

US Army Corps
of Engineers
Portland District

BONNEVILLE LOCK AND DAM BRADFORD ISLAND FISH LADDER FY2019 FISH ACCORDS LAMPREY PASSAGE PLAN AND SPECIFICATIONS DRAWINGS - 90% REVIEW

THIS PROJECT WAS DESIGNED BY THE PORTLAND DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER 1110-1-8152.

MARK J. SAWKA, P.E.
CHIEF, DESIGN BRANCH

PATRICK L. DUYCK, P.E.
CHIEF, ENGINEERING & CONSTRUCTION DIVISION

MICHAEL D. HELTON, PMP
COLONEL, CORPS OF ENGINEERS
DISTRICT COMMANDER

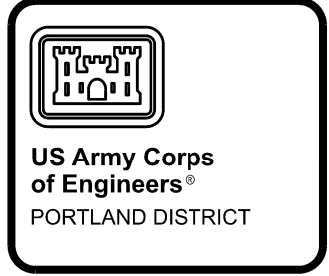
DATE: _____

SOLICITATION NUMBER: _____

REVISION MARK	FILE NAME	SHEET ID	DRAWING TITLE	SHEET ACTION No.	REVISION MARK	FILE NAME	SHEET ID	DRAWING TITLE	SHEET ACTION No.	
GENERAL PLANS					MECHANICAL PLANS					
	BDF1.124_G-001XXX.DGN	G-001	DRAWING INDEX SHEET NO.1	2						
	BDF1.124_G-002XXX.DGN	G-002	DRAWING INDEX SHEET NO.2	2						
	BDF1.124_G-003XXX.DGN	G-003	RESERVED	2						
	BDF1.124_G-004XXX.DGN	G-004	GENERAL NOTES AND SYMBOLS	2		BDF1.124_M###XXX.dgn	M-001	RESERVED	2	
	BDF1.124_G-005XXX.DGN	G-005	DISTRICT BOUNDARY, LOCAL VICINITY, PROJECT SITE MAPS AND PROJECT PHOTO	2						
	BDF1.124_G-006XXX.DGN	G-006	LAMPREY PASSAGE SYSTEM ISOMETRIC LOOKING NORTHEASTERLY	2						
	BDF1.124_G-007XXX.DGN	G-007	LAMPREY PASSAGE SYSTEM ISOMETRIC LOOKING SOUTHEASTERLY	2		BDF1.124_MD###XXX.DGN	MD-001	RESERVED	2	
	BDF1.124_G-008XXX.DGN	G-008	LAMPREY PASSAGE SYSTEM PLAN	2		BDF1.124_MD###XXX.DGN	MD-002	RESERVED	2	
STRUCTURAL PLANS					LAMPREY PASSAGE SYSTEM, "F-SERIES"					
	GENERAL SITE ARRANGEMENTS AND NOTES, (4) SHEETS					BDF1.124_MF###XXX.DGN				2
	BDF1.124_S-001XXX.DGN	S-001	FACILITY STRUCTURES GENERAL STRUCTURAL NOTES	2		BDF1.124_MF###XXX.DGN	MF-101	GENERAL FLUME ASSEMBLY	2	
	BDF1.124_S-002XXX.DGN	S-002	FACILITY STRUCTURES DIMENSIONAL CONTROL PLAN	2		BDF1.124_MF###XXX.DGN	MF-501	ENTRANCE AND CLIMBING RAMP DETAILS	2	
	BDF1.124_S-003XXX.DGN	S-003	RESERVED	2		BDF1.124_MF###XXX.DGN	MF-502	ENTRANCE AND CLIMBING RAMP WELD DETAILS	2	
	BDF1.124_S-004XXX.DGN	S-004	RESERVED	2		BDF1.124_MF###XXX.DGN	MF-503	WEIR CONNECTOR DETAILS	2	
	DEMOLITION SHEETS, FEATURE "D", (3) SHEETS					BDF1.124_MF###XXX.DGN				2
	BDF1.124_SD###XXX.DGN	SD###	RESERVED	2		BDF1.124_MF###XXX.DGN	MF-504	REST BOX DETAILS	2	
	BDF1.124_SD###XXX.DGN	SD###	RESERVED	2		BDF1.124_MF###XXX.DGN	MF-505	TURNING FLUME DETAILS	2	
	BDF1.124_SD###XXX.DGN	SD###	RESERVED	2		BDF1.124_MF###XXX.DGN	MF-506	TRAVERSING FLUME DETAILS	2	
	LAMPREY BOLLARD PLATES, FEATURE "H"					BDF1.124_MF###XXX.DGN				2
	BDF1.124_SH001XXX.DGN	SH001	ISOMETRIC	2		BDF1.124_MF###XXX.DGN	MF-507	TRAVERSING FLUME DETAILS 2	2	
	BDF1.124_SH101XXX.DGN	SH101	LAMPREY BOLLARD PLATES GENERAL ARRANGEMENT PLAN	2		BDF1.124_MF###XXX.DGN	MF-508	TRAVERSING FLUME DETAILS 3	2	
	BDF1.124_SH501XXX.DGN	SH501	LAMPREY BOLLARD PLATES DETAILS SHT No.1	2		BDF1.124_MF###XXX.DGN	MF-509	SHORT CLIMBING RAMP DETAILS	2	
	BDF1.124_SH502XXX.DGN	SH502	LAMPREY BOLLARD PLATES DETAILS SHT No.2	2		BDF1.124_MF###XXX.DGN	MF-510	TRAP BOX DETAILS 1	2	
	BDF1.124_SH503XXX.DGN	SH503	LAMPREY BOLLARD PLATES DETAILS SHT No.3	2		BDF1.124_MF###XXX.DGN	MF-511	TRAP BOX DETAILS 2	2	
	VARIABLE WIDTH WEIR, FEATURE "J"					BDF1.124_MF###XXX.DGN				2
	BDF1.124_SJ001XXX.DGN	SJ001	VARIABLE WIDTH WEIR ISOMETRIC AND WEIR GENERAL NOTES	2		BDF1.124_MP###XXX.DGN	MP-101	RESERVED	2	
	BDF1.124_SJ101XXX.DGN	SJ101	VARIABLE WIDTH WEIR PLAN, ELEVATION, AND SECTIONS	2		BDF1.124_MP###XXX.DGN	MP-501	RESERVED	2	
	FLF1.102_SJ501XXX.DGN	SJ501	VARIABLE WIDTH WEIR UPPER SEGMENT ELEVATION, SECTIONS, AND DETAILS	2		BDF1.124_MP###XXX.DGN	MP###	RESERVED	2	
	BDF1.124_SJ502XXX.DGN	SJ502	VARIABLE WIDTH WEIR MIDDLE SEGMENT ELEVATION, SECTIONS, AND DETAILS	2		LAMPREY PASSAGE TRASH RACK HOISTING SYSTEM, "T-SERIES"				
	BDF1.124_SJ503XXX.DGN	SJ503	VARIABLE WIDTH WEIR LOWER SEGMENT ELEVATION, SECTIONS, AND DETAILS	2		BDF1.124_MT###XXX.DGN	MT-101	GENERAL TRASH RACK HOIST ASSEMBLY	2	
	BDF1.124_SJ504XXX.DGN	SJ504	VARIABLE WIDTH WEIR SECTIONS AND DETAILS SHT No.1	2		BDF1.124_MF###XXX.DGN	MT-501	HOIST DETAILS 1	2	
	BDF1.124_SJ505XXX.DGN	SJ505	VARIABLE WIDTH WEIR SECTIONS AND DETAILS SHT No.2	2		BDF1.124_MF###XXX.DGN	MT-502	HOIST DETAILS 2	2	
	BDF1.124_SJ506XXX.DGN	SJ506	VARIABLE WIDTH WEIR SECTIONS AND DETAILS SHT No.3	2		ENTRANCE COUNTERWEIGHT SLOT MODS, FEATURE "L"				
	BDF1.124_SJ507XXX.DGN	SJ507	VARIABLE WIDTH WEIR SECTIONS AND DETAILS SHT No.4	2		BDF1.124_SL101XXX.DGN	SL101	ENTRANCE COUNTERWEIGHT SLOT MODS ISOMETRIC	2	
	BDF1.124_SL101XXX.DGN	SL101	ENTRANCE COUNTERWEIGHT SLOT MODS ISOMETRIC	2		BDF1.124_SL501XXX.DGN	SL501	ENTRANCE COUNTERWEIGHT SLOT MODS PLAN, ELEVATION, AND SECTIONS	2	
	BDF1.124_SL501XXX.DGN	SL501	ENTRANCE COUNTERWEIGHT SLOT MODS PLAN, ELEVATION, AND SECTIONS	2		BDF1.124_SL502XXX.DGN	SL502	ENTRANCE COUNTERWEIGHT SLOT MODS SECTIONS AND DETAILS	2	
	BDF1.124_SL502XXX.DGN	SL502	ENTRANCE COUNTERWEIGHT SLOT MODS SECTIONS AND DETAILS	2						

NOTES:

1. SHEET ACTION NUMBER IDENTIFICATION KEY SHALL BE AS SHOWN BELOW:
 - 1 DENOTES FIO DRAWING IS OBSOLETE AT THE COMPLETION OF THIS CONTRACT
 - 2 DENOTES DRAWING SHALL BE UPDATED AT THE COMPLETION OF THIS CONTRACT BY THE CONTRACTOR.
 - 3 DENOTES FIO DRAWING WILL BE SUPERCEDED BY THE FOLLOWING DRAWINGS AT THE COMPLETION OF THIS CONTRACT
 - 4 DENOTES FIO DRAWING WAS REFERENCED BY THE FOLLOWING CONTRACT DRAWINGS
 - 5 DENOTES FIO DRAWING IS FOR REFERENCE ONLY
2. FIO DENOTES "FOR INFORMATION ONLY"
3. ALL SHEETS IN THE PLANS AND SPECIFICATION DRAWING SET ARE INTENDED TO BE PRINTED IN COLOR.



DATE 07	DATE 08	DATE 09	DATE 04	DATE 03	DATE 02	DATE 01	DATE	APPR.
P&S REVIEW 90%								MARK

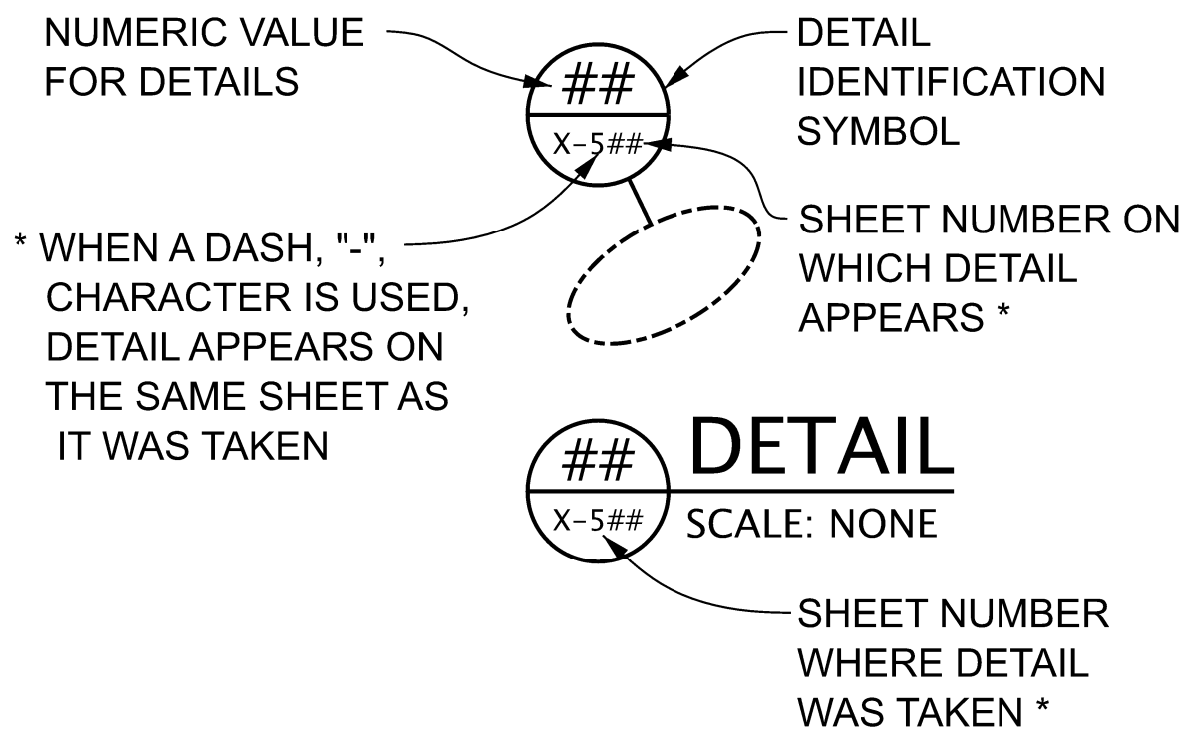
DESIGNED BY: DATE: 01/09/2021	CHECKED BY: SOLICITATION NO.:
DRAWN BY: JACOBSON A WHITE	CONTRACT NO.:
SUBMITTED BY: MATTHEW D. HANSON, PE	DRAWING NUMBER:
PLOT SCALE: 1:1	FILE NAME: BDF1.124G-001XXX.DGN

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
DRAWING INDEX SHEET NO.1

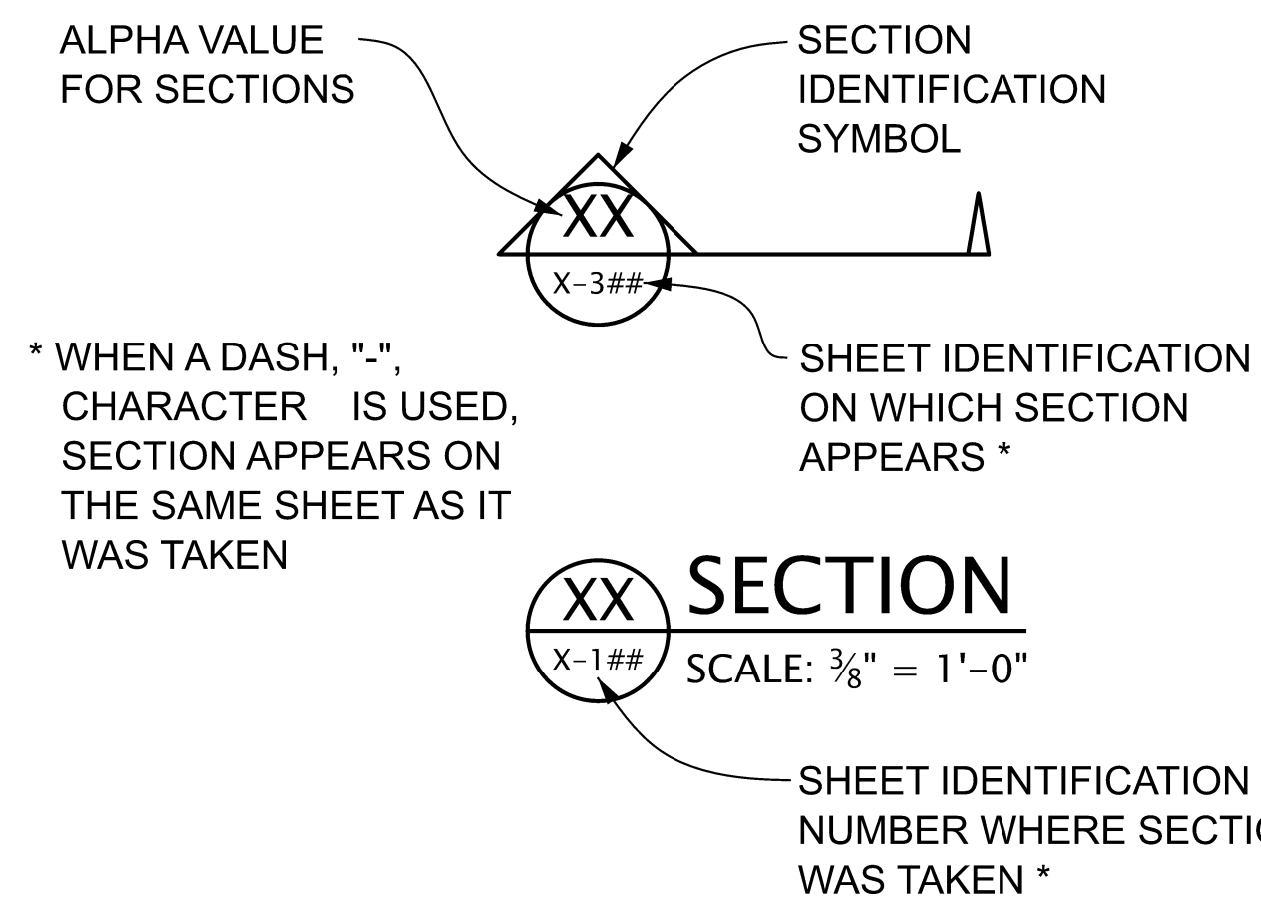
SHEET IDENTIFICATION
G-001

LEGEND:

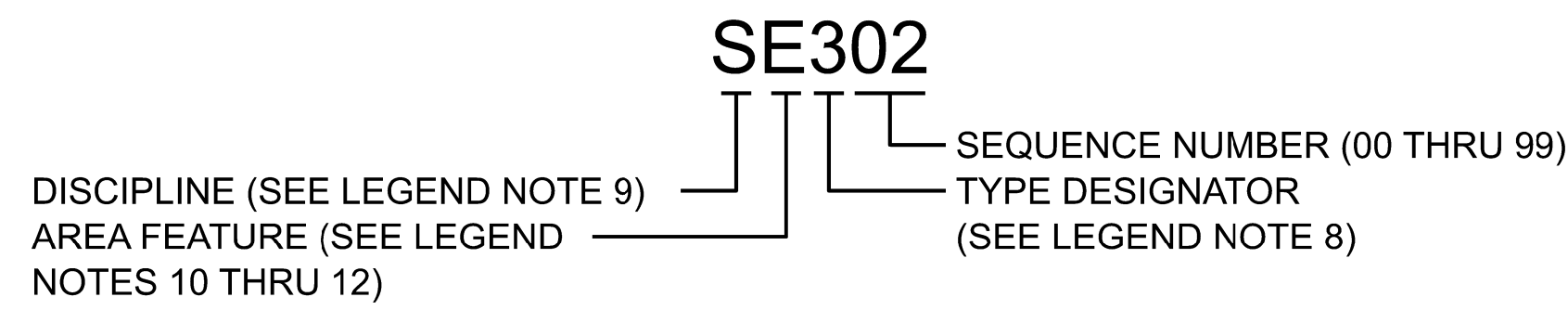
1. DETAILING CONVENTION SHALL BE INTERPRETED AS SHOWN BELOW:



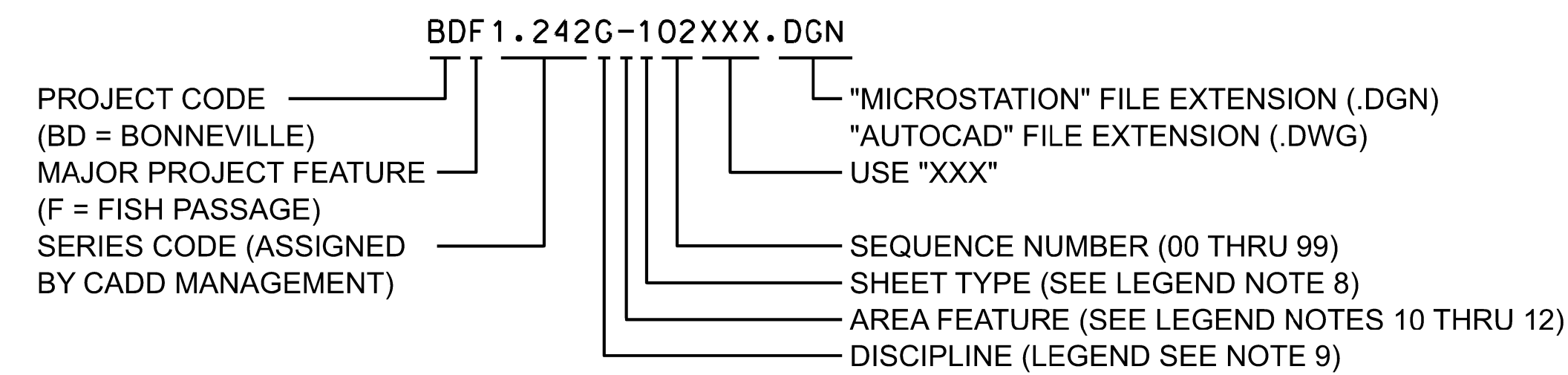
2. SECTIONING CONVENTION SHALL BE INTERPRETED AS SHOWN BELOW:



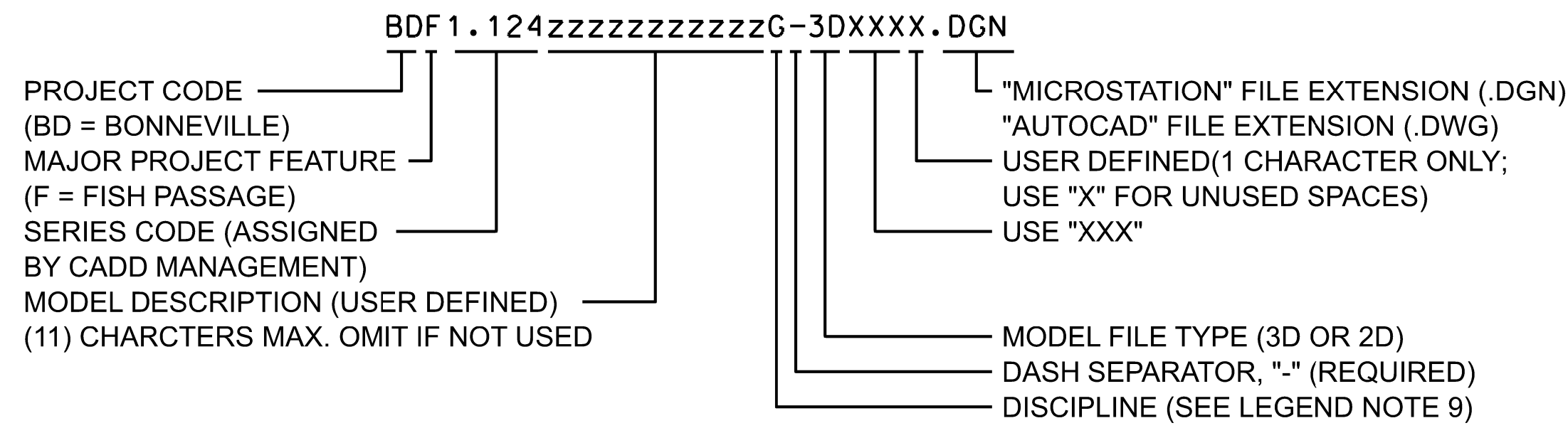
3. SHEET IDENTIFICATION CONVENTION SHALL BE INTERPRETED AS SHOWN BELOW, EXCEPT AS NOTED IN LEGEND NOTE 4 ON THIS SHEET:



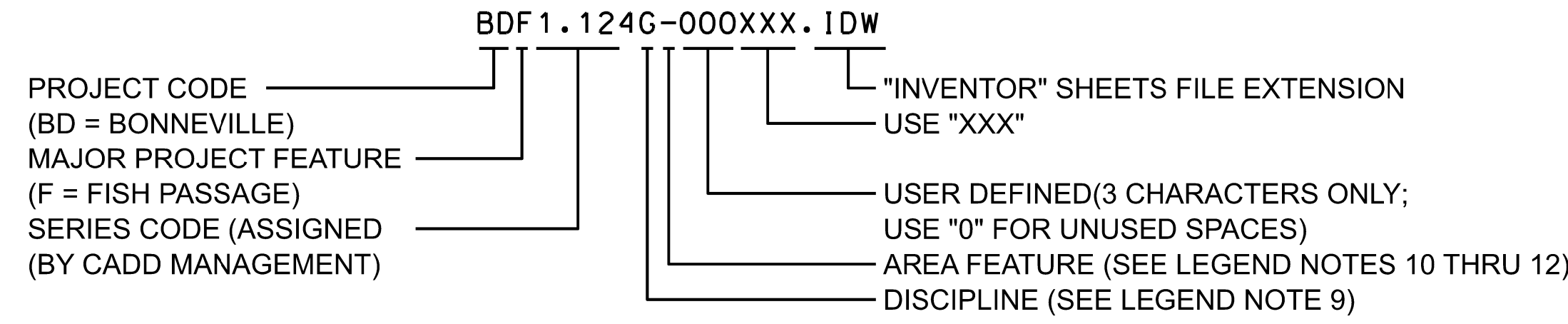
4. "MICROSTATION" / "AUTOCAD" SHEET FILE NAME CONVENTION SHALL BE INTERPRETED AS SHOWN BELOW:



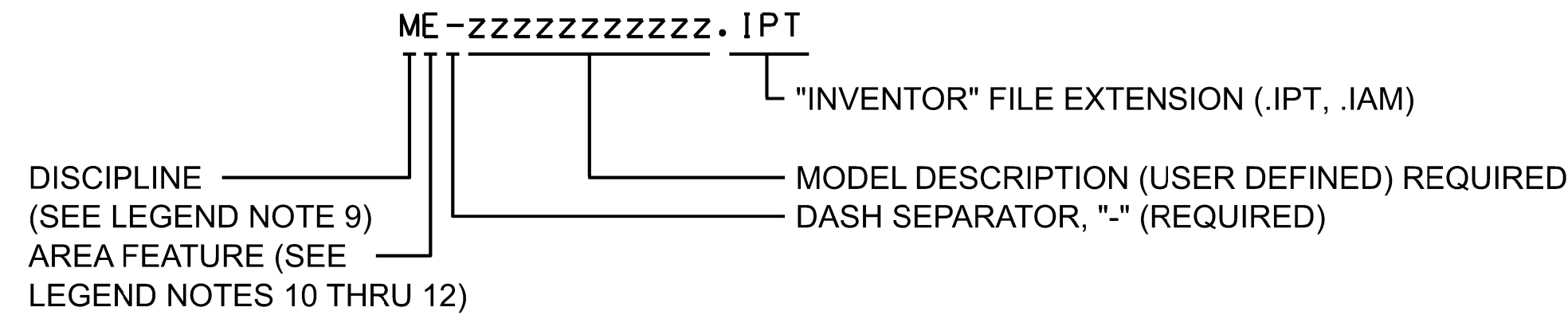
5. "MICROSTATION" / "AUTOCAD" MODEL FILE NAME CONVENTION SHALL BE INTERPRETED AS SHOWN BELOW:



6. "INVENTOR" SHEETS FILE NAME CONVENTION SHALL BE INTERPRETED AS SHOWN BELOW:



7. "INVENTOR" MODEL FILE NAME CONVENTION SHALL BE INTERPRETED AS SHOWN BELOW:



8. TYPE DESIGNATOR FOR SHEET IDENTIFICATION SHALL BE AS SHOWN BELOW:

- 0 DENOTES GENERAL
- 1 DENOTES PLANS
- 2 DENOTES ELEVATIONS
- 3 DENOTES SECTIONS
- 4 DENOTES ENLARGED VIEWS
- 5 DENOTES DETAILS
- 6 DENOTES SCHEDULES AND SCHEMATICS
- 7 DENOTES REINFORCEMENT (USER DEFINED)
- 8 DENOTES USER DEFINED

9. ENGINEERING DISCIPLINE DESIGNATOR FOR SHEET IDENTIFICATION SHALL BE AS SHOWN BELOW:

- G DENOTES GENERAL
- S DENOTES STRUCTURAL
- M DENOTES MECHANICAL
- E DENOTES ELECTRICAL

10. STRUCTURAL AREA FEATURE DESIGNATOR FOR "S" SHEETS IDENTIFICATION SHALL BE AS SHOWN BELOW:

- DENOTES STRUCTURAL GENERAL FEATURES (OR "ALL SHEETS ARE STRUCTURAL")
- D DENOTES STRUCTURAL DEMOLITION
- F DENOTES LAMPREY PASSAGE SYSTEM SUPPORTS
- G DENOTES LAMPREY PASSAGE SYSTEM WATER SUPPLY SUPPORTS
- H DENOTES LAMPREY BOLLARD PLATES
- J DENOTES VARIABLE WIDTH WEIR
- K DENOTES ENTRANCE SLOT FILLER DEVICE
- L DENOTES COUNTERWEIGHT SLOT MODS

11. MECHANICAL AREA FEATURE DESIGNATOR FOR "M" SHEETS IDENTIFICATION SHALL BE AS SHOWN BELOW:

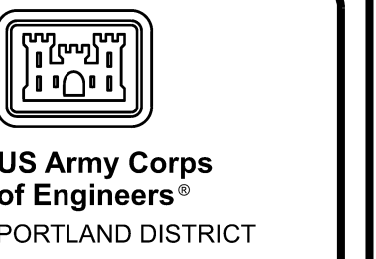
- DENOTES MECHANICAL GENERAL FEATURES (OR "ALL SHEETS ARE MECHANICAL")
- D DENOTES MECHANICAL DEMOLITION
- F DENOTES LAMPREY PASSAGE SYSTEM
- G DENOTES LAMPREY PASSAGE WATER SUPPLY SYSTEM

12. ELECTRICAL AREA FEATURE DESIGNATOR FOR "E" SHEETS IDENTIFICATION SHALL BE AS SHOWN BELOW:

- DENOTES GENERAL FEATURES (OR "ALL SHEETS ARE ELECTRICAL")

GENERAL NOTES:

1. SEE SHEETS G-001 THRU G-002 FOR DRAWING INDEX.

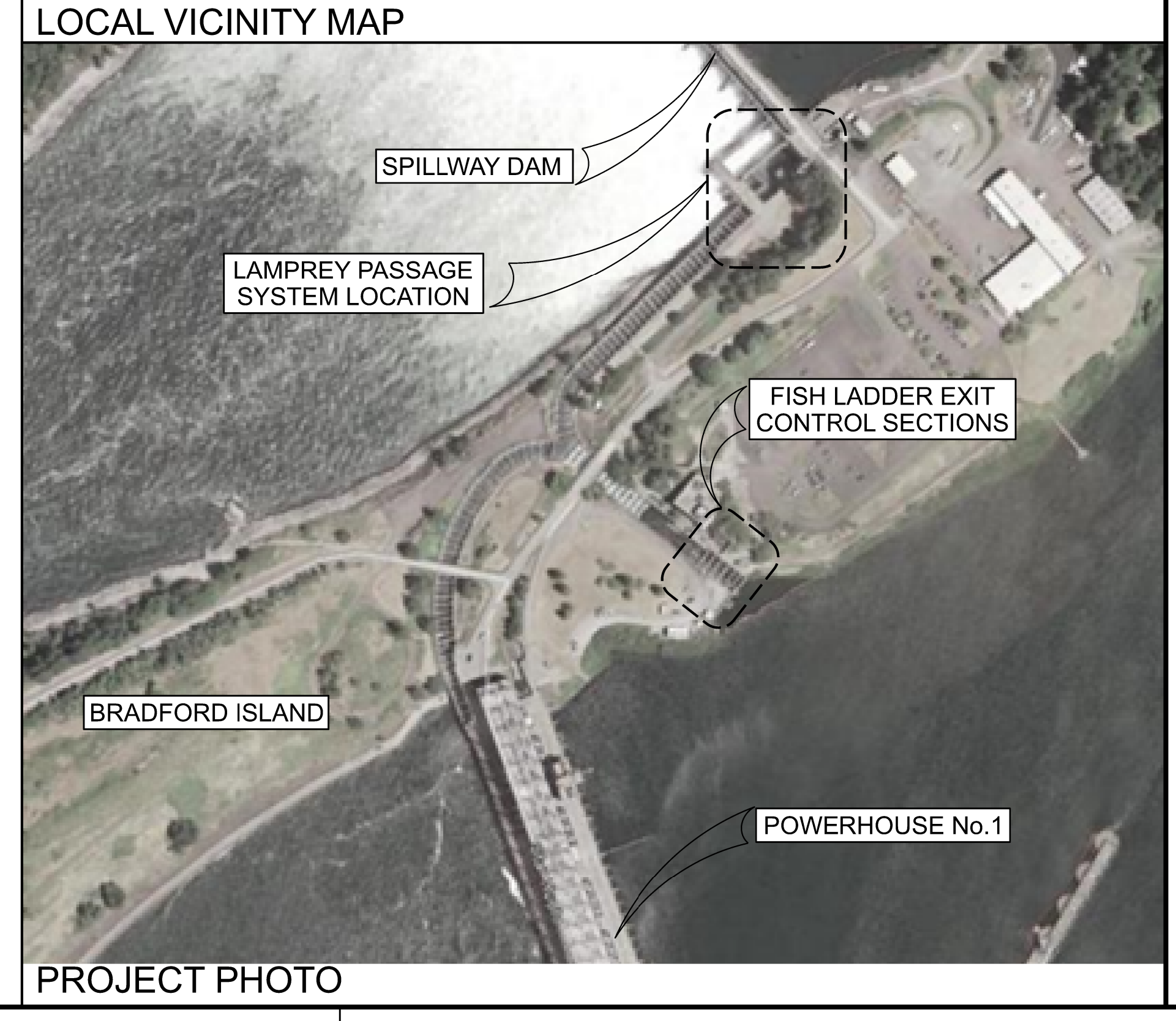
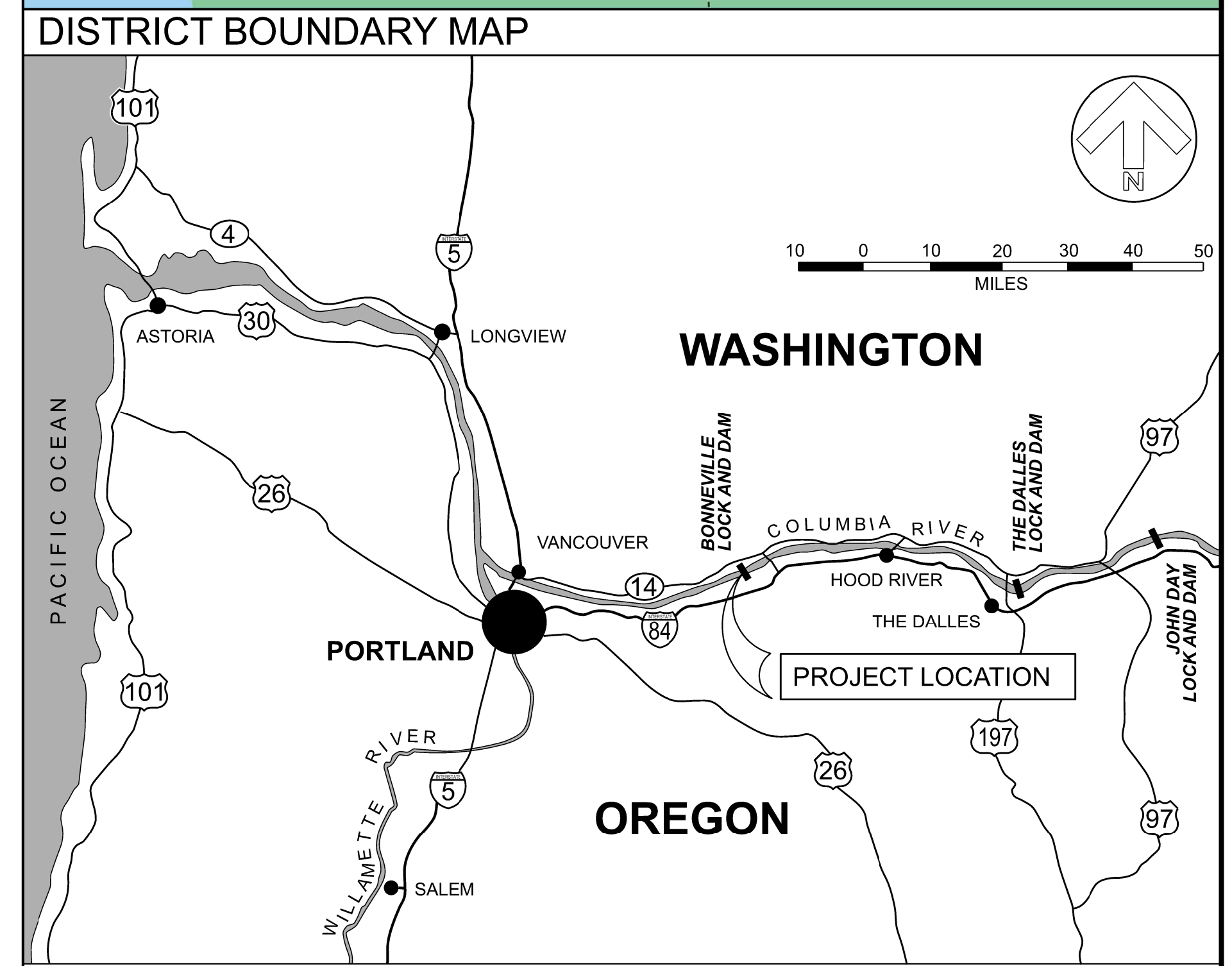
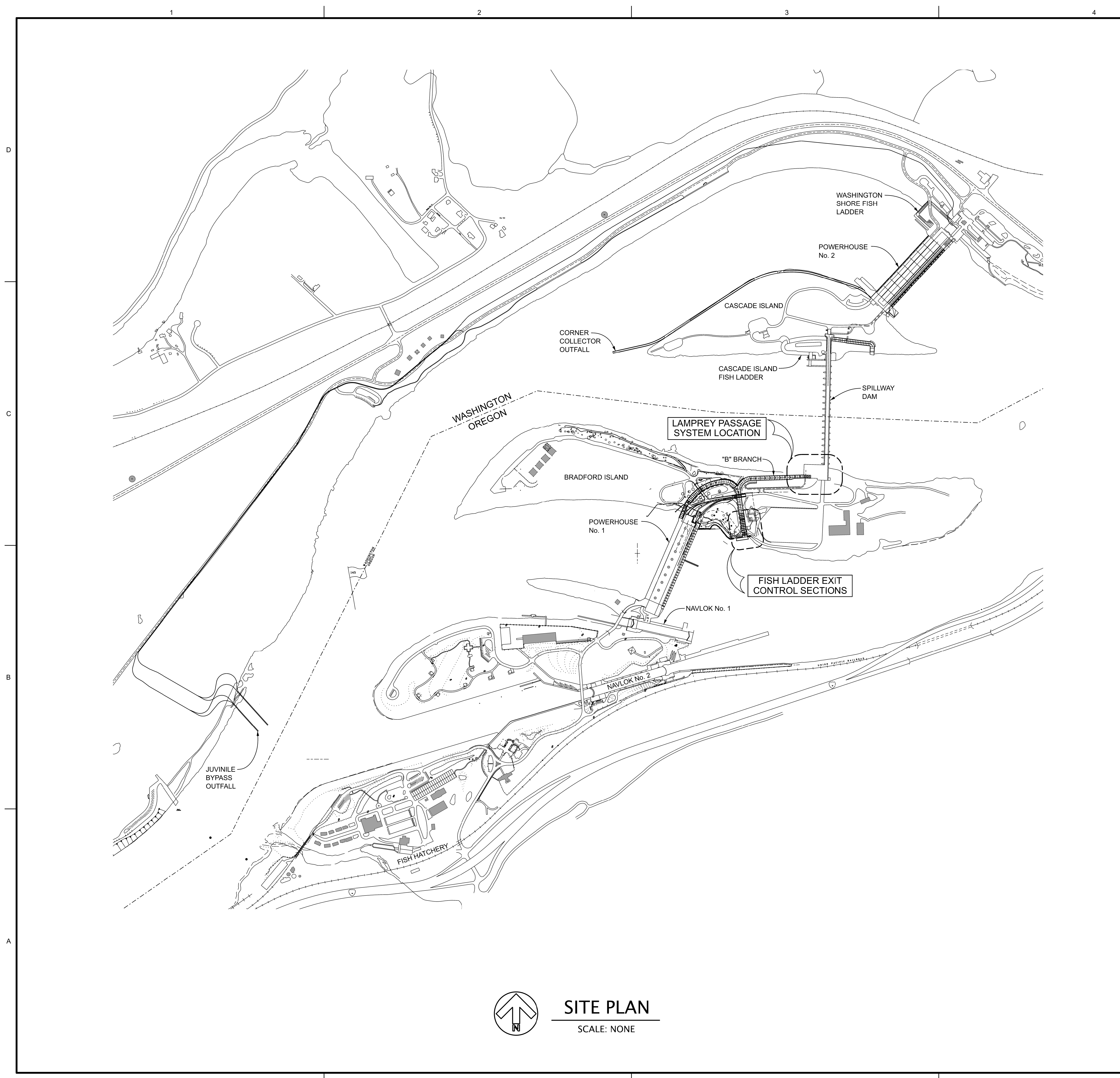


DATE 07	DATE 06	DATE 05	DATE 04	DATE 03	DATE 02	DATE 01	DATE	APPR.
P&S REVIEW 90%								MARK
								DESCRIPTION

DESIGNED BY P.D.T.	CHECKED BY J.MCMONN	SOLICITATION NO.:
DRAWN BY A.WHITE	CONTRACT NO.:	
SUBMITTED BY M.WATSON	DATE:	
DATE: 10/19/2021	FILE NAME: BDF1.124G-000XXX.DGN	
SCALE: 1:1	SIZE: ANS I D	

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
GENERAL NOTES AND SYMBOLS

SHEET IDENTIFICATION
G-004



US Army Corps of Engineers
PORTLAND DISTRICT

DATE 07	DATE 06
DATE 05	DATE 04
DATE 03	DATE 02
DATE 01	DATE 00
DATE	APPR.

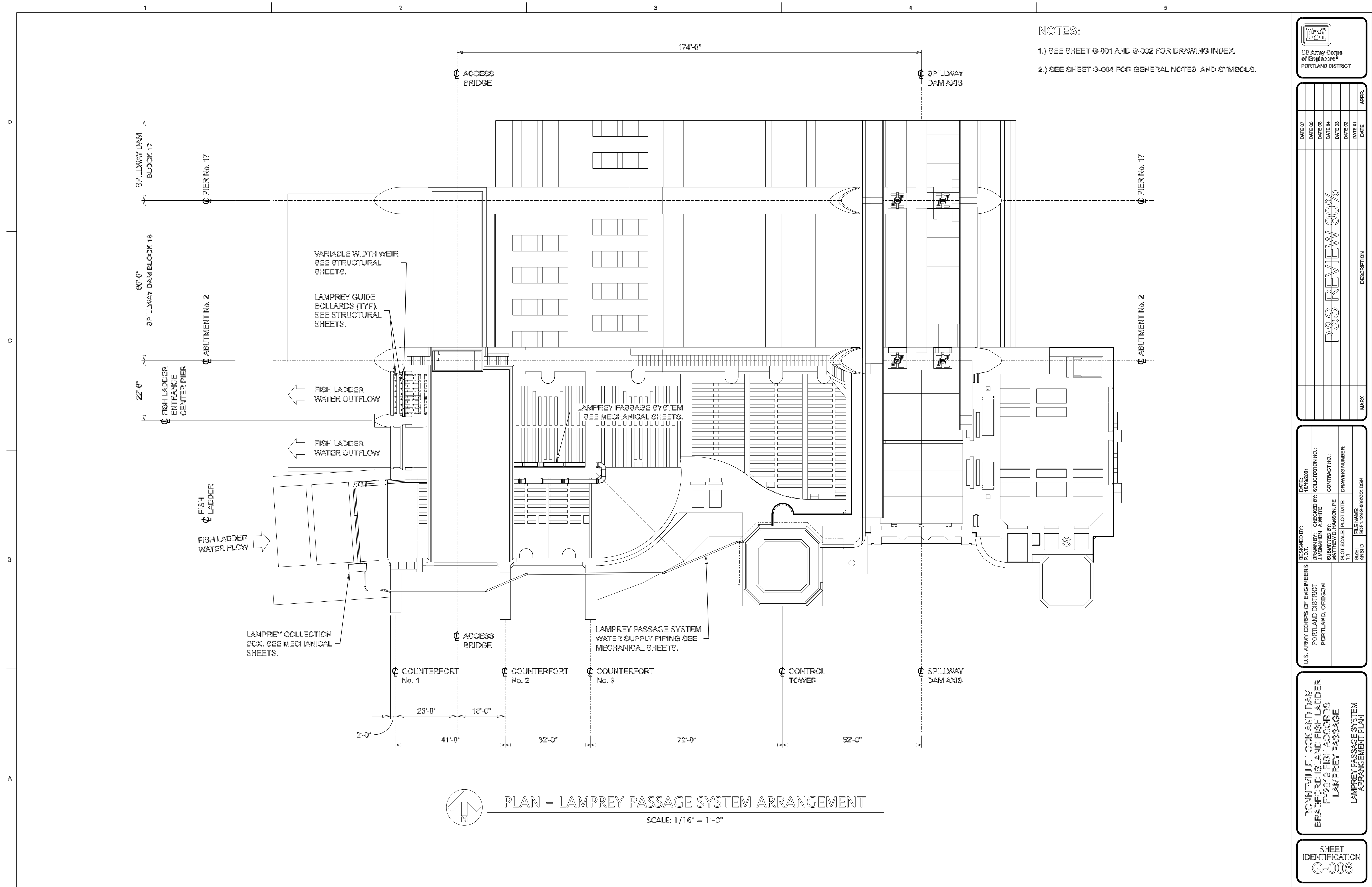
P&S REVIEW 90%

DESIGNED BY:	DATE:
DRAWN BY:	CHECKED BY:
SUBMITTED BY:	APPROVED BY:
FILE NAME:	FILE DATE:
SIZE:	SCALE:
ANSI D	BDF1-124G-05XXXX.DGN

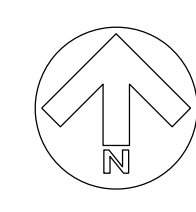
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
PORTLAND, OREGON

BONVILLE LOCK AND DAM
 BRADFORD ISLAND FISH LADDER
 FY2019 FISH ACCORDS
 LAMPREY PASSAGE
 PROJECT SITE MAPS

SHEET IDENTIFICATION
G-005

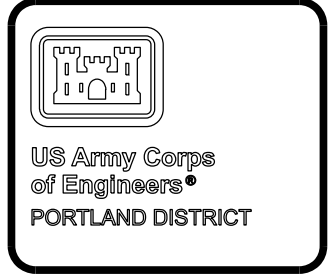


NOTES:
 1.) SEE SHEET G-001 AND G-002 FOR DRAWING INDEX.
 2.) SEE SHEET G-004 FOR GENERAL NOTES AND SYMBOLS.



PLAN - LAMPREY PASSAGE SYSTEM ARRANGEMENT

SCALE: 1/16" = 1'-0"



DATE 07	DATE 08	DATE 08	DATE 04	DATE 03	DATE 01	DATE
P&S REVIEW 90%						
MARK						
DESCRIPTION						
APPR.						

DESIGNED BY: JACKSON A WHITE	CHECKED BY: MATTHEW D. HANSON, PE	DATE: 01/16/2021	SOLICITATION NO.:	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON		FILE NAME: BDP1.124C-00000.DGN	SIZE: ANSI D	DRAWING NUMBER:

BONNEVILLE LOCK AND DAM
 BRADFORD ISLAND FISH LADDER
 FY2019 FISH ACCORDS
 LAMPREY PASSAGE
 LAMPREY PASSAGE SYSTEM
 ARRANGEMENT PLAN

SHEET IDENTIFICATION
G-006

GENERAL STRUCTURAL NOTES:

1. SCOPE

- 1.1 THESE GENERAL STRUCTURAL NOTES COVER STRUCTURAL FEATURES OF THE BONNEVILLE BRADFORD ISLAND FISH LADDER ENTRANCE IMPROVEMENTS FOUND ON THE "S" SERIES DRAWINGS.
- 1.2 THESE NOTES ARE TYPICAL UNLESS NOTED OR DETAILED OTHERWISE ON DRAWINGS.

2. CONCRETE

- 2.1 THERE IS ONE CONCRETE MIX REQUIRED FOR THIS CONTRACT. THE CONTRACTOR SHALL DEVELOP AND SUBMIT THE MIX ACCORDING TO SPECIFICATION 03 31 01.00 25. THE MIX DESIGN IS:
 MIX 1 - CAST-IN-PLACE SHRINKAGE-COMPENSATING CONCRETE. THE 28 DAY COMPRESSIVE STRENGTH FOR THIS CAST-IN-PLACE CONCRETE (f'c) SHALL BE 4500 PSI.
 MIX 2 - CAST-IN-PLACE UNDERWATER CONCRETE. THE 28 DAY COMPRESSIVE STRENGTH FOR THIS CAST-IN-PLACE CONCRETE (f'c) SHALL BE 4500 PSI.
- 2.2 ALL EXPOSED EDGES AND CORNERS OF CONCRETE SHALL HAVE 3/4" CHAMFERS UNLESS OTHERWISE NOTED. THIS SHALL INCLUDE CORNERS OF ABUTTING CONTRACTION, CONSTRUCTION, AND EXPANSION JOINTS BUT SHALL NOT INCLUDE BLOCKOUTS FOR RAILS, GATE GUIDES, HANDRAIL SOCKETS AND STAIR TREADS OR AS NOTED OTHERWISE AND/OR MARKED N.C.
- 2.3 ALL RE-ENTRANT CORNERS SHALL HAVE 1 1/2" FILLETS EXCEPT AT THE JUNCTION OF WALL AND FLOOR SURFACES WHERE FILLET IS NOT CAST SIMULTANEOUSLY WITH ADJOINING MEMBER OR AS NOTED OTHERWISE.
- 2.4 WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, SURFACE SHALL BE CLEANED AND A FRACTURED AGGREGATE PROFILE WITH A MINIMUM AMPLITUDE OF 1/4" PROVIDED, EXCEPT FOR UNDERWATER EXISTING CONCRETE SURFACES NEED TO BE CLEANED ONLY.

3. CONCRETE FINISHING

- 3.1 REQUIRED CONCRETE FINISHES ARE DESCRIBED IN THE SPECIFICATIONS.
- 3.2 ALL SURFACES INSIDE THE FISH LADDER SHALL RECEIVE A CLASS A FINISH. ALL OTHER SURFACES SHALL RECEIVE A CLASS C FINISH.
- 3.3 ANY DAMAGE TO THE CLASS A FINISH DURING CONSTRUCTION SHALL BE REPAIRED AS DESCRIBED IN THE SPECIFICATIONS.

4. CONCRETE COVER

- 4.1 UNLESS NOTED OTHERWISE, THE MINIMUM COVER SHALL BE IN ACCORDANCE WITH TABLE 1. THE MINIMUM COVER SHALL BE THE CLEAR DISTANCE FROM THE EDGE OF THE REINFORCEMENT TO THE EDGE OF THE CONCRETE.
- 4.2 IN NO CASE SHALL THE COVER BE LESS THAN 1.5 TIMES THE NOMINAL MAXIMUM SIZE OF AGGREGATE OR 2.5 TIMES THE MAXIMUM DIAMETER OF REINFORCEMENT.

5. REINFORCEMENT

- 5.1 PREPARATION FOR PLACING DRAWINGS AND BAR BENDING SCHEDULES SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
- 5.2 ALL REINFORCEMENT STEEL SHALL CONFORM TO ASTM A615, GRADE 60 REQUIREMENTS.
- 5.3 UNLESS NOTED OTHERWISE, ALL HOOKS SHALL BE STANDARD HOOKS AS DEFINED BY ACI 318-05.
- 5.4 BAR SPACING DIMENSIONS ARE MEASURED TO THE CENTERS OF BARS.
- 5.5 A SYMBOL SUCH AS $\frac{STAG.}{SPL.}$ INDICATES REINFORCING BARS TO BE STAGGER LAP SPICED (CLASS B) BY ALTERNATING LAP LOCATIONS AS SHOWN, AND PROVIDING THE INDICATED LAP LENGTH.
- 5.6 A NOTATION SUCH AS $7'-6" \uparrow 1'-6"$ FOLLOWING THE BAR SIZE AND SPACING INDICATES A BENT BAR WITH AN OUTSIDE-TO-OUTSIDE DIMENSION (NOT BAR LENGTH) OF 7'-6". A LETTER OR DIMENSION ON THE SHORT LEG INDICATES THE FOLLOWING:
 L: EXTEND BAR LAP SPICE LENGTH BEYOND BEND
 E: EXTEND BAR EMBEDMENT LENGTH BEYOND CROSSING BAR
 DIMENSION: OUTSIDE-TO-OUTSIDE LENGTH OF SHORT LEG
 WHEN NO LETTER OR DIMENSION IS GIVEN, PROVIDE A STANDARD 90° HOOK
- 5.7 ALL BARS SHALL BE SPACED AS SHOWN ON DRAWINGS.
- 5.8 REINFORCING BARS SHALL NOT CONTINUE ACROSS AN EXPANSION OR CONTRACTION JOINT. REBAR SHALL CONTINUE ACROSS CONSTRUCTION JOINTS AS DETAILED IN THE DRAWINGS.
- 5.9 ANY VERTICAL REINFORCEMENT PROJECTING ABOVE THE FORMS SHALL BE SUPPORTED TO PREVENT THE BREAKING OF BOND BETWEEN THE REINFORCING BARS AND FRESHLY PLACED CONCRETE.

6. REINFORCEMENT TABLE (60 KSI), REFER TO TABLE 2.

- 6.1 DEVELOPMENT AND SPICE LENGTHS FOR REINFORCING BARS USED IN THIS CONTRACT SHALL BE AS DESCRIBED IN A.C.I. 350-06 AND A.C.I. 318-08 U.N.O., AND ARE SHOWN IN THE TABLES.
- 6.2 THE TABLES PROVIDED ARE ONLY FOR FIELD INSPECTION REFERENCE. ANY OMISSIONS OR VARIANCES FROM A.C.I. SHALL NOT BE CONSTRUED AS CHANGES IN THE A.C.I. REQUIREMENTS.
- 6.3 TOP BARS ARE HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE DEVELOPMENT LENGTH OR SPICE.

7. STRUCTURAL STEEL

- 7.1 ALL STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO ASTM A709, ASTM A572, ASTM A36 OR A992 STANDARDS AS NOTED IN THE DRAWINGS AND DIVISION 05 OF THE SPECIFICATIONS.
- 7.2 STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A53, GRADE B OR ASTM A500, GRADE B UNLESS NOTED OTHERWISE.
- 7.3 STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500, GRADE B.
- 7.4 GALVANIZING OF STEEL SHALL CONFORM TO ASTM A123, UNLESS OTHERWISE NOTED.
- 7.5 ALL CARBON STEEL BOLTS, NUTS, AND WASHERS USED FOR STRUCTURAL STEEL CONNECTIONS SHALL BE OF THE MATERIAL, GRADE, TYPE, CLASS, STYLE AND FINISH INDICATED BELOW UNLESS NOTED OTHERWISE:
 a. BOLTS - ASTM A325, TYPE 1, GALVANIZED
 b. NUTS - ASTM A563, GRADE DH, TYPE 1, GALVANIZED
 c. PLAIN WASHERS - ASTM F436, TYPE 1, GALVANIZED
 d. SPLIT WASHERS - ASME B18.21.1, ZINC PLATED
- 7.6 STRUCTURAL BOLTS SHALL BE TIGHTENED TO THE SNUG TIGHT CONDITION (U.N.O.) PER AISC SPECIFICATIONS IN THE THE 13th EDITION OF THE STEEL CONSTRUCTION MANUAL.
- 7.7 WELDING SHALL CONFORM TO AWS D1.1 & D1.5 STRUCTURAL WELDING CODE. WELDING THAT IS NOT SHOWN ON THE DRAWINGS WILL NOT BE PERMITTED EXCEPT BY WRITTEN PERMISSION FROM THE CONTRACTING OFFICER AND ENGINEER.
- 7.8 FIELD WELDING WILL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR AUTHORIZED BY THE CONTRACTING OFFICER.
- 7.9 ALL WELDS SHALL BE CONTINUOUS AND WRAPPED AROUND RE-ENTRENT CORNERS UNLESS OTHERWISE NOTED. EVERY ACCESSIBLE JOINT NOT HAVING A DESIGNATED TYPE AND SIZE OF WELD SHALL BE SEAL WELDED PER AISC MINIMUM WELD SIZE.
- 7.10 ALL SHARP EDGES SHALL BE GROUND TO A 1/16" RADIUS MIN. UNO.
- 7.11 ALL WELDS SHALL BE GROUND HAND SMOOTH AND FLUSH SUCH THAT THERE ARE NO BURRS, OFFSETS OR ROUGH AREAS.
- 7.12 ALL HANDRAIL IS 1 1/2" SCH 40 PIPE. ALL HANDRAIL POSTS SHALL BE 1 1/2" SCH 80 PIPE. ALL HANDRAIL MATERIAL SHALL BE ASTM A53, TYPE S, GRADE B GALVANIZED).
- 7.13 HANDRAIL, GRATING, AND STAIRWAYS SHALL BE INSTALLED WHERE INDICATED ON DRAWINGS.
- 7.14 TOTAL HEIGHT AND WIDTH DIMENSIONAL TOLERANCES SHALL BE LIMITED TO PLUS OR MINUS 1/4" UNLESS NOTED OTHERWISE.

8. STAINLESS STEEL

- 8.1 ALL SHAPES, PLATES AND BARS SHALL MEET REQUIREMENTS OF ASTM A276 OR ASTM A240 TYPE 304 UNLESS NOTED OTHERWISE (UNO).
- 8.2 WELDING OF STAINLESS STEEL SHALL BE IN ACCORDANCE WITH PROVISIONS OF AWS D1.6 WELDING CODE. NO FIELD WELDING WILL BE PERMITTED UNLESS NOTED ON THE DRAWINGS OR AUTHORIZED IN WRITING BY THE CONTRACTING OFFICER AND DESIGN ENGINEER.
- 8.3 ALL BOLTS, NUTS AND WASHERS USED FOR STAINLESS STEEL CONNECTIONS SHALL BE OF THE MATERIAL, GRADE, TYPE, CLASS, AND STYLE AS INDICATED BELOW :
 8.3.1 BOLTS - ASTM A593, GROUP 1, COLD WORKED STAINLESS STEEL
 8.3.2 NUTS - ASTM A594, GROUP 1, COLD WORKED STAINLESS STEEL
 8.3.3 WASHERS - WASHERS SHALL BE FABRICATED FROM MATERIAL CONFORMING TO TYPE 304, TYPE 308 OR TYPE 316 THAT CONFORMS TO ASTM A276 OR ASTM A240 STANDARDS.

9. ANCHORAGE TO CONCRETE

- 9.1 POST INSTALLED ANCHORS SHALL BE STUD TYPE ANCHORS MEETING REQUIREMENT STANDARDS OF CID-A-A1923A NOTICE 2 DATED 28 JUNE 2006 FOR TYPE 4 ANCHORS UNLESS NOTED OTHERWISE. THE ANCHORS SHALL BE GALVANIZED OR STAINLESS STEEL AS SHOWN ON THE DRAWING DETAILS.
- 9.2 ANY CAST-IN-PLACE ANCHORS SHALL BE HEADED HEX BOLT ANCHORS. UNLESS NOTED OTHERWISE, ALL HEADED BOLT ANCHORS SHALL MEET ASTM A449, GRADE 1 OR ASTM F1554, GRADE 36 REQUIREMENTS. ANCHOR BOLTS SHALL BE GALVANIZED.

10. MISCELLANEOUS

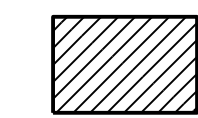
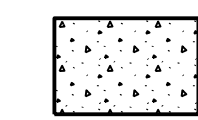
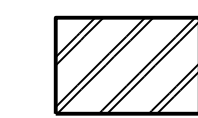
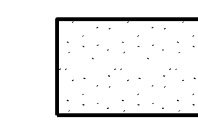
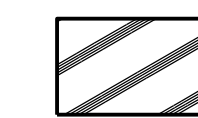
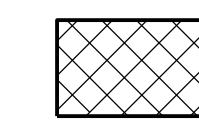
- 10.1 THE PHRASE "BY CONTRACTOR" FOUND ON VARIOUS STRUCTURAL DRAWINGS MEANS THAT THE CONTRACTOR SHALL DESIGN THE ITEM/FEATURE AS WELL AS FURNISH IT.

