COPPER RIVER WATERSHED PROJECT

Advertisement for Proposal RFP#: EYAK LAKE WEIR-2025

Project Name:
EYAK LAKE WEIR REPLACEMENT

Copper River Watershed Project
511 1st Street
Cordova, Alaska 99574

December 3, 2024

Copper River Watershed Project
DECEMBER 3, 2024
Advertisement for Proposals for RFP EYAK LAKE WEIR - 2025

EYAK LAKE WEIR REPLACEMENT

Enclosed is the pertinent information for use in preparing your proposal. The information will be used as a guide in preparing any subsequent contract. A **non-mandatory pre-proposal conference** will be held on 12/16/2024 at 2 pm AKST at the Copper River Watershed Project (CRWP office, 511 1st St. Cordova, Alaska 99574, for information on site locations for proposed work. All responses to the bidder's questions shall be made to all bidders by addendum. Contact Amy Scudder (*partnership@copperriver.org*, for a Zoom link to participate.

We recommend, but do not require, a site visit before submitting your project bids/proposal.

To maintain the project schedule, all questions must be submitted no later than 5pm AKST on 1/10/2025. For information about the solicitation, contact Amy Scudder at 907-424-3334 or by email address *partnership@copperriver.org*. Email contact is preferred.

All correspondence should include the RFP number #EYAK LAKE WEIR-2025 as the subject line.

Proposals must be received at the Copper River Watershed Project, 511 1st St. PO Box 1560, Cordova, Alaska 99574, **by 5 pm AKT on 1/29/2025**. Office hours are Monday through Friday, 9:00 am – 12:00 pm and 1:00 pm – 5:00 pm, excluding holidays.

Please submit your proposal and any supplementary material by email to Amy Scudder at *partnership@copperriver.org* with a subject line including the RFP number. Submissions will be acknowledged with a receipt email response to the sender.

CRWP expressly reserves the right to waive minor informalities, negotiate changes or reject any and all bids, and to not award the proposed project bid, if in its best interest. "Minor Informalities" means matters of form rather than substance that are evident from the submittal or are inconsequential matters that have negligible effect on price, quantity, delivery, or contractual conditions and can be waived or corrected without prejudice to other bidders.

Sincerely,

Kate Morse

Kate Morse

Executive Director, Copper River Watershed Project

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1.0 GENERAL INFORMATION

1.1 Purpose

The Copper River Watershed Project (CRWP), a non-profit organization working to ensure the long-term sustainability of the Copper River watershed's salmon-based economy and culture, is seeking bids for construction services. CRWP is working with The Eyak Corporation, U.S. Forest Service (USFS), Alaska Department of Fish & Game (ADF&G), Chugach National Forest, U.S. Fish & Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), and Alaska Department of Transportation & Public Facilities (ADOT&PF) to replace the aging weir on Eyak Lake. This project is designed to improve fish passage up and downstream of where the weir is located, while maintaining current water levels to protect important nearshore spawning sites for salmon, in particular Sockeye, as well as maintain current property lines along the lakeshore. The new weir structure, once constructed, will be owned and maintained by the City of Cordova.

The Eyak Lake weir is located at approximately milepost 5.7 on the Copper River Highway, east of the City of Cordova, AK. The weir is located approximately 300 feet upstream of the Copper River Highway bridge (Mari Smith Jones Bridge) over the Eyak River. The weir was constructed in 1972 to re-establish the water surface elevation in Eyak Lake following the 1964 'Good Friday' earthquake. The existing weir was constructed of Z-profile sheet piles. The existing structure is composed of two linear sections of sheet pile, forming a wide 'V' shape in the center of the Eyak Lake outlet. A 12-foot-wide by 1.5-foot-deep 'boat slot' was cut into the sheet pile to allow navigation of shallow draft watercraft. A metal pier was constructed to the west of the boat slot, at the apex of the weir, to aid navigation of the boat slot. The sheet pile weir has deteriorated significantly since its initial construction in 1972, and sections of sheet pile near the boat slot have partially failed. The partially failed sheet pile sections have slightly lowered the crest elevation of the weir and no longer follow the constructed alignment.

Included herein are instructions governing the proposals, a description of the work to be performed, requirements that shall be met to be eligible for consideration, evaluation criteria, and other requirements to be met by each Proposer/Bidder (hereafter referred to as Proposer).

The purpose of this RFP solicitation is to select a Contractor to complete the referenced project. Proposals shall consist of: (1) a Qualifications Proposal, including experience and qualifications, and (2) a Cost Proposal indicating all costs necessary to complete the Work as outlined in this RFP.

Funding for the replacement of the Eyak Lake Weir has been provided by the Exxon Valdez Oil Spill Trustee Council, NOAA, Federal Highways, and the Bipartisan Infrastructure Law (BIL).

The Work presented in this RFP is for the construction services to remove and replace the existing sheet pile weir and reconstruct the stream channel at the outlet of Eyak Lake, consisting of furnishing all labor, equipment, materials, supervision, and other facilities necessary to complete the work set forth in the terms of the Contract (**Appendix A**).

1.2 Scope Of Work And Design Documentation

The Scope of Work, presented in **Appendix B**, describes the pre-construction meetings schedule, the definition of roles, submittals, and other project requirements.

Other design documentation appended to the RFP includes:

- Eyak Lake Weir Replacement Project Plans, **Appendix C**
- Alaska Standard Plans G0-05, Standard Guardrail Hardware, **Appendix D**
- 1972 Weir Drawings, **Appendix E**
- Eyak Lake Weir Replacement Geotechnical Report, **Appendix F**

The Hydrologic and Hydraulic Report will be made available upon request.

1.3 Specifications, Codes, Ordinances, And Standards

The Contractor shall perform all construction in accordance with the Contract Documents, which include the current Alaska Department of Transportation and Public Facilities (ADOT&PF Standard Specifications for Highway Construction (SSHC 2020 Edition, as herein revised and supplemented (**Appendix G**). All Work under this Contract shall comply with the latest edition of all applicable codes, ordinances, standards, and all associated addenda. Refer to the Submittal List in **Appendix H**.

1.4 List Of Permits Acquired By Copper River Watershed Project

- ADF&G Fish Habitat Permit (pending)
- ADF&G Aquatic Resource Permit (pending)
- U.S. Army Corps of Engineers Alaska District (ACOE) Nationwide Permit Pre-Construction Notification (Nationwide Permit 27) (pending)
- Landowner
    - ADOT&PF: ROW Encroachment Permit and Temporary Construction Permit (pending)
    - The Eyak Corporation Land Use Permit (pending)
    - Chugach Corporation Land Use Permit (pending)
    - USFS Special Use Permit (pending)
- Alaska Department of Natural Resources (ADNR) Easement on behalf of the City of Cordova (pending)

1.5 Other Pertinent Information

Select project partners may make property available for the contractor to use as staging areas and temporary material storage sites. **Appendix I** details the location, distance to project site and the land owner contact information. The Contractor must directly contact the landowner for more information and to obtain permission and/or permits prior to use.

The Contractor Performance and Payment Bond that describes the terms of performance guaranty is presented in **Appendix J**.

1.6 Questions

Any questions regarding this proposal are to be submitted in writing to:

Request for Proposal # EYAK LAKE WEIR-2025

Amy Scudder, Partnership Administrator

Copper River Watershed Project

P.O. Box 1560

Cordova, AK 99574

Phone: 907-424-3334

E-Mail: *partnership@copperriver.org* (preferred method of contact)

Please identify the project/title RFP number in the subject line of any correspondence.

CRWP's Office hours of operation are 9:00 a.m. to noon; and 1:00 p.m. to 5:00 p.m. local time Monday through Friday, excluding CRWP holidays. Due to time constraints on this project, all questions regarding the scope of work should be received prior to the deadline indicated on the RFP cover letter.

1.7 Preparation Costs

CRWP shall not be responsible for proposal preparation costs nor for costs including attorney fees associated with any (administrative, judicial or otherwise) challenge to the determination of the highest ranked proposer and/or award of contract and/or rejection of the proposal. By submitting a proposal each proposer agrees to be bound in this respect and waives all claims to such costs and fees.

2.0 RULES GOVERNING COMPETITION

2.1 Examination of Proposal

Proposers should carefully examine the entire RFP and any addenda thereto, and all related materials and data referenced in the RFP. Proposers should become fully aware of the nature of the work and the conditions likely to be encountered in performing the work.

2.2 Proposal Acceptance Period

Award of this proposal for construction is anticipated to be announced within 30 Calendar Days of the submission deadline specified in the cover letter, January 29, 2025, although all offers must be complete and irrevocable for 60 Calendar Days following the submission date. A pre-bid conference will be held on 12/16/2024 at 2 p.m. local time at the CRWP office allowing for proposers to visit the site and return for in-house questions. Bidders unable to participate in person may connect via Zoom. Contact Amy Scudder at *partnership@copperriver.org* to receive Zoom information.

Attendance at the pre-proposal conference is highly recommended but not mandatory. Responses to Bidders' questions shall be made to all proposers by addendum.

2.3 Proposal Format

Proposals are to be prepared in such a way as to provide a straight-forward, concise delineation of the proposer's capabilities to satisfy the requirements of this RFP. Emphasis should concentrate on:

1. Conformance to the RFP instructions;
2. Responsiveness to the RFP requirements; and
3. Completeness and clarity of content.

Marketing and/or company brochures included as part of the proposal response shall be considered general information and not a response to these RFP requirements. Such material shall be submitted only as attachments and shall not be used as a substitute for written responses. In case of a conflict between the content in any attachments and the contractor's answers in the body of the proposal, the latter shall prevail.

2.4 Signature Requirements

All proposals must be signed. A proposal may be signed: by an officer or other agent of a corporate contractor, if authorized to sign contracts on its behalf; a member of a partnership; the owner of a privately-owned contractor; or other agent if properly authorized by a power of attorney or equivalent document. Signature on the 'Letter of Transmittal' will meet this requirement.

Failure to sign the Proposals is grounds for rejection. The name and title of the individual(s) signing the proposal must be clearly shown immediately below the signature.

2.5 Proposal Submission Requirements

A proposal (Qualification and Bid) must be received by the CRWP prior to the date and time specified in the cover letter. Copies may be bound or enclosed in folders/binders or e-mailed as the proposer chooses.

The submission for the RFP shall consist of two proposals: A Qualifications Proposal and a Bid Proposal. The Qualifications Proposal and Bid Proposal must be sealed in separate envelopes,

each indicating the name of the contractor, project name and number, stating respectively, 'Qualifications Proposal' and 'Bid Proposal.' *The two sealed envelopes shall be contained within a third sealed envelope.* If submitting by email, please attach the Qualifications Proposal and the Bid Proposal labeled accordingly as separate .pdf files.

The Proposal shall, at a minimum, contain the following information:

1. Fully executed Proposal.
2. Items required under Section 3 - Proposal and Submission Requirements.

All proposals should be plainly marked as a Request for Proposal Response with the Number and Title prominently displayed on the outside of the package.

Proposals must be delivered, mailed or emailed to:

Amy Scudder, Partnership Administrator

Copper River Watershed Project

P.O. Box 1560

Cordova, AK 99576

partnership@copperriver.org

2.6 Disposition of Proposals

All materials submitted in response to this RFP will become the property of CRWP.

2.7 Oral Change/Interpretation

No oral change or interpretation of any provision contained in this RFP is valid whether issued at a pre-proposal conference or otherwise. Written addenda will be issued when changes, clarifications, or amendments to proposal documents are deemed necessary by CRWP.

2.8 Modification/Withdrawal of Proposals

A Proposer may withdraw a proposal at any time prior to the final submission date by sending written notification of its withdrawal, signed by an agent authorized to represent the agency. The respondent may thereafter submit a new proposal prior to the final submission date; or submit written modification or addition to a proposal prior to the final submission date. Modifications offered in any other manner, oral or written will not be considered. A final proposal cannot be changed or withdrawn after the time designated for receipt, except for modifications requested by CRWP after the date of receipt and following oral presentations.

2.9 Late Submissions

Proposals not received prior to the date and time specified in the cover letter will not be considered and will be returned unopened after recommendation of the award.

Rejection of Proposals

CRWP reserves the right to reject any or all proposals if determined to be in the best interest of the CRWP.

3.0 PROPOSAL AND SUBMISSION REQUIREMENTS

3.1 Proposer's Checklist/Instructions to Bidder

Proposers are advised that notwithstanding any instructions or implications elsewhere in this Request for Proposal only the documents shown and detailed on this sheet need be submitted with and made part of their proposal. Other documents may be required to be submitted after proposal time, but prior to award. Proposers are hereby advised that failure to submit the documents shown and detailed on this sheet shall be justification for rendering the proposal nonresponsive.

REQUIRED DOCUMENTS TO BE SUBMITTED WITH THE PROPOSAL:

☐ **Qualification Proposal.** To achieve a uniform review process and obtain the maximum degree of comparability, it is required that the proposals be organized in the manner specified below in Sections 3.2 through 3.9. Proposals shall not exceed ten (10) pages in length (excluding letter of transmittal, resumes, title page(s), index/table of contents, forms, initial construction schedule, attachments, or dividers). The Past Performance Evaluation Questionnaire Form included in RFP **Appendix K** - QUALIFICATION PROPOSAL FORMS **(REQUIRED)** is also not included in the ten (10) page maximum count. Information in excess of those allowed will not be evaluated. One page shall be interpreted as one side of single-spaced, typed, 8-1/2" X 11", piece of paper. One 11" X 17" sheet shall count as two pages.

☐ **Bid Proposal**. Proposal consisting of four (4) pages numbered BP-1 of 4 through BP-4 of 4. The bid proposal summary page and the final page the schedule must be signed where indicated in the bid proposal. (see **Appendix L**, pg. 3 and 4)

☐ **Addenda.** All issued addenda shall be acknowledged in the space provided on the Proposal sheet (BP-1) or by manually signing the Addenda sheet and submitting it prior to the proposal opening.

3.2 Title Page

Show the RFP number and subject, the name of your firm, address, telephone number(s), name of contact person, and date.

3.3 Table of Contents

Clearly identify the materials by section and page number.

3.4 Letter of Transmittal

Limited to two (2) pages, briefly state your firm's understanding of the services to be performed and make a positive commitment to provide the services as specified.

Give the name(s) of the person(s) who are authorized to make representations for your firm, their titles, address, and telephone numbers.

The letter must be signed by a corporate officer or other individual who has the authority to bind the firm.

3.5 Relevant Project Experience

Provide a list of projects completed in the last five years that demonstrate:

- Successful use of dewatering techniques appropriate to the Eyak Lake project site.
- Successful construction of hydraulic structures (e.g. weirs, dams, diversions, sea walls, docks)
- Successful construction of channels, grade control structures, roughened riffles and fish habitat improvement.

For each project, prepare a project summary including a project description, contract award amount, total cost of change orders, construction schedule, key contractor personnel, and the Contracting Officer and Project Engineer's phone number and email. Hydraulic Structures and Habitat Restoration Project Experience Form included in **Appendix K** - QUALIFICATION PROPOSAL FORMS.

3.6 Firm Profile and Professional Qualifications

Provide a table or chart that shows organizational structure, chain of supervision, decision authority, and communications. Include both the respondent firm and any subcontractors. Provide professional qualifications and resumes of the firm's proposed Project Manager, Superintendent, and other key personnel. Include all personnel that will actively be involved with performing the work, to include a listing of all subcontractors, if any, with an explanation of purpose. Indicate any experience that key contractor or subcontractor personnel have in constructing hydraulic structures, channel restoration projects, roughened riffles, or fish habitat improvements.

3.7 Project Understanding/Project Approach

Narrative submittal must address the construction schedule, dewatering approach, method for acquiring materials, materials storage plan, heavy equipment, quality control, unloading and transport of materials, and traffic control. Proposer should include a clear plan to complete construction within the habitat permit window. An initial construction schedule using the critical path method (CPM) is required to be submitted to demonstrate the project approach; the initial CPM schedule is not included in the ten (10) page maximum count.

3.8 Past Performance

Past performance will be evaluated based on previous contracts with Government agencies and private industry in terms of cost control, quality of work, and compliance with performance schedules. Complete Past Performance Evaluation Contact Information table for each project (minimum of 3, up to a maximum of 6) for similar services performed for work preferably in Alaska during the last five years, with the name, email, and phone numbers of the Contracting Officer and Project Engineer for each contract. Past Performance Evaluation Information is included in **Appendix K** - QUALIFICATION PROPOSAL FORMS **(REQUIRED**.

3.9 Cost

Provide Costs as indicated on the Bid Proposal Form within a sealed separate envelope, or if emailed, as a separate .pdf attachment.

4.0 EVALUATION CRITERIA AND PROCESS

4.1 Criteria

The Proposer shall be evaluated under two major areas: Qualifications and Cost. The criteria to be considered during evaluations, and the associated point values, are as follows:

Qualifications:	**55 points possible**
1. Hydraulic Structures and In-Stream Channel Construction Experience	15 Points
2. Firm Profile and Professional Qualifications	10 Points
3. Project Understanding/Project Approach	10 Points
4. Past Performance	20 Points
Cost:	**45 points possible**
5. Cost	45 Points
Total Points Available	***100 Points***

4.2 Qualitative Rating Factor

Firms will be ranked on the non-cost components of the proposal using the following qualitative rating factors for each RFP criteria:

1.0 Outstanding

0.75 Good

0.50 Average

0.25 Poor

0.0 Unsatisfactory

The rating factor for each criteria category will be multiplied against the points available to determine the total points for that category.

EXAMPLE: For the evaluation of the Hydraulic Structures and Habitat Restoration Project Experience factor, if the evaluator determines the response as provided was “Good” a “qualitative rating factor” of 0.75 would be assigned for that criterion. The final score for that criterion would be determined by multiplying the qualitative rating factor of 0.75 by the maximum points available 15 and the resulting score of 11.25 would be assigned to the experience factor. This process would be repeated for each criterion.

4.3 Quantitative Rating Factor

The Proposer with the lowest total costs submitted receives the 45 points maximum. All other proposers receive points based on their submitted costs, as it relates to the lowest costs, using the following formula:

(Lowest Bid Proposal/Bid Proposal) x 45 Points

Example: Contractor A, submitted cost $450,000 (low)
Contractor B, submitted cost $500,000
Contractor C, submitted cost $550,000
Contractor D, submitted cost $600,000

Proposers receivP points as follows:

Contractor A, 45.00 points
Contractor B, 40.50 points
Contractor C, 36.82 points
Contractor D, 33.75 points

The evaluation committee may disqualify bids that are so low they are insufficient to cover the direct costs associated with the contract requirements.

4.4 Evaluation Process

A committee of individuals representing CRWP, the City of Cordova, USFWS, ADOT&PF, and the Engineer will perform an independent evaluation of the qualification proposals and will not receive information regarding bid amounts. Initially, the committee will rank each Qualifications Proposal as submitted. A Proposer must receive a minimum score of 30 points on the Qualifications Proposal (Items 1-4) in order for the correlative Bid Proposal to be evaluated and scored and added to the Qualification Proposal to yield a Total Score. The purpose of the minimum score requirement is to ensure that the proposer has a high level of experience and qualifications with which to accurately and efficiently complete the Work on time. The Cost Proposal of any Proposer that does not receive a minimum score of 30 points as a result of the Qualifications Proposal will not be opened.

CRWP reserves the right to request oral interviews to discuss the Qualifications Proposals with the highest-ranked Proposers. If interviews are conducted, a maximum of three (3) Proposers may be short-listed. A new evaluation sheet will be used to score those Contractors interviewed. The final evaluation of the short-listed Qualifications Proposals will be based on the scores achieved at the second evaluation. The same categories and allowable point ranges will be used during the second evaluation as for the first.

5.0 SELECTION PROCESS

The Proposer with the highest total evaluation score (Items 1-5) will be eligible to be awarded a contract with CRWP. However, CRWP reserves the right to not award a contract with the successful proposer should it be in the CRWP's best interest. CRWP reserves the right to reject any and all proposals submitted.

CRWP will provide:

- Project design Drawings and Specifications.
- Appropriate Design Reports
- Seed mix to be applied according to the design Drawings and Specifications.
- Project inspector to ensure the project is built to specifications.

5.1 Additional Requirements

1. Bidders will not be required to furnish bid bonds or bid security.
2. A Certificate of Insurance for Worker's Compensation and general liability is required before a job contract is signed.
3. An initial construction schedule using the critical path method (CPM) shall be submitted to and approved by CRWP before a job contract is signed.
4. Performance and payment bonds will be required from the selected bidder before a job contract is signed.
5. Pre-construction meetings, as defined in the Scope of Work, are required for the contractor to meet with the Engineer, CRWP, and selected project stakeholders.
6. The contractor shall perform work to the satisfaction of the CRWP and Engineer.
7. No bid will be accepted from any contractor who is not licensed in accordance with the provisions of the Contractor's State license law.

All proposals are due in the CRWP office by 5 PM AKST on 1/29/2025

A receipt will be sent when proposals are received. It is the Proposer's responsibility to ensure the delivery of its proposal. Any specific questions about this project or proposal contents can be directed to Amy Scudder, at 907-424-3334, *partnership@copperriver.org*, or the address above. Email communication is preferred.

APPENDIX A

Contract

COPPER RIVER WATERSHED PROJECT

CONTRACT (SAMPLE)

Request for Proposal: EYAK LAKE WEIR- 2025 Contract Number: EVOS2025

Contractor Name:

Contractor Address:

Check appropriate box:

☐ Individual ☐ Partnership ☐ Joint Venture ☐ Sole Proprietor
☐ Corporation Incorporated under the laws of the State of _____

Owner: COPPER RIVER WATERSHED PROJECT

Contract for: EYAK LAKE WEIR REMOVAL AND REPLACEMENT

BID SCHEDULE	ITEMS	AMOUNT
A		$
B		$
C		$
D		$
TOTAL		**$**

Total amount of contract expressed in words: _____

_____and 00/100 Dollars.

THIS CONTRACT, entered into by the COPPER RIVER WATERSHED PROJECT and the individual, partnership, or corporation named above, hereinafter called the Contractor, WITNESSETH that the parties hereto do mutually agree as follows: Statement of Work: The Contractor shall furnish all labor, equipment, and materials and perform the Work above described, for the amount stated, in strict accordance with the Contract Documents.

CONTRACT DOCUMENTS

(list to be inserted)

Time being of the essence, the work shall be completed by April 30, 2026

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the Contract Date entered below:

COPPER RIVER WATERSHED PROJECT	**CONTRACTOR**
By:	By:
_____	_____
Signature	Signature
Kate Mores, Executive Director	_____
Name and Title	Name and Title
Date: _____	Date: _____

APPENDIX B

SCOPE OF WORK

APPENDIX B: COPPER RIVER WATERSHED PROJECT

Eyak Weir Replacement Project

SCOPE OF WORK

General

The purpose of this project is to remove and replace the existing sheet pile weir and reconstruct the stream channel at the outlet of Eyak Lake.

All construction shall be completed in accordance with the Alaska Department of Transportation and Public Facilities (DOT&PF) Standard Specifications for Highway Construction (SSHC) 2020 Edition. Project-specific special provisions are provided in **Appendix G**. The requirements contained in the standard specifications and these special provisions are hereby made a part of this solicitation and the resultant Contract.

The project is adjacent to the Copper River Highway, MP 5.7, Cordova, Alaska, near the following water bodies:

Waterbody Name	ADF&G Site Number	CRWP ID	Latitude	Longitude	Road Name
Eyak Lake	212-10-10050-0010	Eyak Lake Outlet	60°31'54.85"N°	145°38'44.80"W	Copper River Highway
Eyak River	212-10-10050				

Time is of the essence for in-water Work. All Work below the Ordinary High Water (OHW) mark must be substantially complete by **04/17/26**, as defined by the Alaska Department of Fish and Game Fish Habitat Permit. All construction activities shall be completed by **05/31/26**.

Contractor shall participate in weekly construction update meetings (in person) with the Owner and their representatives.

The Contractor shall be present for a virtual quarterly meeting prior to construction activities:

- Q1: Post-award Orientation Conference (02/26/2025)
- Q2: Pre-construction Submittal Status Meeting (06/04/2025)
- Q3: Pre-construction Submittal Status Meeting (09/03/2025)
- Q4: Pre-construction Meeting (12/03/2025)

Definition of Roles

Copper River Watershed Project (CRWP) is the Owner; CRWP will retain an Engineer. The Engineer will be the Contractor's primary point of contact.

DOWL is the Engineer of Record for the project.

Permits

Unless stipulated otherwise in the permit requirements, notify regulatory agencies a minimum of 14 Calendar Days before beginning Work.

The Contractor shall coordinate permitting with the Owner to transfer permits to the Contractor, including but not limited to:

- ADF&G Fish Habitat Permit
- ADF&G Aquatic Resource Permit
- U.S. Army Corps of Engineers Alaska District (ACOE) Nationwide Permit Pre-Construction Notification (Nationwide Permit 27)
- Landowner
    - ADOT&PF: ROW Encroachment Permit and Temporary Construction Permit
    - The Eyak Corporation Land Use Permit
    - Chugach Corporation Land Use Permit
    - USFS Special Use Permit
- Alaska Department of Natural Resources (ADNR) Easement on behalf of the City of Cordova

The Contractor shall obtain permits and approvals from:

- Affected utility companies.
- The Eyak Corporation for staging areas (MP 5.0)
- DOT&PF for Special Use Permit, Lane Closure Permit, and Traffic Control Plan
- Alaska Department of Environmental Conservation (ADEC) Construction General Permit
- State of Alaska Department of Natural Resources (DNR) Temporary Water Use Permit

Before any excavation begins at Eyak Lake outlet, the Contractor shall fully execute all permit requirements and maintain a copy of the executed permits at the site during construction.

As more than one acre of land is being disturbed, the Contractor shall obtain a Construction General Permit (the latest version), develop a SWPPP based on that permit, and submit a Notice of Intent (NOI) to ADEC five Working Days prior to construction.

Utility Locates

Contractor shall verify the locations of all underground utilities at the site. Request utility locates from the utilities having facilities in the area. Use the Alaska Digline, Inc. Locate Call Center for the utility locates. The Contractor is requested to inform General Communication Inc. (GCI) of intended construction start date at least 60 Calander Days prior to construction (ospdesign@gci.com).

Submittals

The submittals listed in the table below are required of the Contractor and shall be submitted to the Engineer unless otherwise noted.

Item	Submittal	Specification	Review Type	Timeline
Quality Control Plan	Qualifications of the QC Manager	104-1.01	Approval	At least 14 Calendar Days prior to the Q4 Pre-construction Meeting
	Daily Reports	104-1.01	Information	Within 24 hours
Clearing	Identification of Trees for Removal	201-1.01	Approval	At least 72 hours prior to beginning clearing activities
Removal Of Structure and Obstructions	Disposal plan, waiver of claims, permission and/or permits	202-3.03	Information	At least 72 hours prior to disposal of structure
Concrete	Job Mix Design	501-2.02	Approval	At least 45 Working Days prior to scheduled production
	Concrete Plant Certification	501-3.01	Approval	At least 45 Working Days prior to scheduled production with Job Mix Design
	Concrete Test Reports	501-3.03	Approval	Within 48 hours of tests
	Concrete Placement Plan	501-3.05	Approval	At least 30 Working Days before placing concrete
	Cold Temperature Concreting Plan	501-3.09	Approval	At least 30 Working Days before placing concrete
Reinforcing Steel	Placing Drawings	503-3.01	Approval	At least 14 Calendar Days prior to fabrication
Pile Driving	Pile Driving Plan	505-3.01	Approval	At least 30 Working Days prior to the anticipated start of pile driving
	Certified Test Report	715-2.03	Approval	At least 14 Calendar Days prior to Q2 Pre-construction Submittal Status Meeting
Riprap	Material Source	611-3.01	Information	At least 14 Calendar Days prior to Q2 Pre-construction Submittal Status Meeting
Erosion, Sediment, and Pollution Control	Storm Water Pollution Prevention Plan	641-1.03	Information	At least 21 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting

Item	Submittal	Specification	Review Type	Timeline
Erosion, Sediment, and Pollution Control	SWPPP Inspection Reports	641-2.04	Information	Within 24 hours
Erosion, Sediment, and Pollution Control	Notice of Intent	641-4.01	Information	At least five Calander Days before construction begins
Erosion, Sediment, and Pollution Control	Notice of Termination	641-4.01	Information	Final Stabilization has been achieved on all portions of the site
Construction Surveying and Monuments	Grade Controller(s) Qualification	642-1.01	Approval	At least 14 Calendar Days prior to Q4 Pre-construction Meeting
	Control Point Verification	642-1.01	Information	
	As-built Plans	642-3.01	Approval	Within 14 Calendar Days of substantial completion
Traffic Maintenance	Traffic Control Plan	643-1.03	Information	At least 30 Calendar Days prior to Q2 Pre-construction Submittal Status Meeting
	Construction Phasing Plan	643-1.05	Approval	
Construction Schedule	CPM Construction Schedule	646-2.01	Approval	At least 30 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting
Stream Diversion & Dewatering	Stream Diversion and Dewatering Plan	672-1.02	Approval	At least 21 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting
Waterway	Component Material Sources for Waterway Bed Fill and Capping Layer	690-2.01	Information	At least 14 Calendar Days prior to Q2 Pre-construction Submittal Status Meeting
Waterway	Waterway Construction Plan	690-3.01	Approval	At least 21 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting
Waterway	Vegetative Mat Source	690-3.06	Approval (CRWP)	At least 14 Calendar Days prior to Q2 Pre-construction Submittal Status Meeting

Materials Testing Requirement

The material testing submittals listed in the table below are required for acceptance of materials prior to use on the project. If material testing submittals are not accepted, and additional reviews are required, additional review periods will be necessary.

Material	Submittals Required	Specification	Sampling Frequency	Timeline
Concrete	Slump (ASTM C143) Air Content (ASTM C231) Compressive-Strength Tests (7 & 28 Days) (ASTM C 39) Density (ASTM C138)	501-3.03	The first load of concrete delivered each day, and at least one test for every 50 cubic yards thereafter	Within 48 hours of tests
Riprap	Wear – AASHTO T96	611-2.01	Once per source	At least 14 days prior to preconstruction conference
	Gradation	611-3.01	Once prior to transport to site	At least 14 Calendar Days prior to being transported to site
Base Course C-1	Gradation	703-2.03	Once prior to transport to site	Initial acceptance: At least 14 days prior to placement of materials.
Waterway Bed Fill	Gradation	690-2.01	Once prior to transport to site	Initial acceptance: At least 14 days prior to placement of materials.
Waterway Bed Capping Layer	Gradation	690-2.01	Once prior to transport to site	Initial acceptance: At least 14 days prior to placement of materials.

Other Requirements

Contractor must wash all trucks and equipment in accordance with Section 640 Special Provision prior to mobilization to or from the City of Cordova to ensure that the spread of invasive species is prevented.

Park within the public right-of-way or authorized areas. Do not block private property.

The Contractor shall notify the Engineer at least 72 hours prior to beginning any site Work, including Clearing activities. After site activities commence, a weekly coordination meeting will be held to discuss progress and the construction activities planned for the following week. During the weekly coordination meetings, the Contractor shall notify the Engineer when the following milestone activities are planned for the following week:

- The initial excavation
- Commencing stream diversion activities
- Fish trapping.
- Driving of sheet pile
- Placement of concrete
- First placement of habitat rocks and grade control structures
- First placement of Waterway Bed Fill
- First placement of woody debris banks
- Rewatering of the weir and stream

The Contractor is responsible for relocating trapped fish in accordance with the ADF&G Aquatic Resource Permit. The Engineer and agency/habitat personnel (e.g., ADF&G, USFS, USFWS, etc.), at their discretion, may elect to be onsite during stream diversion and rewatering of the constructed weir to observe trapped fish relocation operations.

The Engineer will not issue the letter of project completion until all Work has been approved in accordance with the requirements defined in the Contract Documents and permits.

The Contractor is required to have a supervisor with authority to make construction-related decisions on-site at all times.

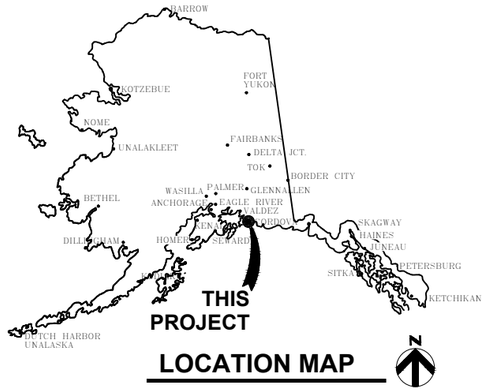
APPENDIX C

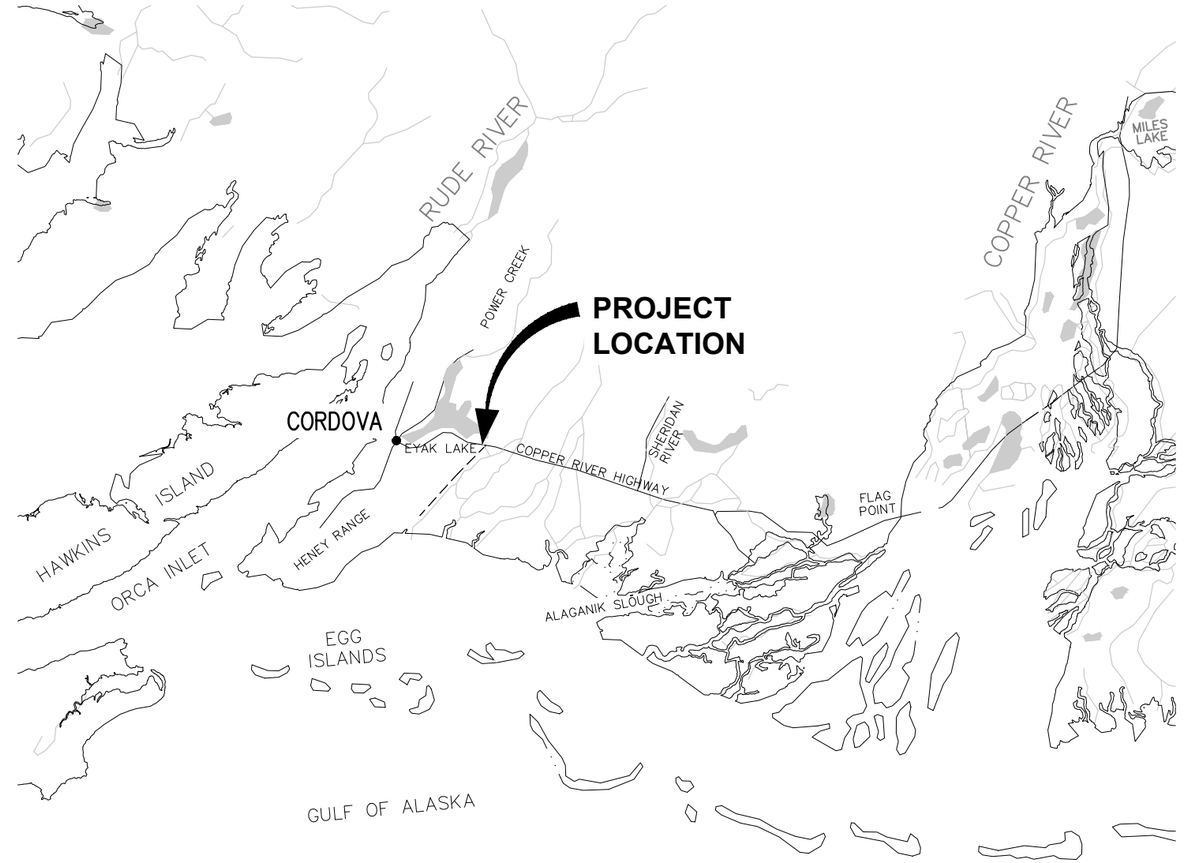
Eyak Lake Weir Replacement Project Plans

Contract Drawings For

EYAK WEIR REPLACEMENT PROJECT
COPPER RIVER HIGHWAY - MP 5.7
EYAK LAKE AND EYAK RIVER
COPPER RIVER WATERSHED PROJECT

SECTION 30 & 31, TOWNSHIP 15 SOUTH, RANGE 2 WEST, COPPER RIVER MERIDIAN, ALASKA
OCTOBER 2024





PROJECT LOCATION	
ADF&G ANADROMOUS WATERS CATALOG CODE	*WATERBODY NAME*
212-10-10050-0010	*EYAK LAKE*
212-10-10050	*EYAK RIVER*

SHEET INDEX

PREPARED BY: DOWL

STATE OF ALASKA
49TH
EUAN-ANGUS MACLEOD
No. CE180639
11/25/24
REGISTERED PROFESSIONAL ENGINEER

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
G1

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL SITE FEATURES. IF THE CONTRACTOR DISCOVERS CONDITIONS OTHER THAN THOSE SHOWN ON THE PLANS, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.
2. PLANS MAY NOT SHOW ALL EXISTING UTILITIES ON SITE. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES BEFORE CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES AND SHALL EXERCISE CAUTION DURING CONSTRUCTION.
4. EXERCISE CAUTION AND COMPLY WITH ALL APPLICABLE OSHA REQUIREMENTS WHILE OPERATING EXCAVATION EQUIPMENT.
5. ALL VEGETATION IN THE AREAS NOT AFFECTED BY WORK SHALL BE PRESERVED AND PROTECTED BY THE CONTRACTOR. PLACE VEGETATIVE MAT OR RESEED ALL DISTURBED AREAS AS DIRECTED IN THE PLANS. THE WORK SHALL BE DONE IN A MANNER THAT PRESERVES EXISTING TREES (INCLUDING SEEDLINGS) AND SHRUBS IN THEIR PRESENT LOCATION TO THE MAXIMUM EXTENT POSSIBLE.
6. NO FIELD FIT CHANGES SHALL BE MADE WITHOUT THE ENGINEER ON SITE AND WITHOUT THE CONCURRANCE OF THE OWNER.
7. THE CONTRACTOR SHALL CONFINE ALL WORK TO THE CONSTRUCTION LIMITS SHOWN ON THE PLANS AND DETAILED IN THE CONTRACT DOCUMENTS.
8. CONSTRUCTION WILL TAKE PLACE ON THE EYAK RIVER AND EYAK LAKE WHICH IS SUBJECT TO PERIODIC FLOODING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF THE SURFACE AND SUBSURFACE WATER DURING THE COURSE OF THE WORK AS DESCRIBED IN SECTION 672-1.02 OF THE SPECIFICATIONS.
9. A LIST OF CONSTRUCTION STAGING AND MOBILIZATION AREAS HAVE BEEN IDENTIFIED IN THE SPECIAL INSTRUCTIONS TO BIDDERS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ARRANGING PERMITS AND PERMISSIONS WITH THE RESPECTIVE LANDOWNERS/AUTHORITIES PRIOR TO MOBILIZATION.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL MATERIAL QUANTITIES.

UTILITY CONTACTS

CORDOVA ELECTRIC COOPERATIVE (CEC)

Clay Koplin – Chief Executive Officer
907-831-6339
ckoplin@cordovaelectric.com

CORDOVA TELEPHONE COOPERATIVE (CTC)

Sarah Kathrein – Project Manager
907-424-2345
sarahk@ctcak.coop

Adrian Smith – Line Foreman
907-424-2145
adrian@ctcak.coop

GENERAL COMMUNICATIONS INCORPORATED (GCI)

Tony Hull – Director of Field Operations
907-727-0472
thull@gci.com

Markus Kofoid – Outside Plant Manager
907-727-9959
mkofoid@gci.com

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES (DOT&PF)

Matthew Myszka – Cordova M&O Foreman
907-424-3202
matthew.myszka@alaska.gov

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	UNIT
201.0007.0000	CLEARING	LUMP SUM	ALL REQUIRED	LUMP SUM
202.0001.0000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP SUM	250	LINEAR FOOT
203.0001.0000	COMMON EXCAVATION	CUBIC YARD	2,684	CUBIC YARD
203.0004.0000	MUCK EXCAVATION	CUBIC YARD	550	CUBIC YARD
501.0002.0000	CLASS A-A CONCRETE	LUMP SUM	104	CUBIC YARD
505.0001.0000	FURNISH AND INSTALL STEEL SHEET PILES	LUMP SUM	4,800	LINEAR FOOT
611.0003.0002	RIPRAP, CLASS II	CUBIC YARD	462	CUBIC YARD
611.0003.0005	RIPRAP, CLASS II, TIE-IN	CUBIC YARD	286	LINEAR FOOT
611.0004.0001	PRIMARY GRADE CONTROL STRUCTURES	LINEAR FOOT	1,925	LINEAR FOOT
611.0004.0002	SECONDARY GRADE CONTROL STRUCTURES	LINEAR FOOT	1,397	LINEAR FOOT
611.0004.0003	DOWNSTREAN TIE-IN	LINEAR FOOT	200	LINEAR FOOT
611.0005.0001	HABITAT ROCKS	EACH	324	EACH
611.0005.0002	HEADER ROCKS	EACH	4	EACH
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQUIRED	LUMP SUM
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQUIRED	LUMP SUM
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQUIRED	LUMP SUM
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQUIRED	LUMP SUM
672.0001.0000	STREAM DIVERSION & DEWATERING	LUMP SUM	ALL REQUIRED	LUMP SUM
690.2001.0000	SALVAGED STREAM BED FILL	CUBIC YARD	2,150	CUBIC YARD
690.2002.0000	WATERWAY BED FILL	CUBIC YARD	3,590	CUBIC YARD
690.2003.0000	WATERWAY BED CAPPING LAYER	CUBIC YARD	260	CUBIC YARD
690.2004.0000	RECLAMATION AND REVEGETATION	LUMP SUM	ALL REQUIRED	LUMP SUM
690.2005.0000	EXCAVATOR, [W/ THUMB, W/OPERATOR]	HOUR	30	HOUR

WATERWAY BED FILL MIX GRADATION

CLASS	% BY WEIGHT
RIPRAP CLASS I	66
BASE COURSE C-1	34

BASE COURSE C-1 MIX GRADATION

SIEVE	% PASSING
1 IN	70-100
3/4 IN	60-90
3/8 IN	45-75
#4	30-60
#8	22-52
#50	6-30
#200	0-6

WATERWAY BED CAPPING LAYER MIX GRADATION

CLASS	% BY WEIGHT
RIPRAP CLASS I	75
FINE AGGREGATE	25

ABBREVIATIONS

CRM	COPPER RIVER MERIDIAN
FT	FEET
GCS	GRADE CONTROL STRUCTURE
H:V	HORIZONTAL TO VERTICAL SLOPE
HAS	HEADED ANCHOR STUDS
CFS	CUBIC FEET PER SECOND
STA	STATION
EL	ELEVATION
ROW	RIGHT OF WAY
MIN	MINIMUM
NTS	NOT TO SCALE
Q	FLOW
OC	STATION
TYP	TYPICAL
TOW	TOP OF WEIR
SCP	SURVEY CONTROL POINT
CEC	CORDOVA ELECTRIC COMPANY
AVAP	AS VERTICAL AS POSSIBLE
ACI	AMERICAN CONCRETE INSTITUTE
DOT&PF	DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

LEGEND

EXISTING FEATURES

- SURVEY CONTROL POINT
- SECONDARY CONTROL POINT
- MISCELLANEOUS PROPERTY CORNER
- SURVEY POINT NUMBER
- WOOD PILE/POLE
- POST
- REFLECTOR/SIGN POST
- TRAFFIC SIGN
- PRIVATE SIGN
- ELECTRIC J-BOX/PEDESTAL
- TELECOM J-BOX/PEDESTAL
- CABLE J-BOX/PEDESTAL
- CULVERT
- TRAFFIC MARKING/STRIPE
- GUARD RAIL
- EDGE OF VEGETATION/BRUSH
- EDGE OF ASPHALT
- CONCRETE STRUCTURE/SURFACE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- RIGHT-OF-WAY LINE
- RIGHT-OF-WAY CENTER LINE
- PROPERTY LINE
- EASEMENT LINE
- UNDERGROUND COMMUNICATIONS LINE
- UNDERGROUND ELECTRICAL LINE

PROPOSED FEATURES

- REFUGE ROCKS AS A COMPONENT OF GCS
- ERATIC REFUGE ROCKS
- PRIMARY GCS
- SECONDARY GCS
- LOW FLOW CHANNEL BANK SUPPORT
- WEIR BACKSLOPE MATERIAL
- PLACED AND COMPACTED STREAMBED MATERIAL
- NATIVE STREAMBED MATERIAL
- PROTECT IN PLACE BANK OR VEG MAT REHAB
- WOODY DEBRIS BANK REHAB
- PROPOSED MAJOR CONTOUR (17.0)
- PROPOSED MINOR CONTOUR
- CENTER OF GRAVITY OF ROCK

ABBREVIATIONS

CTC	CORDOVA TELEPHONE COOPERATIVE
GCI	GENERAL COMMUNICATIONS INC.
M&O	MAINTENANCE AND OPERATIONS
AVG.	AVERAGE
CRH	COPPER RIVER HIGHWAY
HR	HEADER ROCK
SGCS	SECONDARY GRADE CONTROL STRUCTURE
PGCS	PRIMARY GRADE CONTROL STRUCTURE
WS	WATER SERVICE
OHW	ORDINARY HIGH WATER

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Euan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

DOWL AECL848 WWW.DOWL.COM 5015 Business Park Blvd, Suite 4000 Anchorage, Alaska 99503 907-562-2000

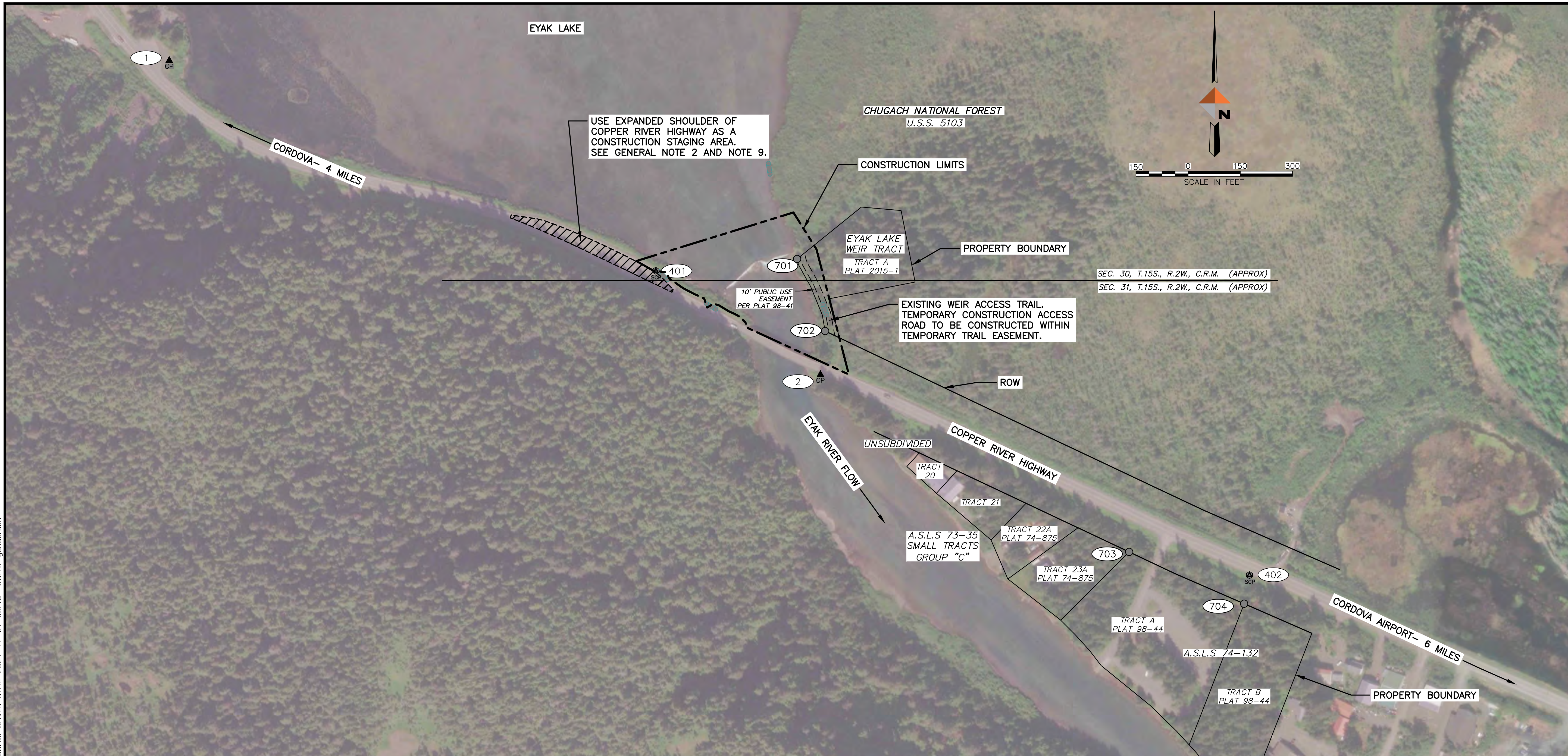
EYAK WEIR REPLACEMENT PROJECT

GENERAL NOTES AND QUANTITIES

CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

SHEET G2



SURVEY CONTROL NOTES

HORIZONTAL CONTROL – ASPC ZONE 3, NAD83(2011)

COORDINATES ARE ALASKA STATE PLANE (ASPC) ZONE 3, NAD83(2011) IN U.S. SURVEY FEET, AND ARE BASED ON AN AVERAGED OPUS SOLUTION AT LOCAL SURVEY CONTROL POINT "ERW-2". THE BASIS OF COORDINATES IS LOCAL SURVEY CONTROL POINT STAMPED "ERW-2", A 2" ALUMINUM CAP SET JUST BEHIND THE SOUTHERN GUARD RAIL OF THE COPPER RIVER HIGHWAY, AT THE SOUTHEAST CORNER OF THE EYAK RIVER BRIDGE, HAVING AN OPUS DERIVED ASPC ZONE 3 VALUE OF N2,386,200.913 AND E1,704,466.959. BEARINGS ARE LOCAL PLANE BEARINGS BASED ON GPS OBSERVATIONS AT LOCAL SURVEY CONTROL "ERW-2".

