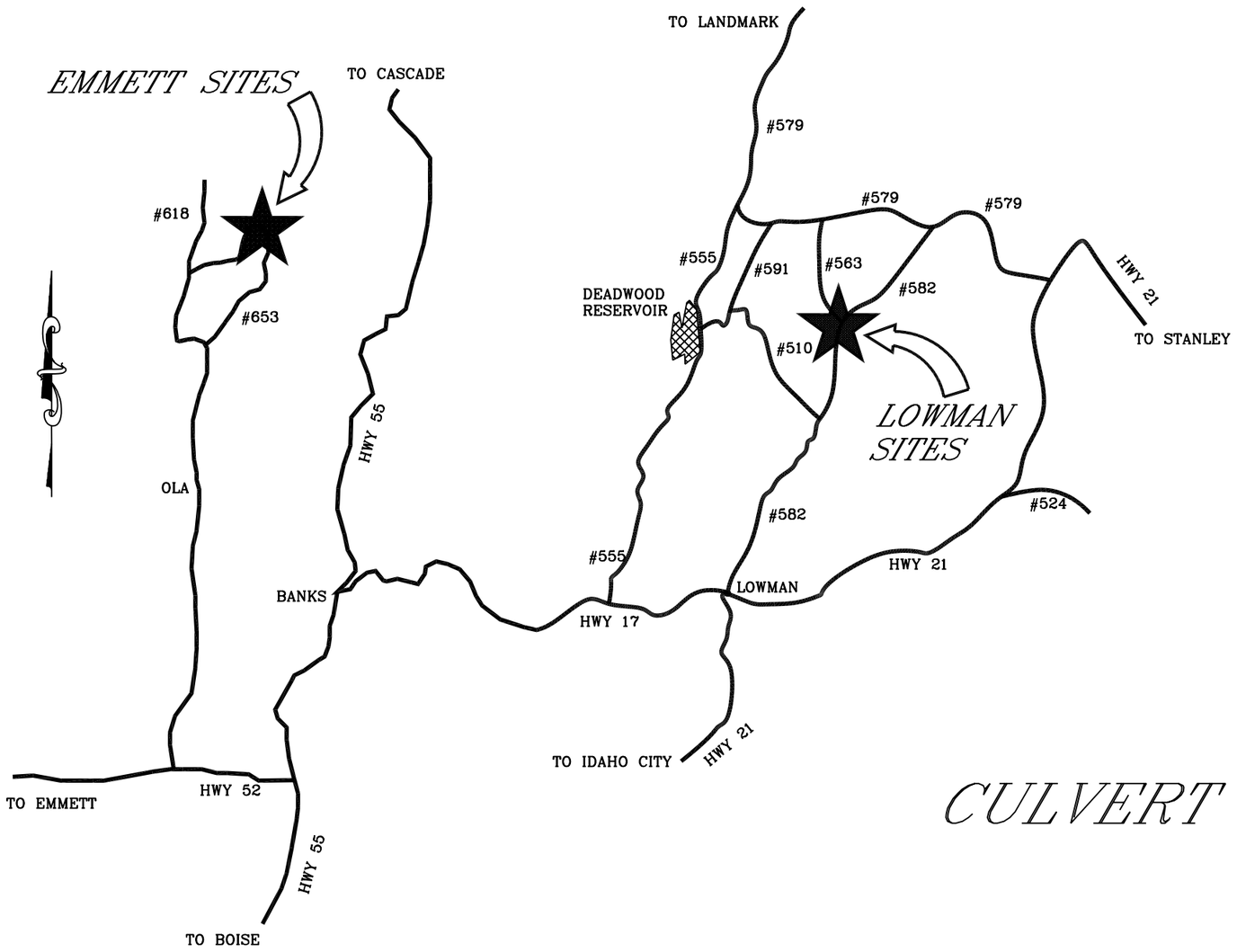
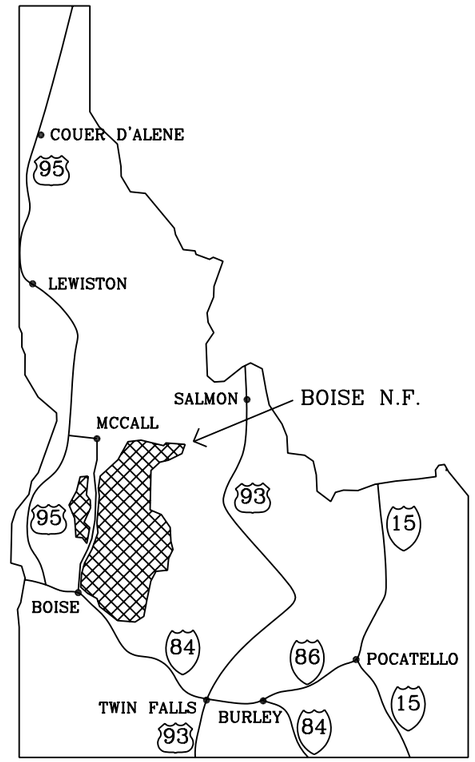
UNITED STATES
DEPARTMENT OF AGRICULTURE
FOREST SERVICE





