

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF PARKS
AND
OUTDOOR RECREATION

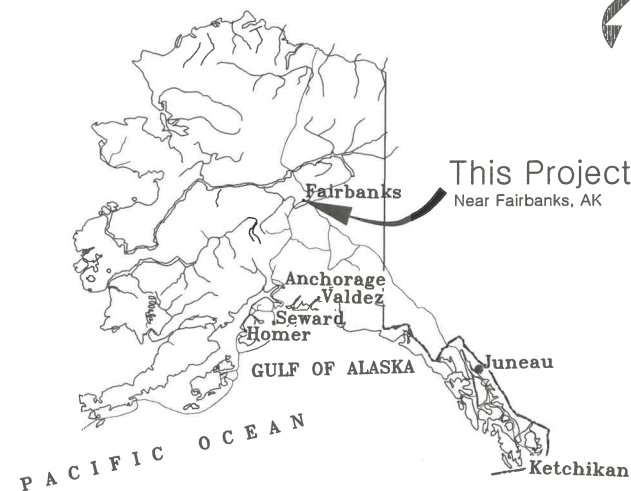
CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS

PROJECT NO. 70011-1

IN COOPERATION WITH THE DEPARTMENT OF FISH AND GAME
AND THE U.S. FISH AND WILDLIFE SERVICE

Vicinity Map

PROJECT LOCATION: FAIRBANKS MERIDIAN, R6E, T1N, SEC13/23



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The following Division of Parks & Outdoor Rec. standard drawings apply to this project: G-2, S-15
The following D.O.T.(Highways) standard drawings apply to this project: D-01.02, D-04.22, D-09.00, S-00.12, S-01.02, S-05.02, S-30.05

Plans developed by:
STATE OF ALASKA
Department of Natural Resources
Division of Parks & Outdoor Recreation
550 W 7th Ave. Suite 1340, Anchorage, AK 99501
Recommended:

Rya Miranda 8/4/2026
Rya Miranda, P.E.
Chief, Design and Construction

Approved:
Ricky Gease 8/4/2026
Ricky Gease
Director, Alaska State Parks

ESTIMATE OF QUANTITIES			
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY
201.0003.0000	CLEARING AND GRUBBING	ACRE	1.5
202.0001.0000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	L.S.	ALL REQ'D
203.0003.0000	UNCLASSIFIED EXCAVATION	C.Y.	2,300
203.0005.000A	BORROW, TYPE A	C.Y.	2,200
203.0005.000C	BORROW, TYPE C	C.Y.	250
301.0001.00D1	AGGREGATE BASE COURSE, GRADING D-1	TON	1,950
401.0001.002B	HOT MIX ASPHALT, TYPE II: CLASS B	TON	300
603.0001.0024	CSP 24 INCH	L.F.	32
603.0003.0024	END SECTION FOR CSP 24 INCH	EACH	2
615.0001.0000	STANDARD SIGN	S.F.	32
618.0002.0000	SEEDING	LB	33
620.0001.000B	TOPSOIL, CLASS B	S.Y.	2,500
622.2018.00DE	DOUBLE ENTRANCE GATE	EACH	1
622.2019.0000	SHOOTING RANGE BENCH	EACH	10
622.2020.0000	SHOOTING RANGE PAVILION	EACH	1
640.0001.0000	MOBILIZATION AND DEMOBILIZATION	L.S.	ALL REQ'D
641.0001.0000	EROSION, SEDIMENT, AND POLLUTION CONTROL ADMINISTRATION	L.S.	ALL REQ'D
641.0005.0000	TEMPORARY EROSION, SEDIMENT, AND POLLUTION CONTROL BY DIRECTIVE	C.S.	ALL REQ'D
641.0006.0000	WITHHOLDING	C.S.	ALL REQ'D
642.0001.0000	CONSTRUCTION SURVEYING	L.S.	ALL REQ'D
642.0003.0000	THREE PERSON SURVEY PARTY	HOUR	5
643.0002.0000	TRAFFIC MAINTENANCE	L.S.	ALL REQ'D
647.0006.0000	HYDRAULIC EXCAVATOR, 1 CY, 100 HP, MINIMUM	HOUR	10
670.0001.0000	PAINTED TRAFFIC MARKINGS	L.S.	ALL REQ'D

TABLE OF ESTIMATING FACTORS		
ITEM NO.	ITEM DESCRIPTION	ESTIMATING FACTOR
203.0005.000A	BORROW, TYPE A	142 LB/CF
203.0005.000C	BORROW, TYPE C	142 LB/CF
301.0001.00D1	AGGREGATE BASE COURSE, GRADING D-1	146 LB/CF
401.0001.002B	HOT MIX ASPHALT, TYPE II, CLASS B	151 LB/C.F.

ABBREVIATIONS

Ø	DIAMETER	L.F.	LINEAR FEET
CL	CENTERLINE	L.S.	LUMP SUM
ACI	AMERICAN CONCRETE INSTITUTE	M.E.	MATCH EXISTING
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	MAX	MAXIMUM
APA	AMERICAN PLYWOOD ASSOCIATION	MF	MOMENT FRAME
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS	MIN	MINIMUM
ASD	ALLOWABLE STRESS DESIGN	MON	MONUMENT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	MP	MILEPOST
AWS	AMERICAN WELDING SOCIETY	NEG	NEGATIVE
BOP	BEGINNING OF PROJECT	NO.	NUMBER
BTW	BETWEEN	O.C.	ON CENTER
BVCE	BEGIN VERTICAL CURVE ELEVATION	OCEW	ON CENTER EACH WAY
BVCS	BEGIN VERTICAL CURVE STATION	OHW	ORDINARY HIGH WATER
C.F.	CUBIC FOOT	OPP	OPPOSITE
CJP	COMPLETE JOINT PENETRATION	PCC	PORTLAND CEMENT CONCRETE
COL	COLUMN	PIP	PROTECT IN PLACE
CONC	CONCRETE	POS	POSITIVE
CP	CONTROL POINT	PSF	POUNDS PER SQUARE FOOT
CSP	CORRUGATED STEEL PIPE	PSI	POUNDS PER SQUARE INCH
C.S.	CONTINGENT SUM	PT	PRESSURE TREATED
C.Y.	CUBIC YARD	QTY.	QUANTITY
DOT	DEPARTMENT OF TRANSPORTATION	RCSC	RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS
ELEV	ELEVATION	REQ'D	REQUIRED
EOP	END OF PROJECT	ROW	RIGHT OF WAY
EOR	ENGINEER OF RECORD	S.F.	SQUARE FEET
EST	ESTIMATE	SIM	SIMILAR
EVCE	END VERTICAL CURVE ELEVATION	SPF	SPRUCE, PINE, FIR
EVCS	END VERTICAL CURVE STATION	SRA	STATE RECREATION AREA
EXT	EXTERIOR	STA	STATION
GA	GAUGE	S.Y.	SQUARE YARD
HSS	HOLLOW STRUCTURAL SECTION	T&B	TOP AND BOTTOM
IBC	INTERNATIONAL BUILDING CODE	T.O.	TOP OF
ICC	INTERNATIONAL CODE COUNCIL	TOS	TOP OF SLAB
INV.	INVERT	TYP.	TYPICAL
KSI	KIPS PER SQUARE INCH	UNO	UNLESS NOTED OTHERWISE
LB	POUND	UT	ULTRASONIC TESTING
LB/LBS	POUND/POUNDS	WF	WIDE FLANGE
		WPS	WELDING PROCEDURE SPECIFICATION

EXISTING	PROPOSED	LEGEND
		EDGE OF AC PAVEMENT
		EDGE OF VEGETATION
		EDGE OF WATER
		MAJOR CONTOUR LINE
		MINOR CONTOUR LINE
		EDGE OF GRAVEL ROAD/PARKING
		LIMIT OF FILL SLOPE
		LIMIT OF CUT SLOPE
		CULVERT
		DOT ROW MONUMENT
		SURVEY CONTROL POINT
		BORING LOCATION
		WOODEN BOLLARD / BARRIER POST
		SIGN
		SINGLE ENTRANCE GATE
		WETLANDS



STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES
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550 W 7TH AVE. SUITE 1340, ANCHORAGE, AK 99501 - 907.269.8731

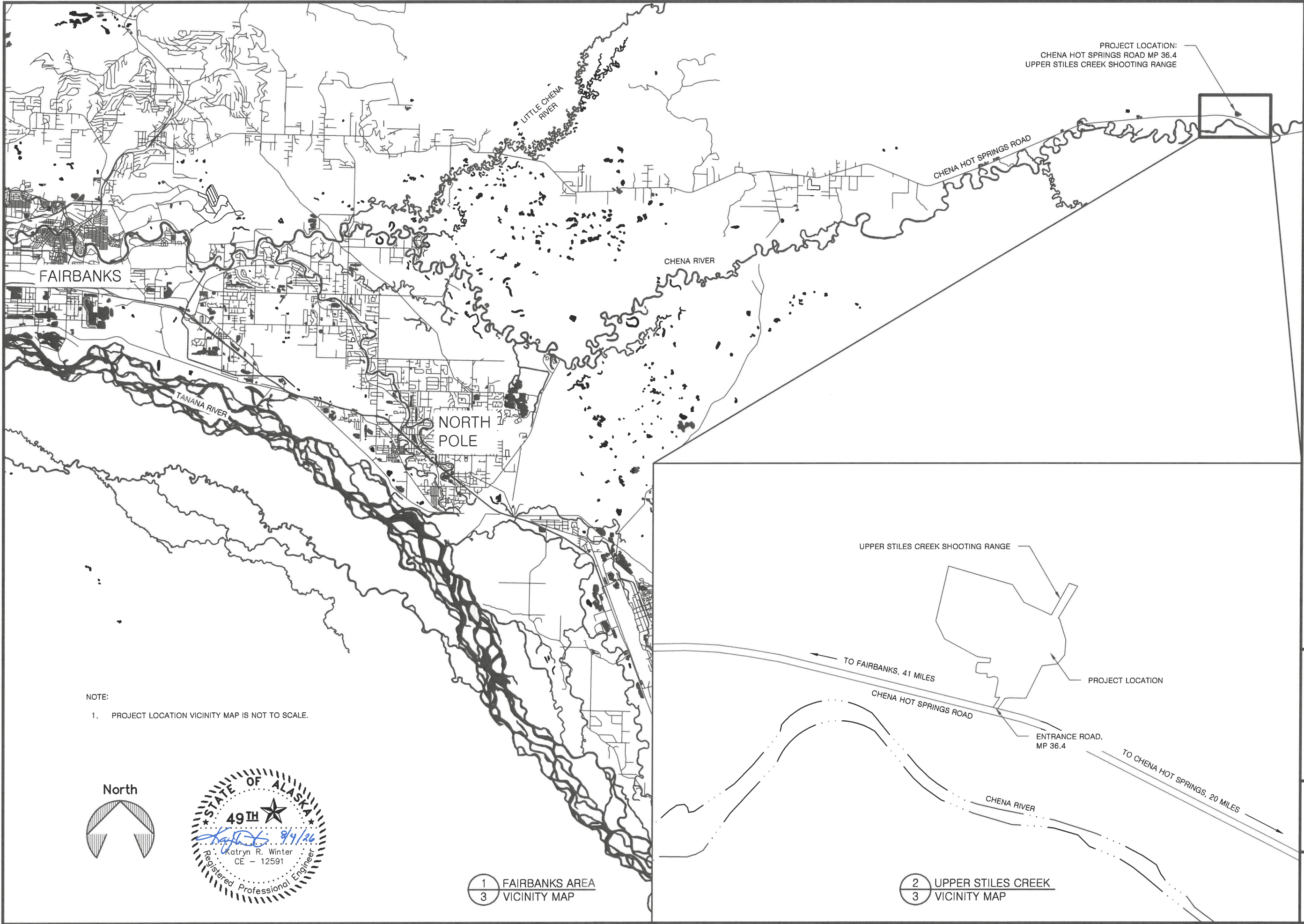
CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

ESTIMATE OF QUANTITIES, LEGEND,
ABBREVIATIONS, AND TABLE OF
ESTIMATING FACTORS

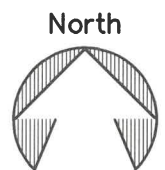


PREPARED: FWS
DRAWN: CKD
REVIEWED: KRW
DATE: AUG. 2026

SHEET
2
OF 22 SHEETS



NOTE:
1. PROJECT LOCATION VICINITY MAP IS NOT TO SCALE.



1 FAIRBANKS AREA
3 VICINITY MAP

2 UPPER STILES CREEK
3 VICINITY MAP

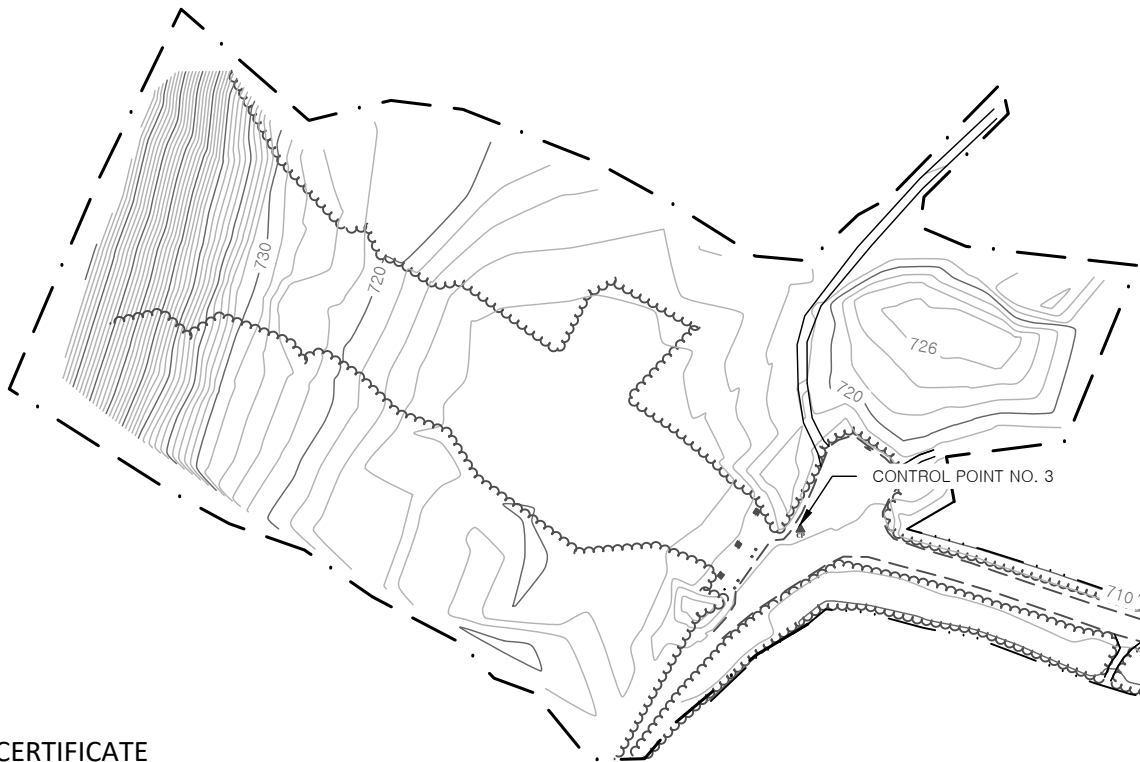
STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES
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VICINITY MAP

PREPARED: FWS
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OF 22 SHEETS



LEGEND

###

POINT NUMBER

▲

SURVEY CONTROL POINT

⊠

DOT ROW MONUMENT

⌵

SIGN

■

SHOOTING TABLE

Point Table				
Point #	Northing	Easting	Elevation	Row Description
101	3985996.04	1569229.53	712.04	CP 1
102	3985825.82	1569502.82	715.01	CP 2
103	3986524.13	1569871.84	714.53	CP 3
104	3986787.85	1569425.58	710.78	CP 4
200	3985798.96	1569005.21	716.78	CONC ROW MON
201	3985518.43	1569892.82	719.44	CONC ROW MON

Typical Set Monument at CP "X"



Set 2-1/2" Al. Cap On a 30" x 5/8" Rebar, Flush to NG



SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT I AM PROPERLY REGISTERED AND LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF ALASKA, AND THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, THAT THE MONUMENTS SHOWN HEREON ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE CORRECT.

07/29/26

DATE

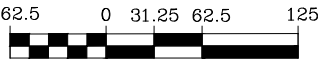
DAVID N. CIAMPA

PROFESSIONAL LAND SURVEYOR, LS-11649

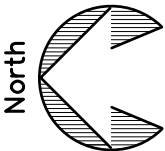
NOTES:

- THE INFORMATION SHOWN HEREON IS BASED ON A FIELD SURVEY PERFORMED BY THE ALASKA DEPARTMENT OF NATURAL RESOURCES, DIVISION OF MINING, LAND AND WATER ON OCTOBER 5, 2021. THE PURPOSE OF THIS SURVEY IS TO PROVIDE TOPOGRAPHIC INFORMATION FOR THE IMPROVEMENT OF CHSR MILE 36.4 SHOOTING RANGE.
- CHENA HOT SPRINGS ROAD ROW CONSTRUCTED USING FOUND DOT ROW MONUMENTS (PT. NO. 200 & 201) AND STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES RIGHT OF WAY MAP, ALASKA PROJECT NO. S-0650(6), MILE 21 TO CHENA HOT SPRINGS.
- THE COORDINATE SYSTEM FOR THIS PROJECT IS ALASKA STATE PLANE ZONE 3, NAD83(2011) EPOCH (2010.0000) IN US SURVEY FEET. THE BASIS OF COORDINATES IS POINT NO. 101 "CP 1" BASED ON A GPS OPUS SOLUTION PERFORMED ON OCTOBER 15, 2021. "CP 1" LATITUDE: 64°54'22.70005" N, LONGITUDE 146°27'30.18067" W.
- ALL BEARINGS SHOWN ARE ALASKA STATE PLANE ZONE 3, NAD83(2011) GRID BEARINGS BASED UPON GPS OBSERVATIONS. ALL DIMENSIONS SHOWN ARE ALASKA STATE PLANE ZONE 3 GRID DISTANCES IN US SURVEY FEET. TO CONVERT TO GROUND DISTANCES SCALE BY THE COMBINED SCALE FACTOR OF 1/0.99987027.
- THE VERTICAL DATUM FOR THIS SURVEY IS NAVD88 (OPUS DERIVED FROM GEOID 12B). THE BASIS OF VERTICAL CONTROL IS POINT NO. 101 "CP 1", HAVING AN ORTHOMETRIC HEIGHT OF 712.04', BASED ON A GPS OPUS DERIVED SOLUTION PERFORMED ON OCTOBER 15, 2021.
- VERIFY HORIZONTAL AND VERTICAL CONTROL PRIOR TO CONSTRUCTION.

GRAPHIC SCALE



(IN FEET)



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CHENA RIVER SRA: UPPER STILES CREEK

SHOOTING RANGE IMPROVEMENTS

PROJECT No. 70011-1

SURVEY CONTROL



PREPARED: FWS

DRAWN: JMD

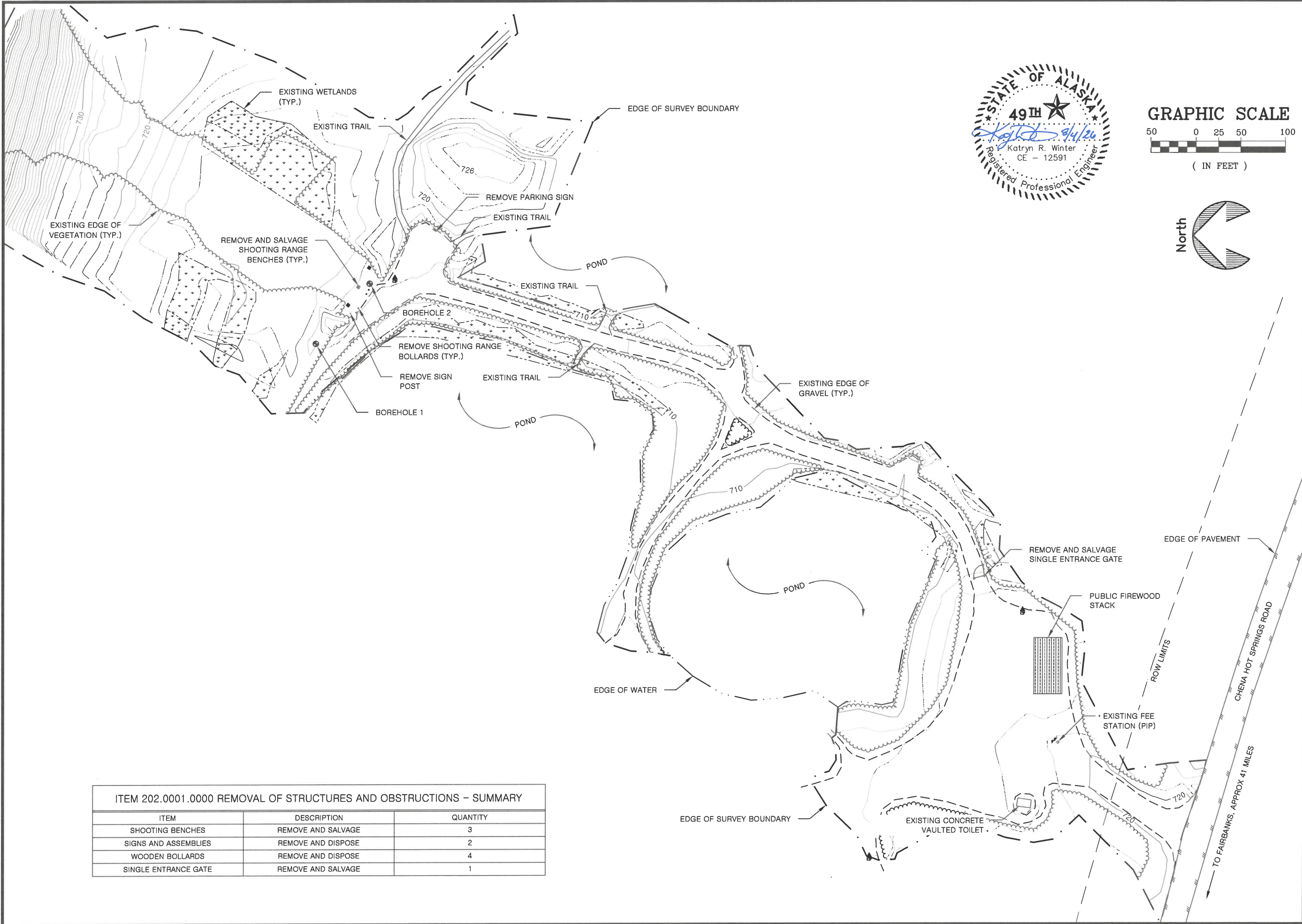
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SHEET

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OF 22 SHEETS



ITEM 202.0001.0000 REMOVAL OF STRUCTURES AND OBSTRUCTIONS - SUMMARY		
ITEM	DESCRIPTION	QUANTITY
SHOOTING BENCHES	REMOVE AND SALVAGE	3
SIGNS AND ASSEMBLIES	REMOVE AND DISPOSE	2
WOODEN BOLLARDS	REMOVE AND DISPOSE	4
SINGLE ENTRANCE GATE	REMOVE AND SALVAGE	1

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EXISTING CONDITIONS
AND DEMOLITION PLAN

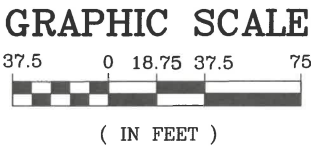
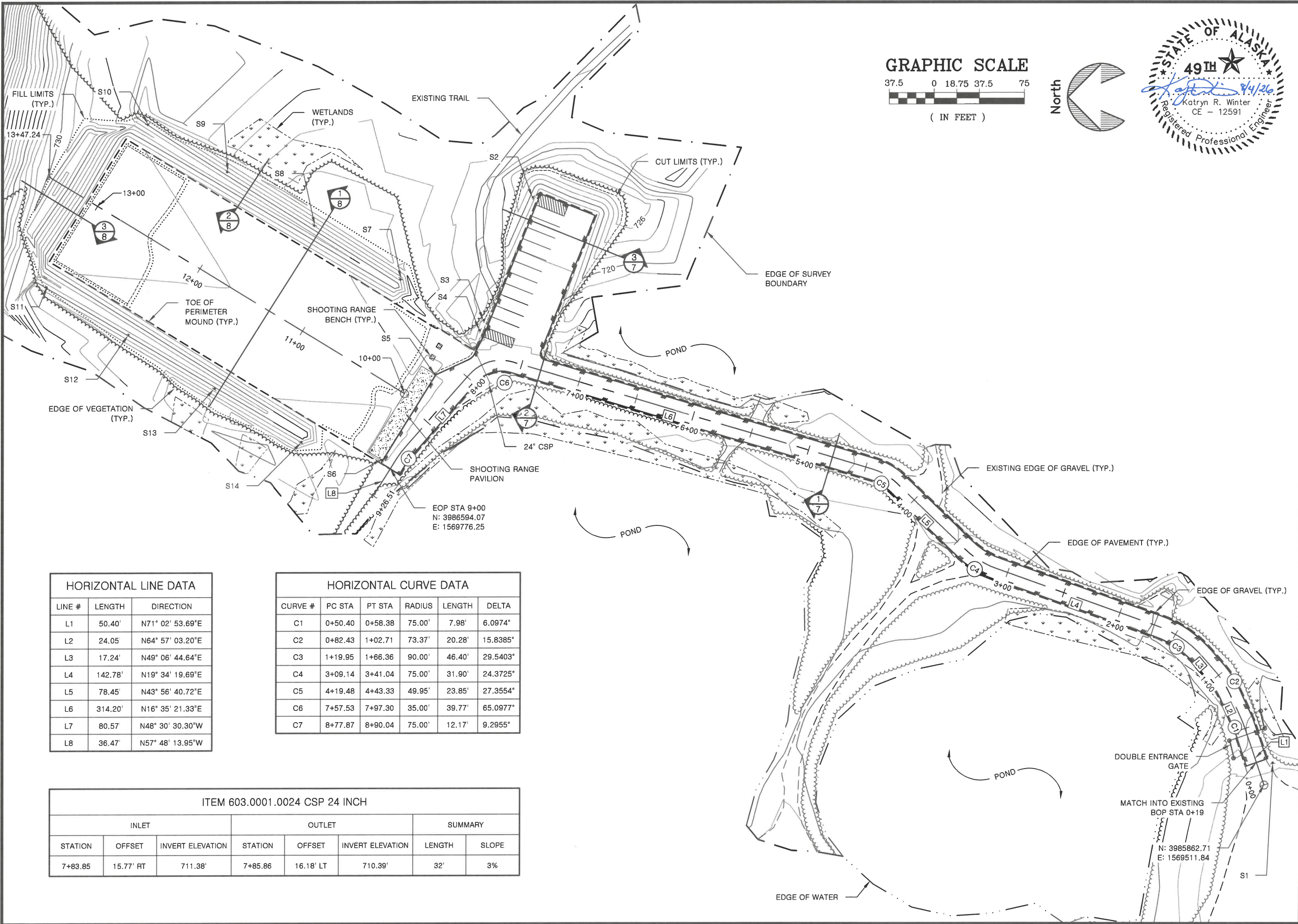


