

DRAFTED | B.W. RM. BA. | CHECKED | D.L. | DESIGNED | B.W. RM. BA. | LAYOUT | A.T. | DATE | 9/10/2020 13:32 | FILE | G:\V\A\0002098\Plan\AK122\00098_A1.dwg

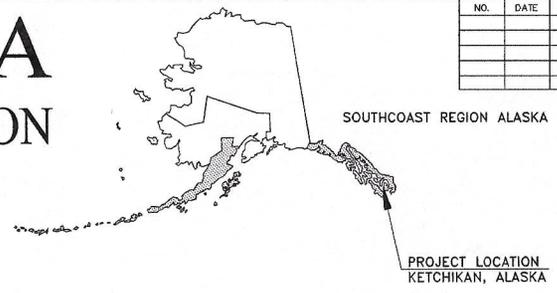
STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

HIGHWAY PROJECT

KTN WOOD ROAD CULVERT REPLACEMENT AK122

PROJECT NO. 0003212/SFHWHY00098



NO.	DATE	REVISIONS	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHWHY00098	2020	A1	17
			CDS ROUTE: 291360		MILEPOINT: 0.15 TO 0.35		
			LATITUDE: 55°19'33.04"N		LONGITUDE: 131°31'48.80"W		

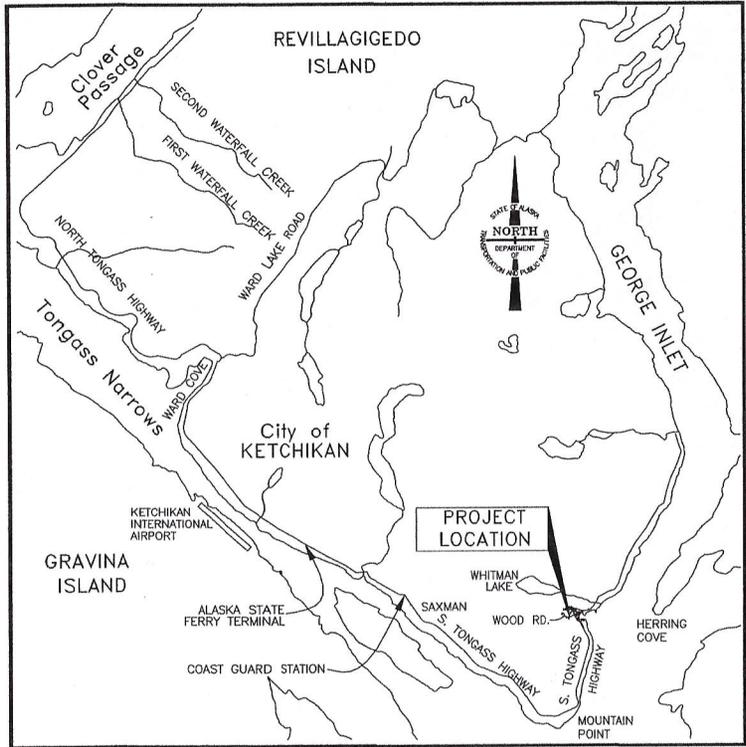
Asbuilt 8/3/2022
2nd Version

The undersigned hereby certifies that this duplicated document is an exact and true copy of the original.

Jessica Dinkale

January 14, 2021

PROJECT SUMMARY	
WOOD ROAD, KETCHIKAN, ALASKA. MILE POINTS 0.15 TO 0.35	
WIDTH OF PAVEMENT	18'
LENGTH OF PAVING	100'
LENGTH OF THE PROJECT	100'



Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

PE *Matthew Spear* 8/3/22

PRINTED: 9/10/2020

USE THESE PLANS IN CONJUNCTION WITH THE STATE OF ALASKA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2020 EDITION AND THE PROJECT SPECIAL PROVISIONS.

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
6860 GLACIER HIGHWAY, JUNEAU, AK 99801
(907) 465-1763

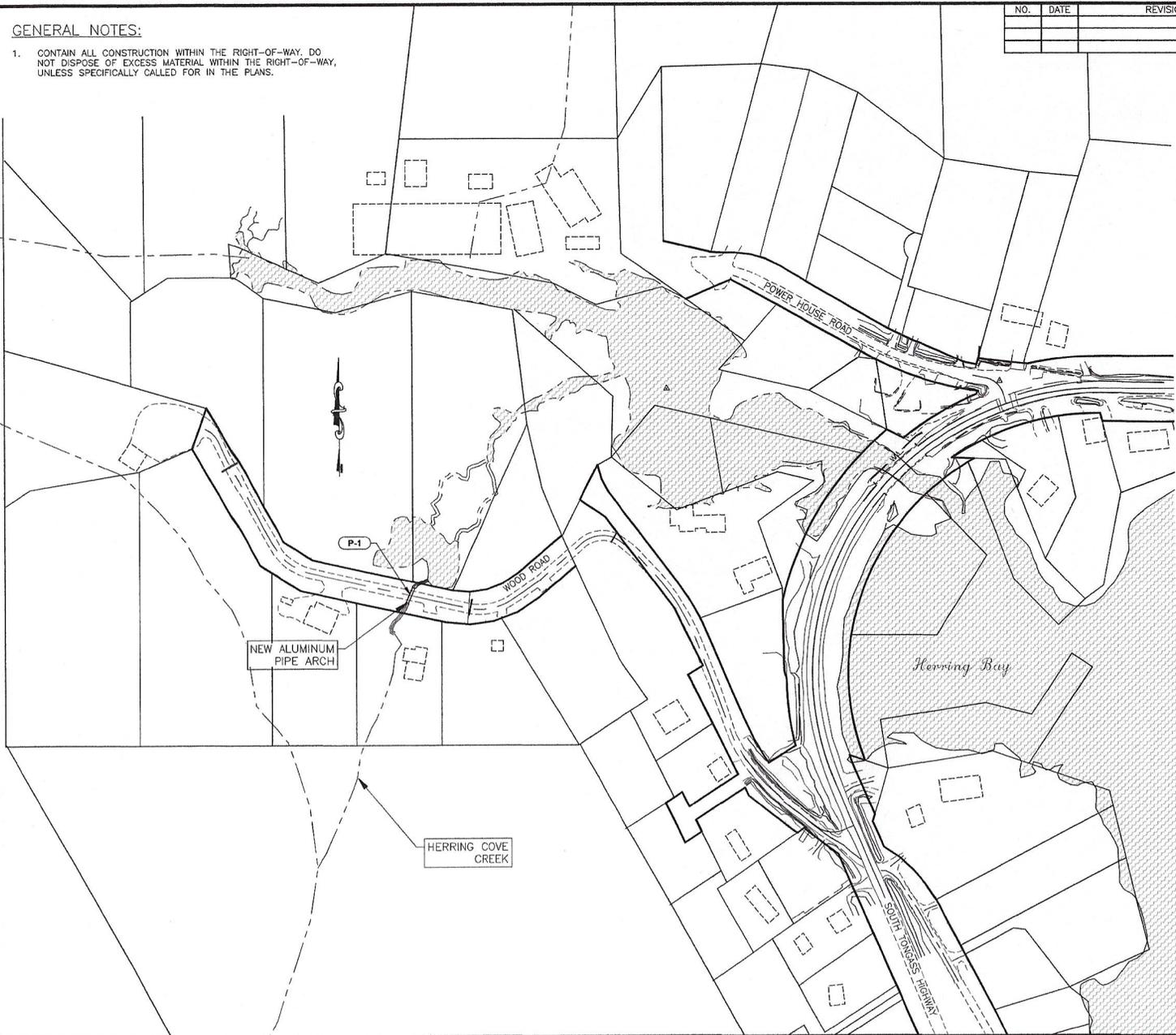
APPROVED: *Kirk Miller*
Digitally signed by Kirk Miller
Date: 2020.09.17 15:16:22 -0800

KIRK MILLER, P.E. REGIONAL PRECONSTRUCTION ENGINEER DATE

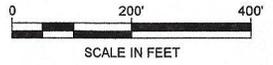
CONCUR: *D. Lance Meurig* 2020.09.17 15:16:22
D. LANCE MEURIG, P.E. DIRECTOR, SOUTHCOAST REGION DATE

FILE | C:\K1\k1\p002098\Project\002098_A2.dwg | DATE | 9/11/2020 8:47 | LAYOUT | A2 | DESIGNED | BW, NM, BA | CHECKED | DL | DRAFTED | BW, NM, BA

GENERAL NOTES:
 1. CONTAIN ALL CONSTRUCTION WITHIN THE RIGHT-OF-WAY. DO NOT DISPOSE OF EXCESS MATERIAL WITHIN THE RIGHT-OF-WAY, UNLESS SPECIFICALLY CALLED FOR IN THE PLANS.



NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHWO0098	2020	A2	17



INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
A1	TITLE SHEET
A2	LAYOUT & INDEX OF SHEETS
A3	LEGEND / SYMBOLS
SCS1-SCS2	SURVEY CONTROL
B1	TYPICAL SECTION
C1	ESTIMATE OF QUANTITIES
D1	SUMMARY TABLES
E1-E4	DETAILS
F1-F2	PLANVIEW
P1-P2	EROSION & POLLUTION CONTROL PLAN
T1	TRAFFIC CONTROL PLAN

THE FOLLOWING ALASKA STANDARD PLANS APPLY TO THIS PROJECT:
 M-13.01
 M-16.01
 M-20.14

Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

PE *Matthew Sperry* 8/3/22

NOTE: THIS BASEMAP IS NOT SURVEYED AND DIGITIZED FOR WOOD ROAD DISPLAY ONLY.



STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
 KTN WOOD ROAD CULVERT
 REPLACEMENT AK122

INDEX

FILE: \\s:\york\york\00098\Project\00098_A3.dwg
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 DRAFTED: BW, NN, BA

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHWW00098	2020	A3	17

	RECOVERED	SET
BLM MONUMENT		
GLO MONUMENT		
USC&GS MONUMENT		
PRIMARY MONUMENT		
CENTERLINE MONUMENT IN CASING		
PRIMARY R.O.W. MONUMENT		
BEARING OBJECT		
MISCELLANEOUS MONUMENT		
LINE OF SIGHT MONUMENT		
CONCRETE R.O.W. MONUMENT		
BENCHMARK		
REBAR AND CAP		
REBAR		
IRON PIPE		
PK NAIL		
SPIKE		
HUB AND TACK		
CONSTRUCTION CENTERLINE		
MISCELLANEOUS CENTERLINE		
STATION EQUATION		
PROJECT RIGHT-OF-WAY LINE		
EXISTING RIGHT-OF-WAY LINE		
EXISTING PROPERTY LINE		
CONTROLLED ACCESS LINE		
EXISTING EASEMENT LINE		
PROPOSED EASEMENT LINE		
PROPOSED CUT SLOPE LIMIT		
PROPOSED FILL SLOPE LIMIT		
SECTION LINE		
1/4 SECTION LINE		
1/16 SECTION LINE		
TOWNSHIP & RANGE LINE		
MEANDER LINE		

	EXISTING	PROPOSED
SANITARY SEWER (FLOW DIRECTION →)		
FUEL LINE		
GAS LINE		
WATER LINE		
METER, VALVE, FIRE HYDRANT		
EXISTING STORM DRAIN (FLOW DIRECTION →)		
PROPOSED STORM DRAIN		
FIBER OPTIC LINE		
DIRECT BURIAL TELEPHONE CABLE		
DIRECT BURIAL ELECTRIC CABLE		
ELECTRIC LINE (OVERHEAD)		
POWER POLE LINE		
JOINT USE POWER & TELEPHONE		
TELEPHONE POLE LINE		
POLE ANCHOR		
STUB POLE (POWER OR TELEPHONE)		
TELEPHONE DUCT		
TELEPHONE PEDESTAL		
BURIED CABLE MARKER		
PIPELINE MARKER OR VALVE		
CATCH BASIN OR DROP INLET		
MANHOLE		
SANITARY SEWER CLEAN OUT		
RIPRAP		
SPECIAL DITCH CENTERLINE		
HIGH TIDE LINE		