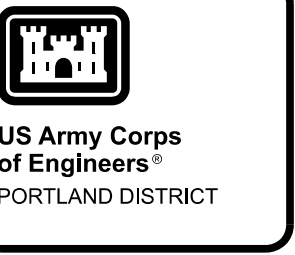
CONCRETE SECTION	MINIMUM CLEAR COVER UNO, INCHES
UNFORMED SURFACES IN CONTACT WITH FOUNDATION	4
FORMED AND SCREEDED SURFACES EQUAL TO OR GREATER THAN 24 INCHES IN THICKNESS:	
#4 TO #11 BARS	4
FORMED AND SCREEDED SURFACES GREATER THAN 12" AND LESS THAN 24" IN THICKNESS:	
#4 TO #11 BARS	3

BAR SIZE NUMBER	TOP BARS EMBEDMENT LENGTH	OTHER BARS EMBEDMENT LENGTH	TOP BAR SPICE LENGTH	OTHER BARS SPICE LENGTH	MINIMUM HOOK EMBEDMENT LENGTH
3	18	14	23	18	7
4	23	18	30	23	9
5	29	23	38	29	11
6	35	27	46	35	13
7	51	39	67	51	16
8	59	45	76	59	18
9	66	51	86	66	20
10	74	57	97	74	23
11	82	63	107	82	25
14	99	76	--	--	30

STRUCTURAL LEGEND:

1. MATERIAL PATTERNS SHALL BE AS SHOWN BELOW:

-  DENOTES EXISTING CONCRETE
-  DENOTES NEW CONCRETE
-  DENOTES STEEL AND OTHER METALS
-  DENOTES GROUT
-  DENOTES RUBBER
-  DENOTES EXISTING CONCRETE TO BE REMOVED

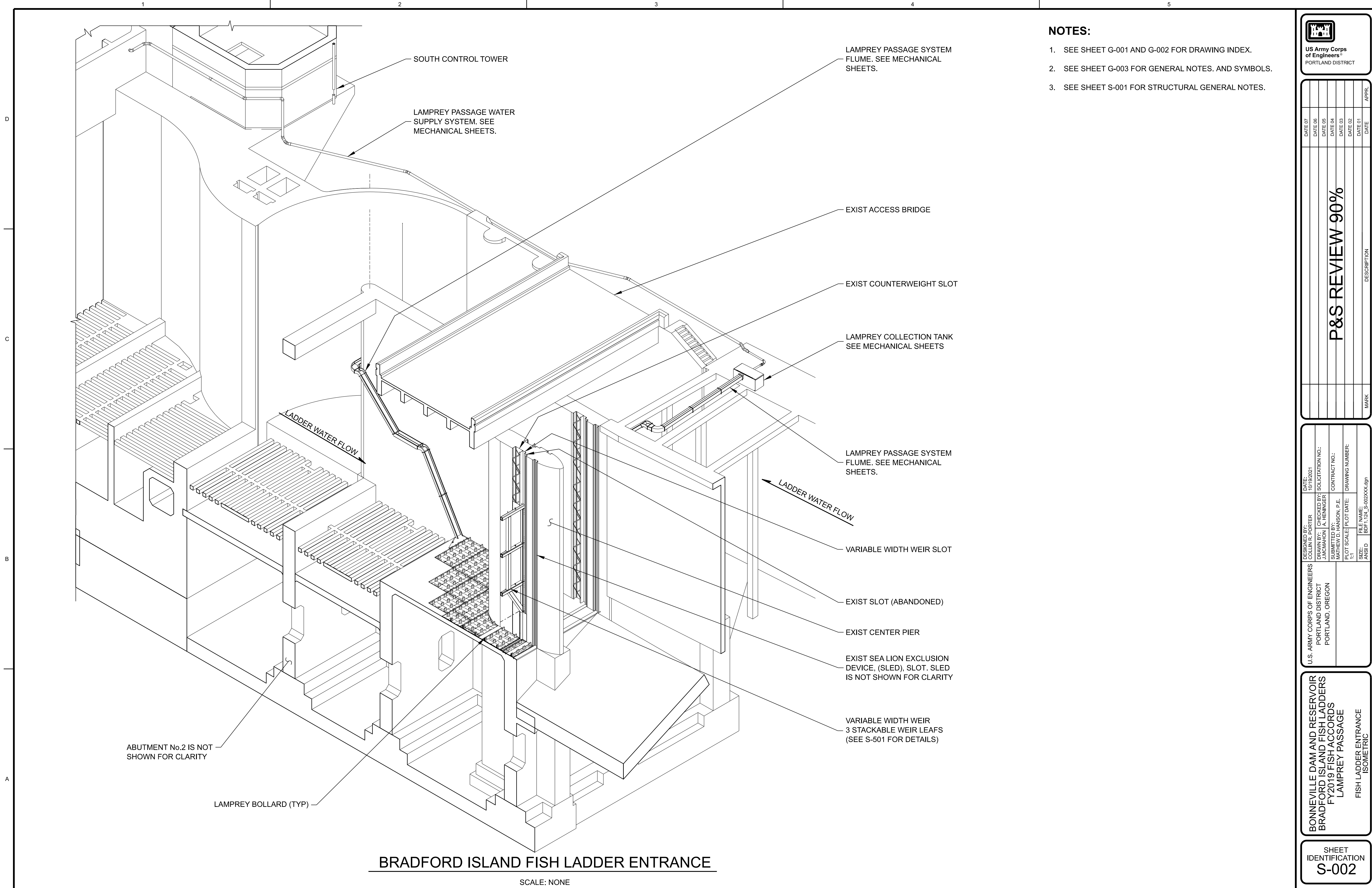


DATE 07	DATE 08	DATE 09	DATE 04	DATE 03	DATE 02	DATE 01	DATE	APPR.
P&S REVIEW 90%								MARK
								DESCRIPTION

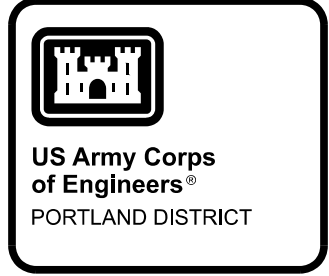
DESIGNED BY: J. W. HENGER	DATE: 01/19/2021
DRAWN BY: M. WILHELM	SOLICITATION NO:
CHECKED BY: M. WILHELM	CONTRACT NO:
SUBMITTED BY: MATTHEW D. HANSON P.E.	DRAWING NUMBER:
PLOT SCALE: 1/8" = 1'-0"	FILE NAME:
SIZE: 11"	ANSI D

BONNEVILLE DAM AND RESERVOIR
BRADFORD ISLAND FISH LADDERS
FY2019 FISH ACCORDS
LAMPREY PASSAGE
GENERAL STRUCTURAL NOTES

SHEET IDENTIFICATION
S-001



- NOTES:**
- SEE SHEET G-001 AND G-002 FOR DRAWING INDEX.
 - SEE SHEET G-003 FOR GENERAL NOTES. AND SYMBOLS.
 - SEE SHEET S-001 FOR STRUCTURAL GENERAL NOTES.



DATE 07	DATE 06	DATE 05	DATE 04	DATE 03	DATE 02	DATE 01	DATE	APPR.
P&S REVIEW 90%								
								MARK
								DESCRIPTION

DESIGNED BY: C. J. HENNINGER	DATE: 01/19/2021	DESIGNED BY: C. J. HENNINGER	SUBMITTED BY: MATHIEW D. HANSON, P.E.	CONTRACT NO.:	DRAWING NUMBER:
CHECKED BY: LAWRENCE A. HENNINGER		CHECKED BY: LAWRENCE A. HENNINGER			
FILE NAME: BDFT.124_S-002XXX.dgn		FILE NAME: BDFT.124_S-002XXX.dgn			
SIZE: ANSI D		SIZE: ANSI D			
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON					

BONNEVILLE DAM AND RESERVOIR
BRADFORD ISLAND FISH LADDERS
FY2019 FISH ACCORDS
LAMPREY PASSAGE
FISH LADDER ENTRANCE
ISOMETRIC

SHEET IDENTIFICATION
S-002

BRADFORD ISLAND FISH LADDER ENTRANCE

SCALE: NONE

1

2

3

4

5

D

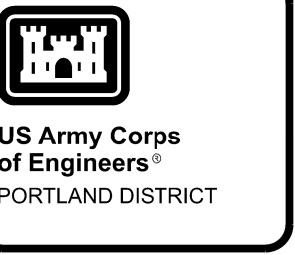
C

B

A

NOTES:

- 1. SEE SHEET G-001 AND G-002 FOR DRAWING INDEX.
- 2. SEE SHEET G-003 FOR GENERAL NOTES AND SYMBOLS.
- 3. SEE SHEET S-001 FOR STRUCTURAL GENERAL NOTES.
- 4. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO FABRICATION.



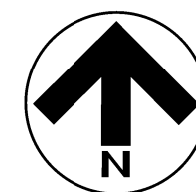
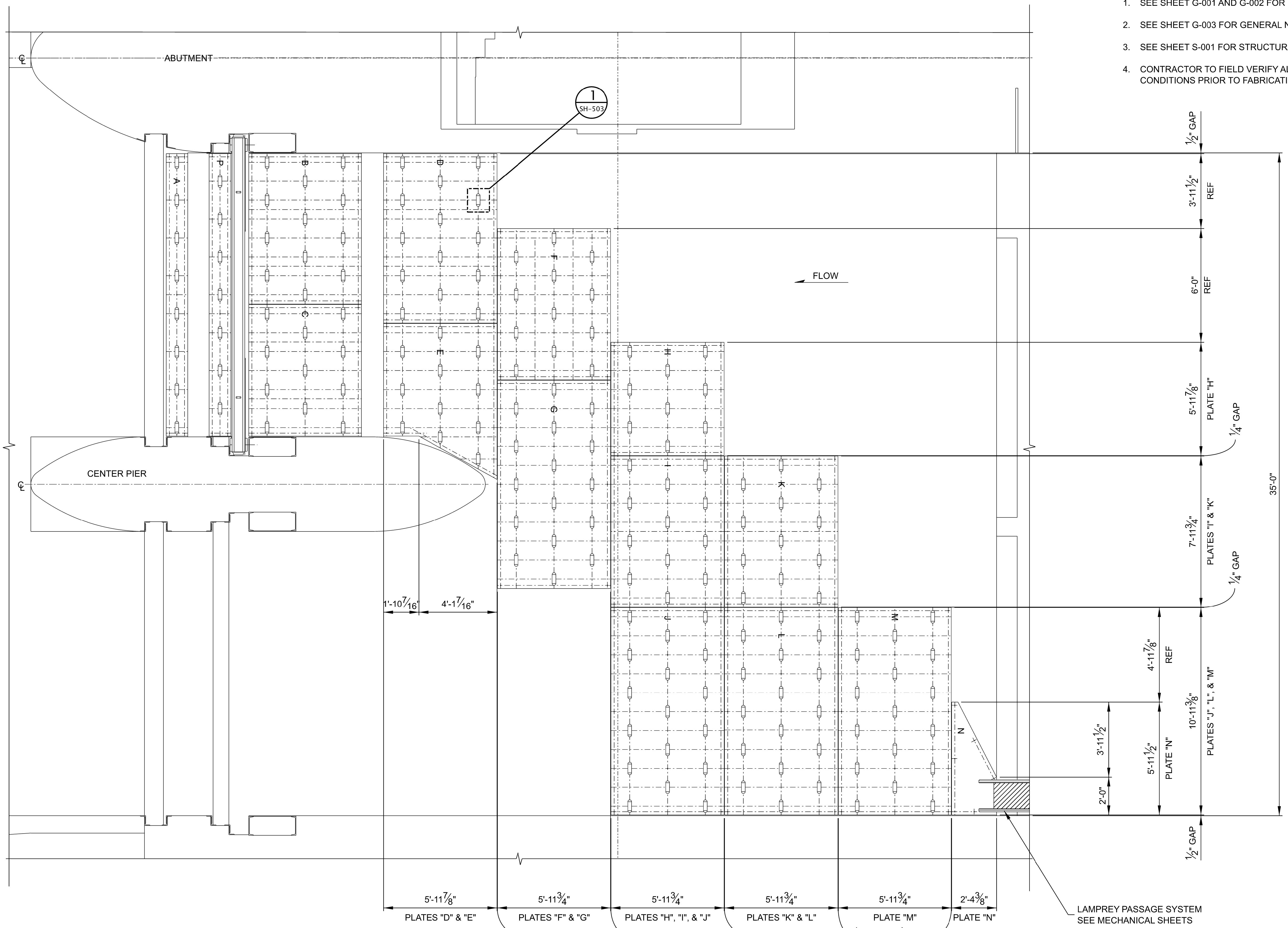
DATE 07	DATE 08	DATE 09	DATE 04	DATE 03	DATE 02	DATE 01	DATE	APPR.
P&S REVIEW 90%								MARK
								DESCRIPTION

DESIGNED BY C. J. WILHELM	DATE 01/09/2021
CHECKED BY M. WILHELM	SUBMITTED BY MATTHEW D. HANSON, P.E.
DESIGNED BY M. WILHELM	FILE NAME BDT1.124_S1010XXX.dgn
DESIGNED BY M. WILHELM	CONTRACT NO.
DESIGNED BY M. WILHELM	PLANT SCALE 1:1
DESIGNED BY M. WILHELM	PLANT DATE
DESIGNED BY M. WILHELM	DRAWING NUMBER

**BONNEVILLE DAM AND RESERVOIR
BRADFORD ISLAND FISH LADDERS
FY2019 FISH ACCORDS
LAMPREY PASSAGE**

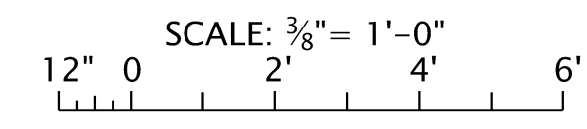
BOLLARD PLATE ARRANGEMENT
PLAN

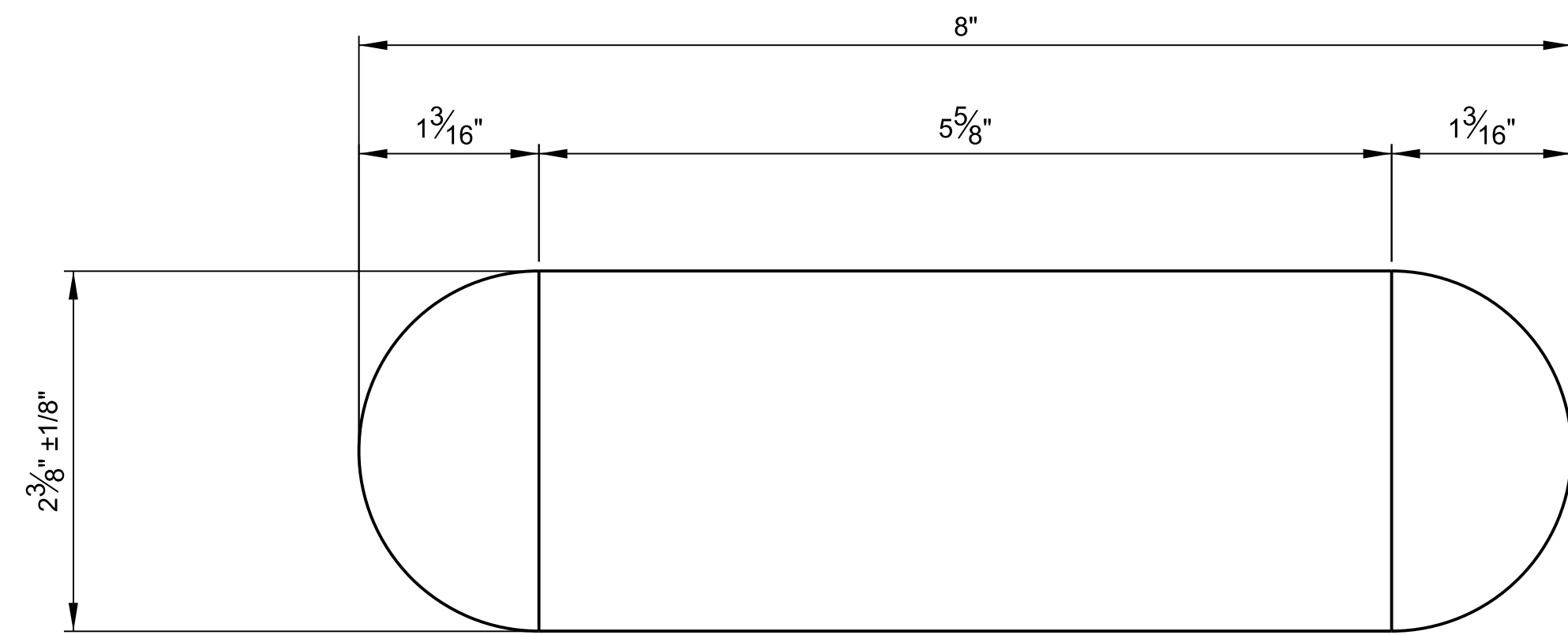
SHEET IDENTIFICATION
SH101



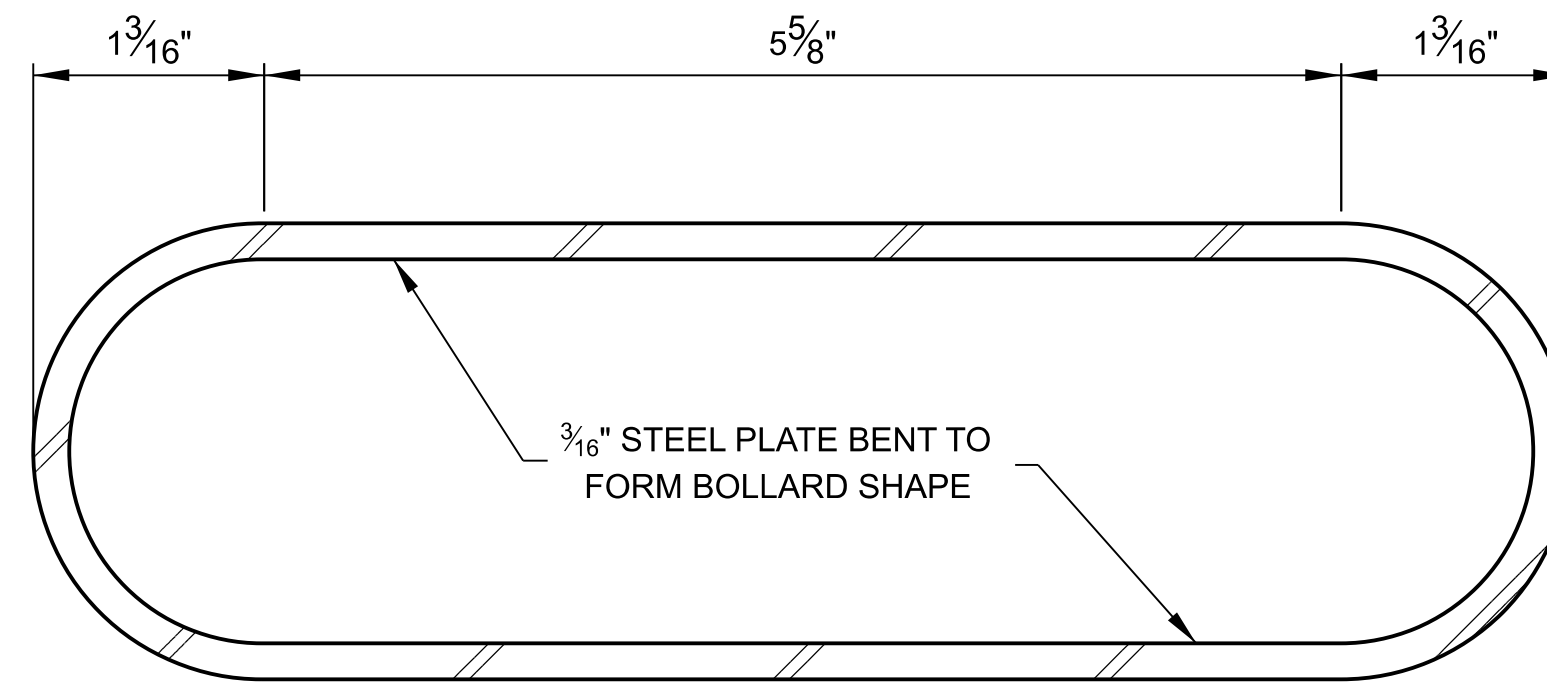
PLAN-BOLLARD PLATE ARRANGEMENT

SCALE: 3/8" = 1'-0"

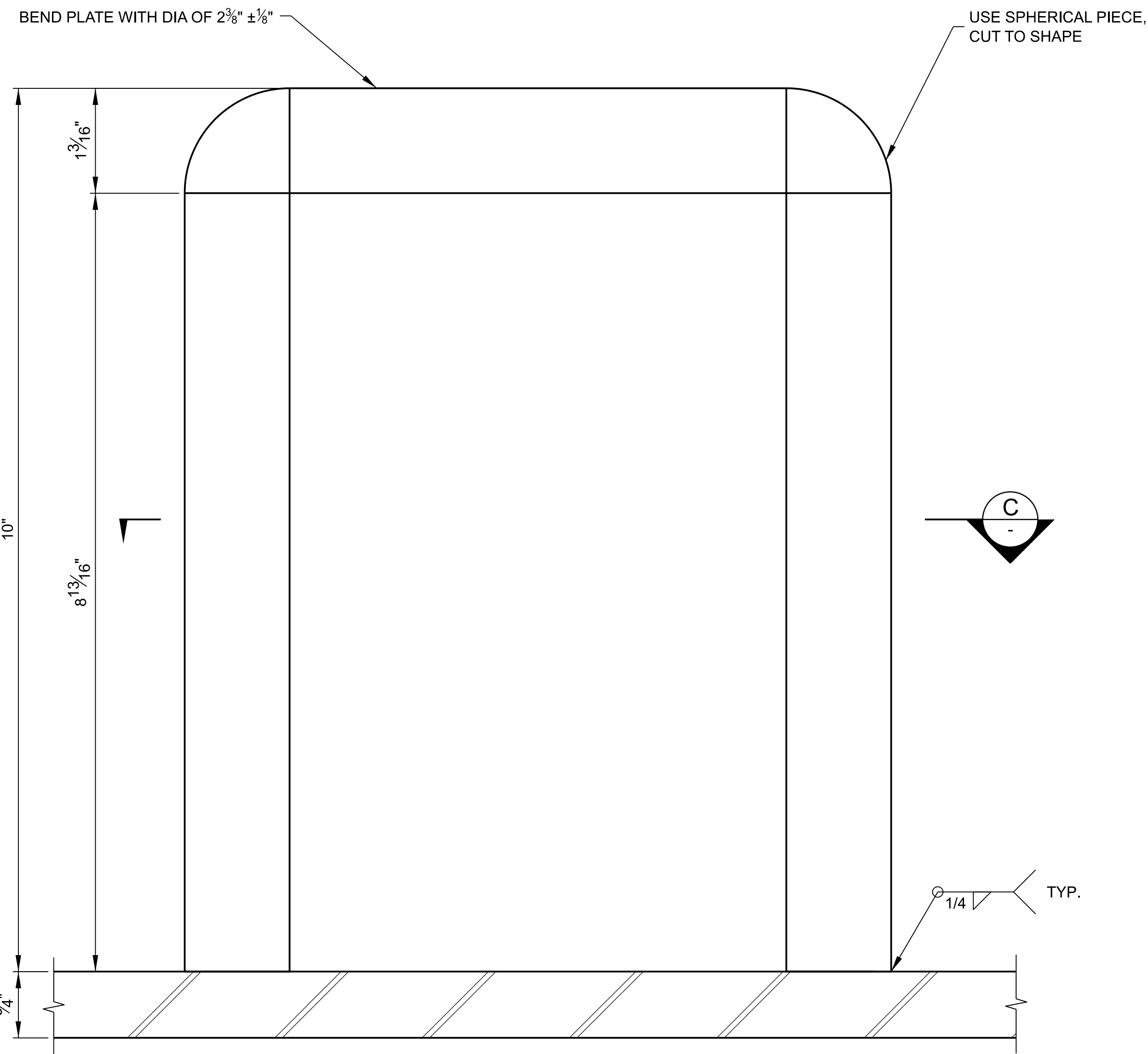




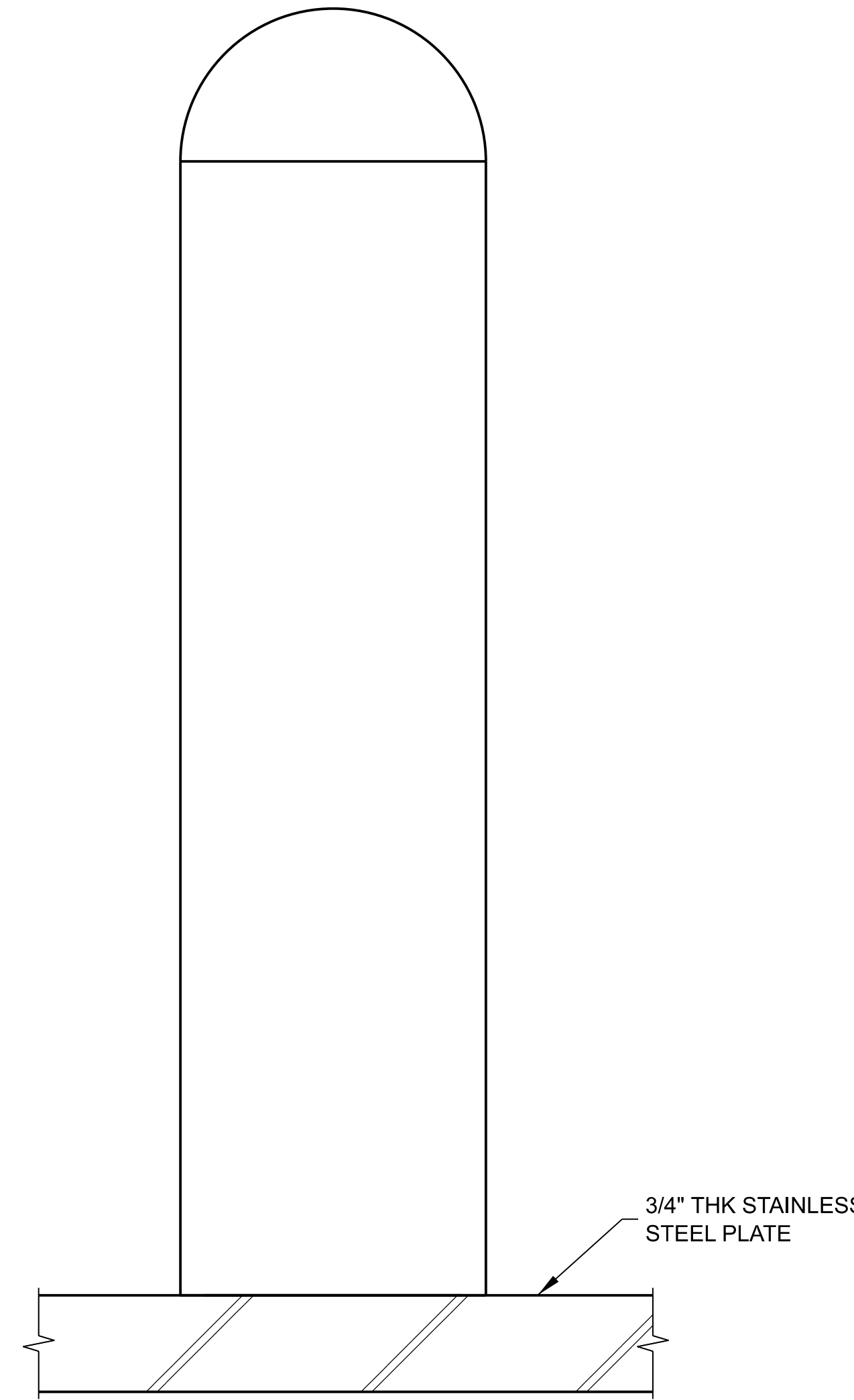
1 ENLARGED PLAN-TYPICAL BOLLARD
SCALE: FULL



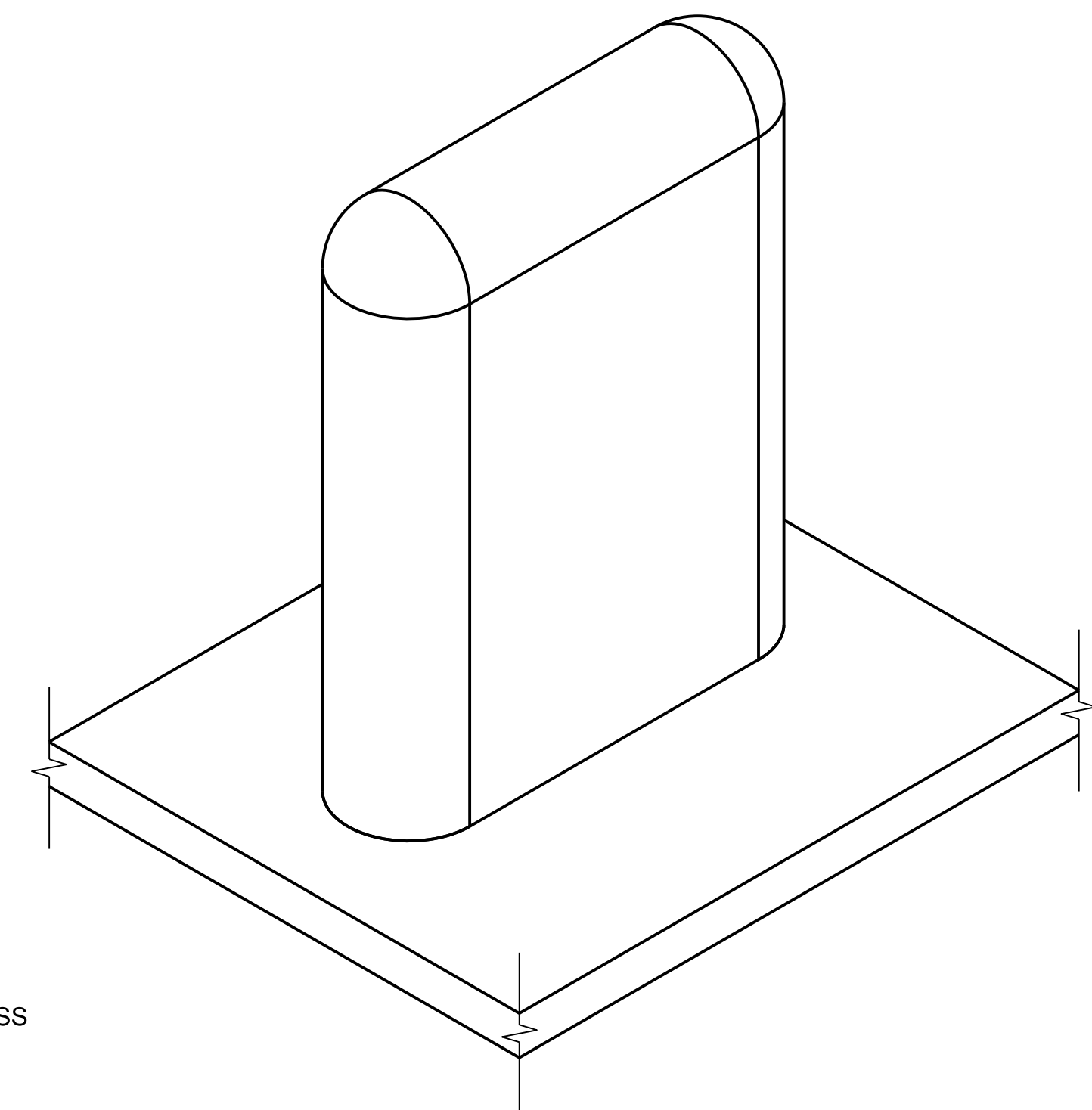
C SECTION
SCALE: FULL



A ELEVATION LOOKING UPSTREAM AT BOLLARD
SCALE: FULL



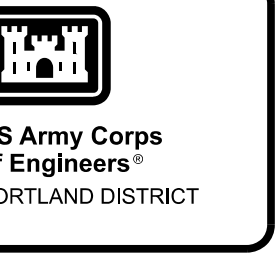
B ELEVATION
SCALE: FULL



ISOMETRIC-TYPICAL BOLLARD
SCALE: 6"=1'-0"

NOTES:

1. SEE SHEET G-001 AND G-002 FOR DRAWING INDEX.
2. SEE SHEET G-003 FOR GENERAL NOTES AND SYMBOLS
3. SEE SHEET S-001 FOR GENERAL STRUCTURAL NOTES.
4. AT THE CONTRACTORS OPTION THE BOLLARDS MAY BE MADE FROM 2.375 X 0.188 INCH ROUND STAINLESS STEEL HSS CUT AND WELDED TO STAINLESS STEEL (ASTM A276) BARS AND PLATES TO FORM THE SHAPE AS SHOWN. A COMPATIBLE STAINLESS STEEL SPHERE SHAPE / PIECE SHALL BE CUT AS NEEDED TO FIT / FORM THE TWO UPPER CORNERS OF EACH BOLLARD.
5. ALL WELD JOINTS SHALL BE GROUND TO A HAND SMOOTH CONDITION SUCH THAT THERE ARE NO ROUGH SPOTS, OFFSETS OR BURRS IN ORDER TO AVOID INJURY TO FISH.



US Army Corps of Engineers
PORTLAND DISTRICT

DATE 07	DATE 08	DATE 09	DATE 04	DATE 03	DATE 02	DATE 01	DATE	APPR.

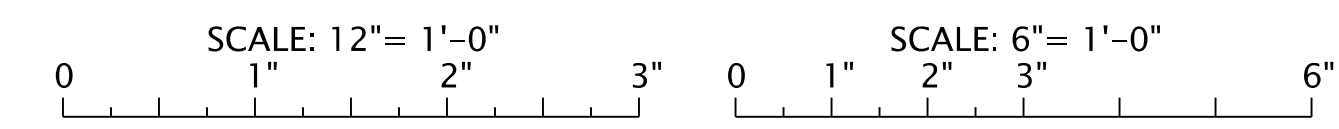
P&S REVIEW 90%

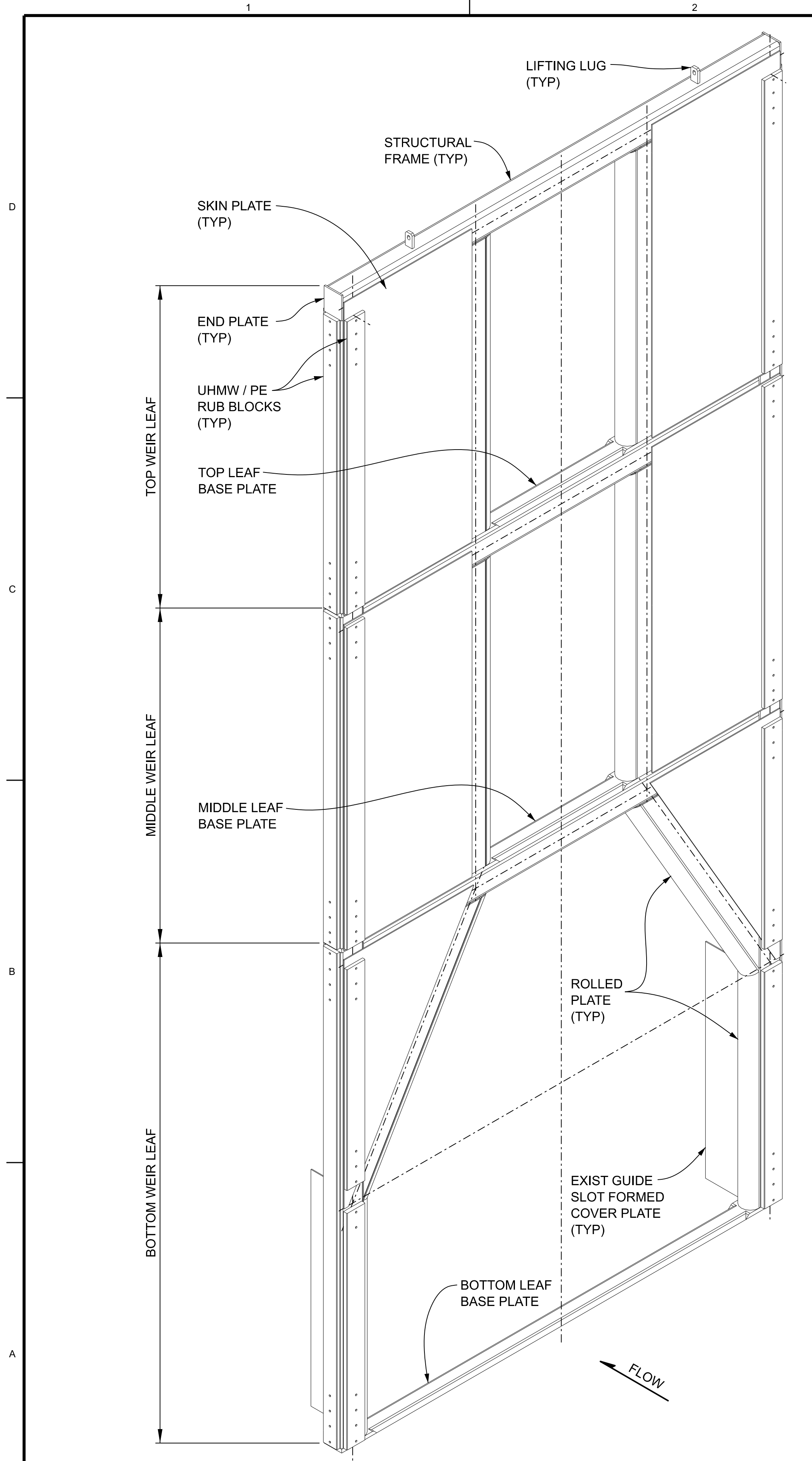
DESIGNED BY: M. WILHELM	CHECKED BY: M. WILHELM	DATE: 01/19/2021	SUBMITTED BY: MATTHEW D. HANSON, P.E.	CONTRACT NO.:	DRAWING NUMBER:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON			FILE NAME: BDT1124_SH500XXX.dgn		

**BONNEVILLE DAM AND RESERVOIR
BRADFORD ISLAND FISH LADDERS
FY2019 FISH ACCORDS
LAMPREY PASSAGE**

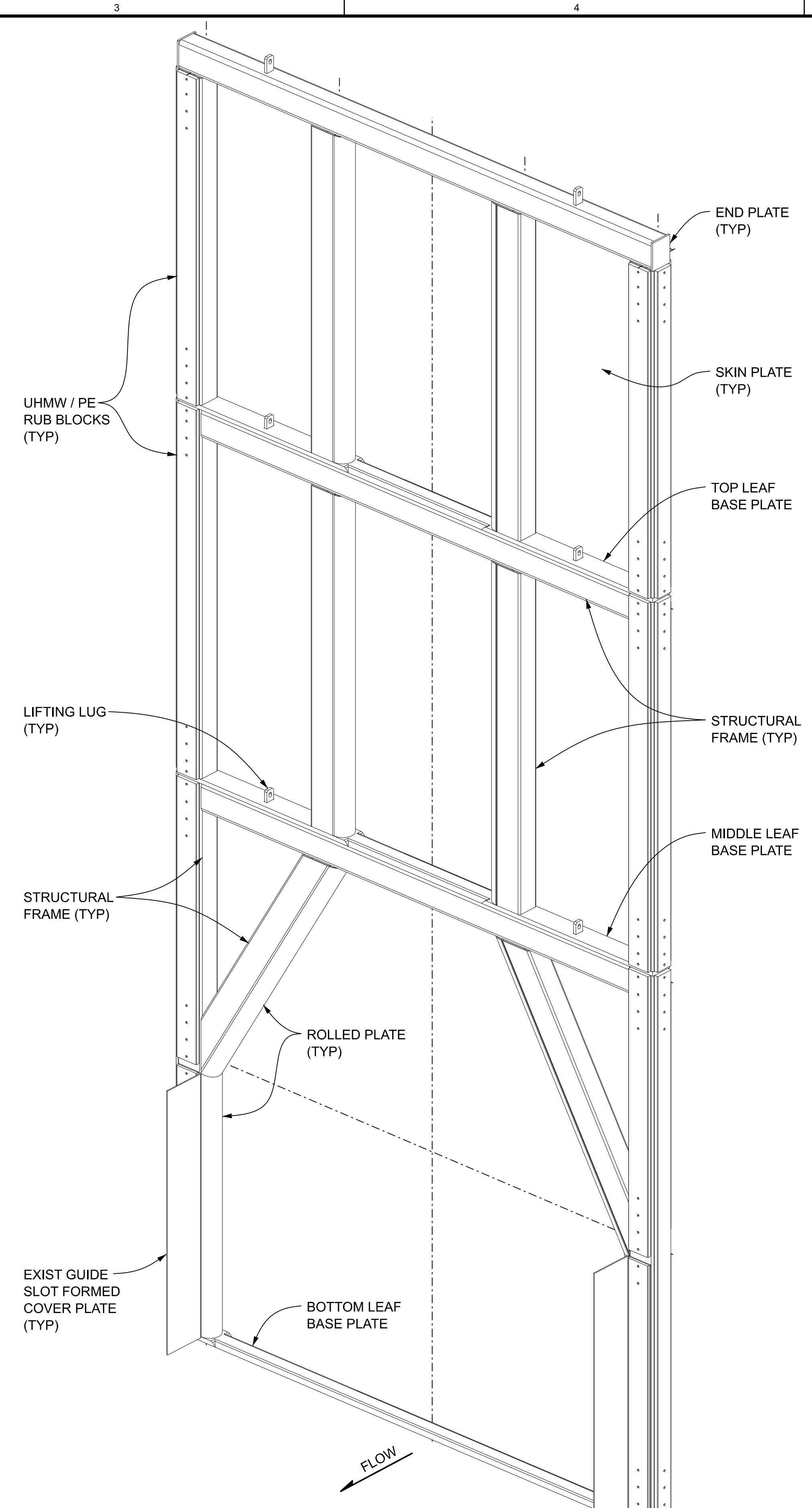
BOLLARD PLATE ARRANGEMENT
SECTIONS AND DETAILS

SHEET IDENTIFICATION
SH503



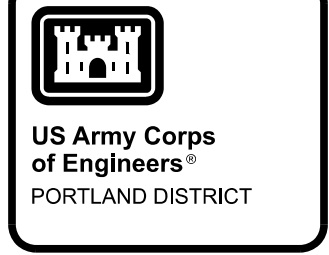


ISOMETRIC - WEIR UPSTREAM SIDE



ISOMETRIC - WEIR DOWNSTREAM SIDE

- NOTES:**
- SEE SHEET G-001 AND G-002 FOR DRAWING INDEX.
 - SEE SHEET G-003 FOR GENERAL NOTES, AND SYMBOLS.
 - SEE SHEET S-001 FOR STRUCTURAL GENERAL NOTES.
 - CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO FABRICATION.
 - (WEIR WEIGHT = XXXX).



DATE	BY	DESCRIPTION	MARK
DATE 07			
DATE 08			
DATE 09			
DATE 04			
DATE 03			
DATE 02			
DATE 01			
DATE			APPR.

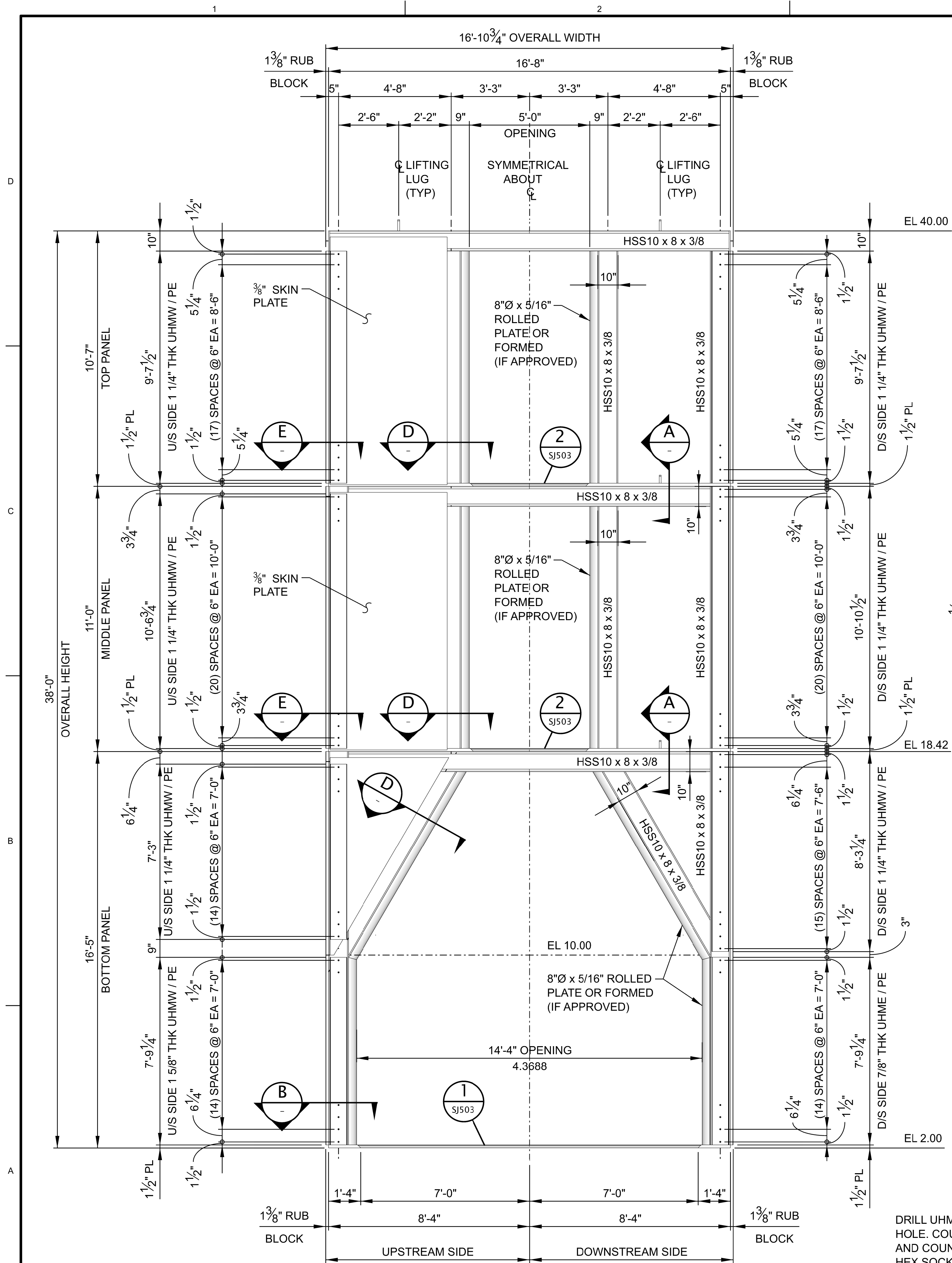
P&S REVIEW 90%

DESIGNED BY: LAWRENCE A. HENNINGER	DATE: 01/19/2021	CHECKED BY: MATTHEW D. HANSON, P.E.	SOLICITATION NO.:
DRAWN BY: LAWRENCE A. HENNINGER		CONTRACT NO.:	
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON		PLOT SCALE: 1:1	DRAWING NUMBER:
		FILE NAME: BDP1.124_SJ501XXX.dgn	
		ANSI D	

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE

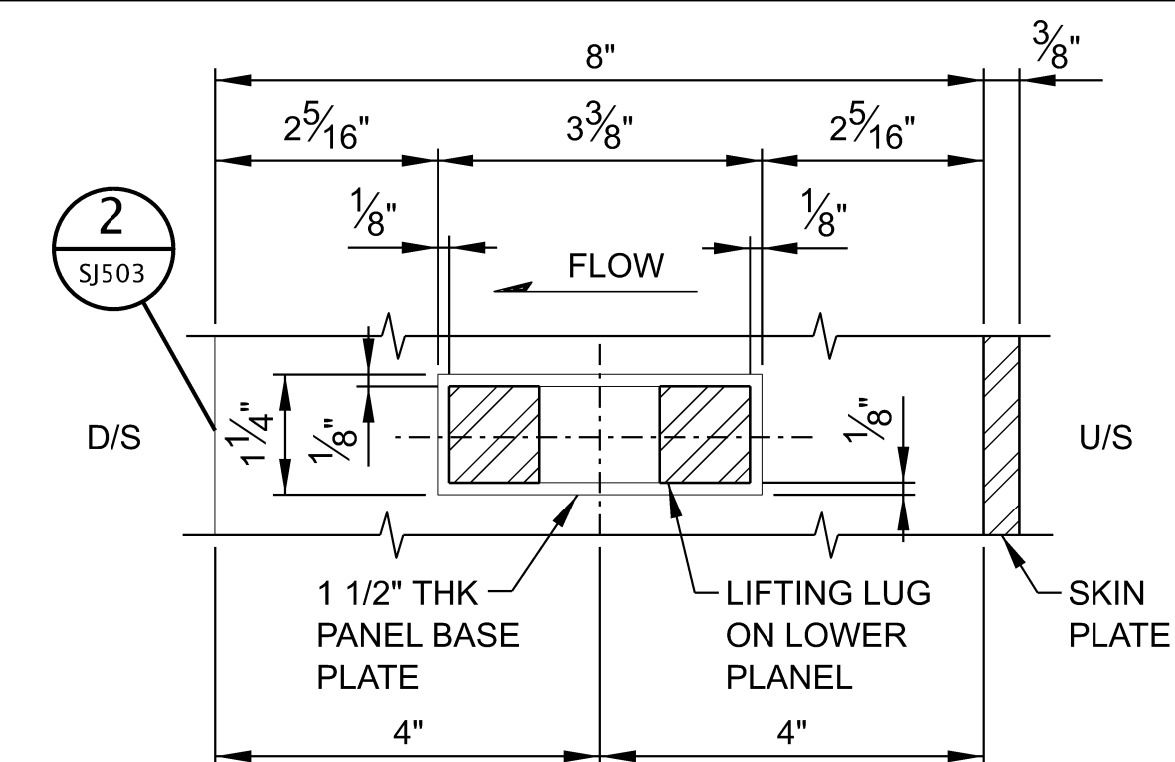
VARIABLE WIDTH WEIR
ISOMETRICS

SHEET IDENTIFICATION
SJ501

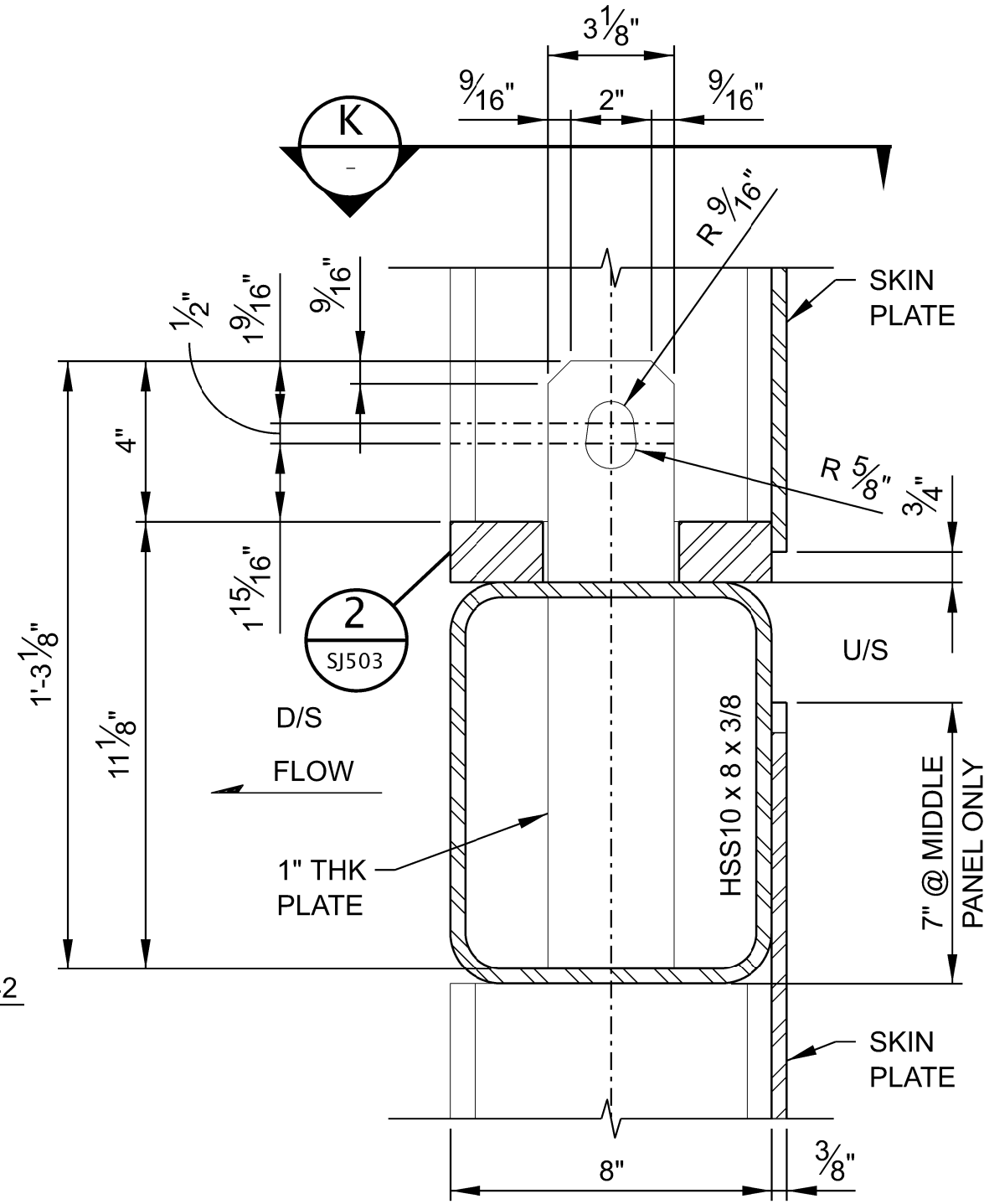


ELEVATION-VARIABLE WIDTH WEIR

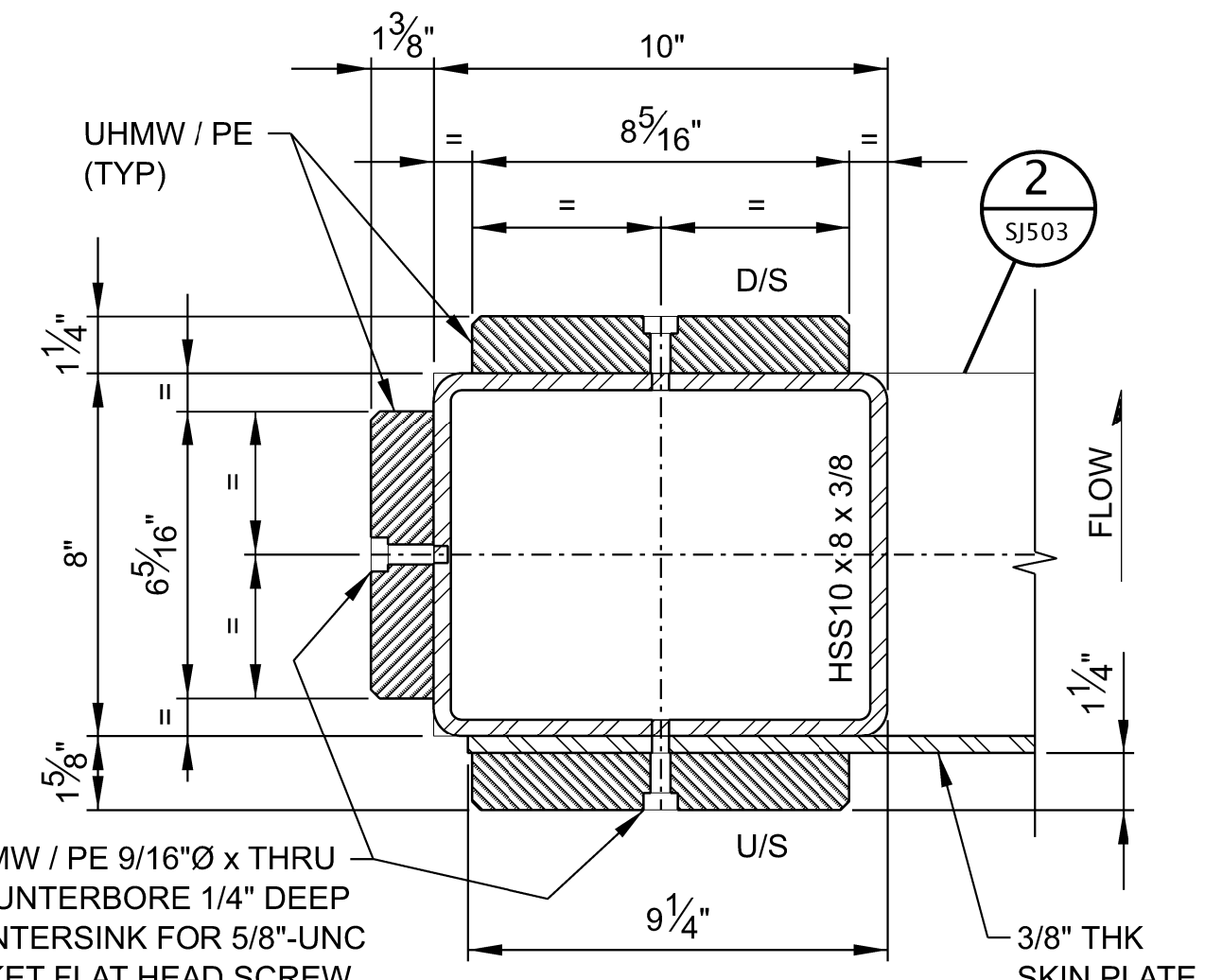
SCALE: 3/8" = 1'-0"



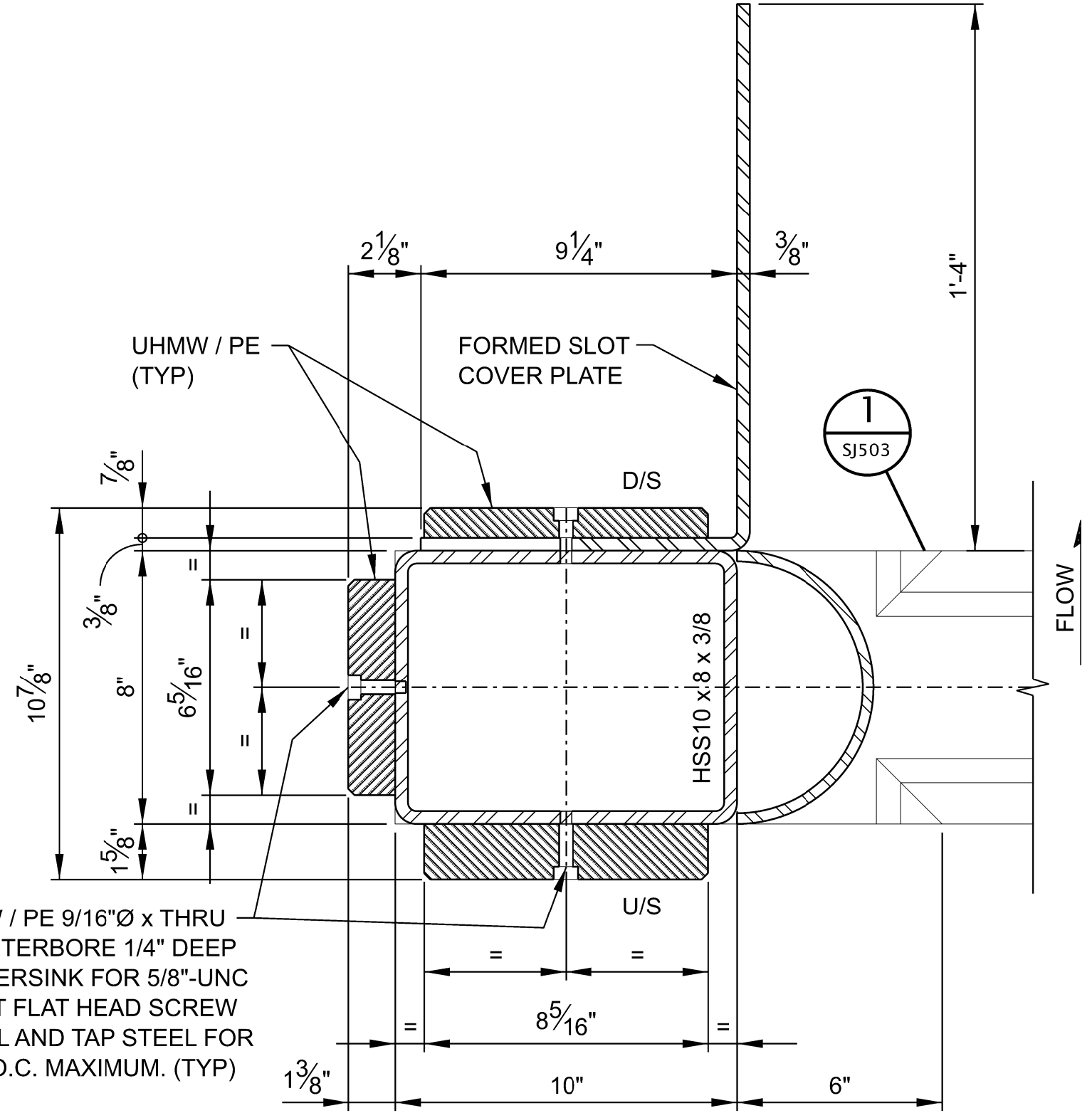
SECTION K
SCALE: HALF SIZE



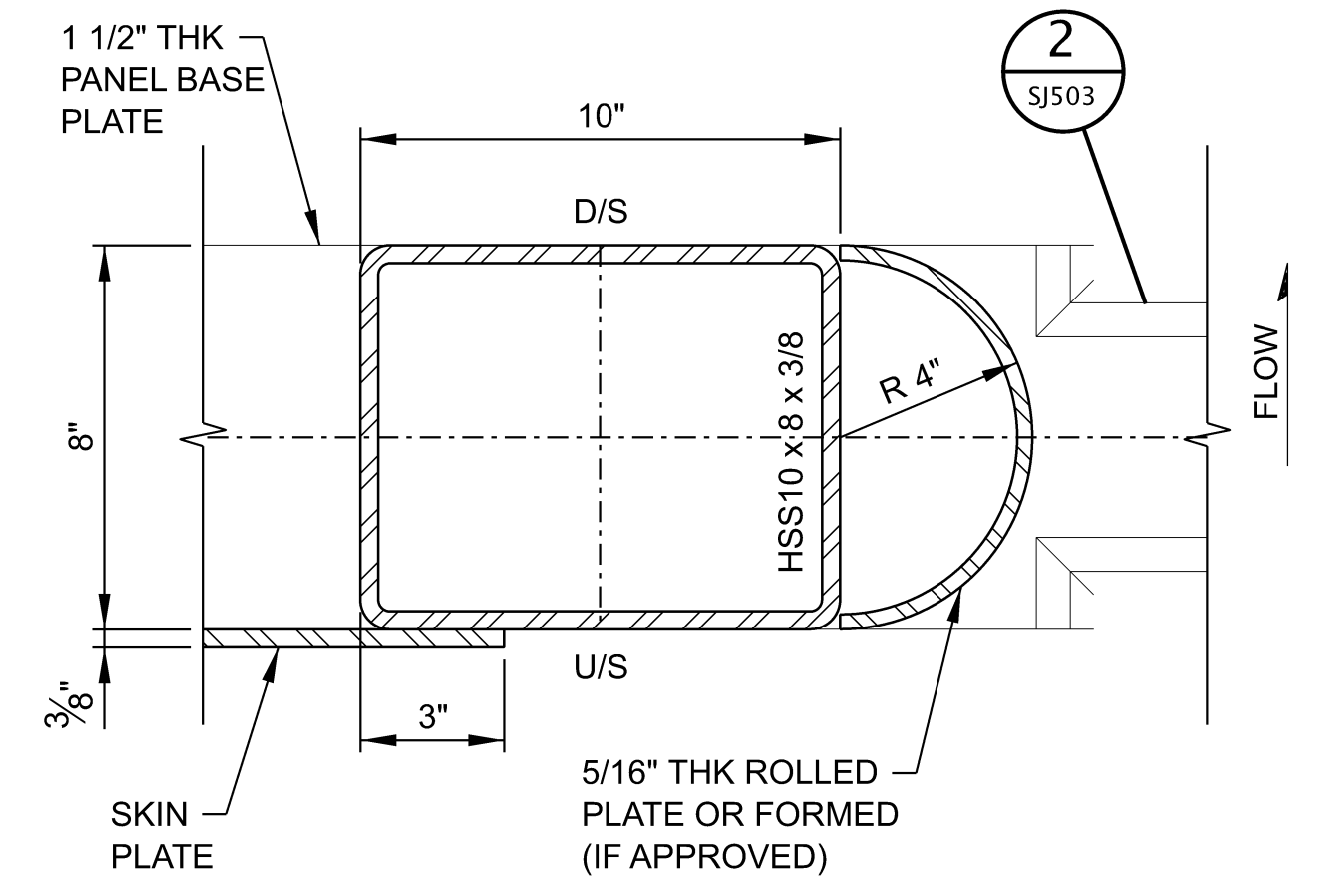
SECTION A
SCALE: 3\"/>



SECTION E
SCALE: 3\"/>



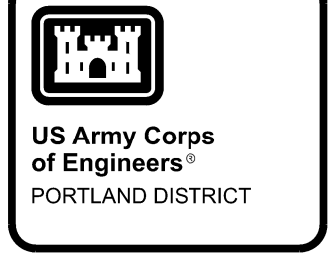
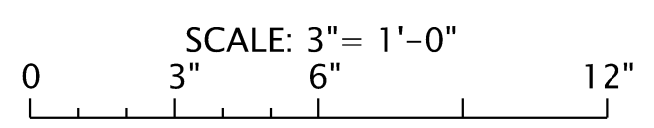
SECTION B
SCALE: 3\"/>



SECTION D
SCALE: 3\"/>

NOTES:

- 1. SEE SHEET SJ001 FOR VARIABLE WIDTH WEIR NOTES.