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REVIEWED: KRW
DATE: AUG. 2026

SHEET

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OF 22 SHEETS



HORIZONTAL LINE DATA		
LINE #	LENGTH	DIRECTION
L1	50.40'	N71° 02' 53.69"E
L2	24.05	N64° 57' 03.20"E
L3	17.24'	N49° 06' 44.64"E
L4	142.78'	N19° 34' 19.69"E
L5	78.45'	N43° 56' 40.72"E
L6	314.20'	N16° 35' 21.33"E
L7	80.57	N48° 30' 30.30"W
L8	36.47'	N57° 48' 13.95"W

HORIZONTAL CURVE DATA					
CURVE #	PC STA	PT STA	RADIUS	LENGTH	DELTA
C1	0+50.40	0+58.38	75.00'	7.98'	6.0974°
C2	0+82.43	1+02.71	73.37'	20.28'	15.8385°
C3	1+19.95	1+66.36	90.00'	46.40'	29.5403°
C4	3+09.14	3+41.04	75.00'	31.90'	24.3725°
C5	4+19.48	4+43.33	49.95'	23.85'	27.3554°
C6	7+57.53	7+97.30	35.00'	39.77'	65.0977°
C7	8+77.87	8+90.04	75.00'	12.17'	9.2955°

ITEM 603.0001.0024 CSP 24 INCH							
INLET			OUTLET			SUMMARY	
STATION	OFFSET	INVERT ELEVATION	STATION	OFFSET	INVERT ELEVATION	LENGTH	SLOPE
7+83.85	15.77' RT	711.38'	7+85.86	16.18' LT	710.39'	32'	3%

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SITE PLAN

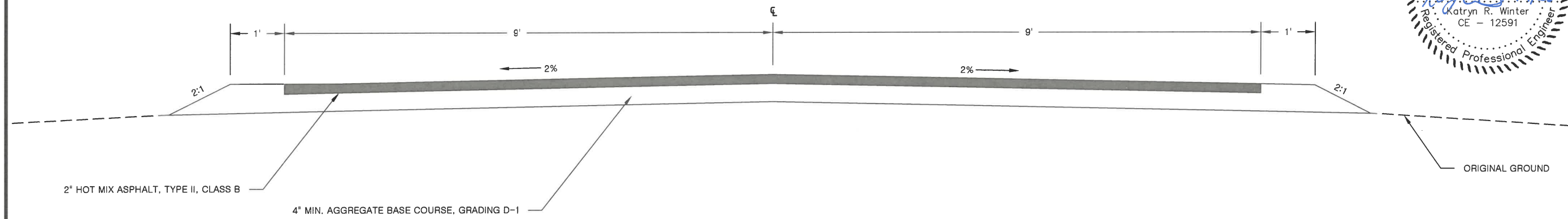


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REVIEWED: KRW
DATE: AUG. 2026

SHEET

6

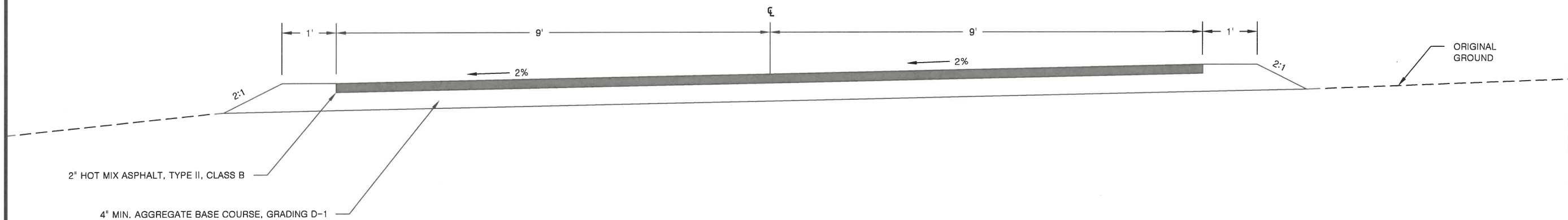
OF 22 SHEETS



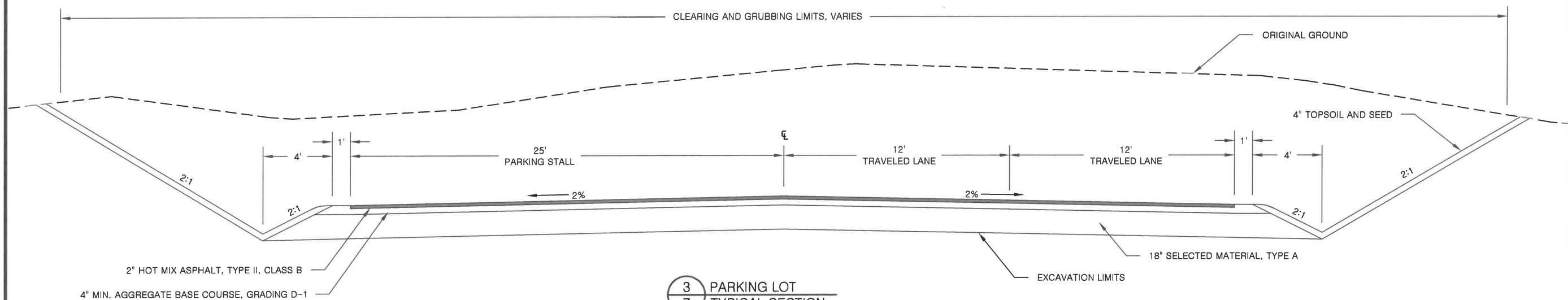
1 ACCESS ROAD
7 TYPICAL SECTION STA. 0+19 TO 6+35

NOTE:

1. ROAD TRANSITIONS FROM CROWNED SECTION TO A UNIFORM 2% CROSS SLOPE BEGINNING AT STATION 6+35 AND ENDING AT STATION 7+35.



2 ACCESS ROAD
7 TYPICAL SECTION STA. 7+35 TO 9+00



3 PARKING LOT
7 TYPICAL SECTION

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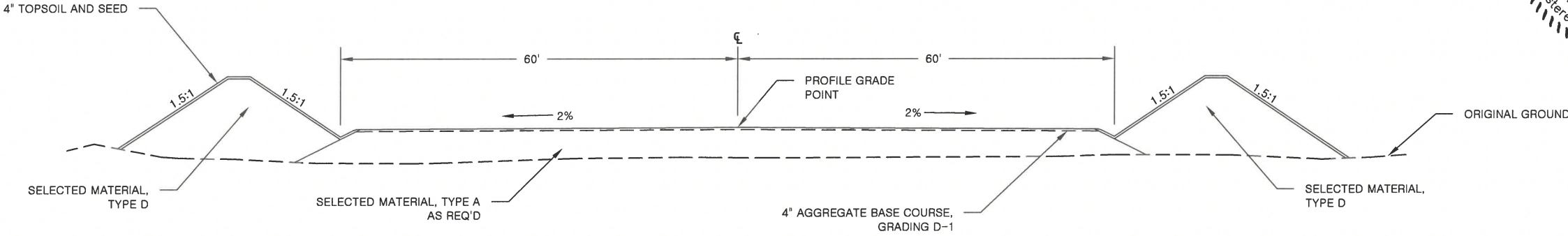
SHEET

7

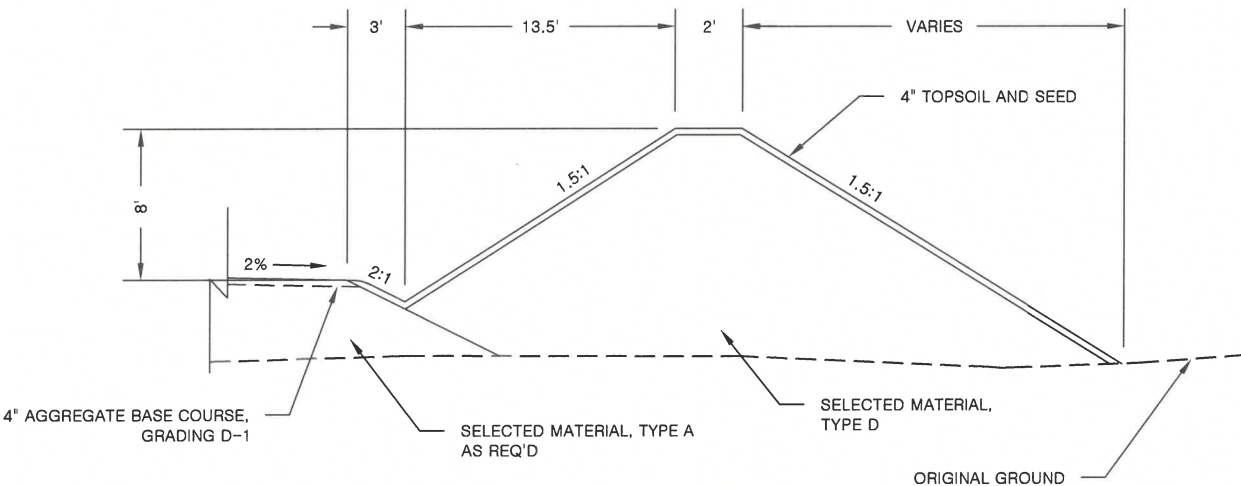
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TYPICAL SECTIONS

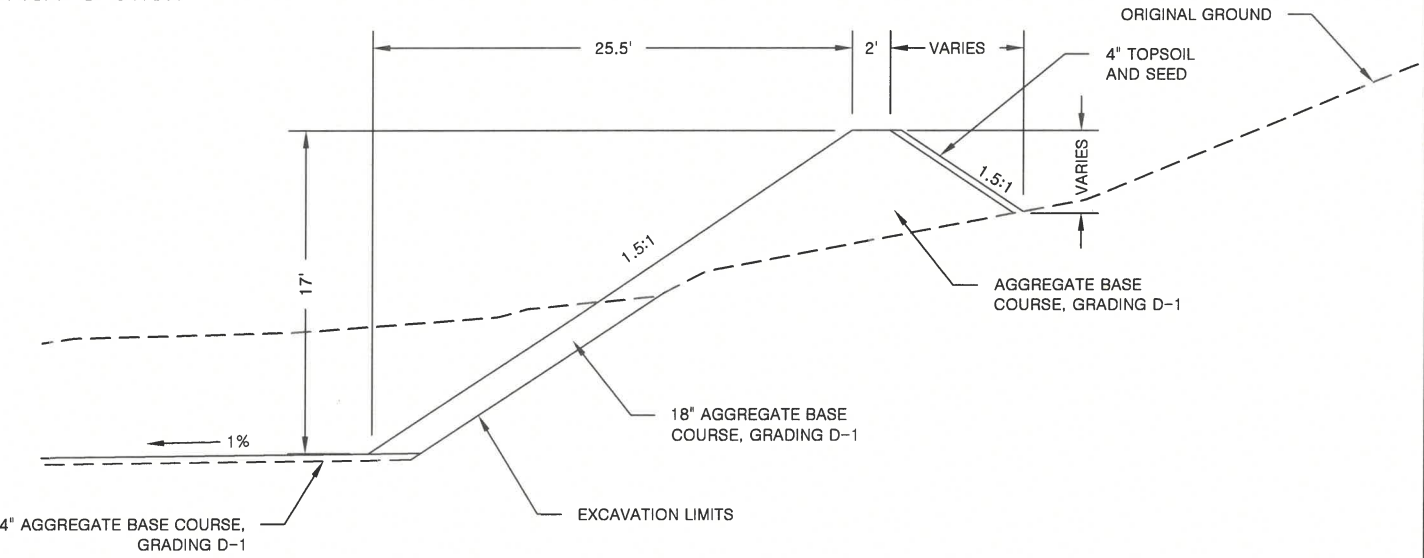
- NOTES:
1. MOUNDS SHALL BE CONSTRUCTED FROM SELECTED MATERIAL, TYPE D UNTIL THE SELECTED MATERIAL, TYPE D IS EXHAUSTED. AFTERWARD, SELECTED MATERIAL, TYPE C SHALL BE USED TO FINISH CONSTRUCTION.
 2. BACKSTOP SHALL BE CONSTRUCTED FROM D-1.



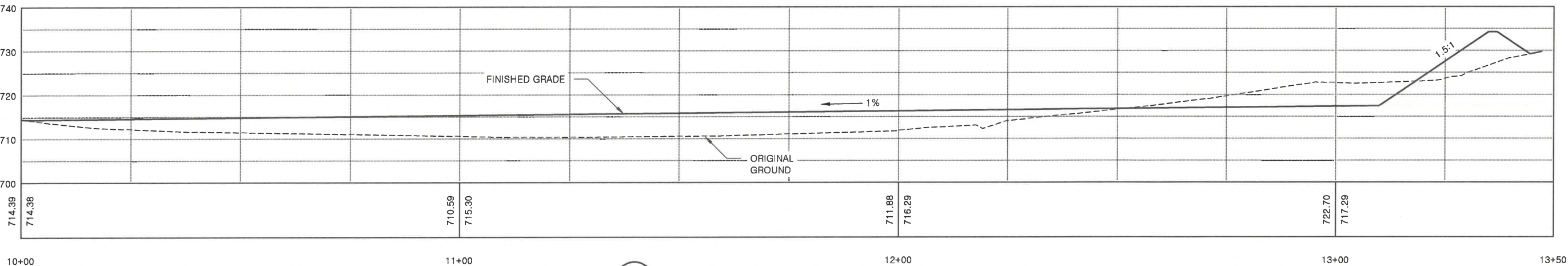
1 SHOOTING RANGE
8 TYPICAL SECTION



2 SHOOTING RANGE MOUNDS
8 TYPICAL SECTION



3 SHOOTING RANGE BACKSTOP
8 TYPICAL SECTION



4 SHOOTING RANGE
8 PROFILE

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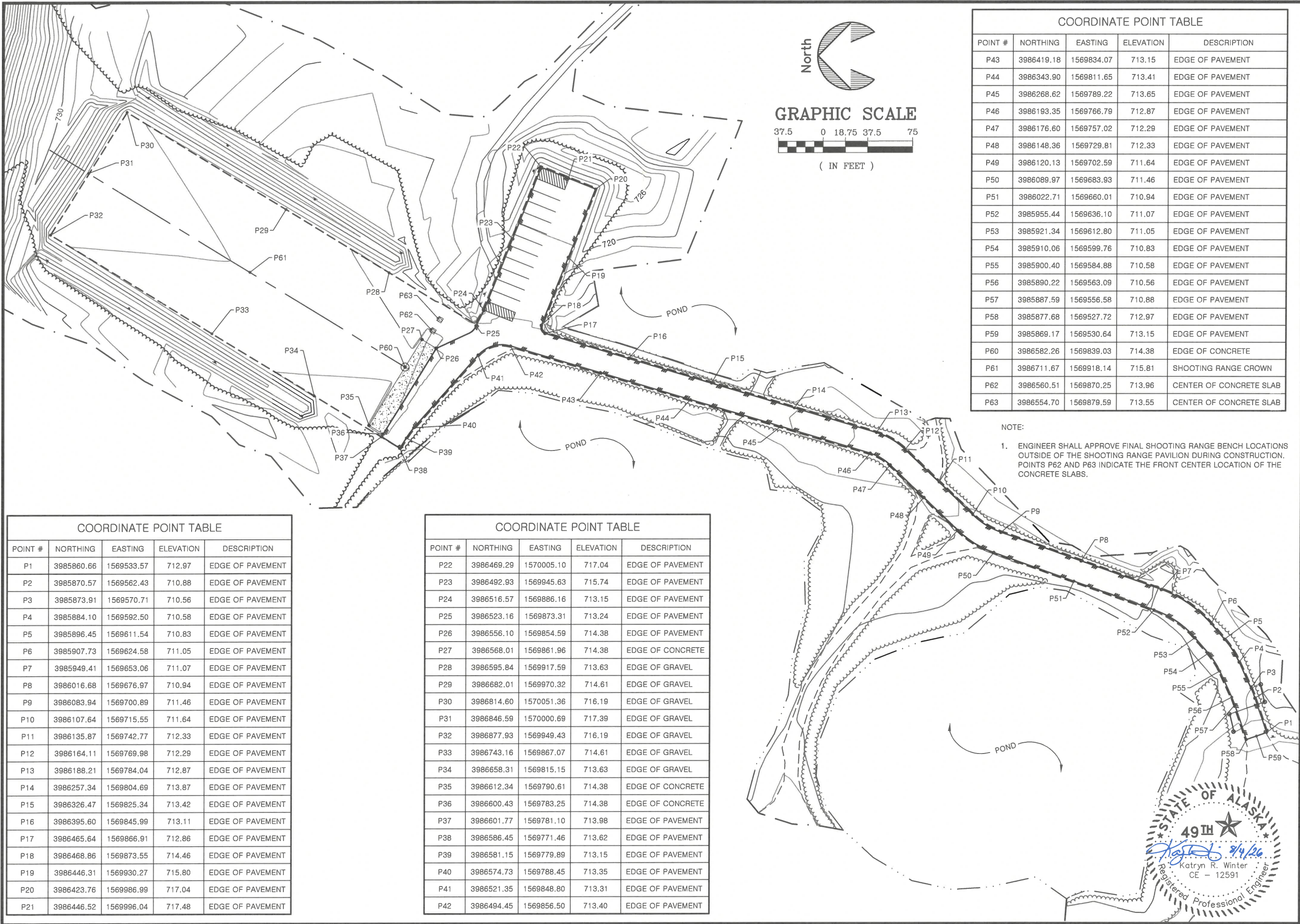


PREPARED: FWS
DRAWN: FWS
REVIEWED: KRW
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SHEET

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OF 22 SHEETS



COORDINATE POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
P1	3985860.66	1569533.57	712.97	EDGE OF PAVEMENT
P2	3985870.57	1569562.43	710.88	EDGE OF PAVEMENT
P3	3985873.91	1569570.71	710.56	EDGE OF PAVEMENT
P4	3985884.10	1569592.50	710.58	EDGE OF PAVEMENT
P5	3985896.45	1569611.54	710.83	EDGE OF PAVEMENT
P6	3985907.73	1569624.58	711.05	EDGE OF PAVEMENT
P7	3985949.41	1569653.06	711.07	EDGE OF PAVEMENT
P8	3986016.68	1569676.97	710.94	EDGE OF PAVEMENT
P9	3986083.94	1569700.89	711.46	EDGE OF PAVEMENT
P10	3986107.64	1569715.55	711.64	EDGE OF PAVEMENT
P11	3986135.87	1569742.77	712.33	EDGE OF PAVEMENT
P12	3986164.11	1569769.98	712.29	EDGE OF PAVEMENT
P13	3986188.21	1569784.04	712.87	EDGE OF PAVEMENT
P14	3986257.34	1569804.69	713.87	EDGE OF PAVEMENT
P15	3986326.47	1569825.34	713.42	EDGE OF PAVEMENT
P16	3986395.60	1569845.99	713.11	EDGE OF PAVEMENT
P17	3986465.64	1569866.91	712.86	EDGE OF PAVEMENT
P18	3986468.86	1569873.55	714.46	EDGE OF PAVEMENT
P19	3986446.31	1569930.27	715.80	EDGE OF PAVEMENT
P20	3986423.76	1569986.99	717.04	EDGE OF PAVEMENT
P21	3986446.52	1569996.04	717.48	EDGE OF PAVEMENT

COORDINATE POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
P22	3986469.29	1570005.10	717.04	EDGE OF PAVEMENT
P23	3986492.93	1569945.63	715.74	EDGE OF PAVEMENT
P24	3986516.57	1569886.16	713.15	EDGE OF PAVEMENT
P25	3986523.16	1569873.31	713.24	EDGE OF PAVEMENT
P26	3986556.10	1569854.59	714.38	EDGE OF PAVEMENT
P27	3986568.01	1569861.96	714.38	EDGE OF CONCRETE
P28	3986595.84	1569917.59	713.63	EDGE OF GRAVEL
P29	3986682.01	1569970.32	714.61	EDGE OF GRAVEL
P30	3986814.60	1570051.36	716.19	EDGE OF GRAVEL
P31	3986846.59	1570000.69	717.39	EDGE OF GRAVEL
P32	3986877.93	1569949.43	716.19	EDGE OF GRAVEL
P33	3986743.16	1569867.07	714.61	EDGE OF GRAVEL
P34	3986658.31	1569815.15	713.63	EDGE OF GRAVEL
P35	3986612.34	1569790.61	714.38	EDGE OF CONCRETE
P36	3986600.43	1569783.25	714.38	EDGE OF CONCRETE
P37	3986601.77	1569781.10	713.98	EDGE OF PAVEMENT
P38	3986586.45	1569771.46	713.62	EDGE OF PAVEMENT
P39	3986581.15	1569779.89	713.15	EDGE OF PAVEMENT
P40	3986574.73	1569788.45	713.35	EDGE OF PAVEMENT
P41	3986521.35	1569848.80	713.31	EDGE OF PAVEMENT
P42	3986494.45	1569856.50	713.40	EDGE OF PAVEMENT

COORDINATE POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
P43	3986419.18	1569834.07	713.15	EDGE OF PAVEMENT
P44	3986343.90	1569811.65	713.41	EDGE OF PAVEMENT
P45	3986268.62	1569789.22	713.65	EDGE OF PAVEMENT
P46	3986193.35	1569766.79	712.87	EDGE OF PAVEMENT
P47	3986176.60	1569757.02	712.29	EDGE OF PAVEMENT
P48	3986148.36	1569729.81	712.33	EDGE OF PAVEMENT
P49	3986120.13	1569702.59	711.64	EDGE OF PAVEMENT
P50	3986089.97	1569683.93	711.46	EDGE OF PAVEMENT
P51	3986022.71	1569660.01	710.94	EDGE OF PAVEMENT
P52	3985955.44	1569636.10	711.07	EDGE OF PAVEMENT
P53	3985921.34	1569612.80	711.05	EDGE OF PAVEMENT
P54	3985910.06	1569599.76	710.83	EDGE OF PAVEMENT
P55	3985900.40	1569584.88	710.58	EDGE OF PAVEMENT
P56	3985890.22	1569563.09	710.56	EDGE OF PAVEMENT
P57	3985887.59	1569556.58	710.88	EDGE OF PAVEMENT
P58	3985877.68	1569527.72	712.97	EDGE OF PAVEMENT
P59	3985869.17	1569530.64	713.15	EDGE OF PAVEMENT
P60	3986582.26	1569839.03	714.38	EDGE OF CONCRETE
P61	3986711.67	1569918.14	715.81	SHOOTING RANGE CROWN
P62	3986560.51	1569870.25	713.96	CENTER OF CONCRETE SLAB
P63	3986554.70	1569879.59	713.55	CENTER OF CONCRETE SLAB

NOTE:
1. ENGINEER SHALL APPROVE FINAL SHOOTING RANGE BENCH LOCATIONS OUTSIDE OF THE SHOOTING RANGE PAVILION DURING CONSTRUCTION. POINTS P62 AND P63 INDICATE THE FRONT CENTER LOCATION OF THE CONCRETE SLABS.

