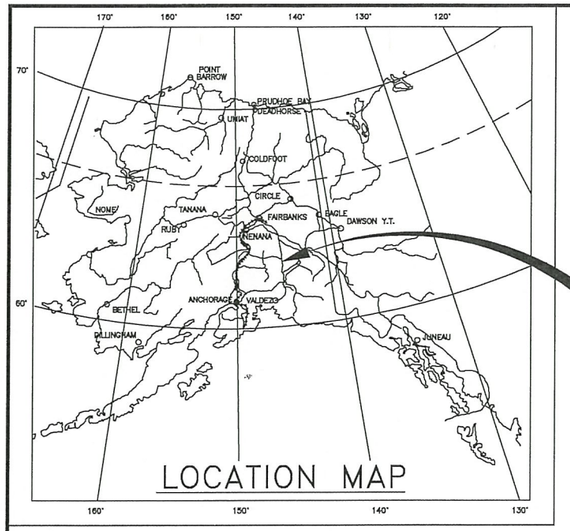


PROJECT LOCATION

ADDENDUM NO. 1, ATTACHMENT NO. 2

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
&
PUBLIC FACILITIES

PROPOSED HIGHWAY PROJECT

0713013/Z622530000

RICHARDSON HIGHWAY MP 159–167 RECONSTRUCTION

GRADING, DRAINAGE, PAVING, & BRIDGE

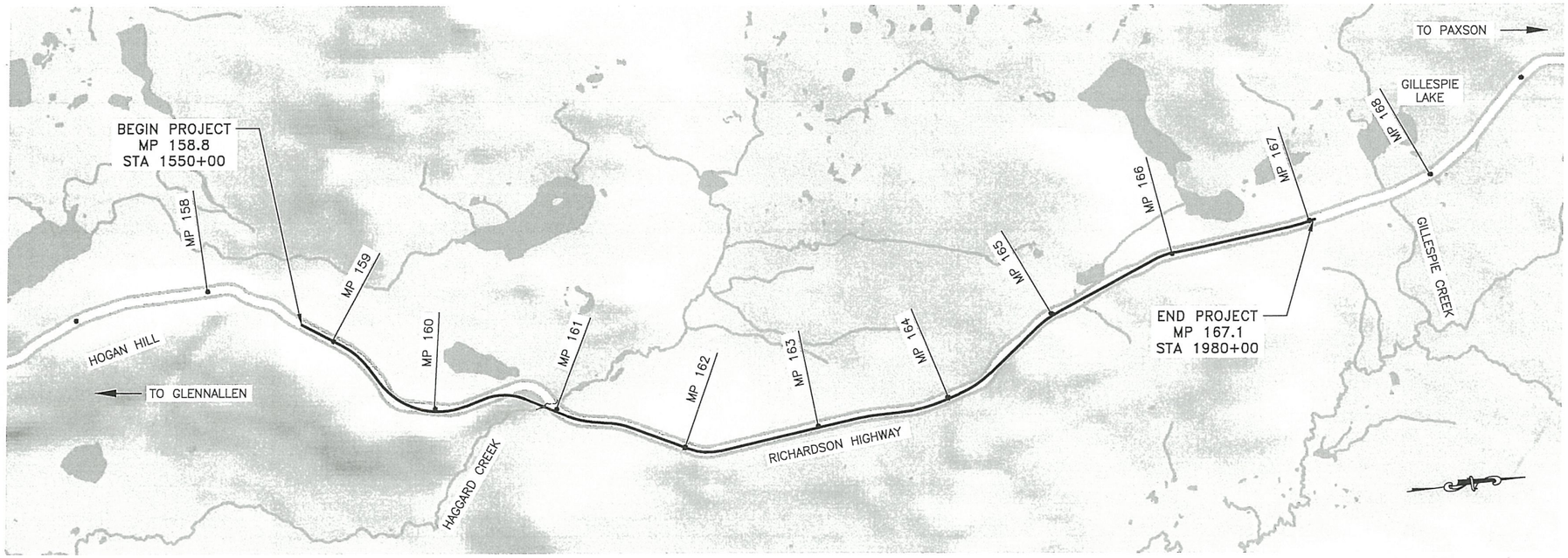
NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	A1	1 97

CDS ROUTE: 190000 MILEPOINT: 158.758 TO 166.902

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
A1	TITLE SHEET
A2–A3	LEGEND & SHEET LAYOUT INDEX
B1–B4	TYPICAL SECTIONS
C1–C2	ESTIMATE OF QUANTITIES & GENERAL NOTES
D1	SUPERELEVATION SUMMARY TABLE
E1–E12	DETAILS & SUMMARIES
F1–F15	PLAN & PROFILE
G1–G4	APPROACH & TURNOUT SUMMARY & DETAILS
H1–H2	SIGNING & STRIPING
N1–N21	BRIDGE PLANS
Q1–Q9	EROSION AND SEDIMENT CONTROL PLAN
1 T1–T2	TEMPORARY TRAFFIC CONTROL
V1–V20	STANDARD DRAWINGS



DESIGN DESIGNATIONS

ADT (2008)	475
ADT (2045)	990
DHV	17.5%
PERCENT TRUCKS (T)	26%
DIRECTIONAL SPLIT (D)	40 / 60
DESIGN SPEED (V)	70 MPH
DESIGN EAL'S (25 YEARS)	479,529

PROJECT SUMMARY

WIDTH OF PAVEMENT	36 FT
LENGTH OF GRADING	43,000 FT
LENGTH OF PAVING	43,000 FT
LENGTH OF PROJECT	43,000 FT

CONFORMED COPY
THE UNDERSIGNED HEREBY CERTIFIES THAT THIS INSTRUMENT IS AN EXACT AND TRUE COPY OF THE ORIGINAL
Stacy McSorley

RUSSELL JOHNSON, P.E., DOT PROJECT MANAGER

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
&
PUBLIC FACILITIES

APPROVED BY: _____ DATE 3/9/20
for Sarah E. Schacher, P.E.
Preconstruction Engineer, Northern Region

ACCEPTED FOR CONSTRUCTION: _____ DATE 3/9/2020
Ryan F. Anderson, P.E.
Regional Director, Northern Region

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	A2	A3

	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		BM
REBAR AND CAP		
REBAR		
IRON PIPE		
PK NAIL		
SPIKE		
HUB AND TACK		

CONSTRUCTION CENTERLINE — 5+00

MISCELLANEOUS CENTERLINE — 10+00

STATION EQUATION — "L"48+97.23 POT BK= / "O"48+97.23 PC AHD

PROJECT RIGHT-OF-WAY LINE — R/W

EXISTING RIGHT-OF-WAY LINE

EXISTING PROPERTY LINE

CONTROLLED ACCESS LINE — C/A

UTILITY EASEMENT LINE — PUE

TEMPORARY EASEMENT LINE (TCP OR TCE) — TCP

ACCESS OR SECTION LINE EASEMENT — ACCESS EASEMENT

PROPOSED CUT SLOPE LIMIT

PROPOSED FILL SLOPE LIMIT

PROPOSED BERM LIMIT

SECTION LINE

1/4 SECTION LINE

1/16 SECTION LINE

TOWNSHIP & RANGE LINE — T. 2 N. / T. 1 N. — T. 1 E. — T. 2 E.

	EXISTING	PROPOSED
SANITARY SEWER (FLOW DIRECTION →)	SS	SS
FUEL LINE	O	O
GAS LINE	G	G
WATER LINE	W	W
METER, VALVE, FIRE HYDRANT	W	W
EXISTING STORM DRAIN (FLOW DIRECTION →)	SD	
PROPOSED STORM DRAIN		S-10, S-11, P-11, P-10, MH
FIBER OPTIC LINE (CVTC)	FO	
DIRECT BURIAL TELEPHONE CABLE (AT&T)	T	T
DIRECT BURIAL ELECTRIC CABLE	E	E
ELECTRIC LINE (OVERHEAD)		
POWER POLE LINE		
JOINT USE POWER & TELEPHONE		
TELEPHONE POLE LINE		
POLE ANCHOR		
STUB POLE (POWER OR TELEPHONE)		
TELEPHONE DUCT	T	T
TELEPHONE PEDESTAL		
BURIED CABLE MARKER		
PIPELINE MARKER OR VALVE		
CATCH BASIN OR DROP INLET		
MANHOLE	MH	MH
SANITARY SEWER CLEAN OUT		
DITCH DIKE		

	EXISTING	PROPOSED
ROADWAY/PAVEMENT EDGE		
FENCE		
CURB AND GUTTER		
DETECTABLE WARNINGS		
GUARDRAIL		
CULVERT PIPE		
SIGN		H
MAILBOX	MB	MB
RAILROAD TRACKS		
RAILROAD DEVICES	CROSS-BUCK, FLASHING LIGHT	CANTILEVER, SWITCH
TREE LINE		
WATER BOUNDARY		
ORDINARY HIGH WATER LINE		
FLOW CENTERLINE		
FLOW DIRECTION		
WETLANDS		
EXISTING BUILDINGS	H	H = HOUSE G = GARAGE M = MERCHANT/STORE B = BARN S = SHED P = PRIVY SS = SERVICE STATION W = WAREHOUSE
POST OR BOLLARD		
WELL OR MONITORING WELL	W	
SEPTIC PIPE	S, MW	
FUEL TANK FILL PIPE/VENT	P	
SATELLITE DISH	SAT. DISH	
TEST HOLE	TH	
CONIFER TREE		
DECIDUOUS TREE		
GRAVE		
THERMOSIPHON		
PARKING METER		
VEHICLE PLUG-IN		
DELINEATOR/GUIDE MARKER		

	EXISTING	PROPOSED
JUNCTION BOX, TYPE IA		5
JUNCTION BOX, TYPE II		6
JUNCTION BOX, TYPE III		3
SIGNAL FACE, VEHICULAR	42	42
SIGNAL FACE, BACKPLATE	42	42
SIGNAL FACE, LEFT TURN, BACKPLATE	43	43
SIGNAL FACE, PEDESTRIAN	60	
LOOP DETECTOR	33	73
VIDEO DETECTOR	2	2
RADAR DETECTOR	4	4A
OPTICOM DETECTOR	1	1
PEDESTRIAN PUSH BUTTON	1	1
SIGNAL POST W/O MAST ARM		1
SIGNAL POLE W/MAST ARM		4
SIGNAL CONTROLLER		
LOAD CENTER		
LUMINAIRE		22
RIGID METAL CONDUIT		

LEGEND

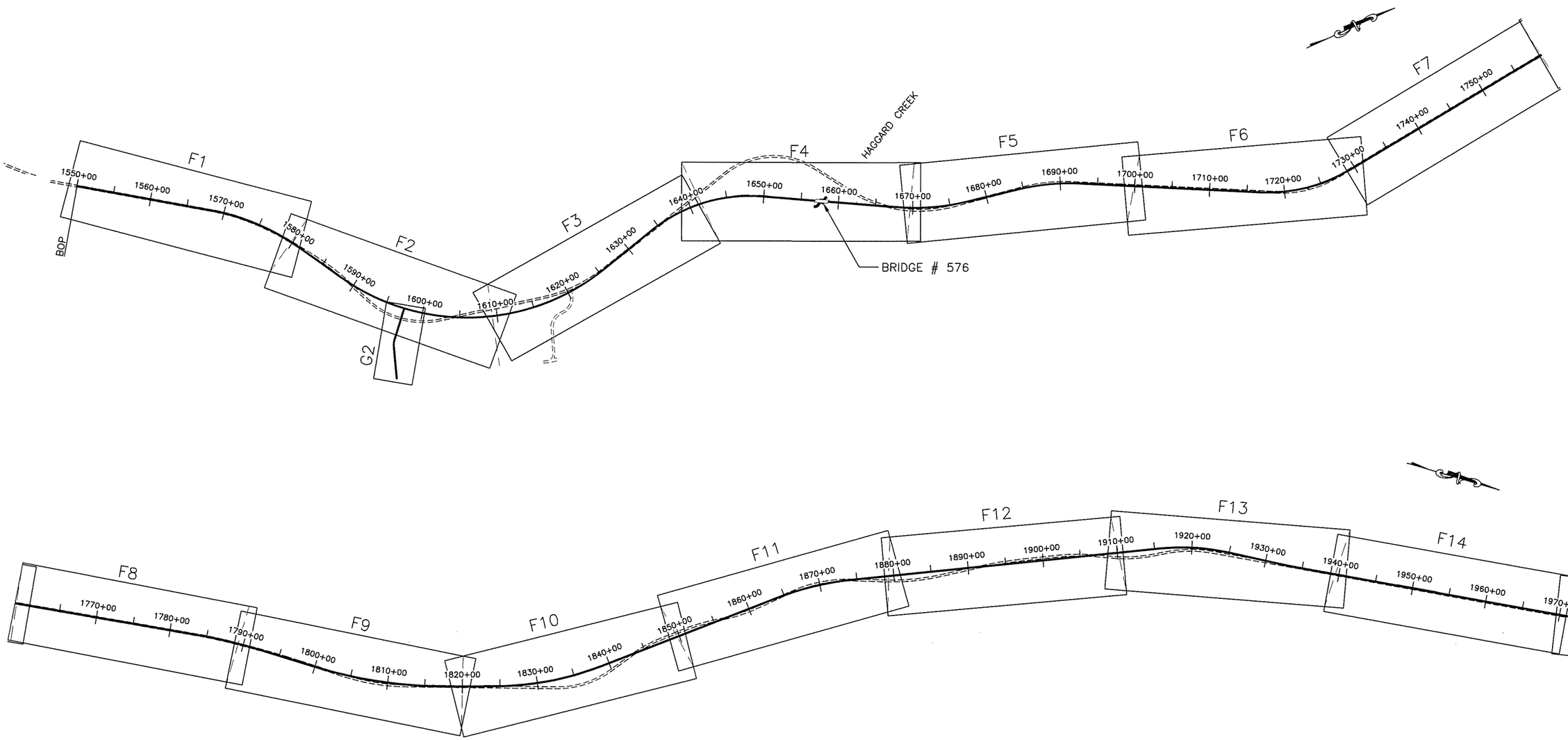
STATE OF ALASKA 49TH — DUSTIN HANNAFIOUS — C.E. 14065 — REGISTERED PROFESSIONAL ENGINEER — 2-8-19

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_A2_LEGEND-A2 Thu, Mar/07/19 04:24pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	A3	A3

SHEET LAYOUT NOTES:

1. SEE SHEET F1 FOR NORTHING AND EASTING COORDINATES TO LOCATE THE BEGINNING OF RICHARDSON HIGHWAY CENTERLINE ALIGNMENT.
2. HORIZONTAL COORDINATE SYSTEM AND VERTICAL DATUM ARE BASED ON RECORD OF SURVEY DRAWING DATED 8/6/2013.



SHEET LAYOUT

STATE OF ALASKA
49TH
DUSTIN HANNAHOUS
C.E. 14065
REGISTERED PROFESSIONAL ENGINEER
3.8.19

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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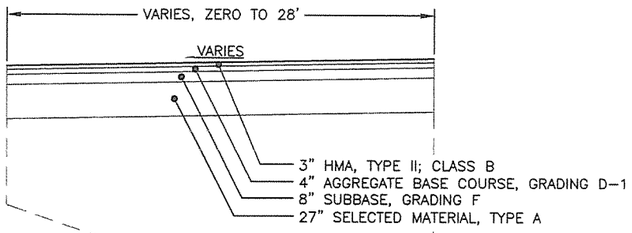
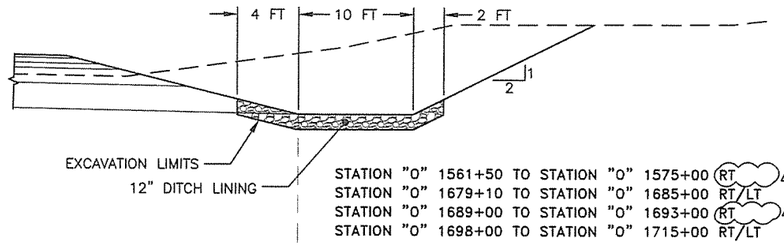
ADDENDUM NO. 3, ATTACHEMENT NO. 2

NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1
3	03/13/2020	ADDENDUM #3

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	B1	B4

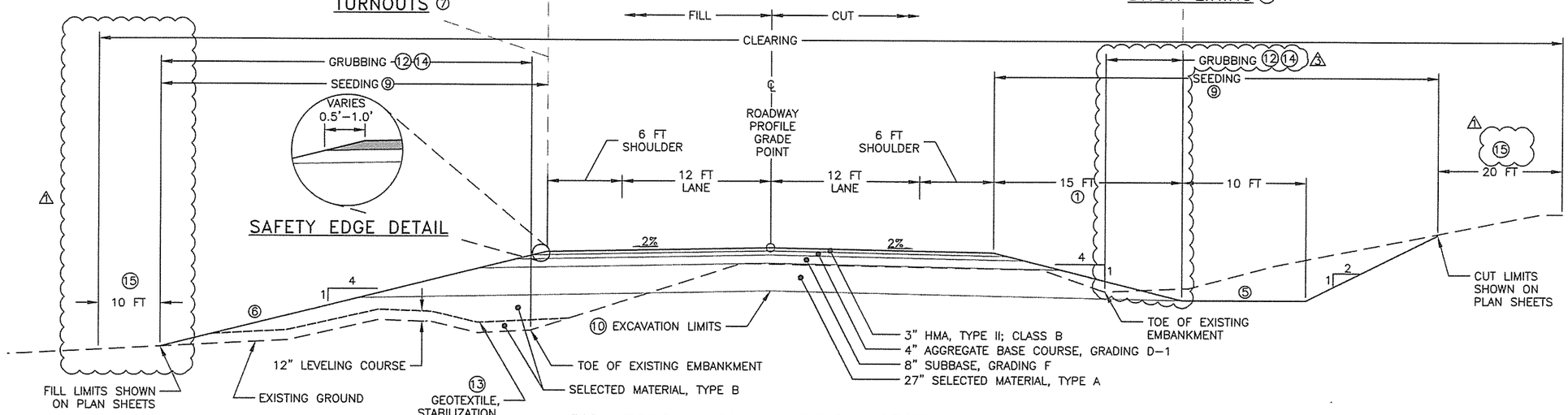




STATION "O" 1561+50 TO STATION "O" 1575+00 RT
STATION "O" 1679+10 TO STATION "O" 1685+00 RT/LT
STATION "O" 1689+00 TO STATION "O" 1693+00 RT
STATION "O" 1698+00 TO STATION "O" 1715+00 RT/LT

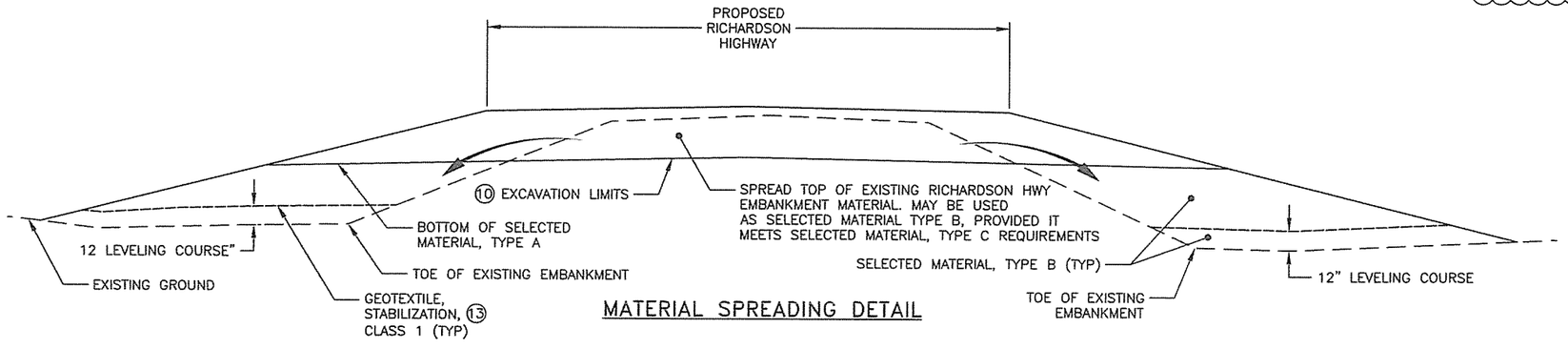
TURNOUTS ⑦

DITCH LINING ⑪



RICHARDSON HIGHWAY TYPICAL SECTION

STATION "O" 1550+00 TO STATION "O" 1593+00
STATION "O" 1632+50 TO STATION "O" 1647+00
STATION "O" 1663+00 TO STATION "O" 1830+00
STATION "O" 1842+00 TO STATION "O" 1845+00
STATION "O" 1854+00 TO STATION "O" 1880+00
STATION "O" 1888+00 TO STATION "O" 1908+00
STATION "O" 1917+00 TO STATION "O" 1980+00



MATERIAL SPREADING DETAIL

TYPICAL SECTION NOTES:

1. IN AREAS OF SUPERELEVATION, ADJUST FORESLOPE WIDTH SO THAT DITCH ELEVATION MATCHES THE INTERSECTION OF THE FORESLOPE AND BOTTOM OF SELECTED MATERIAL, TYPE A.
2. THE ROADWAY PROFILE GRADE POINT IS AT THE TOP OF HMA, TYPE II; CLASS B.
3. TRANSITION THE TYPICAL SECTION, STRUCTURAL SECTION, AND LANE WIDTHS TO THE EXISTING ROADWAY GEOMETRY OVER THE FIRST AND LAST 100 FEET OF THE PROJECT LENGTH.
4. SEE BRIDGE PLANS FOR BRIDGE TYPICAL SECTION
5. IF DAYLIGHT OCCURS BEFORE A 10' WIDE DITCH IS ESTABLISHED GRADE TO DRAIN AWAY FROM THE ROAD AT 20H:1V.
6. SEE STABILIZATION BERM DETAIL ON SHEET B2 FOR EXCEPTIONS TO EMBANKMENT SLOPE
7. SEE SHEET G4 FOR TURNOUT GRADING PLANS.
8. FOR LOCATIONS WHERE GUARDRAIL IS REQUIRED, SEE GUARDRAIL WIDENING DETAIL ON SHEET E1.
9. SEED ALL DISTURBED FORESLOPES, TRANSVERSE SLOPES, DITCHES AND BACKSLOPES IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 618, EXCEPT IN LOCATIONS WHERE RIPRAP, DITCH LINING OR ROCK BLANKET IS INSTALLED. UP TO 25 FEET BEYOND THE ENDS OF CULVERT INSTALLATIONS MAY BE UTILIZED FOR NECESSARY CONSTRUCTION ACTIVITIES; SEED AND STABILIZE TEMPORARY AREAS, IMPACTED BY CONSTRUCTION. THIS WORK WILL BE SUBSIDIARY TO PAY ITEM 618(2).
10. PROOF ROLL THE BOTTOM OF EXCAVATIONS WHERE THE NEW EMBANKMENT AND TURNOUTS CROSSES PREVIOUSLY UNDISTURBED GROUND PRIOR TO PLACING NEW EMBANKMENT MATERIAL ACCORDING TO SUBSECTION 203-305. OMIT PROOF ROLLING ONLY WHEN APPROVED BY THE ENGINEER AND AS NECESSARY TO PREVENT LIQUEFACTION OF SURFACE SOILS.
11. UP TO AN ADDITIONAL 10 STATIONS AS DIRECTED BY THE ENGINEER. DITCH LINING LOCATIONS MAY BE ADJUSTED IN THE FIELD, AS DIRECTED BY THE ENGINEER.
12. GRUBBING LIMITS SHALL BE FROM THE TOE OF EXISTING ROADWAY EMBANKMENT TO THE TOE OF PROPOSED ROADWAY EMBANKMENT.
13. PROOF ROLL LEVELING COURSE AND PLACE GEOTEXTILE, STABILIZATION, CLASS 1 ON TOP OF 12" OF SELECTED MATERIAL, TYPE B OVER PREVIOUSLY UNDISTURBED AREAS.
14. DO NOT GRUB BETWEEN STATIONS 1810+00 AND 1820+00.
15. REDUCE CLEARING WIDTH(S) AS NEEDED TO KEEP CLEARING LIMITS WITHIN THE EXISTING RIGHT-OF-WAY LIMITS.

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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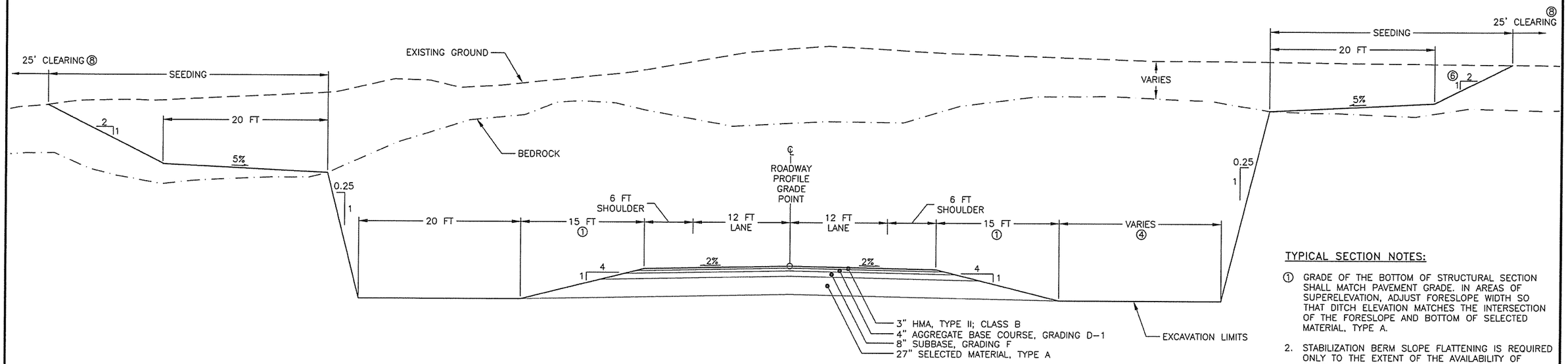
STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER
3/13/20

TYPICAL SECTION (1 OF 4)

ADDENDUM NO. 1, ATTACHMENT NO. 4

NO.	DATE	REVISION
⚠	03/04/2020	ADDENDUM #1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	B2	B4



RICHARDSON HIGHWAY ROCK CUT TYPICAL SECTION

STATION "O" 1601+00 TO STATION "O" 1632+50

TYPICAL SECTION NOTES:

① GRADE OF THE BOTTOM OF STRUCTURAL SECTION SHALL MATCH PAVEMENT GRADE. IN AREAS OF SUPERELEVATION, ADJUST FORESLOPE WIDTH SO THAT DITCH ELEVATION MATCHES THE INTERSECTION OF THE FORESLOPE AND BOTTOM OF SELECTED MATERIAL, TYPE A.

2. STABILIZATION BERM SLOPE FLATTENING IS REQUIRED ONLY TO THE EXTENT OF THE AVAILABILITY OF SURPLUS OR UNSUITABLE MATERIAL, AND AS APPROVED BY THE ENGINEER. EXCEPT FROM STATION 1647+00 TO 1663+00 WHERE THE STABILIZATION BERM IS REQUIRED.

3. ALL LABOR, EQUIPMENT, STAGING, STOCKPILING, DOUBLE HAULING, AND COMPACTION REQUIRED TO CONSTRUCT STABILIZATION BERMS IS SUBSIDIARY TO PAY ITEM 203(3).

④ ON PROJECT RIGHT DITCH WIDTH IS 20 FT FROM STATION 1601+00 TO 1613+60 AND FROM STATION 1623+75 TO 1632+50. DITCH WIDTH IS 150 FT FROM STATION 1613+60 TO 1623+75, OR AS APPROVED BY THE ENGINEER.

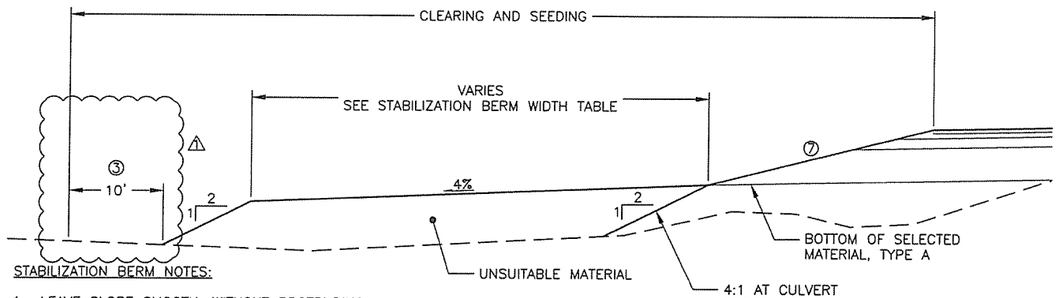
~~5. CLEARING AND GRUBBING IS SUBSIDIARY TO PAY ITEM 203(3) BETWEEN STATIONS 1601+00 AND 1632+50.~~

⑥ SEE BACKSLOPE STABILIZATION DETAIL ON SHEET B4.

⑦ SEE SHEET B1 FOR EMBANKMENT SLOPE.

⑧ CLEARING LIMITS SHALL BE 25 FEET BEYOND CATCH LIMITS OR OUT TO THE ROW LIMITS, WHICHEVER IS LESS.

STABILIZATION BERM WIDTH		
STATION	OFFSET	WIDTH
1560+00 TO 1597+50	LT	65'
1588+50 TO 1595+50	RT	35'
1646+50 TO 1650+00	RT	60'
1649+00 TO 1656+00	LT	20'
1650+00 TO 1656+00	RT	80'
1660+00 TO 1662+00	LT	65'
1662+00 TO 1665+00	LT	75'
1660+00 TO 1663+00	RT	50'
1764+00 TO 1770+00	LT	45'
1770+00 TO 1777+00	LT	40'



STABILIZATION BERM

STABILIZATION BERM NOTES:

1. LEAVE SLOPE SMOOTH, WITHOUT PROTRUDING STUMPS, BRUSH, OR ROOT WADS. GRADE THE SURROUNDING AREA BEYOND TO DRAIN AS DIRECTED BY THE ENGINEER.

2. SEE STABILIZATION BERM TRANSITION AT CULVERT DETAIL FOR INSTALLATION NEAR CULVERTS.

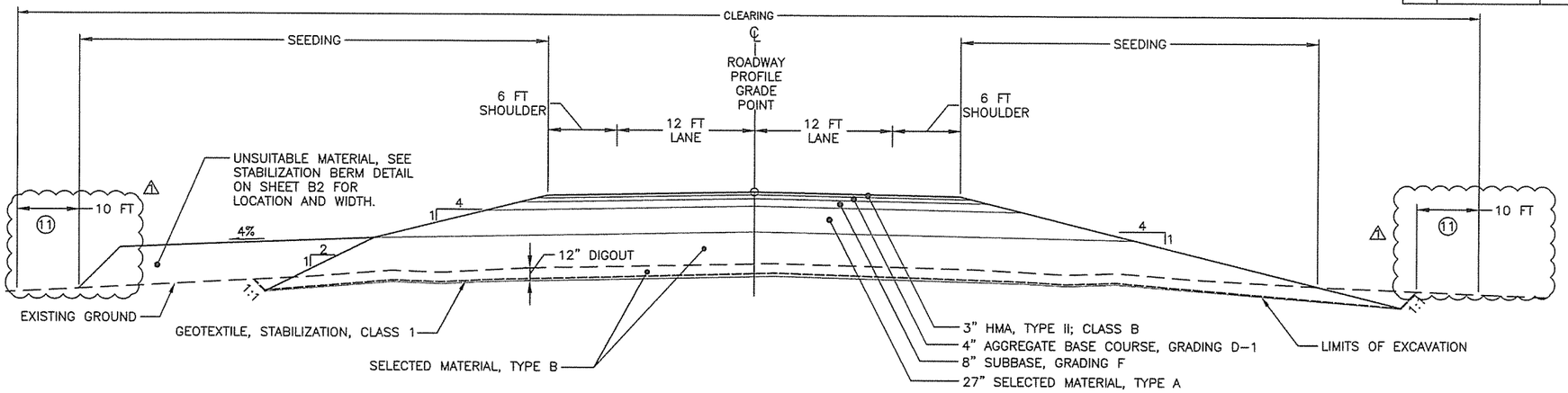
③ REDUCE CLEARING WIDTH AS NEEDED TO KEEP ALL CLEARING WITHINI THE EXISTING RIGHT-OF-WAY LIMITS.

TYPICAL SECTION (2 OF 4)

STATE OF ALASKA
49TH
DUSTIN HANNAFIOUS
CE 14055
REGISTERED PROFESSIONAL ENGINEER
7/4/20

NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1
3	03/13/2020	ADDENDUM #3

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	B3	B4



RICHARDSON HIGHWAY REALIGNMENT

STATION "O" 1593+00 TO STATION "O" 1601+00
~~STATION "O" 1632+50 TO STATION "O" 1647+00~~
STATION "O" 1830+00 TO STATION "O" 1842+00
STATION "O" 1845+00 TO STATION "O" 1854+00
STATION "O" 1880+00 TO STATION "O" 1888+00
STATION "O" 1908+00 TO STATION "O" 1917+00

SHEET NOTES:

1. NO GRUBBING. MECHANIZED CLEARING ACTIVITIES ONLY PERMITTED BETWEEN DECEMBER 10TH AND MARCH 31ST AND SHALL NOT UNDULY DISTURB THE VEGETATIVE MAT.
2. THICKNESS OF SUBBASE, GRADING F SHALL BE INCREASED TO 60" FROM STATION 1652+20 TO STATION 1662+47. TRANSITION USING 4:1 SLOPES PARALLEL TO HIGHWAY CENTERLINE.
3. PLACE GEOTEXTILE, REINFORCEMENT–TYPE 1 PERPENDICULAR TO THE EMBANKMENT CENTERLINE. SHALL BE CONTINUOUS FROM SIDE OF EMBANKMENT TO SIDE OF EMBANKMENT, WITH NO SEAMS ALLOWED PARALLEL TO THE EMBANKMENT CENTERLINE.
4. 4:1 EMBANKMENT SLOPE AT CULVERTS. SEE SHEET E6.
5. STABILIZATION BERMS FROM STATION 1647+00 TO 1663+00 ARE REQUIRED.
6. PLACE GEOTEXTILE, REINFORCEMENT–TYPE 1 PARALLEL TO THE EMBANKMENT CENTERLINE.
7. OVERLAP GEOTEXTILE SECTIONS BY A MINIMUM OF 3 FEET AT ALL LONGITUDINAL AND TRANSVERSE JOINTS. PLACE THE BEGINNING OF EACH NEW ROLL BENEATH THE END OF THE PREVIOUS ROLL TO PREVENT THE ADVANCING FILL FROM LIFTING THE GEOTEXTILE. SHINGLE IN THE DIRECTION OF CONSTRUCTION.
8. EMBANKMENT SLOPES SHALL BE 4H:1V EXCEPT BETWEEN STATIONS 1656+00 TO 1660+00 WHERE EMBANKMENT SLOPES SHALL BE 2H:1V.
9. EMBANKMENT SHALL BE 40 FEET WIDE AT THE BRIDGE APPROACH SLABS. TRANSITION FROM A 6 FOOT WIDE SHOULDER TO AN 8 FOOT WIDE SHOULDER OVER A 40 FOOT SPAN MEASURED FROM THE EDGE OF THE BRIDE APPROACH SLAB.
10. MINIMUM THICKNESS TO SUPPORT HAULING EQUIPMENT, SEE SPEC. SECTION 203–3.03.
11. REDUCE CLEARING WIDTH(S) AS NEEDED TO KEEP CLEARING LIMITS WITHIN THE EXISTING RIGHT–OF–WAY LIMITS.

RICHARDSON HIGHWAY HAGGARD CREEK VALLEY TYPICAL SECTION

STATION "O" 1647+00 TO BRIDGE

BRIDGE TO STATION "O" 1663+00

TYPICAL SECTION (3 OF 4)

STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14065
3/13/20
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644–2000 CERT. OF AUTH. NO. AECC569
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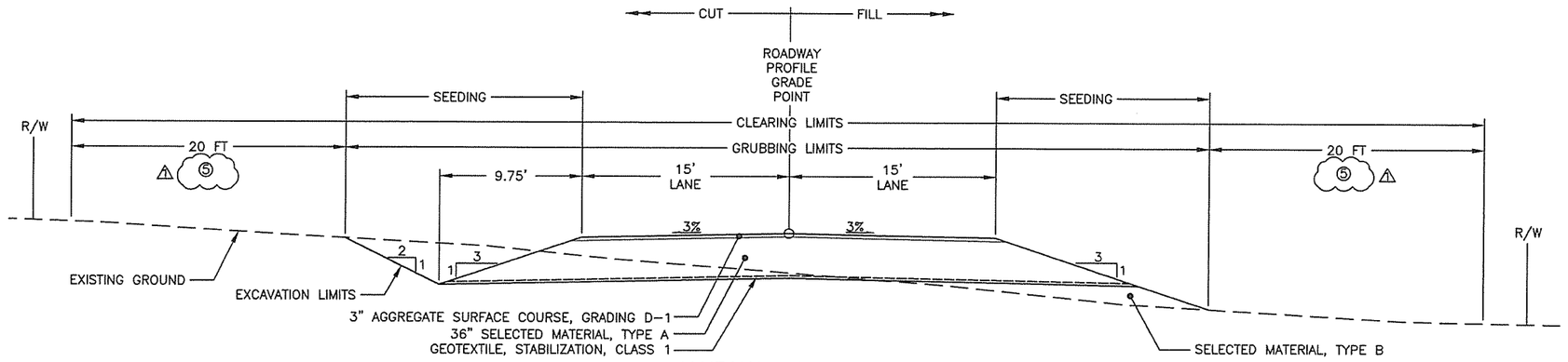
ADDENDUM NO. 1, ATTACHMENT NO. 6

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
⚠1	03/04/2020	ADDENDUM #1	ALASKA	0713013/Z622530000	2019	B4	B4



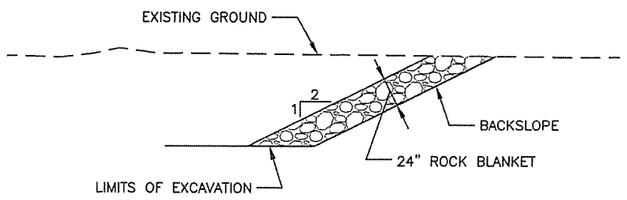
ALYESKA ACCESS RD

STATION "A1" 10+65 TO STATION "A1" 19+60

NOTES:

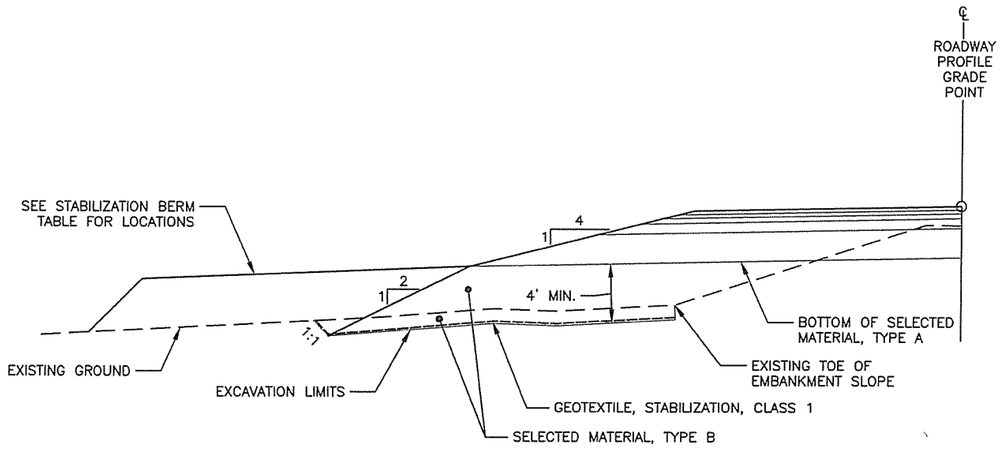
1. SEE SHEET FOR G2 ALYESKA ACCESS ROAD PLAN AND PROFILE.
2. ② VERIFY LOCATIONS WITH THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING WORK. ALL WORK AND MATERIAL REQUIRED IS SUBSIDIARY TO PAY ITEM 203(3).
3. ③ PLUS AN ADDITIONAL 10 STATIONS AS DIRECTED BY THE ENGINEER. ROCK BLANKET LOCATIONS MAY BE ADJUSTED IN THE FIELD BASED ON THE PRESENCE OF ICE RICH SOILS, AS DIRECTED BY THE ENGINEER.
4. WHERE DITCH LINING AND BACKSLOPE STABILIZATION OCCUR AT THE SAME LOCATION DITCH LINING TO BE CONSTRUCTED PRIOR TO BACKSLOPE STABILIZATION.

⚠ ⑤ REDUCE CLEARING WIDTH(S) AS NEEDED TO KEEP CLEARING LIMITS WITHIN THE EXISTING RIGHT-OF-WAY LIMITS.



BACKSLOPE STABILIZATION

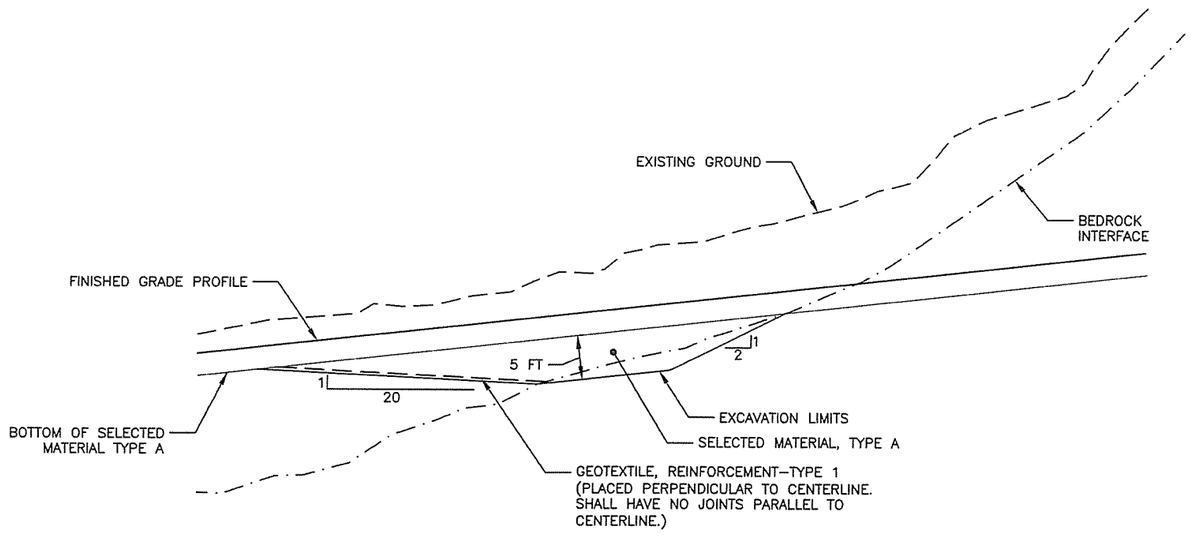
STATION "0" 1620+00 LT/RT TO STATION "0" 1645+00 LT/RT ③



OVER EXCAVATION DETAIL ②

APPLIES TO BOTH SIDES OF ROAD UNLESS OTHERWISE INDICATED

STATION "0" 1582+00 TO STATION "0" 1603+00
STATION "0" 1810+00 TO STATION "0" 1820+00
STATION "0" 1882+00 TO STATION "0" 1890+00
STATION "0" 1933+00 TO STATION "0" 1950+00
STATION "0" 1955+00 RT TO STATION "0" 1967+50 RT



ROCK SUBSURFACE EMBANKMENT TRANSITION

* STATION "0" 1600+50 TO STATION "0" 1602+50 (SHOWN)
* STATION "0" 1636+00 TO STATION "0" 1642+00

* ADJUST BEGINNING AND END STATIONS AS DIRECTED BY THE ENGINEER

TYPICAL SECTION (4 OF 4)

STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14085
REGISTERED PROFESSIONAL ENGINEER
5/4/20

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1
3	03/13/2020	ADDENDUM #3

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	C1	C2

ESTIMATE OF QUANTITIES

ITEM NO.	SSHC 2017 ITEM NO.	PAY ITEM	PAY UNIT	QUANTITY
201.0001.0000	201(1A)	CLEARING	ACRE	136
201.0002.0000	201(2A)	GRUBBING	ACRE	53.5
202.0017.0000	202(4)A	REMOVAL OF CULVERT PIPE	EACH	55
202.2030.0000	202(2030)	RELOCATE STOCKPILE	LUMP SUM	ALL REQ'D
203.0002.0000	203(2)	ROCK EXCAVATION	CUBIC YARD	567,000
203.0003.0000	203(3)	UNCLASSIFIED EXCAVATION	CUBIC YARD	540,000
203.0009.0000	203(9)	OBLITERATION OF ROADWAY	SQUARE YARD	21,700
205.0006.0000	205(6)	STRUCTURAL FILL	CUBIC YARD	1,360
301.0001.00D1	301(1)	AGGREGATE BASE COURSE, GRADING D-1	TON	45,000
304.0001.000F	304(1)	SUBBASE, GRADING F	TON	107,000
401.0001.002B	401(1)	HMA, TYPE II; CLASS B	TON	29,900
401.0004.5240	401(4)	ASPHALT BINDER, GRADE PG 52-40	TON	1,800
401.0008.002B	401(8)	HMA PRICE ADJUSTMENT, TYPE II; CLASS B	CONTINGENT SUM	ALL REQ'D
401.0009.0000	401(9)	LONGITUDINAL JOINT DENSITY PRICE ADJUSTMENT	CONTINGENT SUM	ALL REQ'D
401.0010.0001	401(10)	PAVEMENT SMOOTHNESS PRICE ADJUSTMENT, METHOD 1	CONTINGENT SUM	ALL REQ'D
401.0012.002B	401(12)	HMA, DRIVEWAY, TYPE II; CLASS B	TON	270
401.0015.0000	401(15)	ASPHALT MATERIAL PRICE ADJUSTMENT	CONTINGENT SUM	ALL REQ'D
406.0001.0000	406(1)	RUMBLE STRIPS	LUMP SUM	ALL REQ'D
501.0001.0000	501(1)	CLASS A CONCRETE	LUMP SUM	ALL REQ'D
501.0007.0000	501(7)	PRECAST CONCRETE MEMBER, 131'-0" DECKED BULB-TEE	EACH	6
503.0001.0000	503(1)	REINFORCING STEEL	LUMP SUM	ALL REQ'D
503.0002.0000	503(2)	EPOXY-COATED REINFORCING STEEL	LUMP SUM	ALL REQ'D
505.0005.2405	505(5)	FURNISH STRUCTURAL STEEL PILES, 2'-0" DIA. X 1/2" PIPE	LINEAR FOOT	1,174
505.0006.2405	505(6)	DRIVE STRUCTURAL STEEL PILES, 2'-0" DIA. X 1/2" PIPE	EACH	12
507.0001.0002	507(1)	STEEL BRIDGE RAILING, 2 TUBE	LINEAR FOOT	348
508.0001.0000	508(1)	WATERPROOFING MEMBRANE, SPRAY ON	LUMP SUM	ALL REQ'D
603.0001.0024	603(1)-24	CSP 24 INCH	LINEAR FOOT	350
603.0001.0036	603(1)-36	CSP 36 INCH	LINEAR FOOT	3,404
606.0001.0000	606(1)	W-BEAM GUARDRAIL	LINEAR FOOT	1,350
606.0013.0000	606(13)	PARALLEL GUARDRAIL TERMINAL	EACH	4
606.0016.0000	606(16)	TRANSITION RAIL	EACH	4
610.0001.0000	610(1)	DITCH LINING	CUBIC YARD	2,120
611.0001.0001	611(1)A	RIPRAP, CLASS I	CUBIC YARD	1,023
611.0001.0002	611(1)B	RIPRAP, CLASS II	CUBIC YARD	960
613.0002.0000	613(2)	CULVERT MARKER POST	EACH	84
615.0001.0000	615(1)	STANDARD SIGN	SQUARE FOOT	63.2
616.0002.0050	616(2)	THAW PIPE 1/2 INCH DIAMETER	EACH	5
618.0002.0000	618(2)	SEEDING	POUND	6,800
630.0002.0001	630(1)	GEOTEXTILE, STABILIZATION, CLASS 1	SQUARE YARD	204,600
630.0003.0001	630(3)	GEOTEXTILE, REINFORCEMENT-TYPE 1	SQUARE YARD	55,500
631.0002.0001	631(2)	GEOTEXTILE, EROSION CONTROL, CLASS 1	SQUARE YARD	4,200
639.2000.0000	639(3)	APPROACH	EACH	7
640.0001.0000	640(1)	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D
640.0004.0000	640(4)	WORKER MEALS AND LODGING, OR PER DIEM	LUMP SUM	ALL REQ'D
641.0001.0000	641(1)	EROSION, SEDIMENT AND POLLUTION CONTROL ADMINISTRATION	LUMP SUM	ALL REQ'D
641.0003.0000	641(3)	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D
641.0004.0000	641(4)	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL ADDITIVES	CONTINGENT SUM	ALL REQ'D
641.0006.0000	641(6)	WITHHOLDING	CONTINGENT SUM	ALL REQ'D
641.0007.0000	641(7)	SWPPP MANAGER	LUMP SUM	ALL REQ'D
641.2001.0000	641(8)	ROCK BLANKET	CUBIC YARD	6,230

ESTIMATE OF QUANTITIES

ITEM NO.	SSHC 2017 ITEM NO.	PAY ITEM	PAY UNIT	QUANTITY
642.0001.0000	642(1)	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D
642.0013.0000	642(3A)	THREE PERSON SURVEY PARTY	CONTINGENT SUM	ALL REQ'D
642.2002.0000	642(103)	CONTRACTOR-FURNISHED CROSS SECTIONS	LUMP SUM	ALL REQ'D
643.0002.0000	643(2)	TRAFFIC MAINTENANCE	LUMP SUM	ALL REQ'D
643.0023.0000	643(23)	TRAFFIC PRICE ADJUSTMENT	CONTINGENT SUM	ALL REQ'D
643.0025.0000	643(25)	TRAFFIC CONTROL	CONTINGENT SUM	ALL REQ'D
643.0033.0000		DETOUR	LUMP SUM	ALL REQ'D
644.0001.0000	644(1)	FIELD OFFICE	LUMP SUM	ALL REQ'D
644.0002.0000	644(2)	FIELD LABORATORY	LUMP SUM	ALL REQ'D
644.0003.0000	644(3)	CURING SHED	LUMP SUM	ALL REQ'D
644.0006.0000	644(6)	VEHICLE	LUMP SUM	ALL REQ'D
644.0015.0000	644(15)	NUCLEAR TESTING EQUIPMENT STORAGE SHED	EACH	1
645.0001.0000	645(1)	TRAINING PROGRAM, 4 TRAINEES/APPRENTICES	LABOR HOUR	2,000
646.0001.0000	646(1)	CPM SCHEDULING	LUMP SUM	ALL REQ'D
654.2006.0000	654(1)	CHANNEL REALIGNMENT	LUMP SUM	ALL REQ'D
670.0001.0000	670(1)	PAINTED TRAFFIC MARKINGS	LUMP SUM	ALL REQ'D
802.2000.0000	802(102)A	CONTAMINATED SOIL REMOVAL AND DISPOSAL, MEIERS LAKE MATERIAL SOURCE	CONTINGENT SUM	ALL REQ'D

TABLE OF ESTIMATING FACTORS

ITEM NO.	SSHC 2017 ITEM NO.	DESCRIPTION	FACTOR	UNITS
301.0001.00D1	301(1)	AGGREGATE BASE COURSE, GRADING D-1	2	TONS/CUBIC YARD
304.0001.000F	304(1)	SUBBASE, GRADING F	2	TONS/CUBIC YARD
401.0001.002B	401(1)	ASPHALT CONCRETE, TYPE II, CLASS B	115	POUNDS/SQUARE YARD/INCH
401.0004.5240	401(2)	ASPHALT BINDER, GRADE PG 52-40	0.06	TOTAL WEIGHT OF MIX
401.0012.002B	401(12)	HMA, DRIVEWAY, TYPE II; CLASS B	115	POUNDS/SQUARE YARD/INCH
610.0001.0000	610(1)	DITCH LINING	1.7	TONS/CUBIC YARD
611.0001.0001	611(1A)	RIPRAP, CLASS I	1.7	TONS/CUBIC YARD
611.0001.0002	611(1B)	RIPRAP, CLASS II	1.7	TONS/CUBIC YARD
618.0002.0000	618(2)	SEEDING	1.0	POUNDS/1000 SQUARE FEET

STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
CE 14055
REGISTERED PROFESSIONAL ENGINEER
3/13/20

ESTIMATE OF QUANTITIES

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
1	03/04/2020	ADDENDUM #1	ALASKA	0713013/Z622530000	2019	C2	C2
3	03/13/2020	ADDENDUM #3					

GENERAL NOTES:

1. GRADES AND ALIGNMENTS SHOWN ON THESE PLANS ARE SUBJECT TO MINOR REVISIONS BY THE ENGINEER.
2. THE CENTERLINE IS THE POINT OF SUPERELEVATION ROTATION.
3. THE CONTRACTOR SHALL ESTABLISH PASS / NO PASS ZONES IN ACCORDANCE WITH SECTION 670 SPECIAL PROVISION.
4. QUANTITIES ARE BASED ON IN PLACE (BANK CUT) VOLUMES PRIOR TO EXCAVATION AND ARE NOT ADJUSTED FOR SHRINK OR SWELL. IT IS ASSUMED ROCK EXCAVATION QUANTITY WILL SWELL 25% AFTER BLASTING. 3
5. EXPECT ZONES OF BEDROCK TO REQUIRE BLASTING.
6. SEED ALL DISTRIBUTED AREAS AS DIRECTED BY THE ENGINEER. SEEDING MAY REQUIRE SEVERAL MOBILIZATIONS. ALL MOBILIZATIONS ARE SUBSIDIARY TO PAY ITEM 618(2).
7. ICE MAY BE PRESENT IN CULVERTS. IF CULVERTS ARE REPLACED WHILE CONTAINING ICE, ICE REMOVAL IS SUBSIDIARY TO OTHER 202 AND 603 PAY ITEMS.
8. OBLITERATION OF ROADWAY INCLUDES THE REMOVAL AND DISPOSAL OF EXISTING ASPHALT CONCRETE PAVEMENT. THIS WORK IS SUBSIDIARY TO PAY ITEM 203(9).
9. EXISTING UTILITIES SHOWN ARE BASED ON A 2012 SURVEY. SINCE 2012, SOME UNDERGROUND UTILITIES HAVE BEEN RELOCATED AND/OR ABANDONED.

DRAINAGE NOTES:

1. REMOVED PIPE BECOMES THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT THIS WORK IS SUBSIDIARY TO PAY ITEM 202(4)A.
2. STAKE CULVERT PIPES TO FIT FIELD CONDITIONS.
3. ALL CULVERT PIPE LENGTHS AND LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO ADJUSTMENTS AS DIRECTED BY THE ENGINEER.
4. DITCH CULVERT OUTLETS AND INLETS TO DRAIN AS NEEDED OR AS DIRECTED BY THE ENGINEER. THIS WORK IS SUBSIDIARY TO 603 PAY ITEMS.

SUMMARY OF PROJECT ALIGNMENTS

NAME	DESCRIPTIVE NAME	APPROACH DESCRIPTION	REMARKS	
"A1"	DRIVEWAY APPROACH 1	ALYESKA PIPELINE ACCESS ROAD	APPROACH CENTERLINE FOUND NEAR STATION "O" 1597+50	1
"A4"	DRIVEWAY APPROACH 4	ALYESKA PIPELINE ACCESS ROAD	APPROACH CENTERLINE FOUND NEAR STATION "O" 1684+18	
"A6"	DRIVEWAY APPROACH 6	ALYESKA PIPELINE ACCESS ROAD	APPROACH CENTERLINE FOUND NEAR STATION "O" 1776+34	
"A7"	DRIVEWAY APPROACH 7		APPROACH CENTERLINE FOUND NEAR STATION "O" 1811+20	
"A10"	DRIVEWAY APPROACH 10		APPROACH CENTERLINE FOUND NEAR STATION "O" 1950+66	
"O"	"O" ALIGNMENT		PROPOSED DESIGN ALIGNMENT OF RICHARDSON HIGHWAY	

LIST OF ABBREVIATIONS:

%	PERCENT
Δ	DELTA ANGLE
APPROX, ~	APPROXIMATELY
ADT	AVERAGE DAILY TRAFFIC
AH	AHEAD
ASDS	ALASKA SIGN DESIGN SUPPLEMENT
BFS	BEGIN FULL SUPER
BNC	BEGIN NORMAL CROWN
BOL	BEGINNING OF LINE
BOP	BEGINNING OF PROJECT
℄	CENTER LINE
CSP	CORRUGATED STEEL PIPE
D	DEGREE OF CURVATURE
DEG, °	DEGREE
DEMO	DEMOLISH
DIA.	DIAMETER
DHV	DESIGN HOURLY VOLUME
E	EAST
EAL	EQUIVALENT AXLE LOADING
EFS	END FULL SUPER
ELEV.	ELEVATION
ENC	END NORMAL CROWN
EOL	END OF LINE
EOP	END OF PROJECT
FT, '	FOOT
GALV.	GALVANIZED
H	HORIZONTAL
HMA	HOT MIX ASPHALT
IN, "	INCH
L	LENGTH OF CURVE
LC	LEVEL CROWN
LT	LEFT
LVC	LENGTH OF VERTICAL CURVE
MAX.	MAXIMUM
MIN.	MINIMUM
MP	MILEPOST
N	NORTH
NO., #	NUMBER
OG	ORIGINAL GRADE
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PST	PERFORATED STEEL POST
PT	POINT OF TANGENCY
R	RADIUS
RC	REVERSE CROWN
RT	RIGHT
R/W	RIGHT-OF-WAY
S	SOUTH
S	SUPERELEVATION
SQ	SQUARE
T	CURVE TANGENT LENGTH
TYP	TYPICAL
V	VERTICAL
VPC	VERTICAL POINT OF CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
W	WEST

STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER
3/13/20

GENERAL NOTES

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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ADDENDUM NO. 1, ATTACHMENT NO. 9

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
⚠	03/04/2020	ADDENDUM #1					
			ALASKA	0713013/Z622530000	2019	D1	D1

SUPERELEVATION SUMMARY

CURVE P.I.	RADIUS (FEET)	BEGIN TRANSITION	TRANSITION LENGTH(FEET)	CURVE P.C.	BEGIN FULL SUPERELEVATION	SUPERELEVATION RATE (%)	END FULL SUPERELEVATION	CURVE P.T.	TRANSITION LENGTH(FEET)	END TRANSITION	REMARKS
1574+74.16	2900	1566+35	230	1568+29.14	1568+65	5.6	1580+65	1580+98.51	230	1582+95	
1610+18.58	2900	1586+20	230	1588+11.67	1588+50	5.6	1625+50	1625+84.61	230	1627+80	
1642+21.77	2100	1631+75	240	1633+76.84	1634+15	6.0	1649+50	1649+83.46	240	1651+90	
1672+71.41	2900	1666+10	230	1668+05.02	1668+40	5.6	1676+95	1677+29.88	230	1679+25	
1688+53.29	2900	1682+40	230	1684+33.03	1684+70	5.6	1692+35	1692+67.74	230	1694+65	
1723+18.28	2100	1714+80	240	1716+83.49	1717+20	6.0	1728+85	1729+16.40	240	1731+25	
1788+13.25	7452	1782+10	140	1783+33.21	1783+50	2.8	1792+80	1792+91.97	140	1794+20	
1809+01.94	6059	1798+35	160	1799+71.67	1799+95	3.2	1818+00	1818+17.80	160	1819+60	
1831+73.59	4000	1822+65	200	1824+32.46	1824+65	4.6	1838+75	1838+98.11	200	1840+75	
1869+24.42	3800	1862+40	200	1864+08.59	1864+40	4.6	1874+10	1874+33.98	200	1876+10	
1920+35.14	2900	1913+75	230	1915+66.36	1916+05	5.6	1924+65	1924+95.88	230	1926+95	
1933+59.47	12885	1929+95	120	1930+99.60	1931+15	2.0	1936+10	1936+19.26	120	1937+30	
1972+79.62	3800	1969+50	200	1971+16.79	1971+50	4.6	1974+15	1974+42.24	200	1976+15	

SUPERELEVATION NOTES:

1. CONSTRUCT SUPERELEVATIONS USING CASE #1 SHOWN ON SHEET V16.
⚠ 2. SEE SHEET V16 FOR SUPERELEVATION TRANSITION DETAILS. THE TRANSITION LENGTHS GIVEN IN THE SUMMARY DO NOT INCLUDE THE 1/2 VERTICAL CURVE LENGTHS SHOWN ON EACH END OF THE TRANSITION.

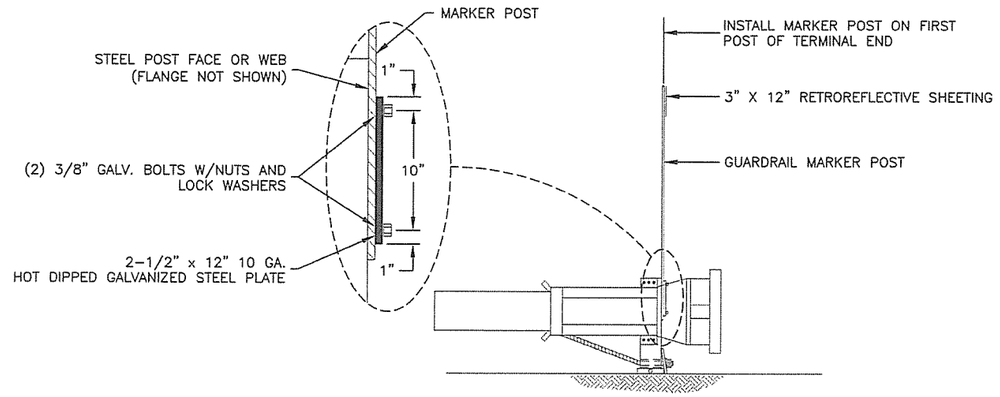
SUPERELEVATION SUMMARY

STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER
3/4/20

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E1	E12

GUARDRAIL SUMMARY

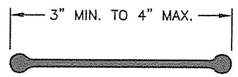
BEGIN STATION	END STATION	LT/RT	606(1) W-BEAM GUARDRAIL (FEET)	606(13) PARALLEL GUARDRAIL TERMINAL (EACH)	606(16) TRANSITION RAIL (EACH)	REMARKS
"0" 1653+70	"0" 1657+02	LT	262.5	1	1	SEE SHEET F4
"0" 1652+09	"0" 1656+79	RT	400.0	1	1	SEE SHEET F4
"0" 1658+76	"0" 1663+59	LT	412.5	1	1	SEE SHEET F4
"0" 1658+53	"0" 1661+98	RT	275.0	1	1	SEE SHEET F4



GUARDRAIL MARKER POST ATTACHMENT DETAIL
PARALLEL GUARDRAIL TERMINAL

GUARDRAIL NOTES:

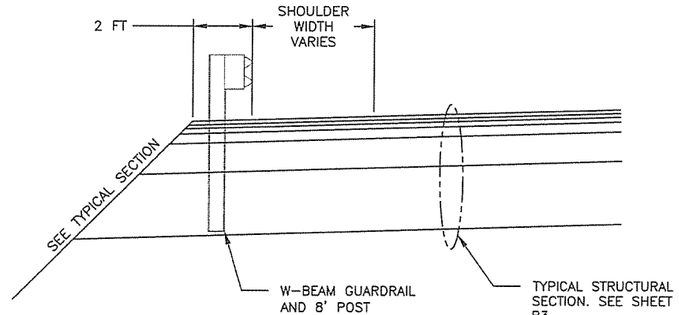
1. FOR PARALLEL GUARDRAIL TERMINALS, CONSTRUCT THE GUARDRAIL TERMINAL WIDENING IN ACCORDANCE WITH THE "STANDARD GUARDRAIL TERMINAL WIDENING DETAIL" ON SHEET V15. THE END OFFSET (X) SHALL BE 2 FEET. USE 50' PARALLEL GUARDRAIL TERMINALS.



POST DETAIL
CROSS-SECTIONAL VIEW

GUARDRAIL MARKER NOTES:

1. GUARDRAIL MARKER POSTS SHALL BE YELLOW AND AT LEAST 72" LONG. POSTS SHALL MEET THE REQUIREMENTS OF SECTION 730-2.05 FLEXIBLE DELINEATOR POSTS.
2. RETROREFLECTIVE SHEETING SHALL MEET ASTM D4956 REQUIREMENTS FOR TYPE VIII, IX, OR XI. COLOR OF RETROREFLECTIVE SHEETING SHALL MATCH COLOR OF ADJACENT EDGE LINE STRIPE. PLACE RETROREFLECTIVE SHEETING ON SIDE OF MARKER POST FACING TRAFFIC IN ADJACENT LANE.
3. DRILL ALL BOLT HOLES. COAT HOLES WITH ZINC RICH PAINT. FLAME CUTTING SHALL NOT BE PERMITTED.
4. ALL WORK AND MATERIAL REQUIRED TO INSTALL GUARDRAIL MARKER POSTS IS SUBSIDIARY TO 606 PAY ITEMS.



GUARDRAIL WIDENING DETAIL
APPLIES TO BOTH SIDES OF THE ROADWAY

GUARDRAIL DETAILS

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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CULVERT SUMMARY

STATION	NEW PIPE LENGTH 603(1)-24 24" CSP	NEW PIPE LENGTH 603(1)-36 36" CSP	613(2) MARKER POST	616(2) THAW PIPE	611(1)A RIPRAP (CY)	DITCH DIKE	REMARKS	AS-BUILT CENTERLINE LOCATION (SEE NOTE 1) STATION	LATITUDE	LONGITUDE
"0"1551+71		58'	X		25.0	RT				
"0"1560+52		68'	X		25.0	RT				
"0"1566+00		158'	X		25.0	RT				
"0"1569+65		162' ⚠	X		25.0	RT				
"0"1574+34		80'	X		25.0					
"0"1589+23		116'	X		25.0					
"0"1590+90		128'	X	X	25.0					
"A1"10+56	⚠ 108'	~~108'~~	X		19.5					
~~"A2" 10+39~~	~~88'~~		~~X~~		~~19.5~~					
"0"1670+50		98'	X	X	25.0					
"0"1676+41		102'	X	X	25.0					
"A4"10+46	⚠ ~~90'~~	88'	X		19.5					
⚠ "0"1686+07		78'	X	X	25.0	RT				
"0"1696+06		90'	X		25.0					
"0"1707+18		58'	X		25.0	RT	SEE SPECIAL DITCH GRADING DETAIL A			
"0"1707+34		58'	X		25.0		SEE SPECIAL DITCH GRADING DETAIL A			
"0"1712+43		68'	X		25.0	RT				
"0"1722+91		68'	X		25.0		SEE SPECIAL DITCH GRADING DETAIL B			
"0"1732+15		70'	X		25.0					
"0"1741+25		67' ⚠	X		25.0					
"0"1745+51		66'	X		25.0					
"0"1766+93		80'	X		25.0					
"0"1769+89		80'	X		25.0					
"A6"10+46	86' ⚠		X		19.5					
"0"1785+58		96'	X		25.0					
"0"1795+32		72'	X		25.0					
"0"1801+28		60'	X		25.0					
"A7"10+46	78'		X		19.5					
"0"1811+81		70'	X		25.0		SEE CULVERT END GRADING DETAIL			
"0"1813+99		106'	X		25.0					
"0"1826+84		93' ⚠	X		25.0					
"0"1844+00		60'	X		25.0	RT				
"0"1859+87		124'	X		25.0					
"0"1875+84		122'	X		25.0					
"0"1885+07		110'	X	X	25.0					
"0"1898+70		86'	X		25.0					
"0"1939+97		134'	X		25.0					
"0"1943+63		116'	X		25.0					
"0"1945+69		92'	X		25.0					
⚠ "A10"10+42	78'		X		19.5					
"0"1951+71		80'	X		25.0					
"0"1966+72		80'	X		25.0					
"0"1977+36		62'	X		25.0					
TOTAL	⚠ 350	⚠ 3404	⚠ 84	5	⚠ 1023					

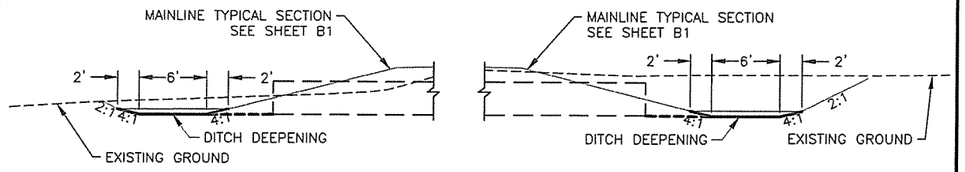
CULVERT NOTES:

1. THE CONTRACTOR SHALL ENTER AS-BUILT LOCATIONS FOR ALL CULVERTS IN THE CULVERT SUMMARY TABLE. COORDINATES SHALL BE LOCATED AT THE INTERSECTION OF THE CULVERT AND ROAD CENTERLINE. USE WGS84 DATUM FORMATTED TO DECIMAL DEGREES TO A PRECISION OF 2 DECIMAL PLACES. THIS WORK IS SUBSIDIARY TO PAY ITEM 642(1).
2. ALL 36" AND LARGER CSP CULVERTS SHALL BE 10 GAUGE. ALL 24" CSP CULVERTS SHALL BE 14 GAUGE.
3. LOCATION AND LENGTH OF NEW CULVERTS ARE APPROXIMATE AND SHALL BE ADJUSTED TO FIT THE EXISTING OR PROPOSED DRAINAGE CHANNEL. INVERT ELEVATION TO BE APPROVED BY THE ENGINEER.
4. MINIMUM ALLOWABLE CULVERT CROSS SLOPE IS 0.5%.
5. ALL PIPES SHALL BE GALVANIZED. SEE SHEET E3 FOR CULVERT MARKER POST DETAILS.
6. SEE RIPRAP APRON DETAIL ON SHEET E5 FOR RIPRAP LAYOUT.
7. ALL CULVERT PIPES ARE PERPENDICULAR TO HIGHWAY CENTERLINE.

NO.	DATE	REVISION
⚠	03/04/2020	ADDENDUM #1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	E2	E12

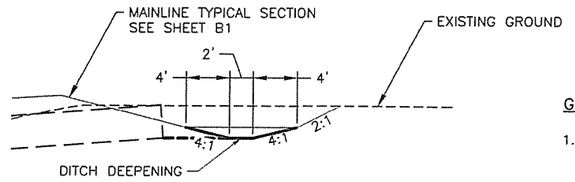
ADDENDUM NO. 1, ATTACHMENT NO.10



GRADING NOTES:

1. TRANSITION FROM MAINLINE TYPICAL SECTION TO DEEPENED DITCH DETAIL OVER 20 FEET DOWN STATION FROM 1707+18 CULVERT CENTERLINE. TRANSITION BACK TO THE MAINLINE TYPICAL SECTION AT STATION 1707+34 CULVERT CENTERLINE OVER 20 FEET.
2. CARRY RIGHT DEEPENED DITCH FROM DITCH DIKE AT STATION 1707+18 CULVERT TO STATION 1707+34 CULVERT CENTERLINE THEN TRANSITION TO MAINLINE TYPICAL SECTION OVER 20 FEET.

