FLUID ABBR.	FUNCTION	PIPING MATERIALS (SEE NOTE 1)				FIELD TEST REQUIREMENTS (SEE NOTES 2, 3, 4)		
		EXPOSED PIPING (SEE NOTES 10 AND 11)		BURIED PIPING (SEE NOTES 10 AND 13)		MINIMUM TEST PRESSURE PSI	TEST MEDIUM	LEAKAGE ALLOWANCE (SEE NOTE 2)
		2 IN. DIA. AND SMALLER	2-1/2 IN DIA. AND LARGER	2 IN. DIA. AND SMALLER	2-1/2 IN DIA. AND LARGER			
AGW	AERATED GROUND WATER	8	8	8, 11	8, 11	70	WATER	8 (A); 11(B)
CA	COMPRESSED AIR	22	7	21	7	200	AIR	NOTE 8
CD	CONDENSATE DRAIN	22	-	21	-	100	AIR	NOTE 8
CFD	COMBINED FACILTY DRAIN	-	-	-	12, 13, 14, 20	NOTE 6	WATER	14 (A): 12 (B): 13, 20 (C)
CW	CHILLED WATER	8	8	8, 10	8, 10, 12	20	WATER	8 (A): 10,12 (B)
F	FORMALIN	8	-	9	-	15	WATER	(A)
FV	FORMALIN VENT	8	-	8	-	NOTE 6	WATER	(A)
FR	FISH RELEASE	-	-	-	10 (NOTE 14)	NOTE 6	WATER	(B)
GP	GLYCOL PIPING	8	8	8	8	75	WATER	(A)
GW	GROUND WATER	8	4, 8	8, 10	8, 10, 12	20	WATER	4, 8 (A): 10,12 (B)
HW	HEATED WATER	8	8	8, 10	8, 10, 12	20	WATER	8 (A): 10,12 (B)
IA	INSTRUMENT AIR	22	-	21	-	100	AIR	NOTE 8
IR	IRRIGATION	-	-	-	8	10	WATER	(A)
LIFT	ADULT FISH LIFT	1	1	5	5	50	WATER	1 (A): 5 (B)
LPA	LOW PRESSURE AIR	1, 2, 7	-	1, 2, 7	-	20	AIR	NOTE 8
O	OXYGEN	22	-	21	-	100	AIR	NOTE 8
OF	OVERFLOW	8	8	10, 13, 14	10, 12, 13, 14	NOTE 6	WATER	4,5,8,14 (A): 10,12 (B): 13 (C)
PB	PUMP BACK	-	-	-	10, 15	60	WATER	15 (A), 10 (B)
PCW	POTABLE COLD WATER	22	-	21	-	100 (NOTE 7)	WATER	(A)
PHW	POTABLE HOT WATER	22	-	21	-	100 (NOTE 7)	WATER	(A)
PW	POTABLE WATER	2	-	9	-	100	WATER	(A)
RO	REUSE OVERFLOW	8	8	10, 13, 14	10, 12, 13, 14	NOTE 6	WATER	4,5,8,14 (A): 10,12 (B): 13 (C)
PWV	PROCESS WATER VENT	1, 4	1, 4	1, 4	1, 4	NOTE 5	WATER	(A)
SD	STORM DRAIN	-	-	13	13	NOTE 6	WATER	(C)
SP	SPRAY	2	2	-	-	100	WATER	(A)
SS	SANITARY SEWER	-	-	6, 13 (NOTE 16)	6, 13 (NOTE 16)	NOTE 6	WATER	(C)
	SANITARY SEWER DRAIN PIPE	-	-	-	19	-	WATER	NOTE 15
SW	SURFACE WATER	8	4, 8	8, 10	8, 10, 12	20	WATER	4, 8 (A): 10,12 (B)
SW/ RO	SURFACE WATER/ REUSE OVERFLOW	-	-	8, 10	8, 10, 12	20	WATER	8 (A): 10,12 (B)
UW	UTILITY WATER	2, 9	2, 9	9	9	75	WATER	(A)
V	VENT	6	6	6	6	NOTE 5	WATER	(A)
WD	WASTE DRAIN	8	8	10, 13, 14	10, 12, 13, 14	NOTE 6	WATER	8,14 (A): 10,12 (B): 13 (C)

PIPING MATERIAL SCHEDULE

GROUP NO.	PIPE (SEE NOTE 10)	FITTINGS
1	STEEL: BLACK, SCHEDULE 40, ASTM A53, (THREADED)/(WELDED FITTINGS).	2-1/2 INCH AND SMALLER: MALLEABLE IRON, ANSI B16.3, THREADED, BANDED, BLACK, 150 PSI 3 INCH AND LARGER: STEEL ANSI B16.9, 125 PSI BUTT WELDED, FLANGED OR MECHANICAL JOINTS.
2	STEEL: GALVANIZED, SCHEDULE 40, WELDED, ASTM A53.	2-1/2 INCH AND SMALLER: MALLEABLE IRON, ANSI B16.3, THREADED, BANDED. GALVANIZED, 150 PSI OR STEEL ANSI B16.9, BUTT-WELDED. 3 INCH AND LARGER: CAST IRON ANSI B16.1 125 PSI FLANGED OR MECHANICAL COUPLING.
3	STEEL: BLACK, SCHEDULE 80, WELDED, ASTM A53.	FORGED STEEL, ANSI B16.11. SOCKET WELDED OR THREADED BLACK. 2000 PSI OR STEEL ANSI B16.9 BUTT-WELDED. SCHEDULE 80.
4	WELDED STEEL: AWWA C200, 1/4" WALL, LINED	WELDED STEEL, AWWA C200 FABRICATED
5	DUCTILE IRON: ANSI A21.51, AWWA C151, BELL AND SPIGOT, MECHANICAL JOINT, MECHANICAL COUPLINGS, OR 125 PSIFLANGED, CEMENT MORTAR LINED.	DUCTILE IRON OR CAST IRON. ANSI A21.10 OR AWWA C110. BELL AND SPIGOT, MECHANICAL COUPLING, FLANGED OR MECHANICAL JOINT. 250 PSI (PRESSURE RATING) 12 INCH OR SMALLER, 150 PSI (PRESSURE RATING) 14 INCH OR LARGER. WITH 125 PSI ANSI B16.1 FLANGES.
6	CAST IRON SOIL: ANSI/ASTM A-74. SERVICE WEIGHT, BELL AND SPIGOT OR HUB-LESS.	CAST IRON SOIL. ANSI/ASTM A-74. SERVICE WEIGHT, BELL AND SPIGOT OR HUB-LESS.
7	STAINLESS STEEL, ASTM A778, SCHEDULE 40.	STAINLESS STEEL TYPE 304L OR 316L ANSI B16.9 BUTT-WELDED SCHEDULE 40S FLANGED.
8	POLYVINYL CHLORIDE: SCHEDULE 40, ASTM D1785 AND ASTM D2665.	POLYVINYL CHLORIDE SCHEDULE 40. NORMAL IMPACT, SOCKET SOLVENT WELDED JOINTS ASTM D2467. TRUE UNIONS.
9	POLYVINYL CHLORIDE: SCHEDULE 80, ASTM D1785.	POLYVINYL CHLORIDE SCHEDULE 80. NORMAL IMPACT, SOCKET SOLVENT WELDED JOINTS ASTM D2467. TRUE UNIONS.
10	POLYVINYL CHLORIDE PRESSURE PIPE: AWWA C900, CLASS 100 BELL AND SPIGOT JOINTS, DIP FITTINGS.	DUCTILE IRON OR CAST IRON 150 PSI FOR POLYVINYL CHLORIDE PIPE. AWWA C110 CEMENT MORTAR LINED C104 AWWA C900.
11	POLYVINYL CHLORIDE PRESSURE PIPE: AWWA C900, CLASS 150 BELL AND SPIGOT JOINTS, DIP FITTINGS.	DUCTILE IRON OR CAST IRON 150 PSI FOR POLYVINYL CHLORIDE PIPE. AWWA C110 CEMENT MORTAR LINED C104 AWWA C900.
12	POLYVINYL CHLORIDE PRESSURE PIPE: AWWA C905, DR 51, 80 PSI, BELL AND SPIGOT JOINTS, DIP FITTINGS.	DUCTILE IRON OR CAST IRON 150 PSI FOR POLYVINYL CHLORIDE PIPE. AWWA C110 CEMENT MORTAR LINED C104 AWWA C905.
13	POLYVINYL CHLORIDE GRAVITY SEWER PIPE: ASTM F679 O ASTM D3034, SDR 35, BELL AND SPIGOT JOINTS.	POLYVINYL CHLORIDE ANSI/ASTM D3034, BELL AND SPIGOT.
14	HIGH-DENSITY POLYETHYLENE: ASTM D3035, SDR 32.5 F714, HEAT FUSED JOINTS. (SEE NOTE 9)	HIGH-DENSITY POLYETHYLENE ASTM D3035, F714, HEAT FUSED ASTM D3261.
15	HIGH-DENSITY POLYETHYLENE: ASTM D3035, SDR 26 F714, HEAT FUSED JOINTS. (SEE NOTE 9)	HIGH-DENSITY POLYETHYLENE ASTM D3035, F714, HEAT FUSED ASTM D3261.
16	POLYETHYLENE: CORRUGATED, SLOTTED, ASTM F405, F667, FILTER WRAPPED.	SPLIT OR INTERNAL COUPLER, ASTM F667.
17	POLYETHYLENE: CORRUGATED, NON-SLOTTED, ASTM F405, F667, FILTER WRAPPED.	SPLIT OR INTERNAL COUPLER, ASTM F667.
18	CORRUGATED METAL PIPE: AASHTO M36.	COUPLING BANDS AND FITTINGS. AASHTO M36.
19	PERFORATED PVC PIPE, ASTM D2729	POLYVINYL CHLORIDE. NORMAL IMPACT, SOCKET SOLVENT WELDED JOINTS
20	REINFORCED CONCRETE PIPE, ASTM C76, CLASS B	BELL AND SPIGOT JOINTS CONFORMING TO ASTM C443
21	COPPER: ASTM B88, TYPE K, HARD TEMPERED WHERE EXPOSED.	WROUGHT COPPER OR CAST BRONZE, SEE SPECIFICATIONS. (FOR OXYGEN PIPING USE SILVER SOLDER: FOR AIR PIPING USE 95-5 TIN-ANTIMONY SOLDER)
22	COPPER: ASTM B88, TYPE L, HARD TEMPERED WHERE EXPOSED.	WROUGHT COPPER OR CAST BRONZE, SEE SPECIFICATIONS. (FOR OXYGEN PIPING USE SILVER SOLDER: FOR AIR PIPING USE 95-5 TIN-ANTIMONY SOLDER)

NOTES

NOTE 1
PIPING SHALL BE AS INDICATED IN SCHEDULE ULESS OTHERWISE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS

NOTE 2
LEAKAGE ALLOWANCE IS AS FOLLOWS:
(A) PIPES SO DESIGNATED SHALL SHOW ZERO LEAKAGE.
(B) PIPES SO DESIGNATED SHALL SHOW ZERO LEAKAGE FOR UNBURIED PIPE AND NOT MORE THAN 0.02 GALLON PER INCH DIAMETER PER 100 FEET OF BURIED PIPE.
(C) PIPES SO DESIGNATED SHALL NOT SHOW A LEAKAGE OF MORE THAN 0.15 GALLON PER HOUR PER INCH OF DIAMETER PER 100 FEET OF PIPE.

NOTE 3
TEST PRESSURE MEASURED AT LOW POINT IN PIPE. FOR FIELD TEST PROCEDURES AND ADDITIONAL TEST REQUIREMENTS, SEE PIPING SECTION OF SPECIFICATIONS.

NOTE 4
ANY DEVIATION FROM THE PIPING MATERIALS OR FIELD TEST REQUIREMENTS SHOWN WILL BE NOTED IN THE SPECIFICATIONS OR ON THE DRAWINGS.

NOTE 5
STATIC WATER TEST WITH WATER SURFACE 10 FEET ABOVE FLOOR.

NOTE 6
STATIC WATER TEST WITH WATER SURFACE 10 FEET ABOVE HIGH POINT OF PIPE.

NOTE 7
INSPECTION AND TESTING SHALL BE IN ACCORDANCE WITH APPLICABLE PLUMBING CODE.

NOTE 8
TEST PIPING WITH A SOAPY WATER SOLUTION APPLIED TO JOINTS AND FITTINGS. PRESSURE SHALL BE HELD FOR 2 HOURS. NO EVIDENCE OF LEAKAGE AS NOTED BY PRESSURE DROP OR BUBBLES IN THE SOAPY SOLUTION IS PERMITTED.

NOTE 9
FOR HDPE PIPING THE SIZES OF PIPING SHOWN ON THE DRAWINGS INDICATE THE MINIMUM INSIDE DIMENSION

NOTE 10
FOR PIPE LINING AND COATING, SEE SPECIFICATIONS.

NOTE 11
EXPOSED PIPING SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATIONS. COLORS TO BE SELECTED BY OWNER.

NOTE 12
VALVES 2-1/2 INCH AND SMALLER MAY HAVE SCREWED ENDS. VALVES 3 INCH AND LARGER SHALL HAVE SPECIFIED FLANGED ENDS, UNLESS OTHERWISE SHOWN OR SPECIFIED.

NOTE 13
CA, CD, IA, O, PW, PCW, PHW PIPING UNDER CONCRETE FLOORS AND FOOTING SHALL CONFORM TO PIPE SYSTEM 21 ALL OTHER PIPING UNDER CONCRETE FLOORS AND FOOTING SHALL BE FERROUS METAL CONFORMING TO PIPE SYSTEM 4 OR 5 UNLESS OTHERWISE NOTED.

NOTE 14
ALL FISH RELEASE PIPE BENDS SHALL HAVE A MINIMUM RADIUS OF 3 TIMES THE PIPE DIAMETER. FITTINGS FOR FISH RELEASE PIPE SHALL BE OF THE SAME MATERIAL AS THE PIPING.

NOTE 15
NO APPARENT LEAKS AT JOINTS UNDER NORMAL OPERATING CONDITIONS.

NOTE 16
SANITARY SEWER PIPING UNDER BUILDING SLABS AND FOOTINGS SHALL CONFORM TO PIPE SYSTEM 6.

NO.		W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED
C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_GM1_NEOH.dgn						

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT 17, 1981 EDWARD E. DONAHUE
Expires 12/31/07
Engineer Seal

HDR | FISHPRO

Design LKP
Drawn ACB
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

STANDARD MECHANICAL PIPE SCHEDULES

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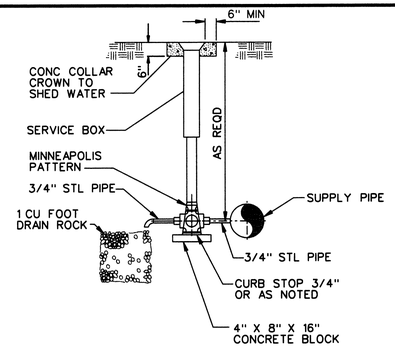
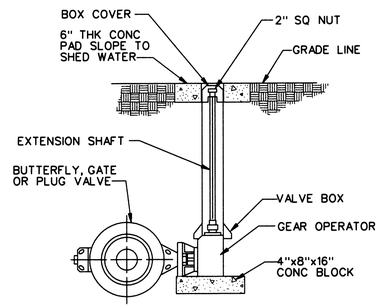


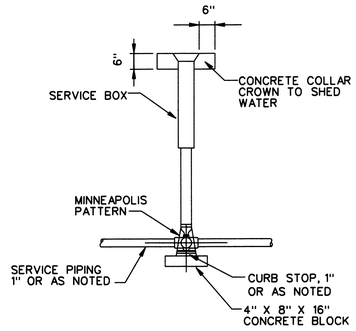
PIPE DRAIN DETAIL 1 – TYP

NO SCALE



BURIED VALVE & BOX 2 – TYP

NO SCALE



CURB STOP DETAIL 3 – TYP

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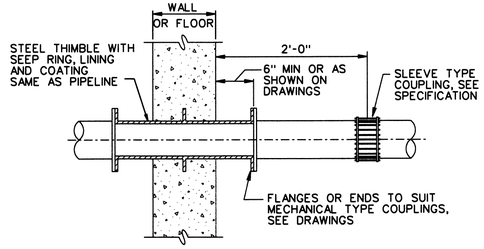

FLANGED THIMBLE 4 – TYP

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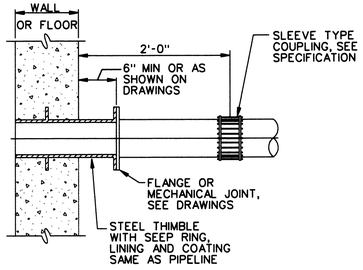

THIMBLE 5 – TYP

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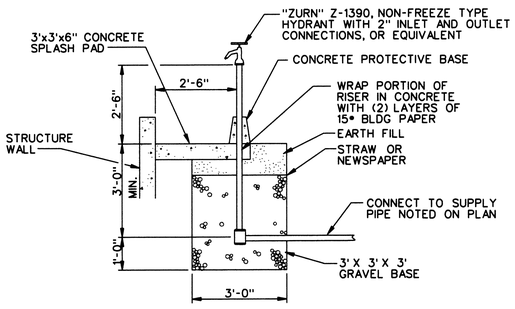

YARD HYDRANT DETAIL 6 – TYP

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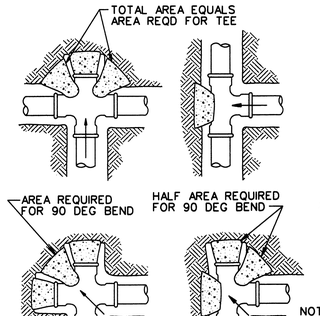
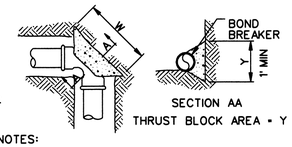




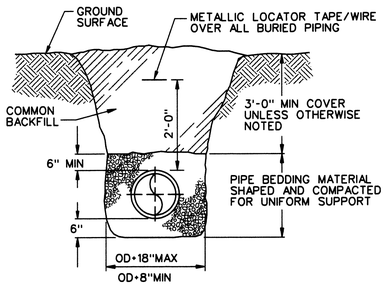
NOTES:

1. THRUST BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND.
2. FORM ALL NON-BEARING VERTICAL SURFACES.
3. PLACE BOND BREAKER ANY PLACE PIPE CONTACTS CONCRETE.
4. ARROW ( ) INDICATES DIRECTION OF FORCE, REGARDLESS OF FLOW DIRECTION.

MINIMUM THRUST BLOCK AREA (SQ.FT.) Y x W		
PIPE SIZE	TEE, DEAD END, 90° BEND	45° & 22½° BENDS
4" & LESS	1.0	1.0
6"	1.0	1.0
8"	1.0	1.0
10"	1.5	1.0
12"	2.0	1.0
16"	3.0	1.5
18"	4.0	2.0
20"	5.0	2.5
24"	6.0	3.0
30"	7.5	4.0
36"	9.0	4.5
48"	12.0	6.0

THRUST BLOCK FOR WATER LINES 7 – TYP

NO SCALE

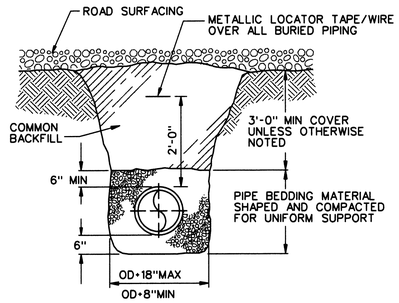


NOTES:

1. TRENCHING DETAIL IS SCHEMATIC ONLY. SLOPE TRENCH SIDES AS REQUIRED TO MAINTAIN STABILITY.
2. IF MORE THAN ONE PIPE IS LOCATED IN TRENCH, PROVIDE 6" (MIN) CLEAR SPACING BETWEEN PIPES. SHAPE AND COMPACT BEDDING MATERIAL BETWEEN PIPING.

TYPICAL PIPE TRENCH 8 – TYP

NO SCALE



NOTES:

1. TRENCHING DETAIL IS SCHEMATIC ONLY. SLOPE TRENCH SIDES AS REQUIRED TO MAINTAIN STABILITY.
2. IF MORE THAN ONE PIPE IS LOCATED IN TRENCH, PROVIDE 6" (MIN) CLEAR SPACING BETWEEN PIPES. SHAPE AND COMPACT BEDDING MATERIAL BETWEEN PIPING.

PIPE TRENCH BENEATH ROADWAYS 8 – TYP

NO SCALE

NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED

C=CONTRACT CONSTR., FA=FORCE ACCOUNT CONSTR., R=RECORD FILE NAME: LRH_GM3_NEOH.dgn

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT 17, 1987 EDWARD E. DONHAM
Expires 12/31/07
Engineer Seal

HDR | FISHPRO

Design EED
Drawn KCP
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

STANDARD MECHANICAL DETAILS I

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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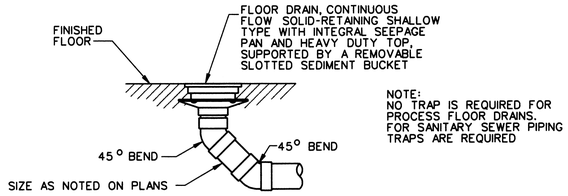
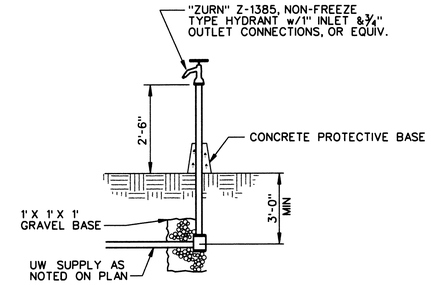


PROCESS PIPING FLOOR DRAIN DETAIL 1 – TYP

NO SCALE



HOSE CONNECTION 2 – TYP

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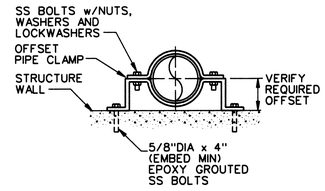

OFFSET PIPE CLAP 3 – TYP

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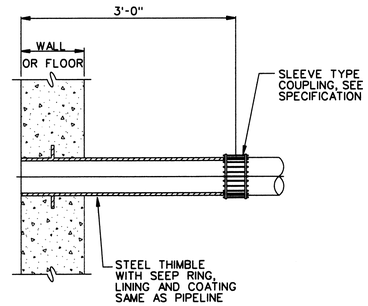

THIMBLE 4 – TYP

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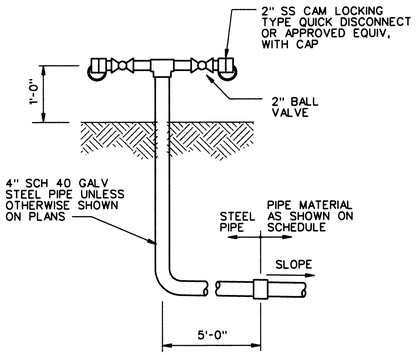

CLEANING WASTE STATION 5 – TYP

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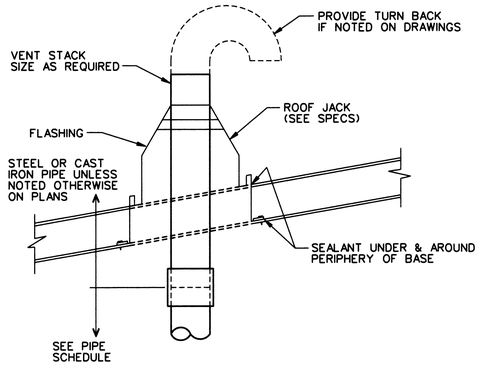

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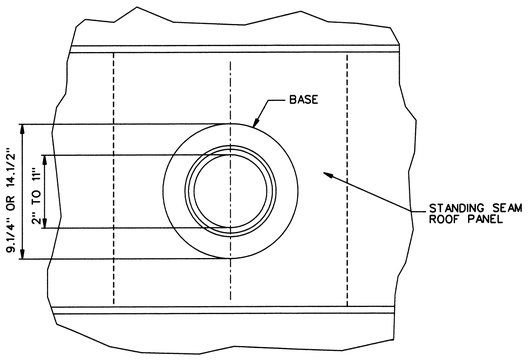
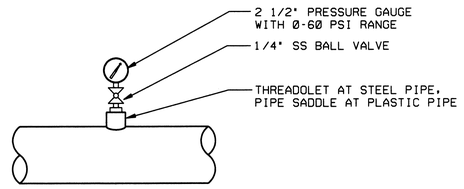


PLAN

VENT THRU ROOF DETAIL 6 – TYP

NO SCALE



PRESSURE GAUGE 7 – TYP

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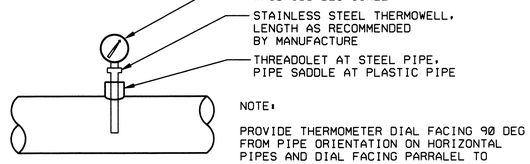

PRESSURE GAUGE 8 – TYP

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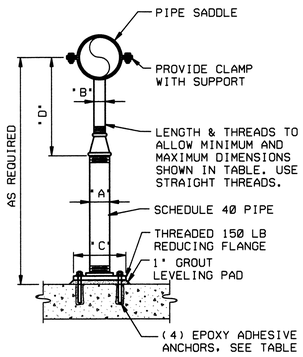
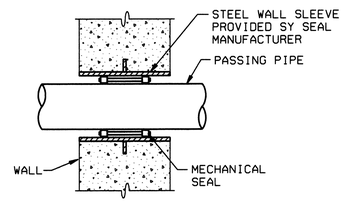


FLOOR PIPE SUPPORT SCHEDULE
DIMENSIONS IN INCHES

PIPE SIZE	"A"	"B"	"C"	"D" MINIMUM	"D" MAXIMUM	ANCHORS DIA	ANCHORS EMBED
≤ 2 1/2	2 1/2	1 1/2	9	8	13	5/8	5
3	2 1/2	1 1/2	9	8 1/2	13 1/2	5/8	5
3 1/2	2 1/2	1 1/2	9	8 1/2	13 1/2	5/8	5
4	3	2 1/2	9	9 1/2	14	5/8	5
6	3	2 1/2	9	10 1/2	15 1/2	5/8	5
8	3	2 1/2	9	11 1/2	16 1/2	5/8	5
10	3	2 1/2	9	13 1/2	18 1/2	5/8	5
12	3	2 1/2	9	15	19 1/2	5/8	5
14	4	3	11	16 1/2	20 1/2	3/4	6 5/8
16	4	3	11	17 1/2	22 1/2	3/4	6 5/8
18	6	3 1/2	13 1/2	19 1/2	24	3/4	6 5/8
20	6	3 1/2	13 1/2	21	25 1/2	3/4	6 5/8
24	6	4	13 1/2	23 1/2	28 1/2	3/4	6 5/8
30	6	4	13 1/2	27	31 1/2	3/4	6 5/8
32	6	4	13 1/2	28 1/2	32 1/2	3/4	6 5/8
36	6	4	13 1/2	30 1/2	34 1/2	3/4	6 5/8

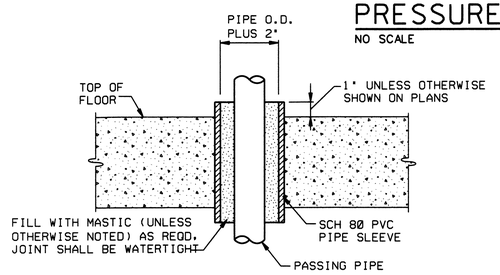
FLOOR PIPE SUPPORT 9 – TYP

NO SCALE



WALL SLEEVE 10 – TYP

NO SCALE



FLOOR SLEEVE 11 – TYP

NO SCALE

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Expires 12/31/07
Engineer Seal

HDR | FISHPRO

Design EED
Drawn KCP
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

STANDARD MECHANICAL DETAILS 2

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
- - -	- -	GM4	OF	

LRH_PF1_NEOH.dgn

GW PIPE SUPPLIES DEICEING WATER TO SURFACE WATER INTAKE

METERS LOCATED IN BURIED VAULTS

BURIED VAULT

FUTURE WELL SUPPLY

LOCATED AT TUCK FILL STATION

HH

METER LOCATED VAULT

SURFACE WATER INTAKE

LOSTINE RIVER

BURIED VAULT

FCV

WELL 1

WELL 2

UTILITY BUILDING
SEE SHEET PF2

COMPRERSSED AIR AND LOW PRESSURE AIR ROUTED TO AIR BACKWASH CLEANING SYSTEM AND BUBBLER SYSTEM

SURFACE WATER ROUTED TO IRRIGATION HYDRANTS

METERS LOCATED IN BURIED VAULTS

HATCHERY BUILDING
SEE SHEET PF3

BURIED VAULT

BURIED VAULT

YH

CLARIFIER

BURIED VAULT

WCS

SP

LOWER RACEWAYS

UPPER RACEWAYS

REMOVABLE PUMP

REUSE WATER CONTROL BOX

PIT TAG READER IN VAULT SEE NOTE

MH

SPAWNING BUILDING

ADULT HOLDING

ADULT HOLDING

TSP, (3) PLACES

TSP, (3) PLACES

BURIED VAULT

BURIED VAULT

BULK OXYGEN FACILTY

PRESSURE REGULATING VALVE STATION

BULK OXYGEN TANK

VAPORIZER

QUARANTINE RACEWAY

WASTE CLEANING STATION, TYPICAL

LOSTINE RIVER

LEGEND

CW	CHILLED WATER
GW	GROUND OR AERATED GROUND WATER
HW	HEATED WATER
O	OXYGEN
OF	OVERFLOW
SW	SURFACE WATER
WD	WASTE DRAIN
FR	FISH RELEASE
UW	UTILITY WATER
PB	PUMPBACK
RO	REUSE OVERFLOW
SW/RO	SURFACE WATER/REUSE OVERFLOW
RO/PB	REUSE OVERFLOW/PUMPBACK
GP	GLYCOL PIPING
	VALVE
• SP	STANDPIPE
NC	NORMALLY CLOSED
FD	FLOOR DRAIN
• TSP	TELESCOPING STANDPIPE
FCV	FLOW CONTROL VALVE

	SCREEN
	OVERFLOW WEIR
	WATER CONTROL GATE
	PUMP OR BLOWER
M	FLOW METER
	CHECK VALVE
	OVERFLOW WEIR w/ WATER CONTROL GATE BELOW
MH	FISH RELEASE MANHOLE
	TEMPERATURE SENSOR
	LEVEL SENSOR
	TEMPERATURE GAGE
	AIR RELEASE OR AIR/VACUUM VALVE
	DIFFERENTIAL PRESSURE GAGE
YH	YARD HYDRANT
HH	HOSE HYDRANT

NOTE:
DOMESTIC WATER, SANITARY SEWER, FORMALIN AND STORM DRAIN PIPING NOT SHOWN.

NOTE:
THE PIT READER IS TO BE CONSIDERED "NOT IN CONTRACT" OR "BY OTHERS" BY THE CONTRACTOR. THIS MAY BY ADDED AS AN ADDEDUM AT A LATER DATE.

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1987 EDWARD E. DONAHUE
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Engineer Seal

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Design LKP
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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

PROCESS FLOW DIAGRAM SITE PLAN

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
___	__	PF1	OF	

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GROUND WATER AND SURFACE WATER HEADTANKS

CHILLED WATER BUFFER TANK

HEATED WATER BUFFER TANK

CYCLONE ROOM 203

GW FROM WELLS, CONTINUED ON SHEET PF1

PACKED COLUMNS

GW TRUCK FILL

SW TRUCK FILL

GW

SW

HYDRO-CYCLONE, (4) PLACES

PNEUMATICALLY ACTUATED VALVES, (4) PLACES. COMPRESSED AIR SUPPLIED BY AIR COMPRESSOR LOCATED IN CYCLONE ROOM. OPEN WHEN BOOSTER PUMP IS RUNNING.

HYDRO-CYCLONE BOOSTER PUMP (4) PLACES

SW, FROM SURFACE WATER INTAKE, CONTINUED ON SHEET PF1

WATER TREATMENT ROOM 202

3-WAY TEMPERATURE CONTROL VALVE, PLC CONTROLLED

ELECTRICALLY ACTUATED VALVE, OPEN AT AIR TEMPERATURE BELOW 15 DEG F, PLC CONTROLLED

HEAT EXCHANGER

FLUID COOLER

CHILLER

UV SYSTEM

AIR SEPERATOR w/ AIR VENT

STRAINER

ELECTRICALLY ACTUATED VALVE, OPEN AT AIR TEMPERATURE ABOVE 15 DEG F, PLC CONTROLLED

GLYCOL BUFFER TANK

FROM BULK OXYGEN STORAGE, CONTINUED ON SHEET PF1

EXPANSION TANK

STRAINER

FLOW METERS

GLYCOL FILL TANK AND PUMP

TO HOSE BIBBS LOCATED IN WATER TREATMENT ROOM

UTILITY WATER BOOSTER PUMP w/ HYDRONEUMATIC TANK

FUTURE WATER HEATING SYSTEM

UW, CONTINUED ON SHEET PF1

CW HW SW GW

TO HATCHERY BUILDING, CONTINUED ON SHEET PF1

RO OF SW

TO SITE, CONTINUED ON SHEET PF1

NOTE:

REFER TO SHEET PF1 FOR LEGEND.

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BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

PROCESS FLOW DIAGRAM UTILITY BUILDING

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
___	__	PF2	OF	

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CW HW SW GW

PIPING CONTINUED ON SHEET PF1

OXYGEN PIPING CONTINUED ON SHEET PF1

FUTURE HW SUPPLY VALVE

FROM FORMALIN ROOM FLOOR DRAIN

FD

FD

DOUBLE SINK

ROUTE TO VENT

AIR RELEASE VALVES INSTALLED (4) PLACES ALONG PIPING LOOPS

(7) DOUBLE STACK INCUBATORS

INCUBATION SUPPLY TROUGH

(7) DOUBLE STACK INCUBATORS

INCUBATION SUPPLY TROUGH

EGG PICKER DRAIN HOSE ROUTED TO TRENCH DRAIN

EGG PICKER

FLOOR TRENCH DRAIN

ROUTE TO VENT

(12) PAIRS OF REARING TANKS TOTAL EAST SIDE OF BUILDING

ROUTE TO VENT

RO PIPING CONTINUED ON SHEET PF1

INCUBATION ROOM 115

(7) SINGLE STACK INCUBATORS

INCUBATION SUPPLY TROUGH

STANDPIPE AT WASTE DRAIN, TYPICAL

(7) SINGLE STACK INCUBATORS

INCUBATION SUPPLY TROUGH

STANDPIPE DRAINS, TYPICAL AT REARING TANKS

(10) PAIRS OF REARING TANKS TOTAL WEST SIDE OF BUILDING

WD PIPING CONTINUED ON SHEET PF1

QUICK DISCONNECT OXYGEN CONNECTION AT EACH PAIR OF REARING TANKS

GW AND SW CONNECTION FOR TAGGING TRAILER

INCUBATION ROOM 114

WET ROOM 116

PRODUCTION ROOM 117

FD

FD

OF PIPING CONTINUED ON SHEET PF1

NOTES:

1. SEE SHEET PF1 FOR LEGEND.
2. DOMESTIC WATER, SANITARY SEWER, FORMALIN AND STORM DRAINAGE PIPING NOT SHOWN.

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NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

PROCESS FLOW DIAGRAM HATCHERY BUILDING

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
---	--	PF3	OF	

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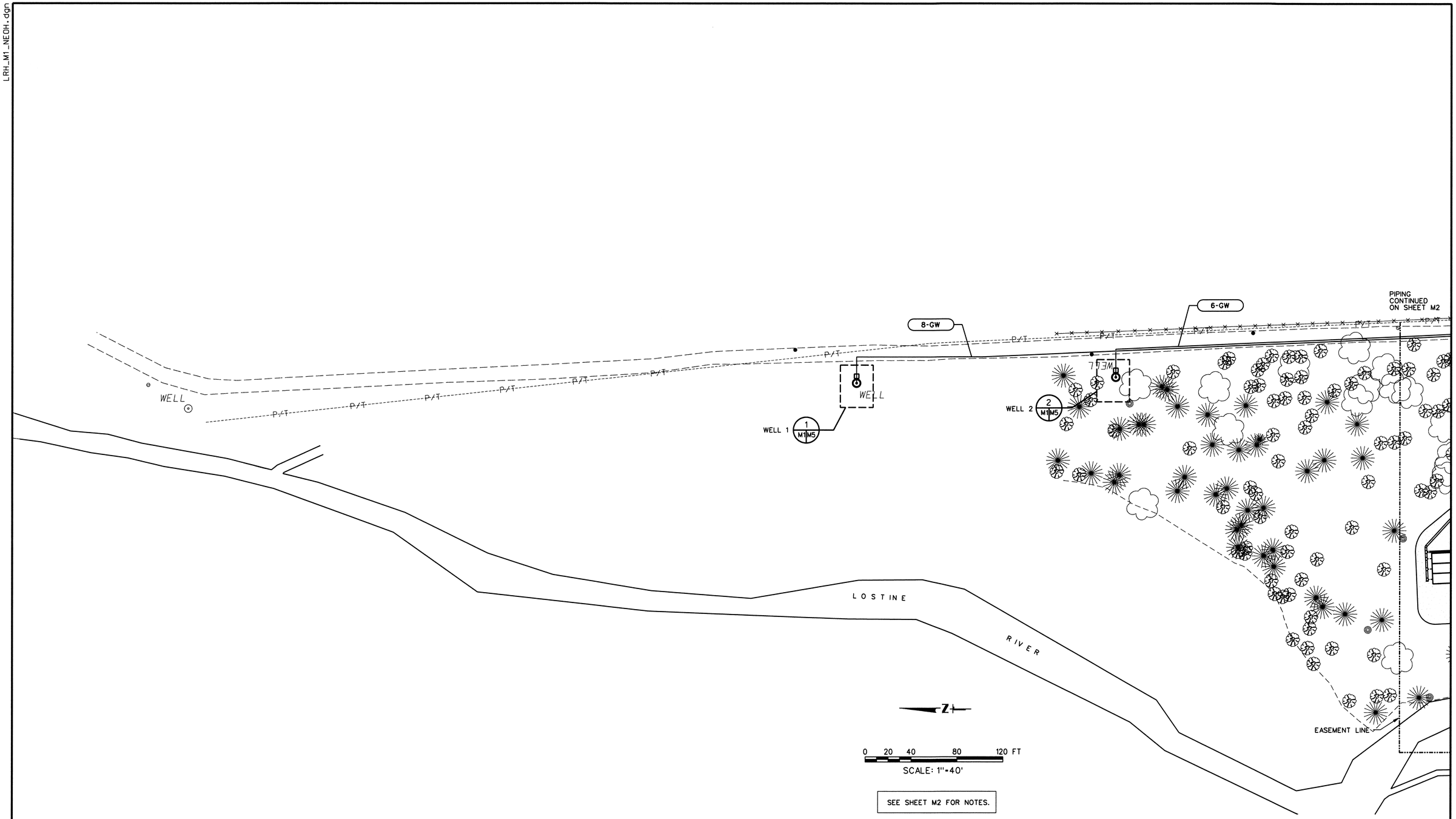

SEE SHEET M2 FOR NOTES.