CULVERT REPLACEMENT PROJECT

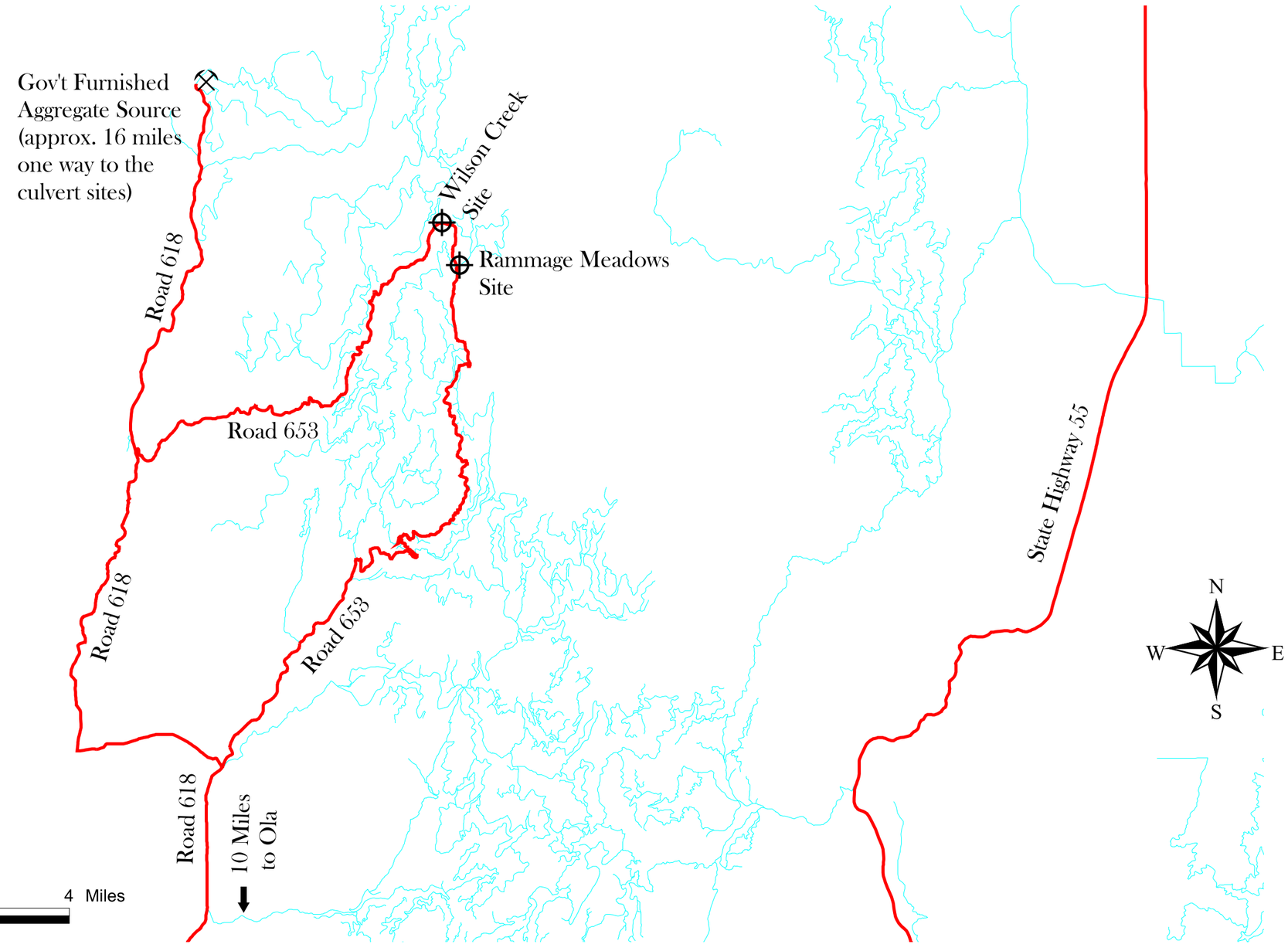
LOWMAN and EMMETT RANGER DISTRICTS

APPROVED _____ DATE _____
Forest Engineer

APPROVED _____ DATE _____
Idaho City District Ranger

INDEX TO SHEETS

Vicinity Map for Emmett Sites



BOISE NATIONAL FOREST, VALLEY AND GEM COUNTIES, IDAHO

PROJECT ESTIMATED QUANTITIES

WORK SITE	Clearing and grubbing, slash treatment method for tops and limbs 4, logs 4, and stumps 4, utilization of timber 4 ....LUMP SUM	Removal of structures and obstructions ....EACH	Soil erosion and pollution control ....LUMP SUM	Minor structure excavation and backfill ....LUMP SUM	Placed riprap, modified class 3, method A ....CUBIC YARD	Placed riprap, class 4, method A ....CUBIC YARD	Placed riprap, modified class 4, method A ....CUBIC YARD	Weir rock, size 18" ....EACH	Weir rock, size 24" ....EACH	Furnish stream bed simulation rock, bed class 2, ...CUBIC YARD	Furnish stream bed simulation rock, bed class 6 .....CUBIC YARD	Furnish stream bed simulation rock, bed class 9 .....CUBIC YARD	Place stream bed simulation rock, method D ....CUBIC YARD
	201(03)	202(02)	204(19)	206A(06)	251(01)A	251(01)B	251(01)C	251(14)A	251(14)B	251(15)A	251(15)B	251(15)C	251(16)
Casner/Cub													
Sites	1	2	1	1	80	27		13	27	24	15		64
Rammage/													
Wilson Sites	1	2	1	1		30	68		52			90	144

BOISE NATIONAL FOREST, VALLEY AND GEM COUNTIES, IDAHO

PROJECT ESTIMATED QUANTITIES

WORK SITE	Placing aggregate, compaction A, Government Furnished .....CUBIC YARD	Precast concrete structure, footings various sizes ....LUMP SUM	Mobilization .....LUMP SUM	Fence timber rail, type 3-rail, height 4 feet ....LINEAR FOOT	Pit development ....EACH	Steel structural-plate arch,10' span, 4' 5" rise, galvanized coated, 12 ga. Thickness ....LINEAR FOOT	Steel structural-plate arch, 8' span, 4' 2" rise, galvanized coated, 12 ga. Thickness ....LINEAR FOOT	Steel structural-plate arch, 16' span, 7' 1" rise, galvanized coated, 12 ga. Thickness ....LINEAR FOOT	Steel structural-plate arch, 16' span, 7' 1" rise, galvanized coated, 12 ga. Thickness ....LINEAR FOOT	Furnish, install and remove signs .....LUMP SUM	
	304(13)	553A(02)	601(01)	607(02)	611(01)	617(03)A	617(03)B	617(03)C	617(03)D	633(18)	
Casner/Cub											
Sites		2	1		1	54	44			1	
Rammage/											
Wilson Sites	48	2	1	96				50	46	1	

CONSTRUCTION NOTES

Construction Staking: Staking of the precast concrete footing locations will be done by the Forest Service to mark the base elevations and centerline of the footings.

