



# REQUEST FOR PROPOSAL (RFP)

**RFP Number:**  
**2021-03**

**RFP Title:**  
**Beatrice Road Project**

## ISSUER INFORMATION

**Contact:**  
Jessie Grossman, US Program Manager, Y2Y  
[Jessie@y2y.net](mailto:Jessie@y2y.net)  
406-291-8213

**Issue Date:**  
**12/10/2021**

## INSTRUCTIONS TO OFFERORS

**Return Print Submissions to:** Yellowstone to Yukon Conservation Initiative  
ATTN: Jessie Grossman  
PO Box 479  
Hope, ID 83836

**Return Electronic Submissions to:** [Jessie@y2y.net](mailto:Jessie@y2y.net)

**RFP Response Due Date and Time:** **01/31/2022, 5:00 PM MST**

## OFFERORS MUST COMPLETE THE FOLLOWING

**Offeror Name/Address:**

**Authorized Offeror Signatory:**

(Please print name and sign in ink)

**Offeror Phone Number:**

**Offeror FAX Number:**

**Offeror E-mail Address:**

**OFFERORS MUST RETURN THIS COVER SHEET WITH RFP RESPONSE**

# INSTRUCTIONS TO OFFERORS

## It is the responsibility of each offeror to:

**Follow the format required in the RFP** when preparing your response. Provide point-by-point responses to all sections in a clear and concise manner.

**Provide complete answers/descriptions.** Read and answer **all** questions and requirements. Don't assume the Y2Y or evaluator/evaluation committee will know what your company capabilities are or what items/services you can provide, even if you have previously contracted with Y2Y. The proposals are evaluated based solely on the information and materials provided in your response.

**Use the forms provided**, i.e., cover page, cost proposal, etc.

**Submit your response on time.** Note all the dates and times listed in the Schedule of Events and within the document, and be sure to submit all required items on time. Late proposal responses are not accepted.

**The following items MUST be included in the response to be considered responsive.  
Failure to include any of these items may result in a nonresponsive determination.**

1. Signed Cover Sheet
2. Cost Proposal
3. RFP Response Form (including point by point response to offeror qualifications/informational requirements)

## SCHEDULE OF EVENTS

### EVENT

### DATE

RFP Issue Date..... 12/10/2021

RFP Response Due Date ..... 01/31/2022

Intended Date for Contract Award\* ..... 2/15/2022

\*Please note: Final contract and implementation is contingent upon confirmation of funding and receipt of required permits. Contractors are welcome to do a self-guided tour of project.

## **SECTION 1: PROJECT OVERVIEW AND INSTRUCTIONS**

### **PROJECT OVERVIEW**

The Yellowstone to Yukon Conservation Initiative(Y2Y) (Contract Issuer), in partnership with Lower Clark Fork Watershed Group (LCFWG) and the Lolo National Forest (LNF), is seeking a contractor to provide equipment and labor for a road storage project on Beatrice Creek, outside of Thompson Falls, Montana. From the date this Request for Proposal (RFP) is issued until an offeror is selected and the selection is announced, all contact regarding project design shall be directed to:

**Kris Richardson, Lolo National Forest**  
**Plains/Thompson Falls Ranger District**  
**406-826-4312**  
**kristin.richardson@usda.gov**

### **SUBMITTING A PROPOSAL**

**Offerors must submit a signed copy of the RFP Cover Sheet, Cost Proposal and RFP Response Form.** Proposals should be submitted as a hard copy or by email (preferred) to:

**Jessie Grossman**  
**Yellowstone to Yukon Conservation Initiative**  
**PO Box 479**  
**Hope, ID 83836**  
**406-291-8213**  
**Jessie@y2y.net**

Offerors failing to comply with these instructions may be subject to point deductions. Y2Y may also choose to not evaluate, may deem nonresponsive, and/or may disqualify from further consideration any proposals that do not follow this RFP format, are difficult to understand, are difficult to read, or are missing any requested information.

The highest scoring offeror will be the prime contractor upon contract award and shall be responsible, in total, for all work of any subcontractors and equipment operators. All subcontractors, if any, and operators of specific equipment along with their experience must be included in the proposal. Y2Y reserves the right to approve all subcontractors and equipment operators. The Contractor shall be responsible to Y2Y for the acts and omissions of all subcontractors, operators, or agents and of persons directly or indirectly employed by such subcontractors, and for the acts and omissions of persons employed directly by the Contractor. Further, nothing contained within this document or any contract documents created as a result of any contract awards derived from this RFP shall create any contractual relationships between any subcontractor and Y2Y.

## **SECTION 2: EVALUATION PROCESS**

### **EVALUATION OF PROPOSALS**

All proposals will initially be classified as either “responsive” or “nonresponsive.” Proposals may be found nonresponsive at any time during the procurement process if any of the required information is not provided; the submitted price is found to be excessive or inadequate as measured by criteria stated in the RFP; or the proposal is not within the plans and specifications described and required in the RFP. If a proposal is found to be nonresponsive, it will not be considered further.

Selection and award will be based on the offeror's proposal and other items outlined in this RFP. Submitted responses may not include references to information located elsewhere, such as Internet websites or libraries, unless specifically requested. Information or materials presented by offerors outside the formal response or subsequent discussion/negotiation or best and final offer, if requested, will not be considered, will have no bearing on any award, and may result in the offeror being disqualified from further consideration.

An evaluation committee will evaluate the remaining proposals and recommend whether to award the contract to the highest scoring offeror or, if necessary, to seek discussion/negotiation or a best and final offer in order to determine the highest scoring offeror.

### **EVALUATION CRITERIA**

Y2Y will award this contract to an offeror with the best bid. All responsive proposals will be evaluated based on the offeror's references; past performance; key personnel; proven experience of equipment operators; method of providing services; and cost outlined in its proposal. Preference will be given to contractors with relevant stream/wetland restoration experience.

