E. NEW BUSINESS

4. **Conditional Use Permit; PC Resolution 2024-02**
   Applicant: Tyonek Tribal Council
   Request: Replace a failing culvert & add gravel to level the road within the 50-foot Habitat Protection district of Tyonek Creek
   Location: Timber Road / PIN 211-153-08
   Tyonek Area

Multi-Agency Permit Application

RIVER CENTER

514 Funny River Road, Soldotna, AK 99669 ● (907) 714-2460 ● KenaiRivCenter@kpb.us

Applicant Information: (must be a landowner)

Name: Laurie Stuart
Mailing: 101 W. Benson Blvd. Suite 501
Anchorage, AK 99503
Phone: 907-278-1021
Email: lstuart@ttcd.org

Agent Information: (if applicable)

Name: Irene Turletes
Mailing: 582 E. 36th Ave, Suite 500
Anchorage, AK 99503
Phone: 907-644-2099
Email: irene.turletes@hdrinc.com

Project Location:

KPB Parcel ID: 21115308
Physical Address: 61.04495°N, 151179923°W
Subdivision: N/A
Lot: N/A Block: N/A Addition/No.: N/A

Waterbody Information:

Waterbody: Tyonek Creek
Riverbank: *(looking downstream)* ☒ Left ☒ Right
River Mile: N/A

State of Alaska Permit Fees:

☐ $100 - ADNR State Parks Permit

KPB Permit Fees: (select one)

☐ $50 - KPB Habitat/Floodplain Permit
☒ $300 - KPB Conditional Use/Floodway Permit

Project Information: ☒ New **OR** ☐ Extension/Amendment to **RC#** _____

Please select all activities that apply to your project:

- ☐ Bank Stabilization
- ☐ Boat Launch
- ☐ Bridge
- ☐ Coir Logs
- ☒ Culvert
- ☐ ELP Structures
- ☐ Equipment Stream Crossing
- ☒ Excavation, Dredging, and/or Fill
- ☐ Fence Installation
- ☐ Fish & Wildlife Management
- ☐ Floating Dock
- ☐ Fuel Storage Green Infrastructure
- ☐ In-Stream Structures (Weir)
- ☐ Oil & Gas
- ☐ On-Site Utilities
- ☒ Prior-Existing Structure
- ☒ Revegetation
- ☒ Root Wads
- ☐ Road Construction
- ☐ Structure (Accessory)
- ☐ Structure (Residential)
- ☐ Spruce Tree Revetment
- ☐ Stream Crossing
- ☐ Utility Line/Easement
- ☒ Veg Mat
- ☒ Vegetation Removal
- ☒ Water Withdrawal
- ☐ Other: See Attachment A Project Description to Support Kenai

Project Description: *Provide a detailed description of your project; attach additional pages if necessary.*

See Attachment A

Cost-Share: Is this project funded by the Cost-Share Program? ☐ Yes ☐ No

KPB Tax Credit Program: The Borough provides a tax credit as partial reimbursement for new habitat protection and restoration projects within 150 feet of anadromous streams. If you would like to pre-qualify for this credit, please provide your estimated project cost(s) below. Do not include grants or other funding assistance:

Elevated Light Penetrating Structures	$ _____
Habitat Restoration & Protection	$ _____
Green Infrastructure	$ _____
Other Activities	$ _____

Project Questions:

1. Start date: May 15, 2024 End date: August 15, 2024 Estimated Days of Construction: 90
2. Is any portion of the work already complete? If yes, please describe: ☐ Yes ☐ No
   No

Ordinary High Water (OHW) and Mean High Water (MHW):

3. Is the project located within 50 feet of OHW or MHW a waterbody? ☐ Yes ☐ No
4. Does any portion of the project extend below the OHW or MHW of the waterbody? ☐ Yes ☐ No
5. Does any portion of the project cantilever or extend over the MHW of the waterbody? ☐ Yes ☐ No
6. Will anything be placed below OHW or MHW of the waterbody? ☐ Yes ☐ No

Regulatory Floodplains:

7. Is the property where the project is taking place near or within a regulatory floodplain? ☐ Yes ☐ No
   a. Is this project within or adjacent to a regulatory floodway? ☐ Yes ☐ No
   b. Is this project within or adjacent to a coastal high hazard zone? ☐ Yes ☐ No
   c. For new buildings and/or additions, list all project costs (labor, materials, etc.): $ _____

Excavation, Dredging, and Fill:

8. Will material be excavated or dredged from the site? ☐ Yes ☐ No
   a. Type of material(s): See Attachment A Project Description to Support Kenai Peninsula Borough Multi-Agency Permit Application
   b. Area to be dredged below OHW or MHW:
      Length: _____ (ft) Width: _____ (ft) Depth: _____ (ft) Total Cubic Yards: _____
   c. Area to be excavated above OHW or MHW:
      Length: _____ (ft) Width: _____ (ft) Depth: _____ (ft) Total Cubic Yards: _____
   d. Location materials will be deposited: _____
9. Will any material (including soils, debris, and/or overburden) be used as fill? ☐ Yes ☐ No
   a. Type of material(s): See Attachment A Project Description to Support Kenai Peninsula Borough Multi-Agency Permit Application
   b. Is this fill permanent or temporary? ☐Perm ☐Temp
   c. Area to be filled above OHW or MHW:
      Length: _____ (ft), Width: _____ (ft), Depth: _____ (ft), Total Cubic Yards: _____
   d. Area to be filled below OHW or MHW:
      Length: _____ (ft), Width: _____ (ft), Depth: _____ (ft), Total Cubic Yards: _____

Motorized Equipment:

10. Will you be using motorized equipment for this project? If yes, please list all equipment: ☐ Yes ☐ No
    See Attachment A Project Description to Support Kenai Peninsula Borough Multi-Agency Permit Application
    a. Will you be crossing a stream or waterbody? ☐ Yes ☐ No
    b. How long will equipment be used below OHW or MHW? _____

Signature & Certification:

This application is hereby made requesting permit(s) to authorize the work described in this application form. I certify the information in this application is complete and accurate to the best of my knowledge and that my site plans or drawings are attached. If applying for a tax credit, I certify that I have not begun construction of the project and that the project will be constructed to the standards in KPB 5.12 Real Property and Personal Property Taxes, KPB 5.14 Habitat Protection Tax Credit, and other applicable federal, state, and local regulations.

_____ 12/15/2023
Applicant Signature (required) **Date**

_____ _____
Agent Signature (if applicable) **Date**

Attachment A: Project Description to Support Tyonek Creek Fish Passage Project Kenai Peninsula Borough Multi-Agency Permit Application

November 2023

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1.1 Project Overview 2
1.2 Purpose and Need 2
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1.3 Excavation and Fill Quantities 4
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1 Introduction

The Tyonek Tribal Conservation District (TTCD) in partnership with the United States Fish and Wildlife Service has requested assistance with the Tyonek Creek Fish Passage Project (Project). The Project includes the design and installation of a replacement roadway culvert at Tyonek Creek (247-20-10040) in Tyonek (Tyonek A-4 S011N011W14). The culvert spans Timber Road and is intended to improve fish passage and flood conveyance. The culvert passage project is located on Tyonek Native Corporation land. This Project description has been written to support the Kenai Peninsula Borough Multi-Agency permit application for the Project.

1.1 Project Overview

The existing Tyonek Creek Culvert is composed of a 72- by 60-inch corrugated, closed-bottom pipe arch buried beneath 20 feet of earth. Debris in combination with buoyant forces have damaged the culvert inlet. This damage has caused the inlet to cut away and shorten. As a result of being undersized and damaged, the culvert constricts flow from Tyonek Creek. This constriction is made worse by large debris that regularly get stuck at the inlet and create obstructions to fish passage. These observations were confirmed by site visits from the Alaska Department of Fish and Game in 2012 and 2016 and by HDR Engineering, Inc. and the Boutet Company in 2020.

Approximately 130 feet to the southeast of the Tyonek Creek culvert lies an overflow channel with one 60- and one 24-inch diameter culverts. During high flood events the overflow culverts provide relief to the Tyonek Creek culvert by diverting flows directly into Cook Inlet. However, these culverts are undersized and damaged from debris carried by overflow from Tyonek Creek, causing water to back up in the overflow channel.

Historical aerial imagery suggests the Tyonek River channel surrounding the culvert beneath Timber Road has been moved significantly since the 1970s due to the creation of a gravel pad immediately north of the culvert. The Project would reestablish the historical creek channel by rerouting the current creek, installing a new culvert beneath Timber Road to increase fish passage, and reconstruct the creek's banks. This design will meet the needs for fish passage design guidelines and is sized for flows above the 100-year event. The installation will accommodate normal sediment transport.

1.2 Purpose and Need

The historic changes and damage to Tyonek Creek has resulted in the creation of barriers to fish passage and flood hazards at flows under the five-year flood event. Flood events affecting Timber Road could cause significant delays in travel, services, and goods for Tyonek residents as the road experiences daily traffic and services the periodic barge shipments on the manmade landing south of the crossing. Additionally, flooding creates a risk of damage or destruction to utility lines in the vicinity of Tyonek Creek.

1 Proposed Design

The proposed design includes a 120-foot long 45'-10" x 22'-11" single radius multiplate arch pipe. The existing 72- by 60-inch culvert will remain during construction as a diversion culvert then filled-in-placed and decommissioned.

1.1 New Tyonek Creek Culvert Construction

The new culvert will span Timber Road approximately 50 feet south of the existing culvert location (Figure 1). The new Tyonek Creek culvert will happen exclusively in uplands and in the dry prior to flooding the new channel. The 45'-10" x 22'-11" single radius multiplate arch (Figure 2) will be placed on top of concrete footings that span the length of the culvert. The footings will be cast in place and buried at a minimum of 7 feet below the creek thalweg inside the culvert. Native material will be used to line the creek bed and will be covered by infill material. The infill will reach a minimum depth of 36 inches within the culvert. Infill material will be comprised of 50 percent coarse material (3 - 24 inches) and 50 percent fine material (<3 inches) by weight. Course material is made up of 50 percent Class III riprap and 50 percent Class II riprap. In total, the Project will use 300 cubic yards of riprap. Footer protection rock will fill the void inside of the culvert between the layer of native material and infill material and the footers. Fine material will fill the voids between footer protection rock. Additional segments of footer protection will extend 20 feet away from the north and south side of the inlet and outlet. These four segments will have a rip rap collar.

The creek bed constructed within the culvert will have an ordinary high water (OHW) wetted width of 35 feet and a thalweg depth of 3.5 feet. The low flow channel wetted width will be 10 feet with a 6 in thalweg. The low flow channel will be flush with the culvert at the inlet and outlet but meander within the culvert. Rip rap will be used for channel lining to resist erosion if grading of the creek crossings locally increases channel slope. Fill removed for the placement of the culvert and construction of the creek bed will be side cast immediately adjacent to the creek bank within the disturbance zone.

1.2 New Tyonek Creek Channel and Bank Construction

With the exception of construction associated with breaking the earthen dam separating the existing and new stream channel and the subsequent procedures to distribute substate fines, all creek bed and bank construction will happen prior to flooding the new channel. Culvert bedding will be used as backfill up to 30 feet away from the culvert inlet and 40 feet of the outlet and will be composed of the same material composition as that which is used within the culvert. Beneath the infill material there will be native material. Beyond these boundaries native material will be used as creek bed fill. The thalweg at the inlet will be at an elevation of 15.26 feet while the thalweg at the outlet is at an elevation of 14.64 feet with a grade through the culvert of -0.42 percent. The wetted width upstream and downstream of the culvert will vary. The upstream thalweg at OHW will be 2.5 feet. The low flow channel both upstream and downstream will be 10 feet with a thalweg depth of 6 inches. The downstream thalweg at OHW will have a depth of 5 feet. The proposed creek channel will diverge from the existing channel approximately 400 feet upstream of the existing structure and rejoin the existing creek channel 125 feet downstream of the proposed culvert.

Creek substrate will be placed in one or more layers with a layer depth less than 1.5 times the maximum dimension of the creek simulation rock, but no greater than four feet. Rocks are to be placed in a way to obtain a uniformly dense, compact, low permeability mass, matching the preexisting creek bed conditions. Bed materials will be compacted and water pressure, tamping rods, and other similar hand operated equipment will be used to force materials into voids.

Creek banks will be constructed to be uneven, protrude into the channel, and be rough in appearance with the top of the bank being relatively uniform. Rootwads will be placed in the creek substrate with boles oriented in the creek bed so that the top of the bole is approximately at the top of the low flow channel. Boles will be placed parallel to one another so that adjacent

root fans overlap a minimum of 3 feet. Header logs will be placed perpendicular to boles near the rootwad. Rebar will be used to stabilize the header log and bole in place, with each rebar extending 2 feet into the creek bed. The top of the rebar is to be bent over so that it doesn't slide down through the header log and bole. Creek substrate will be placed around logs behind rootwad fans with stone pieces locking header logs and boles into riprap mat. The empty space between logs behind the rootwad fans will be filled with salvaged creek bed material. Riprap will be used along the roadway embankment away from the active creek bed and be backfilled with unclassified material excavated from the new creek bed. Exposed riprap outside of the creekbank will be covered with onsite materials to promote revegetation.

Disturbed soil will be covered first in vegetated mat collected nearby the Project and cover the disturbed area to a thickness of 6 inches (Figure 1). In the absence of excess vegetative mats, native organic soils will be laid out to a thickness of six inches and seeded with a native mix. If additional topsoil is needed it will be imported to meet the desired soil thickness in disturbed areas.

Rewatering of the newly constructed Tyonek Creek will be done in a way that minimizes sediment movement downstream of the site. Prior to re-diverting full creek flows into the reconstructed channel and culvert, the channel will be wetted to wash fines into the creek bed. Sediment and turbid water at downstream end of reconstructed channel will be collected and pumped from the downstream end of channel back to upstream end of channel. This will be done until fines are washed into creek bed and water runs clear by using the minimum amount of water possible as determined by the construction contractor. After the initial sediment pulse is removed, the slowly dam separating the existing creek channel and new creek channel will be breached slowly to avoid a large pulse of water being sent through the newly constructed channel.

1.1 Existing Tyonek Creek Culvert and Channel

Once the earthen dam has been breached and flow diverted from the existing creek channel to the new creek channel construction will commence at the existing culvert and creek bed. Unused timber for rootwad banks will be piled within the old creek channel perpendicular to flow behind the armored rootwad bank or other location specified by construction personnel and be pinned in place with rebar. Fill accumulated from new creek channel excavation will also be used to backfill the channel and direct normal flows down the newly constructed channel. The culvert will be filled with a sand slurry and decommissioned.

1.2 Existing Cook Inlet Culverts

The existing 60-inch and 24-inch culverts directing overflow into the Cook Inlet will be removed and disposed of offsite. Material removed during the Project will be sidecast immediately adjacent to the culvert into uplands within the disturbance zone.

1.3 Excavation and Fill Quantities

Table 1 has been provided to fulfill the requirements of section 8 and 9 of the Kenai Peninsula Borough Multi-Agency Permit

Table 1 Excavation and Fill Quantities

Construction Type	Location	Construction Element	Length (ft)	Width (ft)	Depth (ft)	Total Cubic Yards

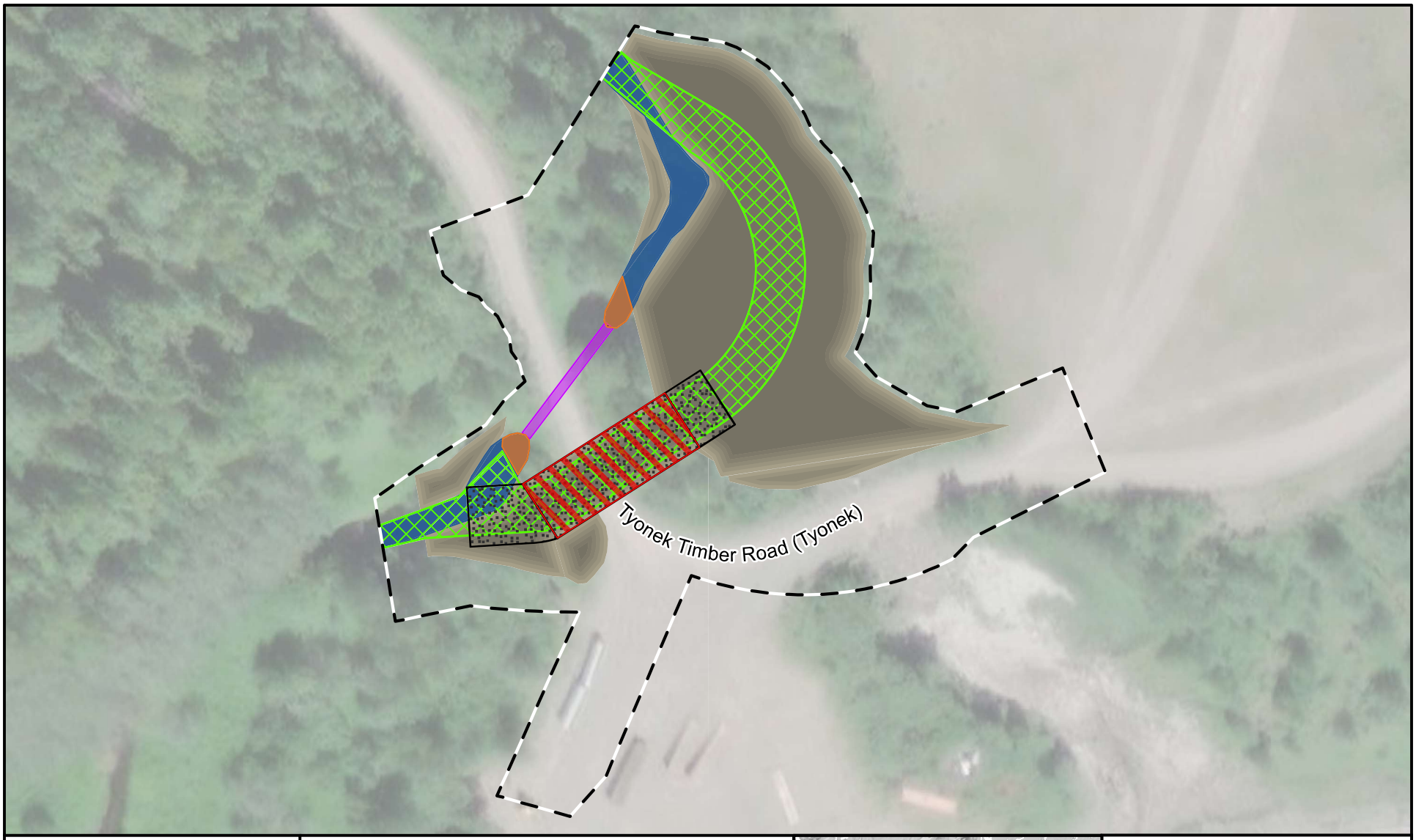
Dredging	Below OHW	N/A	0	0	0	0
Dredging Total	***Below OHW***	***-***	***0***	***0***	***0***	***0***
Excavation	Above OHW	New Creek Channel Excavation	650	Varies	Varies	20,650
Excavation Total	***Above OHW***	***-***	***-***	***-***	***-***	***20,650***
Fill	Above OHW	New Culvert Bedding	190	Varies	3	1,130
Fill	Above OHW	New Creek Bank	Varies	Varies	0.5	183
Fill Total	***Above OHW***	***-***	***-***	***-***	***-***	***1,313***
Fill	Below OHW	Existing Culvert Fill	6	5	5	4
Fill	Below OHW	Existing Creek Channel Fill	43	Varies	5	146
Fill Total	***Below OHW***	***-***	***-***	***-***	***-***	***150***

2 Proposed Conservation Measures

TTCD proposes to implement the following measures to avoid and/or mitigate potential impacts from the Project:

- Conduct existing creek bed construction in the dry and out of fish habitat
- Excavate the new creek bed in the dry and out of fish habitat
- Work below OHW in fish habitat will occur between May 15th and July 15th to minimize overlap with salmon run timing
- Equipment used for Project construction will be the minimum size necessary to perform the work in order to reduce impacts on creek banks and wetlands
- Excavated materials will be strategically placed to avoid creekbank disturbances
- Native material will be used when possible to reduce nonnative fill
- Rootwad construction will be done in a way that minimizes disturbance to stable embankment beyond necessary excavation limits required to place salvaged creek bed material and creek substrate material.
- Pumping procedures will be carried out in a way that reduces risks to fish health. Additionally, the pump will use a mesh size equal to or smaller than 3/32 inch or a profile bar and wedge wire with openings not greater than 1/16 inch. Approach velocities will not exceed a passive velocity of 0.2 feet feet/second or an active velocity of 0.4 feet/second
- Tree clearing will not occur between May 1st and July 15th to avoid impacts to nesting migratory birds

Figure Set

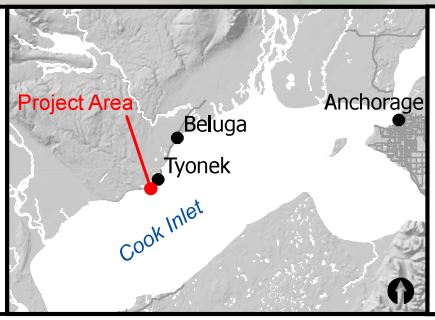


Tyonek Creek (Timber Road)
Fish Passage Project

0 100 Feet

HORIZONTAL DATUM: NAD83 AK State Plane Zone 4

- Existing Culvert
- Current Tyonek Creek Fill Area
- Proposed Culvert
- Culvert Bedding
- New Tyonek Creek Channel
- Current Tyonek Creek Channel
- New Creek Bank
- Disturbance Limits

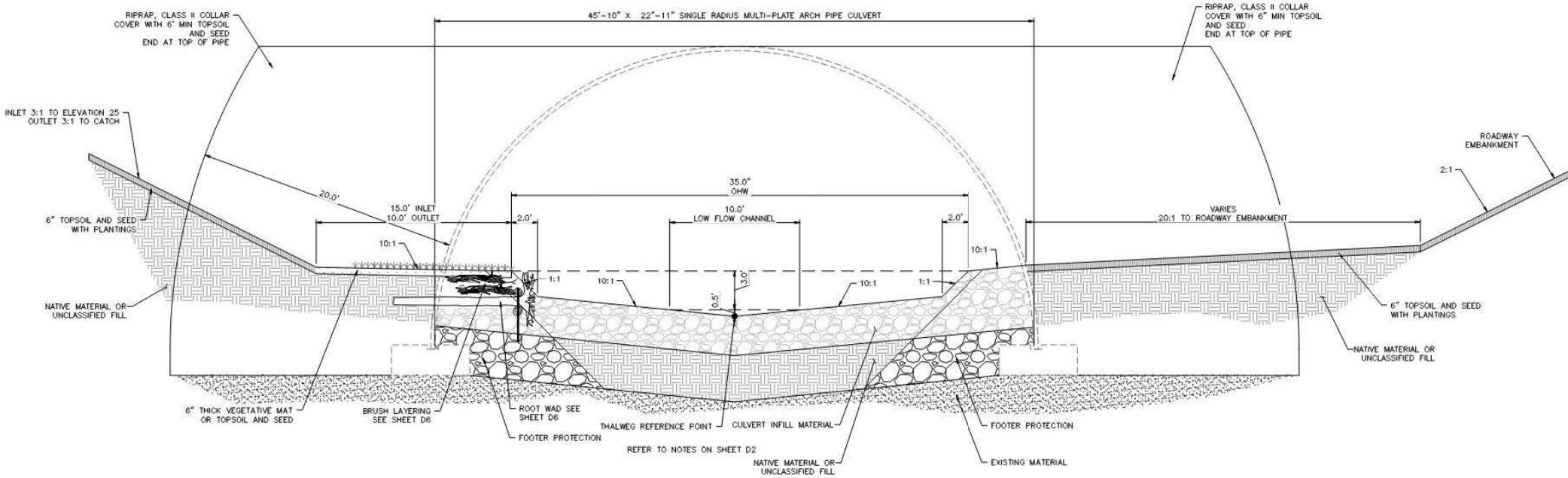


APPLICANT: Tyonek Tribal Conservation District
PERMIT: Kenai Peninsula Borough Multi-Agency
WATERWAY: Tyonek Creek

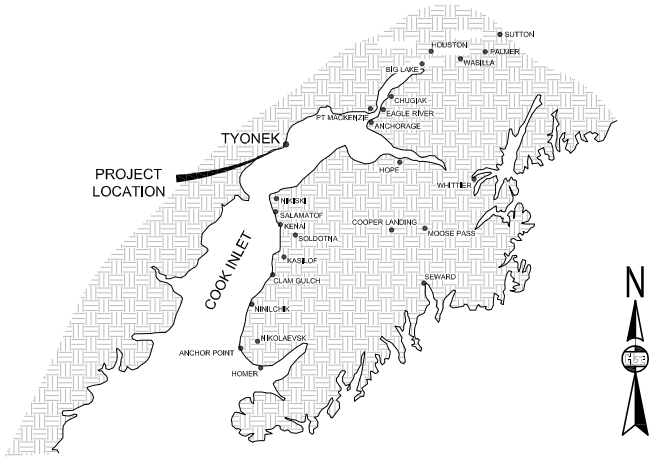
LOCATION: 151.179°W 61.045°N

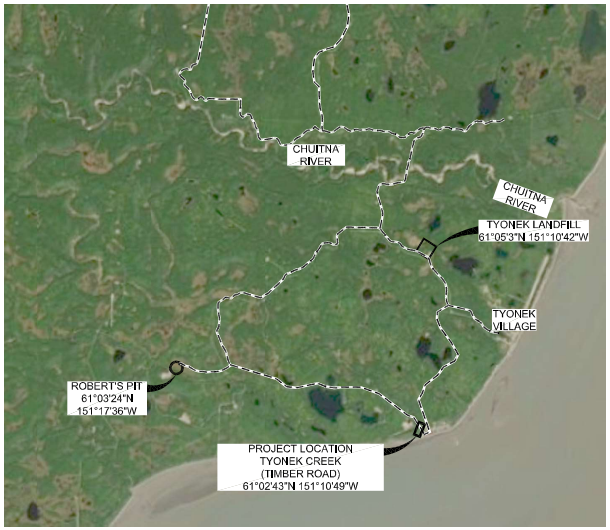
FIGURE 1

DATE: October 13, 2023



1/D3 RECONSTRUCTED STREAM CHANNEL AT CULVERT INLET AND OUTLET
NTS





VICINITY MAP
(NTS)

Tyonek

TRIBAL CONSERVATION DISTRICT

Tyonek Native Corporation

U.S. FISH & WILDLIFE SERVICE

ALASKA DEPARTMENT OF FISH AND GAME

NRCS
Natural Resources Conservation Service

TYONEK CREEK (TIMBER ROAD)
FISH PASSAGE IMPROVEMENTS

ADF&G SITE # 20601540
NOVEMBER 2023

PREPARED BY

THE BOUTET COMPANY, INC.
601 E. 57TH PLACE #102
ANCHORAGE, AK. 99518
PH. 907-522-6776
LICENSE NO. AECC957

SHANNON & WILSON

HDR

ENGINEER'S CERTIFICATION:

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, JUDGEMENT, AND BELIEF THESE PLANS MEET APPLICABLE NRCS STANDARDS.

