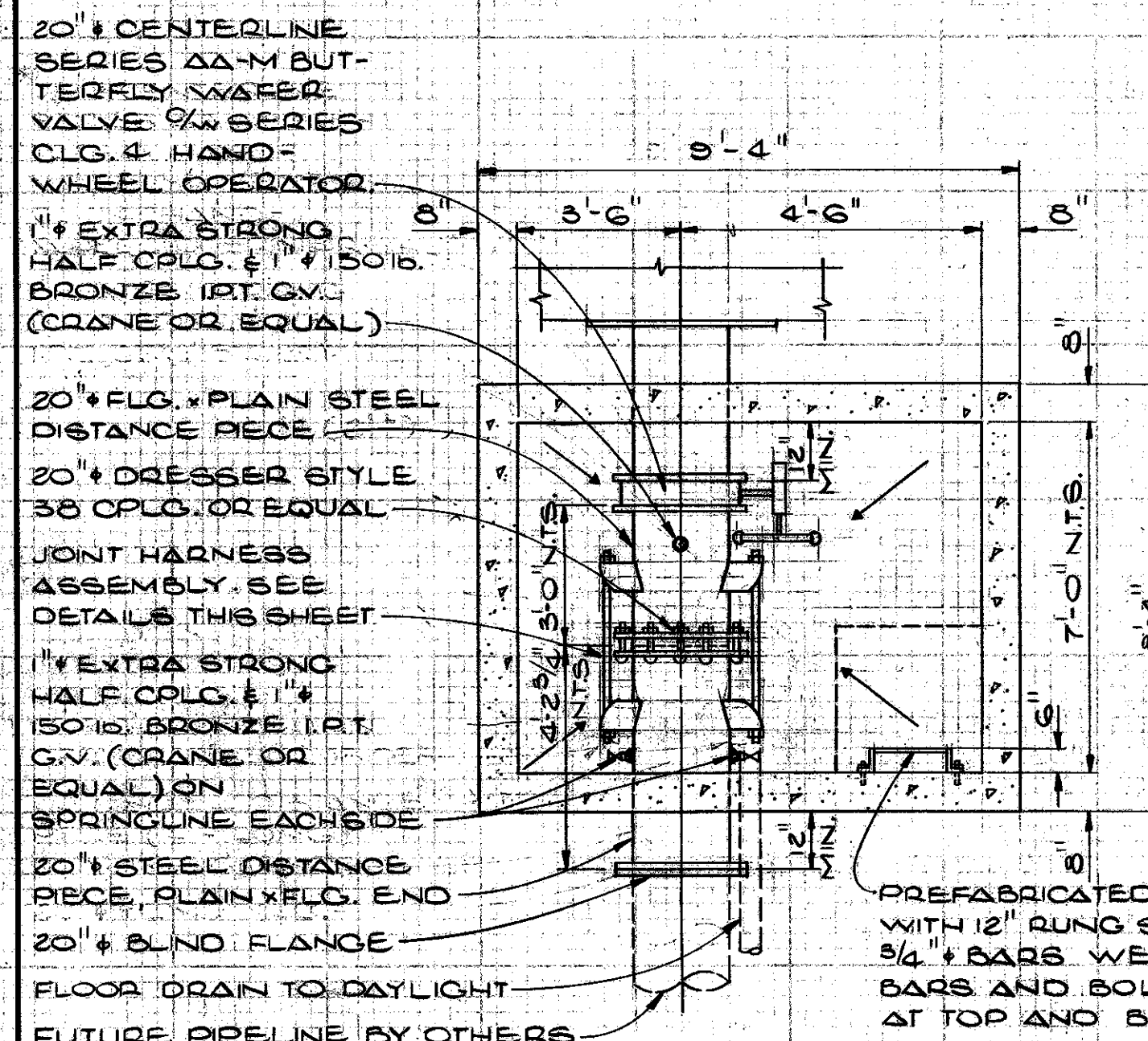
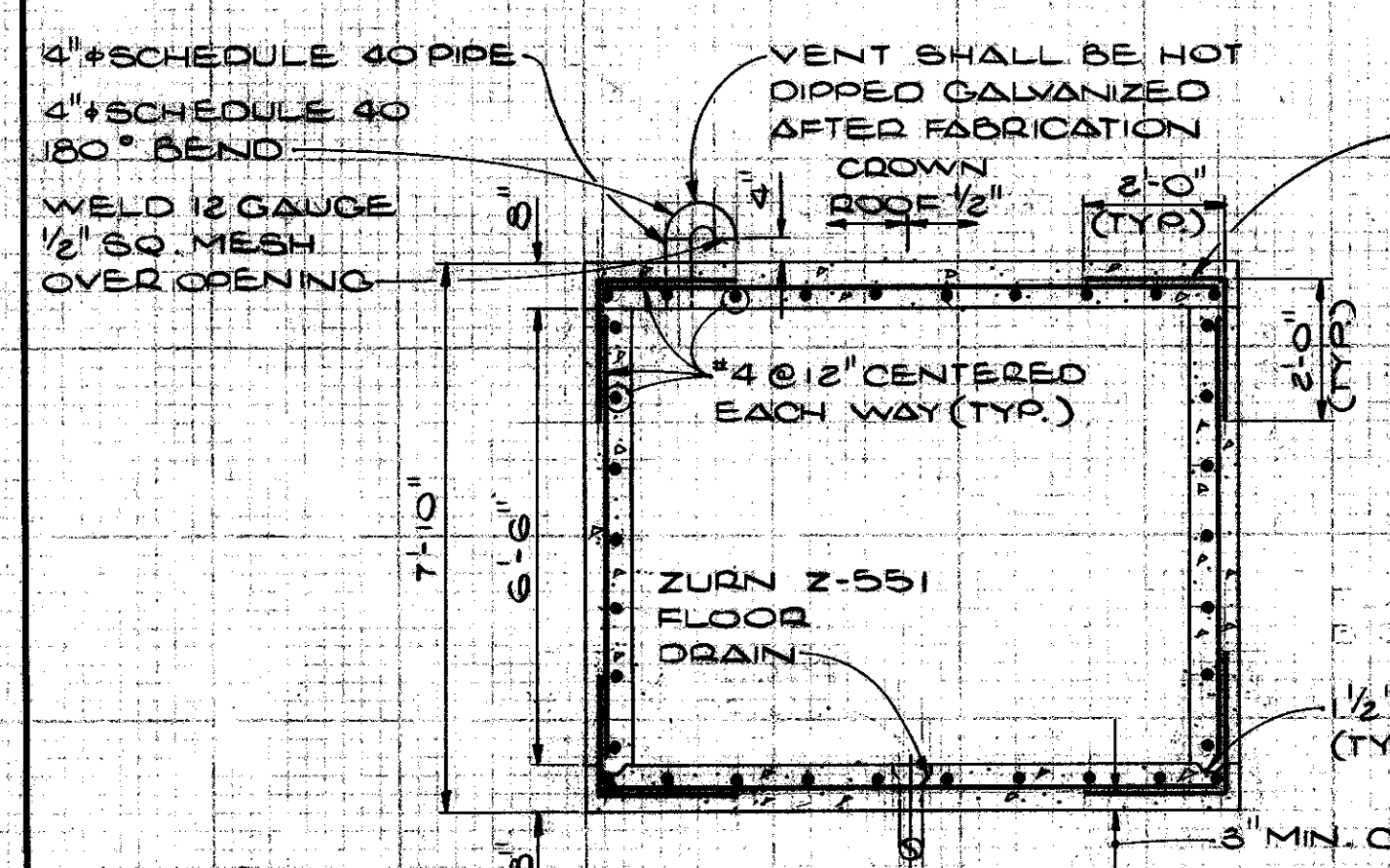