## SECTION 3: SCOPE OF PROJECT

### PROJECT SCOPE

This project will mitigate road-related risks to Beatrice Creek (tributary to Fishtrap Creek) by storing 1.3 miles of National Forest System Road (NFSR) 7670, 3.3 miles of NFSR 7667, and 0.3 miles of NFSR 17393 to a hydrologically neutral condition including removing approximately 11 culverts, roughening and reseeding to restore native vegetation on 4.7 miles of road, and 'heavy storage' of 0.2 miles of road. This form of road closure achieves security needs for grizzly bear, allows potential future road use by preserving the road prism, and reduces conditions that pose short- and long-term issues and risk to streams and aquatic species by removing culverts in stream drainages, remediating sliver fills and groundwater seepage, among other treatments. All disturbed areas will be planted with a native seed mix after project completion. Work is to be completed under the oversight of Lolo National Forest staff, and in line with the attached design specifications.

The project is located on the Plains/Thompson Falls Ranger District (of the Lolo National Forest), accessed by NFSR 516 in the Fishtrap Creek drainage, then Beatrice Creek NFSRs 7670 and 7667, roughly 30 miles outside of Thompson Falls, Montana. (Refer to Maps 1 and 2.)

**All in-stream work (stream crossings) MUST be completed after July 15<sup>th</sup> and before September 1<sup>st</sup> to comply with permitted instream work window.** It is the responsibility of the Contractor to schedule delivery of equipment and all necessary supplies to the site and to ensure that the work can be completed within the specified construction time. Please note: Final contract and implementation is contingent upon the receipt of required permits and funding. In the case that permits and/or funding are not obtained soon enough to facilitate implementation during this period, the project will be delayed by one year.

This project requires furnishing equipment on a fully-operated basis, in good mechanical and operating condition. Equipment shall be operated by competent operators experienced in performing road decommissioning and stream channel rehabilitation type of work required by this contract. **Note: Y2Y reserves the right to reject any operator that is not qualified or is not performing work to reasonable standards or achieving adequate production rates.** The contractor shall provide all equipment, operating supplies, operators, supervision, and support functions necessary to perform the work required under this contract.

Individual electric, natural gas, telephone, propane, etc. have not been identified. The contractor shall contact the underground utilities prior to performing any work.

## **PROJECT REQUIREMENTS**

Typicals for bid items are detailed in Beatrice Project Typical sheet.

### **MOBILIZATION (BID ITEM 1)**

This bid item consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. Mobilization includes all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site. Demobilization includes all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site.

### **REMOVAL OF EXISTING CULVERT (MINOR/MAJOR) (BID ITEM 2)**

There are a total of 11 culverts, 9 minor culverts and 2 major culverts, identified in this project that will need to be removed: 2 major and 1 minor are located on NFSR 7670, 7 minor on NFSR 7667, and 1 minor on NFSR 17393. This item includes the transport and disposal of all 11 CMPs off-site.

### **HOURLY EQUIPMENT SPECIFICATIONS (BID ITEMS 3 and 4)**

A total of 4.7 miles of existing roadway will be roughened in line with attached designs for Closure Level 3 (see maps). This includes deep scarification with a dozer ripper (or similar), construction of water bars, and scattering slash, and seeding. A total of 0.2 miles of existing roadway (NFSR 7667) immediately beyond the lower Beatrice Creek crossing will be scarified more deeply and will include heavier slashing, with the usual water bar and seed application. The lower Beatrice Creek crossing itself will be fully rehabilitated (the dilapidated bridge and a minimal amount of road fill have already been removed).

Road treatment, culvert excavation, and associated stream crossing restoration will be paid for on an hourly basis, directed by Y2Y's Representative (designated LNF personnel). This project requires furnishing equipment on a fully-operated basis, in good mechanical and operating condition. It shall be operated by competent operators experienced in performing road decommissioning, obliteration, and streambank rehabilitation type of work required by this contract. **Note: Y2Y reserves the right to reject any operator that is not qualified or is not performing work to reasonable standards or achieving adequate production rates.**

This work will be measured by the hour and payment will be made on the actual number of hours worked. An hour consists of 60 minutes of actual operation of equipment on authorized work. Moving of equipment under its own power, when so ordered by the owner, (except mobilization to the project) will constitute authorized work. Nonproductive time such as, but not restricted to, lack of operating supplies or qualify operator, service time, time lost by reason of breakdown or being stuck, or loading time of specified accessories shall not constitute "actual operation".

Notwithstanding the intent and requirement of the contract to provide an experienced operator for each ordered piece of equipment, unless otherwise mutually agreed, if the Contractor furnished two pieces of equipment and one operator, only one item will be paid for at the regular rate, with no standby for the second piece of equipment while unoperated.

To complete this work efficiently, and with minimal disturbance, we request the following equipment or comparable:

- Excavator: Fully operated excavator with thumb and minimum 3/4 CY Bucket Capacity (BID ITEM 3)
  - a. Track driven.
  - b. Minimum vehicle weight: 45,000 lbs.
  - d. Power shift or power shuttle.
  - e. Minimum reach, ground level: 25 feet.
  - f. Rollover protection structure (ROPS).

- g. All excavators shall be equipped with fire prevention and suppression equipment in accordance with Lolo National Forest guidelines.
- h. Maximum age: 20 calendar years (year of manufacture no earlier than 2001).
- i. Seat Belts properly installed, useable and in good condition.
- Dozer: Fully operated dozer with ripper shanks. Rippers must have attached sweeps with a minimum bottom width of 16 feet; capable of ripping to a depth of 18-24". (BID ITEM 4).

### **ENVIRONMENTAL PROTECTION**

The contractor is required to have a spill plan. The plan will contain a description of the specific hazardous materials, procedures, and spill containment that will be used, including inventory, storage, and handling.

All vehicles carrying fuel will have specific equipment and materials needed to contain or clean up any incidental spills at the project site.

All pumps and generators used near streams will have appropriate spill containment structures and/or absorbent pads in place during use.

When storage facilities for oil or oil products are on site, appropriate preventive measures shall be taken to ensure that any spill of such oil or oil products does not enter any stream or any other body of water. If a spill of petroleum product should occur in water, immediately notify Y2Y's representative(s) and appropriate state agencies.