11/28/23

TIMOTHY J. ALLEY, P.E.
DESIGN ENGINEER
THE BOUTET COMPANY, INC.

DATE

DRAWING LOCATION: W:\Wasilla\Files\Tyonek Tribal Conservation District\2022\TYONEK CREEK\TBC CAD\TYONEK_CREEK_TITLE NEWER.dwg
PLOT DATE: 11/28/23
SCALE: N/A

FILE	W:\WASILLA\FILES\TYONEK TRIBAL CONSERVATION DISTRICT\2022\TYONEK CREEK\TBC CAD\TYONEK CREEK FP 81423.DWG	DATE/TIME	11/28/2023	LAYOUT		DESIGNED	CBW	CHECKED		DRAFTED	TJA	CBW

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA		2023	A2	A4

SHEET INDEX

SHEET NO.	CONTENTS
A1	TITLE SHEET
A2	NOTES, INDEX, LEGEND & ABBREVIATIONS
A3	PROJECT AREA AND STAGING/STORAGE AREAS
A4	SURVEY CONTROL
B1	TYPICAL SECTION
C1	ESTIMATE OF QUANTITIES
D1-D6	DETAILS AND STREAM CROSS SECTIONS
F1-F6	PLAN AND PROFILE
Q1-Q3	EROSION, SEDIMENT & POLLUTION CONTROL PLAN
P1	PROJECT PHOTOS
1-8	CONTECH BRIDGECOR SINGLE RADIUS ARCH SHOP DRAWINGS

CIVIL NOTES:

1. CIVIL CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE ALASKA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 2020 EDITION, AS CURRENTLY AMENDED BY THE STANDARD MODIFICATIONS AND THESE CONSTRUCTION DRAWINGS.
2. DRAWING SCALES ON SHEETS WITHIN THESE PLANS MAY VARY AND SHOULD BE NOTED PRIOR TO USE. THESE PLANS WERE CREATED FOR 11X17 PLAN SET AND AT A SPECIFIC DRAWING SCALE. ANY REPRODUCTION OR PUBLISHING OF THESE PLANS MAY RESULT IN DISTORTION OF SCALE AND SHALL BE VERIFIED PRIOR TO USE.
3. SURVEY INFORMATION WAS PROVIDED BY THE BOUTET COMPANY. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF ALL SITE FEATURES. IF CONDITIONS OTHER THAN THOSE SHOWN ON THE PLANS ARE ENCOUNTERED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.
4. CONTRACTOR SHALL MAINTAIN "REDLINE" RECORD DRAWINGS ON A CLEAN SET OF CONSTRUCTION DRAWINGS. THE "REDLINES" SHALL BE KEPT CURRENT ON A DAILY BASIS AND SHALL BE AVAILABLE TO THE ENGINEER FOR INSPECTION ON THE JOBSITE.
5. CONTRACTOR SHALL RECORD SURVEY NOTES FOR SUBMITTAL WITH AS-BUILT PLANS, INCLUDING HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES ENCOUNTERED IN THE FIELD. CONTRACTOR SHALL RECORD ALL DEVIATIONS FROM THE PLANS.
6. OWNER OBTAINED PERMITS OR STATUS THERE OF ARE SUPPLIED IN THE CONTRACT DOCUMENTS. CONTRACTOR SHALL ENSURE ALL PERMITS NECESSARY TO COMPLETE THE WORK ARE OBTAINED PRIOR TO EARTH WORK DISTURBING ACTIVITIES. CONTRACTOR SHALL ENSURE COMPLIANCE WITH ALL PERMITS UNTIL THE PROJECT HAS ACHIEVED FINAL ACCEPTANCE. CONTRACTOR SHALL OBTAIN AN ADF&G AQUATIC RESOURCE PERMIT FOR TRANSPORTING STRANDED FISH WITHIN THE PROJECT LIMITS.
7. THESE NOTES CONTAIN INFORMATION NECESSARY FOR THE PROPER EXECUTION OF THE WORK CONTAINED ON THESE IMPROVEMENT PLANS. THESE NOTES APPLY TO ALL PLAN SHEETS. ADDITIONAL CONSTRUCTION NOTES MAY ALSO BE SHOWN ON INDIVIDUAL PLAN SHEETS. THE CONTRACTOR IS RESPONSIBLE TO READ AND COMPLY WITH ALL NOTES SHOWN ON THIS SET OF PLANS. THE TERM "CONTRACTOR", AS USED IN THESE NOTES AND ELSEWHERE IN THIS PLAN SET, MEANS THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS AND INDIVIDUALS AUTHORIZED TO PERFORM WORK SHOWN ON THESE IMPROVEMENT PLANS. THE CONTRACTOR IS RESPONSIBLE TO COMPLY WITH ALL NOTES APPLICABLE TO HIS/HER WORK. ALL CONTRACTORS ARE DIRECTED TO CONTACT THIS ENGINEER FOR ANY QUESTIONS REGARDING THE STATED OR IMPLIED MEANING OF ANY NOTE OR OTHER INFORMATION CONTAINED ON THESE IMPROVEMENT PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT HIS/HER CONTRACT FOR SERVICES INCLUDES THE RESPONSIBILITIES DEFINED BY THE APPLICABLE NOTES.
8. ALL QUANTITIES SHOWN HEREIN ARE APPROXIMATE AND DO NOT ACCOUNT FOR SWELL PRIOR TO COMPACTION OR WASTE. CONTRACTOR SHALL VERIFY ALL QUANTITIES.

EXISTING UTILITIES:

9. PLANS MAY NOT SHOW ALL EXISTING UTILITIES WITHIN THE PROJECT AREA.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING ALL UTILITIES AND PERFORMING ANY NECESSARY VERIFICATION PRIOR TO CONSTRUCTION. UTILITY LOCATING SHALL BE COMPLETED A MINIMUM OF 10 DAYS TO NO MORE THAN 20 DAYS PRIOR TO COMMENCEMENT OF WORK.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES WITHIN THE LIMITS OF CONSTRUCTION, WHETHER OR NOT SAID UTILITIES ARE SHOWN ON THE PLANS. THIS RESPONSIBILITY INCLUDES CONTACTING UTILITY COMPANIES FOR LOCATIONS OR POTHOLING PRIOR TO CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR.
12. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES TO REMAIN AND COORDINATE WITH UTILITY OWNERS FOR REQUIREMENTS FOR SHORING OR SUPPORTING UNDERMINED UTILITIES DURING CONSTRUCTION. SHORING/SUPPORTING OF UTILITIES SHALL BE CONSIDERED SUBSIDIARY TO THE CONTRACT AND WILL NOT BE MEASURED FOR PAYMENT.

EXCAVATION AND CULVERT INSTALLATION:

13. CONTRACTOR SHALL EXERCISE EXTREME CAUTION AND OBSERVE ALL APPLICABLE OSHA REQUIREMENTS FOR WORKING IN CONFINED AREAS AND OPEN EXCAVATIONS.
14. ORGANIC, OVER SATURATED OR NON-COMPACTABLE MATERIAL SHALL BE REMOVED FROM THE SUBGRADE TO A DEPTH TO BE DETERMINED BY THE ENGINEER. NO ORGANIC MATERIAL OR OTHER DELETERIOUS MATERIAL SHALL BE UTILIZED FOR BACKFILL.
15. CONTRACTOR SHALL VERIFY INVERTS OF EXISTING CHANNEL AND ALL PROPOSED STRUCTURES PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES FROM THE PLANS IMMEDIATELY TO THE ENGINEER.
16. FILL MATERIAL SHALL BE PLACED EVENLY AND SIMULTANEOUSLY IN LIFTS ON BOTH SIDES OF STRUCTURES, NOT TO EXCEED 8-INCHES IN DEPTH AND SHALL BE COMPACTED TO 95% MDD.
17. INFILL MATERIAL SHALL BE INSTALLED IN THE PIPE ACCORDING TO THE PLANS.
18. ALL VEGETATION IN THE AREAS NOT AFFECTED BY THE WORK SHALL BE PRESERVED AND PROTECTED BY THE CONTRACTOR. RESEED ALL DISTURBED AREAS IN CONFORMANCE WITH REVEGETATION PLANS ON SHEETS Q1, Q2, Q3, AND THE SWPPP.
19. FINISH GRADE (FG) REPRESENTS THE ELEVATION OF THE FINISHED SURFACE. THIS INCLUDES LANDSCAPE AREAS, ROCK RIP-RAP SURFACE AND ELEVATION AT EXTERIOR OF STRUCTURE FOUNDATION, UNLESS OTHERWISE DENOTED ON DETAIL OR SPECIAL LABEL. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST SUBGRADE OR TOPSOIL TO ALLOW FOR FINISHED SURFACE MATERIAL DIMENSIONS.
20. DEWATERING OF THE EXCAVATION MAY BE REQUIRED TO COMPLETE THE WORK. DISCHARGE OF DEWATERING PUMPS SHALL BE A MINIMUM OF 100' FROM STREAMS AND SHALL BE PROTECTED WITH BMP'S AS REQUIRED TO MINIMIZE SEDIMENT DISCHARGE INTO RECEIVING WATERS.

LEGEND

- EXISTING GRAVEL ROAD SURFACE
- NEW GRAVEL ROAD SURFACE
- INFILL MATERIAL
- EXISTING STREAM
- EXISTING WETLANDS
- SALVAGED VEGETATIVE MAT
- TOPSOIL AND SEED
- VEGATATIVE COLLAR
- ROOT WAD BANK RECONSTRUCTION
- PROPOSED BOTTOM OF STREAM BANK
- PROPOSED TOP OF STREAM BANK (OHW)
- PROPOSED EDGE OF LOW FLOW CHANNEL
- STREAM/ROADWAY CENTERLINE
- EXISTING GRADE
- FINISH GRADE PROFILE
- CUT LIMIT
- FILL LIMIT
- EXISTING MINOR CONTOUR
- 195 EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 195 PROPOSED MAJOR CONTOUR
- PERIMETER CONTROL BMP
- SLOPE INDICATOR
- EXISTING SIGN
- OHE OVERHEAD ELECTRIC

ABBREVIATIONS

ADF&G	ALASKA DEPARTMENT OF FISH AND GAME
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE SEGMENT
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONST	CONSTRUCT
CSP	CORRUGATED STEEL PIPE
DET	DETAIL
DI	DUCTILE IRON
EOP	END OF PROJECT
E	EASTING
ELEV	ELEVATION
EA	EASEMENT LINE
EST	ESTIMATED
ESCP	EROSION & SEDIMENT CONTROL PLAN
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE SEGMENT
EW	EACH WAY
EX	EXISTING
FG	FINISHED GRADE
FL	FLOW LINE
GB	GRADE BREAK
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HORZ	HORIZONTAL
HTC	HEAT TRACE CHANNEL
IE	INVERT ELEVATION
INT	INTERSECTION
IAW	IN ACCORDANCE WITH
KPB	KENAI PENINSULA BOROUGH
L	LENGTH
LF	LINEAR FEET
LOC	LOCATION
LP	LOW POINT
LT	LEFT
LVC	LENGTH OF VERTICAL CURV
MAX	MAXIMUM
MDD	MAXIMUM DRY DENSITY
ME	MATCH EXISTING
MFG	MANUFACTURED
MIN	MINIMUM
MON	MONUMENT
MSL	MEAN SEA LEVEL
N	NORTHING
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OHW	ORDINARY HIGH WATER
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
PAD	PAD ELEVATION
PCC	PORTLAND CEMENT CONCRETE
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
RR	REMOVE AND REPLACE
ROW	RIGHT-OF-WAY
RP	RADIUS POINT
RT	RIGHT
REF	REFERENCE
RET	RETURN
S	SLOPE
SQ FT	SQUARE FOOT
STA	STATION
STD	STANDARD
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
TAN	TANGENT
TEL	TELEPHONE
TBM	TEMPORARY BENCH MARK
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TYP	TYPICAL

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SEAL

TYONEK CREEK (TIMBER ROAD)
FISH PASSAGE IMPROVEMENTS

NOTES, INDEX, LEGEND & ABBREVIATIONS

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA		2023	A3	A4

DESIGNED	DRAFTED	CHECKED	LAYOUT	DATE/TIME	FILE
CBW	CBW	TJA		11/28/2023	W:\WASILLA\FILES\TYONEK TRIBAL CONSERVATION DISTRICT\2022\TYONEK CREEK\TBC CAD\TYONEK CREEK FP 81423.DWG

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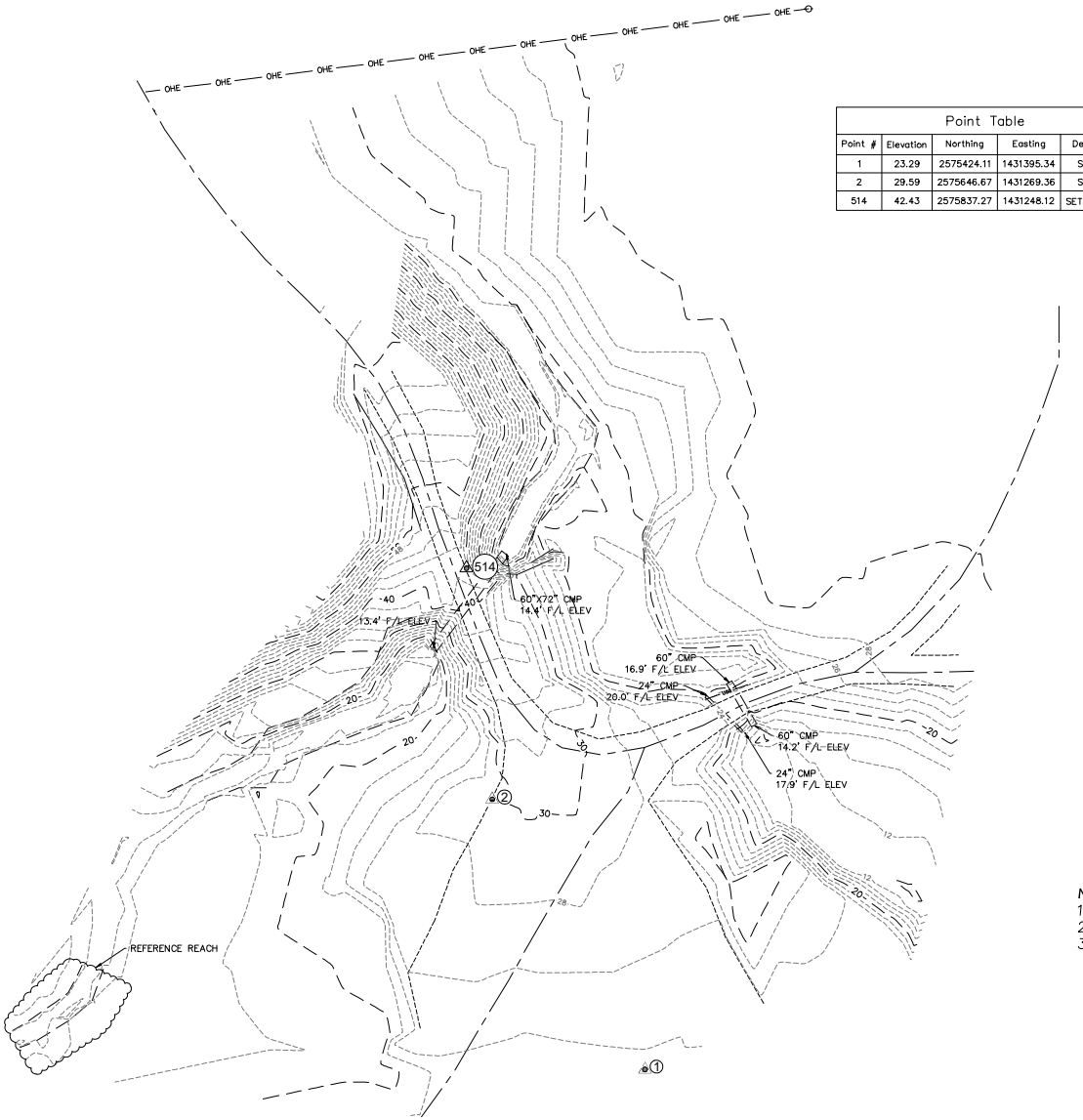
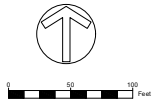
PROJECT AREA AND STAGING/STORAGE AREAS

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA		2020	A4	A4



Point Table				
Point #	Elevation	Northing	Easting	Description
1	23.29	2575424.11	1431395.34	SET YPC
2	29.59	2575646.67	1431269.36	SET YPC
514	42.43	2575837.27	1431248.12	SET 6" NAIL



Notes:
1. *Basis of Vertical Datum is NAVD 88.*
2. *Elevations are expressed in feet.*
3. *Coordinates are expressed in Alaska State Plane, Zone 4, in U.S. Survey Feet.*

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Anthony Hoffman
LS-9020
Registered Professional Land Surveyor

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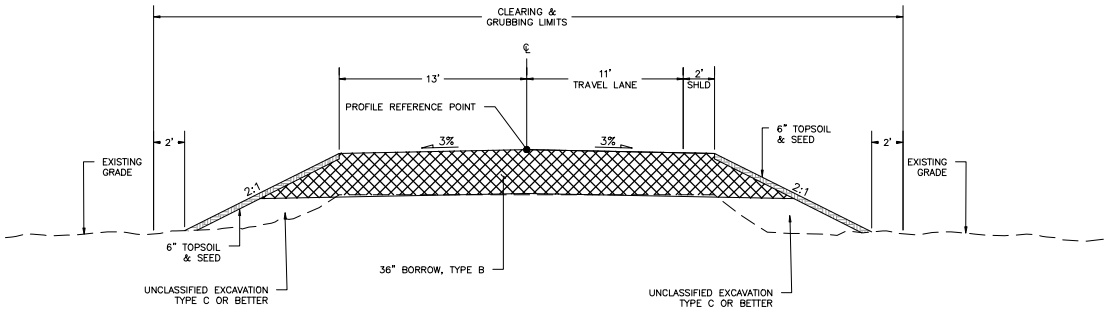
TYONEK CREEK AT TYONEK TIMBER ROAD

FISH PASSAGE IMPROVEMENTS

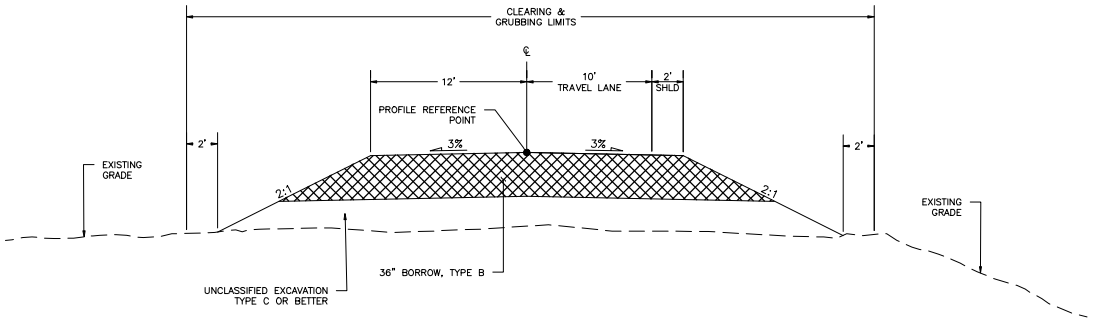
SURVEY CONTROL DIAGRAM

FILE | S:\PROJECTS\TYONEK TRIBAL CONSERVATION DIST - 2020 PROGRAM\SURVEYS\TYONEK CREEK\TYONEK_CREEK_SCD 8-30-23.DWG | DATE/TIME | 11/05/2020 | LAYOUT | | DESIGNED | CBW | CHECKED | TJA | DRAFTED | CBW

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA		2023	B1	B1



TIMBER ROAD RECONSTRUCTION TYPICAL SECTION (NTS)



BARGE LANDING RECONSTRUCTION TYPICAL SECTION (NTS)

TYPICAL SECTION NOTES:

1. CONTRACTOR SHALL CLEAR AND GRUB TO FILL/CUT CATCH LIMITS PLUS 2 FEET PER SIDE. SALVAGE GRUBBING MATERIAL FOR REUSE ON THE PROJECT. CLEARING LIMITS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PERFORMING WORK.
2. SEE CULVERT INSTALLATION DETAIL SHEET D1 FOR MATERIAL TO BE PLACED WITHIN CULVERT EXCAVATION LIMITS.
3. OUTSIDE OF CULVERT EXCAVATION LIMITS, PLACE BORROW, TYPE B ON EXISTING ROAD BED AS NECESSARY TO CONSTRUCT NEW ROAD PROFILE.
4. REUSE EXISTING VEGETATIVE MAT (GRUBBING) AS MUCH AS PRACTICABLE. PLACE 6-INCH TOPSOIL AND SEED AS NECESSARY AFTER REUSE OF GRUBBING MATERIAL.
5. BACKFILL SHALL BE COMPACTED TO 95% MDD.

*SEE SHEETS F4-F6 FOR TIMBER ROAD AND BARGE LANDING RECONSTRUCTION LAYOUT.

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ROADWAY TYPICAL SECTION

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NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA		2023	C1	C1

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM DESCRIPTION	PAY UNIT	QUANTITY	NOTE
201	CLEARING	ACRE	1.7	NIC (WORK BY OTHERS)
	GRUBBING	ACRE	1.7	
202	REMOVAL OF CULVERT PIPE	LINEAR FOOT	82	
	DECOMMISSION EXISTING CULVERT PIPE	LINEAR FOOT	99	
203	UNCLASSIFIED EXCAVATION	CUBIC YARD	20,650	
	BORROW, TYPE B	CUBIC YARD	6,000	
305	STOCKPILE MATERIAL, TYPE B	CUBIC YARD	6,000	NIC (WORK BY OTHERS)
602	45'-10" X 22'-11" SINGLE RADIUS MULTI-PLATE ARCH PIPE (OWNER SUPPLIED)	LINEAR FOOT	120	
	45'-10" X 22'-11" SINGLE RADIUS MULTI-PLATE ARCH PIPE FOUNDATION	CUBIC YARD	123	
611	INFILL MATERIAL	CUBIC YARD	1,130	
	FOOTER PROTECTION MATERIAL	CUBIC YARD	650	
	VEGETATIVE COLLAR MATERIAL	CUBIC YARD	750	
615	FURNISH AND INSTALL SIGNPOST, BASE AND OWNER PROVIDED SIGN	EACH	1	
618	SEEDING	POUND	282	NIC (WORK BY OTHERS)
620	TOPSOIL	SQUARE YARD	7,832	
621	PLANTING TREES AND SHRUBS	EACH	765	NIC (WORK BY OTHERS)
623	VEGETATIVE MAT SALVAGE AND REPLANTING	SQUARE YARD	740	
640	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D	
641	EROSION AND POLLUTION CONTROL ADMINISTRATION	LUMP SUM	ALL REQ'D	
	TEMPORARY EROSION AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D	
642	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D	
643	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D	
671	ROOTWAD BANK RECONSTRUCTION	LINEAR FOOT	400	
	ROOTWAD HARVEST	EACH	150	NIC (WORK BY OTHERS)
	HEADER LOG HARVEST	EACH	150	NIC (WORK BY OTHERS)
672	STREAM DIVERSION & DEWATERING	LUMP SUM	ALL REQ'D	

ESTIMATE OF QUANTITIES NOTES:

1. THE ESTIMATE OF QUANTITIES IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY TO DEMONSTRATE THE RELATIVE SCOPE AND MAGNITUDE OF THE PROJECT. BIDDERS SHALL CALCULATE QUANTITIES IN PREPARATION OF BIDS. DISCREPANCY BETWEEN THIS ESTIMATE AND FINAL QUANTITIES DURING CONSTRUCTION SHALL NOT BE A BASIS FOR A CLAIM.
2. WORK BY OTHERS: MULTIPLE WORK ITEMS WILL BE COMPLETED BY OTHERS PRIOR TO, DURING AND AFTER THE PROJECT. THE CONTRACTOR SHALL BE FAMILIAR WITH THE WORK DONE BY OTHERS AND COORDINATE AS REQUIRED. IF THE WORK OF THE CONTRACTOR IS DELAYED BECAUSE OF ANY ACTS OR OMISSIONS OF OTHERS, THE CONTRACTOR SHALL BE ENTITLED TO ADDITIONAL COMPENSATION AND/OR EXTENSION OF TIME FROM THE OWNER.