DATE 07	DATE 08	DATE 09	DATE 04	DATE 03	DATE 02	DATE 01	APPR.

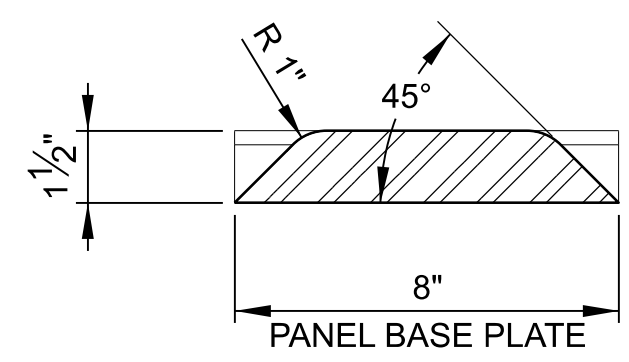
P&S REVIEW 90%	
DESIGNER	DATE 02/2021
CHECKER	DATE 03/2021
DESIGNED BY	SOLICITATION NO:
DESIGNED BY	CONTRACT NO:
DESIGNED BY	DATE 03/2021
DESIGNED BY	DRAWING NUMBER:
DESIGNED BY	FILE NAME:
DESIGNED BY	ANSI D
MARK	DESCRIPTION

DESIGNED BY	DATE 02/2021
CHECKER	DATE 03/2021
DESIGNED BY	SOLICITATION NO:
DESIGNED BY	CONTRACT NO:
DESIGNED BY	DATE 03/2021
DESIGNED BY	DRAWING NUMBER:
DESIGNED BY	FILE NAME:
DESIGNED BY	ANSI D

U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON
------------------------------	-------------------	------------------

BONNEVILLE DAM AND RESERVOIR	VARIABLE WIDTH WEIR
BRADFORD ISLAND FISH LADDERS	ELEVATION AND SECTIONS
FY2019 FISH ACCORDS	
LAMPREY PASSAGE	

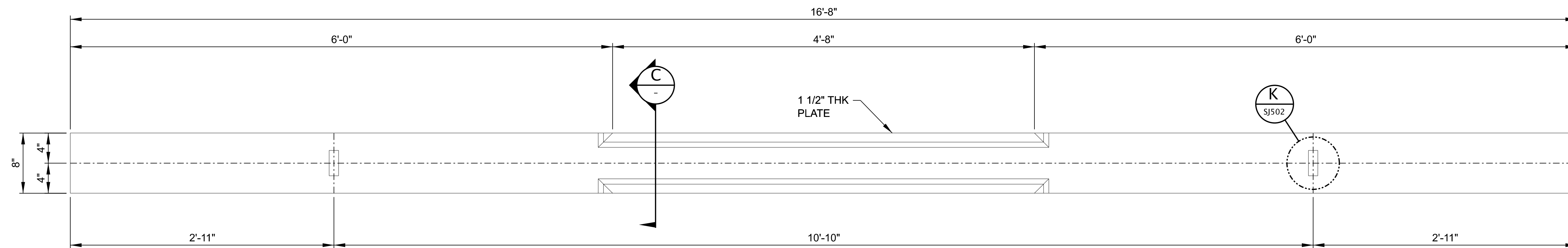
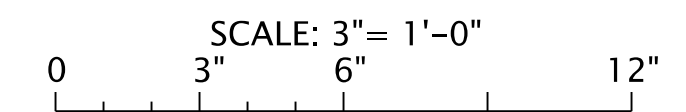
SHEET IDENTIFICATION
SJ501



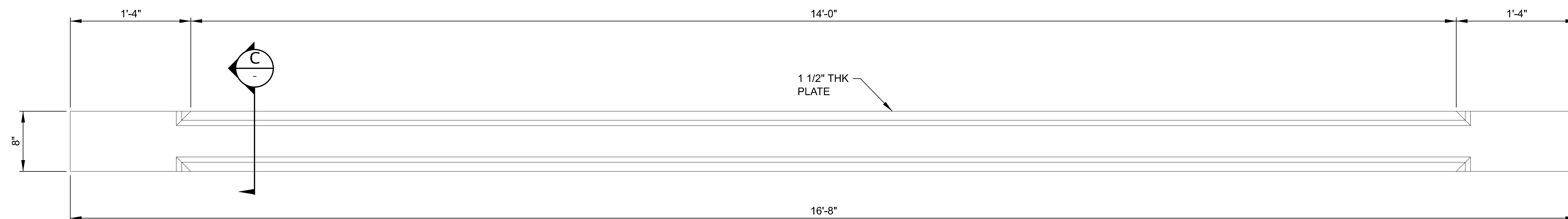
SECTION C
SCALE: 3" = 1'-0"

NOTES:

- SEE SHEET SJ001 FOR VARIABLE WIDTH WEIR NOTES.



2 DETAIL – MIDDLE AND UPPER LEAF BASE PLATE
SCALE: 1 1/2" = 1'-0"



1 DETAIL – LOWER LEAF BASE PLATE
SCALE: 1 1/2" = 1'-0"



US Army Corps of Engineers
PORTLAND DISTRICT

DATE	DESCRIPTION	MARK	APPR.
DATE 07			
DATE 08			
DATE 09			
DATE 04			
DATE 03			
DATE 02			
DATE 01			
DATE			

P&S REVIEW 90%

DESIGNED BY: PORTLAND DISTRICT	DATE: 01/09/2021
CHECKED BY: LAWSON A. HENNINGER	SOLICITATION NO.:
SUBMITTED BY: MATTHEW D. HANSON, P.E.	CONTRACT NO.:
PLOT SCALE: 1:1	DRAWING NUMBER:
FILE NAME: BDPT.124_SJ503.dgn	SIZE:
ANSI D	

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
VARIABLE WIDTH WEIR
SECTIONS AND DETAILS

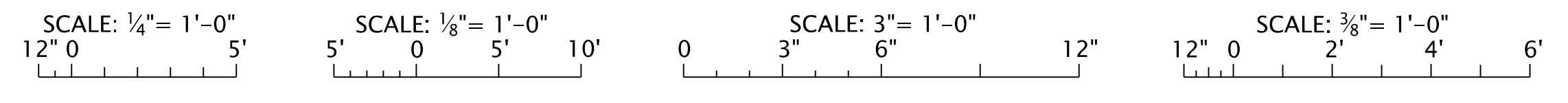
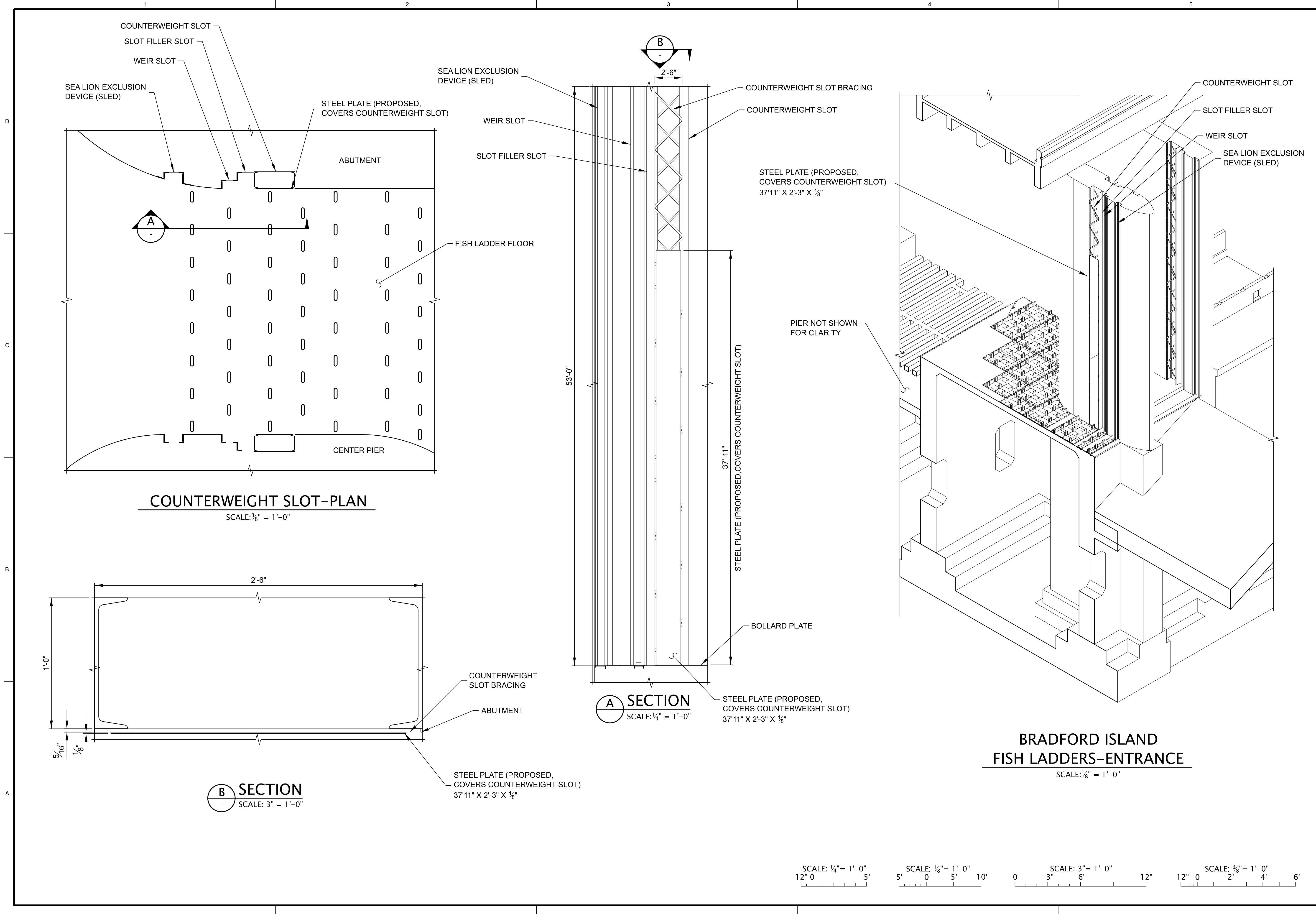
SHEET IDENTIFICATION
SJ503

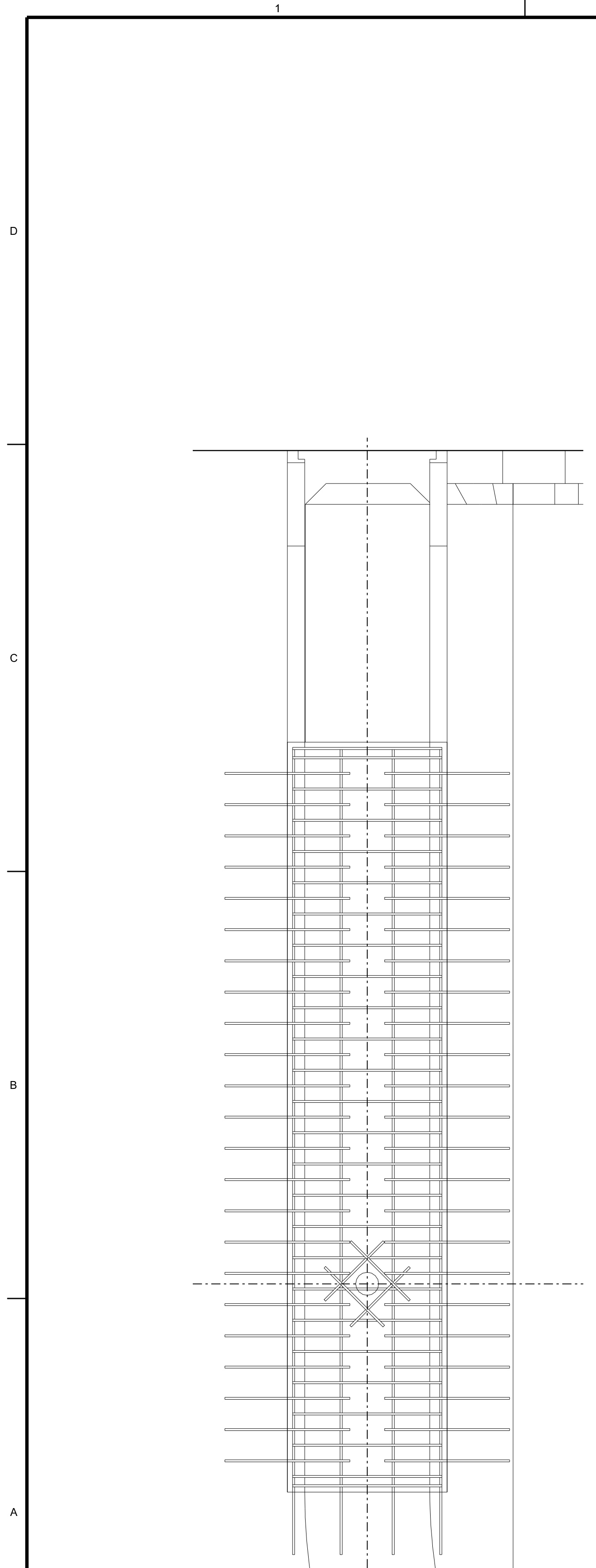
DATE 07	DATE 06	DATE 05	DATE 04	DATE 03	DATE 02	DATE 01	APPR.
P&S REVIEW 90%							MARK
DESCRIPTION							

DESIGNED BY: CENTER	DATE: 01/02/2021	CHECKED BY: M. WILHELM	SOLICITATION NO.:
DRAWN BY: M. WILHELM	HEWNA GER	CONTRACT NO.:	
SUBMITTED BY: MATTHEW D. HANSON, P.E.	FILE NAME:	PLOT SCALE:	PLOT DATE:
	BDFT.124.SL501XXX.dgn	1:1	
ANSI D	SIZE:	DRAWING NUMBER:	

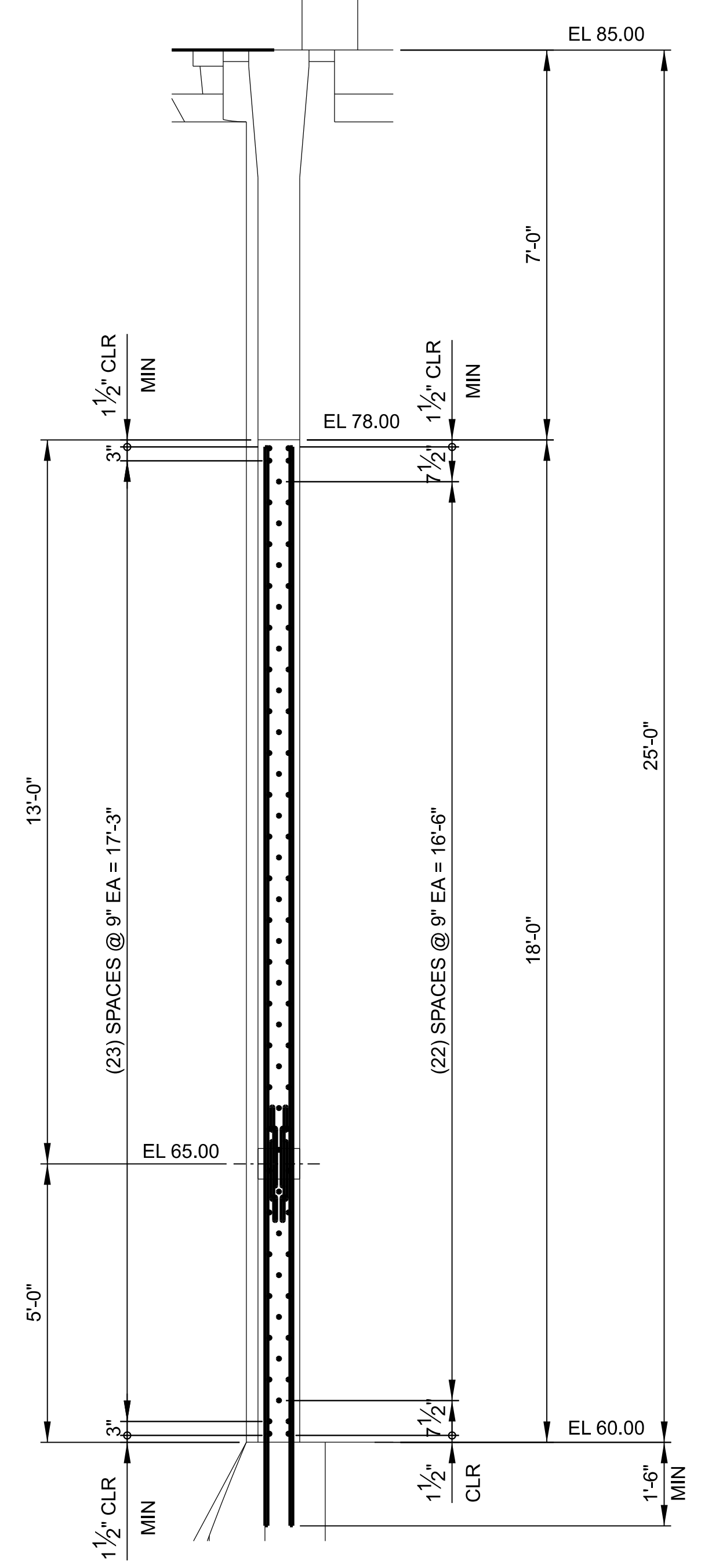
BONNEVILLE DAM AND RESERVOIR
BRADFORD ISLAND FISH LADDERS
FY2019 FISH ACCORDS
LAMPREY PASSAGE
COUNTERWEIGHT SLOT MODIFICATIONS
PLAN AND SECTIONS

SHEET IDENTIFICATION
SL501

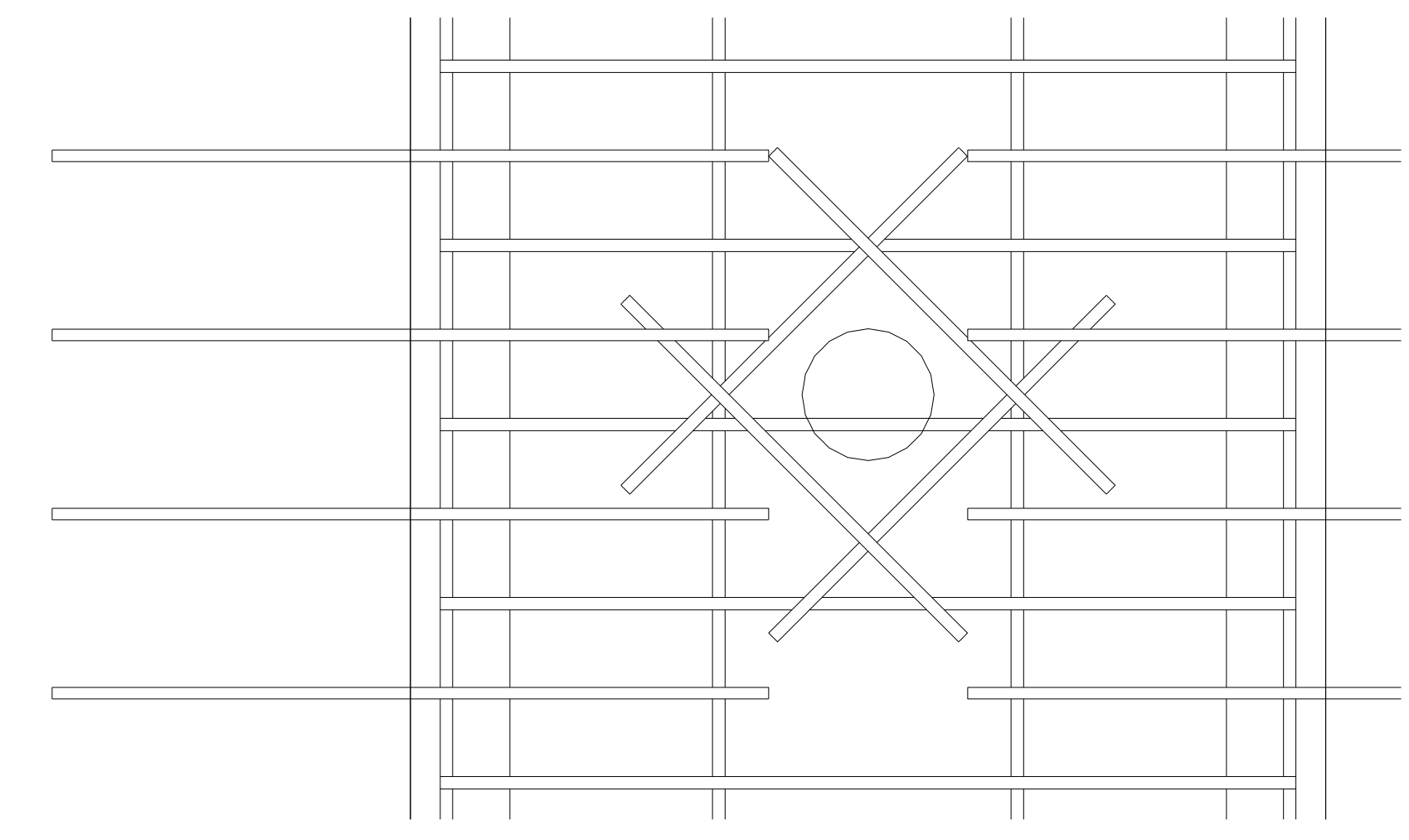




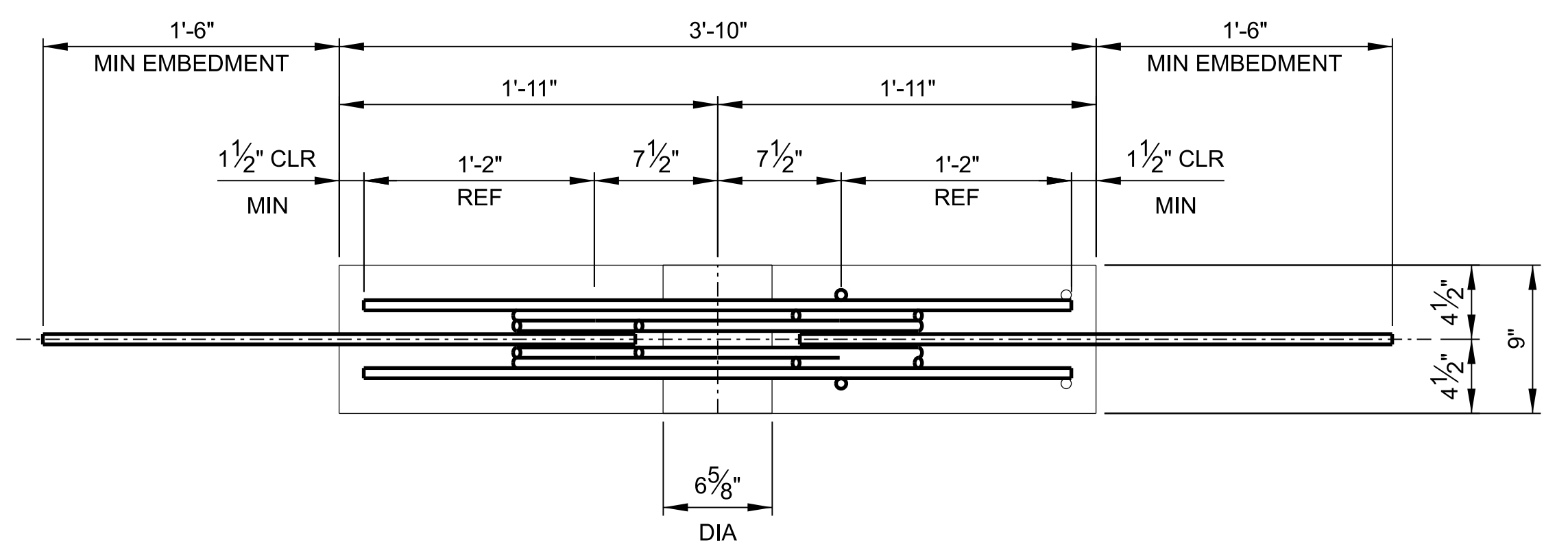
A ELEVATION LOOKING EAST
SCALE: 1/2" = 1'-0"



B SECTION LOOKING SOUTH
SCALE: 1/2" = 1'-0"

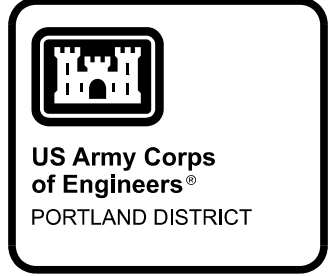


1 DETAIL- REINFORCEMENT AT PIPE PENETRATION
SCALE: 1 1/2" = 1'-0"



B PLAN SECTION THROUGH WEIR
SCALE: 1 1/2" = 1'-0"

- NOTES:**
- SEE SHEET G-001 AND G-002 FOR DRAWING INDEX.
 - SEE SHEET G-003 FOR GENERAL NOTES. AND SYMBOLS.
 - SEE SHEET S-001 FOR STRUCTURAL GENERAL NOTES.
 - ALL REINFORCING STEEL TO BE #5 BAR UNLESS NOTED OTHERWISE

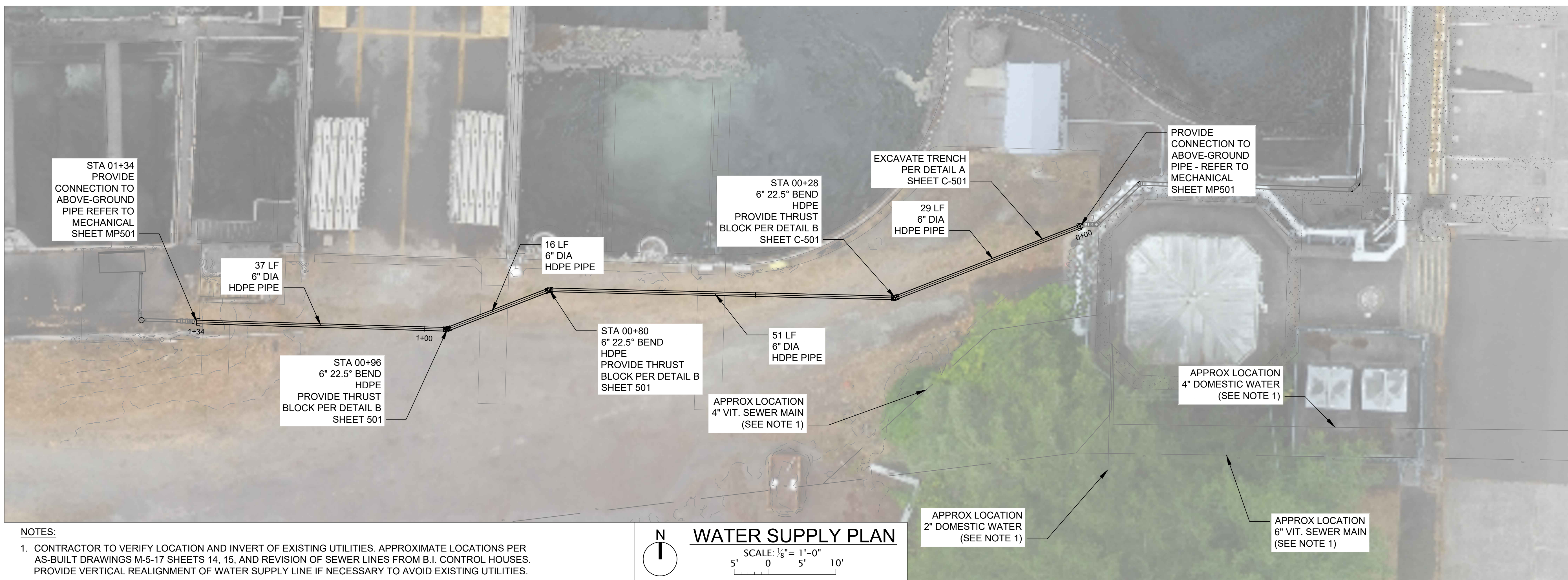


DATE	DESCRIPTION	MARK	APPR.
DATE 07			
DATE 08			
DATE 09			
DATE 04			
DATE 03			
DATE 02			
DATE 01			
DATE			

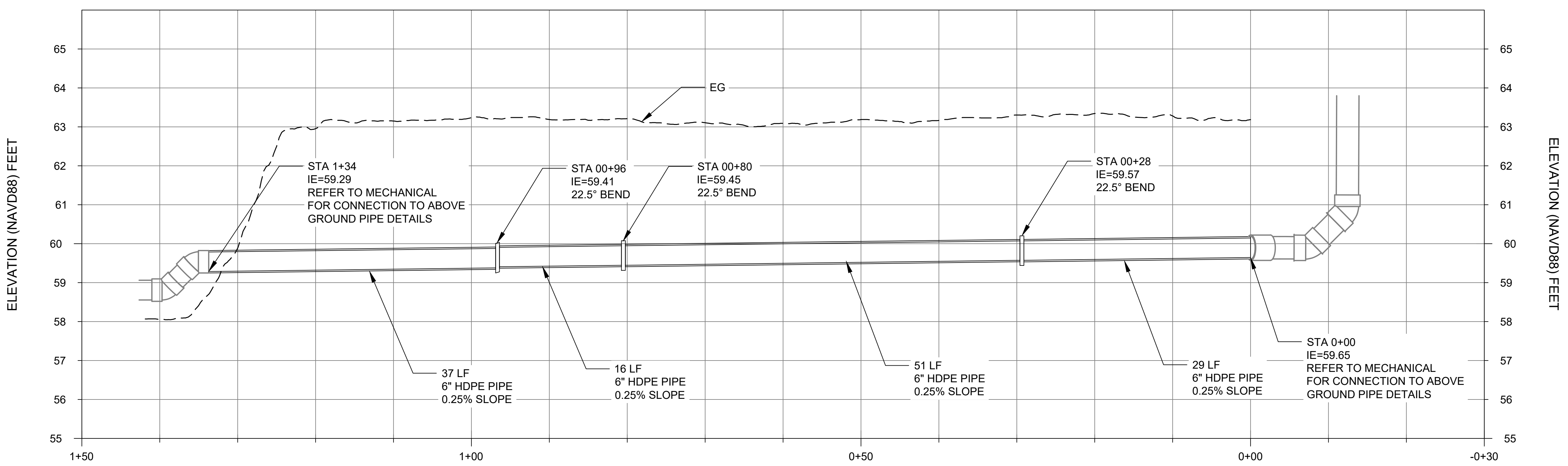
DESIGNED BY: JACOBSON	CHECKED BY: HENNINGER	DATE: 01/30/2021	SOLICITATION NO.:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	CONTRACT NO.:	FILE NAME: BDPT124_SM500XXX.dgn	DRAWING NUMBER:
SUBMITTED BY: MATTHEW D. HANSON, P.E.		ANSI D	SIZE: 1:1

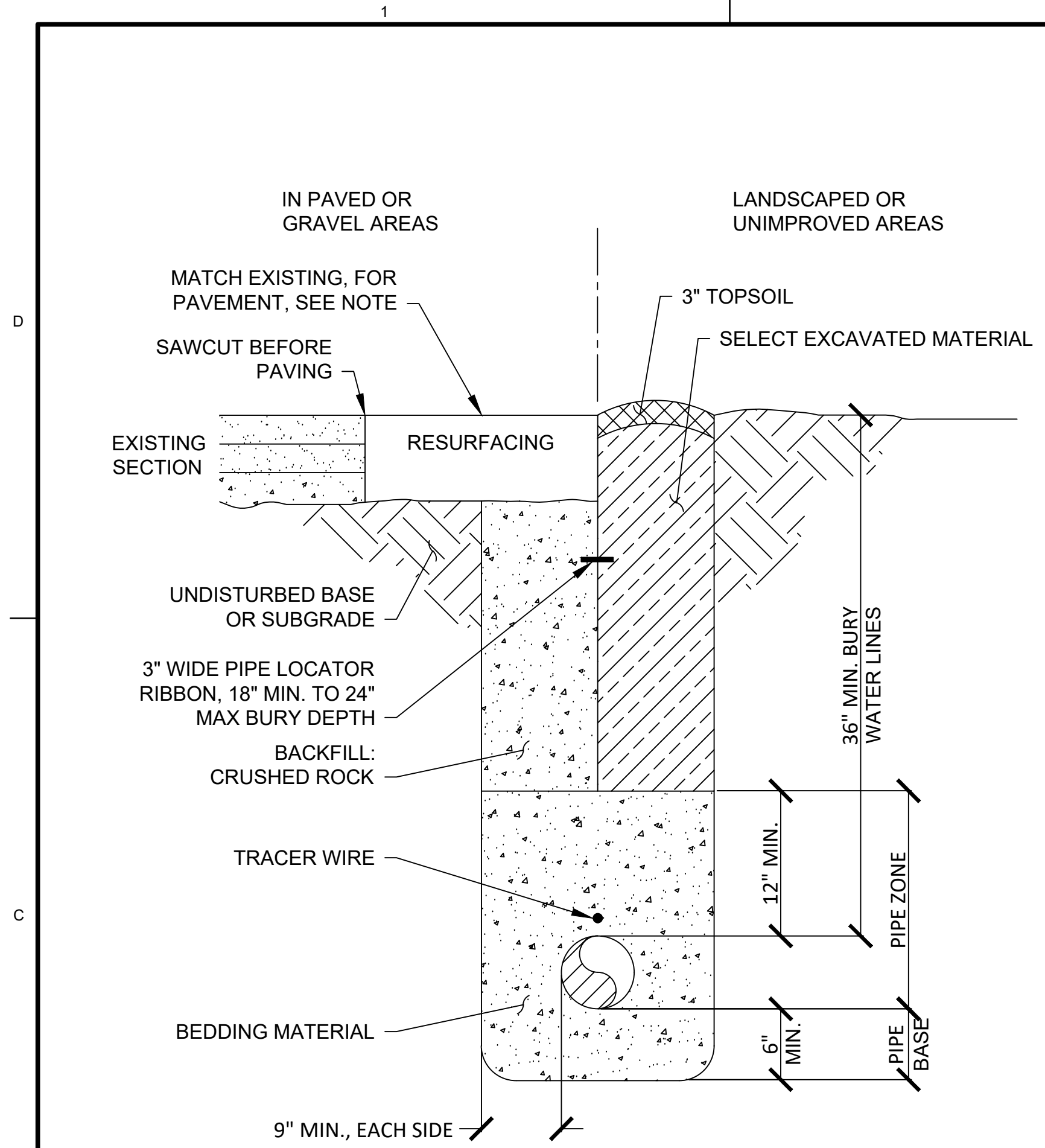
BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
FINGERLING PASSAGE WEIR AT SLOT NO.10
ELEVATION AND SECTIONS

SHEET IDENTIFICATION
SM503



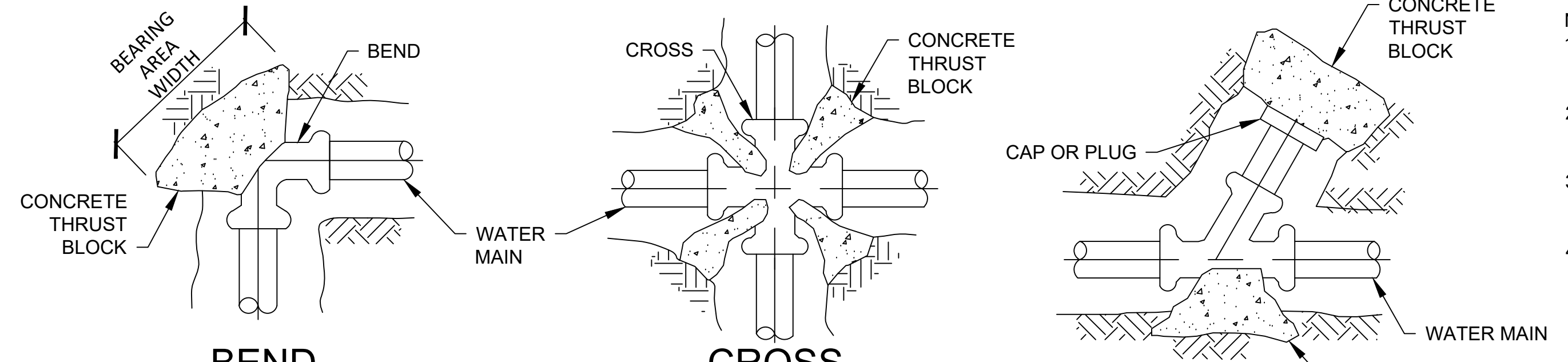
NOTES:
 1. CONTRACTOR TO VERIFY LOCATION AND INVERT OF EXISTING UTILITIES. APPROXIMATE LOCATIONS PER AS-BUILT DRAWINGS M-5-17 SHEETS 14, 15, AND REVISION OF SEWER LINES FROM B.I. CONTROL HOUSES. PROVIDE VERTICAL REALIGNMENT OF WATER SUPPLY LINE IF NECESSARY TO AVOID EXISTING UTILITIES.



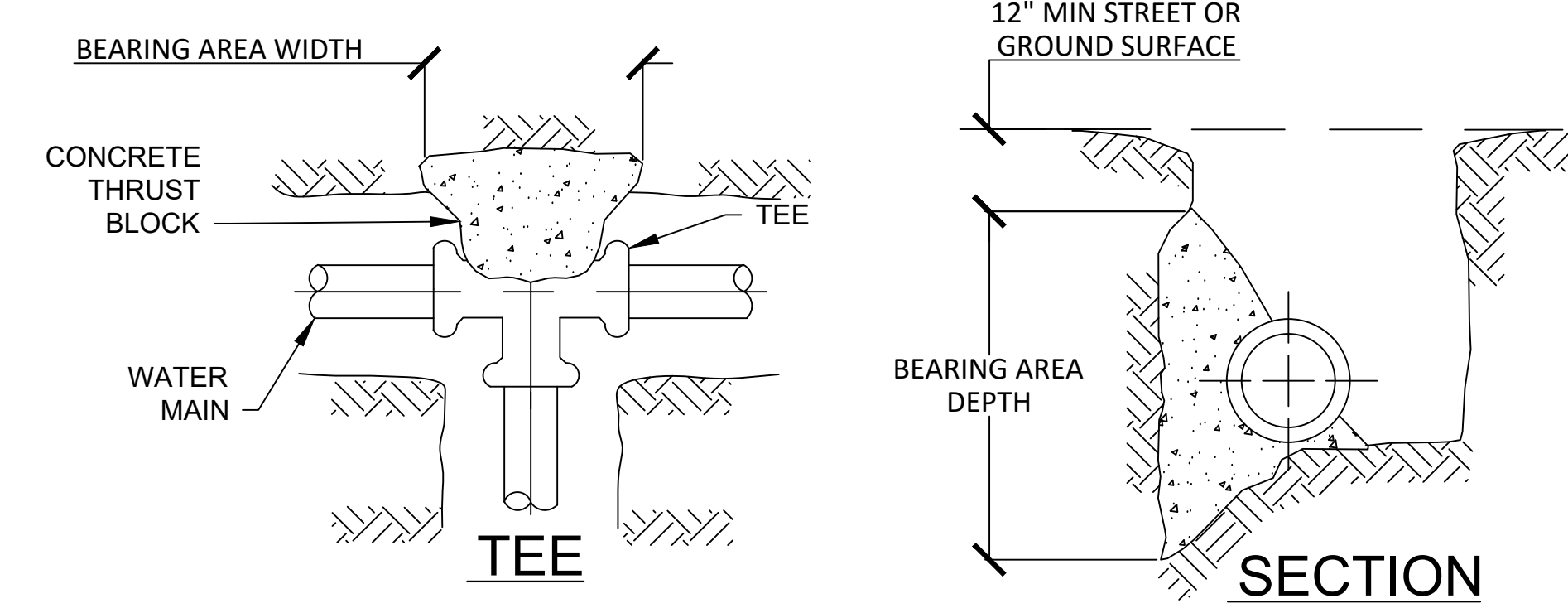


- NOTES:
1. REPLACE ASPHALT AS ENCOUNTERED, EQUIVALENT SECTION OR MINIMUM OF 3" AC, MAX. LIFTS OF 3".

A TYPICAL WATERLINE TRENCH DETAIL
SCALE: NTS



- NOTES:
1. THRUST BLOCKS ARE REQUIRED FOR HORIZONTAL BENDS GREATER THAN 7 DEGREES.
 2. ALL ANCHORS AND THRUST BLOCKS SHALL BE PLACED AGAINST UNDISTURBED SOIL.
 3. ALL CONC. FOR THRUST BLOCKS SHALL BE 3000 PSI.
 4. CONCRETE ANCHORS ARE TO BE KEPT CLEAR OF ALL PIPE AND VALVE JOINTS.



THRUST BLOCK LOCATION	BEARING AREA REQUIRED IN SQUARE FEET
TEE/CAP OR PLUG	2.0
90° BEND	2.9
45° BEND	1.6
22.5° BEND	0.8
11.25° BEND	0.4

B THRUST BLOCK DETAILS
SCALE: NTS



P&S REVIEW 90%

DESIGNED BY: PERRY D. CARROLL, P.E.	DATE: 03/09/2021
DRAWN BY: CARROLL, MICHAEL	SUBMITTED BY: JEREMY S. APPT, P.E.
PROJECT NO.:CARROLL	CONTRACT NO.:8/8/2022
FILE NAME: BDP-1.124_C-501.dwg	DRAWING NUMBER: 1:1

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
WATER SUPPLY DETAILS

SHEET IDENTIFICATION
C-501



US Army Corps
of Engineers®
PORTLAND DISTRICT

DATE	APPR.

DESCRIPTION	MARK
90% REVIEW	

U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	DESIGNED BY:	DATE:
	DRAWN BY: CZECB	10/29/2021
SUBMITTED BY:	ISSUED BY: CZECB	SOLICITATION NO.:
PLOT SCALE: 1:1	FILE NAME:	CONTRACT NO.:

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
GENERAL MECHANICAL NOTES

SHEET
IDENTIFICATION
M-001

TOLERANCES UNLESS OTHERWISE SPECIFIED	
LINEAR DECIMAL	
1 DECIMAL PLACE	± 0.030"
2 DECIMAL PLACES	± 0.010"
3 DECIMAL PLACES	± 0.002"
LINEAR FRACTIONAL	
GENERAL	± 1/32"
SAWING, FLAME CUTTING, SHEARING, AND BREAKING	± 1/16"
STRUCTURAL SHAPES AND WELDING	± 1/8"
ANGULAR	
0 DECIMAL PLACES	± 0.5°
1 DECIMAL PLACE	± 0.1°

LEGEND:

———— BOLD LINES REPRESENT NEW ITEMS.

MECHANICAL GENERAL NOTES:

1. INFORMATION, TOLERANCES, AND NOTES ON THIS SHEET APPLY TO ALL MECH. DRAWINGS, UNLESS NOTED OTHERWISE.
2. DIMENSIONS SHOWN ARE BASED ON SPECIFIED EQUIPMENT. ADJUSTMENTS MAY BE REQUIRED DEPENDING ON SPECIFIC EQUIPMENT APPROVED FOR INSTALLATION.
3. ALL LINEAR UNITS ARE FEET AND INCHES OR INCHES AND ALL ANGULAR UNITS ARE DEGREES, UNLESS SHOWN OTHERWISE.
4. WELDING OF ALUMINUM IS TO BE PERFORMED IN ACCORDANCE WITH AWS D1.2. WELD SIZES WILL BE THE MINIMUM SIZE REQUIRED BY AWS D1.2 FOR THE TYPE OF WELD SHOWN UNLESS SHOWN OTHERWISE.
5. PROVIDE MECHANICAL FASTENERS PER ASTM F593C WITH NUTS AND INSULATING WASHERS. INSTALL WITH AN APPROVED ANTI-GALLING COMPOUND AND NYLON WASHERS UNLESS OTHERWISE NOTED.
6. PROVIDE EPDM GASKETS FOR ALL FLANGED CONNECTIONS.
7. BREAK CORNERS AND EDGES.
8. ALL FISH CONTACTING SURFACES MUST BE SMOOTH TO THE TOUCH WITH NO BURRS OR SNAGS. FINAL SURFACING SUBJECT TO USACE BIOLOGIST APPROVAL.
9. ALL COMPONENTS ARE FABRICATED FROM 3/16" 5052-H34 ALUMINUM SHEET PER ASTM B209 UNLESS SPECIFIED OTHERWISE.
10. ALL LAMPREY FLUME COMPONENTS ARE TO BE COLD FORMED WITH BEND RADII NO LESS THAN 9/16" UNLESS SPECIFIED OTHERWISE. COMPONENTS MUST HAVE CLEAN CUTS AND MAY NOT BE FLAME CUT.
11. WELD ALL LAMPREY FLUME COMPONENTS WATER TIGHT. BUILD UP WELDS AND GRIND TO MATCH BEND RADII WHERE NECESSARY TO ENSURE CONTINUOUS TRANSITION BETWEEN HORIZONTAL AND VERTICAL SURFACES.



US Army Corps
of Engineers®
PORTLAND DISTRICT

90% REVIEW

MARK DESCRIPTION DATE APPR.

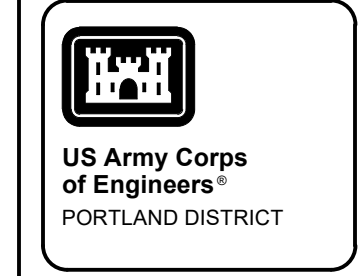
DESIGNED BY: PIN BY: CZEB	CHECKED BY: CZEB	DATE: 10/25/2021
SUBMITTED BY:	PLLOT SCALE: 1:1	SOLICITATION NO:
FILE NAME: ANSID	FILE NAME:	CONTRACT NO:

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
MECHANICAL DEMOLITION

SHEET
IDENTIFICATION
MD101

GENERAL NOTES:
1. CONTRACTOR MAY ENCOUNTER HAZARDOUS MATERIALS DURING DEMOLITION. TEST AS REQUIRED TO ENSURE ENVIRONMENT IS SAFE. CONTRACTOR SHOULD ASSUME AT A MINIMUM THAT LEAD AND ASBESTOS IS PRESENT AND WILL REQUIRE REMEDIATION.

THIS PAGE RESERVED AS OF 90%

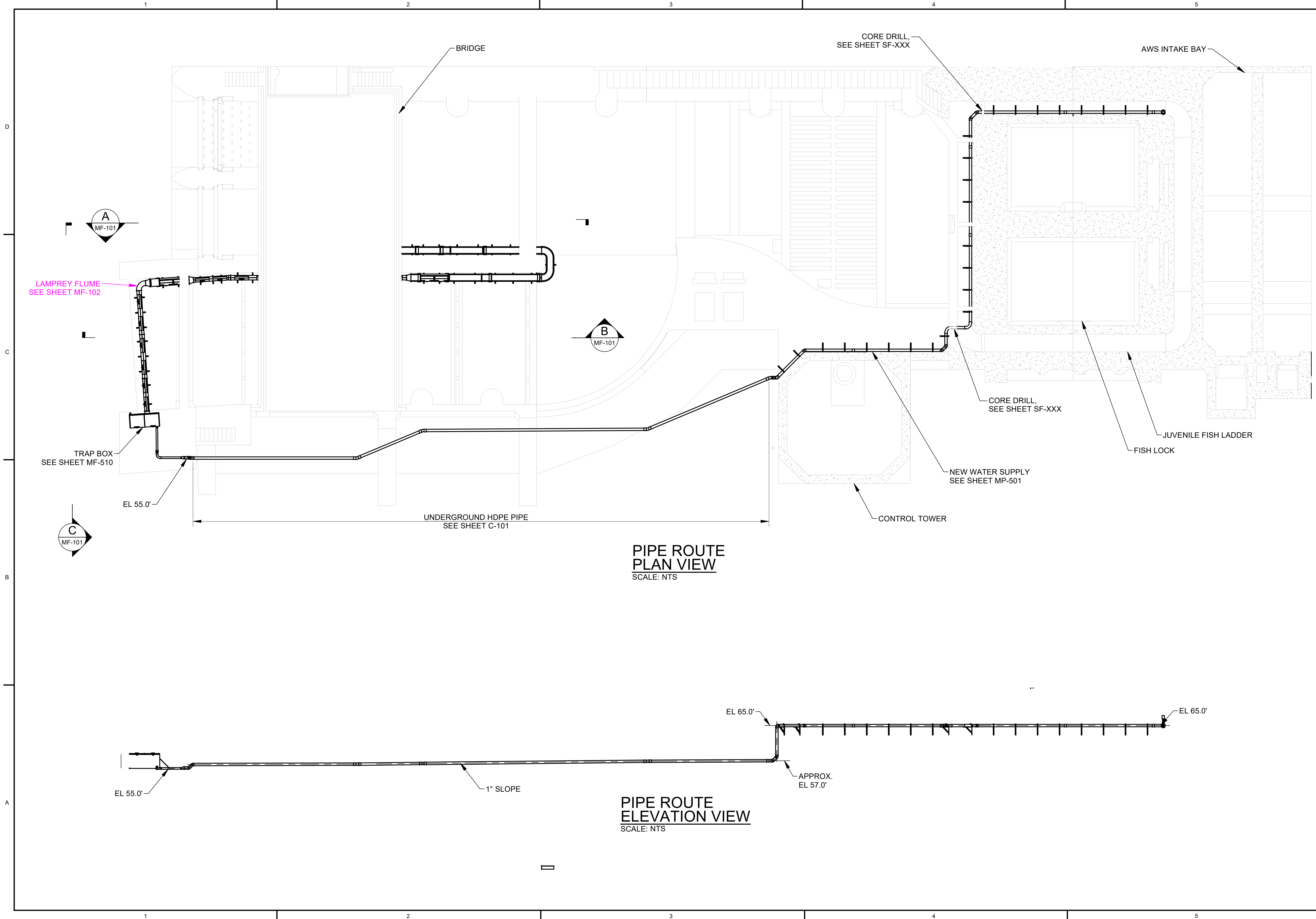


DATE	DESCRIPTION	APPR.
	90% REVIEW	

DESIGNED BY: SZECD/PS GREGORP	CHKD BY: GREGORP	DATE: 10/25/2021	SOLICITATION NO.:	CONTRACT NO.:
SUBMITTED BY:	PLOT SCALE: 1:1	PLOT DATE: 10/25/2021	FILE NAME:	
ANSID	SIZE:			

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
WATER SUPPLY
LOCATION

SHEET
IDENTIFICATION
MP101



**PIPE ROUTE
PLAN VIEW**
SCALE: NTS

**PIPE ROUTE
ELEVATION VIEW**
SCALE: NTS

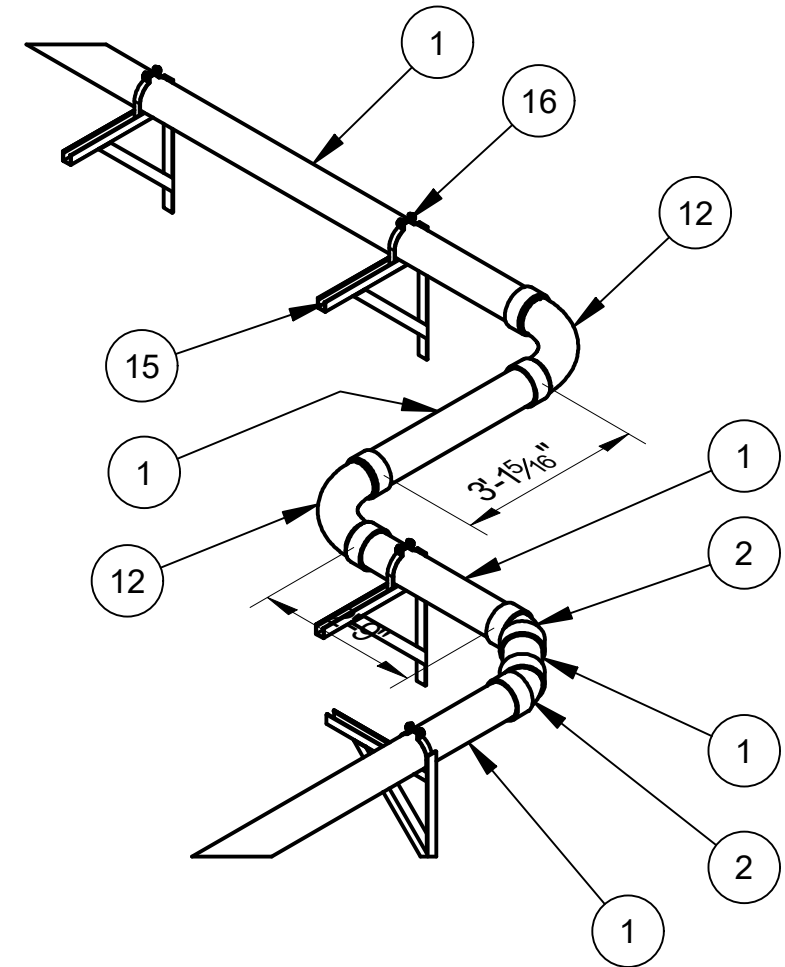
1

2

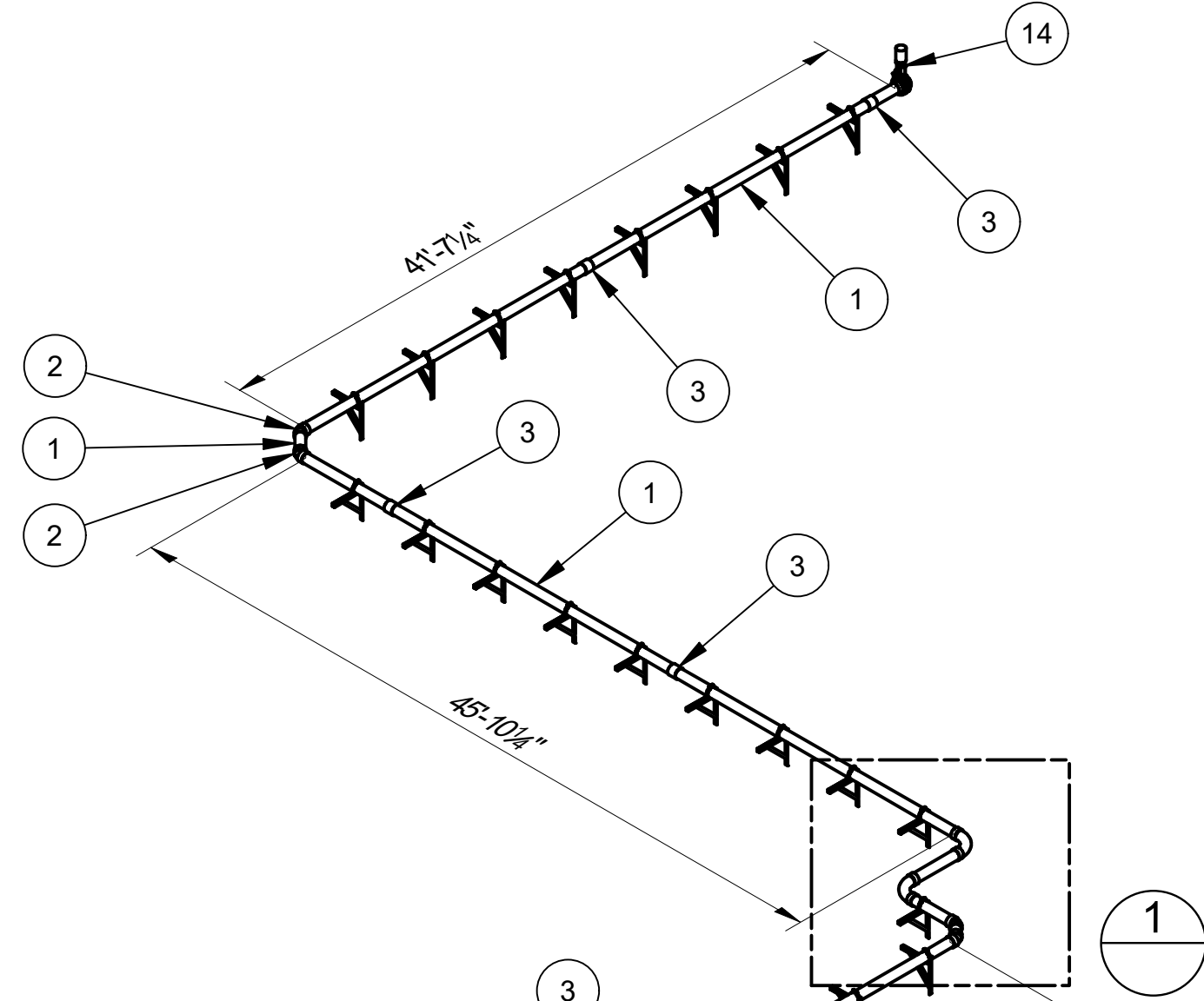
3

4

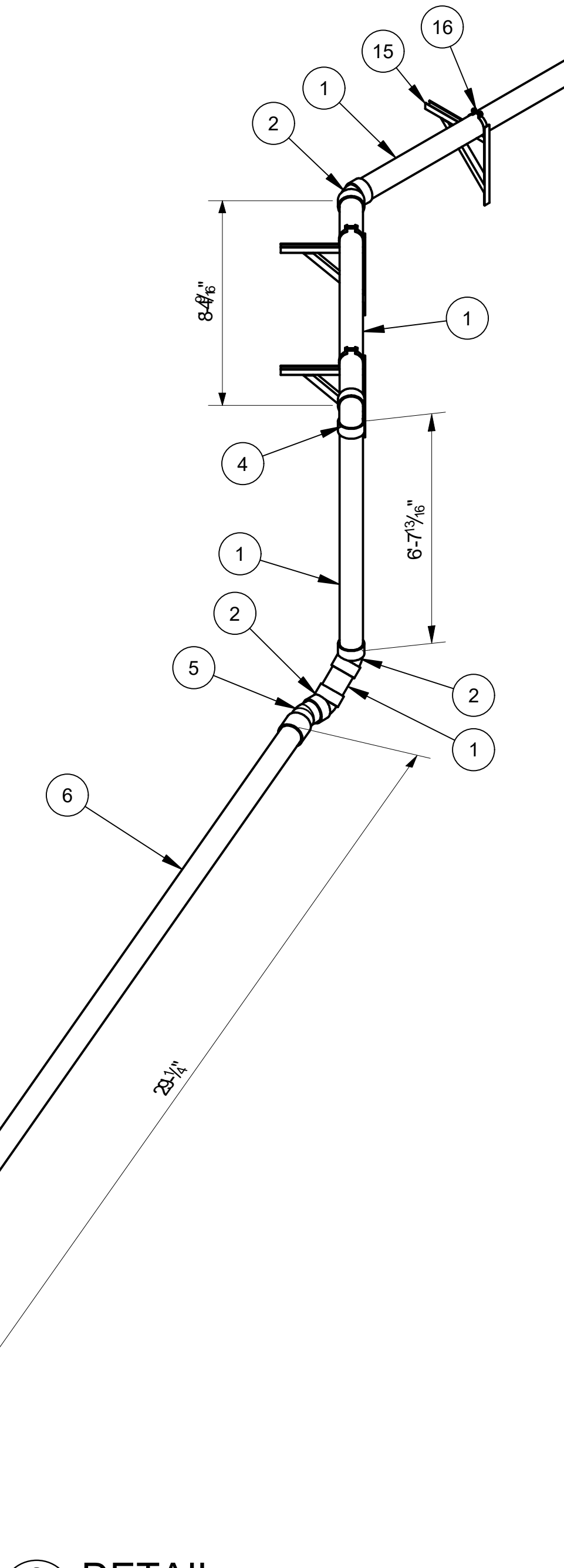
5



1 DETAIL
SCALE: 3/8" = 1'-0"



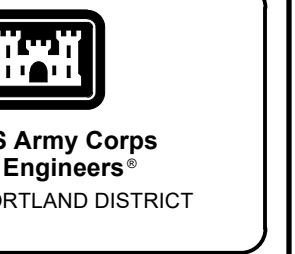
3 DETAIL
SCALE: 3/8" = 1'-0"



2 DETAIL
SCALE: 3/8" = 1'-0"

PARTS LIST		
ITEM	QTY	DESCRIPTION
1	1	6in Sch 80 PVC Pipe
2	9	ASTM D 2467 45 Deg Elbow Socket-Type - Schedule 80 6
3	12	ASTM D 2467 Coupling Socket-Type - Schedule 80 6
4	1	ASTM D 2467 90 Deg Elbow Socket-Type - Schedule 80 6
5	4	6 in HDPE Pipe - 22.5° bend
6	1	6 in HDPE Pipe
7	1	PVC 6 in to 4 in Reducer SCH 80
8	1	4 in Sch 80 PVC Pipe
9	1	4 in Long Sweep 90° Elbow Socket Type SCH 80 4
10	1	4 in Cam and Groove Socket
11	1	4 in Weather Resistant Cam and Groove Hose
12	2	6 in PVC Long Sweep Elbow
13	2	6 in PVC Flange
14	1	6 in Pneumatic Knife Gate Valve
15	26	1-5/8 in Galvanized Steel Channel Strut Bracket with Isolation Material
16	26	6 in Pipe Clamp for 1-5/8 in Galvanized Steel Channel

- NOTES
- USE SOCKET TYPE FITTINGS
 - PIPE LENGTHS FOR REFERENCE ONLY. FIELD VERIFY DIMENSIONS PRIOR TO INSTALLATION.
 - LOCATIONS OF ANCHORS AND SUPPORTS TO BE FIELD VERIFIED.
 - SEE SHEET SF-101 FOR PIPE SUPPORT PLAN.



