CONSTRUCTION PLANS FOR:
AOP CULVERT REPLACEMENT
NFSR 2050000 MP 22.23

TONGASS NATIONAL FOREST
THORNE BAY RANGER DISTRICT

INDEX TO SHEETS

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<td>1X1-1X2</td>
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MATERIAL SOURCES

- GOVERNMENT FURNISHED
  - CHANNEL ROCK
  - RAPID
  - UNEARTHED ROADWAY
  - WASTE SITE
- CONTRACTOR FURNISHED
  - STREAM SIMULATION ROCK
  - ALL OTHER MATERIALS ARE CONTRACTOR FURNISHED

DRAFT PLANS
Not for Construction

PREPARED BY:

ENGINEERS
PLANNERS
SURVEYORS
# SCHEDULE OF QUANTITIES

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>15101</td>
<td>MOBILIZATION</td>
<td>LUMP SUM</td>
<td>ALL</td>
<td>TRAFFIC CONTROL, FIRE PROTECTION, EQUIPMENT CLEANING, AND ANY MAINTENANCE OF EXISTING RFS ROADS FOR CONTRACTOR ACCESS IS INDIRECT TO THIS PAY ITEM</td>
</tr>
<tr>
<td>15221</td>
<td>CONSTRUCTION SURVEY AND STAKING</td>
<td>LUMP SUM</td>
<td>ALL</td>
<td>INCLUDES DEWATERING, SEE GENERAL NOTES</td>
</tr>
<tr>
<td>15713</td>
<td>SOIL EROSION &amp; POLLUTION CONTROL</td>
<td>LUMP SUM</td>
<td>ALL</td>
<td>INCLUDES DEWATERING, SEE GENERAL NOTES</td>
</tr>
<tr>
<td>20301</td>
<td>REMOVAL OF EXISTING CORRUGATED STEEL PIPE, METHOD A</td>
<td>EACH</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>20411</td>
<td>UNCLASSIFIED BORROW EXCAVATION, PLACEMENT METHOD 2</td>
<td>CUBIC YARD</td>
<td>115 CQ</td>
<td>GOVERNMENT SOURCE, ASSUMES 20% OF EXCAVATED MATERIAL IS UNSUITABLE. QUANTITY IN-PLACE AND NOT ADJUSTED FOR SHRINK/SWELL.</td>
</tr>
<tr>
<td>25101</td>
<td>PLACED RIPPED, CLASS 2</td>
<td>CUBIC YARD</td>
<td>12 CQ</td>
<td>GOVERNMENT SOURCE</td>
</tr>
<tr>
<td>55217</td>
<td>FAST-IN-PLACE CONCRETE MEMBER, CULVERT FOOTING</td>
<td>LINEAR FOOT</td>
<td>158</td>
<td>INCLUDES FURNISHING AND PLACING ALL REINFORCING</td>
</tr>
<tr>
<td>60393</td>
<td>12'-0&quot; SPAN x 61.3' RISE CORRUGATED ALUMINIZED-STEEL STRUCTURAL PLATE ARCH, 0.111&quot; THICKNESS</td>
<td>LINEAR FOOT</td>
<td>78</td>
<td>CORRUGATED ARCH MATERIAL SHALL BE ALUMINIZED STEEL. GALVANIZED STEEL WILL NOT BE ALLOWED. MANUFACTURER TO CERTIFY CULVERT MEETS HL-93 LOADING WITH THE MINIMUM COVER SHOWN ON THESE PLANS.</td>
</tr>
<tr>
<td>62594</td>
<td>SEEDING, DRY METHOD</td>
<td>LUMP SUM</td>
<td>ALL</td>
<td>USE TONGASS SEED MIX. SEE FS55 SECTION 625, APPROXIMATELY = 3390 SQ FT</td>
</tr>
<tr>
<td>64802</td>
<td>PLACED STREAMBED SIMULATION MATERIAL, BED CLASS 22.23, METHOD A</td>
<td>CUBIC YARD</td>
<td>30 CQ</td>
<td>COMMERCIAL SOURCE, SEE SHEET 10 FOR GRADEATION REQUIREMENTS. MATERIAL FROM THE EXCAVATION MEETING THE GRADEATION FOR BED CLASS 3.75 MAY BE SALVAGED AND INCORPORATED INTO THE SIMULATED STREAMBED.</td>
</tr>
<tr>
<td>64804</td>
<td>PLACED STREAMBED CHANNEL ROCK FOR CULVERT BANKS, CLASS CR-2, METHOD A</td>
<td>CUBIC YARD</td>
<td>48 CQ</td>
<td>GOVERNMENT SOURCE, SOME SORTING WILL BE REQUIRED. ROCK SALVAGED FROM THE EXCAVATION MEETING THE GRADEATION FOR CLASS CR-2 MAY BE SALVAGED AND INCORPORATED INTO THE SIMULATED STREAMBED.</td>
</tr>
<tr>
<td>64806</td>
<td>PLACED STREAMBED CHANNEL ROCK FOR ROCK WORKS, RISES, &amp; ISOLATED BUILDERS, CLASS CR-2, METHOD A</td>
<td>CUBIC YARD</td>
<td>14 CQ</td>
<td>GOVERNMENT SOURCE, SOME SORTING WILL BE REQUIRED. ROCK SALVAGED FROM THE EXCAVATION MEETING THE GRADEATION FOR CLASS CR-2 MAY BE SALVAGED AND INCORPORATED INTO THE SIMULATED STREAMBED.</td>
</tr>
</tbody>
</table>