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ESTIMATE OF QUANTITIES

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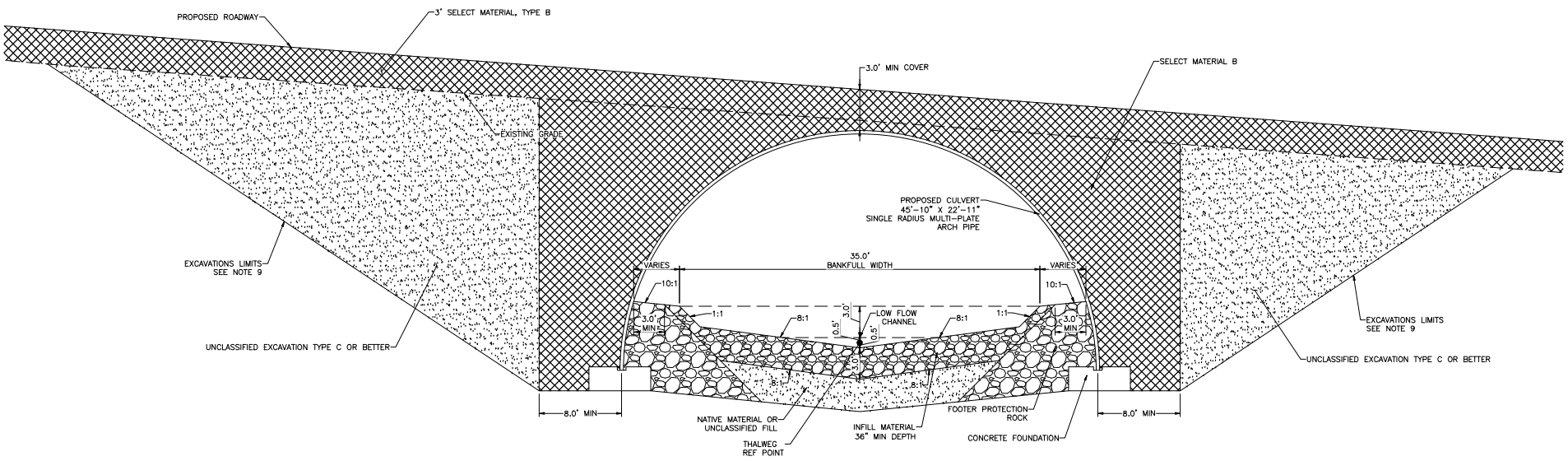
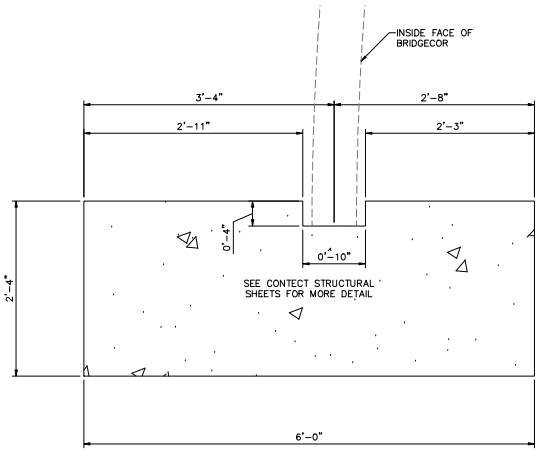
			ALASKA		2023	D1	D6



1 / D1 CULVERT INSTALLATION
NTS LOOKING UP STREAM



1 / D2 FOOTING CROSS SECTION
NTS

TYONEK CREEK CULVERT INFILL MATERIAL

COARSE MATERIAL 50% BY WEIGHT		FINE MATERIAL 50% BY WEIGHT	
SIZE	% PASSING	SIZE	% PASSING
24"	100	3"	100
20"	98	2"	82
16"	90	1.5"	71
12"	83	1"	58
10"	72	0.75"	50
8"	40	0.5"	41
5"	16	#4	25
3"	8	#10	16
–	–	#40	7
–	–	#100	4
–	–	#200	3

CULVERT INSTALLATION NOTES:

1. CULVERT INFILL MATERIAL SHALL INCLUDE ONE PART OF COARSE AND ONE PART FINE MATERIAL MEETING THE GRADATIONS SHOWN HEREIN. COARSE MATERIAL IS MADE UP OF APPROXIMATELY 1 PART RIPRAP CLASS II AND 4 PARTS RIPRAP CLASS I.
2. FOOTER PROTECTION ROCK SHALL INCLUDE 1 PART CLASS III RIP RAP AND 1 PART CLASS II RIPRAP. FILL ALL VOIDS WITH FINE MATERIAL.
3. SALVAGE AND REUSE EXISTING STREAM BED MATERIAL WITHIN THE CUT LIMITS FOR USE AS FINE COMPONENT OF STREAM SUBSTRATE AT THE DIRECTION OF THE ENGINEER. IMPORTED MATERIAL SHALL BE USED IF SUFFICIENT QUANTITY OF EXISTING STREAM BED MATERIAL IS NOT AVAILABLE.
4. STREAM SUBSTRATE MATERIAL SHALL BE INSTALLED IN STRUCTURES ACCORDING TO THE PLANS. MANUAL SHAPING OF THE STREAM CHANNEL IS REQUIRED.
5. ENGINEER TO APPROVE MATERIALS AND METHOD FOR STREAM SUBSTRATE MATERIALS BEFORE MIXING AND PLACING MATERIAL IN CULVERT OR RECONSTRUCTED STREAM CHANNEL. NOTIFY THE ENGINEER AT LEAST 48 HOURS IN ADVANCE OF PLACING CULVERT INFILL MATERIAL.
6. CONSTRUCT STREAMBED AND BANKS LEAVING A ROUGH, NON-UNIFORM SURFACE.
7. CULVERT JOINTS SHALL BE SOIL TIGHT.
8. SPRAY HIGH PRESSURE WATER ON ALL CULVERT INFILL MATERIAL AND FOOTER PROTECTION ROCK TO THOROUGHLY WASH FINES INTO THE STREAMBED PRIOR TO DIVERTING STREAM INTO NEWLY CONSTRUCTED CHANNEL. FINES SHOULD BE WASHED IN UNTIL WATER POOLS ON SURFACE. ADDITIONAL FINES MAY BE REQUIRED DURING THIS PROCESS.
9. TRENCH WALL SLOPES SHALL CONFORM TO OSHA SAFETY STANDARDS.
10. MATERIAL WITHIN A FOOT OF THE EXTERIOR PIPE SURFACE SHALL BE THREE INCH MINUS. REFER TO CONTECH'S STRUCTURAL SHEETS.
11. BACKFILL SHALL BE COMPACTED TO 95% MDD.

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CULVERT INSTALLATION DETAILS

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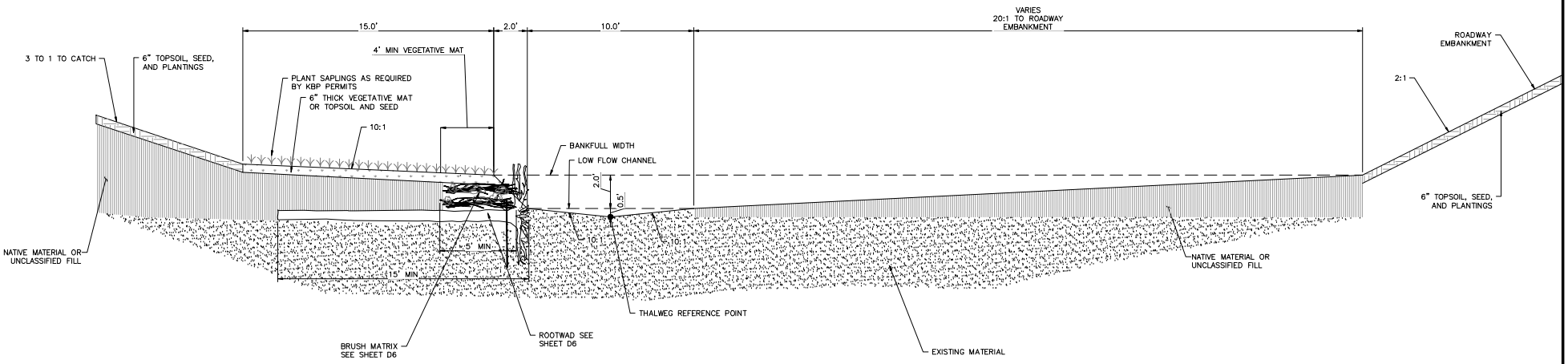
			ALASKA		2023	D2	D6



1/D2 RECONSTRUCTED STREAM CHANNEL UPSTREAM OF CULVERT STA 20+40 TO STA 23+94
NTS LOOKING DOWN STREAM

BANK RECONSTRUCTION NOTE:

1. SEE SHEET D6 FOR BANK RECONSTRUCTION DETAILS
2. STREAM BOTTOM OUTSIDE OF CULVERT TO CONSIST OF NATIVE, INSITU GRAVELS. EXCAVATE TO LIMITS SHOWN.
3. PLANT 2 SAPLINGS 1.5' TO 5.5' TALL FOR EVERY TREE CUT DOWN AS REQUIRED BY KPB PERMITS. SEE SHEET Q2 FOR SAPLING ESTIMATE TABLE FOR APPROXIMATE QUANTITY OF SAPLINGS. REFER TO PAGES 19-20 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR VEGETATIVE MAT SALVAGE AND/OR HARVEST AND REPLANTING.
4. REFER TO PAGES 19-20 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR VEGETATIVE MAT SALVAGE AND/OR HARVEST AND REPLANTING. IF MAT IS NOT PLACED IN FINAL POSITION WITHIN 24 HOURS OF HARVEST STOCKPILE ON PLASTIC SHEETING, ROOTS DOWN AND SURROUND WITH SOIL TO PREVENT ROOTS AROUND THE EDGES FROM DRYING. REGULARLY WATER THE VEGETATIVE MAT UNTIL SITE IS PREPARED FOR PLANTING.
5. REFER TO PAGES 70-75 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR ROOT WADS.
8. SPRAY HIGH PRESSURE WATER ON ALL CULVERT INFILL MATERIAL AND FOOTER PROTECTION ROCK TO THOROUGHLY WASH FINES INTO THE STREAMBED PRIOR TO DIVERTING STREAM INTO NEWLY CONSTRUCTED CHANNEL. FINES SHOULD BE WASHED IN UNTIL WATER POOLS ON SURFACE. ADDITIONAL FINES MAY BE REQUIRED. STREAM SHALL NOT BE RE-DIVERTED INTO CULVERT UNTIL ENGINEER HAS APPROVED BED MATERIALS ARE SUFFICIENTLY SEALED.
9. REFER TO PAGES 34-37 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR LIVE STAKING, PLANTING AND SPACING OF SAPLINGS.
10. REFER TO PAGES 26-27 ADFG'S 2005 STREAMBANK REVEGETATION FOR SELECTION OF SAPLING PLANT SPECIES. ENGINEER SHALL APPROVE SAPLING SPECIES PRIOR TO PLANTING.
11. VEGATATIVE MAT SHOULD BE AT LEAST 6 INCHES THICK. IF LOSS OF TOPSOIL DURING HANDLING AND STOCKPILING REDUCES MAT THICKNESS TO LESS THAN 6 INCHES, PLACE ADDITIONAL TOPSOIL BENEATH MAT TO BRING TOTAL THICKNESS OF VEGATATIVE MAT TO 6 INCHES.
12. THE CONTRACTOR MAY INSTALL THE ROOTWADS IN THE WET GROUND BUT SHALL USE TEMPORARY BALLAST AS NEEDED WHILE INSTALLING TO RESIST BUOYANCY AND ENSURE THE FINAL ELEVATIONS ARE MET.

CROSS SECTION NOTE:

1. THE ROOTWAD CONSTRUCTION DOES NOT START UNTIL STREAM STATION 21+17.

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BANK RECONSTRUCTION AT CULVERT
INLET DETAILS

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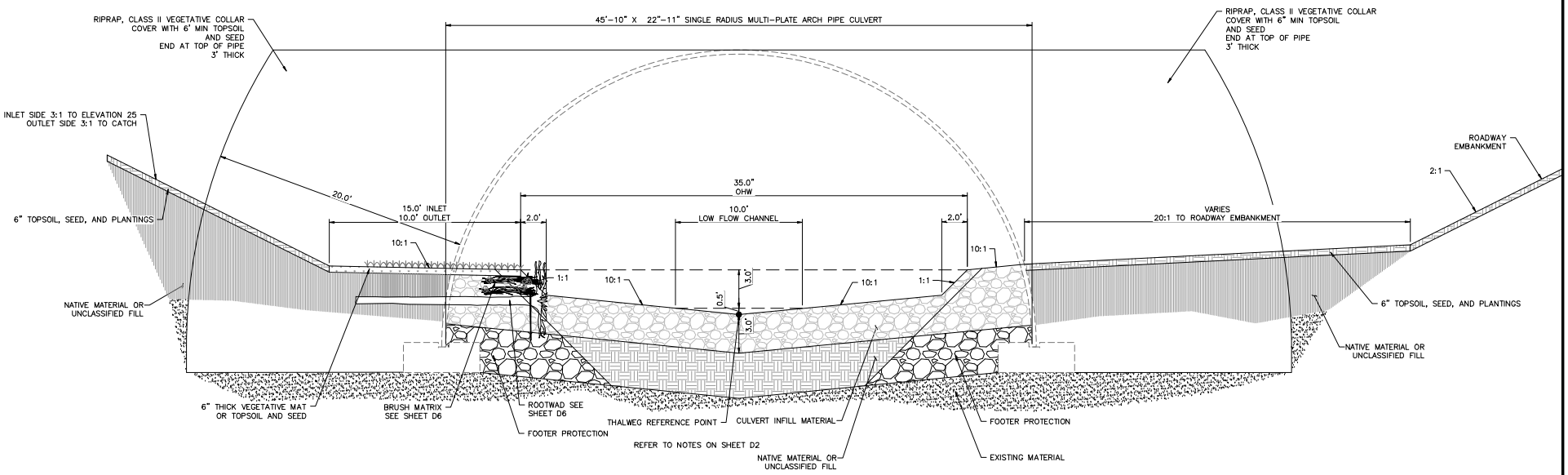

1 / D3 RECONSTRUCTED STREAM CHANNEL AT CULVERT INLET AND OUTLET
NTS LOOKING DOWN STREAM

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BANK RECONSTRUCTION AT CULVERT
INLET DETAILS

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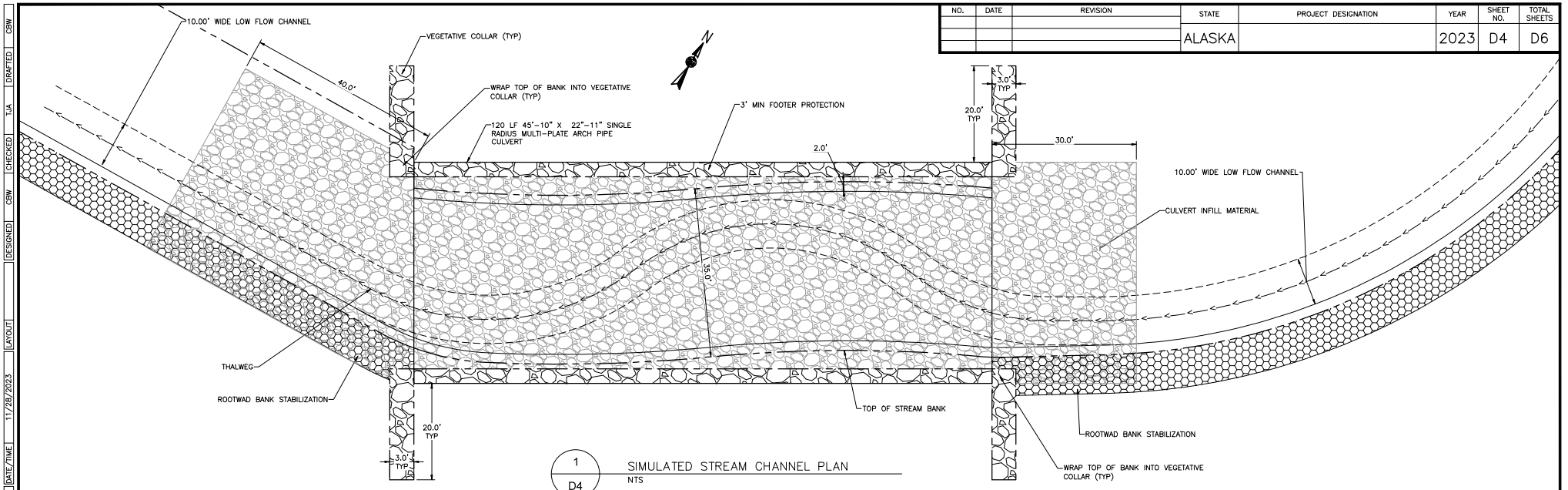
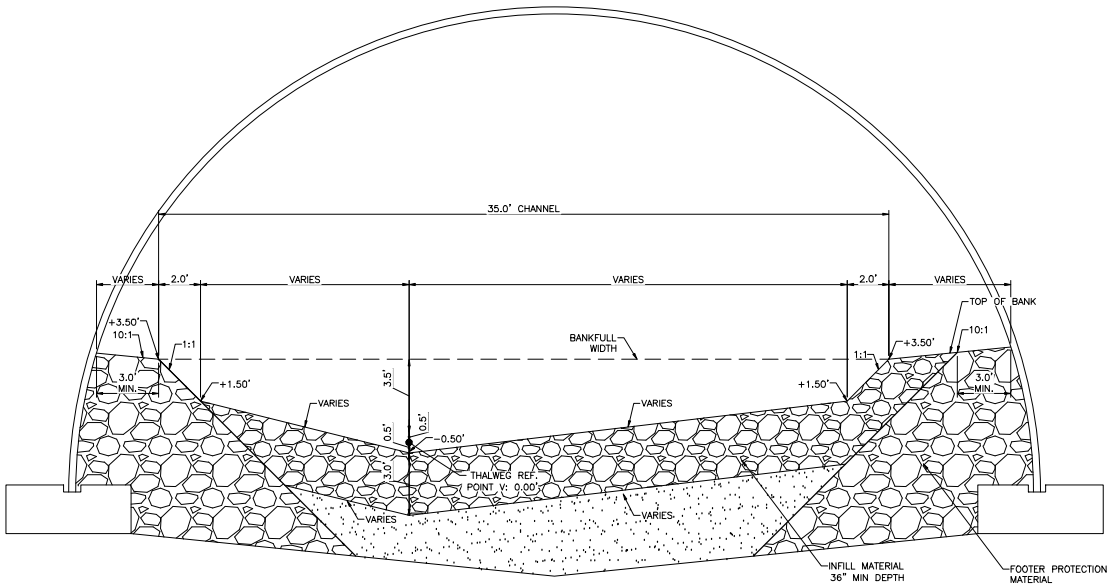
			ALASKA		2023	D4	D6



1/D4 SIMULATED STREAM CHANNEL PLAN
NTS



2/D4 SIMULATED STREAM CHANNEL PROFILE STA 23+94 TO STA 25+23
NTS LOOKING DOWN STREAM

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BANK RECONSTRUCTION AT CULVERT
DETAILS

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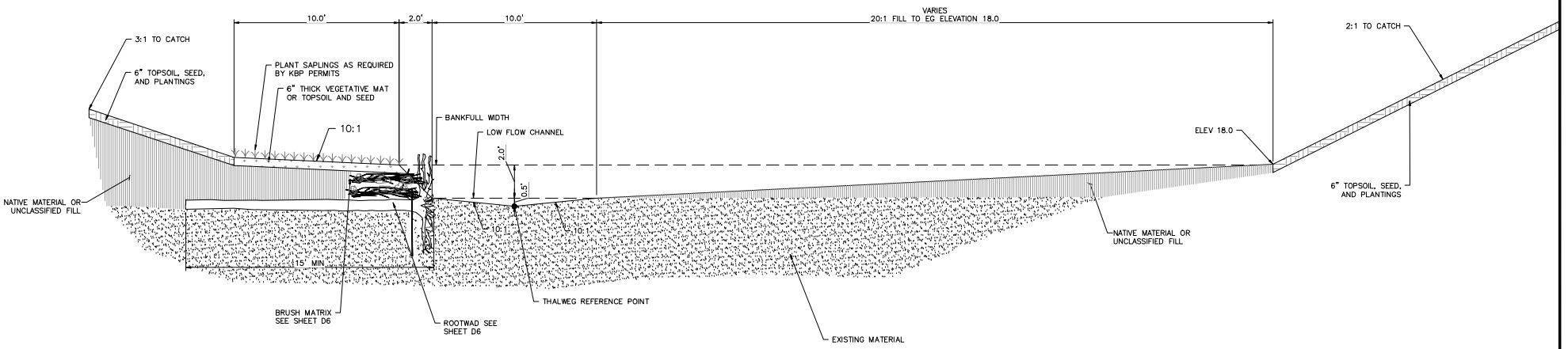

1 / D5 RECONSTRUCTED STREAM CHANNEL DOWNSTREAM OF CULVERT STA 25+23 TO STA 26+10
NTS LOOKING DOWN STREAM

BANK RECONSTRUCTION NOTE:

1. SEE SHEET D6 FOR BANK RECONSTRUCTION DETAILS
2. STREAM BOTTOM OUTSIDE OF CULVERT TO CONSIST OF NATIVE, INSITU GRAVELS. EXCAVATE TO LIMITS SHOWN.
3. PLANT 2 SAPLINGS 1.5' TO 5.5' TALL FOR EVERY TREE CUT DOWN AS REQUIRED BY KPB PERMITS. SEE SHEET Q2 FOR SAPLING ESTIMATE TABLE FOR APPROXIMATE QUANTITY OF SAPLINGS. REFER TO PAGES 19–20 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR VEGETATIVE MAT SALVAGE AND/OR HARVEST AND REPLANTING.
4. REFER TO PAGES 19–20 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR VEGETATIVE MAT SALVAGE AND/OR HARVEST AND REPLANTING. IF MAT IS NOT PLACED IN FINAL POSITION WITHIN 24 HOURS OF HARVEST STOCKPILE ON PLASTIC SHEETING, ROOTS DOWN AND SURROUND WITH SOIL TO PREVENT ROOTS AROUND THE EDGES FROM DRYING. REGULARLY WATER THE VEGETATIVE MAT UNTIL SITE IS PREPARED FOR PLANTING.
5. REFER TO PAGES 70–75 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR ROOTWADS.
6. SPRAY CLEAN WATER ON ALL CULVERT INFILL MATERIAL TO THOROUGHLY WASH FINES INTO THE STREAMBED PRIOR TO DIVERTING STREAM INTO NEWLY CONSTRUCTED CHANNEL.
7. REFER TO PAGES 34–37 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR LIVE STAKING, PLANTING AND SPACING OF SAPLINGS.
8. REFER TO PAGES 26–27 ADFG'S 2005 STREAMBANK REVEGETATION FOR SELECTION OF SAPLING PLANT SPECIES. ENGINEER SHALL APPROVE SAPLING SPECIES PRIOR TO PLANTING.

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STATE OF ALASKA — 49TH — TIMOTHY J. ALLEY — CE 14368 — 11-27-23 — REGISTERED PROFESSIONAL ENGINEER
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TYONEK CREEK (TIMBER ROAD)
FISH PASSAGE IMPROVEMENTS

BANK RECONSTRUCTION AT CULVERT OUTLET DETAILS

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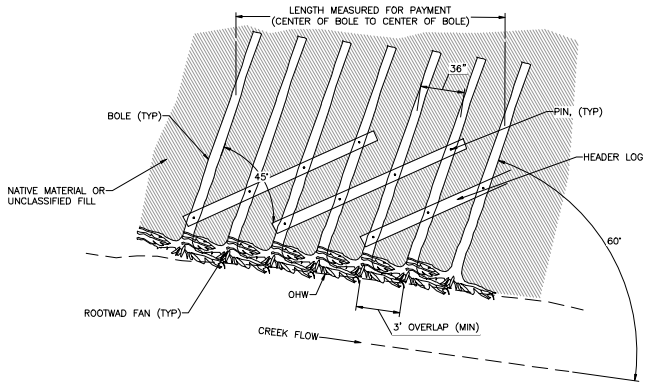
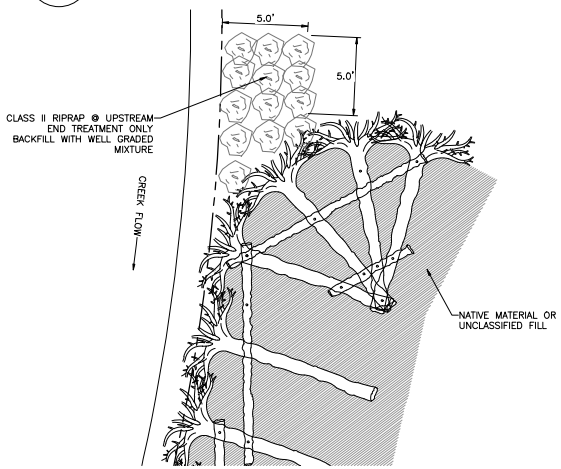
			ALASKA		2023	D6	D6



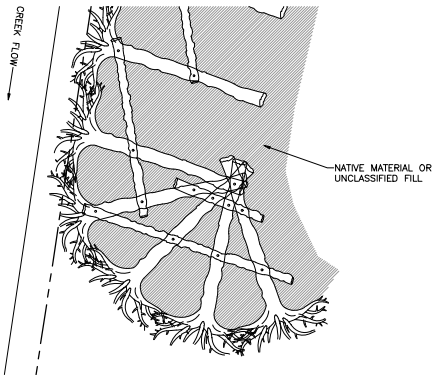
ROOTWAD NOTES:

1. ROOTWAD FAN AND STAGGER AS SHOWN IS APPROXIMATE AND SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER. OVERLAP WILL BE BASED ON ACTUAL FAN DIMENSION. PLACEMENT SHALL FOLLOW THE ALASKA DEPARTMENT OF FISH AND GAME RECOMMENDATIONS IN THE PUBLICATION "STREAMBANK REVEGETATION AND PROTECTION, A GUIDE FOR ALASKA, 2005".
2. ROOTWAD FAN TO BE A MINIMUM OF 6-FEET IN DIAMETER. THE FANS NEED TO BE SHINGLED AND OVERLAPPING AT A MINIMUM 3' ACCORDING TO ADFG DESIGN MANUAL.
3. HEADER LOGS TO BE A MINIMUM OF 10-INCHES IN DIAMETER AND MIN 10' LONG.
4. BOLES TO BE A MINIMUM OF 12-INCHES IN DIAMETER AND 15-FOOT IN LENGTH
5. PIN LOGS TOGETHER WITH #6 REBAR PLACED IN 3/4"ø PILOT HOLE. PINS TO BE DRIVEN FLUSH WITH LOG FACE. EMBED REBAR 2-FOOT MINIMUM INTO NATIVE SOIL.
6. REFER TO PAGES 70-75 OF ADFG'S 2005 STREAMBANK REVEGETATION AND PROTECTION GUIDE FOR ROOT WADS.