VERTICAL CONTROL – MLLW

ELEVATIONS ARE MLLW IN U.S. SURVEY FEET, AND ARE BASED ON A STATIC GPS TIE TO THE BASIS OF ELEVATIONS. THE BASIS OF ELEVATIONS IS NOS/NOAA TIDAL BENCHMARK "945 4050 H" (PID BBFS17), POINT 601 THIS SURVEY, A METAL DRIVE ROD IN MON CASE STAMPED "4050 H 1982", SET ALONG THE EASTERN SIDE OF RAILROAD AVENUE, CORDOVA, HAVING AN NOS/NOAA PUBLISHED ELEVATION OF 30.33 FEET.

SURVEY CONTROL POINTS

POINT	NORTHING	EASTING	MLLW ELEV	DESCRIPTION
1	2387104.35	1702594.56	30.85	ALCAP ERW-1
2	2386200.91	1704466.96	32.87	ALCAP ERW-2
401	2386500.04	1703993.62	31.61	SPIKE
402	2385624.50	1705700.59	29.04	SPIKE

RECOVERED MONUMENTS

POINT	NORTHING	EASTING	DESCRIPTION
701	2386533.67	1704399.59	ALCAP: MC/C7 WEIR TRA
702	2386326.56	1704480.50	ALCAP: MC/C1 WEIR TRA
703	2385691.12	1705354.52	ALMON: ROW/TR23/TR24
704	2385542.16	1705685.11	ALCAP: ROW/TRA/TRB

REV	DATE	REVISIONS DESCRIPTION	BY

DOWL
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000
AECL848

EYAK WEIR REPLACEMENT PROJECT

SURVEY CONTROL AND SITE ACCESS NOTES

CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

SHEET G3

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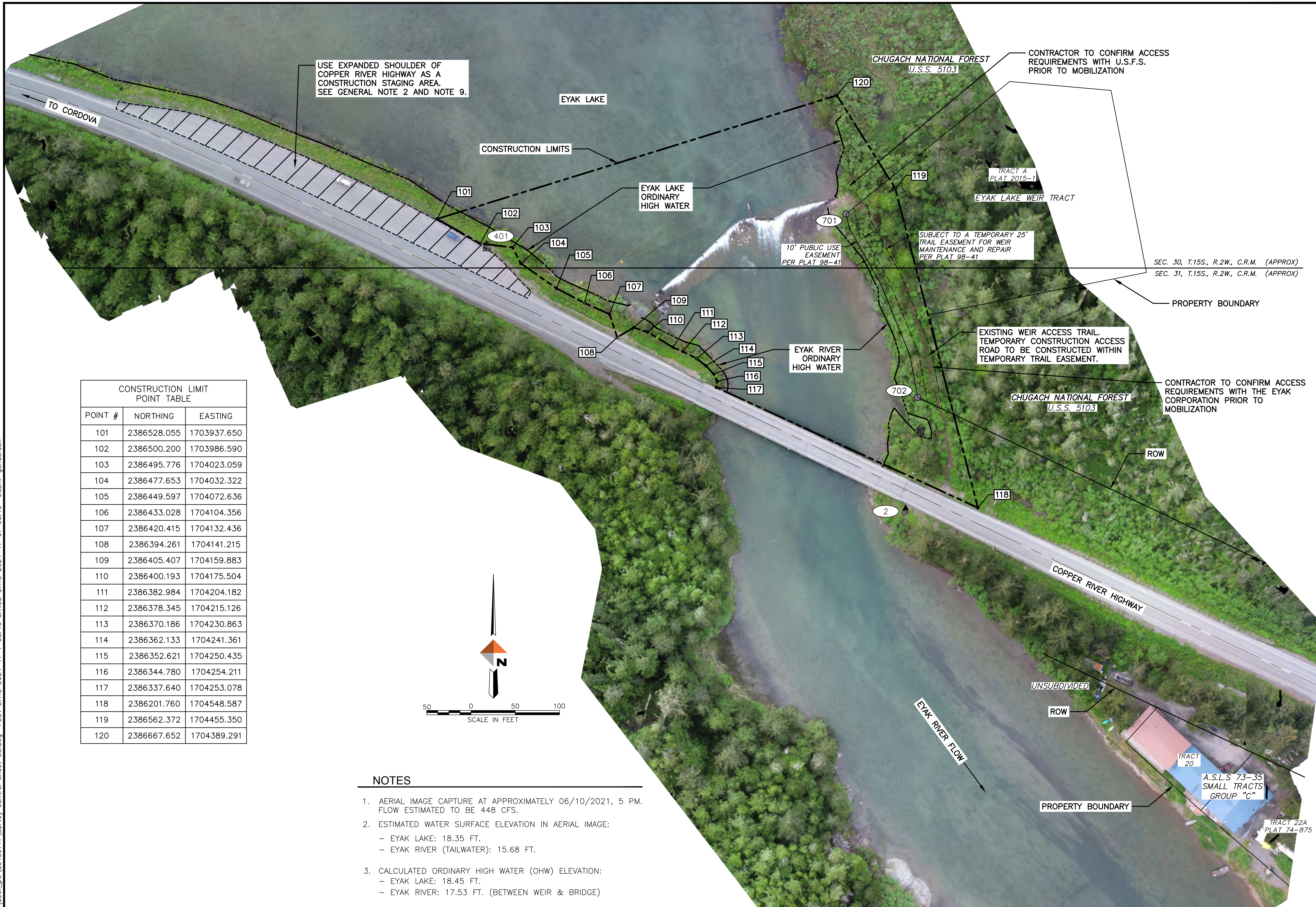

CONSTRUCTION LIMIT POINT TABLE		
POINT #	NORTHING	EASTING
101	2386528.055	1703937.650
102	2386500.200	1703986.590
103	2386495.776	1704023.059
104	2386477.653	1704032.322
105	2386449.597	1704072.636
106	2386433.028	1704104.356
107	2386420.415	1704132.436
108	2386394.261	1704141.215
109	2386405.407	1704159.883
110	2386400.193	1704175.504
111	2386382.984	1704204.182
112	2386378.345	1704215.126
113	2386370.186	1704230.863
114	2386362.133	1704241.361
115	2386352.621	1704250.435
116	2386344.780	1704254.211
117	2386337.640	1704253.078
118	2386201.760	1704548.587
119	2386562.372	1704455.350
120	2386667.652	1704389.291

NOTES

1. AERIAL IMAGE CAPTURE AT APPROXIMATELY 06/10/2021, 5 PM. FLOW ESTIMATED TO BE 448 CFS.
2. ESTIMATED WATER SURFACE ELEVATION IN AERIAL IMAGE:
   - EYAK LAKE: 18.35 FT.
   - EYAK RIVER (TAILWATER): 15.68 FT.
3. CALCULATED ORDINARY HIGH WATER (OHW) ELEVATION:
   - EYAK LAKE: 18.45 FT.
   - EYAK RIVER: 17.53 FT. (BETWEEN WEIR & BRIDGE)

REV	DATE	REVISIONS DESCRIPTION	BY

DOWL
AECL848
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT

SURVEY CONTROL AND SITE ACCESS NOTES (ENLARGED VIEW)

CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
G4

NOTES:

1. CONTRACTOR MAY ACCESS THE WEIR FROM THE RIGHT AND LEFT BANKS.
2. ANY GUARDRAIL AND POSTS REMOVED BY THE CONTRACTOR TO FACILITATE ACCESS TO THE SITE IS REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE STANDARDS OF MASH–TL3 COMPLIANT W31 GUARDRAIL.
3. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ALL DOT&PF PERMITS AND PERMISSIONS TO OBTAIN AND MANAGE SAFE ACCESS TO THE SITE.
4. CEC HAS A CONCRETE VAULT WITH A METAL LID AND CTC HAS A COMPOSITE VAULT ADJACENT TO THE PROPOSED SITE ACCESS. THE CONTRACTOR SHALL PROTECT UTILITIES IN PLACE AND COORDINATE WITH UTILITY COMPANIES TO PROVIDE ADEQUATE PROTECTION FOR VAULTS.

REV	DATE	REVISIONS DESCRIPTION	BY

DOWL
AECL848
www.dowl.com
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT
STAGING AREA ACCESS CONCEPTS
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
G5

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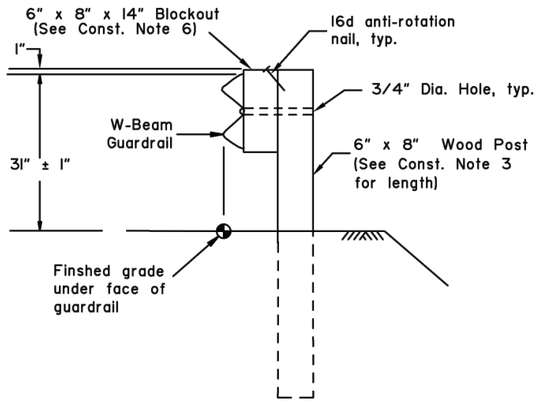
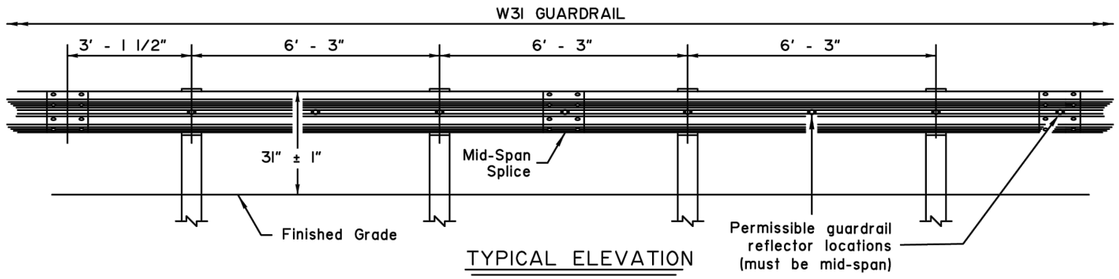
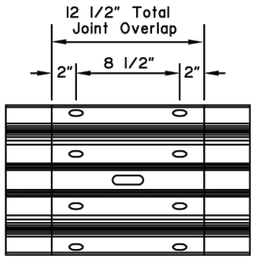


TYPE 1 POST INSTALLATION

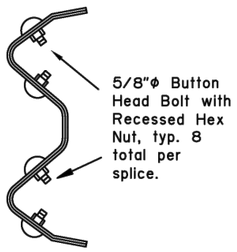


TYPICAL ELEVATION

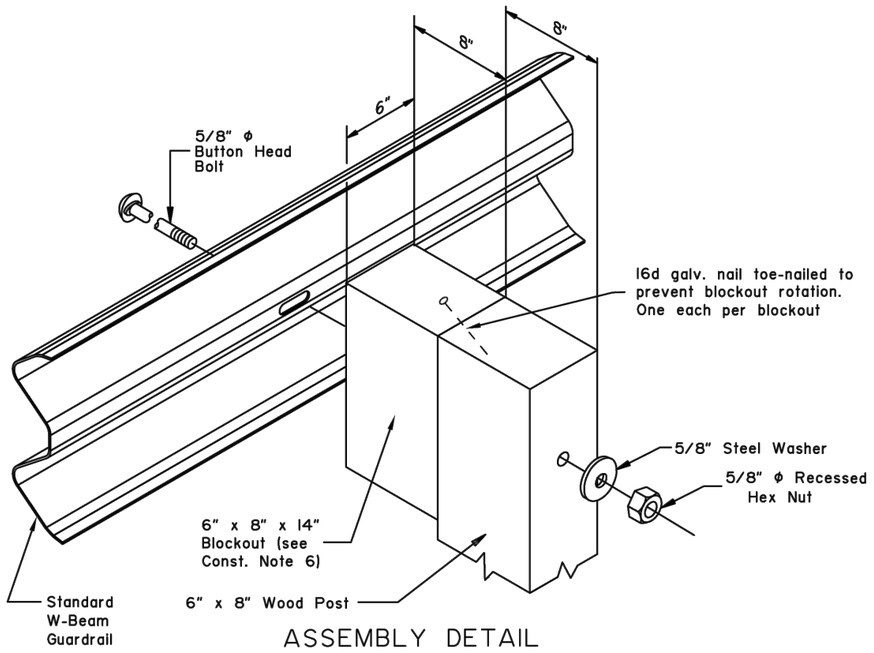


SPLICE DETAIL

(At mid-span between posts only.
Bolts not shown for clarity.)



SPLICE CROSS-SECTION



ASSEMBLY DETAIL

(Type 1 post shown)

CONSTRUCTION NOTES:

1. Provide hardware compliant with the Task Force 13 (TF13) Guide to Standardized Roadside Safety Hardware.
2. See Standard Plan G-00 for hardware details.
3. See Standard Plan G-10 for post lengths corresponding to different combinations of slope and behind-post embankment width.
4. Typical post spacing is 6'-3" center to center.
5. Attach guardrail reflector using a 5/8" button head bolt with 5/8" recessed head hex nut and steel washer at the location shown on the Typical Elevation. Install reflectors every 25' on tangents and every 12.5' on curves starting 100' before the P.C. and ending 100' after the P.T.
6. Use wood blockouts designed, tested, and passed per MASH to be used with wood posts.
7. Use 25 linear foot transition panel to match differing height of existing or new rail elements and end treatments. See Standard Plan G-11.
8. Install flexible delineators on guardrail posts when called for in the contract. See Standard Plan G-00 for guardrail flexible delineator details.

DESIGN NOTES:

1. No fixed objects allowed within 36" of the back side of guardrail post.
2. This barrier is acceptable under MASH tests 3-10 and 3-11.

NOTE:

1. DETAILS OBTAINED FROM STATE OF ALASKA DOT&PF STANDARD PLAN G-05.11W. CONTRACTOR IS TO REFER TO THE ADOT&PF STANDARD DETAILS FOR MORE INFORMATION AND DETAILS ON HOW TO REPAIR/REPLACE GUARDRAIL.

REVISIONS

REV	DATE	DESCRIPTION	BY

DOWL
AECL848
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT

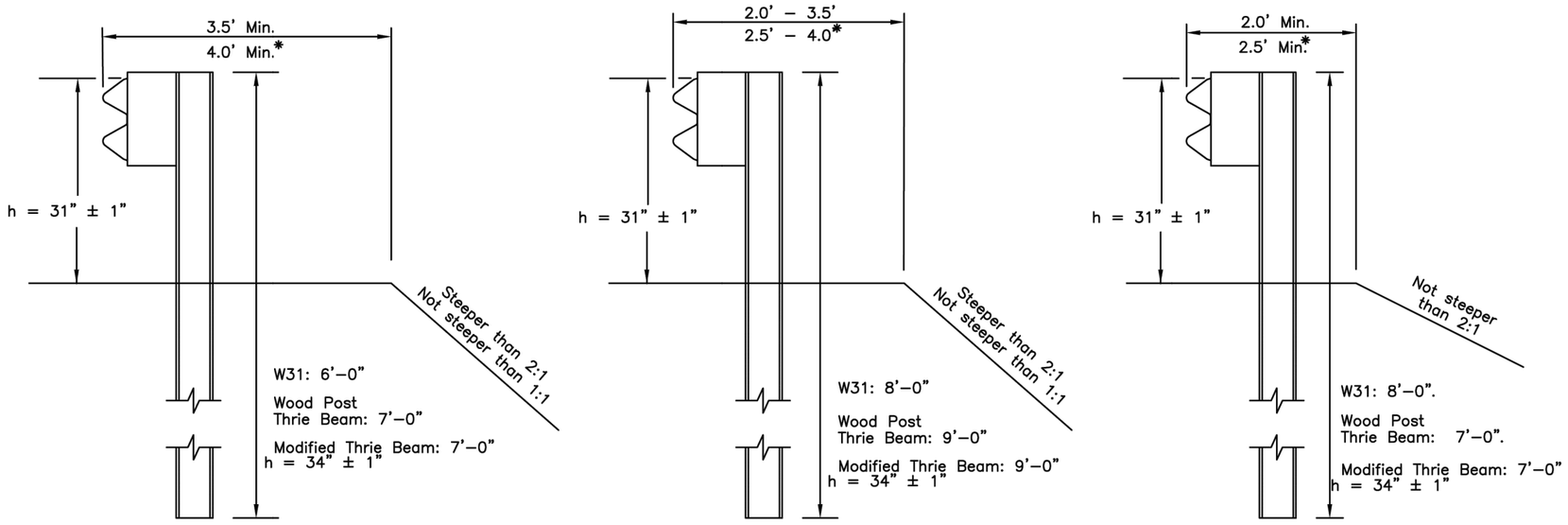
WOOD POST W31 GUARDRAIL

CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET

G6



CASE 1

CASE 2

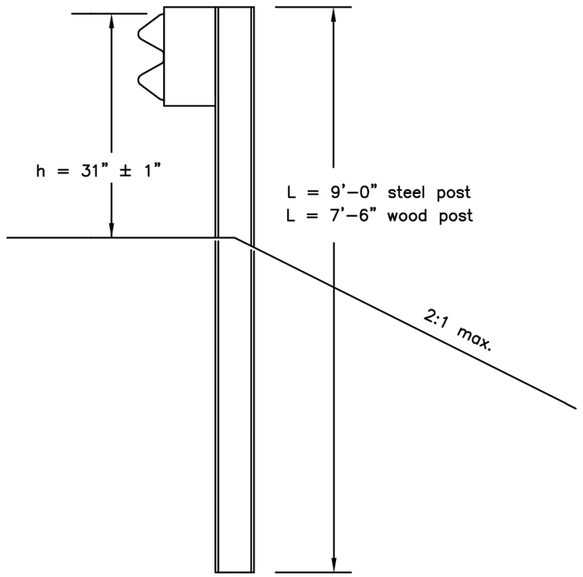
CASE 3

CONSTRUCTION NOTES:

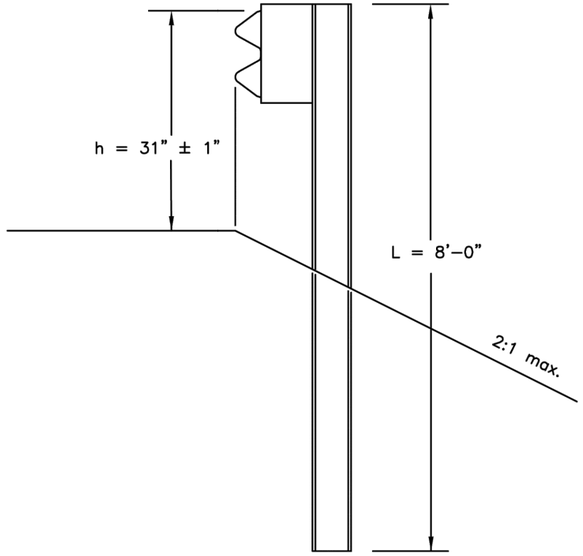
1. This drawings is to be used for post length determination only. See Plans for slopes and behind–post embankment widths.
2. To determine post length, identify the case that matches site conditions and read the length corresponding to the pertinent guardrail type.
3. These dimensions apply to both curbed and uncurbed section.
4. Case 1, 2 and 3 are shown with steel posts. Wood posts may be substituted when allowed by specifications. Wood Post Thrie Beam installations must use wood posts only.
5. Case 4 and 5 apply to W31 guardrail only.

DESIGN NOTES:

1. No fixed objects allowed within 48" of the back of post for Cases 1, 2, 3, 4, and 5.



CASE 4
(See Note 5)



CASE 5
(See Note 5)

NOTE:

1. DETAILS OBTAINED FROM STATE OF ALASKA DOT&PF STANDARD PLAN G–10.21. CONTRACTOR IS TO REFER TO THE ADOT&PF STANDARD DETAILS FOR MORE INFORMATION AND DETAILS ON HOW TO REPAIR/REPLACE GUARDRAIL.

REVISIONS

REV	DATE	DESCRIPTION	BY

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WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT

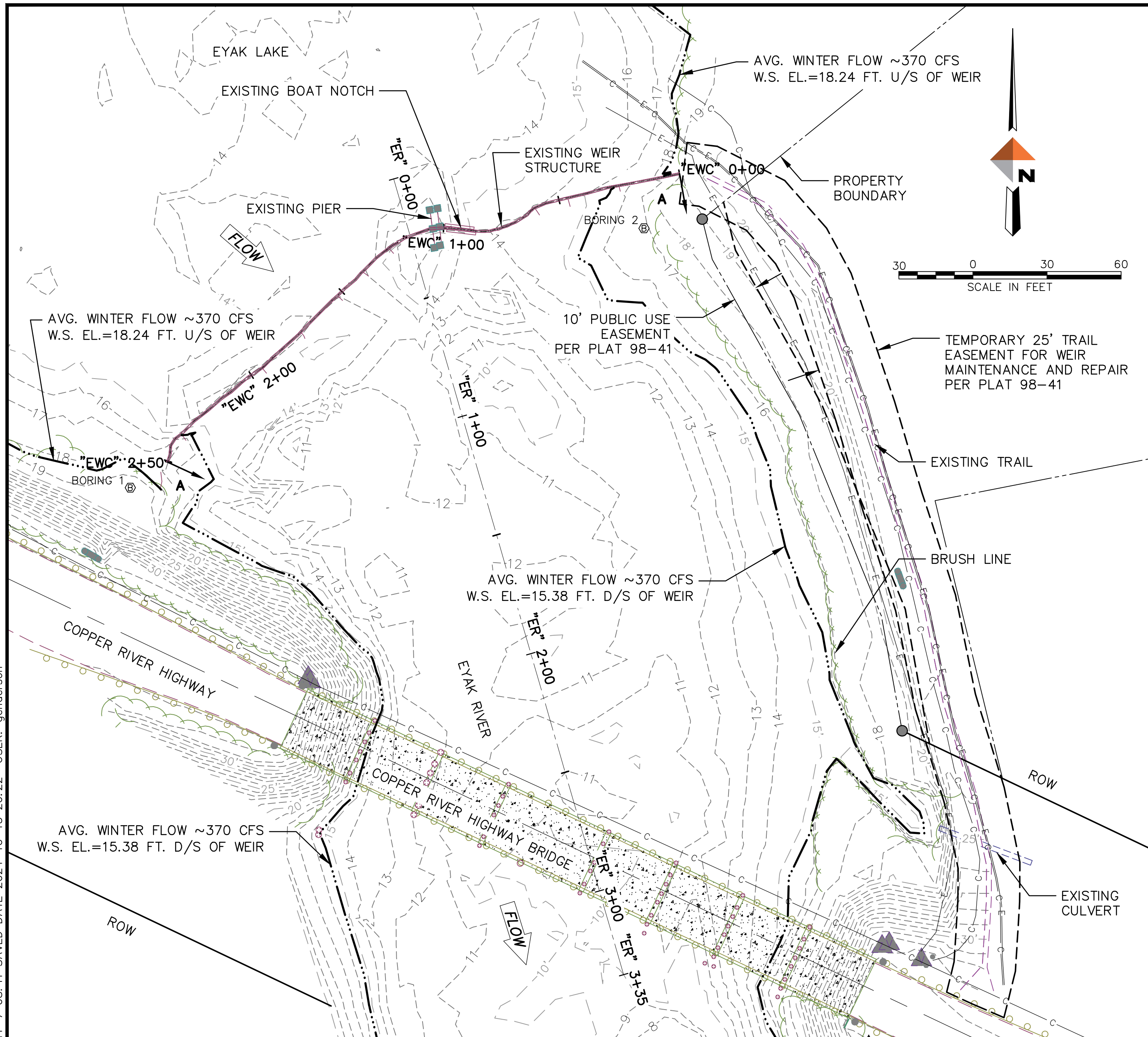
GUARDRAIL POST INSTALLATION

CORDOVA, ALASKA

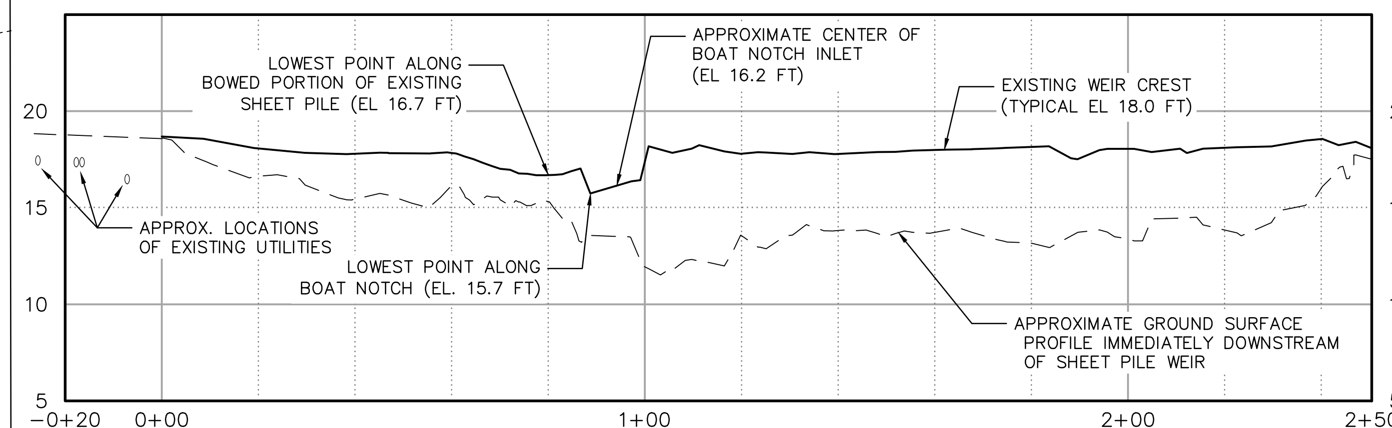
PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET

G7



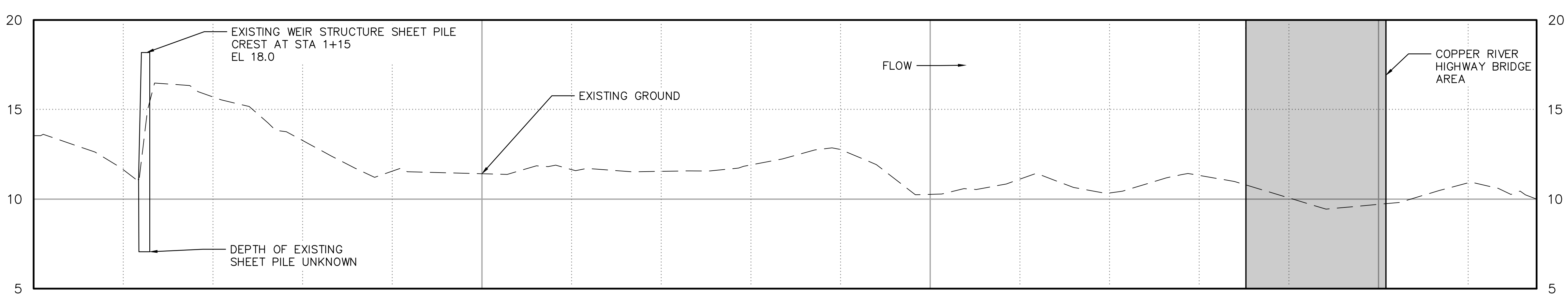
EYAK RIVER – PLAN VIEW



SECTION A–A : EXISTING WEIR CREST – "EWC"
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"= 5'

NOTE:

1. REFER TO THE RECORD DRAWINGS FOR EXISTING SHEET PILE INSTALLATION DETAILS.



EYAK RIVER PROFILE VIEW – "ER"
NTS

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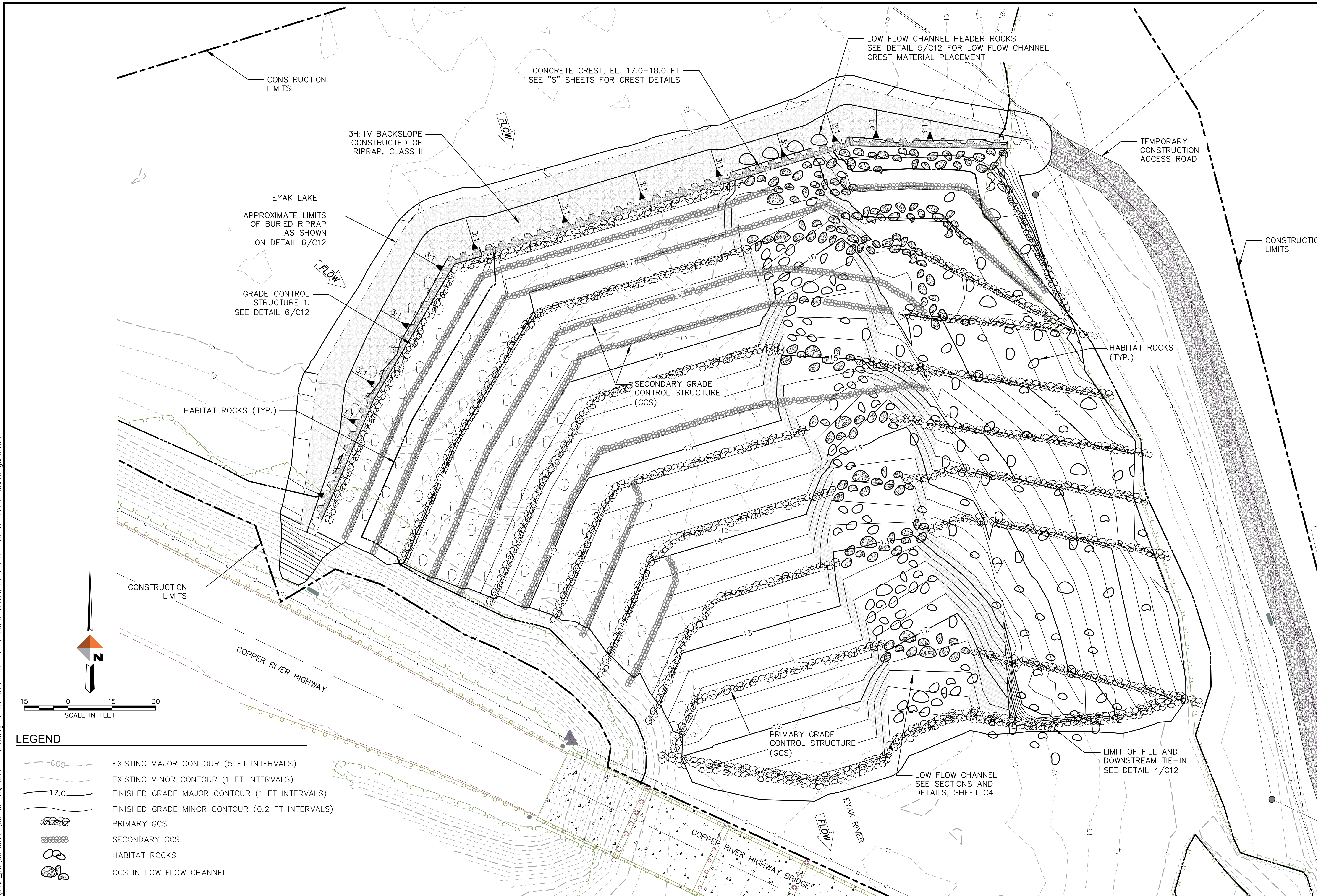
907-562-2000

EYAK WEIR REPLACEMENT PROJECT
EXISTING WEIR – PLAN & PROFILE
CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

SHEET
G8


CONSTRUCTION LIMITS
CONCRETE CREST, EL. 17.0–18.0 FT SEE "S" SHEETS FOR CREST DETAILS
LOW FLOW CHANNEL HEADER ROCKS SEE DETAIL 5/C12 FOR LOW FLOW CHANNEL CREST MATERIAL PLACEMENT
3H:1V BACKSLOPE CONSTRUCTED OF RIPRAP, CLASS II
FLOW
TEMPORARY CONSTRUCTION ACCESS ROAD
EYAK LAKE
APPROXIMATE LIMITS OF BURIED RIPRAP AS SHOWN ON DETAIL 6/C12
CONSTRUCTION LIMITS
GRADE CONTROL STRUCTURE 1, SEE DETAIL 6/C12
HABITAT ROCKS (TYP.)
SECONDARY GRADE CONTROL STRUCTURE (GCS)
HABITAT ROCKS (TYP.)
CONSTRUCTION LIMITS
COPPER RIVER HIGHWAY
PRIMARY GRADE CONTROL STRUCTURE (GCS)
LIMIT OF FILL AND DOWNSTREAM TIE–IN SEE DETAIL 4/C12
LOW FLOW CHANNEL SEE SECTIONS AND DETAILS, SHEET C4
EYAK RIVER
COPPER RIVER HIGHWAY BRIDGE
N
15 0 15 30
SCALE IN FEET
LEGEND
EXISTING MAJOR CONTOUR (5 FT INTERVALS)
EXISTING MINOR CONTOUR (1 FT INTERVALS)
17.0
FINISHED GRADE MAJOR CONTOUR (1 FT INTERVALS)
FINISHED GRADE MINOR CONTOUR (0.2 FT INTERVALS)
PRIMARY GCS
SECONDARY GCS
HABITAT ROCKS
GCS IN LOW FLOW CHANNEL

c:\dowl_pw\d0409711\SC-CH-SG-63341-EYAK.dwg PLOT DATE 2024-11-7 08:42 SAVED DATE 2024-10-11 12:25 USER: genderson

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Euan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

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EYAK WEIR REPLACEMENT PROJECT
SITE PLAN
CORDOVA, ALASKA

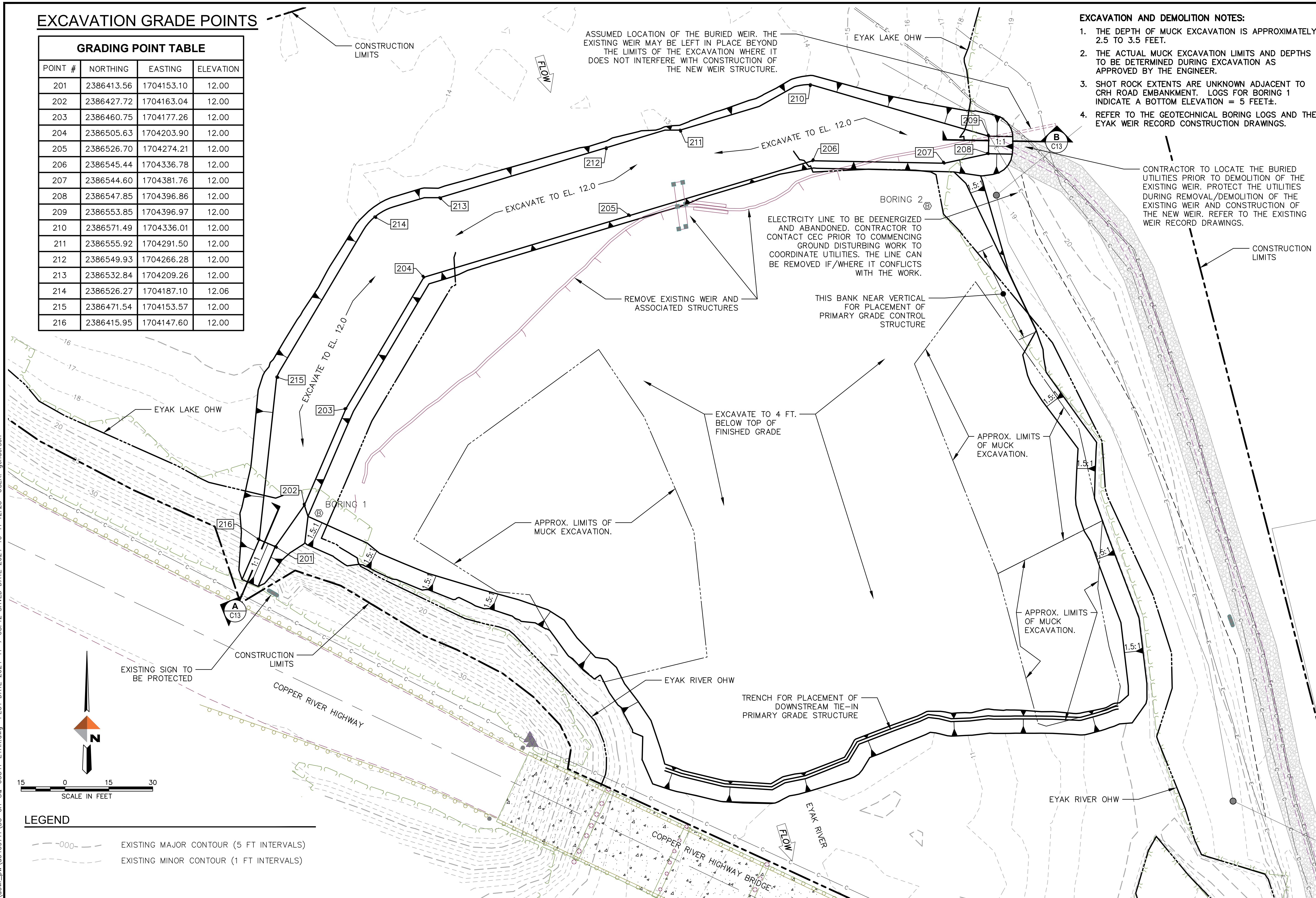
PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
G9

EXCAVATION GRADE POINTS

GRADING POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
201	2386413.56	1704153.10	12.00
202	2386427.72	1704163.04	12.00
203	2386460.75	1704177.26	12.00
204	2386505.63	1704203.90	12.00
205	2386526.70	1704274.21	12.00
206	2386545.44	1704336.78	12.00
207	2386544.60	1704381.76	12.00
208	2386547.85	1704396.86	12.00
209	2386553.85	1704396.97	12.00
210	2386571.49	1704336.01	12.00
211	2386555.92	1704291.50	12.00
212	2386549.93	1704266.28	12.00
213	2386532.84	1704209.26	12.00
214	2386526.27	1704187.10	12.06
215	2386471.54	1704153.57	12.00
216	2386415.95	1704147.60	12.00



LEGEND

- EXISTING MAJOR CONTOUR (5 FT INTERVALS)
- EXISTING MINOR CONTOUR (1 FT INTERVALS)

EXCAVATION AND DEMOLITION NOTES:

1. THE DEPTH OF MUCK EXCAVATION IS APPROXIMATELY 2.5 TO 3.5 FEET.
2. THE ACTUAL MUCK EXCAVATION LIMITS AND DEPTHS TO BE DETERMINED DURING EXCAVATION AS APPROVED BY THE ENGINEER.
3. SHOT ROCK EXTENTS ARE UNKNOWN ADJACENT TO CRH ROAD EMBANKMENT. LOGS FOR BORING 1 INDICATE A BOTTOM ELEVATION = 5 FEET±.
4. REFER TO THE GEOTECHNICAL BORING LOGS AND THE EYAK WEIR RECORD CONSTRUCTION DRAWINGS.

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH
Euan-Angus MacLeod CE 180639
REGISTERED PROFESSIONAL ENGINEER

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Anchorage, Alaska 99503
907-562-2000
AECL848

EYAK WEIR REPLACEMENT PROJECT
EXCAVATION AND DEMOLITION PLAN

CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET C1

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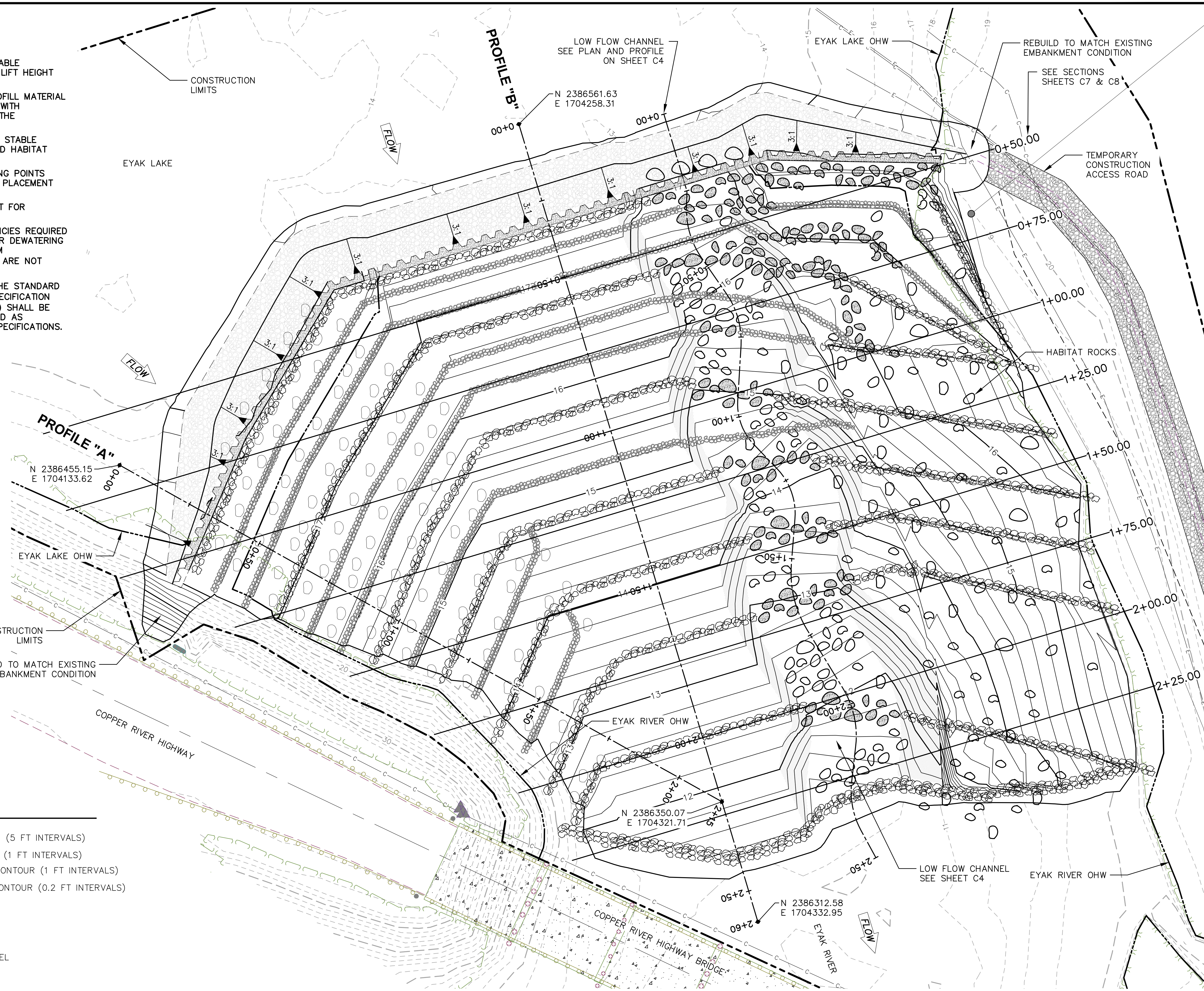
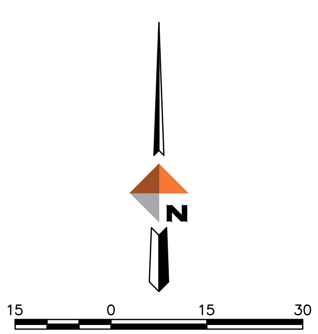
NOTES:

1. THE WATERWAY BEDFILL MATERIAL AND USEABLE EXCAVATION SHALL BE PLACED A MAXIMUM LIFT HEIGHT OF 10 INCH LOOSE LIFTS.
2. COMPACT EACH LIFT OF THE WATERWAY BEDFILL MATERIAL TO 70% RELATIVE DENSITY IN ACCORDANCE WITH SUBSECTIONS 690–3.03 AND 690–3.04 OF THE SPECIFICATIONS.
3. WATERWAY BEDFILL IS TO BE COMPACT AND STABLE BEFORE PLACEMENT OF GRADE CONTROL AND HABITAT ROCKS.
4. FINISHED GROUND SHALL MATCH THE GRADING POINTS DETAILED ON SHEETS C4 AND C5 PRIOR TO PLACEMENT OF CAPPING LAYER.
5. FINISHED GROUND TOLERANCE IS ±0.25 FEET FOR GRADING.
6. APPROVAL OF CLIENT AND PERMITTING AGENCIES REQUIRED BEFORE REWATERING OF CHANNEL. FURTHER DEWATERING TO PROVIDE INSPECTION SUBSIDIARY TO ITEM 672.0001.0000 IF APPROVAL AND/OR FIXES ARE NOT SOUGHT/MADE BEFORE REWATERING SITE.
7. ANY NATIVE GRAVEL OR COBBLE MEETING THE STANDARD OF SELECT MATERIAL B (AS DEFINED BY SPECIFICATION SUBSECTION 703–2.07, SELECTED MATERIAL) SHALL BE CONSIDERED USEABLE EXCAVATION AND USED AS DESCRIBED IN SECTION 690–3.03 OF THE SPECIFICATIONS.