Service and refueling of all equipment only allowed in the areas approved by Y2Y's representative(s). If the total oil or oil products storage exceeds 1320 gallons or if any single container exceeds a capacity of 660 gallons, prepare a Spill Prevention Control and Countermeasures (SPCC) Plan. Meet all applicable EPA requirements (40 CFR 112) including certification by a registered professional engineer.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. The contractor must clean up spills or leaks in a manner that complies with Federal, state, and local laws and regulations and to the satisfaction of Y2Y's representative(s). When necessary provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

### **Equipment Fuel/Oil Leakage**

All equipment used for instream work will be cleaned of external oil, grease, dirt and mud; and leaks repaired; prior to arriving at the project site. All equipment will be inspected by a Y2Y representative before unloading at site. Any leaks or accumulations of grease will be corrected before entering streams or areas that drain directly to streams or wetlands.

Equipment used for in-stream or riparian work (including chainsaws and other hand power tools) will be fueled and serviced in an area approved by Y2Y's representative. When not in use, vehicles will be stored in the designated staging area. The staging area should be in an area that will not deliver fuel, oil, etc. to streams.

Contractor is required to have a Spill Kit or equivalent that contains oil-absorbing floating booms, and other equipment such as pads and absorbent "peanuts" appropriate for the size of the stream, available on-site during all phases of construction. For small streams with few pools or slack water, booms may not be effective. Use pads and straw bales to anchor booms if necessary. Booms will be placed in a location that facilitates an immediate response to potential petroleum leakage.

### **NOXIOUS WEED CONTROL**

In order to prevent the potential spread of noxious weeds into work areas, Contractor shall be required to use weed-free equipment.



The following is considered proof of weed-free equipment:

The Contractor will be required to clean all construction equipment prior to entry on to national forest land. This cleaning shall remove all dirt and plant parts and material that could carry noxious weed seeds into the work area. Only clean construction equipment as approved by Y2Y's representative will be allowed to operate within the work area. All subsequent move-ins of construction equipment shall be treated in the same manner as initial move-in. "Construction equipment" does not include pickup trucks and personal vehicles.

### **LANDSCAPE PRESERVATION**

The Contractor shall confine operations to within the clearing limits or other areas designated in contract documents, and prevent the depositing of rocks, excavated materials, stumps, or other debris outside of these limits. Material, which falls outside of these limits, shall be retrieved, disposed of, or incorporated in the work as directed by Y2Y's representative(s).

Operation shall be scheduled and conducted to minimize erosion of soils and to prevent silting and muddying of streams, rivers, irrigation systems, and impoundments (lakes, reservoirs, etc.).

Pollutants such as fuels, lubricants, bitumens, raw sewage, and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or manmade channels leading thereto. Wash water or waste water from concrete or aggregate operations shall not be allowed to enter live streams prior to treatment by filtration, settling, or other means sufficient to reduce the sediment content to not more than that of the stream into which it is discharged.

### **MAINTENANCE OF TRAFFIC AND USE OF WARNING DEVICES**

Contractor shall provide, erect, and maintain all necessary barricades, danger signals, and detour and other signs, and take all necessary precautions for the protection of the work and safety of the public.

### **HOOT OWL RESTRICTIONS**

The contractor will be responsible for complying with any fire restrictions placed on work, as described below. The contractor may not invoice for additional costs incurred because of these restrictions.

During Stage II Restrictions, the following acts are prohibited:

1. Building maintaining, attending, or using a fire or campfire.
2. Smoking, except within an enclosed vehicle or building, a developed recreation site or while stopped in an area at least three feet in diameter that is barren or cleared of all flammable materials.
3. The following acts are prohibited from 1:00 p.m. to 1:00 a.m.: (a) operating any internal combustion engine; (b) welding, or operating acetylene or other torch with open flame; and (c) using an explosive.

A one-hour foot patrol in the work area is required following the cessation of all activities as identified in #3 above.

4. Operating motorized vehicles off designated roads and trails.

## SECTION 4: OFFEROR QUALIFICATIONS/INFORMATIONAL REQUIREMENTS

### **Y2Y'S RIGHT TO INVESTIGATE AND REJECT**

Y2Y may make such investigations as deemed necessary to determine the ability of the offeror to provide the supplies and/or perform the services specified. Y2Y reserves the right to reject any proposal if the evidence submitted by, or investigation of, the offeror fails to satisfy Y2Y that the offeror is properly qualified to carry out the obligations of the contract. *This includes Y2Y's ability to reject the proposal based on negative references, including poor efficiency or experience with operator skills or in previous project performance. Qualified operators listed for specific equipment operations will be expected to perform as such.*

### **BIDS AND SECURITIES**

No bidder may withdraw his bid for at least thirty (30) calendar days after the scheduled time for receipt of bids except as noted in the Instruction to Bidders.

### **OFFEROR QUALIFICATIONS/INFORMATIONAL REQUIREMENTS**

In order for Y2Y to determine the capabilities of an offeror to provide the supplies and/or perform the services specified in Section 3 above, the offeror must respond to the following requests for information regarding its ability to meet Y2Y's requirements. **THE RESPONSE, "[OFFEROR'S NAME] UNDERSTANDS AND WILL COMPLY," IS NOT APPROPRIATE FOR THIS SECTION.**

**NOTE: Each item must be thoroughly addressed. Offerors taking exception to any requirements listed in this section may be found nonresponsive or be subject to point deductions.**

**Experience/Project Examples.** Offeror should provide a complete description of any relevant past projects, including project name, location, and work performed. Providing photographs of proven work effectiveness is highly encouraged if possible. *Preference will be given to contractors with stream, floodplain or wetland restoration experience.*

**References.** Offeror shall provide a minimum of **(3)** references that are using supplies and/or services similar to those proposed in this RFP. At a minimum, the offeror shall provide the customer's name, the location where the services were provided, contact person(s), telephone number, e-mail address, and a description of the project type, and dates the services were provided. These references may be contacted to verify offeror's ability to perform the contract. Y2Y reserves the right to use any information or additional references deemed necessary to establish the ability of the offeror to perform the conditions of the contract. Negative references may be grounds for proposal disqualification.

**Resumes/Company Profile.** Offeror shall specify how long the individual/company submitting the proposal has been in the business of providing supplies and/or services similar to those requested in this RFP and under what company name. A resume or summary of qualifications, work experience, education, skills, etc., which emphasizes previous experience in this area should be provided for all key personnel who will be involved with any aspects of the contract.

