

CITY OF BETHEL

City Council Meeting Agenda, April 8, 2025 – 6:30 PM

Website: <https://www.cityofbethel.org/council>

Location: Council Chambers, City Hall, 300 Chief Eddie Hoffman Highway, Bethel

Council Members: Mayor Rose Henderson, Vice-Mayor Teresa Keller, Mark Springer, Mikayla Miller, Alicia Miner, Pamela Conrad, John Lloyd

Zoom Meeting Link: <https://us06web.zoom.us/j/4888456188?pwd=bkN1dGI4MHpGZ1kwOUVYWU5kd0xhZz09>

Zoom Meeting ID: 488 845 6188

Zoom Meeting Passcode: 13871

Zoom Meeting Conference Line Numbers: 833 548 0276 US Toll-free

833 548 0282 US Toll-free

877 853 5257 US Toll-free

888 475 4499 US Toll-free



1. CALL TO ORDER

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL

4. PEOPLE TO BE HEARD – FIVE MINUTES PER PERSON

- 4.1. *Written Public Comments can be submitted by opening your phone camera and hovering over this URL code. The link to the submission form will appear. You may also go to www.cityofbethel.org. Written public comment must be submitted 24 hours before the meeting.*



5. APPROVAL OF CONSENT AGENDA AND REGULAR AGENDA

6. APPROVAL OF MEETING MINUTES

- 6.1. *3-25-2025 Regular City Council Meeting Minutes

7. REPORTS OF STANDING COMMITTEES

- 7.1. Committee/Commission Agendas And Draft Meeting Minutes

8. SPECIAL ORDER OF BUSINESS

- 8.1. Proclamation: April 2025 Month Of The Military Child (Mayor Henderson)

9. UNFINISHED BUSINESS

10. NEW BUSINESS

- 10.1. *Resolution 25-01: Requesting Alaska's Congressional Delegation To Support The Sovereignty Of Canada And Kalaallit Nunaat (Council Member Springer)
- 10.2. *AM 25-14: Authorize The City Manager To Negotiate And Execute A Supply Purchase For Culverts (City Manager Strickler)

11. REPORTS

Posted April 2, 2025 at AC Co., Swanson's, City Hall, and the Post Office.

Kevin Morgan, City Clerk

City Clerk's Office Contact Information: Email cityclerk@cityofbethel.net Phone 907-543-1384

Items noted with an asterisk (*) are consent agenda items, unless removed from the consent agenda they are approved upon the approval of the agenda. Ordinances introduced at this meeting may be set for public hearing at the next regular meeting.

The Council may by unanimous consent, after 12:00 AM Fix the Time to Which To Adjourn until the following day at 6:30 PM

11.1. Mayor's Report

11.2. City Manager's Report

11.3. Clerk's Report

12. COUNCIL MEMBER COMMENTS

13. EXECUTIVE SESSION

14. ADJOURNMENT

Posted April 2, 2025 at AC Co., Swanson's, City Hall, and the Post Office.

Kevin Morgan, City Clerk

City Clerk's Office Contact Information: Email cityclerk@cityofbethel.net Phone 907-543-1384

Items noted with an asterisk (*) are consent agenda items, unless removed from the consent agenda they are approved upon the approval of the agenda. Ordinances introduced at this meeting may be set for public hearing at the next regular meeting.

The Council may by unanimous consent, after 12:00 AM Fix the Time to Which To Adjourn until the following day at 6:30 PM

1. CALL TO ORDER

A Regular Meeting of the Bethel City Council was held on March 25, 2025 at 6:30 p.m., in the Council Chambers, Bethel, Alaska.

Mayor Henderson called the meeting to order at 6:30 p.m.

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL

Comprising a quorum of the Council, the following members were present:
City Council Member Mark Springer Mayor Rose Henderson City Council Member Mikayla Miller City Council Member Alicia Miner City Council Member John Lloyd City Council Member Pamela Conrad (<i>arrived after roll call 6:59 p.m.</i>)
Members Absent:
Vice-Mayor Teresa Keller
Also in attendance were the following:
City Manager Lori Strickler (telephonically), City Clerk Kevin Morgan, City Attorney Libby Bakalar (telephonically)

4. PEOPLE TO BE HEARD – Five minutes per person

Jesslyn Elliott- Bethel, Alaska- Asking the Council to encourage the District Attorney's office to take more aggressive and responsible action to protect our community from serious crimes.

Item 4.1. - Written Public Comments

No Written Comments submitted.

5. APPROVAL OF CONSENT AGENDA AND REGULAR AGENDA

Main Motion: Approve the Consent and Regular Agenda.

Moved by:	Mark Springer
Seconded by:	Mikayla Miller
In favor:	Mark Springer, Rose Henderson, Mikayla Miller, Alicia Miner, John Lloyd
Opposed:	None
Results:	Motion Carries

6. APPROVAL OF MEETING MINUTES

Item 6.1. - *3-11-2025 Regular City Council Meeting Minutes
Passed on the Consent Agenda.

7. REPORTS OF STANDING COMMITTEES

Port Commission, Council Member Miner- Nothing to report

Planning Commission, Mayor Henderson- Discussed a list of nuisance properties.

Community Action Grant Committee- No one to report.

Community Parks and Recreation Committee, Council Member Miller- Next meeting in April.

Finance Committee, Council Member Lloyd- No quorum this month.

Public Works Committee, Council Member Springer- Not enough members to have a meeting.

Public Safety and Transportation Commission- No one to report.

Item 7.1. - Committee/Commission Agendas And Draft Meeting Minutes

8. SPECIAL ORDER OF BUSINESS

Item 8.1. - Proclamation Recognizing Mary "Akalleq" Peltola: The First Alaska Native Congressperson (Council Member Springer)

9. UNFINISHED BUSINESS

Item 9.1. - Public Hearing Of Ordinance 25-06: Amending Title 5.08.080 Alcoholic Beverages, Hours And Days Of Operation (Mayor Henderson)

Mayor Henderson opened the Public Hearing.

No one present to be heard.

Mayor Henderson closed the Public Hearing.

Main Motion: Adopt Ordinance 25-06.

Moved by:	Mikayla Miller
Seconded by:	Mark Springer
In favor:	Mark Springer, Rose Henderson, Mikayla Miller, Alicia Miner, John Lloyd
Opposed:	None
Results:	Motion Carries

10. NEW BUSINESS

Item 10.1. - *AM 25-11: Authorize The City Manager To Negotiate And Execute A Contract For Bethel Port Installation Of Floating Docks In The Small Boat Harbor (City Manager Strickler)

Passed on the consent agenda.

Item 10.2. - *AM 25-12: Authorize The City Manager To Negotiate And Execute A Contract For Bethel Bulk Fuel Services (City Manager Strickler)

Passed on the consent agenda.

Item 10.3. - AM 25-13: Authorize The City Manager To Initiate A Summer Internship Program And Seasonal Hires With Unspent Funds From The Fiscal Year 2025 Operating Budget (City Manager Strickler)

Main Motion: Approve AM 25-13.

Moved by:	Mikayla Miller
Seconded by:	John Lloyd
In favor:	Mark Springer, Rose Henderson, Mikayla Miller, Alicia Miner, Pamela Conrad, John Lloyd
Opposed:	None
Results:	Motion Carries

Council Member Conrad arrived at 6:59pm

Item 10.4. - *IM 25-03: Documentation That The Bethel City Council Received And Reviewed The Full Financial Budget Report And Water & Wastewater Activity Report For The Month Of February 2025 (City Manager Strickler)

Passed on the consent agenda.

11. REPORTS

Item 11.1. - Mayor's Report

Item 11.2. - City Manager's Report

Item 11.3. - Clerk's Report

12. COUNCIL MEMBER COMMENTS

Mayor Henderson- Have a fantastic Cama'i. If you are looking to volunteer to help, go to the website and find two hours that you can contribute.

Council Member Miner- No Comment.

Council Member Conrad- Thanked the new water and sewer drivers for good customer service. When applying for your Real ID, be sure to bring something that has your street address.

Council Member Miller- Good luck at Cama'i; be safe, be mindful and volunteer.

Council Member Springer- The wife of the Vice-President of the United States has an interest in dog mushing; maybe she can visit Bethel. Bethel is located within the "100 mile border zone" in Alaska which makes Immigration and Customs Enforcement (ICE) citizenship checkpoints possible in Bethel; something to think about. Recommend getting an online account to access social security. The Real ID deadline is right around the corner. You can also contact the City Clerk to obtain a passport. On March 27th at 5-7pm at the cultural center, Nellie Jimmie is hosting a meeting to discuss health care. Hopes that legislators will visit Cama'i as well.

Council Member Lloyd- Fender benders happen this time of year. Be extra safe this time of year, especially with all the traffic at Cama'i.

13. EXECUTIVE SESSION

14. ADJOURNMENT

Main Motion: Adjournment.

Moved by:	Mikayla Miller
Seconded by:	Alicia Miner
In favor:	Mark Springer, Rose Henderson, Mikayla Miller, Alicia Miner, Pamela Conrad, John Lloyd
Opposed:	None
Results:	Motion Carries

Meeting ended at 7:20 p.m.

Rose Henderson, Mayor

ATTEST:

Kevin Morgan,
City Clerk

City of Bethel, Alaska

Finance Committee Minutes

March 24, 2025

Regular Meeting

Bethel, Alaska

I. CALL TO ORDER

A Regular Meeting of the Finance Committee was held on March 24, 2025 at 5:35 PM in Council Chambers at 300 Chief Eddie Hoffman Highway.

II. ROLL CALL

The following Finance Committee members were present: John Lloyd, & Victoria Sosa

Also in attendance are Kayla Saddler, Recorder (Ex Officio) and Cynthia Sharp (Ex Officio)

Unexcused Absences: Carolann Willard, & John Lloyd

Excused Absences:

No Meeting was held due to lack of quorum.

John Hamilton, Chair

ATTEST:

Kayla Saddler, Recorder

City of Bethel, Alaska

Planning Commission

March 13, 2025

Regular Meeting

Bethel, Alaska

I. CALL TO ORDER:

A regular meeting of the Planning Commission was held virtually via Zoom and in person at the City Hall Council Chambers in Bethel, Alaska on March 13, 2025. The recorder of the Commission, Pauline Boratko called the meeting to order at 6:36 PM.

II. ROLL CALL:

Compromising a quorum of the Commission, the following members were present for roll call: Shadi Rabi, Haley Hanson, Sundi Scott, Jody Brand and Council Rep. Rose Henderson

Excused absence: Kathy Hanson, Lorin Bradbury, and Alex Wasierski

Also Present: Pauline Boratko, recorder

MOVED:	Rose Henderson	Motion to nominate Shadi Rabi as the Chair Pro Tem, in the absences of the chair and co chair.
SECONDED:	Haley Hanson	
VOTE ON MOTION	Unanimous	

III. PEOPLE TO BE HEARD: no one wished to be heard

IV. APPROVAL OF THE AGENDA:

MOVED:	Rose Henderson	Motion to approve the agenda
SECONDED:	Haley Hanson	
VOTE ON MOTION	Unanimous	

V. APPROVAL OF THE MINUTES:

MOVED:	Rose Henderson	Motion to approve regular meeting minutes from February 2025
SECONDED:	Haley Hanson	
VOTE ON MOTION	Unanimous	

VI. UNFINISHED BUSINESS:

- A. Update discussion on nuisance properties: Commissioners discussed the updates on nuisance properties.

VIII: EX OFFICIO REPORT: Pauline Boratko gave the department report

VII. COMMISSIONER'S COMMENTS:

- S. Rabi- Welcome Jody!
S. Scott- Thank you!
H. Hanson- Thank you Mr. Erikson for showing up.

R. Henderson- Sorry I was late.
J. Brand- no comment

X. ADJOURNMENT:

MOVED:	Rose Henderson	Motion to adjourn the meeting.
SECONDED:	Jody Brand	
VOTE ON MOTION	Unanimous	

With no further business the meeting adjourned 6:54 pm

APPROVED THIS ____ DAY OF _____, 2025

Shadi Rabi, Chari Pro-Tem

ATTEST: Pauline Boratko, Recorder



City of Bethel Proclamation

April 2025: Month of the Military Child

WHEREAS, there are more than 1.6 million military children who face unique challenges due to their parents' service in the military;

WHEREAS, military families relocate every two to three years on average, disrupting their children's education and social support networks;

WHEREAS, many brave Alaskans serve in the United States military, sacrificing time with their families to protect the security and freedom of our nation, including those in the National Guard and Reserves on active-duty orders;

WHEREAS, our military members work to ensure a safer America, and it is also important to recognize the impact their service has on their children;

WHEREAS, the Month of the Military Child honors the commitment, sacrifices, and unwavering support that military children provide to our troops and their families;

WHEREAS, April 11, 2025, will be "Purple Up! For Military Kids" in Alaska, where all Alaskans are encouraged to wear purple—representing all branches of the military—as a visible show of support and appreciation for military children;

WHEREAS, the City of Bethel wishes to recognize and commend the children of our community who demonstrate remarkable courage, strength, and resilience as their parents serve our nation, ensuring our freedom;

NOW, THEREFORE, the Bethel City Council proclaims April 2025, as Month of the Military Child, and encourages the residents of Bethel to honor the sacrifices of military children and to show their support for these young heroes.

Signed this 8th day of April, 2025.

Kevin Morgan, City Clerk

Rose Henderson, Mayor

CITY OF BETHEL, ALASKA

Resolution #25-01

A RESOLUTION OF THE BETHEL CITY COUNCIL REQUESTING ALASKA'S CONGRESSIONAL DELEGATION TO SUPPORT THE SOVEREIGNTY OF CANADA AND KALAALLIT NUNAAT

WHEREAS, The Bethel City Council is the elected governing body of the City of Bethel, Alaska;

WHEREAS, The City of Bethel is located on the traditional Yup'ik Village of Mamterilleq;

WHEREAS, Bethel, Alaska is a true multi-cultural community with a high percentage of Alaska Native residents as well as individuals and families representing a diverse number of nations and continents;

WHEREAS, Bethel is the hub community for 56 Yup'ik, Cup'ik, and Dene' villages scattered across the Yukon-Kuskokwim Delta;

WHEREAS, The cultural interests of the Alaska Native People of our region are represented at the Non-Governmental Organization Inuit Circumpolar Conference (ICC) through its member organization, the Association of Village Council Presidents (AVCP);

WHEREAS, The ICC represents Yup'ik, Inuit, and Chukchi People of the Circumpolar North;

WHEREAS, Alaska, Canada, and Kalaallit Nunaat (The Autonomous Territory of Greenland within the Kingdom of Denmark) have been inhabited by Yup'ik, Inuit, and Dene' people since time immemorial and governed by ancient Tribal self-governments with colonial constructs such as national, state, and local governments a very recent development in the collective memory shared by their Elders;

WHEREAS, The strength of the Circumpolar North lies, inherently, in its Native Peoples with their knowledge passed down through hundreds of generations; and

Introduced by: Council Member Springer
Date: April 8, 2025
Action:
Vote:

WHEREAS, The Executive Branch of the United States Government has made no secret of its designs on the National Sovereignty of the Dominion of Canada and of the Kalaallit Nunaat, an Autonomous Territory within the Kingdom of Denmark;

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BETHEL: the Bethel City Council requests that the Alaska Congressional Delegation maintain unwavering support for the National Sovereignty of the Dominion of Canada and the continued status of Kalaallit Nunaat as an Autonomous Territory within the Kingdom of Denmark.

ENACTED THIS 8th DAY OF APRIL 2025 BY A VOTE OF ___ IN FAVOR AND ___ OPPOSED.

Rose Henderson, Mayor

ATTEST:

Kevin Morgan, City Clerk

City of Bethel Action Memorandum

Action memorandum No.	25-14		
Date action introduced:	April 8, 2025	Introduced by:	City Manager Strickler
Date action taken:		Approved	Denied
Confirmed by:			

Action Title: Authorize the City Manager to negotiate and execute a supply purchase for culverts.

Attachment(s) Request for Bid and Addendums

Account information:		Amount of fiscal impact:
\$205,351.60	Capital Budget Project	100-66-9771

Summary Statement

The City of Bethel prepared and issued a Request for Bids (RFB) to solicit bids from a qualified company to purchase two culverts for the Ptarmigan Street Culvert Project. Two bids were received by the deadline however one bidder was determined to not be qualified due to incomplete bidding documents. The bid was therefore not qualified.

The City is seeking permission to negotiate and execute a contract with Contech ES in the amount of \$205,351.60 for the purchase of:

Structural Plate Galvanize Steel Arch Culverts 12'10" Span, 8'4" Rise, 120' Length.

Structural Plate Galvanized Steel Arch Culverts 12'10" Span, 8'4" Rise, 100' Length.

**CITY OF BETHEL
BETHEL, ALASKA**



**REQUEST FOR BID
PURCHASE OF TWO CULVERTS**

RFB Issued:	February 25, 2025
Deadline for Questions:	March 7, 2025
Deadline for Pre-Award Protests:	March 7, 2025
Bid Packages Due Date and Time:	March 17, 2025 at 4:00PM
Bid Opening Place:	City Hall, 300 State Highway Bethel, Alaska 99559

Ptarmigan Road Culverts

Section 1 – Introduction

Objective

The City of Bethel is seeking bids to procure two culverts for a culvert replacement project in Bethel, AK. The bid also includes the necessary engineering, i.e. shop drawings, manufacturing, delivery, and offloading of the culverts to Bethel, Alaska.

Section 2 – Scope of Work

A. General Statement of Work

Provide all culvert materials, bands, and miscellaneous accessories/hardware required to assemble the requested pipe arch culverts (assembly to be completed by a third party and is not in contract) identified in the drawings attached and as described in the scope of work, specifications, and Bid Form. Provide engineering calculations and shop drawings as required for the Culvert Bridge Design Package as described in the specifications. Ship culvert materials to Bethel, Alaska. Deliver materials to the laydown area at Port of Bethel, located at 919 Front Street, Bethel, AK 99559. Notify the City of Bethel at least 3 business days prior to the arrival of materials in Bethel, Alaska.

At the date of this RFB, design drawings for the Ptarmigan St culverts are at 65% design and therefore not stamped. Drawings will be stamped prior to culvert installation.

B. Specifications, Codes, Ordinances, and Standards

Comply with the current Alaska Department of Transportation and Public Facilities (ADOT&PF) Standard Specifications for Highway Construction (SSHC) 2020 Edition. Modifications, clarifications, and special project provisions are detailed in the following sections. The requirements in these specifications and special provisions are part of this solicitation and resultant contract.

C. Description

Furnish manufacturer-designed culvert bridges to meet the contract requirements. Provide manufacturer shop drawings and an independent structural analysis and design check. For review and approval, provide design calculations with load ratings for the culvert bridges.

1. Definitions

Culvert Bridge stands for culverts and buried structures meeting the requirements of National Bridge Inspection Standards (NBIS) CFR§650.305; individual culverts and buried structures greater than 10 feet in width, as measured along the centerline of roadway crossing over the structure. When specified in the contract or required by the DOR (Designer of Record), this includes the headwalls, toe walls, wingwalls, and foundation.

Culvert Bridge Design Package (CBDP). DOR design calculations, DOR load ratings, IE design check calculations, IE load ratings, working drawings, and specifications.

Designer of Record (DOR). A civil engineer registered as a Professional Engineer in the State of Alaska, and in responsible charge of the work described. The DOR must have adequate and relevant prior structural design and inspection experience. The DOR may delegate portions of design, quality acceptance, and inspection work, to qualified technicians.

Independent Design Check (IDC). An independent design check of the design and load rating calculations including but not limited to: design, load ratings, location and dimensions of the foundation, structural members, connections, erection plan and temporary bracing (when required), safety barrier, and independent calculations of design loads, member stress, material properties, hydraulic capacity and scour protection.

Independent Engineer (IE). An engineer registered as Professional Engineer in the State of Alaska, and in responsible charge of the independent design check. The engineer responsible for the check must have adequate and relevant prior structural design experience. The IE must be from a different firm than the DOR.

2. Materials.

Furnish a corrugated Galvanized steel plate pipe-arch culvert:

Material: Galvanized steel

Minimum material thickness: 7 gage (0.188")

Length: 120 feet

Span: 12 feet 10 inches

Rise: 8 feet 4 inches

Area: 85 square feet

Live loading: HL-93

Minimum cover: 3.0 feet

Maximum cover: 40 feet

Furnish a corrugated Galvanized steel structural plate pipe-arch culvert:

Material: Galvanized steel

Minimum material thickness: 7 gage (0.188")

Length: 100 feet

Span: 12 feet 10 inches

Rise: 8 feet 4 inches

Area: 85 square feet

Live loading: HL-93

Minimum cover: 3.0 feet

Maximum cover: 40 feet

- 3. Design Requirements.** Retain the services of a DOR to design and provide a CBDP for each culvert bridge. Retain the services of an IE to perform an IDC of each CBDP.
1. Design culvert bridges according to the following documents:
 - a. Alaska DOT&PF Standard Specifications for Highway Construction for recommended construction methods, material properties, and sampling and testing;
 - b. AASHTO LRFD Bridge Design Specifications, as modified by Subsection 602-2.03;
 - c. Alaska Highway Preconstruction Manual; and the
 - d. Alaska Bridges and Structures Manual (BSM).
 2. Design culvert bridges that:
 - a. Support 100% of HL-93 live loads without overstress. Follow the most recent version, including the interim version, of the AASHTO LRFD Bridge Design Specifications. Indicate governing live load on working drawings;
 - b. Meet the design life specified in AASHTO LRFD Bridge Design Specifications after allowing for metal section loss associated with abrasion and pH levels of the substrate and water;
 - c. Meet the seismic acceleration values recommended in the AASHTO LRFD Bridge Design Specifications;
 - d. Include the capacities and demands of load-supporting members in the design calculations;
 - e. Meet the dimensions, stations, offsets, and elevations of inverts and riprap requirements shown on the plans, with approved variances as stated in these specifications; and
 - f. Provide the minimum hydraulic capacity shown on the Plans when openings are required to allow for the passage of water.
 - g. Provide the minimum horizontal and vertical clearances shown on the Plans when openings are required to allow the passage of traffic. If no vertical clearance is provided, follow the requirements in the Alaska Highway Preconstruction Manual.
 3. Provide working drawings for culvert bridges including:
 - a. Dimensions controlling the culvert bridge design and erection, including proposed fill depth, corrugation spacing, corrugation depth, gauge thickness, concrete thickness, reinforcing steel size and locations, clear opening sizes, utility size and locations, and similar controlling dimensions;
 - b. Design loads and material properties; and
 - c. The soil bearing values.

B. Protests

Protests regarding any alleged improprieties or ambiguities in this request for Bids document must be filed with the purchasing agent no later than the date and time shown on cover page of this RFB. Information on how to file a protest can be found in section 4.20.270 of the Bethel Municipal Code. The Code may be found on the City's website: www.cityofbethel.org. The Code also describes the process for companies that wish to file post-selection protests.

C. Addenda

All interpretations or corrections, as well as any additional RFB provisions that the City may decide to include, will be made into an official addendum and posted on the City's website: www.cityofbethel.org for all parties to download.

It shall be the Respondent's responsibility to ensure that they have received all addenda before submitting a Bid. Any addendum issued by the City shall become part of the RFB.

Each Respondent must, in its Bid, acknowledge receipt of all City addenda published, but the failure of a Respondent to receive, or acknowledge receipt of any addenda shall not relieve a Respondent of the responsibility for complying with the terms thereof. Completion and submission of Attachment B will satisfy this requirement.

The City will be bound by written addenda, not by oral responses to inquiries.

D. Conflict of Interest

All City of Bethel employees and Bethel City Council members adhere to and follow a Conflict of Interest Policy prohibiting them from directly or indirectly participating in procurement of a contract, if the city employee or council member knows, or should reasonably know that:

1. The city employee or council member or any member of the city employee's family has a financial interest pertaining to the anticipated contract.
2. Any other person, business, or organization with whom the city employee or council member or any member of their immediate family is negotiating or has an arrangement concerning prospective employment is involved in the procurement.

Violation of this policy by any Respondent is automatic grounds for disqualification of a Bid and/or a breach of contract.

E. Inducement

All City of Bethel employees and Council Members adhere to and follow the Conflict of Inducements Policy that prohibits gratuities or offers of employment in connection with a decision, approval, disapproval, or recommendation regarding any matter which affects the City or which the City is negotiating. Any attempt by a Respondent to violate this policy is automatic

grounds for disqualification of a Bid.

F. Non-Collusion

Evidence of collusion or other anticompetitive practices among Respondents shall be grounds for disqualification.

G. Debarment

Submission of a Bid in response to this RFB is certification that the Respondent is not currently debarred, suspended, proposed for debarment, and/or declared ineligible or voluntarily excluded from participation in any transaction by any State or Federal departments or agency. Submission is also an agreement that proposer will notify the City if there are any changes in company debarment status.

H. Good Standing

According to the Bethel Municipal Code 4.20.070: "No procurement contract may be awarded to a person, group, organization, or other entity that is delinquent in the payment or collection of sales taxes, fees, charges, penalties, interest or other amounts that are due and owing, or otherwise obligated to the City, which is not remedied within ten (10) business days of notice to the contractor." See Bethel Municipal Code on City website (www.cityofbethel.org).

I. Non-Discrimination

The City will not contract with any persons or entities that discriminate against employees or applicants for any reason other than those related to job performance. All prospective Respondents will comply with all Federal, State, and local laws and policies that prohibit discrimination in the workplace. The City will not discriminate because of race, creed, religion, color, national origin, ancestry, sex, sexual orientation, gender identity, age, marital status, change in marital status, pregnancy, parenthood, disability status, genetic information, political affiliation or status as a disabled veteran.

J. Bid Submission

All bids are due and must be delivered to the City Procurement office on or before the due date and time shown on the front cover of this RFB. Bids submitted late or via oral, telephonic or telegraphic means **will not** be considered or accepted.

Each Respondent must submit one (1) Bid by email, U.S. Postal Service, or private carrier. Bids may be delivered either by hard copy or by electronic submission.

1) Email Submissions

Bids may be submitted by email. Bids submitted by email must be in either MS Word format or Adobe PDF format and sent by email to Purchasing Agent at pwadmin@cityofbethel.net. The subject line of the email must read: "Bid: Ptarmigan Culverts." The City is not responsible for

incomplete transmissions or unsuccessful delivery by electronic means. The City will send an email acknowledging receipt of the Bid.

2) Hard Copy Submissions

Bids submitted in hard copy form must be in a sealed envelope marked: "Bid: Ptarmigan Culverts" and then list Respondent's name, address and phone number.

Mail* completed Bid packages to:
Purchasing Agent
City of Bethel
PO Box 1388
Bethel, AK 99559-1388

Deliver* to:
Purchasing Agent
City of Bethel
City Hall / 300 State Highway
Bethel, AK 99559-1388

* **NOTE:** This is rural Alaska. Mail is unpredictable and weather-dependent, as are the services of UPS, Fed-Ex, and other private carriers. Plan to submit the documents a few days early to ensure on time arrival. Even if mailed on time, there is no guarantee it will be received and in the City's possession by the deadline if sent too close to the deadline.

K. Withdrawal or Correction of Bids

Bids may be withdrawn by written notice prior to the submittal deadline. Corrections may be made to Bids submitted if prior to the submittal deadline.

L. One Bid Accepted

The City will only accept one (1) Bid per Respondent, including its subsidiaries, affiliated companies, organizations, or franchises.

M. Bid Terms and Requirements

Bids must be submitted by an official authorized to bind the Respondent. Fee structures submitted with Bid must be valid for the first year of the contract. In the succeeding four years of the contract, the City will accept revised fee structures.

N. Contract Commencement

Commencement of a contract shall not begin until all necessary documents are received and reviewed; and all City approvals have been completed, including City Council approval. Commencement of a contract without these requirements will be at the Respondent's sole risk and not compensated by the City.

Section 5 – Reservation of Rights

The City reserves the right to reject any Bid, to waive or not waive informalities or irregularities in the response procedures, and to accept or further negotiate cost, terms, or conditions of any Bid determined by the City to be in the best interest of the City. All agreements resulting from

negotiations that differ from what is represented within the RFB or in the Respondent's response, shall be documented and included as part of the final contract.

The City reserves the right to accept any Bid and to reject all Bids in whole or in part and to waive any irregularity and/or informalities in any Bid and to make the award in any manner deemed in the best interest of the City.

The City reserves the right not to consider any Bid, which it determines to be unresponsive and/or deficient in any of the information requested within the RFB.

The City reserves the right to determine that a revised scope be implemented.

All Bids become the property of the City of Bethel, whether awarded or rejected.

The accepting and opening of a Bid document does not constitute the City's acceptance of the Respondent as a responsive and responsible Offeror. By accepting and opening of a Bid, the City presumes the Respondents are familiar with the procurement documents and Chapter 4.20 Purchasing in the Bethel Municipal Code.

The selected Respondent will be required to provide the City an IRS form W-9 after award.

The City is tax exempt from all taxes. The Respondent, if awarded a contract for this work, shall be responsible for all taxes that may be applicable to this work.

A. Cost Liability

The City of Bethel assumes no responsibility or liability for costs incurred by a Respondent prior to execution of a Professional Services Agreement. By submitting a Bid, Respondent agrees to bear all costs incurred or related to the preparation, submission, and selection process for the Bid.

Attachment A: Bid Form

BID FORM
PURCHASE STRUCTURAL PLATE CULVERTS

Provide all culvert materials, bands, and miscellaneous accessories/hardware required to assemble the requested pipe arch culverts (assembly to be completed by a third party and is not in contract) identified in the drawings attached and as described in the scope of work, specifications, and Bid Form. The award will be based on the low bid submitted and the ability to provide materials for construction in 2025. The City of Bethel reserves the right to reject any and all bids if materials cannot be delivered by the **June 1, 2025**, deadline.

To be completed by the Bidder:

Item	Description	Unit	Bid Price
602.0002.0120	STRUCTURAL PLATE GALVANIZED STEEL ARCH CULVERT 12'-10" SPAN, 8'-4" RISE, (120' LENGTH)	LS	\$ _____
602.0002.0100	STRUCTURAL PLATE GALVANIZED STEEL ARCH CULVERT 12'-10" SPAN, 8'-4" RISE, (100' LENGTH)	LS	\$ _____
TOTAL			\$ _____

The anticipated date for delivery of materials to Bethel, Alaska is _____.

Attachment B

SIGNATURE AND VERIFICATION PAGE

By signing below, I hereby acknowledge the following:

1. Proposer, nor any of their representatives or third party mandated by Proposer, has attempted to contact City representatives or members of the selection committee for the purpose of influencing their choice, judgment or recommendation relating to the contract, or with members of the City Council to influence their decision;
2. Proposer has produced the Bid without collusion, communication, agreement or arrangement with a competitor with regards to price, methods, factors or formulas for setting prices, to the decision to submit a Bid or to present a Bid that does not comply, directly or indirectly, with specifications contained in the request for Bids;
3. Neither the proposer nor any of its representatives engaged in discrimination, intimidating measures, influence peddling, corruption or entered any form of collusion, communication, agreement or arrangement with other suppliers or third parties relating to a contract with the City of Bethel.
4. If selected, proposer agrees that neither it nor any of its representatives will engage in discriminating against any person because of race, national origin, color, age, creed, religion, sex, sexual orientation, gender identity, political affiliation, marital status, ancestry, disability, or status as a disabled veteran.
5. Proposer has appropriately identified proprietary information. Proposer agrees, should the City comply with the Proposer's request for non-disclosure, Proposer shall assume all responsibility for any challenges resulting from the non-disclosure, indemnify and hold harmless the City from and against all damages (including but not limited to attorney's fees that may be awarded to the party requesting the Proposer information), and pay any and all costs and expenses related to the withholding of Proposer information. Proposer shall not make a claim, sue, or maintain any legal action against the City or its directors, officers, employees, or agents concerning the disclosure, or withholding from disclosure, of any Proposer information. The City shall have no obligation to withhold non-classified information from disclosure and may release the information sought without any liability to the City.

6. I have read and understand the requirements of this Request for Bids and, that I, as the Proposer, will comply with all requirements and that I am duly authorized to execute this Bid/offer document and any contract(s) and/or other transactions required by award of this RFB.
7. Proposer's failure to certify to the statements in this attachment shall result in automatic rejection of the bid.
8. If Proposer is found to have been in violation of any of the statements in this Attachment, the City shall automatically reject the bid.
9. The City may cancel a contract if, during the course of the contract, the City finds Proposer to be in violation of any of the sworn statements required by this Attachment.

Acknowledgement of Receipt of Addenda

4. I hereby acknowledge receipt of all addenda issued and associated with the Request for Bids for purchase and installation of floating docks in the Small Boat Harbor.

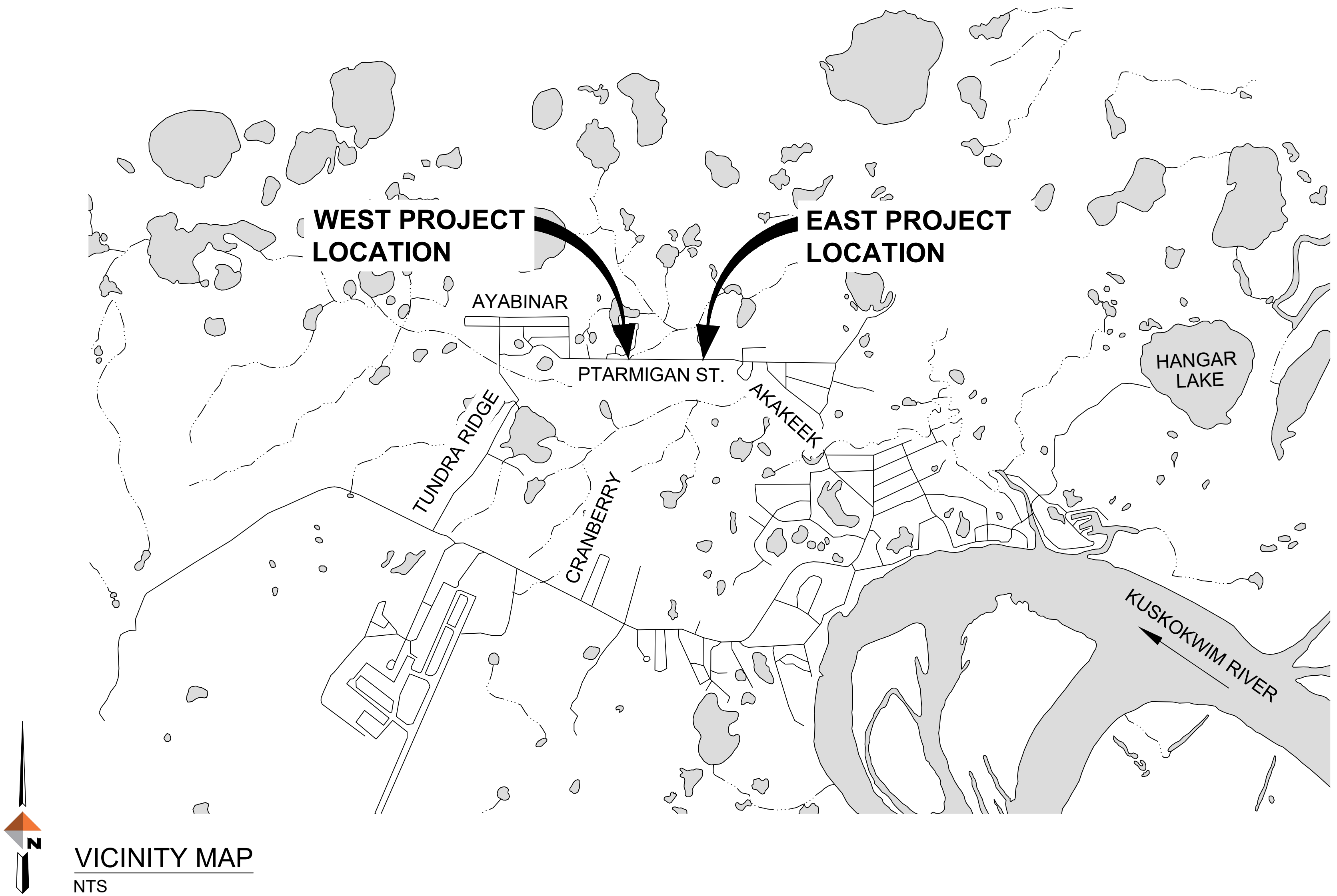
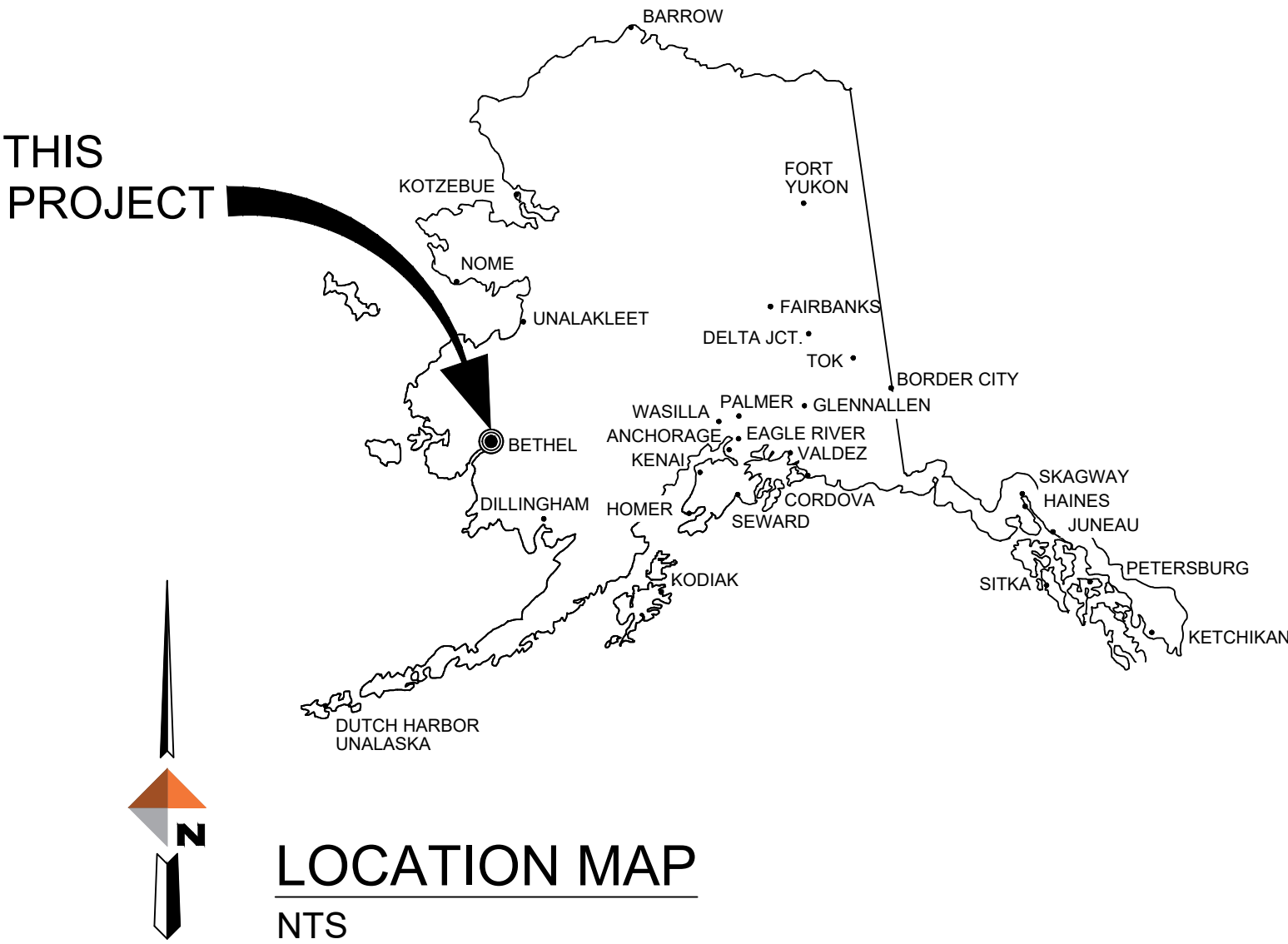
Name (printed):	Title:
Company Name and Mailing Address:	Telephone Number:
	E-mail Address:
Authorized Signature:	

Attachment C: 65% Design Plans for Ptarmigan St Culverts

CONTRACT DRAWINGS FOR

PTARMIGAN STREET CULVERT CROSSINGS PTARMIGAN CREEK FISH PASSAGE IMPROVEMENT PROJECTS CITY OF BETHEL

SECTION 6, TOWNSHIP 8 NORTH, RANGE 71 WEST, SEWARD MERIDIAN, ALASKA
JANUARY 2025



DRAWING INDEX	
C1	COVER SHEET
C2	GENERAL NOTES AND QUANTITIES
C3	SURVEY CONTROL - WEST CULVERT
C4	SURVEY CONTROL - EAST CULVERT
C5	EXISTING STREAM PLAN AND PROFILE - WEST CULVERT
C6	EXISTING STREAM PLAN AND PROFILE - EAST CULVERT
C7	STREAM PLAN AND PROFILE - WEST CULVERT
C8	STREAM PLAN AND PROFILE - EAST CULVERT
C9	ROADWAY PLAN AND PROFILE
C10	DETAILS AND TYPICAL SECTIONS
C11	ESCP & STREAM DIVERSION PLAN
C12	REVEGETATION PLAN
C13	BANK RECONSTRUCTION
C14	CULVERT MARKER POST

PROJECT	LOCATION	WATERBODY NAME	ADF&G ANADROMOUS WATERS CATALOG CODE
WEST CULVERT	PTARMIGAN ST.	PTARMIGAN CREEK	335-10-16600-2621-3020
EAST CULVERT			

65% PLANS

C:\dowl_pw\0418828\C2-SA-CH-WA-50305.dwg PLOT DATE 2025-2-3 13:02 SAVED DATE 2025-02-03 12:37 USER: rduerst

ESTIMATE OF QUANTITIES - WEST CULVERT				
ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	UNIT
202.0004.0000	REMOVAL OF CULVERT PIPE	LUMP SUM	135	LINEAR FOOT
203.0019.0000	UNCLASSIFIED EXCAVATION	LUMP SUM	330	CUBIC YARD
203.0020.000A	BORROW, SELECTED MATERIAL, TYPE A	LUMP SUM	935	CUBIC YARD
203.0020.000F	SUBBASE, GRADING F	LUMP SUM	638	CUBIC YARD
205.0005.0000	CONTROLLED LOW-STRENGTH MATERIAL	LUMP SUM	44	CUBIC YARD
301.0004.0000	AGGREGATE SURFACE COURSE, GRADING E-1	LUMP SUM	72	CUBIC YARD
602.0005.0000	ASSEMBLE AND INSTALL STRUCTURAL PLATE ALUMINUM ARCH CULVERT, 7GA, 12'-10" SPAN, 8'-4" RISE	LUMP SUM	120	LINEAR FOOT
610.0001.0000	DITCH LINING	LUMP SUM	110	CUBIC YARD
613.0002.0000	CULVERT MARKER POST	LUMP SUM	2	EACH
618.0005.0000	SEEDING	LUMP SUM	11	POUND
630.0003.0002	GEOTEXTILE, REINFORCEMENT, TYPE 2	LUMP SUM	660	SQUARE YARD
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
642.0014.0000	AS-BUILT PLANS	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	WATERWAY BED FILL	LUMP SUM	117	CUBIC YARD
690.2003.0000	WATERWAY BANK REVEGETATION AND PROTECTION	LUMP SUM	ALL REQUIRED	LUMP SUM

ABBREVIATIONS	
AVASP	AS VERTICAL AS SAFELY POSSIBLE
BFW	BANKFULL WIDTH
CFS	CUBIC FEET PER SECOND
CL	CENTERLINE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
CRH	COPPER RIVER HIGHWAY
CTC	CORDOVA TELECOM COOPERATIVE
ELEV	ELEVATION
ESCP	EROSION AND SEDIMENT CONTROL PLAN
HW/D	HEADWATER TO DEPTH RATIO
MIN	MINIMUM
MP	MILEPOST
NTS	NOT TO SCALE
OHW	ORDINARY HIGH WATER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PC	PTARMIGAN CREEK
Q	FLOW
ROW	RIGHT-OF-WAY
SPP	STRUCTURAL PLATE PIPE
STA	STATION
TCE	TEMPORARY CONSTRUCTION EASEMENT
TYP	TYPICAL

TABLE 3	
WATERWAY BED FILL	
SIZE/SIEVE	% PASSING
12"	100
9"	100
6"	90
4"	79
3"	65
1"	41
0.75"	30
#4	19
#8	15

QUANTITIES NOTES:

- ESTIMATE OF QUANTITIES ARE FOR INFORMATION ONLY AND CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES.
- EXCAVATION AND BACKFILL REQUIRED FOR STREAM DIVERSION AS SHOWN ON SHEET C11 IS SUBSIDIARY TO PAY ITEM 672.0001.0000 STREAM DIVERSION & DEWATERING.
- WATERWAY BED FILL SHALL BE PRODUCED BY MIXING, BY VOLUME, 35% SELECTED MATERIAL, TYPE D, AND 65% DITCH LINING. REFER TO SPECIFICATION SECTION 690 AND DETAIL 1/C10 FOR MORE INFORMATION ABOUT WATERWAY BED FILL MATERIAL.
- BORROW, SELECTED MATERIAL, TYPE A SHALL BE COMMERCIALY SOURCED IF MATERIAL FOUND DURING EXCAVATION DOES NOT MEET CONTRACT SPECIFICATIONS.

ESTIMATE OF QUANTITIES - EAST CULVERT				
ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	UNIT
202.0004.0000	REMOVAL OF CULVERT PIPE	LUMP SUM	126	LINEAR FOOT
203.0019.0000	UNCLASSIFIED EXCAVATION	LUMP SUM	330	CUBIC YARD
203.0020.000A	BORROW, SELECTED MATERIAL, TYPE A	LUMP SUM	781	CUBIC YARD
203.0020.000F	SUBBASE, GRADING F	LUMP SUM	539	CUBIC YARD
205.0005.0000	CONTROLLED LOW-STRENGTH MATERIAL	LUMP SUM	33	CUBIC YARD
301.0004.0000	AGGREGATE SURFACE COURSE, GRADING E-1	LUMP SUM	60	CUBIC YARD
602.0005.0000	ASSEMBLE AND INSTALL STRUCTURAL PLATE ALUMINUM ARCH CULVERT, 7GA, 12'-10" SPAN, 8'-4" RISE	LUMP SUM	100	LINEAR FOOT
610.0001.0000	DITCH LINING	LUMP SUM	77	CUBIC YARD
613.0002.0000	CULVERT MARKER POST	LUMP SUM	2	EACH
618.0005.0000	SEEDING	LUMP SUM	12	POUND
630.0003.0002	GEOTEXTILE, REINFORCEMENT, TYPE 2	LUMP SUM	550	SQUARE YARD
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
642.0014.0000	AS-BUILT PLANS	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	WATERWAY BED FILL	LUMP SUM	84	CUBIC YARD
690.2003.0000	WATERWAY BANK REVEGETATION AND PROTECTION	LUMP SUM	ALL REQUIRED	LUMP SUM

GENERAL NOTES:

- 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 OWNER'S REPRESENTATIVE.
- UTILITIES ARE SHOWN ON THE PLANS TO THE EXTENT THEY ARE KNOWN. BEFORE CONDUCTING ANY GROUND-DISTURBING ACTIVITIES THE CONTRACTOR SHALL VERIFY UTILITY LOCATIONS. CONTACT THE ALASKA DIGLINE AT 1-907-278-3121 OR AT 811AK.COM. LOCATE ALL UTILITIES WITHIN THE PROJECT AND PROTECT THEM FROM DAMAGE THROUGH THE DURATION OF WORK.
- COORDINATE CONSTRUCTION STAGING AND MOBILIZATION AREAS AND ACTIVITIES WITH OWNER'S REPRESENTATIVE. COORDINATION WITH CITY OF BETHEL DEPARTMENT OF PUBLIC WORKS IS REQUIRED FOR CONCURRENCE.
- EXERCISE CAUTION AND COMPLY WITH ALL APPLICABLE OSHA REQUIREMENTS FOR WORKING IN CONFINED AREAS.
- STATIONING IS ALONG CENTERLINE OF STREAM OR ROADWAY.
- VERIFY ELEVATIONS OF ALL PROPOSED STRUCTURES PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES FROM PLANS IMMEDIATELY TO OWNER'S REPRESENTATIVE.
- CULVERT DESIGN LOAD: AASHTO LOADING HL-93, MINIMUM SOIL BEARING CAPACITY: 3,000 PSF.
- EXCAVATION AND COMPACTION:
 - REMOVE AND DISPOSE OF ALL ORGANIC OR OVERSATURATED SOFT MATERIAL, WHICH CANNOT BE COMPACTED.
 - BACKFILL SHALL BE PLACED AND COMPACTED WITH CARE AND SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY ON BOTH SIDES OF PIPE. MATERIAL TO BE COMPACTED TO 95% MAXIMUM DENSITY.
- CULVERT INSTALLATION:
 - CULVERT INFILL MATERIAL SHALL BE INSTALLED IN PIPE ACCORDING TO PLANS. MANUAL INSTALLATION IS REQUIRED.
- ALL VEGETATION IN THE AREAS NOT AFFECTED BY WORK SHALL BE PRESERVED AND PROTECTED BY THE CONTRACTOR. SEE REVEGETATION PLAN.
- VEGETATIVE MAT WITHIN THE AREA OF DISTURBANCE SHALL BE SALVAGED, STORED AND CARED FOR AS DIRECTED BY THE OWNER REPRESENTATIVE UNTIL IT CAN BE REINSTALLED.

LEGEND:

	DESCRIPTION
	CONTROL POINT
	APPROXIMATE RIGHT-OF-WAY
	ORDINARY HIGH WATER
	EXISTING CULVERT
	EDGE OF PAVEMENT
	EDGE OF GRAVEL/SHOULDER
	EDGE OF VEGETATION
	EXISTING THALWEG
	TOP OF BANK
	TOE OF SLOPE
	PROPOSED CULVERT
	WATERWAY BED FILL
	WATERWAY BANK REVEGETATION AND PROTECTION
	VEGETATIVE MAT
	DITCH LINING
	AGGREGATE SURFACE COURSE, E-1
	SELECTED MATERIAL, TYPE A
	SUBBASE, GRADING F
	ORGANIC SOILS AND VEGETATIVE MAT, AS AVAILABLE; TOPSOIL, SEED, FERTILIZER, AND MULCH, AS NEEDED
	BULK BAG COFFERDAM

REV

DATE

DESCRIPTION

BY

REVISED

DATE

DESCRIPTION

BY

OF ALASKA

REGISTERED PROFESSIONAL ENGINEER

66% DESIGN

Bradley M. Beck

CE 1163

DOWL

WWW.DOWL.COM

PTARMIGAN ST. CULVERT CROSSINGS

CULVERT REPLACEMENT

GENERAL NOTES AND QUANTITIES

PROJECT 1163.50270.68

DATE JANUARY 2025

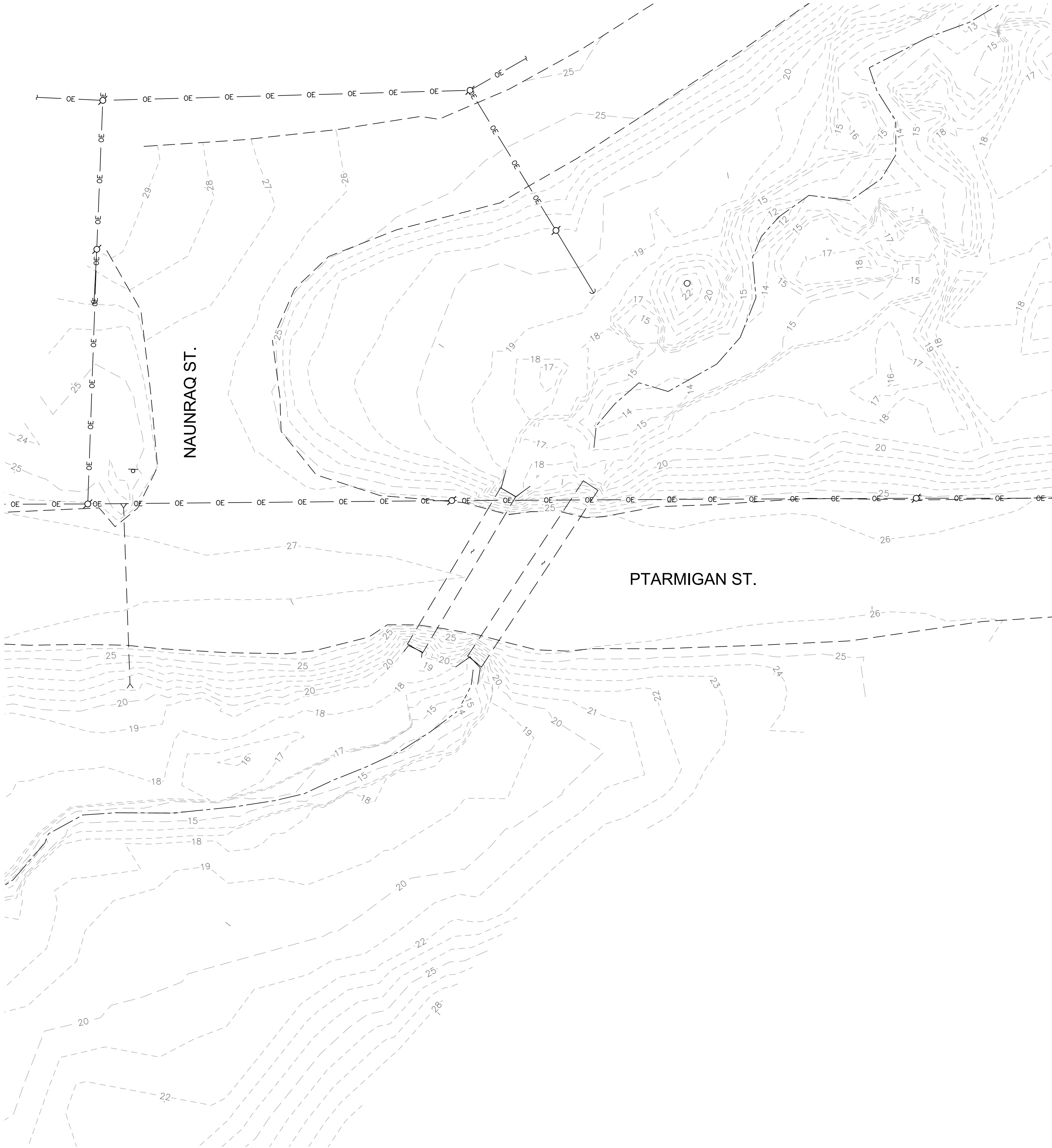
DOWL 2025

SHEET

C2 OF C14

BETHEL, ALASKA

C:\dowl_pw\0418828\C3-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:38 SAVED DATE 2025-01-28 11:38 USER: rduerst



SURVEY CONTROL NOTES:

HORIZONTAL CONTROL

COORDINATE SYSTEM:

THIS PROJECT IS LOCATED ENTIRELY WITHIN THE KUSKOKWIM RIVER 2015 LOW DISTORTION PROJECTION (LDP) COORDINATE SYSTEM. THIS LDP WAS DEVELOPED IN 2015 BY THE STATE OF ALASKA DOT&PF CENTRAL REGION SURVEY SECTION. THIS LDP COVERS COMMUNITIES ON AND AROUND THE LOWER KUSKOKWIM RIVER FROM THE RIVER'S MOUTH TO THE COMMUNITY OF CHUATHBALUK. BERING SEA COASTAL COMMUNITIES FROM CHEFORNAK TO KONGIGANAK ARE ALSO INCLUDED.

BASIS OF COORDINATES:

THE BASIS OF COORDINATES IS NGS STATION BET C (PID:DF3624) PROJECT POINT 553. SAID STATION IS LOCATED WITHIN THE FENCED AREA OF THE BETHEL AIRPORT AND HAS A NAD83(2011) POSITION OF LATITUDE 60°47'03.11084" N, LONGITUDE 161°50'08.36533" W, ELLIPSOID HEIGHT 42.527 METERS. BET C HAS PROJECT COORDINATES OF N 1034266.0570, E 582894.7332 U.S. FEET.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS IS A LOCAL PLANE BEARING BETWEEN NGS STATION BET C (PID: DF3624) AND NGS STATION BET B (PID: DF3623). NGS STATION BET B BEARS S 25°34'22.5" W A DISTANCE OF 2672.876 FEET FROM NGS STATION BET C, ALL AS DETERMINED BY STATIC GNSS TECHNIQUES. NGS STATION BET B HAS PROJECT COORDINATES OF N 1031854.9671, E 581740.9628 U.S. FEET.

TRANSLATION PARAMETERS:

KUSKOKWIM RIVER 2015 LDP PARAMETERS

LINEAR UNIT: U.S. SURVEY FEET

DATUM: NAD83(2011)

ELLIPSOID: GRS80

PROJECTION: HOTINE OBLIQUE MERCATOR

LATITUDE OF CENTER: 60°40'00" N

LONGITUDE OF CENTER: 162°00'00" W

AZIMUTH: 50°00'00"

FALSE NORTHING: -15,500,000.0'

FALSE EASTING: -19,100,000.0'

GRID SCALE FACTOR: 1.000002 (EXACT)

VERTICAL CONTROL

BASIS OF VERTICAL IS LOCAL MEAN TIDE LEVEL, AS DETERMINED FROM LEVELS PERFORMED BY ALASKA DOT&PF BETWEEN TIDAL BENCHMARK NO.6 (1970) AND TIDAL BENCHMARK NO.7 (1970). A DATUM ADJUSTMENT OF -1.55 FEET WAS APPLIED TO THE PUBLISHED MLLW ELEVATIONS PER NOAA/NOS PUBLICATION OF 1/22/71, TO ARRIVE AT PROJECT MEAN TIDE VALUES.

[601]BENCHMARK NO.6 (1970): A BRASS DISK ON COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF AT CAP LEVEL, IS LOCATED +/-400 FEET WESTERLY ALONG THIRD AVENUE (HOFFMAN HIGHWAY) FROM ITS INTERSECTION WITH MAIN STREET, +/-53 FEET SOUTH OF CENTERLINE, +/-20 FEET SOUTH OF UTILITY POLE #L1P70 AND +/-15 FEET NORTH OF THE MIDDLE OF A 2-STORY WOOD BUILDING. ELEVATION = 19.97 FEET (USED THIS SURVEY)

BENCHMARK NO.7 (1970): A BRASS DISK ON A COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF 0.4' BELOW CAP LEVEL, IS LOCATED +/-750 FEET WESTERLY ALONG FOURTH AVENUE FROM ITS INTERSECTION WITH MAIN STREET AND +/-8 FEET NORTH OF THE SOUTHEAST CORNER OF THE BOTTOM STEP LEADING TO THE MAIN ENTRANCE OF THE NATIONAL GUARD ARMORY (UNDER AN ELEVATED, METAL GRATE WALKWAY). ELEVATION = 25.57 FEET (NOT USED THIS SURVEY)

[554]BENCHMARK PS-3(2003): A BRASS CAP IN A BROKEN PVC PIPE FLUSH IN GROUND, IS LOCATED +/-23 FEET SOUTHWEST FROM THE EDGE OF TUNDRA RIDGE ROAD AND +/-27 FEET NORTHWEST FROM THE EDGE OR GEORGE STREET. ELEVATION = 37.58 FEET (USED THIS SURVEY)

VERTICAL CONTROL WAS EXTENDED THROUGHOUT THE PROJECT AREA USING DIFFERENTIAL LEVELING METHODS.

A LEICA DNA10 DIGITAL LEVEL AND LEICA LGO SOFTWARE WERE USED TO CHECK ADJUSTED ELEVATIONS. ELEVATIONS FOR THE LISTED BENCHMARKS WERE PROVIDED TO DOWL BY THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES.

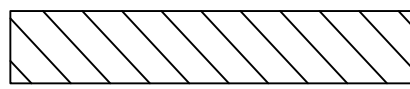
ALL ELEVATIONS ON CONTROL POINTS AND BENCHMARKS NEED TO BE FIELD VERIFIED BEFORE THEY ARE USED.

SURVEY POINTS:

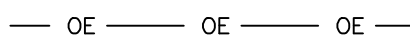
CONTROL MONUMENTS FOUND THIS SURVEY

ID	REC. NORTHING	REC. EASTING	REC. ELEV.	DESCRIPTION
567	1041934.5807	588490.8424	-9999	RCM Fd AM[DOT]: RCM 567
588	1041867.3884	590514.5170	34.83	STS Set AC[12041]: BRR-588
589	1041886.1205	589529.5735	16.03	STS Set AC[12041]: BRR-589

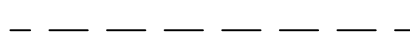
LEGEND



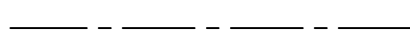
BUILDING OUTLINE



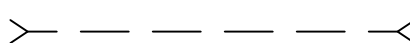
OVERHEAD UTILITY LINES



EDGE OF GRAVEL



CREEK CENTER/THALWEG



CULVERT



MINOR CONTOUR LINE (1')



MAJOR CONTOUR LINE (5')



SIGN



UTILITY POLE



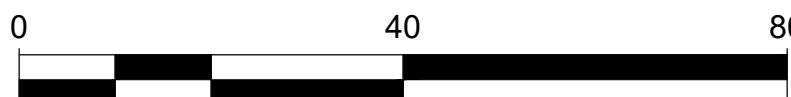
GUY ANCHOR



SURVEY MONUMENT FOUND



SURVEY MONUMENT POINT NUMBER



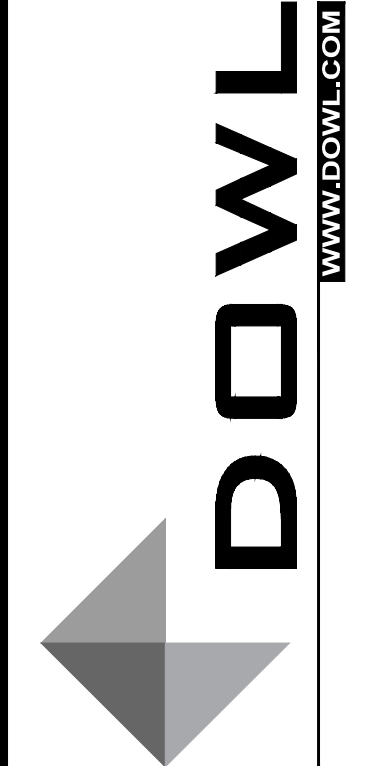
SCALE IN FEET

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
SURVEY CONTROL – WEST CULVERT

PROJECT 1163.50270.68
DATE JANUARY 2025

DOWL 2025
SHEET

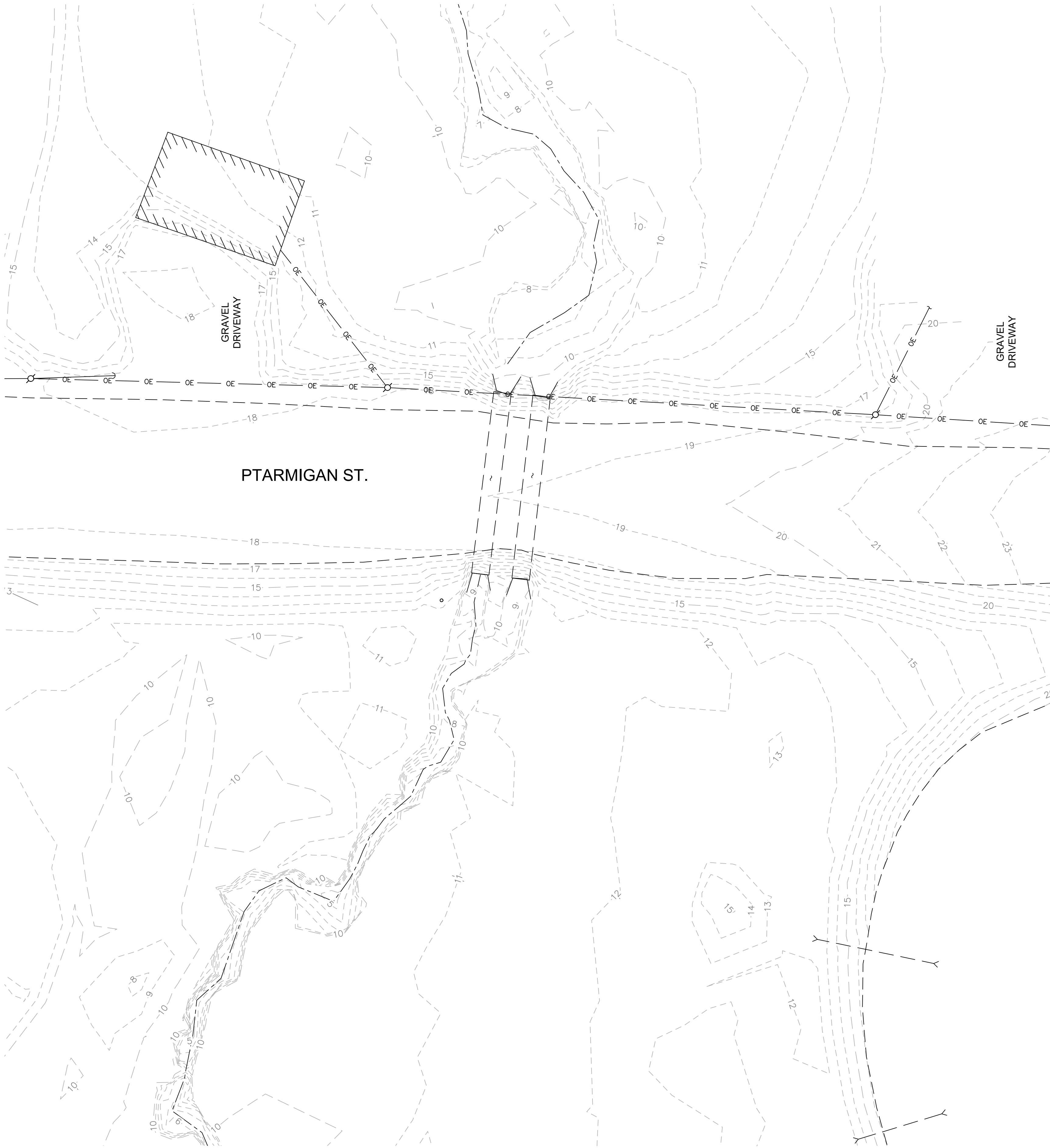
C3 OF C14



REV	DATE	DESCRIPTION	BY

BETHEL, ALASKA

C:\dowl_pw\0418828\C4-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:39 SAVED DATE 2025-01-28 11:39 USER: rduerst



SURVEY CONTROL NOTES:

HORIZONTAL CONTROL

COORDINATE SYSTEM:

THIS PROJECT IS LOCATED ENTIRELY WITHIN THE KUSKOKWIM RIVER 2015 LOW DISTORTION PROJECTION (LDP) COORDINATE SYSTEM. THIS LDP WAS DEVELOPED IN 2015 BY THE STATE OF ALASKA DOT&PF CENTRAL REGION SURVEY SECTION. THIS LDP COVERS COMMUNITIES ON AND AROUND THE LOWER KUSKOKWIM RIVER FROM THE RIVER'S MOUTH TO THE COMMUNITY OF CHUATHBALUK. BERING SEA COASTAL COMMUNITIES FROM CHEFORNAK TO KONGIGANAK ARE ALSO INCLUDED.