**NOTE**  
PENSTOCK STEEL MATERIAL IS ASTM A-285 GRADE C FLANGE QUALITY. THE DESIGN STRESS IS 15,000 P.S.I. TENSION

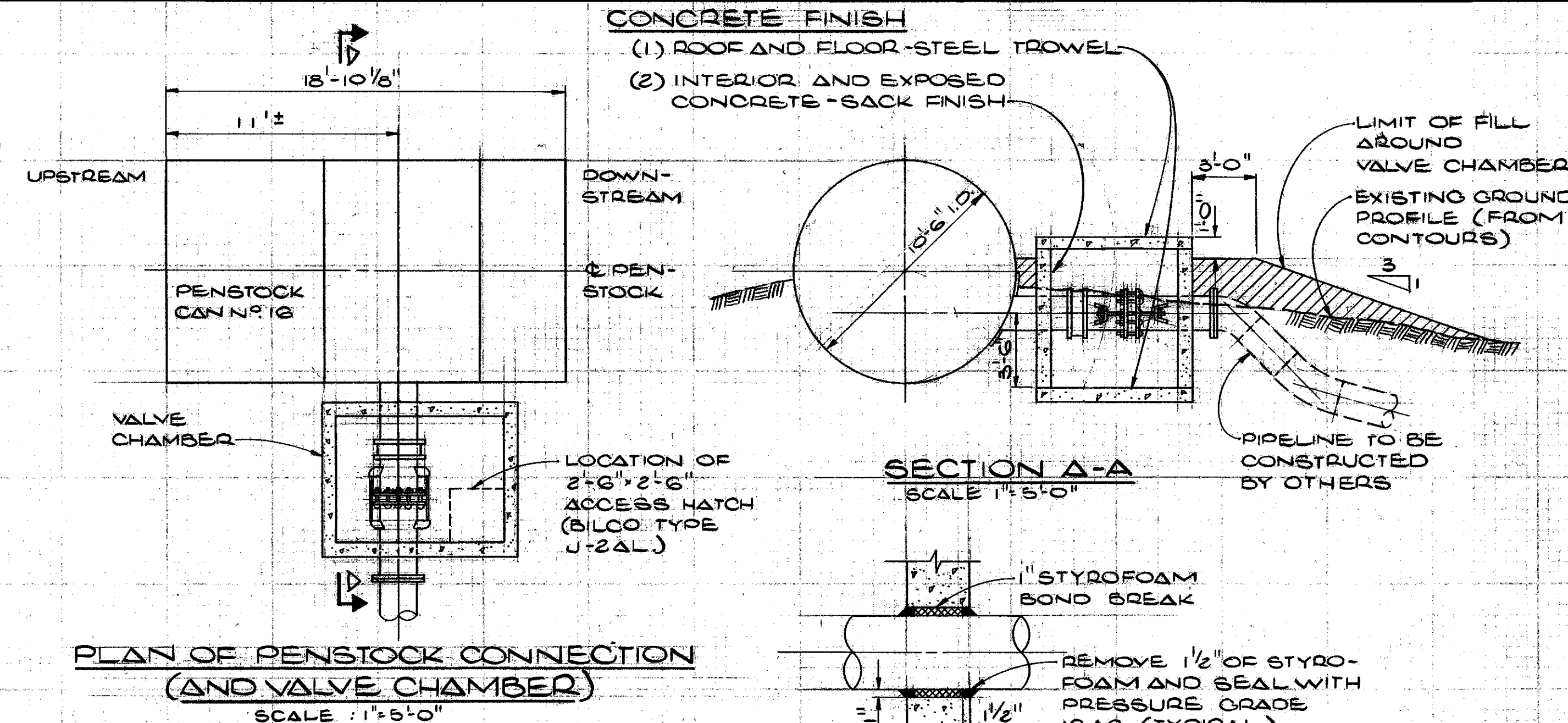
**PENSTOCK PROFILE**  
N.T.S.



