downslope. The upstream channel reach is heavily aggraded in a low gradient setting.</p> <ol style="list-style-type: none"> Excavate fill from top to bottom flag and define an 8 ft. wide channel bottom with 2:1 side slopes for 85 ft. upstream. Replace the culvert with a 95 in. x 67 in. diameter x 60 ft. long arch pipe culvert at the base of fill. Import 300 yd³ of clean fill material to accommodate the large size of the pipe arch CMP and reconstructed road approaches. Fill material minimum depth above the CMP is 2 ft. Rebuild IBF and OBF slopes at 26.5 degrees (50% grade). Install a critical dip to the left hingeline of the crossing. Resurface stream crossing and approach surfaces with 125 yd³ of RR. 	125 yd ³ RR	95" x 67" x 60' CMP 2 coupler
117+26	18	RSDP #2	<p>RSDP #2 is located 115 ft. right of Site #17. Concentrated hillslope runoff from a swale approximately 65 ft. to the right and right road surface runoff has incised a 1 ft. wide x 1 ft. deep x 65 ft. long gully along the outsloped, bermed OBR.</p> <ol style="list-style-type: none"> Install 5 yd³ of 0.5-1.0 ft. diameter AR to the existing rolling dip spillway as energy dissipation. 	5 yd ³ AR	-
120+93	-	RD #42	<ol style="list-style-type: none"> Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-
121+69	-	RD #43	<ol style="list-style-type: none"> Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-
124+04	20	Stream crossing XRD #2	<p>A fill crossing on a near origin Class III stream. There is a skid trail crossing 100 ft. upslope that is diverting some flow past this crossing.</p> <ol style="list-style-type: none"> Remove the dead tan oak on the left hingeline of the crossing. Install an armored fill at the crossing. <ol style="list-style-type: none"> Excavate a broad dip through the road prism. Excavate a keyway: 20 ft. wide at the top x 10 ft. wide at the base x 2 ft. deep x 10 ft. long. Install 15 yd³ of 0.5-2.0 ft. diameter AR to the keyway. Re-rock the road surface at the stream crossing with 15 yd³ of RR. Decommission the skid trail left of the crossing: Rip the road surface for 400 ft. and install XRD at 75 ft. intervals. 	15 yd ³ AR 15 yd ³ RR	-

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125+94	-	RD #44	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
128+74	22	Stream crossing	A large intersection with an undersized Culverted stream crossing. A near origin Class III stream with a low gradient plugged CMP on the semi-winterized forest service road below the crossing. The forest road to the left delivers fine sediment via an inboard ditch to the stream. A 3 ft. tall headcut at the base of 75 ft. of aggraded sediment is present above the crossing. 1. Define a 4 ft. wide channel 75 ft. upstream of the headcut near the IBR, with 2:1 sideslopes. 2. Excavate fill from top to bottom flag. 3. Replace undersized CMP with a 24 in. diameter x 70 ft. long CMP at the BOF. 4. Install a critical dip inline with the newly installed culvert.	-	24"x70' CMP 3 coupler
131+16	-	RD #45	Angle the outsloped spillway of this rolling dip to the west side of the road, towards the 24 in. diameter DRC inlet installed in the midslope road. 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%.	-	-
133+55	23	Stream crossing	A near origin Class III stream with no formal drainage structure. A long gully discharges flow from the OBR to the BOF, then flows into Site #20's stream crossing. There is gully erosion on the left approach. 1. Install an armored fill at the crossing. a. Excavate a broad dip through the road prism. b. Excavate a keyway: 15 ft. wide at the top x 10 ft. wide at the base x 2 ft. deep x 25 ft. long. c. Install 25 yd ³ of 0.5-2.0 ft. diameter AR to the keyway. 2. Re-rock the road surface at the stream crossing with 15 yd ³ of RR.	25 yd ³ AR 15 yd ³ RR	-

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Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
134+81	24	Stream crossing Clean DRC #1	<p>A near origin Class III stream delivers fine sediment to the inboard ditch and diverts to Site #23 along the right road. There is additional contribution from the left inboard ditch. Road runoff delivers flow and road sediment to the crossing at Site #23. There is a dead conifer on the OBR below that will need to be removed during construction.</p> <ol style="list-style-type: none"> 1. Install an armored fill at the crossing. <ol style="list-style-type: none"> a. Excavate a broad dip in the road. b. Excavate a keyway: 18 ft. wide at the top x 8 ft. wide at the base x 2 ft. deep x 15 ft. long. c. Install 15 yd³ of 0.5-2.0 ft. diameter AR to the keyway. 2. Clean the DRC inlet approximately 175 ft. to the left. 3. Re-rock the road surface at the stream crossing with 15 yd³ of RR. 	15 yd ³ AR 15 yd ³ RR	-
136+58	-	RD #46	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, NOT connected to the ditch. Outslope the trough of the dip at 8%. 	-	-
194+69	28	Stream crossing Critical dip #10	<p>Class III stream flow was previously conveyed through this crossing via a 12 in. diameter CMP. The CMP is plugged, rusted, crushed, and exposed in the roadbed. Stream flow overtops the ditch and has created a gully across the road.</p> <ol style="list-style-type: none"> 1. Excavate fill from top to bottom flag and define a 4 ft. wide channel bottom, with 2:1 sideslopes for 60 ft. upstream of the inlet. 2. Replace undersized CMP with a new 24 in. diameter x 50 ft. long CMP at the BOF. 3. Install a critical dip to the right hingeline of the stream crossing. 	-	24"x50' CMP 2 coupler
200+07	30	Stream crossing Critical dip #11	<p>A near origin Class III stream is diverted down the inboard ditch and discharges off the road over a rolling dip 90 ft. to the right. Outboard fill at the rolling dip is eroding slowly.</p> <p>Access the flagged drainage swale location below the road either by excavating the stream crossing here or from the skid trail intersection 120 ft. down the right road.</p> <ol style="list-style-type: none"> 1. Excavate fill from top to bottom flag. 2. Spoil material locally. 3. Install a 24 in. x 50 ft. long CMP at the BOF. 4. Install a critical dip on the right hingeline of the crossing. 	-	24"x50' CMP 2 coupler
203+70	-	RD #47	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 	-	-

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205+06	32	RSDP #3	<p>A semi-functional rolling dip conveys combined swale and left road runoff to a swale below the road. Flow through the swale delivers entrained fine sediment to a stream crossing 160 ft. downslope. The left road is insloped and the swale upslope is heavily vegetated. The road and swale flow diverted down the right road prior to recent road grading activity.</p> <ol style="list-style-type: none"> 1. Regrade the type 1 rolling dip at this location to enhance reverse grade and outsloping of dip trough. Finished rolling dip should be connected to the cutbank, with the dip trough outsloped at 8% grade. 2. Install 5 yd³ of 0.5-1.0 ft. diameter AR to the spillway of the rolling dip as energy dissipation. 3. Install 20 yd³ of RR to the drive surface of the rolling dip. 	<p>5 yd³ AR 20 yd³ RR</p>	-
211+99	-	RD #48	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Install 10 yd³ of 0.5-1.0 ft. diameter AR to the spillway of the rolling dip as energy dissipation. 3. Install 10 yd³ of RR to the drive surface of the rolling dip. 	<p>10 yd³ AR 10 yd³ RR</p>	-

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258+94	54	Stream crossing TR #7	<p>The CMP at this stream crossing is undersized, and upstream the channel is choked with trees and debris. The CMP is installed near the BOF. There is a skid road above and to the right that is contributing concentrated road runoff and entrained fine sediment to this crossing. There are road surface discharge points along the outboard fill.</p> <ol style="list-style-type: none"> 1. Clear woody debris upstream of the stream crossing. 2. Decommission the skid road above this crossing: rip the road surface for 500 ft. and install XRD every 75 ft. 3. Excavate fill from top to bottom flag. 4. Remove logs below the stream crossing and set aside. These will be placed on the right road approach as a guard rail. 5. Excavate the OBF from left to right flag, 50 ft. right of the stream crossing where fill constrains the stream channel: 35 ft. wide x 3 ft. deep x 15 ft. long. Use spoils to rebuild the stream crossing. 6. Replace undersized CMP with a 72 in. diameter x 60 ft. long CMP at the BOF. 7. Install 30 yd³ of 0.5-2.0 ft. diameter AR to the OBF slope. Make sure the AR extends to the edge of the road where road drainage from the left road will spill on the OBF of the reconstructed crossing. 8. Install 10 yd³ of 0.5-2.0 ft. diameter AR to the IBF slope. 9. Install a single-post TR 72 in. above the CMP inlet. 10. Resurface the stream crossing road surface with 50 yd³ of RR. 	<p>40 yd³ AR 50 yd³ RR</p>	<p>72"x60' CMP 2 coupler 1 TR</p>
262+00	-	RD #48.1	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
265+16	-	RD #49	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-
278+40	-	RD #50	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ RR	-

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280+62	56	Stream crossing Clean ditch #1	<p>A class II stream flows into the inboard ditch of this fill crossing and diverts to the right, delivering entrained fine sediment and eroded road surface material to the inboard side of the stream crossing at Site #57. High flows during storms run along the road surface and deliver fine sediment to the outboard side of Site #57 as well. 400 ft. of hydrologically connected low gradient left road and ditch contribute chronic fine sediment to this site. The ditch to the right is eroding, with an active headcut near Site #57 migrating toward this crossing.</p> <p>1. Excavate to construct a 5 ft. wide channel bottom through the inboard ditch leading to the stream crossing downslope for 140 ft. Channel sideslopes will have a finished grade of 2:1 (50% grade). 2. Construct a 15 ft. wide x 15 ft. long grade control structure at the break-in-slope along the bank of Camp Creek where the inboard ditch flows into the creek using 20 yd³ of AR.</p>	20 yd ³ AR	-
283+13	-	Point of Diversion	<p>Water will be drafted from Camp Creek at a stream crossing on Dixie Road using a screened pump utilized for the purposes of moisture conditioning of fill materials for optimal compaction and dust abatement during construction.</p> <ul style="list-style-type: none"> • The water drafting shall be limited to a maximum of 7,000 gallons/day and the maximum instantaneous diversion rate shall not exceed 50 gallons per minute. • The rate of pumping will be manipulated to permit at least 80% bypass flows during drafting activities. • The intake screen shall be placed into the culvert outlet pool and left in-place until the project is completed to minimize disturbance to aquatic wildlife from screen placement. • Width of the outlet pool will be measured prior to drafting and drafting shall temporarily cease if the width of the pool decreases by more than 10%. 	-	-

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Butte County, CA**

Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
287+73	58	Road fill failure	<p>Rotten crib logs brace a failing fillslope on a narrow section of road. Woody debris and unstable fill should be removed. The road segment at excavation #1 will need to be rebuilt with clean, rocky fill from excavation #2, a section of failing OBF 100 ft. left of the crib log road segment. Woody debris will need to be spread on bare soil areas.</p> <ol style="list-style-type: none"> 1. Excavate fill and large wood along the OBF at Excavation #1: 40 ft. wide x 4 ft. deep x 17 ft. long. 2. Excavate fill and large wood along the OBF at Excavation #2: 30 ft. wide x 4 ft. deep x 25 ft. long. 3. Store clean spoils locally for use reconstructing the road. 4. Key in 1.0-3.0 ft. diameter AR to support the base of the new OBF. Build up the road prism with clean fill excavated and pushed from excavation #2. Reconstruct the road prism at Excavation #1 in stages with riprap and compacted fill material. 5. Replace the old rolling dip at excavation #1 at the flagged location, connected to the cutbank. 	90 yd ³ AR	-
288+72	-	RD #51	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Install 10 yd³ of 0.5-1.0 ft. diameter AR to the spillway of the rolling dip as energy dissipation. 3. Resurface the drive surface of the rolling dip with 10 yd³ RR. 	10 yd ³ AR 10 yd ³ RR	-
291+10	-	RD #52	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 25 yd³ RR. 	25 yd ³ RR	-
294+32	-	RD #53	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 25 yd³ RR. 	25 yd ³ RR	-
299+72	-	RD #54	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, do NOT connect to the ditch. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 25 yd³ RR. 	25 yd ³ RR	-
305+56	-	RD #55	<ol style="list-style-type: none"> 1. Install a type 1 rolling dip, do NOT connect to the ditch. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 25 yd³ RR. 	25 yd ³ RR	-

**Implementation Road Log for Dixie Road,
#104180 Post Camp Fire Dixie Road Sediment Reduction Project,
Butte County, CA**