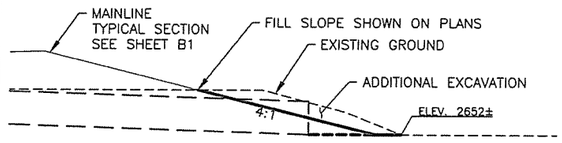
SPECIAL DITCH GRADING DETAIL A



GRADING NOTES:

1. TRANSITION FROM MAINLINE TYPICAL SECTION TO DEEPENED DITCH DETAIL OVER 20', UPSTATION FROM 1722+91 RIGHT. TRANSITION FROM DEEPENED DITCH DETAIL TO MAINLINE TYPICAL OVER 50 FEET DOWN STATION FROM CULVERT CENTERLINE.

SPECIAL DITCH GRADING DETAIL B



GRADING NOTES:

1. CONSTRUCT 1811+81 END DETAIL 10 FEET EITHER SIDE OF 1811+81 CULVERT CENTERLINE.

CULVERT END GRADING DETAIL

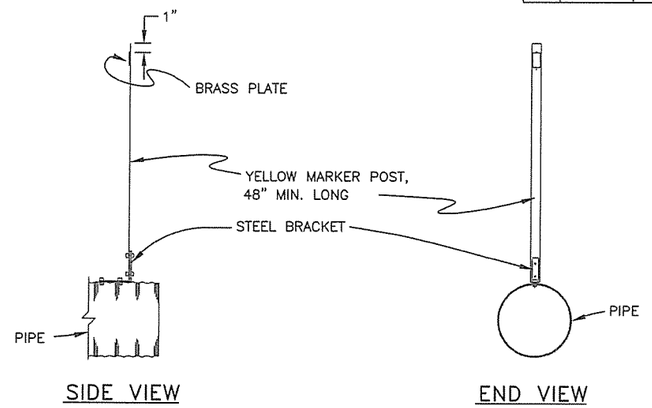
CULVERT DETAILS (1 OF 5)

PLANS DEVELOPED BY: HDR ENGINEERING INC. 2525 C STREET SUITE 500, ANCHORAGE ALASKA 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_E_DETAILS-Culvert Details (1 of 5) Wed, Mar/04/20 02:52pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E3	E12

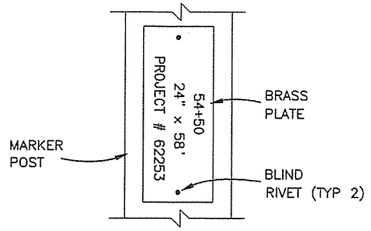
202(4) REMOVAL OF CULVERT PIPE

APPROXIMATE STATION	DESCRIPTION	REMARKS
1551+71		
1560+53		
1565+89		
1569+63		
1574+26		
1574+35		
1589+01		
1589+20		
1590+49		
1590+91		
1596+00		
1601+62		
1607+41		
1610+45		
1614+71		
1620+21		
1624+02		
1631+45		
1638+45		
1658+06		
1660+26		HAGGARD CREEK CULVERT ⑦
1670+59		
1676+41		
1683+92		
1685+32		
1696+06		
1707+18		
1707+34		
1712+43		
1722+45		
1732+15		
1741+25		
1745+51		
1766+93		
1772+13		
1785+76		
1795+29		
1801+26		
1810+73		
1814+02		
1829+03		
1830+47		
1859+98		
1867+78		
1875+97		
1885+24		
1898+69		
1902+62		
1940+12		
1943+76		
1945+81		
1951+84		
1966+85		
1977+48		
TOTAL	54 (EACH)	



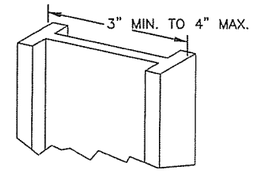
SIDE VIEW END VIEW

CULVERT MARKER POST DETAIL



AS-BUILT STATION AND SIZE OF PIPE TO BE STAMPED USING LETTERS A MINIMUM OF 1/4" HIGH INTO A 2" x 4" x 0.064" THICK BRASS PLATE. FASTEN PLATE TO THE SIDE FACING THE ROADWAY WITH TWO 1/8" DIA. BLIND RIVETS.

BRASS PLATE DETAIL



POST DETAIL

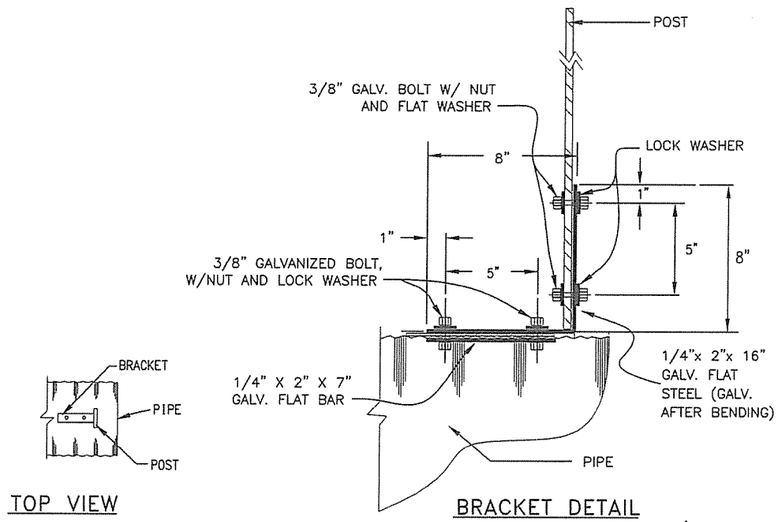
CULVERT MARKER NOTES:

1. DRILL ALL BOLT HOLES. COAT HOLES IN PIPE WITH ZINC RICH PAINT. FLAME CUTTING SHALL NOT BE PERMITTED.
2. MARKER POST ENDS SHALL BE SQUARE.
3. GASKET MATERIAL SHALL BE PLACED BETWEEN DISSIMILAR METALS. GASKET MATERIAL SHALL BE APPROVED PRIOR TO INSTALLATION.
4. ALL DIMENSIONS IN INCHES.
5. WHEN MORE THAN TWO PIPES ARE LOCATED TOGETHER. ONLY THE FIRST AND LAST PIPE SHALL HAVE A MARKER.

CULVERT REMOVAL NOTES:

6. EXCAVATION FOR REMOVAL OF EXISTING CULVERTS SHALL BE SUBSIDIARY TO PAY ITEM 202(4). SUB-EXCAVATION NOT REQUIRED FOR APPROACH CULVERTS.

⑦ SEE SHEET E7 FOR HAGGARD CREEK STREAM BED RESTORATION DETAILS.



TOP VIEW

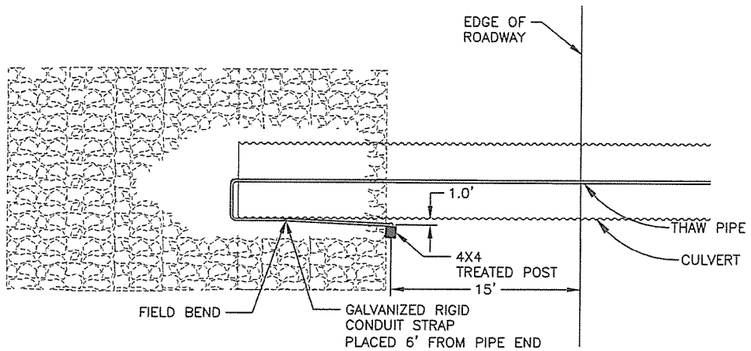
BRACKET DETAIL

CULVERT DETAILS (2 OF 5)

STATE OF ALASKA 49TH DUSTIN HANNAFIOUS C.E. 14055 10/4/19 REGISTERED PROFESSIONAL ENGINEER

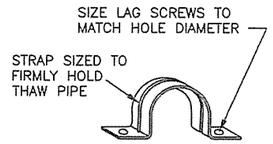
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503. (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\62253_E_DETAILS-Culvert Details (2 of 5) Thu, Oct/03/19 11:03am

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E4	E12

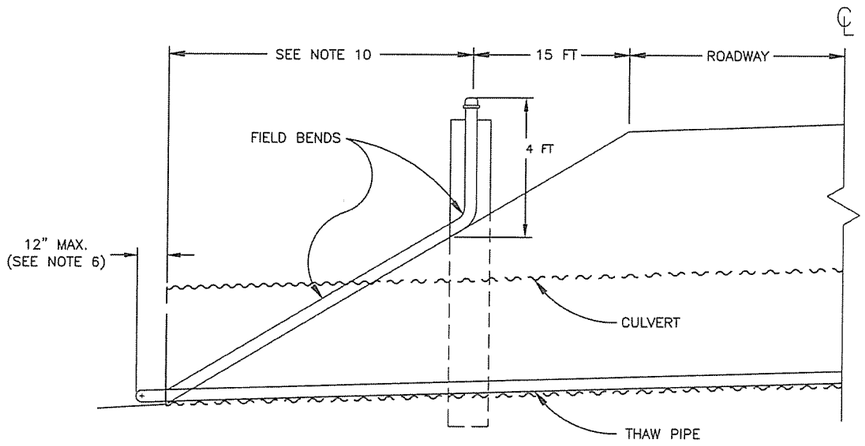


FILL CONDITION TOP VIEW

NOT TO SCALE

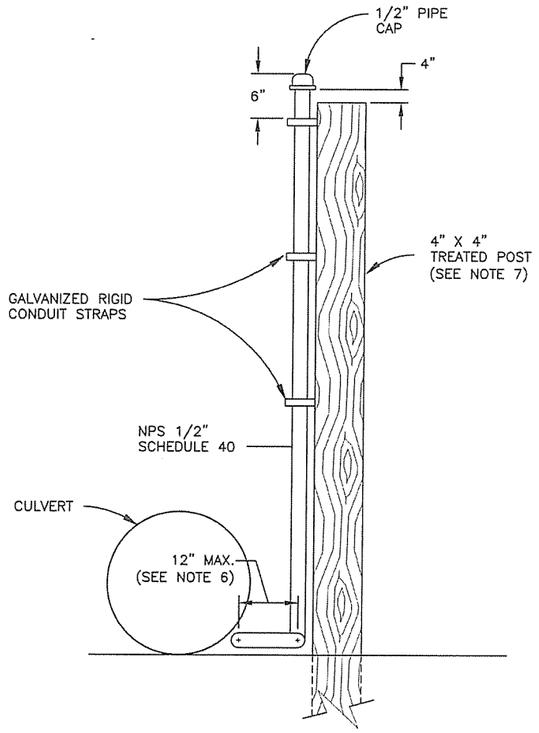


GALVANIZED RIGID CONDUIT STRAP



SECTION VIEW

APPLIES TO BOTH SIDES OF THE ROADWAY

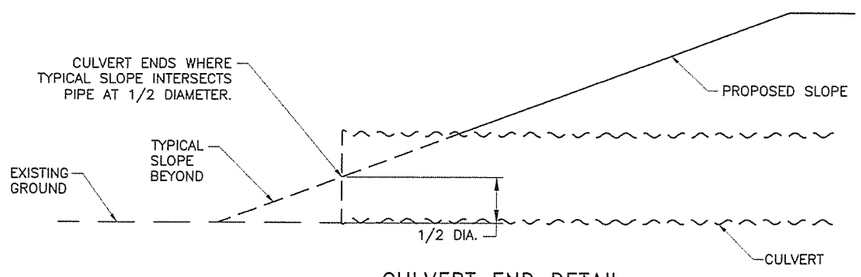


STAND PIPE

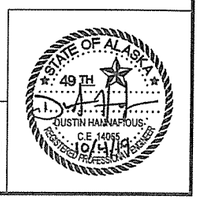
THAW PIPE DETAILS

THAW PIPE NOTES:

1. REFER TO THE CULVERT SUMMARY FOR THAW PIPE LOCATIONS AND QUANTITIES.
2. LAY THE THAW PIPE INSIDE ON THE BOTTOM OF THE SPECIFIED CULVERT (NO INTERNAL PIPE HANGERS OR INTERNAL TIE–DOWN STRAPS ARE REQUIRED).
3. DO NOT LOCATE ANY THAW PIPE JOINTS OR COUPLINGS WITHIN 30 INCHES INSIDE OF CULVERT ENDS.
4. ALL THAW PIPES SHALL BE WATER TIGHT. SEAL ALL THAW PIPE JOINTS EXCEPT THE END CAPS WITH AN APPROVED SEALING COMPOUND.
5. THAW PIPES SHALL BE BENT WITHOUT KINKS 180 DEGREES AROUND CULVERT ENDS FROM THE INSIDE TO OUTSIDE OF THE CULVERT WITH NO GREATER THAN 6–IN BEND RADIUS. THE BEND SHALL NOT PROTRUDE MORE THAN 12 INCHES BEYOND THE END OF THE CULVERT. DO NOT LOCATE THAW PIPE JOINTS OR COUPLINGS WITHIN 6 INCHES OF THE BEND OUTSIDE OF CULVERT ENDS.
6. USE PRESSURE–TREATED WOOD SUPPORT POSTS OF HEM–FIR, NO. 2 OR BETTER, FOR EACH THAW PIPE STAND. PRESERVATIVE SHALL BE AMMONIACAL ZINC ARSENATE (ACZA), OR CHROMATED COPPER ARSENATE (CCA), PRESSURE TREATED IN ACCORDANCE WITH AASHTO M133.
7. EMBED EACH TREATED SUPPORT POST A MINIMUM OF 4 FEET.
8. FASTEN THAW PIPES TO SUPPORT POSTS WITH GALVANIZED RIGID CONDUIT STRAPS ON 1–FT CENTERS AND 2" MINIMUM LENGTH GALVANIZED LAG SCREWS WITH LOCK WASHERS. USE LAG SCREWS HAVING A DIAMETER SIZED TO MATCH THE HOLES IN THE STRAP (SEE DETAIL).
9. WHEN BEND RUN LENGTH EXCEEDS 5 FEET, LAY THE EXPOSED THAW PIPE ON THE EXPOSED CULVERT PIPE AND FLUSH TO THE EMBANKMENT SURFACE FOR THE LENGTH REQUIRED TO REACH THE SUPPORT POST AS APPROVED BY THE ENGINEER.
10. FILL ALL THAW PIPES WITH A MIX OF TINTED PROPYLENE GLYCOL ANTIFREEZE AND WATER TO PROTECT AGAINST FREEZING DOWN TO –50 DEGREES FAHRENHEIT, THEN CAP THE THAW PIPE.
11. ALL LABOR AND MATERIALS REQUIRED TO INSTALL THE THAW PIPES AND SUPPORT POSTS ARE SUBSIDIARY TO PAY ITEM 616(2).



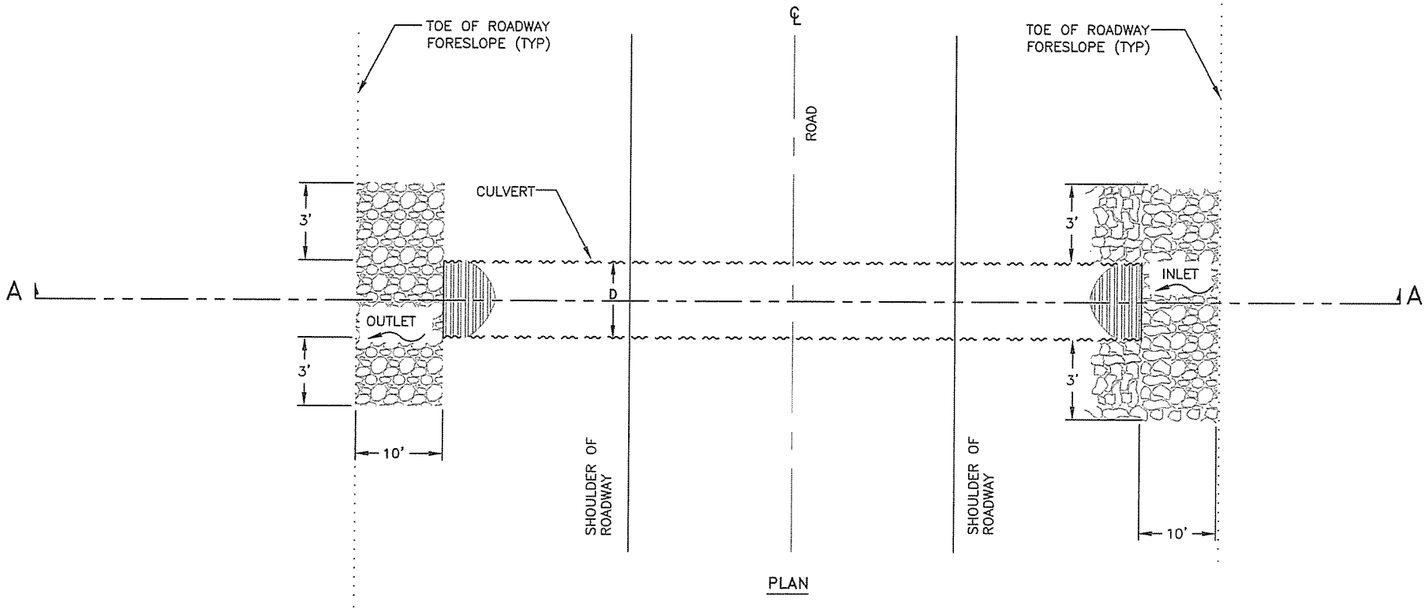
CULVERT END DETAIL



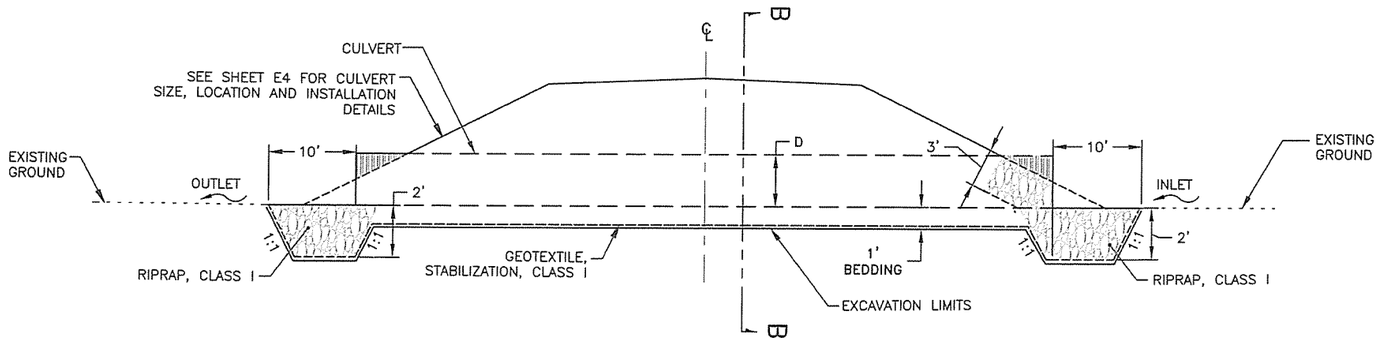
CULVERT DETAILS (3 OF 5)

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644–2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\622553_E_DETAILS–Culvert Details (3 of 5) Thu, Oct/03/19 11:04am

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E5	E12



PLAN

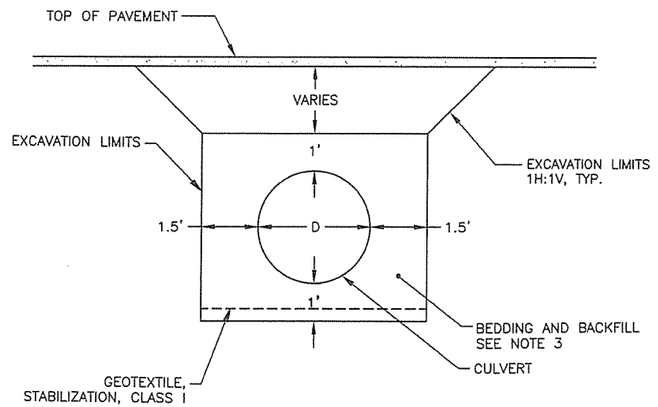


SECTION A–A

RIPRAP APRON DETAIL

CULVERT NOTES:

1. CONSTRUCT RIPRAP APRONS AS NOTED IN THE CULVERT SUMMARY TABLE.
2. EXCAVATE BELOW ORIGINAL GROUND WHERE RIPRAP IS REQUIRED AND BACKFILL WITH RIPRAP, CLASS I. THIS WORK IS SUBSIDIARY TO THE PAY ITEM 611(1) SHOWN ON THE CULVERT SUMMARY TABLE.
3. CONSTRUCT BEDDING AND BACKFILL WITH SELECTED MATERIAL, TYPE F.

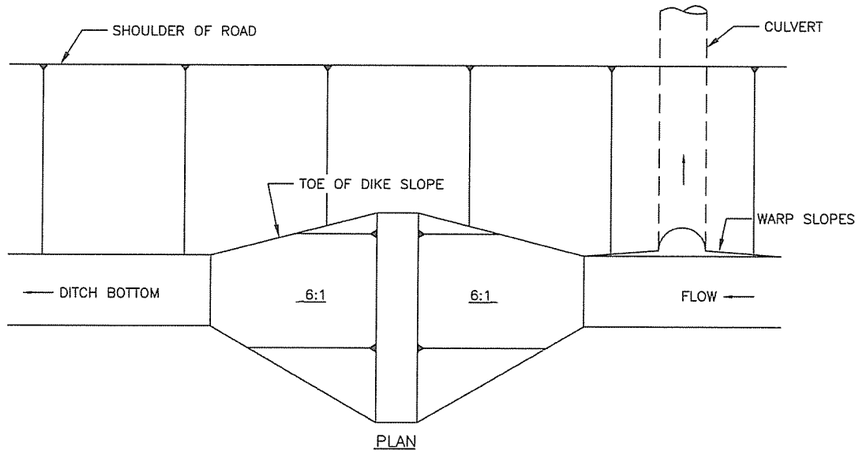


SECTION B–B
CULVERT BEDDING AND BACKFILL DETAIL

CULVERT DETAILS (4 OF 5)

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWORKING\west01\d0483514\622253_E_DETAILS-Culvert Details (4 of 5) Thu, Oct/03/19 11:04am

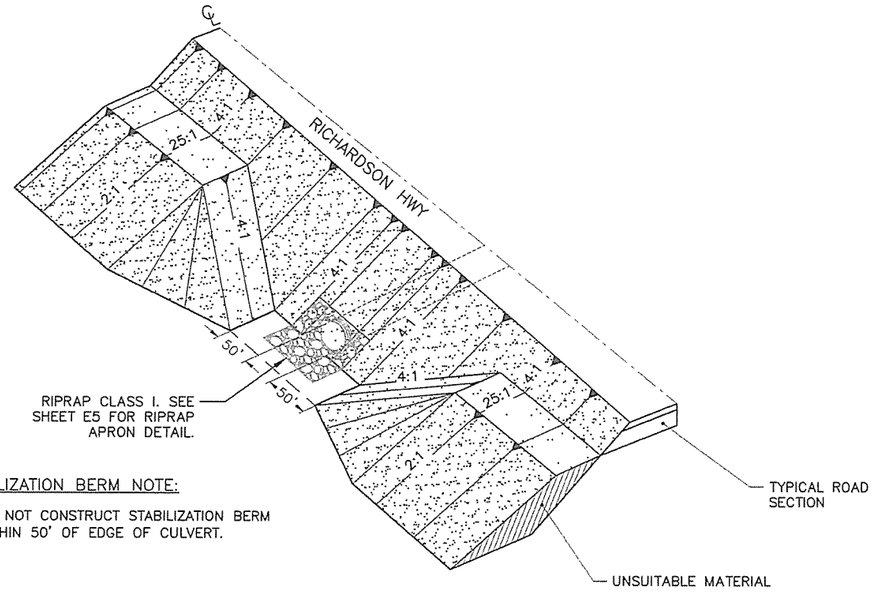
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E6	E12



DITCH DIKE DETAIL
NOT TO SCALE

DITCH DIKE NOTES:

1. SEE CULVERT SUMMARY FOR LOCATIONS.
2. DITCH DIKES SHALL NOT BE MEASURED SEPARATELY, ALL LABOR, EQUIPMENT AND MATERIALS NEEDED TO CONSTRUCT DITCH DIKE IS SUBSIDIARY TO 603 SERIES PAY ITEMS.



STABILIZATION BERM NOTE:

1. DO NOT CONSTRUCT STABILIZATION BERM WITHIN 50' OF EDGE OF CULVERT.

STABILIZATION BERM TRANSITION AT CULVERT

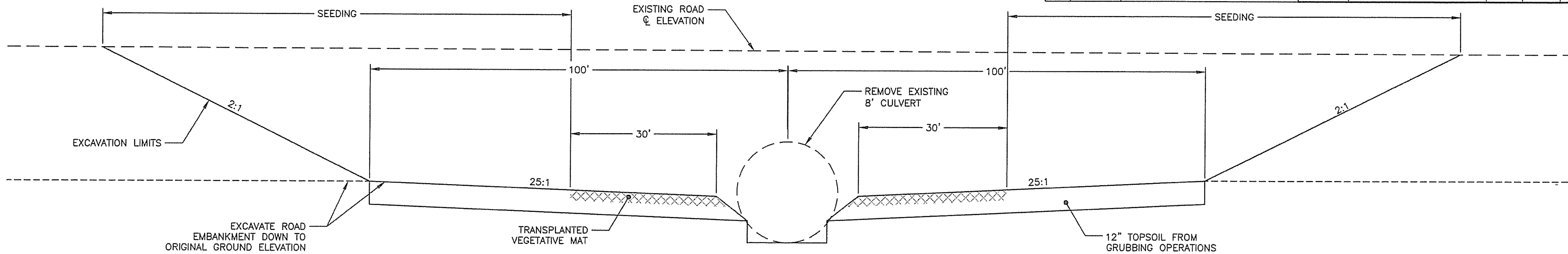
CULVERT DETAILS (5 OF 5)

STATE OF ALASKA
49TH
JUSTIN HANNAFIOUS
C.E. 14055
10/4/19
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\B2253_E_DETAILS-Culvert Details (5 of 5) Thu, Oct/03/19 11:04am

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	E7	E12



HAGGARD CREEK STREAM BED RESTORATION – SECTION A–A

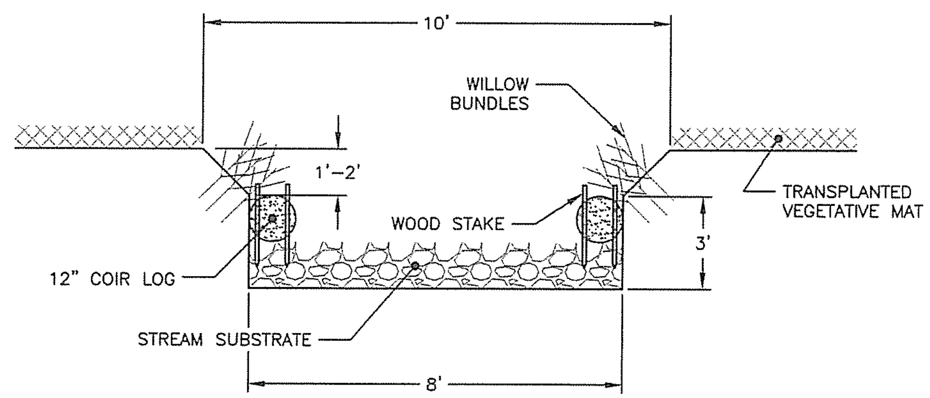
NOT TO SCALE

STREAM BED RESTORATION NOTES:

1. SALVAGE AND TRANSPLANT THE RIPARIAN ZONE VEGETATIVE MAT THAT WILL BE COVERED BY THE NEW ROAD ALIGNMENT AT HAGGARD CREEK BEFORE CONSTRUCTION OF THE NEW ROADWAY. THIS WORK WILL BE PAID FOR UNDER 654 PAY ITEM.
2. TRANSPLANT VEGETATIVE MAT AND ALLOW TO OVERHANG TOP OF WILLOW BUNDLES.

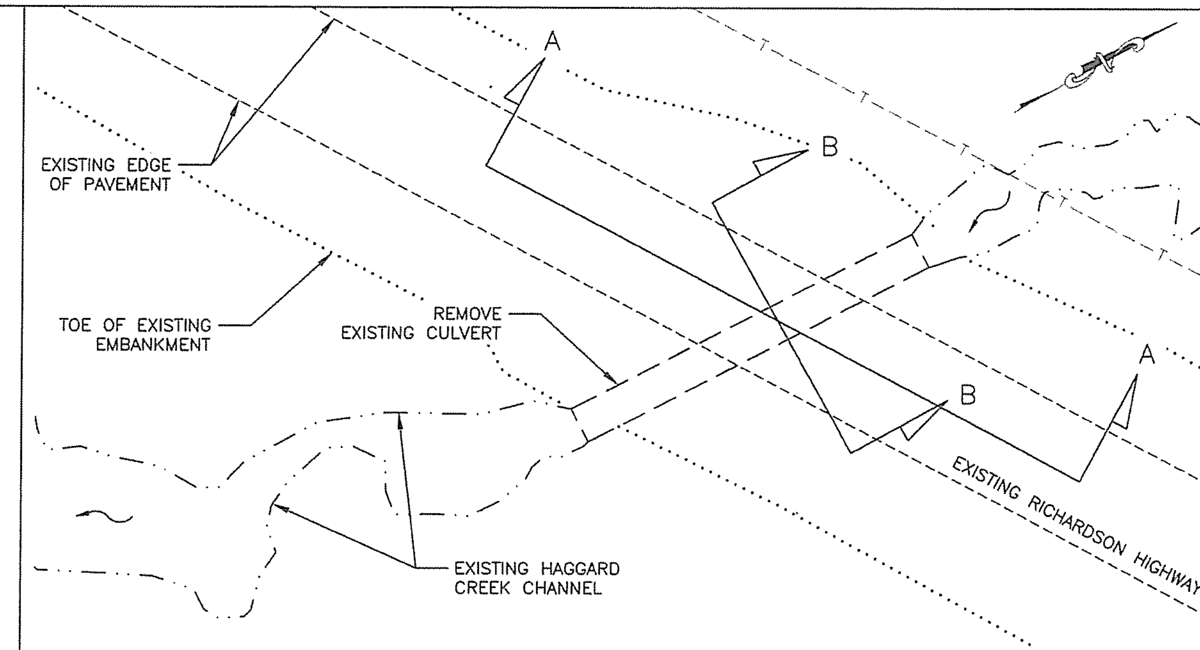
COIR LOG INSTALLATION DETAIL NOTES:

3. INSTALL COIR LOGS AND ENSURE CONTACT WITH SUITABLE MINERAL SOIL, EQUIVALENT TO SELECT MATERIAL, TYPES C, ALONG THE ENTIRE LENGTH. AT NO TIME SHALL THE COIR LOGS SPAN ANY OPEN SPACE THAT MAY OCCUR BETWEEN ROCKS, LOGS, OR UNEVEN GROUND. THE TRENCH SHALL BE FREE OF MUCK; SUB-EXCAVATION OF THE STREAM BED AND SUBSEQUENT BACKFILL WITH SUITABLE MATERIAL MAY BE REQUIRED, AS DIRECTED BY THE ENGINEER.
4. ANCHOR COIR LOGS WITH 2"X2"X36"(MIN) WOODEN STAKES AT A SPACING SHOWN IN THE DETAIL ON THIS SHEET. BIODEGRADABLE TWINE OR WIRE SHALL BE TIED FROM A NOTCH IN ONE STAKE TO A SIMILAR NOTCH IN THE STAKE DIRECTLY OPPOSITE, AND SHALL BE SECURE AGAINST THE TOP OF THE LOG. INSTALL STAKES SUCH THAT THEIR TOPS ARE FLUSH WITH THE TOP OF THE LOG.
5. TO ACHIEVE THE FULL LENGTH OF COIR LOGS REQUIRED BY THE PLANS, LACE TOGETHER THE ABUTTING ENDS OF INDIVIDUAL LOGS WITH BIODEGRADABLE TWINE BY MAKING A NUMBER OF PASSES IN THE END NETTING BETWEEN THE LOGS AND PILLING THE TWINE TAUT. WHERE A LOG DOES NOT ABUT ANOTHER LOG, THE END SHOULD BE BENT DOWNWARD AND AWAY FROM THE CHANNEL, AND BURIED IN THE EMBANKMENT TO PREVENT WATER FROM INTRUDING BEHIND THE LOG AND DISLODGING IT.
6. COIR LOG INSTALLATION IS SUBSIDIARY TO PAY ITEM 654.



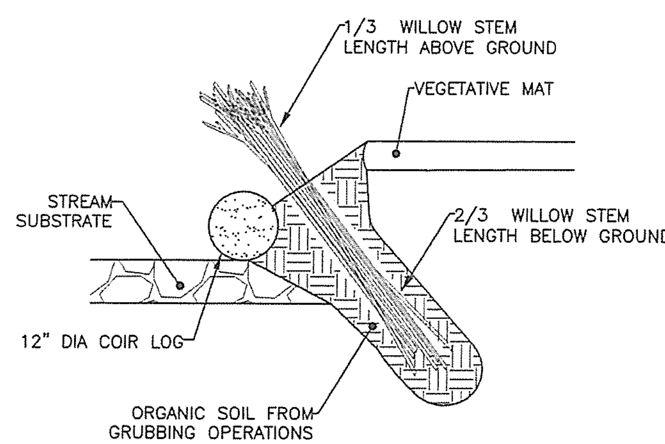
HAGGARD CREEK STREAM BED RESTORATION – SECTION B–B

NOT TO SCALE



HAGGARD CREEK STREAM BED RESTORATION – PLAN VIEW

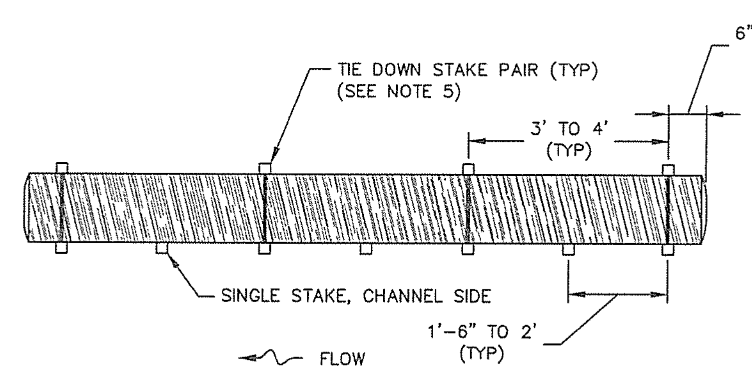
NOT TO SCALE



COIR LOG INSTALLATION DETAIL

MIRROR FOR OPPOSITE SIDE OF CHANNEL

NOT TO SCALE

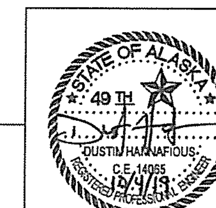


COIR LOG STAKING DETAIL

(PLAN VIEW)

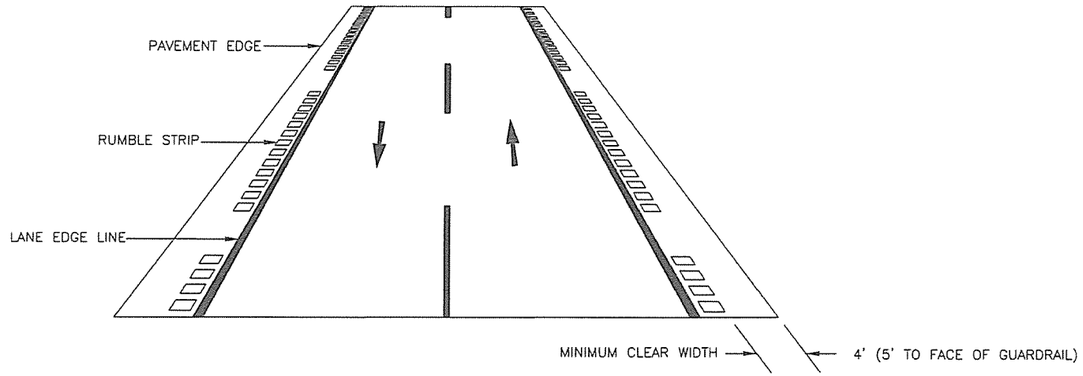
NOT TO SCALE

HAGGARD CREEK RESTORATION

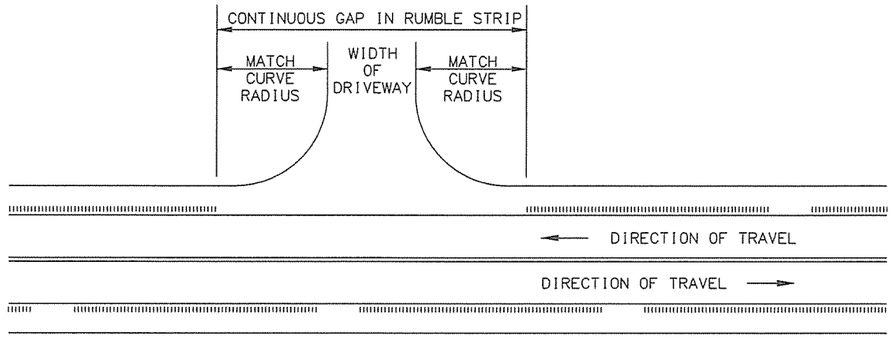


PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\62253_E_Creek_Restoration-Creek Restoration Thu, Oct/03/19 11:04am

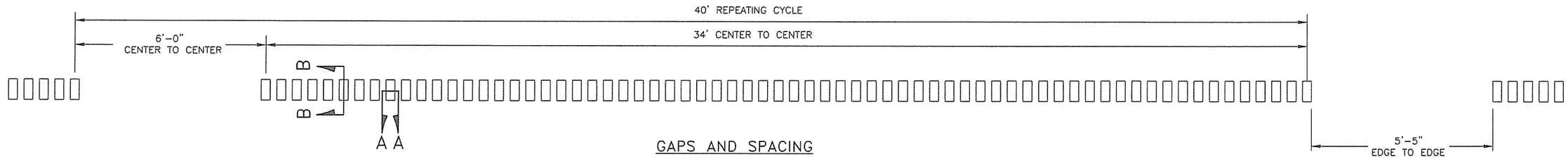
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E8	E12



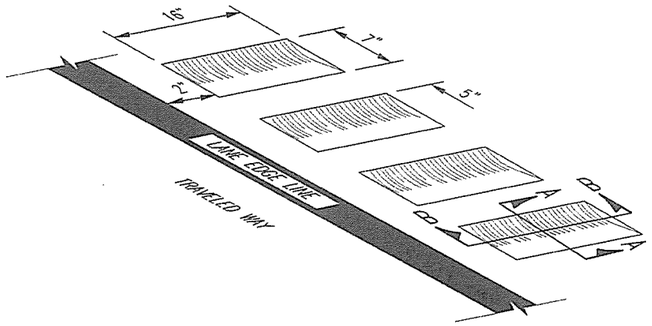
TYPICAL SHOULDER INSTALLATION – TWO–WAY
PERSPECTIVE VIEW

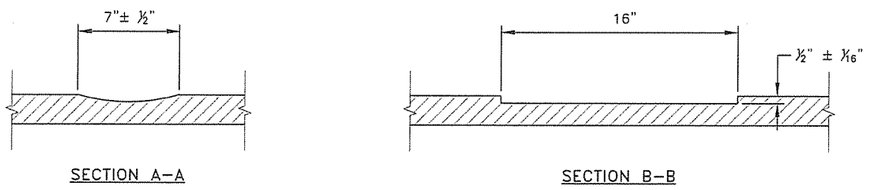


RUMBLE STRIP LAYOUT AT APPROACHES

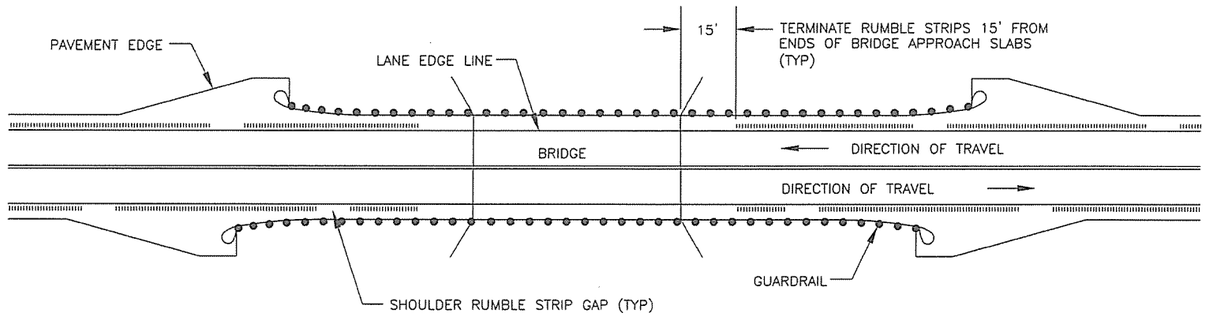


GAPS AND SPACING





TYPICAL SHOULDER INSTALLATION DETAIL

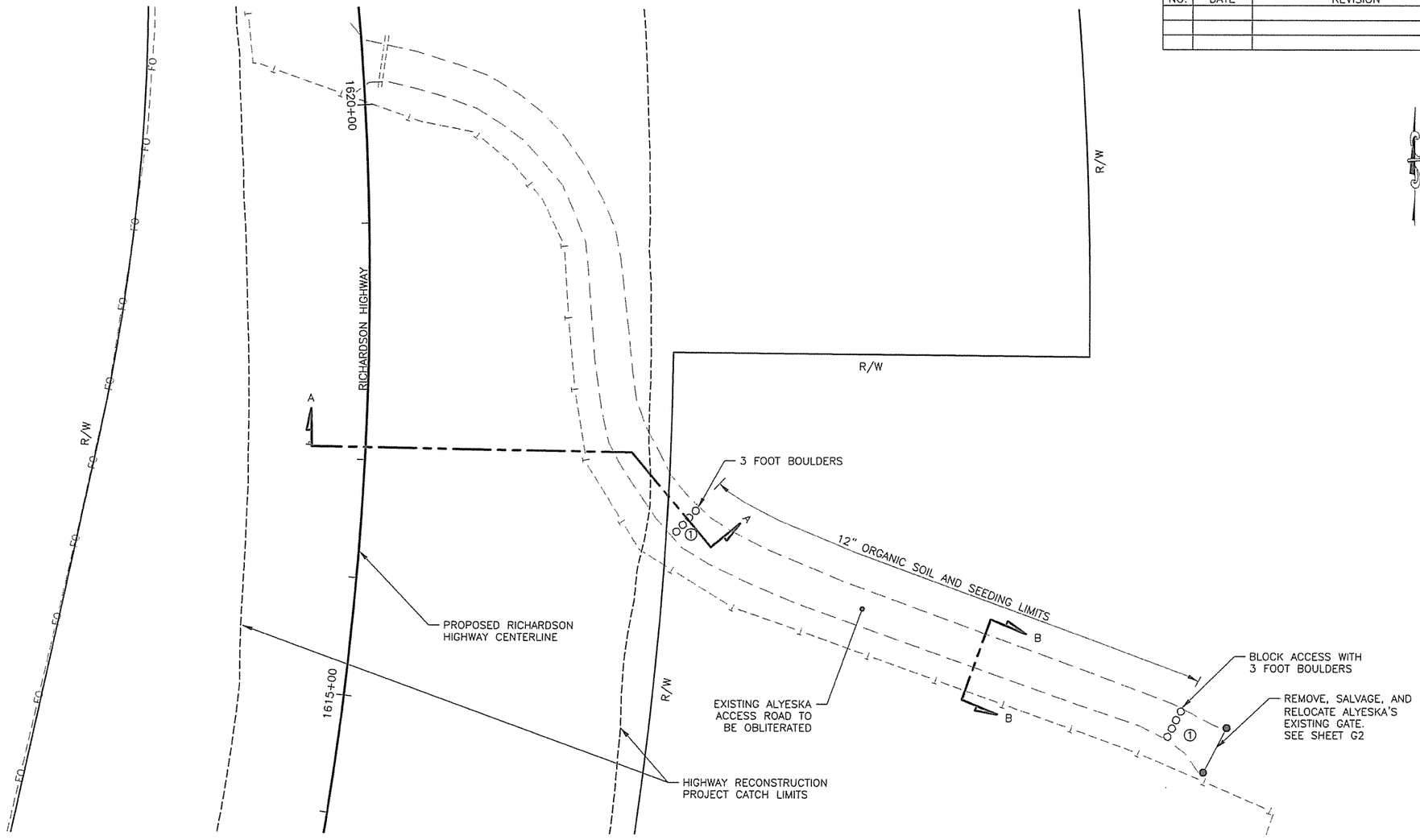


RUMBLE STRIP LAYOUT AT BRIDGES WITH ADEQUATE SHOULDER

RUMBLE STRIP DETAILS

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644–2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\62253_E_DETAILS–Rumble Strip Details Tue, Oct/08/19 02:42pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E9	E12



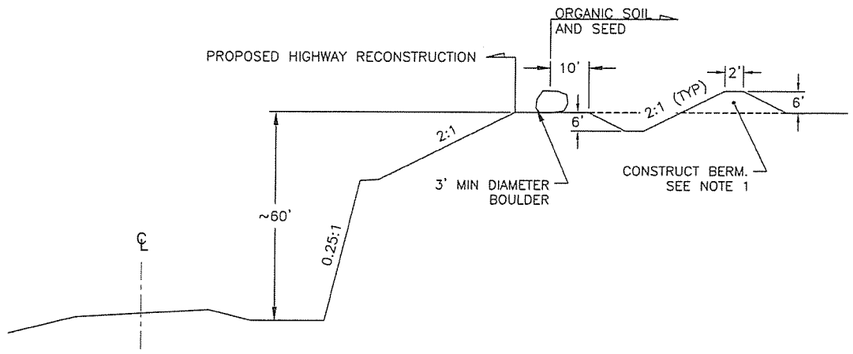
NOTES:

① CONSTRUCT A BERM AT THE BEGINNING AND END OF THE EXISTING ACCESS ROAD. BERMS SHALL BE A MINIMUM OF 6' IN HEIGHT WITH 2:1 SIDE SLOPES USING MATERIAL FROM EXISTING ACCESS ROAD EMBANKMENT. PLACE FOUR 3 FOOT DIAMETER BOULDERS 8 FEET ON CENTER PERPENDICULAR TO THE ROAD AT EACH BERM. AS DEPICTED IN SECTION A–A

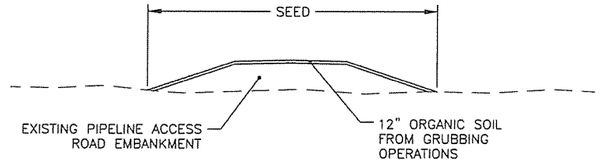
2. PLACE 12" OF ORGANIC SOIL FROM GRUBBING WORK ON TOP OF THE EXISTING ACCESS ROAD EMBANKMENT. SEE SECTION B–B.

3. SCARIFY AND SEED ALL DISTURBED AREAS.

4. SEE SPECIFICATION SECTIONS 201 AND 203.



SECTION A–A



SECTION B–B

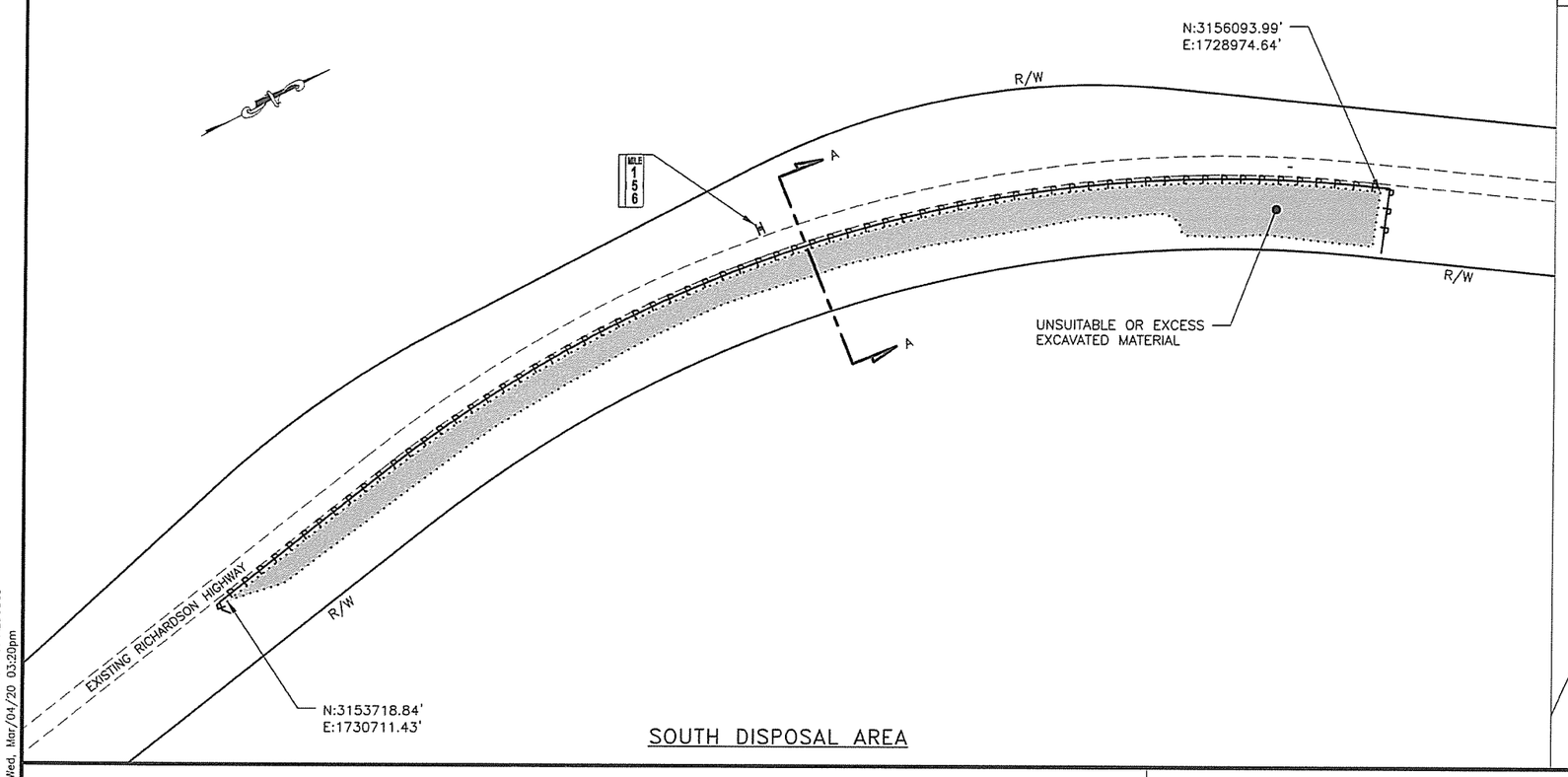
ALYESKA ACCESS ROAD OBLITERATION PLAN

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_E_DETAILS_ALYESKA-Alyeska Access Road Rehabilitation Plan Thu, Oct/03/19 04:05pm

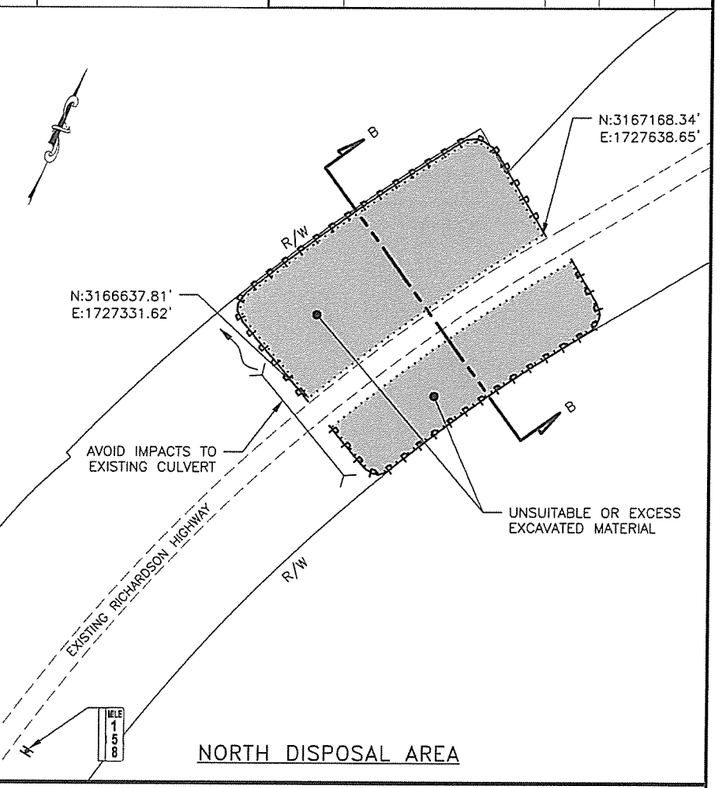
ADDENDUM NO. 1, ATTACHMENT NO.11

NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1

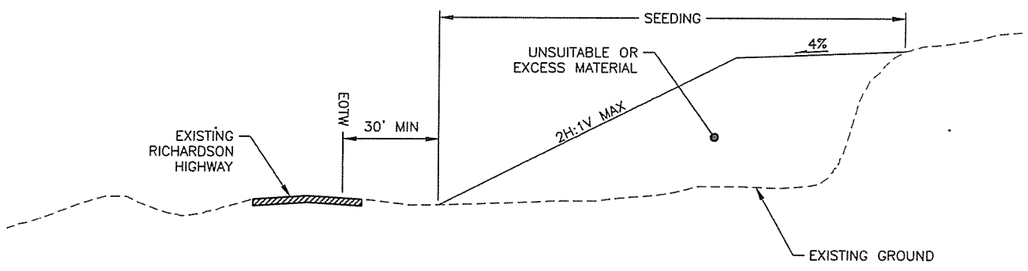
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	E10	E12



SOUTH DISPOSAL AREA

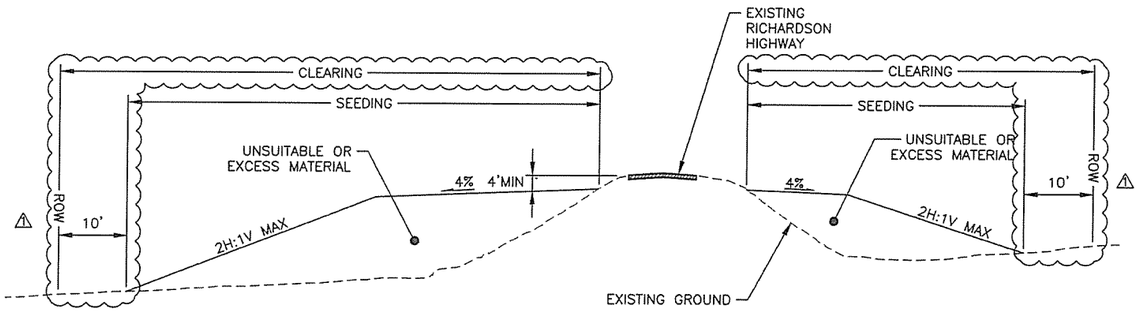


NORTH DISPOSAL AREA



SECTION A–A – SOUTH DISPOSAL AREA

(LOCATED AT MP 156)



SECTION B–B – NORTH DISPOSAL AREA

(LOCATED NORTH OF MILEPOST 158)

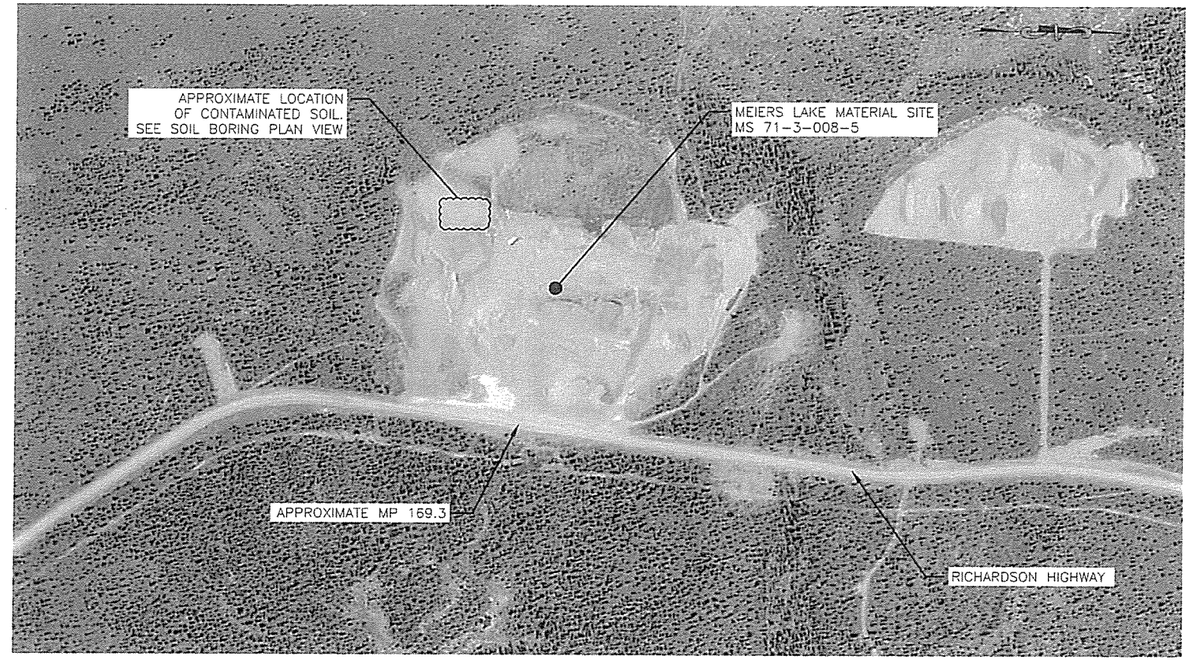
1 ~~* CLEARING IS SUBSIDIARY TO PAY ITEM 203(3)~~

STATE OF ALASKA
49TH
DUSTIN HANNAFIOUS
C.E. 14055
3/4/20
REGISTERED PROFESSIONAL ENGINEER

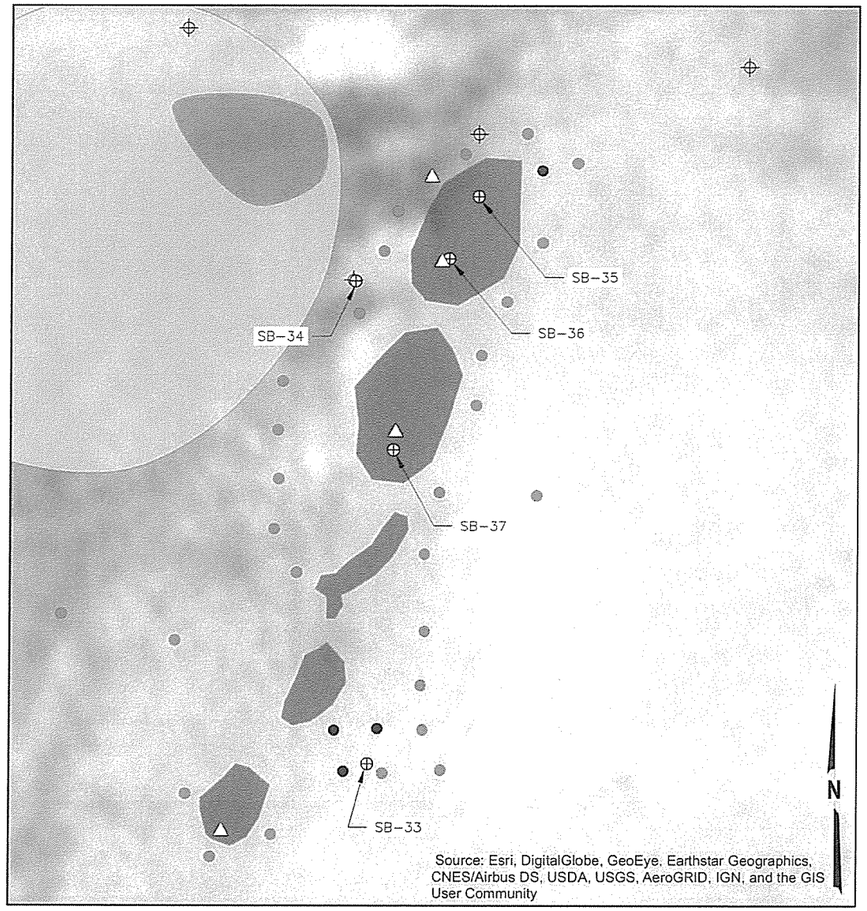
UNSUITABLE OR EXCESS EXCAVATION DISPOSAL

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\prworking\west01\d0483514\62253_E_UNSUITABLE MATERIAL STORAGE-Unsuitable or Excess Excavation Disposal Wed, Mar/04/20 03:20pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	E11	E12



CONTAMINATED SOIL SITE LOCATION



SOIL BORING PLAN VIEW

SHEET NOTES:

1. SEE SPECIFICATION SECTION 802.
2. VOLUME OF CONTAMINATED SOIL TO BE EXCAVATED AND DISPOSED IS ESTIMATED TO BE BETWEEN 500 AND 1,000 CY.

LEGEND

- Soil Boring Field Screening, PID result above 20ppm
- Soil Boring Field Screening, PID result below 20ppm
- Surface Sample
- Soil Boring
- Temporary Well Point
- Tar Visible at Surface
- Surface Water
- Wet Area

SOIL BORINGS		
BORE HOLD ID	LATITUDE	LONGITUDE
SB-33	62.80766	145.50287
SB-34	62.80789	145.50288
SB-35	62.80793	145.50275
SB-36	62.80790	145.50278
SB-37	62.80781	145.50284

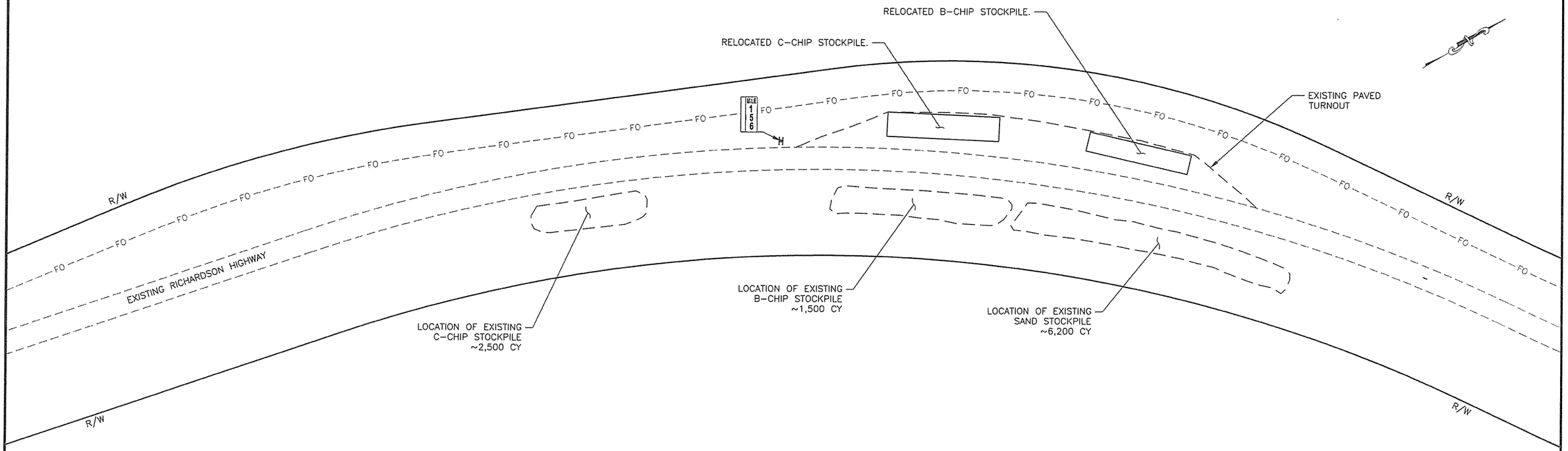
STATE OF ALASKA 49TH DUSTIN HANNAFOUS C.E. 14005 PROFESSIONAL ENGINEER 10/4/19

CONTAMINATED SOIL REMOVAL AND DISPOSAL

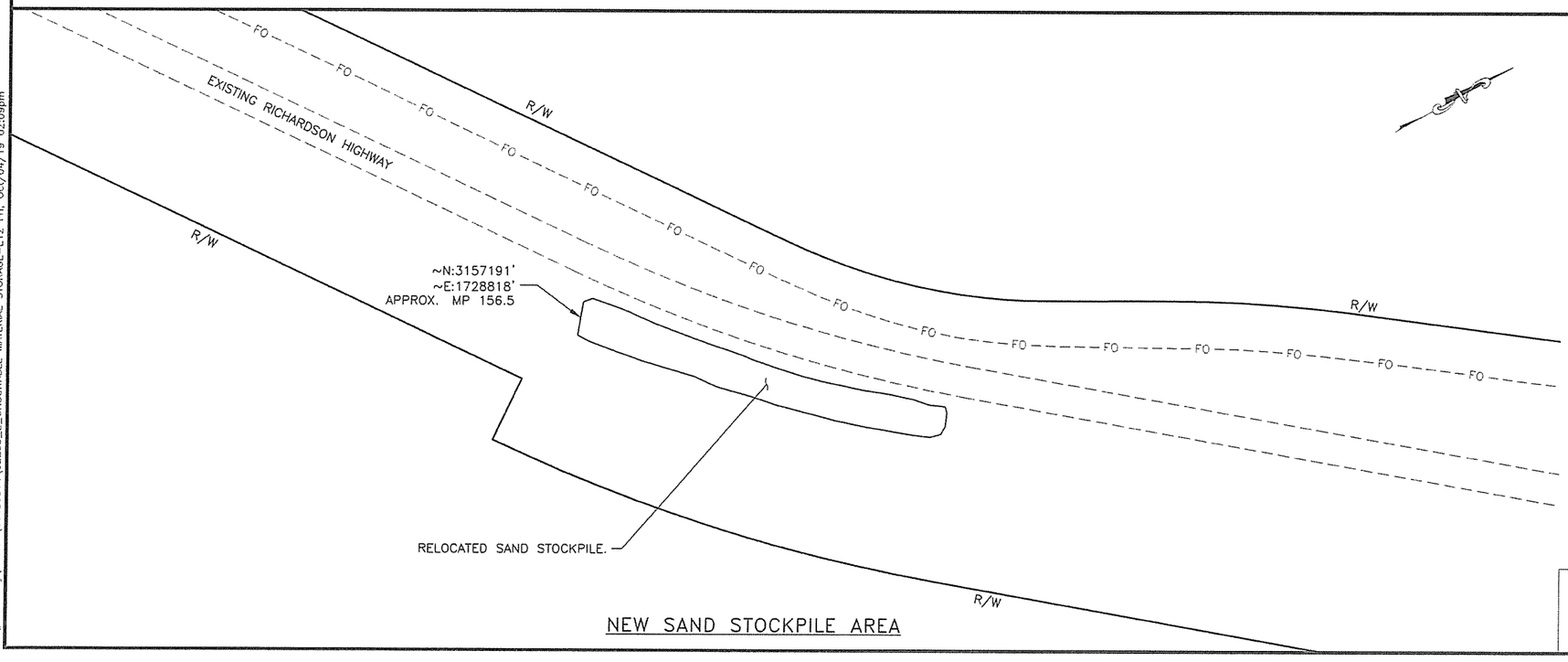
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\62253_E_Contaminated_Soil-Material Storage Thu, Oct/03/19 11:08am

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	E12	E12



MP 156 MATERIAL STOCKPILE AREA



NEW SAND STOCKPILE AREA

SHEET NOTES:

1. LOCATE STOCKPILES AS FAR AWAY FROM THE HIGHWAY AS REASONABLE, MAINTAIN MINIMUM OF 30 FOOT SEPARATION BETWEEN OUTER EDGE OF STOCKPILE AND THE HIGHWAY WHITE FOG LINE.
2. SEE SPECIFICATION SECTION 202.