LEGEND

—000—	EXISTING MAJOR CONTOUR (5 FT INTERVALS)
- - -	EXISTING MINOR CONTOUR (1 FT INTERVALS)
—17.0—	FINISHED GRADE MAJOR CONTOUR (1 FT INTERVALS)
——	FINISHED GRADE MINOR CONTOUR (0.2 FT INTERVALS)
	PRIMARY GCS
	SECONDARY GCS
	HABITAT ROCKS
	GCS IN LOW FLOW CHANNEL

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Evan-Angus MacLeod CE 180639 11/15/24 REGISTERED PROFESSIONAL ENGINEER

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WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
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907-562-2000

EYAK WEIR REPLACEMENT PROJECT
FINISHED GRADING
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET C2

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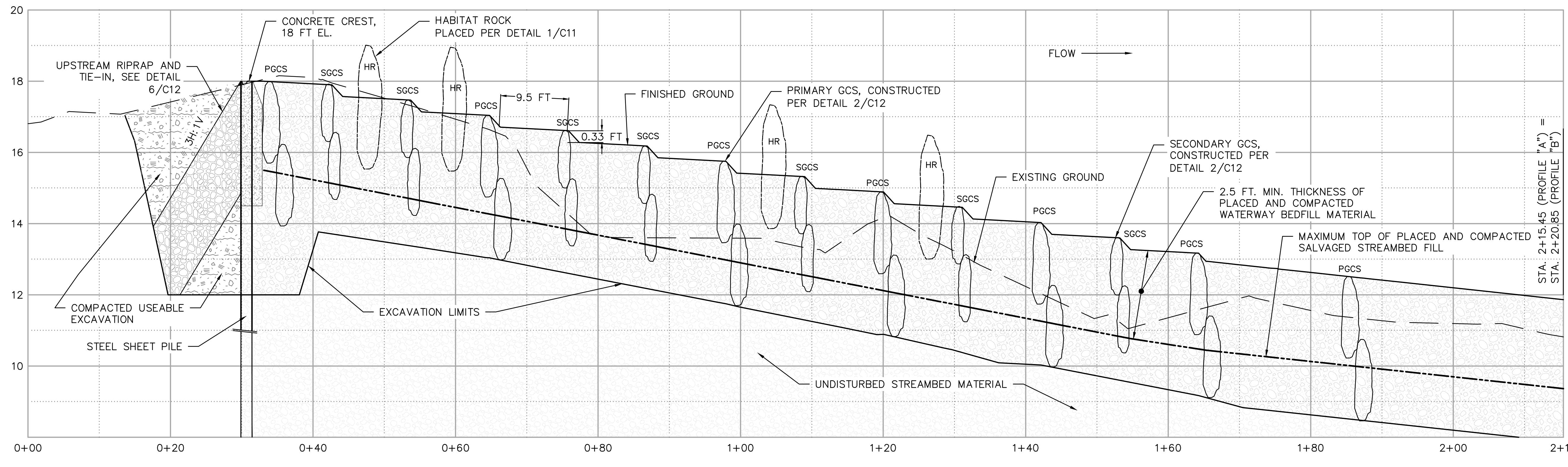
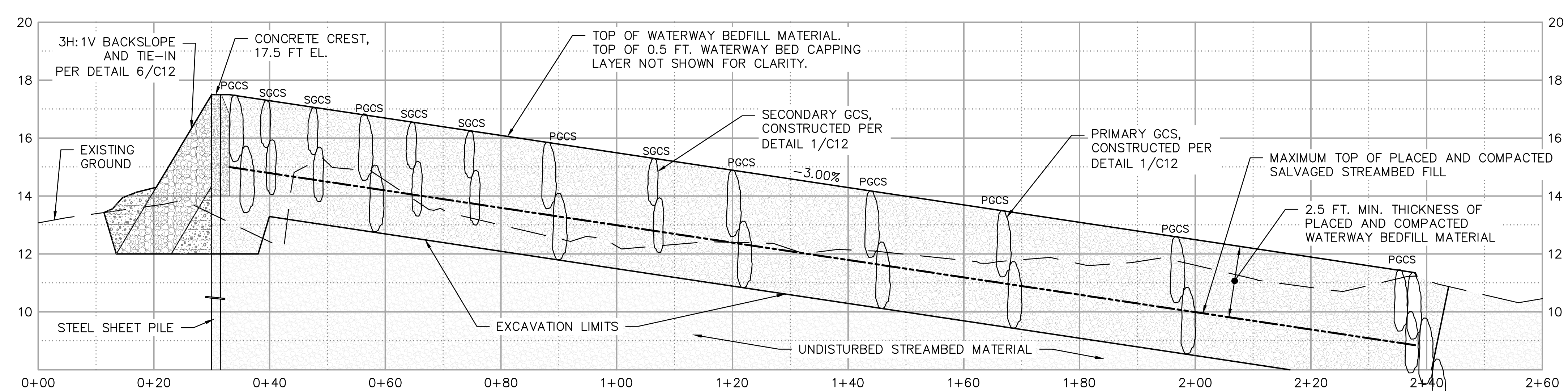


PROFILE "A"

8 0 8 16 HORIZ.
2 0 2 4 VERT.
SCALE IN FEET

ROCK TYPE LEGEND

HRGCS	Habitat Rocks as Grade Control Structure
SGCS	Secondary Grade Control Structure
PGCS	Primary Grade Control Structure
HR	Habitat Rocks



PROFILE "B"

12 0 12 24 HORIZ.
2.4 0 2.4 4.8 VERT.
SCALE IN FEET

STA. 2+20.85 (PROFILE "B") = STA. 2+15.45 (PROFILE "A")

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REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER Ewan-Angus MacLeod CE 180639 11/25/24

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907-562-2000
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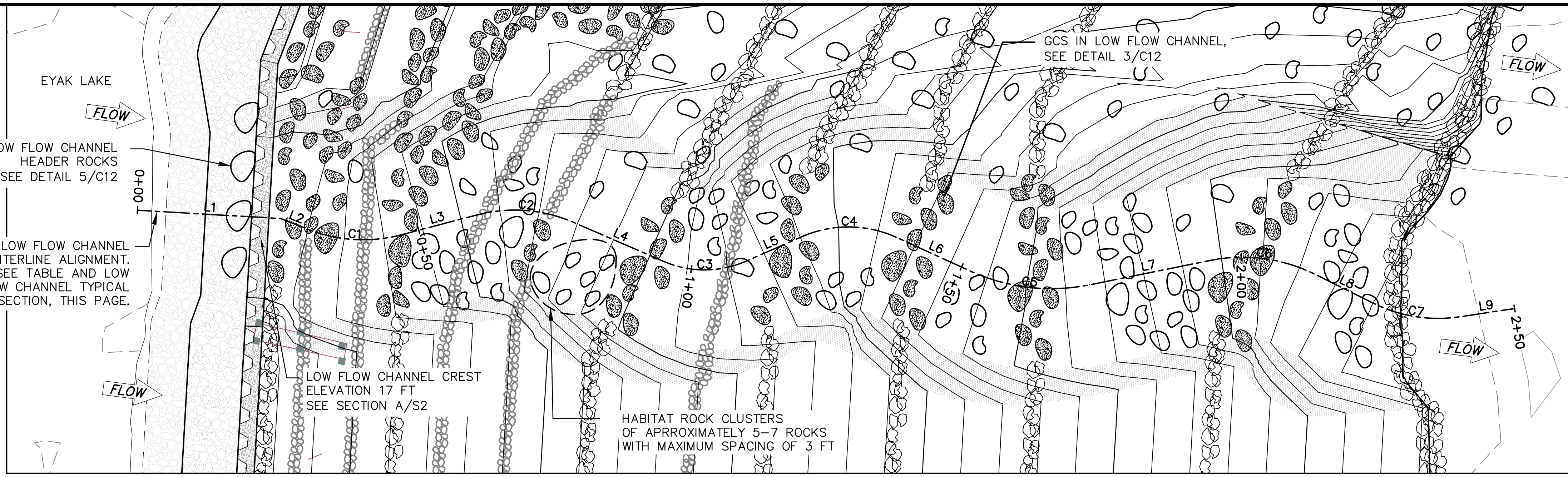
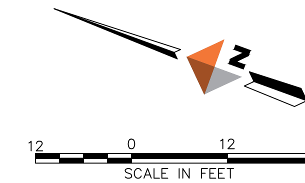
EYAK WEIR REPLACEMENT PROJECT
RAMP PROFILES
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

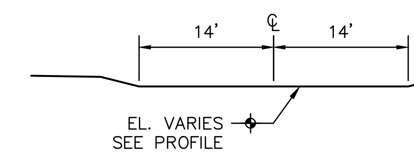
SHEET
C3



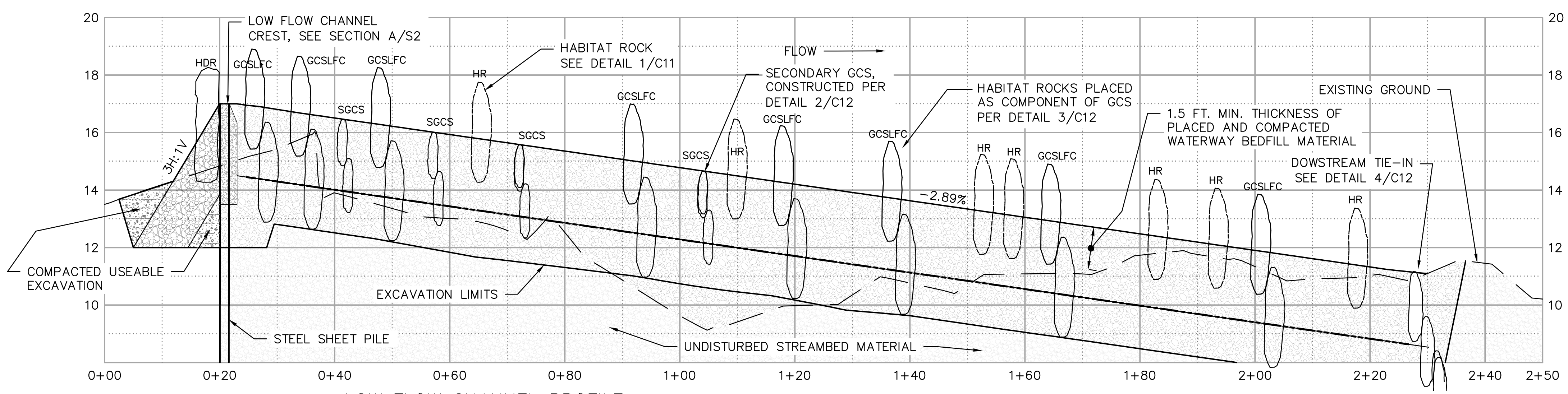


ROCK TYPE LEGEND

PROPOSED STRUCTURE– LOW FLOW CHANNEL



LOW FLOW CHANNEL TYPICAL SECTION



LOW FLOW CHANNEL PROFILE

12 0 12 24 HORIZ.
2.4 0 2.4 4.8 VERT.
SCALE IN FEET

ROCK TYPE LEGEND

HDR	Header Rock
GCSLFC	Grade Control Structure in Low Flow Channel
SGCS	Secondary Grade Control Structure
PGCS	Primary Grade Control Structure
HR	Habitat Rocks

LFC CENTERLINE ALIGNMENT

Number	Start Station	Start Coordinates	End Station	End Coordinates	Tangent/Chord Bearing Length	Curve Data
L1	0+00	N 2386564.76 E 1704303.58	0+25.12	N 2386540.70 E 1704310.79	S16° 41' 01.63"E 25.12'	
L2	0+25.12	N 2386540.70 E 1704310.79	0+30.13	N 2386535.68 E 1704310.65	S1° 39' 54.05"W 5.02'	
C1	0+30.13	N 2386535.68 E 1704310.65	0+46.85	N 2386519.93 E 1704315.33	S16° 32' 49.29"E 16.44'	PI = 0+38.79 N 2386527.03 E 1704310.40 Δ= 36°25'27" R = 26.30' T = 8.65' L = 16.72' E = 1.39'
L3	0+46.85	N 2386519.93 E 1704315.33	0+60.53	N 2386508.69 E 1704323.13	S34° 45' 32.64"E 13.68'	
C2	0+60.53	N 2386508.69 E 1704323.13	0+77.71	N 2386492.45 E 1704327.68	S15° 39' 45.89"E 16.87'	PI = 0+69.45 N 2386501.36 E 1704328.22 Δ= 38°11'33" R = 25.79' T = 8.93' L = 17.19' E = 1.50'
L4	0+77.71	N 2386492.45 E 1704327.68	0+94.98	N 2386475.21 E 1704326.65	S3° 26' 00.86"W 17.26'	

Number	Start Station	Start Coordinates	End Station	End Coordinates	Tangent/Chord Bearing Length	Curve Data
C3	0+94.98	N 2386475.21 E 1704326.65	1+09.77	N 2386461.72 E 1704331.60	S20° 08' 33.67"E 14.37'	PI = 1+02.82 N 2386467.38 E 1704326.18 Δ= 47°09'09" R = 17.97' T = 7.84' L = 14.79' E = 1.64'
L5	1+09.77	N 2386461.72 E 1704331.60	1+20.46	N 2386453.99 E 1704338.99	S43° 43' 08.21"E 10.70'	
C4	1+20.46	N 2386453.99 E 1704338.99	1+37.48	N 2386438.43 E 1704344.53	S19° 35' 33.56"E 16.52'	PI = 1+29.51 N 2386447.45 E 1704345.24 Δ= 48°15'09" R = 20.20' T = 9.05' L = 17.01' E = 1.93'
L6	1+37.48	N 2386438.43 E 1704344.53	1+51.72	N 2386424.22 E 1704343.40	S4° 32' 01.09"W 14.25'	
C5	1+51.72	N 2386424.22 E 1704343.40	1+73.04	N 2386403.83 E 1704348.28	S13° 26' 54.68"E 20.97'	PI = 1+62.75 N 2386413.24 E 1704342.53 Δ= 35°57'52" R = 33.96' T = 11.02' L = 21.32' E = 1.74'

Number	Start Station	Start Coordinates	End Station	End Coordinates	Tangent/Chord Bearing Length	Curve Data
L7	1+73.04	N 2386403.83 E 1704348.28	1+94.58	N 2386385.45 E 1704359.51	S31° 25' 50.46"E 21.54'	
C6	1+94.58	N 2386385.45 E 1704359.51	2+13.34	N 2386367.47 E 1704363.50	S12° 29' 48.23"E 18.42'	PI = 2+04.32 N 2386377.14 E 1704364.59 Δ= 37°52'04" R = 28.38' T = 9.74' L = 18.76' E = 1.62'
L8	2+13.34	N 2386367.47 E 1704363.50	2+24.72	N 2386356.16 E 1704362.22	S6° 26' 14.01"W 11.37'	
C7	2+24.72	N 2386356.16 E 1704362.22	2+40.34	N 2386341.07 E 1704365.17	S11° 04' 09.71"E 15.38'	PI = 2+32.78 N 2386348.15 E 1704361.32 Δ= 35°00'47" R = 25.56' T = 8.06' L = 15.62' E = 1.24'
L9	2+40.34	N 2386341.07 E 1704365.17	2+50	N 2386332.59 E 1704369.80	S28° 34' 33.43"E 9.66'	

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Evan–Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

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WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT
LOW FLOW CHANNEL PLAN, PROFILE AND SECTION
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
C4

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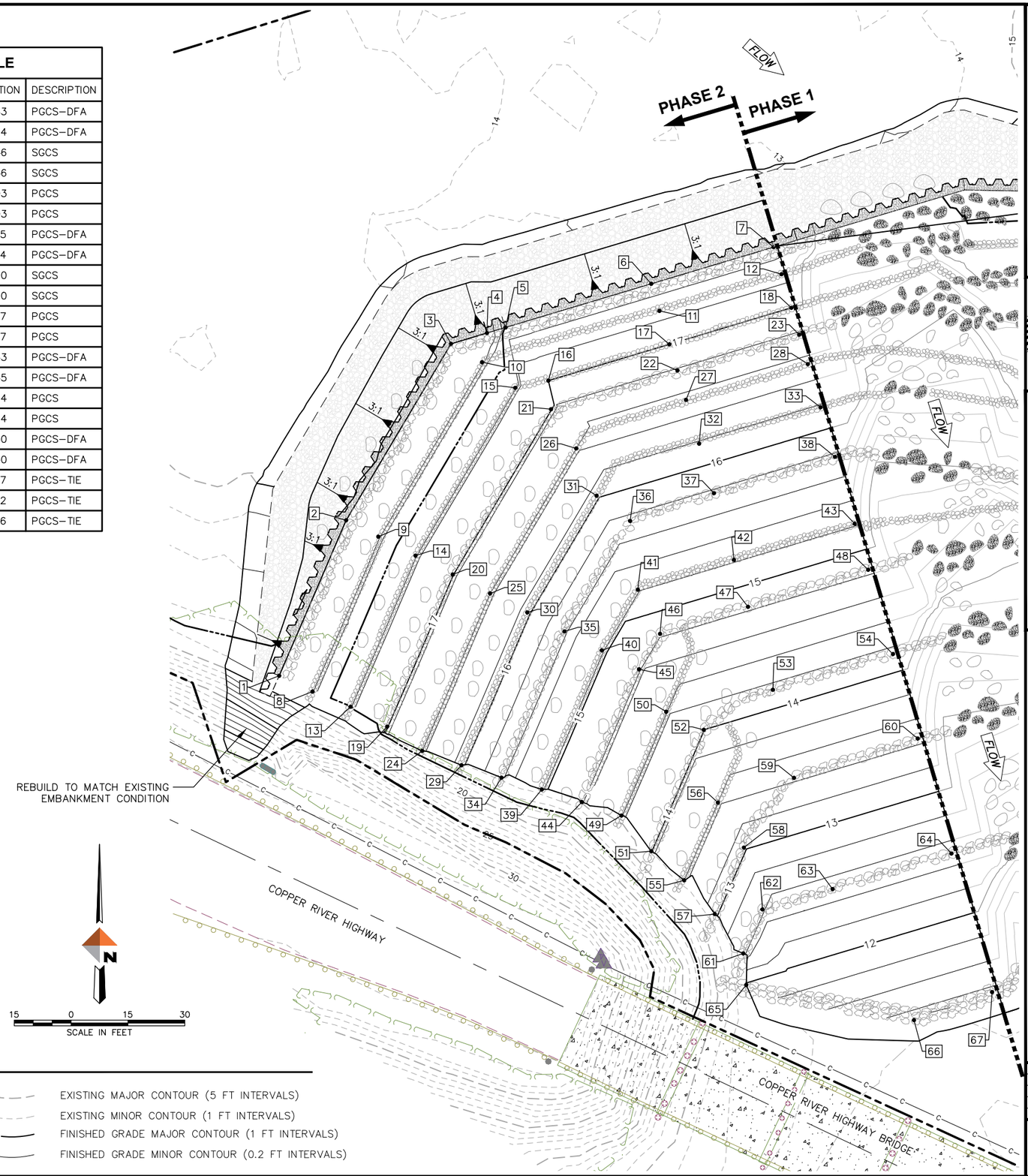
RIGHT SIDE FINISHED GRADE POINTS

GRADING POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	2386422.31	1704155.27	18.00	PGCS–CREST
2	2386463.31	1704172.92	18.00	PGCS–CREST
3	2386509.86	1704200.59	18.00	PGCS–CREST
4	2386512.70	1704210.08	18.00	PGCSCREST
5	2386514.17	1704214.98	17.50	PGCS–CREST
6	2386525.69	1704253.42	17.50	PGCS–CREST
7	2386535.36	1704285.69	17.50	PGCS–CREST
8	2386418.15	1704164.07	17.90	SGCS
9	2386458.99	1704181.41	17.90	SGCS
10	2386505.00	1704208.76	17.90	SGCS
11	2386518.54	1704255.56	17.28	SGCS–DFA
12	2386528.20	1704287.79	17.28	SGCS–DFA
13	2386414.12	1704174.06	17.60	SGCS
14	2386454.00	1704191.23	17.47	SGCS
15	2386498.26	1704217.55	17.47	SGCS
16	2386500.14	1704226.28	17.00	SGCS–DFA
17	2386509.72	1704258.20	17.00	SGCS–DFA
18	2386519.37	1704290.38	17.00	SGCS
19	2386408.91	1704183.75	17.20	PGCS
20	2386449.00	1704201.06	17.04	PGCS
21	2386492.61	1704226.98	17.04	PGCS
22	2386502.83	1704260.32	16.78	PGCS–DFA
23	2386512.26	1704292.47	16.78	PGCS–DFA
24	2386402.50	1704192.99	16.61	SGCS
25	2386444.00	1704210.89	16.61	SGGS
26	2386482.26	1704233.63	16.61	SGCS
27	2386495.08	1704262.59	16.54	SGCS–DFA
28	2386504.52	1704294.74	16.54	SGCS–DFA
29	2386398.71	1704203.34	16.18	SGCS
30	2386439.01	1704220.71	16.18	SGCS
31	2386469.79	1704239.01	16.18	SGCS
32	2386483.52	1704266.06	16.18	SGCS–DFA
33	2386493.12	1704298.09	16.18	SGCS–DFA
34	2386395.43	1704213.91	15.75	PGCS
35	2386434.01	1704230.54	15.75	PGCS
36	2386463.12	1704247.85	15.75	PGCS
37	2386470.47	1704269.97	15.77	PGCS–DFA
38	2386480.05	1704301.92	15.77	PGCS–DFA
39	2386392.31	1704224.55	15.32	SGCS
40	2386429.01	1704240.36	15.32	SGCS
41	2386445.01	1704249.88	15.32	SGCS
42	2386452.85	1704275.25	15.22	SGCS–DFA
43	2386462.40	1704307.10	15.22	SGCS–DFA
44	2386389.00	1704235.11	14.89	PGCS
45	2386424.02	1704250.19	14.89	PGCS
46	2386433.36	1704255.75	14.89	PGCS

GRADING POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
47	2386440.49	1704278.95	14.83	PGCS–DFA
48	2386450.27	1704310.66	14.84	PGCS–DFA
49	2386385.44	1704245.56	14.46	SGCS
50	2386412.82	1704257.36	14.46	SGCS
51	2386376.03	1704253.45	14.03	PGCS
52	2386408.05	1704267.29	14.03	PGCS
53	2386418.61	1704285.51	14.15	PGCS–DFA
54	2386428.03	1704317.19	14.14	PGCS–DFA
55	2386368.34	1704262.10	13.60	SGCS
56	2386388.84	1704271.03	13.60	SGCS
57	2386359.44	1704270.22	13.17	PGCS
58	2386376.98	1704277.87	13.17	PGCS
59	2386395.37	1704291.06	13.43	PGCS–DFA
60	2386405.76	1704323.73	13.45	PGCS–DFA
61	2386349.07	1704277.69	12.74	PGCS
62	2386360.68	1704282.76	12.74	PGCS
63	2386366.04	1704301.27	12.50	PGCS–DFA
64	2386375.43	1704332.62	12.50	PGCS–DFA
65	2386340.75	1704278.49	11.97	PGCS–TIE
66	2386331.47	1704322.74	11.32	PGCS–TIE
67	2386338.88	1704343.35	11.36	PGCS–TIE

DFA = DISPERSED FLOW AREA
PGCS = PRIMARY GRADE CONTROL STRUCTURE
SGCS = SECONDARY GRADE CONTROL STRUCTURE
TIE = TIE TO EXISTING STREAMBED ELEVATION



LEGEND

- EXISTING MAJOR CONTOUR (5 FT INTERVALS)
- EXISTING MINOR CONTOUR (1 FT INTERVALS)
- 17.0 FINISHED GRADE MAJOR CONTOUR (1 FT INTERVALS)
- FINISHED GRADE MINOR CONTOUR (0.2 FT INTERVALS)

REVISIONS

REV	DATE	DESCRIPTION	BY

STATE OF ALASKA 49TH — REGISTERED PROFESSIONAL ENGINEER — Evan Andrew Mustard CE 18639 — 11/25/24

DOWL
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WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT
RIGHT SIDE FINISHED GRADING POINTS
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
C5

c:\dowl_pw\d0409711\SC-CH-SG-63341-EYAK.dwg PLOT DATE 2024-11-7 08:44 SAVED DATE 2024-10-11 12:25 USER: genderson

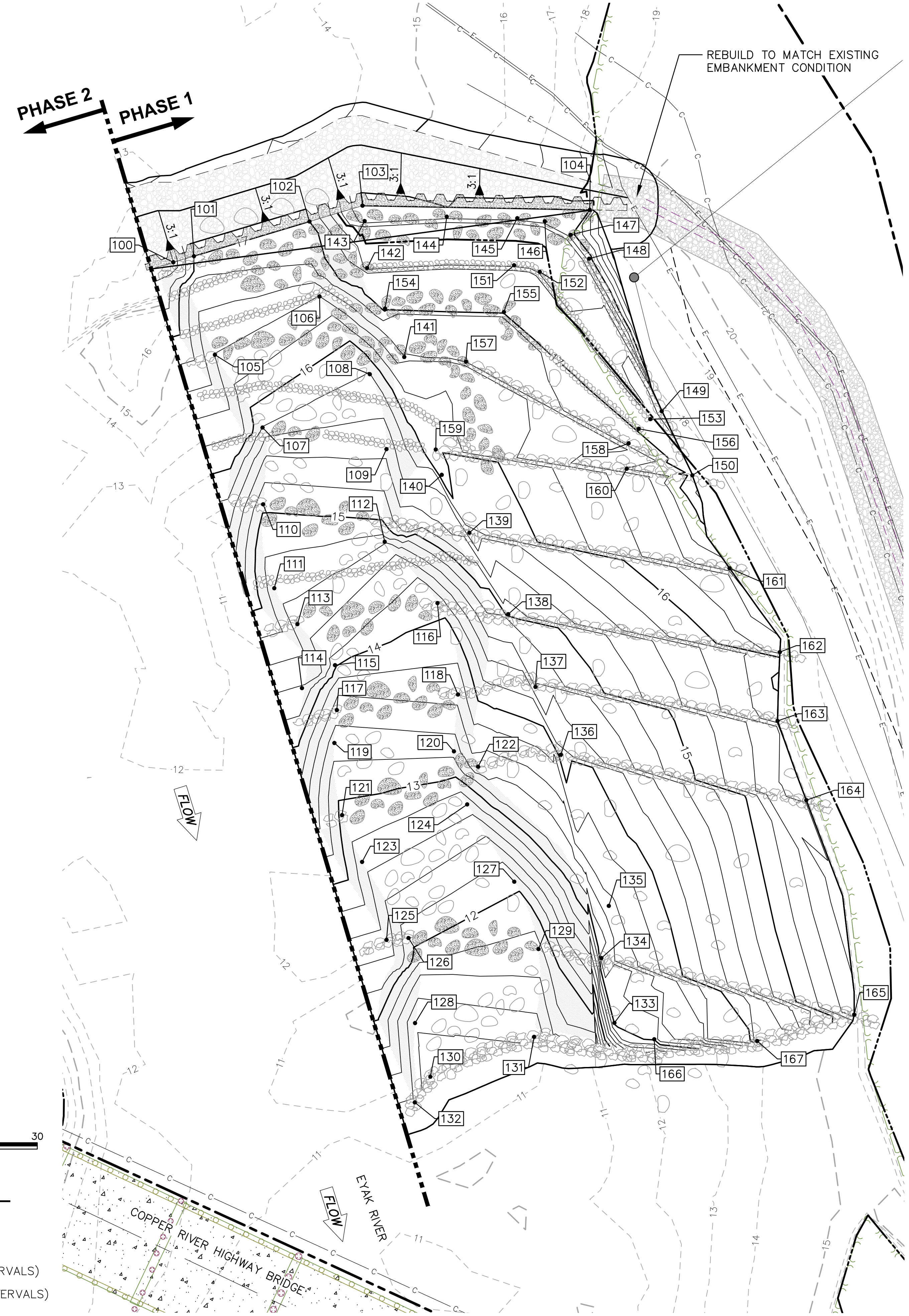
LEFT SIDE FINISHED GRADE POINTS

GRADING POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	2386537.22	1704291.86	17.50	AT CREST
101	2386538.66	1704296.68	17.00	AT CREST
102	2386546.75	1704323.70	17.00	AT CREST
103	2386550.46	1704336.09	18.00	AT CREST
104	2386549.46	1704389.20	18.00	AT CREST
105	2386515.61	1704301.58	16.39	LFC
106	2386529.23	1704326.05	16.39	LFC
107	2386498.60	1704312.72	15.79	LFC
108	2386511.07	1704337.79	15.79	LFC
109	2386493.56	1704341.69	15.44	LFC
110	2386480.66	1704312.86	15.05	LFC
111	2386461.05	1704315.47	14.67	LFC
112	2386471.90	1704341.28	14.67	LFC
113	2386452.66	1704320.88	14.50	LFC
114	2386437.71	1704321.94	14.38	DFA
115	2386443.07	1704329.67	14.06	LFC
116	2386457.57	1704353.62	14.06	LFC
117	2386432.58	1704330.08	13.50	LFC
118	2386436.20	1704358.41	13.66	LFC
119	2386424.88	1704329.52	13.28	LFC
120	2386422.93	1704357.46	13.28	LFC
121	2386408.02	1704331.30	12.94	LFC
122	2386419.33	1704363.11	13.50	LFC
123	2386397.09	1704335.99	12.68	LFC
124	2386410.53	1704360.56	12.68	LFC
125	2386378.86	1704341.71	12.52	DFA
126	2386379.31	1704346.84	12.07	LFC
127	2386392.46	1704371.56	12.07	LFC
128	2386359.42	1704348.37	11.24	LFC
129	2386376.72	1704377.23	11.73	LFC
130	2386346.87	1704351.95	11.03	PGCS–TIE
131	2386356.20	1704376.19	11.24	PGCS–TIE
132	2386340.88	1704348.32	11.37	PGCS–TIE
133	2386359.48	1704394.97	13.02	PGCS
134	2386374.61	1704391.95	13.28	PGCS
135	2386386.81	1704393.67	13.54	PGCS
136	2386422.14	1704382.46	14.12	PGCS
137	2386437.98	1704376.53	14.60	PGCS
138	2386454.98	1704370.15	15.12	PGCS
139	2386474.01	1704361.07	15.74	PGCS
140	2386487.55	1704354.61	16.18	PGCS
141	2386515.09	1704345.86	16.59	PGCS
142	2386535.88	1704337.17	17.47	SGCS
143	2386546.86	1704336.59	17.90	PGCS
144	2386547.89	1704355.79	17.90	PGCS
145	2386547.52	1704372.27	17.90	PGCS

GRADING POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
146	2386546.79	1704378.71	17.90	PGCS
147	2386543.63	1704384.74	17.90	PGCS
148	2386538.07	1704389.08	17.90	PGCS
149	2386502.41	1704406.04	17.30	PGCS
150	2386487.44	1704413.20	17.05	PGCS
151	2386536.53	1704371.53	17.47	SGCS
152	2386534.99	1704377.53	17.47	SGCS
153	2386500.57	1704403.36	17.17	SGCS
154	2386526.40	1704341.36	17.05	SGCS
155	2386525.59	1704369.14	17.05	SGCS
156	2386498.32	1704400.64	17.05	SGCS
157	2386514.00	1704360.28	16.61	PGCS
158	2386494.92	1704398.30	16.93	PGCS
159	2386493.47	1704353.22	16.10	PGCS
160	2386488.98	1704397.86	16.81	PGCS
161	2386465.71	1704421.90	16.74	PGCS
162	2386446.12	1704433.65	16.27	PGCS
163	2386430.04	1704433.11	15.89	PGCS
164	2386411.51	1704439.84	15.73	PGCS
165	2386361.39	1704451.03	15.51	PGCS
166	2386355.64	1704404.30	13.03	PGCS–TIE
167	2386355.23	1704428.36	14.23	PGCS–TIE



N

15 0 15 30
SCALE IN FEET

DFA = DISPERSED FLOW AREA
LFC = LOW FLOW CHANNEL
PGCS = PRIMARY GRADE CONTROL STRUCTURE
SGCS = SECONDARY GRADE CONTROL STRUCTURE
TIE = TIE TO EXISTING STREAMBED ELEVATION

LEGEND

- ---000--- EXISTING MAJOR CONTOUR (5 FT INTERVALS)
- EXISTING MINOR CONTOUR (1 FT INTERVALS)
- —17.0— FINISHED GRADE MAJOR CONTOUR (1 FT INTERVALS)
- FINISHED GRADE MINOR CONTOUR (0.2 FT INTERVALS)

REV	DATE	DESCRIPTION	BY
		REVISIONS	

STATE OF ALASKA 49TH Evan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

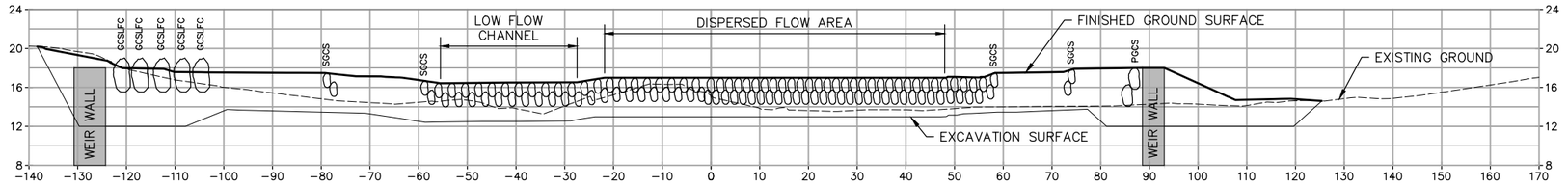
DOWL
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000
AECL848

EYAK WEIR REPLACEMENT PROJECT
LEFT SIDE FINISHED GRADING POINTS
CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

SHEET
C6

0+50.00



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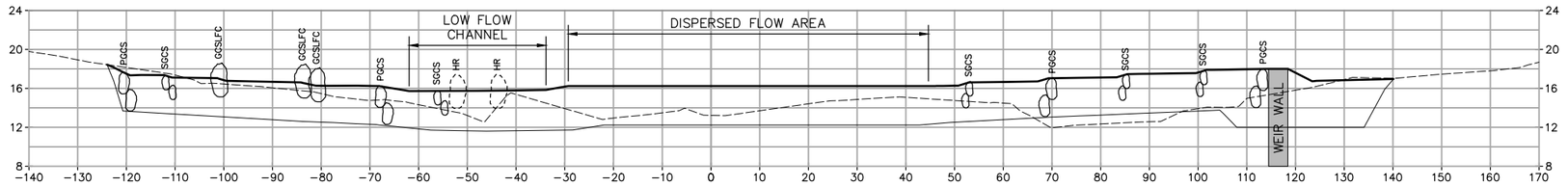

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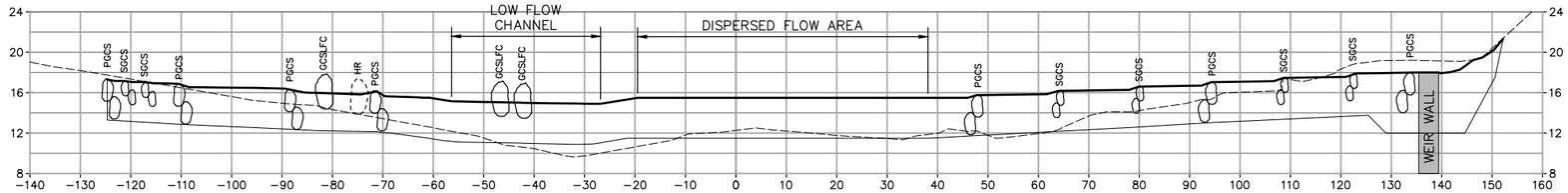


NOTE:

1. ALL SECTIONS ARE ORIENTED LOOKING DOWNSTREAM.

CHANNEL SECTIONS DOWNSTREAM OF WEIR

15 0 15 30 HORIZ.
7.5 0 7.5 15 VERT.
SCALE IN FEET

ROCK TYPE LEGEND

GCSLFC	Grade Control Structure in Low Flow Channel
SGCS	Secondary Grade Control Structure
PGCS	Primary Grade Control Structure
HR	Habitat Rocks

REV	DATE	DESCRIPTION	BY

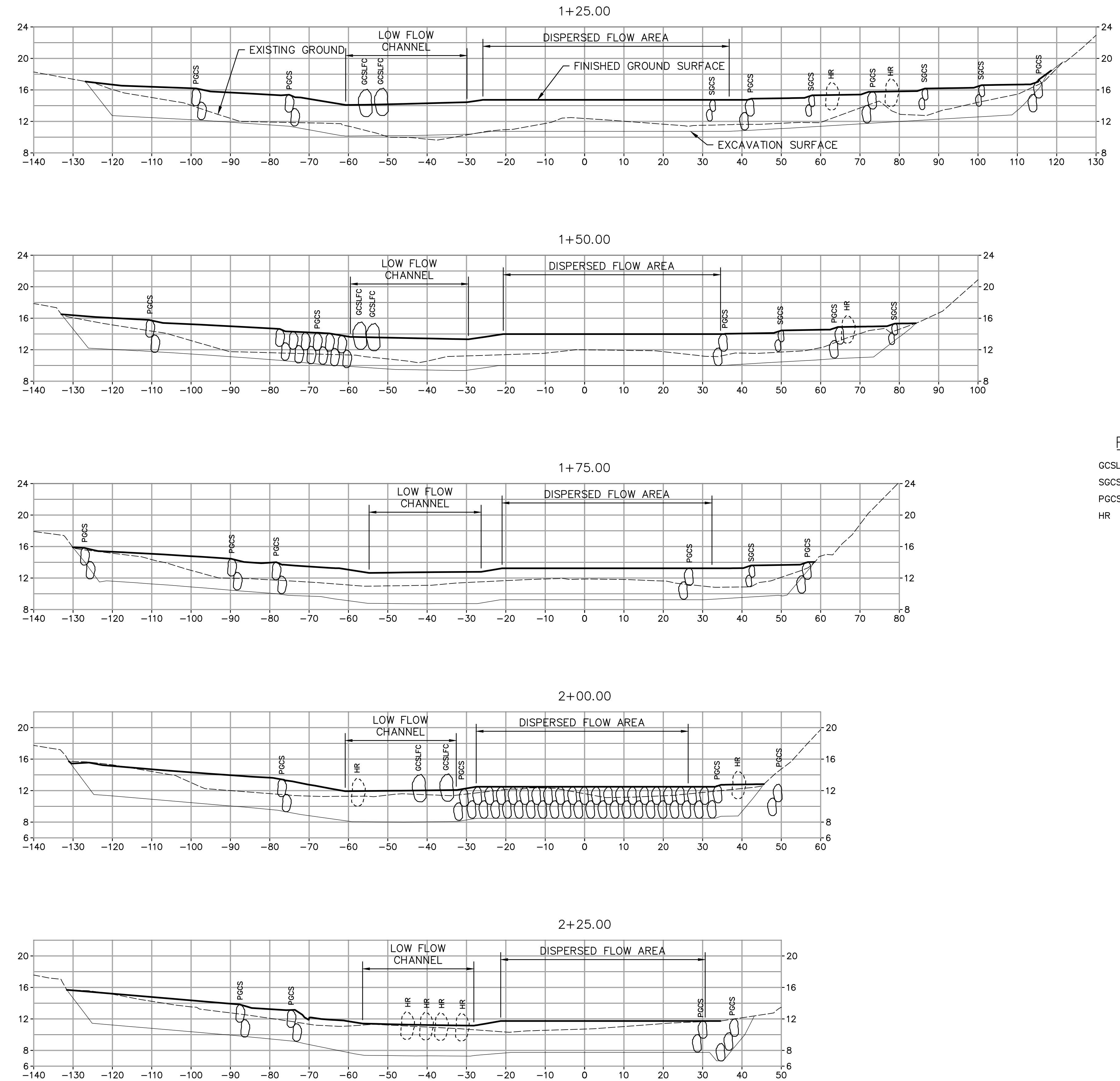
STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER
Evan Adam Mustard
CE 18636
11/13/24

DOWL
AECL848
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT
ROCKY RAMP CHANNEL SECTIONS (1)
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
C7



CHANNEL SECTIONS DOWNSTREAM OF WEIR

15 0 15 30 HORIZ.
7.5 0 7.5 15 VERT.
SCALE IN FEET

ROCK TYPE LEGEND

GCSLFC	Grade Control Structure in Low Flow Channel
SGCS	Secondary Grade Control Structure
PGCS	Primary Grade Control Structure
HR	Habitat Rocks

NOTE:

1. ALL SECTIONS ARE ORIENTED LOOKING DOWNSTREAM.

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Euan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

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907-562-2000
AECL848

EYAK WEIR REPLACEMENT PROJECT

ROCKY RAMP CHANNEL SECTIONS (2)

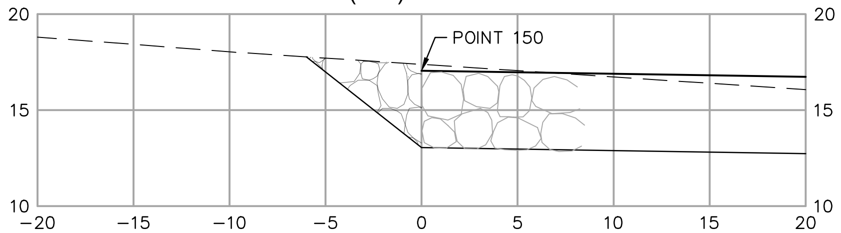
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

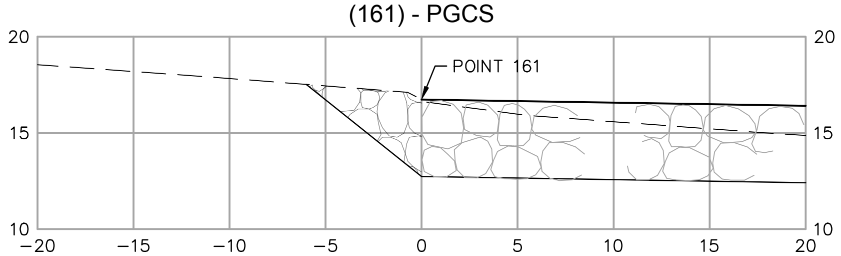
SHEET C8

- SECTIONS ARE CUT IN ALIGNMENT OVER THE GCS LOOKING DOWNSTREAM.
- THE HEADING OF THE SECTION SHOWS THE GRADE POINT NUMBER AND THE TYPE OF GCS.
- THE DASHED LINE IN THE SECTION IS THE EXISTING GROUND AND THE SOLID LINE IS THE FINISHED GRADE (TOP OF GCS ROCK)

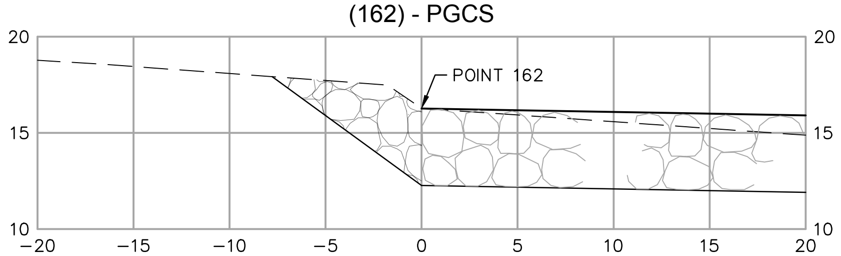
(150) - PGCS



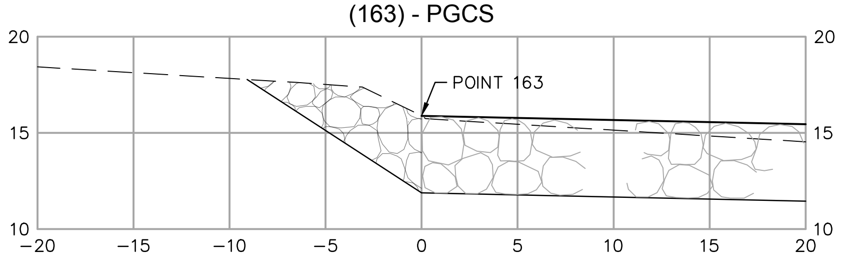
(161) - PGCS



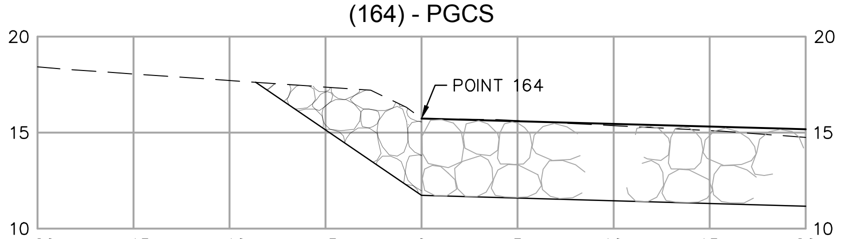
(162) - PGCS



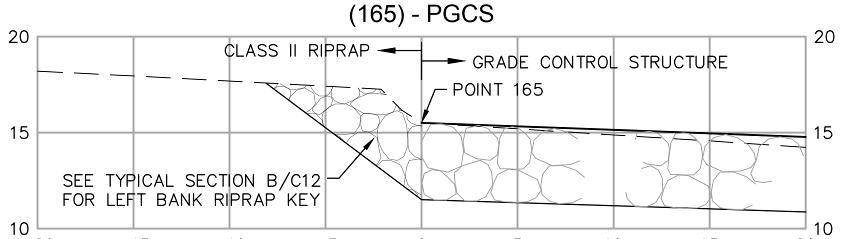
(163) - PGCS

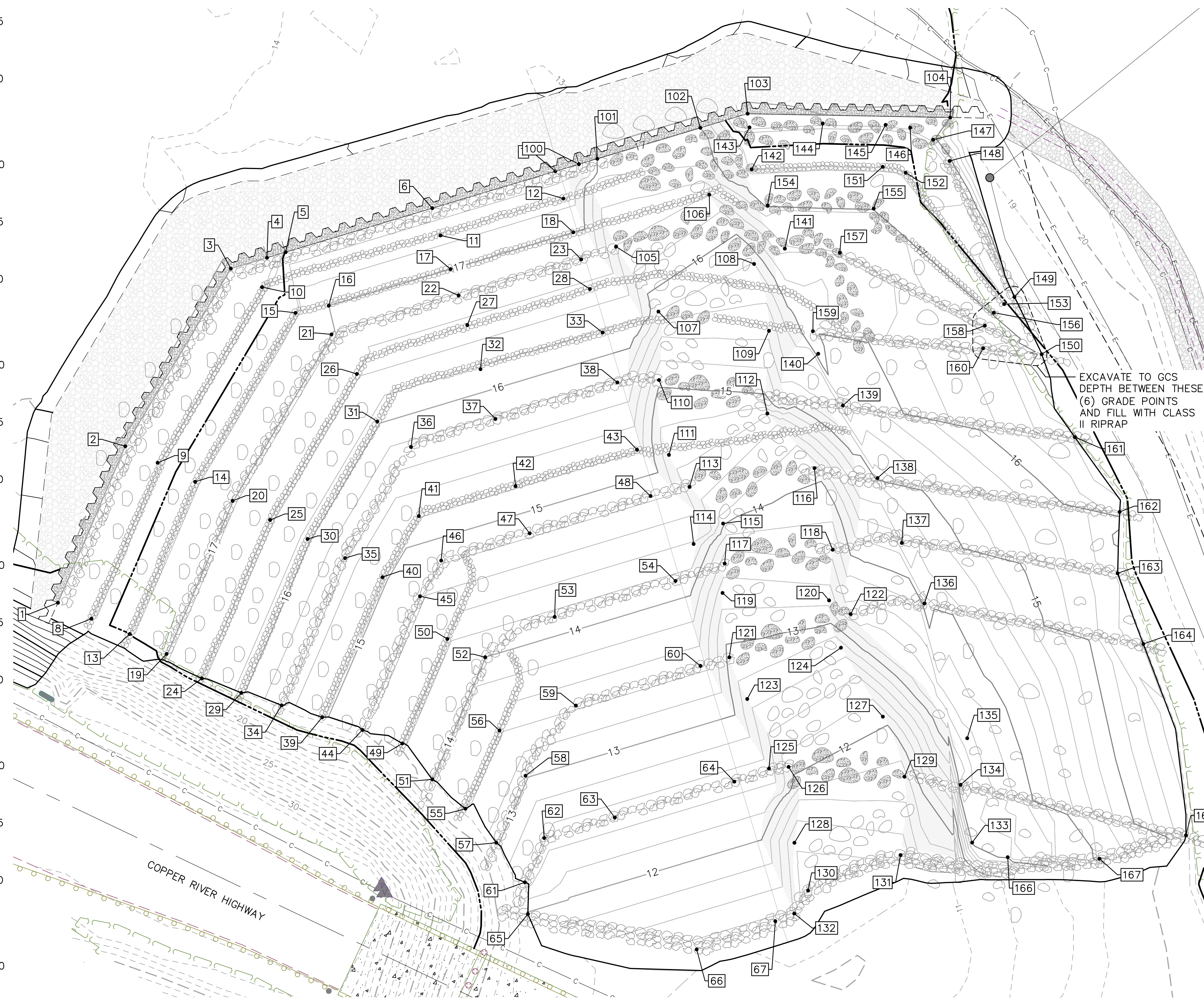


(164) - PGCS



(165) - PGCS





SGCS — Secondary Grade Control Structure

PGCS — Primary Grade Control Structure

REV	DATE	DESCRIPTION	BY

REVISIONS

STATE OF ALASKA 49TH Euan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

DOWL
AECL848
www.DOWL.com
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

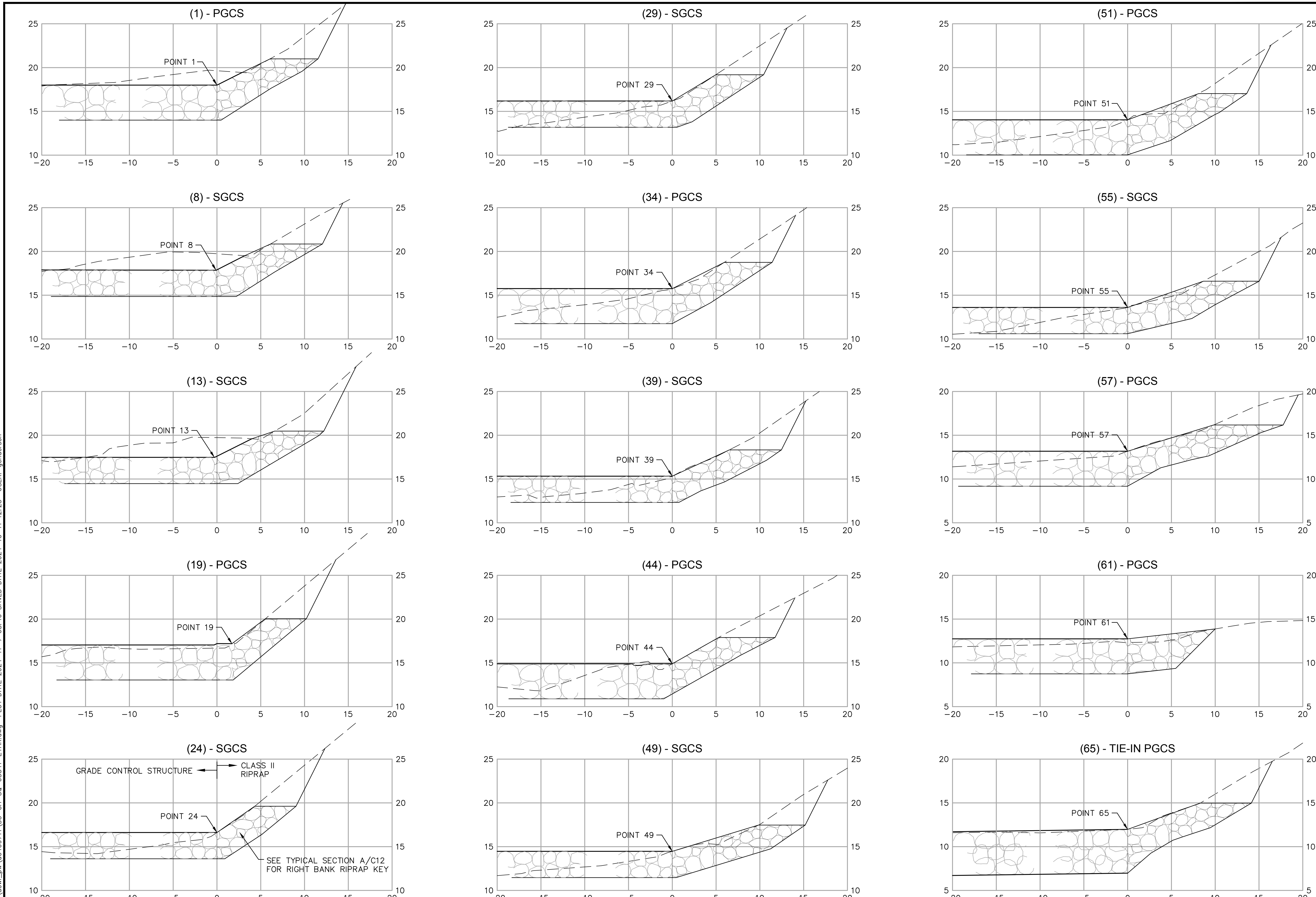
EYAK WEIR REPLACEMENT PROJECT

SECTIONS – GRADE CONTROL STRUCTURES KEYING INTO LEFT BANK

CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

SHEET
C9



REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Evan-Angus MacLeod CE 180639 REGISTERED PROFESSIONAL ENGINEER 11/15/24

