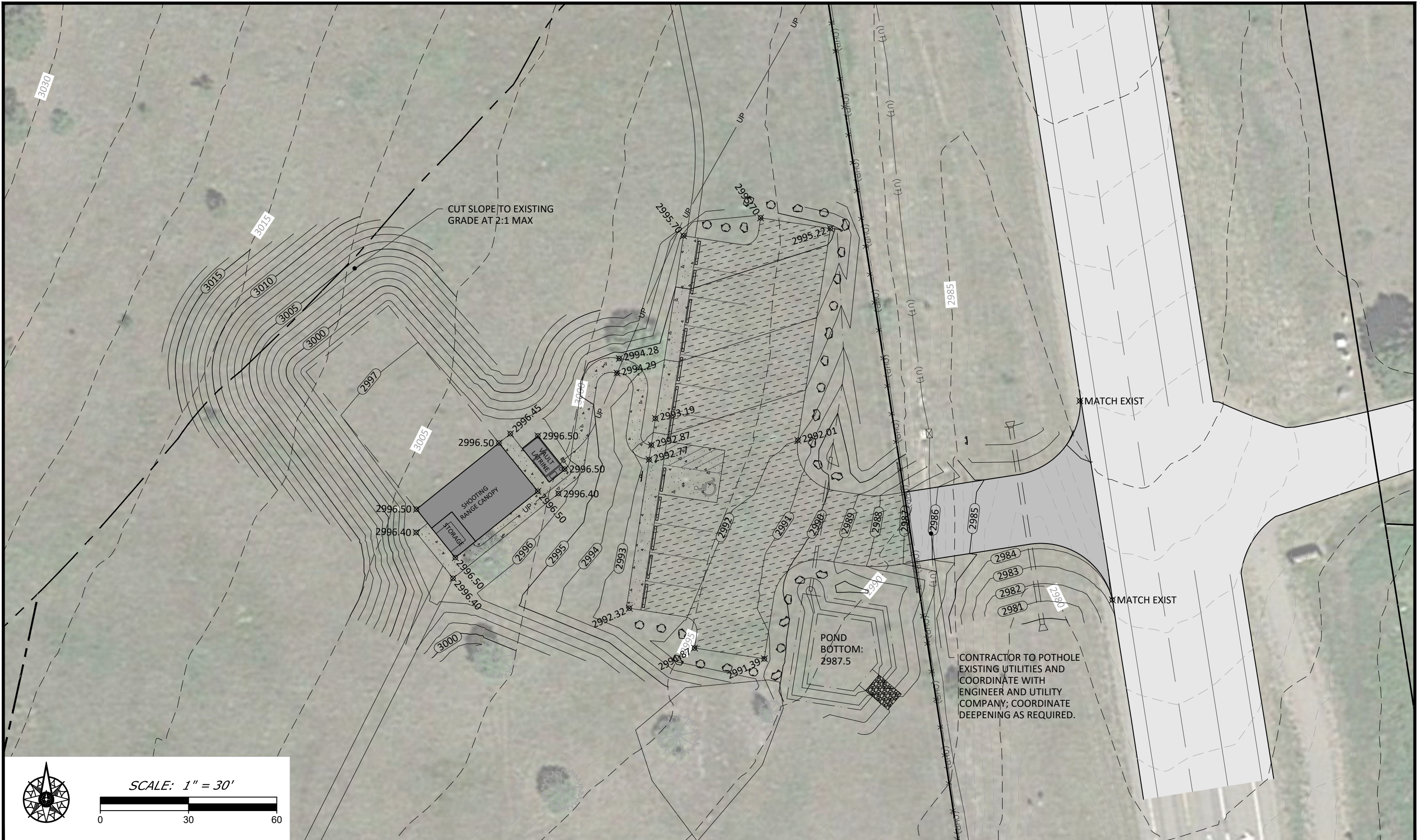
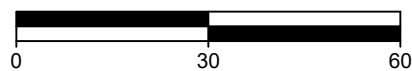


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SCALE: 1" = 30'



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**MONTANA FISH,
WILDLIFE & PARKS**

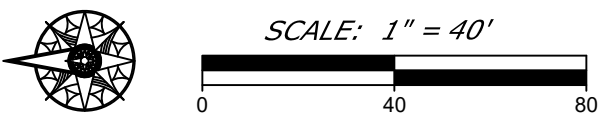
MAIN PARKING GRADING BIG ARM ARCHERY PROJECT



MONTANA FWP

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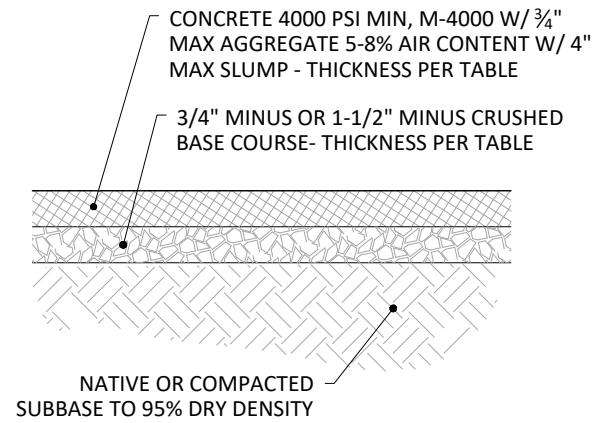
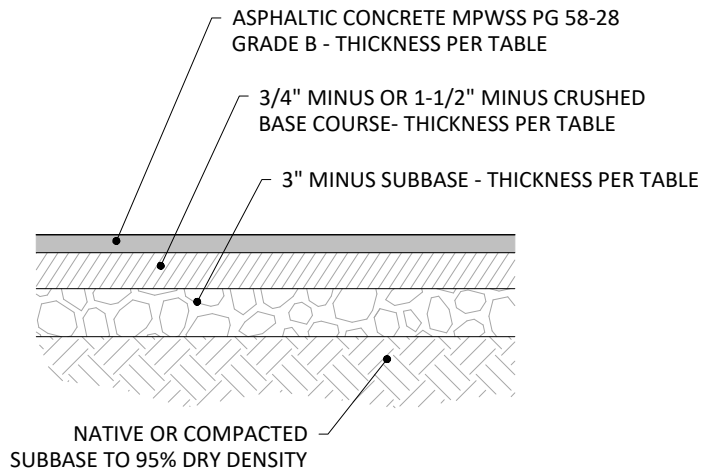
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**MONTANA FISH,
WILDLIFE & PARKS**

OVERFLOW GRADING - BID ALT
BIG ARM ARCHERY PROJECT



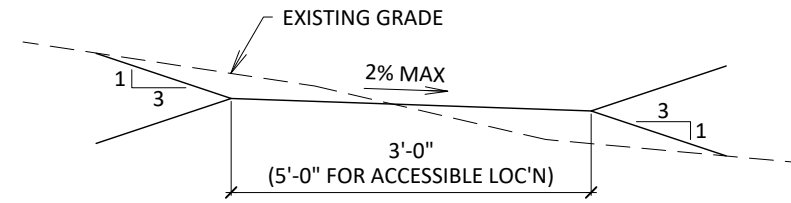


PARKING PAVEMENT SECTIONS			
MATERIAL	ASPHALT	GRAVEL	CONCRETE
ASPHALT	3"	-	6"
CRUSHED BASE	6"	6"	12"
SUBBASE	9"	9"	-
GEOTEXTILE	-	-	-
NATIVE	SEE NOTES	SEE NOTES	SEE NOTES

- NOTES:
1. WHEN PROVIDED, CONTRACTOR TO COMPLY WITH GEOTECHNICAL REPORT INCLUDED IN THE CONTRACT DOCUMENTS.
 2. SCARIFY NATIVE MATERIAL TO 12" DEPTH AND COMPACT TO 95% MAXIMUM DRY DENSITY PER ASTM D698 PRIOR TO BASECOURSE PLACEMENT.
 3. SUBBASE COURSE SHALL MEET MPWSS SECTION 02234, 3" MINUS AND COMPACTED TO AT LEAST 95% OF MAX DRY DENSITY PER ASTM D698.
 4. CRUSHED BASE COURSE SHALL MEET MPWSS SECTION 02235, 1-1/2" OR 3/4" MINUS AND COMPACTED TO AT LEAST 95% OF MAX DRY DENSITY PER ASTM D698.
 5. MPWSS GRADE B PG 58-28 ASPHALTIC CONCRETE SHALL BE USED PER SPECIFIED THICKNESS THROUGHOUT PAVED AREAS. ASPHALT COMPACTED TO MINIMUM 93% OF MAX PER ASTM D2041. ASPHALT SHALL BE ACCOMPLISHED IN ACCORDANCE WITH SECTION 02510 MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS, SEVENTH EDITION, APRIL 2021.
 6. PARKING GRADES ARE BASED ON FINISHED ASPHALT SURFACE. GRAVEL PARKING AREAS SHALL BE CONSTRUCTED TO BASE COURSE ELEVATIONS & 10 FT LONG GRAVEL TRANSITIONS SHALL BE PROVIDED TO HARDSCAPE SURFACES SUCH AS THE ADA PARKING, SIDEWALK, & MDT ROW PAVEMENT APPROACH.

1 PAVEMENT SECTION

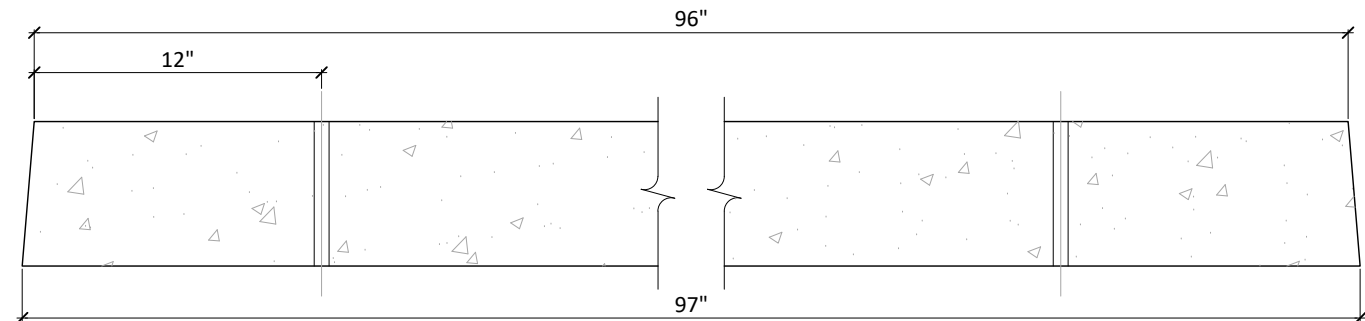
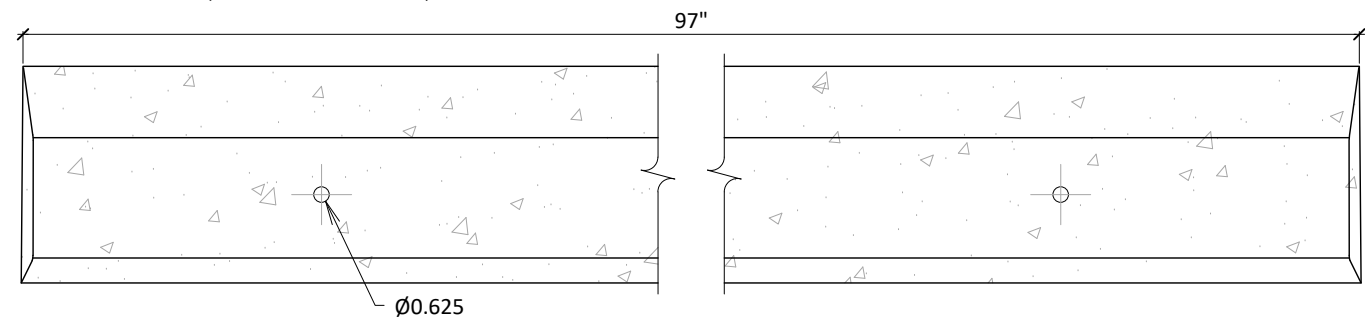
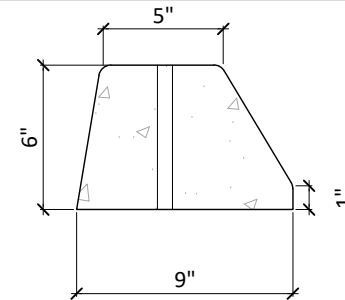
3/8" = 1'-0"



- NOTES:
1. PROVIDE A 5' WIDE GRAVEL TRAIL BTW SHOOTING RANGE & TARGET #1 (INCLUDING SHOOTING STATION) W/ 3" OF 3/4" CRUSHED BASE COURSE COMPACTED TO 95% OF MAX DRY DENSITY PER ASTM D698 AT LOCATIONS NOTED IN THE PLAN
 2. TRAIL CONTRACTOR TO REMOVE ORGANICS PRIOR TO GRADING TRAIL.
 3. GRADE TRAIL TO BALANCE CUT AND FILL WITHIN REACH OF MINI-EXCAVATOR TO THE EXTENT POSSIBLE.
 4. GRADE CUT/FILL SLOPES TO 3:1 MAX SLOPE.
 5. REPLACE ORGANICS ON CUT/FILL SLOPES, COORDINATE STOCKPILE LOCATIONS.
 6. SEED DISTURBED AREAS AS INDICATED IN THE PLANS

2 PEDESTRIAN PATH SECTION

3/8" = 1'-0"



3 PRE-CAST CONCRETE WHEEL STOP

1-1/2" = 1'-0"

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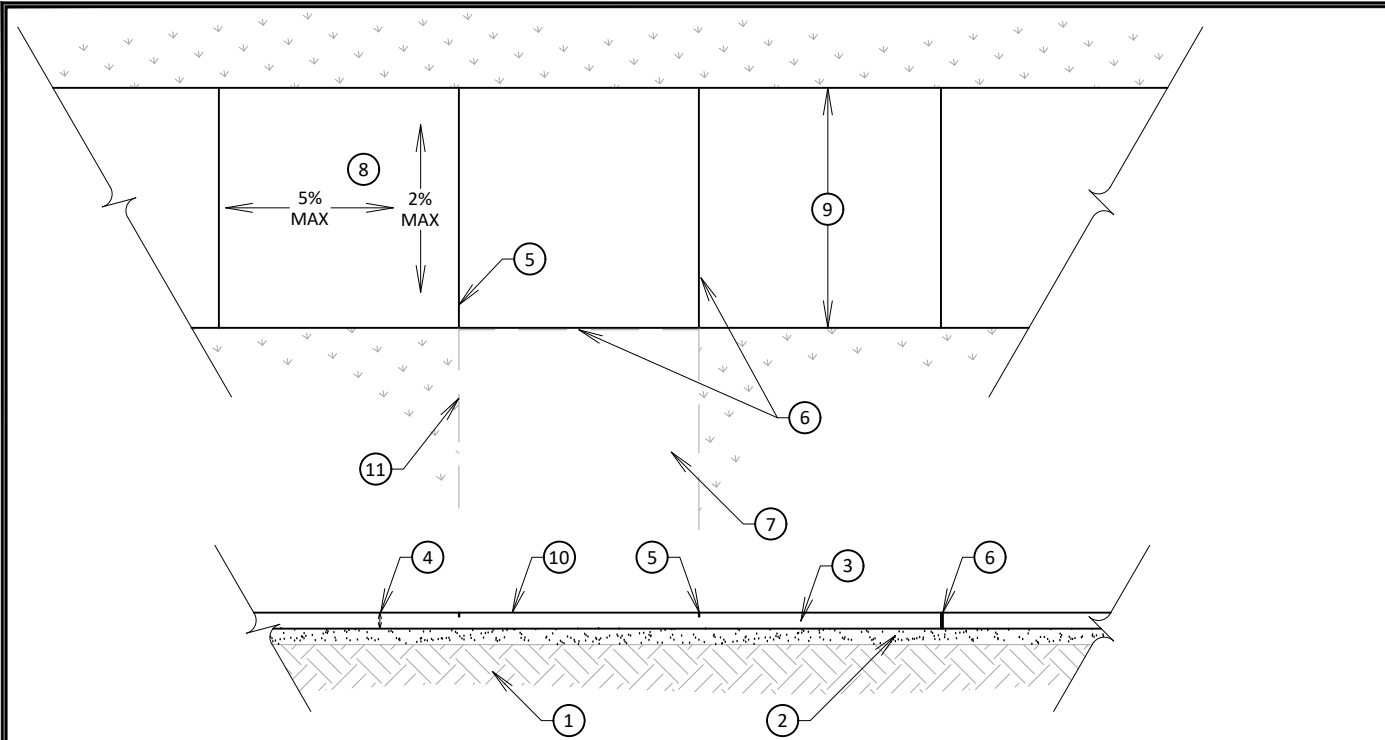


**MONTANA FISH,
 WILDLIFE & PARKS**

GENERAL NOTES AND DETAILS
 BIG ARM ARCHERY PROJECT

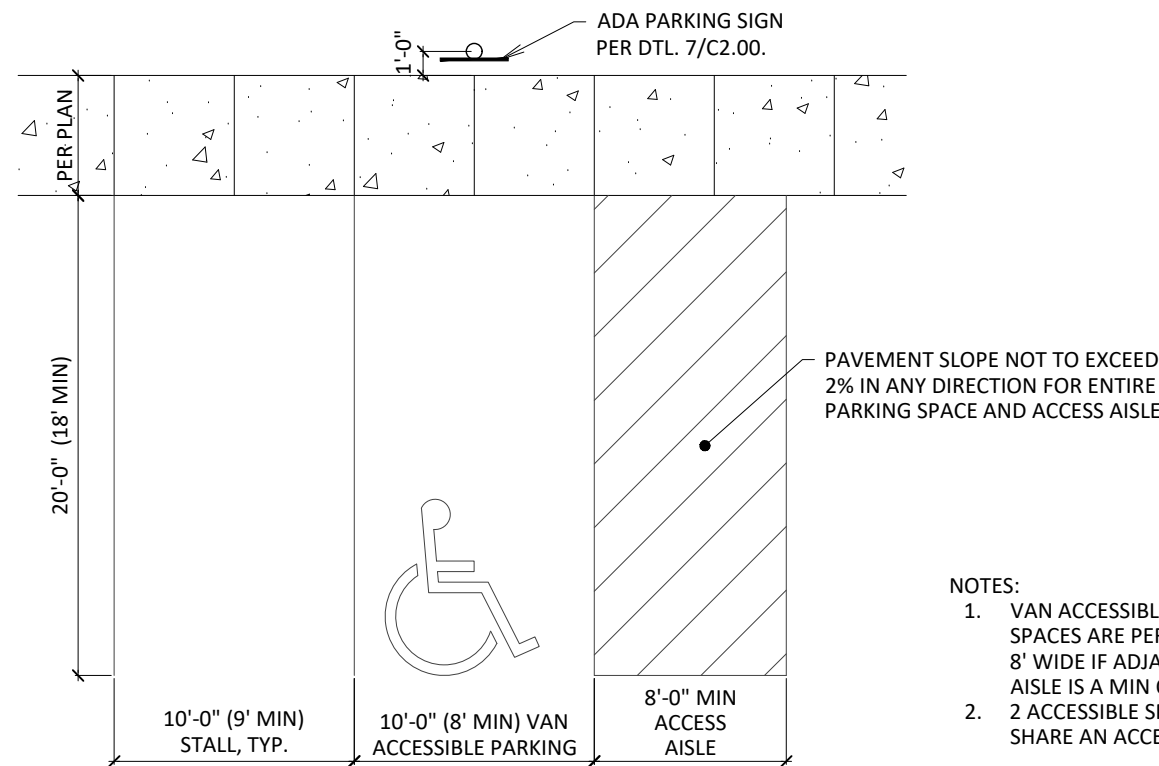
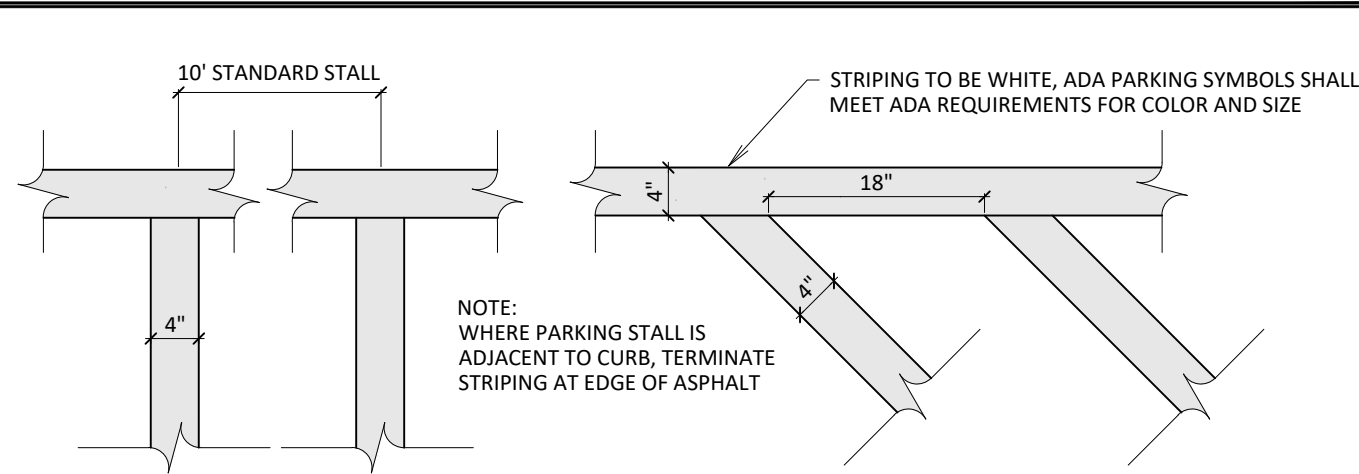


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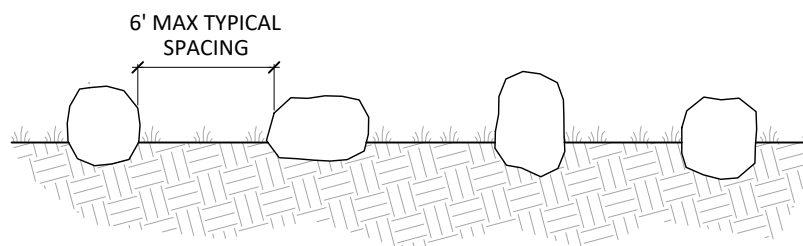
- ① COMPACTED NATIVE TO 95% MAX DRY DENSITY PER ASTM D698
- ② 6" MINIMUM BASE COURSE COMPACTED TO 95% DRY DENSITY PER ASTM D698
- ③ CONCRETE SHALL BE M-4000 WITH 3/4" MAXIMUM AGGREGATE, MINIMUM 28-DAY STRENGTH OF 4000 PSI, 6% ± 1-1/2% AIR ENTRAINMENT, AND MAXIMUM SLUMP OF 4"
- ④ MINIMUM 4" THICK, 6" ADJACENT TO DRIVE APPROACHES
- ⑤ CONTRACTION JOINTS - VERTICAL, 1/8" WIDE MIN, 1" DEEP MIN, MAXIMUM 1.0 x WIDTH SPACING
- ⑥ EXPANSION JOINT - FULL DEPTH, 1/2 THICK JOINT FILLER PER SPECIFICATIONS, SET TOP OF JOINT FILLER FLUSH WITH TOP OF CONCRETE. 50' MAX SPACING
- ⑦ ABUTTING SIDEWALK PER PLAN
- ⑧ 2% SLOPE IN DIRECTION OF DRAINAGE, 5% MAX IN THE DIRECTION OF TRAVEL
- ⑨ MIN 5' WIDTH, REFER TO PLAN
- ⑩ FINISH WITH FINE HAIR BROOM ON LONGITUDINAL GRADES <6% AND ROUGH HAIR BROOM ON LONGITUDINAL GRADES >6%
- ⑪ ALL VISIBLE EDGES AND JOINTS SHALL BE ROUNDED WITH AN EDGING TOOL WITH A MINIMUM 1/4" RADIUS

1 TYPICAL SIDEWALK DETAIL
1/4" = 1'-0"



- NOTES:
- 1. VAN ACCESSIBLE PARKING SPACES ARE PERMITTED TO BE 8' WIDE IF ADJACENT ACCESS AISLE IS A MIN OF 8' WIDE.
 - 2. 2 ACCESSIBLE SPACES MAY SHARE AN ACCESS AISLE

2 PARKING STRIPING DETAIL
1/8" = 1'-0"



- NOTES:
- 1. BOULDERS SHALL BE PLACED AS SHOWN IN SITE PLAN.
 - 2. BOULDERS TO BE QUARRIED ON SITE.
 - 3. BOULDERS SHALL RANGE FROM 30"Ø TO 45"Ø.
 - 4. BOULDERS TO BE INSTALLED WITH 1/3 TO 1/4 OF MASS UNDER SURFACE.
 - 5. GRADE SHALL BE LEVEL ALL AROUND BOULDERS.

3 BOULDER INSTALLATION
NTS

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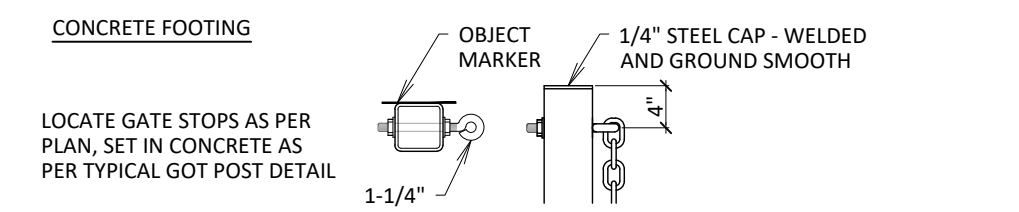
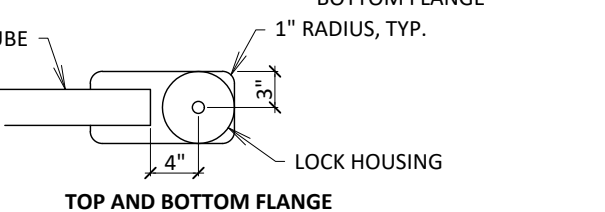
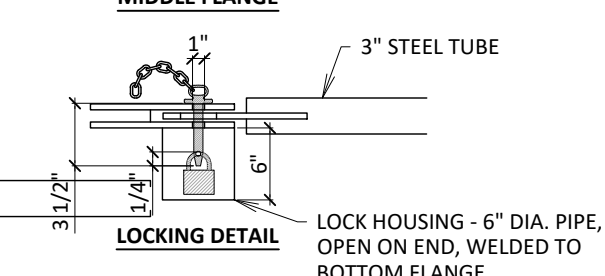
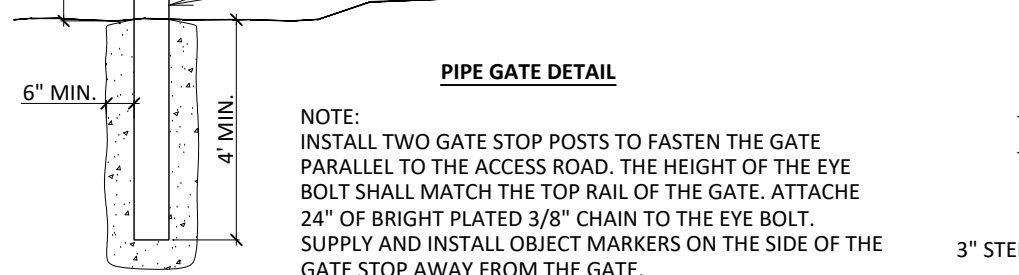
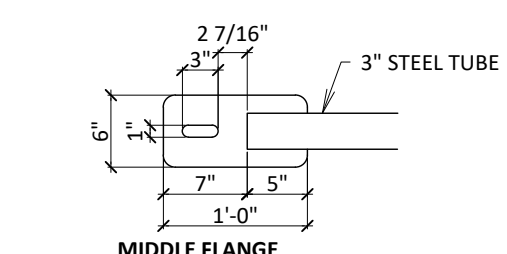
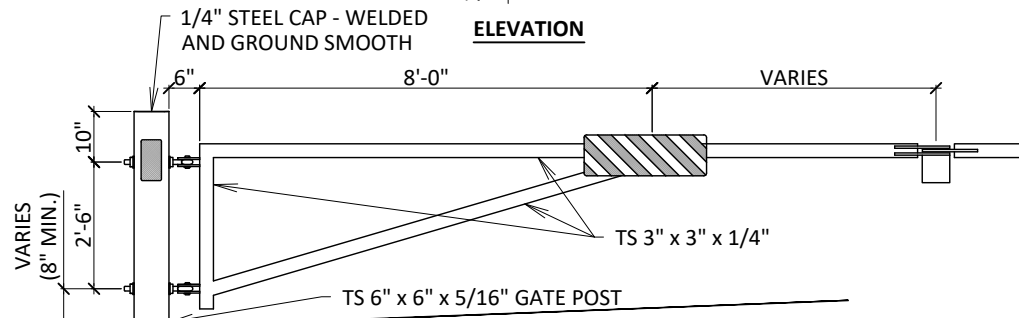
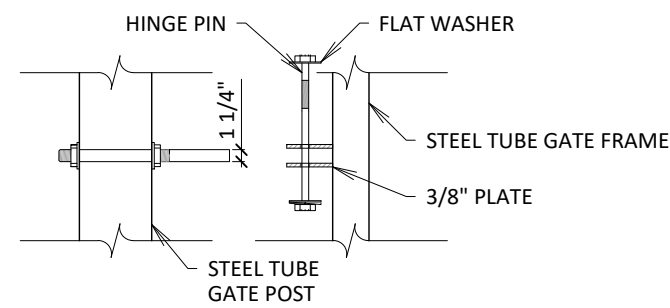
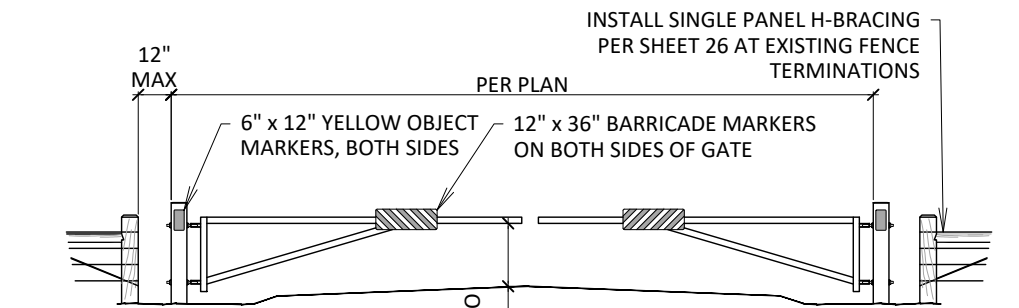
**MONTANA FISH,
WILDLIFE & PARKS**

GENERAL NOTES AND DETAILS
BIG ARM ARCHERY PROJECT



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HINGE NOTES:

- HINGE BOLT THREADS TO BE EXPOSED 1" MINIMUM BEYOND NUTS ON EITHER SIDE OF GATE POST TO ALLOW ADJUSTMENT.
- PROVIDE 3/4" DIA. x 3" HINGE PINS AT EACH HINGE.
- GREASE THREADS OF HINGE BOLTS BEFORE INSTALLATION.

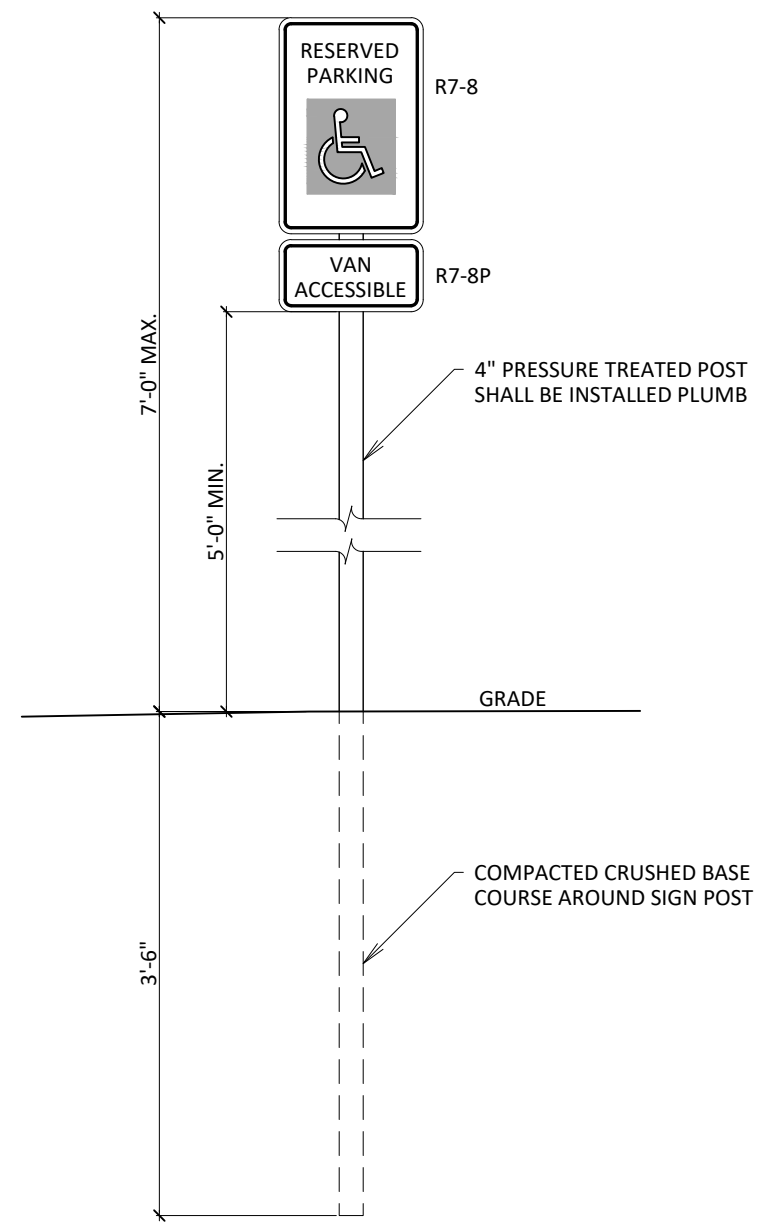
LOCK NOTES:

- PROVIDE 7/8" DIA. x 3 1/2" HITCH PIN. BEVEL END OF PIN AND DRILL HOLE TO ACCEPT 3/8" DIA. PADLOCK HASP.
- ATTACH PIN TO GATE WITH 24" BRIGHT PLATED 3/8" CHAIN.
- IF THE CONTRACTOR CHOOSES TO USE THEIR OWN LOCK DURING CONSTRUCTION, A KEY MUST BE PROVIDED TO FWP PROJECT MANAGER AND REGIONAL STAFF. INSTALL FQP LOCK #2661 AT FINAL ACCEPTANCE.

GENERAL NOTES:

- TUBE STEEL TO BE ASTM A500, GRADE B.
- BOLTS TO BE ASTM A325, GRADE A.
- LENGTHS OF GATE AND STOP POSTS VARY DEPENDING ON TERRAIN. FIELD VERIFY REQUIRED LENGTH PRIOR TO CONSTRUCTION TO ENSURE MINIMUM BURY DEPTH.
- ALL WELDS TO BE GROUND SMOOTH.
- ALL STEEL TO BE FINISHED WITH INDUSTRIAL ACRYLIC POLYURETHANE, SEMI-GLOSS FINISH, COLOR TO BE SELECTED BY OWNER.