US Army Corps
of Engineers
PORTLAND DISTRICT

90% REVIEW

DESIGNED BY: U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
PORTLAND, OREGON

DATE: 10/25/2021

CHK BY: C2ENGCEP

SUBMITTED BY:

PLOT SCALE: 1:1

SIZE: 11

FILE NAME:

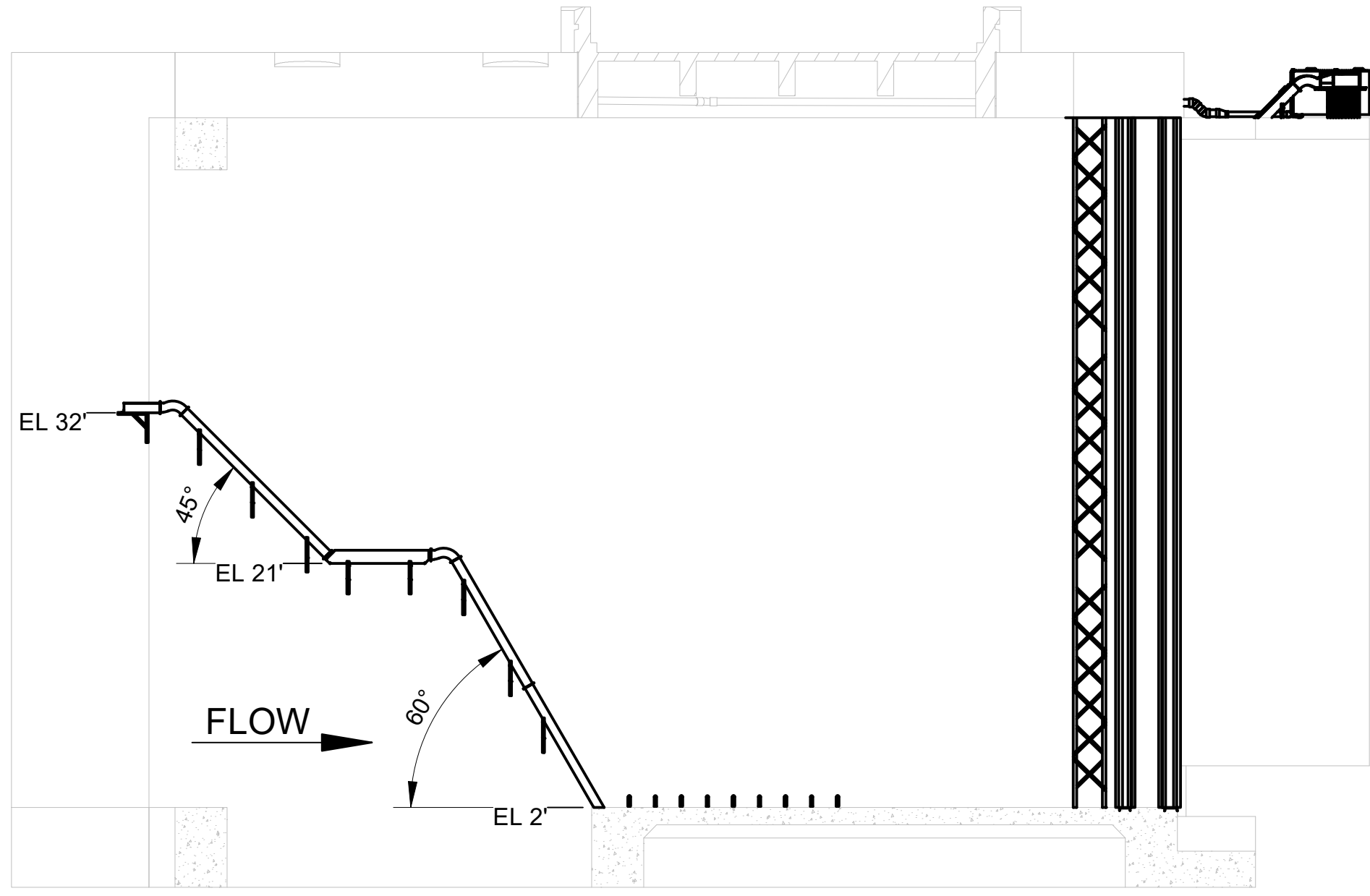
SOLICITATION NO:

CONTRACT NO:

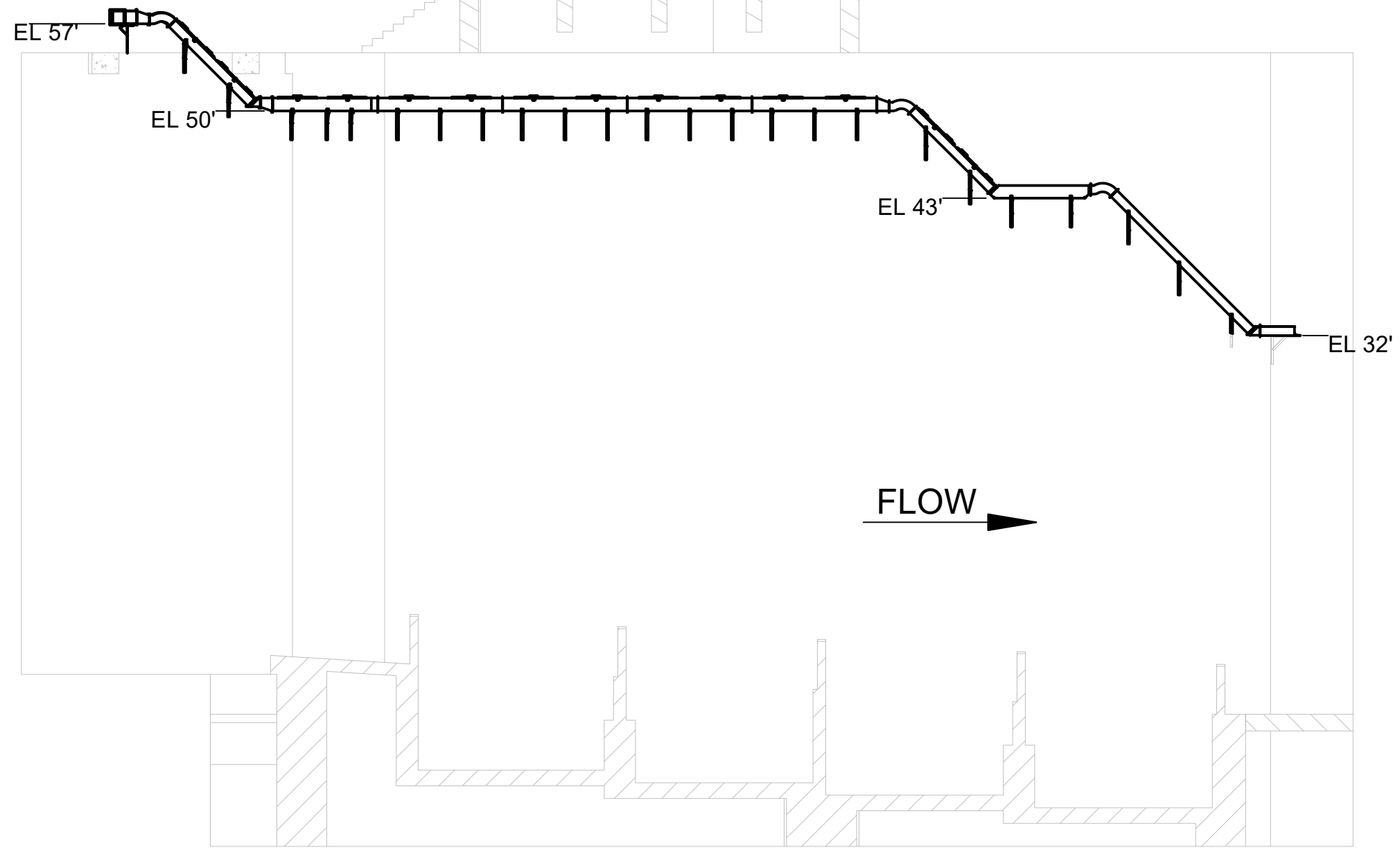
BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE

WATER SUPPLY
PIPING

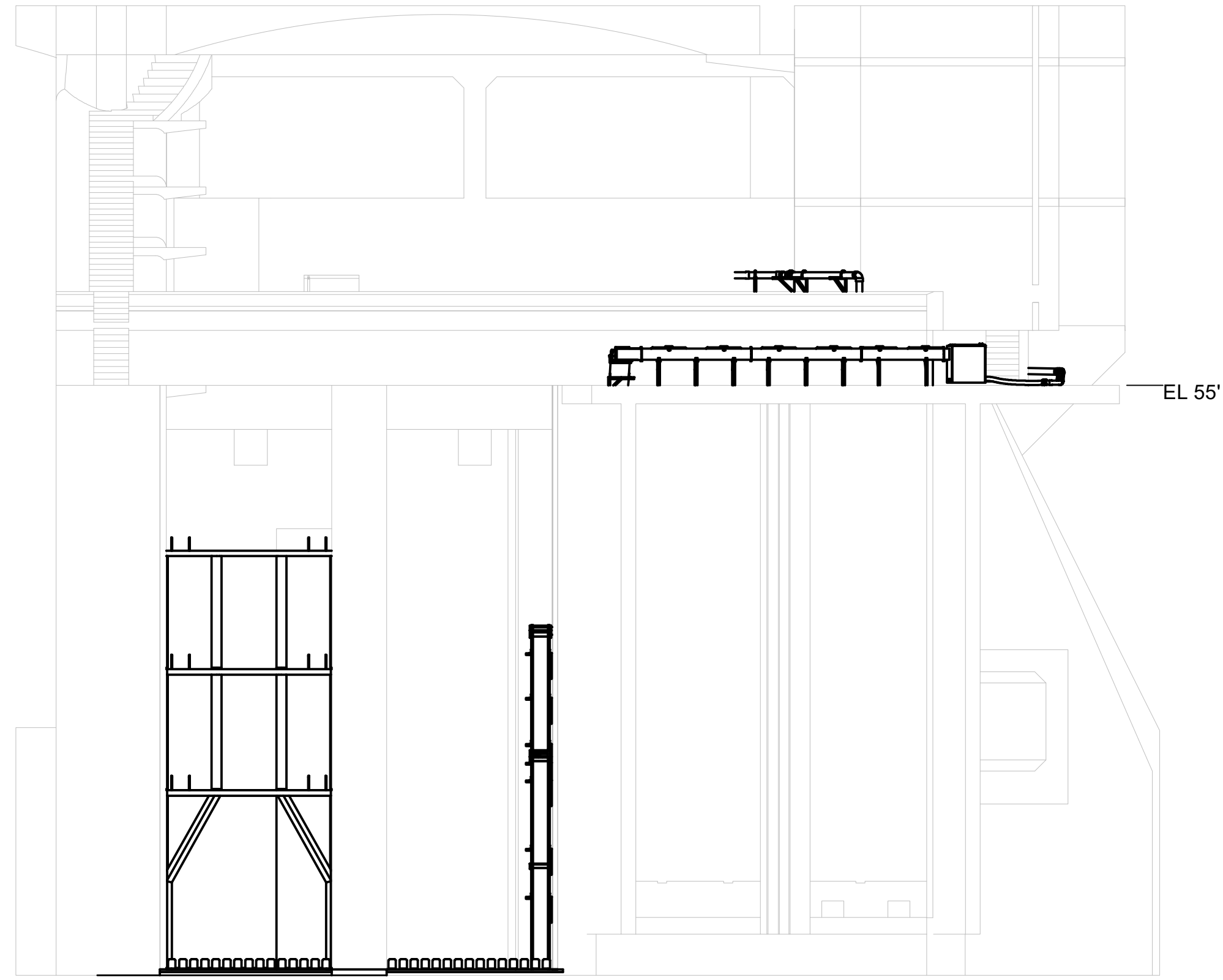
SHEET
IDENTIFICATION
MP501



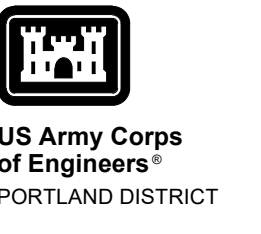
A SECTION
MP-101 SCALE: 3/32" = 1'-0"



B SECTION
MP-101 SCALE: 3/32" = 1'-0"



C SECTION
MP-101 SCALE: 3/32" = 1'-0"



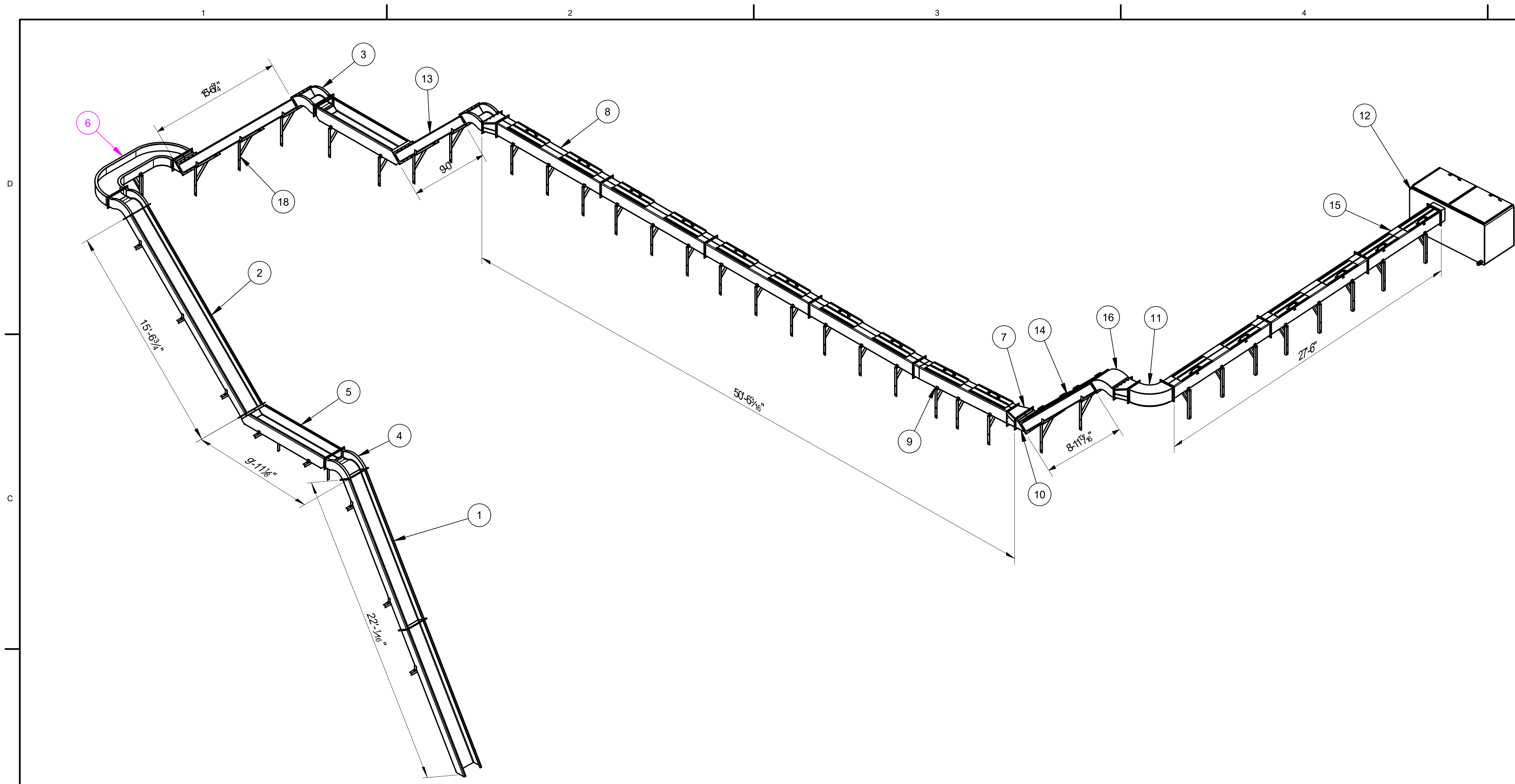
US Army Corps
of Engineers®
PORTLAND DISTRICT

DATE	DESCRIPTION	APPR.

DESIGNED BY: DANIEL PERIN CCE/BOP	CHKD BY: CCE/BOP	DATE: 10/25/2021
SUBMITTED BY:	PLOT SCALE: 1:1	SOLICITATION NO: CONTRACT NO:
	FILE NAME:	

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
LAMPREY FLUME SECTIONS

SHEET
IDENTIFICATION
MF102



PARTS LIST			
ITEM	SHEET	NAME	QTY
1	MF-501	Entrance Ramp Assembly	1
2	MF-501	Climbing Ramp Assembly	2
3	MF-503	45 deg Weir Connector Assembly	3
4	MF-503	60 deg Weir Connector Assembly	1
5	MF-504	Rest Box Assembly	2
6	MF-505	Turning Flume Assembly	1
7	MF-508	Climbing to Traversing Transition Assembly	3
8	MF-506	Traversing Flume Assembly	6
9	MF-507	Traversing Flume Bend Assembly	1
10	MF-505	45 deg Angled Connector	1
11	MF-508	90 deg Traversing Bend Assembly	1
12	MF-510	Trap Box Assembly	1
13	MF-509	Short Climbing Ramp Assembly	2
14	MF-509	Covered Short Climbing Ramp Assembly	1
15	MF-507	Short Traversing Flume Assembly	1
16	MF-503	Weir Connector Lid	1
17	MF-503	Covered 45 deg Weir Connector Assembly	1
18	--	Flume Support (See Note 2)	41

LAMPREY FLUME ASSEMBLY
SCALE: NTS



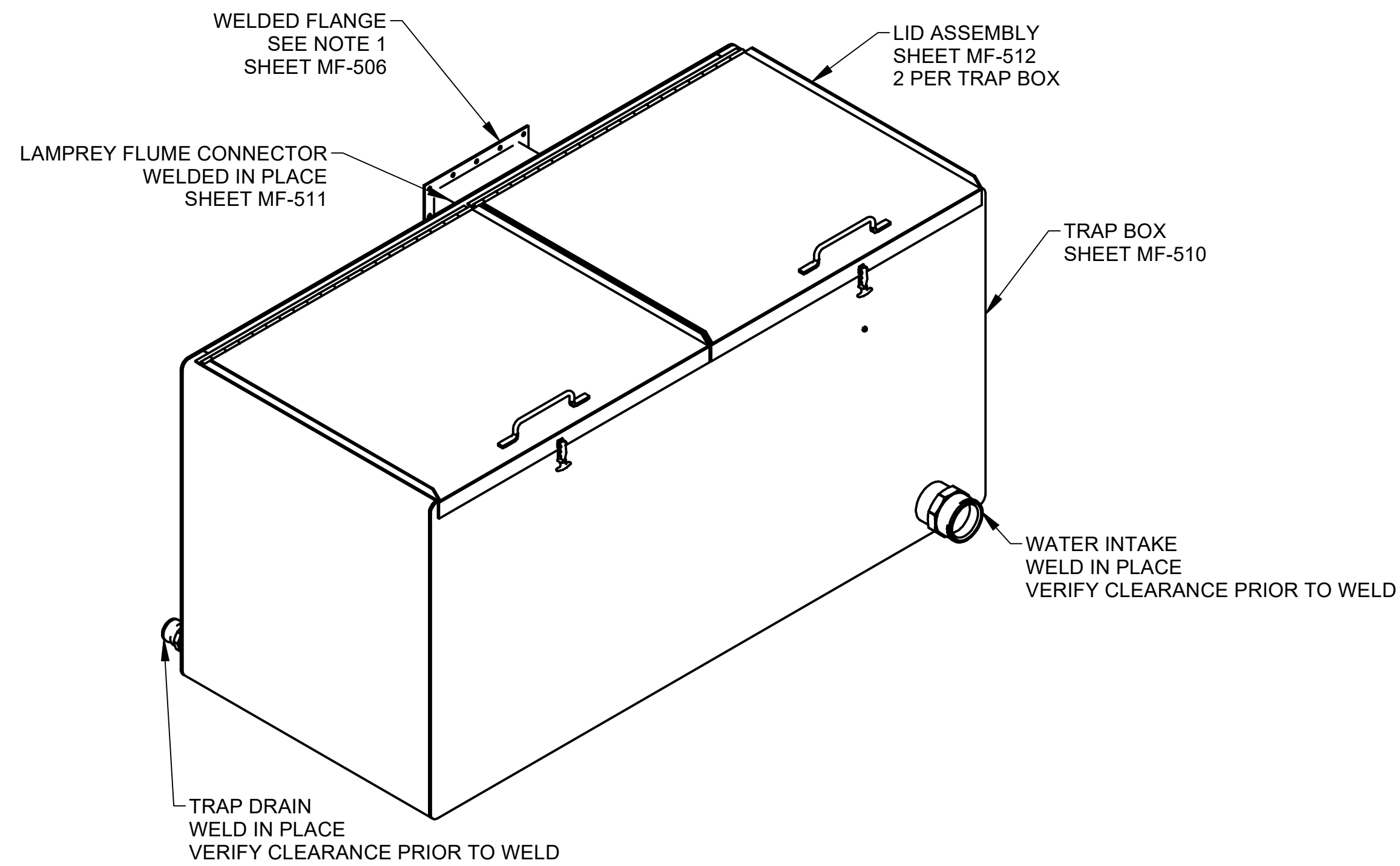
90% REVIEW	DATE	APPR.
	DESCRIPTION	MARK

DESIGNED BY: DANIEL FEIN	CHECKED BY: CZECODPA	DATE: 10/29/2021	SOLICITATION NO.:	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	SUBMITTED BY:	PLOT SCALE: 1:1	PLOT DATE: 10/29/2021	FILE NAME:

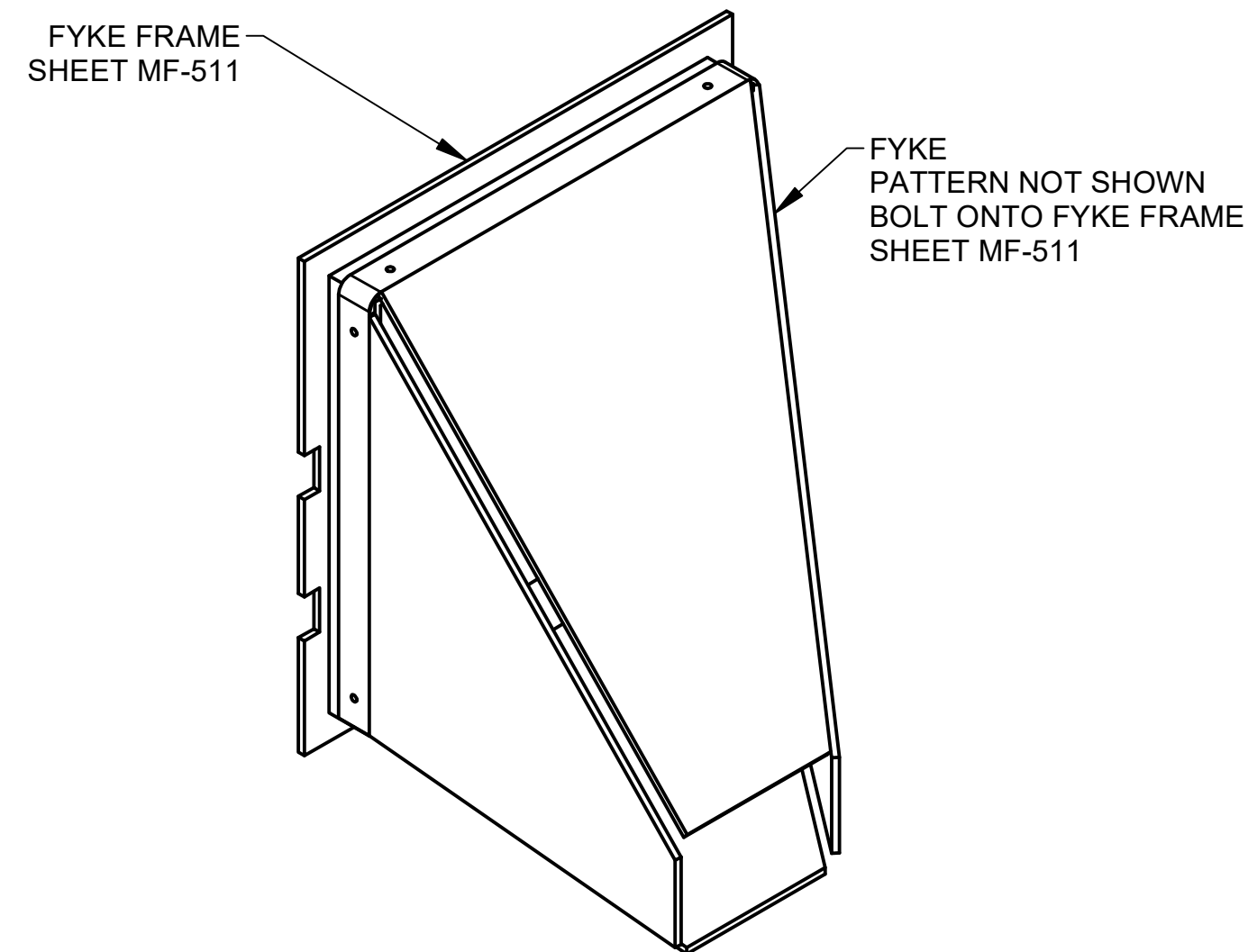
BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
GENERAL FLUME ASSEMBLY

- NOTES
1. REST BOXES MUST BE LEVEL.
2. FLUME SUPPORTS TO BE DESIGNED BY CONTRACTOR TO WITHSTAND A LOAD OF

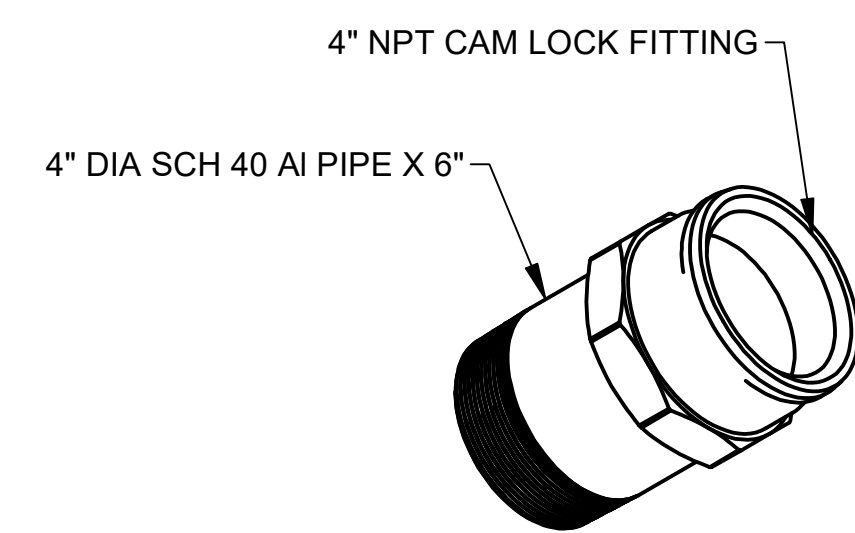
SHEET IDENTIFICATION
MF102



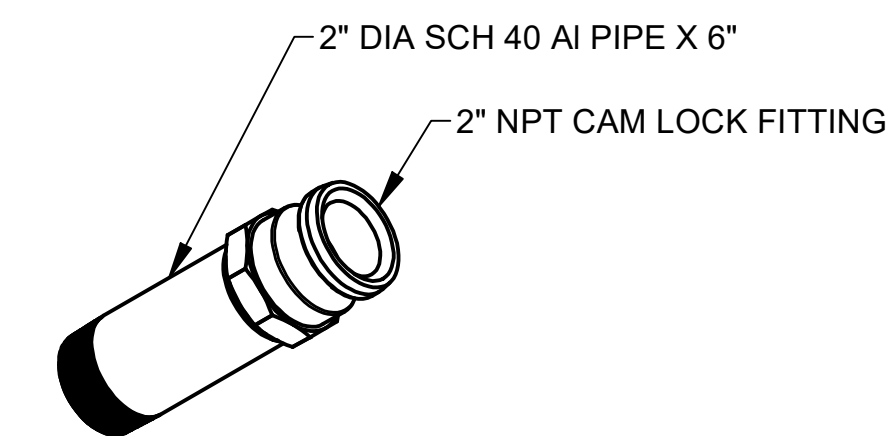
**TRAP BOX ASSEMBLY
FRONT ISOMETRIC VIEW**
SCALE: NTS



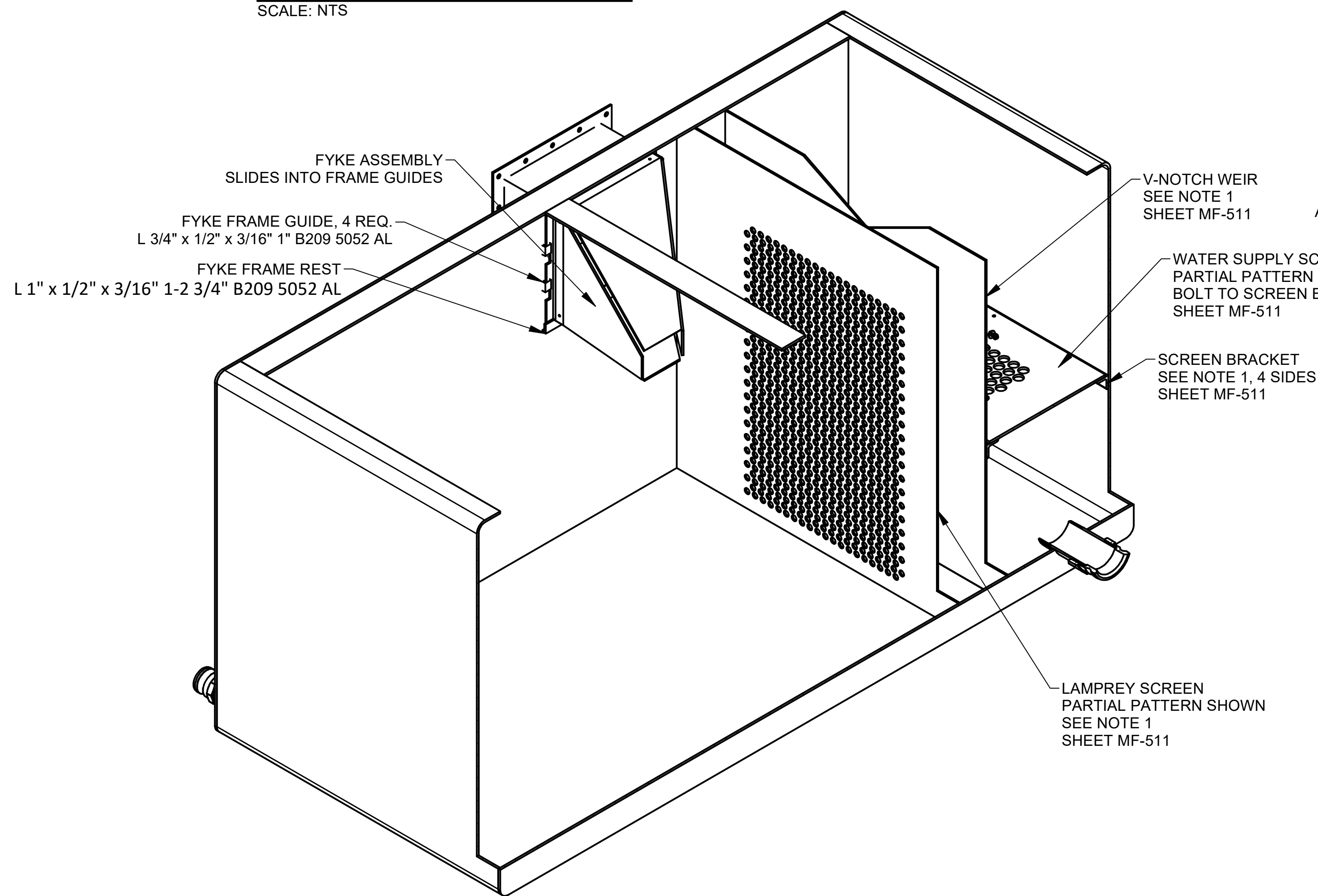
**FYKE ASSEMBLY
FRONT ISOMETRIC VIEW**
SCALE: NTS



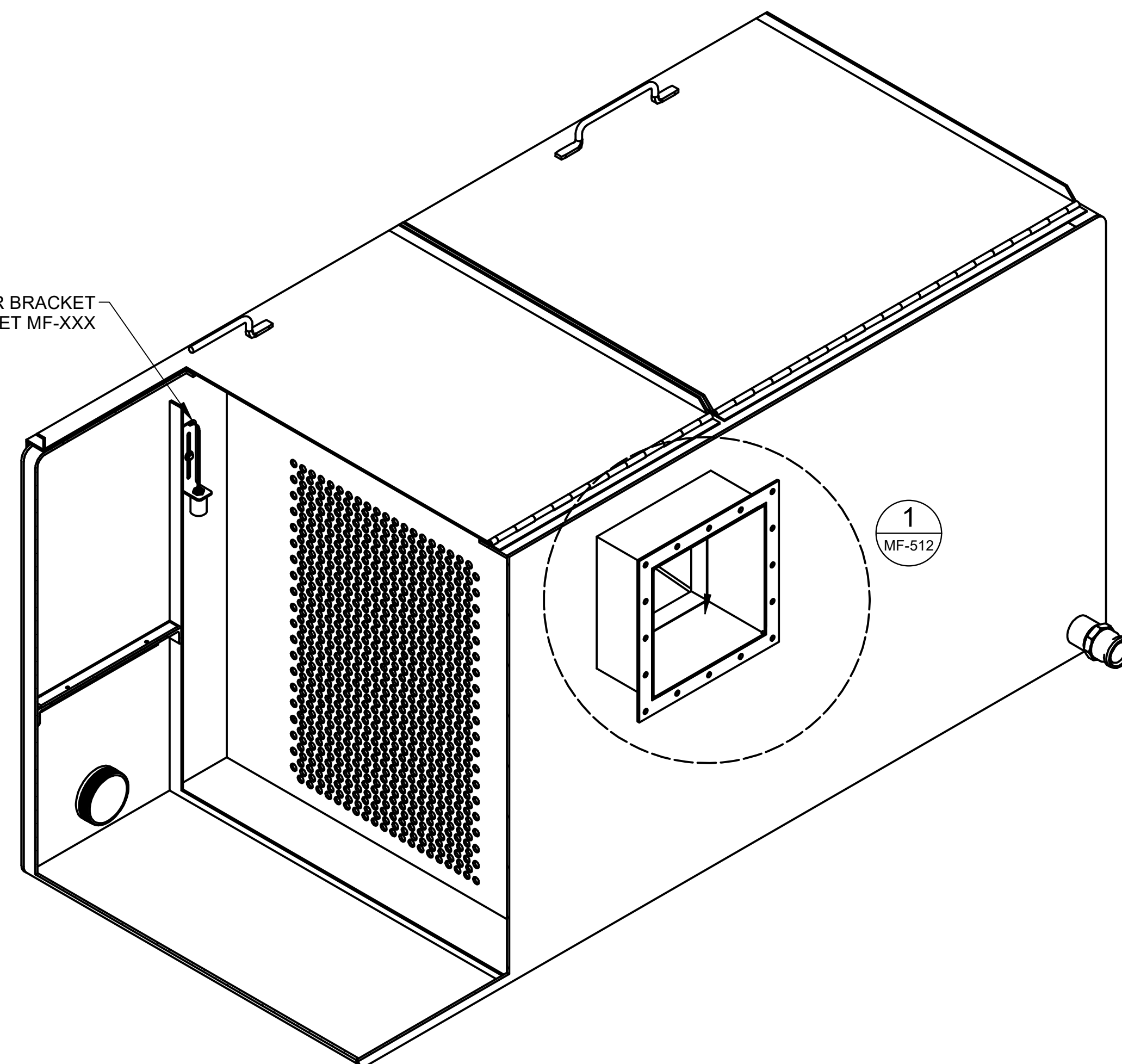
WATER INTAKE
SCALE: NTS



TRAP DRAIN
SCALE: NTS



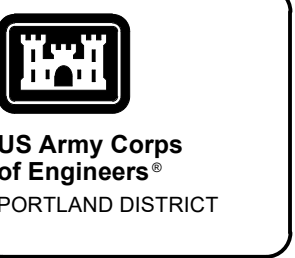
**TRAP BOX ASSEMBLY
FRONT ISOMETRIC BREAK OUT**
SCALE: NTS



**TRAP BOX ASSEMBLY
REAR ISOMETRIC BREAK OUT**
SCALE: NTS

NOTES

1. LAMPREY SCREEN, V-NOTCH WEIR, AND SCREEN BRACKETS TO BE WELDED IN PLACE WITH 1"-3" STITCH WELDS, BOTH SIDES.

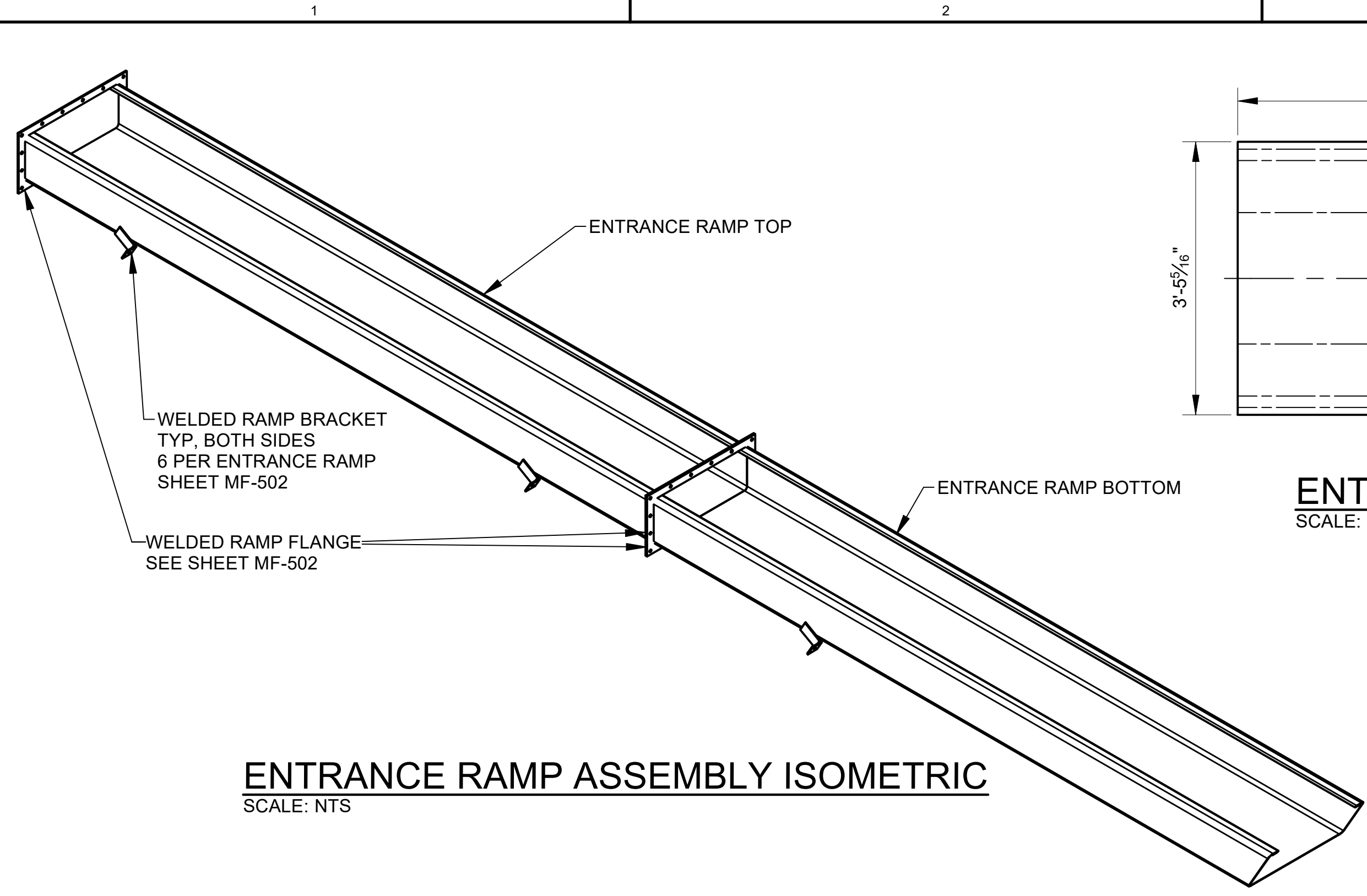


DATE: 10/25/2021	SOLICITATION NO:	APPR.
DESIGNED BY: DANIEL PERIN (2020B09)	CONTRACT NO:	DATE
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	FILE NAME:	DESCRIPTION
90% REVIEW	MARK	

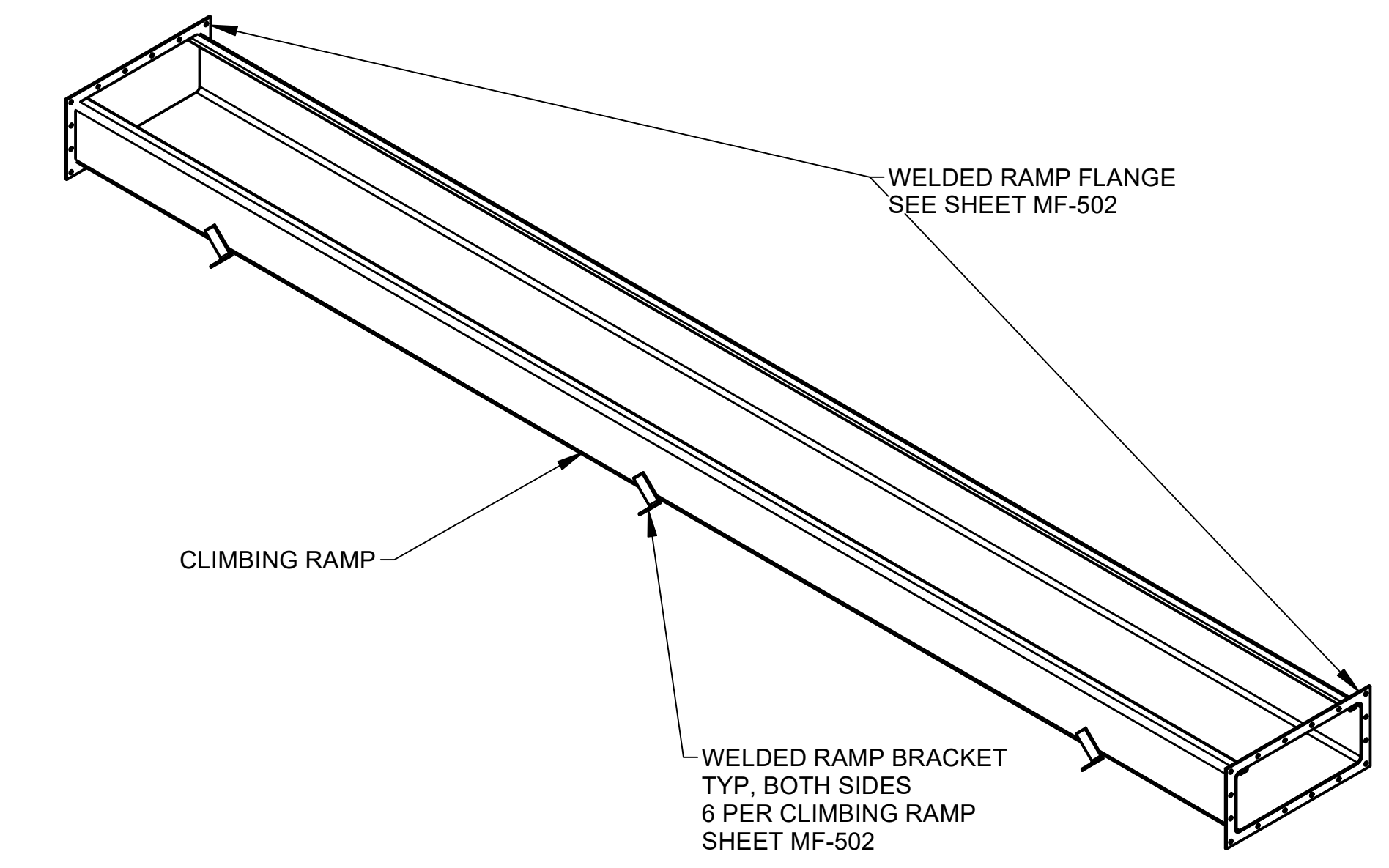
DATE: 10/25/2021	SOLICITATION NO:	APPR.
DESIGNED BY: DANIEL PERIN (2020B09)	CONTRACT NO:	DATE
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	FILE NAME:	DESCRIPTION
90% REVIEW	MARK	

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TRAP BOX ASSEMBLY

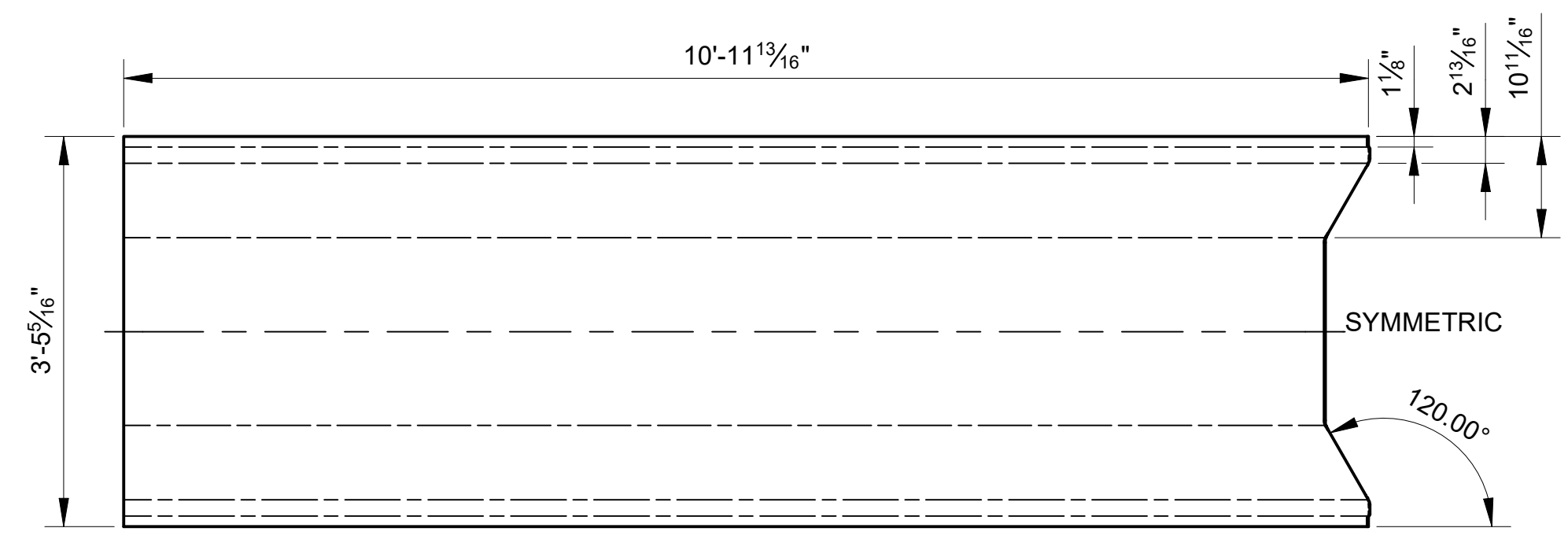
SHEET IDENTIFICATION
MF-103



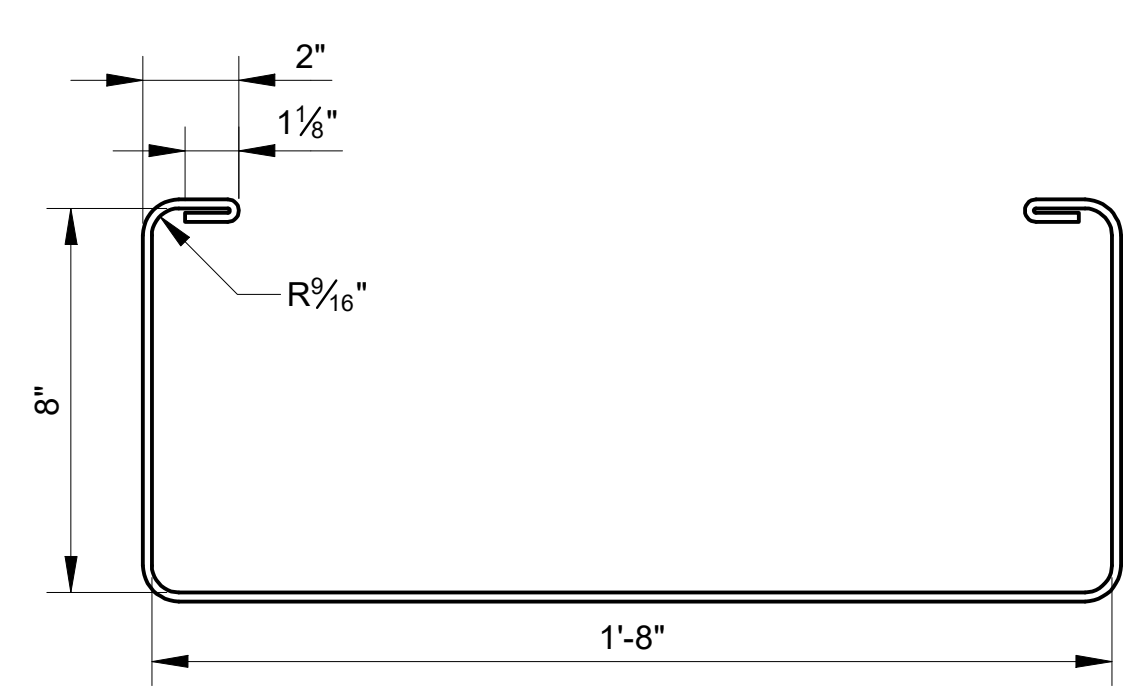
ENTRANCE RAMP ASSEMBLY ISOMETRIC
SCALE: NTS



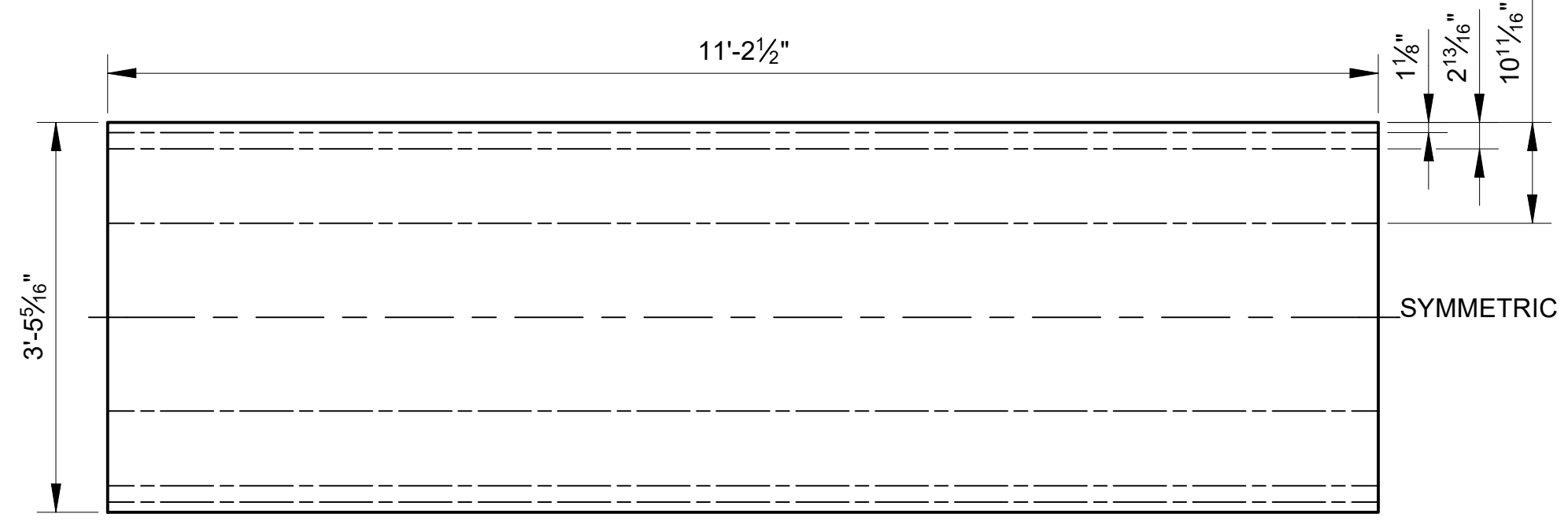
CLIMBING RAMP ASSEMBLY ISOMETRIC
SCALE: NTS



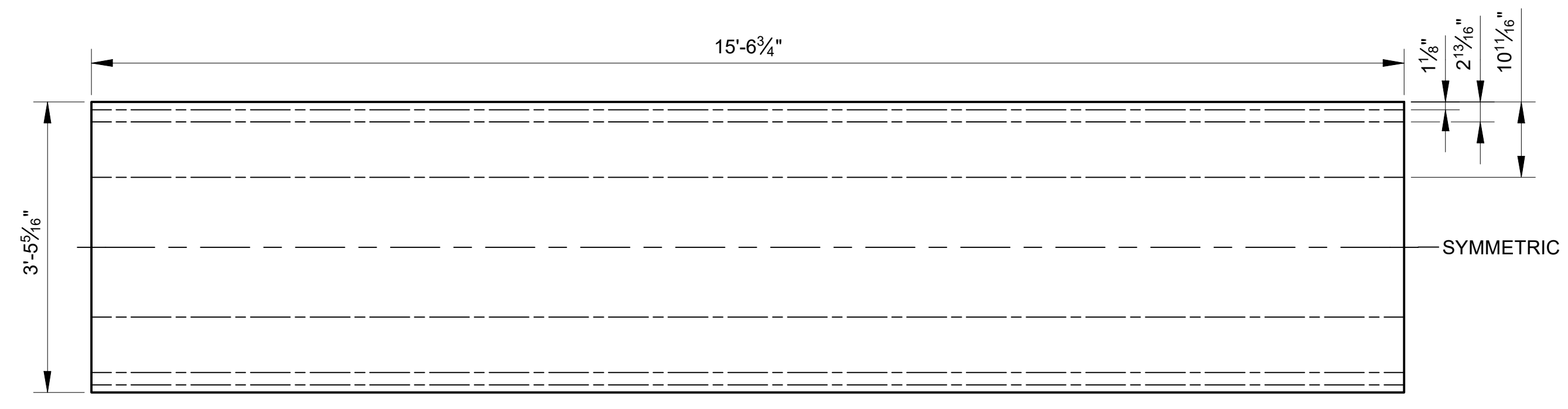
ENTRANCE RAMP BOTTOM PATTERN
SCALE: 3/4" = 1'-0"



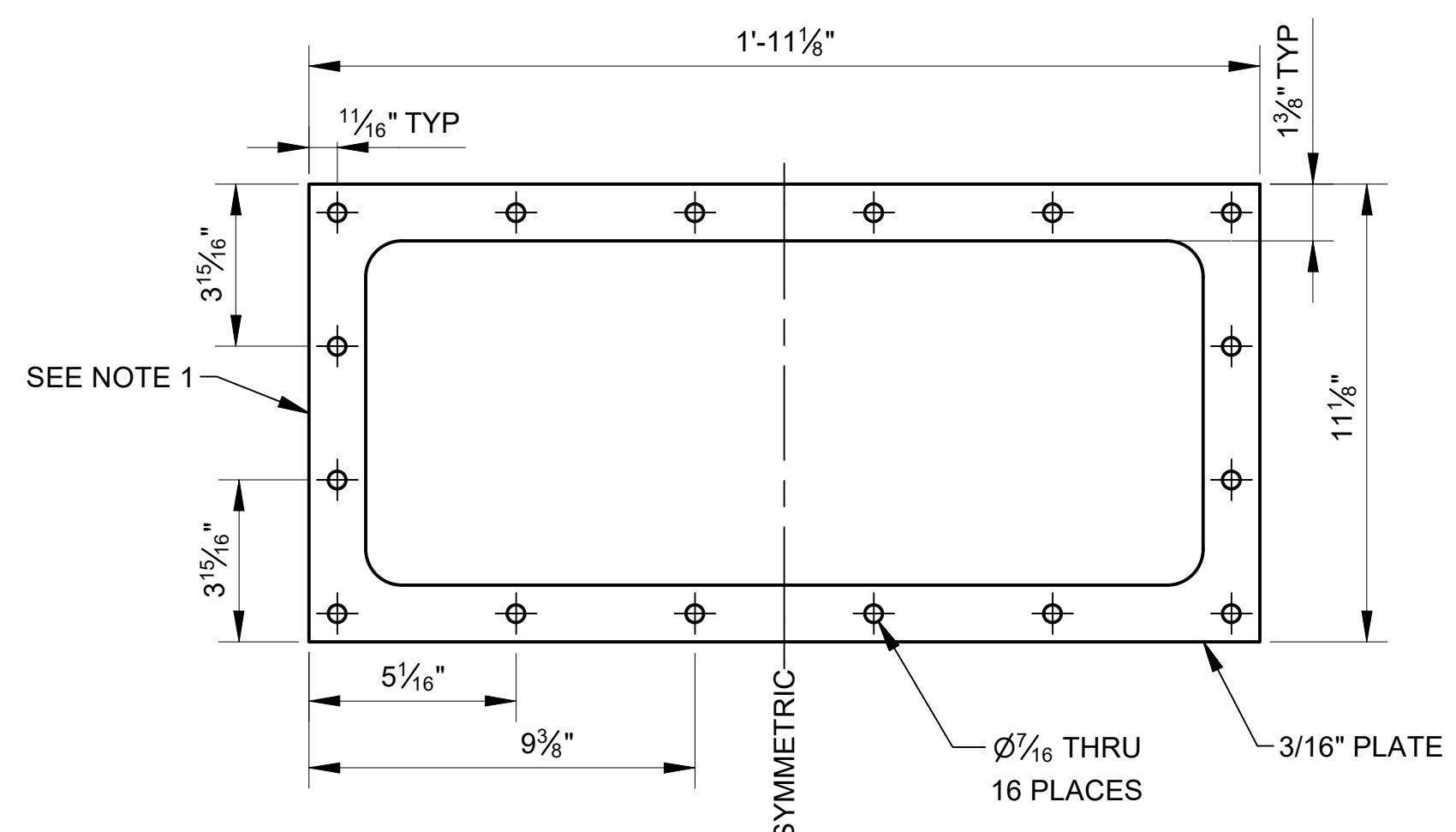
RAMP END VIEW TYPICAL, ALL RAMPS
SCALE: 3" = 1'-0"



ENTRANCE RAMP TOP PATTERN
SCALE: 3/4" = 1'-0"



CLIMBING RAMP FOLD PATTERN
SCALE: 3/4" = 1'-0"



RAMP FLANGE PLAN VIEW
SCALE: 3" = 1'-0"

NOTES
1. PROVIDE 3/8" X 1" FASTENERS. 32 FASTENERS REQUIRED PER ENTRANCE RAMP ASSEMBLY. 16 FASTENERS REQUIRED PER CLIMBING RAMP ASSEMBLY

US Army Corps of Engineers
PORTLAND DISTRICT

90% REVIEW

DATE: 10/25/2021
SOLICITATION NO.:
CONTRACT NO.:

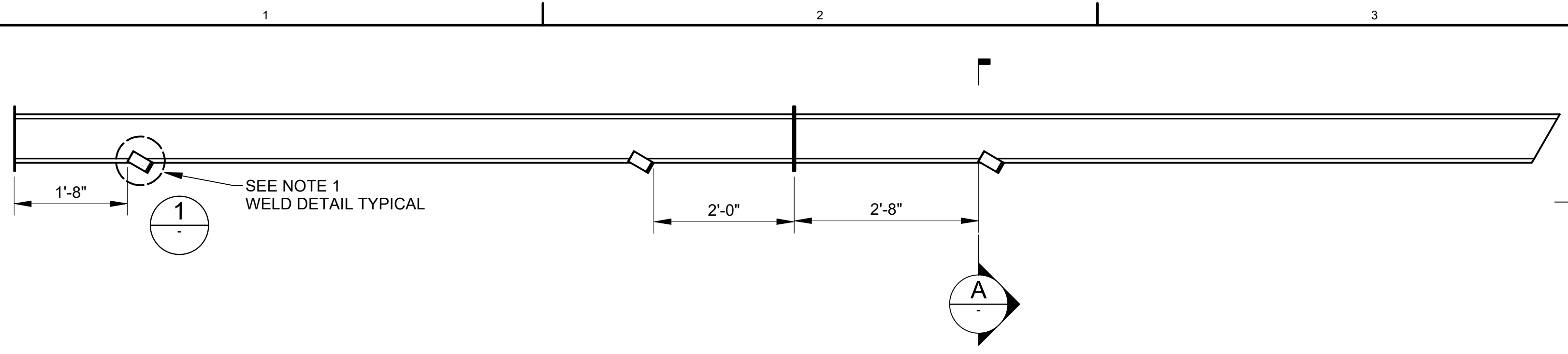
DESIGNED BY: DANIEL PERIN
CHECKED BY: CZEBCOZAK
SUBMITTED BY: CZEBCOZAK

PLOT SCALE: 10/25/2021
PLOT DATE: 10/25/2021
SIZE: 1:1
ANSI ID: FILE NAME:

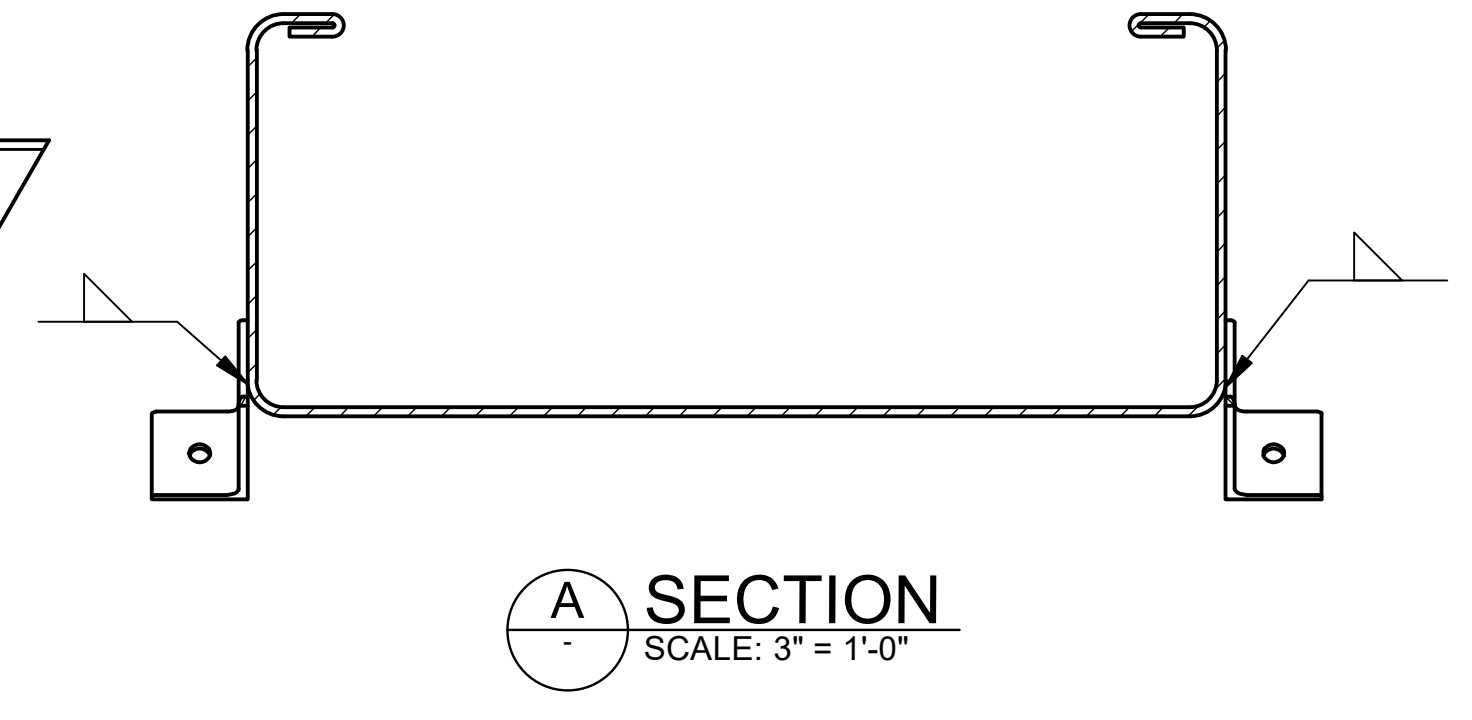
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
PORTLAND, OREGON

**BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE**
RAMP DETAILS

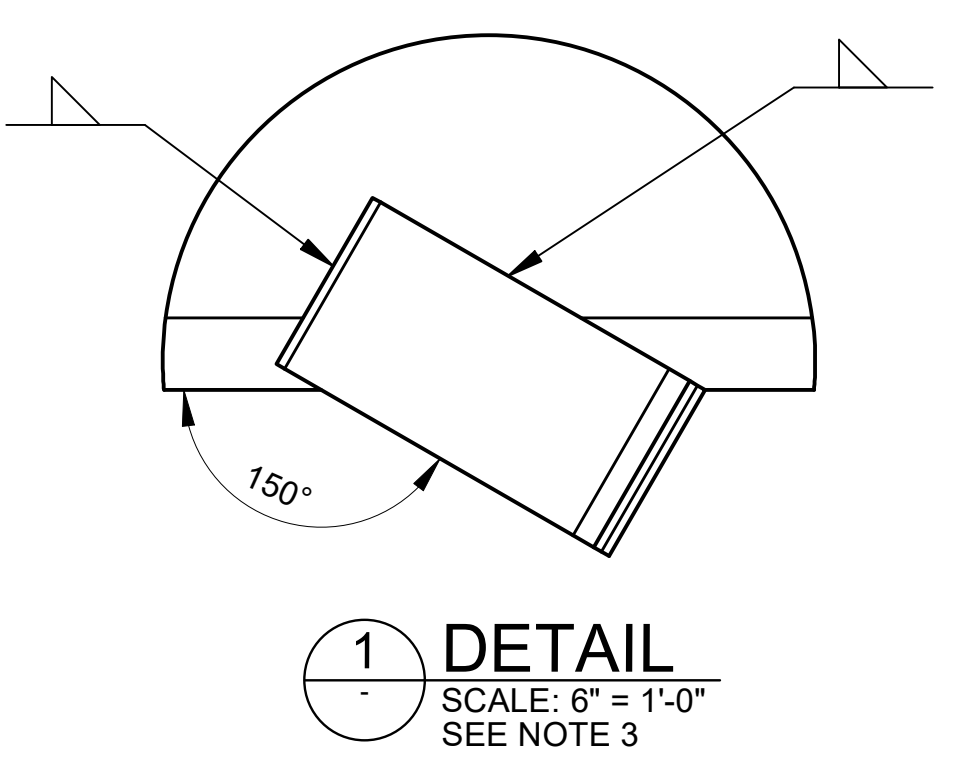
SHEET IDENTIFICATION
MF501



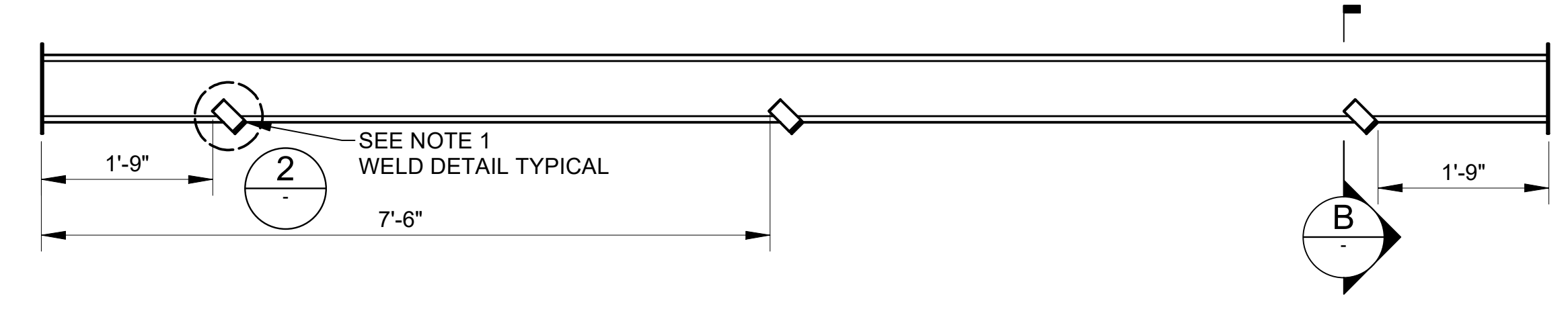
ENTRANCE RAMP ASSEMBLY SIDE VIEW
SCALE: 3/4" = 1'-0"



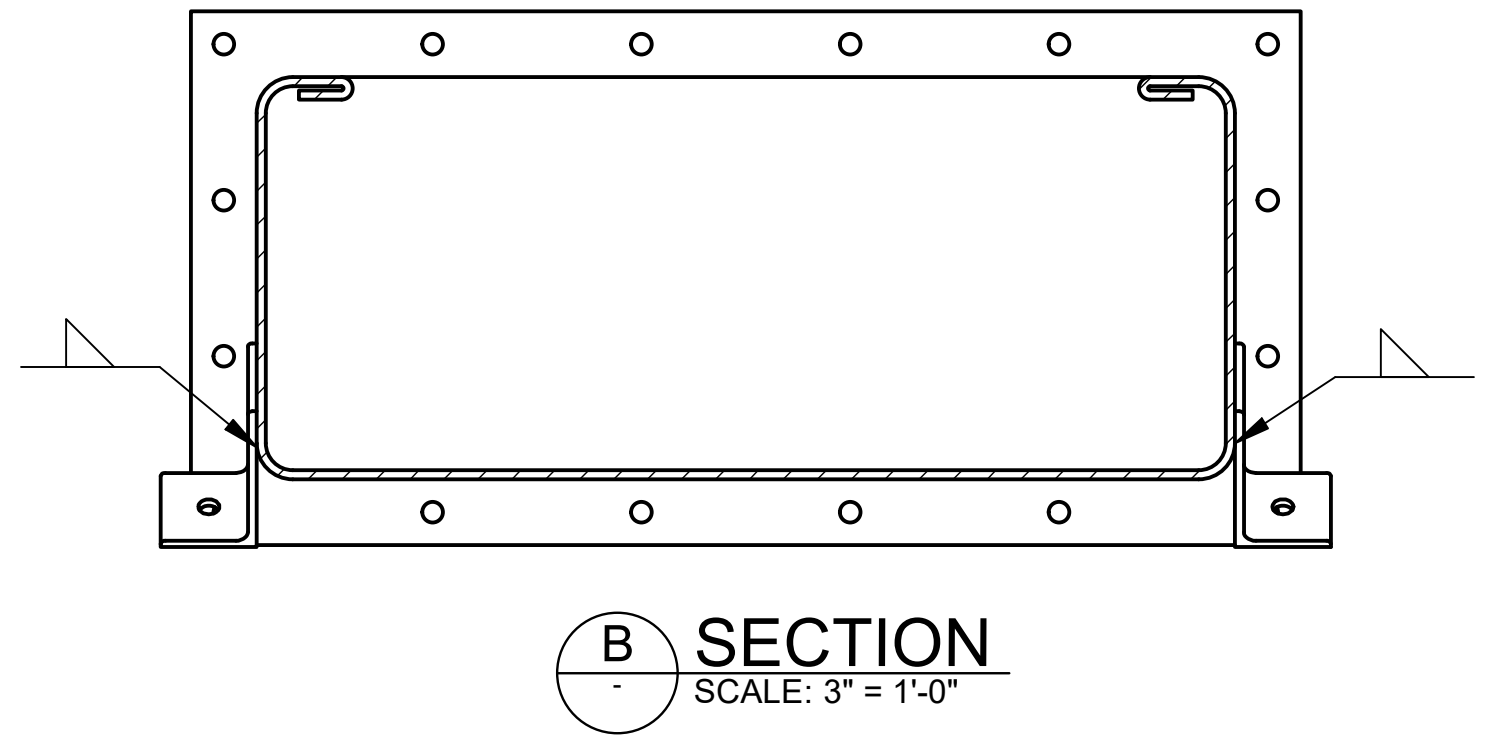
A SECTION
SCALE: 3" = 1'-0"



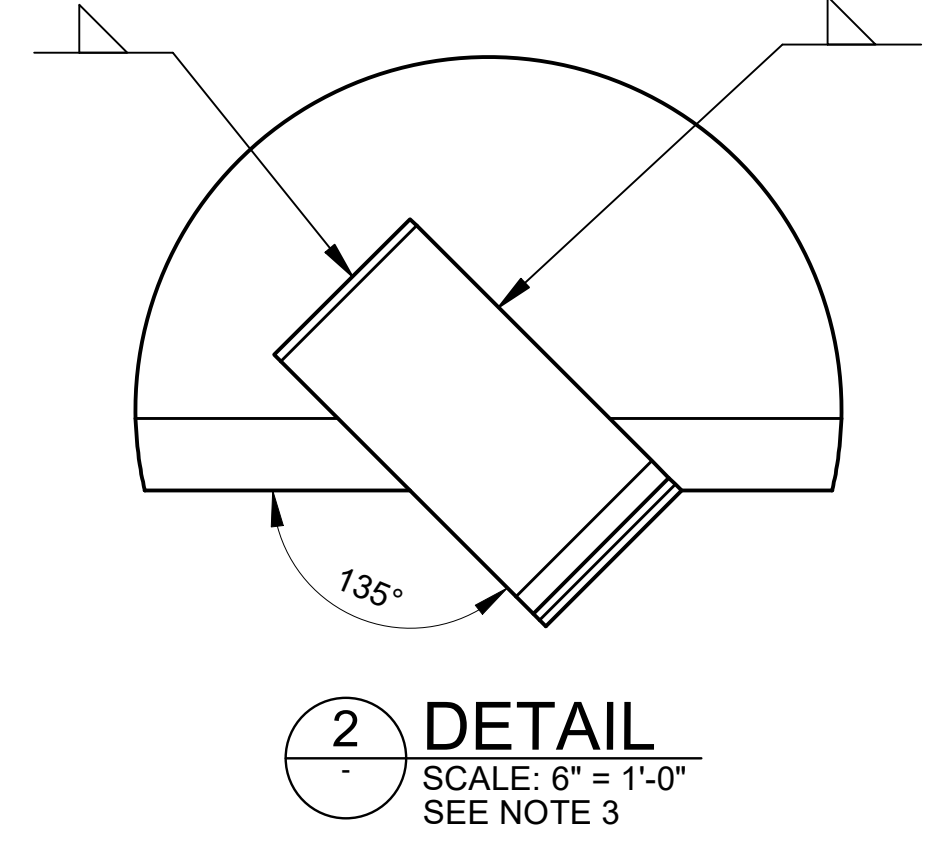
1 DETAIL
SCALE: 6" = 1'-0"
SEE NOTE 3



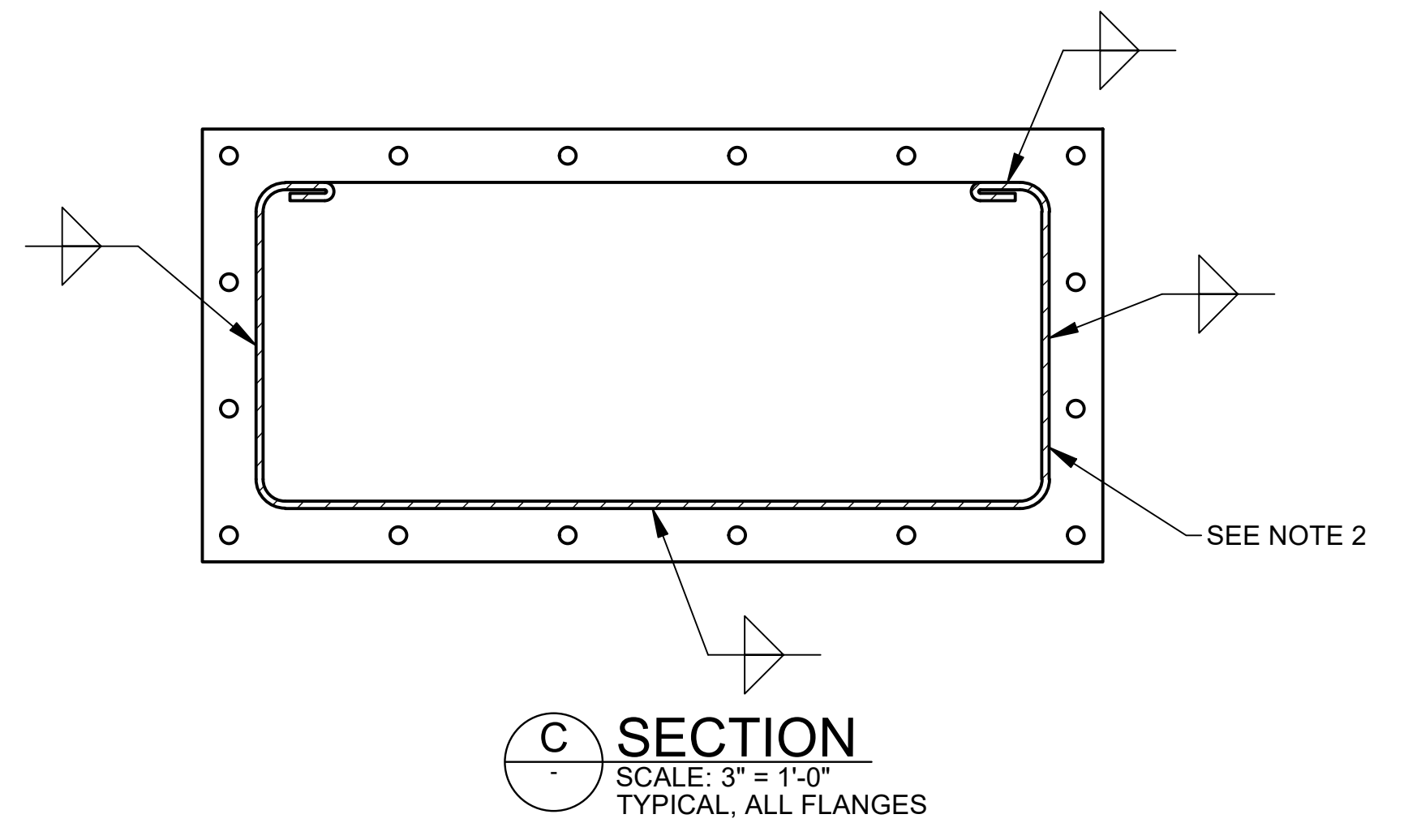
CLIMBING RAMP ASSEMBLY SIDE VIEW
SCALE: 3/4" = 1'-0"



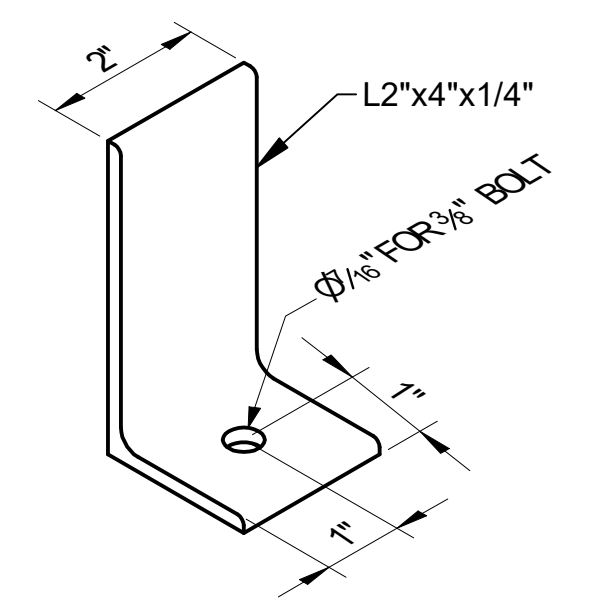
B SECTION
SCALE: 3" = 1'-0"



2 DETAIL
SCALE: 6" = 1'-0"
SEE NOTE 3

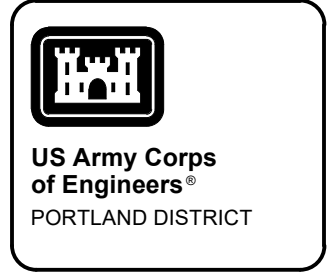


C SECTION
SCALE: 3" = 1'-0"
TYPICAL, ALL FLANGES



RAMP BRACKET
SCALE: 6" = 1'-0"
MATERIAL: ALUMINUM
PER: ASTM B209 5052-H34
NO. REQD: 6 PER RAMP
SEE NOTE 4

- NOTES**
- BRACKET POSITIONS TYPICAL FOR BOTH SIDES
 - WELD FLANGE FLUSH WITH END OF RAMP.
 - FIELD WELD FLUME TO BRACKET AFTER FINAL SUPPORT PLACEMENT.
 - PROVIDE SIX 3/8" X 1" FASTENERS PER RAMP ASSEMBLY.

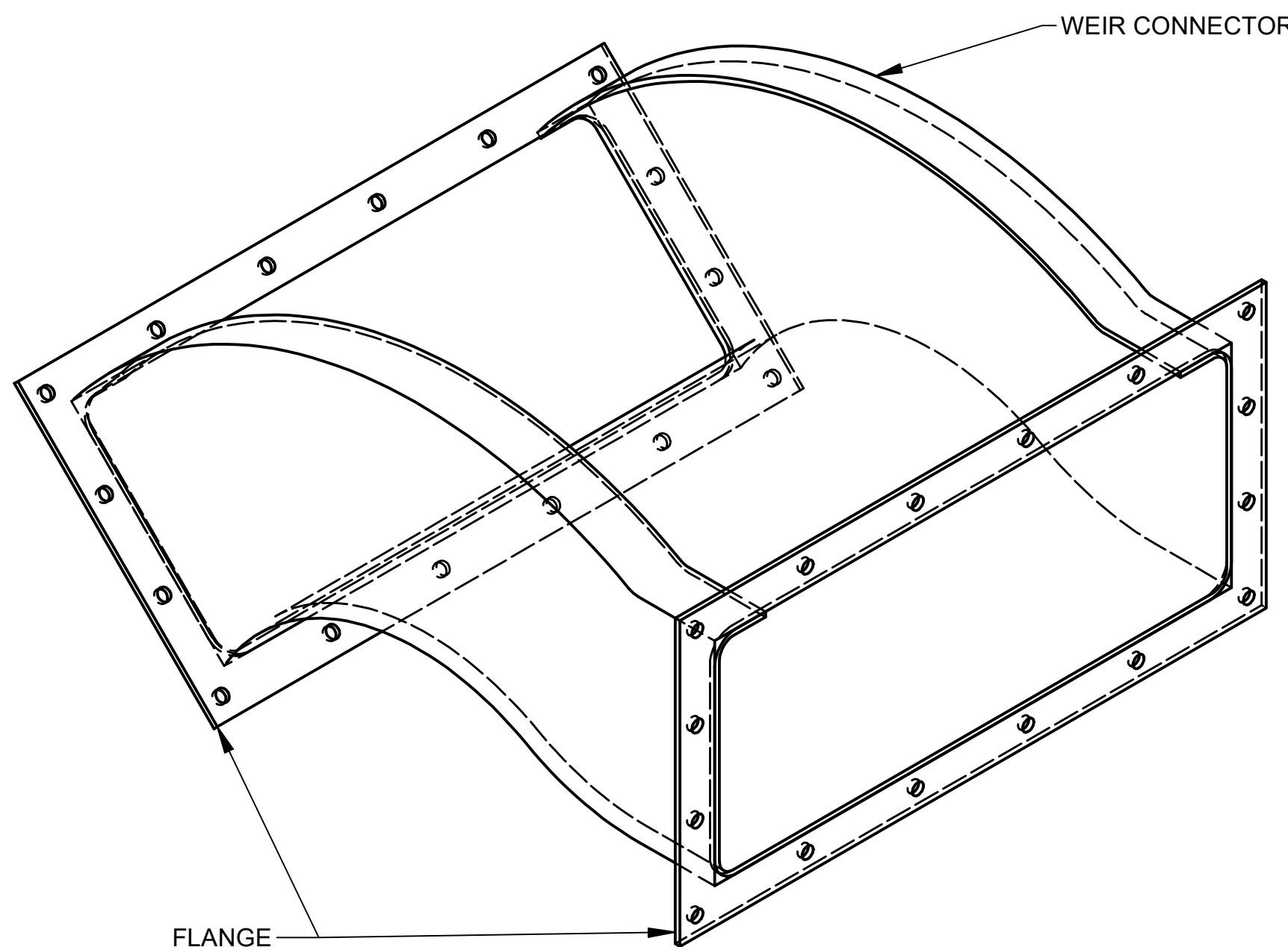


DATE	DESCRIPTION	MARK	APPR.
10/25/2021	90% REVIEW		

DESIGNED BY: DANIEL PERIN 10/25/2021	CHKD BY: CZC/BDP	DATE: 10/25/2021	SOLICITATION NO.	CONTRACT NO.
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	SUBMITTED BY:	PLOT SCALE: 1:1	FILE NAME:	

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
RAMP WELD DETAILS

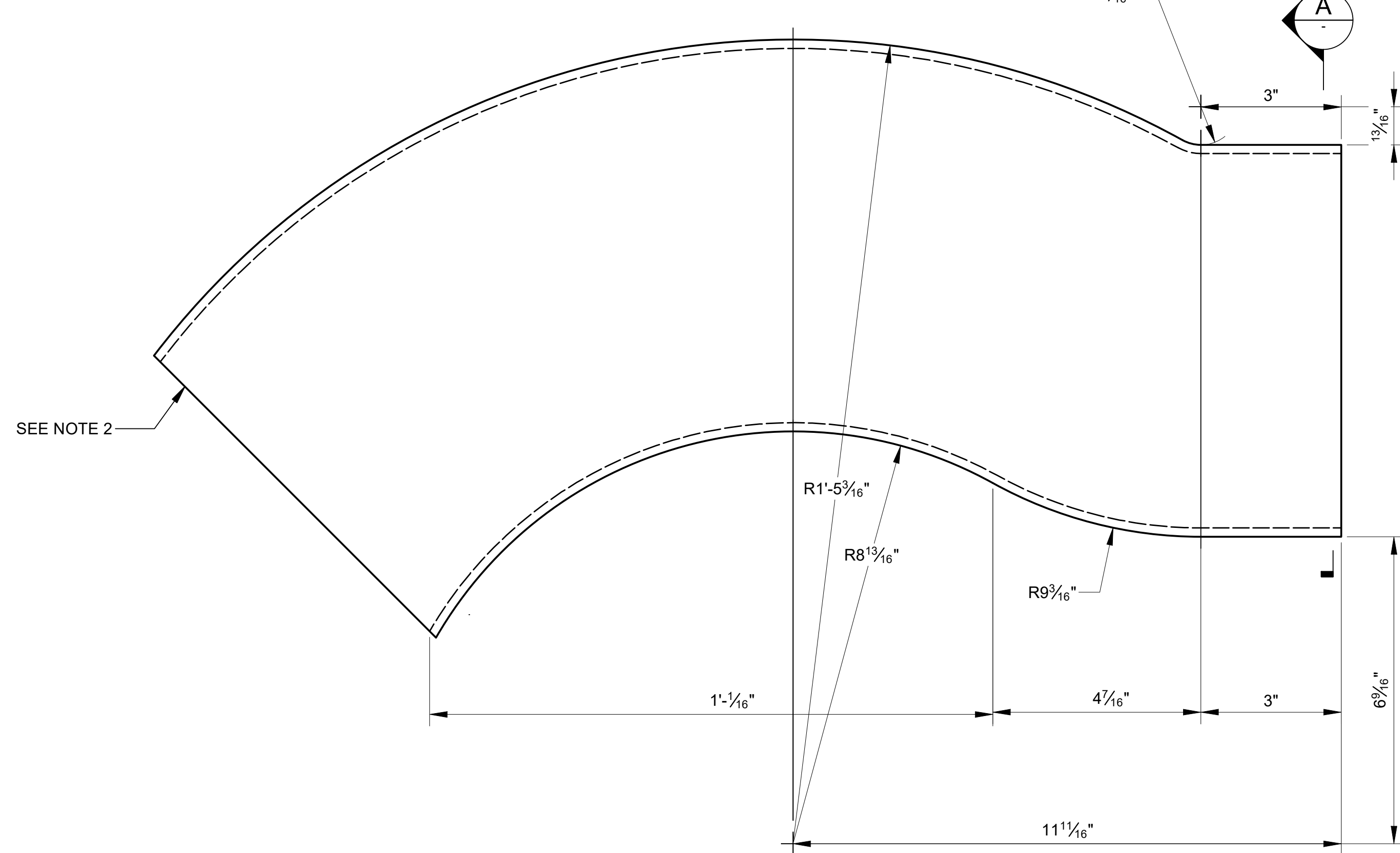
SHEET
IDENTIFICATION
MF-502



**WEIR CONNECTOR ASSEMBLY
ISOMETRIC VIEW**
SCALE: NTS

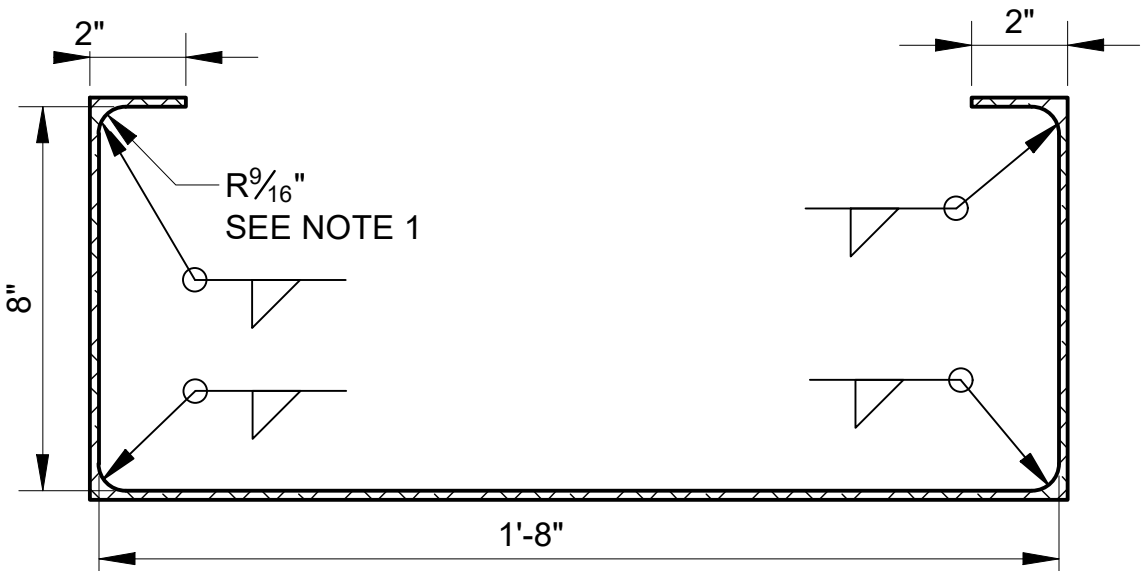
FLANGE
SEE NOTE 2
SHEET MF-501

SEE NOTE 2



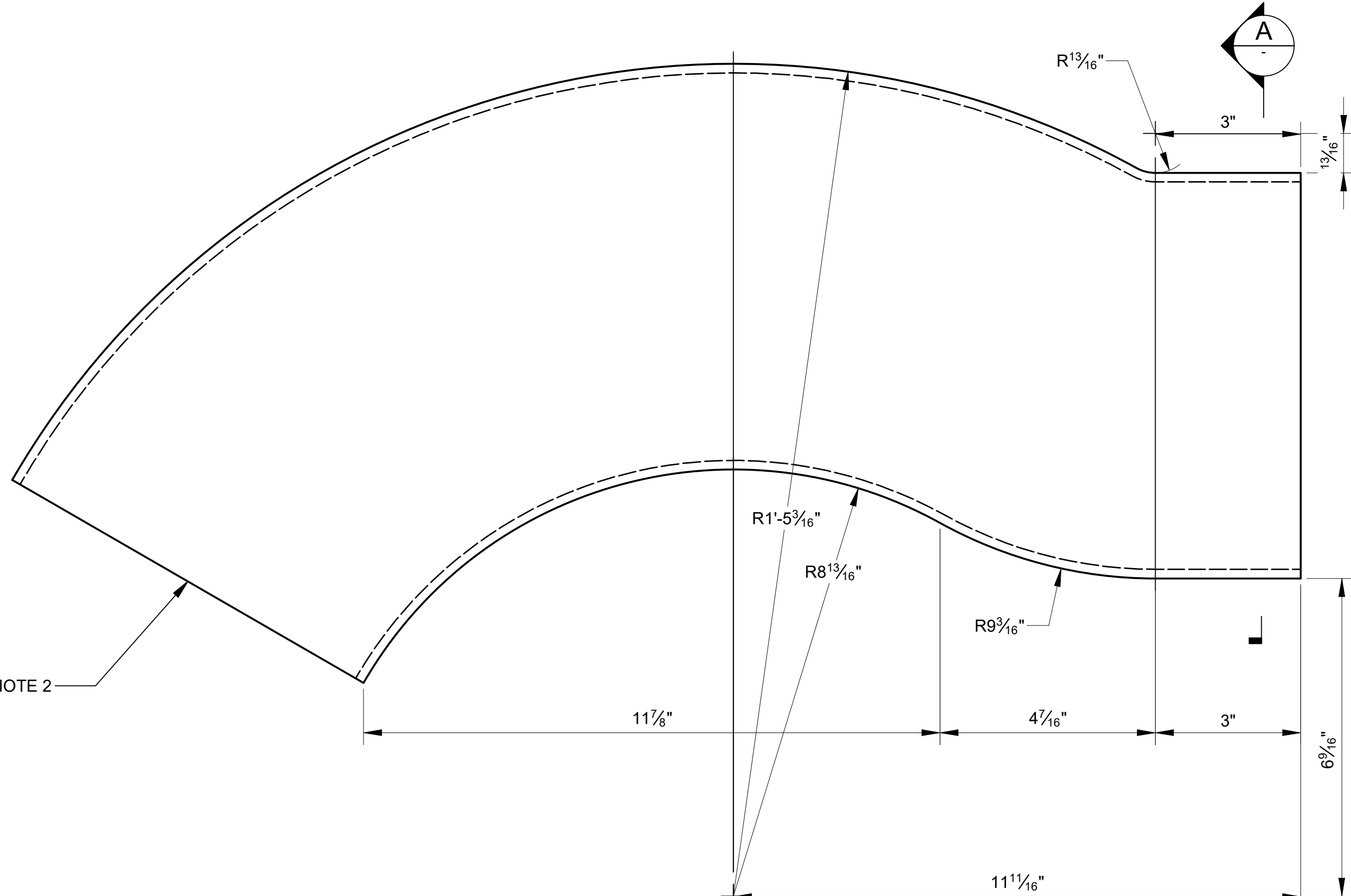
45 DEG WEIR CONNECTOR SIDE VIEW
SCALE: 3" = 1'-0"

**COVERED WEIR CONNECTOR ASSEMBLY
ISOMETRIC VIEW**
SCALE: NTS



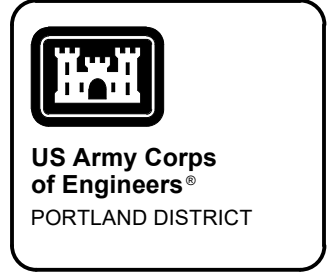
A SECTION
SCALE: 3" = 1'-0"

SEE NOTE 2



60 DEG WEIR CONNECTOR SIDE VIEW
SCALE: 3" = 1'-0"

- NOTES**
1. FILLET INTERNAL CORNERS TO MATCH BEND RADIUS OF RAMPS AND GRIND SMOOTH. SEE SHEET MF-501 FOR RAMP DETAILS.
 2. FLANGE WELDED FLUSH WITH END OF WEIR CONNECTOR.
 3. PROVIDE 3/8"-16 X 1" FASTENERS. 16 REQUIRED PER WEIR CONNECTOR ASSEMBLY.



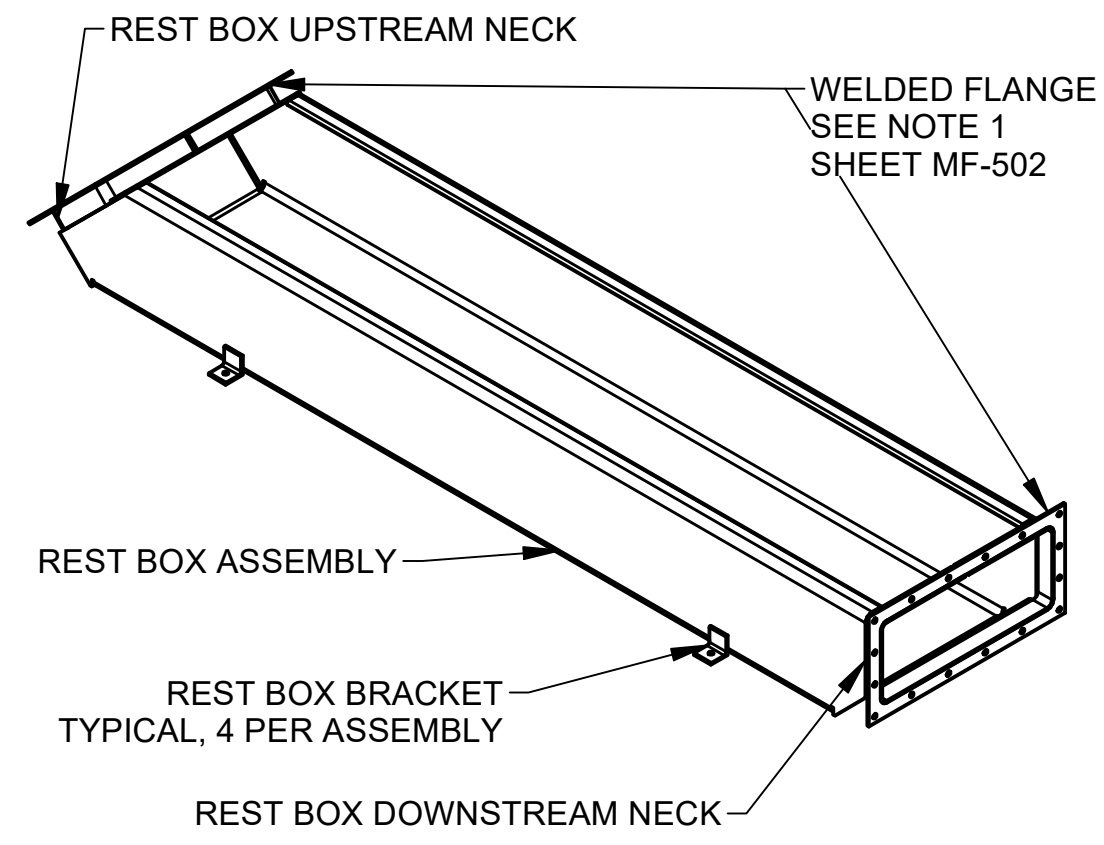
DATE	10/25/2021	SOLICITATION NO.	
DESIGNED BY	DANIEL PERIN	ISSUED BY	CE/ENCCAZ
CHECKED BY	CE/CEB/DP	CONTRACT NO.	
DATE	10/25/2021	FILE NAME	
SIZE	1:1	ANSI D	
MARK		DESCRIPTION	90% REVIEW
		DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	DATE 10/25/2021	SOLICITATION NO.	
DESIGNED BY DANIEL PERIN	ISSUED BY CE/ENCCAZ	CONTRACT NO.	
CHECKED BY CE/CEB/DP	DATE 10/25/2021	FILE NAME	
SIZE 1:1	ANSI D		

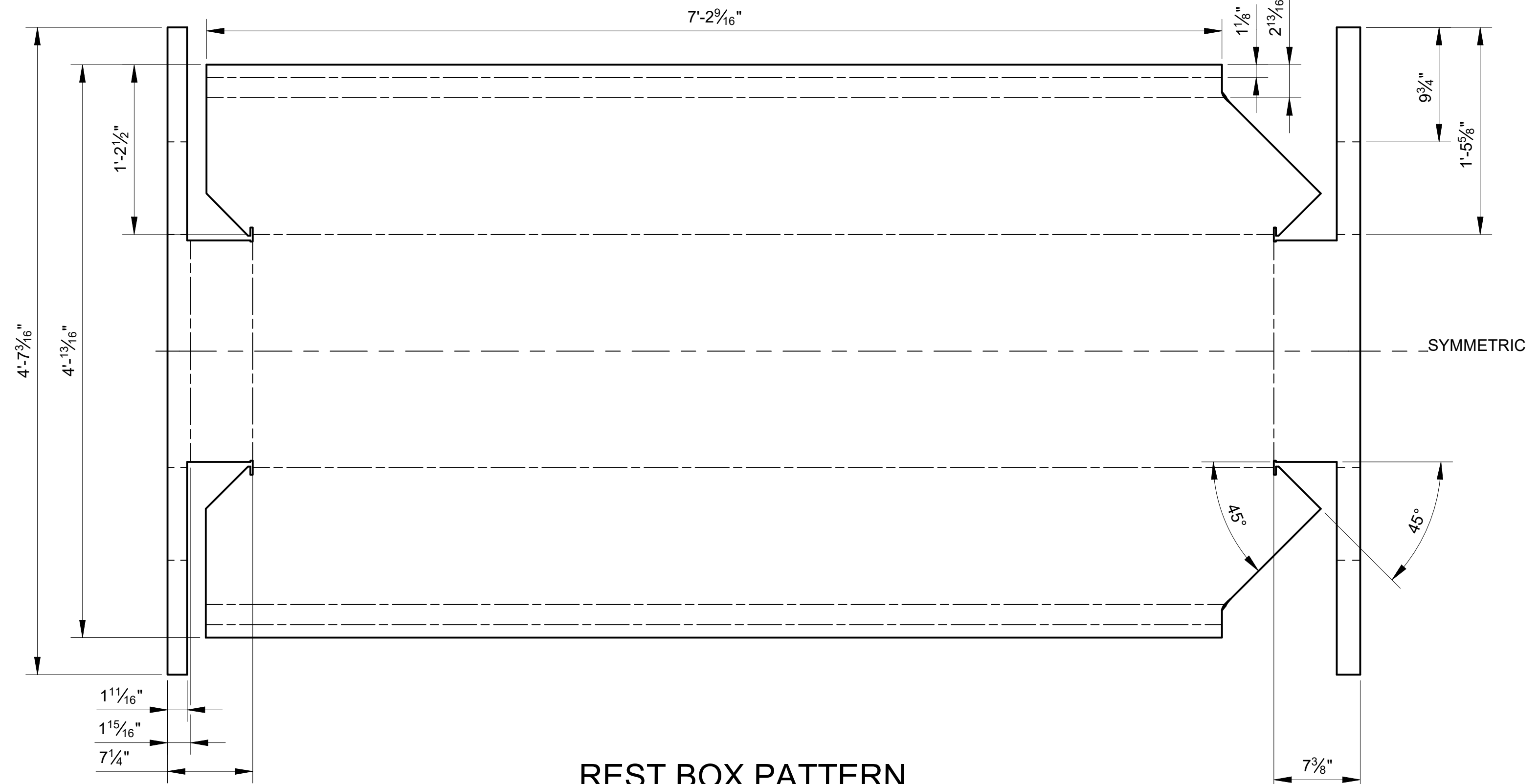
**BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE**

WEIR CONNECTOR DETAILS

SHEET
IDENTIFICATION
MF-503

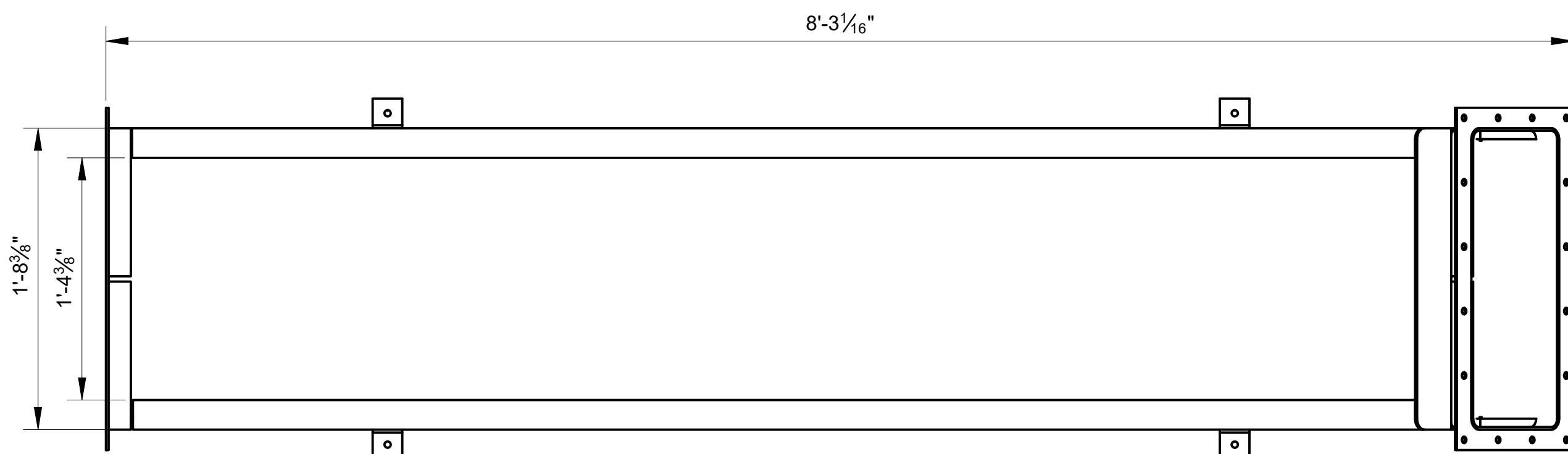


REST BOX ASSEMBLY ISOMETRIC VIEW
SCALE: NTS

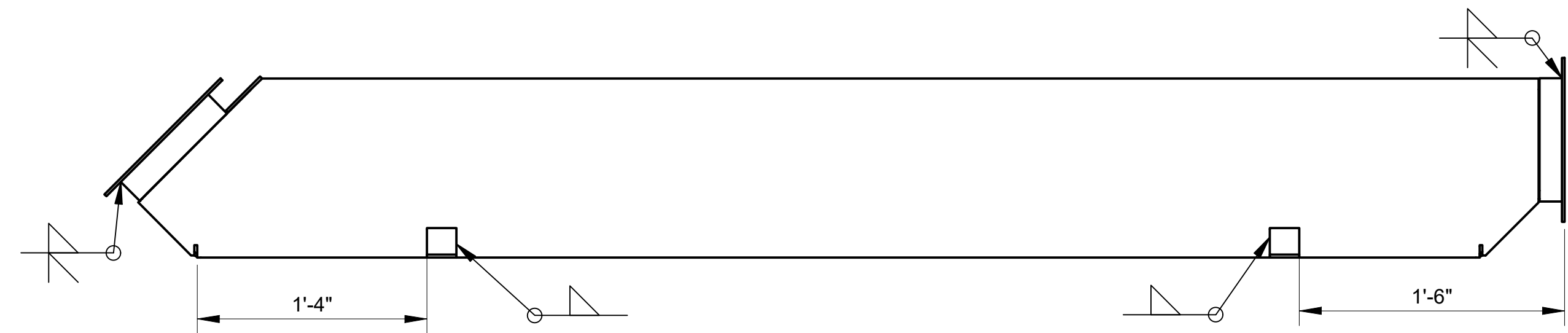


REST BOX PATTERN

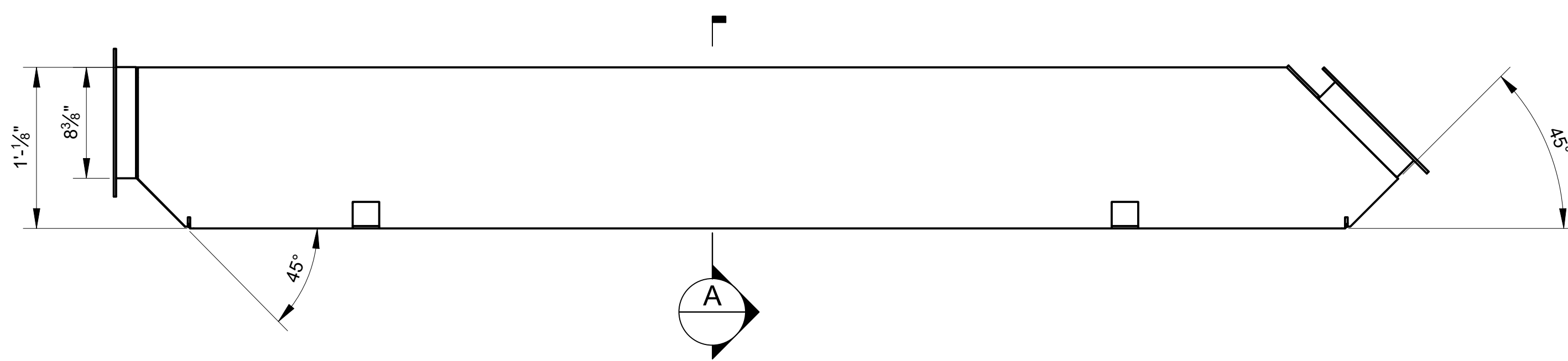
SCALE: 1-1/2" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



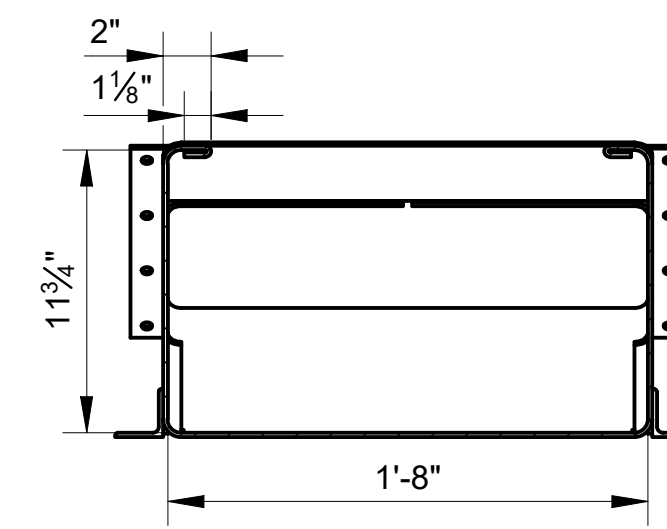
**REST BOX ASSEMBLY
PLAN VIEW**
SCALE: 1-1/2" = 1'-0"



**REST BOX ASSEMBLY
WELD DETAILS**
SCALE: NTS



**REST BOX ASSEMBLY
ELEVATION VIEW**
SCALE: 1-1/2" = 1'-0"



A SECTION
SCALE: 1-1/2" = 1'-0"

NOTES

- WELD FLANGES FLUSH WITH END OF REST BOX NECK.
- PROVIDE 20 3/8" x 1" FASTENERS PER REST BOX ASSEMBLY.



US Army Corps
of Engineers
PORTLAND DISTRICT

90% REVIEW

DESIGNED BY: DANIEL PERIN
CHECKED BY: C2EBCGZ
SUBMITTED BY: C2EBCGZ

DATE: 10/25/2021
SOLICITATION NO:
CONTRACT NO:

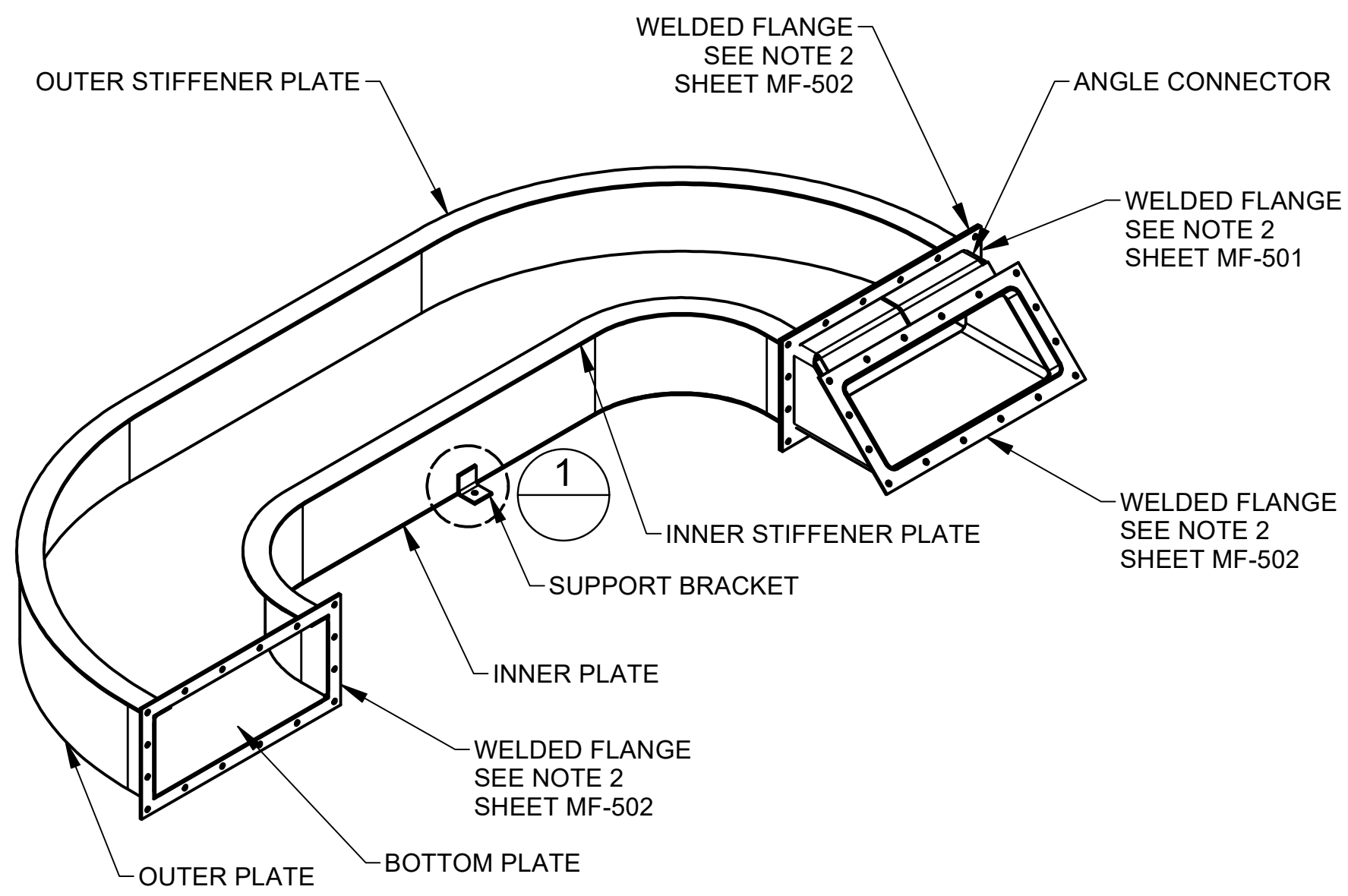
PLOT DATE: 10/25/2021
SIZE: 1:1
ANSI ID: FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
PORTLAND, OREGON

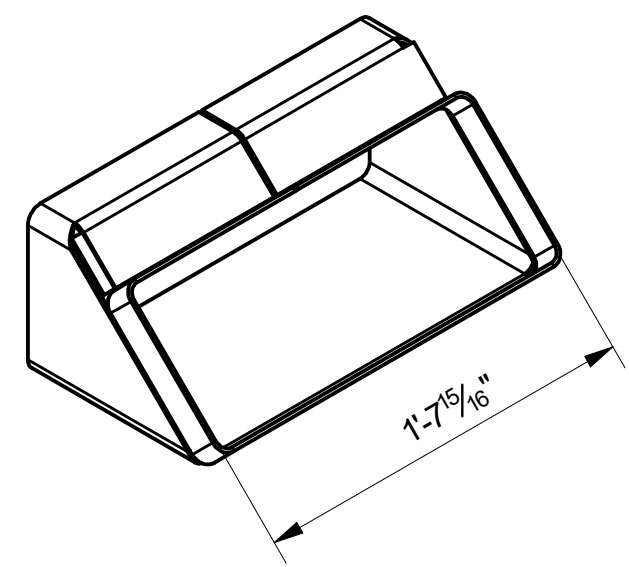
BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE

REST BOX DETAILS

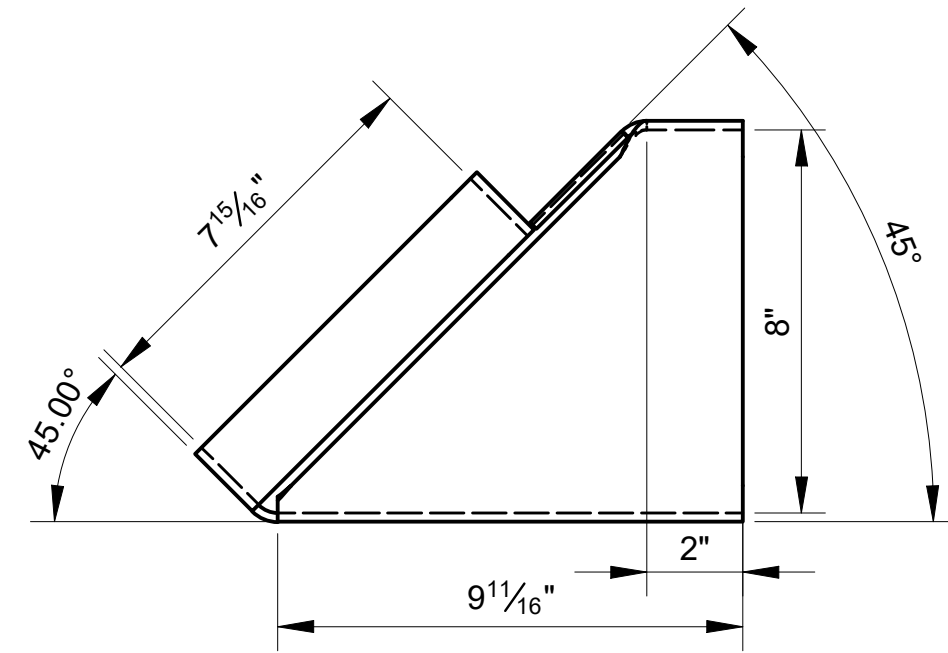
SHEET
IDENTIFICATION
MF-504



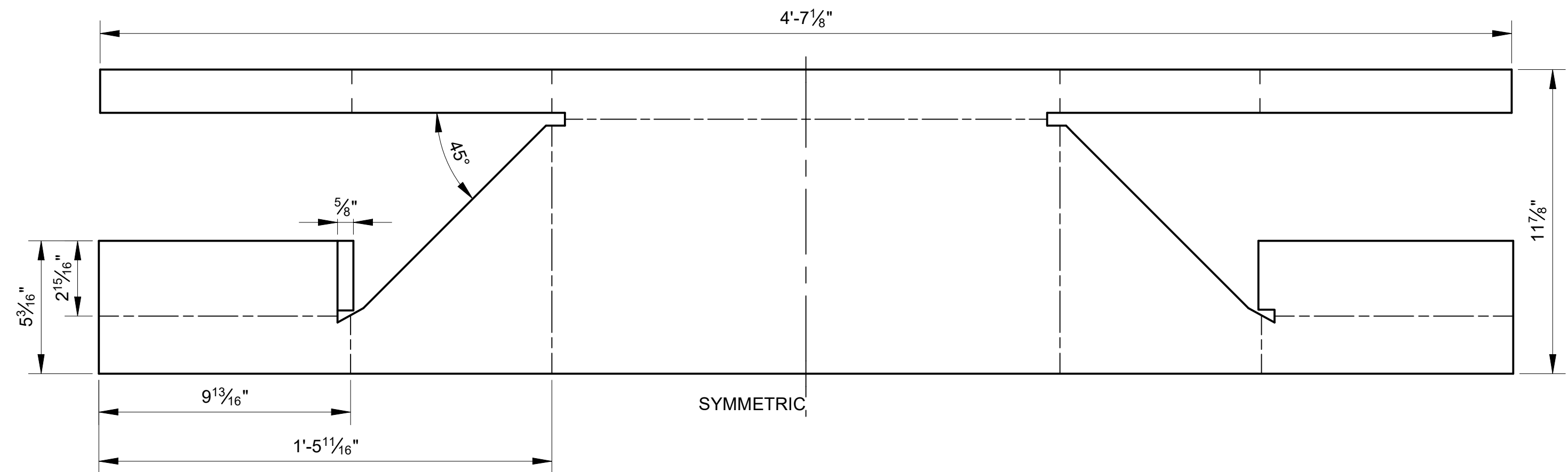
TURNING FLUME ASSEMBLY
SCALE: NTS



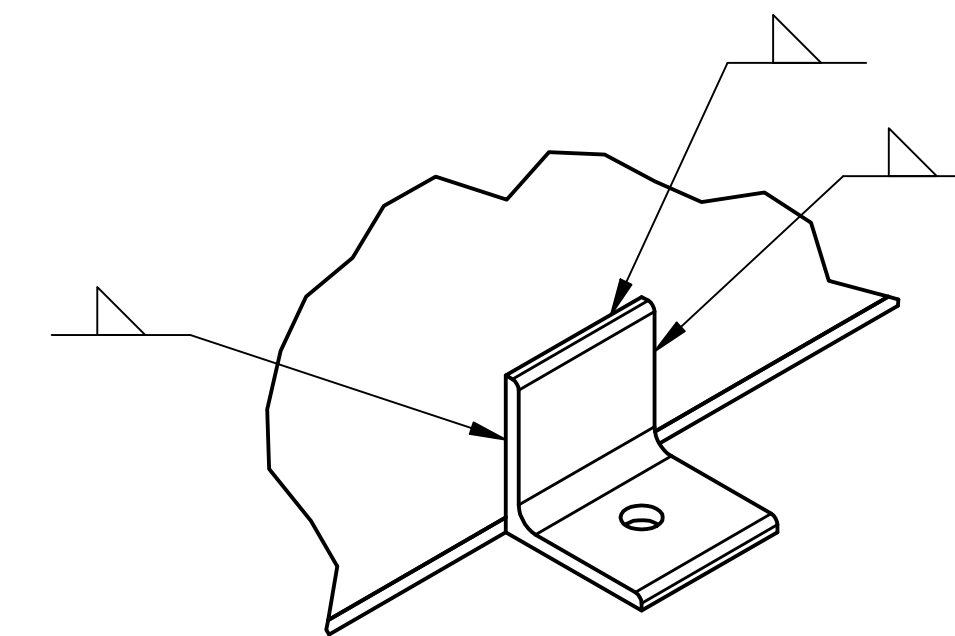
ANGLE CONNECTOR
SCALE: 1'-1/2" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