Station	Site #	Road Tmt ¹	Comments/Treatment	Rock Needs	Materials Needs
308+47	61	Stream crossing Critical dip #11	A Class II stream is diverted down the road via the inboard ditch for 950 ft. to the right. The natural channel swale is visible directly below the road. The stream should be returned to its drainage swale. The turn-out at the crossing should be retained. 550 ft. of left road inboard ditch conveys flow past this crossing. 1. Excavate fill from top to bottom flag. 2. Install a 48 in. diameter x 60 ft. long CMP at the BOF. 3. Install a critical dip to the right hingeline of the crossing. 4. Resurface the stream crossing road surface with 20 yd ³ of RR.	50 yd ³ RR	48"x60' CMP 2 coupler
310+24	-	RD #56	1. Install a type 1 rolling dip, do NOT connect to the ditch. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 25 yd ³ RR.	25 yd ³ RR	-
313+79	62	Stream crossing Critical dip #12 TR #8	A Class II stream is conveyed through the crossing via an 18 in. diameter CMP installed near the BOF. A 30 in. diameter critical pipe is offset, installed high in the fillslope along the right hingeline of the crossing. The smaller CMP is 85% plugged at the inlet but still conveys stream flow. There is minimal diversion potential to the right. 1. Excavate fill from top to bottom flag. Remove the 8 in. diameter Fir tree above the culvert inlet and straighten the channel to new inlet location. 2. Replace undersized CMP with a 48 in. diameter x 80 ft. long CMP at the BOF. 3. Install 10 yd ³ of 0.5-2.0 ft. diameter AR to the OBF slope. 4. Install 5 yd ³ of 0.5-2.0 ft. diameter AR to the IBF slope. 5. Install a single-post TR 48 in. above the CMP inlet. 6. Install a critical dip to the left hingeline of the crossing. 7. Install 20 yd ³ of 0.5-2.0 ft. diameter riprap to the spillway of the critical dip as energy dissipation. 8. Resurface the stream crossing road surface with 50 yd ³ of RR.	35 yd ³ AR 50 yd ³ RR	48"x80' CMP 3 coupler 1 TR
318+30	-	RD #57	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 25 yd ³ RR.	25 yd ³ RR	-
322+12	-	RD #58	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 20 yd ³ RR.	20 yd ³ RR	-

**Implementation Road Log for Dixie Road,
#104180 Post Camp Fire Dixie Road Sediment Reduction Project,
Butte County, CA**

Station	Site #	Road Tmt¹	Comments/Treatment	Rock Needs	Materials Needs
327+31	-	RD #59	1. Install a type 1 rolling dip, connected to the cutbank. Outslope the trough of the dip at 8%. 2. Resurface the drive surface of the rolling dip with 25 yd ³ RR.	25 yd ³ RR	-
335+59	EOS	-	Road log ends at the intersection of Concow and Dixie roads.	-	-

APPENDIX C

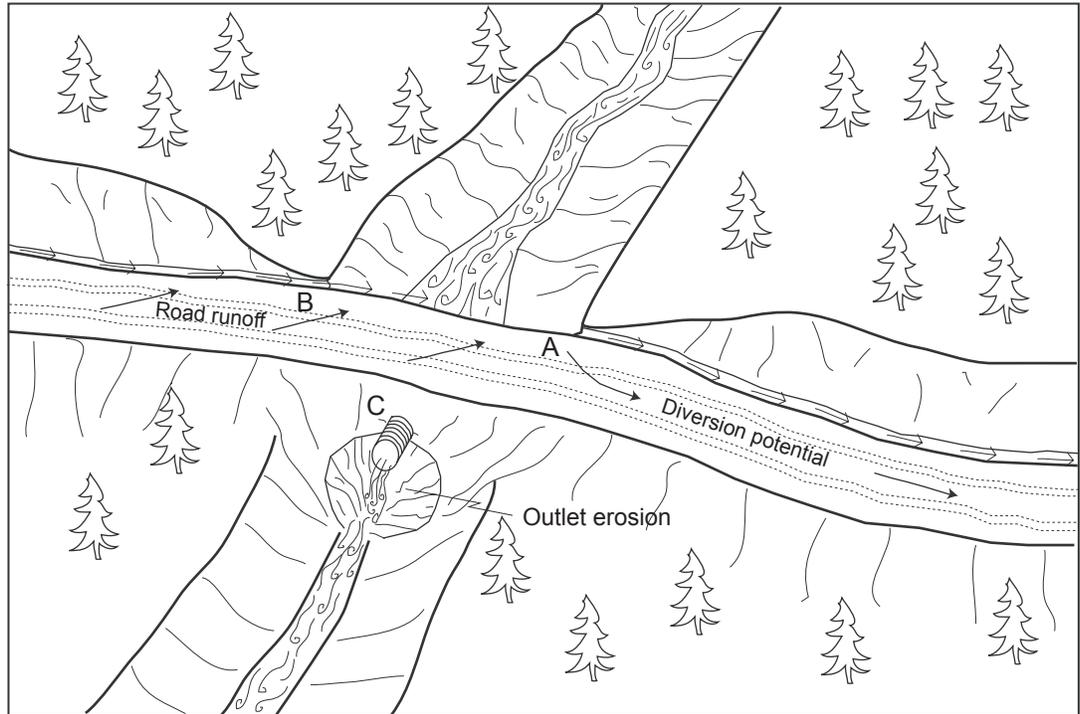
Butte County Resource Conservation District Post-Camp Fire Dixie Road Sediment Reduction Project

Typical Drawings

Typical Problems and Applied Treatments for a Non-fish Bearing Upgraded Stream Crossing

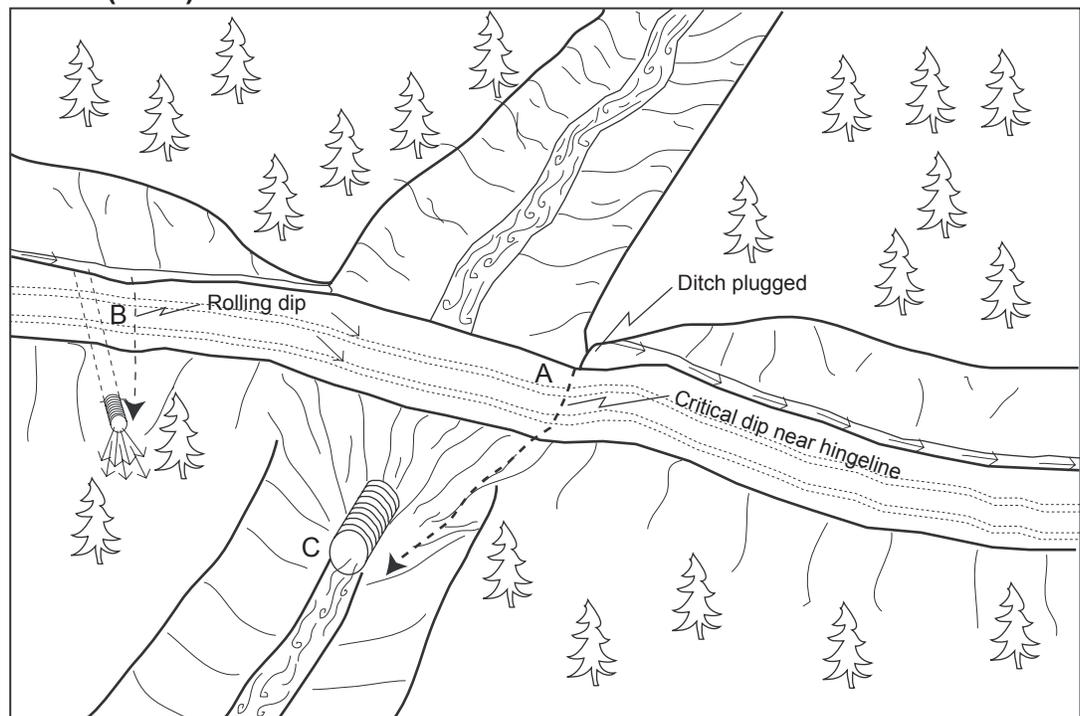
Problem condition (before)

- A - Diversion potential
- B - Road surface and ditch drain to stream
- C - Undersized culvert high in fill with outlet erosion



Treatment standards (after)

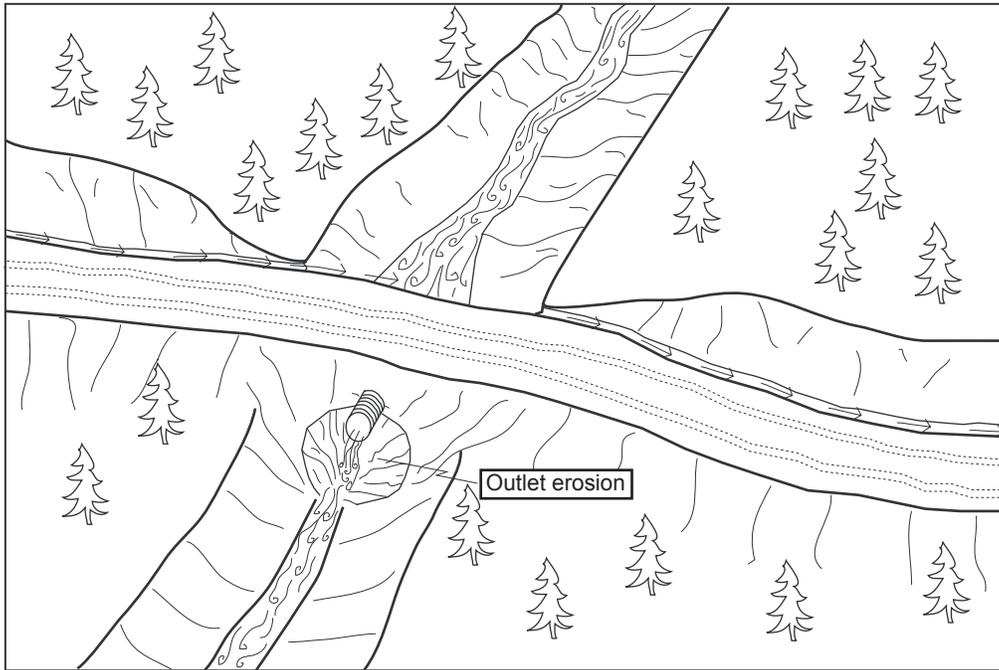
- A - No diversion potential with critical dip installed near hingeline
- B - Road surface and ditch disconnected from stream by rolling dip and ditch relief culvert
- C - 100-year culvert set at base of fill



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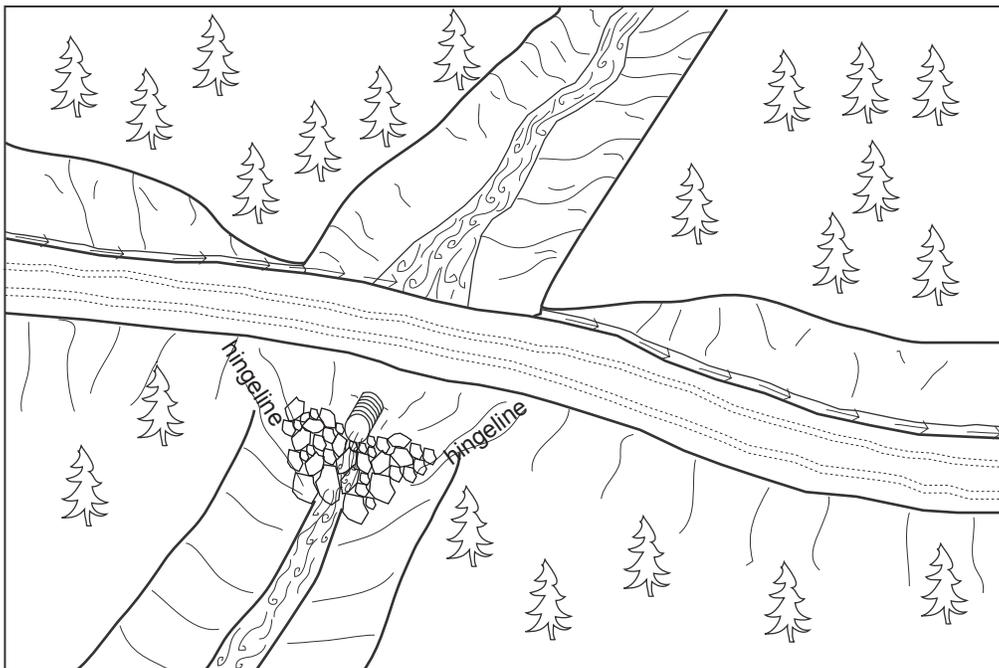
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Armoring Fill Faces to Upgrade Stream Crossings



Problem: Culvert set high in outboard fill has resulted in scour of the outboard fill face and natural channel.

Conditions: The existing stream crossing has a culvert sufficient in diameter to manage design stream flows and has a functional life.



Action: The area of scour is backfilled with rip-rap to provide protection in the form of energy dissipation for the remaining fill face and channel.

Treatment Specifications:

- 1) Placement of rip-rap should be between the left and right hingelines and extend from a keyway excavated below the existing channel base level at the base of the fill slope up and under the existing culvert.
- 2) Rock size and volume is determined on a site by site basis based on estimated discharge and existing stream bed particle size range (See accompanying road log).