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 PE *Matthew Speran* 8/3/22

	EXISTING	PROPOSED
ROADWAY/PAVEMENT EDGE		
FENCE		
CURB AND GUTTER		
DETECTABLE WARNINGS		
GUARDRAIL		
CULVERT PIPE		
SIGN		
MAILBOX		
RAILROAD TRACKS		
RAILROAD DEVICES		
TREE LINE		
WATER BOUNDARY		
ORDINARY HIGH WATER LINE		
FLOW CENTERLINE		
FLOW DIRECTION		
WETLANDS		
EXISTING BUILDINGS		
POST OR BOLLARD		
WELL OR MONITORING WELL		
SEPTIC PIPE		
FUEL TANK FILL PIPE/VENT		
SATELLITE DISH		
TEST HOLE		
CONIFER TREE		
DECIDUOUS TREE		
GRAVE		
THERMOSIPHON		
PARKING METER		
VEHICLE PLUG-IN		
DELINEATOR/GUIDE MARKER		

H = HOUSE
 G = GARAGE
 M = MERCHANT/STORE
 B = BARN
 S = SHED
 P = PRIVY
 SS = SERVICE STATION
 W = WAREHOUSE

	EXISTING	PROPOSED
JUNCTION BOX, TYPE IA		
JUNCTION BOX, TYPE II		
JUNCTION BOX, TYPE III		
SIGNAL FACE, VEHICULAR		
SIGNAL FACE, BACKPLATE		
SIGNAL FACE, LEFT TURN, BACKPLATE		
SIGNAL FACE, PEDESTRIAN		
LOOP DETECTOR		
VIDEO DETECTOR		
RADAR DETECTOR		
OPTICOM DETECTOR		
PEDESTRIAN PUSH BUTTON		
SIGNAL POST W/O MAST ARM		
SIGNAL POLE W/MAST ARM		
SIGNAL CONTROLLER		
LOAD CENTER		
LUMINAIRE		
RIGID METAL CONDUIT		

ABBREVIATIONS:

A.A.D.T.	AVERAGE ANNUAL DAILY TRAFFIC
BOP	BEGINNING OF PROJECT
BFM	BONDED FIBER MATRIX
CL	CENTER LINE
CMP	CORRUGATED METAL PIPE
DIA.	DIAMETER
E.	EASTING
EOP	END OF PROJECT
EXIST.	EXISTING
FT	FOOT
INV	INVERT
LT	LEFT
N:	NORTHING
NO.	NUMBER
O.D.	OUTSIDE DIAMETER
P.E.	PROFESSIONAL ENGINEER
ROW	RIGHT-OF-WAY
RT	RIGHT
STA.	STATION
V	VELOCITY



STATE OF ALASKA DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
 8860 GLACIER HIGHWAY, JUNEAU, AK 99811
 (907) 465-1783
**KTN WOOD ROAD
 CULVERT REPLACEMENT
 AK122**

LEGEND

HORIZONTAL CONTROL

Horizontal Control for this project is based on the DOT/PF South Tongass Grid 2000.

The DOT/PF Ketchikan South Tongass Grid -2000 System is a local ground coordinate system based at DOT/PF GPS control station 95-K-4 (#36). It relates to AKSPC zone 1 NAD83 (92) through the following parameters:
 Zone = NAD83 AKSPC ZONE 1
 Grid Scale = 0.999900264
 Convergence = +144'48"
 Translation about DOT/PF control point 95-K-4 as follows:
 AKSPC Northing = 1277612.22594 FT US
 AKSPC Easting = 3117379.86890 FT US
 Local Northing = 328083.33333 FT US
 Local Easting = 656166.66667 FT US

95-K-4 : 2" Brass Cap located in the breakwater of Saxman harbor,

NAD83(1992) Lat 5518'51.8820" N Long 13135'43.1545" W
 KTN_S-Tongass-Grid N 328083.3333' E 656166.6667'
 AKSPC N=1277612.22594' E=3117379.86890'

95-K-6 : 2" Brass Cap in bedrock on beach located adjacent to 2976 S. Tongass

NAD83(1992) Lat 5518'49.0933" N Long 13135'23.7309" W
 KTN_S-Tongass-Grid N 327799.9386' E 657290.4836'
 AKSPC N 1277363.2420' E 3118511.6888'

MONUMENT NOTES:

- IF ANY PAIR OF CONTROL POINTS DISAGREES FROM PUBLISHED VALUE BY MORE THAN 1:10,000 HORIZONTALLY OR VERTICALLY THEN A THIRD NETWORK POINT MUST BE TIED TO ASCERTAIN WHICH POINT IS IN ERROR OR HAS BEEN DISTURBED.
- WHETHER LISTED OR NOT, ALL PROPERTY MONUMENTS, OR PROPERTY MARKERS, CORNERS OR ACCESSORIES WHICH WILL BE DISTURBED OR BURIED SHALL BE REFERENCED PRIOR TO BEING DISTURBED, AND RE-ESTABLISHED IN THEIR ORIGINAL HORIZONTAL POSITION AND A RECORD OF MONUMENT FORM IN ACCORDANCE WITH (A.S.34.65.040) AND (A.S.19.10.260) SHALL BE SUBMITTED TO THE CONSTRUCTION ENGINEER FOR REVIEW PRIOR TO RECORDING. COORDINATE VALUES LISTED ARE FOR INFORMATIONAL PURPOSES AND SHOULD BE USED TO RESET MONUMENTS ONLY AS A LAST RESORT.
- WHEN POSSIBLE ALL ORIGINAL PRIMARY MONUMENTS SHALL BE SAVED AND RESET IN THEIR ORIGINAL HORIZONTAL POSITION AND A RECORD OF MONUMENT FORM IN ACCORDANCE WITH (A.S.34.65.040) AND (A.S.19.10.260) SHALL BE SUBMITTED TO THE CONSTRUCTION ENGINEER FOR REVIEW PRIOR TO RECORDING
- RIGHT OF WAY LOCATION IS SHOWN FOR GRAPHICAL ORIENTATION PURPOSES ONLY. REFER TO ALASKA DOT&PF RIGHT OF WAY MAPS FOR RIGHT OF WAY INFORMATION.
- HORIZONTAL AND VERTICAL CONTROL MUST BE FIELD VERIFIED BY THE CONTRACTOR. DISCREPANCIES WILL BE REPORTED TO DOT&PF CONSTRUCTION PROJECT ENGINEER.

Point #	Northing	Easting	Elevation	Description	Station	Offset
6	332285.59	669588.64	43.49	SPIKE	15+51.69	0.75L
7	332217.27	669960.68	28.06	SPIKE	11+75.75	10.80L
8	332387.13	670207.01	27.55	SPIKE	N/A	N/A

All **SURVEY CONTROL** monuments in this table are provided strictly for survey control. Should any of them be destroyed during construction they **shall not** be replaced.

Existing Property monuments **SHALL BE PRESERVED IN PLACE**. All **property monuments** in this **existing monument** table shall be preserved and referenced prior to disturbance and replaced at their original horizontal position. **A RECORD OF MONUMENT FORM IN ACCORDANCE WITH A.S.34.65.040 SHALL BE SUBMITTED TO DOT&PF PROJECT ENGINEER FOR REVIEW PRIOR TO RECORDING FOR EACH MONUMENT.**

Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

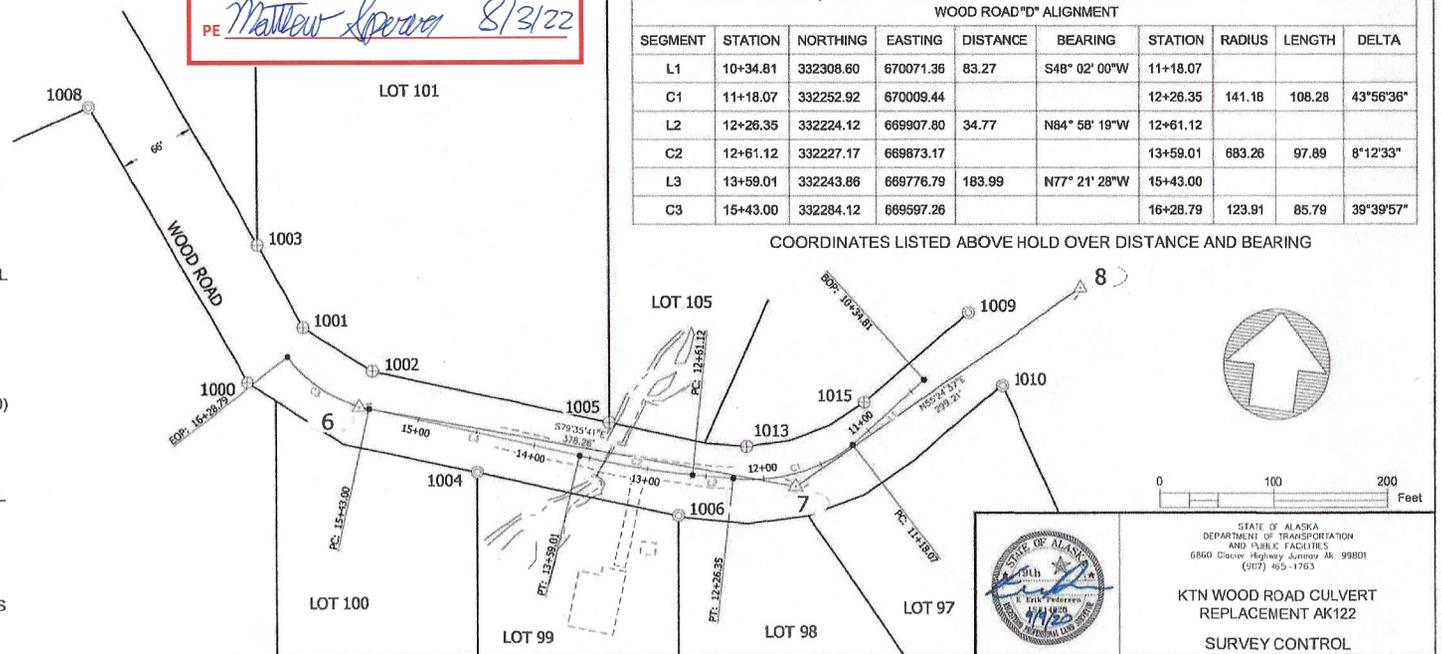
PE Matthew Sperow 8/3/22

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHwy00098	2020	SCS1	17

Point #	Northing	Easting	Description	Station	Offset
1000	332307.16	669491.39	BC_3.25" DIGMON_BLM-S2801_ROW-LOT 103 C5	N/A	N/A
1001	332354.12	669540.61	BC_3.25" DIGMON_BLM-S2801_ROW-LOT 101 C3	N/A	N/A
1002	332316.52	669600.16	BC_3.25" DIGMON_BLM-S2801_ROW-LOT 101 C2	15+48.69	32.16R
1003	332424.60	669500.92	BC_3.25" DIGMON_BLM-S2801_ROW-LOT 102 C1-LOT 101 C4	N/A	N/A
1004	332229.83	669688.62	PLASCAP_LS3408	14+41.98	32.98L
1005	332272.22	669802.01	BC_3.25" DIGMON_BLM-S2801_ROW-LOT 101 C1-LOT 105 C2	13+40.46	33.36R
1006	332192.43	669960.83	ALCAP_LS6269	12+69.50	35.84L
1008	332543.80	669357.79	PLASCAP_UNREADABLE_GOOD CONDITION	N/A	N/A
1009	332366.11	670109.71	SPINHOLE_BC ON IP_LOG ON MON	N/A	N/A
1010	332303.55	670137.79	IP_NO CAP SOLID	N/A	N/A
1011	332167.40	670296.35	BC_2.5" GLO USLM S2216_1934	N/A	N/A
1012	332115.51	670225.48	BC_3.25" DIGMON_BLM-S2801C1 LOT97-S2397 C7-LOT35 C3	10+49.33	246.64L
1013	332251.60	669919.34	BC_3.25" DIGMON_BLM-S2801 C17 ROW_S2408 TR B LOT 77	12+15.69	28.23R
1015	332289.59	670019.30	BC_2.5" GLO S2403 TRB C2 L77-PC ROW	10+86.22	20.67R