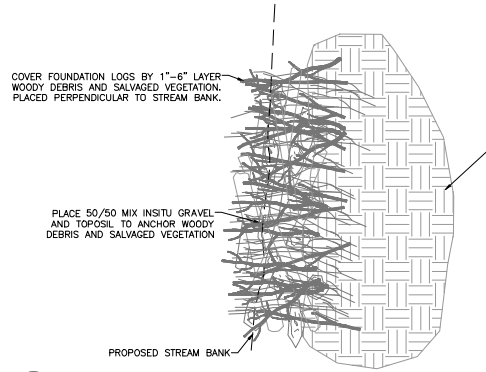
1 / D6 ROOTWAD BANK RECONSTRUCTION
NTS



3 / D6 ROOTWAD BANK UP STREAM TIE BACK
NTS



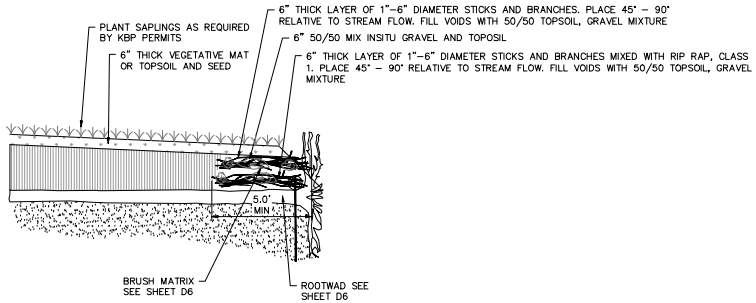
4 / D6 ROOTWAD BANK DOWN STREAM TIE BACK
NTS



2A / D6 BRUSH MATRIX
NTS

BRUSH MATRIX NOTES:

1. LAYER WOODY DEBRIS AND SALVAGED EXISTING MATERIAL IN 4"-6" LAYERS AS NEEDED TO RECONSTRUCT BANK ABOVE BANKFULL WIDTH ELEVATION.
2. BRUSH MATRIX RECONSTRUCTION LENGTHS SHALL BE AS SHOWN OR TO CUT LIMITS WHICHEVER IS GREATER.
3. SLASH MATERIAL SHOULD BE A LENGTH OF 5' - 8'.



2B / D6 BRUSH MATRIX CROSS SECTION
NTS

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TYONEK CREEK (TIMBER ROAD)
FISH PASSAGE IMPROVEMENTS

STABILIZATION DETAILS

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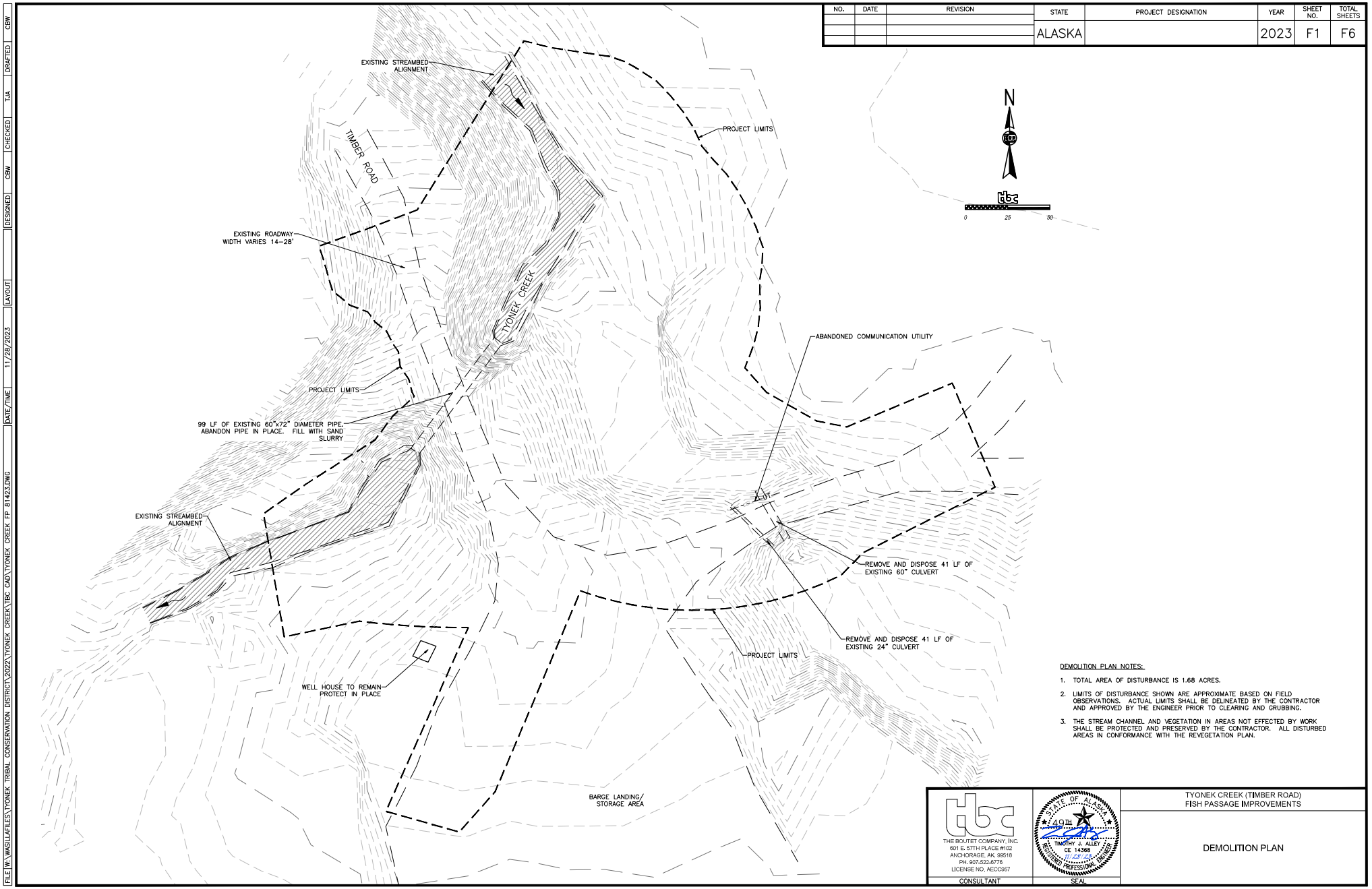

DEMOLITION PLAN NOTES:

1. TOTAL AREA OF DISTURBANCE IS 1.68 ACRES.
2. LIMITS OF DISTURBANCE SHOWN ARE APPROXIMATE BASED ON FIELD OBSERVATIONS. ACTUAL LIMITS SHALL BE DELINEATED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO CLEARING AND GRUBBING.
3. THE STREAM CHANNEL AND VEGETATION IN AREAS NOT EFFECTED BY WORK SHALL BE PROTECTED AND PRESERVED BY THE CONTRACTOR. ALL DISTURBED AREAS IN CONFORMANCE WITH THE REVEGETATION PLAN.

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TYONEK CREEK (TIMBER ROAD)
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DEMOLITION PLAN

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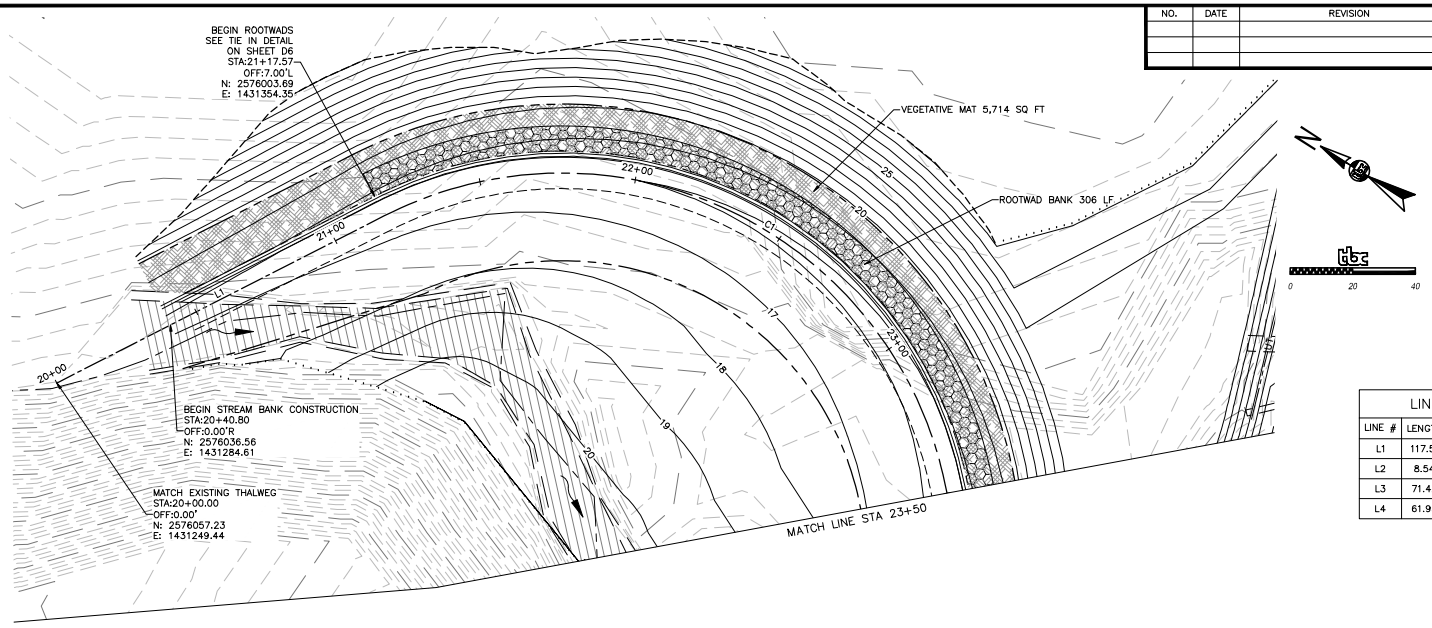
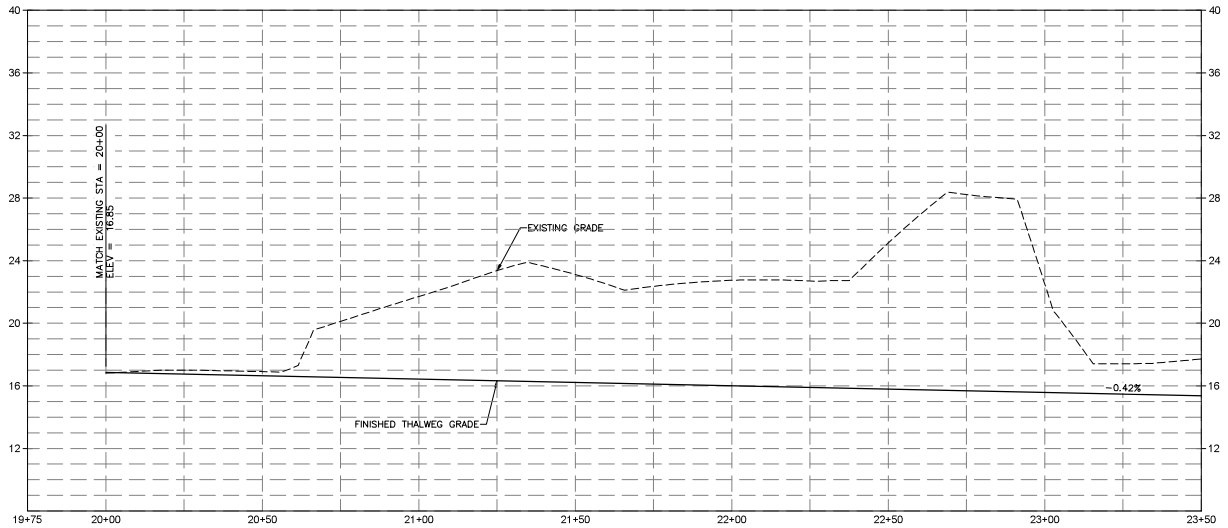


LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	117.51	S59° 33' 21.19"E
L2	8.54	S57° 23' 40.57"W
L3	71.42	S86° 30' 23.81"W
L4	61.93	S74° 49' 08.60"W

CURVE TABLE					
CURVE #	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C1	255.15	125.00	116.95	S1° 04' 50"E	213.10
C2	31.31	47.00	38.17	S76° 28' 48"W	30.74
C3	61.87	47.00	75.43	S57° 51' 08"W	57.50
C4	57.92	50.00	66.37	S53° 19' 22"W	54.73
C5	12.24	60.00	11.69	S80° 39' 46"W	12.22



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CULVERT AND STREAM
PLAN AND PROFILE

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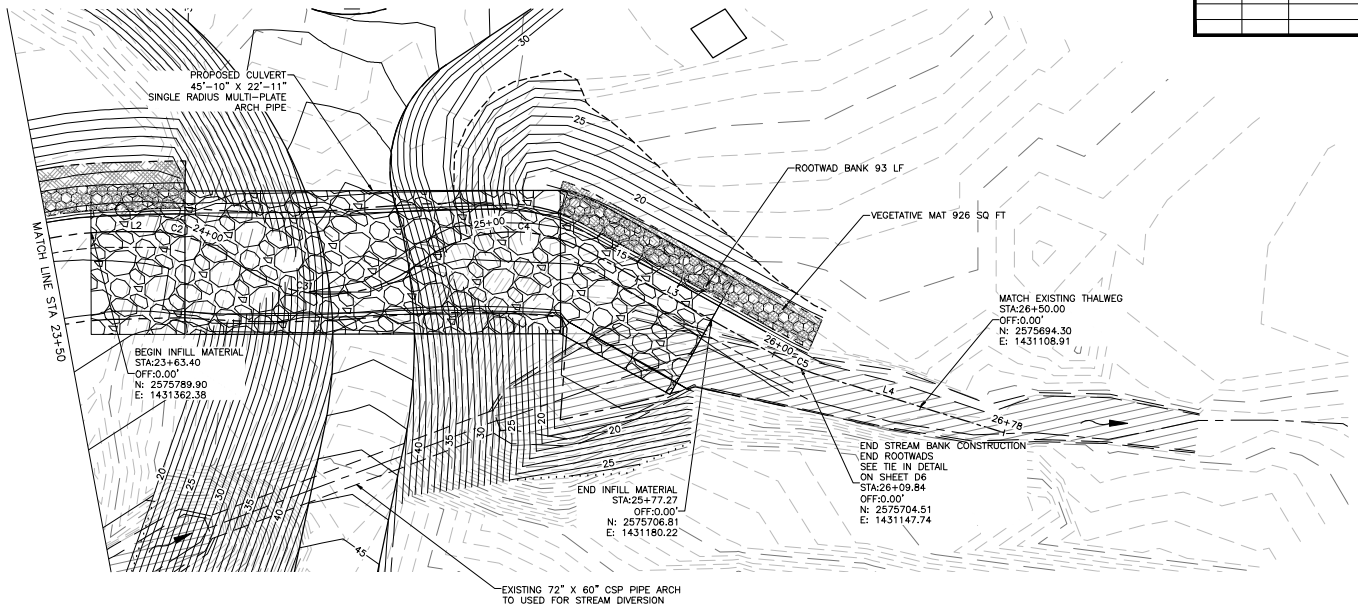

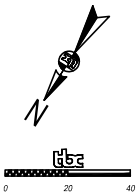

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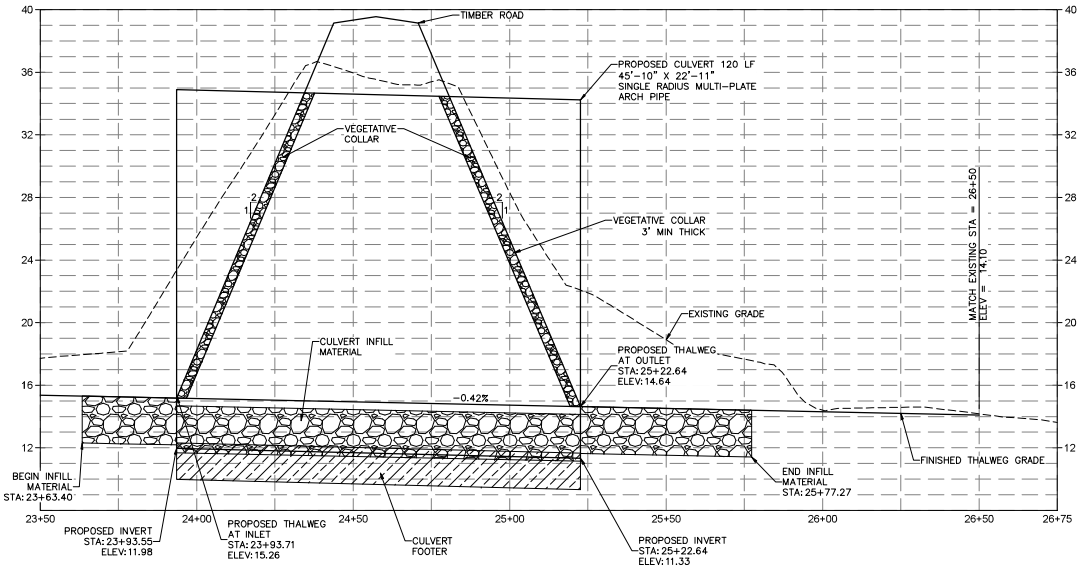

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CULVERT AND STREAM
PLAN AND PROFILE

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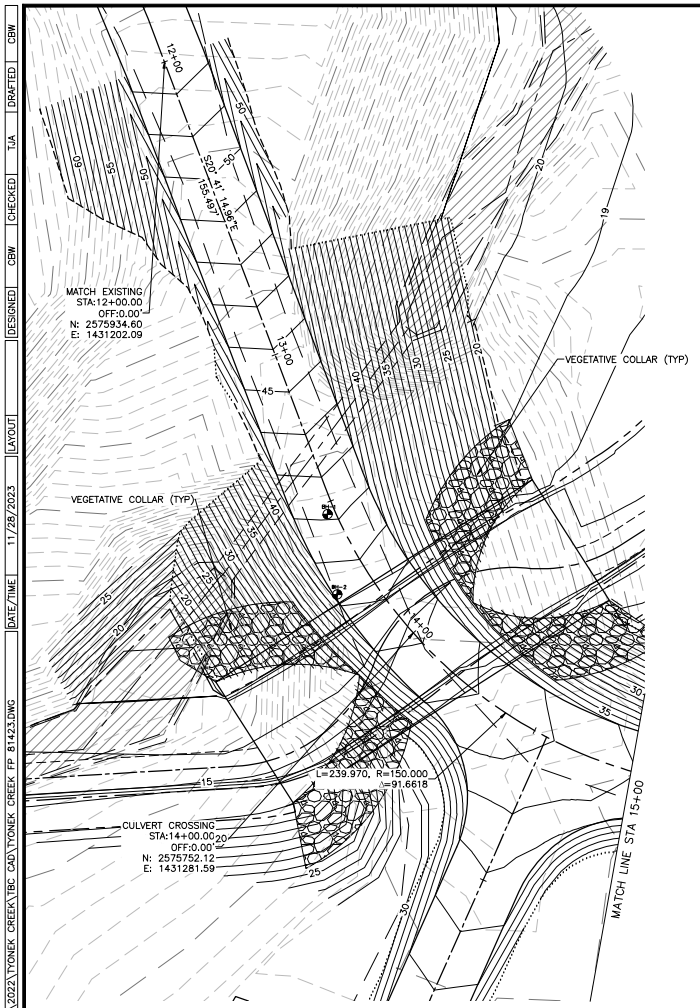

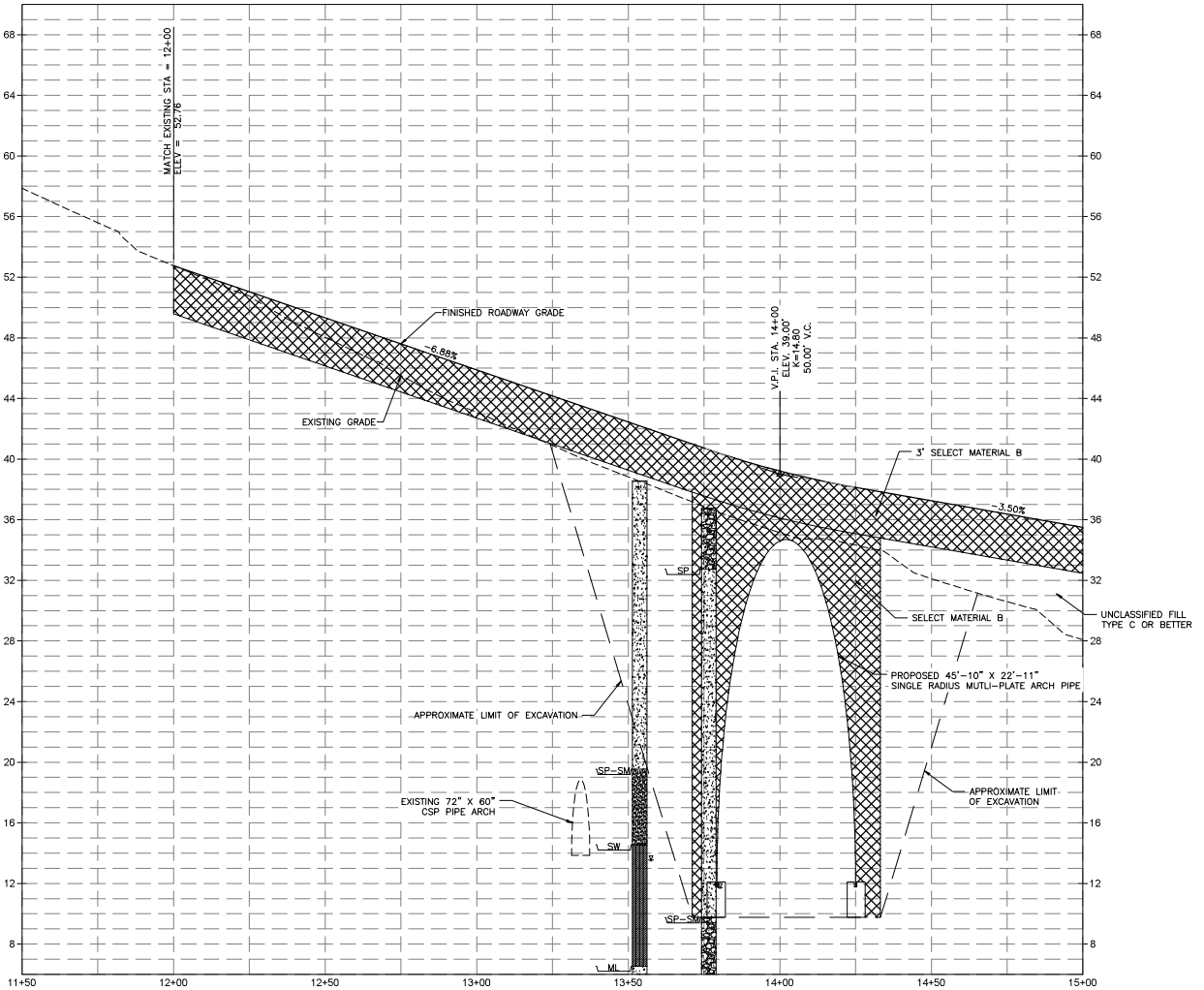

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ROAD PLAN AND PROFILE

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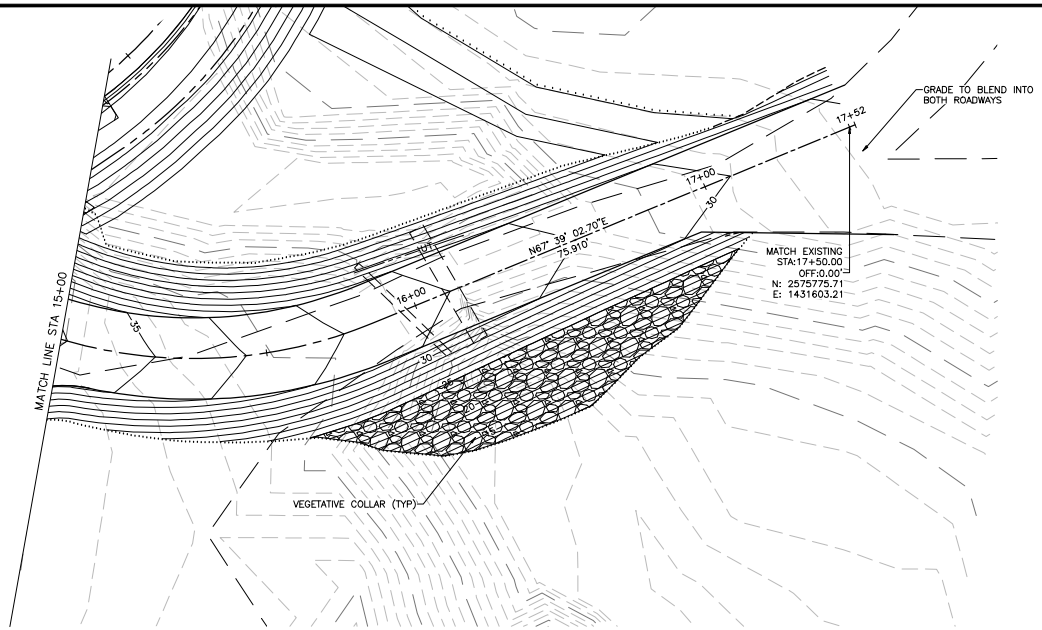