Equipment Cleaning: All equipment shall be thoroughly cleaned with a pressure washer to remove dirt and potential noxious weed seed prior to entering National Forest land. If it is determined that noxious weeds exist on the project sites, the contractor shall clean the equipment at an approved location prior to leaving National Forest land. Equipment shall not enter the stream channel unless absolutely necessary to complete the work. Prior to entering any watercourse, equipment shall be inspected for fuel and hydraulic leaks. If leaks are found, the equipment shall be cleaned at an approved location by pressure washing.

Storage of fuel and other toxicants within Riparian Conservation Areas (RCA – within 300 feet of live streams) is prohibited. Refueling of equipment may be done within the RCA only at locations approved by the COR. Pumps used for removing water from structure excavation shall sit in a secondary spill container with sufficient capacity to contain the quantity of fuel in the pump fuel tank. A Spill Prevention & Containment Plan is required and shall be submitted to the COR for approval prior to beginning construction. A sample plan form is available and can be obtained at the Pre-Work Meeting. A spill containment kit will be available on site that will be able to accommodate potential spills from the equipment used during construction.

Stream Diversion: Estimated streamflows are shown on the plan sheets for each site. The maximum estimated streamflow during the construction period is 8 cubic feet per second(cfs). A 24" culvert should be able to pass this flow, however the Contractor is responsible for installing a diversion structure capable of handling the flow conditions on site. The stream diversion shall be constructed in such a way as to provide as near a water free work area as possible. Payment for this work is incidental to Item 553A(02). Prior to the start of construction, the Contractor shall submit a written diversion plan, detailing the proposed method for diverting the stream around the construction site, as part of the written erosion control plan required under Specification Section 204.03. The Forest Service will be responsible for removing any fish that become stranded during the diversion process. The Contractor shall give the Forest Service at least 72 hours advance notice prior to diverting the stream so appropriate personnel can be on site to deal with the fish.

Clearing: Dispose of any clearing slash generated during operations by scattering at locations approved by the Engineer.

Installation of precast concrete footings: If pumping of the footing excavations is required, the discharge water shall be diverted to an approved location. Pumps must be outfitted with a suction screen that has a maximum opening size of 3/32". The contractor may need to place clean ¾" aggregate beneath the concrete footings to obtain a uniform foundation surface. All this work is incidental to Item 553A(02).

Construction Signing: Contractor shall furnish, install, and remove appropriate signing as specified in the traffic control plan. Maximum road closure at each site is limited to 15 days maximum.

Structure Excavation: Stockpile all excavated material at approved locations only. Excess material remaining at the stockpile sites shall be smoothed out as directed by the Engineer. The finished surface must be suitable for driving on by a low clearance vehicle. Incidental to Item 206A(01).

Riprap: Commercial rock sources in the vicinity of the project area have been appraised by the Forest Service for the Emmett sites, as material is not available at Forest Service sources. The Forest Service has not obtained any commitment for price, quantity, or when, or if, such material would be available. Bidders must make their own determination of price, availability, quantity, and time material would be available. An existing rock pit at Milepost 1 of the 579 road is the designated source for the Lowman sites. Slopes to be riprapped shall be reasonably smoothed and covered with Type II geotextile fabric, Contech C70/06 woven monofilament or equivalent prior to installation. Payment for the geotextile and installation is incidental to Item 251(01)B. The Contractor shall conserve and utilize rock encountered during construction that will meet the requirements of riprap. Riprap rock must meet the requirements of Specification Section 705.02. Gradation requirements are shown below.

Gradation Requirements for Modified Class 3 Riprap – 251(01)A

	% of Rock by Mass	Mass(lbs)	Approx. Cubic Dimension(in.)
Modified Class 3 Riprap	20	220 - 330	14 - 16
	30	110 - 220	10 – 14
	30	11 - 110	5 - 10
	20	<11	0 - 5

Gradation Requirements for Modified Class 4 Riprap – 251(01)C

	% of Rock by Mass	Mass(lbs)	Approx. Cubic Dimension(in.)
Modified Class 4 Riprap	20	550 - 770	18 - 20
	30	220 - 550	14 - 18
	30	22 - 220	6 - 14
	20	<22	<6

(continued on next page)

CONSTRUCTION NOTES (continued)