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BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

WELL FIELD PIPING PLAN

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MATCHLINE SHEET M3

PARTIAL PLAN 4 M2/M57

12-PB

PIPING CONTINUED ON SHEET C11

6-GW

8-GW

30-SW

INSULATE 24" SW PIPING THAT HAS LESS THAN 3' OF COVER WITH 6" LAYER OF INSULATION SUITABLE FOR UNDERGROUND INSTALLATION. AT BEND ELBOW DOWNWARD UNTIL THERE IS 3' OF COVER OVER PIPE AND THEN ELBOW HORIZONTALLY. SLOPE PIPE FROM THIS POINT TO UPPER RACEWAY AND TO CONTROL BOX.

12-OF

12-OF

20-RO

SEE NOTE 8

24-SW

2 GM4 HOSE HYDRANT

HH

12-GW

6-CW

6-HW

UTILITY BUILDING

1-UW

SEPTIC DRAIN FIELD

14-GW

14-SW

3 M2/M57 RACEWAY SUPPLY METER VAULT

8-OF

18-SW

3-UW

10" BURIED VALVE 2 GM3

2" BURIED VALVE 2 GM3

ADULT HOLDING SUPPLY METER VAULT 4 M2/M57

10-SW

12-PB

3-UW

2-SW

12-OF

12-WD

YH

18-SW/RO

18-SW/RO

2-UW

6-WD

2-UW

6-WD

20-RO

SEE NOTE 8

SPAWNING FACILITY

PUMP BACK STATION 1 M2/M57

12-OF

CLARIFIER

12-WD

12-OF

30-RO

2-UW

YH

18-SW/RO

12-SW/RO

ADULT HOLDING PONDS

ADULT HOLDING PONDS

30-OF

CONTROL BOX

EASEMENT LINE

YH

36-CFD

2-UW

18-RO

YARD HYDRANT, TYPICAL 6 GM3

18-FR

FISHWAY

MATCHLINE SHEET M3

EASEMENT LINE

LOSTINE RIVER

N

0 10 20 40 60 FT

SCALE: 1"=20'

NOTES:

1. REFER TO MECHANICAL AND STRUCTURAL DRAWINGS FOR PIPE INVERTS AT STRUCTURES.
2. PIPING SHALL BE SLOPED AT A CONTINUOUS AND CONSTANT SLOPE FROM STRUCTURE TO STRUCTURE UNLESS OTHERWISE NOTED. CONSULT PROJECT ENGINEER IF CONFLICTS ARE FOUND.
3. WHERE INVERTS ARE NOT NOTED ON STRUCTURAL OR MECHANICAL DRAWINGS, PIPING SHALL HAVE A MINIMUM OF 3' OF COVER OVER TOP OF PIPE.
4. SANITARY SEWER AND POTABLE WATER PIPING NOT SHOWN. REFER TO SHEETS C5, C15, C16, C17 AND M56 FOR THIS PIPING.
5. OXYGEN PIPING NOT SHOWN, REFER TO SHEET M44 FOR THIS PIPING.
6. STORM DRAIN PIPING NOT SHOWN, REFER TO SHEET C4 FOR THIS PIPING.
7. REFER TO PIPE SCHEDULE ON SHEET GM1 FOR PIPE MATERIALS, UNLESS OTHERWISE NOTED.
8. PIPE NOTED SHALL UTILIZE ONLY PIPE SYSTEM 8, 12 OR 14 AS INDICATED IN THE PIPE SCHEDULE, SHEET GM1.

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HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

SITE PIPING PLAN HATCHERY AREA (NORTH)

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
---	--	M2	OF	

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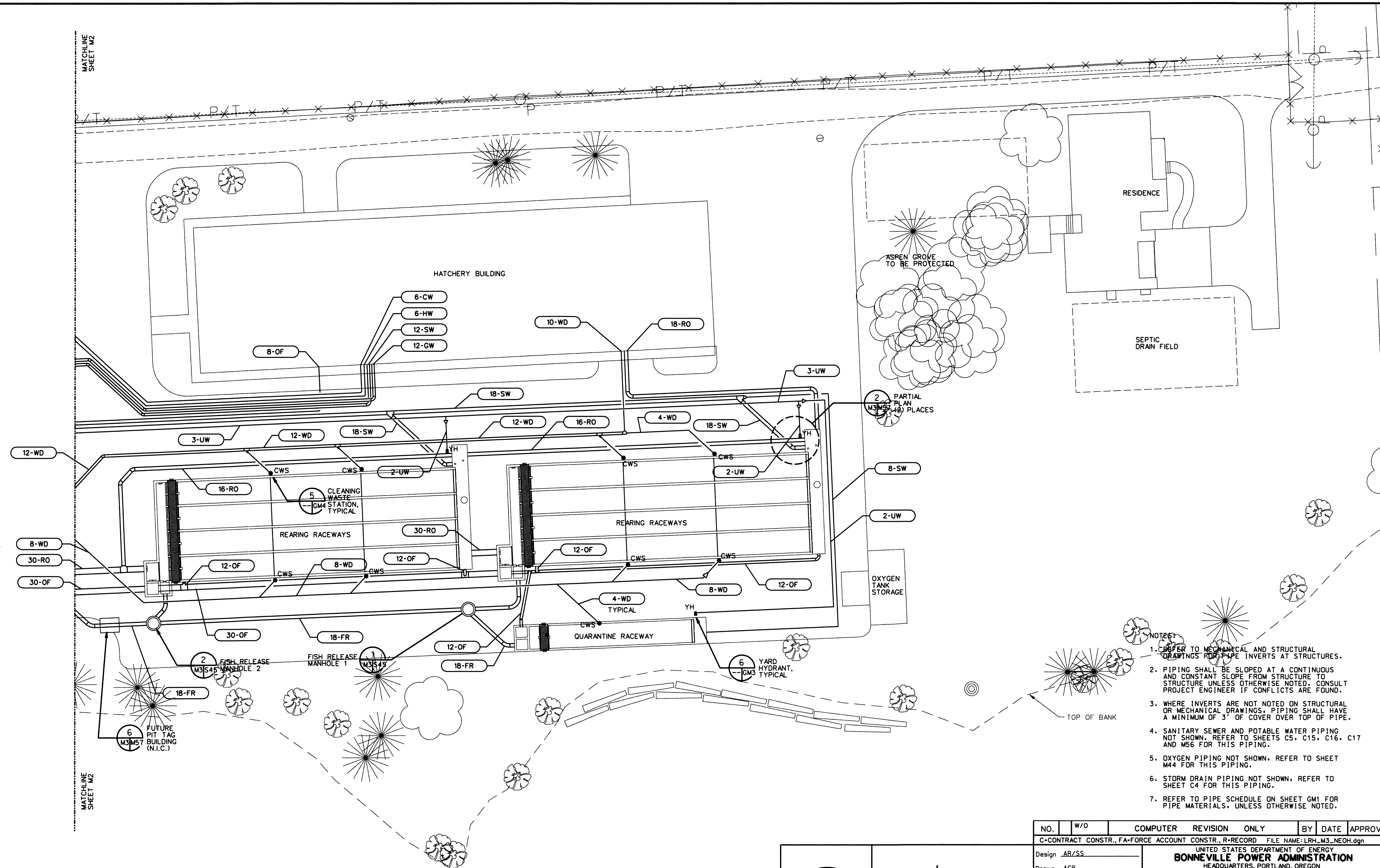

NOTES:

1. REFER TO MECHANICAL AND STRUCTURAL DRAWINGS FOR PIPE INVERTS AT STRUCTURES.
2. PIPING SHALL BE SLOPED AT A CONTINUOUS AND CONSTANT SLOPE FROM STRUCTURE TO STRUCTURE UNLESS OTHERWISE NOTED. CONSULT PROJECT ENGINEER IF CONFLICTS ARE FOUND.
3. WHERE INVERTS ARE NOT NOTED ON STRUCTURAL OR MECHANICAL DRAWINGS, PIPING SHALL HAVE A MINIMUM OF 3' OF COVER OVER TOP OF PIPE.
4. SANITARY SEWER AND POTABLE WATER PIPING NOT SHOWN. REFER TO SHEETS C5, C15, C16, C17 AND M56 FOR THIS PIPING.
5. OXYGEN PIPING NOT SHOWN. REFER TO SHEET M44 FOR THIS PIPING.
6. STORM DRAIN PIPING NOT SHOWN. REFER TO SHEET C4 FOR THIS PIPING.
7. REFER TO PIPE SCHEDULE ON SHEET GM1 FOR PIPE MATERIALS, UNLESS OTHERWISE NOTED.

0 10 20 40 60 FT
SCALE: 1"=20'

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BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

SITE PIPING PLAN
HATCHERY AREA (SOUTH)

SERIAL	SOURCE	SHEET NO.	SHEET OF	REVISION
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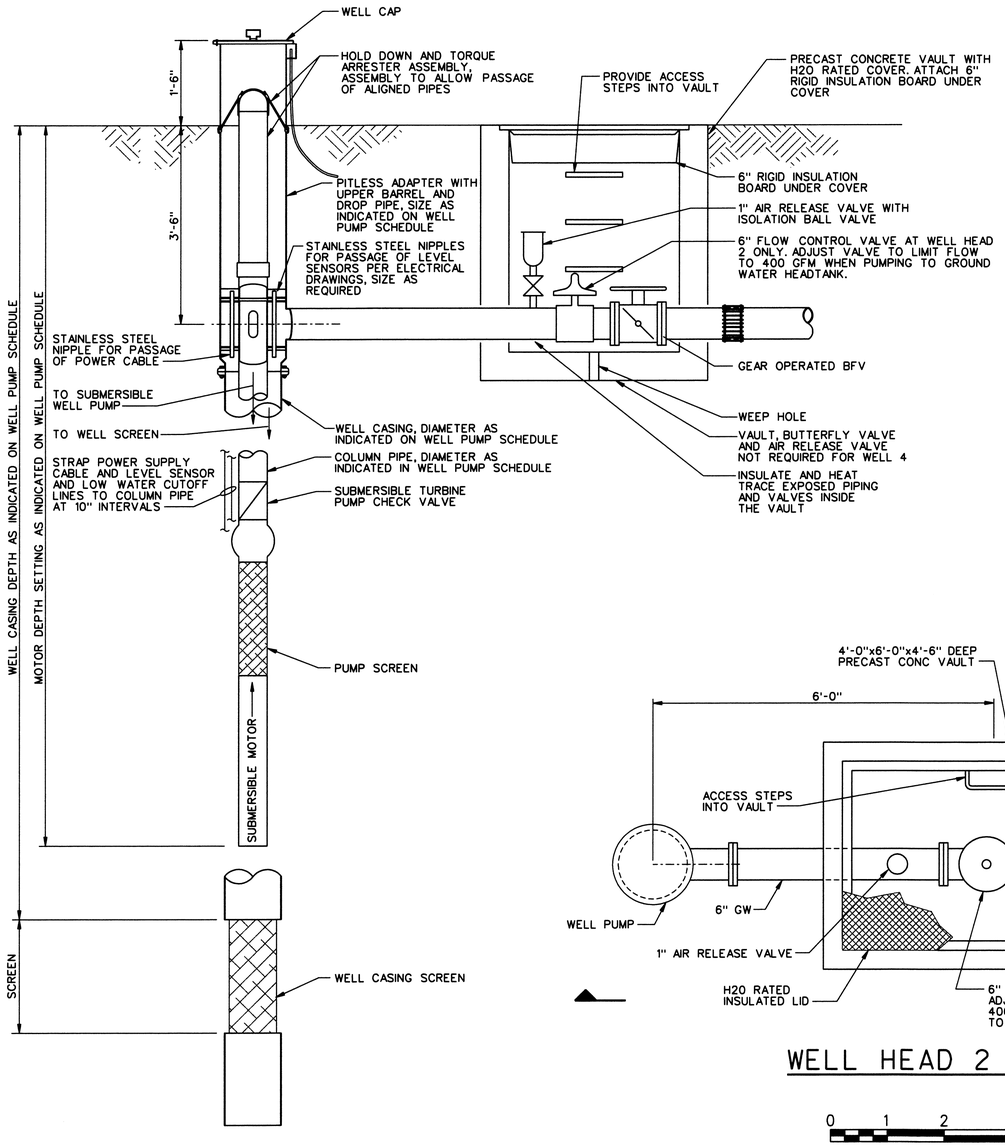
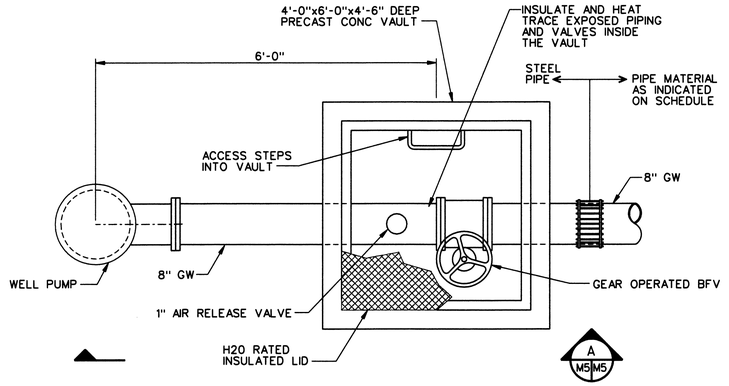


WELL HEAD SECTION (A M5|M5)

0 1 2 4 FT

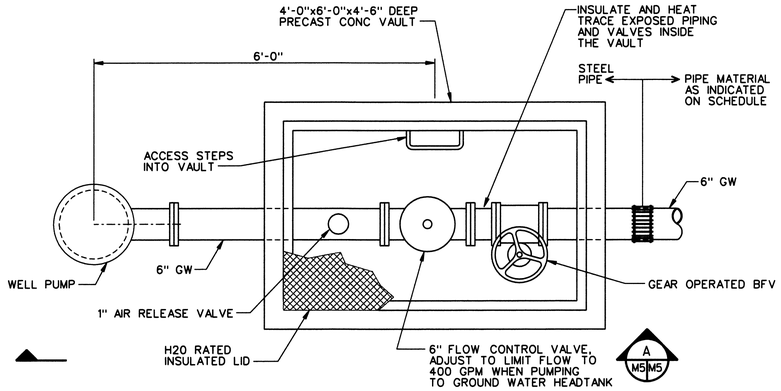
SCALE: 3/4"=1'-0"



WELL HEAD 1 PLAN (1 M1|M5)

0 1 2 4 FT

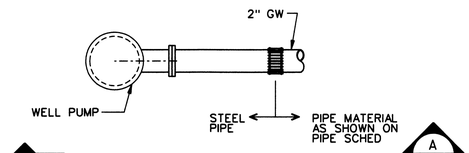
SCALE: 3/4"=1'-0"



WELL HEAD 2 PLAN (2 M1|M5)

0 1 2 4 FT

SCALE: 3/4"=1'-0"



WELL HEAD 4 PLAN (3 M56|M5)

0 1/2 1 2 FT

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

WELL PUMP SCHEDULE

		P-1	P-2	P-3	P-4
WELL NO					
WELL CASING INFORMATION	WELL CASING DIAMETER (IN) *	12	6	****	6
	CASING DEPTH TO SCREEN OR CASING SIZE CHANGE (FT) **	72	79	****	105
PUMP INFORMATION	PUMP TYPE	SUBMERSIBLE TURBINE	SUBMERSIBLE TURBINE	****	SUBMERSIBLE TURBINE
	NUMBER OF STAGES	1	4	****	5
	IMPELLER MATERIAL	STAINLESS STEEL	STAINLESS STEEL	****	SILICON BRONZE
	MOTOR DEPTH (FT) ***	70	77	****	100
	COLUMN PIPE DIAMETER (IN)	6	4	****	2
	DISCHARGE PIPE DIAMETER (IN)	8	6	****	2
	MOTOR HORSEPOWER	40	30	****	5
	MOTOR SERVICE FACTOR	1.15	1.15	****	1.15
	MOTOR VOLTAGE	460	460	****	460
	MOTOR PHASE	3	3	****	3
	RPM	3450	3450	****	3550
	SHUT OFF HEAD (FT)	201	315	****	420
	DESIGN FLOW (GPM)	800	400	****	40
	HEAD AT DESIGN FLOW (FT)	148	210	****	306
	EFFICIENCY AT DESIGN FLOW	85%	74%	****	63
	MAXIMUM FLOW (GPM)	1200	550	****	65
	HEAD AT MAXIMUM FLOW (FT)	94	125	****	105
	EFFICIENCY AT MAXIMUM FLOW	75%	60%	****	43
	MANUFACTURER AND MODEL NO OR EQUIVALENT	GOULDS 9RCLC	GOULDS 6DHC	****	GOULDS 4OGS

* CONTRACTOR TO VERIFY CASING DIAMETER PRIOR TO INSTALLATION AND PROCUREMENT OF PUMPS.
** CASING DEPTH IS MEASURED FROM FINISHED GRADE TO TOP OF CASING SCREEN. CONTRACTOR SHALL VERIFY PRIOR TO INSTALLATION AND PROCUREMENT OF PUMPS.
*** MOTOR DEPTH IS MEASURED FROM FINISHED GRADE TO THE BOTTOM OF THE MOTOR.
****DESIGN PARAMETERS FOR WELL P-3 TO BE DETERMINED IN FUTURE

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Expires 12/31/07
Engineer Seal

HDR | FISHPRO

Design LP
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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

WELL HEAD PLANS SECTION AND SCHEDULE

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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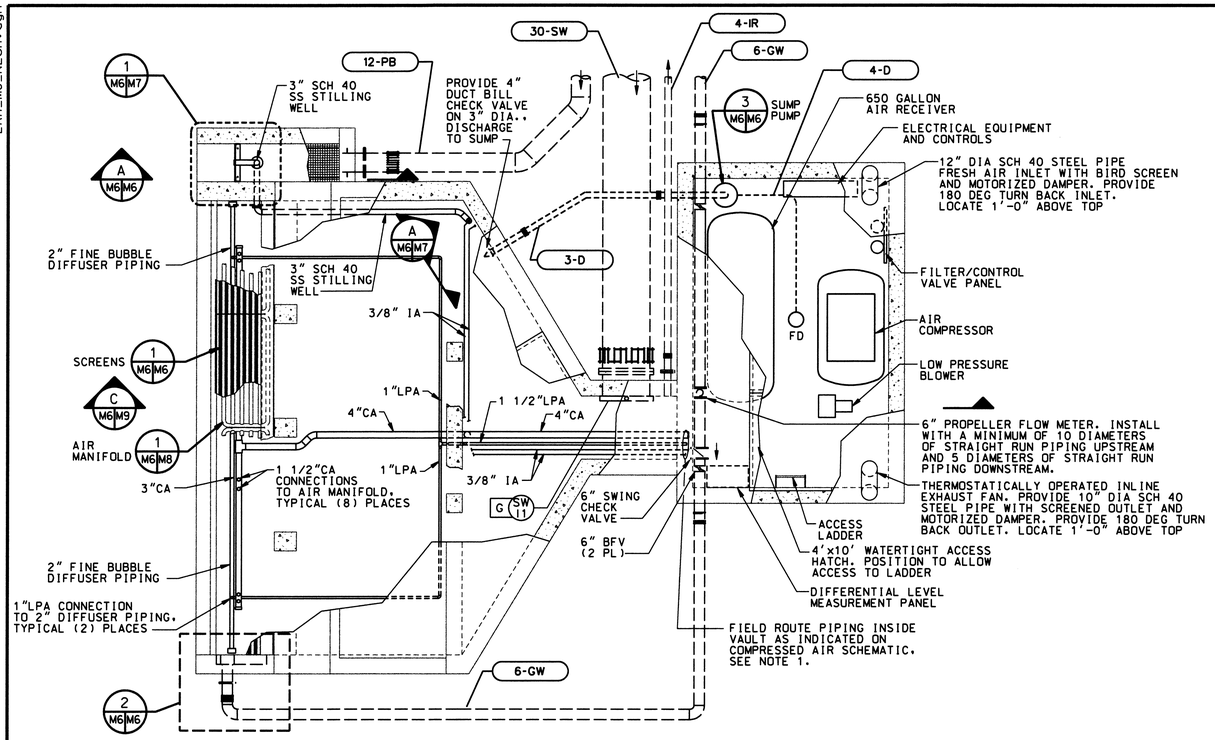
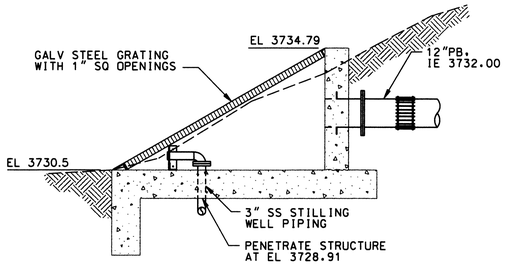


INTAKE PLAN

1 / M6

0 4 8 12 FT

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

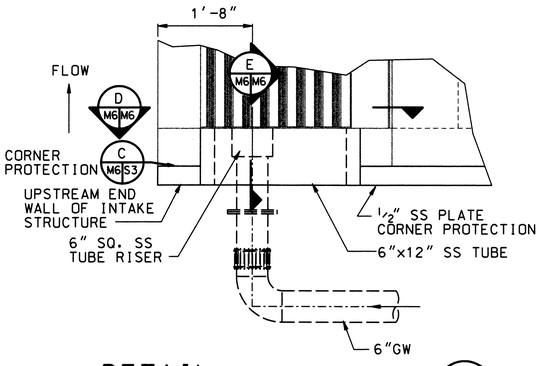


SECTION

A / M6|M6

0 2 4 8 FT

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

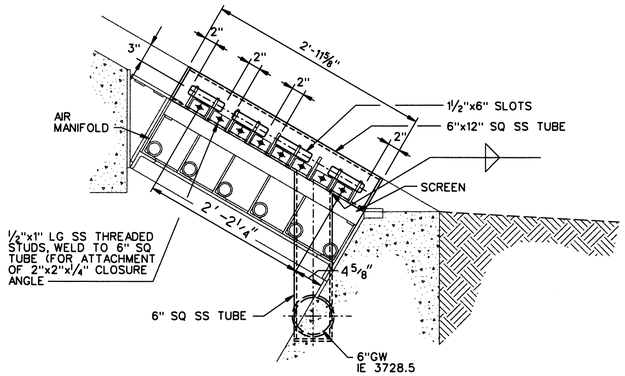


DETAIL

2 / M6|M6

0 1 2 4 FT

SCALE: 3/4"=1'-0"

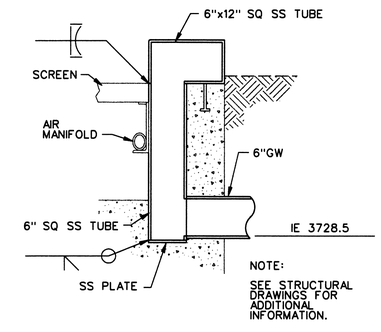


SECTION

D / M6|M6

0 1 2 3 FT

SCALE: 1"=1'-0"

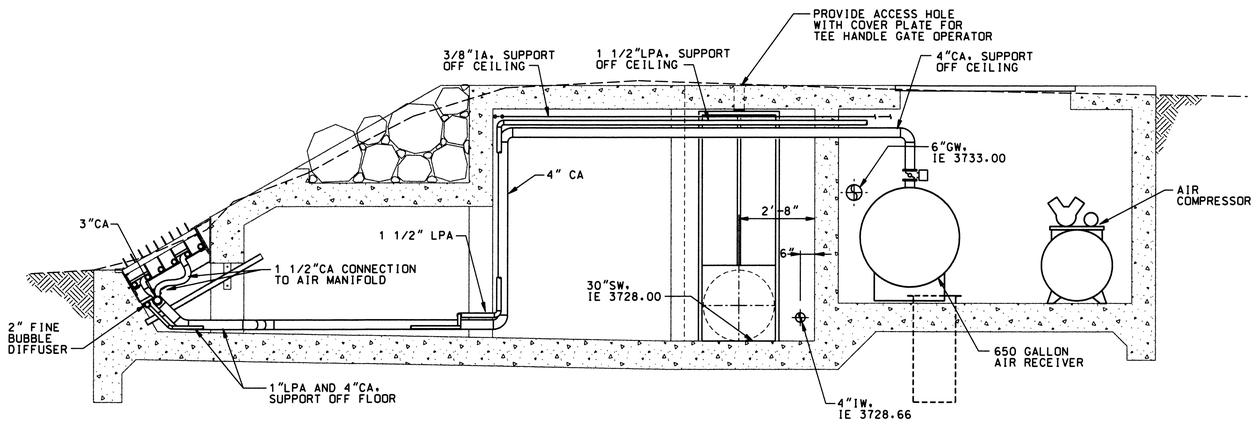


SECTION

E / M6|M6

0 1 2 3 FT

SCALE: 1"=1'-0"

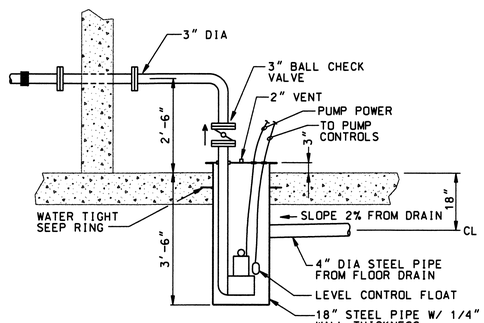


INTAKE SECTION

C / M6|M6

0 2 4 8 FT

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



SUMP PUMP

3 / M6|M6

0 1 2 4 6 FT

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

NOTES:

1. PIPING INSIDE EQUIPMENT VAULT SHALL BE INSTALLED TO MEET THE REQUIREMENTS OF THE COMPRESSED AIR SCHEMATIC SHOWN ON SHEET M-___. PIPING SHALL BE SUPPORTED AT WALLS AND CEILING 5' OC AND AT ALL BENDS, VALVES, FILTERS, DRIERS AND TERMINATION POINTS.
2. PIPE ROUTING IS APPROXIMATE AND MAY BE ADJUSTED AS REQUIRED IN FIELD.
3. EQUIPMENT ARRANGEMENT SHOWN IS APPROXIMATE AND DOES NOT SHOW ALL PIPING AND VALVES REQUIRED. ARRANGEMENT MAY BE ADJUSTED AS REQUIRED TO PROVIDE EQUIPMENT ACCESS AND CONFORM TO APPLICABLE LOCAL AN NATIONAL CODES, INCLUDING BUT NOT LIMITED TO BUILDING CODES, MECHANICAL CODES AND ELECTRICAL CODES.
4. LABELS SHALL BE PROVIDED FOR ALL EQUIPMENT.
5. PROVIDE A VALVED LOW POINT DRAIN AT ALL LOW POINTS WHETHER SHOWN OF NOT ON THE PROCESS AND INSTRUMENTATION DIAGRAM.
6. PIPING ABOVE BUILDING ELECTRICAL PANEL SHALL CONFORM TO NEC 110.26F (1) (b).

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1987 EDWARD E. DONHAE
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Design LP
Drawn SLS
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

INTAKE STRUCTURE AIR BURST SYSTEM PLAN

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
___	__	M6	OF	

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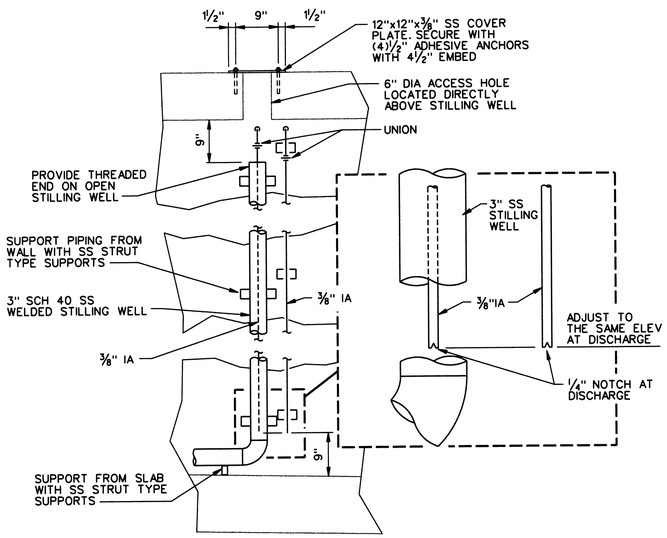
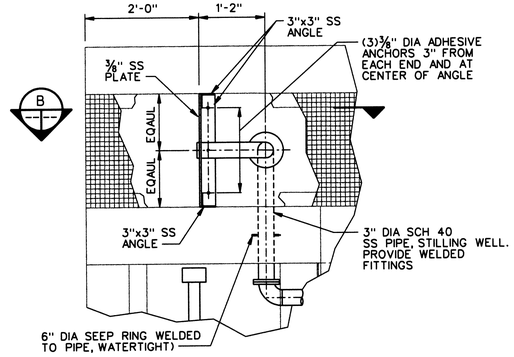


SECTION A (M6|M7)

0 1 2 4 FT

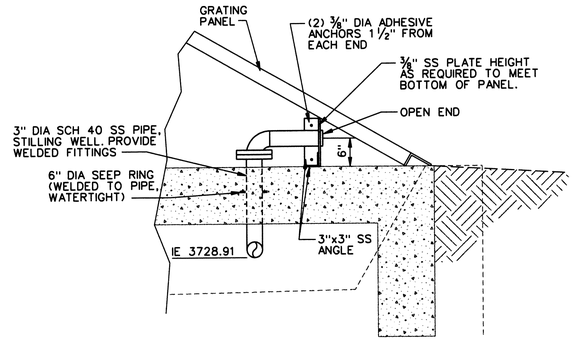
SCALE: ¾"=1'-0"



PLAN 1 (M6|M7)

0 1 2 4 FT

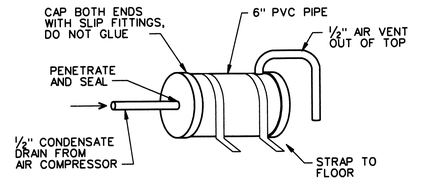
SCALE: ¾"=1'-0"



SECTION B (---|---)

0 1 2 4 FT

SCALE: ¾"=1'-0"



CONDENSATE COLLECTOR 2 (M59|M7)

NO SCALE

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Expires 12/31/07
Engineer Seal

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Design LKP
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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
INTAKE SCREEN
AIR BURST SYSTEM
SECTIONS AND DETAILS 1

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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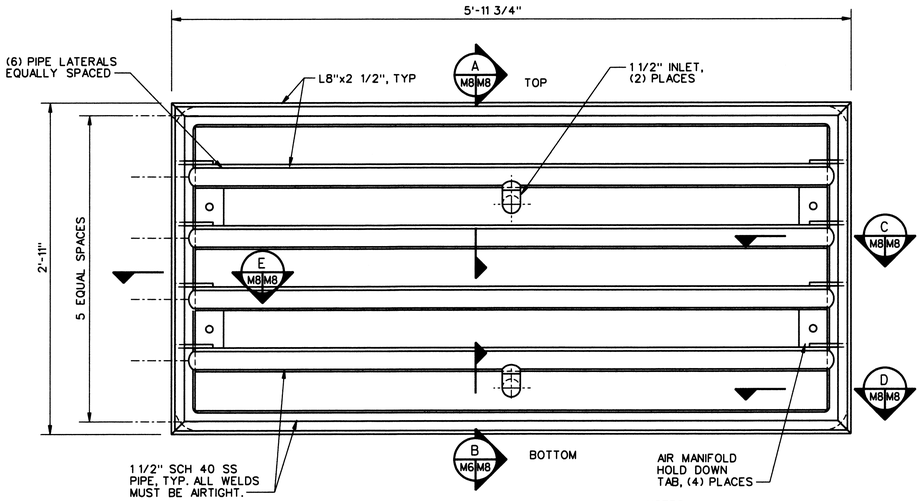


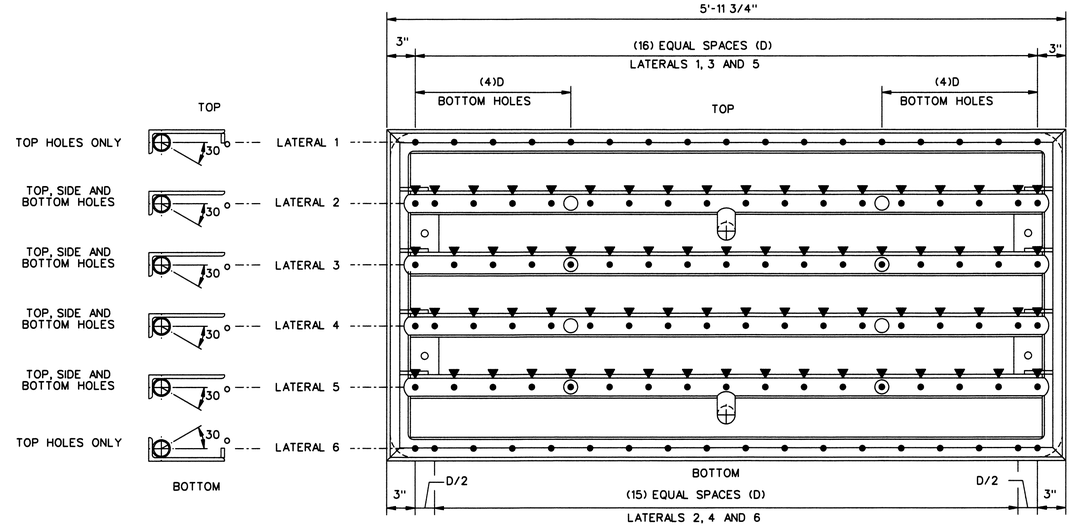
MANIFOLD PLAN 1 M8|M8

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

NOTES:

1. SEE DETAIL, 2 ON THIS SHEET FOR SPACING AND ORIENTATION.
2. L8"x2 1/2"x3/8" TYPE 304 SS IS A SPECIAL SECTION TO AVOID WELDED FABRICATION



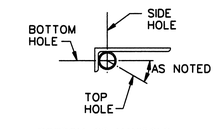
MANIFOLD HOLE SPACING AND ORIENTATION DETAIL 2 M8|M8

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

LEGEND

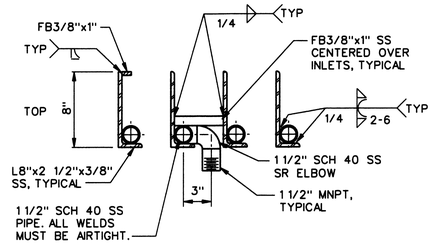
- ● - TOP HOLES
- ▼ - SIDE HOLES
- ○ - BOTTOM HOLES



HOLE ORIENTATION

NOTE:

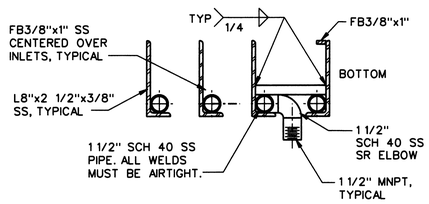
ALL AIR DISTRIBUTION HOLES SHALL BE 1/8" DIA.



SECTION A M8|M8

0 ½ 1 2 FT

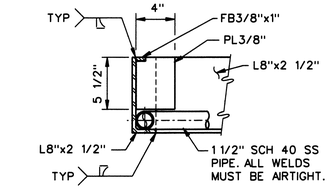
SCALE: 1½"=1'-0"



SECTION B M8|M8

0 ½ 1 2 FT

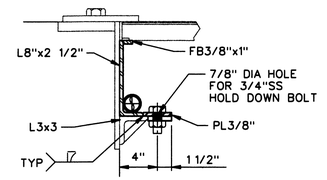
SCALE: 1½"=1'-0"



SECTION C M8|M8

0 ½ 1 2 FT

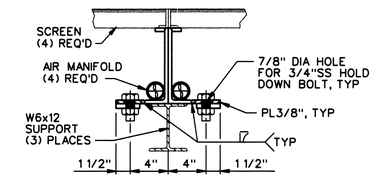
SCALE: 1½"=1'-0"



SECTION D M8|M8

0 ½ 1 2 FT

SCALE: 1½"=1'-0"



SECTION E M8|M8

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

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Drawn	SLS
Chkd	EED
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Rec	
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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

INTAKE SCREEN AIR BURST MANIFOLD PLAN, SECTIONS AND DETAILS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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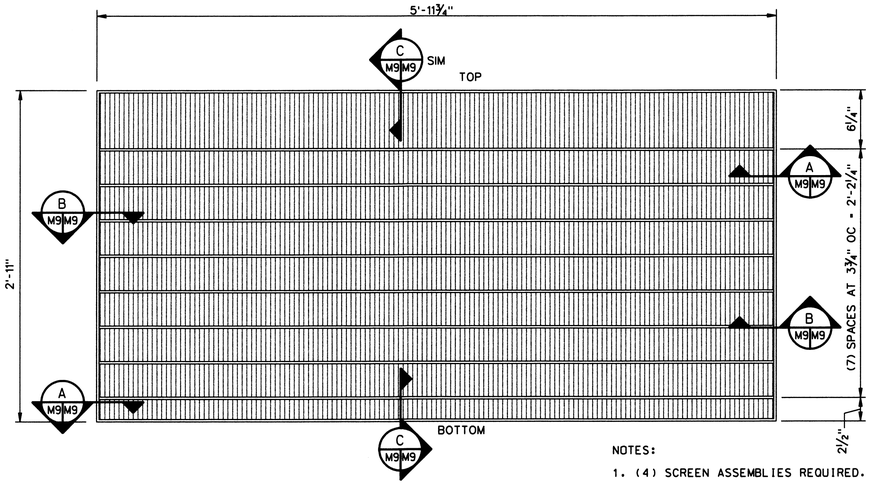


MANIFOLD PLAN

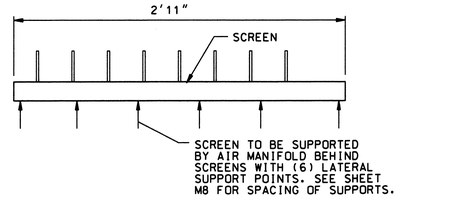
1 M6 M9

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

NOTES:

1. (4) SCREEN ASSEMBLIES REQUIRED.
2. SPACING OF SCREEN V-WIRE IS 1.75mm CLEAR.
3. TOTAL DESIGN HEAD FOR SCREEN IS 6 FT OF WATER WITH TOTAL OCCLUSION. REFER TO SCREEN SUPPORT DETAILS.
4. SIZE AND SPACING OF SUPPORT RODS AND BARS PER MANUFACTURERS DESIGN.
5. PROVIDE HOLES AS REQUIRED IN RIBS TO ALLOW INSTALLATION AND REMOVAL.