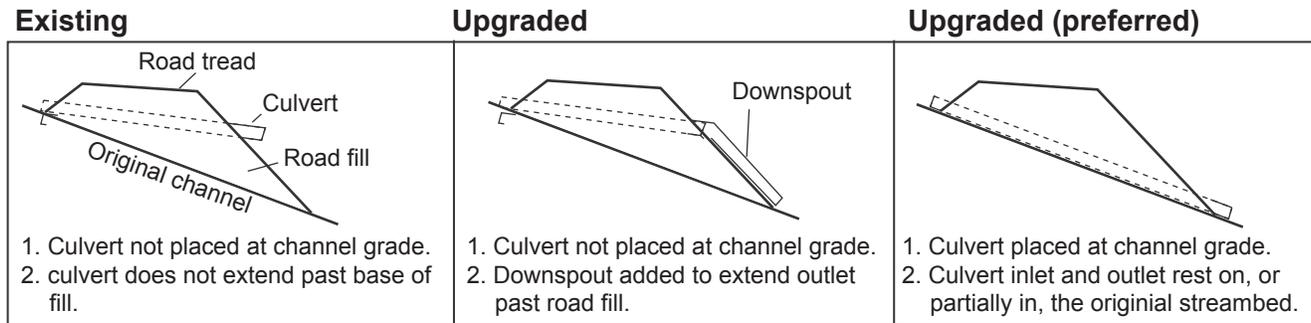
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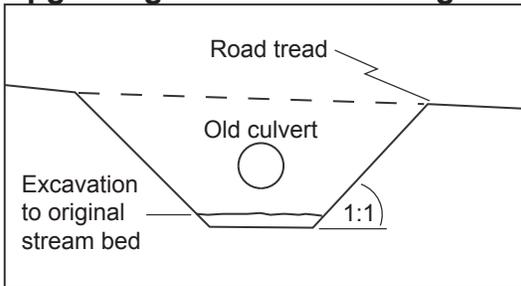
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PWA Typical Drawing #1b

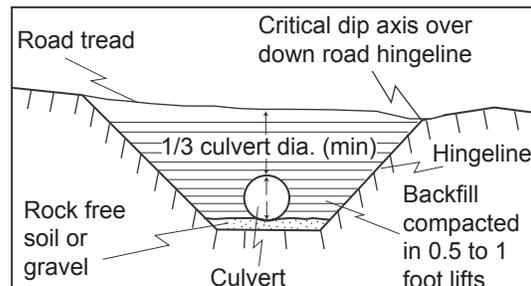
Typical Design of a Non-fish Bearing Culverted Stream Crossing



Excavation in preparation for upgrading culverted crossing



Upgraded stream crossing culvert installation



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.

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 inches 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:

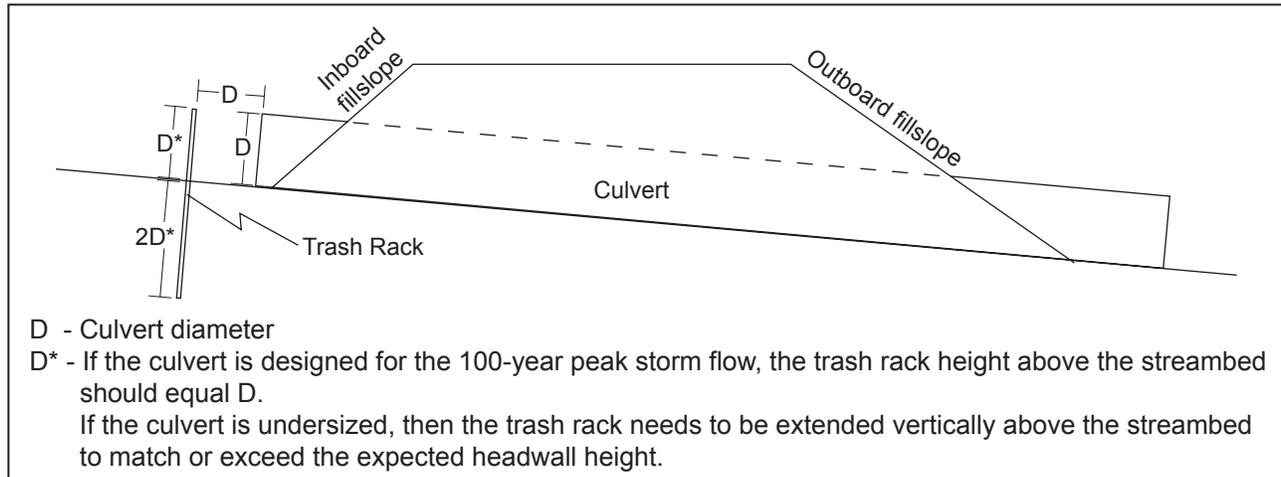
1. Minimizing soil exposure by limiting excavation areas and heavy equipment disturbance.
2. Installing filter windrows of slash at the base of the road fill to minimize the movement of eroded soil to downslope areas and stream channels.
3. Retaining rooted trees and shrubs at the base of the fill as "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 Design of a Single-post Culvert Inlet Trash Rack

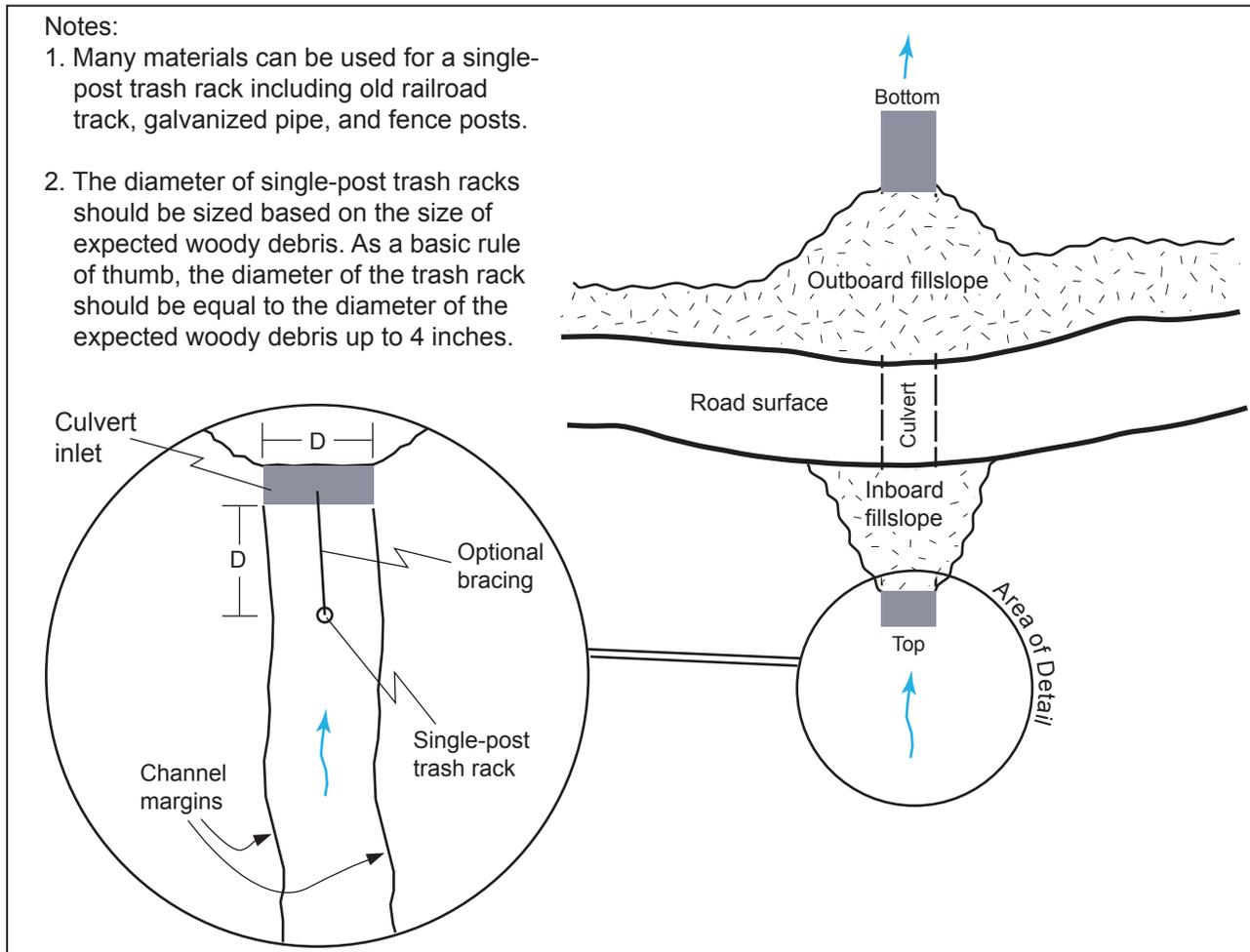
Cross section view



Plan view

Notes:

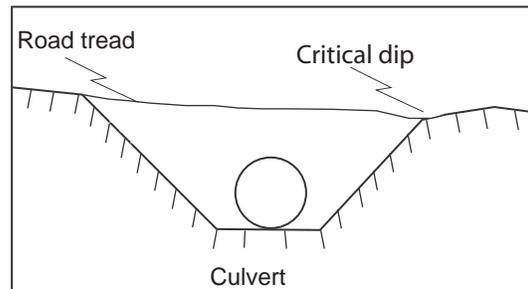
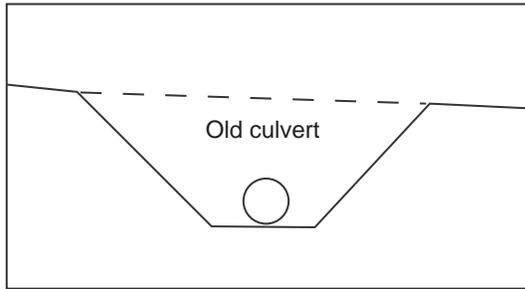
1. Many materials can be used for a single-post trash rack including old railroad track, galvanized pipe, and fence posts.
2. The diameter of single-post trash racks should be sized based on the size of expected woody debris. As a basic rule of thumb, the diameter of the trash rack should be equal to the diameter of the expected woody debris up to 4 inches.



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Typical Design of Upgraded Stream Crossings



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 inches 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 and 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.

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.

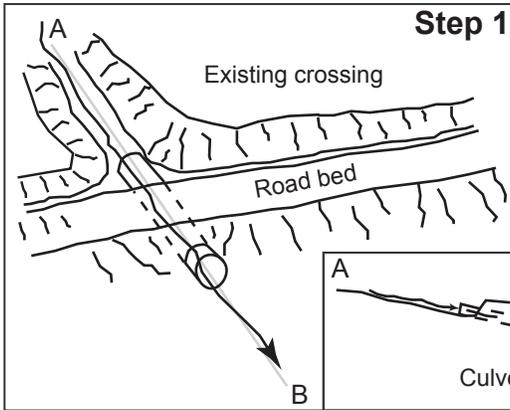
Armoring fill faces

Fill angles $\leq 2:1$	Fill angles (between 2:1 & 1.5:1)	Fill angles steeper than 1.5:1
<p>No rock armor needed</p>	<p>Armor 1/4 up fill face</p>	<p>Armor 3/4 way up fill face</p>

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Ten Steps for Constructing a Typical Armored Fill Stream Crossing

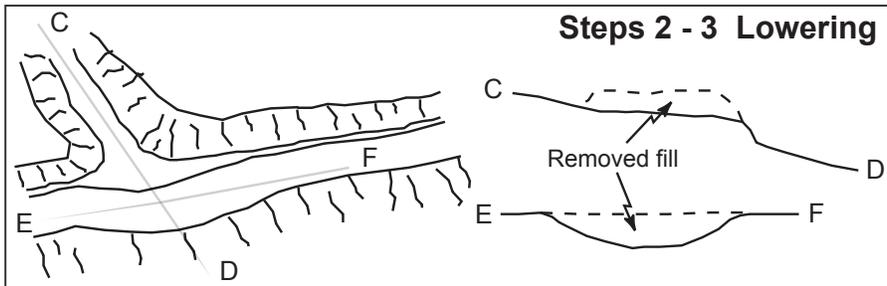


Step 1

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).

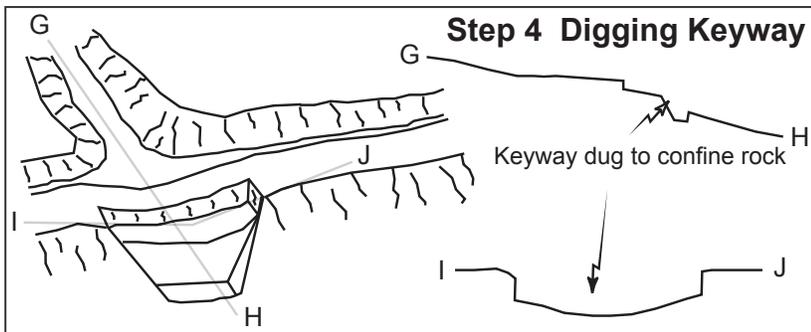
B) **The largest rocks must be used to buttress the rest of the armor in two locations:** i) The base of the armored fill where the fill meets natural channel. (This will buttress the armor placed on the outboard fill face and reduce the likelihood of it washing downslope). ii) The break in slope from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



Steps 2 - 3 Lowering

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

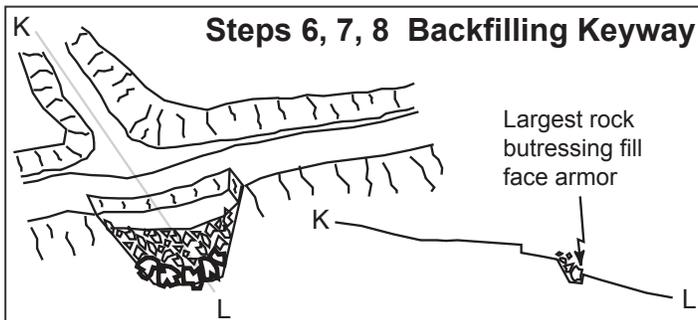
3. **Construct a dip** centered at the crossing that is large enough to accommodate the 100-year flow event and prevent diversion (C-D, E-F).



Step 4 Digging Keyway

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 outboard 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.