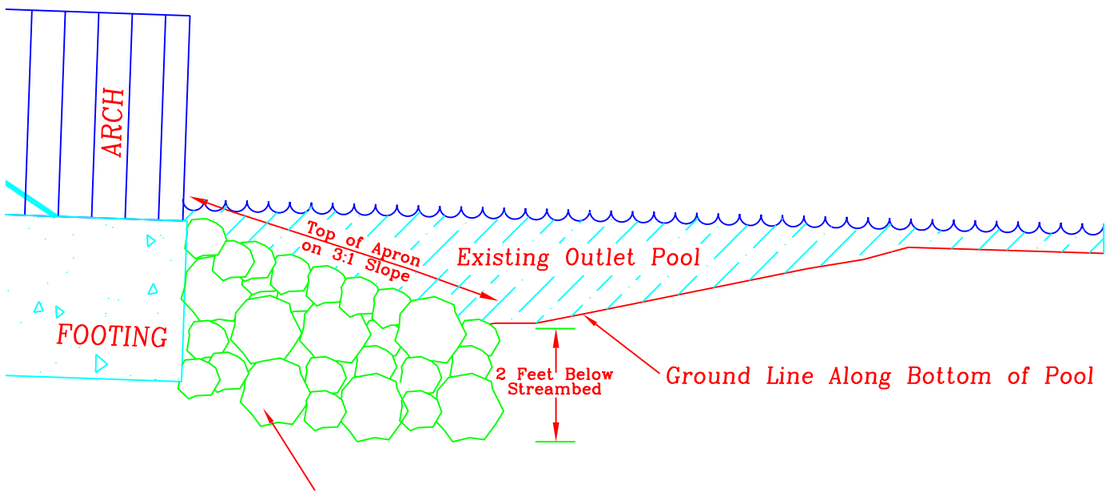
Gradation Requirements for Class 4 Riprap – 251(01)B

	% of Rock by Mass	Mass(lbs)	Approx. Cubic Dimension(in.)
Class 4 Riprap	20	550 - 770	18 - 20
	30	220 - 550	14 - 18
	40	22 - 220	6 - 14
	10	<22	<6

STREAM BED SIMULATION MATERIAL: This work is covered by 2 separate item numbers. Item number 251(15) covers the furnishing of the material to be placed between the concrete footings that will become the finished streambed. There are 3 different gradations required, designated by Bed Class, tabulated in the Special Project Specifications. Designated source for the Casner site is an existing borrow pit on Road 569 approximately 0.1 mile from the site. For the Cub site, the designated source is at a rock pit on Road 579, approximately 22 miles from the site. For the Rammage and Wilson sites, there is no designated Government source. Commercial rock sources in the vicinity of the project area have been appraised by the Forest Service for the Emmett sites, and the Forest Service has not obtained any commitment for price, quantity, or when, or if, such material would be available. Bidders must make their own determination of price, availability, quantity, and time material would be available. The quantity to be furnished for each site represents 50% of the actual volume required to construct the streambed, based on an assumption that half of the existing material under the culverts to be removed will be suitable stream bed simulation rock. Volumes shown in the Schedule of Items and Summary of Quantities are loose yards to be hauled to the sites.
Item Number 251(16) covers the placing of the stream bed simulation rock. The quantity for each site represents the total in place volume of the material between the footings, including suitable material on site plus the furnished material. The process of placing this material requires hand labor with metal tamping rods, water pressure via hose lines connected to pumps, and similar hand operated equipment to force fines into all surface and subsurface voids between the footings and individual rocks. The source for the additional fines, if needed, is from the excess structure excavation stockpiles. Payment for the additions of extra fines is incidental to Item number 251(16). The purpose of this process is to create a finished stream bed that will be non-porous enough keep water flowing on the top surface even at low flows.

SEDIMAT: Sedimat will be installed by the Forest Service where shown on the drawings prior to any excavation work at the culvert sites. The sedimat shall remain in place until removal is approved by the Engineer. Contractor is responsible for removal of Sedimat and final placement as outlined below.
Once removal has been approved, pull the stakes and remove the holding rocks, then roll the mat up from the far side of the stream toward the side where equipment can assist. When wet and full of sediment, a mat can weigh over 1000 pounds. Tie up the roll, gently pull the mat from the stream with a piece of equipment, move it to a location approved by the Engineer on the streambank above the highwater mark, unroll and stake out flat.

Typical Arch Outlet Apron



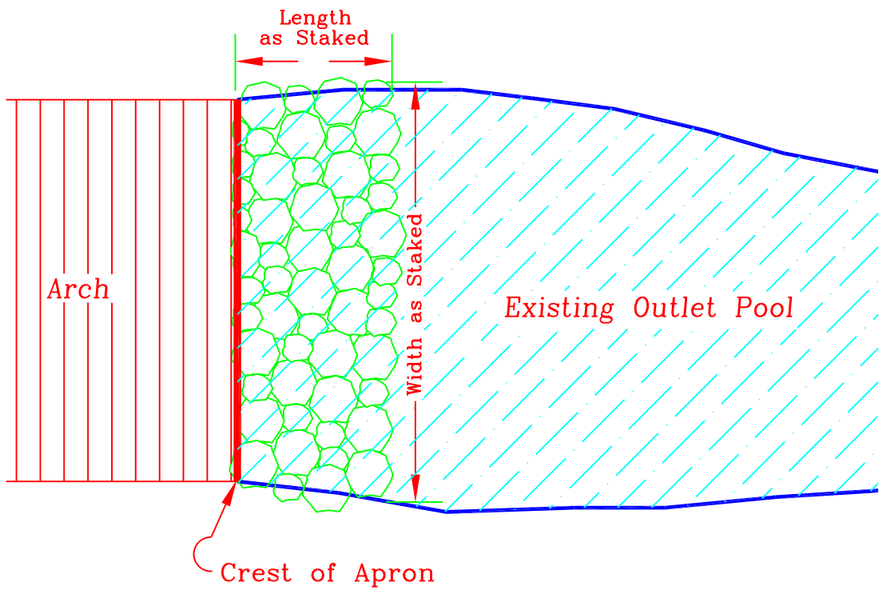
Modified Class of Riprap – Item 251(01)A or 251(01)C (varies by site)
See Individual Plan Sheets for Quantities and Type of Riprap