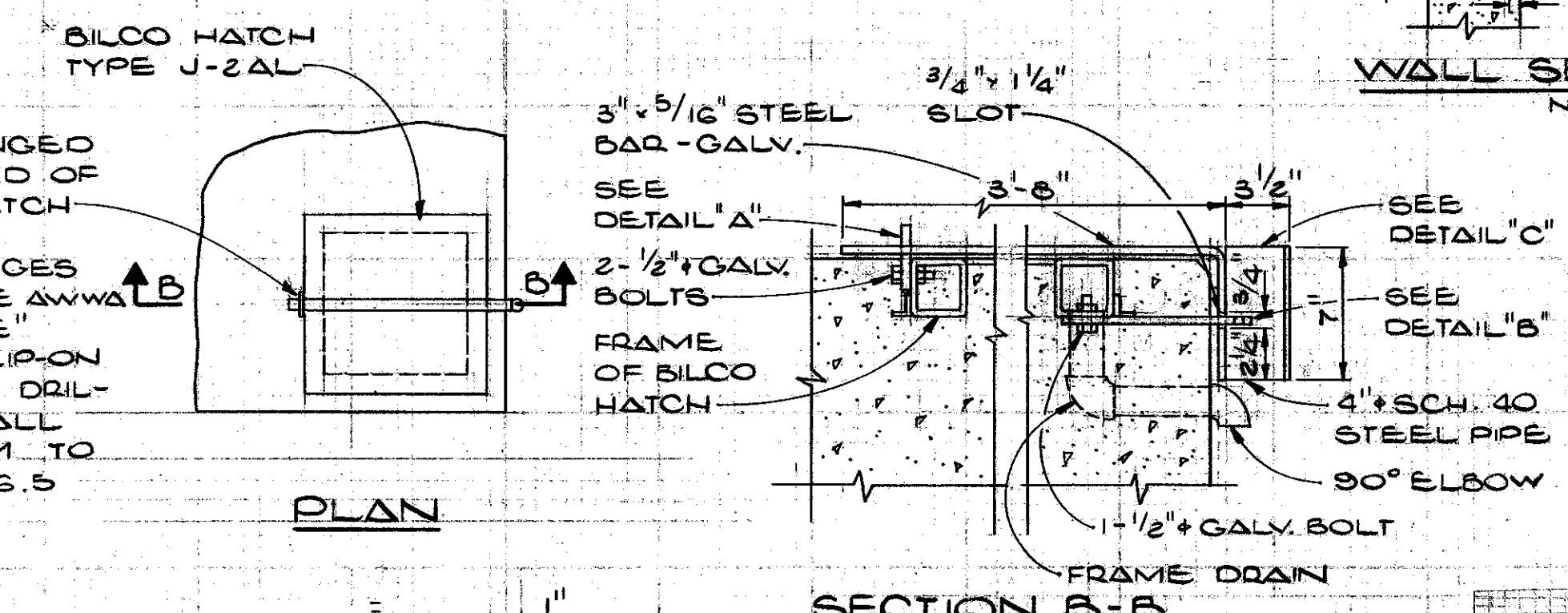
**LAYOUT OF VALVE CHAMBER**  
SCALE: 3/8" = 1'-0"