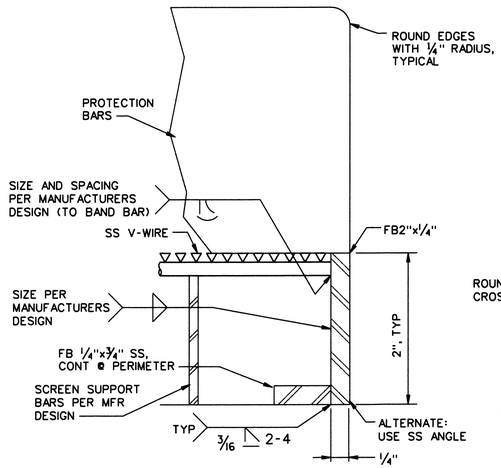


SCREEN SUPPORT DETAIL

2 M9 M9

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

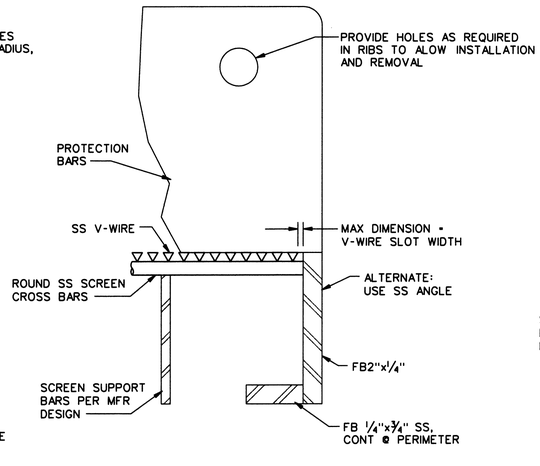


SECTION

A M9 M9

0 1" 2" 3"

SCALE: 1"=1'-0"

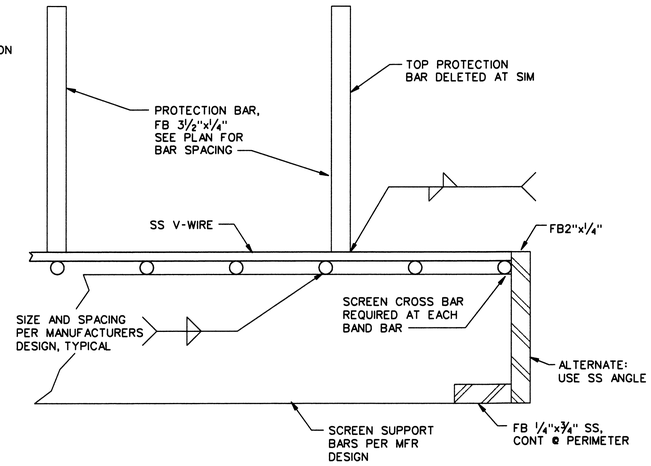


SECTION

B M9 M9

0 1" 2" 3"

SCALE: 1"=1'-0"



SECTION

C M9 M9 SIM NOTED

0 1" 2" 3"

SCALE: 1"=1'-0"

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Design JDN
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BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

INTAKE SCREEN PLAN AND SECTIONS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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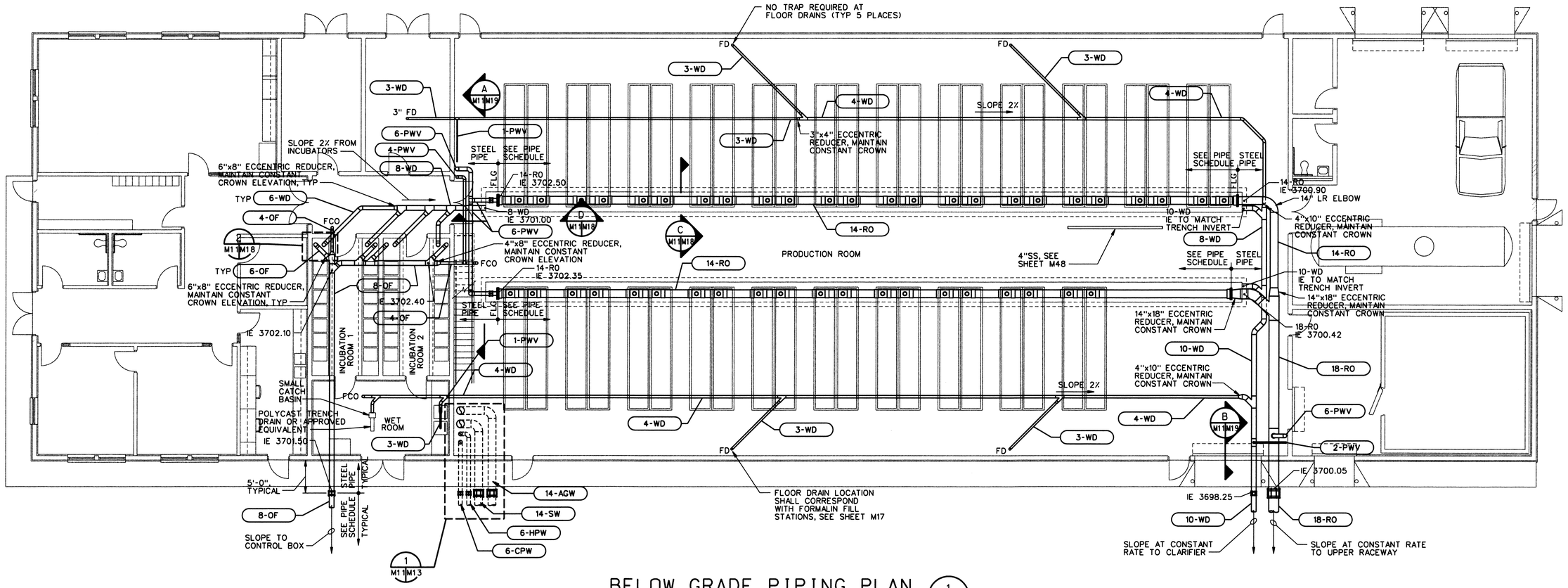

BELOW GRADE PIPING PLAN

0 4 8 12 16 20 24 FT

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

NOTES:

1. POTABLE WATER AND SANITARY SEWER PIPING NOT SHOWN. REFER TO SHEET M40 FOR THIS PIPING.
2. OXYGEN PIPING NOT SHOWN. REFER TO SHEET M44 FOR THIS PIPING.
3. PIPING ABOVE THE FLOOR NOT SHOWN. REFER TO SHEET M12 FOR PIPING ABOVE THE FLOOR.

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C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M11_NEOH.dgn

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Rec
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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
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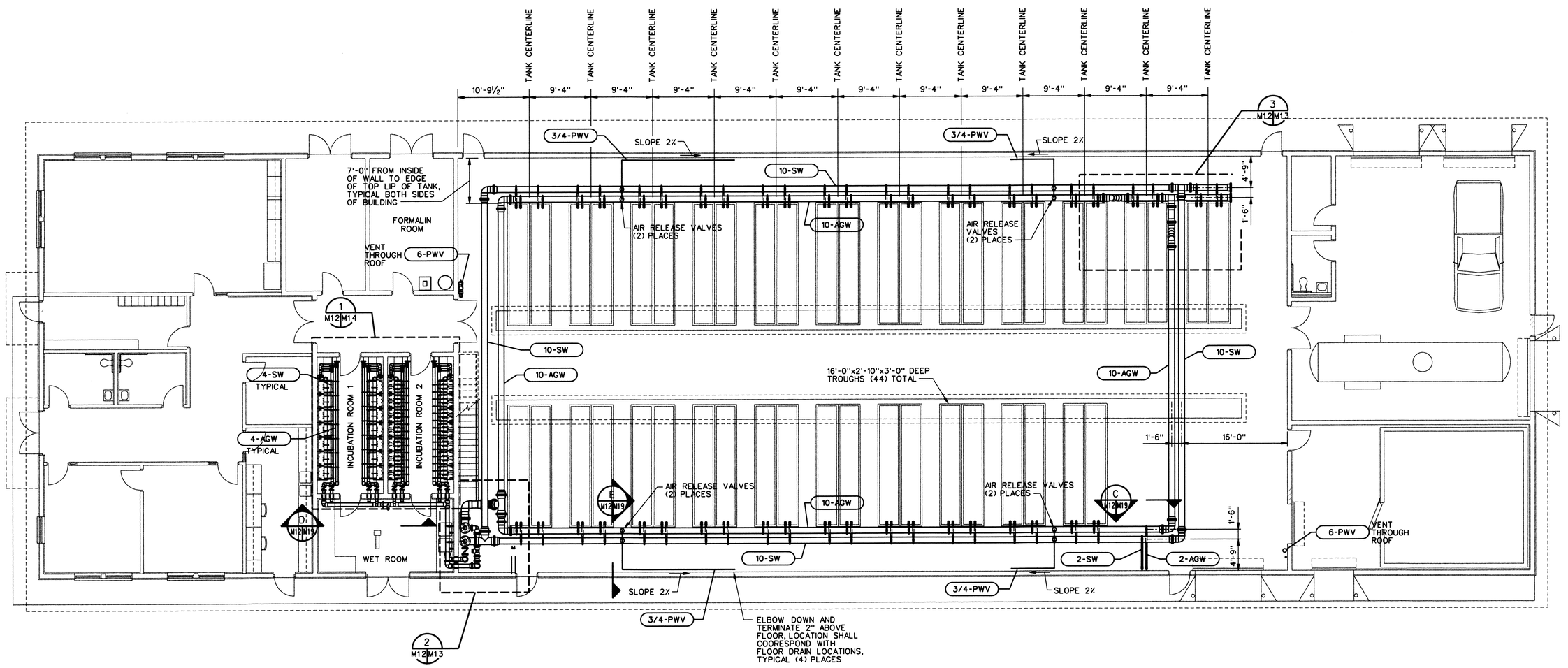
NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
HATCHERY BUILDING
BELOW GRADE
PRODUCTION PIPING

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
___	__	M11	OF	



ABOVE GRADE PIPING PLAN

1 / M12

0 4 8 12 16 20 24 FT

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

NOTES:

1. PIPING SUPPORTS ARE NOT SHOWN. 10" LOOP PIPING IN PRODUCTION ROOM SHALL BE SUPPORTED WITH LATERLLY BRACED TRAPEZE HANGERS AT BENDS, TERMINATION POINTS AND BETWEEN EACH PAIR OF TANKS AT 9'-4" OC.
2. REFER TO SHEET M11 FOR BELOW GRADE PROCESS WATER PIPING.
3. REFER TO SHEET M48 FOR POTABLE PIPING INSIDE BUILDING.
4. REFER TO SHEETS M14, M16, M17 AND M18 FOR FORMALIN PIPING.
5. REFER TO SHEET M44 FOR OXYGEN PIPING. SUPPORT OXYGEN PIPING IN PRODUCTION ROOM FROM 10"SW AND 10"GW LOOP PIPE HANGERS.

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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

HATCHERY BUILDING
ABOVE GRADE
PRODUCTION PIPING

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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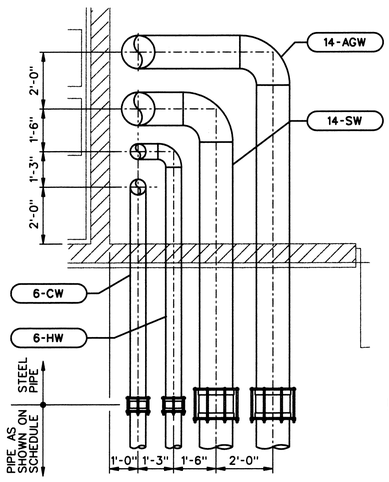
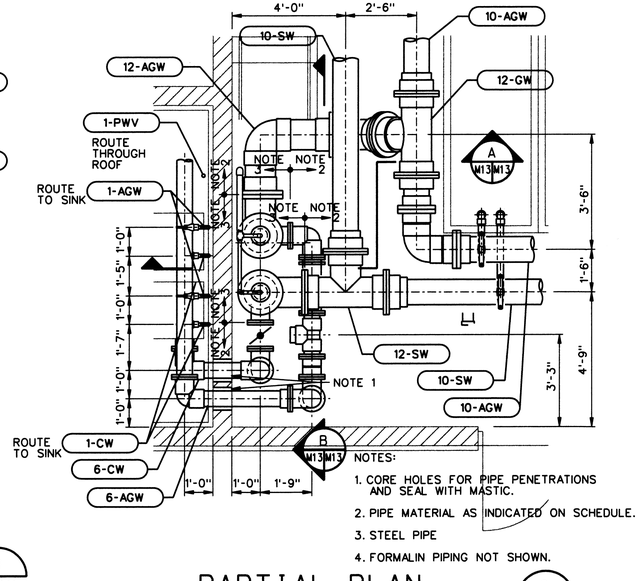


PARTIAL PLAN 1 M11|M13

0 2 4 8 FT

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



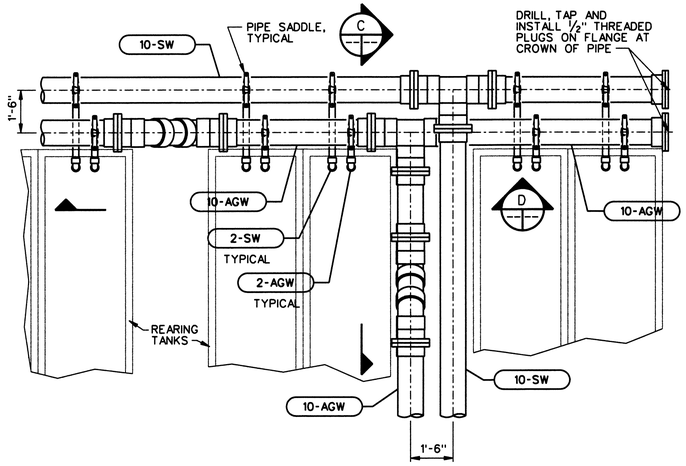
NOTES:

1. CORE HOLES FOR PIPE PENETRATIONS AND SEAL WITH MASTIC.
2. PIPE MATERIAL AS INDICATED ON SCHEDULE.
3. STEEL PIPE
4. FORMALIN PIPING NOT SHOWN.

PARTIAL PLAN 2 M12|M13

0 2 4 8 FT

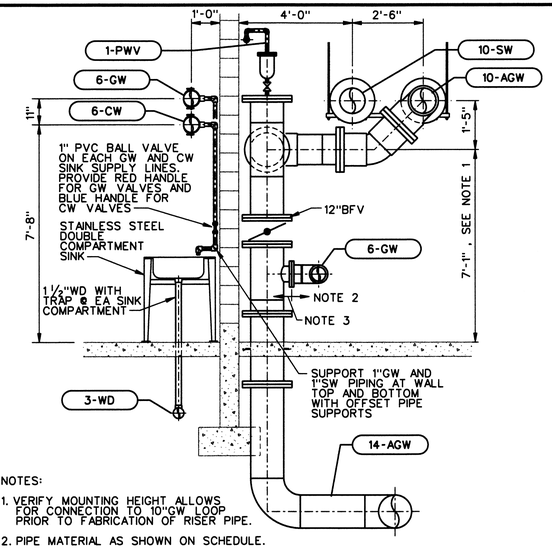
SCALE: 3/8"=1'-0"



PARTIAL PLAN 3 M12|M13

0 2 4 8 FT

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



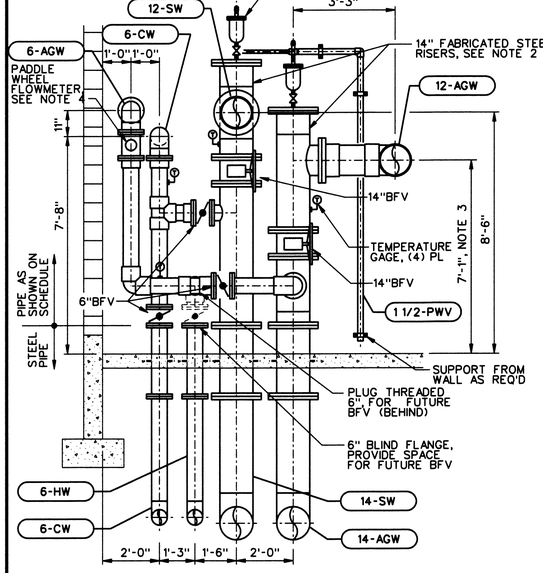
NOTES:

1. VERIFY MOUNTING HEIGHT ALLOWS FOR CONNECTION TO 10"GW LOOP PRIOR TO FABRICATION OF RISER PIPE.
2. PIPE MATERIAL AS SHOWN ON SCHEDULE.
3. STEEL PIPE.

SECTION A M13|M13

0 2 4 8 FT

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



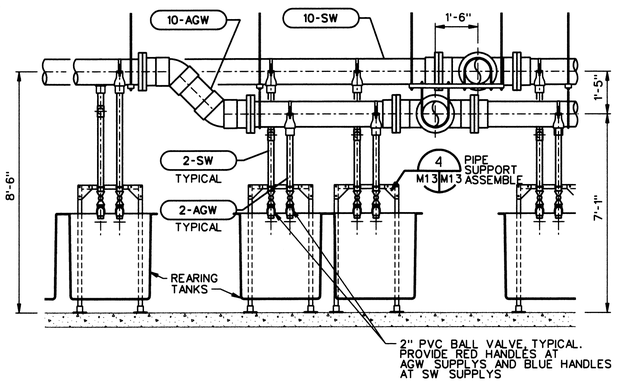
NOTES:

1. ALL BUTTERFLY VALVES SHALL BE GEAR OPERATED WITH HANDWHEELS.
2. PROVIDE FLANGED CONNECTIONS FOR ALL 6" AND 12" BRANCHES. PIPING MATERIAL TO BE AS INDICATED ON SCHEDULE DOWNSTREAM OF CONNECTIONS.
3. VERIFY MOUNTING HEIGHT ALLOWS FOR CONNECTION TO 10"GW LOOP PRIOR TO FABRICATION OF RISER PIPE.
4. PADDLE WHEEL FLOWMETER SHALL BE INSTALLED WITH A MINIMUM OF 2'-6" STRAIGHT PIPING UPSTREAM OF METER.

SECTION B M13|M13

0 2 4 8 FT

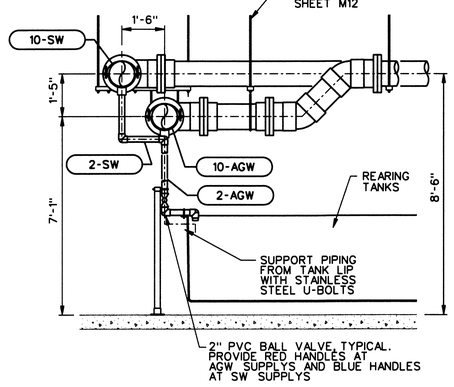
SCALE: 3/8"=1'-0"



SECTION C M13|M13

0 2 4 8 FT

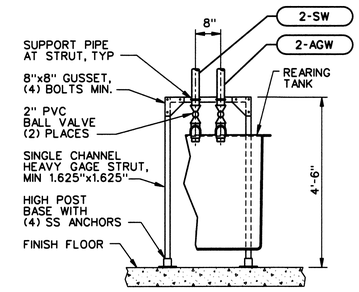
SCALE: 3/8"=1'-0"



SECTION D M13|M13

0 2 4 8 FT

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



DETAIL 4 M13|M13

NOTE:
SUPPORT ASSEMBLY SHALL BE ALL SS, FRP OR ALUM, INCLUDING FASTENERS

0 1 2 4 6 FT

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

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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
HATCHERY BUILDING
PRODUCTION PIPING PLANS, SECTIONS AND DETAILS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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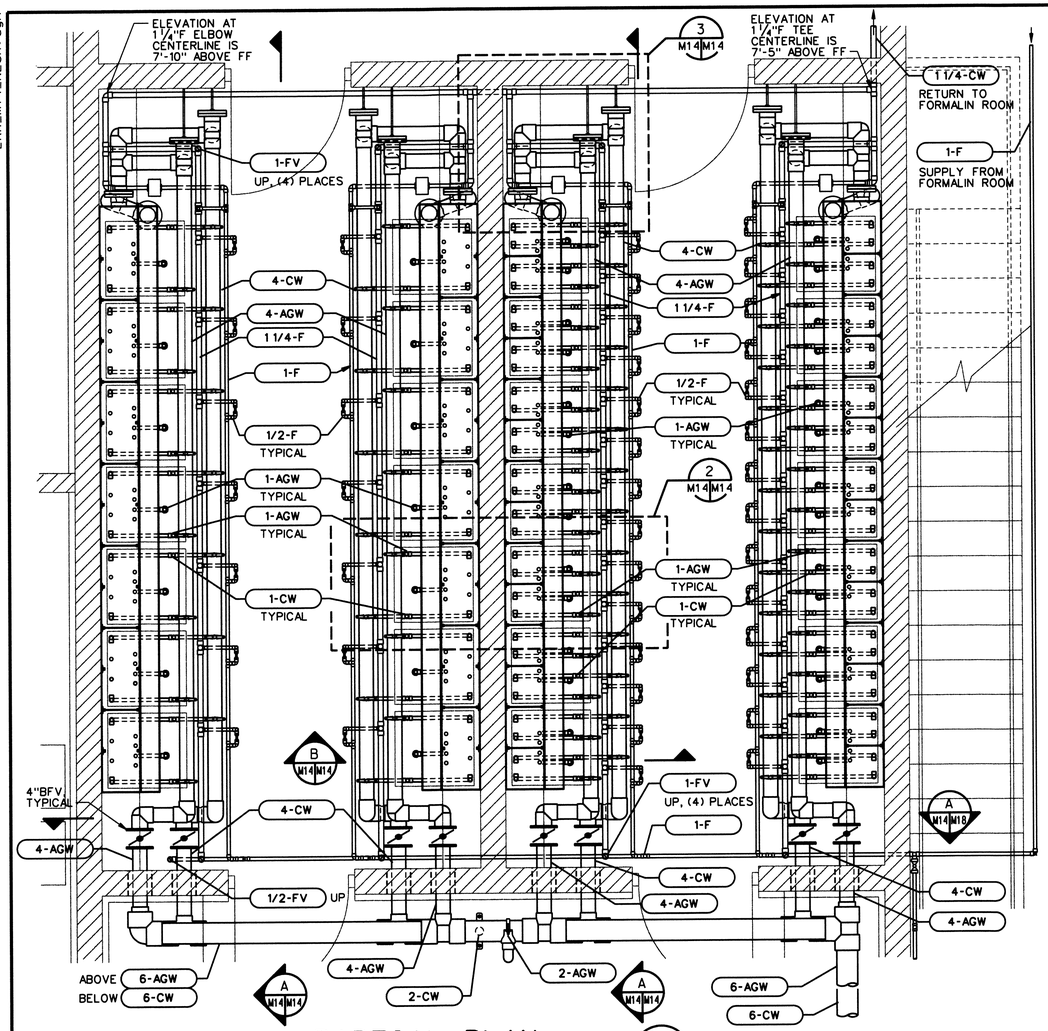
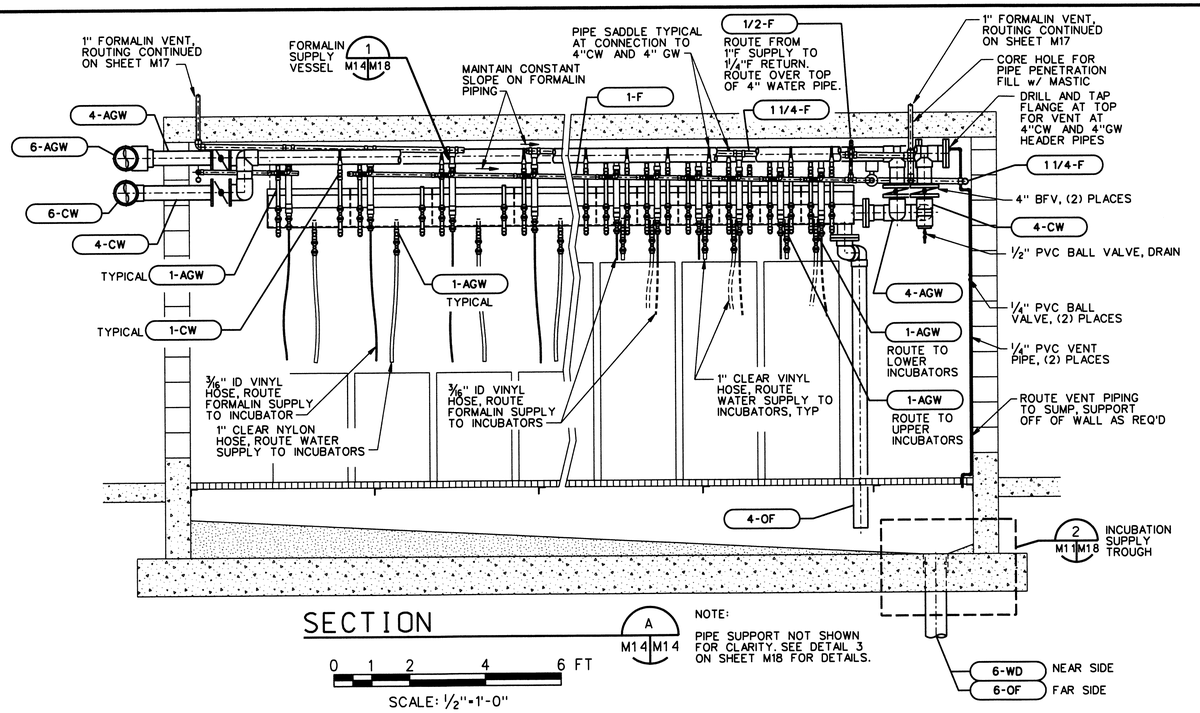


PARTIAL PLAN 1 M12|M14

0 1 2 4 6 FT

SCALE: ½"=1'-0"



SECTION A M14|M14

0 1 2 4 6 FT

SCALE: ½"=1'-0"

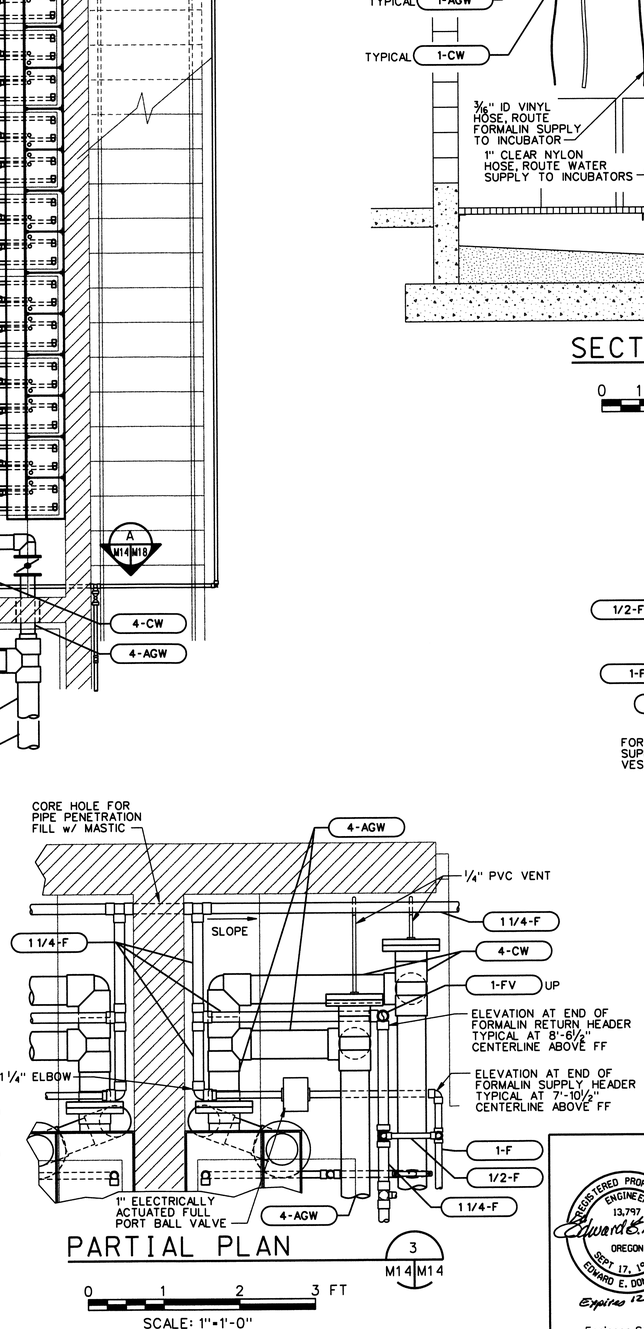
NOTE:

PIPE SUPPORT NOT SHOWN FOR CLARITY. SEE DETAIL 3 ON SHEET M18 FOR DETAILS.

PARTIAL PLAN 2 M14|M14

0 1 2 3 FT

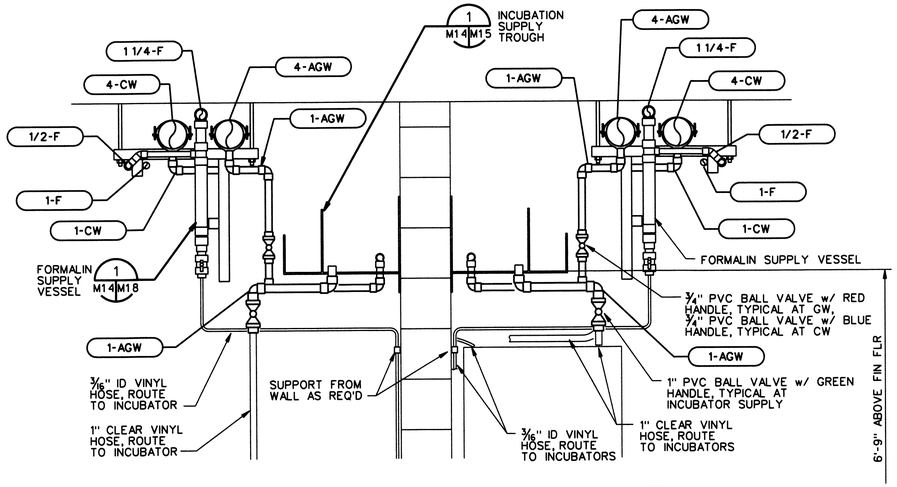
SCALE: 1"=1'-0"



PARTIAL PLAN 3 M14|M14

0 1 2 3 FT

SCALE: 1"=1'-0"



SECTION B M14|M14

0 1 2 3 FT

SCALE: 1"=1'-0"

NOTE:

SUPPORT 1"AGW AND 1"CW PIPING AND VALVES FROM INCUBATION SUPPLY TROUGH STRUCTURAL MEMBERS.

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C-CONTRACT CONSTR., F-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M14_NEOH.dgn

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1987 EDWARD E. DONHAM Expires 12/31/07

Engineer Seal

HDR | FISHPRO

Design LKP
Drawn ACB
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
HATCHERY BUILDING
INCUBATION PIPING PLANS AND SECTIONS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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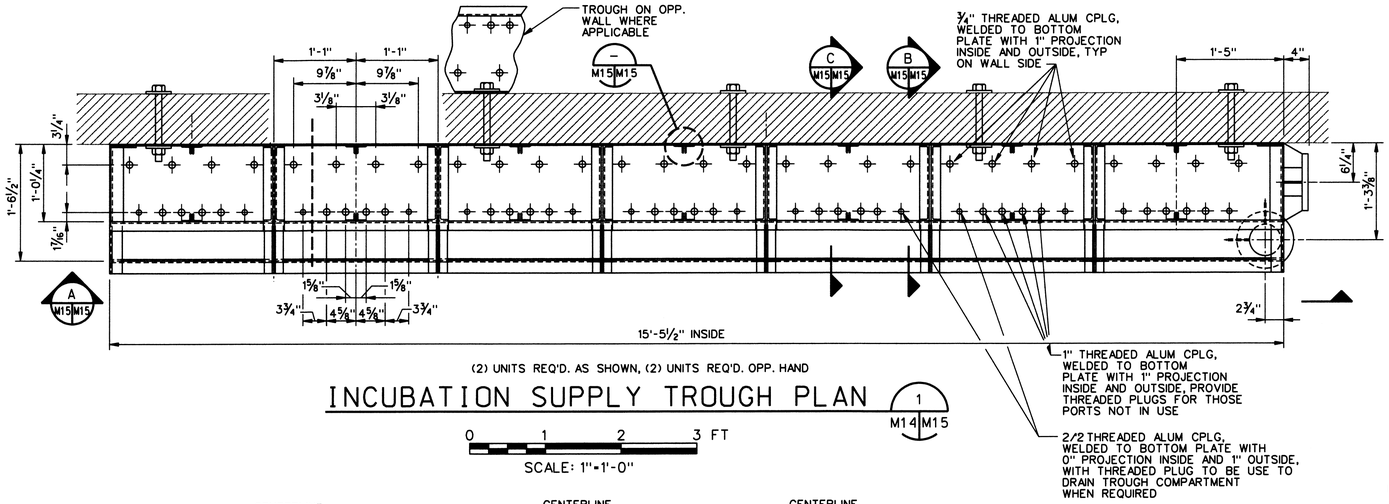


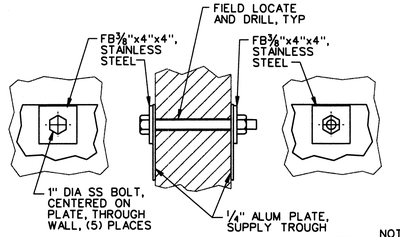
(2) UNITS REQ'D. AS SHOWN, (2) UNITS REQ'D. OPP. HAND

INCUBATION SUPPLY TROUGH PLAN

1 M14 M15

0 1 2 3 FT

SCALE: 1"=1'-0"



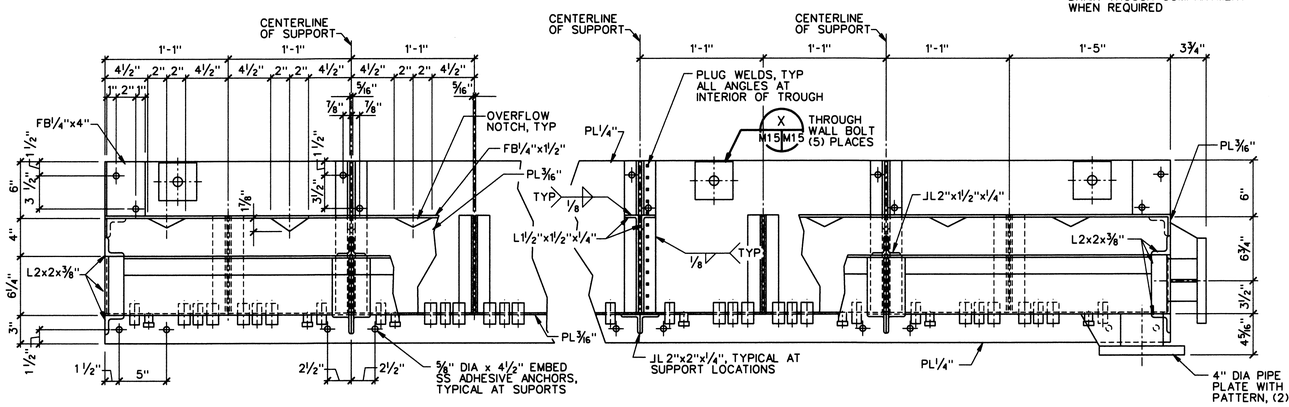
DETAIL

2 M15 M15

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

NOTE:
DETAIL IS LOCATED AT WALL BETWEEN INCUBATION ROOMS. OPPOSITE WALL SIM., TROUGH NOT REQIURED ONE SIDE.



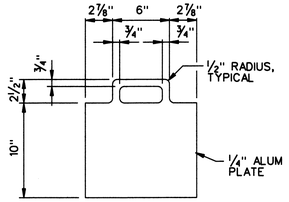
ELEVATION

A M15 M15

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

NOTES:
1. CONSTRUCT (38) UNITS.
2. INSTALL (13) DIVIDERS IN EACH TROUGH IN ROOM 115 TO CREATE (14) INCUBATOR SUPPLY CHAMBERS AS SHOWN ON PIPING DRAWINGS ON PIPING DRAWINGS.
3. INSTALL (6) DIVIDERS IN EACH TROUGH IN INCUBATION ROOM 114 TO CREATE (7) INCUBATOR SUPPLY CHAMBERS AS SHOWN ON PIPING DRAWINGS.
4. SEAL AROUND SIDES AND BOTTOM WITH SILICON AFTER INSTALLATION.