Elevation View – No Scale

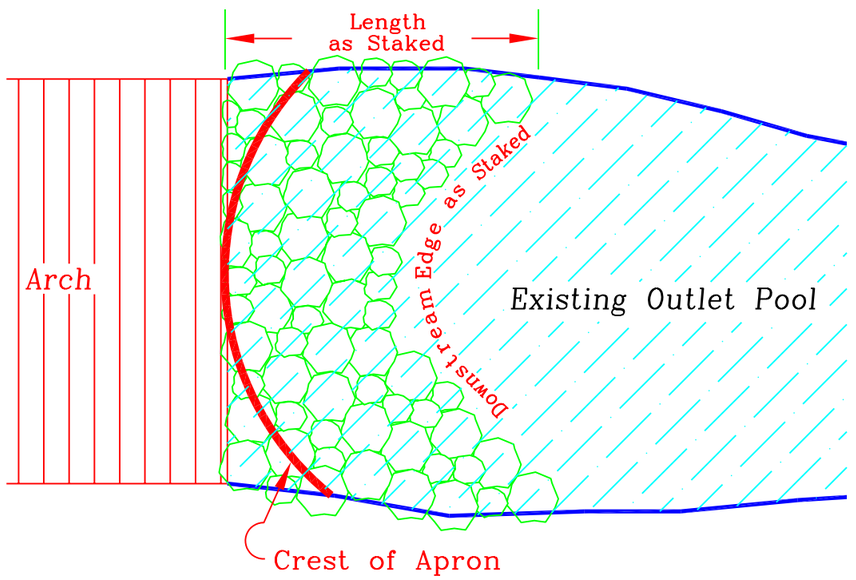
Construct the outlet apron by placing Riprap downstream of the arches as shown. Depth of the rock along the outlet of the arch is from the top to the bottom of the concrete footers. Key the rock a minimum of 2 feet into the existing streambed. The top surface of the rock shall slope downward at a slope no steeper than 3:1. Width of the apron will span between the bankfull limits of the pool. The Forest Service will stake the dimensions of the outlet apron on the ground. See the individual plan sheets for information on which type of apron and what classification of riprap is required.

Place the rock in layers, filling in the voids with fine material taken from the excess structure excavation stockpile. Force fines into all surface and subsurface voids between individual rocks using water pressure, metal tamping rods, and similar hand operated equipment. Payment for the addition of extra fines is incidental to Item numbers 251(01)A and 251(01)C. Shape the top of the apron to match up with the streambed constructed inside the arch.

Some reshaping of the streambed will be required and is incidental to Item numbers 251(01)A and 251(01)C. Dispose of excess material by placing at a location approved by the Engineer.



Plan View of Ramp Apron – No Scale



Plan View of Crescent Apron – No Scale

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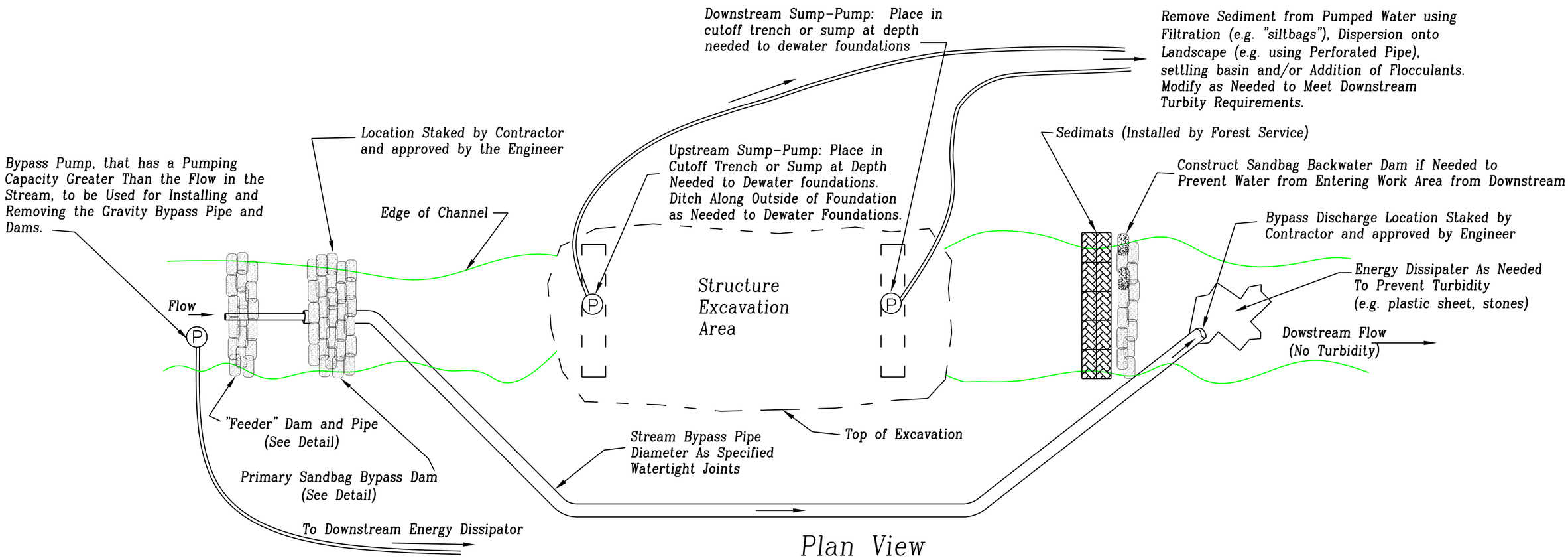
REGION 4 BOISE NF