1 SQUARE TUBE GATE DOUBLE SPAN
N.T.S.



2 TYPICAL HANDICAP PARKING SIGN
3/4" = 1'-0"

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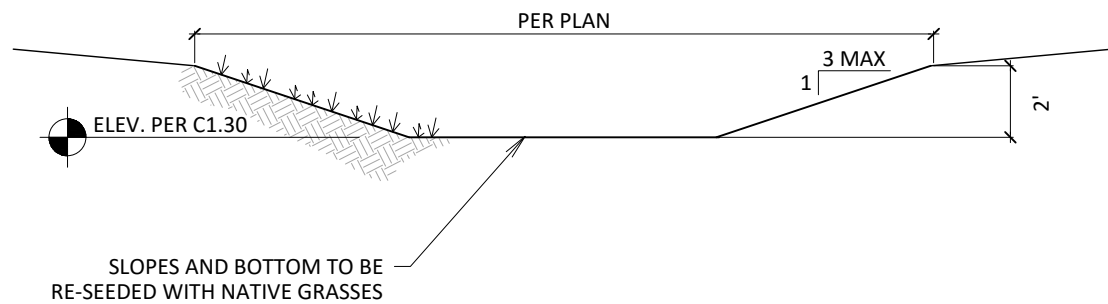


MONTANA FISH, WILDLIFE & PARKS

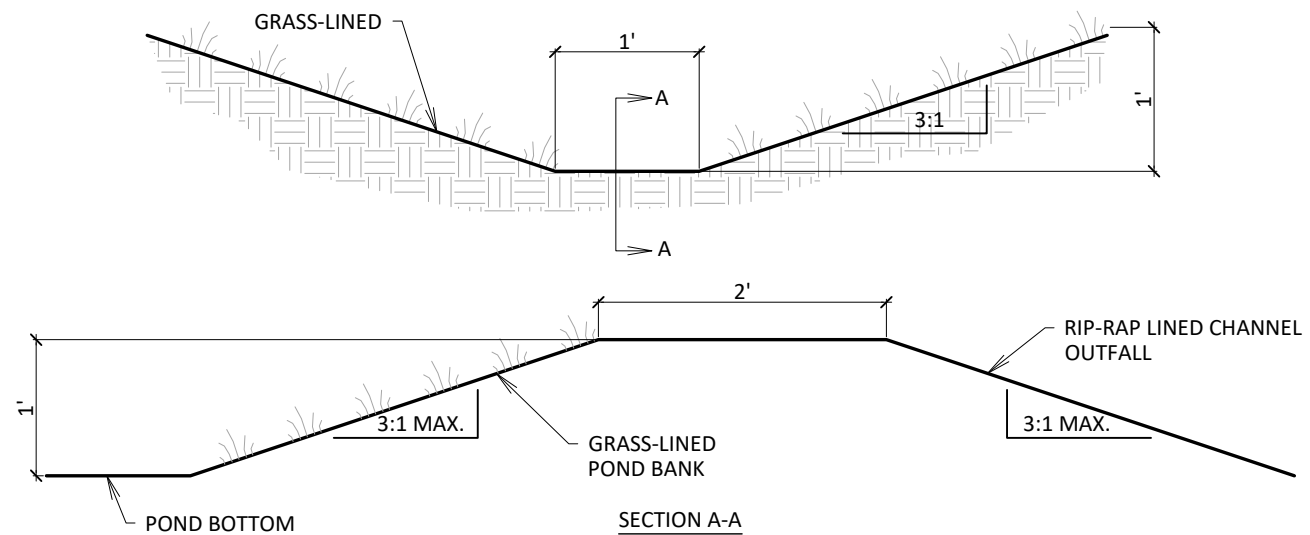
GENERAL NOTES AND DETAILS
BIG ARM ARCHERY PROJECT



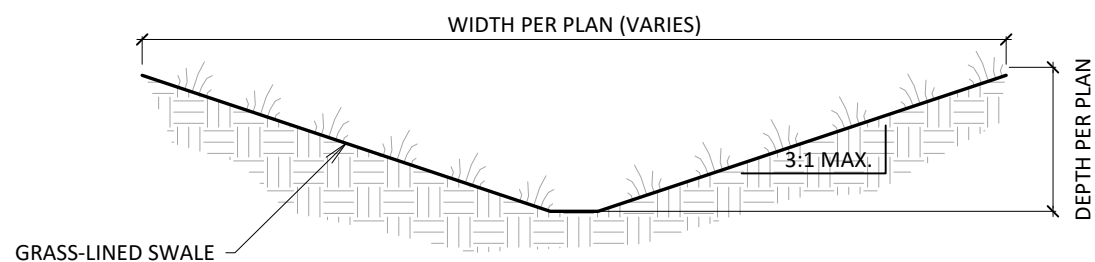
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1 POND SECTION
NTS



3 STORM POND OUTLET
3/4" = 1'-0"



2 TYPICAL SWALE
3/4" = 1'-0"

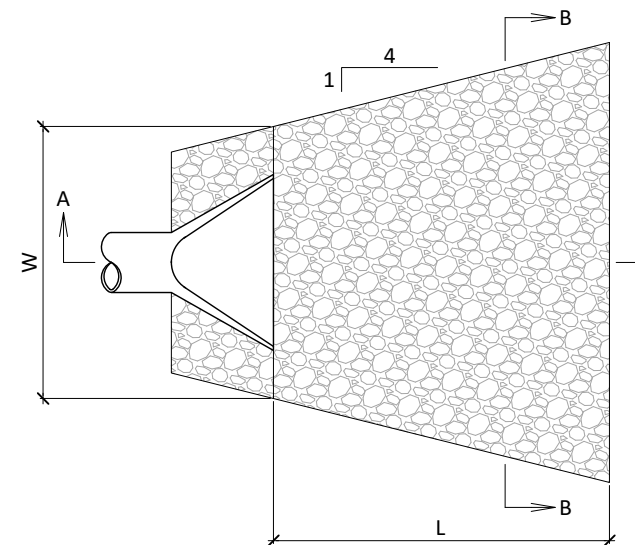


TABLE OF QUANTITIES FOR RIPRAP AT OUTLETS					
DIA. (IN)	W (FT)	L (FT)	GEO. FABRIC (SY)	GRANULAR FILTER (CY)	18" DEPTH RIPRAP (CY)
12	6	8	19.6	.3	4.4
15	6.5	8	20.8	.3	4.8
18	7	10	25.6	.4	6.4
21	7.5	10	27.4	.6	7.1
24	8	12	33.4	.8	9.2
27	8.5	12	35.2	.9	9.9
30	9	14	41.6	1.1	12.3
36	10	16	50.5	1.6	15.8
42	10.5	18	57.8	1.7	18.7
48	11	20	66.5	2.2	22.2



- NOTES:
1. RIPRAP $D_{50}=9"$ WITH $D_{MIN}=6"$.
 2. PIPE SIZES LARGER THAN SHOWN SHALL HAVE SPECIAL DESIGN SUBMITTED TO CK PWD FOR REVIEW AND APPROVAL.
 3. GEOTEXTILE FABRIC SHALL COVER THE BOTTOM AND SIDES OF THE AREA EXCAVATED FOR THE RIPRAP AND GRANULAR FILTER MATERIALS.

4 RIPRAP AT OUTLETS
NTS

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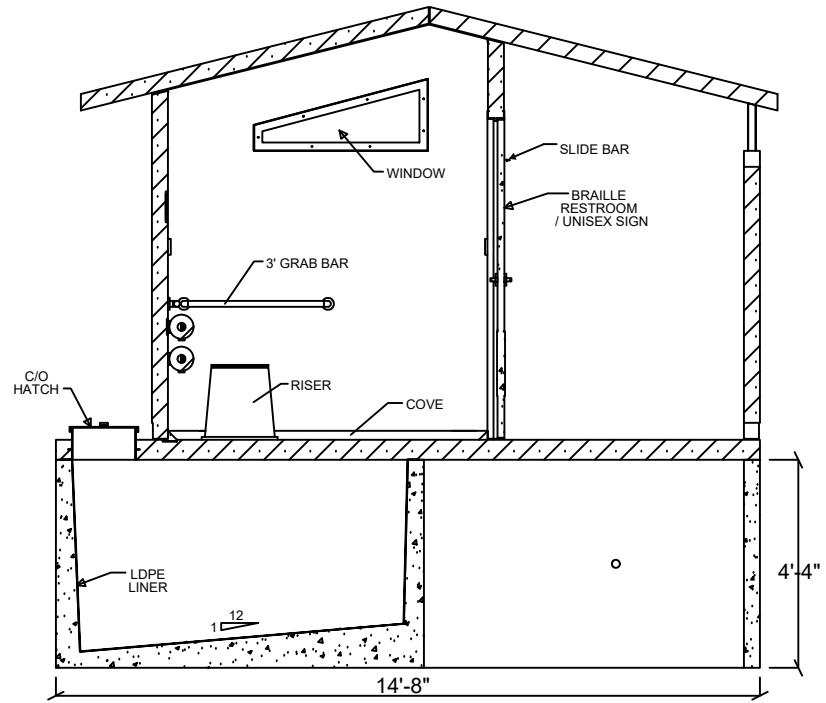
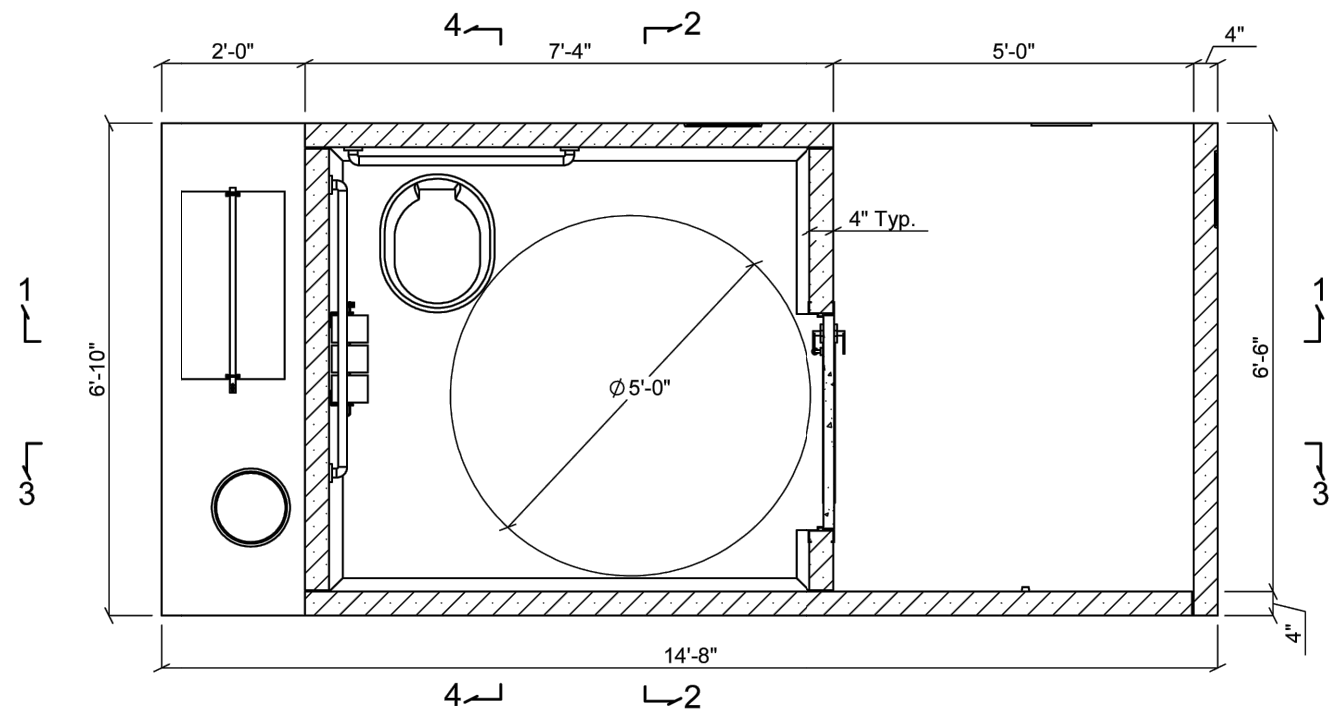
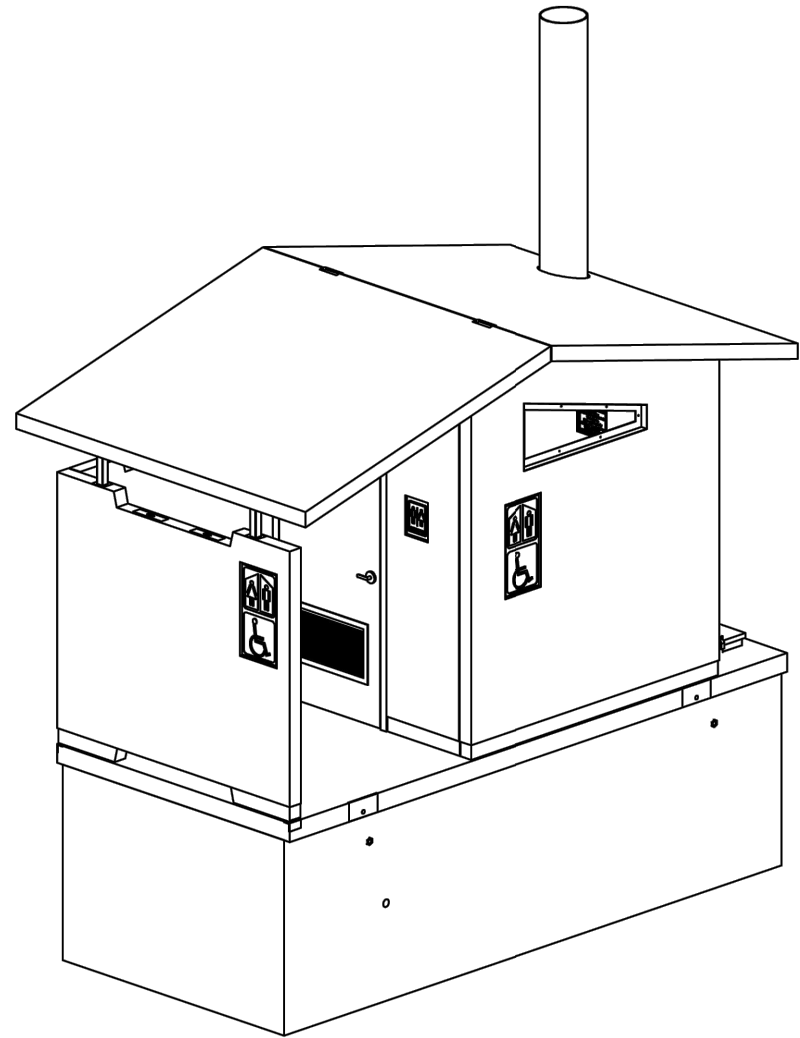
**MONTANA FISH,
WILDLIFE & PARKS**

GENERAL NOTES AND DETAILS
BIG ARM ARCHERY PROJECT

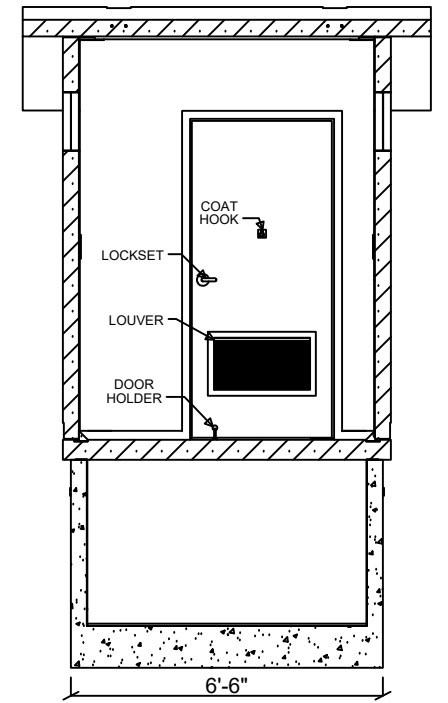


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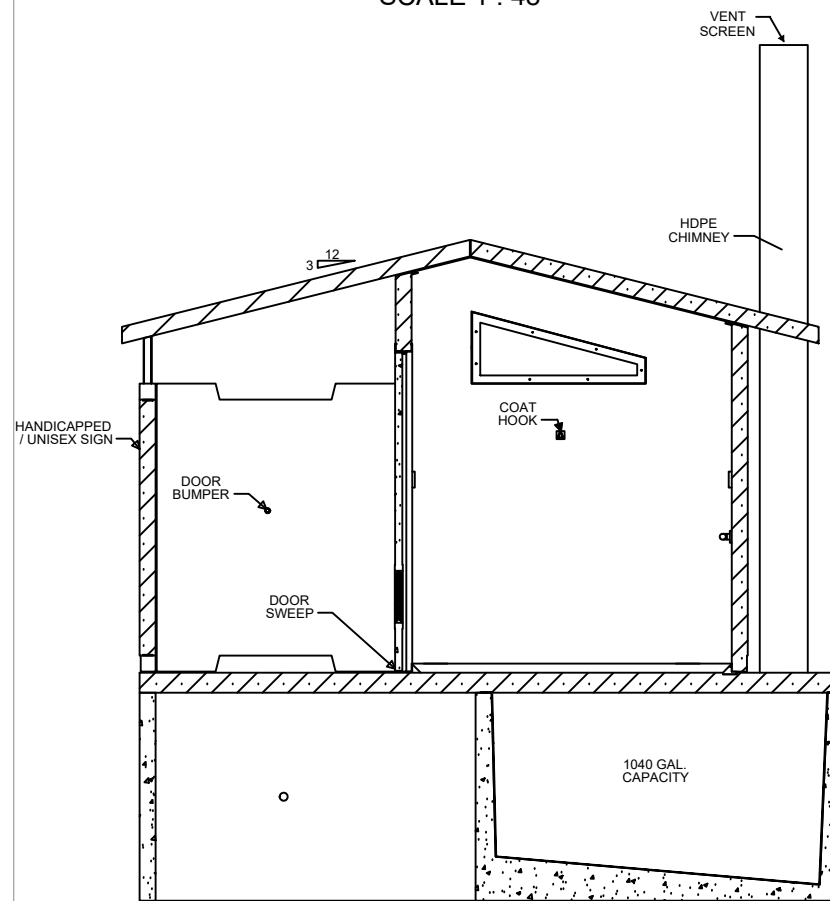
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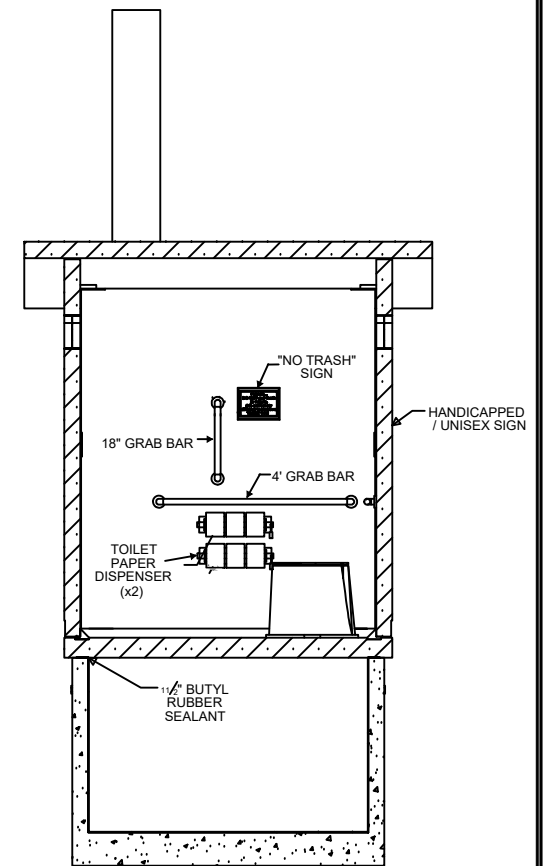
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SCALE 1 : 48



SECTION 2-2
SCALE 1 : 48



SECTION 3-3
SCALE 1 : 48



SECTION 4-4
SCALE 1 : 48

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**MONTANA FISH,
WILDLIFE & PARKS**

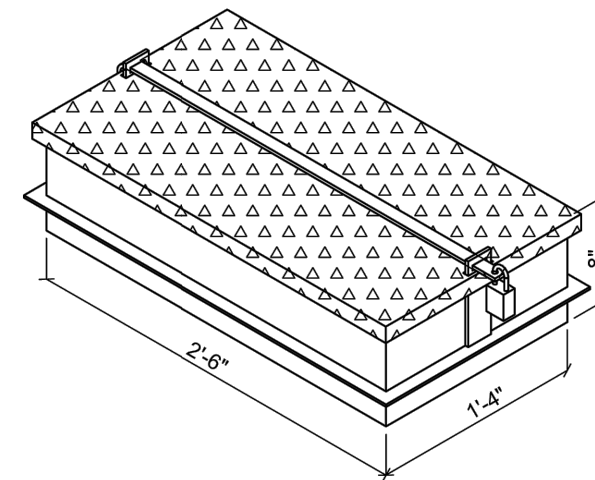
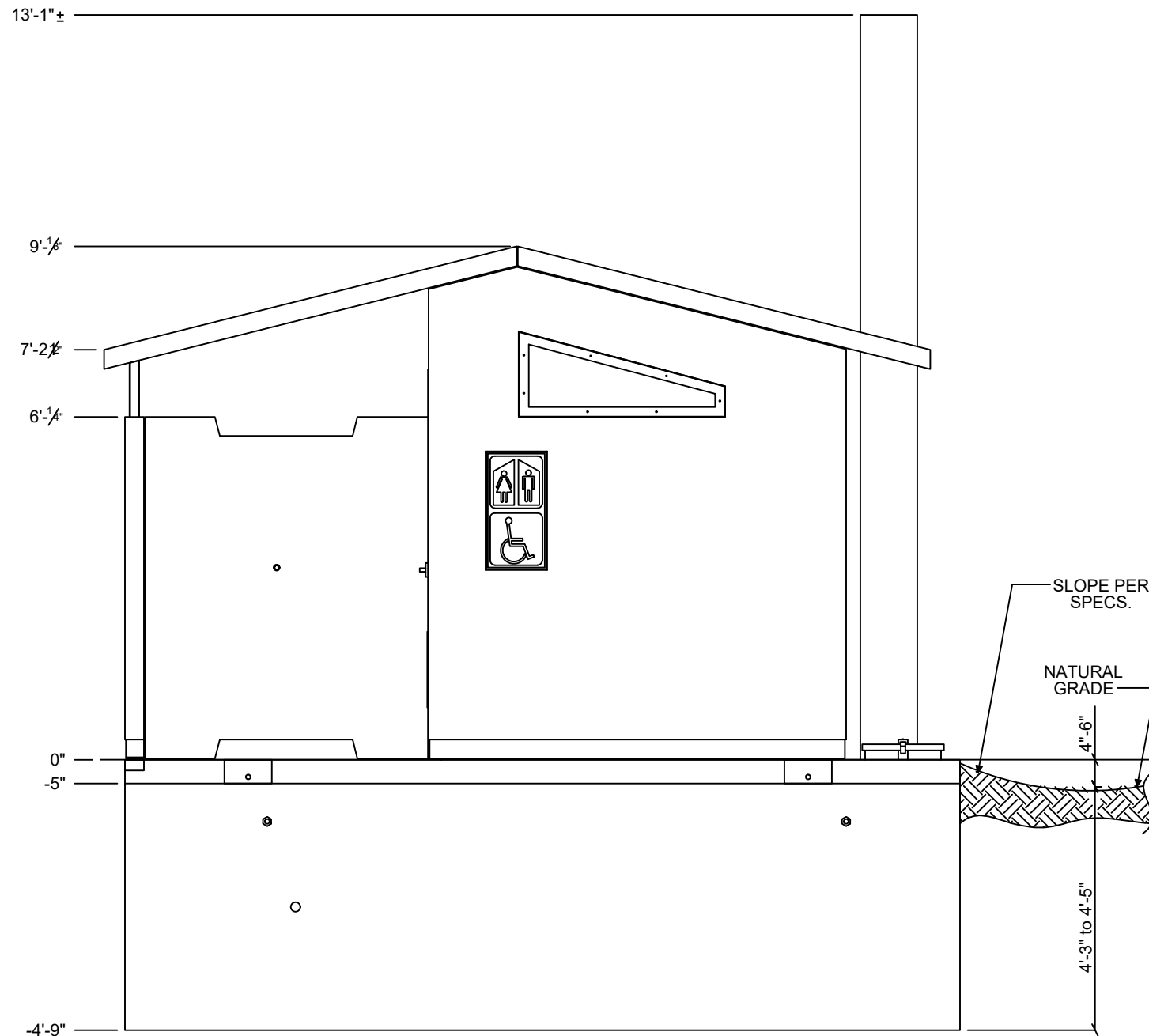
GENERAL NOTES AND DETAILS

BIG ARM ARCHERY PROJECT

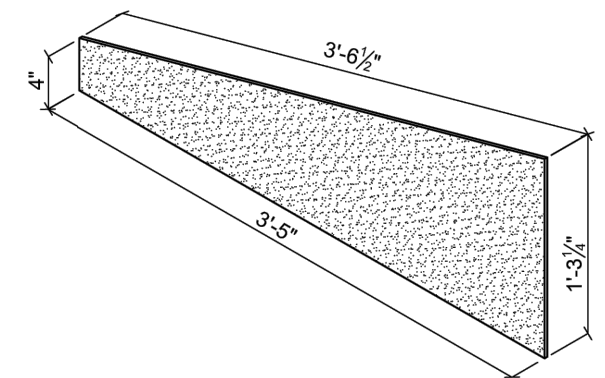


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CLEANOUT HATCH



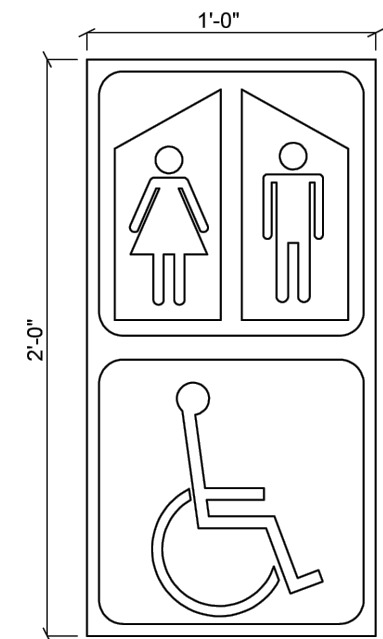
POLYCARBONATE WINDOW



BRaille RESTROOM SIGN



"NO TRASH" SIGN



"HANDICAPPED / UNISEX" SIGN

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MONTANA FISH, WILDLIFE & PARKS

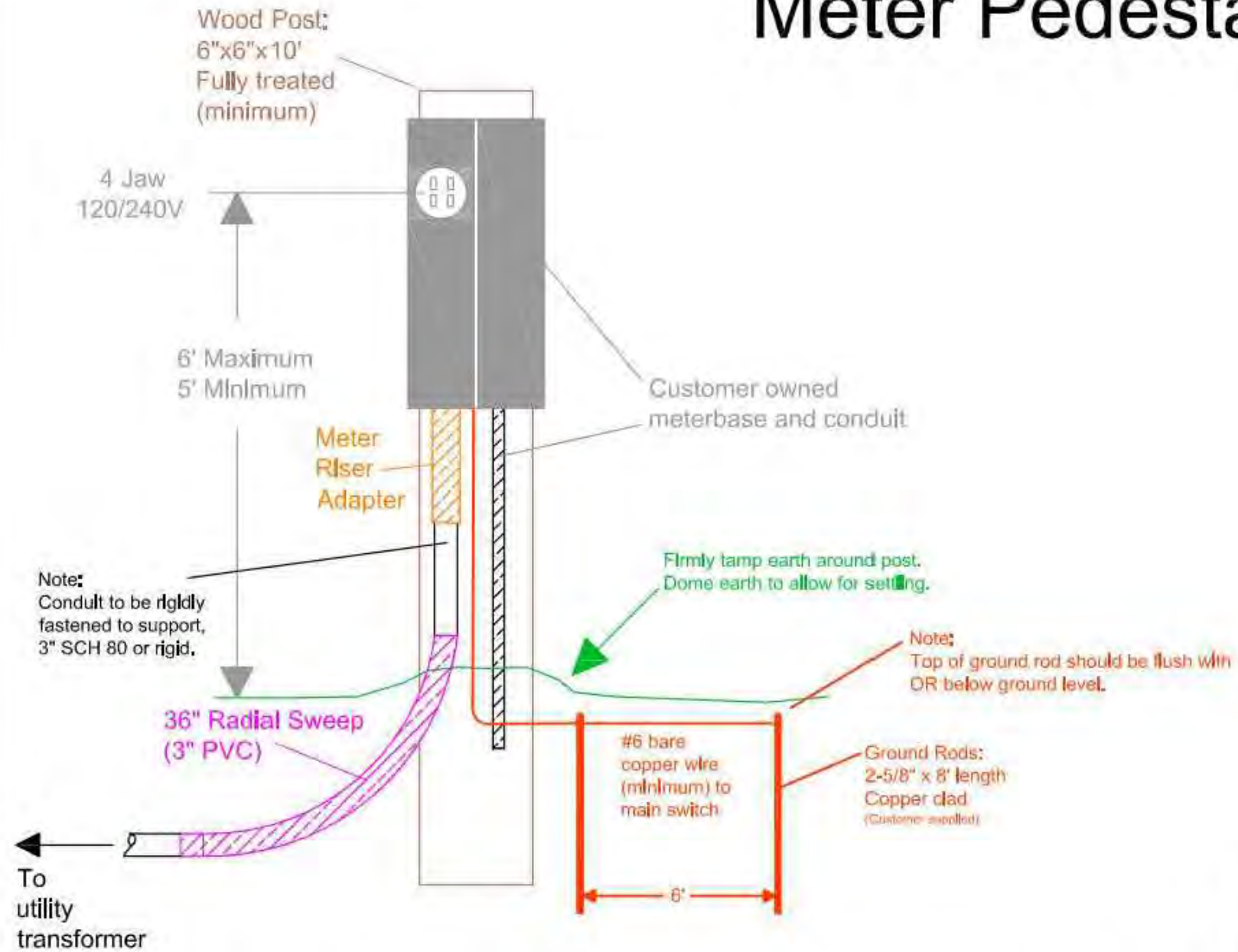
GENERAL NOTES AND DETAILS


BIG ARM ARCHERY PROJECT



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Meter Pedestal Installation



METERPEDINSTALLATION	
S:\ENGINEERING\MONTE\DRAWINGS ENGR.DEPT	
 MISSION VALLEY POWER <small>PABLO, MONTANA (406)583-7900</small>	MPEDINST_01 Rev. REVISION SHEET_1

No.	Date	Revision	No.	Date	Revision	Eng:	Scale:
1	5/17/21	Update sweep from "Long" to "36"				CAYE	5/17/21
		update "36" to "36"				CAYE	
		update "36" to "36"				CHECKED	
		update "36" to "36"				APPROVED	

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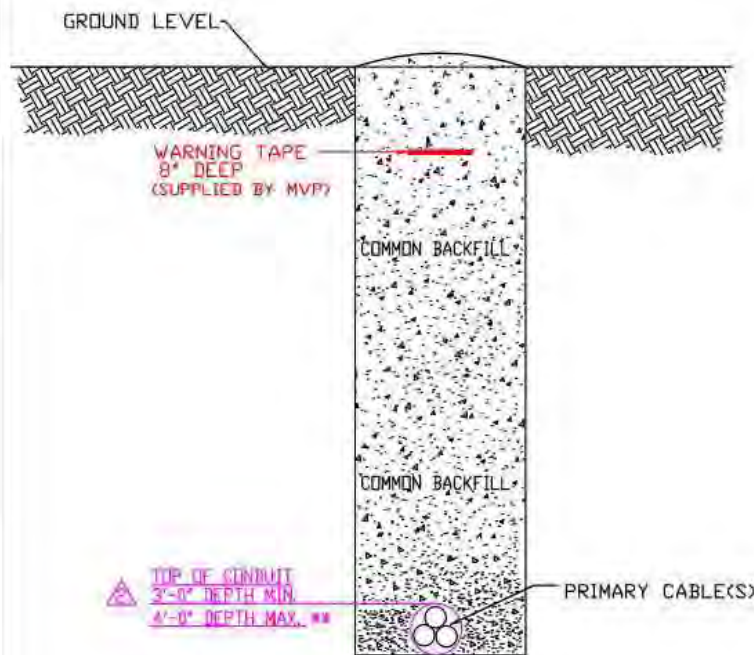


**MONTANA FISH,
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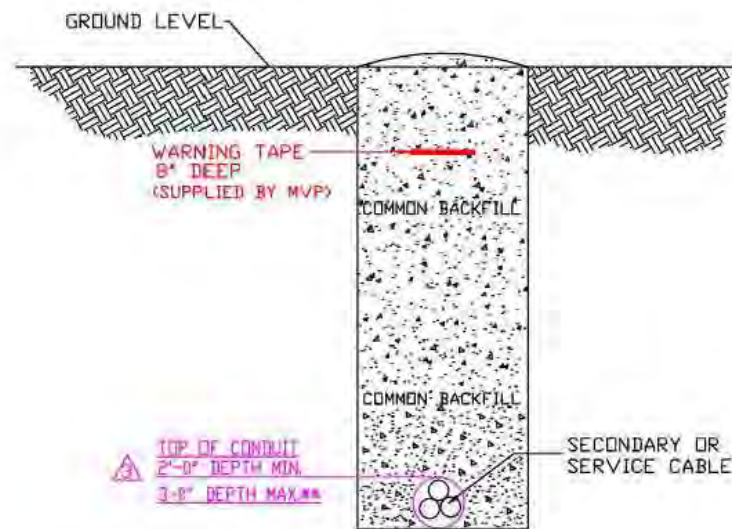
GENERAL NOTES AND DETAILS
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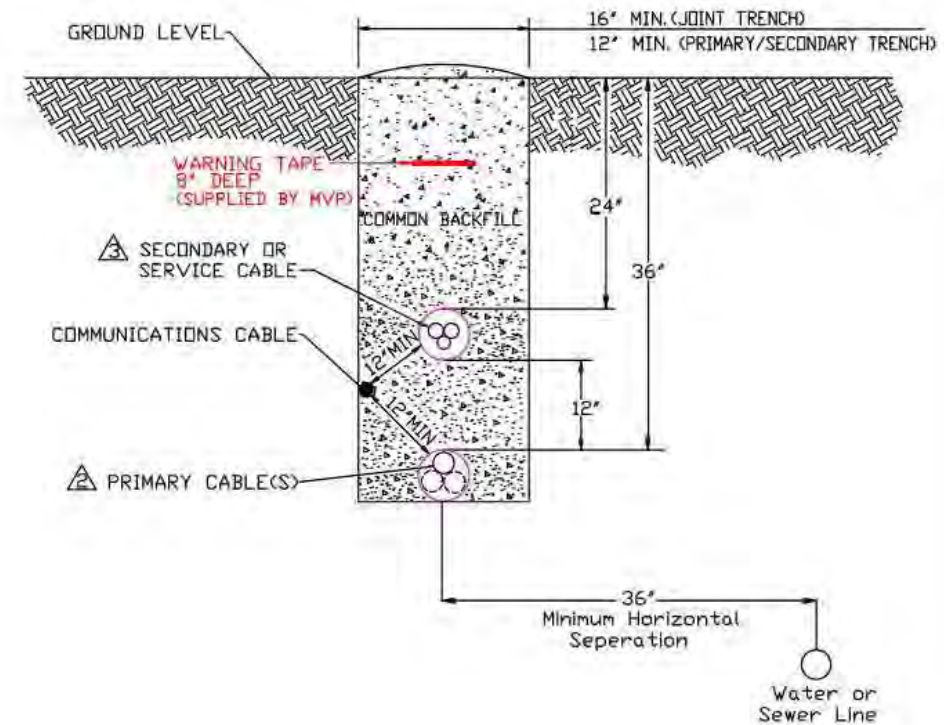
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TRENCH
Primary Distribution Line Only



TRENCH
Secondary or Service Cables



TRENCH
Joint Use

NOTES:

- JOINT TRENCH MAY INCLUDE COMMUNICATION WITH POWER, BUT CANNOT CONTAIN WATER AND OR SEWER LINES.
- THE PVC CONDUIT TRENCH MUST BE DEEP ENOUGH FOR 3 FEET OF COVER OVER CONDUIT. A 1/4" NYLON ROPE MUST BE INSTALLED IN CONDUIT FOR PULLING CABLE.
- THE PVC CONDUIT TRENCH MUST BE DEEP ENOUGH FOR 2 FEET OF COVER OVER CONDUIT. A 1/4" NYLON ROPE MUST BE INSTALLED IN CONDUIT FOR PULLING CABLE.
- ALL CONDUIT MUST BE GRAY ELECTRICAL CONDUIT MEETING UL STANDARDS 651 & NEMA TC2 AND BE RATED FOR 90°C. WHITE WATER PIPE WILL NOT BE ACCEPTED.
- SCHEDULE 80 PVC CONDUIT IS REQUIRED WHEN CROSSING UNDER BLACKTOP, CONCRETE, DRIVEWAYS, OR ROADWAYS OR ANY OTHER AREAS SUBJECT TO HEAVY LOADS.
- CUSTOMER IS RESPONSIBLE FOR CONTACTING ALL UTILITIES TO LOCATE THEIR UNDERGROUND FACILITIES.
- 45 DEGREE OR 90 DEGREE LONG SWEEPS ARE REQUIRED FOR ALL CHANGES OF DIRECTION WITHIN THE TRENCH. ALL RUNS OF 250'+ ARE REQUIRED TO USE A FIBERGLASS SWEEP.
- THE CONDUIT ENDS WILL BE CAPPED OR COVERED WITH DUCT TAPE TO KEEP DEBRIS OUT.
- LONG RADIAL SWEEPS ARE REQUIRED FOR CONDUIT INSTALLATIONS.
- THE CUSTOMER WILL NEED TO MAKE SURE THAT THE CONDUIT IS NOT DAMAGED OR CRUSHED DURING THE BACKFILLING OF THE TRENCH AND THAT THE PULL ROPE IS FREE TO MOVE. FAILURE TO DO SO MAY RESULT IN MVP NOT ACCEPTING THE CONDUIT OR BILLING THE CUSTOMER FOR REPAIRS.

PRIMARY CABLE(S)		
QTY	DESCRIPTION	SIZE OF CONDUIT*
1	#2 URD	1 - 3" DIA.
3	#2 OR 4/0 URD	3 - 3" DIA.
SECONDARY AND SERVICE CABLES		
QTY	DESCRIPTION	SIZE OF CONDUIT
1	1/0 - 4/0 URD	1 - 3" DIA.
1	350 MCM URD	1 - 3" DIA.

* CONTACT ENGINEERING FOR ALL OTHER SIZES.
** MAXIMUM DEPTH MAY BE INCREASED ON A CASE BY CASE BASIS.

MVP_TRENCH_SPECS.

S:\ENGINEERING\MONTE\DRAWINGS
ENGR.DEPT



TRENCH2
Rev. REVISION
SHEET__1

No.	Date	Revision	No.	Date	Revision	Engr: ENGINEER	Scale: SCALE
			1	11/4/03	Relocated water and sewer line distance	Dwn: DRAWN	Date: DATE
			2	02/2/06	Add notes 8, 9 & 10	Chkd: CHECKED	Plot: PLOT
			3	11/6/18	Removed sand requirements, adjusted notes	App: APPROVED	W.D. No. WD_NUM

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APPROVED BY: DATE:

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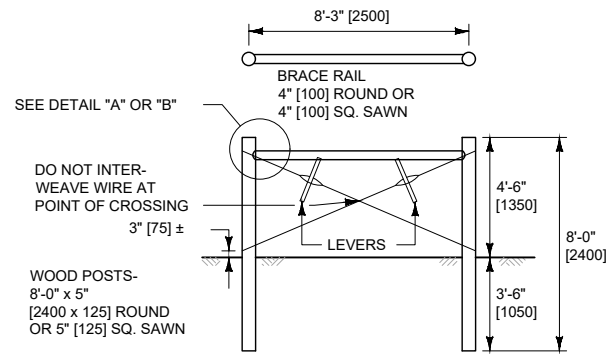
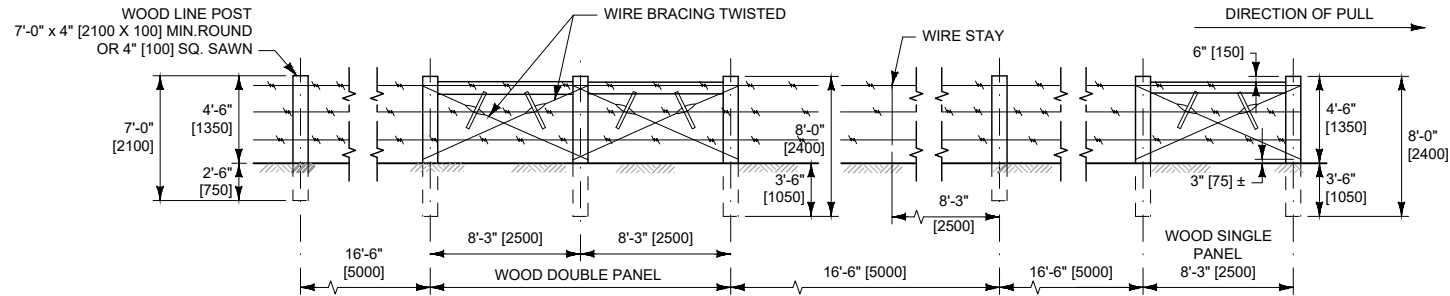
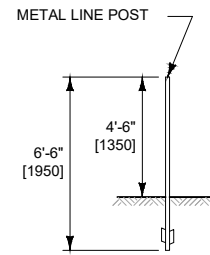
MONTANA FISH,
WILDLIFE & PARKS

GENERAL NOTES AND DETAILS
BIG ARM ARCHERY PROJECT



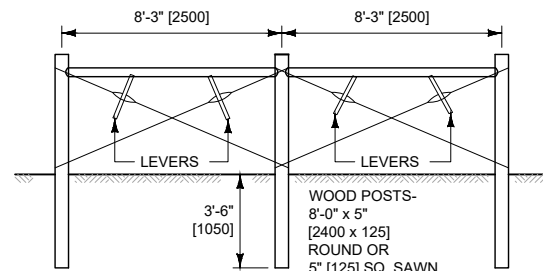
MONTANA FWP

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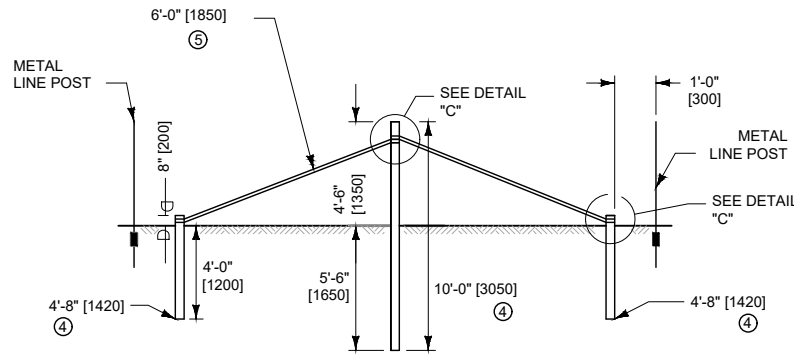
SINGLE WOOD PANEL

FOR PULLING, STRETCHING, CHANGES IN VERTICAL ALIGNMENT OR PANELS ON A RUN OF LESS THAN 330' [100 m].