RELOCATE STOCKPILE

STATE OF ALASKA 49TH
DUSTIN HANNAPOUS
C.E. 14055
10/4/19
REGISTERED PROFESSIONAL ENGINEER

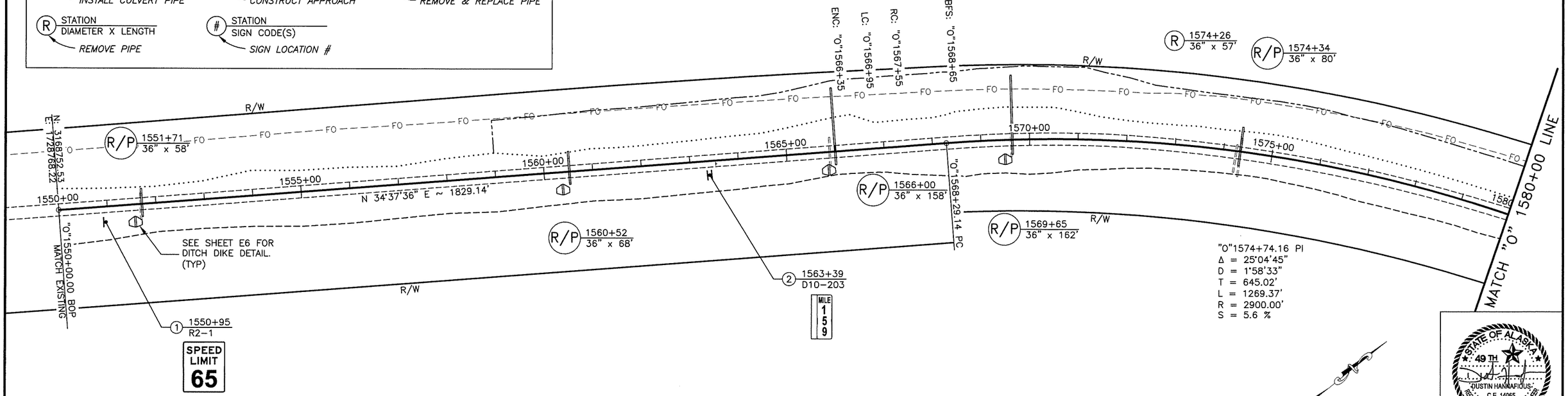
PLANS DEVELOPED BY: STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES, NORTHERN REGION, 2301 PEGER ROAD, FAIRBANKS, AK 99709 (907)451-2200
C:\pwworking\west01\d0483514\62253_E_UNSUITABLE MATERIAL STORAGE-E12 Fri, Oct/04/19 02:09pm

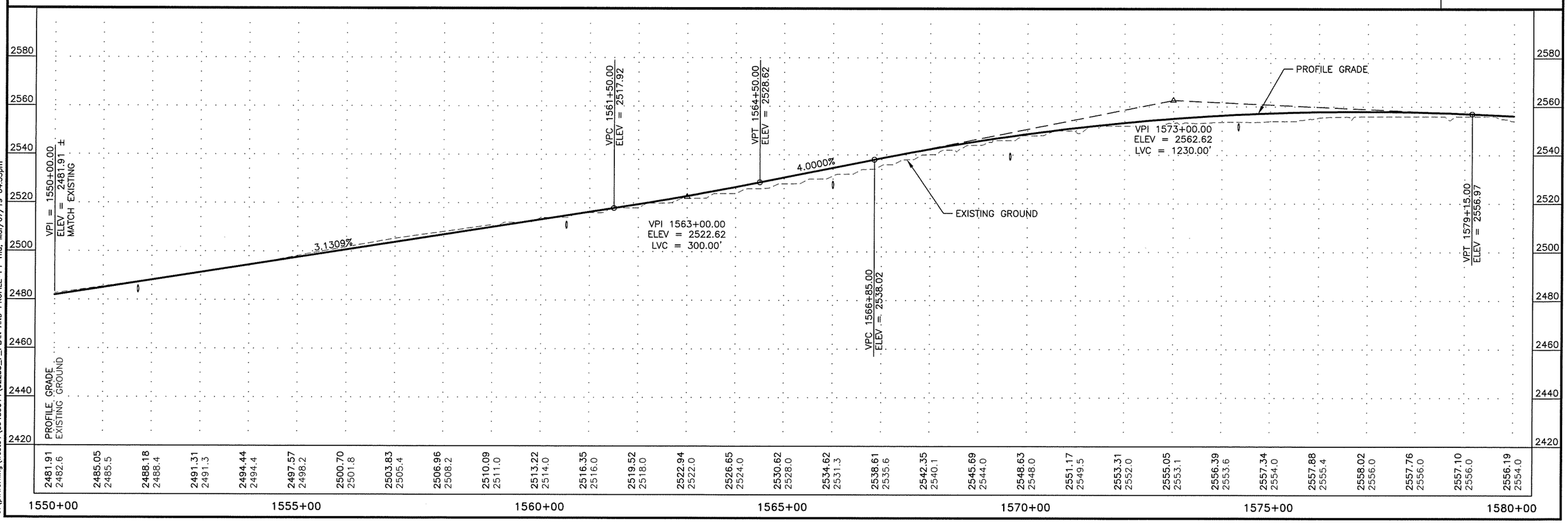
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F1	F15

PLAN VIEW KEY

- (P) STATION / DIAMETER X LENGTH — *INSTALL CULVERT PIPE*
- (A) STATION / TYPE, WIDTH — *CONSTRUCT APPROACH*
- (R/P) STATION / DIAMETER X LENGTH — *REMOVE & REPLACE PIPE*
- (R) STATION / DIAMETER X LENGTH — *REMOVE PIPE*
- (#) STATION / SIGN CODE(S) — *SIGN LOCATION #*



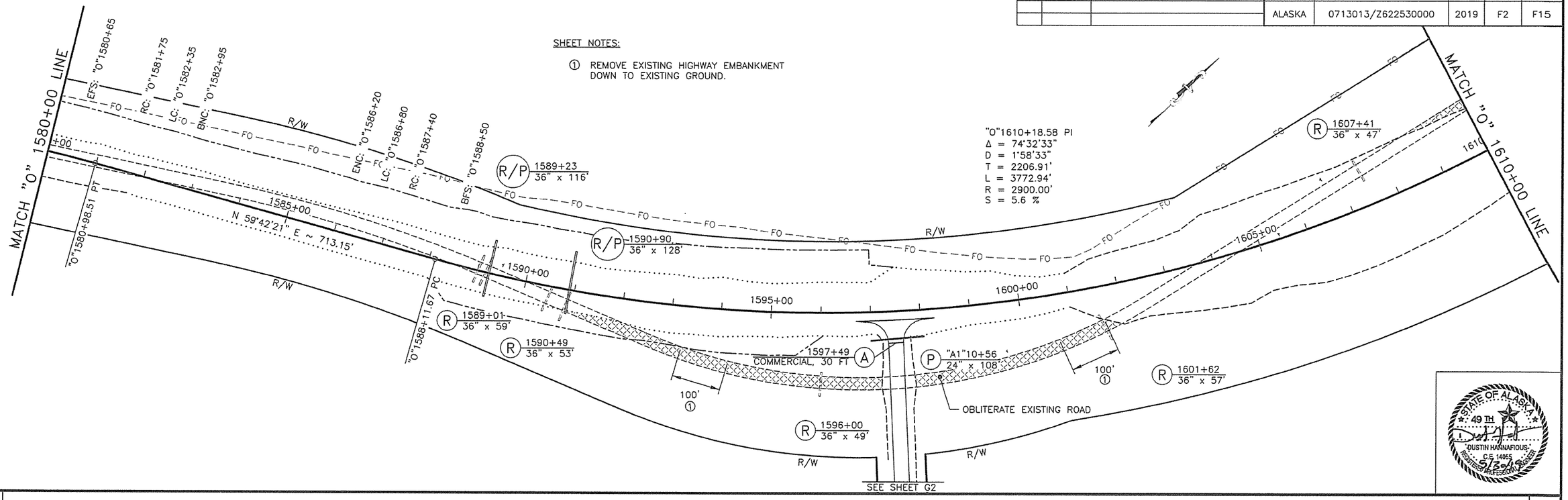


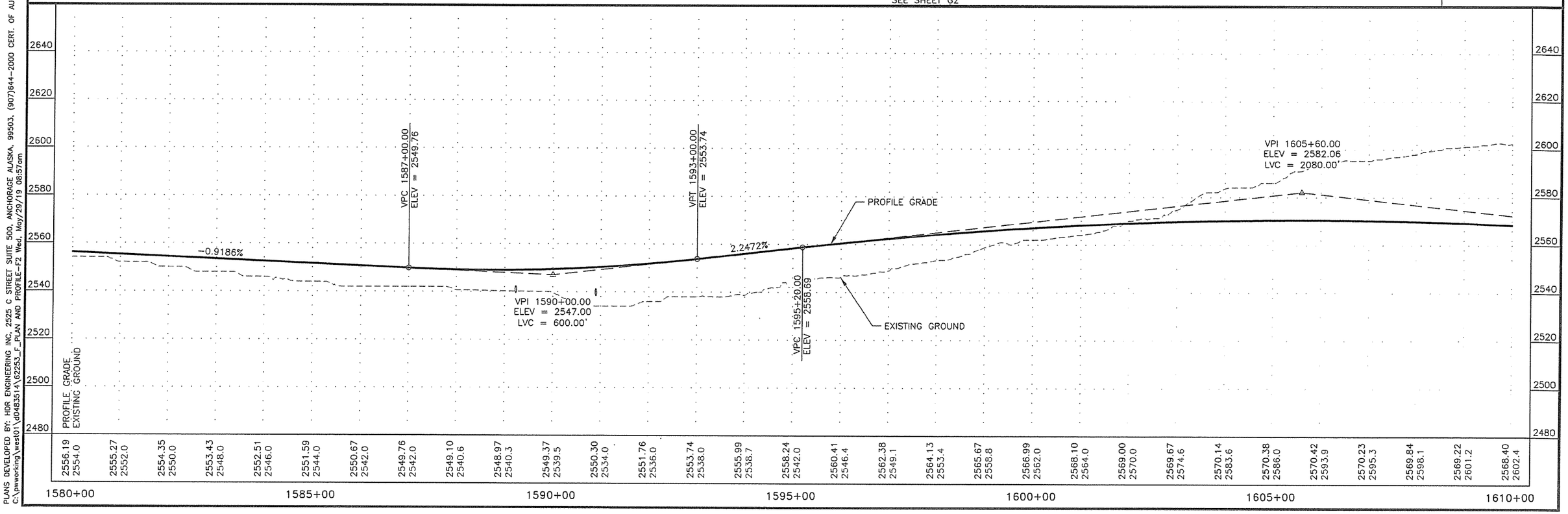
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d048351\4\62253_F_PLAN AND PROFILE-F1 Thu, Mar/07/19 04:33pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	F2	F15

SHEET NOTES:

① REMOVE EXISTING HIGHWAY EMBANKMENT DOWN TO EXISTING GROUND.





STATE OF ALASKA
49 TH
DUSTIN HAINAFIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC. 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503. (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\G2253_F_PLAN AND PROFILE-F2 Wed, May/29/19 08:57am

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	F3	F15

"O"1610+18.58 PI
Δ = 74°32'33"
D = 1°58'33"
T = 2206.91'
L = 3772.94'
R = 2900.00'
S = 5.6 %

MATCH "O" 1610+00 LINE

R 1610+45 36" x 60'

OBLITERATE ROADWAY

R 1614+71 36" x 54'

4 1613+98 D10-203

MILE 160

SEE SHEET E9 FOR ALYESKA ACCESS ROAD REHABILITATION PLAN

R 1620+21 36" x 40'

R 1624+02 36" x 57'

"O"1625+84.61 PT

ABANDONED IN PLACE.
HAS BEEN RELOCATED OUTSIDE
OF PROJECT LIMITS BY OTHERS.

N 14°50'12" W ~ 792.23'

R 1631+44 36" x 53'

"O"1633+76.84 PC

R 1638+37 36" x 55'

MATCH "O" 1640+00 LINE

EFS: "O"1625+50
RC: "O"1626+60
LC: "O"1627+20
BNC: "O"1627+80
ENC: "O"1631+75
LC: "O"1632+35
RC: "O"1632+95
BFS: "O"1634+15

R/W

"O"1642+21.77 PI
Δ = 43°50'05"
D = 2°43'42"
T = 844.93'
L = 1606.62'
R = 2100.00'
S = 6.0 %

STATE OF ALASKA
49TH
DUSTIN HANNAFIOUS
C.E. 14065
REGISTERED PROFESSIONAL ENGINEER
3-8-19

VPT 1616+00.00
ELEV = 2558.92

VPC 1625+00.00
ELEV = 2538.90

VPT 1633+00.00
ELEV = 2509.23

VPI 1629+00.00
ELEV = 2530.00
LVC = 800.00'

-2.2246%

-5.1935%

EXISTING GROUND

PROFILE GRADE

PROFILE GRADE	2568.40	2567.36	2566.10	2564.63	2562.94	2561.04	2558.92	2556.70	2554.47	2552.25	2550.02	2547.80	2545.57	2543.35	2541.12	2538.90	2536.49	2533.71	2530.55	2527.03	2523.14	2518.87	2514.23	2509.23	2504.03	2498.84	2493.65	2488.45	2483.26	2478.06	2472.87
EXISTING GROUND	2602.4	2603.9	2605.1	2606.1	2605.5	2605.2	2604.9	2604.4	2602.8	2600.9	2599.4	2595.1	2592.0	2588.0	2582.6	2577.7	2571.3	2564.4	2559.1	2553.7	2548.1	2542.4	2537.7	2532.1	2526.8	2520.5	2516.0	2510.9	2501.9	2497.7	2495.8

2600 2580 2560 2540 2520 2500 2480 2460 2440

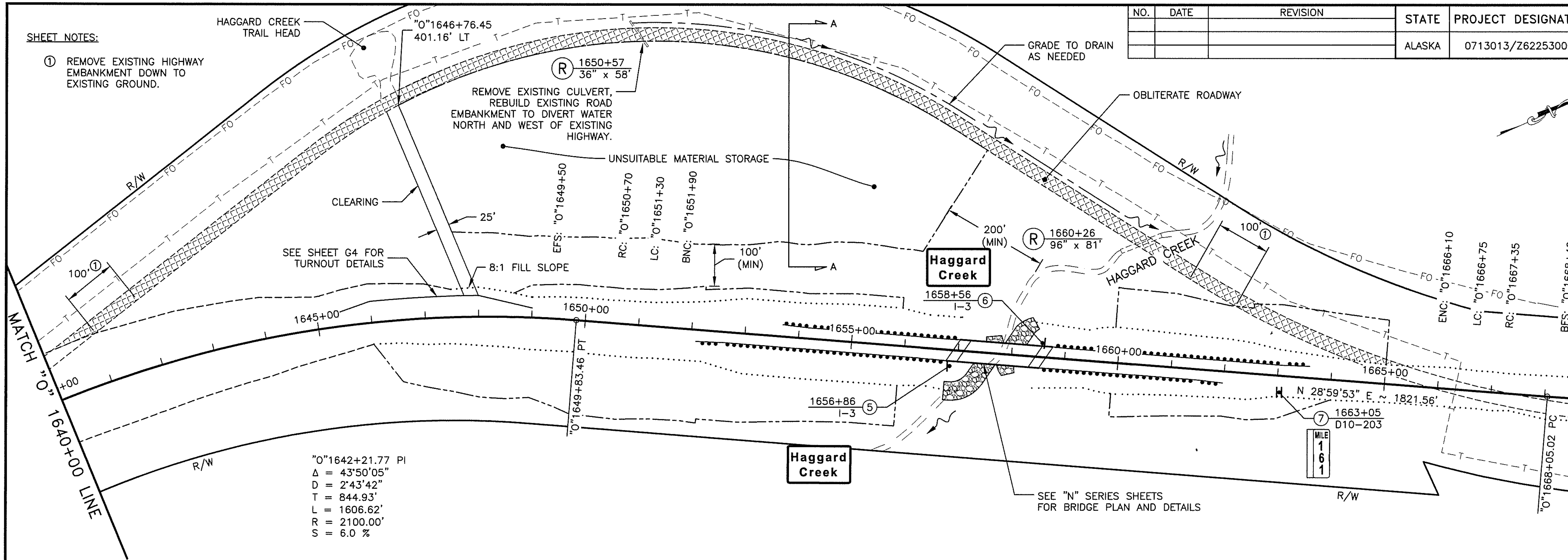
1610+00 1615+00 1620+00 1625+00 1630+00 1635+00 1640+00

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\$2253_F_PLAN AND PROFILE-F3 Thu, Mar/07/19 04:34pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	F4	F15

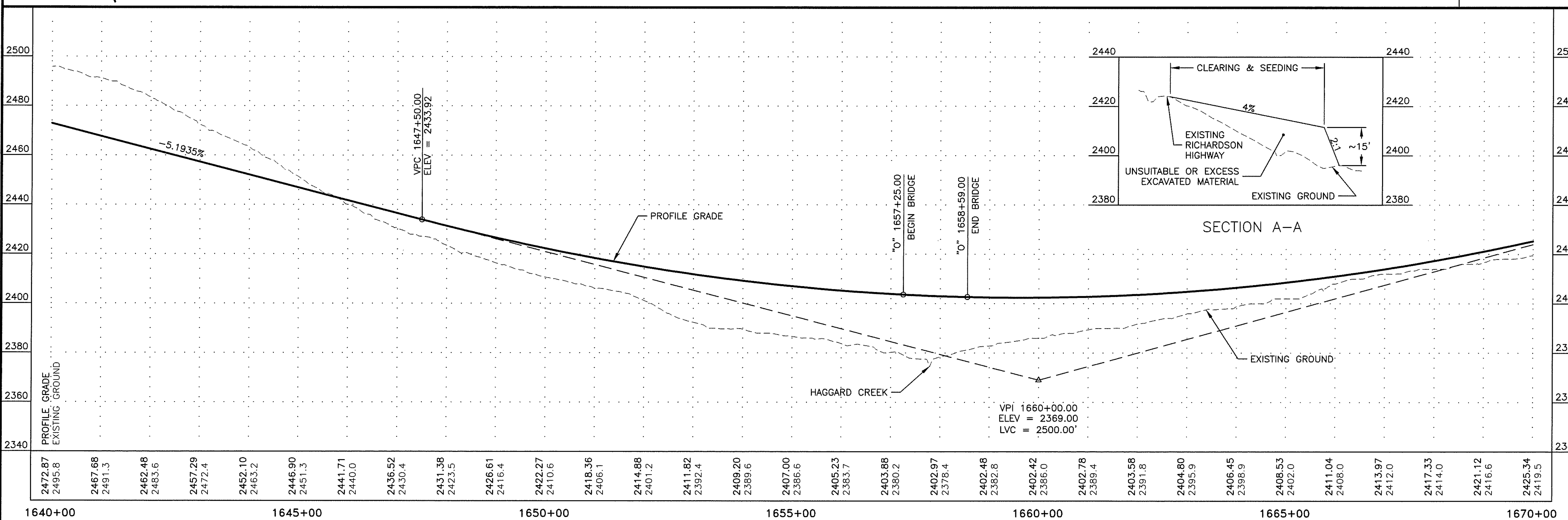
SHEET NOTES:

① REMOVE EXISTING HIGHWAY EMBANKMENT DOWN TO EXISTING GROUND.



HAGGARD CREEK TRAIL HEAD
"O"1646+76.45
401.16' LT
R 1650+57 36" x 58'
REMOVE EXISTING CULVERT, REBUILD EXISTING ROAD EMBANKMENT TO DIVERT WATER NORTH AND WEST OF EXISTING HIGHWAY.
UNSUITABLE MATERIAL STORAGE
GRADE TO DRAIN AS NEEDED
OBLITERATE ROADWAY
CLEARING
25'
EFS: "O"1649+50
RC: "O"1650+70
LC: "O"1651+30
BNC: "O"1651+90
100' (MIN)
A
200' (MIN)
R 1660+26 96" x 81'
Haggard Creek
HAGGARD CREEK
100' ①
SEE SHEET G4 FOR TURNOUT DETAILS
8:1 FILL SLOPE
1645+00
1650+00
1655+00
1658+56 I-3 ⑥
1660+00
1665+00
1670
1656+86 I-3 ⑤
N 28°59'53" E ~ 1821.56'
⑦ 1663+05 D10-203
MILE 1 6 1
"O"1649+83.46 PT
"O"1668+05.02 PC
ENC: "O"1666+10
LC: "O"1666+75
RC: "O"1667+35
BFS: "O"1668+40
MATCH "O" 1640+00 LINE
MATCH "O" 1670+00 LINE
R/W
FO
T
"O"1642+21.77 PI
Δ = 43°50'05"
D = 2°43'42"
T = 844.93'
L = 1606.62'
R = 2100.00'
S = 6.0 %
SEE "N" SERIES SHEETS FOR BRIDGE PLAN AND DETAILS

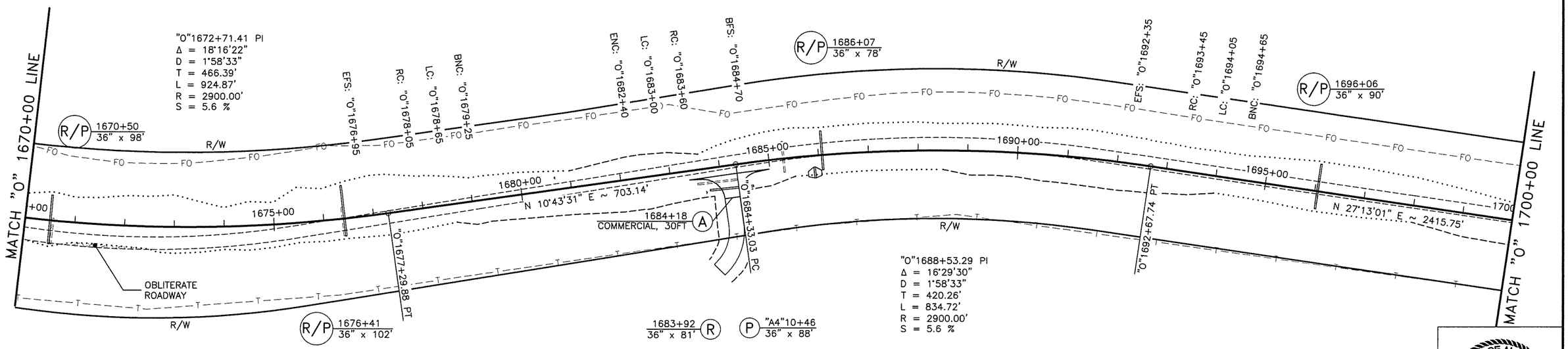
STATE OF ALASKA 49 TH DUSTIN HANNAFIOUS C.E. 14065 3-8-19 REGISTERED PROFESSIONAL ENGINEER

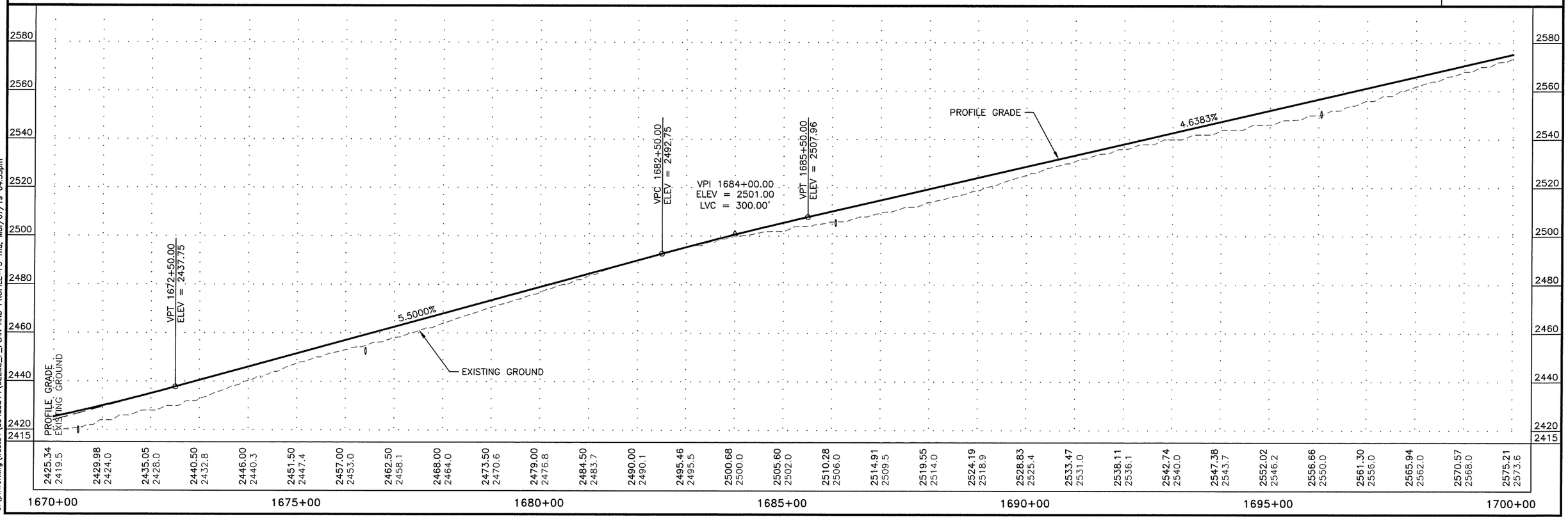


2500
2480
2460
2440
2420
2400
2380
2360
2340
-5.1935%
VPC 1647+50.00
ELEV = 2433.92
PROFILE GRADE
"O" 1657+25.00 BEGIN BRIDGE
"O" 1658+59.00 END BRIDGE
HAGGARD CREEK
VPI 1660+00.00
ELEV = 2369.00
LVC = 2500.00'
EXISTING GROUND
2440
2420
2400
2380
CLEARING & SEEDING
4%
EXISTING RICHARDSON HIGHWAY
UNSUITABLE OR EXCESS EXCAVATED MATERIAL
EXISTING GROUND
2:1
~15'
SECTION A-A
PROFILE GRADE
EXISTING GROUND
2472.87 2495.8
2467.68 2491.3
2462.48 2483.6
2457.29 2472.4
2452.10 2463.2
2446.90 2451.3
2441.71 2440.0
2436.52 2430.4
2431.38 2423.5
2426.61 2416.4
2422.27 2410.6
2418.36 2406.1
2414.88 2401.2
2411.82 2392.4
2409.20 2389.6
2407.00 2386.6
2405.23 2383.7
2403.88 2380.2
2402.97 2378.4
2402.48 2382.8
2402.42 2386.0
2402.78 2389.4
2403.58 2391.8
2404.80 2395.9
2406.45 2398.9
2408.53 2402.0
2411.04 2408.0
2413.97 2412.0
2417.33 2414.0
2421.12 2416.6
2425.34 2419.5
1640+00
1645+00
1650+00
1655+00
1660+00
1665+00
1670+00

PLANS DEVELOPED BY: HDR ENGINEERING INC. 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_F_PLAN AND PROFILE-Plan and Profile (4 of 15) Thu, Mar/07/19 04:34pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	F5	F15



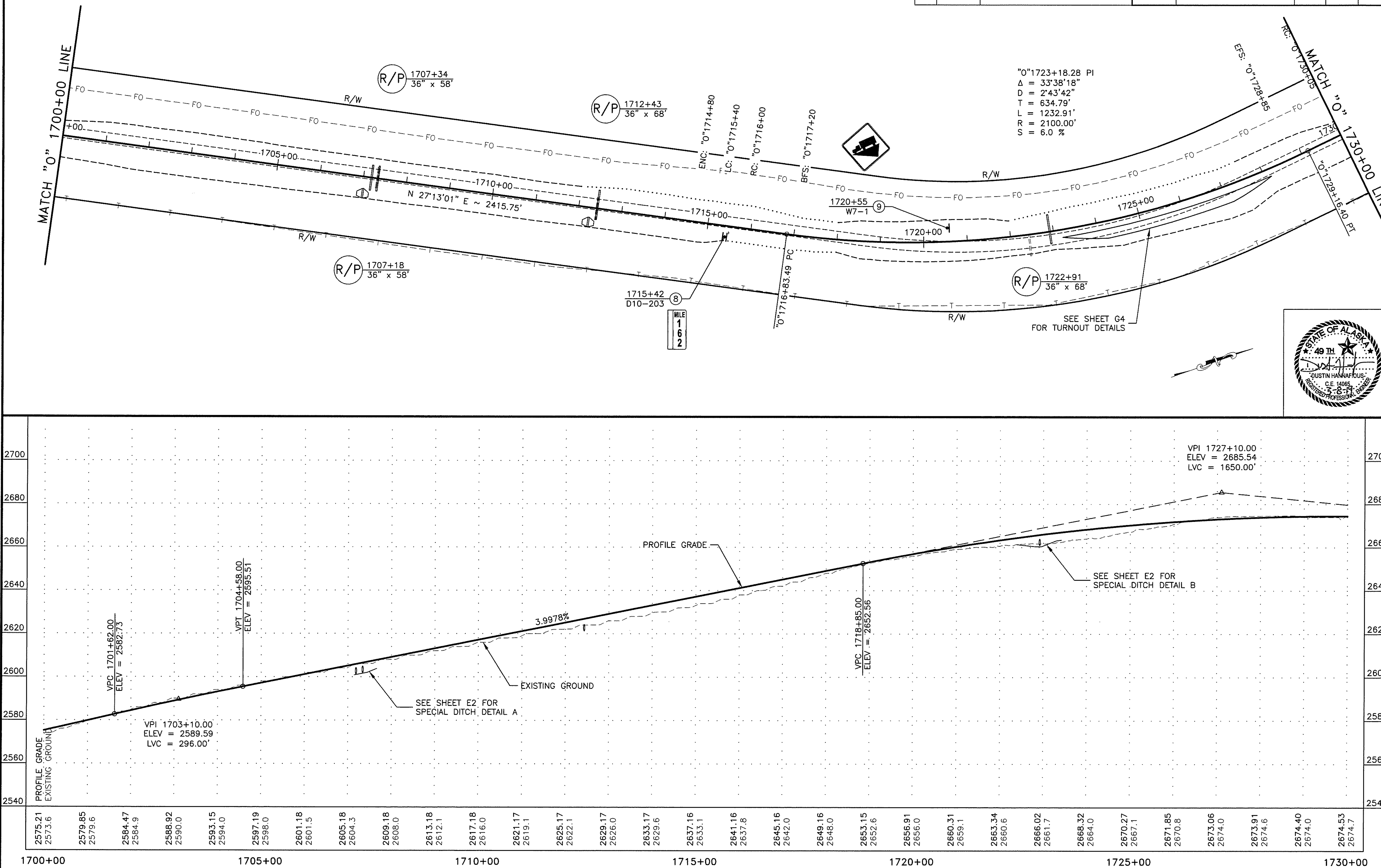


STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14065
3-28-19
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0435514\62253_F_PLAN AND PROFILE-F5 Thu, Mar/07/19 04:35pm

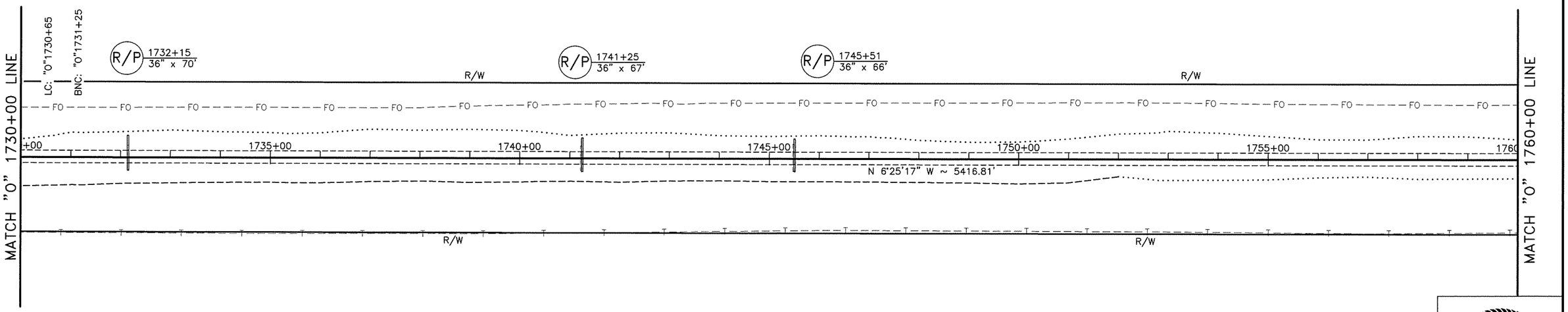
NO.	DATE	REVISION

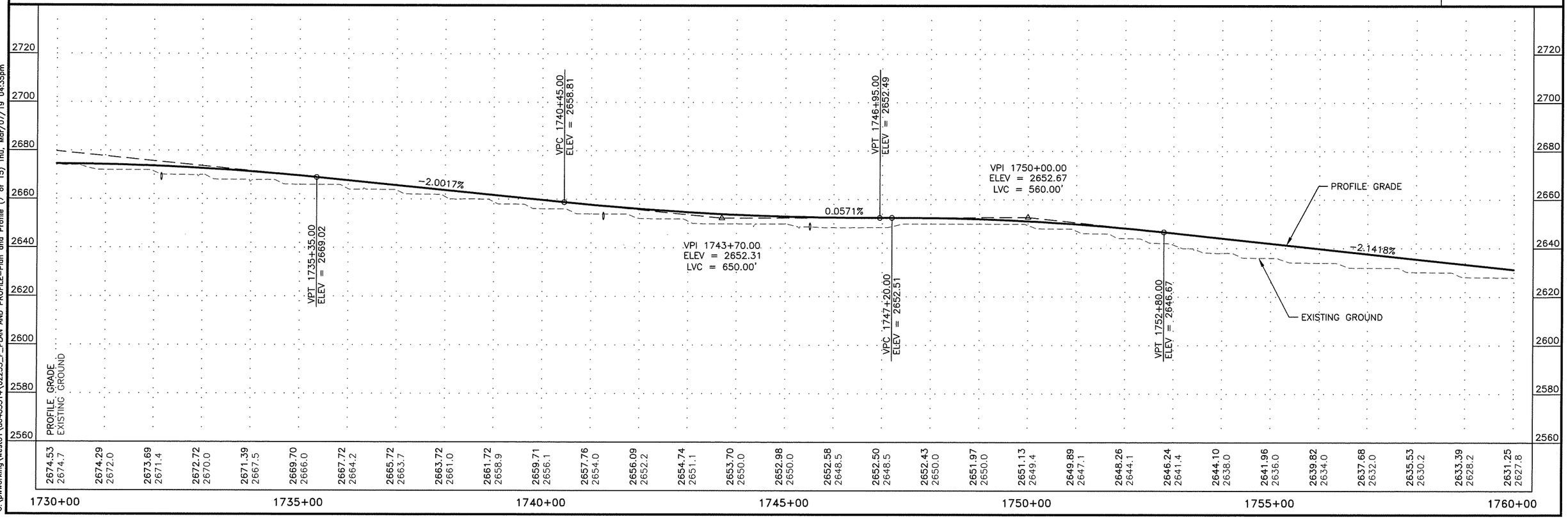
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F6	F15

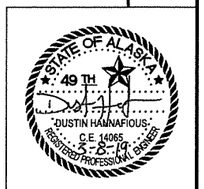


PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_F_PLAN AND PROFILE-Plan and Profile (6 of 15) Thu, Mar/07/19 04:35pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	F7	F15





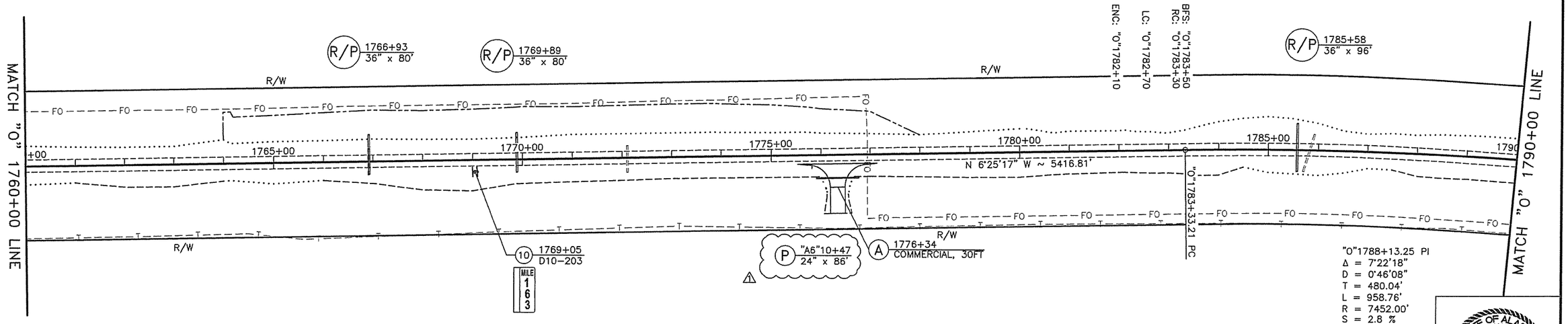


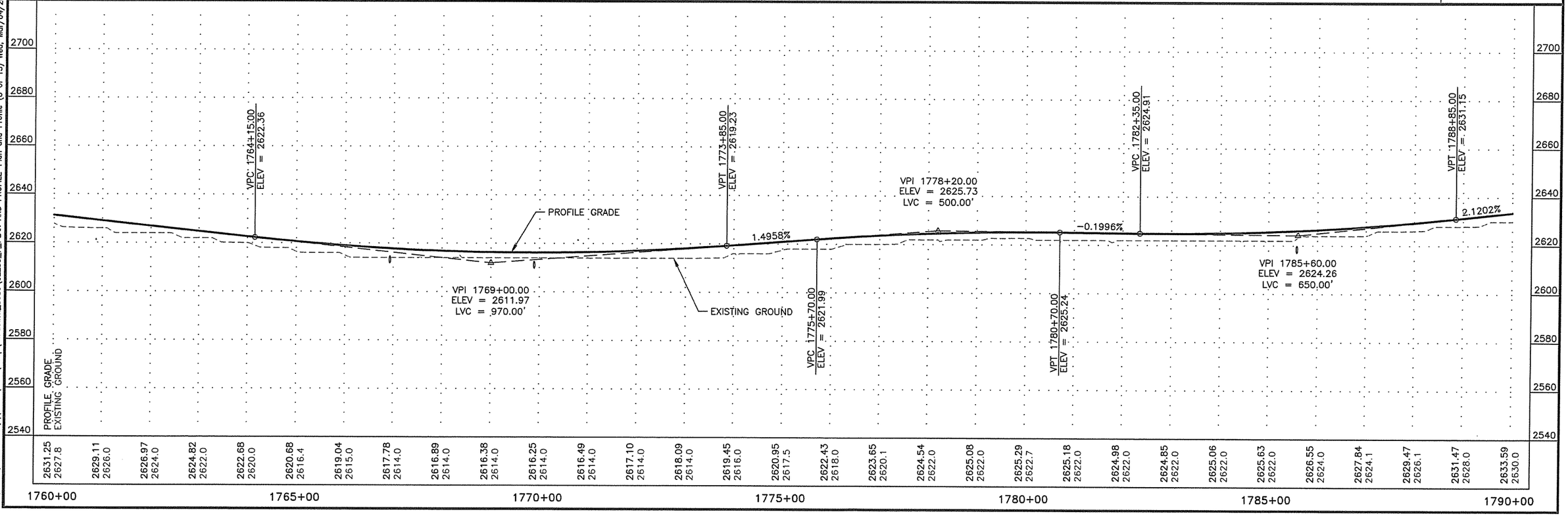
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\westot\d0485514\k2253_F_PLAN AND PROFILE-Plan and Profile (7 of 15) Thu, Mar/07/19 04:35pm

ADDENDUM NO. 1, ATTACHMENT NO.12

NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F8	F15

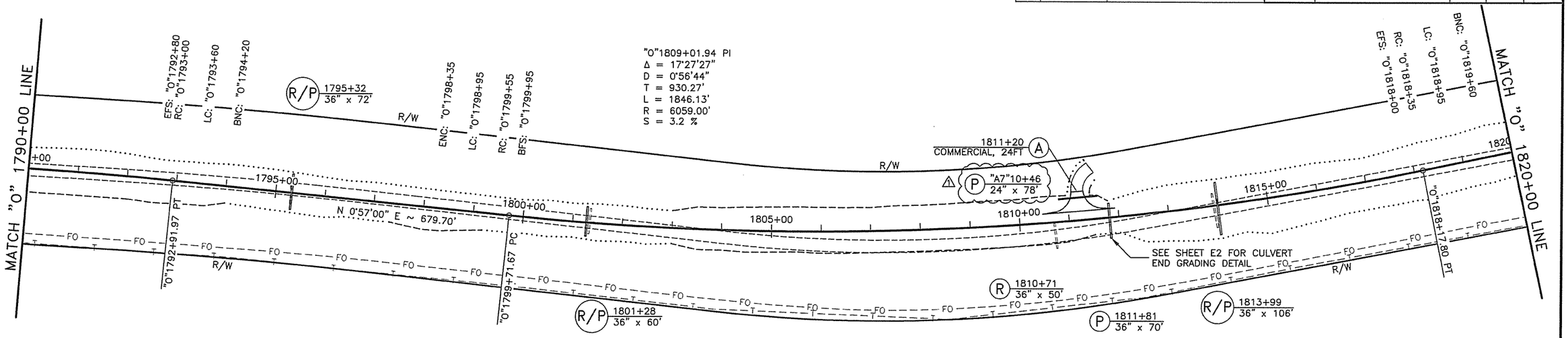


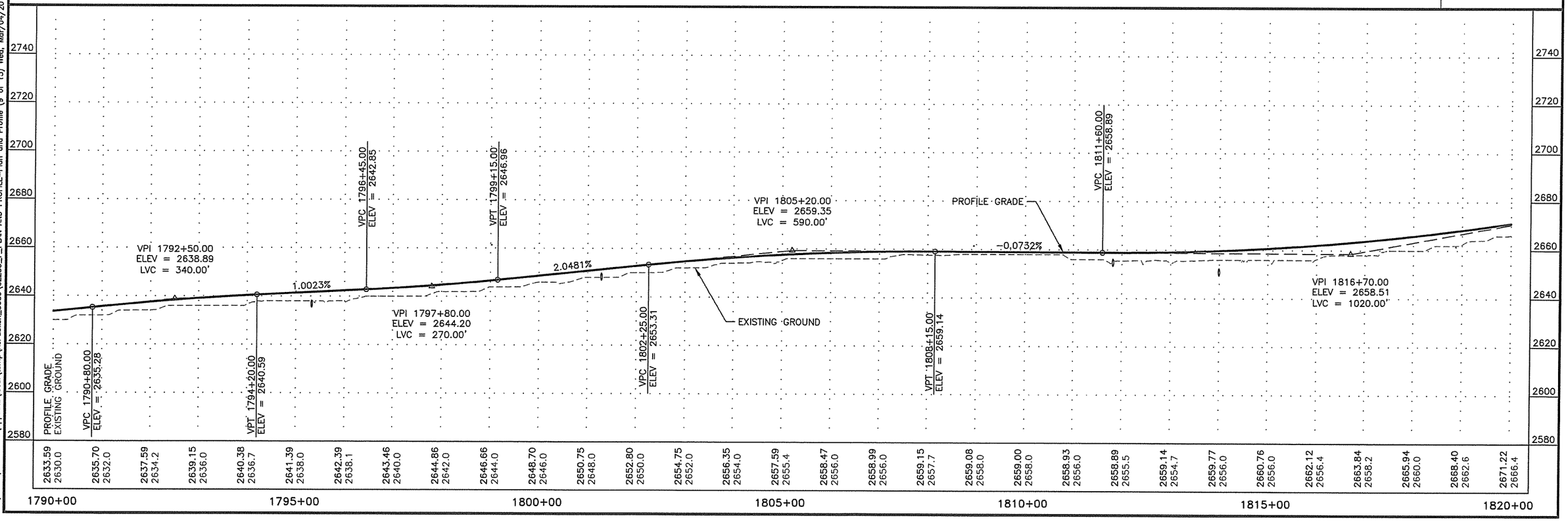


ADDENDUM NO. 1, ATTACHMENT NO.13

NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F9	F15





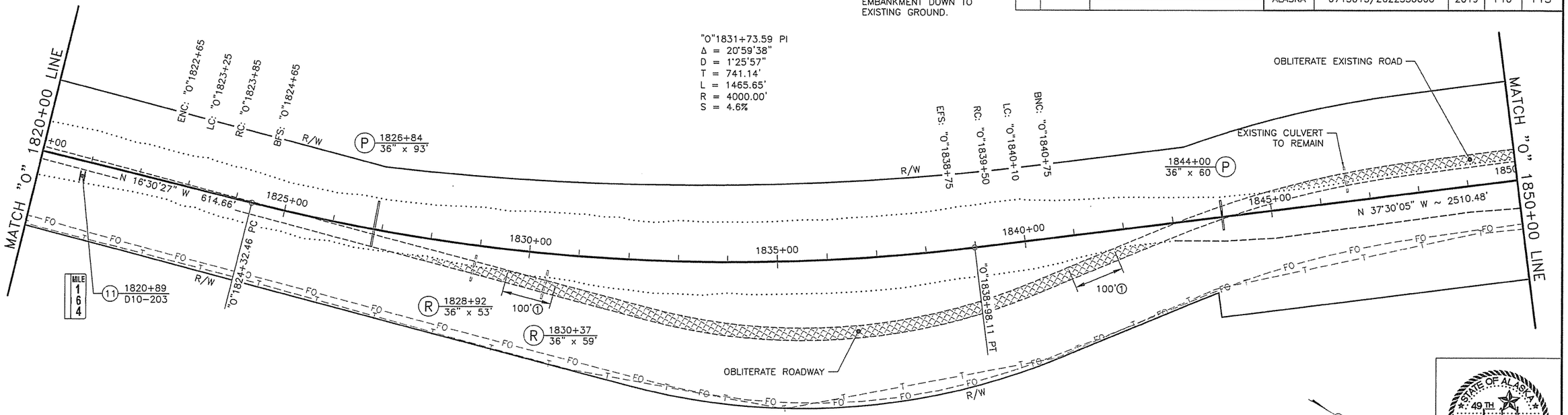
STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER
3/4/20

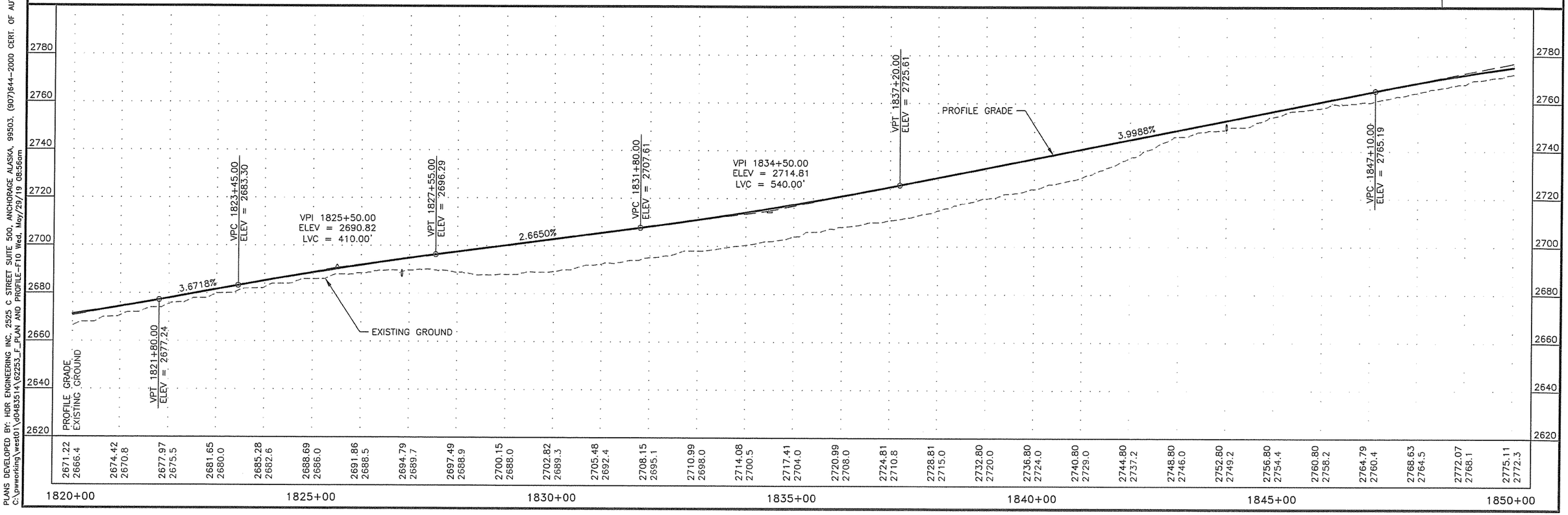
SHEET NOTES:

① REMOVE EXISTING HIGHWAY EMBANKMENT DOWN TO EXISTING GROUND.

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F10	F15

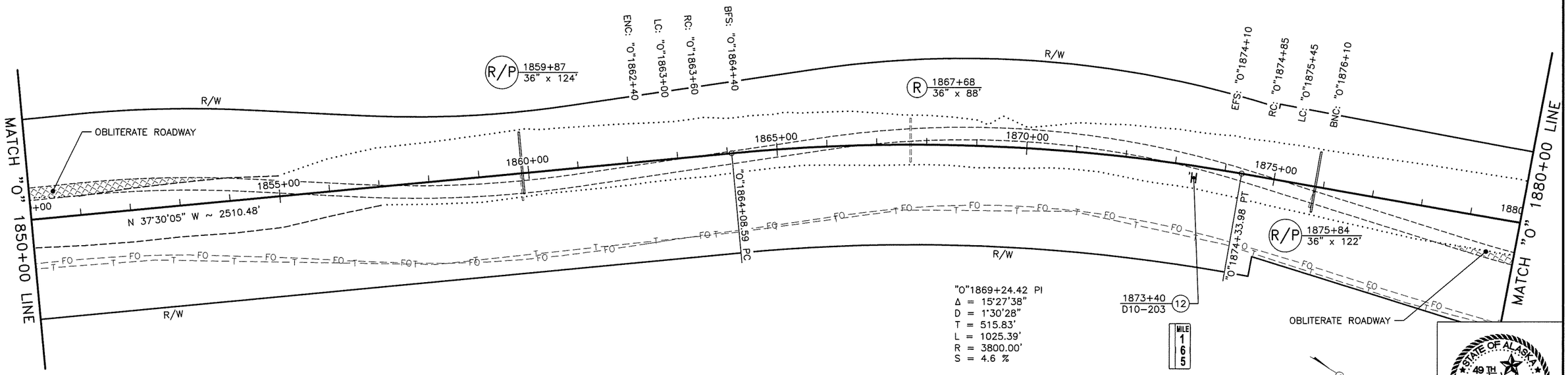


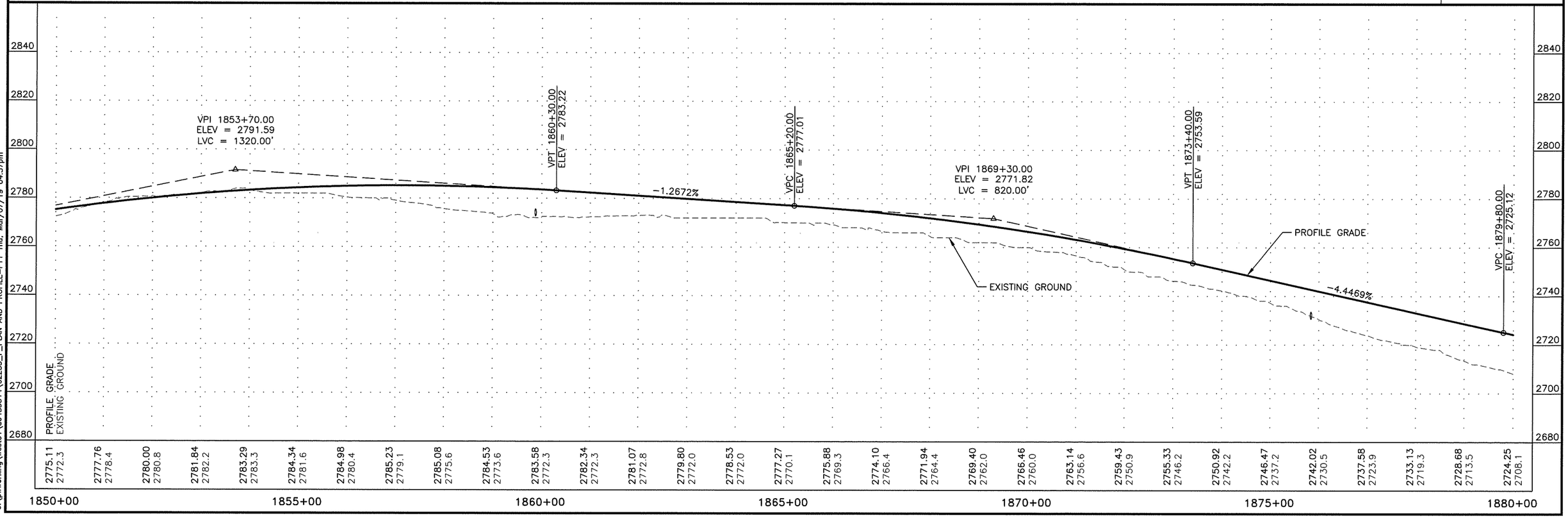


PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_F_PLAN AND PROFILE-F10 Wed, May/29/19 08:56am

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F11	F15

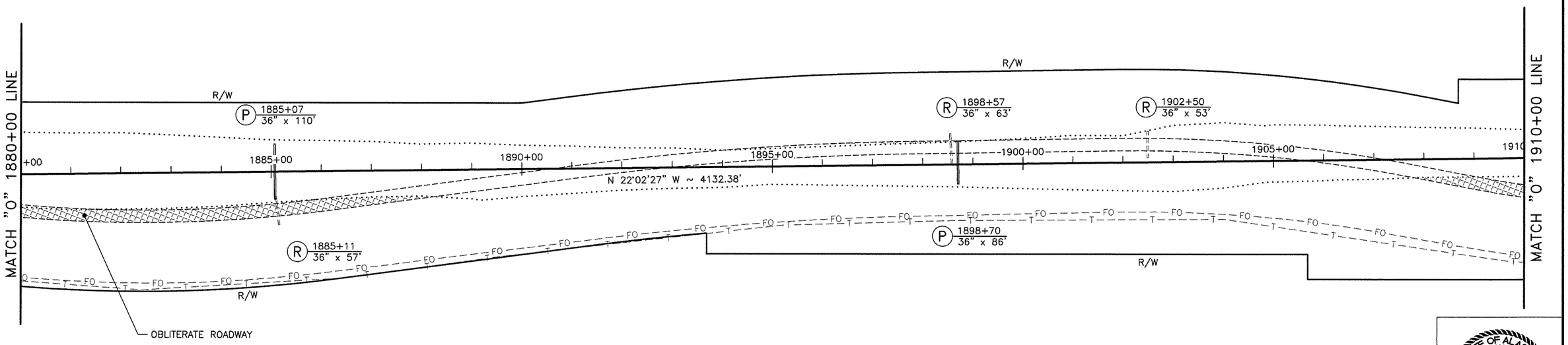


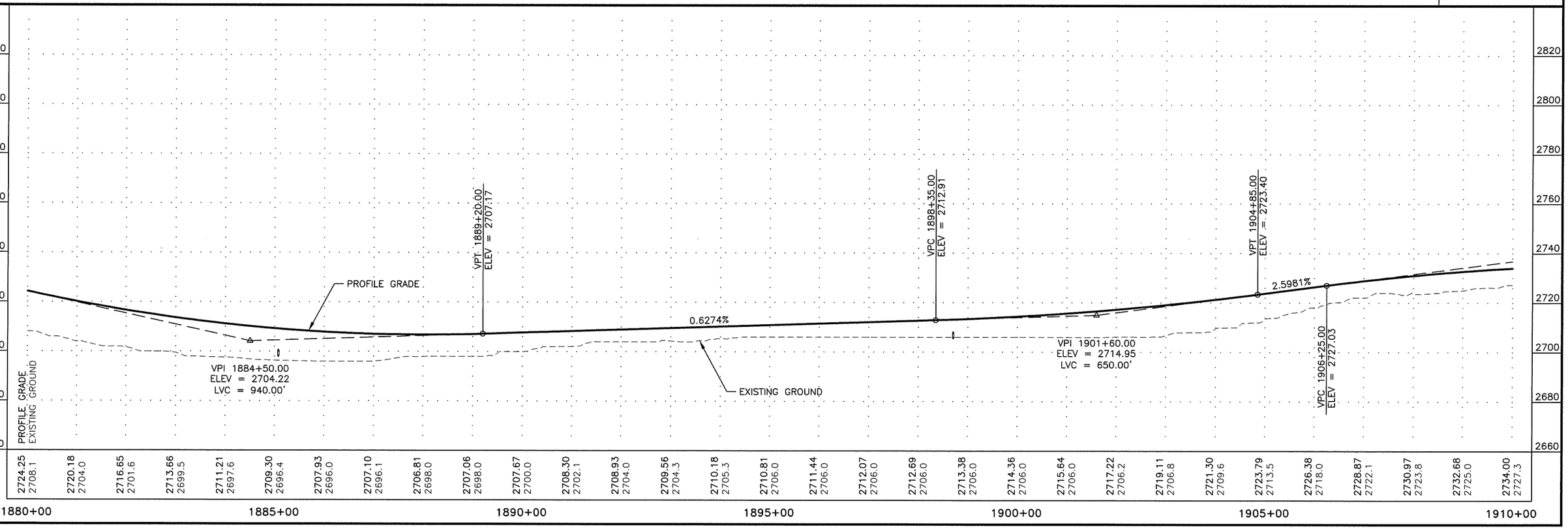


PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\b2253_F_PLAN AND PROFILE-F11 Thu, Mar/07/19 04:37pm

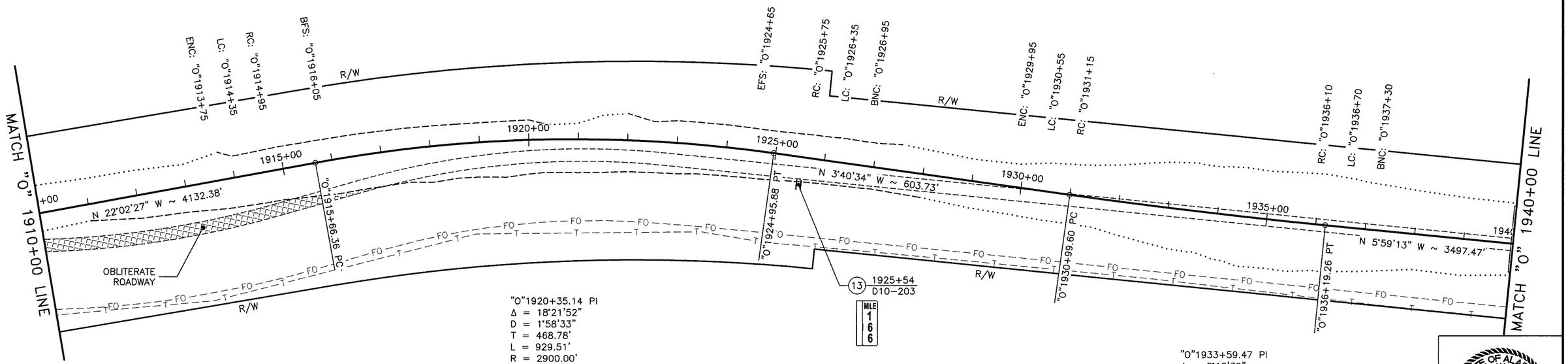
NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F12	F15





NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	F13	F15



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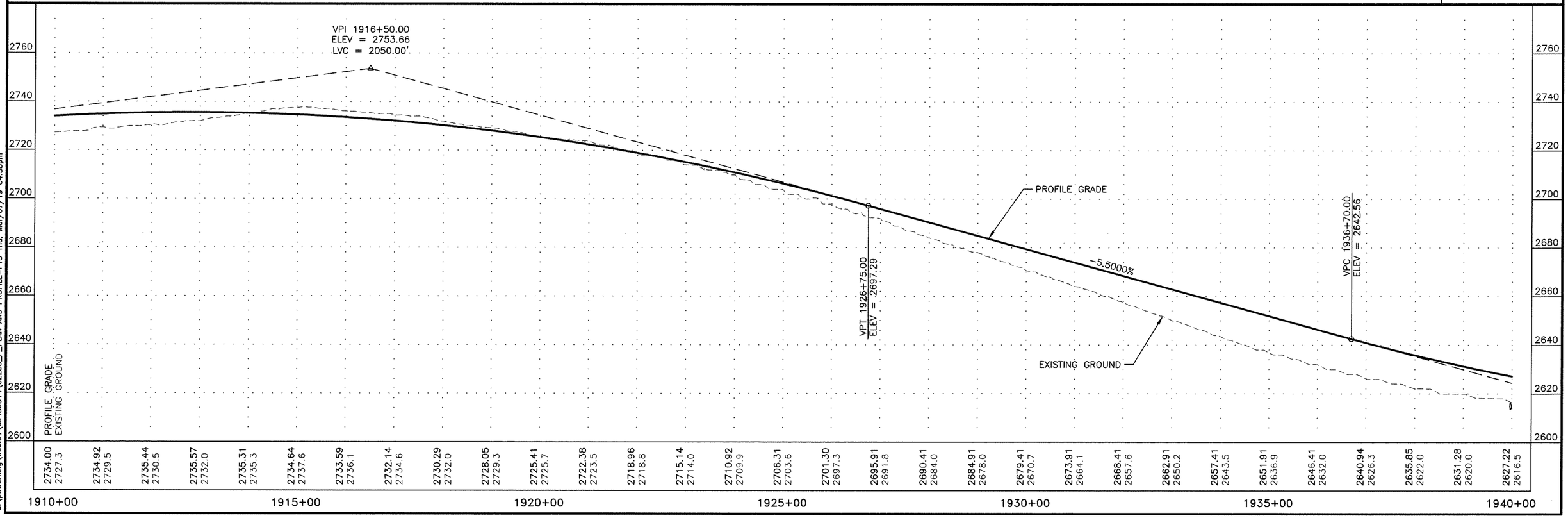
D = 1°58'33"
T = 468.78'
L = 929.51'
R = 2900.00'
S = 5.6 %

"O"1933+59.47 PI
Δ = 2°18'39"
D = 0°26'41"
T = 259.87'
L = 519.66'
R = 12885.00'
S = 2.0 %

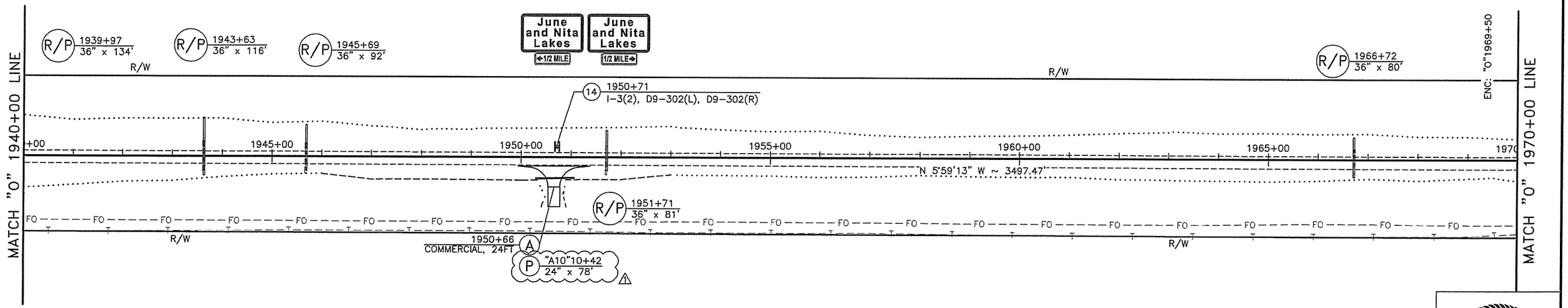
STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14065
REGISTERED PROFESSIONAL ENGINEER
3-8-19

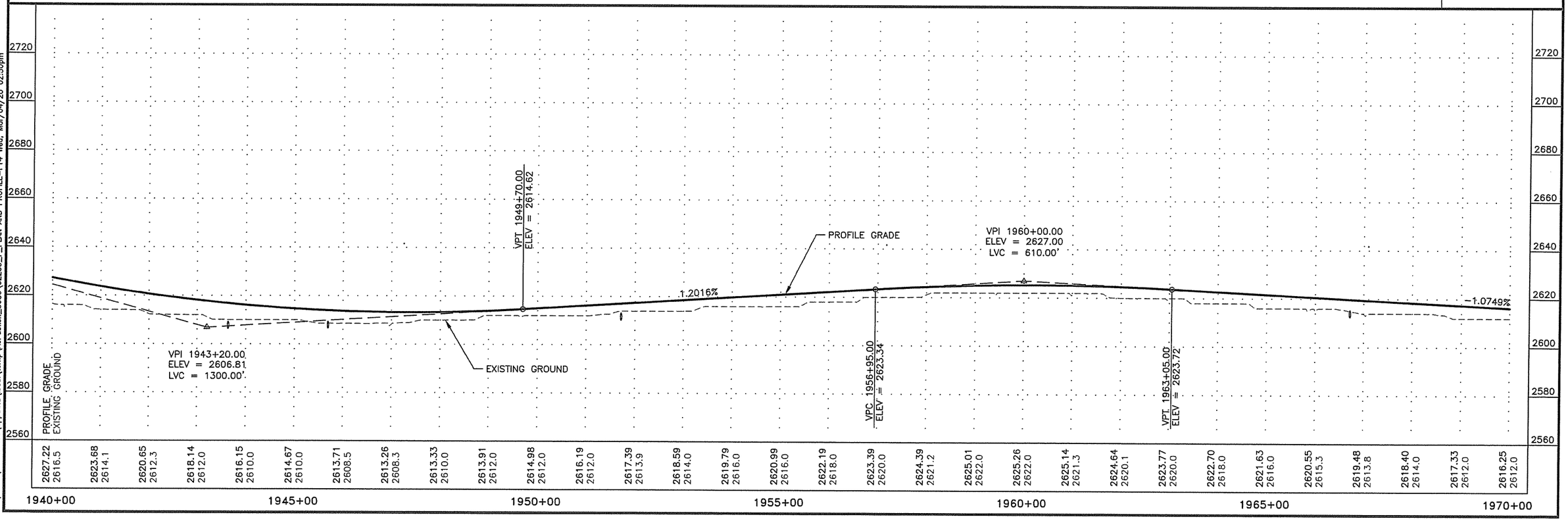


ADDENDUM NO. 1, ATTACHMENT NO.14

NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	F14	F15





STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14055
5/1/20
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\Users\dhannafiou\appdata\local\temp\AcPublish_8080\62253_F_PLAN AND PROFILE-F14 Wed, Mar/04/20 02:50pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	F15	F15

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T = 162.82'
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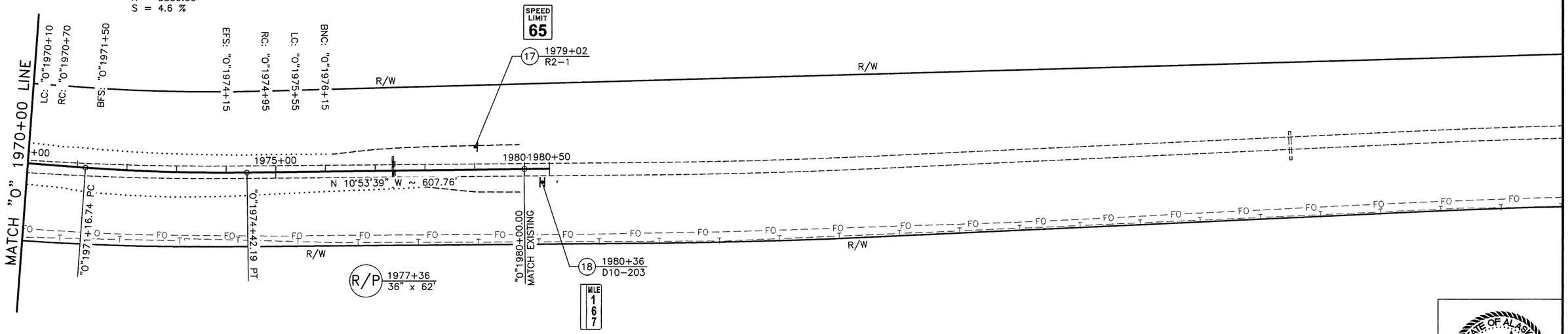
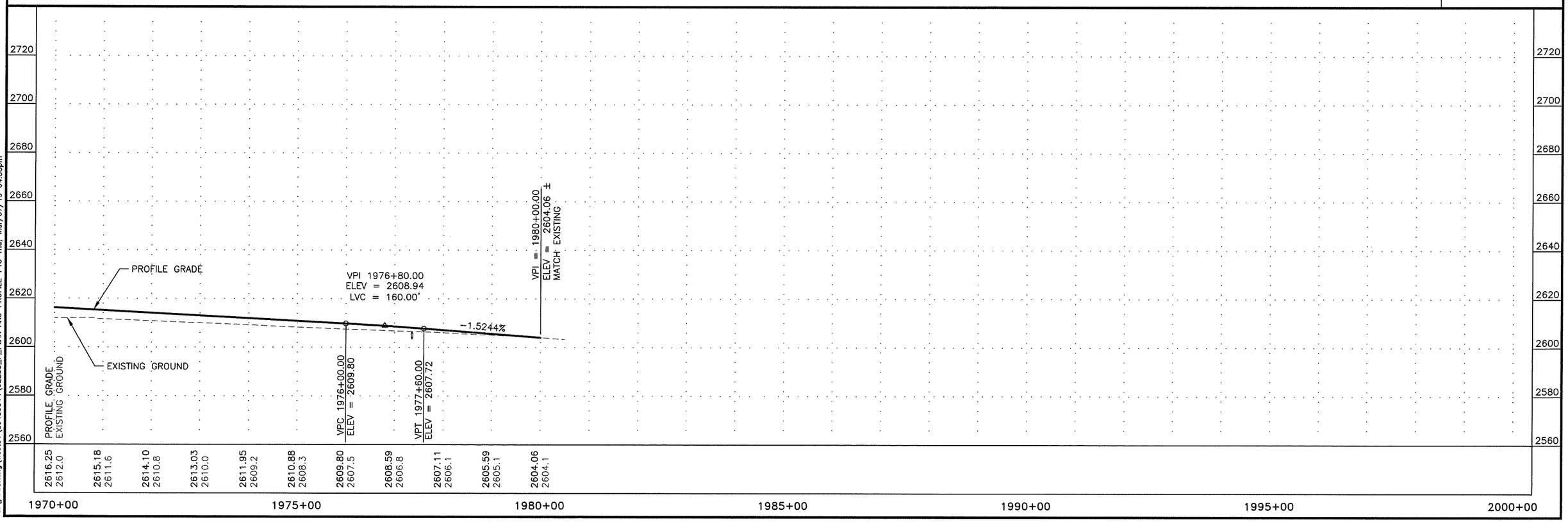
R = 3800.00'
S = 4.6 %





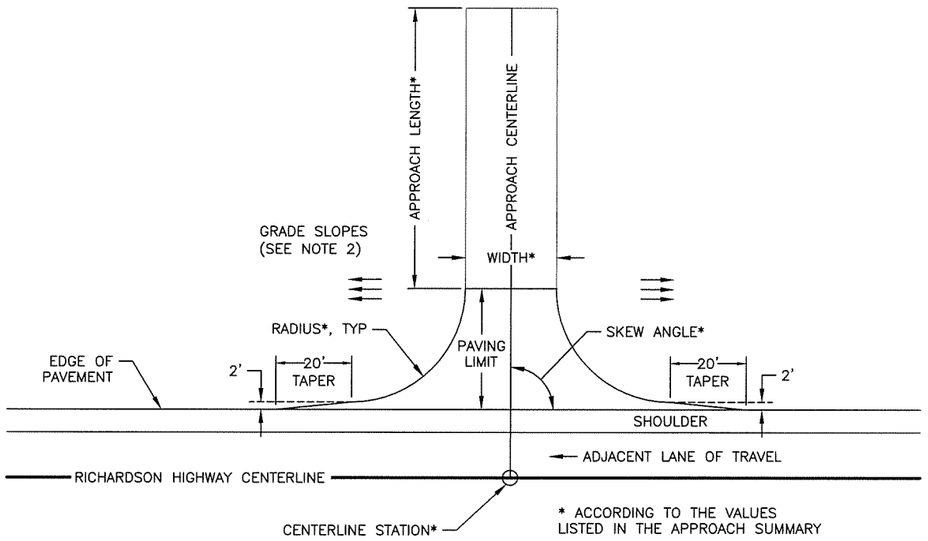
STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14065
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_F_PLAN AND PROFILE-F15 Thu, Mar/07/19 04:38pm

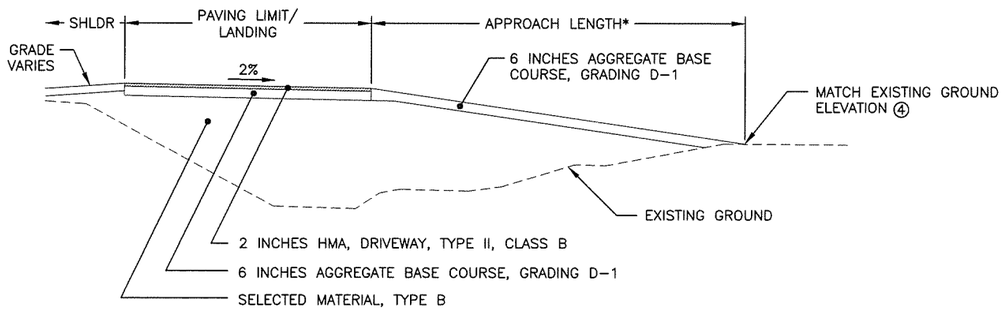
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	G1	G4

APPROACH SUMMARY

APPROACH	CENTERLINE STATION	LT	RT	SKEW ANGLE (DEG)	WIDTH (FT)	RADIUS (FT) ⑤	APPROACH LENGTH (FT)	639 (3) APPROACH	REMARKS
A1	1597+49.66		X	90	30	45	960	X	ALYESKA PIPELINE ACCESS ROAD, SEE SHEET G2 FOR PLAN AND PROFILE INFORMATION AND SHEET B4 FOR TYPICAL SECTION
A4	1684+17.51		X	90	30	45	157	X	ALYESKA PIPELINE ACCESS ROAD, SEE SHEET B4 FOR TYPICAL SECTION
A6	1776+33.81		X	90	30	45	69	X	ALYESKA PIPELINE ACCESS ROAD, SEE SHEET B4 FOR TYPICAL SECTION
A7	1811+20.36	X		90	24	40	56	X	
A10	1950+66.16		X	90	24	40	42	X	



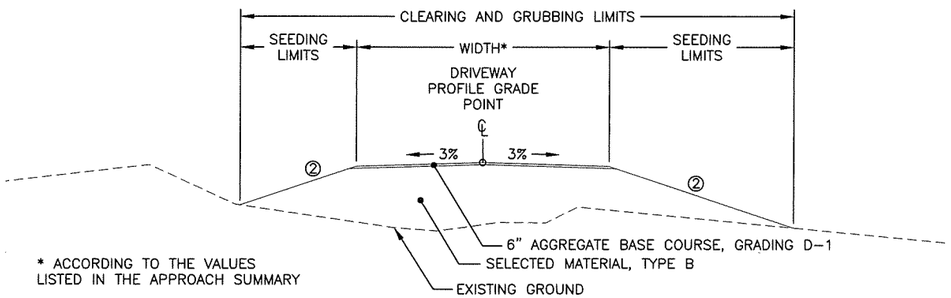
APPROACH PLAN VIEW



APPROACH PROFILE

APPROACH DETAIL NOTES:

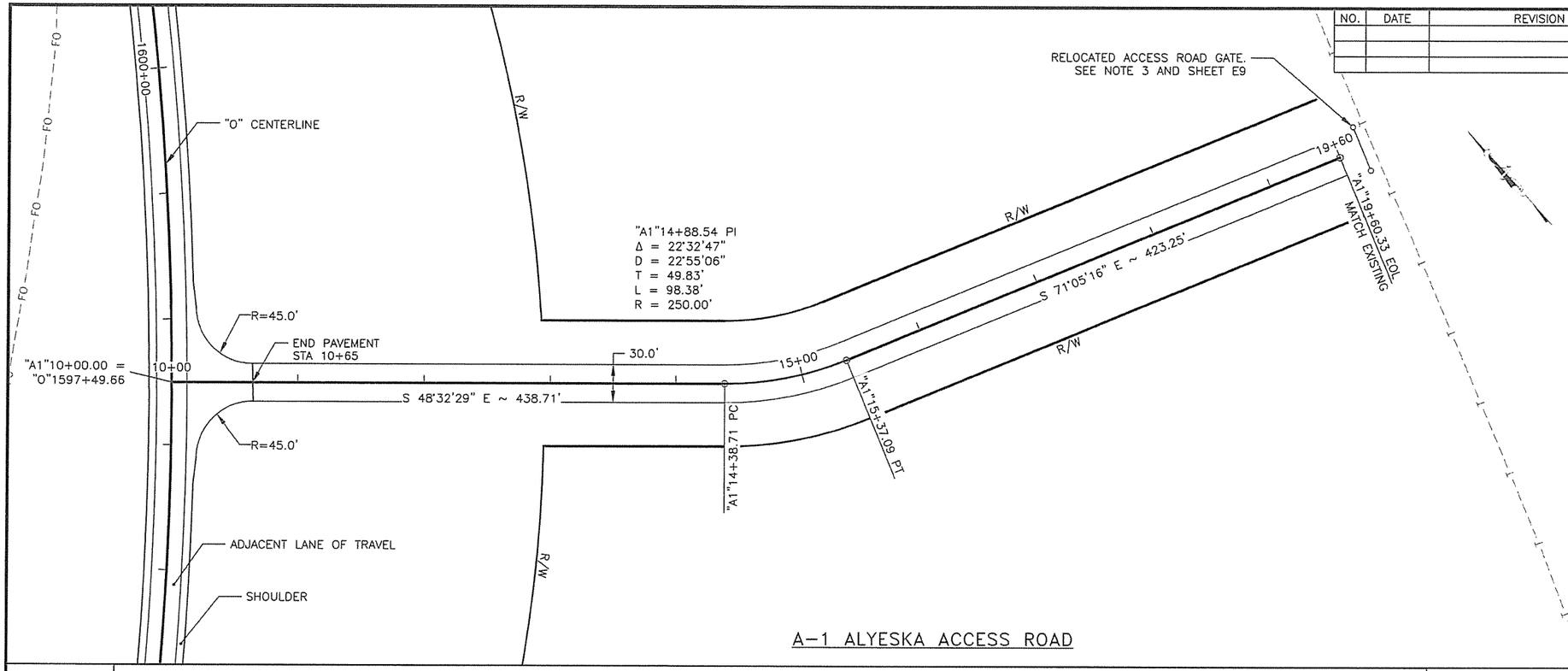
1. REMOVAL OF EXISTING APPROACH EMBANKMENT WILL NOT BE MEASURED FOR PAYMENT AND IS SUBSIDIARY TO THE 639(3) PAY ITEM.
2. ② APPROACH FILL SLOPES SHALL BE 6:1 (H:V) PARALLEL TO THE ROADWAY BETWEEN THE SHOULDER AND THE PAVING LIMIT. BEYOND THE PAVING LIMIT, WARP EMBANKMENT SLOPES FROM 6:1 (H:V) TO 3:1 (H:V) OVER 50 FT OR AS APPROVED BY THE ENGINEER. GRADING OF SLOPES IS SUBSIDIARY TO PAY ITEM 639(3).
3. CONSTRUCT THE DRIVEWAY TO THE SPECIFIED PROFILE GRADE AND TYPICAL SECTION ALONG THE DRIVEWAY CENTERLINE. WARP CROSS-SLOPES TO MATCH INTO THE SHOULDER OF RICHARDSON HIGHWAY.
4. ④ BLEND AND GRADE FOR A SMOOTH TRANSITION BETWEEN THE DRIVEWAY AND THE EXISTING GROUND.
5. ⑤ APPROACH RADIUS BEGINS AT END OF TAPER.
6. ENSURE POSITIVE DRAINAGE AWAY FROM THE ROADWAY AND DRIVEWAY EMBANKMENTS.
7. DRIVEWAY AND APPROACH TERMS ARE USED INTERCHANGEABLE.
8. APPROACH GRADES SHALL NOT EXCEED 8%.
9. SEE CULVERT SUMMARY ON SHEET E2 FOR CROSS CULVERT INFORMATION.
10. SEE SHEETS G2 – G3 FOR APPROACH LAYOUTS.