**Method of Providing Services.** Offeror must specify the make, model, and year of equipment proposed for project implementation. Also, offeror must specify the name and experience of all equipment operators for stream channel construction work.

## SECTION 5: COST PROPOSAL

### QUANTITIES:

The number of hours and quantities are estimates only and will be the basis for evaluation of bids. Bid includes equipment, fuel and operator time. Final quantities for specific line items will be established during development of a contract and scope of work with the offeror selected for the project. The CO reserves the right to adjust the quantities below with no adjustment of the unit price.

BID ITEM	DESCRIPTION	PAY UNIT	EST. QUANTITY	UNIT PRICE	COST
1	<b>Mobilization</b>	Lump Sum	1	\$	\$
2*	<b>Removal of Existing Culvert:</b> Transport and disposal of all excavated CMPs off-site	Each	11	\$	\$
3*	<b>Equipment Rental: Excavator</b> (Fully operated excavator w/thumb and minimum 3/4 CY bucket)	Hour	100	\$	\$
4*	<b>Equipment Rental: Dozer</b> (Fully operated D5 dozer with rippers)	Hour	45	\$	\$
<b>TOTAL</b>					<b>\$</b>

Additional bid items, pending weather conditions and fire restrictions:

BID ITEM	DESCRIPTION	PAY UNIT	EST. QUANTITY	UNIT PRICE
5	<b>Equipment Rental: Water Truck</b> Required in the event of hoot owl / Stage II fire restrictions	Day	TBD	\$
6	<b>Equipment Rental:</b> <i>(Alternative equipment recommended by operator, please describe)</i>	Hour		
7	<b>Equipment Rental:</b> <i>(Alternative equipment recommended by operator, please describe)</i>	Hour		
8	<b>Equipment Rental:</b> <i>(Alternative equipment recommended by operator, please describe)</i>	Hour		

## RFP RESPONSE FORM

(USE ADDITIONAL SHEETS AS NECESSARY)

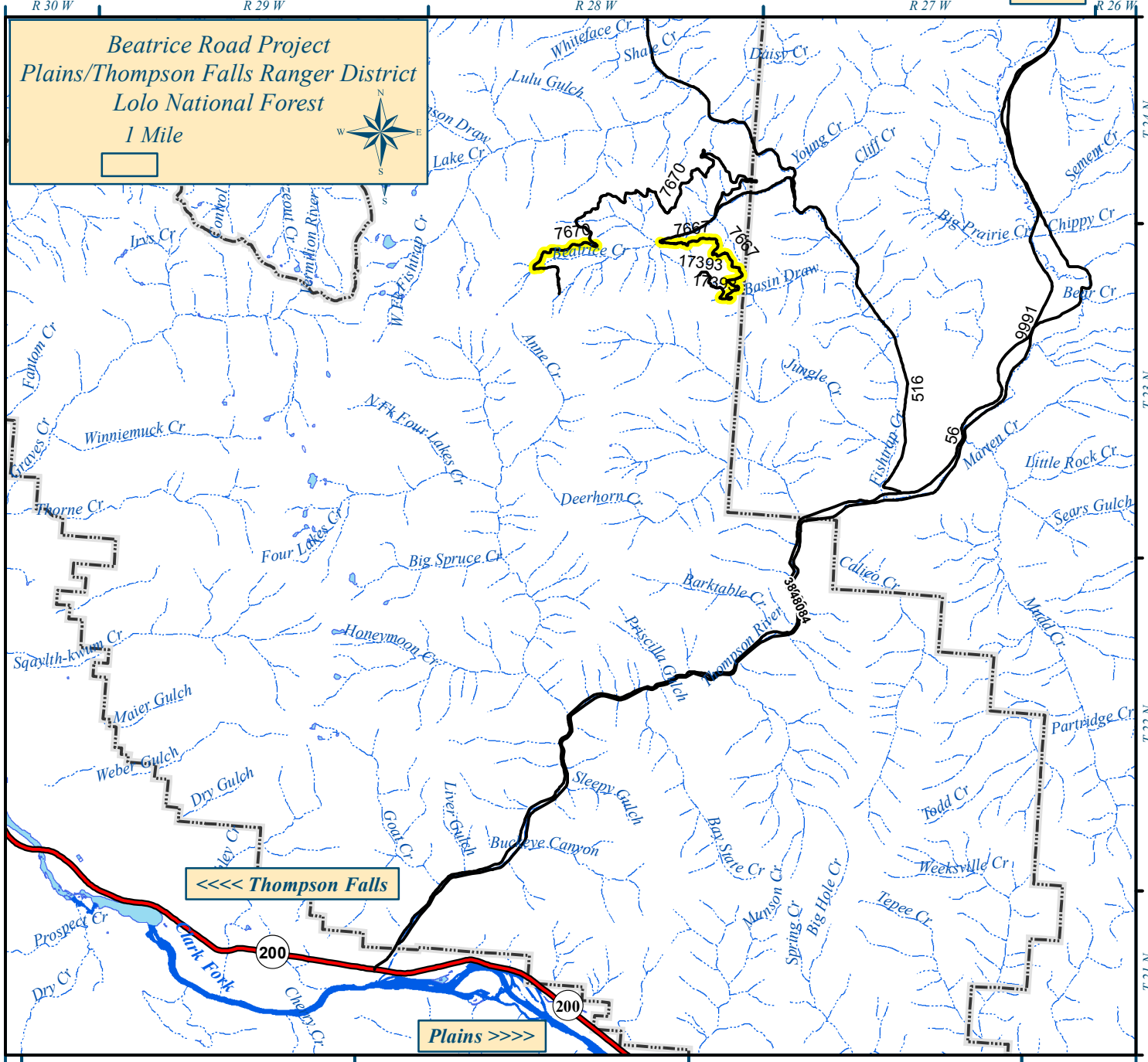
1. Offeror must provide a signed copy of the RFP Cover Sheet.
2. References
3. Resumes/Company Profile
4. Experience/Project Examples
5. Method of Providing Services
  - Equipment to be used:
  - Operators names/years experience:
  - Confirmation of availability within the construction window (7/15/22-9/01/2022): Yes/No

**Number of Copies and Due Date.** Offerors must submit one signed, hard copy **or** an electronic copy (.pdf via email) of the RFP Cover Sheet, Cost Proposal and RFP Response Form to the address listed below. Proposals must be received prior to 5:00 PM MST 01/31/2022. Proposals received after this time will not be accepted for consideration.