**WALL AND SLAB REINFORCING**  
SCALE: 3/8" = 1'-0"

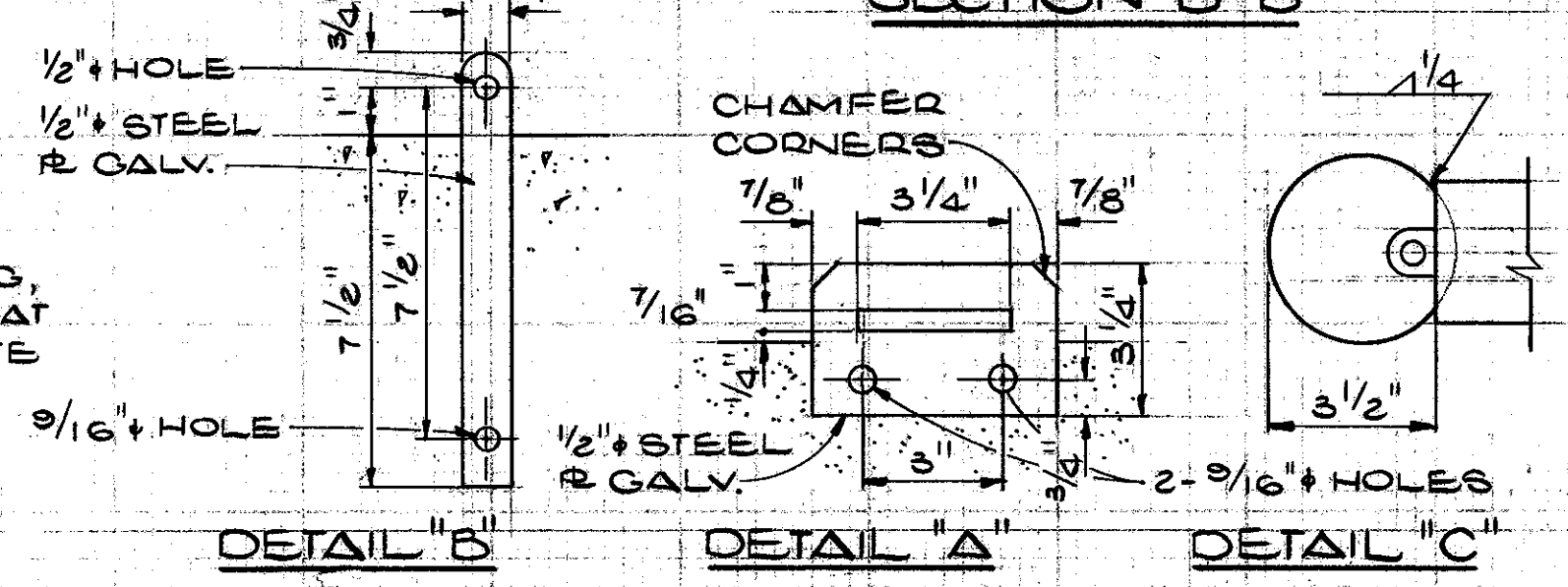


**PLAN OF PENSTOCK CONNECTION (AND VALVE CHAMBER)**  
SCALE: 1" = 5'-0"

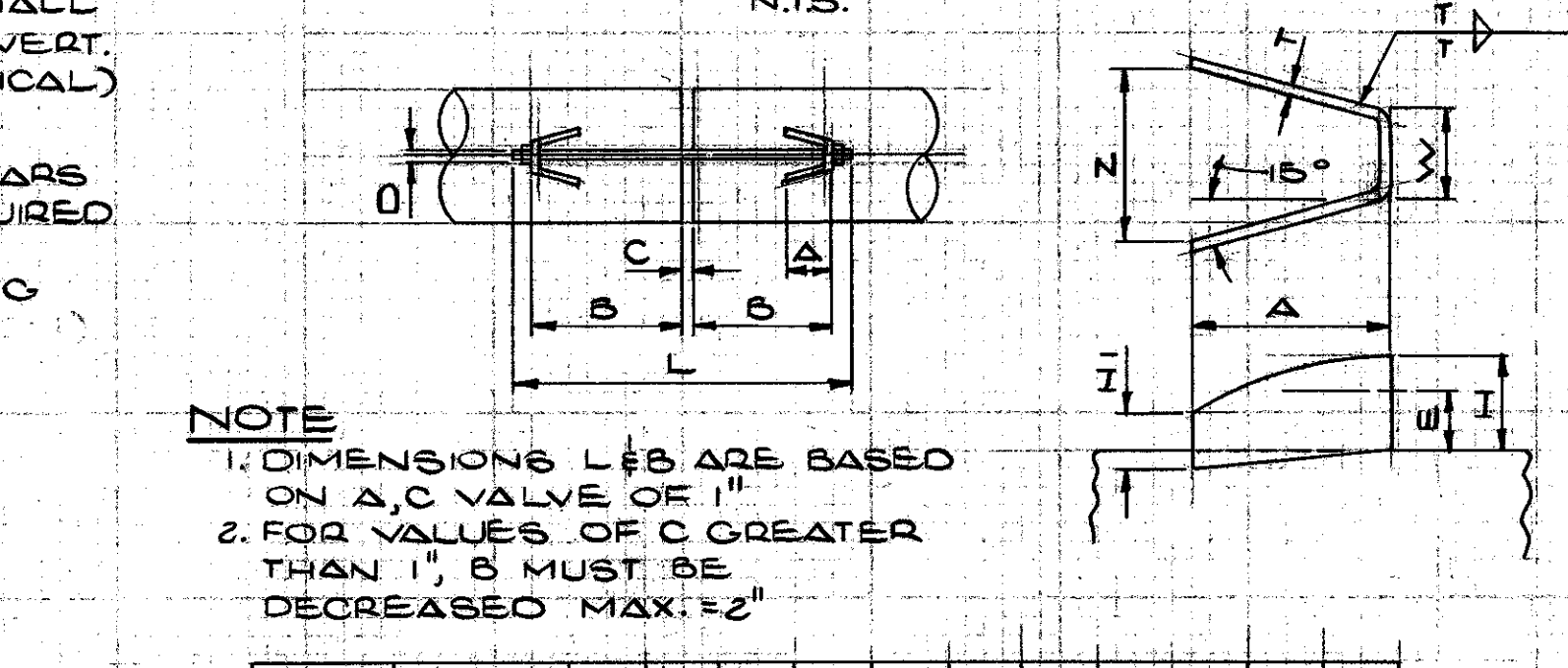


**PLAN**

**SECTION B-B**



**CHAMBER HATCH COVER**  
N.T.S.

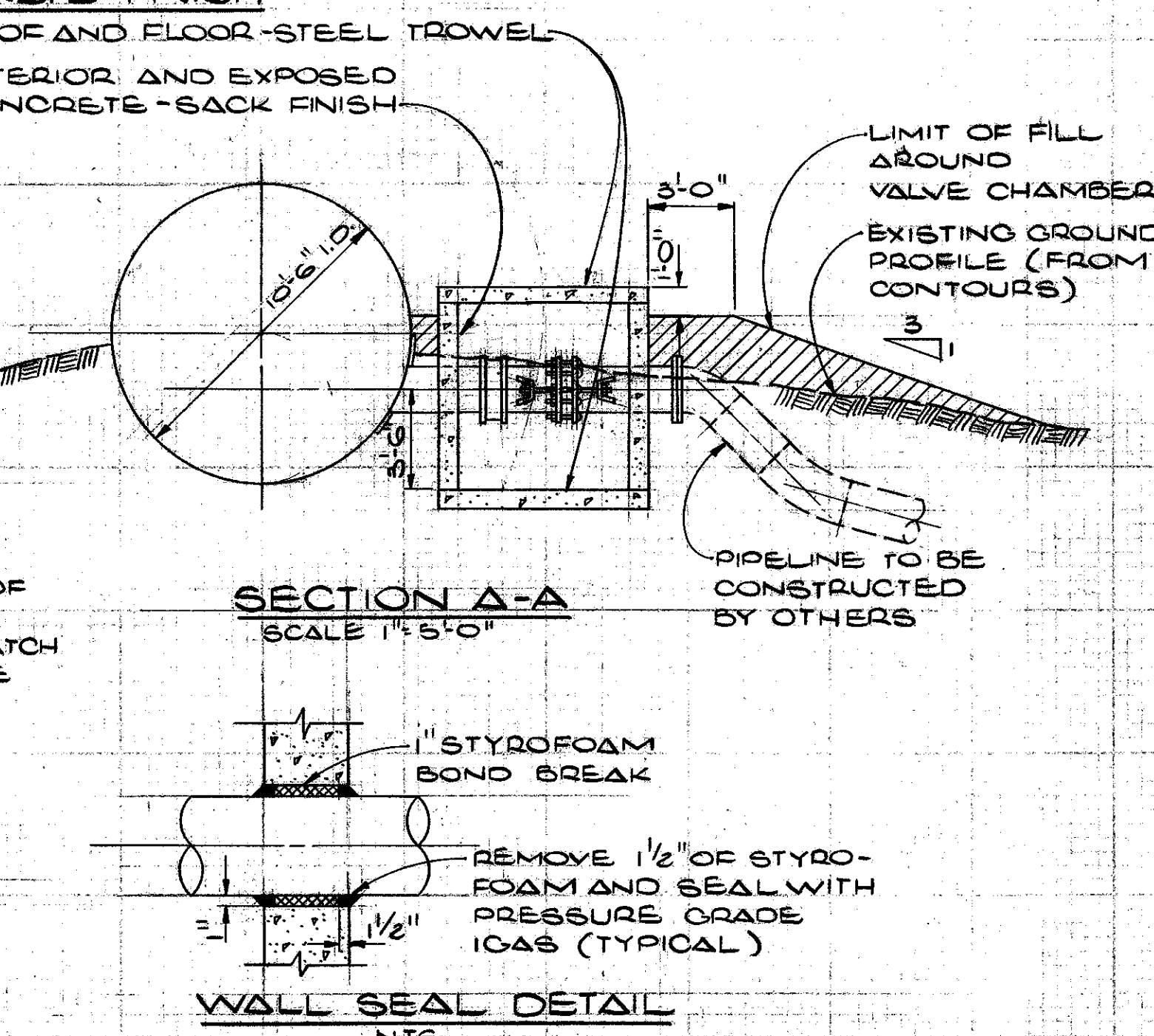