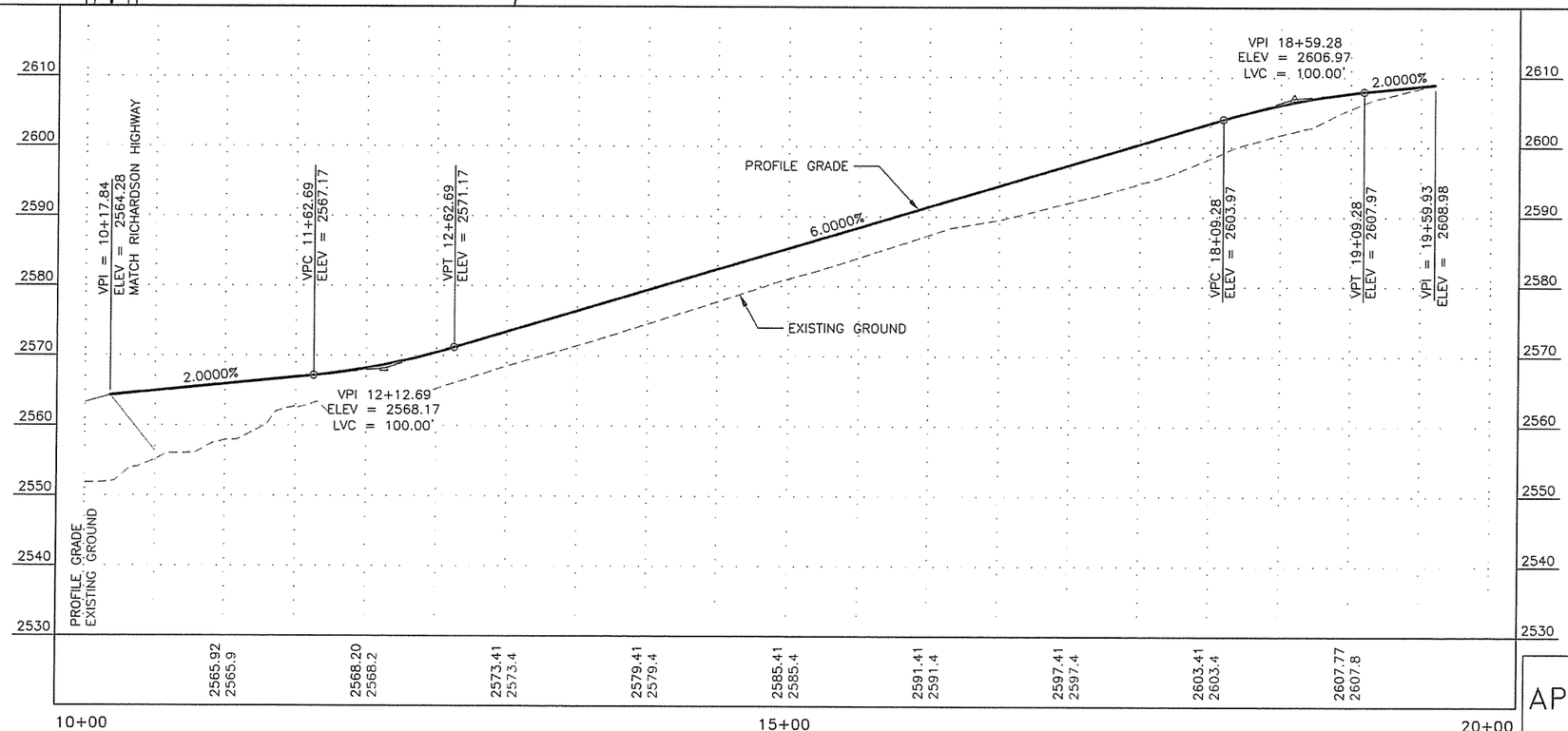
APPROACH TYPICAL SECTION

APPROACH DETAILS

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	G2	G4



A-1 ALYESKA ACCESS ROAD



APPROACH LAYOUT (1 OF 2)

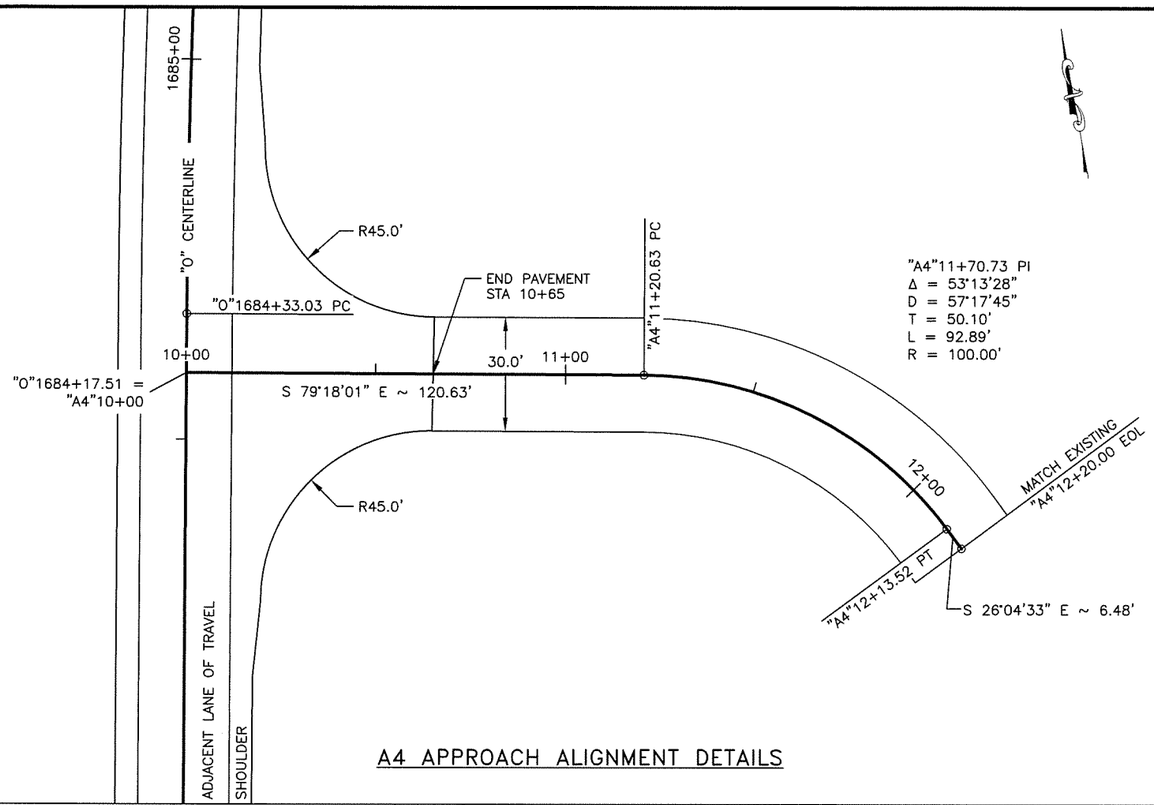
NOTES:

1. SEE SHEET B4 FOR TYPICAL SECTION.
2. REMOVAL & RELOCATION OF EXISTING GATE IS SUBSIDIARY TO PAY ITEM 203(9).
3. COORDINATE GATE LOCATION WITH ALYESKA PRIOR TO INSTALLATION. CONTACT ALYESKA'S CIVIL MAINTENANCE COORDINATOR AT (907) 450-4906.
4. FOLLOW THE GATE CONSTRUCTION REQUIREMENTS IDENTIFIED IN BULLET #4 IN ALYESKA'S LETTER OF NON-OBJECTION.

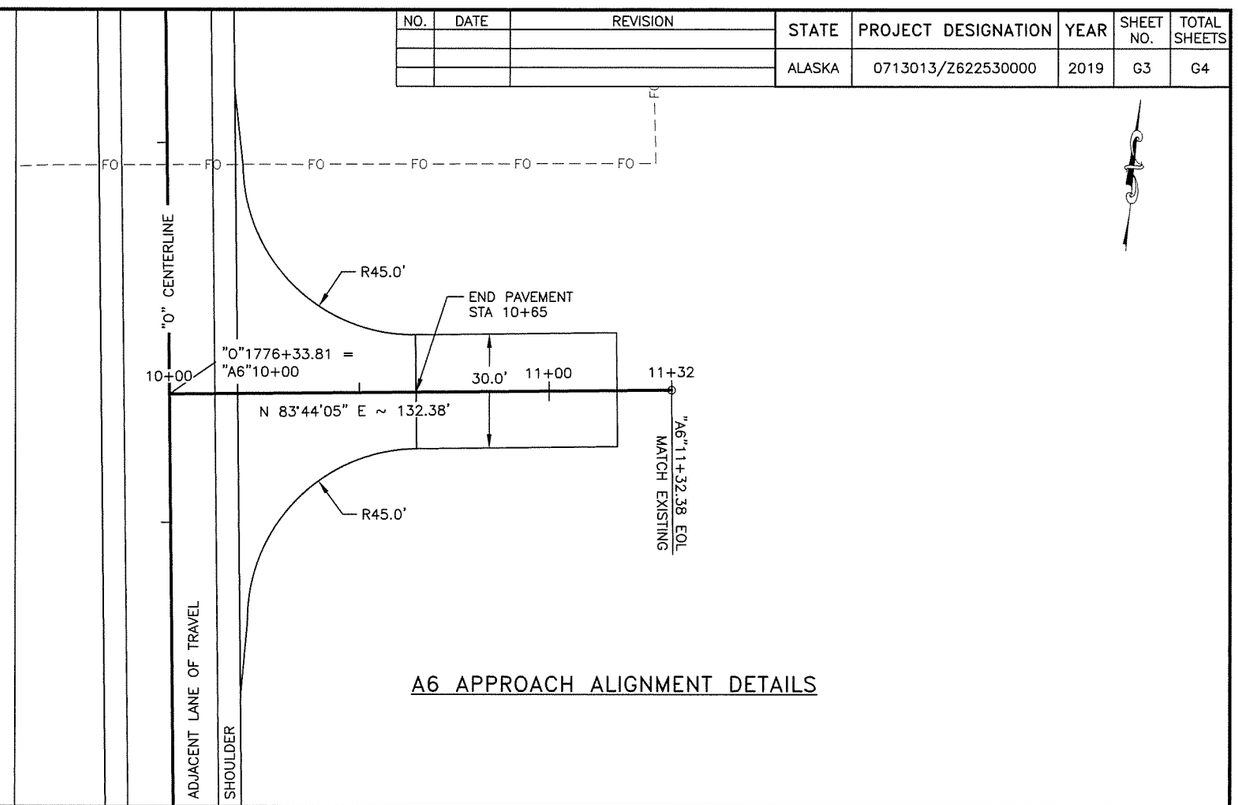
STATE OF ALASKA
49TH
DUSTIN HANAPOUS
C.E. 14055
10/4/19
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\prworking\West01\d0483514\62253_6_GRADING-Approach Layout (1 of 2) Fri, Oct/04/19 02:12pm

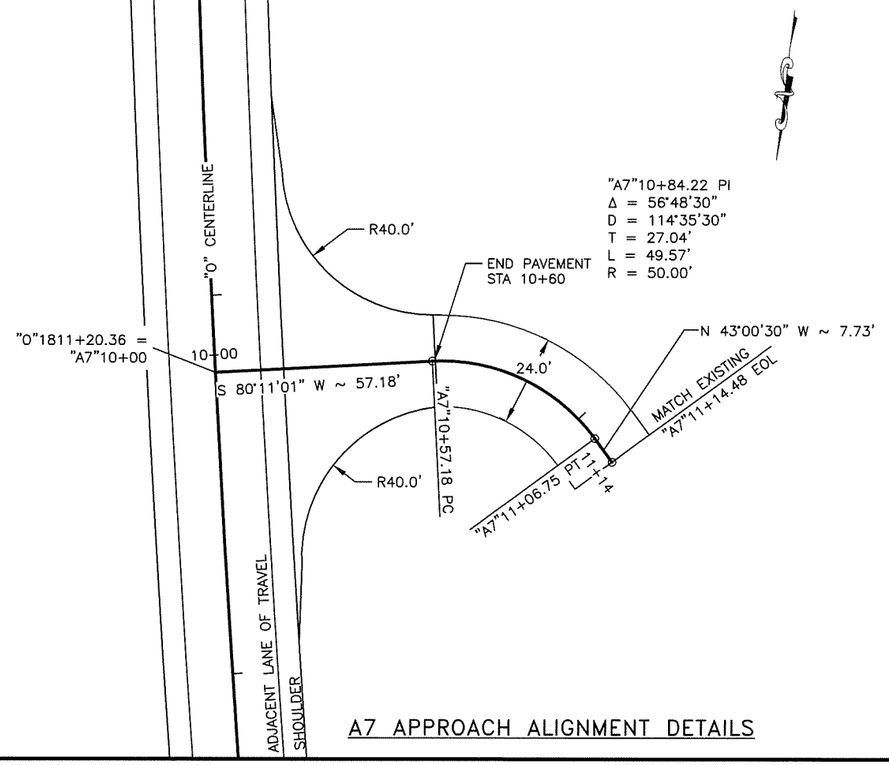
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	G3	G4



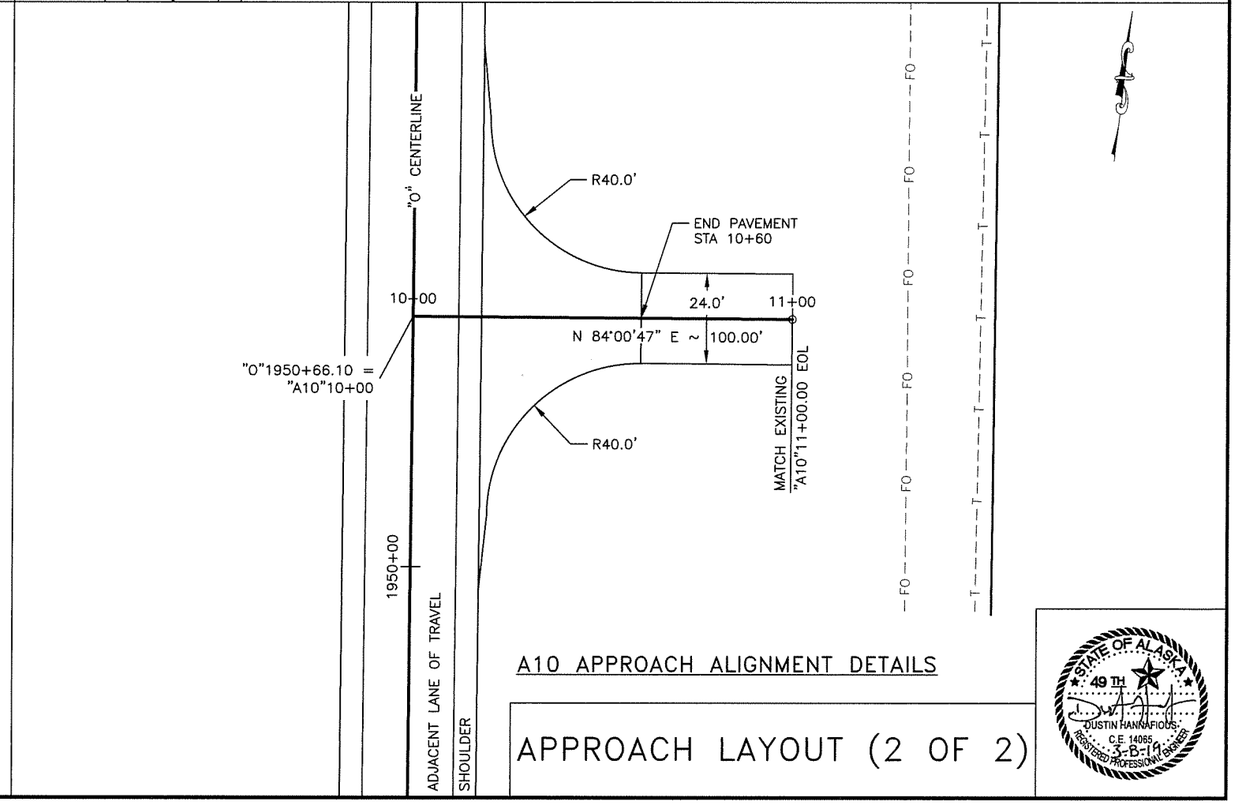
A4 APPROACH ALIGNMENT DETAILS



A6 APPROACH ALIGNMENT DETAILS



A7 APPROACH ALIGNMENT DETAILS



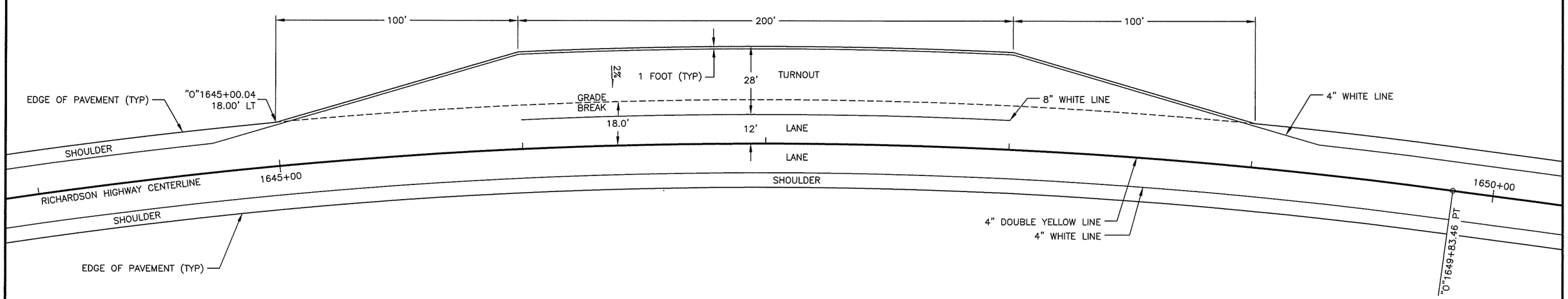
A10 APPROACH ALIGNMENT DETAILS

APPROACH LAYOUT (2 OF 2)

STATE OF ALASKA
49TH
DUSTIN HANNAFIOUS
C.E. 14065
REGISTERED PROFESSIONAL ENGINEER
3-B-19

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\62253_G_GRADING-Approach Layout (2 of 2) Thu, Mar/07/19 04:40pm

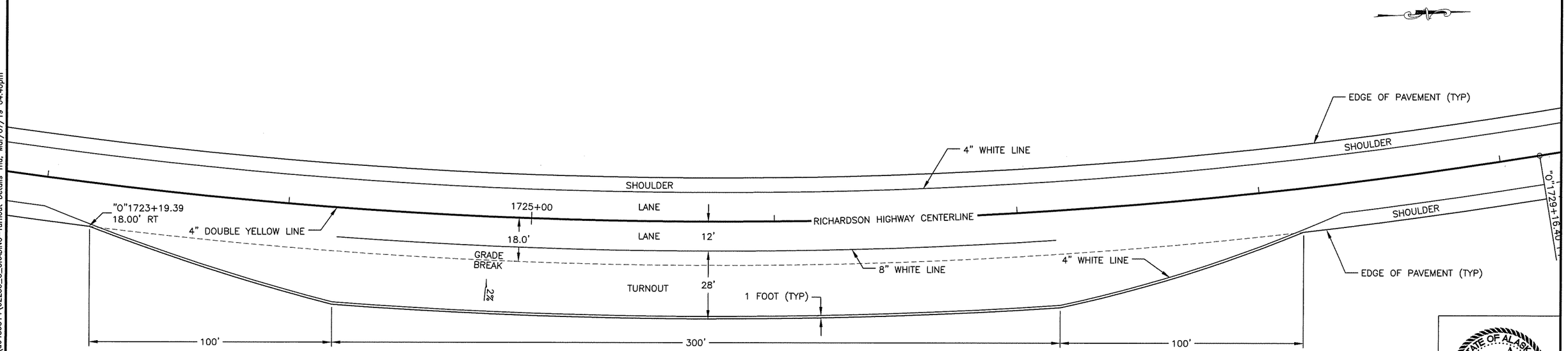
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	G4	G4



HAGGARD CREEK TRAILHEAD TURNOUT DETAILS

NOTES:

1. SEE SHEET H2 FOR STRIPING DETAILS AND NOTES.



STA 1725+00 TURNOUT DETAILS

TURNOUT DETAILS

STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14065
3-28-19
REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0485314\622253_G_GRADING-Turnout Details Thu, Mar/07/19 04:40pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	H1	H2

SIGNING SUMMARY

LOC. NO.	STATION	LOCATION RT.	LOCATION LT.	ASDS CODE	LEGEND	SIZE H X V (INCHES)	BRACING/FRAMING BRACED	BRACING/FRAMING FRAMED	AREA (SQ.FT.)	MTG. HGT. (FT.)	DIR.	POST TYPE	POST SIZE (INCHES)	POST NO.	REMARKS
1	"O"1550+95	X		R2-1	SPEED LIMIT 65	30 X 36			7.50	11.5	S	PST	2.5	1	SEE SHEET F1
2	"O"1563+39	X		D10-203	MILE 159	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F1
4	"O"1613+98	X		D10-203	MILE 160	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F3
5	"O"1656+86	X		I-3	Haggard Creek	36 X 18	X		4.50	9.3	S	PST	2.5	1	SEE SHEET F4
6	"O"1658+56		X	I-3	Haggard Creek	36 X 18	X		4.50	9.3	N	PST	2.5	1	SEE SHEET F4
7	"O"1663+05	X		D10-203	MILE 161	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F4
8	"O"1715+42	X		D10-203	MILE 162	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F6
9	"O"1720+55		X	W7-1	HILL SYMBOL	36 X 36	X		9.00	11.5	N	PST	2.5	1	SEE SHEET F6
10	"O"1769+05	X		D10-203	MILE 163	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F8
11	"O"1820+98	X		D10-203	MILE 164	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F10
12	"O"1873+53	X		D10-203	MILE 165	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F11
13	"O"1925+67	X		D10-203	MILE 166	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F13
14	"O"1950+71		X	I-3(2)	June and Nita Lakes	36 X 18			4.50	11.5	N&S	PST	2.5	1	SEE SHEET F14
				D9-302(L)	Left Arrow W/½ Mile	24 X 6			1.00						
				D9-302(R)	Right Arrow W/½ Mile	24 X 6			1.00						
17	"O"1979+14		X	R2-1	SPEED LIMIT 65	30 X 36			7.50	11.5	N	PST	2.5	1	SEE SHEET F15
18	"O"1980+50	X		D10-203	MILE 167	14 X 27			2.63	11.1	N&S	PST	2.5	1	SEE SHEET F15
TOTAL = 63.20															

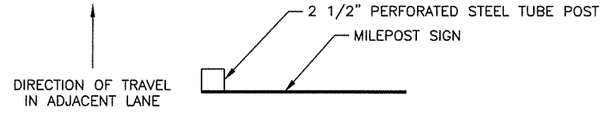
SIGNING NOTES:

1. LOCATE AND PROTECT ALL NEW AND EXISTING UNDERGROUND UTILITIES, INCLUDING BUT NOT LIMITED TO, FIBER OPTIC AND TELEPHONE CABLES PRIOR TO INSTALLING SIGN POSTS. NOT ALL EXISTING UTILITIES MAY BE SHOWN ON THE PLANS.
2. MAINTAIN EXISTING SIGNS UNTIL NEW SIGNS ARE INSTALLED. DO NOT LEAVE DUPLICATE OR CONFLICTING SIGNING AT ANY TIME.
3. REMOVE AND SALVAGE ALL EXISTING SIGNS AND SIGN FOUNDATIONS WITHIN THE PROJECT LIMITS.
4. DELIVER ALL SALVAGED SIGNS TO THE PAXSON MAINTENANCE YARD LOCATED AT MP 186 OF THE RICHARDSON HIGHWAY.
5. MOUNTING HEIGHTS ARE PER SHEET V19 UNLESS OTHERWISE NOTED.
6. DETERMINE POST LENGTHS IN THE FIELD. DO NOT EXTEND POSTS ABOVE TOP OF SIGN.
7. INSTALL PST SIGN POSTS WITH SLEEVE TYPE SOIL EMBEDMENT PER STANDARD DRAWING S-30.04. ATTACH THE SIGN POST TO THE SLEEVE USING GALVANIZED ⅜" BOLT, NUT, SPLIT LOCK WASHER AND TWO FLAT WASHERS.
8. ATTACH ALL SIGNS TO THEIR SUPPORTS WITH ⅜" BOLTS, EXCEPT ATTACH UNFRAMED SIGNS TO PST POSTS WITH ALUMINUM DRIVE RIVETS. WIND WASHERS ARE NOT REQUIRED WITH DRIVE RIVETS. INCLUDE SPLIT LOCK WASHERS WHEN BOLTS ARE USED.
9. ALL FASTENER HARDWARE SHALL MEET THE REQUIREMENTS OF THE "FASTENER SPECIFICATION TABLE" ON THIS SHEET.
10. INSTALL MILEPOST SIGNS (D10 SERIES) IN ACCORDANCE WITH SHEET V19, EXCEPT WITH A 15 TO 30 FOOT OFFSET. REDUCE THE OFFSET AS NECESSARY SO THE BOTTOM OF THE SIGN IS NO MORE THAN 15 FEET ABOVE THE GROUND. THE SIGN OFFSET SHALL NOT BE LESS THAN THE OFFSET SHOWN ON SHEET V19.
11. SIGN OFFSET DISTANCES FOR ALL OTHER SIGNS ARE NOT PROVIDED, FOLLOW OFFSET DISTANCES SHOWN ON SHEET V19.
12. THE 4" MOUNTING AREA ON MILEPOST SIGNS SHALL BE BARE ALUMINUM. THIS ELIMINATES THE OPTION OF INSTALLING GREEN REFLECTIVE SHEETING IN THIS AREA AS NOTED IN THE ASDS.
13. ADDITIONAL CLEARING BEYOND WHAT IS COVERED UNDER PAY ITEM 201(1A) MAY BE REQUIRED TO ENSURE ADEQUATE VISIBILITY OF SIGNS. THIS WORK IS SUBSIDIARY TO PAY ITEM 615(1).

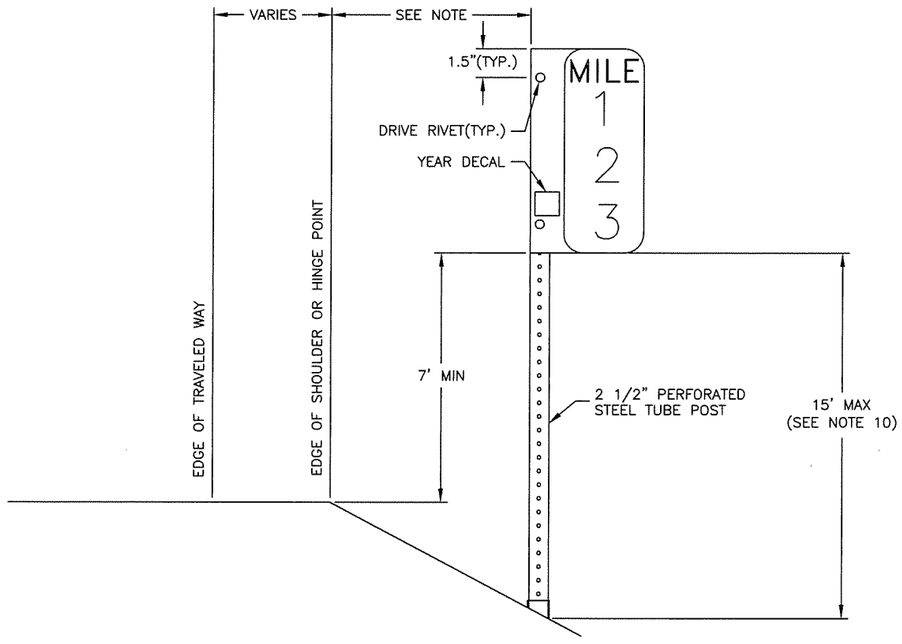
FASTENER SPECIFICATION TABLE

FASTENERS	STEEL	STAINLESS STEEL
BOLTS	ASTM A 307	ASTM F 593
NUTS	ASTM A 563	ASTM F 594
WASHERS	ASTM A 36	ASTM A 480

THESE SPECIFICATIONS APPLY TO ALL SIGN FASTENER HARDWARE ON THE PROJECT.



MILEPOST MOUNTING DETAIL



MILEPOST DETAIL
(D10-203)

SIGN SUMMARY

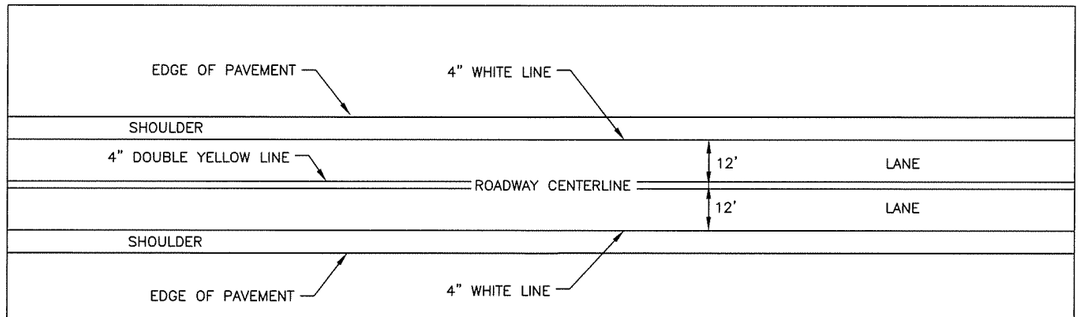
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	H2	H2

TRAFFIC MARKING NOTES:

1. TRANSITION BETWEEN NEW AND EXISTING MARKINGS USING A 100:1 TAPER.
2. DISTANCE BETWEEN CENTERLINE AND LANE EDGE LINE IS 12 FEET UNLESS OTHERWISE NOTED. THIS DIMENSION IS TO CENTER OF STRIPE OR STRIPE GROUP.
3. THE STRIPE/SKIP RATIO FOR THIS PROJECT WILL BE 10FT/30 FT. THE PASS/NO-PASS ZONES WILL BE DETERMINED IN THE FIELD BY THE CONTRACTOR ACCORDING TO SECTION 670. THIS WORK IS SUBSIDIARY TO PAY ITEM 670(10) PAINTED TRAFFIC MARKING.
4. PAVEMENT MARKINGS WILL BE PLACED IN ACCORDANCE WITH STANDARD DRAWING T-21.03 ON SHEET V20 AND SECTION 670.
5. LENGTH OF 4" DOUBLE YELLOW IS BASED ON A CONTINUOUS 4" DOUBLE YELLOW STRIPE THROUGH THE LENGTH OF THE PROJECT. NO ADJUSTMENT WILL BE MADE TO THE 670(1) PAY ITEM FOR DIFFERENCES IN QUANTITY OF YELLOW STRIPE INSTALLED ACCORDING TO 670-3.05, PRELIMINARY SPOTTING
6. SEE TURNOUT DETAILS ON SHEET G4 FOR TURNOUT STRIPING LAYOUT
7. STRIPING SEPARATION DISTANCES SHOWN ARE TO CENTER OF STRIPE.

670(1) PAINTED TRAFFIC MARKINGS SUMMARY

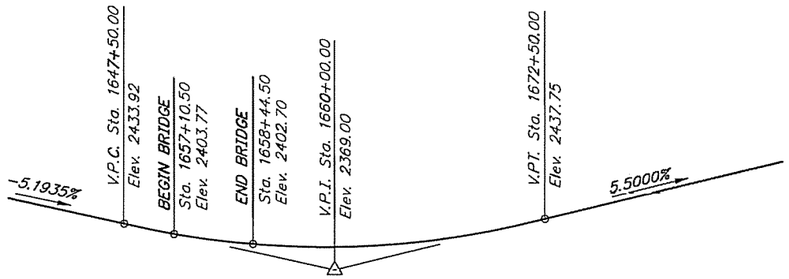
DESCRIPTION	LENGTH (FT)	REMARKS
4" WHITE	86,000	
8" WHITE	900	SEE TURNOUT DETAIL
4" DOUBLE YELLOW	43,000	SEE NOTES 3 AND 5



TYPICAL MAINLINE STRIPING DETAIL

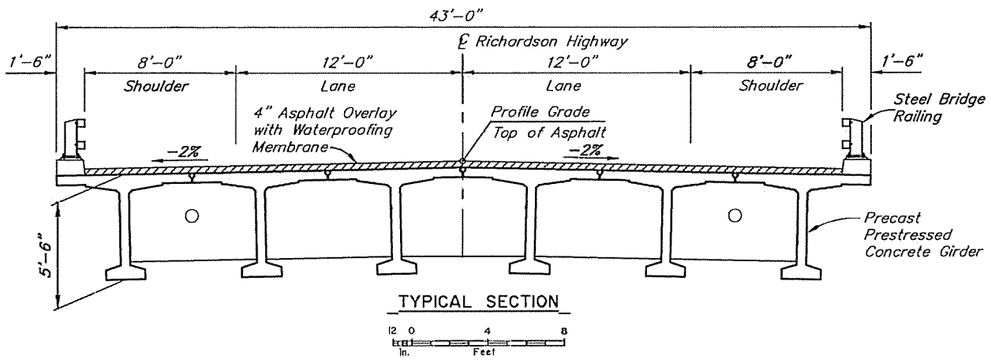
STRIPING DETAILS

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N1	N21



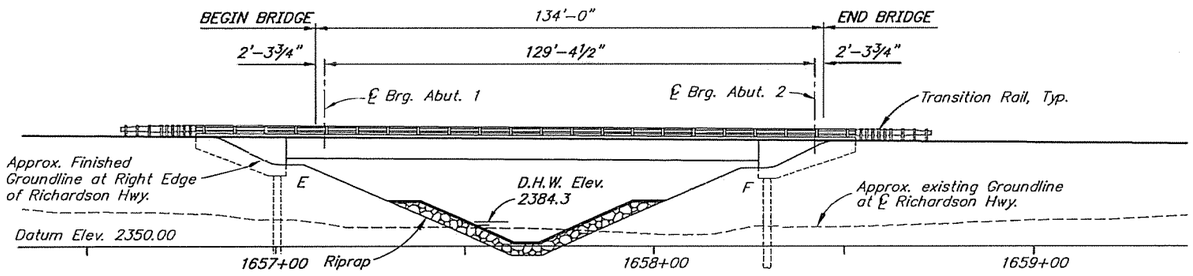
PROFILE GRADE DATA

No Scale



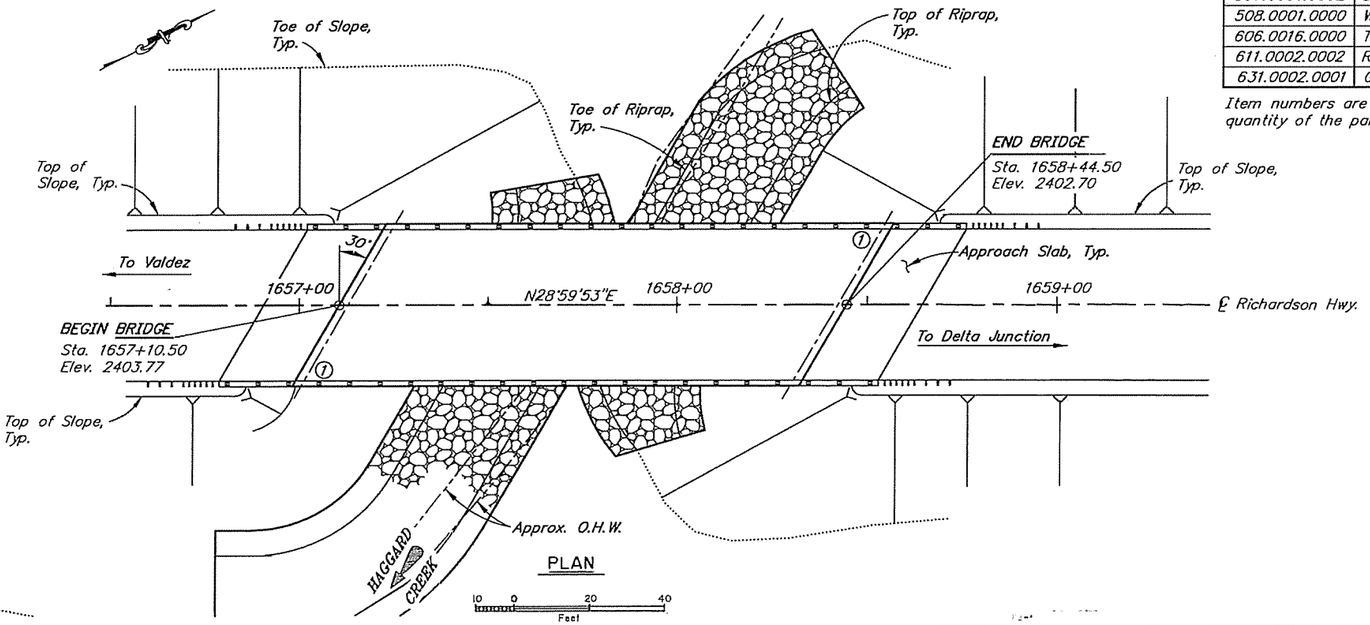
TYPICAL SECTION

12 0 4 8 In. Feet



ELEVATION

10 0 20 40 Feet



PLAN

10 0 20 40 Feet

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	PAY UNIT	ESTIMATING UNIT	SUBST.	SUPERST.	TOTAL QUANTITY
205.0006.0000	Structural Fill	CY	CY	1,360	---	1,360
501.0001.0000	Class A Concrete	LS	CY	139.9	139.1	279.0
501.0007.0000	Precast Concrete Member, 131'-0" Decked Bulb-Tee	EA	EA	---	6	6
503.0001.0000	Reinforcing Steel	LS	LBS	29,580	---	29,580
503.0002.0000	Epoxy-Coated Reinforcing Steel	LS	LBS	185	21,175	21,360
505.0005.2405	Furnish Structural Steel Piles, 2'-0" Dia. x ½" Pipe	LF	LF	1,174.2	---	1,174.2
505.0006.2405	Drive Structural Steel Piles, 2'-0" Dia. x ½" Pipe	EA	EA	12	---	12
507.0001.0002	Steel Bridge Railing, 2-Tube	LF	LF	---	348.0	348.0
508.0001.0000	Waterproofing Membrane, Spray-Applied	LS	SF	---	6,960	6,960
606.0016.0000	Transition Rail	EA	EA	---	4	4
611.0002.0002	Riprap, Class II	CY	CY	960	---	960
631.0002.0001	Geotextile, Erosion Control, Class 1	SY	SY	1000	---	1000

Item numbers are for reference only. Quantities shown are not necessarily the pay quantities nor the total quantity of the particular item.

BRIDGE DRAWING INDEX

TITLE	DWG. NO.
GENERAL LAYOUT	1
SITE PLAN	2
RIPRAP LAYOUT	3
RIPRAP DETAILS	4
ABUTMENT 1	5
ABUTMENT 2	6
ABUTMENT DETAILS	7
WINGWALLS	8
FRAMING PLAN AND TYPICAL SECTION	9
GIRDERS	10
GIRDER DETAILS	11
APPROACH SLABS	12
STEEL BRIDGE RAILING	13
TEST BORING LOGS AND LOCATIONS	14-21

① *Approximate location of Bridge Number Plate.*

DESIGNED BY: Elmer E Marx	CHECKED: Andrew Wells	LAYOUT BY: Elmer E Marx	CHECKED BY: Andrew Wells
DRAWN BY: Sam Sollie	CHECKED: Elmer E Marx	SPECIFICATIONS BY: Elmer E Marx	P S & E COMPARED: Andrew Wells
QUANTITIES BY: Elmer E Marx	CHECKED: Andrew Wells	APPROVAL RECOMMENDED BY:	Rich Pratt

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA 19TH — Elmer E. Marx III No. CE 9490 — 1-19-19 — REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

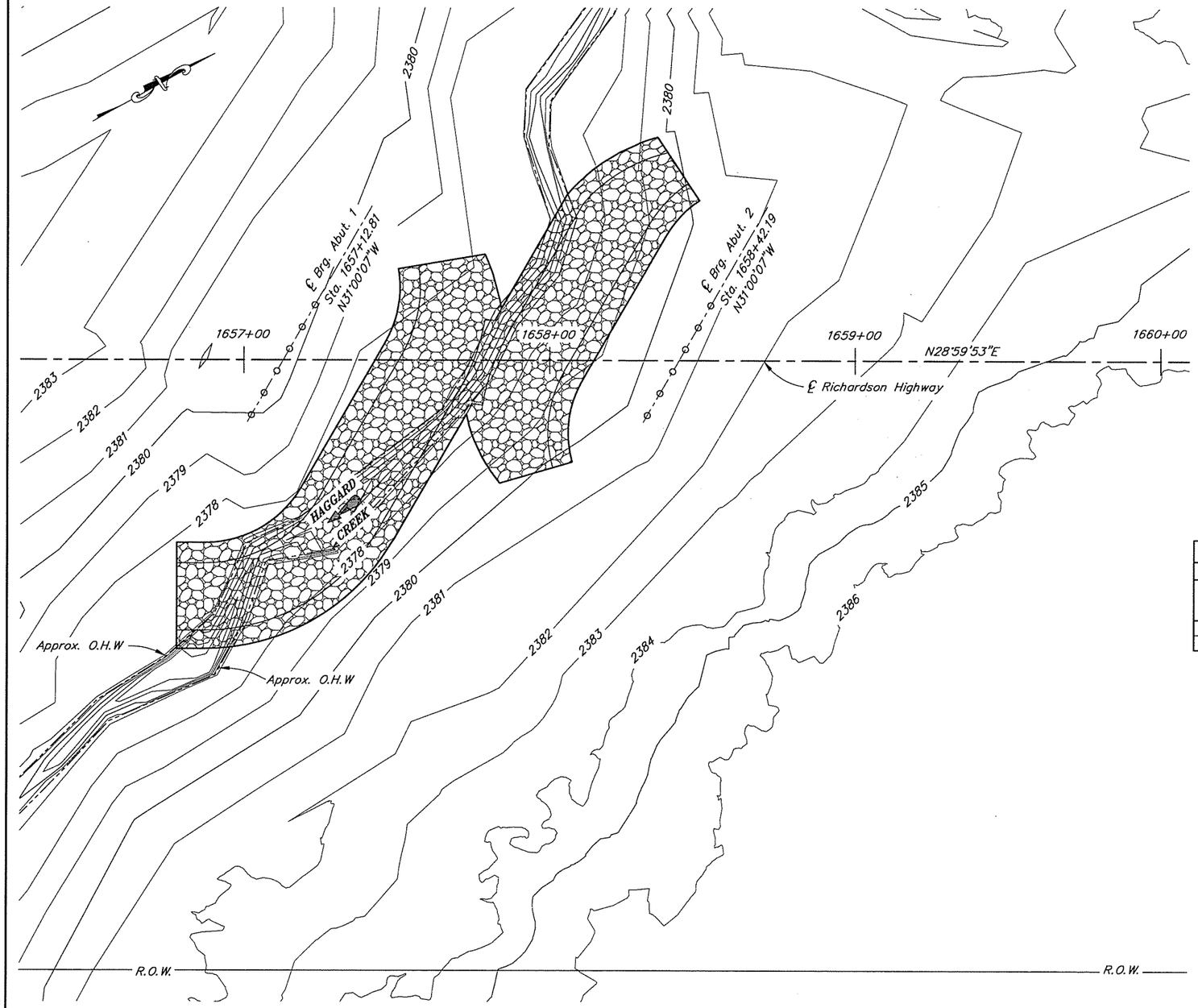
GENERAL LAYOUT

BRIDGE NO. 576

DWG. NO. 1

R:\cad\576\576-GEN Tue, Feb/19/19 03:00pm

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N2	N21



SITE PLAN

10 0 20 40
Feet

GENERAL NOTES

DESIGN: ..... AASHTO LRFD Bridge Design Specifications, 2017 Edition, with latest interim specifications.

Seismic design per AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2011 with latest interim revisions.

LIVE LOAD: HL-93

DEAD LOAD: ..... Includes 50 psf for all wearing surfaces.

SEISMIC PARAMETERS: ..... PGA = 0.20
Ss = 0.45
S1 = 0.22
Site Class = D
Liquefaction Potential = High
AASHTO 7% probability of exceedance in 75 years.

REINFORCEMENT: ..... ASTM A706, Grade 60, Fy = 60,000 psi
ASTM A970 Headed bars, Class HA.
Space reinforcement evenly unless otherwise noted.

PRESTRESSED CONCRETE: ..... See "GIRDERS" Dwg.

CONCRETE: ..... Class A Concrete unless otherwise noted, f'c = 4000 psi

STRUCTURAL STEEL: ..... ASTM A709, Grade 36T3, Fy = 36,000 psi
Galvonize structural steel in accordance with AASHTO M111 unless noted otherwise.

STRUCTURAL STEEL PILING: ..... API 5L X52 PSL2, Fy = 52,000 psi. or
ASTM A709 GR50T3, Fy = 50,000 psi.
Open Ended Pile Tip reinforcing is required.

PILE DATA TABLE

		DRIVING CRITERIA			DESIGN DATA		
LOCATION	PILE TYPE	MINIMUM PENETRATION (ft)	ESTIMATED PILE TIP ELEVATION (ft)	DRIVING RESISTANCE (K)	STRENGTH I FACTORED LOAD (K)	NOMINAL RESISTANCE (K)	RESISTANCE FACTOR, ϕ
Abutment 1	2'-0"x1/2 Pipe	76	2307	610	395	610	0.65
Abutment 2	2'-0"x1/2 Pipe	100	2282	610	395	610	0.65

Prebore 1.5 foot maximum diameter to minimum penetration depth.

ABBREVIATIONS:

℄	= centerline	f.f.	= front/air face
℗	= plate	f'c	= specified concrete compressive strength
&	= and	Fy	= yield stress
@	= at	Galv.	= galvanize
ø	= diameter	Hwy.	= highway
±	= approximate	Jt.	= joint
AASHTO	= American Association of State Highway and Transportation Officials	ksf	= 1000 pounds per square foot
		LB	= pound
ASTM	= American Society for Testing and Materials	LF	= linear foot
		LS	= lump sum
Abut.	= abutment	Lt.	= left
Approx.	= approximate	max.	= maximum
b.f.	= back/dirt face	min.	= minimum
bot.	= bottom	n.f.	= near face
Br.	= bridge	No.	= number
btwn.	= between	o.c.	= on center
Brg.	= bearings	O.H.W.	= ordinary high water
c.g.	= center of gravity	pcf	= pounds per cubic foot
C.I.P.	= cast in place	psf	= pounds per square foot
CJP	= complete joint penetration	psi	= pounds per square inch
Clr.	= clear, clearance	R.O.W.	= right of way
CY	= cubic yard	Rt.	= right
D.H.W.	= design high water	Rd.	= road
dia.	= diameter	spc.	= space, spaces
Dwg.	= drawing	Sta.	= station
E	= expansion	SF	= square feet
(E)	= existing	Symm.	= symmetric
EA	= each	Typ.	= typical
Elev.	= elevation	UT	= ultrasonic testing
e.f.	= each face	V.P.C.	= point of vertical curve
e.w.	= each way	V.P.I.	= point of vertical intersection
F	= fixed	V.P.T.	= point of vertical tangent
		w/	= with

DESIGNED BY: Elmer E Marx	CHECKED: Andrew Wells	FOUNDATIONS REVIEWED BY: Dave Hemstreet
DRAWN BY: Sam Sollie	CHECKED: Elmer E Marx	
QUANTITIES BY: Elmer E Marx	CHECKED: Andrew Wells	

STATE OF ALASKA
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STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
2.19.19
REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

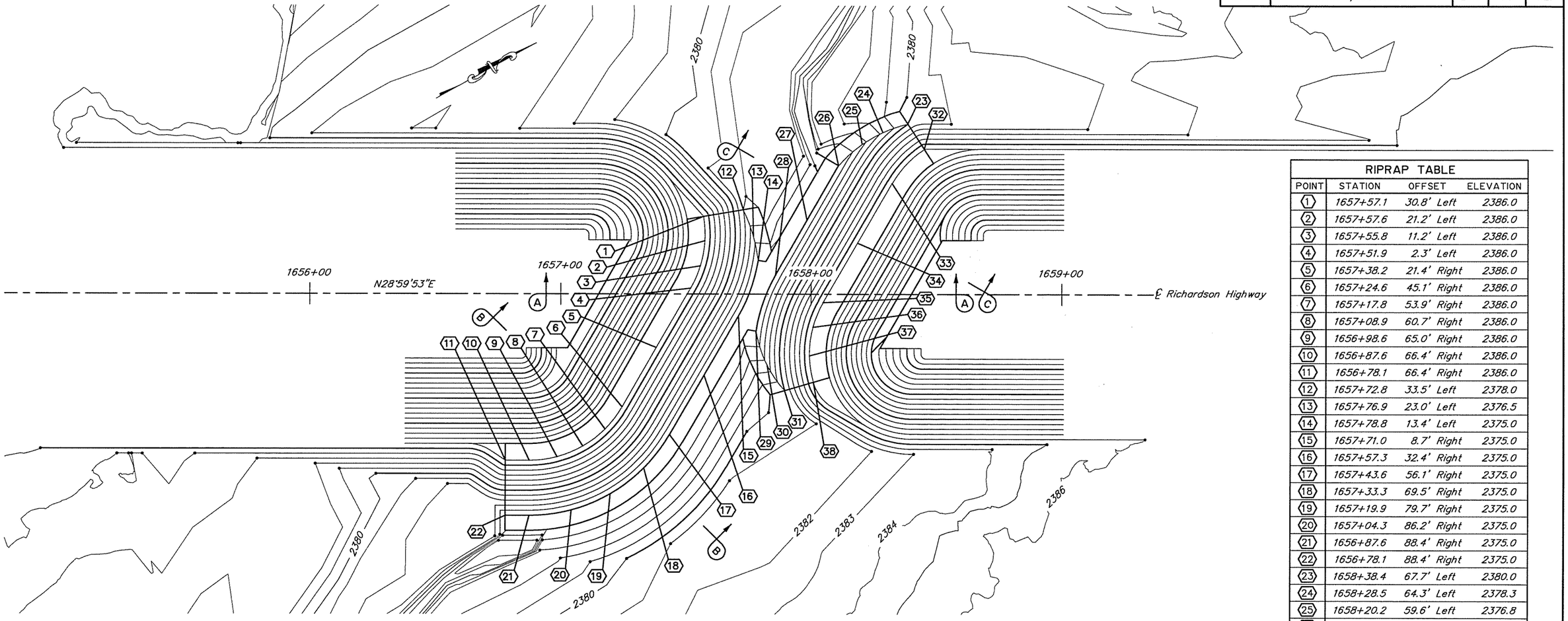
SITE PLAN

BRIDGE NO. 576

DWG. NO. 2

R:\cad\576\576-SITE PLAN Tue, Feb/19/19 09:22am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N3	N21



RIPRAP LAYOUT

RIPRAP TABLE

POINT	STATION	OFFSET	ELEVATION
1	1657+57.1	30.8' Left	2386.0
2	1657+57.6	21.2' Left	2386.0
3	1657+55.8	11.2' Left	2386.0
4	1657+51.9	2.3' Left	2386.0
5	1657+38.2	21.4' Right	2386.0
6	1657+24.6	45.1' Right	2386.0
7	1657+17.8	53.9' Right	2386.0
8	1657+08.9	60.7' Right	2386.0
9	1656+98.6	65.0' Right	2386.0
10	1656+87.6	66.4' Right	2386.0
11	1656+78.1	66.4' Right	2386.0
12	1657+72.8	33.5' Left	2378.0
13	1657+76.9	23.0' Left	2376.5
14	1657+78.8	13.4' Left	2375.0
15	1657+71.0	8.7' Right	2375.0
16	1657+57.3	32.4' Right	2375.0
17	1657+43.6	56.1' Right	2375.0
18	1657+33.3	69.5' Right	2375.0
19	1657+19.9	79.7' Right	2375.0
20	1657+04.3	86.2' Right	2375.0
21	1656+87.6	88.4' Right	2375.0
22	1656+78.1	88.4' Right	2375.0
23	1658+38.4	67.7' Left	2380.0
24	1658+28.5	64.3' Left	2378.3
25	1658+20.2	59.6' Left	2376.8
26	1658+10.8	51.1' Left	2375.0
27	1657+98.3	29.4' Left	2375.0
28	1657+85.7	7.6' Left	2375.0
29	1657+78.0	14.7' Right	2375.0
30	1657+82.4	28.4' Right	2377.5
31	1657+89.5	38.4' Right	2380.0
32	1658+45.0	57.7' Left	2386.0
33	1658+32.2	44.1' Left	2386.0
34	1658+18.5	20.4' Left	2386.0
35	1658+04.8	3.3' Right	2386.0
36	1658+00.7	13.2' Right	2386.0
37	1657+99.4	24.6' Right	2386.0
38	1658+01.0	35.1' Right	2386.0

HYDRAULIC & HYDROLOGIC SUMMARY, BRIDGE NO. 576

Flood Frequency (Yr.)	50	100	500
Exceedance Probability (%)	2	1	0.2
Discharge (cfs)	1550	1780	2340
Water Surface Elevation (ft)	2384.3	2384.9	2386.1
Anticipated Add'l Backwater (ft)	0	0	0
Contraction Scour (ft)	0	0	0
Abutment Scour (ft)	n.c.		
Long-Term Degradation (ft)	3		

Drainage Area: 16.5 square miles
The hydraulic capacity is >> Q500. Water surface elevations above are based on an ice-free channel condition.

NOTES:

1. Riprap toes merge between points 14, 15, 28, & 29.
2. See roadway plans for embankment catch limits beyond the bridge ends.

DESIGNED BY: Michael Knapp	CHECKED:
DRAWN BY: Sam Sollie	CHECKED: Michael Knapp
QUANTITIES BY: Michael Knapp	CHECKED:

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
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STATE OF ALASKA 49TH
Michael W. Knapp
No. CE 11079
REGISTERED PROFESSIONAL ENGINEER
2-19-19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

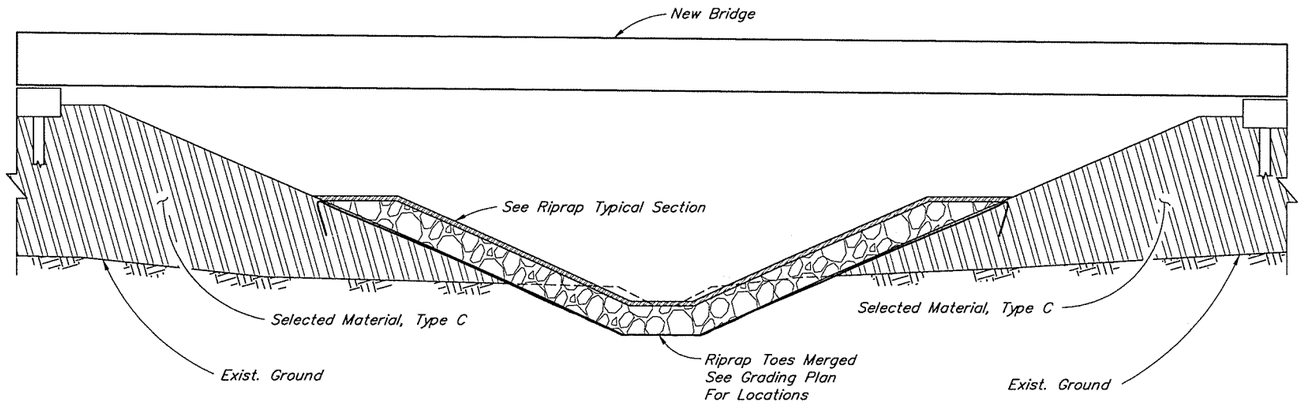
RIPRAP LAYOUT

BRIDGE NO. 576

DWG. NO. 3

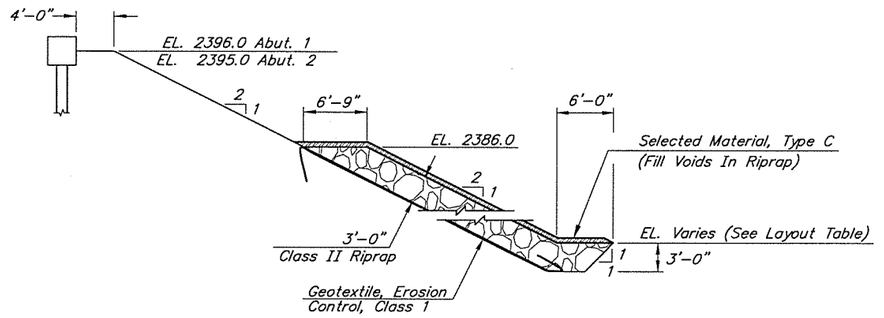
R:\cad\576\576-RIPRAP Tue, Feb/19/19 09:22am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N4	N21



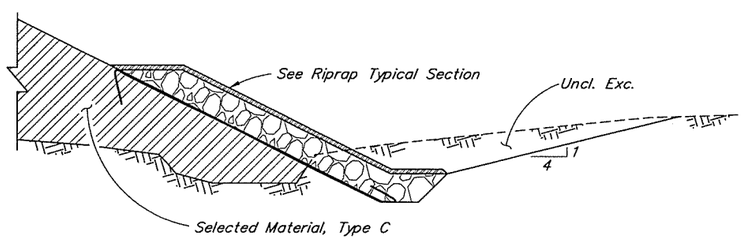
RIPRAP SECTION A-A

No Scale



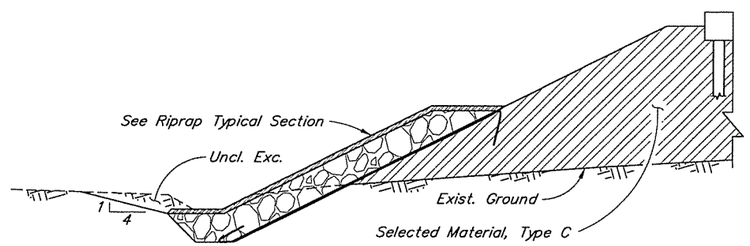
RIPRAP TYPICAL SECTION

No Scale



RIPRAP SECTION B-B

No Scale



RIPRAP SECTION C-C

No Scale

DESIGNED BY: Michael Knapp	CHECKED:
DRAWN BY: Sam Sollie	CHECKED: Michael Knapp
QUANTITIES BY: Michael Knapp	CHECKED:

STATE OF ALASKA
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STATE OF ALASKA 49 TH
Michael W. Knapp
No. CE 11079
REGISTERED PROFESSIONAL ENGINEER
2-19-19

HAGGARD CREEK BRIDGE

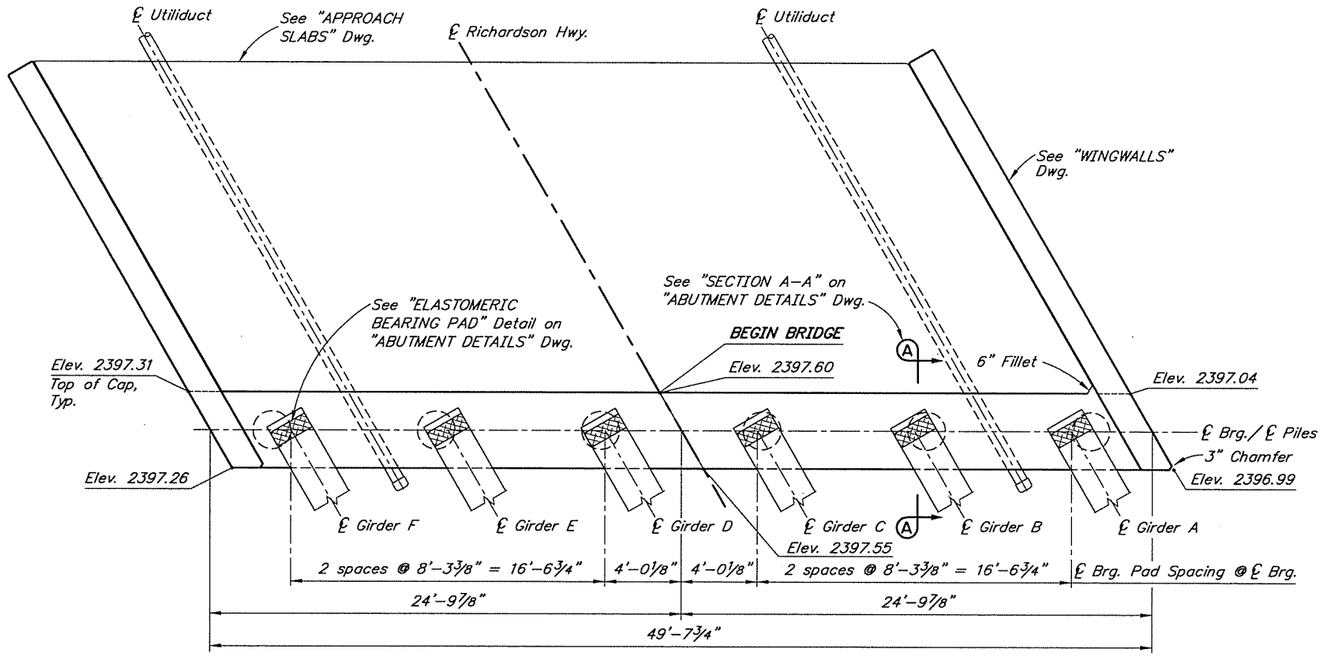
RICHARDSON HIGHWAY

RIPRAP DETAILS

BRIDGE NO. 576
DWG. NO. 4

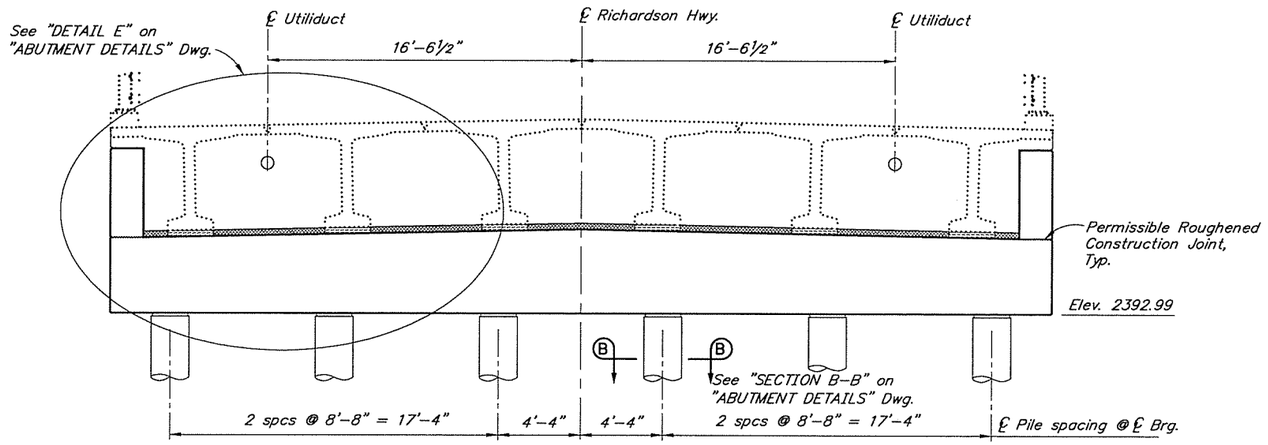
R:\cad\576\576-RIPRAP (2) Tue, Feb/19/19 02:55pm

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N5	N21



PLAN

12 0 4 8
In. Feet



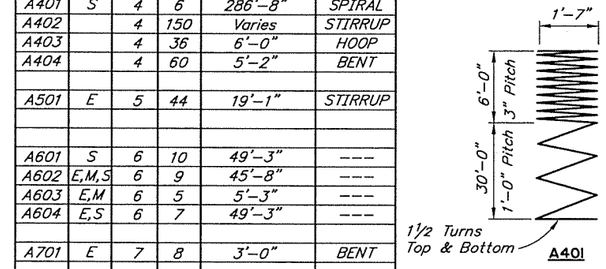
ELEVATION

(Looking back on station)

12 0 4 8
In. Feet

REINFORCING STEEL - ABUTMENT 1

MARK	NOTE	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
A401	S	4	6	286'–8"	SPIRAL	
A402		4	150	Varies	STIRRUP	
A403		4	36	6'–0"	HOOP	
A404		4	60	5'–2"	BENT	
A501	E	5	44	19'–1"	STIRRUP	
A601	S	6	10	49'–3"	---	
A602	E,M,S	6	9	45'–8"	---	
A603	E,M	6	5	5'–3"	---	
A604	E,S	6	7	49'–3"	---	
A701	E	7	8	3'–0"	BENT	
A801		8	48	40'–0"	---	
A1001	H,M,S	10	14	49'–3"	HEADED	



E – Epoxy–Coated
H – Headed reinforcing steel
M – Field adjust to match cross slope
S – Splices not Included

R:\cad\576\576-1-ABUTMENT 1 Tue, Feb/19/19 09:23am

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
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STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
Feb. 19, 19
REGISTERED PROFESSIONAL ENGINEER