SEGMENT	STATION	NORTHING	EASTING	DISTANCE	BEARING	STATION	RADIUS	LENGTH	DELTA
L1	10+34.81	332308.60	670071.36	83.27	S48° 02' 00"W	11+18.07			
C1	11+18.07	332252.92	670009.44			12+26.35	141.18	108.28	43°56'36"
L2	12+26.35	332224.12	669907.80	34.77	N84° 58' 19"W	12+61.12			
C2	12+61.12	332227.17	669873.17			13+59.01	683.26	97.89	8°12'33"
L3	13+59.01	332243.86	669776.79	183.99	N77° 21' 28"W	15+43.00			
C3	15+43.00	332284.12	669597.26			16+28.79	123.91	85.79	39°39'57"

COORDINATES LISTED ABOVE HOLD OVER DISTANCE AND BEARING



STATE OF ALASKA
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 8650 Chena Highway, Anchorage, AK 99501
 (907) 465-1763

KTN WOOD ROAD CULVERT
 REPLACEMENT AK122

SURVEY CONTROL

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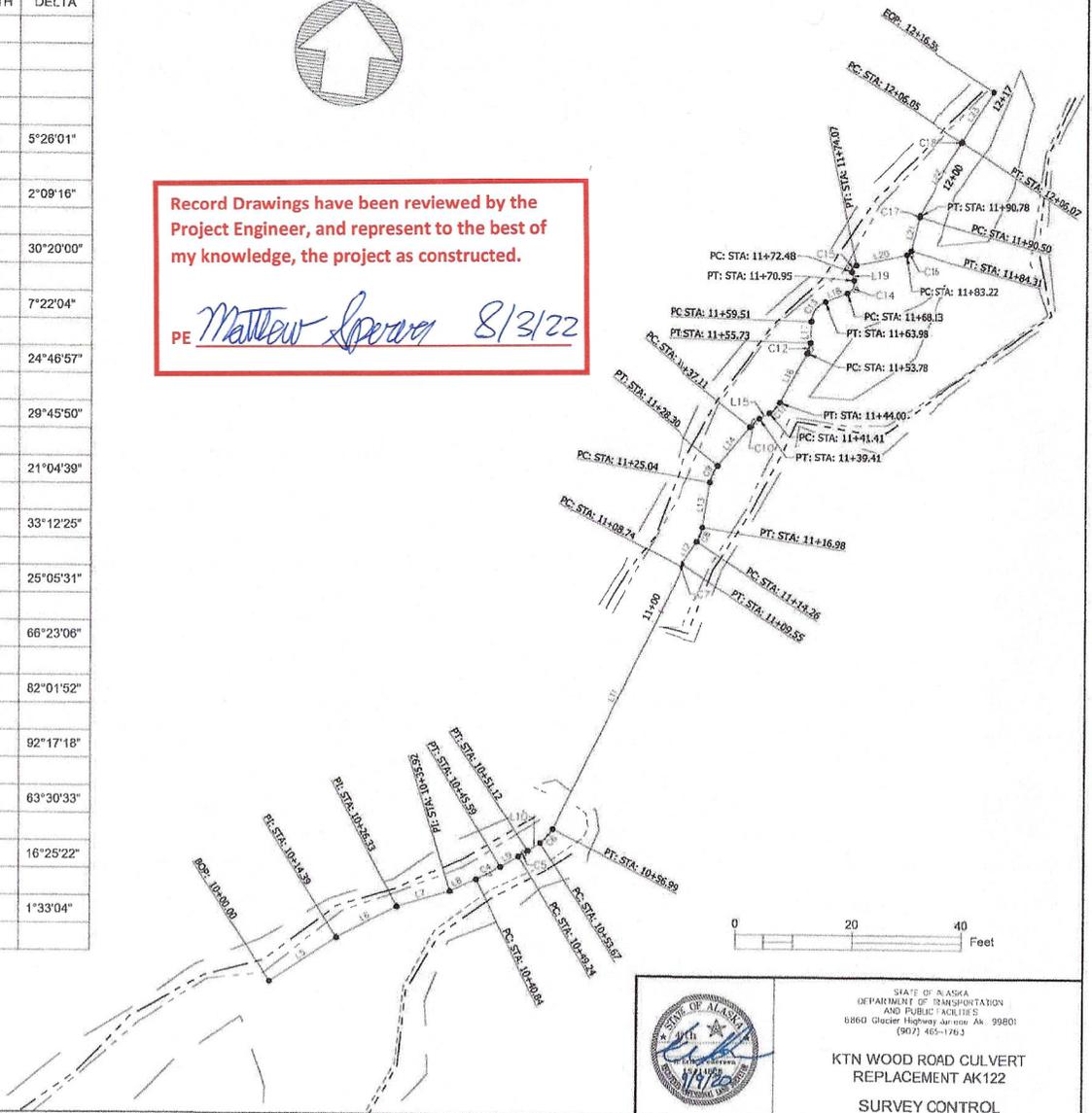
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WOOD ROAD STREAM 'C' ALIGNMENT									
SEGMENT	STATION	NORTHING	EASTING	DISTANCE	BEARING	STATION	RADIUS	LENGTH	DELTA
L5	10+00.00	332181.79	669739.95	14.39	N57° 07' 47"E	10+14.39			
L6	10+14.39	332189.60	669752.04	11.94	N62° 24' 45"E	10+26.33			
L7	10+26.33	332205.14	669762.62	9.58	N73° 00' 02"E	10+35.92			
L8	10+35.92	332207.94	669771.79	4.93	N64° 25' 31"E	10+40.84			
C4	10+40.84	332210.06	669776.23			10+45.59	50.00	4.74	5°26'01"
L9	10+45.59	332212.31	669780.41	3.66	N58° 59' 30"E	10+49.24			
C5	10+49.24	332214.19	669783.54			10+51.12	50.00	1.88	2°09'16"
L10	10+51.12	332215.19	669785.13	2.55	N56° 50' 14"E	10+53.67			
C6	10+53.67	332216.59	669787.27			10+56.99	6.27	3.32	30°20'00"
L11	10+56.99	332219.04	669789.45	51.75	N26° 30' 14"E	11+08.74			
C7	11+08.74	332265.35	669812.54			11+09.55	6.27	0.81	7°22'04"
L12	11+09.55	332266.04	669812.95	4.72	N33° 52' 18"E	11+14.26			
C8	11+14.26	332269.96	669815.57			11+16.98	6.27	2.71	24°46'57"
L13	11+16.98	332272.47	669818.56	8.07	N9° 05' 21"E	11+25.04			
C9	11+25.04	332280.43	669817.83			11+28.30	6.27	3.26	29°45'50"
L14	11+28.30	332283.38	669819.14	8.80	N38° 51' 10"E	11+37.11			
C10	11+37.11	332290.23	669824.67			11+39.41	6.27	2.31	21°04'39"
L15	11+39.41	332291.72	669826.41	2.00	N59° 55' 50"E	11+41.41			
C11	11+41.41	332292.73	669828.14			11+44.00	4.47	2.59	33°12'25"
L16	11+44.00	332294.58	669829.89	9.78	N26° 43' 25"E	11+53.78			
C12	11+53.78	332303.32	669834.28			11+55.73	4.47	1.96	25°05'31"
L17	11+55.73	332305.20	669834.76	3.78	N1° 37' 54"E	11+59.51			
C13	11+59.51	332308.98	669834.87			11+63.98	3.85	4.47	66°23'06"
L18	11+63.98	332312.44	669837.28	4.15	N68° 01' 00"E	11+68.13			
C14	11+68.13	332314.00	669841.13			11+70.85	1.96	2.81	82°01'52"
L19	11+70.85	332316.29	669842.30	1.54	N14° 00' 52"W	11+72.48			
C15	11+72.48	332317.79	669841.93			11+74.07	0.98	1.59	92°17'18"
L20	11+74.07	332318.99	669842.68	9.15	N78° 16' 26"E	11+83.22			
C16	11+83.22	332320.85	669851.64			11+84.31	0.98	1.09	63°30'33"
L21	11+84.31	332321.56	669852.40	6.18	N14° 45' 53"E	11+90.50			
C17	11+90.50	332327.54	669853.97			11+90.78	0.98	0.28	16°25'22"
L22	11+90.78	332327.80	669854.08	15.27	N31° 11' 15"E	12+06.05			
C18	12+06.05	332340.86	669861.99			12+06.07	0.98	0.03	1°33'04"
L23	12+06.07	332340.88	669862.00	10.47	N32° 44' 19"E	12+16.55			



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 PE *Matthew Spear* 8/3/22

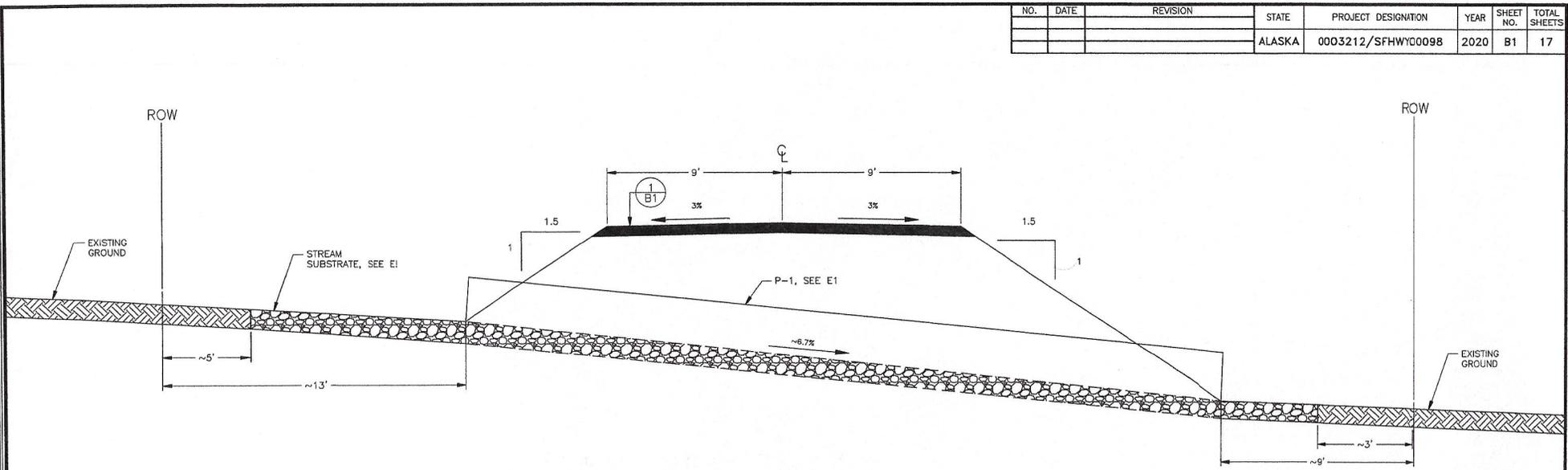
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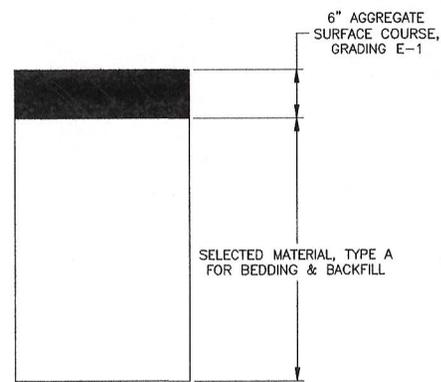
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC SAFETY
 6860 Glacier Highway, Anchorage, AK 99501
 (907) 465-1763
**KTN WOOD ROAD CULVERT
 REPLACEMENT AK122**
 SURVEY CONTROL

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHWD0098	2020	B1	17

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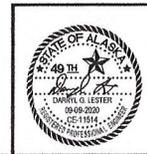
WOOD ROAD TYPICAL SECTION
STA. 13+29



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 Project Engineer, and represent to the best of
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 PE Matthew Spear 8/3/22



1 B1 PAVEMENT SECTION
SCALE: NOT TO SCALE



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
KTN WOOD ROAD CULVERT
REPLACEMENT AK122

TYPICAL

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 CHECKED: DL
 DRAFTED: BW, RM, BA