DOWL
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000
AECL848

EYAK WEIR REPLACEMENT PROJECT

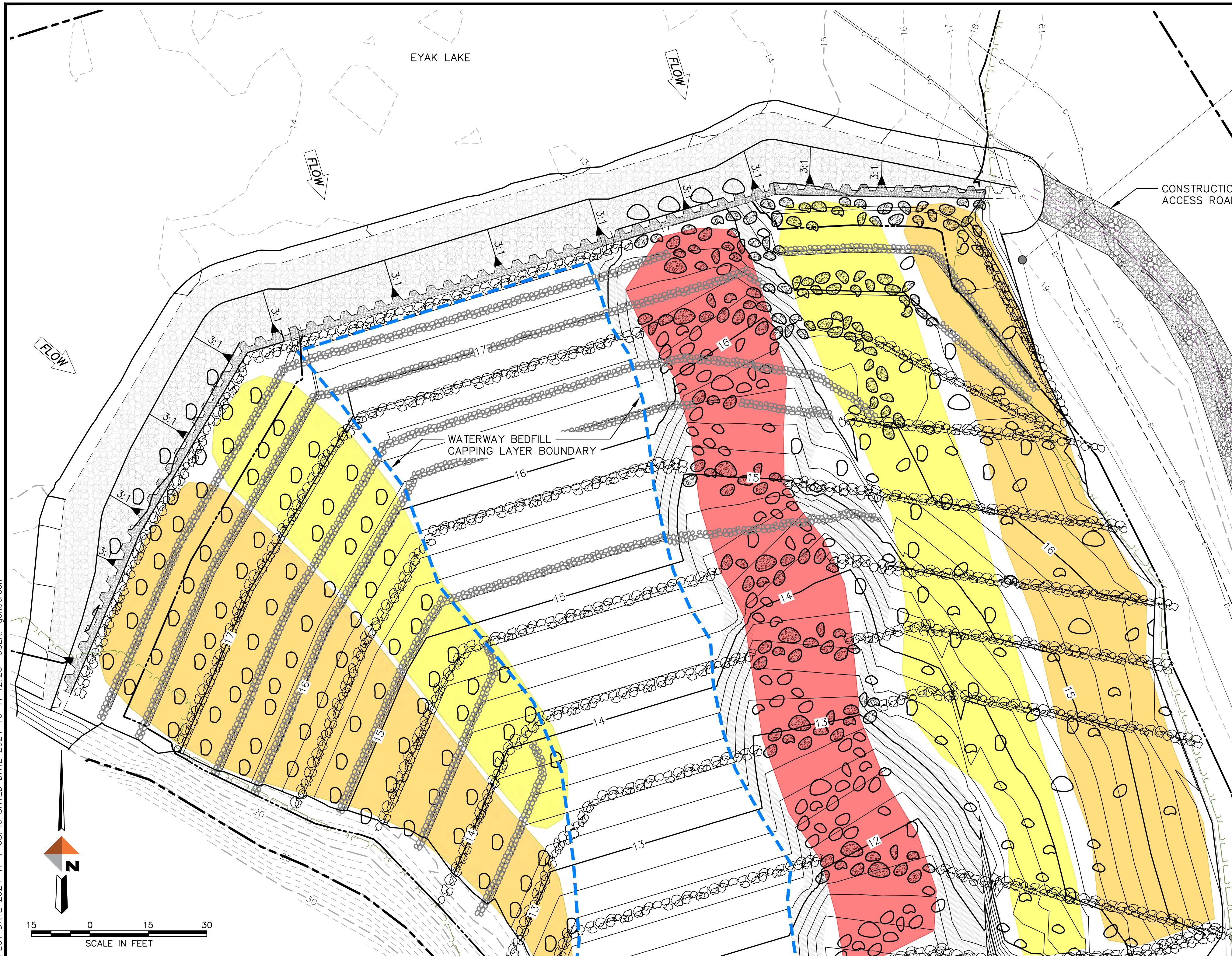
SECTIONS – GRADE CONTROL STRUCTURES KEYING INTO RIGHT BANK

CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

SHEET
C10

c:\dowl_pw\d0409711\SC-CH-SQ-63341-EYAK.dwg PLOT DATE 2024-11-7 08:46 SAVED DATE 2024-10-11 12:25 USER: genderson

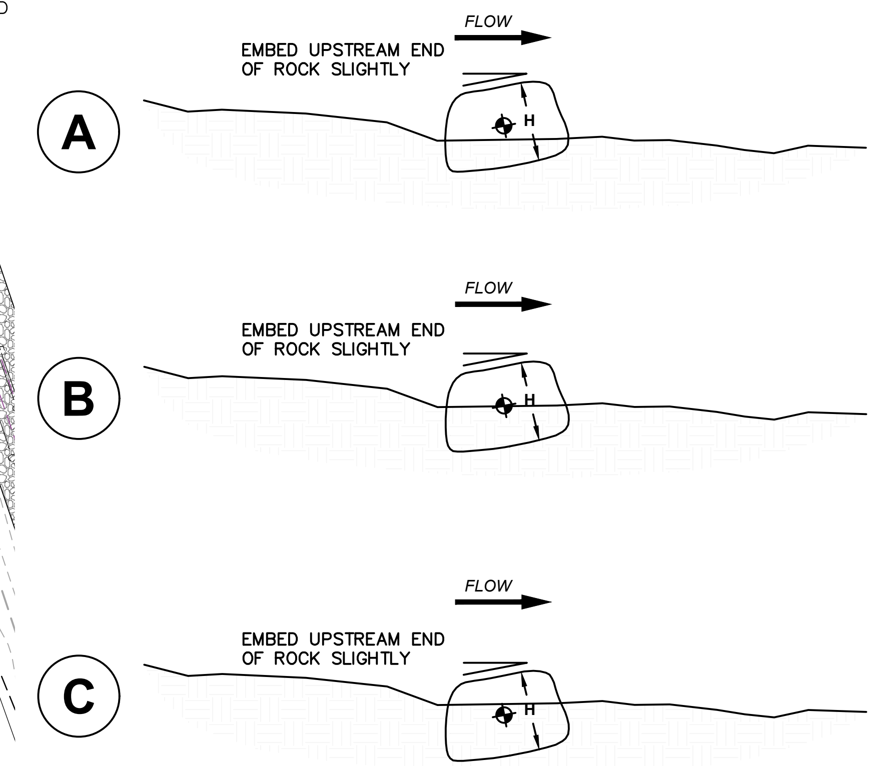


LEGEND

- EXISTING MAJOR CONTOUR (5 FT INTERVALS)
- EXISTING MINOR CONTOUR (1 FT INTERVALS)
- FINISHED GRADE MAJOR CONTOUR (1 FT INTERVALS)
- FINISHED GRADE MINOR CONTOUR (0.2 FT INTERVALS)
- PRIMARY GCS
- SECONDARY GCS
- HABITAT ROCKS
- GCS IN LOW FLOW CHANNEL
- CENTER OF GRAVITY OF ROCK
- H MEDIAN ROCK DIAMETER

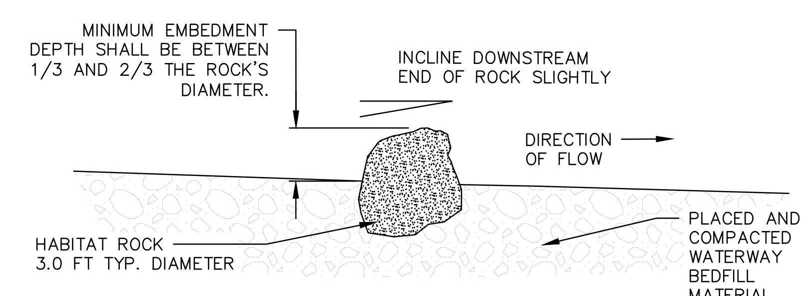
HABITAT ROCK VERTICAL PLACEMENT

ZONE	COLOR	TYPE (C) LOW	TYPE (B) MED	TYPE (A) HIGH	NUMBER OF ROCKS LT. BANK/RT. BANK
INSIDE	(yellow)	60%	35%	5%	50 / 30
OUTSIDE	(orange)	10%	40%	50%	40 / 60
CHANNEL	(red)	0%	50%	50%	90



NOTES:

1. INCLINE DOWNSTREAM END OF ROCKS SLIGHTLY TO ENCOURAGE SCOUR.
2. CONSTRUCT HABITAT ROCKS AS GENERALLY SHOWN ON THIS SHEET. LOCATIONS ARE SUGGESTIONS ONLY TO SHOW TYPICAL DISTRIBUTION. PLACE HABITAT ROCKS RANDOMLY WITHIN THE ZONES IDENTIFIED, OR AS DIRECTED BY THE ENGINEER, TO CREATE A NATURALLY LOOKING CHANNEL.
3. VARY BURIAL DEPTHS SO THAT HABITAT ROCKS PROTRUDE AT VARYING HEIGHTS ABOVE GRADE. DISTRIBUTE A, B, AND C BURIAL DEPTHS RANDOMLY WITHIN THE SPECIFIED ZONES.
4. TYPE A ROCKS REQUIRE A FOOTER ROCK AS SHOWN IN DETAIL 3/C12.



1/C11 HABITAT ROCK PLACEMENT DETAIL
NTS

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Euan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

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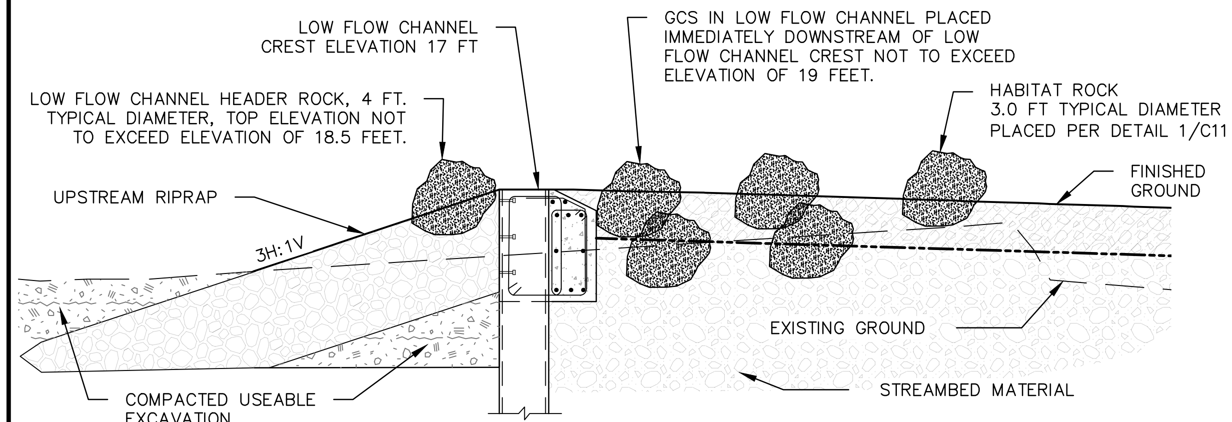
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000
AECL848

EYAK WEIR REPLACEMENT PROJECT
HABITAT ROCK PLACEMENT PLAN
CORDOVA, ALASKA

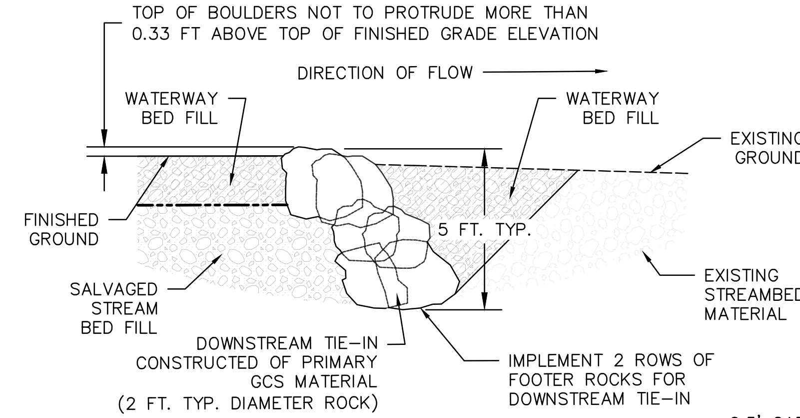
PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
C11

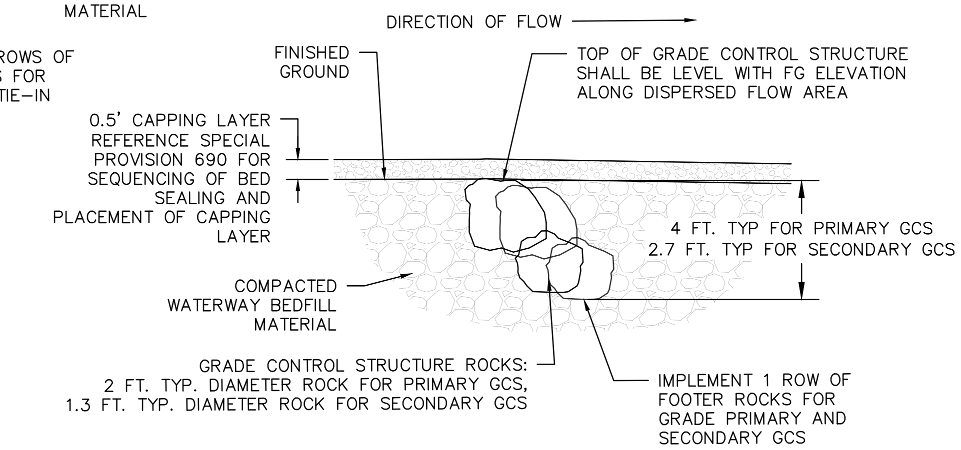
c:\dowl_pw\d0409711\SC-CH-SQ-63341-EYAK.dwg PLOT DATE 2024-11-7 08:46 SAVED DATE 2024-10-11 12:25 USER: genderson



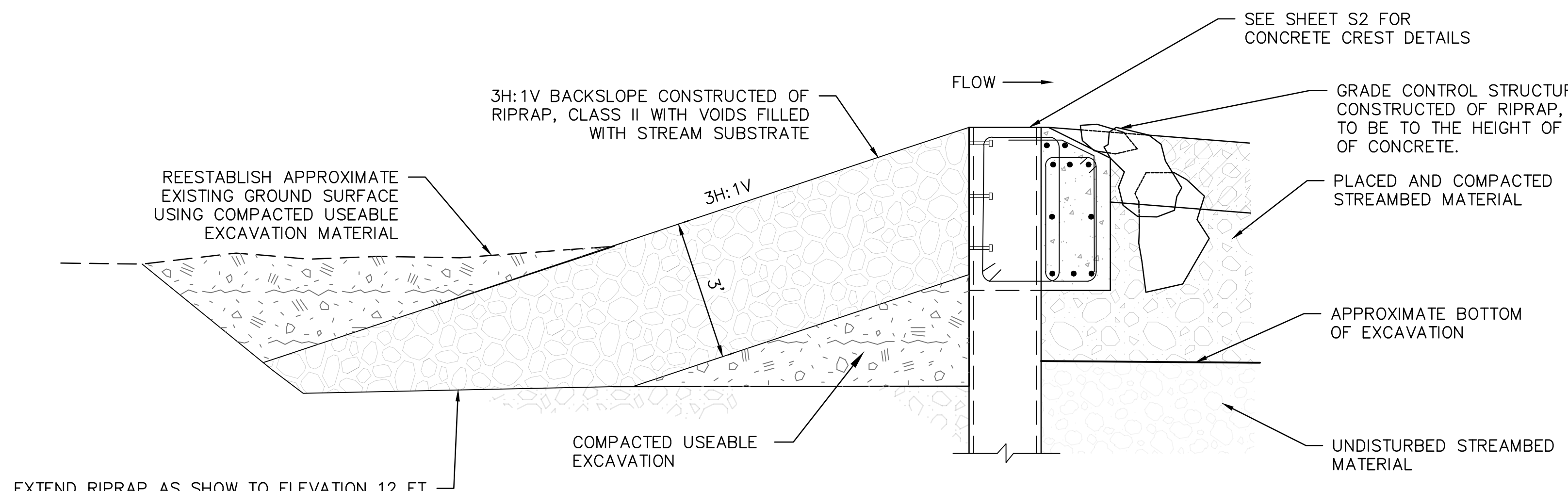
5 / C12 LOW FLOW CHANNEL CREST DETAIL
SCALE: 1"=3'



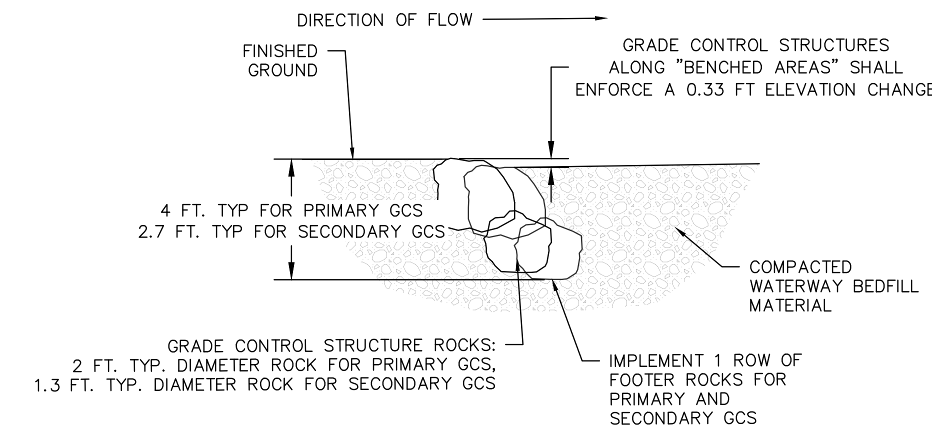
4 / C12 DOWNSTREAM TIE-IN DETAIL
NTS



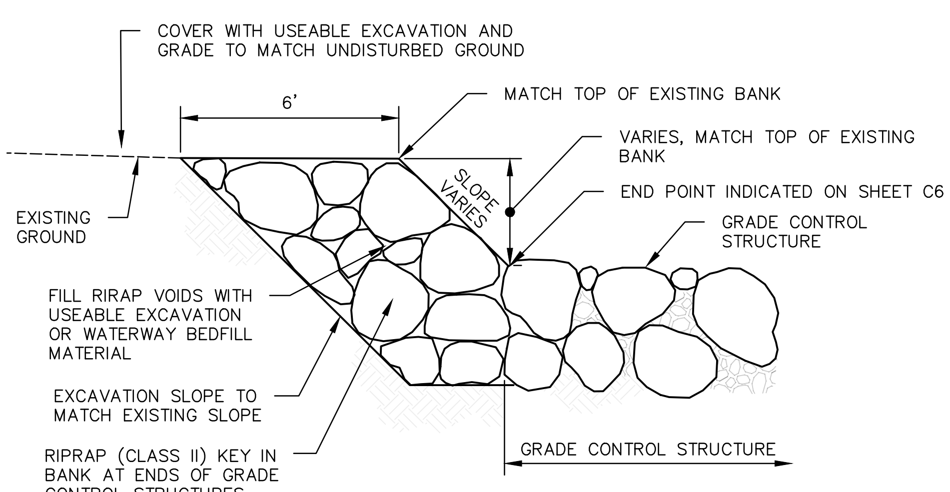
1 / C12 DISPERSED FLOW AREA GRADE CONTROL STRUCTURE DETAIL
NTS



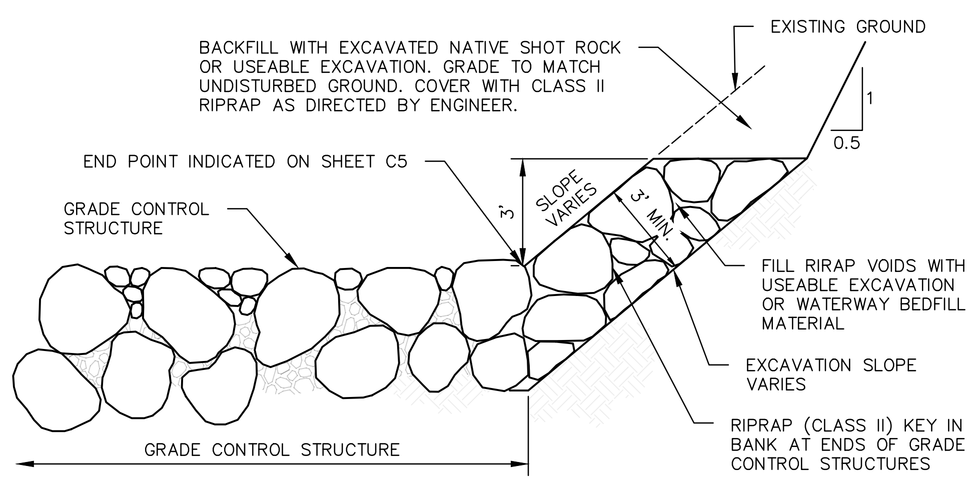
6 / C12 CREST MATERIAL PLACEMENT
NTS



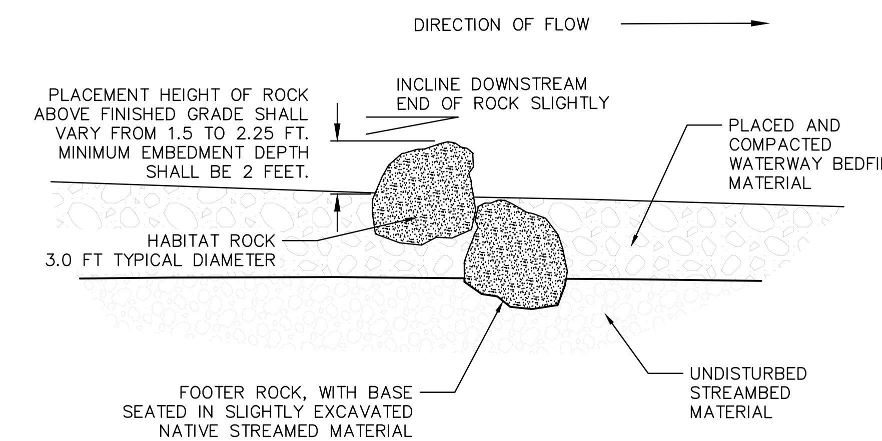
2 / C12 RIGHT AND LEFT BANK GRADE CONTROL STRUCTURE DETAIL
NTS



B / C12 TYPICAL SECTION - LEFT BANK
RIPRAP KEY AT ENDS OF GCS



A / C12 TYPICAL SECTION - RIGHT BANK
RIPRAP KEY AT ENDS OF GCS



3 / C12 GCS DETAIL IN LOW FLOW CHANNEL
NTS

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Euan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

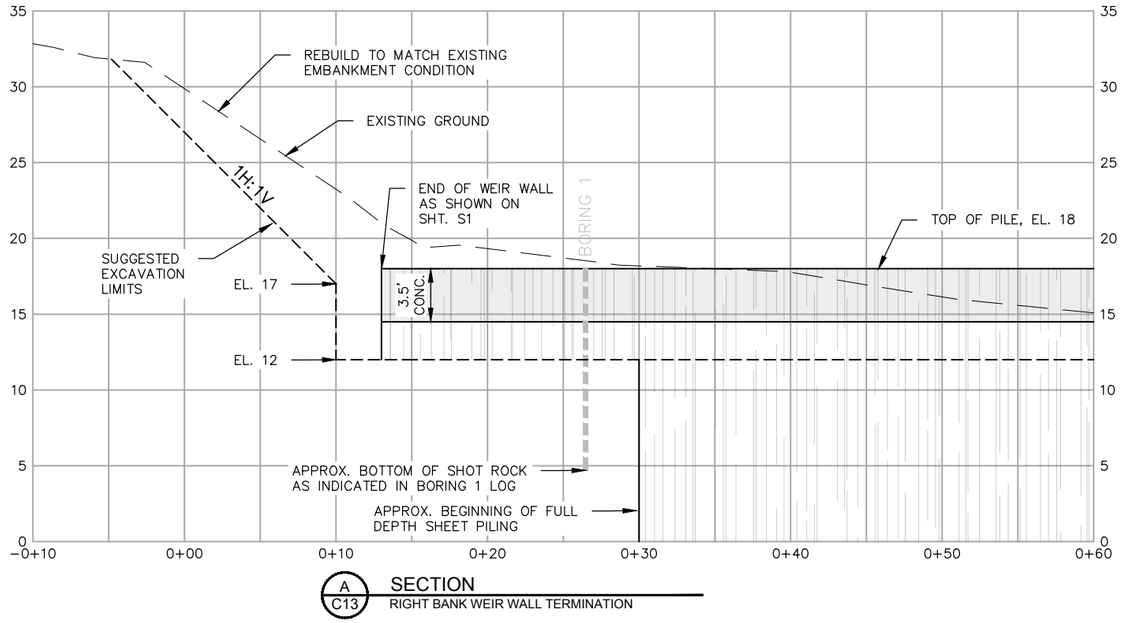
DOWL
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000
AECL848

EYAK WEIR REPLACEMENT PROJECT
DETAILS AND SECTIONS
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
C12

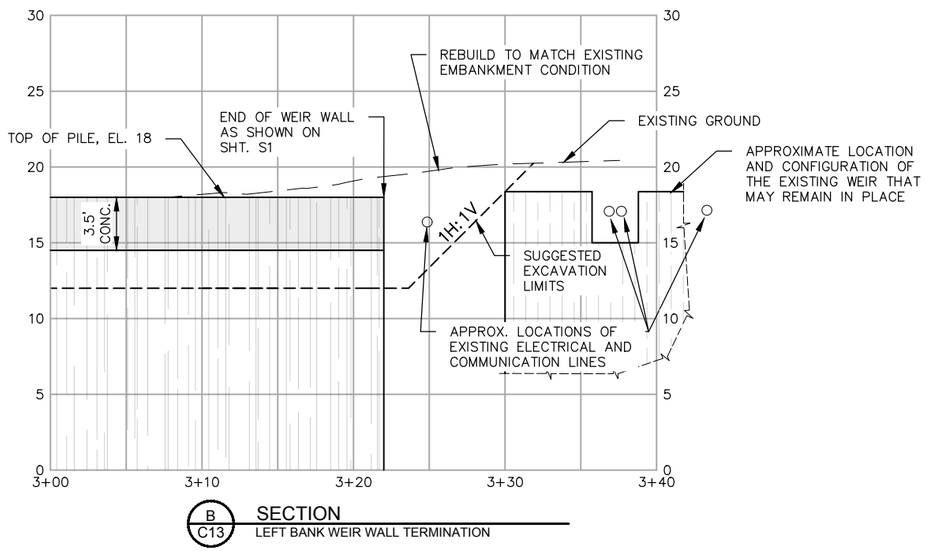
c:\dowl_pw\d0409711\SC20-CH-FG-63341-EYAK-65%-NEW6.dwg PLOT DATE 2024-11-7 08:46 SAVED DATE 2024-11-07 08:34 USER: genderson



A / C13 **SECTION**
RIGHT BANK WEIR WALL TERMINATION

NOTE:

1. CONTRACTOR IS RESPONSIBLE FOR EROSION MITIGATION OF OVER-STEEPENED SLOPE DURING CONSTRUCTION TO MINIMIZE EROSION RISK DURING PRECIPITATION EVENTS.
2. CONTRACTOR TO LOCATE AND PROTECT BURIED UTILITIES DURING THE DEMOLITION OF EXISTING WEIR AND CONSTRUCTION OF THE NEW WEIR.



B / C13 **SECTION**
LEFT BANK WEIR WALL TERMINATION

REVISIONS

REV	DATE	DESCRIPTION	BY

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER
Evan Adam Mustard
CE 18636
11/25/24

DOWL
AECL848
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT

SECTIONS AND DETAILS

CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
C13

EYAK LAKE
FLOW
FLOW
FLOW
APPROX. 30 FT. UPSTREAM OF WEIR
WOODY DEBRIS BANK STABILIZATION, PER DETAILS 2/R2, 3/R2
APPROX. 66 FT. DOWNSTREAM OF WEIR
16 0 16 32
SCALE IN FEET
N
MINIMIZE DISTURBANCE WITHIN TEMPORARY EASEMENT (CROSS HATCHED AREA). REHABILITATE WITH VEGETATIVE MAT IF DISTURBED.
15'
30'
15'
PROTECT STREAMBANK IN PLACE, AND MINIMIZE DISTURBANCE. REPLACE SALVAGED RIPRAP AND REHABILITATE VEGETATED AREAS WITH TOPSOIL AND SEED, PER DETAIL PER SECTION 618 OF THE SPECIFICATIONS. RECONSTRUCT DISTURBED RIPRAP TO ORIGINAL SHAPE.
COPPER RIVER HIGHWAY
PROTECT STREAMBANK IN PLACE, AND MINIMIZE DISTURBANCE. REHABILITATE WITH VEGETATIVE MAT BANK STABILIZATION IF DISTURBED, PER DETAIL 1/R2
FLOW
EYAK RIVER
FLOW
30'
25'
20'
15'
COPPER RIVER HIGHWAY BRIDGE
15'
20'
15'
25'

c:\dowl_pw\d0409711\SC20-CH-FG-63341-EYAK-65%-NEW6.dwg PLOT DATE 2024-11-07 08:47 SAVED DATE 2024-11-07 08:34 USER: genderson

REV	DATE	REVISIONS DESCRIPTION	BY

STATE OF ALASKA 49TH Euan-Angus MacLeod CE 180639 11/25/24 REGISTERED PROFESSIONAL ENGINEER

DOWL
WWW.DOWL.COM
AECL848
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

EYAK WEIR REPLACEMENT PROJECT

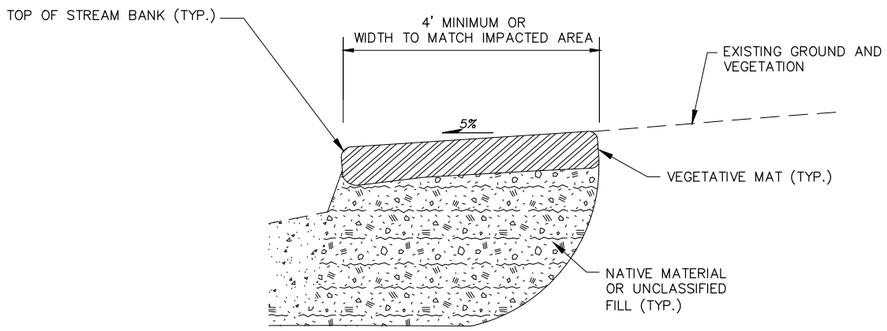
REVEGETATION PLAN

CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET

R1



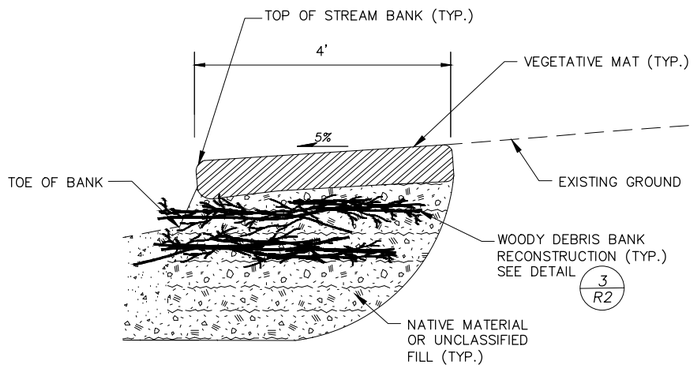
1 / R2 VEGETATIVE MAT BANK RECONSTRUCTION SECTION VIEW
NTS

NOTES:

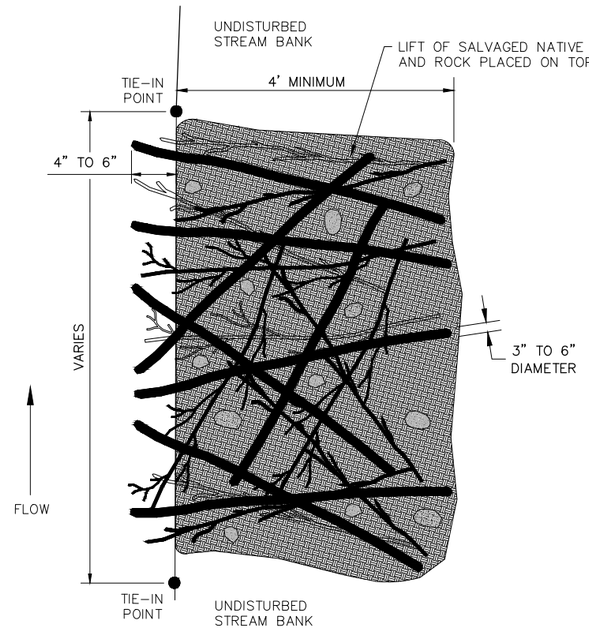
1. SALVAGED VEGETATIVE MAT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND BE SOURCED FROM THE DISTURBED AREA OR LOCAL AREA COORDINATED WITH CRWP.
2. WOODY DEBRIS BANK RECONSTRUCTION TO BE PLACED IN LOCATIONS SHOWN ON SHEET R1.
3. TAPER BANKS AND TIE INTO EXISTING BANKS UPSTREAM AND DOWNSTREAM, AS DIRECTED BY THE ENGINEER.

INSTALL VEGETATIVE MAT IN THE FOLLOWING SEQUENCE

1. STAKE ALL AREAS TO BE PLANTED WITH VEGETATIVE MATS PRIOR TO INSTALLATION.
2. WET THE IN-SITU SOIL, OR WOODY DEBRIS/SOIL MATRIX THAT THE VEGETATIVE MAT WILL BE PLACED ON.
3. IF THE VEGETATIVE MAT HAS LOST TOPSOIL, SUCH THAT THE IN-PLACE THICKNESS OF THE MAT WILL BE LESS THAN 9 INCHES THICK, PLACE ADDITIONAL FILL, FILLING VOIDS, AND TO INCREASE THE EFFECTIVE MAT THICKNESS TO 12 INCHES.
4. IF THE VEGETATIVE MAT IS GREATER THAN 15 INCHES THICK, ADJUST THE BENCH HEIGHT SUCH THAT THE TOP OF THE BANK WILL BE WITHIN 3 INCHES OF FINAL GRADE, OR USE AT A LOCATION MORE THAN 6 FEET FROM THE EDGE OF BANK.
5. PLACE VEGETATIVE MATS TIGHTLY TOGETHER, WITHOUT GAPS, WITH FULL CONTACT OF THE ROOT MASS TO THE SOIL SURFACE BELOW, TAMP INTO PLACE.
6. IN DISTURBED AREAS LESS THAN 6 FEET WIDE, USE ONLY THE WIDTH OF THE VEGETATIVE MAT NECESSARY TO EXTEND TO UNDISTURBED VEGETATION.
7. IN DISTURBED AREAS MORE THAN 6 FEET WIDE, PLACE VEGETATIVE MAT TO EXTEND AT LEAST 6 FEET FROM EDGE OF BANK.
8. PLACE ANY REMAINING SMALL MOBILE WOODY DEBRIS MATERIAL AND SLASH ON TOP OF STREAM BANKS TO PROVIDE OVERBANK HABITAT. PLACE SLASH BY SCATTERING MATERIAL IN A NON-UNIFORM MANNER WITH GAPS TO ALLOW VEGETATION RE-ESTABLISHMENT.



2 / R2 WOODY DEBRIS BANK RECONSTRUCTION SECTION VIEW
NTS



3 / R2 WOODY DEBRIS BANK RECONSTRUCTION PLAN VIEW
NTS

NOTES:

WOODY DEBRIS BANK RECONSTRUCTION CONSISTS OF CRISS-CROSSED WOODY DEBRIS AND SALVAGED IN-SITU SOIL MIXED WITH ROCK, TOPPED WITH VEGETATIVE MAT. STEM/TRUNK DIAMETER TO RANGE FROM 3 TO 6 INCHES AND LENGTHS TO RANGE FROM 5 TO 7 FEET.

WOODY DEBRIS CONSTRUCTION SEQUENCE

1. INSTALL EROSION CONTROL MEASURES BEFORE BEGINNING SOIL-DISTURBING WORK.
2. STAKE THE LIMITS OF DISTURBANCE.
3. CLEAR AND GRUB THE DISTURBANCE AREA. SALVAGE/HARVEST AND STOCKPILE VEGETATIVE MAT. MEASURE TYPICAL, MINIMUM, AND MAXIMUM VEGETATIVE MAT THICKNESSES.
4. EXCAVATE A FOUR FOOT BENCH, NO DEEPER THAN THE TOE OF BANK, FOR CONSTRUCTED BANK AREAS. WHERE A BENCH TIE-IN POINT IS NOT PERPENDICULAR TO THE RIVER BANK, COMPLETE THE FOLLOWING ADDITIONAL STEPS AT THE TIE-IN POINT.
   a) CREATE PLANTING HOLE AT LEAST 12 INCHES INTO BENCH WALL USING A SHOVEL OR REBAR AND HAMMER.
   b) INSERT A BRANCH INTO THE HOLE. THE BRANCH SHOULD BE ROUGHLY PERPENDICULAR TO THE WALL, ANGLED ALONG THE BENCH. TRIM IF THE BRANCH EXTENDS MORE THAN 6 INCHES OUTSIDE THE BANK LINE.
   c) REPEAT EVERY 6 INCHES ALONG THE EDGE OF THE BENCH UNTIL THE POINT WHERE THE BENCH IS AT LEAST 4 FEET WIDE, MEASURED PERPENDICULAR TO THE FINAL BANK LINE.
5. PLACE WOODY DEBRIS AT RANDOM ANGLES ON THE BENCH, CRISSCROSSING INDIVIDUAL PIECES. TRIM ANY BRANCHES THAT EXTEND MORE THAN 6 INCHES PAST THE FINAL BANK LINE.
6. PLACE WATERWAY BANK FILL OVER WOODY DEBRIS. FILL ALL VOIDS BETWEEN WOODY DEBRIS WITH WATERWAY BEDFILL MATERIAL AND TAMP TO COMPACT.
7. REPEAT THE STAKING (IF NECESSARY), WOODY DEBRIS PLACEMENT, AND SOIL FILL UNTIL A DISORDERLY JUMBLE OF WOODY DEBRIS IS CREATED, WITH DEBRIS ENDS ALIGNED WITHIN 6 INCHES OF THE FINAL BANK LINE, ALL VOID SPACES FILLED BY TOPSOIL, AND THE TOP ELEVATION 12 INCHES (OR THE TYPICAL VEGETATIVE MAT THICKNESS) BELOW THE FINAL BANK ELEVATION.
8. TOP WOODY DEBRIS WITH SALVAGED VEGETATIVE MAT.

REVISIONS

REV	DATE	DESCRIPTION	BY

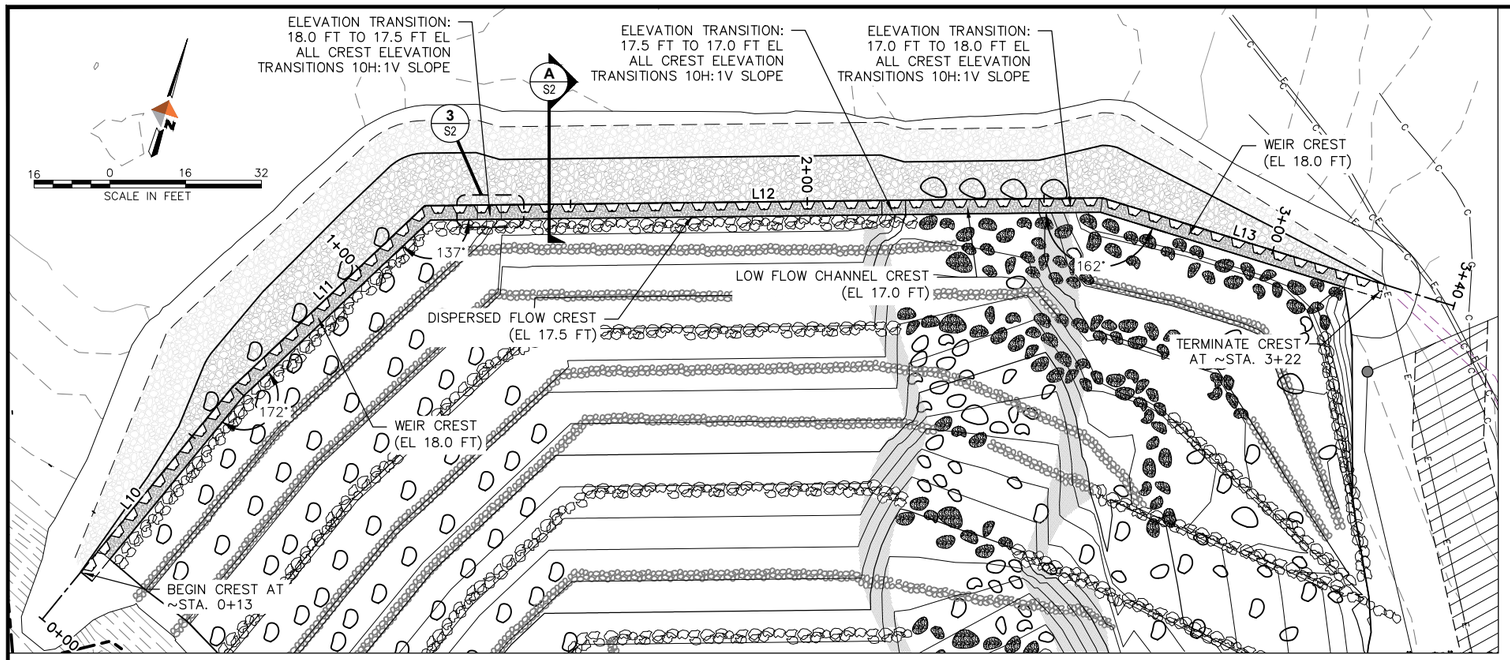
STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER
Evan Adam Mustard
CE 18639
11/25/24

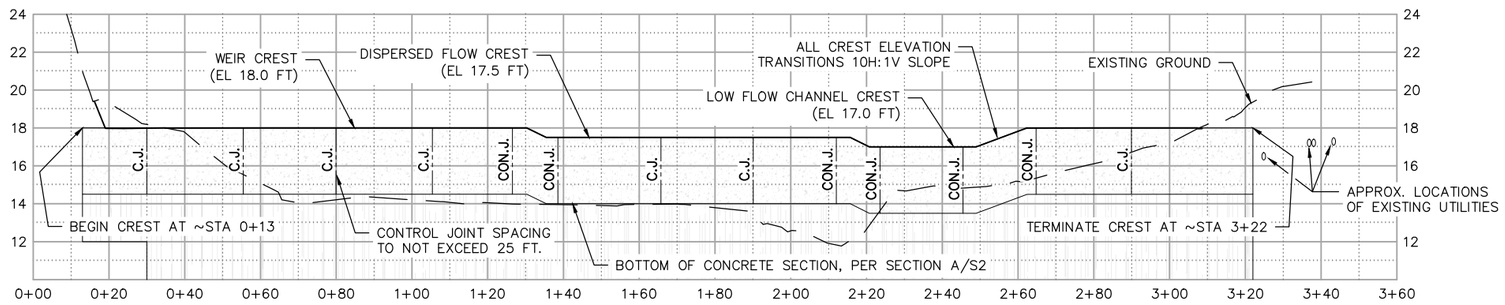
DOWL
AECL848
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000
WWW.DOWL.COM

EYAK WEIR REPLACEMENT PROJECT
REVEGETATION DETAILS
CORDOVA, ALASKA

PROJECT	1136.63341.04
DATE	OCTOBER 2024
DESIGNED	EAM
CHECKED	RCR

SHEET
R2





PROPOSED WEIR CREST

WALL JOINT LEGEND

CON. J.	CONSTRUCTION JOINT	(SEE DTL. 5/S2)
C.J.	CONTROL JOINT	(SEE DTL. 4/S2)

NOTE: SEE TABLES ON SHT. S2 FOR APPROXIMATE JOINT LOCATIONS.

WEIR CREST ALIGNMENT

Number	Start Station	Start Coordinates	End Station	End Coordinates	Tangent Bearing Length
L10	0+00	N 2386406.17 E 1704145.02	0+63.40	N 2386464.40 E 1704170.09	N23° 17' 42.68"E 63.40'
L11	0+63.40	N 2386464.40 E 1704170.09	1+19.24	N 2386512.42 E 1704198.59	N30° 41' 20.06"E 55.84'
L12	1+19.24	N 2386512.42 E 1704198.59	2+62.37	N 2386553.50 E 1704335.69	N73° 19' 18.10"E 143.12'
L13	2+62.37	N 2386553.50 E 1704335.69	3+40	N 2386552.04 E 1704413.31	S88° 55' 25.55"E 77.63'

NOTE: THIS ALIGNMENT REPRESENTS THE UPSTREAM FACE OF SHEET PILE WALL

STRUCTURAL GENERAL NOTES

1. APPLICABLE SPECIFICATIONS AND CODES:
CONSTRUCTION AND DESIGN COMPLETED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION, THE 9TH EDITION LRFD BRIDGE DESIGN SPECIFICATION, 2020 ALASKA DOT&PF STANDARD SPECIFICATIONS AND THE REQUIREMENTS NOTED AS FOLLOWS.

2. TESTING AND INSPECTION
a. CONCRETE – ADOT&PF STANDARD SPECIFICATION SECTION 501–3.03
i. PERIODIC INSPECTION OF REINFORCEMENT BEFORE CONCRETE IS PLACED.
ii. FULL TIME INSPECTION DURING PLACEMENT OF CONCRETE INCLUDING THE TAKING OF TEST SPECIMENS, SLUMP AND AIR CONTENT MEASUREMENT SHALL BE PERFORMED BY THE CONTRACTOR. INSPECTION AND TESTING SHALL BE LIMITED TO STRUCTURAL REINFORCED CONCRETE WITH TESTING FREQUENCY CONSISTING OF THE FIRST LOAD OF CONCRETE DELIVERED EACH DAY AND AT LEAST ONE TEST FOR EVERY 50 CUBIC YARDS THEREAFTER.
b. PILING, ADOT&PF STANDARD SPECIFICATION SECTION 505–3.02

3. DESIGN LOADS
i. DESIGN LOADS AND LOAD APPLICATIONS SHALL BE IN ACCORDANCE WITH THE MODEL CODES LISTED HEREIN.
j. UNIFORM LOADS
i. STRUCTURE DEAD LOAD – – – – – – – – – – – – SELF–WEIGHT
ii. HYDRAULIC HEAD – HIGH FLOW – – – – 3.22 FEET OR 201 PSF
iii. HYDRAULIC HEAD – LOW FLOW – – – – 0.14 FEET OR 8.74 PSF
c. SEISMIC LOADS
i. IMPORTANCE FACTOR – I= 1.00
ii. MAPPED SPECTRAL RESPONSE S_S – – – – – – – – – – – – – – –1.50
iii. MAPPED SPECTRAL RESPONSE S_1 – – – – – – – – – – – – – – 1.80
iv. SITE CLASS – C
v. SPECTRAL RESPONSE COEFFICIENT S_{DS} – – – – – – – – – – – 1.2
vi. SPECTRAL RESPONSE COEFFICIENT S_{D1} – – – – – – – – – – – 0.752
vii. PEAK GROUND ACCELERTION PGA_M – – – – – – – – – – – –0.678
viii. SEISMIC DESIGN COEFFICIENT K_H – – – – – – – – – – – – –0.339

4. CONSTRUCTION LOADS
STRUCTURES HAVE BEEN DESIGNED FOR DEAD LOADS AND THE DESIGN LOADS NOTED ABOVE. PROVIDE TEMPORARY BRACING, SHORING OR OTHER SUPPLEMENTAL SUPPORT DURING CONSTRUCTION AS NECESSARY TO PROTECT THE STRUCTURES FROM EXCESSIVE CONSTRUCTION LOADS.

5. FOUNDATIONS
a. DRIVEN PILE DESIGN CRITERIA
i. MINIMUM SHEETPILE LENGTH – – – – – – – – – – – – – 35 FEET
ii. MINIMUM DRIVING DEPTH – – – – – – – – – – – – – – 30 FEET *
b. MATERIALS – DOT&PF STANDARD SPECIFICTION SECTIONS 505 AND 715.
i. SHEET PILE SECTIONS – – – – – – – – – ASTM A572, GRADE 60
ii. HEADED ANCHOR STUDS – – – – – – – – – ASTM A108, TYPE B
* IF THE MINIMUM DEPTH IS REACHED AND SHEET PILE INSTALLATION RATE EXCEEDS 2 INCHES PER SECOND (VIBRATORY HAMMER) MEASURED OVER THE FINAL THREE FEET OF INSTALLATION THEN THE GEOTECHNICAL ENGINEER SHALL BE CONSULTED. IF THE MINIMUM DEPTH IS NOT ACHIEVED DUE TO REFUSAL OF 10 BLOWS PER INCH (IMPACT HAMMER), THEN THE GEOTECHNICAL ENGINEER SHALL BE CONSULTED. IF THE MINIMUM DEPTH IS NOT ACHIEVED DUE TO REFUSAL, THEN THE GEOTECHNICAL ENGINEER SHALL BE CONSULTED. KEY–IN INSTALLATION AT WALL ENDS MAY CONSIST OF EXCAVATION AND COMPACTED BACKFILL (PER SPECIFICATIONS).

6. CONCRETE
a. CONCRETE CONSTRUCTION SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318).
b. DETAILING, FABRICATION AND PLACEMENT OF REINFORCEMENT SHALL CONFORM TO DETAILS AND DETAILING OF CONCRETE REINFORCEMENT (ACI 315).
c. MATERIALS – DOT&PF STANDARD SPECIFICATION SECTIONS 501 AND 709
i. CONCRETE
(a) CLASS AA – – – – – – – – – – – – – – – – F'C = 5,000 PSI
(a) EPOXY COATED REINFORCING BARS – – ASTM A775, GRADE 60

d. ALL BENT REINFORCING BARS SHALL BE SHOP FABRICATED ONLY. REBENDING OR WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS AUTHORIZED BY ENGINEER.
e. CONCRETE COVER OVER REINFORCEMENT SHALL BE 2" CLEAR, EXCEPT FOR THE FOLLOWING, UNLESS OTHERWISE NOTED.
I, CONCRETE PLACED AGAINST AND PERMANENTLY IN CONTACT WITH EARTH – – – – – – – – – – – – – – – – – 3" CLEAR
f. REINFORCEMENT SPLICES NOT PERMITTED EXCEPT AS DETAILED OR AUTHORIZED BY THE ENGINEER. LAP EPOXY–COATED REINFORCING BARS THE FOLLOWING MINIMUMS AT ALL SPLICES, UNLESS OTHERWISE INDICATED. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BAR.

BAR SIZE	REG BARS	TOP BARS
#4	2'–7"	3'–2"
#5	3'–3"	3'–10"

g. STAGGER ADJACENT REINFORCEMENT LAP SPLICES IN 18" MINIMUM.
h. PROVIDE BAR SUPPORTS TO PROPERLY SECURE AND SUPPORT REINFORCING BARS AT POSITIONS SHOWN ON THE DRAWINGS.
i. LOCATE CONSTRUCTION JOINTS WHERE SHOWN ON THE DRAWINGS OR AS AUTHORIZED BY THE ENGINEER. THE GRADE BEAM CANNOT NOT HAVE JOINTS IN A HORIZONTAL PLANE.
j. THOROUGHLY CLEAN ALL KEYWAYS AND CONSTRUCTION JOINTS VIA MECHANICAL MEANS, SUCH AS GRINDING, WIRE BRUSHING, BUSH HAMMERING, OR PRESSURE WASHING, PRIOR TO PLACING CONCRETE IN ADJACENT POUR.