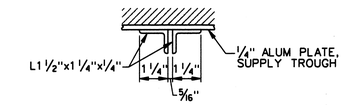


DETAIL

3 M15 M15

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

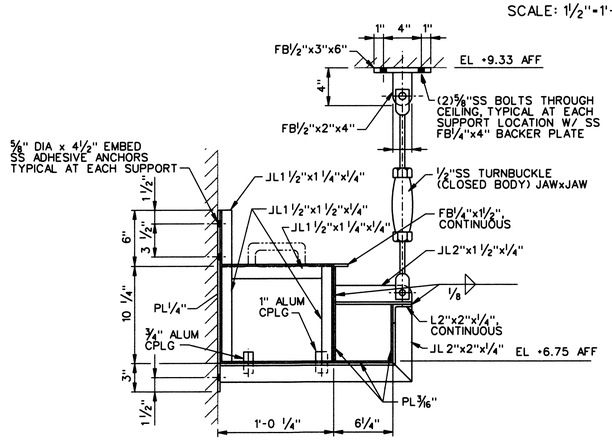


DETAIL

4 M15 M15

0 ½ 1 FT

SCALE: 3"=1'-0"

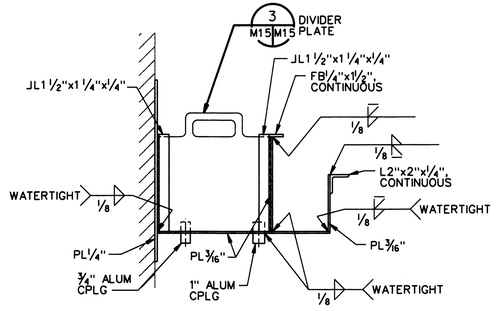


SECTION

B M15 M15

0 ½ 1 2 FT

SCALE: 1½"=1'-0"



SECTION

C M15 M15

0 ½ 1 2 FT

SCALE: 1½"=1'-0"

CONSTRUCTION NOTES:

1. ALL FASTENERS TO BE TYPE 304 OR 316 STAINLESS STEEL.
2. ALL ALUMINUM SHAPES, PLATES AND PIPE SHALL CONFORM TO THE FOLLOWING:

SHEET	- 5052-H32 ALUMINUM ALLOY
PLATE	- 5052-H32 ALUMINUM ALLOY
ANGLES	- 6061-T6 ALUMINUM ALLOY
CHANNELS	- 6061-T6 ALUMINUM ALLOY
BEAMS	- 6061-T6 ALUMINUM ALLOY
BARS	- 6061-T53 ALUMINUM ALLOY
PIPE	- 6061-T6 ALUMINUM ALLOY

3. GRIND ALL EDGES TO A ROUND, SMOOTH SURFACE.
4. PROTECT ALL SURFACES FROM WELD SPLATTER.

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1987 EDWARD E. DONAHUE
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BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
HATCHERY BUILDING
INCUBATION SUPPLY TROUGH PLAN, SECTIONS AND DETAILS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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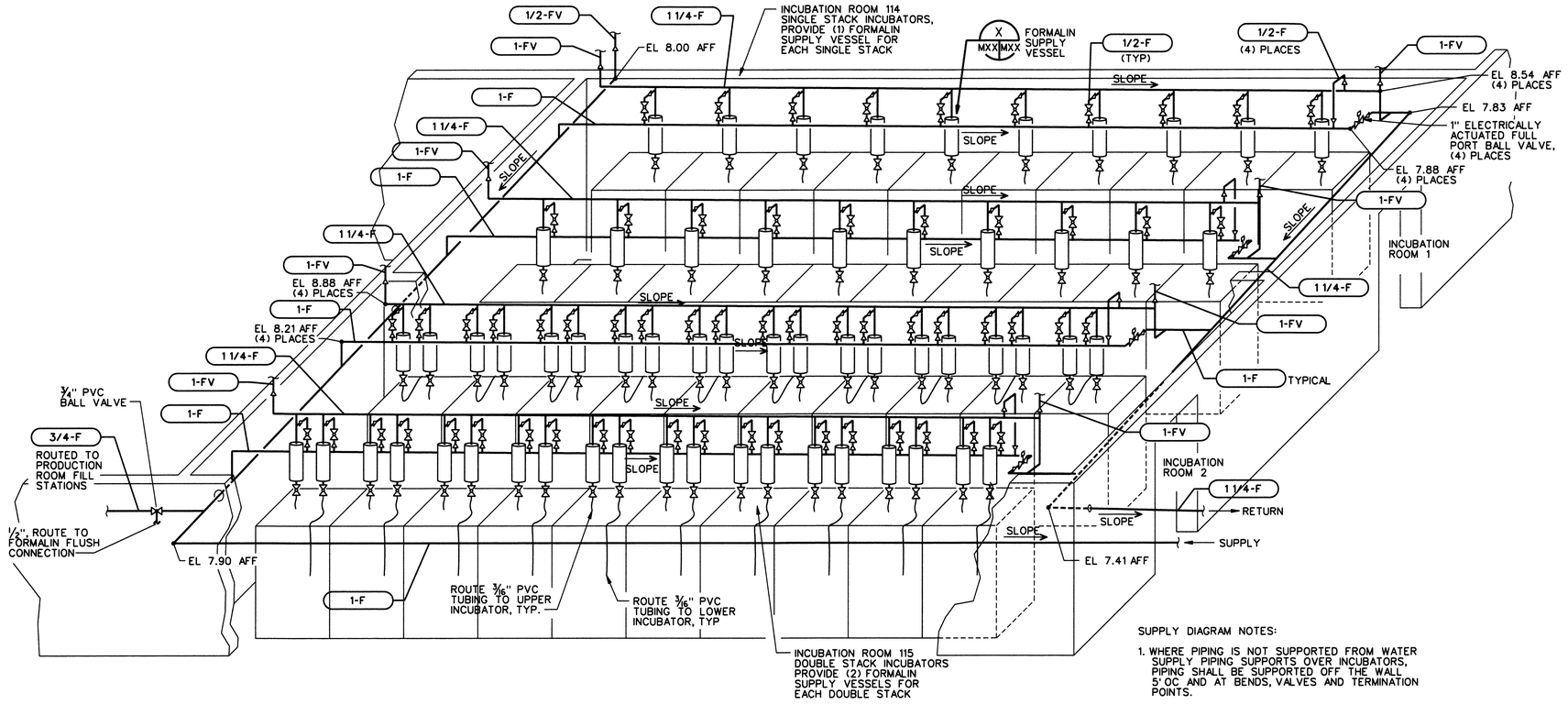
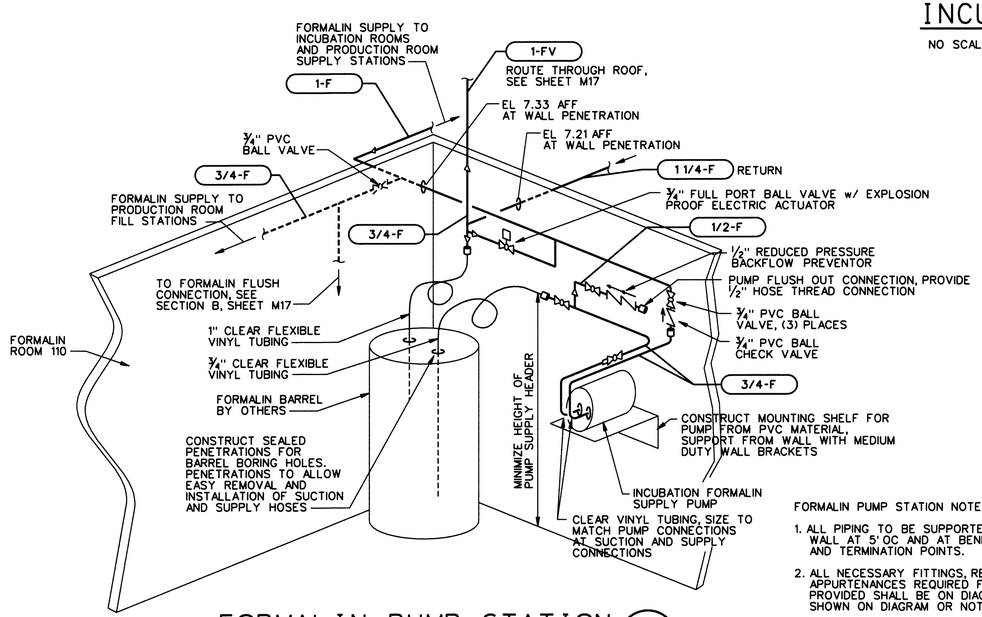


INCUBATION FORMALIN SUPPLY DIAGRAM (1 / M17 | M16)

NO SCALE

SUPPLY DIAGRAM NOTES:

1. WHERE PIPING IS NOT SUPPORTED FROM WATER SUPPLY PIPING SUPPORTS OVER INCUBATORS, PIPING SHALL BE SUPPORTED OFF THE WALL 5' OC AND AT BENDS, VALVES AND TERMINATION POINTS.
2. ALL NECESSARY FITTINGS, REDUCER AND PIPING APPURTENANCES REQUIRED FOR INSTALLATION SHALL BE PROVIDED WHETHER SHOWN OR NOT.
3. ALL ELEVATIONS ARE REFERENCED ABOVE FINISH FLOOR (AFF) ELEVATION.
4. FORMALIN VENT PIPING (FV PIPING) CONTINUED ON SHEET M17.
5. ELEVATION ARE TO CENTERLINE OF PIPE.



FORMALIN PUMP STATION (2 / M17 | M16)

NO SCALE

FORMALIN PUMP STATION NOTES:

1. ALL PIPING TO BE SUPPORTED OFF OF WALL AT 5'OC AND AT BENDS, VALVES AND TERMINATION POINTS.
2. ALL NECESSARY FITTINGS, REDUCERS AND APPURTENANCES REQUIRED FOR INSTALLING PROVIDED SHALL BE ON DIAGRAM WHETHER SHOWN ON DIAGRAM OR NOT.
3. ALL ELEVATIONS ARE REFERENCED ABOVE FINISH FLOOR (AFF) ELEVATION.
4. ELEVATION ARE TO CENTERLINE OF PIPE.

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REGISTERED PROFESSIONAL ENGINEER 13,797 Edward E. Donahue OREGON SEPT 17, 1967 EDWARD E. DONAHUE Expires 12/31/07

Engineer Seal

HDR | FISHPRO

Design	LKP
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Chkd	EED
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Rec	
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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

HATCHERY BUILDING FORMALIN SYSTEM

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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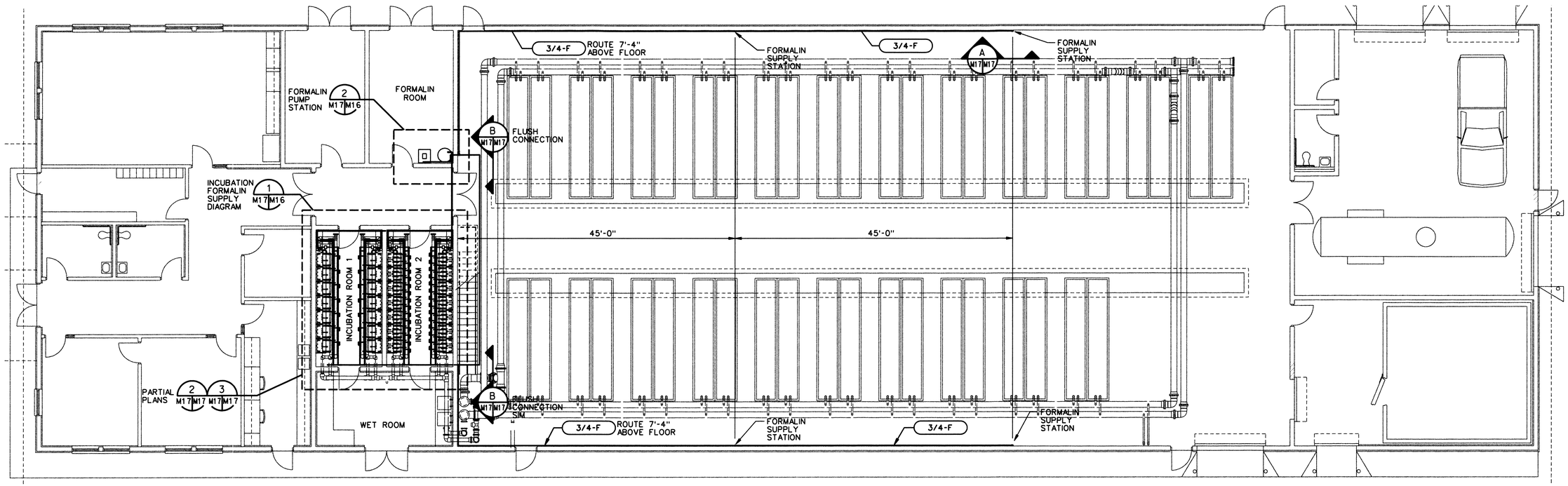
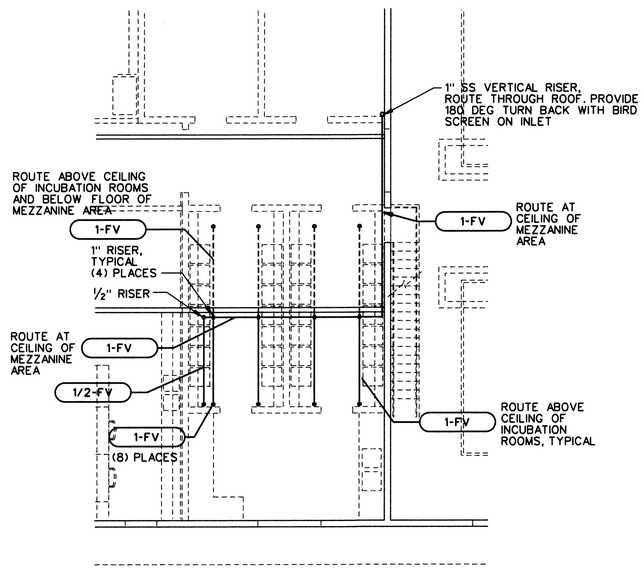


FORMALIN SUPPLY PIPING PLAN

1 / M12

0 4 8 12 16 20 24 FT

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



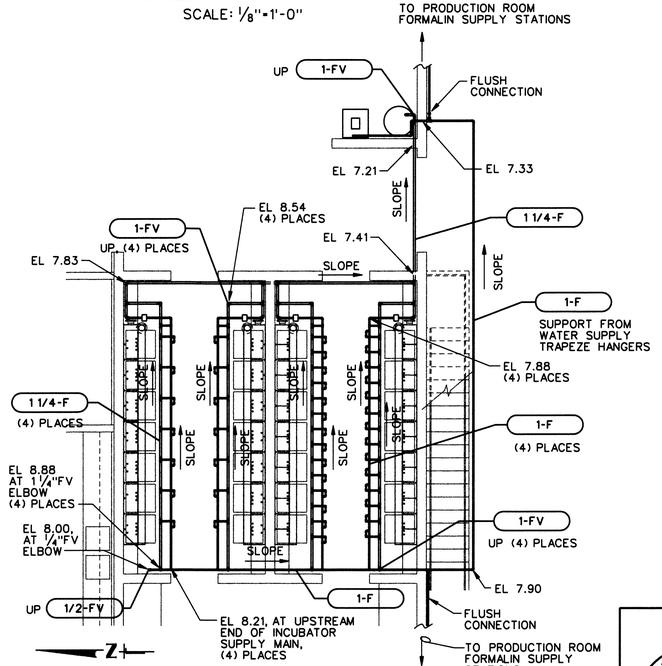
Z

FORMALIN VENT PARTIAL PLAN

2 / M17/M17

0 4 8 12 16 20 24 FT

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



Z

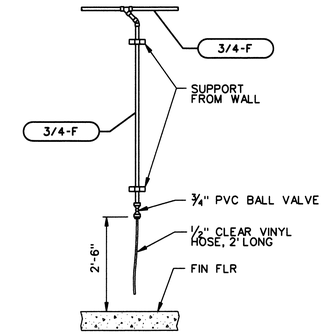
NOTES:
1. REFERENCE FINISH FLOOR EL 0.00.
2. ELEVATIONS ARE TO CENTERLINE OF PIPE.

FORMALIN INCUBATION PIPING PARTIAL PLAN

3 / M17/M17

0 4 8 16 FT

SCALE: 3/16"=1'-0"

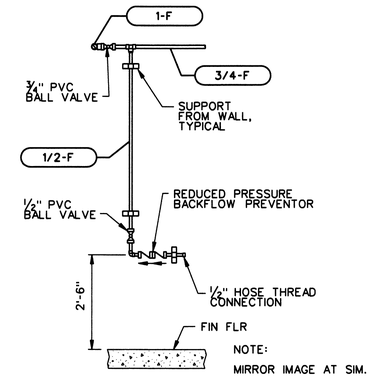


FORMAILN SUPPLY STATION SECTION

A / M17/M17

0 1 2 4 6 FT

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



FLUSH CONNECTION SECTION

B / M16, M17/M17

0 1 2 4 6 FT

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

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REGISTERED PROFESSIONAL ENGINEER 13,797 Edward E. Donahue OREGON SEPT. 17, 1987 EDWARD E. DONAHUE Expires 12/31/07

Engineer Seal

HDR | FISHPRO

Design LKP
Drawn ACB
Chkd EED
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Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
HATCHERY BUILDING
FORMALIN PIPING PLANS AND SECTIONS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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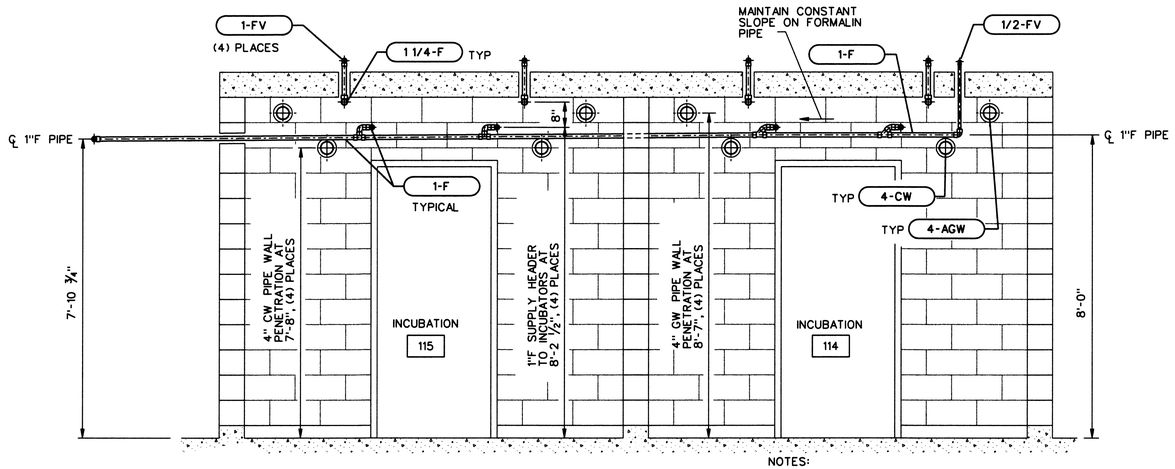


ELEVATION

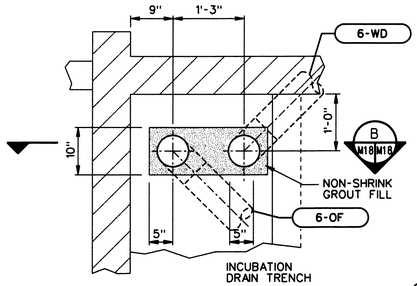
A M14 M18

0 1 2 4 6 FT

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

NOTES:

1. ALL PIPE PENETRATIONS IN CEILING AND WALLS SHALL BE CORED TO ALLOW PIPE PENETRATION AND SEALED WITH MASTIC.
2. CAST A 6" SCHEDULE 40 STEEL SPOOL PIECE IN CONCRETE LINTEL AROUND DOORWAYS FOR 4" CW PENETRATIONS. COORDINATE LOCATION OF PENETRATION WITH LINTEL REINFORCEMENT

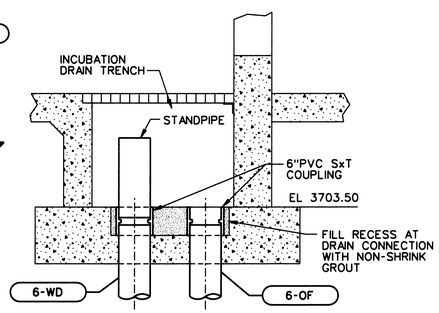


DETAIL

2 M11 M18

0 1 2 4 FT

SCALE: 3/4"=1'-0"

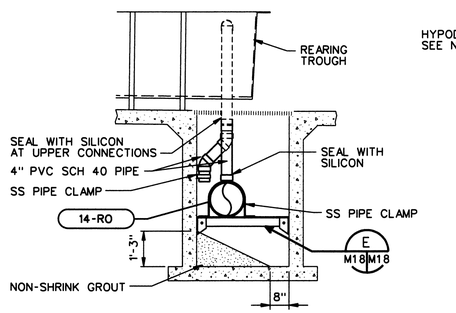


SECTION

B M18 M18

0 1 2 4 FT

SCALE: 3/4"=1'-0"

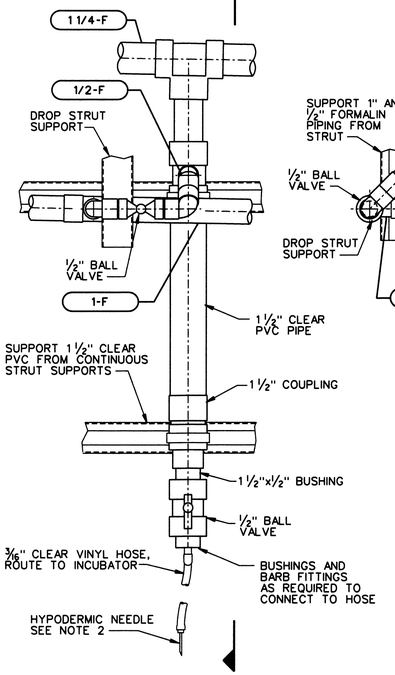


SECTION

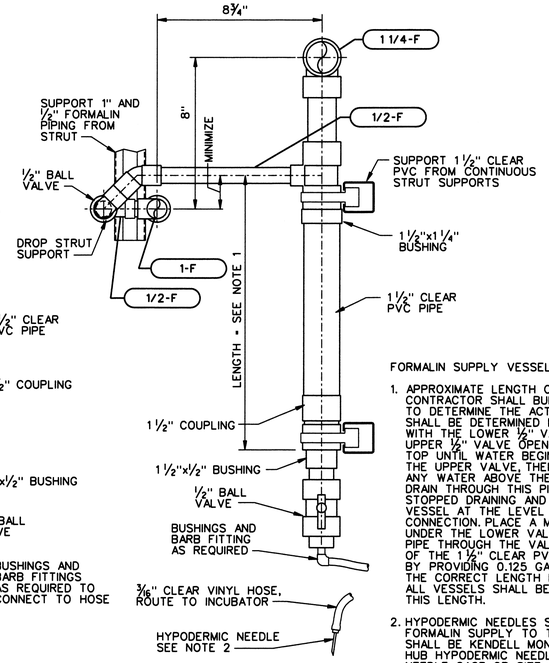
C M11 M18

0 2 4 8 FT

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



ELEVATION



SECTION

FORMALIN SUPPLY VESSEL NOTES:

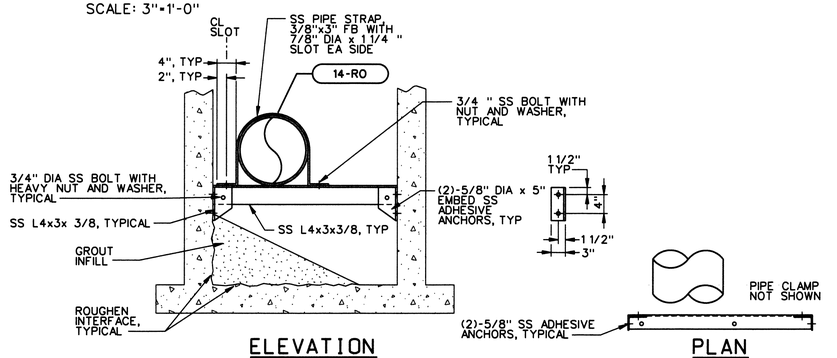
1. APPROXIMATE LENGTH OF VESSEL IS 14 1/2". CONTRACTOR SHALL BUILD A MOCK-UP OF VESSEL TO DETERMINE THE ACTUAL LENGTH. THE LENGTH SHALL BE DETERMINED BY FILLING THE VESSEL WITH THE LOWER 1/2" VALVE CLOSED AND THE UPPER 1/2" VALVE OPEN. FILL VESSEL FROM THE TOP UNTIL WATER BEGINS DISCHARGING THROUGH THE UPPER VALVE, THEN STOP FILLING AND ALLOW ANY WATER ABOVE THE 1/2" SUPPLY PIPE TO BACK DRAIN THROUGH THIS PIPE UNTIL THE WATER HAS STOPPED DRAINING AND HAS EQUILIZED IN THE VESSEL AT THE LEVEL OF THE SUPPLY TEE CONNECTION. PLACE A MEASUREMENT CONTAINER UNDER THE LOWER VALVE AND DRAIN THE 1 1/2" PIPE THROUGH THE VALVE. THE CORRECT LENGTH OF THE 1 1/2" CLEAR PVC PIPE SHALL BE DETERMINED BY PROVIDING 0.125 GALLONS IN THE VESSEL. ONCE THE CORRECT LENGTH HAS BEEN DETERMINED, ALL VESSELS SHALL BE CONSTRUCTED USING THIS LENGTH.
2. HYPODERMIC NEEDLES SHALL BE PROVIDED TO METER FORMALIN SUPPLY TO THE INCUBATORS. NEEDLES SHALL BE KENDELL MONOJECT VETERINARIAN ALUMINUM HUB HYPODERMIC NEEDLES OR EQUIVALENT. THE NEEDLE GAGE OR SIZE SHALL BE DETERMINED BY THE CONTRACTOR AND SHALL METER THE CONTENTS ON THE VESSEL INTO THE TOP TRAY OF THE INCUBATORS IN APPROXIMATELY 15 MINUTES. NOTE THAT WATER MAY USED AS THE TEST FLUID TO DETERMINE NEEDLE SIZE AND DIFFERENT SIZE NEEDLES MAY BE REQUIRED FOR UPPER AND LOWER INCUBATION STACKS WHERE DOUBLE STACKS ARE INSTALLED. PROVIDE 50 EXTRA NEEDLES OF EACH SIZE REQUIRED.

FORMALIN SUPPLY VESSEL

1 M14, M17 M18

0 1/2 1 FT

SCALE: 3"=1'-0"



ELEVATION

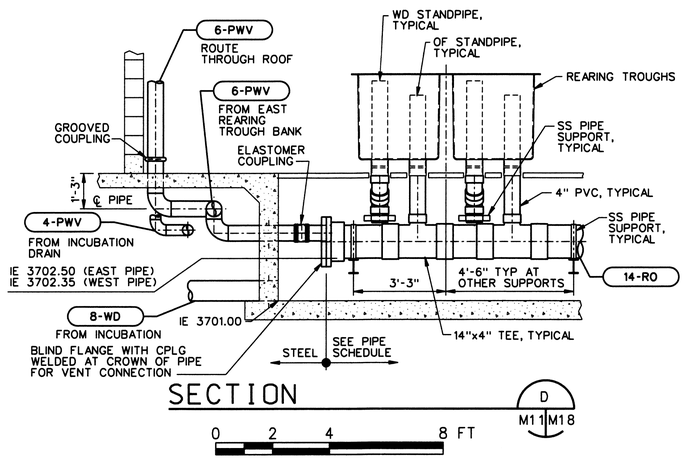
PLAN

PIPE SUPPORT DETAIL

E M18 M18

0 1 2 4 FT

SCALE: 3/4"=1'-0"

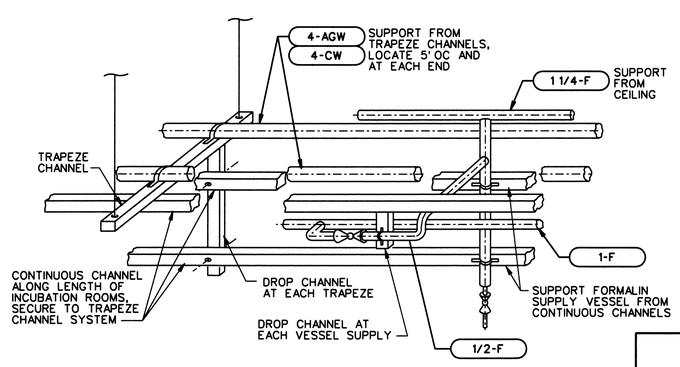


SECTION

D M11 M18

0 2 4 8 FT

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



INCUBATION PIPING SUPPORTS

3 M14 M18

NO SCALE

NOTE:

PIPING DROPS TO INCUBATORS NOT SHOWN

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REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT 17, 1987 EDWARD E. DONAHUE

Expires 12/31/07

Engineer Seal

HDR | FISHPRO

Design LKP
Drawn ACB
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

HATCHERY BUILDING PIPING DETAILS 1

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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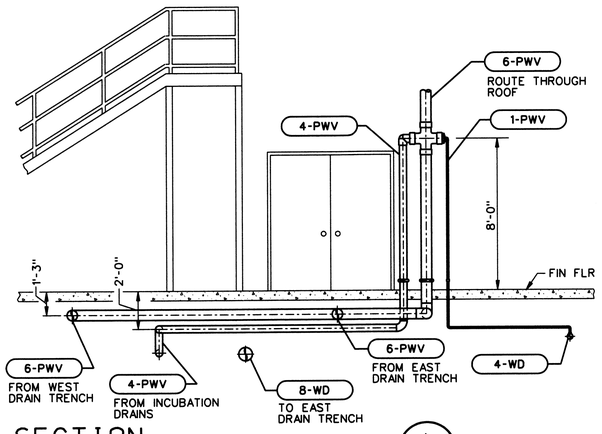
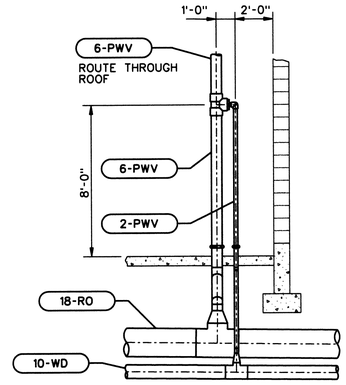


SECTION A M11 M19

0 4 8 12 FT

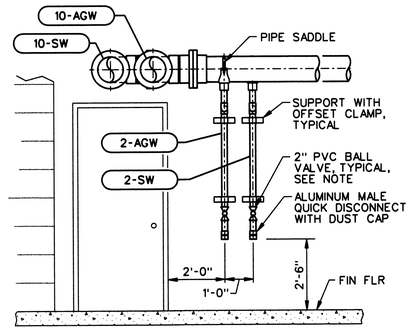
SCALE: 1/4"=1'-0"



SECTION B M11 M19

0 4 8 12 FT

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



TAGGING TRAIL CONNECTION

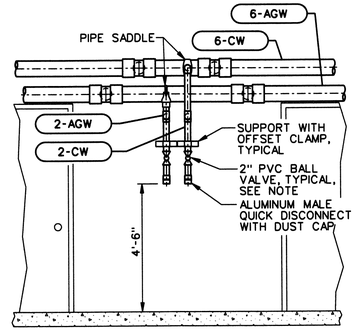
SECTION C M12 M19

0 2 4 8 FT

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

NOTE:

FOR BALL VALVES PROVIDE A RED HANDLE AT THE AGW SUPPLY AND A BLUE HANDLE AT THE CW SUPPLY.



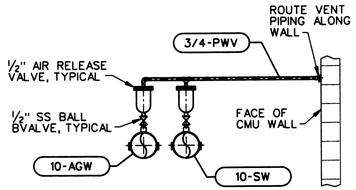
SECTION D M12 M19

0 2 4 8 FT

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

NOTE:

FOR BALL VALVES PROVIDE A RED HANDLE AT THE AGW SUPPLY AND A BLUE HANDLE AT THE CW SUPPLY.



SECTION E M12 M17

0 2 4 8 FT

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

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT 17, 1987 EDWARD E. DONAHUE

Expires 12/31/07

Engineer Seal

HDR | FISHPRO

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C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M19_NEOH.dgn

Design LKP
Drawn ACB
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

HATCHERY BUILDING PIPING DETAILS 2

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
___	__	M19	OF	

LRH_M19_NEOH.dgn

4/8/2006
12:21:28 PM
0.0833 ' / IN.
NEOH_FULL_SIZE.tbl

FLUID COOLER

CHILLER

NOTE: FLOOR DRAIN LOCATIONS ARE APPOXIMATE. CONTRACTOR SHALL MAKE FINAL DETERMINATIONS BASED ON EQUIPMENT LAYOUT AND DIMENSIONS.

SLEEVE THRU FOUNDATION WALL

YCO

4"

2"V. UP

3" UP TO FD

3"

WATER TREATMENT ROOM

D.I. 90 DEG EL, MJ

20" RO FROM OF BOX ABOVE

SURFACE WATER HEADTANK

12" PVC

FLEX COUPLING

SLEEVE THRU FOUNDATION FLOOR

12" D.I.

SEE SHEET M3 FOR CONTINUATION

30"

30" FLANGED TEE UP

30" SW TO SW HEADTANK

30x24" FLANGED REDUCING EL UP

4" PVC DOWN THRU FLOOR AND CONNECT TO CYCLONE UNDERFLOW DRAIN FOR FLUSHING

4" UP TO FLOOR CLEANOUT

12"x4" REDUCER

12" OF

CYCLONE ROOM

12" UP TO CYCLONE UNDERDRAIN

E M20/M22

4" UP TO CO

12" GW UP FROM WELL FIELD

WELL WATER HEADTANK

8" D.I.

20" D.I.

D.I. 90 DEG EL, MJ

12" UP TO SUCTION HEADER

FLANGED 90" EL

2" UP TO VENT

BLOW-OFF

12" D.I.

INV. 3696.00

12" OF SCH 40 PVC

ADAPT TO PVC

12"x12" MJ LATERAL

SEE SHEET M3 FOR CONTINUATION

14" SW & AGW DOWN THRU FLOOR AND CONTINUE TO HATCHERY BUILDING

6" HEATED WATER & CHILLED WATER DOWN THRU FLOOR AND CONTINUE TO HATCHERY BUILDING

INV. 3696.50

INV. 3691.00

8" D.I. 90 DEG EL, MJ

8" PLUG VALVE IN BOX

24x8" D.I. TEE, MJ

8" PLUG VALVE IN BOX

0' 2' 4' 6'

UTILITY BUILDING – BELOW FLOOR PLAN

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

A M20/M20

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON Sept. 17, 1987 EDWARD E. DONAHUE Expires 12/31/07

LINCOLN D. COCHRAN 62-31349 REGISTERED PROFESSIONAL ENGINEER ILLINOIS EXPIRES 11/30/07 Engineer Seal

HDR | FISHPRO

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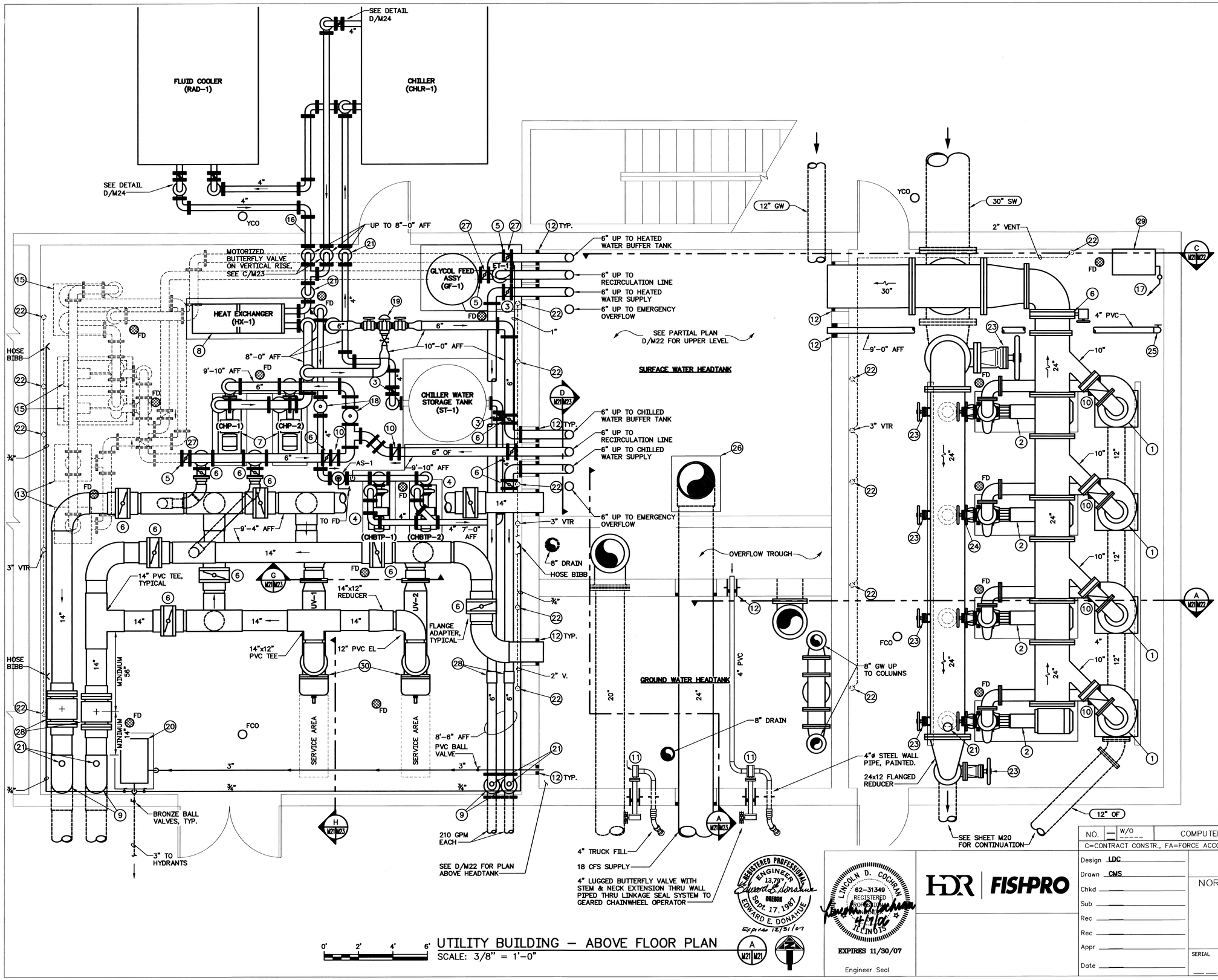
UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

UTILITY BUILDING UNDERFLOOR PIPING

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
		M20	· OF ·	



GENERAL NOTES

1. SHAFTS OF BUTTERFLY VALVES SHALL BE MOUNTED HORIZONTAL UNLESS NOTED OTHERWISE.
2. FLOOR AND WALL PENETRATIONS THRU WATER HOLDING STRUCTURES OR WHERE OTHERWISE NOTED SHALL BE PER DETAIL B/M25.
3. ON GRADE PENETRATIONS THRU NON-WATER HOLDING STRUCTURES SHALL BE PER DETAIL E/M25.
4. ALL HYDROCYCLONES PLUS ASSOCIATED PUMPS, PIPING, VALVES AND CONTROLS SHALL BE FACTORY ASSEMBLED, SKID MOUNTED SYSTEM. SEE SPEC. SECTION 15141.
5. ALL CHILLED WATER AND COOLED WATER PIPING SHALL BE INSULATED AND A PVC JACKET PROVIDED. SEE SPEC. 15250.

KEYED NOTES

1. HYDROCYCLONE, 4 EA. KREBS MODEL DS20L-GMAX RATED FOR 2000 GPM.
2. BASE MOUNTED CENTRIFUGAL PUMP, 4 EA.. SULZER APT 31-6, 50 HP, RATED FOR 2000 GPM.
3. BUTTERFLY VALVE WITH SHAFT MOUNTED HORIZONTAL.
4. CHILLER LOOP PUMPS, SEE DETAIL B/M26. EACH PUMP RATED FOR 257 GPM @ 85 FT. TDH. SEE PUMP SCHEDULE SHEET M26.
5. BLIND FLANGE FOR FUTURE CONNECTION.
6. CHAIN OPERATED BUTTERFLY VALVE.
7. CHILLED WATER PUMPS, SEE DETAIL B/M26. EACH PUMP RATED FOR 230 GPM @ 65 FT THD. SEE PUMP SCHEDULE SHEET M26.
8. CHILLED WATER HEAT EXCHANGER. SEE SCHEDULE SHEET M26 AND DETAIL G/M24.
9. DROP THROUGH FLOOR AND EXTEND TO OUTSIDE OF BLDG.
10. CHECK VALVE.
11. TRUCK FILL VALVE. 4" CHAIN OPERATED BFV.
12. LINK SEAL WALL PENETRATION. SEE DETAIL B/M25, TYPICAL.
13. FUTURE BOILERS.
14. FUTURE HEATED WATER PUMPS.
15. FUTURE HEATED WATER HEAT EXCHANGER.
16. SLEEVE AND SEAL WALL PENETRATIONS.
17. EXTEND ¾" COPPER AIR LINE TO CONTROL PANEL OF EACH PUMP.
18. BASKET STRAINER.
19. 3" 3-WAY CONTROL VALVE. SEE DETAIL D/M23.
20. UTILITY WATER BOOSTER PUMP SYSTEM, 75 GPM @ 50 PSI.
21. HIGH CAPACITY FLOAT TYPE AUTO AIR RELEASE VALVE. PIPE TO FLOOR DRAIN.
22. COMBINE VENTS ABOVE FLOOR AND NEAR WALL.
23. KNIFE VALVE.
24. PNEUMATIC OPERATED KNIFE VALVE AT DISCHARGE OF EACH PUMP.
25. DROP 4" PVC PRESSURE PIPE DOWN THRU FLOOR AND CONNECT TO HYDROCYCLONE UNDERDRAIN PIPING FOR FLUSHING. PROVIDE 4" BFV 4'-0" AFF.
26. CONSTRUCT PIPE SUPPORT CRADLE AND BASE ON FLOOR OF HEADTANK.
27. LUG STYLE BFV TO ENABLE REMOVAL OF BLIND FLANGE WITH BFV IN PLACE.
28. MAGNETIC-TYPE FLOWMETER.
29. AIR COMPRESSOR. TWO STAGE ASME RECEIVER MOUNTED - VERTICAL CONFIGURATION. MOTOR 3 HP, 460 VOLT, 3 PHASE. ASME - 80 GALLOS. PROVIDE PRESSURE GAUGE, PRESSURE RELIEF AND AUTO TANK DRAIN.
30. UV UNITS. SEE SCHEDULE ON M26. PROVIDE ALUMINUM SUPPORTS FROM FLOOR AS REQUIRED.