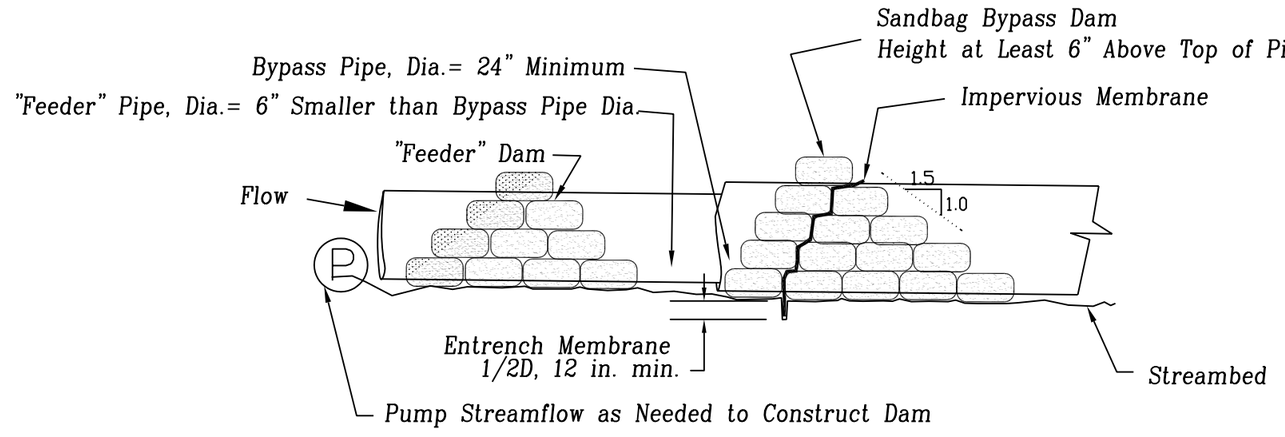
ARCH OUTLET APRON DETAILS



Plan View

TYPICAL DEWATERING & SEDIMENT CONTROL PLAN

NOT TO SCALE



Elevation View at Streambed Invert

Sandbag Bypass Dam

Not to Scale

NOTE: When constructing stream diversion Contractor shall carefully remove sod and topsoil containing vegetation that lies along the diversion path and stockpile in a location approved by the Engineer. After removing the diversion structure and backfilling the trench, Contractor shall carefully replace this stockpiled material with the green side facing up. Priority areas for replacement of vegetation are streambanks and floodplains.

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TYPICAL DEWATERING and SEDIMENT CONTROL PLAN

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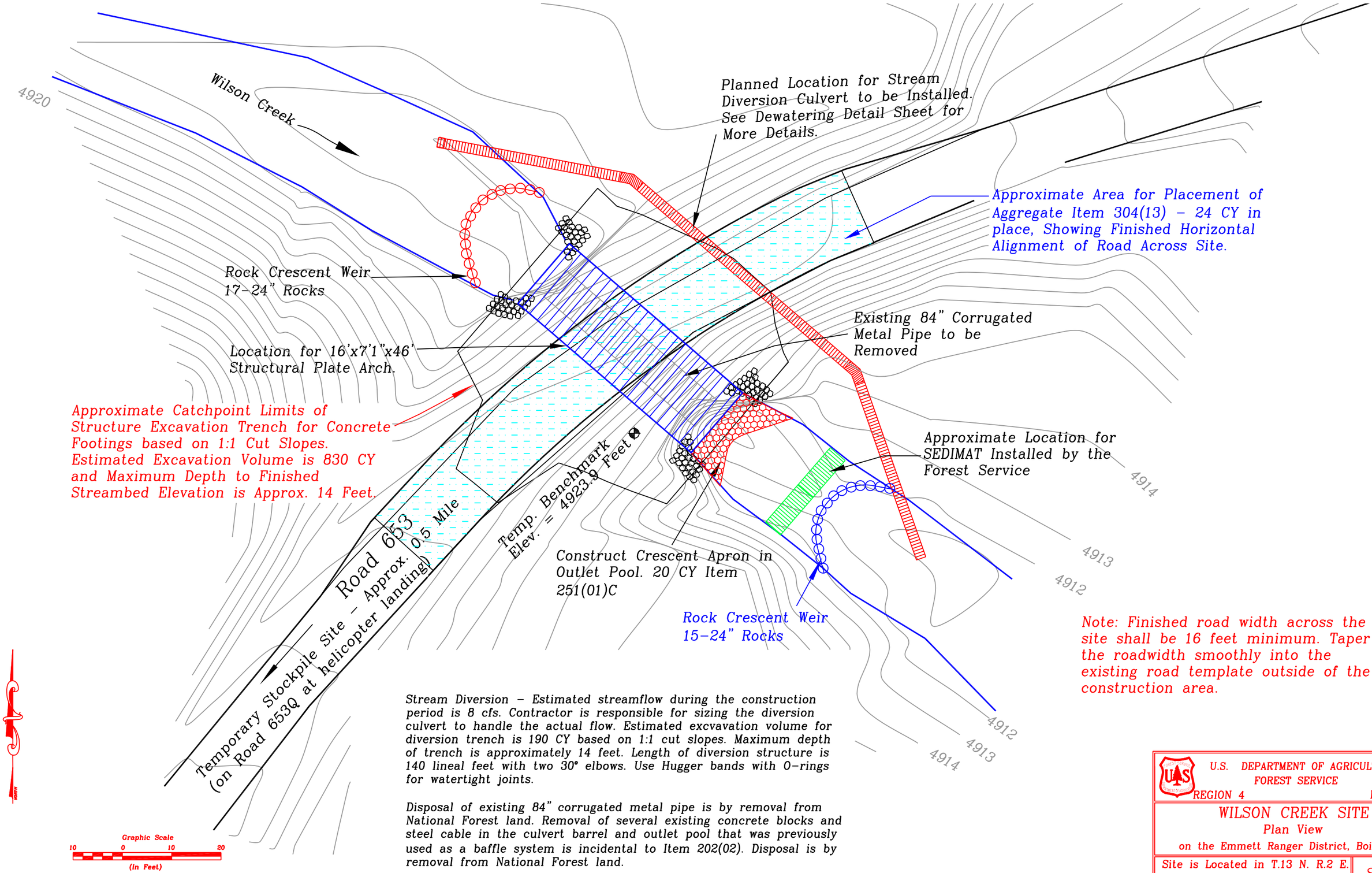