**CQ** = CONTRACT QUANTITY (SEE SECTION 109.628(8) OF THE STANDARD SPECIFICATIONS)

### OPTIONAL ITEMS

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>20901</td>
<td>ROCK EXCAVATION</td>
<td>CUBIC YARD</td>
<td>10</td>
</tr>
</tbody>
</table>

### GENERAL NOTES

**DESIGN**: This structure is designed for HL-93 live loading in accordance with AASHTO LRFD Bridge Design Specifications, 7th Edition.

**HYDROLOGY AND HYDRAULICS**: This structure has been designed to pass a 100-year flood event with a headwater depth to culvert rise ratio less than 0.8. Flow data is provided on Sheet 6.

**SPECIFICATIONS**: Construct the project in compliance with Federal Highway Administration Standard Specifications for Construction of Road and Bridges on Federal Highway Projects (FHWA 14) and applicable Forest Service Supplemental Specifications.

**ROAD WORK**: Depths of all materials are given as final compacted depths. Remove all berm, existing or created, unless designated to remain, to allow drainage of water from the traveled way.

**DEWATERING & EROSION CONTROL PLAN**: Submit a dewatering and soil erosion and sediment control plan to the contracting officer for approval at least seven (7) days prior to beginning work. See Section 159 of the Supplemental Specifications, the notes on Sheet 7, and the general requirements shown on Sheet 11. Construct temporary means to divert the flow of the live stream as necessary to permit work. Do not pump water from excavations directly into the live stream.

**DISPOSAL**: All materials designated for removal become the property of the contractor and are to be disposed of by removing from the forest in an environmentally safe manner in accordance with all local, state and federal requirements. Dispose of excess or unsuitable material at the location designated in FS55 Section 159. Hauling of excess or unsuitable material is incidental to associated work.

**TEMPORARY TRAFFIC CONTROL**: Submit a temporary traffic control plan to the Contracting Officer for approval at least 30 days prior to intended use.

**IN-STREAM WORK**: All in-stream work will be done between June 15th and August 31st. Allowance shall be given to the Forest Service to capture and remove fish and other aquatic organisms from within the construction area prior to and during work activities.

**EQUIPMENT STORAGE**: Storage of all equipment on government lands will be at a location approved by the CO.

**REEDING**: Seed and mulch all disturbed soil that is not within travel way or stream channel. Use Tongass Seed Mix. See FS55 Section 625.

**CONCRETE**: Use Class A(AK) Concrete for Precast members. The required 28-day compressive strength (FC) is 5,000 psi with an entrained air content of 5% ± 1%. Finish all precast elements with an ordinary surface finish. Make all concrete in accordance with an approved mix design. Chamfer all exposed edges of concrete 3/4" and filet all acute angles 3° unless otherwise noted.

**PRIMING STEPS**: Use reinforcing steel of the deformed type conforming to AASHTO M23 (ASTM A615) Grade 60. Concrete cover is as shown, where not shown it must conform to AASHTO. Cut and bend reinforcing steel in conformance with ACI 318. Lap splice bars 2" min.

**WELDING**: Weld in accordance with the Structural Welding Code, AWS D1.1.
See sheet 3 for Floating Layout Points Table.

12'-0" Span x 6'-3" Rise Aluminized Steel Structural Plate Arch

Centerline Culvert (STA 22+72.33) B Centerline Road (STA 22+89.88)

Remove existing culvert
Furnish and place 12 CF Class 4 Riprap. See DETAIL on this sheet

12'-0" Span x 6'-3" Rise Aluminized Steel Structural Plate Arch

Furnish and place 12 CF Class 4 Riprap. See DETAIL on this sheet

Construct Rock Wall, typ. See sheet 9

Tower of Fil, typ.