0' 2' 4' 6'

UTILITY BUILDING - ABOVE FLOOR PLAN
SCALE: 3/8" = 1'-0"

A M21 M21

REGISTERED PROFESSIONAL ENGINEER
EDWARD E. DONAHUE
OREGON
Sept. 17, 1987
Expires 12/31/07

LINCOLN D. COCHRAN
62-31349
REGISTERED PROFESSIONAL ENGINEER
4/1/06
ILLINOIS
EXPIRES 11/30/07
Engineer Seal

HDR | FISHPRO

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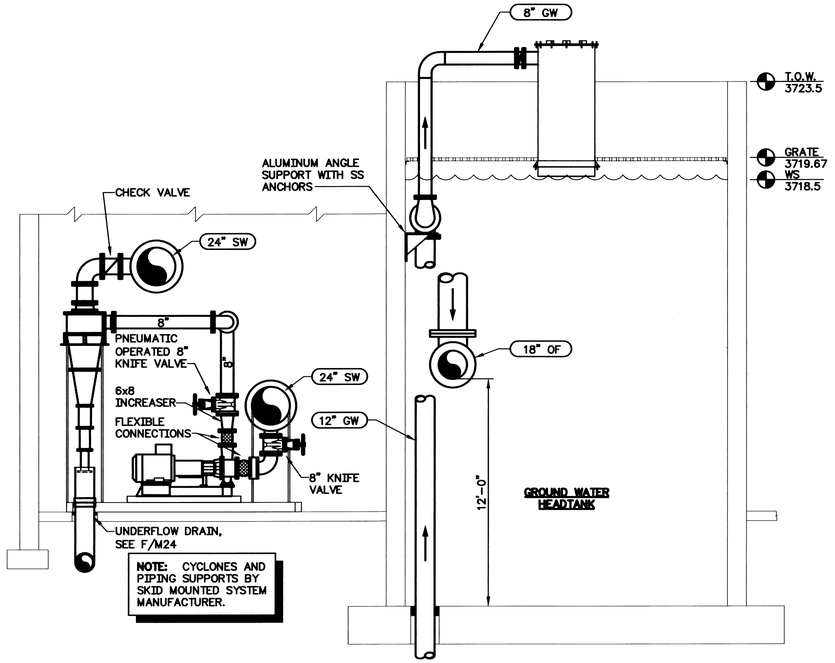
UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

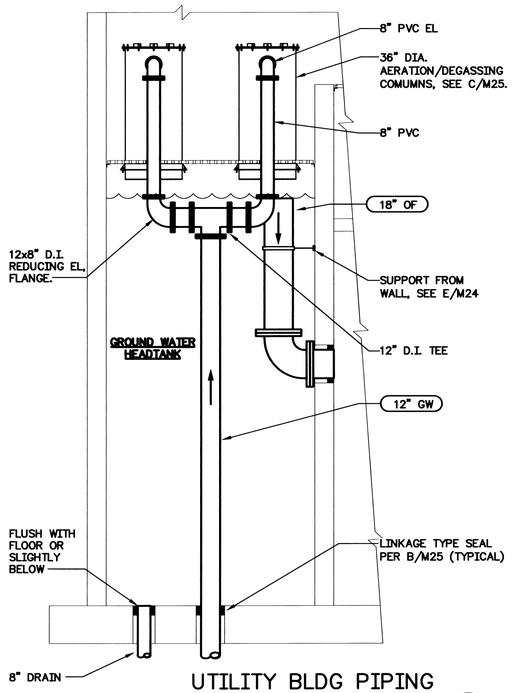
NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

UTILITY BUILDING ABOVE FLOOR PIPING

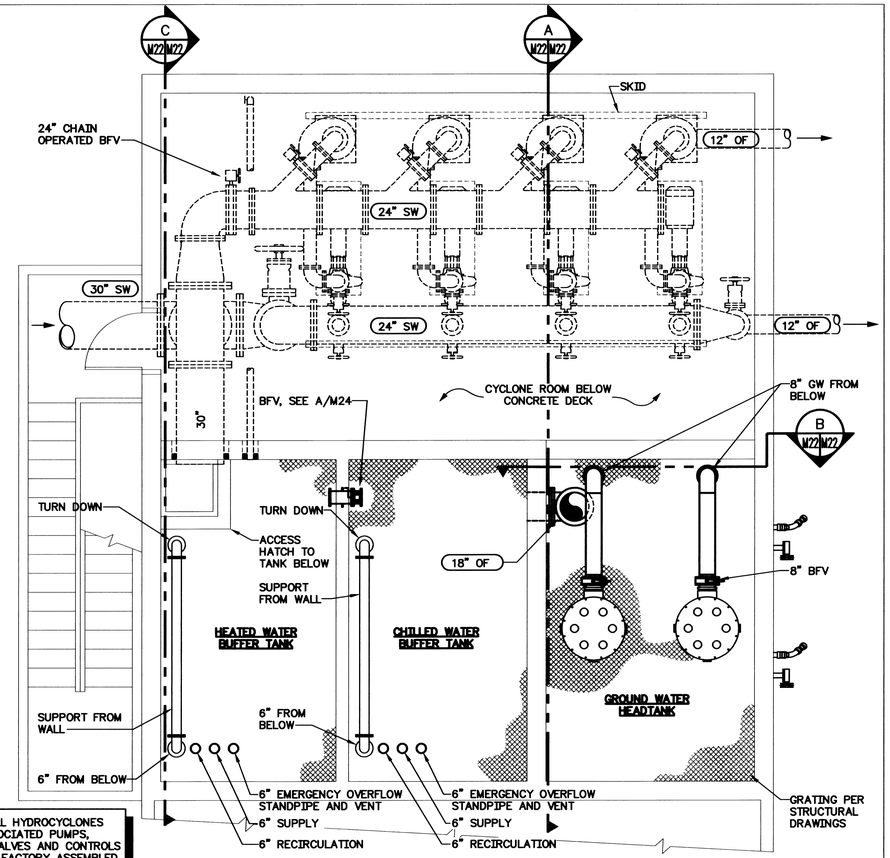
SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
		M21	· OF ·	



0' 4' 8' 12' UTILITY BLDG PIPING SECTION (A M21/M22)
SCALE: 1/4" = 1'-0"

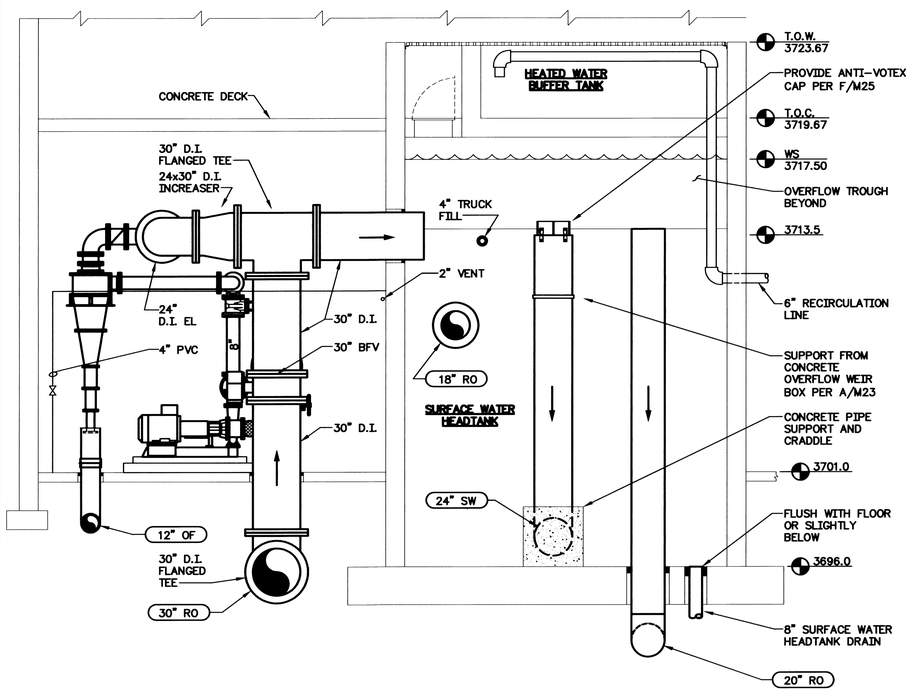


0' 4' 8' 12' UTILITY BLDG PIPING SECTION (B M22/M22)
SCALE: 1/4" = 1'-0"

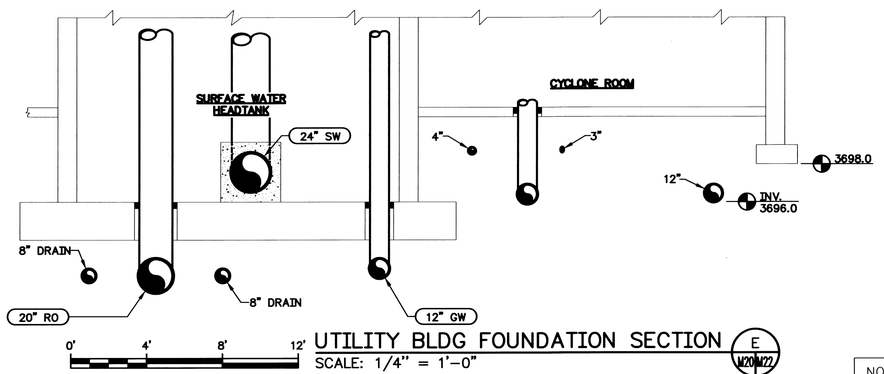


NOTE: ALL HYDROCYCLONES PLUS ASSOCIATED PUMPS, PIPING, VALVES AND CONTROLS SHALL BE FACTORY ASSEMBLED, SKID MOUNTED SYSTEM. SEE SPEC. SECTION 15141.

0' 4' 8' 12' UTILITY BLDG PARTIAL PIPING PLAN AT ELEVATION 3719.67 (D M22/M22)
SCALE: 1/4" = 1'-0"



0' 4' 8' 12' UTILITY BLDG PIPING SECTION (C M22/M22)
SCALE: 1/4" = 1'-0"



0' 4' 8' 12' UTILITY BLDG FOUNDATION SECTION (E M22/M22)
SCALE: 1/4" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER 13,797 EDWARD E. DONAHUE Sept. 17, 1987 OREGON
Expires 12/31/07

LINCOLN D. COCHRAN 62-31349 REGISTERED PROFESSIONAL ENGINEER ILLINOIS
EXPIRES 11/30/07
Engineer Seal

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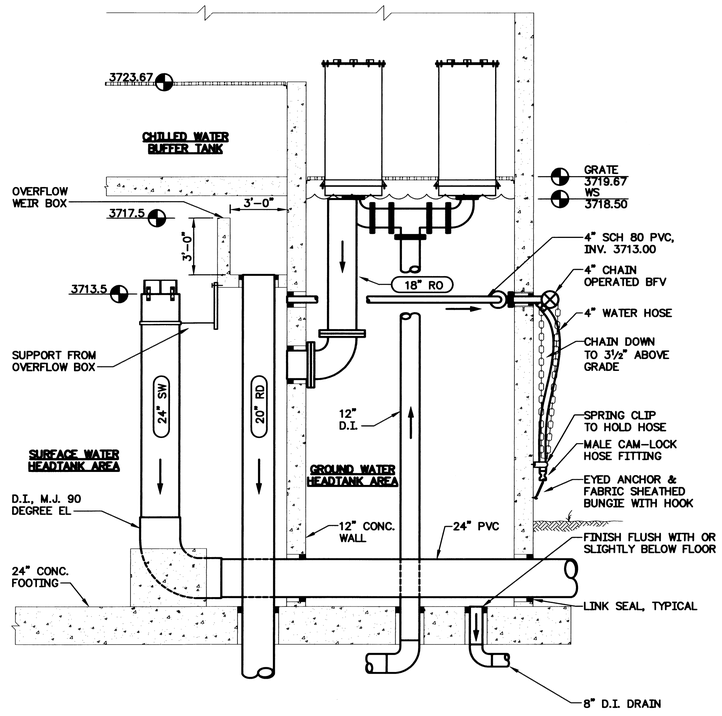
HEADQUARTERS, PORTLAND, OREGON

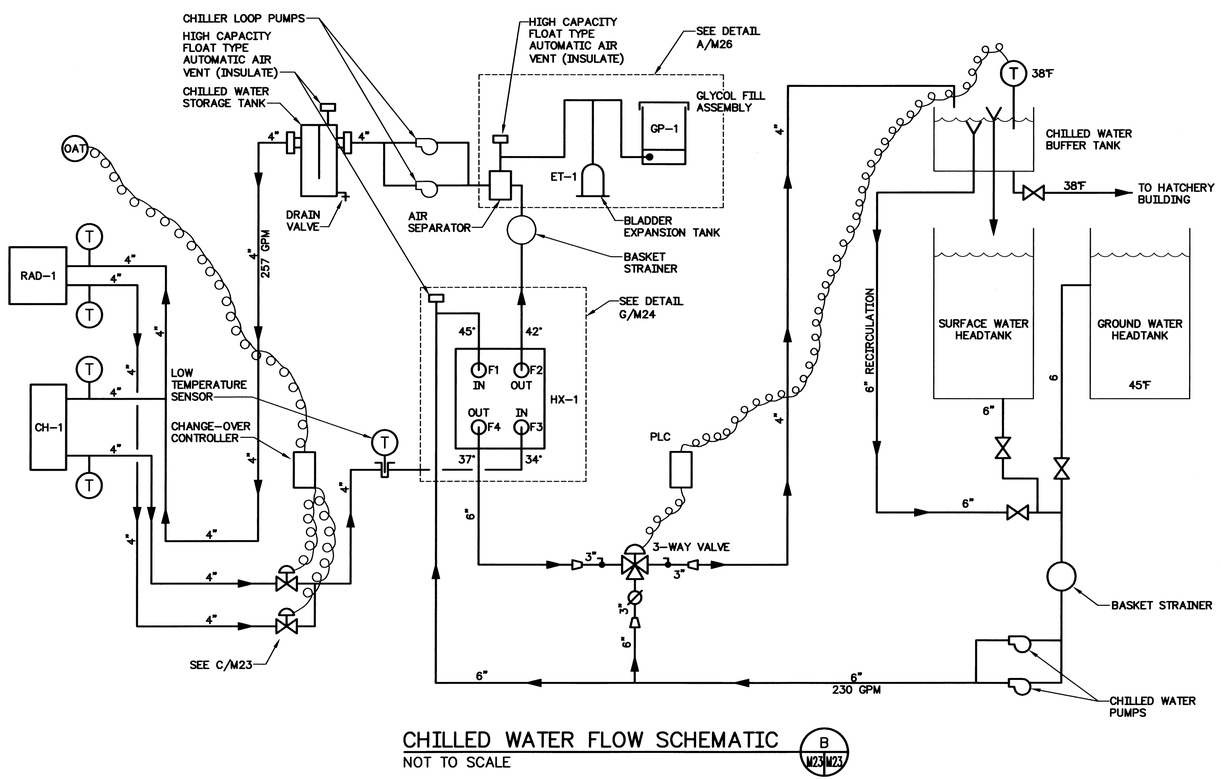
NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

UTILITY BUILDING PARTIAL PIPING PLAN & SECTIONS

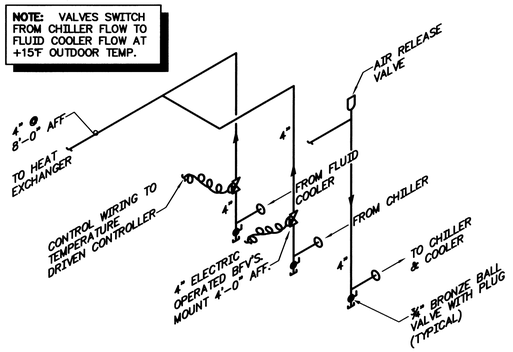
SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
		M22	· OF ·	



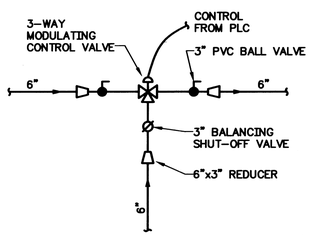
UTILITY BLDG WEIR BOX PIPING SECTION (A M21|M23)
0' 4' 8' 12'
SCALE: 1/4" = 1'-0"



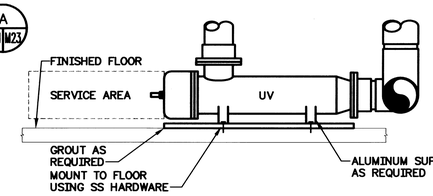
CHILLED WATER FLOW SCHEMATIC (B M23|M23)
NOT TO SCALE



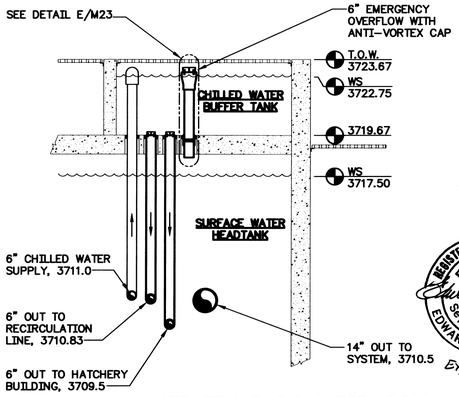
CHILLER LOOP SWITCH OVER VALVE (C M21|M23)
NOT TO SCALE



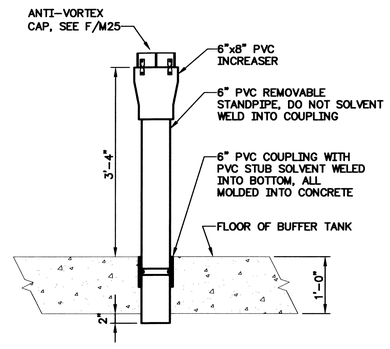
3-WAY VALVE DETAIL (E M24|M23)
NOT TO SCALE



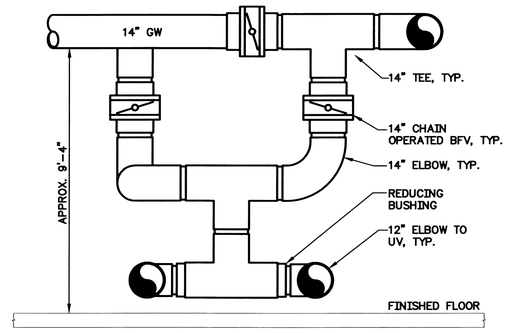
UV UNIT MOUNTING DETAIL (H M21|M23)
0' 2' 4' 6'
SCALE: 3/8" = 1'-0"



UTILITY BLDG WEIR BOX PIPING SECTION (D M21|M23)
0' 4' 8' 12'
SCALE: 1/4" = 1'-0"



EMERGENCY OVERFLOW STANDPIPE DETAIL (E M23|M23)
0' 1' 2' 3'
3/4" = 1'-0"



SECTION AT UV UNITS (G M21|M23)
0' 2' 4' 6'
SCALE: 3/8" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1987 EDWARD E. DONAHUE Expires 12/31/07

LINCOLN D. COCHRAN 62-31349 REGISTERED PROFESSIONAL ENGINEER ILLINOIS EXPIRES 11/30/07 Engineer Seal

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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

UTILITY BUILDING SECTIONS & CHILLED WATER SCHEMATIC

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
———	——	M23	· OF ·	—

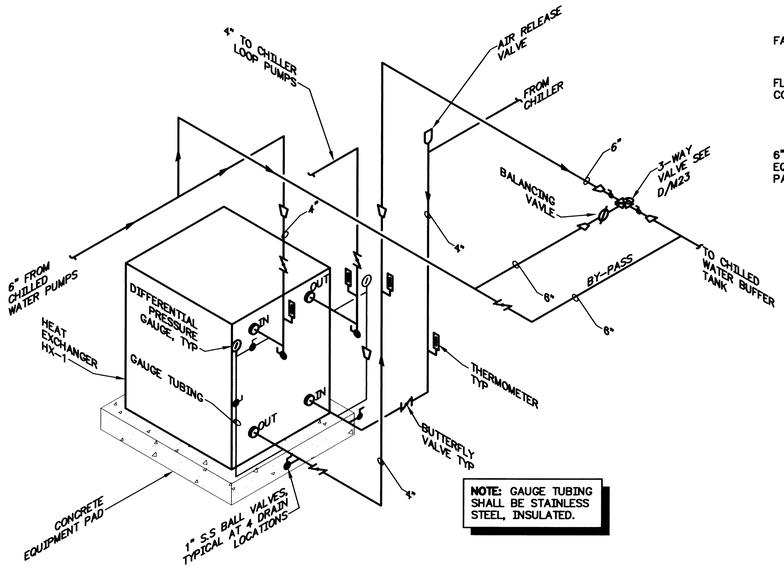
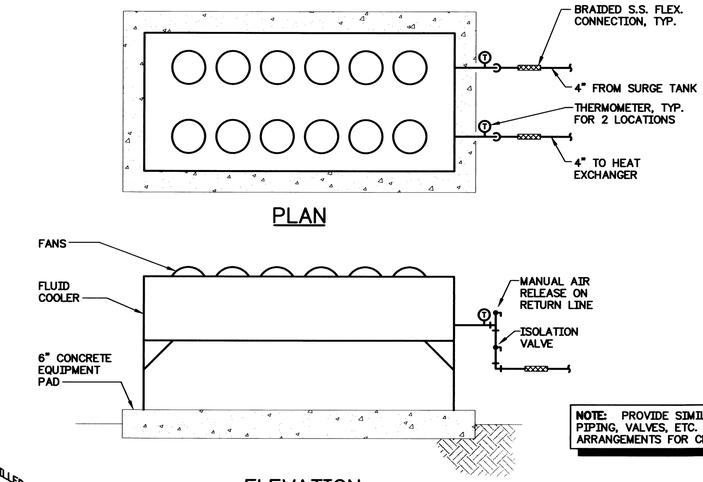
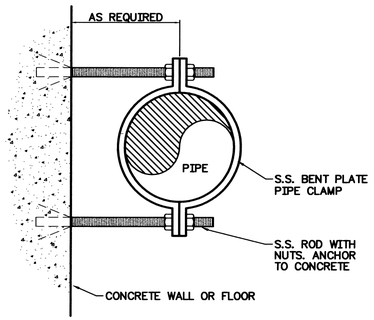


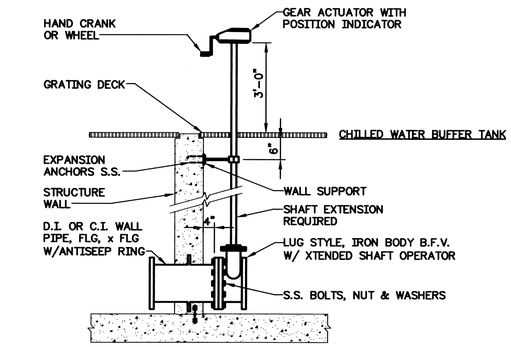
PLATE HEAT EXCHANGER DIAGRAM (G, M24/M24)
NOT TO SCALE



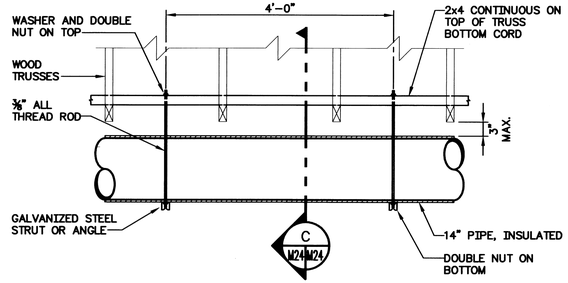
FLUID COOLER DETAIL (D, M24/M24)
NOT TO SCALE



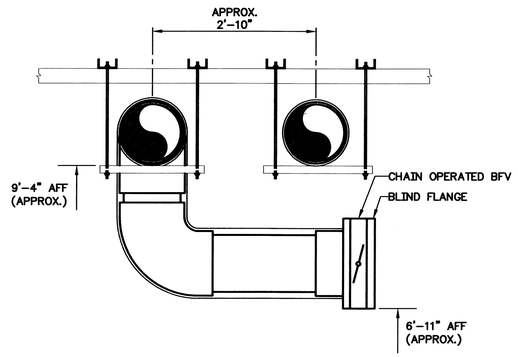
EXTENDED PIPE SUPPORT (E, M24/M24)
NOT TO SCALE



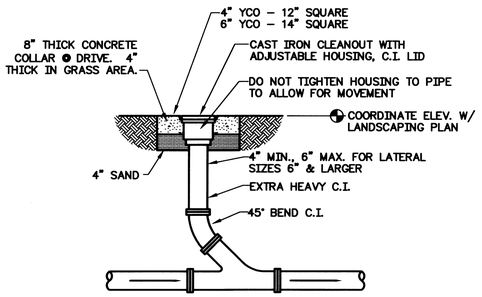
BUTTERFLY VALVE MOUNTING DETAIL (A, M22/M24)
NOT TO SCALE



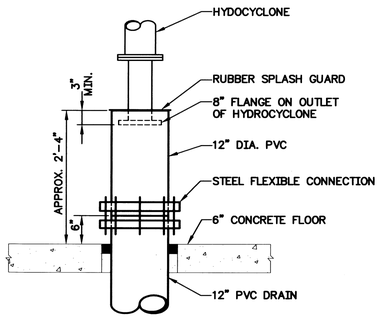
PIPE HANGER DETAIL (B, M24/M24)
NOT TO SCALE



PIPE HANGER SECTION (C, M24/M24)
NOT TO SCALE



YARD CLEANOUT DETAIL (H, TYP/M24)
NOT TO SCALE



HYDROCYCLONE UNDER FLOW DRAIN CONNECTION (F, M24/M24)
0' 1' 2' 3'
3/4" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER — EDWARD E. DONAHUE — 13797 — OREGON — Sept. 17, 1987 — Expires 12/31/07

LINCOLN D. COCRAN — 62-31349 — REGISTERED PROFESSIONAL ENGINEER — ILLINOIS — EXPIRES 11/30/07 — Engineer Seal

HDR | FISHPRO

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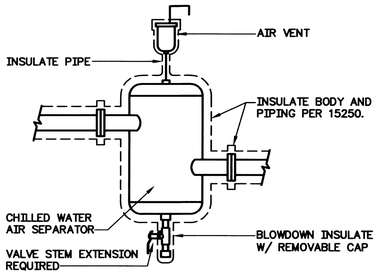
UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

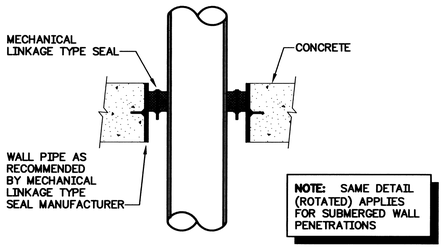
NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

UTILITY BUILDING PIPING DETAILS 1

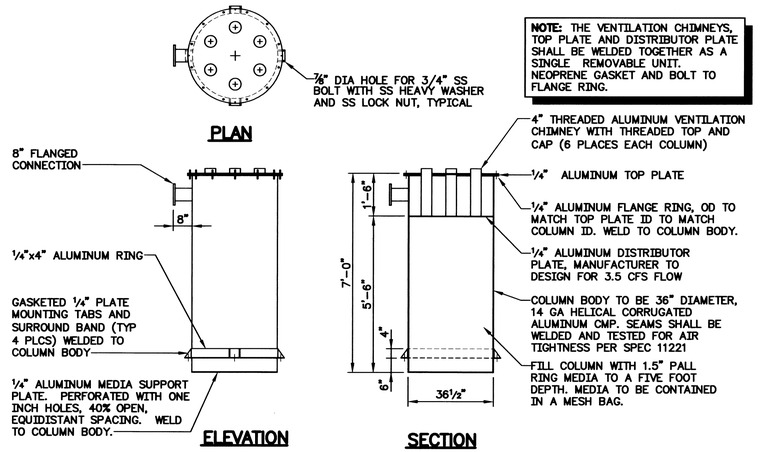
SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
___	___	M24	· OF ·	—



CHILLED WATER ROLATROL INSULATION DETAIL (A)
NOT TO SCALE

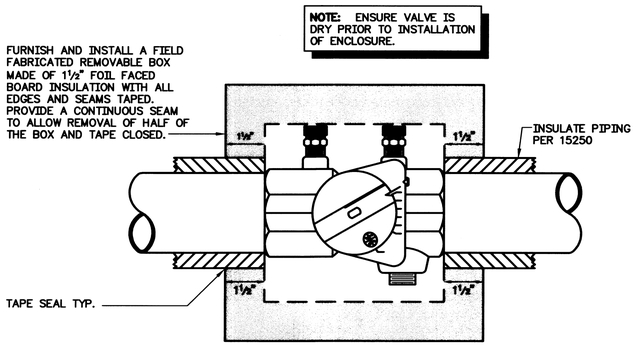


LINKAGE TYPE PIPE SEAL (B)
NOT TO SCALE

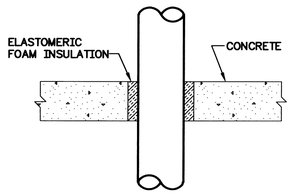


0' 2' 4' 6'

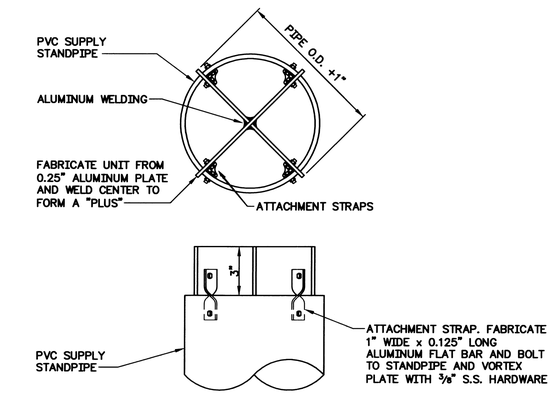
COLUMN DETAIL (C)
SCALE: 3/8" = 1'-0"



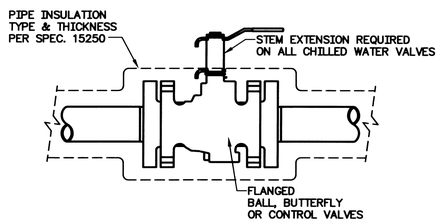
CHILLED WATER CIRCUIT SETTER INSULATION DETAIL (D)
NOT TO SCALE



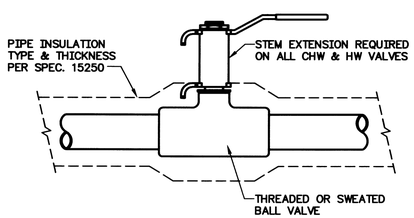
PIPE PENETRATION DETAIL (E)
NOT TO SCALE



ANTI-VORTEX CAP (F)
NOT TO SCALE



CHILLED WATER VALVE INSULATION DETAIL (FLANGED) (G)
NOT TO SCALE



CHILLED WATER VALVE INSULATION DETAIL (THREADED OR SOLDERED) (H)
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON Sept. 17, 1987 EDWARD E. DONAHUE
Expires 12/31/09

LINCOLN D. COCHRAN 62-31349 REGISTERED PROFESSIONAL ENGINEER ILLINOIS
EXPIRES 11/30/07
Engineer Seal

HDR | FISHPRO

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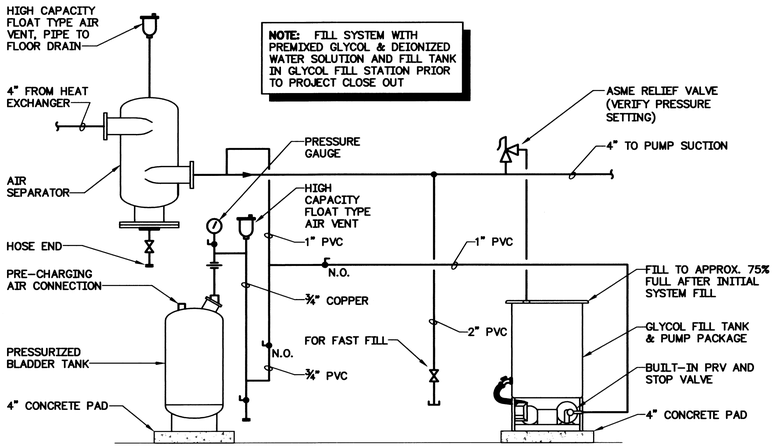
UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

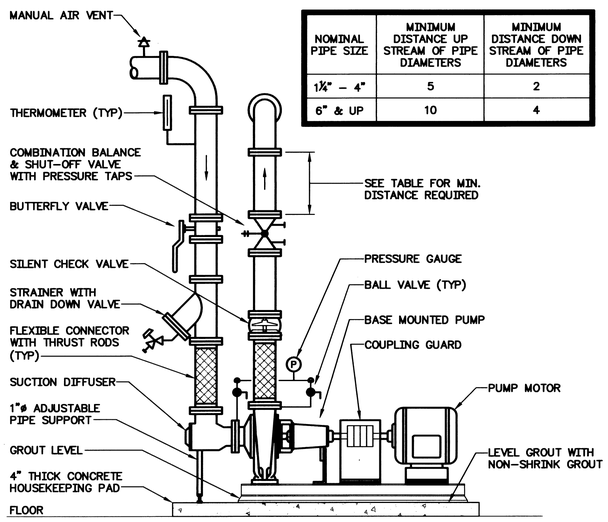
NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

UTILITY BUILDING PIPING DETAILS 2

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
		M25	· OF ·	



GLYCOL SYSTEM AND EXPANSION TANK DETAIL (A M26|M26)
NOT TO SCALE



NOMINAL PIPE SIZE	MINIMUM DISTANCE UP STREAM OF PIPE DIAMETERS	MINIMUM DISTANCE DOWN STREAM OF PIPE DIAMETERS
1¼" – 4"	5	2
6" & UP	10	4

BASE MOUNTED PUMP PIPING DETAIL (B M26|M26)
NOT TO SCALE

ULTRAVIOLET DISINFECTION SCHEDULE

DESIGNATION	QTY	WATER TEMPERATURE RANGE	PEAK FLOW	PRESSURE LOSS MAX.	TRANSMITTANCE AT 253.7 nm	UV DOSE AT END OF LAMP LIFE	VOLTAGE	MAXIMUM WATTS	CONNECTION SIZE	MAXIMUM LAMPS	TROJAN MODEL
UV–1	1	38° F	1400 GPM	5" WATER	70%	60,000 mW sec/cm²	277/1	4877	12" FLANGE	18	18AL40
UV–2	1	38° F	1400 GPM	5" WATER	70%	60,000 mW sec/cm²	277/1	4877	12" FLANGE	18	18AL40

ACCESSORIES: PROVIDE ELECTRIC MOTOR DRIVEN AUTOMATIC WIPER SYSTEM AND TRANSFORMER TO MATCH UNIT VOLTAGE TO AVAILABLE BUILDING POWER WHICH IS 277 VOLT, 1 PHASE.