BASIS OF COORDINATES:

THE BASIS OF COORDINATES IS NGS STATION BET C (PID:DF3624) PROJECT POINT 553. SAID STATION IS LOCATED WITHIN THE FENCED AREA OF THE BETHEL AIRPORT AND HAS A NAD83(2011) POSITION OF LATITUDE 60°47'03.11084" N, LONGITUDE 161°50'08.36533" W, ELLIPSOID HEIGHT 42.527 METERS. BET C HAS PROJECT COORDINATES OF N 1034266.0570, E 582894.7332 U.S. FEET.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS IS A LOCAL PLANE BEARING BETWEEN NGS STATION BET C (PID: DF3624) AND NGS STATION BET B (PID: DF3623). NGS STATION BET B BEARS S 25°34'22.5" W A DISTANCE OF 2672.876 FEET FROM NGS STATION BET C, ALL AS DETERMINED BY STATIC GNSS TECHNIQUES. NGS STATION BET B HAS PROJECT COORDINATES OF N 1031854.9671, E 581740.9628 U.S. FEET.

TRANSLATION PARAMETERS:

KUSKOKWIM RIVER 2015 LDP PARAMETERS

LINEAR UNIT: U.S. SURVEY FEET

DATUM: NAD83(2011)

ELLIPSOID: GRS80

PROJECTION: HOTINE OBLIQUE MERCATOR

LATITUDE OF CENTER: 60°40'00" N

LONGITUDE OF CENTER: 162°00'00" W

AZIMUTH: 50°00'00"

FALSE NORTHING: -15,500,000.0'

FALSE EASTING: -19,100,000.0'

GRID SCALE FACTOR: 1.000002 (EXACT)

VERTICAL CONTROL

BASIS OF VERTICAL IS LOCAL MEAN TIDE LEVEL, AS DETERMINED FROM LEVELS PERFORMED BY ALASKA DOT&PF BETWEEN TIDAL BENCHMARK NO.6 (1970) AND TIDAL BENCHMARK NO.7 (1970). A DATUM ADJUSTMENT OF -1.55 FEET WAS APPLIED TO THE PUBLISHED MLLW ELEVATIONS PER NOAA/NOS PUBLICATION OF 1/22/71, TO ARRIVE AT PROJECT MEAN TIDE VALUES.

[601]BENCHMARK NO.6 (1970): A BRASS DISK ON COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF AT CAP LEVEL, IS LOCATED +/-400 FEET WESTERLY ALONG THIRD AVENUE (HOFFMAN HIGHWAY) FROM ITS INTERSECTION WITH MAIN STREET, +/-53 FEET SOUTH OF CENTERLINE, +/-20 FEET SOUTH OF UTILITY POLE #L1P70 AND +/-15 FEET NORTH OF THE MIDDLE OF A 2-STORY WOOD BUILDING. ELEVATION = 19.97 FEET (USED THIS SURVEY)

BENCHMARK NO.7 (1970): A BRASS DISK ON A COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF 0.4' BELOW CAP LEVEL, IS LOCATED +/-750 FEET WESTERLY ALONG FOURTH AVENUE FROM ITS INTERSECTION WITH MAIN STREET AND +/-8 FEET NORTH OF THE SOUTHEAST CORNER OF THE BOTTOM STEP LEADING TO THE MAIN ENTRANCE OF THE NATIONAL GUARD ARMORY (UNDER AN ELEVATED, METAL GRATE WALKWAY). ELEVATION = 25.57 FEET (NOT USED THIS SURVEY)

[554]BENCHMARK PS-3(2003): A BRASS CAP IN A BROKEN PVC PIPE FLUSH IN GROUND, IS LOCATED +/-23 FEET SOUTHWEST FROM THE EDGE OF TUNDRA RIDGE ROAD AND +/-27 FEET NORTHWEST FROM THE EDGE OR GEORGE STREET. ELEVATION = 37.58 FEET (USED THIS SURVEY)

VERTICAL CONTROL WAS EXTENDED THROUGHOUT THE PROJECT AREA USING DIFFERENTIAL LEVELING METHODS.

A LEICA DNA10 DIGITAL LEVEL AND LEICA LGO SOFTWARE WERE USED TO CHECK ADJUSTED ELEVATIONS. ELEVATIONS FOR THE LISTED BENCHMARKS WERE PROVIDED TO DOWL BY THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES.

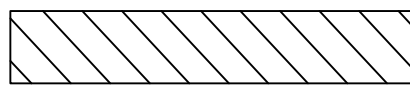
ALL ELEVATIONS ON CONTROL POINTS AND BENCHMARKS NEED TO BE FIELD VERIFIED BEFORE THEY ARE USED.

SURVEY POINTS:

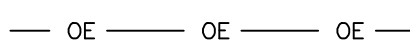
CONTROL MONUMENTS FOUND THIS SURVEY

ID	REC. NORTHING	REC. EASTING	REC. ELEV.	DESCRIPTION
567	1041934.5807	588490.8424	-9999	RCM Fd AM[DOT]: RCM 567
588	1041867.3884	590514.5170	34.83	STS Set AC[12041]: BRR-588
589	1041886.1205	589529.5735	16.03	STS Set AC[12041]: BRR-589

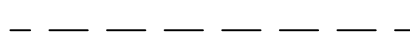
LEGEND



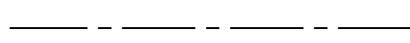
BUILDING OUTLINE



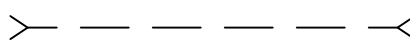
OVERHEAD UTILITY LINES



EDGE OF GRAVEL



CREEK CENTER/THALWEG



CULVERT



MINOR CONTOUR LINE (1')



MAJOR CONTOUR LINE (5')



SIGN

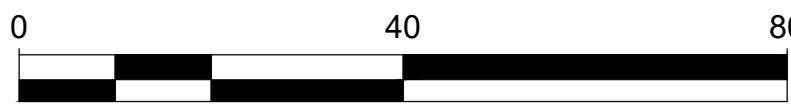


UTILITY POLE

GUY ANCHOR

SURVEY MONUMENT FOUND

SURVEY MONUMENT POINT NUMBER



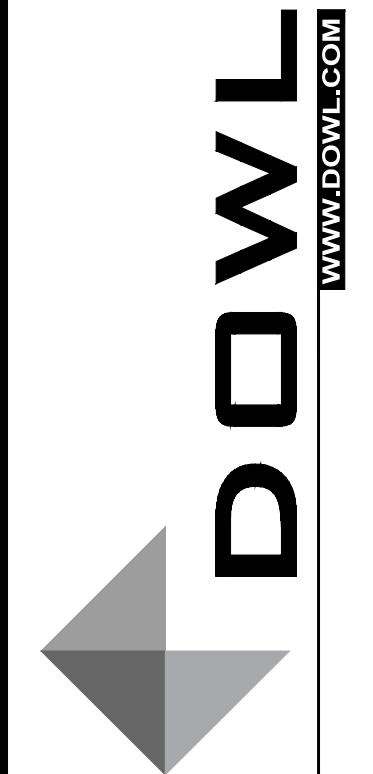
SCALE IN FEET

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
SURVEY CONTROL – EAST CULVERT

PROJECT 1163.50270.68
DATE JANUARY 2025

DOWL 2025
SHEET

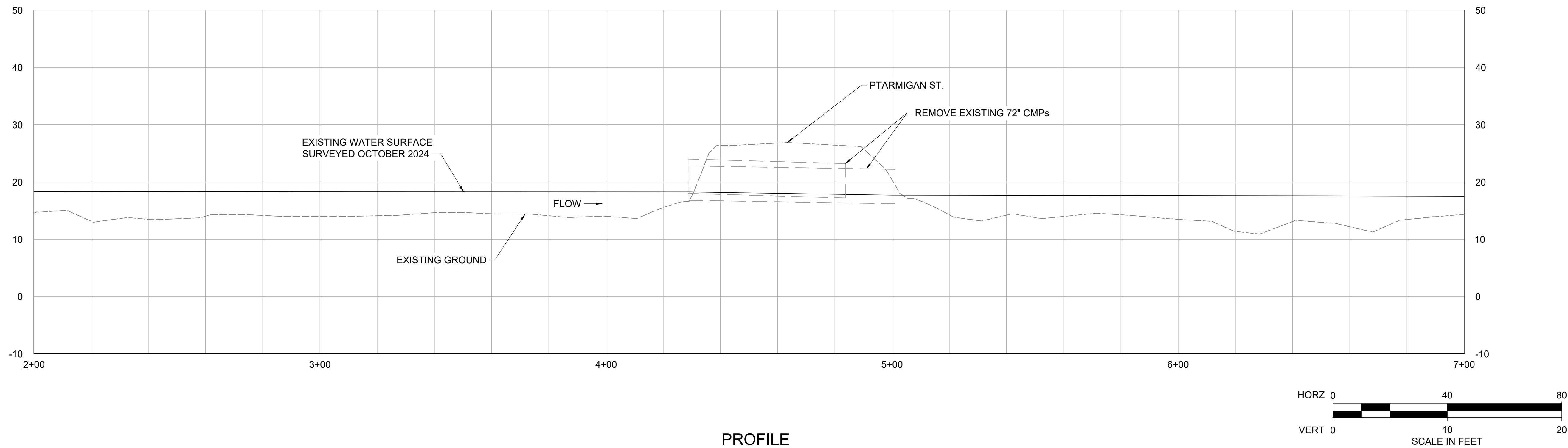
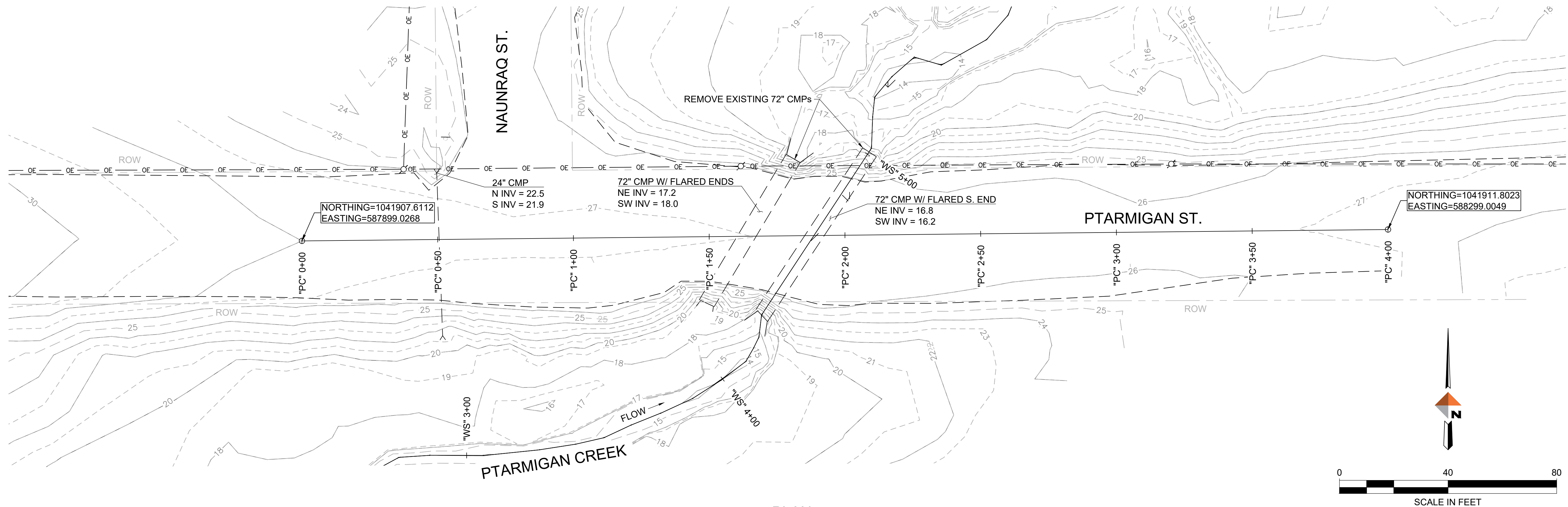
C4 OF C14



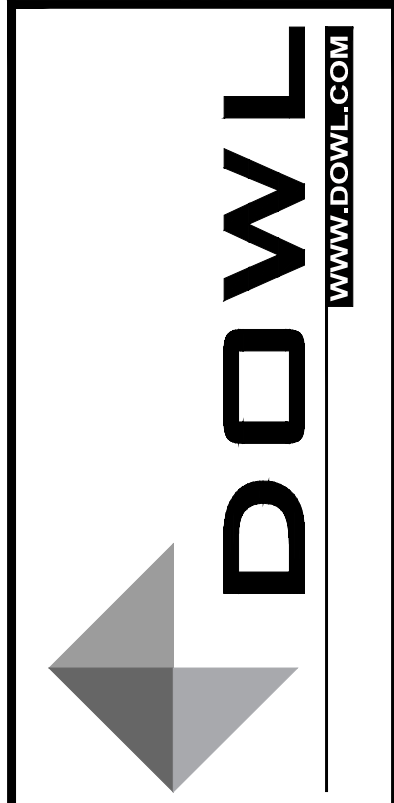
REV	DATE	DESCRIPTION	BY

BETHEL, ALASKA

C:\dowl_pw\0418828\C5-SA-CH-WA-50305.dwg PLOT DATE 2025-2-3 13:00 SAVED DATE 2025-01-29 10:37 USER: rduerst



REVISIONS		DESCRIPTION	BY
REV	DATE		

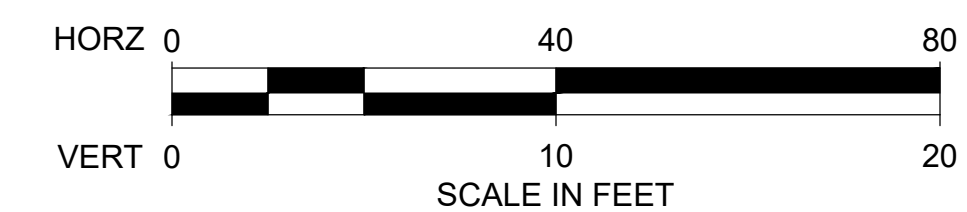
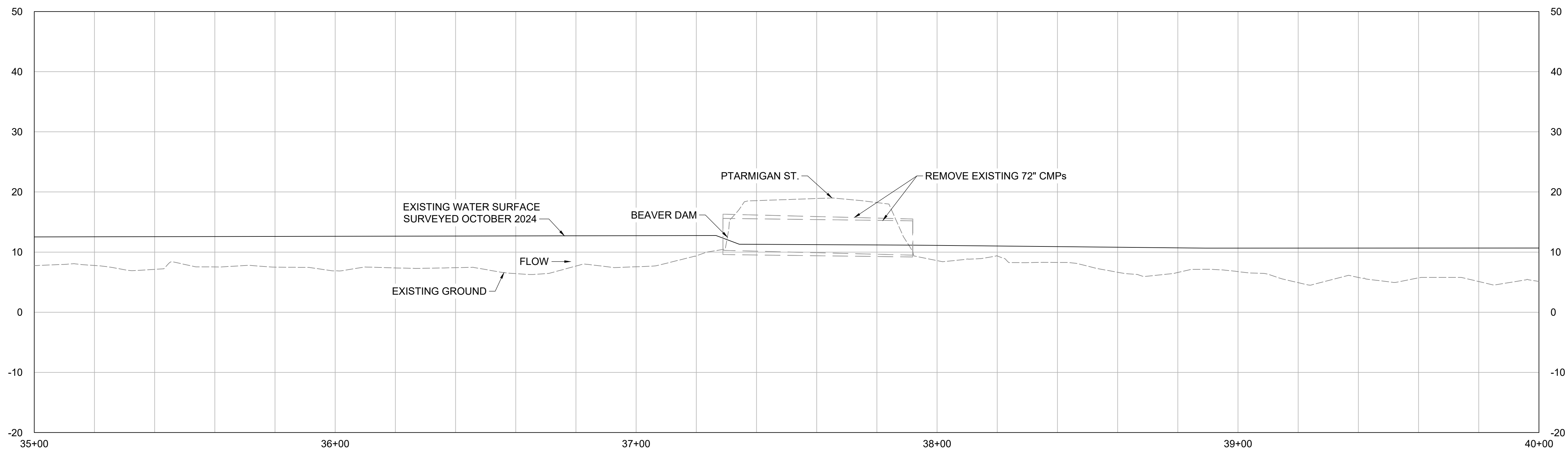
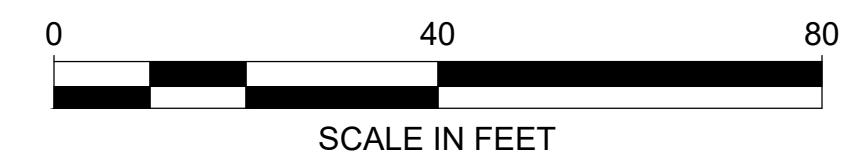
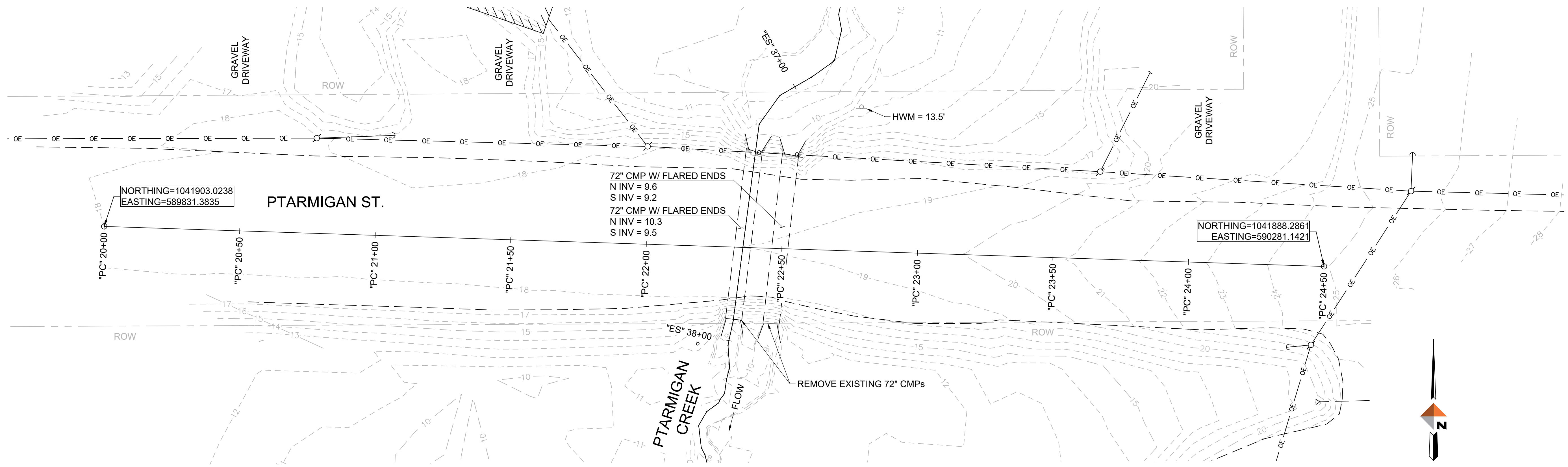


PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
EXISTING STREAM PLAN AND PROFILE
WEST CULVERT
BETHEL, ALASKA

PROJECT 1163.50270.68
DATE JANUARY 2025

DOWL 2025
SHEET

C5 OF C14



PROFILE



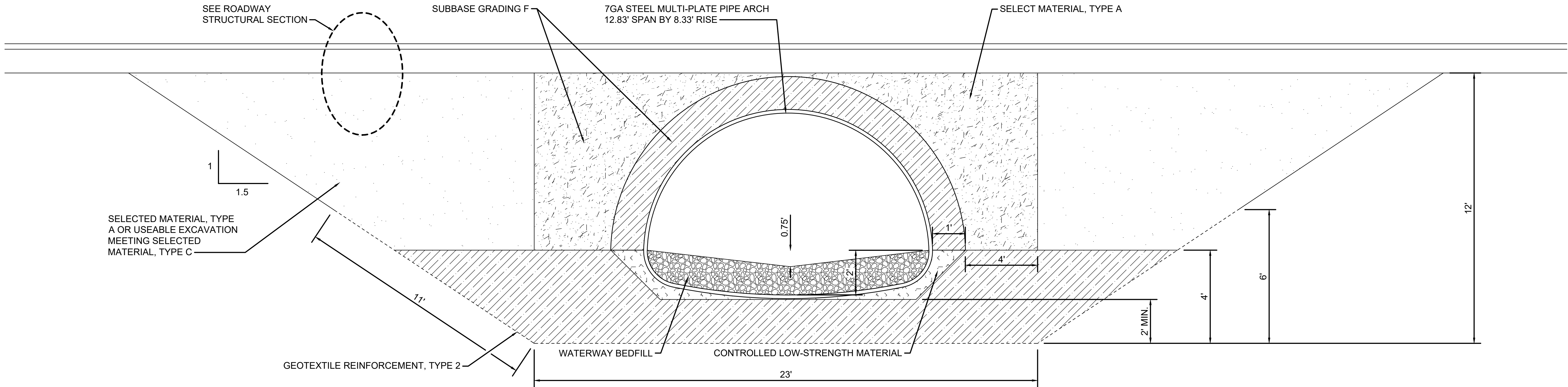
PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
EXISTING STREAM PLAN AND PROFILE
EAST CULVERT
BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025

© DOWL 2025
SHEET

C6 OF C14

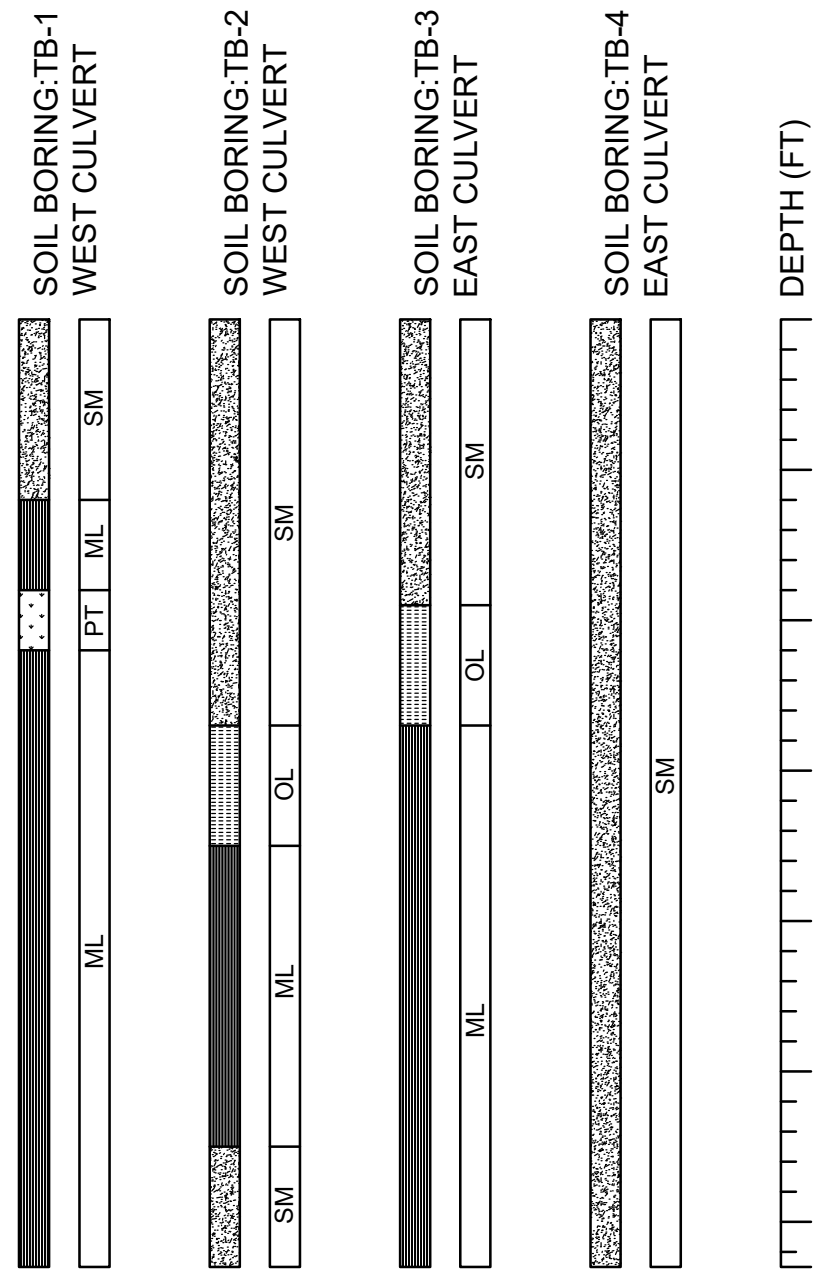
C:\dowl_pw\j0418828\C10-SA-CH-WA-50305.dwg PLOT DATE 2025-02-03 15:23 USER: rduerst



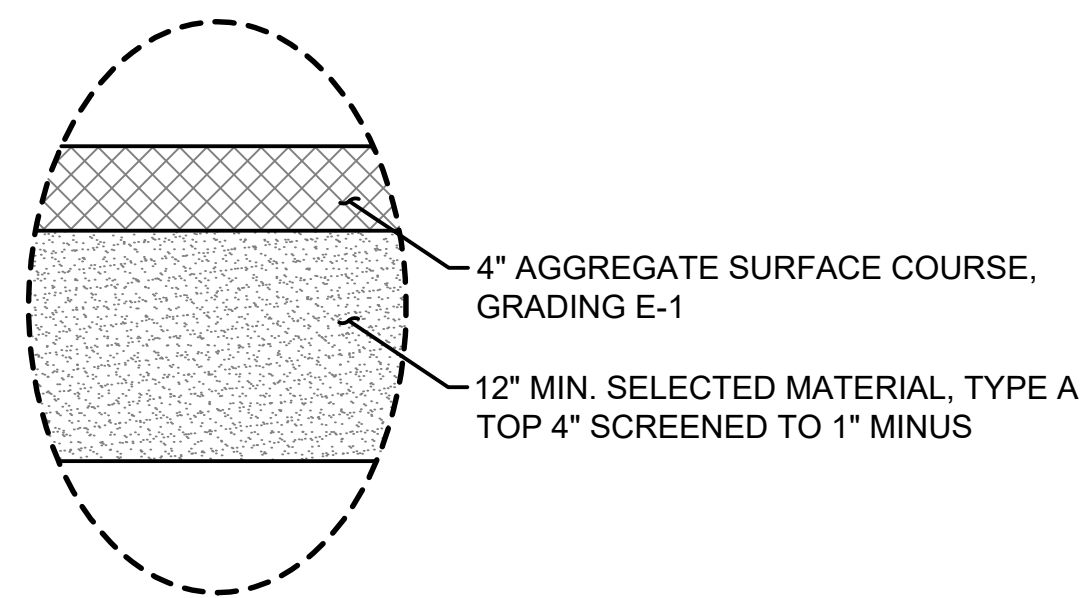
1 PIPE ARCH TYPICAL SECTION
C10 NTS

NOTES:

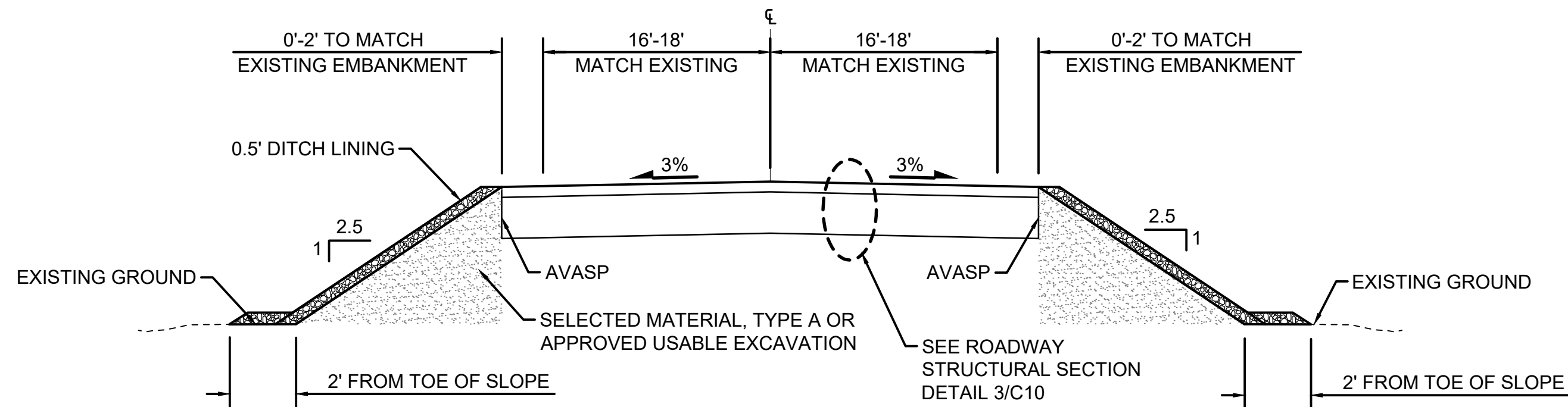
1. EXCAVATE ALL ORGANICS OR A MINIMUM OF 2' FEET BELOW CULVERT INVERT, WHICHEVER IS GREATER.
2. GEOTEXTILE REINFORCEMENT, TYPE 2 SHALL BE PLACED BETWEEN IN-SITU MATERIAL AND SUBBASE, GRADING F.
3. FOR QUANTITY ESTIMATION PURPOSES, NO USABLE EXCAVATION WAS ASSUMED AND EMBANKMENT QUANTITIES WERE CALCULATED USING SELECTED MATERIAL, TYPE A.
4. MINIMUM COVER FOR PIPE ARCH CULVERT IS 2.0'.
5. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED FOR PIPE BEDDING. PREPARATION AND PLACEMENT PER SPECIFICATION 205-2.01 AND REFERENCE SUBSECTION 712-2.22. PAY ITEM 205.0005.
6. MIX MATERIAL FOR WATERWAY BED FILL TO ACHIEVE A WELL GRADED MIXTURE.
7. FILL VOIDS IN FOR WATERWAY BED FILL AND WASH FINES IN AFTER PLACEMENT.
8. PLACE WATERWAY BED FILL MATERIAL THROUGH THE FULL LENGTH OF THE CULVERT.



2 BOREHOLE LOGS
C10 NTS

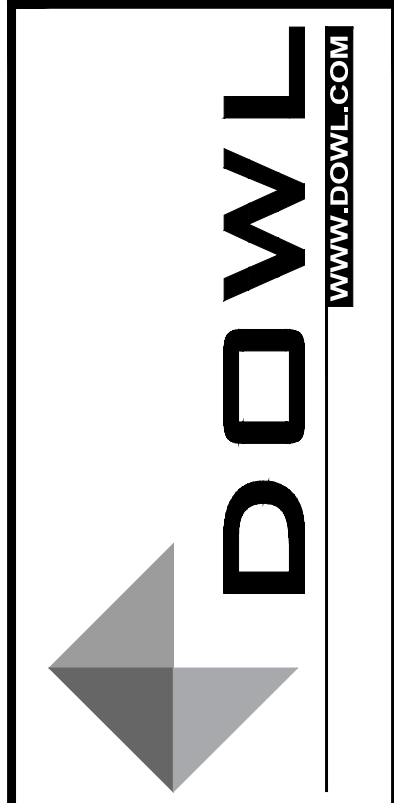


3 ROADWAY STRUCTURAL SECTION
C10 NTS



4 ROADWAY SECTION
C10 NTS

REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
DETAILS AND TYPICAL SECTIONS

BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	

C10 OF C14

6 MIL. REINFORCED VISQUEEN OR EQUIVALENT

3' MIN.

3' MIN.

KEY IN PLASTIC LINER USING BORROW

1. REFER TO SPECIFICATIONS FOR ROAD CLOSURE AND TRAFFIC CONTROL INFORMATION.
2. PTARMIGAN STREET DETOUR CLOSURE PLAN SHALL BE SUBMITTED BY CONTRACTOR FOR APPROVAL BY CITY OF BETHEL.

THIS WORK MAY REQUIRE A DIVERSION OF STREAM WATER. THE DESIGNERS RECOGNIZE THAT DIFFERENT CONTRACTORS WILL HAVE VARIOUS APPROACHES FOR CONTROLLING WATER AND CONSTRUCTION SEQUENCING. THIS DIVERSION PLAN HAS BEEN DEVELOPED TO CHECK FOR CONSTRUCTABILITY AND AS A STARTING POINT FOR A CONTRACTOR-GENERATED PLAN. CONTRACTOR MUST SUBMIT DIVERSION PLANS TO ENGINEER FOR APPROVAL PRIOR TO IMPLEMENTATION.

PROPOSED TCE

PUMP/DEWATERING

BULK BAGS (TYP.)

ROW

GRAVEL DRIVEWAY

PROTECT IN PLACE

REMOVE EXISTING 72" CMPs

INSTALL 7GA STEEL MULTI-PLATE 12'-10" - 8'-4", PIPE ARCH

TYPE III BARRICADE WITH R11-2 ROAD CLOSED SIGN

"PC" 21+00

"PC" 21+50

"PC" 22+00

"PC" 22+50

"PC" 23+00

"PC" 23+50

PTARMIGAN ST.

TEMPORARY DIVERSION CHANNEL LOCATION APPROX.

PTARMIGAN CREEK

FLOW

PUMP/DEWATERING

PROPOSED TCE

TYPE III BARRICADE WITH R11-2 ROAD CLOSED SIGN

1. DEWATER TRENCH AND WORK AREA WITH PUMP HOSE IF REQUIRED.
2. ALL DISCHARGE POINTS REQUIRE PERMANENT OR TEMPORARY VELOCITY CONTROLS.
3. PROVIDE FOR SEDIMENT REMOVAL FOR ALL DEWATERING ACTIVITY PRIOR TO DISCHARGE FROM THE PROJECT INTO ANY WATER OF THE U.S.
4. PROVIDE SPARE (EXTRA) PUMPS FOR BOTH THE STREAM BYPASS PUMP AND DETWATERING PUMP.
5. EXISTING RIPARIAN VEGETATION SHOULD BE PROTECTED TO MINIMIZE DISTURBANCE.
6. SILT FENCING TO BE USED TO PREVENT DISTURBED SEDIMENT FROM ENTERING THE WATERBODY. ADJUST LOCATION AS NECESSARY AND AS DIRECTED BY THE ENGINEER DURING CONSTRUCTION.
7. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS. MAINTENANCE SHALL INCLUDE REMOVAL AND DISPOSAL OF ACCUMULATED SEDIMENT, CLEANING AND REPAIR OF DAMAGED SEDIMENT CONTROL DEVICES.
8. ALL DISTURBED GROUND CAPABLE OF SUPPORTING VEGETATION SHALL BE REVEGETATED FOR FINAL STABILIZATION. ALL AREAS NOT REVEGETATED SHALL BE 100% COVERED BY ROCK OR OTHER PERMANENT NON-ERODIBLE MATERIAL. FINAL STABILIZATION SHALL BE AS APPROVED BY THE ENGINEER.
9. PUMPS OUTSIDE OF THE FISH EXCLUSION AREA MUST HAVE FISH SCREENS MADE OF WEDGE WIRE WITH OPENINGS NOT GREATER THAN 1/16TH INCH.

[illegible]

DOWL
WWW.DOWL.COM

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
ESCP & STREAM DIVERSION PLAN

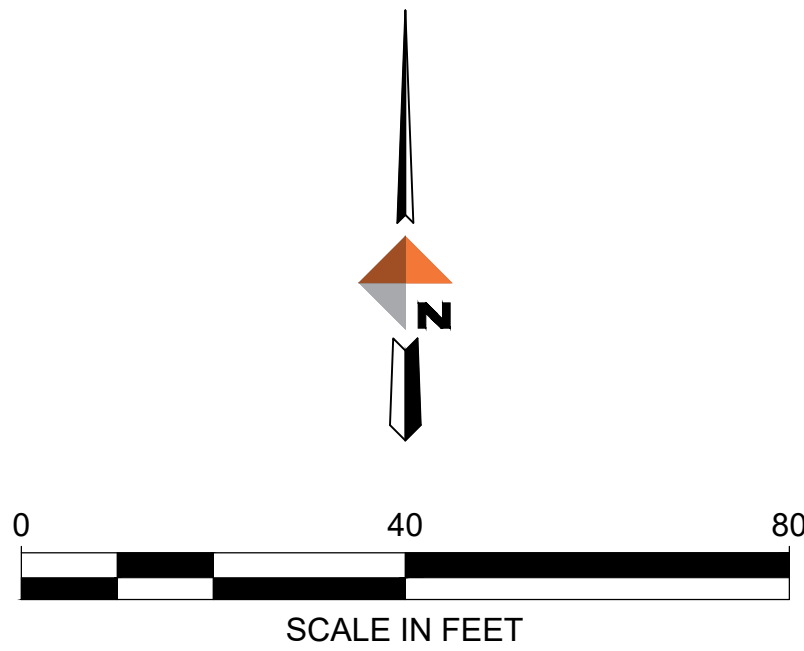
PROJECT	1163.50270.68
DATE	JANUARY 2025

○ DOWL 2025
SHEET

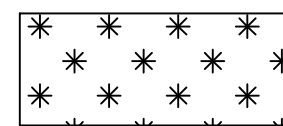
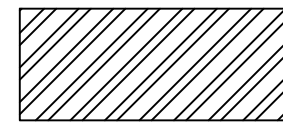
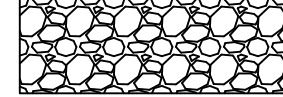
C11 OF C14

NOTES:

- REHABILITATE VEGETATED AREAS WITH SEED, PER SECTION 618 OF THE SPECIFICATIONS.
- VEGETATIVE MAT SHALL BE PLACED ON DISTURBED AREAS OUTSIDE OF THE SEEDING AREAS AS SHOWN ON THE PLANS.
- VEGETATIVE MAT LOCATIONS MAY VARY BASED ON SITE CONDITIONS AND AVAILABILITY DURING CONSTRUCTION.
- SALVAGED VEGETATIVE MAT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND BE SOURCED FROM THE DISTURBED AREA OR LOCAL AREA. SEE DETAIL 1/C13.
- REFER TO SPECIFICATION SECTION 690 FOR ADDITIONAL BANK REVEGETATION INFORMATION.
- PROTECT STREAMBANK IN PLACE, AND MINIMIZE DISTURBANCE. REHABILITATE WITH VEGETATIVE MAT BANK STABILIZATION IF DISTURBED, PER DETAIL 1/C13

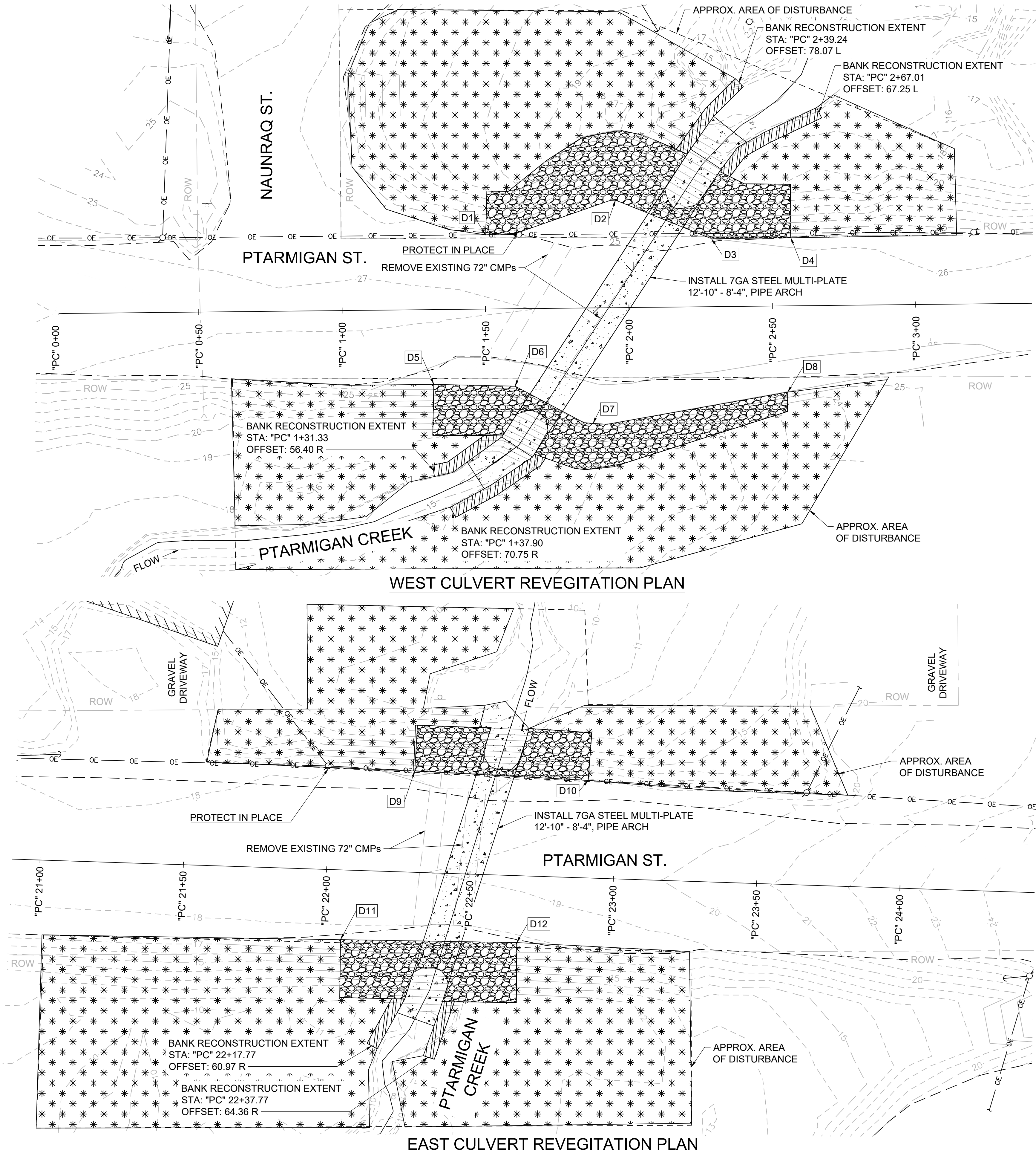


SITE REVEGETATION

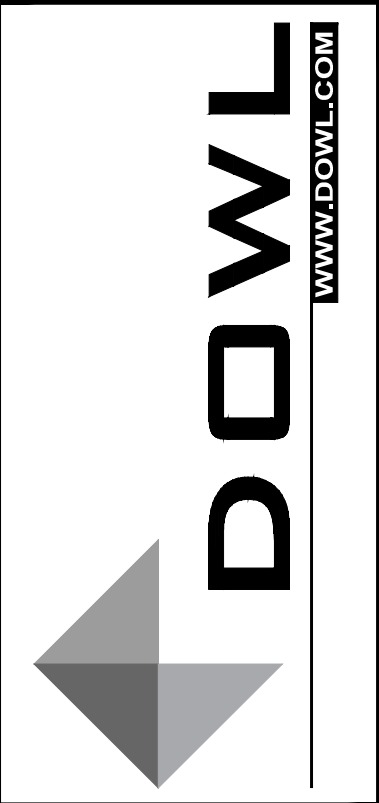
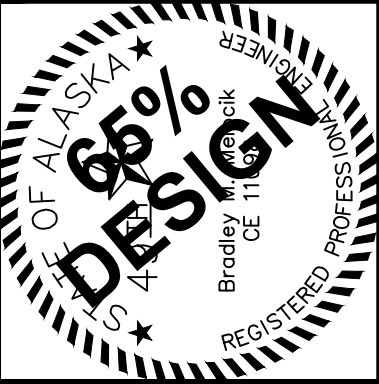
-  ORGANIC SOILS AND VEGETATIVE MAT, AS AVAILABLE. SEED AND MULCH AS NEEDED
-  WATERWAY BANK REVEGETATION AND PROTECTION VEGETATIVE MAT
-  WATERWAY BED FILL
-  DITCH LINING

SEEDING MIX	
CATEGORY 1	
80 - 90% OF AT LEAST 2 TYPES	ARCTARED RED FESCUE
	NORCOAST BERING HAIRGRASS
	NORTTRAN TUFTED HAIRGRASS
	GRUENING ALPINE BLUEGRASS
CATEGORY 2	
10 - 20% OF AT LEAST 1 TYPE	KENAI POLARGRASS
	TUNDRA GLAUCOUS BLUEGRASS
	ALYESKA POLARGRASS
	SOURDOUGH BLUEJOINT REEDGRASS

COORDINATE TABLE: DITCH LINING			
LOCATION	POINT ID	"PC" STATION	OFFSET
WEST CULVERT DS	D1	1+50.34	25.87 L
WEST CULVERT DS	D2	1+95.71	37.47 L
WEST CULVERT DS	D3	2+29.07	23.68 L
WEST CULVERT DS	D4	2+56.71	23.71 L
WEST CULVERT US	D5	1+31.68	26.06 R
WEST CULVERT US	D6	1+60.01	27.01 R
WEST CULVERT US	D7	1+87.07	40.24 R
WEST CULVERT US	D8	2+55.07	30.05 R
EAST CULVERT US	D9	22+90.11	33.98 L
EAST CULVERT US	D10	22+90.85	50.64 L
EAST CULVERT DS	D11	22+05.63	24.33 R
EAST CULVERT DS	D12	22+67.05	23.33 R



REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
REVEGETATION PLAN

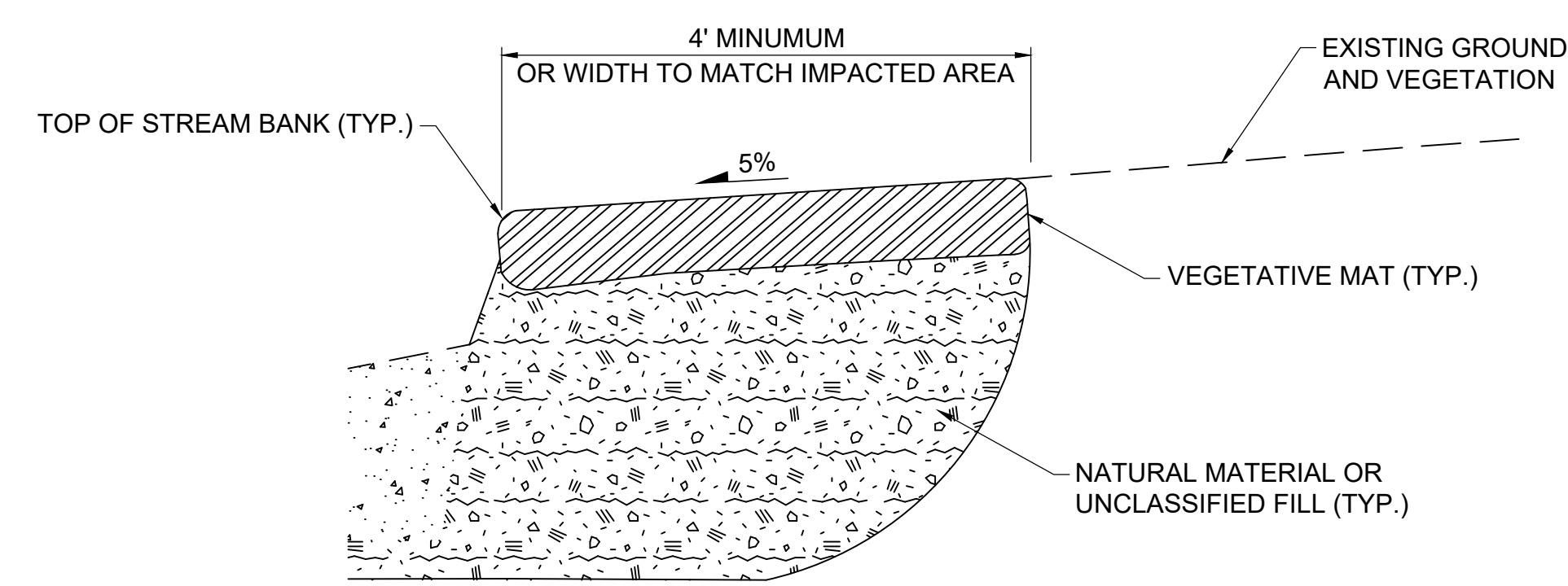
BETHEL, ALASKA

PROJECT 1163.50270.68
DATE JANUARY 2025

DOWL 2025
SHEET

C12 OF C14

C:\dowl_pw\0418828\C13-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:57 SAVED DATE 2025-02-04 09:37 USER: rduerst



1
C13 **VEGETATIVE MAT BANK RECONSTRUCTION SECTION VIEW**
NTS

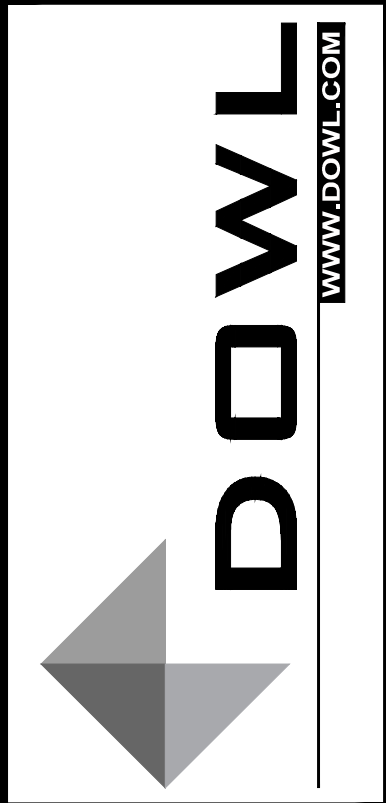
NOTES:

1. SALVAGED VEGETATIVE MAT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND BE SOURCED FROM THE DISTURBED AREA OR LOCAL AREA.
2. TAPER BANKS AND TIE INTO EXISTING BANKS UPSTREAM AND DOWNSTREAM.

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 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.
5. PLACE VEGETATIVE MATS TIGHTLY TOGETHER, WITHOUT GAPS, WITH FULL CONTACT OF THE ROOT MASS TO THE SOIL SURFACE BELOW, TAP INTO PLACE.
6. 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.

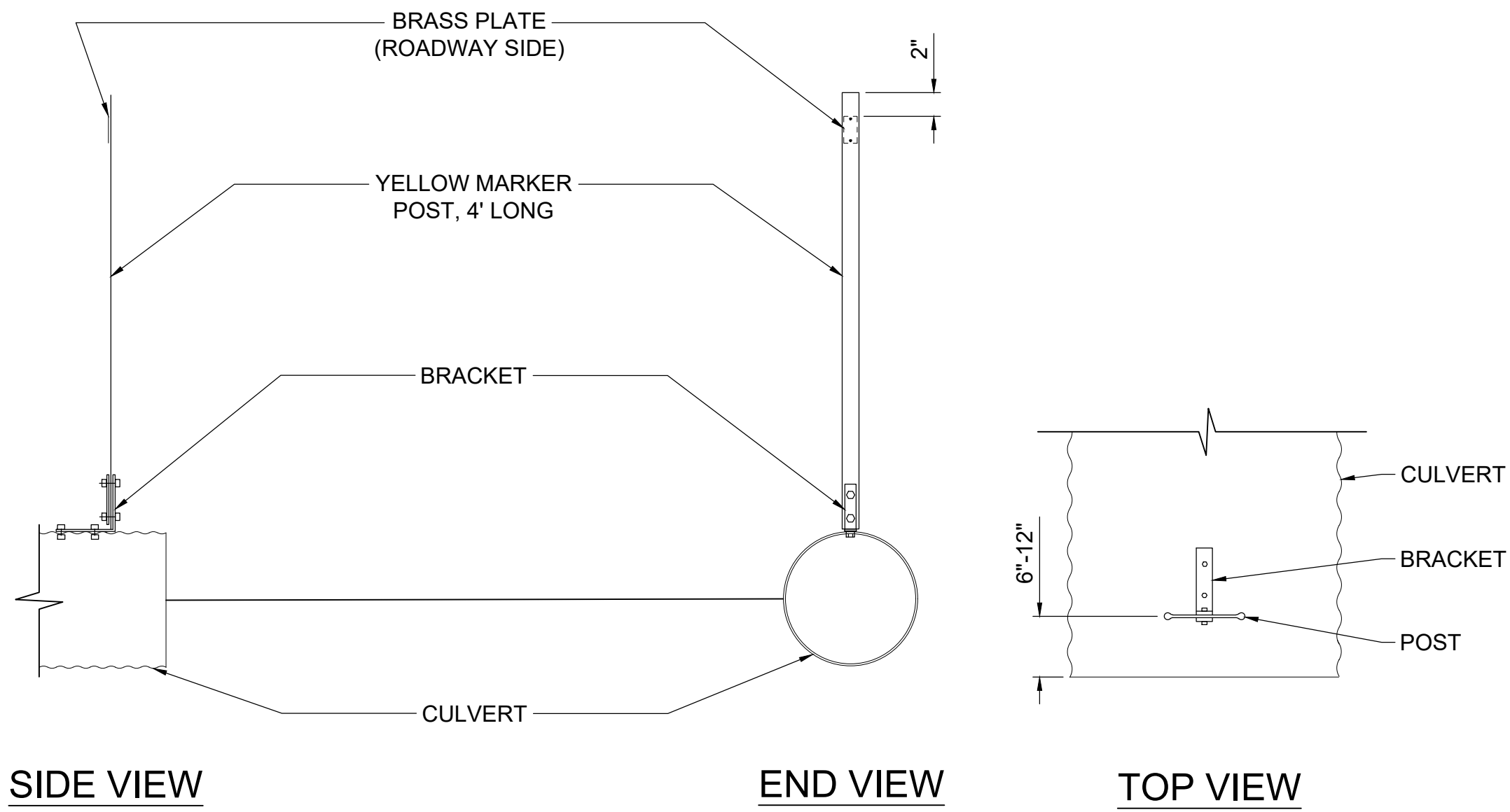
REVISIONS		REV	DATE	DESCRIPTION	BY



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
BANK RECONSTRUCTION

BETHEL, ALASKA

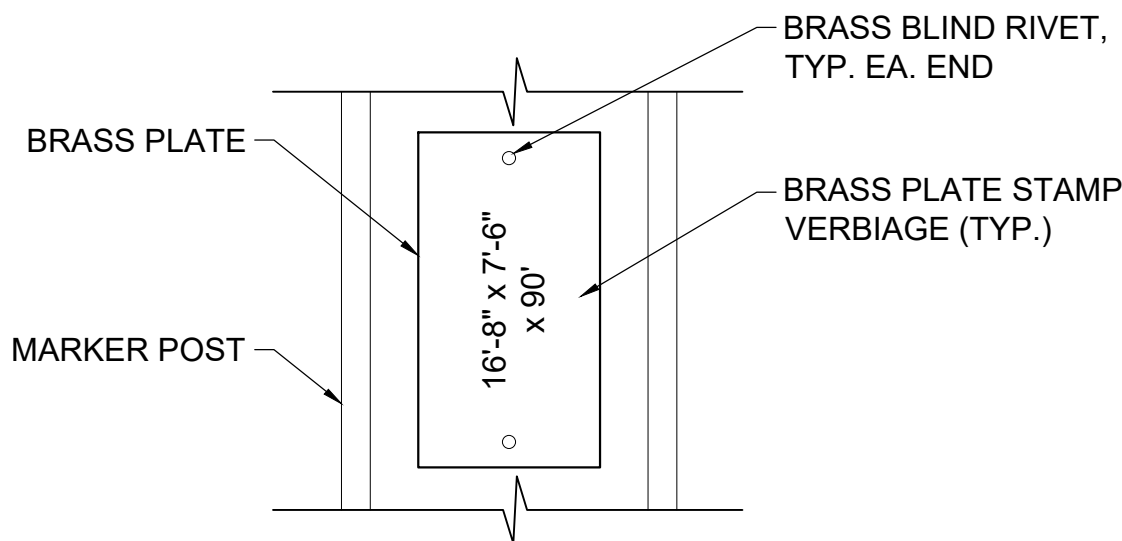
PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C13 OF C14	



1 CULVERT MARKER POST DETAIL
C14 NTS

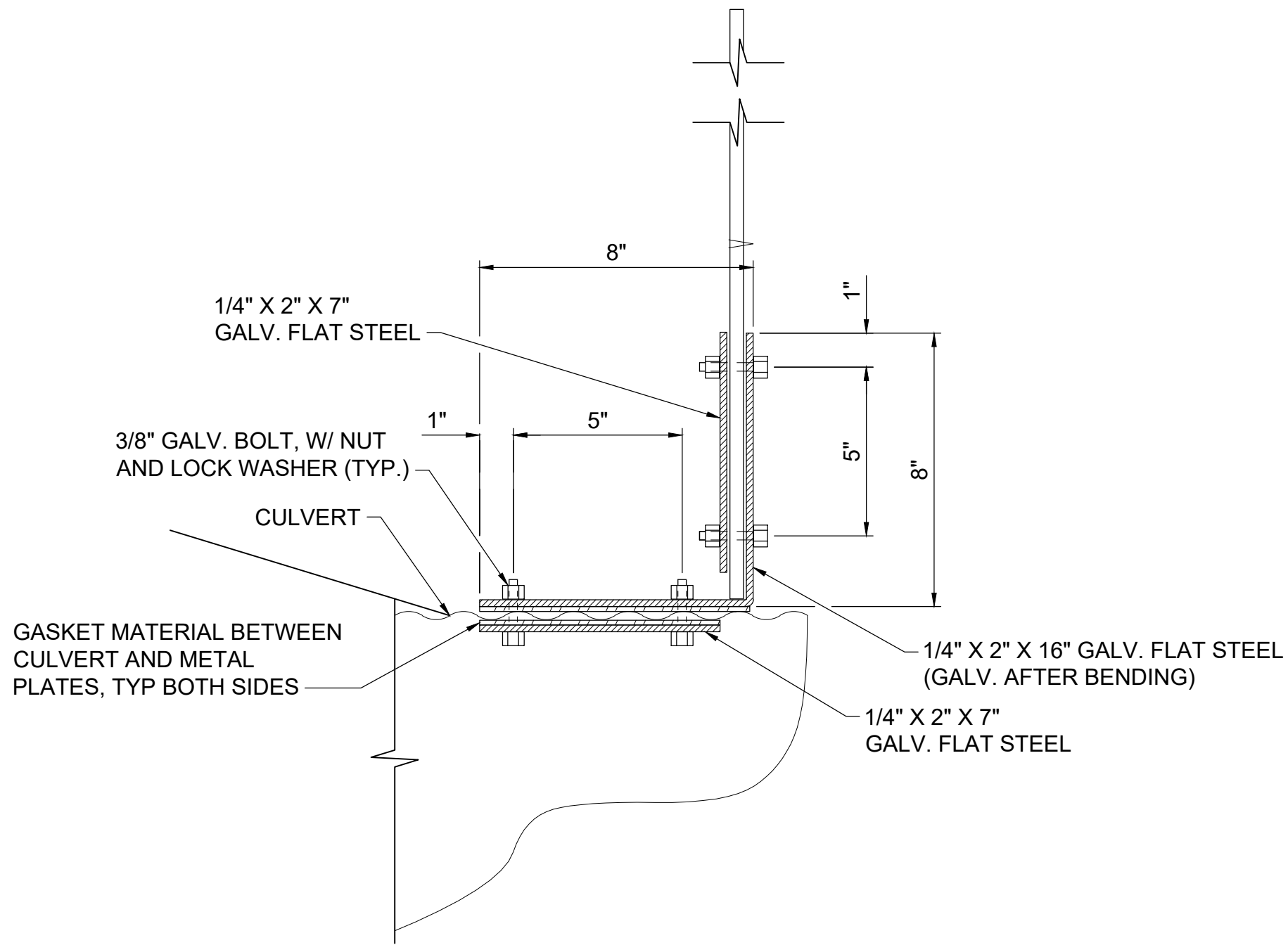
NOTES:

1. MARKER POSTS ARE TO BE INSTALLED ON ALL PROJECT CULVERTS.
2. DRILL ALL BOLT HOLES. FLAME CUTTING SHALL NOT BE PERMITTED.
3. GASKET MATERIAL SHALL BE PLACED BETWEEN DISSIMILAR METALS. GASKET MATERIAL SHALL BE APPROVED PRIOR TO INSTALLATION.

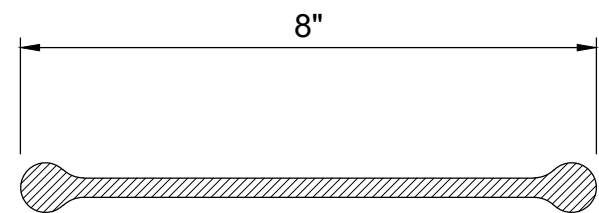


STAMP STATION AND PIPE SIZE, USING 3/8" HIGH MINIMUM LETTERS INTO A 2" X 4" X 0.064" THICK BRASS PLATE. FASTEN PLATE TO THE SIDE FACING THE ROADWAY WITH TWO 1/8" BRASS BLIND RIVETS.

3 BRASS PLATE DETAIL
C14 NTS

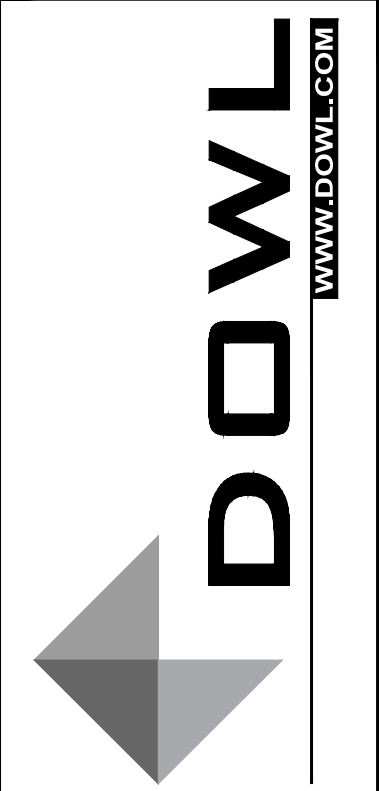
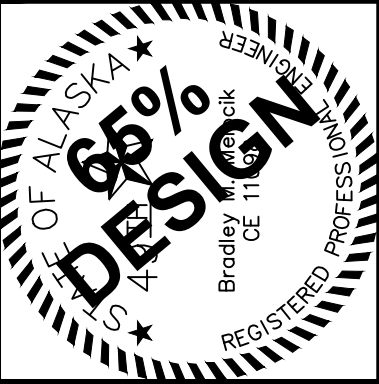


2 BRACKET DETAIL
C14 NTS



4 POST CROSS SECTION
C14 NTS

REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
CULVERT MARKER POST
BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C14 OF C14	

Attachment D: Geotechnical Report



February 3, 2025

Mr. Bill Arnold
City of Bethel
P.O. Box 1388
Bethel, AK 99559

**Subject: Task order #68 – Ptarmigan Street Culvert Crossing – Bethel, Alaska
Geotechnical Investigation and Recommendations**

Dear Mr. Arnold:

This report presents the results of our field investigation, the results of laboratory testing, and preliminary recommendations regarding foundation design and site development in support of the proposed replacement of the culverts at two locations that convey Ptarmigan Creek under Ptarmigan Street in Bethel, Alaska.

PROJECT UNDERSTANDING

The two culvert locations and the surrounding embankment were compromised after major flooding events occurred in the spring of 2024. The City of Bethel (City) intends to replace both culverts to maintain the connectivity of Bethel residents located on the west side of the culverts to the rest of Bethel. Within this report, the westernmost crossing shall be referred to as Site 1, and the easternmost crossing as Site 2.

SCOPE OF WORK

Our geotechnical scope of work for this project included:

- A review of existing geotechnical and geological information at or near the culvert replacement locations.
- Drilling four (4) borings to a depth of approximately 30 feet below the existing site grade.
- Complete associated laboratory testing on collected samples to determine engineering properties.
- Prepare a report that presents the data obtained, analysis and interpretation, and engineering recommendations with respect to the observed site soils and subsurface conditions.

Our proposal was accepted, and we received Notice-to-Proceed on September 17, 2024.

BACKGROUND REVIEW

DOWL has reviewed several geotechnical investigations in the vicinity of the subject site. The nearest investigation took place approximately ½-mile from the culvert locations. These reports and findings were reviewed to predict the subsoils at the site, determine appropriate test boring depths and quantity, and prepare a sampling plan.

Based on the regional geology and previous geotechnical explorations near the site, the subsurface site conditions were anticipated to consist of fill material composed of silty sand over multiple feet of organics over silty sand and sandy silt deposits with organics.

EXPLORATION SUMMARY

The field investigation for this site was conducted November 12 and 13, 2024. Four (4) test borings were drilled, sampled, and logged to depths of 31.5 feet below existing grade near the existing culverts.

Locations of the test borings were determined in the field by handheld GPS and are only as accurate as the method implies. Test boring locations are on Figure A-2, Test Boring Location Map (Appendix A), and a list of the exploration locations is presented as Table 1.

Table 1: Test Boring Location

Boring Number	Boring Depth (feet)	Latitude (deg)	Longitude (deg)	Location
TB-01	31.5	60.805111	-161.806626	Site 1, West culvert, North side
TB-02	31.5	60.805032	-161.806484	Site 1, West culvert, South side
TB-03	31.5	60.805067	-161.795537	Site 2, East culvert, North side
TB-04	31.5	60.804955	-161.795249	Site 2, East culvert, North side

The test boring was drilled using a Geoprobe 6620 DT track-mounted drill rig fitted with continuous-flight, hollow-stem auger. The rig is owned and operated by GeoTek Alaska out of Anchorage, Alaska. The drilling was supervised, and the samples logged by a geotechnical engineer with DOWL. Test boring logs and descriptive guide are presented in Appendix B.

A grab sample was obtained at the surface where each test boring was drilled. Disturbed samples were obtained at depths of 2.5, 5, 7.5 and 10 feet and then at 5-foot intervals thereafter using a standard split-spoon sampler.

The Standard Penetration Test (SPT) was performed in the test borings by driving a 2-inch outside-diameter, split-spoon sampler a distance of 18 inches ahead of the auger with a 140-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 standard penetration resistance (N) value shown on the test boring logs indicates the number of blows required to drive the sampler the last 12 inches. The results are an indication of the relative density or consistency of the subsoil. The N-values shown in the logs are raw data from the field and have not been adjusted for sampling equipment type or overburden pressure. In frozen soils, the SPT values are highly influenced by ice content, ground temperature, and the presence of gravel.

Soil samples recovered during drilling were classified in general accordance with ASTM D2488 (visual-manual procedures) and sealed in plastic bags to preserve the natural water content. The samples were then transported to Alaska Testlab in Anchorage in accordance with ASTM D4220, for further testing.

Laboratory Testing

Laboratory tests were performed on selected samples to measure soil index properties to provide a basis for estimating engineering properties. Soil index tests including moisture

contents and grain size analyses were performed on select samples. The natural water content of all the recovered samples was measured.