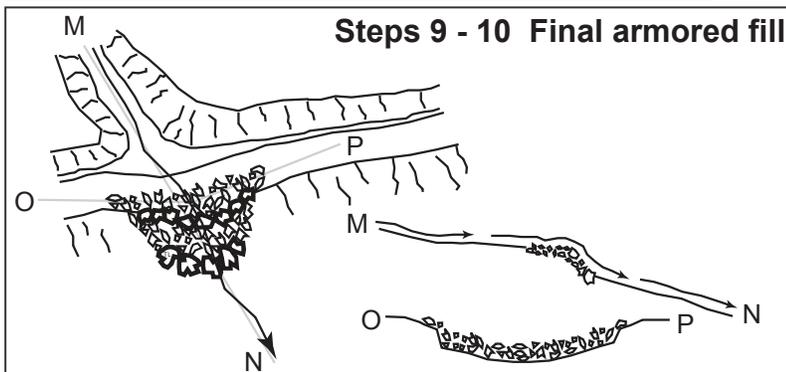


Steps 6, 7, 8 Backfilling Keyway

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 accommodate the largest expected flow (K-L).



Steps 9 - 10 Final armored fill

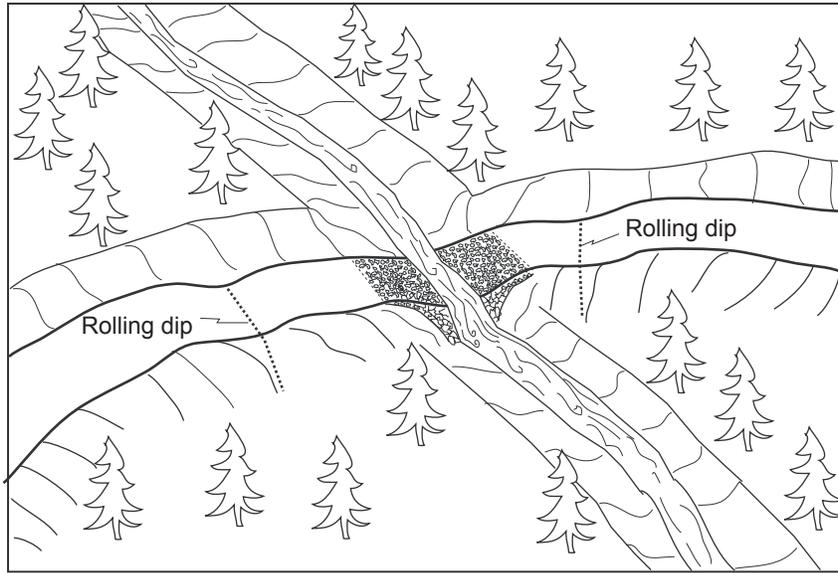
9. **Install a second buttress** at the break in slope between the outboard road and the outboard fill face. (This should define the base level of the stream and determine how deep the stream will backfill after construction) (M-N).

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).

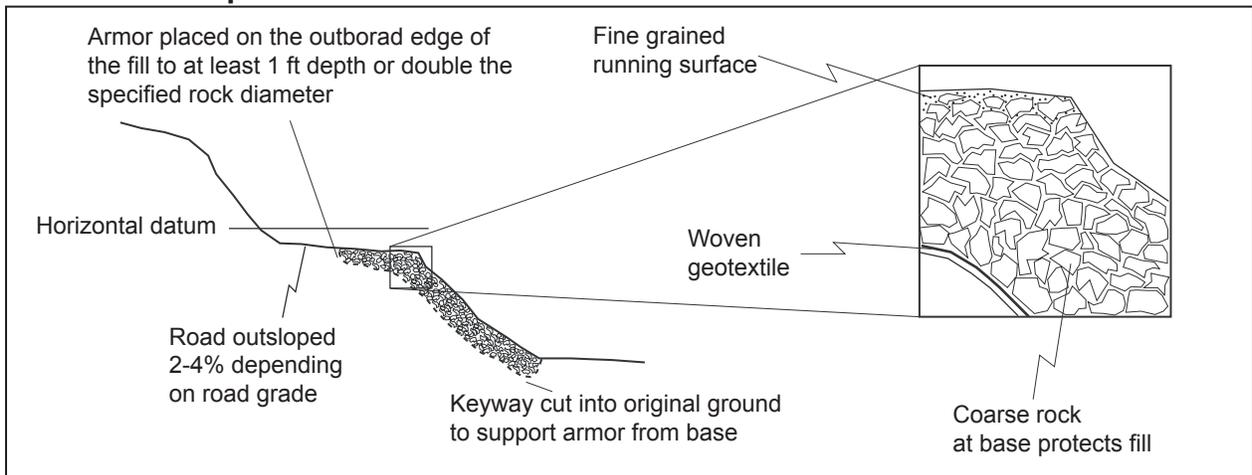
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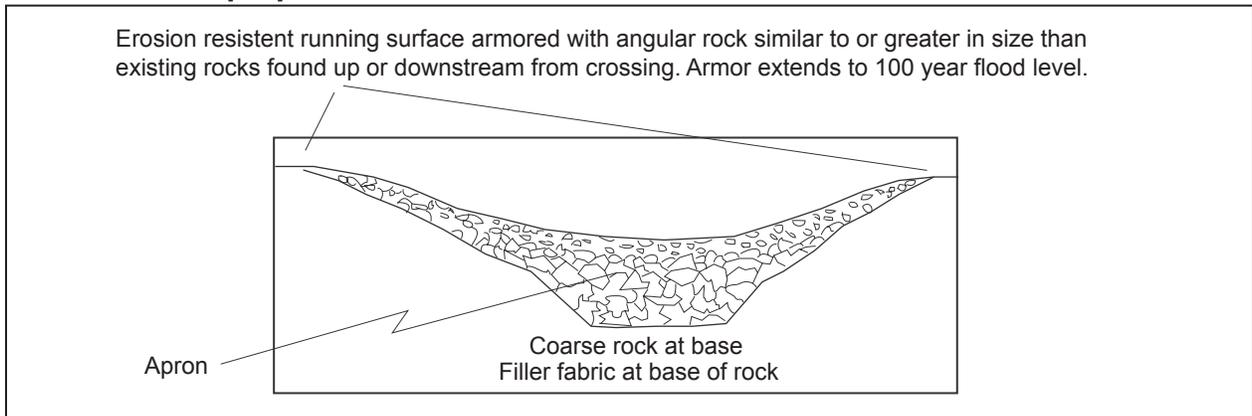
Typical Armored Fill Crossing Installation



Cross section parallel to watercourse



Cross section perpendicular to watercourse

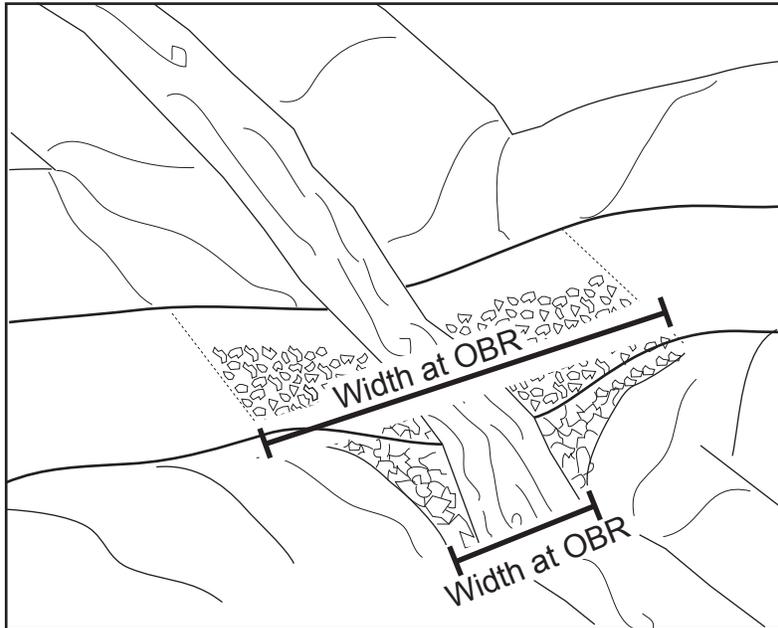


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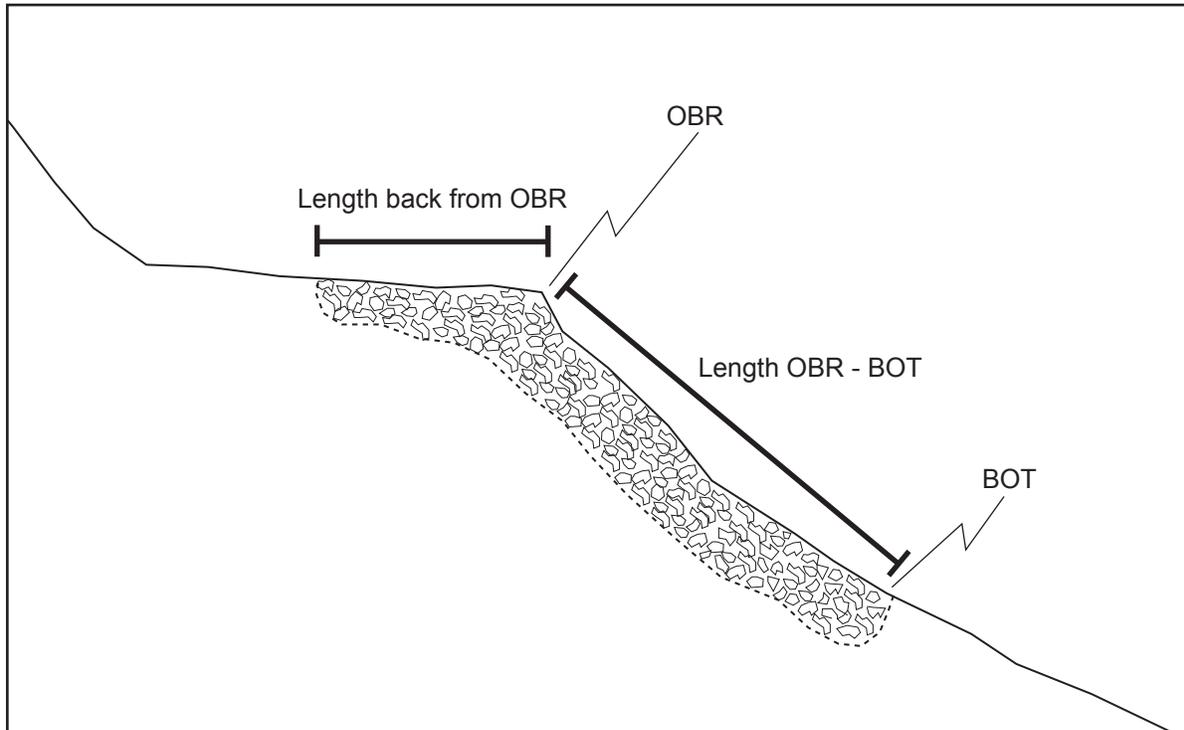
Typical Dimensions Referred to for Armored Fill Crossings

Widths in oblique view



OBR - Outboard edge of road

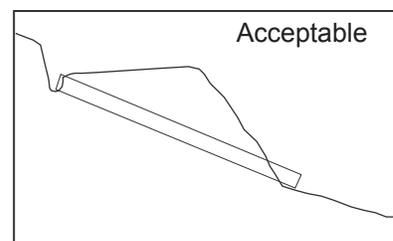
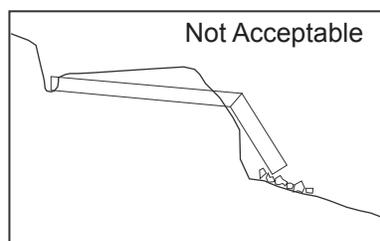
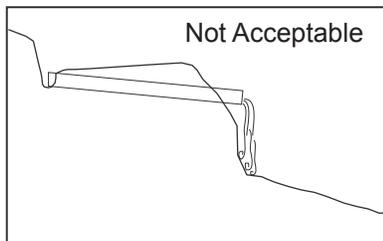
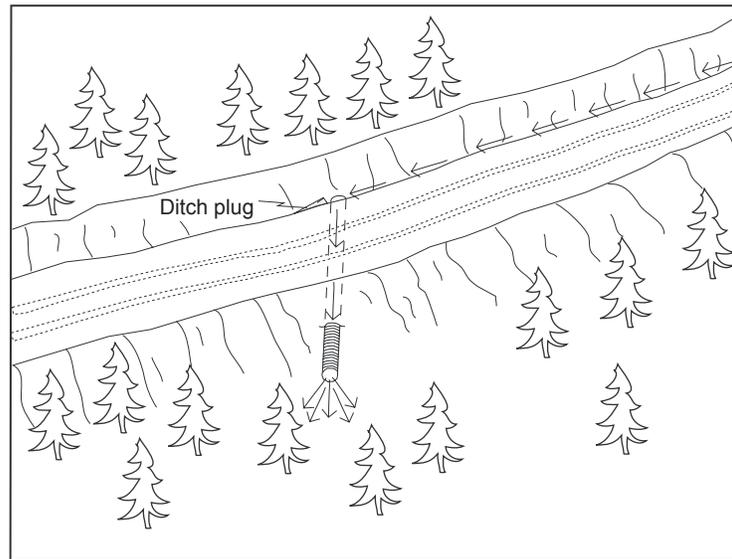
Lengths in profile view