Stream Diversion – Estimated streamflow during the construction period is 8 cfs. Contractor is responsible for sizing the diversion culvert to handle the actual flow. Estimated excvavation volume for diversion trench is 190 CY based on 1:1 cut slopes. Maximum depth of trench is approximately 14 feet. Length of diversion structure is 140 lineal feet with two 30° elbows. Use Hugger bands with O–rings for watertight joints.

Disposal of existing 84" corrugated metal pipe is by removal from National Forest land. Removal of several existing concrete blocks and steel cable in the culvert barrel and outlet pool that was previously used as a baffle system is incidental to Item 202(02). Disposal is by removal from National Forest land.

Note: Finished road width across the site shall be 16 feet minimum. Taper the roadwidth smoothly into the existing road template outside of the construction area.

Contour Interval is 1 Foot

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 4 BOISE NF

WILSON CREEK SITE
Plan View
on the Emmett Ranger District, Boise N.F.

Site is Located in T.13 N. R.2 E. NW 1/4 Sec 34, in Gem County on the USGS Tripod Quadrangle

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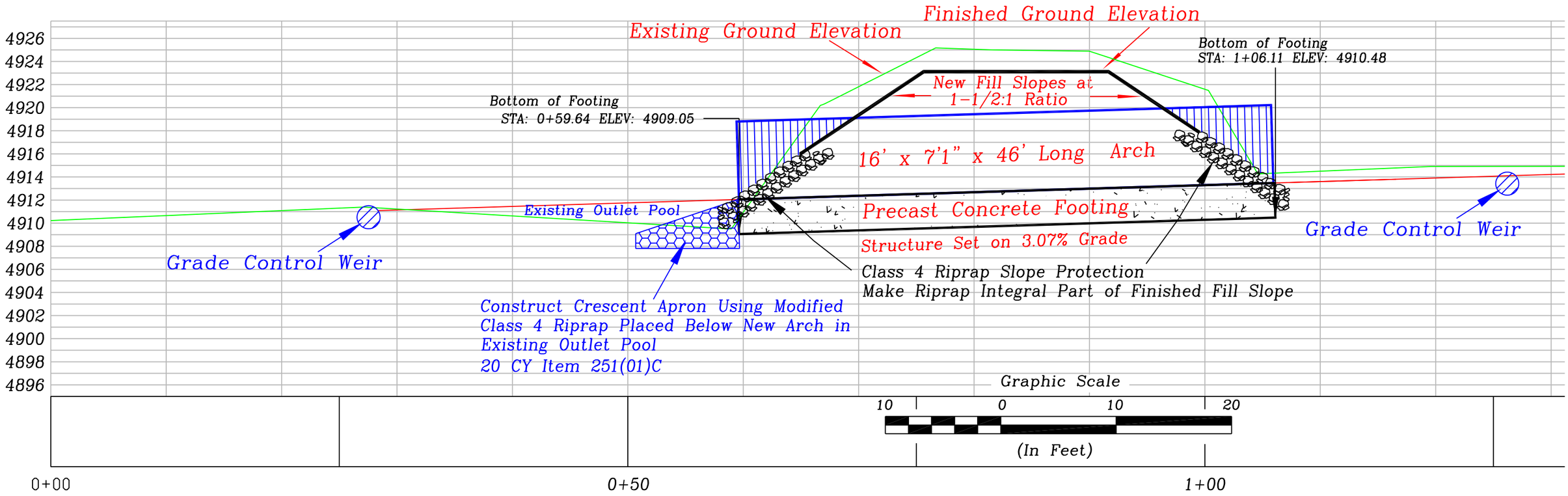

Profile View of Arch Installation

Structural Plate Arch Data: Design length is 46 feet. According to Contech Construction Products, Inc. the actual length of the arch from inlet to outlet will be about 4" longer due to the individual plates being sized to allow for a 2" overlap at each end. Therefore the assembled length should be about 46'4". Payment for the structural plate arch will be made under Item 617(03)D and is based on the nominal length of 46 L.F.

Length of concrete footings: Concrete footings shall extend 1" beyond the ends of the assembled arch. For this site the total footing length each side should be 46'6".