**Yellowstone to Yukon Conservation Initiative**  
**ATTN: Jessie Grossman**  
**PO Box 479**  
**Hope, ID 83836**  
[jessie@y2y.net](mailto:jessie@y2y.net)

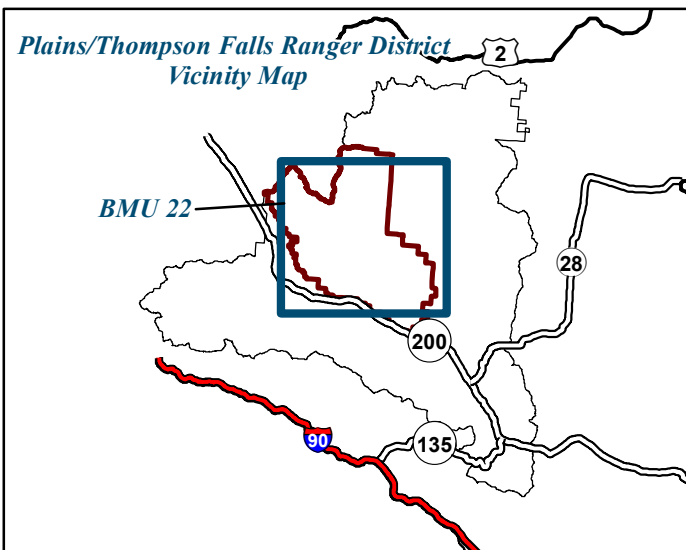
# Beatrice Road Project Plains/Thompson Falls Ranger District Lolo National Forest

1 Mile



## Plains/Thompson Falls Ranger District Vicinity Map

BMU 22

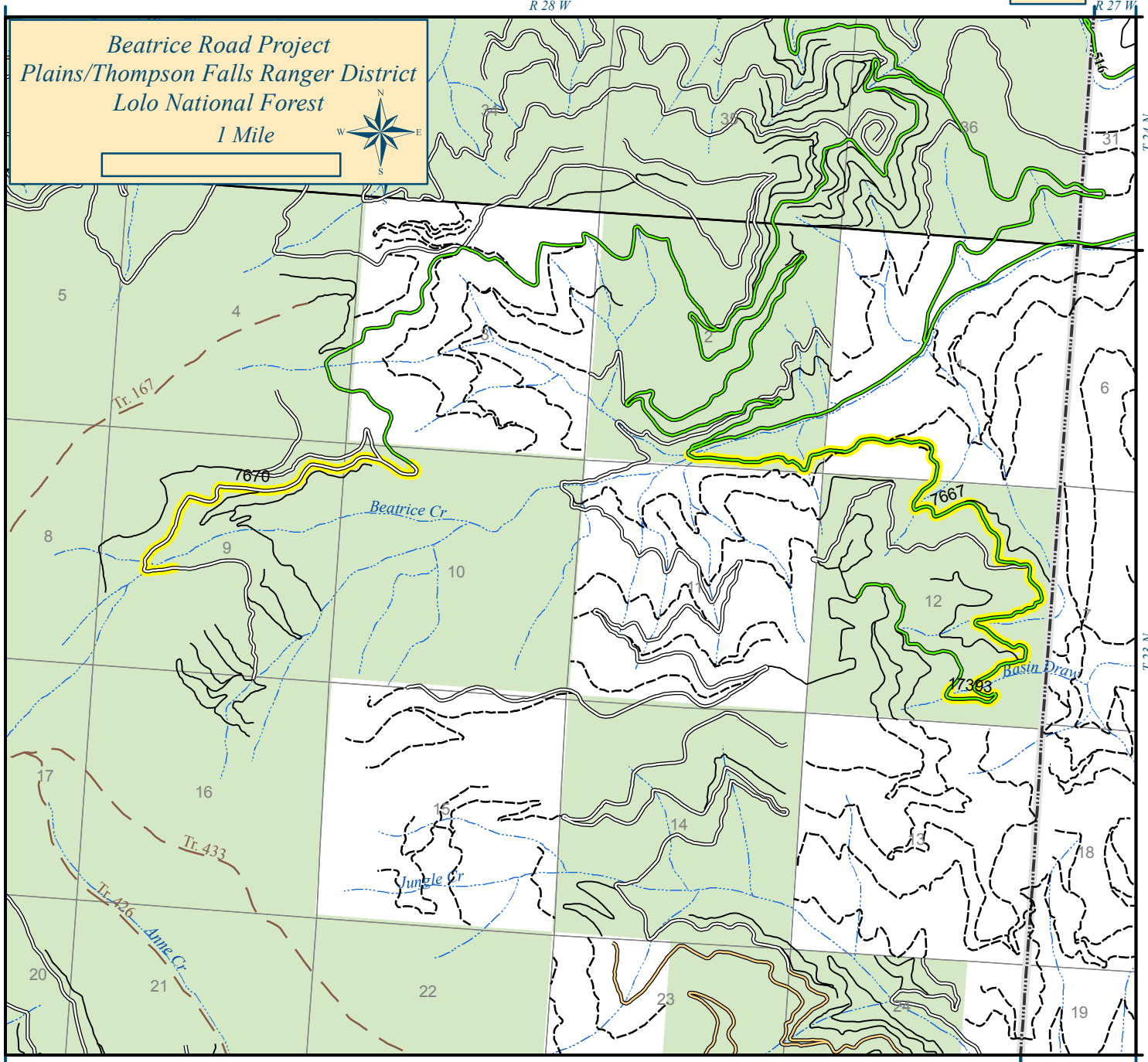


### Legend

- Main Forest Roads
- State Highways
- Streams
- Bear Management Unit
- Closure Level
- Level 3