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHWW00098	2020	C1	17

ESTIMATE OF QUANTITIES			
ITEM NUMBER	PAY ITEM	PAY UNIT	QUANTITY
201.0009.0000	CLEARING AND GRUBBING	LUMP SUM	ALL REQUIRED
202.0004.0000	REMOVAL OF CULVERT PIPE	LINEAR FOOT	60
202.0010.0000	SINGLE MAIL BOX INSTALLATION	EACH	1
203.0005.000A	BORROW, TYPE A	CUBIC YARD	258
203.0005.000B	BORROW, TYPE B	CUBIC YARD	26
204.0003.0000	STRUCTURE EXCAVATION	LUMP SUM	ALL REQUIRED
301.0003.00E1	AGGREGATE SURFACE COURSE, GRADING E-1	TON	24
602.0003.0000	STRUCTURAL PLATE ARCH 8'-0" SPAN, 4'-2" RISE, 0.125" THICK	LINEAR FOOT	43
611.0002.0001	RIPRAP, CLASS I	TON	49
611.0002.0002	RIPRAP, CLASS II	TON	4
613.0002.0000	CULVERT MARKER POST	EACH	2
618.0002.0000	SEEDING	BOUND	6
619.2013.0000	BONDED FIBER MATRIX (BFM)	BOUND	70
620.0003.0000	TOPSOIL	LUMP SUM	ALL REQUIRED
639.0002.0000	DRIVEWAY, RESIDENTIAL	EACH	1
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQUIRED
640.0004.0000	WORKER MEALS AND LODGING, OR PER DIEM	LUMP SUM	ALL REQUIRED
641.0001.0000	EROSION, SEDIMENT AND POLLUTION CONTROL ADMINISTRATION	LUMP SUM	ALL REQUIRED
641.0003.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQUIRED
641.0005.0000	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL BY DIRECTIVE	CONTINGENT SUM	ALL REQUIRED
641.0006.0000	WITHHOLDING	CONTINGENT SUM	ALL REQUIRED
642.0001.0000	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQUIRED
643.0002.0000	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQUIRED
643.0023.0000	TRAFFIC PRICE ADJUSTMENT	CONTINGENT SUM	ALL REQUIRED
643.0032.0000	FLAGGING	CONTINGENT SUM	ALL REQUIRED
671.2004.0000	STREAM SUBSTRATE	CUBIC YARD	18

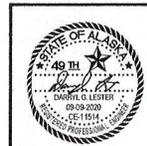
→ Deleted by CO #3

→ Deleted by CO #2

BASIS OF ESTIMATE		
ITEM NUMBER	PAY ITEM	ESTIMATING FACTORS
201.0009.0000	CLEARING AND GRUBBING	145 SQ. YDS.
204.0003.0000	STRUCTURE EXCAVATION	196 CU. YDS. EXCAVATION
301.0003.00E1	AGGREGATE SURFACE COURSE, GRADING E-1	125 LBS/CU. FT.
611.0002.0001	RIPRAP, CLASS I	125 LBS/CU. FT.
611.0002.0002	RIPRAP, CLASS II	125 LBS/CU. FT.
619.2013.0000	BONDED FIBER MATRIX (BFM)	3500 LBS/AC.

Record Drawings have been reviewed by the
 Project Engineer, and represent to the best of
 my knowledge, the project as constructed.

PE Matthew Sperava 8/31/22



STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
**KTN WOOD ROAD CULVERT
 REPLACEMENT AK122**
 ESTIMATE OF QUANTITIES

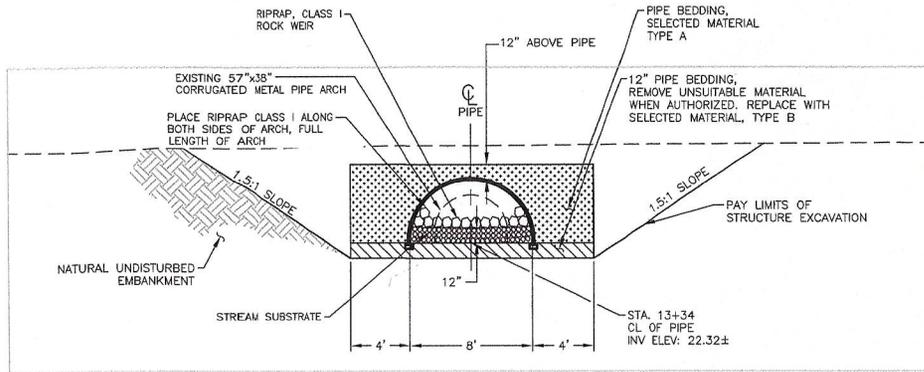
Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

PE *Matthew Spraver* 8/3/22

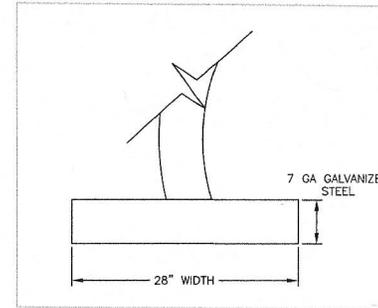
Addendum #1; Attachment #2

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
	11/17/2020	ADDENDUM 1, ATTACHMENT 1	ALASKA	0003212/SFHW00098	2020	E1A	17

FILE: Q:\104\SFHW00098\Figures\00098_E_Sheet01.dwg
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 CHECKED: DL
 DRAFTED: BW, NN, BA



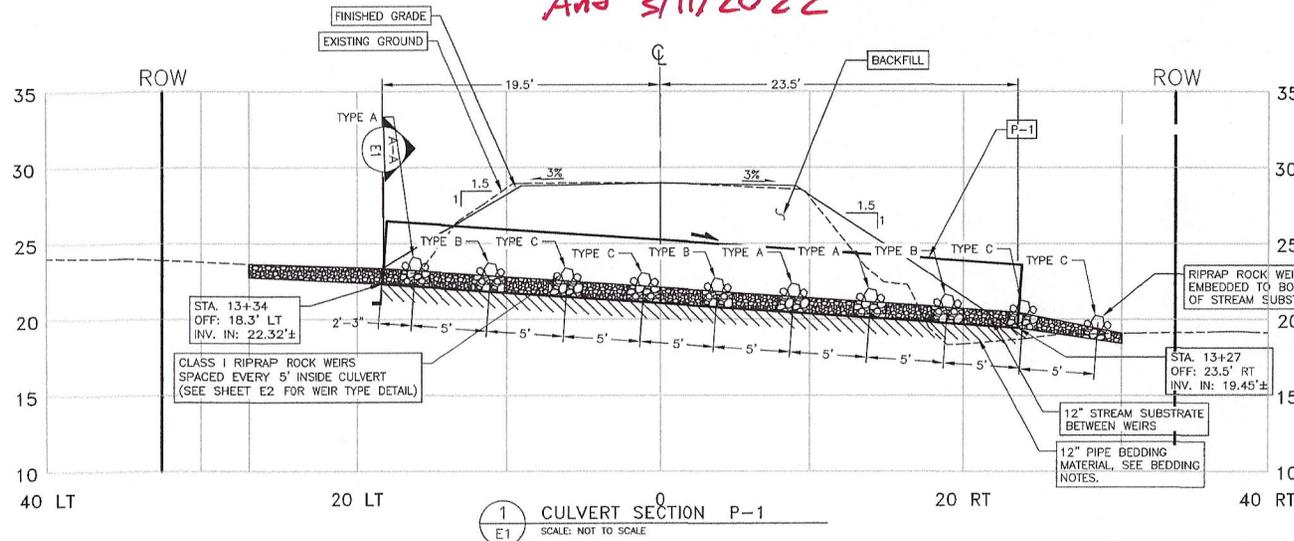
A SECTION A-A PIPE BEDDING / BACKFILL SECTION
 E1 SCALE: NOT TO SCALE



B TYPICAL FOOTING DETAIL
 E1 SCALE: NOT TO SCALE

See Attached Email dated 3/8/2022 from Bob Trousil for Corrective work on weirs And 3/11/2022

- NOTES:
- FOOTING DIMENSIONS AND DETAILS SHOWN ARE BASED ON 2'-0" OF COVER, HL-93 LIVE LOAD, 4,000 PSF MIN BEARING CAPACITY.
 - FOOTING PAD TO BE 7 GA GALVANIZED STEEL.



1 CULVERT SECTION P-1
 E1 SCALE: NOT TO SCALE

Hydraulic Summary **Wood Road**

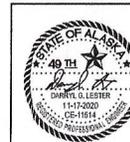
Design Storm Events	Discharge cfs	Head ft
Q _{50%}	59.00	2.26
Q _{20%}	95.00	3.33
Q _{10%}	122.00	4.14
Q _{4%}	150.00	5.59
Q _{2%}	188.00	5.46
Q _{1%}	220.00	5.98
Q _{0.3%}	253.00	6.10
Pipe Full (HW/D=1)	89.56	3.17
Overtopping Discharge (Estimated)	149.23	5.64
Roadway Overtopping Discharge Annual Exceedance Probability, %		2.46%

Culvert Data

Culvert Rise, in	50
Culvert Span, in	96
Inlet Elevation, ft	22.32
Outlet Elevation, ft	19.45
Length, ft	43.00
Design Slope, ft/ft	0.067
Material	Corrugated Aluminum
Corrugations	6" x 2"
End Treatment	Projecting
Embedment Depth, in	12
Rock Weirs	9 Rock Weirs placed @ 5.00 ft

PIPE BEDDING NOTES:

- IF BEDROCK IS ENCOUNTERED WHILE EXCAVATING FOR THE ARCH, OVER EXCAVATE TO 8" BELOW THE ARCH FOUNDATION AND REPLACE WITH 8" BEDDING MATERIAL.
- IF NO BEDROCK IS ENCOUNTERED, PROVIDE 12" BEDDING BENEATH THE FOUNDATION.

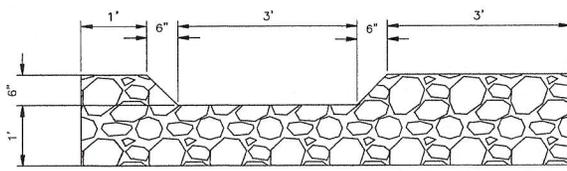


STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
 KTN WOOD ROAD CULVERT
 REPLACEMENT AK122

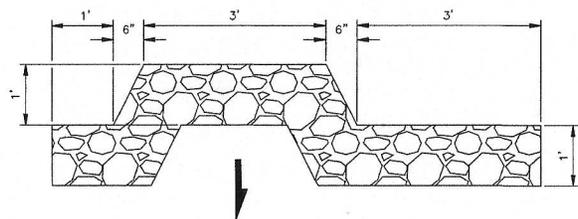
DETAILS

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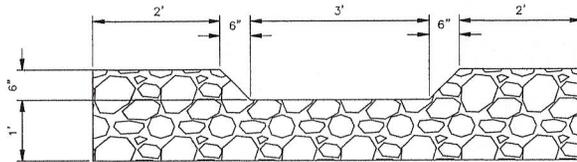
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFH00098	2020	E2	17



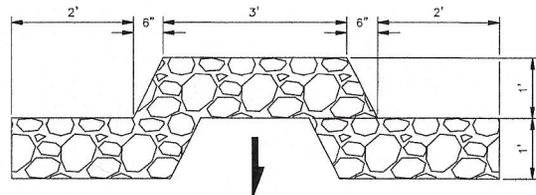
1 ROCK WEIR PROFILE VIEW (TYPE A)
 E2 SCALE: NOT TO SCALE



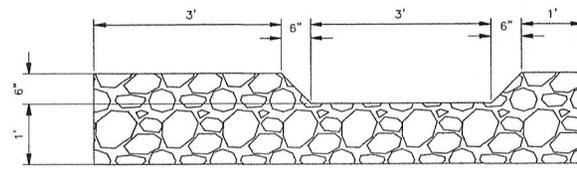
2 ROCK WEIR PLAN VIEW (TYPE A)
 E2 SCALE: NOT TO SCALE



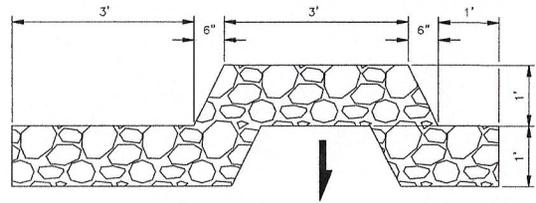
3 ROCK WEIR PROFILE VIEW (TYPE B)
 E2 SCALE: NOT TO SCALE



4 ROCK WEIR PLAN VIEW (TYPE B)
 E2 SCALE: NOT TO SCALE



5 ROCK WEIR PROFILE VIEW (TYPE C)
 E2 SCALE: NOT TO SCALE



6 ROCK WEIR PLAN VIEW (TYPE C)
 E2 SCALE: NOT TO SCALE

See Attached
 Email dated
 3/8/2022 From
 Bob Travis!
 For Corrective
 Work on
 Weirs

 And 3/11/2022

NOTES:
 1. ALL ROCK WEIRS ARE CONSTRUCTED WITH RIPRAP, CLASS 1
 AND ARE EMBEDDED FULL DEPTH TO THE BOTTOM OF THE
 STREAM SUBSTRATE.