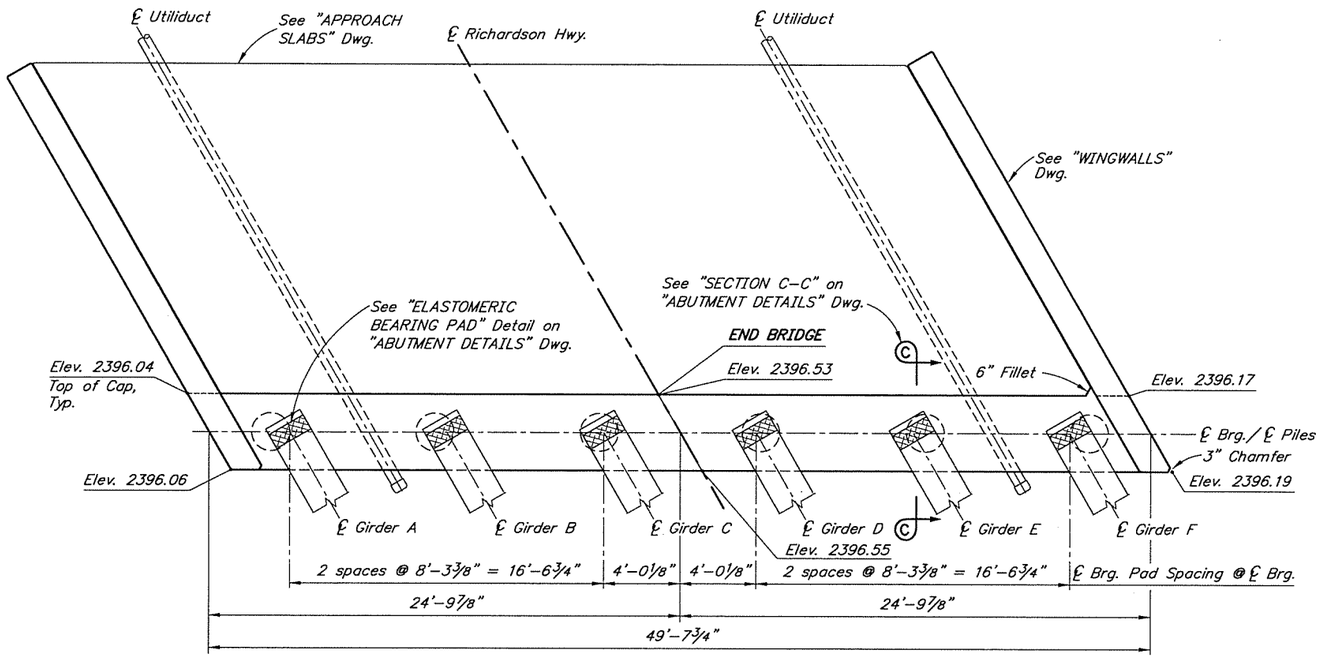
HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

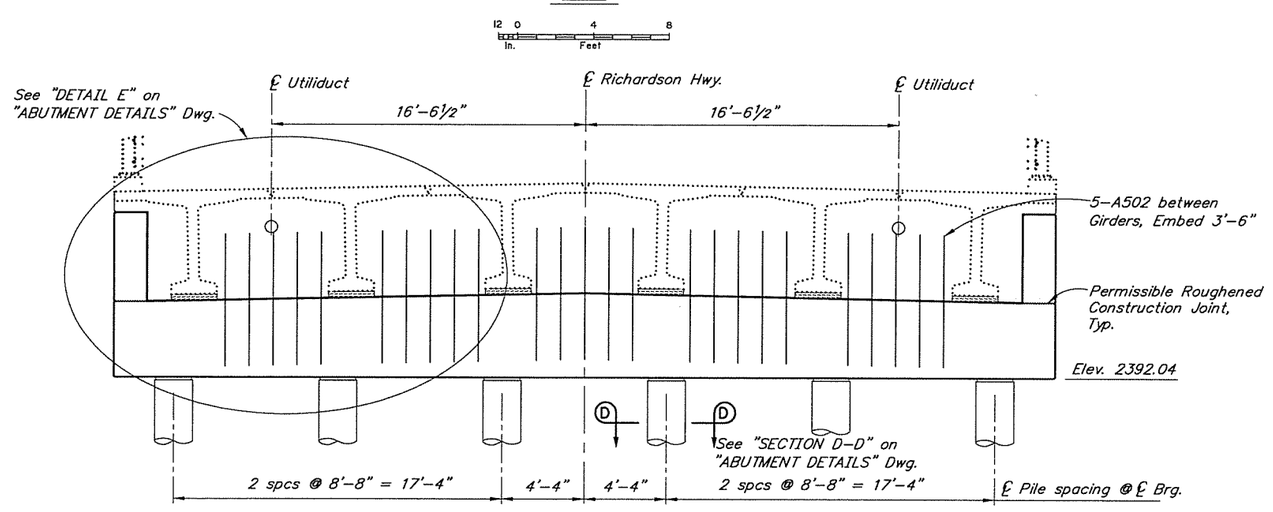
ABUTMENT 1

BRIDGE NO. 576
DWG. NO. 5

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N6	N21



PLAN

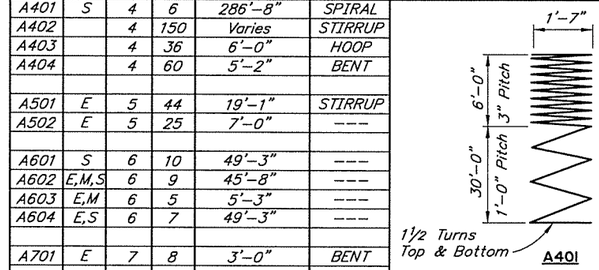


ELEVATION

(Looking ahead on station)

REINFORCING STEEL - ABUTMENT 2

MARK	NOTE	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
A401	S	4	6	286'–8"	SPIRAL	
A402		4	150	Varies	STIRRUP	
A403		4	36	6'–0"	HOOP	
A404		4	60	5'–2"	BENT	
A501	E	5	44	19'–1"	STIRRUP	
A502	E	5	25	7'–0"	---	
A601	S	6	10	49'–3"	---	
A602	E,M,S	6	9	45'–8"	---	
A603	E,M	6	5	5'–3"	---	
A604	E,S	6	7	49'–3"	---	
A701	E	7	8	3'–0"	BENT	
A801		8	48	40'–0"	---	
A1001	H,M,S	10	14	49'–3"	HEADED	



E – Epoxy–Coated
H – Headed reinforcing steel
M – Field adjust to match cross slope
S – Splices not Included

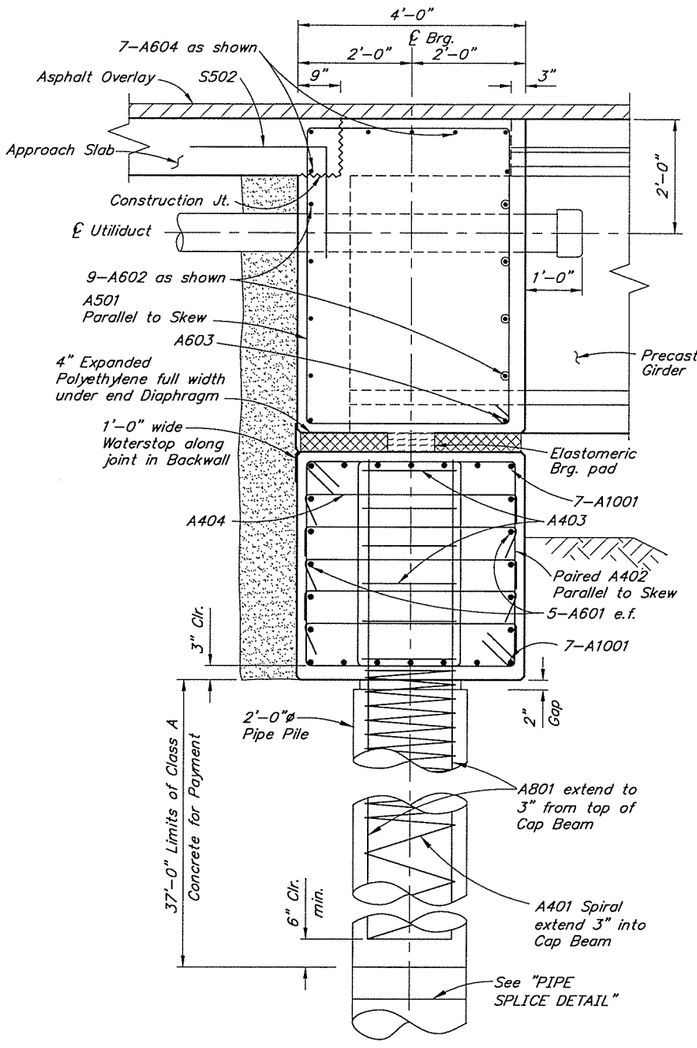
DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES BRIDGE SECTION 3132 Channel Drive Juneau, Alaska 99801 907–465–2975	HAGGARD CREEK BRIDGE RICHARDSON HIGHWAY ABUTMENT 2
DRAWN BY: Som Sollie	CHECKED: Elmer Marx		
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells		

STATE OF ALASKA 49TH — Elmer E. Marx III No. CE 9490 — 2.19.19 — REGISTERED PROFESSIONAL ENGINEER

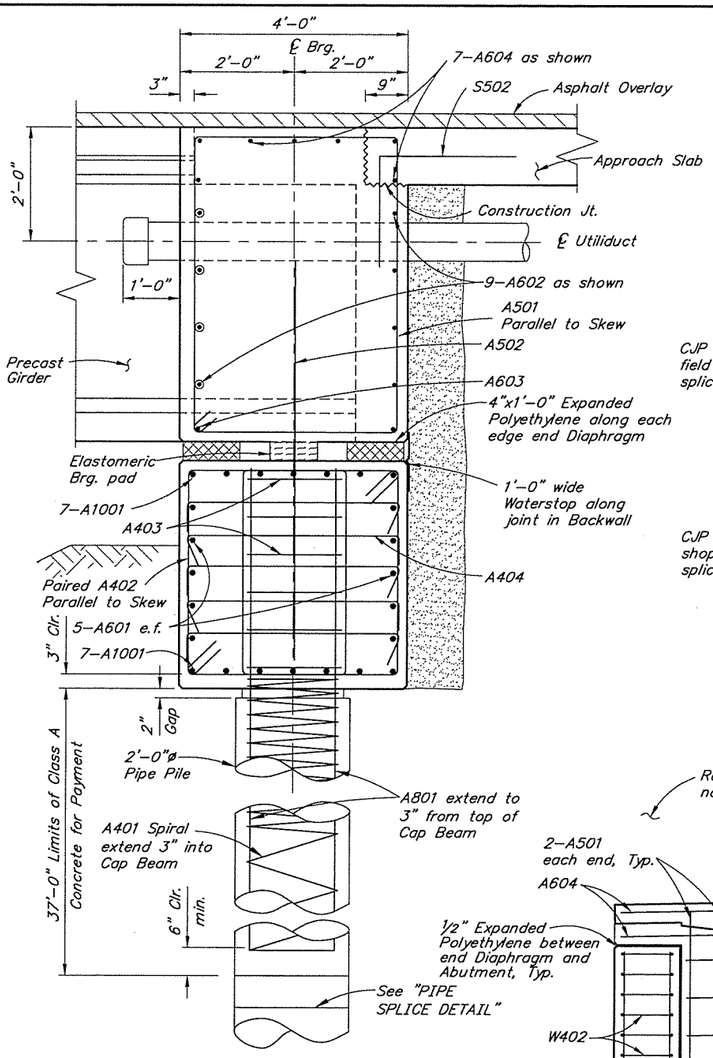
BRIDGE NO. 576
DWG. NO. 6

R:\cad\576\576-1-ABUTMENT 2 Tue, Feb/19/19 09:23am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N7	N21



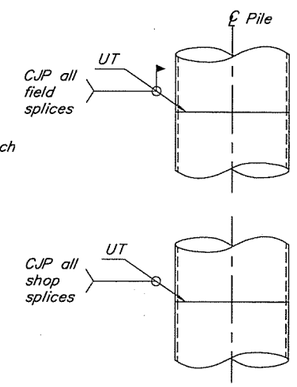
SECTION A-A



SECTION C-C

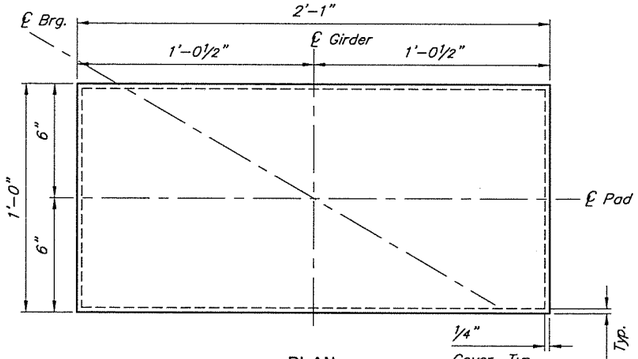
SECTION B-B

SECTION D-D

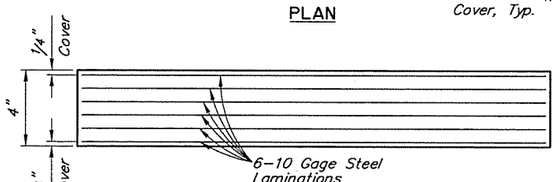


PIPE SPLICE DETAIL

No Scale



PLAN

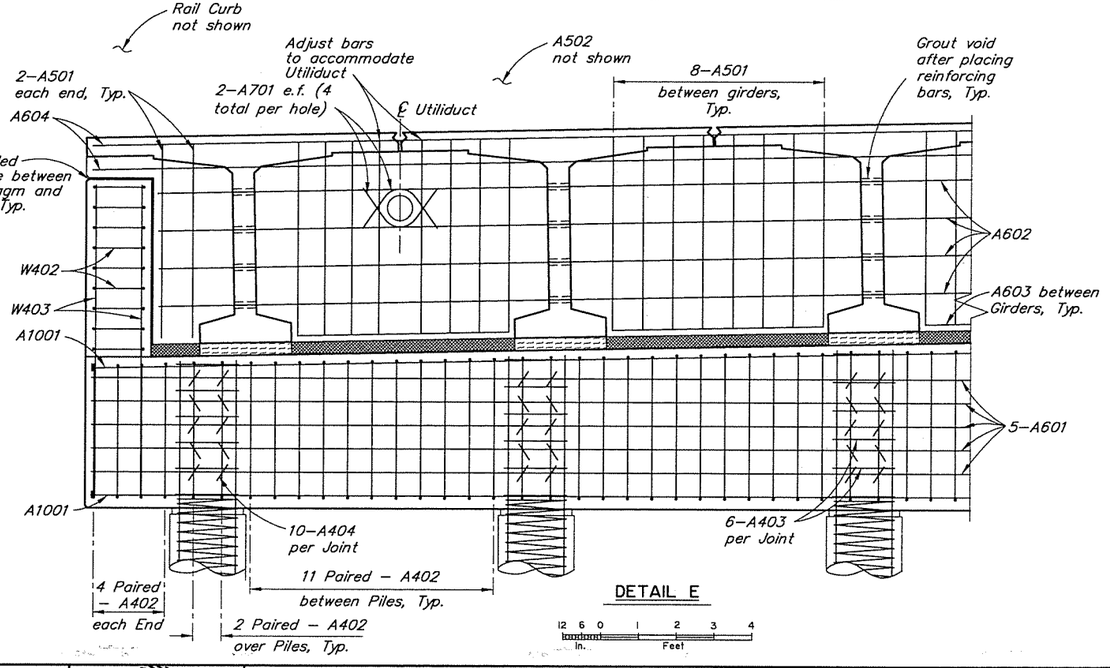


ELEVATION

ELASTOMERIC BEARING PAD

Grade 5
Dead Load = 124 k
Live Load = 102 k
Shear Modulus = 115 psi

6 3 0 1
In. Feet



DETAIL E

12 6 0 1 2 3 4
In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA
49TH
Elmer E. Marx III
No. CE 9490
10-9-19
REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

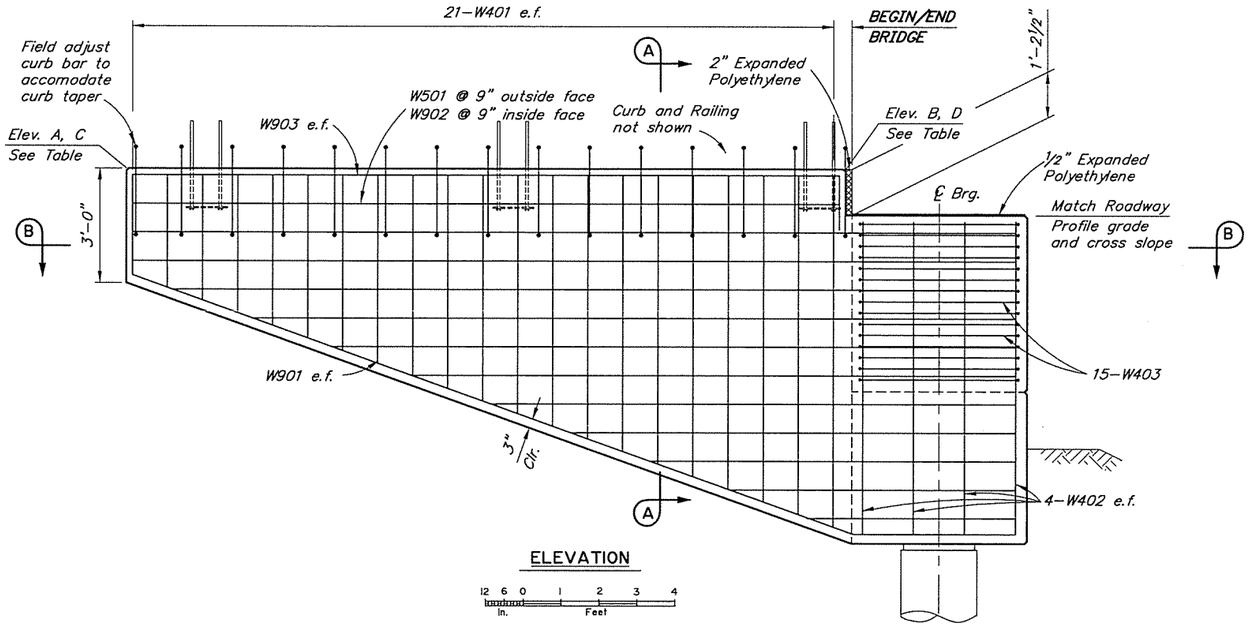
RICHARDSON HIGHWAY

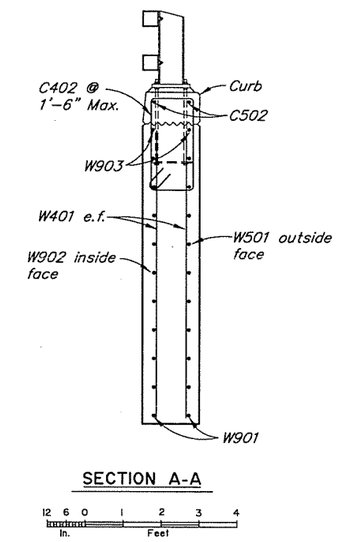
ABUTMENT DETAILS

BRIDGE NO. 576
DWG. NO. 7

R:\cad\576\576-1-ABUTMENT DETAILS Tue, Feb/19/19 09:23am

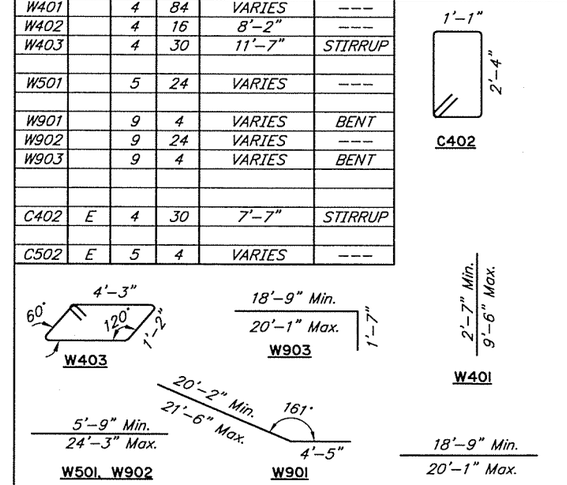
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N8	N21





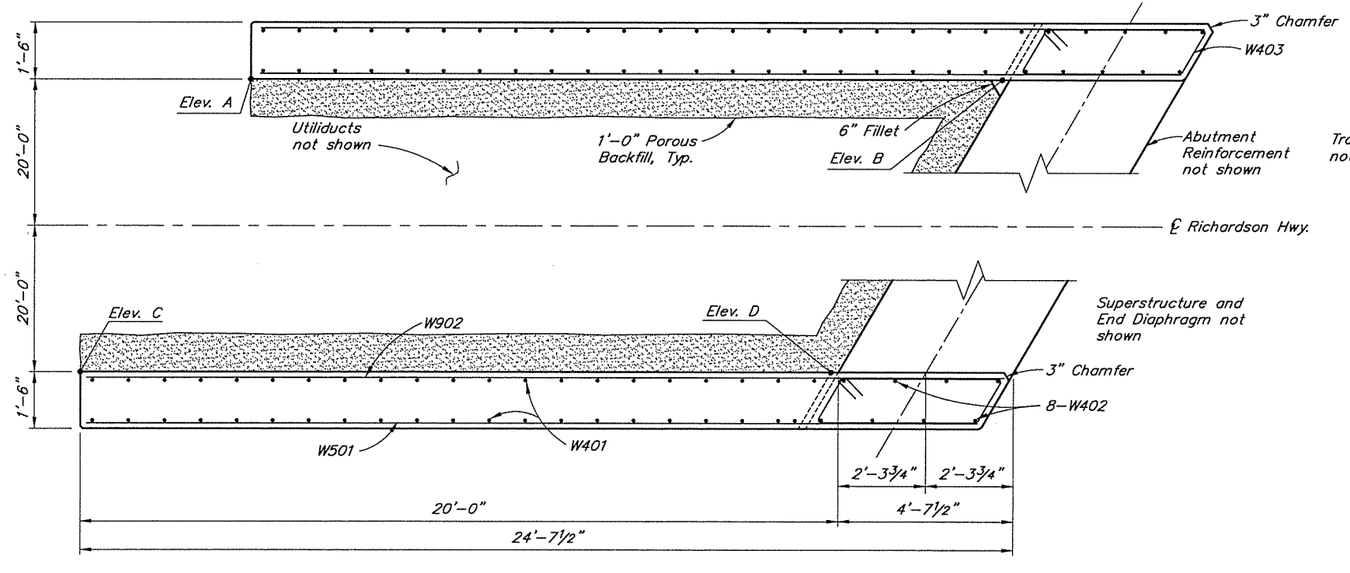
REINFORCING STEEL - ONE ABUTMENT

MARK	NOTE	SIZE	NO.	LENGTH	TYPE
W401		4	84	VARIES	---
W402		4	16	8'–2"	---
W403		4	30	11'–7"	STIRRUP
W501		5	24	VARIES	---
W901		9	4	VARIES	BENT
W902		9	24	VARIES	---
W903		9	4	VARIES	BENT
C402	E	4	30	7'–7"	STIRRUP
C502	E	5	4	VARIES	---



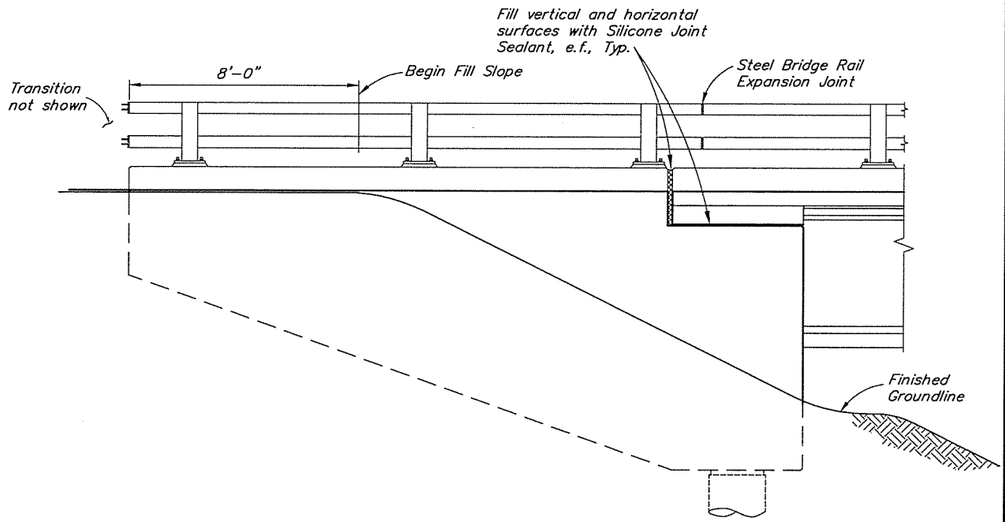
E – Epoxy-Coated

TOP OF WINGWALL ELEVATION TABLE (FT)				
LOCATION	A UPSTREAM	B UPSTREAM	C DOWNSTREAM	D DOWNSTREAM
ABUTMENT 1	2403.13	2402.91	2403.40	2403.16
ABUTMENT 2	2401.82	2401.91	2401.92	2402.02



SECTION B-B

12 6 0 1 2 3 4
In. Feet



FINISHED ELEVATION

12 0 1 2 3 4
In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
REGISTERED PROFESSIONAL ENGINEER
2-19-19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

WINGWALLS

BRIDGE NO. 576
DWG. NO. 8

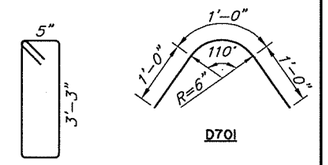
R:\cad\576\576-1-WINGWALLS Tue, Feb/19/19 09:23am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N9	N21

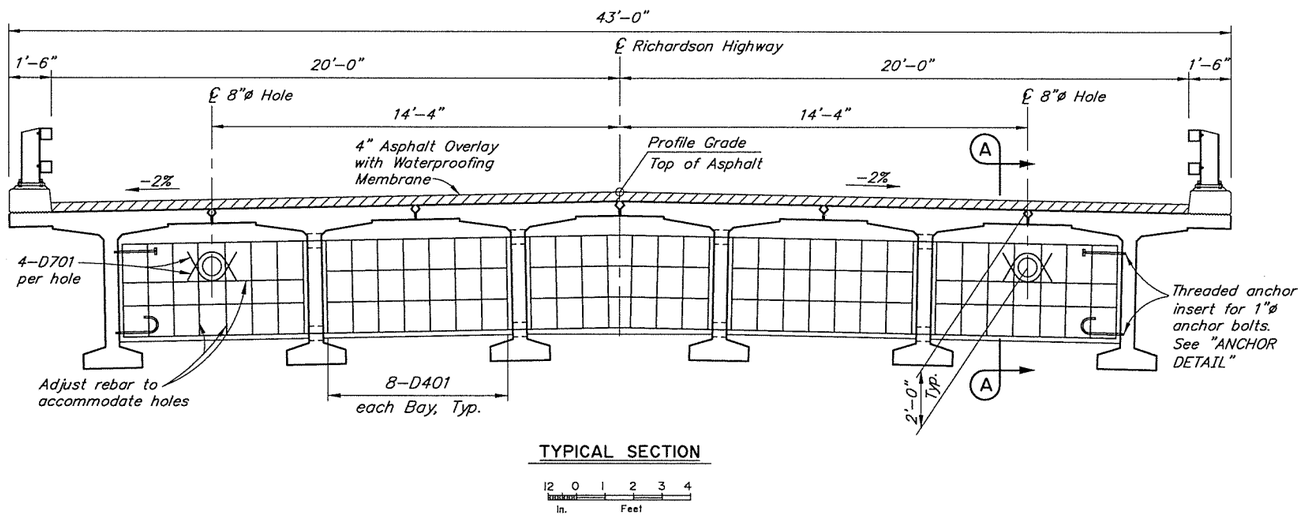
REINFORCING STEEL - ONE DIAPHRAGM

MARK	NOTE	SIZE	NO.	LENGTH	TYPE
D401	E	4	40	8'-1"	STIRRUP
D501	E	5	20	7'-2"	---
D601	E,M	6	4	40'-3"	---
D701	E	7	8	3'-0"	BENT

BENDING DIAGRAM

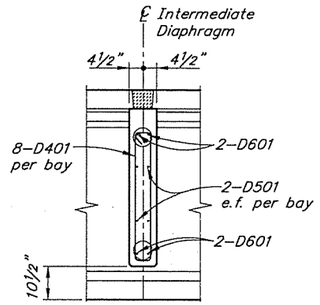


E – Epoxy-Coated
M – Field adjust to match crown



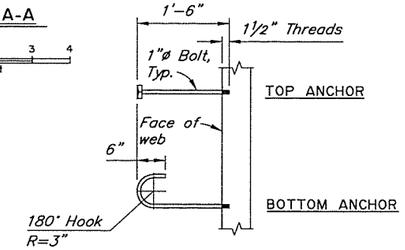
TYPICAL SECTION

12 0 1 2 3 4
In. Feet



SECTION A-A

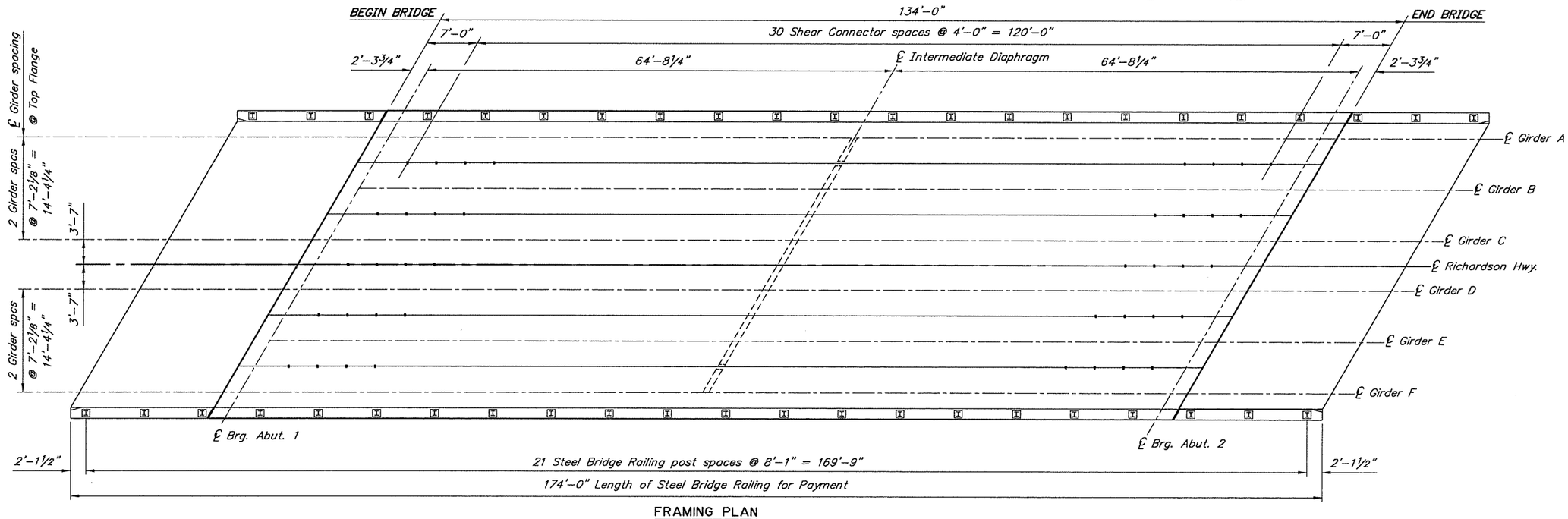
12 6 0 1 2 3 4
In. Feet



ASTM A307 GALVANIZED

ANCHOR DETAIL

12 6 0 1 2 3
In. Feet



FRAMING PLAN

12 0 4 8 12
In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
2-19-19
REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

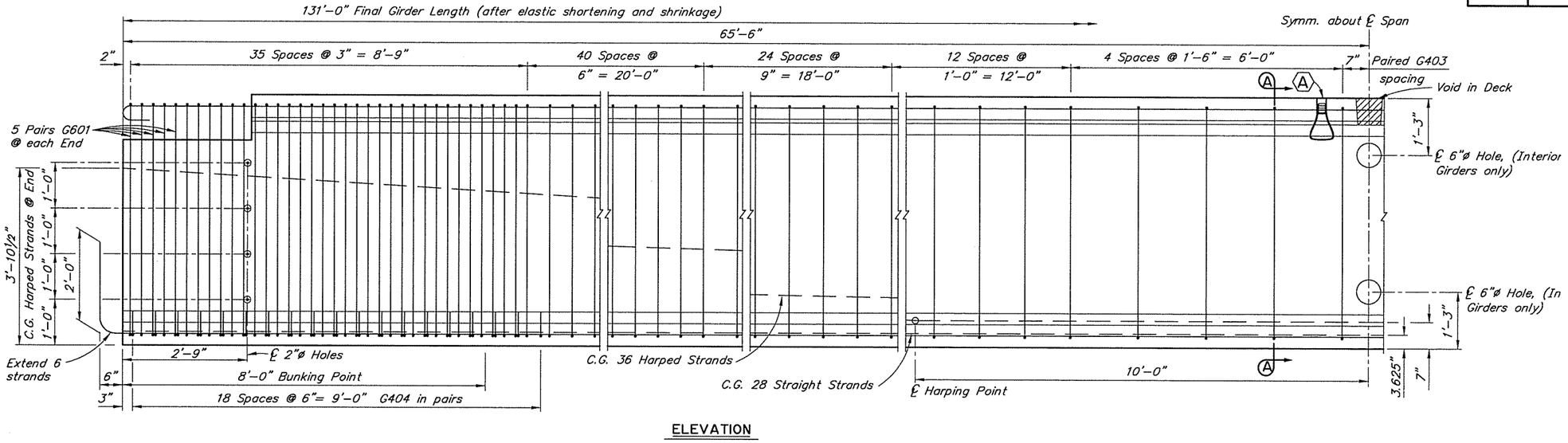
RICHARDSON HIGHWAY

FRAMING PLAN AND TYPICAL SECTION

BRIDGE NO. 576
DWG. NO. 9

R:\cad\576\576-1-TYPICAL SECTION Tue, Feb/19/19 09:23am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N10	N21

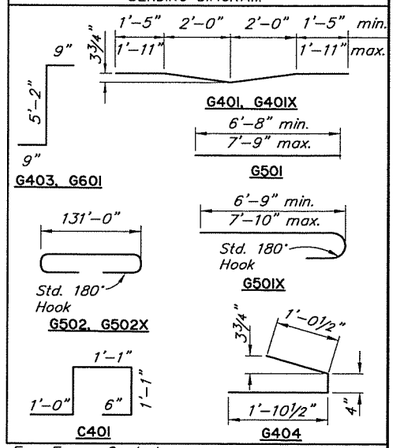


ELEVATION

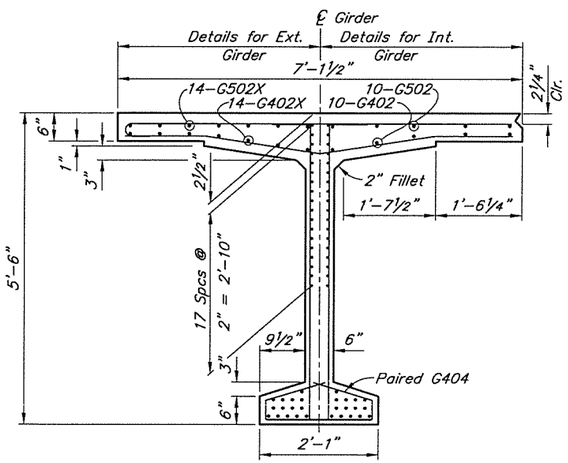
REINFORCING STEEL-ONE GIRDER

MARK	NOTE	SIZE	NO.	LENGTH	TYPE
G401	E	4	259	VARIES	BENT
G401X	E	4	311	VARIES	BENT
G402	E,S	4	10	125'-0"	----
G402X	E,S	4	14	125'-0"	----
G403	E	4	444	6'-8"	BENT
G404	E	4	76	3'-3"	BENT
G501	E	5	259	VARIES	----
G501X	E	5	311	VARIES	BENT
G502	E,S	5	10	132'-2"	BENT
G502X	E,S	5	14	132'-2"	BENT
G601	E	6	20	6'-8"	BENT
C401	E,L	4	98	4'-9"	BENT
C501	E,S	5	2	133'-8"	----

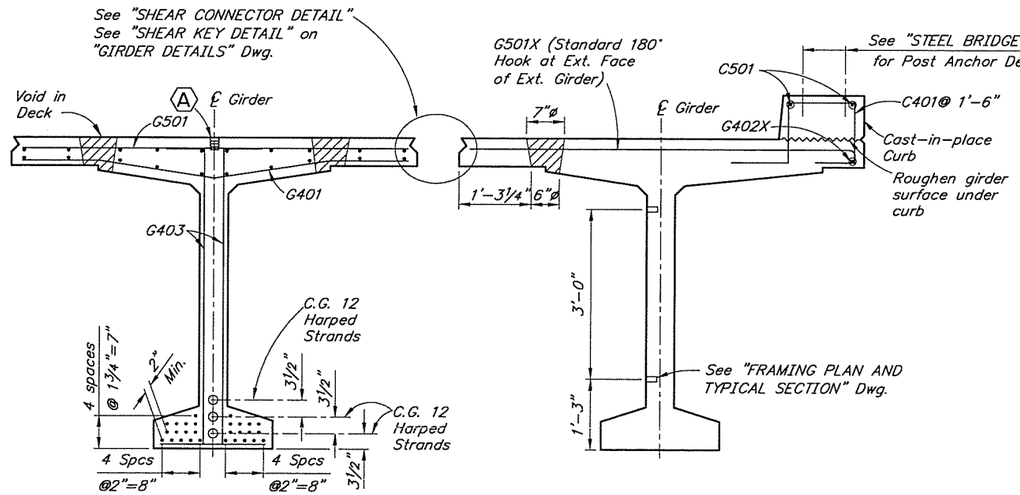
BENDING DIAGRAM



E – Epoxy-Coated
L – Ship 8 loose for diaphragms
S – Length does not include splices
X – Exterior Girders only



END VIEW



SECTION A-A

EXTERIOR MIDSPAN SECTION

GIRDER NOTES

Class P Concrete: at Stress Transfer.....f'ci = 6500 psi
at 28 Days.....f'c = 7500 psi

½"ø low-relaxation prestressing strands with an ultimate strength of 270 ksi and a cross sectional area of 0.153 in².

Steel stresses: Pretensioning – Jacking Stress 189 ksi
After initial losses 170 ksi
After all losses 140 ksi

One inch clear cover on reinforcing steel unless otherwise noted.

See "FRAMING PLAN AND TYPICAL SECTION" Dwg. for Shear Connector and Rail Post spacing.

Deflect forms to compensate for camber.

Galvanize structural steel embedded in girders except for shear connectors.

(A) 1"X1'-0" Coil Anchor Insert for vertical adjustment of girders. Recess 2". Prevent concrete from filling hole.

Omit Shear Key, Shear Key Connector and Deck Void in exterior face of exterior girders.

Cast ends of girders plumb with respect to roadway grade. Install web holes and web anchor inserts parallel to ℄ bearing.

Finish top flange with light broom.

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA – 49TH – Elmer E. Marx III – No. CE 9490 – 2-19-19 – REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

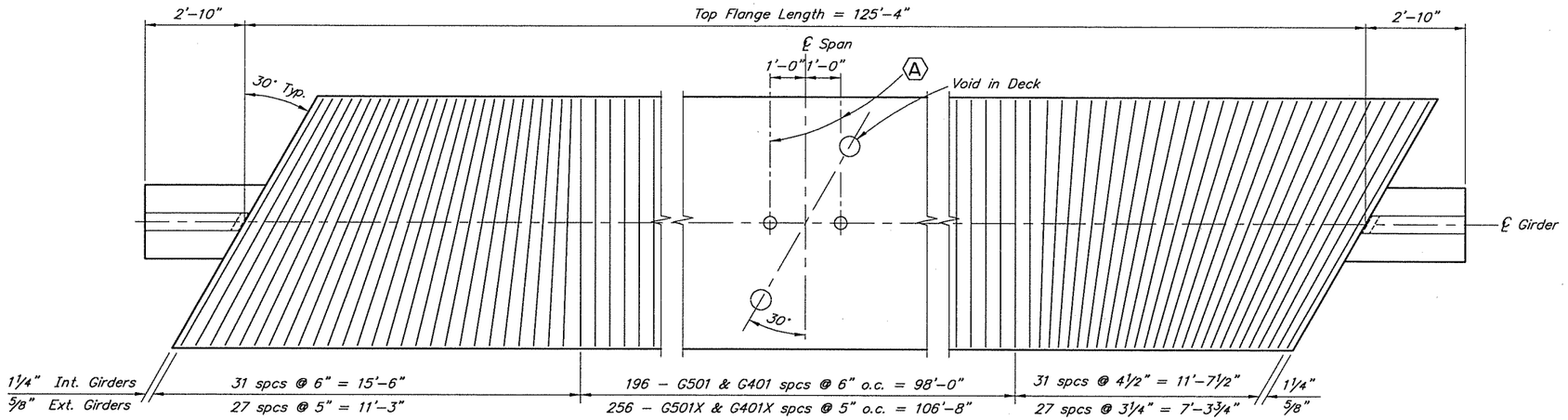
RICHARDSON HIGHWAY

GIRDERS

BRIDGE NO. 576
DWG. NO. 10

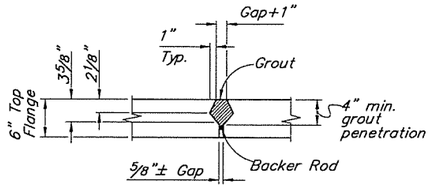
R:\cad\576\576-1-GIRDERS Tue, Feb/19/19 09:23am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N11	N21



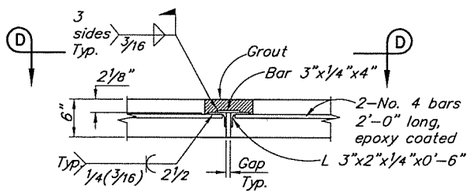
PLAN

12 6 0 1 2 3 4
In. Feet

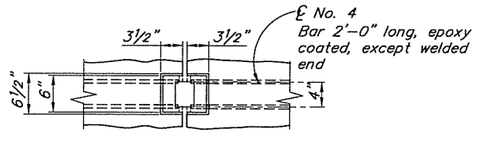


SHEAR KEY DETAIL

12 6 0 1 2
In. Feet



SHEAR CONNECTOR DETAIL



VIEW D-D

12 6 0 1 2
In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA
Elmer E. Marx III
No. CE 9490
2.19.19
REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

GIRDER DETAILS

BRIDGE NO. 576

DWG. NO. 11

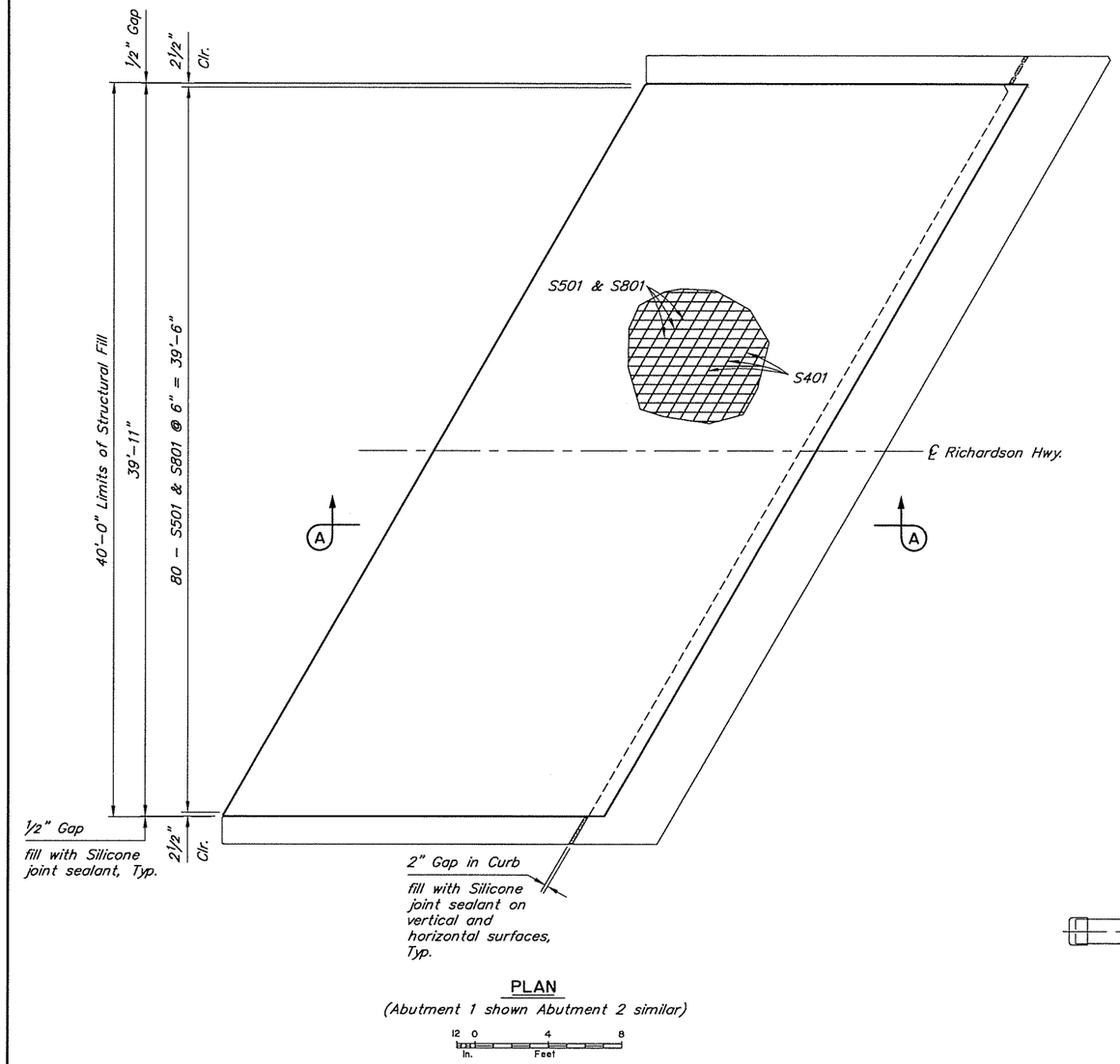
R:\cad\576\576-1-GIRDERS (2) Tue, Feb/19/19 09:23am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	N12	N21

REINFORCING STEEL - ONE APPROACH SLAB

MARK	NOTE	SIZE	NO.	LENGTH	TYPE	BENDING DIAGRAM
S401	E,M,S	4	62	45'-7"	---	
S501	E	5	80	20'-5"	---	
S502	E	5	40	5'-0"	BENT	2'-0", 3'-0", S502
S801	E	8	80	20'-5"	---	

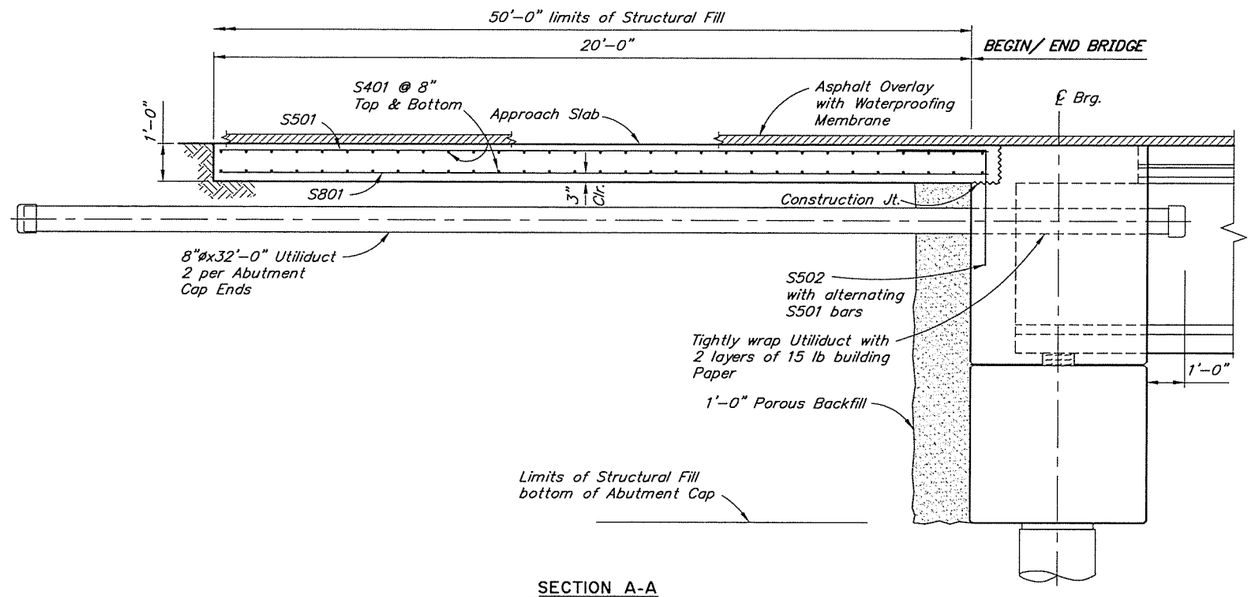
E – Epoxy-Coated
M – Field adjust to match crown
S – Length does not include splices



PLAN

(Abutment 1 shown Abutment 2 similar)

12 0 4 8
In. Feet



SECTION A-A

12 6 0 1 2 3 4
In. Feet

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx	
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells	

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
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STATE OF ALASKA 49TH
Elmer E. Marx III
No. CE 9490
REGISTERED PROFESSIONAL ENGINEER
2.19.19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

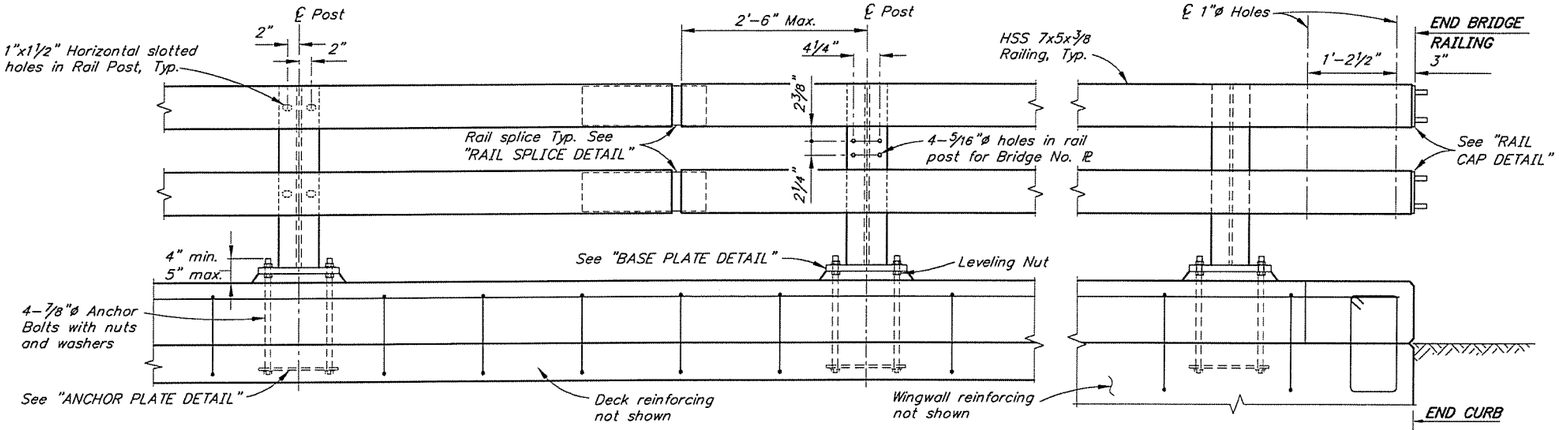
APPROACH SLABS

BRIDGE NO. 576
DWG. NO. 12

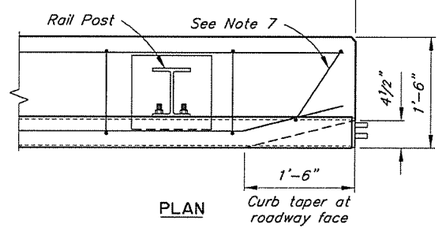
R:\cad\576\576-1-APPROACH SLAB Tue, Feb/19/19 09:23am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2020	N13A	N21

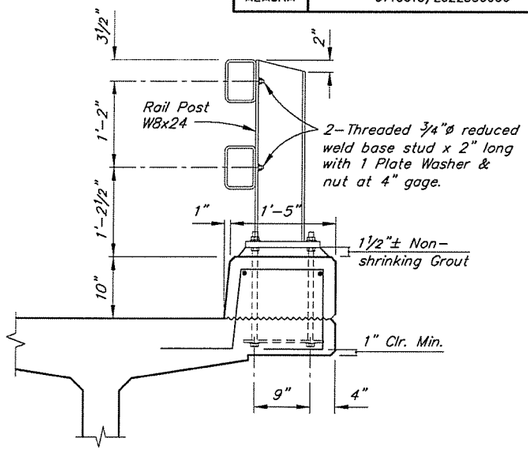
ADDENDUM NO. 1, ATTACHMENT NO.15



ELEVATION



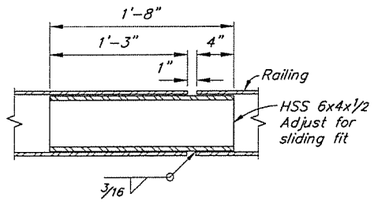
PLAN



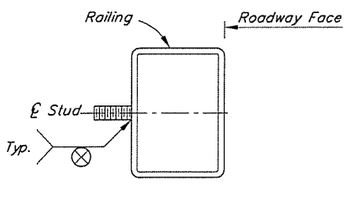
TYPICAL SECTION

TYPICAL POST ELEVATION

EXPANSION JOINT

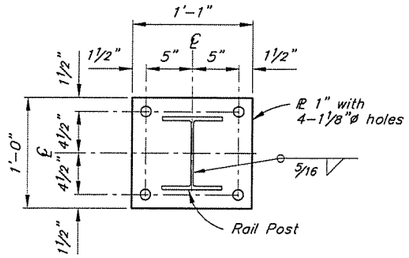


RAIL SPLICE DETAIL



RAILING STUD DETAIL

END POST DETAIL



BASE PLATE DETAIL

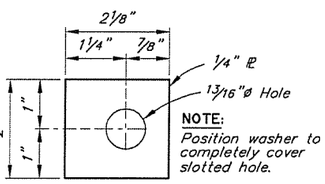
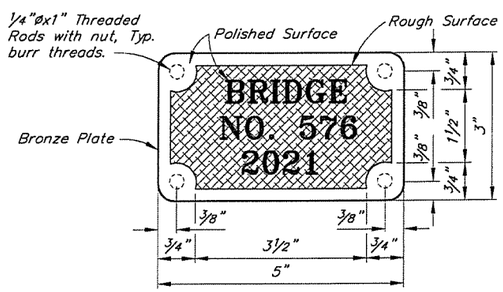


PLATE WASHER

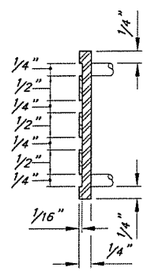
No Scale

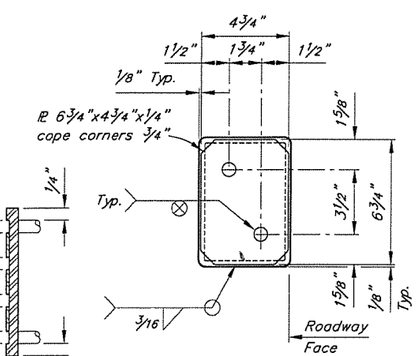
NOTE: Position washer to completely cover slotted hole.



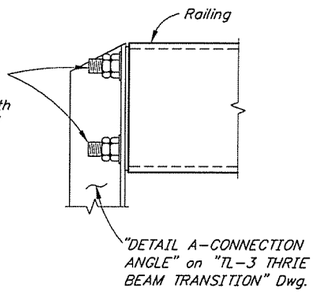
BRONZE BRIDGE NO. PLATE

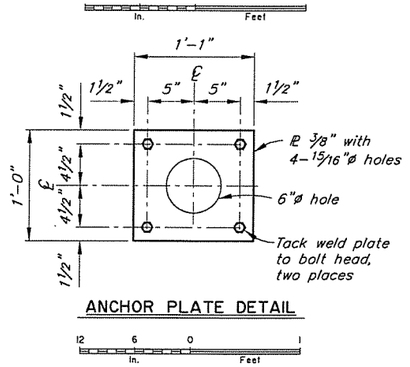
No Scale





RAIL CAP DETAIL





ANCHOR PLATE DETAIL

NOTES

1. Locate bridge number plates on right hand side of approaching traffic near each end as shown on General Layout Dwg. (2 total).
2. Furnish bridge number plates. Use "Century" type style lettering. Use studs and nuts that conform to UNS C65100 or C65500. Braze ¼"ø threaded rod to back of plate with nut – 4 required. Use tamper proof nuts.
3. Provide railing expansion joints at 50'-0" maximum intervals. Railing shall be continuous over 2 posts minimum. Railing expansion joints are required in rail panels that span bridge expansion joints.
4. Use grout with a minimum 24-hour f'c of 3000 psi in single placement.
5. See "FRAMING PLAN AND TYPICAL SECTION" Dwg. for rail post spacing.
6. Install bridge rail posts plumb.
7. Adjust reinforcing to accommodate curb taper.

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells	REVISIONS	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx		
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells		

No.	Date	By	Description
1	3-2-2020	EEM	New MASH TL-4 Railing

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA 49TH — Elmer E. Marx III No. CE 9490 — 7-2-20 — REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

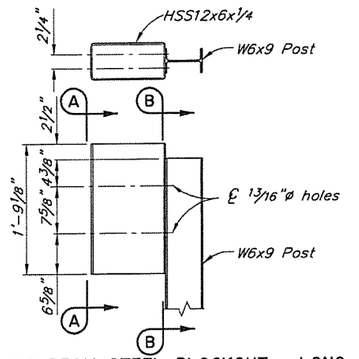
TL-4 STEEL BRIDGE RAILING

BRIDGE NO. 576
DWG. NO. 13A

R:\evault\576\cad\576 As Sent\576-1-MASH Mon, Mar/02/20 10:52am

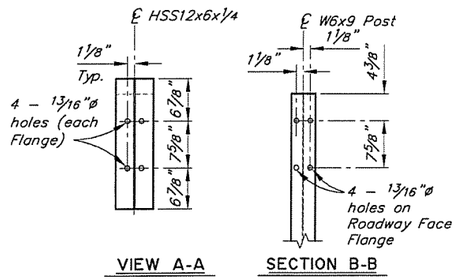
ADDENDUM NO. 1, ATTACHMENT NO.16

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2020	N13B	N21

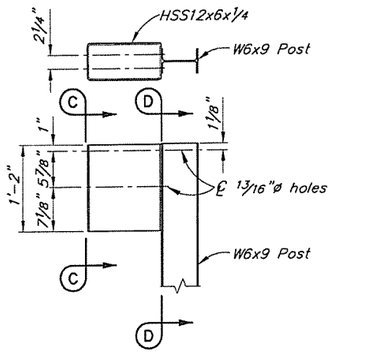


THRIE BEAM STEEL BLOCKOUT - LONG

See Note 4 for additional details

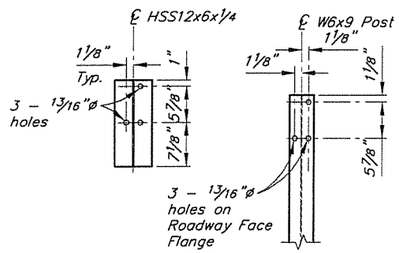


VIEW A-A SECTION B-B

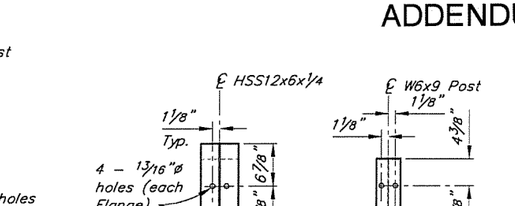


THRIE BEAM STEEL BLOCKOUT - SHORT

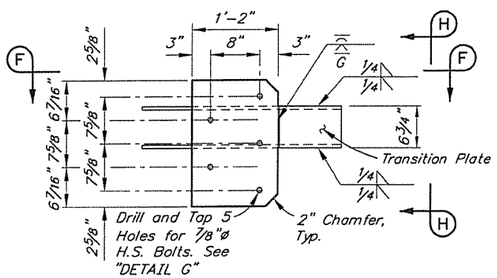
See Note 4 for additional details



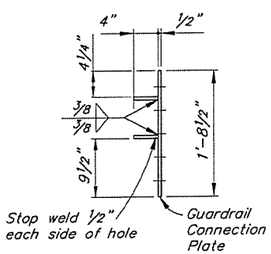
VIEW C-C SECTION D-D



VIEW F-F

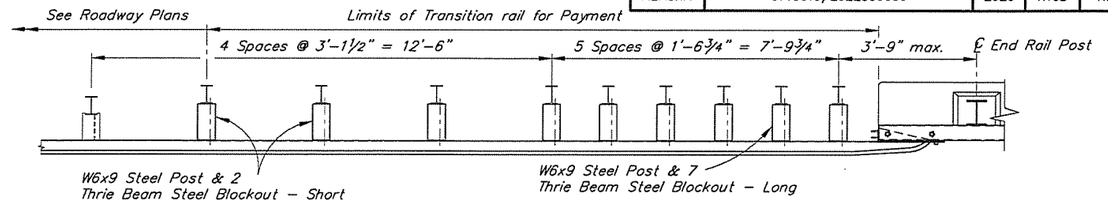


ELEVATION

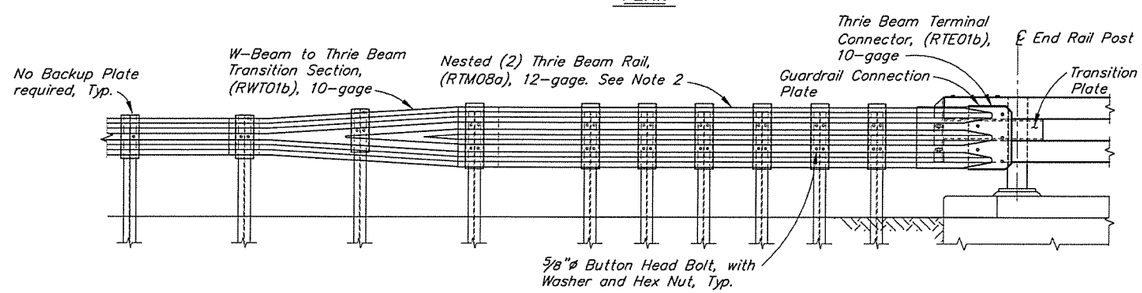


SECTION H-H

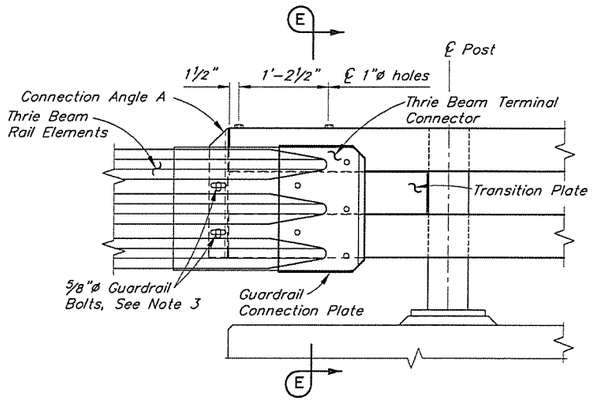
GUARDRAIL CONNECTION PLATE DETAILS



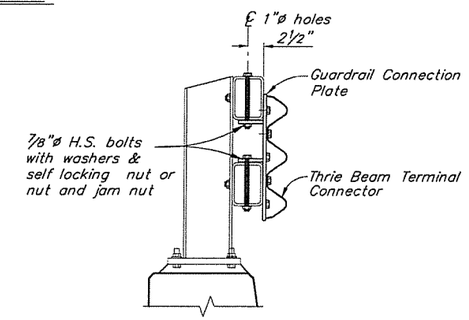
PLAN



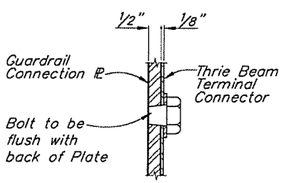
ELEVATION



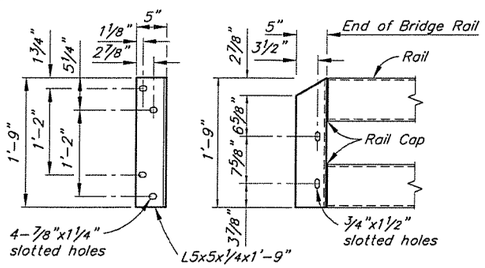
TRANSITION CONNECTION - ELEVATION



SECTION E-E



DETAIL G



END VIEW ELEVATION

CONNECTION ANGLE A

No Scale

NOTES:

1. *All guardrail and guardrail connection hardware to conform to AASHTO M 180. Use H.S. Bolts conforming to ASTM A325. All other steel conforms to ASTM A709 Grade 50.*
2. *Lap approach guardrail to prevent snags from oncoming traffic.*
3. *Provide 4½" horizontal slots in approach guardrail. Adjust guardrail bolts for sliding fit.*
4. *Conform to G-00, G-05S and G-10 of the Standard Plans for all guardrail details not shown.*

DESIGNED BY: Elmer Marx	CHECKED: Andrew Wells	REVISIONS	
DRAWN BY: Sam Sollie	CHECKED: Elmer Marx		
QUANTITIES BY: Elmer Marx	CHECKED: Andrew Wells		

No.	Date	By	Description
1	3-2-2020	EEM	New MASH TL-3 Transition

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
BRIDGE SECTION
3132 Channel Drive
Juneau, Alaska 99801
907-465-2975

STATE OF ALASKA 49TH — Elmer E. Marx III No. CE 9490 — REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY

TL-3 THRIE BEAM TRANSITION

BRIDGE NO. 576
DWG. NO. 13B

R:\evault\576\cad\576 As Sent\576-1-TRANSITION Mon, Mar/02/20 10:52am

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N14	N21

LEGEND

- TEST HOLE
- PENETROMETER

NORTH

10 0 20 40
Feet

2390
2380
2380
2380
2380
2390

PENI3-2
PENI3-4
THI3-1
THI3-3
THI3-5
THI3-6

℄ Brg. Abut. 1
Sta. 1657+23.00

℄ Brg. Abut. 2
Sta. 1658+55.00

N28°59'53"E

1656+00
1657+00
1658+00
1659+00
1660+00
1661+00

℄ Richardson Highway

TEST HOLE AND PENETROMETER LOCATIONS				
TEST HOLE / PENETROMETER	STATION	OFFSET	DEPTH	LOCATION
TH13-1	1656+65	6' Lt	50.5'	APPROACH
PEN13-2	1657+19	10' Lt	95.75'	ABUTMENT 1
TH13-3	1657+34	5' Rt	113.0'	ABUTMENT 1
PEN13-4	1658+49	10' Lt	78.75'	ABUTMENT 2
TH13-5	1658+61	10' Rt	100.0'	ABUTMENT 2
TH13-6	1659+12	℄	45.5'	APPROACH

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO,-N14 LOC Jan 31, 2019 - 2:51pm

DESIGNED BY: D. Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH
David A. Hemstreet
No. CE 9800
REGISTERED PROFESSIONAL ENGINEER
2/20/19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

TEST HOLES & PENETROMETER LOCATION

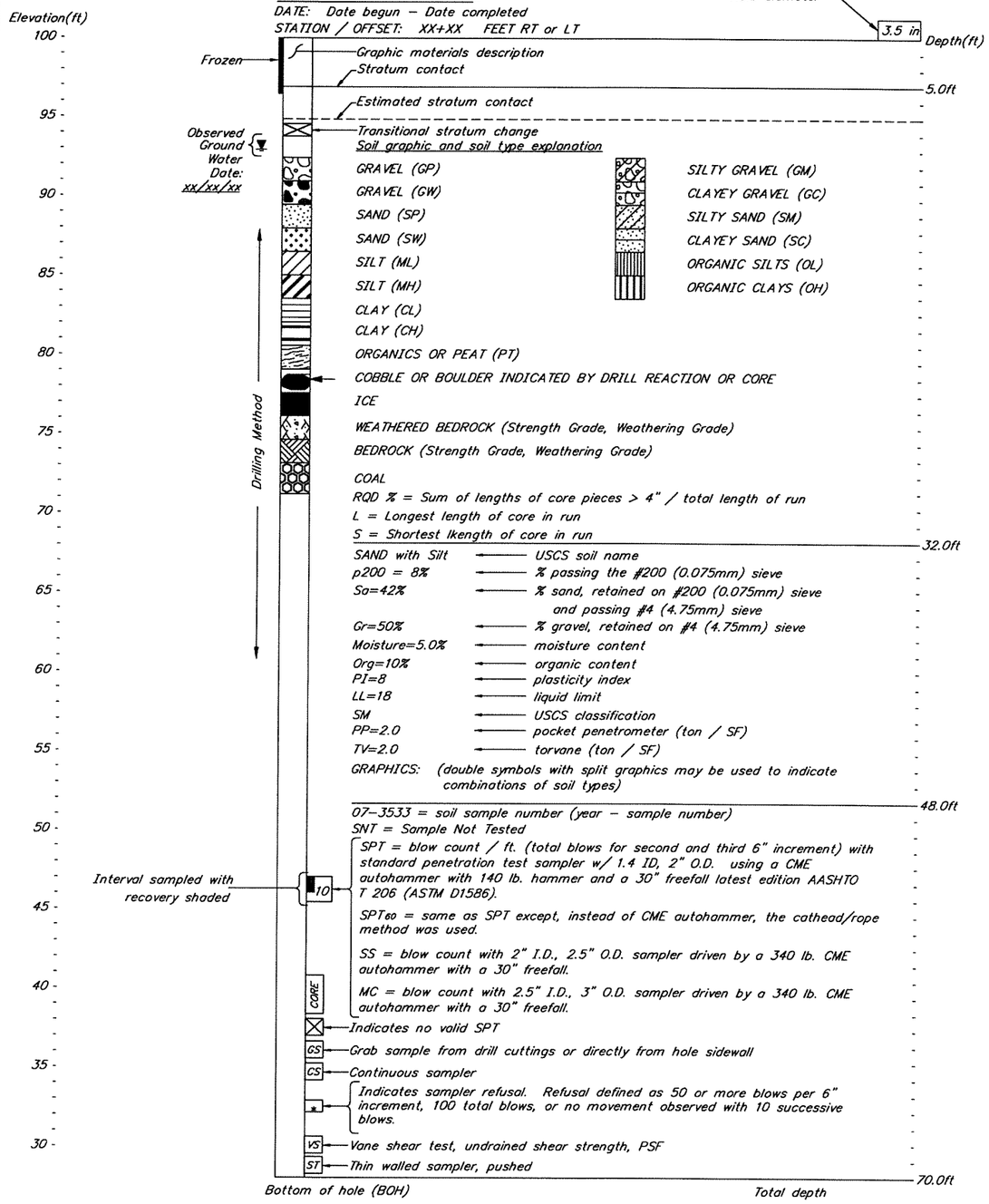
BRIDGE NO. 0576
DWG. NO. 14

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N15	N21

TYPICAL TEST HOLE LOG

DATE: Date begun – Date completed
STATION / OFFSET: XX+XX FEET RT or LT

Hole diameter — 3.5 in

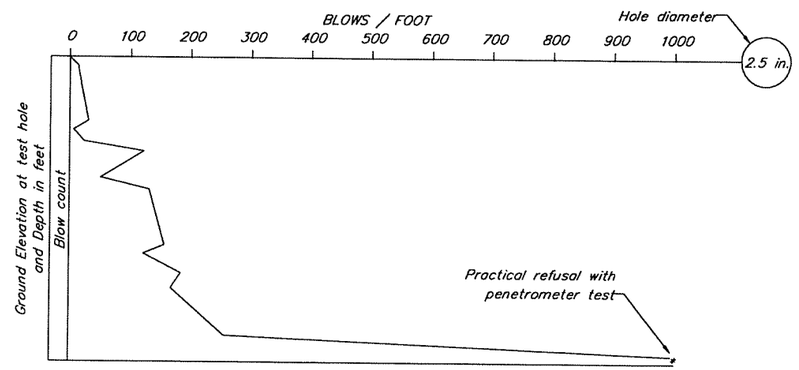


NOTES:

1) The test hole logs depicted graphically in these drawings are distillations of the original field logs, based on post-field investigation review and analysis. These drafted logs include changes made to field descriptions based upon laboratory test data, review and analysis. Detailed field observations of rock and soil sampled during the drilling program are not reproduced in the drafted logs.
2) Description of soils follows Alaska Geotechnical Procedures manual.
   Classification of soils follows Unified Soil Classification System (ASTM D2487).
3) The test hole logs from these sheets are an integral part of the Foundation Geology Report. See Construction Contract Bid Documents – invitation to bid/notice to bidders. Important information about the test hole logs and the foundation investigation is contained in the report. The test hole logs are not severable from and cannot be completely and correctly interpreted without reference to the Foundation Geology Report.