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CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

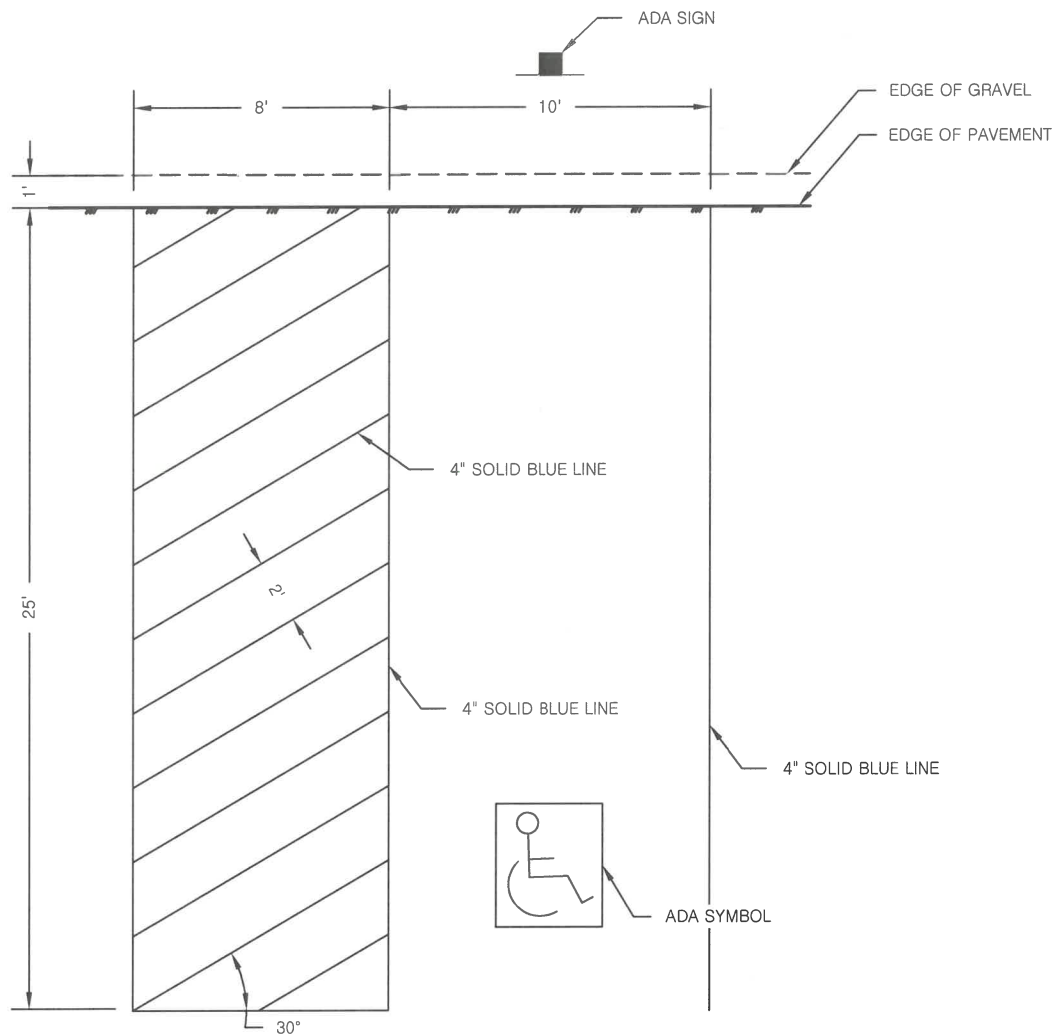


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REVIEWED: KRW
DATE: AUG. 2026

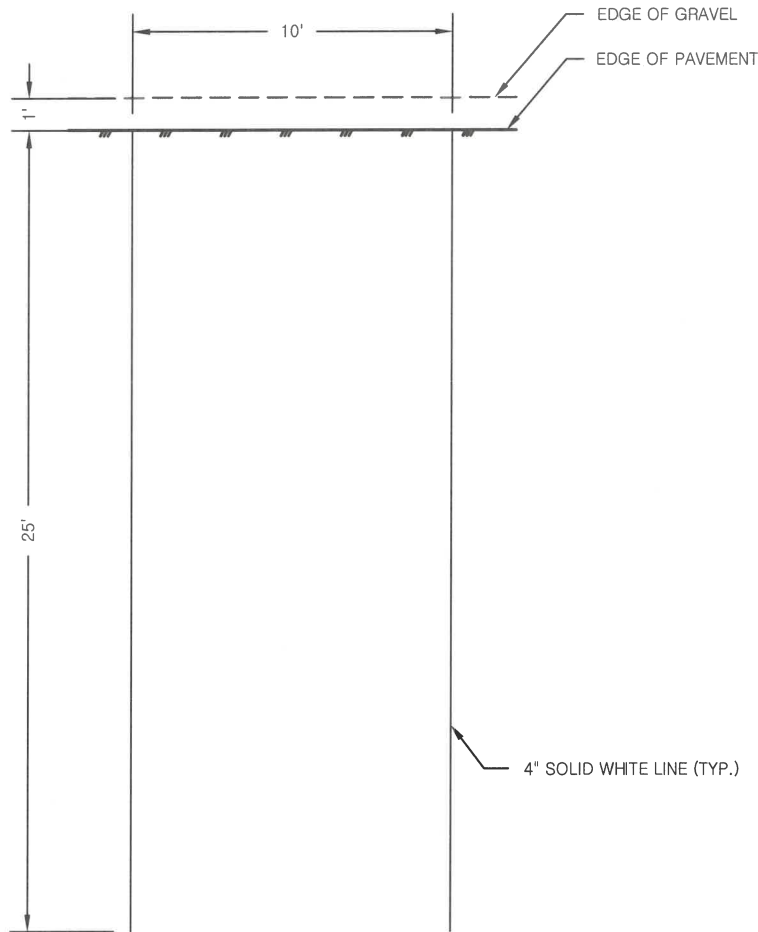
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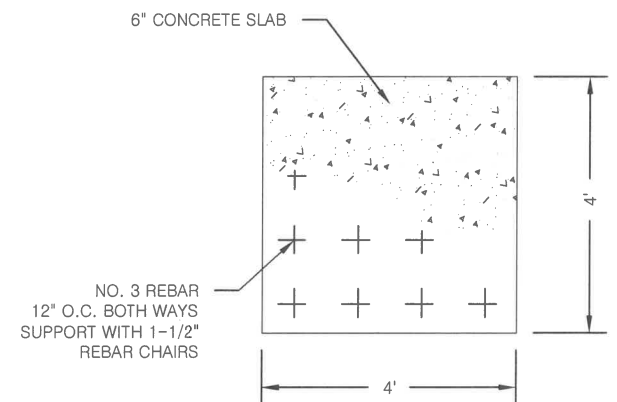
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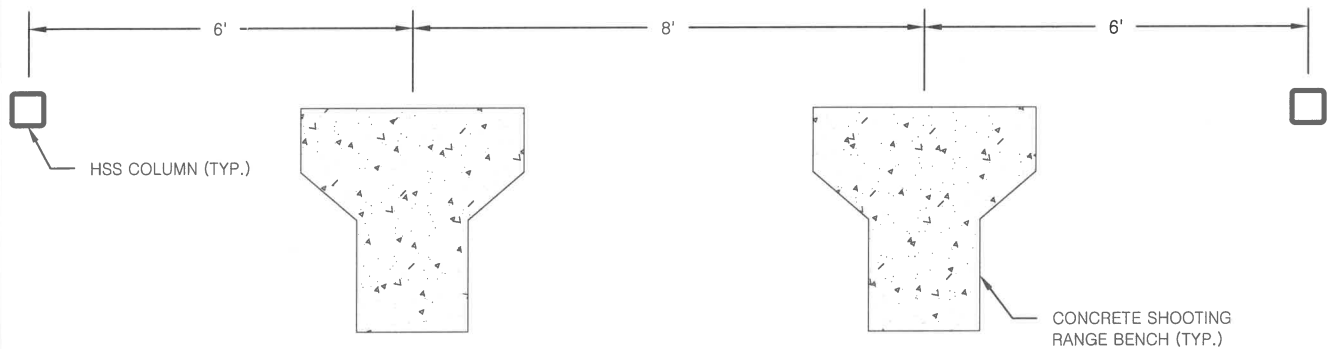
1
10 HANDICAP SPACE STRIPING
DETAIL



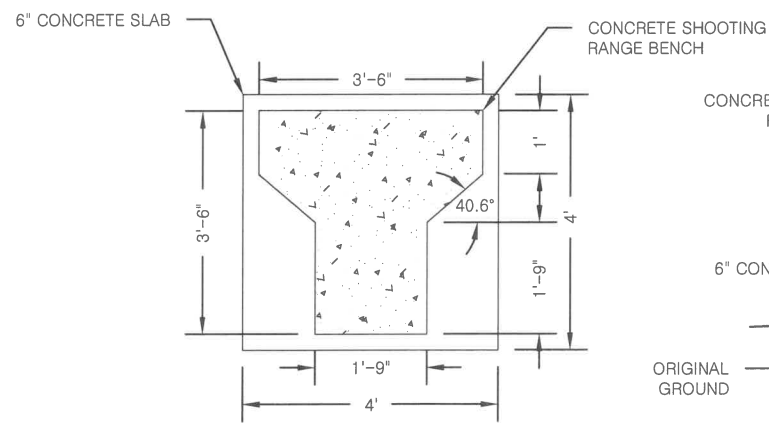
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10 STANDARD SPACE STRIPING
DETAIL



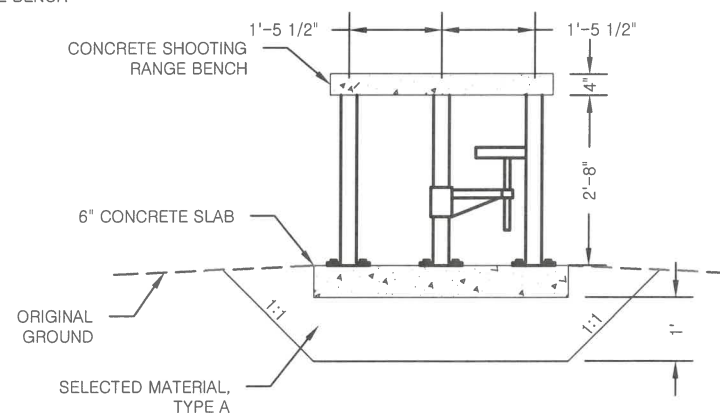
3
10 UNCOVERED CONCRETE SLAB
PLAN VIEW



4
10 CANOPY COVERED SHOOTING BENCH
PLAN VIEW



5
10 UNCOVERED SHOOTING BENCH
PLAN VIEW



6
10 UNCOVERED SHOOTING BENCH
FRONT VIEW

NOTES:

1. ALIGN FRONT OF CANOPY COVERED SHOOTING RANGE BENCHES WITH CENTER OF COLUMN.
2. ANCHOR SHOOTING RANGE BENCH TO SLAB WITH CONCRETE SCREW ANCHORS.



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DETAILS



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 DRAWN: FWS
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 DATE: AUG. 2026

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GENERAL STRUCTURAL NOTES

A. DESIGN CRITERIA

1.

BUILDING CODE.....

2021 IBC (INTERNATIONAL BUILDING CODE)
- GOVERNING JURISDICTION.....

STATE OF ALASKA
2.

DEAD LOADS
- ROOF SUPERIMPOSED DEAD LOAD.....

6 PSF
3.

SNOW LOADS
- GROUND SNOW LOAD P_g

60 PSF
- BALANCED ROOF SNOW LOAD P_s

50 PSF
- SNOW EXPOSURE FACTOR C_e

1.0
- SNOW LOAD IMPORTANCE FACTOR I

1.0
- THERMAL FACTOR C_t

1.2
4.

WIND LOADS
- ULTIMATE DESIGN WIND SPEED V_{ULT}

110 MPH
- NOMINAL DESIGN WIND SPEED V_{ASD}

85 MPH
- RISK CATEGORY

II
- EXPOSURE

B
- INTERNAL PRESSURE COEFFICIENT

N/A

WIND LOADING ZONE PRESSURES

COMPONENTS AND CLADDING ULTIMATE DESIGN PRESSURE IN PSF FOR EFFECTIVE AREA OF 0-10 SF ARE LISTED. NET PRESSURES INCLUDE CONTRIBUTIONS FROM TOP AND BOTTOM SURFACES FOR OPEN AIR STRUCTURE. (SEE FIG 30.7-1 ASCE 7-16) LISTED PRESSURES CAN BE CONVERTED TO ASD LOADS BY APPLYING A LOAD FACTOR OF 0.6

ZONE 1		ZONE 2		ZONE 3	
POS	NEG	POS	NEG	POS	NEG
+23	-24	+34	-37	+46	-48

5. SEISMIC LOADS

- S_s

0.79
- S_1

0.32
- S_{DS}

0.63
- S_{D1}

0.42
- C_s

0.18
- R

3.5
- SITE CLASS.....

D (DEFAULT)
- SEISMIC DESIGN CATEGORY.....

D
- RISK CATEGORY

II
- IMPORTANCE FACTOR.....

1.0
- BASIC SEISMIC FORCE RESISTING SYSTEM.....

STEEL ORDINARY MOMENT FRAME
- DESIGN BASE SHEAR.....

5.1 KIPS
- ANALYSIS PROCEDURE.....

EQUIVALENT LATERAL FORCE METHOD

B. GENERAL

1.

THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OR SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO: BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR PROCEDURE OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERETO (NOR SHALL OBSERVATION VISITS TO THE SITE INCLUDE INSPECTION OF THESE ITEMS.)
2.

CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF ALL SCAFFOLDING, BRACING AND SHORING.
3.

CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED CONSTRUCTION. LOADS SHALL NOT EXCEED THE DESIGN LIVE LOAD.
4.

DO NOT USE SCALED DIMENSIONS TAKEN FROM STRUCTURAL DRAWINGS. CONTACT STRUCTURAL ENGINEER IF DIMENSIONAL INFORMATION IS MISSING.
5.

ANY ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF ALASKA.

C. WOOD CONSTRUCTION

1.

ROOF SHEATHING SHALL BE APA RATED SHEATHING:
- a.

SPAN RATING: 40/20
- b.

EXPOSURE DURABILITY CLASSIFICATION: EXPOSURE 1
- c.

EDGE DETAIL - SQUARE
- d.

THICKNESS PER DRAWINGS
2.

LUMBER NAILERS: PRESSURE TREATED SPF

D. FOUNDATION

1.

FOUNDATION DESIGN IS BASED ON A GEOTECHNICAL INVESTIGATION PREPARED BY DESIGN ALASKA DATED 02/23.
2.

ALLOWABLE SOIL BEARING PRESSURE: 2000 PSF
3.

ALL ORGANIC AND/ OR OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM SUB-GRADE AND BACKFILLED WITH SELECT MATERIAL, TYPE A.
4.

THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PREVENT ANY FROST OR ICE FROM PENETRATING ANY FOOTING OR SLAB SUB-GRADE BEFORE AND AFTER PLACING CONCRETE UNTIL SUCH SUB-GRADES ARE PERMANENTLY PROTECTED BY THE BUILDING STRUCTURE.

E. STRUCTURAL STEEL

1.

ALL STRUCTURAL STEEL WIDE FLANGE MEMBERS SHALL BE ASTM A572 - GRADE 50 ($F_y = 50$ KSI) OR A992 ($F_y = 50$ KSI).
2.

SQUARE/RECTANGULAR HOLLOW STRUCTURAL SECTIONS (HSS) SHALL CONFORM TO ASTM A500 GRADE C ($F_y = 50$ KSI).
3.

ANGLES, PLATES, AND CHANNELS SHALL BE ASTM A36 ($F_y = 36$ KSI).
4.

ALL STRUCTURAL STEEL SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC STEEL CONSTRUCTION MANUAL.
5.

BOLTED CONNECTIONS SHALL BE ACCOMPLISHED WITH TENSION-CONTROLLED HIGH-STRENGTH BOLTS CONFORMING TO ASTM F3125 GRADE F1852 (A325-TC) IN STANDARD HOLES UNLESS NOTED OTHERWISE.
6.

ALL BOLTED CONNECTIONS SHALL BE PRE-TENSIONED UNLESS NOTED OTHERWISE.
7.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF ALL ERECTION PROCEDURES AND SEQUENCES WITH REGARD TO TEMPERATURE DIFFERENTIALS.
8.

WELDING SHALL BE PERFORMED WITH E70XX ELECTRODES. WELDING SHALL BE DONE BY QUALIFIED WELDERS AND SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE-STEEL, LATEST EDITION. ALL WELDS ARE INTENDED TO BE CONTINUOUS UNLESS NOTED OTHERWISE.
9.

FIELD WELDS NOTED THROUGHOUT THE CONTRACT DOCUMENTS ARE ACCEPTABLE LOCATIONS FOR FIELD WELDING AT THE CONTRACTOR'S OPTION. FIELD WELDS MAY BE PERFORMED IN THE SHOP.
10.

ALL STRUCTURAL STEEL COMPONENTS WITHIN MOMENT FRAMES SHALL CONFORM TO THE FOLLOWING ADDITIONAL REQUIREMENTS:
- a.

WELDING SHALL BE PERFORMED IN ACCORDANCE WITH A WELDING PROCEDURE SPECIFICATION (WPS) AS REQUIRED IN AWS D1.1 AND APPROVED BY THE ENGINEER OF RECORD. WELDS SHALL BE MADE WITH FILLER METALS MEETING THE REQUIREMENTS SPECIFIED IN AWS D1.8 CLAUSE 6.3.
- b.

WELDS DESIGNATED AS DEMAND CRITICAL SHALL BE MADE WITH FILLER METALS MEETING THE REQUIREMENTS SPECIFIED IN AWS D1.8 CLAUSE 6.3.
- c.

ALL FAYING SURFACES DESIGNATED AS SLIP-CRITICAL SHALL BE PREPARED AS REQUIRED FOR CLASS A OR BETTER SLIP-CRITICAL JOINTS.
11.

SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL STEEL ITEMS. THE CONTRACTOR SHALL REVIEW SHOP DRAWINGS PRIOR TO SUBMITTAL AND FLAG ITEMS THAT ARE NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. REVIEWING IS ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. RESPONSIBILITY FOR CORRECTNESS AND COMPLETENESS SHALL REST WITH THE CONTRACTOR.
-
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- CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1
- STRUCTURAL GENERAL NOTES
-
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F. CONCRETE

A. GENERAL:

1.

a.

A MINIMUM 28-DAY COMPRESSIVE STRENGTH (f_c) OF 4500 PSI.
- b.

MAXIMUM AGGREGATE SIZE: 3/4"
- c.

6% ±1.5% AIR ENTRAINMENT BY VOLUME.
- d.

MAXIMUM WATER TO CEMENT RATIO OF 0.45
- e.

MAXIMUM SLUMP OF 6" AT TRUCK CHUTE DISCHARGE POINT.
2.

CONCRETE SHALL BE TESTED FOR TEMPERATURE, SLUMP, AIR CONTENT AND STRENGTH VERIFICATION IN ACCORDANCE WITH ASTM C 1064, ASTM C 143, ASTM C321, ASTM C31 & C39 RESPECTIVELY. TESTING FREQUENCY SHALL BE AS FOLLOWS:
- a.

0-25 CY PER DAY: ONE TEST
- b.

ONE TEST PER EACH ADDITIONAL 50 CY
3.

CONCRETE SHALL MEET ALL REQUIREMENTS OF ACI 301 SPECIFICATION FOR STRUCTURAL CONCRETE BUILDINGS.

B. REINFORCING:

1.

REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60.
2.

DETAIL REINFORCING BARS IN ACCORDANCE WITH THE ACI DETAILING MANUAL AND THE ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, LATEST EDITION.
3.

PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING AT POSITIONS SHOWN ON THE DRAWINGS. PROVIDE SUFFICIENT TIE BARS TO SUPPORT ALL REINFORCING.
4.

DO NOT CUT ANY REINFORCEMENT AT OPENINGS.
5.

UNLESS A REINFORCING SPLICE, CLEAR DISTANCE BETWEEN REINFORCING SHALL NOT BE LESS THAN 1.5 BAR DIAMETERS NOR LESS THAN 1 1/2".
6.

MINIMUM LAP SPLICE LENGTHS FOR REINFORCING BARS SHALL BE 62 BAR DIAMETERS
7.

PROVIDE REINFORCEMENT COVER AS FOLLOWS (ACI 7.7), UNLESS NOTED OTHERWISE ON DRAWINGS:
- a.

MINIMUM COVER: 3" ±3/8"
- b.

CONCRETE SLABS ON GRADE: CENTERED IN SLAB

C. POST-INSTALLED ANCHORS

1.

POST-INSTALLED ANCHORS SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
2.

SCREW ANCHORS: SIMPSON TITEN HD, 316 STAINLESS
3.

INSTALL POST-INSTALLED ANCHORS ONLY AS INDICATED ON THE DRAWINGS OR WITH SPECIFIC WRITTEN APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION.
4.

THE CONTRACTOR MAY NOT USE SUBSTITUTES FOR THE POST-INSTALLED ANCHORS WITHOUT PRIOR APPROVAL OF THE ENGINEER.
5.

SEE DRAWINGS FOR ANCHOR TYPE, SIZE, AND EMBEDMENT DEPTHS. INSTALL ANCHORS AS OUTLINED IN MANUFACTURER'S SPECIFICATIONS AND ICC REPORTS. UTILIZE PROPER DRILL TYPE, BIT SIZE, AND HOLE CLEANING, DRIVING OR TIGHTENING TECHNIQUES, UNLESS NOTED OTHERWISE.

D. FINISH

- a.

EXTERIOR CONCRETE TO BE BROOM FINISHED.
- b.

ALL PERMANENTLY EXPOSED CONCRETE EDGES TO BE CHAMFERED 3/4", UNO.

E. COLD-WEATHER CONCRETE:

- COLD WEATHER CONDITIONS EXIST WHEN AIR TEMPERATURE HAS FALLEN TO OR IS EXPECTED TO FALL BELOW 40°F DURING CONCRETE PLACEMENT OR STANDARD PROTECTION PERIOD OR AT ANYTIME DURING THE PROTECTION PERIOD DURATION AS OUTLINED BELOW. COMPLY WITH ACI 306.1, STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING AND AS FOLLOWS:
1.

SUBGRADE TO BE THAWED PRIOR TO CONCRETE PLACEMENT.
2.

DO NOT PLACE CONCRETE ON FROZEN MATERIALS, ICE, SNOW, OR STANDING WATER.
3.

DO NOT USE CALCIUM CHLORIDE, SALT, OR OTHER MATERIALS CONTAINING ANTIFREEZE AGENTS OR CHEMICAL ACCELERATORS UNLESS OTHERWISE SPECIFIED AND APPROVED IN MIXTURE DESIGNS.
4.

DO NOT USE FROZEN MATERIALS OR MATERIALS CONTAINING ICE OR SNOW IN THE CONCRETE MIXTURE.
5.

ALL MASSIVE EMBEDMENTS (STRUCTURAL STEEL EMBEDMENTS IN CONTACT WITH CONCRETE WITH A CROSS-SECTIONAL AREA GREATER THAN 4 IN²) MUST BE ABOVE FREEZING BEFORE CONCRETE PLACEMENT.
6.

PROTECT CONCRETE DURING PLACEMENT AND THROUGHOUT THE PROTECTION PERIOD:
- a.

MAINTAIN A MINIMUM CONCRETE TEMPERATURE OF 55°F DURING THE PROTECTION PERIOD.
- b.

PROTECTION PERIOD DURATION:
- 5 DAYS FOR FOUNDATIONS AND THICKENED EDGE SLABS.
- UNTIL CONCRETE HAS REACHED A MINIMUM IN-PLACE COMPRESSIVE STRENGTH OF 3500 PSI.
- c.

DO NOT REMOVE SHORING OR FORMWORK DURING THE PROTECTION PERIOD.
- d.

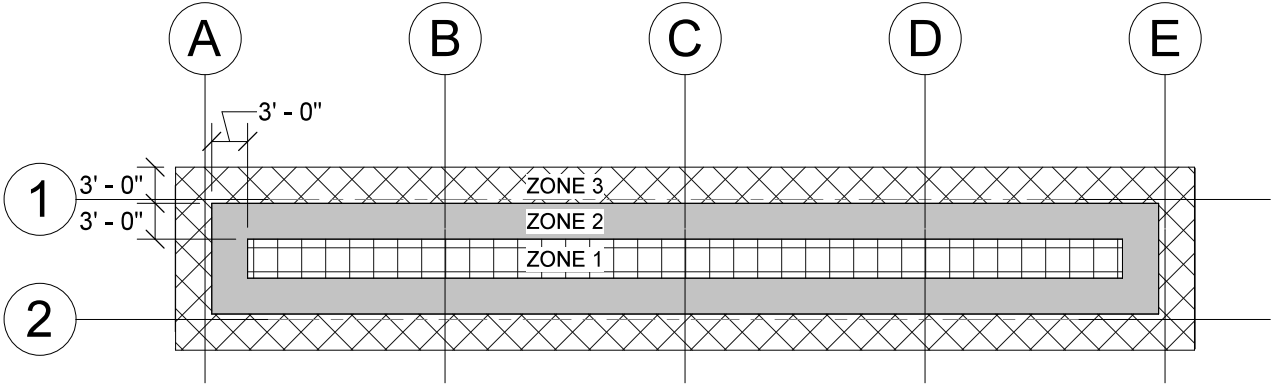
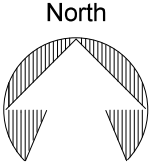
AVOID OVERHEATING AND DRYING CONCRETE SURFACES DURING PROTECTION.
- e.

RECORD CONCRETE TEMPERATURE AT REGULAR TIME INTERVALS AT LEAST TWICE EVERY 24 HOURS.
- f.

PROTECTION TERMINATION REQUIREMENTS:
- FOLLOWING THE PROTECTION PERIOD GRADUALLY COOL CONCRETE SURFACE BY THE FOLLOWING MAXIMUM COOLING RATE UNTIL THE CONCRETE SURFACE TEMPERATURE IS WITHIN 20°F OF THE AMBIENT AIR TEMPERATURE.
- SECTION THICKNESS LESS THAN 12"..... 50°F PER 24 HOURS
7.

FOR FLATWORK, USE LOW SLUMP CONCRETE TO MITIGATE PROBLEMS DUE TO BLEED WATER.
8.

ALL WATER ADDED TO THE CONCRETE MIX SHALL NOT BE LESS THAN 55°F.