**JOINT HARNESS DETAIL**  
N.T.S.

**NOTE**  
1. DIMENSIONS L & B ARE BASED ON A, C VALVE OF 11"  
2. FOR VALUES OF C GREATER THAN 11", B MUST BE DECREASED MAX. = 2"

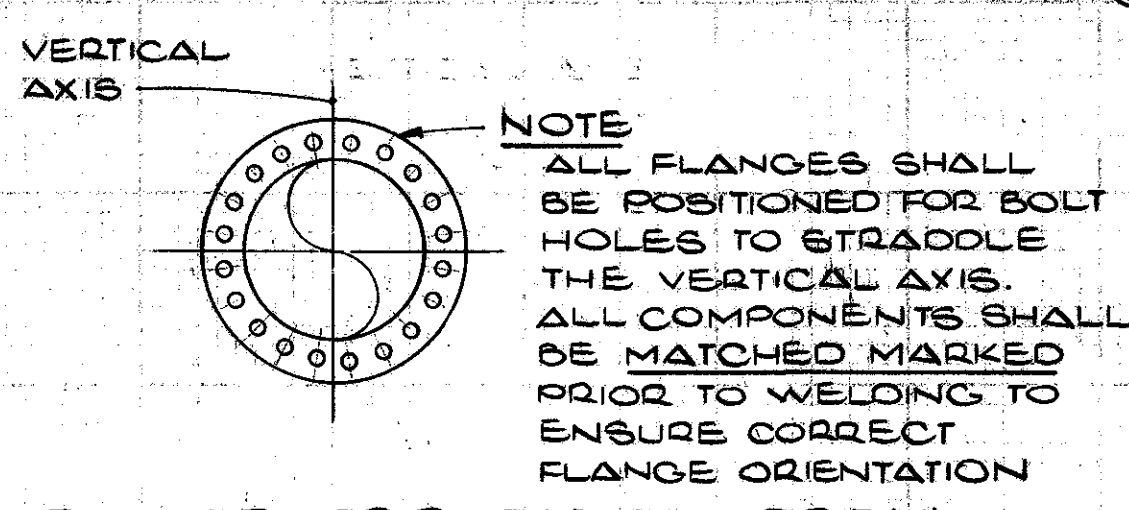
PIPE DIA.	BOLT DIA.	A	W	Z	T	H	E	H	HOLE DIA.	L	B
20	1 1/8	6 1/8	2 1/8	5 3/8	1/2	4 3/8	5 3/8	2 1/8	1 1/4	5 1/4	1 1/2