HEAT EXCHANGER SCHEDULE

MARK		HX–1
LOCATION		MECH. ROOM
MANUFACTURER		ITT HEAT TRANSFER
MODEL		P47DW–209–TL
CHILLER SYSTEM CHARACTERISTICS (COLD SIDE)	FLUID TYPE	PROPYLENE GLYCOL/ DEIONIZED WATER SOLUTION
	BRINE CONCENTRATION	46% PG BY VOLUME
	EWT (DEG F)	34.0
	LWT (DEG F)	42.0
	GPM	257.0
	WPD (PSI)	4.73
CHILLED BUFFER TANK SYSTEM CHARACTERISTICS (HOT SIDE)	FLUID TYPE	WATER
	BRINE CONCENTRATION	0%
	EWT (DEG F)	45.0
	LWT (DEG F)	37.0
	GPM	230.0
	WPD (PSI)	2.68
PHYSICAL CHARACTERISTICS	NUMBER OF PLATES	209
	MAXIMUM NUMBER OF PLATES	223
	EFFECTIVE HEAT SURFACE AREA (SQ FT)	1114.06
	OVERALL K–VALVE (DUTY/CLEAN)	277/278
	PLATE MATERIAL	2 x 0.0138 IN AISI 316
	GASKET MATERIAL	NITRIL LOCK
	MAXIMUM WORKING TEMPERATURE (DEG F)	302
	WORKING PRESSURE (PSIG)	150.0
	TEST PRESSURE (PSIG)	195.0
	FRAME TYPE	IS
	CONNECTIONS HOT SIDE (INCHES)	4
	CONNECTIONS COLD SIDE (INCHES)	4
	LIQUID VOLUME (CUBIC FT)	8.44
	LENGTH (INCHES)	73.2
	WIDTH (INCHES)	20.5
	HEIGHT (INCHES)	72.1
	CARRY BAR LENGTH (INCHES)	59.04
	WEIGHT (LBS)	3160
ACCESSORIES		
REMARKS		

AIR COOLED FLUID COOLER SCHEDULE

MARK		RAD–1
LOCATION		ON GRADE
MANUFACTURER		EXACT EXCHANGER INC.
MODEL		HL/FLD–1213
FLUID COOLER COOLING CAPACITY	FLUID TYPE	PROPYLENE GLYCOL/ DEIONIZED WATER SOLUTION
	BRINE CONCENTRATION	46% PG BY VOLUME
	EWT (DEG F)	43.4
	LWT (DEG F)	34.0
	OUTDOOR TEMPERATURE (DEG F)	MINUS 14
	GPM	257.0
	WPD (FT)	11.61
UNIT DIMENSIONS & OPERATING WEIGHT	LENGTH (INCHES)	312
	WIDTH (INCHES)	84
	HEIGHT (INCHES)	53
	WEIGHT (LBS)	–
	PIPING CONNECTION SIZES (NOMINAL DIA., INCH)	TWO @ 4"
ELECTRICAL DATA	VOLTAGE	460
	PHASE	3
	TOTAL UNIT KW	–
	MCA	–
	MOCP	–
	CONTROL CKT	YES–FACTORY WIRED
	SINGLE OR DUAL POWER CONNECTION	SINGLE
FLUID COOLER FANS	NUMBER	12
	TOTAL AIRFLOW (SCFM)	107,532
	INSTALLATION ELEVATION (FT)	4500
	HP (EACH)	1.5
	VOLTAGE	460
	PHASE/ 60 HERTZ	3
ACCESSORIES		INTEGRAL DIGITAL ELECTRONIC OUTLET FLUID TEMPERATURE CONTROLLER & FAN VFD'S
REMARKS		COPPER TUBE ALUMINUM FIN COIL & GALVANIZED STEEL HOUSING

AIR COOLED LIQUID CHILLER SCHEDULE

MARK		CHLR–1
LOCATION		ON GRADE
MANUFACTURER		CARRIER
MODEL		30RB100
UNIT COOLING CAPACITY	E.A.T. (DEG F)	84.0
	SUCTION TEMPERATURE (DEG F)	–
	INPUT TEMPERATURE (DEG F)	–
	CAPACITY (TONS)	84
FLUID COOLER COOLING CAPACITY	FLUID TYPE	PROPYLENE GLYCOL/ DEIONIZED WATER SOLUTION
	BRINE CONCENTRATION	46% PG BY VOLUME
	EWT (DEG F)	42.9
	LWT (DEG F)	34.0
	GPM	257.0
	WPD (FT)	24.13
UNIT DIMENSIONS & OPERATING WEIGHT	LENGTH (INCHES)	142
	WIDTH (INCHES)	89
	HEIGHT (INCHES)	90
	WEIGHT (LBS)	6155
	PIPING CONNECTION SIZES (NOMINAL DIA., INCH)	4
ELECTRICAL DATA	VOLTAGE	460
	PHASE	3
	TOTAL UNIT KW	114.1
	MCA	427.0
	MOCP	500
	CONTROL CKT	YES–FACTORY WIRED
	SINGLE OR DUAL POWER CONNECTION	SINGLE
CONDENSER FANS	NUMBER	6
	KW TOTAL	15.4
	VOLTAGE	460
	PHASE/ 60 HERTZ	3
	INSTALLATION ELEVATION (FT)	4500
COMPRESSORS	TYPE	SCROLL
	NUMBER	4
	TOTAL RUNNING LOAD AMPS	91.7 EACH
	KW TOTAL	98.7
	VOLTAGE	460
	PHASE/ 60 HERTZ	3
	CAPACITY UNLOADING STEPS	0,25,50,75,100 PLUS HGB
	MINIMUM UNLOADED CAPACITY (TONS)	15% OF MINIMUM UNIT CAPACITY
	HOT GAS BYPASS	YES
	REFRIGERATION CKTS	2
	REFRIGERANT	R410A
ACCESSORIES		COIL COVERS, LOWER & UPPER GRILLES
EER		8.84
REMARKS		PROVIDE POWER FACTOR CORRECTION CAPACITORS AND MODBUS COMMUNICATIONS OPTIONS

HYDRONIC EQUIPMENT SCHEDULE

AIR SEPARATORS		
MARK		AS–1
SYSTEM		CHILLER
FLOW RATE (GPM)		257
PRESSURE DROP (FT)		5
STRAINER (YES/NO)		NO
CONNECTION SIZES (INCHES)		4
MANUFACTURE & MODEL	BELL & GOSSETT	RL–4
	TACO	–
	WHEATLY	–
ACCESSORIES		AUTOMATIC AIR VENT
EXPANSION TANKS		
MARK		ET–1
SYSTEM		CHILLER
TYPE		BLADDER
INITIAL PRESSURE (PSIG)		35.0
MAXIMUM SYSTEM PRESSURE (PSIG)		55.0
RELIEF VALVE PRESSURE SETTING (PSIG)		65.0
TOTAL SYSTEM VOLUME (GAL)		1000.0
TANK VOLUME (GAL)		33.6
ACCEPTANCE VOLUME (GAL)		11.1
TANK DIAMETER (INCHES)		16.25
TANK HEIGHT OR LENGTH (INCHES)		43.0
OPERATING WEIGHT (LBS)		200.0
MANUFACTURE & MODEL	BELL & GOSSETT	D–60V
	TACO	–
	WHEATLY	–
ACCESSORIES		CHARGING VALVE

CHILLER SYSTEM STORAGE TANK SCHEDULE

MARK	ST–1
SYSTEM	CHILLER
MANUFACTURER	CEMLINE
MODEL	CWB–850
FLOW RATE (GPM)	257
PRESSURE DROP (FEET)	5
TANK DIAMETER (INCHES)	54
TANK LENGTH (INCHES)	96
MINIMUM NUMBER OF SUPPORT LEGS	3
DRAIN CONNECTION SIZE (INCHES)	1½
VENT CONNECTION SIZE (INCHES)	¾
DISTANCE OF CENTER OPENING (INCHES)	18
HEIGHT OF INTERIOR BAFFLE FROM BOTTOM OF TANK (INCHES)	32
CONNECTION SIZES (INCHES)	4
ACCESSORIES	AUTOMATIC AIR VENT
REMARKS	INTERIOR BAFFLE ON TANK CENTERLINE FROM TOP DOWN TO FLOW CHANNEL AT BOTTOM OF TANK

PUMP SCHEDULE

MARK		CHP–1 & 2	CHBTP–1 & 2
MANUFACTURER		BELL & GOSSETT	BELL & GOSSETT
MODEL		1510	1510
SIZE		3E	2½BB
LOCATION		MECH. ROOM	MECH. ROOM
SERVICE		CHILLER	CHILLED WATER BUFFER TANK
IMPELLER SIZE (SIZES)		9.5	8.5
TYPE (BASE MOUNT/ INLINE)		BASE MOUNT	BASE MOUNT
FLOW RATE (GPM)		257	230
HEAD (FT)		85	65
NO FLOW HEAD (FT)		91	75
MINIMUM EFFICIENCY %		71.0%	75.5%
FLUID OPERATION TEMP (DEG F)		34.0	37.0
MOTOR	HP	10.0	7.5
	RPM	1750	1750
	VOLTAGE	460	460
	PHASE/ 60 HERTZ	3	3
	TYPE	PREMIUM HI–EFF	PREMIUM HI–EFF
VIBRATION ISOLATION	TYPE	–	–
	DEFLECTION	–	–
ACCESSORIES		SUCTION DIFFUSER	SUCTION DIFFUSER
REMARKS		MOTORS RATED FOR INVERTER DUTY	MOTORS RATED FOR INVERTER DUTY

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REGISTERED PROFESSIONAL ENGINEER 13,79 OREGON Sept. 17, 1987 EDWARD E. DONAHUE Expires 12/31/09

LINCOLN D. COCHRAN 62–31349 REGISTERED PROFESSIONAL ENGINEER ILLINOIS EXPIRES 11/30/07 Engineer Seal

HDR | FISHPRO

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

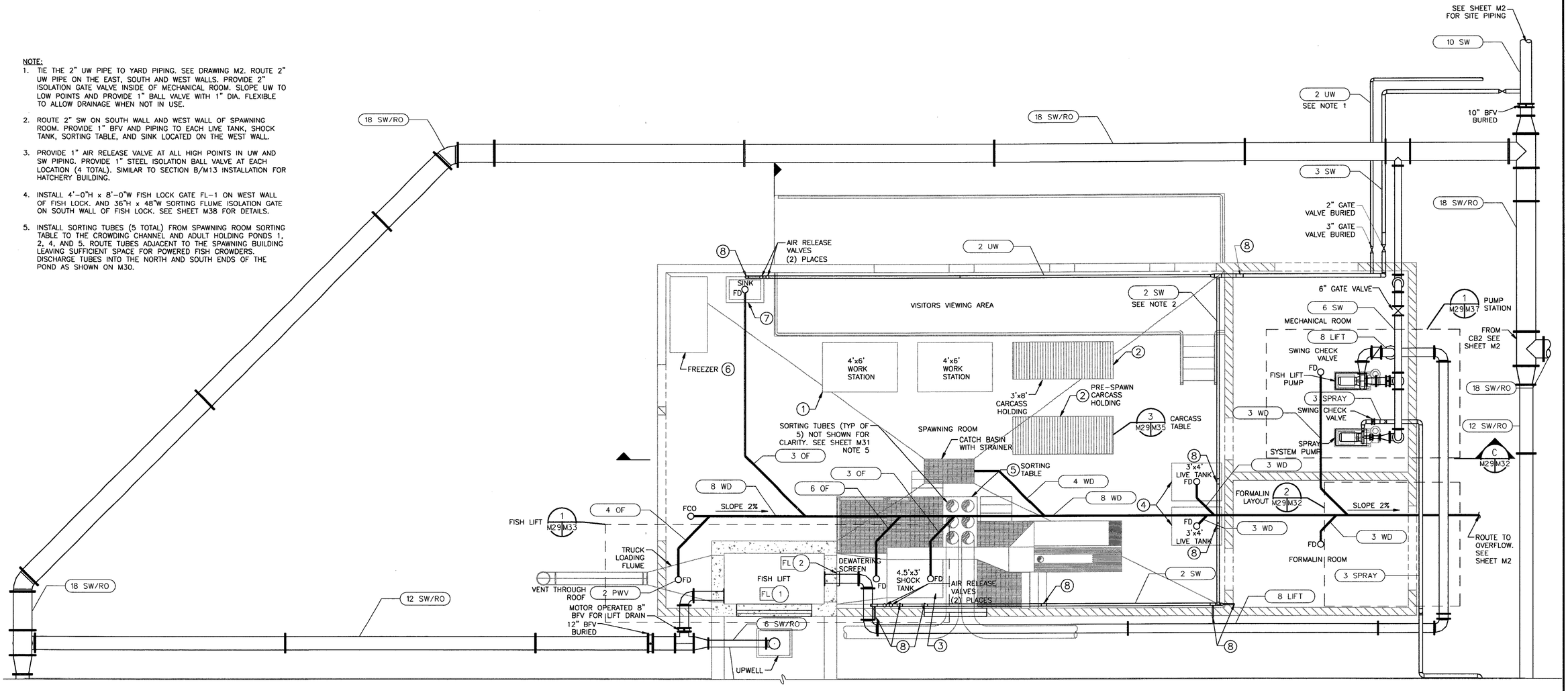
NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

UTILITY BUILDING PIPING DETAILS & EQUIPMENT SCHEDULES

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
— — —	— —	M26	· OF ··	—

NOTE:

1. TIE THE 2" UW PIPE TO YARD PIPING. SEE DRAWING M2. ROUTE 2" UW PIPE ON THE EAST, SOUTH AND WEST WALLS. PROVIDE 2" ISOLATION GATE VALVE INSIDE OF MECHANICAL ROOM. SLOPE UW TO LOW POINTS AND PROVIDE 1" BALL VALVE WITH 1" DIA. FLEXIBLE TO ALLOW DRAINAGE WHEN NOT IN USE.
2. ROUTE 2" SW ON SOUTH WALL AND WEST WALL OF SPAWNING ROOM. PROVIDE 1" BFV AND PIPING TO EACH LIVE TANK, SHOCK TANK, SORTING TABLE, AND SINK LOCATED ON THE WEST WALL.
3. PROVIDE 1" AIR RELEASE VALVE AT ALL HIGH POINTS IN UW AND SW PIPING. PROVIDE 1" STEEL ISOLATION BALL VALVE AT EACH LOCATION (4 TOTAL). SIMILAR TO SECTION B/M13 INSTALLATION FOR HATCHERY BUILDING.
4. INSTALL 4'-0"H x 8'-0"W FISH LOCK GATE FL-1 ON WEST WALL OF FISH LOCK. AND 36"H x 48"W SORTING FLUME ISOLATION GATE ON SOUTH WALL OF FISH LOCK. SEE SHEET M38 FOR DETAILS.
5. INSTALL SORTING TUBES (5 TOTAL) FROM SPAWNING ROOM SORTING TABLE TO THE CROWDING CHANNEL AND ADULT HOLDING PONDS 1, 2, 4, AND 5. ROUTE TUBES ADJACENT TO THE SPAWNING BUILDING LEAVING SUFFICIENT SPACE FOR POWERED FISH CROWDERS. DISCHARGE TUBES INTO THE NORTH AND SOUTH ENDS OF THE POND AS SHOWN ON M30.



ITEM	QTY	DESCRIPTION
①	2	4'x6' STAINLESS STEEL WORKSTATION
②	2	3'x8' STAINLESS STEEL CARCASS RACKS
③	1	ALUMINUM SHOCK TANK
④	2	FIBERGLASS HOLDING TANK: AQUATIC ECO-SYSTEMS, INC. PART NO. FT293 OR EQUIVALENT
⑤	1	4'x2.75' STAINLESS STEEL SORTING TABLE
⑥	1	20 CF FREEZER (MINIMUM)
⑦	2	UTILITY WATER SINK, PVC CONSTRUCTION MOUNTED ON ALUMINUM FRAME
⑧	13	2" BALL VALVES

B M29/M31

MECHANICAL PLAN

0 4 8 12 FT

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

REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21 1992 MORTON D. McMILLEN

EXP. 12-31-06

Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

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Drawn R. GUERRERO
Chkd M. McMILLEN
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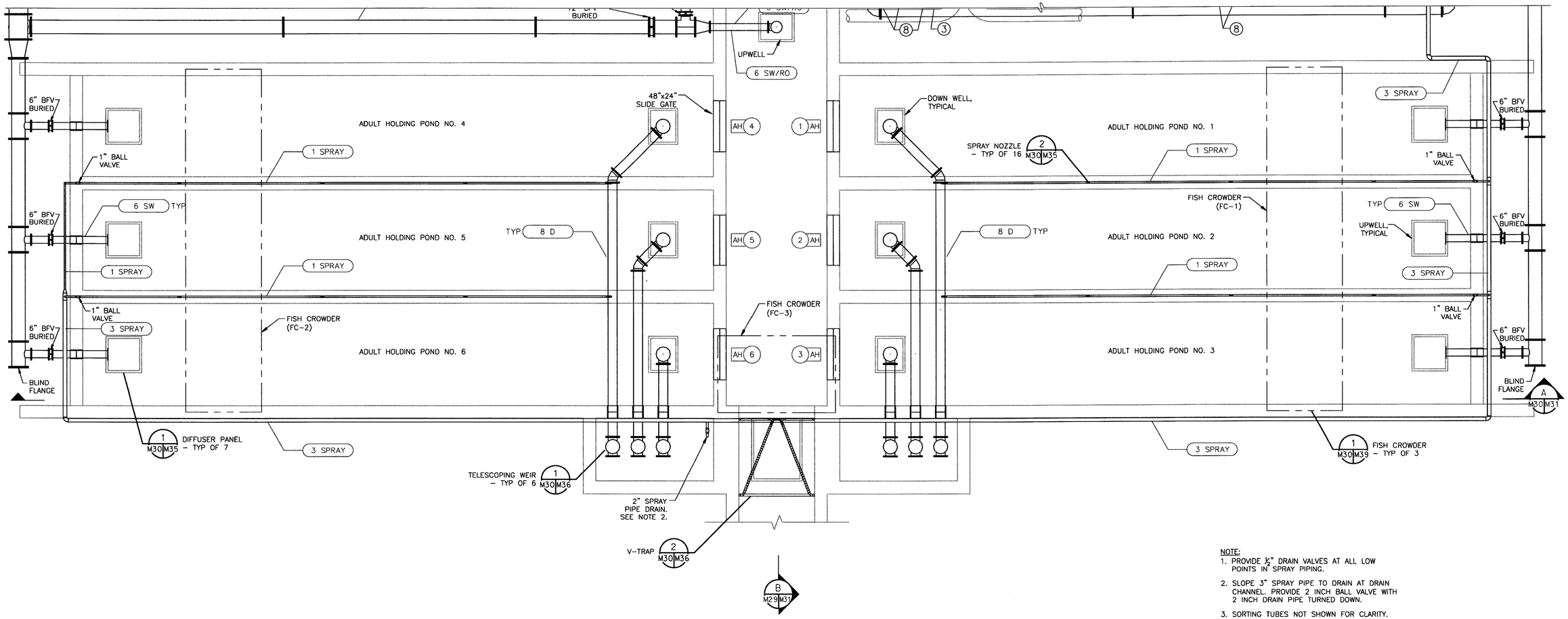
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
ADULT HOLDING AND SPAWNING BUILDING
MECHANICAL PLAN

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
		M29	OF	



MECHANICAL PLAN

0 4 8 12 FT

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

NOTE:
1. PROVIDE ½" DRAIN VALVES AT ALL LOW POINTS IN SPRAY PIPING.
2. SLOPE 3" SPRAY PIPE TO DRAIN AT DRAIN CHANNEL. PROVIDE 2 INCH BALL VALVE WITH 2 INCH DRAIN PIPE TURNED DOWN.
3. SORTING TUBES NOT SHOWN FOR CLARITY. SEE DRAWING M32.

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EXP. 12-31-06
Engineer Seal

HDR | FISHPRO

ME McMILLEN ENGINEERING BOISE, IDAHO

Design D. NELSON
Drawn R. GUERRERO
Chkd M. McMILLEN
Sub ---
Rec ---
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NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
ADULT HOLDING AND SPAWNING BUILDING
MECHANICAL PLAN

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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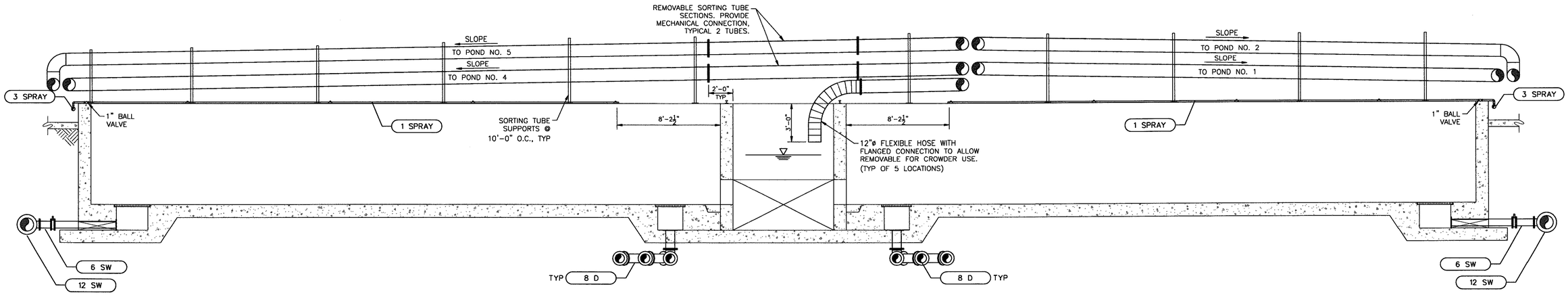
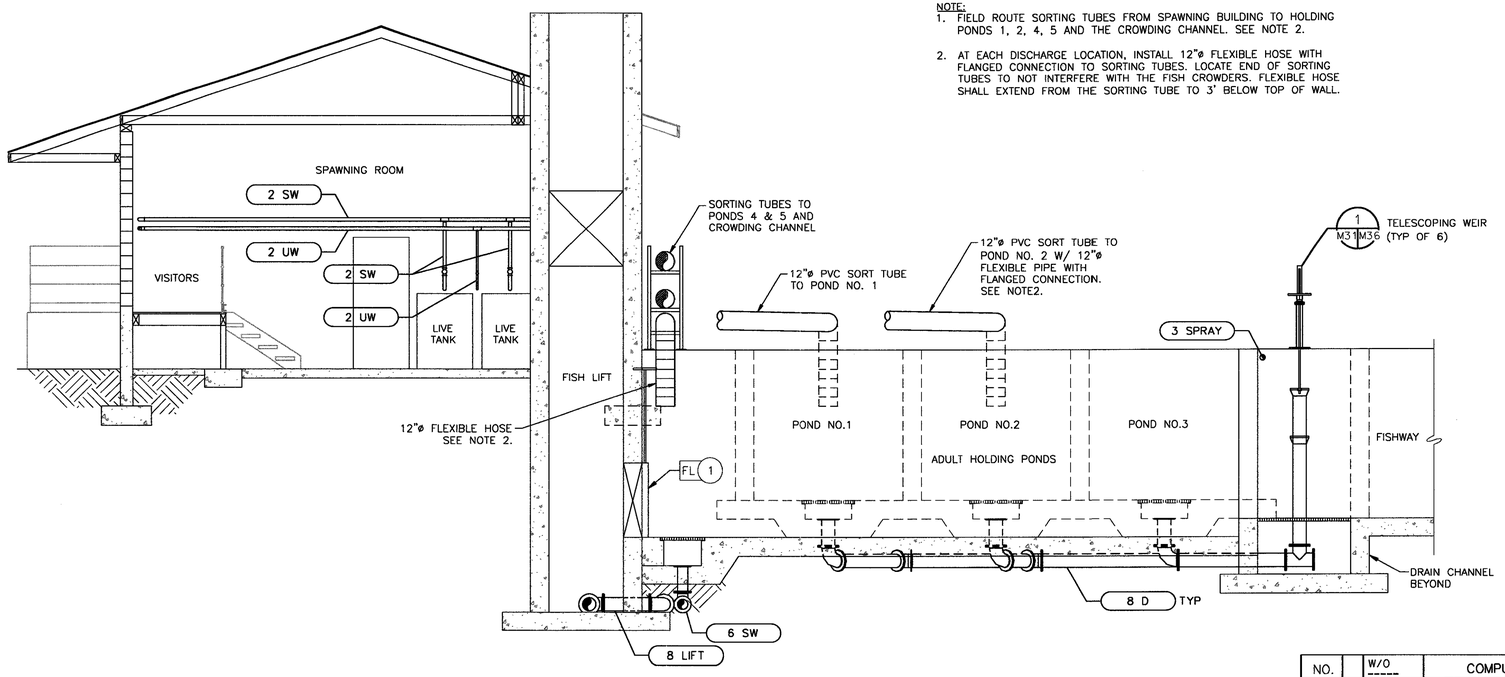


POND SECTION

A M30 M31

0 4 8 12 FT

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



BUILDING/POND SECTION

B M30 M31

0 4 8 12 FT

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

NOTE:
1. FIELD ROUTE SORTING TUBES FROM SPAWNING BUILDING TO HOLDING PONDS 1, 2, 4, 5 AND THE CROWDING CHANNEL. SEE NOTE 2.
2. AT EACH DISCHARGE LOCATION, INSTALL 12"ø FLEXIBLE HOSE WITH FLANGED CONNECTION TO SORTING TUBES. LOCATE END OF SORTING TUBES TO NOT INTERFERE WITH THE FISH CROWDERS. FLEXIBLE HOSE SHALL EXTEND FROM THE SORTING TUBE TO 3' BELOW TOP OF WALL.

REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21 1992 MORTON D. McMILLEN
EXP. 12-31-06
Engineer Seal

HDR | FISHPRO

ME McMILLEN ENGINEERING BOISE, IDAHO

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NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

ADULT HOLDING AND SPAWNING BUILDING SECTIONS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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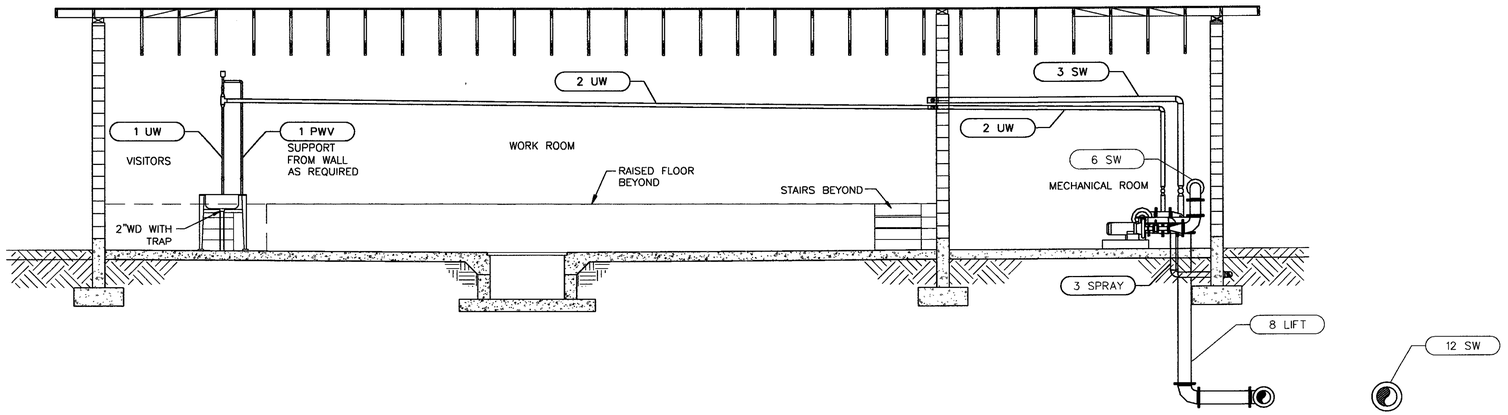
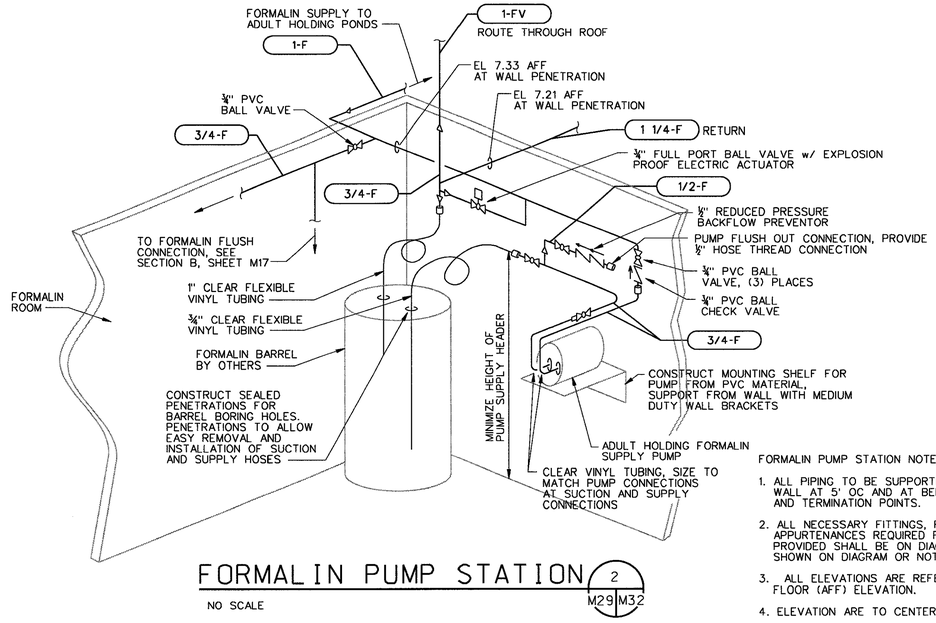


BUILDING SECTION

A
M29 | M32

0 4 8 12 FT

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



FORMALIN PUMP STATION

2
M29 | M32

NO SCALE

FORMALIN PUMP STATION NOTES:

1. ALL PIPING TO BE SUPPORTED OFF OF WALL AT 5' OC AND AT BENDS, VALVES AND TERMINATION POINTS.
2. ALL NECESSARY FITTINGS, REDUCERS AND APPURTENANCES REQUIRED FOR INSTALLING PROVIDED SHALL BE ON DIAGRAM WHETHER SHOWN ON DIAGRAM OR NOT.
3. ALL ELEVATIONS ARE REFERENCED ABOVE FINISH FLOOR (AFF) ELEVATION.
4. ELEVATION ARE TO CENTERLINE OF PIPE.
5. THE FORMALIN PUMP STATION FOR THE ADULT HOLDING PONDS IS SIMILAR TO THE HATCHERY BUILDING

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REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21, 1992 MORTON D. McMILLEN

EXP. 12-31-06

Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

Design D. NELSON
Drawn R. GUERRERO
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NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

ADULT HOLDING AND SPAWNING BUILDING MECHANICAL SECTIONS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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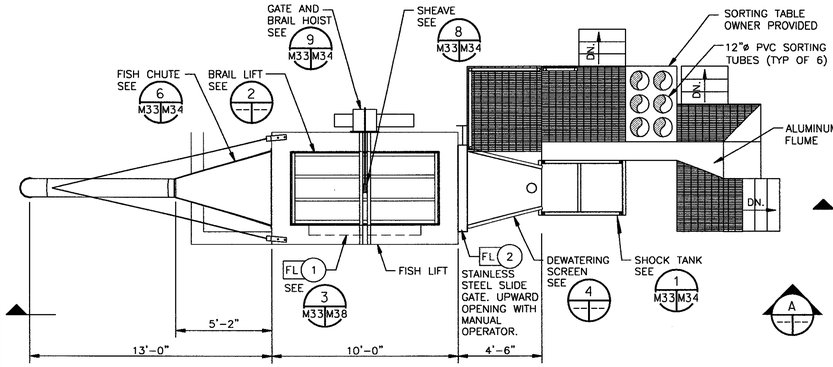
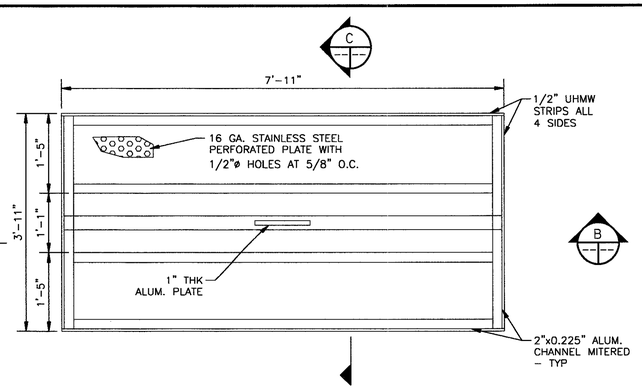


FISH LIFT - PLAN 1 M29 M33

0 4 8 12 FT

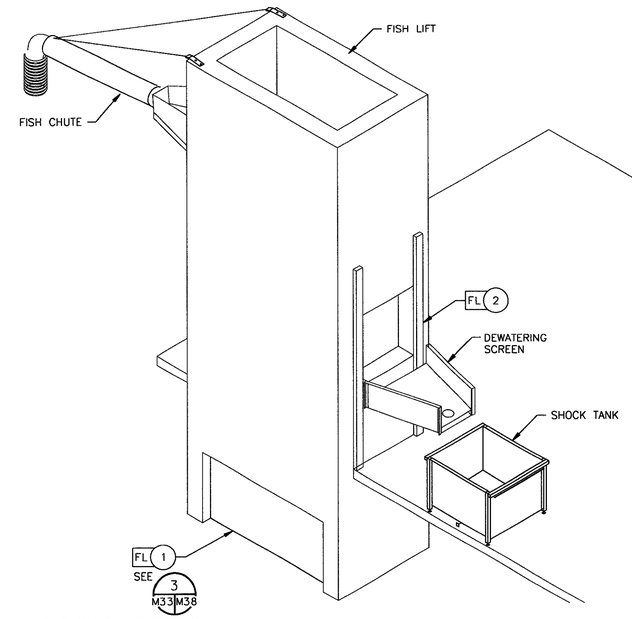
SCALE: 1/4"=1'-0"



BRAIL LIFT - PLAN 2

0 1 2 4 FT

SCALE: 3/4"=1'-0"



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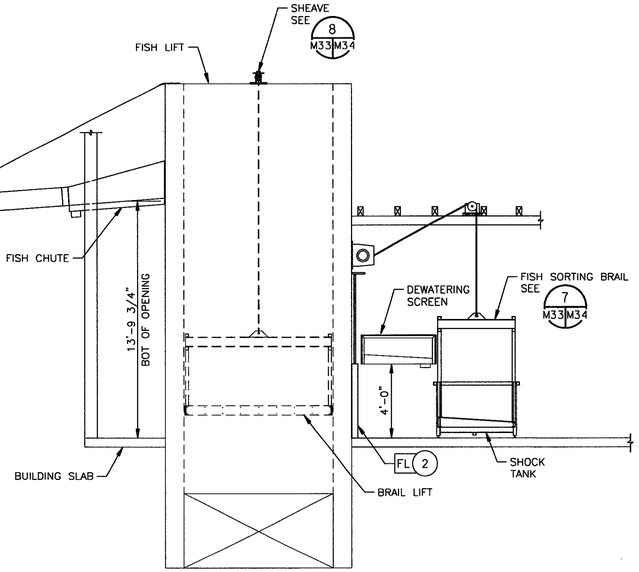
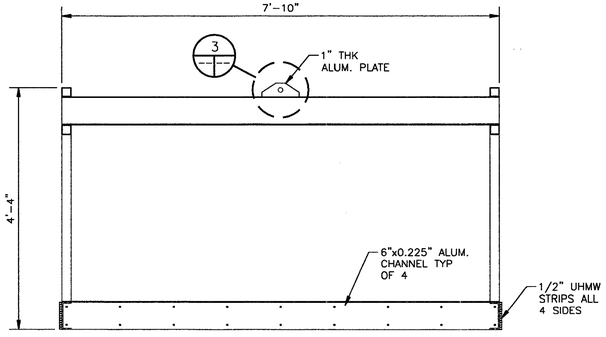


FISH LIFT - ELEVATION A

0 4 8 12 FT

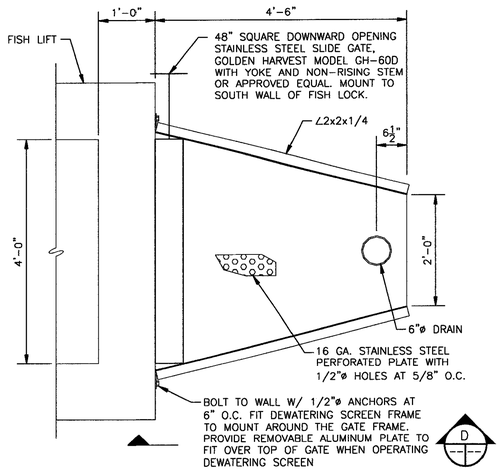
SCALE: 1/4"=1'-0"



BRAIL LIFT - SECTION B

0 1 2 4 FT

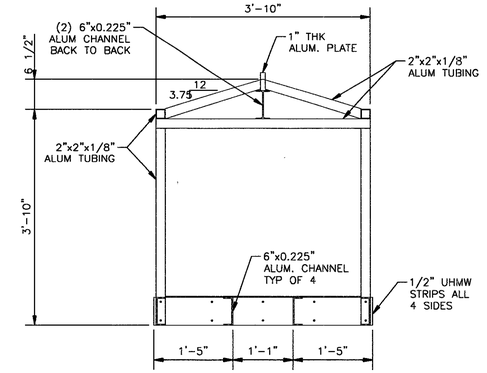
SCALE: 3/4"=1'-0"



FISH DEWATERING SCREEN - PLAN 4

0 1 2 4 FT

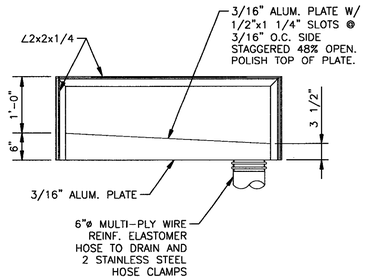
SCALE: 3/4"=1'-0"



BRAIL LIFT - SECTION C

0 1 2 4 FT

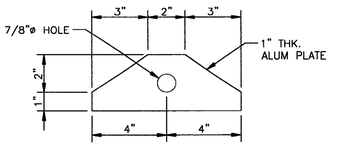
SCALE: 3/4"=1'-0"



FISH DEWATERING SCREEN - ELEVATION D

0 1 2 4 FT

SCALE: 3/4"=1'-0"



ALUM. PLATE 3

0 1/4 1/2 1 FT

SCALE: 3"=1'-0"

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C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M-33.dwg

REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21 1995 MORTON D. McMILLEN

EXP. 12-31-06

Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

Design	D. AXNESS
Drawn	R. GUERRERO
Chkd	M. McMILLEN
Sub	
Rec	
Rec	
Appr	
Date	

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

ADULT HOLDING AND SPAWNING BUILDING DETAILS 1

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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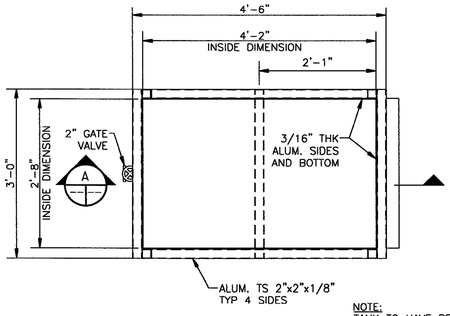
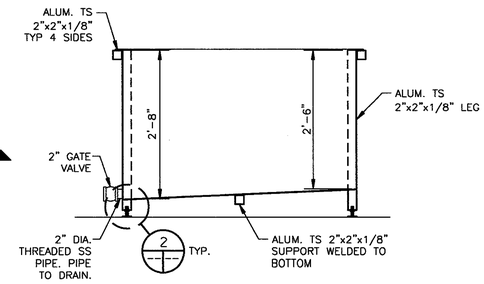




NOTE:
TANK TO HAVE BRUSH SATIN FINISH.