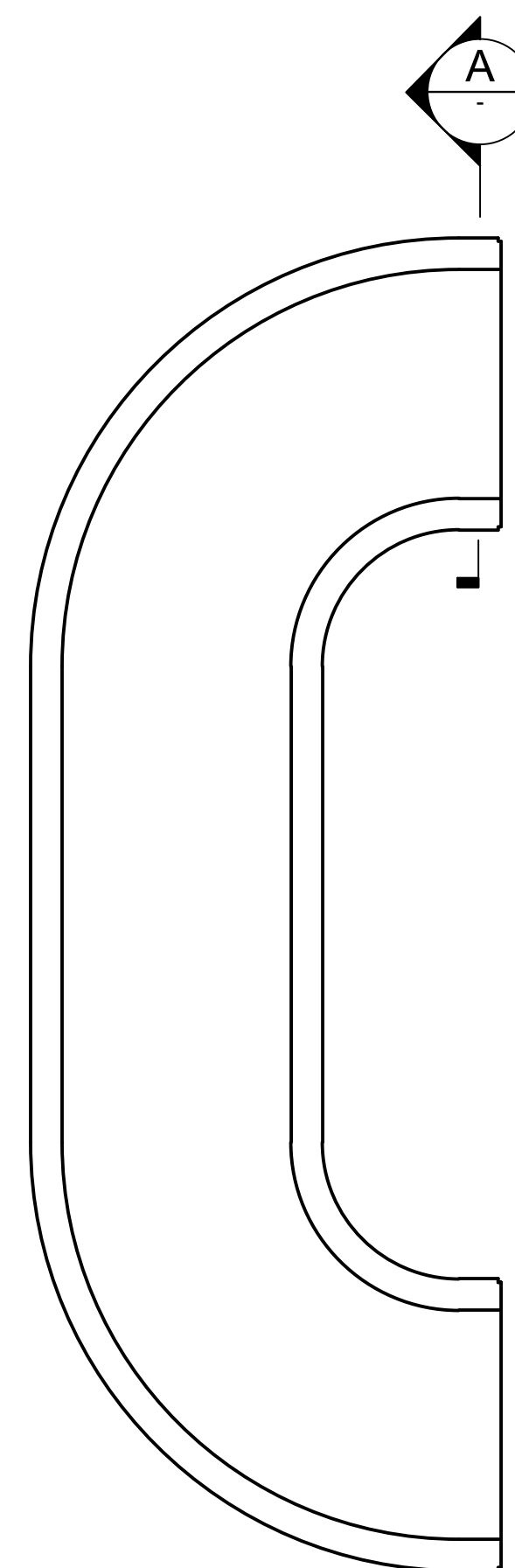
ANGLE CONNECTOR SIDE VIEW
SCALE: 3" = 1'-0"



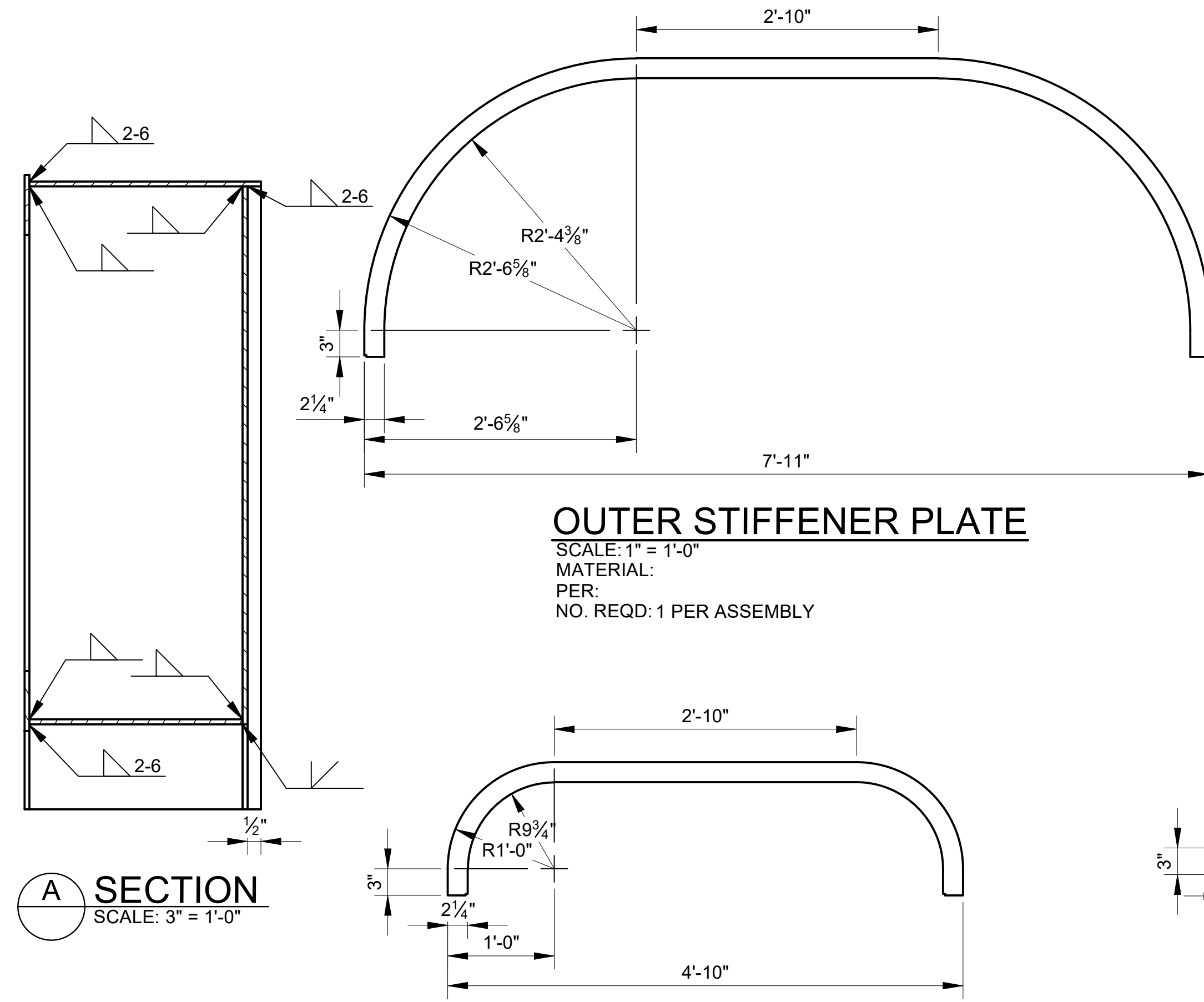
ANGLE CONNECTOR PATTERN
SCALE: 1'-1/2" = 1'-0"



1 DETAIL
SCALE: 6" = 1'-0"

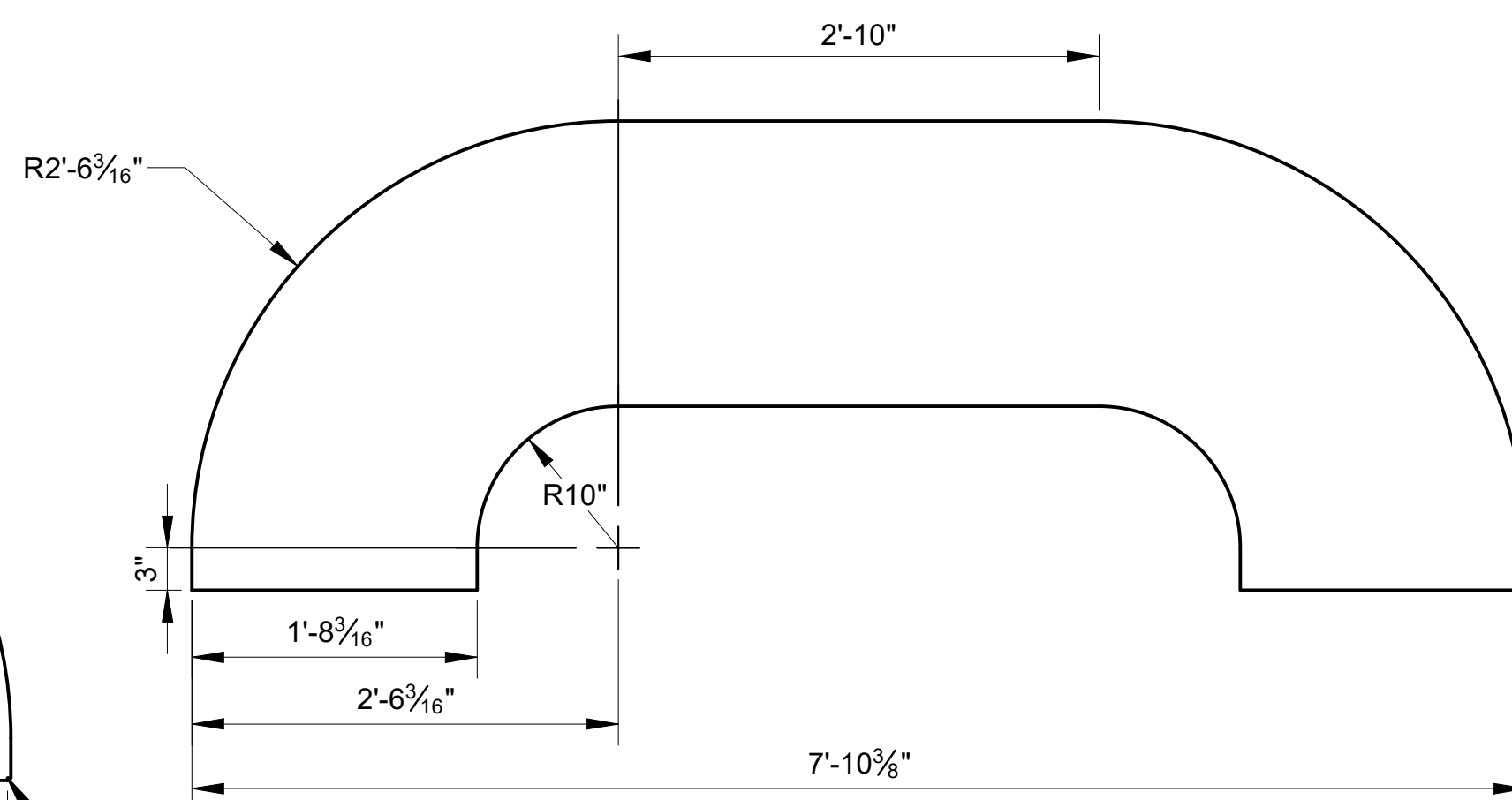


Turning Flume Weldment
SCALE: 1" = 1'-0"

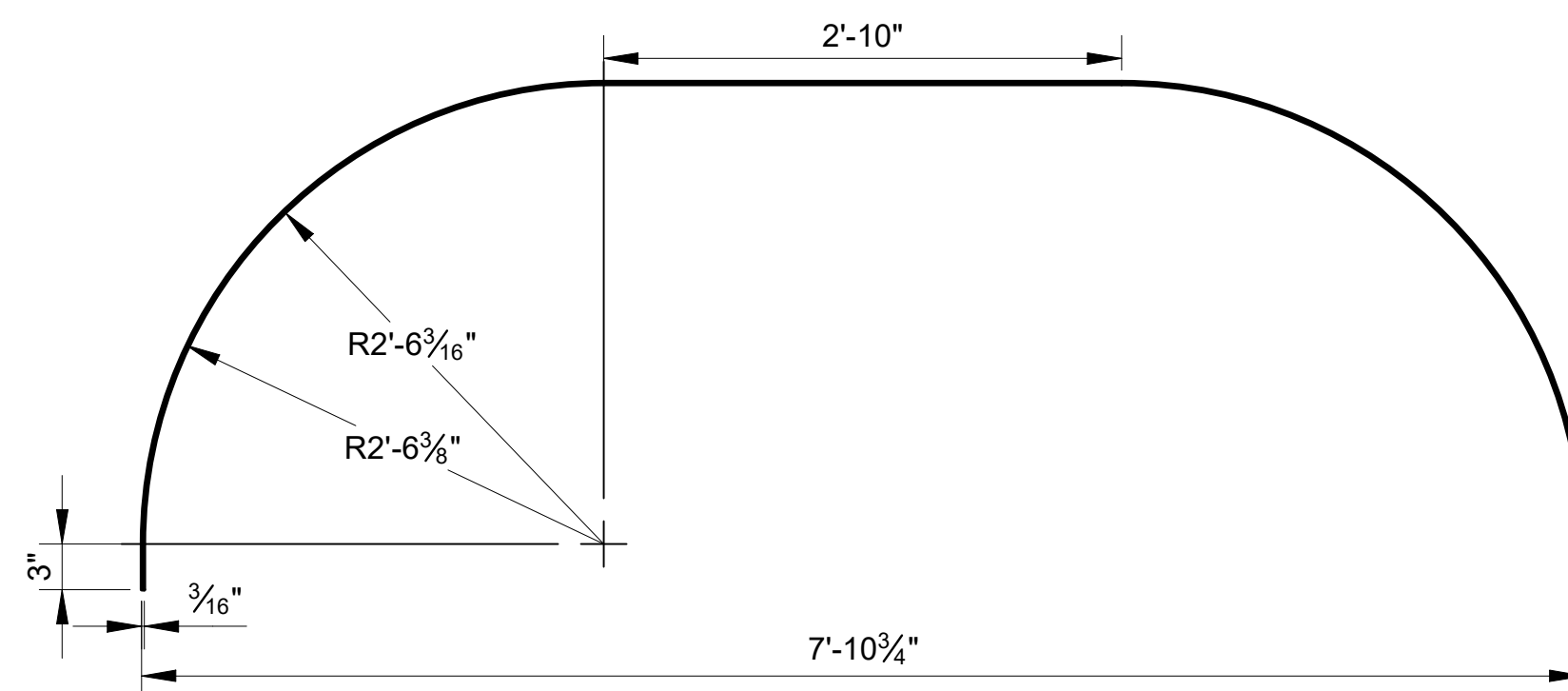


OUTER STIFFENER PLATE
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY

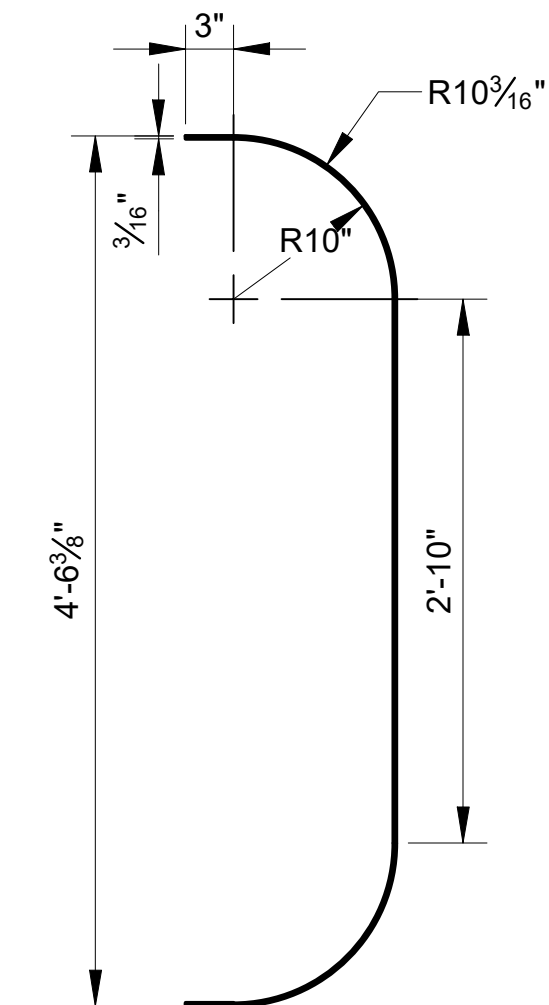
INNER STIFFENER PLATE
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



BOTTOM PLATE
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



OUTER PLATE
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



INNER PLATE
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY

- NOTES**
- TURNING BOX MAY BE FABRICATED BY ALTERNATE MEANS PER NOTE 10 ON SHEET M-001 AND SUBJECT TO APPROVAL BY THE CONTRACTING OFFICER.
 - WELD FLANGES FLUSH WITH END TURNING BOX AND ANGLE CONNECTOR.
 - PROVIDE 3/8" x 1" FASTENERS. 34 REQUIRED.



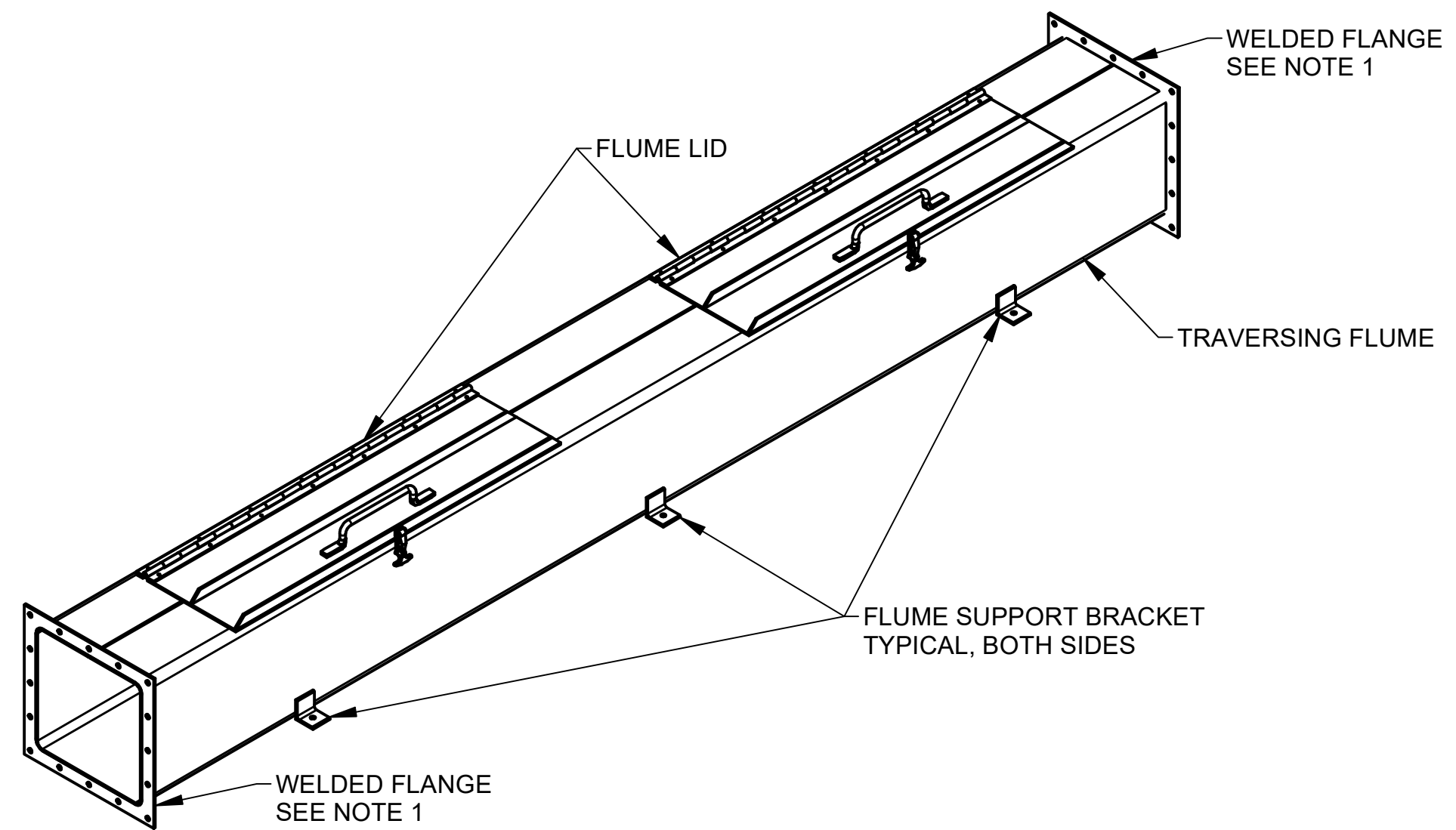
US Army Corps of Engineers
PORTLAND DISTRICT

DATE	10/25/2021	SOLICITATION NO.	
DESIGNED BY	DANIEL PERIN	ISS. BY	CEBACAZ
CHECKED BY	CEBACAZ	CONTRACT NO.	
DATE	10/25/2021	FILE NAME	
ANSI D	1:1		

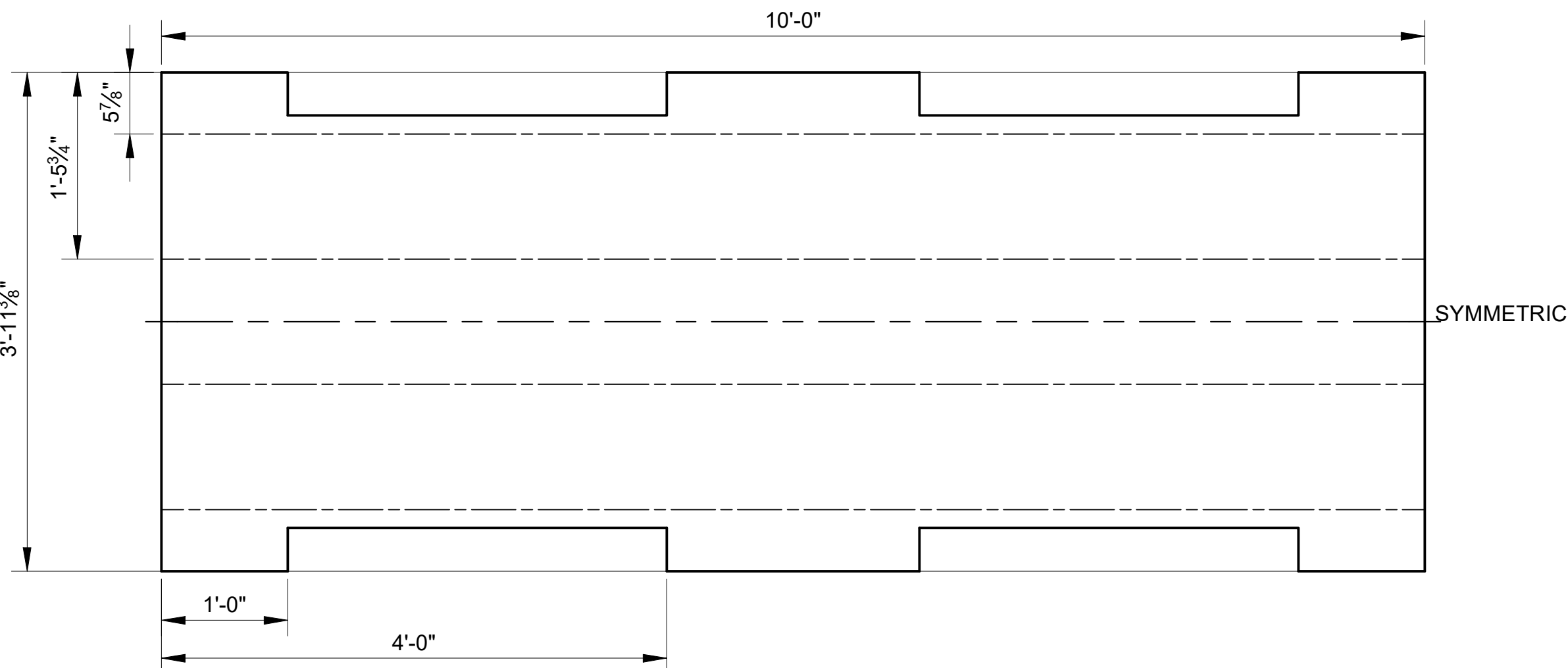
90% REVIEW

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TURNING FLUME DETAILS

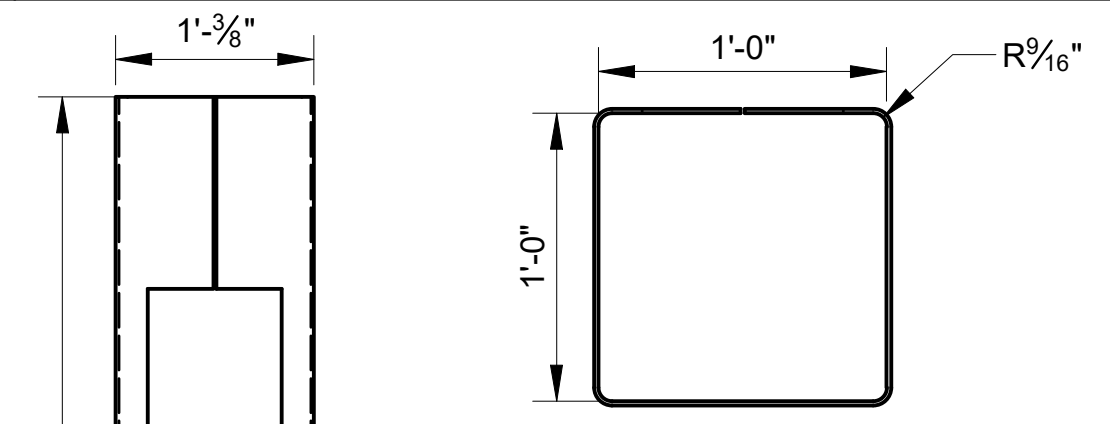
SHEET IDENTIFICATION
MF-505



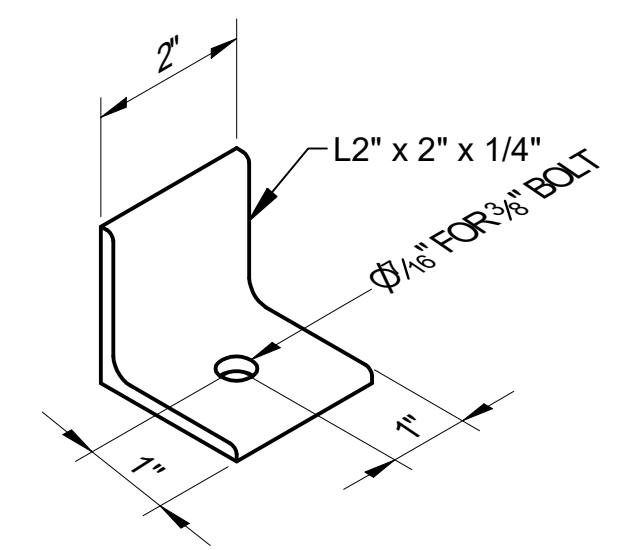
TRAVERSING FLUME ASSEMBLY
SCALE: NTS



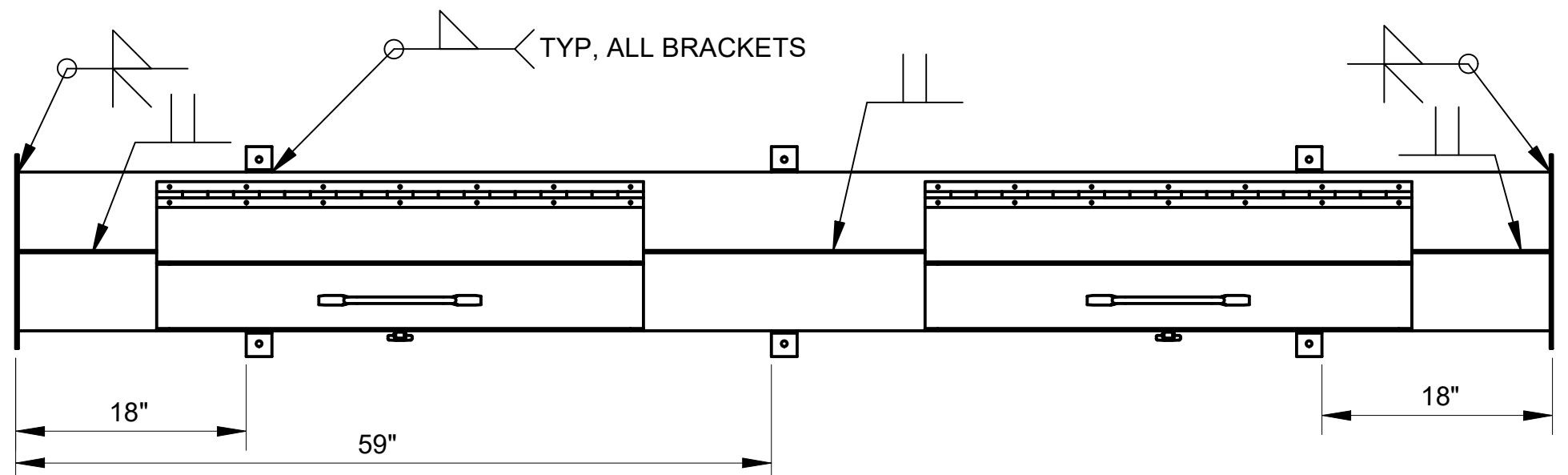
TRAVERSING FLUME PATTERN
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



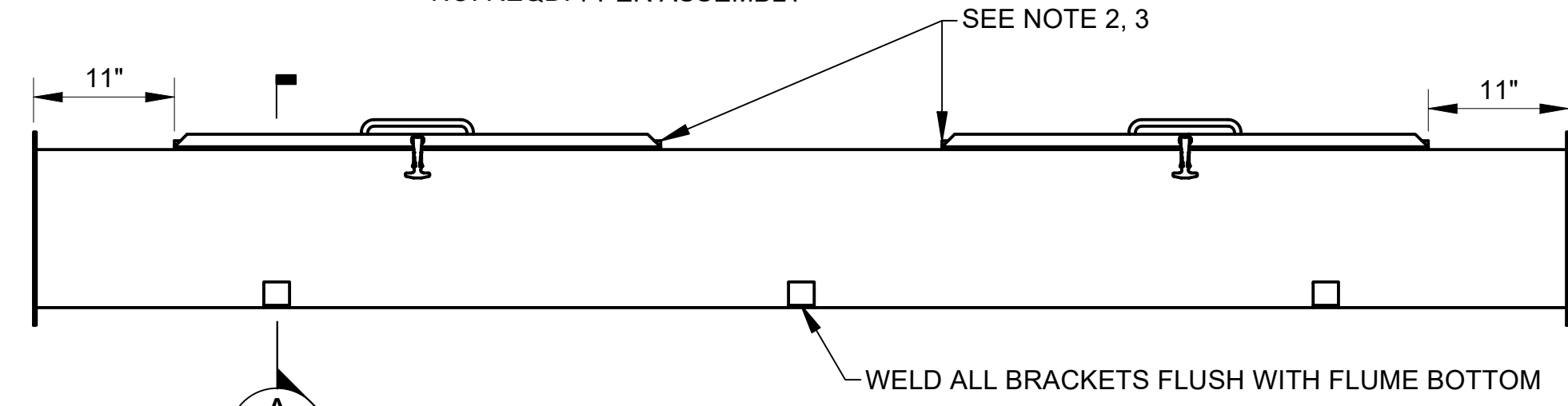
TRAVERSING FLUME END VIEW
SCALE: 1-1/2" = 1'-0"



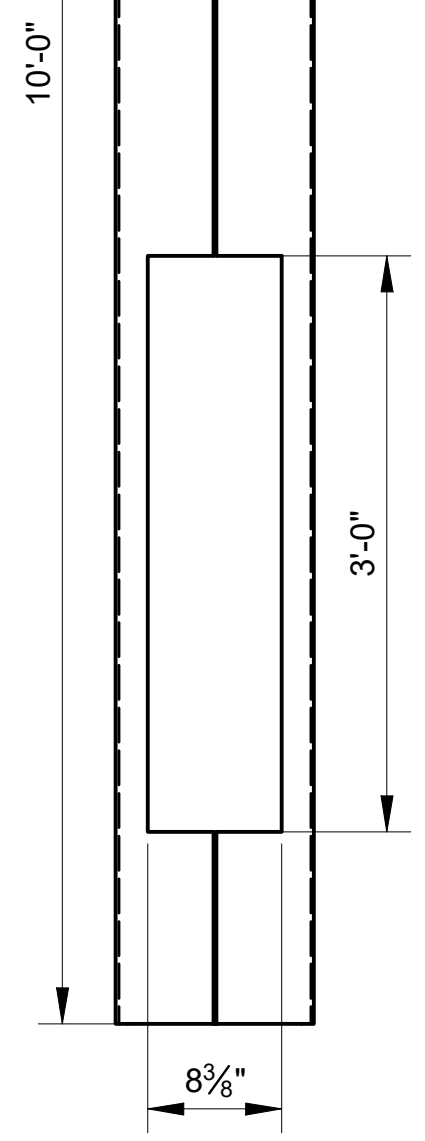
FLUME BRACKET
SCALE: 6" = 1'-0"
MATERIAL:
PER:
NO. REQD: 6 PER ASSEMBLY



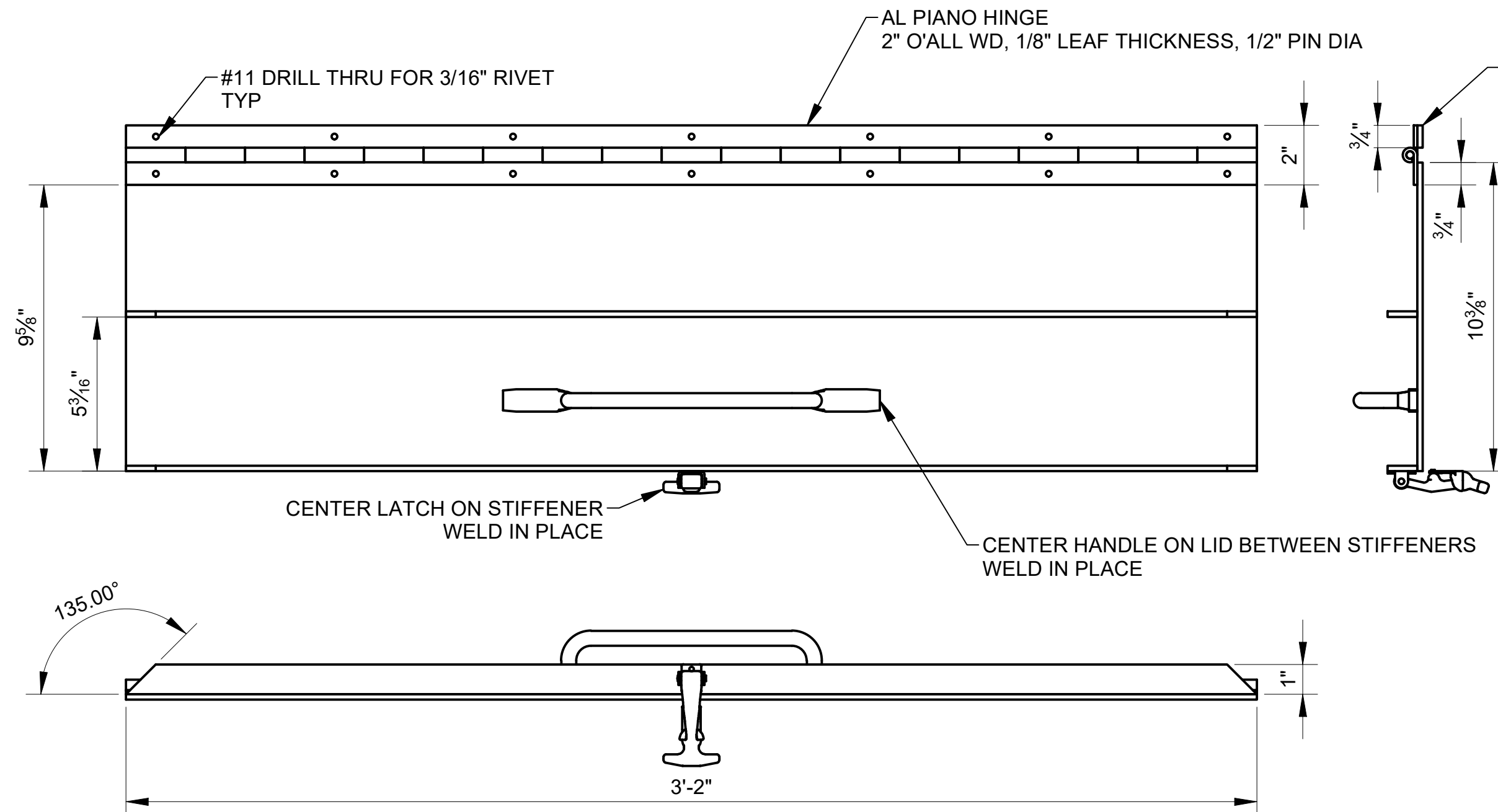
TRAVERSING FLUME ASSEMBLY PLAN VIEW WELD DETAILS
SCALE: 1" = 1'-0"



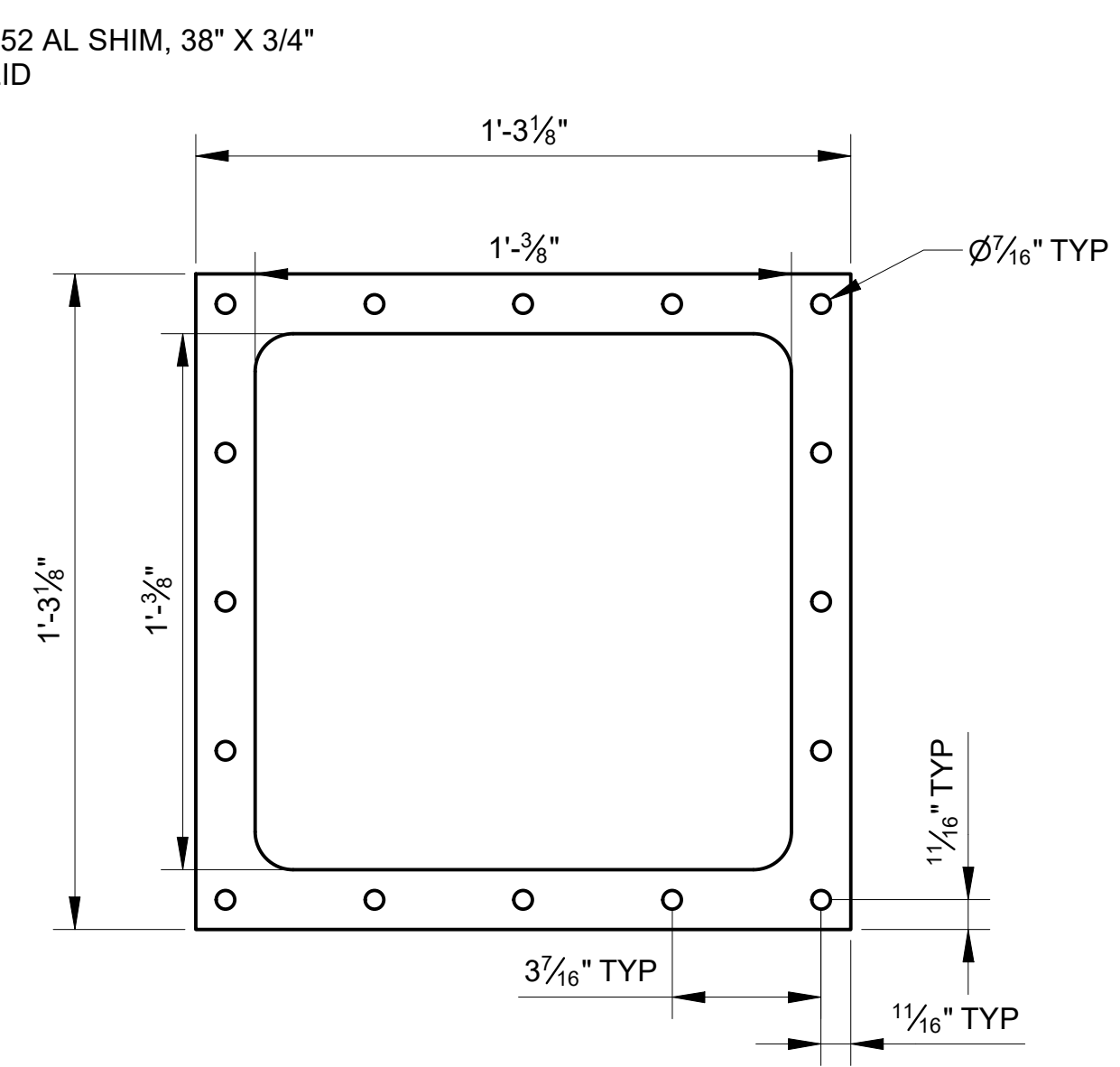
TRAVERSING FLUME ASSEMBLY ELEVATION VIEW WELD DETAILS
SCALE: 1" = 1'-0"



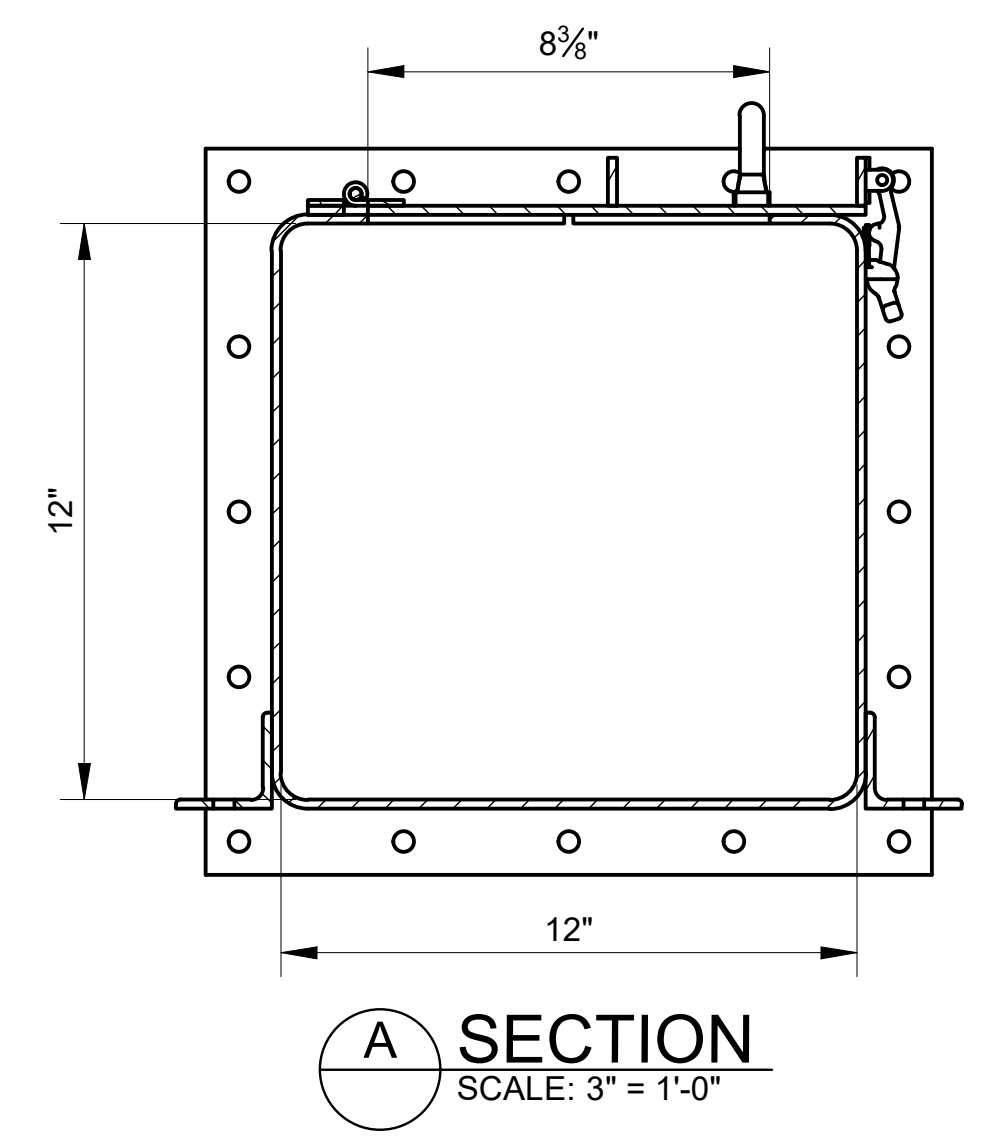
TRAVERSING FLUME PLAN VIEW
SCALE: 1" = 1'-0"



FLUME LID
SCALE: 3" = 1'-0"
MATERIAL:
PER:
NO. REQD: 2 PER ASSEMBLY

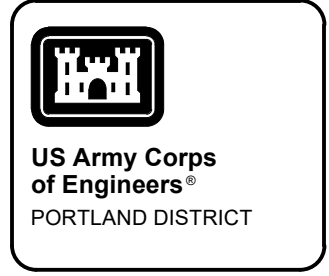


TRAVERSING FLUME FLANGE
SCALE: 3" = 1'-0"
MATERIAL:
PER:
NO. REQD: 2 PER ASSEMBLY



A SECTION
SCALE: 3" = 1'-0"

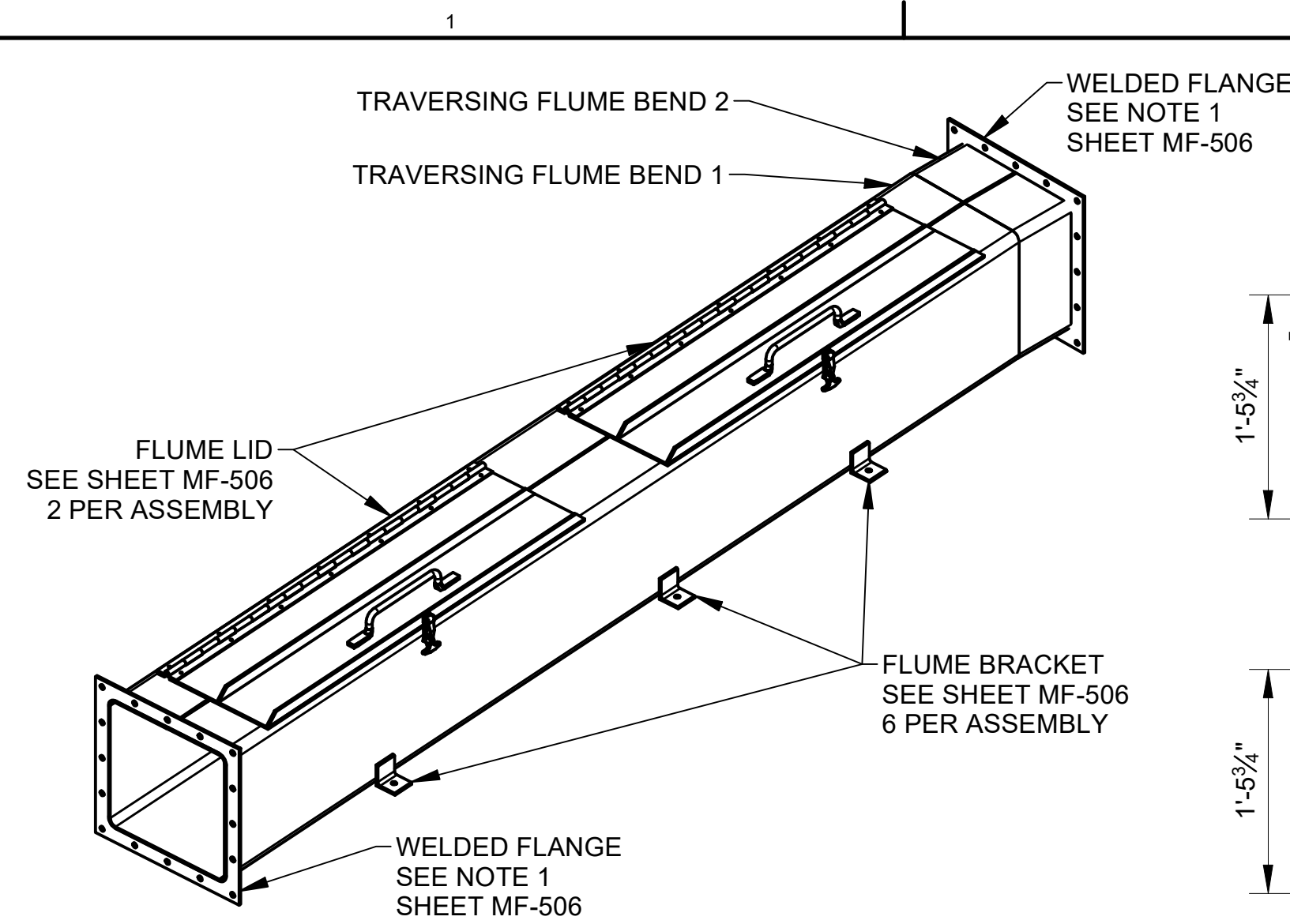
- NOTES**
1. WELD FLANGES FLUSH WITH END OF FLUME.
 2. POSITION FRONT LID STIFFENER FLUSH WITH SIDE WALL PRIOR TO DRILLING FLUME FOR RIVETS.
 3. MATCH-MARK HOLES PRIOR TO DRILLING.
 4. PROVIDE 3/8" x 1" FASTENERS. 22 REQUIRED PER TRAVERSING FLUME ASSEMBLY



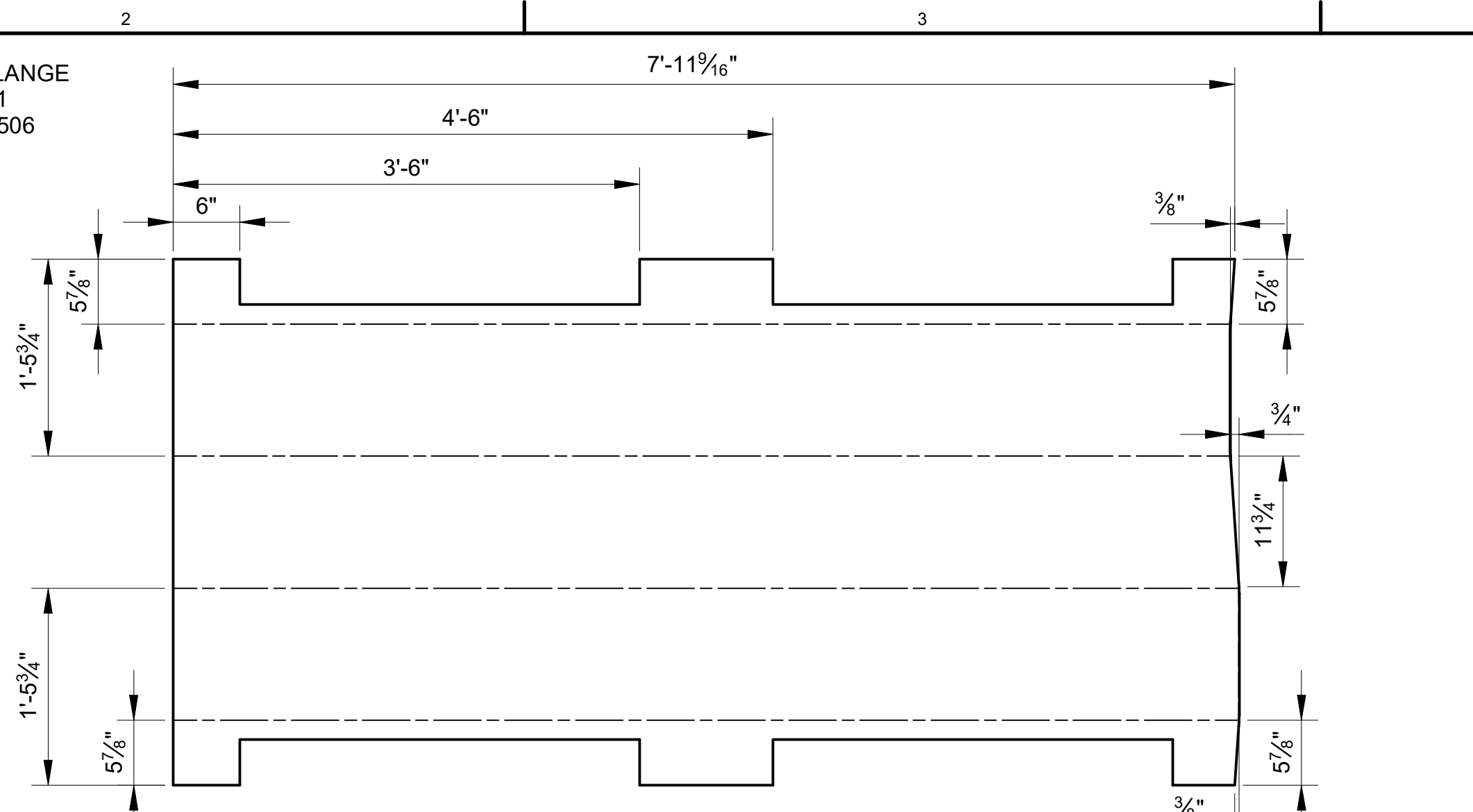
DESIGNED BY: DANIEL PERIN CCE/BD/PA	CHKD BY: CCE/BD/PA	DATE: 10/25/2021	SOLICITATION NO.:	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	SUBMITTED BY:	PLOT DATE: 10/25/2021	FILE NAME:	MARK
BONNEVILLE LOCK AND DAM BRADFORD ISLAND FISH LADDER FY2019 FISH ACCORDS LAMPREY PASSAGE		90% REVIEW		
TRAVERSING FLUME DETAILS		DATE		
SHEET IDENTIFICATION MF-506		APPR.		

DATE: 10/25/2021	SOLICITATION NO.:	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	FILE NAME:	MARK

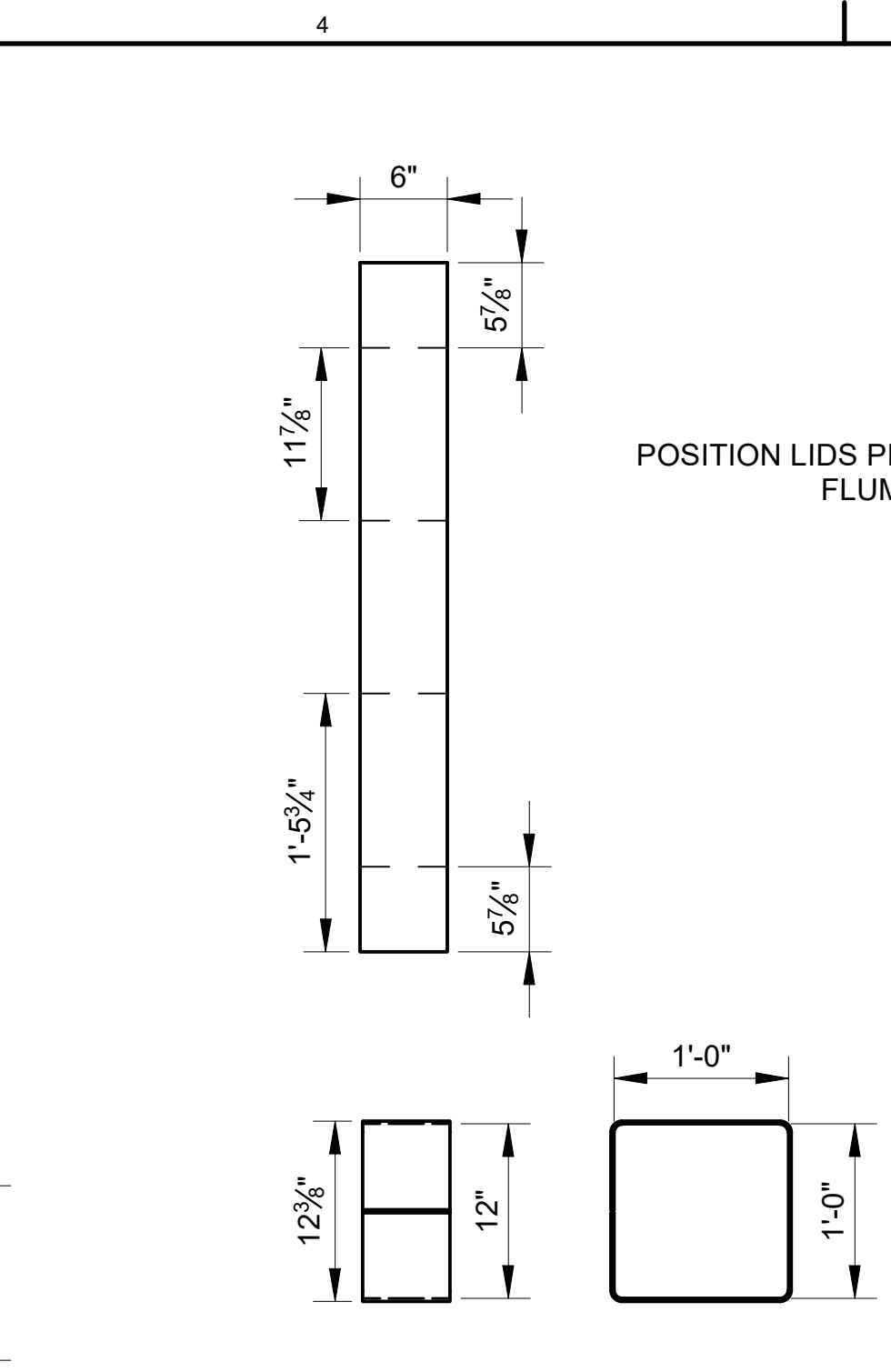
BONNEVILLE LOCK AND DAM BRADFORD ISLAND FISH LADDER FY2019 FISH ACCORDS LAMPREY PASSAGE	90% REVIEW
TRAVERSING FLUME DETAILS	DATE
SHEET IDENTIFICATION MF-506	APPR.