**NOTE**  
USE HEAT TREATED BOLTS WITH YIELD STRENGTH OF 70,000 P.S.I. LUG MATERIAL TO CONFORM TO ASTM A285 GRADE B OR A285 GRADE C, OR EQUAL. FIELD WELDING TO A.W.W.A. C-206.

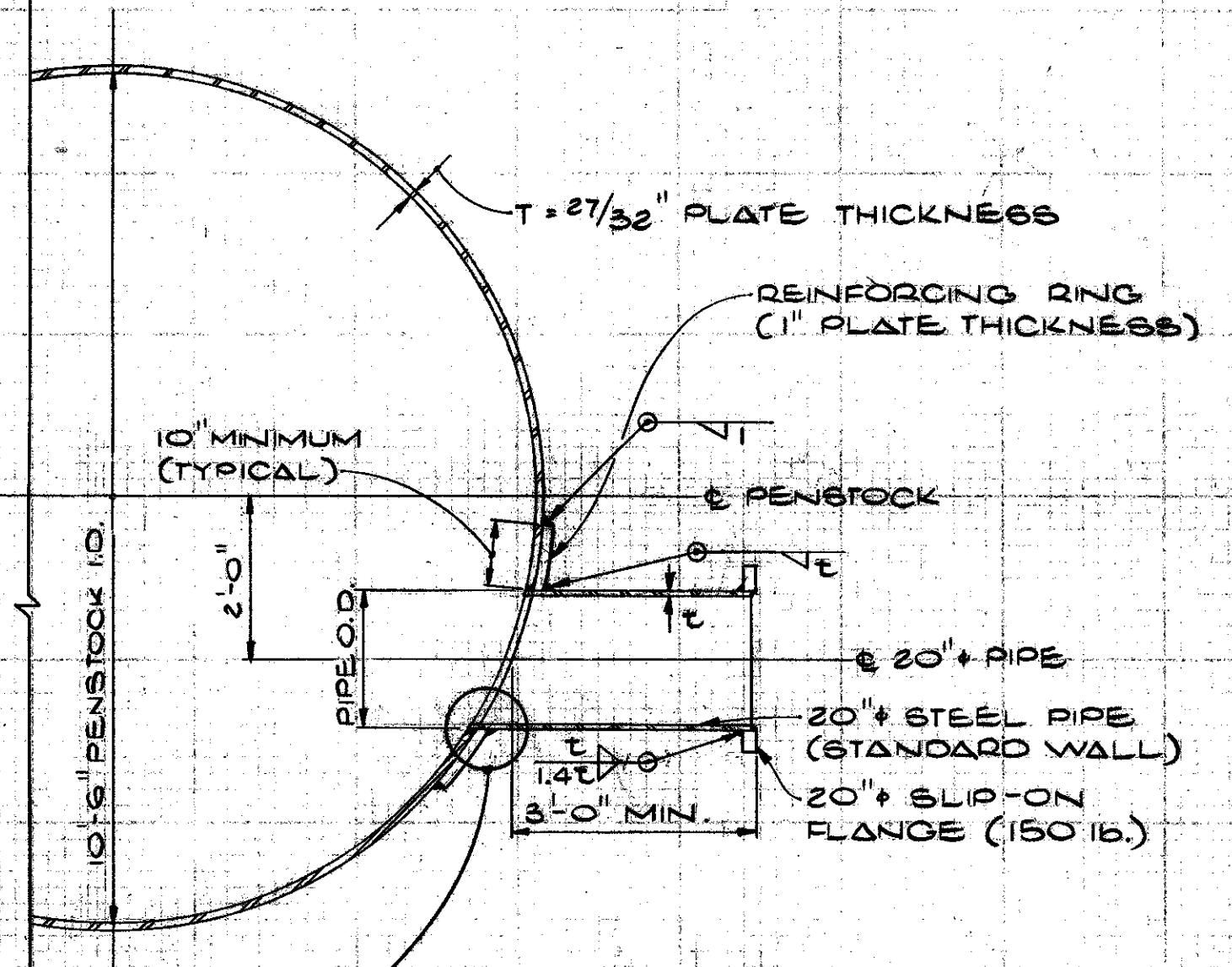


**SECTION A-A**  
SCALE: 1" = 5'-0"

**WALL SEAL DETAIL**  
N.T.S.



**FLANGE ORIENTATION DETAIL**  
N.T.S.



**CONNECTION DETAIL**  
SCALE: 1/2" = 1'-0"

- NOTES**
1. INSERT NOZZLE INTO PENSTOCK AND WELD THE EXTERIOR ROOT PASS FOLLOWED BY SUCCESSIVE COVER PASSES.
  2. TRIM NOZZLE END TO SUIT CONTOUR OF PENSTOCK AND CHAMFER EDGE.
  3. BACK GOUGE THE EXTERIOR ROOT PASS (FROM THE INSIDE OF THE PENSTOCK) TO SOLID WELD; WELD INNER ROOT PASS INTO GROOVE FOLLOWED BY COVER PASSES AND GRIND SMOOTH.