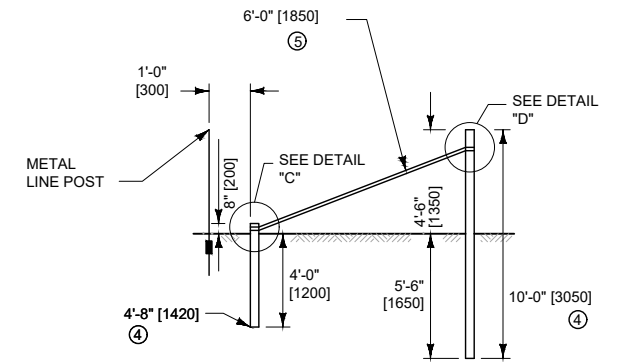


DOUBLE WOOD PANEL

FOR CORNERS, PULLING, STRETCHING, AND CHANGES IN HORIZONTAL ALIGNMENT.

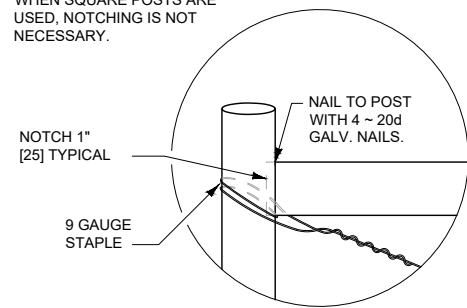


DOUBLE STEEL PANEL



SINGLE STEEL PANEL

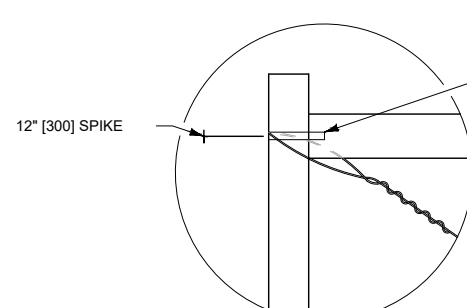
WHEN SQUARE POSTS ARE USED, NOTCHING IS NOT NECESSARY.



DETAIL "A"

BRACE WIRES - PROVIDE MINIMUM 12 1/2 GAUGE SMOOTH WIRE DOUBLED TO FORM A FOUR WIRE BRACE. ATTACH BRACE WIRES TO POSTS BY WRAPPING AROUND THE POST AT LEAST TWO TIMES AND THEN WRAPPING AROUND ITSELF FIVE TIMES.

LEVERS - 1 1/2" x 2" x 12" [37.5 x 50 x 300] MINIMUM SIZE. LEAVE IN PLACE AFTER TWISTING

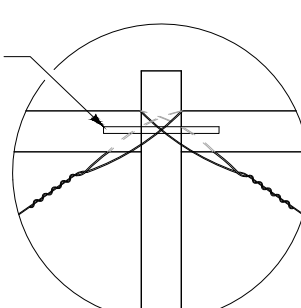


DETAIL "B"

ALTERNATE PANEL BRACING

POSTS ARE NOT NOTCHED. PILOT HOLE DIAMETER IS 5/16" [7.9].

FURNISH AND INSTALL BRACE WIRES AND LEVERS IN ACCORDANCE WITH NOTES ON DETAIL "A".

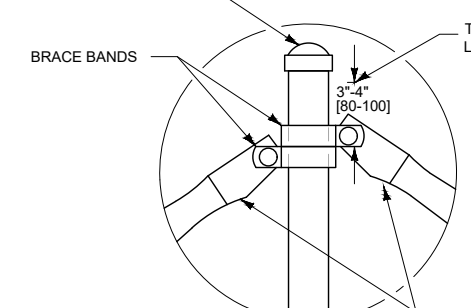


DETAIL "C"

STEEL POST DOUBLE PANEL BRACING

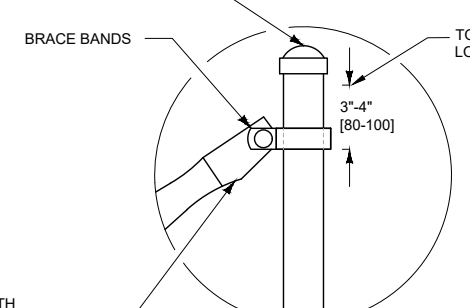
INSTALL A 20" x 3/8" [500 x 9.5] ROD IN THE MIDDLE POST PRIOR TO SETTING THE BRACES. PIN THE BRACES IN PLACE FROM THE OUTSIDE.

CAP OR PLUG AS APPROVED BY PROJECT MANAGER



FLATTEN APPROXIMATELY 1 1/2" OF BOTH ENDS OF THE BRACE RAILS AND DRILL/PUNCH A HOLE IN THE FLATTENED PART FOR THE 3/8" BOLT

CAP OR PLUG AS APPROVED BY PROJECT MANAGER



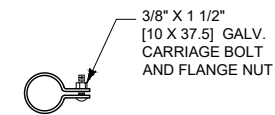
DETAIL "D"

STEEL POST SINGLE PANEL BRACING

NOTES:

- ① SEE THE SPECIFICATIONS FOR POST AND WIRE REQUIREMENTS.
- ② LINE POST SPACING IS 16'-6" [5000] CENTER TO CENTER. LINE POST SPACING FROM BRACE OR PANEL POST IS 16'-6" [5000] CENTER TO CENTER.
- ③ SEE DTL. DWG. NO. 607-00, 607-10 AND 607-15 FOR ADDITIONAL FENCING DETAILS.

- ④ 2 1/2" [65] DIA. NOMINAL STEEL PIPE-SCHEDULE 40 OR BETTER
- ⑤ 1 1/2" [40] DIA. NOMINAL STEEL PIPE-SCHEDULE 40 OR BETTER



BRACE BAND DETAIL
FOR STEEL PANELS
(SEE SUBSECTION 712.01.5.)

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 607	DWG. NO. 607-05

FENCE DETAILS



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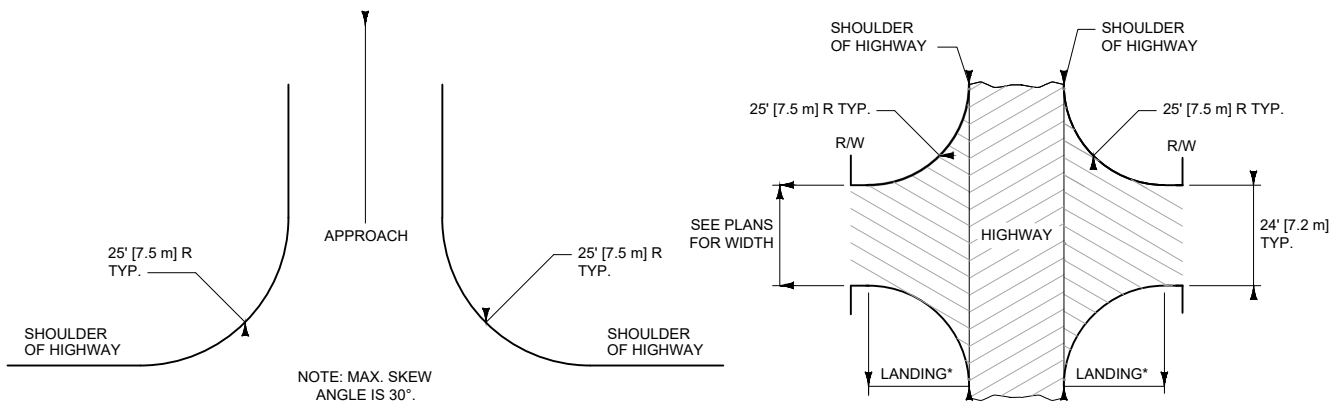
MONTANA FISH, WILDLIFE & PARKS

GENERAL NOTES AND DETAILS
BIG ARM ARCHERY PROJECT



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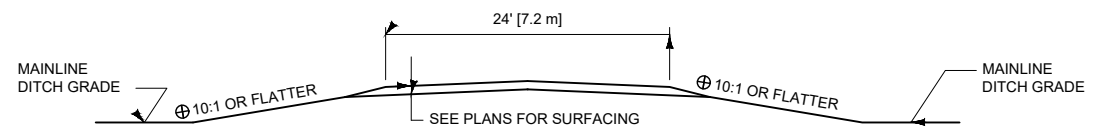
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NOTE: MAX. SKEW ANGLE IS 30°.

* 25.0' [7.5 m] MIN. FOR PRIVATE OR FIELD APP. 75.0' [25.0 m] MIN. FOR COUNTY AND MAIN ROADS.

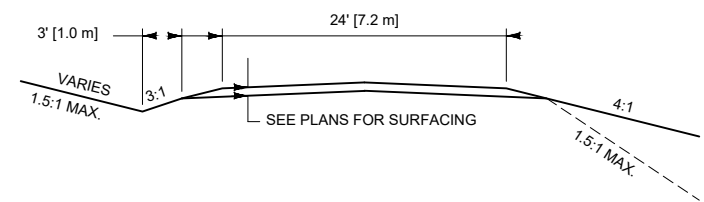
LANDING GRADE (-3% DESIRABLE, +3% ALLOWABLE).



TYPICAL SECTION WITHIN CLEAR ZONE

USE A PIPE AS NECESSARY FOR DRAINAGE. INSTALL CULVERTS OUTSIDE THE CLEAR ZONE OR PROVIDE END TREATMENT.

⊕ PROVIDE 6:1 SLOPES AT A MINIMUM.



TYPICAL SECTION BEYOND CLEAR ZONE

BACK SLOPES **	
0' - 5' [0.0 m - 1.5 m]	4:1
5' - 10' [1.5 m - 3.0 m]	2:1
OVER 10' [3.0 m]	1.5:1

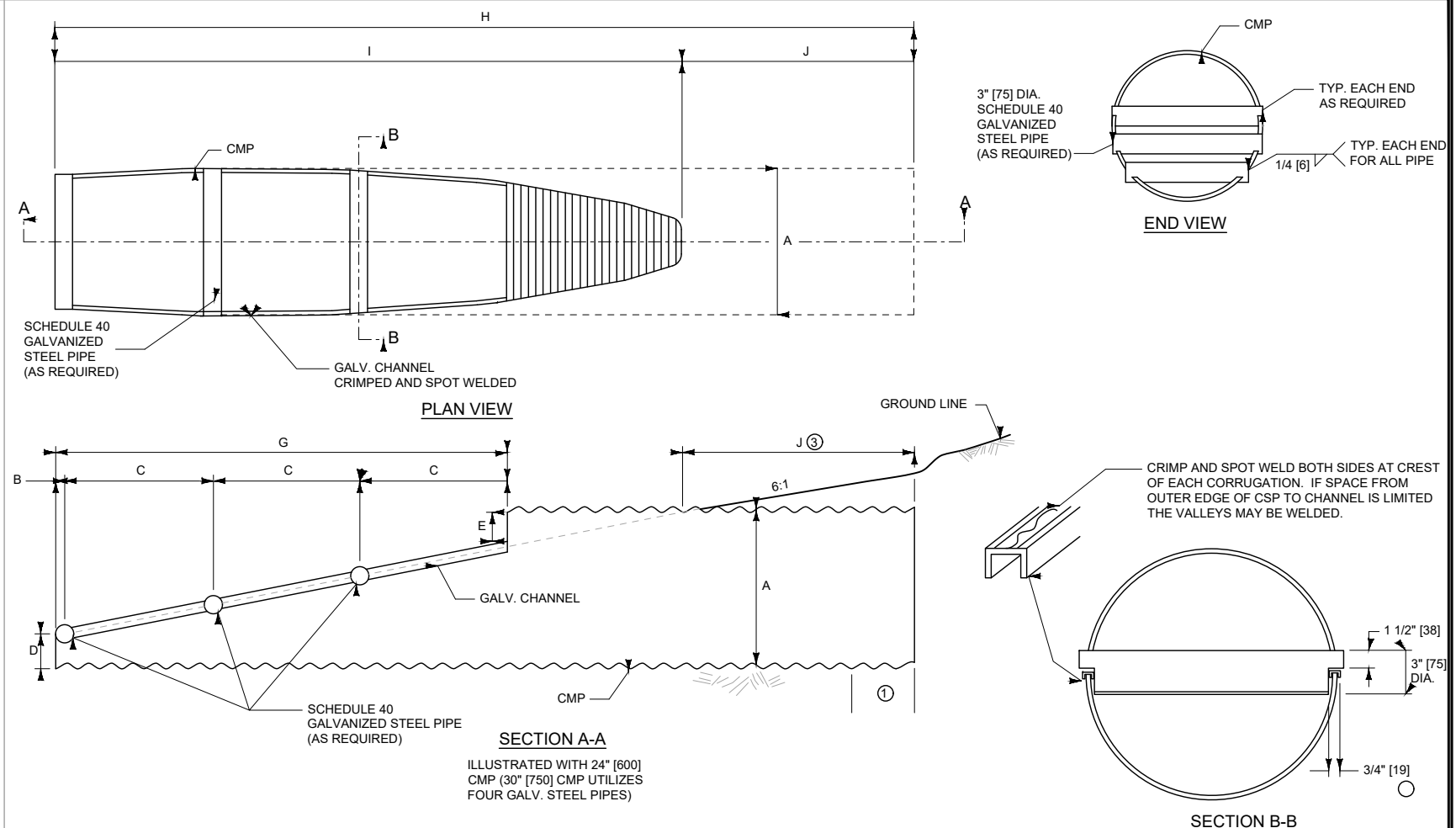
FILL SLOPES **	
0' - 10' [0.0 m - 3.0 m]	4:1
10' - 20' [3.0 m - 6.0 m]	2:1
OVER 20' [6.0 m]	1.5:1

- NOTES:
- APPROACH GRADE BEYOND LANDING IS NOT TO EXCEED 10% UNLESS TRAFFIC VOLUMES AND COST INDICATE SUCH TO BE JUSTIFIABLE.
 - CONSTRUCT APPROACHES TO FIT LOCAL CONDITIONS.
 - SECURE WRITTEN PERMISSION FROM LANDOWNER FOR WORK BEYOND THE RIGHT-OF-WAY.
- ** CRITERIA SHOWN ARE FOR PRIVATE AND FARM FIELD APPROACHES. FOR COUNTY AND MAIN ROADS USE ESTABLISHED STANDARDS FOR APPLICABLE FUNCTIONAL CLASS.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 203	DWG. NO. 203-05

APPROACHES



ROAD APPROACH CULVERT END TREATMENT										
QUANTITIES (FOR ESTIMATING ONLY)										
DIA. A CMP	H PIPE LENGTH	3/4" x 3/8" x 1/8" GALV. CHANNEL	LENGTH 3" DIA SCHEDULE 40 GALV. PIPE	DIMENSIONS (FT.)						
				B	C	D	E	G	I	J
15"	7.0'	10'	~	~	~	0.20	0.20	5.0	6.0	1.0
18"	8.0'	10'	~	~	~	0.33	0.33	5.0	7.0	1.0
24"	10.0'	12'	6.0'	0.15	1.95	0.50	0.50	6.0	9.0	1.0
30"	12.5'	16'	10.0'	0.20	1.95	0.60	0.60	8.0	11.5	1.0

METRIC QUANTITIES (FOR ESTIMATING ONLY) (ALL DIMENSIONS IN MILLIMETERS)										
DIA. A CMP	H PIPE LENGTH	19 x 10 x 3.2 GALV. CHANNEL	LENGTH 75 DIA. SCHEDULE 40 GALV. PIPE	DIMENSIONS						
				B	C	D	E	G	I	J
375	2134	3048	~	~	~	61	61	1524	1829	305
450	2438	3048	~	~	~	101	101	1524	2133	305
600	3048	3656	1800	46	594	152	152	1828	2743	305
750	3810	4874	3000	61	594	183	183	2437	3505	305

- NOTES:
- PIPE TO HAVE ANNULAR CORRUGATION OR REROLLED ENDS. USE ONLY APPROVED COUPLING BAND PER SECTION 709 FOR CMP. FOR RCP END TREATMENT, SEE DTL. DWG. NO. 603-26 FOR CONNECTION.
 - THE TWO 3/4" [19] CHANNELS MAY BE ELIMINATED FROM THE CULVERT END TREATMENT IF:
 - THE CULVERT IS FABRICATED WITH 12 GAUGE (0.109" [2.8] THICK) MATERIAL.
 - HALF CIRCLE NOTCHES ARE CUT IN THE CULVERT FOR THE STEEL PIPE WITH CONTINUOUS WELD OF THE PERIPHERY IN CONTACT PROVIDED.
 - ALL WELDS AND OTHER NON-GALVANIZED PARTS ARE PAINTED PER SECTION 710.
- CONNECTIONS MADE PER DTL. DWG. NO. 603-26 REQUIRE PIPE LENGTHS H AND J TO BE INCREASED BY 3" [76].

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 603,709,710	DWG. NO. 603-14

CMP ROAD APPROACH CULVERT END TREATMENT (RACET)



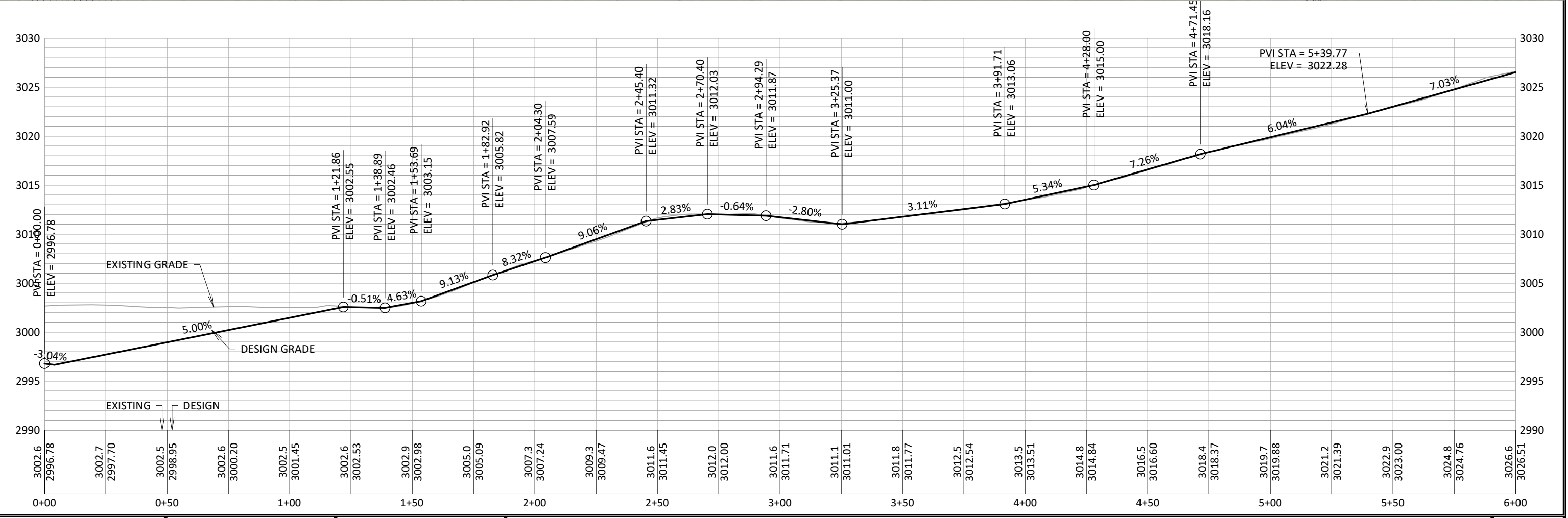
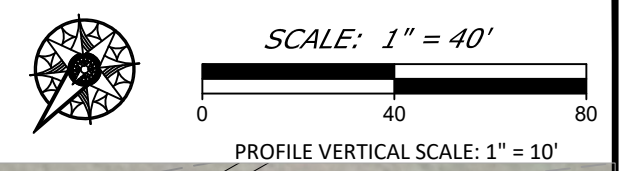
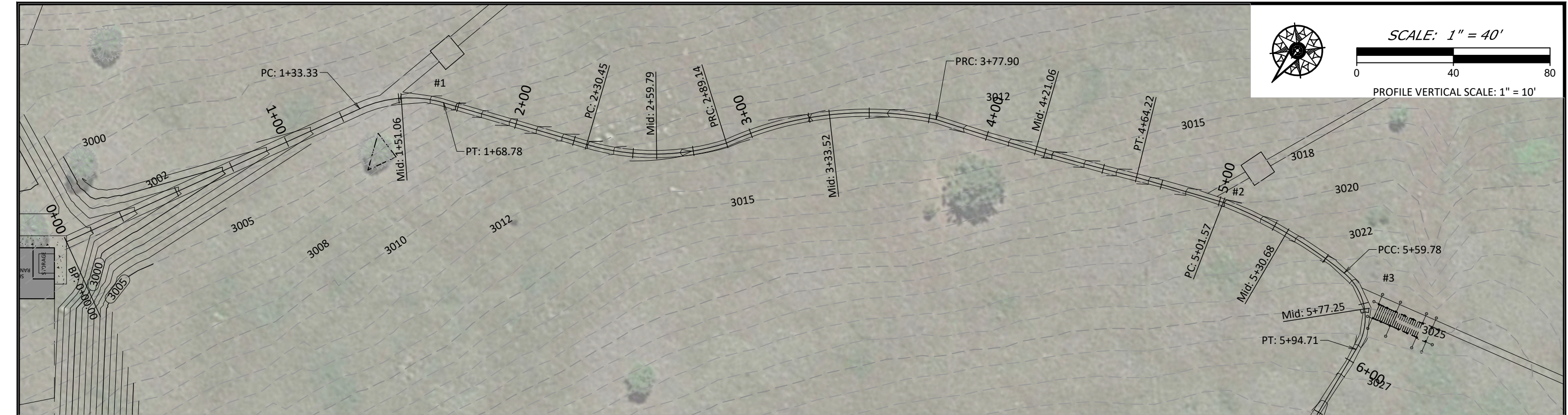
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GENERAL NOTES AND DETAILS
BIG ARM ARCHERY PROJECT



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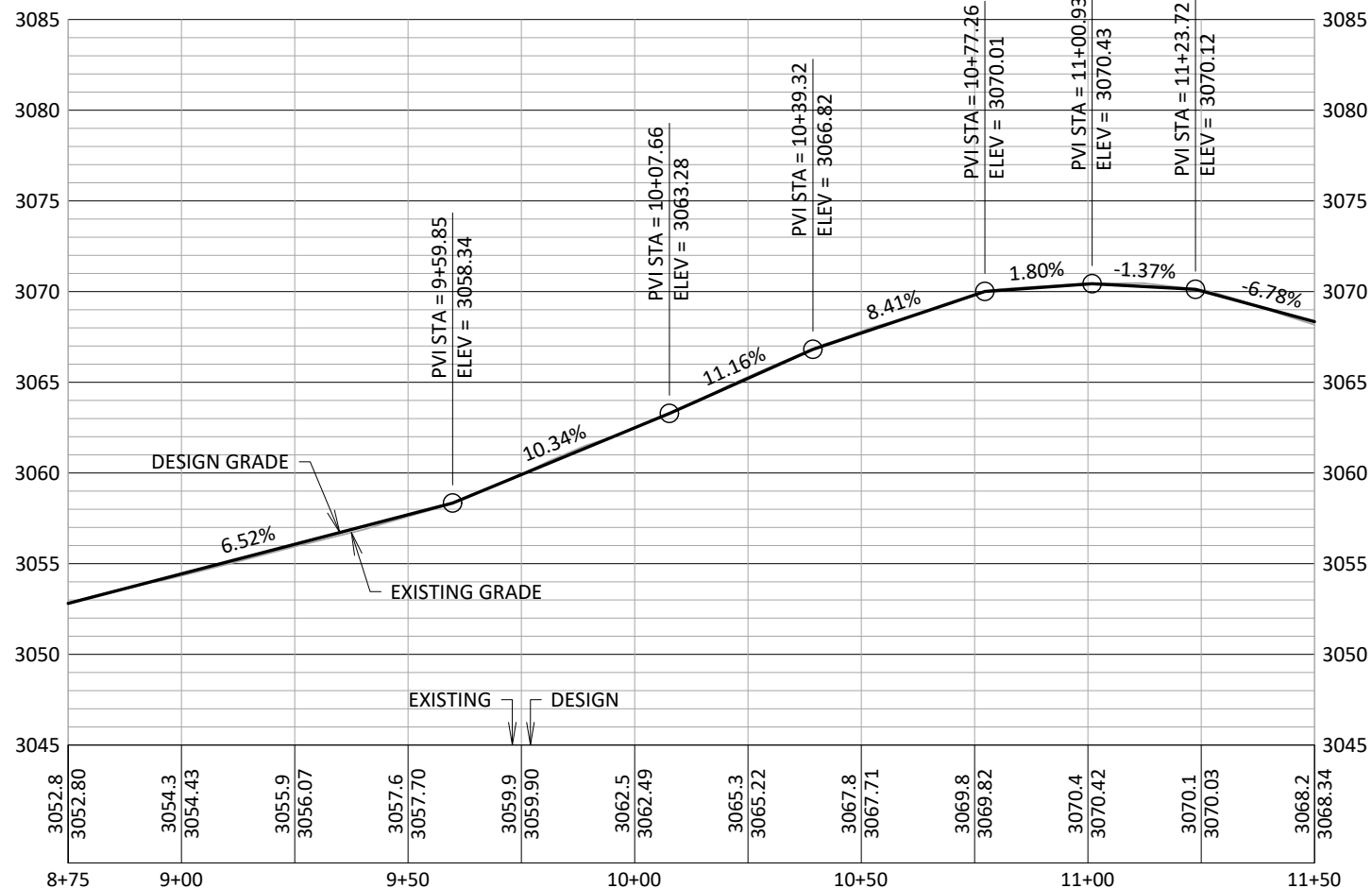
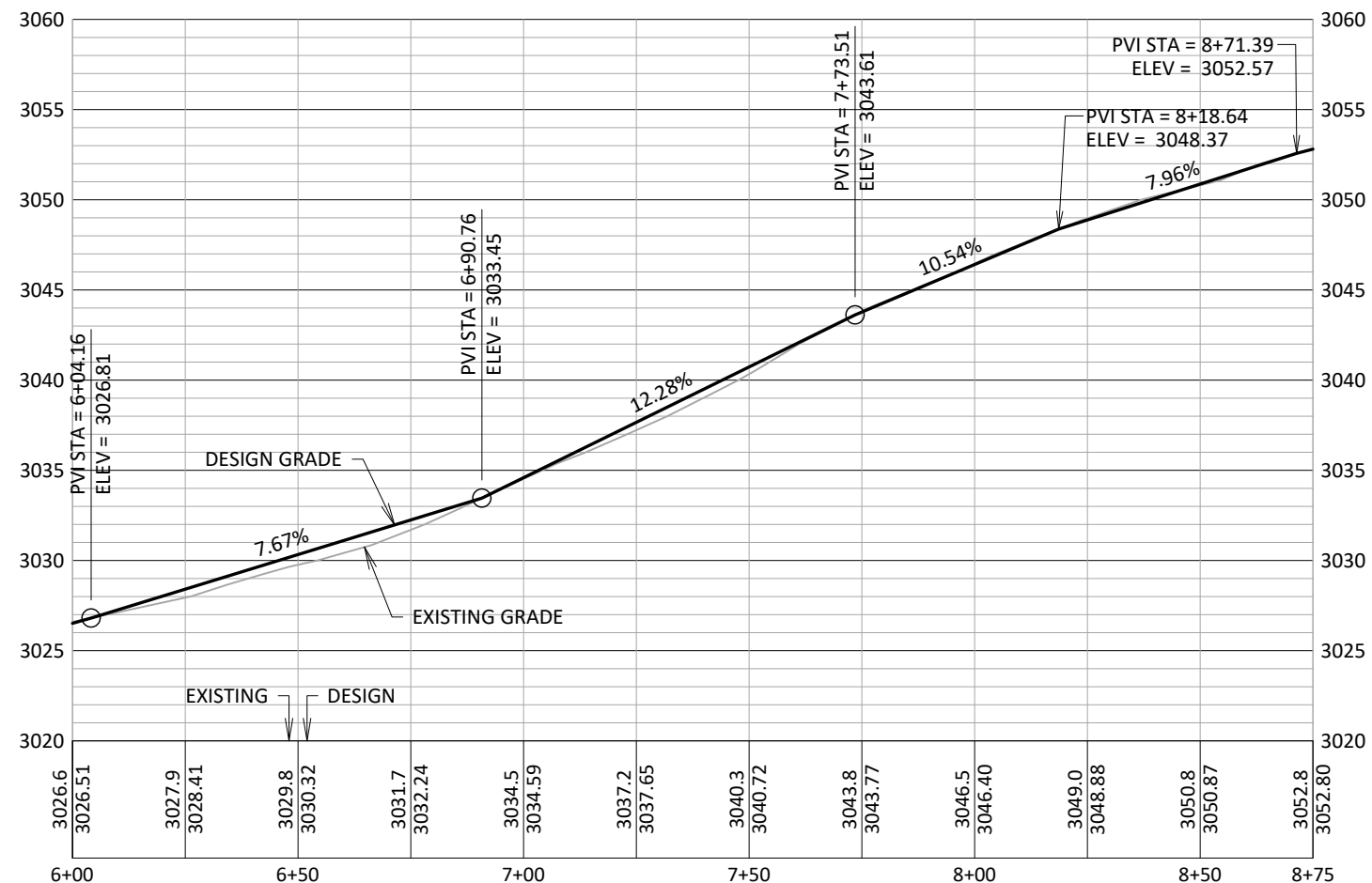
**MONTANA FISH,
WILDLIFE & PARKS**

PATH PLAN AND PROFILE

BIG ARM ARCHERY PROJECT



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**MONTANA FISH,
WILDLIFE & PARKS**

PATH PLAN AND PROFILE

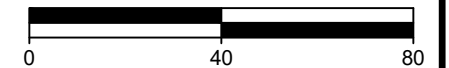
BIG ARM ARCHERY PROJECT



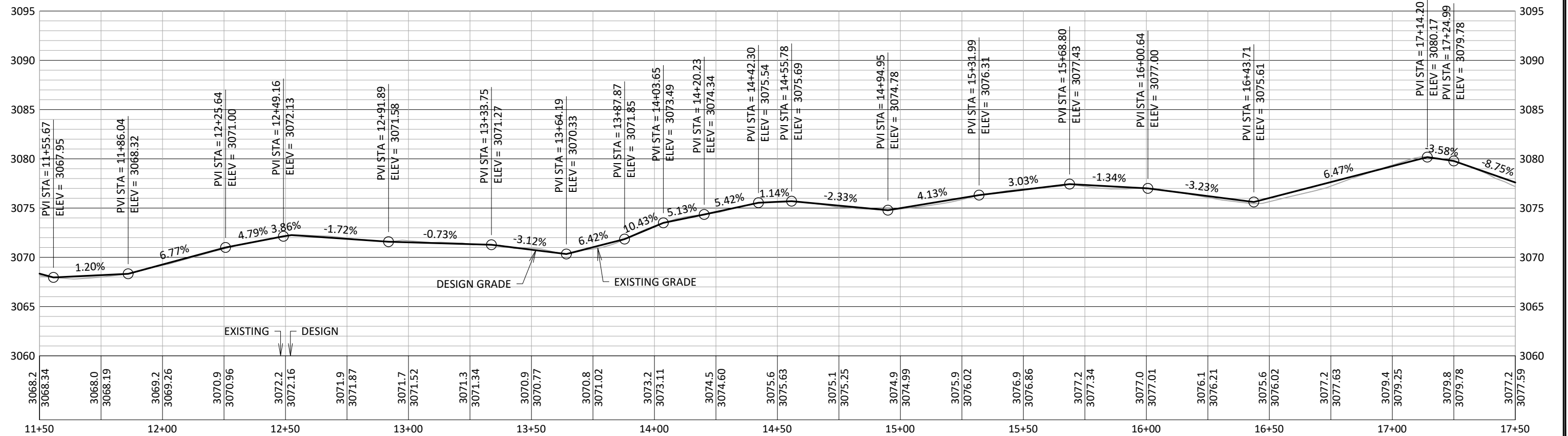
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SCALE: 1" = 40'



PROFILE VERTICAL SCALE: 1" = 10'



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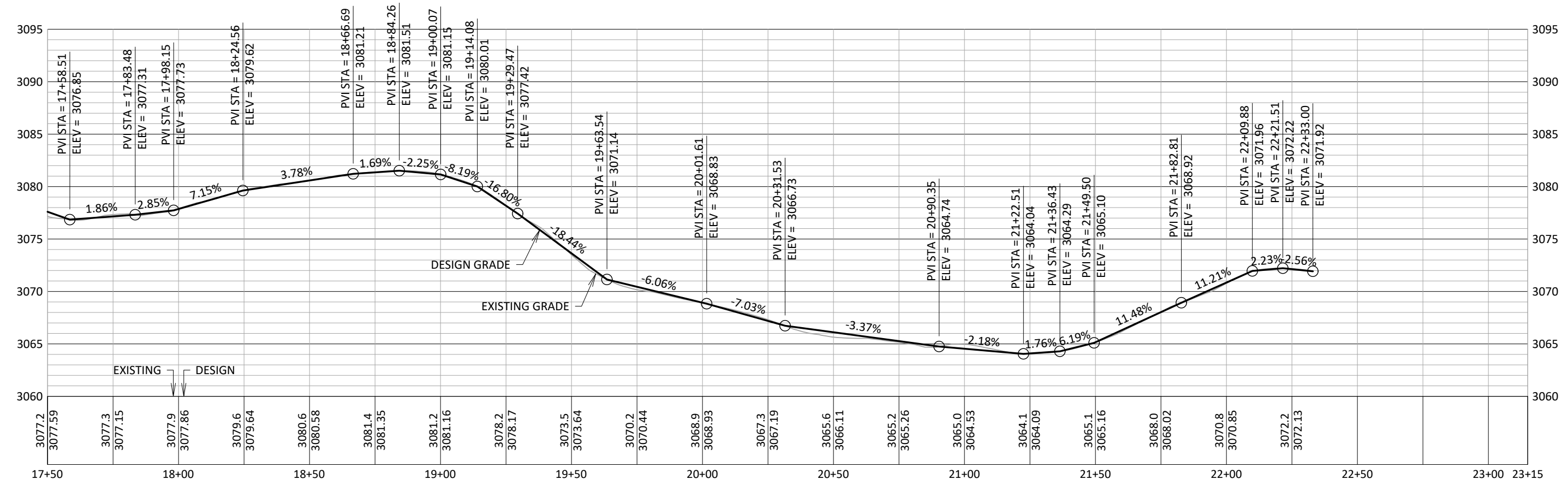
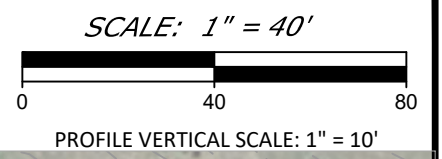
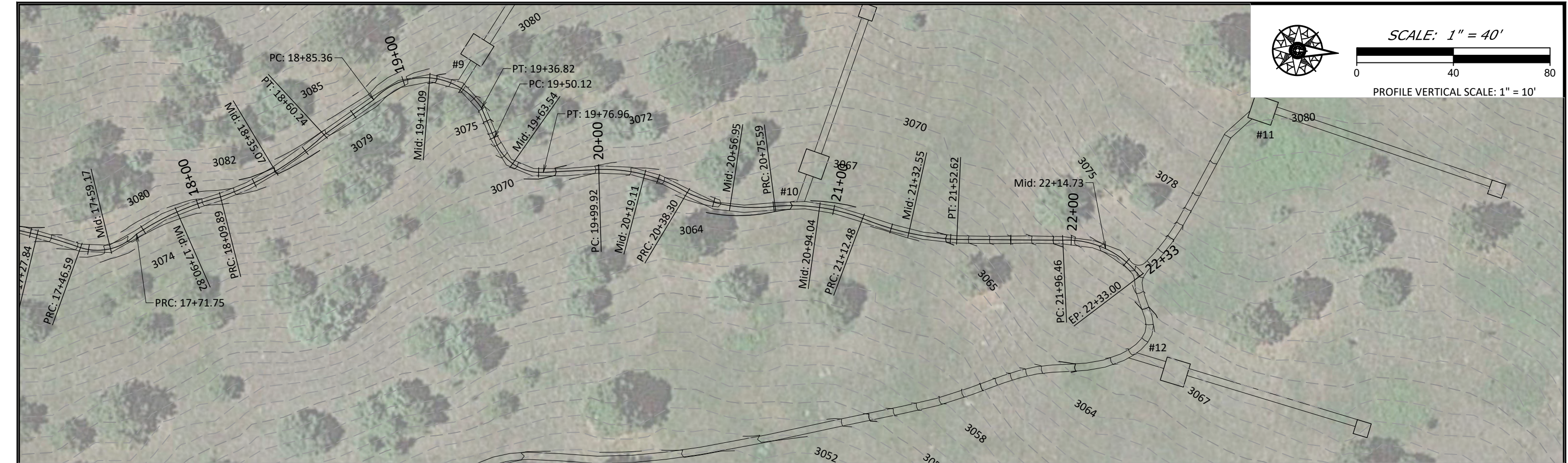