1 ROOF WIND PRESSURE ZONE MAP
12 1/16" = 1'-0"

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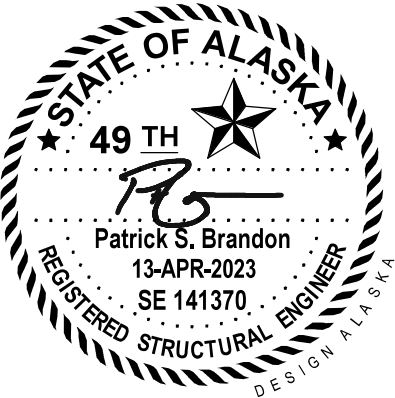
STRUCTURAL GENERAL NOTES



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DATE: 04/14/2023

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SPECIAL INSPECTIONS						
THE FOLLOWING STRUCTURAL ITEMS REQUIRE SPECIAL INSPECTION PER IBC SECTIONS 1704-1707. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR INSPECTION AND TESTING THAT ARE NOT PART OF SPECIAL INSPECTIONS.						
CONTINUOUS: SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS PRESENT WHEN AND WHERE THE WORK TO BE INSPECTED IS BEING PERFORMED.						
PERIODIC: SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS INTERMITTENTLY PRESENT WHERE THE WORK TO BE INSPECTED HAS BEEN OR IS BEING PERFORMED.						
SYSTEM or MATERIAL	INSPECTION			REMARKS		
	IBC CODE REFERENCE	CODE or STANDARD REFERENCE	FREQUENCY			
			CONTINUOUS			PERIODIC
DIVISION #03 - CONCRETE						
CONCRETE						
INSPECT REINFORCEMENT	TABLE 1705.3	ACI 318-19: CH. 20, 25.2, 25.3, 26.6.1 - 26.6.3		X	TOLERANCES AND REINFORCING PLACEMENT PER ACI CHAPTER 25	
INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE		ACI 318-19: 26.7, 6.13.3.2(h), 26.13.3.2(i)		X	SPECIAL INSPECTIONS APPLY TO ANCHOR PRODUCT NAME, TYPE, AND DIMENSIONS, HOLE DIMENSIONS, COMPLIANCE WITH DRILL BIT REQUIREMENTS, CLEANLINESS OF THE HOLE AND ANCHOR, ANCHOR INSTALLATION, ANCHOR EMBEDMENT, AND TIGHTENING TORQUE. INSPECTION FREQUENCY PER MANUFACTURER'S REQUIREMENTS BUT NOT LESS THAN 10% OF EACH ANCHOR TYPE	
INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES. VERIFY USE OF APPROVED MIX DESIGN	TABLE 1705.3, 1904.1, 1904.2	ACI 318-19: 26.5, 26.13.3	X			
DIVISION #05 - STRUCTURAL STEEL						
FABRICATORS						
FABRICATORS	1704.2.5 1704.2.5.1	AISC 360-16: N6		X	SPECIAL INSPECTION IS REQUIRED FOR STRUCTURAL LOAD-BEARING MEMBERS AND ASSEMBLIES FABRICATED ON THE PREMISES OF A FABRICATOR'S SHOP. NOTE: SPECIAL INSPECTION IS NOT REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION	
PRIOR TO BOLTING/WELDING						
MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	1705.2.1	AISC 360-16: TABLE N5.6-1	X			
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS		AISC 306-16: TABLE N5.6-1 RCSC SPECIFICATION FOR STRUCTURAL JOINTS FIGURE C-2.1		X		
CORRECT BOLTING PROCEDURE AND FASTENERS SELECTED FOR JOINT DETAIL		AISC 360-16: TABLE N5.6-1		X	GRADE, TYPE, BOLT LENGTH, IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE	
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS		AISC 360-16: TABLE N5.6-1		X		
PROTECTED STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS, AND OTHER FASTENER COMPONENTS		AISC 360-16: TABLE N5.6-1		X		
WELDER QUALIFICATION RECORDS AND CONTINUITY RECORDS		AISC 360-16: TABLE N5.4-1		X		
WPS AVAILABLE		AISC 360-16: TABLE N5.4-1	X			
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE		AISC 360-16: TABLE N5.4-1		X		
MATERIAL IDENTIFICATION		AISC 360-16: TABLE N5.4-1		X	TYPE/GRADE	
WELDER IDENTIFICATION SYSTEM		AISC 360-16: TABLE N5.4-1		X	THE FABRICATOR OR ERECTOR SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED	
FIT-UP OF FILLET AND GROOVE WELDS		AISC 360-16: TABLE N5.4-1		X	JOINT PREPARATIONS, DIMENSIONS, CLEANLINESS, TACKING, BACKING TYPE AND FIT	



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SPECIAL INSPECTIONS



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SPECIAL INSPECTIONS, CONTINUED						
SYSTEM OR MATERIAL	INSPECTION				REMARKS	
	IBC CODE REFERENCE	CODE OR STANDARD REFERENCE	FREQUENCY			
			CONTINUOUS	PERIODIC		
DIVISION #05 - STRUCTURAL STEEL						
DURING BOLTING/WELDING						
FASTENER ASSEMBLIES PLACED IN ALL HOLES AND WASHERS AND NUTS ARE POSITIONED AS REQUIRED AND COMPONENT NOT TURNED BY THE WRENCH PREVENTED BY ROTATING	1705.2.1	AISC 360-16: TABLE N5.6-2		X	ALL CONNECTIONS INSPECTED AND VERIFIED SNUG	
JOINT BROUGHT TO SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION		RCSC SPECIFICATION FOR STRUCTURAL JOINTS BOLTS SECTION 9 AISC 306-16: TABLE N5.6-2 AISC 360: SECT. N5.6a		X		
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES		AISC 360-16: TABLE N5.6-2		X		
CONTROL AND HANDLING OF WELDING CONSUMABLES		AISC 360-16: TABLE N5.4-2		X		ITEMS INCLUDE: PACKAGING AND EXPOSURE CONTROL
NO WELDING OVER CRACKED TACK WELDS		AISC 360-16: TABLE N5.4-2		X		
WPS FOLLOWED PLAN FOR ENVIRONMENTAL CONDITIONS		AISC 360-16: TABLE N5.4-2		X		WIND SPEED WITHIN LIMITS, PRECIPITATION AND TEMPERATURE
AFTER BOLTING/WELDING						
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS OR WELDED JOINT OR MEMBER	1705.2.1	AISC 360-16: TABLE N5.6-3, TABLE N5.4-3	X			
WELDS CLEANED		AISC 360-16: TABLE N5.4-3		X		
SIZE, LENGTH, AND LOCATION OF WELDS.		AISC 360-16: TABLE N5.4-3	X			
WELDS MEET VISUAL ACCEPTANCE CRITERIA		AISC 360-16: N5.4, TABLE N5.4-3	X			
ARC STRIKES		AISC 360-16: TABLE N5.4-3	X			
REPAIR ACTIVITIES		AISC 360-16: TABLE N5.4-3	X			
NO PROHIBITED WELDS HAVE BEEN ADDED WITHOUT THE APPROVAL OF THE EOR		AISC 360-16: TABLE N5.4-3		X		
HIGH STRENGTH BOLTING: PRETENSIONED AND SLIP-CRITICAL JOINT HIGH-STRENGTH BOLT INSTALLATION USING TURN-OF-THE-NUT METHOD WITH MATCH MARKING, TWIST-OFF BOLT, OR DIRECT TENSION INDICATOR METHOD		RCSC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS SECTION 9 AISC 360, SECTION M2.5, N5.6b, TABLE N5.6-2		X	ALL CONNECTIONS INSPECTED AFTER PRETENSIONING	
COMPLETE JOINT PENETRATION WELDS		AISC 360 N5.5	X		ALL WELDS TO BE VISUALLY INSPECTED PER AWS D1.1 6.9 ULTRASONIC TESTING (UT) IS REQUIRED FOR CJP WELDS, UT FREQUENCY IS 10%.	
DIVISION #31 - EARTHWORK						
SOILS						
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	TABLE 1705.6			X	BY THE GEOTECHNICAL ENGINEER OR OTHER APPROVED INSPECTOR	
PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY				X	BY THE GEOTECHNICAL ENGINEER OR OTHER APPROVED INSPECTOR	



STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES
PLANS DEVELOPED BY: DIVISION OF PARKS AND OUTDOOR RECREATION
550 W 7TH AVE. SUITE 1340, ANCHORAGE, AK 99501 - 907.269.8731

CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

SPECIAL INSPECTIONS

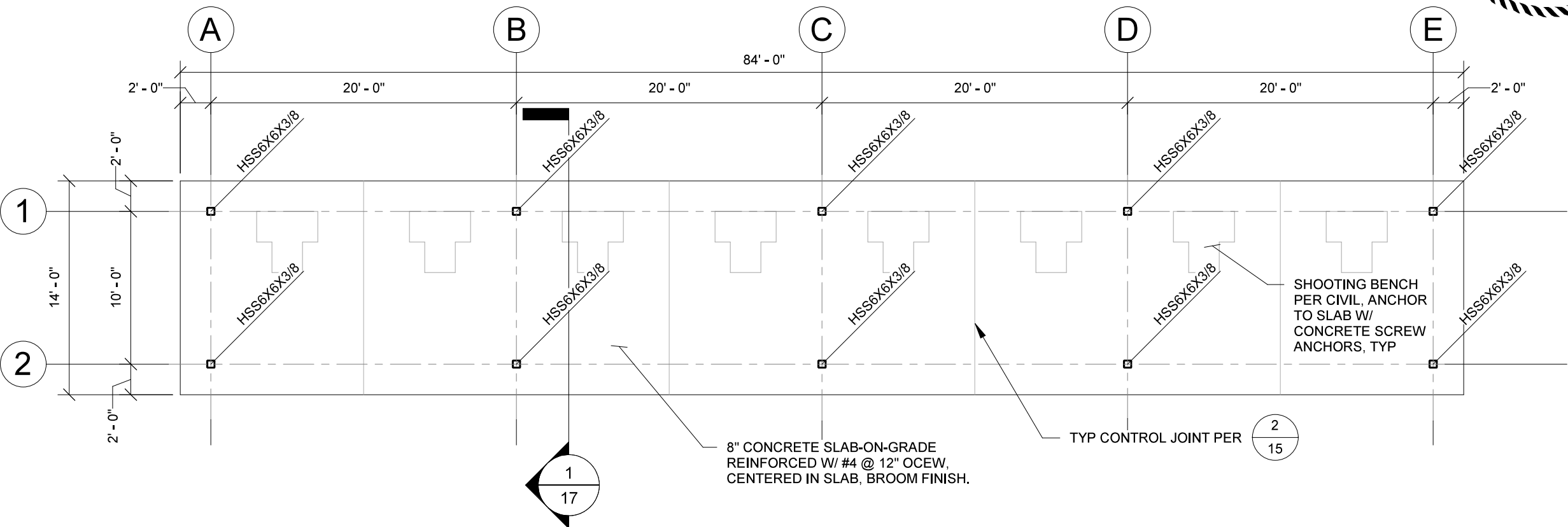
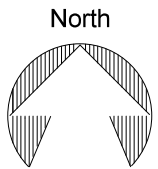


PREPARED: TBT
DRAWN: TBT
REVIEWED: PSB
DATE: 04/14/2023

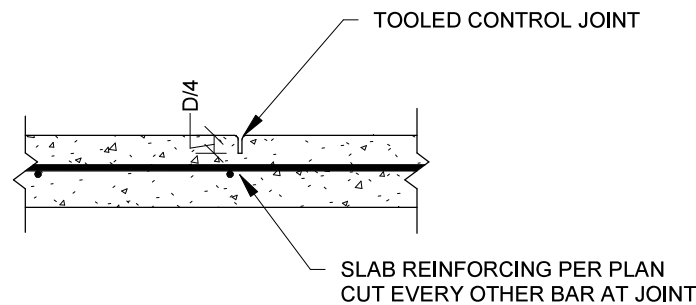
SHEET

14

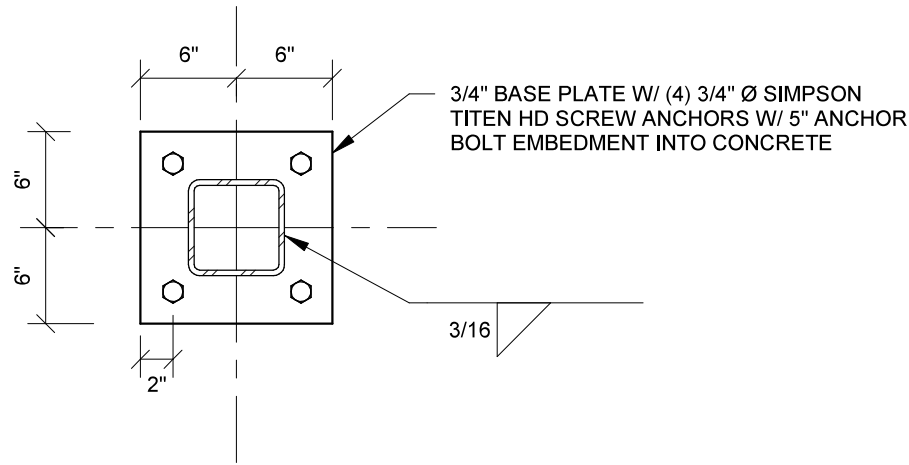
OF 22 SHEETS



1 FOUNDATION PLAN
1/8" = 1'-0"



2 TYPICAL CONCRETE CONTROL JOINT
3/4" = 1'-0"



3 HSS COLUMN BASEPLATES
1" = 1'-0"

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CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

PAVILION FOUNDATION PLAN

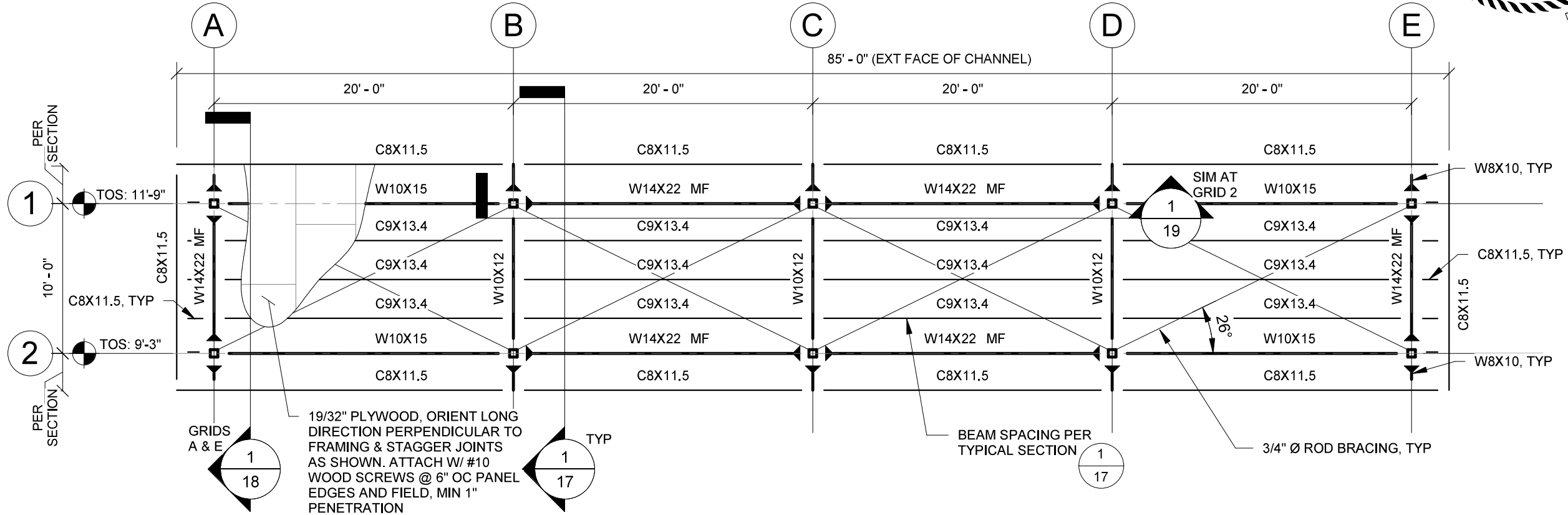
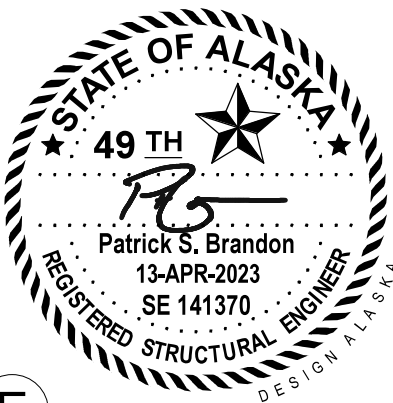
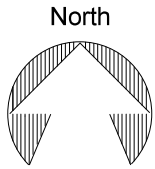


PREPARED: TBT
DRAWN: TBT
REVIEWED: PSB
DATE: 04/14/2023

SHEET

15

OF 22 SHEETS



1 ROOF PLAN
16 1/8" = 1'-0"

ROOFING ASSEMBLY:

1. PROVIDE CONTINUOUS LAPPED 15# FELT UNDERLAYMENT.
2. PROVIDE 29 GA HEAD, RAKE, AND EAVE FLASHING. FACTORY FINISHED, PAINT FINISH TO BE 0.8 MIL ACRYLIC EMULSION FINISH COAT OVER 0.2 MIL BAKED-ON ACRYLIC PRIMER, COLOR TO MATCH DENALI GREEN BY IMSA BUILDING PRODUCTS INC. OR APPROVED EQUAL. SUBMIT COLOR SAMPLES FOR APPROVAL.
3. PAINT UNDERSIDE OF PLYWOOD ROOF SHEATHING, COLOR TO MATCH STRUCTURAL STEEL.
4. PROVIDE OWENS CORNING DURATION ASPHALT SHINGLE ROOFING, OR APPROVED EQUAL. COLOR: CHATEAU GREEN

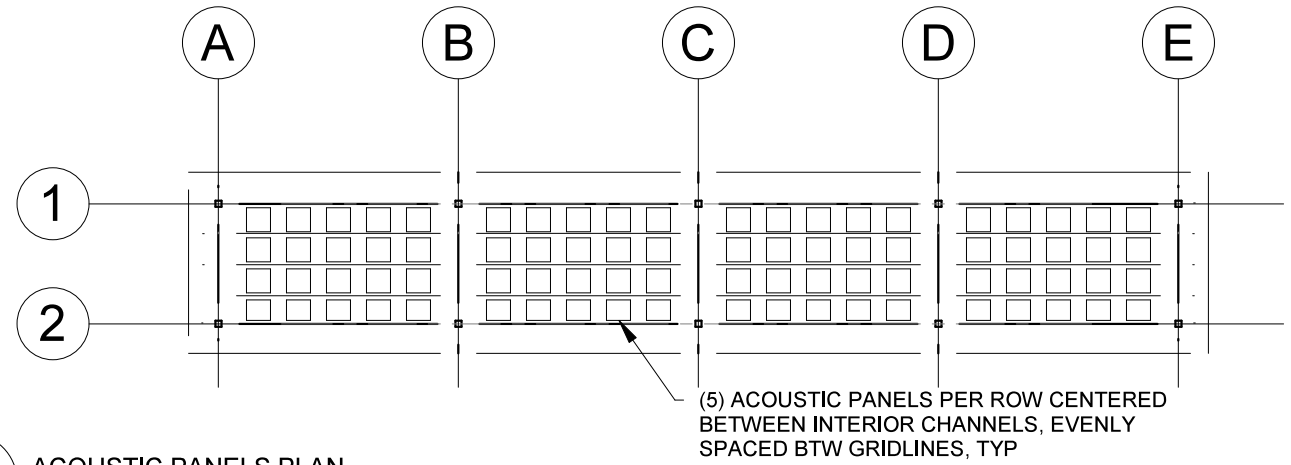
SOUND DEADENING:

1. PROVIDE ACOUSTICAL SURFACES INC., ARPRO 24" X 24" X 2" OUTDOOR RATED ACOUSTIC PANELS, OR APPROVED EQUAL. CENTER BETWEEN INTERIOR CHANNELS, 5 PANELS WIDE BETWEEN GRIDLINES, EVENLY SPACED. COLOR: CHARCOAL.

STEEL COATING:

1. ALL STRUCTURAL STEEL TO BE PRIMED WITH 1 COAT MACROPOXY 646 AND FINISHED WITH 1 TOP COAT OF ACROLON 218 HS, OR APPROVED EQUAL, COLOR: SW 3045 RUSSET BROWN. SUBMIT SAMPLES FOR APPROVAL.

FRAMING LEGEND



2 ACOUSTIC PANELS PLAN
16 1/16" = 1'-0"

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CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS

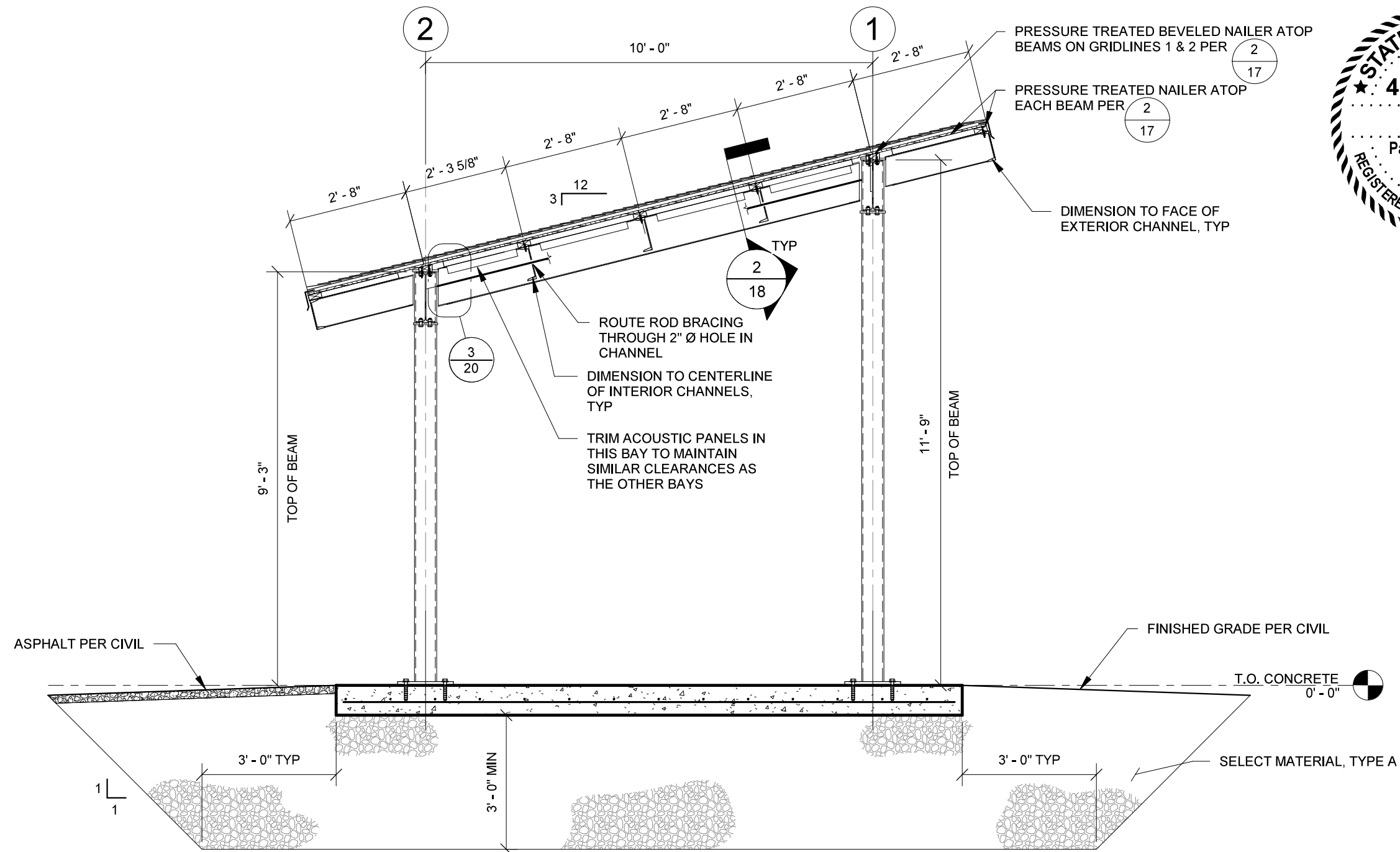
PROJECT No. 70011-1

PAVILION ROOF PLAN

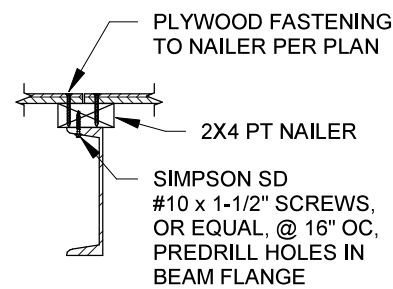


PREPARED: TBT
DRAWN: TBT
REVIEWED: PSB
DATE: 04/14/2023

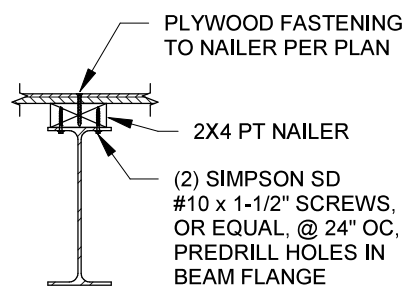
SHEET
16
OF 22 SHEETS



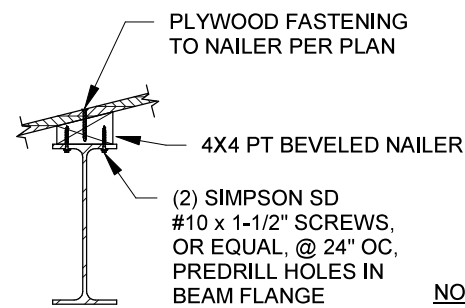
1
17
TYPICAL PAVILION SECTION
3/8" = 1'-0"



**NAILER
AT CHANNEL**



**NAILER
AT WIDE FLANGE**



**BEVELED NAILER
AT WIDE FLANGE**

- NOTES:**
1. STOP AND START NAILERS WITHIN 2" OF CONNECTION INTERFERENCES.
2. TREAT CUT EDGE OF BEVELED NAILER WITH WOOD PRESERVATIVE COATING.

2
17
NAILER CONNECTION
1" = 1'-0"

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CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

TYPICAL PAVILION SECTION

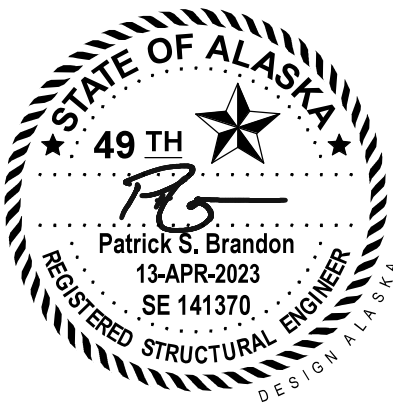


PREPARED: TBT
DRAWN: TBT
REVIEWED: PSB
DATE: 04/14/2023

SHEET

17

OF 22 SHEETS



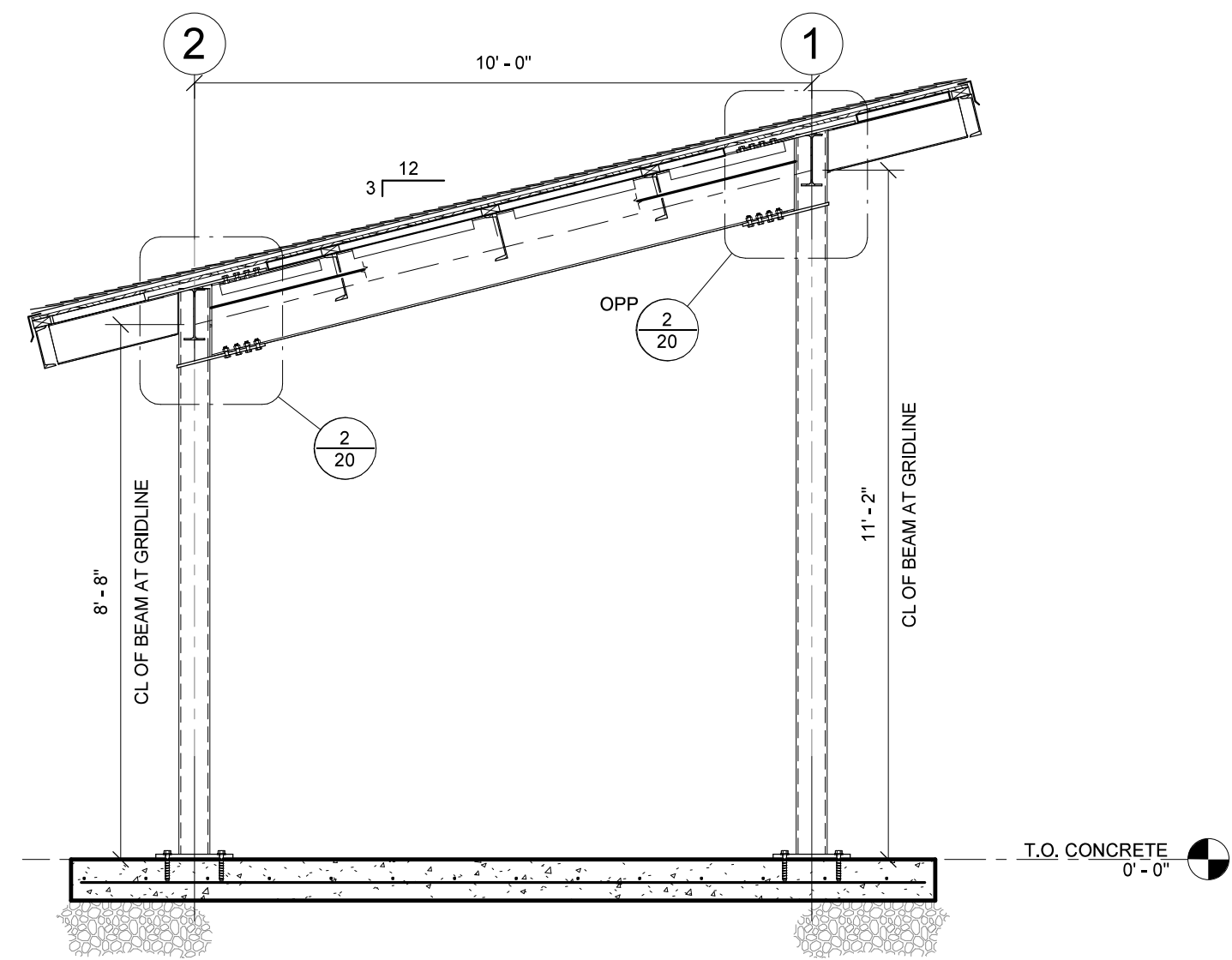
STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES
PLANS DEVELOPED BY: DIVISION OF PARKS AND OUTDOOR RECREATION
550 W 7TH AVE. SUITE 1340, ANCHORAGE, AK 99501 - 907.269.8731

CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

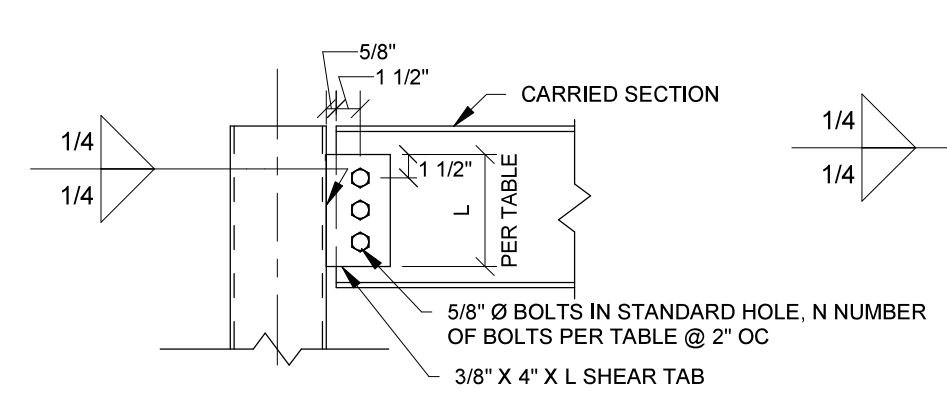


PREPARED: TBT
DRAWN: TBT
REVIEWED: PSB
DATE: 04/14/2023

SHEET
18
OF 22 SHEETS

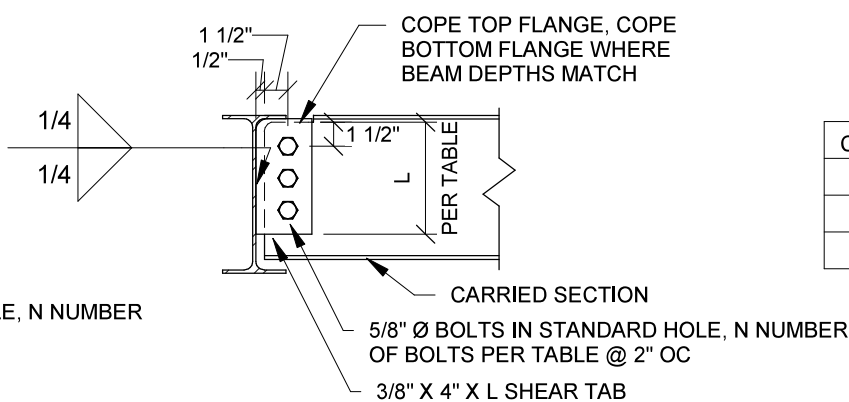


1
18 PAVILION SECTION AT MOMENT FRAME (GRIDLINES A & E)
3/8" = 1'-0"



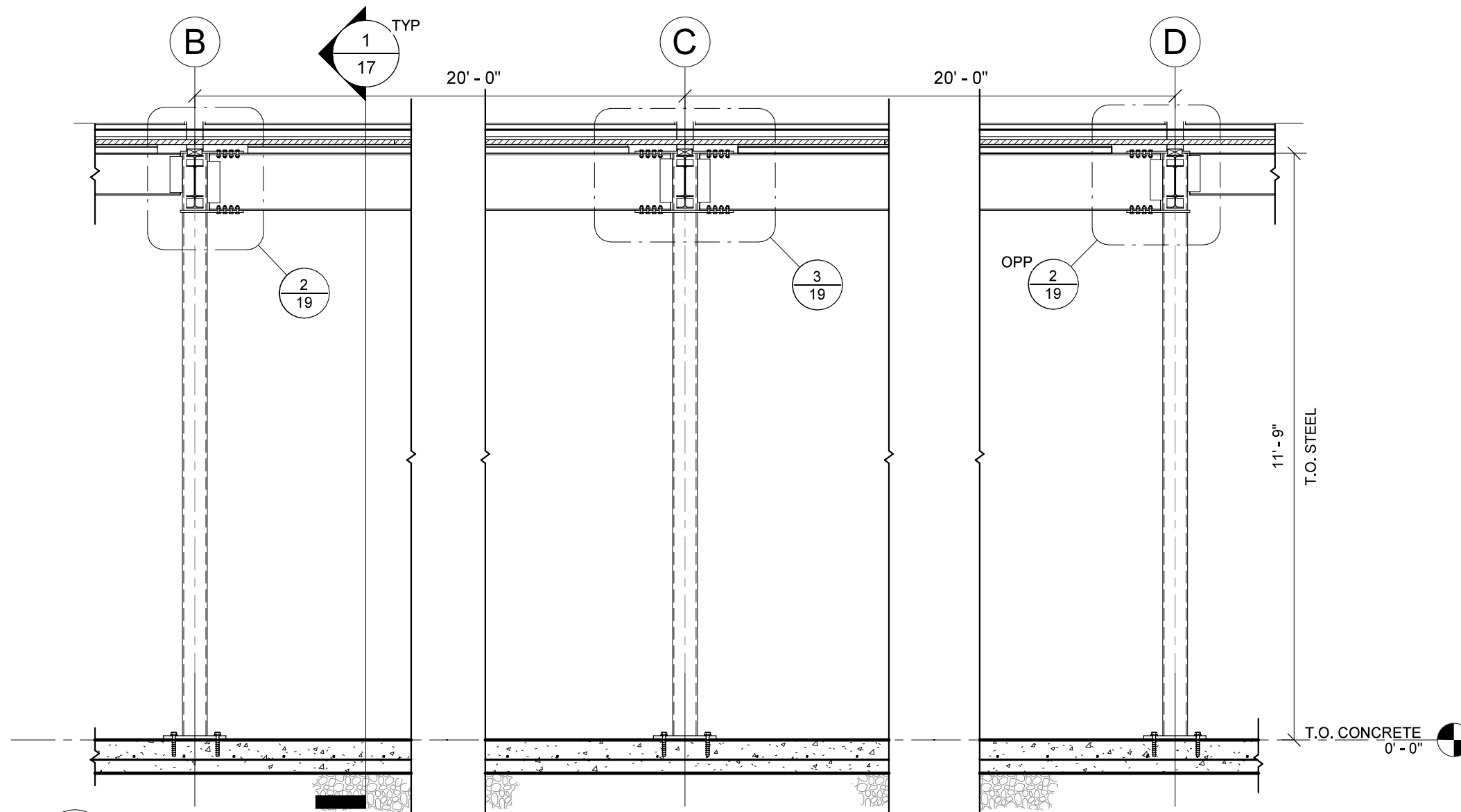
AT COLUMN

2
18 TYPICAL STEEL SHEAR TAB
1" = 1'-0"

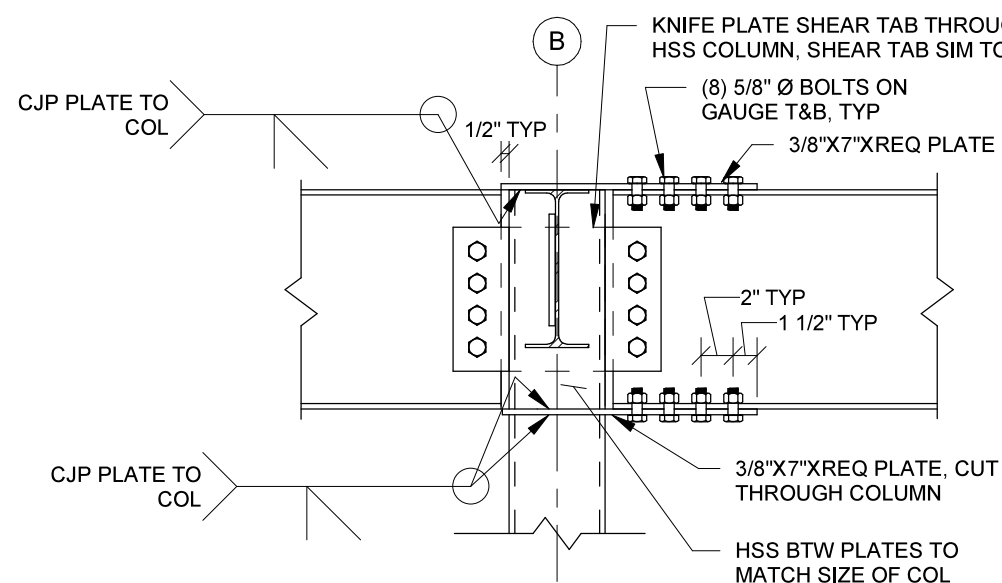


AT BEAM

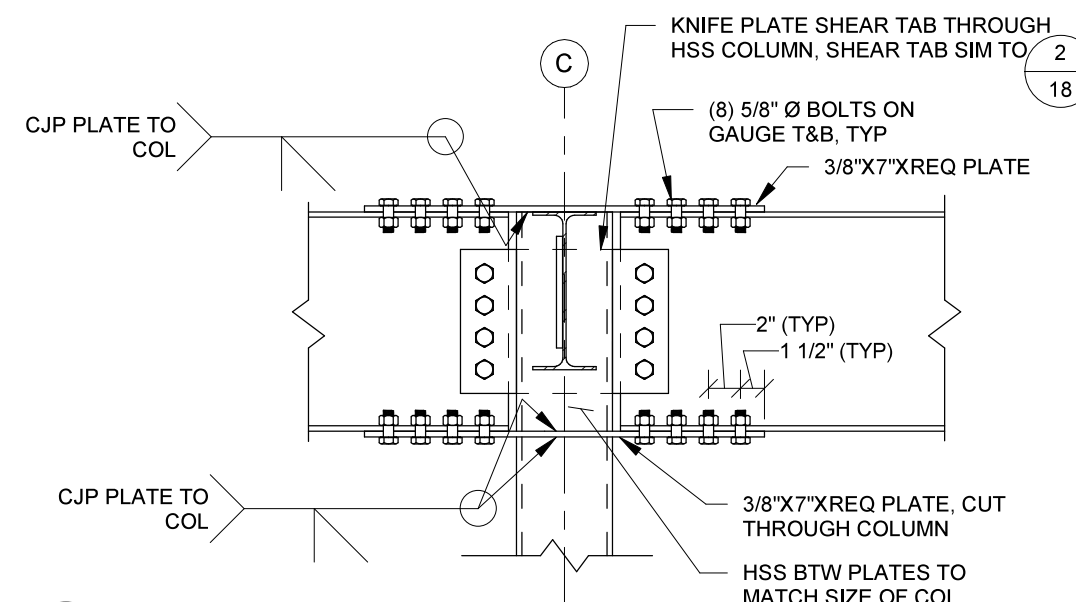
CARRIED SECTION	N	L (IN)
W8 / C8	2	5
W10 / C9	3	7
W14	4	9



1
19 PAVILION SECTION AT MOMENT FRAME, GRIDLINES 1 & 2
3/8" = 1'-0"



2
19 WIDE FLANGE TO HSS COL MOMENT CONNECTION AT GRIDLINE B & D
1" = 1'-0"



3
19 WIDE FLANGE TO HSS COL MOMENT CONNECTION AT GRIDLINE C
1" = 1'-0"



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CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1



PREPARED: TBT
DRAWN: TBT
REVIEWED: PSB
DATE: 04/14/2023

SHEET

19

OF 22 SHEETS



STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES
PLANS DEVELOPED BY: DIVISION OF PARKS AND OUTDOOR RECREATION
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CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

STRUCTURAL DETAILS

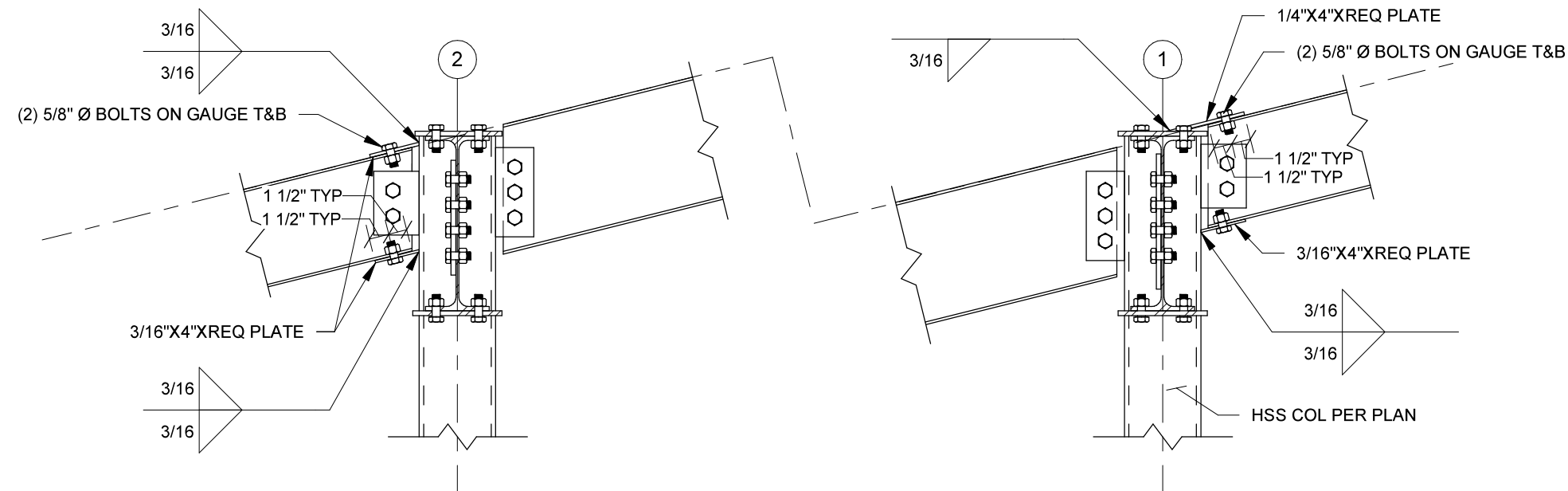


PREPARED: TBT
DRAWN: TBT
REVIEWED: PSB
DATE: 04/14/2023

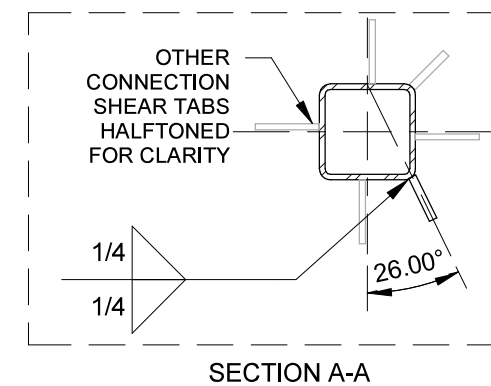
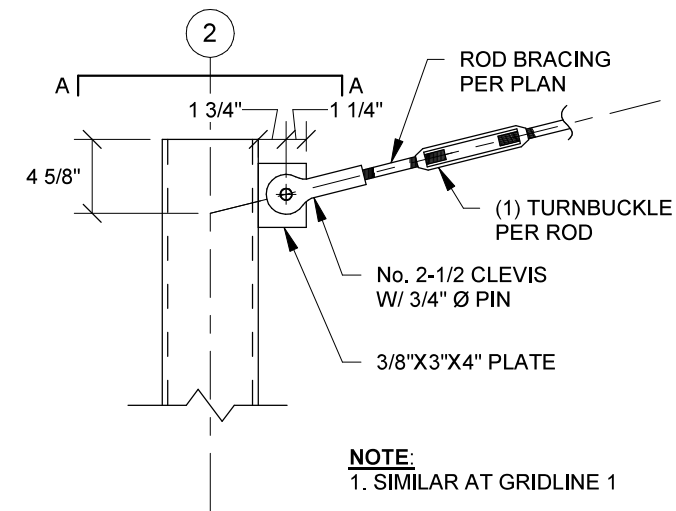
SHEET

20

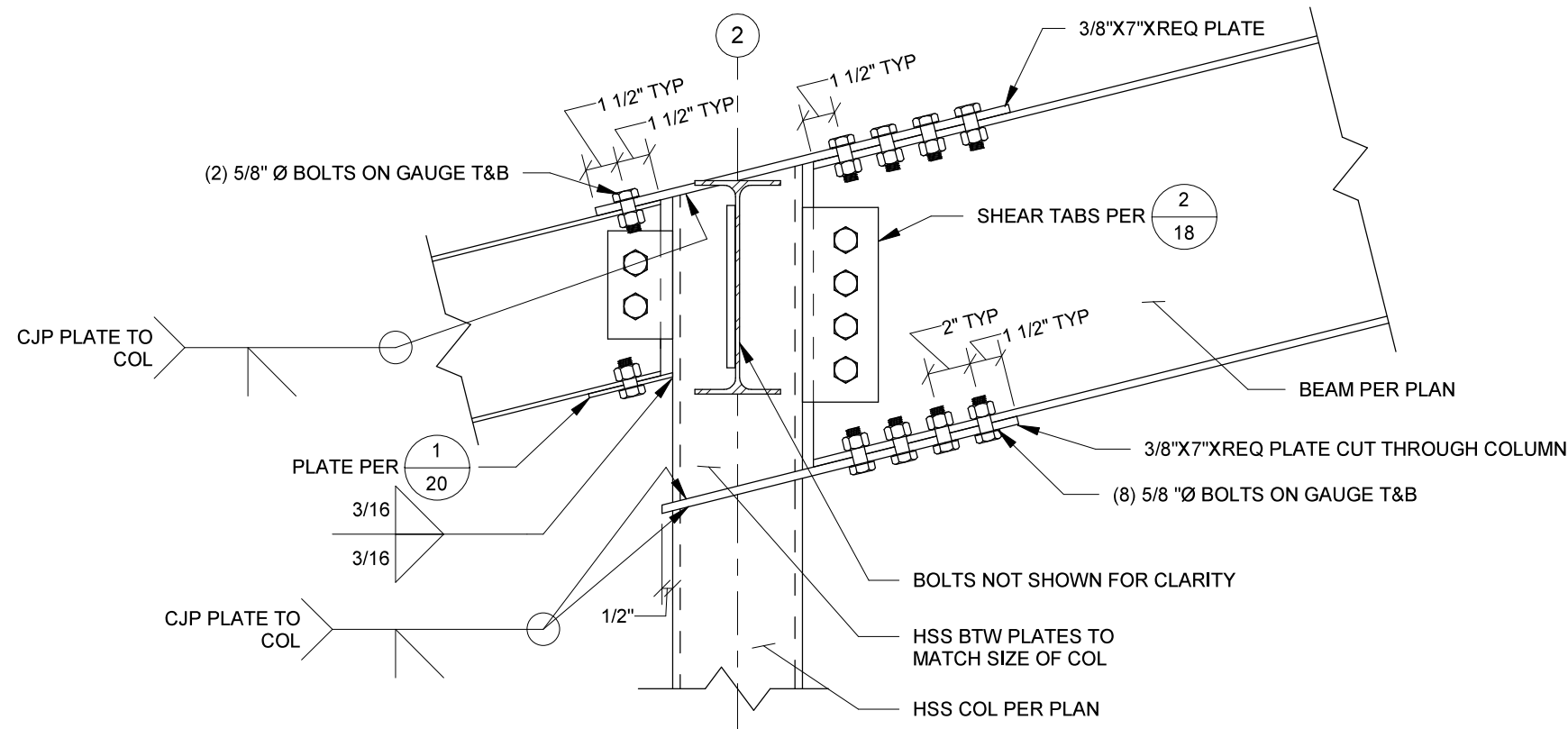
OF 22 SHEETS



1
20 WF OUTLOOKERS MOMENT CONNECTION AT GRIDLINES B, C, & D
1" = 1'-0"



3
20 ROD BRACING CONNECTION
1" = 1'-0"



2
20 SLOPED WIDE FLANGE TO HSS COL MOMENT FRAME AND OUTLOOKER CONNECTION
1 1/2" = 1'-0"

615.0001.0000 STANDARD SIGN – SIGN SUMMARY												
SIGN NO.	ORIENTATION	TYPE	LEGEND	SIZE (IN. X IN.)	AREA (S.F.)	THICKNESS (IN.)	SIGN POST DATA					
							TYPE	SIZE (IN.)	NO.			
S1	WEST	R2-1		24 X 18	3	0.125	PST	2.5 X 2.5	1			
	NORTHING	3985855.33										
	EASTING	1569529.81										
S2	SOUTHWEST	CS-1		18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986474.92										
	EASTING	1570001.97										
S3	SOUTHWEST	R7-8		18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986515.58										
	EASTING	1569899.71										
	SOUTHWEST	R7-8A		12 X 6	0.5	0.125						
	NORTHING	3986515.58										
	EASTING	1569899.71										
S4	SOUTHWEST	R7P-101L		18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986518.89										
	EASTING	1569891.39										
S5	SOUTHWEST	CS-2	SEE DETAIL 1/22	36 X 24	6	0.125	RANGE PAVILION MOUNTED	N/A	N/A			
	NORTHING	3986584.39										
	EASTING	1569840.33										
S6	SOUTHWEST	CS-2	SEE DETAIL 1/22	36 X 24	6	0.125	RANGE PAVILION MOUNTED	N/A	N/A			
	NORTHING	3986600.43										
	EASTING	1569783.25										
S7	SOUTHEAST	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986585.43										
	EASTING	1569934.67										
S8	SOUTHEAST	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986657.63										
	EASTING	1569979.53										
S9	SOUTHEAST	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986729.82										
	EASTING	1570024.40										
S10	NORTHEAST	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986796.80										
	EASTING	1570063.93										
S11	NORTH	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986881.94										
	EASTING	1569927.94										
S12	NORTHWEST	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986813.11										
	EASTING	1569887.80										
S13	NORTHWEST	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986740.91										
	EASTING	1569842.94										
S14	NORTHWEST	CS-3	SEE DETAIL 1/21	18 X 12	1.5	0.125	PST	2.5 X 2.5	1			
	NORTHING	3986668.72										
	EASTING	1569798.07										
			TOTALS		32.0				12			

NOTES:

1.

ALL SIGN TYPES ARE REFERENCED FROM THE ALASKA SIGN DESIGN SPECIFICATIONS UNLESS OTHERWISE SPECIFIED.
2.

SIGN LOCATIONS ARE APPROXIMATE, FINAL LOCATIONS WILL BE APPROVED BY THE ENGINEER.
3.

ALL SIGN POSTS SHALL HAVE A CONCRETE BASE.



121

ACTIVE SHOOTING RANGE KEEP OUT SIGN
DETAIL



STATE OF ALASKA, DEPARTMENT OF NATURAL RESOURCES

PLANS DEVELOPED BY: DIVISION OF PARKS AND OUTDOOR RECREATION

550 W 7TH AVE. SUITE 1340, ANCHORAGE, AK 99501 - 907.269.8731

CHENA RIVER SRA: UPPER STILES CREEK

SHOOTING RANGE IMPROVEMENTS

PROJECT No. 70011-1

SIGN SUMMARY



PREPARED: FWS

DRAWN: CKD

REVIEWED: KRW

DATE: AUG. 2026

SHEET

21

OF 22 SHEETS

NOTES:

1. ALL SIGN TEXTS SHALL CONSIST OF CLEARVIEW-HIGHWAY FONT.
2. SIGN TEXT HEIGHTS SHALL BE 1.5" FOR THE TITLE, 0.625" FOR THE NUMBERED RULES, AND 0.6" FOR THE CONTACT INFORMATION.
3. SIGN SHALL BE WHITE ON BROWN EXCEPT FOR THE ALASKA STATE PARKS LOGO, WHICH IS TO BE IN COLOR.