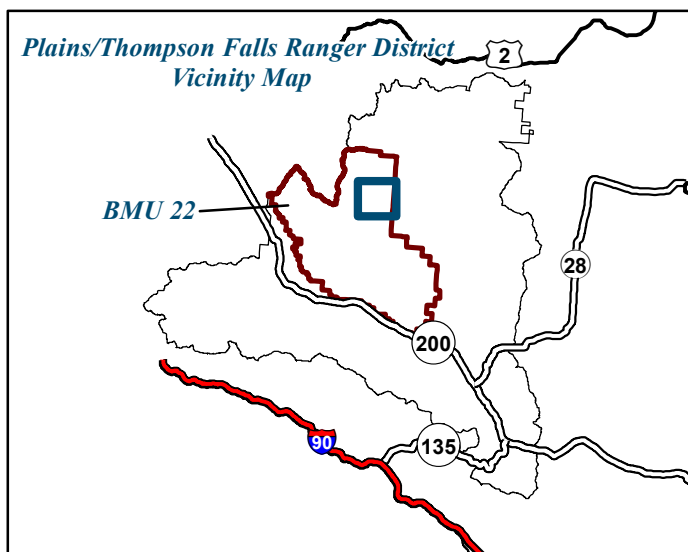
Beatrice Road Project  
Plains/Thompson Falls Ranger District  
Lolo National Forest

1 Mile



Plains/Thompson Falls Ranger District  
Vicinity Map

BMU 22



Legend

Existing Road

- Open Roads
- Closed Yearlong
- Open Seasonal
- Private Roads
- Undetermined
- State Highways
- Streams
- Existing Trails
- Bear Management Unit

Ownership

- Lolo National Forest
- Private
- State of Montana
- Weyerhaeuser

Closure Level

- Level 3

## ROADWAY OBLITERATION LEVEL III

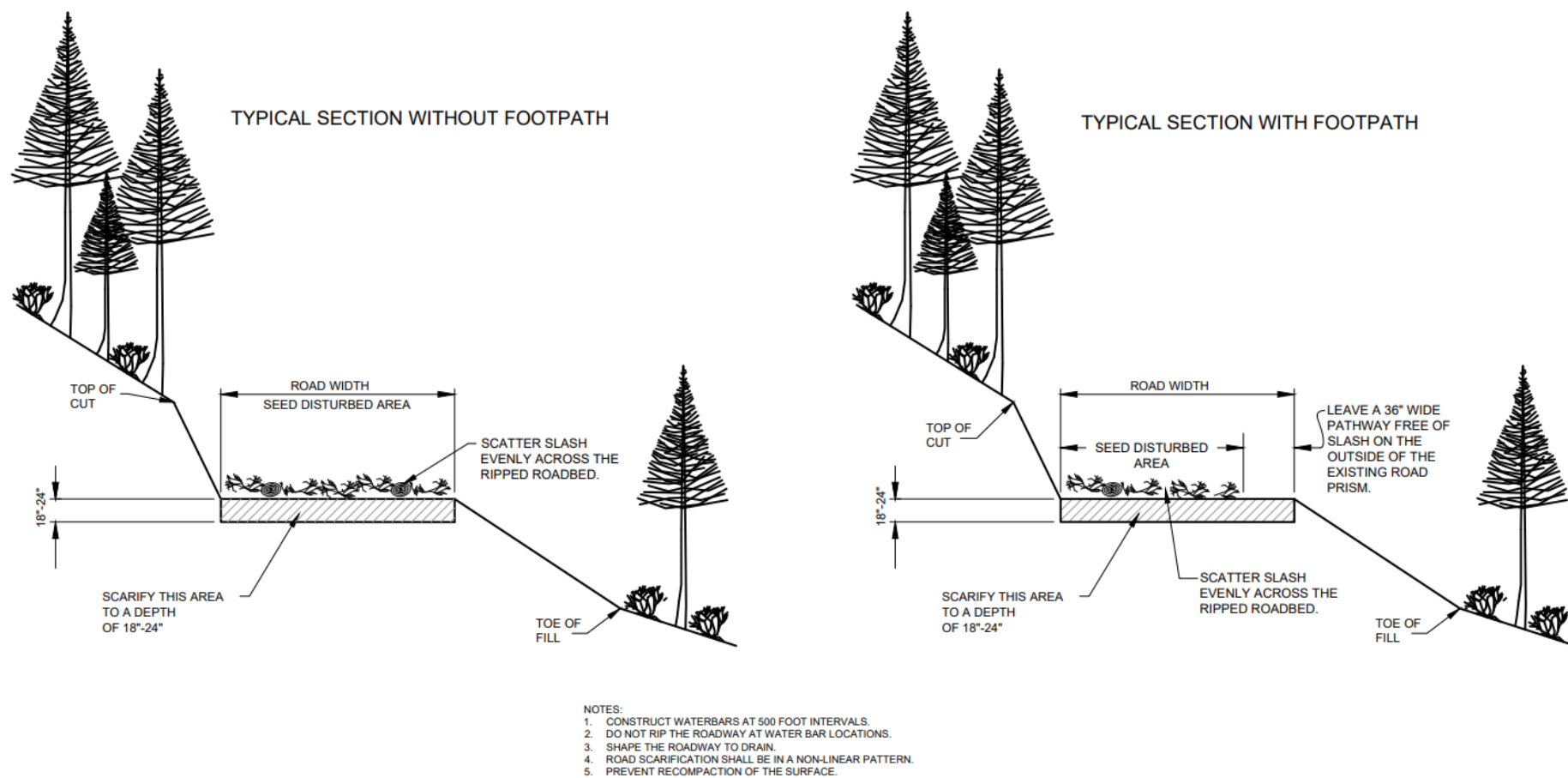
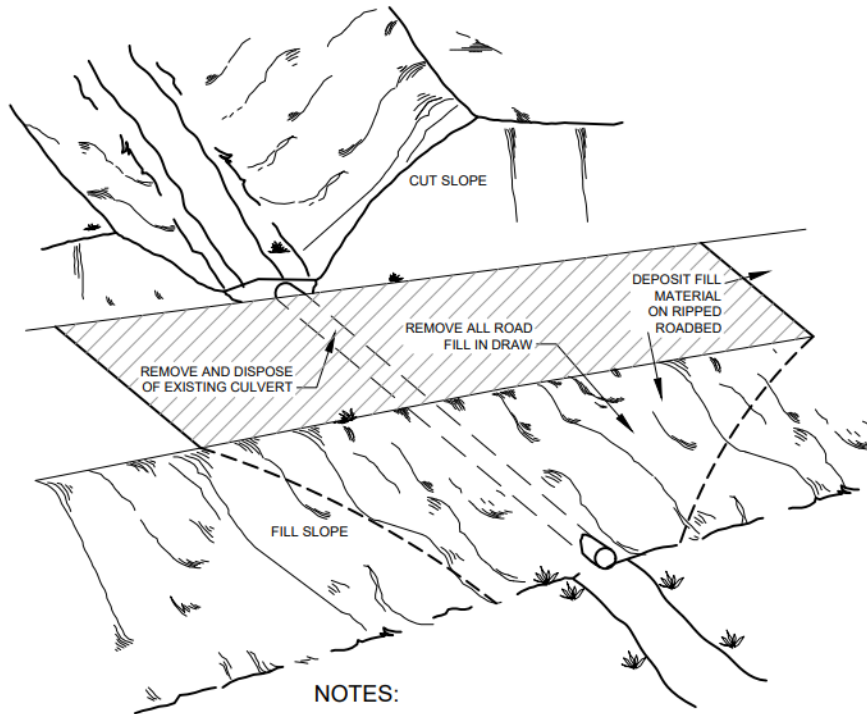