**MONTANA FISH,
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PATH PLAN AND PROFILE BIG ARM ARCHERY PROJECT



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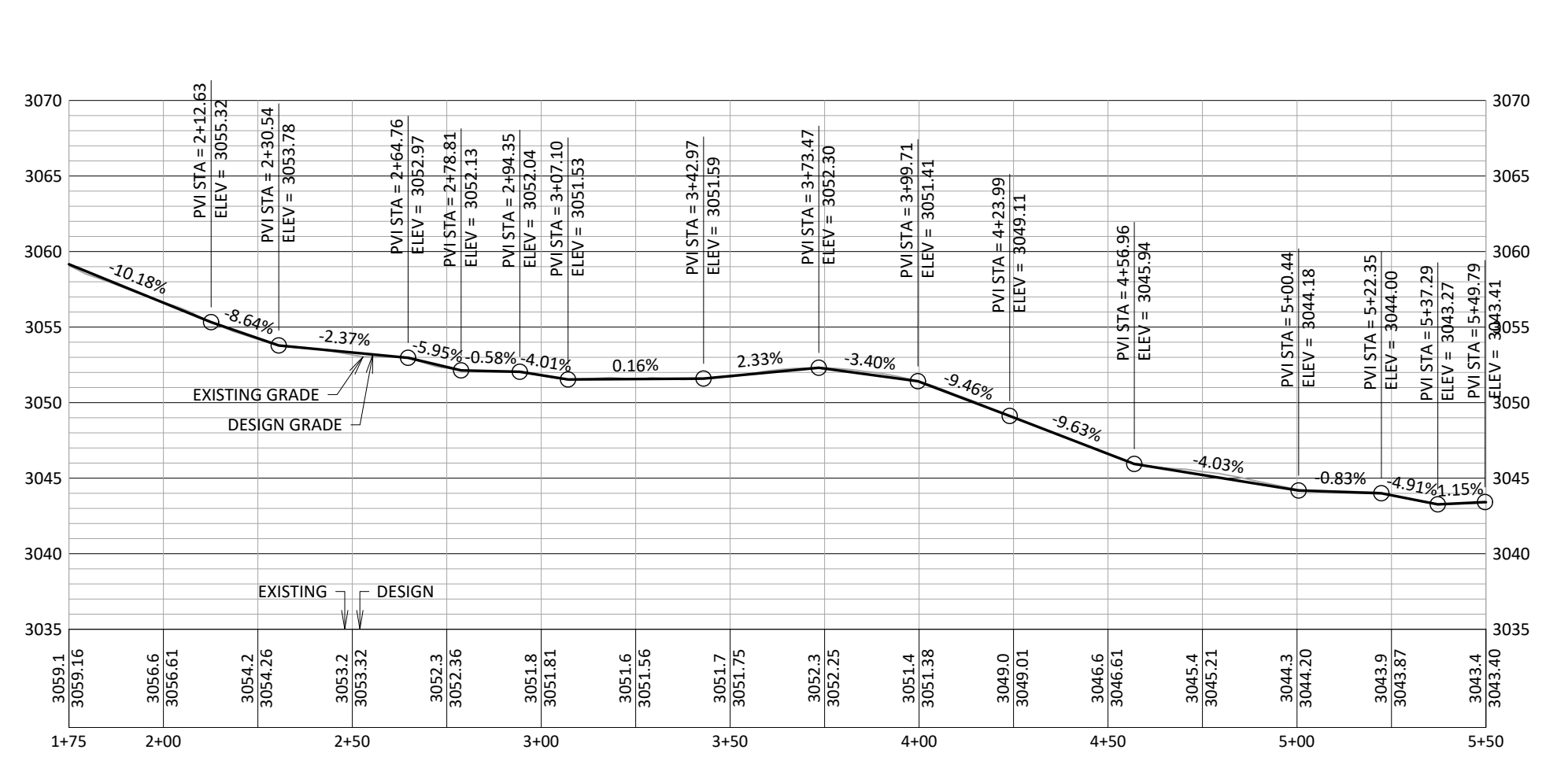
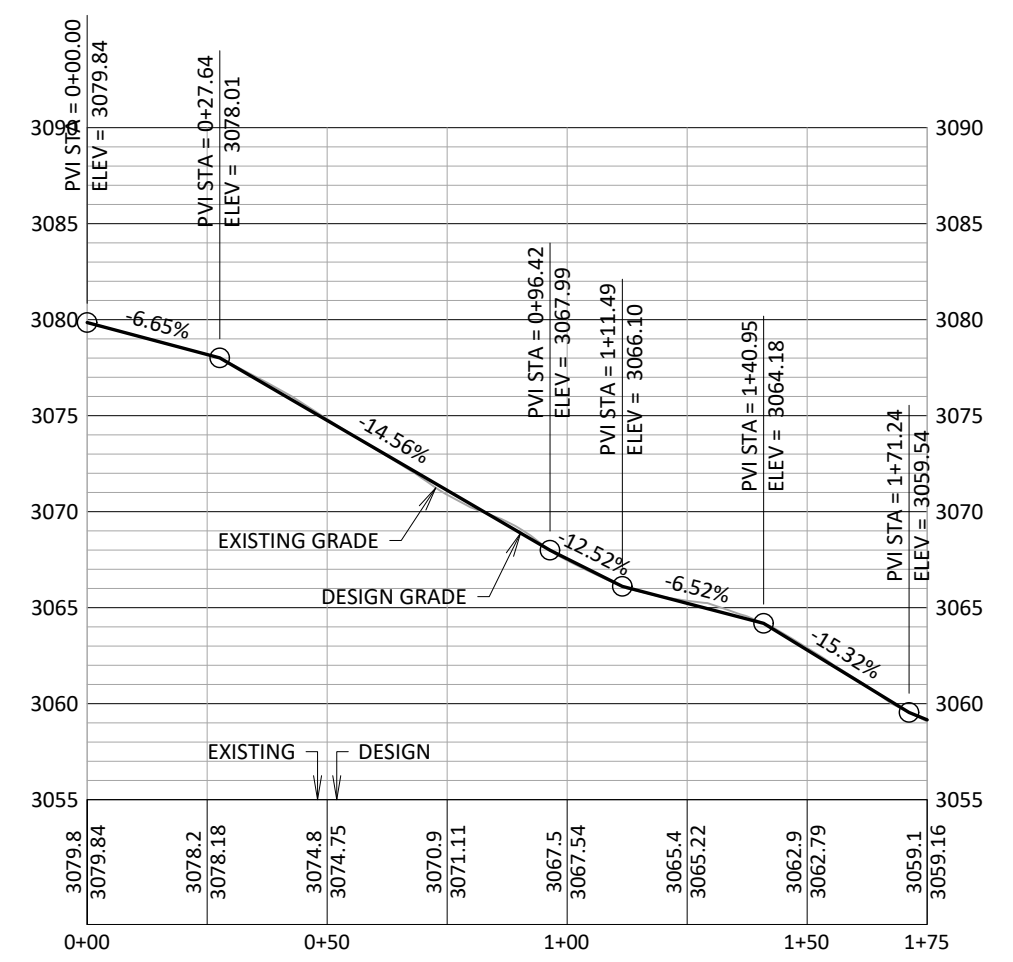
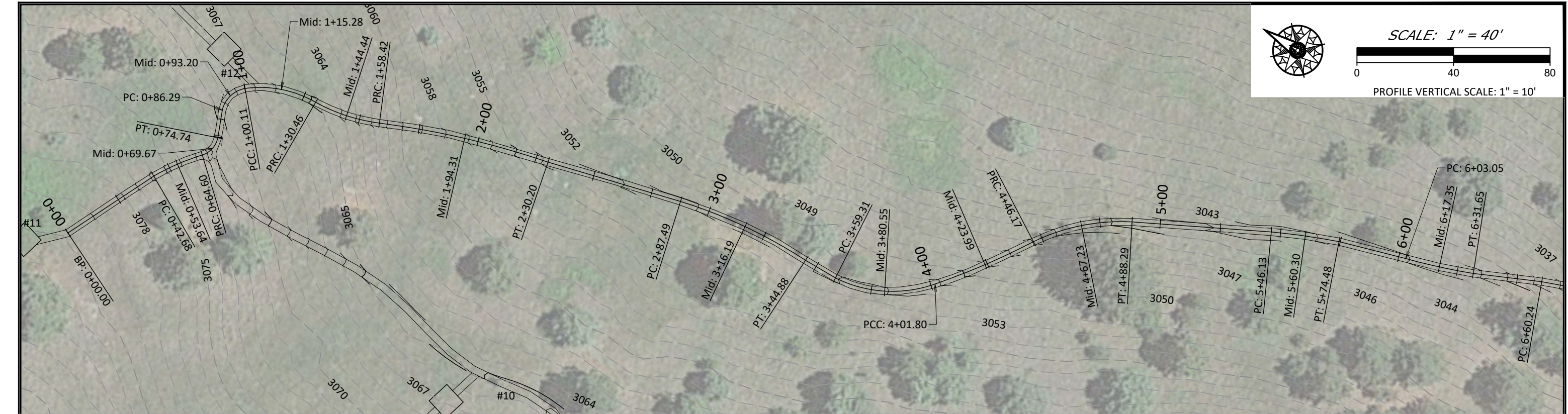
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PATH PLAN AND PROFILE

BIG ARM ARCHERY PROJECT



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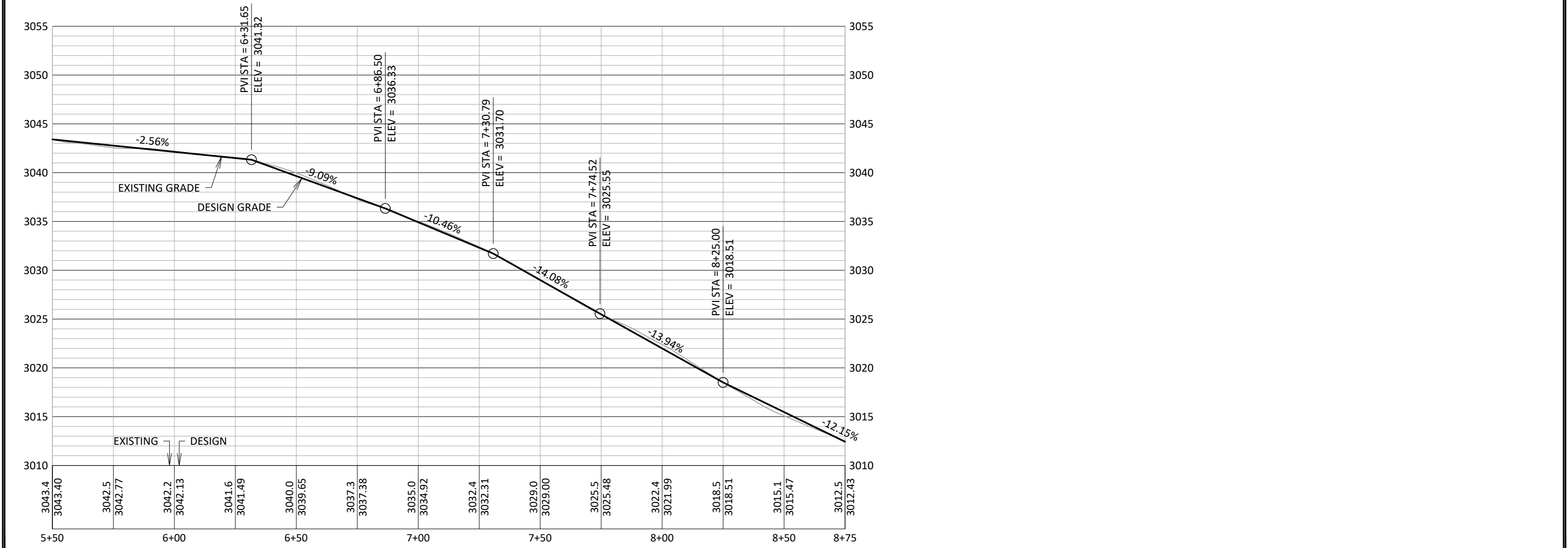
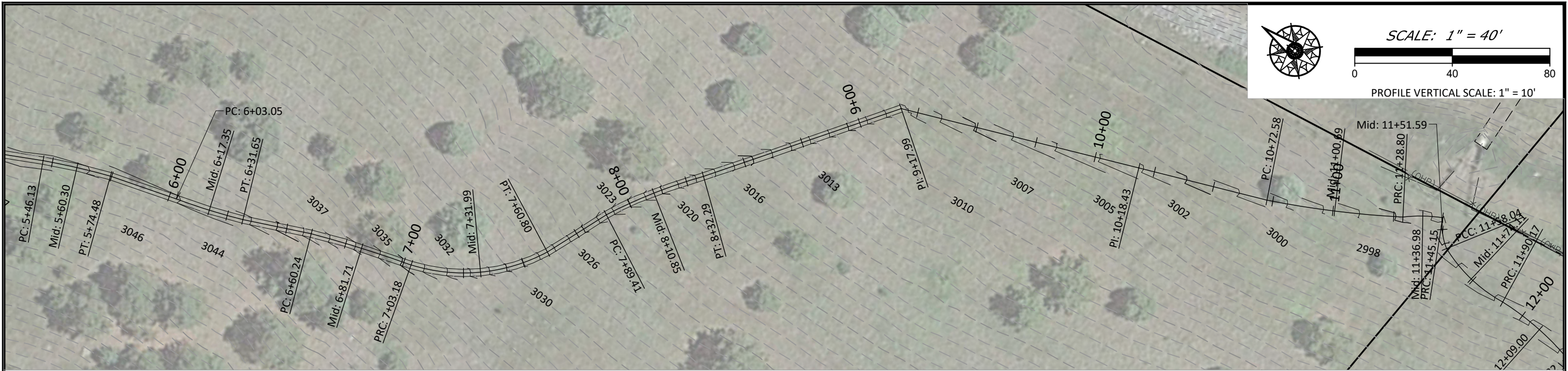
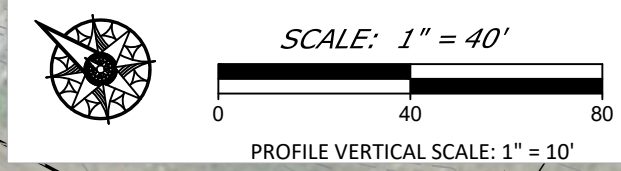
**MONTANA FISH,
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PATH PLAN AND PROFILE

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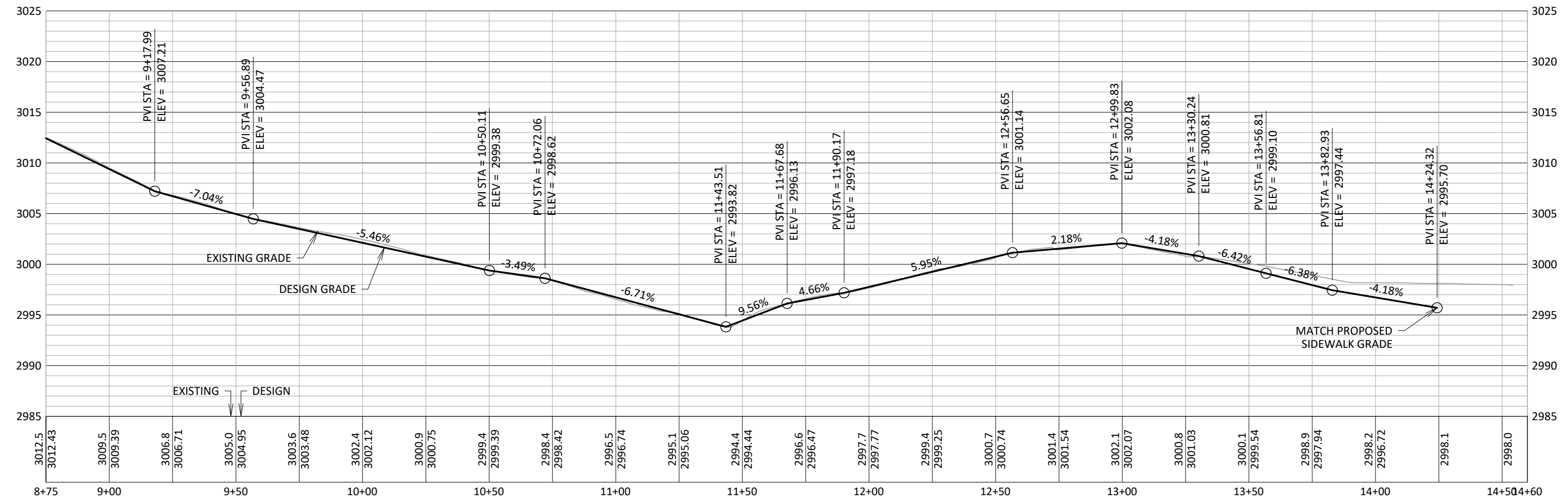
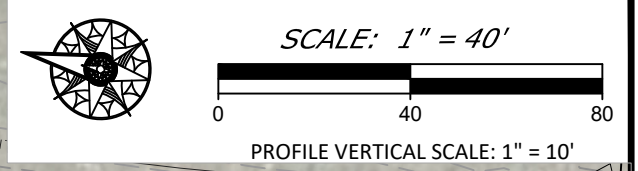
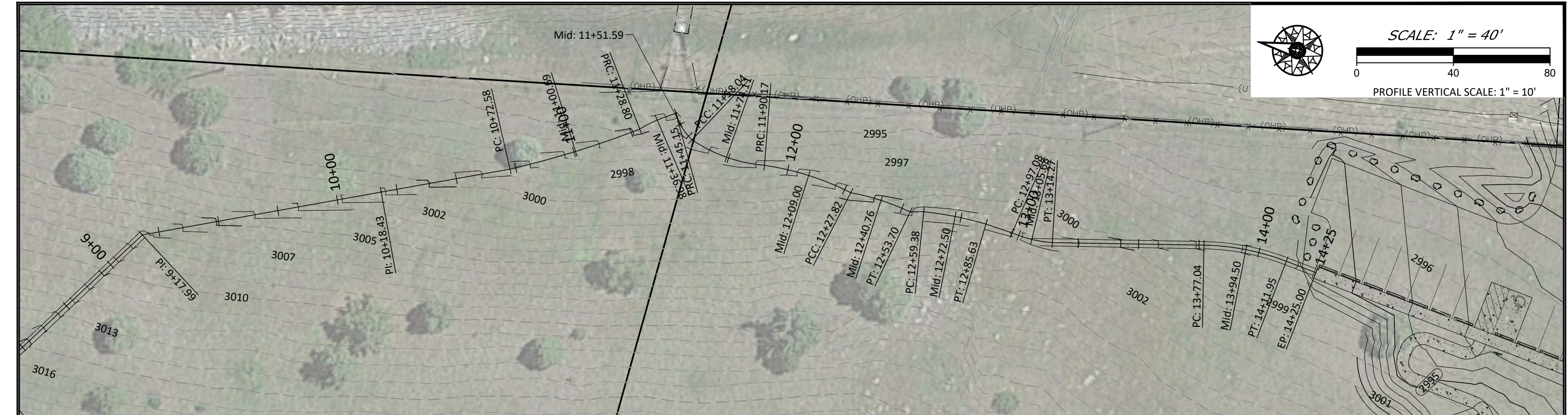
**MONTANA FISH,
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PATH PLAN AND PROFILE

BIG ARM ARCHERY PROJECT



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**MONTANA FISH,
WILDLIFE & PARKS**

PATH PLAN AND PROFILE

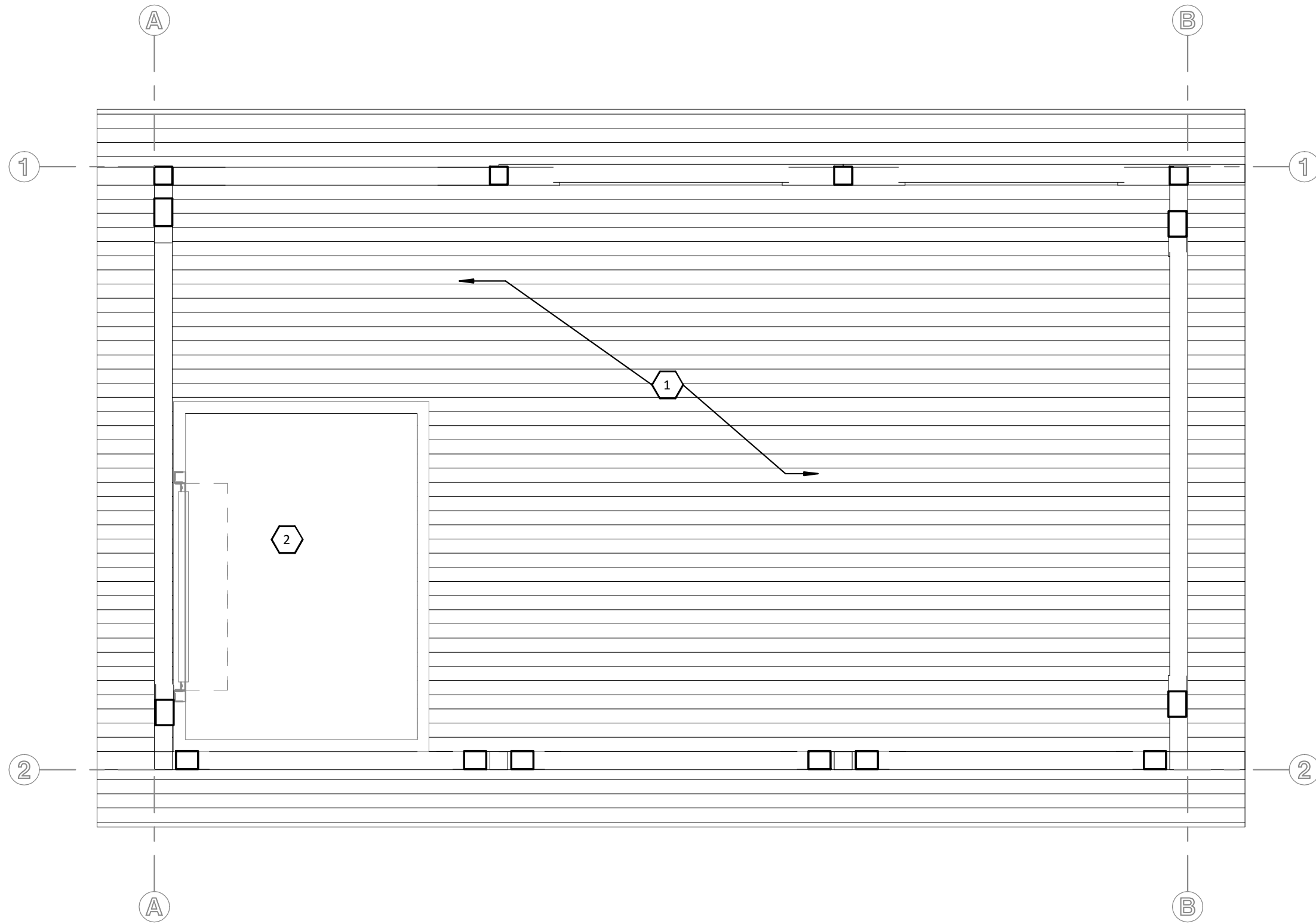
BIG ARM ARCHERY PROJECT



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RCP KEYNOTES

- 1 HARDI PLANK CEDARMILL SOFFIT IN TIMBERLINE BROWN, OR SIMILAR.
- 2 EXPOSED TO SHEATHING ATTACHED TO BOTTOM SIDE OF DROP CEILING



Scale: 1/4" = 1'-0"



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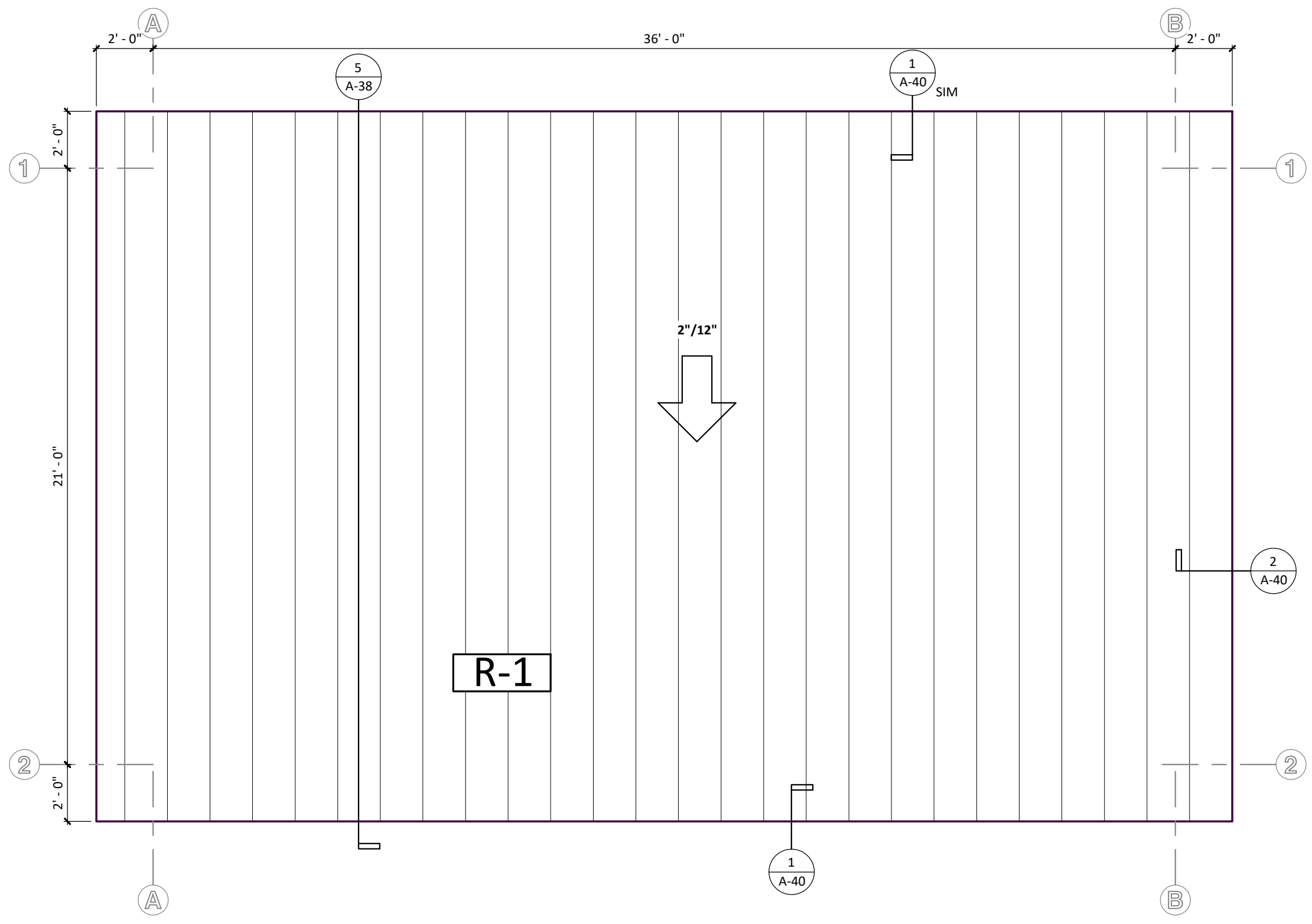
**MONTANA FISH,
 WILDLIFE & PARKS**

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**REFLECTED CEILING PLAN
 BIG ARM ARCHERY PROJECT**



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ROOF TYPE LEGEND

R-1

- 26 GA. GLACIER STEEL DESERT BROWN 3 FOOT R-PANEL OR SIMILAR
- HYDRASHELL25 OR SIMILAR UNDERLAYMENT
- SHEATHING PER STRUC.
- WOOD JOISTS PER STRUC.

Scale: 1/4" = 1'-0"



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**MONTANA FISH,
 WILDLIFE & PARKS**

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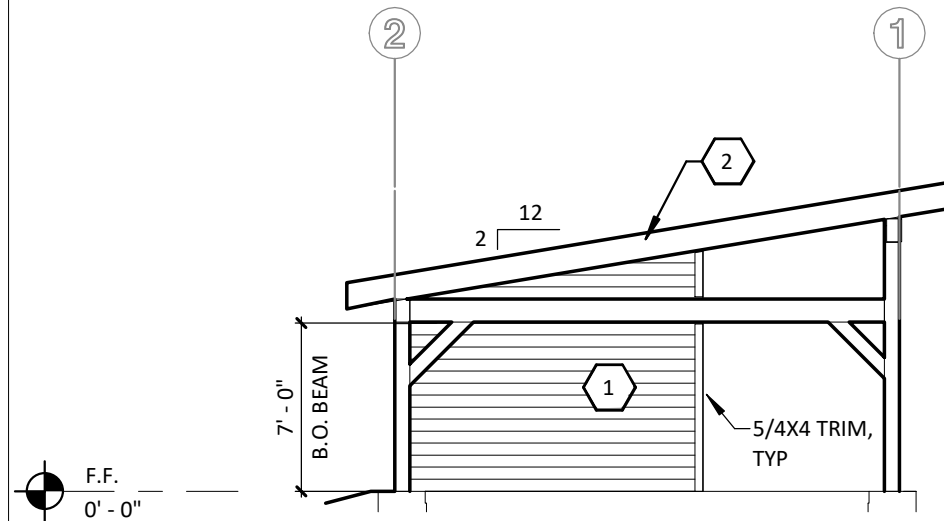
ROOF PLAN
BIG ARM ARCHERY PROJECT



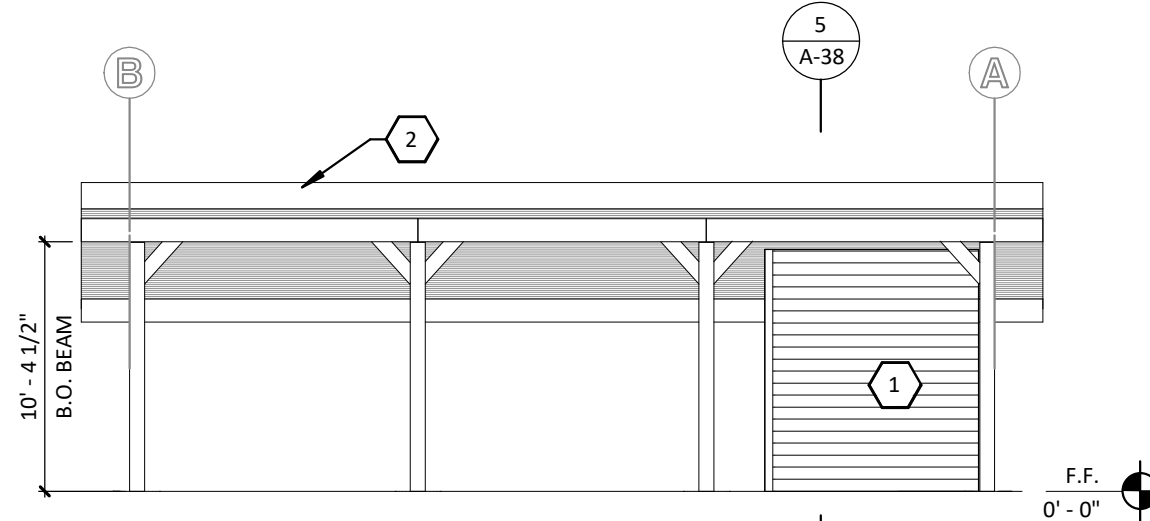
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ELEVATION KEYNOTES

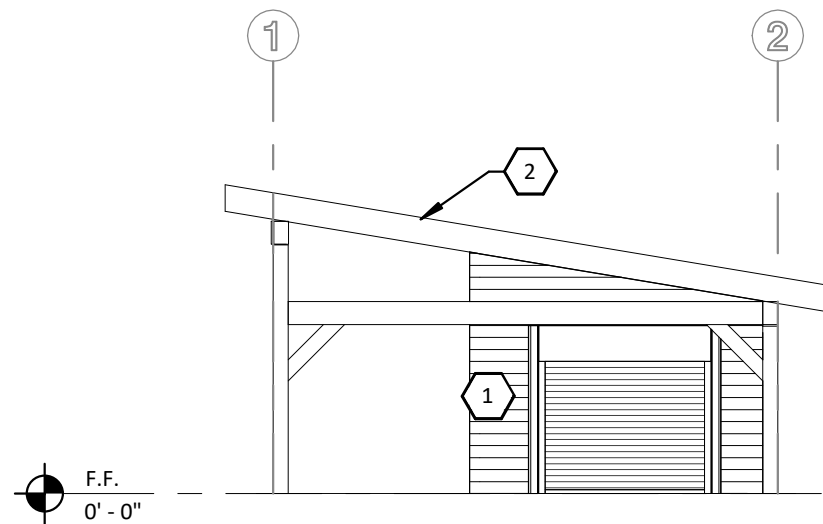
- 1 HARDI PLANK CEDARMILL SIDING, TIMBER BARK COLOR OR SIMILAR
- 2 FASCIA PER METAL ROOF MANUF



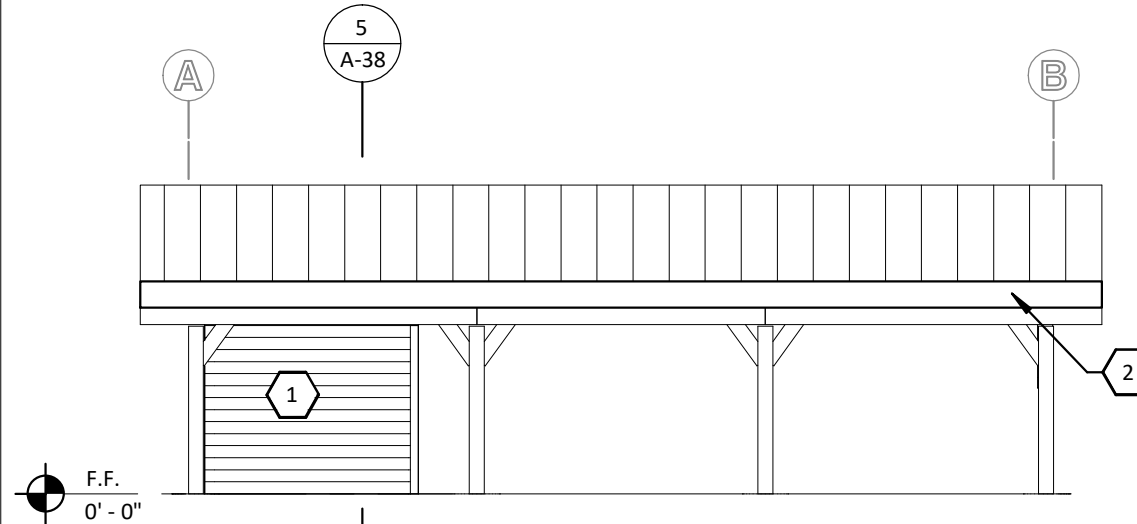
1 EAST ELEVATION
1/8" = 1'-0"



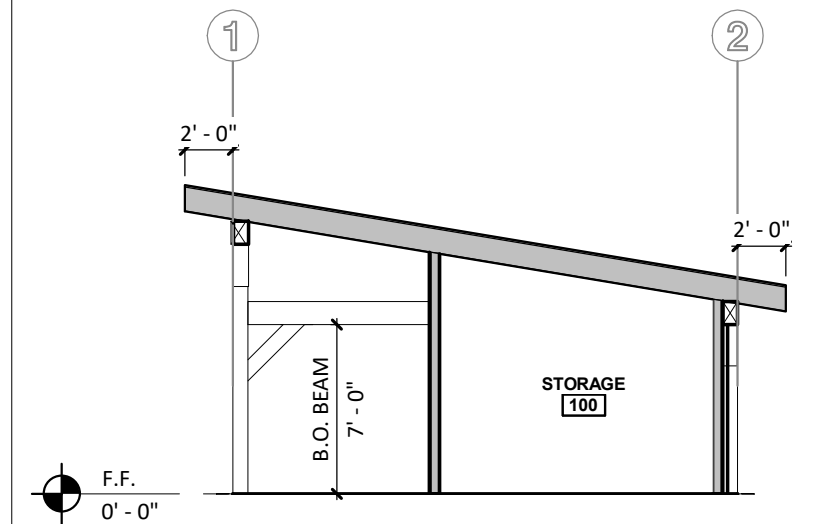
3 NORTH ELEVATION
1/8" = 1'-0"



2 WEST ELEVATION
1/8" = 1'-0"



4 SOUTH ELEVATION
1/8" = 1'-0"



5 BUILDING SECTION
1/8" = 1'-0"

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**MONTANA FISH,
WILDLIFE & PARKS**