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CHENA RIVER SRA: UPPER STILES CREEK
SHOOTING RANGE IMPROVEMENTS
PROJECT No. 70011-1

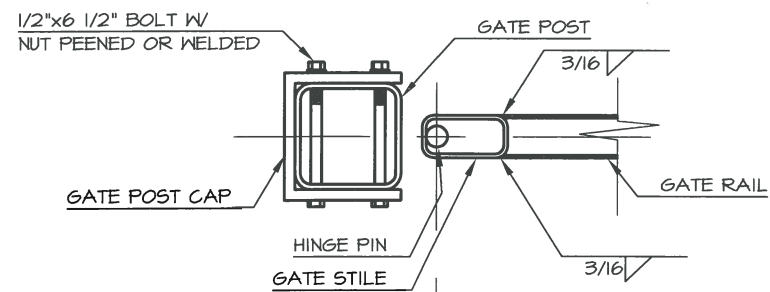
SIGN DETAIL



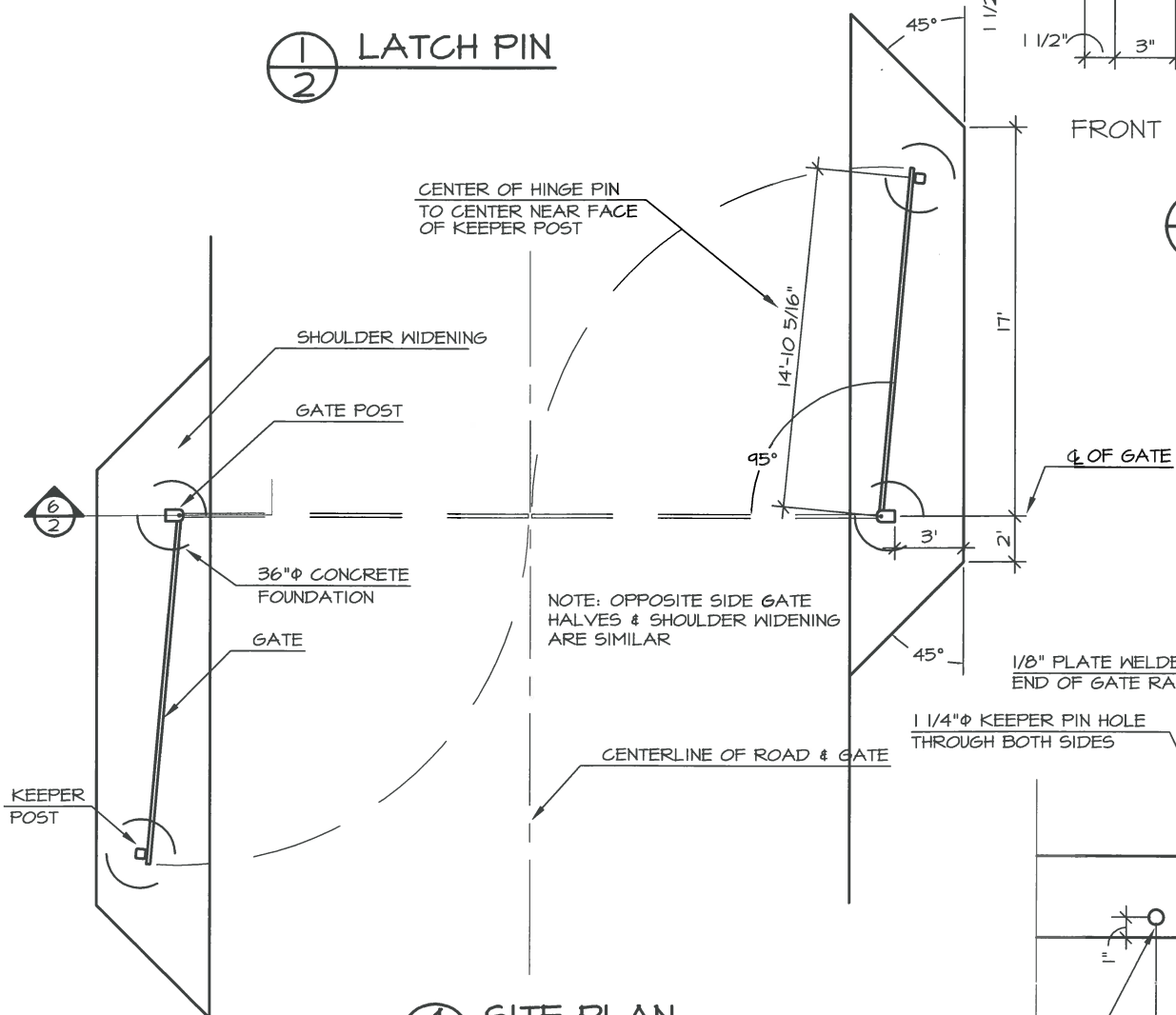
PREPARED: FWS
DRAWN: FWS
REVIEWED: KRW
DATE: AUG. 2026

SHEET

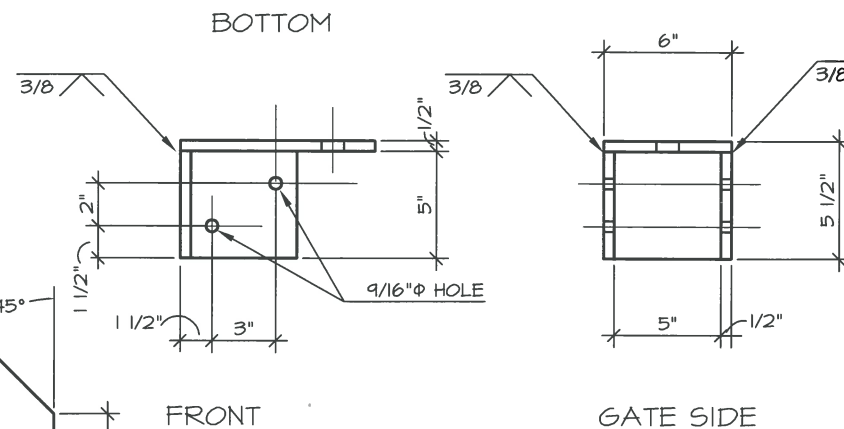
22
OF 22 SHEETS



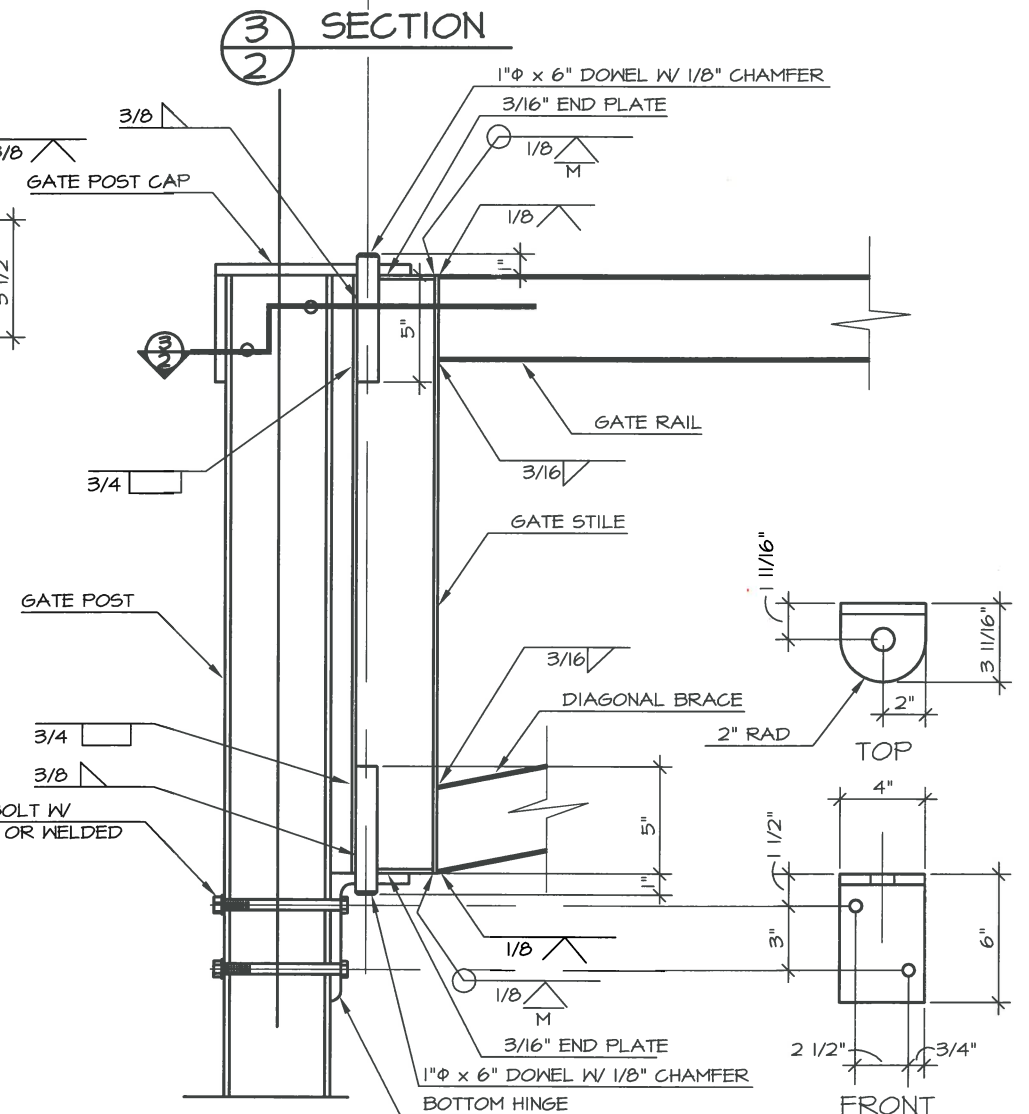
① LATCH PIN



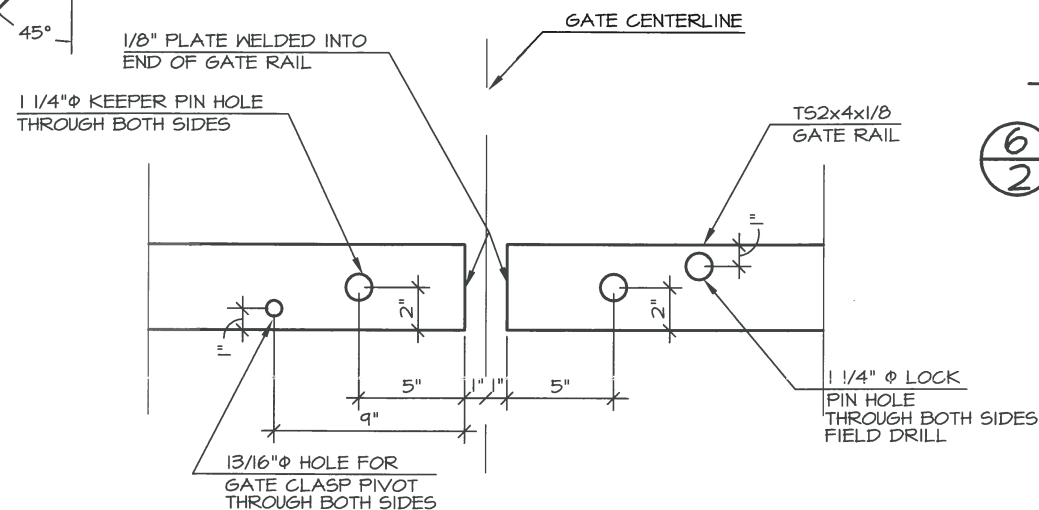
④ SITE PLAN



② GATE POST CAP



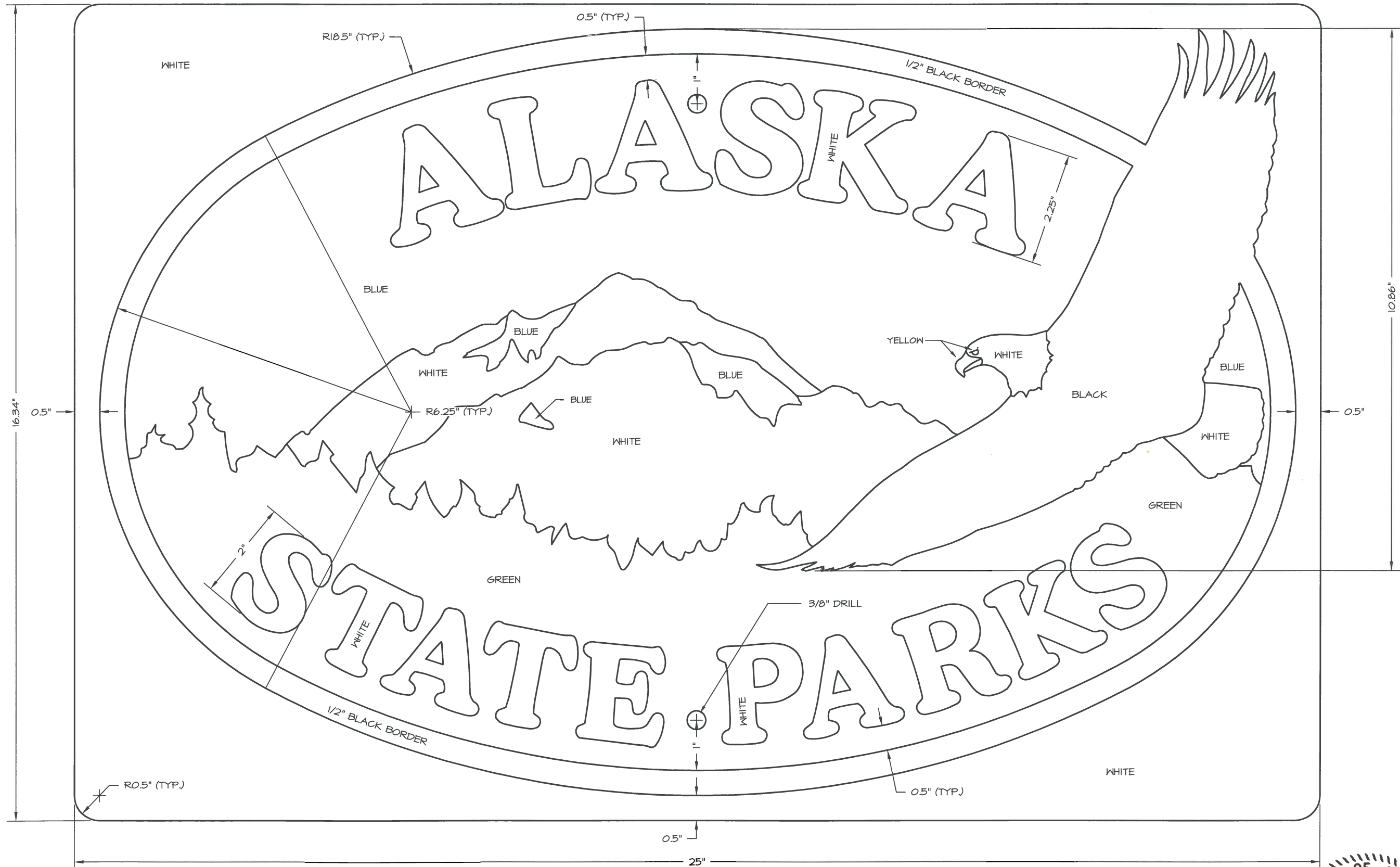
7 BOTTOM HINGE



⑤ / 2 DETAIL

19	REPLACED STAMP	12/13	RBM
18	CHANGED STATE PARK LOGO	04/10	MP5
17	CHANGED TITLE BLOCK	12/07	MP5
16	RESIZED KEEPER PIN HOLE & LOCK PIN HOLE	12/04	MP5
15	REPLACED STAMP	3/04	MP5
14	REPLACED STAMP	3/02	DH
NO.	REVISION	DATE	APPROVE





NOTES:

- ALL LETTERS AND OBJECTS SHALL BE OUTLINED IN BLACK.
- LETTERING SHALL BE COOPER LT-BOLD, AND BE PLACED TO FOLLOW THE RADIUS OF THE BORDER, AS SHOWN.

- COLORS FOR SILK SCREENING SHALL MATCH THE FOLLOWING SCOTCHLITE 3M COLOR PROCESS CHART NUMBERS.

COLOR	SCOTCHLITE 3M NUMBER
GREEN	708
BLUE	710
BLACK	705
YELLOW	714
WHITE	2290

NO.	DATE	DESCRIPTION
2	12/26/13	REPLACED STAMP
1	06/05/12	CHANGED OVERALL SIZE
REVISIONS		



STATE OF ALASKA DEPARTMENT OF NATURAL RESOURCES

EAGLE LOGO SIGN

DESIGN & CONSTRUCTION SECTION



PREPARED: LEB
DRAWN: SJS
REVIEWED: MPS
DATE: 12/10/10

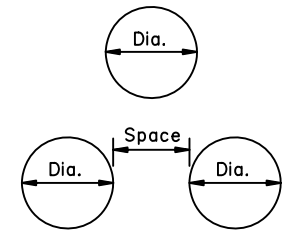
SHEET 1

S-15
OF 1 SHEETS

GENERAL NOTES:

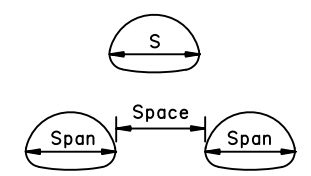
1. Sidefill shall be placed and compacted with care under haunches of pipe and shall be brought up evenly and simultaneously on both sides of pipe to 1 foot above the top of the full length of the pipe.
2. Alternate installation methods may only be used when specified or approved by the Engineer.

D = Nominal Pipe Diameter



MULTIPLE INSTALLATIONS	
Dia.	Minimum Space Between Pipes
0" - 42"	24"
48" & Over	1/2 Dia. of pipe or 3', whichever is less.

S = Nominal Pipe Arch Span



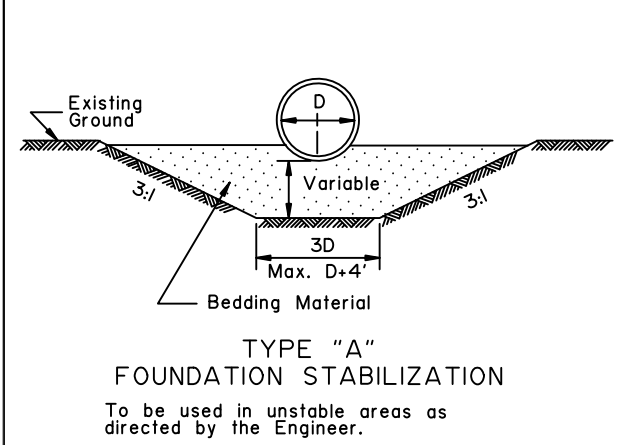
MULTIPLE INSTALLATIONS	
Dia.	Minimum Space Between Pipes
0" - 42"	24"
48" & Over	1/2 Span of pipe arch or 3', whichever is less.

State of Alaska DOT&PF
ALASKA STANDARD PLAN
CULVERT PIPE & ARCH
INSTALLATION DETAILS

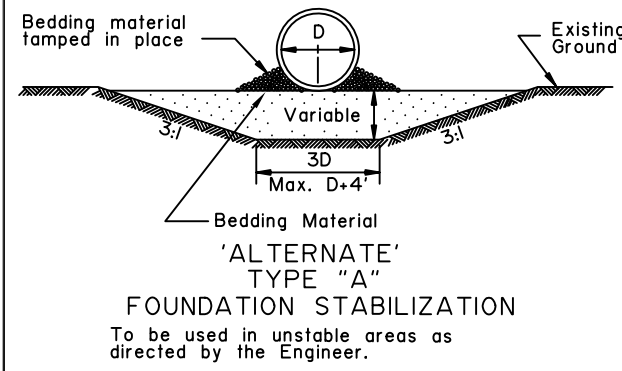
Adopted as an Alaska
Standard Plan by: *Kenneth J. Fisher*
Kenneth J. Fisher, P.E.
Chief Engineer

Adoption Date: 02/08/2019

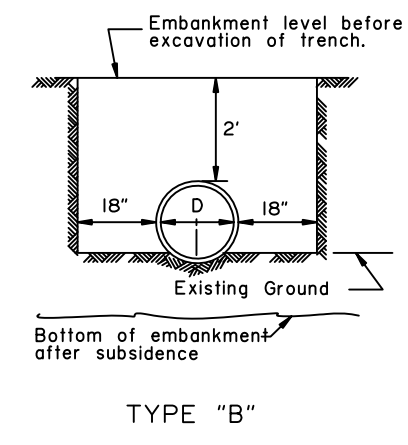
Last Code and Stds. Review
By: Date:
Next Code and Standards Review date: 02/08/2029



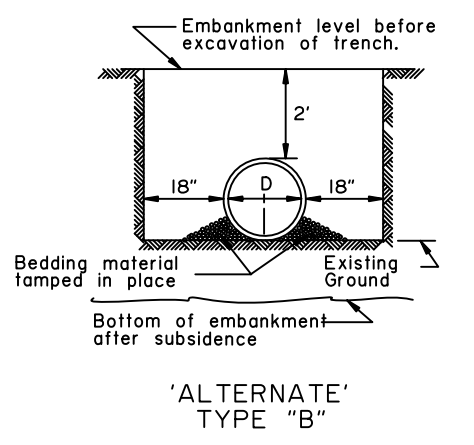
TYPE "A"
FOUNDATION STABILIZATION
To be used in unstable areas as
directed by the Engineer.



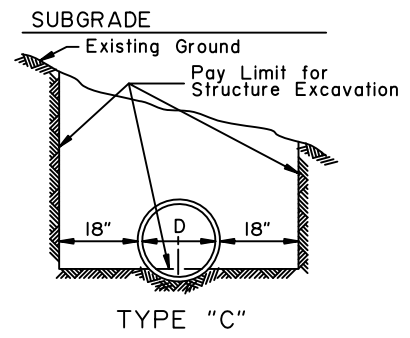
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TYPE "A"
FOUNDATION STABILIZATION
To be used in unstable areas as
directed by the Engineer.



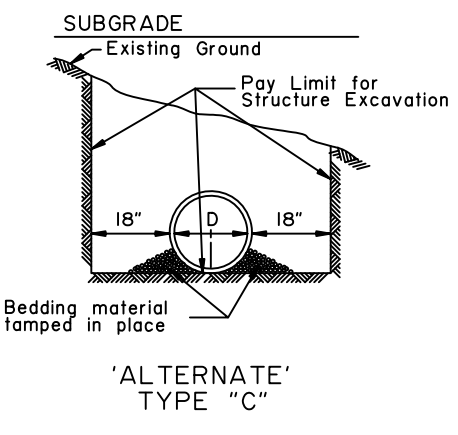
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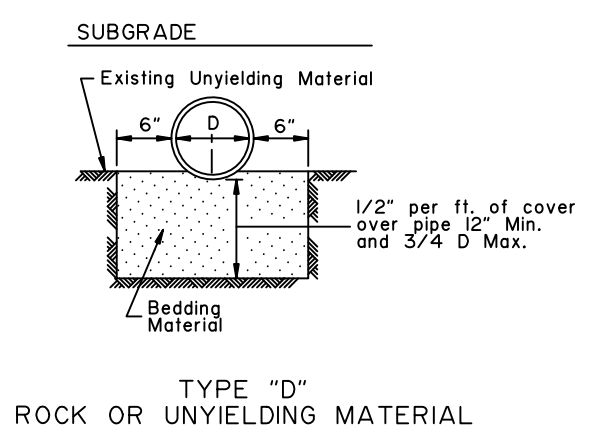
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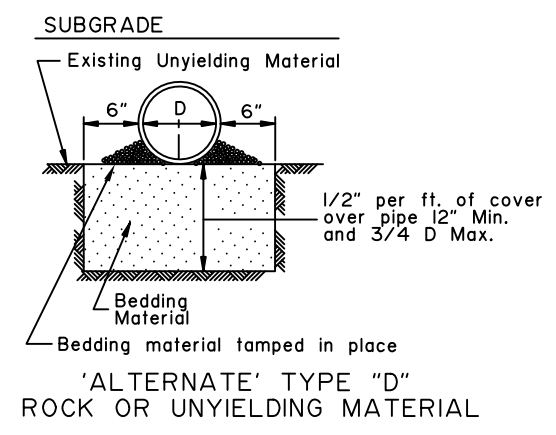
TYPE "C"



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TYPE "C"

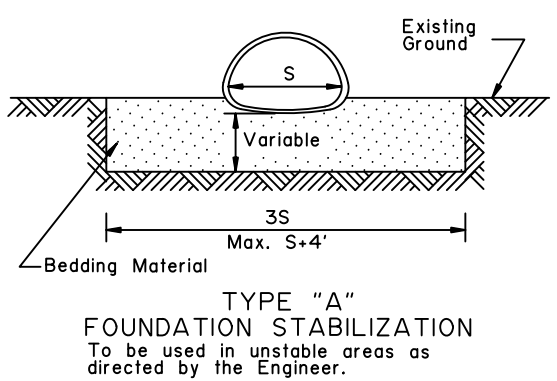


TYPE "D"
ROCK OR UNYIELDING MATERIAL

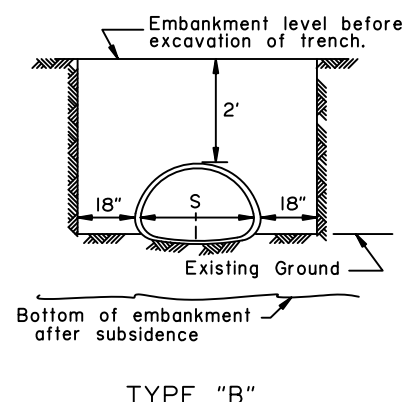


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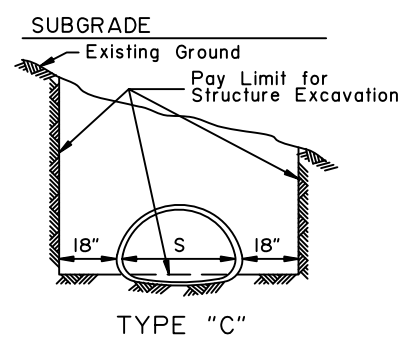
CULVERT PIPE



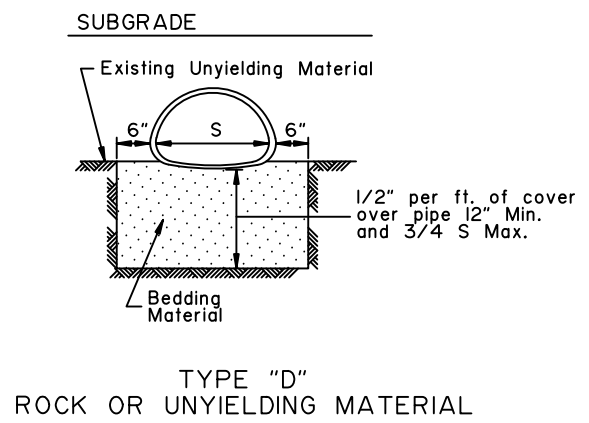
TYPE "A"
FOUNDATION STABILIZATION
To be used in unstable areas as
directed by the Engineer.



TYPE "B"



TYPE "C"



TYPE "D"
ROCK OR UNYIELDING MATERIAL

ARCH

GENERAL NOTES:

- All material and workmanship shall be in accordance with the State of Alaska, Standard Specifications for Highway Construction.
- The contractor shall select only pipes that meet specific height of cover criteria shown on the plans or in the special provisions.
- No more than one type of pipe may be used on any single installation or installation grouping.
- 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.
- See Standard Plan D-01 "Culvert Pipe & Arch Installation Details" for foundation and structural backfill details.
- Minimum cover shall be measured from the top of pipe to the top of rigid pavement or to the bottom 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 deflection.
- These tables have been developed for an HL-93 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 2017 AASHTO "LRFD Bridge Design Specifications".

Minimum & Maximum Cover for 2 2/3" X 1/2" Aluminum Pipe						
Gage		16	14	12	10	8
Thickness		0.060	0.075	0.105	0.135	0.164
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
12	12	100+	100+	100+	100+	100+
15	12	100	100+	100+	100+	100+
18	12	83	100+	100+	100+	100+
21	12	71	89	100+	100+	100+
24	12	62	78	100+	100+	100+
27	12		69	97	100+	100+
30	12		62	87	100+	100+
36	12		51	73	94	100+
42	12			62	80	100+
48	12			54	70	85
54	15			48	62	76
60	15				52	64
66	18					52
72	18					43

Minimum & Maximum Cover for 3" x 1" Aluminum Pipe						
Gage		16	14	12	10	8
Thickness		0.060	0.075	0.105	0.135	0.164
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
30	12	57	72	100+	100+	100+
36	12	47	60	84	100+	100+
42	12	40	51	72	96	100+
48	12	35	44	62	84	99
54	15	31	39	55	74	88
60	15	28	35	50	67	79
66	18	25	32	45	61	72
72	18	23	29	41	56	66
78	21		27	38	51	61
84	21			35	48	56
90	24			33	44	52
96	24			31	41	49
102	24				39	46
108	24				37	43
114	24					39
120	24					36

Minimum & Maximum Cover for 9" X 2 1/2" Aluminum Structural Plate Pipe*			
Thickness		0.125	0.150
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)
84	18	31	
90	18	27	
96	18	27	
102	18	24	
108	18	24	
114	18	21	
120	24	21	
126	24	19	
132	30	19	
138	30	18	
144	30	18	
150	30		22
156	30		22
162	36		20
168	36		20

*5.33 - 3/4" dia. steel bolts per foot.