Figure 1



### EXISTING CULVERT IN DRAW

NO SCALE



#### NOTES:

1. REMOVE AND DISPOSE OF EXISTING CULVERT ACCORDING TO SECTION 203.
2. REMOVE ROAD FILL MATERIAL FROM THE STREAM CHANNEL AND FLOODPLAIN. USE REMOVED MATERIAL TO FULLY RECONTOUR THE ADJACENT ROADWAY WITHIN THE STREAM RESTORATION AREA.

### COMPLETED CULVERT REMOVAL AND RESTORATION

NO SCALE

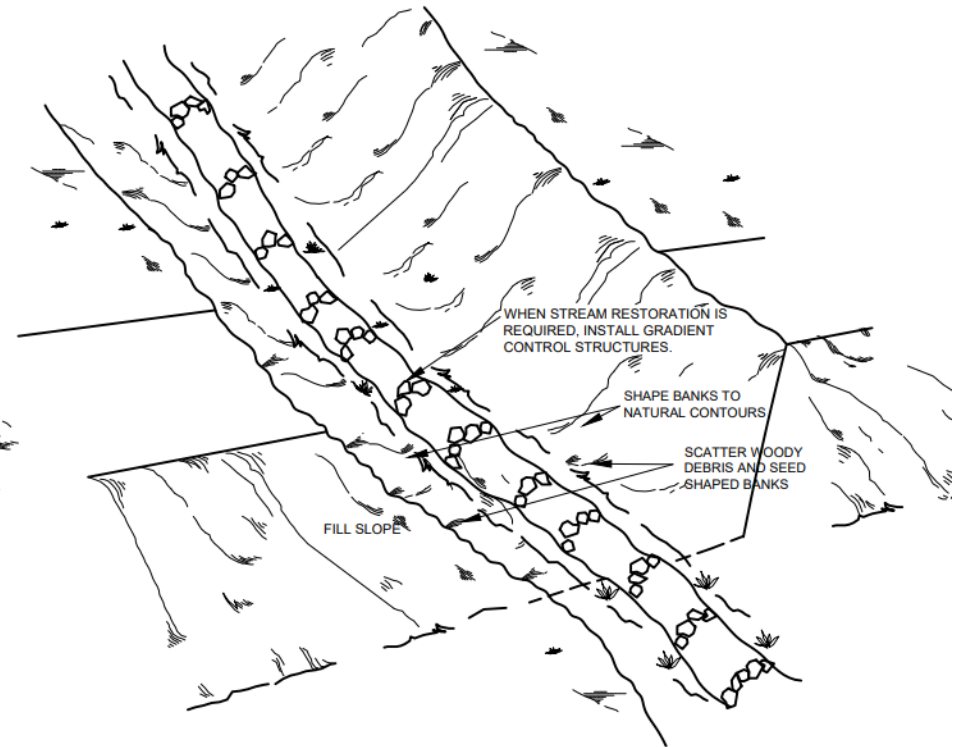
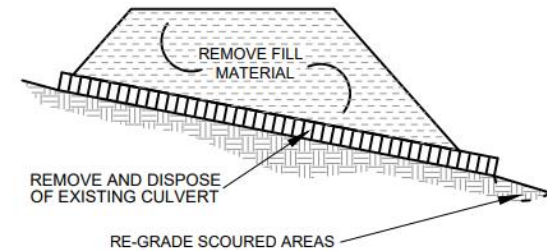
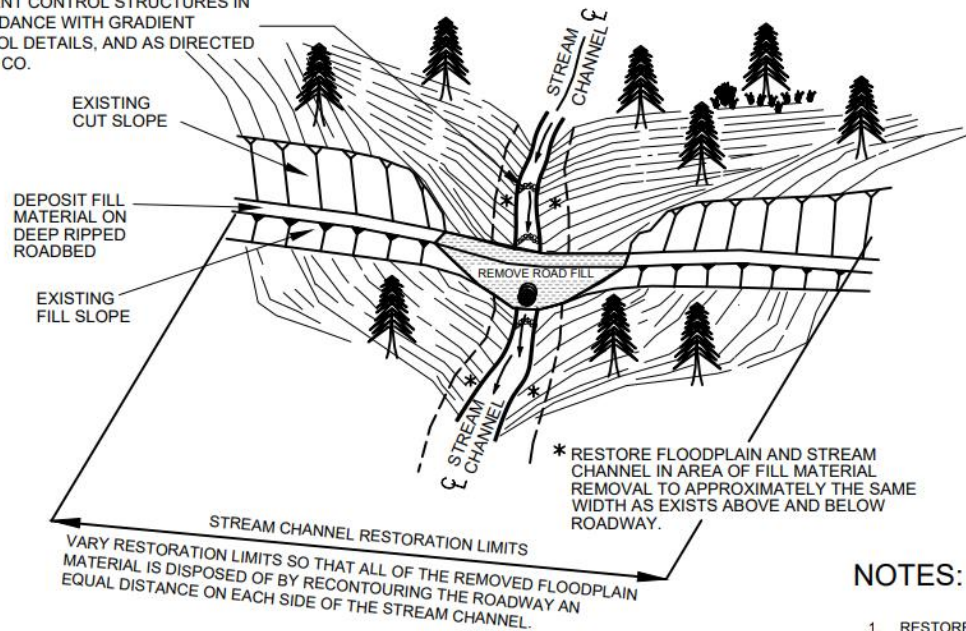


Figure 3



## STREAM CHANNEL RESTORATION

AT EACH RESTORATION SITE, INSTALL GRADIENT CONTROL STRUCTURES IN ACCORDANCE WITH GRADIENT CONTROL DETAILS, AND AS DIRECTED BY THE CO.