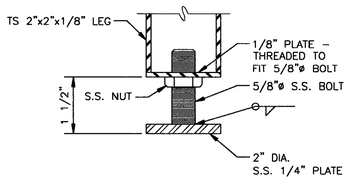
PLAN

SECTION A

SHOCK TANK 1

0 1 2 4 FT

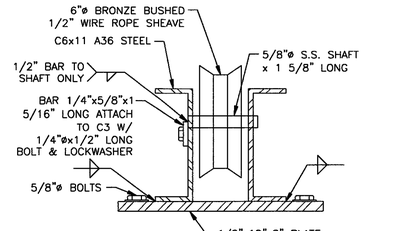
SCALE: 3/4"=1'-0"



DETAIL 2

0 3" 6" 1 FT

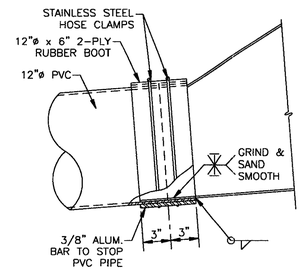
SCALE: 6"=1'-0"



SHEAVE 8

0 1/4 1/2 1 FT

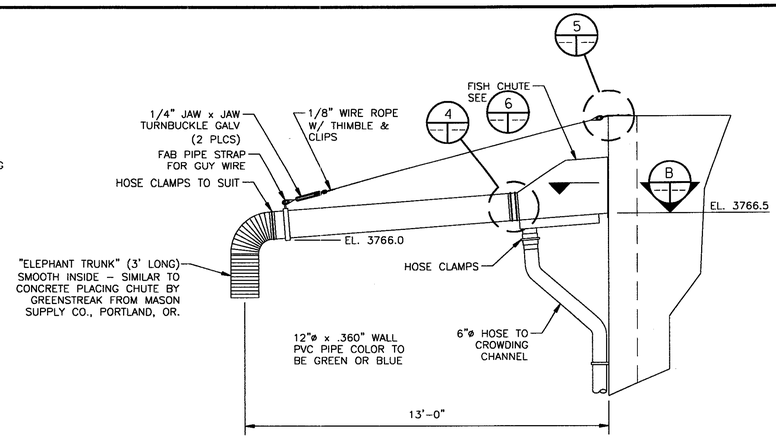
SCALE: 3"=1'-0"



FISH CHUTE TO PIPE TRANSITION 4

0 1/2 1 2 FT

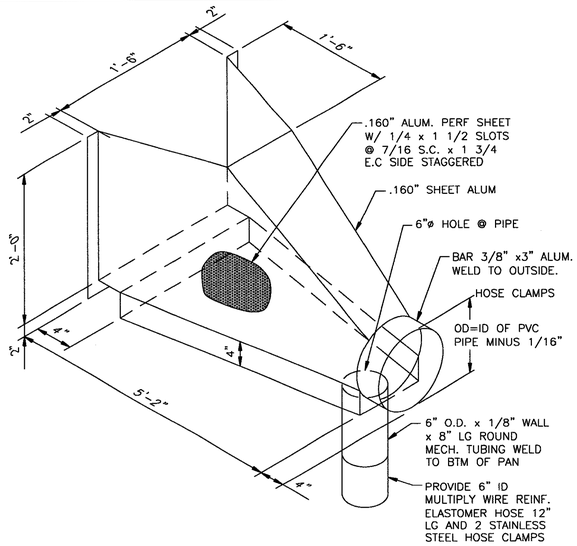
SCALE: 1 1/2"=1'-0"



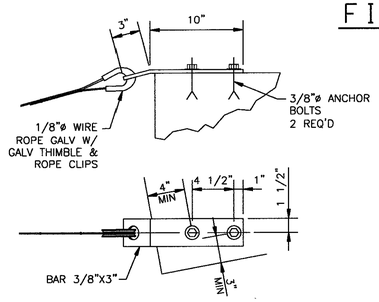
FISH CHUTE 3

0 2 4 8 FT

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



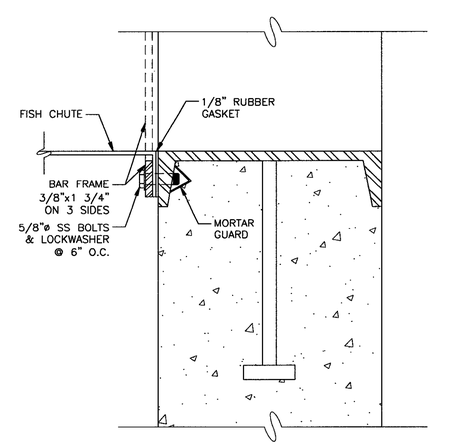
FISH CHUTE - ISOMETRIC 6



GUY ANCHOR 5

0 1/2 1 2 FT

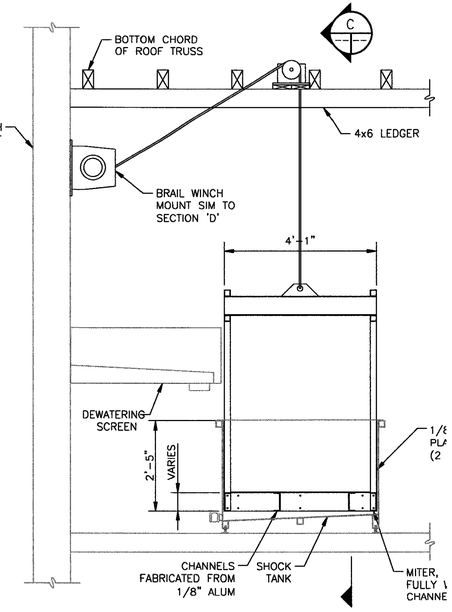
SCALE: 1 1/2"=1'-0"



FISH CHUTE SECTION B

0 1/4 1/2 1 FT

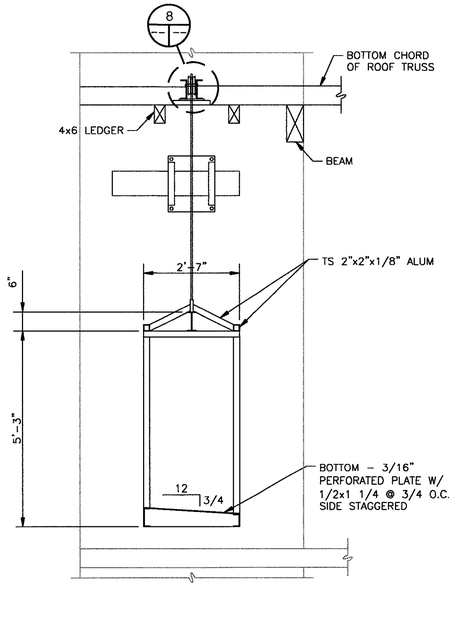
SCALE: 3"=1'-0"



FISH SORTING BRAIL 7

0 1 2 4 6 FT

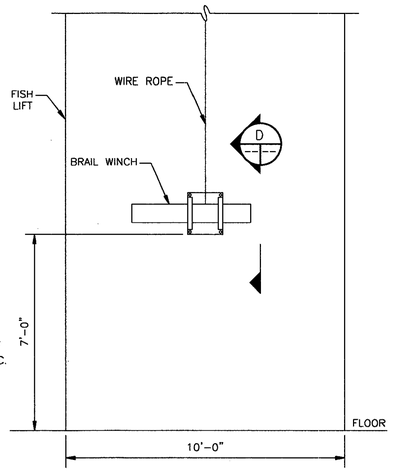
SCALE: 1/2"=1'-0"



FISH SORTING BRAIL C

0 1 2 4 6 FT

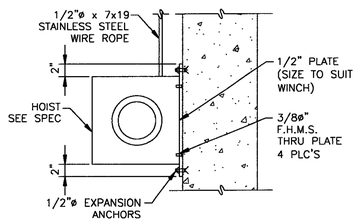
SCALE: 1/2"=1'-0"



GATE AND BRAIL HOISTS 9

0 2 4 8 FT

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



HOIST - SECTION D

0 1 2 3 FT

SCALE: 1"=1'-0"

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REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21, 1995 MORTON D. McMILLEN
EXP. 12-31-06
Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

Design	D. AXNESS
Drawn	R. GUERRERO
Chkd	M. McMILLEN
Sub	
Rec	
Rec	
Appr	
Date	

UNITED STATES DEPARTMENT OF ENERGY
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HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
ADULT HOLDING AND SPAWNING BUILDING
DETAILS 2

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
---	--	M34	OF	

LRH_M-34.dwg
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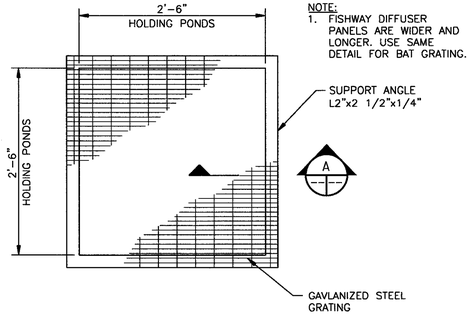
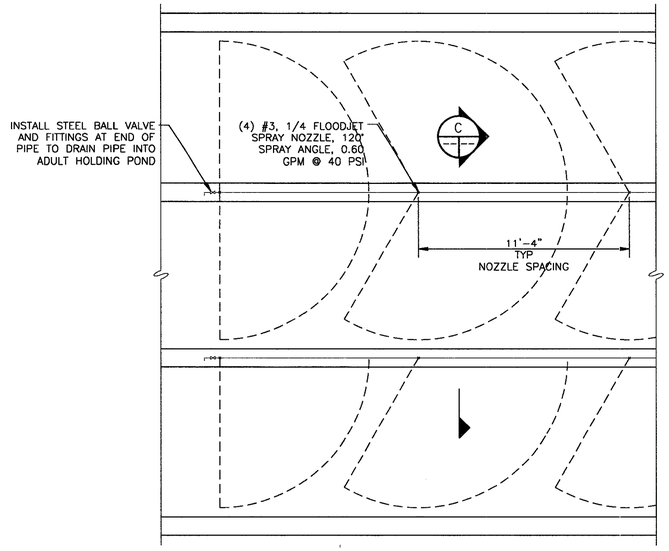


NOTE:
1. FISHWAY DIFFUSER PANELS ARE WIDER AND LONGER. USE SAME DETAIL FOR BAT GRATING.

FLOOR DIFFUSER PLAN (1 / M30 M35)

0 1 2 3 FT

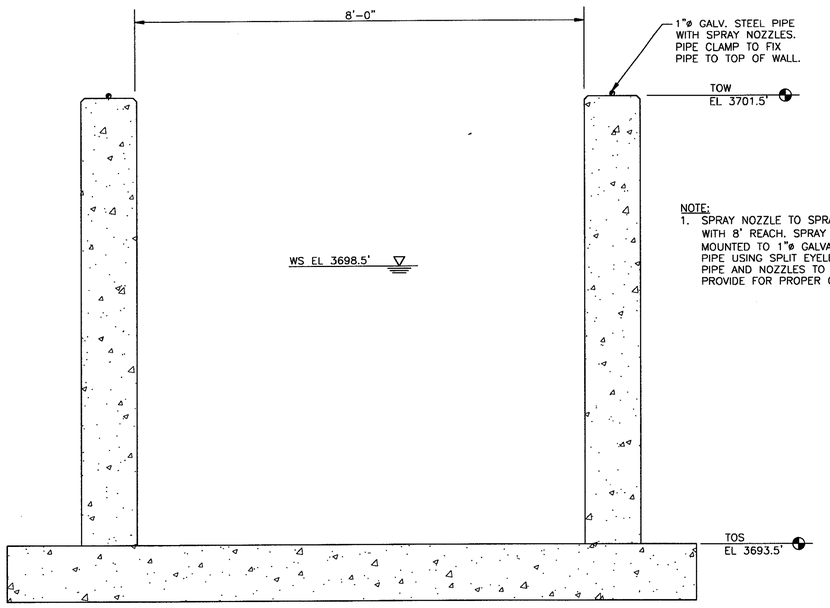
SCALE: 1"=1'-0"



DETAIL - END SPRAY (2 / M30 M35)

0 4 8 12 FT

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

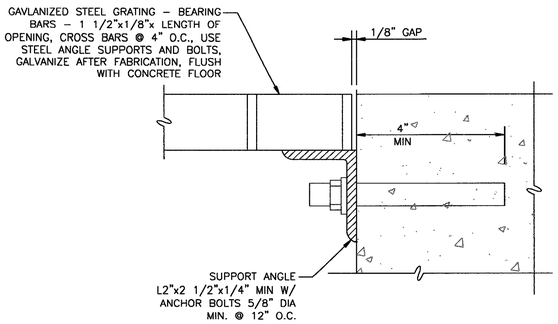


NOTE:
1. SPRAY NOZZLE TO SPRAY 120° RADIUS WITH 8' REACH. SPRAY NOZZLE TO BE MOUNTED TO 1"ø GALVANIZED STEEL PIPE USING SPLIT EYELET CONNECTORS PIPE AND NOZZLES TO BE ROTATED TO PROVIDE FOR PROPER COVERAGE

SPRAY NOZZLE SECTION (C)

0 1 2 4 FT

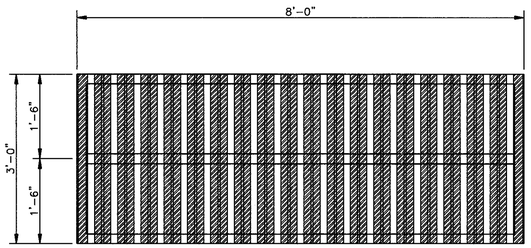
SCALE: 3/4"=1'-0"



FLOOR DIFFUSER SECTION (A)

0 3" 6" 1 FT

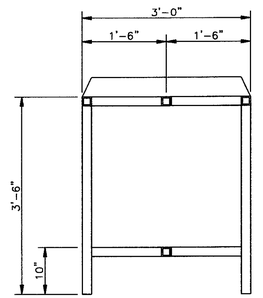
SCALE: 6"=1'-0"



CARCASS RACK PLAN (3 / M29 M35)

0 1 2 4 FT

SCALE: 3/4"=1'-0"

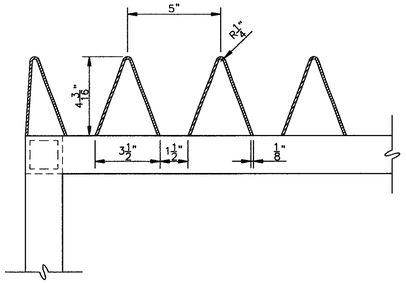


NOTES
1. FRAME CONSTRUCTED FROM 2" SQUARE x 1/8" THICK ALUMINUM TUBE.
2. 1/8" ALUMINUM SHEET FOR SURFACE.

CARCASS RACK ELEVATION (5)

0 1 2 4 FT

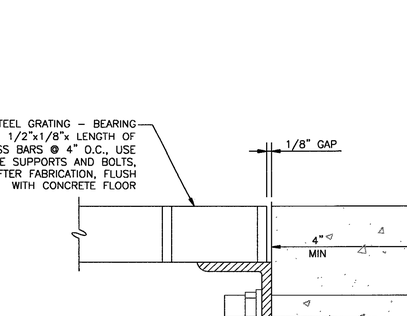
SCALE: 3/4"=1'-0"



DETAIL (6)

0 1/4 1/2 1 FT

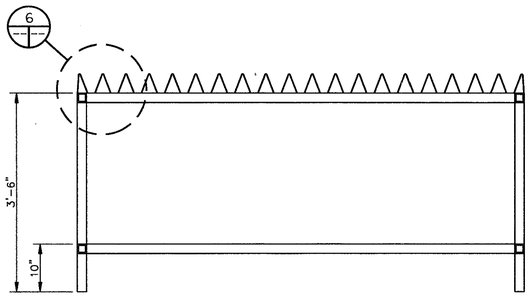
SCALE: 3"=1'-0"



DIFFUSER ATTACHMENT DETAIL (B)

0 3" 6" 1 FT

SCALE: 6"=1'-0"



CARCASS RACK ELEVATION (4)

0 1 2 4 FT

SCALE: 3/4"=1'-0"

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REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21 1992 MORTON D. McMILLEN
EXP. 12-31-06
Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

Design	D. NELSON
Drawn	R. GUERRERO
Chkd	M. McMILLEN
Sub	
Rec	
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Appr	
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UNITED STATES DEPARTMENT OF ENERGY
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NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
ADULT HOLDING AND SPAWNING BUILDING DETAILS 3

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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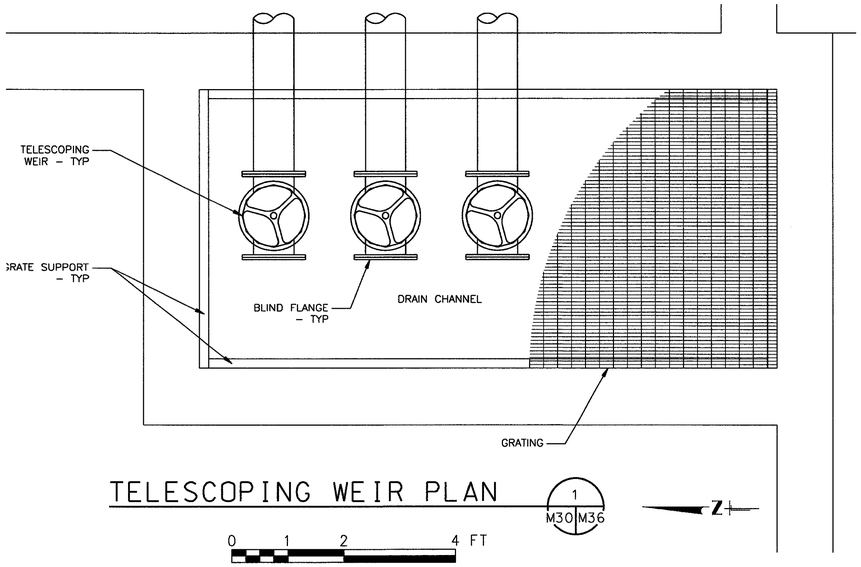
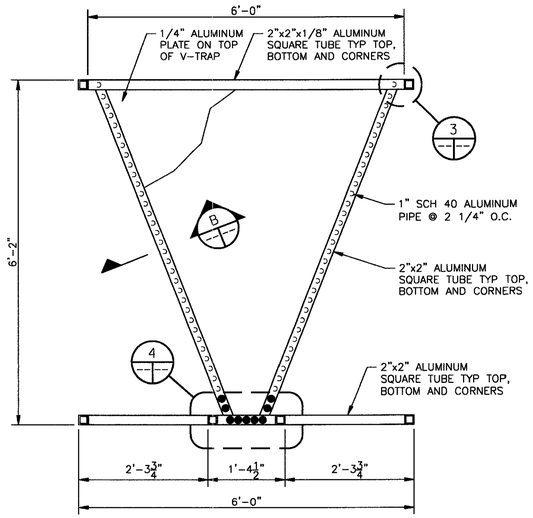


TELESCOPING WEIR PLAN (1, M30 M36)

0 1 2 4 FT

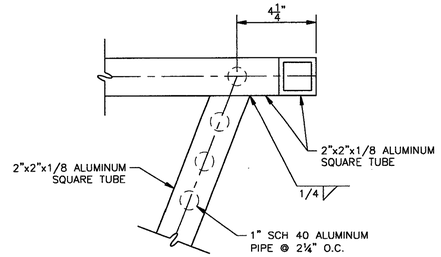
SCALE: 3/4"=1'-0"



V-TRAP (2, M30 M36)

0 1 2 4 FT

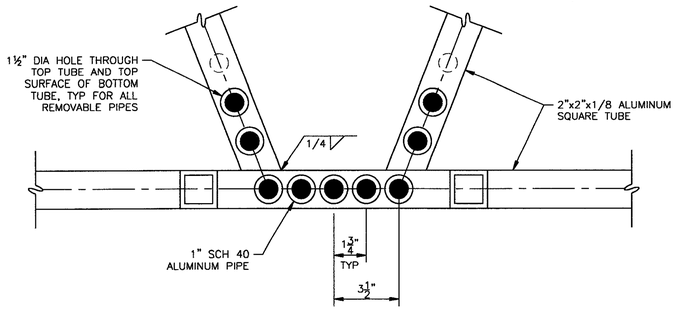
SCALE: 3/4"=1'-0"



DETAIL (3)

0 1/4 1/2 1 FT

SCALE: 3"=1'-0"



DETAIL (4)

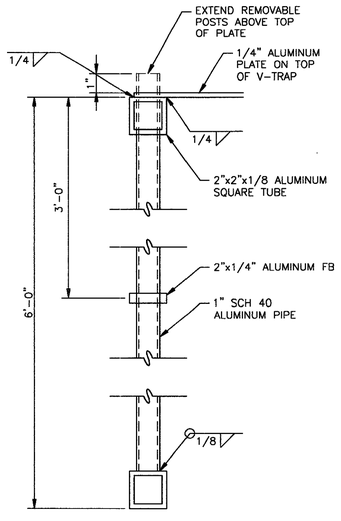
0 1/4 1/2 1 FT

SCALE: 3"=1'-0"

TELESCOPING WEIR ELEVATION (A)

0 1 2 4 6 FT

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



SECTION (B)

0 1/4 1/2 1 FT

SCALE: 3"=1'-0"

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REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21 1992 MORTON D. McMILLEN

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DETAILS 4

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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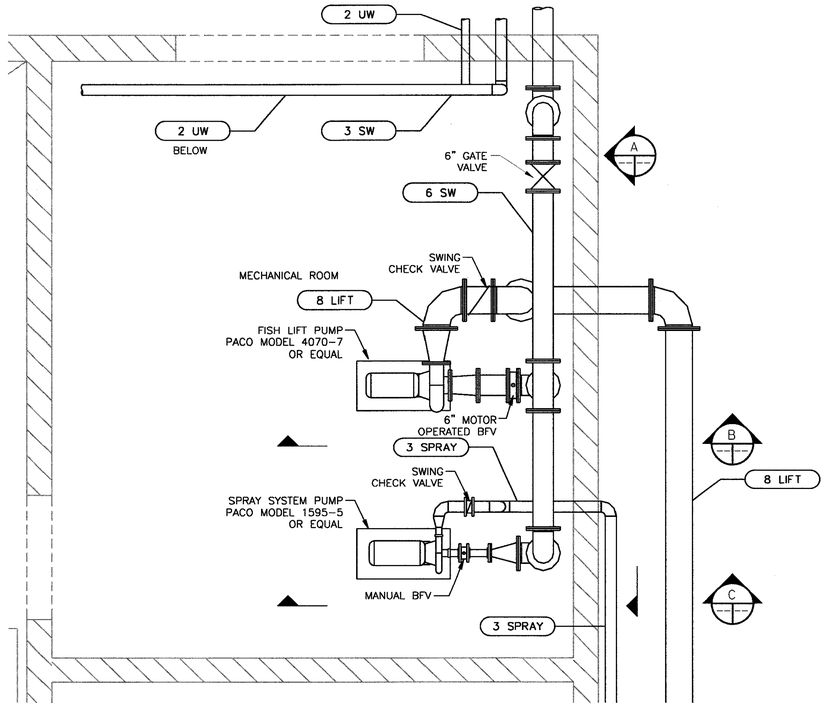
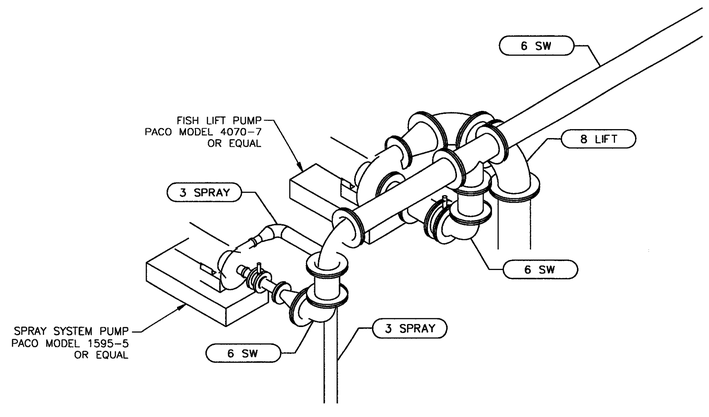


PUMP STATION PLAN

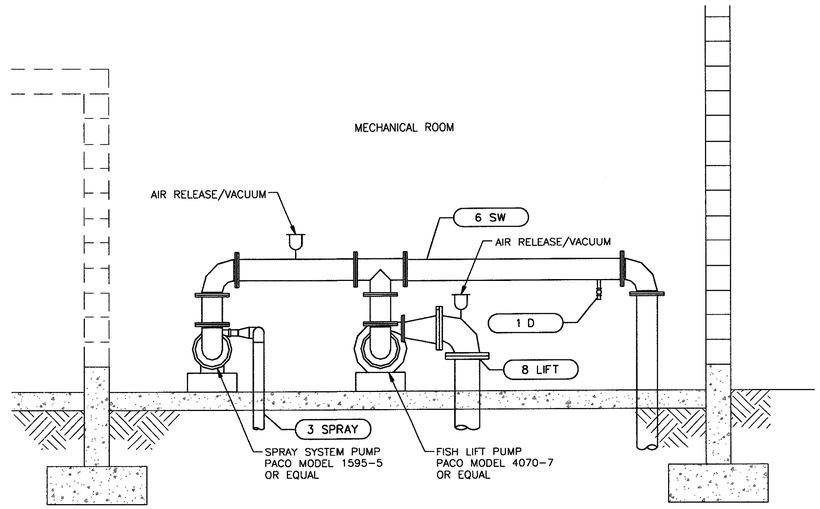
1 / M29 | M37

0 1 2 4 6 FT

SCALE: ½"=1'-0"



PUMP STATION ISOMETRIC

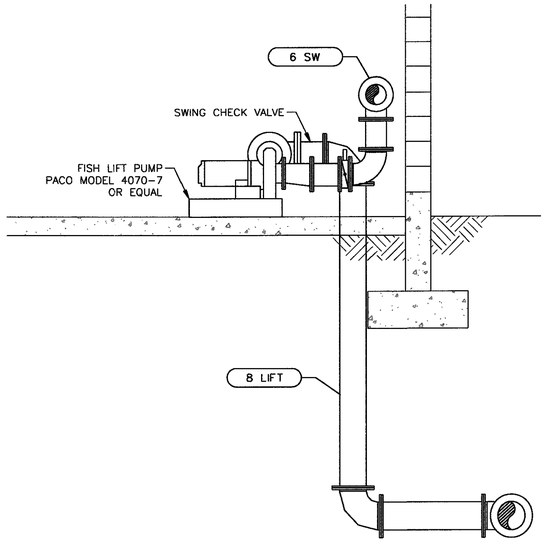


PUMP STATION ELEVATION

A

0 1 2 4 6 FT

SCALE: ½"=1'-0"

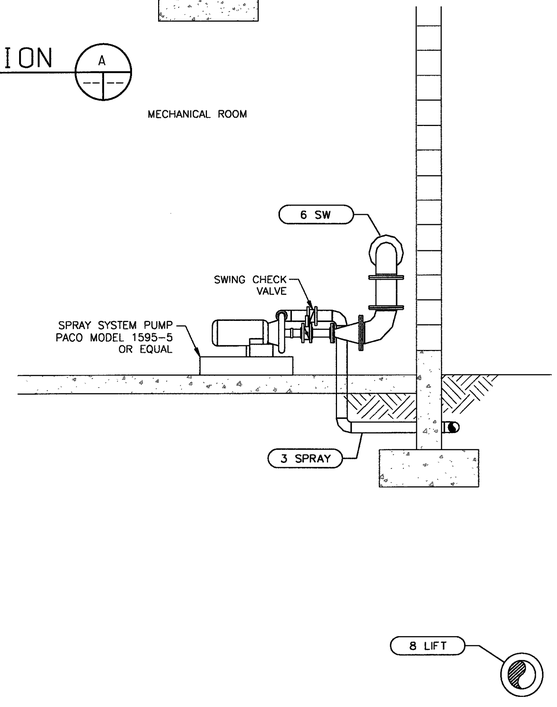


PUMP STATION SECTION

B

0 1 2 4 6 FT

SCALE: ½"=1'-0"



PUMP STATION SECTION

C

0 1 2 4 6 FT

SCALE: ½"=1'-0"

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REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21, 1992 MORTON D. McMILLEN

EXP. 12-31-06

Engineer Seal

HDR | FISHPRO

ME McMILLEN ENGINEERING BOISE, IDAHO

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NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
ADULT HOLDING AND SPAWNING BUILDING
PUMP STATION

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
		M37	OF	

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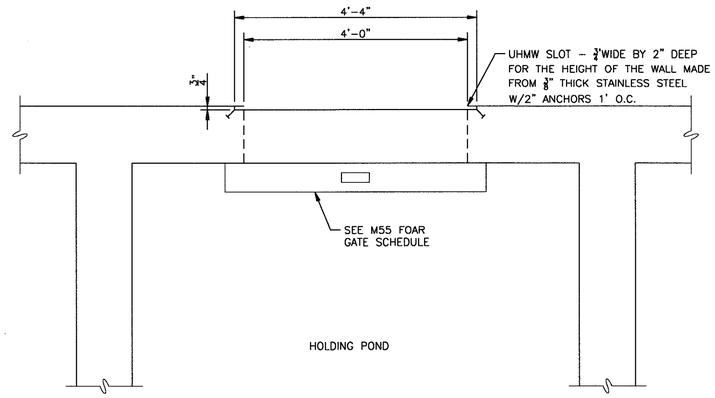
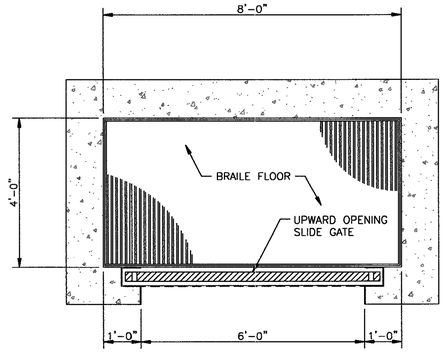


HOLDING POND GATES (AH1-AH6) PLAN

2

0 1 2 4 FT

SCALE: ¾"=1'-0"



FISH LOCK GATE (FL-1) PLAN

3
M33 M38

0 1 2 4 6 FT

SCALE: ½"=1'-0"

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ME McMILLEN ENGINEERING BOISE, IDAHO

NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED
C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M-38.dwg					

Design D. NELSON
Drawn R. GUERRERO
Chkd M. McMILLEN
Sub ---
Rec ---
Rec ---
Appr ---
Date ---

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

ADULT HOLDING AND SPAWNING BUILDING FACILITIES GATES

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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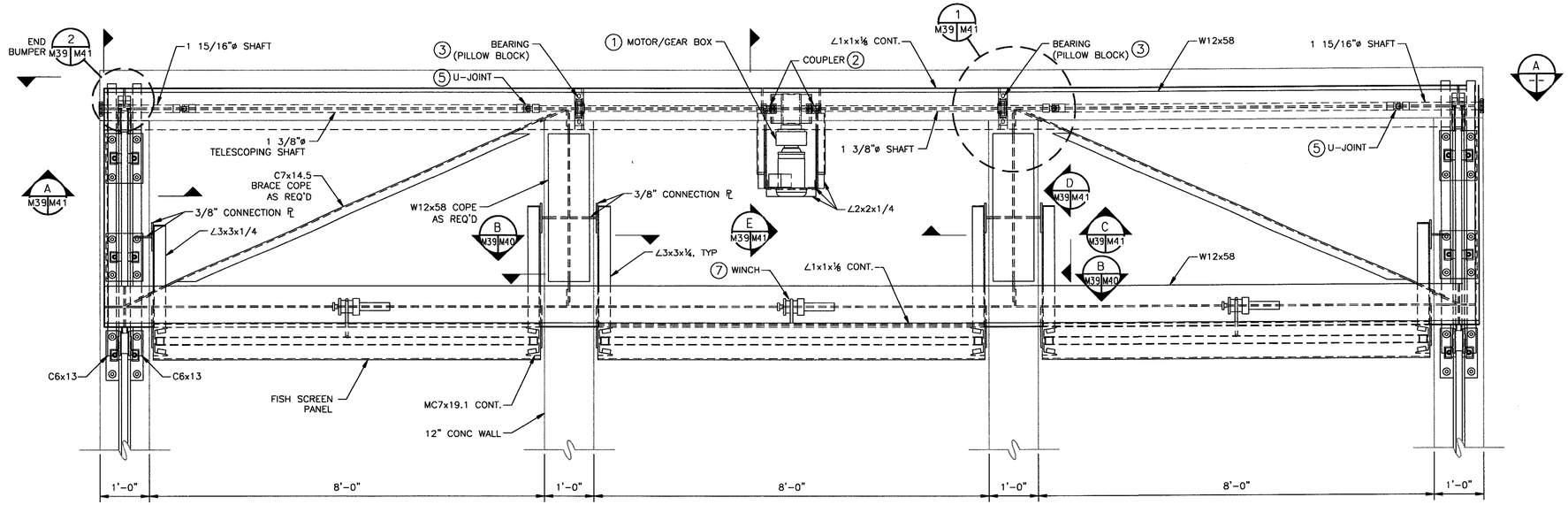


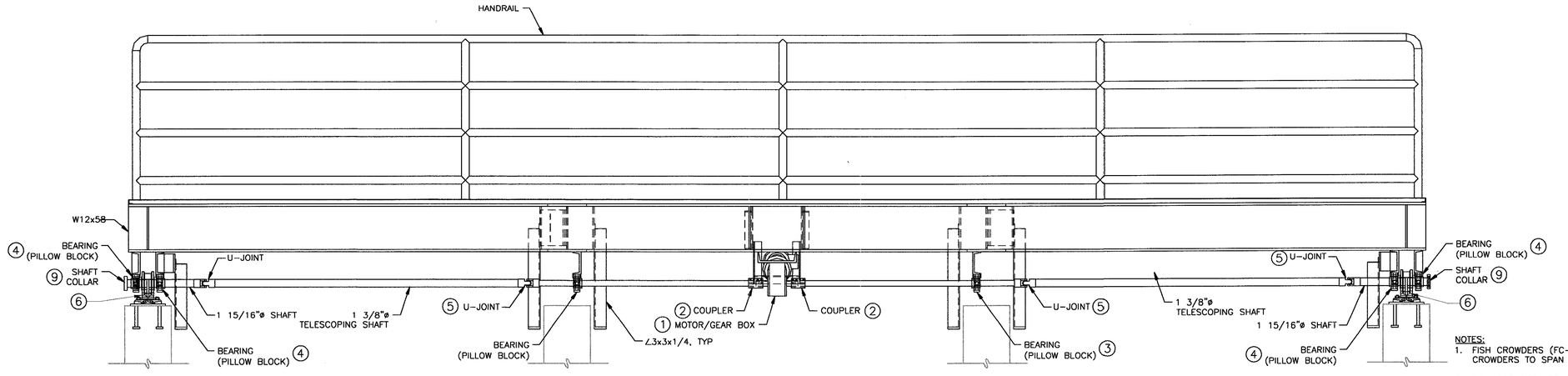
A M39 M40

FISH CROWDER PLAN

1 M30 M39

0 1 2 4 FT

SCALE: ¾"=1'-0"



SECTION

A

0 1 2 4 FT

SCALE: ¾"=1'-0"

MECHANICAL COMPONENETS		
1	DRIVE MOTOR & SPEED REDUCERS	1 HP ELECTRIC MOTOR WITH DUAL SPEED REDUCERS: PRIMARY REDUCTION 4:1, SECONDARY REDUCTION 30:1, DUAL OUTPUT SHAFTS 14-16 RPM, OUTPUT TORQUE 2900-3100 IN-LBS, VARIABLE FREQUENCY CONTROLS
2	SHAFT COUPLER	TORQUE CAPACITY MIN OF 3200 IN-LBS
3	BEARINGS	BORE TO ACCOMODATE SHAFT SIZE OF 1 3/8", STATIC LOAD RATING OF 3400 LBS, MRC BEARING SERVICES ZPB ZMoRC CAST IRON UNIT OR EQUIVALENT
4	BEARINGS	BORE TO ACCOMODATE SHAFT SIZE OF 1 15/16", STATIC LOAD RATING OF 5200 LBS, MRC BEARING SERVICES ZPB ZMoRC CAST IRON UNIT OR EQUIVALENT
5	U-JOINT	TORQUE CAPACITY 3200 IN-LB
6	TRACK WHEEL	5"ø DOUBLE FLANGED WHEEL, LOAD CAPACITY OF 6000 LBS, 6"ø FLANGE, TRAVELING FACE WIDTH 1 11/16", HAMILTON SERIES WFT FLANGED TRACK WHEELS OR EQUIVALENT
7	WINCH	PANEL LIFTING WINCH, SUPERWINCH AC1500 OR EQUIVALENT, 1500 LB CAPACITY
8	BEARINGS	BORE TO ACCOMODATE 1"ø STANDPIPE (O.D. 1.32"), LOAD CAPACITY 1500 LBS, MAX DEFLECTION 0.1"
9	SHAFT COLLAR	STAFFORD MANUFACTURING CORP OR EQUIVALENT

NOTES:
1. FISH CROWDERS (FC-1) AND (FC-2) ARE FULL SIZE CROWDERS TO SPAN 3 RACEWAYS.
2. FISH CROWDER (FC-3) IS TO SPAN THE CROWDING CHANNEL AND CONSISTS OF A SHORTENED VERSION OF THE ABOVE PLAN AND SECTION.
3. CONTRACTOR TO PROVIDE COMPLETE CONTROLS PACKAGE INCLUDING HAND HELD PENDANT CONTROL WITH STOP, FORWARD, AND REVERSE. SPEED OF CROWDER TO BE VARIABLE WITH PRESSURE ON CONTROL SWITCHES. SEE TECHNICAL SPECIFICATIONS.
4. PROVIDE POWER REEL AND CABLE FOR EACH CROWDER. POWER REEL WILL BE LOCATED ON CROWDER.

NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED
	-----	C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M-39-41.dwg			

REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21, 1992 MORTON D. McMILLEN

EXP. 12-31-06

Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

Design D. NELSON
Drawn R. GUERRERO
Chkd M. McMILLEN
Sub
Rec
Rec
Appr
Date

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

FISH CROWDER PLAN AND SECTION

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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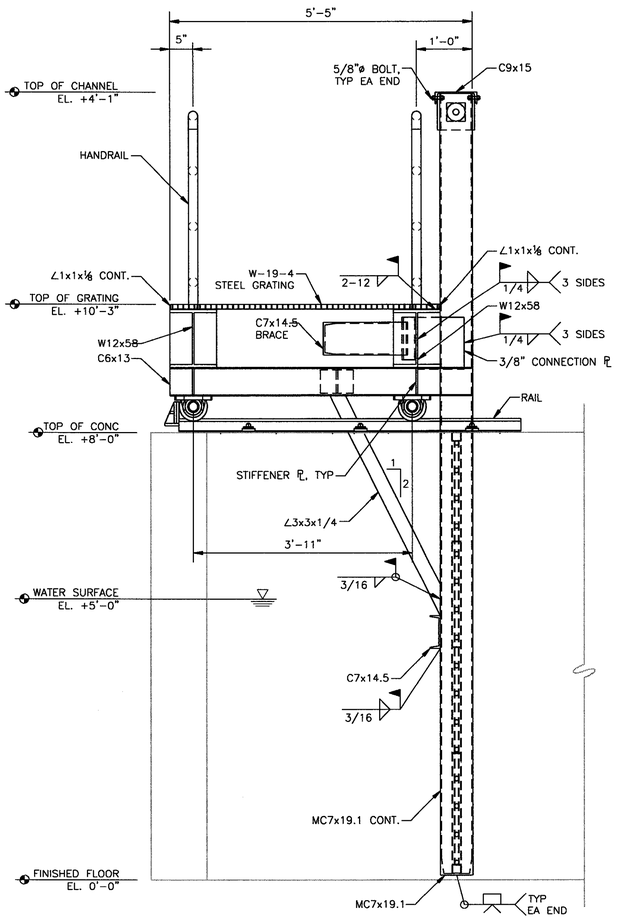

SECTION A

M39 | M40

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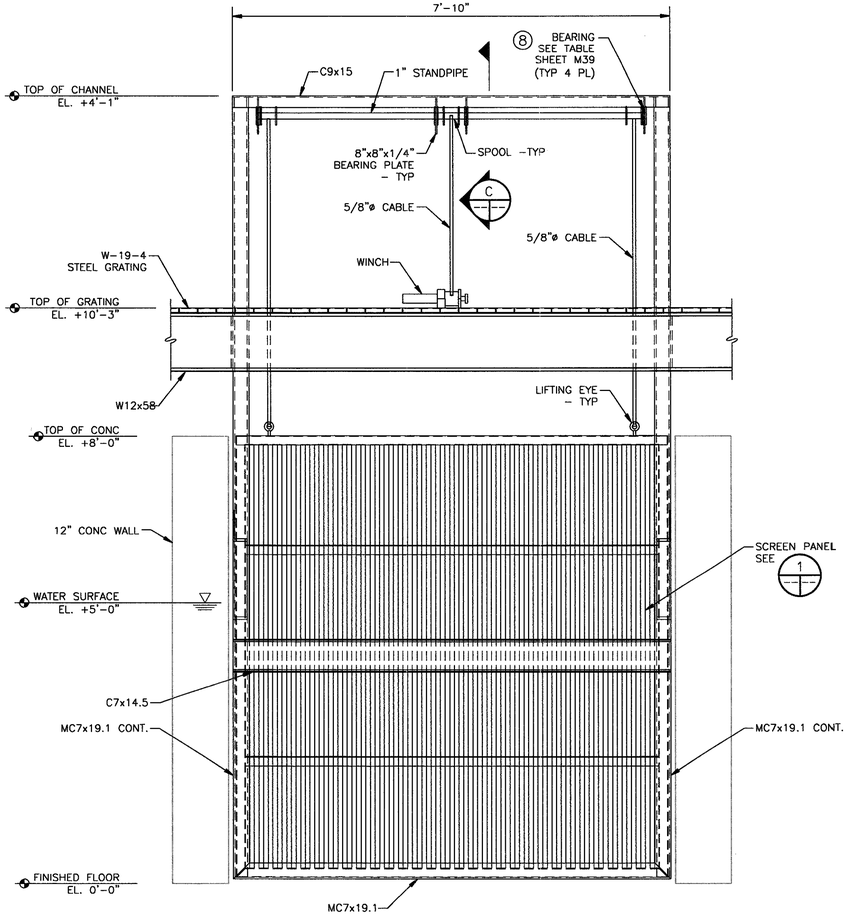
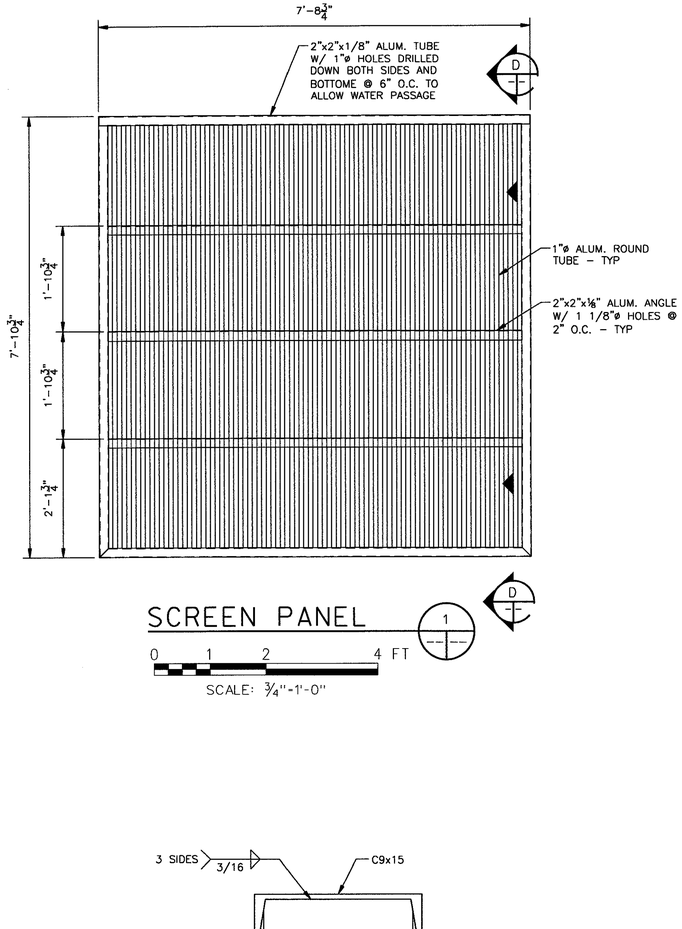


SECTION B

M39 | M40

0 1 2 4 FT

SCALE: 3/4"=1'-0"

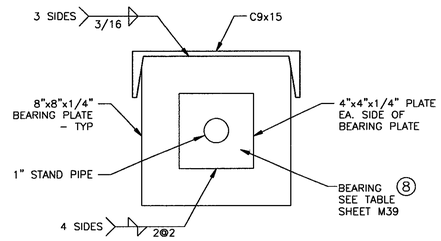


SCREEN PANEL

1

0 1 2 4 FT

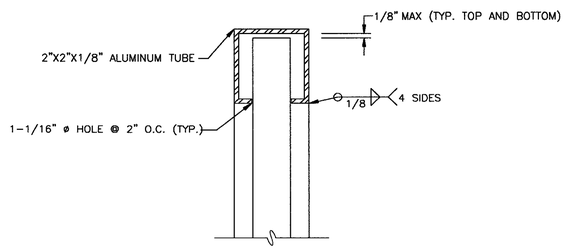
SCALE: 3/4"=1'-0"



SECTION C

0 ¼ ½ 1 FT

SCALE: 3"=1'-0"



SECTION D

0 ¼ ½ 1 FT

SCALE: 6"=1'-0"

NO.		W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED
C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M-39-41.dwg						

REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21, 1992 MORTON D. McMILLEN

EXP. 12-31-06

Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

Design	D. NELSON
Drawn	R. GUERRERO
Chkd	M. McMILLEN
Sub	
Rec	
Rec	
Appr	
Date	

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

FISH CROWDER SECTIONS AND DETAILS 1

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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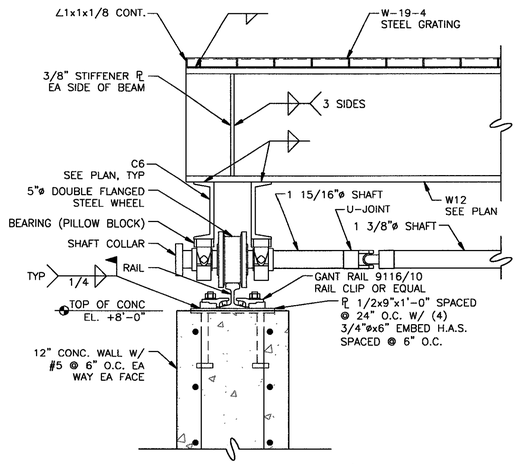
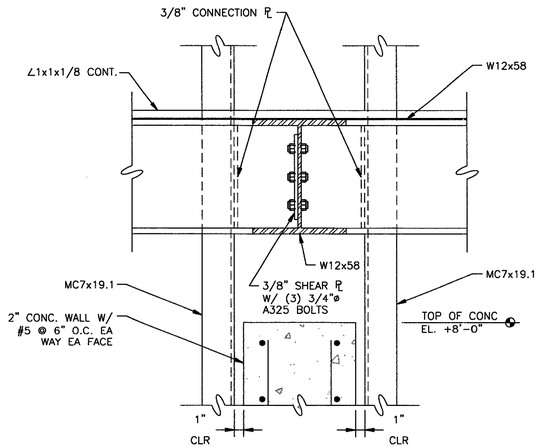


SECTION A M39 M41

0 1/2 1 2 FT

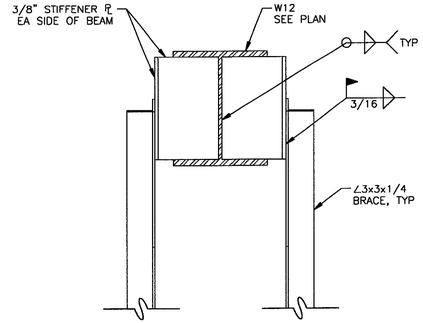
SCALE: 1 1/2"=1'-0"



SECTION B M39 M41

0 1/2 1 2 FT

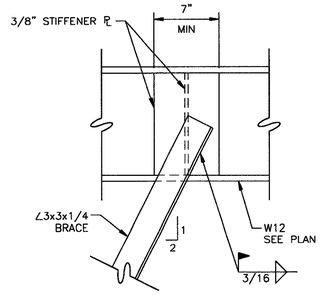
SCALE: 1 1/2"=1'-0"



SECTION C M39 M41

0 1/2 1 2 FT

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



ELEVATION D M39 M41

0 1/2 1 2 FT

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

NOTE:
BOLT MOTOR/GEAR BOX AND DRIVE TO SUPPORT FRAME AS PER MOTOR/GEAR BOX VENDOR RECOMMENDATIONS.