TYPICAL SECTION

Not to Scale

RIPRAP DETAIL

NOT TO SCALE

The ends of culverts shall not be cut on the drawings, or schedule for in the schedule of items.
DEWATERING AND SOIL EROSION CONTROL NOTES:
1. Protect against soil erosion and sedimentation during dewatering in accordance with FP-14 Section 157, the project permits, Forest Service Handbook (FSH) 238.22, Region 10 BMPs for Erosion Control, and the Guidance for the Invasive Plant Management Program (Kneece 2017). Prepare and submit a site erosion and sediment control plan to the CO for approval.
2. Dewater the excavation in accordance with FP-14 Sections 206 and 157 and the requirements on sheet 12.
3. Contractor should anticipate water infiltrating the excavations.
4. Culvert excavation, riprap and rock fill placement, and backfill are to be completed in accordance with the Contract Specifications. Standing or running water in the work area does not relieve the contractor from meeting the specifications.
5. Dewatering is the sole responsibility of the contractor. Develop and submit to the CO a project-specific dewatering and sediment control plan with the excavation plan for approval. Sheet 11 illustrates the general dewatering requirements and possible methods and equipment and is not considered adequate or complete for this project. Develop and submit a project-specific dewatering plan including drawings and a written outline illustrating and describing proposed layout, methods, and equipment. See sheet 11 for dewatering flows during construction. Approval of the contractor's dewatering plan does not relieve the contractor from completing the work as required. If the contractor's methods are not producing adequate results, the contractor must re-evaluate and submit another dewatering plan. Re-submittal of the dewatering plan, if required, is incidental to the work.

STRUCTURE EXCAVATION NOTES:
1. Complete structure excavation in accordance with FP-14 Section 209.
2. The contractor is solely responsible for excavation support and compliance with all applicable OSPRA regulations.
3. Notify the CO immediately if bedrock or soil unsuitable for construction is encountered.

STRUCTURE BACKFILL NOTES:
1. Backfill limits shown here are the minimum requirements. Place backfill in accordance with FP-14 Section 209, and as shown on these plans, with material meeting the requirements of Subsection 704.06a. Compacted backfill material in accordance with FP-14 Subsection 209.15. Any material outside the Backfill limits shown is considered Road Embankment and the material must meet the requirements of FP-14 Subsection 704.06.
2. It is assumed that material conserved from the structure excavation at this site will meet the requirement for Backfill (704.06a) or Road Embankment (704.06). Some mixing and sorting may be required to meet the material specification. Haul and dispose unsuitable and excess material to the designated waste site. Haul and disposal of unsuitable and excess material is paid for with Item 2041.

NOTE TO SCALE

LIMITS OF EXCAVATION per OSPRA
New structural plate arch on concrete footings

15'-8" Out-to-Out Footings

FOUNDATION FALL

6'-0" Leveling course

FINISHED GROUND

Culvert Backfill limit
Backfill (704-03a)
See "STRUCTURE BACKFILL NOTES" on this sheet.

Material meeting FP-14 Specification 704.06 outside of the Culvert Backfill limits shown.

Existing ground

Approximate culvert excavation limits

Existing corrugated steel pipe

New concrete footings

Edge of existing road

2709.9" Minimum depth of Buried utilities
FOUNDATION NOTES

1. A foundation investigation has NOT been conducted at this site. Rock outcroppings are visible directly above the invert of the existing culvert. It is possible that bedrock will be encountered during excavation for the culvert foundations. Laying the OD immediately if bedrock is encountered within the limits of the foundations shown in these PLANS. In no case should the footing be placed directly on large boulders, or random outcroppings of bedrock without prior approval. If bedrock is encountered adjust the footing depth and footing stem wall height AS SHOWN ON THIS SHEET.

2. Prepare foundation in accordance with Section 208 of the Specifications. Foundation must be approved in writing by the OD prior to placing the concrete.

3. The Contractor may elect to precut the culvert footing but is solely responsible for any resulting rock excavation that may be required. Do not place precut footing directly on rock. The 5" minimum leveling course is required for precast footing placement. Precast footing details are provided on Sheet 12.

NOTE: Provide minimum dimensions shown. Rock excavation required to achieve the minimum dimensions shown is paid for with Optional Item 20401.

ALTERNATE FOUNDATION DETAIL IF BEDROCK ENCOUNTERED ABOVE INTENDED FOOTING ELEVATION

INFORMATIONAL QUANTITIES

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<tbody>
<tr>
<td>STRUCTURAL CONCRETE, CLASS A(42)</td>
<td>Cubic Yard</td>
<td>38.0</td>
</tr>
<tr>
<td>REINFORCING STEEL</td>
<td>Pounds</td>
<td>3200</td>
</tr>
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</table>

Informational Quantities shown above are for the cast-in-place culvert footing and assume maximum stem wall height. Informational Quantities are considered incidental to item 55217.
Construct continuous hardened banks the entire length of the culvert with Class CR-2 Channel Rock.