- GENERAL SPECIFICATIONS**
1. The work included in these specifications consists of the fabrication and installation of a 20" pipe connection to the penstock; installation of a 20" butterfly valve; and construction of the concrete hatch cover as shown. The butterfly valve and the aluminum hatch cover will be supplied by Federal Fisheries. The Contractor shall furnish all other materials and equipment necessary for completion of the work.
  2. The Contractor shall be responsible for ensuring that all work is done in accordance with B.C. Hydro's "Safety Practice Regulations." Neither the Federal Fisheries Service, Kerr Wood Leidal Associates Ltd., nor B.C. Hydro accept any responsibility for any consequence arising from the Contractor's compliance with or failure to comply with these safety regulations.
- B. SCHEDULING**
4. The new connection can only be made when the penstock is dewatered by B.C. Hydro. The work is to be scheduled according to Hydro's annual generator maintenance program. Normally this is during the first week of October. Dates provided by Hydro are tentative, and subject to change at any time.
  5. The Contractor shall be responsible for contacting the Superintendent of the Puntledge Generating Station to confirm the period during which the work can be done. A minimum of two weeks notice is required by Hydro in advance of the date then selected by the Contractor to install the connection.
  6. The installation of the connection and valve must be completed within a 24-hour period (from 8:00 a.m. to 8:00 a.m.).
  7. The installation procedure for the connection must be coordinated with Hydro.
  8. The Contractor shall inform Kerr Wood Leidal Associates Ltd. of the scheduling of the connection in order that a representative of the Consultant may be on hand at the site.
- C. PREPARATORY WORK**
9. The penstock is presently backfilled to within approximately 12 inches of the horizontal centerline. Therefore, some hand excavation is required to clear a working area.
  10. In preparation for cutting an opening in the penstock, the existing coating shall be removed to a distance of not less than 6 inches from the cut so that the remaining shop coat will not be blistered or melted.
  11. After the penstock is dewatered, the lining shall be removed from the inside to a distance of not less than 6 inches from the cut.

- D. WELDING**
12. Field welding shall be in accordance with American Pipe Institution (API) and American Welding Society (AWS) pipe welding practices.
  13. The welding operator shall possess a valid certificate of qualification as a welder issued under the authority of the British Columbia Boiler and Pressure Vessels Act.
  14. The cut or sheared edge of the opening cut in the penstock shall be filed smooth prior to welding the 20-inch stub.
  15. Surfaces to be welded shall be smooth, uniform and free from defects which adversely affect proper welding.
  16. Prior to installation of the connection, the Contractor shall advise Kerr Wood Leidal Associates Ltd. of the weld rods to be used in order to confirm their compatibility with the existing steel in the penstock.
- E. CORROSION PROTECTION**
17. Areas where the interior lining of the penstock and 20" pipe connection is damaged during the welding process shall be cleaned to bare metal and given two coats of Tnemastic 104 to a minimum dry coating thickness of 16 mils. Similarly areas where the exterior coating is damaged during welding shall be cleaned to bare metal and given two coats of coaltar epoxy to a minimum dry coating thickness of 16 mils.
  18. The pipe used for fabrication of steel specials shall be shop-coated on the inside with coaltar enamel in accordance with AWWA C201, and the outside sandblasted and shop primed and coated with two coats of coaltar epoxy.
- F. CONSTRUCTION OF VALVE CHAMBER**
19. Concrete to be 3000 psi @ 28 days; maximum 3/4" aggregate and maximum 3" slump.
  20. Reinforcing bars to be new bars conforming to ASTM-A615 with 60,000 psi yield strength.
  21. Field cut all steel bar openings.
  22. Pipe for fabrication of steel specials shall be "standard wall" thickness, and shall conform to the latest AWWA C201 or C206.
  23. Fabrication of steel pipe and fittings shall be shop-welding conforming to AWWA C206.

**REFERENCE DRAWING ONLY**  
**PENSTOCK CONNECTION AND VALVE CHAMBER CONSTRUCTED UNDER ANOTHER CONTRACT**

REVISIONS	ISSUE	DATE	DRN	CHD	APPD	DESCRIPTION	DESIGNED	CHECKED	DATE	SCALE	DRAWING No.	SHEET	OF	ISSUE
	5	01/17/78	RK	JAW	[Signature]	AS CONSTRUCTED	K.A.S.	[Signature]	28/4/78	AS SHOWN	15-76-1	7	OF 32	ISSUE 5

**DEPARTMENT OF FISHERIES AND THE ENVIRONMENT**  
**FISHERIES MANAGEMENT - PACIFIC REGION**

DESIGNED: K.A.S.  
DRAWN: [Signature]  
CHECKED: [Signature]