TYPICAL PENETROMETER TEST LOG

DATE: Date begun – Date completed
STATION / OFFSET: XX+XX / RT or LT (feet)



Bottom of hole (BOH)

NOTES:
Penetrometer W/2.5" O.D., with a CME AUTOMATIC Hammer using a 340 lb. weight and a 30" freefall

DESIGNED BY: D.Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH — David A. Hemstreet No. CE 5800 REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

TEST HOLE & PENETROMETER LEGEND

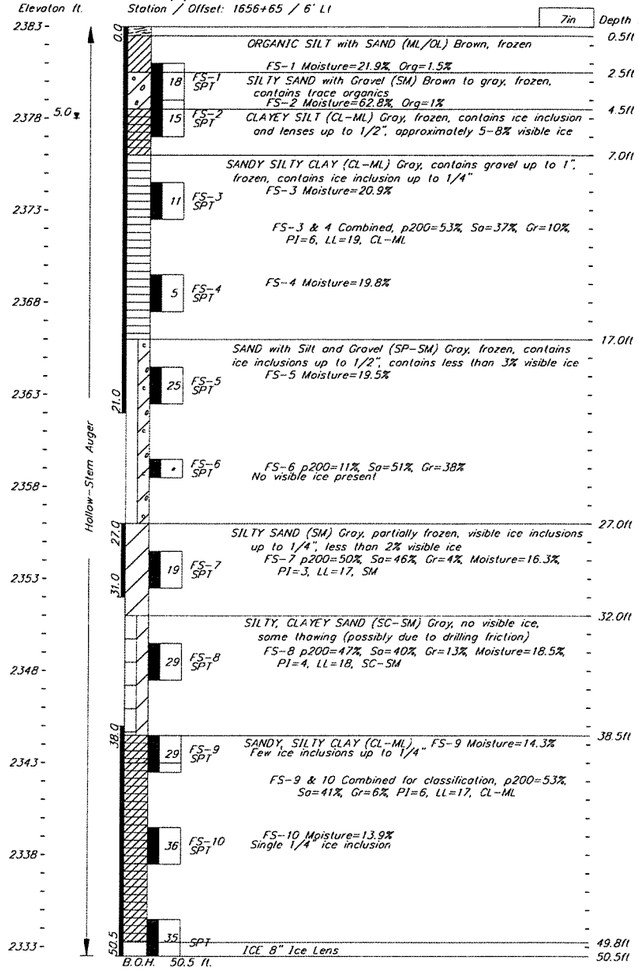
BRIDGE NO. 0576
DWG. NO. 15

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO_-N15 TYP Jan 31, 2019 - 2:51pm

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N16	N21

TH13-1

Date: 2/1/13
Station / Offset: 1656+65 / 6' Lt



DESIGNED BY: D.Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH
David A. Hemstreet
No. CE 9800
REGISTERED PROFESSIONAL ENGINEER
7/20/19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

TEST HOLE & PENETROMETER LOGS

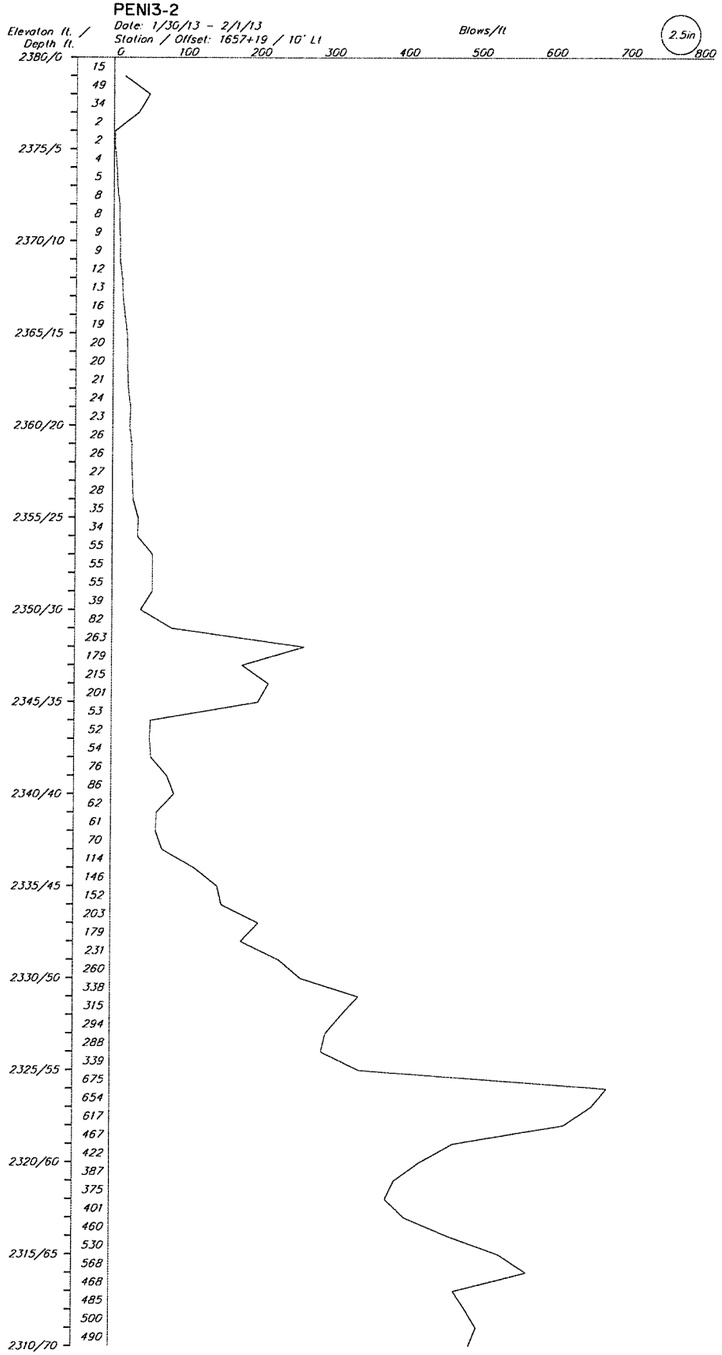
BRIDGE NO. 0576
DWG. NO. 16

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO_-N16 TH13-1 Jan 31, 2019 - 2:51pm

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N17	N21

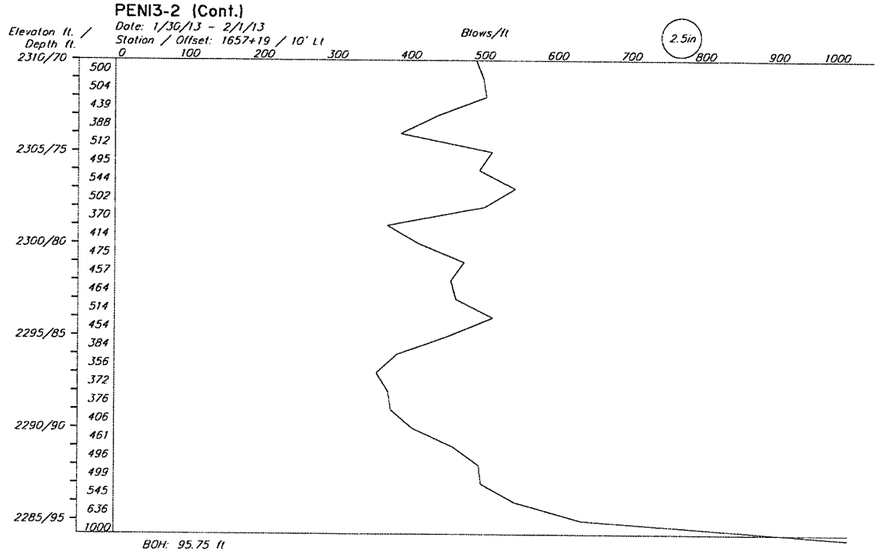
PENI3-2

Date: 1/30/13 - 2/1/13
Station / Offset: 1657+19 / 10' Lt



PENI3-2 (Cont.)

Date: 1/30/13 - 2/1/13
Station / Offset: 1657+19 / 10' Lt



BOH: 95.75 ft

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO_-N17 PEN13-2 Jan 31, 2019 - 2:51pm

DESIGNED BY: D.Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH David A. Hemstreet No. CE 9800 REGISTERED PROFESSIONAL ENGINEER 3/20/19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

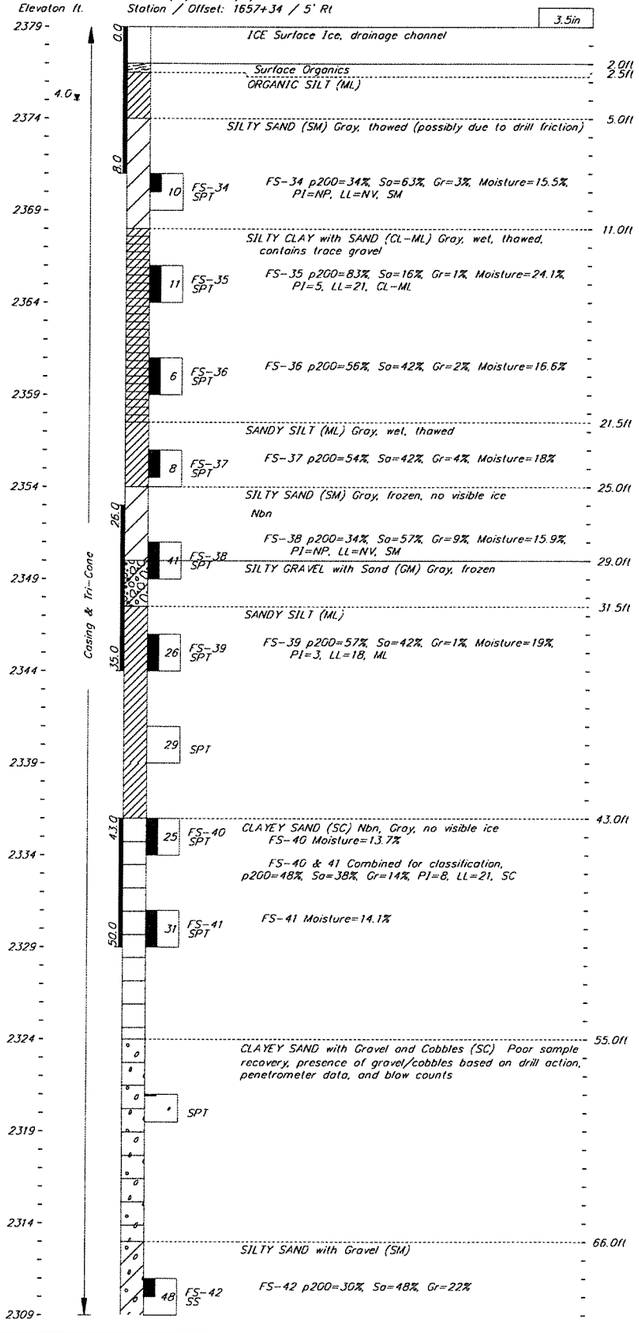
TEST HOLE & PENETROMETER LOGS

BRIDGE NO. 0576
DWG. NO. 17

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N18	N21

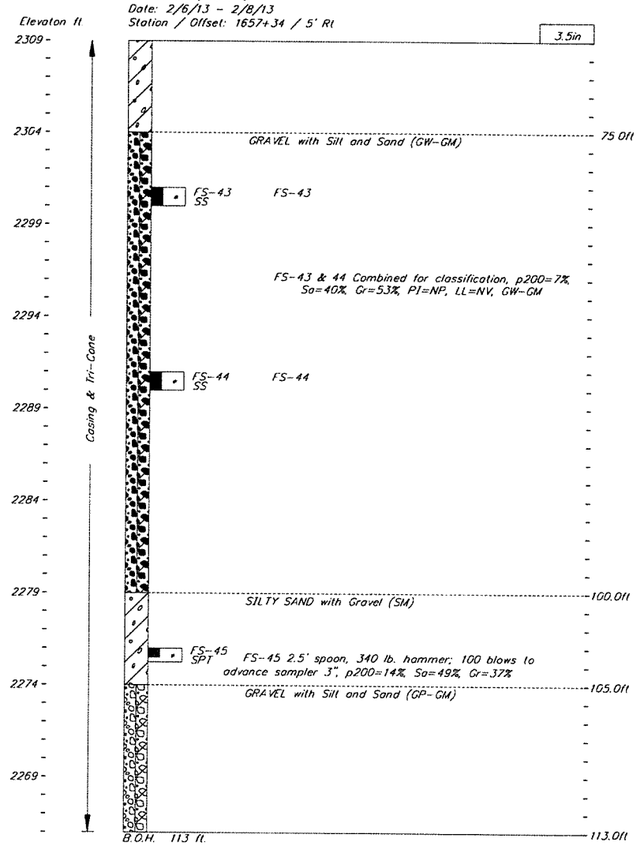
TH13-3

Date: 2/6/13 - 2/8/13
Station / Offset: 1657+34 / 5' Rt



TH13-3 (Cont.)

Date: 2/6/13 - 2/8/13
Station / Offset: 1657+34 / 5' Rt



DESIGNED BY: D.Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH
David A. Hemstreet
No. CE 9800
REGISTERED PROFESSIONAL ENGINEER

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

TEST HOLE & PENETROMETER LOGS

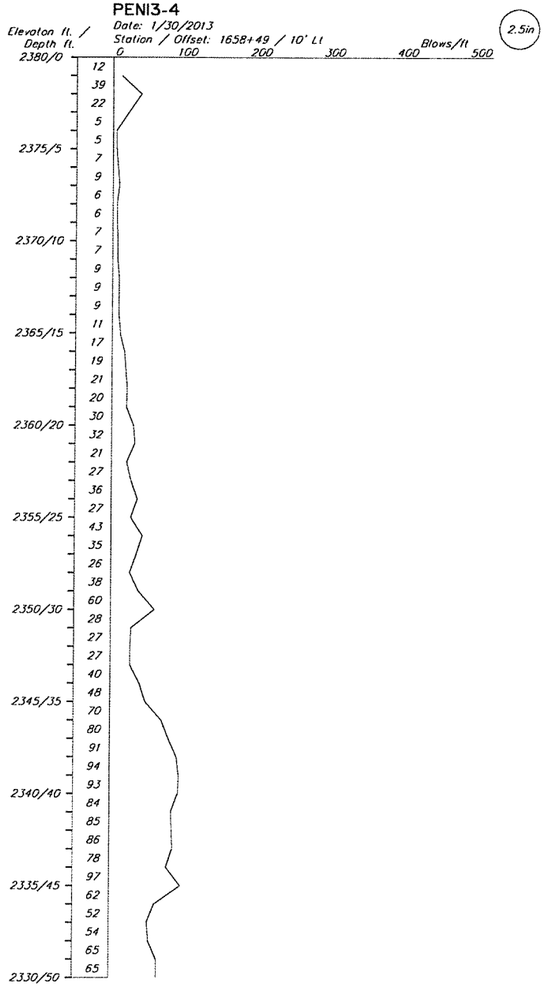
BRIDGE NO. 0576
DWG. NO. 18

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO_-N18 TH13-3 Jan 31, 2019 - 2:51pm

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N19	N21

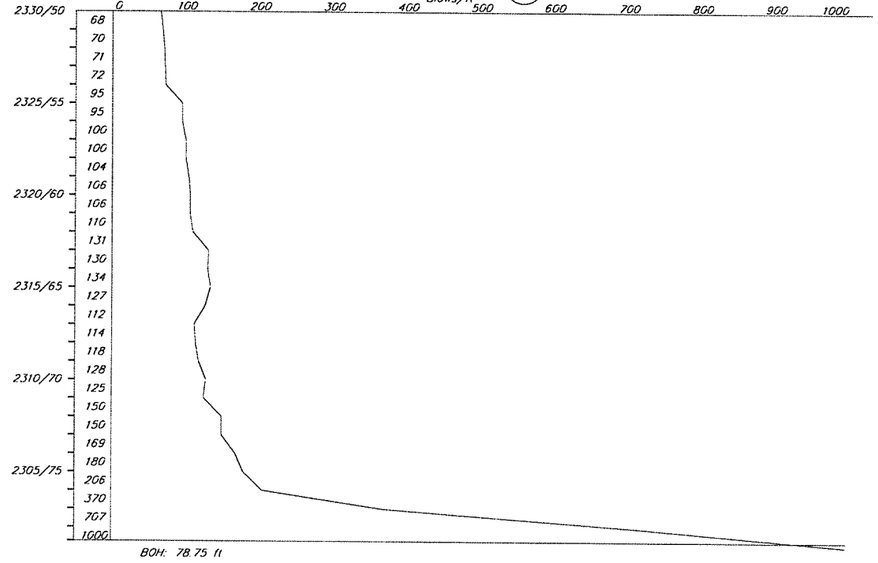
PENI3-4

Date: 1/30/2013
Station / Offset: 1658+49 / 10' Lt



PENI3-4 (Cont.)

Date: 1/30/2013
Station / Offset: 1658+49 / 10' Lt



BOH: 78.75 ft

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO_-N19 PEN13-4 Jan 31, 2019 - 2:51pm

DESIGNED BY: D.Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH
David A. Hemstreet
No. CE 9800
REGISTERED PROFESSIONAL ENGINEER
7/20/19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

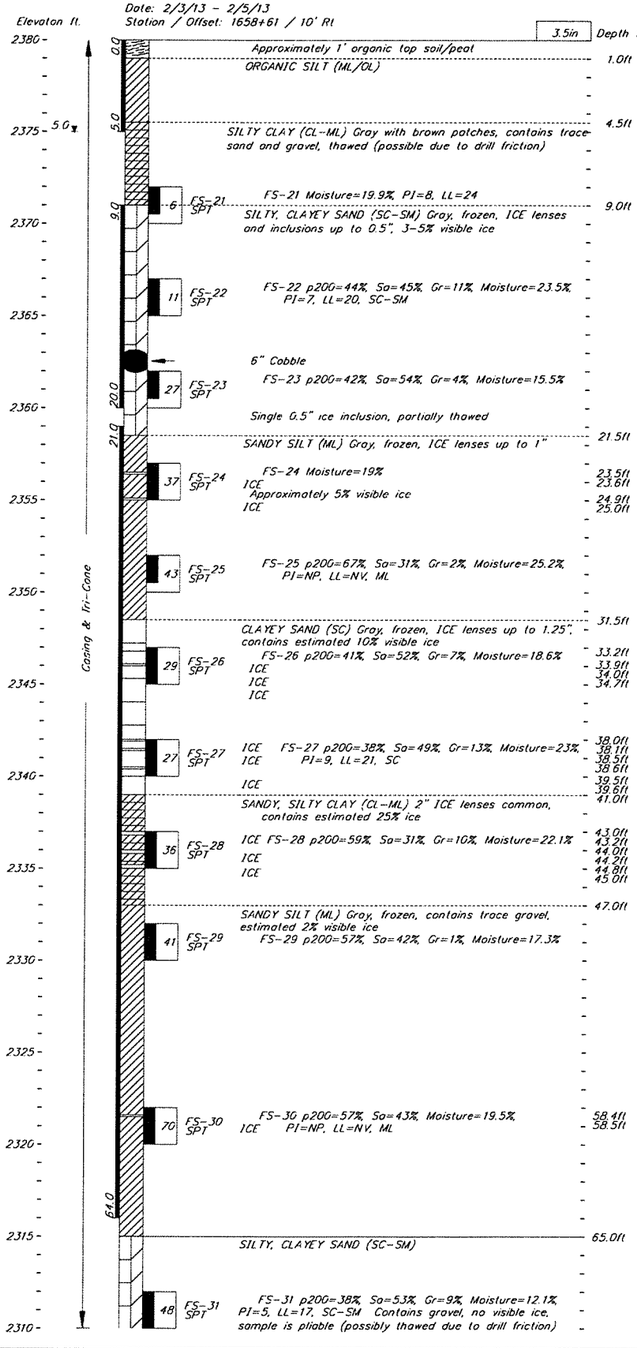
TEST HOLE & PENETROMETER LOGS

BRIDGE NO. 0576
DWG. NO. 19

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N20	N21

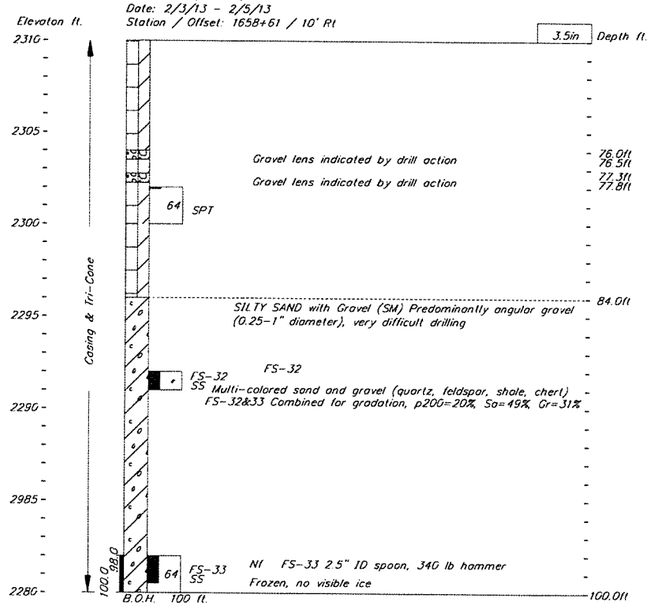
THI3-5

Date: 2/3/13 – 2/5/13
Station / Offset: 1658+61 / 10' Rt



THI3-5 (Cont.)

Date: 2/3/13 – 2/5/13
Station / Offset: 1658+61 / 10' Rt



DESIGNED BY: D.Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH
David A. Hemstreet
No. CE 9800
REGISTERED PROFESSIONAL ENGINEER
2/20/19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

TEST HOLE & PENETROMETER LOGS

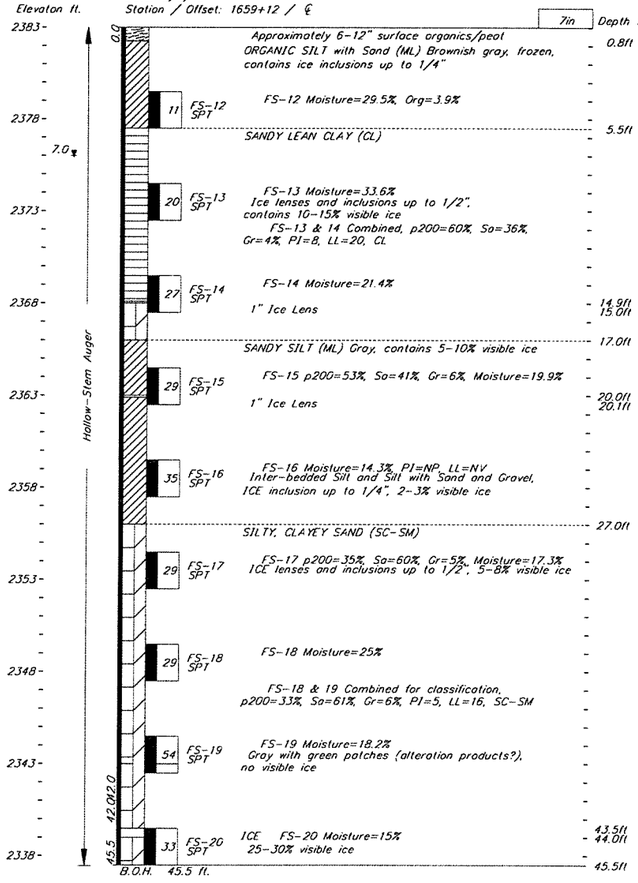
BRIDGE NO. 0576
DWG. NO. 20

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO_-N20 TH13-5 Jan 31, 2019 – 2:51pm

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	Z631860000	2019	N21	N21

TH13-6

Date: 2/2/13
Station / Offset: 1659+12 / ℄



DESIGNED BY: D.Hemstreet	CHECKED: Engineer		
DRAWN BY: R. Angell	CHECKED: Engineer		
QUANTITIES BY: Engineer	CHECKED: Engineer		

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
STATEWIDE MATERIALS

STATE OF ALASKA 49TH David A. Hemstreet No. CE 9800 REGISTERED PROFESSIONAL ENGINEER
2/20/19

HAGGARD CREEK BRIDGE

RICHARDSON HIGHWAY MP148 TO 173

TEST HOLE & PENETROMETER LOGS

BRIDGE NO. 0576
DWG. NO. 21

R:\Projects\Rich_Hwy\63186_rich_167_173\07 eng support\05 bridge\Drafting\63186_GEO_-N21 TH13-6 Jan 31, 2019 - 2:51pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	Q1	Q9

ESCP GENERAL NOTES:

GENERAL:

1. READ AND COMPLY WITH THE CONSTRUCTION GENERAL PERMIT (CGP) AND SECTION 641 OF THE PROJECT SPECIFICATIONS.
2. INITIATE EROSION AND SEDIMENT CONTROLS PRIOR TO ANY EARTH DISTURBING ACTIVITIES.
3. ALL DISTURBED GROUND CAPABLE OF SUPPORTING VEGETATION SHALL BE RE-VEGETATED FOR FINAL STABILIZATION. FINAL STABILIZED AREAS NOT RE-VEGETATED SHALL BE 100% COVERED BY ROCK OR OTHER PERMANENT LOW-ERODIBLE MATERIAL. ATTAINMENT OF FINAL STABILIZATION SHALL BE AS APPROVED IN THE FIELD BY THE ENGINEER.
4. STOCKPILE AND STAGING LOCATIONS SHALL BE RECLAIMED TO THEIR ORIGINAL CONDITION AS APPROVED BY THE ENGINEER.
5. TEMPORARY BMP'S REQUIRED BY THIS ESCP WILL NOT BE MEASURED FOR PAYMENT AND ARE SUBSIDIARY TO PAY ITEM 641(3).

CULVERTS:

6. PROVIDE TEMPORARY INLET AND OUTLET PROTECTION FOR ALL CULVERTS (EXISTING AND PROPOSED) IN THE AREA OF DISTURBANCE PRIOR TO MAKING THEM OPERATIONAL OR BEGINNING EARTH DISTURBING ACTIVITIES.
7. PERMANENT CULVERT INLET AND OUTLET PROTECTION SHALL BE CULVERT RIPRAP APRONS. SEE THE CULVERT SUMMARY FOR RIPRAP CLASS. SEE SHEETS E4-E6 FOR CULVERT AND CULVERT RIPRAP APRON INSTALLATION DETAILS.

DITCH PROTECTION AND CONCENTRATED FLOWS:

8. DURING CONSTRUCTION, PROTECT DITCHES TO LIMIT RELEASE OF SEDIMENT. IF DITCH LINING PER THE PLANS IS NOT CONSTRUCTED SIMULTANEOUSLY WITH EMBANKMENT CONSTRUCTION, PROVIDE TEMPORARY DITCH PROTECTION IN THE FORM OF VELOCITY CONTROLS OR TEMPORARY NON-ERODIBLE LINING.
9. EXPOSED MATERIAL OF NEW DITCHES CAPABLE OF SUPPORTING VEGETATION SHALL BE SEEDED OR DITCH LINED PER THE PLANS FOR FINAL STABILIZATION.
10. WHEN POSSIBLE, AVOID CONDITIONS WHICH PROMOTE CONCENTRATED FLOWS. OTHERWISE, INSTALL VELOCITY CONTROL BMPS (I.E. WATTLE CHECK DAMS OR ROCK CHECK DAMS) OR NON-ERODIBLE CHANNEL LINING (I.E. DITCH LINING).

PERIMETER CONTROL:

11. VEGETATIVE BUFFER IS THE PREFERRED PERIMETER PROTECTION FOR THIS PROJECT EXCEPT AT ADJACENT WETLANDS WHERE VEGETATIVE BUFFER WIDTH IS NOT 25 FEET.
12. VEGETATIVE BUFFER ARE NOT APPROPRIATE IN AREAS WITH STANDING WATER OR EMERGENT WETLANDS ADJACENT TO THE IMPACT AREA. IN THESE AREAS, APPROPRIATE BMP SHALL BE INSTALLED TO PREVENT THE ACCUMULATION OF SEDIMENT OUTSIDE OF THE PERMITTED IMPACT AREA.
13. REFERENCE ARMY CORPS PERMIT # POA-2019-00082
14. SEE SHEET E11 FOR PERIMETER CONTROL AT UNSUITABLE OR EXCESS EXCAVATION DISPOSAL AREAS.

HAULING:

15. ENSURE LOADS ARE STABLE OR COVERED SO THAT NO MATERIAL ESCAPEMENT OCCURS DURING HAULING ACTIVITIES.

STOCKPILE PROTECTION:

16. ALL ERODIBLE STOCKPILES MUST BE PROTECTED BY EROSION AND SEDIMENT CONTROL DEVICES.
17. EROSION AND SEDIMENT CONTROL BMPS MAY HAVE TO BE REMOVED AND RE-INSTALLED EACH SHIFT.
18. COVER MUST BE USED ON STOCKPILES IN ACCORDANCE WITH SUBSECTION 641-3.01.5 TO PROVIDE ADDITIONAL EROSION PROTECTION.

IN WATER WORK

19. ALL IN WATER WORK WILL BE ISOLATED FROM FLOWING WATER.

EXCAVATION DEWATERING

20. IF EXCAVATION DEWATERING WILL OCCUR ON THE PROJECT, THE CONTRACTOR WILL COMPLY WITH THE ALASKA DEPARTMENT OF ENVIRONMENTAL CONVERSATION EXCAVATION DEWATERING GENERAL PERMIT AKG0020000. ADEC WRITTEN AUTHORIZATION IS REQUIRED PRIOR TO DISCHARGING.

TIMING OF BMP INSTALLATION:

21. INSTALL EROSION AND SEDIMENT CONTROL BMP'S PRIOR TO THE START OF CONSTRUCTION, AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ONSITE.
22. INSTALL TEMPORARY PERIMETER CONTROL BMP'S BEFORE ANY UP-GRADIENT SOIL DISTURBANCE OCCURS.
23. START PLACEMENT OF DITCH LINING OR OTHER DISSIPATION MEASURES WITHIN 24 HOURS OF PLACEMENT OF THE CULVERT AND COMPLETED IN ON CONTINUOUS OPERATION.

WINTER SHUTDOWN:

24. IF FINAL STABILIZATION IS NOT ACHIEVED BEFORE WINTER SHUTDOWN, EXPOSED GROUND, INCLUDING BUT NOT LIMITED TO EMBANKMENT SLOPES AND STOCKPILES, SHALL BE TEMPORARILY STABILIZED BEFORE WINTER SHUTDOWN AND UNTIL PERMANENT STABILIZATION IS ACHIEVED THE NEXT SEASON. ALL STABILIZATION AND OTHER EROSION CONTROL MEASURES NECESSARY FOR WINTER SHUTDOWN ARE SUBSIDIARY TO PAY ITEM 641(3).

WETLANDS IN MATERIAL SITES:

25. AVOID IMPACTS OF WETLANDS WITHIN MATERIAL SITES MADE AVAILABLE WITHIN THESE PLANS. IF WETLANDS ARE UNAVOIDABLE, NOTIFY THE ENGINEER AT LEAST 60 DAYS PRIOR TO ANY EARTH DISTURBING ACTIVITY WITHIN THE MATERIAL SITES, AND IDENTIFY ALL POTENTIAL IMPACTS TO WETLANDS WITHIN THE SITE; IDENTIFY WHETHER THESE IMPACTS ARE TEMPORARY OR PERMANENT, AND PROVIDE DETAILED DRAWINGS DELINEATING THE PROPOSED IMPACT AREAS.
26. GRADE MATERIAL SITE FLOOR(S) TO RETAIN ALL WATER WITHIN EACH SITE AND TO AVOID ANY STORM WATER DISCHARGE FROM THE SITES DURING AND AFTER CONSTRUCTION.

PUBLIC WATER SYSTEM:

27. IDENTIFY ANY EXISTING PUBLIC WATER SYSTEM (PWS) DRINKING WATER PROTECTION AREAS (DWPA) THAT INTERSECT THE BOUNDARY OF THE PROPOSED PROJECT/PERMIT AREA USING http://dec.alaska.gov/das/GIS/apps.htm and http://dec.alaska.gov:8080/DWW. PROVIDE PWS CONTACT INFORMATION USING AND ENTERING THE APPROPRIATE 6-DIGIT PWS ID.

EAGLE NESTS:

27. IF EAGLE NEST(S) ARE IDENTIFIED BY DOT&PF OR THE CONTRACTOR STAFF WITHIN 660 FEET OF THE CONSTRUCTION ACTIVITY, THE PROJECT ENGINEER SHALL BE INFORMED AND THE ENGINEER SHALL CONSULT THE USFWS FOR MEASURES TO PROTECT THE NEST FROM DISTURBANCES. WHEN AN EAGLE NEST IS FOUND WITHIN ½ MILE OF THE PROJECT AND HIGH-NOISE LEVEL WORK IS PLANNED (PILE DRIVING FOR EXAMPLE) SEE USFWS NOISE GUIDELINES.

SETTING:

28. CHARACTERIZED BY NEARLY LEVEL TO UNDULATING PLAINS AND ROLLING HILLS, WITH FREQUENT DEPRESSIONAL WETLANDS AND SHALLOW PONDS. THE AREA IS POORLY DRAINED, WITH GENERALLY HIGHLY ORGANIC SOILS OVERLYING DISCONTINUOUS PERMAFROST. THE COPPER RIVER BASIN IS LOCATED IN AN ANCIENT LAKE BED WITH HIGH SILT/CLAY CONTENT. TYPICAL VEGETATION CONSISTS OF TUSSOCKS, TUNDRA GRASSES, BLUEBERRY BUSHES, MOSS, WILLOW, STUNTED SPRUCE, BIRCH AND POPLAR. GROWING SEASON IS SHORT (JUNE TO MID AUGUST).

THREATENED AND ENDANGERED SPECIES

ACCORDING TO THE LIST PUBLISHED AT:
HTTP://WWW.FAKR.NOAA.GOV/PROTECTEDRESOURCES/ESA/AK_SPECIESLST051110.PDF,
THERE ARE NO THREATENED AND ENDANGERED SPECIES LISTED FOR THIS AREA.

WILDLIFE & WATERFOWL REFUGES:

ALL PROJECT WORK WILL TAKE PLACE INSIDE THE EXISTING DOT&PF RIGHT-OF-WAY (ROW)' THE WRANGELL-ST. ELIAS NATIONAL PARK & PRESERVE IS LOCATED SOUTH OF THE PROJECT CORRIDOR. IT'S NORTHERN MOST BOUNDARY IS THE COPPER RIVER WHICH DOES NOT ABUT THE EXISTING DOT&PF RIGHT-OF-WAY. THE WRANGELL-ST. ELIAS NATIONAL PARK & PRESERVE IS A SECTION 4(f) PROTECTED RESOURCE AND NO IMPACTS WILL OCCUR.

PROJECT AREA	362.22 ACRES
DISTURBED AREA	107.07 ACRES
PRE-CONSTRUCTION IMPERVIOUS AREA	25.9861 ACRES
POST-CONSTRUCTION IMPERVIOUS AREA	42.1419 ACRES
PRE-CONSTRUCTION RUNOFF COEFFICIENT	0.6
POST-CONSTRUCTION RUNOFF COEFFICIENT	0.6

NOTE: PROJECT AREA AND DISTURBED AREA CALCULATIONS DO NOT INCLUDE MATERIALS SITES OR ACCESS ROADS TO THOSE SITES.

ENVIRONMENTAL INFORMATION

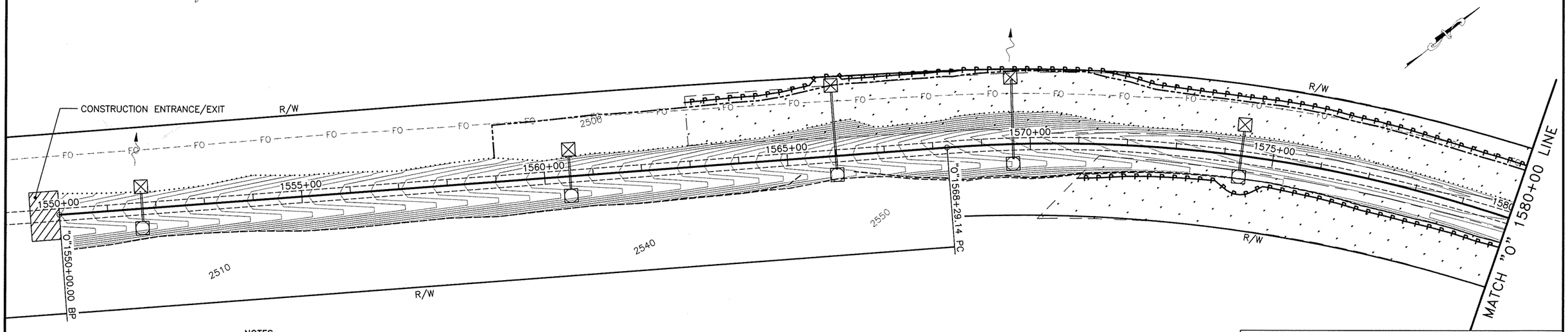
- RECEIVING WATER BODIES: HAGGARD CREEK AND ADJACENT WETLANDS.
- IMPAIRED WATER BODIES: NONE
- TOTAL MAXIMUM DAILY LOAD (TMDL) WATERS: NONE
- THREATENED AND ENDANGERED SPECIES: THIS PROJECT AND ITS SUPPORT AREAS DO NOT CONTAIN ANY KNOWN ESA SPECIES OR HABITAT.
- HISTORIC PLACES: NO HISTORIC PROPERTIES HAVE BEEN IDENTIFIED IN THE PROJECT AREA.
- MIGRATORY BIRD TREATY: ALL CONSTRUCTION ACTIVITIES SHALL COMPLY WITH THE MIGRATORY BIRD TREATY ACT TO PREVENT THE KILLING OR TAKING OF MIGRATORY BIRDS OR ANY PART, NEST, OR EGG OF ANY SUCH BIRDS.
- WETLANDS: SHOWN ON SUBSEQUENT Q SHEETS
- REFER TO APPENDIX A FOR PROJECT SPECIFIC PERMITS AND ENVIRONMENTAL COMMITMENTS
- DEC HAS IDENTIFIED ONE CONTAMINATE SITES WITHIN 1500 FEET OF THE PROJECT. DEC SITE #26783. MP 164.4

GENERAL SITE INFORMATION

- SITE FUNCTION: ROAD
- CLIMATE: AVERAGE ANNUAL TOTAL PRECIPITATION = 15.91 INCHES (SOURCE: WESTERN REGIONAL CLIMATE CENTER WEBSITE FOR SOURDOUGH 1N (508625), AK), 2-YEAR 24-HOUR PRECIPITATION = 1.08 INCHES (SOURCE: http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_ak.html)

EROSION AND SEDIMENT CONTROL NOTES

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	Q2	Q9



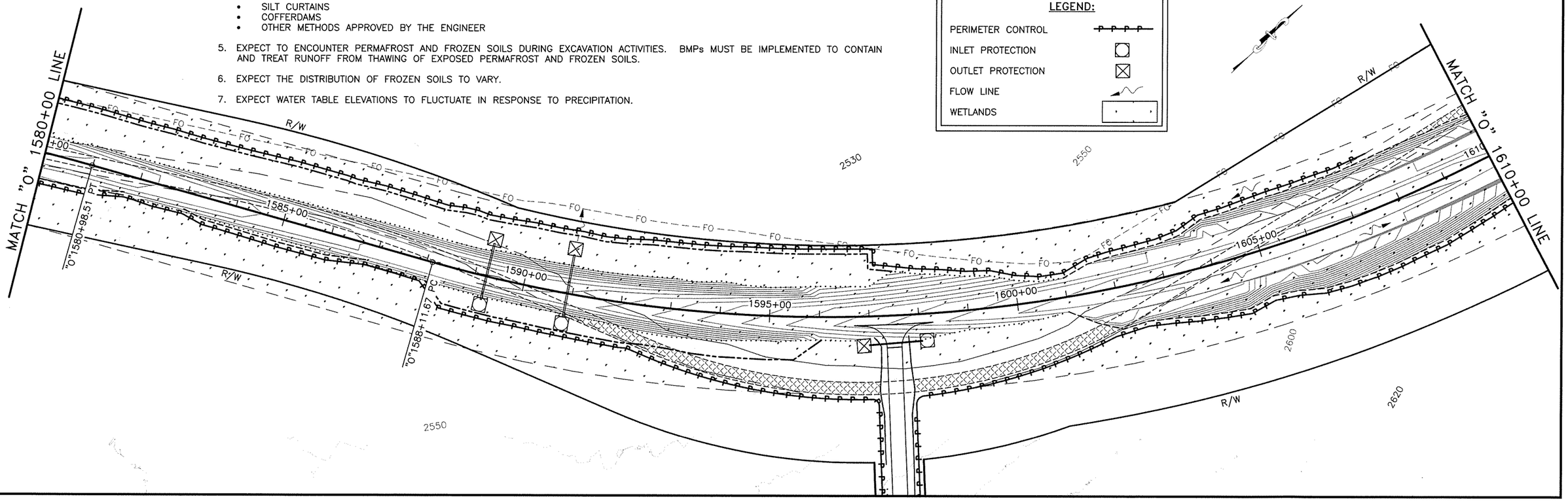
EROSION AND SEDIMENT CONTROL PLAN (1 OF 8)

NOTES:

1. VELOCITY CONTROLS INCLUDE WATTLE CHECK DAMS OR ROCK CHECK DAMS OR OTHER METHOD AS APPROVED BY THE ENGINEER. VELOCITY CONTROLS ARE REQUIRED AT LOCATIONS OF HIGH VELOCITY FLOW.
2. IMPLEMENT PRACTICABLE MEASURES AS APPROVED BY THE ENGINEER TO MINIMIZE THE INTRODUCTION OR SPREAD OF NOXIOUS WEEDS INTO OR FROM THE PROJECT SITE. WASHING CONSTRUCTION EQUIPMENT PRIOR TO ENTERING OR LEAVING THE PROJECT SITE IS AN APPROVED MEASURE.
3. INSTALL PERIMETER PROTECTION WHEN WORKING WITHIN 25 FEET OF SURFACE WATER. IF PERIMETER VEGETATIVE BUFFER WIDTH IS INSUFFICIENT, USE TEMPORARY DEVICES AND METHODS.
4. ALL IN WATER WORK MUST BE ISOLATED FROM FLOWING WATER. ISOLATION METHODS INCLUDE:
   - SILT CURTAINS
   - COFFERDAMS
   - OTHER METHODS APPROVED BY THE ENGINEER
5. EXPECT TO ENCOUNTER PERMAFROST AND FROZEN SOILS DURING EXCAVATION ACTIVITIES. BMPs MUST BE IMPLEMENTED TO CONTAIN AND TREAT RUNOFF FROM THAWING OF EXPOSED PERMAFROST AND FROZEN SOILS.
6. EXPECT THE DISTRIBUTION OF FROZEN SOILS TO VARY.
7. EXPECT WATER TABLE ELEVATIONS TO FLUCTUATE IN RESPONSE TO PRECIPITATION.

LEGEND:

- PERIMETER CONTROL
- INLET PROTECTION
- OUTLET PROTECTION
- FLOW LINE
- WETLANDS



PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
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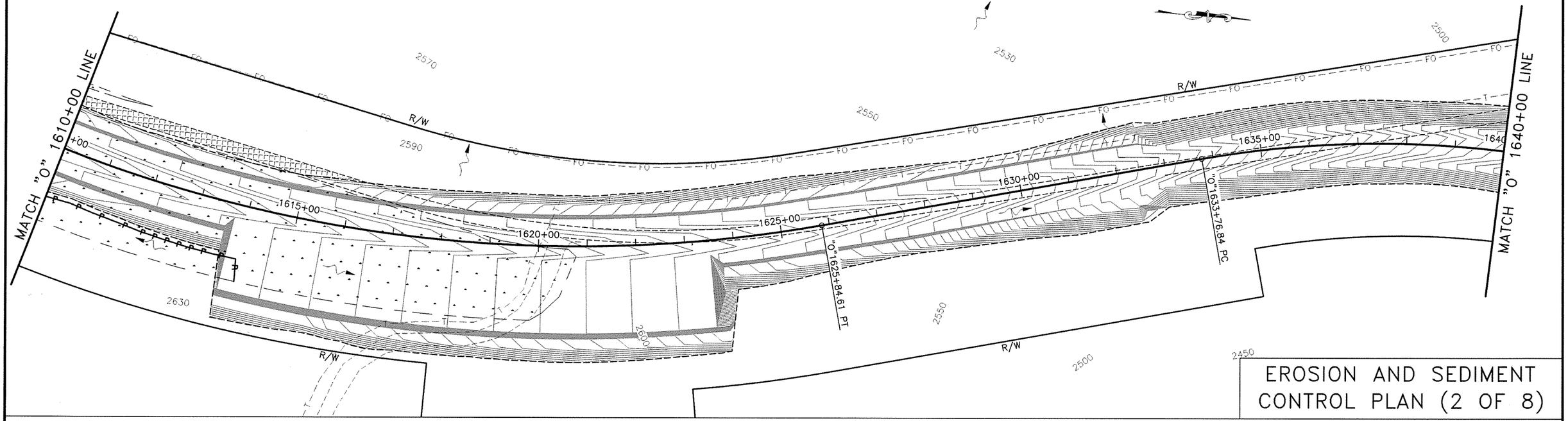
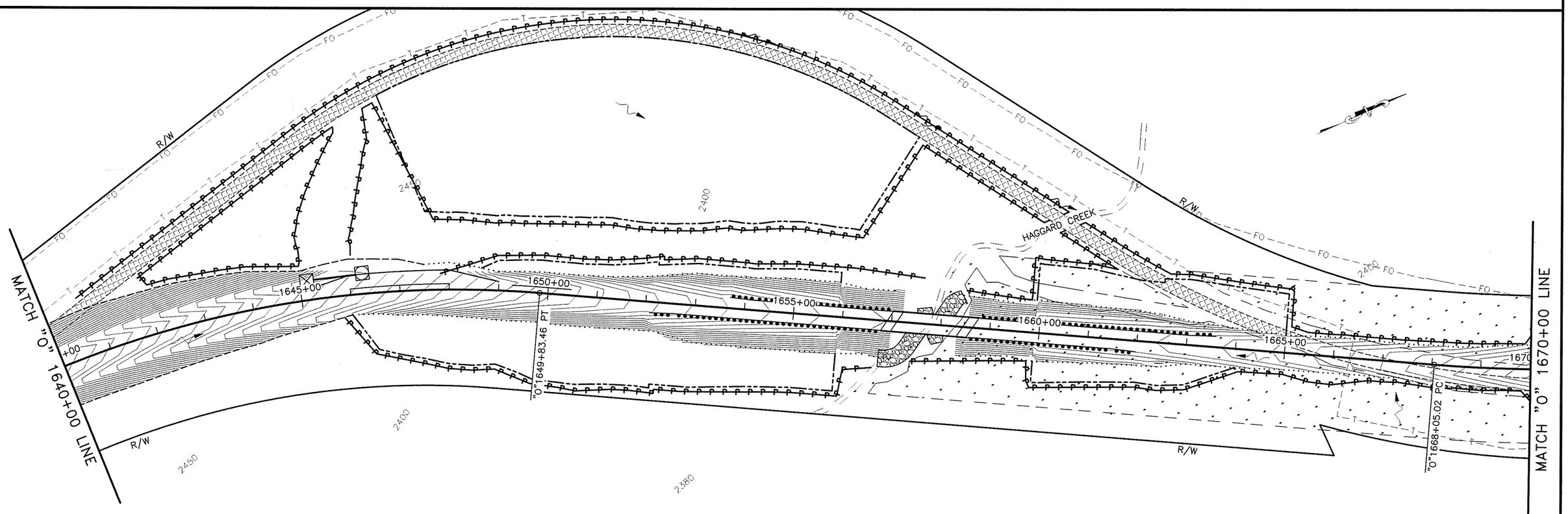


EROSION AND SEDIMENT CONTROL PLAN (2 OF 8)



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STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
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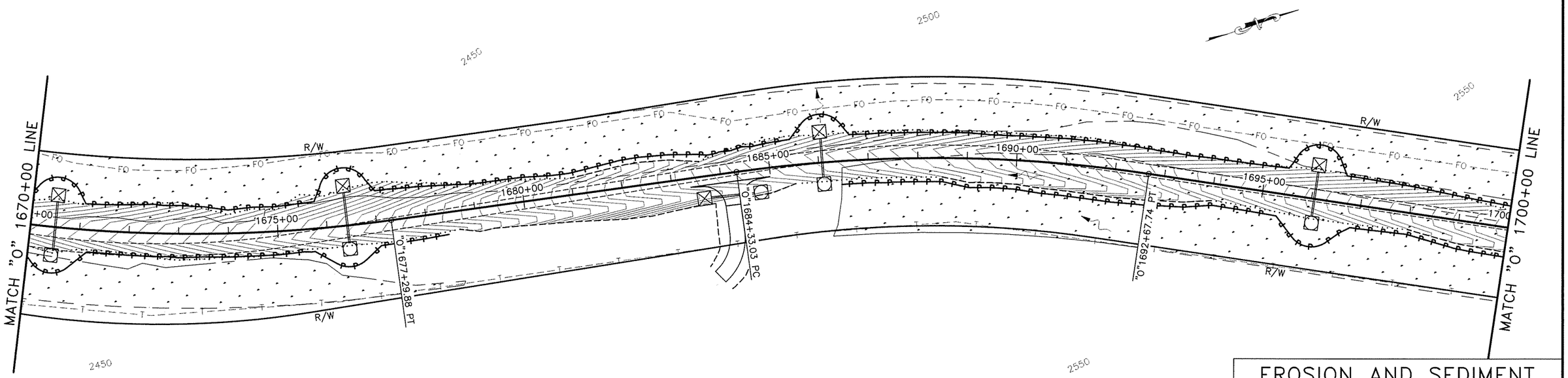
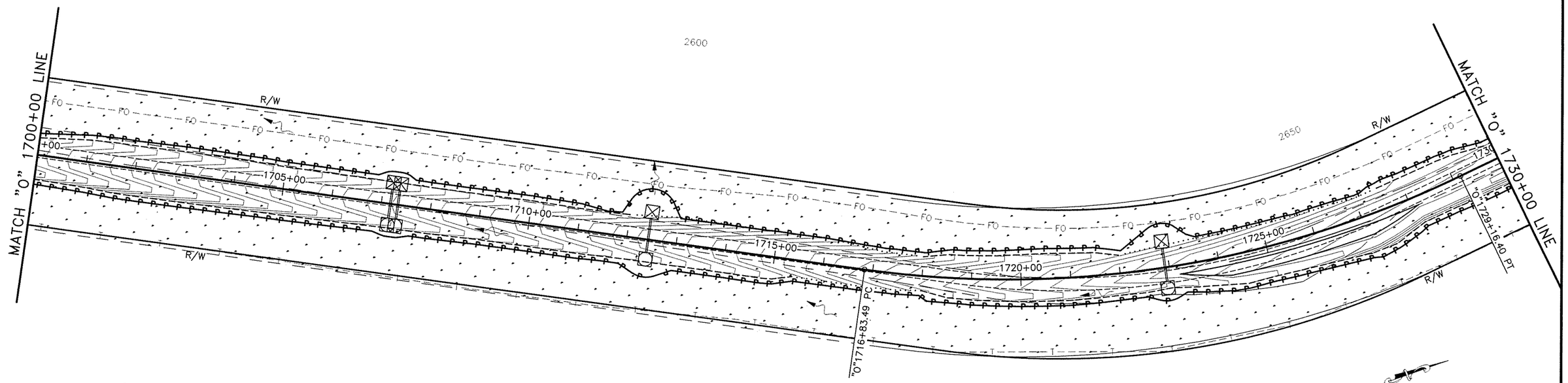


EROSION AND SEDIMENT CONTROL PLAN (3 OF 8)



PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
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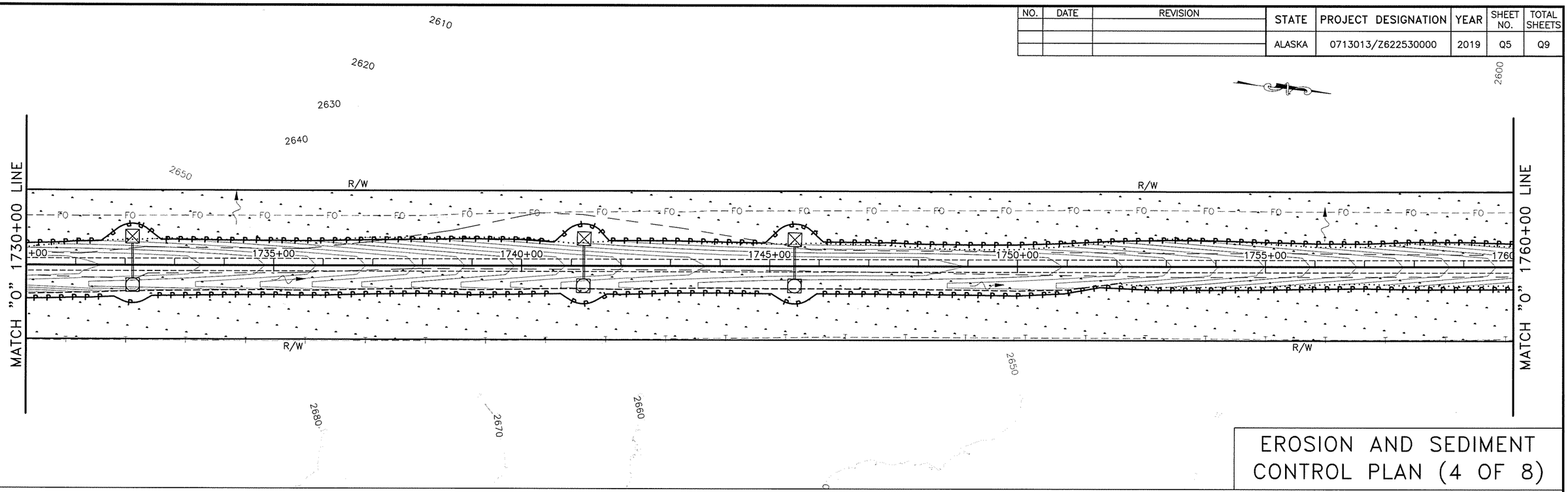
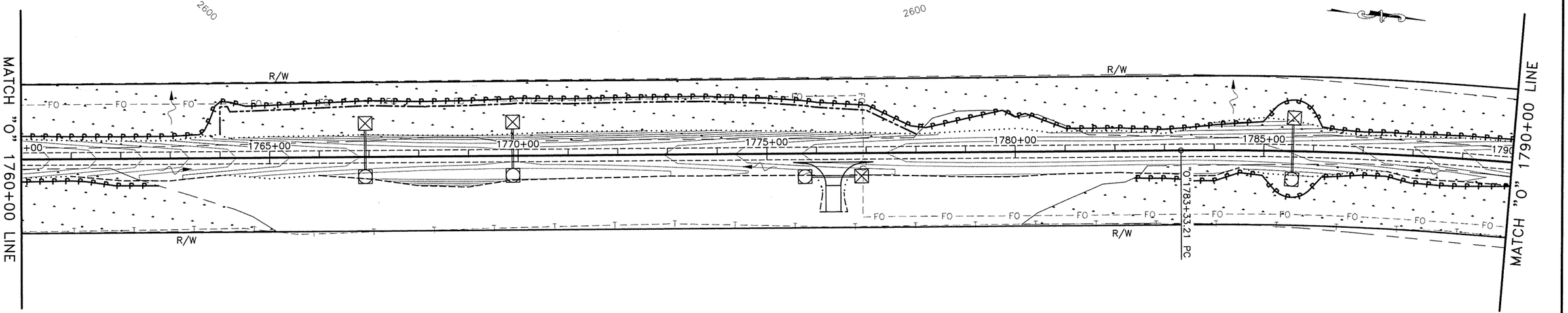


EROSION AND SEDIMENT CONTROL PLAN (4 OF 8)



NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
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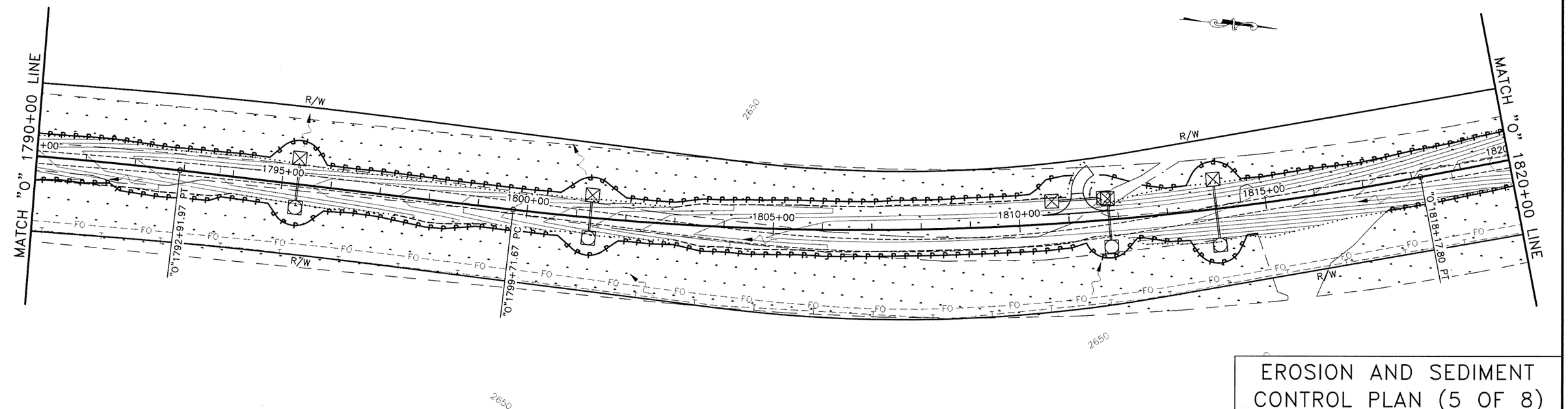
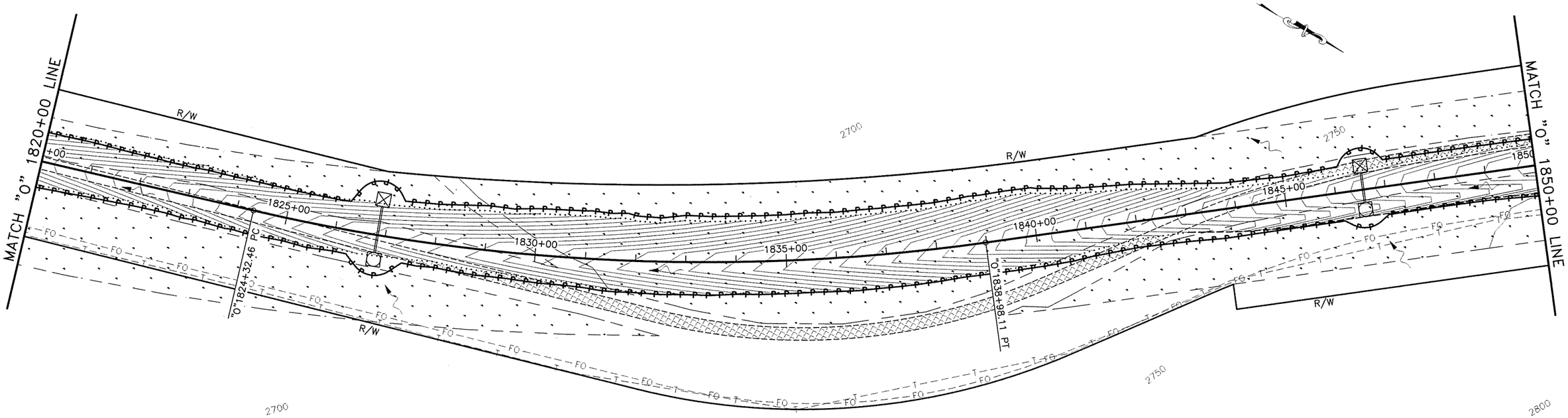


EROSION AND SEDIMENT CONTROL PLAN (5 OF 8)



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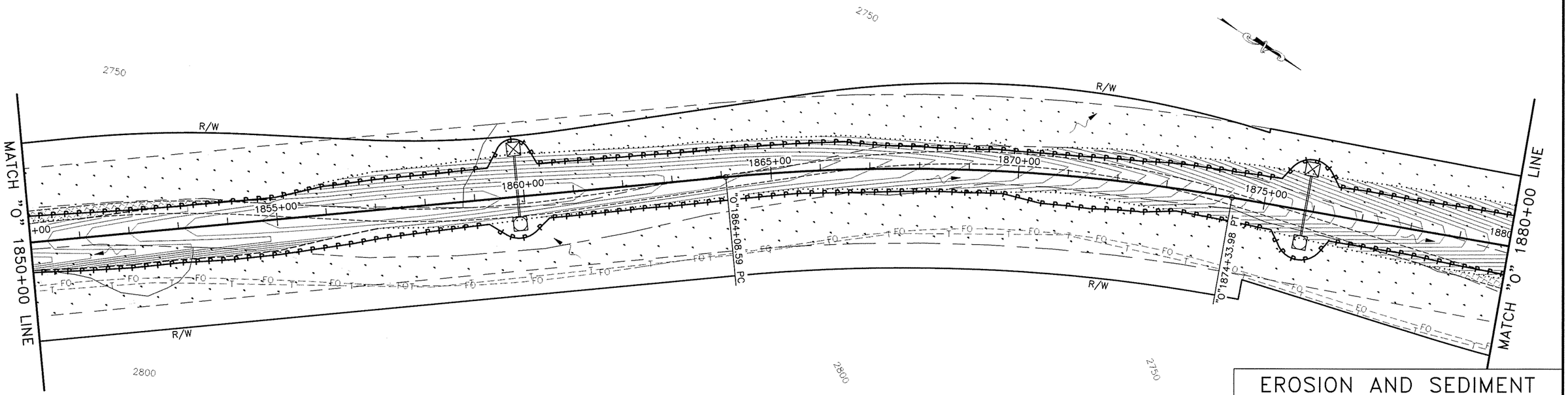
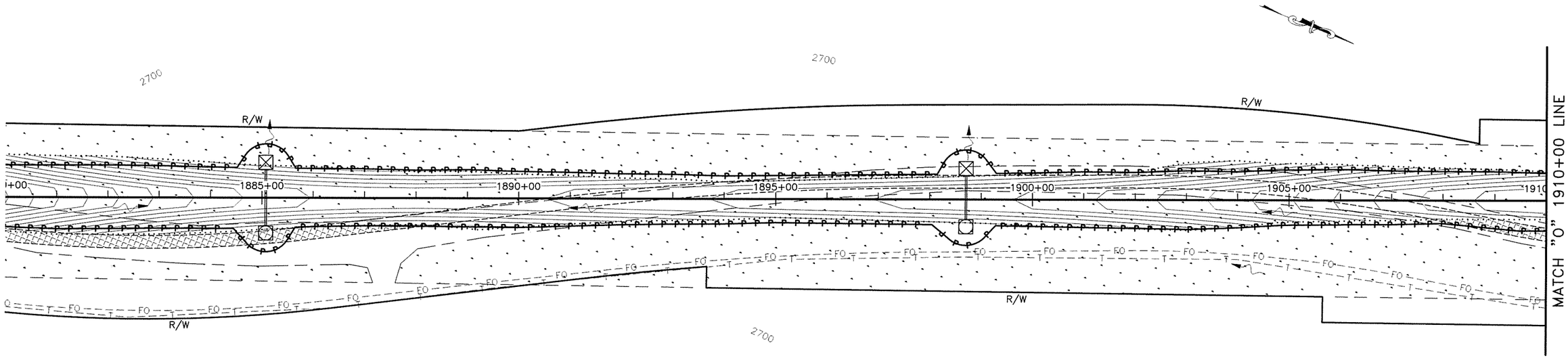


EROSION AND SEDIMENT CONTROL PLAN (6 OF 8)



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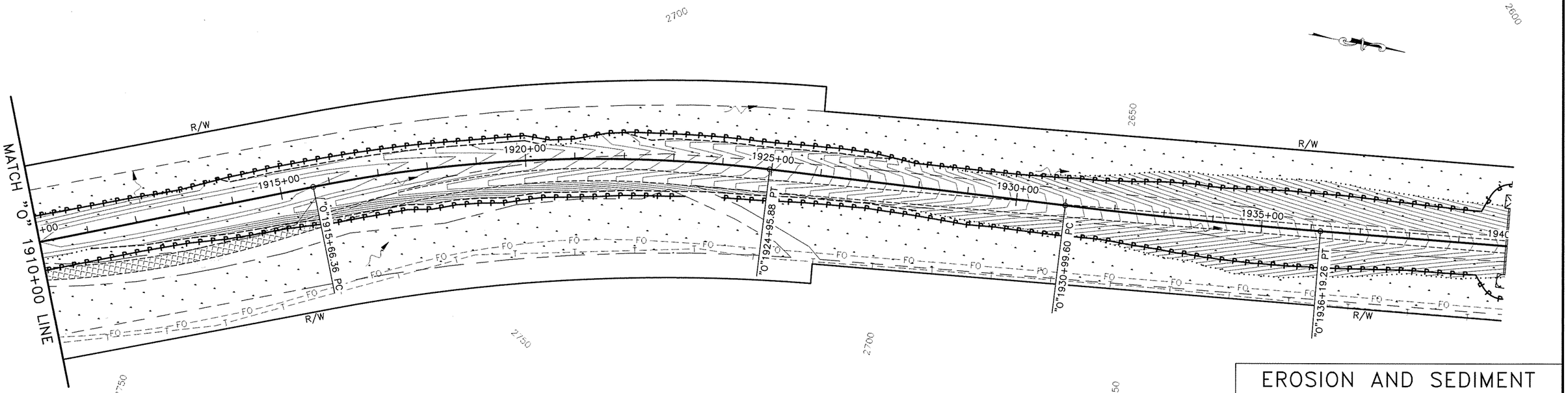
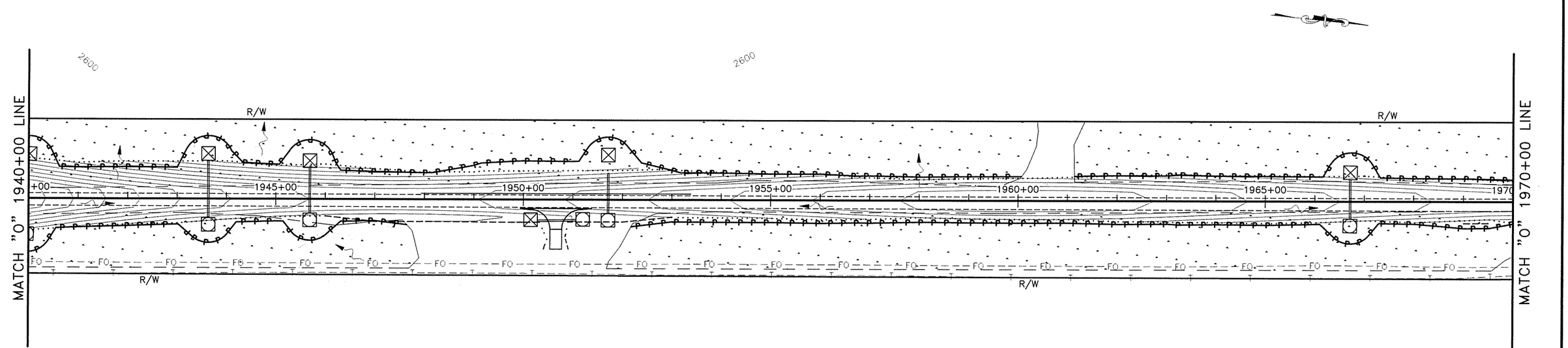
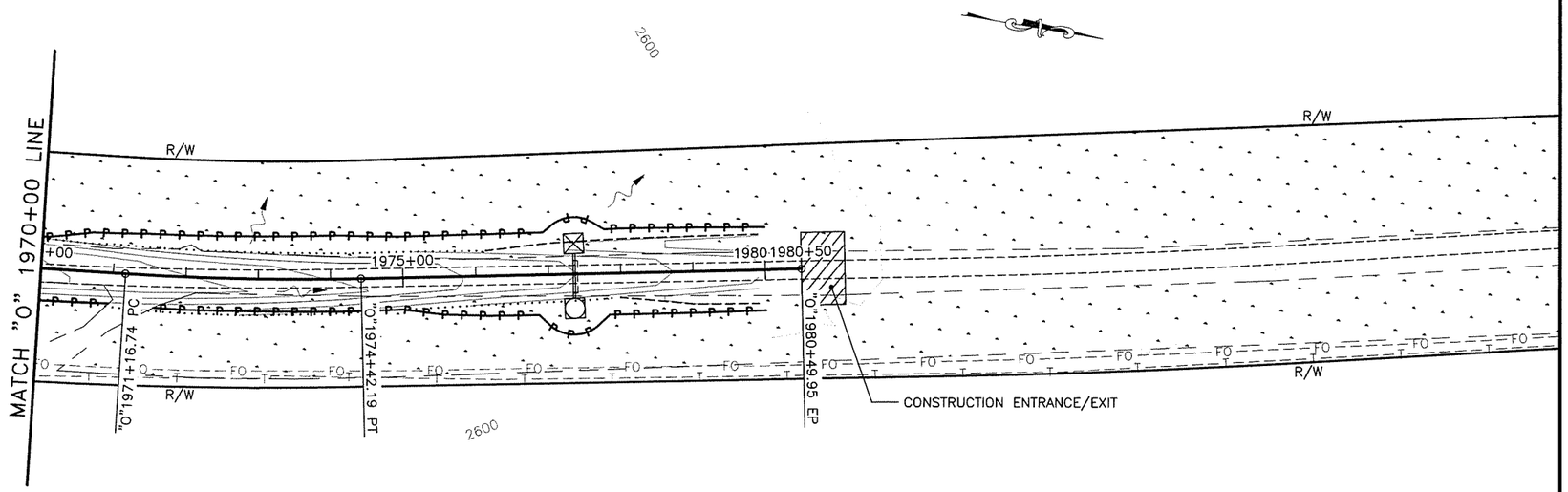


EROSION AND SEDIMENT CONTROL PLAN (7 OF 8)



NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	Q9	Q9



EROSION AND SEDIMENT CONTROL PLAN (8 OF 8)

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
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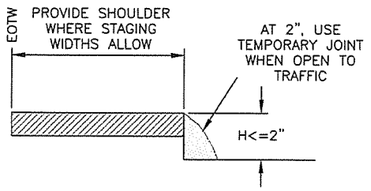
ADDENDUM NO. 1, ATTACHMENT NO.17

FILL SLOPES

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
1	03/04/2020	ADDENDUM #1	ALASKA	0713013/Z622530000	2019	T1	T2

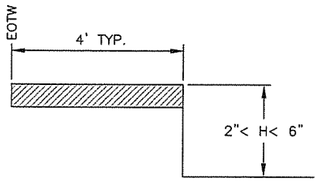
VERTICAL DROP-OFFS



CASE A

DROP-OFFS ≤2 INCHES
(PAVED SURFACES ONLY)

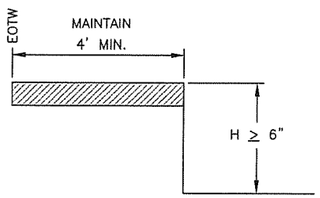
1. USE "UNEVEN LANES" (CW8-11) SIGNS FOR ALL DROP-OFFS IN BETWEEN TRAFFIC LANES.
2. LEAVE NO DROP-OFFS > 1.5" IN THE TRAFFIC LANE OR ACTIVE WHEEL TRACK.