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**EXTERIOR ELEVATIONS
BIG ARM ARCHERY PROJECT**

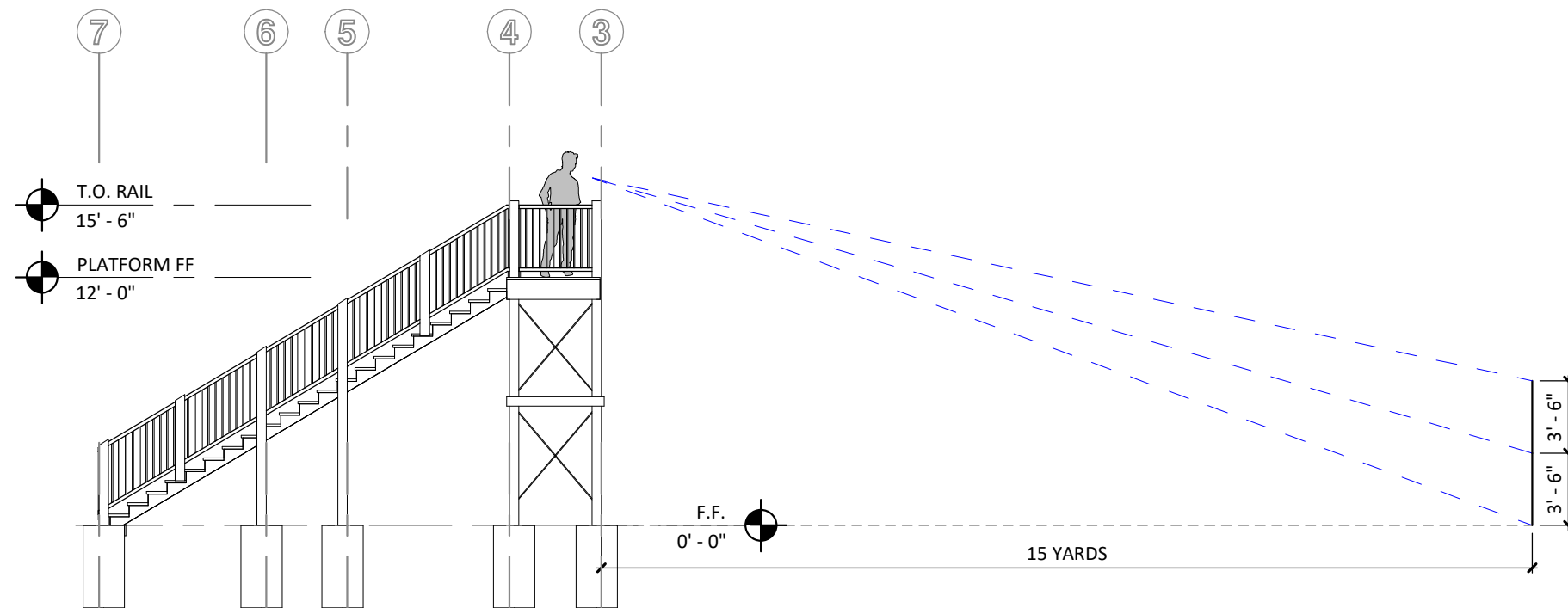


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MONTANA FWP



2 STAIRS 3D

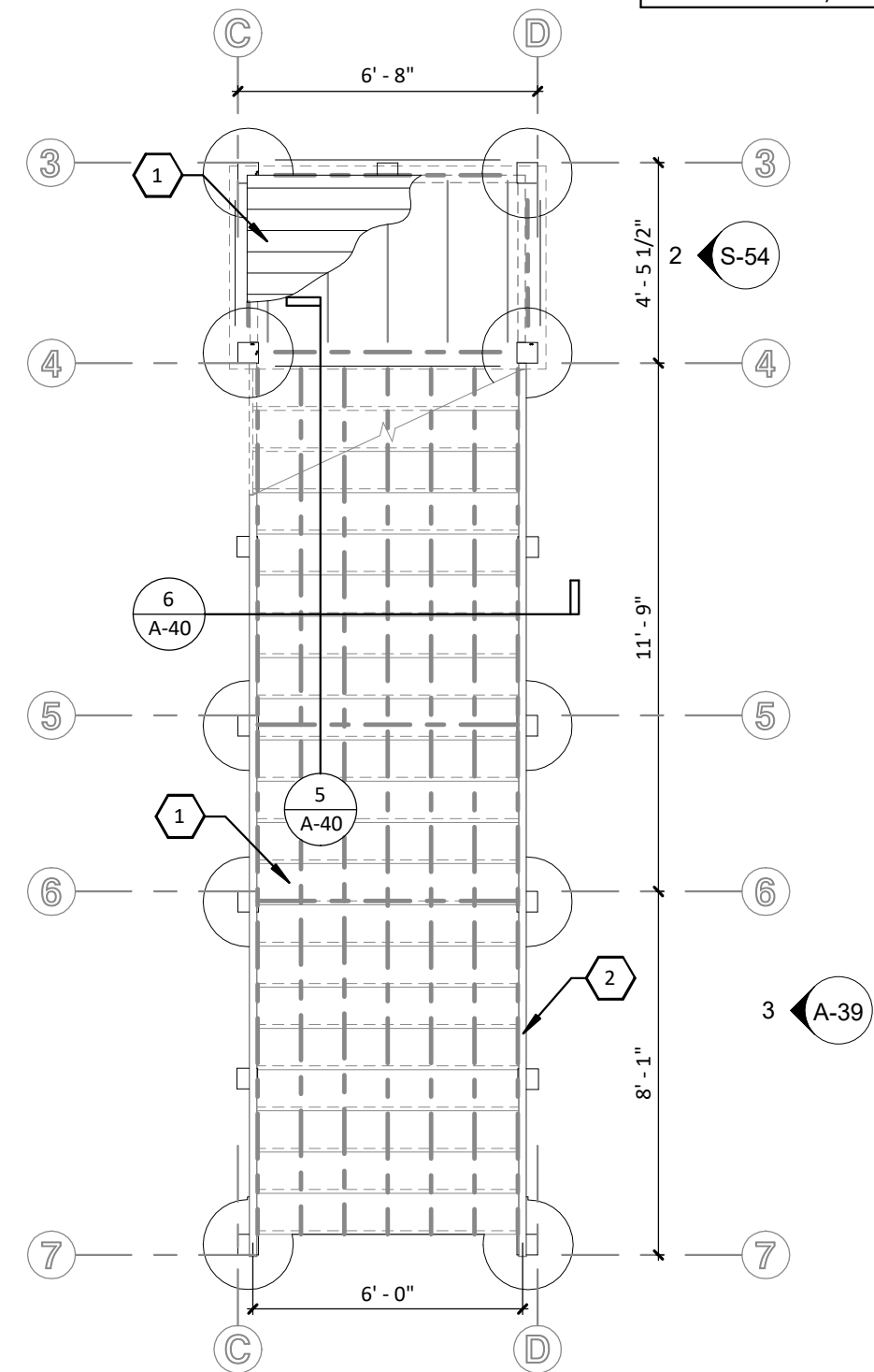


3 STAIR ELEVATION
1/8" = 1'-0"

NOTE: SEE STRUCTURAL FOR CONTINUATION OF INFORMATION

STAIR PLAN KEYNOTES

- 1 TREX ENHANCE DECKING IN ROCKY HARBOR , OR SIMILAR
- 2 STRINGER / BEAM PER STRUCTURAL



1 LEVEL 1 PLAN STAIRS
1/4" = 1'-0"

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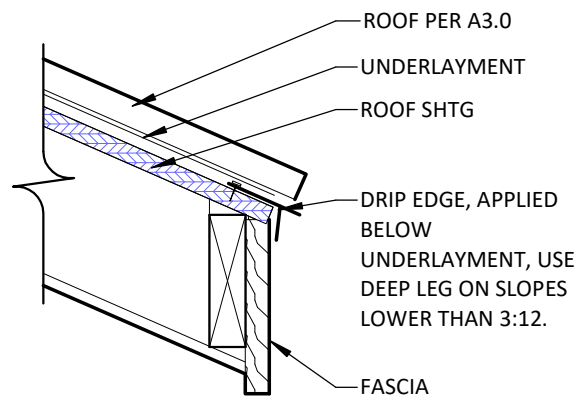


**MONTANA FISH,
WILDLIFE & PARKS**

ARCHERY PLATFORM PLAN & ELEV
BIG ARM ARCHERY PROJECT

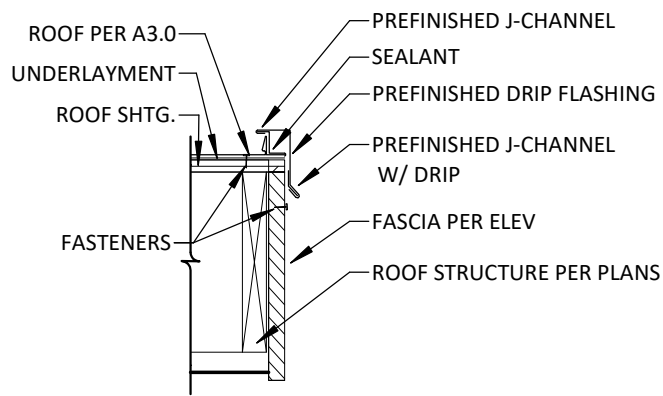


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1 DRIP EDGE

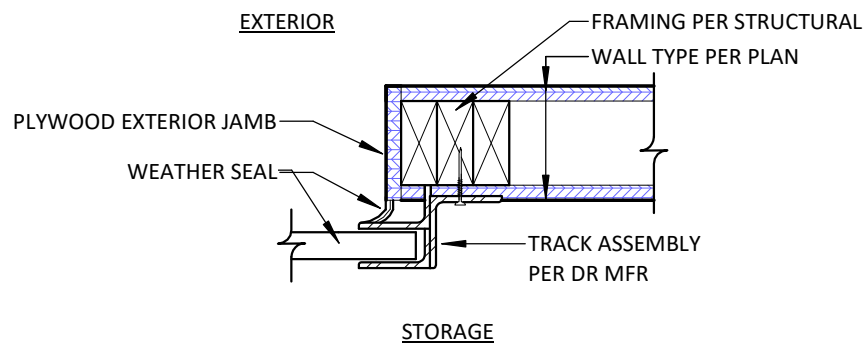
1 1/2" = 1'-0"



AT EAVE ALONG RAKE

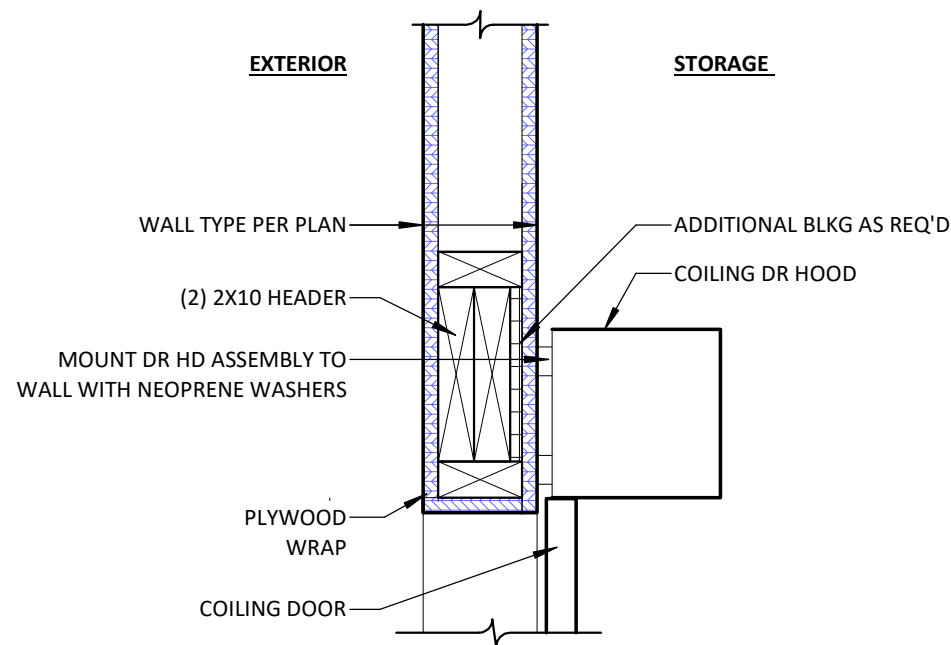
2 FASCIA AT RAKE

1" = 1'-0"



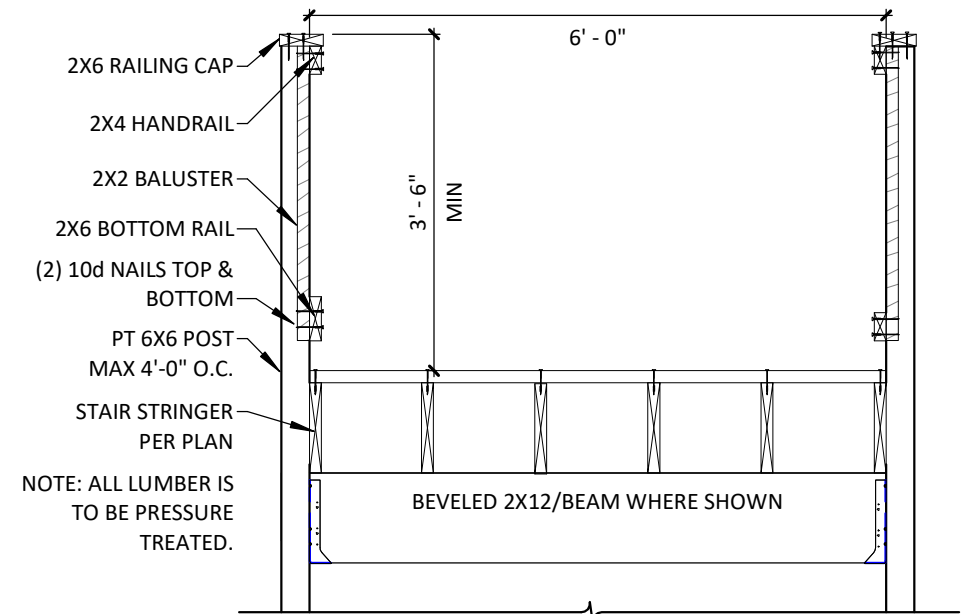
3 OH COILING DR JAMB-INT

1 1/2" = 1'-0"



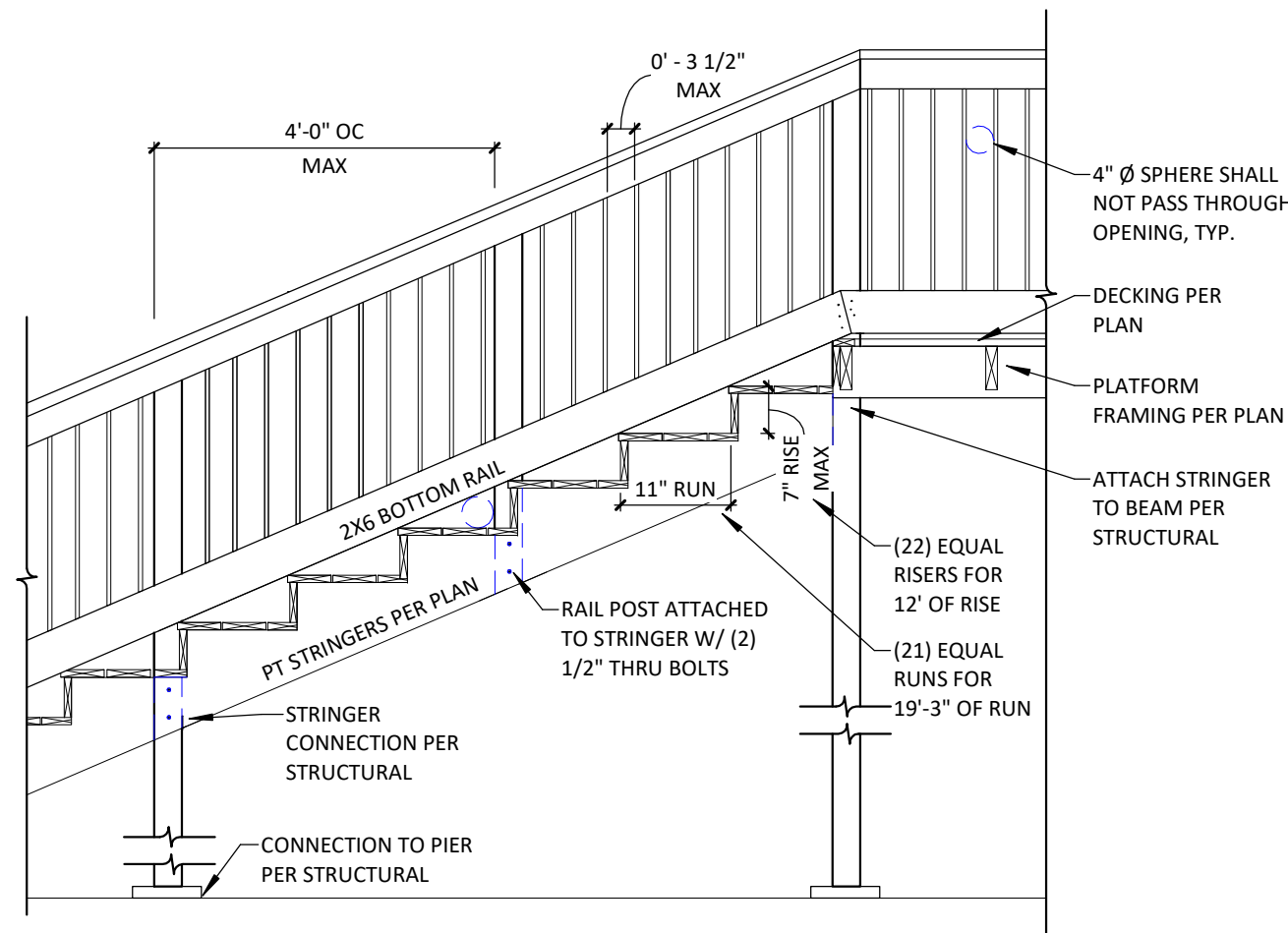
4 OH COILING DR HD DTL

1 1/2" = 1'-0"



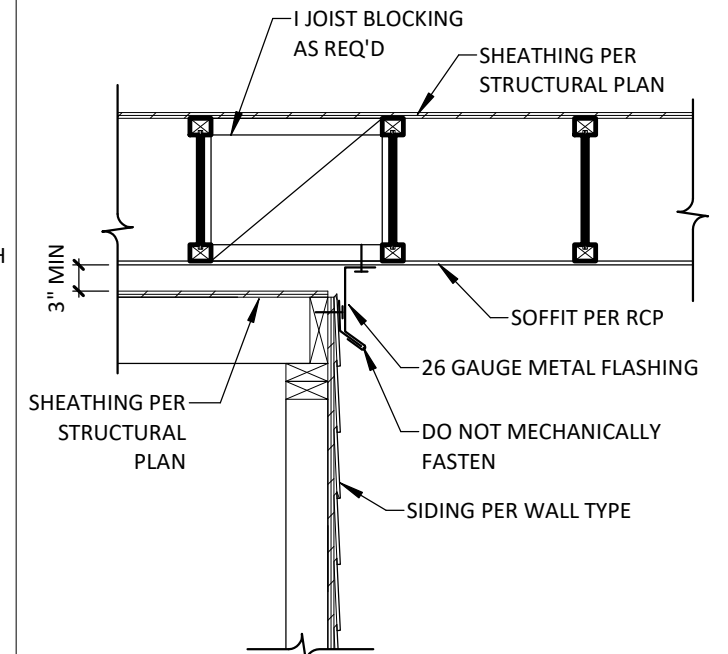
6 TYPICAL STAIR CROSS-SECTION

1/2" = 1'-0"



5 STAIR SECTION

1/2" = 1'-0"



7 ROOF SLIP JOINT

3/4" = 1'-0"

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**MONTANA FISH,
WILDLIFE & PARKS**

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ARCHITECTURAL DETAILS
BIG ARM ARCHERY PROJECT



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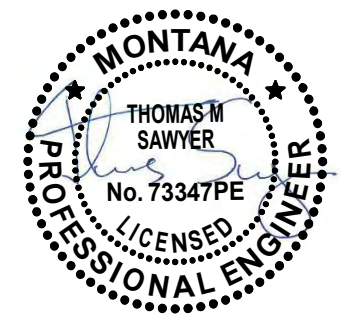
STRUCTURAL DESIGN

- A. GOVERNING CODES AND GENERAL NOTES
 INTERNATIONAL BUILDING CODE (IBC) 2021
 AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)- MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES- ASCE 7-16 W/ SUPPLEMENT 1
 AMERICAN CONCRETE INSTITUTE (ACI) - BUILDING CODE & COMMENTARY ACI 318-19
 THE MASONRY SOCIETY (TMS) - BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES TMS 402-16
 AMERICAN INSTITUTE STEEL OF CONSTRUCTION (AISC) - STEEL CONSTRUCTION MANUAL FOURTEENTH EDITION AISC 360-16
 AMERICAN FOREST & PAPER ASSOCIATION (AF&PA) - NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION NDS 2018
 AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC) 9TH EDITION
 THE CONTRACTOR IS RESPONSIBLE FOR LOCATING OR HAVING LOCATED THE BUILDING ON THE SITE AND VERIFYING ALL FOUNDATION DIMENSIONS, AND SETBACK REQUIREMENTS FROM EASEMENTS AND PROPERTY LINES WITH THE ARCHITECT PRIOR TO CONSTRUCTION.
- B. DESIGN LOADS:

1. ROOF DEAD LOAD	10 PSF
2. FLOOR LIVE LOAD	100 PSF
3. ROOF LIVE LOAD -	20 PSF
4. ROOF SNOW LOAD	
A. THE GROUND SNOW LOAD, P_g -	62.2 PSF
B. FLAT-ROOF SNOW LOAD, P_f -	52.3 PSF
C. SNOW EXPOSURE FACTOR, C_e -	1.0
D. SNOW LOAD IMPORTANCE FACTOR, I -	1
E. THERMAL FACTOR, C_t -	1.2
5. WIND LOAD	
A. BASIC WIND SPEED (3-SECOND GUST) -	105 MPH
B. WIND IMPORTANCE FACTOR-	1.0
C. BUILDING CATEGORY -	II
D. WIND EXPOSURE -	C
6. EARTHQUAKE DESIGN DATA	
A. SEISMIC IMPORTANCE FACTOR -	1.0
B. OCCUPANCY CATEGORY-	II
C. MAPPED SPECTRAL RESPONSE ACCELERATIONS S_s / S_1 -	1.258 / 0.370
D. SPECTRAL RESPONSE COEFFICIENTS SDS / $SD1$ -	1.006 / 0.486
E. SITE CLASS -	D
F. SEISMIC DESIGN CATEGORY	D
G. BASIC SEISMIC FORCE RESISTING SYSTEM-	CANTILEVERED COLUMN SYSTEM
H. BASE SHEAR	
a. CANOPY	13.7 KIPS
b. PLATFORM	0.9 KIPS
I. SEISMIC RESPONSE COEFFICIENT C_s	0.671
J. RESPONSE MODIFICATION FACTOR	1.5
K. ANALYSIS PROCEDURE USED	EQUIVALENT LATERAL FORCE

STRUCTURAL STEEL

- A. DETAIL, FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH THE AISC SPECIFICATIONS AND CODES, LATEST EDITION
- B. PROVIDE MATERIAL CONFORMING TO THE FOLLOWING REQUIREMENTS FOR ALL STRUCTURAL STEEL:
- SHAPES AND PLATES (EXCEPT WIDE FLANGE) AND PLATES: ASTM A36, $F_y=36$ KSI
 - WIDE FLANGE SHAPES: ASTM A992, $F_y=50$ KSI MIN. (65 KSI MAX.)
 - STRUCTURAL TUBING: ASTM A500, GRADE B, $F_y=46$ KSI
 - ANCHOR BOLTS: ASTM F1554 GR 36/ OR ASTM A36 THREADED ROD - UNLESS NOTED OTHERWISE
 - THREADED ROD: ASTM A36
 - WELDING ELECTRODE: E70XX
- C. FABRICATOR SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
- D. MEMBERS SHALL BE FABRICATED PER AISC WITH 'STANDARD' HOLES 1/16" LARGER THAN BOLT DIAMETER UNLESS SPECIFICALLY DETAILED OR APPROVED OTHERWISE. HOLES FOR ANCHOR BOLTS MAY BE 5/16" MAX. LARGER THEN BOLT UNLESS NOTED OTHERWISE. (PROVIDE WASHERS AT ALL ANCHOR BOLTS.)
- E. USE NON-SHRINK GROUT/DRYPACK BELOW STEEL BASE PLATES AND BEARING PLATES.
- F. SHOP WELDING SHALL BE DONE IN A CERTIFIED FABRICATOR'S SHOP APPROVED BY THE BUILDING OFFICIAL (IBC 1704.2) OR SHALL BE PERFORMED UNDER SPECIAL INSPECTION WITH SUCH INSPECTION AT THE FABRICATOR'S EXPENSE. SUBMIT EVIDENCE OF CERTIFICATION PRIOR TO COMMENCING FABRICATION.
- G. STEEL TO STEEL CONNECTIONS - A325 BOLTS SHALL BE INSTALLED 'SNUG-TIGHT' PER RCSC 'SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS' AND COMMENTARY WITH PERIODIC INSPECTION PER SECTION 1704.3.3. STEEL TO WOOD CONNECTIONS - ASTM A307 BOLTS TO BE USED.
- H. MAXIMUM FILLET WELDS SIZE SHALL BE 1/16" LESS THAN MATERIAL THICKNESS IF THICKNESS IS 1/4" OR LARGER, 3/16" SHALL BE USED ON MATERIAL 3/16" THICK.
- I. FABRICATOR TO HAND CLEAN THE STEEL OF LOOSE RUST, LOOSE MILL SCALE, DIRT, AND OTHER FOREIGN MATTER PRIOR TO PAINTING BY MEANS OF WIRE BRUSHING, OR OTHER MEANS TO MEET REQUIREMENTS OF SSDC-SP2.
- J. ALL STEEL SHALL BE SHOP PRIMED PRIOR TO SHIPMENT TO SITE. CONNECTIONS SHALL BE FIELD PRIMED AFTER WELDING AND/OR BOLTING. UNLESS OTHERWISE NOTED, PAINT IS TO BE APPLIED BY BRUSH, SPRAY, ROLLER COATING, FLOW COATING, OR DIPPING WITH STANDARD PRIMER.
- K. CONTRACTORS RESPONSIBILITY TO PROVIDE TOUCH-UP OF ABRASIONS CAUSED BY FIELD HANDLING.
- L. PAINT IS NOT REQUIRED ON EMBEDDED STEEL.
- M. NO CUTTING, DRILLING, OR OTHER ALTERATION OF STEEL FRAMEWORK IS PERMITTED EITHER TO ACCOMMODATE OTHER TRADES OR TO REPAIR MISALIGNMENTS. CONTACT ENGINEERS FOR ANY FIELD REVISIONS OR REPAIRS.



1 STRUCTURAL DESIGN INFORMATION
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**MONTANA FISH,
 WILDLIFE & PARKS**

2 STRUCTURAL STEEL NOTES
NTS

STRUCTURAL NOTES
BIG ARM ARCHERY PROJECT



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CONNECTION	NAILING ¹
1. JOIST TO SILL OR GIRDER, TOENAIL	3-8d
2. BRIDGING TO JOIST, TOENAIL EACH END	2-8d
3. 1"X6" SUBFLOOR OR LESS TO EACH JOIST, FACE NAIL	2-8d
4. WIDER THAN 1"X6" SUBFLOOR TO EACH JOIST, FACE NAIL	3-8d
5. 2" SUBFLOOR TO JOIST OR GIRDER, BLIND AND FACE NAIL	2-16d
6. SOLE PLATE TO JOIST OR BLOCKING, TYPICAL FACE NAIL	16d @ 16" o.c.
SOLE PLATE TO JOIST OR BLOCKING, AT BRACED WALL PANELS	3-16d @ 16"
7. TOP PLATE TO STUD, END NAIL	2-16d
8. STUD TO SOLE PLATE 2	4-8d, TOENAIL OR 2-16d, END NAIL
9. DOUBLE STUDS, FACE NAIL	16d @ 24" o.c.
10. DOUBLED TOP PLATES, TYPICAL FACE NAIL	16d @ 16" o.c.
DOUBLE TOP PLATES, SEE DETAIL FOR LAP SPLICE	
11. BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE, TOE NAIL	3-8d
12. RIM JOIST TO TOP PLATE, TOENAIL	8d @ 6" o.c.
13. TOP PLATES, LAPS AND INTERSECTIONS, FACE NAIL	2-16d
14. CONTINUOUS HEADER, TWO PIECES	16d @ 16" o.c. ALONG EACH EDGE
15. CEILING JOIST TO PLATE, TOENAIL	3-8d
16. CONTINUOUS HEADER TO STUD, TOENAIL	4-8d
17. CEILING JOISTS, LAPS OVER PARTITIONS, FACE NAIL	3-16d
18. CEILING JOISTS TO PARALLEL RAFTERS, FACE NAIL	3-16d
19. RAFTER TO PLATE, TOE NAIL	3-8d
20. 1" BRACE TO EACH STUD AND PLATE, FACE NAIL	2-8d
21. 1"X8" SHEATHING OR LESS TO EACH BEARING, FACE NAIL	2-8d
22. WIDER THAN 1"X8" SHEATHING TO EACH BEARING, FACE NAIL	3-8d
23. BUILT-UP CORNER STUDS	16d @ 24" o.c.
24. BUILT-UP GIRDER AND BEAMS	20d @ 32" o.c. AT TOP AND BOTTOM AND STAGGERED 2-20d AT ENDS AND AT EACH SPLICE
25. 2" PLANKS	2-16d AT EACH BEARING
26. WOOD STRUCTURAL AND PARTICLE BOARD	SEE STRUCTURAL PLANS
27. PANEL SIDING (TO FRAMING):	
1/2" OR LESS	3
5/8"	6d 3
	8d
28. FIBERBOARD SHEATHING:	
1/2"	No. 11 ga. 4
	6d 1
	5
	No. 16 ga. 4
25/32"	No. 11 ga. 4
	8d 4
	5
	No. 16 ga. 4
	6d 6
	7
29. INTERIOR PANELING	
1/4"	4d 6
3/8"	6d 7

- COMMON OR BOX NAILS MAY BE USED EXCEPT WHERE OTHERWISE STATED.
- WHEN 3X SOLE PLATE IS USED, END NAILING SHALL BE 2-30d BOX OR COMMON NAILS TO STUD.
- CORROSION-RESISTANT SIDING OR CASING NAILS CONFORMING TO TABLE 2304.9.1 OF IBC.
- CORROSION-RESISTANT ROOFING NAILS WITH 7/16" DIA. HEAD AND 1-1/2" LENGTH FOR 1/2" SHEATHING AND 1-3/4" LENGTH FOR 25/32" SHEATHING CONFORMING TO TABLE 2304.9.1 OF IBC.
- CORROSION-RESISTANT STAPLES WITH NOMINAL 7/16" CROWN AND 1-1/8" LENGTH FOR 1/2" SHEATHING AND 1-1/2" LENGTH FOR 25/32" SHEATHING CONFORMING TO TABLE 2304.9.1 OF IBC.
- PANEL SUPPORTS AT 16" (20" IF STRENGTH AXIS IN THE LONG DIRECTION OF THE PANEL, UNLESS OTHERWISE MARKED). CASING OR FINISH NAILS SPACED 6" ON PANEL EDGES, 12" AT INTERMEDIATE SUPPORTS.
- PANEL SUPPORTS AT 24". CASING OR FINISH NAILS SPACED 6" ON PANEL EDGES, 12" AT INTERMEDIATE SUPPORTS.

1 NAILING SCHEDULE

NTS

STRUCTURAL COMPOSITE LUMBER (SCL)

- PRODUCTS: STRUCTURAL COMPOSITE LUMBER (SCL)
 - I-JOIST PRODUCTS SHALL BE DESIGNED TO FIT THE DIMENSIONS AND LOADS INDICATED ON PLANS. JOISTS SHALL BE MANUFACTURED WITH ORIENTED STRAND WEBS, LAMINATED VENEER LUMBER FLANGES AND WATERPROOF STRUCTURAL ADHESIVES.
 - RIMBOARD SHALL BE BCI 1 1/2 VERSA STRAND 0.8 WITH A MINIMUM MODULUS OF ELASTICITY OF 800,000 PSI
 - LAMINATED VENEER LUMBER BEAMS SHALL BE VERSA-LAM 2.0 2800 AND 2.0 3100 OR APPROVED EQUAL. MINIMUM MODULUS OF ELASTICITY OF 2,000,000 PSI AND BENDING STRENGTH OF 2,800 AND 3,100 PSI DEPENDING ON SIZE.
 - GLU-LAMS - UNO ALL GLULAMS SHALL BE ARCHITECTURAL APPEARANCE BEAMS AND COLUMNS WITH VOIDS GREATER THAN 3/4" FILLED. IF AVAILABLE HEADER BEAMS MAY BE USED IN CONCEALED APPLICATIONS.
 - SIMPLE SPAN GLULAM BEAMS SHALL BE BOISE GLULAM 24F-V4 UNBALANCED UNO WITH MINIMUM MODULUS OF ELASTICITY OF 1,800,000 PSI, BENDING STRENGTH OF 2,400 TENSION ZONE IN TENSION, 1,850 PSI COMPRESSION ZONE IN TENSION. SIMPLE SPAN GLULAM BEAMS SHALL BE CAMBERED WITH A 3,500 RADIUS FOR SPANS OVER 25' UNLESS SPECIFIED OTHERWISE ON PLANS.
 - MULTIPLE SPAN GLULAM BEAMS SHALL BE BOISE GLULAM 24F-V8 BALANCED UNO WITH MINIMUM MODULUS OF ELASTICITY OF 1,800,000 PSI, BENDING STRENGTH OF 2,400 PSI IN BOTH TENSION ZONE IN TENSION AND COMPRESSION ZONE IN TENSION UNLESS SPECIFIED OTHERWISE ON PLANS.
 - GLULAM COLUMNS SHALL BE BOISE GLULAM COLUMNS UNO WITH MINIMUM MODULUS OF ELASTICITY OF 1,900,000 PSI PERPENDICULAR AND PARALLEL TO THE GLUELINES, BENDING STRENGTH OF 2,000 PSI PERPENDICULAR AND 2,100 PSI PARALLEL TO GLUELINES AND 2,300 PSI COMPRESSION STRENGTH PARALLEL TO THE GRAIN. ARCHITECTURAL ACCENT COLUMNS CAN HAVE GLULAM BEAM SPECIFICATIONS
- FOR JOIST & BEAM SUBSTITUTIONS: A COMPLETE SET OF DESIGN CALCULATIONS SHALL BE PREPARED BY THE MANUFACTURER VERIFYING MEMBERS MEET OR EXCEEDING THE LOADS SPECIFIED AND THE GEOMETRY SHOWN. CALCULATIONS AND LAYOUT DRAWING SHALL BE SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF THIS PROJECT.
- FOR JOIST AND BEAM SUBSTITUTIONS. SHOP DRAWINGS SHOWING LAYOUT AND DETAIL NECESSARY FOR DETERMINING FIT AND PLACEMENT IN THE BUILDING SHALL BE PROVIDED BY THE SUPPLIER TO THE EOR FOR APPROVAL ALONG WITH THE DESIGN CALCULATIONS.
- ALL SCL LUMBER SHALL BE MANUFACTURED IN ACCORDANCE WITH AN APPROVED ICC MATERIALS REPORT, AND PRODUCED WITH MATERIALS SATISFYING THE APPROVED ICC-ES CODE REPORT, PRODUCTS SHALL BE PROVEN BY TESTING AND EVALUATION IN ACCORDANCE WITH THE PROVISIONS OF ASTM D-5055.
- IDENTIFICATION: EACH OF THE SCL MEMBERS EXCLUDING G/L'S SHALL BE IDENTIFIED BY A STAMP INDICATING THE JOIST SERIES OR MEMBER PROPERTIES, ICC-ES REPORT NUMBER, MANUFACTURER'S NAME, PLANT NUMBER, DATE OF FABRICATION AND THE INDEPENDENT INSPECTION AGENCY'S LOGO UNLESS ARCHITECTURAL GRADE IS SPECIFIED. COORDINATE WITH ARCHITECT IN THIS CASE.
- HANGERS AND HARDWARE : ANY HARDWARE SHOWN ON THE PLANS TO ATTACH THE MEMBERS TO APPROPRIATE WALLS, BEAMS, HEADERS, ETC. SHALL BE SPECIFIED AND CERTIFIED TO MEET THE LOAD REQUIRED FOR THE APPLICATION. ALL HARDWARE SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS.
- INSTALLATION: SCL, IF STORED PRIOR TO INSTALLATION, SHALL BE PROTECTED FROM THE WEATHER. THEY SHALL BE HANDLED WITH CARE SO THEY ARE NOT DAMAGED. MEMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS AND ANY MANUFACTURER DRAWINGS AND INSTALLATION SUGGESTIONS. TEMPORARY CONSTRUCTION LOADS THAT CAUSE STRESSES BEYOND DESIGN LIMITS ARE NOT PERMITTED, SAFETY BRACING IS TO BE PROVIDED BY THE INSTALLED TO KEEP THE MEMBER STRAIGHT AND PLUMB AS REQUIRED, AND TO ENSURE ADEQUATE LATERAL SUPPORT FOR THE INDIVIDUAL MEMBERS AND THE ENTIRE SYSTEM UNTIL THE SHEATHING MATERIAL IS APPLIED.
- WARRANTY: THE PRODUCTS DELIVERED SHALL BE FREE FROM MANUFACTURING ERRORS OR DEFECTS IN WORKMANSHIP AND MATERIAL. THE PRODUCTS, WHEN CORRECTLY INSTALLED AND MAINTAINED, SHALL BE WARRANTED TO PERFORM AS DESIGNED FOR THE NORMAL AND EXPECTED LIFE OF THE BUILDING.