REVISIONS
REV | DATE | DESCRIPTION | BY

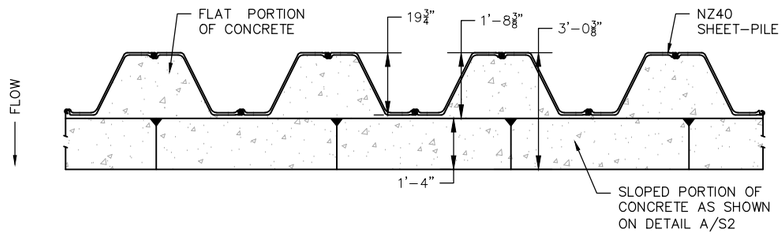
STATE OF ALASKA
49TH
MATTHEW J. METTLER
SE 13920
REGISTERED PROFESSIONAL ENGINEER
11/25/2024

DOWL
AECI.848
WWW.DOWL.COM
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000

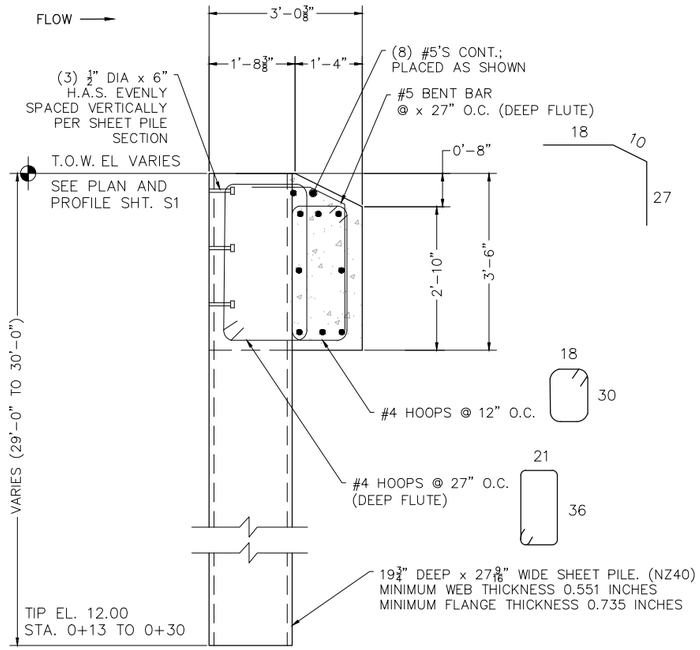
EYAK WEIR REPLACEMENT PROJECT
CREST PLAN, PROFILE AND GENERAL NOTES
CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

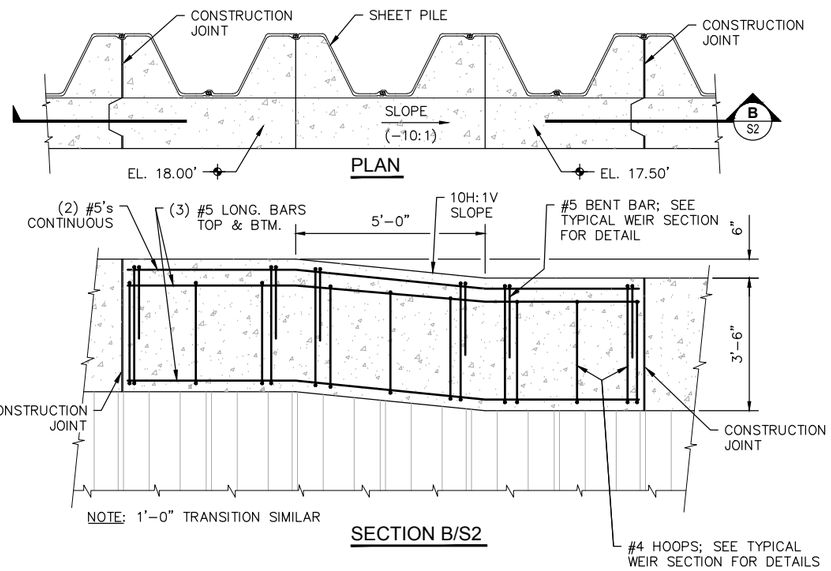
SHEET
S1



1/S2 SHEET PILE AND CONCRETE CREST PLAN VIEW
1"=4'

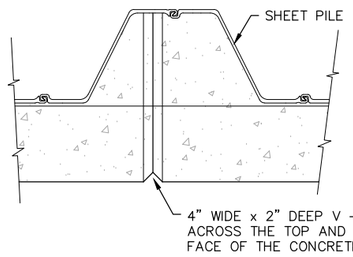


A/S2 WEIR TYPICAL SECTION
NTS



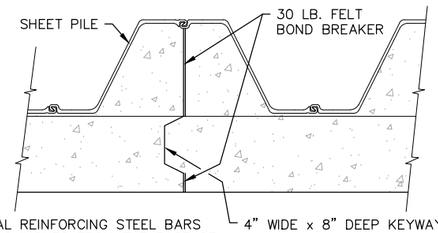
3/S2 WEIR TRANSITION DETAIL
1/2" = 1'-0"

NOTE: REBAR IS CONTINUOUS THRU JOINT



4/S2 CONTROL JOINT DETAIL (C. J.)
3/4" = 1'-0"

NOTE: SEE PROFILE ON SHT. S1 FOR APPROXIMATE JOINT LOCATIONS



NOTE: LONGITUDINAL REINFORCING STEEL BARS TERMINATE 2 INCHES FROM THE FACE OF THE CONSTRUCTION JOINTS ON BOTH SIDES OF THE JOINT.

5/S2 CONSTRUCTION JOINT DETAIL (CON. J.)
3/4" = 1'-0"

CONTROL JOINTS
STA. 0+30±
STA. 0+55±
STA. 0+80±
STA. 1+05±
STA. 1+66±
STA. 1+90±
STA. 2+90±

CONSTRUCTION JOINTS
STA. 1+27±
STA. 1+39±
STA. 2+12±
STA. 2+24±
STA. 2+45±
STA. 2+65±

CONTROL AND CONSTRUCTION JOINT LOCATIONS

NOTE: JOINT LOCATION STATIONS ARE ONLY APPROXIMATE. JOINTS ARE TO BE PLACED WITHIN SHEET PILE WEBS AS SHOWN ON DETAILS 4 AND 5, NEAREST TO THE STATIONS SHOWN ON THESE TABLES.

REVISIONS

REV	DATE	DESCRIPTION	BY

STATE OF ALASKA 49TH — MATTHEW J. METTLER — SE 13920 — REGISTERED PROFESSIONAL ENGINEER — 11/25/2024

DOWL
AECL848
5015 Business Park Blvd, Suite 4000
Anchorage, Alaska 99503
907-562-2000
WWW.DOWL.COM

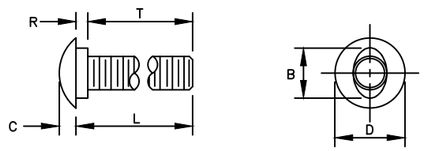
EYAK WEIR REPLACEMENT PROJECT
WEIR CREST STRUCTURE SECTIONS AND DETAILS
CORDOVA, ALASKA

PROJECT 1136.63341.04
DATE OCTOBER 2024
DESIGNED EAM
CHECKED RCR

SHEET
S2

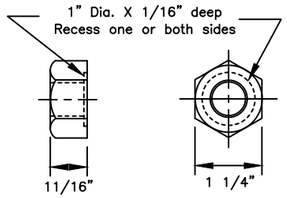
APPENDIX D

Alaska Standard Plans G0-05, Standard Guardrail Hardware

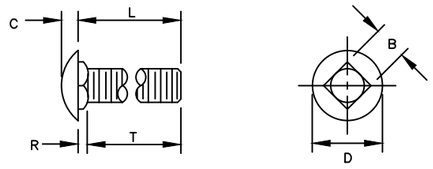


B	C	D	L (Length)	R	T (Thread Length)
15/16"	5/16"	1 5/16" or 1 7/16"	As Required	7/32"	As Required

5/8" BUTTONHEAD BOLT
(FBB01–05)

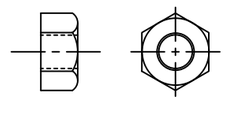


5/8" Dia. RECESSED HEX NUT
(FBB01–05)



B	C	D	L (Length)	R	T (Thread Length)
5/8"	5/16"	1 5/16"	As Required	3/16"	As Required

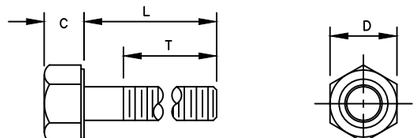
5/8" Dia. CARRIAGE BOLT
(FBC10–20)



STANDARD HEX NUT

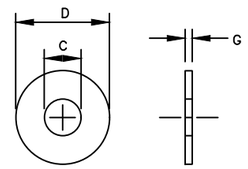
GENERAL NOTES:

1. All covered hardware shall comply with the Task Force 13 (TF13) Guide to Standardized Roadside Safety Hardware online publication. Designators given when possible in parentheses.



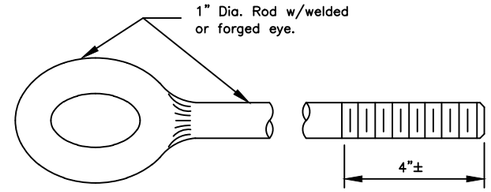
Bolt Size	C	D	L (Length)	T (Thread Length)
5/16"	——	——	1 1/2"	7/8"
5/16"	——	——	1"	1"
3/8"	——	——	7 1/2"	1 1/2"
1/2"	——	——	1 1/2"	1 1/2"
1/2"	——	——	1 1/4"	1 1/4"
5/8" H.S.	5/16"	7/8"	8"	1 1/2"
5/8"–11	——	——	1 1/2"	1 1/2"
3/4"	——	——	1 1/2"	1 1/2"
3/4"	——	——	As Required	2"
3/4" H.S.	15/32"	1 1/4"	2"	1 1/2"

STANDARD HEX BOLTS

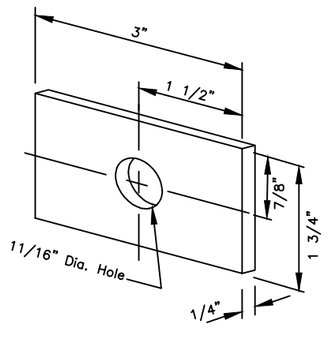


For Bolt ø	C	D	G
3/8"	7/16"	1"	5/64"
1/2"	17/32"	1 1/16"	3/32"
1/2" H.S.	17/32"	1 1/16"	3/32"
5/8"	11/16"	1 3/4"	9/64"
3/4"	13/16"	1 15/32"	9/64"
3/4" H.S.	13/16"	2"	5/32"
1"	1 1/16"	2"	9/64"

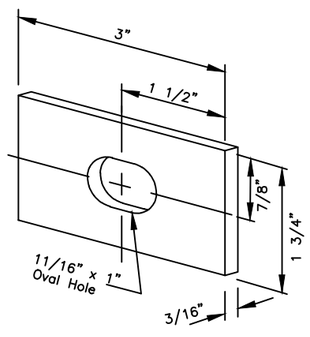
STANDARD STEEL WASHERS



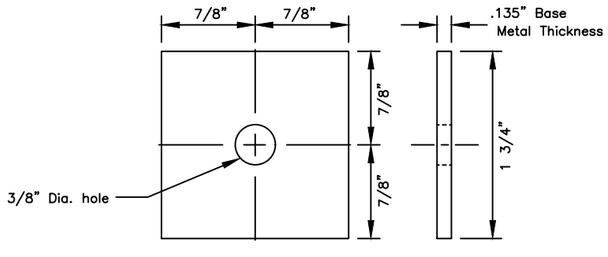
EYE BOLT



FLAT PLATE WASHER



RECTANGULAR POST BOLT WASHER
(FWR03)



SQUARE STEEL WASHER
(FWR01)

State of Alaska DOT&PF
ALASKA STANDARD PLAN

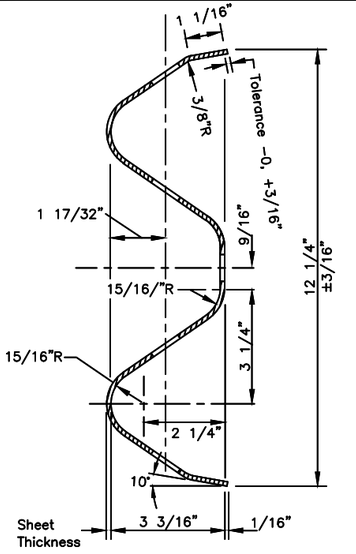
STANDARD GUARDRAIL HARDWARE
(NUTS, BOLTS & WASHERS)

Adopted as an Alaska Standard Plan by: Carolyn Morehouse
Carolyn Morehouse, P.E.
Chief Engineer

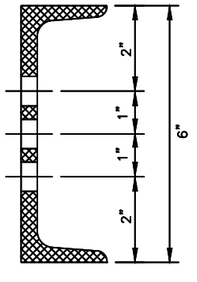
Adoption Date: 7/17/2020

Last Code and Stds. Review
By: KLK Date: 7/8/2020

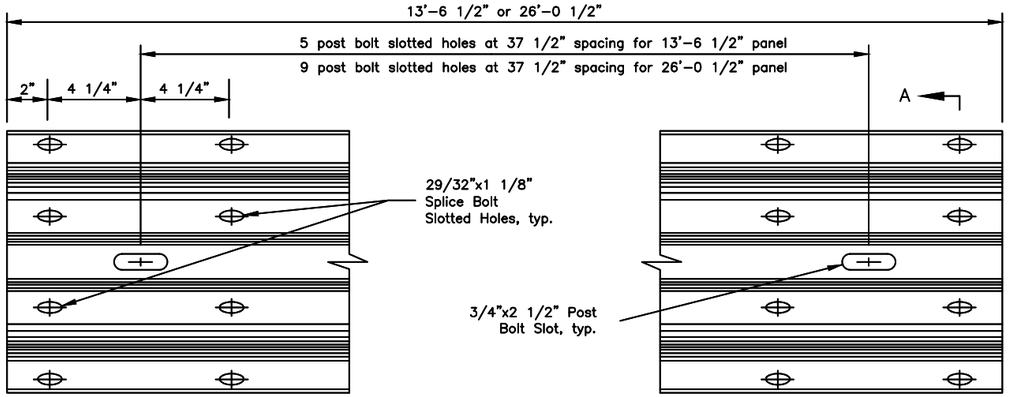
Next Code and Standards Review Date: 7/8/2030



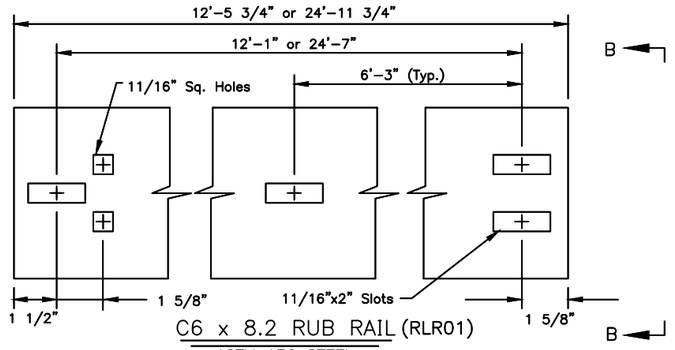
SECTION A–A
(cross section same as RWM02a–b)



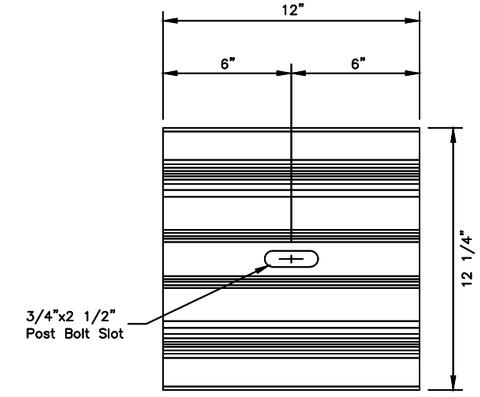
SECTION B–B



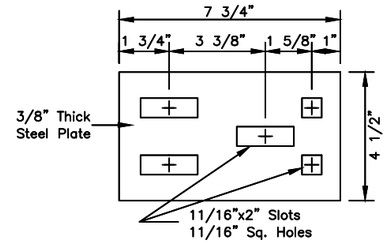
STANDARD W–BEAM PANEL (RWM04a–b)



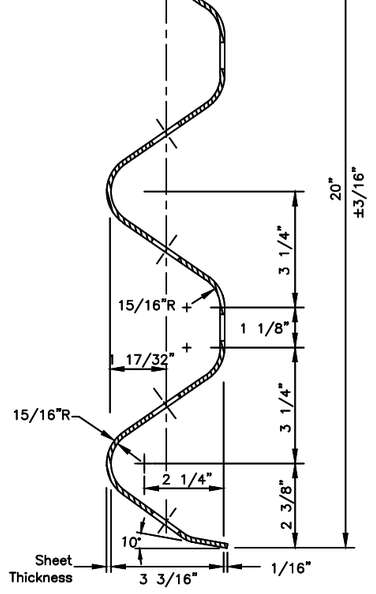
C6 x 8.2 RUB RAIL (RLR01)
ASTM A36 STEEL



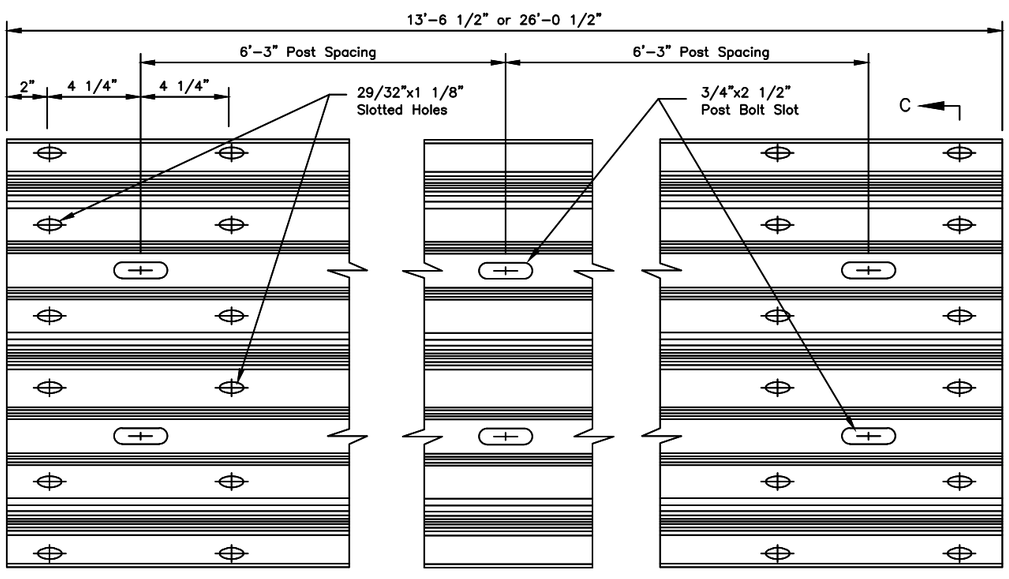
W–BEAM BACKUP PLATE
(RWB01a–b)



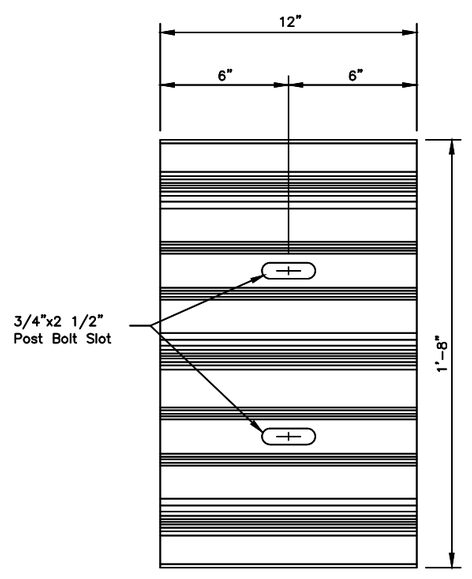
SPLICE PLATE (RLR01)
ASTM A36 STEEL



SECTION C–C
(RTM01a–02b)



STANDARD THRIE BEAM PANEL (RTM01a–02b)



THRIE BEAM BACKUP PLATE
(RTB01a–02b)

GENERAL NOTES:

1. All covered hardware shall comply with the Task Force 13 (TF13) Guide to Standardized Roadside Safety Hardware online publication. Designators given when possible in parentheses.
2. Install back–up plates between blockouts and w–beam or thrie–beam rail at intermediate (non–splice) posts when steel blockouts are used but not with wood, rubber, plastic, or other approved blockouts.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

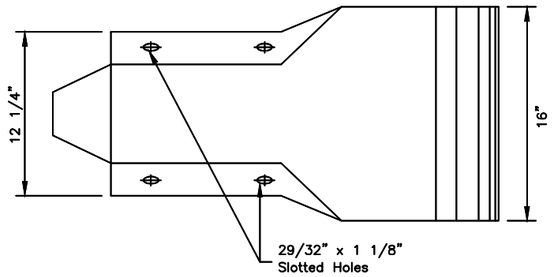
STANDARD GUARDRAIL HARDWARE (RAILS AND SPLICES)

Adopted as an Alaska Standard Plan by: Carolyn Morehouse
Carolyn Morehouse, P.E.
Chief Engineer

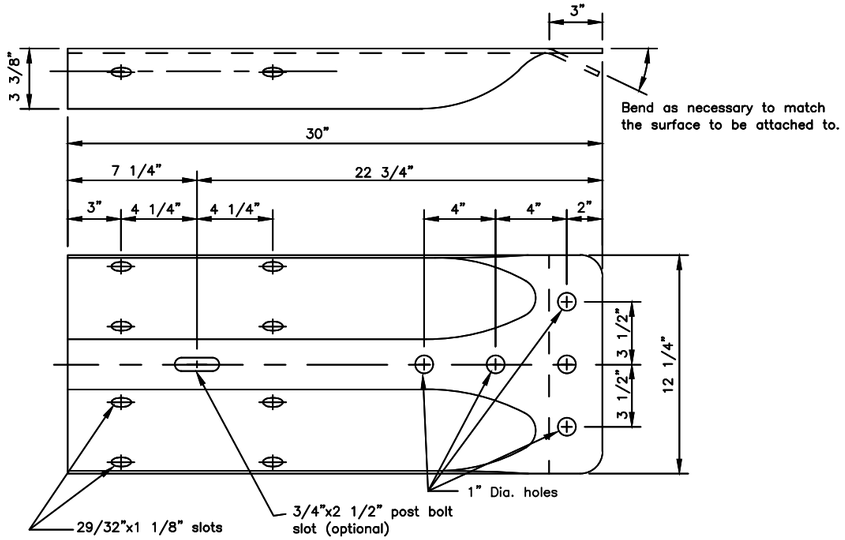
Adoption Date: 7/17/2020

Last Code and Stds. Review
By: KLK Date: 7/8/2020

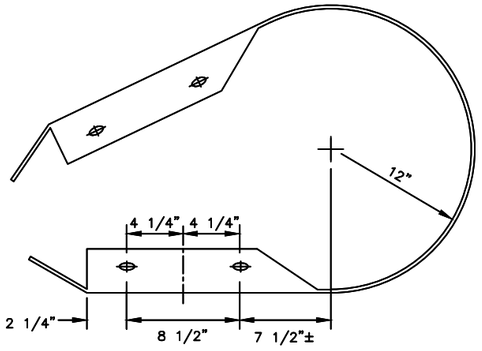
Next Code and Standards Review Date: 7/8/2030



PROFILE

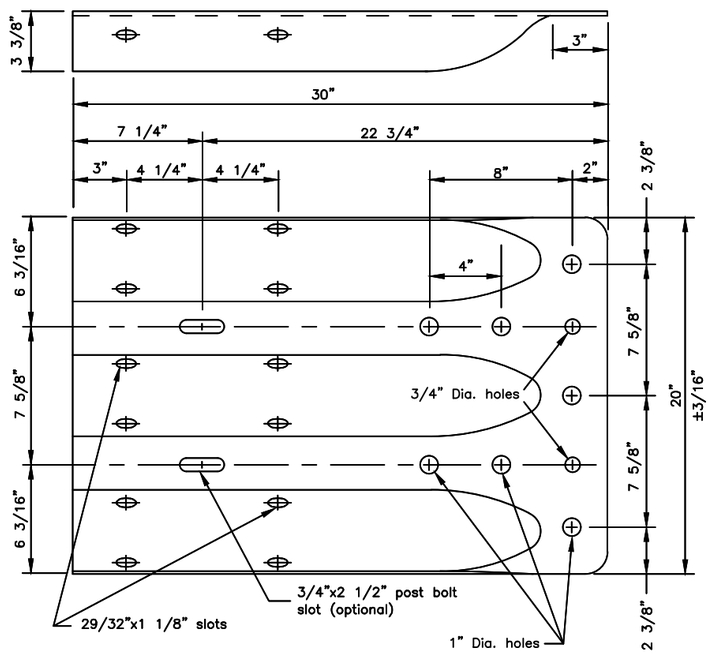


STANDARD W-BEAM TERMINAL CONNECTOR
(RWE02)



W-BEAM PLAN VIEW
*Radius to be specified on the plans

STANDARD W-BEAM END SECTION
(RWE06)



STANDARD THRIE BEAM TERMINAL CONNECTOR
(RTE01b)

GENERAL NOTES:

1. W-Beam and Thrie Beam Terminal Connectors shall conform to AASHTO M 180, Class B, Type II.
2. W-Beam end sections shall conform to AASHTO M 180, Class A, Type II.
3. All covered hardware shall comply with the Task Force 13 (TF13) Guide to Standardized Roadside Safety Hardware online publication. Designators given when possible in parentheses.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

STANDARD GUARDRAIL HARDWARE (TERMINAL CONNECTORS)

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Carolyn Morehouse, P.E.
Chief Engineer

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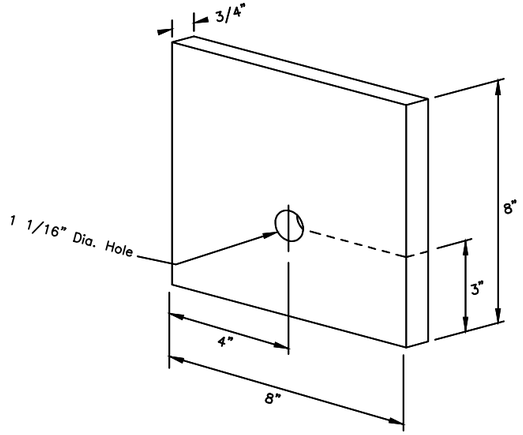
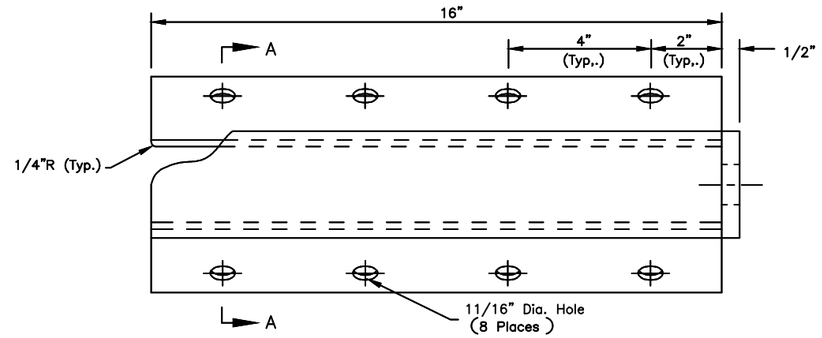
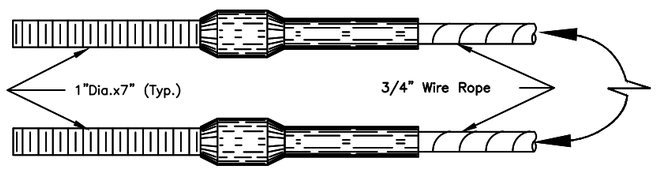


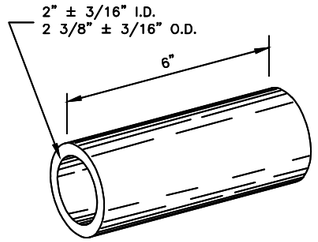
BEARING PLATE for CRT TERMINAL ANCHOR
(FPB01)



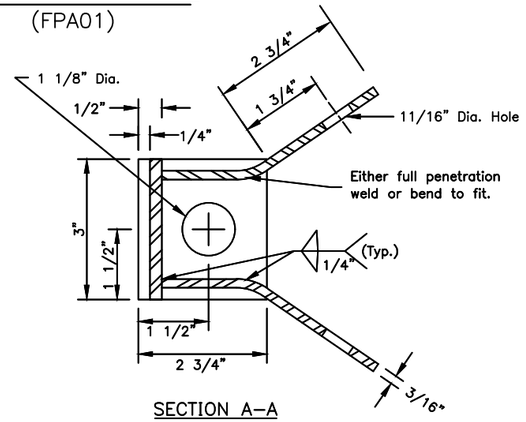
CABLE ANCHOR PLATE
(FPA01)



SWAGED FITTING DETAIL
(FCA01–02)



SLEEVE DETAIL
(FMM02)

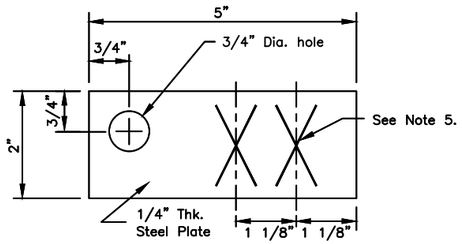


SECTION A–A

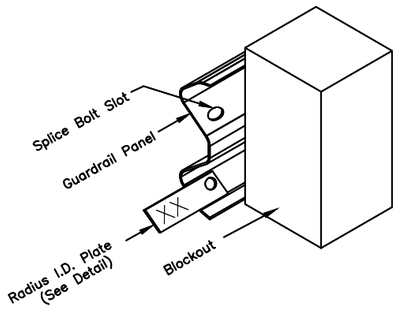
CONTROLLED RELEASE TERMINAL HARDWARE DETAILS

GENERAL NOTES:

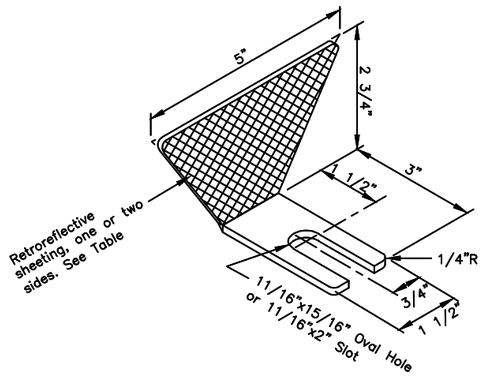
1. Cable Anchor Plate may be formed in single unit or welded fabrication.
2. Anchor Cable Assembly must conform to AASHTO M 30 with Type II Wire Rope.
3. Provide Sleeve for Wood Posts meeting the requirements of ASTM A53 and made of 2–inch galvanized standard pipe. Sleeve shall be a tight, pressed fit in post.
4. Attach radius ID plates to all shop–bent guardrail sections. Bolt the ID plates to the back side of the guardrail panel with the lower splice bolt nearest the P.C. of the radius.
5. Show the Rail bend radius, in feet, as "XX" on the radius ID plate. Digits shall be etched or stamped and have a min. height of 1 1/2" and a max. width of 3/4". Galvanize the plate after the digits are marked.
6. All covered hardware shall comply with the Task Force 13 (TF13) Guide to Standardized Roadside Safety Hardware online publication. Designators given when possible in parentheses.



RADIUS I.D. PLATE



RADIUS I.D. PLATE MOUNTING DETAIL



GUARDRAIL REFLECTOR

Guardrail Reflector Table

Type	Color	Reflectorized
A	White	Front & Rear
B	White	Front
C	Yellow	Front
D	Yellow	Front & Rear

State of Alaska DOT&PF
ALASKA STANDARD PLAN

STANDARD GUARDRAIL HARDWARE (MISCELLANEOUS)

Adopted as an Alaska Standard Plan by: Carolyn Morehouse
Carolyn Morehouse, P.E.
Chief Engineer

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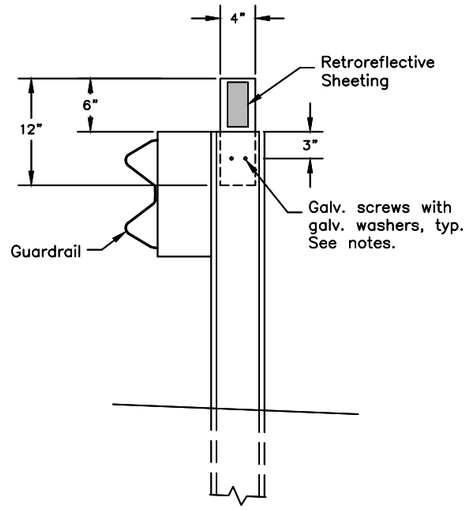

GUARDRAIL FLEXIBLE DELINEATOR DETAIL

(Steel post shown – similar for wood post)

CONSTRUCTION NOTES

1. Install guardrail flexible delineators where shown on the plans.
2. Install guardrail flexible delineators at 50 foot spacing, unless otherwise noted on the plans. Install not less than 2 delineators per guardrail run.
3. Use 3" x 5" white/yellow/red retroreflective sheeting as required per Standard Plan T–05. Install retroreflective sheeting on both sides of delineator on two–way roads.
4. Attach 4" x 12" flexible delineators to the top of new guardrail posts, on the trailing side of the posts relative to the adjacent lane's direction of travel.
5. Use 2 each 1/4" dia. x 1–1/2" long galvanized lag screws for attaching to wood posts and 2 each 1/4" dia. x 3/4" long galvanized self–drilling fasteners for steel posts. Install a galvanized washer between the fastener head and the flexible delineator.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

STANDARD GUARDRAIL HARDWARE (FLEXIBLE DELINEATORS)

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Carolyn Morehouse, P.E.
Chief Engineer

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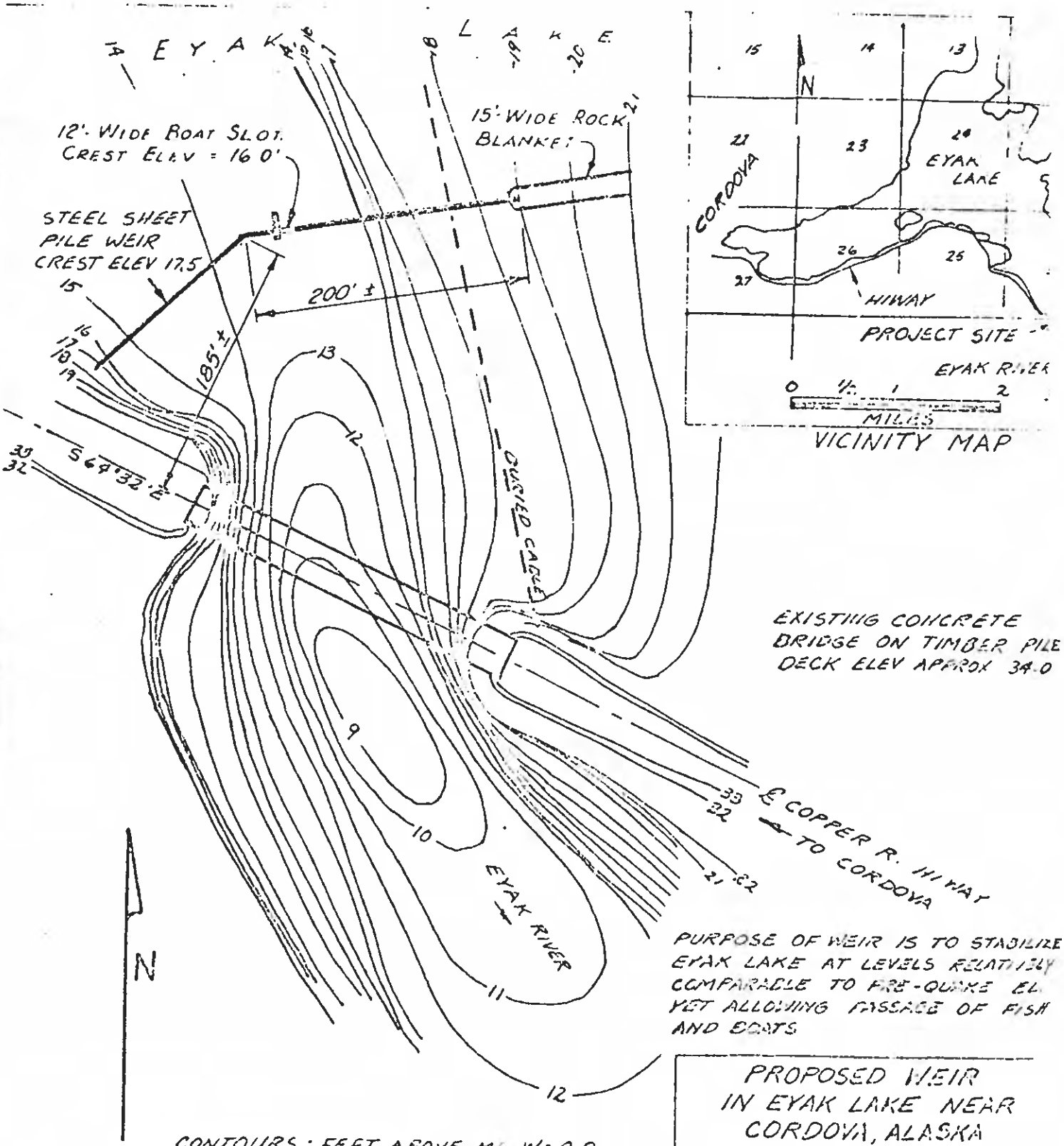
APPENDIX E

1972 Weir Drawings



PROPOSED WEIR IN EYAK LAKE NEAR CORDOVA, ALASKA

APPLICATION BY

ALASKA DEPT OF PUBLIC WORKS

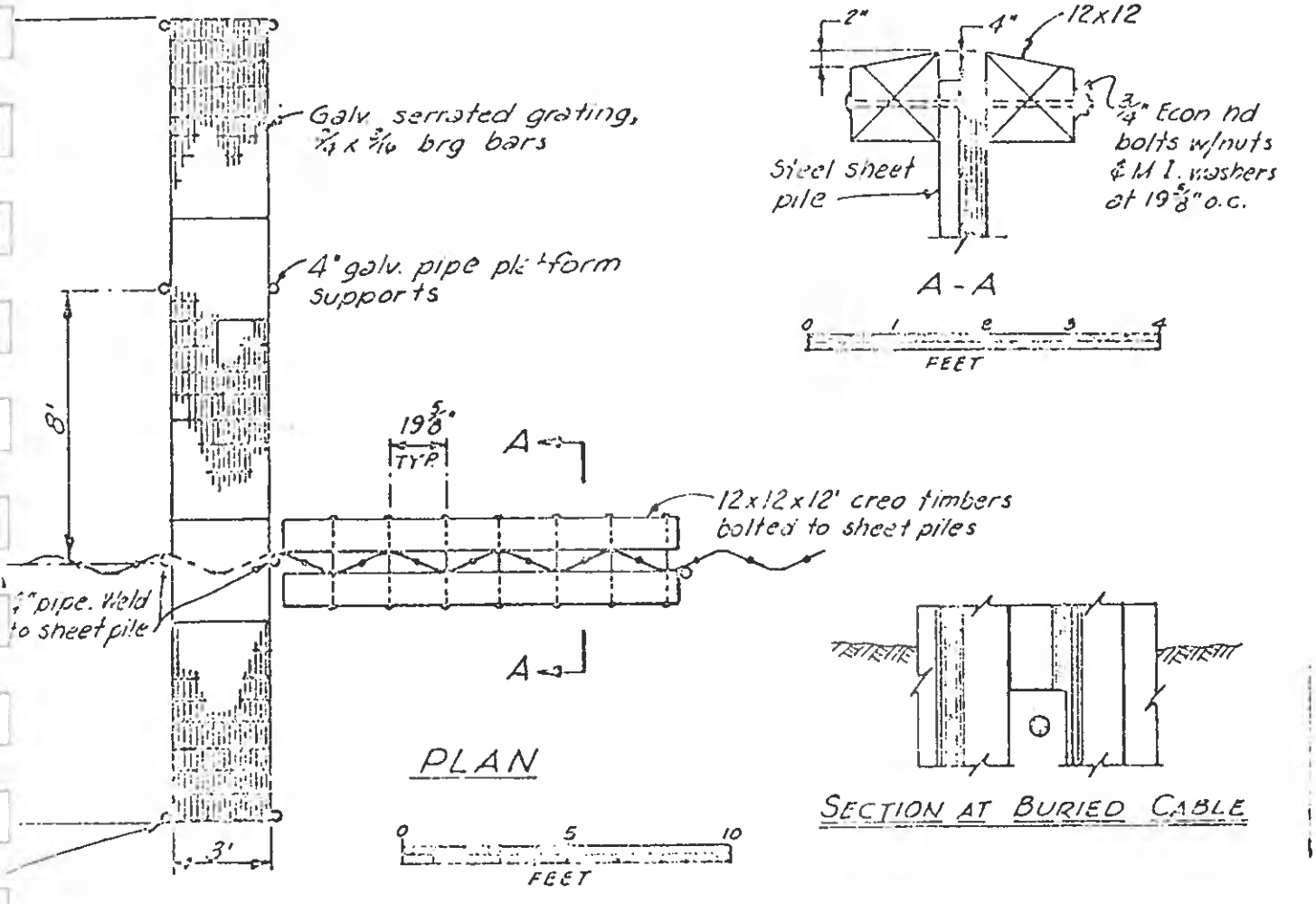
DIVISION OF WATER & HARBORS

POUCH Z

JUNEAU, ALASKA

D.S. MILLER 27 JAN.

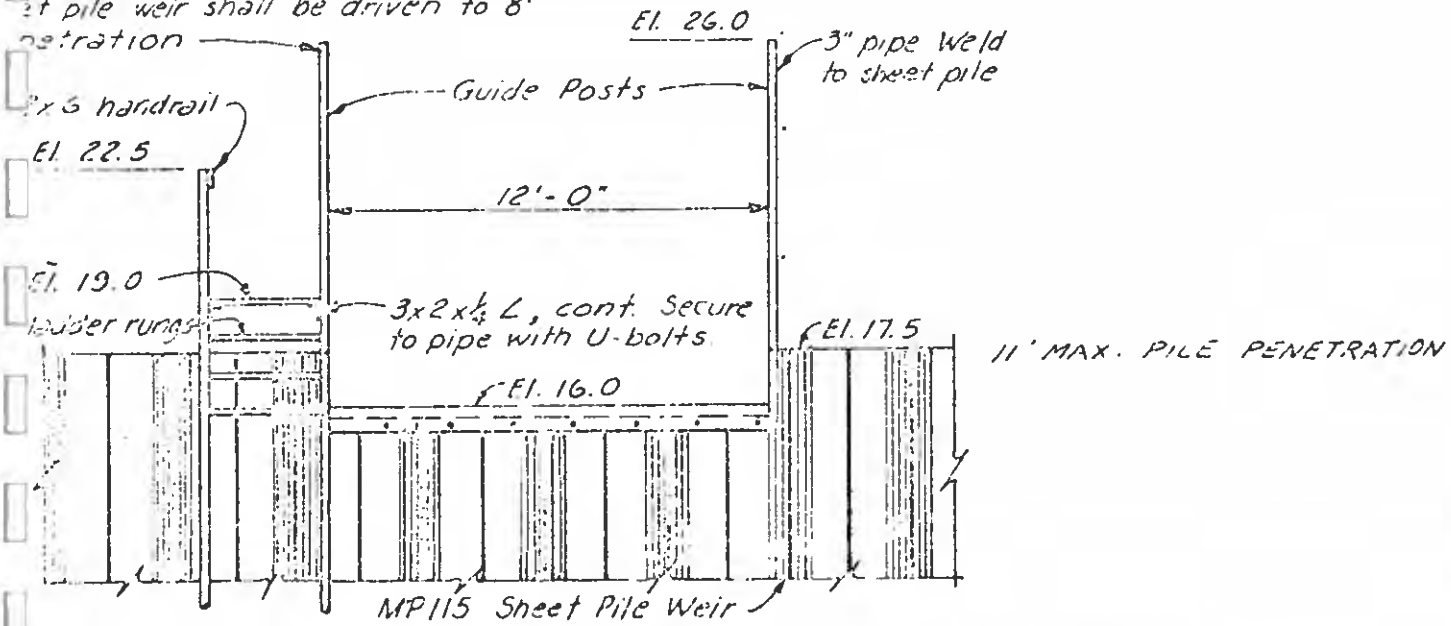
Revised 2-28-72 JET



PLAN

SECTION AT BURIED CABLE

All support pipes not welded to sheet pile weir shall be driven to 8' penetration



ELEVATION

EYAK LAKE WEIR
12' WIDE BOAT SLOT DETAILS

Revised 2-29-72 JET SH. 2 OF 2 JET 1-72

APPENDIX F

Eyak Lake Weir Replacement Geotechnical Report

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FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

The Eyak Lake Outlet Structure Replacement project seeks to retain existing lake water surface elevations, improve upstream fish passage, and address community concerns at the lake outlet. The purpose of this geotechnical engineering report is to support the planning, design, and construction of potential improvements to the outlet structure. This report presents the results of our geotechnical field exploration, laboratory soil testing program, and geotechnical engineering considerations and recommendations. This work was completed for Copper River Watershed Project (CRWP).

1.1 Purpose and Scope

DOWL completed a geotechnical investigation for the proposed Eyak Lake Outlet Structure Replacement in Cordova, Alaska. The scope of geotechnical services consisted of reviewing existing geotechnical and geological information, field observations, subsurface exploration, laboratory testing, engineering analyses, and preparing this geotechnical report. We conducted this work referencing our proposal to CRWP dated April 30, 2021.

Our geotechnical engineering scope of work for this project included drilling two test borings to depths ranging from approximately 50 to 51 feet below existing site grades, laboratory testing for soil engineering properties, and engineering analyses to provide soil engineering properties, foundation or embedded structure options, and earthwork considerations.

1.2 Project Understanding

1.2.1 Existing Outlet Structure Description

The existing weir structure was originally built as a dam in 1972 to reestablish the water surface elevation in Eyak Lake after the 1964 ‘Good Friday’ earthquake raised the ground elevation resulting in the Eyak Lake draining. The existing weir is constructed of Z-profile sheet piles. The sheet piles are 5/16-inch thick, have a corrugation depth of 9.5 inches, and each individual sheet is 22 inches wide. The embedment depth of the sheet piles is unknown.

The overall weir structure is composed of two linear sections forming a ‘V’ shape in the center of Eyak Lake outlet. Currently, about 140 feet of sheet pile is visible west of the ‘V’ near the center of the weir and 110 feet of sheet pile visible to the east of the ‘V’. Historical drawings show approximately 200 feet of sheet pile installed to the east of the ‘V’. If the historical drawings are correct, the sheet pile extends into the woods east of the weir and may have since been infilled with sediment and vegetation, obstructing the view of the sheet pile.

It is also possible that the original west end of the sheet pile extended to the road embankment. Currently, 22 feet of the western-most sections of the visible weir have failed and shot rock placed at the abutment may bury additional sheet pile sections between the visible end of the sheet pile and the road embankment. Historical documents note that shot rock was placed adjacent to the highway prior to 1978 (International Engineering Company, 1985).

A 12-foot wide by 1.5-foot deep boat slot was designed into the sheet pile to allow shallow draft watercraft to navigate upstream during high flows. The boat slot has two timbers bolted to the sheet pile to help guard boat hulls from damage. A metal pier or platform is constructed at the

apex of the weir beside the boat slot to aid navigation of the boat slot. The platform is 8 feet by 3 feet on the downstream side and a 16 feet by 3 feet on the upstream side; the farthest upstream 8 feet of the platform has failed. The available design drawings show that the platform was originally supported on 4-inch pipe piles driven to a depth of 8 feet. However, It was observed that the upstream platform supports were currently supported with H-piles.

The central failing portion of the sheet pile is directly east of the platform and is about 37 feet wide with maximum downstream displacement of about 6 feet. Erosion of the material downstream of the weir reached a point of imminent structural failure in 1978. An emergency repair placed 1,100 cubic yards of quarry rock to buttress along the downstream side of the weir (International Engineering Company, 1985).

1.2.2 Proposed Development

Four preliminary alternatives have been identified by DOWL for consideration for the repair and improvement of the Eyak Lake Outlet Structure. The Alternative Analysis report provides details on these alternatives and a summary of the the alternatives follows.

Alternative 1: No Action

Alternative 1 is the “no action” option and is the existing condition. However, CRWP and other stakeholders desire new features to remove concerns regarding fish passage, maintaining existing lake levels, public safety, and the longevity of the structure.