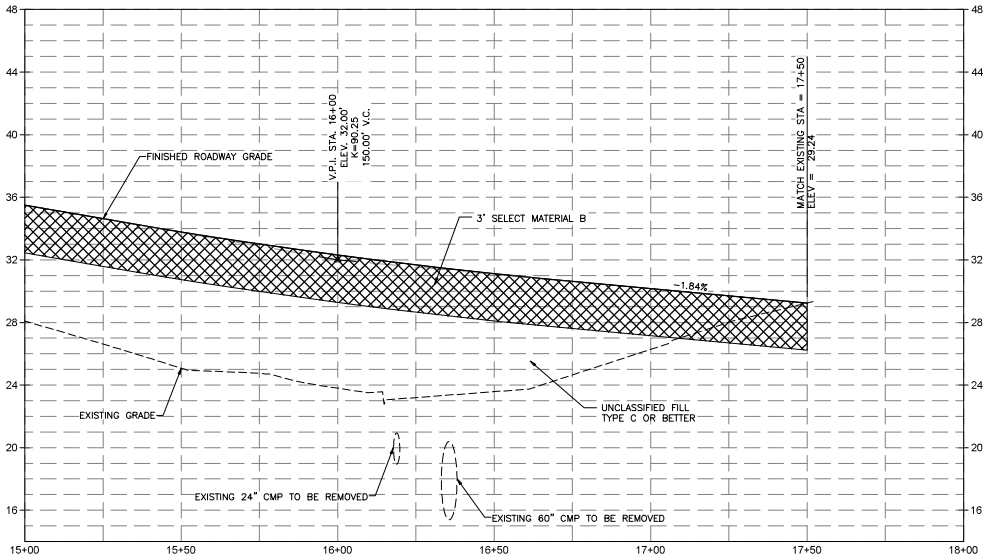

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ROAD PLAN AND PROFILE

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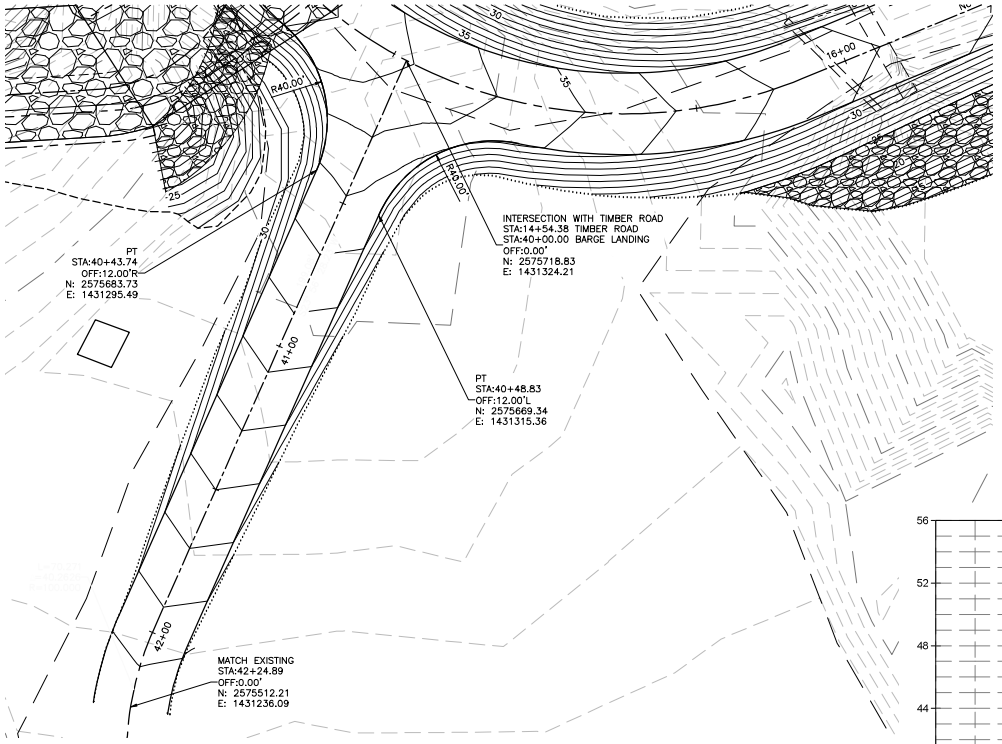

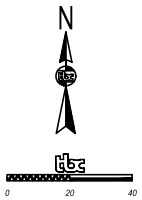

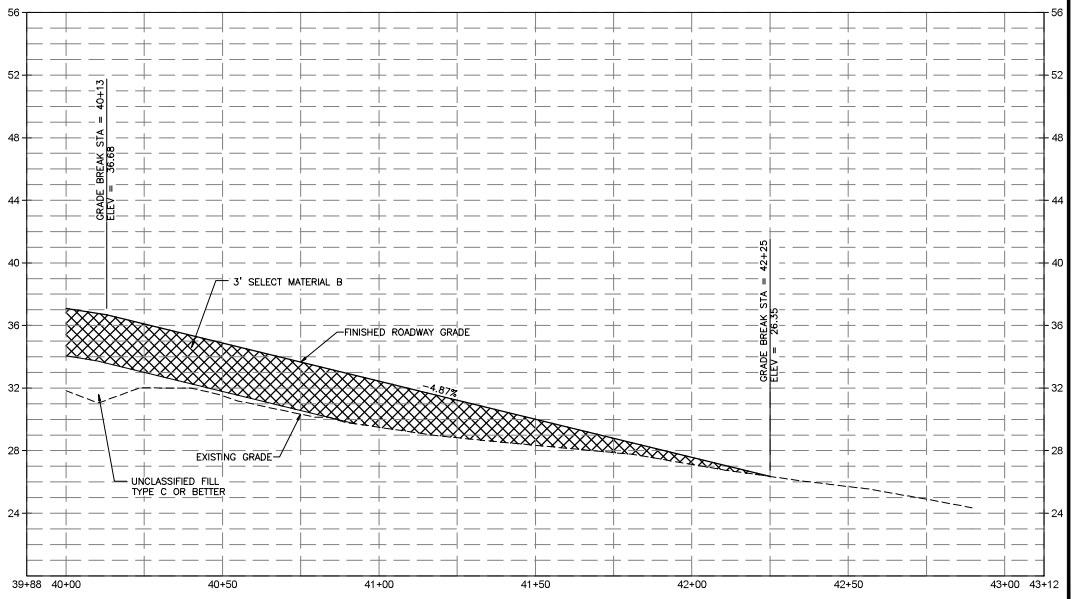

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ROAD PLAN AND PROFILE

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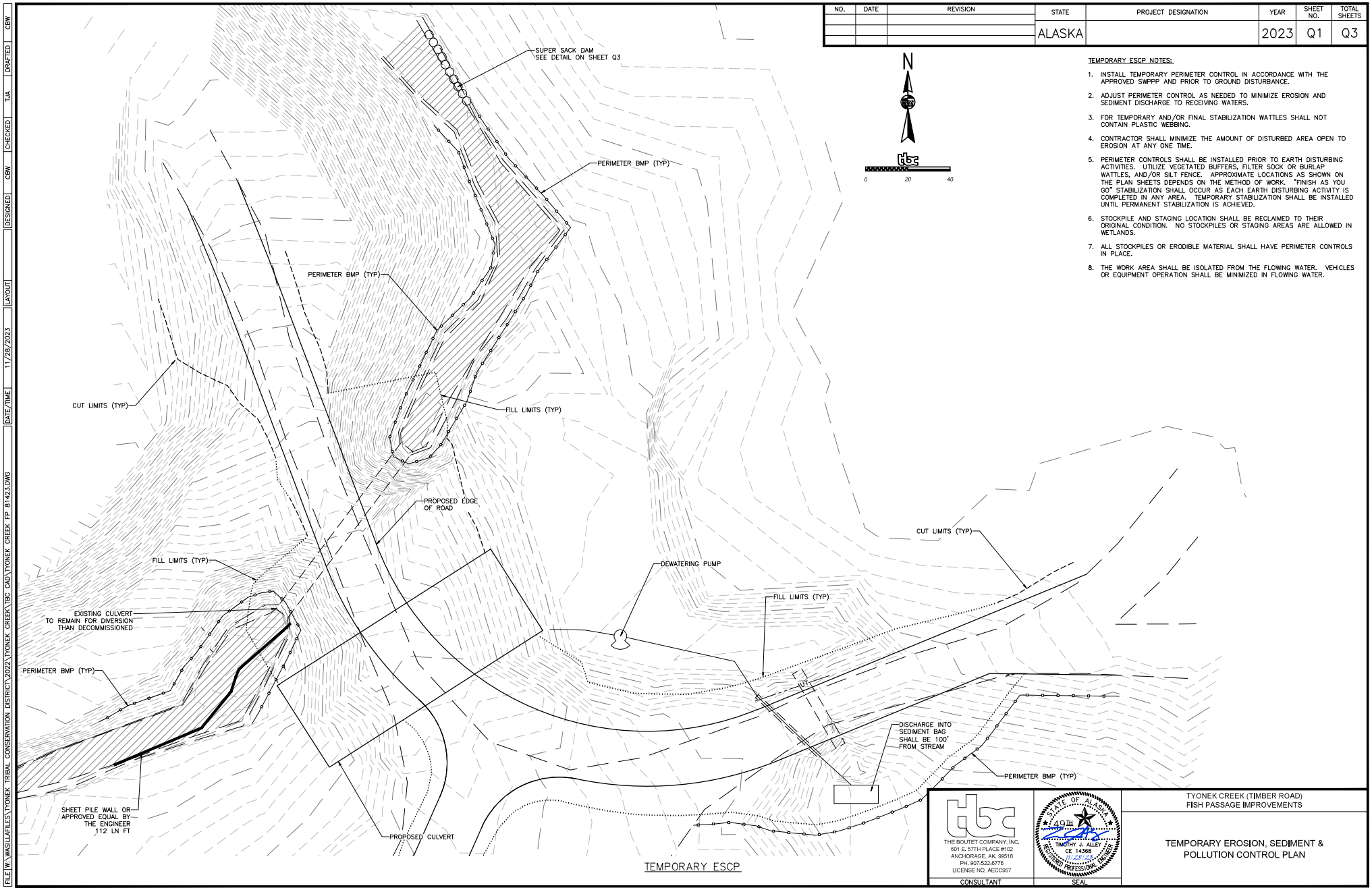

TEMPORARY ESCP

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA		2023	Q1	Q3

TEMPORARY ESCP NOTES:

1. INSTALL TEMPORARY PERIMETER CONTROL IN ACCORDANCE WITH THE APPROVED SWPPP AND PRIOR TO GROUND DISTURBANCE.
2. ADJUST PERIMETER CONTROL AS NEEDED TO MINIMIZE EROSION AND SEDIMENT DISCHARGE TO RECEIVING WATERS.
3. FOR TEMPORARY AND/OR FINAL STABILIZATION WATTLES SHALL NOT CONTAIN PLASTIC WEBBING.
4. CONTRACTOR SHALL MINIMIZE THE AMOUNT OF DISTURBED AREA OPEN TO EROSION AT ANY ONE TIME.
5. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. UTILIZE VEGETATED BUFFERS, FILTER SOCK OR BURLAP WATTLES, AND/OR SILT FENCE. APPROXIMATE LOCATIONS AS SHOWN ON THE PLAN SHEETS DEPENDS ON THE METHOD OF WORK. "FINISH AS YOU GO" STABILIZATION SHALL OCCUR AS EACH EARTH DISTURBING ACTIVITY IS COMPLETED IN ANY AREA. TEMPORARY STABILIZATION SHALL BE INSTALLED UNTIL PERMANENT STABILIZATION IS ACHIEVED.
6. STOCKPILE AND STAGING LOCATION SHALL BE RECLAIMED TO THEIR ORIGINAL CONDITION. NO STOCKPILES OR STAGING AREAS ARE ALLOWED IN WETLANDS.
7. ALL STOCKPILES OR ERODIBLE MATERIAL SHALL HAVE PERIMETER CONTROLS IN PLACE.
8. THE WORK AREA SHALL BE ISOLATED FROM THE FLOWING WATER. VEHICLES OR EQUIPMENT OPERATION SHALL BE MINIMIZED IN FLOWING WATER.

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TEMPORARY EROSION, SEDIMENT & POLLUTION CONTROL PLAN

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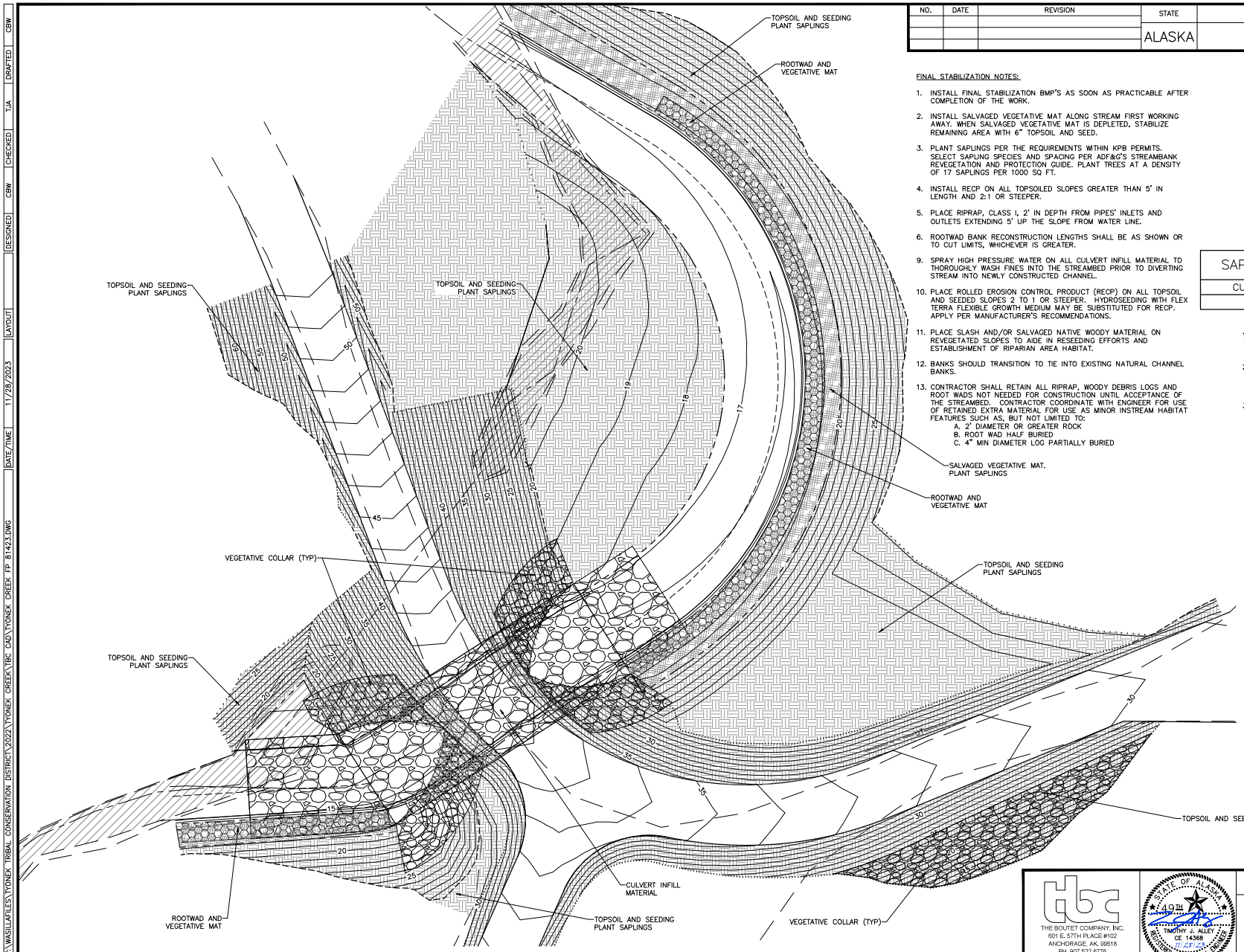

FINAL STABILIZATION PLAN

FINAL STABILIZATION NOTES:

1. INSTALL FINAL STABILIZATION BMP'S AS SOON AS PRACTICABLE AFTER COMPLETION OF THE WORK.
2. INSTALL SALVAGED VEGETATIVE MAT ALONG STREAM FIRST WORKING AWAY. WHEN SALVAGED VEGETATIVE MAT IS DEPLETED, STABILIZE REMAINING AREA WITH 6" TOPSOIL AND SEED.
3. PLANT SAPLINGS PER THE REQUIREMENTS WITHIN KPB PERMITS. SELECT SAPLING SPECIES AND SPACING PER ADF&G'S STREAMBANK REVEGETATION AND PROTECTION GUIDE. PLANT TREES AT A DENSITY OF 17 SAPLINGS PER 1000 SQ FT.
4. INSTALL RECP ON ALL TOPSOILED SLOPES GREATER THAN 5' IN LENGTH AND 2:1 OR STEEPER.
5. PLACE RIPRAP, CLASS I, 2' IN DEPTH FROM PIPES' INLETS AND OUTLETS EXTENDING 5' UP THE SLOPE FROM WATER LINE.
6. ROOTWAD BANK RECONSTRUCTION LENGTHS SHALL BE AS SHOWN OR TO CUT LIMITS, WHICHEVER IS GREATER.
9. SPRAY HIGH PRESSURE WATER ON ALL CULVERT INFILL MATERIAL TO THOROUGHLY WASH FINES INTO THE STREAMBED PRIOR TO DIVERTING STREAM INTO NEWLY CONSTRUCTED CHANNEL.
10. PLACE ROLLED EROSION CONTROL PRODUCT (RECP) ON ALL TOPSOIL AND SEEDED SLOPES 2 TO 1 OR STEEPER. HYDROSEEDING WITH FLEX TERRA FLEXIBLE GROWTH MEDIUM MAY BE SUBSTITUTED FOR RECP. APPLY PER MANUFACTURER'S RECOMMENDATIONS.
11. PLACE SLASH AND/OR SALVAGED NATIVE WOODY MATERIAL ON REVEGETATED SLOPES TO AIDE IN RESEEDING EFFORTS AND ESTABLISHMENT OF RIPARIAN AREA HABITAT.
12. BANKS SHOULD TRANSITION TO TIE INTO EXISTING NATURAL CHANNEL BANKS.
13. CONTRACTOR SHALL RETAIN ALL RIPRAP, WOODY DEBRIS LOGS AND ROOT WADS NOT NEEDED FOR CONSTRUCTION UNTIL ACCEPTANCE OF THE STREAMBED. CONTRACTOR COORDINATE WITH ENGINEER FOR USE OF RETAINED EXTRA MATERIAL FOR USE AS MINOR INSTREAM HABITAT FEATURES SUCH AS, BUT NOT LIMITED TO:
    A. 2' DIAMETER OR GREATER ROCK
    B. ROOT WAD HALF BURIED
    C. 4" MIN DIAMETER LOG PARTIALLY BURIED

N

0 20 40

SAPLING QUANTITY ESTIMATE TABLE	
CULVERT LOCATION	NUMBER OF SAPLINGS
TYONEK CREEK	765

SAPLING NOTES:

1. CONTRACTOR SHALL PROVIDE POTTED SAPLINGS AT A RATE OF 2 SAPLINGS MINIMUM FOR EACH TREE CLEARED PER KENAI PENINSULA BOROUGH (KPB) PERMITS.
2. SAPLING SPECIES SHALL BE COTTONWOOD AND ALDER. SPACE PLANTINGS PER ADF&G'S STREAMBANK REVEGETATION GUIDE PLANT SAPLINGS AT AN APPROXIMATE DENSITY OF 17 SAPLINGS PER 1,000 SF.
3. PLANT TREES A MINIMUM OF FIVE FEET APART.

LEGEND

- INFILL MATERIAL
- EXISTING STREAM
- EXISTING WETLANDS
- SALVAGED VEGETATIVE MAT
- TOPSOIL AND SEED
- VEGATATIVE COLLAR
- ROOT WAD BANK RECONSTRUCTION
- PROPOSED BOTTOM OF STREAM BANK
- PROPOSED TOP OF STREAM BANK (OHW)
- PROPOSED EDGE OF LOW FLOW CHANNEL
- CUT LIMIT
- FILL LIMIT
- EXISTING MINOR CONTOUR
- 195 EXISTING MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- 195 PROPOSED MAJOR CONTOUR
- PERIMETER CONTROL BMP

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EROSION, SEDIMENT & POLLUTION CONTROL PLAN
FINAL STABILIZATION PLAN

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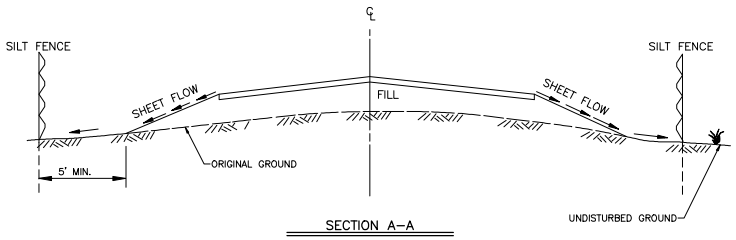
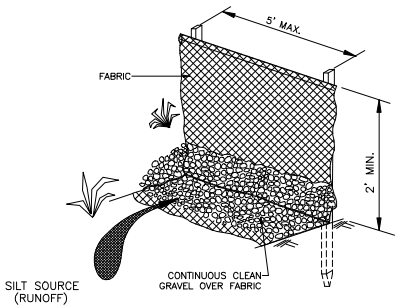
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA		2023	Q3	Q3



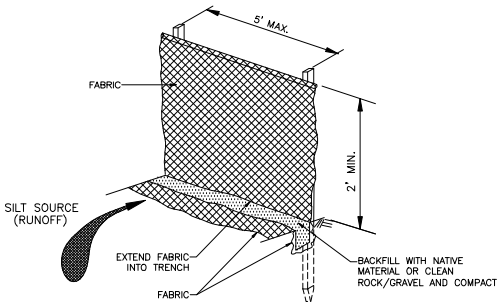
SECTION A–A

SILT FENCE NOTES:

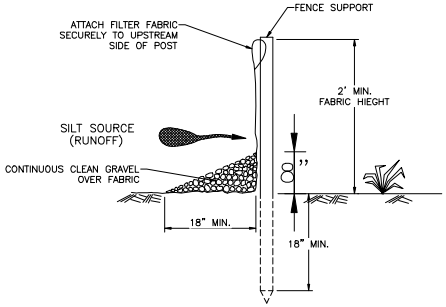
1. INSTALLATION AND APPLICATION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND PER THE MANUFACTURER'S RECOMMENDATION.
2. SILT FENCE FABRIC SHALL BE OVERLAPPED 6" AT FENCE SUPPORTS.
3. SILT FENCE FABRIC SHALL BE TAUT, NOT LOOSE OR FOLDED.
4. THE CONTRACTOR SHALL INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT.
5. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.



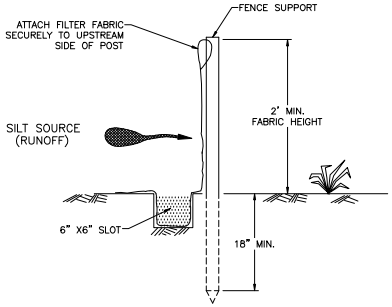
BACKFILL ALTERNATE



TRENCH ALTERNATE

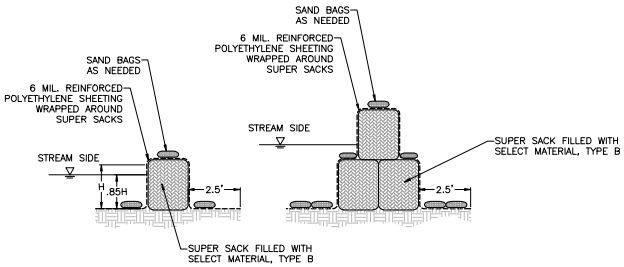


BACKFILL CROSS SECTION



TRENCH CROSS SECTION

1. FENCE SHALL BE PLACED AT LEAST 5' FROM THE TOE OF EMBANKMENT OR EXCAVATION AREAS, OR AS DIRECTED BY THE ENGINEER.
2. ACCUMULATION OF SEDIMENT BEHIND SILT FENCE SHALL BE REMOVED WHEN DEPTH REACHES 12". REMOVED SEDIMENT SHALL BE DEPOSITED IN AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF–SITE AND CAN BE PERMANENTLY STABILIZED.



1 / Q3 SUPER SACK DAM
NTS

SHEET NOTES:

1. SILT FENCE MAY BE SUBSTITUTED FOR WATTLES AS APPROVED BY THE ENGINEER.
2. WATTLES FOR TEMPORARY AND/OR FINAL STABILIZATION SHALL NOT CONTAIN PLASTIC WEBBING.