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Typical Ditch Relief Culvert Installation



Ditch relief culvert installation

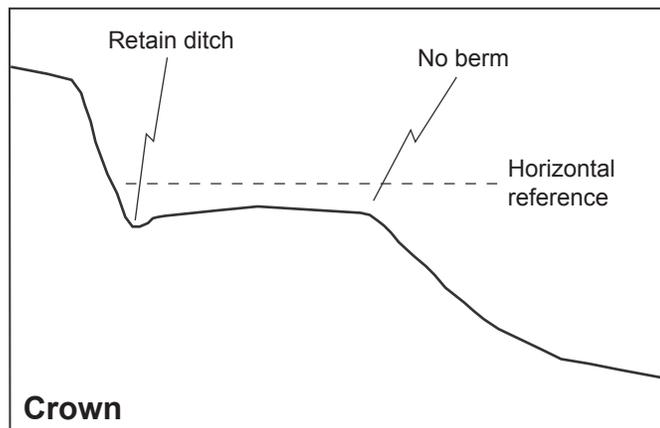
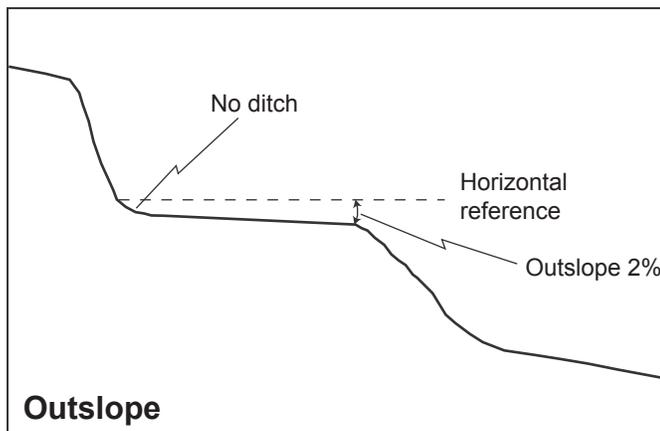
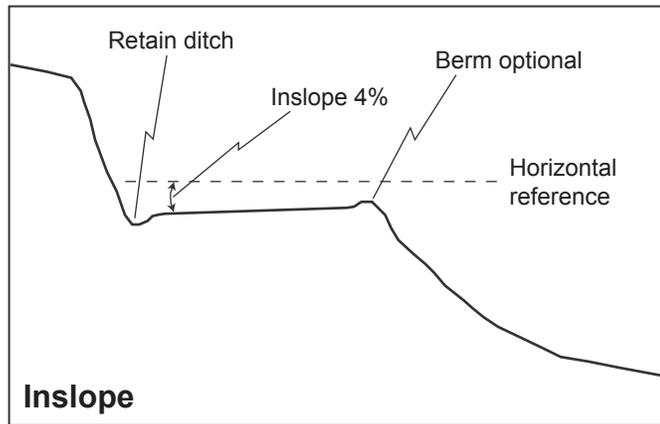
- 1) The same basic steps followed for stream crossing installation shall be employed.
- 2) Culverts shall be installed at a 30 degree angle to the ditch to lessen the chance of inlet erosion and plugging.
- 3) Culverts shall be seated on the natural slope or at a minimum depth of 5 feet at the outside edge of the road, whichever is less.
- 4) At a minimum, culverts shall be installed at a slope of 2 to 4 percent steeper than the approaching ditch grade, or at least 5 inches every 10 feet.
- 5) Backfill shall be compacted from the bed to a depth of 1 foot or 1/3 of the culvert diameter, whichever is greater, over the top of the culvert.
- 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, whichever is less.

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PWA Typical Drawing #8

Typical Designs for Using Road Shape to Control Road Runoff

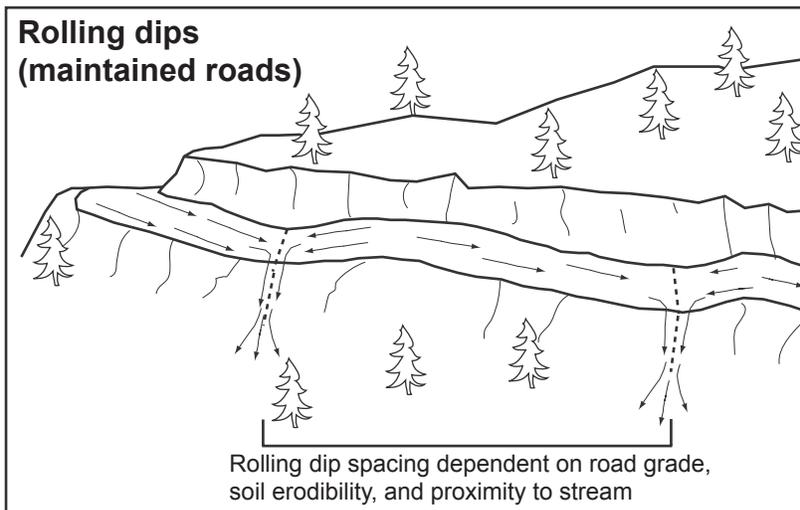
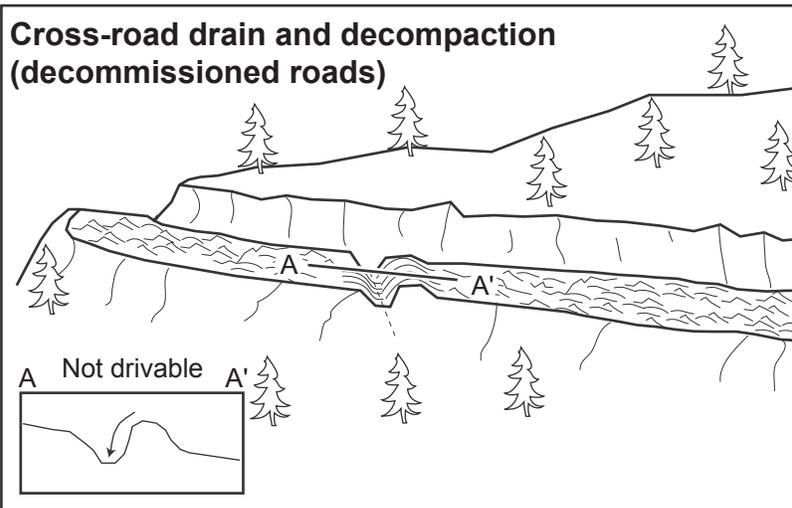
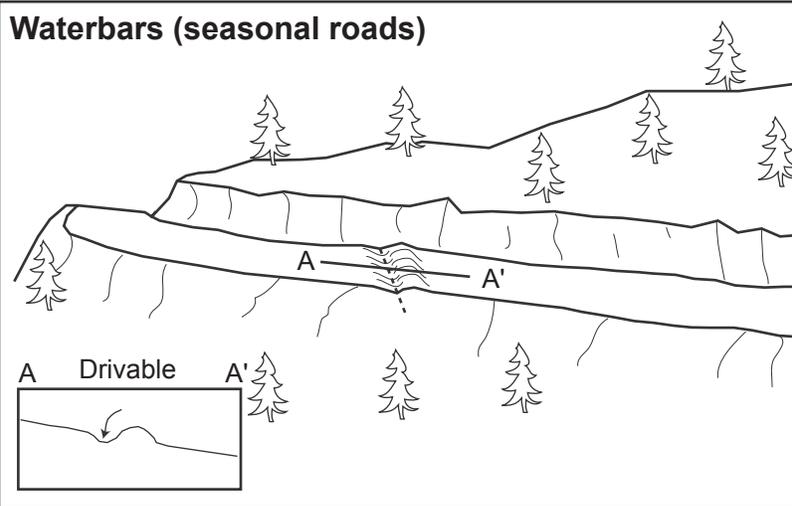


Outsloping Pitch for Roads Up to 8% Grade		
Road grade	Unsurfaced roads	Surfaced roads
4% or less	3/8" per foot	1/2" per foot
5%	1/2" per foot	5/8" per foot
6%	5/8" per foot	3/4" per foot
7%	3/4" per foot	7/8" per foot
8% or more	1" per foot	1 1/4" per foot

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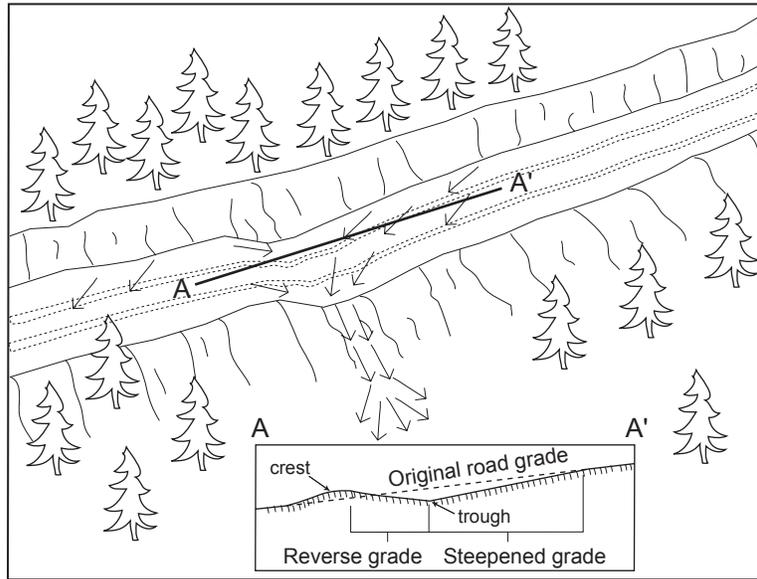
Typical Methods for Dispersing Road Surface Runoff with Waterbars, Cross-road Drains, and Rolling Dips



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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 with the trough aligned at 5 to 30 degree angles from perpendicular to the road centerline, 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 until the trough 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 trough, 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 trough to the crest will be in a road distance of at least 15 to 30 feet (see table below).

Table of rolling dip dimensions by road grade

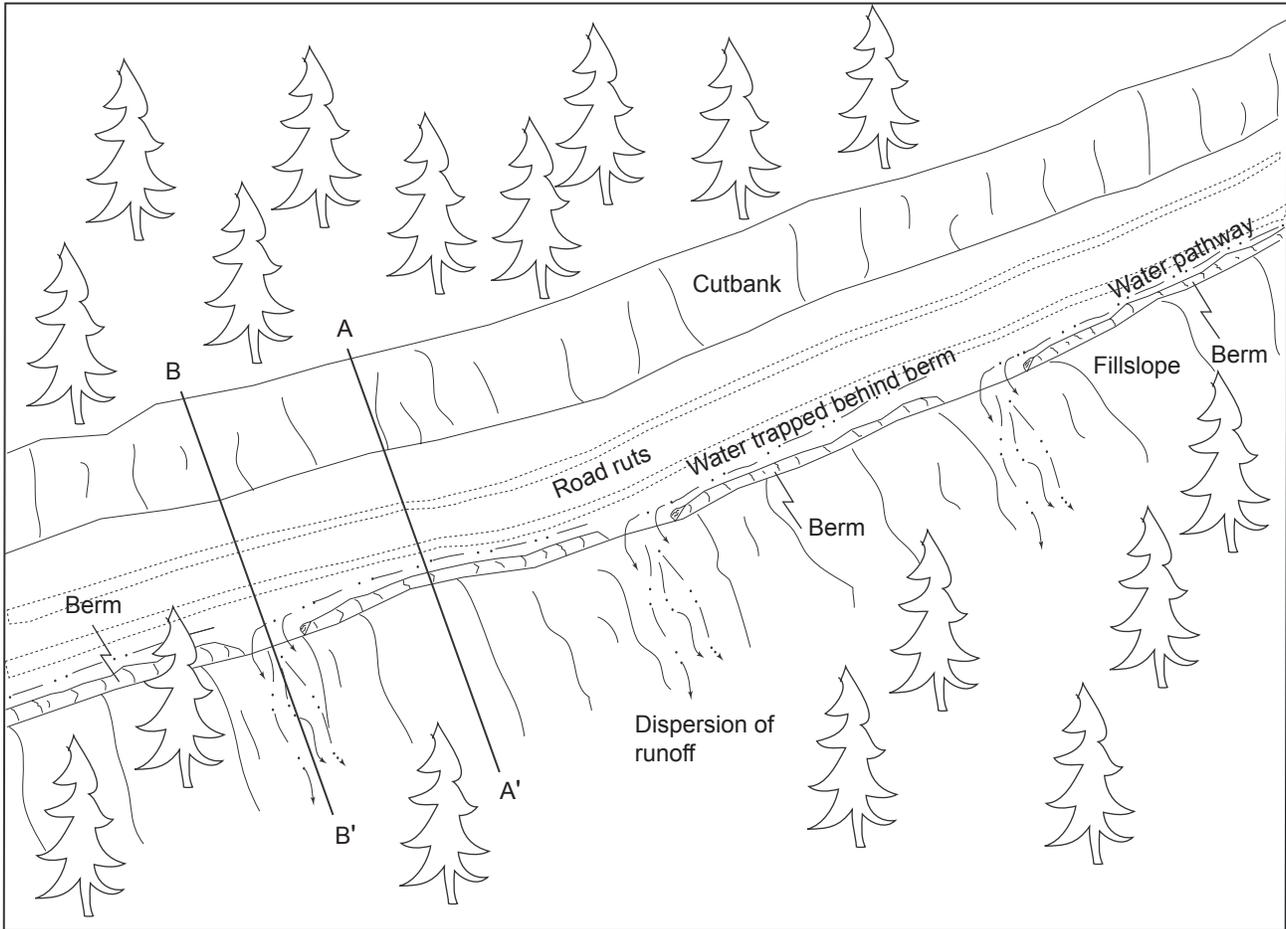
Road grade %	Upslope approach distance (from up road start to trough) ft	Reverse grade distance (from trough to crest) ft	Depth at trough outlet (below average road grade) ft	Depth at trough inlet (below average road grade) ft
<6	55	15 - 20	1.0	0.5
8	65	15 - 20	1.3	0.6
10	75	15 - 20	1.4	0.7
12	85	20 - 25	1.6	0.8
>12	100	20 - 25	1.8	0.9