Table 2: Laboratory Tests

Test	Purpose
Natural Moisture Content ASTM D2216	Provides a measure of natural (<i>in situ</i>) water content.
Atterberg Limits ASTM D4318	Provides an indicator of the consistency and swell potential of fine-grained soils.
Particle-Size Distribution ASTM D422	Provides a measure of grain sizes of the soils for classification and identification of physical characteristics.
Limited Mechanical Analysis ASTM D1140	Provides the percentage of material finer than the #4 and #200 screen generating percentages of gravel, sand, and silt sized particles.

Laboratory testing results are presented in Appendix C.

SITE AND SUBSURFACE CONDITIONS

The two existing culvert sites are located on Ptarmigan Street. The western culvert site (Site 1) is located near Naunraq Street and eastern culvert site (Site 2) is located near the Lulu Heron Congregate Home. The area consists of residential development to the north and native ground and brush to the south.



Figure 1: Site 1 culvert crossing viewed northeast.



Figure 2: Site 2 culvert crossing viewed southwest.

Observed soils varied between test borings with varying depths and thickness of organic soils. Conditions were generalized to simplify the engineering analysis. The soils conditions observed at the Site 1 can be generalized as follows:

- 10 to 14 feet thick: Fill, silty sand with gravel to sandy silt (SM, ML), over
- 2 to 4 feet thick: Peat and Organic Silt with varying amounts of silt, sand, and fibrous organics (OL, PT), over
- 18 feet below ground surface (bgs) to drilling termination depth: Mineral silt with sand (ML, SM)

Site 1 conditions are described in greater detail in Table 3.

Table 3:Site 1 (West) Soil Unit summary

Depth (feet)		Soil Unit	USCS	Moisture Content (%)		Fines Content (%)		Blows per 12- inches	
Top	Bottom			Low	High	Low	High	Low	High
0	10-14	Fill material	SM, ML	6	23	16	22	4	8
10-14	12-18	Peat and organic silt	OL, ML, PT	34	78	-	70	3	7
18	30	Silt with sand	ML, SM	23	40	-	62	12	27

The soils conditions observed at the Site 2 can be generalized as follows:

- 0 to 10 feet: Silty sand fill (SM)
- 10 to 14 feet: Organic Silt with fine sand (OL) (OL not observed in TB-4)
- 14 to 30 feet: Silty sand (SM) with trace organics (OL)

Site 2 conditions are described in greater detail in Table 4.

Table 4:Site 2 (East) Soil Unit summary

Depth (feet)		Soil Unit	USCS	Moisture Content (%)		Fines Content (%)		Blows per 12-inches	
Top	Bottom			Low	High	Low	High	Low	High
0	10	Fill material	SM	6	21	14	39	5	25
10	14	Organic silt	OL, SM	20	60	-	43	2	8
20	30	Silty sand	SM	19	35	21	31	9	50

Groundwater. Groundwater was encountered during drilling at approximately 10 feet and 13.5 feet below ground surface at Sites 1 and 2, respectively.

Frozen Ground. Seasonally frozen ground was observed from the surface down to approximately 2 to 4.5 feet bgs. Permafrost or perennially frozen ground was not observed to the maximum depth of exploration but is common in the area.

CLIMATE

NOAA climate data for the period of 1994 through 2023 was analyzed to calculate the average and design air thawing and freezing indices for the minimum and maximum using a 100-year return period over a Weibull probability distribution. The design indices are given in Table 5. The average annual temperature in Bethel over the last 30 years is 31.5 °F; however, from 2014 to 2019 the average annual temperature ranged from 33.5 to 37 °F with air thawing indices approaching or exceeding the 100-year event in 2016 and 2019.

Table 5:Design Air-Thawing and Design Air-Freezing Indices

	Design Air Temperature Indices (°F-Degree*Days)		
	Minimum	Mean	Design or Maximum
Thawing	2,008	3,014	3,687
Freezing	1,173	3,177	5,037

ENGINEERING ANALYSIS AND DISCUSSION

In general, the proposed culvert replacements are feasible at both sites provided the organics within the bearing prism are excavated and replaced with structural fill. Our engineering analysis and recommendations assumes the new culverts will be box or pipe arch culverts with full inverts. If the design is significantly different, we will revise our recommendations accordingly. The analyses and associated recommendations for each culvert crossing are the same for both the Site 1 and 2 culvert crossings.

Bearing Capacity and Settlement. We estimate the culverts will bear on soil approximately five to six feet below the groundwater table. Soils at this depth consist of sand and mineral and organic silt with some fibrous organics.

To improve bearing conditions and combat localized settlement, over excavation and replacement with structural fill below the culverts will be recommended. A reinforcement geotextile placed between the structural fill and underlying mineral soil will provide separation to improve fill placement and reduce differential settlement below the structure. We anticipate that excavation will extend a minimum of two feet below the bottom of the culvert and should extend laterally five feet beyond the edge of the culvert. Settlement will be nearly immediate with loading and placement of backfill assuming organics are fully excavated.

An allowable bearing capacity of 3,000 psf may be used for each culvert to maintain total settlement at 1-inch or less with a differential settlement half that. Higher bearing pressures are feasible but will result in higher settlement. A completely frost-protected design including headwall installation was deemed uneconomical. Complete frost protection would require a large, deep excavation on the order of 10 feet below the bottom of culvert with structural fill placed. The recommended section is for a cost-effective solution that is not completely frost protected and may be subject to frost heave during winter months. An insulated section below the culvert to reduce frost penetration is feasible, however multiple cold years could reintroduce permafrost and frost heave at the insulation extents.

Geotextile. A reinforcement type, woven geotextile with permittivity meeting DOT&PF Reinforcement Geotextile (Type 2) specifications (729-2.01) is needed for separation and to support the overlying culverts and fill.

RECOMMENDATIONS

Bearing Capacity and Settlement. The structural section beneath each culvert shall consist of the following:

- 24 inches NFS structural fill, over
- DOT&PF Reinforcement Geotextile, Type 2, over
- Native mineral soil

To construct the structural section, excavate all organics or a minimum of two feet below the bottom of the culvert (whichever is deeper) and extend excavation five feet beyond the sides of the culvert walls.

Geotextile. The reinforcement geotextile placed at the base of the structural section shall have stitched seams and placed in accordance with DOT&PF Standard Specifications Section 630. If overlapping is required, overlaps shall be a minimum of five feet and oriented perpendicular to the culvert alignment or parallel to centerline.

CONSTRUCTION CONSIDERATIONS

Structural Fill. All 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 provided in Table 6.

Table 6: Structural Fill Gradation Requirements

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

Other fill material, which does not meet this gradation requirement, may be acceptable for use. However, the gradation of such material should be evaluated by the project geotechnical engineer prior to its use.

Excavation. Our recommendations assume that the culvert bases will be founded directly on a minimum of 2 feet of structural fill, constructed above the undisturbed silty and sandy soil.

Any peat or organic material shall be removed from below the culvert footprints extending horizontally from the edge of culverts 1-foot for each foot below the bottom of the culverts and replaced with structural fill. Frozen soil should not be used as fill or backfill and may need to be thawed until compactable or removed and replaced with compactable backfill.

Earthwork. Earthwork should be completed with quality control inspection, including bottom-of-hole inspections, fill gradation classification, and in-situ compacting testing. A bottom-of-hole inspection should be conducted by a qualified geotechnical engineer, geologist, or special inspector following each site excavation activities (and before any foundation construction begins) to visually confirm the findings of this report and provide recommendations for non-conforming conditions encountered during the excavation activities.

Fill material should be placed at 95 percent of the modified Proctor density as determined by ASTM D1557, unless specifically stated otherwise in other sections of this report. Structural fill and backfill around the culvert should be placed in six-inch lifts. All earthwork should be completed with quality control inspection.

Dewatering. Excavation for the reinforced soil mat will require dewatering or control of the adjacent stream. We anticipate sheet piles be driven around the excavation area to limit the disturbance to the site. Sheet pile shoring and dewatering should be designed by the contractor's engineer.

LIMITATIONS

DOWL based the conclusions and recommendations presented in this report, based 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 City of Bethel to 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, figures, and design details specifically for the culvert replacement project on Ptarmigan Street. 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.

Sincerely,
DOWL



Robert Sanders, EI
Geotechnical Engineer



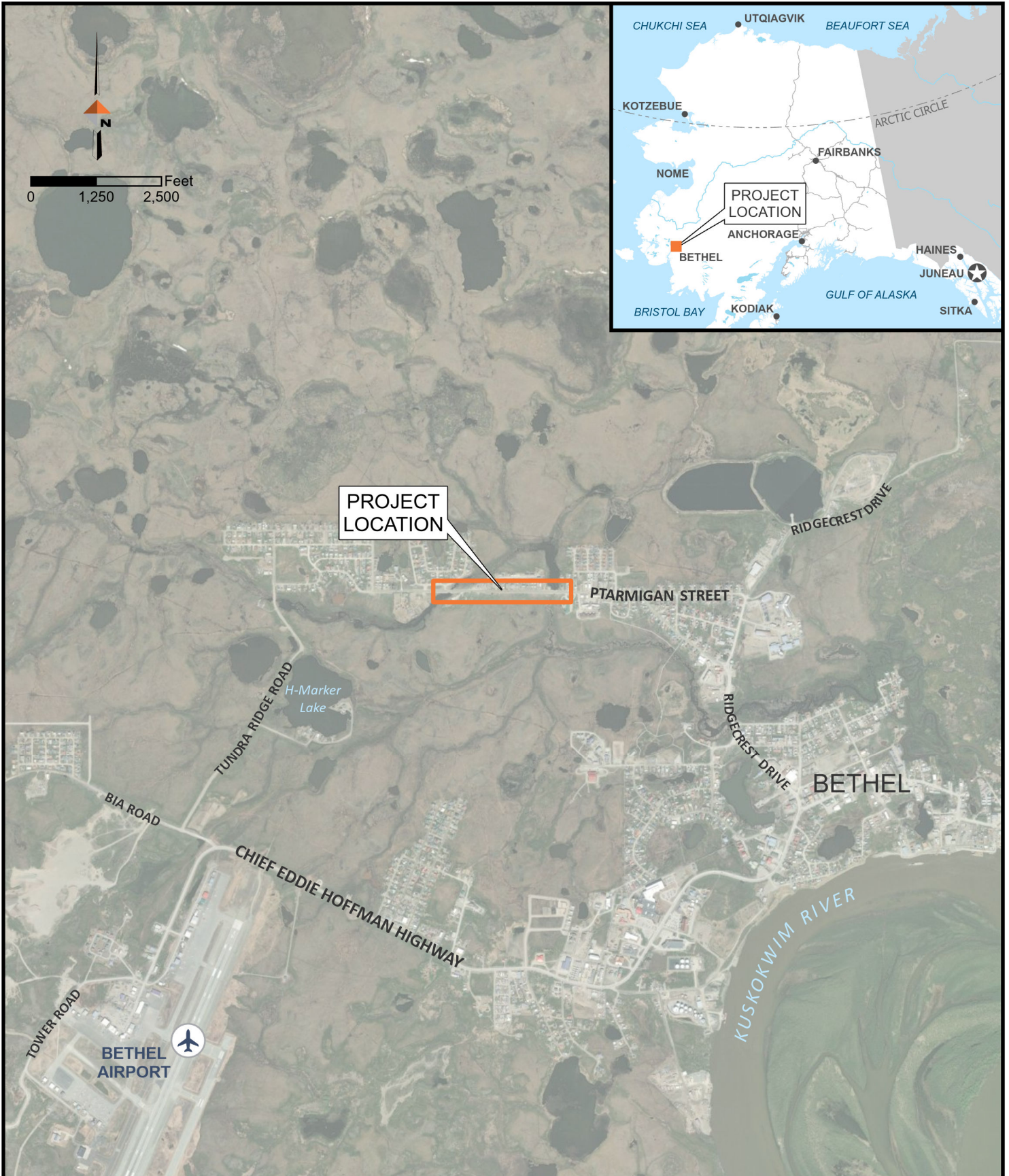
Jeremiah Holland, P.E.
Senior Geotechnical Engineer



Appendices: Appendix A: Project Location and Test Boring Location Map
 Appendix B: Test Borings Logs and Descriptive Guide
 Appendix C: Laboratory Test Result

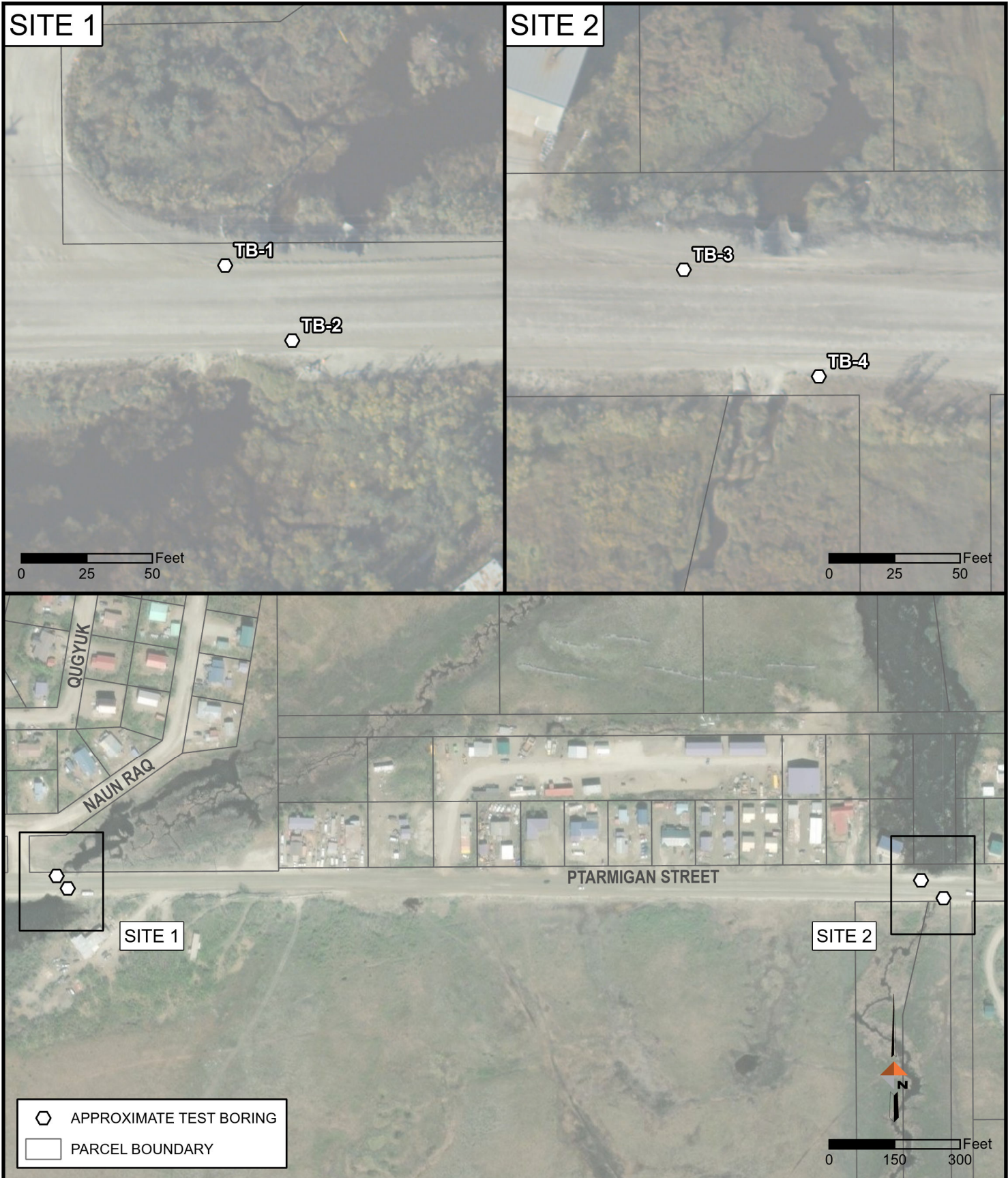
APPENDIX A

Project Vicinity and Test Boring Location Map



	PROJECT LOCATION AND VICINITY	PROJECT	1163.50270.68
	PTARMIGAN ST. CULVERT CROSSING GEOTECHNICAL INVESTIGATION	DATE	JAN 06, 2025
	BETHEL, AK	FIGURE A-1	

Service Layer Credits: World Imagery, Maxar



	TEST BORING LOCATION	PROJECT1163.50270.68
	PTARMIGAN ST. CULVERT CROSSING GEOTECHNICAL INVESTIGATION	DATEJAN 08, 2025
	BETHEL, AK	FIGURE A-2

Service Layer Credits: World Imagery: Kodiak Mapping Inc
World Imagery: Maxar

APPENDIX B

Test Boring Logs and Descriptive Guide



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-1

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/12/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.805111, -161.806626
Operator:	Mason Iverson	Drilling Water Level:	10'
Logged By:	Robert Sanders	Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Atterberg Limits (LL-PL-Pi)	Sample Number	Blow Counts	Sample Graphic					
	24	56	20	6		1		■				FILL, Silty Sand with Gravel (SM) - 25% fine, subangular to subrounded gravel; 55% fine sand; 20% fines; brown, FROZEN , Nbn	4.5
				9		2	4 3 5	▲	16.0 [89]		SM		
5	0	78	22	10		3	4 4 4	▲	16.0 [89]				
				20		4	2 2 2	▲	16.0 [89]		ML	FILL, Sandy Silt (ML) - 40% fine sand; 60% low to medium plasticity fines; wet, gray, soft	7.0
10				44		5	2 1 2	▲	12.0 [67]		PT		10.0
												Peat (PT) - 15% fine sand; wet, brown	12.0
15	0	30	70	34	NP	6	2 3 4	▲	16.0 [89]				
				35		7	5 5 7	▲	16.0 [89]		ML	Silt (ML) - 30 to 40% fine sand; 60 to 70% non plastic fines; wet, gray, firm to very stiff	11-12-24
20													
25	0	38	62	26		8	10 8 10	▲	14.0 [78]				31.5
30				27		9	3 5 7	▲	16.0 [89]				

End of Boring, backfilled with soil cuttings



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-2

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/12/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.805032, -161.806483
Operator:	Mason Iverson	▽ Drilling Water Level:	10.3'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
5				12	1		■					FILL, Silty Sand (SM) - 10% fine, subangular to subrounded gravel; 70% fine sand; 20% fines; grayish brown, FROZEN , Nbn	4.5
				19	2	4 3 4	▲	2.0 [11]				FILL, Silty Sand with Gravel (SM) - 20% fine, subrounded gravel; 65% fine sand; 15% fines; moist, brown, loose	9.5
	18	66	16	9	3	4 3 2	▲	16.0 [89]			SM	FILL, Silty Sand (SM) - 80% fine sand; 20% fines; wet, gray, loose	13.5
				23	4	2 2 2	▲	8.0 [44]				Organic Silt (OL) - 10% fine sand; 90% fines; moist to wet, brown, firm, contains fibrous organics	17.5
10	2	77	21	22	5	2 3 3	▲	16.0 [89]				Sandy Silt (ML) - 40% fine sand; 60% low to medium plasticity fines; wet, gray, stiff	27.5
												Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
15				78	6	2 3 2	▲	16.0 [89]			OL	Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
												Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
												Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
20				40	7	4 4 8	▲	18.0 [100]			ML	Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
												Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
25				26	8	7 7 10	▲	16.0 [89]			SM	Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
												Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
30				23	9	5 10 17	▲	16.0 [89]			SM	Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5

End of Boring, backfilled with soil cuttings



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-3

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/13/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	30.9'
Method:	Auger	Coordinates:	60.805067, -161.795537
Operator:	Mason Iverson	Drilling Water Level:	13.5'
Logged By:	Robert Sanders	Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
				12	1		■					FILL, Silty Sand (SM) - 10% fine to coarse, subangular to subrounded gravel; 75% fine sand; 15% fines; light brown, FROZEN , No	
0	0	77	23	6	2	6 9 9	■	16.0 [89]			SM	FILL, Silty Sand (SM) - 75% fine sand; 25% fines; wet, brownish gray, medium dense	
5													
				13	3	6 8 7	■	16.0 [89]					
				20	4	6 6 5	■	16.0 [89]					
10													9.5
				60	5	2 1 5	■	10.0 [56]			OL	Organic (OL) - 10% fine sand; 90% fines; wet, brown, firm	
15	0	57	43	30	6	2 2 3	■	16.0 [89]				Silty Sand (SM) - 55% fine sand; 45% low to medium plasticity fines; wet, gray, firm	11-13-24 13.5
													17.5
20												Silty Sand (SM) - 80% fine sand; 20% fines; wet, gray, medium dense	
				21	7	7 8 10	■	18.0 [100]			SM		23.5
25												Silty Sand (SM) - 70% fine sand; 30% fines; wet, gray	
				21	8	5 8 27	■	18.0 [100]					
30	0	69	31	24	9	36 50/5"	■	11.0 [100]					30.9

End of Boring, backfilled with soil cuttings



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-4

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/13/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.804955, -161.795249
Operator:	Mason Iverson	▽ Drilling Water Level:	13.6'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
				17	1		■						
9	52	39		21	2	2 2 3	▲	2.0 [11]					
5													4.5
				19	3	1 1 1	▲	18.0 [100]					
8	78	14		17	4	8 11 14	▲	16.0 [89]					
10													9.5
				20	5	4 4 4	▲	16.0 [89]					
15													
				22	6	1 1 1	▲	6.0 [33]					
20	0	79	21	35	7	WOH 5 8	▲	18.0 [100]					
25													
				26	8	5 9 12	▲	18.0 [100]					
30													
				19	9	3 4 5	▲	18.0 [100]					31.5

End of Boring, backfilled with soil cuttings

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 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)

Based on the Unified Soil Classification System (USCS)				USCS Soil Classification		
Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				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	
		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}	
	Sands	Clean Sands	$Cu \geq 6$ and $1 \geq Cc \leq 3$ ^E	SW	Well-graded sand ^I	
		Less than 5% fines ^D	$Cu \geq 6$ and/or $1 \leq Cc \leq 3$ ^E	SP	Poorly graded sand ^I	
		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}	
			$PI < 4$ 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}	
	Silt and Clays	Inorganic	PI plots on or above "A" line	CH	Fat clay ^{K,L,M}	
			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		F	If fines classify as CL-ML, use dual symbol GC-GM, SC-SM	
B	If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name		G	If soil contains $\geq 15\%$ sand, add "with sand to group name		
C	Gravels with 5 to 12% require dual symbols:		H	If fines are organic, add " with organic fines" to group name		
	GW-GM well-graded gravel with silt		I	If soil contains $\geq 15\%$ gravel, add "with gravel" to group name		
	GW-GC well-graded gravel with clay		J	If Atterberg Limits plot in hatched area, soil is CL-ML, silty clay		
	GP GM poorly-graded gravel with silt		K	If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.		
D	GP-GC poorly graded gravel with clay		L	If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.		
	Sands with 5 to 12% require dual symbols:		M	If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.		
	SW-SM well-graded sand with silt		N	$PI \geq 4$ or plots below "A" line		
	SW-SC well-graded sand with clay		O	$PI < 4$ or plots below "A" line		
E	SP-SM poorly graded sand with silt		P	PI plots on or above "A" line		
	SP-SC poorly graded sand with clay		Q	PI plots below A line		
E	$Cu = D_{60}/D_{10}$ $Cc = [(D_{30})^2/(D_{10} \times D_{60})]$					

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

Part I Description of Soil Phase			Classify Soil Phase by ASTM D2487 or D2488		
Part II Description of Frozen Soil	Segregated ice is not visible by eye	Group Symbol	Subgroup		Field Identification
		N	Description	Symbol	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)
			Poorly bonded or friable	Nf	
			No excess ice	Nb	
	Well-bonded Excess ice	Nbe			
	Segregated ice is visible by eye (ice 1- inc 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
			Ice coatings on particles	Vc	
			Random or irregularly oriented ice formations	Vr	
			Stratified or distinctly oriented ice formations	Vs	Estimate volume of visible segregated ice present as percentage of total sample volume. (Note 2)
			Uniformly distributed ice	Vu	
Part III Description of Substantial Ice	Ice (greater than 1-inh 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: <u>HARDNESS</u> : Hard, Soft (of mass, not individual crystals) <u>STRUCTURE</u> (Note 4): Clear, Cloudy, Porous, Canded, Granular, Stratified <u>COLOR</u> : Colorless, Gray, Blue <u>ADMIXTURES</u> : Contains few thin silt inclusions
			Ice without soil inclusions	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) Canded 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.

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 jar, 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.

FROST DESIGN SOIL CLASSIFICATION¹

Frost² 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) (MOA F2)	(a) Gravels Crushed stone Crushed rock	1.5 to 3	GW and GP
	(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	Over 15	ML and MH
	(b) Very fine silty sands		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



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details					
Sample ID	24-10360-S01	24-10360-S02	24-10360-S03	24-10360-S04	24-10360-S05
Field Sample ID					
Client Sample ID	TB-01 Sa1	TB-01 Sa2	TB-01 Sa3	TB-01 Sa4	TB-01 Sa5
Date Sampled					

Particle Size Distribution			
Method:	Sieve Size	% Passing	Limits
ASTM D 422	3in	100	
Description: Analysis of Particle Size Distribution in Soils. Sieving for Particles >75µm, Hydrometer	2in	100	
	1½in	100	
	1in	100	
	¾in	100	
	½in	99	
	3/8in	89	
Washed: Sample Washed	No.4	76	
	No.10	63	
	No.20	56	
	No.40	51	
	No.60	47	
	No.100	36	
	No.200	20	
	Finer No.200 (75µm)	18.9	

Other Test Results						
Description	Method	Results				Limits
Dispersion device	ASTM D 422	Dispersant by hand				
Dispersion time (min)						
Shape						
Hardness						
Water Content (%)	ASTM D2216	6	9	10	20	44
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487	SM			SM	
Group Name		Silty sand with gravel			Silty sand	
Liquid Limit		0			0	
Plasticity Index		0			0	
Gravel (%)		24			0	
Sand (%)		56			78	
Fines (%)		20			22	
Tested By	ASTM D2487	Desirae Pascale			Desirae Pascale	

Comments
Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10360-S06	24-10360-S07	24-10360-S08	24-10360-S09
Field Sample ID				
Client Sample ID	TB-01 Sa6	TB-01 Sa7	TB-01 Sa8	TB-01 Sa9
Date Sampled				

Particle Size Distribution

Method:	Sieve Size	% Passing	Limits
ASTM D 422	3in	100	
Description: Analysis of Particle Size Distribution in Soils. Sieving for Particles >75µm, Hydrometer	2in	100	
	1½in	100	
	1in	100	
	¾in	100	
	½in	100	
	3/8in	100	
Washed: Sample Washed	No.4	100.0	
	No.10	100	
	No.20	100	
	No.40	100	
	No.60	98	
	No.100	89	
	No.200	70	

Other Test Results

Description	Method	Results	Limits
Water Content (%)	ASTM D2216	34 35 26 27	
Date Tested		11/22/2024 11/22/2024 11/22/2024 11/22/2024	
Tested By		Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale	
Group Code	ASTM D2487	ML ML	
Group Name		Sandy silt Sandy silt	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		0	
Sand (%)		30	
Fines (%)		70	
Tested By	ASTM D2487	Desirae Pascale Desirae Pascale	
Liquid Limit	ASTM D4318	Not Obtainable	
Plastic Limit		NP (Non-Plastic)	
Plasticity Index		NP (Non-Plastic)	
As-Received Water Content (%)		33.9	
Preparation Method		Air Dry	
Oversize Removed By		Dry Sieving over No. 40 sieve	
Liquid Limit Apparatus		Mechanical	
Grooving Tool		Plastic	
Rolling		Hand	
Tested By		Cindy Zickefoose	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10360-S06	24-10360-S07	24-10360-S08	24-10360-S09
Field Sample ID				
Client Sample ID	TB-01 Sa6	TB-01 Sa7	TB-01 Sa8	TB-01 Sa9
Date Sampled				

Other Test Results

Description	Method	Results	Limits
Date Tested	ASTM D4318	11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10593
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details						
Sample ID	24-10593-S01	24-10593-S02	24-10593-S03	24-10593-S04	24-10593-S05	
Field Sample ID						
Client Sample ID	TB-02 Sa1	TB-02 Sa2	TB-02 Sa3	TB-02 Sa4	TB-02 Sa5	
Date Sampled						
Other Test Results						
Description	Method	Results				Limits
Water Content (%)	ASTM D2216	12	19	9	23	22
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487			SM		SM
Group Name				Silty sand with gravel		Silty sand
Liquid Limit				0		0
Plasticity Index				0		0
Gravel (%)				18		2
Sand (%)				66		77
Fines (%)				16		21
Tested By	ASTM D2487			Desirae Pascale		Desirae Pascale

Comments
Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10593
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10593-S06	24-10593-S07	24-10593-S08	24-10593-S09
Field Sample ID				
Client Sample ID	TB-02 Sa6	TB-02 Sa7	TB-02 Sa8	TB-02 Sa9
Date Sampled				

Other Test Results

Description	Method	Results				Limits
Water Content (%)	ASTM D2216	78	40	26	23	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10594
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details						
Sample ID	24-10594-S01	24-10594-S02	24-10594-S03	24-10594-S04	24-10594-S05	
Field Sample ID						
Client Sample ID	TB-03 Sa1	TB-03 Sa2	TB-03 Sa3	TB-03 Sa4	TB-03 Sa5	
Date Sampled						
Other Test Results						
Description	Method	Results				Limits
Water Content (%)	ASTM D2216	12	6	13	20	60
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487		SM			
Group Name			Silty sand			
Liquid Limit			0			
Plasticity Index			0			
Gravel (%)			0			
Sand (%)			77			
Fines (%)			23			
Tested By	ASTM D2487		Desirae Pascale			

Comments
Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10594
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10594-S06	24-10594-S07	24-10594-S08	24-10594-S09
Field Sample ID				
Client Sample ID	TB-03 Sa6	TB-03 Sa7	TB-03 Sa8	TB-03 Sa9
Date Sampled				

Particle Size Distribution

Method:	Sieve Size	% Passing	Limits
ASTM D6913	3in	100	
Description: Sieve Analysis of Soil	2in	100	
	1½in	100	
	1in	100	
	¾in	100	
	¾in	100	
Drying By: Oven	½in	100	
	3/8in	100	
Washed: Sample Washed	No.4	100.0	
	No.10	100	
	No.20	100	
	No.40	100	
	No.60	99	
	No.100	85	
	No.200	31	

Other Test Results

Description	Method	Results	Limits
Water Content (%)	ASTM D2216	30 21 21 24	
Date Tested		11/22/2024 11/22/2024 11/22/2024 11/22/2024	
Tested By		Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale	
Group Code	ASTM D2487	SM SM	
Group Name		Silty sand Silty sand	
Liquid Limit		0 0	
Plasticity Index		0 0	
Gravel (%)		0 0	
Sand (%)		57 69	
Fines (%)		43 31	
Tested By	ASTM D2487	Desirae Pascale Desirae Pascale	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10595-S01	24-10595-S02	24-10595-S03	24-10595-S04	24-10595-S05
Field Sample ID					
Client Sample ID	TB-04 Sa1	TB-04 Sa2	TB-04 Sa3	TB-04 Sa4	TB-04 Sa5
Date Sampled					

Particle Size Distribution

Method:	Sieve Size	% Passing				Limits
ASTM D 422	3in		100		100	
	2in		100		100	
Description:	1½in		100		100	
Analysis of Particle Size	1in		100		100	
Distribution in Soils. Sieving for	¾in		100		98	
Particles >75µm, Hydrometer	½in		100		95	
	3/8in		96		93	
Washed:	No.4		91		91.8	
Sample Washed	No.10		86		89	
	No.20		83		85	
	No.40		81		82	
	No.60		76		73	
	No.100		62		45	
	No.200		39		14	
	Finer No.200 (75µm)		35.7			

Other Test Results

Description	Method	Results					Limits
Water Content (%)	ASTM D2216	17	21	19	17	20	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	
Dispersion device	ASTM D 422		Dispersant by hand				
Dispersion time (min)							
Shape							
Hardness							
Group Code	ASTM D2487		SM		SM		
Group Name			Silty sand		Silty sand		
Atterberg Limits Estimated					Yes		
Liquid Limit			0				
Plasticity Index			0				
Gravel (%)			9		8		
Sand (%)			52		78		
Fines (%)			39		14		
Tested By	ASTM D2487		Desirae Pascale		Desirae Pascale		

Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503

Project Code: 241419

CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID	24-10595-S01	24-10595-S02	24-10595-S03	24-10595-S04	24-10595-S05
Field Sample ID					
Client Sample ID	TB-04 Sa1	TB-04 Sa2	TB-04 Sa3	TB-04 Sa4	TB-04 Sa5
Date Sampled					

Other Test Results

Description	Method	Results	Limits
Method	ASTM D6913		A
Preparation Method			Oven Dry
Composite Sieving?			Yes
Separating Sieve(s)			No. 4
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10595-S06	24-10595-S07	24-10595-S08	24-10595-S09
Field Sample ID				
Client Sample ID	TB-04 Sa6	TB-04 Sa7	TB-04 Sa8	TB-04 Sa9
Date Sampled				

Other Test Results

Description	Method	Results				Limits
Water Content (%)	ASTM D2216	22	35	26	19	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	
Group Code	ASTM D2487		SM			
Group Name			Silty sand			
Liquid Limit			0			
Plasticity Index			0			
Gravel (%)			0			
Sand (%)			79			
Fines (%)			21			
Tested By	ASTM D2487		Desirae Pascale			

Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10360-S01
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10360-S01
Client Sample ID TB-01 Sa1
Specification Sieve

Particle Size Distribution

Method: ASTM D 422

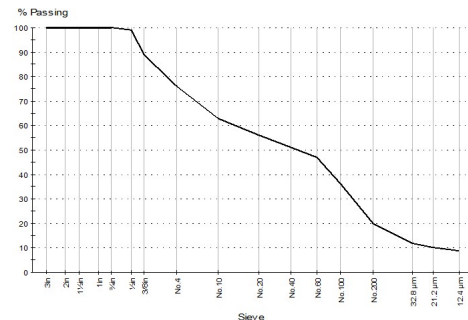
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	99	
3/8in	89	
No.4	76	
No.10	63	
No.20	56	
No.40	51	
No.60	47	
No.100	36	
No.200	20	
Finer No.200 (75µm)	18.9	
32.8 µm	11.9	
21.2 µm	10.0	
12.4 µm	8.8	

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			
Water Content (%)	ASTM D2216	6	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand with gravel	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		24	
Sand (%)		56	
Fines (%)		20	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	

Chart



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10360-S06
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10360-S06
Client Sample ID TB-01 Sa6

Particle Size Distribution

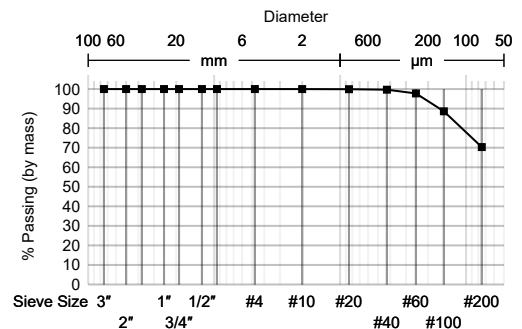
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	100	
No.4	100.0	
No.10	100	
No.20	100	
No.40	100	
No.60	98	
No.100	89	
No.200	70	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	34	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	ML	
Group Name		Sandy silt	
Gravel (%)		0	
Sand (%)		30	
Fines (%)		70	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	
	ASTM D4318		
Liquid Limit		Not Obtainable	
Plastic Limit		NP (Non-Plastic)	
Plasticity Index		NP (Non-Plastic)	
As-Received Water Content (%)		33.9	
Preparation Method		Air Dry	
Oversize Removed By		Dry Sieving over No. 40 sieve	
Liquid Limit Apparatus		Mechanical	
Grooving Tool		Plastic	
Rolling		Hand	
Tested By		Cindy Zickefoose	
Date Tested		11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

N/A



Material Test Report

Report No: MAT:24-10594-S09
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10594-S09
Client Sample ID TB-03 Sa9

Particle Size Distribution

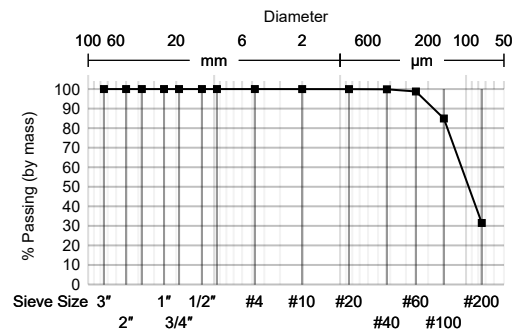
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	100	
No.4	100.0	
No.10	100	
No.20	100	
No.40	100	
No.60	99	
No.100	85	
No.200	31	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	24	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		0	
Sand (%)		69	
Fines (%)		31	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing
No Plasticity Index Test Performed



Material Test Report

Report No: MAT:24-10595-S02
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503

Project Code: 241419

CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

[Signature]

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10595-S02
Client Sample ID TB-04 Sa2
Specification Sieve

Particle Size Distribution

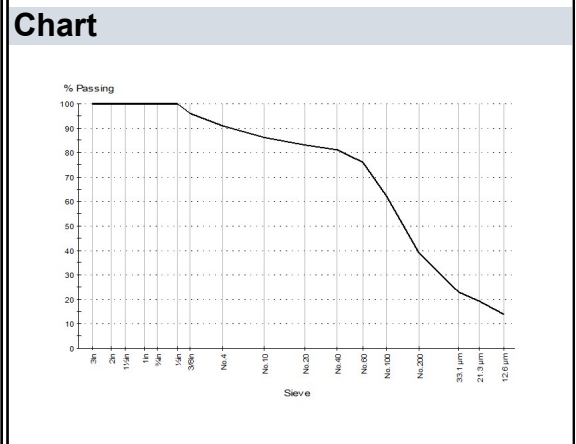
Method: ASTM D 422

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	96	
No.4	91	
No.10	86	
No.20	83	
No.40	81	
No.60	76	
No.100	62	
No.200	39	
Finer No.200 (75µm)	35.7	
33.1 µm	22.9	
21.3 µm	19.1	
12.6 µm	14.0	

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			
Water Content (%)	ASTM D2216	21	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		9	
Sand (%)		52	
Fines (%)		39	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10595-S04
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10595-S04
Client Sample ID TB-04 Sa4

Particle Size Distribution

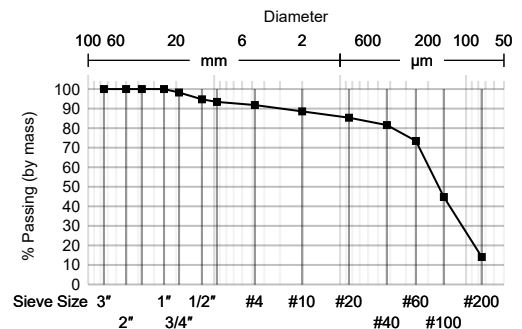
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	98	
½in	95	
3/8in	93	
No.4	91.8	
No.10	89	
No.20	85	
No.40	82	
No.60	73	
No.100	45	
No.200	14	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	17	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Atterberg Limits Estimated		Yes	
Gravel (%)		8	
Sand (%)		78	
Fines (%)		14	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing

Attachment A: Bid Form

BID FORM
PURCHASE STRUCTURAL PLATE CULVERTS

Provide all culvert materials, bands, and miscellaneous accessories/hardware required to assemble the requested pipe arch culverts (assembly to be completed by a third party and is not in contract) identified in the drawings attached and as described in the scope of work, specifications, and Bid Form. The award will be based on the low bid submitted and the ability to provide materials for construction in 2025. The City of Bethel reserves the right to reject any and all bids if materials cannot be delivered by the **June 1, 2025**, deadline.

To be completed by the Bidder:

Item	Description	Unit	Bid Price
602.0002.0120	STRUCTURAL PLATE GALVANIZED STEEL ARCH CULVERT 12'-10" SPAN, 8'-4" RISE, (120' LENGTH)	LS	\$ _____
602.0002.0100	STRUCTURAL PLATE GALVANIZED STEEL ARCH CULVERT 12'-10" SPAN, 8'-4" RISE, (100' LENGTH)	LS	\$ _____
TOTAL			\$ _____

The anticipated date for delivery of materials to Bethel, Alaska is _____.

**THE CITY OF BETHEL
ALASKA
PTARMIGAN ST CULVERT REPLACEMENT
PROJECT: DESIGN DOCUMENT PREPARATION
ARCHITECTURE / ENGINEERING SERVICES FOR
CULVERTS**

STATEMENT OF WORK

February 2025

**THE CITY OF BETHEL
REQUEST FOR BIDS: PTARMIGAN ST CULVERTS-2025**

PURCHASE CULVERTS

Ptarmigan St Culvert Replacements

1.1 Introduction

The City of Bethel is seeking bids to procure two culverts for a culvert replacement project in Bethel, AK. The bid also includes the necessary engineering, i.e. shop drawings, manufacturing, delivery, and offloading of the culverts to Bethel, Alaska

1.2 General Statement of Work

Provide all culvert materials, bands, and miscellaneous accessories/hardware required to assemble the requested pipe arch culverts (assembly to be completed by a third party and is not in contract) identified in the drawings attached and as described in the scope of work, specifications, and Bid Form. Provide engineering calculations and shop drawings as required for the Culvert Bridge Design Package as described in the specifications. Ship culvert materials to Bethel, Alaska. Deliver materials to the laydown area at Port of Bethel, located at 919 Front Street, Bethel, AK 99559. Notify the City of Bethel at least 3 business days prior to the arrival of materials in Bethel, Alaska.

At the date of this RFP, design drawings for the Ptarmigan St culverts are at 65% design and therefore not stamped. Drawings will be stamped prior to culvert installation.

1.3 Specifications, Codes, Ordinances, and Standards

Comply with the current Alaska Department of Transportation and Public Facilities (ADOT&PF) Standard Specifications for Highway Construction (SSHC) 2020 Edition. Modifications, clarifications, and special project provisions are detailed in the following sections. The requirements in these specifications and special provisions are part of this solicitation and resultant contract.

SECTION 602

STRUCTURAL PLATE PIPE

Special Provisions

602-1.01 DESCRIPTION. Add the following:

Furnish manufacturer-designed culvert bridges to meet the contract requirements. Provide manufacturer shop drawings and an independent structural analysis and design check. For review and approval, provide design calculations with load ratings for the culvert bridges.

Add the following Subsection:

602-1.02 DEFINITIONS.

Culvert Bridge stands for culverts and buried structures meeting the requirements of National Bridge Inspection Standards (NBIS) CFR§650.305; individual culverts and buried structures greater than 10 feet in width, as measured along the centerline of roadway crossing over the structure. When specified in the contract or required by the DOR (Designer of Record), this includes the headwalls, toe walls, wingwalls, and foundation.

Culvert Bridge Design Package (CBDP). DOR design calculations, DOR load ratings, IE design check calculations, IE load ratings, working drawings, and specifications.

Designer of Record (DOR). A civil engineer registered as a Professional Engineer in the State of Alaska, and in responsible charge of the work described. The DOR must have adequate and relevant prior structural design and inspection experience. The DOR may delegate portions of design, quality acceptance, and inspection work, to qualified technicians.

Independent Design Check (IDC). An independent design check of the design and load rating calculations including but not limited to: design, load ratings, location and dimensions of the foundation, structural members, connections, erection plan and temporary bracing (when required), safety barrier, and independent calculations of design loads, member stress, material properties, hydraulic capacity and scour protection.

Independent Engineer (IE). An engineer registered as Professional Engineer in the State of Alaska, and in responsible charge of the independent design check. The engineer responsible for the check must have adequate and relevant prior structural design experience. The IE must be from a different firm than the DOR.

602-2.01 MATERIALS. Add the following:

Furnish a corrugated Galvanized steel plate pipe-arch culvert:

Material: Galvanized steel

Minimum material thickness: 7 gage (0.188")

Length: 120 feet

Span: 12 feet 10 inches

Rise: 8 feet 4 inches

Area: 85 square feet

Live loading: HL-93

Minimum cover: 3.0 feet

Maximum cover: 40 feet

Furnish a corrugated Galvanized steel structural plate pipe-arch culvert:

Material: Galvanized steel

Minimum material thickness: 7 gage (0.188")

Length: 100 feet

Span: 12 feet 10 inches

Rise: 8 feet 4 inches

Area: 85 square feet

Live loading: HL-93

Minimum cover: 3.0 feet

Maximum cover: 40 feet

Add the following Subsection:

602-2.03 DESIGN REQUIREMENTS. Retain the services of a DOR to design and provide a CBDP for each culvert bridge. Retain the services of an IE to perform an IDC of each CBDP.

1. Design culvert bridges according to the following documents:
 - a. Alaska DOT&PF Standard Specifications for Highway Construction for recommended construction methods, material properties, and sampling and testing;
 - b. AASHTO LRFD Bridge Design Specifications, as modified by Subsection 602-2.03;
 - c. Alaska Highway Preconstruction Manual; and the
 - d. Alaska Bridges and Structures Manual (BSM).
2. Design culvert bridges that:
 - a. Support 100% of HL-93 live loads without overstress. Follow the most recent version, including the interim version, of the AASHTO LRFD Bridge Design Specifications. Indicate governing live load on working drawings;

- b. Meet the design life specified in AASHTO LRFD Bridge Design Specifications after allowing for metal section loss associated with abrasion and pH levels of the substrate and water;
 - c. Meet the seismic acceleration values recommended in the AASHTO LRFD Bridge Design Specifications;
 - d. Include the capacities and demands of load-supporting members in the design calculations;
 - e. Meet the dimensions, stations, offsets, and elevations of inverts and riprap requirements shown on the plans, with approved variances as stated in these specifications; and
 - f. Provide the minimum hydraulic capacity shown on the Plans when openings are required to allow for the passage of water.
 - g. Provide the minimum horizontal and vertical clearances shown on the Plans when openings are required to allow the passage of traffic. If no vertical clearance is provided, follow the requirements in the Alaska Highway Preconstruction Manual.
3. Provide working drawings for culvert bridges including:
- a. Dimensions controlling the culvert bridge design and erection, including proposed fill depth, corrugation spacing, corrugation depth, gauge thickness, concrete thickness, reinforcing steel size and locations, clear opening sizes, utility size and locations, and similar controlling dimensions;
 - b. Design loads and material properties; and
 - c. The soil bearing values.
4. Provide load ratings for the culvert bridges according to the most recent version, interim version, of the AASHTO Manual for Bridge Evaluation (MBE) and the BSM. Load rate metal and concrete culvert bridges using the Load Factor Rating (LFR) and Load and Resistance Factor Rating (LRFR) methods.

Provide load ratings that reflect the bridge culvert final as-constructed condition. Include values for moment, shear and, where applicable, thrust for concrete culvert bridges. Include values for wall area, buckling, and seam strength for metal culvert bridges. Specify live load type, placement for maximum stress, distribution, and impact.

Include the following cases for LFR load ratings:

- a. Inventory with multiple lanes and impact included
- b. Operating with multiple lanes and impact not included
- c. Operating with one lane centered on the roadway and impact not included.

Add the following Subsection:

602-2.04 DESIGN SUBMITTALS AND REVIEW. Submit the following for review and approval at least 30 days prior to the beginning of manufacture related to the culvert bridges:

1. The CBDP. The design drawings and load ratings in the CBDP must be stamped with the seal of, dated by, and signed by the DOR;
2. An IDC letter stamped with the seal of, dated by, and signed by the IE certifying: "The Culvert Design Bridge Package meets the AASHTO LRFD Bridge Design Specifications, the AASHTO Manual for Bridge Evaluation, and the Contract requirements".

Revise and resubmit the CBDP to incorporate any comments received during review. Resubmit the IDC letter after comments have been incorporated.

The approval of the CBDP shall not be construed as complete review but will only indicate that the general method of construction and working drawings are acceptable to the Engineer, that the CBDP appears complete, and that an IDC letter was provided. The Buried Bridge Manufacturer shall remain responsible for all structural calculations and load rating completed for the culvert bridge.

602-3.01 CONSTRUCTION REQUIREMENTS. Add the following:

The Culvert Manufacturer shall be responsible for shipping.

If requested by the Engineer, provide the Engineer access to the manufacturer's installation recommendations.

602-5.01 BASIS OF PAYMENT. Delete the first sentence and replace with the following:

All work including labor, materials, and equipment necessary to complete design and load rating for culvert bridges and meet the submittal requirements stated in this Section is subsidiary to Section 602 pay items.

All work including labor, materials, and equipment associated with furnishing and transporting culvert bridges is subsidiary to Section 602 pay items.

Replace the Pay Item table with the following:

Pay Item	Pay Unit
602.0002.0120 Structural Plate Galvanized Steel Arch Culvert, 12'-10" Span, 8'-4" Rise (120' Length)	Lump Sum
602.0002.0100 Structural Plate Galvanized Steel Arch Culvert, 12'-10" Span, 8'-4" Rise (100' Length)	Lump Sum

1.4 Delivery

Delivery will be to the Port of Bethel, located at 919 Front Street, Bethel, AK 99559.

Contact The Bethel City, Public Works Director (Bill Arnold, 907-543-2018, warnold@cityofbethel.net) with any questions regarding this location. Please notify when product is being shipped.

Delivery Date: Fabrication time from award of bid is estimated to take up to 16 weeks with delivery taking up to 2 weeks.

Desired delivery date is May 1, 2025. Materials must be delivered no later than **June 1, 2025**.

1.5 Schedule

The permitted/anticipated work window for construction of the culverts is June 1, 2025 to July 31, 2025.

February 26, 2025	Bids due
March 2, 2025	Anticipated award / purchase order.
March 9, 2025	Provide shop drawings to The City of Bethel. Expect a one-week review period.
June 1, 2025	All materials delivered on or before June 1, 2025 .

1.6 Attachments

- A. Bid Form
- B. 65% Design Plans for Ptarmigan St Culverts
- C. Geotechnical Report

Appendix A: Bid Form

BID FORM
PURCHASE STRUCTURAL PLATE CULVERTS

Provide all culvert materials, bands, and miscellaneous accessories/hardware required to assemble the requested pipe arch culverts (assembly to be completed by a third party and is not in contract) identified in the drawings attached and as described in the scope of work, specifications, and Bid Form. The award will be based on the low bid submitted and the ability to provide materials for construction in 2025. The City of Bethel reserves the right to reject any and all bids if materials cannot be delivered by the **June 1, 2025**, deadline.

To be completed by the Bidder:

Item	Description	Unit	Bid Price
602.0002.0120	STRUCTURAL PLATE GALVANIZED STEEL ARCH CULVERT 12'-10" SPAN, 8'-4" RISE, (120' LENGTH)	LS	\$ _____
602.0002.0100	STRUCTURAL PLATE GALVANIZED STEEL ARCH CULVERT 12'-10" SPAN, 8'-4" RISE, (100' LENGTH)	LS	\$ _____
TOTAL			\$ _____

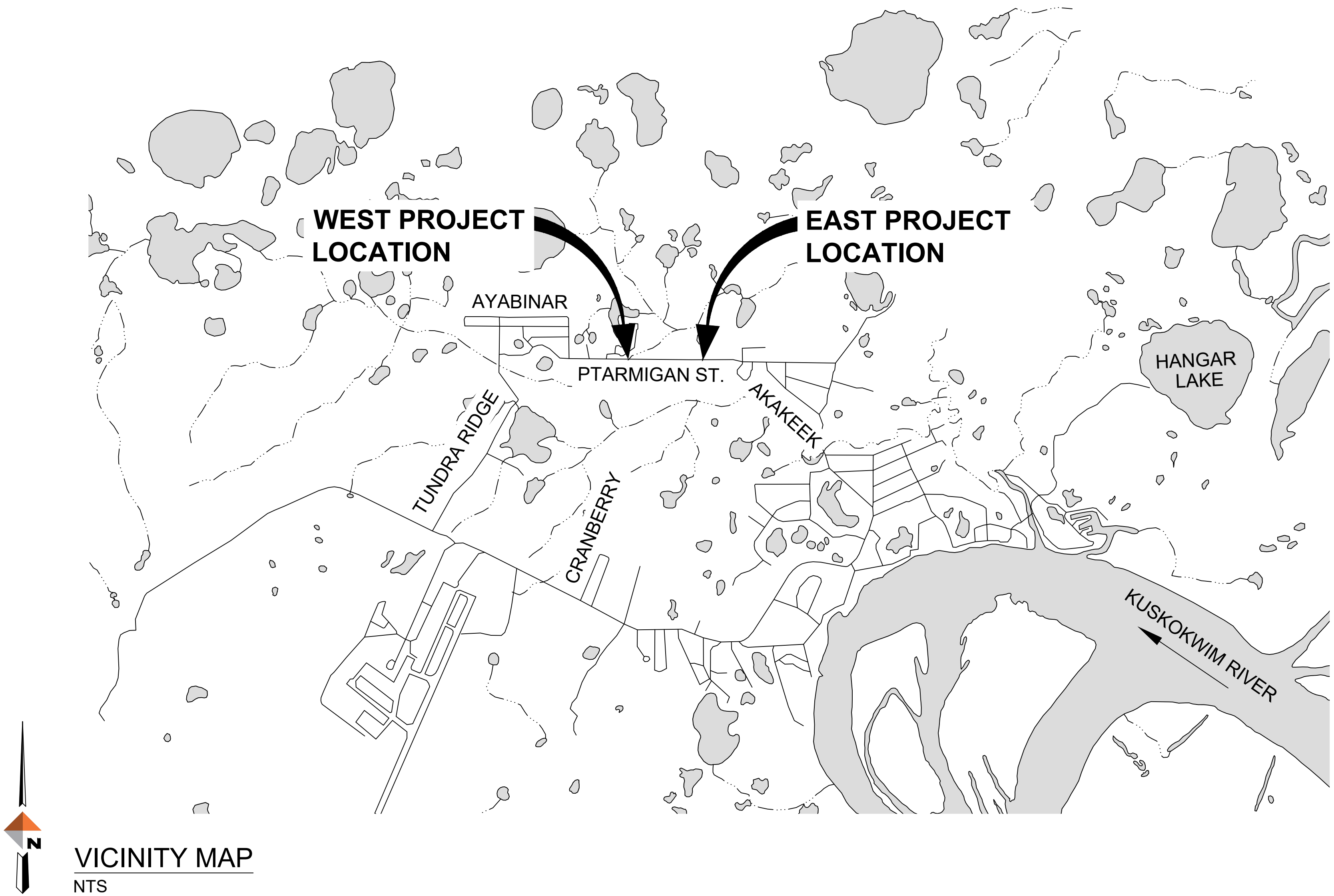
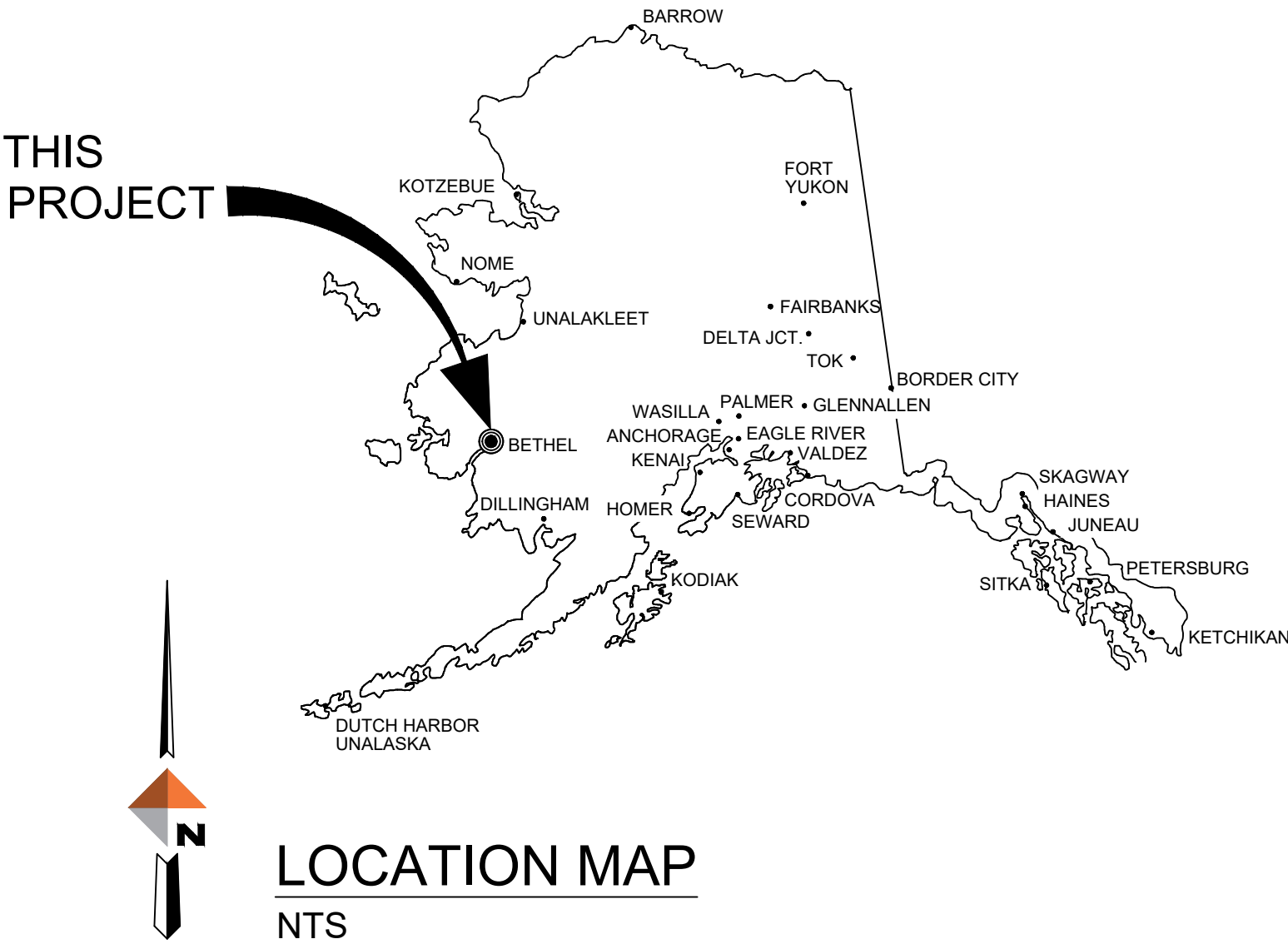
The anticipated date for delivery of materials to Bethel, Alaska is _____.

Appendix B: 65% Design Plans for Ptarmigan St Culverts

CONTRACT DRAWINGS FOR

PTARMIGAN STREET CULVERT CROSSINGS PTARMIGAN CREEK FISH PASSAGE IMPROVEMENT PROJECTS CITY OF BETHEL

SECTION 6, TOWNSHIP 8 NORTH, RANGE 71 WEST, SEWARD MERIDIAN, ALASKA
JANUARY 2025



DRAWING INDEX	
C1	COVER SHEET
C2	GENERAL NOTES AND QUANTITIES
C3	SURVEY CONTROL - WEST CULVERT
C4	SURVEY CONTROL - EAST CULVERT
C5	EXISTING STREAM PLAN AND PROFILE - WEST CULVERT
C6	EXISTING STREAM PLAN AND PROFILE - EAST CULVERT
C7	STREAM PLAN AND PROFILE - WEST CULVERT
C8	STREAM PLAN AND PROFILE - EAST CULVERT
C9	ROADWAY PLAN AND PROFILE
C10	DETAILS AND TYPICAL SECTIONS
C11	ESCP & STREAM DIVERSION PLAN
C12	REVEGETATION PLAN
C13	BANK RECONSTRUCTION
C14	CULVERT MARKER POST

PROJECT	LOCATION	WATERBODY NAME	ADF&G ANADROMOUS WATERS CATALOG CODE
WEST CULVERT	PTARMIGAN ST.	PTARMIGAN CREEK	335-10-16600-2621-3020
EAST CULVERT			

65% PLANS

ESTIMATE OF QUANTITIES - WEST CULVERT				
ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	UNIT
202.0004.0000	REMOVAL OF CULVERT PIPE	LUMP SUM	135	LINEAR FOOT
203.0019.0000	UNCLASSIFIED EXCAVATION	LUMP SUM	330	CUBIC YARD
203.0020.000A	BORROW, SELECTED MATERIAL, TYPE A	LUMP SUM	935	CUBIC YARD
203.0020.000F	SUBBASE, GRADING F	LUMP SUM	638	CUBIC YARD
205.0005.0000	CONTROLLED LOW-STRENGTH MATERIAL	LUMP SUM	44	CUBIC YARD
301.0004.0000	AGGREGATE SURFACE COURSE, GRADING E-1	LUMP SUM	72	CUBIC YARD
602.0005.0000	ASSEMBLE AND INSTALL STRUCTURAL PLATE ALUMINUM ARCH CULVERT, 7GA, 12'-10" SPAN, 8'-4" RISE	LUMP SUM	120	LINEAR FOOT
610.0001.0000	DITCH LINING	LUMP SUM	110	CUBIC YARD
613.0002.0000	CULVERT MARKER POST	LUMP SUM	2	EACH
618.0005.0000	SEEDING	LUMP SUM	11	POUND
630.0003.0002	GEOTEXTILE, REINFORCEMENT, TYPE 2	LUMP SUM	660	SQUARE YARD
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
642.0014.0000	AS-BUILT PLANS	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	WATERWAY BED FILL	LUMP SUM	117	CUBIC YARD
690.2003.0000	WATERWAY BANK REVEGETATION AND PROTECTION	LUMP SUM	ALL REQUIRED	LUMP SUM

ABBREVIATIONS	
AVASP	AS VERTICAL AS SAFELY POSSIBLE
BFW	BANKFULL WIDTH
CFS	CUBIC FEET PER SECOND
CL	CENTERLINE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
CRH	COPPER RIVER HIGHWAY
CTC	CORDOVA TELECOM COOPERATIVE
ELEV	ELEVATION
ESCP	EROSION AND SEDIMENT CONTROL PLAN
HW/D	HEADWATER TO DEPTH RATIO
MIN	MINIMUM
MP	MILEPOST
NTS	NOT TO SCALE
OHW	ORDINARY HIGH WATER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PC	PTARMIGAN CREEK
Q	FLOW
ROW	RIGHT-OF-WAY
SPP	STRUCTURAL PLATE PIPE
STA	STATION
TCE	TEMPORARY CONSTRUCTION EASEMENT
TYP	TYPICAL

TABLE 3	
WATERWAY BED FILL	
SIZE/SIEVE	% PASSING
12"	100
9"	100
6"	90
4"	79
3"	65
1"	41
0.75"	30
#4	19
#8	15

QUANTITIES NOTES:

- ESTIMATE OF QUANTITIES ARE FOR INFORMATION ONLY AND CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES.
- EXCAVATION AND BACKFILL REQUIRED FOR STREAM DIVERSION AS SHOWN ON SHEET C11 IS SUBSIDIARY TO PAY ITEM 672.0001.0000 STREAM DIVERSION & DEWATERING.
- WATERWAY BED FILL SHALL BE PRODUCED BY MIXING, BY VOLUME, 35% SELECTED MATERIAL, TYPE D, AND 65% DITCH LINING. REFER TO SPECIFICATION SECTION 690 AND DETAIL 1/C10 FOR MORE INFORMATION ABOUT WATERWAY BED FILL MATERIAL.
- BORROW, SELECTED MATERIAL, TYPE A SHALL BE COMMERCIALY SOURCED IF MATERIAL FOUND DURING EXCAVATION DOES NOT MEET CONTRACT SPECIFICATIONS.

ESTIMATE OF QUANTITIES - EAST CULVERT				
ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	UNIT
202.0004.0000	REMOVAL OF CULVERT PIPE	LUMP SUM	126	LINEAR FOOT
203.0019.0000	UNCLASSIFIED EXCAVATION	LUMP SUM	330	CUBIC YARD
203.0020.000A	BORROW, SELECTED MATERIAL, TYPE A	LUMP SUM	781	CUBIC YARD
203.0020.000F	SUBBASE, GRADING F	LUMP SUM	539	CUBIC YARD
205.0005.0000	CONTROLLED LOW-STRENGTH MATERIAL	LUMP SUM	33	CUBIC YARD
301.0004.0000	AGGREGATE SURFACE COURSE, GRADING E-1	LUMP SUM	60	CUBIC YARD
602.0005.0000	ASSEMBLE AND INSTALL STRUCTURAL PLATE ALUMINUM ARCH CULVERT, 7GA, 12'-10" SPAN, 8'-4" RISE	LUMP SUM	100	LINEAR FOOT
610.0001.0000	DITCH LINING	LUMP SUM	77	CUBIC YARD
613.0002.0000	CULVERT MARKER POST	LUMP SUM	2	EACH
618.0005.0000	SEEDING	LUMP SUM	12	POUND
630.0003.0002	GEOTEXTILE, REINFORCEMENT, TYPE 2	LUMP SUM	550	SQUARE YARD
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
642.0014.0000	AS-BUILT PLANS	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	WATERWAY BED FILL	LUMP SUM	84	CUBIC YARD
690.2003.0000	WATERWAY BANK REVEGETATION AND PROTECTION	LUMP SUM	ALL REQUIRED	LUMP SUM

GENERAL NOTES:

- 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 OWNER'S REPRESENTATIVE.
- UTILITIES ARE SHOWN ON THE PLANS TO THE EXTENT THEY ARE KNOWN. BEFORE CONDUCTING ANY GROUND-DISTURBING ACTIVITIES THE CONTRACTOR SHALL VERIFY UTILITY LOCATIONS. CONTACT THE ALASKA DIGLINE AT 1-907-278-3121 OR AT 811AK.COM. LOCATE ALL UTILITIES WITHIN THE PROJECT AND PROTECT THEM FROM DAMAGE THROUGH THE DURATION OF WORK.
- COORDINATE CONSTRUCTION STAGING AND MOBILIZATION AREAS AND ACTIVITIES WITH OWNER'S REPRESENTATIVE. COORDINATION WITH CITY OF BETHEL DEPARTMENT OF PUBLIC WORKS IS REQUIRED FOR CONCURRENCE.
- EXERCISE CAUTION AND COMPLY WITH ALL APPLICABLE OSHA REQUIREMENTS FOR WORKING IN CONFINED AREAS.
- STATIONING IS ALONG CENTERLINE OF STREAM OR ROADWAY.
- VERIFY ELEVATIONS OF ALL PROPOSED STRUCTURES PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES FROM PLANS IMMEDIATELY TO OWNER'S REPRESENTATIVE.
- CULVERT DESIGN LOAD: AASHTO LOADING HL-93, MINIMUM SOIL BEARING CAPACITY: 3,000 PSF.
- EXCAVATION AND COMPACTION:
 - REMOVE AND DISPOSE OF ALL ORGANIC OR OVERSATURATED SOFT MATERIAL, WHICH CANNOT BE COMPACTED.
 - BACKFILL SHALL BE PLACED AND COMPACTED WITH CARE AND SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY ON BOTH SIDES OF PIPE. MATERIAL TO BE COMPACTED TO 95% MAXIMUM DENSITY.
- CULVERT INSTALLATION:
 - CULVERT INFILL MATERIAL SHALL BE INSTALLED IN PIPE ACCORDING TO PLANS. MANUAL INSTALLATION IS REQUIRED.
- ALL VEGETATION IN THE AREAS NOT AFFECTED BY WORK SHALL BE PRESERVED AND PROTECTED BY THE CONTRACTOR. SEE REVEGETATION PLAN.
- VEGETATIVE MAT WITHIN THE AREA OF DISTURBANCE SHALL BE SALVAGED, STORED AND CARED FOR AS DIRECTED BY THE OWNER REPRESENTATIVE UNTIL IT CAN BE REINSTALLED.