THE BOUTET COMPANY, INC.
601 E. 57TH PLACE #102
ANCHORAGE, AK 99518
PH. 907-522-6776
LICENSE NO. AECC957
CONSULTANT

STATE OF ALASKA — 49TH — TIMOTHY J. ALLEY — CE 14368 — REGISTERED PROFESSIONAL ENGINEER
SEAL

TYONEK CREEK (TIMBER ROAD)
FISH PASSAGE IMPROVEMENTS

EROSION, SEDIMENT & POLLUTION CONTROL DETAILS

CBW | DRAFTED | TJA | CHECKED | CBW | DESIGNED | LAYOUT | DATE/TIME | 11/28/2023 | FILE | W:\WASILLA\FILES\TYONEK TRIBAL CONSERVATION DISTRICT\2022\TYONEK CREEK\TBC CAD\TYONEK CREEK FP 81423.DWG

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA		2023	P1	P1

EXISTING CULVERT INLET

EXISTING CULVERT OUTLET

BARGE LANDING FACING NORTH TOWARD PROJECT

STAGING AREA FACING NORTH FROM END OF PROJECT

THE BOUTET COMPANY, INC.
601 E. 57TH PLACE #102
ANCHORAGE, AK 99518
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CONSULTANT

STATE OF ALASKA
49TH
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SEAL

TYONEK CREEK (TIMBER ROAD)
FISH PASSAGE IMPROVEMENTS

PROJECT PHOTOS

FILE | W:\WASILLA\FILES\TYONEK TRIBAL CONSERVATION DISTRICT\2022\TYONEK CREEK\TBC CAD\TYONEK CREEK FP 81423.DWG | DATE/TIME | 11/28/2023 | LAYOUT | DESIGNED | CBW | CHECKED | TJA | DRAFTED | CBW

GENERAL NOTES:

1. THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE GALVANIZED STEEL DEEP CORRUGATED ARCH STRUCTURE (BRIDGECOR®) AS DETAILED IN THE PLANS. ANY INSTALLATION INFORMATION PROVIDED HEREIN SHALL BE REVIEWED AND APPROVED BY THE ENGINEER. CHANGES AND DISCREPANCIES MUST BE FORWARDED TO THE MANUFACTURER TO BE INCORPORATED IN A REVISED DRAWING SET.

2. THE ENGINEER SHALL VERIFY THAT THE PROPOSED STRUCTURE IS APPROPRIATE FOR THE SITE CONDITIONS AND THE DESIGN PARAMETERS ARE CONSISTENT WITH THE PROJECT REQUIREMENTS. ALL ASPECTS OF THE STRUCTURE DESIGN AND SITE LAYOUT NOT EXPLICITLY INCLUDED IN THESE DRAWINGS SHALL BE PROVIDED OR COORDINATED BY THE ENGINEER. THIS MAY INCLUDE BUT IS NOT LIMITED TO: FOUNDATIONS, BACKFILL, END TREATMENTS, HYDRAULIC ANALYSIS AND SCOUR ANALYSIS AS REQUIRED.

3. CONTECH PRODUCT DRAWINGS MAY NOT BE USED, REPRODUCED, COPIED, OR ISSUED TO A THIRD PARTY WITHOUT THE PRIOR WRITTEN PERMISSION OF CONTECH ENGINEERED SOLUTIONS.

4. ALL DIMENSIONS ARE TO THE INSIDE CREST OF THE CORRUGATION PROFILE UNLESS NOTED OTHERWISE AND ARE SUBJECT TO MANUFACTURING TOLERANCES.

5. THE STRUCTURE GEOMETRY, DESIGN, AND MATERIALS AS SHOWN IN THESE DRAWINGS ONLY APPLY FOR BRIDGECOR®, DESIGNED AND FABRICATED BY CONTECH ENGINEERED SOLUTIONS (CONTECH). ALTERNATIVE SYSTEMS SHALL BE FULLY DESIGNED AND APPROVED PRIOR TO BIDDING, WITH SEALED DRAWINGS AND CALCULATIONS PROVIDED TO DEMONSTRATE COMPLIANCE WITH THE SAME GEOMETRY, DESIGN, AND MATERIAL REQUIREMENTS AS SHOWN HEREIN.

6. CIRCUMFERENTIAL PLATE LENGTHS ARE IN TERMS OF S = 16 INCHES.

7. FOR WATER CONVEYANCE APPLICATIONS THE STRUCTURE MUST MEET HYDRAULIC REQUIREMENTS OF THE SITE AS DETERMINED BY THE ENGINEER. SHEET PILING, INLET AND OUTLET APRONS, CUTOFF WALLS, RIP RAP, AND/OR OTHER MEASURES SHALL BE INSTALLED AS NECESSARY TO PREVENT LOSS OF ENGINEERED BACKFILL AND/OR FOUNDATION SOILS DUE TO SCOUR. THE EXTENT, SIZE, AND LOCATION OF SCOUR PROTECTION SHALL BE DETERMINED BY THE ENGINEER.

8. PERIMETER DRAINAGE, SURFACE DRAINAGE, AND GRADING AROUND THE STRUCTURE SHALL BE DESIGNED, SPECIFIED, SUPPLIED, AND INSTALLED BY OTHERS. .

DESIGN PARAMETERS

1. DESIGN BY CONTECH ENGINEERED SOLUTIONS IS BASED ON THE FOLLOWING DESIGN CRITERIA:
   - VEHICLE LIVE LOAD: HL-93, U80
   - MINIMUM COVER: 3.0'
   - MAXIMUM COVER: 5.0'
   - DESIGN UNIT WEIGHT OF ENGINEERED BACKFILL = 135 LBS/FT³.
2. ENGINEERED BACKFILL MATERIAL SHALL COMPLY WITH THE ENGINEERED BACKFILL MATERIAL REQUIREMENTS SHOWN IN THESE DRAWINGS.
3. DESIGN COVER AND LATERAL EXTENT OF ENGINEERED BACKFILL ZONE SHALL BE AS SHOWN IN THESE DRAWINGS AND REQUIRED BY THE DESIGN STANDARDS REFERENCED IN THESE NOTES.
4. REFERENCE AASHTO LRFD SECTION 12.6.1 FOR SEISMIC DESIGN CONSIDERATIONS.
5. STRUCTURE DESIGN BASED ON SITE SOIL INFORMATION PROVIDED IN CONTRACT DOCUMENTS. IF UNEXPECTED SITE SOIL CONDITIONS ARE ENCOUNTERED, CONTECH MUST BE NOTIFIED TO DETERMINE IF DESIGN CHANGES ARE NEEDED.
6. TEMPORARY CONSTRUCTION VEHICLE LOADING HEAVIER THAN THE DESIGN VEHICLE LIVE LOAD SHALL NOT BE PERMITTED TO CROSS OVER THE STRUCTURE WITHOUT THE APPROVAL OF CONTECH. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY CONTECH OF THE SIZE, TYPE AND WEIGHT OF ANY CONSTRUCTION VEHICLES INTENDED TO CROSS OVER THE STRUCTURE.

BRIDGECOR SINGLE RADIUS ARCH
TYONEK CREEK - COOK INLET
ANCHORAGE, AK

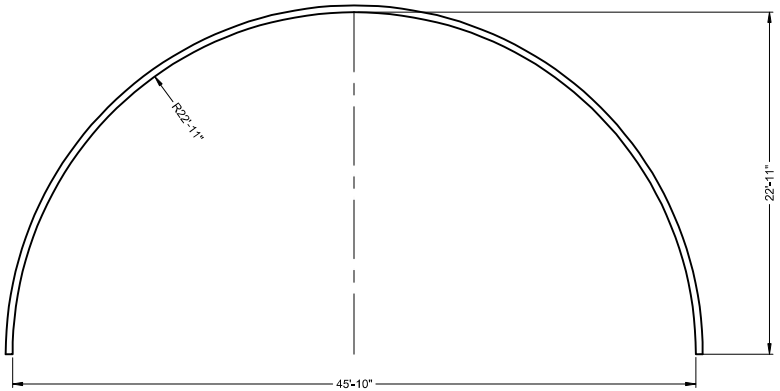

PLATE MAKE UP: 4 @ 11 S, 1 @ 10 S

NOTES:

1) MEASUREMENTS ARE TO THE INSIDE CRESTS OF THE CORRUGATIONS.
2) DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
3) CIRCUMFERENTIAL PLATE LENGTHS ARE IN TERMS OF S = 16 INCHES.

BRIDGECOR SINGLE RADIUS ARCH
INSIDE END AREA = 825.7 ft²
TOTAL S = 54

STRUCTURE CROSS-SECTION

STATE OF ALASKA 49 TH
Joel A. Hahm
No.13396
REGISTERED PROFESSIONAL ENGINEER
10/30/23

FOR APPROVAL

MARK	DATE	REVISION DESCRIPTION	BY
C	9/8/2023	REVISED PER REVIEWER COMMENTS	JEM

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

BridgeCor
CONTECH
CONTRACT
DRAWING

BRIDGECOR SINGLE RADIUS ARCH
45'-10" SPAN X 22'-11" RISE
TYONEK CREEK - COOK INLET
ANCHORAGE, AK

PROJECT No.:	SEQ. No.:	DATE:
704132	010	3/1/2023
DESIGNED:		DRAWN:
XXX		SCC
CHECKED:		APPROVED:
JAH		XXX
SHEET NO.:		
1	OF	8

1. **DESIGN AND MANUFACTURING STANDARDS**

1.1 ALL STANDARDS REFER TO THE CURRENT ASTM/AASHTO EDITION UNLESS OTHERWISE NOTED

1.2 AASHTO M111 - STANDARD SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS

1.3 AASHTO M232 - STANDARD SPECIFICATION FOR ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE

1.4 AASHTO M 167 - STANDARD SPECIFICATION FOR CORRUGATED STEEL STRUCTURAL PLATE, ZINC COATED, FOR FIELD-BOLTED PIPE, PIPE-ARCHES AND ARCHES

1.5 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS - SECTION 12

1.6 AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS - SECTION 26

1.7 ASTM A761 - STANDARD SPECIFICATION FOR CORRUGATED STEEL STRUCTURAL PLATE, ZINC COATED, FOR FIELD-BOLTED PIPE, PIPE-ARCHES AND ARCHES

1.8 ASTM A796 - STANDARD PRACTICE FOR STRUCTURAL DESIGN OF CORRUGATED STEEL PIPE, PIPE-ARCHES, AND ARCHES FOR STORM AND SANITARY SEWERS AND OTHER BURIED APPLICATIONS

1.9 ASTM A807 - STANDARD PRACTICE FOR INSTALLING CORRUGATED STEEL STRUCTURAL PLATE PIPE FOR SEWERS AND OTHER APPLICATIONS

1.10 ASTM A449 - STANDARD SPECIFICATION FOR HEX CAP SCREWS, BOLTS AND STUDS, HEAT TREATED, 120/105/90 KSI MINIMUM TENSILE STRENGTH, GENERAL USE

1.11 ASTM A123 - STANDARD SPECIFICATION FOR ZINC (HOT DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS

1.12 ASTM A153 - STANDARD SPECIFICATION FOR ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE

2. **DEFINITIONS**

2.1 ENGINEER - IN THESE NOTES THE WORD "ENGINEER" SHALL MEAN THE ENGINEER OF RECORD OR OWNER'S DESIGNATED ENGINEERING REPRESENTATIVE.

2.2 MANUFACTURER - IN THESE NOTES THE WORD "MANUFACTURER" SHALL MEAN THE MANUFACTURER OF THE DEEP CORRUGATED ARCH PLATES, CONTECH ENGINEERED SOLUTIONS @ PHONE 800/338-1122.

2.3 CONTRACTOR - IN THESE NOTES THE WORD "CONTRACTOR" SHALL MEAN THE FIRM OR CORPORATION UNDERTAKING THE EXECUTION OF ANY INSTALLATION WORK UNDER THE TERMS OF THESE SPECIFICATIONS.

3. **BRIDGECOR® STRUCTURE ASSEMBLY**

3.1 ASSEMBLY OF THE BRIDGECOR® STRUCTURE SHALL BE IN ACCORDANCE WITH SECTION 26 OF AASHTO LRFD CONSTRUCTION SPECIFICATIONS (LATEST EDITION, WITH INTERIMS) AND ANY SUPPLEMENTAL RECOMMENDATIONS PROVIDED BY THE MANUFACTURER.

3.2 ALL PLATES SHALL BE UNLOADED AND HANDLED WITH REASONABLE CARE. PLATES SHALL NOT BE ROLLED OR DRAGGED OVER GRAVEL ROCK AND SHALL BE PREVENTED FROM STRIKING ROCK OR OTHER HARD OBJECTS DURING PLACEMENT IN TRENCH OR ON BEDDING.

GALVANIZED COATINGS THAT HAVE BEEN COMPROMISED SHALL BE RESTORED WITH A MINIMUM OF TWO COATS OF COLD GALVANIZING COMPOUND (SPRAY OR PAINT) IN ACCORDANCE WITH ASTM A761, SECTION 7 OR OTHER MEASURES AS DESCRIBED IN ASTM A780.

3.3 FOR STRUCTURES SET ON FOOTINGS, PLATE ASSEMBLY CAN BEGIN AFTER PLACEMENT OF STRUCTURE FOOTINGS HAS BEEN APPROVED BY THE ENGINEER. VERIFICATION OF PROPER SPACING, ALIGNMENT, AND ORIENTATION OF THE FOUNDATIONS IS STRONGLY RECOMMENDED PRIOR TO BEGINNING PLATE ASSEMBLY. ANY MODIFICATIONS TO THE FOUNDATIONS SHALL BE MADE PRIOR TO BEGINNING PLATE ASSEMBLY.

BEDDING PREPARATION FOR ROUND AND ELLIPTICAL SHAPES SHOULD BE APPROVED BY THE ENGINEER PRIOR TO ASSEMBLY. THE BED SHOULD BE CONSTRUCTED TO UNIFORM LINE AND GRADE. IT SHOULD BE FREE OF ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS AND OTHER FOREIGN MATTER.

3.4 THE SPAN AND RISE OF THE STRUCTURE SHOULD BE CHECKED FREQUENTLY DURING THE EARLY STAGES OF ASSEMBLY TO VERIFY THAT ASSEMBLY TOLERANCES ARE BEING ACHIEVED AND TO ALLOW FOR ADJUSTMENTS TO PROCEDURES, IF NECESSARY, BEFORE ASSEMBLY IS COMPLETE.

3.5 CUT PLATES FOR SKEWED OR BEVELED ENDS SHOULD BE ATTACHED AFTER THE MAIN BARREL OF A STRUCTURE HAS BEEN ASSEMBLED. WHEN CAST-IN-PLACE CONCRETE COLLARS OR HEADWALLS ARE TO BE CONSTRUCTED, THE CONTRACTOR MUST ALLOW FOR FORMWORK TO BE ERECTED ON THE END OF THE STRUCTURE. FORMING AGAINST A SKEWED CORRUGATION PROFILE IS COMPLEX AND SHOULD BE ACCOUNTED FOR BY THE FORMING CONTRACTOR WHEN PLANNING PROCEDURES AND METHODS FOR FORMWORK CONSTRUCTION. IN SOME CASES, FIELD TRIMMING OF THE STRUCTURE MAY BE NECESSARY. SPECIAL BRACING AND/OR SCAFFOLDING (DESIGN BY OTHERS) IS REQUIRED TO SUPPORT SKEWED ENDS UNTIL ADEQUATE COMPRESSIVE STRENGTH IS ACHIEVED AS REQUIRED BY THE COLLAR/HEADWALL DESIGNER.

3.6 NUTS SHALL BE PLACED WITH THE ROUNDED FACE IN CONTACT WITH THE PLATES UNLESS NOTED OTHERWISE. NUTS CAN BE ON EITHER THE INSIDE OR OUTSIDE OF THE STRUCTURE TO FACILITATE ASSEMBLY.

3.7 RECOMMENDED TORQUE RANGE ON THE BOLTS IS 150 TO 300 FT-LBS FOR 3/4" DIAMETER BOLTS AND 200-350 FT-LBS FOR 7/8" DIAMETER BOLTS.

3.8 INSIDE SPAN AND RISE OF THE ASSEMBLED STRUCTURE AFTER BOLTING SHALL BE WITHIN 2% (OR 5 INCHES, WHICHEVER IS LESS) OF THE PLAN DIMENSIONS. THE TOLERANCE ON STRUCTURE LENGTH IS ± 1/2" PER 10 FT OF STRUCTURE LENGTH

4. **ENGINEERED BACKFILL ENVELOPE**

4.1 ENGINEERED BACKFILL MATERIAL SHALL BE PLACED WITHIN THE ENGINEERED BACKFILL ENVELOPE TO THE MINIMUM WIDTH AND WITHIN THE COVER LIMITS SHOWN ON THESE DRAWINGS. THE ENGINEERED BACKFILL ENVELOPE SHALL NOT BE ALTERED WITHOUT WRITTEN APPROVAL FROM CONTECH.

4.2. IN-SITU SOILS BELOW AND ADJACENT TO THE ENGINEERED BACKFILL ENVELOPE SHALL PROVIDE A FIRM SURFACE AGAINST WHICH TO COMPACT THE ENGINEERED BACKFILL MATERIAL. THE GEOTECHNICAL ENGINEER SHALL EVALUATE THE IN-SITU SOILS AND DETERMINE THE TYPE AND DEGREE OF ANY SOIL IMPROVEMENTS REQUIRED. THESE MAY INCLUDE BENCHING OR SLOPING OF THE SIDE SOILS. BACKFILL PLACEMENT MAY NOT BEGIN UNTIL THE GEOTECHNICAL ENGINEER HAS APPROVED THE IN-SITU SOILS AND ANY REQUIRED IMPROVEMENTS.

4.3. A DRAINED CONDITION WAS ASSUMED FOR THE ENGINEERED BACKFILL ENVELOPE. DESIGN AND SUPPLY OF A SUBSURFACE DRAINAGE SYSTEM (IF NEEDED) SHALL BE PROVIDED BY OTHERS.

4.4. IF REQUIRED BY THE GEOTECHNICAL ENGINEER, A GEOTEXTILE OR GRADED SOIL FILTER MAY BE USED BETWEEN THE ENGINEERED BACKFILL AND IN-SITU SOIL TO PREVENT MIGRATION OF FINES AND POSSIBLE INTERNAL EROSION OF THE SOIL.

5. **ENGINEERED BACKFILL MATERIAL REQUIREMENTS**

5.1 THE DESIGN OF BRIDGECOR® STRUCTURES RELIES ON COMPACTED SOIL PROPERTIES PROVIDED BY THE ENGINEERED BACKFILL MATERIALS. THE CORRECT SELECTION AND PLACEMENT OF COMPACTED ENGINEERED BACKFILL MATERIAL IS CRITICAL TO THE PERFORMANCE OF BRIDGECOR® STRUCTURES.

5.2 THE ENGINEERED BACKFILL MATERIAL SHALL NOT BE ADVERSELY AFFECTED BY WETTING, DRYING, SATURATION, FREEZE/THAW, VIBRATIONS, OR FLOWING WATER.

5.3 BACKFILL MATERIALS SHALL CONFORM TO PROPERTIES REFERENCED IN THE PROJECT SPECIFICATIONS OR THE PROPERTIES DESCRIBED HEREIN, WHICHEVER IS MORE STRINGENT.

5.4 BACKFILL MATERIAL SHOULD CONSIST OF A WELL-GRADED, ANGULAR GRANULAR SOIL WITH A MAXIMUM PARTICLE SIZE OF 3 INCHES. OPEN GRADED OR GAP GRADED MATERIALS ARE NOT PREFERRED. THE BACKFILL MATERIAL SHOULD BE FREE OF FROZEN LUMPS, FOREIGN MATERIAL OR ORGANIC DECOMPOSABLE MATERIALS. FINE BEACH SANDS, WINDBLOWN SANDS, AND STREAM DEPOSITED SANDS ALL OF WHICH EXHIBIT FINE, ROUNDED PARTICLES AND TYPICALLY ARE CLASSIFIED BY AASHTO M 145 AS A-3 MATERIALS ARE NOT ALLOWED. WHEN USING A-2 MATERIALS, MOISTURE CONTENT MUST BE BETWEEN -3% AND +2% OPTIMUM AS DEFINED BY AASHTO T 180

5.5 GRAIN SIZE DISTRIBUTION (GRADATION) OF THE ENGINEERED BACKFILL MATERIAL SHALL SATISFY: Cu GREATER THAN OR EQUAL TO 3 AND Cc BETWEEN 0.7 AND 3, WHERE Cu = COEFFICIENT OF UNIFORMITY = D60/D10 AND Cc = COEFFICIENT OF CURVATURE = $(D30)^2/(D60XD10)$. DXX IS THE PARTICLE SIZE CORRESPONDING TO XX% FINER ON THE CUMULATIVE PARTICLE SIZE DISTRIBUTION CURVE (ASTM D2487).

Cu REQUIREMENTS ARE WAIVED FOR CRUSHER RUN SCREENED AGGREGATES. Cc REQUIREMENTS ARE WAIVED FOR BACKFILL MATERIAL CONTAINING MORE THAN 60% GRAVEL (> #4 SIEVE).

5.6 ABRASION LOSS SHALL NOT EXCEED 45% AS DETERMINED BY THE LOS ANGELES ABRASION TEST (ASTM C131).

5.7 HUMIC (DECAYING) ORGANIC MATTER SHALL NOT EXCEED 1.0% (DRY WEIGHT BASIS).

5.8 ELECTROCHEMICAL REQUIREMENTS FOR SOIL AND WATER IN CONTACT WITH BOTH THE INSIDE AND OUTSIDE OF THE BRIDGECOR® STRUCTURE ARE AS FOLLOWS, PER THE NCSPA DESIGN MANUAL:

- PH = 6 TO 10
- RESISTIVITY = 2,000 to 10,000 OHM-CM
- WATER HARDNESS > 50 PPM $CaCO_3$

5.9 IF THE ELECTROCHEMICAL PROPERTIES OF THE BACKFILL OR WATER FALL OUTSIDE OF THE RECOMMENDED RANGE, A SECONDARY PROTECTION SYSTEM MAY BE NEEDED TO ACHIEVE THE DESIGN SERVICE LIFE. SECONDARY PROTECTION SYSTEMS (IF REQUIRED) SHALL BE DESIGNED AND PROVIDED BY OTHERS.

5.10 THE SELECTION AND EVALUATION OF PROPOSED ENGINEERED BACKFILL MATERIAL IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE CONTECH WITH DOCUMENTATION FROM A QUALIFIED GEOTECHNICAL ENGINEER THAT THE PROPOSED ENGINEERED BACKFILL MATERIAL MEETS OR EXCEEDS THE REQUIREMENTS.

6. **ENGINEERED BACKFILL PLACEMENT PROCEDURE**

6.1 A CONTECH REPRESENTATIVE WILL CONDUCT A PRECONSTRUCTION CONFERENCE PRIOR TO COMMENCEMENT OF WORK TO REVIEW AND DISCUSS THE RECOMMENDED PROCEDURES FOR BACKFILLING, AND STRUCTURE SHAPE MEASUREMENTS. ANY CONTRACTOR WITH RESPONSIBILITY FOR BACKFILLING OR CONSTRUCTION OF END TREATMENTS MUST BE REPRESENTED AT THIS MEETING. IT IS RECOMMENDED THAT THE ENGINEER AND ANY THIRD PARTY INVOLVED IN COMPACTION TESTING OR OTHER QUALITY CONTROL MEASURES ALSO ATTEND.

6.2 ANY IMPROVEMENT OF THE SUBGRADE AND EMBANKMENT SOILS REQUIRED BY THE GEOTECHNICAL ENGINEER SHALL BE COMPLETED AND APPROVED PRIOR TO BEGINNING PLACEMENT OF ENGINEERED BACKFILL MATERIAL.

6.3 THE ENGINEERED BACKFILL MATERIAL SHALL BE PLACED UNIFORMLY ON BOTH SIDES OF THE STRUCTURE IN LAYERS OF 8 INCHES OR LESS (BEFORE COMPACTION).

6.4 BACKFILL SHALL BE COMPACTED TO THE MINIMUM DENSITY INDICATED IN THESE DRAWINGS, DEPENDING ON THE COMPACTION EQUIPMENT AND ENGINEERED BACKFILL MATERIAL USED, IT MAY BE NECESSARY TO DECREASE THE LIFT THICKNESS AND/OR MOISTURE CONDITION THE LOOSE SOIL TO ACHIEVE THE SPECIFIED MINIMUM LEVEL OF COMPACTION.

6.5 IF THE ENGINEERED BACKFILL MATERIAL DOES NOT PRODUCE A PROCTOR CURVE AND/OR IS NOT CONDUCIVE TO TRADITIONAL FIELD-TESTING METHODS, QUALITATIVE METHODS OF EVALUATING COMPACTION MAY BE USED. SUCH METHODS SHALL BE EVALUATED AND APPROVED BY THE GEOTECHNICAL ENGINEER AND A COPY OF THE METHOD BE PROVIDED TO THE DESIGNER.

6.6 THE DIFFERENCE IN BACKFILL LEVELS ON THE TWO SIDES OF THE STRUCTURE AT ANY TRANSVERSE SECTION SHALL NOT EXCEED 24 INCHES WITHOUT PRIOR APPROVAL FROM CONTECH.

6.7 CONSTRUCTION EQUIPMENT USED WITHIN 5 FEET LATERALLY OF THE WIDEST PART OF THE STRUCTURE, UP TO THE MINIMUM DESIGN COVER HEIGHT ABOVE THE STRUCTURE, SHALL HAVE A STATIC MASS OF 10 TONS OR LESS. IT MAY BE POSSIBLE TO USE HEAVIER EQUIPMENT IF IT CAN BE DEMONSTRATED THAT THE STRUCTURE SHAPE IS NOT ADVERSELY AFFECTED. ENGINEERED BACKFILL MATERIAL PLACED WITHIN 1 FOOT LATERALLY OF THE WIDEST PART OF THE STRUCTURE SHALL BE COMPACTED USING HAND OPERATED EQUIPMENT UNTIL THE MINIMUM COVER HEIGHT IS REACHED. OVER-COMPACTION OF ENGINEERED BACKFILL IN THIS ZONE SHOULD BE AVOIDED, AS THIS CAN CONTRIBUTE TO EXCESSIVE DEFLECTION OF SOME STRUCTURES. AREAS CLOSEST TO THE STRUCTURE SHALL BE COMPACTED RUNNING PARALLEL TO THE LENGTH OF THE STRUCTURE.