CORRUGATED CIRCULAR ALUMINUM PIPE

CORRUGATED ALUMINUM PIPE-ARCH

Minimum & Maximum Cover for 2 2/3" X 1/2" Aluminum Pipe-Arch					
				2 Tons/Sf Corner Bearing Pressure	
Span (Ft.-In.)	Rise (Ft.-In.)	Corner Radius (In)	Min. Thickness (In)	Min. Cover (In)	Max. Cover (Ft)
17	13	3 4/8	16 (0.060)	12	13
21	15	4 1/8	16 (0.060)	12	12
24	18	4 7/8	16 (0.060)	12	12
28	20	5 4/8	14 (0.075)	12	12
35	24	6 7/8	14 (0.075)	12	12
42	29	8 2/8	12 (0.105)	12	12
49	33	9 5/8	12 (0.105)	15	12
57	38	11	10 (0.135)	15	12
64	43	12 3/8	10 (0.135)	18	12
71	47	13 6/8	8 (0.164)	18	12

Minimum & Maximum Cover for 3" x 1" Aluminum Pipe-Arch					
				2 Tons/Sf Corner Bearing Pressure	
Span (Ft.-In.)	Rise (Ft.-In.)	Corner Radius (In)	Min. Thickness (In)	Min. Cover (In)	Max. Cover (Ft)
60	46	18 6/8	14 (0.075)	15	20
66	51	20 6/8	14 (0.075)	18	20
73	55	22 7/8	14 (0.075)	21	20
81	59	20 7/8	12 (0.105)	21	16
87	63	22 7/8	12 (0.105)	24	16
95	67	24 3/8	12 (0.105)	24	16
103	71	26 1/8	10 (0.135)	24	16
112	75	27 6/8	8 (0.164)	24	16

Minimum & Maximum Cover for 9" x 2 1/2" Aluminum Multiplate Pipe-Arch*					
Span (Ft.-In.)	Rise (Ft.-In.)	Corner Radius (In)	Min. Thickness (In)	Min. Cover (In)	2 Tons/Sf Corner Bearing Pressure Max. Cover (Ft)
6-7	5-8	31.75	0.125	24	24
6-11	5-9	31.75	0.125	24	24
7-3	5-11	31.75	0.125	24	18
7-9	6-0	31.75	0.125	24	18
8-5	6-3	31.75	0.125	24	16
9-3	6-5	31.75	0.125	24	15
10-3	6-9	31.75	0.125	30	13
10-9	6-10	31.75	0.125	30	13
11-5	7-1	31.75	0.125	30	13
12-7	7-5	31.75	0.125	30	11
12-11	7-6	31.75	0.125	30	11
13-1	8-2	31.75	0.125	30	11
13-11	8-5	31.75	0.125	36	10
14-8	9-8	31.75	0.125	36	9
15-4	10-0	31.75	0.150	36	8
16-1	10-4	31.75	0.150	36	8
16-9	10-8	31.75	0.150	42	7
17-3	11-0	31.75	0.150	42	7
18-0	11-4	31.75	0.175	42	7
18-8	11-8	31.75	0.175	42	7

*5.33 - 3/4" dia. steel bolts per foot.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PIPE AND ARCH TABLES

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

Adoption Date: 7/17/2020

Last Code and Stds. Review
By: KLH Date: 7/8/2020
Next Code and Standards Review date: 7/8/2030

GENERAL NOTES

- All material and workmanship shall be in accordance with the State of Alaska, Standard Specifications for Highway Construction.
- The contractor shall select only pipes that meet specific height of cover criteria shown on the plans or in the special provisions.
- No more than one type of pipe may be used on any single installation or installation grouping.
- 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.
- See Standard Plan D-01 "Culvert Pipe & Arch Installation Details" for foundation and structural backfill details.
- Minimum cover shall be measured from the top of pipe to the top of rigid pavement or to the bottom 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 deflection.
- These tables have been developed for an HL-93 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 2017 AASHTO "LRFD Bridge Design Specifications".

Minimum & Maximum Cover for 2 2/3" x 1/2" Steel Pipe						
Gage		16	14	12	10	8
Thickness		0.060	0.075	0.105	0.135	0.164
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
12	12	100+	100+	100+	100+	100+
15	12	100+	100+	100+	100+	100+
18	12	100+	100+	100+	100+	100+
21	12	100+	100+	100+	100+	100+
24	12	100+	100+	100+	100+	100+
30	12	83	100+	100+	100+	100+
36	12	69	86	100+	100+	100+
42	12	59	74	100+	100+	100+
48	12	51	64	91	100+	100+
54	12		57	80	100+	100+
60	12			72	93	100+
66	12			66	85	100+
72	12				78	95
78	12					84
84	12					73

Minimum & Maximum Cover fo 3" x 1" Steel Pipe						
Gage		16	14	12	10	8
Thickness		0.060	0.075	0.105	0.135	0.164
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
36	12			100+	100+	100+
42	12			100+	100+	100+
48	12		74	100+	100+	100+
54	12	53	66	93	100+	100+
60	12	47	59	83	100+	100+
66	12	43	54	76	98	100+
72	12	39	49	69	89	100+
78	12	36	45	64	82	100+
84	12	33	42	59	77	94
90	12	31	39	55	71	87
96	12	29	37	52	67	82
102	18	27	34	49	63	77
108	18		32	46	59	73
114	18		31	43	56	69
120	18		29	41	53	65
126	18			39	51	62
132	18			37	48	59
138	18			36	46	57
144	18				44	54

Minimum & Maximum Cover for 5" x 1" Steel Pipe						
Gage		16	14	12	10	8
Thickness		0.060	0.075	0.105	0.135	0.164
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
36	12	71	88	100+	100+	100+
42	12	60	76	100+	100+	100+
48	12	53	66	93	100+	100+
54	12	47	59	82	100+	100+
60	12	42	53	74	96	100+
66	12	38	48	67	87	100+
72	12	35	44	62	79	97
78	12	32	40	57	73	90
84	12	30	37	53	68	83
90	12	28	35	49	63	78
96	12	26	33	46	59	73
102	18	24	31	43	56	69
108	18		29	41	53	65
114	18		27	39	50	61
120	18		26	37	47	58
126	18			35	45	55
132	18			33	43	53
138	18			32	41	50
144	18				39	48

Minimum & Maximum Cover for 6" x 2" Steel Multiplate Pipe*							
Gage		12	10	8	7	5	3
Thickness		0.111	0.140	0.170	0.188	0.218	0.249
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
60	12	46	67	87	100	100+	100+
66	12	42	60	79	91	100+	100+
72	12	38	55	73	83	100+	100+
78	12	35	51	67	77	93	100+
84	12	32	47	62	71	86	100+
90	12	30	44	58	67	80	95
96	12	28	41	54	62	75	89
102	18	27	39	51	59	71	84
108	18	25	37	48	55	67	79
114	18	24	35	45	52	63	75
120	18	22	33	43	50	60	71
126	18	21	31	41	47	57	68
132	18	20	30	39	45	54	64
138	18	19	28	37	43	52	62
144	18	18	27	36	41	50	59

*4 - 3/4" dia. steel bolts per foot.

CORRUGATED CIRCULAR STEEL PIPE

CORRUGATED STEEL PIPE-ARCH

Minimum & Maximum Cover for 2 2/3" X 1/2" Steel Pipe-Arch						
2 Tons/Sf Corner Bearing Pressure						
Span (Ft.-In.)	Rise (Ft.-In.)	Corner Radius (In)	Min. Thickness (In)	Min. Cover (In)	Max. Cover (Ft)	
17	13	3 4/8	16 (0.060)	12	11	
21	15	4 1/8	16 (0.060)	12	11	
24	18	4 7/8	16 (0.060)	12	11	
28	20	5 4/8	16 (0.060)	12	11	
35	24	6 7/8	16 (0.060)	12	11	
42	29	8 2/8	16 (0.060)	12	11	
49	33	9 5/8	14 (0.075)	12	11	
57	38	11	12 (0.109)	12	11	
64	43	12 3/8	12 (0.109)	12	11	
71	47	13 6/8	10 (0.138)	12	11	
77	52	15 1/8	10 (0.138)	12	11	
83	57	16 4/8	8 (0.168)	12	11	

Minimum & Maximum Cover for 3" X 1" Steel Pipe-Arch						
2 Tons/Sf Corner Bearing Pressure						
Span (Ft.-In.)	Rise (Ft.-In.)	Corner Radius (In)	Min. Thickness (In)	Min. Cover (In)	Max. Cover (Ft)	
53	41	10 2/8	14 (0.079)	12	10	
60	46	18 6/8	14 (0.079)	15	29	
66	51	20 6/8	14 (0.079)	15	29	
73	55	22 7/8	14 (0.079)	18	18	
81	59	20 7/8	14 (0.079)	18	15	
87	63	22 7/8	14 (0.079)	18	15	
95	67	24 3/8	14 (0.079)	18	15	
103	71	26 1/8	14 (0.079)	18	14	
112	75	27 6/8	14 (0.079)	21	14	
117	79	29 4/8	12 (0.109)	21	14	
128	83	31 2/8	10 (0.138)	24	14	
137	87	33	10 (0.138)	24	14	
142	91	34 6/8	10 (0.138)	24	13	
150	96	36	10 (0.138)	30	13	
157	96	38	10 (0.138)	30	13	
164	105	40	10 (0.138)	30	14	
171	110	41	10 (0.138)	30	13	

Minimum & Maximum Cover for 5" X 1" Steel Pipe-Arch						
2 Tons/Sf Corner Bearing Pressure						
Span (Ft.-In.)	Rise (Ft.-In.)	Corner Radius (In)	Min. Thickness (In)	Min. Cover (In)	Max. Cover (Ft)	
53	41	10 2/8	14 (0.079)	12	10	
60	46	18 6/8	14 (0.079)	15	29	
66	51	20 6/8	14 (0.079)	15	29	
73	55	22 7/8	14 (0.079)	18	18	
81	59	20 7/8	14 (0.079)	18	15	
87	63	22 7/8	14 (0.079)	18	15	
95	67	24 3/8	14 (0.079)	18	15	
103	71	26 1/8	14 (0.079)	18	14	
112	75	27 6/8	14 (0.079)	21	14	
117	79	29 4/8	12 (0.109)	21	14	
128	83	31 2/8	10 (0.138)	24	14	
137	87	33	10 (0.138)	24	14	
142	91	34 6/8	10 (0.138)	24	13	
150	96	36	10 (0.138)	30	13	
157	96	38	10 (0.138)	30	13	
164	105	40	10 (0.138)	30	14	
171	110	41	10 (0.138)	30	13	

Minimum & Maximum Cover for Steel Multiplate Pipe-Arch 6" x 2" *						
2 Tons/Sf Corner Bearing Pressure						
Span (Ft.-In.)	Rise (Ft.-In.)	Corner Radius (In)	Min. Gage (In)	Min. Cover (In)	Max. Cover (Ft)	
6-1	4-7	18	12 (0.111)	12	14	
7-0	5-1	18	12 (0.111)	12	12	
7-11	5-7	18	12 (0.111)	12	10	
8-10	6-1	18	12 (0.111)	18	9	
9-9	6-7	18	12 (0.111)	18	8	
10-11	7-1	18	12 (0.111)	18	6	
11-10	7-7	18	12 (0.111)	18	5	
12-10	8-4	18	12 (0.111)	24	5	
13-3	9-4	31	10 (0.140)	24	11	
14-2	9-10	31	10 (0.140)	24	10	
15-4	10-4	31	10 (0.140)	24	9	
16-3	10-10	31	10 (0.140)	30	8	
17-2	11-4	31	10 (0.140)	30	8	
18-1	11-10	31	10 (0.140)	30	7	
19-3	12-4	31	10 (0.140)	30	7	
19-11	12-10	31	10 (0.140)	30	6	
20-7	13-2	31	10 (0.140)	36	6	

*4 - 3/4" dia. steel bolts per foot.

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PIPE AND ARCH TABLES

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

Adoption Date: 7/17/2020

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

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

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 Plan D-OI "Culvert Pipe & Arch Installation Details".
3. Pipe cover height is measured from top of the pipe to top of rigid pavement, or to the bottom 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.

Maximum Cover for Type S Corrugated Polyethelene Pipe	
Size (in)	Max. Cover (ft)
12	24
15	25
18	24
24	20
30	20
36	18
42	16
48	17

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- All material and workmanship shall be in accordance with the State of Alaska, Standard Specifications for Highway Construction.
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- No more than one type of pipe may be used on any single installation or installation grouping.
- 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.
- See Standard Plan D-01 "Culvert Pipe & Arch Installation Details" for foundation and structural backfill details.
- Minimum cover shall be measured from the top of pipe to the top of rigid pavement or to the bottom 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.
- These tables have been developed for an HL-93 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 2017 AASHTO "LRFD Bridge Design Specifications".

Minimum & Maximum Cover for Aluminum Spiral Rib Circular Pipe*					
Gage		I6	I4	I2	I0
Thickness		0.064	0.079	0.109	0.138
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
18	12	43	61		
21	12	38	52	84	
24	12	33	45	73	
30	15	26	36	58	
36	18	21	30	49	69
42	21		25	41	59
48	24			36	51
54	24			32	46
60	24			29	41
66	24				37
72	30				34

* $\frac{3}{4}$ x $\frac{3}{4}$ x $7\frac{1}{2}$ in. Corrugations

Minimum & Maximum Cover for Aluminum Spiral Rib Pipe-Arch*						
Gage			I6	I4	I2	I0
Thickness			0.060	0.075	0.105	0.135
Span (Ft.-In.)	Rise (Ft.-In.)	Min. Cover (In)	Max. Cover (Ft)			
20	16	12	16			
23	19	12	15			
27	21	15	13	13		
33	26	18	13	13	13	
40	31	21		13	13	
46	36	24			13	13
53	41	24			13	13
60	46	24			13	13
66	51	24				13

* $\frac{3}{4}$ x $\frac{3}{4}$ x $7\frac{1}{2}$ in. Corrugations

ALUMINUM SPIRAL RIB PIPE

STEEL SPIRAL RIB PIPE

Minimum & Maximum Cover for Steel and Aluminized Steel Spiral Rib Circular Pipe*					
Gage		I6	I4	I2	I0
Thickness		0.064	0.079	0.109	0.138
Dia. (In)	Min. (In)	Max. (Ft)	Max. (Ft)	Max. (Ft)	Max. (Ft)
18	12	91			
24	12	68	95	100+	
30	12	54	76	100+	
36	12	45	63	100+	
42	12	38	54	90	
48	12	33	47	79	
54	18	30	42	70	
60	18	27	38	63	92
66	18	24	34	57	83
72	18		31	52	76
78	24		29	48	70
84	24		27	45	65
90	24			42	61
96	24			39	56
102	30			36	50
108	30			32	45

* $\frac{3}{4}$ x $\frac{3}{4}$ x $7\frac{1}{2}$ in. Corrugations.

Minimum & Maximum Cover for Steel Spiral Rib Pipe-Arch*					
2 Tons/Sf Corner Bearing Pressure					
Thickness			0.064	0.079	0.109
Span (Ft.-In.)	Rise (Ft.-In.)	Min. Cover (In)	Max. Cover (Ft)		
20	16	12	13		
23	19	12	13		
27	21	12	11		
33	26	12	11		
40	31	12	11		
46	36	12	11		
53	41	18		11	
60	46	18		19	
66	51	18		19	
73	55	18			18
81	59	18			15
87	63	18			15
95	67	18			15

* $\frac{3}{4}$ x $\frac{3}{4}$ x $7\frac{1}{2}$ in. Corrugations

State of Alaska DOT&PF
ALASKA STANDARD PLAN

PIPE AND ARCH TABLES

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

Adoption Date: 7/17/2020

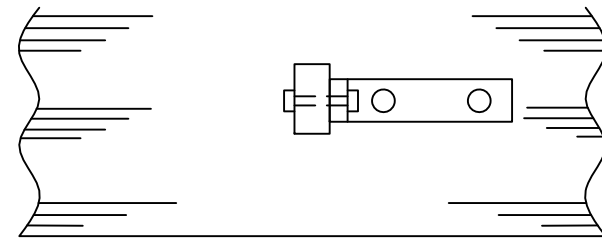
Last Code and Stds. Review
By: KLH Date: 7/8/2020
Next Code and Standards Review date: 7/8/2030

GENERAL NOTES:

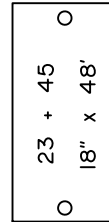
- Culvert marker post shall be installed with galvanized steel hardware meeting the following requirements: Galvanizing for nuts and washers shall meet the requirements of ASTM A-153, Class C. Galvanizing for steel mounting supports shall meet the requirements of MIL-P-26915A, or ASTM A-153, Class C.

DIRECTION OF TRAFFIC

Shoulder of Road



TOP VIEW

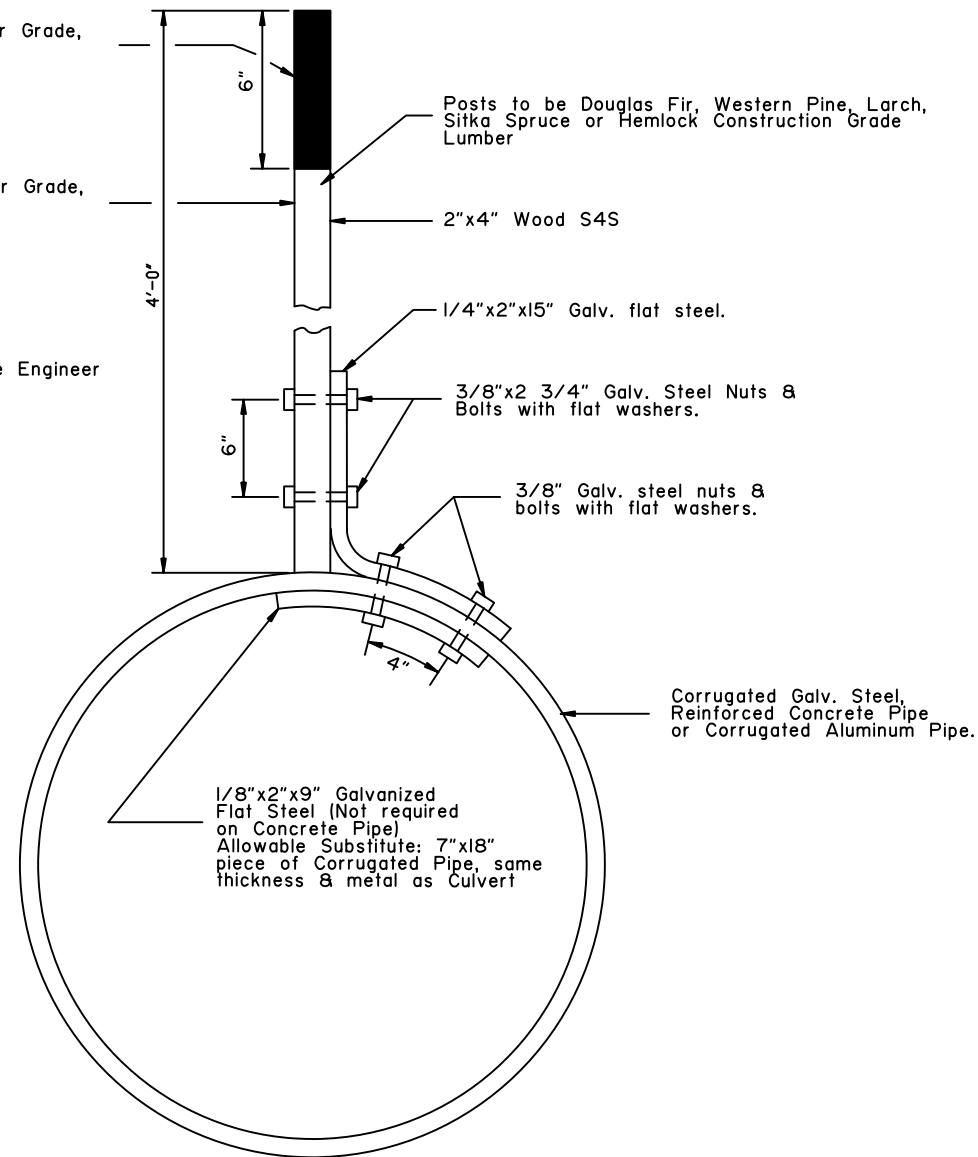


Sta. and size of Culvert to be stamped into a 2"x4"x0.064" thick brass plate, fastened, with No. 8 round head brass screws, to the marker post as shown. Plate to be on side of post facing traffic.

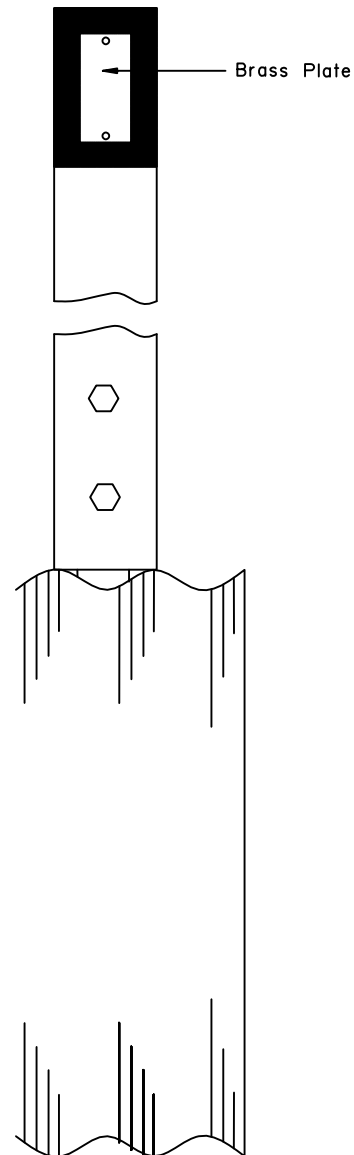
* Black Paint, Exterior Grade, Semi Gloss Enamel.

* White Paint, Exterior Grade, Semi Gloss Enamel

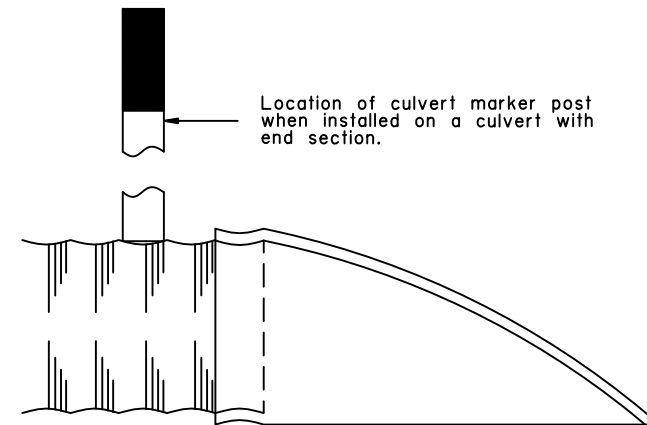
* As approved by the Engineer



END VIEW



SIDE VIEW



END SECTION SIDE VIEW

State of Alaska DOT&PF
ALASKA STANDARD PLAN

CULVERT MARKER POST

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

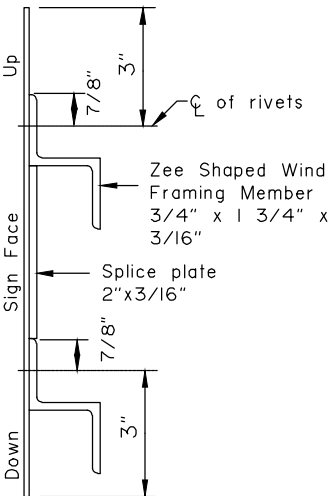
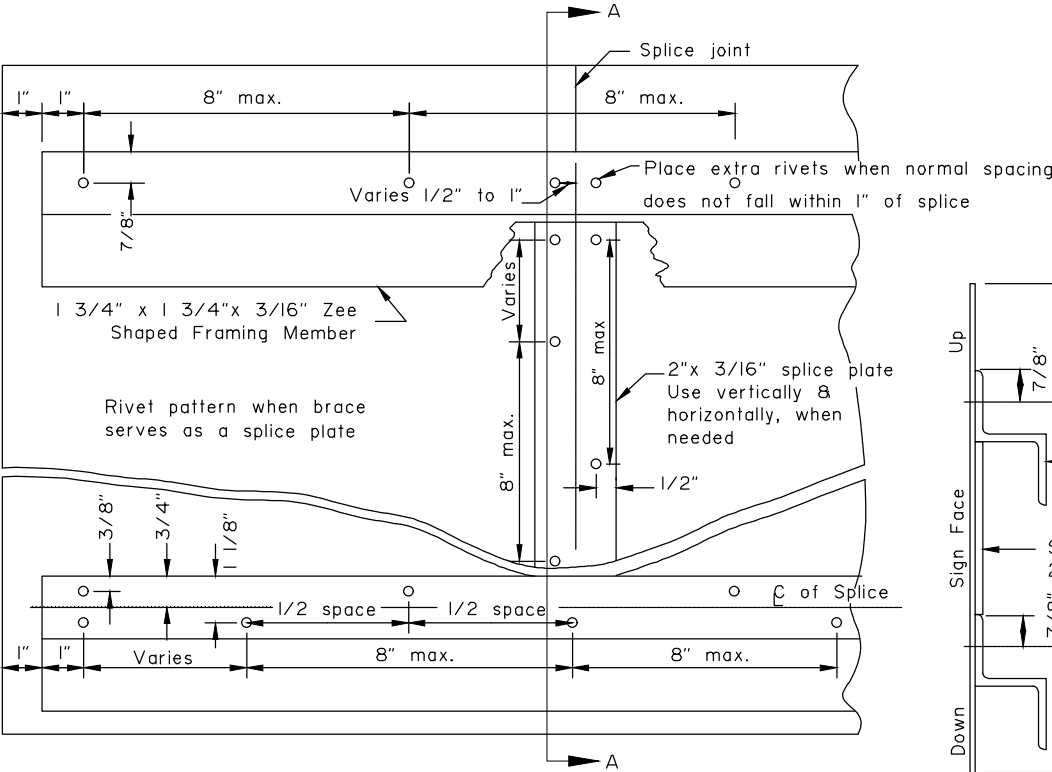
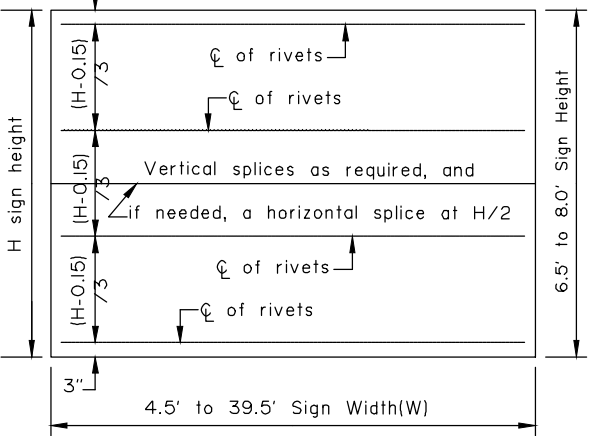
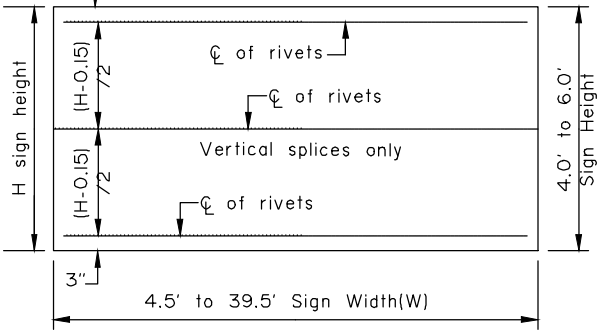
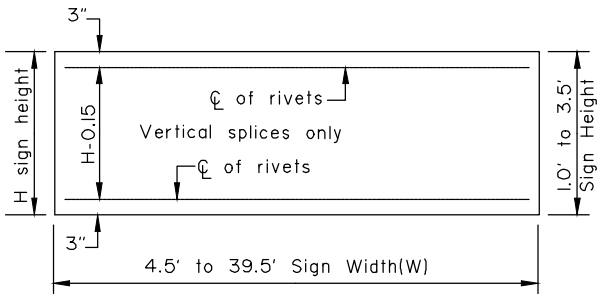
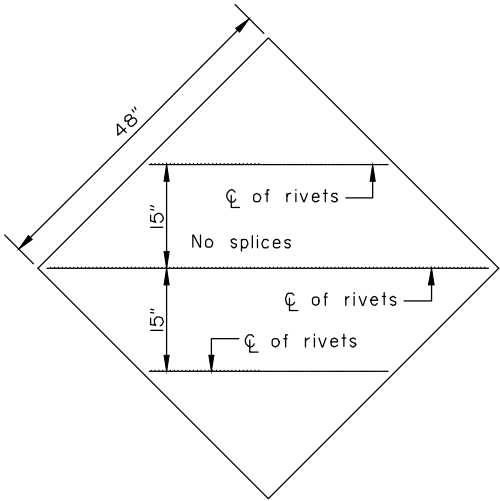
Adoption Date: 02/08/2019

Last Code and Stds. Review
By: Date:

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

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.