LEGEND:

	DESCRIPTION
	CONTROL POINT
	APPROXIMATE RIGHT-OF-WAY
	ORDINARY HIGH WATER
	EXISTING CULVERT
	EDGE OF PAVEMENT
	EDGE OF GRAVEL/SHOULDER
	EDGE OF VEGETATION
	EXISTING THALWEG
	TOP OF BANK
	TOE OF SLOPE
	PROPOSED CULVERT
	WATERWAY BED FILL
	WATERWAY BANK REVEGETATION AND PROTECTION
	VEGETATIVE MAT
	DITCH LINING
	AGGREGATE SURFACE COURSE, E-1
	SELECTED MATERIAL, TYPE A
	SUBBASE, GRADING F
	ORGANIC SOILS AND VEGETATIVE MAT, AS AVAILABLE; TOPSOIL, SEED, FERTILIZER, AND MULCH, AS NEEDED
	BULK BAG COFFERDAM

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
GENERAL NOTES AND QUANTITIES

BETHEL, ALASKA

PROJECT 1163.50270.68
DATE JANUARY 2025

○ DOWL 2025

SHEET

C2 OF C14

REV

DATE

DESCRIPTION

1

2

3

4

5

6

7

8

9

10

11

REVISIONS

BY

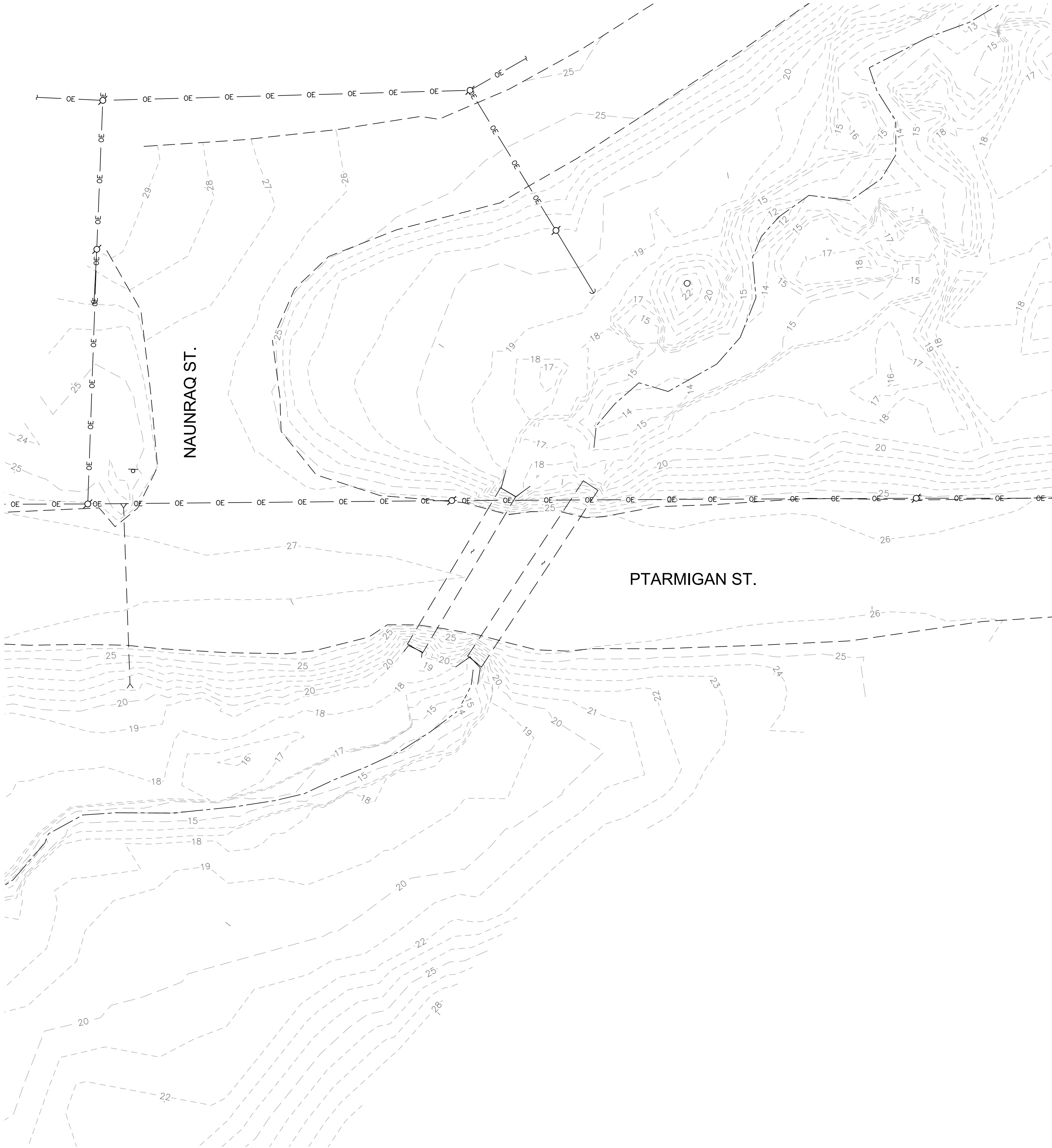
66% DESIGN

REGISTERED PROFESSIONAL ENGINEER

Bradley M. Bradley

CE 11635 MECH

C:\dowl_pw\0418828\C3-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:38 SAVED DATE 2025-01-28 11:38 USER: rduerst



SURVEY CONTROL NOTES:

HORIZONTAL CONTROL

COORDINATE SYSTEM:

THIS PROJECT IS LOCATED ENTIRELY WITHIN THE KUSKOKWIM RIVER 2015 LOW DISTORTION PROJECTION (LDP) COORDINATE SYSTEM. THIS LDP WAS DEVELOPED IN 2015 BY THE STATE OF ALASKA DOT&PF CENTRAL REGION SURVEY SECTION. THIS LDP COVERS COMMUNITIES ON AND AROUND THE LOWER KUSKOKWIM RIVER FROM THE RIVER'S MOUTH TO THE COMMUNITY OF CHUATHBALUK. BERING SEA COASTAL COMMUNITIES FROM CHEFORNAK TO KONGIGANAK ARE ALSO INCLUDED.

BASIS OF COORDINATES:

THE BASIS OF COORDINATES IS NGS STATION BET C (PID:DF3624) PROJECT POINT 553. SAID STATION IS LOCATED WITHIN THE FENCED AREA OF THE BETHEL AIRPORT AND HAS A NAD83(2011) POSITION OF LATITUDE 60°47'03.11084" N, LONGITUDE 161°50'08.36533" W, ELLIPSOID HEIGHT 42.527 METERS. BET C HAS PROJECT COORDINATES OF N 1034266.0570, E 582894.7332 U.S. FEET.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS IS A LOCAL PLANE BEARING BETWEEN NGS STATION BET C (PID: DF3624) AND NGS STATION BET B (PID: DF3623). NGS STATION BET B BEARS S 25°34'22.5" W A DISTANCE OF 2672.876 FEET FROM NGS STATION BET C, ALL AS DETERMINED BY STATIC GNSS TECHNIQUES. NGS STATION BET B HAS PROJECT COORDINATES OF N 1031854.9671, E 581740.9628 U.S. FEET.

TRANSLATION PARAMETERS:

KUSKOKWIM RIVER 2015 LDP PARAMETERS

LINEAR UNIT: U.S. SURVEY FEET

DATUM: NAD83(2011)

ELLIPSOID: GRS80

PROJECTION: HOTINE OBLIQUE MERCATOR

LATITUDE OF CENTER: 60°40'00" N

LONGITUDE OF CENTER: 162°00'00" W

AZIMUTH: 50°00'00"

FALSE NORTHING: -15,500,000.0'

FALSE EASTING: -19,100,000.0'

GRID SCALE FACTOR: 1.000002 (EXACT)

VERTICAL CONTROL

BASIS OF VERTICAL IS LOCAL MEAN TIDE LEVEL, AS DETERMINED FROM LEVELS PERFORMED BY ALASKA DOT&PF BETWEEN TIDAL BENCHMARK NO.6 (1970) AND TIDAL BENCHMARK NO.7 (1970). A DATUM ADJUSTMENT OF -1.55 FEET WAS APPLIED TO THE PUBLISHED MLLW ELEVATIONS PER NOAA/NOS PUBLICATION OF 1/22/71, TO ARRIVE AT PROJECT MEAN TIDE VALUES.

[601]BENCHMARK NO.6 (1970): A BRASS DISK ON COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF AT CAP LEVEL, IS LOCATED +/-400 FEET WESTERLY ALONG THIRD AVENUE (HOFFMAN HIGHWAY) FROM ITS INTERSECTION WITH MAIN STREET, +/-53 FEET SOUTH OF CENTERLINE, +/-20 FEET SOUTH OF UTILITY POLE #L1P70 AND +/-15 FEET NORTH OF THE MIDDLE OF A 2-STORY WOOD BUILDING. ELEVATION = 19.97 FEET (USED THIS SURVEY)

BENCHMARK NO.7 (1970): A BRASS DISK ON A COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF 0.4' BELOW CAP LEVEL, IS LOCATED +/-750 FEET WESTERLY ALONG FOURTH AVENUE FROM ITS INTERSECTION WITH MAIN STREET AND +/-8 FEET NORTH OF THE SOUTHEAST CORNER OF THE BOTTOM STEP LEADING TO THE MAIN ENTRANCE OF THE NATIONAL GUARD ARMORY (UNDER AN ELEVATED, METAL GRATE WALKWAY). ELEVATION = 25.57 FEET (NOT USED THIS SURVEY)

[554]BENCHMARK PS-3(2003): A BRASS CAP IN A BROKEN PVC PIPE FLUSH IN GROUND, IS LOCATED +/-23 FEET SOUTHWEST FROM THE EDGE OF TUNDRA RIDGE ROAD AND +/-27 FEET NORTHWEST FROM THE EDGE OR GEORGE STREET. ELEVATION = 37.58 FEET (USED THIS SURVEY)

VERTICAL CONTROL WAS EXTENDED THROUGHOUT THE PROJECT AREA USING DIFFERENTIAL LEVELING METHODS.

A LEICA DNA10 DIGITAL LEVEL AND LEICA LGO SOFTWARE WERE USED TO CHECK ADJUSTED ELEVATIONS. ELEVATIONS FOR THE LISTED BENCHMARKS WERE PROVIDED TO DOWL BY THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES.

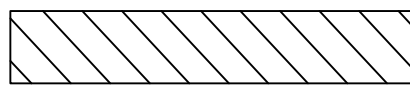
ALL ELEVATIONS ON CONTROL POINTS AND BENCHMARKS NEED TO BE FIELD VERIFIED BEFORE THEY ARE USED.

SURVEY POINTS:

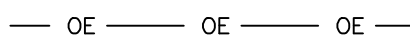
CONTROL MONUMENTS FOUND THIS SURVEY

ID	REC. NORTHING	REC. EASTING	REC. ELEV.	DESCRIPTION
567	1041934.5807	588490.8424	-9999	RCM Fd AM[DOT]: RCM 567
588	1041867.3884	590514.5170	34.83	STS Set AC[12041]: BRR-588
589	1041886.1205	589529.5735	16.03	STS Set AC[12041]: BRR-589

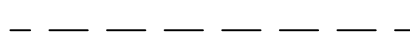
LEGEND



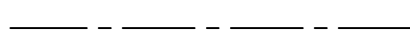
BUILDING OUTLINE



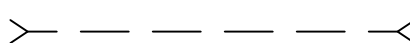
OVERHEAD UTILITY LINES



EDGE OF GRAVEL



CREEK CENTER/THALWEG



CULVERT



MINOR CONTOUR LINE (1')



MAJOR CONTOUR LINE (5')



SIGN



UTILITY POLE



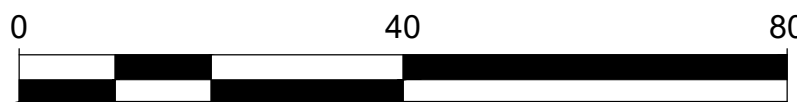
GUY ANCHOR



SURVEY MONUMENT FOUND



SURVEY MONUMENT POINT NUMBER



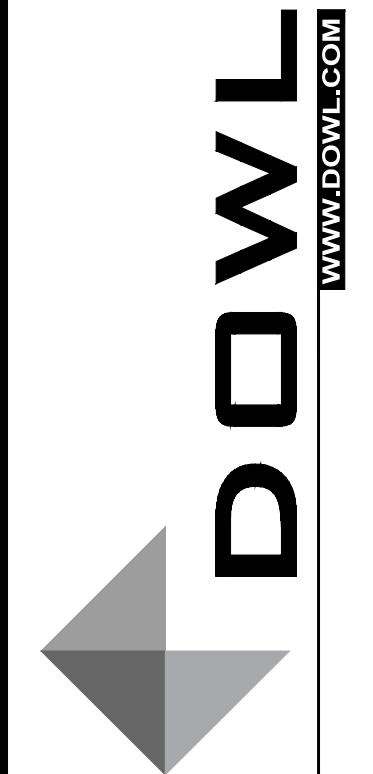
SCALE IN FEET

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
SURVEY CONTROL – WEST CULVERT

PROJECT 1163.50270.68
DATE JANUARY 2025

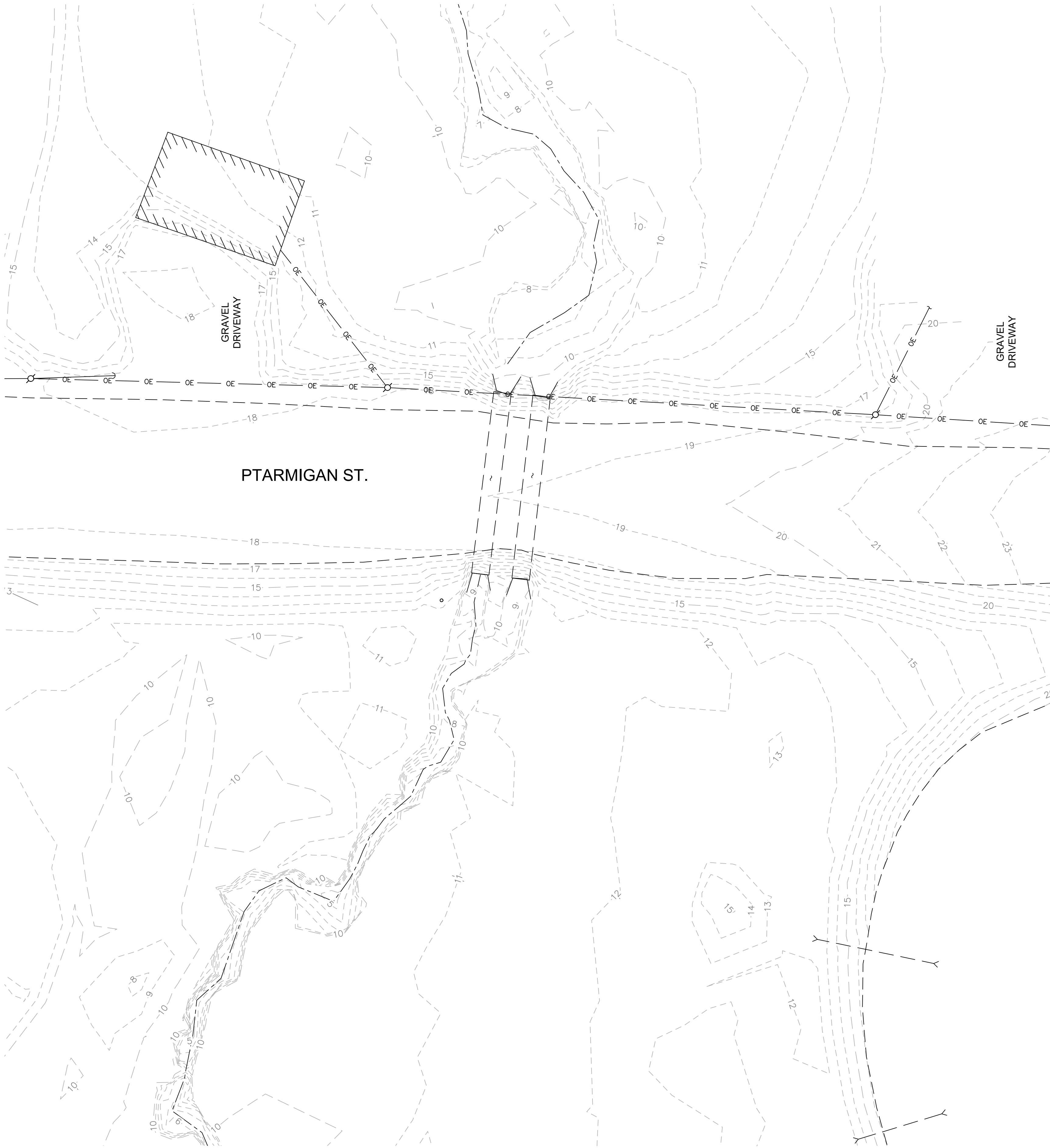
DOWL 2025
SHEET

C3 OF C14



REV	DATE	DESCRIPTION	BY

C:\dowl_pw\0418828\C4-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:39 SAVED DATE 2025-01-28 11:39 USER: rduerst



SURVEY CONTROL NOTES:

HORIZONTAL CONTROL

COORDINATE SYSTEM:

THIS PROJECT IS LOCATED ENTIRELY WITHIN THE KUSKOKWIM RIVER 2015 LOW DISTORTION PROJECTION (LDP) COORDINATE SYSTEM. THIS LDP WAS DEVELOPED IN 2015 BY THE STATE OF ALASKA DOT&PF CENTRAL REGION SURVEY SECTION. THIS LDP COVERS COMMUNITIES ON AND AROUND THE LOWER KUSKOKWIM RIVER FROM THE RIVER'S MOUTH TO THE COMMUNITY OF CHUATHBALUK. BERING SEA COASTAL COMMUNITIES FROM CHEFORNAK TO KONGIGANAK ARE ALSO INCLUDED.

BASIS OF COORDINATES:

THE BASIS OF COORDINATES IS NGS STATION BET C (PID:DF3624) PROJECT POINT 553. SAID STATION IS LOCATED WITHIN THE FENCED AREA OF THE BETHEL AIRPORT AND HAS A NAD83(2011) POSITION OF LATITUDE 60°47'03.11084" N, LONGITUDE 161°50'08.36533" W, ELLIPSOID HEIGHT 42.527 METERS. BET C HAS PROJECT COORDINATES OF N 1034266.0570, E 582894.7332 U.S. FEET.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS IS A LOCAL PLANE BEARING BETWEEN NGS STATION BET C (PID: DF3624) AND NGS STATION BET B (PID: DF3623). NGS STATION BET B BEARS S 25°34'22.5" W A DISTANCE OF 2672.876 FEET FROM NGS STATION BET C, ALL AS DETERMINED BY STATIC GNSS TECHNIQUES. NGS STATION BET B HAS PROJECT COORDINATES OF N 1031854.9671, E 581740.9628 U.S. FEET.

TRANSLATION PARAMETERS:

KUSKOKWIM RIVER 2015 LDP PARAMETERS

LINEAR UNIT: U.S. SURVEY FEET

DATUM: NAD83(2011)

ELLIPSOID: GRS80

PROJECTION: HOTINE OBLIQUE MERCATOR

LATITUDE OF CENTER: 60°40'00" N

LONGITUDE OF CENTER: 162°00'00" W

AZIMUTH: 50°00'00"

FALSE NORTHING: -15,500,000.0'

FALSE EASTING: -19,100,000.0'

GRID SCALE FACTOR: 1.000002 (EXACT)

VERTICAL CONTROL

BASIS OF VERTICAL IS LOCAL MEAN TIDE LEVEL, AS DETERMINED FROM LEVELS PERFORMED BY ALASKA DOT&PF BETWEEN TIDAL BENCHMARK NO.6 (1970) AND TIDAL BENCHMARK NO.7 (1970). A DATUM ADJUSTMENT OF -1.55 FEET WAS APPLIED TO THE PUBLISHED MLLW ELEVATIONS PER NOAA/NOS PUBLICATION OF 1/22/71, TO ARRIVE AT PROJECT MEAN TIDE VALUES.

[601]BENCHMARK NO.6 (1970): A BRASS DISK ON COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF AT CAP LEVEL, IS LOCATED +/-400 FEET WESTERLY ALONG THIRD AVENUE (HOFFMAN HIGHWAY) FROM ITS INTERSECTION WITH MAIN STREET, +/-53 FEET SOUTH OF CENTERLINE, +/-20 FEET SOUTH OF UTILITY POLE #L1P70 AND +/-15 FEET NORTH OF THE MIDDLE OF A 2-STORY WOOD BUILDING. ELEVATION = 19.97 FEET (USED THIS SURVEY)

BENCHMARK NO.7 (1970): A BRASS DISK ON A COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF 0.4' BELOW CAP LEVEL, IS LOCATED +/-750 FEET WESTERLY ALONG FOURTH AVENUE FROM ITS INTERSECTION WITH MAIN STREET AND +/-8 FEET NORTH OF THE SOUTHEAST CORNER OF THE BOTTOM STEP LEADING TO THE MAIN ENTRANCE OF THE NATIONAL GUARD ARMORY (UNDER AN ELEVATED, METAL GRATE WALKWAY). ELEVATION = 25.57 FEET (NOT USED THIS SURVEY)

[554]BENCHMARK PS-3(2003): A BRASS CAP IN A BROKEN PVC PIPE FLUSH IN GROUND, IS LOCATED +/-23 FEET SOUTHWEST FROM THE EDGE OF TUNDRA RIDGE ROAD AND +/-27 FEET NORTHWEST FROM THE EDGE OR GEORGE STREET. ELEVATION = 37.58 FEET (USED THIS SURVEY)

VERTICAL CONTROL WAS EXTENDED THROUGHOUT THE PROJECT AREA USING DIFFERENTIAL LEVELING METHODS.

A LEICA DNA10 DIGITAL LEVEL AND LEICA LGO SOFTWARE WERE USED TO CHECK ADJUSTED ELEVATIONS. ELEVATIONS FOR THE LISTED BENCHMARKS WERE PROVIDED TO DOWL BY THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES.

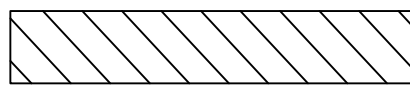
ALL ELEVATIONS ON CONTROL POINTS AND BENCHMARKS NEED TO BE FIELD VERIFIED BEFORE THEY ARE USED.

SURVEY POINTS:

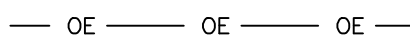
CONTROL MONUMENTS FOUND THIS SURVEY

ID	REC. NORTHING	REC. EASTING	REC. ELEV.	DESCRIPTION
567	1041934.5807	588490.8424	-9999	RCM Fd AM[DOT]: RCM 567
588	1041867.3884	590514.5170	34.83	STS Set AC[12041]: BRR-588
589	1041886.1205	589529.5735	16.03	STS Set AC[12041]: BRR-589

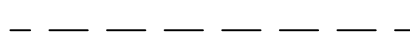
LEGEND



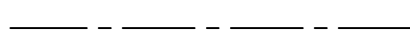
BUILDING OUTLINE



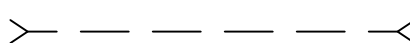
OVERHEAD UTILITY LINES



EDGE OF GRAVEL



CREEK CENTER/THALWEG



CULVERT



MINOR CONTOUR LINE (1')



MAJOR CONTOUR LINE (5')



SIGN



UTILITY POLE



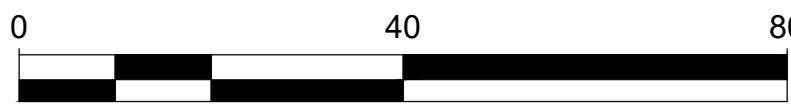
GUY ANCHOR



SURVEY MONUMENT FOUND



SURVEY MONUMENT POINT NUMBER



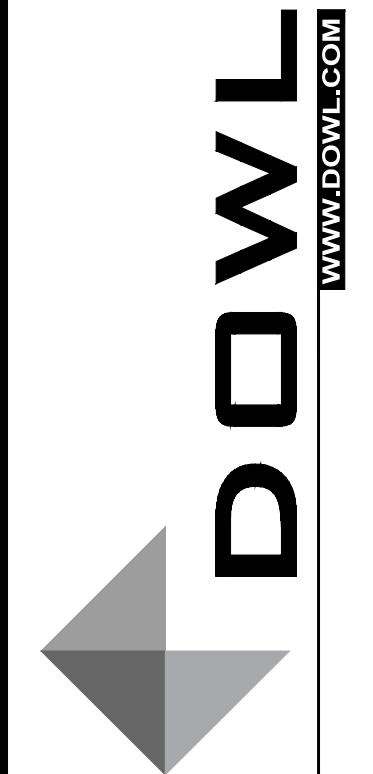
SCALE IN FEET

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
SURVEY CONTROL – EAST CULVERT

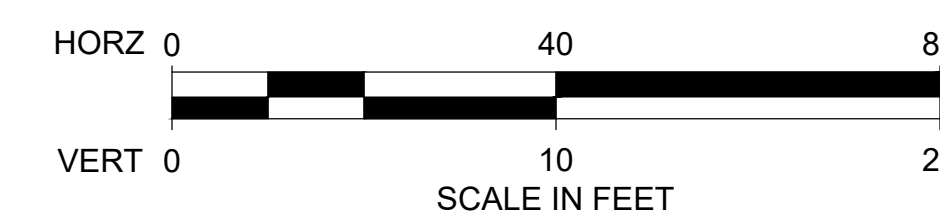
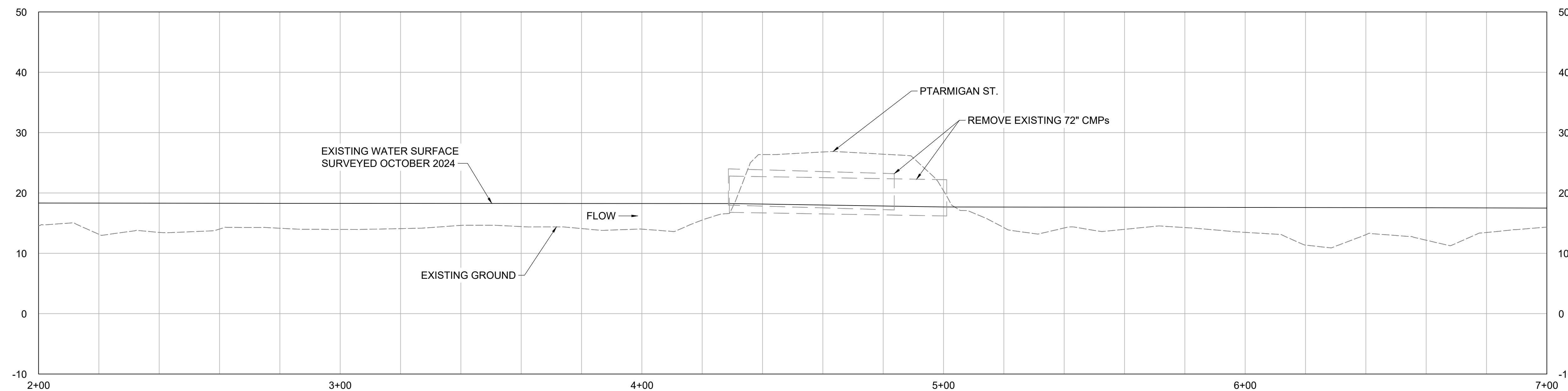
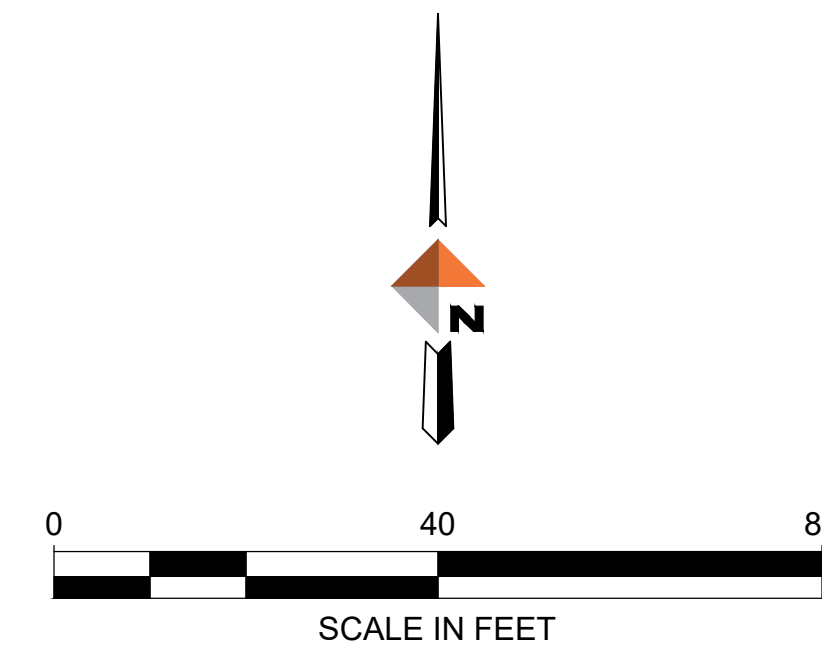
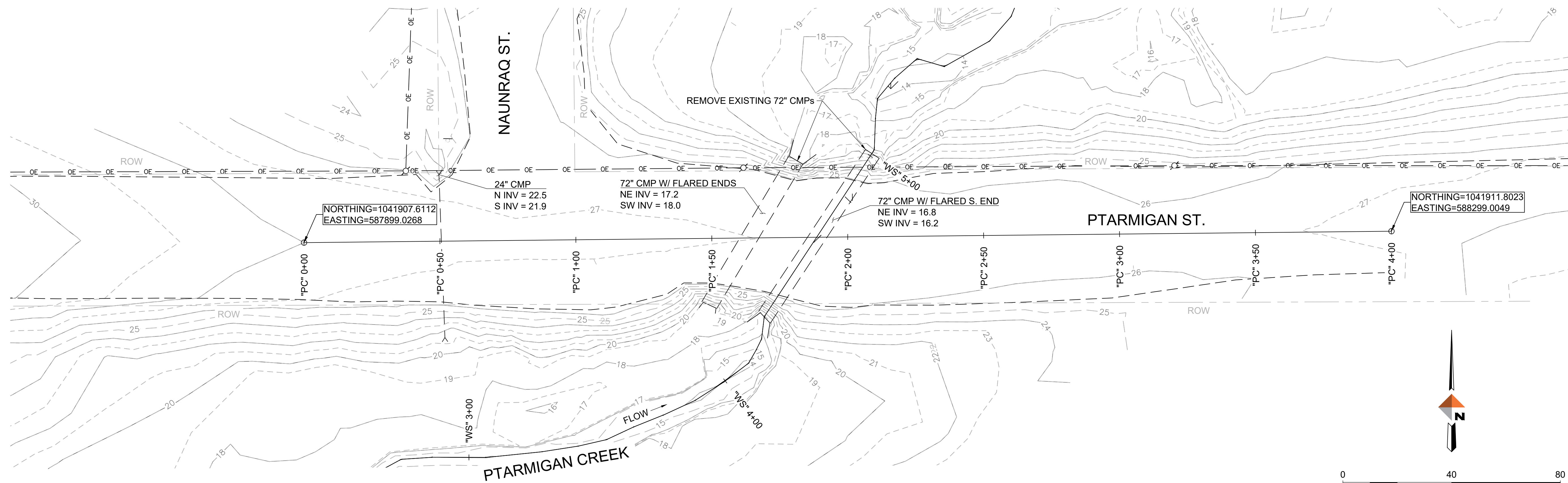
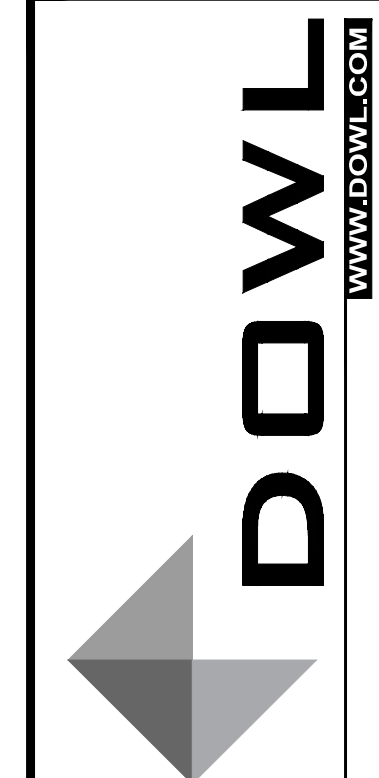
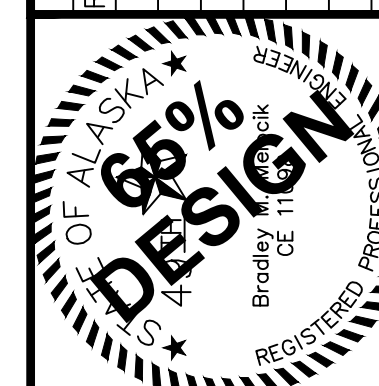
PROJECT 1163.50270.68
DATE JANUARY 2025

DOWL 2025
SHEET

C4 OF C14



REV	DATE	DESCRIPTION	BY

[illegible]

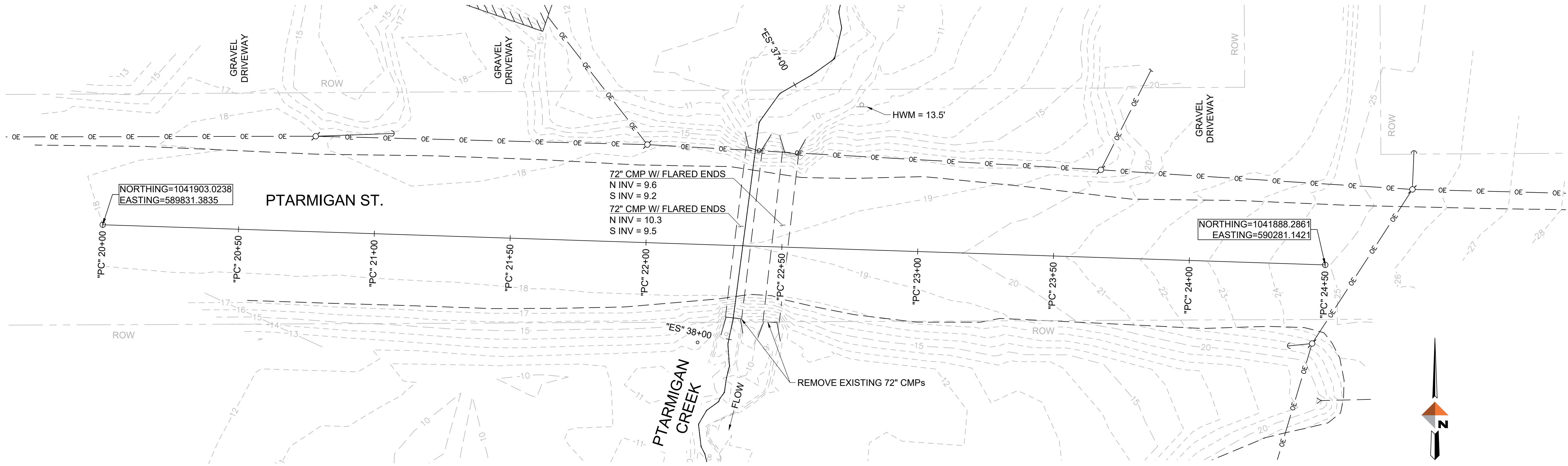
PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
EXISTING STREAM PLAN AND PROFILE
WEST CULVERT

PROJECT	1163.50270.6
DATE	JANUARY 202

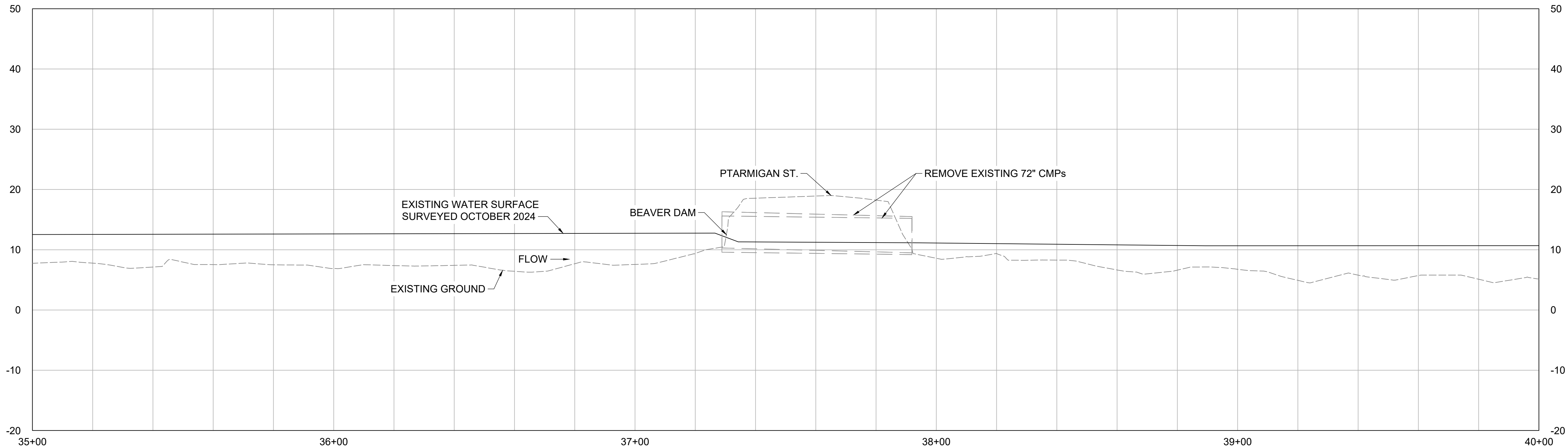
○ DOWL 2025
SHEET

C5 OF C14

C:\dowl_pw\0418828\C6-SA-CH-WA-50305.dwg PLOT DATE 2025-2-3 13:49 SAVED DATE 2025-01-29 10:42 USER: rduerst

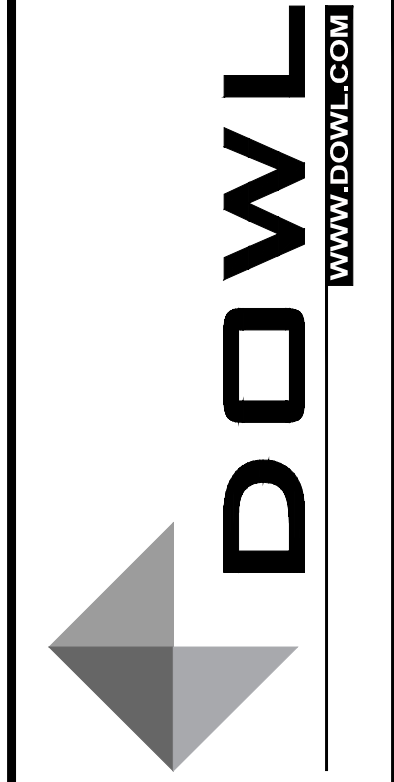


PLAN



PROFILE

REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
EXISTING STREAM PLAN AND PROFILE
EAST CULVERT
BETHEL, ALASKA

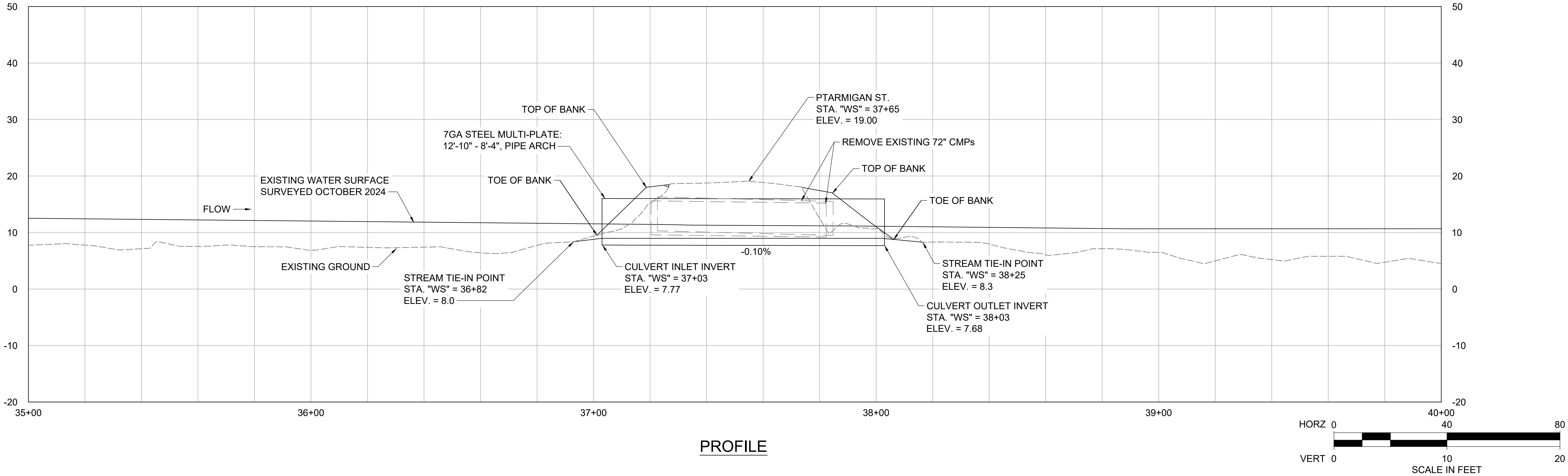
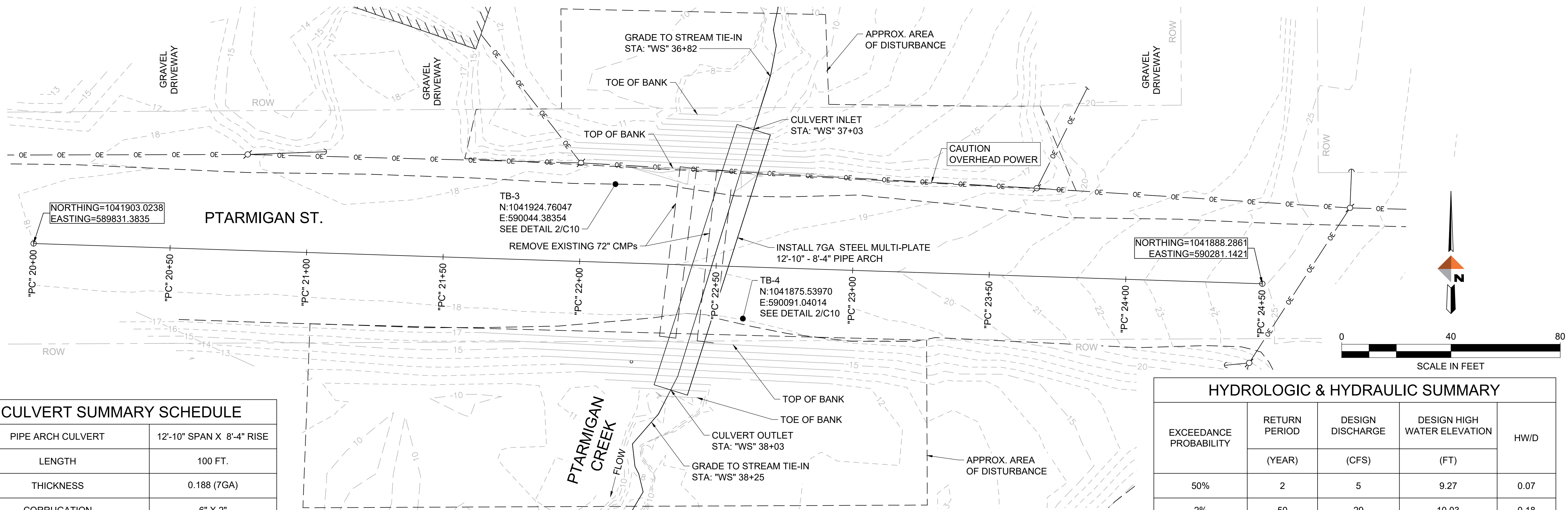
PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C6 OF C14	

C:\dowl_pw\0418828\C8-SA-CH-WA-50305.dwg PLOT DATE 2025-2-3 14:19 SAVED DATE 2025-02-03 14:10 USER: rduerst

CULVERT SUMMARY SCHEDULE	
PIPE ARCH CULVERT	12'-10" SPAN X 8'-4" RISE
LENGTH	100 FT.
THICKNESS	0.188 (7GA)
CORRUGATION	6" X 2"
MATERIAL	GALVANIZED STEEL
SLOPE	0.1%
LOADING	HL-93
"PC" CL STATION	2+42.5

COORDINATE TABLE: EAST CULVERT			
POINT	NORTHING	EASTING	ELEVATION
INLET INSERT	1041944.6996	50094.9822	7.77
OUTLET INVERT	141849.4172	50064.6193	7.68

HYDROLOGIC & HYDRAULIC SUMMARY				
EXCEEDANCE PROBABILITY	RETURN PERIOD	DESIGN DISCHARGE	DESIGN HIGH WATER ELEVATION	HW/D
	(YEAR)	(CFS)	(FT)	
50%	2	5	9.27	0.07
2%	50	29	10.03	0.18
1%	100	39	10.26	0.22
DRAINAGE AREA = 8.8 SQUARE MILES				
ANTICIPATED ADDITIONAL BACKWATER = 0 FEET				
ROADWAY OVERTOPPING Q = 687 CFS				



REV

DATE

DESCRIPTION

BY

OF ALASKA

66%

DESIGN

REGISTERED PROFESSIONAL ENGINEER

Bradley M. Beck

CE 1163

DOWL

WWW.DOWL.COM

PTARMIGAN ST. CULVERT CROSSINGS

CULVERT REPLACEMENT

STREAM PLAN AND PROFILE

EAST CULVERT

BETHEL, ALASKA

PROJECT 1163.50270.68

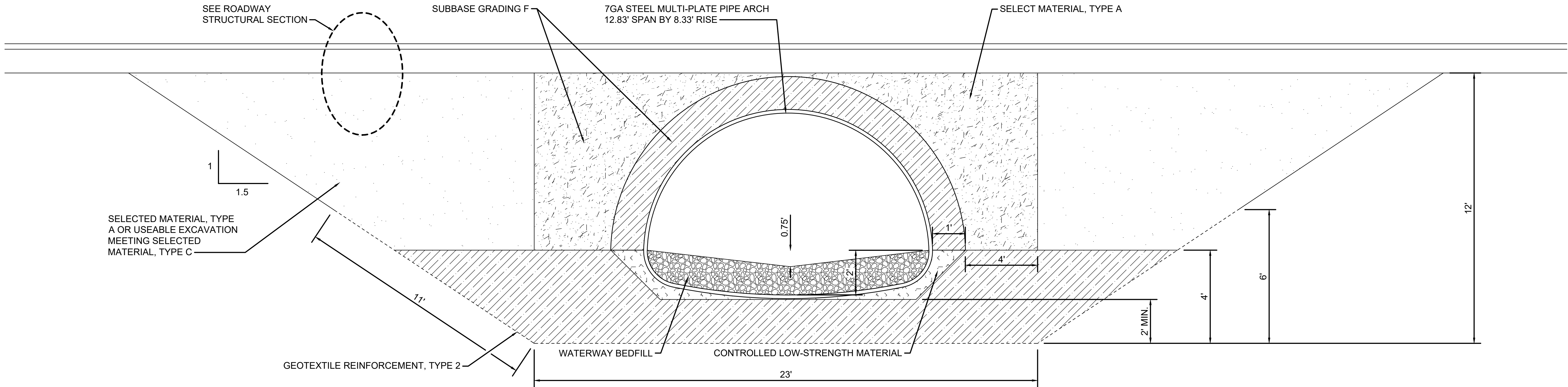
DATE JANUARY 2025

© DOWL 2025

SHEET

C8 OF C14

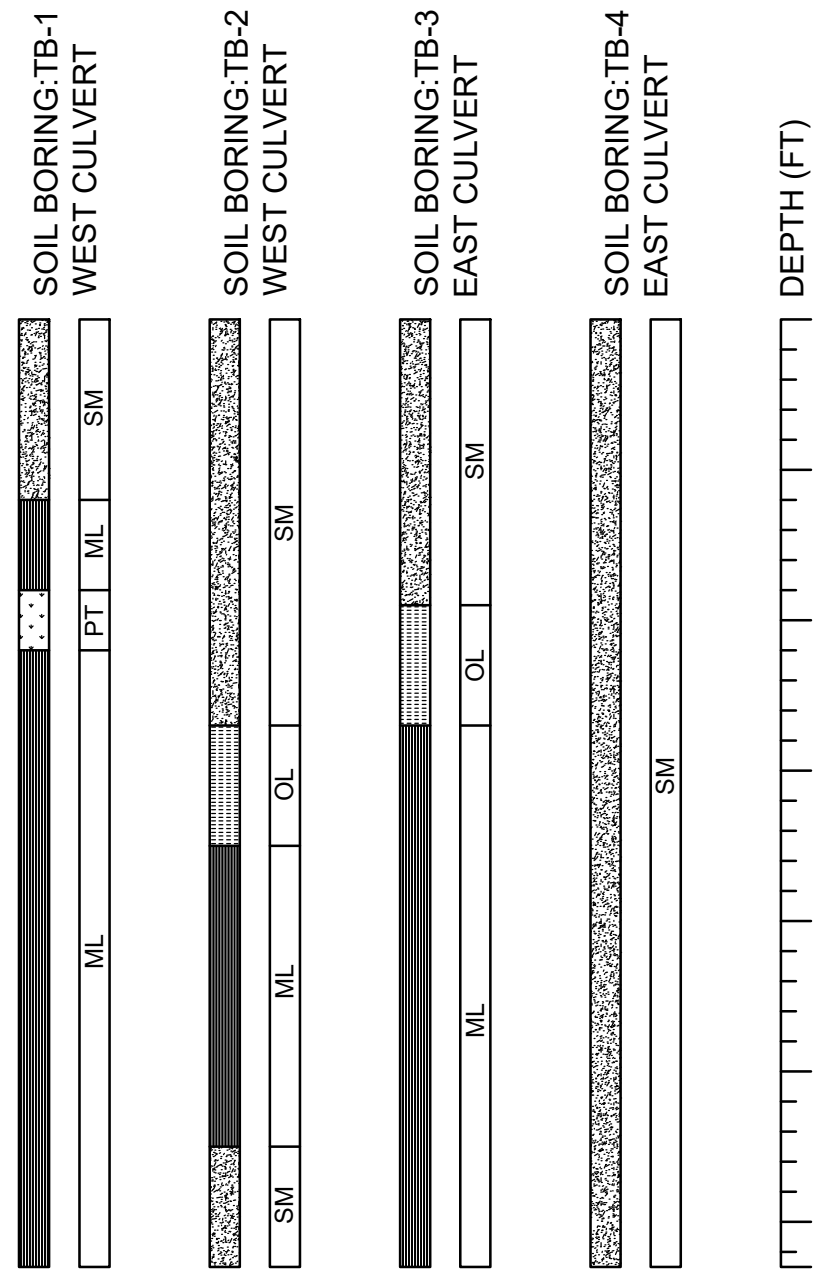
C:\dowl_pw\0418828\C10-SA-CH-WA-50305.dwg PLOT DATE 2025-02-03 15:23 USER: rduerst



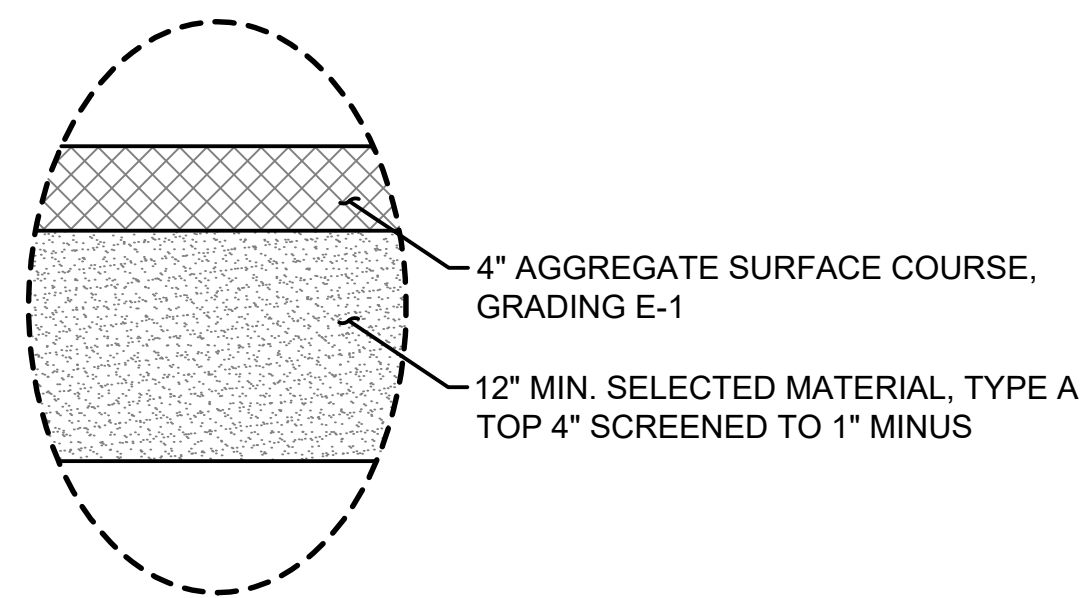
1 PIPE ARCH TYPICAL SECTION
C10 NTS

NOTES:

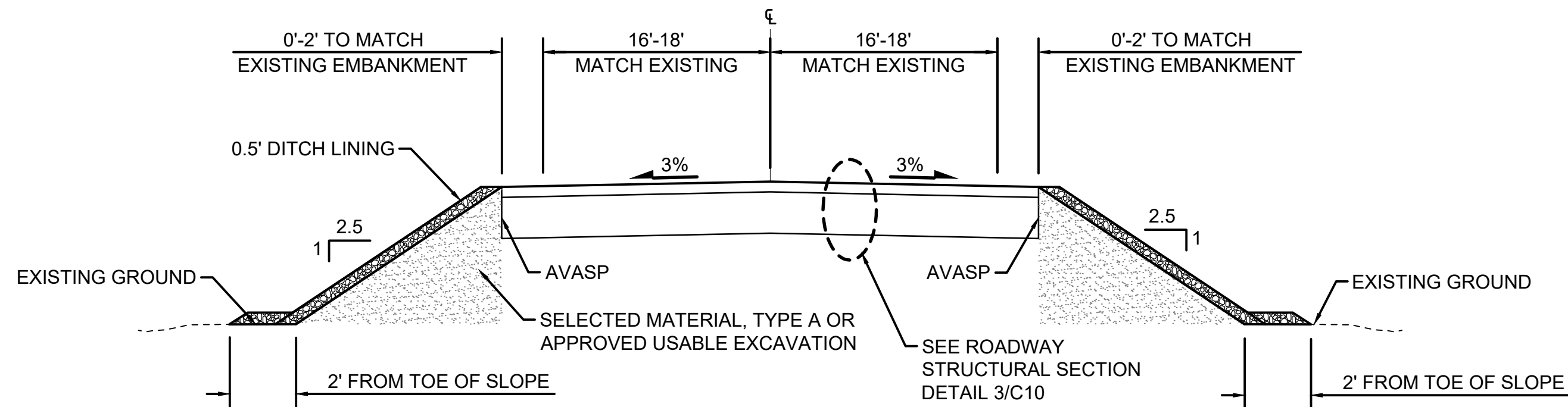
1. EXCAVATE ALL ORGANICS OR A MINIMUM OF 2' FEET BELOW CULVERT INVERT, WHICHEVER IS GREATER.
2. GEOTEXTILE REINFORCEMENT, TYPE 2 SHALL BE PLACED BETWEEN IN-SITU MATERIAL AND SUBBASE, GRADING F.
3. FOR QUANTITY ESTIMATION PURPOSES, NO USABLE EXCAVATION WAS ASSUMED AND EMBANKMENT QUANTITIES WERE CALCULATED USING SELECTED MATERIAL, TYPE A.
4. MINIMUM COVER FOR PIPE ARCH CULVERT IS 2.0'.
5. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED FOR PIPE BEDDING. PREPARATION AND PLACEMENT PER SPECIFICATION 205-2.01 AND REFERENCE SUBSECTION 712-2.22. PAY ITEM 205.0005.
6. MIX MATERIAL FOR WATERWAY BED FILL TO ACHIEVE A WELL GRADED MIXTURE.
7. FILL VOIDS IN FOR WATERWAY BED FILL AND WASH FINES IN AFTER PLACEMENT.
8. PLACE WATERWAY BED FILL MATERIAL THROUGH THE FULL LENGTH OF THE CULVERT.



2 BOREHOLE LOGS
C10 NTS

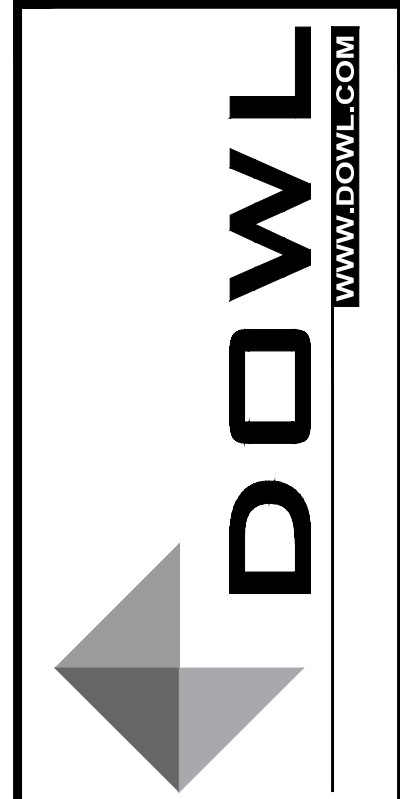


3 ROADWAY STRUCTURAL SECTION
C10 NTS



4 ROADWAY SECTION
C10 NTS

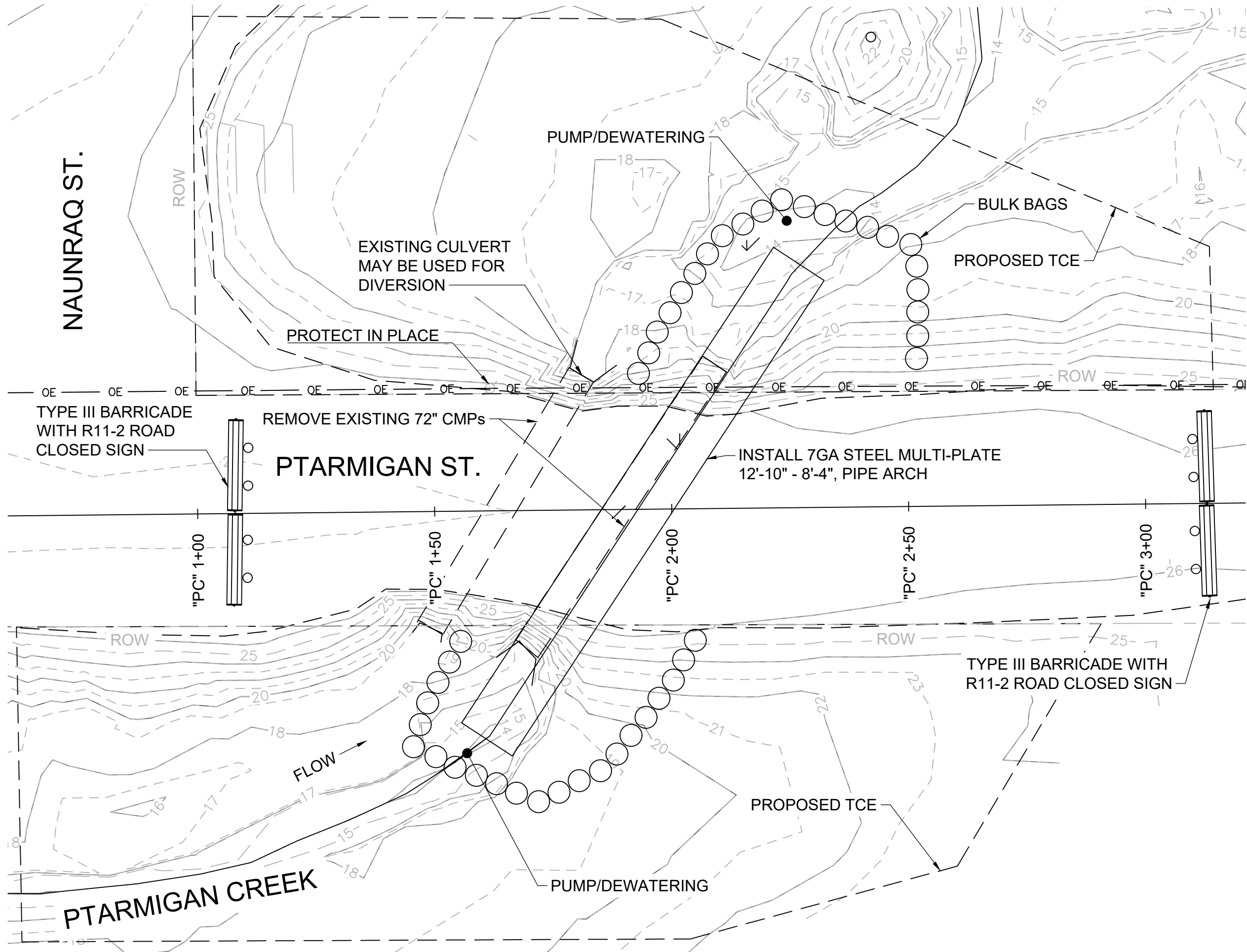
REVISIONS		DESCRIPTION	BY
REV	DATE		



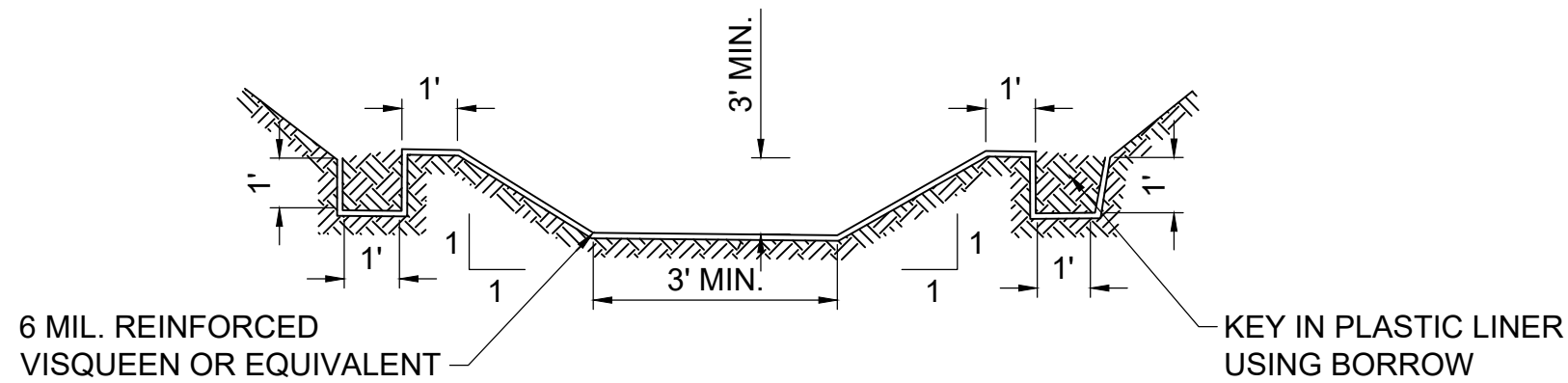
PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
DETAILS AND TYPICAL SECTIONS
BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C10 OF C14	

C:\dowl_pw\40418828\C11-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 08:04 SAVED DATE 2025-01-29 11:06 USER: rduerst



WEST CULVERT
PLAN



ROADWAY DIVERSION NOTES:

- REFER TO SPECIFICATIONS FOR ROAD CLOSURE AND TRAFFIC CONTROL INFORMATION.
- PTARMIGAN STREET DETOUR CLOSURE PLAN SHALL BE SUBMITTED BY CONTRACTOR FOR APPROVAL BY CITY OF BETHEL.

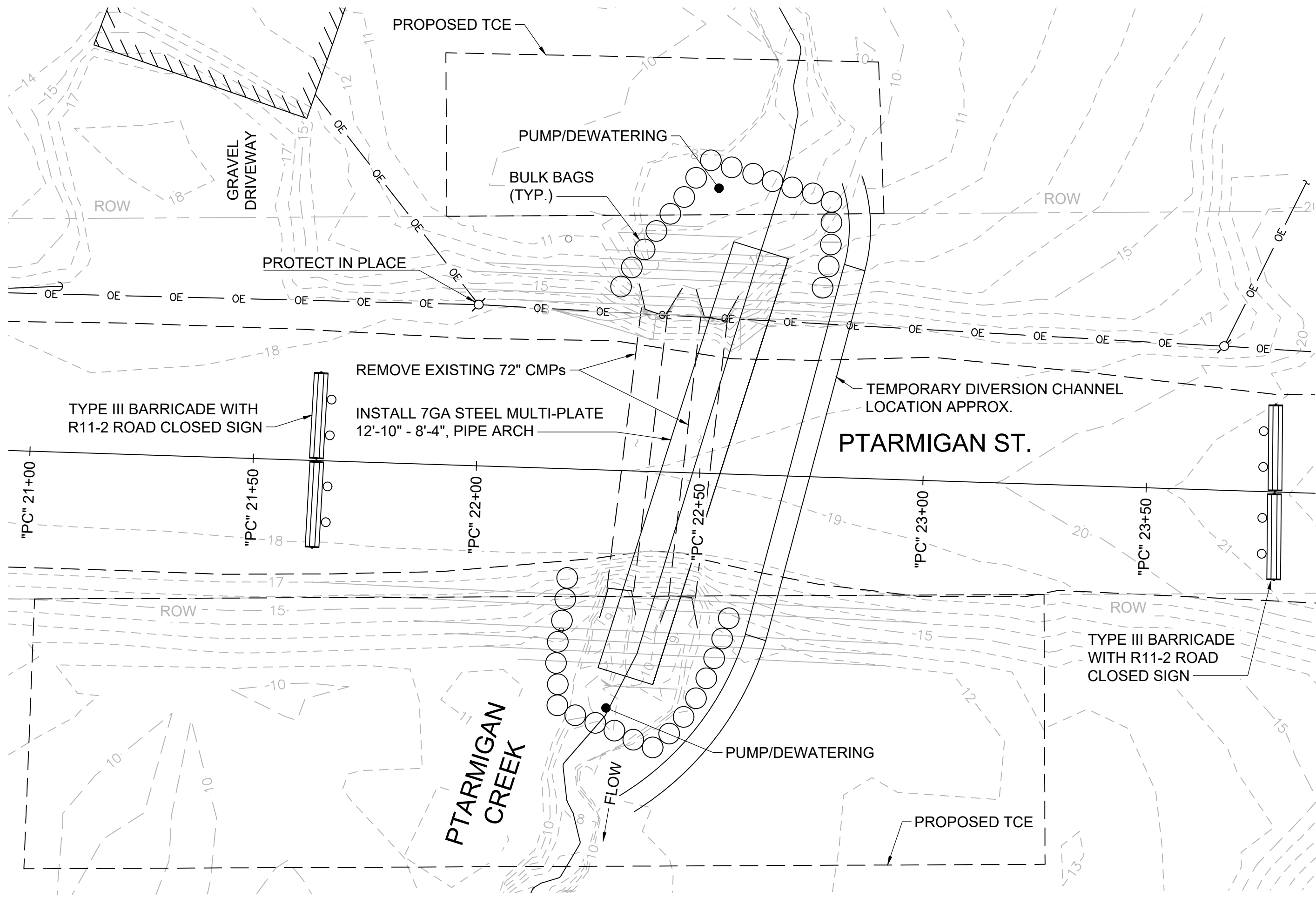
STREAM DIVERSION NOTES:

THIS WORK MAY REQUIRE A DIVERSION OF STREAM WATER. THE DESIGNERS RECOGNIZE THAT DIFFERENT CONTRACTORS WILL HAVE VARIOUS APPROACHES FOR CONTROLLING WATER AND CONSTRUCTION SEQUENCING. THIS DIVERSION PLAN HAS BEEN DEVELOPED TO CHECK FOR CONSTRUCTABILITY AND AS A STARTING POINT FOR A CONTRACTOR-GENERATED PLAN. CONTRACTOR MUST SUBMIT DIVERSION PLANS TO ENGINEER FOR APPROVAL PRIOR TO IMPLEMENTATION.