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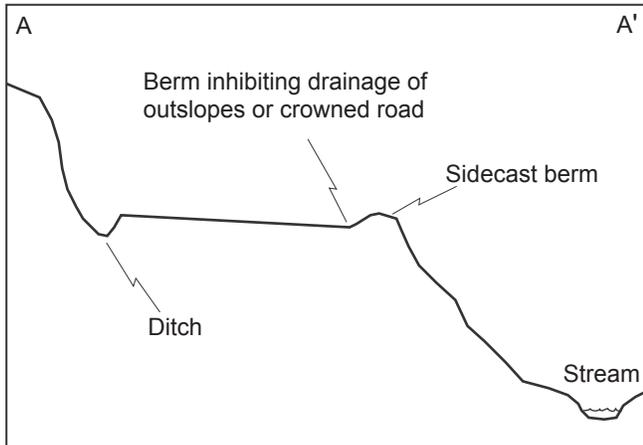
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Typical Sidecast or Excavation Methods for Removing Outboard Berms on a Maintained Road

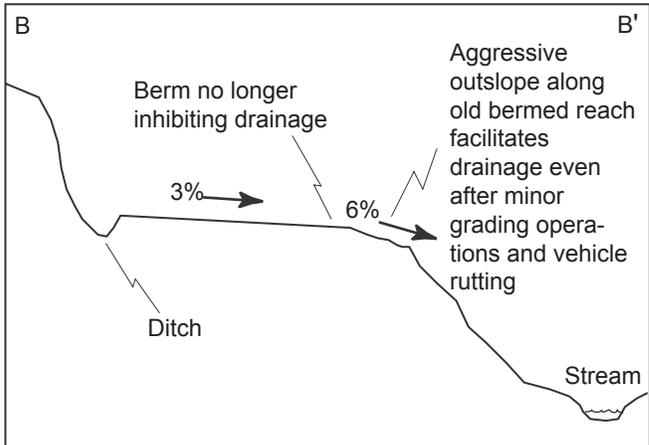
1. On gentle road segments berms can be removed continuously (see B-B').
2. On steep road segments, where safety is a concern, the berm can be frequently breached (see A-A' & B-B').
 Berm breaches should be spaced every 30 to 100 feet to provide adequate drainage of the road system while maintaining a semi-continuous berm for vehicle safety.



Road cross section between berm breaches



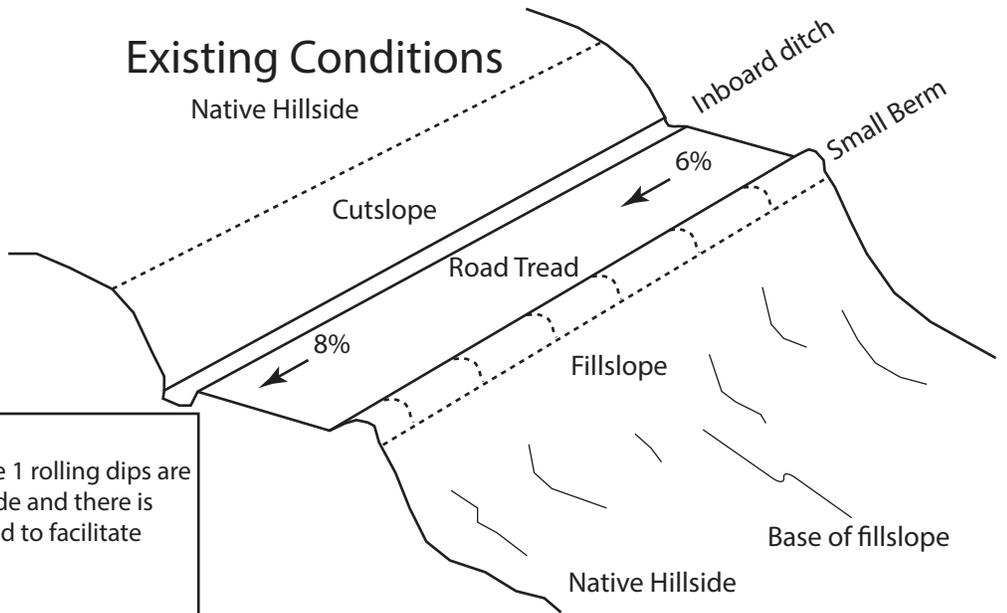
Road cross section at berm breaches



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Standard (Type 1) Rolling Dip Construction



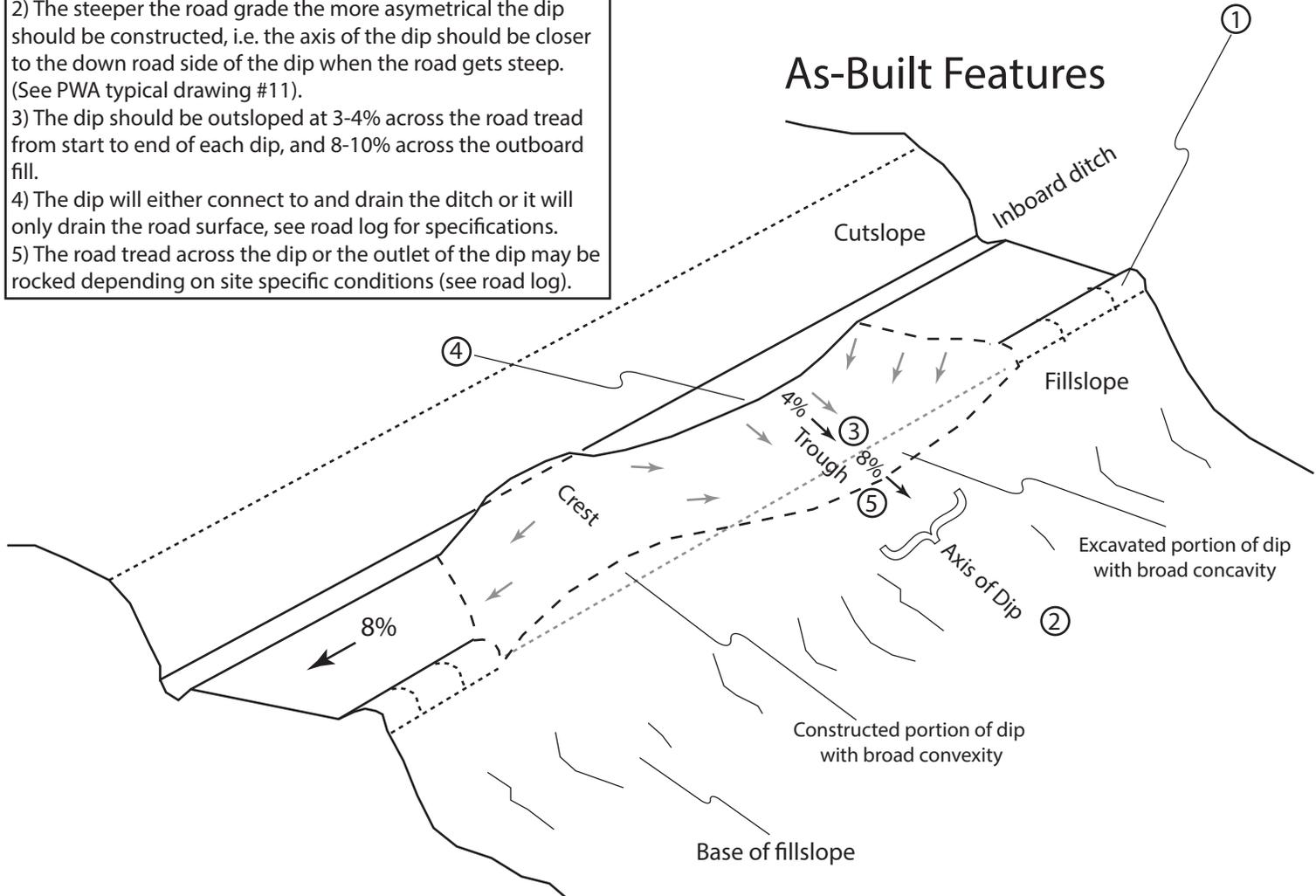
Notes

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 asymmetrical 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

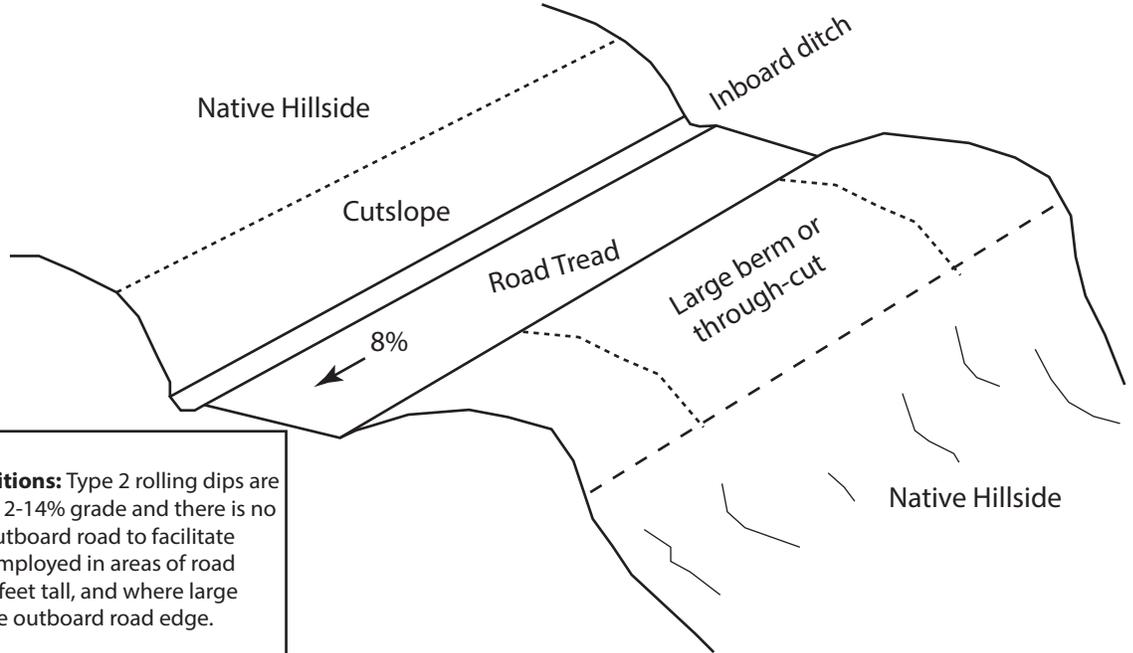


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Type 2 Rolling Dip Construction

(Through-cut or thick berm road reaches)