Alternative 2: Rehabilitate Existing Structure with Natural Fishway

Alternative 2 seeks to use the existing site as much as possible and incorporate the most functional elements of the outlet structure and in-stream features with new fish passage components and would include the following features:

- Replace displaced section of sheet pile
- Repair and reinforce boat slot including more buttressing
- Place fish ladder close to river right
- Repair pier structure
- Place large rocks or energy dissipating blocks to mitigate the hydraulic jump
- Reconfigure existing scour control to meet updated standards
- Place bollards at an angle to direct large woody debris away from fishway

Alternative 3: Replace in Kind with Natural Fishway

Alternative 3 would install a sheetpile weir immediately downstream of the existing outlet structure without removing the existing structure. The space between the two structures would be filled with a compacted fill and capped with an erosion resistant layer of rock to create a uniform surface. Alternative 3 would include the following features:

- Construct new sheetpile structure in front of existing structure
- The void between the sheetpiles to be filled to create a uniform structure
- Place boat slot closer to shore for safety
- Construct fish ladder close to existing boat slot
- Construct boat slot closer to river right
- Construct bollards at an angle to direct large woody debris away from fishway

Alternative 4: Series of Rock Weirs

Alternative 4 proposes to construct a series of rock structures by carefully placingplacing interlocking ripraprip rap around the existing outlet structure supported by structural fill and subsequent rock structures constructed of large quarried rock. The intent is to create a series of riffles and pools with gradual drops. This alternative would include the following features:

- Buttress/encapsulate existing weir with rock
- Add additional rock weir downstream of the outlet structure to create a shallower hydraulic gradient
- Increases energy dissipation, reducing the downstream velocities
- Removes the safety concerns for a rolling hydraulic jump downstream of the weir
- Increased complexity of navigation for watercraft

1.2.3 Geotechnical and Geologic Background Review

DOWL reviewed the Eyak Lake AMSA Cooperative Management Plan (Professional Fishery Consultants, 1985), Eyak Lake Dam Periodic Safety Inspection Report No. 1 (International Engineering Company, 1985), the Field Inspection and Deregulation Report, Eyak Lake Dam (ADNR, 2012), and the geotechnical report for the Eyak River Boat Launch (DOWL, 2011). Little geotechnical information for the weir was available from the background documents review. The topography and records of the highway bridge development suggested that bedrock may have been be shallow near the west abutment. One interpretation of the Eyak Lake bathymetry is that Eyak Lake was once near sea level and may have been a tidal flat (Professional Fishery Consultants, 1985), this interpretation suggests that liquafiable soil could have been present. Fine-grained floodplain deposits consisting of silts and fine sands were encountered at the Eyak River boat launch interbedded with alluvial sands and gravels (DOWL, 2011).

Based on the data available, we anticipated that the subsurface soils would consist of sands and gravels and that it may have been possible for fine-grained materials such as silt and clay to be present and some of these material may be liquafiable. The exploration did not encounter any silt, clay, or bedrock, and the material encountered was consistent with a geologic interpretation that the material encountered is alluvial and glaciofluvial in nature and no lacustrine or tidal deposits were encountered to depth of exploration.

2.0 PHYSICAL SETTING

2.1 Area Topography and Development

The Eyak Lake outlet structure is located at approximately Milepost 5.5 on the Copper River Highway, east of Cordova, Alaska; the weir is located approximately 120 to 300 feet upstream of the Copper River Highway bridge over the Eyak River. The Cooper River Highway is about 13 feet higher in elevation than the west abutment. The topography surrounding east abutment is relatively flat with shallow slopes.

The west abutment of the weir (river right) is only accessible by foot from the highway by a narrow trail used for fishing access. The east weir abutment (river left) can be accessed from an

approximate 10-foot wide trail/access road on the river left of the bank that allows access to the left side of the weir from the Copper River Highway.

Utilities consisting of fiber optic cable and energized power lines are buried within the lake and cross over the buried weir approximately 14 feet east of the edge of the visible sheet pile and continue down the middle of the trail/access road to the Copper River Highway. Communications cable are buried adjacent to the west side of the Copper River Highway.

The project location is shown in Figure A-1, Vicinity Map, in Appendix A and the project site is shown in Figure 1 below.

Figure 1**: Eyak Lake Weir and Copper River Highway Bridge**

2.2 Regional Geology

Eyak Lake in Cordova, Alaska is situated within the Chugach Mountains along the north coast of the Gulf of Alaska. Underlying and exposed bedrock in the area is composed of graywacke, greenstone, shale, and some limestone (Wahrhaftig, 1965; Winkler and Plafker, 1993); however, the most common lithologies are shale and graywacke. These sedimentary rocks have been altered during the accretionary process and metamorphosed to varying degrees. Glacial and alluvial activity were the primary natural processes contributing to the formation of the present topography around the Eyak Lake outlet and upper Eyak River area.

There are several faults located near the project site. The Eyak Fault has an azimuth orientation of about 70/230 and is located beneath Eyak Lake extending south of downtown Cordova. The

Cordova Fault has a similar orientation and passes through Mount Eyak and extends north of downtown Cordova. These two faults are not known to be active during the past 1.6 million years. The Heney Fault to the south west has a similar orientation and is in the southern Heney Range. The United States Geological Survey has determined this fault to have been active within the past 15,000 years (USGS and ADNR, accessed 2021).

2.3 Climate

The Cordova area is a marine climate zone. Weather patterns are influenced by the Chugach mountains and the Gulf of Alaska. The climatological data presented below was taken from a range of sources; including the Alaska Climate Research Center (ACRC), the Western Regional Climate Center, and NOAA's National Climatic Data Center.

Mean Annual Precipitation	159 inches
Mean Annual Snowfall	111 inches
Mean Maximum Temperature July	61 °F
Mean Maximum Temperature January	35 °F
Mean Minimum Temperature July	50 °F
Mean Minimum Temperature January	25 °F
Average Annual Temperature	43 °F
Average Freezing Degree Days (°F-day)	791
Design Air-Freezing Index, F_{100} (°F-day)	2,335

Mean monthly temperatures and precipitation for Cordova and vicinity, for the period between 1981 and 2010 are shown in Table 1.

Table 1: Average Monthly Temperatures and Precipitation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Temperature (°F)	32.4	32.6	34.4	39.4	46.7	52.5	56.2	55.9	50.2	41.9	35.3	33.8
Precipitation (in)	12.5	11.6	9.3	8.6	8.1	6.5	7.6	13.5	21.6	20.0	12.4	16.7

3.0 FIELD INVESTIGATION AND LABORATORY TESTING

3.1 Field Investigation

The test boring exploration for the Eyak Lake Outlet Structure Replacement Design project was conducted on June 7 through 10, 2021. Two test borings were drilled, sampled, and logged to depths of 50 to 51.3 feet below existing grade near each abutment.

The test borings were located in the field by measuring tape from surveyed features and are only as accurate as the method implies. The locations of the test borings are shown on Figure A-2, Test Boring Location Map, located in Appendix A, and a summary of the exploration locations is presented as Table 2.

Table 2: Exploration Summary

Boring Number	Drill Depth (feet)	Surface Elevation (feet)	Northing (feet)	Easting (feet)	Location
1	51.3	~19	2386425	1704168	West abutment: 6 feet downstream from projected alignment of intact weir and 10 feet southwest of most western visible section of sheet pile.
2	50	~16.5	2386530	1704376	East abutment: 18 feet downstream of weir and 41 feat east of eastern edge of bowed section of weir.

Coordinates are Alaska State Plane (ASPC) Zone 3, NAD83(2011) in U.S. Survey Feet. Elevations are in Mean Lower Low Water (MLLW) in U.S. Survey Feet.

The test borings were drilled using a Geoprobe 6712DT rubber-tracked drill rig fitted with air rotary tooling. Discovery Drilling, Inc. of Anchorage, Alaska owns and operated the rig. A geologist with our firm supervised the drilling and logged the samples. Samples were generally obtained at five foot intervals using a split-spoon sampler.

The Modified Penetration Test (MPT) was performed in the test borings by driving a 3-inch outside-diameter, split-spoon sampler a distance of 18 to 24 inches ahead of the casing with a 340-pound hammer falling 30 inches in general accordance with ASTM Standard Test Method for Standard Penetration Test and Split-Barrel Sampling of Soils (D1586). The penetration resistance (N) value shown on the test boring logs indicates the number of blows required to drive the sampler from 6 to 18 inches. The results are an indication of the relative density or consistency of the subsoil. The N-values shown on the the test boring logs are raw data from the field and have not been adjusted for sampling equipment type or overburden pressure. The test boring logs are presented in Appendix B.

Soil samples recovered during drilling were visual-manually classified in general accordance with ASTM D2488 and sealed in plastic bags to preserve the natural water content. The samples were then transported to DOWL's Anchorage laboratory partner Alaska Testlab in accordance with ASTM D4220, for further testing.

No environmental testing or monitoring was conducted as a part of this investigation.

3.2 Laboratory Testing

Laboratory tests were performed on selected samples to measure soil index properties to provide a basis for estimating engineering properties. The natural water content of nearly all the recovered samples was measured and grain size analyses were performed on selected samples (Table 3). Soil samples will be stored until October 2021, after which time they will be discarded unless other arrangements are made. Laboratory test results are presented in Appendix C.

Table 3: Laboratory Tests

Test	Purpose
Natural Moisture Content ASTM D 2216	Provides a measure of natural (in situ) water content.
Particle-Size Distribution ASTM D 421	Provides a measure of grain sizes of the soils for classification and identification of physical characteristics.

4.0 SUBSURFACE CONDITIONS

The soil descriptions and stratigraphy contained herein and the classifications shown on the test boring logs are the project geotechnical engineer's interpretation of the field logs and the results of the laboratory soil testing. The largest particle size that can be recovered with standard drill hole samplers is often smaller than the maximum particle size in a gravelly soil deposit. Therefore, the soil descriptions and test results for gravelly soils tend to be biased toward the finer particle sizes.

Refer to the Test Boring Log - Descriptive Guide in Appendix B immediately following the test boring logs for a more detailed presentation on sample sizes, sample quality, frost classifications, soil types, and the soil classification procedures.

4.1 Observed Soil Conditions

Shot Rock Fill. The surficial fill material on at the west abutment test boring location extends from the ground surface to depths about 13.5 feet. Cobbles around four to six inches diameter are commonly visible on the surface but boulders up to 2 feet in diameter are also present. The moisture content of the fill ranges from 3 to 6 percent. The uncorrected MPT N-values range from a low of 4 to a high of 7 with an average of 6.The surficial fill material at the east abutment test hole location extends from the ground surface to depths of about 3 feet. The visible shot rock size at the boring location is in the 3 to 6 inch range.

Sand. Poorly graded sand was encountered to depth of 10 to 15 feet in test boring 2 on the east side of the weir. The silt content varies from 2 to 3 percent. The moisture content of the sand ranges from 20 to 22 percent. The raw field MPT N-values range from a low of 6 to a high of 9 with an average N-value.

Sand with Gravel. The fill and sand is underlain by sand with gravel which extends to depths of about 28 to 32 feet below the ground surface. This deposit generally classifies as well graded sand with gravel to poorly graded sand with gravel. The silt content varies from 3 to 4 percent. The moisture content of the sand with gravel ranges from 7 to 18 percent. The raw field MPT N-values range from a low of 14 to a high of 28 with an average N-value of 20.

Gravel with Sand. The sand with gravel is underlain by gravel which which was encountered to depths of 48.5 to 51.3 feet below the ground surface. This deposit generally ranges in classification from well graded gravel with sand to well graded gravel with sand and silt. The silt content varies from 2 to 7 percent. The moisture content 5 to 13 The raw field MPT N-values range from a low of 18 to a high of greater than 50 with an average N-value of 29. Cobbles and boulders may be present in this layer based on drill action.

5.0 ENGINEERING ANALYSIS AND RECOMMENDATIONS

5.1 Generalized Soil Profile

As design alternative analyses progresses and project elements are selected, the following generalized soil profile can be used to compute capacity of design elements. Presented densities and friction angles are based on SPT correlations after the raw field MTP N-values were converted to SPT using a hammer energy and spoon size correction of 186 percent of the MTP N-value. The generalize soil profile in Table 4 is based off elevation of approximately 14 feet. This corresponds with the bottom of fill (top of native material) elevation observed in Test Boring 2 on the east side of the of the weir.

Table 4: Generalized Native Soil Profile Properties

Depth (ft)	USCS Classification	Hammer Energy Corrected Average N-Value	Wet Density (pcf)	Effective/ Buoyant Density (pcf)	Friction Angle (degrees)	LPILE Soil Model and k value
0-15	Poorly Graded Sand (SP)	11	110	48	32	Submerged Sand 60 lb/in^3
15-30	Poorly Graded Sand with Gravel (SP)	39	130	68	36	Submerged Sand 125 lb/in^3
30-50	Well Graded Gravel with Sand (GW)	61	135	73	38	Submerged Sand 125 lb/in^3

5.2 Seismic Design Criteria

In order to asses seismic design criteria and seismic risks during this preliminary design phase, a site characterization was conducted in general accordance with ASCE 7-16. However, if another design code is determined to be appropriate, the seismic design criteria may change.

Under ASCE 7-16, Seismic Site Class definitions are based on the average properties in the top 100 feet of the soil column. The standard penetration resistance or N-value can be correlated to the soil shear wave velocity which defines the classification from A to F; for further details please refer to ASCE 7-16 Chapter 20. The subject site was explored to a depth of 50 feet, however, it is anticipated deeper soils will increase in relative density and shear wave velocity. Because potentially liquefiable soils are present, the site should be classified under Seismic Site Class F. If the exceptions in ASCE 7-16 Chapter 20.3.1 section 1 are valid using deep foundations designed to resist settlement down drag, lateral spread, and post-liquefaction conditions, then Seismic Site Class C may be applied. Liquefaction analysis and discussion are in the following section.

Mapped acceleration parameters, site coefficients, and adjusted maximum considered earthquake spectral response acceleration parameters for this site have been determined using the United States Geological Survey (USGS) Seismic Design Maps application based on the

ASCE 7-16 Seismic Site Class C, and an assumed Risk Category of II are summarized in Table 5. The USGS detailed report is presented in Appendix D

Table 5: ASCE 7-16 Seismic Design Parameters (USGS 2021)

S_S	1.5 g
S_{MS}	1.8 g
S_{DS}	1.2 g
S_1	0.805 g
S_{M1}	1.1 g
S_{D1}	0.752 g
Mapped MCE PGA_M	0.678

5.3 Liquefaction

Liquefaction is the partial or total loss of strength of soils that can occur during strong earthquake shaking of significant duration. Earthquake-induced liquefaction generally occurs only under particular conditions, including high groundwater table, strong earthquake ground shaking of long duration, and loose uniform sands. Typically, liquefaction occurs where the water table is shallow (within 5 to 10 feet of the surface) and generally only at depths less than about 50 feet.

A liquefaction analysis was conducted for a design seismic event with a peak ground acceleration 0.678 g using the Simplified Method described by Youd et al 2001. The analyses found that the sand encountered to depths of 15 feet are potentially liquefiable. Liquefaction may be mitigated by deep foundations designed to handle the seismic and post-liquefaction conditions, or by using ground improvements to densify the loose, potentially liquefiable soils.

The liquefaction analyses showed that lateral ground displacement of about one to two feet is possible during a design seismic event due to the liquefiable sands in the upper 15 feet.

5.4 Pile Foundations and Sheet Pile

Pile foundations and sheet pile weir replacement or installation are feasible provided they are installed deep enough to resist scour and potential liquefaction. Resisting scour can be achieved by deep installation and/or scour protection using large rock or other hydraulic measures. See the Hydrologic and Hydraulics report presented under separate cover for more information on scour protection.

Due to liquefaction susceptibility in the upper 10 to 15 feet and the possibility of lateral ground spreading we recommend that structures be founded on deep foundations designed to handle the seismic forces and post-liquefaction conditions. Conceptually, driven pipe pile or sheet pile may be feasible assuming a minimum tip depth of 25 feet, however, final depths must be designed to support design axial and lateral loads which may require larger, thick-walled piles to resist down drag caused by liquefaction and the reduced strength typical in post-liquefaction soils. The final depth will be dependent on the chosen structure, deep foundation type, loads, and the structure's configuration.

5.5 Earthwork

Existing Navite Material Reuse. The existing native material to depths of approximately 30 feet does not meet the requirements for reuse as structural fill. If excavations are required, it is likely the material will need to be wasted off site.

Structural Fill. Structural fill is defined as load-bearing fill placed under footings, building foundations, structural slabs, roads, and parking areas. Structural fill should consist of non-frost susceptible (NFS) or possibly frost susceptible (PFS) gravel and contain no lumps, frozen material, organic matter, or other deleterious matter. Structural fill shall meet the following gradation requirements:

Sieve Size	Percent Finer
3”	100*
1-1/2”	70-100
3/4”	30-100
½”	25-100
No. 4	20-49
No. 40	0-25
No. 200	0-6
0.02mm	0-3

* The fill may contain up to 10 percent cobbles.

6.0 LIMITATIONS

DOWL based the conclusions and recommendations presented in this report, on the assumption that site conditions are not substantially different than those exposed by the explorations. If during construction, subsurface conditions are different from those encountered in the explorations, advise DOWL at once to review those conditions and reconsider recommendations if necessary. The geotechnical recommendations provided herein are based on the premise that an adequate program of tests and observations will be conducted during construction in order to document compliance with DOWL’s recommendations and to confirm conditions exposed during subgrade preparations. DOWL geotechnical personnel must review final designs to verify that recommendations provided herein have been properly implemented.

If there is a substantial lapse of time between submission of this report and the start of work at the site, and especially if conditions have changed due to natural causes or construction operations at or near the site, contact DOWL to review this report and to evaluate the applicability of the conclusions and recommendations presented herein.

DOWL prepared this report for the CRWP use on this project. DOWL recommends you make this report available to prospective contractors for information and factual data only, but not as a warranty of subsurface conditions. DOWL prepared this report, including engineering analyses, recommendations, and figures specifically for the project. These recommendations are not applicable to other construction sites. Do not separate the figures from the text for independent use.

DOWL performed these services consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar time and budgetary constraints. No warranty is made or implied.

Any conclusions made by a construction contractor or bidder relating to construction means, methods, techniques, sequences, or costs based upon the information provided in this report are not the responsibility of DOWL.

7.0 REFERENCES

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APPENDIX A: VICINITY AND TEST BORING LOCATION MAPS

DOWL

Project Vicinity Map

EYAK LAKE OUTLET STRUCTURE REPLACEMENT DESIGN

Cordova, Alaska

PROJECT	1136.63341
DATE	Jul 08, 2021

FIGURE A-1

Service Layer Credits: World Imagery: Maxar

DOWL

Test Boring Location Map

EYAK LAKE OUTLET STRUCTURE
REPLACEMENT DESIGN

Cordova, Alaska

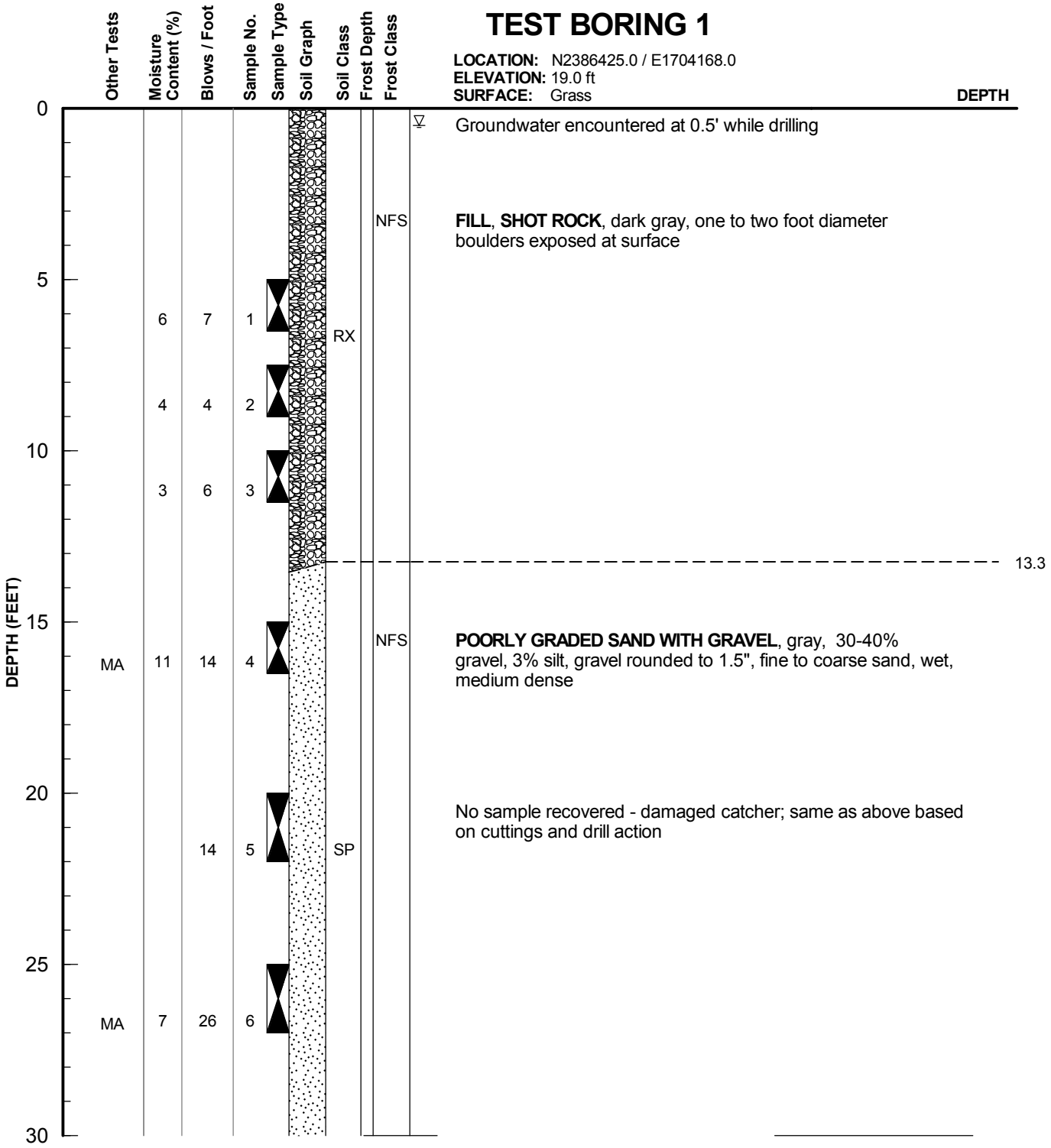
PROJECT	1136.63341
DATE	Jul 08, 2021

FIGURE A-2

APPENDIX B: TEST BORING LOGS AND DESCRIPTIVE GUIDE

TEST BORING 1

LOCATION: N2386425.0 / E1704168.0
ELEVATION: 19.0 ft
SURFACE: Grass



KEY
MA = Mechanical Analysis
TD = Total Depth
□ = Grab Sample
◪ = SPT Sample
▨ = Shelby Tube - pushed
⊟ = Direct Push Sample
⊠ = 2.5" I.D. Spoon Sample
340# weight, 30" fall

DRILLING CO.: Discovery Drilling
EQUIPMENT: Geoprobe 6712DT
OPERATOR: Gary Erickson
METHOD: Air Rotary
FIELD NO.: 1

CLIENT: Copper River Watershed Project
PROJECT: Eyak Lake Outlet Structure
LOGGED BY: Paul Pribyl
TEST BORING COMPLETED: 6-9-21
W.O. 1136.63341.01

DOWL

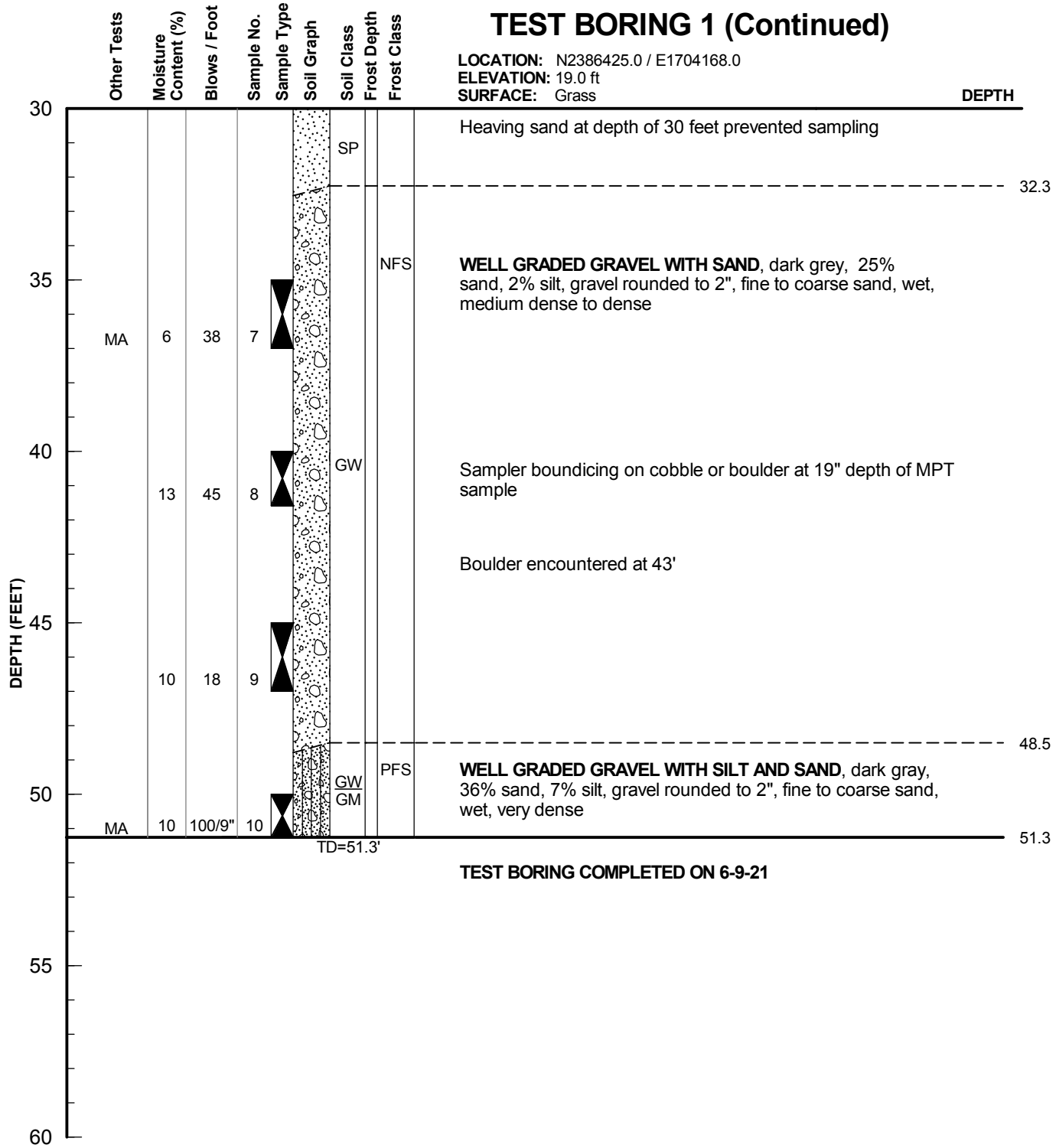
LOG OF TEST BORING 1

FIGURE B--1

LOG OF EXPLORATION 63341.GPJ BLANK2.GDT 7/16/21

TEST BORING 1 (Continued)

LOCATION: N2386425.0 / E1704168.0
ELEVATION: 19.0 ft
SURFACE: Grass



KEY
MA = Mechanical Analysis
TD = Total Depth
□ = Grab Sample
◪ = SPT Sample
▨ = Shelby Tube - pushed
⊟ = Direct Push Sample
⊠ = 2.5" I.D. Spoon Sample
340# weight, 30" fall

DRILLING CO.: Discovery Drilling
EQUIPMENT: Geoprobe 6712DT
OPERATOR: Gary Erickson
METHOD: Air Rotary
FIELD NO.: 1

CLIENT: Copper River Watershed Project
PROJECT: Eyak Lake Outlet Structure
LOGGED BY: Paul Pribyl
TEST BORING COMPLETED: 6-9-21
W.O. 1136.63341.01

DOWL

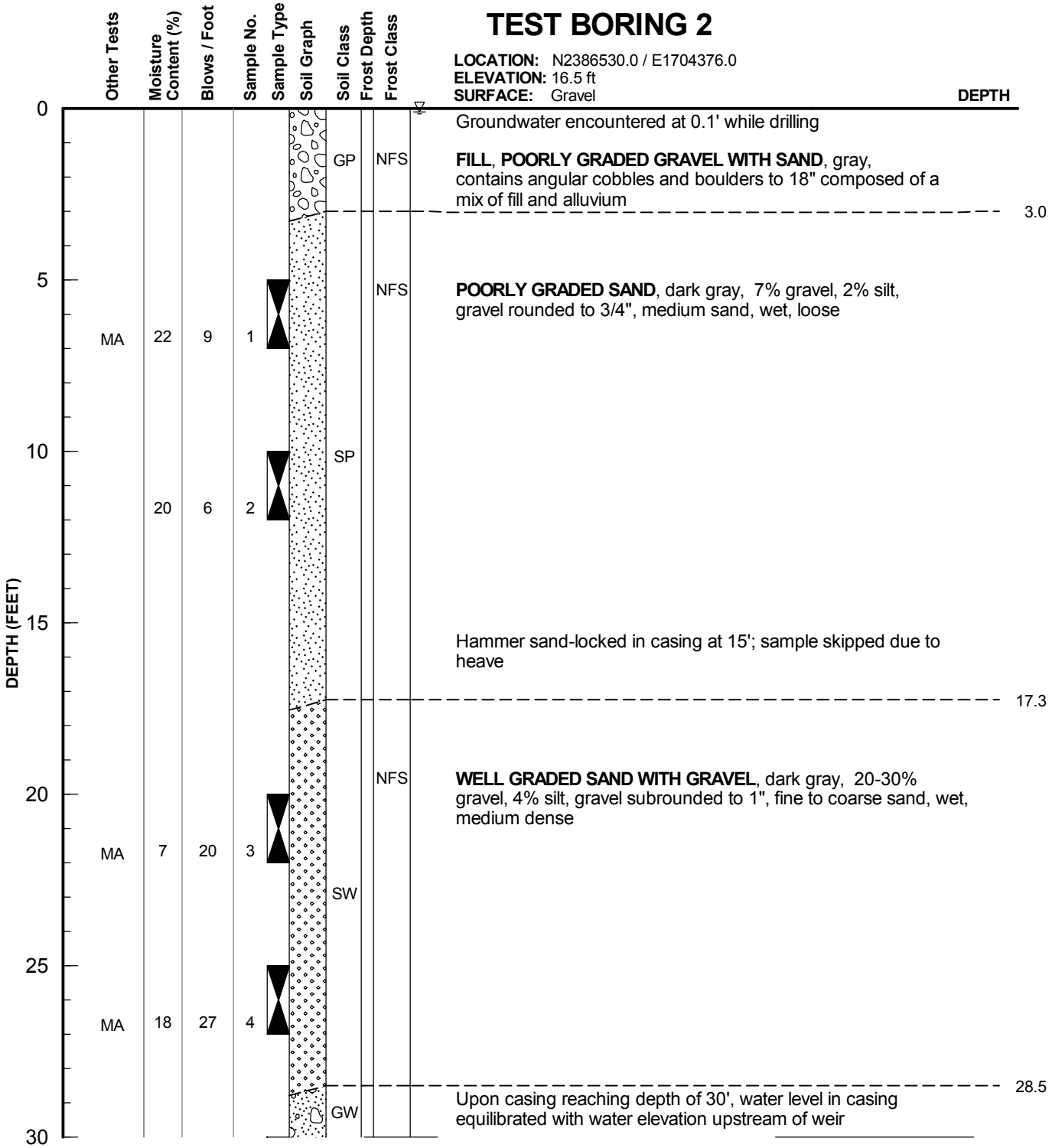
LOG OF TEST BORING 1

FIGURE B--1

LOG OF EXPLORATION 63341.GPJ BLANK2.GDT 7/16/21

TEST BORING 2

LOCATION: N2386530.0 / E1704376.0
ELEVATION: 16.5 ft
SURFACE: Gravel



KEY
MA = Mechanical Analysis
TD = Total Depth
□ = Grab Sample
◪ = SPT Sample
▨ = Shelby Tube - pushed
⊟ = Direct Push Sample
⊠ = 2.5" I.D. Spoon Sample
340# weight, 30" fall

DRILLING CO.: Discovery Drilling
EQUIPMENT: Geoprobe 6712DT
OPERATOR: Gary Erickson
METHOD: Air Rotary
FIELD NO.: 2

CLIENT: Copper River Watershed Project
PROJECT: Eyak Lake Outlet Structure
LOGGED BY: Paul Pribyl
TEST BORING COMPLETED: 6-10-21
W.O. 1136.63341.01

DOWL

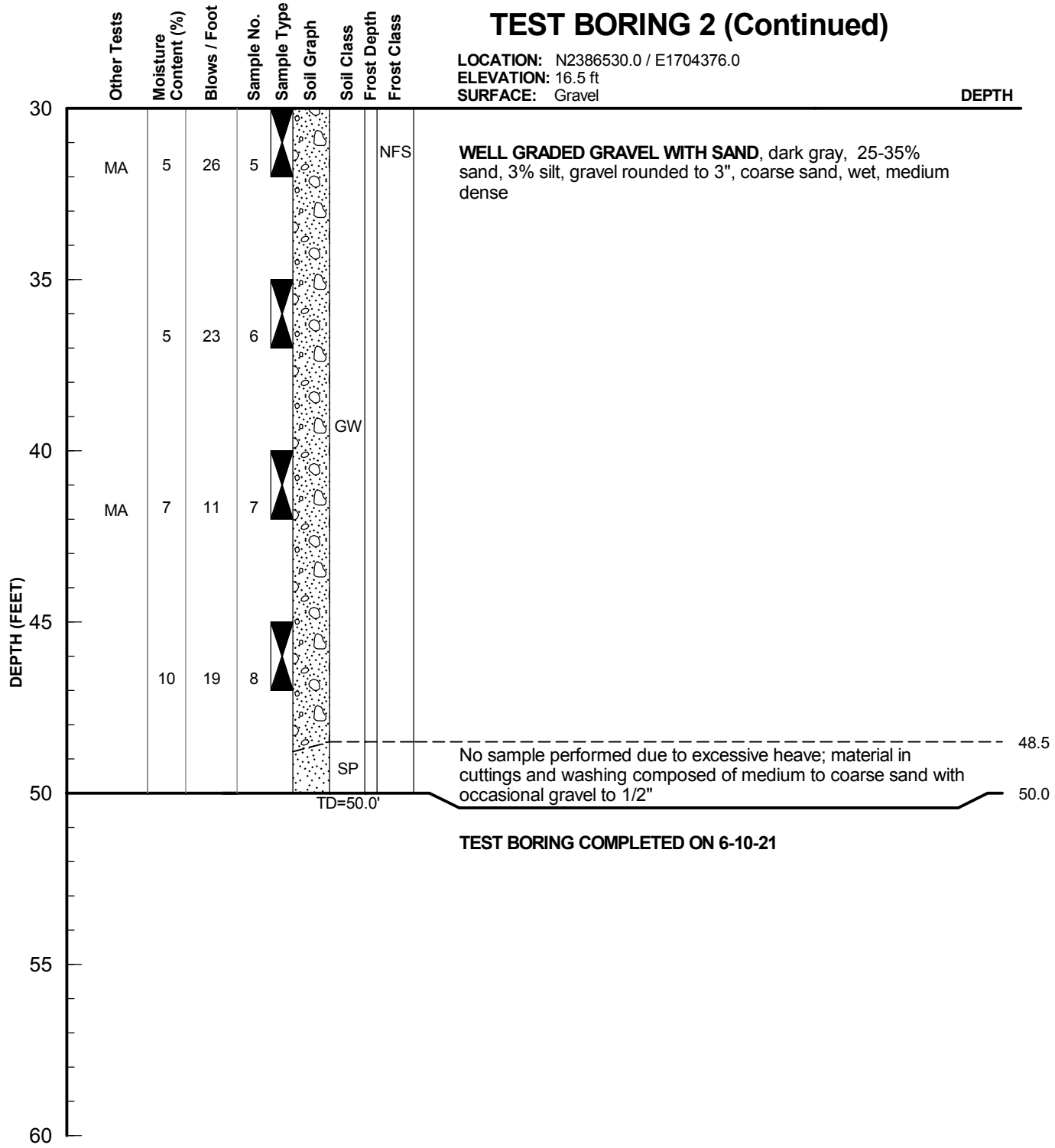
LOG OF TEST BORING 2

FIGURE B--2

LOG OF EXPLORATION 63341.GPJ BLANK2.GDT 7/16/21

TEST BORING 2 (Continued)

LOCATION: N2386530.0 / E1704376.0
ELEVATION: 16.5 ft
SURFACE: Gravel



KEY
MA = Mechanical Analysis
TD = Total Depth
□ = Grab Sample
◪ = SPT Sample
▨ = Shelby Tube - pushed
⊟ = Direct Push Sample
⊠ = 2.5" I.D. Spoon Sample
340# weight, 30" fall

DRILLING CO.: Discovery Drilling
EQUIPMENT: Geoprobe 6712DT
OPERATOR: Gary Erickson
METHOD: Air Rotary
FIELD NO.: 2

CLIENT: Copper River Watershed Project
PROJECT: Eyak Lake Outlet Structure
LOGGED BY: Paul Pribyl
TEST BORING COMPLETED: 6-10-21
W.O. 1136.63341.01

DOWL

LOG OF TEST BORING 2

FIGURE B--2

LOG OF EXPLORATION 63341.GPJ BLANK2.GDT 7/16/21

TEST BORING LOG – DESCRIPTIVE GUIDE

Soil Descriptions – The soil classified visually in the field based on drill action, auger cuttings, and sample information. The recovered soil samples are classified visually again in the laboratory. The soil description on the on the boring log is based on an interpretation of the field and laboratory visual classifications, along with the results of the laboratory testing which may have been performed.

The **soil classification** is based on ASTM Designation D2487 "Standard Test method for Classification of Soils for Engineering Purposes" and ASTM D 2488 "Standard Practice for Description and Identification of Soils (Visual – Manual Procedure)". The soil frost classification is based on the system developed by the U.S. Army Corps of Engineers and is performed in accordance with the Departments of the Army and Air Force Publication TM 5-822-5 "Pavement Design for Roads, Streets, Walks, and Open Storage Areas". Outlines of these classification procedures are presented on the following pages.

The soil color is the subjective interpretation of the individual logging the test boring.

Plasticity Indices - The plasticity of the minus No. 40 fraction of the soil is described and the fine-grained soils are identified from manual tests using the following tables as a guide:

Soil Symbol	Dry Strength	Dilatancy	Toughness
ML	none to low	slow to rapid	low or thread cannot be formed
CL	medium to high	none to slow	medium
MH	low to medium	none to slow	low to medium
CH	high to very high	none	high

Plasticity Description	Criteria
Non Plastic	A 1/8" (3.2mm) thread cannot be rolled at any water content
Low	A thread can barely be rolled and the lump cannot be formed when drier than the plastic limit
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

Laboratory Atterberg Limits tests are usually performed on a few of the plastic soils and results are reported on the test boring log. These laboratory tests are performed in accordance with ASTM D4318 "Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils."

Gravel Shape – The shape of the gravel particles is described based on this guide:

Angular: Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular: Particles are similar to angular but have somewhat rounded edges.
Subrounded: Particles exhibit nearly plane sides but have well-rounded corners and edges.
Rounded: Particles have smoothly curved sides and no edges.

Material Size – The maximum nominal size of gravel and predominate percentage of sand particles are described using the following table:

Description	Gravel	Sand
Coarse	Passes 3" (75 mm) sieve, retained on ¾" (19 mm) sieve)	Passes No. 4 sieve, retained on No. 10 sieve
Medium	N/A	Passes No. 10 sieve, retained on No. 40 sieve
Fine	Passes ¾" (19 mm) sieve, retained on No. 4 sieve	Passes No. 40 sieve, retained on No. 200 sieve

Soil Moisture – The soils moisture is described as:

Dry:	Powdery, dusty, no visible moisture
Moist:	Enough moisture to affect the color of the soil; damp
Moist to Wet:	Water in pores but not dripping; capillary zone above water table
Wet:	Dripping wet, contains significant free water, or sampled below water table

Field Density Estimates – The subject estimate of the density of coarse-grained soils is based on the observed drill action and on drive sample data. The guide below is used with the Standard Penetration Test (SPT) for sands with minor amounts of fine gravel; however blow counts can be affected strongly by gravel content, thermal state, drilling procedures, condition of equipment, and performance of the test.

Standard Penetration Resistance N (blows/foot)	Relative Soil Density
0 - 4	Very loose
5 - 10	Loose
11 - 30	Medium dense
31 - 50	Dense
More than 50	Very Dense

An estimate of the consistency of fine-grained soils is based on the observed drill action and on drive sample data. The guide below is used:

Standard Penetration Resistance N (blows/foot)	Relative Soil Density
0 - 2	Very soft
3 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very Stiff
More than 30	Hard

Soil Layer Boundaries – Generally, there is a gradual transition from one soil type to another in a natural soil deposit, and it is difficult to determine accurately the boundaries of the soil layers.

- A *solid diagonal line* between soil layers on the graphic boring log indicates the general region of transition from one soil layer to another.
- A *dashed diagonal line* indicates the soil boundary was detected only by a change in the recovered samples and the actual boundary may be anywhere between the indicated sample depths.
- A soil *horizontal line* between soil layers indicates a relatively distinct transition between soil types was observed in the recovered samples and/or by a distinct change in drill action

Sample Interval – The sample interval is shown graphically on the test boring log and generally is accurate to about 0.5-foot.

Frost Depth and Soil Temperatures – If frozen ground is encountered during drilling, the interval of frozen soil is shown graphically on the test boring log. Generally, the temperature of a few soil samples is measured and shown on the boring log. These sample temperatures only give a qualitative indication of in situ soil temperatures. The temperature of samples can be influenced significantly by ambient air temperature and friction during drilling and sampling. Greater confidence is given to temperatures obtained through thermistors installations.

Soil Moisture Content - Generally, laboratory soil moisture content tests are performed on all recovered samples. Only about 30 grams of minus No.4 material is typically used for the moisture content test, so results reported on the log may not reflect accurately the *in situ* moisture content of gravelly soils.

Soil Density/Unit Weight – The soil density shown on the test boring logs generally is determined by measuring the wet weight, moisture content, and physical dimensions of relatively undisturbed specimens.

Groundwater – The depth to groundwater observed during drilling is generally shown on the test boring log. Alternatively, depth to groundwater can be measured in a perforated PVC pipe installed in the boring to monitor groundwater level. Differences can occur between depth to groundwater during drilling and those measured after drilling due to the time needed to equalize the groundwater elevation during and after drilling.

Penetration Resistance, N – Standard Penetration Tests (SPT) are performed in accordance with ASTM Designation D186 “Standard Method for Penetration Test and Split- Barrel Sampling of Soils”. A Modified Penetration Test (MPT) using a 2.5-inch inside-diameter split spoon driven with a 340-pound hammer falling 30 inches is performed to obtain larger samples, particularly in gravelly soils. The boring log key describes the graphic symbols used to differentiate between sample types.

Undisturbed Samples – Undisturbed Shelby tube samples are obtained in accordance with ASTM D1587, “Standard Practice for Thin-Walled Tube Sampling of Soils.” Generally, 3-inch outside-diameter Shelby tubes are used.

Grab Samples – Grab samples are obtained from the auger flights. The sample depth and interval indicated on the test boring log should be considered a rough approximation. The grab samples may not be representative of in situ soils, particularly in layer soil deposits.

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES
ASTM DESIGNATION: D2487

Based on the Unified Soil Classification System (USCS)

		Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]		USCS Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils	Gravels	Clean Gravels	$Cu \geq 4$ and $1 \geq Cc \leq 3$ [E]	GW	Well-graded gravel
		Less than 5% fines [C]	$Cu < 4$ and/or $1 \leq Cc \leq 3$ [E]	GP	Poorly graded gravel
	More than 50% of coarse fraction retained on #4 sieve	Gravel with Fines	Fines classify as ML or MH	GM	Silty gravel [F,G,H]
		More than 12% fines [C]	Fines classify as CL or CH	GC	Clayey gravel [F,G,H]
More than 50% retained on #200 sieve	Sands	Clean Sands	$Cu \geq 6$ and $1 \geq Cc \leq 3$ [E]	SW	Well-graded sand [I]
		Less than 5% fines [D]	Cu 6 4 and/or $1 \leq Cc \leq 3$ [E]	SP	Poorly graded sand [I]
	50% or more of coarse fraction passes #4 sieve	Sands with Fines	Fines classify as ML or MH	SM	Silty sand [G,H,I]
		More than 12% fines [D]	Fines classify as CL or CH	SC	Clayey sand [G,H,I]
Fine-Grained Soils	Silts and Clays	Inorganic	PI > 7 and plots on or above "A" line [J]	CL	Lean clay [K,L,M]
	Liquid limit less than 50		PI < 4 and plots on or above "A" line [J]	ML	Silt [K,L,M]
		Organic	Liquid limit - oven dried < 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried	OL	Organic silt [K,L,M,O]
50% or more passes the #200 sieve	Silt and Clays	Inorganic	PI plots on or above "A" line	CH	Fat clay [K,L,M]
	Liquid limit 50 or more		PI plots below "A" line	MH	Elastic silt [K,L,M]
		Organic	Liquid limit - oven dried > 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried	OH	Organic clay [K,L,M,Q]
High Organic Soils		Primarily organic matter	dark in color, and organic odor	PT	Peat

A Based on material passing the 3-in sieve

B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name

C Gravels with 5 to 12% require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP GM poorly-graded gravel with silt
GP-GC poorly graded gravel with clay

D Sands with 5 to 12% require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

E $Cu=D_{60}/D_{10}$ $Cc = [(D_{30})^2/(D_{10}xD_{60})]$

F If fines classify as CL-ML, use dual symbol GC-GM, SC-SM

G If soil contains ≥ 15% sand, add "with sand to group name

H If fines are organic, add " with organic fines" to group name

I If soil contains ≥ 15% gravel, add "with gravel" to group name

J If Atterberg Limits plot in hatched area, soil is CL-ML, silty clay

K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

L If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.

M If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

N PI ≥ 4 or plots below "A" line

O PI< 4 or plots below "A" line

P PI plots on or above "A" line

Q PI plots below A line

DESCRIPTION OF FROZEN SOILS (Visual-Manual Procedure) ASTM Designation: D4083

Part I Description of Soil Phase		Classify Soil Phase by ASTM D2487 or D2488			
		Group Symbol	Subgroup		Field Identification
			Description	Symbol	
Part II Description of Frozen Soil	Segregated ice is not visible by eye	N	Poorly bonded or friable	Nf	Identify by visual examination to determine presence of excess ice, use procedures under Note 2 and hand magnifying lens as necessary. For soils not fully saturated, estimate degree of ice saturation; medium, low. Note presence of crystals or ice coatings around larger particles. (Note 1)
			No excess ice	Nb / Nbn	
			Well-bonded Excess ice	Nb / Nbe	
	Segregated ice is visible by eye (ice 1-inch or less in thickness)	V	Individual ice crystal or inclusions	Vx	For ice phase, record the following when applicable: Location, Structure, Orientation, Color, Thickness, Size, Length, Shape, Spacing, Hardness, Pattern of arrangement Estimate volume of visible segregated ice present as percentage of total sample volume. (Note 2)
			Ice coatings on particles	Vc	
			Random or irregularly oriented ice formations	Vr	
			Stratified or distinctly oriented ice formations	Vs	
			Uniformly distributed ice	Vu	
Part III Description of Substantial Ice	Ice (greater than 1-inch in thickness)	ICE	Ice with soil inclusions	ICE+Soil Type	Designate material as ICE (Note 3) and use descriptive terms as follows, usually one item from each group where applicable: HARDNESS: Hard, Soft (of mass, not individual crystals) STRUCTURE (Note 4): Clear, Cloudy, Porous, Candled, Granular, Stratified COLOR: Colorless, Gray, Blue ADMIXTURES: Contains few thin silt inclusions
			Ice without soil inclusions	ICE	

Note 1: Frozen soils in the N group may, on close examination, indicate presence of ice within the voids of the material by crystalline reflections or by a sheen on fractured or trimmed surfaces. The impression received by the unaided eye, however, is that none of the frozen water occupies space in excess of the original voids in the soils. The opposite is true of frozen soils in the V group

Note 2: When visual methods may be inadequate, a simple field test to aid evaluation of the volume of excess ice can be made by placing some frozen soil in a small jay, allowing it to melt, and observing the quantity of supernatant water as a percentage of total volume

Note 3: Where special forms of ice such as hoarfrost can be distinguished, more explicit description should be given

Note 4: Observer should be careful to avoid being misled by surface scratches or frost coating on the ice.

DEFINITIONS

1) Ice coatings on particles - discernible layers of ice found on or below larger soils particles in a frozen soil mass.
2) Ice Crystal - a very small individual ice particle visible in the face of a soil mass. Crystals may be present alone or in combination with other ice formations.
3) Clear Ice - ice that is transparent and contains only a moderate number of air bubbles.
4) Cloudy Ice - ice that is translucent or relatively opaque due to the content of air or other reasons, but which is essentially sound and impervious
5) Porous Ice - ice that contains numerous voids, usually interconnected and usually resulting from melting at air bubbles or along crystal interfaces from presence of salt or other materials in the water or from the freezing of saturated snow. Though porous, the mass retains its structural unity.
6) Candled Ice - ice that has rotted or otherwise formed into long columnar crystals, very loosely bonded together
7) Granular Ice - ice that is composed of coarse, more or less equidimensional crystals weakly bonded together
8) Ice Lenses - lenticular ice formations in soil occurring essentially parallel to each other, generally normal to the direction of heat loss, and commonly in repeated layers.
9) Ice Segregation - the growth of ice within soil in excess of the amount that may be produced by the in-place conversion of the original void moisture to ice. Ice segregation occurs most often as distinct lenses, layers, veins, and masses, commonly, but not always, oriented normal to the direction of heat loss.
10) Well-Bonded - a condition in which the soil particles are strongly held together by the ice so that the frozen soil possesses relatively high resistance to chipping or breaking.
11) Poorly-Bonded - a condition in which the soil particles are weakly held together by the ice so that the frozen soil has poor resistance to chipping and breaking.
12) Thaw Stable - the characteristics of frozen soils that, upon thawing, do not show loss of strength in comparison to normal, long-time thawed values nor produce detrimental settlement.