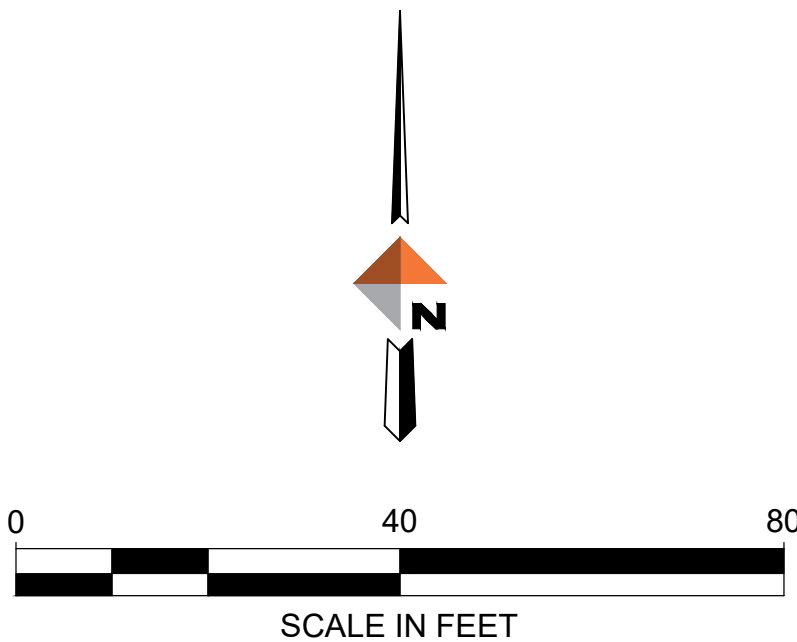
A COFFERDAM MADE OF SHEET PILE MAY BE NEEDED TO REDUCE GROUNDWATER FLOW INTO EXCAVATED AREA. TEMPORARY DIKES OR BERMS MAY BE USED TO ISOLATE THE WORK AREA FROM WATERS OF THE SURROUNDING AREA.

SUGGESTED DIVERSION PLAN:

- PLACE BARRICADES, SIGNS, AND TEMPORARY ROAD DETOUR IN COMPLIANCE WITH SPECIFICATIONS, ADOT&PF, AND MUTCD. COORDINATE WITH OTHER CONTRACTORS WHO MAY BE PRESENT IN AREA AND USING PTARMIGAN STREET FOR CONSTRUCTION ACCESS.
- IF EXISTING CULVERTS ON PTARMIGAN STREET ARE NOT SUFFICIENT, REMOVE THE 72" EXISTING CULVERTS AND CONSTRUCT VISQUEEN LINED DIVERSION CHANNEL.
- USE BULK BAGS (SUPERSACKS) TO DIVERT STREAM FLOW THROUGH DIVERSION CHANNEL.
- CONSTRUCT THE NEW PIPE ARCH CULVERT.
- INFILL CULVERT AND RECONSTRUCT CREEK CHANNEL AS SHOWN IN PLANS.
- DIVERT CREEK FLOW THROUGH THE NEW ARCH CULVERT.
- FILL DIVERSION CHANNEL/ROAD EMBANKMENT.
- RECONSTRUCT CREEK CHANNEL AND BANKS AS SHOWN IN PLANS.
- RECONSTRUCT PTARMIGAN STREET OVER THE NEWLY INSTALLED CULVERT.
- RETURN VEHICULAR TRAFFIC TO PTARMIGAN STREET. REMOVE DETOUR ROAD AND FILL REMAINING PORTION OF DIVERSION CHANNEL.
- STABILIZE AND REVEGETATE ALL REMAINING DISTURBED AREAS.



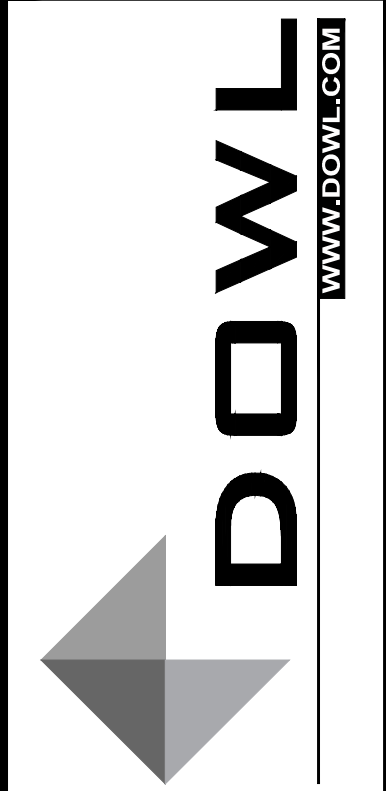
EAST CULVERT
PLAN



ESCP AND DEWATERING NOTES:

- DEWATER TRENCH AND WORK AREA WITH PUMP HOSE IF REQUIRED.
- ALL DISCHARGE POINTS REQUIRE PERMANENT OR TEMPORARY VELOCITY CONTROLS.
- PROVIDE FOR SEDIMENT REMOVAL FOR ALL DEWATERING ACTIVITY PRIOR TO DISCHARGE FROM THE PROJECT INTO ANY WATER OF THE U.S.
- PROVIDE SPARE (EXTRA) PUMPS FOR BOTH THE STREAM BYPASS PUMP AND DETWATERING PUMP.
- EXISTING RIPARIAN VEGETATION SHOULD BE PROTECTED TO MINIMIZE DISTURBANCE.
- SILT FENCING TO BE USED TO PREVENT DISTURBED SEDIMENT FROM ENTERING THE WATERBODY. ADJUST LOCATION AS NECESSARY AND AS DIRECTED BY THE ENGINEER DURING CONSTRUCTION.
- EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS. MAINTENANCE SHALL INCLUDE REMOVAL AND DISPOSAL OF ACCUMULATED SEDIMENT, CLEANING AND REPAIR OF DAMAGED SEDIMENT CONTROL DEVICES.
- ALL DISTURBED GROUND CAPABLE OF SUPPORTING VEGETATION SHALL BE REVEGETATED FOR FINAL STABILIZATION. ALL AREAS NOT REVEGETATED SHALL BE 100% COVERED BY ROCK OR OTHER PERMANENT NON-ERODIBLE MATERIAL. FINAL STABILIZATION SHALL BE AS APPROVED BY THE ENGINEER.
- PUMPS OUTSIDE OF THE FISH EXCLUSION AREA MUST HAVE FISH SCREENS MADE OF WEDGE WIRE WITH OPENINGS NOT GREATER THAN 1/16TH INCH.

REVISIONS		DESCRIPTION
REV	DATE	



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
ESCP & STREAM DIVERSION PLAN

PROJECT 1163.50270.68
DATE JANUARY 2025

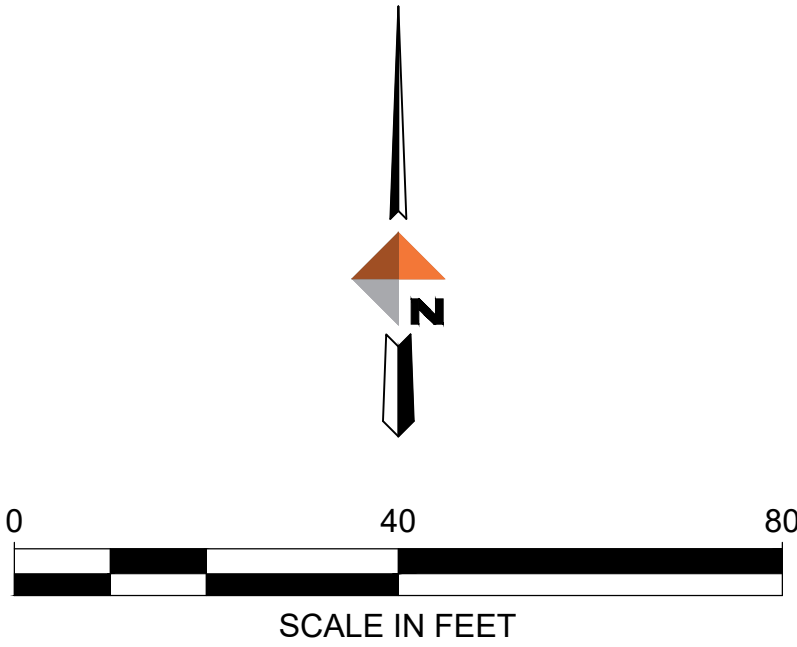
© DOWL 2025
SHEET

C11 OF C14

BETHEL, ALASKA

NOTES:

- REHABILITATE VEGETATED AREAS WITH SEED, PER SECTION 618 OF THE SPECIFICATIONS.
- VEGETATIVE MAT SHALL BE PLACED ON DISTURBED AREAS OUTSIDE OF THE SEEDING AREAS AS SHOWN ON THE PLANS.
- VEGETATIVE MAT LOCATIONS MAY VARY BASED ON SITE CONDITIONS AND AVAILABILITY DURING CONSTRUCTION.
- SALVAGED VEGETATIVE MAT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND BE SOURCED FROM THE DISTURBED AREA OR LOCAL AREA. SEE DETAIL 1/C13.
- REFER TO SPECIFICATION SECTION 690 FOR ADDITIONAL BANK REVEGETATION INFORMATION.
- PROTECT STREAMBANK IN PLACE, AND MINIMIZE DISTURBANCE. REHABILITATE WITH VEGETATIVE MAT BANK STABILIZATION IF DISTURBED, PER DETAIL 1/C13

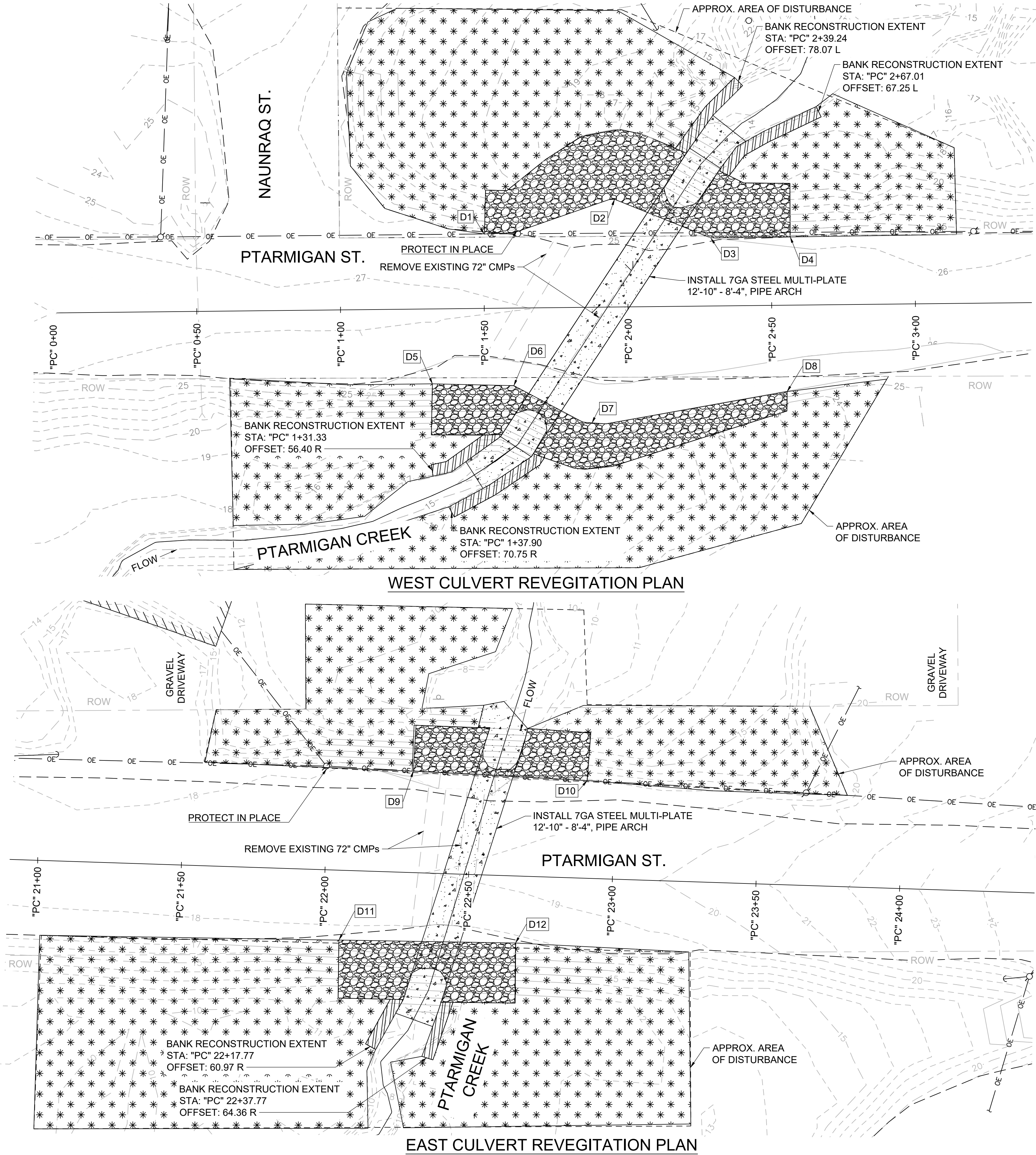


SITE REVEGETATION

- ORGANIC SOILS AND VEGETATIVE MAT, AS AVAILABLE. SEED AND MULCH AS NEEDED
- WATERWAY BANK REVEGETATION AND PROTECTION VEGETATIVE MAT
- WATERWAY BED FILL
- DITCH LINING

SEEDING MIX	
CATEGORY 1	
80 - 90% OF AT LEAST 2 TYPES	ARCTARED RED FESCUE
	NORCOAST BERING HAIRGRASS
	NORTTRAN TUFTED HAIRGRASS
	GRUENING ALPINE BLUEGRASS
CATEGORY 2	
10 - 20% OF AT LEAST 1 TYPE	KENAI POLARGRASS
	TUNDRA GLAUCOUS BLUEGRASS
	ALYESKA POLARGRASS
	SOURDOUGH BLUEJOINT REEDGRASS

COORDINATE TABLE: DITCH LINING			
LOCATION	POINT ID	"PC" STATION	OFFSET
WEST CULVERT DS	D1	1+50.34	25.87 L
WEST CULVERT DS	D2	1+95.71	37.47 L
WEST CULVERT DS	D3	2+29.07	23.68 L
WEST CULVERT DS	D4	2+56.71	23.71 L
WEST CULVERT US	D5	1+31.68	26.06 R
WEST CULVERT US	D6	1+60.01	27.01 R
WEST CULVERT US	D7	1+87.07	40.24 R
WEST CULVERT US	D8	2+55.07	30.05 R
EAST CULVERT US	D9	22+90.11	33.98 L
EAST CULVERT US	D10	22+90.85	50.64 L
EAST CULVERT DS	D11	22+05.63	24.33 R
EAST CULVERT DS	D12	22+67.05	23.33 R



REV

DATE

DESCRIPTION

BY

OF ALASKA

66% DESIGN

REGISTERED PROFESSIONAL ENGINEER

Bradley M. Cook

CE 11663

PROJECT 1163.50270.68

DATE JANUARY 2025

DOWL 2025

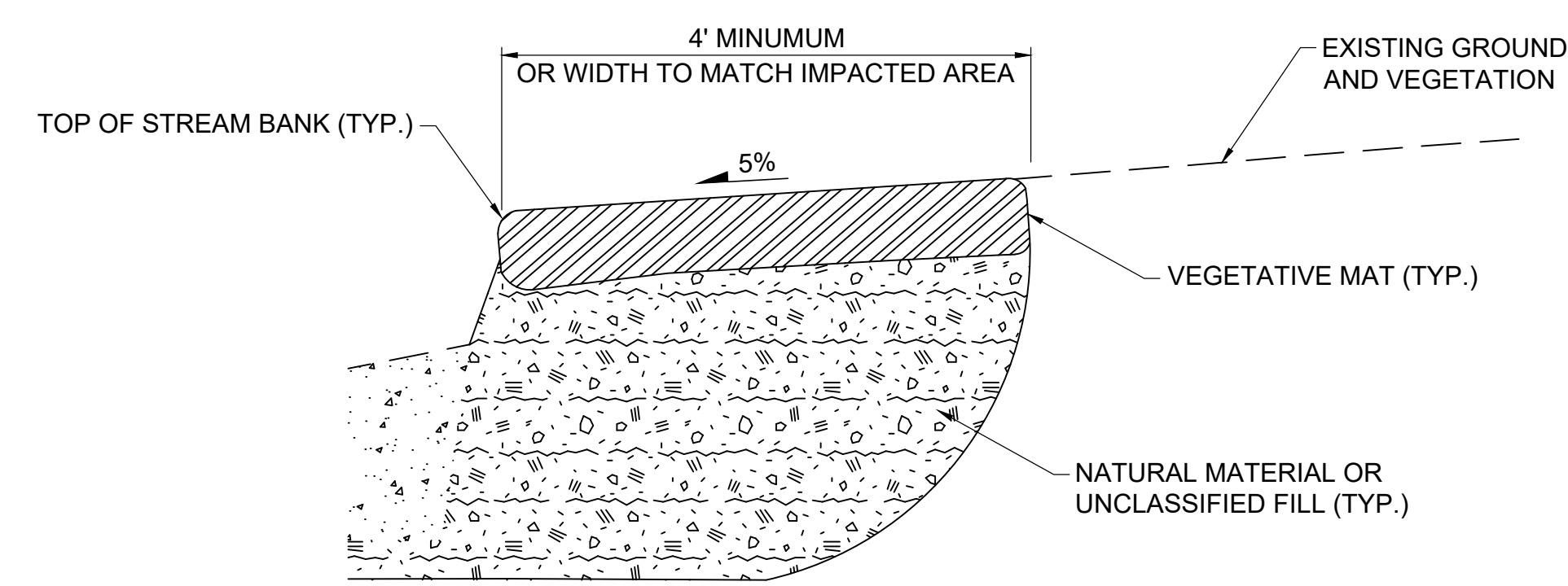
SHEET

C12 OF C14

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
REVEGETATION PLAN

BETHEL, ALASKA

C:\dowl_pw\0418828\C13-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:57 SAVED DATE 2025-02-04 09:37 USER: rduerst



1
C13

VEGETATIVE MAT BANK RECONSTRUCTION SECTION VIEW

NTS

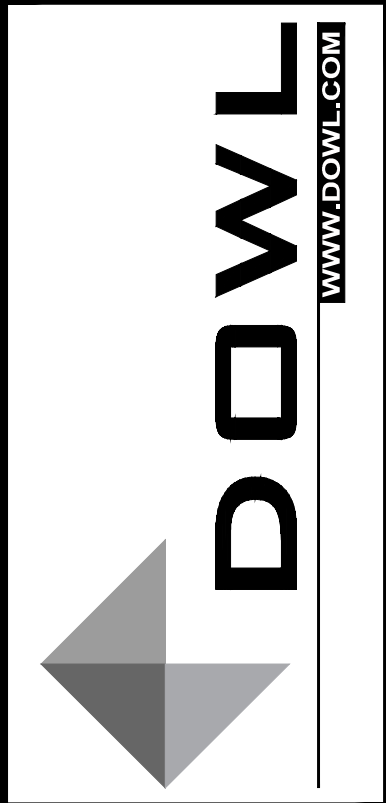
NOTES:

1. SALVAGED VEGETATIVE MAT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND BE SOURCED FROM THE DISTURBED AREA OR LOCAL AREA.
2. TAPER BANKS AND TIE INTO EXISTING BANKS UPSTREAM AND DOWNSTREAM.

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 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.
5. PLACE VEGETATIVE MATS TIGHTLY TOGETHER, WITHOUT GAPS, WITH FULL CONTACT OF THE ROOT MASS TO THE SOIL SURFACE BELOW, TAP INTO PLACE.
6. 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.

REVISIONS		REV	DATE	DESCRIPTION	BY

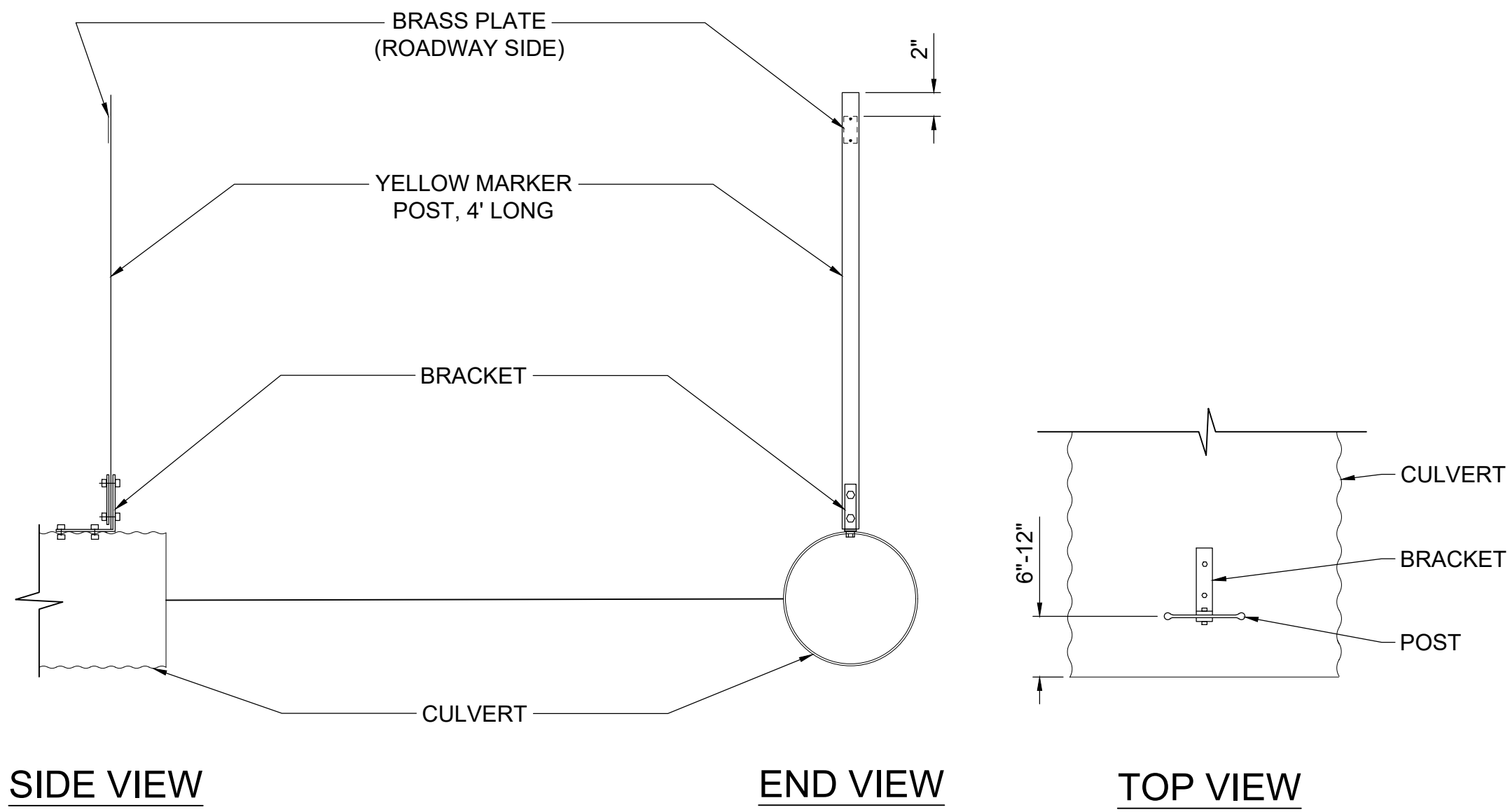


PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
BANK RECONSTRUCTION

BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	

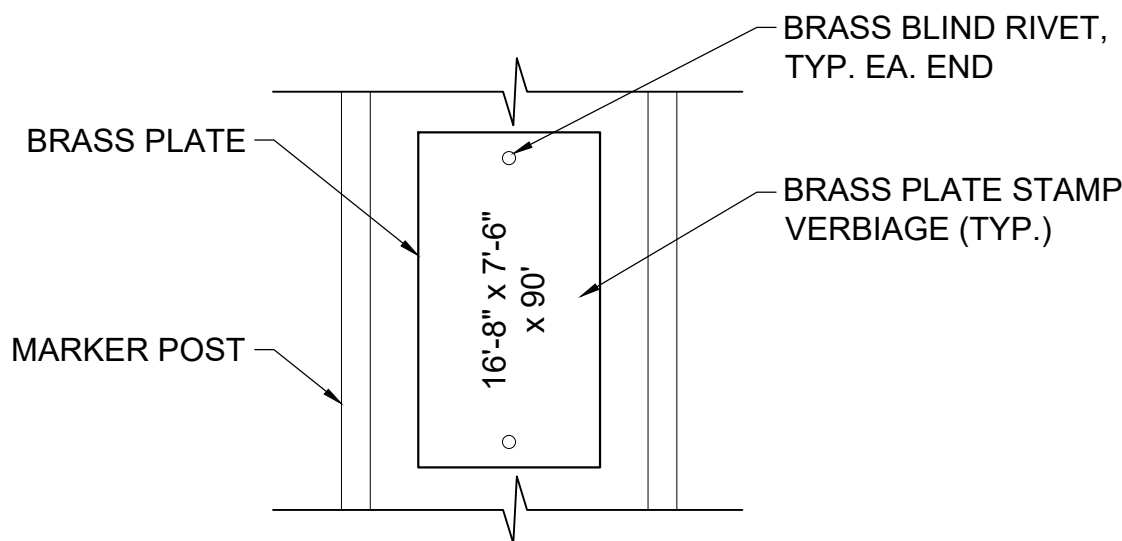
C13 OF C14



1 CULVERT MARKER POST DETAIL
C14 NTS

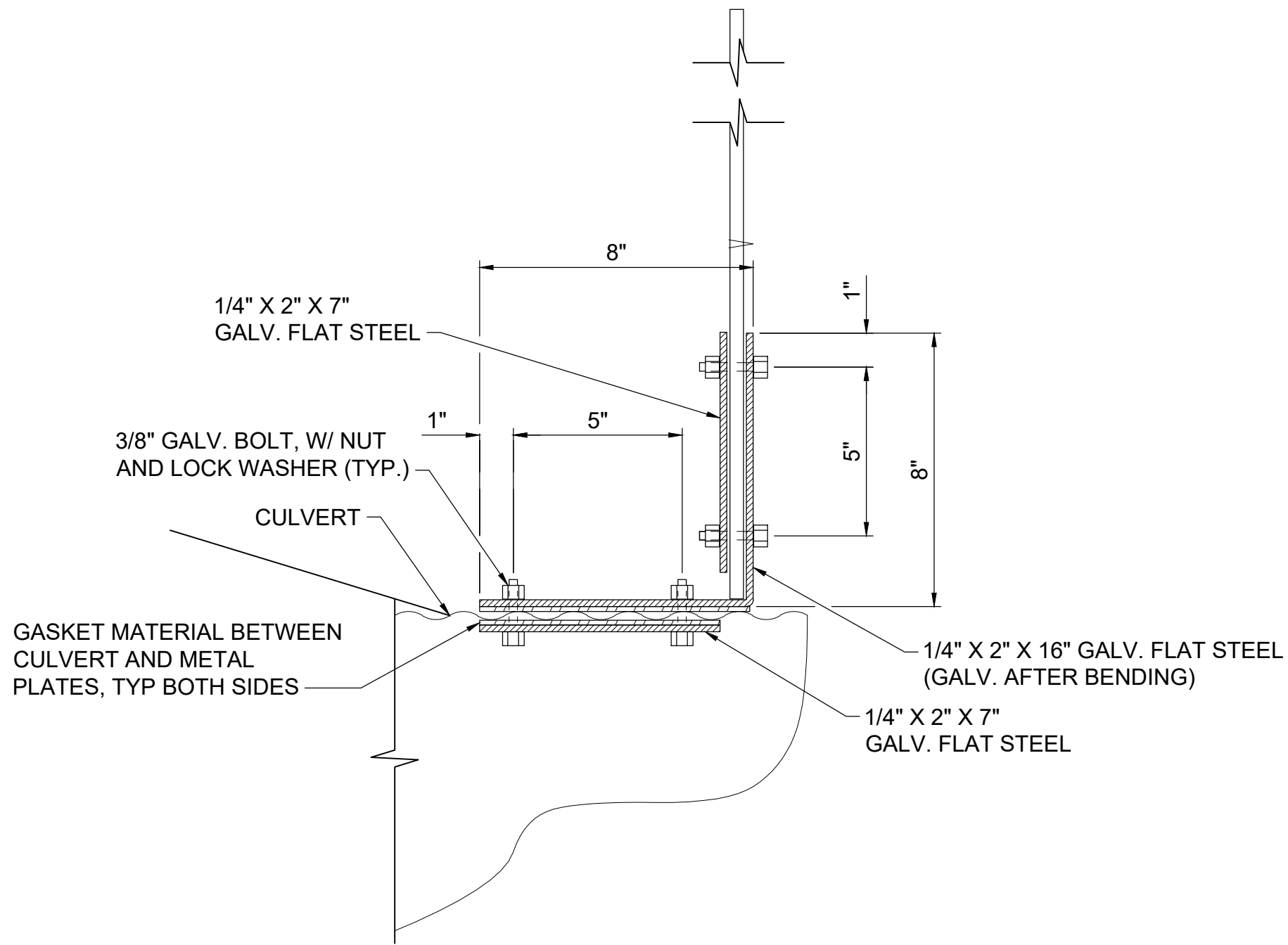
NOTES:

1. MARKER POSTS ARE TO BE INSTALLED ON ALL PROJECT CULVERTS.
2. DRILL ALL BOLT HOLES. FLAME CUTTING SHALL NOT BE PERMITTED.
3. GASKET MATERIAL SHALL BE PLACED BETWEEN DISSIMILAR METALS. GASKET MATERIAL SHALL BE APPROVED PRIOR TO INSTALLATION.

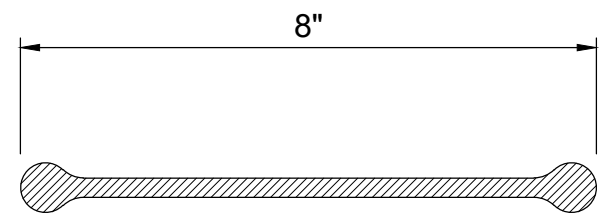


STAMP STATION AND PIPE SIZE, USING 3/8" HIGH MINIMUM LETTERS INTO A 2" X 4" X 0.064" THICK BRASS PLATE. FASTEN PLATE TO THE SIDE FACING THE ROADWAY WITH TWO 1/8" BRASS BLIND RIVETS.

3 BRASS PLATE DETAIL
C14 NTS

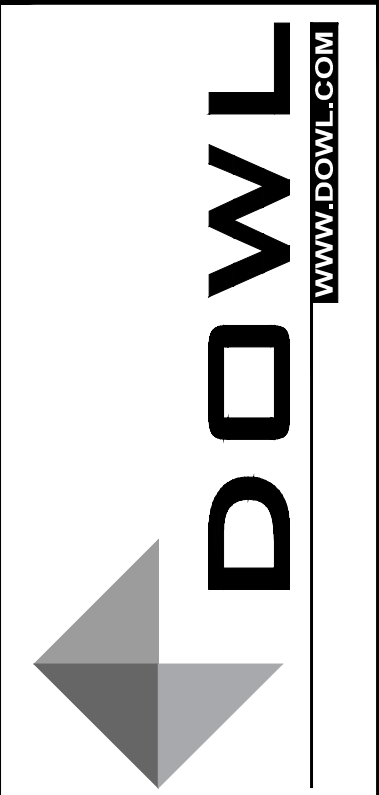
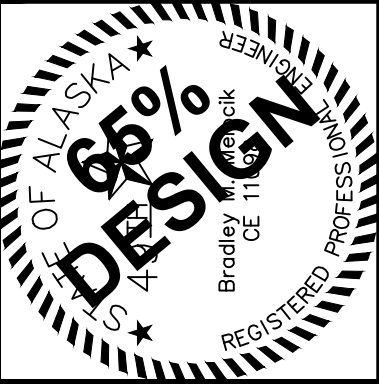


2 BRACKET DETAIL
C14 NTS



4 POST CROSS SECTION
C14 NTS

REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
CULVERT MARKER POST
BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C14 OF C14	

Appendix C: Geotechnical Report



February 3, 2025

Mr. Bill Arnold
City of Bethel
P.O. Box 1388
Bethel, AK 99559

**Subject: Task order #68 – Ptarmigan Street Culvert Crossing – Bethel, Alaska
Geotechnical Investigation and Recommendations**

Dear Mr. Arnold:

This report presents the results of our field investigation, the results of laboratory testing, and preliminary recommendations regarding foundation design and site development in support of the proposed replacement of the culverts at two locations that convey Ptarmigan Creek under Ptarmigan Street in Bethel, Alaska.

PROJECT UNDERSTANDING

The two culvert locations and the surrounding embankment were compromised after major flooding events occurred in the spring of 2024. The City of Bethel (City) intends to replace both culverts to maintain the connectivity of Bethel residents located on the west side of the culverts to the rest of Bethel. Within this report, the westernmost crossing shall be referred to as Site 1, and the easternmost crossing as Site 2.

SCOPE OF WORK

Our geotechnical scope of work for this project included:

- A review of existing geotechnical and geological information at or near the culvert replacement locations.
- Drilling four (4) borings to a depth of approximately 30 feet below the existing site grade.
- Complete associated laboratory testing on collected samples to determine engineering properties.
- Prepare a report that presents the data obtained, analysis and interpretation, and engineering recommendations with respect to the observed site soils and subsurface conditions.

Our proposal was accepted, and we received Notice-to-Proceed on September 17, 2024.

BACKGROUND REVIEW

DOWL has reviewed several geotechnical investigations in the vicinity of the subject site. The nearest investigation took place approximately ½-mile from the culvert locations. These reports and findings were reviewed to predict the subsoils at the site, determine appropriate test boring depths and quantity, and prepare a sampling plan.

Based on the regional geology and previous geotechnical explorations near the site, the subsurface site conditions were anticipated to consist of fill material composed of silty sand over multiple feet of organics over silty sand and sandy silt deposits with organics.

EXPLORATION SUMMARY

The field investigation for this site was conducted November 12 and 13, 2024. Four (4) test borings were drilled, sampled, and logged to depths of 31.5 feet below existing grade near the existing culverts.

Locations of the test borings were determined in the field by handheld GPS and are only as accurate as the method implies. Test boring locations are on Figure A-2, Test Boring Location Map (Appendix A), and a list of the exploration locations is presented as Table 1.

Table 1: Test Boring Location

Boring Number	Boring Depth (feet)	Latitude (deg)	Longitude (deg)	Location
TB-01	31.5	60.805111	-161.806626	Site 1, West culvert, North side
TB-02	31.5	60.805032	-161.806484	Site 1, West culvert, South side
TB-03	31.5	60.805067	-161.795537	Site 2, East culvert, North side
TB-04	31.5	60.804955	-161.795249	Site 2, East culvert, North side

The test boring was drilled using a Geoprobe 6620 DT track-mounted drill rig fitted with continuous-flight, hollow-stem auger. The rig is owned and operated by GeoTek Alaska out of Anchorage, Alaska. The drilling was supervised, and the samples logged by a geotechnical engineer with DOWL. Test boring logs and descriptive guide are presented in Appendix B.

A grab sample was obtained at the surface where each test boring was drilled. Disturbed samples were obtained at depths of 2.5, 5, 7.5 and 10 feet and then at 5-foot intervals thereafter using a standard split-spoon sampler.

The Standard Penetration Test (SPT) was performed in the test borings by driving a 2-inch outside-diameter, split-spoon sampler a distance of 18 inches ahead of the auger with a 140-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 standard penetration resistance (N) value shown on the test boring logs indicates the number of blows required to drive the sampler the last 12 inches. The results are an indication of the relative density or consistency of the subsoil. The N-values shown in the logs are raw data from the field and have not been adjusted for sampling equipment type or overburden pressure. In frozen soils, the SPT values are highly influenced by ice content, ground temperature, and the presence of gravel.

Soil samples recovered during drilling were classified in general accordance with ASTM D2488 (visual-manual procedures) and sealed in plastic bags to preserve the natural water content. The samples were then transported to Alaska Testlab in Anchorage in accordance with ASTM D4220, for further testing.

Laboratory Testing

Laboratory tests were performed on selected samples to measure soil index properties to provide a basis for estimating engineering properties. Soil index tests including moisture

contents and grain size analyses were performed on select samples. The natural water content of all the recovered samples was measured.

Table 2: Laboratory Tests

Test	Purpose
Natural Moisture Content ASTM D2216	Provides a measure of natural (<i>in situ</i>) water content.
Atterberg Limits ASTM D4318	Provides an indicator of the consistency and swell potential of fine-grained soils.
Particle-Size Distribution ASTM D422	Provides a measure of grain sizes of the soils for classification and identification of physical characteristics.
Limited Mechanical Analysis ASTM D1140	Provides the percentage of material finer than the #4 and #200 screen generating percentages of gravel, sand, and silt sized particles.

Laboratory testing results are presented in Appendix C.

SITE AND SUBSURFACE CONDITIONS

The two existing culvert sites are located on Ptarmigan Street. The western culvert site (Site 1) is located near Naunraq Street and eastern culvert site (Site 2) is located near the Lulu Heron Congregate Home. The area consists of residential development to the north and native ground and brush to the south.



Figure 1: Site 1 culvert crossing viewed northeast.



Figure 2: Site 2 culvert crossing viewed southwest.

Observed soils varied between test borings with varying depths and thickness of organic soils. Conditions were generalized to simplify the engineering analysis. The soils conditions observed at the Site 1 can be generalized as follows:

- 10 to 14 feet thick: Fill, silty sand with gravel to sandy silt (SM, ML), over
- 2 to 4 feet thick: Peat and Organic Silt with varying amounts of silt, sand, and fibrous organics (OL, PT), over
- 18 feet below ground surface (bgs) to drilling termination depth: Mineral silt with sand (ML, SM)

Site 1 conditions are described in greater detail in Table 3.

Table 3:Site 1 (West) Soil Unit summary

Depth (feet)		Soil Unit	USCS	Moisture Content (%)		Fines Content (%)		Blows per 12- inches	
Top	Bottom			Low	High	Low	High	Low	High
0	10-14	Fill material	SM, ML	6	23	16	22	4	8
10-14	12-18	Peat and organic silt	OL, ML, PT	34	78	-	70	3	7
18	30	Silt with sand	ML, SM	23	40	-	62	12	27

The soils conditions observed at the Site 2 can be generalized as follows:

- 0 to 10 feet: Silty sand fill (SM)
- 10 to 14 feet: Organic Silt with fine sand (OL) (OL not observed in TB-4)
- 14 to 30 feet: Silty sand (SM) with trace organics (OL)

Site 2 conditions are described in greater detail in Table 4.

Table 4:Site 2 (East) Soil Unit summary

Depth (feet)		Soil Unit	USCS	Moisture Content (%)		Fines Content (%)		Blows per 12-inches	
Top	Bottom			Low	High	Low	High	Low	High
0	10	Fill material	SM	6	21	14	39	5	25
10	14	Organic silt	OL, SM	20	60	-	43	2	8
20	30	Silty sand	SM	19	35	21	31	9	50

Groundwater. Groundwater was encountered during drilling at approximately 10 feet and 13.5 feet below ground surface at Sites 1 and 2, respectively.

Frozen Ground. Seasonally frozen ground was observed from the surface down to approximately 2 to 4.5 feet bgs. Permafrost or perennially frozen ground was not observed to the maximum depth of exploration but is common in the area.

CLIMATE

NOAA climate data for the period of 1994 through 2023 was analyzed to calculate the average and design air thawing and freezing indices for the minimum and maximum using a 100-year return period over a Weibull probability distribution. The design indices are given in Table 5. The average annual temperature in Bethel over the last 30 years is 31.5 °F; however, from 2014 to 2019 the average annual temperature ranged from 33.5 to 37 °F with air thawing indices approaching or exceeding the 100-year event in 2016 and 2019.

Table 5:Design Air-Thawing and Design Air-Freezing Indices

	Design Air Temperature Indices (°F-Degree*Days)		
	Minimum	Mean	Design or Maximum
Thawing	2,008	3,014	3,687
Freezing	1,173	3,177	5,037

ENGINEERING ANALYSIS AND DISCUSSION

In general, the proposed culvert replacements are feasible at both sites provided the organics within the bearing prism are excavated and replaced with structural fill. Our engineering analysis and recommendations assumes the new culverts will be box or pipe arch culverts with full inverts. If the design is significantly different, we will revise our recommendations accordingly. The analyses and associated recommendations for each culvert crossing are the same for both the Site 1 and 2 culvert crossings.

Bearing Capacity and Settlement. We estimate the culverts will bear on soil approximately five to six feet below the groundwater table. Soils at this depth consist of sand and mineral and organic silt with some fibrous organics.

To improve bearing conditions and combat localized settlement, over excavation and replacement with structural fill below the culverts will be recommended. A reinforcement geotextile placed between the structural fill and underlying mineral soil will provide separation to improve fill placement and reduce differential settlement below the structure. We anticipate that excavation will extend a minimum of two feet below the bottom of the culvert and should extend laterally five feet beyond the edge of the culvert. Settlement will be nearly immediate with loading and placement of backfill assuming organics are fully excavated.

An allowable bearing capacity of 3,000 psf may be used for each culvert to maintain total settlement at 1-inch or less with a differential settlement half that. Higher bearing pressures are feasible but will result in higher settlement. A completely frost-protected design including headwall installation was deemed uneconomical. Complete frost protection would require a large, deep excavation on the order of 10 feet below the bottom of culvert with structural fill placed. The recommended section is for a cost-effective solution that is not completely frost protected and may be subject to frost heave during winter months. An insulated section below the culvert to reduce frost penetration is feasible, however multiple cold years could reintroduce permafrost and frost heave at the insulation extents.

Geotextile. A reinforcement type, woven geotextile with permittivity meeting DOT&PF Reinforcement Geotextile (Type 2) specifications (729-2.01) is needed for separation and to support the overlying culverts and fill.

RECOMMENDATIONS

Bearing Capacity and Settlement. The structural section beneath each culvert shall consist of the following:

- 24 inches NFS structural fill, over
- DOT&PF Reinforcement Geotextile, Type 2, over
- Native mineral soil

To construct the structural section, excavate all organics or a minimum of two feet below the bottom of the culvert (whichever is deeper) and extend excavation five feet beyond the sides of the culvert walls.

Geotextile. The reinforcement geotextile placed at the base of the structural section shall have stitched seams and placed in accordance with DOT&PF Standard Specifications Section 630. If overlapping is required, overlaps shall be a minimum of five feet and oriented perpendicular to the culvert alignment or parallel to centerline.

CONSTRUCTION CONSIDERATIONS

Structural Fill. All 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 provided in Table 6.

Table 6: Structural Fill Gradation Requirements

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

Other fill material, which does not meet this gradation requirement, may be acceptable for use. However, the gradation of such material should be evaluated by the project geotechnical engineer prior to its use.

Excavation. Our recommendations assume that the culvert bases will be founded directly on a minimum of 2 feet of structural fill, constructed above the undisturbed silty and sandy soil.

Any peat or organic material shall be removed from below the culvert footprints extending horizontally from the edge of culverts 1-foot for each foot below the bottom of the culverts and replaced with structural fill. Frozen soil should not be used as fill or backfill and may need to be thawed until compactable or removed and replaced with compactable backfill.

Earthwork. Earthwork should be completed with quality control inspection, including bottom-of-hole inspections, fill gradation classification, and in-situ compacting testing. A bottom-of-hole inspection should be conducted by a qualified geotechnical engineer, geologist, or special inspector following each site excavation activities (and before any foundation construction begins) to visually confirm the findings of this report and provide recommendations for non-conforming conditions encountered during the excavation activities.

Fill material should be placed at 95 percent of the modified Proctor density as determined by ASTM D1557, unless specifically stated otherwise in other sections of this report. Structural fill and backfill around the culvert should be placed in six-inch lifts. All earthwork should be completed with quality control inspection.

Dewatering. Excavation for the reinforced soil mat will require dewatering or control of the adjacent stream. We anticipate sheet piles be driven around the excavation area to limit the disturbance to the site. Sheet pile shoring and dewatering should be designed by the contractor's engineer.

LIMITATIONS

DOWL based the conclusions and recommendations presented in this report, based 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 City of Bethel to 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, figures, and design details specifically for the culvert replacement project on Ptarmigan Street. 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.

Sincerely,
DOWL



Robert Sanders, EI
Geotechnical Engineer



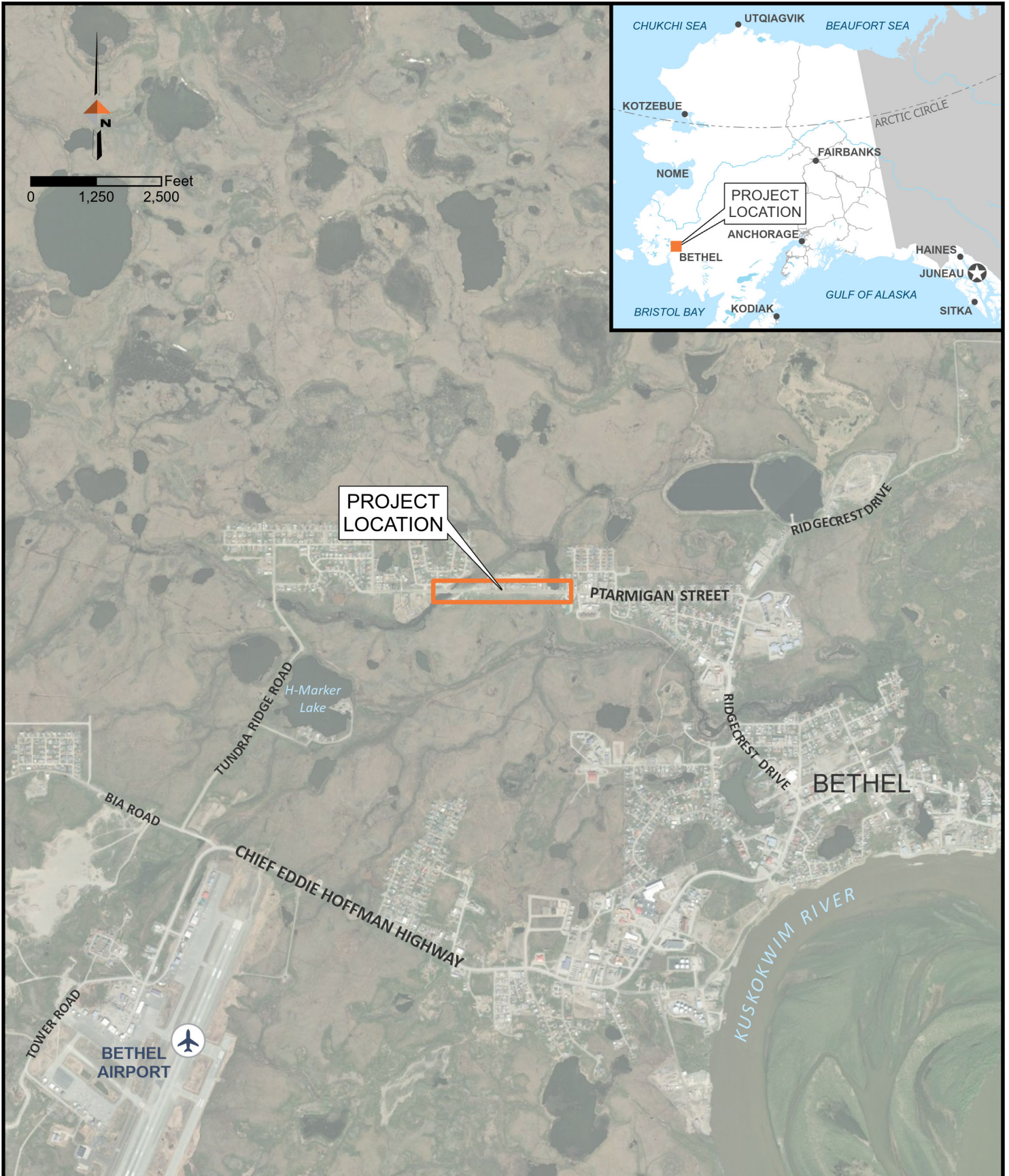
Jeremiah Holland, PE
Senior Geotechnical Engineer



Appendices: Appendix A: Project Location and Test Boring Location Map
 Appendix B: Test Borings Logs and Descriptive Guide
 Appendix C: Laboratory Test Result

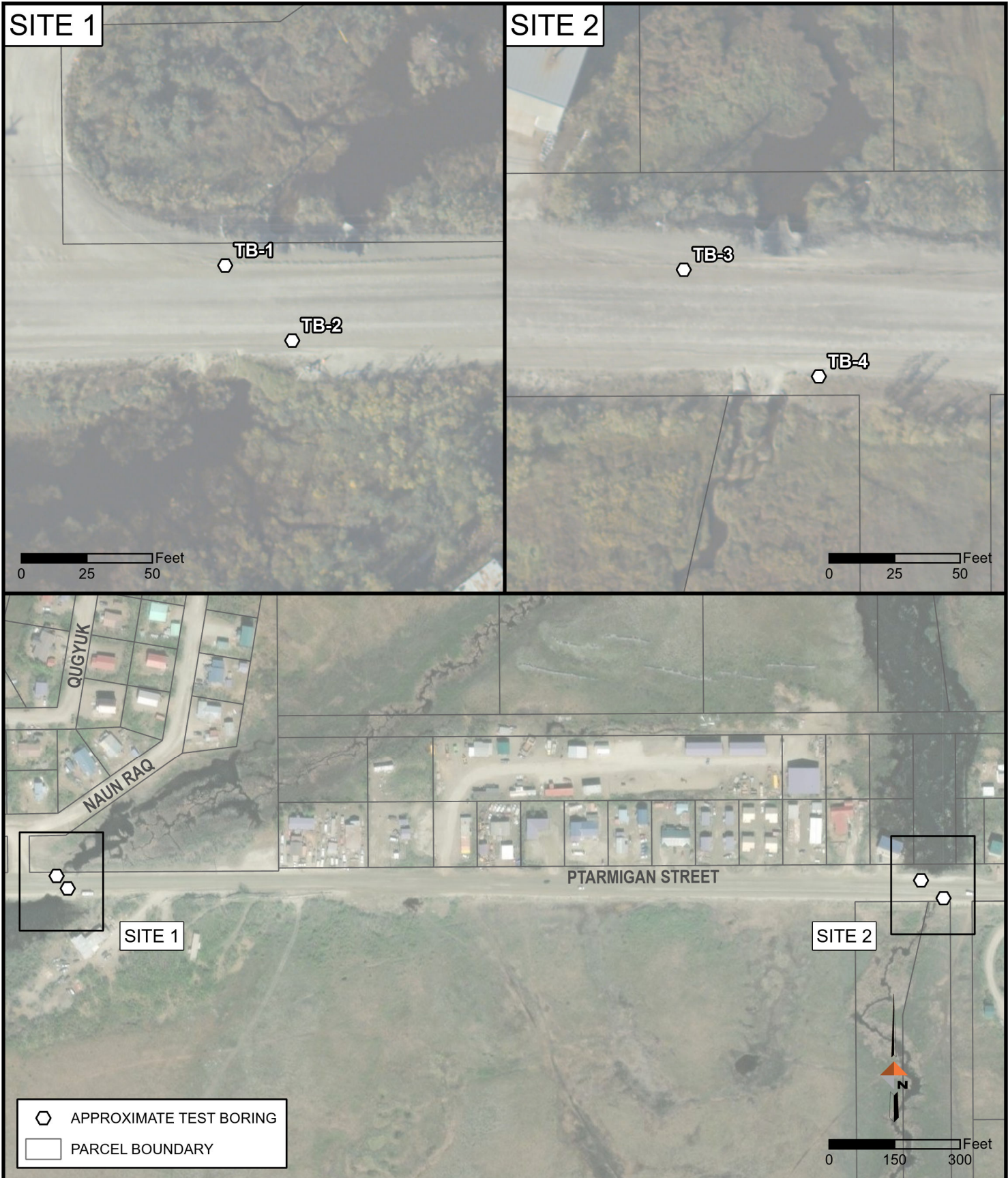
APPENDIX A

Project Vicinity and Test Boring Location Map



	PROJECT LOCATION AND VICINITY		PROJECT	1163.50270.68
	PTARMIGAN ST. CULVERT CROSSING GEOTECHNICAL INVESTIGATION		DATE	JAN 06, 2025
	BETHEL, AK		FIGURE A-1	

Service Layer Credits: World Imagery, Maxar



	TEST BORING LOCATION	PROJECT1163.50270.68
	PTARMIGAN ST. CULVERT CROSSING GEOTECHNICAL INVESTIGATION	DATEJAN 08, 2025
	BETHEL, AK	FIGURE A-2

Service Layer Credits: World Imagery: Kodiak Mapping Inc
World Imagery: Maxar

APPENDIX B

Test Boring Logs and Descriptive Guide



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-1

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/12/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.805111, -161.806626
Operator:	Mason Iverson	▽ Drilling Water Level:	10'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Atterberg Limits (LL-PL-Pi)	Sample Number	Blow Counts	Sample Graphic					
	24	56	20	6		1		■				FILL, Silty Sand with Gravel (SM) - 25% fine, subangular to subrounded gravel; 55% fine sand; 20% fines; brown, FROZEN , Nbn	4.5
				9		2	4 3 5	■			SM		
5	0	78	22	10		3	4 4 4	■				FILL, Silty Sand (SM) - 80% fine sand; 20% fines; brown	7.0
				20		4	2 2 2	■			ML	FILL, Sandy Silt (ML) - 40% fine sand; 60% low to medium plasticity fines; wet, gray, soft	10.0
10				44		5	2 1 2	■			PT	Peat (PT) - 15% fine sand; wet, brown	12.0
15	0	30	70	34	NP	6	2 3 4	■				Silt (ML) - 30 to 40% fine sand; 60 to 70% non plastic fines; wet, gray, firm to very stiff	31.5
				35		7	5 5 7	■			ML		
25	0	38	62	26		8	10 8 10	■					
30				27		9	3 5 7	■					

End of Boring, backfilled with soil cuttings



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-2

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/12/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.805032, -161.806483
Operator:	Mason Iverson	▽ Drilling Water Level:	10.3'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
5				12	1		■				SM	FILL, Silty Sand (SM) - 10% fine, subangular to subrounded gravel; 70% fine sand; 20% fines; grayish brown, FROZEN, Nbn	4.5
				19	2	4 3 4	▲	2.0 [11]					
	18	66	16	9	3	4 3 2	▲	16.0 [89]					
10											SM	FILL, Silty Sand with Gravel (SM) - 20% fine, subrounded gravel; 65% fine sand; 15% fines; moist, brown, loose	9.5
				23	4	2 2 2	▲	8.0 [44]					
	2	77	21	22	5	2 3 3	▲	16.0 [89]					
15											OL	FILL, Silty Sand (SM) - 80% fine sand; 20% fines; wet, gray, loose	13.5
				78	6	2 3 2	▲	16.0 [89]					
20											ML	Organic Silt (OL) - 10% fine sand; 90% fines; moist to wet, brown, firm, contains fibrous organics	17.5
				40	7	4 4 8	▲	18.0 [100]					
25											ML	Sandy Silt (ML) - 40% fine sand; 60% low to medium plasticity fines; wet, gray, stiff	27.5
				26	8	7 7 10	▲	16.0 [89]					
30											SM	Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	31.5
				23	9	5 10 17	▲	16.0 [89]					



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-3

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/13/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	30.9'
Method:	Auger	Coordinates:	60.805067, -161.795537
Operator:	Mason Iverson	▽ Drilling Water Level:	13.5'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
				12	1		■					FILL, Silty Sand (SM) - 10% fine to coarse, subangular to subrounded gravel; 75% fine sand; 15% fines; light brown, FROZEN , No	
0	0	77	23	6	2	6 9 9	▲	16.0 [89]			SM	FILL, Silty Sand (SM) - 75% fine sand; 25% fines; wet, brownish gray, medium dense	
5													
				13	3	6 8 7	▲	16.0 [89]					
				20	4	6 6 5	▲	16.0 [89]					
10													9.5
				60	5	2 1 5	▲	10.0 [56]			OL	Organic (OL) - 10% fine sand; 90% fines; wet, brown, firm	
15	0	57	43	30	6	2 2 3	▲	16.0 [89]				Silty Sand (SM) - 55% fine sand; 45% low to medium plasticity fines; wet, gray, firm	11-13-24 ▽
													17.5
20												Silty Sand (SM) - 80% fine sand; 20% fines; wet, gray, medium dense	
				21	7	7 8 10	▲	18.0 [100]			SM		23.5
25												Silty Sand (SM) - 70% fine sand; 30% fines; wet, gray	
				21	8	5 8 27	▲	18.0 [100]					
30	0	69	31	24	9	36 50/5"	▲	11.0 [100]					30.9

End of Boring, backfilled with soil cuttings



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-4

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/13/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.804955, -161.795249
Operator:	Mason Iverson	▽ Drilling Water Level:	13.6'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
				17	1		■						
9	52	39		21	2	2 2 3	▲	2.0 [11]					
5													4.5
				19	3	1 1 1	▲	18.0 [100]					
8	78	14		17	4	8 11 14	▲	16.0 [89]					
10													9.5
				20	5	4 4 4	▲	16.0 [89]					
15													
				22	6	1 1 1	▲	6.0 [33]					
20	0	79	21	35	7	WOH 5 8	▲	18.0 [100]				Trace fibrous organics	
25													
				26	8	5 9 12	▲	18.0 [100]					
30													
				19	9	3 4 5	▲	18.0 [100]					31.5

End of Boring, backfilled with soil cuttings

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 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)**

0 - 4
 5 - 10
 11 - 30
 31 - 50
 More than 50

Relative Soil Density

Very loose
 Loose
 Medium dense
 Dense
 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)**

0 - 2
 3 - 4
 5 - 8
 9 - 15
 16 - 30
 More than 30

Relative Soil Density

Very soft
 Soft
 Firm
 Stiff
 Very Stiff
 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)

Based on the Unified Soil Classification System (USCS)				USCS Soil Classification		
Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				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	$Cu \geq 6$ 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}	
			$PI < 4$ and plots on or above "A" line ^J	ML	Silt ^{K,L,M}	
	Liquid limit less than 50	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}
				PI plots below "A" line	MH	Elastic silt ^{K,L,M}
		Liquid limit 50 or more	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		F	If fines classify as CL-ML, use dual symbol GC-GM, SC-SM		
B	If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name		G	If soil contains $\geq 15\%$ sand, add "with sand 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		H	If fines are organic, add " with organic fines" to group name		
			I	If soil contains $\geq 15\%$ 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 $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.		
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		M	If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.		
			N	$PI \geq 4$ 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		
E	$Cu = D_{60}/D_{10}$ $Cc = [(D_{30})^2/(D_{10} \times D_{60})]$					

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

Part I Description of Soil Phase			Classify Soil Phase by ASTM D2487 or D2488		
Part II Description of Frozen Soil	Segregated ice is not visible by eye	Group Symbol	Subgroup		Field Identification
		N	Description	Symbol	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)
			Poorly bonded or friable	Nf	
			No excess ice	Nb	
	Well-bonded Excess ice	Nbe			
	Segregated ice is visible by eye (ice 1- inc 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
			Ice coatings on particles	Vc	
			Random or irregularly oriented ice formations	Vr	
			Stratified or distinctly oriented ice formations	Vs	Estimate volume of visible segregated ice present as percentage of total sample volume. (Note 2)
			Uniformly distributed ice	Vu	
Part III Description of Substantial Ice	Ice (greater than 1-inh 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: <u>HARDNESS</u> : Hard, Soft (of mass, not individual crystals) <u>STRUCTURE</u> (Note 4): Clear, Cloudy, Porous, Canded, Granular, Stratified <u>COLOR</u> : Colorless, Gray, Blue <u>ADMIXTURES</u> : Contains few thin silt inclusions
			Ice without soil inclusions	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) Canded 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.

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 jar, 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.