6.8 ONCE THE BACKFILL ELEVATION REACHES APPROXIMATELY ¾ OF THE STRUCTURE RISE (DEPENDING ON THE SHAPE OF THE STRUCTURE AND RELATIVE MOVEMENT DURING THE BACKFILL PROCESS), PLACE AND COMPACT ENGINEERED BACKFILL MATERIAL IN RADIAL LIFTS OVER THE TOP OF THE STRUCTURE USING EQUIPMENT AS DESCRIBED ABOVE. THE FIRST RADIAL LIFT SHOULD BE THICKER AND PROVIDE A MINIMUM 12 INCHES OF COVER BETWEEN THE STRUCTURE AND COMPACTION EQUIPMENT. EQUIPMENT SHOULD RUN PERPENDICULAR TO THE LONGITUDINAL AXIS OF THE STRUCTURE. NO EQUIPMENT SHALL BE ALLOWED OVER THE STRUCTURE THAT WOULD EXCEED THE DESIGN LOAD AT THE MINIMUM DESIGN HEIGHT OF COVER. NO CONSTRUCTION EQUIPMENT SHALL BE ALLOWED TO PARK ON TOP OF A PARTIALLY BACKFILLED STRUCTURE.

6.9 AT NO TIME SHALL THE ENGINEERED BACKFILL MATERIAL BE DUMPED OR PUSHED AGAINST THE STRUCTURE WALL(S) SO AS TO CHANGE THE SHAPE OR ALIGNMENT OF THE STRUCTURE. MATERIAL SHALL NOT BE DUMPED ON TOP OF THE STRUCTURE AT ANY TIME. TRUCKS MAY UNLOAD IN ROUGH LAYERS NO CLOSER THAN 5 FEET FROM THE WIDEST PART OF THE STRUCTURE.

6.10 THE STRUCTURE SHALL BE CHECKED PERIODICALLY DURING BACKFILLING TO ENSURE THE SHAPE OF THE STRUCTURE MEETS DESIGN REQUIREMENTS AND IS CONSISTENT WITH THE ASSEMBLY TOLERANCES AS STATED IN THESE NOTES. IF DEFLECTION OF THE STRUCTURE IS GREATER THAN EXPECTED, BACKFILLING SHALL BE HALTED AND BACKFILL PLACEMENT AND COMPACTION PROCEDURES MODIFIED TO CORRECT THE STRUCTURE SHAPE. IT MAY BE NECESSARY TO REMOVE SOME OF THE BACKFILL TO CORRECT EXCESSIVE DEFLECTION. AFTER COMPLETION OF BACKFILL PLACEMENT, THE FINAL SHAPE OF THE STRUCTURE SHALL BE WITHIN 2% (OR 5 INCHES, WHICHEVER IS LESS) OF THE PLAN DIMENSIONS.

7. **CONSTRUCTION OBSERVATIONS AND TESTING**

7.1. OBSERVATION AND TESTING SHALL BE PERFORMED DURING CONSTRUCTION TO VERIFY COMPLIANCE WITH THESE DRAWINGS , APPLICABLE PROJECT DOCUMENTS, AND STANDARDS REFERENCED IN THESE NOTES.

7.2. THE CONTRACTOR IS RESPONSIBLE FOR QUALITY CONTROL PROCEDURES, VERIFICATION MEASUREMENTS, ADEQUATE SUPERVISION, PROGRESS TESTING, EVALUATION OF PROPOSED ENGINEERED BACKFILL MATERIALS, AND/OR OTHER MEASURES AS NEEDED TO ENSURE THAT THE COMPLETED PROJECT COMPLIES WITH THESE DRAWINGS AND NOTES.

7.3. THE PROJECT OWNER (OR THEIR DESIGNATED REPRESENTATIVE) IS RESPONSIBLE FOR PROJECT OVERSIGHT AND FINAL ACCEPTANCE OF THE CONSTRUCTED STRUCTURE. THE OWNER MAY ACCEPT THE CONTRACTOR'S QUALITY CONTROL PROGRAM OR ADOPT AN INDEPENDENT QUALITY ASSURANCE PROGRAM TO VERIFY COMPLIANCE.

7.4. OBSERVATIONS AND TESTING PRIOR TO STRUCTURE ASSEMBLY & BACKFILL SHALL INCLUDE BUT NOT BE LIMITED TO:

- EVALUATION OF FOUNDATION SOILS BELOW FOOTINGS AND THE ENGINEERED BACKFILL ENVELOPE
- VERIFICATION OF PROPER ALIGNMENT, DIMENSIONS, AND PLACEMENT OF FOUNDATIONS
- VERIFICATION OF PROPER SHAPING, PLACEMENT, AND PREPARATION OF BEDDING SOILS (STRUCTURES WITH INVERTS)
- VERIFICATION OF PROPER PREPARATION OF EMBANKMENT SOILS ADJACENT TO THE ENGINEERED BACKFILL ENVELOPE
- EVALUATION AND APPROVAL OF ENGINEERED BACKFILL MATERIALS
- VERIFICATION OF PROPER PLACEMENT OF GEOTEXTILES (WHEN REQUIRED)

7.5 OBSERVATIONS AND TESTING DURING ASSEMBLY & BACKFILLING SHALL INCLUDE BUT NOT BE LIMITED TO:

- STRUCTURE ALIGNMENT
- PLATE TIGHTNESS OBSERVATIONS
- BOLT TORQUE MEASUREMENTS
- INITIAL STRUCTURE SHAPE MEASUREMENTS (PRIOR TO STARTING BACKFILLING)
- PERIODIC STRUCTURE SHAPE MEASUREMENTS (DURING BACKFILLING)
- ENGINEERED BACKFILL MATERIAL SAMPLING AND TESTING
- OBSERVATIONS OF PROPER FILL PLACEMENT AND COMPACTION PROCEDURES.

7.6 CONTECH MAY REQUIRE ADDITIONAL OBSERVATIONS AND/OR TESTING WHICH MAY INCLUDE, BUT NOT BE LIMITED TO, FULL TIME SHAPE MONITORING, ADDITIONAL SOIL TESTING, AND SITE EVALUATIONS DEPENDING ON THE STRUCTURE GEOMETRY, DESIGN, AND/OR OTHER PROJECT SPECIFIC FACTORS.

STATE OF ALASKA
49 TH
Joel A. Hahm
No.13396
REGISTERED PROFESSIONAL ENGINEER
10/30/23

FOR APPROVAL

MARK	DATE	REVISION DESCRIPTION	BY
C	9/8/2023	REVISED PER REVIEWER COMMENTS	JEM

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

BridgeCor
CONTECH
CONTRACT DRAWING

BRIDGECOR SINGLE RADIUS ARCH
45'-10" SPAN X 22'-11" RISE
TYONEK CREEK - COOK INLET
ANCHORAGE, AK

PROJECT No.	SEQ. No.	DATE
704132	010	3/1/2023
DESIGNED: XXX	DRAWN: SCC	
CHECKED: JAH	APPROVED: XXX	
SHEET NO.: 2 OF 8		

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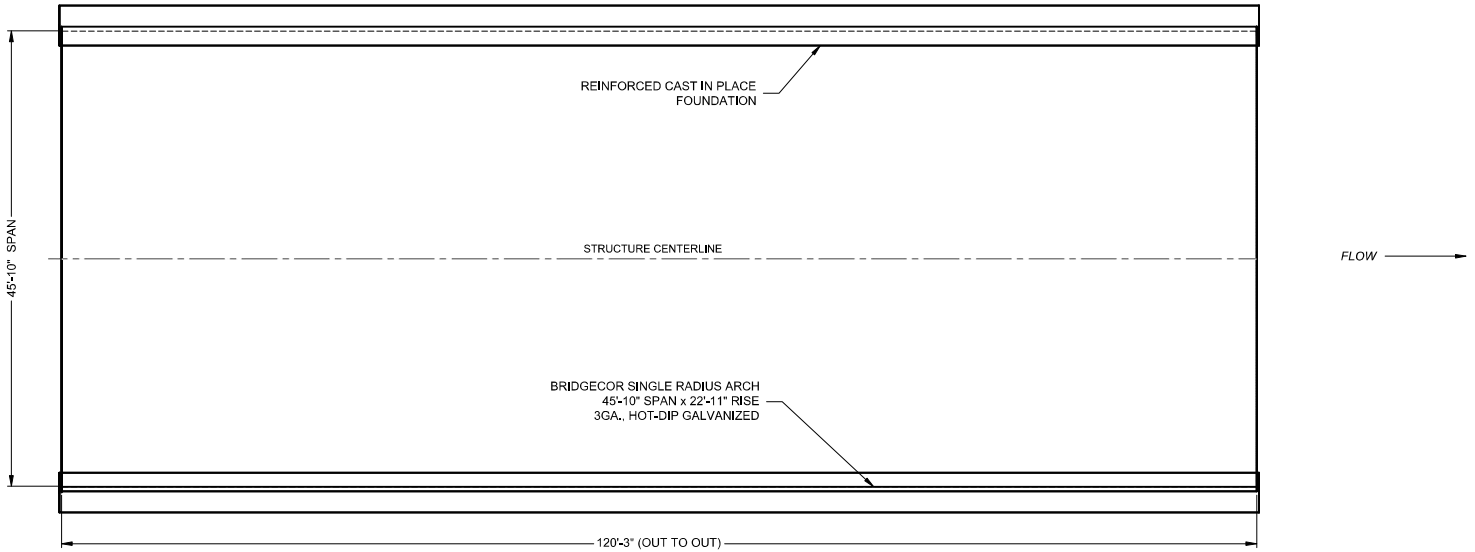
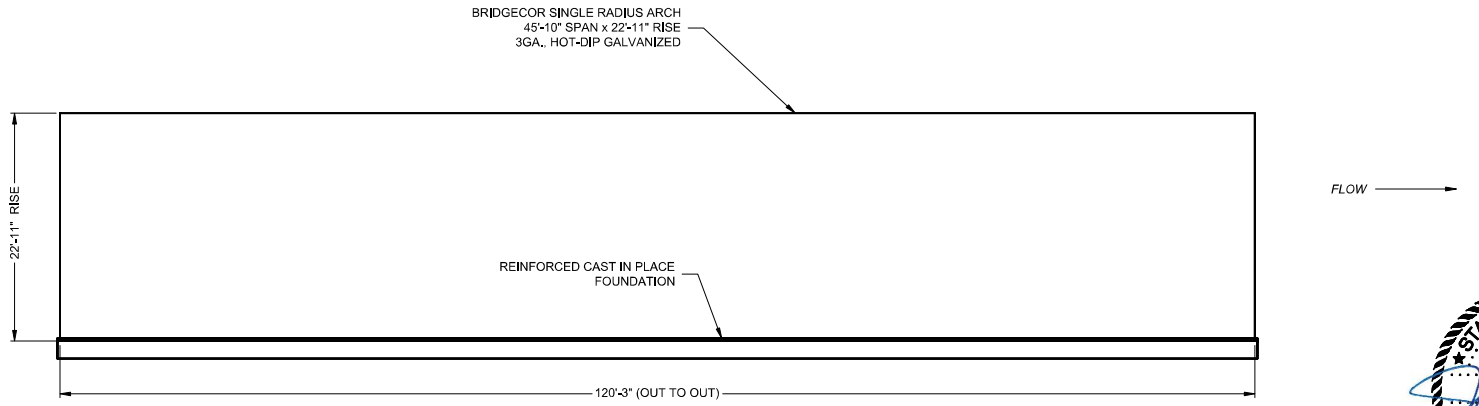


BRIDGE PLAN



BRIDGE PROFILE

STATE OF ALASKA
49 TH
Joel A. Hahm
No.13396
REGISTERED PROFESSIONAL ENGINEER

10/30/23

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SHEET NO.: 3 OF 8		

FOUNDATION NOTES:

THE ENGINEER SHALL VERIFY THAT THE PROPOSED FOUNDATION IS APPROPRIATE FOR THE SITE CONDITIONS AND THE DESIGN PARAMETERS ARE CONSISTENT WITH THE PROJECT REQUIREMENTS. THE FOUNDATION DESIGN CONSIDERS STRUCTURAL REQUIREMENTS OF THE FOUNDATION ONLY. HYDRAULIC ANALYSIS AND SCOUR ANALYSIS, AS REQUIRED, SHALL BE PERFORMED OR COORDINATED BY THE ENGINEER.

PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN WITH THE ENGINEER.

FOUNDATION DESIGN IS BASED ON SITE SOIL INFORMATION PROVIDED TO CONTECH AND DESCRIBED IN THE DESIGN PARAMETERS BELOW. FOUNDATION BEARING SOILS, INCLUDING ANY SOIL IMPROVEMENTS REQUIRED, SHALL BE EVALUATED AND APPROVED BY OTHERS PRIOR TO FOUNDATION CONSTRUCTION. IF UNEXPECTED SOIL CONDITIONS ARE ENCOUNTERED, OR THE BEARING REQUIREMENTS CANNOT BE ACHIEVED, CONTECH MUST BE NOTIFIED TO DETERMINE IF FOOTING DESIGN CHANGES ARE NEEDED.

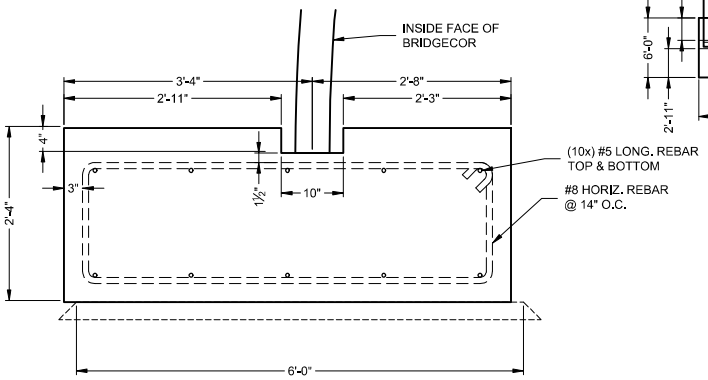
REINFORCED CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, SECTION 8, REINFORCED CONCRETE, FOR CLASS A CONCRETE HAVING A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

REINFORCING STEEL FOR FOUNDATIONS SHALL CONFORM TO ASTM A615, GRADE 60 (Fy=60 ksi).

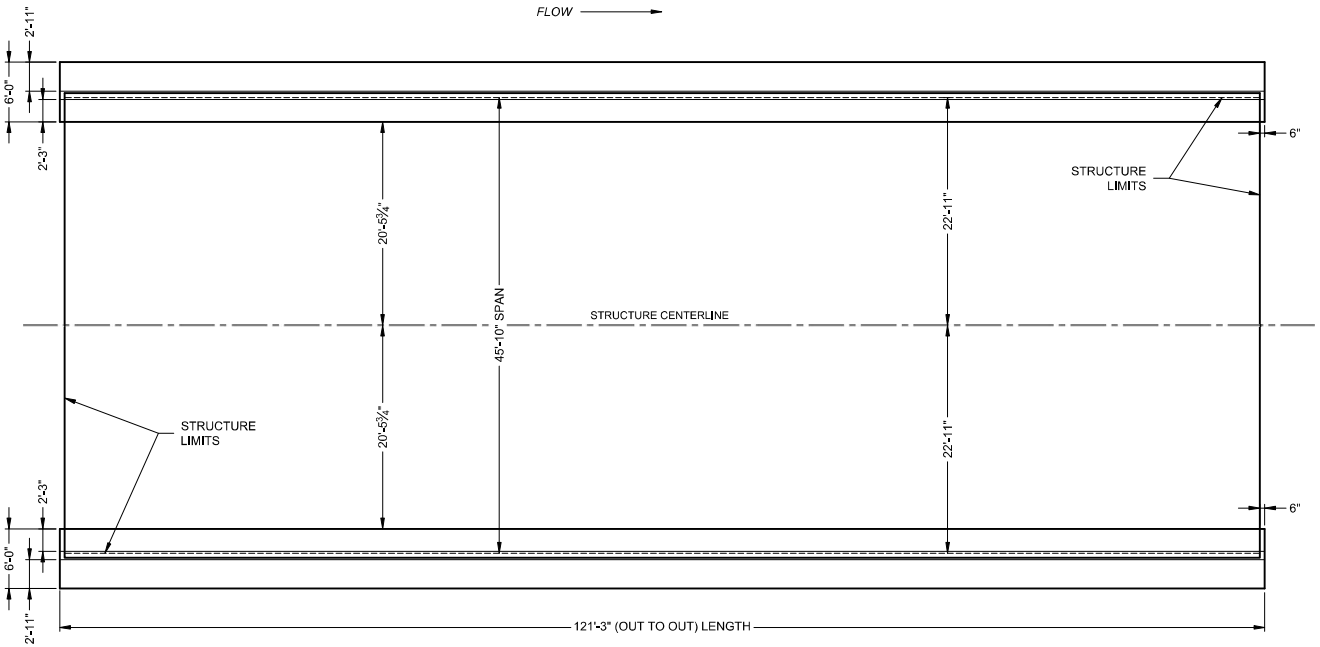
KEYWAY TO BE FILLED WITH NON-METALLIC, NON-SHRINK GROUT, WITH A MINIMUM 4,000 PSI COMPRESSIVE STRENGTH (ASTM C1107). GROUT AND SHIMMING MATERIAL SHOULD NOT CONTAIN ANY CORROSION-PROMOTING AGENTS.

DESIGN PARAMETERS:
DESIGN LIVE LOAD: HL-93, U80
DESIGN MAXIMUM FILL HEIGHT: 5.0'
DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN
DESIGN FACTORED BEARING RESISTANCE: 8000 PSF

THE FACTORED BEARING BEARING RESISTANCE WAS BASED ON FIGURE 8b (BEARING ON DENSE SAND) IN THE PROJECT GEOTECHNICAL REPORT PREPARED BY SHANNON & WILSON (SW PROJECT NO. 108855-001) DATED APRIL 2023. THE BEARING RESISTANCE IS GOVERNED BY THE STRENGTH LIMIT STATE AT THE 6 FT FOOTING WIDTH SHOWN. FOUNDATION SOILS SHALL BE PREPARED IN ACCORDANCE WITH THE RECOMMENDATIONS IN SECTIONS 6.1.2.1 AND 6.1.2.2 OF THE GEOTECHNICAL REPORT, INCLUDING REMOVAL AND REPLACEMENT OF SILT SOILS ENCOUNTERED AT THE FOOTING ELEVATION.



FOOTING CROSS SECTION



FOUNDATION PLAN

STATE OF ALASKA
49 TH
Joel A. Hahm
No.13396
REGISTERED PROFESSIONAL ENGINEER

10/30/23

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BridgeCor

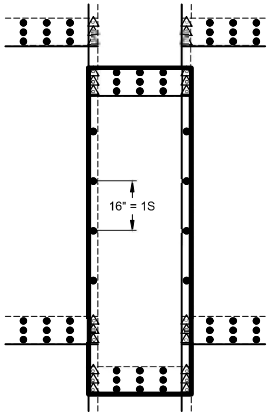
CONTECH CONTRACT DRAWING

BRIDGECOR SINGLE RADIUS ARCH
45'-10" SPAN X 22'-11" RISE
TYONEK CREEK - COOK INLET
ANCHORAGE, AK

PROJECT No.:	SEQ. No.:	DATE:
704132	010	3/1/2023
DESIGNED:		DRAWN:
XXX		SCC
CHECKED:		APPROVED:
JAH		XXX
SHEET NO.:		
4	OF	8

NOTES:

1. ALL COMPONENTS MUST BE ASSEMBLED AS SHOWN. PAY CLOSE ATTENTION TO MARK NUMBERS ON THE COMPONENTS.
2. MANUFACTURING FACILITY: MANSFIELD, TX.
3. REFERENCE FINAL SHEET FOR PLATE LAP DETAIL.



EXAMPLE PLATE LAYOUT

SCALE: N.T.S.

LEGEND

● 2 PLATE LAP SEAMS

△ 3-PLATE SEAM

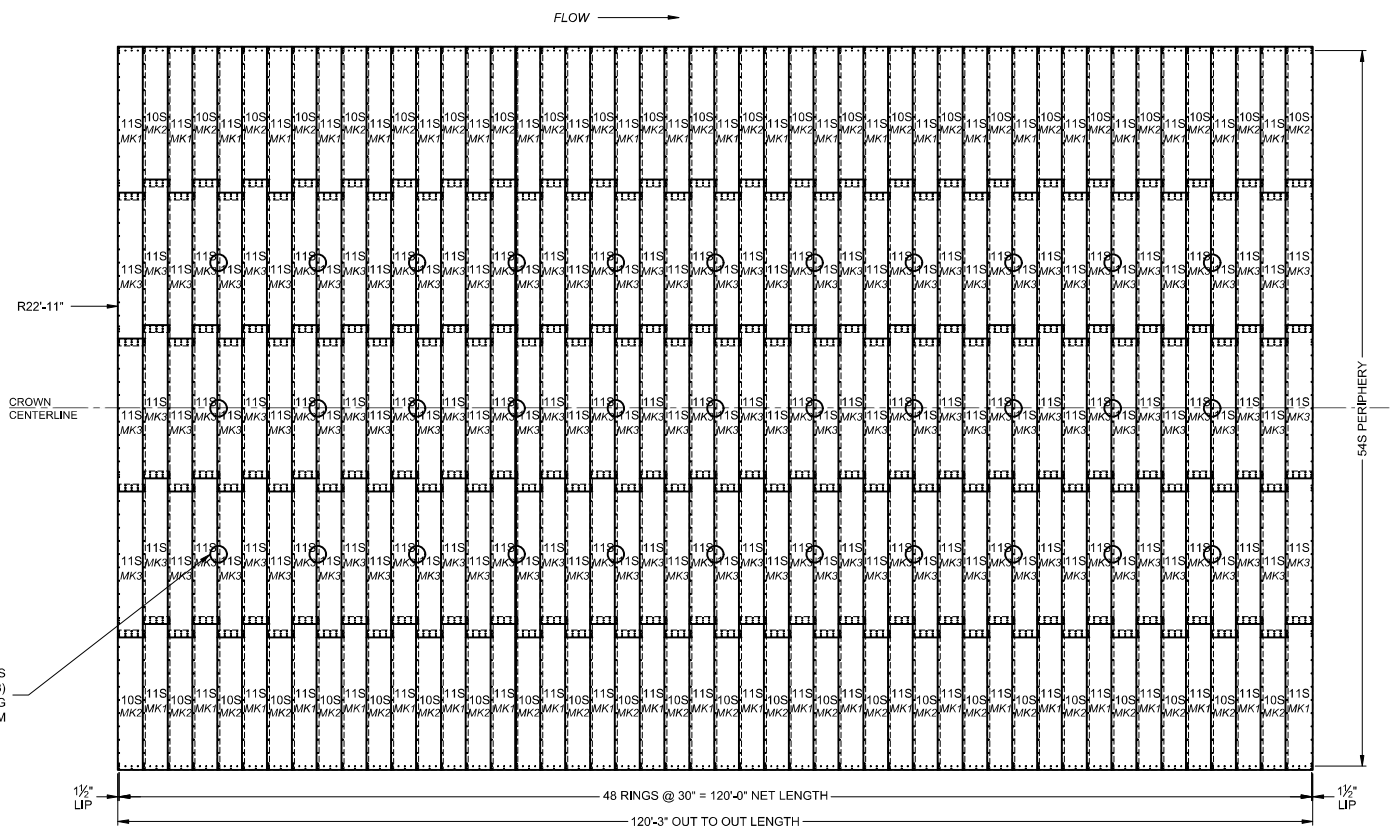


PLATE LAYOUT DRAWING
BRIDGECOR SINGLE RADIUS ARCH (OUTSIDE VIEW)
45'-10" SPAN x 22'-11" RISE

BRIDGECOR PLATE DETAILS (30" LONG PLATES)						
PLATE WIDTH "S"	GAGE	PLATE QTY.	MK #	OVERALL WIDTH (INCHES)	NUMBER OF CIRCUMFERENTIAL BOLT HOLES AT 16" CENTERS	PLATE WEIGHT WITHOUT FASTENERS
10	3	48	2	169	11	506
11	3	192	1 ; 3	185	12	554

STATE OF ALASKA 49 TH
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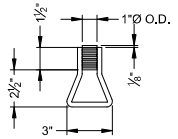
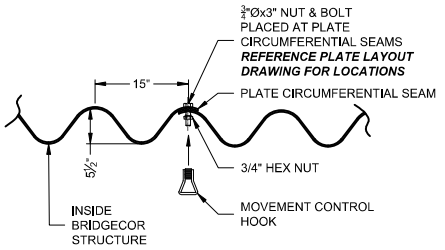
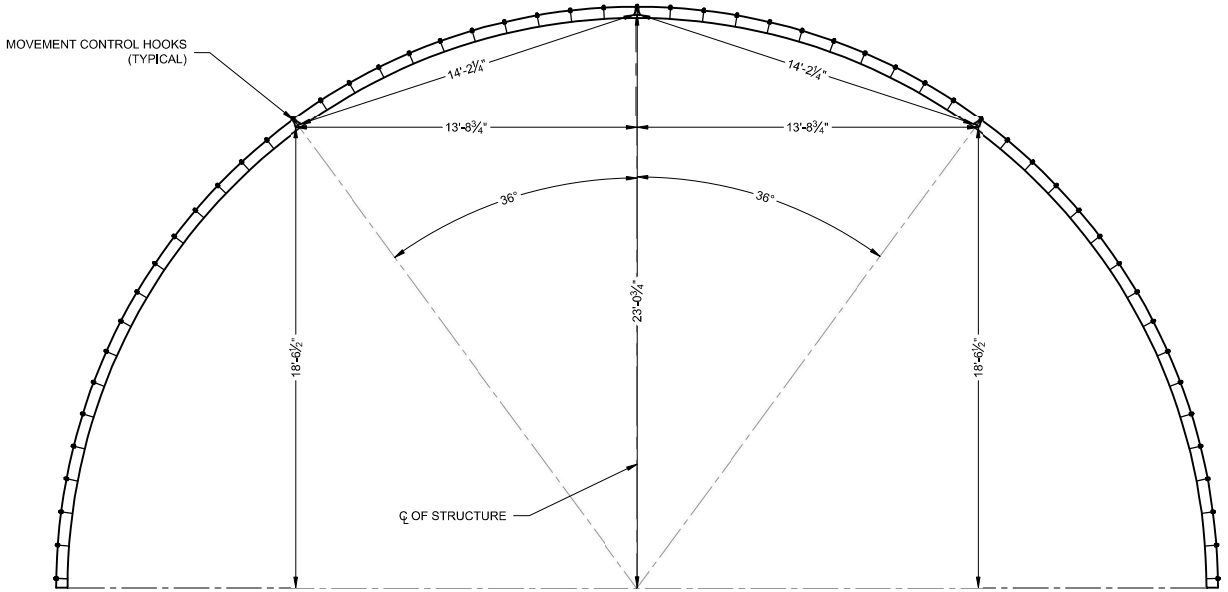
NOTES:

1. REFERENCE PLATE LAYOUT DIAGRAM FOR MOVEMENT CONTROL HOOK LOCATIONS.





MOVEMENT CONTROL HOOK DETAIL



MOVEMENT CONTROL HOOK PLACEMENT DETAIL

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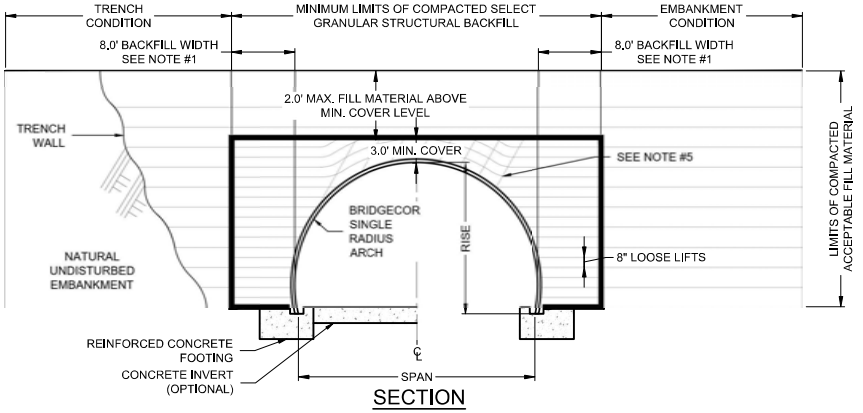

SECTION

SELECT GRANULAR STRUCTURAL BACKFILL LIMITS.