Record Drawings have been reviewed by the
 Project Engineer, and represent to the best of
 my knowledge, the project as constructed.

 PE *Matthew Sperera* 8/3/22



STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
 KTN WOOD ROAD CULVERT
 REPLACEMENT AK122

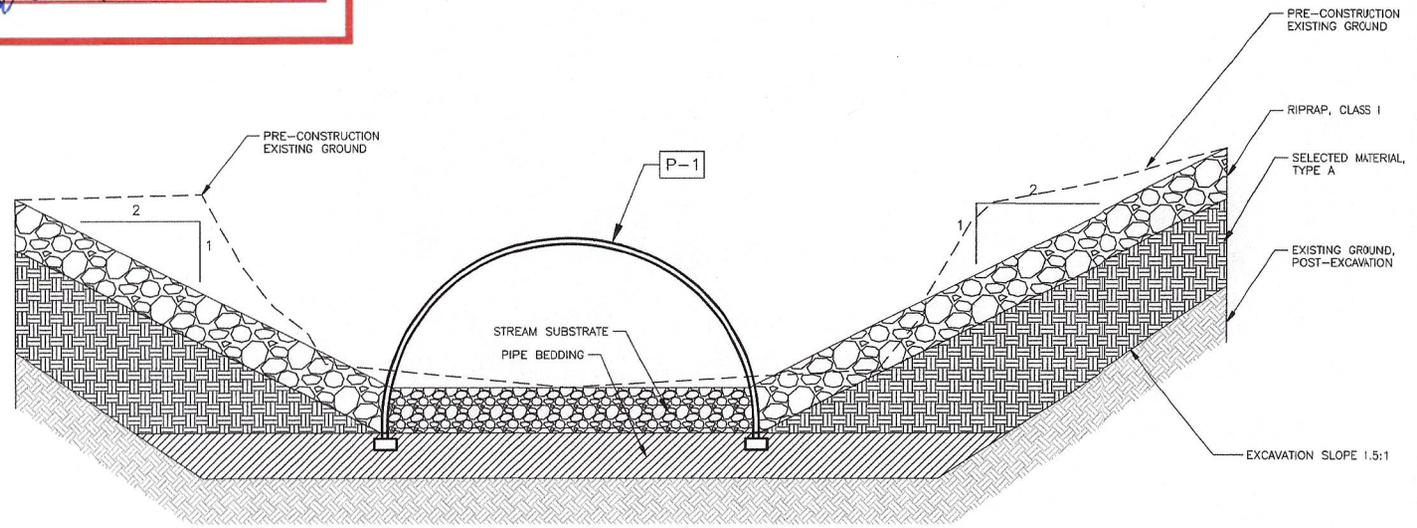
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NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFH00098	2020	E3	17

Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

PE *Matthew Sporer* 8/31/22



1 OUTLET SECTION VIEW
 E3 SCALE: NOT TO SCALE

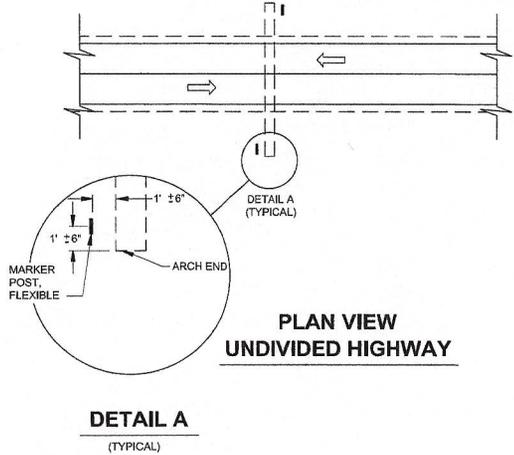
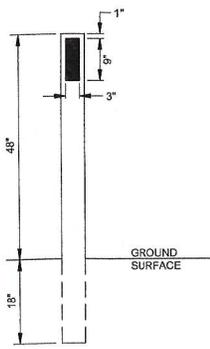
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES

**KTN WOOD ROAD CULVERT
 REPLACEMENT AK122**

DETAILS

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 DESIGNED: BW, RN, BA CHECKED: DL
 DRAFTED: BW, RN, BA

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
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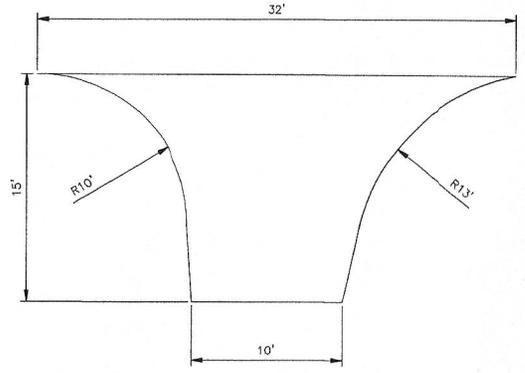


Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.
 PE *Matthew Sporer* 8/31/22

1 FLEXIBLE MARKER POST DETAIL
 E4 SCALE: NOT TO SCALE

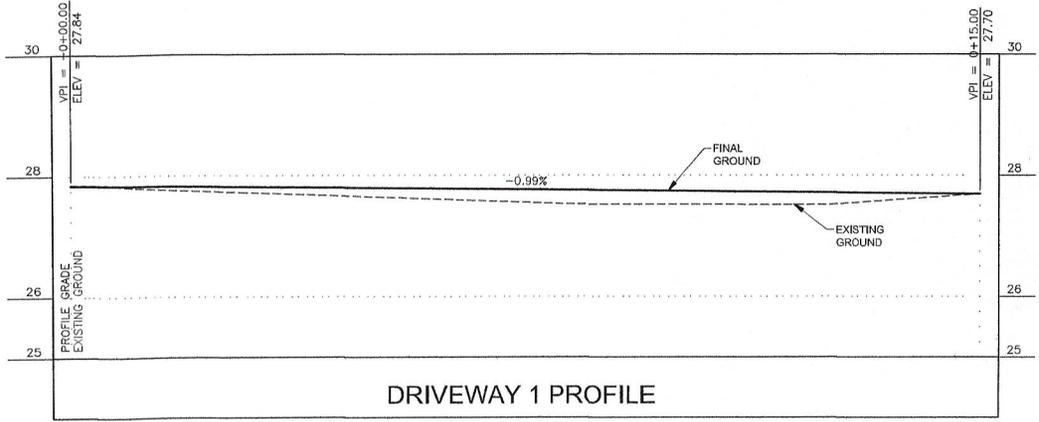
2 FLEXIBLE MARKER POST LOCATION
 E4 SCALE: NOT TO SCALE

- FLEXIBLE MARKER POST NOTES:**
- FLEXIBLE MARKER POSTS SHALL BE WHITE, FIBERGLASS COMPOSITE.
 - A 3" BY 9" STRIP OF BLACK 2-MIL GRAPHIC FILM SHALL BE AFFIXED TO EACH SIDE OF THE POST AS SHOWN IN THE FLEXIBLE MARKER POST DETAIL DRAWING. THE MATERIAL SHALL BE CENTERED WITHIN THE WIDTH OF THE POST. APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.

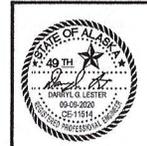


4 DRIVEWAY 1 LAYOUT
 E4 SCALE: NOT TO SCALE

- NOTES:**
- APPLY AGGREGATE SURFACE COURSE, GRADING E-1 AS REQUIRED TO OBTAIN DRIVEWAY GRADE.



3 DRIVEWAY 1 PROFILE
 E4 SCALE: NOT TO SCALE



STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
**KTN WOOD ROAD CULVERT
 REPLACEMENT AK122**

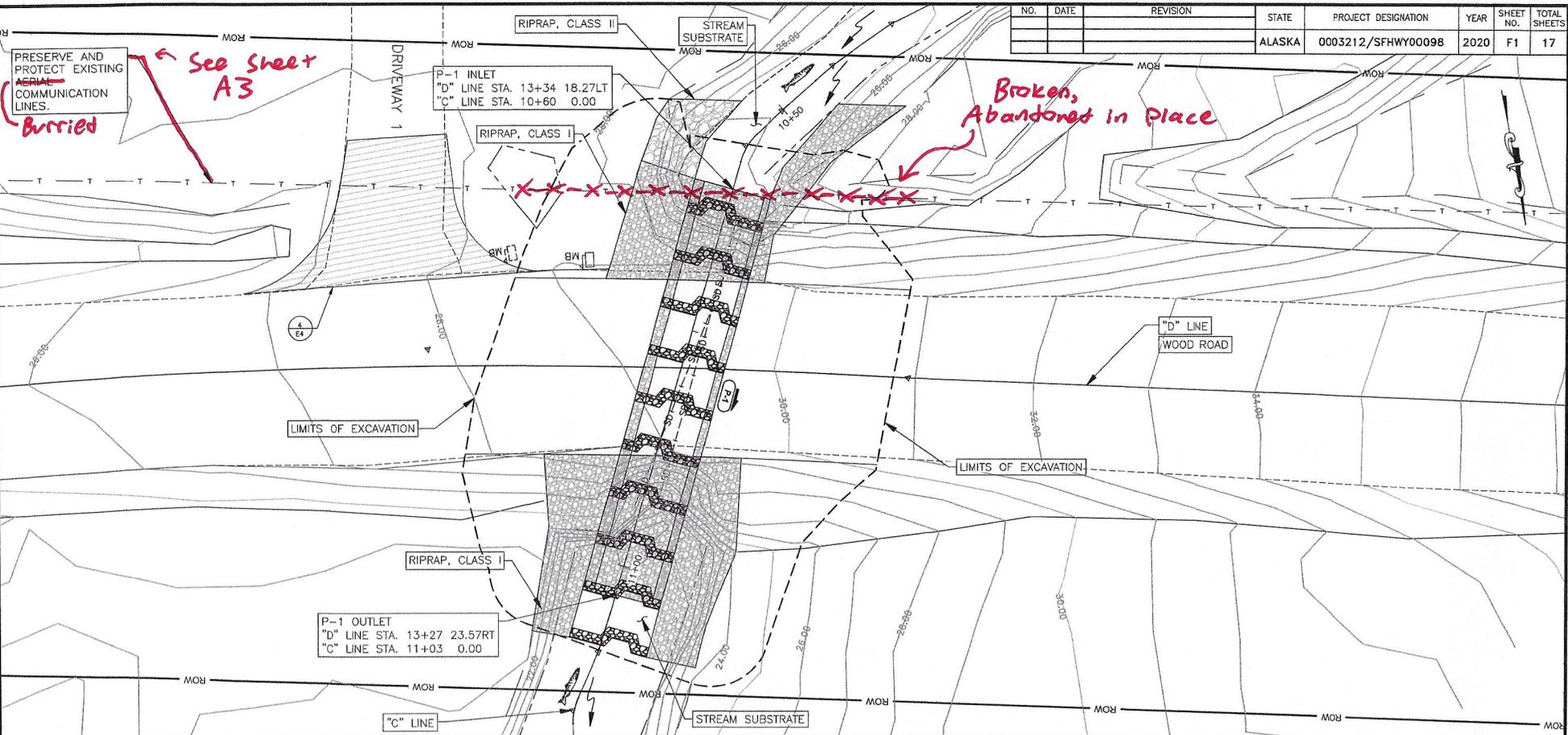
DETAILS

DRAFTED: BW, NM, BA | CHECKED: DL | DESIGNED: BW, NM, BA | LAYOUT: FT | DATE: 9/10/2020 14:08 | FILE: \\s:\v\1\al\p\003212\sfhwy00098_f1_plan.dwg

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHwy00098	2020	F1	17

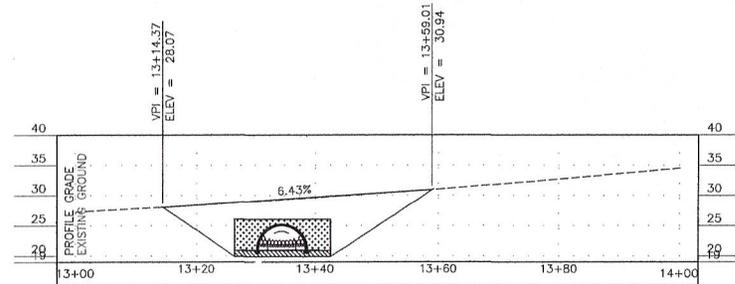
PRESERVE AND PROTECT EXISTING
 UTILITIES AND COMMUNICATION LINES.
See Sheet A3
Buried

*Broken,
 Abandoned in place*

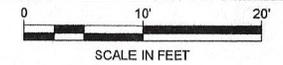


Record Drawings have been reviewed by the
 Project Engineer, and represent to the best of
 my knowledge, the project as constructed.