FROST DESIGN SOIL CLASSIFICATION¹

Frost² 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) (MOA F2)	(a) Gravels Crushed stone Crushed rock	1.5 to 3	GW and GP
	(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	Over 15	ML and MH
	(b) Very fine silty sands		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



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details					
Sample ID	24-10360-S01	24-10360-S02	24-10360-S03	24-10360-S04	24-10360-S05
Field Sample ID					
Client Sample ID	TB-01 Sa1	TB-01 Sa2	TB-01 Sa3	TB-01 Sa4	TB-01 Sa5
Date Sampled					

Particle Size Distribution			
Method:	Sieve Size	% Passing	Limits
ASTM D 422	3in	100	
Description: Analysis of Particle Size Distribution in Soils. Sieving for Particles >75µm, Hydrometer	2in	100	
	1½in	100	
	1in	100	
	¾in	100	
	½in	99	
	3/8in	89	
Washed: Sample Washed	No.4	76	
	No.10	63	
	No.20	56	
	No.40	51	
	No.60	47	
	No.100	36	
	No.200	20	
	Finer No.200 (75µm)	18.9	

Other Test Results						
Description	Method	Results				Limits
Dispersion device	ASTM D 422	Dispersant by hand				
Dispersion time (min)						
Shape						
Hardness						
Water Content (%)	ASTM D2216	6	9	10	20	44
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487	SM			SM	
Group Name		Silty sand with gravel			Silty sand	
Liquid Limit		0			0	
Plasticity Index		0			0	
Gravel (%)		24			0	
Sand (%)		56			78	
Fines (%)		20			22	
Tested By	ASTM D2487	Desirae Pascale			Desirae Pascale	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10360-S06	24-10360-S07	24-10360-S08	24-10360-S09
Field Sample ID				
Client Sample ID	TB-01 Sa6	TB-01 Sa7	TB-01 Sa8	TB-01 Sa9
Date Sampled				

Particle Size Distribution

Method:	Sieve Size	% Passing	Limits
ASTM D 422	3in	100	
Description: Analysis of Particle Size Distribution in Soils. Sieving for Particles >75µm, Hydrometer	2in	100	
	1½in	100	
	1in	100	
	¾in	100	
	½in	100	
	3/8in	100	
Washed: Sample Washed	No.4	100.0	
	No.10	100	
	No.20	100	
	No.40	100	
	No.60	98	
	No.100	89	
	No.200	70	

Other Test Results

Description	Method	Results	Limits
Water Content (%)	ASTM D2216	34 35 26 27	
Date Tested		11/22/2024 11/22/2024 11/22/2024 11/22/2024	
Tested By		Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale	
Group Code	ASTM D2487	ML ML	
Group Name		Sandy silt Sandy silt	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		0	
Sand (%)		30	
Fines (%)		70	
Tested By	ASTM D2487	Desirae Pascale Desirae Pascale	
Liquid Limit	ASTM D4318	Not Obtainable	
Plastic Limit		NP (Non-Plastic)	
Plasticity Index		NP (Non-Plastic)	
As-Received Water Content (%)		33.9	
Preparation Method		Air Dry	
Oversize Removed By		Dry Sieving over No. 40 sieve	
Liquid Limit Apparatus		Mechanical	
Grooving Tool		Plastic	
Rolling		Hand	
Tested By		Cindy Zickefoose	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Alaska Testlab - Anchorage
1020 W International Airport Rd
Anchorage, AK 99518
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10360-S06	24-10360-S07	24-10360-S08	24-10360-S09
Field Sample ID				
Client Sample ID	TB-01 Sa6	TB-01 Sa7	TB-01 Sa8	TB-01 Sa9
Date Sampled				

Other Test Results

Description	Method	Results	Limits
Date Tested	ASTM D4318	11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10593
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details						
Sample ID	24-10593-S01	24-10593-S02	24-10593-S03	24-10593-S04	24-10593-S05	
Field Sample ID						
Client Sample ID	TB-02 Sa1	TB-02 Sa2	TB-02 Sa3	TB-02 Sa4	TB-02 Sa5	
Date Sampled						
Other Test Results						
Description	Method	Results				Limits
Water Content (%)	ASTM D2216	12	19	9	23	22
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487			SM		SM
Group Name				Silty sand with gravel		Silty sand
Liquid Limit				0		0
Plasticity Index				0		0
Gravel (%)				18		2
Sand (%)				66		77
Fines (%)				16		21
Tested By	ASTM D2487			Desirae Pascale		Desirae Pascale

Comments
Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10593
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10593-S06	24-10593-S07	24-10593-S08	24-10593-S09
Field Sample ID				
Client Sample ID	TB-02 Sa6	TB-02 Sa7	TB-02 Sa8	TB-02 Sa9
Date Sampled				

Other Test Results

Description	Method	Results				Limits
Water Content (%)	ASTM D2216	78	40	26	23	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10594
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10594-S01	24-10594-S02	24-10594-S03	24-10594-S04	24-10594-S05
Field Sample ID					
Client Sample ID	TB-03 Sa1	TB-03 Sa2	TB-03 Sa3	TB-03 Sa4	TB-03 Sa5
Date Sampled					

Other Test Results

Description	Method	Results					Limits
Water Content (%)	ASTM D2216	12	6	13	20	60	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	
Group Code	ASTM D2487		SM				
Group Name			Silty sand				
Liquid Limit			0				
Plasticity Index			0				
Gravel (%)			0				
Sand (%)			77				
Fines (%)			23				
Tested By	ASTM D2487		Desirae Pascale				

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10594
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10594-S06	24-10594-S07	24-10594-S08	24-10594-S09
Field Sample ID				
Client Sample ID	TB-03 Sa6	TB-03 Sa7	TB-03 Sa8	TB-03 Sa9
Date Sampled				

Particle Size Distribution

Method:	Sieve Size	% Passing	Limits
ASTM D6913	3in	100	
Description:	2in	100	
Sieve Analysis of Soil	1½in	100	
	1in	100	
	¾in	100	
Drying By:	½in	100	
Oven	3/8in	100	
Washed:	No.4	100.0	
Sample Washed	No.10	100	
	No.20	100	
	No.40	100	
	No.60	99	
	No.100	85	
	No.200	31	

Other Test Results

Description	Method	Results	Limits
Water Content (%)	ASTM D2216	30 21 21 24	
Date Tested		11/22/2024 11/22/2024 11/22/2024 11/22/2024	
Tested By		Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale	
Group Code	ASTM D2487	SM SM	
Group Name		Silty sand Silty sand	
Liquid Limit		0 0	
Plasticity Index		0 0	
Gravel (%)		0 0	
Sand (%)		57 69	
Fines (%)		43 31	
Tested By	ASTM D2487	Desirae Pascale Desirae Pascale	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10595-S01	24-10595-S02	24-10595-S03	24-10595-S04	24-10595-S05
Field Sample ID					
Client Sample ID	TB-04 Sa1	TB-04 Sa2	TB-04 Sa3	TB-04 Sa4	TB-04 Sa5
Date Sampled					

Particle Size Distribution

Method:	Sieve Size	% Passing				Limits
ASTM D 422	3in		100		100	
	2in		100		100	
Description:	1½in		100		100	
Analysis of Particle Size	1in		100		100	
Distribution in Soils. Sieving for	¾in		100		98	
Particles >75µm, Hydrometer	½in		100		95	
	3/8in		96		93	
Washed:	No.4		91		91.8	
Sample Washed	No.10		86		89	
	No.20		83		85	
	No.40		81		82	
	No.60		76		73	
	No.100		62		45	
	No.200		39		14	
	Finer No.200 (75µm)		35.7			

Other Test Results

Description	Method	Results					Limits
Water Content (%)	ASTM D2216	17	21	19	17	20	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	
Dispersion device	ASTM D 422		Dispersant by hand				
Dispersion time (min)							
Shape							
Hardness							
Group Code	ASTM D2487		SM		SM		
Group Name			Silty sand		Silty sand		
Atterberg Limits Estimated					Yes		
Liquid Limit			0				
Plasticity Index			0				
Gravel (%)			9		8		
Sand (%)			52		78		
Fines (%)			39		14		
Tested By	ASTM D2487		Desirae Pascale		Desirae Pascale		

Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Report No: ASM:24-10595
Issue No: 1

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample ID	24-10595-S01	24-10595-S02	24-10595-S03	24-10595-S04	24-10595-S05
Field Sample ID					
Client Sample ID	TB-04 Sa1	TB-04 Sa2	TB-04 Sa3	TB-04 Sa4	TB-04 Sa5
Date Sampled					

Description	Method	Results	Limits
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details					
Sample ID	24-10595-S06	24-10595-S07	24-10595-S08	24-10595-S09	
Field Sample ID					
Client Sample ID	TB-04 Sa6	TB-04 Sa7	TB-04 Sa8	TB-04 Sa9	
Date Sampled					
Other Test Results					
Description	Method	Results			
Water Content (%)	ASTM D2216	22	35	26	19
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487		SM		
Group Name			Silty sand		
Liquid Limit			0		
Plasticity Index			0		
Gravel (%)			0		
Sand (%)			79		
Fines (%)			21		
Tested By	ASTM D2487		Desirae Pascale		

Comments
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10360-S01
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10360-S01
Client Sample ID TB-01 Sa1
Specification Sieve

Particle Size Distribution

Method: ASTM D 422

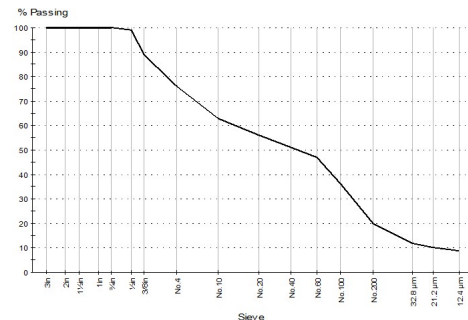
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	99	
3/8in	89	
No.4	76	
No.10	63	
No.20	56	
No.40	51	
No.60	47	
No.100	36	
No.200	20	
Finer No.200 (75µm)	18.9	
32.8 µm	11.9	
21.2 µm	10.0	
12.4 µm	8.8	

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			
Water Content (%)	ASTM D2216	6	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand with gravel	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		24	
Sand (%)		56	
Fines (%)		20	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	

Chart



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10360-S06
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10360-S06
Client Sample ID TB-01 Sa6

Particle Size Distribution

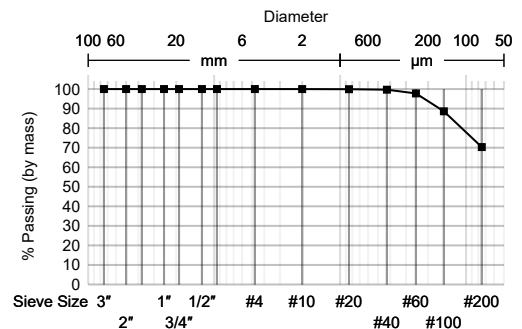
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	100	
No.4	100.0	
No.10	100	
No.20	100	
No.40	100	
No.60	98	
No.100	89	
No.200	70	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	34	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	ML	
Group Name		Sandy silt	
Gravel (%)		0	
Sand (%)		30	
Fines (%)		70	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	
	ASTM D4318		
Liquid Limit		Not Obtainable	
Plastic Limit		NP (Non-Plastic)	
Plasticity Index		NP (Non-Plastic)	
As-Received Water Content (%)		33.9	
Preparation Method		Air Dry	
Oversize Removed By		Dry Sieving over No. 40 sieve	
Liquid Limit Apparatus		Mechanical	
Grooving Tool		Plastic	
Rolling		Hand	
Tested By		Cindy Zickefoose	
Date Tested		11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

N/A



Material Test Report

Report No: MAT:24-10594-S09
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10594-S09
Client Sample ID TB-03 Sa9

Particle Size Distribution

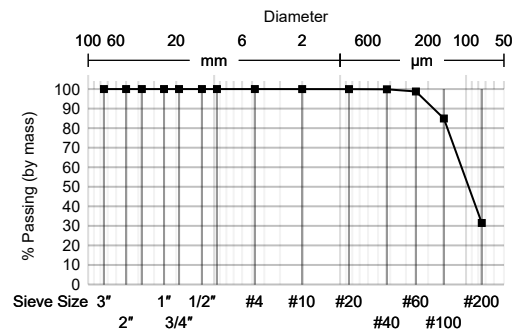
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	100	
No.4	100.0	
No.10	100	
No.20	100	
No.40	100	
No.60	99	
No.100	85	
No.200	31	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	24	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		0	
Sand (%)		69	
Fines (%)		31	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing
No Plasticity Index Test Performed



Material Test Report

Report No: MAT:24-10595-S02
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503

Project Code: 241419

CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

[Signature]

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10595-S02
Client Sample ID TB-04 Sa2
Specification Sieve

Particle Size Distribution

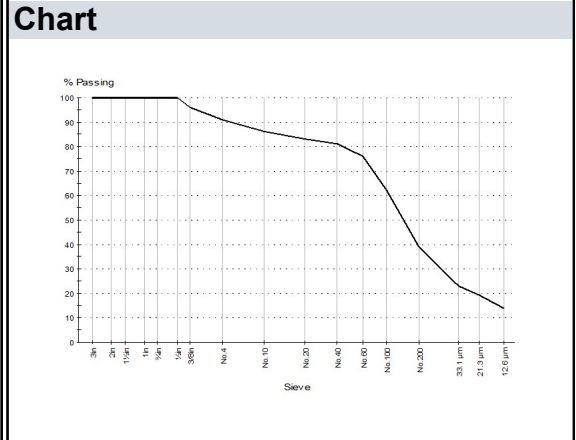
Method: ASTM D 422

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	96	
No.4	91	
No.10	86	
No.20	83	
No.40	81	
No.60	76	
No.100	62	
No.200	39	
Finer No.200 (75µm)	35.7	
33.1 µm	22.9	
21.3 µm	19.1	
12.6 µm	14.0	

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			
Water Content (%)	ASTM D2216	21	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		9	
Sand (%)		52	
Fines (%)		39	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10595-S04
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10595-S04
Client Sample ID TB-04 Sa4

Particle Size Distribution

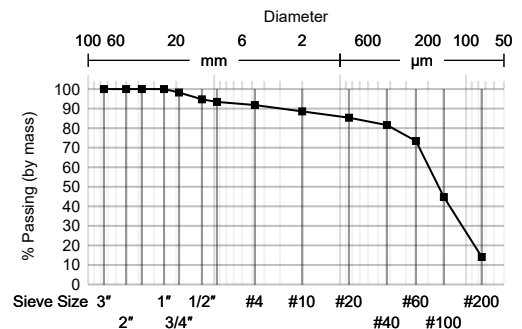
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	98	
½in	95	
3/8in	93	
No.4	91.8	
No.10	89	
No.20	85	
No.40	82	
No.60	73	
No.100	45	
No.200	14	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	17	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Atterberg Limits Estimated		Yes	
Gravel (%)		8	
Sand (%)		78	
Fines (%)		14	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

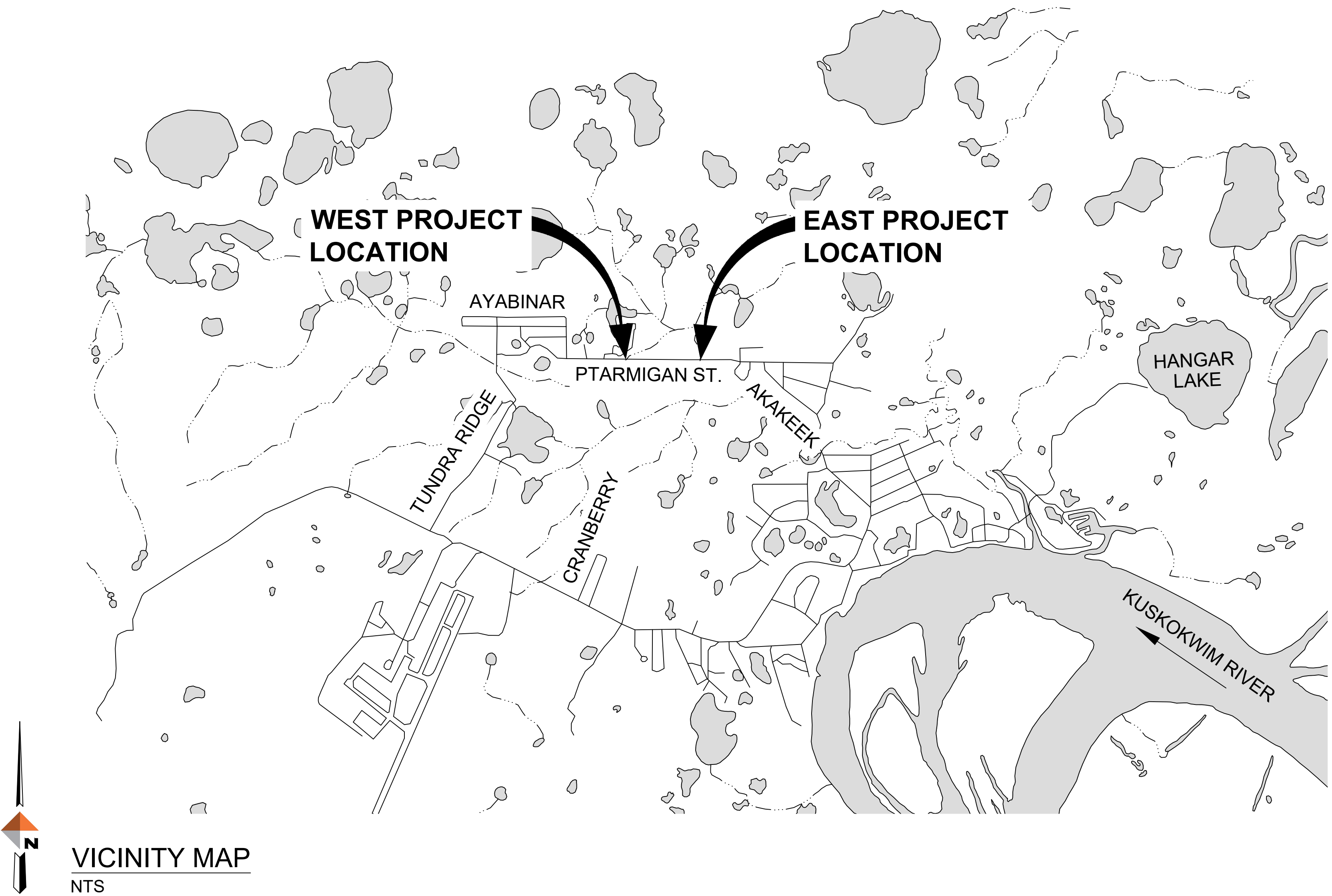
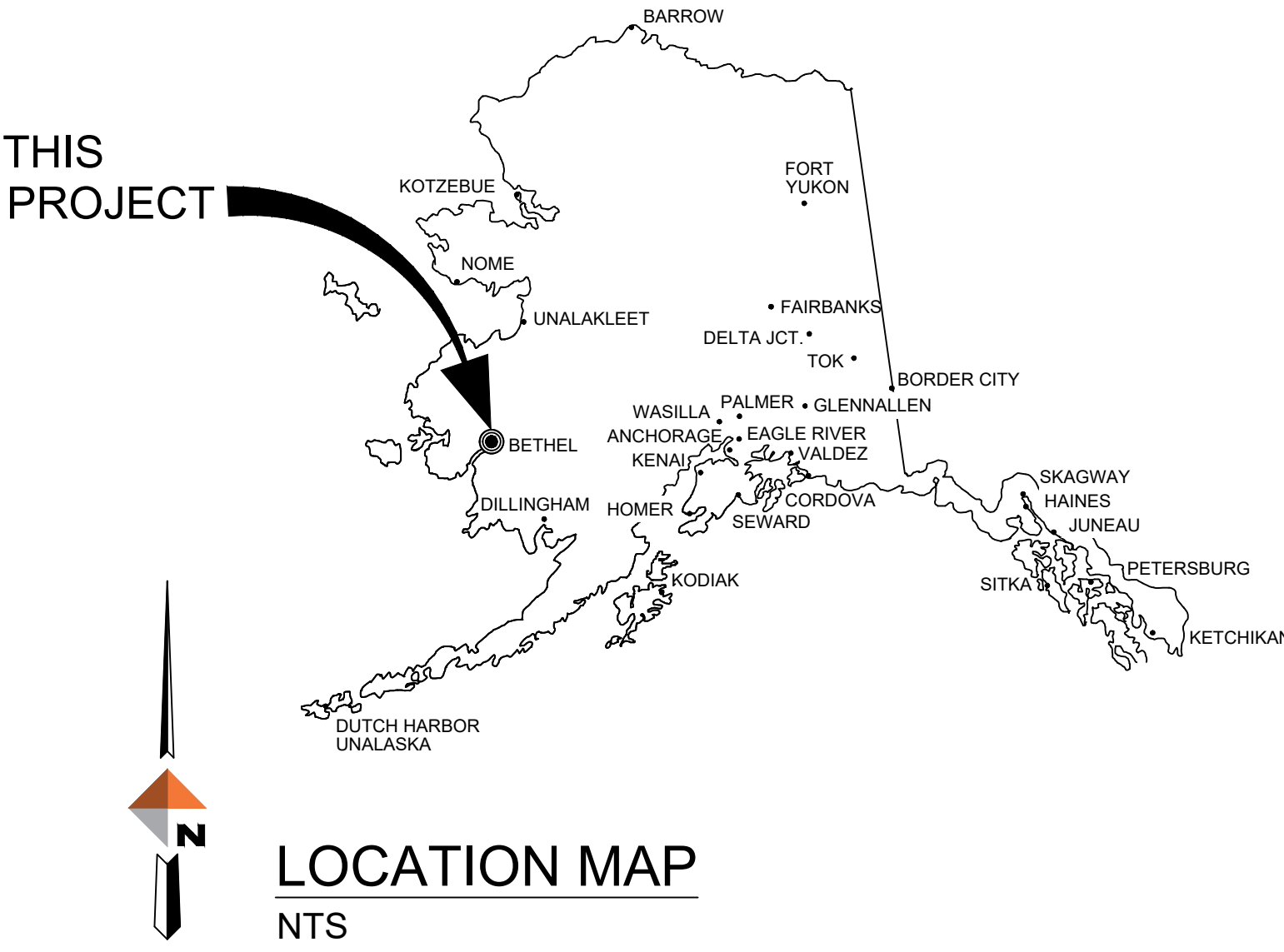
No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing

Appendix C: 65% Design Plans for Ptarmigan St Culverts

CONTRACT DRAWINGS FOR

PTARMIGAN STREET CULVERT CROSSINGS PTARMIGAN CREEK FISH PASSAGE IMPROVEMENT PROJECTS CITY OF BETHEL

SECTION 6, TOWNSHIP 8 NORTH, RANGE 71 WEST, SEWARD MERIDIAN, ALASKA
JANUARY 2025



DRAWING INDEX	
C1	COVER SHEET
C2	GENERAL NOTES AND QUANTITIES
C3	SURVEY CONTROL - WEST CULVERT
C4	SURVEY CONTROL - EAST CULVERT
C5	EXISTING STREAM PLAN AND PROFILE - WEST CULVERT
C6	EXISTING STREAM PLAN AND PROFILE - EAST CULVERT
C7	STREAM PLAN AND PROFILE - WEST CULVERT
C8	STREAM PLAN AND PROFILE - EAST CULVERT
C9	ROADWAY PLAN AND PROFILE
C10	DETAILS AND TYPICAL SECTIONS
C11	ESCP & STREAM DIVERSION PLAN
C12	REVEGETATION PLAN
C13	BANK RECONSTRUCTION
C14	CULVERT MARKER POST

PROJECT	LOCATION	WATERBODY NAME	ADF&G ANADROMOUS WATERS CATALOG CODE
WEST CULVERT	PTARMIGAN ST.	PTARMIGAN CREEK	335-10-16600-2621-3020
EAST CULVERT			

65% PLANS

C:\dowl_pw\0418828\C2-SA-CH-WA-50305.dwg PLOT DATE 2025-2-3 13:02 SAVED DATE 2025-02-03 12:37 USER: rduerst

ESTIMATE OF QUANTITIES - WEST CULVERT				
ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	UNIT
202.0004.0000	REMOVAL OF CULVERT PIPE	LUMP SUM	135	LINEAR FOOT
203.0019.0000	UNCLASSIFIED EXCAVATION	LUMP SUM	330	CUBIC YARD
203.0020.000A	BORROW, SELECTED MATERIAL, TYPE A	LUMP SUM	935	CUBIC YARD
203.0020.000F	SUBBASE, GRADING F	LUMP SUM	638	CUBIC YARD
205.0005.0000	CONTROLLED LOW-STRENGTH MATERIAL	LUMP SUM	44	CUBIC YARD
301.0004.0000	AGGREGATE SURFACE COURSE, GRADING E-1	LUMP SUM	72	CUBIC YARD
602.0005.0000	ASSEMBLE AND INSTALL STRUCTURAL PLATE ALUMINUM ARCH CULVERT, 7GA, 12'-10" SPAN, 8'-4" RISE	LUMP SUM	120	LINEAR FOOT
610.0001.0000	DITCH LINING	LUMP SUM	110	CUBIC YARD
613.0002.0000	CULVERT MARKER POST	LUMP SUM	2	EACH
618.0005.0000	SEEDING	LUMP SUM	11	POUND
630.0003.0002	GEOTEXTILE, REINFORCEMENT, TYPE 2	LUMP SUM	660	SQUARE YARD
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
642.0014.0000	AS-BUILT PLANS	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	WATERWAY BED FILL	LUMP SUM	117	CUBIC YARD
690.2003.0000	WATERWAY BANK REVEGETATION AND PROTECTION	LUMP SUM	ALL REQUIRED	LUMP SUM

ABBREVIATIONS	
AVASP	AS VERTICAL AS SAFELY POSSIBLE
BFW	BANKFULL WIDTH
CFS	CUBIC FEET PER SECOND
CL	CENTERLINE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
CRH	COPPER RIVER HIGHWAY
CTC	CORDOVA TELECOM COOPERATIVE
ELEV	ELEVATION
ESCP	EROSION AND SEDIMENT CONTROL PLAN
HW/D	HEADWATER TO DEPTH RATIO
MIN	MINIMUM
MP	MILEPOST
NTS	NOT TO SCALE
OHW	ORDINARY HIGH WATER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PC	PTARMIGAN CREEK
Q	FLOW
ROW	RIGHT-OF-WAY
SPP	STRUCTURAL PLATE PIPE
STA	STATION
TCE	TEMPORARY CONSTRUCTION EASEMENT
TYP	TYPICAL

TABLE 3	
WATERWAY BED FILL	
SIZE/SIEVE	% PASSING
12"	100
9"	100
6"	90
4"	79
3"	65
1"	41
0.75"	30
#4	19
#8	15

QUANTITIES NOTES:

- ESTIMATE OF QUANTITIES ARE FOR INFORMATION ONLY AND CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES.
- EXCAVATION AND BACKFILL REQUIRED FOR STREAM DIVERSION AS SHOWN ON SHEET C11 IS SUBSIDIARY TO PAY ITEM 672.0001.0000 STREAM DIVERSION & DEWATERING.
- WATERWAY BED FILL SHALL BE PRODUCED BY MIXING, BY VOLUME, 35% SELECTED MATERIAL, TYPE D, AND 65% DITCH LINING. REFER TO SPECIFICATION SECTION 690 AND DETAIL 1/C10 FOR MORE INFORMATION ABOUT WATERWAY BED FILL MATERIAL.
- BORROW, SELECTED MATERIAL, TYPE A SHALL BE COMMERCIALY SOURCED IF MATERIAL FOUND DURING EXCAVATION DOES NOT MEET CONTRACT SPECIFICATIONS.

ESTIMATE OF QUANTITIES - EAST CULVERT				
ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	UNIT
202.0004.0000	REMOVAL OF CULVERT PIPE	LUMP SUM	126	LINEAR FOOT
203.0019.0000	UNCLASSIFIED EXCAVATION	LUMP SUM	330	CUBIC YARD
203.0020.000A	BORROW, SELECTED MATERIAL, TYPE A	LUMP SUM	781	CUBIC YARD
203.0020.000F	SUBBASE, GRADING F	LUMP SUM	539	CUBIC YARD
205.0005.0000	CONTROLLED LOW-STRENGTH MATERIAL	LUMP SUM	33	CUBIC YARD
301.0004.0000	AGGREGATE SURFACE COURSE, GRADING E-1	LUMP SUM	60	CUBIC YARD
602.0005.0000	ASSEMBLE AND INSTALL STRUCTURAL PLATE ALUMINUM ARCH CULVERT, 7GA, 12'-10" SPAN, 8'-4" RISE	LUMP SUM	100	LINEAR FOOT
610.0001.0000	DITCH LINING	LUMP SUM	77	CUBIC YARD
613.0002.0000	CULVERT MARKER POST	LUMP SUM	2	EACH
618.0005.0000	SEEDING	LUMP SUM	12	POUND
630.0003.0002	GEOTEXTILE, REINFORCEMENT, TYPE 2	LUMP SUM	550	SQUARE YARD
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
642.0014.0000	AS-BUILT PLANS	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	WATERWAY BED FILL	LUMP SUM	84	CUBIC YARD
690.2003.0000	WATERWAY BANK REVEGETATION AND PROTECTION	LUMP SUM	ALL REQUIRED	LUMP SUM

GENERAL NOTES:

- 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 OWNER'S REPRESENTATIVE.
- UTILITIES ARE SHOWN ON THE PLANS TO THE EXTENT THEY ARE KNOWN. BEFORE CONDUCTING ANY GROUND-DISTURBING ACTIVITIES THE CONTRACTOR SHALL VERIFY UTILITY LOCATIONS. CONTACT THE ALASKA DIGLINE AT 1-907-278-3121 OR AT 811AK.COM. LOCATE ALL UTILITIES WITHIN THE PROJECT AND PROTECT THEM FROM DAMAGE THROUGH THE DURATION OF WORK.
- COORDINATE CONSTRUCTION STAGING AND MOBILIZATION AREAS AND ACTIVITIES WITH OWNER'S REPRESENTATIVE. COORDINATION WITH CITY OF BETHEL DEPARTMENT OF PUBLIC WORKS IS REQUIRED FOR CONCURRENCE.
- EXERCISE CAUTION AND COMPLY WITH ALL APPLICABLE OSHA REQUIREMENTS FOR WORKING IN CONFINED AREAS.
- STATIONING IS ALONG CENTERLINE OF STREAM OR ROADWAY.
- VERIFY ELEVATIONS OF ALL PROPOSED STRUCTURES PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES FROM PLANS IMMEDIATELY TO OWNER'S REPRESENTATIVE.
- CULVERT DESIGN LOAD: AASHTO LOADING HL-93, MINIMUM SOIL BEARING CAPACITY: 3,000 PSF.
- EXCAVATION AND COMPACTION:
 - REMOVE AND DISPOSE OF ALL ORGANIC OR OVERSATURATED SOFT MATERIAL, WHICH CANNOT BE COMPACTED.
 - BACKFILL SHALL BE PLACED AND COMPACTED WITH CARE AND SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY ON BOTH SIDES OF PIPE. MATERIAL TO BE COMPACTED TO 95% MAXIMUM DENSITY.
- CULVERT INSTALLATION:
 - CULVERT INFILL MATERIAL SHALL BE INSTALLED IN PIPE ACCORDING TO PLANS. MANUAL INSTALLATION IS REQUIRED.
- ALL VEGETATION IN THE AREAS NOT AFFECTED BY WORK SHALL BE PRESERVED AND PROTECTED BY THE CONTRACTOR. SEE REVEGETATION PLAN.
- VEGETATIVE MAT WITHIN THE AREA OF DISTURBANCE SHALL BE SALVAGED, STORED AND CARED FOR AS DIRECTED BY THE OWNER REPRESENTATIVE UNTIL IT CAN BE REINSTALLED.

LEGEND:

	DESCRIPTION
	CONTROL POINT
	APPROXIMATE RIGHT-OF-WAY
	ORDINARY HIGH WATER
	EXISTING CULVERT
	EDGE OF PAVEMENT
	EDGE OF GRAVEL/SHOULDER
	EDGE OF VEGETATION
	EXISTING THALWEG
	TOP OF BANK
	TOE OF SLOPE
	PROPOSED CULVERT
	WATERWAY BED FILL
	WATERWAY BANK REVEGETATION AND PROTECTION
	VEGETATIVE MAT
	DITCH LINING
	AGGREGATE SURFACE COURSE, E-1
	SELECTED MATERIAL, TYPE A
	SUBBASE, GRADING F
	ORGANIC SOILS AND VEGETATIVE MAT, AS AVAILABLE; TOPSOIL, SEED, FERTILIZER, AND MULCH, AS NEEDED
	BULK BAG COFFERDAM

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
GENERAL NOTES AND QUANTITIES

BETHEL, ALASKA

PROJECT 1163.50270.68
DATE JANUARY 2025

© DOWL 2025

SHEET

C2 OF C14

REV DATE

DESCRIPTION

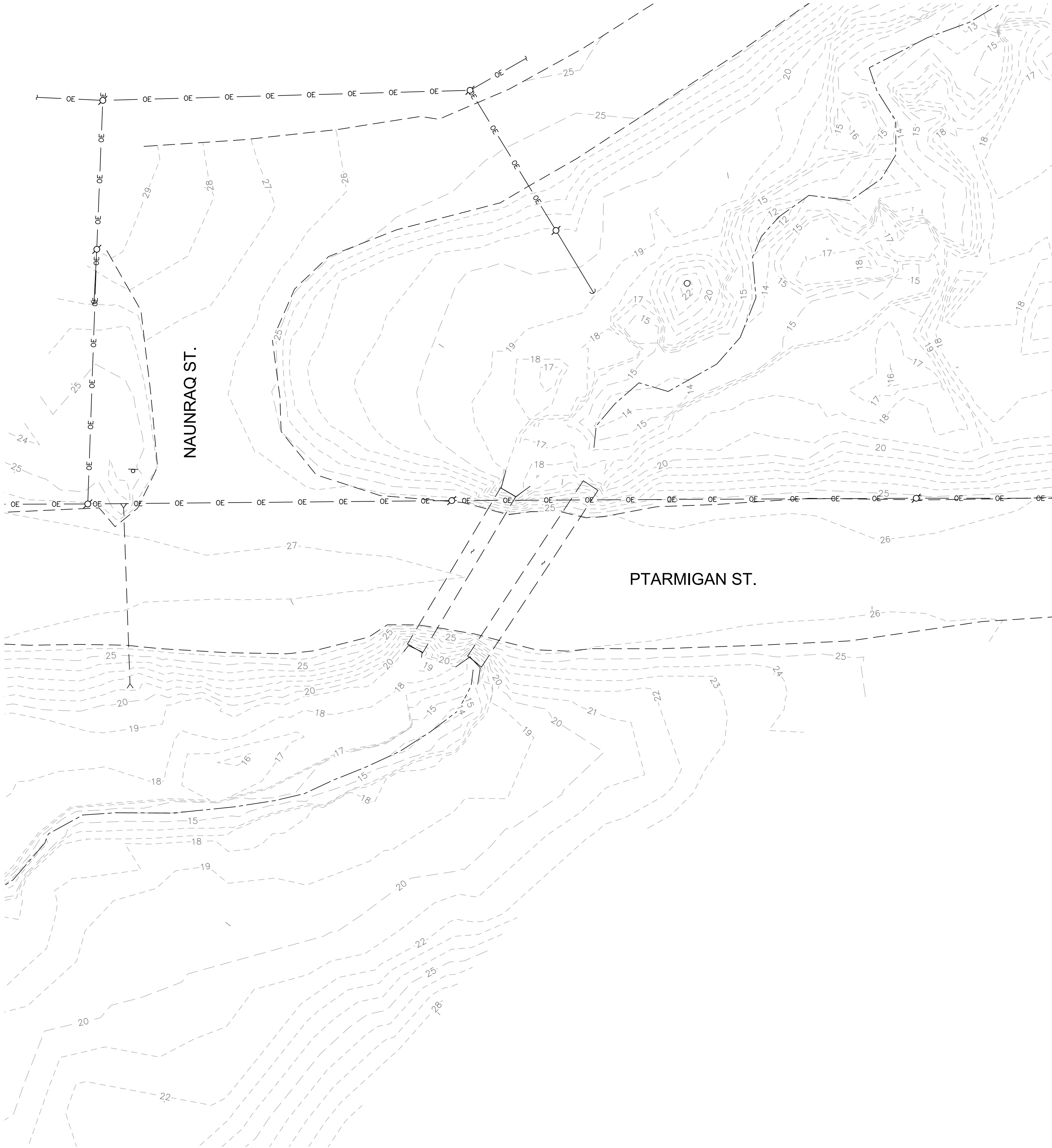
REVISIONS

BY

REGISTERED PROFESSIONAL ENGINEER
66% DESIGN
Bradley M. Beck
CE 1163

STATE OF ALASKA

C:\dowl_pw\0418828\C3-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:38 SAVED DATE 2025-01-28 11:38 USER: rduerst



SURVEY CONTROL NOTES:

HORIZONTAL CONTROL

COORDINATE SYSTEM:

THIS PROJECT IS LOCATED ENTIRELY WITHIN THE KUSKOKWIM RIVER 2015 LOW DISTORTION PROJECTION (LDP) COORDINATE SYSTEM. THIS LDP WAS DEVELOPED IN 2015 BY THE STATE OF ALASKA DOT&PF CENTRAL REGION SURVEY SECTION. THIS LDP COVERS COMMUNITIES ON AND AROUND THE LOWER KUSKOKWIM RIVER FROM THE RIVER'S MOUTH TO THE COMMUNITY OF CHUATHBALUK. BERING SEA COASTAL COMMUNITIES FROM CHEFORNAK TO KONGIGANAK ARE ALSO INCLUDED.

BASIS OF COORDINATES:

THE BASIS OF COORDINATES IS NGS STATION BET C (PID:DF3624) PROJECT POINT 553. SAID STATION IS LOCATED WITHIN THE FENCED AREA OF THE BETHEL AIRPORT AND HAS A NAD83(2011) POSITION OF LATITUDE 60°47'03.11084" N, LONGITUDE 161°50'08.36533" W, ELLIPSOID HEIGHT 42.527 METERS. BET C HAS PROJECT COORDINATES OF N 1034266.0570, E 582894.7332 U.S. FEET.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS IS A LOCAL PLANE BEARING BETWEEN NGS STATION BET C (PID: DF3624) AND NGS STATION BET B (PID: DF3623). NGS STATION BET B BEARS S 25°34'22.5" W A DISTANCE OF 2672.876 FEET FROM NGS STATION BET C, ALL AS DETERMINED BY STATIC GNSS TECHNIQUES. NGS STATION BET B HAS PROJECT COORDINATES OF N 1031854.9671, E 581740.9628 U.S. FEET.

TRANSLATION PARAMETERS:

KUSKOKWIM RIVER 2015 LDP PARAMETERS

LINEAR UNIT: U.S. SURVEY FEET

DATUM: NAD83(2011)

ELLIPSOID: GRS80

PROJECTION: HOTINE OBLIQUE MERCATOR

LATITUDE OF CENTER: 60°40'00" N

LONGITUDE OF CENTER: 162°00'00" W

AZIMUTH: 50°00'00"

FALSE NORTHING: -15,500,000.0'

FALSE EASTING: -19,100,000.0'

GRID SCALE FACTOR: 1.000002 (EXACT)

VERTICAL CONTROL

BASIS OF VERTICAL IS LOCAL MEAN TIDE LEVEL, AS DETERMINED FROM LEVELS PERFORMED BY ALASKA DOT&PF BETWEEN TIDAL BENCHMARK NO.6 (1970) AND TIDAL BENCHMARK NO.7 (1970). A DATUM ADJUSTMENT OF -1.55 FEET WAS APPLIED TO THE PUBLISHED MLLW ELEVATIONS PER NOAA/NOS PUBLICATION OF 1/22/71, TO ARRIVE AT PROJECT MEAN TIDE VALUES.

[601]BENCHMARK NO.6 (1970): A BRASS DISK ON COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF AT CAP LEVEL, IS LOCATED +/-400 FEET WESTERLY ALONG THIRD AVENUE (HOFFMAN HIGHWAY) FROM ITS INTERSECTION WITH MAIN STREET, +/-53 FEET SOUTH OF CENTERLINE, +/-20 FEET SOUTH OF UTILITY POLE #L1P70 AND +/-15 FEET NORTH OF THE MIDDLE OF A 2-STORY WOOD BUILDING. ELEVATION = 19.97 FEET (USED THIS SURVEY)

BENCHMARK NO.7 (1970): A BRASS DISK ON A COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF 0.4' BELOW CAP LEVEL, IS LOCATED +/-750 FEET WESTERLY ALONG FOURTH AVENUE FROM ITS INTERSECTION WITH MAIN STREET AND +/-8 FEET NORTH OF THE SOUTHEAST CORNER OF THE BOTTOM STEP LEADING TO THE MAIN ENTRANCE OF THE NATIONAL GUARD ARMORY (UNDER AN ELEVATED, METAL GRATE WALKWAY). ELEVATION = 25.57 FEET (NOT USED THIS SURVEY)

[554]BENCHMARK PS-3(2003): A BRASS CAP IN A BROKEN PVC PIPE FLUSH IN GROUND, IS LOCATED +/-23 FEET SOUTHWEST FROM THE EDGE OF TUNDRA RIDGE ROAD AND +/-27 FEET NORTHWEST FROM THE EDGE OR GEORGE STREET. ELEVATION = 37.58 FEET (USED THIS SURVEY)

VERTICAL CONTROL WAS EXTENDED THROUGHOUT THE PROJECT AREA USING DIFFERENTIAL LEVELING METHODS.

A LEICA DNA10 DIGITAL LEVEL AND LEICA LGO SOFTWARE WERE USED TO CHECK ADJUSTED ELEVATIONS. ELEVATIONS FOR THE LISTED BENCHMARKS WERE PROVIDED TO DOWL BY THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES.

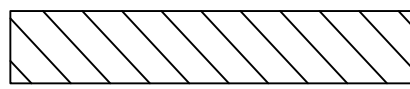
ALL ELEVATIONS ON CONTROL POINTS AND BENCHMARKS NEED TO BE FIELD VERIFIED BEFORE THEY ARE USED.

SURVEY POINTS:

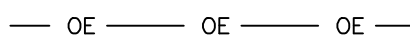
CONTROL MONUMENTS FOUND THIS SURVEY

ID	REC. NORTHING	REC. EASTING	REC. ELEV.	DESCRIPTION
567	1041934.5807	588490.8424	-9999	RCM Fd AM[DOT]: RCM 567
588	1041867.3884	590514.5170	34.83	STS Set AC[12041]: BRR-588
589	1041886.1205	589529.5735	16.03	STS Set AC[12041]: BRR-589

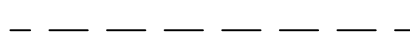
LEGEND



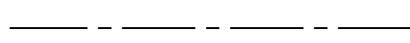
BUILDING OUTLINE



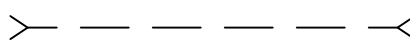
OVERHEAD UTILITY LINES



EDGE OF GRAVEL



CREEK CENTER/THALWEG



CULVERT



MINOR CONTOUR LINE (1')



MAJOR CONTOUR LINE (5')



SIGN



UTILITY POLE



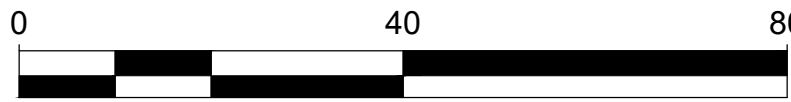
GUY ANCHOR



SURVEY MONUMENT FOUND



SURVEY MONUMENT POINT NUMBER



SCALE IN FEET

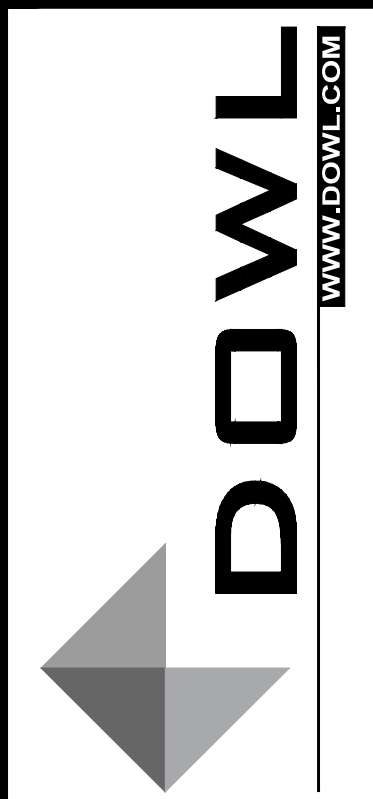
PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
SURVEY CONTROL – WEST CULVERT

PROJECT 1163.50270.68
DATE JANUARY 2025

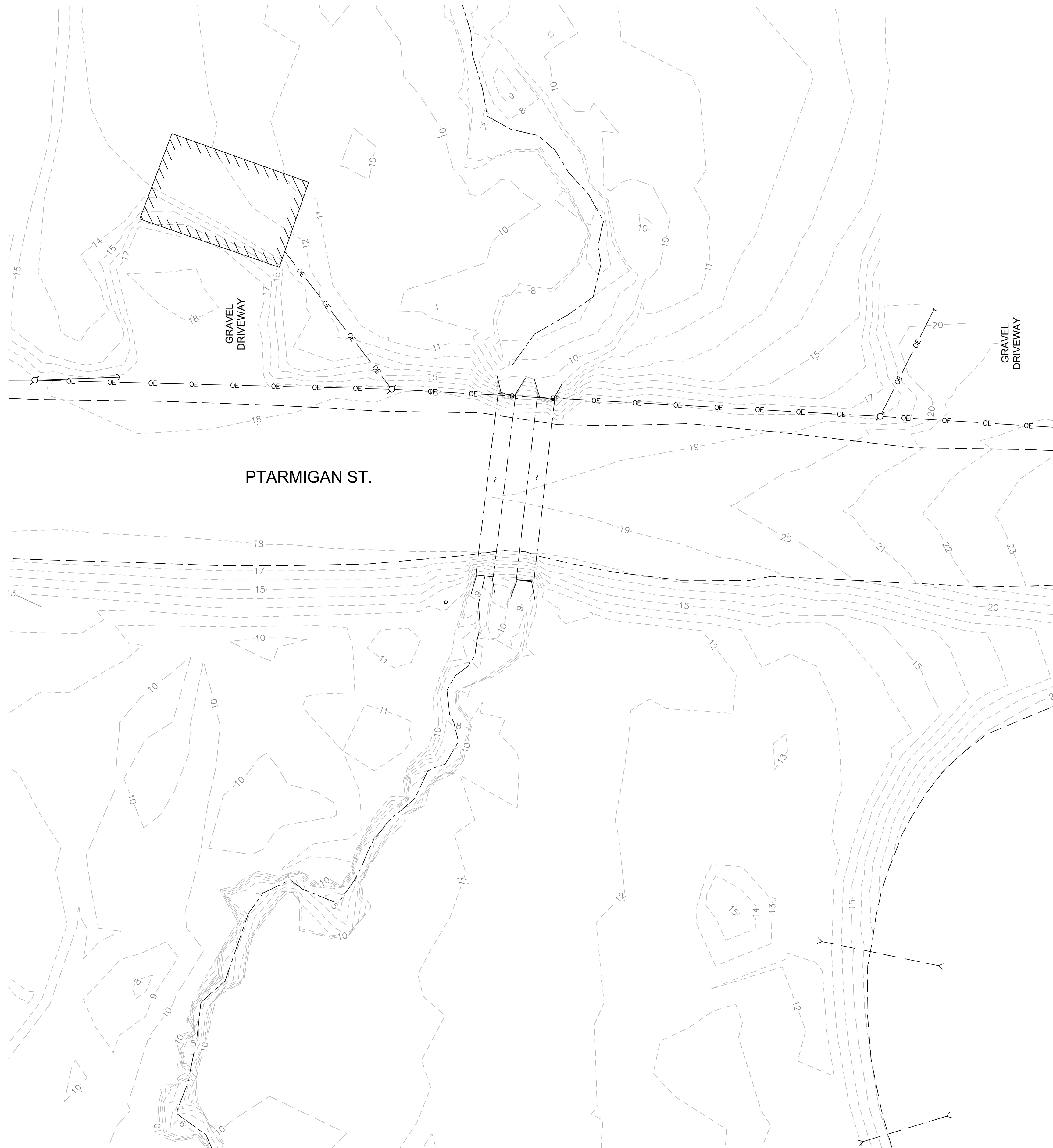
DOWL 2025
SHEET

C3 OF C14

REV	DATE	DESCRIPTION	BY



BETHEL, ALASKA



SURVEY CONTROL NOTES:

HORIZONTAL CONTROL
COORDINATE SYSTEM:
THIS PROJECT IS LOCATED ENTIRELY WITHIN THE KUSKOKWIM RIVER 2015 LOW DISTORTION PROJECTION (LDP) COORDINATE SYSTEM. THIS LDP WAS DEVELOPED IN 2015 BY THE STATE OF ALASKA DOT&PF CENTRAL REGION SURVEY SECTION. THIS LDP COVERS COMMUNITIES ON AND AROUND THE LOWER KUSKOKWIM RIVER FROM THE RIVER'S MOUTH TO THE COMMUNITY OF CHUATHBALUK. BERING SEA COASTAL COMMUNITIES FROM CHEFORKAK TO KONGIGANAK ARE ALSO INCLUDED.

BASIS OF COORDINATES:
THE BASIS OF COORDINATES IS NGS STATION BET C (PID:DF3624) PROJECT POINT 553. SAID STATION IS LOCATED WITHIN THE FENCED AREA OF THE BETHEL AIRPORT AND HAS A NAD83(2011) POSITION OF LATITUDE 60°47'03.11084" N, LONGITUDE 161°50'08.36533" W, ELLIPSOID HEIGHT 42.527 METERS. BET C HAS PROJECT COORDINATES OF N 1034266.0570, E 582894.7332 U.S. FEET.

BASIS OF BEARINGS:
THE BASIS OF BEARINGS IS A LOCAL PLANE BEARING BETWEEN NGS STATION BET C (PID: DF3624) AND NGS STATION BET B (PID: DF3623). NGS STATION BET B BEARS S 25°34'22.5" W A DISTANCE OF 2672.876 FEET FROM NGS STATION BET C, ALL AS DETERMINED BY STATIC GNSS TECHNIQUES. NGS STATION BET B HAS PROJECT COORDINATES OF N 1031854.9671, E 581740.9628 U.S. FEET.

TRANSLATION PARAMETERS:
KUSKOKWIM RIVER 2015 LDP PARAMETERS
LINEAR UNIT: U.S. SURVEY FEET
DATUM: NAD83(2011)
ELLIPSOID: GRS80
PROJECTION: HOTINE OBLIQUE MERCATOR
LATITUDE OF CENTER: 60°40'00" N
LONGITUDE OF CENTER: 162°00'00" W
AZIMUTH: 50°00'00"
FALSE NORTHING: -15,500,000.0'
FALSE EASTING: -19,100,000.0'
GRID SCALE FACTOR: 1.000002 (EXACT)

VERTICAL CONTROL

BASIS OF VERTICAL IS LOCAL MEAN TIDE LEVEL, AS DETERMINED FROM LEVELS PERFORMED BY ALASKA DOT&PF BETWEEN TIDAL BENCHMARK NO.6 (1970) AND TIDAL BENCHMARK NO.7 (1970). A DATUM ADJUSTMENT OF -1.55 FEET WAS APPLIED TO THE PUBLISHED MLLW ELEVATIONS PER NOAA/NOS PUBLICATION OF 1/22/71, TO ARRIVE AT PROJECT MEAN TIDE VALUES.

[B01] BENCHMARK NO. 6 (1970): A BRASS DISK ON COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF AT CAP LEVEL, IS LOCATED +/400 FEET WESTERLY ALONG THIRD AVENUE (HOFFMAN HIGHWAY) FROM ITS INTERSECTION WITH MAIN STREET, +/-53 FEET SOUTH OF CENTERLINE, +/-20 FEET SOUTH OF UTILITY POLE #L1P70 AND +/-15 FEET NORTH OF THE MIDDLE OF A 2-STORY WOOD BUILDING. ELEVATION = 19.97 FEET
(USED THIS SURVEY)

BENCHMARK NO.7 (1970): A BRASS DISK ON A COPPER COATED ROD, ENCASED IN A 4" CONCRETE PIPE BROKEN OFF 0.4' BELOW CAP LEVEL, IS LOCATED +/-750 FEET WESTERLY ALONG FOURTH AVENUE FROM ITS INTERSECTION WITH MAIN STREET AND +/-8 FEET NORTH OF THE SOUTHEAST CORNER OF THE BOTTOM STEP LEADING TO THE MAIN ENTRANCE OF THE NATIONAL GUARD ARMORY (UNDER AN ELEVATED, METAL GRATE WALKWAY). ELEVATION = 25.57 FEET
(NOT USED THIS SURVEY)

[554] BENCHMARK PS-3(2003): A BRASS CAP IN A BROKEN PVC PIPE FLUSH IN GROUND, IS LOCATED +/-23 FEET SOUTHWEST FROM THE EDGE OF TUNDRA RIDGE ROAD AND +/-27 FEET NORTHWEST FROM THE EDGE OR GEORGE STREET. ELEVATION = 37.58 FEET (USED THIS SURVEY)

VERTICAL CONTROL WAS EXTENDED THROUGHOUT THE PROJECT AREA USING DIFFERENTIAL LEVELING METHODS.

A LEICA DNA10 DIGITAL LEVEL AND LEICA LGO SOFTWARE WERE USED TO CHECK ADJUSTED ELEVATIONS. ELEVATIONS FOR THE LISTED BENCHMARKS WERE PROVIDED TO DOWL BY THE ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES.

ALL ELEVATIONS ON CONTROL POINTS AND BENCHMARKS NEED TO BE FIELD VERIFIED BEFORE THEY ARE USED.

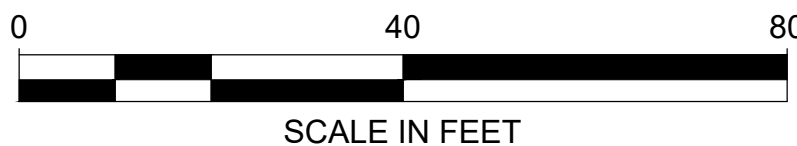
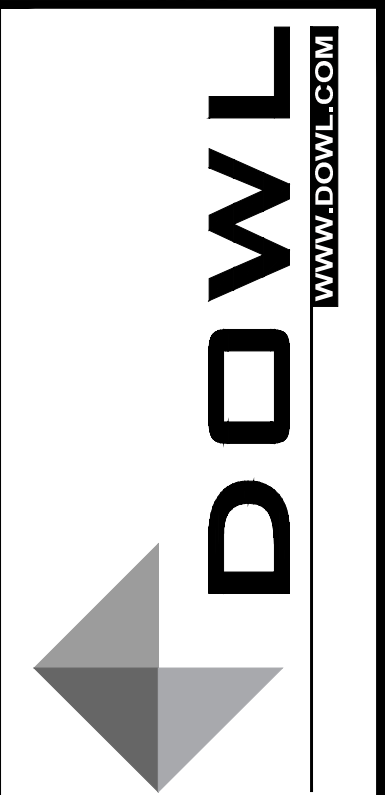
SURVEY POINTS:

CONTROL MONUMENTS FOUND THIS SURVEY

ID	REC. NORTHING	REC. EASTING	REC. ELEV.	DESCRIPTION
567	1041934.5807	588490.8424	-9999	RCM Fd AM[DOT]: RCM 567
588	1041867.3884	590514.5170	34.83	STS Set AC[12041]: BRR-588
589	1041886.1205	589529.5735	16.03	STS Set AC[12041]: BRR-589

LEGEND

	BUILDING OUTLINE
— OE — OE — OE —	OVERHEAD UTILITY LINES
- - - - -	EDGE OF GRAVEL
— - - - -	CREEK CENTER/THALWEG
> - - - - - <	CULVERT
- - - - - 39 - - - - -	MINOR CONTOUR LINE (1')
- - - - - 40 - - - - -	MAJOR CONTOUR LINE (5')
d	SIGN
⊙	UTILITY POLE
←	GUY ANCHOR
⊙	SURVEY MONUMENT FOUND
588	SURVEY MONUMENT POINT NUMBER

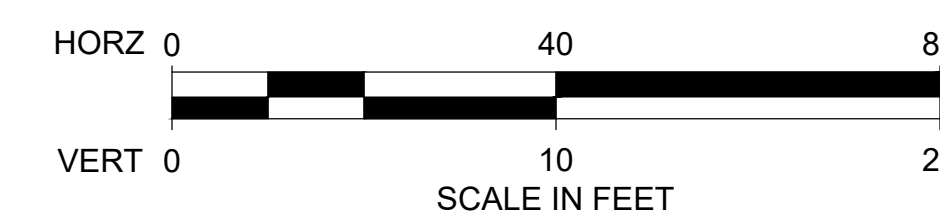
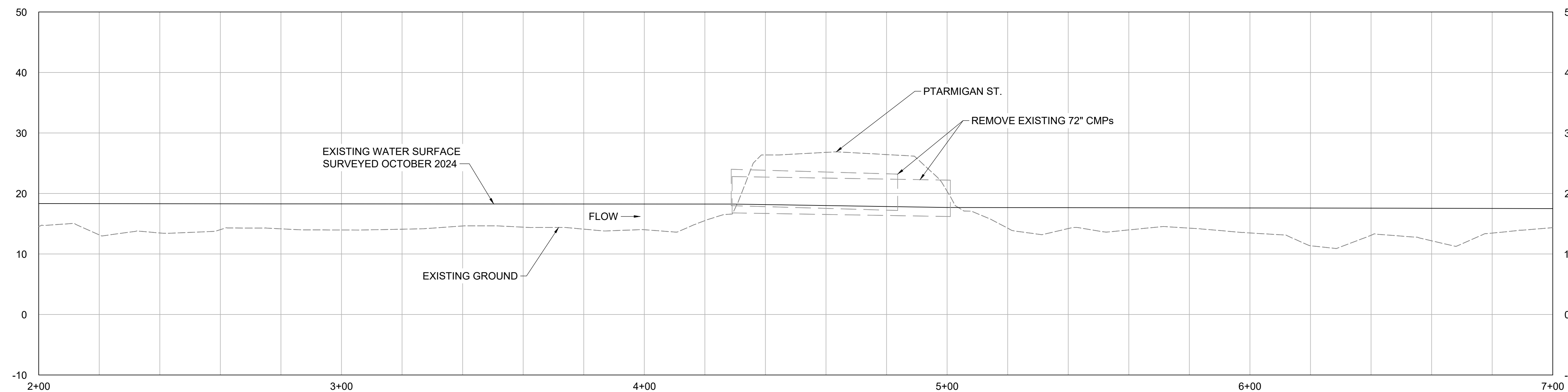
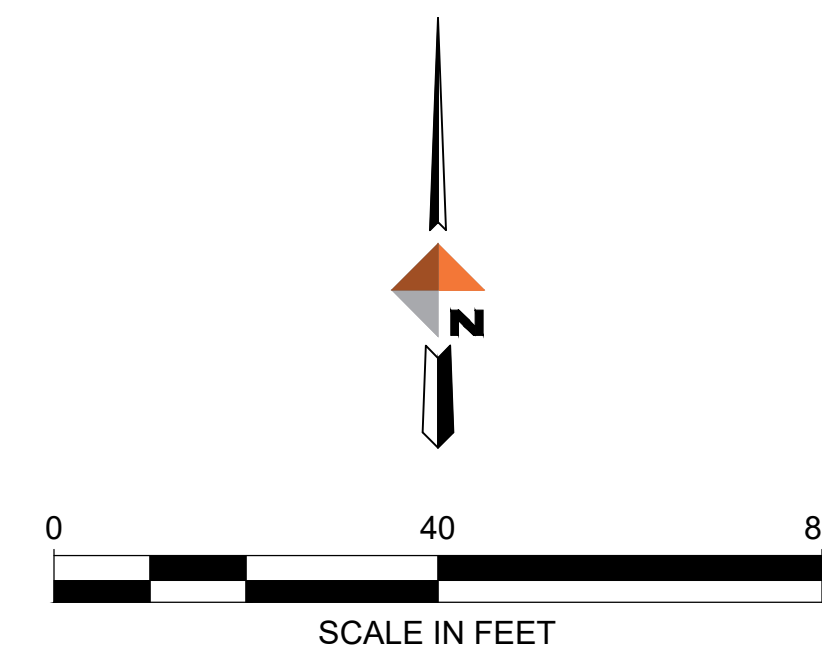
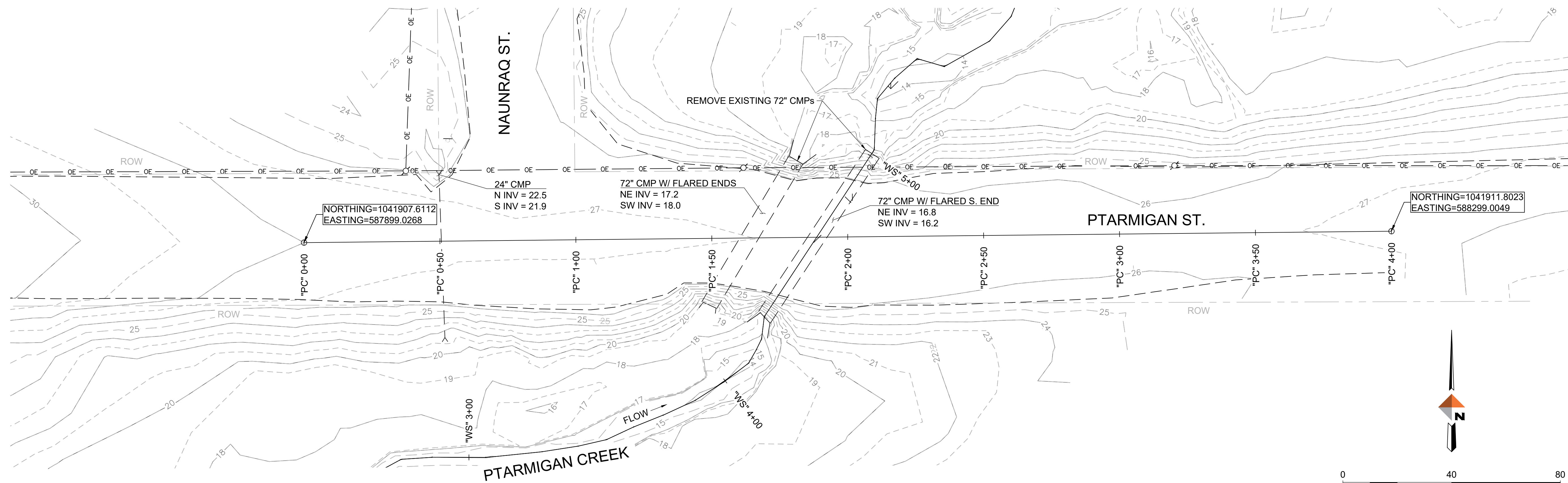
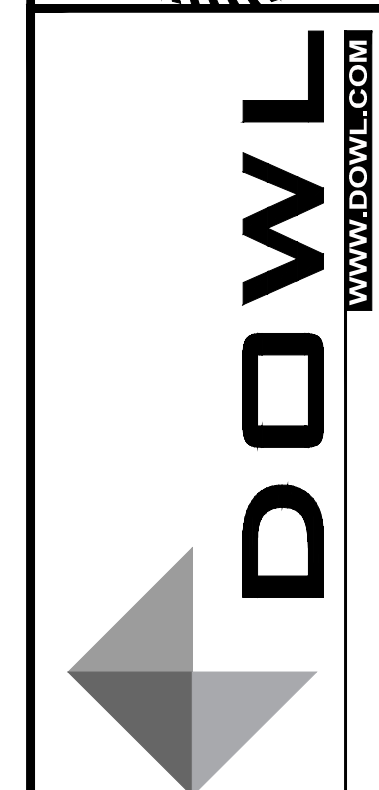
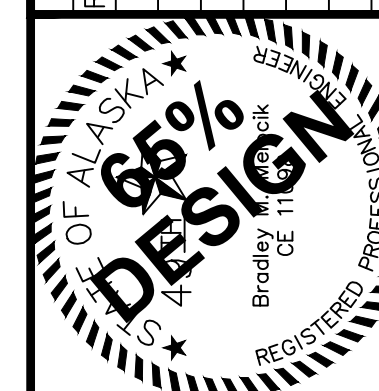
[illegible]

PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
SURVEY CONTROL – EAST CULVERT

PROJECT	1163.50270.68
DATE	JANUARY 2025

© DOWL 2025
SHEET

C4 OF C14

[illegible]

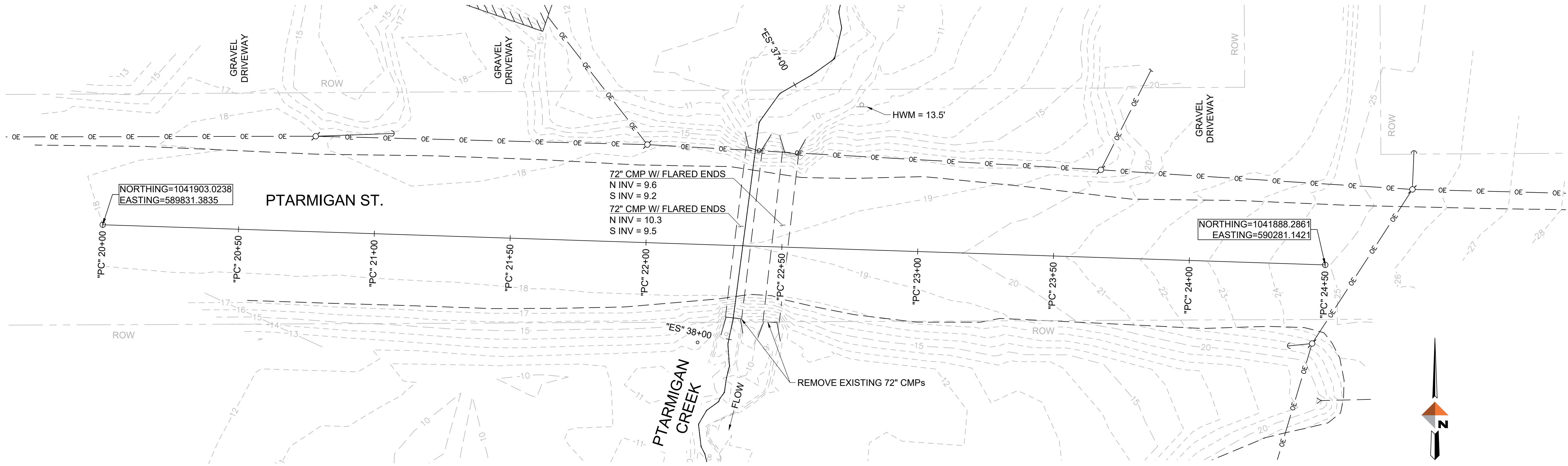
PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
EXISTING STREAM PLAN AND PROFILE
WEST CULVERT

PROJECT	1163.50270.6
DATE	JANUARY 202

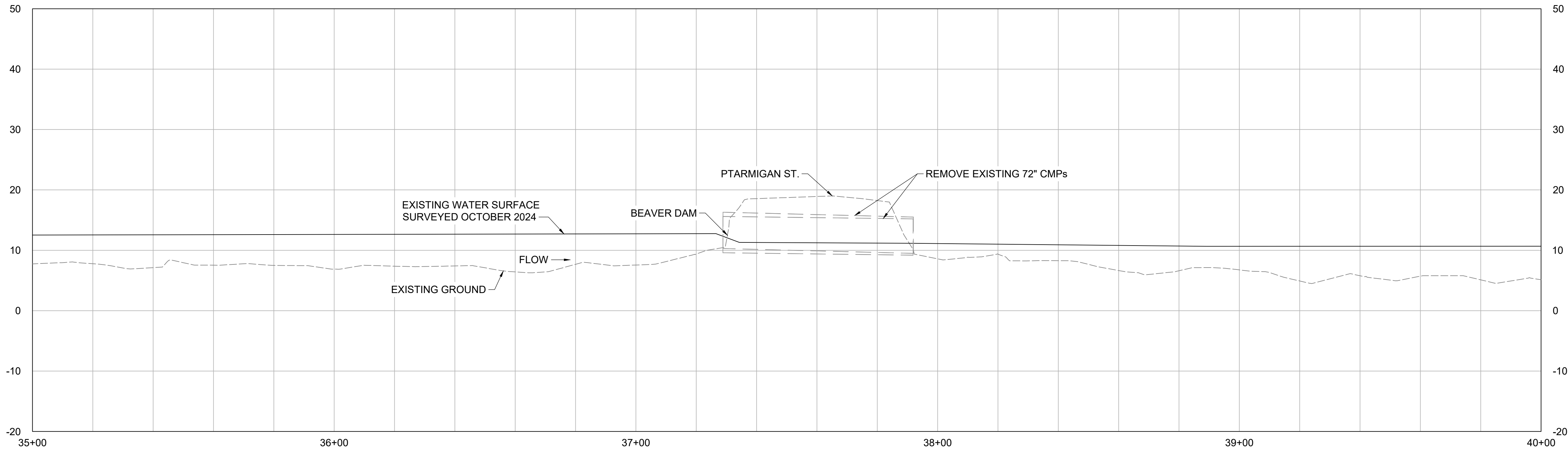
© DOWL 2025
SHEET

C5 OF C14

C:\dowl_pw\0418828\C6-SA-CH-WA-50305.dwg PLOT DATE 2025-2-3 13:49 SAVED DATE 2025-01-29 10:42 USER: rduerst

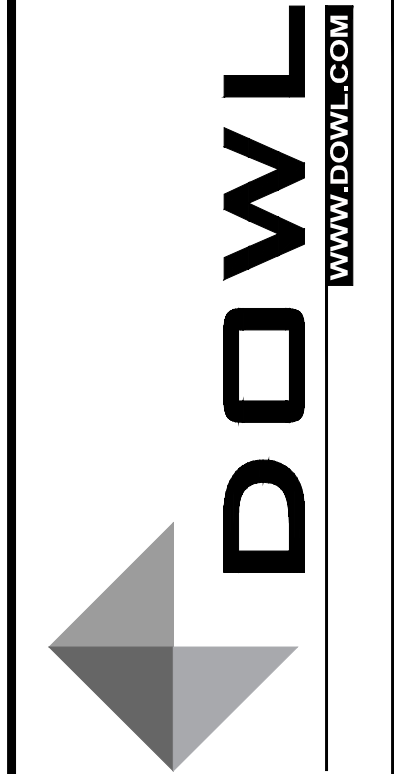


PLAN



PROFILE

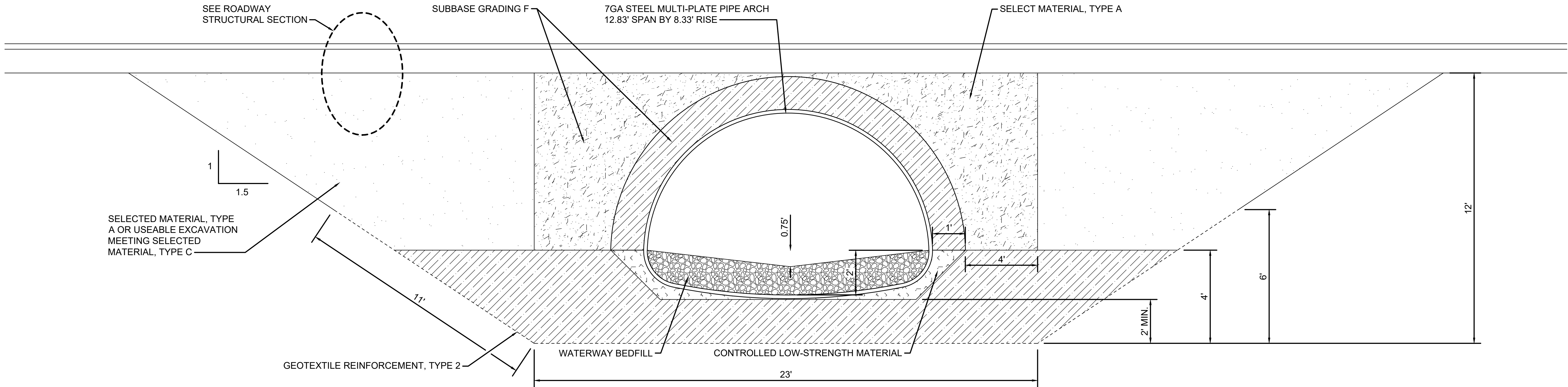
REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
EXISTING STREAM PLAN AND PROFILE
EAST CULVERT
BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C6 OF C14	

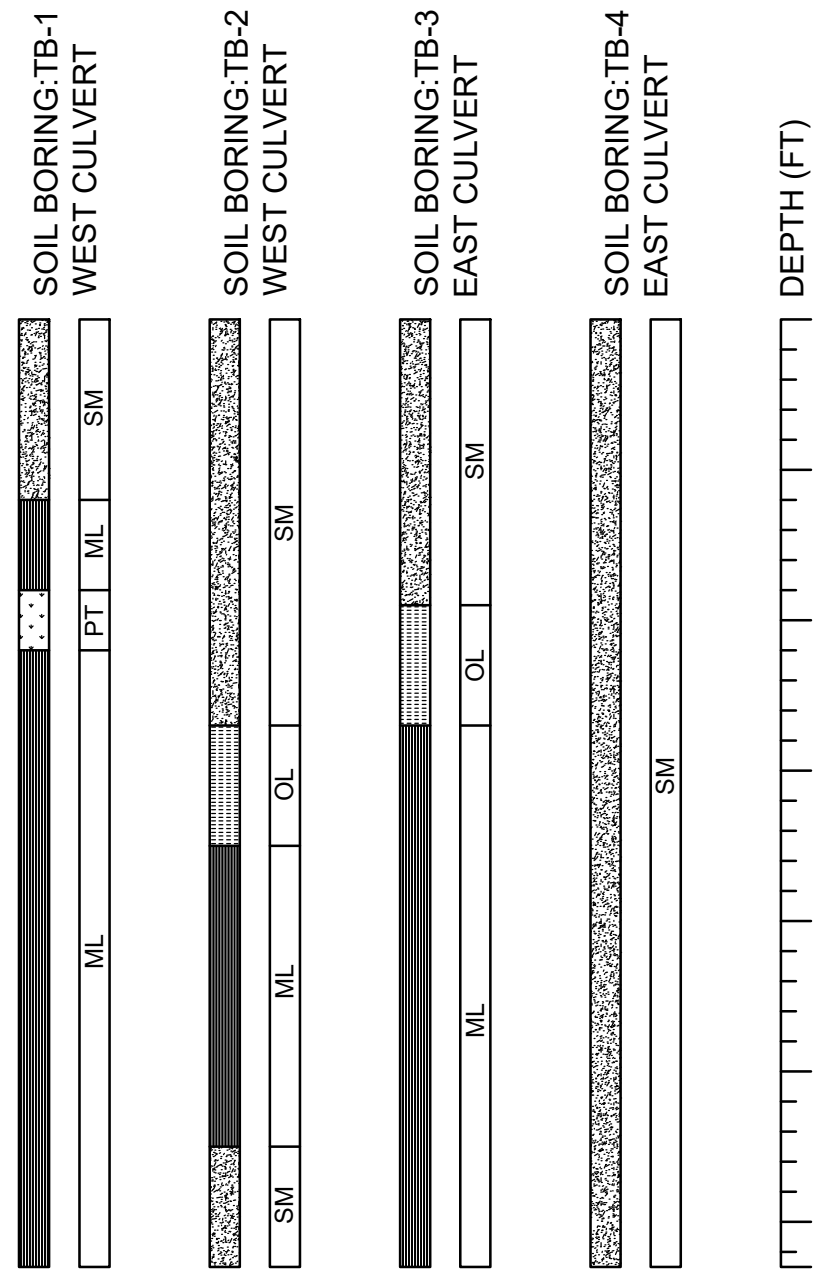
C:\dowl_pw\0418828\C10-SA-CH-WA-50305.dwg PLOT DATE 2025-02-03 15:23 USER: rduerst



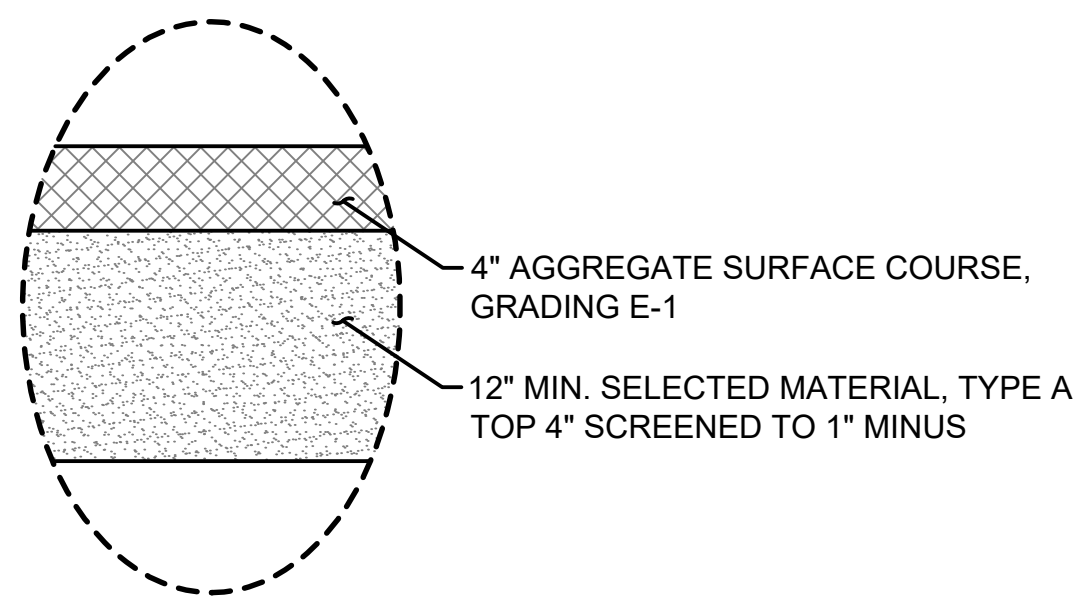
1 PIPE ARCH TYPICAL SECTION
C10 NTS

NOTES:

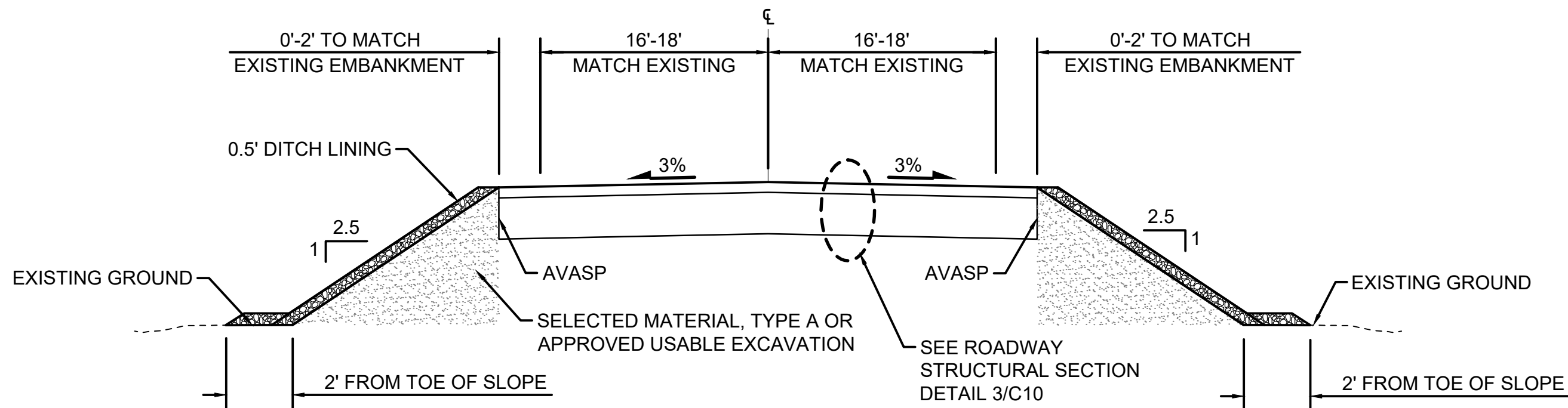
1. EXCAVATE ALL ORGANICS OR A MINIMUM OF 2' FEET BELOW CULVERT INVERT, WHICHEVER IS GREATER.
2. GEOTEXTILE REINFORCEMENT, TYPE 2 SHALL BE PLACED BETWEEN IN-SITU MATERIAL AND SUBBASE, GRADING F.
3. FOR QUANTITY ESTIMATION PURPOSES, NO USABLE EXCAVATION WAS ASSUMED AND EMBANKMENT QUANTITIES WERE CALCULATED USING SELECTED MATERIAL, TYPE A.
4. MINIMUM COVER FOR PIPE ARCH CULVERT IS 2.0'.
5. CONTROLLED LOW-STRENGTH MATERIAL SHALL BE USED FOR PIPE BEDDING. PREPARATION AND PLACEMENT PER SPECIFICATION 205-2.01 AND REFERENCE SUBSECTION 712-2.22. PAY ITEM 205.0005.
6. MIX MATERIAL FOR WATERWAY BED FILL TO ACHIEVE A WELL GRADED MIXTURE.
7. FILL VOIDS IN FOR WATERWAY BED FILL AND WASH FINES IN AFTER PLACEMENT.
8. PLACE WATERWAY BED FILL MATERIAL THROUGH THE FULL LENGTH OF THE CULVERT.