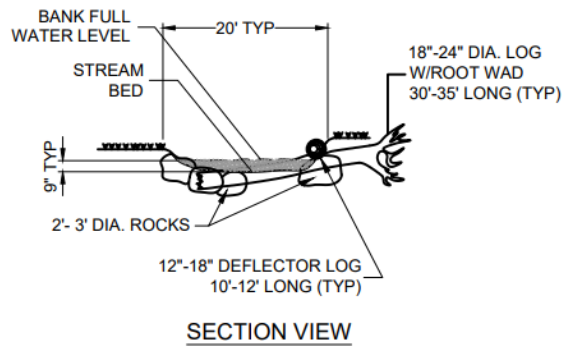


TYPICAL SECTION - STREAM CHANNEL

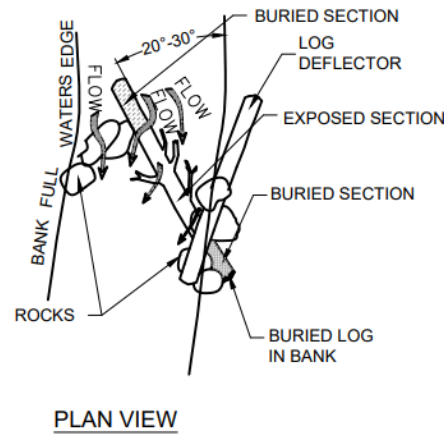
### NOTES:

1. RESTORE THE STREAM CHANNEL AND FLOODPLAIN TO NATURAL DIMENSIONS INCLUDING NATURAL STREAM GRADIENT, AND BANKFULL WIDTH AND DEPTH.
2. STREAM CHANNEL RESTORATION LIMITS MAY BE EXTENDED ON EITHER SIDE OF THE CHANNEL TO ACCOMMODATE OVERLAPPING SECTIONS WHERE STREAMS ARE CLOSE TOGETHER.
3. SCATTER AVAILABLE SLASH AND WOODY DEBRIS ON THE RECONTOURED STREAM SLOPES ACCORDING TO SECTION 211. PLACE LARGER WOOD AND ROCK ON THE FLOODPLAIN. PLACE SEED AND MULCH ACCORDING TO SECTION 625.
4. FURNISH AND MAINTAIN EROSION CONTROL MEASURES ACCORDING TO SECTION 157.

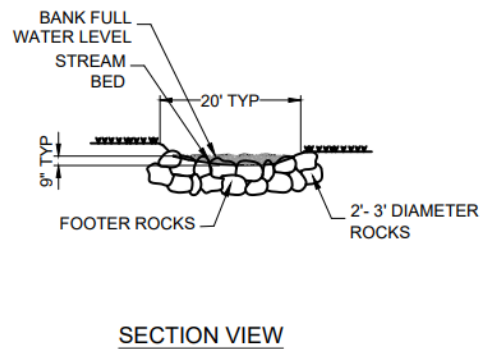
Figure 4



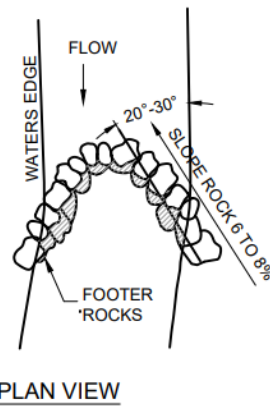
**LOG-SPUR**  
NO SCALE



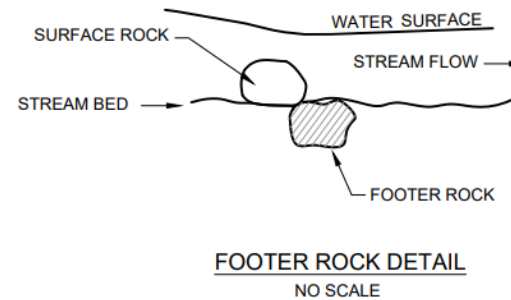
**PLAN VIEW**



**ROCK CROSS VANE**  
NO SCALE



**PLAN VIEW**



**FOOTER ROCK DETAIL**  
NO SCALE

#### NOTES:

- 1.) USE LOGS WITH A MINIMUM 16" DIAMETER UNLESS OTHERWISE APPROVED BY THE C.O.
- 2.) ROCK MAY BE SUBSTITUTED AND USED IN THE SAME MANNER AS LOGS. USE 2 - 3 FOOT DIAMETER ROCKS.
- 3.) KEY THE STRUCTURE (LOG OR ROCK) A MINIMUM OF 2'-3' INTO EACH STREAM BANK AT OR JUST BELOW ORIGINAL GRADE.
- 4.) ALL COSTS ASSOCIATED WITH CONSTRUCTING GRADIENT CONTROL STRUCTURES, MULCHING, AND TEMPORARY EROSION CONTROL TO BE PAID FOR UNDER ITEM 21150 STREAM CHANNEL RESTORATION.
- 5.) SPACING OF STRUCTURE DEPENDS ON THE FOLLOWING NATURAL STREAM GRADIENT OR AS MEASURED IN THE STREAM ABOVE THE CROSSING INFLUENCE ZONE:
  - a) > 8% : 1-2 (WBF)\*
  - b) 4-8% : 2-3 (WBF)\*
  - c) 2-4% : 3-4 (WBF)\*
  - d) < 2% : 4 (WBF)\*

\*(WBF IS THE NATURAL BANKFULL STREAM WIDTH)
- 6.) ALL SURFACE ROCKS WILL BE ADEQUATELY PROTECTED FROM SCOUR USING FOOTER ROCKS AS SHOWN IN FOOTER ROCK DETAIL.

Figure 5