PE *Matthew Speron* 8/3/22



"D" LINE PROFILE ALONG CENTERLINE (STA 13+00 TO 14+00)



LEGEND	
	CULVERT FLOW
	FLOW DIRECTION
	FISH HABITAT



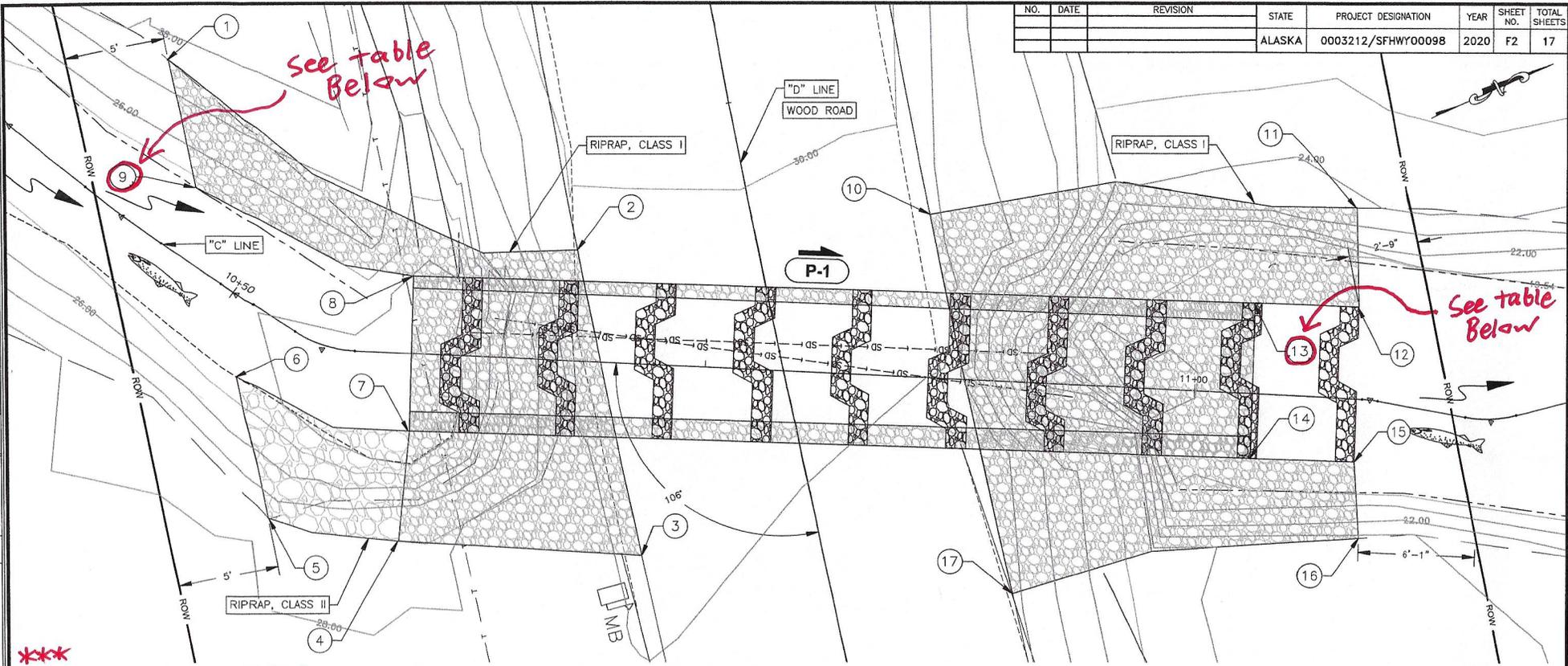
STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
**KTN WOOD ROAD CULVERT
 REPLACEMENT AK122**

PLAN

*See Attached Email dated 3/8/2022 from
 Bob Trovslil for Corrective Work on weirs
 And 3/11/2022*

FILE: E:\VIA\00098\00098_Plan\AK122_Riprap.dwg
 DESIGNED: BW, RM, BA
 CHECKED: DL
 DRAFTED: BW, RM, BA
 DATE: 3/10/2020 14:08
 LAYOUT: F2

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHWO0098	2020	F2	17

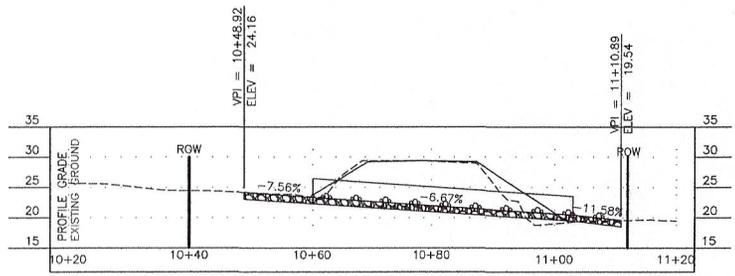


See Table Below

See table Below

 See Photos 3/9/2022 for
 Larger Riprap placed at
 Inlet End for Corrective
 Work + Scour Repair

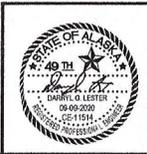
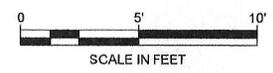
POINT NO.	STATION ("C" LINE)	OFFSET (FT) ("C" LINE)	POINT NO.	STATION ("C" LINE)	OFFSET (FT) ("C" LINE)
1	10+40	7.6 LT	9	10+85	8.2 LT
2	10+68	5.7 LT	10	11+06	9.8 LT
3	10+72	9.9 RT	11	11+08	4.7 LT
4	10+80	9.7 RT	12	11+04	4.7 LT
5	10+55	9.4 RT	13	11+05	3.3 RT
6	10+52	3.5 RT	14	11+03	3.3 RT
7	10+60	4.0 RT	15	11+08	3.2 RT
8	10+60	4.0 LT	16	11+10	7.1 RT
9	10+45	3.4 LT	17	10+91	10.9 RT



"D" LINE PROFILE ALONG CENTERLINE (STA 10+20 TO 11+20)

Duplicate

	CULVERT FLOW
	FISH HABITAT



STATE OF ALASKA
 DEPARTMENT OF TRANSPORTATION
 AND PUBLIC FACILITIES
 KTN WOOD ROAD CULVERT
 REPLACEMENT AK122

PLAN

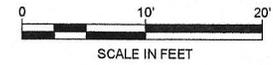
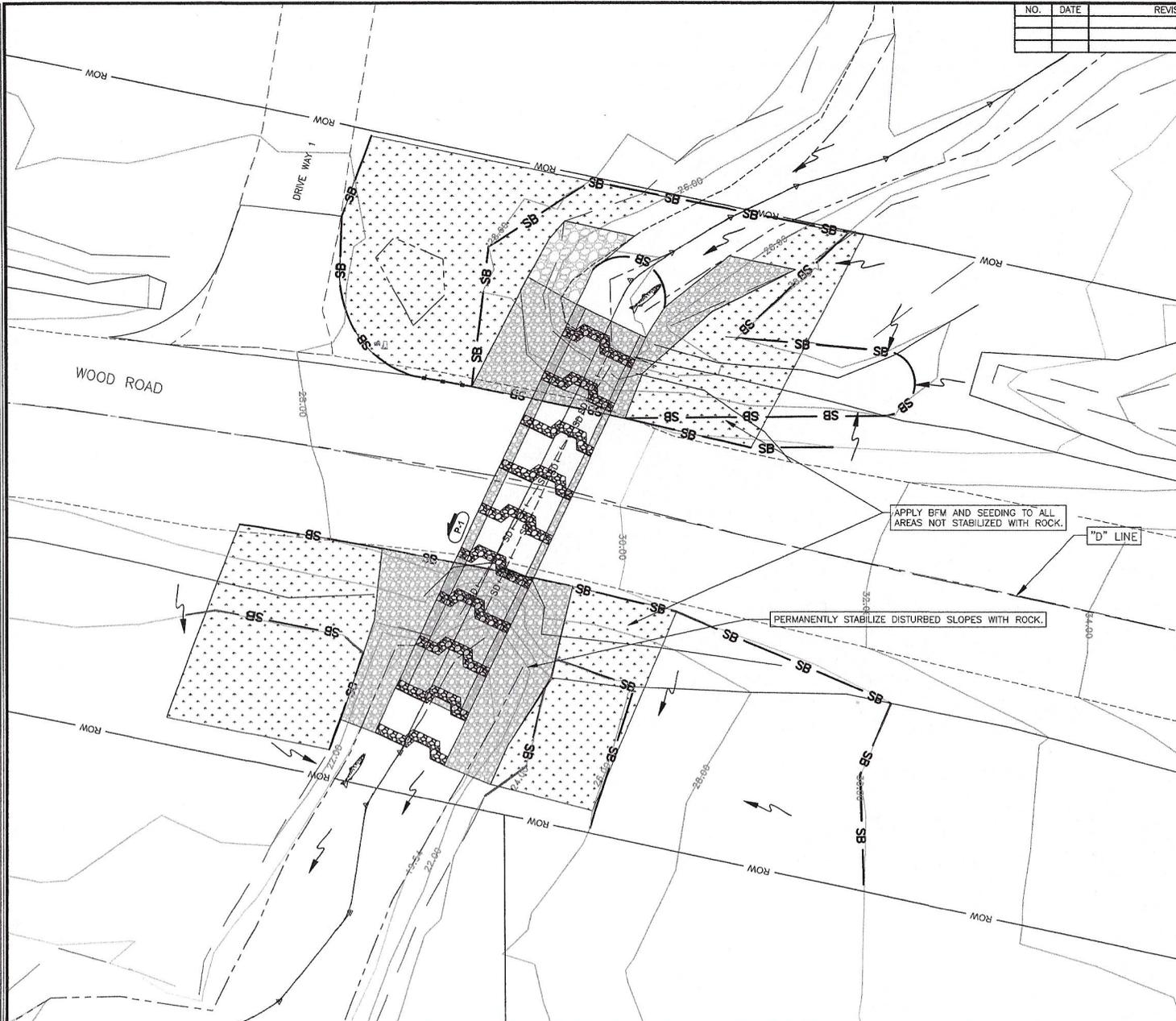
Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

PE Matthew Spear 8/3/22

See Attached Email dated 3/8/2022 From Bob Trousil for Corrective Work on Weirs And 3/11/2022

FILE C:\VIA\SFW\00098\Plan\AK122\00098_P1-Sheets.dwg
 DATE 9/14/2020 4:48 LAYOUT P1
 DESIGNED BW, BM, BA CHECKED DL
 DRAFTED BW, BM, BA

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFW00098	2020	P1	17



LEGEND	
	SEDIMENT BARRIER
	CULVERT FLOW
	FLOW DIRECTION
	FISH HABITAT
	SEEDING

- NOTES:
1. DEWATERING MAY BE REQUIRED.
 2. STREAM DIVERSION MAY BE REQUIRED.
 3. LIMITS OF CLEARING AND GRUBBING EXTEND TO EXCAVATION AREA.