INITIAL LIFTS OVER THE CROWN OF STRUCTURE AS INDICATED BY SHADED AREA TO BE COMPACTED TO REQUIRED DENSITY WITH HAND OPERATED EQUIPMENT OR WITH LIGHTWEIGHT TRACTOR (D-4 OR LIGHTER) EQUIPMENT.

NOTES:

1. MINIMUM SELECT GRANULAR STRUCTURAL BACKFILL WIDTH IS BASED ON AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12 AND/OR THE RESULTS OF THE PROJECT SPECIFIC FINITE ELEMENT ANALYSIS.
2. ALL SELECT GRANULAR STRUCTURAL BACKFILL TO BE PLACED IN A BALANCED FASHION IN THIN LIFTS (8" LOOSE TYPICALLY) AND COMPACTED TO 90 PERCENT DENSITY PER AASHTO T-180.
3. MONITORING OF THE SINGLE RADIUS ARCH STRUCTURE IS REQUIRED DURING THE BACKFILLING PROCESS. THE METHOD, FREQUENCY AND DURATION SHALL BE DETERMINED BASED ON THE SIZE AND SHAPE OF THE STRUCTURE.
4. PREVENT DISTORTION OF SHAPE AS NECESSARY BY VARYING COMPACTION METHODS AND EQUIPMENT.
5. PLACE SELECT GRANULAR STRUCTURAL BACKFILL IN RADIAL LIFTS AT APPROXIMATELY 75% OF THE RISE OF THE SINGLE RADIUS ARCH STRUCTURE.
6. BECAUSE OF THE FLEXING AND VIBRATION OF THE CROWN PLATES, THE FULL COMPACTION DENSITY LEVELS OFTEN CAN NOT BE ACHIEVED IN THE FIRST SEVERAL INCHES OF FILL OVER THE CROWN.

BASED ON A PROJECT SPECIFIC ANALYSIS GAGE TO BE 3
BACKFILL MATERIAL TO BE A-1, COMPACTED TO 90 %
PER AASHTO T-180.

IF OTHER BACKFILL MATERIALS ARE TO BE EVALUATED, CONTACT YOUR LOCAL CONTECH REPRESENTATIVE.

ADDITIONAL SELECT GRANULAR STRUCTURAL BACKFILL NOTES:

SATISFACTORY BACKFILL MATERIAL, PROPER PLACEMENT, AND COMPACTION ARE KEY FACTORS IN OBTAINING MAXIMUM STRENGTH AND STABILITY.

THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND FOREIGN MATERIAL THAT COULD CAUSE HARD SPOTS OR DECOMPOSE TO CREATE VOIDS. BACKFILL MATERIAL SHOULD BE WELL GRADED GRANULAR MATERIAL THAT MEETS THE REQUIREMENTS OF THE PROJECT SPECIFIC ANALYSIS NOTED BELOW. REFERENCE THE STRUCTURAL PLATE BACKFILL GROUP CLASSIFICATION TABLE ON THIS SHEET. RECYCLED CONCRETE/SLAG ARE NOT RECOMMENDED FOR STRUCTURAL BACKFILL MATERIAL.
BACKFILL MUST BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN 8" LOOSE LIFTS. EACH LIFT IS TO BE COMPACTED TO A MINIMUM OF 90% DENSITY PER AASHTO T-180.

A HIGH PERCENTAGE OF SILT OR FINE SAND IN THE NATIVE SOILS SUGGESTS THE NEED FOR A WELL GRADED GRANULAR BACKFILL MATERIAL TO PREVENT SOIL MIGRATION. IF THE PROPOSED BACKFILL IS NOT A WELL GRADED GRANULAR MATERIAL, A NON-WOVEN GEOTEXTILE FILTER FABRIC SHALL BE PLACED BETWEEN THE SELECT BACKFILL AND THE IN SITU MATERIAL.

DURING BACKFILL, ONLY LIGHTWEIGHT TRACKED VEHICLES (D-4 OR LIGHTER) SHOULD BE NEAR THE STRUCTURE AS FILL PROGRESSES ABOVE THE CROWN AND TO THE FINISHED GRADE. THE ENGINEER AND CONTRACTOR ARE CAUTIONED THAT THE MINIMUM COVER MAY NEED TO BE INCREASED TO HANDLE TEMPORARY CONSTRUCTION VEHICLE LOADS (HEAVIER THAN D-4).

STRUCTURAL PLATE BACKFILL GROUP CLASSIFICATION, REFERENCE AASHTO M-145		
GROUP CLASSIFICATION	A-1-a	A-1-b
Sieve Analysis Percent Passing		
No. 10 (2.000 mm)	50 max.	---
No. 40 (0.425 mm)	30 max.	50 max.
No. 200 (0.075 mm)	15 max.	25 max.
Atterberg Limits for Fraction Passing No. 40 (0.425 mm)		
Liquid Limits	---	---
Plasticity Index	6 max.	6 max.
Usual Materials	Stone Fragment, Gravel and Sand	

*Modified from AASHTO M-145.

Fine beach sands, windblown sands, stream deposited sands, etc., exhibiting fine, rounded particles and typically classified by AASHTO M-145 as A-3 Materials should not be used.

If 95% compaction per AASHTO T-180 is specified, the backfill material shall be A-1-a.

Reference the most current version of ASTM D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), for comparable soil groups.

FOR APPROVAL

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49 TH
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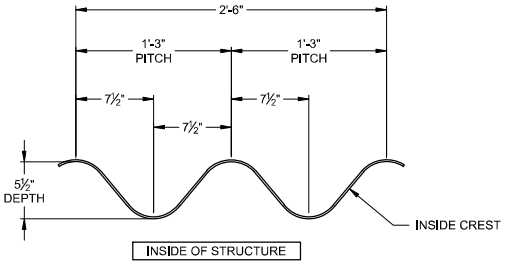


BRIDGECOR CORRUGATION PROFILE

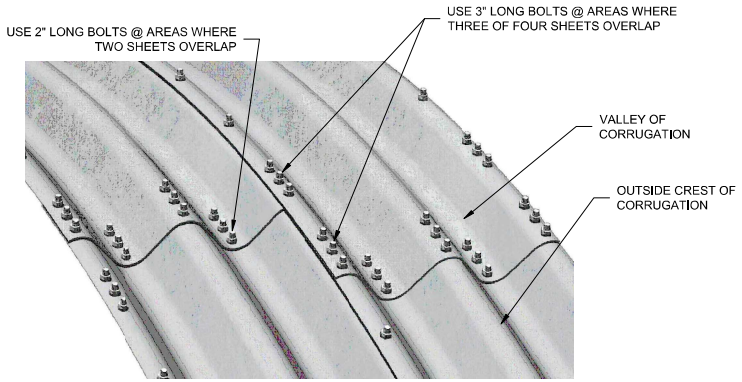
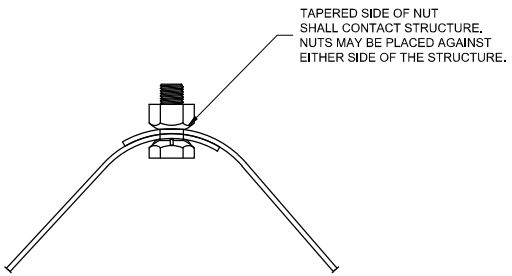


PLATE LAP DETAIL



TYPICAL BOLTING DETAIL

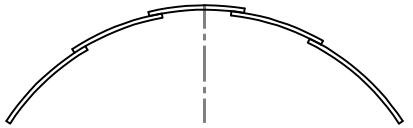


PLATE LAPPING DETAIL (LOOKING DOWNSTREAM)

STATE OF ALASKA
49 TH
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XXX		SCC
CHECKED:		APPROVED:
JAH		XXX
SHEET NO.:		
8	OF	8

Conditional Use Permit
Anadromous Waters Habitat Protection District
Staff Report

KPB File No.	**2024-02**
Planning Commission Meeting:	**January 22, 2024**
Applicant	**Tyonek Tribal Council**
Mailing Address	**101 W Benson Blvd Suite 501**
	Anchorage, AK 99503
Legal Description	**T 11N R 11W SEC 14 SM AN PORTION NW1/4 SEC 14 LYING SOUTH OF AREA KNOWN AS TYONEK CHIP MILL & CAMP FACILITY EXCLUDING USS 194 TRACT A**
KPB Parcel Number	**211-153-08**

Project Description

A Conditional Use Permit is sought pursuant to KPB 21.18 for the construction of replacing a culvert and adding fill to the roadway within the 50-foot Habitat Protection District of the Tyonek Creek, as established in KPB 21.18.040.

Background Information

The current culvert at this location is undersized and is preventing fish passage. In order to put the necessary size culvert in place, the road must be brought up to grade and fill placed around the culvert on both sides. This project will replace the failing culvert and redirect the stream into the historical channel, as the stream has moved significantly since the culvert was installed. Removal of debris around the culvert inlet will help prevent future blocking of the culvert and a root wad revetment barrier will keep the stream in the channel. There will be 484 cubic yards of rip rap placed at the culvert inlet to keep erosion from the road bank. Revegetation will include; 740 square yards of vegetative mat, 765 plantings of shrubs and trees, and re-seeding around the disturbed area.

Project Details within the 50-foot Habitat Protection District

1. Placement of 400 linear feet of root wads.
2. Placement of a 120 foot long, 45’-10” x 22’-11” single radius multiplate arch pipe culvert.
3. Placement of 484 cubic yards of rip rap.
4. Placement of 1490 cubic yards of additional fill.

Findings of fact pursuant to KPB 21.18.081 Conditional Use Permit

1. Portions of this proposed project are within the 50-foot habitat protection district as defined by KPB 21.18.040.
2. Pursuant to KPB 21.18.081(B)(5), construction of transportation and utility infrastructure may be approved as a conditional structure/use within the habitat protection district.

3. Pursuant to 21.18.081(D) General Standards, staff finds that the proposed project meets the five general standards.
4. Pursuant to KPB 21.18.020(A), this chapter was established to protect and preserve the stability of anadromous fish through controlling shoreline alterations and disturbances along anadromous waters and to preserve nearshore habitat.
5. Pursuant to KPB 21.18.20(B)(5), one purpose of this chapter was established to separate conflicting land uses.
6. The current culvert is undersized and is preventing fish passage in the stream.
7. The road bed itself must be brought up to grade to allow the placement of the larger culvert with the addition of fill.
8. Pursuant to KPB 21.06.081(D)(3), the proposed work will occur on the applicant's property and shall not have an adverse effect on adjoining properties.
9. Kenai Peninsula Borough Planning Commission Resolution 2015-35 defines water-dependent as:

   "…a use or structure located on, in or adjacent to water areas because the use requires access to the waterbody. The definition is applicable to facilities or activities that must be located at or near the shoreline and within the 50-foot buffer. An activity is considered water dependent if it is dependent on the water as part of the intrinsic nature of its operation. Examples of water dependent facilities may include, but are not limited to, piers, boat ramps, and elevated walkways."
10. The River Center found the application complete and scheduled a public hearing for January 22, 2023.
11. Agency review was distributed on January 10, 2024. No comments or objections have been received from resource agencies to date.
12. Pursuant to KPB 21.11.030, public notice was mailed to all property owners within a radius of 300 feet of the project on January 10, 2024. A total of 3 mailings were sent.
13. Pursuant to KPB 21.11.020, public notice was published in the Peninsula Clarion on January 10, 2024 and January 17, 2024.
14. The applicant is currently in compliance with Borough permits and ordinances.

Permit Conditions

1. Construction techniques and best management practices shall be utilized to ensure that land disturbing activities do not result in runoff or sedimentation to the Tyonek Creek.
2. The culvert must be designed and installed to meet KPB floodplain requirements.
3. The permittee shall minimize damage to all vegetation and shall revegetate all disturbed areas with native vegetation.
4. For each tree removed, two seedlings less than 5.5-feet tall of a species native to the region will be planted within the 50-foot HPD.
5. Storage or use of fuel is prohibited within 50-feet of any open water.
6. The River Center shall be notified at least 3 days prior to the start of the project.
7. If changes to the approved project described above are proposed prior to or during its siting, construction, or operation, the permittee is required to notify the River Center to determine if additional approval is required.
8. The permittee shall be held responsible for the actions of the contractors, agents, or others who perform work to accomplish the approved plan.
9. The construction or installation phase of this Conditional Use Permit must be completed within three calendar years from the date of the permit's issuance, or the Conditional Use Permit shall expire unless the Planning Commission finds that more time is necessary to effectuate the purposes of this chapter, in which case the commission may extend the deadline for a maximum of six years from the date of issuance. Prior to its expiration date and upon written request, the Planning Director may grant a Conditional Use Permit extension for 12 months (KPB 21.18.081 (H)).

10. In addition to the penalties provided by KPB 21.18.110, and pursuant to KPB 21.50, the permit may be revoked if the permittee fails to comply with the provisions of this chapter or the terms and conditions of a permit issued under this chapter. The Borough Clerk shall provide at least 15 day's written notice to the permittee of a revocation hearing before the hearing officer (KPB 21.18.082).
11. The permittee shall comply with the terms, conditions and requirements of the Kenai Peninsula Borough Code of Ordinances Chapter 21.18, and any regulations adopted pursuant to this chapter.
12. The permittee is responsible for abiding by all other federal, state, and local laws, regulations, and permitting requirements applicable to the project (KPB 21.18.081 (G)).

General Standards

Pursuant to 21.18.081(D) General Standards, the following standards shall be met before conditional use approval may be granted:

1. The use or structure will not cause significant erosion, sedimentation, damage within the habitat protection district, an increase in ground or surface water pollution, and damage to riparian wetlands and riparian ecosystems; **Conditions 1-3 and Findings 1-4 appear to support this standard.**
2. Granting of the conditional use shall be consistent with the purposes of this chapter, the borough comprehensive plan, other applicable chapters of the borough Code, and other applicable planning documents adopted by the borough; **Condition 12 and Finding 4-5 appear to support this standard.**
3. The development of the use or structure shall not physically damage the adjoining property; **Finding 8 appears to support this standard.**
4. The proposed use or structure is water-dependent; **Finding 6-7, 9 appears to support this standard.**
5. Applicant's or owner's compliance with other borough permits and ordinance requirements; **Conditions 12 and Finding 14 appear to support this standard.**

Attachments

Multi-Agency Application
Draft Resolution 2024-02

Recommendation

Based on the findings, staff finds that the proposed project meets the five general standards of KPB 21.18.081. The Planning Commission could consider additional permit conditions to mitigate for any habitat loss if it chooses.

Staff recommends the Planning Commission grant a Conditional Use Permit for the proposed project details subject to adopted conditions as set forth in 2024-02.

Note: An appeal of a decision of the Planning Commission may be filed to the Hearing Officer, in accordance with the requirements of the Kenai Peninsula Borough Code of Ordinances, Chapter 21.20.250. An appeal must be filed with the Borough Clerk within 15 days of date of the notice of the decision using the proper forms and be accompanied by the filing and records preparation fee.

END OF STAFF REPORT

Donald E. Gilman River Center
514 Funny River Road, Soldotna, Alaska 99669 • (907) 714-2460 • (907) 260-5992 Fax
A Division of the Planning Department

Peter A. Micciche
Borough Mayor

KENAI PENINSULA BOROUGH PLANNING COMMISSION
NOTICE OF PUBLIC HEARING

The Kenai Peninsula Borough received an application for a Conditional Use Permit under KPB 21.18.081 for a project within the 50-foot Habitat Protection District (HPD) of Tyonek Creek. This project has been scheduled for a public hearing before the Kenai Peninsula Borough Planning Commision.

Why are you receiving this notice?

Per code, property owners within 300 feet of the proposed project must receive notice of the public hearing. This project is located on Timber Road, Tyonek Alaska, Parcel ID 21115308. Our records indicate that you are a property owner within 300 feet of that parcel.

Project Description:

Tyonek Tribal Council is requesting to replace a failing culvert and add gravel to level the road within the 50-foot HPD of Tyonek Creek

How can you look at the application?

The meeting packet will be posted the week prior to the meeting. Once it has been posted it can be viewed at https://kpb.legistar.com/Calendar.

How do you attend the Planning Commission meeting?

When: Monday, January 22, 2024 at 7:30 p.m.
Where: Betty Glick Conference Room, George Navarre Building, 144 N Binkley St Soldotna AK
Zoom: Meeting ID 907 714 2200
https://us06web.zoom.us/j/9077142200
1-888-788-0099 or 1-877-853-5247

How do I comment on the project?

You can provide verbal comment at the meeting (see information above). You may also submit written comments. **Written comments must be received by 1:00 pm Friday, January 19, 2024.**

Mail comments to:
Donald E. Gilman River Center
514 Funny River Road
Soldotna, Alaska 99669

Email comments to:
planning@kpb.us
KenaiRivCenter@kpb.us

For additional information, please contact Morgan Aldridge at maldridge@kpb.us or (907) 714-2465.

KENAI PENINSULA BOROUGH PLANNING COMMISSION

RESOLUTION 2024-02

A RESOLUTION GRANTING A CONDITIONAL USE PERMIT PURSUANT TO KPB 21.18 FOR THE CULVERT REPLACEMENT AND PLACEMENT OF FILL WITHIN THE 50-FOOT HABITAT PROTECTION DISTRICT OF TYONEK CREEK.

WHEREAS, Chapter 21.18 provides for the approval of Conditional Use Permits for certain activities within the habitat protection district; and

WHEREAS, KPB 21.18.081 provides that a conditional use permit is required for construction not meeting the standards of KPB 21.18.071; and

WHEREAS, KPB 21.18.091 provides for mitigation measures by the planning department staff to address impacts to the Habitat Protection District from a proposed, ongoing, or completed project; and

WHEREAS, public notice was sent to all property owners within a 300-foot radius of the proposed activity as provided in Section 21.11.030; and

WHEREAS, public notice was published in the Peninsula Clarion on January 10, 2024 and January 17, 2024 as provided in Section 21.11.020; and

WHEREAS, public testimony was received at the January 22, 2023 meeting of the Kenai Peninsula Borough Planning Commission;

NOW, THEREFORE, BE IT RESOLVED BY THE PLANNING COMMISSION OF THE KENAI PENINSULA BOROUGH:

That the Planning Commission makes the following findings of fact pursuant to KPB 21.18:

Section 1. Project Details Within the 50-foot Habitat Protection District

1. Placement of 400 linear feet of root wads.
2. Placement of a 120 foot long, 45’-10” x 22’-11” single radius multiplate arch pipe culvert.
3. Placement of 484 cubic yards of rip rap.
4. Placement of 1490 cubic yards of additional fill.

Section 2. Findings of fact pursuant to KPB 21.18.081

1. Portions of this proposed project are within the 50-foot habitat protection district as defined by KPB 21.18.040.
2. Pursuant to KPB 21.18.081(B)(5), construction of transportation and utility infrastructure may be approved as a conditional structure/use within the habitat protection district.
3. Pursuant to 21.18.081(D) General Standards, staff finds that the proposed project meets the five general standards.

4. Pursuant to KPB 21.18.020(A), this chapter was established to protect and preserve the stability of anadromous fish through controlling shoreline alterations and disturbances along anadromous waters and to preserve nearshore habitat.
5. Pursuant to KPB 21.18.20(B)(5), one purpose of this chapter was established to separate conflicting land uses.
6. The current culvert is undersized and is preventing fish passage in the stream.
7. The road bed itself must be brought up to grade to allow the placement of the larger culvert with the addition of fill.
8. Pursuant to KPB 21.06.081(D)(3), the proposed work will occur on the applicant's property and shall not have an adverse effect on adjoining properties.
9. Kenai Peninsula Borough Planning Commission Resolution 2015-35 defines water-dependent as:

   "…a use or structure located on, in or adjacent to water areas because the use requires access to the waterbody. The definition is applicable to facilities or activities that must be located at or near the shoreline and within the 50-foot buffer. An activity is considered water dependent if it is dependent on the water as part of the intrinsic nature of its operation. Examples of water dependent facilities may include, but are not limited to, piers, boat ramps, and elevated walkways."
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13. Pursuant to KPB 21.11.020, public notice was published in the Peninsula Clarion on January 10, 2024 and January 17, 2024.
14. The applicant is currently in compliance with Borough permits and ordinances.

Section 3. Permit Conditions

1. Construction techniques and best management practices shall be utilized to ensure that land disturbing activities do not result in runoff or sedimentation to Tyonek Creek.
2. The culvert and fill must be designed and installed to meet KPB floodplain requirements.
3. The permittee shall minimize damage to all vegetation and shall revegetate all disturbed areas with native vegetation.
4. For each tree removed, two seedlings less than 5.5-feet tall of a species native to the region will be planted within the 50-foot HPD.
5. Storage or use of fuel is prohibited within 50-feet of any open water.
6. The River Center shall be notified at least 3 days prior to the start of the project.
7. If changes to the approved project described above are proposed prior to or during its siting, construction, or operation, the permittee is required to notify the River Center to determine if additional approval is required.
8. The permittee shall be held responsible for the actions of the contractors, agents, or others who perform work to accomplish the approved plan.
9. The construction or installation phase of this Conditional Use Permit must be completed within three calendar years from the date of the permit's issuance, or the Conditional Use Permit shall expire unless the Planning Commission finds that more time is necessary to effectuate the purposes of this chapter, in which case the commission may extend the deadline for a maximum of six years from the date of issuance. Prior to its expiration date and upon written request, the

Planning Director may grant a Conditional Use Permit extension for 12 months (KPB 21.18.081 (H)).

10. In addition to the penalties provided by KPB 21.18.110, and pursuant to KPB 21.50, the permit may be revoked if the permittee fails to comply with the provisions of this chapter or the terms and conditions of a permit issued under this chapter. The Borough Clerk shall provide at least 15 day's written notice to the permittee of a revocation hearing before the hearing officer (KPB 21.18.082).
11. The permittee shall comply with the terms, conditions and requirements of the Kenai Peninsula Borough Code of Ordinances Chapter 21.18, and any regulations adopted pursuant to this chapter.
12. The permittee is responsible for abiding by all other federal, state, and local laws, regulations, and permitting requirements applicable to the project (KPB 21.18.081 (G)).

Section 4. Pursuant to 21.18.081(D) General Standards, the following standards shall be met before conditional use approval may be granted:

1. The use or structure will not cause significant erosion, sedimentation, damage within the habitat protection district, an increase in ground or surface water pollution, and damage to riparian wetlands and riparian ecosystems; **Conditions 1-**3 **and Findings 1-4 appear to support this standard.**
2. Granting of the conditional use shall be consistent with the purposes of this chapter, the borough comprehensive plan, other applicable chapters of the borough Code, and other applicable planning documents adopted by the borough; **Condition 12 and Findings 4-5 appear to support this standard.**
3. The development of the use or structure shall not physically damage the adjoining property; **Finding 8 appears to support this standard.**
4. The proposed use or structure is water-dependent; **Findings 6-7, 9 appear to support this standard.**
5. Applicant's or owner's compliance with other borough permits and ordinance requirements. **Condition 12 and Finding 14 appears to support this standard.**

THIS CONDITIONAL USE PERMIT EFFECTIVE ON _____ DAY OF_____, 2024.

_____
Jeremy Brantley, Chairperson
Planning Commission

ATTEST:

_____
Ann Shirnberg
Administrative Assistant

Note: An appeal of a decision of the Planning Commission may be filed to the hearing officer, in accordance with the requirements of the KPB Code of Ordinances, Chapter 21.20.250. An appeal must be filed with the Borough Clerk within 15 days of date of the notice of the decision using the proper forms and be accompanied by the filing and records preparation fee.