CASE B

2"< DROP-OFFS < 6"
(ALL ROADWAY SURFACES)

1. PLACE CONES OR CANDLES FOR DROP-OFFS ≥ 4 FEET AND ≤ 30 FEET FROM THE EOTW.
2. USE DRUMS OR TYPE II BARRICADES FOR DROP-OFFS < 4 FEET FROM THE EOTW.

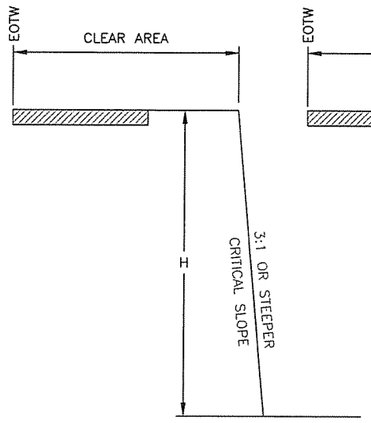


CASE C

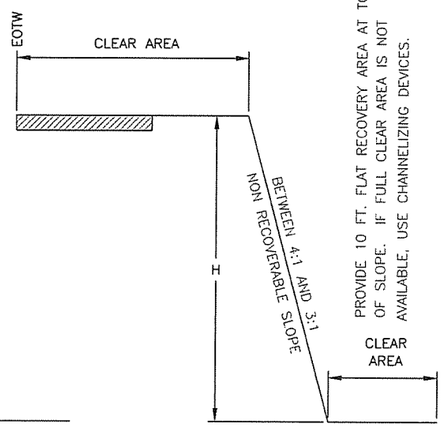
DROP-OFFS ≥6"
(ALL ROADWAY SURFACES
AND ROADSIDE SLOPES)

1. PLACE DRUMS OR TYPE II BARRICADES FOR DROP-OFFS ≤ 24" WITHIN THE CLEAR AREA.
2. PROVIDE PORTABLE CONCRETE BARRIER FOR DROP-OFFS >24" WITHIN 15 FEET OF THE EOTW. USE DRUMS OR TYPE II BARRICADES IF BEYOND 15 FEET.

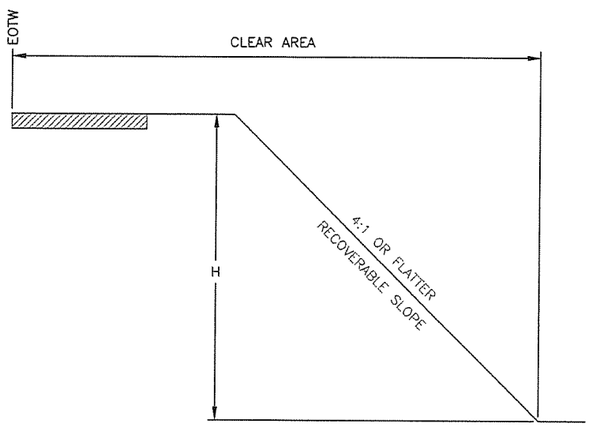
STEEPER THAN OR EQUAL TO 3:1



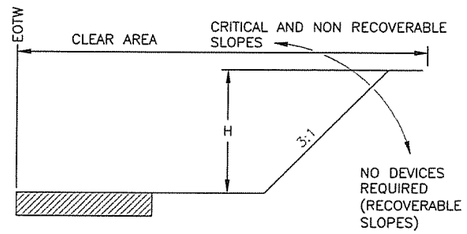
BETWEEN 4:1 AND 3:1



FLATTER THAN OR EQUAL TO 4:1



CUT SLOPES



EOTW = EDGE OF TRAVELED WAY

CLEAR AREA REQUIREMENTS

	LOW SPEED < = 35 MPH	INTERMEDIATE SPEED 40 MPH TO 45 MPH	HIGH SPEED ≥ = 50 MPH
RURAL	15'	24'	30'
URBAN	10' DITCH SECTIONS, OR 2' BEHIND CURB	15' DITCH CONDITIONS, OR 2' BEHIND CURB	15' DITCH CONDITIONS, OR 2' BEHIND CURB

CHANNELIZING DEVICE REQUIREMENTS FOR SLOPES 3:1 OR STEEPER WITHIN THE CLEAR AREA

	H <= 15'	H > 15'
< 2000 VPD LOW VOLUME	CANDLES OR CONES	TYPE II BARRICADES OR DRUMS
> 2000 VPD	TYPE II BARRICADE OR DRUMS	PORTABLE CONCRETE BARRIER OR TEMPORARY GUARDRAIL

TRAFFIC CONTROL NOTES:

1. USE THE EXISTING CROSS-SECTION (PRIOR TO CONSTRUCTION) AS A BASIS FOR DETERMINING WHEN CHANNELIZING DEVICES ARE NEEDED.
2. INSTALL CHANNELIZING DEVICES WHEN THE HORIZONTAL OR VERTICAL CURVATURE IS MADE MORE SEVERE.
3. INSTALL FLEXIBLE DELINEATORS WHEN ALL VEGETATION OVER 4 FEET HIGH IS CLEARED FROM FILL SLOPES THAT ARE 3:1 OR STEEPER IN THE CLEAR AREA.
4. USE PORTABLE CONCRETE BARRIER FOR WARRANTING CONDITIONS WHICH LAST LONGER THAN 3 DAYS. FOR CONDITIONS LASTING LESS THAN 3 DAYS, OTHER CHANNELIZING DEVICES MAY BE INSTALLED.
5. TERMINATE RUNS OF PORTABLE CONCRETE BARRIER USING THE FOLLOWING METHODS:
   - A) CONNECT TO A PORTABLE CRASH CUSHION, OR
   - B) PROVIDE A CONCRETE BARRIER WITH THRIE BEAM TRANSITION TO W-BEAM GUARDRAIL, TREATED WITH A PARALLEL TERMINAL (SEE SECTION 710).
   - C) FLARE THE ENDS OF THE PORTABLE CONCRETE BARRIER AWAY FROM THE ROADWAY AT A RATE OF 7:1 ON A COMPACTED SLOPE OF 6:1 OR FLATTER, OUTSIDE OF THE CLEAR AREA. INSTALL A SLOPING PORTABLE CONCRETE BARRIER END TREATMENT, OR
   - D) BURY IN THE BACKSLOPE.
6. TERMINATE THE RUNS OF TEMPORARY W-BEAM GUARDRAIL USING THE FOLLOWING METHODS:
   - A) PROVIDE A PARALLEL TERMINAL (SEE SECTION 710)
   - B) FLARE THE ENDS OF THE TEMPORARY GUARDRAIL AWAY FROM THE ROADWAY AT A RATE OF 6:1 ON A COMPACTED SLOPE OF 6:1 OR FLATTER OUTSIDE OF THE CLEAR AREA, TERMINATE WITH A STANDARD W-BEAM END SECTION, OR
   - C) BURY IN THE BACKSLOPE.

EQUIPMENT NOTES:

1. WHEN THERE IS ACTIVE, NONMOBILE CONSTRUCTION EQUIPMENT WITHIN THE CLEAR AREA, DELINEATE THE ROADSIDE WITH TRAFFIC CONES.
2. SEPARATE PROCEDURES ARE REQUIRED FOR MOBILE WORK ZONE OPERATIONS AND SHORT DURATION WORK OF LESS THAN 12 HOURS.

WINTER SHUTDOWN NOTES:

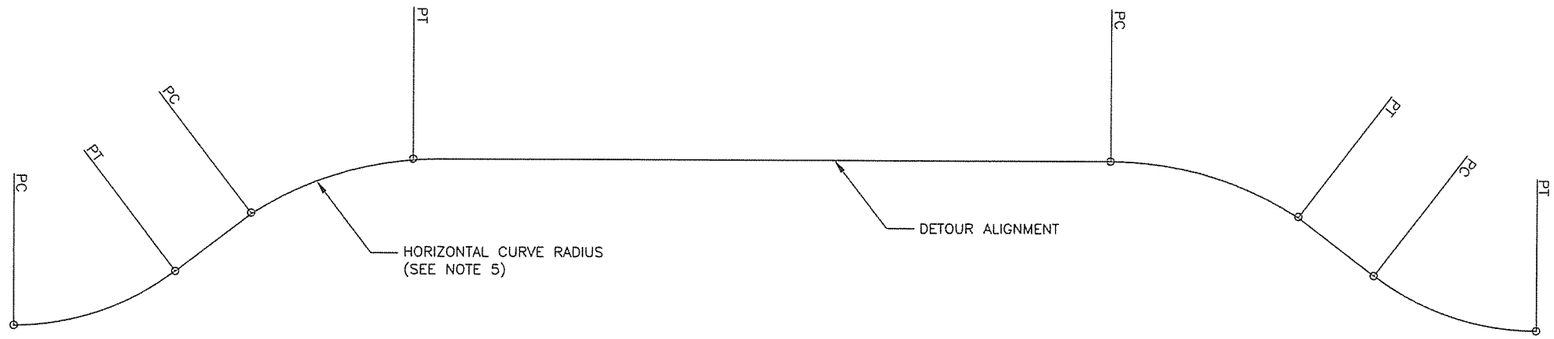
1. WHEN REQUIRED, USE CHANNELIZING DEVICES WHICH CAN BE MAINTAINED OVER WINTER.
2. NO CHANNELIZING DEVICES ARE REQUIRED IF:
   - A) CONSTRUCTION SLOPES ARE RECOVERABLE, AND
   - B) SLOPES ARE SMOOTH AND COMPACTED, AND
   - C) REQUIRED CLEAR AREA IS PROVIDED

STATE OF ALASKA 49TH DUSTIN HANNAFIOUS C.E. 14065 REGISTERED PROFESSIONAL ENGINEER

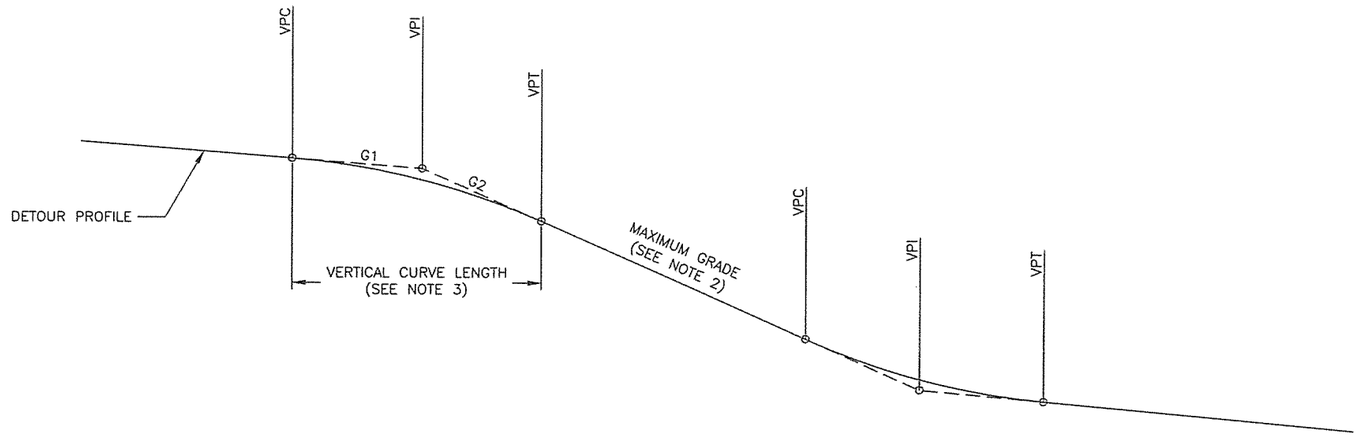
FILL SLOPES

NO.	DATE	REVISION
1	03/04/2020	ADDENDUM #1
3	03/13/2020	ADDENDUM #3

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	T2	T2



HORIZONTAL GEOMETRY REQUIREMENTS



PROFILE REQUIREMENTS

DETOUR NOTES:

1. HORIZONTAL AND VERTICAL GEOMETRY MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER TO ADJUST FOR EXISTING CONDITIONS.
2. THE MAXIMUM ALLOWABLE VERTICAL GRADE IS 8%
3. DETERMINE THE MINIMUM ALLOWABLE LENGTH OF VERTICAL CURVE BY MULTIPLYING THE ALGEBRAIC DIFFERENCE IN GRADES (G1–G2) BY THE APPLICABLE RATE OF VERTICAL CURVATURE RATE (K) GIVEN BELOW:
   - 3.1. FOR CREST VERTICAL CURVES K = 61
   - 3.2. FOR SAG VERTICAL CURVES K = 79
   - 3.3. THE ALGEBRAIC DIFFERENCE IN GRADE BETWEEN G1 AND G2 SHALL NOT EXCEED 7%
4. ALL WORK AND RESOURCES REQUIRED TO DEVELOP DETOUR PROFILES AND HORIZONTAL ALIGNMENTS ARE SUBSIDIARY TO PAY ITEM 643.0033.0000.
5. THE MINIMUM HORIZONTAL CURVE RADIUS IS 450'
6. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING AND SUBMITTING DETOUR HORIZONTAL ALIGNMENT AND VERTICAL PROFILE TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING DETOUR CONSTRUCTION.
7. OBTAIN THE ENGINEERS APPROVAL ON ALL TRAFFIC CONTROL PLANS PRIOR TO BEGINNING DETOUR CONSTRUCTION.
8. DETOUR LIMITS MUST STAY WITHIN THE RIGHT–OF–WAY.
9. THE CONTRACTOR IS ALLOWED TO CLEAR AND CONSTRUCT DETOURS ANYWHERE IN UPLANDS AND WITHIN PERMITTED BOUNDARIES. (3)
10. MINIMUM LANE WIDTH SHALL BE 14' WITH 2' SHOULDERS.
11. THE MINIMUM POSTED SPEED THROUGH THE PROJECT CORRIDOR SHALL BE 45 MPH. THE MINIMUM DETOUR CURVE RADIUS IS 450' (WHICH CORRESPONDS TO A 30 MPH DESIGN SPEED) 30 MPH ADVISORY CURVE WARNING SIGNS MUST BE POSTED IF THE DETOUR IS CONSTRUCTED USING THE MINIMUM HORIZONTAL DETOUR CURVE RADIUS.
12. REMOVE DETOUR(S) BEFORE PROJECT COMPLETION. SEEDING OF DISTURBED AREAS IS SUBSIDIARY TO PAY ITEM 643.0033.0000. (3)

DETOUR REQUIREMENTS

STATE OF ALASKA 49TH
DUSTIN HANDAFIOUS
C.E. 14055
5/13/20
REGISTERED PROFESSIONAL ENGINEER

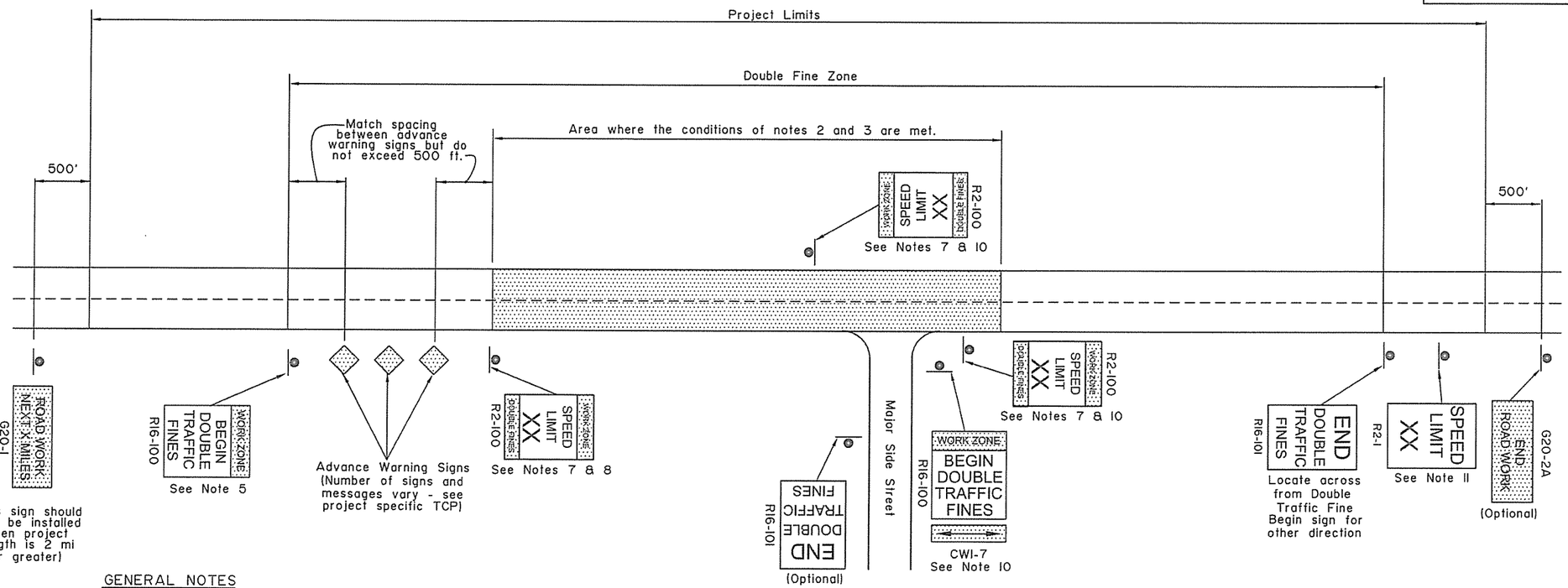
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644–2000 CERT. OF AUTH. NO. AECC569
C:\pwworking\west01\d0483514\Detour Sheet–T2 Fri, Mar/13/20 11:02am

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	V1	V21

C-04.12

SHEET 1 of 1



GENERAL NOTES

1. Signs are shown for one direction only (with one exception). Signs for the other direction mirror those shown.
2. Double fine signs shall be used only where one or more of the following conditions exist:
   a. Active work areas (where road workers and/or machines are presently working on or adjacent to a road)
   b. Detours on new temporary roads built for that purpose (this does not include detours on existing streets)
   c. Sections of paved roads where pavement has been removed.
   d. Roads being paved where unmatched asphalt lifts result in a vertical lip between lanes.
3. Double fine signs shall be confined to the areas where the above conditions exist, with the following exceptions:
   a. If the project is 2 miles or shorter in length, the entire project may be posted for double fines when the above conditions exist on any part of the project.
   b. When the above conditions exist at multiple locations separated by less than 2 miles, the locations and the intervening segments may be posted as a single double fine zone.
4. Double fine signs shall be removed or covered when work activity ceases for more than two days and conditions b, c, or d of note 2 are not met.
5. The R16-100 "BEGIN" sign may be used in place of the first advance warning sign. However, when this is done, the appropriate advance warning sign must be reinstalled when the double fine sign is taken down or covered.
6. When a double fine zone is longer than 2 miles, work zone speed limit signs shall be posted at spacings not greater than 2 miles within the double fine zone.
7. "Work zone speed limit signs", as used here, refer either to 1) R2-100 signs or 2) standard R2-1 regulatory speed limit signs with CW20-102 "DOUBLE FINES" plates mounted below.
8. The limit shown on work zone speed limit signs shall be either the existing limit before construction or, if a work zone speed limit order has been approved in accordance with ADOT&PF Procedure 05.05.020 PDR, a reduced limit.
9. All existing regulatory speed limit signs within double fine zones shall either be replaced with R2-100 signs or supplemented with CW20-102 plates.
10. Signs shall be installed at major intersections within the double fine zone to warn entering drivers of double fines. This may be done with a R16-100 sign with a CWI-7 arrow panel on the side street or with two work zone speed limit signs on the main street on either side of the intersection. Use of R16-100 signs on side streets eliminates the need for "Road Work Ahead" signs on those streets. If the speed limit has been reduced, the two work zone speed limit signs are mandatory.
11. At the end of each double fine zone, install an R2-1 sign showing the speed limit for the road beyond the double fine zone.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

LOCATION OF DOUBLE TRAFFIC FINE SIGNS

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher
Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

STATE OF ALASKA 49TH DUSTIN HANNAFIOUS C.E. 14065 10/8/19 REGISTERED PROFESSIONAL ENGINEER

STANDARD PLAN C-04.12

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\b2253_V_Standard Details-c04.12 Tue, Oct/08/19 04:00pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V2	V21

D-04.21

SHEET 1 of 4

Minimum & Maximum Cover For 2 2/3" x 1/2" Aluminum Pipe

GAGE	0.060"		0.075"		0.105"		0.135"		0.164"	
Dia. (in)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)
12	12	100+	12	100+	12	100+	12	100+	12	100+
15	12	94	12	100+	12	100+	12	100+	12	100+
18	12	75	12	94	12	100+	12	100+	12	100+
21	12	65	12	82	12	100+	12	100+	12	100+
24	12	56	12	71	12	99	12	100+	12	100+
27	12	48	12	63	12	89	12	100+	12	100+
30			12	56	12	79	12	100+	12	100+
36			12	47	12	66	12	85	12	100+
42			12	55	12	56	12	73	12	100+
48			12	47	12	49	12	63	12	78
54					15	43	15	56	15	69
60							15	50	15	62
66							18	44	18	56
72									18	45

Minimum & Maximum Cover For 3" x 1" Aluminum Pipe

GAGE	0.060"		0.075"		0.105"		0.135"		0.164"	
Dia. (in)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)
30	12	52	12	65						
36	12	43	12	54	12	100+	12	100+	12	100+
42	12	36	12	46	12	65	12	100+	12	100+
48	12	32	12	40	12	57	12	73	12	100+
54	15	28	15	35	15	50	12	65	12	100+
60	15	25	15	32	15	45	15	58	15	72
66	18	23	18	28	18	41	18	53	18	65
72	18	21	18	26	18	37	18	48	18	59
78			21	24	21	34	21	44	21	55
84					21	31	21	41	21	57
90					24	29	24	38	21	47
96					24	27	24	36	24	44
102							24	33	24	41
108							24	31	24	39
114									24	37
120									24	35

Minimum & Maximum Cover For 9" x 2 1/2" Aluminum Structural Plate Pipe *

GAGE	0.100"		0.125"		0.150"		0.175"		0.200"		0.225"		0.250"	
Dia. (in)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)	Min. (in)	Max. (Ft)
60	12	29 / 31	12	38 / 45	12	49 / 60	12	58 / 70	12	58 / 81	12	58 / 92	12	58 / 100+
66	12	26 / 28	12	35 / 41	12	44 / 54	12	53 / 64	12	53 / 74	12	53 / 84	12	53 / 94
72	13	24 / 25	12	32 / 37	12	41 / 50	12	48 / 58	12	48 / 67	12	48 / 77	12	48 / 86
78	14	22 / 23	12	29 / 35	12	37 / 46	12	45 / 54	12	45 / 62	12	45 / 71	12	45 / 79
84	15	20 / 22	13	27 / 32	12	35 / 42	12	41 / 50	12	41 / 58	12	41 / 66	12	41 / 73
90	16	19 / 20	14	25 / 30	13	32 / 40	12	39 / 47	12	39 / 54	12	39 / 61	12	39 / 68
96	17	18 / 19	15	24 / 28	14	30 / 37	13	36 / 44	12	36 / 50	12	36 / 57	12	36 / 64
102	18	17 / 18	16	22 / 26	15	29 / 35	14	34 / 41	13	34 / 47	13	34 / 54	13	34 / 60
108	19	16 / 17	17	21 / 25	16	27 / 33	14	32 / 39	14	32 / 45	14	32 / 51	14	32 / 57
114	20	15 / 16	18	20 / 23	16	25 / 31	15	30 / 37	15	30 / 42	15	30 / 48	15	30 / 54
120	21	14 / 15	19	19 / 22	17	24 / 30	16	29 / 35	15	29 / 40	15	29 / 46	15	29 / 51
126	22	13 / 14	20	18 / 21	18	23 / 28	17	27 / 33	16	27 / 38	16	27 / 44	16	27 / 49
132	23	13 / 14	21	17 / 20	19	22 / 27	18	26 / 32	17	26 / 37	17	26 / 42	17	26 / 47
138	24	12 / 13	22	16 / 19	20	21 / 26	18	25 / 30	18	25 / 35	18	25 / 40	18	25 / 44
144	25	12 / 12	22	16 / 18	21	20 / 25	19	24 / 29	18	24 / 33	18	24 / 38	18	24 / 43
150			23	15 / 18	21	19 / 24	20	23 / 28	19	23 / 32	19	23 / 36	19	23 / 41
156			24	14 / 17	22	18 / 23	21	22 / 27	20	22 / 31	20	22 / 35	20	22 / 39
162					23	18 / 22	21	21 / 26	21	21 / 30	21	21 / 34	21	21 / 38
168					24	17 / 21	22	20 / 25	21	20 / 29	21	20 / 33	21	20 / 36
174					25	17 / 20	23	20 / 24	22	20 / 28	22	20 / 31	22	20 / 35
180							24	19 / 23	23	19 / 27	23	19 / 30	23	19 / 34

*Longitudinal seams use (5 1/3) 3/4" dia. bolts per foot.

58 — Upper figure for pipe with aluminum bolts.
100+ — Lower figure for pipe with galvanized steel bolts.
(FOR TABLE ABOVE ONLY.)

GENERAL NOTES:

1. All material and workmanship shall be in accordance with the State of Alaska, Standard Specifications for Highway Construction.
2. The contractor shall select only pipes that meet specific height of cover criteria shown on the plans or in the special provisions.
3. No more than one type of pipe may be used on any single installation or installation grouping.
4. All structural plate pipes shall be placed on a pre-shaped foundation conforming to the depth of the bottom plates with clearance for assembling to the adjacent plates allowed.
5. See Standard Drawing "Culvert Pipe & Arch Installation Details" for foundation and structural backfill details.
6. Minimum cover shall be measured from the top of pipe to the top of rigid pavement or to the top of flexible pavement subgrade. In all cases, the minimum cover shall not be less than 12". Minimum cover during construction shall be that required to protect the pipe from damage or deflecton.
7. These tables have been developed for an H-20 live load and for compacted soil weighing 120 lbs. per cubic foot or less. If compacted soil cover exceeds 120 lbs. per cubic foot, the contractor shall use the depth of cover shown in the plans for the specific pipe. Where compacted soil cover exceeds 120 lbs. per cubic foot and no specific cover requirements are provided in the plans, the contractor shall determine the required minimum pipe cover in accordance with Section 12 of the 2000 AASHTO "LRFD Bridge Design Specifications".

CORRUGATED CIRCULAR ALUMINUM PIPE

CORRUGATED ALUMINUM PIPE-ARCH

Minimum & Maximum Cover For 2 2/3" x 1/2" Aluminum Pipe-Arch

Span x Rise (In. x In.)	Corner Radius (In)	Minimum Gage (In)	Min. Cover (In)	Max. Cover (Ft) 2 Tons Corner Bearing Pressure	Max. Cover (Ft) 3 Tons Corner Bearing Pressure ②
17 x 13	3	0.060	12	13	20
21 x 15	3	0.060	12	12	19
24 x 18	3	0.060	12	11	16
28 x 20	3	0.075	12	10	16
35 x 24	3	0.075	12	9	14
42 x 29	3 1/2	0.105	12	7	13
49 x 33	4	0.105	15	6	12
57 x 38	5	0.135	15	6	12
64 x 43	6	0.135	18	6	12
71 x 47	7	0.164	18	6	12

Minimum & Maximum Cover For 3" x 1" Aluminum Pipe-Arch

Span x Rise (In. x In.)	Corner Radius (In)	Minimum Gage (In)	Min. Cover (In)	Max. Cover (Ft) 2 Tons Corner Bearing Pressure	Max. Cover (Ft) 3 Tons Corner Bearing Pressure ②
40 x 31	5	0.075	30	8	12
46 x 36	6	0.075	24	8	13
53 x 41	7	0.075	24	8	13
60 x 46	8	0.075	24	13	20
66 x 51	9	0.075	18	13	20
73 x 55	12	0.075	18	16	24
81 x 59	14	0.105	18	14	22
87 x 63	14	0.105	18	13	20
95 x 67	16	0.105	18	12	18
103 x 71	16	0.135	24	11	17
112 x 75	18	0.164	24	10	16
117 x 79	18	0.164	24	10	15

Minimum & Maximum Cover For 9" x 2½" Aluminum Structural Plate Pipe-Arch*

Span x Rise (Ft-In x Ft-In)	Corner Radius (In)	Minimum Gage (In)	Min. Cover (Ft)	Max. Cover in Feet For Soil Bearing Capacity of: 2 Tons/Ft²	3 Tons/Ft²
5 - 11 x 5 - 5	31.8	0.100	2	24**	24**
6 - 11 x 5 - 9	31.8	0.100	2	22**	22**
7 - 3 x 5 - 11	31.8	0.100	2	20**	20**
7 - 9 x 6 - 0	31.8	0.100	2	28**	18 **
8 - 5 x 6 - 3	31.8	0.100	2	17 **	17 **
9 - 3 x 6 - 5	31.8	0.100	2	15 **	15 **
10 - 3 x 6 - 9	31.8	0.100	2	14 **	14 **
10 - 9 x 6 - 10	31.8	0.100	2	13 **	13 **
11 - 5 x 7 - 1	31.8	0.100	2	12 **	12 **
12 - 7 x 7 - 5	31.8	0.125	2	14	16 **
12 - 11 x 7 - 6	31.8	0.150	2	13	14 **
13 - 1 x 8 - 2	31.8	0.150	2	13	18 **
13 - 11 x 8 - 5	31.8	0.150	2	12	17 **
14 - 8 x 9 - 8	31.8	0.175	2	12	18
15 - 4 x 10 - 0	31.8	0.175	2	11	17
16 - 1 x 10 - 4	31.8	0.200	2	10	16
16 - 9 x 10 - 8	31.8	0.200	2.17	10	15
17 - 3 x 11 - 0	31.8	0.225	2.25	10	15
18 - 0 x 11 - 4	31.8	0.255	2.25	9	14
18 - 8 x 11 - 8	31.8	0.250	2.33	9	14

*Longitudinal seams use (5 1/3) 3/4" dia. bolts per foot.
**Fill limited by the seam strength of the bolts. 3/4" dia. bolts per foot.

METAL THICKNESSES & GAGES

ALUMINUM	GAGE NO. (For Info Only)
0.060	16
0.075	14
0.105	12
0.135	10
0.164	8

② This column shall not be used unless specified on the plans or approved by the Regional Geotechnical Engineer.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PIPE AND ARCH TABLES (ALUMINUM PIPE)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review By: Date:

Next Code and Standards Review date: 02/08/2029

STANDARD PLAN D-04.21 (1 OF 4)

RUSSELL M. JOHNSON C.E. 9953 REGISTERED PROFESSIONAL ENGINEER STATE OF ALASKA 49TH

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V3	V21

D-04.21

Minimum & Maximum Cover For 2 2/3" x 1/2" Steel Pipe

GAGE	0.064"		0.079"		0.109"		0.138"		0.168"	
Dia. (In)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)
12	12	100+	12	100+	12	100+	12	100+	12	100+
15	12	100+	12	100+	12	100+	12	100+	12	100+
18	12	100+	12	100+	12	100+	12	100+	12	100+
21	12	100+	12	100+	12	100+	12	100+	12	100+
24	12	100+	12	100+	12	100+	12	100+	12	100+
27	12	100+	12	100+	12	100+	12	100+	12	100+
30	12	99	12	100+	12	100+	12	100+	12	100+
36	12	83	12	100+	12	100+	12	100+	12	100+
42	12	71	12	88	12	100+	12	100+	12	100+
48	12	62	12	77	12	100+	12	100+	12	100+
54			12	66	12	93	12	100+	12	100+
60					12	79	12	100+	12	100+
66					12	68	12	88	12	100+
72							12	75	12	93
78									12	79
84									12	66

Minimum & Maximum Cover For 3" x 1" Steel Pipe

GAGE	0.064"		0.079"		0.109"		0.138"		0.168"	
Dia. (In)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)
36	12		12		12	100+	12	100+	12	100+
42	12		12		12	100+	12	100+	12	100+
48	12		12	76	12	100+	12	100+	12	100+
54	12	63	12	79	12	100+	12	100+	12	100+
60	12	56	12	71	12	99	12	100+	12	100+
66	12	52	12	64	12	90	12	100+	12	100+
72	12	47	12	59	12	82	12	100+	12	100+
78	12	44	12	54	12	77	12	98	12	100+
84	12	41	12	51	12	71	12	92	12	100+
90	12	37	12	47	12	67	12	86	12	100+
96	12	35	12	44	12	62	12	80	12	98
102	18	33	18	42	18	59	18	76	18	93
108			18	40	18	55	18	71	18	87
114			18	36	18	51	18	66	18	80
120			18	34	18	46	18	61	18	75
126					18	44	18	56	18	70
132					18	41	18	53	18	64
138					18	37	18	49	18	60
144							18	44	18	55
150									18	52

Minimum & Maximum Cover For 5" x 1" Steel Pipe*

GAGE	0.064"		0.079"		0.109"		0.138"		0.168"	
Dia. (In)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)
36	12	81	12	90	12	100+	12	100+	12	100+
42	12	71	12	77	12	100+	12	100+	12	100+
48	12	62	12	68	12	100+	12	100+	12	100+
54	12	56	12	70	12	98	12	100+	12	100+
60	12	50	12	63	12	88	12	100+	12	100+
66	12	46	12	57	12	80	12	100+	12	100+
72	12	42	12	52	12	73	12	95	12	100+
78	12	39	12	48	12	68	12	87	12	100+
84	12	36	12	45	12	63	12	81	12	99
90	12	33	12	42	12	59	12	76	12	93
96	12	31	12	39	12	55	12	71	12	87
102	18	29	18	37	18	52	18	67	18	82
108			18	35	18	49	18	63	18	77
114			18	32	18	45	18	58	18	71
120			18	30	18	41	18	54	18	66
126					18	39	18	50	18	62
132					18	36	18	47	18	57
138					18	33	18	43	18	53
144							18	39	18	49
150									19	47

*Table for pipe with helical lockseams or helical welded seams ONLY.

Minimum & Maximum Cover For 6" x 2" Steel Structural Plate Pipe**

GAGE	ALL	0.111"	0.140"	0.170"	0.188"	0.218"	0.249"	0.280"
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
60	12	46	68	90	100+	100+	100+	100+
66	12	42	62	81	93	100+	100+	100+
72	12	38	57	75	86	100+	100+	100+
78	12	35	52	69	79	95	100+	100+
84	12	33	49	64	73	88	100+	100+
90	12	31	45	60	68	82	97	100+
96	12	29	43	56	64	77	91	100+
102	18	27	40	52	60	73	86	94
108	18	25	38	50	57	69	81	88
114	18	24	36	47	54	65	77	84
120	18	23	34	45	51	62	73	80
126	18	22	32	42	49	59	69	76
132	18	21	31	40	46	56	66	72
138	18	20	29	39	44	54	63	69
144	18	19	28	37	43	51	61	66
150	24	18	27	36	41	49	58	64
156	24	17	26	34	39	47	56	61
162	24	17	25	33	38	46	54	59
168	24	16	24	32	36	44	52	57
174	24	16	23	31	35	42	50	55
180	24	15	22	30	34	41	48	53
186	24	15	22	29	33	40	47	51
192	24		21	28	32	38	45	50
198	30		20	27	31	37	44	48
204	30		20	26	30	36	43	47
210	30		19	25	29	35	41	45
216	30			25	28	34	40	44
222	30			24	27	33	39	43
228	30			23	27	32	38	42
234	30			23	26	31	37	41
240	30				25	31	36	40
246	36				25	30	35	39
252	36					29	34	38
258	36					28	34	37
264	36					28	33	36
270	36					27	32	35
276	36						31	34
282	36						31	34
288	42						30	33
294	42							32
300	42							32
306	42							31
312	42							30

**Longitudinal seams use (4) 3/4" dia. bolts per foot.

GENERAL NOTES

1. All material and workmanship shall be in accordance with the State of Alaska, Standard Specifications for Highway Construction.
2. The contractor shall select only pipes that meet specific height of cover criteria shown on the plans or in the special provisions.
3. No more than one type of pipe may be used on any single installation or installation grouping.
4. All structural plate pipes shall be placed on a pre-shaped foundation conforming to the depth of the bottom plates with clearance for assembling to the adjacent plates allowed.
5. See Standard Drawing "Culvert Pipe & Arch Installation Details" for foundation and structural backfill details.
6. Minimum cover shall be measured from the top of pipe to the top of rigid pavement or to the top of flexible pavement subgrade. In all cases, the minimum cover shall not be less than 12". Minimum cover during construction shall be that required to protect the pipe from damage or deflecton.
7. These tables have been developed for an H-20 live load and for compacted soil weighing 120 lbs. per cubic foot or less. If compacted soil cover exceeds 120 lbs. per cubic foot, the contractor shall use the depth of cover shown in the plans for the specific pipe. Where compacted soil cover exceeds 120 lbs. per cubic foot and no specific cover requirements are provided in the plans, the contractor shall determine the required minimum pipe cover in accordance with Section 12 of the 2000 AASHTO "LRFD

CORRUGATED CIRCULAR STEEL PIPE

CORRUGATED STEEL PIPE-ARCH

Minimum & Maximum Cover For 2 2/3" x 1/2" Steel Pipe-Arch

Span x Rise (In. x In.)	Corner Radius (In)	Minimum Gage (In)	Min. Cover (In)	Max. Cover (Ft) 2 Tons Corner Bearing Pressure	Max. Cover (Ft) 3 Tons Corner Bearing Pressure ⓒ
17 x 13	3	0.064	12	16	18
21 x 15	3	0.064	12	15	14
24 x 18	3	0.064	12	15	13
28 x 20	3	0.064	12	15	11
35 x 24	3	0.064	12	15	7
42 x 29	3 1/2	0.064	12	15	7
49 x 33	4	0.079	12	15	6
57 x 38	5	0.109	12	15	8
64 x 43	6	0.109	12	15	9
71 x 47	7	0.138	12	15	10
77 x 52	8	0.168	12	15	10
83 x 57	9	0.168	12	15	10

Minimum & Maximum Cover For 3" x 1" Steel Pipe-Arch

Span x Rise (In. x In.)	Corner Radius (In)	Minimum Gage (In)	Min. Cover (In)	Max. Cover (Ft) 2 Tons Corner Bearing Pressure	Max. Cover (Ft) 3 Tons Corner Bearing Pressure ⓒ
40 x 31	5	0.079	12	25	12
46 x 36	6	0.079	12	25	13
53 x 41	7	0.079	12	25	13
60 x 46	8	0.079	15	25	13
66 x 51	9	0.079	15	25	13
73 x 55	12	0.079	18	24	16
81 x 59	14	0.079	18	21	17
87 x 63	14	0.079	18	20	16
95 x 67	16	0.079	18	20	17
103 x 71	16	0.079	18	20	15
112 x 75	18	0.079	21	20	16
117 x 79	18	0.109	21	19	15
128 x 83	18	0.138	24	19	14
137 x 87	18	0.138	24	19	13
142 x 91	18	0.138	24	19	12
150 x 96	18	0.138	30	19	
157 x 96	18	0.138	30	19	
164 x 105	18	0.138	30	19	
171 x 110	18	0.138	30	19	

Minimum & Maximum Cover For 5" x 1" Steel Pipe-Arch

Span x Rise (In. x In.)	Corner Radius (In)	Minimum Gage (In)	Min. Cover (In)	Max. Cover (Ft) 2 Tons Corner Bearing Pressure	Max. Cover (Ft) 3 Tons Corner Bearing Pressure ⓒ
40 x 31	5	0.109	12	25	12
46 x 36	6	0.109	15	25	13
53 x 41	7	0.109	15	25	13
60 x 46	8	0.109	18	25	13
66 x 51	9	0.109	18	25	13
73 x 55	12	0.109	18	24	16
81 x 59	14	0.109	18	21	17
87 x 63	14	0.109	18	20	16
95 x 67	16	0.109	18	20	17
103 x 71	16	0.109	18	20	15
112 x 75	18	0.109	21	20	16
117 x 79	18	0.109	21	19	15
128 x 83	18	0.109	24	19	14
137 x 87	18	0.109	24	19	13
142 x 91	18	0.109	24	19	12
150 x 96	18	0.138	30	19	
157 x 96	18	0.138	30	19	
164 x 105	18	0.138	30	19	
171 x 110	18	0.138	30	19	

NS = Not Suitable

Minimum & Maximum Cover For 6" x 2" Steel Structural Plate Pipe-Arch**

Span x Rise (Ft-In x Ft-In)	Corner Radius (In)	Minimum Gage (In)	2 Tons Corner Bearing Pressure Min. Cover (In)	2 Tons Corner Bearing Pressure Max. Cover (Ft)	3 Tons Corner Bearing Pressure ⓒ Min. Cover (In)	3 Tons Corner Bearing Pressure ⓒ Max. Cover (Ft)
6-1 x 4-7	18	0.111	18	16	12	24
7-0 x 5-1	18	0.111	18	14	12	21
7-11 x 5-7	18	0.111	18	13	12	19
8-10 x 6-1	18	0.111	24	11	18	17
9-9 x 6-7	18	0.111	24	10	18	15
10-11 x 7-1	18	0.111	24	9	18	14
11-10 x 7-7	18	0.111	24	7	18	13
12-10 x 8-4	18	0.111	30	6	24	12
14-1 x 8-9	18	0.111	30	5	24	11
15-4 x 9-3	18	0.111	NS	NS	24	10
15-10 x 9-10	18	0.111	NS	NS	24	9
16-7 x 10-1	18	0.111	NS	NS	24	9
13-3 x 9-4	31	0.111	24	13	24	17
14-2 x 9-10	31	0.111	24	12	24	16
15-4 x 10-4	31	0.111	24	11	24	15
16-3 x 10-10	31	0.111	24	11	24	14
17-2 x 11-4	31	0.111	30	10	30	13
18-1 x 11-10	31	0.111	30	10	30	12
19-3 x 12-4	31	0.111	30	9	30	13
19-11 x 12-10	31	0.140	30	9	30	13
20-7 x 13-2	31	0.140	36	7	36	13

ⓒ This column shall not be used unless specified on the plans or approved by the Region Geotechnical Engineer.

**Longitudinal seams use (4) 3/4" dia. bolts per foot.

METAL THICKNESSES & GAGES

STEEL		GAGE NO. (For Info Only)
ZINC COATED	UNCOATED	
0.064	0.0598	16
0.079	0.0747	14
0.109	0.1047	12
0.138	0.1345	10
0.168	0.1644	8
0.188	0.1838	7
0.218	0.2145	5
0.249	0.2451	3
0.280	0.2758	1

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PIPE AND ARCH TABLES (STEEL PIPE)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review By: Date:

Next Code and Standards Review date: 02/08/2029

STATE OF ALASKA 49TH RUSSELL M. JOHNSON C.E. 9883 REGISTERED PROFESSIONAL ENGINEER

STANDARD PLAN D-04.21 (2 OF 4)

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWORKING\west01\d0483514\62253_V_Standard Details-d04.21b Tue, Oct/08/19 04:00pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V4	V21

D-04.21

Maximum Cover for Type S Corrugated Polyethelene Pipe	
Size (in.)	Max. Cover (ft.)
12	30.0
15	30.0
18	30.0
24	30.0
30	30.0
36	30.0
40	20.0
48	20.0

GENERAL NOTES

1. All materials and workmanship shall be in accordance with the State of Alaska Standard Specifications for Highway Construction.
2. For foundation and structural backfill details see Standard Drawing "Culvert Pipe & Arch Installation Details".
3. Pipe cover height is measured from top of the pipe to top of rigid pavement, or to the top of subgrade for flexible pavement. In all cases the minimum cover shall be no less than 2 ft. Where loads traverse the culvert during construction minimum cover shall be no less than 4 ft.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PIPE AND ARCH TABLES
(PLASTIC PIPE)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review By: Date:

Next Code and Standards Review date: 02/08/2029

STANDARD PLAN D-04.21
(3 OF 4)

STATE OF ALASKA 49TH RUSSELL M. JOHNSON C.E. 9863 REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\62253_V_Standard Details-d04.21c Tue, Oct/08/19 04:00pm

NO.	DATE	REVISION

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	V5	V21

ALUMINUM SPIRAL RIB PIPE

Minimum & Maximum Cover For Aluminum Spiral Rib Circular Pipe*

GAGE	0.060"		0.075"		0.105"		0.135"	
Dia. (In)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)
12	24	35	24	50				
18	24	34	24	49				
24	24	25	24	36	24	63	24	82
30	24	19	24	28	24	50	24	65
36	24	15	24	24	24	41	24	54
42			24	19	24	35	24	46
48			24	17	24	30	24	40
54			24	14	24	27	24	35
60			24	12	24	24	24	30

*¾ x ¾ x 7½ in. or ¾ x 1 x 1½ in. Corrugations

Minimum & Maximum Cover For Aluminum Spiral Rib Pipe-Arch*

		Soil Corner Bearing Capacity of 2 Tons/ s.f.		
		0.060"	0.075"	0.105"
Span x Rise (In. x In.)	Min. Cover (In.)	Max. Cover (ft.)	Max. Cover (ft.)	Max. Cover (ft.)
20 x 16	12	13		
23 x 19	12	14		
27 x 21	12	13		
33 x 26	12	13		
40 x 31	12	13		
46 x 36	12	14		
53 x 41	18		13	
60 x 46	18		20	
66 x 51	18		21	
73 x 55	18			21
81 x 59	18			17
87 x 63	18			17
95 x 67	18			17

*¾ x ¾ x 7½ in. or ¾ x 1 x 1½ in. Corrugations

STEEL SPIRAL RIB PIPE

Minimum & Maximum Cover For Steel and Aluminized Steel Spiral Rib Circular Pipe*

GAGE	0.064"		0.079"		0.109"		0.138"**	
Dia. (In)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)	Min. (In)	Max. (Ft)
18	12							
24	12	51	12	72	12	121		
30	12	41	12	58	12	97		
36	12	34	12	48	12	81		
42	12	29	12	41	12	69		
48	12	26	12	36	12	61		
54	18	23	18	32	18	54		
60	18	21	18	29	18	49	18	73
66	18	19	18	26	18	44	18	65
72			18	24	18	40	18	59
78			24	22	24	37	24	55
84			24	21	24	35	24	52
90					24	32	24	47
96					24	30	24	44
102					30	29	30	43
108					30	27	30	41

*¾ x ¾ x 7½ in. or ¾ x 1 x 1½ in. Corrugations
**¾ x ¾ x 7½ in. Corrugations Only.

Minimum & Maximum Cover For Steel Spiral Rib Arch-Pipe*

		Soil Corner Bearing Capacity of 2 Tons/ s.f.		
		0.064"	0.079"	0.109"
Span x Rise (In. x In.)	Min. Cover (In.)	Max. Cover (ft.)	Max. Cover (ft.)	Max. Cover (ft.)
20 x 16	12	13		
23 x 19	12	14		
27 x 21	12	13		
33 x 26	12	13		
40 x 31	12	13		
46 x 36	12	14		
53 x 41	18		13	
60 x 46	18		20	
66 x 51	18		21	
73 x 55	18			21
81 x 59	18			17
87 x 63	18			17
95 x 67	18			17

*¾ x ¾ x 7½ in. or ¾ x 1 x 1½ in. Corrugations

GENERAL NOTES

1. All material and workmanship shall be in accordance with the State of Alaska, Standard Specifications for Highway Construction.
2. The contractor shall select only pipes that meet specific height of cover criteria shown on the plans or in the special provisions.
3. No more than one type of pipe may be used on any single installation or installation grouping.
4. All structural plate pipes shall be placed on a pre-shaped foundation conforming to the depth of the bottom plates with clearance for assembling to the adjacent plates allowed.
5. See Standard Drawing "Culvert Pipe & Arch Installation Details" for foundation and structural backfill details.
6. Minimum cover shall be measured from the top of pipe to the top of rigid pavement or to the top of flexible pavement subgrade. In all cases, the minimum cover shall not be less than 12". Minimum cover during construction shall be that required to protect the pipe from damage or deflecton.
7. These tables have been developed for an H-20 live load and for compacted soil weighing 120 lbs. per cubic foot or less. If compacted soil cover exceeds 120 lbs. per cubic foot, the contractor shall use the depth of cover shown in the plans for the specific pipe. Where compacted soil cover exceeds 120 lbs. per cubic foot and no specific cover requirements are provided in the plans, the contractor shall determine the required minimum pipe cover in accordance with Section 12 of the 2000 AASHTO "LRFD Bridge Design Specifications".

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PIPE AND ARCH TABLES (SPIRAL RIB PIPE)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

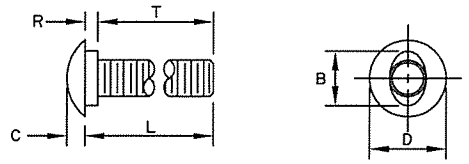
Next Code and Standards Review date: 02/08/2029

STATE OF ALASKA 49TH RUSSELL M. JOHNSON CE 9963 REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AEC0569
C:\PWWORKING\west01\d0483514\62253_V_Standard Details-d04.21d Tue, Oct/08/19 04:00pm

NO.	DATE	REVISION

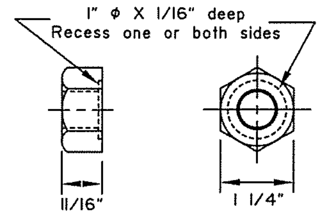
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	V6	V21



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

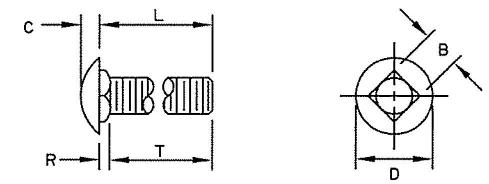
5/8" BUTTONHEAD BOLT

(FBB01-05)



5/8" Dia. RECESSED HEX NUT

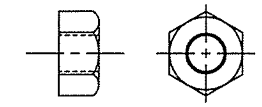
(FBB01-05)



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

5/8" Dia. CARRIAGE BOLT

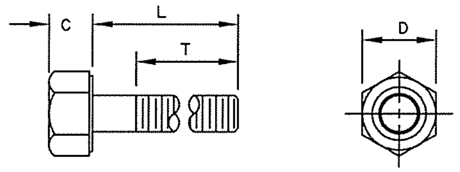
(FBC10-20)



STANDARD HEX NUT

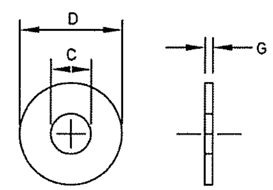
GENERAL NOTES:

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



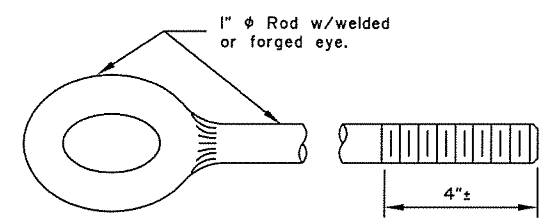
Bolt Size	C	D	L (Length)	T (Thread Length)
5/16"	——	——	1 1/2"	7/8"
5/16"	——	——	1"	1"
3/8"	——	——	7 1/2"	1 1/2"
1/2"	——	——	1 1/2"	1 1/2"
1/2"	——	——	1 1/4"	1 1/4"
5/8" H.S.	5/16"	7/8"	8"	1 1/2"
5/8"-11	——	——	1 1/2"	1 1/2"
3/4"	——	——	1 1/2"	1 1/2"
3/4"	——	——	As Required	2"
3/4" H.S.	15/32"	1 1/4"	2"	1 1/2"

STANDARD HEX BOLTS

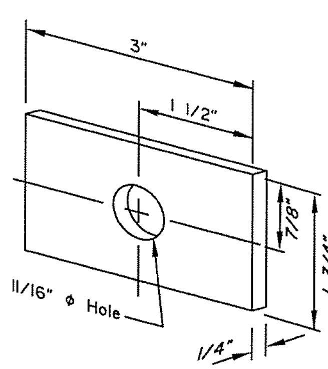


For Bolt φ	C	D	G
3/8"	7/16"	1"	5/64"
1/2"	17/32"	1 1/16"	3/32"
1/2" H.S.	17/32"	1 1/16"	3/32"
5/8"	11/16"	1 3/4"	9/64"
3/4"	13/16"	1 15/32"	9/64"
3/4" H.S.	13/16"	2"	5/32"
1"	1 1/16"	2"	9/64"

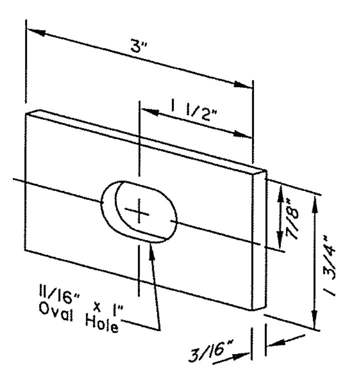
STANDARD STEEL WASHERS



EYE BOLT

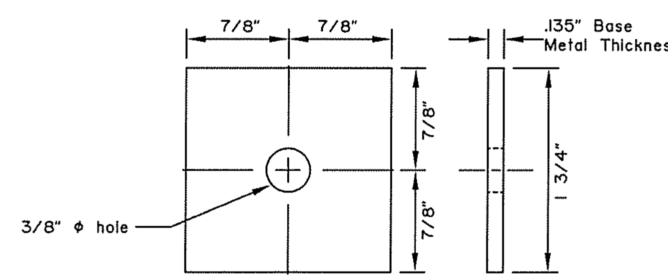


FLAT PLATE WASHER



RECTANGULAR POST BOLT WASHER

(FWR03)



SQUARE STEEL WASHER

(FWR01)

Note: drawing not to scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

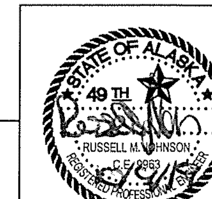
STANDARD GUARDRAIL HARDWARE (NUTS, BOLTS, AND WASHERS)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review By: Date:

Next Code and Standards Review date: 02/08/2029



STANDARD PLAN G-00.04 (1 OF 5)

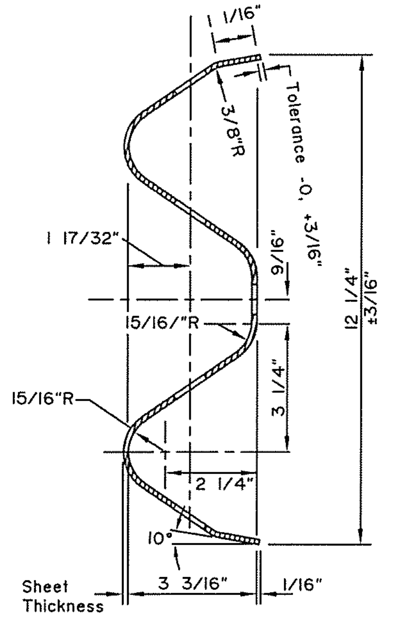
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AEC0569
C:\PWWORKING\west01\d0483514\62253_V_Standard Details-g00.04p1 Tue, Oct/08/19 04:00pm

NO.	DATE	REVISION

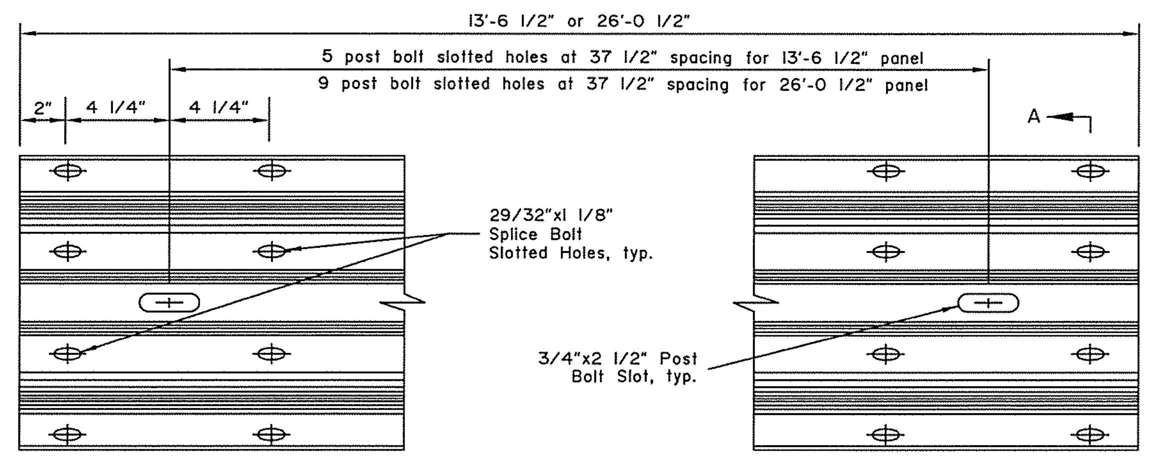
STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	0713013/Z622530000	2019	V7	V21

G-00.04

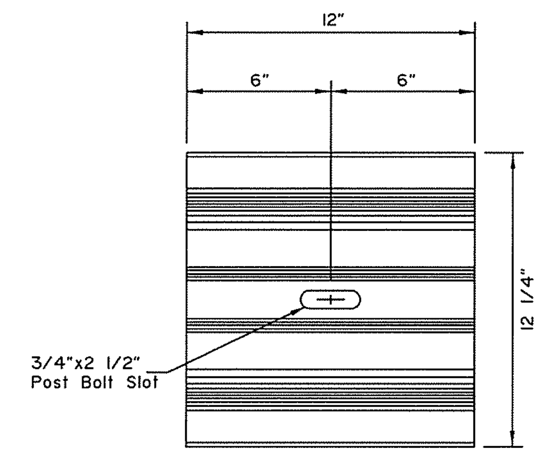
SHEET 2 of 5



SECTION A-A
(RWM02a-b)



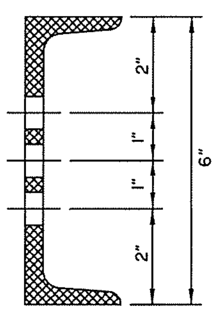
STANDARD W-BEAM PANEL (RWM04a-b)



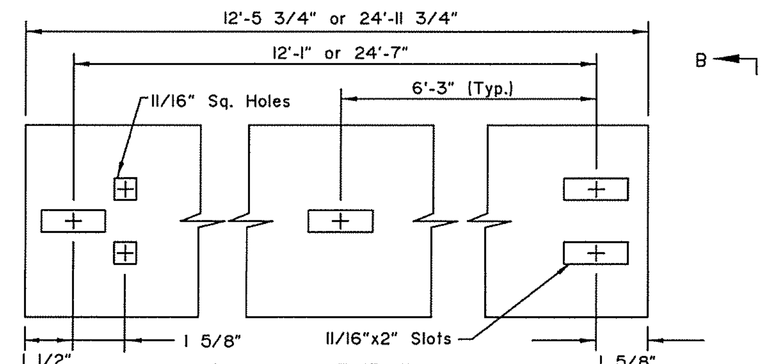
W-BEAM BACKUP PLATE
(RWB01a-b)

GENERAL NOTES:

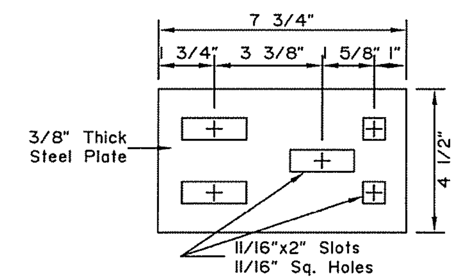
1. All covered hardware shall comply with the Task Force 13 (TF13) Guide to Standardized Roadside Safety Hardware online publication. Designators given when possible in parentheses.
2. Install back-up plates between blockouts and w-beam or thrie-beam rail at intermediate (non-splice) posts when steel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



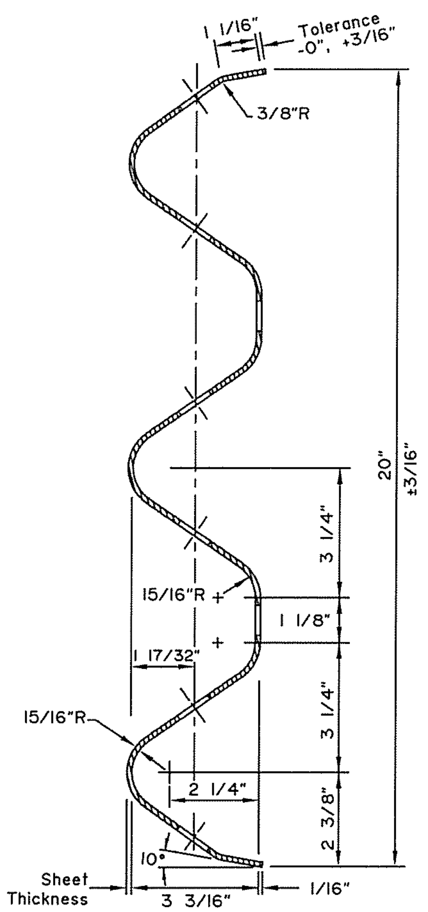
SECTION B-B



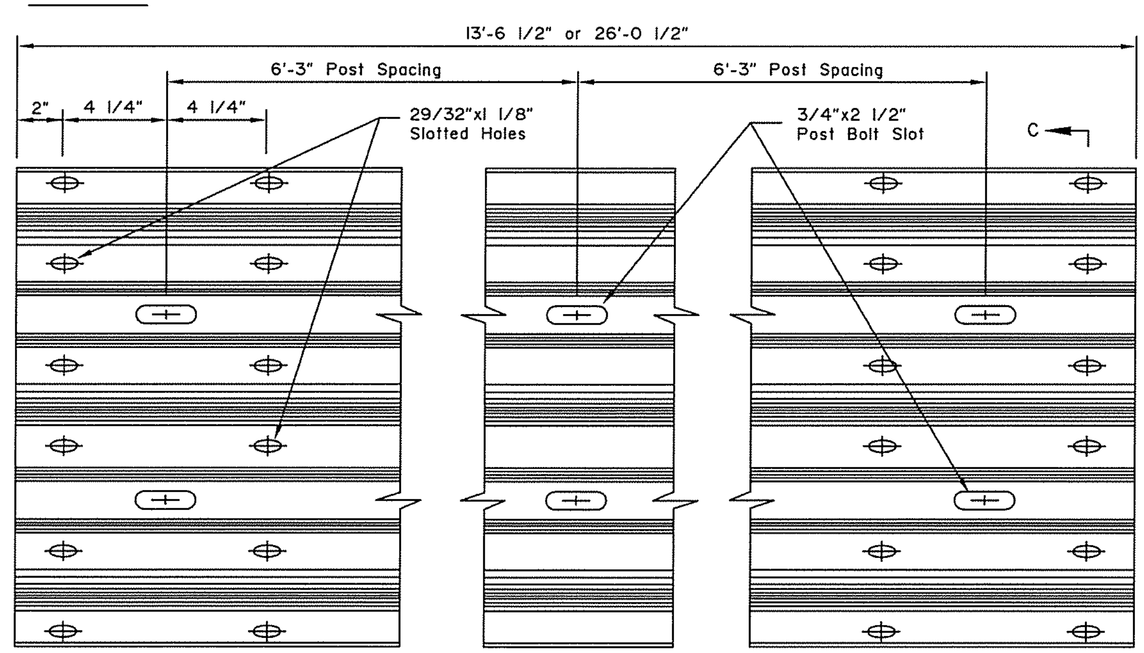
C6 x 8.2 RUB RAIL (RLR01)
ASTM A36 STEEL



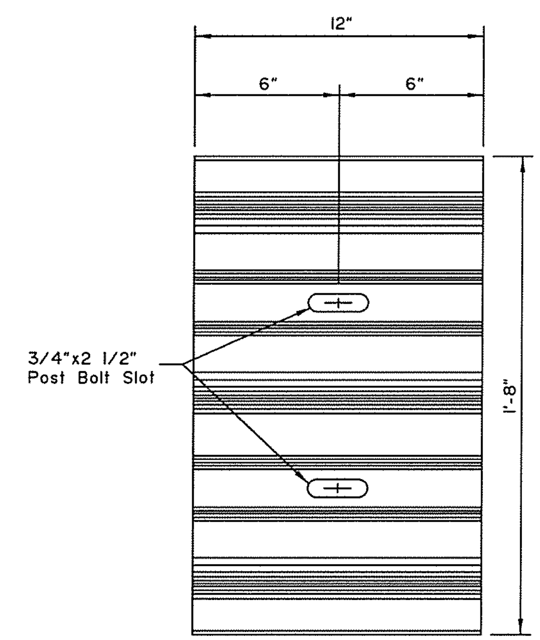
SPLICE PLATE (RLR01)
ASTM A36 STEEL



SECTION C-C
(RTM01a-02b)



STANDARD THRIE BEAM PANEL (RTM01a-02b)



THRIE BEAM BACKUP PLATE
(RTB01a-02b)

State of Alaska DOT&PF
ALASKA STANDARD PLAN

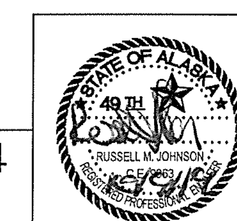
STANDARD GUARDRAIL HARDWARE (RAIL AND SPLICES)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

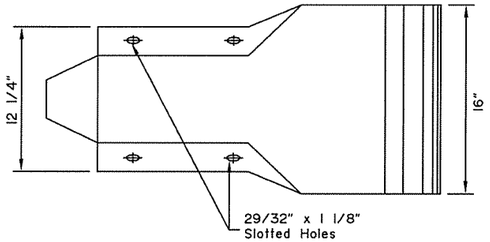


STANDARD PLAN G-00.04
(2 OF 5)

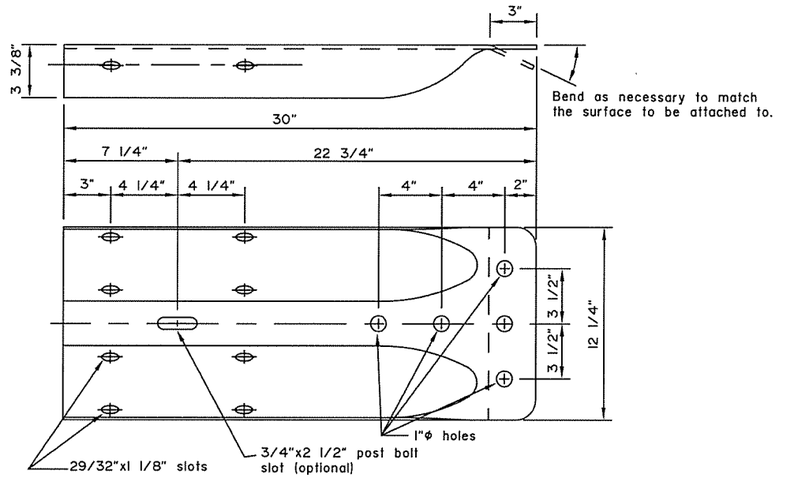
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\62233_V_Standard Details-g00.04p2 Tue, Oct/08/19 04:00pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V8	V21

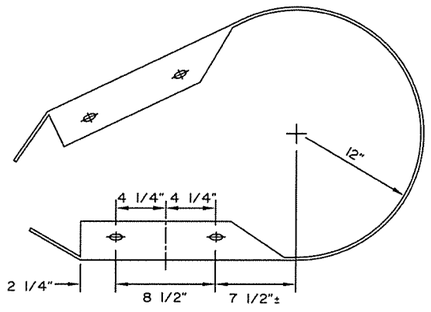
G-00.04



PROFILE

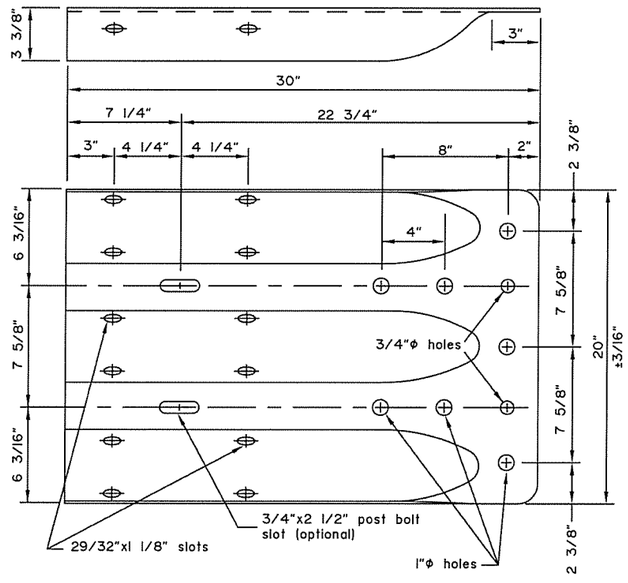


STANDARD W-BEAM TERMINAL CONNECTOR
(RWE02)



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

STANDARD W-BEAM END SECTION
(RWE06)



STANDARD THRIE BEAM TERMINAL CONNECTOR
(RTE01b)

Note: Drawing not to scale

GENERAL NOTES:

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

State of Alaska DOT&PF
ALASKA STANDARD PLAN

STANDARD GUARDRAIL HARDWARE (TERMINAL CONNECTORS)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

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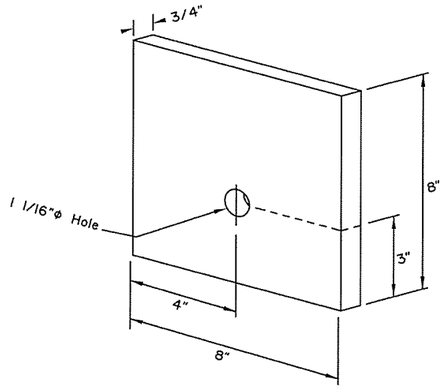
By: Date:

Next Code and Standards Review date: 02/08/2029

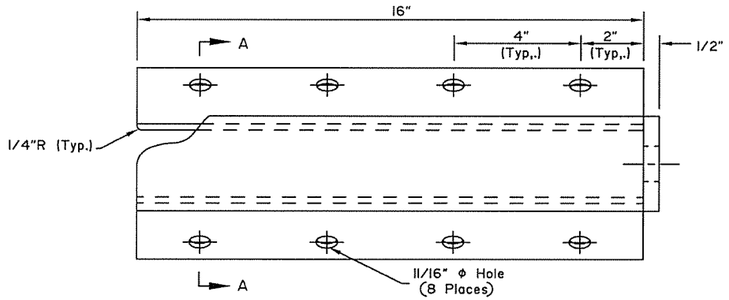
STANDARD PLAN G-00.04
(3 OF 5)

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V9	V21

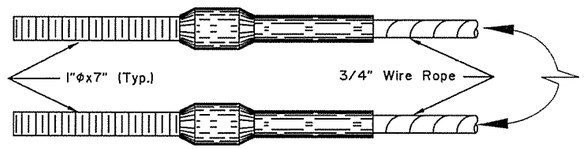
G-00.04 SHEET 4 of 5



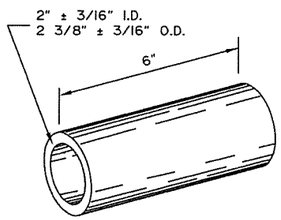
BEARING PLATE for CRT TERMINAL ANCHOR
(FPB01)



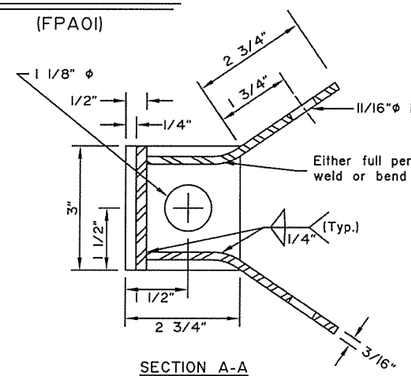
CABLE ANCHOR PLATE
(FPA01)



SWAGED FITTING DETAIL
(FCA01-02)



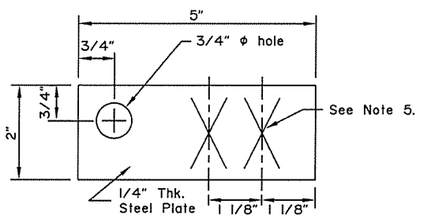
SLEEVE DETAIL
(FMM02)



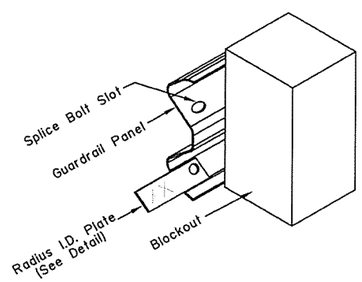
SECTION A-A

CONTROLLED RELEASE TERMINAL HARDWARE DETAILS

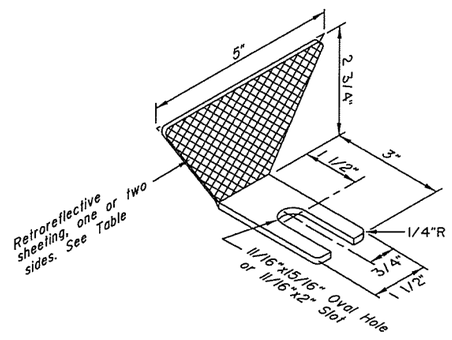
Note: Drawing not to scale



RADIUS I.D. PLATE



RADIUS I.D. PLATE MOUNTING DETAIL



GUARDRAIL REFLECTOR

Guardrail Reflector Table

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

GENERAL NOTES:

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

State of Alaska DOT&PF
ALASKA STANDARD PLAN

STANDARD GUARDRAIL HARDWARE (MISCELLANEOUS)

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review By: Date:

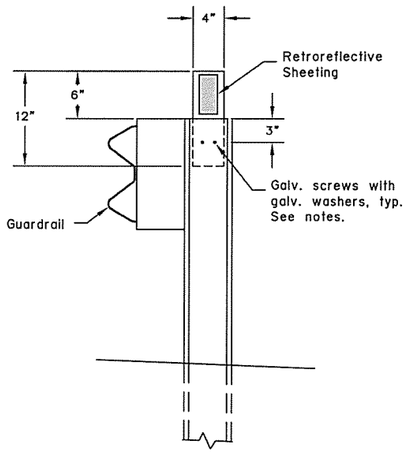
Next Code and Standards Review date: 02/08/2029

STANDARD PLAN G-00.04
(4 OF 5)

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V10	V21

G-00.04

SHEET 5 of 5



GUARDRAIL FLEXIBLE DELINEATOR DETAIL

(Steel post shown - similar for wood post)

CONSTRUCTION NOTES

1. Install guardrail flexible delineators where shown on the plans.
2. Install guardrail flexible delineators at 50 foot spacing, unless otherwise noted on the plans. Install not less than 2 delineators per guardrail run.
3. Use 3" x 5" white/yellow/red retroreflective sheeting as required per Standard Drawing T-05. Install retroreflective sheeting on both sides of delineator on two-way roads.
4. Attach 4" x 12" flexible delineators to the top of new guardrail posts, on the trailing side of the posts relative to the adjacent lane's direction of travel.
5. Predrill or preform 5/16" diameter mounting holes in steel posts by the manufacturer prior to galvanizing. Predrilling or preforming holes not required for wood posts.
6. Use 2 each 1/4" dia. x 1-1/2" long galvanized lag screws for attaching to wood posts and 2 each 1/4" dia. x 3/4" long galvanized self-drilling fasteners for steel posts. Install a galvanized washer between the fastener head and the flexible delineator.