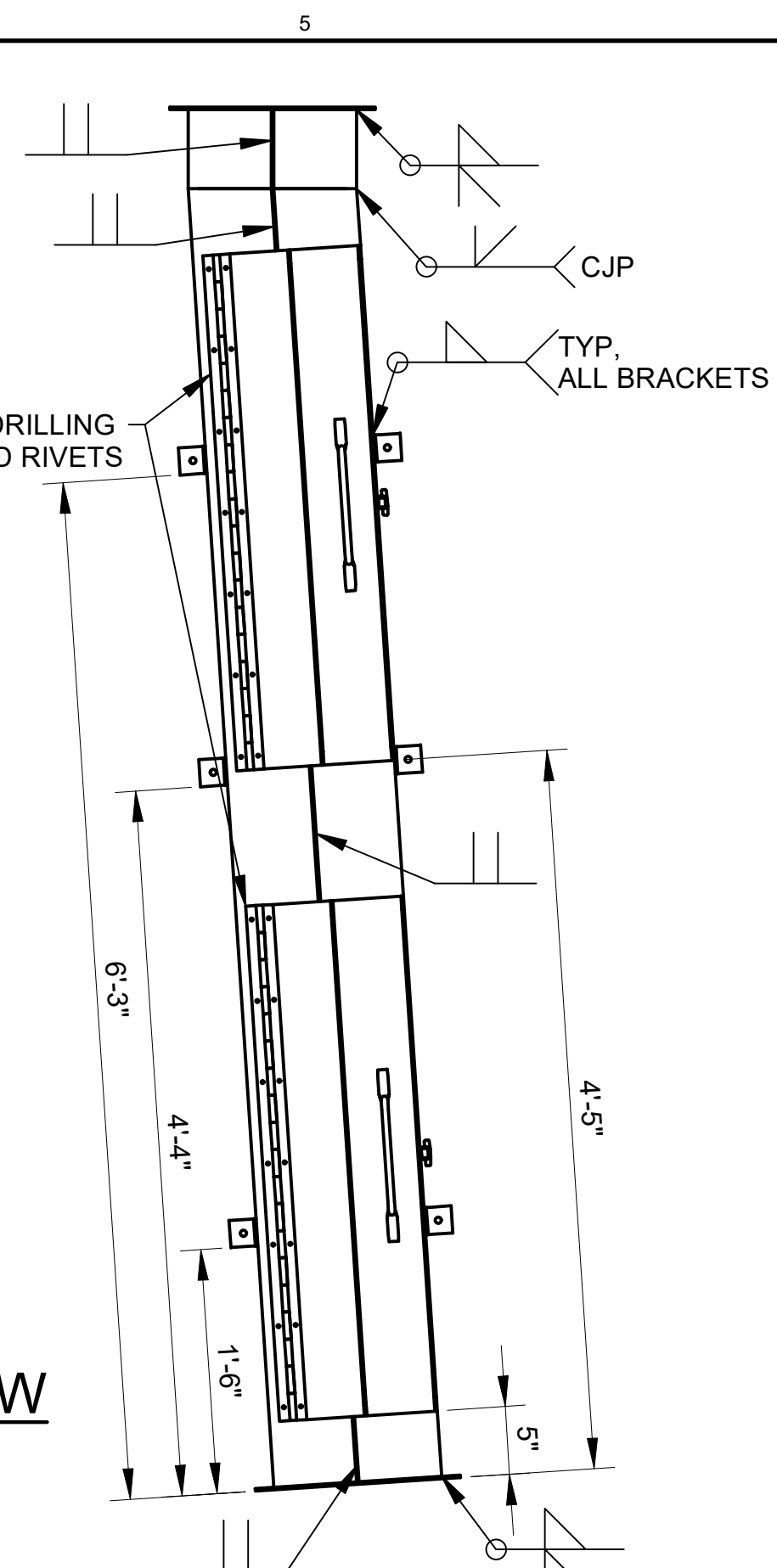
TRaversing Flume Bend Assembly
SCALE: NTS



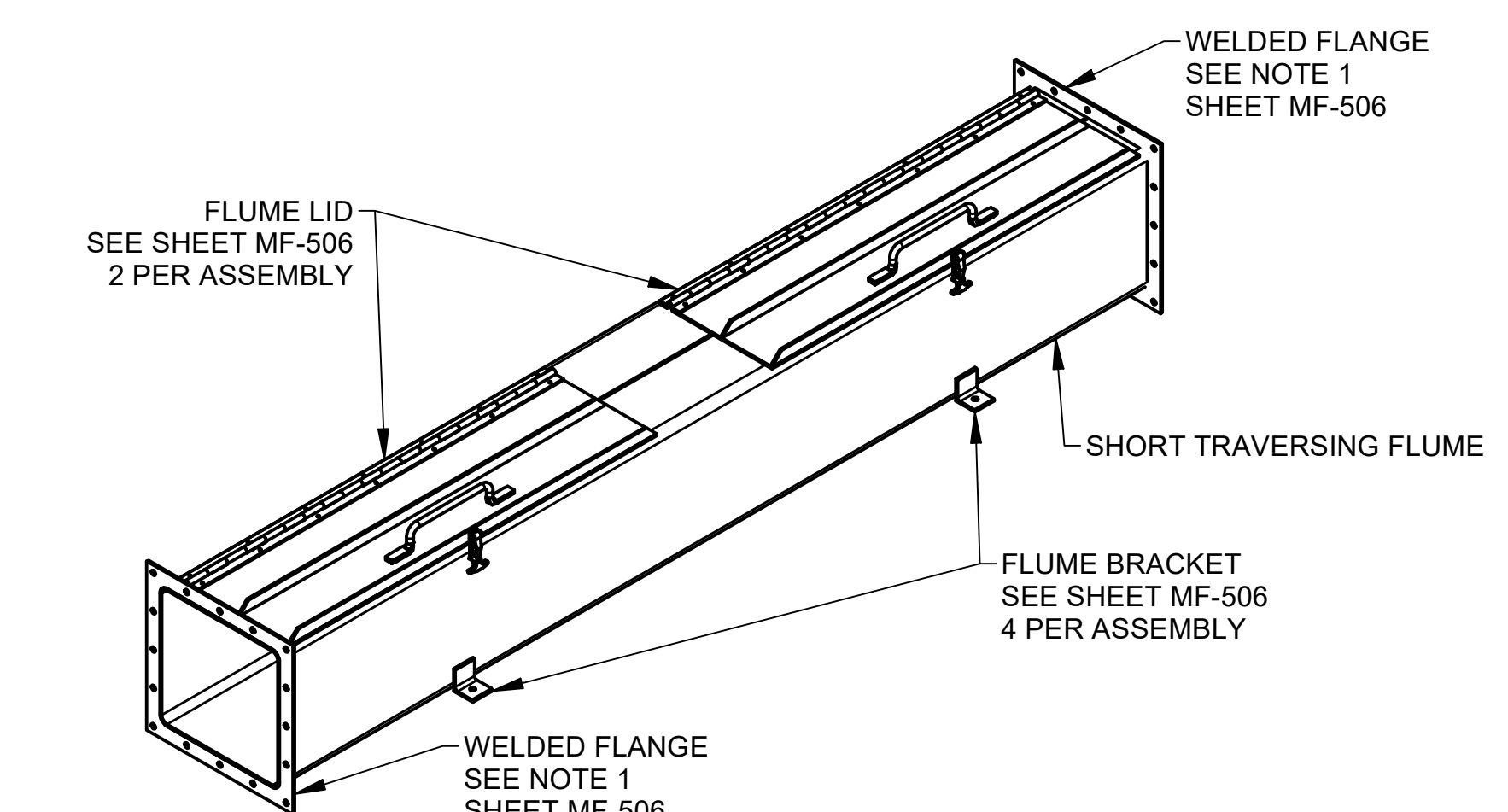
TRaversing Flume Bend 1 Pattern and Folded Plan View
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



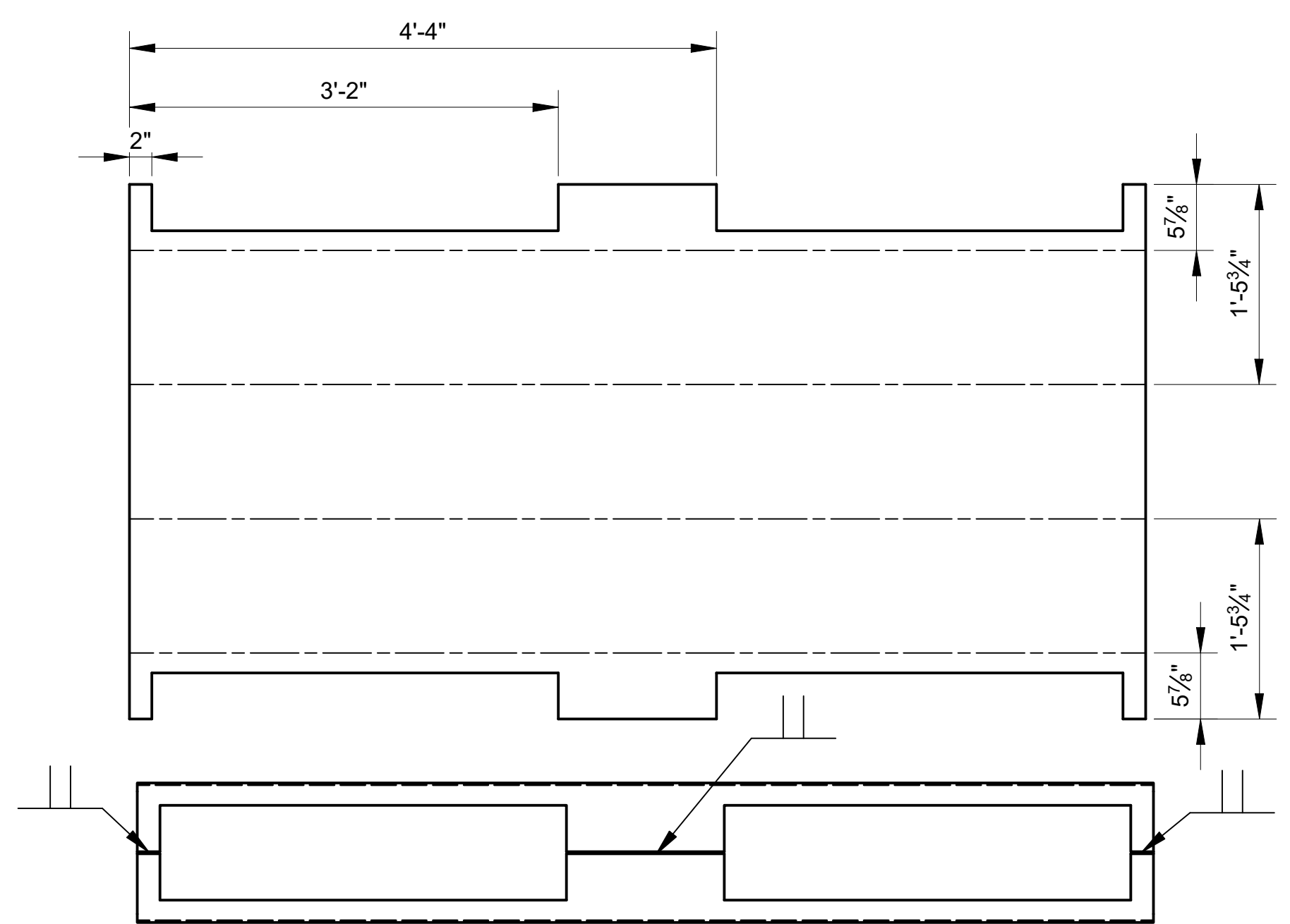
TRaversing Flume Bend 2 Pattern and Folded Plan View
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



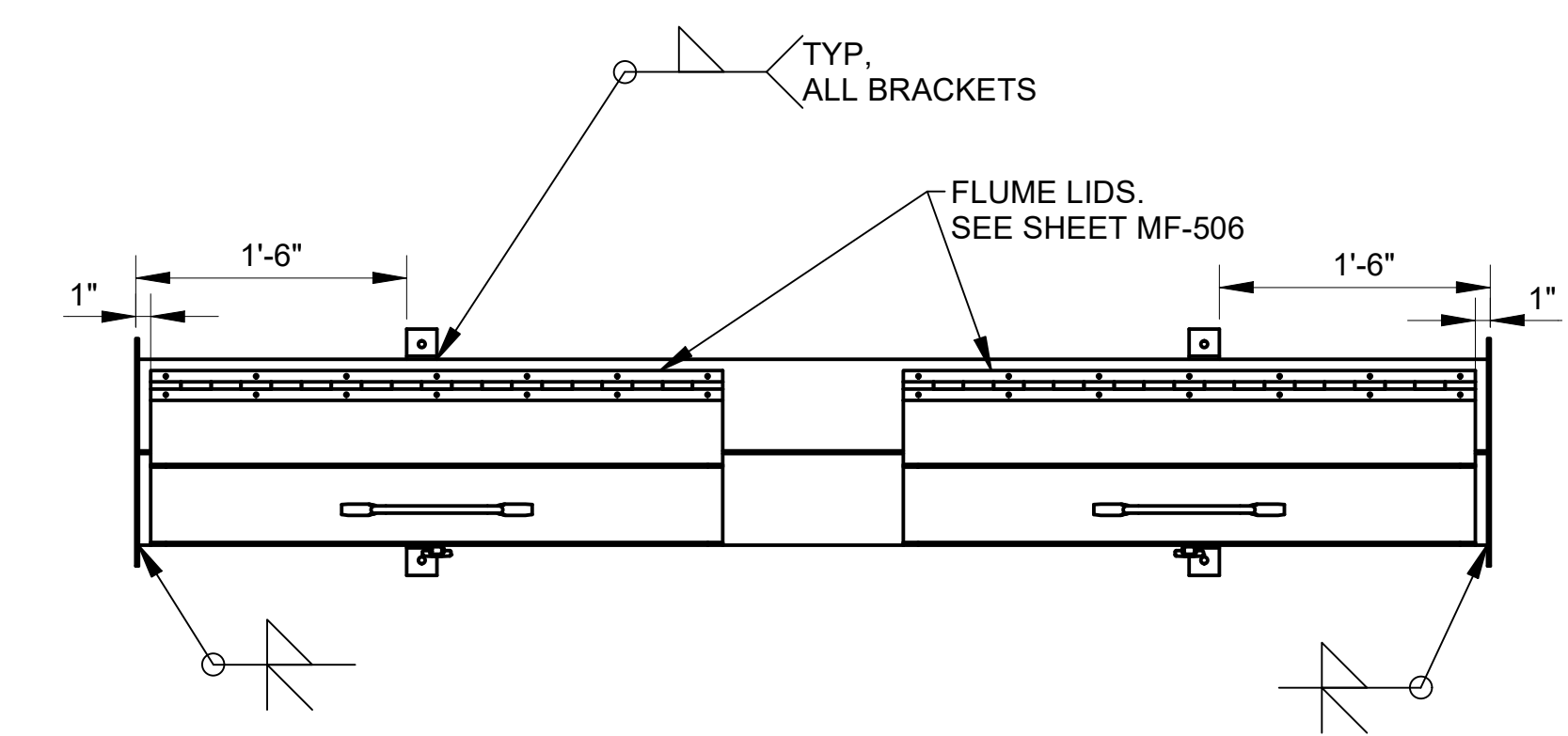
TRaversing Flume Bend Assembly Weld Details
SCALE: 1" = 1'-0"



SHORT Traversing Flume Assembly
SCALE: NTS



SHORT Traversing Flume Pattern and Folded Plan View
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



SHORT Traversing Flume Assembly Weld Details
SCALE: 1" = 1'-0"



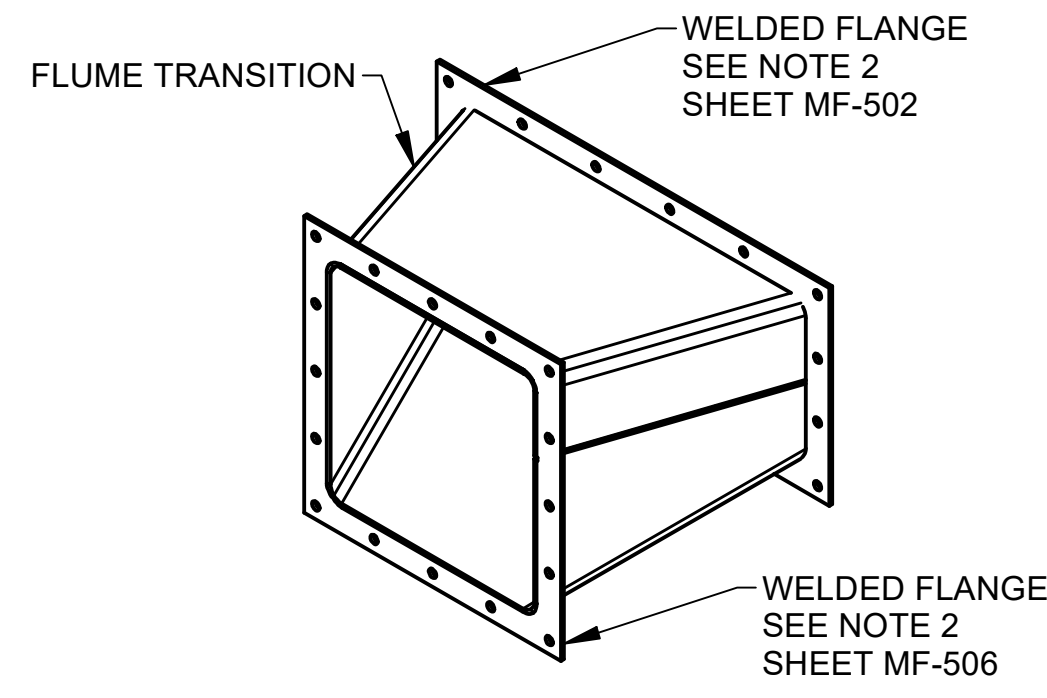
DATE	10/25/2021	SOLICITATION NO.	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	
DATE	10/25/2021	CONTRACT NO.	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	
DATE	10/25/2021	CONTRACT NO.	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	

DATE	10/25/2021	SOLICITATION NO.	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	
DATE	10/25/2021	CONTRACT NO.	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	

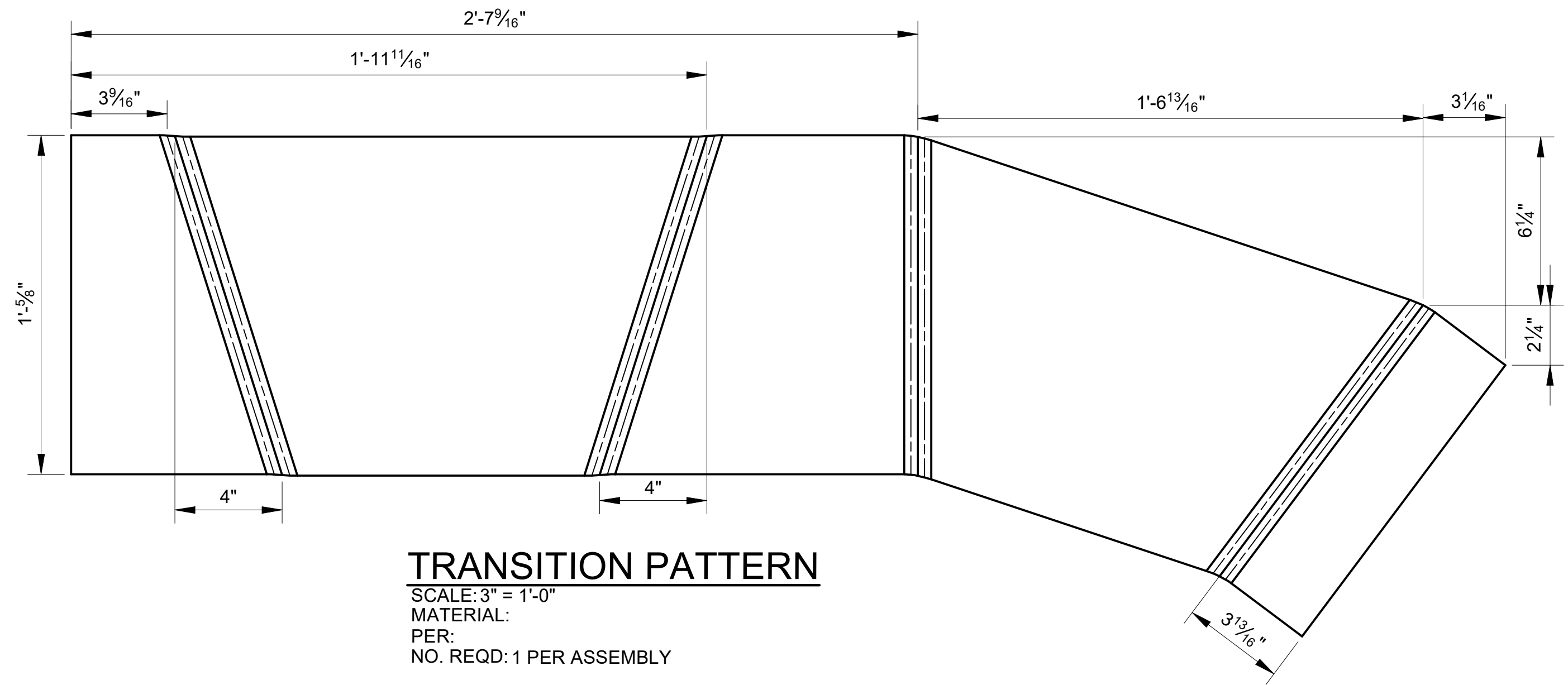
BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TRaversing Flume Details 2

SHEET IDENTIFICATION
MF507

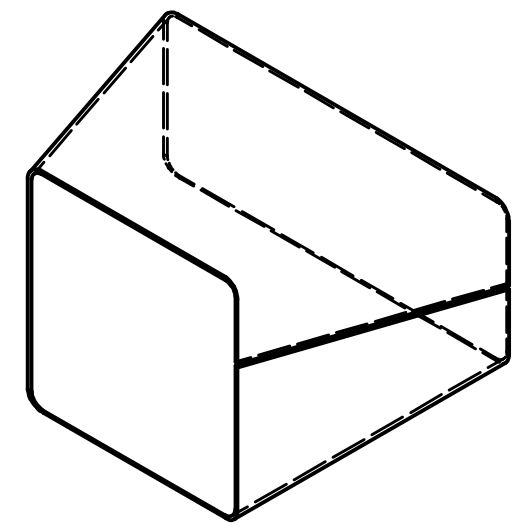
- NOTES**
- WELD FLANGES FLUSH WITH END OF FLUME.
 - PROVIDE 3/8" x 1" FASTENERS. 16 REQUIRED PER TRaversing Flume Assembly



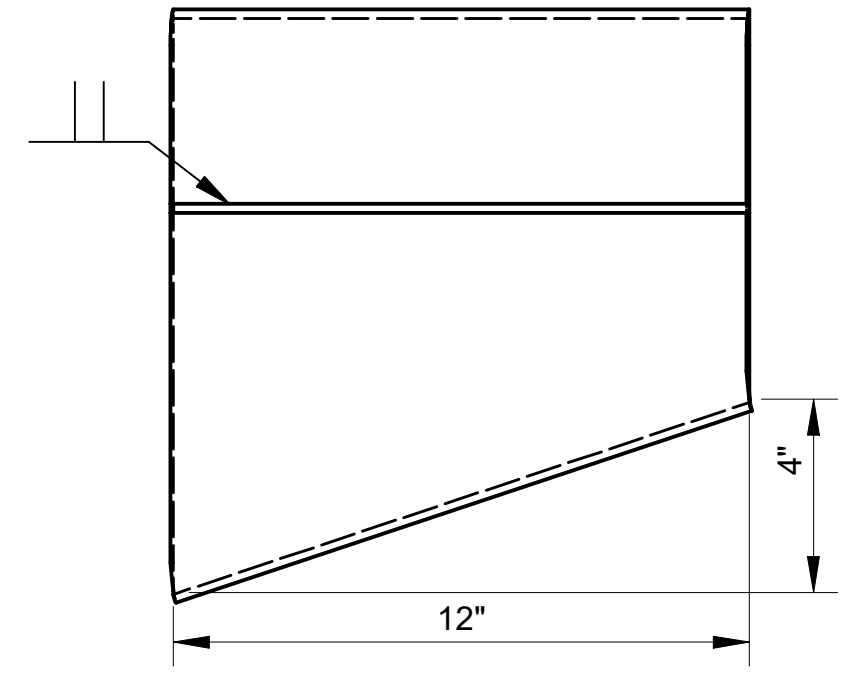
TRANSITION ASSEMBLY
SCALE: NTS



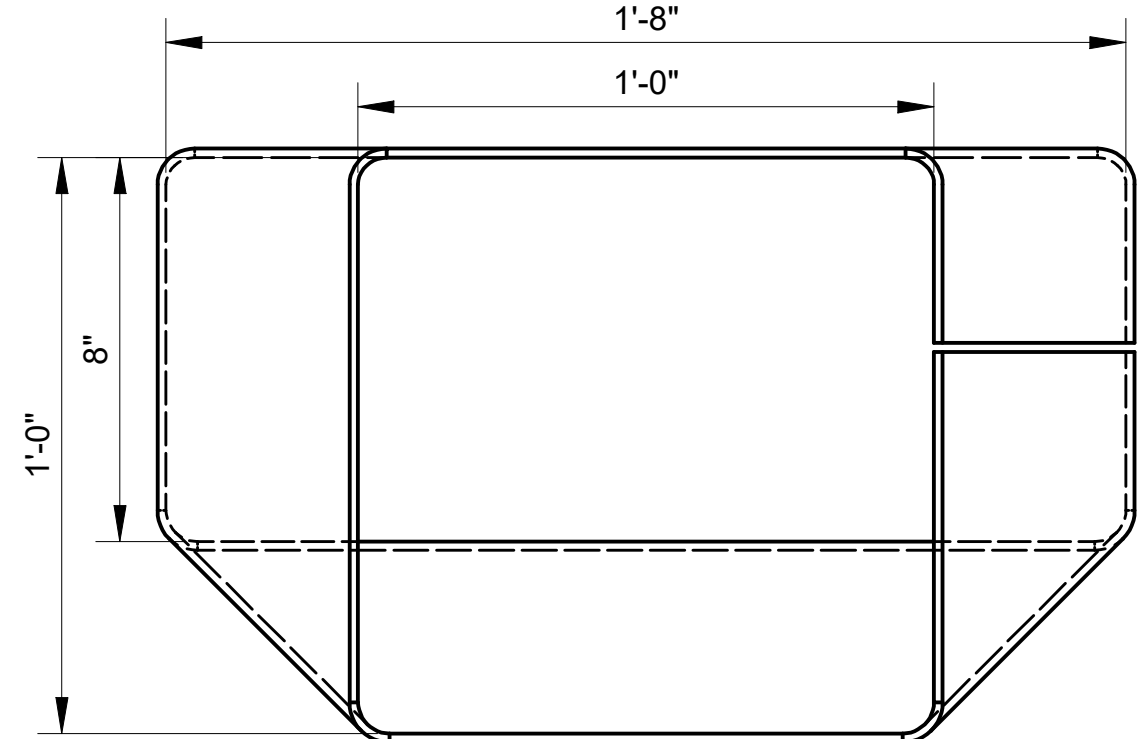
TRANSITION PATTERN
SCALE: 3" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



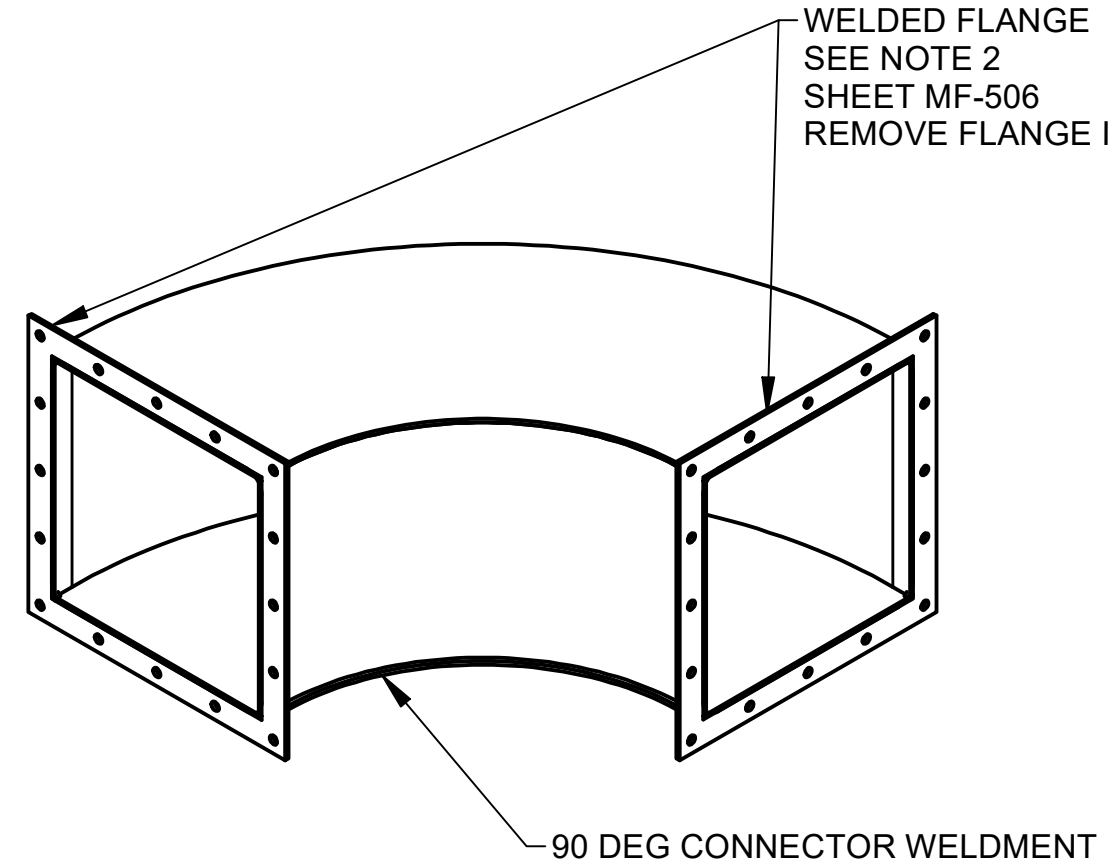
TRANSITION FOLDED ISOMETRIC
SCALE: NTS



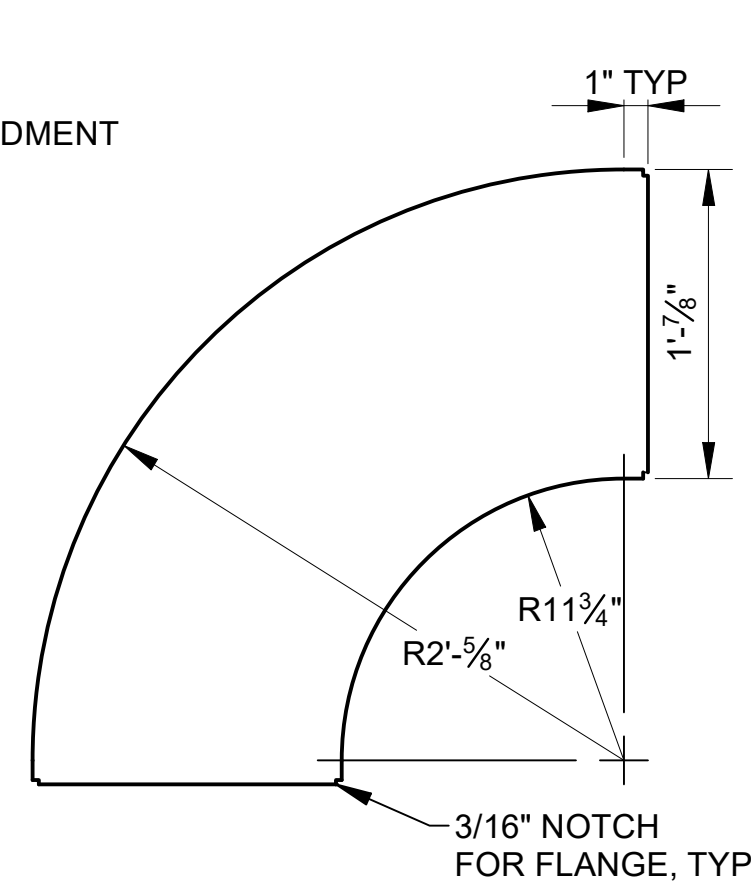
TRANSITION ELEVATION VIEW
SCALE: 3" = 1'-0"



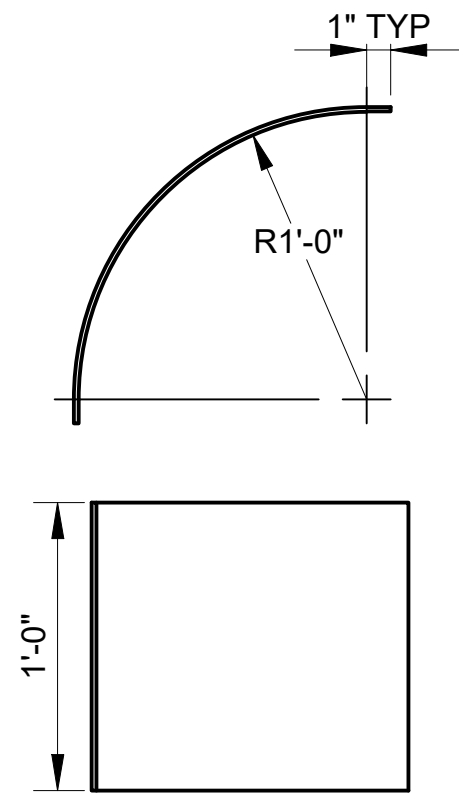
TRANSITION END VIEW
SCALE: 3" = 1'-0"



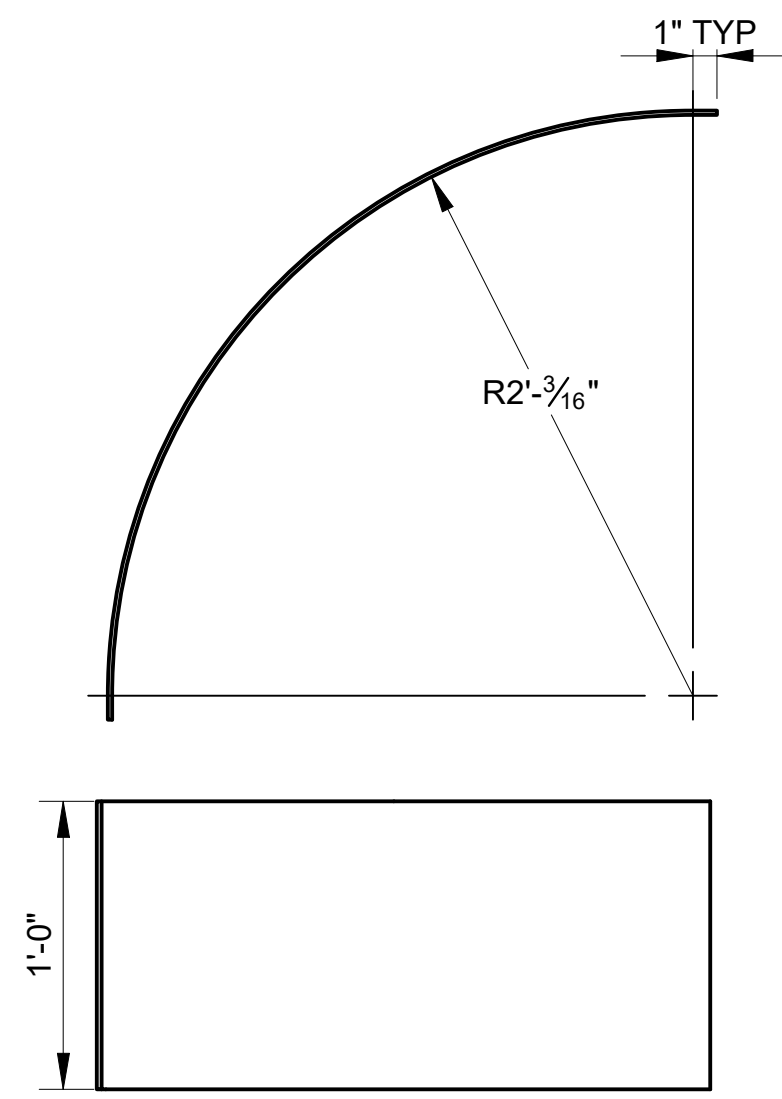
90 DEGREE CONNECTOR ASSEMBLY
SCALE: NTS



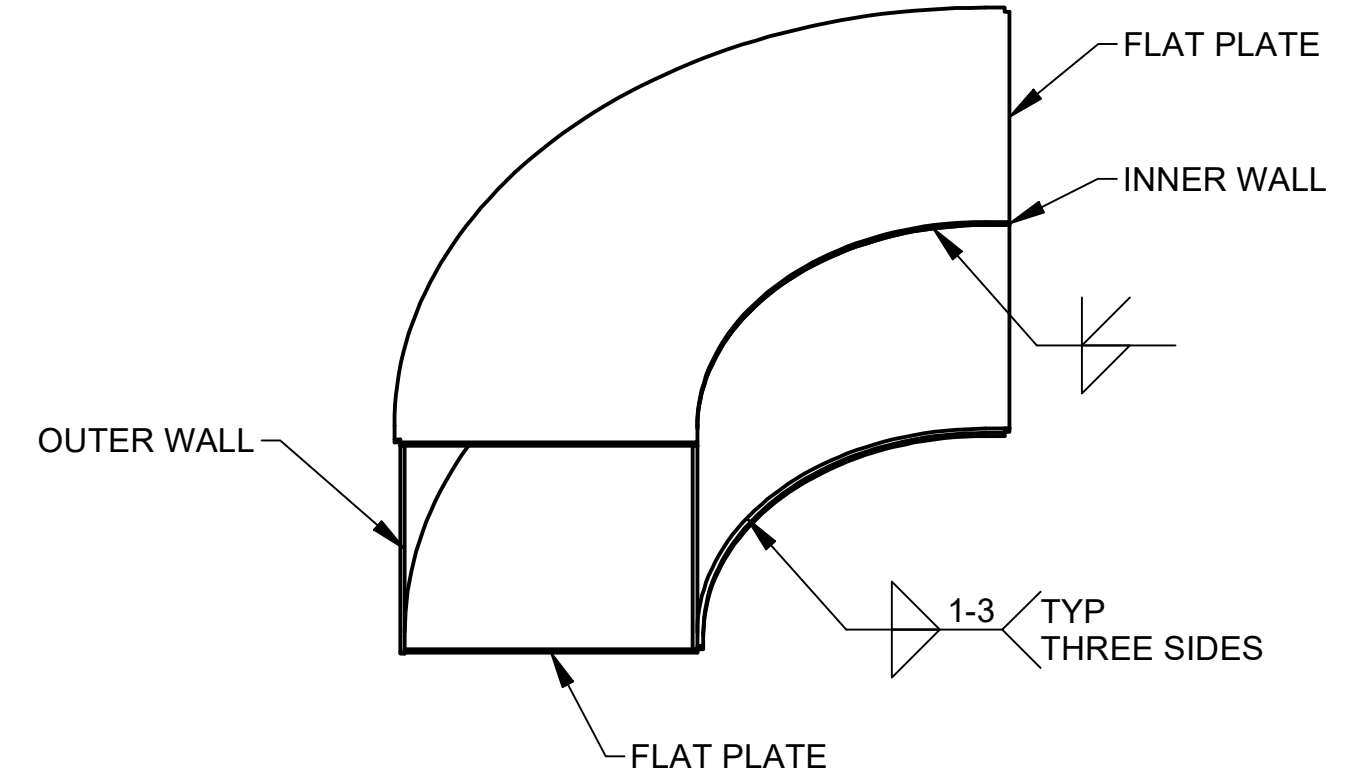
FLAT PLATE
SCALE: 1-1/2" = 1'-0"
MATERIAL:
PER:
NO. REQD: 2 PER ASSEMBLY



INNER WALL
SCALE: 1-1/2" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



OUTER WALL
SCALE: 1-1/2" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



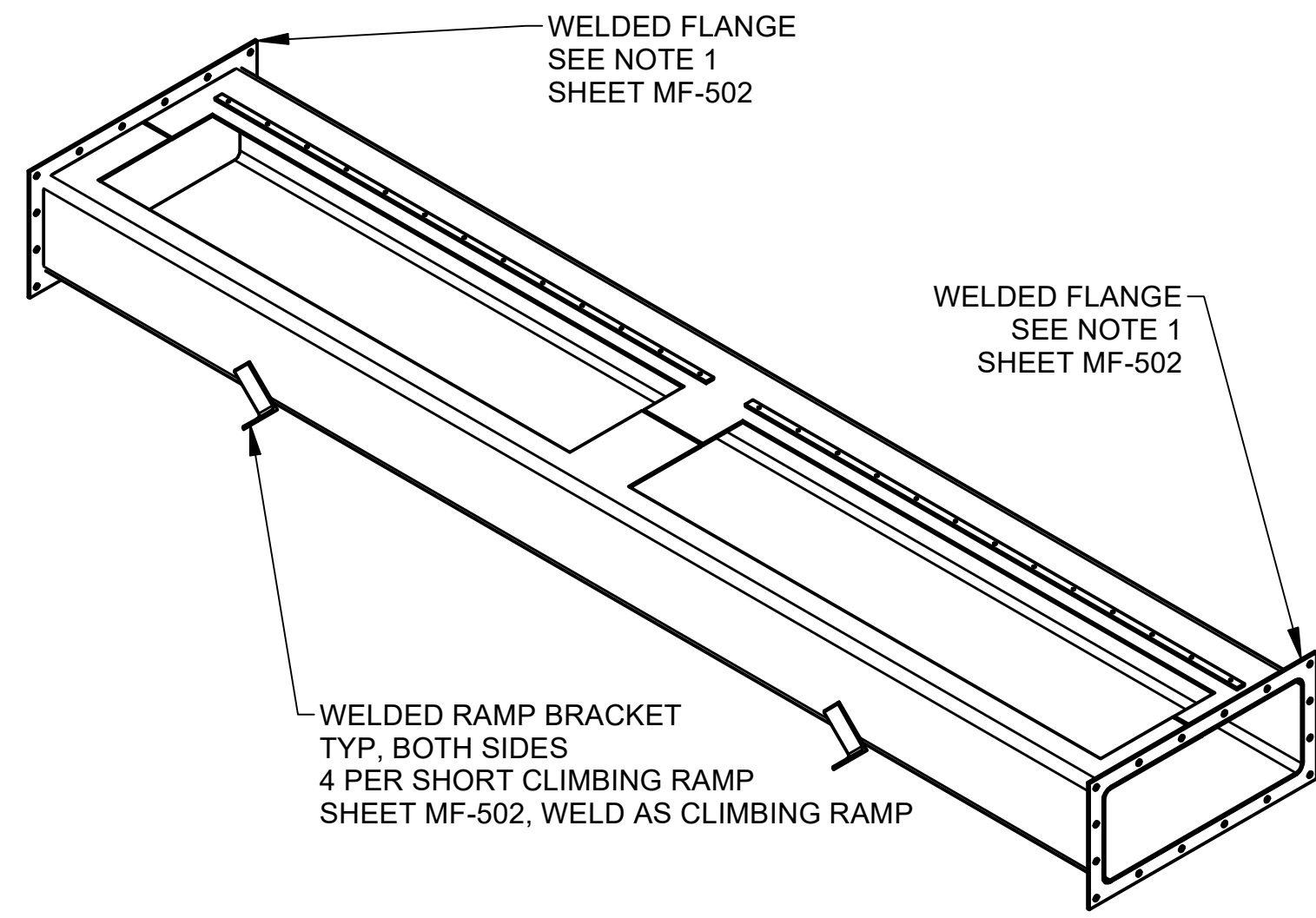
90 DEGREE CONNECTOR WELDMENT WELD DETAILS
SCALE: NTS

- NOTES**
- 90 DEG CONNECTOR MAY BE FABRICATED BY ALTERNATE MEANS PER NOTE 10 ON SHEET M-001 AND SUBJECT TO APPROVAL BY THE CONTRACTING OFFICER.
 - WELD FLANGES FLUSH WITH ENDS.
 - PROVIDE 3/8" x 1" FASTENERS. 32 REQUIRED.

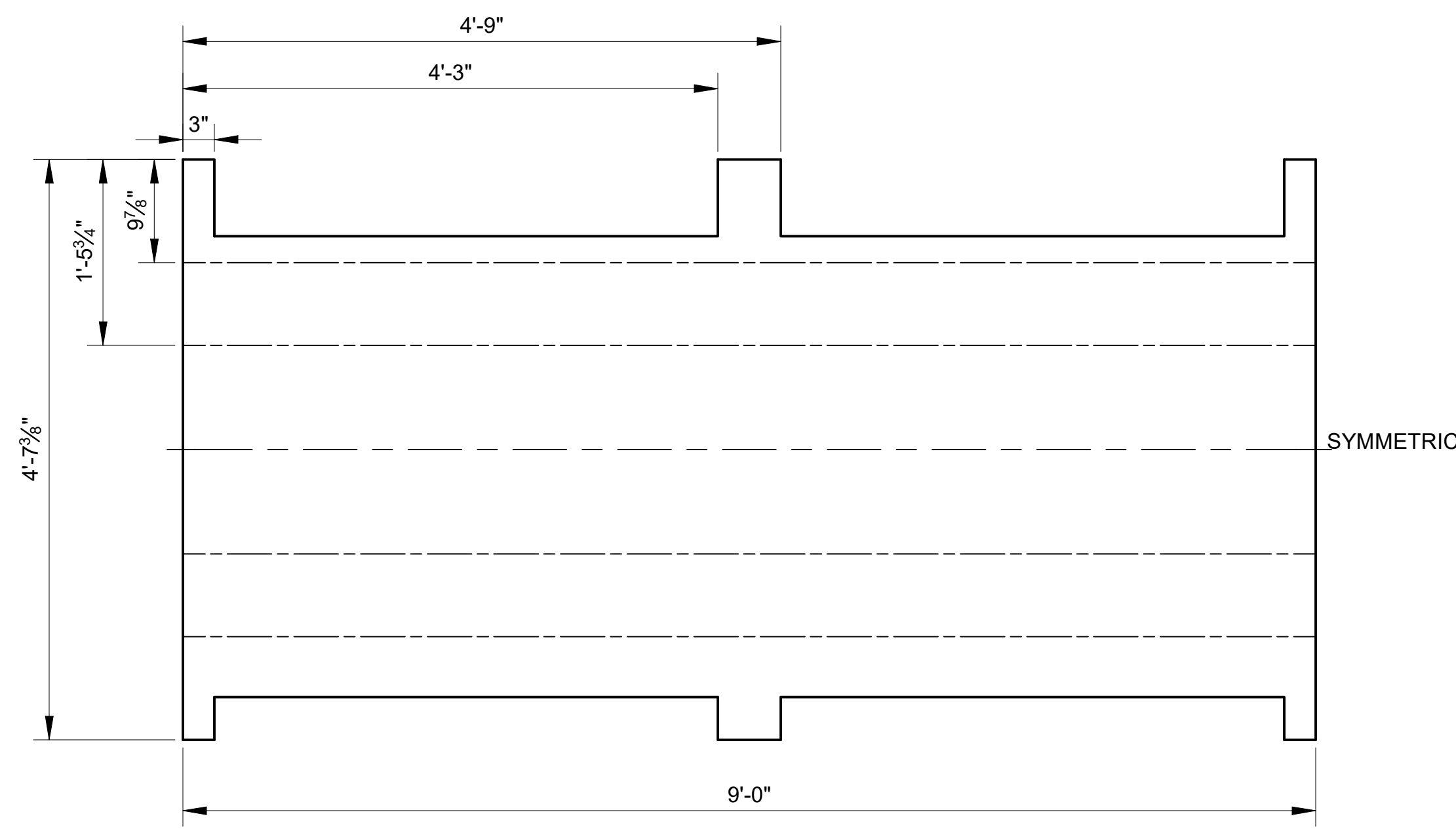
DATE	DESCRIPTION	MARK
10/25/2021 <td>90% REVIEW</td> <td></td>	90% REVIEW	

DESIGNED BY: DANIEL PERIN CCE/BD/PP	CHKD BY: CCE/BD/PP	SUBMITTED BY: CCE/BD/PP	DATE: 10/25/2021	SOLICITATION NO.:	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON			PLOT SCALE: 1:1	FILE NAME:	

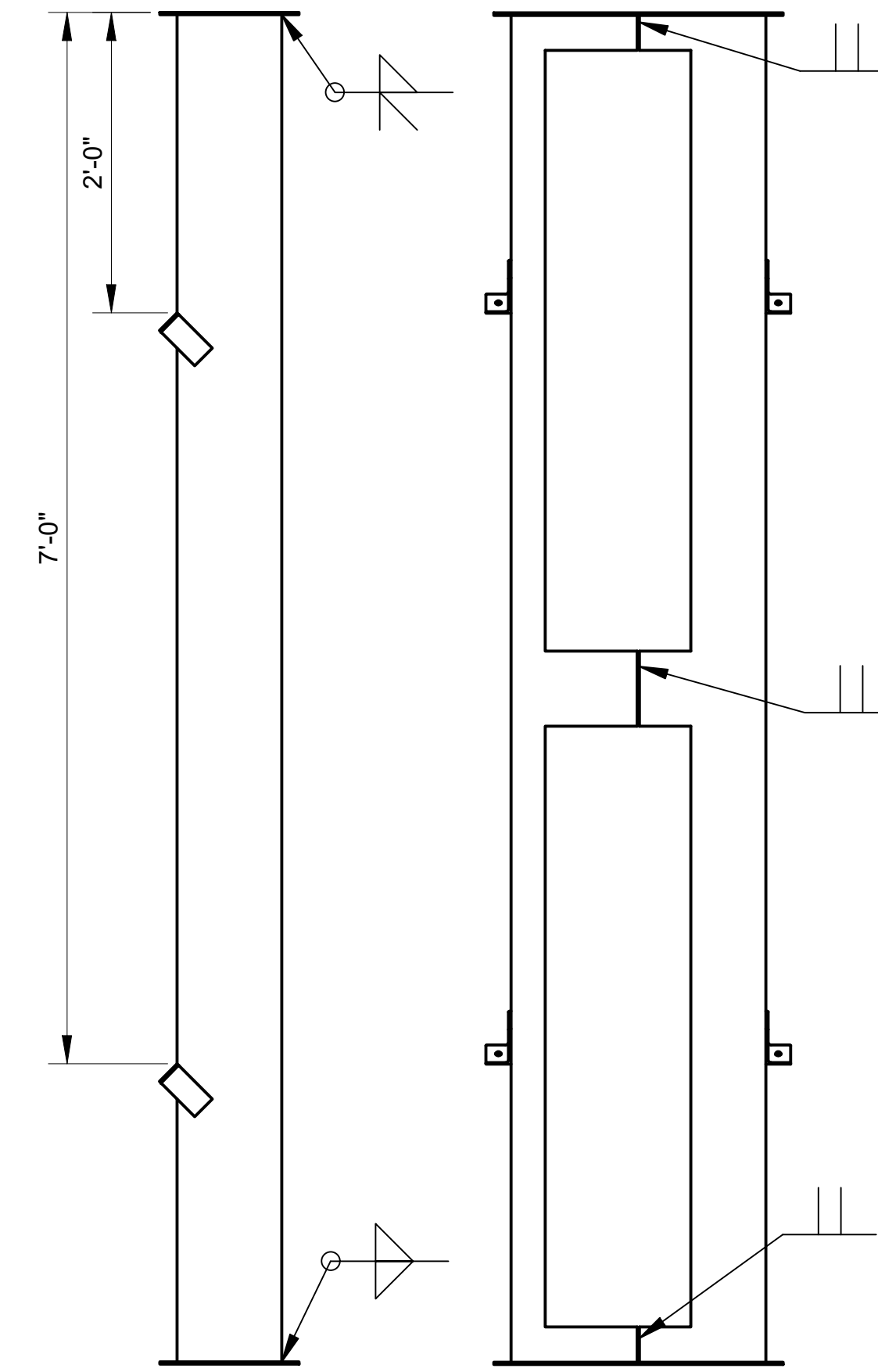
BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TRAVERSING FLUME DETAILS 3



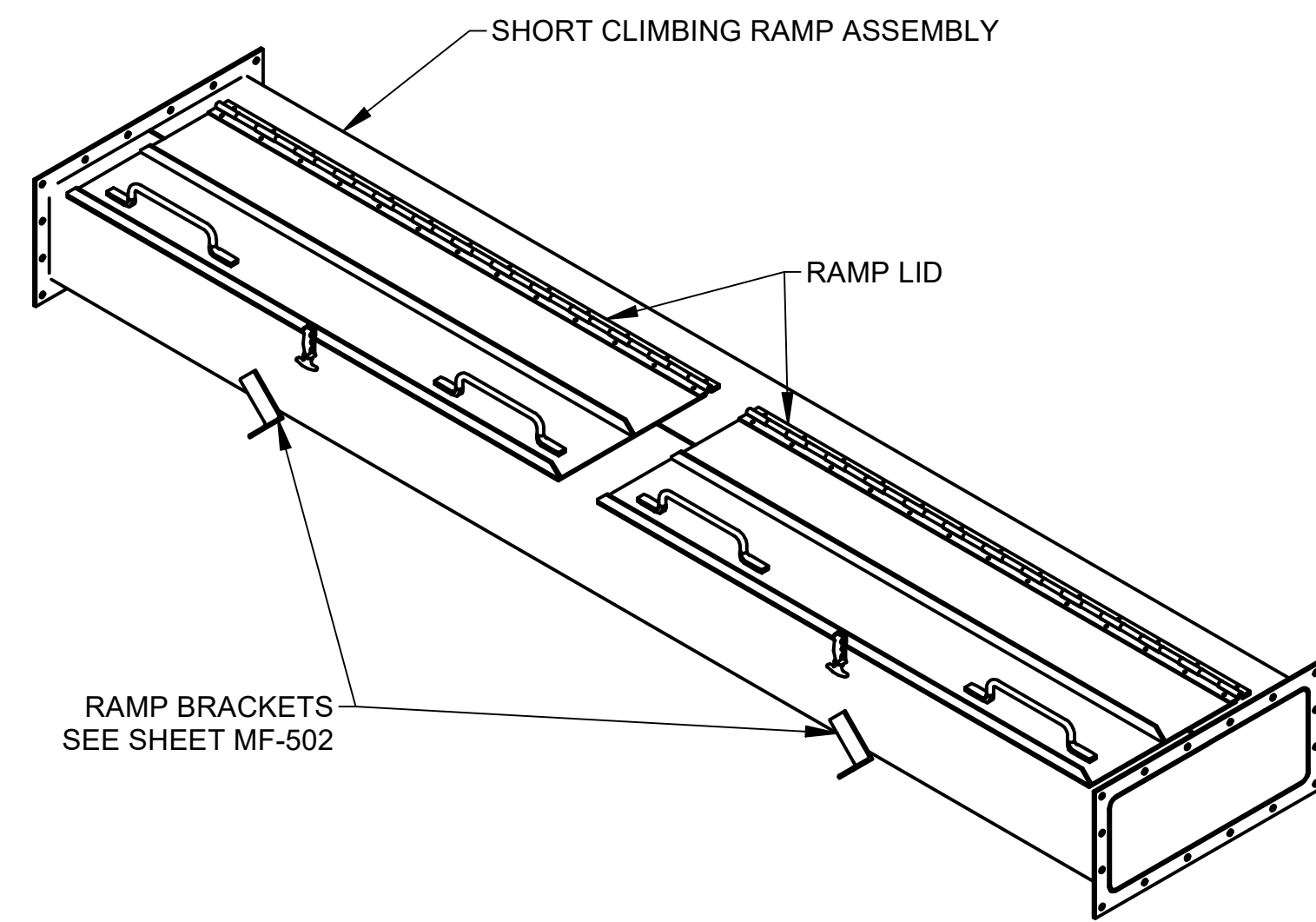
SHORT CLIMBING RAMP ASSEMBLY
SCALE: NTS



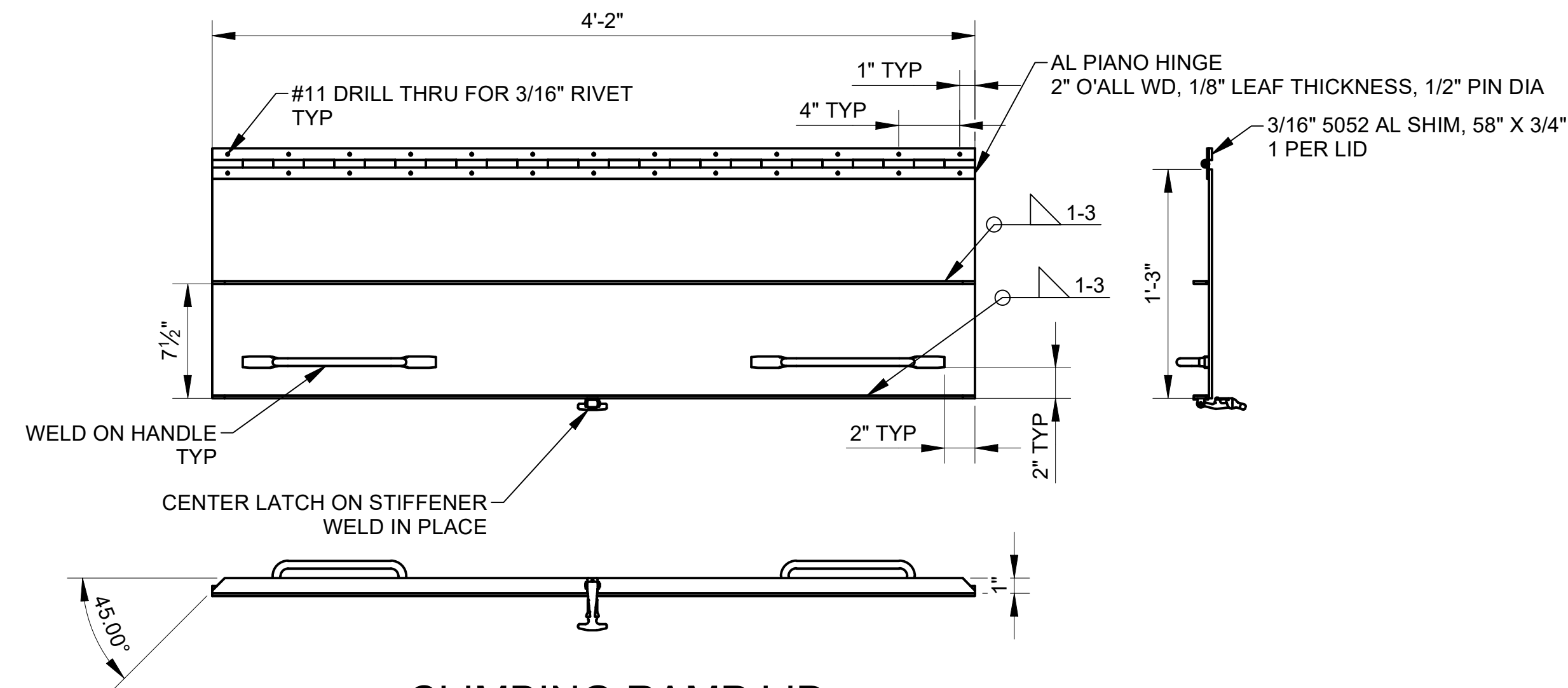
SHORT CLIMBING RAMP PATTERN
SCALE: 1" = 1'-0"
MATERIAL:
PER:
NO. REQD: 1 PER ASSEMBLY



SHORT CLIMBING RAMP WELD DETAILS
SCALE: 1" = 1'-0"

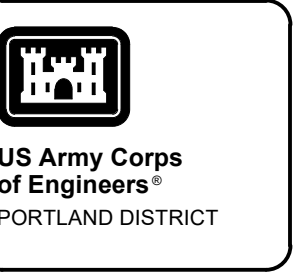


COVERED SHORT CLIMBING RAMP ASSEMBLY
SCALE: NTS



CLIMBING RAMP LID
SCALE: 1-1/2" = 1'-0"
MATERIAL:
PER:
NO. REQD: 2 PER ASSEMBLY

- NOTES**
1. WELD FLANGES FLUSH WITH ENDS.
 2. PROVIDE 3/8" x 1" FASTENERS.
20 REQUIRED PER RAMP ASSEMBLY.