2 STRUCTURAL COMPOSITE LUMBER

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**MONTANA FISH,
WILDLIFE & PARKS**

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STRUCTURAL NOTES

BIG ARM ARCHERY PROJECT



MONTANA FWP

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CONCRETE

- A. SEE SOILS AND GEOTECHNICAL NOTES FOR SITE PREP AND STRUCTURAL FILL REQUIREMENTS FOR SUBGRADE PREP.
- B. ALL CEMENT IN CONCRETE TO CONFORM TO ASTM C150 SPECIFICATION FOR PORTLAND CEMENT.
- C. ALL AGGREGATE TO CONFORM TO ASTM C33 SPECIFICATION FOR CONCRETE AGGREGATES.
- D. CONCRETE SUPPLIER TO MIX BASED ON HIS TESTING TO ASSURE THIS MINIMUM COMPRESSIVE STRENGTH PER ACI 318 SECTION 19.2.1.1. IN THE ABSENCE OF SUFFICIENT TEST DATA, CONCRETE PROPORTIONING SHALL BE DONE IN ACCORDANCE WITH ACI 318 SECTION 26.4, 26.4.1.1.1, 26.4.1.2.1, 26.4.2.1, & 26.4.4.1.
- E. THE MAXIMUM NOMINAL AGGREGATE SIZE SHALL BE ONE FIFTH THE NARROWEST DIMENSION BETWEEN THE FORMS OR ONE THIRD THE DEPTH OF THE SLAB, OR THREE-FOURTHS THE MINIMUM CLEAR SPACING BETWEEN INDIVIDUAL REINFORCING BARS OR WIRES, WHICHEVER APPLIES. THESE PROVISIONS ARE TO ASSURE CONCRETE PLACEMENT WITHOUT VOIDS OR HONEYCOMBS AND MAY BE WAIVED ONLY BY THE BUILDING OFFICIAL IF THEY JUDGE THAT LARGER SIZES ARE ADEQUATE BECAUSE OF WORKABILITY AND METHODS OF CONSOLIDATION.
- F. CONCRETE CURING (OTHER THAN HIGH-EARLY) SHALL BE MAINTAINED ABOVE A TEMPERATURE OF 50°F AND IN A MOIST CONDITION FOR AT LEAST THE FIRST SEVEN DAYS AFTER PLACEMENT. HIGH EARLY CONCRETE SHALL BE CURED ABOVE 50°F AND IN A MOIST CONDITION FOR AT LEAST THE FIRST THREE DAYS.
- G. ADEQUATE EQUIPMENT SHALL BE PROVIDED FOR HEATING CONCRETE MATERIALS AND PROTECTING CONCRETE DURING FREEZING OR NEAR-FREEZING WEATHER. ALL CONCRETE MATERIALS, REINFORCEMENT, FORMS, FILLERS, AND GROUND WHICH THE CONCRETE IS TO BE IN CONTACT WITH IS TO BE FREE OF FROST. FROZEN MATERIALS OR MATERIALS CONTAINING ICE SHALL NOT BE USED.
- H. DURING HOT WEATHER, PROPER ATTENTION SHALL BE GIVEN TO INGREDIENTS, PRODUCTION METHODS, HANDLING, PLACING, PROTECTION, AND CURING TO PREVENT EXCESSIVE CONCRETE TEMPERATURES AND EVAPORATION THAT MAY IMPAIR REQUIRED STRENGTH OR SERVICEABILITY OF THE MATERIAL.
- I. ALL WALLS & FOUNDATIONS SHALL BE MECHANICALLY CONSOLIDATED. VIBRATORS SHALL BE INSERTED IN PREVIOUS POURED FRESH CONCRETE TO PREVENT COLD JOINTS WHEN MULTIPLE LAYER OF CONCRETE ARE PLACED IN A WALL.
- J. CONDUITS, PIPES, AND SLEEVES SHALL BE ALLOWED ONLY WHERE NOTED ON THE PLANS. ANY ADDITIONAL ALTERATIONS ARE NOT PERMITTED WITHOUT ENGINEER APPROVAL THAT IT WILL NOT COMPROMISE STRUCTURAL INTEGRITY.
- K. THE SURFACE OF ALL CONSTRUCTION JOINTS SHALL BE CLEANED AND LAITANCE REMOVED. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, JOINTS SHALL BE WETTED AND STANDING WATER REMOVED. PROVISIONS SHALL BE MADE TO TRANSFER SHEAR FORCES THROUGH THE CONSTRUCTION JOINT.
- L. INTERIOR SLAB ON GRADE SHALL BE CLASS 1 W/ A NORMAL STEEL TROWELED FINISH. TOTAL AIR CONTENT SHALL NOT EXCEED 3%. FLOOR SHALL BE WITHIN 1/8" PER 10 FT FOR FLATNESS REQUIREMENTS. SLAB SHALL BE SEALED WITH A HIGH SOLID CONTENT SOLVENT BASED CURE & SEAL, EUCLID SUPER DIAMOND OR APPROVED EQUAL
- M. CONCRETE IN SIDEWALKS OR EXTERIOR SLABS THAT WILL BE EXPOSED TO FREEZING/THAWING OR DEICING CHEMICALS SHALL HAVE A MINIMUM 0.45 WATER/CEMENTITIOUS RATIO BY WEIGHT FOR NORMAL WEIGHT AGGREGATE CONCRETE AND BE 4000 PSI MINIMUM.
- N. ALL REINFORCING BARS SPECIFIED SHALL BE DEFORMED BARS AT LEAST GRADE 60.
- O. ALL BENDING OF REINFORCING MATERIAL SHALL BE DONE COLD AND MINIMUM BEND DIAMETER SHALL BE 6 TIMES THE NOMINAL BAR DIAMETER FOR #3-#8 BAR AND 8 TIMES THE NOMINAL BAR DIAMETER FOR #9-#11 BARS. REINFORCEMENT PARTIALLY IMBEDDED IN CONCRETE MAY NOT BE FIELD BENT.
- P. REINFORCEMENT, ANCHORS AND EMBEDDED ITEMS SHALL BE ACCURATELY PLACED AND SUPPORTED BEFORE CONCRETE IS PLACED AND SHALL BE SECURED AGAINST DISPLACEMENT WITHIN TOLERANCES OF SECTION 1907.5 OF THE CURRENT VERSION OF CURRENT IBC.
- Q. #5 BAR REQUIRED 2" CLEAR FROM TOP AND BOTTOM OF STEM WALLS AROUND FULL PERIMETER OF FOUNDATION, MIN.
- R. STANDARD HOOK ON REINFORCING BAR SHALL BE:
 - 1. 180° BEND PLUS 4d EXTENSION, BUT NOT LESS THAN 2 1/2" AT FREE END OF BAR.
 - 2. 90° BEND PLUS 12d EXTENSION AT FREE END OF BAR.
 - 3. FOR STIRRUP AND TIE HOOKS: SEE S3.0
- S. MINIMUM REBAR LAPS - FOR #3-15", #4-20", #5-24 & #6-30" WITH A CLEAR SPACING OF NOT LESS THAN 2d AND CLEAR COVER OF NOT LESS THAN d. ALL OTHER SPLICES CONDITIONS SHALL BE BY THE EOR AND ILLUSTRATED ON FOUNDATION PLAN & DETAIL SHEETS.
- T. REFER TO TABLE BELOW FOR MINIMUM COVER AND TOTAL AIR CONTENT FOR CONCRETE IN DIFFERENT SERVICE CONDITIONS.

CONCRETE PROTECTION FOR REINFORCEMENT	
CAST-IN-PLACE CONCRETE (NON-PRESTRESSED)	
DESCRIPTION	MINIMUM COVER (IN)
CONCRETE CAST AGAINST & PERMANENTLY EXPOSED TO EARTH	3
CONCRETE EXPOSED TO EARTH OR WEATHER:	
No. 6 THRU No. 18 BAR	2
No. 5 BAR, W31 OR D31 WIRE AND SMALLER	1-1/2
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND:	
SLABS, WALLS, AND JOISTS:	
No. 14 AND No. 18 BAR	1-1/2
No. 11 BAR AND SMALLER	3/4
CONCRETE TILT-UP PANELS CAST AGAINST A RIGID HORIZONTAL SURFACE	
SUCH AS A CONCRETE SLAB EXPOSED TO THE WEATHER:	
No. 8 BAR AND SMALLER	1
No. 9 THRU No. 18 BAR	2

	28 DAY COMPRESSIVE STRENGTH	SLUMP (IN) MAX/MIN	MAX W/C RATIO	AIR CONTENT (%)
FOOTINGS	3000 PSI	3/1	.5	6 +/- 1.5%
FOUNDATION WALLS	3000 PSI	4/1	.5	6 +/- 1.5%
INTERIOR SLAB	4000 PSI	4/1	.45	3 MAX
EXTERIOR SLAB	4500 PSI	4/1	.45	6 +/- 1.5%

NOTE: SLABS WITH SUPER PLASTICIZER SHALL HAVE A MAXIMUM SLUMP OF 6 1/2".

1 CONCRETE NOTES
NTS

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**MONTANA FISH,
WILDLIFE & PARKS**

210

STRUCTURAL NOTES
BIG ARM ARCHERY PROJECT



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SOILS AND FOUNDATIONS

- A. FOUNDATIONS HAVE BEEN DESIGNED BASED ON ALLOWABLE BEARING PRESSURE OF 1,500 PSF
 - B. CONSTRUCTION MATERIAL - EARTHWORK:
 - 1. STRUCTURAL FILL SHALL CONSIST OF APPROVED ON-SITE SOILS OR BE FROM AN APPROVED MATERIAL SOURCE.
 - 2. GRANULAR STRUCTURAL FILL SHALL MEET THE FOLLOWING GRADATION & COMPOSITION

SIEVE SIZE	% PASSING BY WEIGHT
3 INCH	100
1 1/2"	85-100
NO. 4	30-60
NO. 200	10 MAXIMUM
- BOTH STRUCTURAL FILL & GRANULAR STRUCTURAL FILL SHALL MEET THE FOLLOWING:
- a. PLACED IN NO GREATER THAN 8" THICK LIFTS COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698
 - b. MOISTURE CONTENT OF THE STRUCTURAL FILL AT THE TIME OF COMPACTION SHOULD BE WITHIN 3% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM 698
 - c. COBBLES AND BOULDERS LARGER THAN 4" MAXIMUM SIZE SHOULD NOT BE USED IN FILL MATERIALS
 - d. SAND & GRAVEL SIZE PARTICLES COMPRISING THE FILL SHOULD BE HARD DURABLE ROCK MATERIALS THAT WILL NOT DEGRADE BY MOISTENING OR UNDER MECHANICAL ACTION OF THE COMPACTION EQUIPMENT; I.E. NO SHALE OR OTHER CLAYEY ROCK TYPES
 - e. THE BINDER/FINES SHOULD HAVE MAXIMUM LIQUID LIMIT AND PLASTIC INDEX VALUES OF 25 & 10% RESPECTIVELY
 - f. NO FROZEN, ORGANIC OR OTHER DELETERIOUS MATERIALS SHOULD BE PRESENT IN FILL MATERIAL.
 - g. GRANULAR STRUCTURAL FILL SHALL BE USED UNDER BUILDING FOUNDATION AND IF THE FILL OPERATIONS ARE PLANNED FOR RELATIVELY WET FALL, WINTER & SPRING MONTHS.
- 3. OPEN GRADED ANGULAR CRUSH ROCK:
 - a. BETWEEN 1/4 TO 3/4" ANGULAR CRUSHED ROCK
 - b. COMPACTED USING VIBRATORY COMPACTION METHODS UNTIL WELL KEYED
 - 4. 1/4 TO 1 1/2" OPEN GRADED DRAINAGE AGGREGATE.
 - 5. NON-WOVEN DRAINAGE GEOTEXTILE: MIRAFI 140N OR APPROVED EQUAL. EDGES SHALL BE OVERLAPPED AND HELD IN PLACE DURING BACK FILL OPERATION TO ENSURE THE DRAIN AGGREGATE IS COMPLETELY ENCLOSED FOLLOWING BACKFILL

- C. SITE PREPARATION:
 - 1. THE REMOVAL OF TOPSOIL, OTHER ORGANIC MATERIAL & FILL, INCLUDING THE CLEARING AND GRUBBING OF SURFICIAL VEGETATION AND ROOT ZONES, SHOULD BE ACCOMPLISHED WITHIN THE CONSTRUCTION ZONE PRIOR TO ANY EARTHWORK CONSTRUCTION.
 - 2. SURFACE DRAINAGE SHOULD BE ESTABLISHED TO DIRECT RUNOFF AWAY FROM THE CONSTRUCTION AREA
 - 3. CARE SHOULD BE TAKEN TO MINIMIZE CONSTRUCTION TRAFFIC OVER MOISTURE SENSITIVE SUBGRADE SOILS DURING WET WEATHER CONDITIONS.
 - 4. THE STABILITY OF CONSTRUCTION EXCAVATIONS AND ASSOCIATED WORKER SAFETY ARE THE RESPONSIBILITY OF THE CONTRACTOR IN ACCORDANCE WITH CURRENT OSHA REGULATIONS; THIS RESPONSIBILITY MAY REQUIRE DESIGN BY A REGISTERED PROFESSIONAL ENGINEER BASED ON THE PREDOMINANT SOIL TYPES ENCOUNTERED. ACTUAL SUBSURFACE CONDITIONS AT THE TIME OF EXCAVATION SHOULD BE OBSERVED BY A GEOTECHNICAL ENGINEER TO DETERMINE WHETHER SLOPE FLATTENING, BRACING OR OTHER STABILIZATION IS NECESSARY DUE TO SEEPAGE OR OTHER UNEXPECTED CONDITIONS.
 - 5. FINAL EXCAVATIONS SHALL BE COMPLETED WITH A SMOOTH-LIPPED BUCKETS IN FINE GRAINED SOILS SUCH AS SILTS & CLAYS. ANY AREAS OF RUTTING, EXCESSIVE DEFORMATION, OR OTHER NON-UNIFORM PERFORMANCE OF THE NATIVE SURFACE OR THE BACKFILL SHALL BE REMOVED AND REPLACED BY GRANULAR STRUCTURAL FILL
- D. FOUNDATION & SLAB PREPARATION:
 - 1. CONTINUOUS WALL AND SPREAD FOOTING FOUNDATIONS SHALL BE ESTABLISHED ON UNDISTURBED NATIVE. NOTIFY EOR IF ANY RUTTING, EXCESSIVE DEFORMATION, OR OTHER NON-UNIFORM PERFORMANCE OF THE NATIVE SURFACE IS OBSERVED
 - 2. ALL INTERIOR FOOTINGS SHOULD HAVE A MINIMUM EMBEDMENT OF 1.0 FT BELOW FINISHED INTERIOR SURFACES. EXTERIOR WALL FOOTINGS SHOULD BE EMBEDDED TO ESTABLISH FROST PROTECTION.
 - 3. BACKFILL COMPACTION WITHIN 5 FEET OF FOUNDATION WALLS SHOULD BE CONDUCTED USING HAND OPERATED TAMPING EQUIPMENT ONLY.
 - 4. EXTERIOR SLAB PREPARATION
 - a. A MINIMUM OF 18" OF GRANULAR STRUCTURAL FILL SHALL BE INSTALLED UNDERNEATH SLABS. A GEOTEXTILE SEPARATION FABRIC SHOULD BE PLACED ATOP THE SUBGRADE FOLLOWED BY A 3 INCH +/- LAYER OF CLEAN ANGULAR CRUSHED ROCK TO SERVE AS A CAPILLARY BREAK FOLLOWED BY ANOTHER LAYER OF GEOTEXTILE FABRIC. STRUCTURAL FILL SHALL BE USED TO ACHIEVE FINAL SUBGRADE ELEVATION. ALL ITEMS SHALL BE COMPACTED PER THE ABOVE SPECIFICATIONS.
 - b. THE TOP 2 INCHES OF THIS FILL MAY CONSIST OF 3/4" MINUS CRUSHED ROCK TO PROVIDE A COMPACT SURFACE FOR CONSTRUCTION ACTIVITIES.
 - 5. IF GRADE NEEDS TO BE RAISED UNDER THE SLAB BETWEEN THE NATIVE & THE BASE OF THE CAPILLARY BREAK LAYER EITHER STRUCTURAL OR GRANULAR FILL PER B1 & B2 ABOVE SHALL BE INSTALLED.
- E. QUALITY CONTROL SHALL BE COMPLETED PER THE REQUIREMENTS OF THE TESTING AND OBSERVATION NOTES.

1 SOILS & GEOTECHNICAL NOTES
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STRUCTURAL NOTES
BIG ARM ARCHERY PROJECT

WOOD FRAMING

- A. WOOD IBC CHAPTER 23
1. GRADE STAMPED DOUGLAS FIR/LARCH (SEE LUMBER GRADES).
 2. NAILS: COMMON WIRE UNLESS OTHERWISE NOTED. EDGE OR END DISTANCES IN THE DIRECTION OF STRESS SHALL NOT BE LESS THAN ONE HALF OF THE REQUIRED PENETRATION. THE SPACING CENTER TO CENTER OF NAILS IN THE DIRECTION OF STRESS SHALL NOT BE LESS THAN THE REQUIRED PENETRATION. HOLES FOR NAILS, WHERE NECESSARY TO PREVENT SPLITTING, SHALL BE BORED TO A DIAMETER SMALLER THAN THAT OF THE NAIL.
 3. ANCHOR BOLTS (FOUNDATION ANCHOR BOLTS) MINIMUM REQUIRED: PROVIDE 5/8 INCH DIAMETER ANCHOR OR MACHINE BOLTS WITH A MINIMUM OF 7 INCHES EMBEDMENT INTO THE CONCRETE AND WITHIN 12 INCHES OF EACH END OF EACH PLATE. SPACE ANCHORS AT 48 INCHES ON CENTER UNO. ANCHORS SHALL BE LOCATED A MAXIMUM OF 2 INCHES FROM THE FACE OF STUD RECEIVING WOOD STRUCTURAL PANELS. ANCHOR BOLT HOLES 1/32 TO 1/16 INCH LARGER THAN THE ANCHOR BOLT DIAMETER. HOLES MORE THAN 1/16 INCH LARGER THAN THE ANCHOR BOLT SHALL BE EPOXY FILLED UNDER THE CONTINUOUS SUPERVISION OF A LICENSED SPECIAL INSPECTOR.
 4. BOLTS: NOT LESS THAN 7 BOLT DIAMETERS FROM THE END AND 4 DIAMETERS FROM THE EDGE OF THE MEMBER. BOLT HOLES 1/32 TO 1/16 INCH LARGER THAN THE BOLT DIAMETER. ALL NUTS SHALL BE TIGHTENED WHEN INSTALLED AND RE-TIGHTENED AT THE COMPLETION OF WORK OR BEFORE CLOSING IN. THREAD PROJECTION SHALL BE 1/16 INCH MINIMUM BEYOND THE NUT. BOLTS IN SPECIFIED SLOTTED HOLES SHALL BE CENTERED IN THE SLOT UNO.
 5. LAG SCREW CLEARANCE & LEAD HOLES SHALL BE BORED AS FOLLOWS: THE CLEARANCE HOLE FOR THE SHANK SHALL HAVE THE SAME DIAMETER AS THE SHANK, AND THE SAME DEPTH OF PENETRATION AS THE LENGTH OF UNTHREADED SHANK. THE LEAD HOLE FOR THE THREADED PORTION SHALL HAVE A DIAMETER EQUAL TO 60 % TO 75 % OF THE SHANK DIAMETER AND A LENGTH EQUAL TO AT LEAST THE LENGTH OF THE THREADED PORTION.
 6. SQUARE STEEL PLATE WASHERS (PW): ANCHOR BOLTS, BOLTS, LAGS AND NUTS, NOTED PW, SHALL BE SQUARE STEEL PW:

BOLT DIAM (IN)	THICKNESS (IN)	SIZE (IN)
1/2	3/16	2 X 2
5/8	1/4	2 1/2X2 1/2
3/4	5/16	2 3/4X2 3/4
7/8	5/16	3X3
1	3/8	3 1/2X3 1/2
 7. CUT STEEL WASHERS: FOR BOLTS, LAGS AND NUTS, UNO.
 8. FRAMING CONNECTORS: PER MANUFACTURER'S APPROVED PRODUCT EVALUATION REPORTS ICC APPROVED AND INSTALLED ACCORDINGLY. SIZE AND NUMBER OF NAILS TO BE MAXIMUM SPECIFIED BY THE MANUFACTURER UNO.
 9. NAILED/SCREWED HOLD DOWN ANCHORS: INSTALL PER MANUFACTURER'S APPROVED ICC-ES PRODUCT EVALUATION REPORT. INSTALL HOLD DOWNS 1/2 INCH MINIMUM ABOVE THE PLATE TO ALLOW FOR TIGHTENING ANCHOR BOLT. THE HOLD DOWN SHALL BE INSTALLED TIGHT TO THE HOLD DOWN POST WITHOUT FILLERS OR DAPPING. DO NOT BEND HOLD DOWN ANCHORS.
 10. BOLTED HOLD DOWN ANCHORS: INSTALL PER MANUFACTURER'S APPROVED ICC PRODUCT EVALUATION REPORT. INSTALL HOLD DOWNS 1/2 INCH MINIMUM ABOVE THE PLATE TO ALLOW FOR TIGHTENING ANCHOR BOLT. TIGHTEN HOLD DOWN ANCHOR BEFORE TIGHTENING POST BOLTS. USE EXTRA CARE IN BORING THE POST BOLT HOLES 1/32 TO 1/16 LARGER THAN THE BOLT DIAMETER. THE HOLD DOWN SHALL BE INSTALLED TIGHT TO THE HOLD DOWN POST WITHOUT FILLERS OR DAPPING. THE POST BOLTS SHALL NOT BE COUNTERSUNK INTO THE HOLD DOWN POST UNO. DO NOT BEND HOLD DOWN ANCHORS.
 11. PRESERVATIVE TREATED WOOD: WOOD EXPOSED TO THE WEATHER; FOUNDATION PLATES ON CONCRETE SLABS, FOUNDATIONS WHICH ARE IN DIRECT CONTACT WITH EARTH SHALL BE TREATED WOOD WITH PRESERVATIVE RETENTION AS REQUIRED FOR USE. NEWLY EXPOSED SURFACES RESULTING FROM FIELD CUTTING, BORING OR HANDLING SHALL BE FIELD TREATED IN ACCORDANCE WITH AWPA M-4.
 12. TOP PLATES: TWO PIECES, SAME SIZE AS STUDS, STAGGER SPLICES AND CONNECT PER SCHEDULE.
 13. FULL-DEPTH SOLID BLOCKING OR CROSS BRACING: INSTALLED AT INTERVALS NOT EXCEEDING 8 FEET FOR ALL JOISTS AND RAFTERS 2x12 AND DEEPER. SOLID BLOCKING OR I-JOIST BLOCKING SHALL BE INSTALLED AT WALL JOIST BEARING WHERE RIM JOISTS ARE NOT INSTALLED
 14. SOLID BLOCKING: TWO INCH FULL WIDTH BLOCKING FIRE STOPS IN CONCEALED SPACES OF STUD WALLS AND PARTITIONS, INCLUDING FURRED SPACES, AT THE CEILING AND FLOOR LEVELS AND AT 10-FOOT INTERVALS HORIZONTAL.
 15. CUTTING AND NOTCHING: DO NOT CUT, BORE, COUNTERSINK OR NOTCH WOOD MEMBERS EXCEPT WHERE SHOWN IN THE DETAILS. HOLES THROUGH PLATES, STUDS AND DOUBLE PLATES IN WALLS SHALL NOT EXCEED 40 % THE MEMBER WIDTH AND SHALL BE LOCATED IN THE CENTER OF THE MEMBER. SEE DETAILS ON FRAMING DRAWINGS.
 16. PARTITIONS: DOUBLE JOISTS UNDER PARTITIONS PARALLEL TO JOISTS AND PROVIDE SOLID BLOCKING UNDER PARTITIONS PERPENDICULAR TO JOISTS.
 17. END SUPPORT: ROOF AND FLOOR JOISTS OVER 4" DEEP SHALL HAVE THEIR ENDS HELD IN POSITION WITH EITHER: FULL DEPTH SOLID BLOCKING; NAILED BRIDGING: NAILING OR BOLTING TO OTHER FRAMING MEMBERS; OR APPROVED JOIST HANGERS.
 18. GALVANIZING: ALL EXPOSED STEEL TIMBER HARDWARE, FASTENERS AND CONNECTORS.
 19. TRIMMERS AND HEADER JOISTS SHALL BE DOUBLED OR OF LUMBER OF EQUIVALENT CROSS SECTION WHERE THE SPAN OF THE HEADER EXCEEDS 4 FT.
 20. NOT LESS THAN 3 STUDS OR LUMBER OF EQUIVALENT CROSS SECTION SHALL BE INSTALLED AT EA CORNER OF ALL EXT. WALLS.
- B. LUMBER GRADES DOUGLAS FIR/LARCH IBC CHAPTER 23
 COMPLY WITH PS 20, AMERICAN SOFTWOOD LUMBER STANDARD AND STANDARD GRADING RULES FOR WESTERN LUMBER. 19% MAXIMUM MOISTURE CONTENT AT TIME OF PLACEMENT.
1. DIMENSION LUMBER: BLOCKING 2" TO 4" THICK, STANDARD
 2. DIMENSION LUMBER: JOISTS & RAFTERS, 2" TO 4" THICK, NO. 2 AND BETTER.
 3. BEAMS AND STRINGERS: 5" AND THICKER, NO. 1
 4. POSTS AND TIMBERS: 5" BY 5" AND LARGER, NO.1
 5. HOLD DOWN POSTS: NO. 1
- C. WOOD STRUCTURAL PANELS PANEL - EXPOSURE I APA RATED
1. REFERENCES: PS1, PS2, APA STANDARD PRP-108, NATIONAL EVALUATION SERVICE REPORT NER-108 AND ICC ES REPORT 1952.
 2. WALL PANELS: PER SCHEDULE
 3. ROOF PANELS: PER SCHEDULE
 4. FLOOR PANELS: PER SCHEDULE
 5. BLOCKING:
 - a. WALLS: ALL UNSUPPORTED PANEL JOINTS SHALL BE BLOCKED SOLID WITH 2x BLOCKING.
 - b. FLOORS & ROOFS: WHERE NOTED ON THE DRAWINGS, ALL UNSUPPORTED PANEL JOINTS SHALL BE BLOCKED SOLID WITH 2x4 FLAT BLOCKING
 6. NAILING: COMMON WIRE NAILS IN PANEL SHALL BE DRIVEN SO THAT THE HEADS ARE FLUSH WITH THE SURFACE OF THE PANEL. FIELD NAILING (FN) SHALL BE PER SCHEDULE AND THE MINIMUM PANEL EDGE DISTANCES SHALL BE MAINTAINED.
 7. MACHINE NAILING: SUBJECT TO A SATISFACTORY JOB SITE DEMONSTRATION FOR THIS PROJECT AND REVIEW BY THE ENGINEER. THE USE OF MACHINE NAILING IS SUBJECT TO CONTINUED SATISFACTORY PERFORMANCE. PANEL NAILS SHALL BE DRIVEN SO THAT THE HEADS ARE FLUSH WITH THE SURFACE OF THE PANEL AND THE MINIMUM PANEL EDGE DISTANCES ARE MAINTAINED.
 8. WOOD STRUCTURAL PANELS (PANELS): WHERE ADJACENT WALLS ARE paneled, PANELS SHALL BE INSTALLED OVER AND UNDER OPENINGS

- D. COMMON WIRE NAILS
- | SIZE | DIAMETER | WIRE | PENETRATION | |
|-------|----------|------|-------------|--------|
| PENNY | INCHES | | GAGE | INCHES |
| 8d | .131 | | 10-1/4 | 1-1/2 |
| 10d | .148 | | 9 | 1-5/8 |
| 16d | .162 | | 8 | 1-3/4 |
| 20d | .192 | | 6 | 2-1/8 |
| 30d | .207 | | 5 | 2-1/4 |
- PENETRATION IS MEASURED INTO THE PIECE RECEIVING THE NAIL POINT. 1-1/2 INCHES OF PENETRATION FOR 10d AND 16d NAILS IS ACCEPTABLE FOR TOP PLATES AND DOUBLED 2X MEMBERS. WHERE THE NAIL PENETRATION WILL BE LESS THAN SPECIFIED, INCREASE NAIL LENGTH (SIZE) TO OBTAIN THE PENETRATION REQUIRED FOR THE NAIL SPECIFIED. ALL HORIZONTAL SEAMS ON paneled SHEAR WALLS TO BE BLOCKED AND VERTICAL SEAMS TO LIE ON A STUD LINE, SEE ALL DIAPHRAGM BOUNDARIES TO BE 3x OR DBL 2x AND STAGGER NAILED PER SCHEDULE. SHEAR WALL DIAPHRAGM BOUNDARIES ARE STRUCTURAL RESISTANCE LINES, I.E. SILL PLATES, TOP PLATES, & HOLD DOWN POSTS. PANEL EDGES ARE VERTICAL OR HORIZONTAL SEAMS, NOT ONE OF ABOVE. FIELD IS FASTENING AREAS WHERE MEMBERING OCCURS INSIDE PANEL EDGES. SHEAR WALL NAILS SHALL BE PLACED NOT LESS THAN 3/8" FROM THE PANEL EDGE, AND FIRMLY DRIVEN INTO FRAMING MEMBER WITHOUT CRUSHING THE SURFACE OF THE SHEETING WITH THE HEAD. SHEAR WALL SHEATHING MATERIAL TO BE MANUFACTURED USING EXTERIOR GLUE; IF PARTICLEBOARD, MINIMUM GRADE IS 2-M-F, IF FRAMED OPENINGS IN SHEAR WALLS SHALL CONSIST OF DOUBLE FRAMING MEMBERS WITH NO PANEL EDGES ALIGNING WITH THE FRAME LINE WITHIN 2'. THE EDGE NAILING SHALL BE 6" STAGGERED UNLESS A PATTERN IS SPECIFIED ON THE SHEAR WALL SCHEDULE. ALL LUMBER TO BE NUMBER 2 OR BETTER UNLESS SPECIFIED OTHERWISE. ALL BEAMS/HEADERS TO BE AS SPECIFIED, CONTACT EOR FOR SUBSTITUTIONS SINCE ALLOWABLE STRESSES VARY
- E. STRUCTURAL CONNECTORS
 SIMPSON STRONG-TIE IS SPECIFIED FOR ALL LIGHT GAUGE METAL CONNECTORS SUCH AS HOLD DOWNS, COLUMN CAPS & BASES, JOIST, TRUSS & BEAM HANGERS & CONNECTORS AND STRAPS & TIES UNLESS NOTED OTHERWISE. USP STRUCTURAL CONNECTORS ARE AN ACCEPTABLE SUBSTITUTION PROVIDED THE LOAD VALUE FOR THE USP PRODUCT MEETS OR EXCEEDS THE SIMPSON PRODUCT.
- F. IF LUMBER OR PREFABRICATED PORTIONS OF THE BUILDING ARE STORED PRIOR TO INSTALLATION THESE MATERIALS SHALL BE PROTECTED FROM WEATHER AND STORED ON DUNNAGE TO PREVENT THEM FROM SITTING IN STANDING WATER/SNOW OR IN CONTACT WITH THE GROUND.
- G. CORROSION RESISTANCE FOR STRUCTURAL CONNECTORS:
1. LIGHT GAUGE METAL CONNECTORS:
 - a. A MINIMUM OF A STANDARD G90 COATING SHALL BE USED FRO DRY SERVICE APPLICATIONS WITH UNTREATED, SBX-DOT ZINC BORAT TREATED LUMBER AND TREATED LUMBER WITH A CHEMICAL RETENTION LESS THAN OR EQUAL TO THE REQUIREMENTS FOR AWPA UC4A.
 - b. A MINIMUM OF A STANDARD G185 COATING SHALL BE USED FOR ALL WET SERVICE AND EXTERIOR APPLICATIONS WITH UNTREATED, TREATED LUMBER WITH A CHEMICAL RETENTION LESS THAN OR EQUAL TO THE REQUIREMENTS OF AWPA UC4A AND ACZA TREATED LUMBER IN DRY SERVICE APPLICATION.
 - c. TYPE 316 STAINLESS STEEL SHALL BE USED FOR ALL TREATED LUMBER WITH A CHEMICAL RETENTION GREATER THAN THE REQUIREMENTS OF AWPA UC4A AND ACZA TREATED LUMBER IN WET SERVICE APPLICATIONS.
 2. 14 GAUGE AND THICKER CONNECTORS:
 - a. PRIME AND FINISH PAINT ALL SURFACES PER ARCHITECTURAL DRAWINGS UNLESS STATED OTHERWISE.
 - b. HOT DIPPED GALVANIZED PER ASTM A123 OR TYPE 316 STAINLESS STEEL SHALL BE USED WHEN SPECIFIED AND FOR TREATED LUMBER PER MANUFACTURERS REQUIREMENTS. POWDER COATED TO MATCH ARCHITECTURAL REQ'D.
 3. FOR FIRE RETARDANT TREATED LUMBER:
 - a. USE MANUFACTURERS RECOMMENDATIONS. WHERE THERE ARE NO MANUFACTURERS RECOMMENDATIONS USE A MINIMUM OF A STANDARD G185 COATING FOR DRY SERVICE APPLICATIONS AND TYPE 316 STAINLESS STEEL FOR WET SERVICE APPLICATIONS.
 4. STANDARD G90 COATING - CONTAINS A MINIMUM COATING OF 0.90 OZ OF ZINC PER SQUARE FOOT OF SURFACE AREA (TOTAL BOTH SIDES)
 5. STANDARD G185 COATING - CONTAINS A MINIMUM COATING OF 1.85 OZ OF ZINC PER SQUARE FOOR OF SURFACE AREA (HOT DIPPED GALVANIZED PER ASTM A123 (TOTAL FOR BOTH SIDES))
 6. HOT DIPPED GALVANIZED - CONTAINS A MINIMUM COATING OF 2.0 OZ OF ZINC PER SQUARE FOOR OF SURFACE AREA (HOT DIPPED GALVANIZED PER ASTM A123 (TOTAL FOR BOTH SIDES))
 7. ALL FASTENERS SHALL BE COATED TO MATCH THE CONNECTOR AND LUMBER REQUIREMENTS.

1 WOOD FRAMING NOTES
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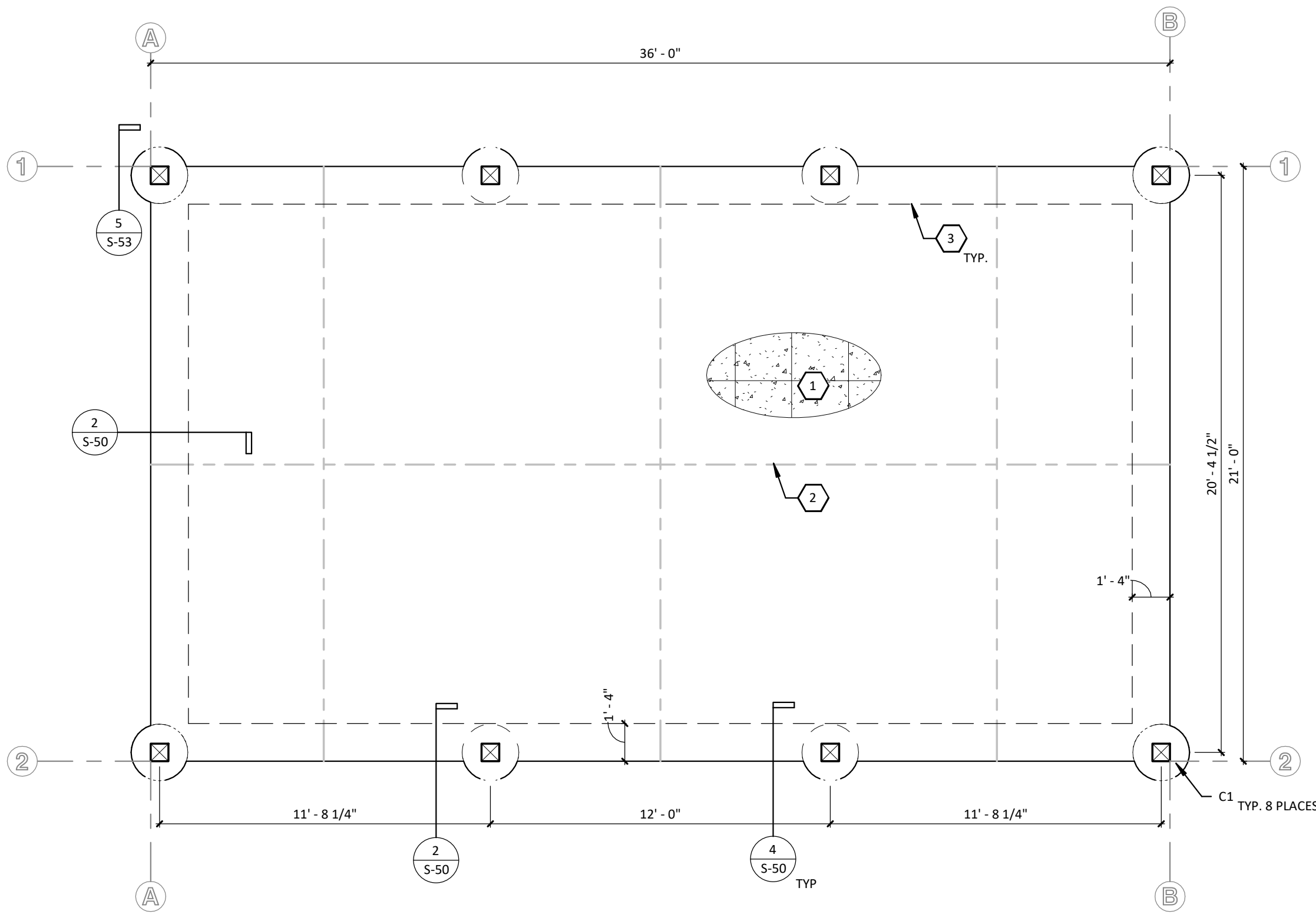
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**MONTANA FISH,
 WILDLIFE & PARKS**

STRUCTURAL NOTES
BIG ARM ARCHERY PROJECT



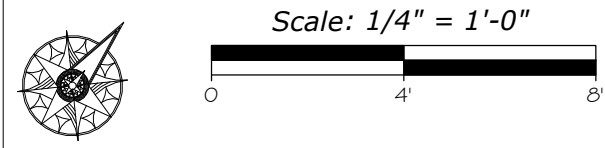


FOUNDATION LEGEND	
	FOOTING
	THICKENED SLAB
	CONTROL JOINT

FOUNDATION KEYNOTES	
1	4" CONC. SLAB W/ #4 @ 24" OC EW, SEE 1/S4.00
2	CONTROL JOINT. SEE 1/S-50
3	16" DEEP THICKENED EDGE.

COLUMN SCHEDULE			
TAG	SIZE	MATERIAL	NOTES
C1	8X8	PT HEM FIR #1	
C2	6X6	PT HEM FIR #1	

NOTE:
NOT ALL COLUMNS SHOWN ON THIS PAGE.