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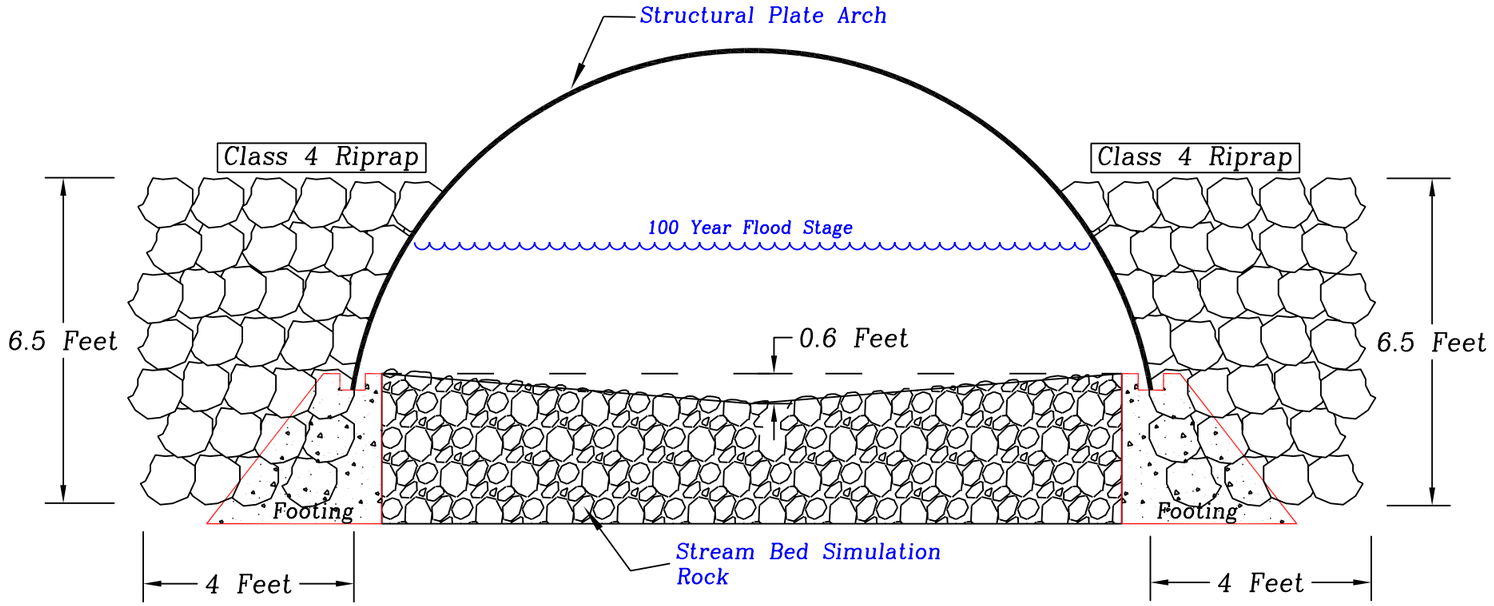
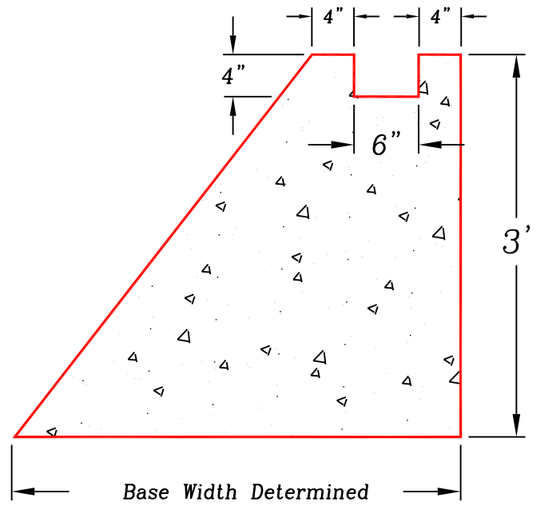
FOREST SERVICE
REGION 4 BOISE NF

WILSON CREEK SITE
Profile View
on the Emmett Ranger District, Boise N.F.

Site is Located in T.13 N. R.2 E.
NW 1/4 Sec 34, in Gem County
on the USGS Tripod Quadrangle



End View of 16' x 7'1" Structural Plate Arch for Wilson Creek Culvert Replacement. Construct Finished Streambed Shape as Shown.
Precast Concrete Footings are 3 ft tall x 3.5 ft wide for this Drawing



Typical Footing Dimensions for 3 Foot Tall Design

RIPRAP:

Place Class 4 riprap as shown above on each side of the inlet and outlet. Volume of Item 251(01)B required is 15 CY. Place the riprap to obtain a minimum finished thickness of 2 feet. Riprap shall be keyed a minimum of 2 feet into the ground below finished streambed elevation and shall be made an integral part of the finsihed fill slopes. Slopes to be riprapped shall be no steeper than a 1–1/2:1 slope and shall be reasonably smoothed and covered with geotextile fabric, Contech C70/06 woven monofilament or equivalent, prior to installation. Estimated quantity of geotextile fabric is 22 square yards; payment for furnishing and installation is incidental to Item 251(01)B.

STREAM BED SIMULATION ROCK:

Construct the finished streambed by placing Stream Bed Simulation Rock, Bed Class 9, between the concrete footings as shown above. Material encountered under the existing culvert may be used if approved by the Engineer. Maximum quantity required is 69 CY in place. Additional fines may need to be added to the material during placement to create a tightly packed non–porous bed. Source for this fine material is the excess structure excavation stockpile and payment for this work is incidental to Item 251(16).
See the Construction Notes sheets for more information concerning the furnishing and placing of Stream Bed Simulation Rock.

FOOTING DESIGN:

A typical design for a precast concrete footing is shown to the right. Contractor shall submit shop drawings for approval to the Forest Service prior to manufacture for a design that meets the 3 foot height requirement, has a slot on the top that allows for proper fit of the arch base, has a minimum concrete strength of 3000 psi, air content of 5% +/–1%, has a Class 1 – Ordinary Surface Finish, has appropriate reinforcing steel, and meets the 2000 psf allowable soil bearing capacity. Contractor shall determine the indivdual piece lengths that can be handled on site. Once set in place, individual pieces shall be attached to one another by either a mechanical splice or by grouted keyways. Arch shall be grouted in the top of the footing with non–shrink grout, after the entire arch has been set.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 4 BOISE NF

WILSON CREEK SITE
End View, Footing
on the Emmett Ranger District, Boise N.F.

Site is Located in T.13 N. R.2 E.
NW 1/4 Sec 34, in Gem County
on the USGS Tripod Quadrangle