2 BOREHOLE LOGS
C10 NTS

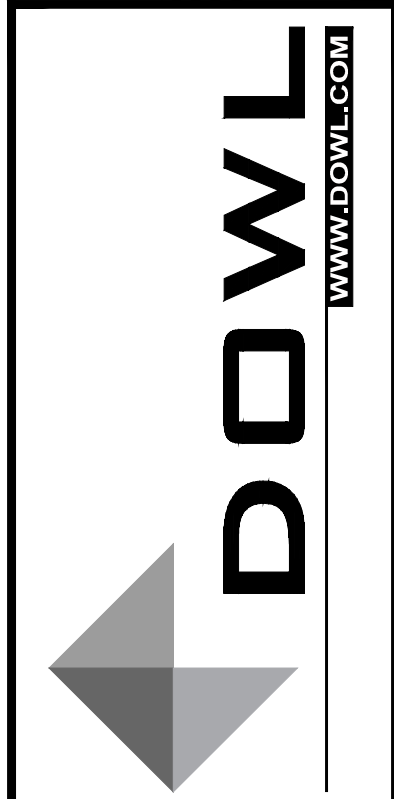


3 ROADWAY STRUCTURAL SECTION
C10 NTS



4 ROADWAY SECTION
C10 NTS

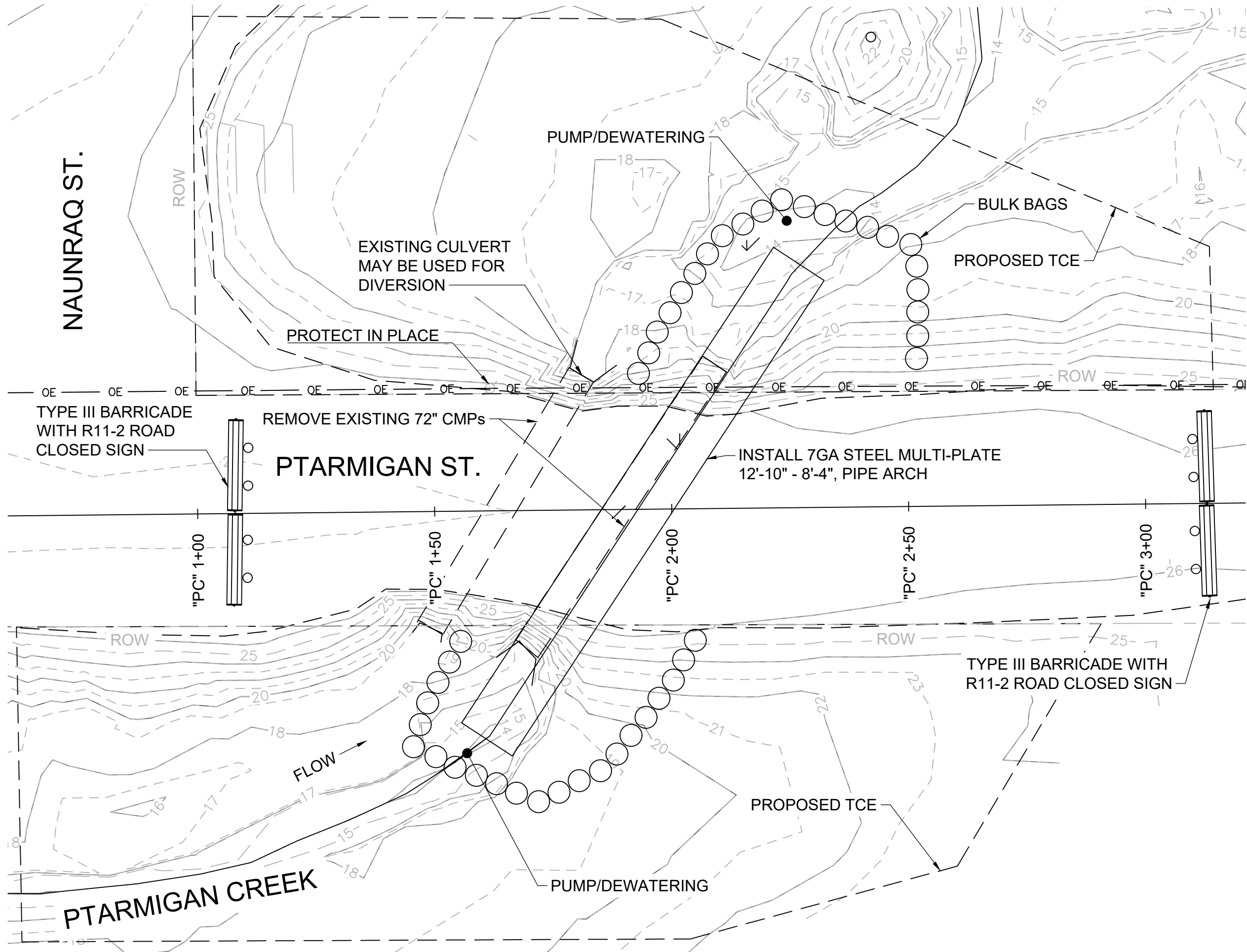
REVISIONS		DESCRIPTION	BY
REV	DATE		



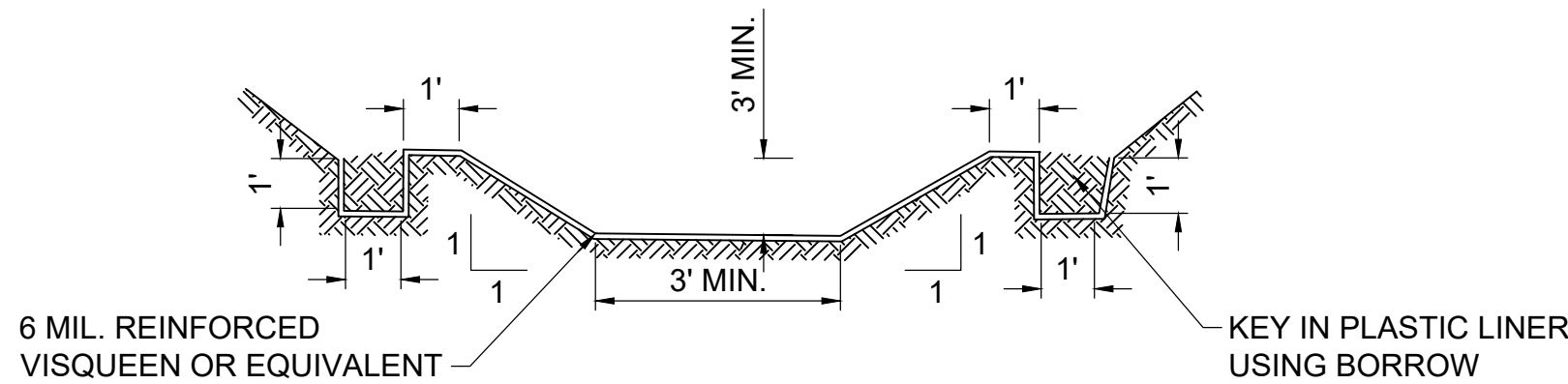
PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
DETAILS AND TYPICAL SECTIONS
BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C10 OF C14	

C:\dowl_pw\40418828\C11-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 08:04 SAVED DATE 2025-01-29 11:06 USER: rduerst



WEST CULVERT
PLAN



ROADWAY DIVERSION NOTES:

1. REFER TO SPECIFICATIONS FOR ROAD CLOSURE AND TRAFFIC CONTROL INFORMATION.
2. PTARMIGAN STREET DETOUR CLOSURE PLAN SHALL BE SUBMITTED BY CONTRACTOR FOR APPROVAL BY CITY OF BETHEL.

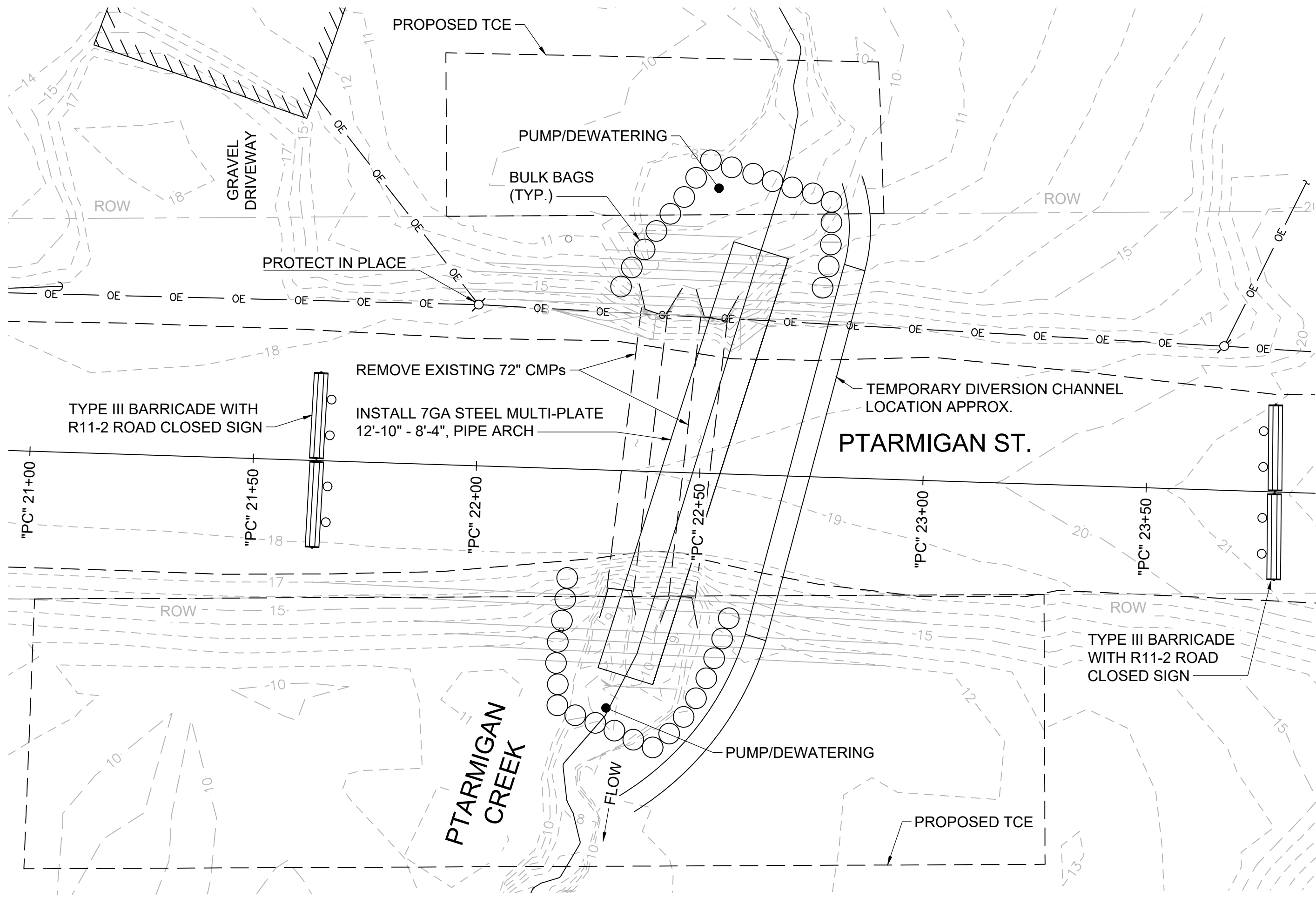
STREAM DIVERSION NOTES:

THIS WORK MAY REQUIRE A DIVERSION OF STREAM WATER. THE DESIGNERS RECOGNIZE THAT DIFFERENT CONTRACTORS WILL HAVE VARIOUS APPROACHES FOR CONTROLLING WATER AND CONSTRUCTION SEQUENCING. THIS DIVERSION PLAN HAS BEEN DEVELOPED TO CHECK FOR CONSTRUCTABILITY AND AS A STARTING POINT FOR A CONTRACTOR-GENERATED PLAN. CONTRACTOR MUST SUBMIT DIVERSION PLANS TO ENGINEER FOR APPROVAL PRIOR TO IMPLEMENTATION.

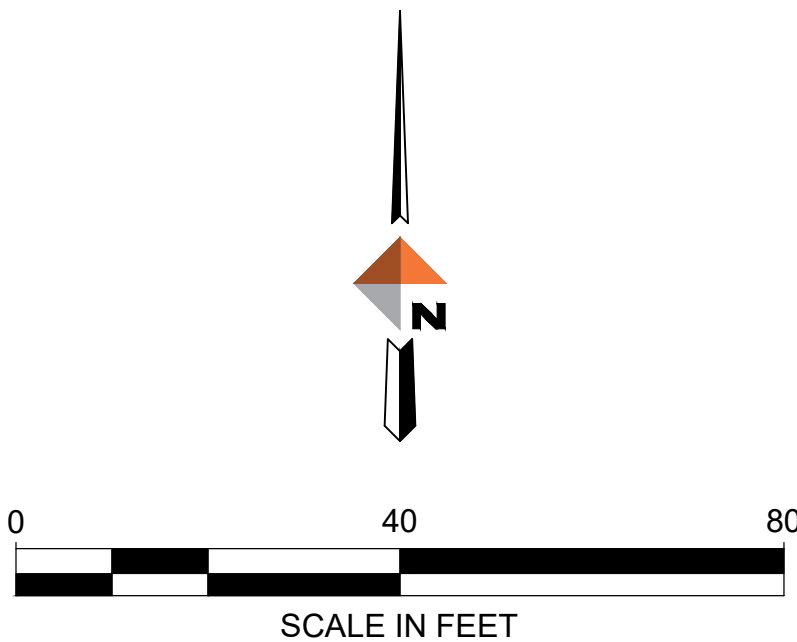
A COFFERDAM MADE OF SHEET PILE MAY BE NEEDED TO REDUCE GROUNDWATER FLOW INTO EXCAVATED AREA. TEMPORARY DIKES OR BERMS MAY BE USED TO ISOLATE THE WORK AREA FROM WATERS OF THE SURROUNDING AREA.

SUGGESTED DIVERSION PLAN:

1. PLACE BARRICADES, SIGNS, AND TEMPORARY ROAD DETOUR IN COMPLIANCE WITH SPECIFICATIONS, ADOT&PF, AND MUTCD. COORDINATE WITH OTHER CONTRACTORS WHO MAY BE PRESENT IN AREA AND USING PTARMIGAN STREET FOR CONSTRUCTION ACCESS.
2. IF EXISTING CULVERTS ON PTARMIGAN STREET ARE NOT SUFFICIENT, REMOVE THE 72" EXISTING CULVERTS AND CONSTRUCT VISQUEEN LINED DIVERSION CHANNEL.
3. USE BULK BAGS (SUPERSACKS) TO DIVERT STREAM FLOW THROUGH DIVERSION CHANNEL.
4. CONSTRUCT THE NEW PIPE ARCH CULVERT.
5. INFILL CULVERT AND RECONSTRUCT CREEK CHANNEL AS SHOWN IN PLANS.
6. DIVERT CREEK FLOW THROUGH THE NEW ARCH CULVERT.
7. FILL DIVERSION CHANNEL/ROAD EMBANKMENT.
8. RECONSTRUCT CREEK CHANNEL AND BANKS AS SHOWN IN PLANS.
9. RECONSTRUCT PTARMIGAN STREET OVER THE NEWLY INSTALLED CULVERT.
10. RETURN VEHICULAR TRAFFIC TO PTARMIGAN STREET. REMOVE DETOUR ROAD AND FILL REMAINING PORTION OF DIVERSION CHANNEL.
11. STABILIZE AND REVEGETATE ALL REMAINING DISTURBED AREAS.



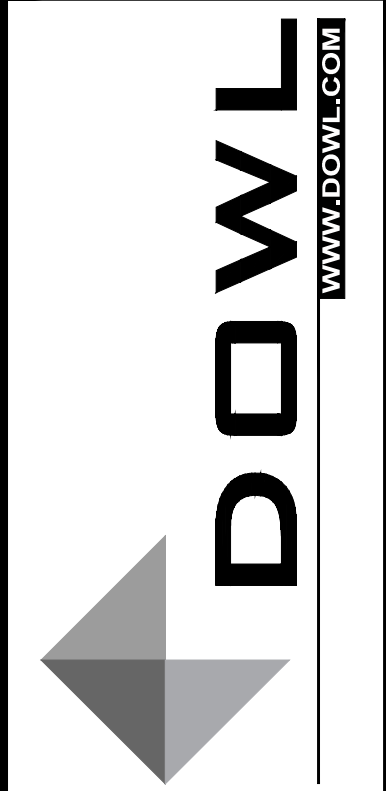
EAST CULVERT
PLAN



ESCP AND DEWATERING NOTES:

1. DEWATER TRENCH AND WORK AREA WITH PUMP HOSE IF REQUIRED.
2. ALL DISCHARGE POINTS REQUIRE PERMANENT OR TEMPORARY VELOCITY CONTROLS.
3. PROVIDE FOR SEDIMENT REMOVAL FOR ALL DEWATERING ACTIVITY PRIOR TO DISCHARGE FROM THE PROJECT INTO ANY WATER OF THE U.S.
4. PROVIDE SPARE (EXTRA) PUMPS FOR BOTH THE STREAM BYPASS PUMP AND DETWATERING PUMP.
5. EXISTING RIPARIAN VEGETATION SHOULD BE PROTECTED TO MINIMIZE DISTURBANCE.
6. SILT FENCING TO BE USED TO PREVENT DISTURBED SEDIMENT FROM ENTERING THE WATERBODY. ADJUST LOCATION AS NECESSARY AND AS DIRECTED BY THE ENGINEER DURING CONSTRUCTION.
7. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS. MAINTENANCE SHALL INCLUDE REMOVAL AND DISPOSAL OF ACCUMULATED SEDIMENT, CLEANING AND REPAIR OF DAMAGED SEDIMENT CONTROL DEVICES.
8. ALL DISTURBED GROUND CAPABLE OF SUPPORTING VEGETATION SHALL BE REVEGETATED FOR FINAL STABILIZATION. ALL AREAS NOT REVEGETATED SHALL BE 100% COVERED BY ROCK OR OTHER PERMANENT NON-ERODIBLE MATERIAL. FINAL STABILIZATION SHALL BE AS APPROVED BY THE ENGINEER.
9. PUMPS OUTSIDE OF THE FISH EXCLUSION AREA MUST HAVE FISH SCREENS MADE OF WEDGE WIRE WITH OPENINGS NOT GREATER THAN 1/16TH INCH.

REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
ESCP & STREAM DIVERSION PLAN

PROJECT 1163.50270.68
DATE JANUARY 2025

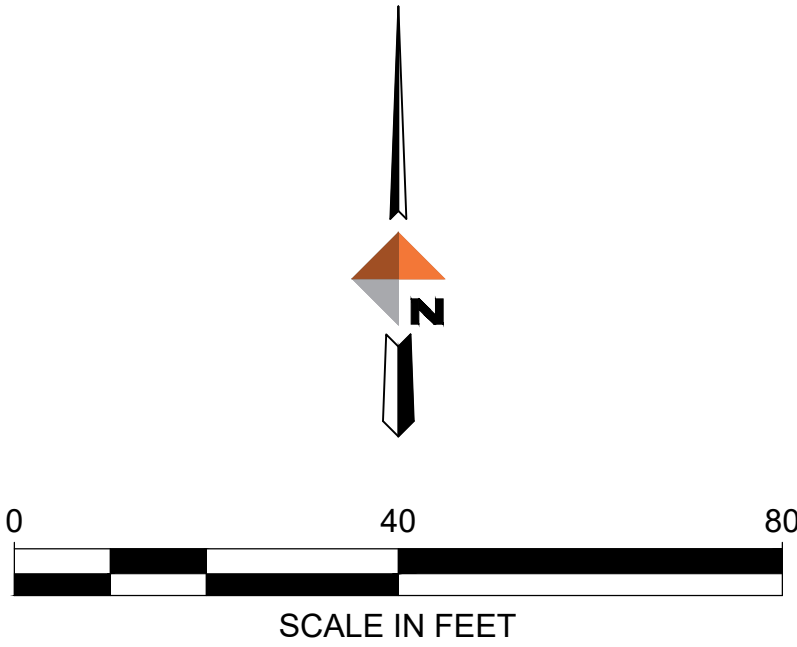
© DOWL 2025
SHEET

C11 OF C14

BETHEL, ALASKA

NOTES:

- 1. REHABILITATE VEGETATED AREAS WITH SEED, PER SECTION 618 OF THE SPECIFICATIONS.
- 2. VEGETATIVE MAT SHALL BE PLACED ON DISTURBED AREAS OUTSIDE OF THE SEEDING AREAS AS SHOWN ON THE PLANS.
- 3. VEGETATIVE MAT LOCATIONS MAY VARY BASED ON SITE CONDITIONS AND AVAILABILITY DURING CONSTRUCTION.
- 4. SALVAGED VEGETATIVE MAT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND BE SOURCED FROM THE DISTURBED AREA OR LOCAL AREA. SEE DETAIL 1/C13.
- 5. REFER TO SPECIFICATION SECTION 690 FOR ADDITIONAL BANK REVEGETATION INFORMATION.
- 6. PROTECT STREAMBANK IN PLACE, AND MINIMIZE DISTURBANCE. REHABILITATE WITH VEGETATIVE MAT BANK STABILIZATION IF DISTURBED, PER DETAIL 1/C13

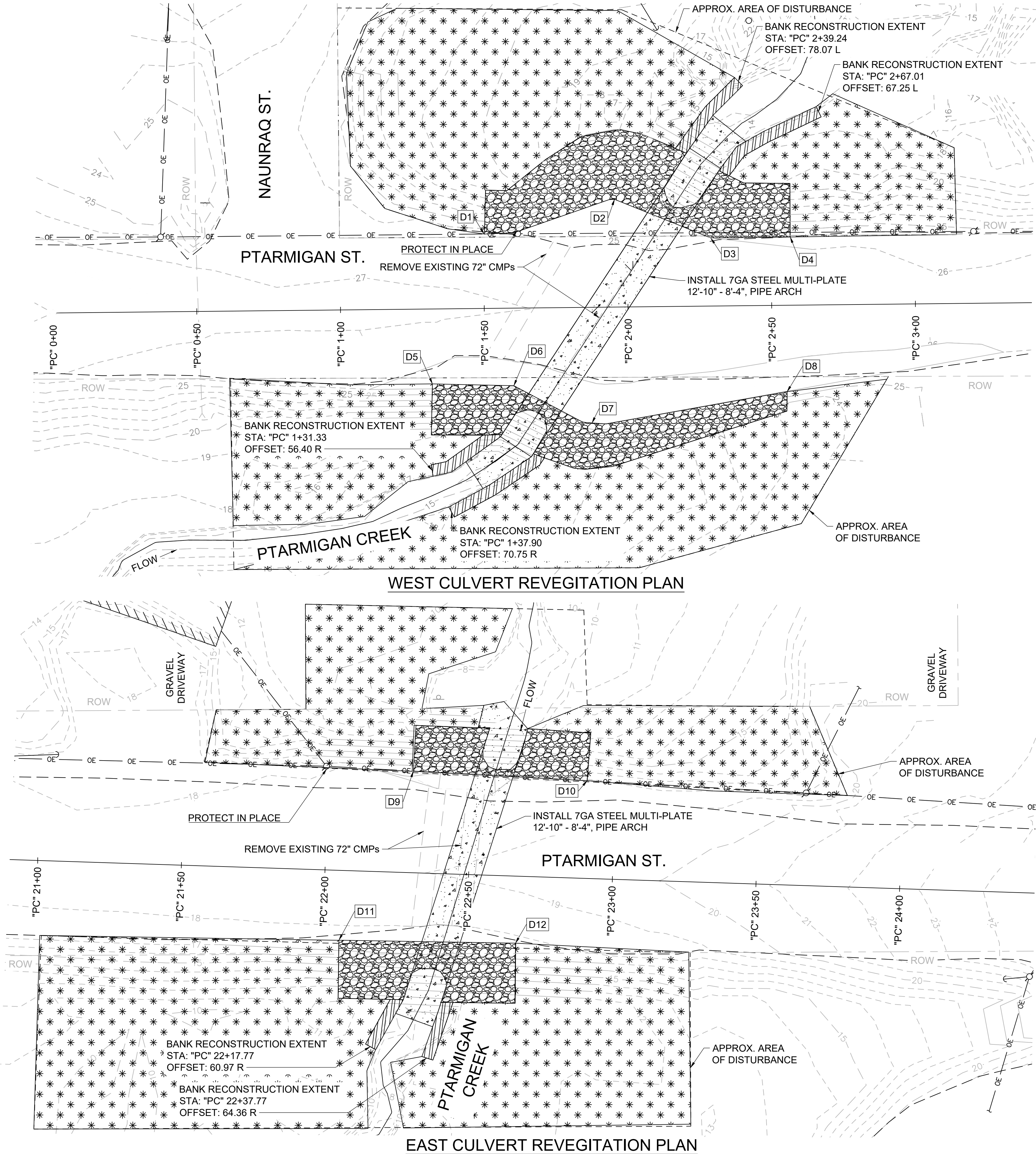


SITE REVEGETATION

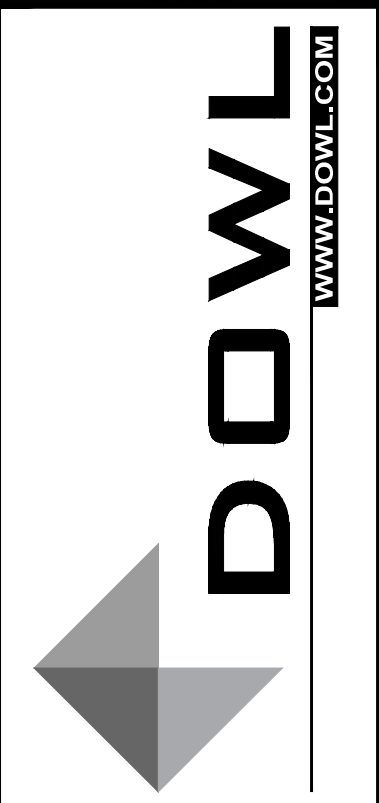
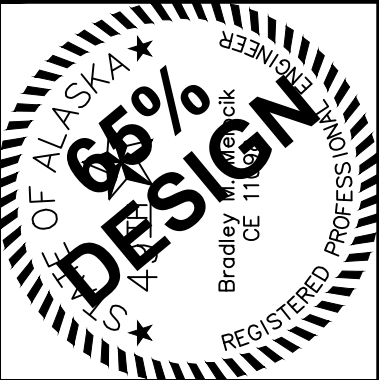
- ORGANIC SOILS AND VEGETATIVE MAT, AS AVAILABLE. SEED AND MULCH AS NEEDED
- WATERWAY BANK REVEGETATION AND PROTECTION VEGETATIVE MAT
- WATERWAY BED FILL
- DITCH LINING

SEEDING MIX	
CATEGORY 1	
80 - 90% OF AT LEAST 2 TYPES	ARCTARED RED FESCUE
	NORCOAST BERING HAIRGRASS
	NORTTRAN TUFTED HAIRGRASS
	GRUENING ALPINE BLUEGRASS
CATEGORY 2	
10 - 20% OF AT LEAST 1 TYPE	KENAI POLARGRASS
	TUNDRA GLAUCOUS BLUEGRASS
	ALYESKA POLARGRASS
	SOURDOUGH BLUEJOINT REEDGRASS

COORDINATE TABLE: DITCH LINING			
LOCATION	POINT ID	"PC" STATION	OFFSET
WEST CULVERT DS	D1	1+50.34	25.87 L
WEST CULVERT DS	D2	1+95.71	37.47 L
WEST CULVERT DS	D3	2+29.07	23.68 L
WEST CULVERT DS	D4	2+56.71	23.71 L
WEST CULVERT US	D5	1+31.68	26.06 R
WEST CULVERT US	D6	1+60.01	27.01 R
WEST CULVERT US	D7	1+87.07	40.24 R
WEST CULVERT US	D8	2+55.07	30.05 R
EAST CULVERT US	D9	22+90.11	33.98 L
EAST CULVERT US	D10	22+90.85	50.64 L
EAST CULVERT DS	D11	22+05.63	24.33 R
EAST CULVERT DS	D12	22+67.05	23.33 R



REVISIONS		DESCRIPTION
REV	DATE	



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
REVEGETATION PLAN

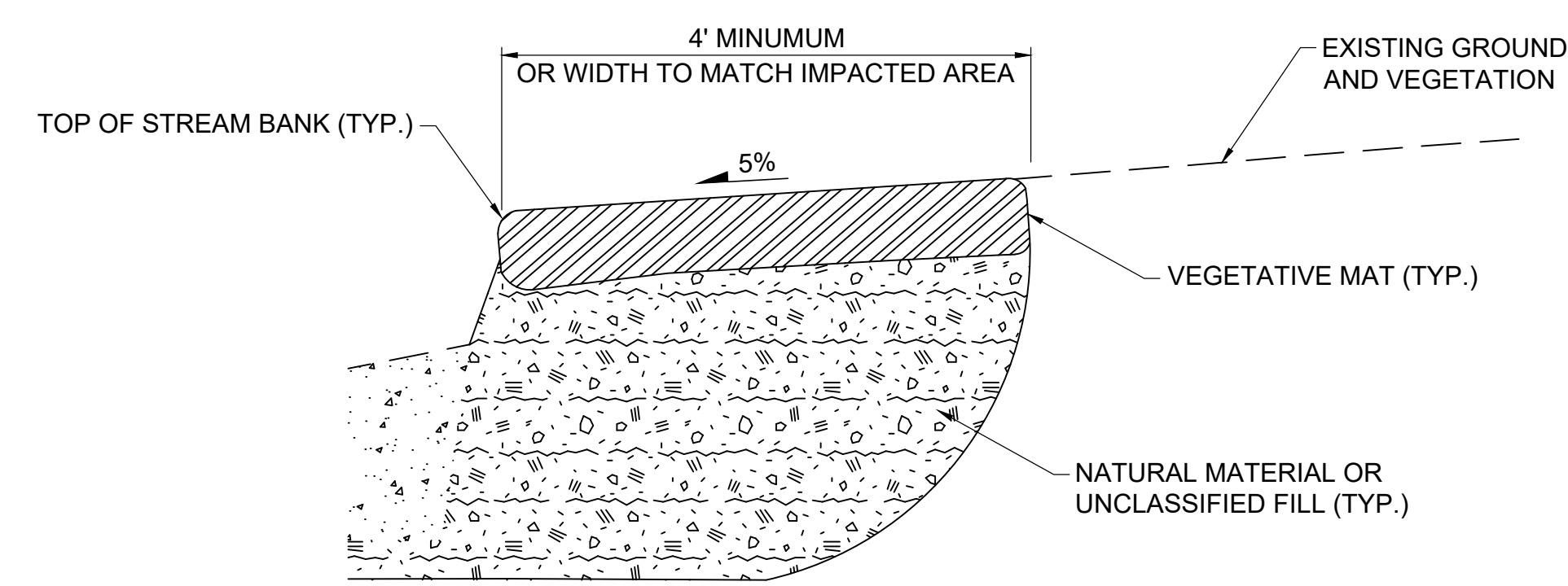
BETHEL, ALASKA

PROJECT 1163.50270.68
DATE JANUARY 2025

DOWL 2025
SHEET

C12 OF C14

C:\dowl_pw\0418828\C13-SA-CH-WA-50305.dwg PLOT DATE 2025-2-4 09:57 SAVED DATE 2025-02-04 09:37 USER: rduerst



1
C13 **VEGETATIVE MAT BANK RECONSTRUCTION SECTION VIEW**
NTS

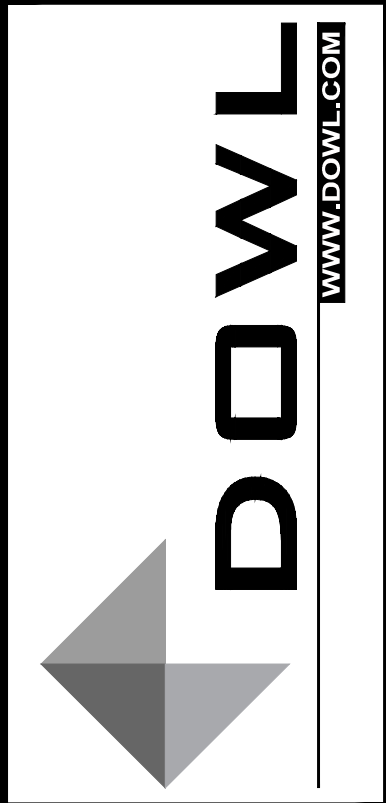
NOTES:

1. SALVAGED VEGETATIVE MAT MUST HAVE A MINIMUM THICKNESS OF 12 INCHES AND BE SOURCED FROM THE DISTURBED AREA OR LOCAL AREA.
2. TAPER BANKS AND TIE INTO EXISTING BANKS UPSTREAM AND DOWNSTREAM.

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 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.
5. PLACE VEGETATIVE MATS TIGHTLY TOGETHER, WITHOUT GAPS, WITH FULL CONTACT OF THE ROOT MASS TO THE SOIL SURFACE BELOW, TAP INTO PLACE.
6. 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.

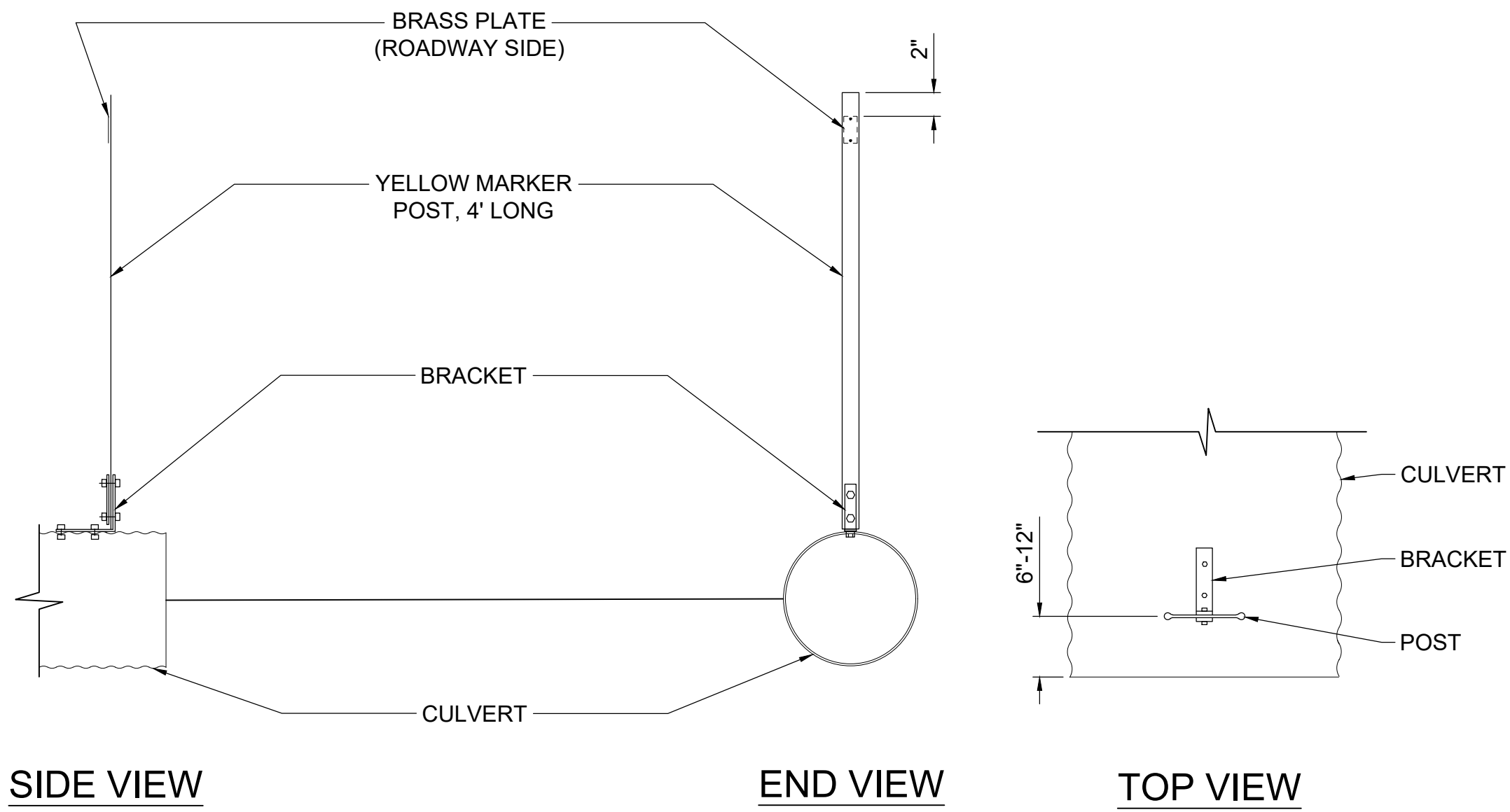
REVISIONS		REV	DATE	DESCRIPTION	BY



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
BANK RECONSTRUCTION

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	

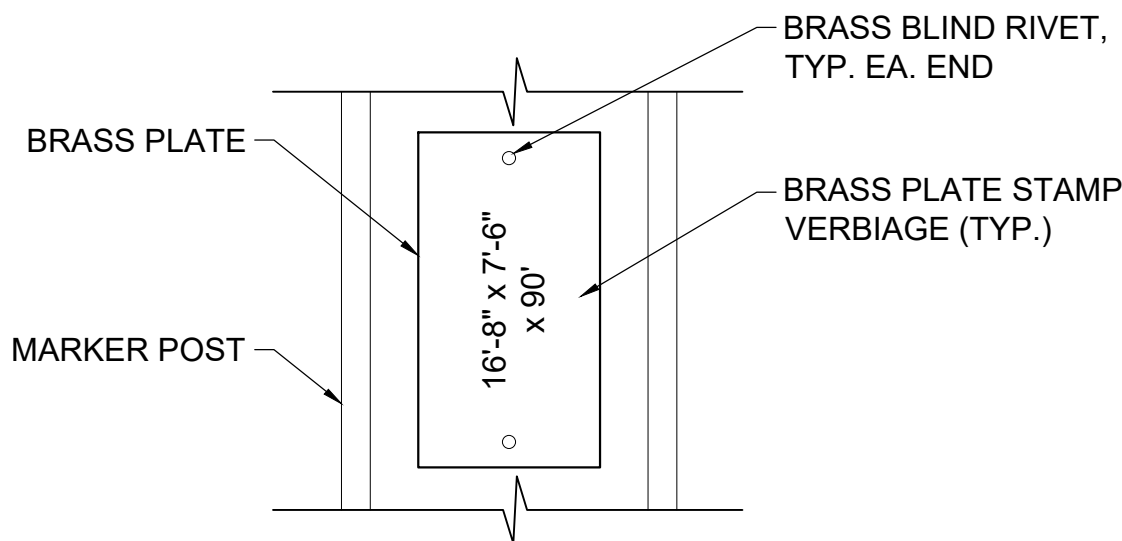
C13 OF C14



1 CULVERT MARKER POST DETAIL
C14 NTS

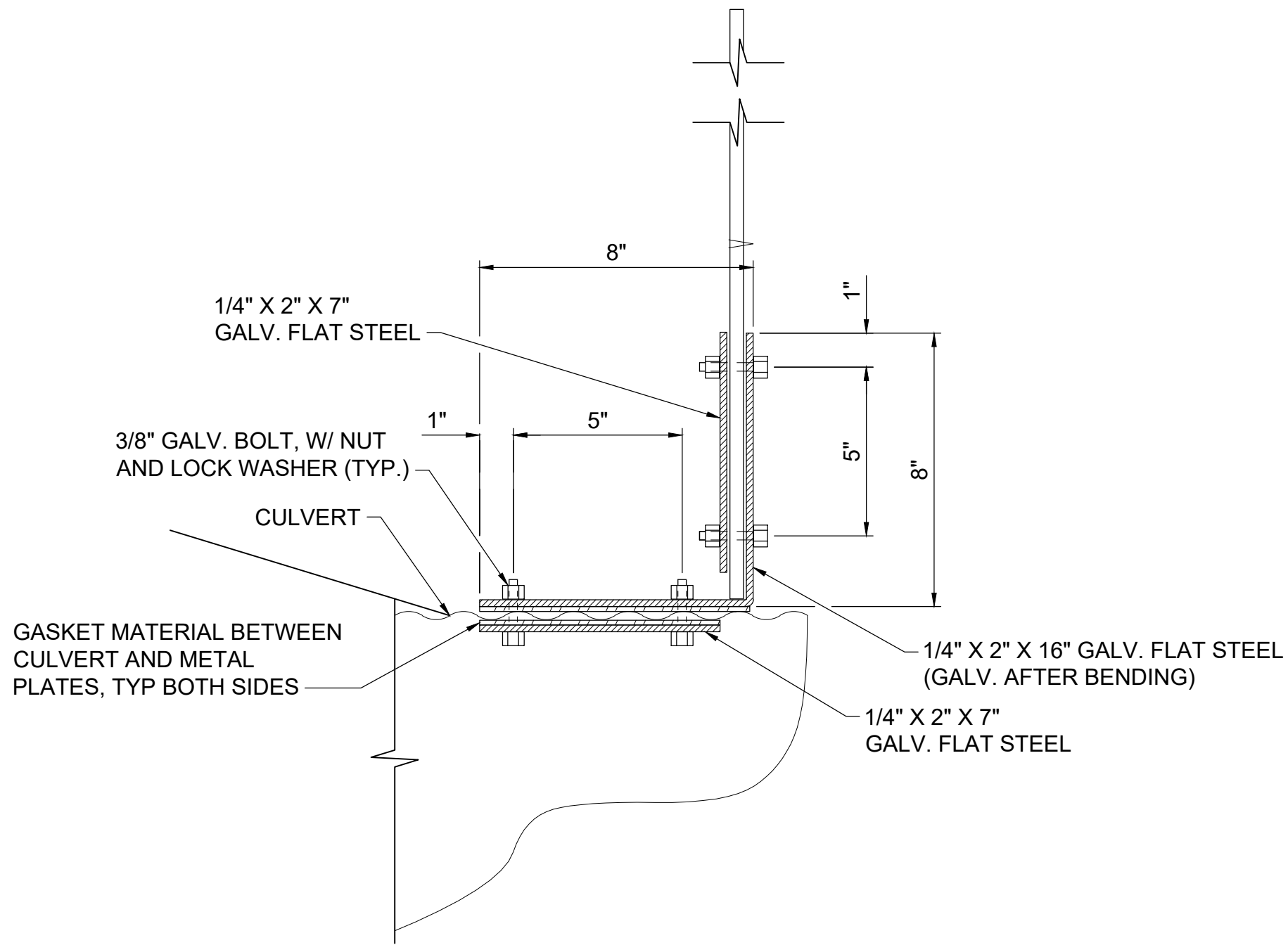
NOTES:

1. MARKER POSTS ARE TO BE INSTALLED ON ALL PROJECT CULVERTS.
2. DRILL ALL BOLT HOLES. FLAME CUTTING SHALL NOT BE PERMITTED.
3. GASKET MATERIAL SHALL BE PLACED BETWEEN DISSIMILAR METALS. GASKET MATERIAL SHALL BE APPROVED PRIOR TO INSTALLATION.

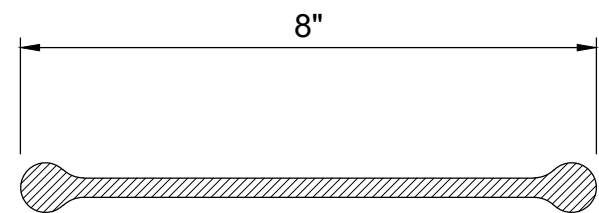


STAMP STATION AND PIPE SIZE, USING 3/8" HIGH MINIMUM LETTERS INTO A 2" X 4" X 0.064" THICK BRASS PLATE. FASTEN PLATE TO THE SIDE FACING THE ROADWAY WITH TWO 1/8" BRASS BLIND RIVETS.

3 BRASS PLATE DETAIL
C14 NTS

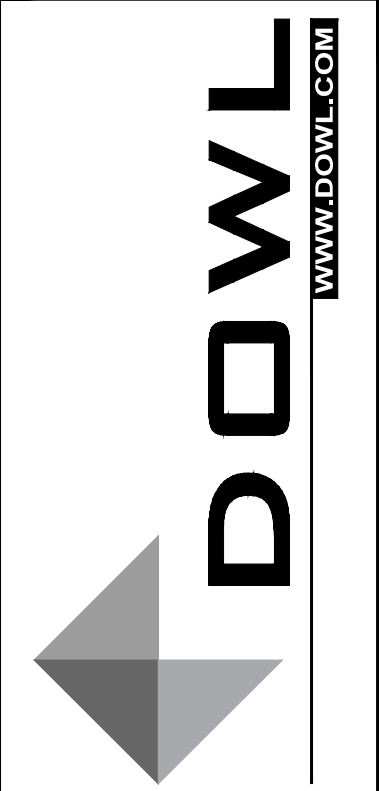
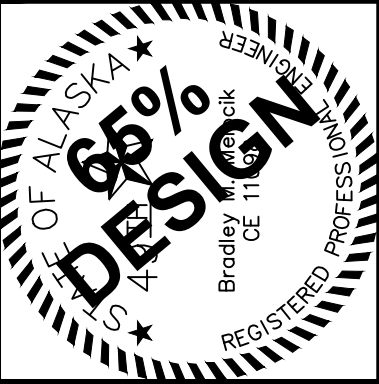


2 BRACKET DETAIL
C14 NTS



4 POST CROSS SECTION
C14 NTS

REVISIONS		DESCRIPTION	BY
REV	DATE		



PTARMIGAN ST. CULVERT CROSSINGS
CULVERT REPLACEMENT
CULVERT MARKER POST
BETHEL, ALASKA

PROJECT	1163.50270.68
DATE	JANUARY 2025
DOWL 2025	
SHEET	
C14 OF C14	

Appendix D: Geotechnical Report



February 3, 2025

Mr. Bill Arnold
City of Bethel
P.O. Box 1388
Bethel, AK 99559

**Subject: Task order #68 – Ptarmigan Street Culvert Crossing – Bethel, Alaska
Geotechnical Investigation and Recommendations**

Dear Mr. Arnold:

This report presents the results of our field investigation, the results of laboratory testing, and preliminary recommendations regarding foundation design and site development in support of the proposed replacement of the culverts at two locations that convey Ptarmigan Creek under Ptarmigan Street in Bethel, Alaska.

PROJECT UNDERSTANDING

The two culvert locations and the surrounding embankment were compromised after major flooding events occurred in the spring of 2024. The City of Bethel (City) intends to replace both culverts to maintain the connectivity of Bethel residents located on the west side of the culverts to the rest of Bethel. Within this report, the westernmost crossing shall be referred to as Site 1, and the easternmost crossing as Site 2.

SCOPE OF WORK

Our geotechnical scope of work for this project included:

- A review of existing geotechnical and geological information at or near the culvert replacement locations.
- Drilling four (4) borings to a depth of approximately 30 feet below the existing site grade.
- Complete associated laboratory testing on collected samples to determine engineering properties.
- Prepare a report that presents the data obtained, analysis and interpretation, and engineering recommendations with respect to the observed site soils and subsurface conditions.

Our proposal was accepted, and we received Notice-to-Proceed on September 17, 2024.

BACKGROUND REVIEW

DOWL has reviewed several geotechnical investigations in the vicinity of the subject site. The nearest investigation took place approximately ½-mile from the culvert locations. These reports and findings were reviewed to predict the subsoils at the site, determine appropriate test boring depths and quantity, and prepare a sampling plan.

Based on the regional geology and previous geotechnical explorations near the site, the subsurface site conditions were anticipated to consist of fill material composed of silty sand over multiple feet of organics over silty sand and sandy silt deposits with organics.

EXPLORATION SUMMARY

The field investigation for this site was conducted November 12 and 13, 2024. Four (4) test borings were drilled, sampled, and logged to depths of 31.5 feet below existing grade near the existing culverts.

Locations of the test borings were determined in the field by handheld GPS and are only as accurate as the method implies. Test boring locations are on Figure A-2, Test Boring Location Map (Appendix A), and a list of the exploration locations is presented as Table 1.

Table 1: Test Boring Location

Boring Number	Boring Depth (feet)	Latitude (deg)	Longitude (deg)	Location
TB-01	31.5	60.805111	-161.806626	Site 1, West culvert, North side
TB-02	31.5	60.805032	-161.806484	Site 1, West culvert, South side
TB-03	31.5	60.805067	-161.795537	Site 2, East culvert, North side
TB-04	31.5	60.804955	-161.795249	Site 2, East culvert, North side

The test boring was drilled using a Geoprobe 6620 DT track-mounted drill rig fitted with continuous-flight, hollow-stem auger. The rig is owned and operated by GeoTek Alaska out of Anchorage, Alaska. The drilling was supervised, and the samples logged by a geotechnical engineer with DOWL. Test boring logs and descriptive guide are presented in Appendix B.

A grab sample was obtained at the surface where each test boring was drilled. Disturbed samples were obtained at depths of 2.5, 5, 7.5 and 10 feet and then at 5-foot intervals thereafter using a standard split-spoon sampler.

The Standard Penetration Test (SPT) was performed in the test borings by driving a 2-inch outside-diameter, split-spoon sampler a distance of 18 inches ahead of the auger with a 140-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 standard penetration resistance (N) value shown on the test boring logs indicates the number of blows required to drive the sampler the last 12 inches. The results are an indication of the relative density or consistency of the subsoil. The N-values shown in the logs are raw data from the field and have not been adjusted for sampling equipment type or overburden pressure. In frozen soils, the SPT values are highly influenced by ice content, ground temperature, and the presence of gravel.

Soil samples recovered during drilling were classified in general accordance with ASTM D2488 (visual-manual procedures) and sealed in plastic bags to preserve the natural water content. The samples were then transported to Alaska Testlab in Anchorage in accordance with ASTM D4220, for further testing.

Laboratory Testing

Laboratory tests were performed on selected samples to measure soil index properties to provide a basis for estimating engineering properties. Soil index tests including moisture

contents and grain size analyses were performed on select samples. The natural water content of all the recovered samples was measured.

Table 2: Laboratory Tests

Test	Purpose
Natural Moisture Content ASTM D2216	Provides a measure of natural (<i>in situ</i>) water content.
Atterberg Limits ASTM D4318	Provides an indicator of the consistency and swell potential of fine-grained soils.
Particle-Size Distribution ASTM D422	Provides a measure of grain sizes of the soils for classification and identification of physical characteristics.
Limited Mechanical Analysis ASTM D1140	Provides the percentage of material finer than the #4 and #200 screen generating percentages of gravel, sand, and silt sized particles.

Laboratory testing results are presented in Appendix C.

SITE AND SUBSURFACE CONDITIONS

The two existing culvert sites are located on Ptarmigan Street. The western culvert site (Site 1) is located near Naunraq Street and eastern culvert site (Site 2) is located near the Lulu Heron Congregate Home. The area consists of residential development to the north and native ground and brush to the south.



Figure 1: Site 1 culvert crossing viewed northeast.



Figure 2: Site 2 culvert crossing viewed southwest.

Observed soils varied between test borings with varying depths and thickness of organic soils. Conditions were generalized to simplify the engineering analysis. The soils conditions observed at the Site 1 can be generalized as follows:

- 10 to 14 feet thick: Fill, silty sand with gravel to sandy silt (SM, ML), over
- 2 to 4 feet thick: Peat and Organic Silt with varying amounts of silt, sand, and fibrous organics (OL, PT), over
- 18 feet below ground surface (bgs) to drilling termination depth: Mineral silt with sand (ML, SM)

Site 1 conditions are described in greater detail in Table 3.

Table 3:Site 1 (West) Soil Unit summary

Depth (feet)		Soil Unit	USCS	Moisture Content (%)		Fines Content (%)		Blows per 12- inches	
Top	Bottom			Low	High	Low	High	Low	High
0	10-14	Fill material	SM, ML	6	23	16	22	4	8
10-14	12-18	Peat and organic silt	OL, ML, PT	34	78	-	70	3	7
18	30	Silt with sand	ML, SM	23	40	-	62	12	27

The soils conditions observed at the Site 2 can be generalized as follows:

- 0 to 10 feet: Silty sand fill (SM)
- 10 to 14 feet: Organic Silt with fine sand (OL) (OL not observed in TB-4)
- 14 to 30 feet: Silty sand (SM) with trace organics (OL)

Site 2 conditions are described in greater detail in Table 4.

Table 4:Site 2 (East) Soil Unit summary

Depth (feet)		Soil Unit	USCS	Moisture Content (%)		Fines Content (%)		Blows per 12-inches	
Top	Bottom			Low	High	Low	High	Low	High
0	10	Fill material	SM	6	21	14	39	5	25
10	14	Organic silt	OL, SM	20	60	-	43	2	8
20	30	Silty sand	SM	19	35	21	31	9	50

Groundwater. Groundwater was encountered during drilling at approximately 10 feet and 13.5 feet below ground surface at Sites 1 and 2, respectively.

Frozen Ground. Seasonally frozen ground was observed from the surface down to approximately 2 to 4.5 feet bgs. Permafrost or perennially frozen ground was not observed to the maximum depth of exploration but is common in the area.

CLIMATE

NOAA climate data for the period of 1994 through 2023 was analyzed to calculate the average and design air thawing and freezing indices for the minimum and maximum using a 100-year return period over a Weibull probability distribution. The design indices are given in Table 5. The average annual temperature in Bethel over the last 30 years is 31.5 °F; however, from 2014 to 2019 the average annual temperature ranged from 33.5 to 37 °F with air thawing indices approaching or exceeding the 100-year event in 2016 and 2019.

Table 5:Design Air-Thawing and Design Air-Freezing Indices

	Design Air Temperature Indices (°F-Degree*Days)		
	Minimum	Mean	Design or Maximum
Thawing	2,008	3,014	3,687
Freezing	1,173	3,177	5,037

ENGINEERING ANALYSIS AND DISCUSSION

In general, the proposed culvert replacements are feasible at both sites provided the organics within the bearing prism are excavated and replaced with structural fill. Our engineering analysis and recommendations assumes the new culverts will be box or pipe arch culverts with full inverts. If the design is significantly different, we will revise our recommendations accordingly. The analyses and associated recommendations for each culvert crossing are the same for both the Site 1 and 2 culvert crossings.

Bearing Capacity and Settlement. We estimate the culverts will bear on soil approximately five to six feet below the groundwater table. Soils at this depth consist of sand and mineral and organic silt with some fibrous organics.

To improve bearing conditions and combat localized settlement, over excavation and replacement with structural fill below the culverts will be recommended. A reinforcement geotextile placed between the structural fill and underlying mineral soil will provide separation to improve fill placement and reduce differential settlement below the structure. We anticipate that excavation will extend a minimum of two feet below the bottom of the culvert and should extend laterally five feet beyond the edge of the culvert. Settlement will be nearly immediate with loading and placement of backfill assuming organics are fully excavated.

An allowable bearing capacity of 3,000 psf may be used for each culvert to maintain total settlement at 1-inch or less with a differential settlement half that. Higher bearing pressures are feasible but will result in higher settlement. A completely frost-protected design including headwall installation was deemed uneconomical. Complete frost protection would require a large, deep excavation on the order of 10 feet below the bottom of culvert with structural fill placed. The recommended section is for a cost-effective solution that is not completely frost protected and may be subject to frost heave during winter months. An insulated section below the culvert to reduce frost penetration is feasible, however multiple cold years could reintroduce permafrost and frost heave at the insulation extents.

Geotextile. A reinforcement type, woven geotextile with permittivity meeting DOT&PF Reinforcement Geotextile (Type 2) specifications (729-2.01) is needed for separation and to support the overlying culverts and fill.

RECOMMENDATIONS

Bearing Capacity and Settlement. The structural section beneath each culvert shall consist of the following:

- 24 inches NFS structural fill, over
- DOT&PF Reinforcement Geotextile, Type 2, over
- Native mineral soil

To construct the structural section, excavate all organics or a minimum of two feet below the bottom of the culvert (whichever is deeper) and extend excavation five feet beyond the sides of the culvert walls.

Geotextile. The reinforcement geotextile placed at the base of the structural section shall have stitched seams and placed in accordance with DOT&PF Standard Specifications Section 630. If overlapping is required, overlaps shall be a minimum of five feet and oriented perpendicular to the culvert alignment or parallel to centerline.

CONSTRUCTION CONSIDERATIONS

Structural Fill. All 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 provided in Table 6.

Table 6: Structural Fill Gradation Requirements

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

Other fill material, which does not meet this gradation requirement, may be acceptable for use. However, the gradation of such material should be evaluated by the project geotechnical engineer prior to its use.

Excavation. Our recommendations assume that the culvert bases will be founded directly on a minimum of 2 feet of structural fill, constructed above the undisturbed silty and sandy soil.

Any peat or organic material shall be removed from below the culvert footprints extending horizontally from the edge of culverts 1-foot for each foot below the bottom of the culverts and replaced with structural fill. Frozen soil should not be used as fill or backfill and may need to be thawed until compactable or removed and replaced with compactable backfill.

Earthwork. Earthwork should be completed with quality control inspection, including bottom-of-hole inspections, fill gradation classification, and in-situ compacting testing. A bottom-of-hole inspection should be conducted by a qualified geotechnical engineer, geologist, or special inspector following each site excavation activities (and before any foundation construction begins) to visually confirm the findings of this report and provide recommendations for non-conforming conditions encountered during the excavation activities.

Fill material should be placed at 95 percent of the modified Proctor density as determined by ASTM D1557, unless specifically stated otherwise in other sections of this report. Structural fill and backfill around the culvert should be placed in six-inch lifts. All earthwork should be completed with quality control inspection.

Dewatering. Excavation for the reinforced soil mat will require dewatering or control of the adjacent stream. We anticipate sheet piles be driven around the excavation area to limit the disturbance to the site. Sheet pile shoring and dewatering should be designed by the contractor's engineer.

LIMITATIONS

DOWL based the conclusions and recommendations presented in this report, based 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 City of Bethel to 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, figures, and design details specifically for the culvert replacement project on Ptarmigan Street. 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.