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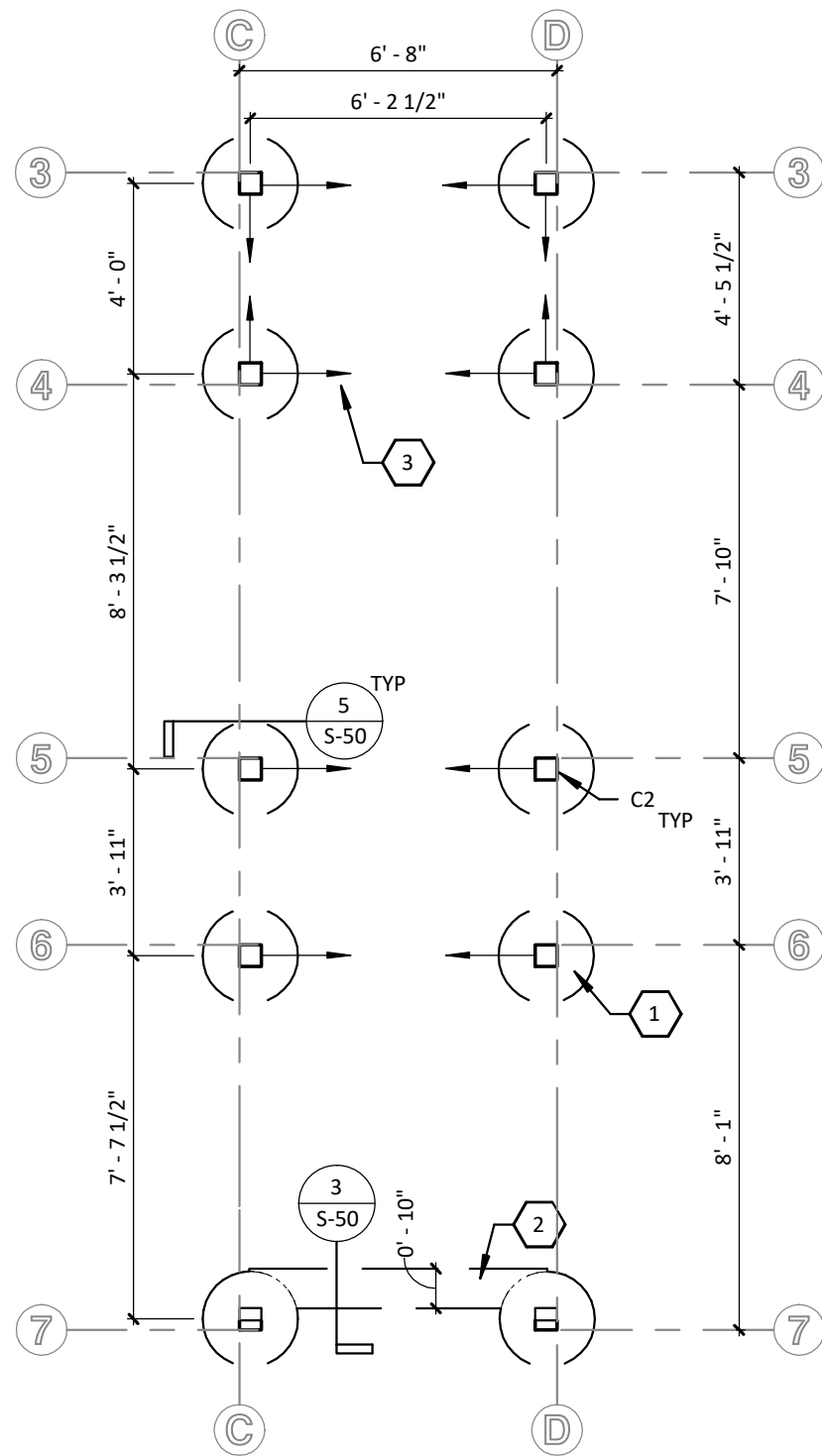
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WILDLIFE & PARKS**

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**CANOPY FDN PLAN
BIG ARM ARCHERY PROJECT**



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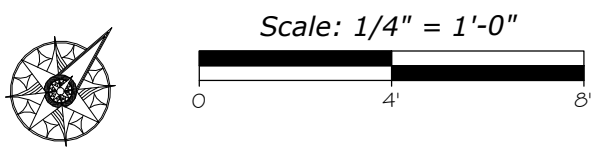


FOUNDATION LEGEND	
	FOOTING
	THICKENED SLAB
	CONTROL JOINT

STAIR FOUNDATION KEYNOTES	
1	24" DIA X 4'-0" DEEP SONOTUBE
2	4" CONCRETE STAIR LANDING.
3	STEEL ROD TENSION BRACING

COLUMN SCHEDULE			
TAG	SIZE	MATERIAL	NOTES
C1	8X8	PT HEM FIR #1	
C2	6X6	PT HEM FIR #1	

NOTE:
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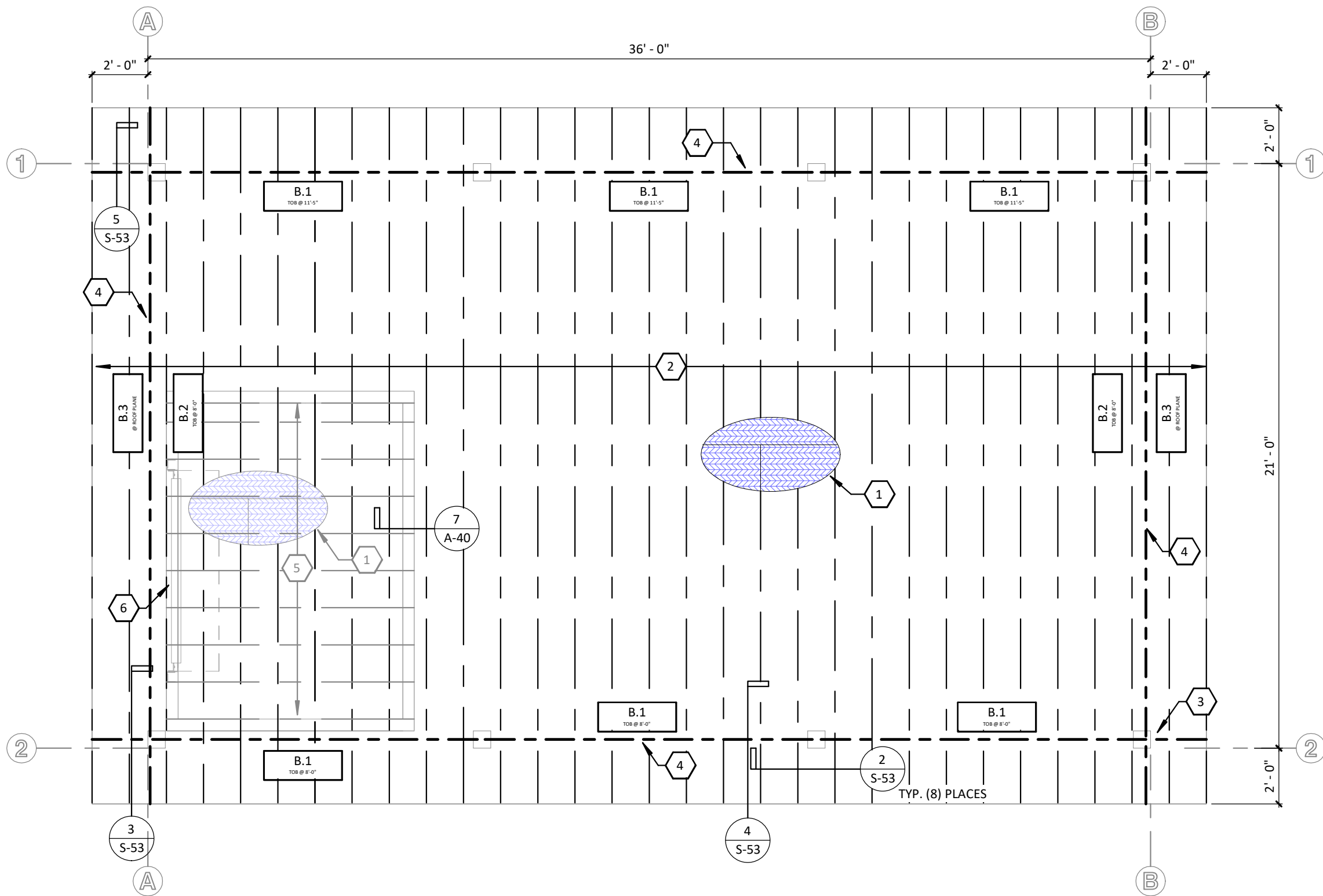
**MONTANA FISH,
WILDLIFE & PARKS**

ARCHERY PLATFORM FDN PLAN

BIG ARM ARCHERY PROJECT



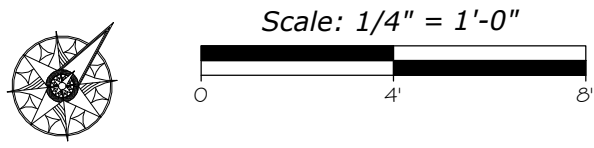
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ROOF FRAMING LEGEND	
	JOIST
	BEAM
	SHEATHING

ROOF FRAMING KEYNOTES	
1	15/32" SHEATHING WITH 10d NAILS @ 6" OC BOUNDARY AND 12" OC FIELD
2	11 7/8" BCI 6500S-1.8 RAFTERS OR SIMILAR @ 16" OC
3	B.2 BEAM TO BEAR ON CCT88 OR SIMILAR HANGER ON LOW SIDE OF ROOF AND HUC812 OR SIMILAR HANGER AGAINST 8X8 POST ON HIGH SIDE OF ROOF
4	PROVIDE 10d NAILS @ 6" OC, TYP. @ ROOF PERIMETER BEAM
5	2X6 JOISTS @ 16" OC DROP. TOP OF CEILING MIN 3" BELOW ROOF FRAMING.
6	(2) 2X10 HEADER W/ (1) TRIMMER AND (2) KINGS

ROOF BEAM SCHEDULE			
TAG	SIZE	MATERIAL	BEARING
B.1	8X12	DF/L NO. 1	SEE DETAILS
B.2	8X8	DF/L NO. 1	SEE DETAILS
B.3	3 1/2" X 11 7/8"	LVL	SEE 3/S-53



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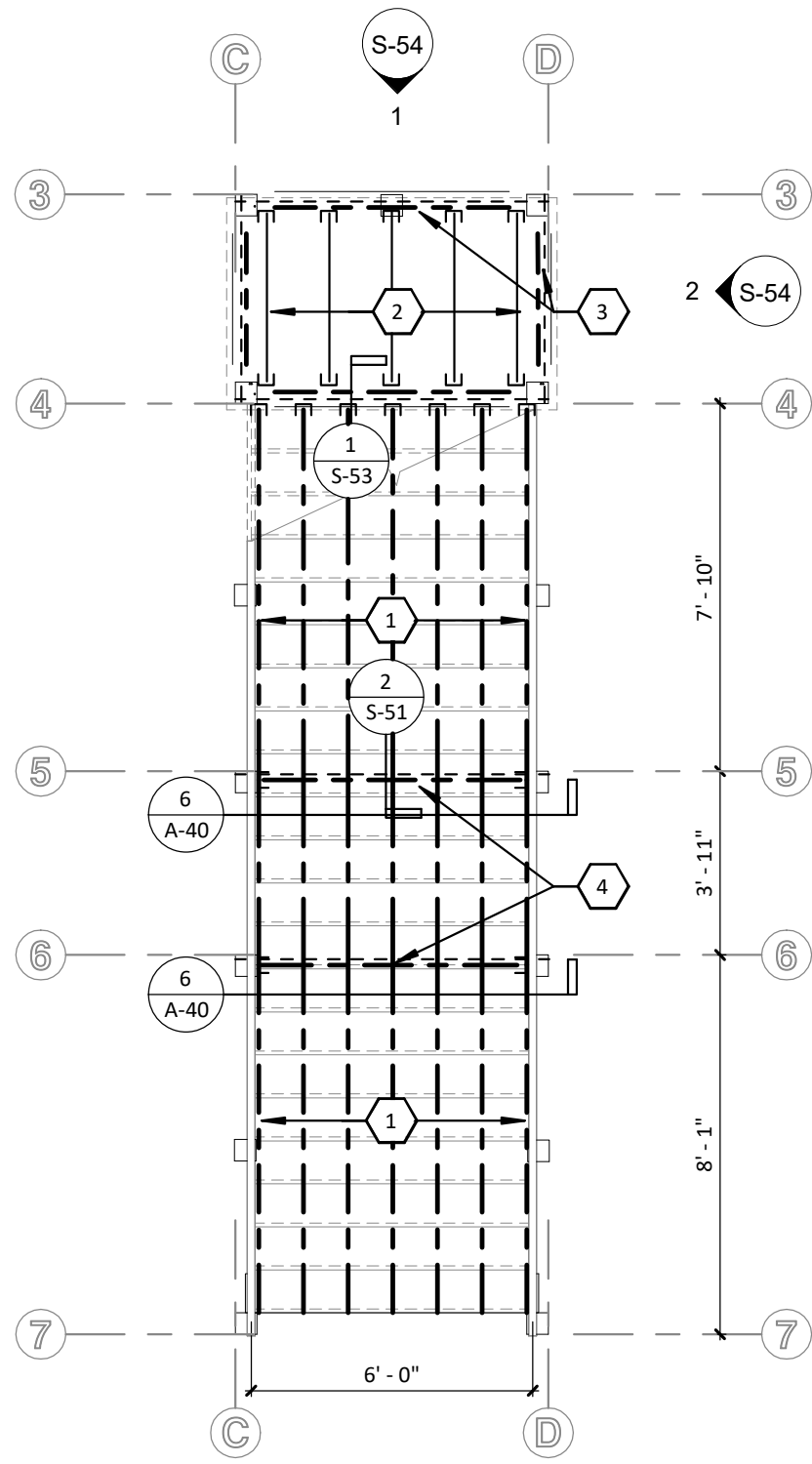
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CANOPY ROOF FRAMING PLAN

BIG ARM ARCHERY PROJECT



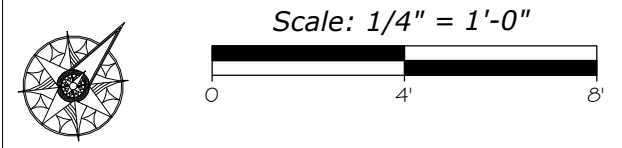
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FLOOR FRAMING LEGEND	
	JOIST
	BEAM
	CROSS MEMBER

STAIR FRAMING KEYNOTES	
1	PT 2X12 STRINGER @ 12" OC
2	PT 2X6 JOISTS @ 16" OC W/ SIMPSON LUS26 OR SIMILAR HANGERS
3	PT 6X6 POSTS AND BEAMS. SEE 4/S4.03
4	PT (2)2X12 BEAM W/ SIMPSON HUC412 OR SIMILAR HANGERS

GENERAL NOTES:
 1) SEE ARCH FOR DECKING & STAIR TREADS
 2) ALL PT LUMBER TO BE HEM FIR NO 1 OR BETTER



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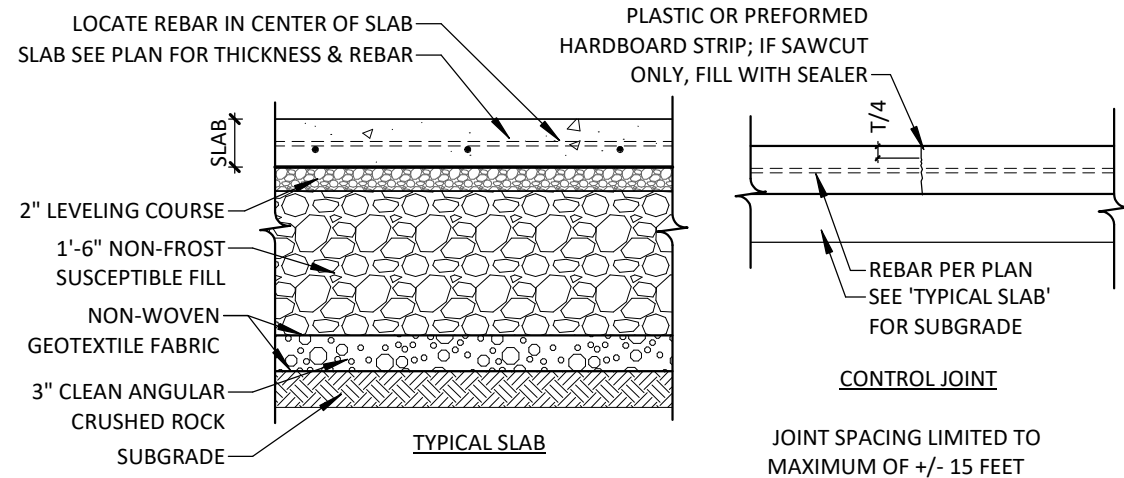
**MONTANA FISH,
 WILDLIFE & PARKS**

ARCHERY PF FRAMING PLAN

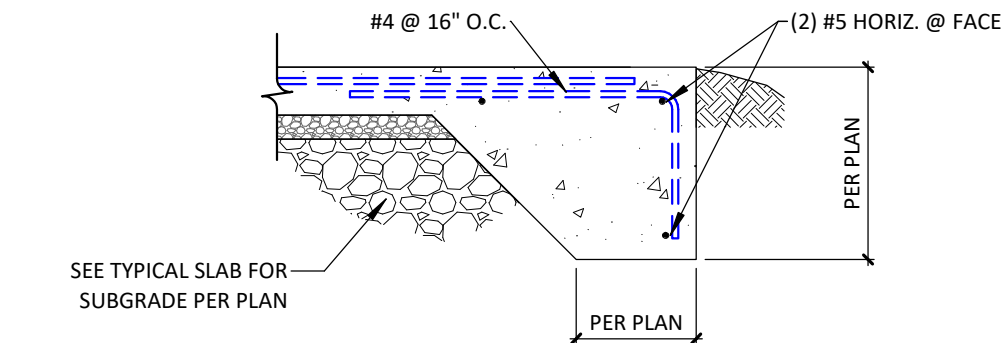
BIG ARM ARCHERY PROJECT



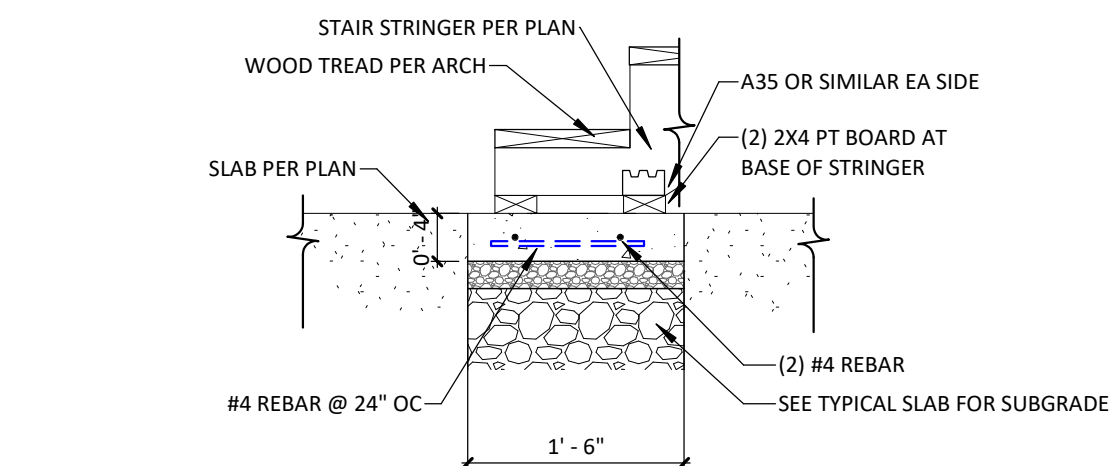
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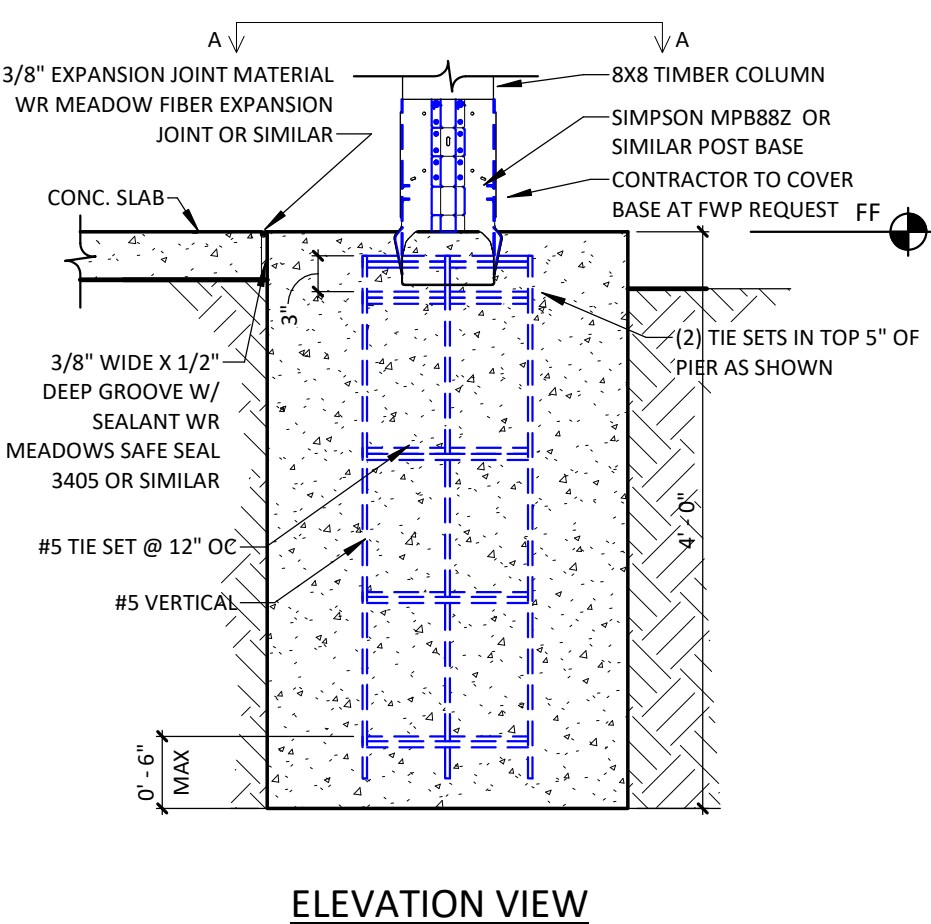
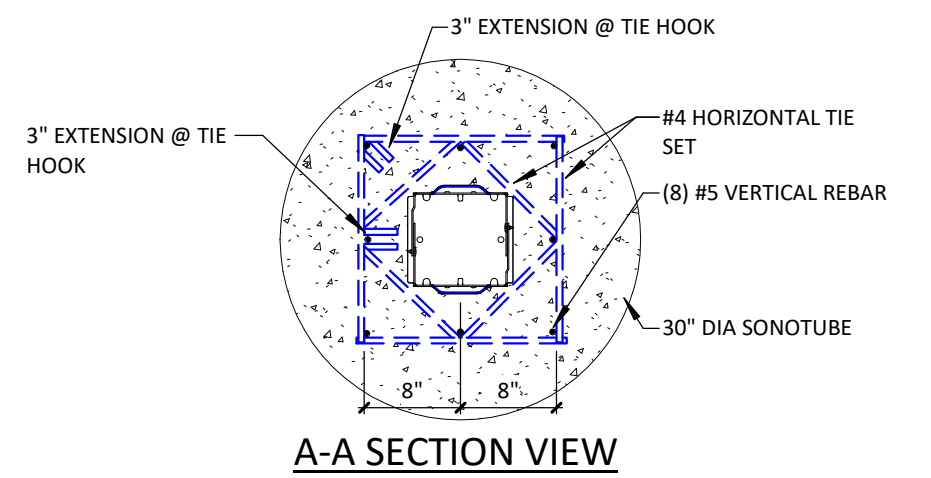
1 SLAB AND CONTROL JOINT
3/4" = 1'-0"



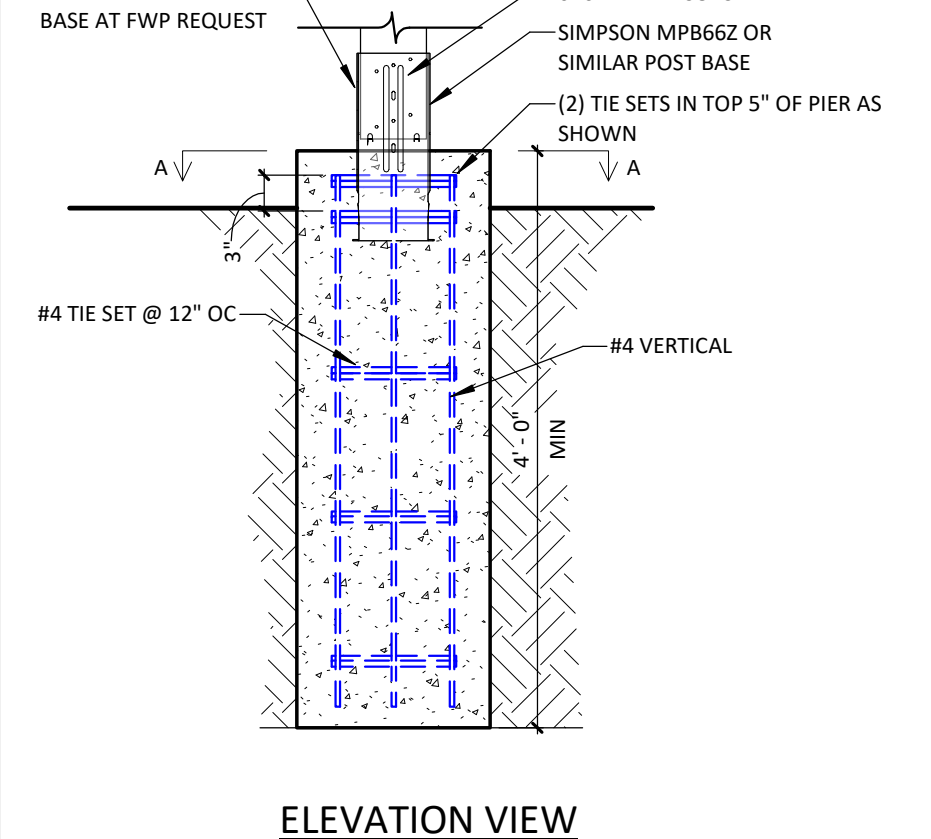
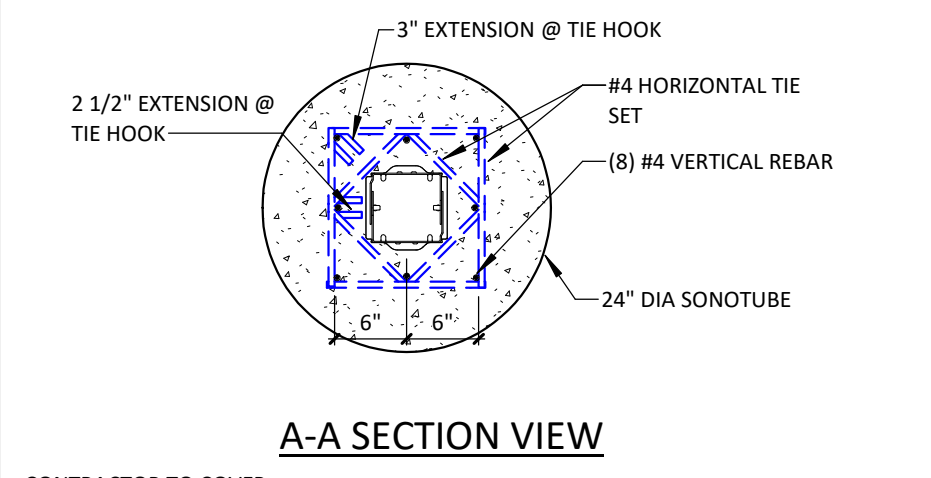
2 THICKENED SLAB
3/4" = 1'-0"



3 STAIR @ CONCRETE
3/4" = 1'-0"



4 SONOTUBE FOUNDATION
3/4" = 1'-0"



5 MPB66Z REINFORCEMENT
3/4" = 1'-0"

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**MONTANA FISH,
WILDLIFE & PARKS**

**STRUCTURAL DETAILS
BIG ARM ARCHERY PROJECT**



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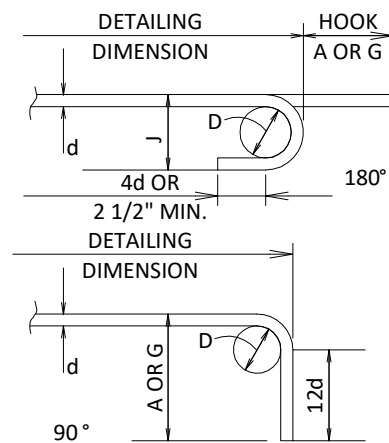
STANDARD HOOKS

ALL SPECIFIC DIMENSIONS RECOMMENDED BY CRSI BELOW MEET MINIMUM REQUIREMENTS OF ACI 318

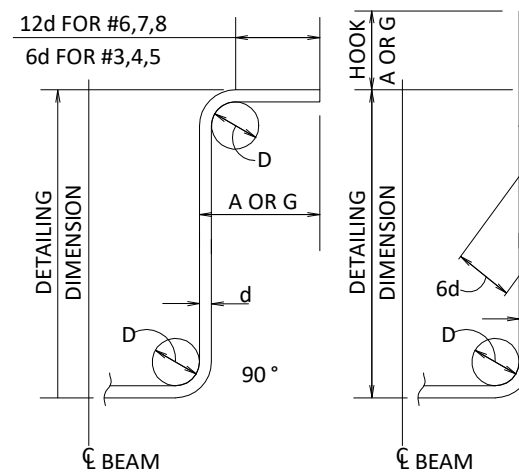
RECOMMENDED END HOOKS

ALL GRADES OF STEEL
D = FINISHED BEND DIAMETER

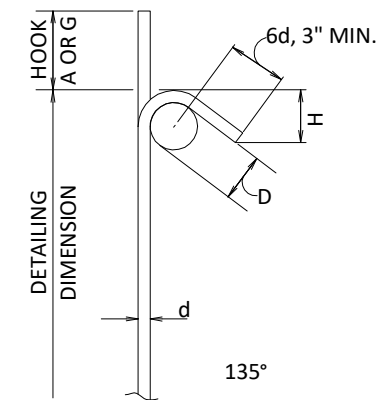
BAR SIZE	D, IN.	180° HOOKS, FT.-IN.		90° HOOKS, FT.-IN.
		A OR G	J	A OR G
#3	2 1/4	0-5	0-3	0-6
#4	3	0-6	0-4	0-8
#5	3 3/4	0-7	0-5	0-10
#6	4 1/2	0-8	0-6	1-0
#7	5 1/4	0-10	0-7	1-2
#8	6	0-11	0-8	1-4
#9	9 1/2	1-3	0-11 3/4	1-7
#10	10 3/4	1-5	1-1 1/4	1-10
#11	12	1-7	1-2 3/4	2-0
#14	18 1/4	2-3	1-9 3/4	2-7
#18	24	3-0	2-4 1/2	3-5



90° AND 135° STIRRUP AND TIE HOOKS



135° SEISMIC STIRRUP/ TIE HOOKS

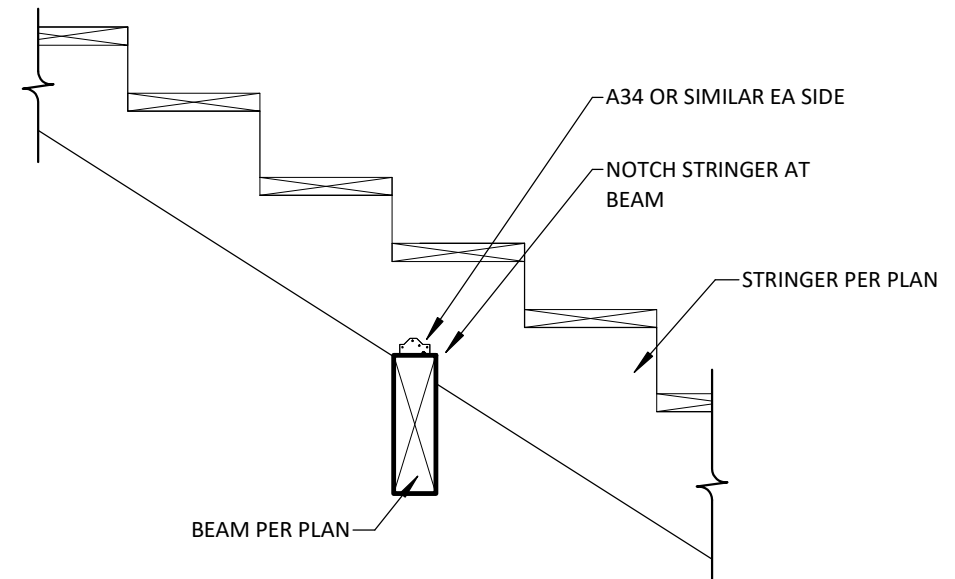


STIRRUP (TIES SIMILAR) STIRRUP AND TIE HOOK DIMENSIONS ALL GRADES OF STEEL

BAR SIZE	D, IN.	90° HOOK, IN.		
		A OR G	A OR G	H (APPROX.)
#3	1 1/2	0-4	4	2 1/2
#4	2	0-4 1/2	4 1/2	3
#5	2 1/2	0-6	5 1/2	3 3/4
#6	4 1/2	1-0	8	4 1/2
#7	5 1/4	1-2	9	5 1/4
#8	6	1-4	10 1/2	6

135° SEISMIC STIRRUP/ TIE HOOK DIMENSIONS ALL GRADES OF STEEL

BAR SIZE	D, IN.	135° HOOK, IN.	
		A OR G	H (APPROX.)
#3	1 1/2	4 1/4	3
#4	2	4 1/2	3
#5	2 1/2	5 1/2	3 3/4
#6	4 1/2	8	4 1/2
#7	5 1/4	9	5 1/4
#8	6	10 1/2	6



2 STAIR STRINGER TO 2X BEAM

3/4" = 1'-0"

1 STANDARD HOOK DETAIL

3/4" = 1'-0"

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**MONTANA FISH,
WILDLIFE & PARKS**

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STRUCTURAL DETAILS
BIG ARM ARCHERY PROJECT

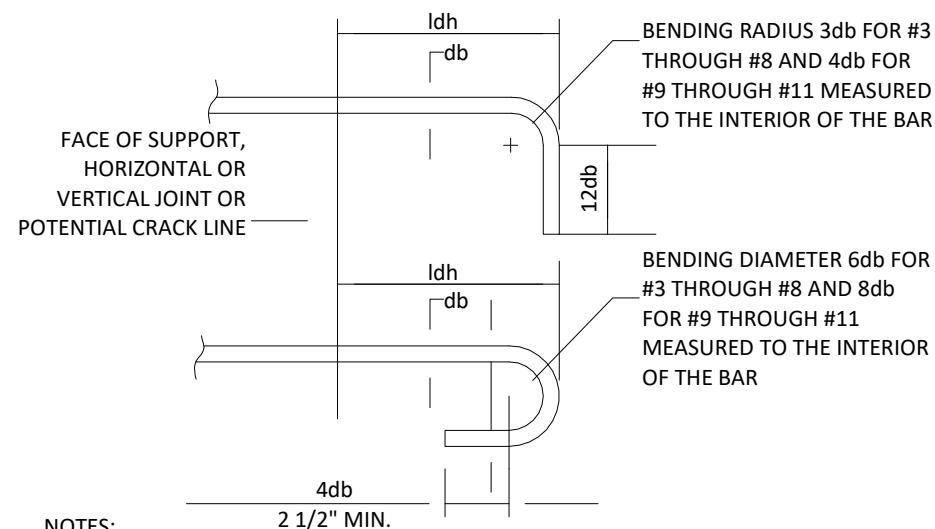


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HOOKED REINFORCEMENT TENSION DEVELOPMENT LENGTH SCHEDULE

BAR SIZE	TENSION DEVELOPMENT LENGTH, (ldh), INCHES	
	f'c = 3 KSI	f'c = 4 KSI
#3	9"	8"
#4	11"	10"
#5	14"	12"
#6	17"	15"
#7	20"	17"
#8	22"	19"
#9	25"	22"
#10	28"	24"
#11	31"	27"

SEE NOTES BELOW FOR BAR YIELD STRENGTH FACTOR



NOTES:

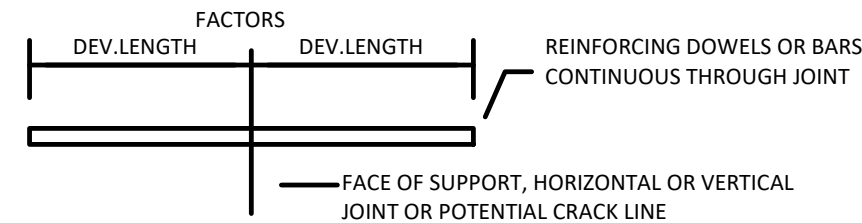
1. TABULATED DEVELOPMENT LENGTHS ARE BASED ON REINFORCING YIELD STRENGTH $F_y = 60$ KSI AND NORMAL WEIGHT CONCRETE.
2. ALL TABULATED VALUES ARE MINIMUM LENGTHS. IN CASE OF CONFLICT WITH THE PLANS, SECTIONS OR DETAILS, USE THE LONGER LENGTH.
3. ADJUST TABULATED LENGTHS BY THE FOLLOWING FACTOR WHERE APPLICABLE.
 - A. REINFORCING BAR YIELD STRENGTH OTHER THAN 60 KSI: $(f_y / 60,000)$

STRAIGHT SPLICE LENGTH SCHEDULE

BAR SIZE	LAP SPLICE LENGTH, INCHES					
	FOOTINGS		FDN WALLS		SLABS	
	TOP	BOTTOM	VERTS	HORIZ.	SINGLE MAT	DOUBLE MAT
#3	21"	28"		28"	28"	21"
#4	28"	37"		37"	37"	28"
#5	36"	46"		46"	46"	36"
#6	43"	56"		56"	56"	43"

MINIMUM 60 KSI STEEL
MINIMUM 3000 PSI CONCRETE

SEE NOTES BELOW FOR COVER AND SPACING

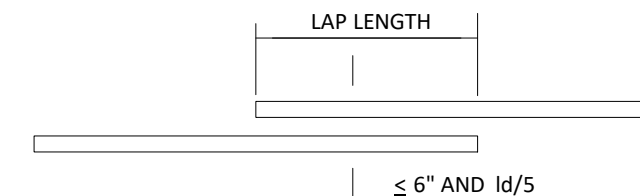


DEVELOPMENT

REFER TO "HOOKED REINFORCEMENT TENSION DEVELOPMENT LENGTH SCHEDULE" WHEN THE STRAIGHT DEV. LENGTH IN TENSION CANNOT BE ACCOMMODATED IN THE CONCRETE SECTION.

NOTES:

1. ALWAYS USE TENSION DEVELOPMENT LENGTH AND TENSION LAP SPLICE LENGTH VALUES, EXCEPT WHEN THE PLANS OR DETAILS NOTE SPECIFICALLY COMPRESSION LENGTHS.
2. TABULATED DEVELOPMENT AND LAP SPLICE LENGTHS ARE BASED ON REINFORCING YIELD STRENGTH $F_y = 60$ KSI, NORMAL WEIGHT CONCRETE AND CLASS B LAPS.
3. TOP BARS ARE DEFINED AS HORIZONTAL BARS WITH MORE THAN 12 INCHES OF FRESH CONCRETE CAST IN THE MEMBER BELOW THE DEVELOPMENT LENGTH OR SPLICE.



LAP SPLICE

LAP SPLICES IN ADJACENT BARS SHALL BE STAGGERED A MINIMUM OF 24 INCHES.