CO #2 replaces Seed, BFM, Topsoil w/ Rock Slope Armor

Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

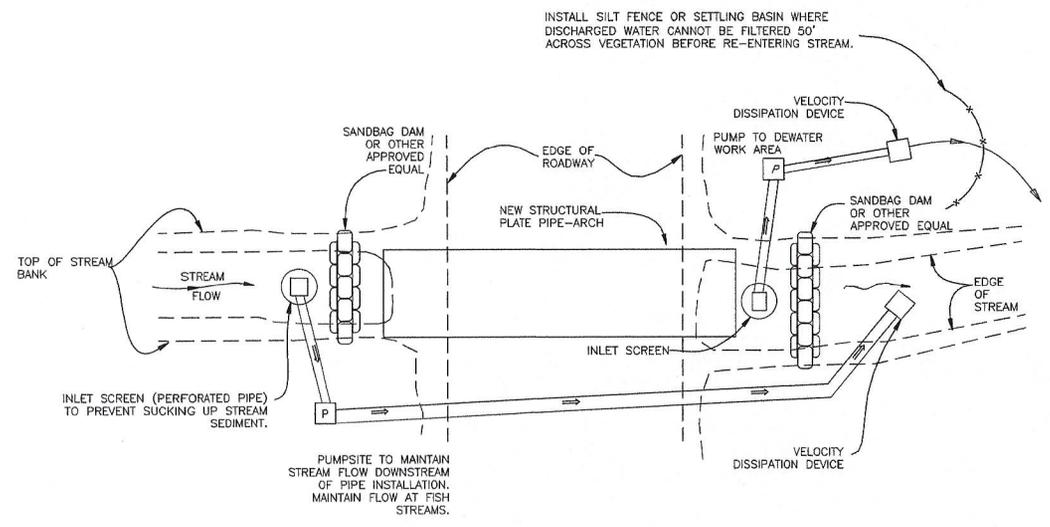
PE *Matthew Sporer* 8/3/22

ESCP NOT SEALED IN ACCORDANCE WITH ALASKA HIGHWAY PRECONSTRUCTION MANUAL SECTION 1120.7.3 DATED NOVEMBER 15, 2013	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES KTN WOOD ROAD CULVERT REPLACEMENT AK122 EROSION SEDIMENT CONTROL PLAN
---	--

See Attached Email dated 3/8/2022 From Bob Traugil for corrective work on WIERS And 3/11/2022

FILE | E:\VIA\p\00098\00098_P\Sheet\00098_P-Sheet.dwg | DATE | 9/10/2020 14:13 | LAYOUT | P2 | DESIGNED | BW, BM, BA | CHECKED | DL | DRAFTED | BW, BM, BA

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHwy00098	2020	P2	17



DEWATERING AND DIVERSION DETAIL
NTS

NOTES:

1. MULTIPLE PUMPS MAY BE NECESSARY TO DEWATER WORK AREAS AND/OR MAINTAIN STREAM BYPASS FLOW. THE CONTRACTOR SHALL PROVIDE ADEQUATE QUANTITIES AND SIZES OF PUMPS.
2. THIS PLAN IS A RECOMMENDATION ONLY. CONTRACTOR SHALL SUBMIT A FINAL WORK PLAN FOR APPROVAL BY THE PROJECT ENGINEER AT LEAST 10 DAYS BEFORE PLANNED INSTALLATION.
3. FOR PUMPING OPERATIONS, THE WATER INTAKE STRUCTURE SHALL BE CENTERED AND ENCLOSED IN A SCREENED BOX. THE INTAKE STRUCTURE MUST BE ENCLOSED AND CENTERED WITHIN A SCREENED BOX MADE OF NON-CORROSIVE MATERIAL WITH A MAXIMUM SCREEN-MESH SIZE OF 0.04 INCHES (1mm).
4. REFERENCE BMP-09.00, BMP-15.00, BMP-34.00, AND BMP-35.00.

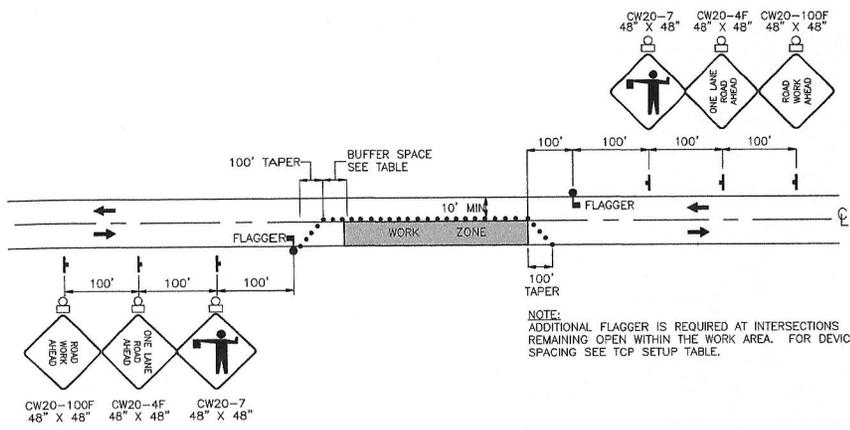
Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

 PE *Matthew Sperry* 8/31/22

ESCP NOT SEALED IN ACCORDANCE WITH ALASKA HIGHWAY PRECONSTRUCTION MANUAL SECTION 1120.7.3 DATED NOVEMBER 15, 2013	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES KTN WOOD ROAD CULVERT REPLACEMENT AK122 EROSION SEDIMENT CONTROL PLAN
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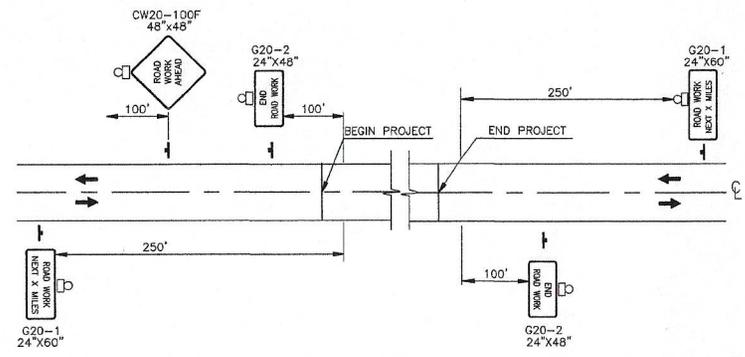
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 DATE 10/10/2020 14:22 LAYOUT T1 DESIGNED B.W.R./B.A. CHECKED J.B. DRAFTED C.M./M.B.A.

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0003212/SFHwy00098	2020	T1	17



TWO LANE ROADWAY—SINGLE LANE CLOSURE

LEGEND	
⦿	FLAGGER
⚡	CONSTRUCTION SIGN
⊙	DRUMS
●	CONE
◻	WARNING LIGHT



PERMANENT CONSTRUCTION SIGNING

Record Drawings have been reviewed by the
 Project Engineer and represent to the best of
 my knowledge, the project as constructed.

PE: [Signature]

TRAFFIC CONTROL NOTES:

1. ALL TCPs SHALL BE CREATED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEERING FOR APPROVAL.
2. TEMPORARY DRIVING LANES SHALL HAVE A MINIMUM WIDTH OF 10'-0".
3. MAINTAIN A MINIMUM OF ONE LANE TO BE OPEN FOR TRAFFIC AT ALL TIMES.
4. CONSTRUCTION SIGNS SHALL BE PLACED SUCH THAT THEY DO NOT OBSCURE EXISTING TRAFFIC SIGNS.
5. NO MAJOR SIDE STREETS ARE PRESENT IN PROJECT VICINITY.

SPEED (MPH)	MAX DEVICE SPACING IN FEET		BUFFER SPACE (FT)
	ALONG TAPER	ALONG TANGENT	
25 OR BELOW	25	50	155

TCP NOT SEALED IN ACCORDANCE WITH ALASKA HIGHWAY PRECONSTRUCTION MANUAL SECTION 1400.3.5 DATED JANUARY 30, 2012.	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES KTN WOOD ROAD CULVERT REPLACEMENT AK122 TCP
--	--

Sperber, Matthew Louis (DOT)

From: Trousil, Robert E (DOT)
Sent: Tuesday, March 8, 2022 8:17 PM
To: Shull, Patty Lynn (DOT); Sperber, Matthew Louis (DOT)
Cc: Paul, Garrett R (DOT)
Subject: RE: Wood Road culvert

Patty,

Since I won't be there tomorrow during the day, here is a concept drawing of what I think will work best in placing the stockpiled rock materials. Ignore the weirs that are shown in the drawing. Rocks, in dark blue, are schematically shown and not meant to necessarily represent individual rocks but rather rock clusters. Here is a bulleted list things to do:

1. Place the largest rocks at the intake-end to support and cover the exposed footer. Alternate these rock clusters from side to side with the larger rocks in the pattern shown.
2. Use smaller rocks to fill scour holes and shore up the side walls of the pipe as you progress downstream.
3. Place smallest rock in the areas shown in tan.
4. Basically, looking to create protrusions, forcing water flow "side to side" through the pipe.
5. From the photos, I don't believe I would do much, if anything, in the last 15 feet of the pipe.
6. There is no need to remove or rearrange any materials/rocks that are currently in place in the pipe.
7. Arrows (→) indicate anticipated flow path(s).
8. If you have "fines" I would use them as filler in the tan areas.

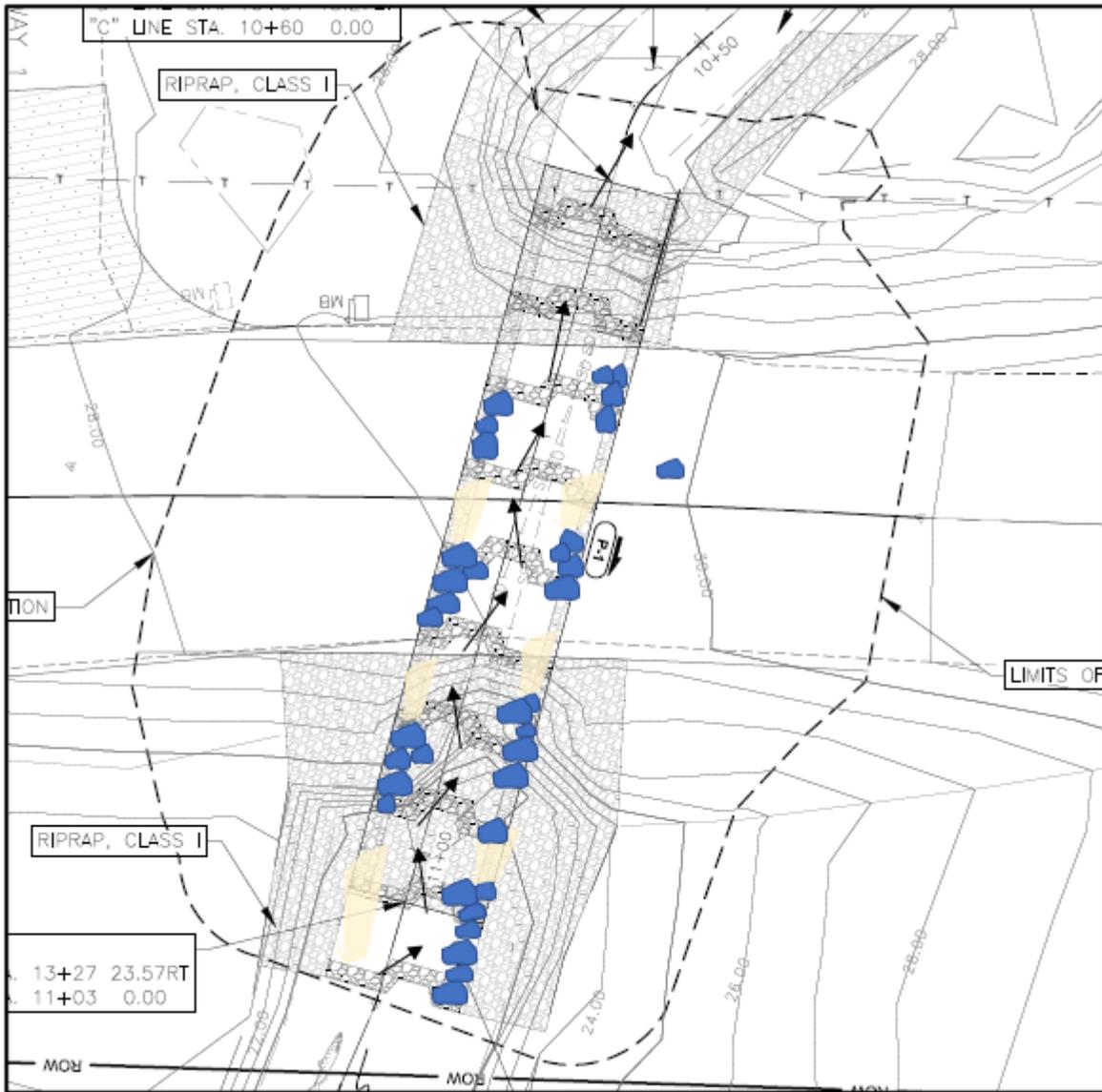
Call if you have any questions.