SECTION A-A

RIVET DETAIL FOR ZEE SHAPED WIND FRAMING & SPLICE PLATE

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

Note: Drawing not to scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

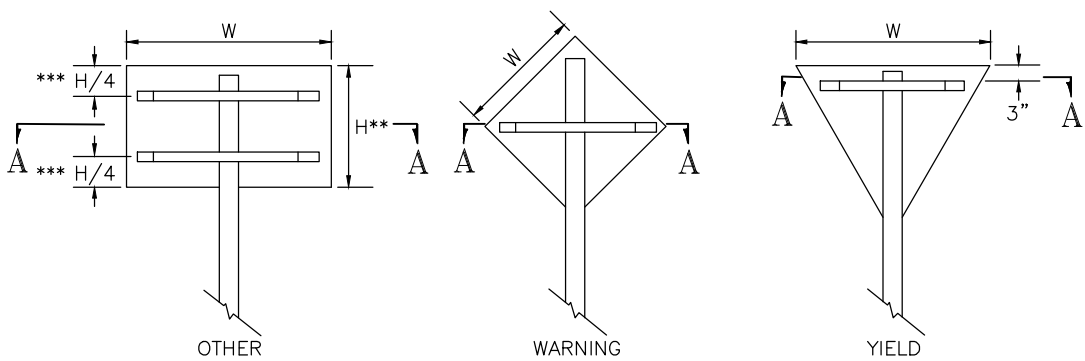
SIGN FRAMING

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

Adoption Date: 7/17/2020

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

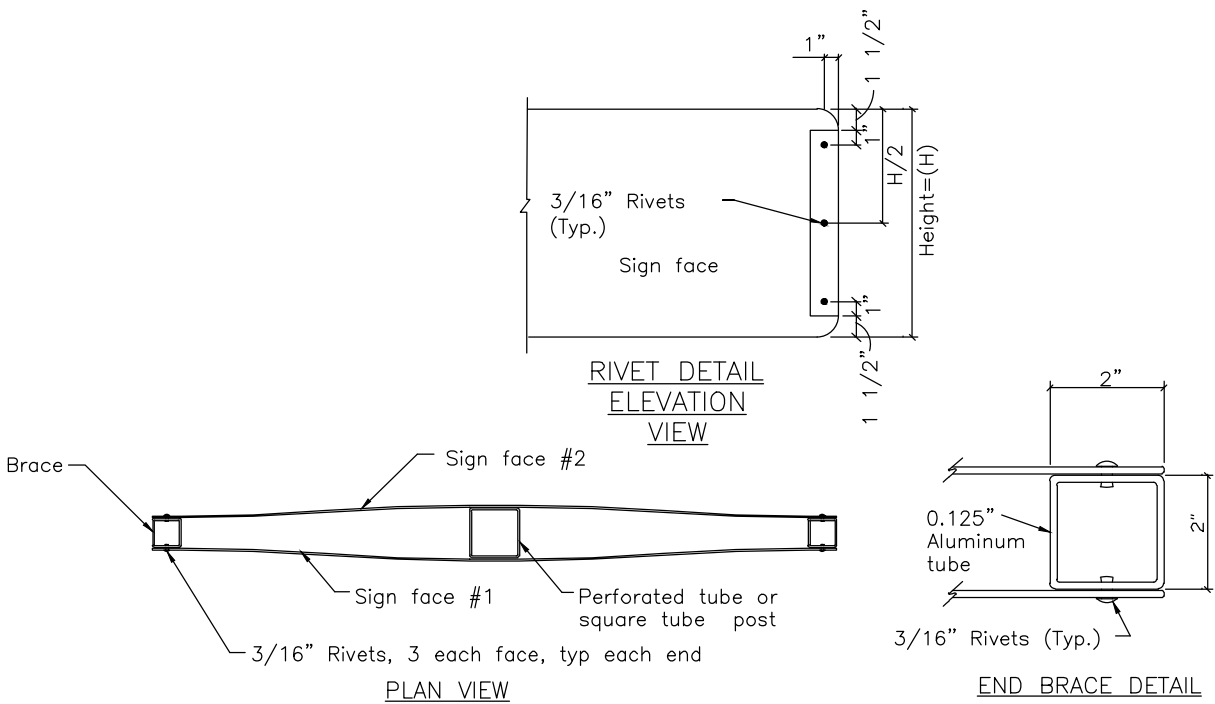
Next Code and Standards Review date: 7/8/2030



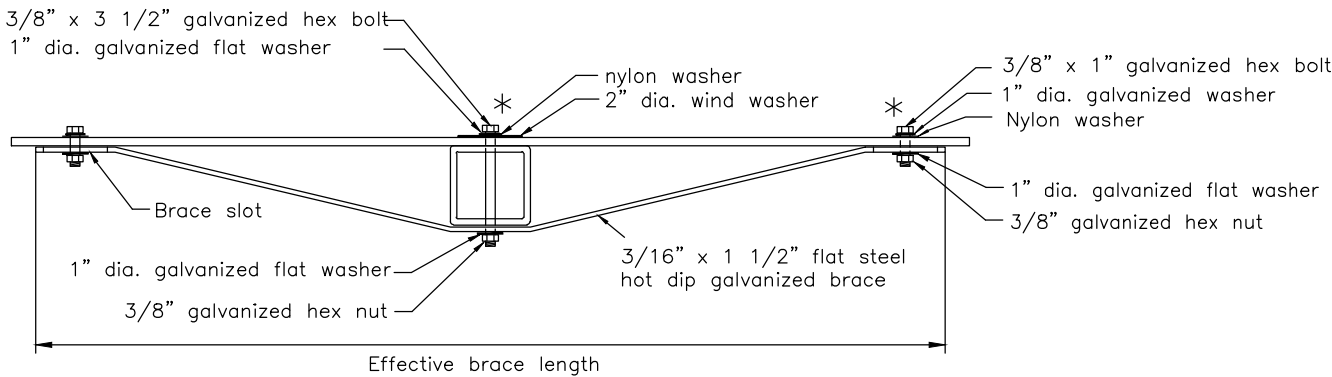
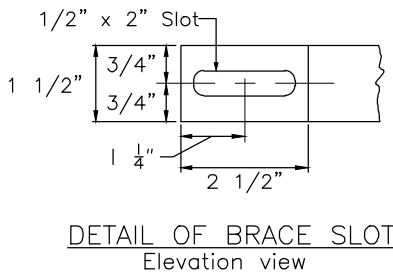
*** Use one brace when $H \leq 18"$
Use two braces when $18" < H < 48"$
Use three braces when $H \geq 48"$

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

SIGN BRACING PLACEMENT



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



TUBE POST SIGN BRACING SECTION A-A
Plan view

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

Note: Drawing not to scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

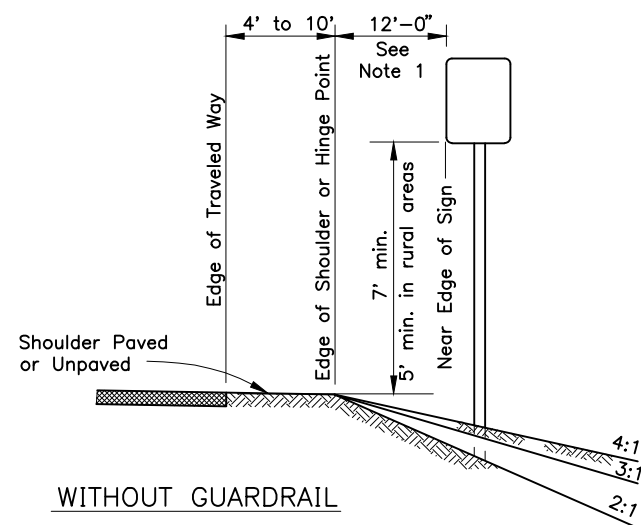
BRACING FOR SIGNS
MOUNTED ON SINGLE POST

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

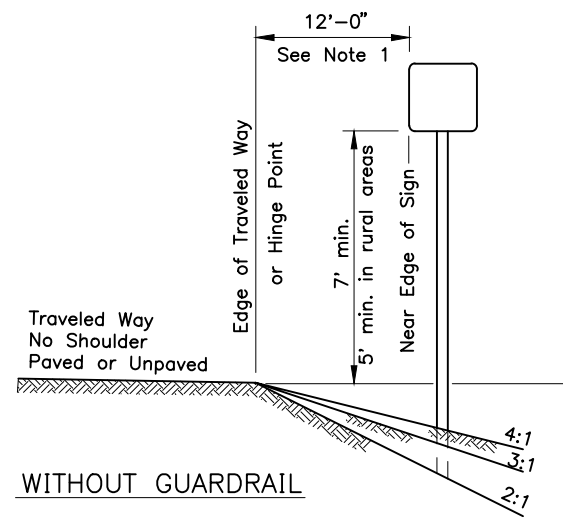
Adoption Date: 7/17/2020

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

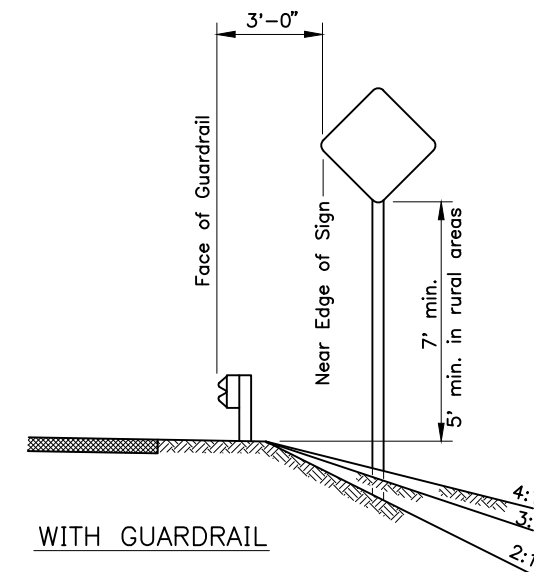
Next Code and Standards Review date: 7/8/2030

WITHOUT GUARDRAIL

SUBGRADES OVER 28', ALL SLOPES

WITHOUT GUARDRAIL

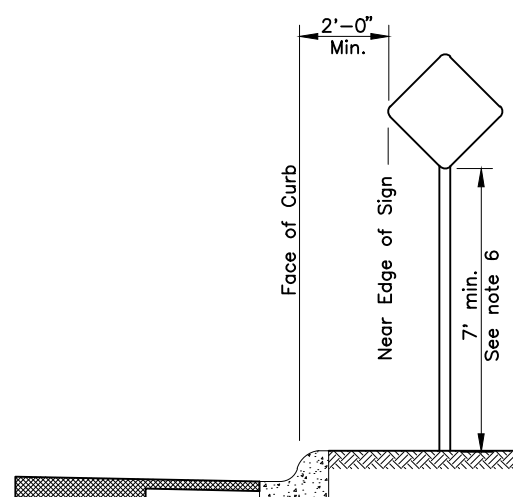
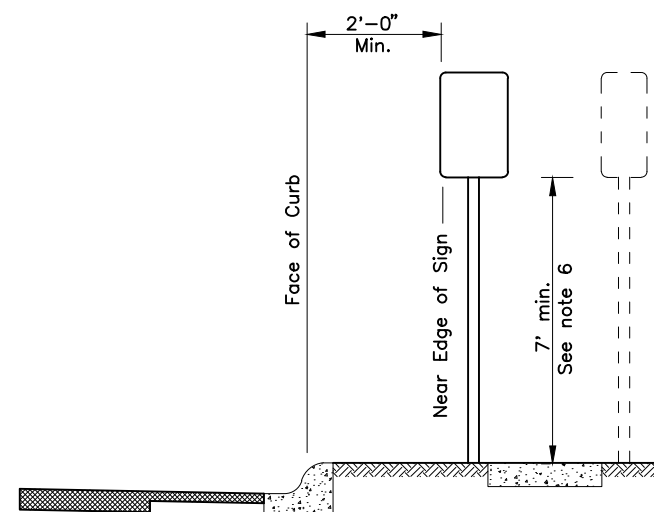
SUBGRADES 24' TO 28', ALL SLOPES

WITH GUARDRAIL

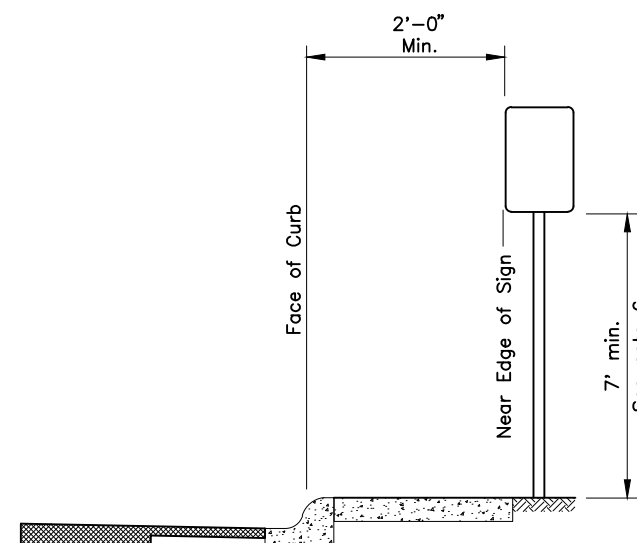
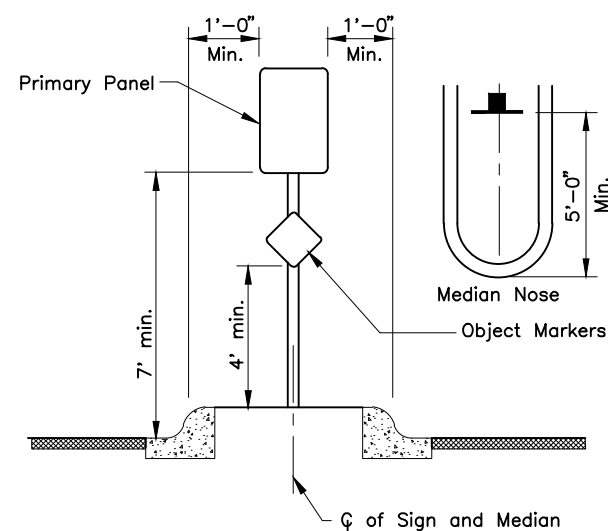
ALL SUBGRADES, ALL SLOPES

GENERAL NOTES

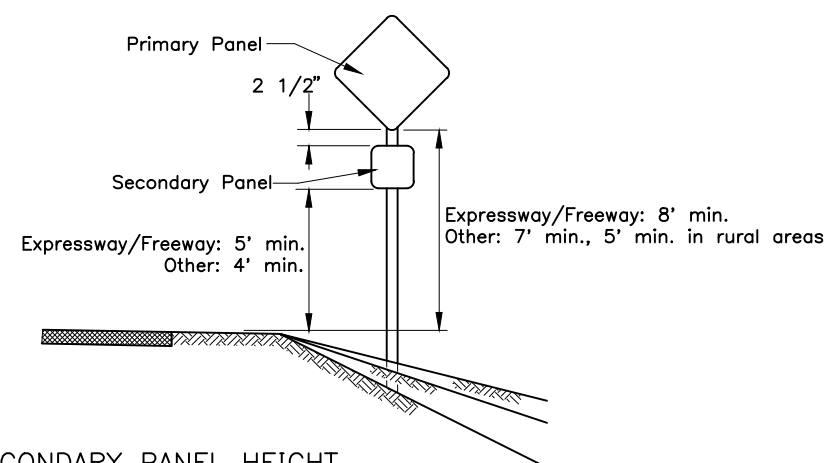
1. Unless shown otherwise on the plans, the standard sign offset is 12'. The minimum is 6' where shoulder width is 6' or greater.
2. Add 6" to mounting height on unpaved roads.
3. If signs extend over bike paths, the minimum vertical clearance is 8' 0".
4. When signs are placed 30' or more from the edge 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.
5. When multiple hinged sign supports are used, mount hinges at least 7' above the ground.
6. Minimum mounting height is 7'-0" where parking or pedestrian movements are likely to occur, or where signs extend over sidewalks.
7. For construction signs in rural areas, mounting height shall be 7' minimum.

CURB WITHOUT SIDEWALKCURB WITH PARKWAY AND SIDEWALK

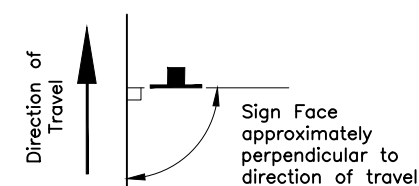
(If R/W width permits, signs should be placed behind sidewalk.)

CURB WITH SIDEWALK WITHOUT PARKWAYRAISED MEDIANS

Minimum 4' Width for Signing

SECONDARY PANEL HEIGHT

ALL TWO PANEL MOUNTING

SIGN POSITIONINGState of Alaska DOT&PF
ALASKA STANDARD PLANPOST MOUNTED SIGN
OFFSET AND HEIGHTAdopted as an Alaska
Standard Plan by *Carolyn Morehouse*
Carolyn Morehouse, P.E.
Chief Engineer

Adoption Date: 7/17/2020

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

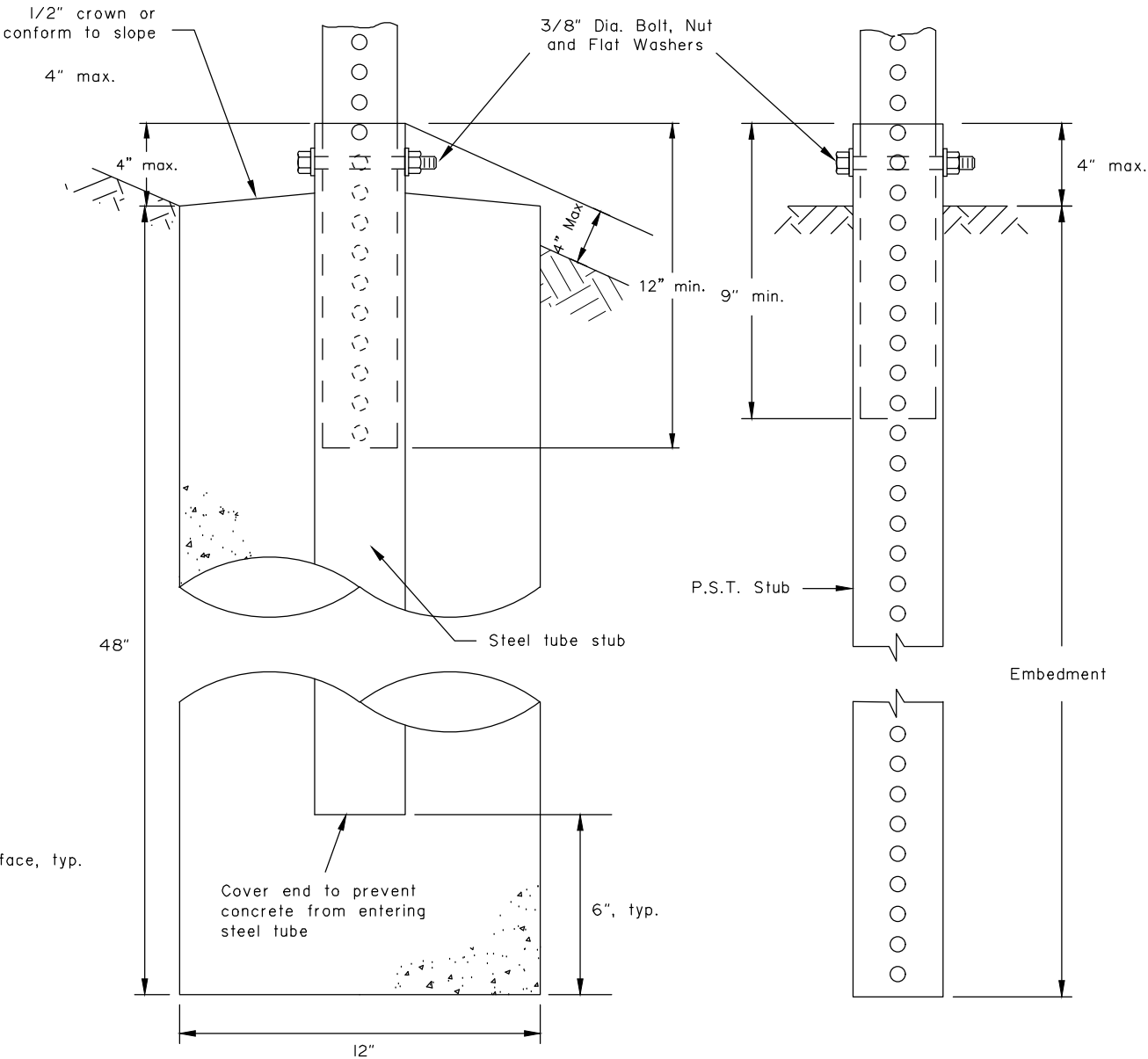
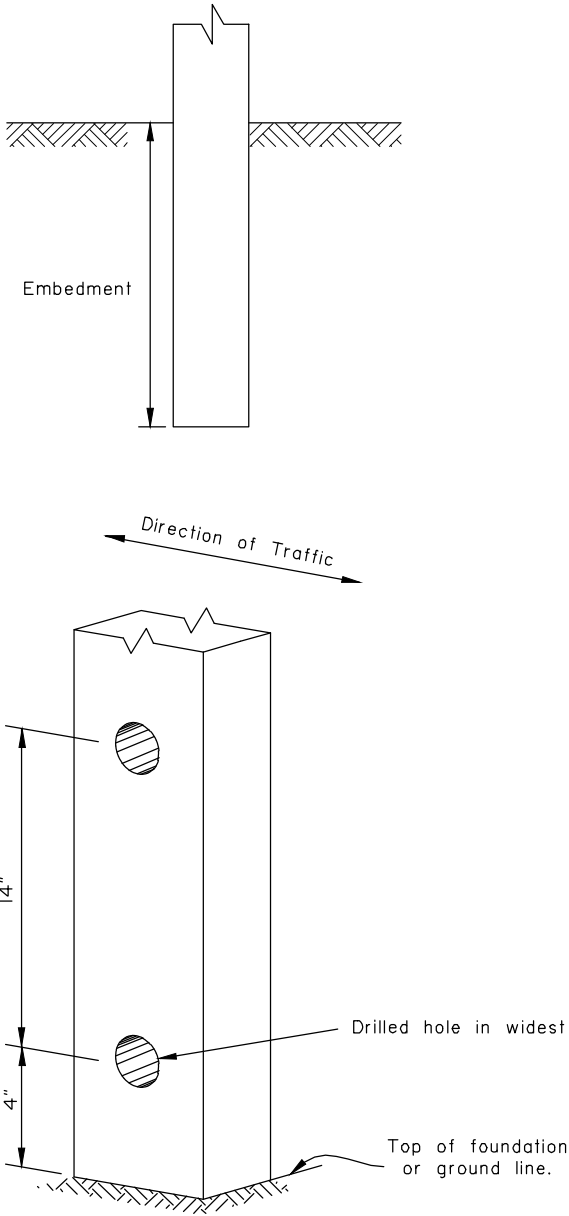
Next Code and Standards Review Date: 7/8/2030

GENERAL NOTES:

1. Sign shall be placed symmetrically around posts and refer to Standard Plan 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. Concrete shall be class B.
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.

SIGN POST SPACING NOTES:

1. Install sign support in accordance with the table below, unless otherwise required by plans or specifications.
2. Exceptions:
 - a. Use one post for all E5-I 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 tables below 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 Plan S-3I for frangible couplings, hinges, and foundations for tube and W-shape sign supports.



SLEEVE TYPE
CONCRETE FOUNDATION

SLEEVE TYPE*
SOIL EMBEDMENT

WOOD SIGN POSTS			
SIZE	HOLE DIA.	EMBEDMENT*	NO. OF POSTS WITHIN 7 Ft. PATH
4"x4"	NONE	4'-1"	2
4"x6"	1 1/2"	5'-3"	2
6"x6"	1 1/2"	4'-9"	1
6"x8"	3"	4'-9"	1

* Embedment depth applies in both strong and weak soil.

WOOD POSTS

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"	4'-8"	2
1 3/4" x 1 3/4"	4'-6"	2
2" x 2"	4'-3"	2
2 1/4" x 2 1/4"	5'-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

TUBE SIGN POST SPACING								
Sign Width (feet)	No. of Posts	Distance Between Posts	Sign Overhang	Post Type				Notes
				P.S.T.	Wood	Steel Tube	W-Shape	
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	

TUBE SIGN POST SPACING

Note: Drawing not to scale

State of Alaska DOT&PF
ALASKA STANDARD PLAN

LIGHT SIGN STRUCTURE
POST EMBEDMENT

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

Adoption Date: 7/17/2020

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

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