Sincerely,
DOWL



Robert Sanders, EI
Geotechnical Engineer



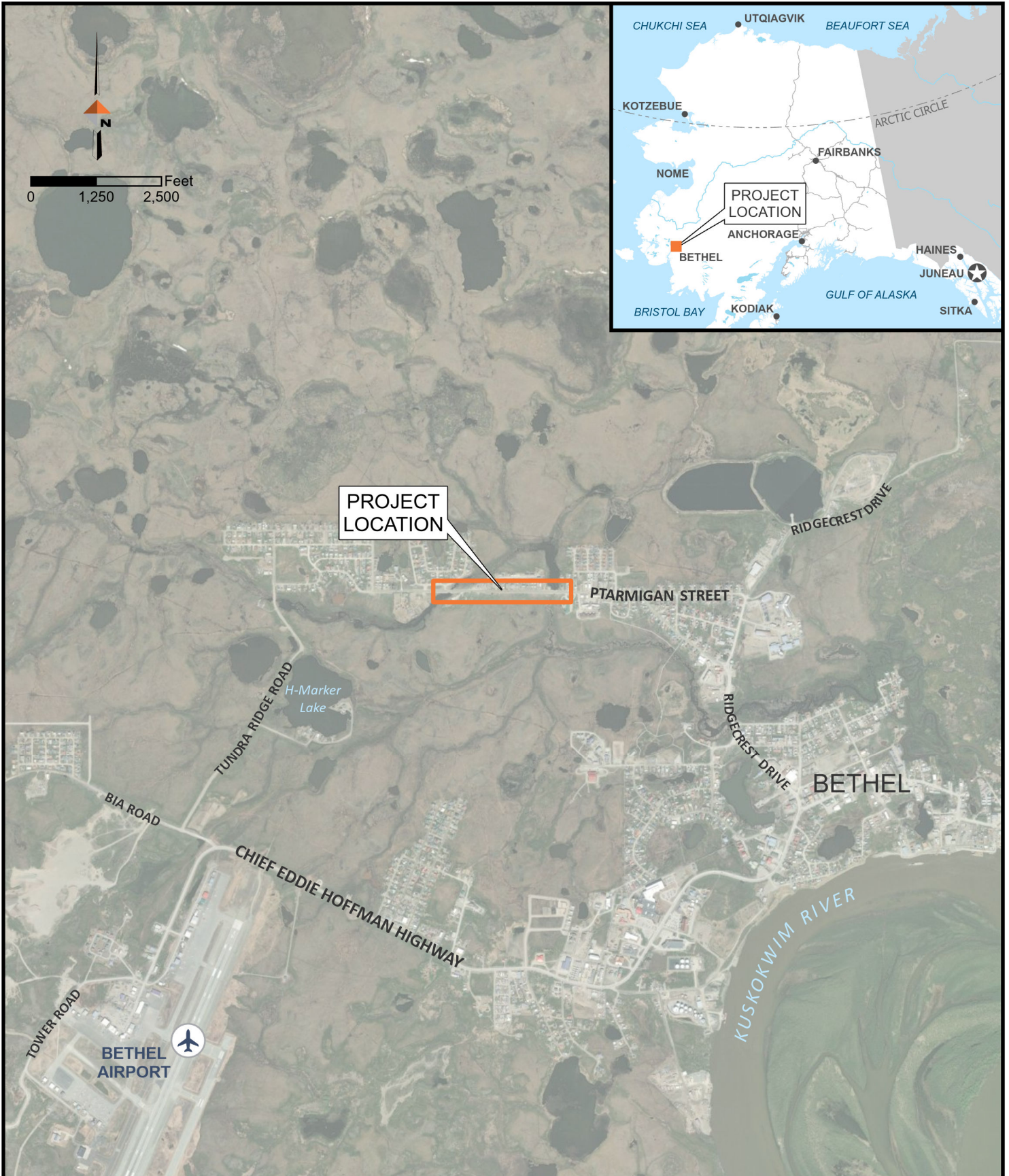
Jeremiah Holland, PE
Senior Geotechnical Engineer



Appendices: Appendix A: Project Location and Test Boring Location Map
 Appendix B: Test Borings Logs and Descriptive Guide
 Appendix C: Laboratory Test Result

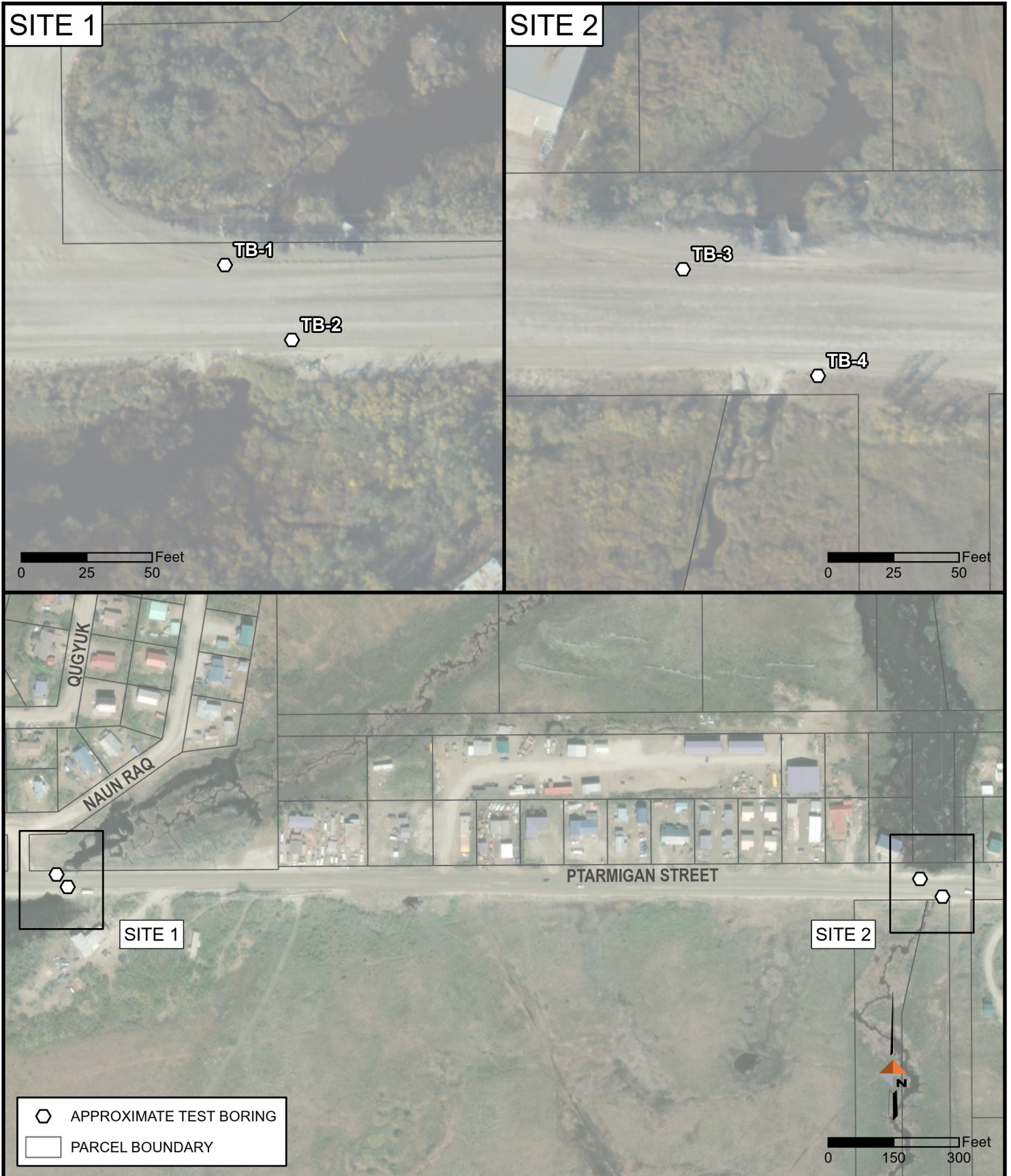
APPENDIX A

Project Vicinity and Test Boring Location Map



	PROJECT LOCATION AND VICINITY	PROJECT	1163.50270.68
	PTARMIGAN ST. CULVERT CROSSING GEOTECHNICAL INVESTIGATION	DATE	JAN 06, 2025
	BETHEL, AK	FIGURE A-1	

Service Layer Credits: World Imagery, Maxar



	TEST BORING LOCATION	PROJECT	1163.50270.68
	PTARMIGAN ST. CULVERT CROSSING GEOTECHNICAL INVESTIGATION	DATE	JAN 08, 2025
		FIGURE A-2	
	BETHEL, AK		

Service Layer Credits: World Imagery: Kodiak Mapping Inc
World Imagery: Maxar

APPENDIX B

Test Boring Logs and Descriptive Guide



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-1

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/12/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.805111, -161.806626
Operator:	Mason Iverson	Drilling Water Level:	10'
Logged By:	Robert Sanders	Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Atterberg Limits (LL-PL-Pi)	Sample Number	Blow Counts	Sample Graphic					
0	24	56	20	6		1		■			SM	FILL, Silty Sand with Gravel (SM) - 25% fine, subangular to subrounded gravel; 55% fine sand; 20% fines; brown, FROZEN , Nbn	
5				9		2	4 3 5	▲	16.0 [89]		SM		4.5
5	0	78	22	10		3	4 4 4	▲	16.0 [89]		SM	FILL, Silty Sand (SM) - 80% fine sand; 20% fines; brown	7.0
10				20		4	2 2 2	▲	16.0 [89]		ML	FILL, Sandy Silt (ML) - 40% fine sand; 60% low to medium plasticity fines; wet, gray, soft	10.0
10				44		5	2 1 2	▲	12.0 [67]		PT	Peat (PT) - 15% fine sand; wet, brown	11-12-24
15	0	30	70	34	NP	6	2 3 4	▲	16.0 [89]		ML	Silt (ML) - 30 to 40% fine sand; 60 to 70% non plastic fines; wet, gray, firm to very stiff	12.0
20				35		7	5 5 7	▲	16.0 [89]		ML		
25	0	38	62	26		8	10 8 10	▲	14.0 [78]		ML		
30				27		9	3 5 7	▲	16.0 [89]		ML		31.5

End of Boring, backfilled with soil cuttings



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-2

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/12/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.805032, -161.806483
Operator:	Mason Iverson	▽ Drilling Water Level:	10.3'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
5				12	1		■				SM	FILL, Silty Sand (SM) - 10% fine, subangular to subrounded gravel; 70% fine sand; 20% fines; grayish brown, FROZEN , Nbn	4.5
				19	2	4 3 4	▲	2.0 [11]					
	18	66	16	9	3	4 3 2	▲	16.0 [89]					
				23	4	2 2 2	▲	8.0 [44]					
10	2	77	21	22	5	2 3 3	▲	16.0 [89]			OL	FILL, Silty Sand (SM) - 80% fine sand; 20% fines; wet, gray, loose	9.5
15				78	6	2 3 2	▲	16.0 [89]			ML	Organic Silt (OL) - 10% fine sand; 90% fines; moist to wet, brown, firm, contains fibrous organics	13.5
20				40	7	4 4 8	▲	18.0 [100]			SM	Sandy Silt (ML) - 40% fine sand; 60% low to medium plasticity fines; wet, gray, stiff	17.5
25				26	8	7 7 10	▲	16.0 [89]			SM	Silty Sand (SM) - 75% fine sand; 25% fines; wet, gray, medium dense	27.5
30				23	9	5 10 17	▲	16.0 [89]					31.5



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-3

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/13/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	30.9'
Method:	Auger	Coordinates:	60.805067, -161.795537
Operator:	Mason Iverson	▽ Drilling Water Level:	13.5'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
				12	1		■					FILL, Silty Sand (SM) - 10% fine to coarse, subangular to subrounded gravel; 75% fine sand; 15% fines; light brown, FROZEN , No	
0	0	77	23	6	2	6 9 9	▲	16.0 [89]			SM	FILL, Silty Sand (SM) - 75% fine sand; 25% fines; wet, brownish gray, medium dense	
5													
				13	3	6 8 7	▲	16.0 [89]					
				20	4	6 6 5	▲	16.0 [89]					
10													9.5
				60	5	2 1 5	▲	10.0 [56]			OL	Organic (OL) - 10% fine sand; 90% fines; wet, brown, firm	
15	0	57	43	30	6	2 2 3	▲	16.0 [89]				Silty Sand (SM) - 55% fine sand; 45% low to medium plasticity fines; wet, gray, firm	11-13-24 ▽
													17.5
20												Silty Sand (SM) - 80% fine sand; 20% fines; wet, gray, medium dense	
				21	7	7 8 10	▲	18.0 [100]			SM		23.5
25												Silty Sand (SM) - 70% fine sand; 30% fines; wet, gray	
				21	8	5 8 27	▲	18.0 [100]					
30	0	69	31	24	9	36 50/5"	▲	11.0 [100]					30.9

End of Boring, backfilled with soil cuttings



Bethel Ptarmigan Street Culvert Crossings

Soil Boring: TB-4

Client:	City of Bethel	Project Number:	1163.50270.68
Contractor:	GeoTek Alaska	Date Completed:	11/13/2024
Equipment:	Geoprobe 6620DT	Boring Depth:	31.5'
Method:	Auger	Coordinates:	60.804955, -161.795249
Operator:	Mason Iverson	▽ Drilling Water Level:	13.6'
Logged By:	Robert Sanders	▼ Delayed Water Level:	N/A

Depth (ft)	Lab				Samples				Frozen	Graphic Log	USCS	Soil Description and Remarks	Water Levels
	% Gravel	% Sand	% Fines	Moisture Content (%)	Sample Number	Blow Counts	Sample Graphic	Sampler Recovery					
				17	1		■						
	9	52	39	21	2	2 2 3	▲	2.0 [11]					
5													4.5
				19	3	1 1 1	▲	18.0 [100]					
	8	78	14	17	4	8 11 14	▲	16.0 [89]					
10													9.5
				20	5	4 4 4	▲	16.0 [89]					
15				22	6	1 1 1	▲	6.0 [33]					
20	0	79	21	35	7	WOH 5 8	▲	18.0 [100]				Trace fibrous organics	
25				26	8	5 9 12	▲	18.0 [100]					
30				19	9	3 4 5	▲	18.0 [100]					

End of Boring, backfilled with soil cuttings

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 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)**

0 - 4
 5 - 10
 11 - 30
 31 - 50
 More than 50

Relative Soil Density

Very loose
 Loose
 Medium dense
 Dense
 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)**

0 - 2
 3 - 4
 5 - 8
 9 - 15
 16 - 30
 More than 30

Relative Soil Density

Very soft
 Soft
 Firm
 Stiff
 Very Stiff
 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)

Based on the Unified Soil Classification System (USCS)				USCS Soil Classification		
Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A				Group Symbol	Group Name ^B	
Coarse-Grained Soils	<u>Gravels</u>	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	<u>Sands</u>	Clean Sands	$Cu \geq 6$ and $1 \geq Cc \leq 3$ ^E	SW	Well-graded sand ^I
			Less than 5% fines ^D	$Cu \geq 6$ 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	<u>Silts and Clays</u>	Inorganic	$PI > 7$ and plots on or above "A" line ^J	CL	Lean clay ^{K,L,M}	
			$PI < 4$ and plots on or above "A" line ^J	ML	Silt ^{K,L,M}	
	Liquid limit less than 50	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	<u>Silt and Clays</u>	Inorganic	PI plots on or above "A" line	CH	Fat clay ^{K,L,M}
				PI plots below "A" line	MH	Elastic silt ^{K,L,M}
		Liquid limit 50 or more	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		F	If fines classify as CL-ML, use dual symbol GC-GM, SC-SM		
B	If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name		G	If soil contains $\geq 15\%$ sand, add "with sand 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		H	If fines are organic, add " with organic fines" to group name		
			I	If soil contains $\geq 15\%$ 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 $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.		
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		M	If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.		
			N	$PI \geq 4$ 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		
E	$Cu = D_{60}/D_{10}$ $Cc = [(D_{30})^2/(D_{10} \times D_{60})]$					

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

Part I Description of Soil Phase			Classify Soil Phase by ASTM D2487 or D2488		
Part II Description of Frozen Soil	Segregated ice is not visible by eye	Group Symbol	Subgroup		Field Identification
		N	Description	Symbol	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)
			Poorly bonded or friable	Nf	
			No excess ice	Nb	
	Well-bonded Excess ice	Nbe			
	Segregated ice is visible by eye (ice 1- inc 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
			Ice coatings on particles	Vc	
			Random or irregularly oriented ice formations	Vr	
			Stratified or distinctly oriented ice formations	Vs	Estimate volume of visible segregated ice present as percentage of total sample volume. (Note 2)
			Uniformly distributed ice	Vu	
Part III Description of Substantial Ice	Ice (greater than 1-inh 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: <u>HARDNESS</u> : Hard, Soft (of mass, not individual crystals) <u>STRUCTURE</u> (Note 4): Clear, Cloudy, Porous, Canded, Granular, Stratified <u>COLOR</u> : Colorless, Gray, Blue <u>ADMIXTURES</u> : Contains few thin silt inclusions
			Ice without soil inclusions	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) Canded 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.

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 jar, 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.

FROST DESIGN SOIL CLASSIFICATION¹

Frost² 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) (MOA F2)	(a) Gravels Crushed stone Crushed rock	1.5 to 3	GW and GP
	(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	Over 15	ML and MH
	(b) Very fine silty sands		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



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10360-S01	24-10360-S02	24-10360-S03	24-10360-S04	24-10360-S05
Field Sample ID					
Client Sample ID	TB-01 Sa1	TB-01 Sa2	TB-01 Sa3	TB-01 Sa4	TB-01 Sa5
Date Sampled					

Particle Size Distribution

Method:	Sieve Size	% Passing	Limits
ASTM D 422	3in	100	
Description: Analysis of Particle Size Distribution in Soils. Sieving for Particles >75µm, Hydrometer	2in	100	
	1½in	100	
	1in	100	
	¾in	100	
	½in	99	
	3/8in	89	
	No.4	76	
Washed: Sample Washed	No.10	63	
	No.20	56	
	No.40	51	
	No.60	47	
	No.100	36	
	No.200	20	
	Finer No.200 (75µm)	18.9	

Other Test Results

Description	Method	Results	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			
Water Content (%)	ASTM D2216	6 9 10 20 44	
Date Tested		11/22/2024 11/22/2024 11/22/2024 11/22/2024 11/22/2024	
Tested By		Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale	
Group Code	ASTM D2487	SM SM	
Group Name		Silty sand with gravel Silty sand	
Liquid Limit		0 0	
Plasticity Index		0 0	
Gravel (%)		24 0	
Sand (%)		56 78	
Fines (%)		20 22	
Tested By	ASTM D2487	Desirae Pascale Desirae Pascale	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10360-S06	24-10360-S07	24-10360-S08	24-10360-S09
Field Sample ID				
Client Sample ID	TB-01 Sa6	TB-01 Sa7	TB-01 Sa8	TB-01 Sa9
Date Sampled				

Particle Size Distribution

Method:	Sieve Size	% Passing	Limits
ASTM D 422	3in	100	
Description: Analysis of Particle Size Distribution in Soils. Sieving for Particles >75µm, Hydrometer	2in	100	
	1½in	100	
	1in	100	
	¾in	100	
	½in	100	
	3/8in	100	
	No.4	100.0	
Washed: Sample Washed	No.10	100	
	No.20	100	
	No.40	100	
	No.60	98	
	No.100	89	
	No.200	70	

Other Test Results

Description	Method	Results	Limits
Water Content (%)	ASTM D2216	34 35 26 27	
Date Tested		11/22/2024 11/22/2024 11/22/2024 11/22/2024	
Tested By		Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale	
Group Code	ASTM D2487	ML ML	
Group Name		Sandy silt Sandy silt	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		0	
Sand (%)		30	
Fines (%)		70	
Tested By	ASTM D2487	Desirae Pascale Desirae Pascale	
Liquid Limit	ASTM D4318	Not Obtainable	
Plastic Limit		NP (Non-Plastic)	
Plasticity Index		NP (Non-Plastic)	
As-Received Water Content (%)		33.9	
Preparation Method		Air Dry	
Oversize Removed By		Dry Sieving over No. 40 sieve	
Liquid Limit Apparatus		Mechanical	
Grooving Tool		Plastic	
Rolling		Hand	
Tested By		Cindy Zickefoose	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10360
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10360-S06	24-10360-S07	24-10360-S08	24-10360-S09
Field Sample ID				
Client Sample ID	TB-01 Sa6	TB-01 Sa7	TB-01 Sa8	TB-01 Sa9
Date Sampled				

Other Test Results

Description	Method	Results	Limits
Date Tested	ASTM D4318	11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10593
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details						
Sample ID	24-10593-S01	24-10593-S02	24-10593-S03	24-10593-S04	24-10593-S05	
Field Sample ID						
Client Sample ID	TB-02 Sa1	TB-02 Sa2	TB-02 Sa3	TB-02 Sa4	TB-02 Sa5	
Date Sampled						
Other Test Results						
Description	Method	Results				Limits
Water Content (%)	ASTM D2216	12	19	9	23	22
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487			SM		SM
Group Name				Silty sand with gravel		Silty sand
Liquid Limit				0		0
Plasticity Index				0		0
Gravel (%)				18		2
Sand (%)				66		77
Fines (%)				16		21
Tested By	ASTM D2487			Desirae Pascale		Desirae Pascale

Comments
Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10593
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10593-S06	24-10593-S07	24-10593-S08	24-10593-S09
Field Sample ID				
Client Sample ID	TB-02 Sa6	TB-02 Sa7	TB-02 Sa8	TB-02 Sa9
Date Sampled				

Other Test Results

Description	Method	Results				Limits
Water Content (%)	ASTM D2216	78	40	26	23	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10594
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details						
Sample ID	24-10594-S01	24-10594-S02	24-10594-S03	24-10594-S04	24-10594-S05	
Field Sample ID						
Client Sample ID	TB-03 Sa1	TB-03 Sa2	TB-03 Sa3	TB-03 Sa4	TB-03 Sa5	
Date Sampled						
Other Test Results						
Description	Method	Results				Limits
Water Content (%)	ASTM D2216	12	6	13	20	60
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale
Group Code	ASTM D2487		SM			
Group Name			Silty sand			
Liquid Limit			0			
Plasticity Index			0			
Gravel (%)			0			
Sand (%)			77			
Fines (%)			23			
Tested By	ASTM D2487		Desirae Pascale			

Comments
Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10594
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10594-S06	24-10594-S07	24-10594-S08	24-10594-S09
Field Sample ID				
Client Sample ID	TB-03 Sa6	TB-03 Sa7	TB-03 Sa8	TB-03 Sa9
Date Sampled				

Particle Size Distribution

Method:	Sieve Size	% Passing	Limits
ASTM D6913	3in	100	
Description:	2in	100	
Sieve Analysis of Soil	1½in	100	
	1in	100	
	¾in	100	
Drying By:	½in	100	
Oven	3/8in	100	
Washed:	No.4	100.0	
Sample Washed	No.10	100	
	No.20	100	
	No.40	100	
	No.60	99	
	No.100	85	
	No.200	31	

Other Test Results

Description	Method	Results	Limits
Water Content (%)	ASTM D2216	30 21 21 24	
Date Tested		11/22/2024 11/22/2024 11/22/2024 11/22/2024	
Tested By		Desirae Pascale Desirae Pascale Desirae Pascale Desirae Pascale	
Group Code	ASTM D2487	SM SM	
Group Name		Silty sand Silty sand	
Liquid Limit		0 0	
Plasticity Index		0 0	
Gravel (%)		0 0	
Sand (%)		57 69	
Fines (%)		43 31	
Tested By	ASTM D2487	Desirae Pascale Desirae Pascale	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in LMAs Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10595-S01	24-10595-S02	24-10595-S03	24-10595-S04	24-10595-S05
Field Sample ID					
Client Sample ID	TB-04 Sa1	TB-04 Sa2	TB-04 Sa3	TB-04 Sa4	TB-04 Sa5
Date Sampled					

Particle Size Distribution

Method:	Sieve Size	% Passing				Limits
ASTM D 422	3in		100		100	
	2in		100		100	
Description:	1½in		100		100	
Analysis of Particle Size	1in		100		100	
Distribution in Soils. Sieving for	¾in		100		98	
Particles >75µm, Hydrometer	½in		100		95	
	3/8in		96		93	
Washed:	No.4		91		91.8	
Sample Washed	No.10		86		89	
	No.20		83		85	
	No.40		81		82	
	No.60		76		73	
	No.100		62		45	
	No.200		39		14	
	Finer No.200 (75µm)		35.7			

Other Test Results

Description	Method	Results					Limits
Water Content (%)	ASTM D2216	17	21	19	17	20	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	
Dispersion device	ASTM D 422	Dispersant by hand					
Dispersion time (min)							
Shape							
Hardness							
Group Code	ASTM D2487		SM		SM		
Group Name			Silty sand		Silty sand		
Atterberg Limits Estimated					Yes		
Liquid Limit			0				
Plasticity Index			0				
Gravel (%)			9		8		
Sand (%)			52		78		
Fines (%)			39		14		
Tested By	ASTM D2487		Desirae Pascale		Desirae Pascale		

Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Alaska Testlab - Anchorage
1020 W International Airport Rd
Anchorage, AK 99518
Phone: 907-205-1987
Fax: 907-782-4409
info@alaskatestlab.com

Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10595-S01	24-10595-S02	24-10595-S03	24-10595-S04	24-10595-S05
Field Sample ID					
Client Sample ID	TB-04 Sa1	TB-04 Sa2	TB-04 Sa3	TB-04 Sa4	TB-04 Sa5
Date Sampled					

Other Test Results

Description	Method	Results	Limits
Method	ASTM D6913		A
Preparation Method			Oven Dry
Composite Sieving?			Yes
Separating Sieve(s)			No. 4
Cu	ASTM D2487		
Cc			

Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: ASM:24-10595
Issue No: 1

Client: DOWL, LLC 5015 Business Park Blvd. Suite 4000 Anchorage, AK, 99503	Project Code: 241419 CC: DOWL Maria Kampsen	The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.  Reviewed By: Cindy Zickefoose Title: Laboratory Supervisor Date: 11/25/2024
Project: PT Culvert		
1163.50270.68 02		

Sample Details

Sample ID	24-10595-S06	24-10595-S07	24-10595-S08	24-10595-S09
Field Sample ID				
Client Sample ID	TB-04 Sa6	TB-04 Sa7	TB-04 Sa8	TB-04 Sa9
Date Sampled				

Other Test Results

Description	Method	Results				Limits
Water Content (%)	ASTM D2216	22	35	26	19	
Date Tested		11/22/2024	11/22/2024	11/22/2024	11/22/2024	
Tested By		Desirae Pascale	Desirae Pascale	Desirae Pascale	Desirae Pascale	
Group Code	ASTM D2487		SM			
Group Name			Silty sand			
Liquid Limit			0			
Plasticity Index			0			
Gravel (%)			0			
Sand (%)			79			
Fines (%)			21			
Tested By	ASTM D2487		Desirae Pascale			

Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10360-S01
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10360-S01
Client Sample ID TB-01 Sa1
Specification Sieve

Particle Size Distribution

Method: ASTM D 422

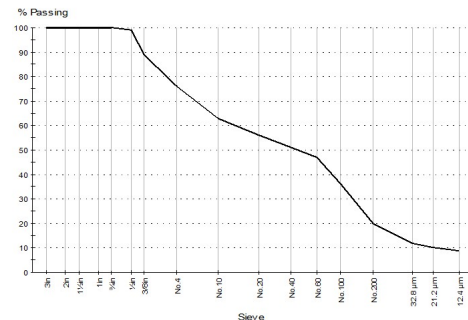
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	99	
3/8in	89	
No.4	76	
No.10	63	
No.20	56	
No.40	51	
No.60	47	
No.100	36	
No.200	20	
Finer No.200 (75µm)	18.9	
32.8 µm	11.9	
21.2 µm	10.0	
12.4 µm	8.8	

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			
Water Content (%)	ASTM D2216	6	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand with gravel	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		24	
Sand (%)		56	
Fines (%)		20	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	

Chart



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10360-S06
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project: PT Culvert

1163.50270.68 02

Project Code: 241419
CC: DOWL
Maria Kampsen

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10360-S06
Client Sample ID TB-01 Sa6

Particle Size Distribution

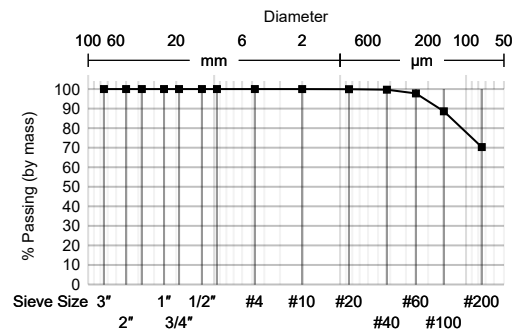
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	100	
No.4	100.0	
No.10	100	
No.20	100	
No.40	100	
No.60	98	
No.100	89	
No.200	70	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	34	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	ML	
Group Name		Sandy silt	
Gravel (%)		0	
Sand (%)		30	
Fines (%)		70	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	
	ASTM D4318		
Liquid Limit		Not Obtainable	
Plastic Limit		NP (Non-Plastic)	
Plasticity Index		NP (Non-Plastic)	
As-Received Water Content (%)		33.9	
Preparation Method		Air Dry	
Oversize Removed By		Dry Sieving over No. 40 sieve	
Liquid Limit Apparatus		Mechanical	
Grooving Tool		Plastic	
Rolling		Hand	
Tested By		Cindy Zickefoose	
Date Tested		11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

N/A



Material Test Report

Report No: MAT:24-10594-S09
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project Code: 241419
CC: DOWL
Maria Kampsen

Project: PT Culvert

1163.50270.68 02

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10594-S09
Client Sample ID TB-03 Sa9

Particle Size Distribution

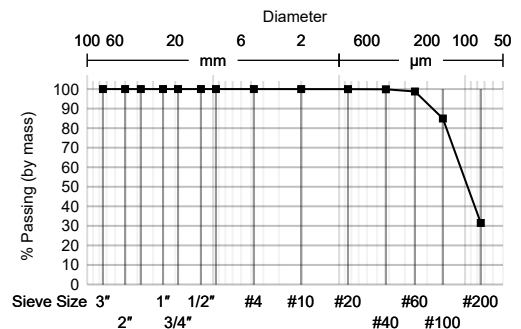
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	100	
No.4	100.0	
No.10	100	
No.20	100	
No.40	100	
No.60	99	
No.100	85	
No.200	31	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	24	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		0	
Sand (%)		69	
Fines (%)		31	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/21/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing
No Plasticity Index Test Performed



Material Test Report

Report No: MAT:24-10595-S02
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project: PT Culvert

1163.50270.68 02

Project Code: 241419
CC: DOWL
Maria Kampsen

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

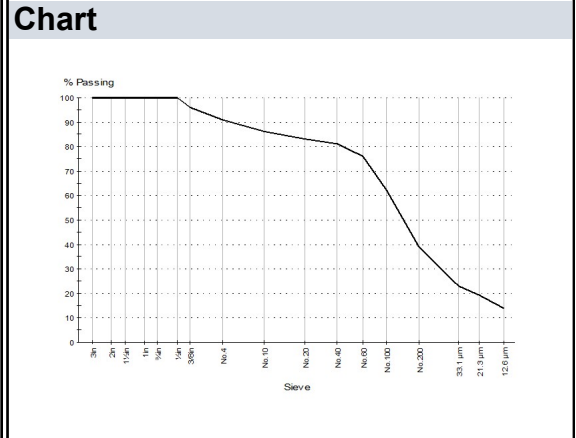
[Signature]

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details			
Sample ID	24-10595-S02		
Client Sample ID	TB-04 Sa2		
Specification	Sieve		

Particle Size Distribution		
Method:	ASTM D 422	
Date Tested:		
Tested By:		
Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	96	
No.4	91	
No.10	86	
No.20	83	
No.40	81	
No.60	76	
No.100	62	
No.200	39	
Finer No.200 (75µm)	35.7	
33.1 µm	22.9	
21.3 µm	19.1	
12.6 µm	14.0	

Other Test Results			
Description	Method	Result	Limits
Dispersion device	ASTM D 422	Dispersant by hand	
Dispersion time (min)			
Shape			
Hardness			
Water Content (%)	ASTM D2216	21	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Liquid Limit		0	
Plasticity Index		0	
Gravel (%)		9	
Sand (%)		52	
Fines (%)		39	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing



Material Test Report

Report No: MAT:24-10595-S04
Issue No: 1

Client: DOWL, LLC
5015 Business Park Blvd. Suite 4000
Anchorage, AK, 99503
Project: PT Culvert

1163.50270.68 02

Project Code: 241419
CC: DOWL
Maria Kampsen

The results contained below pertain only to the items tested below. This report should not be reproduced, except in full, without the prior written approval of Alaska Testlab or the agency.

Reviewed By: Cindy Zickefoose
Title: Laboratory Supervisor
Date: 11/25/2024

Sample Details

Sample ID 24-10595-S04
Client Sample ID TB-04 Sa4

Particle Size Distribution

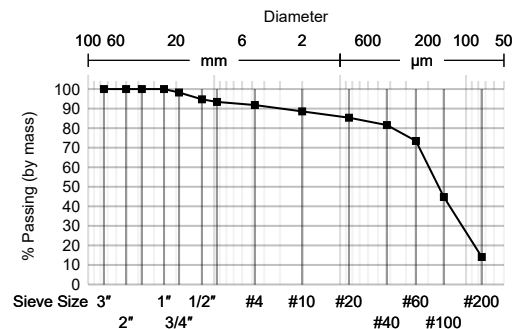
Method: ASTM D6913
Drying By: Oven
Date Tested: 11/21/2024
Tested By: Desirae Pascale

Sieve Size	% Passing	Limits
3in	100	
2in	100	
1½in	100	
1in	100	
¾in	98	
½in	95	
3/8in	93	
No.4	91.8	
No.10	89	
No.20	85	
No.40	82	
No.60	73	
No.100	45	
No.200	14	

Other Test Results

Description	Method	Result	Limits
Water Content (%)	ASTM D2216	17	
Date Tested		11/22/2024	
Tested By		Desirae Pascale	
Group Code	ASTM D2487	SM	
Group Name		Silty sand	
Atterberg Limits Estimated		Yes	
Gravel (%)		8	
Sand (%)		78	
Fines (%)		14	
	ASTM D2487		
Tested By		Desirae Pascale	
Date Tested		11/22/2024	
Method	ASTM D6913	A	
Preparation Method		Oven Dry	
Composite Sieving?		Yes	
Separating Sieve(s)		No. 4	
Cu	ASTM D2487		
Cc			
Date Tested		11/21/2024	

Chart



Comments

No Plasticity Index Test Performed
Soil Classification of Fines (-#200) in Sieve Analyses Assumed Unless Verified by Additional Testing

Ptarmigan Culverts Request for Bid

Addendum #1

March 3, 2025

Question #1: When is the anticipated award date?

Response #1: March 28, 2025

Question #2: Request the required delivery time be extended to August 1, 2025. The reason for this is the amount of time required for shop drawings to be approved by the owner, the triple engineering review completed and finally the production of the structural plate. The estimated time from the manufacture to complete all the required documentation is 3 – 4 weeks. Current production time is approximately 8 - 10 weeks but as the season gets underway, this will lengthen. Shipping time will add up to 5-6 weeks to Bethel.

Response #2: The City will permit an extension in delivery time until July 1, 2025. The intent is to construct this project in Summer 2025 and the culverts need to be on-site by July 1, 2025.

Question #3: To save some time and expense, request that the triple engineering review be reduced to manufacture supplied engineered shop drawings that are reviewed and stamped by an independent Alaskan PE.

Response #3: The supplier provided engineering shop drawings should be reviewed and stamped by an independent Alaskan PE.

**Request for Bid
Ptarmigan Culverts**

Addendum #2 Released March 7, 2025

Question #1: Please clarify maximum cover of both West and East Structural Plate Pipe Arches for design calcs and load rating purposes. Section 2-C-2 Materials lists minimum/maximum cover for each crossing at 3'/40'.

- a. AASHTO limits maximum cover for pipe arches of this size to 5' – the 40' max cover listed will not check structurally.
- b. Sheet C7 of C14 shows max cover for the West culvert to be approximately 2.75'
- c. Sheet C8 of C14 shows max cover for the East culvert to be approximately 3.15'.
- d. However, Sheet C9 of C14 shows profiles for both culverts with the West culvert showing approximately 5' of max cover and East culvert showing approximately 3.3' of max cover.

Please clarify max cover for both.

Response #1: Please use:

1. Sheet C7 of C14 shows max cover for the West culvert to be approximately 2.75'
2. Sheet C8 of C14 shows max cover for the East culvert to be approximately 3.15'.

Question #2: Please confirm if supplier is required to perform lifespan durability calculations to confirm a 75 year life span per DOT specs. If so, PH, Resistivity and Abrasion design information will need to be provided to CONTECH by others. Who will be providing this information to CONTECH?

Response #2: We will waive this requirement.

City of Bethel, Alaska

City Manager's Office

March 20, 2025-April 2, 2025

Personnel

New Hires

We are excited to welcome to the team:

Tore Signstad, Fire Fighter

Todd Henderson, Hauled Services Driver

Nelson Anaver, Finance Accounting Specialist

Kylee Henderson, Finance Accounting Clerk

Nikki Zaukar, Police Officer

Jonathan Devries, Police Officer

Odilia Robb, Part Time Accounting Specialist

Resignations

We want to wish the following team members who have resigned the best of luck:

Daniel Watson, Police Sergeant

Patty Watson, Police Evidence Custodian

Frank Bayer, Vehicle and Equipment Parts Clerk

Report of Business Interests and Ethics

As suggested by the Ethics Board a few years back, Administration requires all employees to complete a Report of Business Interest, and acknowledgment of their understanding of the City's conflict of interest provisions. This form was distributed to team members on March 31st.

Summer Internship Programs

We hope to roll out the summer internship program information the week of the 7th. We have to update the forms for employment and evaluate which of the positions may be issued that don't require a driver's license.

Request for Proposals

Pending Contracts:

- Bethel Port Floating Docks (Small Boat Harbor Capital Project) – Contract initiated
- Bulk Fuel Services (General Fund) – Contract will be initiated 4/7/25

Upcoming RFPs:

- Pedestrian Bridge (Pinky's Park Boardwalk to Akakee) – Should be issued 4/4/2025
- Janitorial Services – Should be issued 4/11/25

General Operations

- Administration issued a proposed FY26 Operating budget to the City Council with the following fund balances:
 - General Fund \$2,200,170
 - Solid Waste Enterprise Fund \$1,491,498
 - Water & Sewer Enterprise Fund \$2,923,236
 - Municipal Dock Fund \$717,257

- Leased Properties Fund \$150,138
- Transit System Fund \$0

We will hold a planning/review meeting to go over changes to the budget and goals for the coming years.

Hauled Utility Vehicles Out for Auction

We are working with an auction company to sell two of our hauled utility vehicles. They will be shipped into Anchorage for the final sale. We anticipate getting over \$200,000 for the sales.

Solid Waste Services Audit

- Staff is reviewing over 100 accounts that may not be in compliance.
- Current actions:
 - Cross-checking reported noncompliant accounts for accuracy.
 - Notifying commercial users of required billing changes.
 - Developing an action plan for correction and next steps.

Leases

- University of Alaska Lease & Contract – The City has not heard back from the University following our intent to terminate the lease and operating contract due to noncompliance.
- Lions Club Lease – The leaseholders responded to our notice of intent to terminate. They are working on obtaining nonprofit status with the City. The Lions member representative said their nonprofit status was processed. We are awaiting documentation confirming this is the case. The new lease will not be signed until compliance is confirmed.
- City-Owned Lot Appraisals – Updates received regarding two City-owned lots in City Subdivision. The next step is to present the

Hazard Mitigation Plan

The last Hazard Mitigation Plan update was in 2017. Public Safety, Planning, and Administration are working on an update of the plan with the State of Alaska.

City Walkability Action Plan

The City was encouraged to create a Walkability Action Plan through participation in the Walkability Action Institute, hosted by the State of Alaska Department of Health. The working group for the plan is suggested to be:

- 1 public health staff -YKHC
- 1 public transportation staff Dalton Perry (will need to find out who that is)
- 1 staff from a local or regional planning department Lee Foley, City Planner
- 1 elected official Rose Henderson, Mayor

It will feature interactive seminars and activities with national experts to help Alaskan communities implement policy, systems, and environmental (PSE) change interventions that support community design to improve health. The goal will be to improve our ability to qualify for grants related to walking trails and pedestrian safety.

Safe Streets 4 All

The Grant Manager, John Sargent, and Administration, attended a Peer Exchange meeting hosted by AML on the Safe Streets 4 All grant. We are awaiting the grant agreement before we proceed with the contractor on the program, but the Peer Exchange meeting was helpful overview.

T Mobile Homegrown Grant

The Grant Manager, and Community Parks and Recreation Director collaborated on a grant application for computer lab equipment. This is a nationally competitive grant so will be difficult to obtain but fingers crossed.

Regional Resource Coordination Meeting

Administration attended the Regional Resource Coordination meeting on March 21st with the partnering agencies to discuss planning for potential community and regional emergencies.

YKHC Emergency Coordination Meeting-Mount Spurr

Administration, and the Chief of Public Safety attended a meeting with many divisions within YKHC to discuss potential impacts and responses to an expected eruption of Mount Spurr. While the potential is unlikely the conversation ensures we are more prepared for an event.

Port Approaches

The Streets and Roads and Port Team continued to work on the approaches.



Ptarmigan Road Project

We are nearly ready to go out to bid for construction of/installation of the culverts but are waiting on confirmation of our ability to obtain a temporary construction easement for a property. We will need to work with BIA for a full easement which will take some time to complete.

Community Center Expansion

The team provided DOWL with our final design elements to get us to 95% design. We look forward to getting the 95% design updates and estimates within the next few weeks.

MEMORANDUM

DATE: April 1, 2025

TO: Lori Strickler, Acting City Manager

FROM: John Sargent, Grant Manager

SUBJECT: Grant Manager's Report for April 8, 2025 Bethel City Council Meeting



Grant Applications Submitted

Congressional Directed Spending

I requested funding for these four congressional directed spending projects:

1. Expansion of Bethel Community Center - \$3,000,000
2. Planning, permitting, and design of Cargo Dock East Wall - \$3,000,000
3. Planning, permitting, and design of new Public Works building - \$3,000,000
4. Port of Bethel security cameras - \$300,000

Congressional Appropriations

I requested funding for these three congressional appropriation projects:

1. Bethel Heights Water Treatment Plant Automation - \$1,418,000
2. Solar Energy - \$150,000
3. Police Station security cameras and access control system - \$70,000

VSW CIP Planning Grant Application

I prepared and submitted a Capital Improvement Project grant application to the Village Safe Water Program. I requested \$45,000 for DOWL to prepare a technical memorandum describing a new water and sewer utility facility that would house water trucks and sewer trucks in separate bays and have a full mechanics' shop where only work on water and sewer trucks and equipment would take place. Piped utilities and hauled utilities dispatch would occupy space in the building. The new building would be located north of the current Public Works building.

T-Mobile Hometown Grant Application

I prepared and submitted a Hometown grant application by the March 31, 2025 quarterly deadline to request \$50,000, the maximum that could be requested, to cover costs associated with the renovation of the break room at the YK Fitness Center to the Computer Room / Telehealth Center. The grant would cover renovation, installation of CAT-6 cable, and the purchase of a telehealth pod, health monitoring equipment, computers, furniture, and supplies.

Grant Applications in Preparation

EPA Grant for Removal of Derelict Vessels

On February 26, 2025, City administrators met with EPA staff members in a Teams call. The staff laid out the application process and grant responsibilities. The City must apply for a grant from the Environmental Protection Agency in order to secure the \$5.018 million appropriation from Senator Murkowski's Office to remove derelict vessels from Steamboat Slough.

Grant Administration

Current Grants

See list on following pages.

City of Bethel Current Grants

#	Grant	Amount	Expiration
1	Coronavirus Capital Project Fund	\$ 9,000,000	12/31/2026
	Design and construction of Bethel Multiuse Community Center (gym, computer facilities). This fund is now being tapped for design/construction costs. Design at 95% nearly done.		
2	Denali Commission Grant	\$ 500,000	9/30/2026
	Design and construction of Bethel Multiuse Community Center (gym, computer facilities). City still waiting on a grant agreement from grantor.		
3	CSP - DHSS FY 2025	\$ 323,081	6/30/2025
	One CSP recently promoted to police officer. Vacancy to fill. Applied for FY 26 CSP grant for same amount.		
4	23SHSP-GY23 – Virtual Simulator & Fencing	\$ 268,000	9/30/2025
	The City must complete the Environmental, Historical and Preservation documents necessary for		
5	Coronavirus Local Fiscal Recovery Fund (ARPA)	\$ 3,361,604	12/31/2024
	The performance period closed December 31, 2024. The City expects to claim the remaining balance of \$1,242,895 on the Final Report, which is due April 30, 2025.		
6	Designated Legislative Grant > YK Fitness Ctr. Gym Design	\$ 500,000	6/30/2026
	This grant is fully expended. Final report will be completed in April 2025.		
7	Designated Legislative Grant > Public Safety Communication Tower	\$ 500,000	6/30/2028
	STG, Inc. completed the installation of the Public Safety Communications Tower. Final report to be completed in April 2025.		
8	Designated Legislative Grant> Dust Control	\$ 1,200,000	6/30/2029
	Finance Dept. assigned GL# combination so that purchases can be credited correctly.		
9	State and Local Cybersecurity Grant Program (SLCGP)	\$ 75,000	9/30/2026
	The City of Bethel plans to hire a consultant to conduct a cybersecurity review of the City's IT network, equipment, software, and physical layout. The City plans to use recommendations in the plan as grant requests next year.		
10	VSW Capital Improvement Project Grant	\$ 13,860,000	
	Sturgeon Electric nearly completed the water treatment plant improvements. DOWL is now working on the design to run water pipes from the Bethel Heights Water Treatment Plant to the Martina Oscar Subdivision.		

11	Last Frontier Housing Initiative	\$ 5,000,000	12/31/2026
Alaska Housing Finance Corporation is the grantor. City hired Urban KNKT to construct and operate three rental units to serve low-income residents. The City hired Kuqo Construction to construct three professional housing two-bedroom units.			
12	State Homeland Security Program Grant - SFY 25	\$ 9,000	9/30/2026
This grant will cover the cost of paying a trainer to come to Bethel to teach ICS-300, an Incident Command System course for first responders and municipal administrators who may play a role in a major emergency situation.			
13	Safe Streets 4 All Grant	\$ 52,800	TBD
The City is waiting on grantor to obtain federal agency approval and then produce a grant agreement. Infrastructure, equipment, road signs, and other hardware recommended in the safety plan become eligible for funding in the next Safe Streets 4 All grant opportunity.			
14	Justice Assistance Grant (JAG)	\$ 11,116	9/30/2025
Security cameras and access control system installation at Police Station. The City is applying for Homeland Security grant funds to match this grant for the full purchase of cameras and card reader equipment.			
15	Energy Efficiency and Conservation Block Grant (EEBG)	\$ 75,220	9/30/2026
Solar panel installation on YK Fitness Center. Project likely to begin once UIC begins construction of Bethel Community Center (gymnasium). Parks and Rec. Director assumed role of Project Manager.			
16	Rasmuson Foundation Grant	\$ 250,000	1/31/2026
This grant will cover part of the cost of constructing a new animal shelter in Bethel.			
17	Community Transit Operating Grant	\$ 184,131	6/30/2025
Transit Manager Evon Fox manages the daily operation of the transit system, handles all purchases, and completes monthly billing summaries and quarterly reports.			
18	Community Transit Capital Grant	\$ 853,563	6/30/2026
This grant covers the capital cost of a new boiler in the transit center and the purchase of two new buses. Two buses purchased and in use.			

Total \$ 36,023,515



City of Bethel

Finance Department

Manager's Report for March 2025

Date: 4/2/2025

To: Lori Strickler, City Manager

From: Cynthia Sharp, Deputy Finance Director

Subject: Management Report

Current Events within the Finance Department

The Finance Department has a few new employees we would like to welcome.

Kylee Henderson is our new Front Desk person.

Nathaniel Ayuluk is our new Accounting Specialist I-Sales tax.

Jim Chevigny is our new Finance Director.

The FY23 Audit is almost complete.

The FY26 Budget has been submitted to City Council.

Finance Committee

The Finance Committee did not have a quorum.

Personnel/Open positions: Accounting Specialist I



William Arnold, Public Works Director
 1155 Ridgecrest Drive
 PO Box 649 Bethel, AK 99559
 P: (907) 543-3110
 F: (907) 543-2046
 warnold@cityofbethel.net

MEMORANDUM

DATE: 03.31.2025

TO: City Manager

FROM: Bill Arnold, Public Works Director

SUBJECT: Manager's Report – Public Works Department

Programs/Divisions

Chemical Storage Building is about 90% complete, Work at the Bethel Heights Water Treatment Plant is about 95% complete.

Hauled Utilities: We have had one or two claims this month. There has been a claim this month. Two of our water trucks have been damaged in the shop. Road Maintenance has provided towing services several times this month. Vehicle maintenance has repaired every mechanical issue we have brought to their attention. Building Maintenance is waiting on the contractor and the new garage door to arrive. Once this happens the repairs will be made. We will finish the month with our water and sewer routes on time.

Utility Maintenance:

3/2	931 Ridgecrest lower exit line coming from home.
3/5	Took out pump on highway lift station and sent for repairs
3/10	Used grinder pump on Ridgecrest lift station
3/11	Akakeek lift station electrical issues. Electrician investigated issue- issue resolved
3/12	160 Ptarmigan reports of sewage leakage from pipe
3/14	409 Napakiak Dr - New Customer water meter reading
3/17	216 Akiak evac lift station
3/27	225 City Sub pump change
3/31	Shop door issue
	7 alarms on residential lift stations-3 repair pumps changed
	Monthly meter reading and service connection/shutoff complete
	Sewer line leveling at Boardwalk needed when Ice melts. Causing backup issues
	Highway lift station pump repair underway, currently using one pump.
	2 vacant positions for Utility Maintenance Dept.

Property Maintenance:

Pool Building	
	3/14 Work on door lock switches for family bathroom
	3/18 Repair mag locks on family bathroom
	3/20 Work on mixing valves mens showers
	3/20 Work on eye boiler 2
	3/27 Work on mixing valve mens shower
	3/27 Work on sump pump in pool pump room
Public Works Building	
	3/5 Build door for Q2 lift station
	3/6 Install new door for Q2 lift station
	3/6 Work on shipping crate for Utilitie Maintenance
	3/7 Work on shipping crate for Utilitie Maintenance
	3/19 Refill waste oil burners
	3/24 Get measurements for spings on southside overhead door
	3/25 Filter waste oil
	3/25 Work on Northside waste oil burner
	3/26 Replace bay light on southside
	3/27 Replace bay light on southside
City Hall	
	3/4 Make key to IT room for Cindy
	3/15 Work on zone valve finance office
	3/17 Replaced zone valve in finance office
	3/25 Look at stopped up toilet unclog toilet
	2/28 Move furniture for finance
Police Department	
	3/1 Reset waterpump
	3/2 Prime clean water water pump
	3/3 Replace pressure switch for water pump
	3/6 Repaired overhead door in shop
	3/7 Replace handle on main floor toilet
Utilities Maintenance	
	03/21 Clean TOYO stove
	3/24 Work on Toyo stove
Bethel Heights Water Plant	
	3/7 Work on boiler 2
	3/10 Clean boiler 2
	3/11 Replace control module and fuel pump Boiler 2
	3/12 Replace nozzle and ignitors boiler 2

	3/13 Replace nozzle boiler 1
	3/26 Seal building where someone pulled back siding to break inside
Courthouse Building	
	3/5 Add glycol to heating system
	3/7 Boiler in lockout instructed to set boiler temperature controls as listed on controls
	3/24 Reset tripped breaker due to space heater being plugged
	3/24 Replace ballast in fixture near security door
	3/27 Unclog toilet
Transit Bus Building	
	3/7 Empty fuel from fuel leak
	3/14 Empty fuel from fuel leak
	3/21 Empty fuel from fuel leak
	3/28 Empty fuel from fuel leak
	3/28 Replace lamps in light fixtures in storage room
Port Office Building	
	3/25 Repair power to receptacles in conex
Play Parks in General	
x10 Parks	
	3/4 Check parks for trash and damage
	3/11 Check for trash and damage
	3/18 Check for trash and damage
	3/25 Check for trash and damage
All City Buildings	
	03/01/2025 Building checks and rounds
	03/02/2025 Building checks and rounds
	03/03/2025 Building checks and rounds
	03/04/2025 Building checks and rounds
	03/05/2025 Building checks and rounds, Salt entrances to buildings
	03/06/2025 Building checks and rounds
	03/07/2025 Building checks and rounds
	03/08/2025 Building checks and rounds
	03/09/2025 Building checks and rounds
	03/10/2025 Building checks and rounds
	03/11/2025 Building checks and rounds
	03/12/2025 Building checks and rounds
	03/13/2025 Building checks and rounds
	03/14/2025 Building checks and rounds
	03/15/2025 Building checks and rounds
	03/16/2025 Building checks and rounds

	03/17/2025 Building checks and rounds
	03/18/2025 Building checks and rounds
	03/19/2025 Building checks and rounds
	03/20/2025 Building checks and rounds
	03/21/2025 Building checks and rounds
	03/22/2025 Building checks and rounds
	03/23/2025 Building checks and rounds
	03/24/2025 Building checks and rounds shovel snow at entrances
	03/25/2025 Building checks and rounds
	03/26/2025 Building checks and rounds
	03/27/2025 Building checks and rounds
	03/28/2025 Building checks and rounds
	03/29/2025 Building checks and rounds
	03/30/2025 Building checks and rounds
	03/31/2025 Building checks and rounds

Road Maintenance: Business as usual aside from working with Port to level the approaches for the floats.

Vehicles and Equipment: fixing repairing and servicing vehicles and equipment as needed

Transit System:

Another busy month of ridership. No unusual happenings to report. Riders consisted of 926 Elders, 17 Youth, 102 Adults, 128 Disabled, and 1,237 Pass riders. 103 Day & 19 Month passes were purchased. Total fares for the month came out to \$1,035.00.

Landfill & Hauled Refuse:

Thanks to Robbie and his crew for the repairs to the compactor. For the month of March the dumpster truck brought 78 loads of trash to the landfill, the landfill received 10 loads of trash from other city trucks, private citizens brought 119 load of trash to the landfill and the landfill received 862 cubic yards of trash from commercial accounts, the landfill received 6 refrigerators to drain freon from before we disposed of them, and there were 7 cars brought to the landfill.

Staffing Issues/Concerns/Training:



CITY OF BETHEL
OFFICE OF
JAMES C. HARRIS
CHIEF OF PUBLIC SAFETY
harrisjc@cityofbethel.net



January 2025 Monthly Report
Police Department

Personnel:

Current Staffing			
Position	Allocated	Staffed	Vacant
Safety Patrol (three grant funded)	3	2	1
Community Service Officer	2	2	0
Evidence and Record Custodian	1	0	0
Administrative Assistant/Taxi Inspector	1	0	1
Public Safety Dispatcher (one E911 funded)	5	3	2
Public Safety Dispatch Supervisor	1	1	0
Peace Officers (one grant funded/reimbursed SRO)	20	18	2

Operations:

Operations Tempo				
	March 2025	February 2025	March 2024	2025 Total
Calls Total	827	910	2702	2932
Reports Total	81	109	104	315
Intoxicated Pedestrian Calls	167	157	152	527
Driving Under Influence Calls	14	14	18	40
Domestic Violence Reports	16	12	42	46
Disturbance Calls	69	58	60	221
Subject Removal Calls	70	70	90	234
Animal Calls	28	22	26	83
Animal Bite Reports	0	1	1	3
Sexual Assault Reports	3	4	1	7
Death Investigation Reports	0	0	0	0

Dispatch: (907) 543-3781 FAX: (907) 543-5086



CITY OF BETHEL
OFFICE OF
JAMES C. HARRIS
CHIEF OF PUBLIC SAFETY
harrisjc@cityofbethel.net



PERSONNEL:

Officer Saulter and Lt. Poole attended homicide investigation class.

Officer Devries, Officer Wilkinson, and Officer Aycock, all certified from Georgia have started work.

Jeffrey Kirkham has accepted the Position as Deputy Director of Public Safety and will begin work on April 14

Background on Alexis Tracy has been completed and an offer of employment is pending.

Madison Abolafia has been hired as Admin Assistant and will begin work on 04/02/2025

Bethel Fire Department March Report

March Calls

Total calls: 94

Fire Calls: 15

EMS Calls: 79

Most fire calls were lockouts both car and house and false alarms made up most fire calls.

Notable Fire Call

On 3-23-25 at 10:02 p.m. firefighters were dispatched to a steam house on fire. Medic 5 was enroute to a high acuity EMS call at the same time, so they toned out for staff and volunteers to go to the fire. Crews extinguished the fire. Total firefighters on scene volunteer and staff 12. Total apparatuses 3. This is a good sign that our recruiting efforts for volunteers are paying off

Notable EMS Calls

On 3-5-25 at 4:54 p.m. medics responded to a person having an allergic reaction. Medics responded and found a person in anaphylaxis shock and had to administer an epi-pen to help the patient breathe again. Patient transported to the hospital without incident.

On 3-19-25 at 9:12 a.m. medics responded to the report of a person that was found right above bethel in Church Slough and was extremely hypothermic and the troopers were bringing her to EMS. Patient feet were frozen solid and was barely alive. Patient transported to the hospital without incident.

Sobering Center calls: 1 total

Dispatch: (907) 543-3781 FAX: (907) 543-5086



**CITY OF BETHEL
OFFICE OF
JAMES C. HARRIS
CHIEF OF PUBLIC SAFETY
harrisjc@cityofbethel.net**



Most other calls were alcohol related.

Staffing

Career Staffing. 12 out of 12 positions. Added two career staff. That made the Fire Department fully staffed for the first time in almost 10 years.

Volunteering staffing. volunteers 38

The EMT class has started with 13 students and that added 11 more volunteers to the department.

PORT OF BETHEL

Post Office Box 1388
Bethel, Alaska 99559
Voice: 907-543-2310
Fax: 907-543-2311



To: Lori Strickler, City Manager
From: Edward Flores, Port Director
Subject: March 2025 Managers Report

- **Small Boat Harbor**

March was another slow month for the Small Boat Harbor. However, I expect the Boat Harbor to start ramping up in the next couple of months. Napaimute will be storing equipment for the remainder of the winter season in the southside parking lot for the harbor. Our project in the harbor to lower the approaches has taken off! After the first test approach was done, the port crew set up and dug around the pilings, as well as removed armor rock from beneath the approaches on the north side. Starting with the D float approach and the help of the Streets & Roads crew. The approaches for D & C were cut in the first week of March. As well as welded back down to the pilings. To close off the month of March, Approaches A & B were slated to get cut and welded back down. Once those are complete, we will have all of our approaches at, if not close to, level. One of the biggest complaints that we were getting was the level of the approaches, especially at low tide. This fix, paired with the new floats, should alleviate the problem we were seeing with the steepness of the ramps.

- **City Dock/Beach 1/Petro Port**

The Dock is starting to come back to life with representatives from the different marine companies. We were able to get the Dock Warehouse set up with a dozen high bay LED lights. This should provide adequate lighting for our tenants. Pre-construction meetings for the repair of the City Dock have been happening. H Construction won the bid to repair the west wing wall as well as the impact point on the face of the dock. I expect H Construction to be on ground the last day of this month to start the project. We are shooting to have the repair done well before the first barge of the year is due in to Bethel.

- **Port Office**

The port office is running well. We have no issues with connectivity or heat. Building Maintenance continues to do their morning checks on the building with no problems..

- **Admin**

Our monthly storage is prepared and will leave the Port office this first week of April. The Port Commission did not meet in March. Our next scheduled meeting will be at 7 p.m. on April 21, 2025. At City Council Chambers. We currently have an opening for an Administrative Assistant; we would like to fill that position before summer.

- **Misc.**

We are close to being done with an RFP for the purchase and installation of new floats for the small boat harbor. We are contemplating holding off on deploying the old floats so that way port crews do not have to deploy them and then take them out a month or so later to make way for the new ones. I think this would affect our revenue on moorage, but I don't think it would be anything substantial.

Community Parks & Recreation Report – March 2025

By: Dept. Director, Shane Iverson

Project Tasks

Completed & delivered Telehealth **Computer Center Project Package** including grant budget for furthering grant application to T-Mobile.

Gym Expansion

Assisted in further development of the Gym Expansion Project as we wrapped up **35% and 65% design plans**, and will conclude **95% plan** first week of April.

- Site visits & research
- Community discussion
- Regular design meetings

YKFC Transition

- Obtained, analyzed, and shared facility **payroll information**
- Continued on-site training
 - Front desk operations
 - Essential applications
 - Routine pool maintenance.
- Added to **Transition Plan documents** for review:
 - Transition Comprehensive Plan, Summary Plan, Transition Timeline
- Begin self-training for **Pool Operators Certificate**
 - CDC – Model Aquatic Health Code
 - OSHA _ Chemical Handling
 -

New Projects

- Reviewed and familiarized myself with the following projects:
 - Solar project
 - Energy Efficiency projects (YKFC energy audit & waste heat delivery)

END REPORT



CITY OF BETHEL

Post Office Box 1388

Bethel, Alaska 99559

Phone: 907- 543- 2047

TO: City Manager
FROM: Human Resources
SUBJECT: Monthly Manager Report

DATE: A 1, 2025

The following identifies significant projects that were in addition to general personnel action-based activities during the week (hiring, terminations, benefits review, employee support, etc):

Position Update

Department	Budgeted FY25	Apps Received Mar 25	Vacancies As of 3/31/25	<u>Change Since Last Report</u>		
				Pending	Hired	Separated
Administration	4		0			
City Clerk	2		1		1	
Finance	9	4	1		3	1
Planning	2		0			
Attorney	1		0			
Public Safety						
<i>Admin</i>	4	4	1	1		1
<i>Fire</i>	10	1	0		2	
<i>Police Officers</i>	18	3	2		4	2
<i>Non-Sworn Patrol</i>	5	1	0			1
<i>Dispatch</i>	6	5	0			2
Public Works						
<i>Admin</i>	2		0			
<i>Streets/Roads</i>	6		0		1	
<i>Prop Maintenance</i>	5		0			
<i>Refuse/Landfill</i>	3		0			
<i>Hauled Services</i>	19	5 (incl temps)	13*		1	
<i>Util Maint/Water</i>	9	6	1		1	1
<i>Vehicles & Equip</i>	7	1	1	1	1	
Transit	2.5		0			1
Port and Harbor	3		1			
Parks and Rec	1		0			
Total	118.5	30	37.5	* Supported with 8 temps		

Recruitment and Hiring

No update. Hauled Services continue to be the most challenging vacancy. HR will be working with the City Manager and various Departments to refine and advertise for internship positions.

NeoGOV Activity

Employees will begin completing their annual policy reviews on NeoGov during April. This includes the City Vehicle policy and prompts HR to complete motor vehicle record reviews for those using City vehicles.

Workplace Safety, Injuries and OSHA Notifications

Two injuries were reported during the month of March. Non were OSHA-reportable.

Ongoing and Future Projects

- Updating classification and compensation data.
- Job Description review and updates.
- Presentation and acknowledgment of City Drug and Alcohol Policies.
- Updating the Employee Handbook, last adopted by City Council in 2015.



City of Bethel

April 1, 2025

FROM: Planning Director

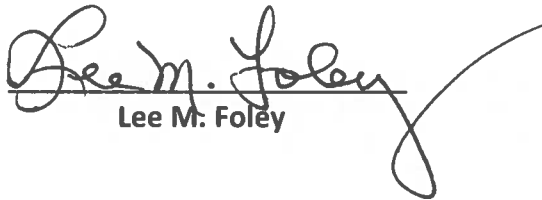
TO: Lori Strickler, City Manager

SUBJ: Planning Director's March 2025 Report

March 2025 Events

- **Planning Commission:** The Chair and Vice Chair were excused absences. The monthly update on public nuisances was provided.
- **YK Fitness Center Gym Expansion:** The parking issues with respect to the gym to be built have been resolved. Both Planning and Public Works have indicated their acceptance and DOWL will now finalize the Commercial Site Plan Permit
- **Residential Site Plan Permits Submitted and Approved: 1**
- **Commercial Site Plan Permits Submitted and Approved: 1**
- **Conditional Use Permits Submitted and Approved by The Planning Commission: None**
- **Variances Requested and Disposition: None**
- **Zoning Amendments Submitted and Approved: None**
- **Plats Submitted for Review and Disposition: 1.** Final mylar for KYUK's Tall Tower Project was approved and signed. Planning will be notified when it is recorded so a report can be made to the Planning Commission that their condition for CUP approval has been satisfied.
- **Summary Statement:** There are no major Planning projects under review.
- **Abandoned and/or Junk Vehicles:**
 1. On March 7, 2025, a certified letter was sent to the owner of the property located at 834A Ptarmigan stating that the sheer number of junk vehicles on his property presented a public nuisance. Subsequently, the owner visited the Planning Department, discussed the issue, and stated he would initiate steps to start the process of removing the junk vehicles within the thirty (30) day window that the letter provided.
 2. On March 27, 2025, Planning sent a certified letter to the Chairman/President of Sea Lion Native Corporation, with respect to the plethora of junk and derelict vehicles on their property at the Bethel Trailer Park, U.S. Survey 4117, Lot 37, located at the end of ***Our Own Road***. Sea Lion was given thirty (30) calendar days to initiate immediate steps to remove the junk vehicles from the property. A copy of the letter to Sea Lion was also provided to the Bethel Trailer Park manager by certified mail
- **Vacancies:** Fully staffed.

- **Other Events:** None
- **Large Projects:**
 1. **Ptarmigan Street Encroachments** – No updates.
 2. **City of Bethel Professional Housing Project** – Internal progress photos
 3. **AC Store Construction** – Entrance to the store is now through the vestibule. It appears this project is now completed and will no longer be reported monthly unless there is a change.


Lee M. Foley









City of Bethel, Alaska

City Clerk's Office

Meetings

April 8, 2025 Regular City Council Meeting
April 22, 2025 Regular City Council Meeting
April 29, 2025 Nuisance Abatement Hearings
April 30, 2025 Nuisance Abatement Hearings

City Clerk's Office

- The City Manager sent a report to Council Identifying seven properties for Nuisance Abatement. The City Council will hold hearings on April 29th, 30th, 2025 to determine the report's accuracy and if the Council declares a property a fire hazard, health hazard, or public nuisance, it may order the owner or their agent to correct the issue, remove the structure, or demolish it. If the order is not followed, the City may take corrective action—including demolition and removal, the cost of which constitutes a lien on the property, chargeable to the proceeds of its sale. The abatement process is found in BMC 15.04. The Clerk's Office created the record for each Nuisance Abatement Hearing and will serve the record and notice of the Hearings to the property owners. Although the City Council will hold the Hearings, they will be serving in a Quasi-judicial capacity.

- Sent out the yearly financial disclosure statements. Our code requires the City Council, Planning Commission and City Manager to file a Financial Disclosure Statement Annually. The deadline to fill out the form is April 15th, 2025.

Task	Period Total	Year to Date Total
Passport Appointments	6	47
Burial Permits/Reservations	2	4
Notary Services	2	22
Meeting Minutes Drafted	1	9
Resolutions Drafted	-	-
Ordinances Drafted	-	2
AM/IM/Proclamation Drafted	1	7

Committee/Commission Vacancies	Regular	Alternate
Community Parks and Recreation Committee	full	full
Planning Commission	full	1
Port Commission	1	2
Public Safety and Transportation Commission	1	2
Community Action Grant Technical Review Board	2	2
Public Works Committee	4	2
Finance Committee	3	2
Ethics Board	4	1