FROST DESIGN SOIL CLASSIFICATION[1]

Frost[2] Group	Kind of Soil	Percentage Finer than 0.02 mm by Weight	Typical Soil Types Under Unified Soil Classification
NFS[3]	(a) Gravels Crushed stone Crushed rock	0 to 1.5	GW and GP
	(b) Sands	0 to 3	SW and SP
PFS[4] (MOA NFS)	(a) Gravels Crushed stone Crushed rock	1.5 to 3	GW and GP
(MOA F2)	(b) Sands	3 to 10	SW and SP
S1 (MOA F1)	Gravelly soils	3 to 6	GW, GP, GW-GM, and GP-GM
S2 (MOA F2)	Sandy soils	3 to 6	SW, SP, SW-SM, and SP-SM
F1	Gravelly soils	6 to 10	GM, GW-GM, and GP-GM
F2	(a) Gravelly soils	10 to 20	GM, GW-GM, and GP-GM
	(b) Sands	6 to 15	SM, SW-SM, and SP-SM
F3	(a) Gravelly soils	Over 20	GM and GC
	(b) Sands, except very fine silty sands	Over 15	SM and SC
	(c) Clays, PI>12		CL and CH
F4	(a) All silts		ML and MH
	(b) Very fine silty sands	Over 15	SM
	(c) Clays, PI<12		CL and CL-ML
	(d) Varved clays and other fine-grained, banded sediments		CL and ML CL, ML, and SM CL, CH, and ML CL, CH, ML and SM

1 Departments of the Army and Air Force Publication TM 5-822-5/AFM 88-7, "Pavement Design for Roads, Streets, Walks, and Open Storage Areas", Table 18-2.

2 Corps of Engineers Frost groups directly correspond to the Municipality of Anchorage soil frost classification groups, except as noted.

3 Non Frost-Susceptible.

4 Possibly frost-susceptible, but requires laboratory test to determine frost design soil classification.

APPENDIX C: LABORATORY TEST RESULTS

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: ASM:21-1119
Issue No: 2

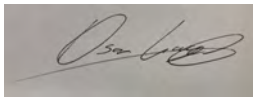
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/12/2021

Sample Details

Sample ID	21-1119-S01	21-1119-S02	21-1119-S03	21-1119-S04	21-1119-S05	21-1119-S06	21-1119-S07	21-1119-S08	21-1119-S11
Client Sample ID	TB-1 S1	TB-1 S2	TB-1 S3	TB-1 S4	TB-1 S6	TB-1 S7	TB-1 S8	TB-1 S9	TB-1 S10
Date Sampled									

Particle Size Distribution

Method:
ASTM D 6913

Description:
Particle size distribution (gradation) of soils using sieve analysis.

Drying by:

Washed:
Sample Washed

Sieve Size	% Passing								Limits
75.0mm				100	100	100			
50.0mm				100	100	100		100	
37.5mm				100	100	93		92	
25.0mm				97	97	75		82	
19.0mm				95	92	62		72	
12.5mm				87	83	48		63	
9.5mm				76	76	41		56	
4.75mm				72	60	27		43	
2.0mm				57	42	17		31	
850µm				33	25	12		21	
425µm				14	15	8		15	
250µm				6	8	5		11	
150µm				4	6	3		9	
75µm				3	4	2		7	
Finer 75µm				3.0	4.5	2.1		6.6	

Other Test Results

Description	Method	Results									Limits
Water Content (%)	ASTM D 2216	6.3	3.8	2.7	11.0	6.2	6.9	12.6	10.4	10.1	
Method		B	B	B	B	B	B	B	B	B	
Tested By		Ryan Perlerslia	Ryan Perlerslia	Ryan Perlerslia	Ryan Perlerslia	Ryan Perlerslia	Ryan Perlerslia	Ryan Perlerslia	Ryan Perlerslia	Ryan Perlerslia	
Group Symbol	ASTM D 2487				SP	GW	SP			GW-GM	
Group Name					Poorly graded sand with	Well-graded gravel with	Poorly graded sand with			Well-graded gravel with silt	
Method	ASTM D 6913										
Sample Obtained While					Oven-Dried	Oven-Dried	Oven-Dried			Oven-Dried	
Group Name					Poorly graded sand with	Well-graded gravel with	Poorly graded sand with			Well-graded gravel with silt	
Group Symbol					SP	GW	SP				
Composite Sieving Used					No	No	No			No	
Dispersion Method					Dispersant by hand	Dispersant by hand	Dispersant by hand			Dispersant by hand	
Prior Testing											

Comments

N/A

Alaska Testlab - Anchorage
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Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: ASM:21-1120
Issue No: 1

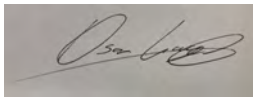
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

Sample Details

Sample ID	21-1120-S01	21-1120-S02	21-1120-S03	21-1120-S04
Client Sample ID	TB-2 Sample 1	TB-2 Sample 2	TB-2 Sample 3	TB-2 Sample 4
Date Sampled				

Particle Size Distribution

Method:
ASTM D 6913

Description:
Particle size distribution (gradation) of soils using sieve analysis.

Drying by:

Washed:
Sample Washed

Sieve Size	% Passing			Limits
75.0mm	100	100	100	
50.0mm	100	100	93	
37.5mm	100	100	84	
25.0mm	100	100	83	
19.0mm	100	99	82	
12.5mm	98	97	78	
9.5mm	96	93	76	
4.75mm	93	81	68	
2.0mm	90	60	52	
850µm	80	31	34	
425µm	48	18	23	
250µm	12	10	12	
150µm	3	6	5	
75µm	2	4	4	
Finer 75µm	1.8	4.5	3.8	

Other Test Results

Description	Method	Results				Limits
Water Content (%)	ASTM D 2216	22.2	19.7	6.9	18.4	
Method		B	B	B	B	
Tested By		Ryan Pederslie	Ryan Pederslie	Ryan Pederslie	Ryan Pederslie	
Group Symbol	ASTM D 2487	SP		SW	SP	
Group Name		Poorly graded sand		Well-graded sand with gravel	Poorly graded sand with gravel	
Method	ASTM D 6913					
Sample Obtained While		Oven-Dried		Oven-Dried	Oven-Dried	
Group Name		Poorly graded sand		Well-graded sand with gravel	Poorly graded sand with gravel	
Group Symbol		SP		SW	SP	
Composite Sieving Used		No		No	No	
Dispersion Method		Dispersant by hand		Dispersant by hand	Dispersant by hand	
Prior Testing						

Comments

N/A

Alaska Testlab - Anchorage
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Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: ASM:21-1120
Issue No: 1

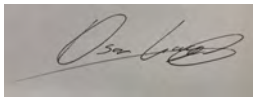
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

Sample Details

Sample ID	21-1120-S05	21-1120-S06	21-1120-S07	21-1120-S08
Client Sample ID	TB-2 Sample 5	TB-2 Sample 6	TB-2 Sample 7	TB-2 Sample 8
Date Sampled				

Particle Size Distribution

Method:
ASTM D 6913

Description:
Particle size distribution (gradation) of soils using sieve analysis.

Drying by:

Washed:
Sample Washed

Sieve Size	% Passing			Limits
75.0mm	100		100	
50.0mm	100		100	
37.5mm	91		100	
25.0mm	77		90	
19.0mm	74		80	
12.5mm	63		67	
9.5mm	56		55	
4.75mm	40		31	
2.0mm	22		20	
850µm	11		12	
425µm	7		8	
250µm	5		5	
150µm	4		4	
75µm	3		3	
Finer 75µm	2.7		2.7	

Other Test Results

Description	Method	Results				Limits
Water Content (%)	ASTM D 2216	4.7	5.3	7.2	10.1	
Method		B	B	B	B	
Tested By		Ryan Pederslie	Ryan Pederslie	Ryan Pederslie	Ryan Pederslie	
Group Symbol	ASTM D 2487	GW		GW		
Group Name		Well-graded gravel with sand		Well-graded gravel with sand		
Method	ASTM D 6913					
Sample Obtained While		Oven-Dried		Oven-Dried		
Group Name		Well-graded gravel with sand		Well-graded gravel with sand		
Group Symbol		GW		GW		
Composite Sieving Used		No		No		
Dispersion Method		Dispersant by hand		Dispersant by hand		
Prior Testing						

Comments

N/A

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1119-S04
Issue No: 1

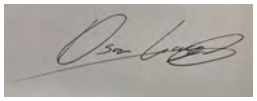
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

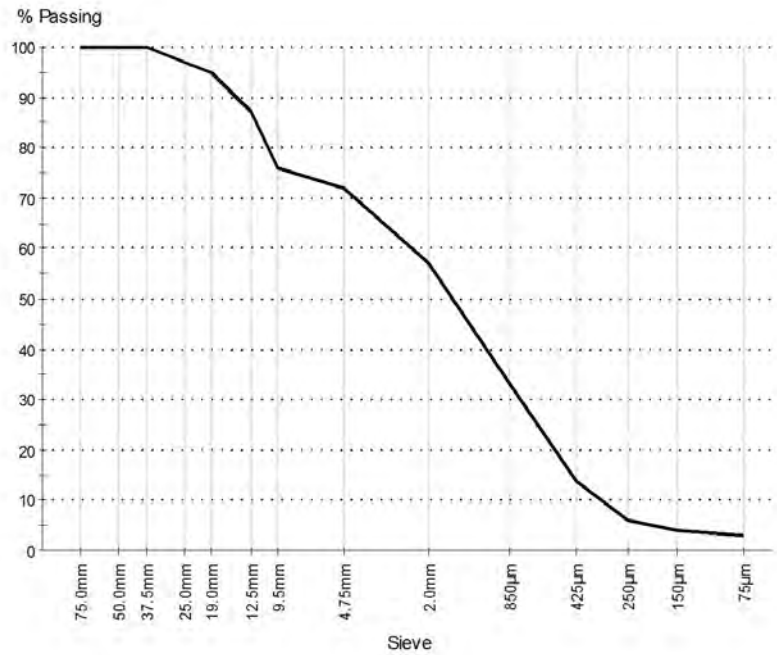
Sample Details

Sample ID	21-1119-S04
Client Sample ID	TB-1 S4
Specification	Sieve SOILS

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	11.0	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Poorly graded sand with gravel	
Group Symbol		SP	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/24/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	100	
1½in (37.5mm)	100	
1in (25.0mm)	97	
¾in (19.0mm)	95	
½in (12.5mm)	87	
3/8in (9.5mm)	76	
No.4 (4.75mm)	72	
No.10 (2.0mm)	57	
No.20 (850µm)	33	
No.40 (425µm)	14	
No.60 (250µm)	6	
No.100 (150µm)	4	
No.200 (75µm)	3	
Finer 75µm	3.0	

Comments

N/A

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1119-S05
Issue No: 2

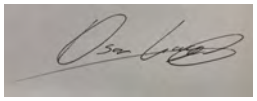
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC: Maria Kampsen
Paul Pribyl

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/12/2021

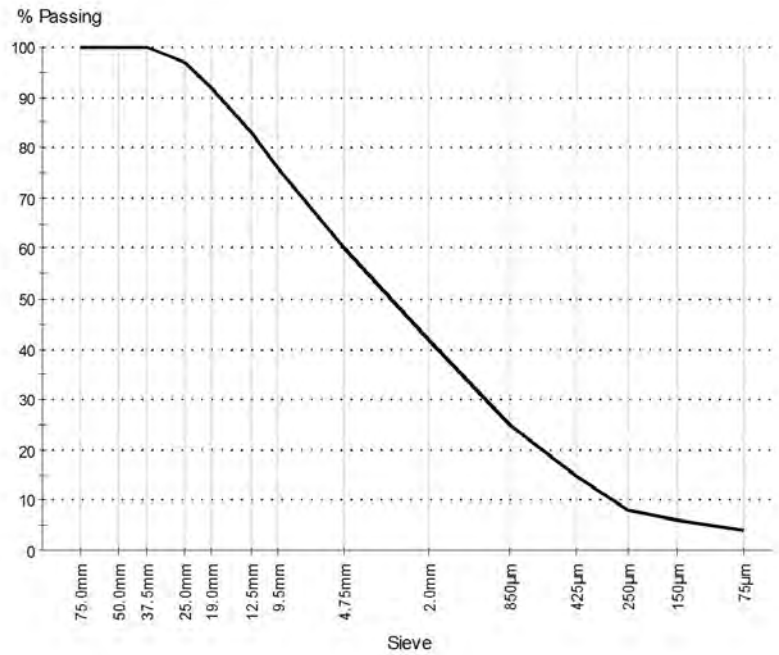
Sample Details

Sample ID	21-1119-S05
Client Sample ID	TB-1 S6
Specification	Sieve SOILS

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	6.2	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Well-graded gravel with sand	
Group Symbol		GW	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/24/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	100	
1½in (37.5mm)	100	
1in (25.0mm)	97	
¾in (19.0mm)	92	
½in (12.5mm)	83	
3/8in (9.5mm)	76	
No.4 (4.75mm)	60	
No.10 (2.0mm)	42	
No.20 (850µm)	25	
No.40 (425µm)	15	
No.60 (250µm)	8	
No.100 (150µm)	6	
No.200 (75µm)	4	
Finer 75µm	4.5	

Comments

N/A

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1119-S06
Issue No: 2

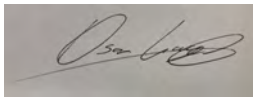
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC: Maria Kampsen
Paul Pribyl

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/12/2021

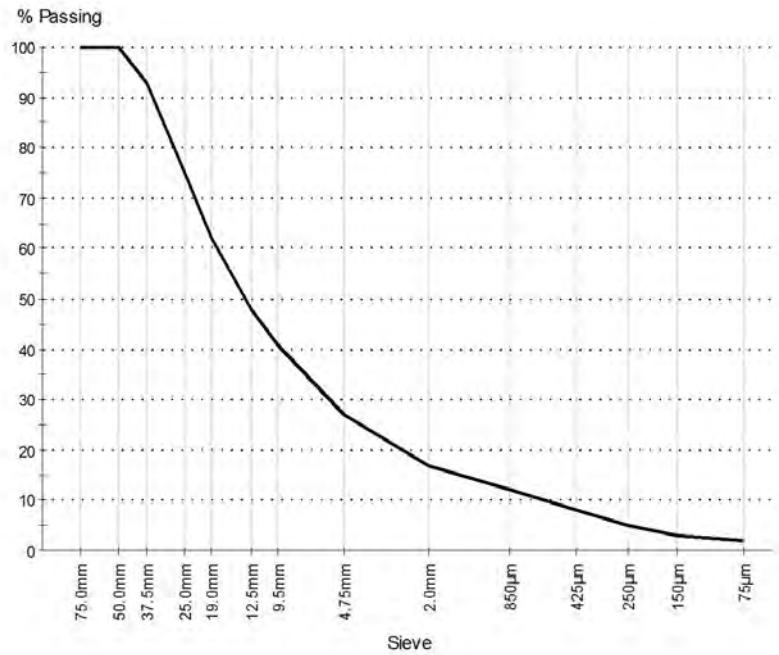
Sample Details

Sample ID	21-1119-S06
Client Sample ID	TB-1 S7
Specification	Sieve SOILS

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	6.9	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Poorly graded sand with gravel	
Group Symbol		SP	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/24/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	100	
1½in (37.5mm)	93	
1in (25.0mm)	75	
¾in (19.0mm)	62	
½in (12.5mm)	48	
3/8in (9.5mm)	41	
No.4 (4.75mm)	27	
No.10 (2.0mm)	17	
No.20 (850µm)	12	
No.40 (425µm)	8	
No.60 (250µm)	5	
No.100 (150µm)	3	
No.200 (75µm)	2	
Finer 75µm	2.1	

Comments

N/A

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1119-S11
Issue No: 1

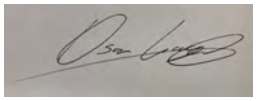
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

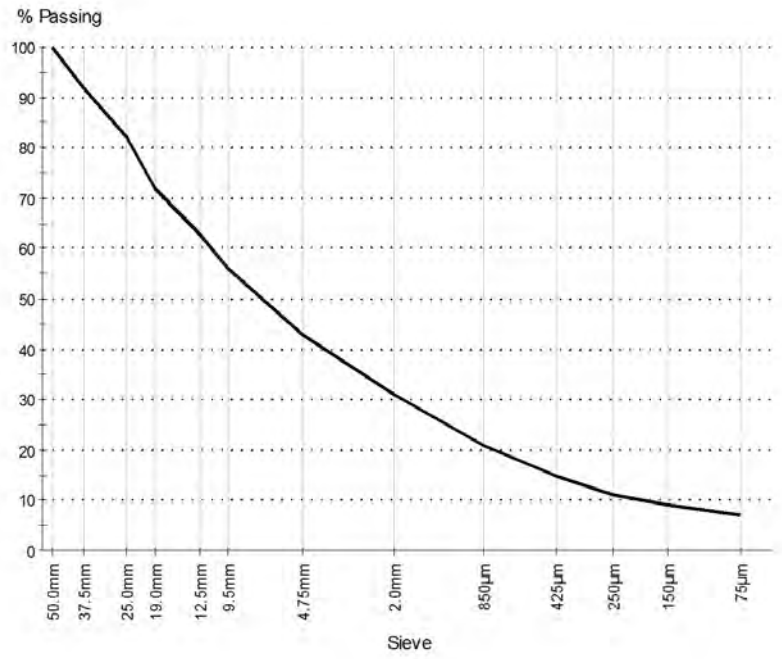
Sample Details

Sample ID	21-1119-S11
Client Sample ID	TB-1 S10
Specification	Sieve SOILS

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	10.1	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Group Symbol	ASTM D 2487	GW-GM	
Group Name	Well-graded gravel with silt and sand		
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name	Well-graded gravel with silt and sand		
Group Symbol			
Composite Sieving Used		No	

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/18/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
2in (50.0mm)	100	
1½in (37.5mm)	92	
1in (25.0mm)	82	
¾in (19.0mm)	72	
½in (12.5mm)	63	
3/8in (9.5mm)	56	
No.4 (4.75mm)	43	
No.10 (2.0mm)	31	
No.20 (850µm)	21	
No.40 (425µm)	15	
No.60 (250µm)	11	
No.100 (150µm)	9	
No.200 (75µm)	7	
Finer 75µm	6.6	

Comments

N/A

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Material Test Report

Report No: MAT:21-1119-S11
Issue No: 1

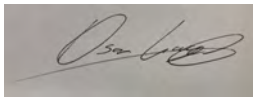
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

Other Test Results

Description	Method	Result	Limits
Dispersion Method Prior Testing		Dispersant by hand	

Comments

N/A

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1120-S01
Issue No: 1

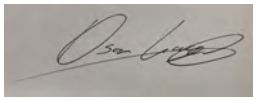
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC: Maria Kampsen
Paul Pribyl

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/9/2021

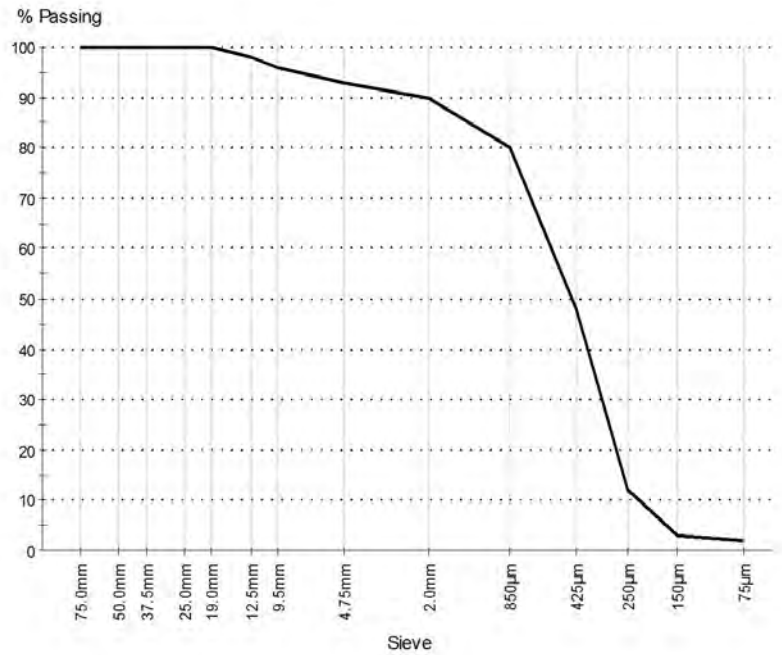
Sample Details

Sample ID	21-1120-S01
Client Sample ID	TB-2 Sample 1
Specification	Sieve

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	22.2	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Poorly graded sand	
Group Symbol		SP	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/21/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	100	
1½in (37.5mm)	100	
1in (25.0mm)	100	
¾in (19.0mm)	100	
½in (12.5mm)	98	
3/8in (9.5mm)	96	
No.4 (4.75mm)	93	
No.10 (2.0mm)	90	
No.20 (850µm)	80	
No.40 (425µm)	48	
No.60 (250µm)	12	
No.100 (150µm)	3	
No.200 (75µm)	2	
Finer 75µm	1.8	

Comments

N/A

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Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1120-S03
Issue No: 1

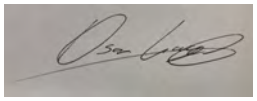
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

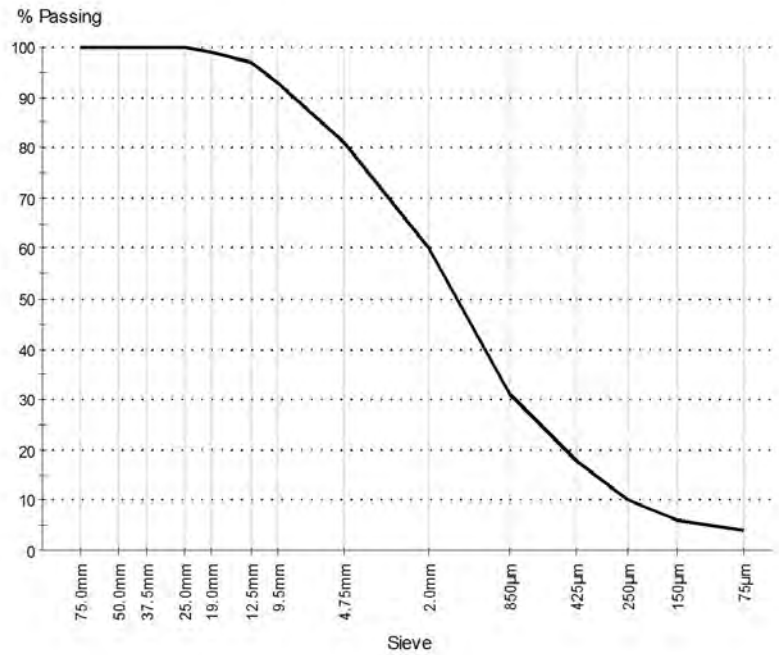
Sample Details

Sample ID	21-1120-S03
Client Sample ID	TB-2 Sample 3
Specification	Sieve

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	6.9	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Well-graded sand with gravel	
Group Symbol		SW	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/18/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	100	
1½in (37.5mm)	100	
1in (25.0mm)	100	
¾in (19.0mm)	99	
½in (12.5mm)	97	
3/8in (9.5mm)	93	
No.4 (4.75mm)	81	
No.10 (2.0mm)	60	
No.20 (850µm)	31	
No.40 (425µm)	18	
No.60 (250µm)	10	
No.100 (150µm)	6	
No.200 (75µm)	4	
Finer 75µm	4.5	

Comments

N/A

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4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1120-S04
Issue No: 1

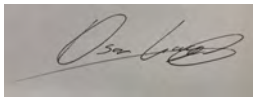
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

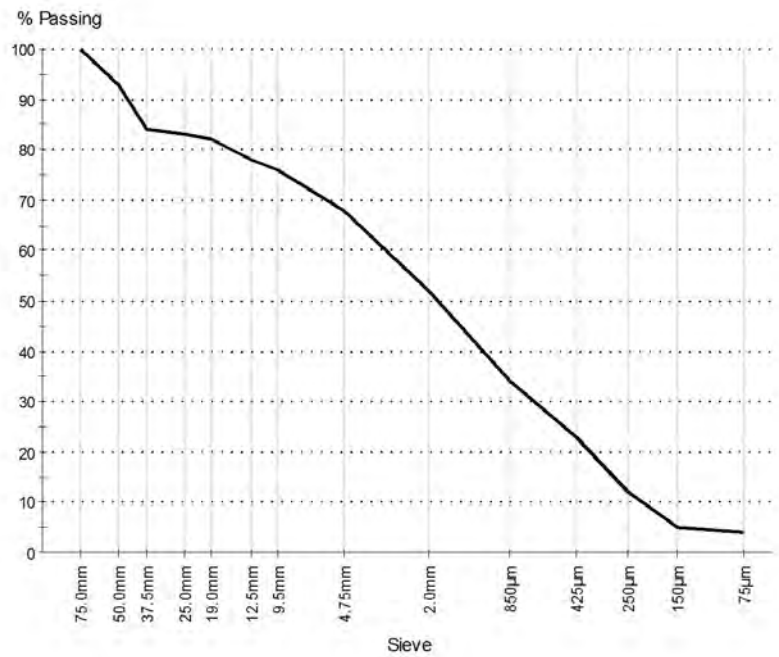
Sample Details

Sample ID	21-1120-S04
Client Sample ID	TB-2 Sample 4
Specification	Sieve

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	18.4	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Poorly graded sand with gravel	
Group Symbol		SP	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/18/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	93	
1½in (37.5mm)	84	
1in (25.0mm)	83	
¾in (19.0mm)	82	
½in (12.5mm)	78	
3/8in (9.5mm)	76	
No.4 (4.75mm)	68	
No.10 (2.0mm)	52	
No.20 (850µm)	34	
No.40 (425µm)	23	
No.60 (250µm)	12	
No.100 (150µm)	5	
No.200 (75µm)	4	
Finer 75µm	3.8	

Comments

N/A

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1120-S05
Issue No: 1

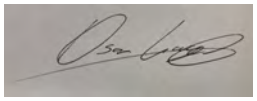
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

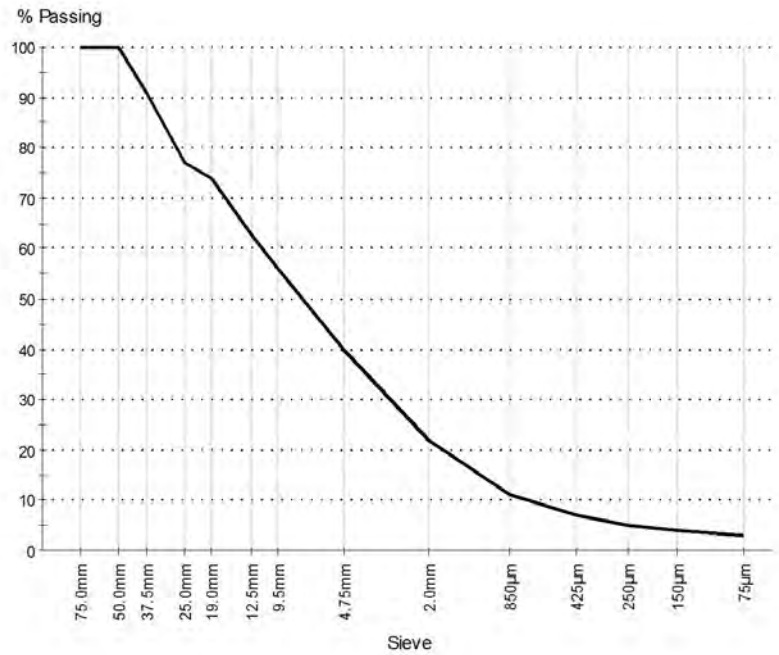
Sample Details

Sample ID	21-1120-S05
Client Sample ID	TB-2 Sample 5
Specification	Sieve

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	4.7	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Well-graded gravel with sand	
Group Symbol		GW	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/18/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	100	
1½in (37.5mm)	91	
1in (25.0mm)	77	
¾in (19.0mm)	74	
½in (12.5mm)	63	
3/8in (9.5mm)	56	
No.4 (4.75mm)	40	
No.10 (2.0mm)	22	
No.20 (850µm)	11	
No.40 (425µm)	7	
No.60 (250µm)	5	
No.100 (150µm)	4	
No.200 (75µm)	3	
Finer 75µm	2.7	

Comments

N/A

Alaska Testlab - Anchorage
4040 B Street, Suite 102
Anchorage, AK 99503
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: MAT:21-1120-S07
Issue No: 1

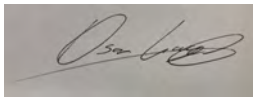
Client: DOWL, LLC
4041 B Street
Anchorage, AK, 99503

Project Code: 210207

CC:

Project: Eyak Weir Preliminary Investigation

1136.63



Reviewed By: Oscar Lage
Title: Laboratory Supervisor
Date: 7/8/2021

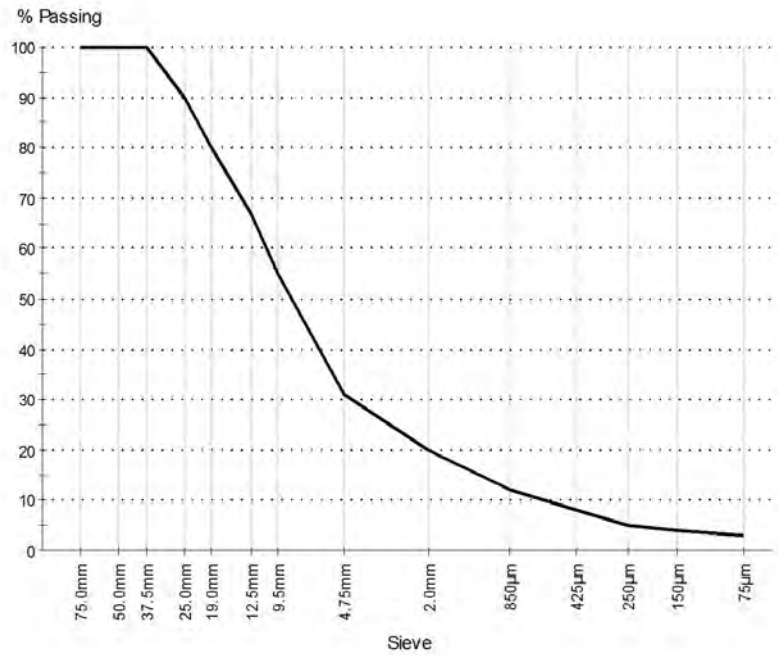
Sample Details

Sample ID	21-1120-S07
Client Sample ID	TB-2 Sample 7
Specification	Sieve

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D 2216	7.2	
Method		B	
Tested By		Ryan Pederslie	
Date Tested		6/16/2021	
Method	ASTM D 6913		
Sample Obtained While		Oven-Dried	
Group Name		Well-graded gravel with sand	
Group Symbol		GW	
Composite Sieving Used		No	
Dispersion Method		Dispersant by hand	
Prior Testing			

Particle Size Distribution



Method: ASTM D 6913

Date Tested: 6/18/2021
Tested By: Quinton Goodman

Sieve Size	% Passing	Limits
3in (75.0mm)	100	
2in (50.0mm)	100	
1½in (37.5mm)	100	
1in (25.0mm)	90	
¾in (19.0mm)	80	
½in (12.5mm)	67	
3/8in (9.5mm)	55	
No.4 (4.75mm)	31	
No.10 (2.0mm)	20	
No.20 (850µm)	12	
No.40 (425µm)	8	
No.60 (250µm)	5	
No.100 (150µm)	4	
No.200 (75µm)	3	
Finer 75µm	2.7	

Comments

N/A

APPENDIX D: USGS SEISMIC DESIGN MAPS

Eyak Lake Outlet Structure Replacement Design

Latitude, Longitude: 60.53118610, -145.64514775

Date	7/7/2021, 11:57:00 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S_S	1.518	MCE_R ground motion. (for 0.2 second period)
S_1	0.805	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.821	Site-modified spectral acceleration value
S_{M1}	1.127	Site-modified spectral acceleration value
S_{DS}	1.214	Numeric seismic design value at 0.2 second SA
S_{D1}	0.752	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	E	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	1.4	Site amplification factor at 1.0 second
PGA	0.565	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.678	Site modified peak ground acceleration
T_L	16	Long-period transition period in seconds
SsRT	1.917	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.812	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.518	Factored deterministic acceleration value. (0.2 second)
S1RT	0.928	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.962	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.805	Factored deterministic acceleration value. (1.0 second)
PGAd	0.565	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	1.058	Mapped value of the risk coefficient at short periods
C_{R1}	0.965	Mapped value of the risk coefficient at a period of 1 s

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APPENDIX G

Eyak Lake Weir Replacement Project Specifications

COPPER RIVER WATERSHED PROJECT

Request for Proposal EYAK LAKE WEIR -2025

Eyak Weir Replacement Project

MODIFICATIONS & SPECIAL PROVISIONS TO
2020 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION

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SECTION 104
SCOPE OF WORK

Special Provision

104-1.01 INTENT OF CONTRACT *Add the following:*

The Contractor shall designate a Quality Control (QC) Manager to ensure materials and Workmanship meet the contract requirements. Qualifications of the QC Manager shall be submitted to the Engineer for approval at least 14 Calendar Days prior to the Q4 Pre-construction Meeting. The Contractor shall prepare daily reports, which shall be submitted to the Engineer within 24 hours. The daily reports shall contain the following information at a minimum: Work performed, equipment and personnel onsite, survey notes, quality control activities, test results, the Work activities anticipated over the next three days, and identification of any issues that may affect the Work or construction schedule.

SECTION 105
CONTROL OF WORK

Special Provision

105-1.18 WARRANTIES. *Add the following:*

If within one year after the date of the Project Completion any Work is found to be defective, the Contractor shall promptly, and without cost to the CRWP and in accordance with the Engineer's written instructions, either correct defective Work or remove it from the site and replace it with conforming Work. Defective Work will include the presence of the highly invasive species in Cordova listed below that were introduced as a result of the construction activities:

Common Name	Scientific Name	Invasive Rank
Bohemian Knotweed	*Fallopia ×bohemica (J. Chrtek & Chrtkov) J.P. Bailey*	87
Reed Canarygrass	*Phalaris arundinacea L. (cultivar)*	83
Orange Hawkweed	*Hieracium aurantiacum L.*	79
Bird Vetch	*Vicia cracca L. ssp. cracca*	73
Butter and Eggs Flower	*Linaria vulgaris Mill.*	69
Oxeye Daisy	*Leucanthemum vulgare Lam.*	61
Narrowleaf Hawksbeard	*Crepis tectorum L.*	56

If the Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the CRWP may have the defective Work corrected or removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of Engineers, architects, attorneys and other professionals) shall be borne by the Contractor.

SECTION 109
MEASUREMENT AND PAYMENT

Special Provisions

109-1.03 SCOPE OF PAYMENT. *Delete the text of this subsection in its entirety and replace with:*

The Owner will make payment at the Contract price for each item shown on the bid schedule or as modified by change order with specified price adjustments. The Contractor shall accept the Contract prices as full and complete payment for furnishing all labor, equipment, and materials and for performing all operations required to complete the Work as specified in the Contract Documents. The Contract price and payment shall also constitute full compensation for all Work. In the event Work not identified as being directly incident or incidental to the completion of any Contract item is necessary, the Contract price for all enumerated items shall also constitute full compensation of such Work.

The Contractor shall accept the Contract Price as full payment for furnishing all resources necessary to complete all Work under the Contract in a complete and acceptable manner.

109-1.08 FINAL PAYMENT. *Add the following paragraph:*

Final payment will be withheld until the As-Built Plans have been submitted and approved in accordance with the requirements stated in Section 642.

SECTION 201

CLEARING AND GRUBBING

Special Provisions

201-1.01 DESCRIPTION. *Add the following:*

Selectively cut and remove only the trees necessary to complete the Work. The Contractor shall give the Engineer 72-hour notice and cut only the trees identified in the approved Identification of Trees for Removal submittal.

Salvage and stockpile woody debris.

201-3.01 GENERAL. *Add the following:*

Clearing is not permitted within the migratory bird window of May 1 to July 15; except as permitted by Federal, State, and local laws.

Woody Debris. Salvage trunks, sticks, branches, roots, and slash in accordance with Section 690.

201-5.01 BASIS OF PAYMENT. *Replace the Pay Item table with the following:*

Pay Item	Pay Unit
202.0007.0000 Clearing	Lump Sum

SECTION 202

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Special Provision

202-3.03 REMOVAL OF BRIDGES, CULVERTS, AND OTHER DRAINAGE STRUCTURES. *Add the following:*

3. Existing Structure. The existing sheet pile weir and appurtenant features shall be removed and legally disposed of off site. Coordinate removal of the existing sheet pile with the requirements of Section 672; the Contractor shall maintain a water surface elevation of at least 17.4 ft on Eyak Lake throughout construction, which may require a phased approach to removing the existing sheet pile weir.

The Contractor is to inform the Engineer, in writing, of the disposal plan, waiver of claims, permission and/or permits for the removal of the existing structure and appurennant features at least 72 hours prior to disposal of the structure.

202-4.01 METHOD OF MEASUREMENT. *Add the following:*

Pay item 202.0001.0000 Removal of Structures and Obstructions is a lump sum item and will not be measured for payment. However, to accommodate incorporation of the existing sheet pile weir into the Contractor's Stream Diversion and Dewatering Plan, intermediate progress payments may be made based on the ratio of the quantity of sheet pile removed to the total quantity of sheet pile to be removed.

202-5.01 BASIS OF PAYMENT. *Add the following:*

All Work, including labor, materials, and equipment necessary to remove the existing weir and appurtenant structures and dispose of off site is subsidiary to pay item 202.0001.0000 Removal of Structures and Obstructions.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
202.0001.0000 Removal of Structures and Obstructions	Lump Sum

SECTION 203

EXCAVATION AND EMBANKMENT

Special Provision

203-4.01 METHOD OF MEASUREMENT. *Delete item 1 through 13. and replace with:*

1. Items 203.0001.0000 and 203.0004.0000. The Contractor will be paid for the actual excavation quantities cut to the excavation limits shown on the Plans or as directed by the Engineer. The quantities for payment will be the volume measured in original position based on pre- and post- excavation surveys performed by the Contractor.

a. As defined in Section 109, excavation quantities may be calculated using either the Average End Area Method with sufficient cross sections to adequately define the excavation area or by a Three-Dimensional method approved by the Engineer prior to commencing the Work. Regardless of the calculation method, the Contractor shall submit the survey points (including point numbers, northings, eastings, elevations, and descriptions in .csv or .dwg format) and volume calculations as supporting documentation with the Contractor's application for payment.

203-5.01 BASIS OF PAYMENT. *Add the following:*

For pay item 203.0004.0000, all activities required to excavate, handle, process, haul, and dispose of the material offsite are subsidiary.

All Work, including labor, materials, and equipment, necessary to define quantities is subsidiary to pay item 642.0001.0000 Construction Surveying.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
203.0001.0000 Common Excavation	Cubic Yard
203.0004.0000 Muck Excavation	Cubic Yard

SECTION 501

CONCRETE FOR STRUCTURES

Special Provisions

501-3.03 BATCHING. *Replace the first sentence of Item 1 f with the following:*
Submit documentation required for plant certification and weighing and measuring device calibration meeting the requirements of this Subsection to the Engineer for approval at least 45 Working Days before commencing concrete work.

501-3.03 EVALUATION OF MATERIAL FOR ACCEPTANCE. *Add the following:*

The Contractor is responsible for quality control testing during placement of concrete as defined in the Plans under Structural General Notes.

Personnel conducting field tests to be qualified as an ACI Concrete Field-Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

The Contractor is to report results of tests, in writing, to the Engineer within 48 hours of tests. Test reports shall include the following, as applicable, to each test and inspection:

a) Project name.
b) Names and certification numbers of field and laboratory technicians performing testing.
c) Name of concrete manufacturer.
d) Truck and batch ticket numbers.
e) Date and time of sampling and field testing.
f) Date and time of concrete placement.
g) Location in concrete Work represented by samples.
h) Design compressive strength at 28 days.
i) Concrete mixture designation, proportions, and materials.
j) Field test results.
k) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
l) Type of fracture and compressive break strengths at seven days and 28 days.

501-3.04 PREPARATION FOR CONCRETE PLACEMENT *Delete the first paragraph and add the following:*

The Contractor shall notify the Engineer a minimum of 72 hours prior to placement of concrete to allow for inspection of reinforcement, headed anchor studs, and other embedded items.

501-3.05 PLACING CONCRETE *Delete the first sentence of Item 1 and add the following to the list of items required in the Concrete Placement Plan:*
Add the following in item 1:

i. Cold Temperature Protection Plan as defined in Section 501-3.09.

501-4.01 METHOD OF MEASUREMENT. *Add the following:*

Pay item 501.0002.0000 is a lump sum item and will not be measured for payment. However, to accommodate phasing of the Work, intermediate progress payments may be made based on the ratio of the quantity of completed concrete weir crest to the total quantity of weir crest to be constructed.

501-5.01 BASIS OF PAYMENT. *Add the following:*

All Work, including labor, reinforcing steel, forming, materials, equipment, protection and curing, and testing necessary to complete the concrete Work is subsidiary to this pay item.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
501.0002.0000 Class A-A Concrete	Lump Sum

SECTION 503

REINFORCING STEEL

Special Provisions

503-3.01 PLACING DRAWINGS. *Delete the first sentence and add the following:*

Submit placing drawings, detailed according to ACI 315, Chapter 3, at least 14 Calendar Days prior to fabrication for approval by the Engineer.

503-3.04 PLACING AND FASTENING *Add the following:*

Placement of reinforcement, anchor rods, and other embedded items shall be inspected and accepted by the Engineer prior to placing concrete.

503-5.01 BASIS OF PAYMENT *Delete the first paragraph and add the following:*

Furnishing, fabricating, placing, splicing, heading, inspecting and testing reinforcement steel, headed anchor studs, and any other embedded items indicated in the Contract documents shall be considered subsidiary to pay item 501.0002.0000 Class A-A Concrete.

SECTION 505

PILING

Special Provisions

505-3.02 PILE TESTING AND PILE DRIVING CRITERIA. *Delete the text of this subsection in its entirety and replace with:*

Inspections by the Engineer shall be performed during installation of the sheet pile as defined in the Plans under Structural General Notes.

505-3.03 DRIVING PILES *Delete description in item 1.a though c. and replace with:*

Weirs. Position the center of the piles within 2 inches of the horizontal position specified in the Contract documents at the ground elevation at the time of driving.

505-3.06 CUTTING OFF PILES *Delete and replace with:*

Cut off piles to within -1/2 inch to +1/2 inches of the plan elevation. Ensure that all injured material is removed.

505-4.01 METHOD OF MEASUREMENT. *Add the following:*
Pay item 505.0001.0000 is a lump sum item and will not be measured for payment. However, to accommodate phasing of the Work, intermediate progress payments may be made based on the ratio of the quantity of installed sheet piles to the total quantity of sheet piles to be installed.

505-5.01 BASIS OF PAYMENT. *Delete this subsection in its entirety and replace with the following:*

All Work including labor, materials, and equipment necessary to furnish and install the sheet pile. Sheet piles used as temporary shoring for excavation, whether removed or left in place at your option with permission of the Engineer, are subsidiary.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
505.0001.0000 Furnish and Install Steel Sheet Piles	Lump Sum

SECTION 611
RIPRAP

Special Provisions

611-2.01 MATERIALS *Add the following:*

The Contractor shall set up an example of rocks that demonstrate the gradation of each rock class as shown in Tables 611-1 to 611-4. Each rock shall be labeled with its respective nominal size. An example shall be set up at each site where the sorting of rock occurs.

5. PRIMARY GRADE CONTROL STRUCTURES: Meet the requirements in Table 611-1

TABLE 611-1
PRIMARY GRADE CONTROL STRUCTURE ROCK PROPERTIES

Nominal Size (inches)	Range of Smallest Dimension of Individual Stones (inches)	Maximum Ratio between Largest to Smallest Rock Dimension of Individual stones
24	22-26	1.5

6. SECONDARY GRADE CONTROL STRUCTURES: Meet the requirements in Table 611-2

TABLE 611-2
SECONDARY GRADE CONTROL STRUCTURE ROCK PROPERTIES

Nominal Size (inches)	Range of Smallest Dimension of Individual Stones (inches)	Maximum Ratio between Largest to Smallest Rock Dimension of Individual stones
16	14-18	1.5

7. HABITAT ROCKS: Meet the requirements in Table 611-3

TABLE 611-3
HABITAT ROCK PROPERTIES

Nominal Size (inches)	Range of Smallest Dimension of Individual Stones (inches)	Maximum Ratio between Largest to Smallest Rock Dimension of Individual stones
36	26-40	1.5

8. HEADER ROCKS: Meet the requirements in Table 611-4

TABLE 611-4
HEADER ROCK PROPERTIES

Nominal Size (inches)	Range of Smallest Dimension of Individual Stones (inches)	Maximum Ratio between Largest to Smallest Rock Dimension of Individual stones
48	46-50	1.5

611-3.01 CONSTRUCTION REQUIREMENTS. *Delete the first paragraph add the following:*

Each material source for rock is required to be submitted with its respective AASHTO T 96 material testing results to the at least 14 Calendar Days prior to Q2 Pre-construction Submittal Status Meeting. The Contractor shall provide a level compact area of sufficient size to dump and sort typical loads of riprap at the source of material, prior to being transported to site. They shall further deposit loads specified in this area and assist the Engineer as needed to sort and measure the

rocks in the load for the purpose of determining if the riprap is within specifications. Approval of each stockpiled material is required from the Engineer at least 14 Calendar Days prior to being transported to site. Mechanical equipment, as needed, to assist in this sorting shall be provided by the Contractor at no additional cost to the Owner.

Add the following:

Use rock defined in Tables 611-1 and Table 611-2, to construct grade control structures to the lines and grades shown in the Plans. Grade control structures shall be placed in a manner such that adjacent rocks are touching one another and to minimize voids. Voids between rocks in the grade control structures shall be filled in with Waterway Bed Fill material and tamped prior to backfill with Waterway Bed Fill material. Waterway Bed Fill shall not prevent rock to rock contact between header and footer rocks.

Header and Habitat Rocks serve fish passage function by reducing velocities and shall be placed and rotated into final position as directed by the Engineer to achieve the desired result. Arrangement of Header and Habitat Rocks will be as shown in the Plans and per the Engineer's direction. Depth of Habitat Rock placement shall be in accordance with the details shown on Sheet C11, or as directed by the Engineer.

Riprap placed upstream of the weir shall have a smooth surface. Fill voids using Waterway Bed Fill or useable excavation to the satisfaction of the Engineer. Waterway Bed Fill or usable material shall not prevent rock to rock contact.

611-4.01 METHOD OF MEASUREMENT. *Add the following:*

The Contractor will be paid for the actual quantity of riprap rock installed. The Contractor shall submit the survey points (including point numbers, northings, eastings, elevations, and descriptions in .csv or .dwg format) and volume calculations as supporting documentation with the Contractor's application for payment.

611.0003.0002 Riprap, Class II: Cubic Yard. Calculate using the Average End Area, Three Dimensional, or Nominal method as defined in Section 109.

611.0003.0005 Riprap, Class II Grade Control Structures Tie-in: Linear Foot. Calculate using the Nominal method as defined in Section 109. Estimated volume of rock per linear foot (for information purposes only): 0.5 Cubic Yards

611.0004.0001 Riprap, Primary Grade Control Structures: Linear Foot. Calculate using the Nominal method as defined in Section 109. Estimated volume of rock per linear foot (for information purposes only): 0.7 Cubic Yards

611.0004.0002 Riprap, Secondary Grade Control Structures: Linear Foot. Calculate using the Nominal method as defined in Section 109. Estimated volume of rock per linear foot (for information purposes only): 0.3 Cubic Yards.

611.0004.0003 Riprap, Downstream Tie-In: Linear Foot. Calculate using the Nominal method as defined in Section 109. Estimated volume of rock per linear foot (for information purposes only): 0.75 Cubic Yards

611.0005.0001 Habitat Rocks: Each.

611.0005.0002 Header Rocks: Each.

611-5.01 BASIS OF PAYMENT. *Add the following:*

The unit price shall include the cost to purchase, transport, haul, process and sort, stockpile, and handle the riprap rock and any and all other materials and equipment necessary for the placement of the riprap rock features. Excavation, subgrade preparation, including compaction, in preparation for the placement of riprap, as well as backfill and the use of Waterway Bed Fill or Useable Excavation to fill voids in placed riprap, grade control structures, grade control structure tie-ins, and habitat rocks is subsidiary.

Salvaging of existing rocks on site is acceptable and encouraged for use for Primary and Secondary Grade Control Structures.

All Work, including labor, materials, and equipment, necessary to define quantities is subsidiary to pay item 642.0001.0000 Construction Surveying.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
611.0003.0002 Riprap, Class II	Cubic Yard
611.0003.0005 Riprap, Class II, TIE-IN	Linear Foot
611.0004.0001 Riprap, PRIMARY GRADE CONTROL STRUCTURES	Linear Foot
611.0004.0002 Riprap, SECONDARY GRADE CONTROL STRUCTURES	Linear Foot
611.0005.0001 Riprap, HABITAT ROCK	Each
611.0005.0002 Riprap, HEADER ROCK	Each

SECTION 618

SEEDING

Special Provisions

618-1.01 DESCRIPTION. *Delete subsection in entirety and replace with the following*:

Topsoil and seed all new or disturbed areas, that are not identified to be armored with riprap, woody debris, or revegetated with vegetative mat and other areas directed by the Engineer. Track the soil and apply seed, mulch, and water. Provide a living ground cover on slopes as soon as possible.