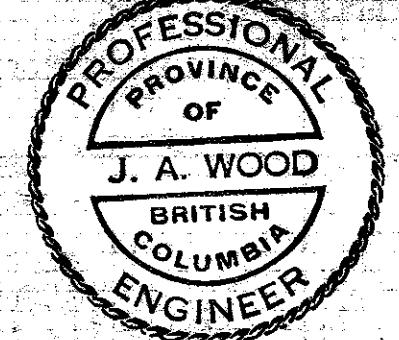
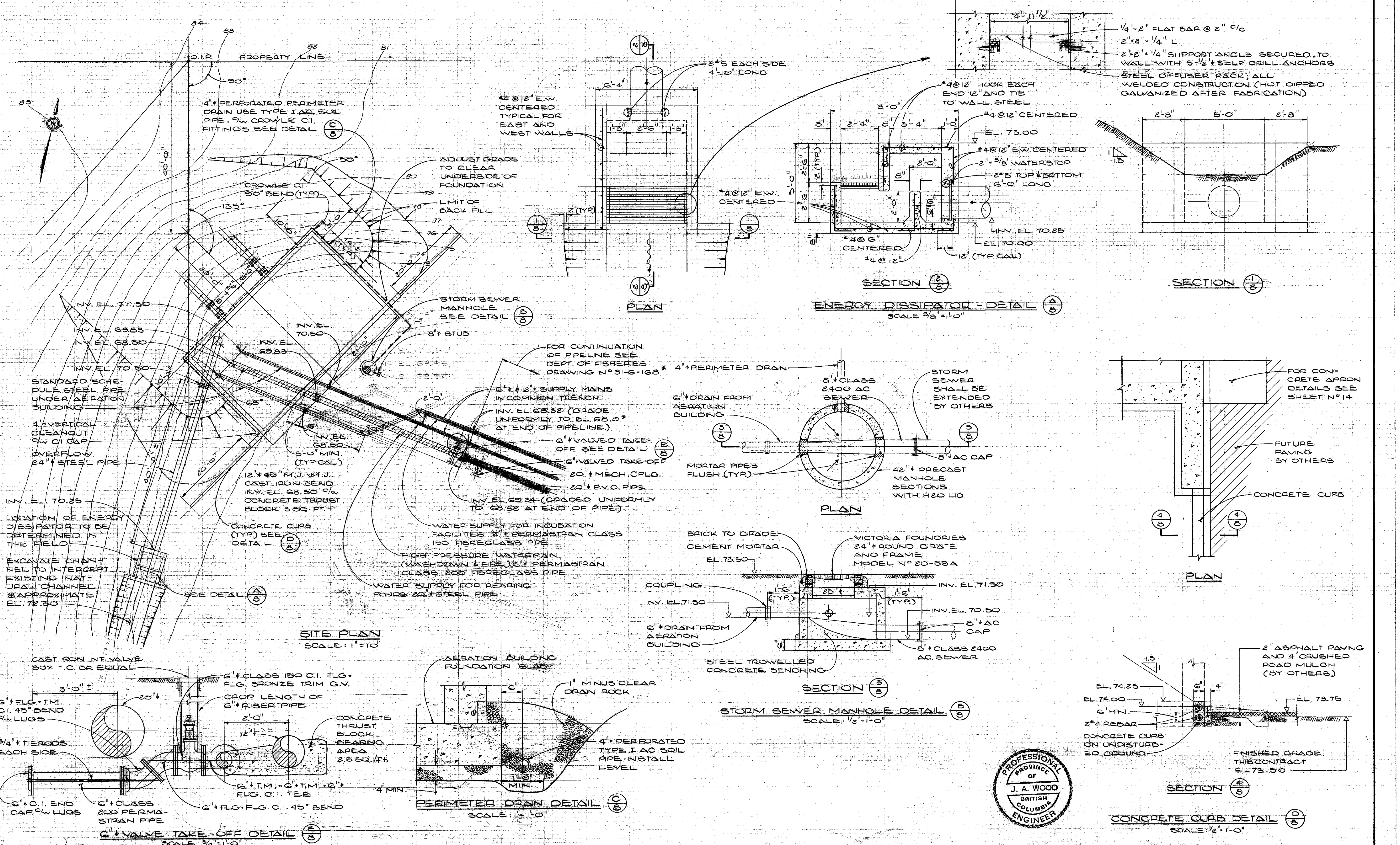
**KERR WOOD LEIDAL ASSOCIATES LTD.**  
CONSULTING ENGINEERS

[Signature] 28/4/78

**DEPARTMENT OF FISHERIES AND THE ENVIRONMENT**  
PUNTLIDGE RIVER HATCHERY  
20" CONNECTION TO B.C. HYDRO  
PENSTOCK (REFERENCE ONLY)

SCALE: AS SHOWN  
DRAWING No. 15-76-1  
SHEET 7 OF 32 ISSUE 5  
31-6-210





REVISIONS	ISSUE	DATE	DRN	CHD	APPD	DESCRIPTION	<b>DEPARTMENT OF FISHERIES AND THE ENVIRONMENT</b> <b>FISHERIES MANAGEMENT - PACIFIC REGION</b> RECOMMENDED APPROVED APPROVED	DESIGNED: JAW. DRAWN: RK CHECKED: JAW.	<b>KERR WOOD LEIDAL ASSOCIATES LTD.</b> CONSULTING ENGINEERS 2814 78	<b>DEPARTMENT OF FISHERIES &amp; THE ENVIRONMENT</b> PUNTLEGE RIVER HATCHERY AERATION BUILDING SITE PLAN, OUTSIDE PIPING AND MISC. DETAILS	SCALE: AS SHOWN DRAWING No. 10.76.1 SHEET 5 OF 52 ISSUE C 31-6-211
	5	16/78	RL	JAW	JAW	REFERENCE DWG. NO. AND INVERT ELEVATION CORRECTED*					
	C	20/78	RL	JAW	JAW	AS CONSTRUCTED					