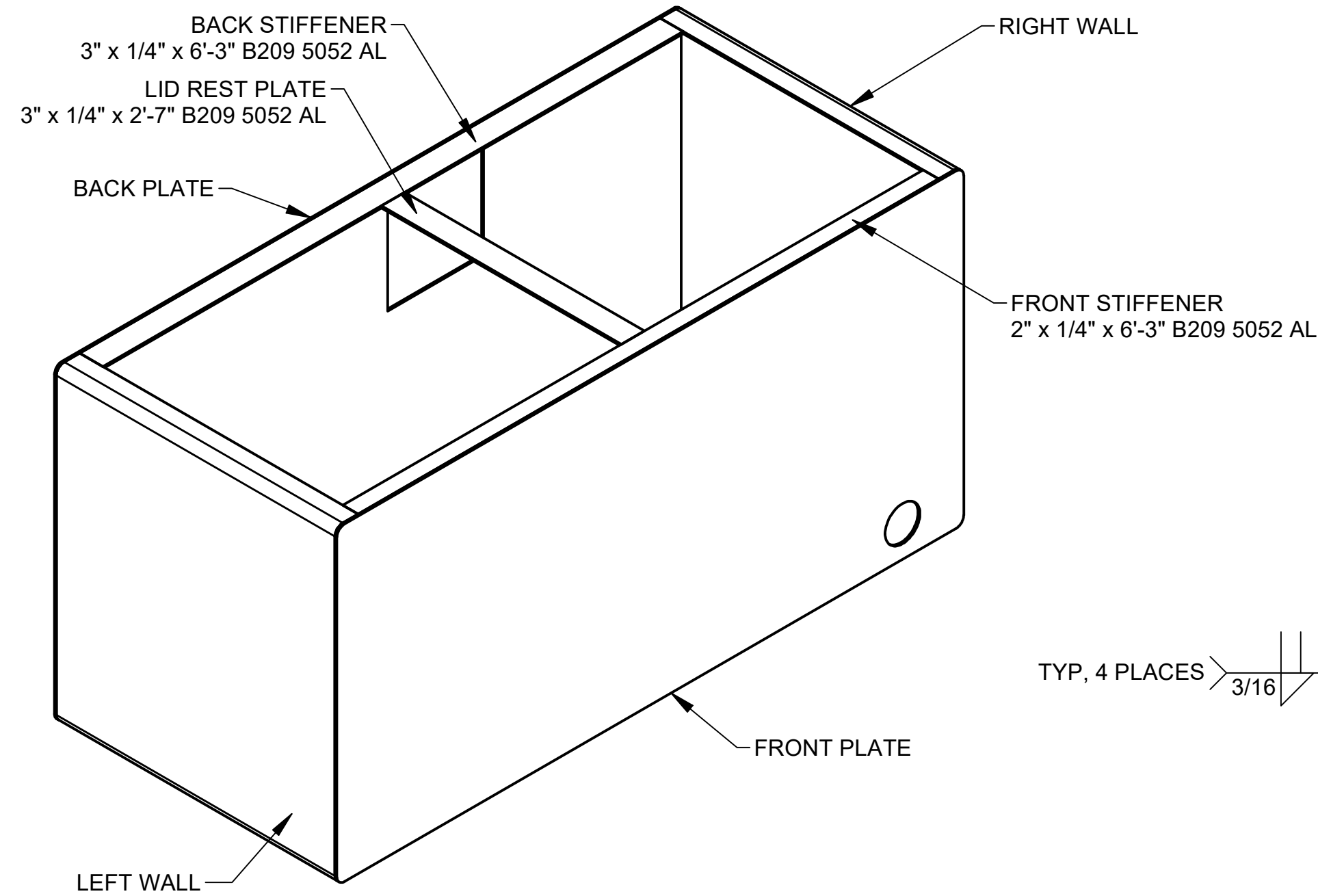


DATE	10/25/2021	SOLICITATION NO.		APPR.
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP	DATE
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON		
CONTRACT NO.		FILE NAME		
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP	
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON		
CONTRACT NO.		FILE NAME		
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP	
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON		
CONTRACT NO.		FILE NAME		
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP	
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON		
CONTRACT NO.		FILE NAME		

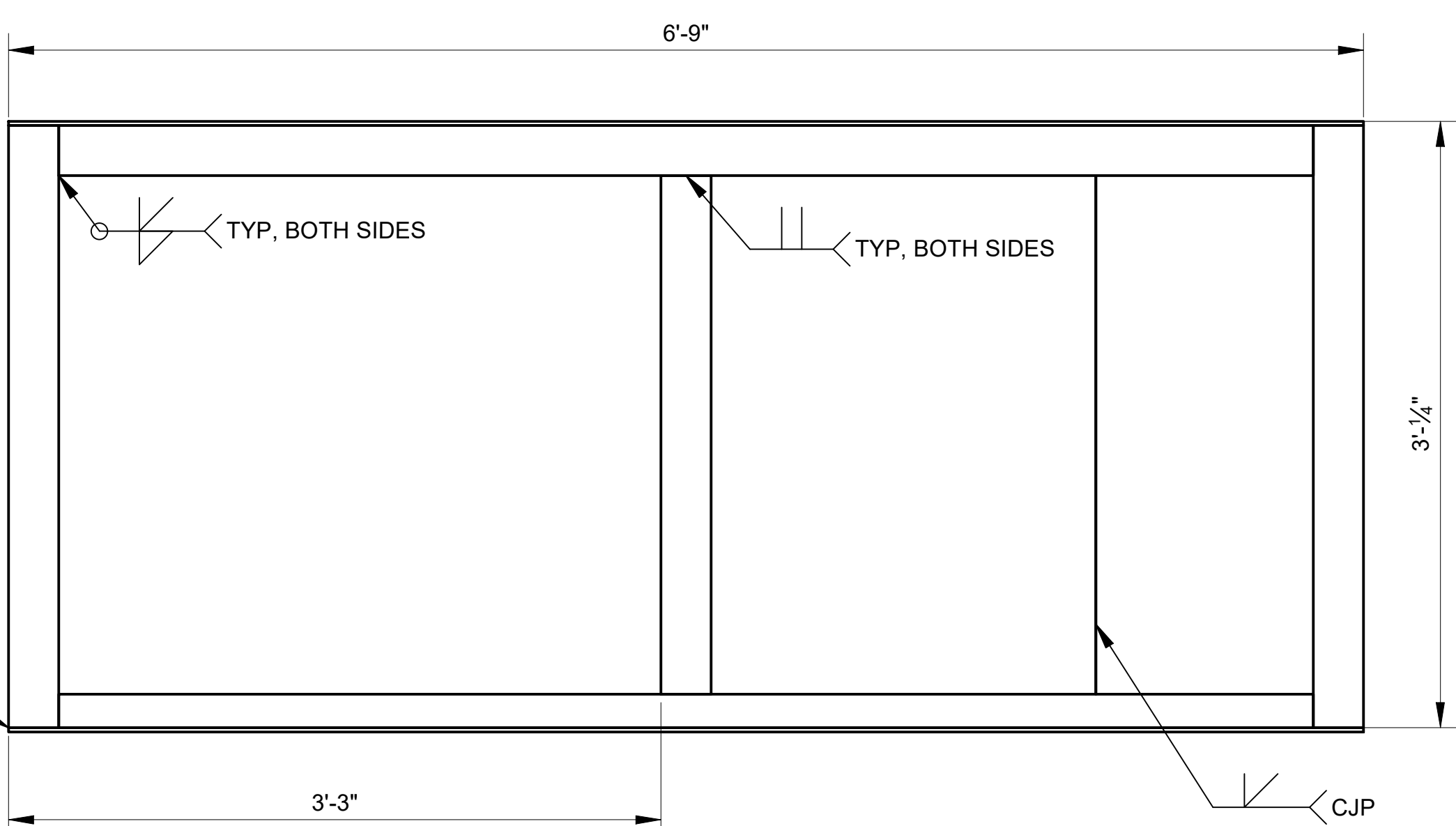
DATE	10/25/2021	SOLICITATION NO.	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	
CONTRACT NO.		FILE NAME	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	
CONTRACT NO.		FILE NAME	
DESIGNED BY	DANIEL PERIN	CHKD BY	CEC/BDP
U.S. ARMY CORPS OF ENGINEERS	PORTLAND DISTRICT	PORTLAND, OREGON	
CONTRACT NO.		FILE NAME	

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
SHORT CLIMBING RAMP DETAILS

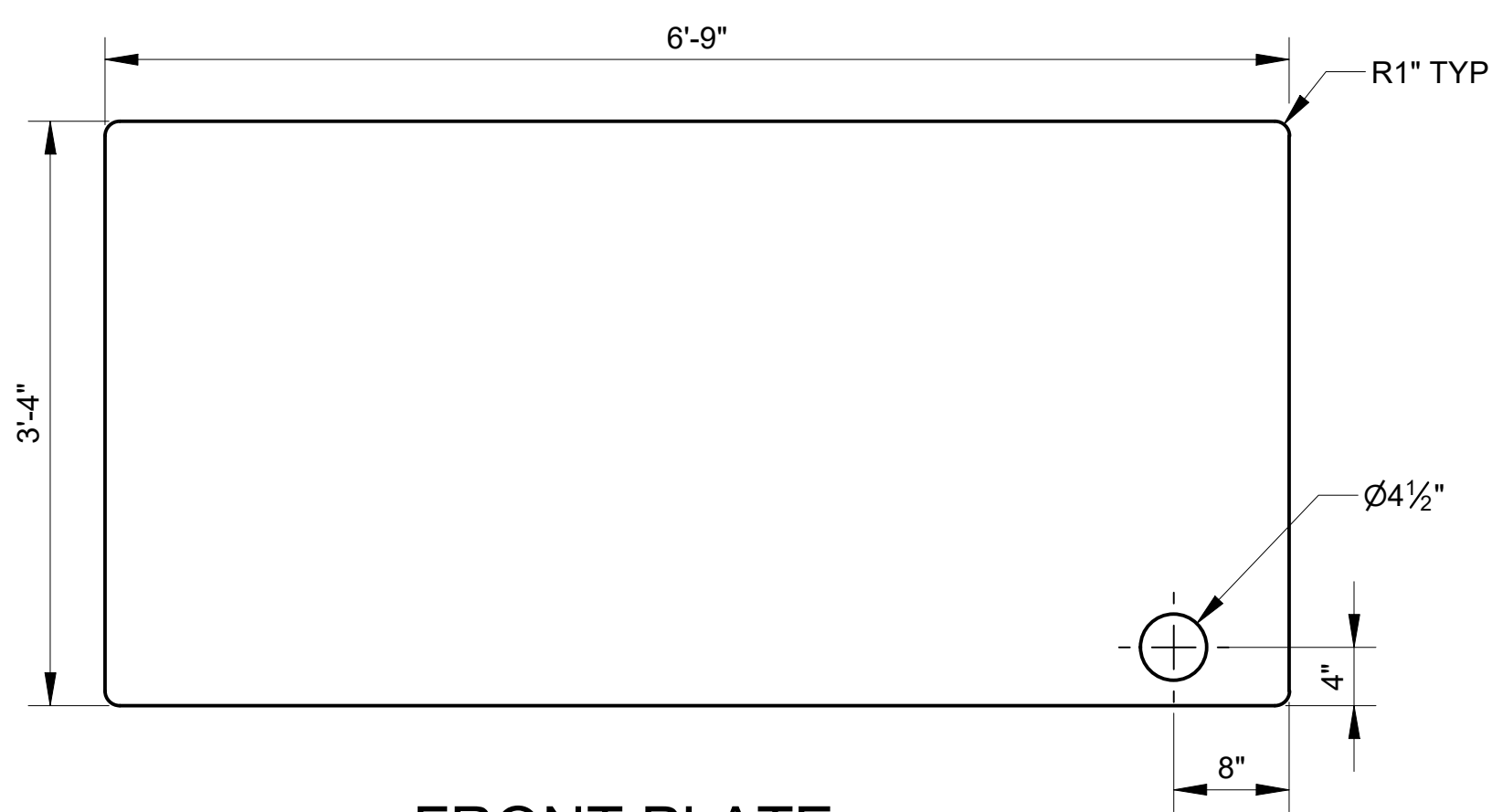
SHEET IDENTIFICATION
MF-509



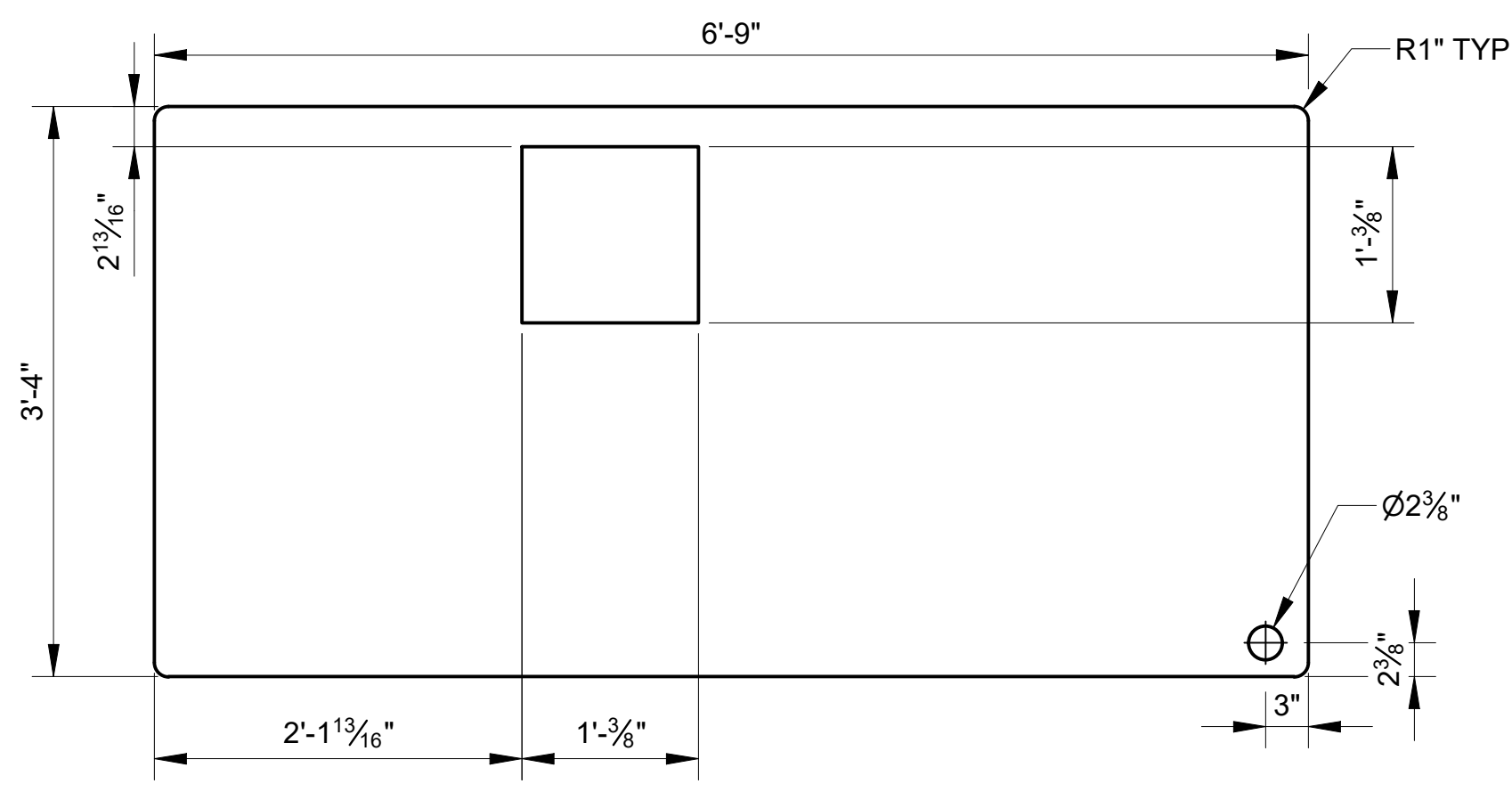
TRAP BOX ISOMETRIC VIEW
SCALE: NTS



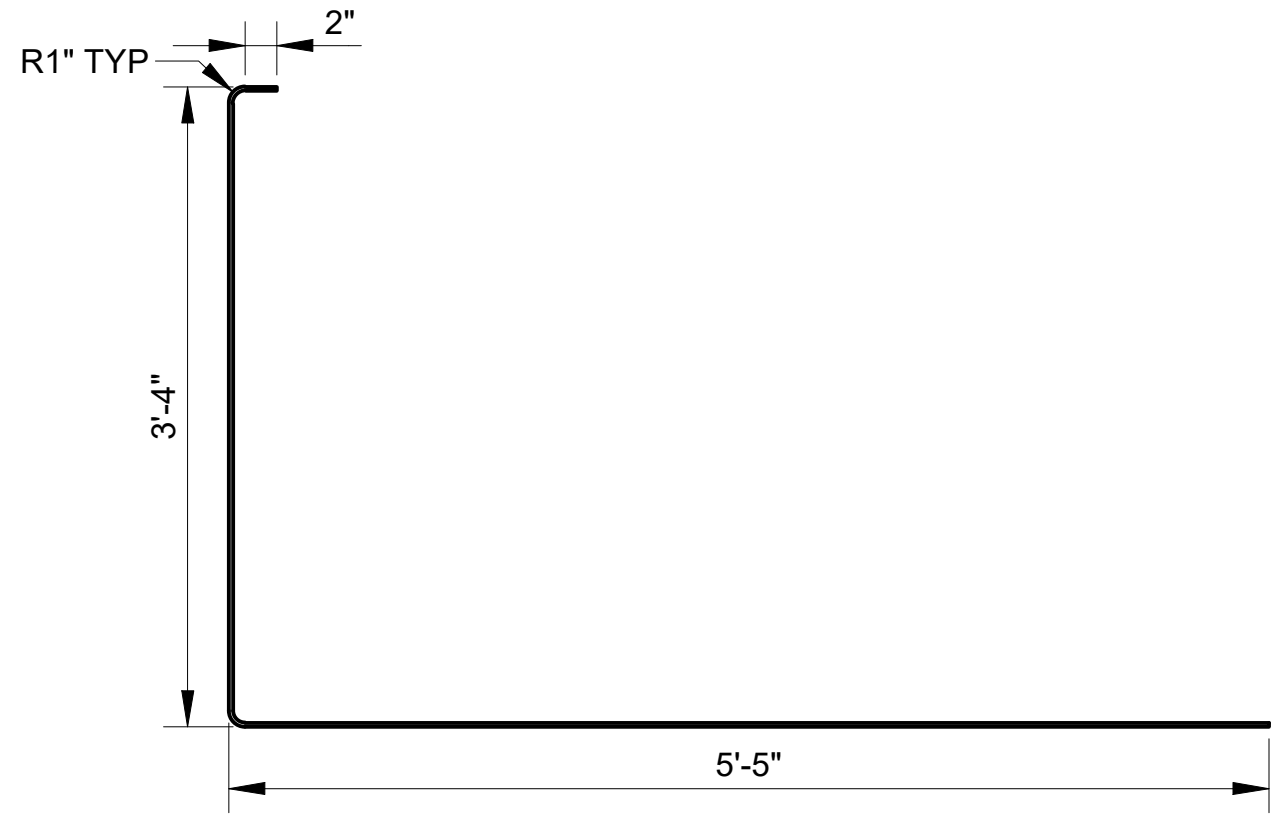
TRAP BOX PLAN VIEW
SCALE: 1-1/2" = 1'-0"



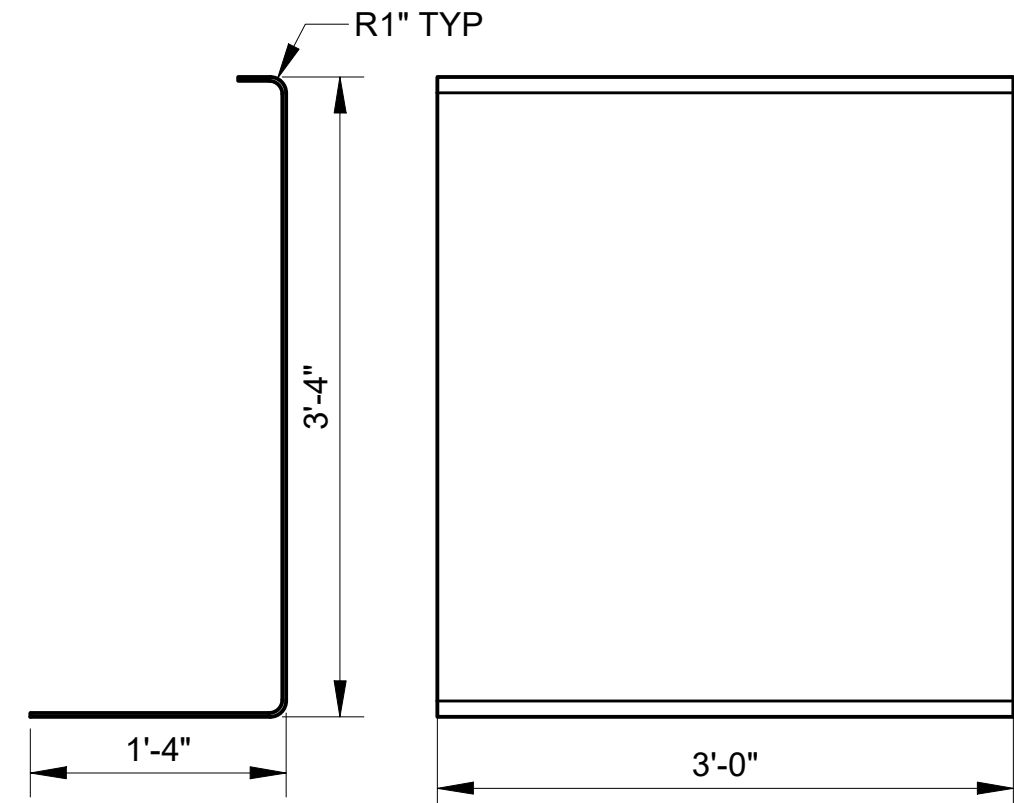
FRONT PLATE
SCALE: 1" = 1'-0"
MATERIAL: 1/4" ALUMINUM SHEET
PER: 5052-H34
NO. REQD: 1 PER ASSEMBLY



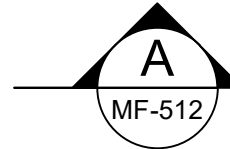
BACK PLATE
SCALE: 1" = 1'-0"
MATERIAL: 1/4" ALUMINUM SHEET
PER: 5052-H34
NO. REQD: 1 PER ASSEMBLY



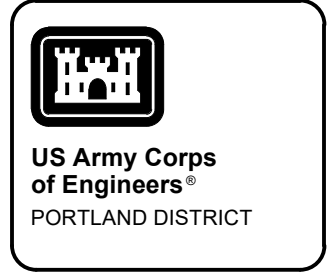
LEFT WALL
SCALE: 1" = 1'-0"
MATERIAL: 1/4" ALUMINUM SHEET
PER: 5052-H34
NO. REQD: 1 PER ASSEMBLY



RIGHT WALL
SCALE: 1" = 1'-0"
MATERIAL: 1/4" ALUMINUM SHEET
PER: 5052-H34
NO. REQD: 1 PER ASSEMBLY



NOTES
1. COMPONENTS ON THIS SHEET MAY BE FABRICATED BY ALTERNATE MEANS PER NOTE 10 ON SHEET M-001 AND SUBJECT TO APPROVAL BY THE CONTRACTING OFFICER.

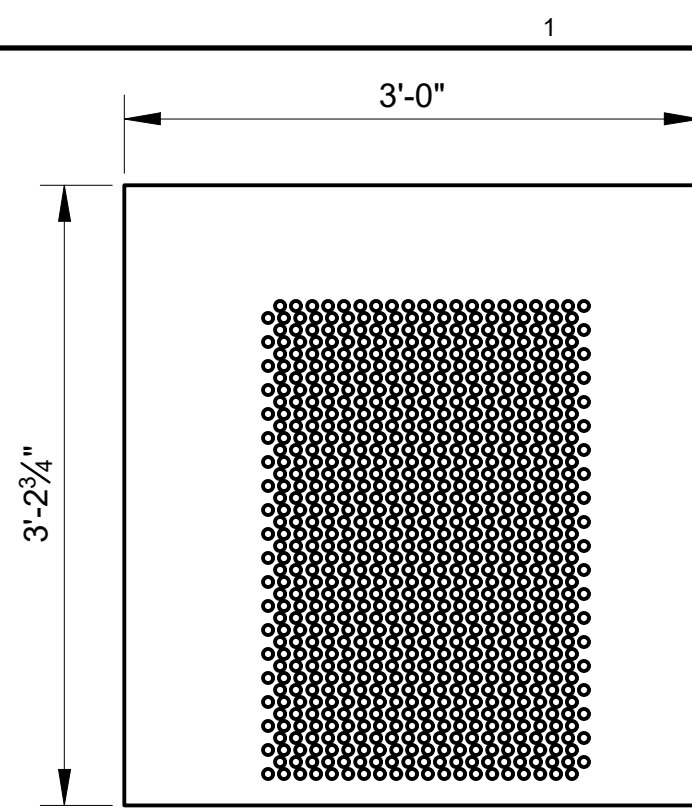


DATE	DESCRIPTION	APPR.
10/25/2021	90% REVIEW	

DESIGNED BY: DANIEL PERIN CCE/BDP	CHKD BY: CCE/BDP	DATE: 10/25/2021	SOLICITATION NO.:	CONTRACT NO.:
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON	SUBMITTED BY:	PLOT SCALE: 1:1	FILE NAME:	

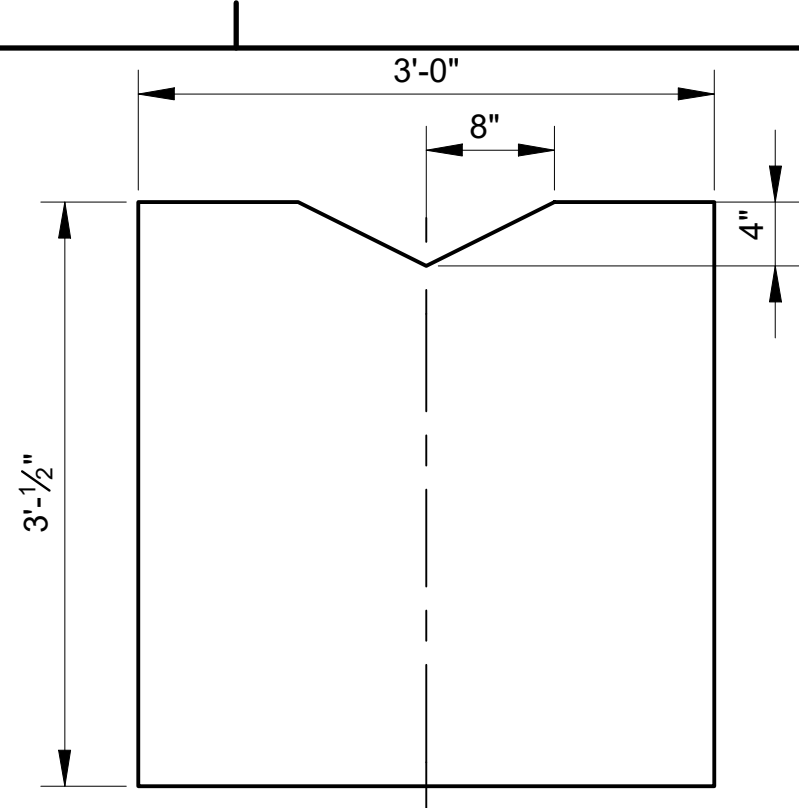
BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TRAP BOX DETAILS

SHEET IDENTIFICATION
MF-510



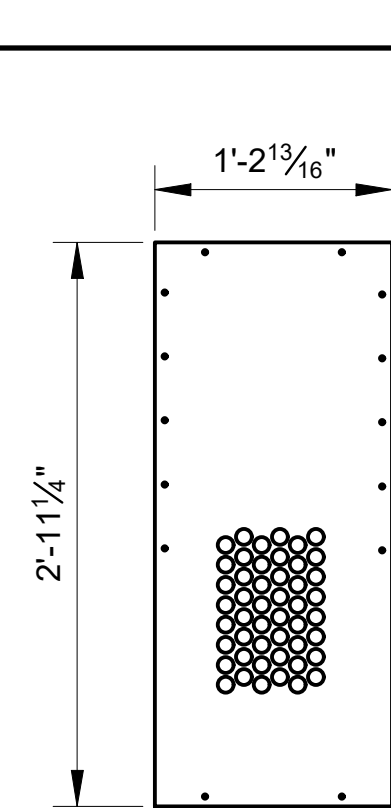
LAMPREY SCREEN

SCALE: 1" = 1'-0"
 MATERIAL: 1/4" ALUMINUM SHEET
 PER: 5052-H34
 NO. REQD: 1 PER ASSEMBLY
 PARTIAL PATTERN SHOWN. SEE NOTE 3



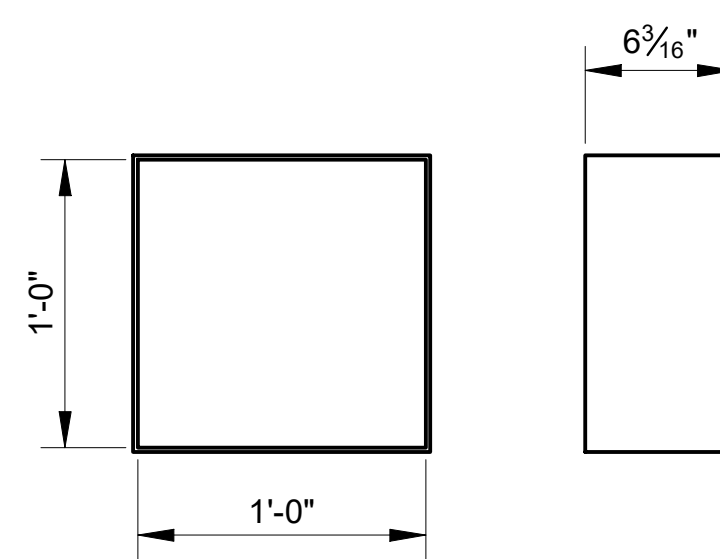
V-NOTCH WEIR PLATE

SCALE: 1" = 1'-0"
 MATERIAL: 1/4" ALUMINUM SHEET
 PER: 5052-H34
 NO. REQD: 1 PER ASSEMBLY



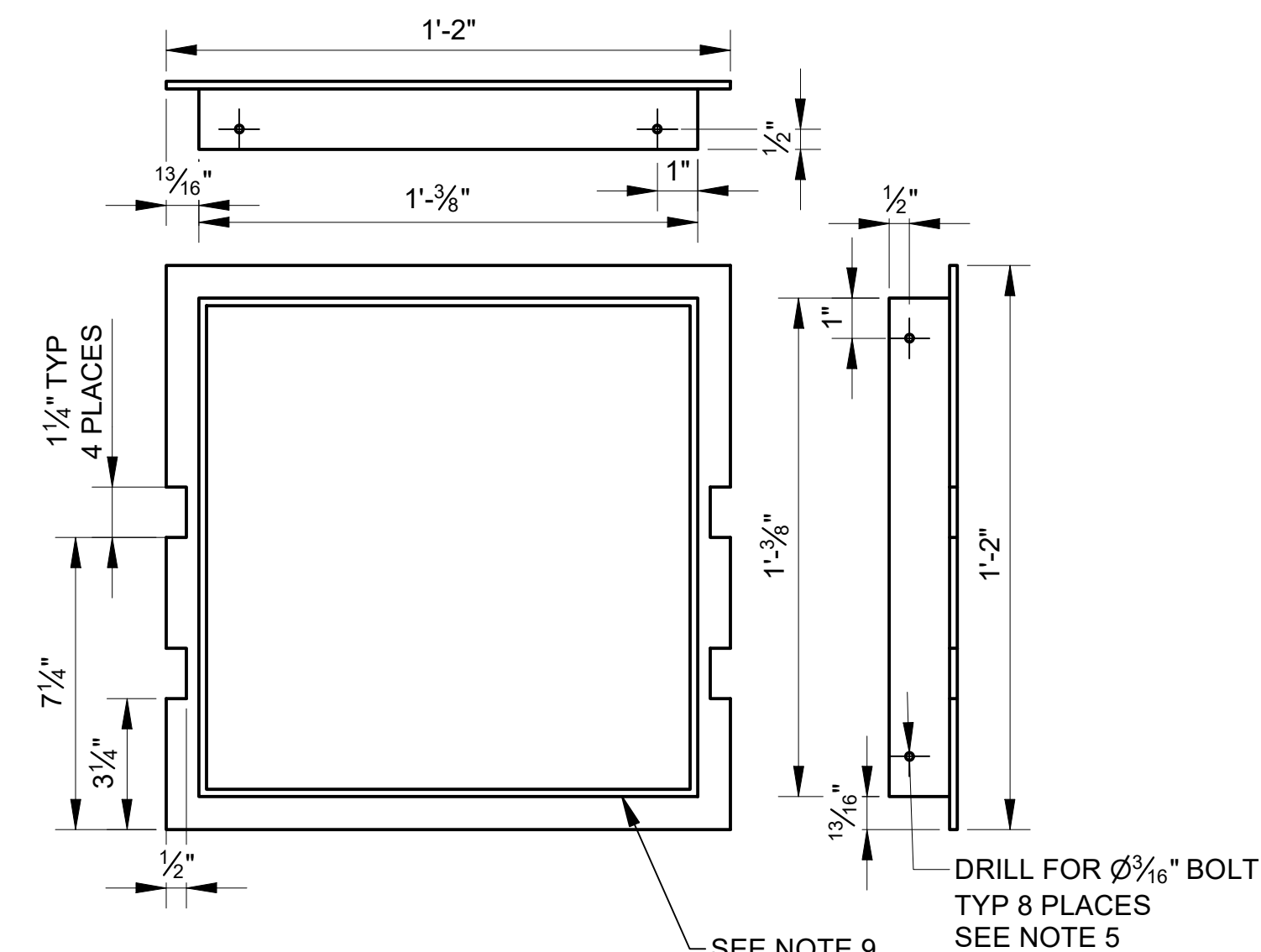
WATER INTAKE SCREEN

SCALE: 1" = 1'-0"
 MATERIAL:
 PER:
 NO. REQD: 1 PER ASSEMBLY
 PARTIAL PATTERN SHOWN. SEE NOTE 4



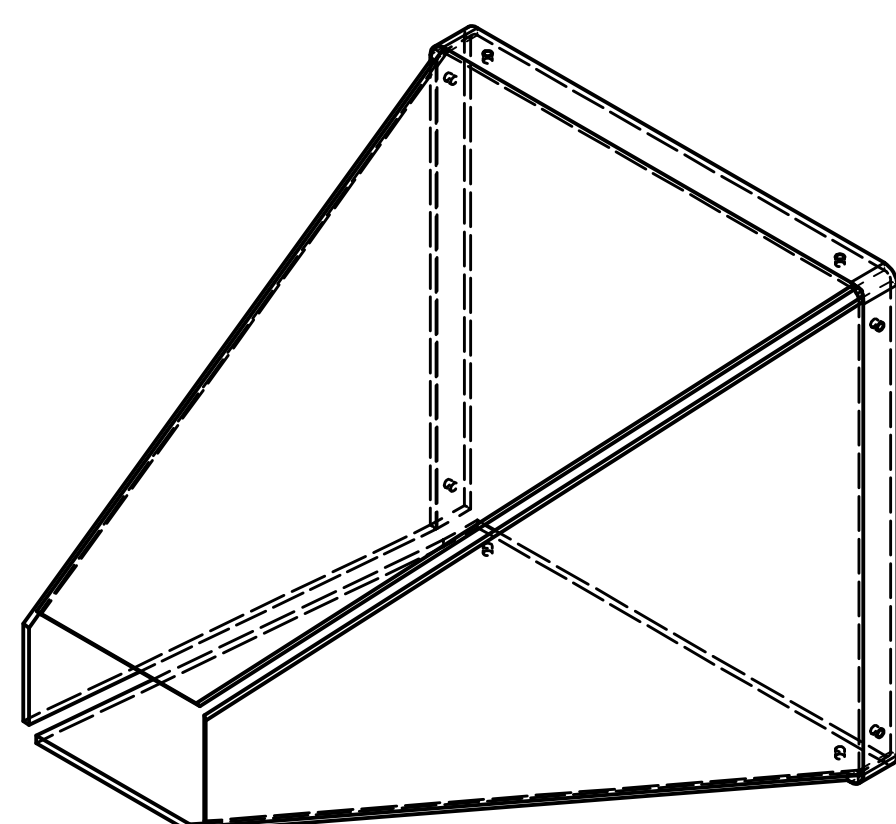
LAMPREY FLUME CONNECTOR

SCALE: 3" = 1'-0"
 MATERIAL:
 PER:
 NO. REQD: 1 PER ASSEMBLY



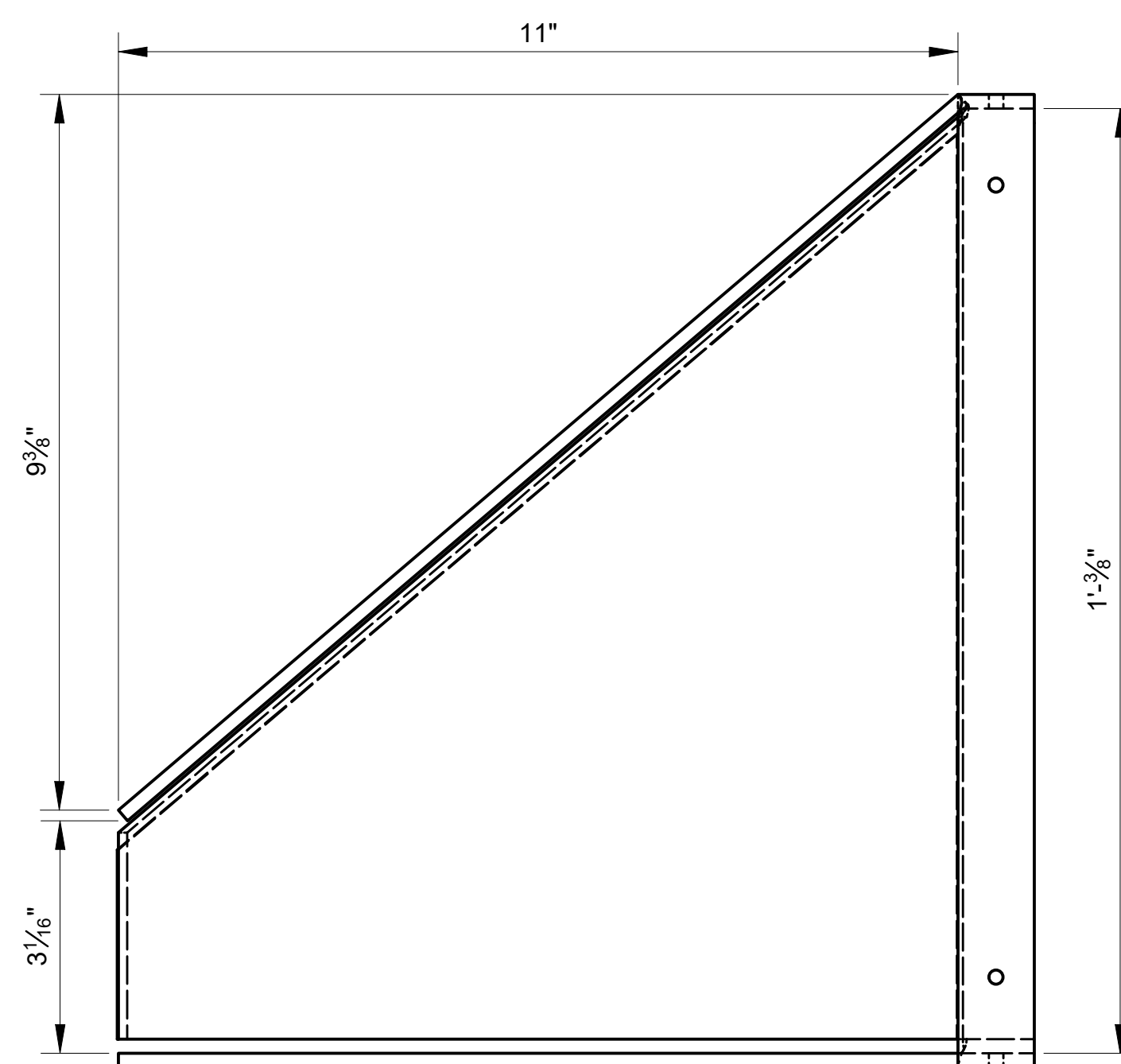
FYKE FRAME

SCALE: 3" = 1'-0"
 MATERIAL: 3/16" ALUMINUM SHEET
 PER: 5052-H34
 NO. REQD: 1 PER ASSEMBLY



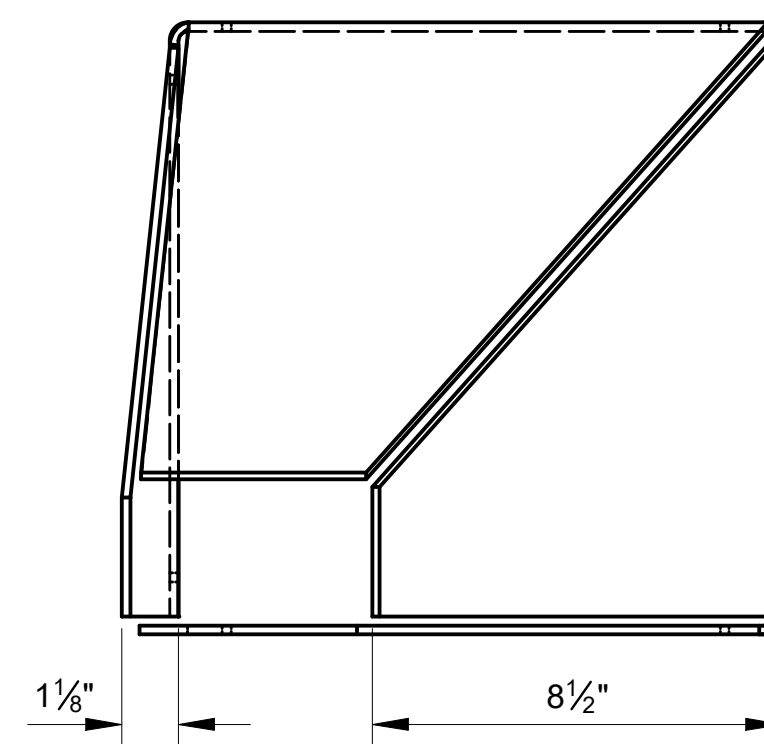
FYKE ISOMETRIC VIEW

SCALE: NTS



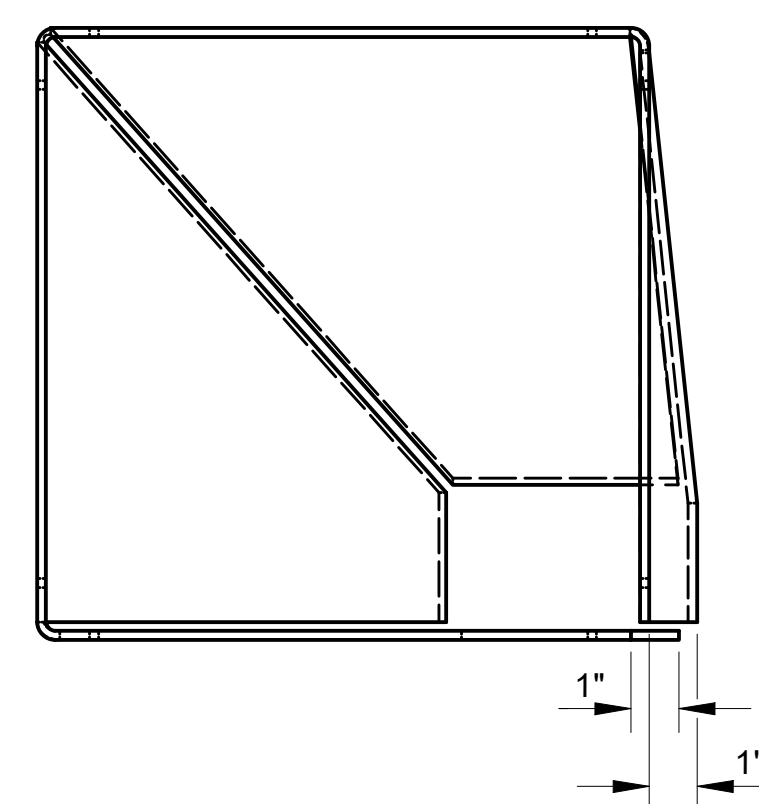
FYKE LEFT FACING ELEVATION VIEW

SCALE: 6" = 1'-0"



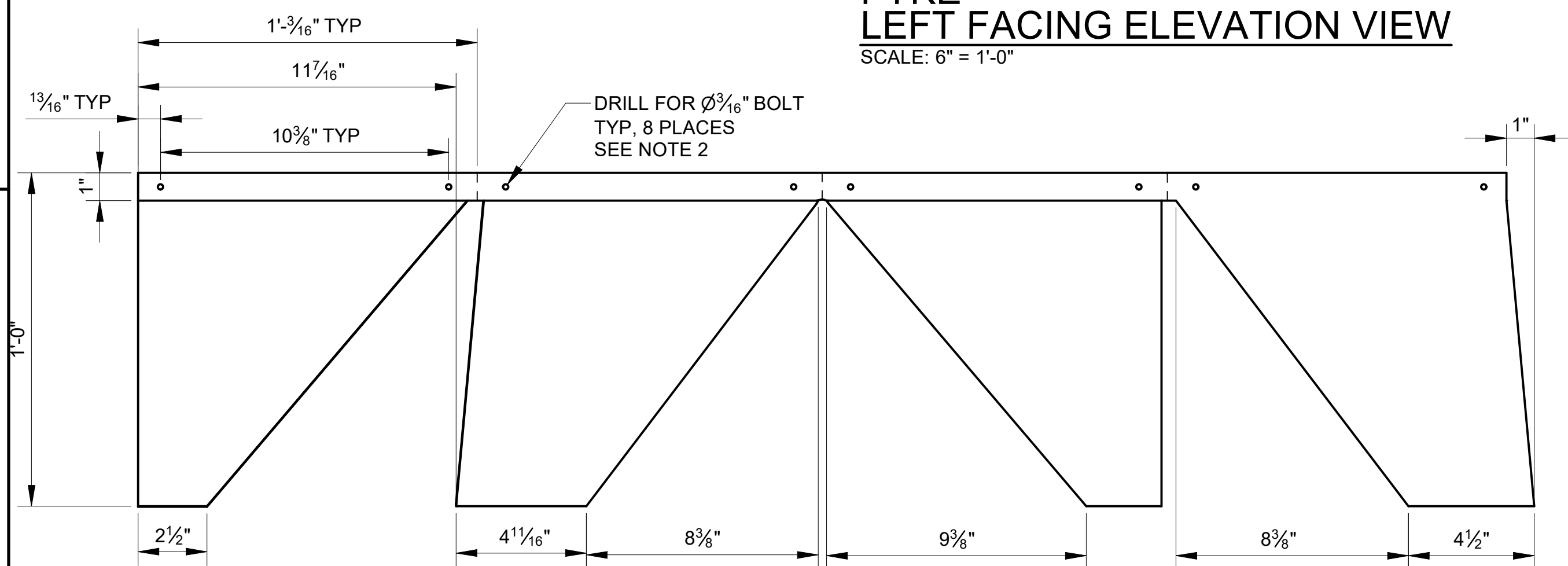
FYKE FRONT FACING ELEVATION VIEW

SCALE: 3" = 1'-0"



FYKE REAR FACING ELEVATION VIEW

SCALE: 3" = 1'-0"



FYKE PATTERN

SCALE: 1-1/2" = 1'-0"
 MATERIAL: 3/16" ALUMINUM SHEET
 PER: 5052-H34
 NO. REQD: 1 PER ASSEMBLY
 SEE NOTES 6, 7, 8

NOTES

- COMPONENTS ON THIS SHEET MAY BE FABRICATED BY ALTERNATE MEANS PER NOTE 10 ON SHEET M-001, SUBJECT TO APPROVAL BY THE CONTRACTING OFFICER.
- PROVIDE 3/16" x 3/4" BUTTON HEAD FASTENERS. 8 REQUIRED.
- 3/16" DIA HOLES ON 1/4" CENTERS STAGGERED WITH 51% OPEN AREA. MAINTAIN 1" CLEARANCE BETWEEN HOLES AND PLATE EDGE.
- 3/4" DIA HOLES ON 1" CENTERS STAGGERED WITH 51% OPEN AREA. MAINTAIN 1" CLEARANCE BETWEEN HOLES AND PLATE EDGE.
- MATCH MARK HOLES WITH FYKE PRIOR TO DRILLING.
- 1/4" DIA HOLES ON 5/16" CENTERS WITH 58% OPEN AREA. MAINTAIN 1/2" CLEARANCE BETWEEN HOLES AND EDGES.
- FYKE MAY BE COLD FORMED OR MACHINED FROM PLATES AND WELDED.
- BREAK OR ROUND ALL EDGES.
- APPLY SLIP FIT BETWEEN FYKE AND FYKE FRAME



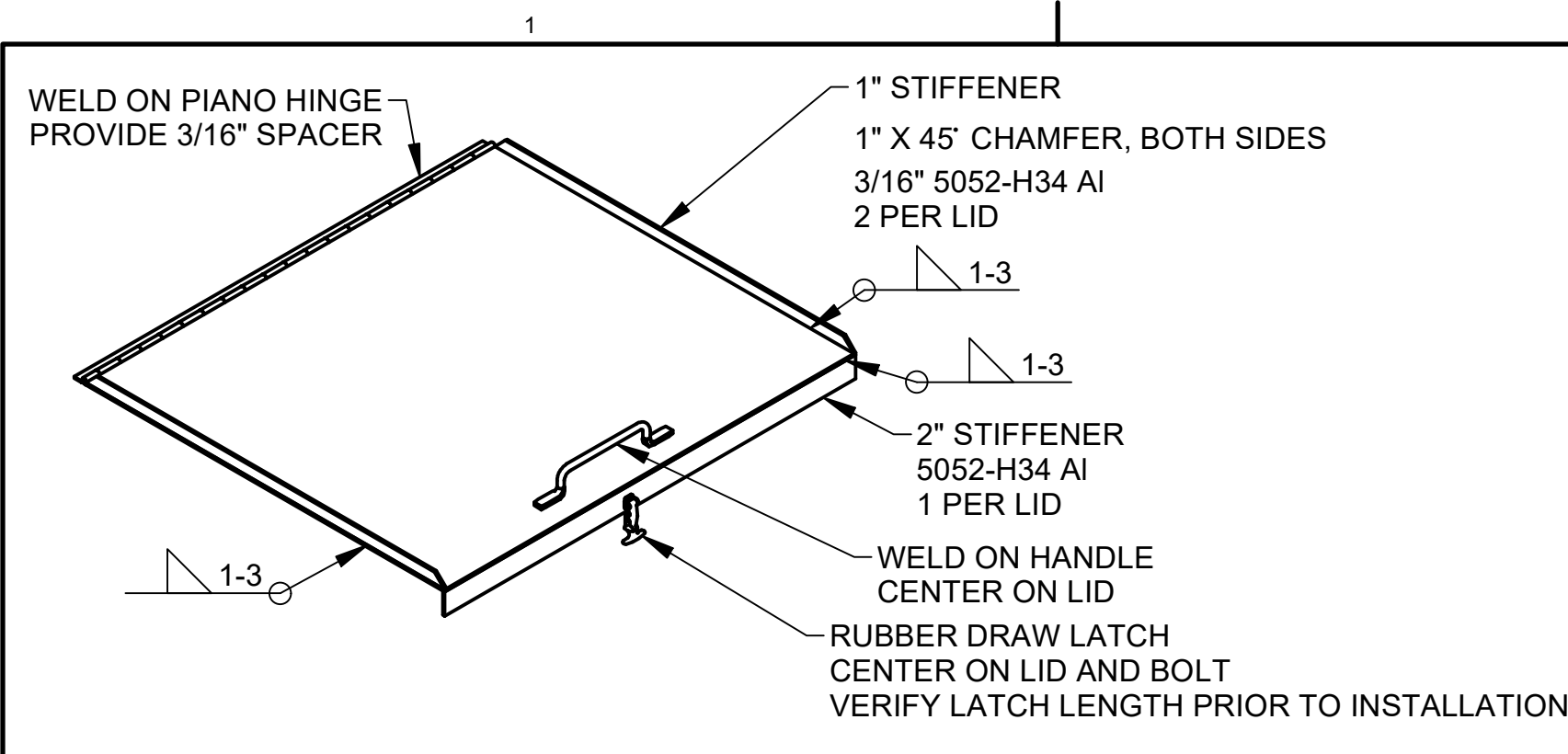
US Army Corps of Engineers
 PORTLAND DISTRICT

DATE	10/25/2021	SOLICITATION NO.	
DESIGNED BY	DANIEL PERIN	CONTRACT NO.	
CHKD BY	CEC/BDP		
SUBMITTED BY		PLOT DATE:	10/25/2021
		SIZE:	1:1
		ANSI D	
U.S. ARMY CORPS OF ENGINEERS PORTLAND DISTRICT PORTLAND, OREGON		MARK	

BONNEVILLE LOCK AND DAM BRADFORD ISLAND FISH LADDER FY2019 FISH ACCORDS LAMPREY PASSAGE	
TRAP BOX DETAILS 2	

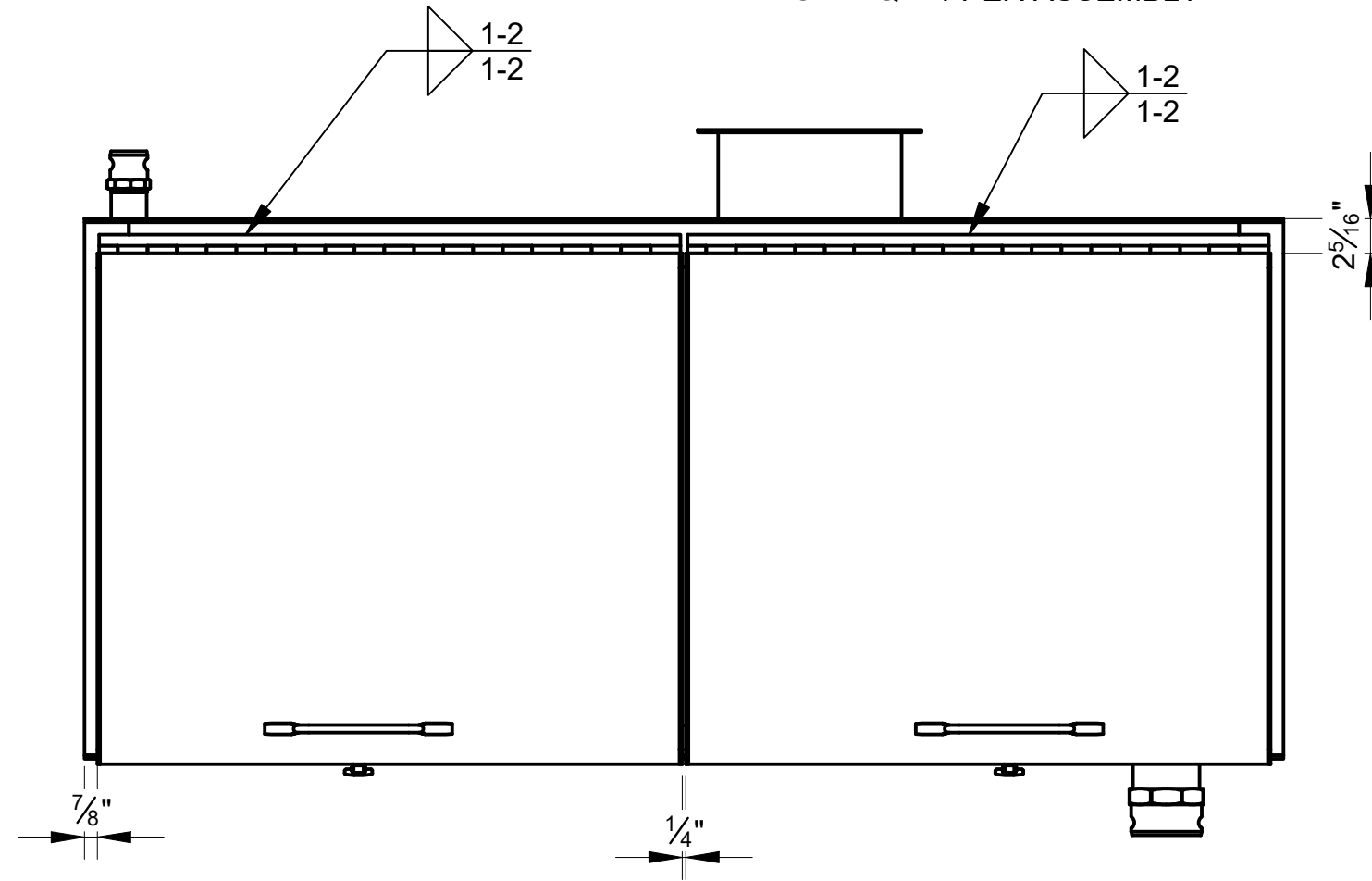
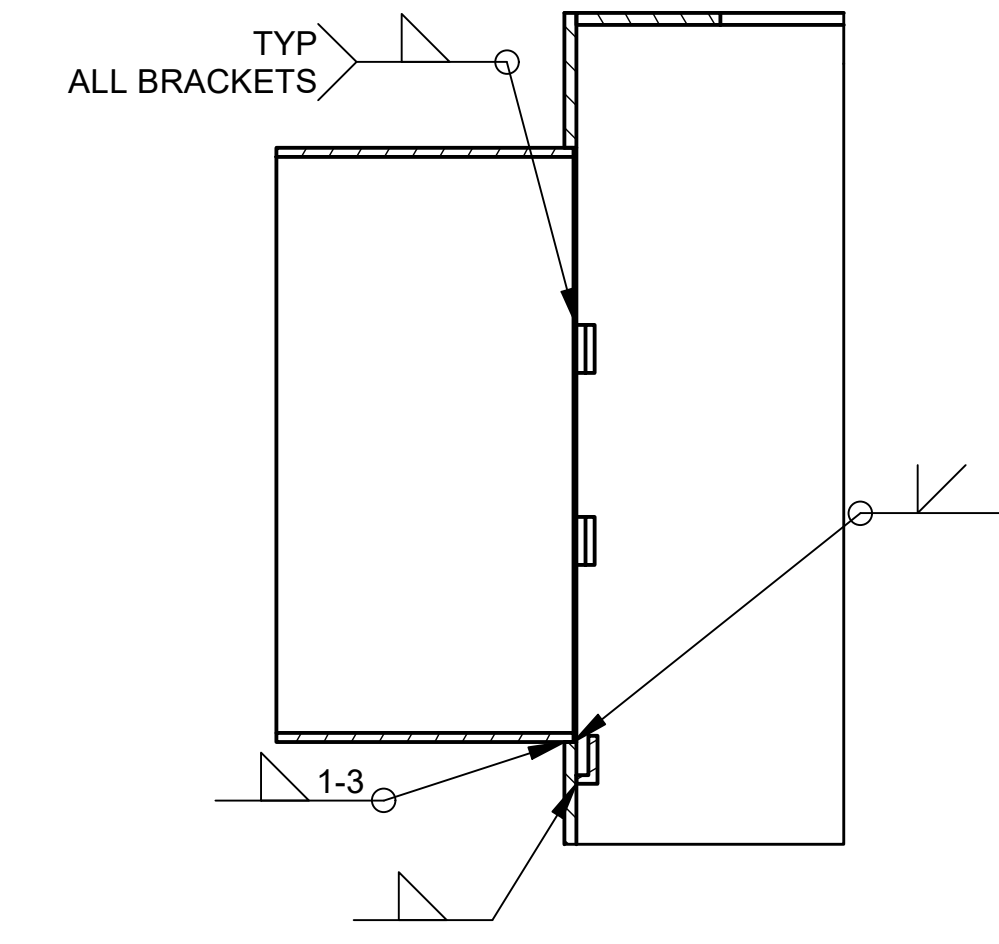
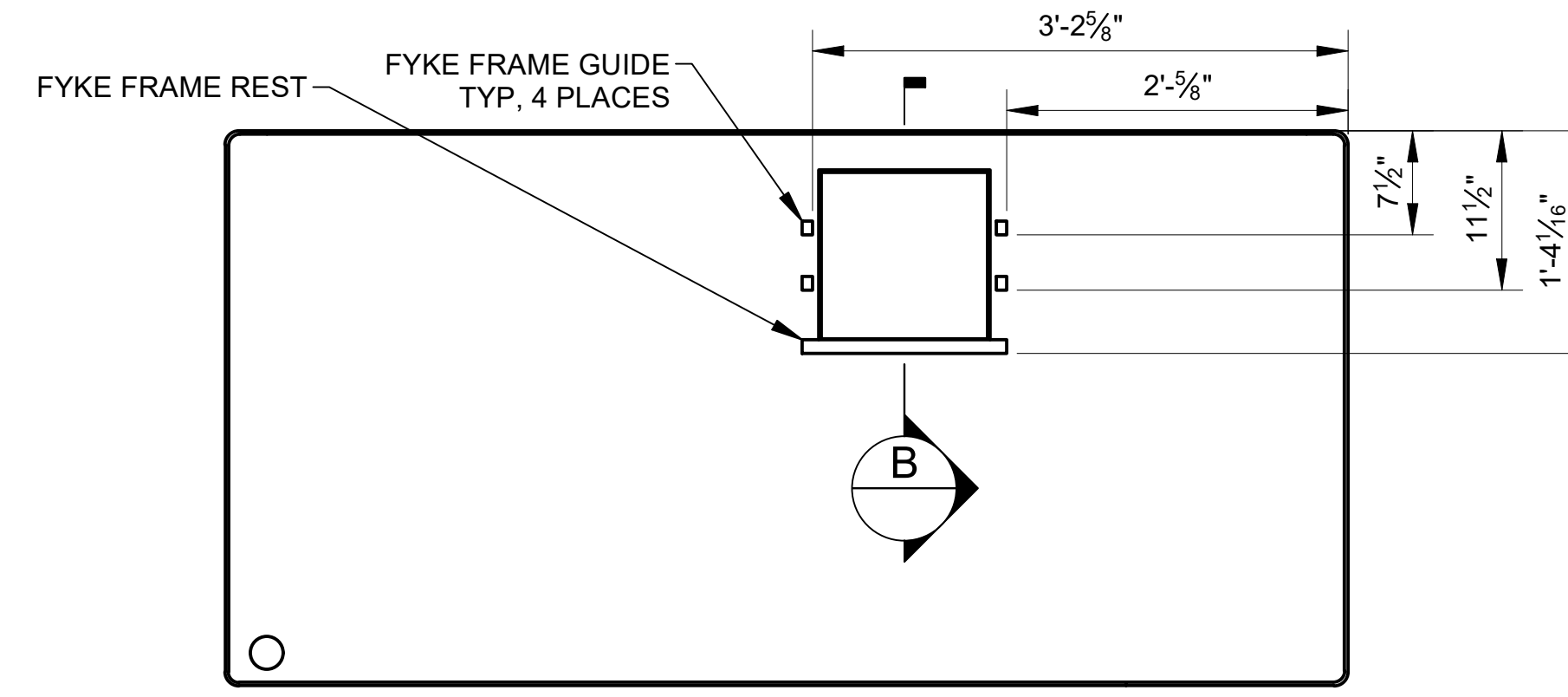
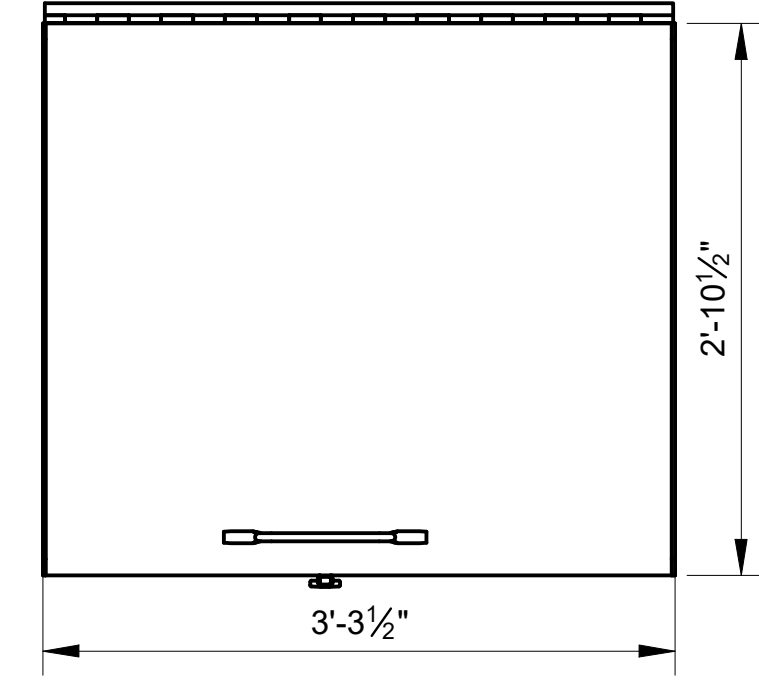
SHEET IDENTIFICATION	MF-511
----------------------	--------

90% REVIEW



LID ASSEMBLY

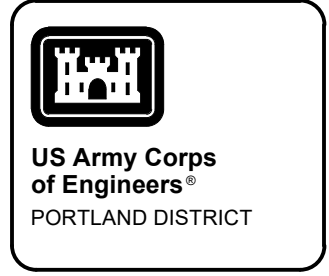
SCALE: 1" = 1'-0"
MATERIAL: 1/4" ALUMINUM SHEET
PER: 5052-H34
NO. REQD: 1 PER ASSEMBLY



**TRAP BOX ASSEMBLY
LID ASSEMBLY POSITIONING**

SCALE: 1" = 1'-0"

**RESERVED FOR ADJUSTABLE
SENSOR BRACKET DETAILS AS OF 90%**



DATE	APPR.	DESCRIPTION
		90% REVIEW

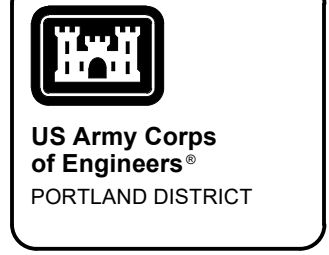
DESIGNED BY: DANIEL FEIN GCE/BDP9	DATE: 10/29/2021	CHKD BY: GCE/BDP9	SOLICITATION NO.:
SUBMITTED BY:	PLOT DATE: 10/29/2021	CONTRACT NO.:	
PLOT SCALE: 1:1	FILE NAME:		

**BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE**

TRAP BOX DETAILS 3

SHEET
IDENTIFICATION
MF-512

RESERVED AS OF 90%



MARK	DESCRIPTION	DATE	APPR.
	90% REVIEW		

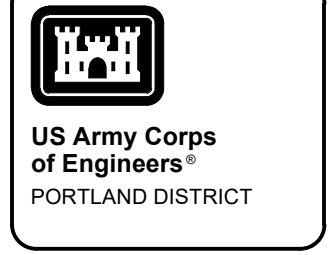
DESIGNED BY: DANIEL PERIN	DATE: 10/25/2021
DWN BY:	SOLICITATION NO:
CKO BY:	CONTRACT NO:
SUBMITTED BY:	
PLOT SCALE: 1:1	PLOT DATE: 10/25/2021
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
PORTLAND, OREGON

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TRASH RACK HOIST ASSEMBLY

SHEET
IDENTIFICATION
MT-101

RESERVED AS OF 90%



MARK	DESCRIPTION	DATE	APPR.
	90% REVIEW		

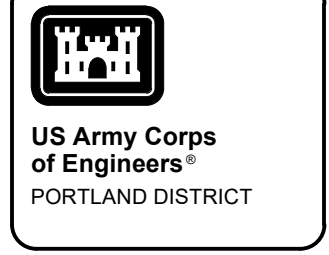
DESIGNED BY: DANIEL PERIN	DATE: 10/25/2021
DWN BY:	SOLICITATION NO:
CHK BY:	CONTRACT NO:
SUBMITTED BY:	
PLOT SCALE: 1:1	PLOT DATE: 10/25/2021
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
PORTLAND, OREGON

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TRASH RACK HOIST DETAILS

SHEET
IDENTIFICATION
MT-501

RESERVED AS OF 90%



US Army Corps
of Engineers®
PORTLAND DISTRICT

MARK	DESCRIPTION	DATE	APPR.
	90% REVIEW		

DESIGNED BY: DANIEL PERIN	DATE: 10/25/2021
DWN BY:	SOLICITATION NO:
CKO BY:	CONTRACT NO:
SUBMITTED BY:	
PLOT SCALE: 1:1	PLOT DATE: 10/25/2021
SIZE: ANSI D	FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
PORTLAND, OREGON

BONNEVILLE LOCK AND DAM
BRADFORD ISLAND FISH LADDER
FY2019 FISH ACCORDS
LAMPREY PASSAGE
TRASH RACK HOIST DETAILS 2

SHEET
IDENTIFICATION
MT502