618-3.03 APPLICATION. *Add the following*:

Contractor is responsible for applying Owner furnished seed to the project site.

Apply seed at two pounds per 1,000 square feet (87 pounds/acre). Do not apply fertilizer. Use mulch per Section 619.

Evenly mix the seeds in a sack immediately before dispersing or adding to a hydroseeding solution, and then evenly mix the seeds into solution. Water lightly and keep top 1/8 in. of soil moist until final acceptance of the Project is received.

Water seeded areas per seed supplier's recommendations.

618-5.01 BASIS OF PAYMENT. *Add the following:*

Furnishing, mobilizing, modifying, operating, and maintaining all materials and equipment necessary to place seed is subsidiary to pay item 690.2004.0000 Reclamation and Revegetation. Water for seeding is subsidiary.

SECTION 619

SOIL STABILIZATION

Special Provisions

619-3.02 APPLICATION. *Add the following:*

Apply Wood Cellulose Fiber or Natural Wood Fiber mulch meeting the requirements of Subsection 727-2.01 Mulch over all disturbed areas to be seeded as in accordance with Section 618 Seeding. Mulch can be placed concurrently with seed if the Hydraulic Method is used for seeding in accordance with Subsection 618-3.03 Application. Straw is not an approved soil stabilization material and is prohibited on the project site.

Apply mulch at 40 pounds/1,000 square feet.

Delete Subsections 619-4.01 and 619-5.01 in their entirety, and add the following new subsections:

619-5.01 BASIS OF PAYMENT.

Mulch, application, water, maintenance, and repair are subsidiary to pay item 690.2004.0000 Reclamation and Revegetation.

SECTION 620

TOPSOIL

Special Provision

620-3.01 PLACING. *Add the following:*

Place native organic soils (salvaged during excavation work) or topsoil meeting the requirements of Section 726 to a thickness of 4 inches (or as approved by the Engineer) on all disturbed soil identified for seeding in accordance with Section 618. Excess salvaged vegetated mat beyond what is required by the Plans may be used in lieu of topsoil and seeding.

620-5.01 BASIS OF PAYMENT. *Delete subsection in entirety and replace with the following*:

Top Soil, application, water, maintenance, and repair are subsidiary to pay item 690.2004.0000 Reclamation and Revegetation.

SECTION 640

MOBILIZATION AND DEMOBILIZATION

Special Provision

640-3.01 CONSTRUCTION REQUIREMENTS. *Add the following:*

Pressure wash all tracked equipment, excavation equipment, and excavation hauling equipment prior to mobilization so that no invasive species will be spread or imported into the site. At a minimum, there should be no visible dirt on equipment.

Remove temporary access features that the Contractor deems necessary to access the site to ensure the site returns to pre-construction condition. Any vegetated area disturbed by temporary access features shall be rehabilitated using Vegetative Mat with the exception of the Copper River Highway Embankment, which shall be reclaimed using topsoil and seeding.

Any guardrail and posts removed by the Contractor to facilitate access to the site is required to be replaced to pre-construction conditions in accordance with the standards of MASH-TL3 compliant W31 guardrail.

640-4.01 METHOD OF MEASUREMENT. *Delete the text of this subsection in its entirety and replace with:*

1. Ten percent of the amount bid for mobilization and demobilization will be paid in the month following award of the construction contract.

2. Ten percent of the amount bid for mobilization and demobilization will be paid for the first month in which ground-disturbing activities occur, including demolition of existing structures or installation of the stream diversion system.

3. When 40 percent of the original contract amount from the other bid items, excluding Mobilization and Demobilization, is paid, an additional 40 percent of the amount bid for mobilization and demobilization will be paid.

4. The remaining 40 percent of the amount bid for Mobilization and Demobilization will be paid after all disturbed areas have been reclaimed and accepted by the Engineer, and all required submittals under the Contract are received and approved.

640-5.01 BASIS OF PAYMENT. *Add the following:*

All labor, equipment, and materials necessary to install and remove temporary access features, such as temporary access roads and/or ramps, reclaiming disturbed ground, restoring damaged pavement and traffic control/safety elements, removing and disposing of fill for ramps, and for any and all other necessary activities required to complete the Work that not paid for under another pay item are subsidiary to pay item 640.0001.0000 Mobilization and Demobilization.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
640.0001.0000 Mobilization and Demobilization	Lump Sum

SECTION 641

EROSION, SEDIMENT, AND POLLUTION CONTROL

Special Provisions

641-1.03 PLAN AND PERMIT SUBMITTALS. *Add the following:*

Storm Water Pollution Prevention Plan. Submit an electronic copy and three hard copies of the SWPPP to the Engineer for information. Deliver these documents to the Engineer at least 21 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting.

The Engineer will review the SWPPP submittals within 14 days after they are received.

ADEC SWPPP Review.

1. Transmit a copy of the CRWP approved SWPPP to ADEC as more than one (1) acre of land is being disturbed.
2. Transmit a copy of the delivery receipt confirmation to the Engineer within (7) days of receiving the confirmation.
3. Retain a copy of delivery receipt confirmation in the SWPPP.

641-1.06 RESPONSIBILITY FOR STORM WATER PERMIT COVERAGE. *Delete this subsection in its entirety and replace with the following:*

1. The Contractor is solely responsible for permitting and permit compliance for all disturbed areas. The Contractor has sole responsibility for compliance with all federal, state, and local requirements, and for securing all necessary clearances, rights, and permits.
2. An entity that owns or operates a material source or disposal site is responsible for permitting and permit compliance. The Contractor is solely responsible for verification that the entity has appropriate permit coverage.
3. The CRWP is not responsible for permitting or permit compliance, and is not liable for fines resulting from noncompliance with permit conditions:

641-2.04 RESPONSIBILITY AND AUTHORITY OF THE SWPPP MANAGER. *Add the following:*

The SWPPP Manager must be available at all times to administer SWPPP requirements and be physically present at the project site or the project office for at least eight hours per day when construction activities are occurring. The SWPPP Manager must provide SWPPP Inspection Reports to the Engineer when available.

The SWPPP Manager shall have the Contractor's complete authority and be responsible for suspending construction activities that do not conform to the SWPPP.

641-4.01 METHOD OF MEASUREMENT. *Add the following:*

Item 641.0003.0000 Temporary Erosion, Sediment, and Pollution Control

1. Ten percent of the pay item bid amount will be paid after the SWPPP is received and accepted.
2. Starting in the first month in which ground disturbing activities occur and the SWPP is implemented, through the schedule month in which the SWPPP will be terminated, equal monthly payments that total eighty percent of the pay item bid amount.
3. Ten percent of the pay item bid amount will be paid after evidence of the NOT is filed is submitted to the Engineer.

641-5.01 BASIS OF PAYMENT. *Add the following:*

Replace the Pay Item table with the following:

Pay Item	Pay Unit
641.0003.0000 Temporary Erosion, Sediment, and Pollution Control	Lump Sum

SECTION 642

CONSTRUCTION SURVEYING AND MONUMENTS

Special Provisions

642-1.01 Description. *Add the following:*

The Contractor shall submit for approval the qualifications of all persons engaged in grade control at least 14 Calendar Days prior to Q4 Pre-construction Meeting. The lead person establishing and checking grades in the field must have a minimum of 2 years of relevant surveying experience and be assigned the responsibility for grade control. At least one person competent in setting, adjusting and recording grades *shall always be on site* during streambed excavation, weir installation, and backfill operations.

Contractor is responsible for having a Surveyor to verify the survey control prior to the start of construction. The horizontal and vertical positions of the monuments will be verified by two methods: RTK positions will be collected on all site control points, and a closed differential level loop including all site survey control will be completed. Provide documentation of control point verification to the Engineer at least 14 Calendar Days prior to Q4 Pre-construction Meeting. If the horizontal or vertical position of the survey control varies from record values by more than 0.1 foot, the Contractor, while on site, shall coordinate with the Surveyor of Record to resolve the discrepancy.

Prepare as-built plans to submit at project completion.

642–3.01 GENERAL. *Add the following:*

As-Built Plans. Prepare a complete set of red lined as-built plans and keep them current during construction. Detail in the as-built plans all construction changes made to the Plans. Include the following information on the appropriate sheets:

1. Weir crest elevation profile across the total length of the structure. The elevation profile shall be based on survey points obtained at horizontal and vertical changes in alignment, with a maximum survey point spacing of 20 feet.

2. Profiles along the primary and secondary grade control structures. The elevation profile shall be based on survey points obtained at horizontal and vertical changes in alignment, with a maximum survey point spacing of 10 feet.

3. A profile along the upstream tie-in between the riprap and the lake bed.

4. A profile along the downstream tie-in between the toe of the rock ramp and the riverbed

Furnish a copy of the as-built plans and survey points (.csv or .dwg file format in point number, northing, easting, elevation, description format) at the completion of construction. As-built plans shall be sealed by a Surveyor. Submit as-built plans within 14 Calendar Days of substantial completion for review and approval by the Engineer.

642–4.01 METHOD OF MEASUREMENT. *Delete this subsection in its entirety and replace with the following:*

Item 642.0001.0000 Construction Surveying:

1. Ten percent of the amount bid for Construction Surveying will be paid after the control point verification survey is complete and the Control Point Verification documentation is submitted.
2. Starting in the first month in which ground disturbing activities occur, through the estimated month of substantial completion, equal monthly payments that total sixty-five percent of the pay item bid amount.
3. Twenty-five percent of the amount bid for Construction Surveying will be paid after the As-Built Plans submittal is received and approved.

642-5.01 BASIS OF PAYMENT. *Delete this subsection in its entirety and replace with the following:*

Construction Surveying includes field and office Work required to accomplish the Work, including furnishing necessary personnel, equipment, transportation, and supplies.

Payment will be made under:

Pay Item	Pay Unit
642.0001.0000 Construction Surveying	Lump Sum

SECTION 643
TRAFFIC MAINTENANCE

Special Provisions

643-1.03 TRAFFIC CONTROL PLAN. *Add the following:*

The Contractor shall submit a Traffic Control Plan prepared under the supervision of a Traffic Control Supervisor for approval to DOT&PF. No Work shall begin on the project until the Traffic Control Plan is approved. Submit Traffic Control Plan to the Engineer for information at least 30 Calendar Days prior to preconstruction conference.

643-1.05 CONSTRUCTION PHASING PLAN. *Delete the first sentence and add the following:*
Submit a Construction Phasing Plan for approval by the Engineer no later than 60 Calendar Days after notice of Award.

643-3.03 PUBLIC NOTICE. *Add the following:*

1. CRWP Program Director, Kate Morse, (907) 424-3334, kate@copperriver.org
2. DOT&PF NR Public Information Officer, (907) 451-5311, John.Perreault@alaska.gov
3. DOT&PF M&O Valdez District Superintendent, (907) 834-1039, Robert.Mattson@alaska.gov
4. DOT&PF Cordova M&O Foreman, (907) 424-3202, matthew.myszka@alaska.gov

643-4.01 METHOD OF MEASUREMENT. *Delete items 1 through 16 and add the following:*

Item 643.0002.0000 Traffic Maintenance

1. Ten percent of the pay item bid amount will be paid after the Traffic Control Plan is submitted to the Engineer
2. Fifteen percent of the pay item bid amount will be paid the month the Traffic Control Plan is implemented.
3. Starting in the first month after the Traffic Control Plan is implemented, through the schedule month in which the traffic control devices will be removed, equal monthly payments that total sixty percent of the pay item bid amount.
4. Fifteen percent of the pay item bid amount will be paid in the month following removal of traffic control devices.

643-5.01 BASIS OF PAYMENT. *Delete paragraphs 1 through 17 and add the following:*

Traffic Maintenance. The contract price includes all resources required to produce, obtain relevant permits for, and implement the Traffic Control Plan, including public notices and the maintenance of all roadways, approaches, crossings, intersections, and pedestrian and bicycle facilities. Any temporary construction signs, traffic control devices flagging, and pilot car services, if required by the approved Traffic Control Plan, are subsidiary to this pay item.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
643.0002.0000 Traffic Maintenance	Lump Sum

SECTION 646
CPM SCHEDULING

Special Provisions

646-2.01 SUBMITTAL OF SCHEDULE. *Delete the first sentence and replace with the following:*

Submit a detailed CPM schedule at least 30 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting, for the Engineer's approval.

646-3.01 REQUIREMENTS AND USE OF SCHEDULE *Delete items 1 and 2 and replace with the following:*

2. Following each weekly construction update meeting, update the CPM schedule and provide the updated CPM schedule to the project team at the next weekly construction update meeting.

646-5.01 BASIS OF PAYMENT *Delete and replace with the following:*

Non-compliance with CPM Schedule update requirements is considered unsatisfactory performance and may result in withholding progress payments according to subsection 109-1.06.

There is no specific pay item for CPM Scheduling. The initial issue of the CPM schedule and schedule updates are subsidiary to pay item 640.0001.0000 Mobilization and Demobilization.

Add the following Section:

SECTION 672

STREAM DIVERSION & DEWATERING

672-1.01 DESCRIPTION. The Work under this Section consists of performing all operations pertaining to the dewatering of Work areas or diversion of surface and subsurface water flows during construction operations.

672-1.02 GENERAL. Construction will take place around a river and lake, which is subject to periodic flooding. The Contractor shall be responsible for the control of the surface and subsurface water during the course of the Work. Any damage to the Work resulting from surface flows, base flows, or flood flows (equivalent to a maximum lake elevation of 20.00 ft.) shall be corrected by the Contractor at the Contractor's sole cost.

A conceptual Construction phasing sequence is shown on the Drawings. The suggested Construction sequence is only intended to convey general concepts, and sequence boundaries are approximate. The Contractor shall specify the locations of bulk bags (super sacks), coffer dams (e.g., Portadam), temporary culverts, diversion channels, access roads, and related items based on the Contractor's approved Stream Diversion and Dewatering Plan and as needed to fit field conditions. The diversion structure shall not be constructed of exposed earthen materials. The Contractor shall submit a Stream Diversion and Dewatering Plan, signed and sealed by a third-party Professional Engineer registered in the State of Alaska, to the Engineer for approval at least 21 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting. The Contractor shall be solely responsible for the Stream Diversion and Dewatering operations, regardless of review and approval by the Engineer.

Design dewatering systems to:

1. Lower water table within areas of excavation to a minimum of 1 foot below bottom of excavations to facilitate Work being completed on dry and stable subgrade.
2. Prevent quick conditions.
3. Maintain stability of sides and bottoms of excavations.

Design stream diversion system to divert the river around the Work area. The stream diversion system shall be designed to maintain a minimum lake elevation of 17.4 ft and a maximum lake elevation of 20.00 ft. A lake elevation above an elevation of 19.0 ft may induce overbank flow on the river left bank of Eyak Lake. During construction, the Contractor shall install and maintain a lake level gage that will be used to verify compliance with the minimum lake level requirement and to provide warning should the lake level rise and approach the maximum allowable lake elevation. Upon request, design reports for the project will be made available to the Contractor to aid in preparing the Stream Diversion and Dewatering Plan. The Owner and Engineer assume no responsibility for deductions, interpretations, or conclusions made by the Contractor based on the information made available by the Owner or Engineer.

At a minimum, the Stream Diversion and Dewatering Plan shall include:

1. Descriptions of proposed water control measures including, but not limited to, coffer dam design, proposed stream diversion plan, and dewatering methods and equipment.

2. Proposed construction sequencing/phasing and a description of how the sequencing/phasing will be implemented.
3. Descriptions of dewatering and monitoring procedures.
4. Emergency procedures to follow when problems arise.
5. Product data for dewatering pumps and stream diversion systems.

The Contractor shall notify ADF&G and the Engineer a minimum of 72 hours before implementing the approved Stream Diversion and Dewatering Plan, or as required by permits, whichever is greater.

The following flow estimates are for the Eyak River below Eyak Lake during the anticipated construction period and are provided for information only:

- Estimated Low Flow: 110 cfs (January 1 through April 30)
- Estimated Average Flow: 200 cfs (January 1 through April 30)
- 2-year Flood Flow (Q2): 2,310 cfs
- 10-Year Flood Flow (Q10): 3,480 cfs

672-2.01 MATERIALS. The Contractor shall be responsible for obtaining, mobilizing, operating, and maintaining all materials and equipment necessary to complete stream diversion and dewatering operations.

672-3.01 PROJECT CONDITIONS. The groundwater is directly connected to Eyak Lake; the Contractor should anticipate groundwater in excavations.

Refer to the Geotechnical Report and/or Design Report for information on geologic, subsurface, and hydrologic conditions.

672-4.01 CONSTRUCTION. Provide a redundant pump onsite during dewatering activities and maintain adequate fuel levels for dewatering operations.

672-5.02 STREAM CONTROL & DEWATERING. Relocate fish stranded within any coffer/diversion dams or the river channel before a work area is completely dewatered. Place relocated fish in the closest waterbody upstream of the construction area. If pumps are used for dewatering an isolated pools after diversion, the intake must meet specifications required by the Fish Habitat Permit to prevent fish entrapment, entrainment, or injury.

Water resulting from Contractor's dewatering effort may not be pumped or otherwise diverted directly back into the Eyak River unless the required permits, including, but not limited to, ADNR, ADEC, ADF&G and the ACOE, are obtained. Water pumped from the construction site may require additional filtration by filter fabrics, settling, or other methods to prevent turbid water from directly entering the stream. Under no circumstances will the Contractor be allowed to discharge water from the excavation onto roadways. The Contractor shall discharge of surface water runoff and dewatering water in accordance with the permit requirements.

672-6.03 REPAIR. Repair damage to Work caused by inadequate performance of facilities, mechanical or electrical failure of equipment, or inadequate monitoring or maintenance of facilities.

672-7.03 REWATERING. Conduct rewatering activities to minimize downstream sediment movement upon completion of in-stream Work. Prior to restoring stream flow to the reconstructed

channel, wet the channel to wash fines into the stream bed. Slowly wet the channel using pumps, or by diverting a small portion of the stream flow into the reconstructed channel, to wash fines into the stream bed. Provide means for collecting sediment and turbid water at the downstream end of the reconstructed channel. Capture and pump turbid water from the downstream end of the channel back to the upstream end of the channel until the fines are washed into stream bed and the water runs clear as determined by the Engineer. After the newly constructed channel is washed of sediment, breach the coffer dam system in such a manner as to avoid a damaging pulse of water being sent through the newly constructed channel.

672-8.01 Method of Measurement.

Item 672.0001.0000 Stream Diversion & Dewatering:

1. Ten percent of the pay item bid amount will be paid after the Stream Diversion and Dewatering Plan submittal is approved.
2. Twenty percent of the pay item bid amount will be paid after the Stream Diversion and Dewatering Plan is implemented (i.e., the coffer dam is installed and the Eyak River is being diverted around the Work).
3. Starting in the month after the Stream Diversion and Dewatering Plan is implemented through the scheduled month for which stream diversion activities are planned, equal monthy payments that total sixty percent of the pay item bid amount.
4. Ten percent of the pay item bid amount will be paid after the coffer dam is removed and no longer needed.

672-9.01 BASIS OF PAYMENT. The Contract lump sum price for administration of all Work. The contract price includes (but is not limited to) all resources required to implement the Stream Diversion and Dewatering Plan, such as sump and trench excavations and backfill, temporary culverts, pumps, hoses, stilling basins, sandbags, bulk bags (e.g., Super Sacks), coffer dams (e.g., Portadam), plastic liners, temporary rock and riprap.

Payment will be made under:

Pay Item	Pay Unit
672.0001.0000 Stream Diversion & Dewatering	Lump Sum

Add the following Section:

SECTION 690

WATERWAY

690-1.01 DESCRIPTION. Construct a waterway bed (stream bed, riverbed, creek bed, and/or similar), reclamation and revegetation, as shown on the Plans.

690-1.02 REFERENCES.

1. Stream Bank Revegetation and Protection: A Guide for Alaska; published by Alaska Department of Fish and Game; printed copy available from the Department, and electronic copy available on the internet.

690-2.01 MATERIALS.

Clearing and Grubbing (salvage Vegetative Mat)	Section 201
Excavation and Embankment (waterway bed and bank)	Section 203 & 703
Riprap	Section 611
Aggregates (Base Course & Selected Material)	Section 703

Identification of Source Material
Each source for Vegetative Mat and component materials of Waterway Bed Fill and Waterway Bed Capping Layer are required to be submitted to the Engineer at least 14 Calendar Days prior to Q2 Pre-construction Submittal Status Meeting for information.

Useable Excavation
Material that meets Selected Material Type B as defined in Section 703-2.07.

Salvaged Stream Bed Fill: Excavated native streambed material processed to remove unsuitable material containing muck, frozen material, roots, sod, or other deleterious matter.

Waterway Bed Fill: Waterway Bed Fill produced by mixing, 34% Base Course C-1 and 66% Riprap, Class I. Submit a gradation for produced Waterway Bed Fill to the Engineer for approval 14 days prior to placement of materials. The Engineer's approval of the Waterway Bed Fill must be obtained before placing Waterway Bed Fill.

Waterway Bed Capping Layer: Waterway Bed Capping Layer produced by mixing, 25% Base Course C-1 and 75% Riprap, Class I. Submit a gradation for produced Waterway Bed Capping Layer to the Engineer for approval 14 days prior to placement of materials. The Engineer's approval of the Waterway Bed Capping Layer must be obtained before placing Waterway Capping Layer.

Salvaged Organic Soil: Salvaged topsoil, or other excavated material high in organics and fines.

Woody Debris: Trunks, branches, roots, and slash harvested or collected in the vicinity of the project and meeting the length and diameter requirements stated on the plans. Materials may be harvested

from shrubs and trees, including willow, alder, dogwood, spruce, hemlock, and cottonwood. Material does not include soft and herbaceous materials such as grass, cow parsnip, fireweed, ferns, etc.

Vegetative Mat. Use living native plants and grasses that grow in fertile soils near the project. The Contractor shall harvest, transport, and store Vegetative Mats from an approved onsite or offsite location coordinated with CRWP. The Contractor shall prioritize salvaging Vegetative Mats from the project site or in the vicinity of the project from areas that will be disturbed for other Work. Cut Vegetative Mat in blocks of at least 6 ft^2. Obtain approval from the Engineer to use different dimensions. Include an intact root system with natural soil at least 12 inches thick. The Contractor shall place Vegetative Mats harvested from offsite locations within one day of harvesting.

690-3.01 CONSTRUCTION REQUIREMENTS. Provide equipment of a size and type to efficiently complete the Work with the least impact on the waterway and surrounding riparian areas.

Contractor is responsible for initial acceptance testing of all materials, including constituent materials for mixed products (such as Waterway Bed Fill and Waterway Bed Capping Layer), and submitting test results to the Engineer. Material tests for Base Course C-1 are required if material sources change, or if the provided material is visibly different than previously accepted material. Material gradations for riprap, waterway bed fill, and waterway bed capping layer will not be required after the initial gradation submittals. However, gradations shall be visually verified upon delivery to the project site and/or mixing site, and additional gradation testing may be required to verify the gradation of the as-delivered material.

The Contractor shall submit a Waterway Construction Plan that details the proposed sequencing, equipment, and methods for excavating the waterway area and placing the Grade Control Structures, Waterway Bed Fill, Habitat Rocks, and the Waterway Bed Capping Layer to the Engineer for approval at least 14 Calendar Days prior to Q3 Pre-construction Submittal Status Meeting.

Notify the Engineer 72 hours before beginning Waterway Work to provide opportunity for the Engineer to coordinate having one person with fish habitat experience (CRWP, USFWS, USFS, ADF&G, or similar) on site during construction of waterway bed and bank reconstruction.

690-3.02 EXCAVATION. Excavate to the elevations, grades, and limits shown on the Plans. Control excavation activities to minimize disturbance to the channel banks.

690-3.03 SALVAGED STREAM BED FILL

Place and compact Useable Excavation Material over the excavated surface before placing Waterway Bed Fill. Useable Excavation Material shall not be placed within 2.5 feet of the finished grade of the channel. Place the Useable Excavation Material in maximum loose lifts of 10 inches. Compact each lift of the waterway bed material to 70% relative density. In the presence of the Engineer, the Contractor shall determine the compactive effort necessary to achieve 70% relative density using a test strip with minimum dimensions 20 ft long by 10 ft wide and the compaction equipment and methods described in the Waterway Construction Plan; a minimum of four passes with a vibratory plate compactor will be required, but the lift thickness and compaction methods may be adjusted based on the results of the test strip.

690-3.04 WATERWAY BED. Place Waterway Bed Fill material by methods that do not cause segregation or particle breakdown. Place the fill in maximum loose lifts of 10 inches. The minimum thickness of Waterway Bedfill Material shall be 2.5 feet. Compact each lift of the waterway bed material to 70% relative density. In the presence of the Engineer, the Contractor shall determine the compactive effort necessary to achieve 70% relative density using a test strip with minimum dimensions 20 ft long by 10 ft wide and the compaction equipment and methods described in the Waterway Construction Plan; a minimum of four passes with a vibratory plate compactor will be required, but the lift thickness and compaction methods may be adjusted based on the results of the test strip. Make the finished waterway bed surface roughness similar to the natural waterway bed.

Fill voids between all rocks and riprap with Waterway Bed Fill material or Useable Excavation meeting the requirements of Selected Material, Type B.

Waterway Bed Sealing: Use water pressure (pumps and hoses), metal tamping rods, or similar hand-operated equipment to force loose material into the finished surface of the Waterway Bed. If surface voids form during the sealing operation, add additional Useable Excavation material and compact until water is flowing on the surface of the waterway bed. Waterway bed material shall be sealed prior to placement of the Waterway Bed Capping Layer.

690-3.05 WATERWAY BED CAPPING LAYER

Place the Waterway Bed Capping Layer (Capping Layer) by methods that do not cause segregation or particle breakdown. Place the Capping Layer as shown on the Plans, or as directed by the Engineer. Fill in voids with smaller stones as directed by the Engineer. Place the Capping Layer to its full course thickness in one operation.

690-3.06 WATERWAY BANK. Tie the ends of the reconstructed banks to the undisturbed banks. Grade the reconstructed bank areas to create a smooth transition to the undisturbed bank.

Place the bank reconstruction materials as shown on the Plans. Place the salvaged Useable Excavation, woody debris, and Vegetative Mat such that the vegetated mat cover is fairly flat and at a similar elevation as the undisturbed bank.

690-3.07 ESTABLISHMENT PERIOD The contractor is responsible for the establishment and maintenance of the revegetation for the time the contractor is physically on site. Preserve the Vegetative Mat in a healthy and vigorous condition to ensure successful establishment. Water as frequently as necessary to keep the immediate root area moist at all times.

690-3.08 EXTRA HABITAT WORK The exact footprint of disturbance and materials salvaged won't be known until the project is close to completion. Addition of salvaged materials into the final grading of disturbed areas shall be directed by the Engineer, if required.

690-4.01 METHOD OF MEASUREMENT.

Items 690.2001.0000 through 690.2003.0000. The Contractor will be paid for the actual in-place quantity of compacted fill material. The Contractor shall submit the survey points (including point numbers, northings, eastings, elevations, and descriptions in .csv or .dwg format) and volume calculations as supporting documentation with the Contractor's application for payment.

690.2001.0000 Salvaged Stream Bed Fill: Cubic Yard. Calculate using the Average End Area or Three Dimensional method as defined in Section 109.

690.2002.0000 Waterway Bed Fill: Cubic Yard. Calculate using the Average End Area or Three Dimensional method as defined in Section 109. Subtract out the volume of the riprap rock placed as part of a Primary or Secondary Grade Control Structure or for the downstream Tie-In.

690.2003.0000 Waterway Bed Capping Layer: Cubic Yard. Calculate using the Average End Area, Three Dimensional, or Nominal method as defined in Section 109.

690.2004.0000 Reclamation and Revegetation: Lump Sum. No quantities will be measured.

690.2005.0000 Excavator, [w/ thumb, w/Operator]: Hour. As directed by the Engineer.

690-5.01 BASIS OF PAYMENT.

1. Pay Item 690.2001.0000 include all of the materials and Work to place and maintain the materials including, but not limited to, useable excavation, placement/backfilling, benching, compacting, filling voids, and similar. All Work to grade placed fill in channel to match the downstream channels is subsidiary. Hauling, stockpiling, and disposal of surplus material are subsidiary to Section 690 pay items. Backfill material, obtained from useable excavation (within the limits of excavation), is subsidiary to item 203.0001.0000.

2. Pay Item 690.2003.0000 includes the materials and all Work to restore, reclaim, revegetate, and protect disturbed areas, such as to salvage/harvest, store, transport, place, and maintain organic materials (Vegetative Mat and Woody Debris) and seed. Watering and establishment efforts are subsidiary.

3. Pay Item 690.2004.0000 includes the equipment and labor to complete supplemental as-directed habitat work not shown on the Plans. Such efforts may include random placement of salvaged materials (logs and slash) over disturbed areas, incorporating rootfans or other woody material into bank reconstruction, or the artful arrangement of boulders encountered & salvaged during earthwork into the final grading.

Payment will be made under:

Pay Item	Pay Unit
690.2001.0000 Salvaged Stream Bed Fill	Cubic Yard
690.2002.0000 Waterway Bed Fill	Cubic Yard
690.2003.0000 Waterway Bed Capping Layer	Cubic Yard
690.2004.0000 Reclamation and Revegetation	Lump Sum
690.2005.0000 Excavator, [w/ Thumb, w/Operator]	Hour

SECTION 727

SOIL STABILIZATION MATERIAL

Special Provision

Add the following Subsection:

727-2.04 SEDIMENT RETENTION FIBER ROLLS (SRFRs). Fiber rolls, also referred to as wattles. Manufacture of photodegradable or biodegradable fabric netting without preservative treatment, evenly woven, free of crusted material, cuts, and tears. Fiber rolls shall contain no plastic netting. Manufacture stakes of photodegradable or biodegradable material (wood stakes, except as approved by the Owner). SRFRs shall be removed at project completion.

Straw is prohibited on the project site.

1. Filter Sock (Wattle)
    a. Biodegradable, fabric netting.
    b. Filled with wood fiber, flax, rice, coconut fiber material.
    c. Minimum diameter 5 inches.
2. Compost Sock.
    a. Extra Heavy weight fabric netting with a minimum strand width of 5 mils.
    b. Filled with coarse compost.
    c. Minimum diameter 8 inches.
3. Coir Log.
    a. Woven wrap bristle coir twine netting.
    b. Filled with 100% coconut (coir) fiber uniformly compacted.
    c. Segments maximum length 20 foot, diameter as suited to the application and a density of 7 lbs/pcf or greater.
    d. Coir twine strength equal to 80 lb minimum weaved to a 2 inch x 2 inch opening pattern.
    e. Ties made of hemp rope by 1/4 inch diameter.

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APPENDIX H

Submittal List

EYAK LAKE WEIR REPLACEMENT SUBMITTAL LIST (2 PAGES)

Submittal	Specification	Review Type	Construction Project Engineer	Design Engineer of Record	Manufacturer / Remarks
Qualifications of the QC Manager	104-1.01	Approval			
Daily Reports	104-1.01	Information			
Identification of Trees for Removal	201-1.01	Approval			
Disposal plan, waiver of claims, permission and/or permits	202-3.03	Information			
Job Mix Design	501-2.02	Approval			
Concrete Plant Certification	501-3.01	Approval			
Concrete Test Reports:	501-3.03	Approval			
Slump (ASTM C143)					
Air Content (ASTM C231)					
Compressive-Strength Tests (7 & 28 Days) (ASTM C 39)					
Density (ASTM C138)					
Concrete Placement Plan	501-3.05	Approval			
Cold Temperature Concreting Plan	501-3.09	Approval			
Placing Drawings	503-3.01	Approval			
Pile Driving Plan	505-3.01	Approval			
Certified Test Report	715-2.03	Approval			
Riprap: Wear – AASHTO T96	611-2.01	Approval			
Riprap Gradation:	611-3.01	Approval			
Class 1					
Class 2					
Primary Grade Control Structures					
Secondary Grade Control Structures					
Habitat Rocks					
Header Rocks					
Material Source	611-3.01	Information			
Storm Water Pollution Prevention Plan	641-1.03	Information			
SWPPP Inspection Reports	641-2.04	Information			
eNOI	641-4.01	Information			
eNOT					
Grade Controller(s) Qualification	642-1.01	Approval			
Control Point Verification	642-1.01	Information			
As-built Plans	642-3.01	Approval			
Traffic Control Plan	643-1.03	Information			

Submittal	Specification	Review Type	Construction Project Engineer	Design Engineer of Record	Manufacturer / Remarks
Construction Phasing Plan	643-1.05	Approval			
CPM Construction Schedule	646-2.01	Approval			
Stream Diversion and Dewatering Plan	672-1.02	Approval			
Component Material Sources for Waterway Bed Fill and Capping Layer	690-2.01	Information			
Gradation: Base Course C-1	703-2.03	Approval			
Gradation: Waterway Bed Fill	690-2.01	Approval			
Gradation: Waterway Bed Capping Layer	690-2.01	Approval			
Waterway Construction Plan	690-3.01	Approval			
Vegetative Mat Source	690-3.06	Approval			

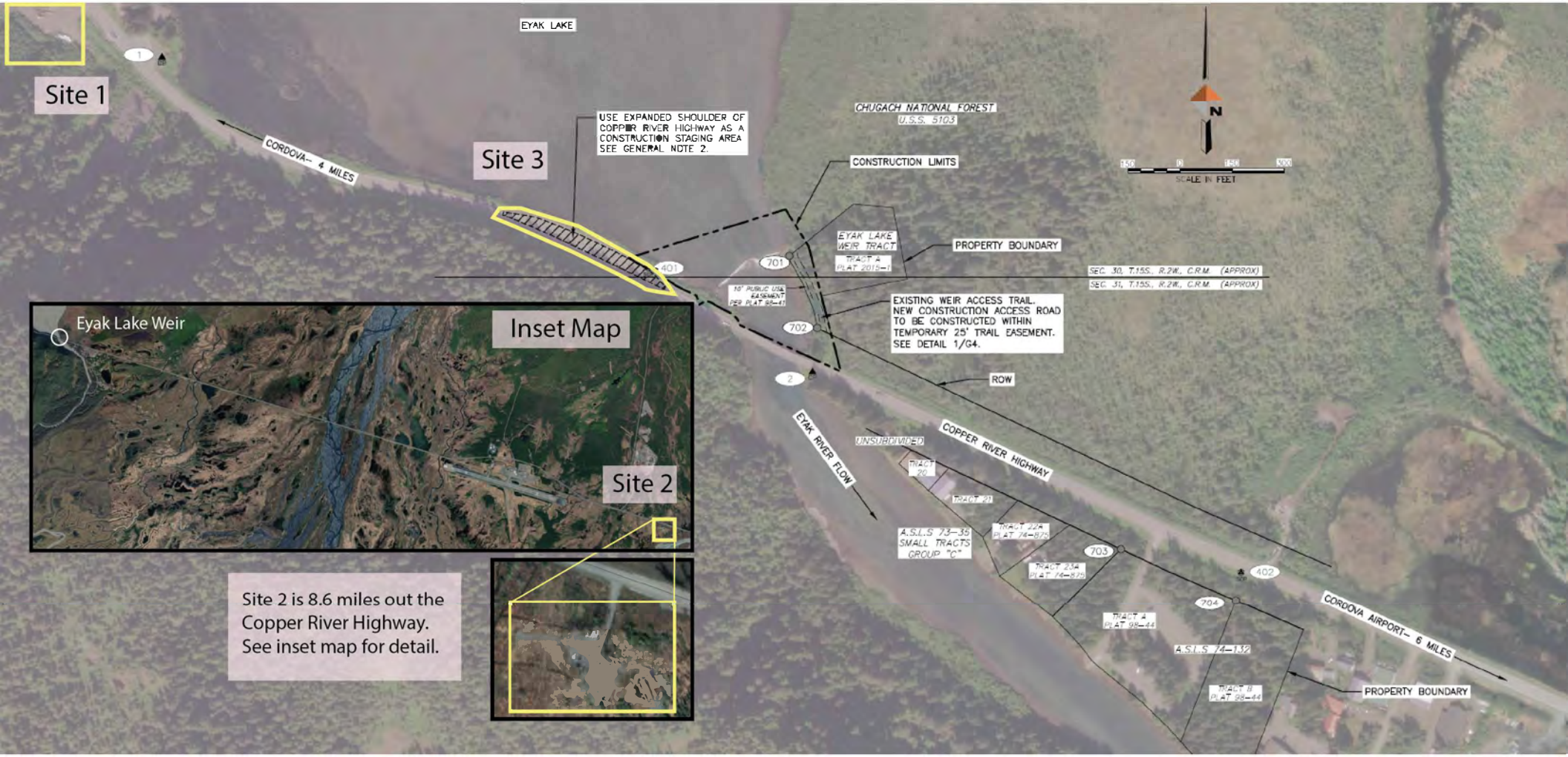
NOTE: The above materials certification list is not all inclusive. In addition to the above, the Contractor is required to comply with all submittal requirements as required or identified in the plans, specifications, ADOT&PF Standard Specifications for Highway Construction (SSHC) 2020 Edition, or as directed by the Engineer.

APPENDIX I

Potential Material Storage and Stockpile Locations

APPENDIX I Potential Material Storage and Stockpile Locations

These are sites that partners have agreed to make available to potential contractor. Contractor must directly contact the land owner for more information.
The roads that access these sites are plowed by the State, but none of the sites themselves are plowed by the land owners. This would be a responsibility of the contractor.



Site #	Site Name	Distance to Project Site	Availablity	Land Owner	Contact
1	5 Mile Material Site	2,400 ft	Nov - April	The Eyak Corporation	Tiffany Beedle, Lands Manager
2	Pink Warehouse	8.6 miles	Year Round	The Eyak Corporation	Tiffany Beedle, Lands Manager
3	Copper River Hwy Shoulder	550 ft	Year Round	ADOT&PF	Subject to Special Use Permit
Tiffany Beedle, tbeedle@eyakcorp.com (907) 424 - 7161					

APPENDIX J

Contractor Performance and Payment Bond

CONTRACT PERFORMANCE AND PAYMENT
BOND SIGNATURE INSTRUCTIONS

1. The full name and business of the Contractor shall be inserted on Page 1 of the Contract and on the Performance and Payment Bond, hereinafter the Bond.

2. Two copies of the Contract and the Bond shall be manually signed by the Contractor. If the Contractor is a partnership or joint venture, all partners or joint ventures shall sign the Contract and the Bond except that one partner or one joint venturer may sign for the partnership or joint venture when all other partners or joint venturers have executed a Power-of-Attorney authorizing one partner or joint venturer to sign. The Power-of-Attorney shall accompany the executed contract and the Bond.

3. If the Contractor is a corporation, the President of the corporation shall execute the Contract and the Bond unless a Power-of-Attorney or corporate resolution shall accompany the executed Contract and Bond.

The Bond shall be returned to the Copper River Watershed Project. The Contract Date shall be inserted on the Contract when the Copper River Watershed Project signs the Contract and the Bond shall be dated the same as the Contract Date

CONTRACT PERFORMANCE AND PAYMENT BOND

For

Project Name EYAK LAKE WEIR REPLACEMENT

Project Number EYAK LAKE WEIR-2025

Bond Number _____

KNOW ALL WHO SHALL SEE THESE PRESENTS:

That _____

of _____, as Principal,

and _____,
a corporation organized under the laws of the

_____
and authorized to transact surety business in the State of Alaska,

of _____, as Surety,
are held and firmly bound unto the COPPER RIVER WATERSHED PROJECT, as Obligee,
in the full and just sum of

_____ Dollars

($_____), lawful money of the United States of America
for the payment which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION IS SUCH, that whereas the principal has entered into a certain contract dated the _____ date of _____, 2025
with the Obligee for the construction of the above-named project, said work to be done according to the terms of said contract, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract, and shall promptly make payments to all persons supplying labor and material in the prosecution of the work provided for in said contract, during the original term of said contract and any extensions or modifications thereof that may be granted by the Copper River Watershed Project, with or without notice to the Surety, then this obligation to be void; otherwise to remain in full force and effect.
This obligation is made for the use of said Obligee and also for use and benefit of all persons who may perform any work or labor or furnish any material in the execution of said Contract and may be sued on thereby in the name of said Obligee.

The said Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same, shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

Whenever Principal shall be, and declared by Obligee to be in default under the Contract the

Obligee having performed Obligee's obligations thereunder, the Surety may promptly remedy the default or shall promptly:

1. Complete the Contract in accordance with its terms and conditions, or
2. Obtain a bid or bids for submission to Obligee for completing the Contract in accordance with its terms and conditions and upon determination by Surety of the lowest responsible bidder, or, if the Obligee elects, upon determination by Obligee and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Obligee and make available as Work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price but not exceeding, including other costs and damages for which the Surety may be liable hereunder the amount set forth in the first paragraph hereof. The term "balance of the contract price" as used in this paragraph, shall mean the total amount payable by Obligee to Principal under the Contract and any amendments thereto, less the amount properly paid by Obligee to Principal.

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution hereof in _____ original counterparts as of the _____ day of _____, 20_____.

WITNESS AS TO PRINCIPAL:

Principal Name _____

Principal Signature _____

Principal Address _____

By _____

Contact Name _____

Phone _____

(AFFIX CORPORATE SEAL)

Corporate Surety _____

Surety Address _____

By _____

Contact Name _____

Phone _____

(Attorney-In-Fact)

(AFFIX SURETY SEAL)

APPENDIX K

Qualification Proposal Form

HYDRAULIC STRUCTURES AND HABITAT RESTORATION PROJECT EXPERIENCE
(*one form per job)

Project Title:	
Project Location:	
Project Owner (Name of organization):	
Contracting Officer (Name and Phone No.)	
Project Engineer (Name and Phone No.)	
Key Contractor Personnel (Name and Phone No.)	
Contract Cost (Bid Cost):	
Total Cost of Change Orders:	
Brief Description of Scope of Work:	
Project Start and End Dates:	
Describe any scheduling challenges and how they were met. Was the contract completed on schedule? If not, please explain reason for any delays.	

PAST PERFORMANCE EVALUATION BACKGROUND:

Each reference provided for past performance (minimum of 3, maximum of 6) will be asked to evaluate work of the contractor in the following areas:

A. Compliance of deliverables to specification requirements and standards of good workmanship.

B. Effectiveness of project management (to include use and control of subcontractors).

C. Timeliness of performance for contract completion.

D. Effectiveness in controlling costs.

E. Commitment to customer satisfaction and business-like concern for its customers' interest.

F. General comments. Provide any other relevant performance information.

References will be asked to use the following categories to describe contractor's performance:

Outstanding: Performance meets contractual requirements and exceeds many requirements that benefit the end user. Work was accomplished with few, if any, minor problems for which corrective actions taken by the contractor were highly effective. **Explanation requested.**

Good: Performance meets contractual requirements and exceeds some requirements that benefit the end user. Work was accomplished with some minor problems for which corrective actions taken by the contractor were effective.

Average: Performance meets contractual requirements. Work was accomplished with some minor problems for which corrective actions taken by the contractor were satisfactory.

Poor: Performance does not meet some contractual requirements. Serious problems with contractor performance were experienced for which the contractor has either not yet identified corrective actions or the corrective actions taken appear only marginally effective. **Explanation requested.**

Unsatisfactory: Performance does not meet most contractual requirements. Serious problems with contractor performance were experienced for which the corrective actions were ineffective. **Explanation requested.**

PAST PERFORMANCE EVALUATION CONTACT INFORMATION:

(1) Descriptive Job Title & Contract number:	
Date(s) of project implementation:	
Point of Contact (Name):	
Title (ex: Project Manager):	
Job Contact Information: (Agency, Phone No., E-mail Address)	
Project Engineer (Name and Phone No.)	
Contract Cost (Bid Cost):	
Total Cost with Change Orders:	

(2) Descriptive Job Title & Contract number:	
Date(s) of project implementation:	
Point of Contact (Name):	
Title (ex: Project Manager):	
Job Contact Information: (Agency, Phone No., E-mail Address)	
Project Engineer (Name and Phone No.)	
Contract Cost (Bid Cost):	
Total Cost with Change Orders:	

(3) Descriptive Job Title & Contract number:	
Date(s) of project implementation:	
Point of Contact (Name):	
Title (ex: Project Manager):	
Job Contact Information: (Agency, Phone No., E-mail Address)	
Project Engineer (Name and Phone No.)	
Contract Cost (Bid Cost):	
Total Cost with Change Orders:	

(4) Descriptive Job Title & Contract number:	
Date(s) of project implementation:	
Point of Contact (Name):	
Title (ex: Project Manager):	
Job Contact Information: (Agency, Phone No., E-mail Address)	
Project Engineer (Name and Phone No.)	
Contract Cost (Bid Cost):	
Total Cost with Change Orders:	

(5) Descriptive Job Title & Contract number:	
Date(s) of project implementation:	
Point of Contact (Name):	
Title (ex: Project Manager):	
Job Contact Information: (Agency, Phone No., E-mail Address)	
Project Engineer (Name and Phone No.)	
Contract Cost (Bid Cost):	
Total Cost with Change Orders:	

(6) Descriptive Job Title & Contract number:	
Date(s) of project implementation:	
Point of Contact (Name):	
Title (ex: Project Manager):	
Job Contact Information: (Agency, Phone No., E-mail Address)	
Project Engineer (Name and Phone No.)	
Contract Cost (Bid Cost):	
Total Cost with Change Orders:	

APPENDIX L

Bid Form for Proposal

BID FORM

(CERTIFICATION)

TO: Copper River Watershed Project
511 1ST Street
Cordova, AK 99574

Date: Add date

SUBJECT: Request for Proposal EYAK LAKE WEIR -2025

Pursuant to and in compliance with subject Request for Proposals, and other bid documents relating thereto, the bidder hereby proposes to furnish all labor and materials and to perform all work for the construction of the above referenced project in strict accordance with the bid documents at the prices established in the Bid Proposal, page BP-1 through BP-4 submitted herewith.

The bidder agrees, if awarded the contract, to commence and complete the work within the time specified in the bid documents.

The bidder acknowledges receipt of the following addenda to RFP EYAK LAKE WEIR-2025

Addenda Number	Date of Addenda

Type of Business Organization

The bidder, by checking the applicable box, represents that it operates as

( ) a corporation incorporated under the laws of the State of _____

( ) an individual,

( ) an LLC,

( ) a partnership,

( ) a nonprofit organization, or

( ) a joint venture.

If a partnership or joint venture, identify all parties on a separate page.

BID FORM

(CERTIFICATION)

Continued

TO: Copper River Watershed Project
511 1ST Street
Cordova, AK 99574

Date: Add date

SUBJECT: Request for Proposal EYAK LAKE WEIR-2025

Alaska Contractor's License Number
Contractor Name
Employer's Tax ID Number
Authorized Representative's Signature
Printed Name and Title
Company Mailing Address
Company Phone Number
Company Fax Number
Company Physical Address
Company Email Address

COPPER RIVER WATERSHED PROJECT

Request for Proposal EYAK LAKE WEIR-2025

Project Name: EYAK LAKE WEIR REPLACEMENT

BID FORM

BASE BID

Description	Bid Amount
EYAK LAKE WEIR REPLACEMENT	

Date: _____

Contractor Name: _____

Authorized Representative Signature: _____

Printed Name & Title: _____

BASE BID: Eyak Lake Weir Replacement						
Item No.	**Item Description**	**Pay Unit**	**Unit**	**Unit Price**	**Quantity**	**Amount**
201.0007.0000	CLEARING	LUMP SUM	LUMP SUM		ALL REQUIRED	
202.0001.0000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LUMP SUM	LINEAR FOOT		250	
203.0001.0000	COMMON EXCAVATION	CUBIC YARD	CUBIC YARD		2,684	
203.0004.0000	MUCK EXCAVATION	CUBIC YARD	CUBIC YARD		550	
501.0002.0000	CLASS A-A CONCRETE	LUMP SUM	CUBIC YARD		104	
505.0001.0000	FURNISH AND INSTALL STEEL SHEET PILES	LUMP SUM	LINEAR FOOT		4,800	
611.0003.0002	RIPRAP, CLASS II	CUBIC YARD	CUBIC YARD		462	
611.0003.0005	RIPRAP, CLASS II, TIE-IN	CUBIC YARD	LINEAR FOOT		286	
611.0004.0001	PRIMARY GRADE CONTROL STRUCTURES	LINEAR FOOT	LINEAR FOOT		1,925	
611.0004.0002	SECONDARY GRADE CONTROL STRUCTURES	LINEAR FOOT	LINEAR FOOT		1,397	
611.0004.0003	DOWNSTREAM TIE-IN	LINEAR FOOT	LINEAR FOOT		200	
611.0005.0001	HABITAT ROCKS	EACH	EACH		324	
611.0005.0002	HEADER ROCKS	EACH	EACH		4	
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	LUMP SUM		ALL REQUIRED	
641.0003.0000	TEMPORARY EROSION, SEDIMENT, AND POLLUTION CONTROL	LUMP SUM	LUMP SUM		ALL REQUIRED	
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	LUMP SUM		ALL REQUIRED	
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	LUMP SUM		ALL REQUIRED	
672.0001.0000	STREAM DIVERSION & DEWATERING	LUMP SUM	LUMP SUM		ALL REQUIRED	
690.2001.0000	SALVAGED STREAM BED FILL	CUBIC YARD	CUBIC YARD		2,150	
690.2002.0000	WATERWAY BED FILL	CUBIC YARD	CUBIC YARD		3,590	
690.2003.0000	WATERWAY BED CAPPING LAYER	CUBIC YARD	CUBIC YARD		260	
690.2004.0000	RECLAMATION AND REVEGETATION	LUMP SUM	LUMP SUM		ALL REQUIRED	
690.2005.0000	EXCAVATOR, [W/ THUMB, W/OPERATOR]	HOUR	HOUR		30	
					TOTAL BASE BID	

Date: _____ Contractor Name: _____

##########

END OF ADVERTISEMENT FOR RFP#: EYAK LAKE WEIR - 2025