Thanks!

Bob

Record Drawings have been reviewed by the
Project Engineer, and represent to the best of
my knowledge, the project as constructed.

PE *Matthew Sperber* 8/3/22



Record Drawings have been reviewed by the Project Engineer, and represent to the best of my knowledge, the project as constructed.

PE *Matthew Sperber* 8/3/22

From: Trousil, Robert E (DOT)
Sent: Tuesday, March 8, 2022 4:05 PM
To: Shull, Patty Lynn (DOT) <patty.shull@alaska.gov>; Sperber, Matthew Louis (DOT) <matthew.sperber@alaska.gov>
Cc: Paul, Garrett R (DOT) <garrett.paul@alaska.gov>
Subject: FW: Wood Road culvert

Copying you on correspondence I had with Mark this afternoon. He might try to make it to KTN, which is fine, but probably not. We were talking about Shelter Cove pipes when he asked about Wood Road at the end of the conversation.

I primed Mark on the what the project looked like in December and what it looks like now, what I recommend we should do and approach the subject of not using weirs.

So, FYI.

Thanks.

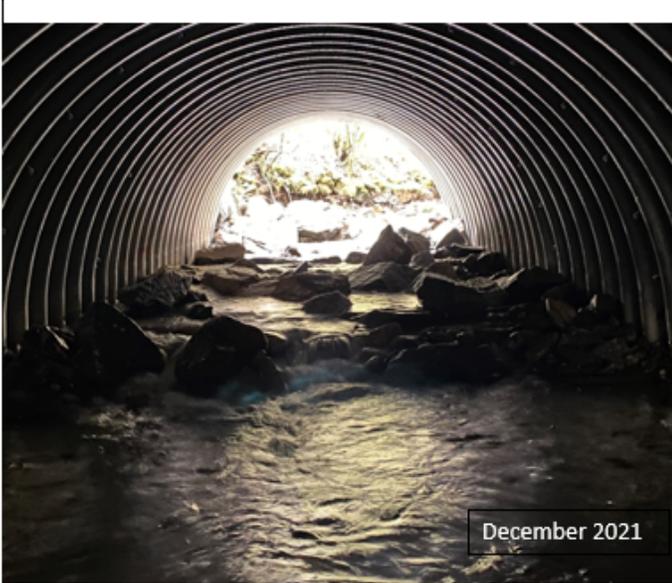
Bob

From: Trousil, Robert E (DOT)
Sent: Tuesday, March 8, 2022 3:53 PM
To: Minnillo, Mark J (DFG) <mark.minnillo@alaska.gov>
Subject: Wood Road culvert

Mark,

Following up on the latest re: Wood Road. Looks like I will need to get to KTN tomorrow, but can't until evening. So, I'm spending the night and will be there all of Thursday. Work is going to be done over the next few days.

In asked Patty to send me pictures. Here are the two that are the most informative:



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PE *Matthew Sprague* 8/3/22



It appears that rock placed on the left side of the pipe in December, near the entrance of the pipe, has migrated and filled the scour pool shown in the foreground of the December shot. The footer is again exposed. That side just gets hammered because of the orientation of the stream at the entrance.

But I do like the way the materials have adjusted in the pipe over the winter. However, more, large rock is needed to support and bury the footer as shown, and any other place along the side of the pipe that would be vulnerable to high flows.

My recommendation is that we build up the left side near the intake with large rocks, which will send flow back to the other side of the pipe. Then need to consider armoring the right side of the pipe as well. Then again the left side...etc. Basically building vanes structures, forcing flows from one side of the pipe to the other. Hydraulically, its not very efficient. But, for fish passage it would be much better.

That said, the “vane” approach might be a better solution than the weirs. The flow path distance from the discharge to the intake would be increased by about 13 feet, which means the effective stream gradient is reduced from 6.7% to 5.1%. The culvert remains at 6.7% of course.

That’s it in a nutshell. Hope you can make it down Thursday.

Thanks.

Bob

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PE *Matthew Spencer* 8/3/22

Sperber, Matthew Louis (DOT)

From: Trousil, Robert E (DOT)
Sent: Friday, March 11, 2022 4:45 PM
To: Shull, Patty Lynn (DOT)
Cc: Paul, Garrett R (DOT); Minnillo, Mark J (DFG); Sperber, Matthew Louis (DOT); Storey, Benjamin M (DOT)
Subject: Wood Road Culvert Corrective Action

Patty,

Thanks you for arranging to get the Wood Culvert work done on Wednesday and Thursday of this week. Here are my observations and conclusions with respect to fish passage and culvert/stream hydraulics.

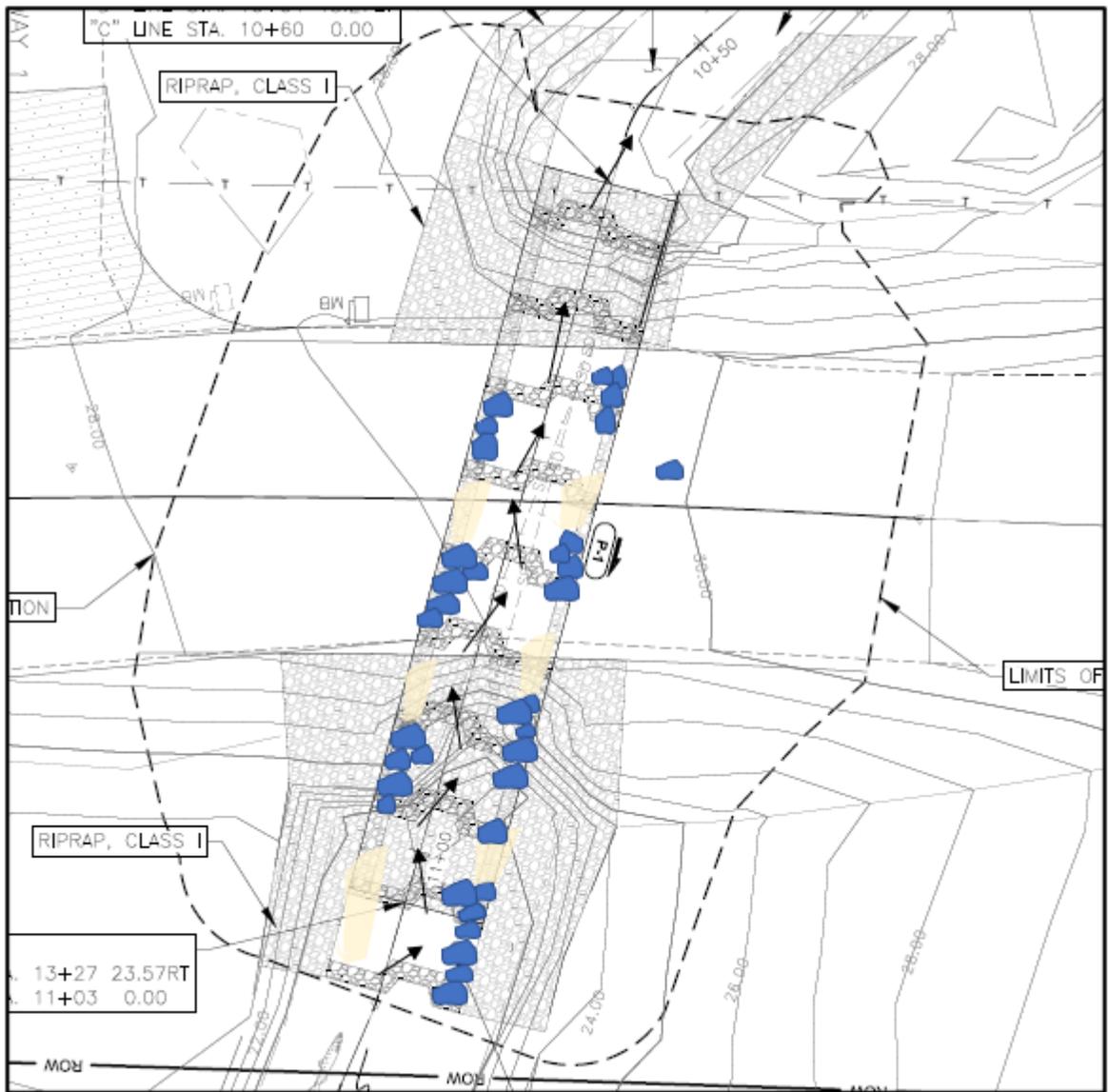
The work that remained included the repair of scoured sections within the bottomless culvert structure and the placement of larger rock in configurations that would accommodate for fish passage and stabilize the footer system within the culvert. The decision was made to take advantage of good weather and the absence of snow/ice at the site, as the fish window for this work appears to expire April 15.

Due to the expedited nature of the work, I was unable to be onsite Wednesday. Rocks, in dark blue, are schematically shown in figure 1 and not meant to necessarily represent individual rocks but rather rock clusters. A drawing indicates the nature of the work required, which is summarized as follows:

1. Place the largest rocks at the intake-end to support and cover the exposed footer. Alternate these rock clusters from side to side with the larger rocks in the pattern shown.
2. Use smaller rocks to fill scour holes and shore up the side walls of the pipe as you progress downstream.
3. Place smallest rock in the areas shown in tan.
4. Basically, looking to create protrusions, forcing water flow "side to side" through the pipe.
5. From the photos, I don't believe I would do much, if anything, in the last 15 feet of the pipe.
6. There is no need to remove or rearrange any materials/rocks that are currently in place in the pipe.
7. Arrows () indicate anticipated flow path(s).
8. If you have "fines" I would use them as filler in the tan areas.

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PE  8/3/22



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PE *Matthew Spruill* 8/3/22

Figure 1. Schematic of placed rock and fine materials. Note: weirs shown in drawing should be ignored.

I arrived on site Thursday morning to inspect the rock placement. New, larger rock had been placed near the entrance on the side of the pipe that had scoured and exposed the footing, (figure 2). Since December 2021, several scour holes have been completely filled from bed load transport and were no longer visible. The footer, clearly exposed prior to placement of the larger rock is now covered. The new rock is shown on the right side of the in the photo below.



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PE *Matthew Speranza* 8/3/22

Figure 2. *Stabilized footer section prior to placement of fine materials.*

Intermediate rock clusters, as indicated schematically above in figure 1, were alternatively placed from side to side to reduce the impact of reflective currents and to effectively reduce the hydraulic gradient by creating a slightly longer flow path. These rocks (figure 3) increase the friction of the streambed within the pipe, reducing flow velocity at higher stages.



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PE *Matthew Spivak* 8/3/22

Figure 3. Typical placement of intermediate rock alongside of culvert.

The culverts vulnerability to streambed scour has been greatly reduced. At the same time the streambed within the culvert is significantly improved by the introduction of the larger rock, finer streambed materials, and channel geometries which now better resemble the natural stream both above and below the culvert.

The gradient in the pipe was estimated to be between 4.0% and 6.0%. The stream gradient above the culvert was measured to be 6.7%. Although difficult the measure, the theoretical flow gradient within the culvert is reduced, likely to a value of near 5.0%.

After allowing the culvert to “settle and correct” through the winter, observing the scour/erosion and flow patterns that were produced, and taking corrective action to re-design the streambed hydraulics within the culvert, using alternating rock clusters is considered a better solution to the installation of weirs for this particular stream. The streambed gradient within the pipe is close to, if not slightly less than, the natural gradients found immediately upstream of the pipe.

I would recommend the acceptance of the culvert in light of the re-design and installation of the streambed as described above. I would encourage Mark to inspect the pipe at his earliest convenience for his concurrence.

If you have any questions, please do not hesitate to contact me.

Thanks.

Bob

Robert Trausil, PE

SR Materials Engineer

State of Alaska DOT & PF
6860 Glacier Hwy
PO Box 112506
Juneau, AK 99811-2506
Phone: (907) 465-4441
Fax: (907) 465-3506



Record Drawings have been reviewed by the
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my knowledge, the project as constructed.

PE *Matthew Sperava* 8/31/22