Slight contraction to bankfull width just upstream of rock weir.

Channel Rock Bank outside of structure. Cover with slash from clearing and grubbing and unsuitable material conserved from excavation. Place seeding on channel banks. Typical of both sides.

Place and embed Isolated Boulder, Class CR-2. See Sheet 10 for layout locations.

Surface and Footer Rocks to be 24”-30” dia. (Channel Rock Class CR-2)

Construct Rock Weirs from Class CR-2 Channel Rock, typ. See DETAIL on this sheet for rock weir details outside of culvert.

Construct Rock Weirs @ ±45’ C-C Typical Spacing

Provide gaps in Surface Rocks outside of culvert for rock weirs outside of culvert.

Bank fill with native streambed material flush with top of surface rocks.

Place Surface Rocks and Footer Rocks as close together as possible so that gaps between any of the rocks are minimal, except as noted.

Key rocks into bank

Flow:

 içerik: 

**ROCK WEIR PLAN**

- Not to Scale

**STREAM PROFILE**

- Not to Scale

**ROCK WEIR PLAN - OUTSIDE CULVERT**

- Not to Scale

**ROCK WEIR DETAILS**

- Not to Scale

**ROCK WEIR & RIB NOTES**

1. Rib rock will be in contact with the adjacent piece and protrude ±3” from stream bed.

2. Very direction, shape, and orientation of the ribs. Ribs to be angled 30°, perpendicular to centerline of pipe. Ribs oriented straight across the channel are not desirable.

3. Rock Weir & Rib placement is 1/4 from designated station shown in profile. The spacing and configuration of rock weirs maybe adjusted in the field by the CO to fit actual streambed conditions.
Construct continuous hardened banks the entire length of the culvert with Channel Rock, Class CR-2. Typical both sides (See FSSS 705.08).

Streambed Simulation Rock, Bed Class 22.23

Footnotes:
1) Inter mix streambed material as directed by CO during placement of Channel Rock Bank to seal voids throughout the section.

2) The final channel bottom should be a dense, well interlocked streambed with low permeability. Compact each layer and fill surface voids by washing in fine material. Use water pressure, tamping rods, and similar hand operated equipment to force fine material into all surface voids.

THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE STREAM FLOW DOES NOT GO SUBSURFACE THROUGH THE CULVERT FOR A 48 HOUR PERIOD AFTER RE-WATERING.

Native material meeting the gradation for the specified Bed Class, and Channel Rock may be salvaged and incorporated into the simulated streambed.
1. Design dewatering flow for construction is 23 CFS.
2. The plan shown here is intended to represent the general dewatering requirements and not applicable to a specific site. Submit a plan specific to the site.
3. Contractor to determine the size of the bypass pipe based on the specified flow.
4. Ensure that the bypass pipe and dam are leak-proof. Do not proceed with construction until the implemented dewatering plan has been inspected and accepted by the CO in writing.
5. Ensure pumps are clean and free of leaks and placed in a containment kit.
6. Excavate drawdown pool for sumps a minimum of 2 feet below the bottom of the excavation and a minimum of 3 feet in diameter.
7. Maintain all elements of the operation in order to dewater the foundation, facilitate construction, prevent harm to aquatic organisms (not just fish) and prevent sediment and turbidity from entering the stream. Construct the dewatering system in a manner which enables USFS biologists to collect and transport organisms from the live channel, just before completion of the diversion dam.
8. Operate pumps (preferably electric) downstream of the bypass dam if the dam does not seal thoroughly. Maintain a pump running 24 hours a day in the downstream sediment retention dam to divert water containing sediment to the forest floor where it will be filtered before entering back into the stream. Leave pumps in position on site even if water discharge drops considerably, to be prepared for storm flows.

NOTES:

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Prior to fabricating precast footings submit for approval shop drawings detailing segment lengths, splice connections, proposed concrete mix design, pick locations, and selected connection for culvert.

Other precast/prefabricated footing options that meet size, strength and functionality of concrete footings shown may be submitted for review and approval.

**NOTICE:** THESE DETAILS ARE TO BE USED ONLY IF THE CONTRACTOR ELECTS TO PRECAST THE FOUNDATION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY ROCK EXCAVATION REQUIRED TO SET THE PRECAST FOUNDATION AT THE ELEVATIONS SHOWN ON SHEET B.