Note: Drawing not to scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

STANDARD GUARDRAIL
(FLEXIBLE DELINEATORS)

Adopted as an Alaska Standard Plan by:
Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

STANDARD PLAN G-00.04
(5 OF 5)

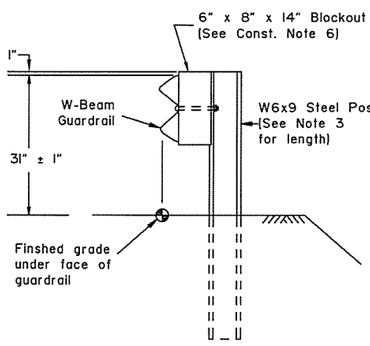
STATE OF ALASKA 49TH RUSSELL M. JOHNSON C.P.E. 8863 PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\622253_V_Standard Details-g00.04p5 Tue, Oct/08/19 04:00pm

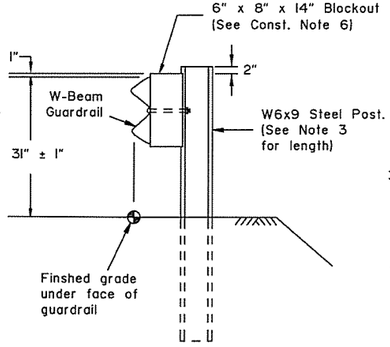
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V11	V21

G-05.11S

SHEET 1 of 1

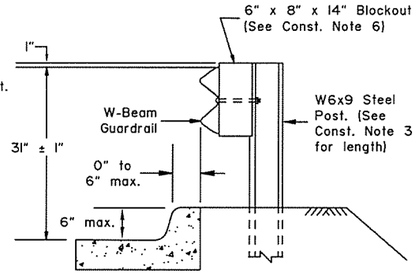


TYPE I POST INSTALLATION

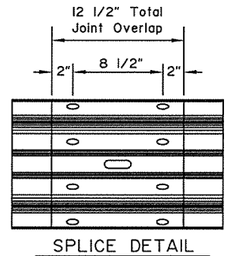


TYPE II POST INSTALLATION

(Facilitates raising rail for future overlays.)

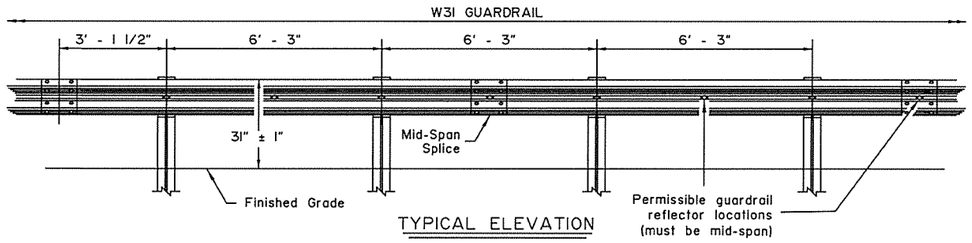


TYPE III POST INSTALLATION

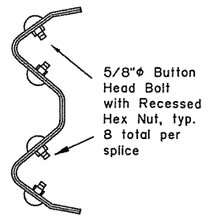


SPLICE DETAIL

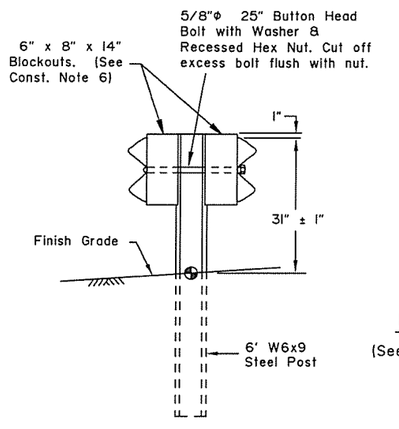
(At mid span between posts only. Bolts not shown for clarity)



TYPICAL ELEVATION



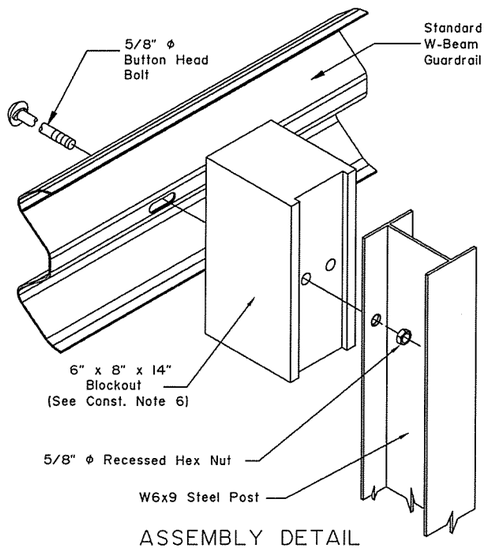
SPLICE CROSS-SECTION



TYPE IV DOUBLE SIDED INSTALLATION

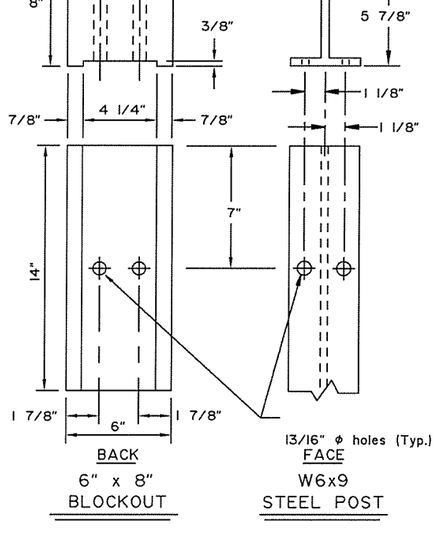
GUARDRAIL REFLECTOR

(See Const. Note 5)



ASSEMBLY DETAIL

(Type I post shown)



BACK

6" x 8" BLOCKOUT

FACE

W6x9 STEEL POST

CONSTRUCTION NOTES:

1. Provide hardware compliant with the Task Force 13 (TF13) Guide to Standardized Roadside Safety Hardware.
2. See Standard Plan G-00 for hardware details not shown on this drawing.
3. See Standard Plan G-10 for post lengths corresponding to different combinations of slope and behind-post embankment width.
4. Typical post spacing is 6'-3" center to center.
5. Attach guardrail reflector to guardrail using a 5/8" button head bolt with 5/8" recessed head hex nut and steel washer at location shown in the Typical Elevation. Install reflectors every 25' on tangents and every 12.5' on curves starting 100' before the P.C. and ending 100' after the P.T.
6. Use wood or synthetic blockouts designed, tested, and passed per MASH for use with steel posts. Either bolt hole on the blockout may be used for attachment.
7. Use a 25 linear foot transition to match differing height of existing or new rail elements and end treatments - see Standard Plan G-11.
8. W6x8.5 steel post may be substituted for W6x9 steel post.
9. Install flexible delineators on guardrail posts when called for in the contract. See Standard Plan G-00 for guardrail flexible delineator details.

DESIGN NOTES:

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

State of Alaska DOT&PF
ALASKA STANDARD PLAN

STEEL POST W31 GUARDRAIL

Adopted as an Alaska Standard Plan by: Carolyn Morehouse

Carolyn Morehouse, P.E.
Chief Engineer

Adoption Date: 05/15/2019

Last Code and Stds. Review
By: LRG Date: 5/15/2019

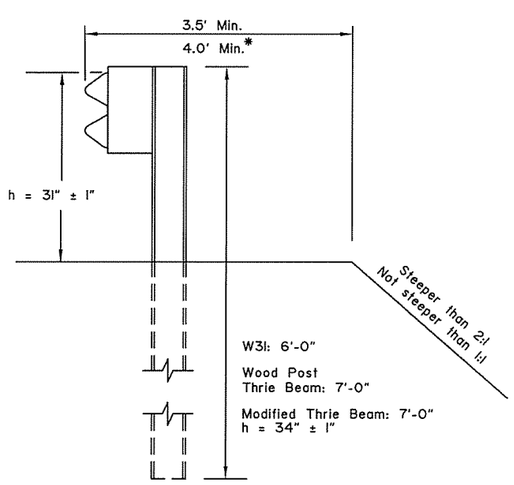
Next Code and Standards Review date: 5/15/2029

STANDARD PLAN G-05.11S

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V12	V21

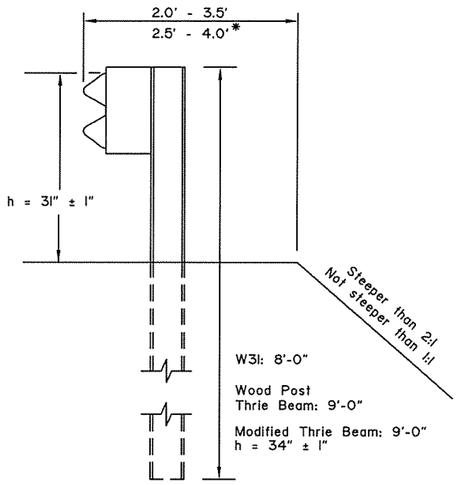
G-10.20

SHEET 1 of 1



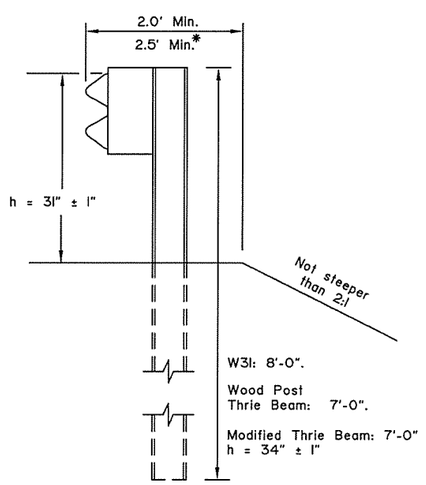
* with Modified Thrie Beam

CASE 1

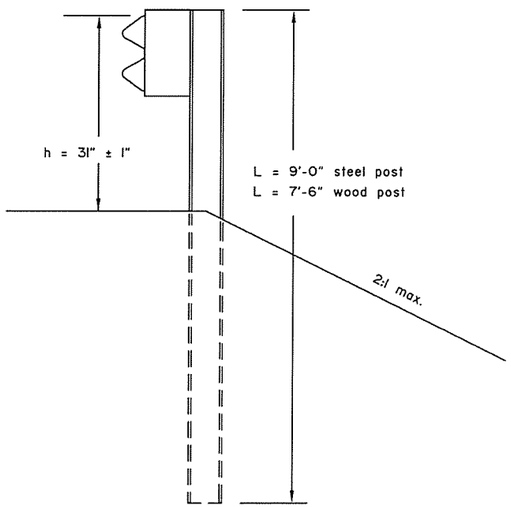


* with Modified Thrie Beam

CASE 2

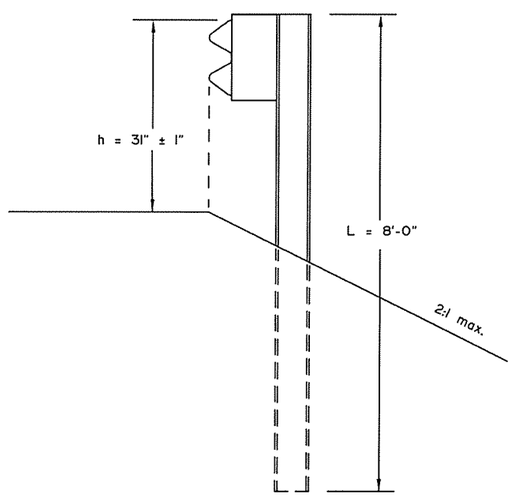


CASE 3



CASE 4

(See Note 5)



CASE 5

(See Note 5)

CONSTRUCTION NOTES:

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

DESIGN NOTES:

1. No fixed objects allowed within 36" of the back of post for Cases 1, 2 & 3.
2. No fixed objects allowed within 48" of the back of post for Cases 4 & 5.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

GUARDRAIL
POST INSTALLATION

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

STANDARD PLAN G-10.20

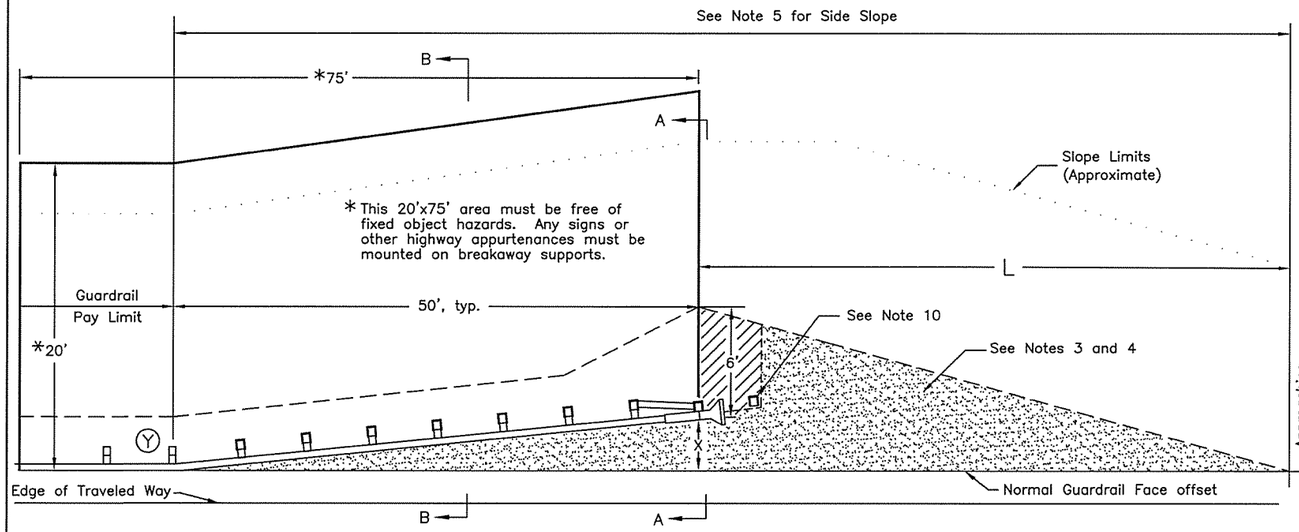
STATE OF ALASKA 49TH RUSSELL M. JOHNSON C.P.E. 9963 REGISTERED PROFESSIONAL ENGINEER

PLANS DEVELOPED BY: HDR ENGINEERING INC. 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503. (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\B2253_V_Standard Details-g10.20 Tue, Oct/08/19 04:00pm

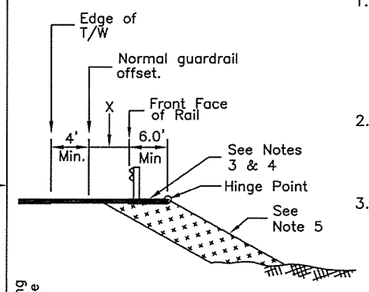
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V13	V21

G-20.12

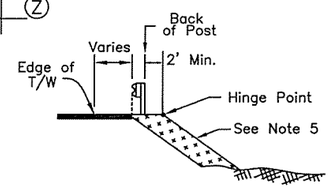
SHEET 1 of 1



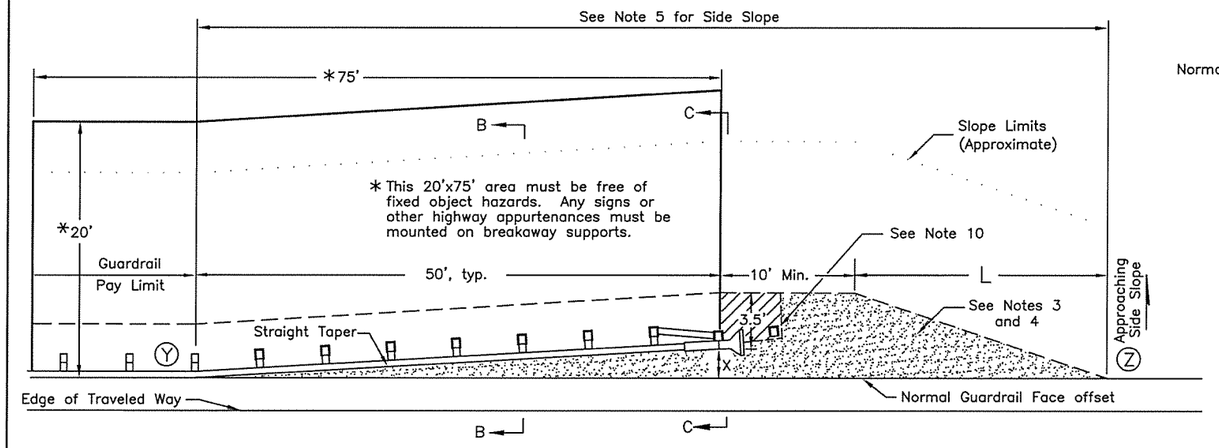
STANDARD GUARDRAIL TERMINAL WIDENING DETAIL



SECTION A–A

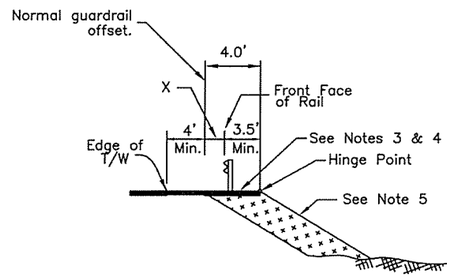


SECTION B–B
(Applies to both details)



ALTERNATE GUARDRAIL TERMINAL WIDENING DETAIL

(USE ONLY WHEN LIMITED RIGHT–OF–WAY OR LIMITING SITE CONDITIONS MAKE THE STANDARD DETAIL INFEASIBLE)



SECTION C–C

X= End offset. See manufacturer's information for the range of acceptable end offsets for each MASH compliant terminal.

Taper Lengths (L) for Common End Offsets (X)		
End Offset	Standard Detail	Alternate Detail
0'	24.0'	13.0'
1'	26.0'	17.0'
1.5'	28.0'	19.0'
2'	30.0'	21.0'
2.5'	32.0'	22.0'
4'	37.0'	28.0'
Interpolate if the end offset falls between table values		

GENERAL NOTES

1. This Std. Dwg. applies to all MASH approved guardrail end terminals (GETs). The alternate detail may only be used with parallel or tangent GETs. The terminal details shown are for illustration only – see manufacturer's drawings for actual post, rail, strut, etc. configuration and layout.
2. Use this Std. Widening Detail for all GETs except when limited right–of–way or limiting site conditions make the use of the Std. Widening Detail infeasible. In that case, the alternate detail is permissable.
3. Construct the shaded areas to match the slope of the adjacent shoulder. The slope may be increased to 10:1 if identified in the plans or when approved by the engineer. Match the slope when the shoulder slopes toward the road as well as away from the road.
4. On paved roads, the shaded areas shall be paved. On gravel roads, surface the shaded areas with the same materials used to surface the travel lanes.
5. From point Ⓨ to point Ⓩ make the side slope match the approaching side slope except where it is flatter than 4:1. In that case, the slope may be steepened to 4:1.
6. Attach a flexible marker at the beginning of each GET.
7. The max. allowable height for foundation tubes or other steel components of terminal post breakaway systems is 4" above the surrounding grade.
8. The details on this sheet do not apply to W31 Downstream End Anchors (Std Dwg G–14).
9. The details on this sheet apply to GETs on both the approach and downstream ends on two–way undivided roads and to any downstream MASH compliant GETs.
10. Some MASH GET systems have an additional post/anchor at the approximate location shown. If this post/anchor is present do not pave the diagonally hatched area. If not present, pave the diagonally hatched area also.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

WIDENING FOR GUARDRAIL END TERMINALS

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

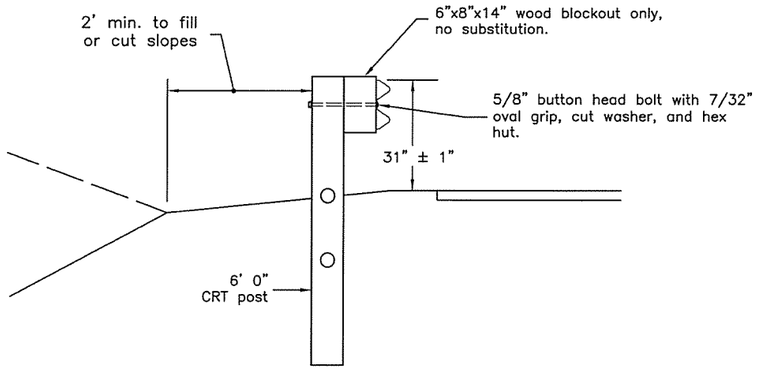
Last Code and Stds. Review By: Date:

Next Code and Standards Review date:02/08/2029

STANDARD PLAN G–20.12

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V14	V21

G-29.00



SECTION A–A

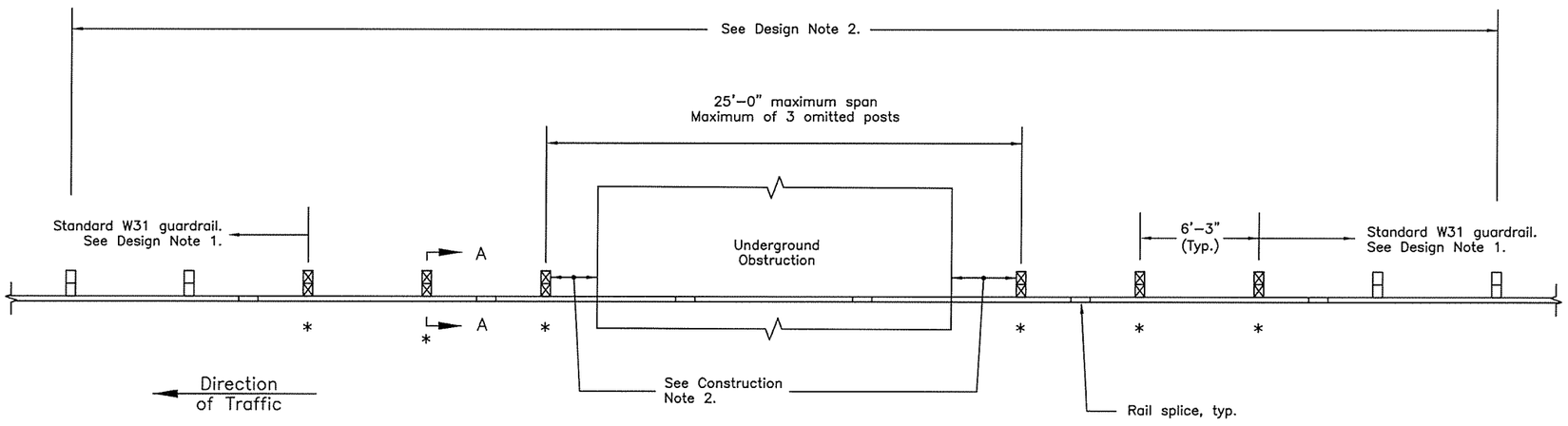
Typical for all CRT post locations shown in the plan view

CONSTRUCTION NOTES

1. See Standard Drawings G–00 and G–05 for additional guardrail and guardrail hardware details. See G–26 Sheet 1 of 3 for CRT post details.
2. Provide 1' minimum lateral clearance between posts and underground obstruction.
3. Nesting of rail elements in the long span area is not allowed.

DESIGN NOTES

1. Total installed length of guardrail and end anchorage (including end terminals, downstream anchors, etc.) shall not be less than 62.5' measured from the outermost CRT post on both the upstream and downstream ends.
2. No fixed objects allowed within 9'–0" from the back of posts where post are omitted. This is the crash–tested lateral deflection of the long span section.
3. Do no install curb in the long span area – this includes the area of CRT posts.



*–Designates CRT post location

LONG SPAN GUARDRAIL PLAN

State of Alaska DOT&PF
ALASKA STANDARD PLAN

LONG SPAN
W31 GUARDRAIL

Adopted as an Alaska Standard Plan by:
Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date:02/08/2029

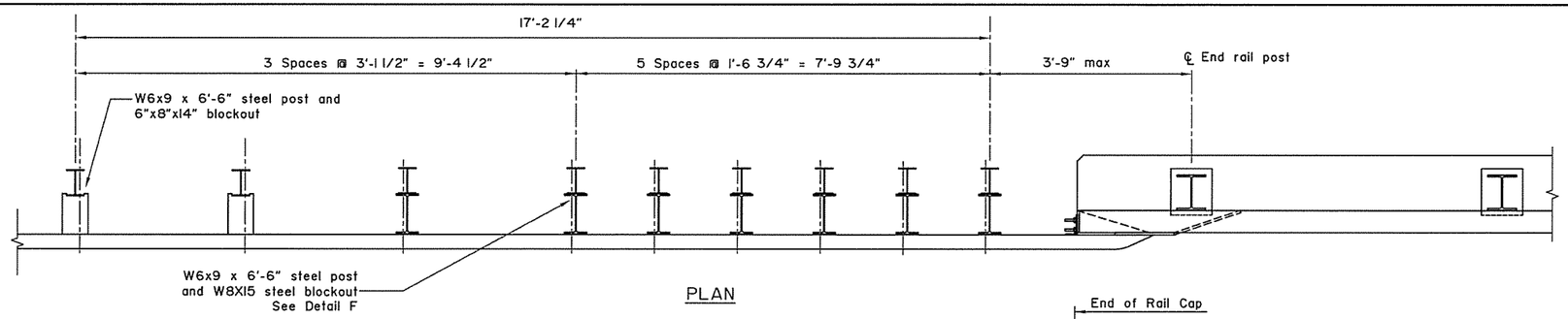
STANDARD PLAN G–29.00

PLANS DEVELOPED BY: HDR ENGINEERING INC. 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644–2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\weat01\d0483514\62253_V_Standard Details–g29.00 Tue, Oct/08/19 04:01pm

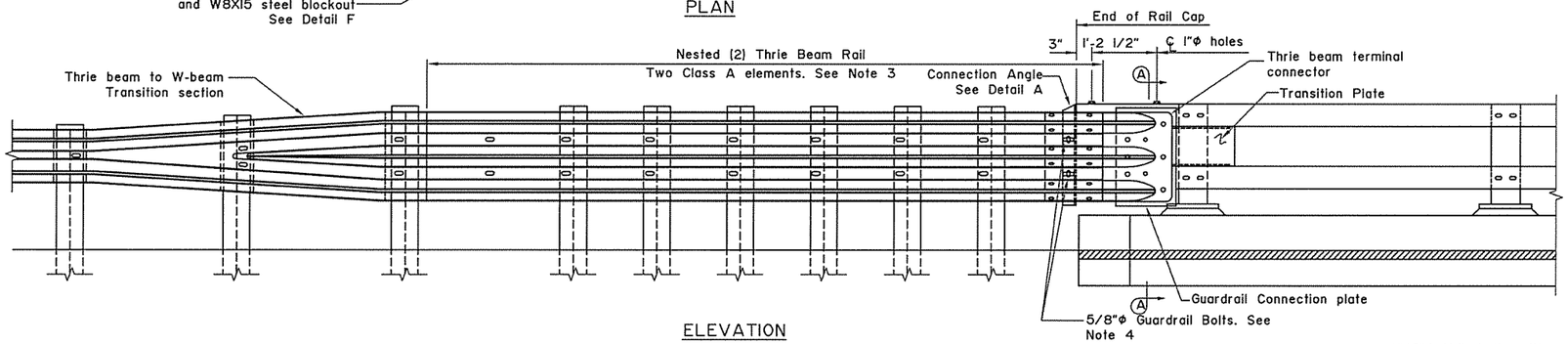
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V15	V21

G-31.01

SHEET | of |



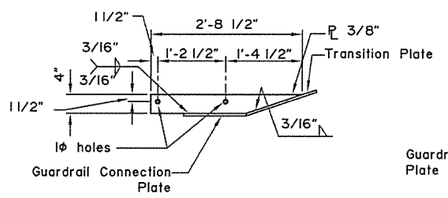
PLAN



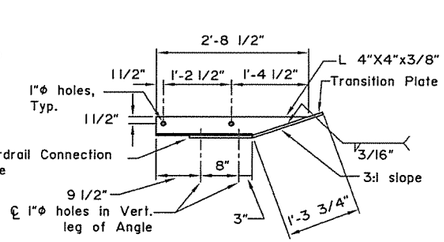
ELEVATION

GENERAL NOTES

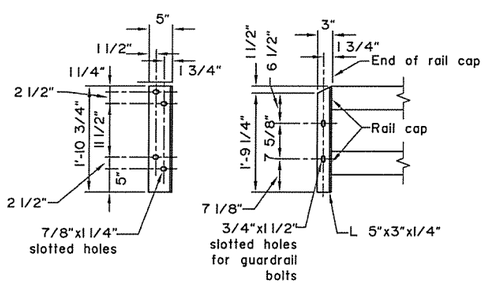
1. All guardrail and guardrail connection hardware to conform to AASHTO M-180.
   All H.S. Bolts conform to ASTM A325.
   All other steel to conform to ASTM A709 Grade 36.
2. Conform to G-00, G-04S, G-10 for all guardrail details not shown. No Back-up Plates required.
3. Lap approach guardrail to prevent snags from oncoming traffic.
4. Provide 4 1/2" horizontal slot in approach guardrail. Adjust guardrail bolts for sliding fit.
5. This design is approved for NCHRP 350, TL 4.



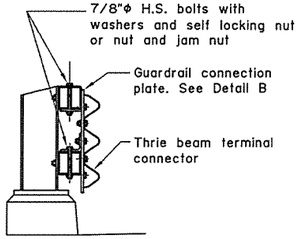
VIEW D-D



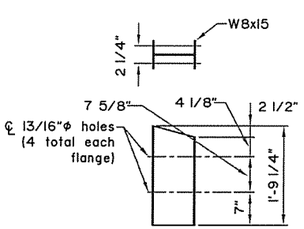
SECTION C-C



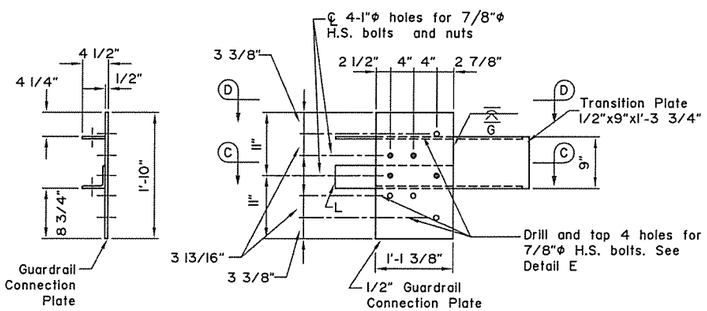
DETAIL A - CONNECTION ANGLE



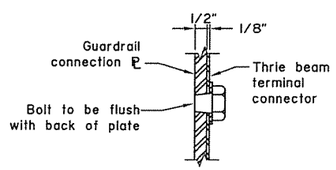
SECTION A-A



DETAIL F - STEEL BLOCKOUT



DETAIL B - GUARDRAIL CONNECTION PLATE



DETAIL E

No Scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

BRIDGE RAIL THRIE BEAM TRANSITION

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

STATE OF ALASKA 49TH RUSSELL MJOHNSON PROFESSIONAL ENGINEER 12/20/18

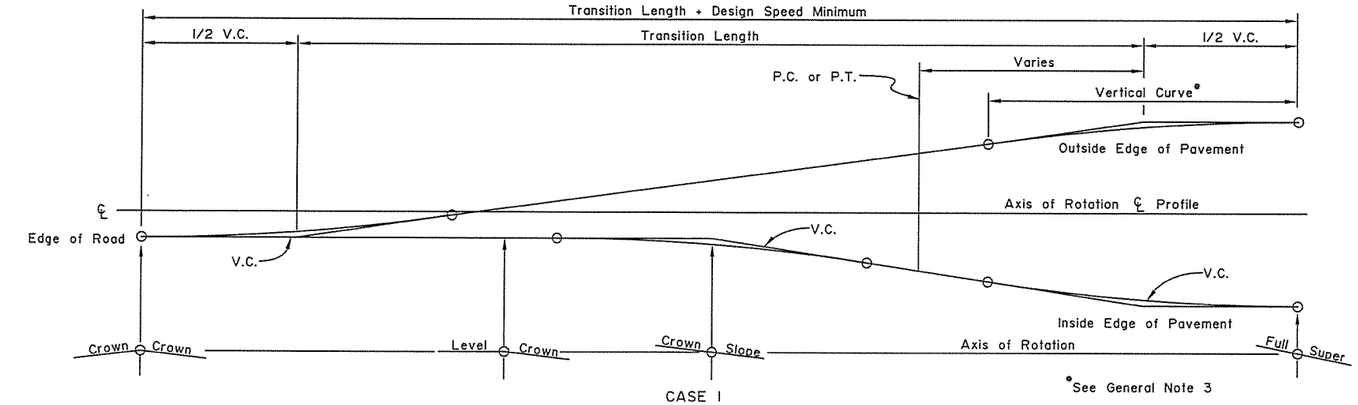
STANDARD PLAN G-31.01

PLANS DEVELOPED BY: HDR ENGINEERING INC. 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\62253_V_Standard Details-g31.01 Tue, Oct/08/19 04:01pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V16	V21

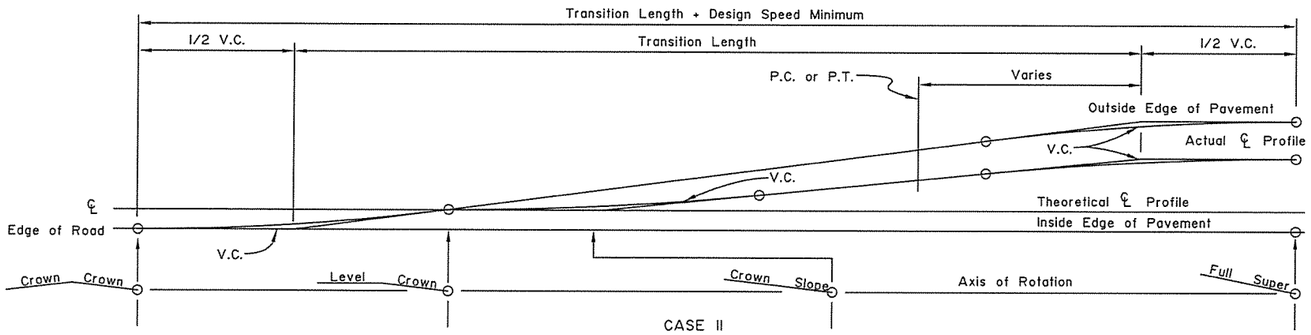
I-81.00

SHEET | of |



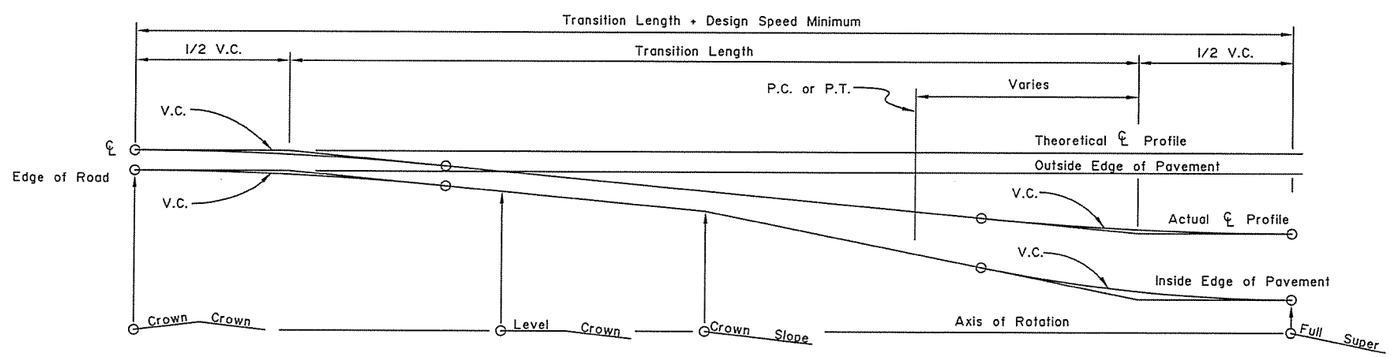
CASE I

PAVEMENT REVOLVED ABOUT CENTERLINE



CASE II

PAVEMENT REVOLVED ABOUT INSIDE EDGE
TO BE USED WHERE DRAINAGE IS THE GOVERNING CONSIDERATION



CASE III

PAVEMENT REVOLVED ABOUT OUTSIDE EDGE TO BE
USED WHERE OVERALL APPEARANCE IS THE MAIN CONTROL

GENERAL NOTES:

1. Location of transition length relative to horizontal curves will be shown on the plans or as directed by the Engineer.
2. Widening for guardrail or curvature will not change the location of the axis of rotation.
3. Minimum vertical curve length in feet shall be the numerical value of the design speed in M.P.H.
4. Superelevation shall be built into the subgrade and carried through the shoulders.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

SUPERELEVATION TRANSITION

Adopted as an Alaska Standard Plan by:
Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER
10/5/19

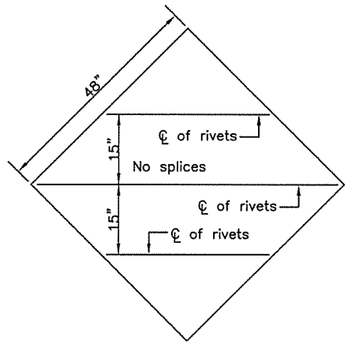
STANDARD PLAN I-81.00

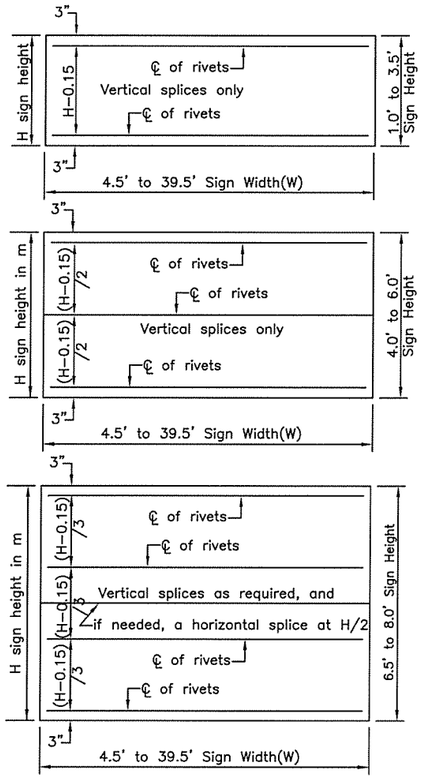
PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA, 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWORKING\west01\d0483514\622253_V_Standard Details-I81.00 Tue, Oct/08/19 04:01pm

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V17	V21

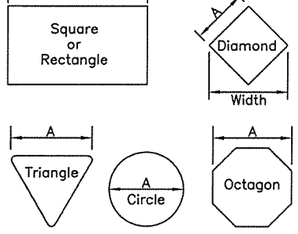
S-00.11

SHEET 1 of 1





WIND FRAMING LOCATIONS



Maximum size unframed signs using 0.125" thick aluminum sheeting.	
Sign Shape	A
Squares, Shields, and Route Markers	48"
Rectangles	48"
Diamonds	48"
Triangles	48"
Rounds and Octagons	48"

Install wind framing on all signs that exceed the dimensions listed.

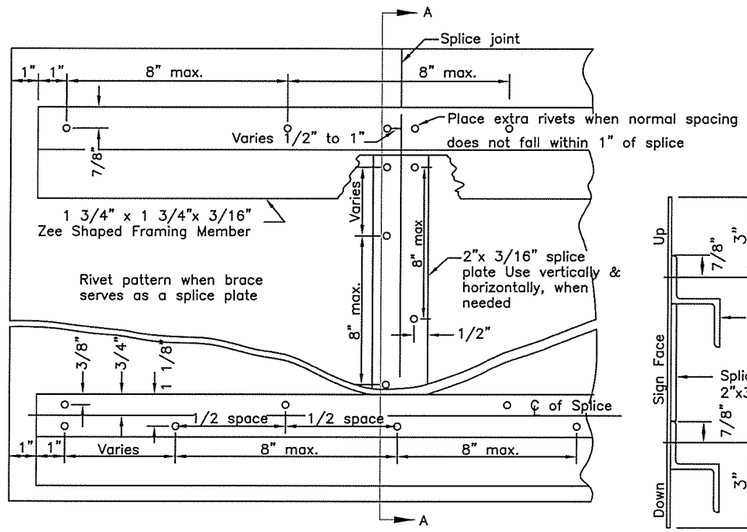
LIGHT SIGNS

TUBE SIGN POST SPACING

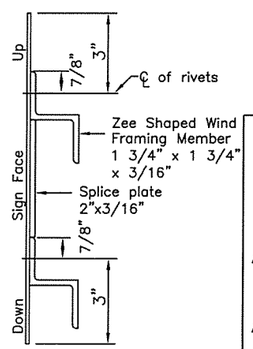
Sign Width (feet)	No. of Posts	Distance Between Posts	Sign Overhang	Post Type P.S.T.	Wood	Steel Tube	W–Shape	Notes
0.5 to 4.0	1	–	0.5W	X	X	X		See Note 2.
4.5 to 10.0	2	0.6W	0.2W	X	X	X		See Note 3.
10.5 to 11.0	2	6	Varies	X	X	X		See Note 3.
11.5 to 13.0	2	8	Varies				X	
13.5 to 20.0	2	0.6W	0.2W				X	
20.5 to 22.5	3	8	Varies				X	
23.0 to 29.5	3	0.35W	0.15W				X	
30.0 to 31.5	4	8	Varies				X	
32.0 to 40.0	4	0.25W	0.125W				X	

SIGN POST SPACING NOTES:

1. Install sign support in accordance with the table above, unless otherwise required by plans or specifications.
2. Exceptions:
   a. Use one post for all E5–1 gore signs, regardless of width.
   b. Use one 2.5" P.S.T. for all STOP signs, with or without street name signs.
3. Supports placed within 7' of each other must be acceptable for that use. See Standard Drawing S–30 for the sizes of wood posts and P.S.T.s that may be used within 7'. See Manufacturer's documentation for breakaway couplings and tubes that may be used within 7'.
4. See Standard Drawing S–31 for frangible couplings, hinges, and foundations for tube and W–shape sign supports.



RIVET DETAIL FOR ZEE SHAPED WIND FRAMING & SPLICE PLATE



SECTION A–A

GENERAL NOTES

1. See the standard specifications for the aluminum alloys that you may use for sign sheeting and wind framing members.
2. Fabricate all signs from 0.125" thick aluminum sheeting.
3. Sign fabricators may use alternates to the zee shaped framing member with approval of the engineer, if the frame manufacturer certifies their design equals or exceeds the strength of the zee shaped design.
4. Install one piece wind framing members on all signs up to 23.5' wide. Use one splice in each wind frame on all signs wider than 23.5'. Locate splices at least 18" from all posts and panel edges. Stagger splices in adjacent framing members at least 8.0' apart.
5. Attach wind framing members with rivets or with an engineer approved, double sided, high strength, adhesive tape. Clean and handle sheeting and framing members and apply tape in accordance with the tape manufacturer's written instructions. Install two rivets in both ends of each framing member.
6. Use 3/16" diameter rivets conforming to aluminum alloy 6061–T6 for cold driven rivets, or aluminum alloy 6061–T43 for hot driven rivets.
7. Sign fabricators may use sign panels extruded with integral framing with approval of the engineer, if the manufacturer certifies their design equals or exceeds the strength of the 0.125" thick panel with framing attached to it.
8. Frame all signs taller than 8.0' with five wind framing members located (H–0.15)/4 spaces. If needed, make a horizontal splice at the middle wind frame.
9. Do not use round pipes for sign supports.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

SIGN FRAMING AND POST SPACING

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E. Chief Engineer

Adoption Date: 02/08/2019

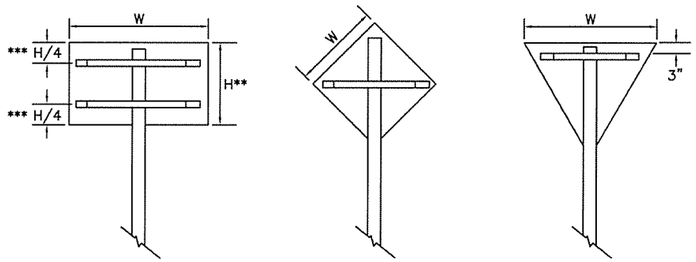
Last Code and Stds. Review By: Date:

Next Code and Standards Review date:02/08/2029

STANDARD PLAN S–00.11

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V18	V21

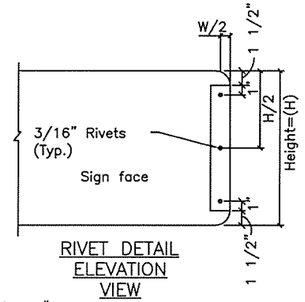
S01.01 SHEET | of |



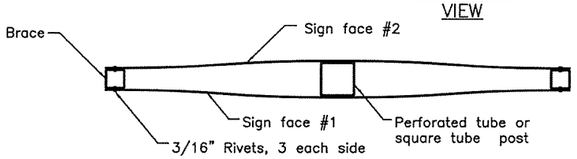
*** Use one brace when H ≤ 18"
Use two braces when 18"< H < 48"
Use three braces when H ≥ 48"

** Position of brace may be varied to match Predrilled mounting holes in panel

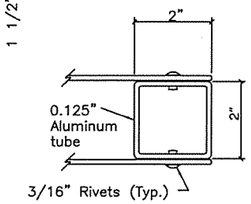
SIGN BRACING PLACEMENT



RIVET DETAIL ELEVATION VIEW

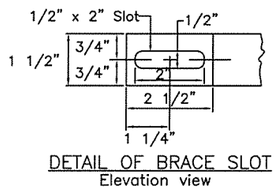


PLAN VIEW

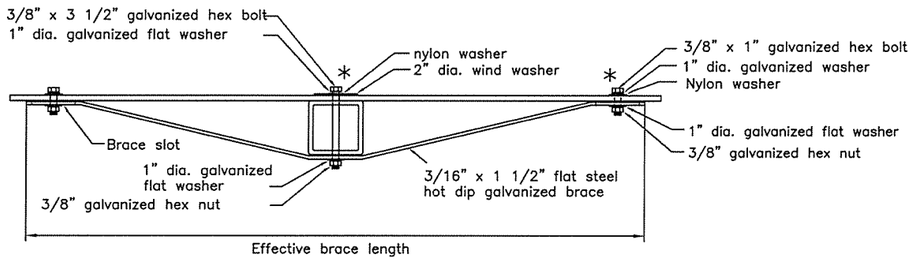


END BRACE DETAIL

SMALL STREET NAME SIGN (D3-1, D3-1A, D3-1D) BRACING DETAILS



DETAIL OF BRACE SLOT
Elevation view



TUBE POST SIGN BRACING
Plan view

* Adjust location of bracing so that bolts and washers will miss the sign legend

Sign Width(W)	Effective Brace Length		
	Warning	Yield	Other
30"	36"	24"	24"
36"	42"	30"	30"
42"	48"	–	36"
48"	Two posts	36"	42"

< 30" No bracing required and use square tube

DRAWING NOT TO SCALE

State of Alaska DOT&PF
ALASKA STANDARD PLAN

BRACING FOR SIGNS MOUNTED ON SINGLE POST

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

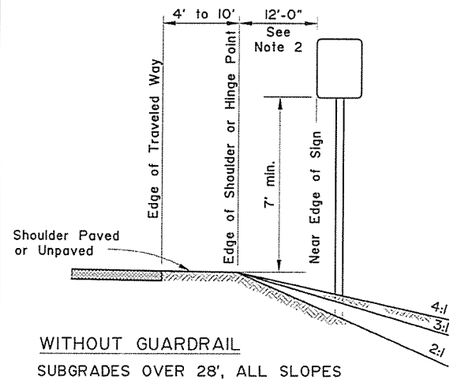
Next Code and Standards Review date: 02/08/2029

STANDARD PLAN S-01.01

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V19	V21

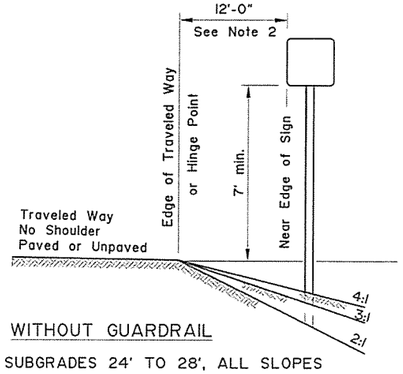
S-05.01

SHEET | of |



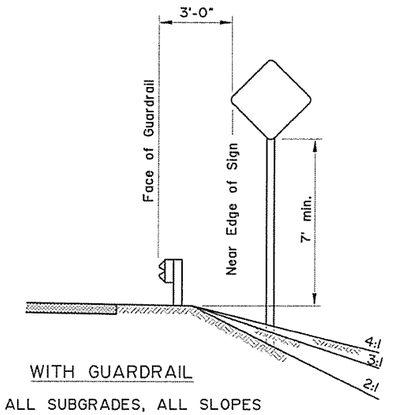
WITHOUT GUARDRAIL

SUBGRADES OVER 28', ALL SLOPES



WITHOUT GUARDRAIL

SUBGRADES 24' TO 28', ALL SLOPES

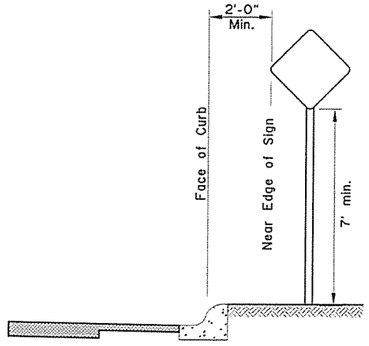


WITH GUARDRAIL

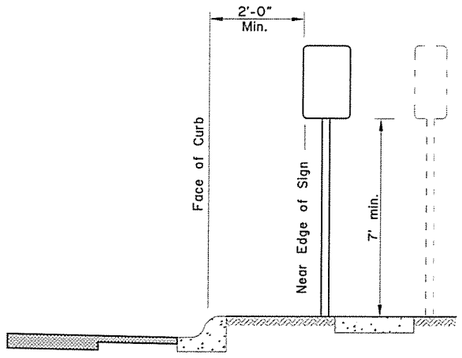
ALL SUBGRADES, ALL SLOPES

GENERAL NOTES

1. Unless shown otherwise on the plans, the standard sign offset is 12'. The minimum is 6'.
2. If signs extend over sidewalks, the minimum vertical clearance is 7'-0".
3. Add 6" to mounting height on unpaved roads.
4. If signs extend over bike paths, the minimum vertical clearance is 8' 0".
5. When signs are placed 30' or more from the edge of traveled way, mount them with the bottom of the sign at least 5' above the road surface at the near edge of the road.
6. When multiple hinged sign supports are used, mount hinges at least 7' above the ground.

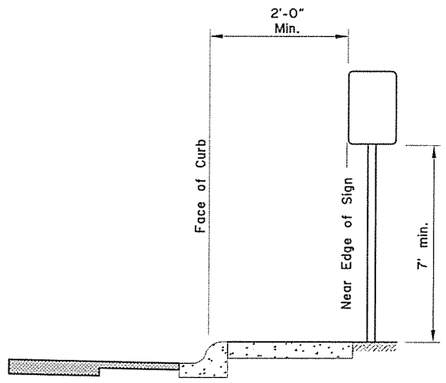


CURB WITHOUT SIDEWALK

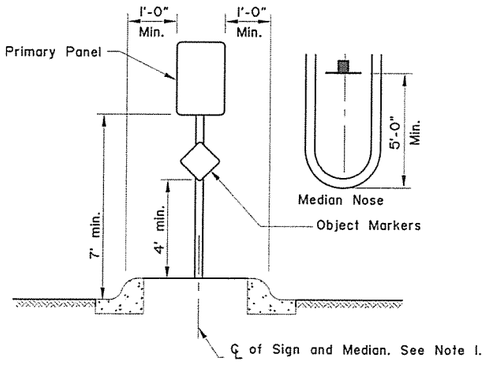


CURB WITH PARKWAY AND SIDEWALK

(If R/W width permits, signs should be placed behind sidewalk.)

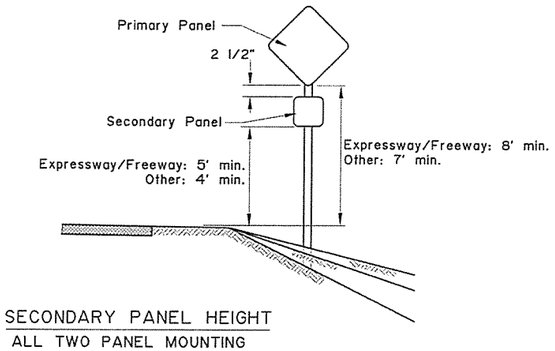


CURB WITH SIDEWALK WITHOUT PARKWAY



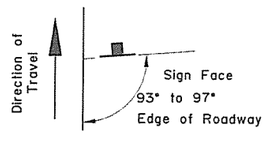
RAISED MEDIANS

Minimum 4' Width for Signing



SECONDARY PANEL HEIGHT

ALL TWO PANEL MOUNTING



SIGN POSITIONING

State of Alaska DOT&PF
ALASKA STANDARD PLAN

POST MOUNTED SIGN
OFFSET AND HEIGHT

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher

Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

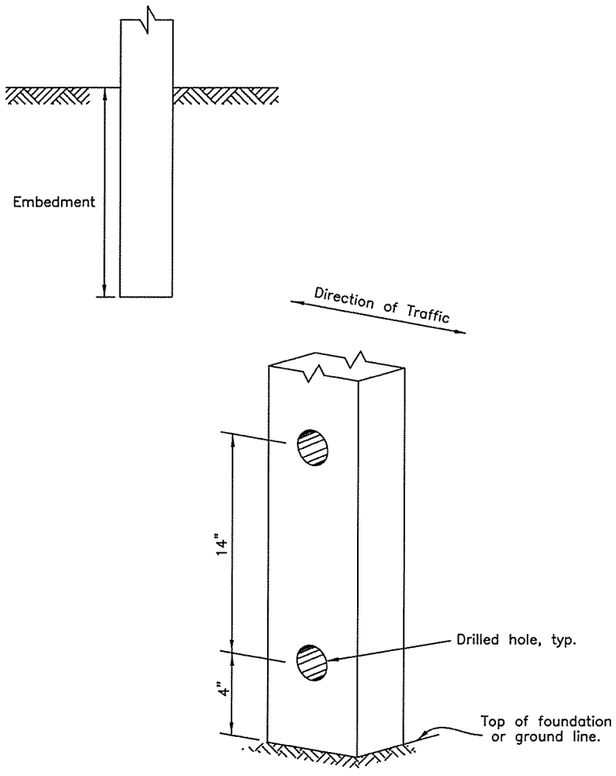
STATE OF ALASKA 49TH
DUSTIN HANNAFIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER
10/8/19

STANDARD PLAN S-05.01

NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V20	V21

S-30.04

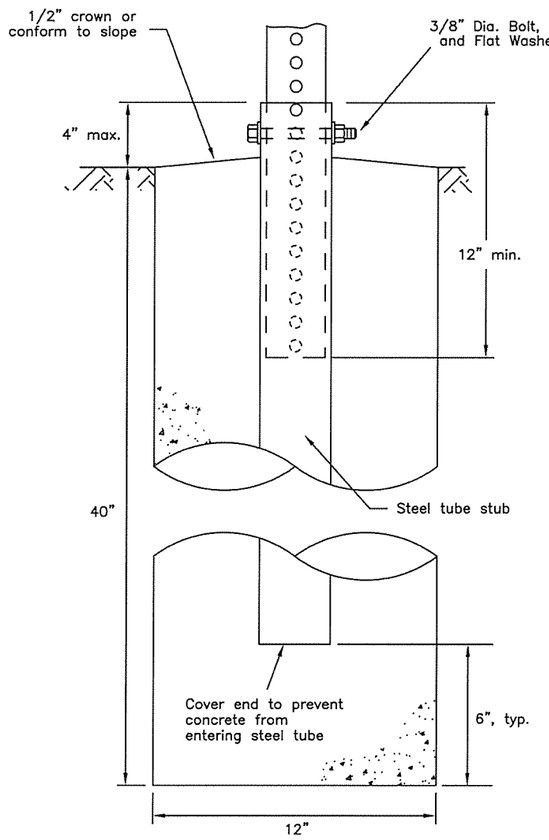
SHEET 1 of 1



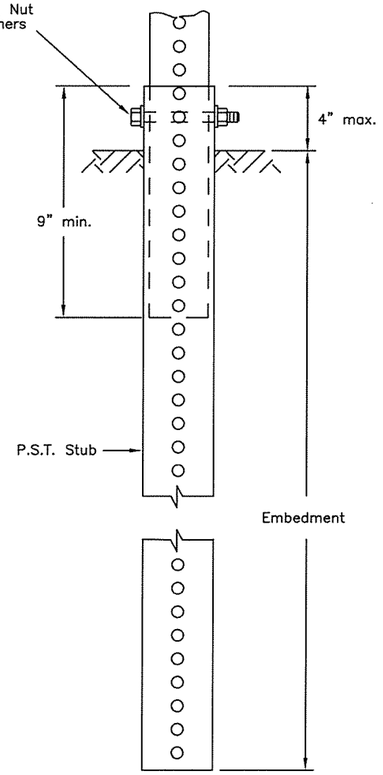
WOOD SIGN POSTS			
SIZE	HOLE DIA.	EMBEDMENT*	NO. OF POSTS WITHIN 7 Ft. PATH
4"x4"	NONE	36"	2
4"x6"	1 1/2"	36"	2
6"x6"	1 1/2"	40"	1
6"x8"	3"	48"	1

* Embedment depth applies in both strong and weak soil.

WOOD POSTS



SLEEVE TYPE
CONCRETE FOUNDATION



SLEEVE TYPE *
SOIL EMBEDMENT

PERFORATED STEEL TUBES (P.S.T.)		
POST SIZE	Embedment Depth	No. of P.S.T.s permitted within 7 ft path
1 1/2" x 1 1/2"	3'-0"	2
1 3/4" x 1 3/4"	3'-0"	2
2" x 2"	3'-6"	2
2 1/4" x 2 1/4"	4'-0"	1
2 1/2" x 2 1/2"	4'-6"	1

* Use 3"x3"x3/16" Stub for 2 1/2"x2 1/2" PST Applications.

PERFORATED STEEL TUBE (PST) POSTS

GENERAL NOTES:

1. Refer to Std Dwg S-00 for sign framing details.
2. See plans for type of post, size and embedment type.
3. To maintain crashworthiness, install no more than the number of P.S.T.s or wood posts specified in the tables within 7' of each other.
4. Do not install wood posts larger than 6"x8".
5. Do not use the supports on this drawing for multiple support signs if supports are separated by more than 7 feet.
6. Treat all field cuts and field drilled holes in wood posts in accordance with Section 730-2.04 of the Standard Specifications.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

LIGHT SIGN STRUCTURE
POST EMBEDMENT

Adopted as an Alaska Standard Plan by: Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

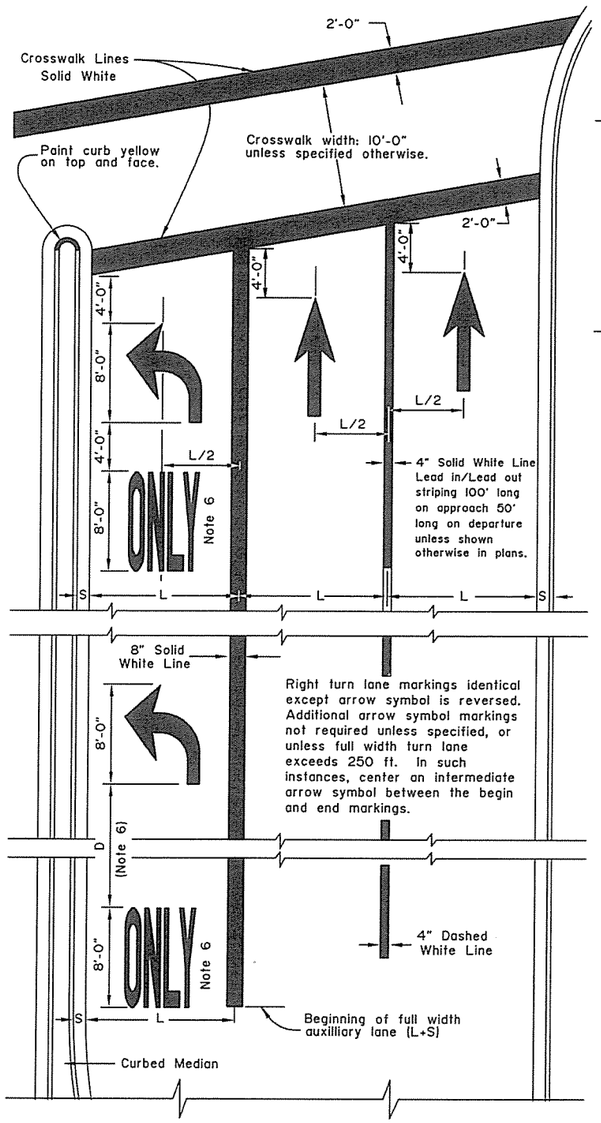
Next Code and Standards Review date:02/08/2029

STANDARD PLAN S-30.04

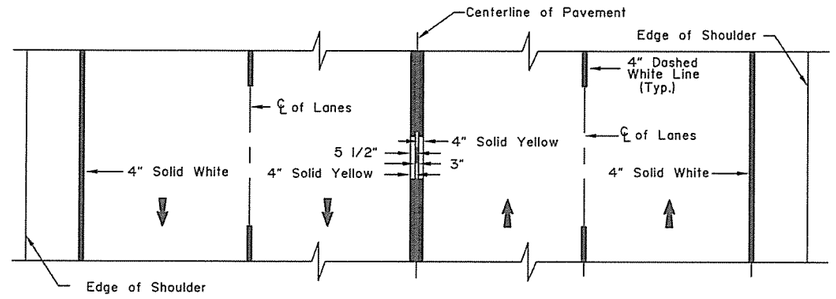
NO.	DATE	REVISION	STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			ALASKA	0713013/Z622530000	2019	V21	V21

T-21.03

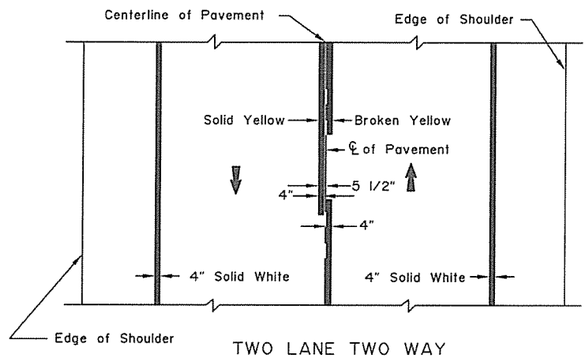
SHEET | of |



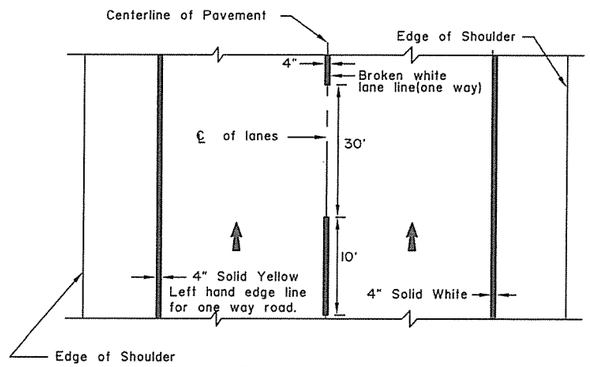
APPROACH TO INTERSECTION



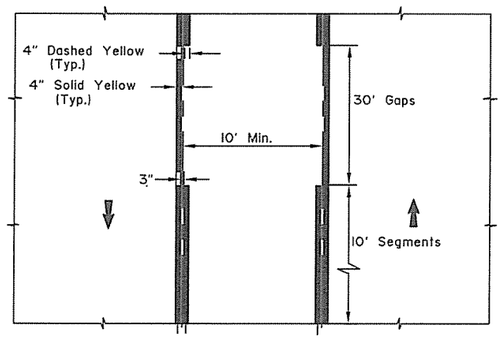
FOUR LANE TWO WAY



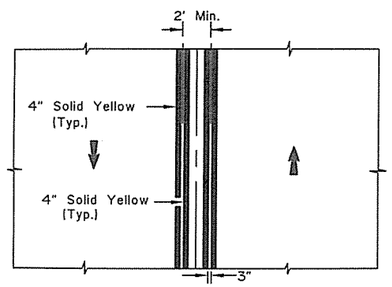
TWO LANE TWO WAY



TWO LANE ONE WAY



TWO-WAY LEFT TURN LANE



STRIPED MEDIAN

SPEED	D
25 or less	35'
30	45'
35	50'
40	60'
45	65'
50	75'
55 or more	80'

GENERAL NOTES:

1. All markings white unless indicated otherwise.
2. Lengths of stripe and gap for lane and center lines identical.
3. Lane lines for auxiliary lanes are unbroken solid lines.
4. "L" = driving lane width.
5. "S" = shy distance as shown on plans, otherwise 1 to 2 feet.
6. ONLY markings are required where through lanes change to turn lanes. In other cases, apply ONLY markings as indicated on plans.
7. See ALASKA TRAFFIC MANUAL for additional instruction on the use of TRAFFIC CONTROL DEVICES.
8. 6. Adjust distance D between ONLY and Turn Arrow based on SPEED vs. D table.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PAVEMENT MAKING APPLICATIONS

Adopted as an Alaska Standard Plan by:
Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

Next Code and Standards Review date: 02/08/2029

STATE OF ALASKA 49TH
DUSTIN HANAPIOUS
C.E. 14055
REGISTERED PROFESSIONAL ENGINEER
10/8/19

STANDARD PLAN T-21.03

PLANS DEVELOPED BY: HDR ENGINEERING INC, 2525 C STREET SUITE 500, ANCHORAGE ALASKA 99503, (907)644-2000 CERT. OF AUTH. NO. AECC569
C:\PWWORKING\west01\d0483514\Z62253_V_Standard Details-121.03 Tue, Oct/08/19 04:01pm