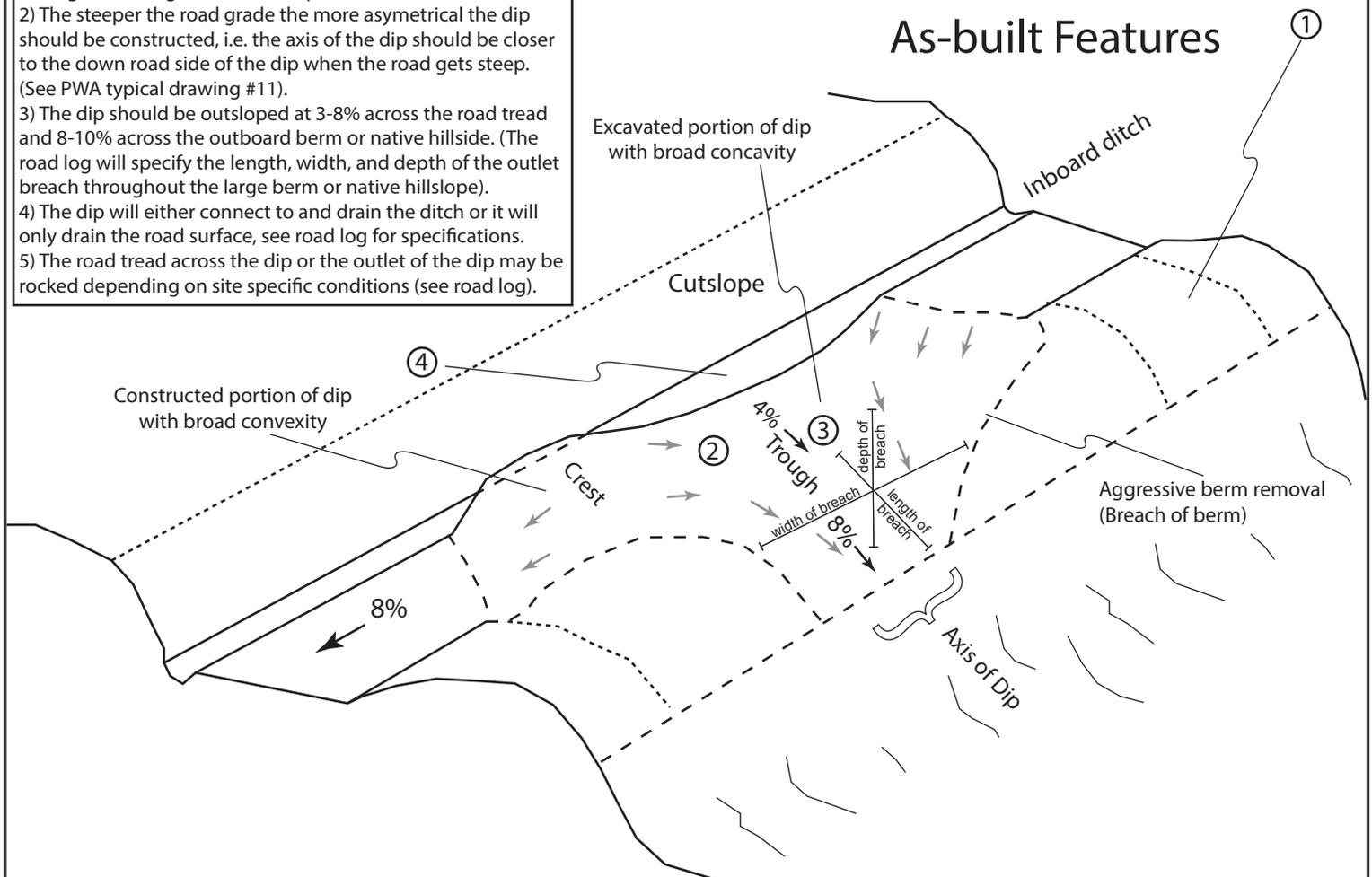
Notes

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 throughcuts 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 minimum through the trough/axis of the dip.
- 2) The steeper the road grade the more asymmetrical 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.
- 3) The dip should be outsloped at 3-8% across the road tread and 8-10% across the outboard berm or native hillside. (The road log will specify the length, width, and depth of the outlet breach throughout the large berm or native hillside).
- 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).

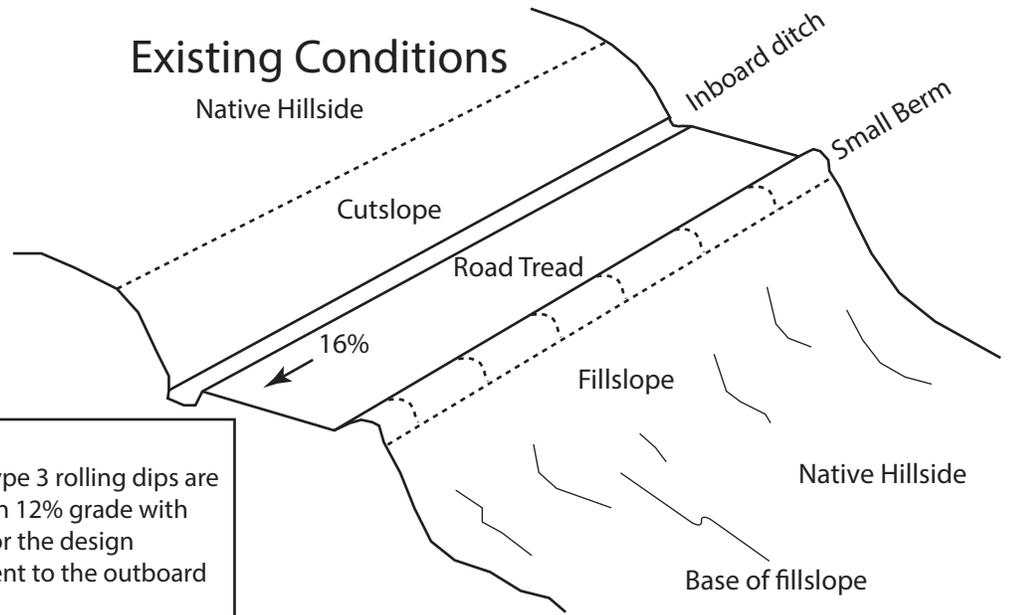
As-built Features



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Type 3 Rolling Dip Construction (steep slope outslope)

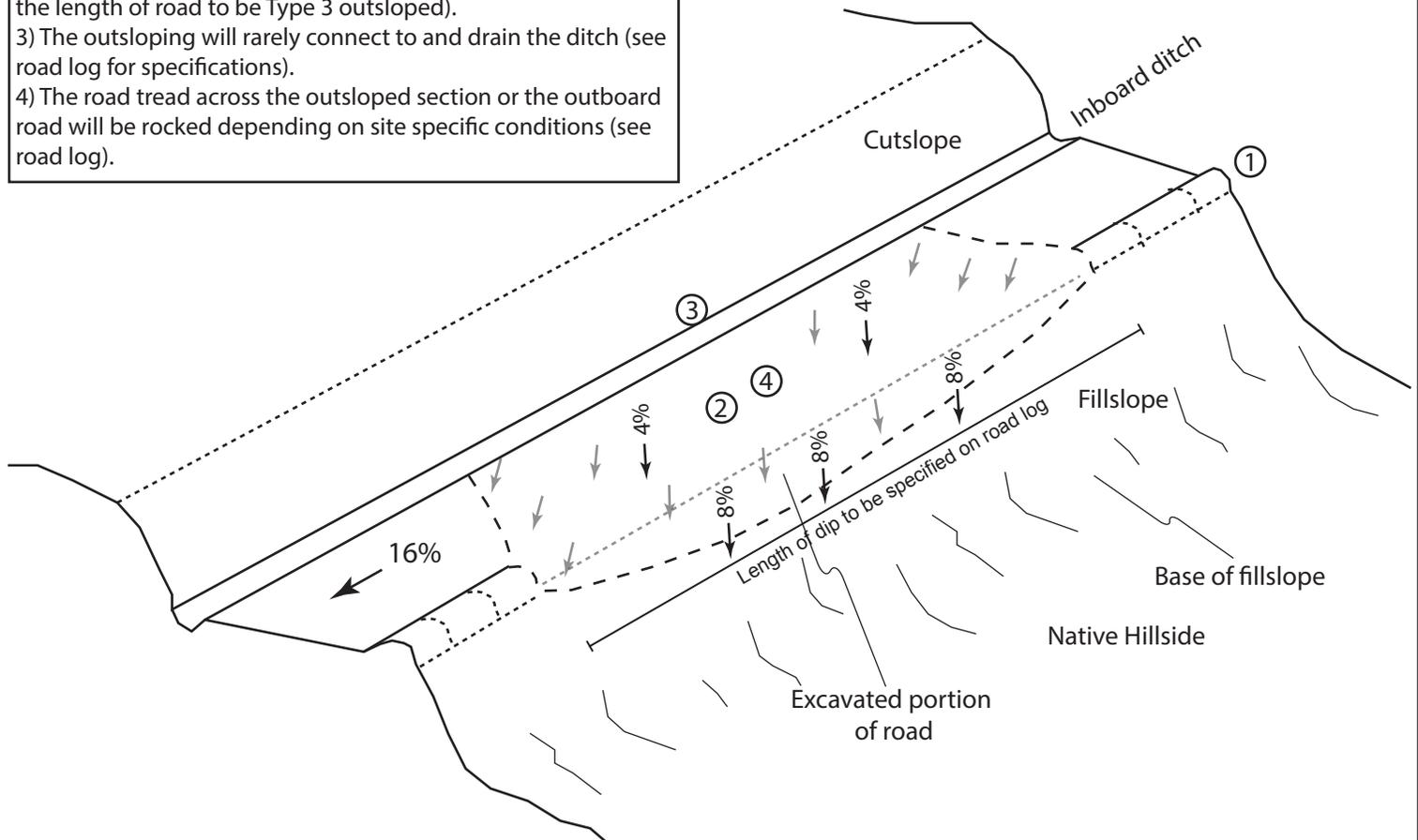


Notes

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 3-8% across the road tread and 8-10% 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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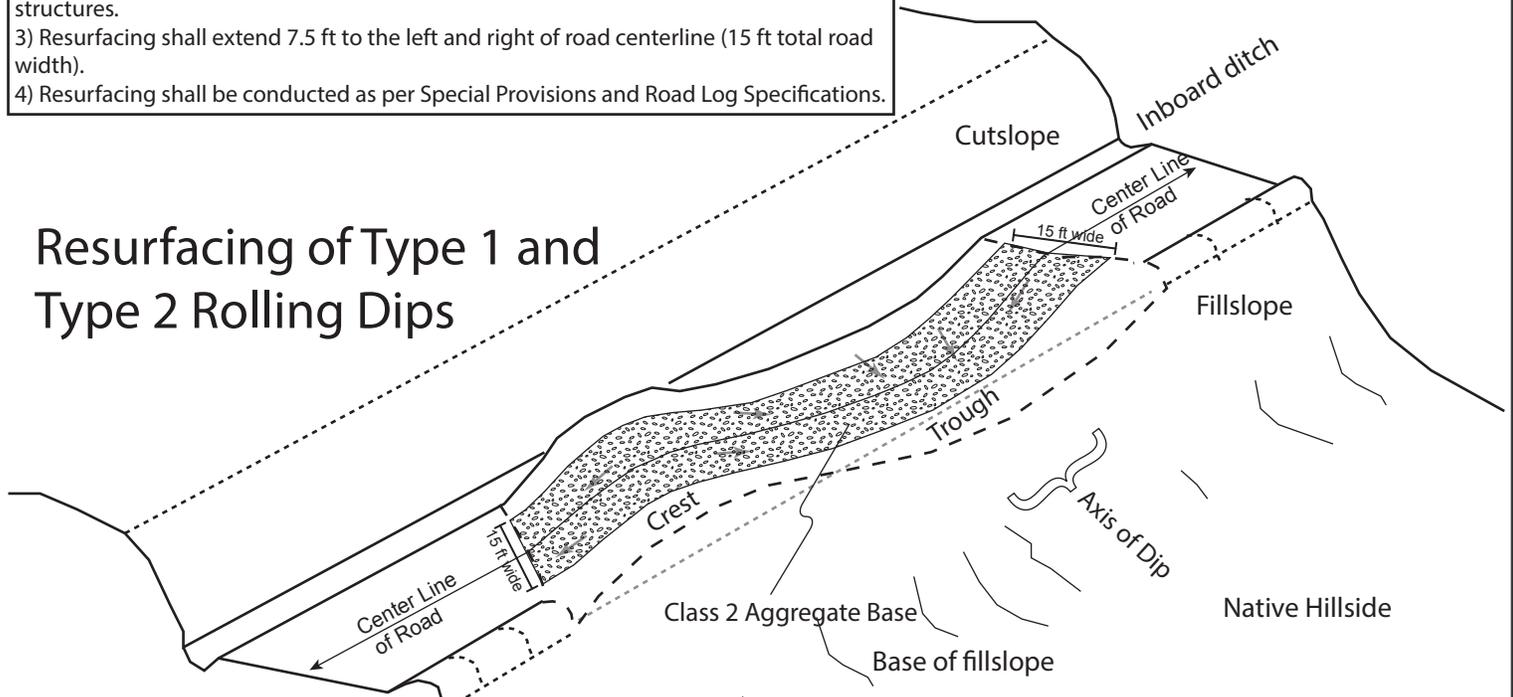
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Resurfacing after Dip Construction