4. WHEN DIFFERENT BAR DIAMETERS ARE SPLICED, USE LARGER BAR LAP SPLICE LENGTH.
5. ALL TABULATED VALUES ARE MINIMUM LENGTHS. IN CASE OF CONFLICT WITH THE PLANS, SECTIONS OR DETAILS, USE THE LONGER LENGTH.
6. TABULATED VALUES FOR DEVELOPMENT AND LAP LENGTHS IN TENSION SHALL BE FACTORED BY 1.5 WHEN THE CLEAR COVER IS LESS THAN db AND THE CLEAR SPACING IS LESS THAN db (AND THERE ARE STIRRUPS OR TIES ALONG ld) OR IS LESS THAN $2db$ (AND THERE ARE NO STIRRUPS OR TIES ALONG ld).
7. ALL STRAIGHT BAR DEVELOPMENTS AND SPLICES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI 318.
8. $db =$ BAR DIAMETER

1 STANDARD REINFORCEMENT SCHEDULES

1" = 1'-0"

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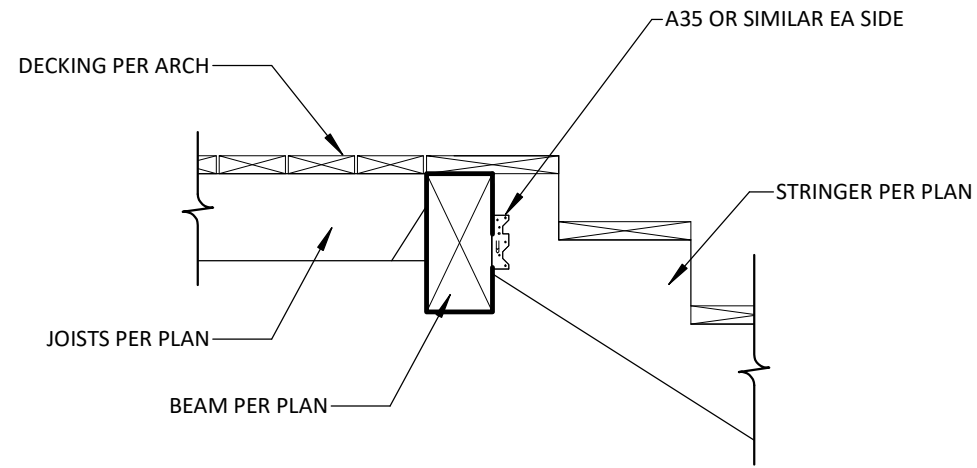
**MONTANA FISH,
WILDLIFE & PARKS**

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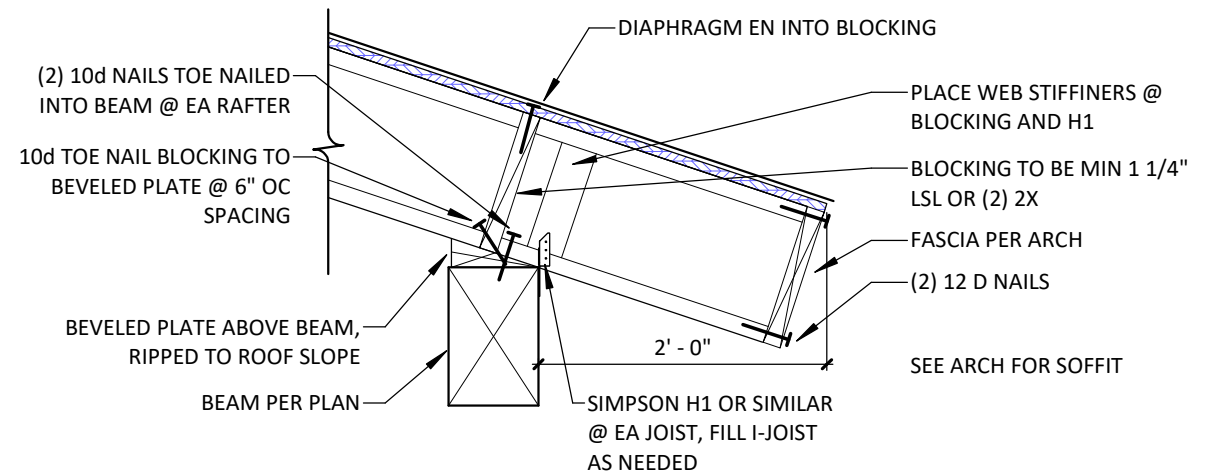
**STRUCTURAL DETAILS
BIG ARM ARCHERY PROJECT**



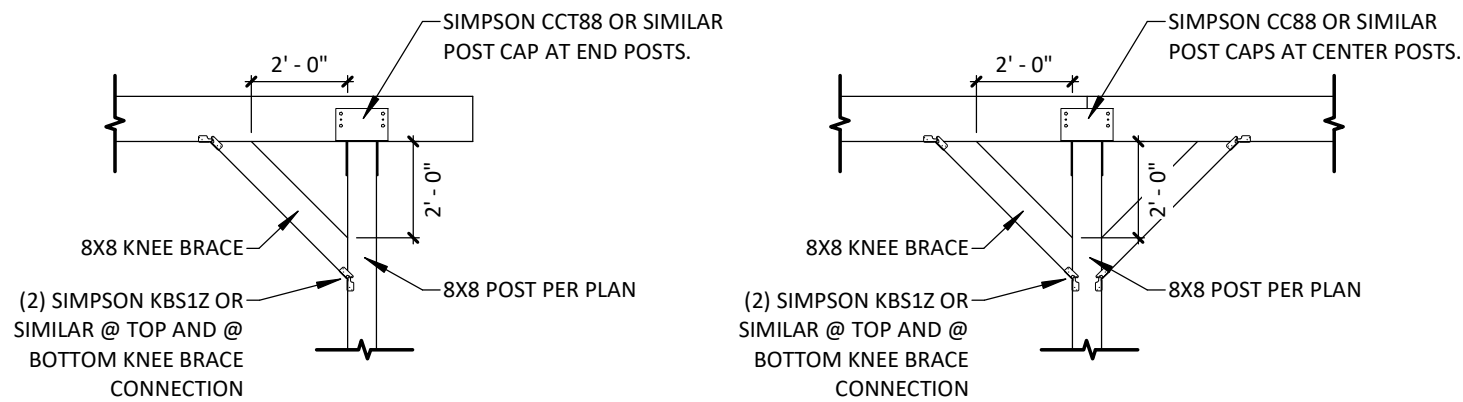
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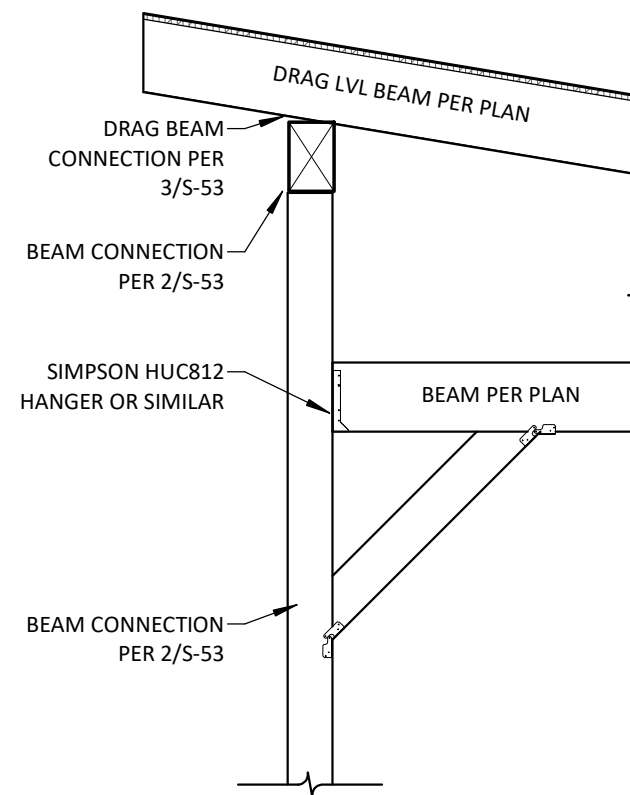
1 STAIR STRINGER TO BEAM
3/4" = 1'-0"



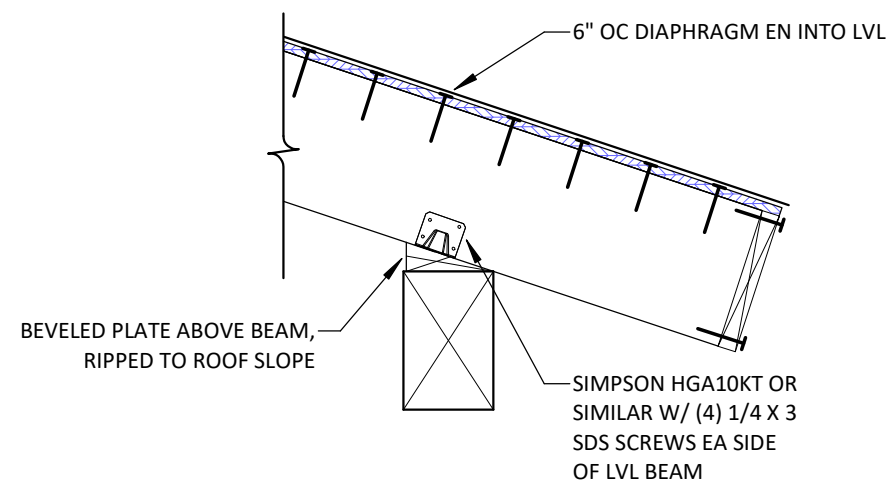
4 TYP RAFTER TO BEAM
3/4" = 1'-0"



2 KNEE BRACE CONNECTIONS
1/4" = 1'-0"



5 N/S BEAM ELEVATION
3/8" = 1'-0"



3 DRAG BEAM CONNECTION
3/4" = 1'-0"

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**MONTANA FISH,
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STRUCTURAL DETAILS
BIG ARM ARCHERY PROJECT



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ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION
	SURFACE LIGHT (TYPE DENOTED)
	WALL MOUNTED FLOODLIGHT (TYPE DENOTED)
	RECESSED LINEAR LIGHT (TYPE DENOTED)
	STRIP LIGHT (TYPE DENOTED)
	SINGLE POLE SWITCH
	DUPLEX RECEPTACLE
	CIRCUIT BREAKER PANEL
	KEYED NOTE (SEE SCHEDULE)
	HOME RUN TO BRANCH CIRCUIT PANELBOARD. THE PANELBOARD DESIGNATION IS SHOWN WITH THE HOME RUN ARROW AIMING AT THE ID. CIRCUIT BREAKER SIZES (AMPS/NUMBER OF POLES) ARE SHOWN IN THE PANELBOARD SCHEDULE WITH THE CORRESPONDING PANELBOARD AND CIRCUIT DESIGNATION.
	CIRCUIT ID. NOTATION IS FOUND NEXT TO A SWITCH, WIRE, LIGHT, RCPT OR EQMT. INDICATES PANEL NAME AND CIRCUIT NUMBER(S). EXAMPLE: PANEL A, CIRCUIT NUMBER 1

CODE COMPLIANCE

BUILDING ELECTRICAL SYSTEMS ARE DESIGNED IN ACCORDANCE WITH THE FOLLOWING CODES:

- 2018 IBC (INTERNATIONAL BUILDING CODE)
- 2020 NFPA 70 (NATIONAL ELECTRICAL CODE)

ELECTRICAL MOUNTING HEIGHTS

HEIGHTS ARE TO TOP OF BOX UNLESS OTHERWISE NOTED

RECEPTACLE	20"
SWITCH	48"
PANELBOARD	72" TOP OF ENCLOSURE

GENERAL ELECTRICAL NOTES AND SPECIFICATIONS

GENERAL NOTES:

1. ALL WORK SHALL CONFORM TO ALL APPLICABLE REQUIREMENTS OF FEDERAL AND STATE CODES, REGULATIONS, LAWS AND ORDINANCES, LOCAL LAWS AND REGULATIONS, LOCAL JURISDICTIONS, AND THE AUTHORITY HAVING JURISDICTION (AHJ).
2. ALL ELECTRICAL WORK UNDER THE REQUIREMENTS OF THESE SPECIFICATIONS SHALL MEET THE REQUIREMENTS OF THE CURRENT STATE ADOPTED EDITIONS OF THE NATIONAL ELECTRICAL CODE (NEC) AND SHALL ALSO BE IN COMPLIANCE WITH ALL APPLICABLE STATE AND/OR LOCAL LAWS AND ORDINANCES.

COORDINATION:

1. ALL WORK SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES. EC TO COORDINATE ALL ELECTRICAL MATERIAL, EQUIPMENT, FIXTURES, AND DEVICE LOCATIONS WITH ALL RELATED ARCHITECTURAL, MECHANICAL, STRUCTURAL, AND OTHER TRADE DRAWINGS.
2. OWNER, GENERAL CONTRACTOR, AND ELECTRICAL CONTRACTOR SHALL COORDINATE AND VERIFY ALL OTHER ELECTRICAL WORK REQUIRED WHETHER OR NOT SPECIFIED ON THE DRAWINGS. OTHER WORK INCLUDES BUT IS NOT LIMITED TO: AUDIO SYSTEMS, LIFE SAFETY SYSTEMS, FIRE/SECURITY ALARMS, MECHANICAL SYSTEMS, TELEPHONE/DATA CABLES, SITE/SEWERAGE WORK, UTILITY/TRENCHING, AND EMERGENCY/STANDBY POWER SYSTEMS.

ELECTRICAL DRAWINGS:

1. UNLESS OTHERWISE NOTED, ELECTRICAL WORK IS DRAWN WITH BOLD LINES.
2. THE CONTRACTOR SHALL KEEP A RECORD OF CHANGES MADE AND THE RECORD SHALL BE TURNED OVER TO THE OWNER AT THE COMPLETION OF PROJECT FOR THE OWNERS RECORDS. PROVIDE THE OWNER WITH ONE COMPLETE SET OF ELECTRICAL "AS-BUILT" DRAWINGS AT THE COMPLETION OF THE JOB.

WORKMANSHIP:

1. WORKMANSHIP SHALL BE FIRST QUALITY AND IN ACCORDANCE WITH THE BEST PRACTICE OF THE TRADE. ONLY WORKMEN SKILLED IN THE TASKS ASSIGNED TO THEM SHALL BE EMPLOYED.
2. ALL ELECTRICAL WORK IS TO BE PERFORMED, INSTALLED, TESTED, INSPECTED, AND APPROVED BY QUALIFIED, LEGALLY LICENSED AND BONDED ELECTRICAL CONTRACTORS PER THE LAWS OF THE STATE.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGE CAUSED BY THE CONTRACTOR OR ITS EMPLOYEES TO THE SOLE SATISFACTION OF OWNER.

DELIVERY, STORAGE, AND HANDLING:

1. RECEIVE, INSPECT, HANDLE, AND STORE ALL ELECTRICAL EQUIPMENT, FIXTURES, AND MATERIALS IN ACCORDANCE WITH MANUFACTURE'S INSTRUCTIONS.

MATERIAL:

1. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIALS, METHODS, AND WORK MUST BE IN ACCORDANCE AND IN COMPLIANCE WITH THE MOST RECENT APPROVED EDITION OF ADAAG, ANSI, IEEE, NEC, NEMA, NFPA, OSHA, IBC, TIA, CODES AND STANDARDS, OR OTHER AS REQUIRED BY THE AHJ.
2. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIAL, AND DEVICES SHALL BE NEW AND ORIGINAL EQUIPMENT MANUFACTURED (UNLESS OTHERWISE NOTED), AND BE LISTED WITH THE UNDERWRITERS LABORATORIES INC., OR EQUAL.
3. ALL ELECTRICAL EQUIPMENT, FIXTURES, MATERIAL, AND DEVICES SHALL BE COMPATIBLE, EACH WITH ONE ANOTHER AND WITH EXISTING WORK AND WITH EXISTING BUILDING (IF APPLICABLE) STANDARDS.

CONTRACTOR RESPONSIBILITIES:

1. CONTRACTOR SHALL APPLY AND PAY FOR ALL REQUIRED PERMITS, FEES, LICENSES AND INSPECTIONS FOR ALL ELECTRICAL WORK.
2. CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS, EQUIPMENT, LABOR AND SERVICES NECESSARY TO FURNISH AND INSTALL COMPLETE WORKING ELECTRICAL SYSTEMS.
3. UNLESS OTHERWISE INDICATED, MANUFACTURERS SPECIFIED IN THE DRAWINGS AND SPECIFICATIONS ARE BASIS OF DESIGN. APPROVED EQUAL PRODUCTS ARE ALSO ALLOWED IF:
 - a. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND SUBMITTALS FOR ENGINEER AND ARCHITECTURAL REVIEW PRIOR TO CONSTRUCTION.
 - b. AT A MINIMUM PROVIDE SUBMITTALS FOR ENGINEER AND ARCHITECTURAL REVIEW FOR LIGHTING, POWER DISTRIBUTION EQUIPMENT, AND ELECTRICAL DEVICES.

CLEANING:

1. CLEAN FINISHES, TOUCH UP PAINT, AND OTHERWISE REPAIR AND RESTORE MARRED EXPOSED FINISHES TO ELIMINATE VISUAL DEFECTS. MATCH ORIGINAL FACTORY FINISH.

CLOSEOUT:

1. ALL SYSTEMS, AT PROJECT COMPLETION AND BEFORE FINAL ACCEPTANCE, SHALL BE DEMONSTRATED TO HAVE A COMPLETE AND WORKING FUNCTIONAL OPERATION.
2. ALL BROCHURES, OPERATING AND MAINTENANCE DATA AND MANUALS, CATALOGS, SHOP DRAWINGS, ETC, RELATED TO ELECTRICAL WORK SHALL BE TURNED OVER TO THE OWNER AT JOB COMPLETION BY EC. ALL PRODUCT WARRANTY REGISTRATION CARDS, APPLICATIONS, AND CERTIFICATES SHALL BE COMPLETED, FILLED OUT, AND TURNED OVER TO OWNER. ALL SPARE, SURPLUS, AND RELATED ADJUSTMENT PARTS, TOOLS OR DEVICES ARE TO BE TURNED OVER TO OWNER.
3. ALL COMPLETED ELECTRICAL JOB(S) SHALL BE GUARANTEED BY THE EC. AT COMPLETION OF WORK, PROVIDE WRITTEN WARRANTY.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES:

1. PROVIDE AND INSTALL PROPER SIZE AND NUMBER OF CONDUCTORS REQUIRED BY THE NEC TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.
2. ALLOW FOR 3% MAXIMUM VOLTAGE DROP ON ALL CONDUCTORS. UPSIZE WIRES IF NECESSARY.
3. MINIMUM CONDUCTOR SIZE:
 - A. BRANCH CIRCUITS: 12 AWG.
4. CONDUCTOR MATERIAL:
 - A. ALL CONDUCTOR SHALL BE TYPE THHN, THHN/THWN, OR THHN/THWN-2 UNLESS NOTED OTHERWISE.
 - B. PROVIDE COPPER CONDUCTORS FOR ALL CIRCUITS UNLESS NOTED OTHERWISE. CONDUCTOR SIZES INDICATED ARE BASED ON COPPER. PANEL FEEDS MAY BE ALUMINUM.
 - C. MC CABLE IS ACCEPTABLE.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEM:

1. GROUNDING AND BONDING WORK SHALL COMPLY WITH REQUIREMENTS OF NEC, LOCAL UTILITY, TELEPHONE COMPANY REQUIREMENTS, AND AHJ.
 - a. UNLESS SPECIFICALLY INDICATED TO BE EXCLUDED, PROVIDE ALL REQUIRED COMPONENTS, CONDUCTORS, CONNECTORS, CONDUIT, BOXES, FITTING, SUPPORTS, ACCESSORIES, ETC. AS NECESSARY FOR COMPLETE GROUNDING AND BONDING SYSTEM.
 - b. PROVIDE A COPPER EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAYS.

CONDUIT FOR ELECTRICAL SYSTEM:

1. CONCEAL ALL CONDUIT AND WIRING IN WALLS AND CEILING SPACES. MECHANICAL/ELECTRICAL ROOMS AND AREAS WITH UNFINISHED SURFACES MAY HAVE EXPOSED CONDUIT.

IDENTIFICATION FOR ELECTRICAL SYSTEM:

1. COMPLY WITH REQUIREMENTS OF NEC.
2. PANELBOARD IDENTIFICATION MUST BE TWO-LAYER OR THREE LAYER LAMINATED ACRYLIC OR ELECTRICALLY NON-CONDUCTIVE PHENOLIC WITH BEVELED EDGES, MINIMUM THICKNESS OF 1/16 INCH; MECHANICALLY ENGRAVED TEXT.

INTERIOR LIGHTING:

1. COORDINATE THE INSTALLATION OF LUMINARIES WITH MOUNTING SURFACES INSTALLED UNDER OTHER SECTIONS OR BY OTHERS. COORDINATE THE WORK WITH PLACEMENT OF SUPPORTS, ANCHORS, ETC. REQUIRED FOR MOUNTING. COORDINATE COMPATIBILITY OF LUMINARIES AND ASSOCIATED TRIMS WITH MOUNTING SURFACES AT INSTALLED LOCATIONS.
2. NOTIFY ARCHITECT OF ANY CONFLICTS OR DEVIATIONS FROM CONTRACT DOCUMENTS TO OBTAIN DIRECTION PRIOR TO PROCEEDING WITH WORK.

EXTERIOR LIGHTING:

1. COORDINATE PLACEMENT OF POLES AND ASSOCIATED FOUNDATIONS WITH UTILITIES, CURBS, SIDEWALKS, TREES, WALLS, FENCES, ETC. INSTALLED BY OTHERS. COORDINATE ELEVATION TO OBTAIN SPECIFIED FOUNDATION HEIGHT.
2. NOTIFY ARCHITECT OF ANY CONFLICTS OR DEVIATIONS FROM CONTRACT DOCUMENTS TO OBTAIN DIRECTION PRIOR TO PROCEEDING WITH WORK.

26 06 00 SCHEDULES FOR ELECTRICAL:

1. PANEL SCHEDULES SHALL BE TYPEWRITTEN DIRECTORY OF CIRCUITS AND PLACED IN LOCATION PROVIDED BY PANELBOARD MANUFACTURER.

26 27 00 WIRING DEVICES:

1. ELECTRICAL DEVICES SHALL BE 20A COMMERCIAL GRADE WITH STAINLESS STEEL PLATES.
2. PROVIDE AND INSTALL GFCI AND ARC FAULT PROTECTION REQUIRED BY THE NEC AND AHJ.
3. PROVIDE AND INSTALL WEATHER-RESISTANT RECEPTACLES AND COVERS REQUIRED BY THE NEC AND AHJ.

PANELS:

1. PANELS MAY HAVE PLUG-TYPE BREAKERS.

DRAWING INDEX

E0.00	ELECTRICAL TITLE SHEET
E1.10	LIGHTING PLAN
E2.10	POWER PLAN
E5.00	ELEC DIAGRAMS & SCHEDULES



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**MONTANA FISH,
WILDLIFE & PARKS**

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ELECTRICAL TITLE SHEET
BIG ARM ARCHERY PROJECT



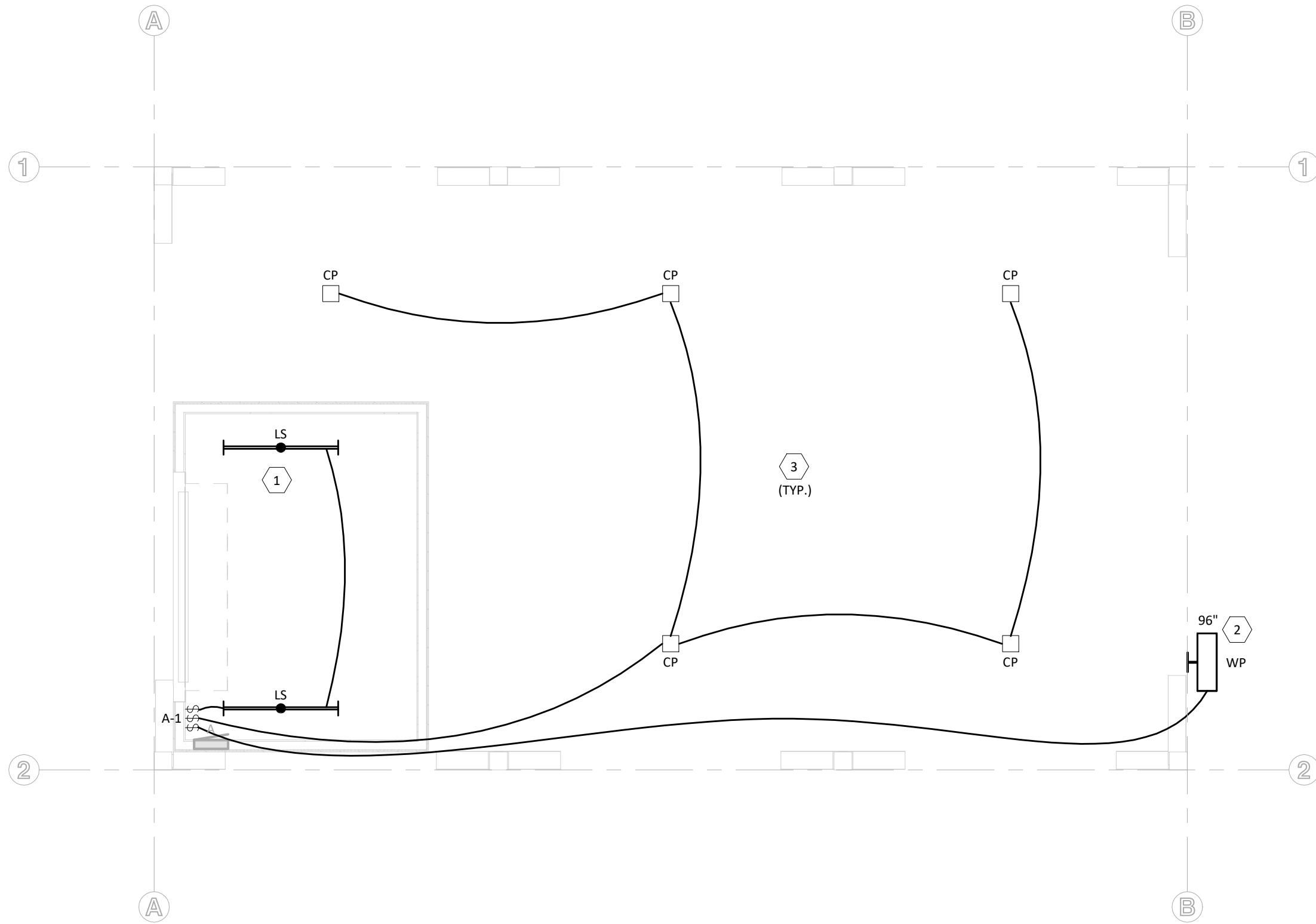
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LIGHTING GENERAL NOTES

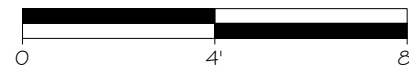
- * PROVIDE 20A SWITCHES & STAINLESS STEEL COVERS.
- * PROVIDE METAL 4 SQUARE BOXES AND MUD RINGS.
- * CONCEAL MC CABLE IN ROOF/WALL STRUCTURE .

KEYNOTES

- 1 COORDINATE EXACT LOCATION OF LIGHTING IN THIS SPACE WITH GARAGE DOOR INSTALLER.
- 2 MOUNT WALLPACK ON GABLE END.
- 3 CONCEAL MC CABLE IN ROOF STRUCTURE.



Scale: 1/4" = 1'-0"



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**MONTANA FISH,
 WILDLIFE & PARKS**

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LIGHTING PLAN

BIG ARM ARCHERY PROJECT



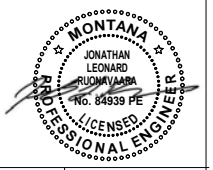
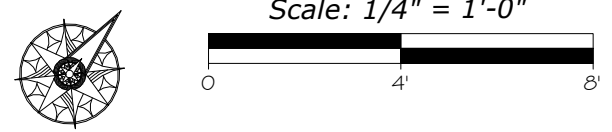
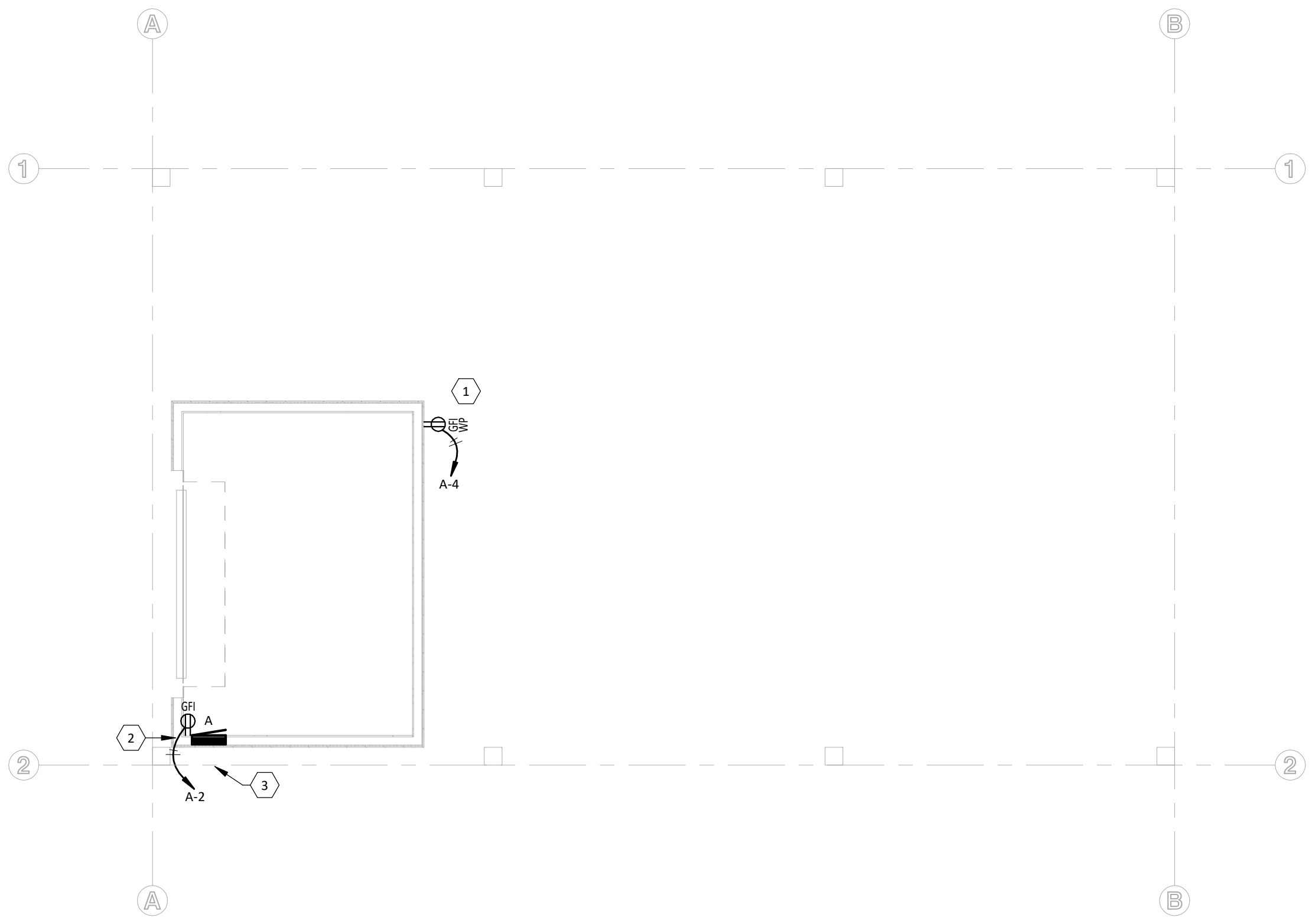
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POWER GENERAL NOTES

- * PROVIDE 20A WEATHER RESISTANT RECEPTACLES & STAINLESS STEEL COVERS.
- * PROVIDE METAL 4 SQUARE BOXES AND MUD RINGS.
- * CONCEAL MC CABLE IN ROOF/WALL STRUCTURE .

KEYNOTES

- 1 PROVIDE METAL LOCKABLE WEATHERPROOF IN-USE COVER. HUBBELL MX3200 OR EQUAL.
- 2 MOUNT GFI RCPT UNDER PANEL.
- 3 PANEL IS SERVED FROM PEDESTAL MOUNTED SERVICE. REFER TO ELECTRICAL RISER DIAGRAM AND CIVIL DRAWINGS.



JLR DRAWN BY:	9/21/22 DATE:	REVISD BY:	DATE:	APPROVED BY:	DATE:
TLM CHECKED BY:	9/21/22 DATE:	APPROVED BY:	DATE:	APPROVED BY:	DATE:



**MONTANA FISH,
WILDLIFE & PARKS**

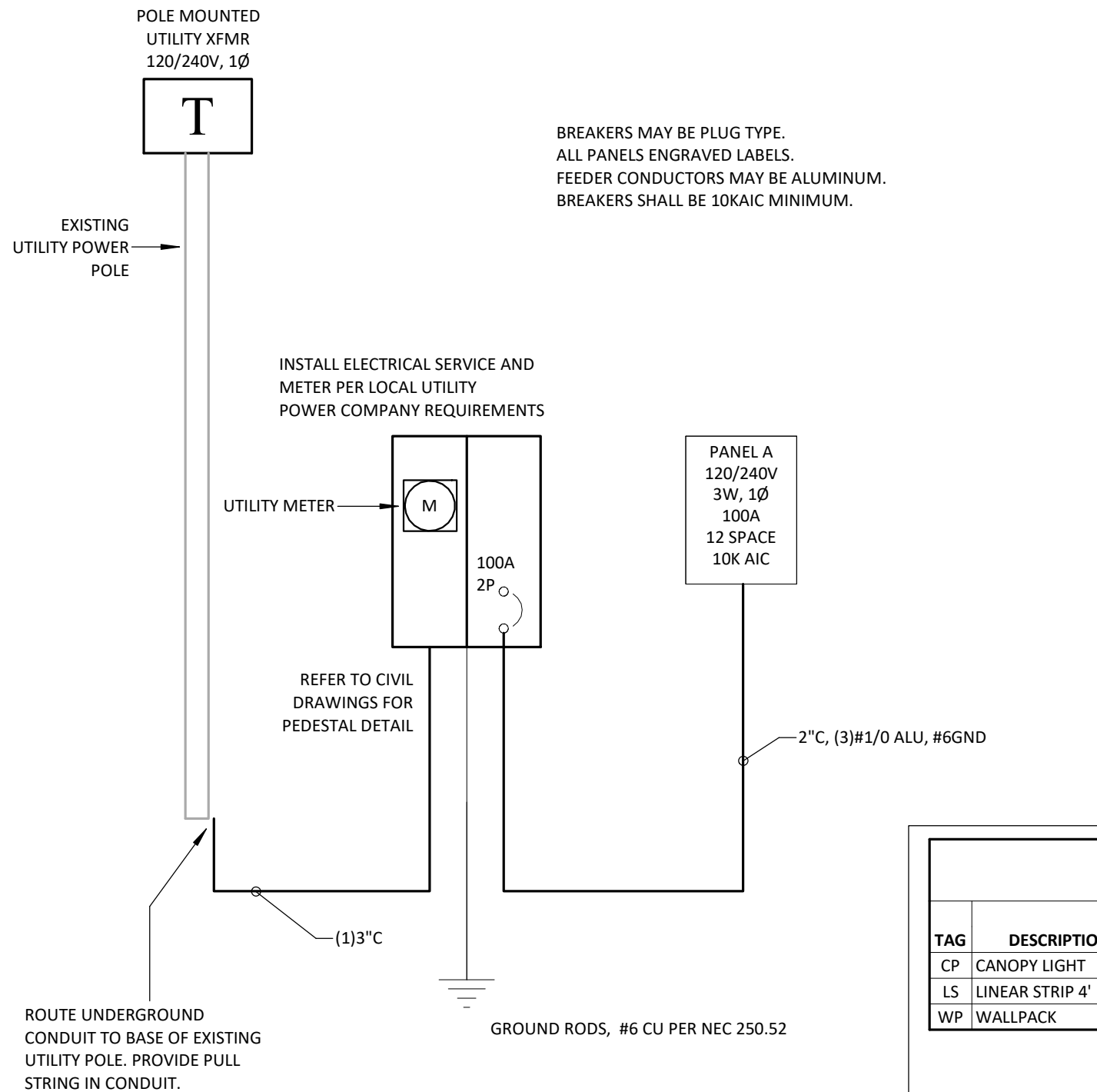
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POWER PLAN

BIG ARM ARCHERY PROJECT



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PANEL: A

LOCATION: VOLTS: 120/240 1Ø A.I.C. RATING: 10,000 AMPS SYMMETRICAL
 SUPPLY FROM: PHASES: 1 MAINS TYPE:
 MOUNTING: WIRES: 3 MAINS RATING: 100 A
 ENCLOSURE: MCB RATING: 100 A

NOTES: OPTIONAL DWELLING UNIT CALCULATIONS

CKT	CIRCUIT DESCRIPTION	BKR	P	A	B	P	BKR	CIRCUIT DESCRIPTION	CKT		
1	LIGHTS	20 A	1	266 VA	180 VA		1	20 A	RCPT-INTERIOR	2	
3						180 VA	1	20 A	RCPT-EXTERIOR	4	
5										6	
7										8	
9										10	
11										12	
				TOTAL LOAD:							
				446 VA		180 VA					
				TOTAL AMPS:							
				4 A		2 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
RCPT	360 VA	100.00%	360 VA		
LIGHTS	266 VA	125.00%	333 VA		
				TOTAL CONN. LEAD: 626 VA	
				TOTAL EST. DEMAND: 693 VA	
				TOTAL CONN.: 3 A	
				TOTAL EST. DEMAND: 3 A	

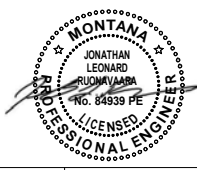
NOTES:

LIGHTING FIXTURE SCHEDULE

TAG	DESCRIPTION	BASIS OF DESIGN		MOUNTING	VOLT	WATTS	LED LAMP			NOTE
		MFR	CATALOG SERIES				COLOR TEMP	LUMENS	CRI	
CP	CANOPY LIGHT	H.E. WILLIAMS	VG1-L30/740-T5-DBZ-DRV-120	SURFACE	120 V	36 W	4000K	3566 lm	70	DARK BRONZE FINISH. PROVIDE WIREGUARD.
LS	LINEAR STRIP 4'	H.E. WILLIAMS	76R-4-L30/840-120V	SURFACE	120 V	21 W	4000K	3000 lm	80	
WP	WALLPACK	H.E. WILLIAMS	WPAS-L34/850-BZ-WG-UNV	WALL	120 V	44 W	5000K	3433 lm	80	BRONZE FINISH. PROVIDE WIREGUARD.

1 ELECTRICAL RISER DIAGRAM

N.T.S.



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TLM CHECKED BY:	9/21/22 DATE:	APPROVED BY:	DATE:	APPROVED BY:	DATE:



ELEC DIAGRAMS & SCHEDULES

BIG ARM ARCHERY PROJECT