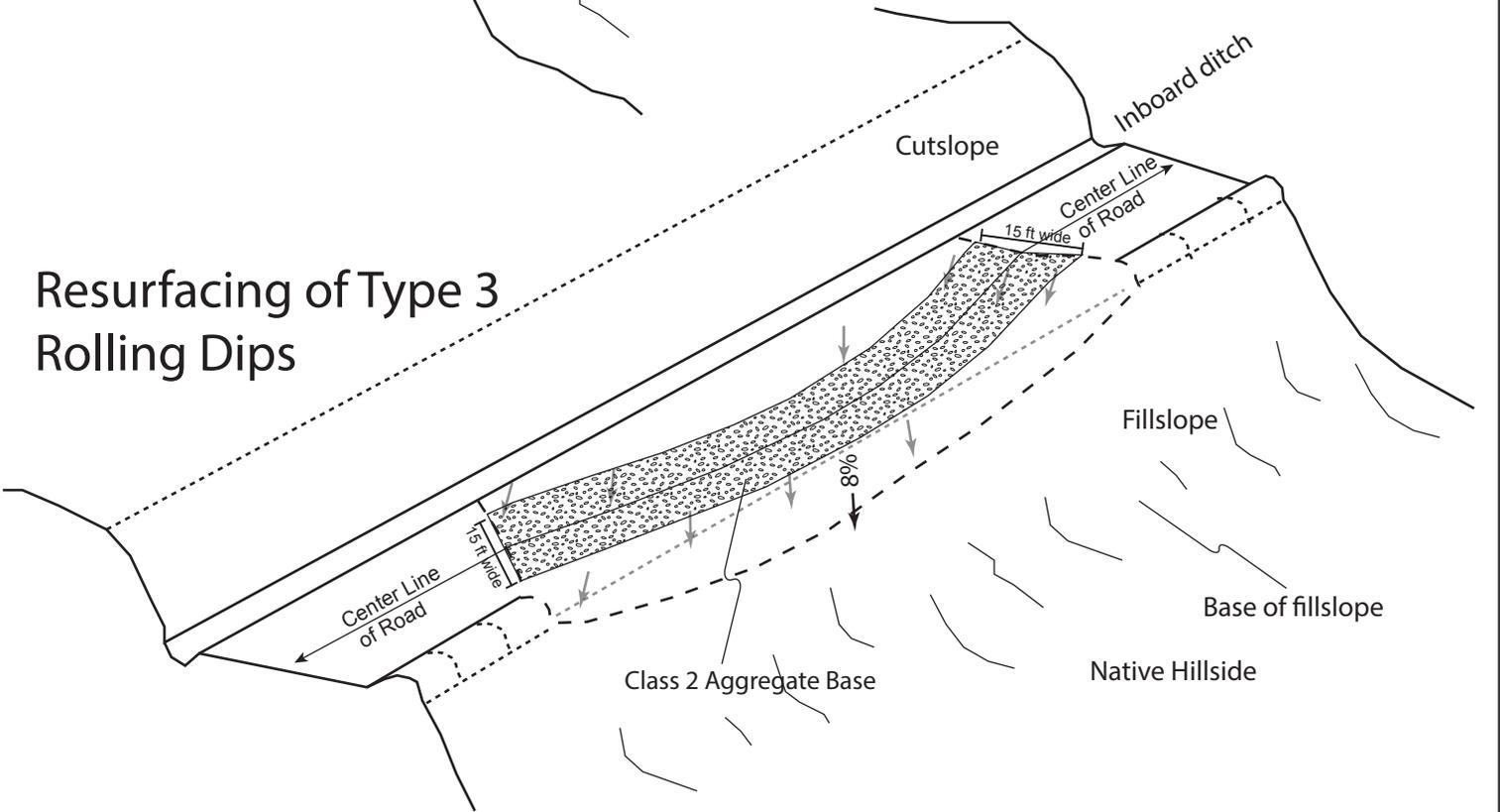
Notes

- 1) Road travelway areas disturbed by rolling dip construction shall be resurfaced with Class 2 Aggregate Base, as per Special Provisions.
- 2) Resurfacing shall extend through rolling dip excavated trough and constructed crest structures.
- 3) Resurfacing shall extend 7.5 ft to the left and right of road centerline (15 ft total road width).
- 4) Resurfacing shall be conducted as per Special Provisions and Road Log Specifications.

Resurfacing of Type 1 and Type 2 Rolling Dips



Resurfacing of Type 3 Rolling Dips



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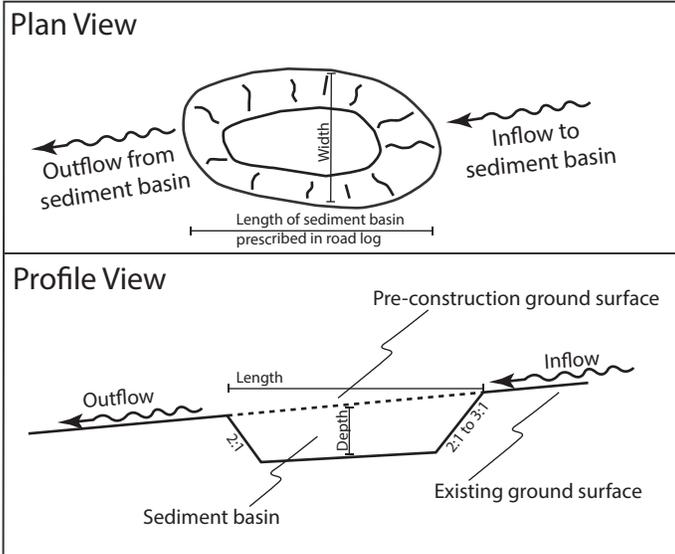
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Sediment Basin

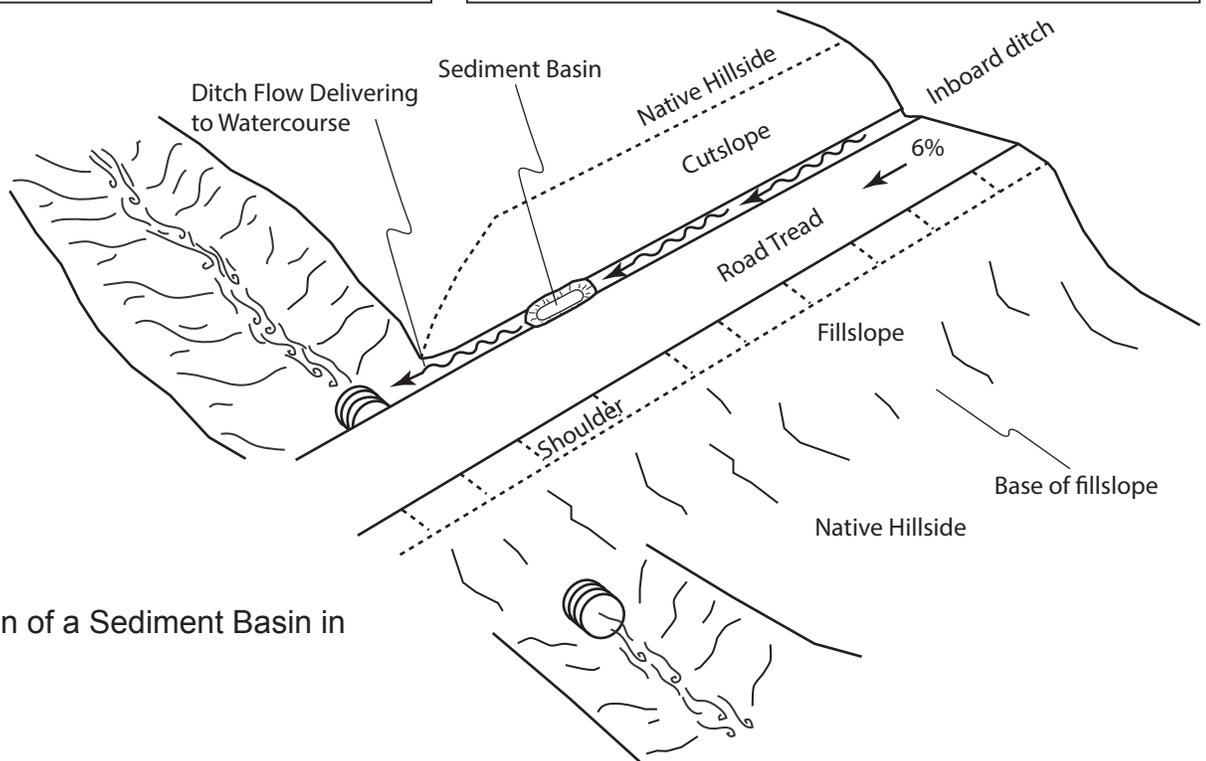
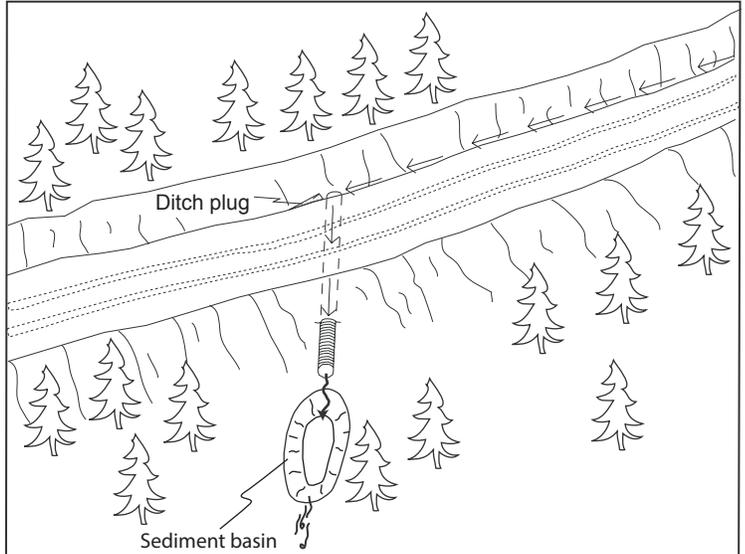
Notes

- 1) Sediment Basins will be constructed through excavation of earthen material only, and no embankment will be constructed with fill. Sediment Basin construction dimensions shall be specified in the Road Log and "length, width, and depth" dimensions shall pertain to the Sediment Basin as per the Plan View and Profile View diagrams below. Excavated fill will be disposed of as per project Special Provisions or as specified in the Road Logs.
- 2) Interior slopes of the sediment basin shall be no steeper than 2:1 and will be gentle enough in slope to allow animals to freely exit at least 3 sides of the Sediment Basin.
- 3) Sediment basins shall be constructed such that they intercept all concentrated flow from the incoming flow path.
- 4) Sediment Basins shall not be constructed in the road travelway or in other locations where they may present a danger to the public, vehicular traffic, or wildlife.

Measurement Descriptions in Road Logs



Typical Sediment Basin Installation at DRC outlet

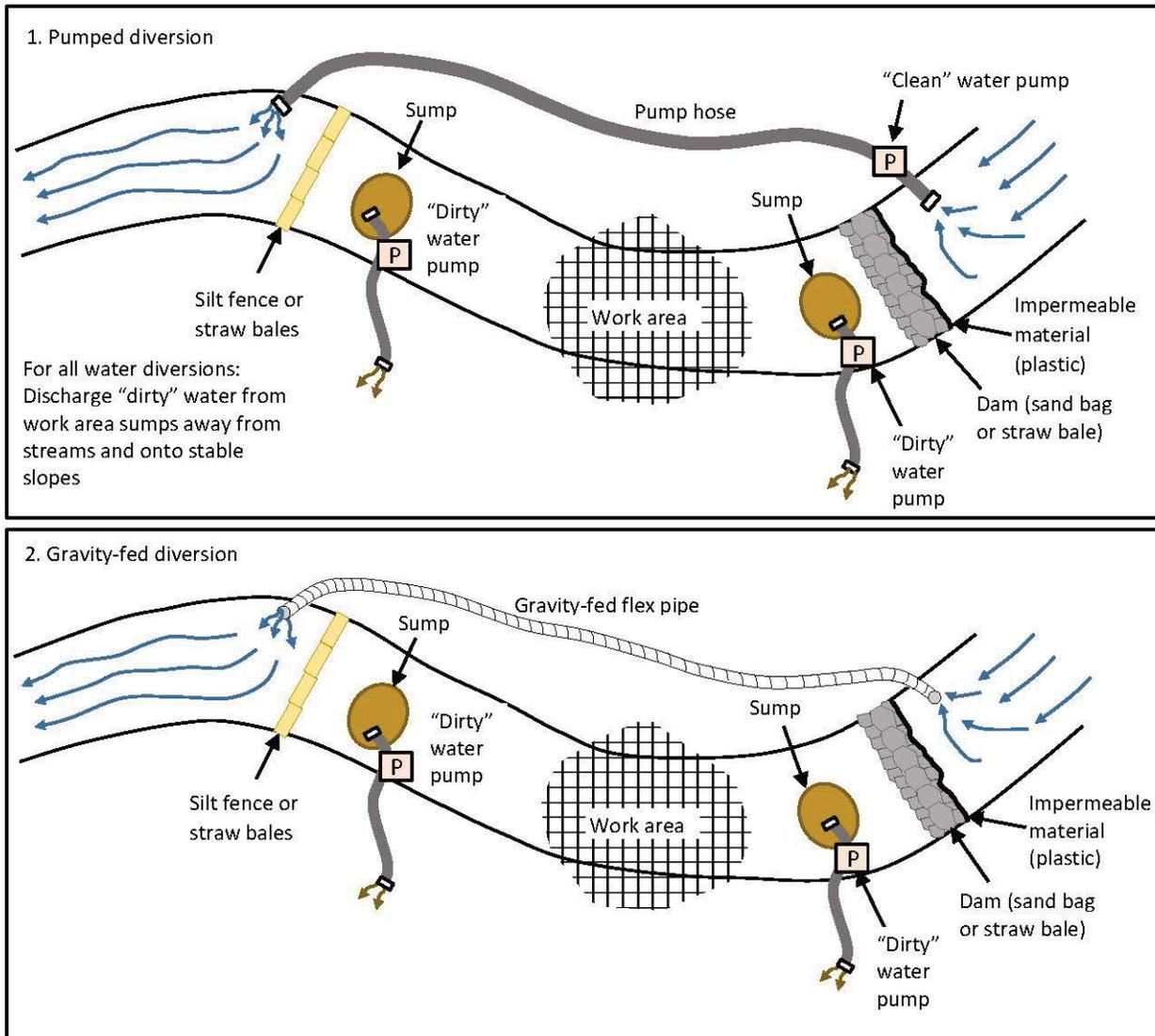


Typical Installation of a Sediment Basin in an Inboard Ditch

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Typical Design for De-watering Streams



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.

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APPENDIX D

Butte County Resource Conservation District Post-Camp Fire Dixie Road Sediment Reduction Project

Equipment Logs

APPENDIX E

**Butte County Resource Conservation District
Post-Camp Fire Dixie Road Sediment Reduction Project
Final CDFW Lake and Streambed Alteration Agreement**

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