SECTION E M39 M41

0 1/2 1 2 FT

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

DETAIL 1 M39 M41

0 1/2 1 2 FT

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

DETAIL - END BUMPER 2 M39 M41

0 1/2 1 FT

SCALE: 6"=1'-0"

NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED

C=CONTRACT CONSTR., FA=FORCE ACCOUNT CONSTR., R=RECORD FILE NAME: LRH_M-39-41.dwg

REGISTERED PROFESSIONAL ENGINEER 16047 OREGON JULY 21, 1992 MORTON D. McMILLEN

EXP. 12-31-06

Engineer Seal

HDR | FISHPRO

McMILLEN ENGINEERING BOISE, IDAHO

Design D. NELSON
Drawn R. GUERRERO
Chkd M. McMILLEN
Sub ---
Rec ---
Rec ---
Appr ---
Date ---

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

FISH CROWDER SECTIONS AND DETAILS 2

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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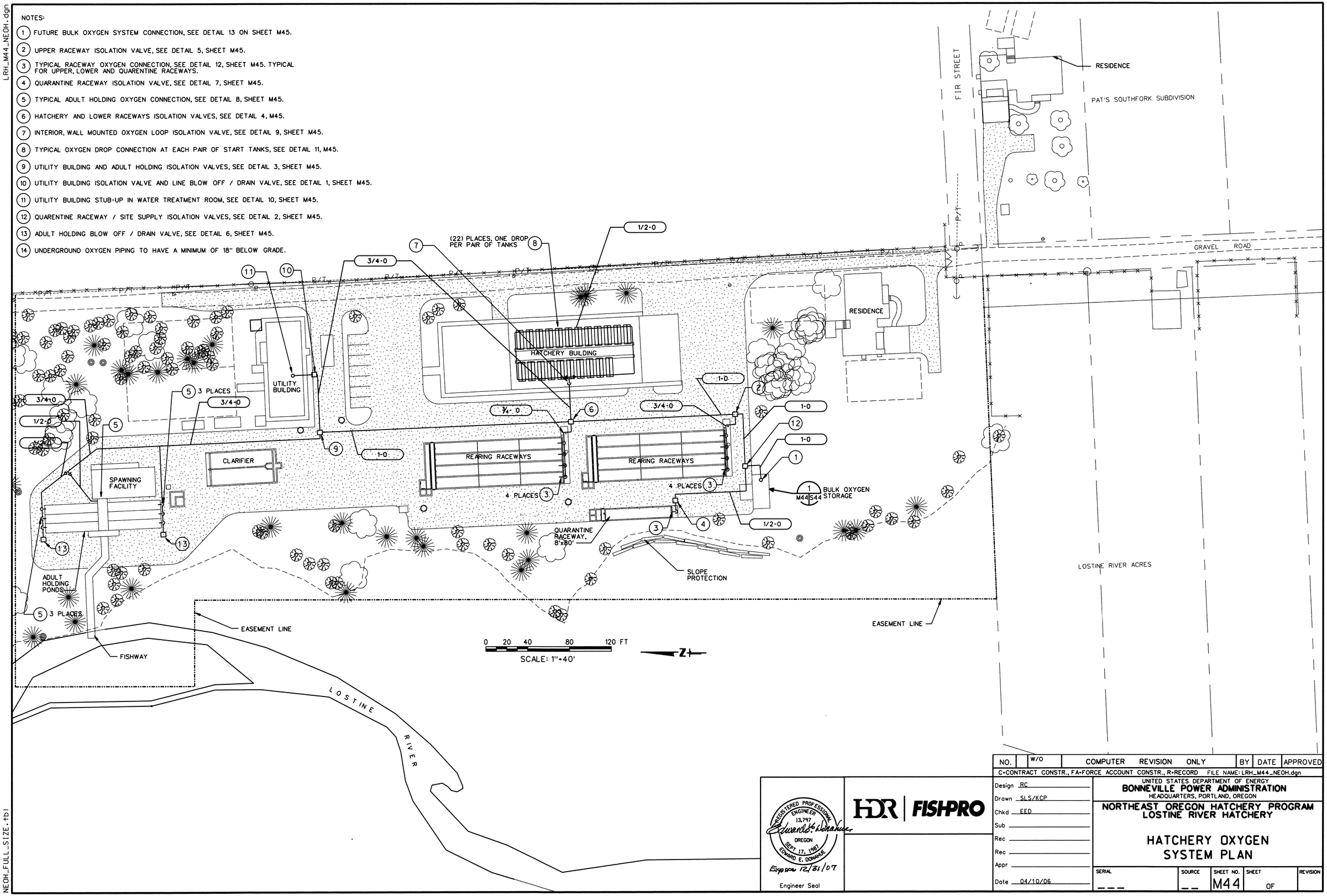
NOTES:

1. FUTURE BULK OXYGEN SYSTEM CONNECTION, SEE DETAIL 13 ON SHEET M45.
2. UPPER RACEWAY ISOLATION VALVE, SEE DETAIL 5, SHEET M45.
3. TYPICAL RACEWAY OXYGEN CONNECTION, SEE DETAIL 12, SHEET M45. TYPICAL FOR UPPER, LOWER AND QUARENTINE RACEWAYS.
4. QUARANTINE RACEWAY ISOLATION VALVE, SEE DETAIL 7, SHEET M45.
5. TYPICAL ADULT HOLDING OXYGEN CONNECTION, SEE DETAIL 8, SHEET M45.
6. HATCHERY AND LOWER RACEWAYS ISOLATION VALVES, SEE DETAIL 4, M45.
7. INTERIOR, WALL MOUNTED OXYGEN LOOP ISOLATION VALVE, SEE DETAIL 9, SHEET M45.
8. TYPICAL OXYGEN DROP CONNECTION AT EACH PAIR OF START TANKS, SEE DETAIL 11, M45.
9. UTILITY BUILDING AND ADULT HOLDING ISOLATION VALVES, SEE DETAIL 3, SHEET M45.
10. UTILITY BUILDING ISOLATION VALVE AND LINE BLOW OFF / DRAIN VALVE, SEE DETAIL 1, SHEET M45.
11. UTILITY BUILDING STUB-UP IN WATER TREATMENT ROOM, SEE DETAIL 10, SHEET M45.
12. QUARENTINE RACEWAY / SITE SUPPLY ISOLATION VALVES, SEE DETAIL 2, SHEET M45.
13. ADULT HOLDING BLOW OFF / DRAIN VALVE, SEE DETAIL 6, SHEET M45.
14. UNDERGROUND OXYGEN PIPING TO HAVE A MINIMUM OF 18" BELOW GRADE.



NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED

C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M44_NEOH.dgn

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1987 EDWARD E. DONAHUE
Expires 12/31/07
Engineer Seal

HDR | FISHPRO

Design RC
Drawn SLS/KCP
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

HATCHERY OXYGEN SYSTEM PLAN

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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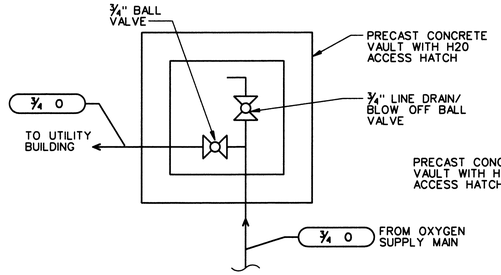

DETAIL 1 M44|M45
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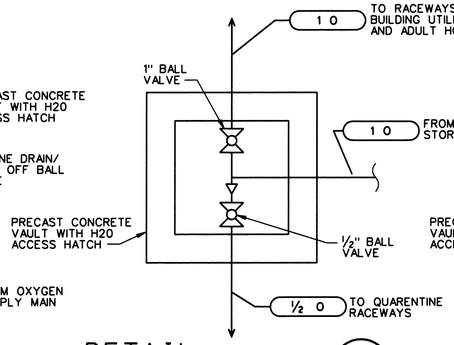

DETAIL 2 M44|M45
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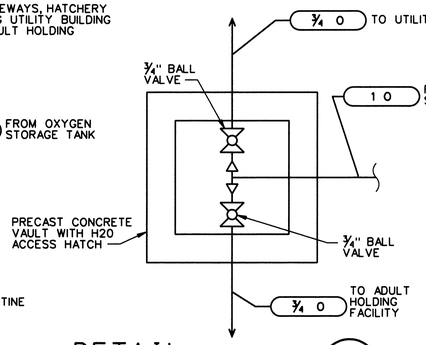

DETAIL 3 M44|M45
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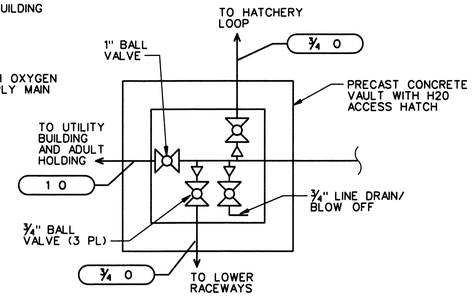
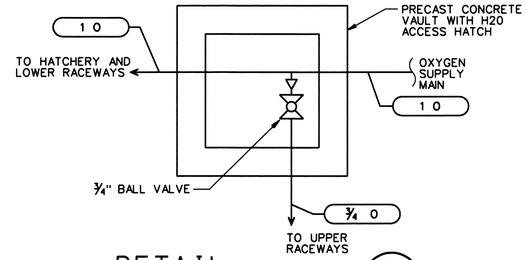


DETAIL 4 M44|M45
NO SCALE



DETAIL 5 M44|M45
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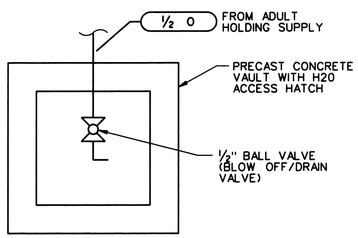

DETAIL 6 M44|M45
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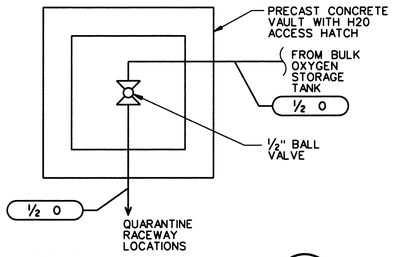

DETAIL 7 M44|M45
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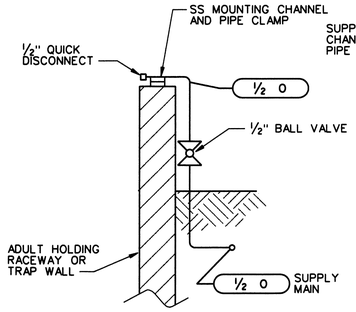

DETAIL 8 M44|M45
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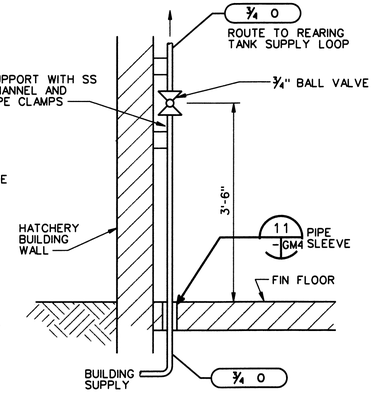

DETAIL 9 M44|M45
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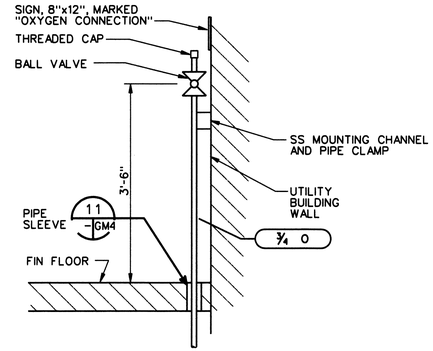

DETAIL 10 M44|M45
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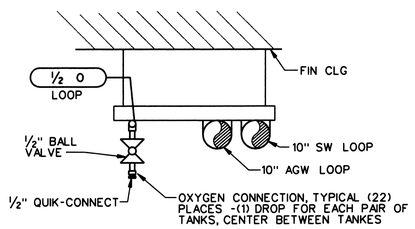

DETAIL 11 M44|M45
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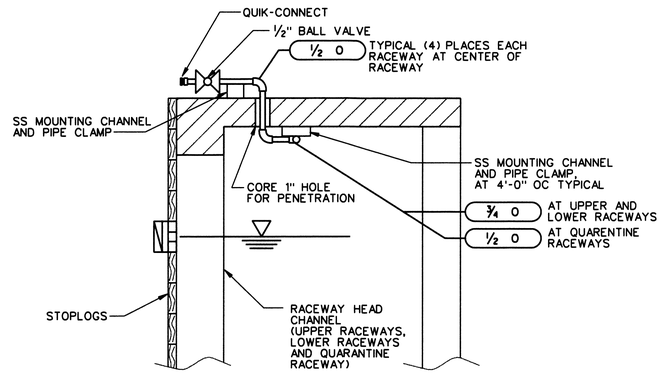
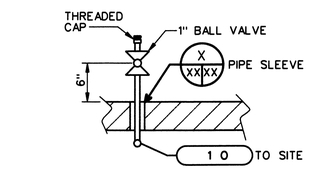


DETAIL 12 M44|M45
NO SCALE
TYPICAL (9) PLACES



DETAIL 13 M44|M45
NO SCALE

NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED
C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: LRH_M45_NEOH.dgn					

REGISTERED PROFESSIONAL ENGINEER 13,797 Edward E. Donahue OREGON SEPT. 17, 1987 EDWARD E. DONAHUE
Expires 12/31/07
Engineer Seal

HDR | FISHPRO

Design RC
Drawn SLS
Chkd EED
Sub
Rec
Rec
Appr
Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

OXYGEN DISTRIBUTION PIPING DETAILS

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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GENERAL NOTES

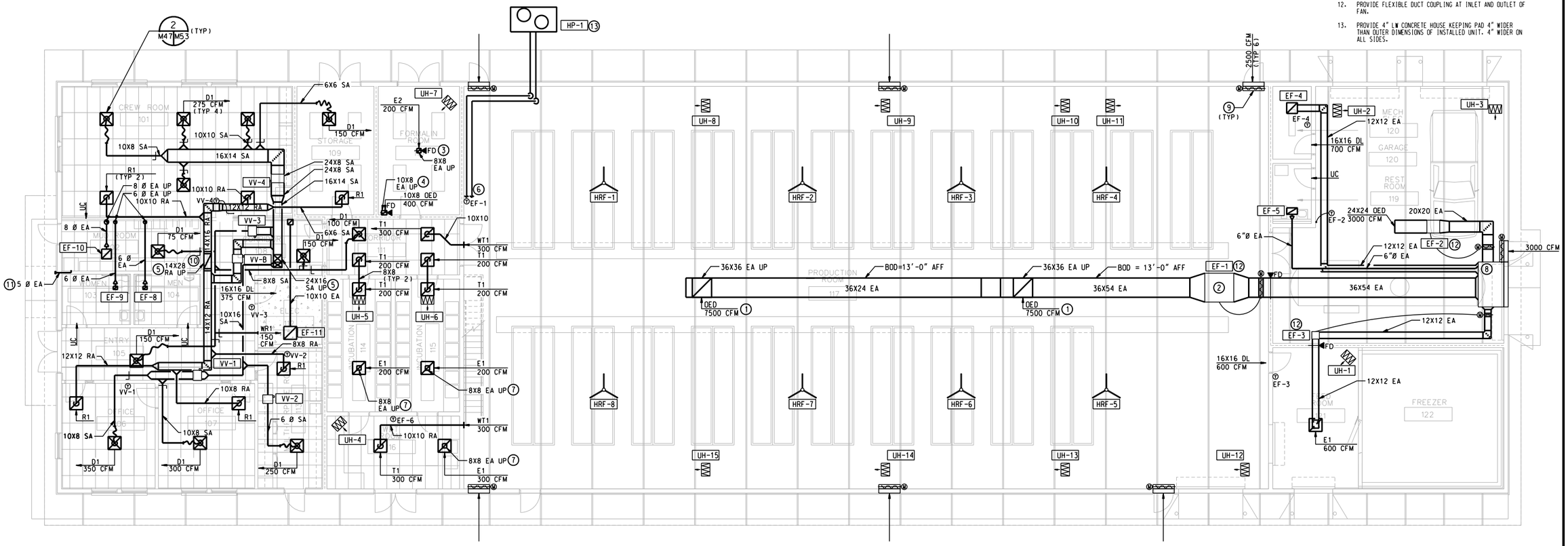
A. FOR LOUVER LOCATIONS SEE ARCHITECTURAL DRAWINGS.

B. UNIT HEATERS TO BE MOUNTED AT 10'-0" AFF (TYPICAL).

C. FOR DUCT CONTINUATION ABOVE SEE DRAWING M53.

KEYED NOTES

1. TOP OF EXHAUST DUCT AT 20'-0" AFF. PROVIDE OPPOSED BLADE BALANCING DAMPER IN VERTICAL.
2. EXHAUST FAN MOUNTED BETWEEN TRUSSES WITH BOTTOM OF FAN AT 13'-0" AFF.
3. PROVIDE CEILING RADIATION DAMPER AT CEILING PENETRATION.
4. ROUTE 10X8 EA FROM 12" AFF THROUGH CEILING SLAB. PROVIDE FIRE DAMPER AT SLAB PENETRATION.
5. TO FAN COIL FCU-1 ON MEZZANINE.
6. ROUTE REFRIGERANT SUCTION AND LIQUID PIPING UP TIGHT TO TRUSSES TO FAN COIL FCU-1 ON MEZZANINE.
7. TRANSITION UP TO 8"Ø.
8. PROVIDE 48" DEEP PLENUM AT LOUVER.
9. PROVIDE DAMPER TO MATCH LOUVER OPENING. SEE DETAIL 3/M53. SEE ARCHITECTURAL FOR BLANK OFF PANELS.
10. UNDER CUT DOOR.
11. PROVIDE DRYER EXHAUST WITH CAP AND BACKDRAFT DAMPER. TERMINATE EXHAUST AT 18" ABOVE FINISHED CONCRETE.
12. PROVIDE FLEXIBLE DUCT COUPLING AT INLET AND OUTLET OF FAN.
13. PROVIDE 4" LW CONCRETE HOUSE KEEPING PAD 4" WIDER THAN OUTER DIMENSIONS OF INSTALLED UNIT. 4" WIDER ON ALL SIDES.



HATCHERY BUILDING - HVAC

1 / M47

0 4 8 12 16 20 24 FT

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

NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED

C-CONTRACT CONSTR., FA-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: M47_NEOH.dgn

REGISTERED PROFESSIONAL ENGINEER 46968PE OREGON LARRY T. BALL JR.
EXPIRES 12/31/07
Engineer Seal

HDR | FISHPRO

Design KMS
Drawn JAH
Chkd LTB
Sub ---
Rec ---
Rec ---
Appr ---
Date ---

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
HATCHERY BUILDING
HVAC

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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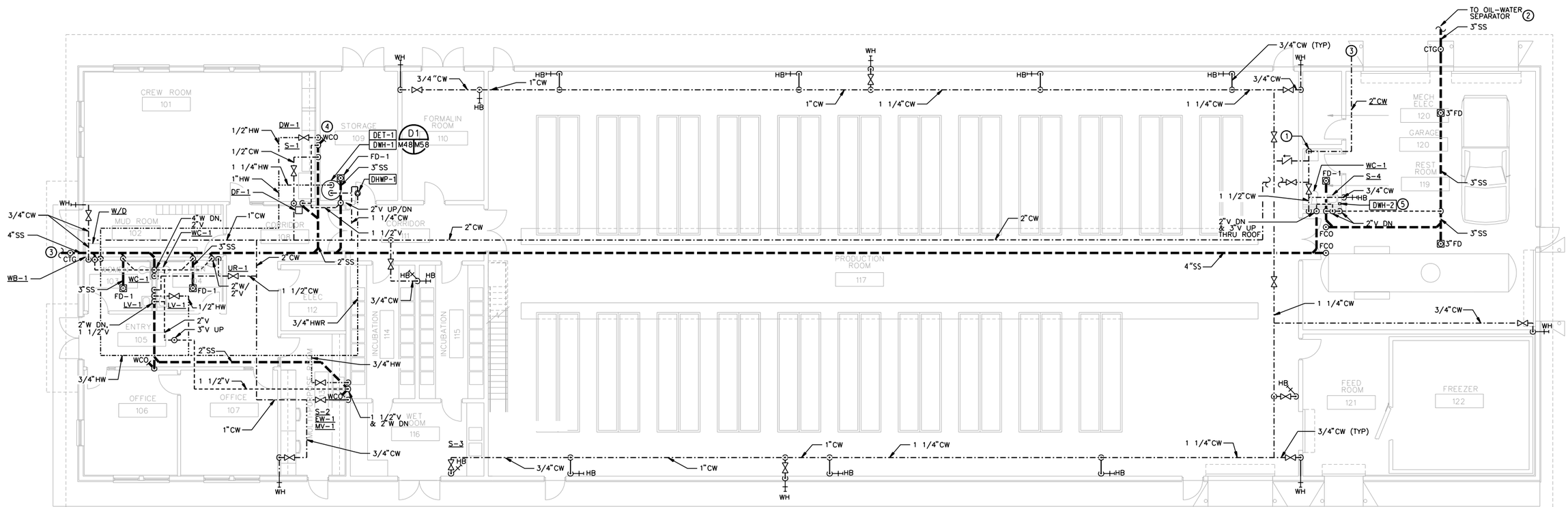
KEYED NOTES

1. PROVIDE ACCESSIBLE BLDG SHUT-OFF VALVE IN VERTICAL RISER.
2. SEE DWG C3 FOR LOCATION.
3. SEE DWG C5 FOR CONTINUATION.
4. CONNECT WASTE FROM DW-1 TO FOOD WASTE DISPOSER BELOW S-1 AND ROUTE HW TO DW-1 FROM HW SUPPLY FROM THE SINK.
5. INSTALL ON WALL NEAR SINK.



HATCHERY BUILDING - PLUMBING

1 / M48

0 4 8 12 16 20 24 FT

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

NO.		W/O -----	COMPUTER REVISION ONLY	BY	DATE	APPROVED
C=CONTRACT CONSTR., FA=FORCE ACCOUNT CONSTR., R=RECORD FILE NAME: M48_NEOH.dgn						

REGISTERED PROFESSIONAL ENGINEER 46968PE OREGON DECEMBER 9, 1982 HARRY T. BALL JR.
EXPIRES 12/31/07
Engineer Seal

HDR | FISHPRO

Design DOB
Drawn JAH
Chkd LTB
Sub ---
Rec ---
Rec ---
Appr ---
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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
HATCHERY BUILDING
PLUMBING

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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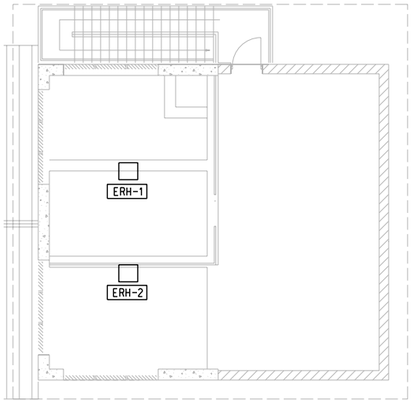


UTILITY BUILDING - MEZZANINE PLAN HVAC

2 --M

0 4 8 12 16 20 24 FT

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

N

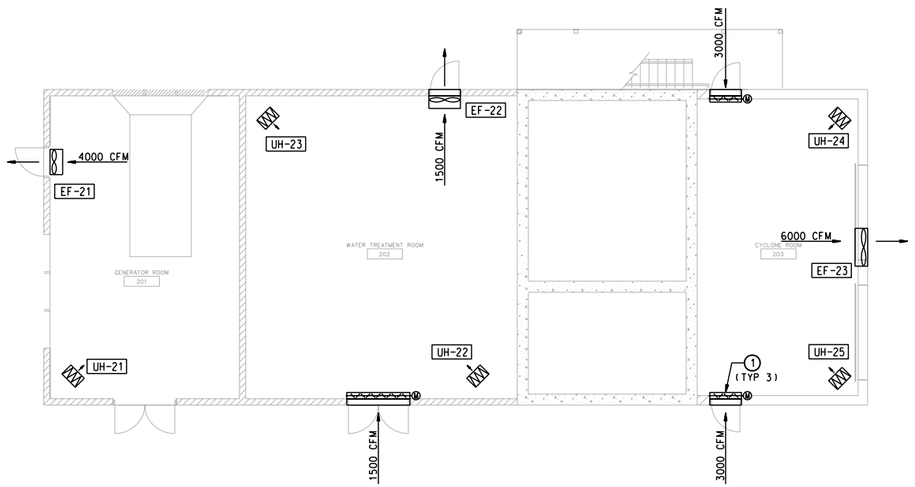
GENERAL NOTES

A. FOR LOUVER LOCATIONS SEE ARCHTECTURAL DRAWINGS.

B. UNIT HEATERS TO BE MOUNTED AT 10'-0" AFF (TYPICAL).

KEYED NOTES

1. PROVIDE DAMPER TO MATCH LOUVER OPENING. SEE DETAIL 3/M53. SEE ARCHITECTURAL FOR BLANK OFF PANELS.



UTILITY BUILDING - FLOOR PLAN HVAC

1 --M

0 4 8 12 16 20 24 FT

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

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REGISTERED PROFESSIONAL ENGINEER 46968PE OREGON LARRY T. BALL, JR.

EXPIRES 12/31/07

Engineer Seal

HDR | FISHPRO

Design KMS
Drawn JAH
Chkd LTB
Sub ---
Rec ---
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UNITED STATES DEPARTMENT OF ENERGY
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HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
UTILITY BUILDING
HVAC

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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FAN COIL AND EVAPORATOR SCHEDULE

NO.	TYPE	CFM	HP	VOLT/PH	SPT	HEATING (ELEC. BACKUP)		COOLING						FRESH AIR CFM	ESP	MANUFACTURER
						KW INPUT	MBH OUTPUT	EAT	LAT	SEN	TOTAL	EAT	LAT			
FCU-1	HORIZONTAL	2700	3	480/3ø	---	35 (2)	120	42	95°	63.7	91.0	85 / 57	54 / 47	525	1.0	CARRIER 40RMQ008/38ARQ008

(1) FURNISH WITH PROGRAMABLE HEATING/COOLING T-STAT WITH FAN ON/AUTO SUBBASE AND DIRTY FILTER LIGHT. SELECT TO MATCH HEAT PUMP OPERATION WITH ELECTRICAL HEAT BACK UP. SEE SECTION 15600.
(2) KW @ 480/3ø

HEAT PUMP UNIT SCHEDULE

NO.	MBH	EAT	EER	MOCP	MCA	VOLT/PH	MANUFACTURER (1)
HP-1	91.0	85	10.4	30	19.8	480/3ø	CARRIER 38ARQ008 (2)

(1) FURNISH WITH MANUFACTURE SIZE REFRIGERANT LINE KIT.
(2) PROVIDE OUTSIDE AIR TEMPERATURE SENSOR TO LOCK OUT HP-1 WHEN OSA TEMP IS LESS THAN 15°F

UNIT HEATER SCHEDULE (ELECTRIC)

NO.	TYPE	CFM	HP	MBH	Kw	CHAR	CONTROL	MANUFACTURER	NOTES
UH-1	ELECT	400	1/125	17.1	5.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5105CA1N	
UH-2	ELECT	700	1/50	34.1	10.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5110CA1N	
UH-3	ELECT	700	1/50	34.1	10.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5110CA1N	
UH-4	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-5	ELECT	400	1/125	17.1	5.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5105CA1N	
UH-6	ELECT	400	1/125	17.1	5.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5105CA1N	
UH-7	ELECT	2450	1/2	51.2	15.0	480/3ø	T-STAT INTEGRAL	'MARKEL' HLA20-480360-15-24-T	(1)
UH-8	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-9	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-10	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-11	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-12	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-13	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-14	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-15	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-16	ELECT	400	1/125	17.1	5.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5105CA1N	
UH-21	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-22	ELECT	400	1/125	17.1	5.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5105CA1N	
UH-23	ELECT	400	1/125	17.1	5.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5105CA1N	
UH-24	ELECT	700	1/50	34.1	10.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5110CA1N	
UH-25	ELECT	1100	1/50	34.1	10.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5110CA1N	
UH-31	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-32	ELECT	700	1/50	25.6	7.5	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5107CA1N	
UH-33	ELECT	400	1/125	17.1	5.0	480/3ø	T-STAT INTEGRAL	'MARKEL' TASKMASTER P3P5105CA1N	
UH-34	ELECT	2450	1/2	51.2	15.0	480/3ø	T-STAT INTEGRAL	'MARKEL' HLA20-480360-15-24-T	(1)

(1) UL LISTED FOR HAZARDOUS LOCATIONS.

EXHAUST FAN SCHEDULE

NO.	TYPE	CFM	SPE	HP	CHAR	RPM	TIP SPEED	OV	MANUFACTURER	REMARKS
EF-1	INLINE	15000	0.75	5.0	460/3ø	495	5475	---	GREENHECK BSQ-420-50	
EF-2	INLINE	3000	0.75	0.75	460/3ø	1053	5100	---	GREENHECK BSQ-180-7	
EF-3	INLINE	600	0.75	0.25	120/1ø	1727	5058	---	GREENHECK BSQ-90-4	
EF-4	CABINET	700	0.625	0.25	120/1ø	1293	2529	---	GREENHECK BCF-107	(4)
EF-5	CEILING	100	0.25	53 W	120/1ø	1100	---	---	GREENHECK SP-A125	(1) (3)
EF-6	INLINE	700	0.625	0.25	120/1ø	1730	5046	---	GREENHECK BSQ-90-4	
EF-7	INLINE	600	0.75	0.25	120/1ø	1727	5058	---	GREENHECK BSQ-90-4	(2)
EF-8	CEILING	100	0.25	53 W	120/1ø	1100	---	---	GREENHECK SP-A125	(1) (3)
EF-9	CEILING	100	0.25	53 W	120/1ø	1100	---	---	GREENHECK SP-A125	(1) (3)
EF-10	CEILING	250	0.25	81W	120/1ø	1050	---	---	GREENHECK SP-A290	(1) (3)
EF-11	CABINET	525	0.375	0.25	120/1ø	1727	2600	---	GREENHECK BCF-106	(4)
EF-21	PROPELLER	4000	0.25	0.5	120/1ø	1097	5744	---	GREENHECK SBE-2L20-5	
EF-22	PROPELLER	1500	0.25	0.5	120/1ø	895	4650	---	GREENHECK SBE-1H20-5	
EF-23	PROPELLER	6000	0.25	0.75	480/3ø	756	5940	---	GREENHECK SBE-1H30-7	
EF-31	INLINE	3000	0.375	0.5	120/1ø	894	4330	---	GREENHECK BSQ-180-5	
EF-32	PROPELLER	250	0.25	1/30	120/1ø	1650	4320	---	GREENHECK SEI-10-428-P-1	(2)

(1) PROVIDE WITH TWIST TIMER OPERATOR (ADJ. 10 MIN TO 120 MIN)
(2) PROVIDE WITH WALL SLEEVE, RAINHOOD, AND BACKDRAFT DAMPER
(3) PROVIDE WITH BACKDRAFT DAMPER, AND SPEED CONTROLLER
(4) PROVIDE WITH BACKDRAFT DAMPER

DIFFUSER, REGISTER, AND GRILLE SCHEDULE

MARK NUMBER	MAX AIRFLOW CFM	FACE SIZE IN (WXH)	CONNECTION SIZE, IN (WXH OR DIA)	MAX STATIC PRESS DROP IN WG	MAX NC	MOUNTING LOCATION	FRAME TYPE	MATERIAL	FINISH	BASIS OF DESIGN	NOTES
D1	140	24X24	6 DIA	0.10	30	CEILING	LAY-IN	STEEL	WHITE	TITUS TMSA (ADJUSTABLE)	1
	250	24X24	8 DIA	0.10	30	CEILING	LAY-IN	STEEL	WHITE	TITUS TMSA (ADJUSTABLE)	1
	380	24X24	10 DIA	0.10	30	CEILING	LAY-IN	STEEL	WHITE	TITUS TMSA (ADJUSTABLE)	1
R1, E1, T1	100	24X24	6 DIA	0.10	30	CEILING	LAY-IN	NOTE 6	WHITE	TITUS PAR	1, 2
	180	24X24	8 DIA	0.10	30	CEILING	LAY-IN	NOTE 6	WHITE	TITUS PAR	1, 2
	280	24X24	10 DIA	0.10	30	CEILING	LAY-IN	NOTE 6	WHITE	TITUS PAR	1, 2
	400	24X24	12 DIA	0.10	30	CEILING	LAY-IN	NOTE 6	WHITE	TITUS PAR	1, 2
R2, E2	100	12X12	6 DIA	0.10	30	CEILING	LAY-IN	NOTE 6	WHITE	TITUS PAR	1, 2
	180	12X12	8 DIA	0.10	30	CEILING	LAY-IN	NOTE 6	WHITE	TITUS PAR	1, 2
	350	12X12	10X10	0.10	30	CEILING	LAY-IN	NOTE 6	WHITE	TITUS PAR	1, 2
E3	500	10X10	10X10	0.10	40	DUCT	DUCT	ALUMINUM	WHITE	TITUS 50F	1, 3
	7500	36x36	36x36	0.15	40	DUCT	DUCT	ALUMINUM	WHITE	TITUS 50F	1, 3
WR1, WE1, WT1	140	6X6	6X6	0.10	30	SIDEWALL	SURFACE	STEEL	WHITE	TITUS 350RL	4
	240	10X6	10X6	0.10	30	SIDEWALL	SURFACE	STEEL	WHITE	TITUS 350RL	4
	400	16X8	26X8	0.10	30	SIDEWALL	SURFACE	STEEL	WHITE	TITUS 350RL	4
	2500	24X24	24X24	0.10	40	SIDEWALL	SURFACE	STEEL	WHITE	TITUS 350RL	4
OED	–	–	–	–	–	–	–	–	–	–	5

NOTES:
SEE PLANS FOR ACTUAL AIRFLOW.

1 PROVIDE RAPID MOUNT FRAME FOR ALL GYPBOARD AND HARD SURFACE CEILINGS.
2 PERFORATED GRILLE.
3 EGGCRATE GRILLE.
4 SINGLE DEFLECTION GRILLE WITH 3/4 IN BLADE SPACING AND FIXED BLADES SET AT 35 DEG AND PARALLEL TO THE WIDTH (W) DIMENSION.
5 PROVIDE 1/2" BIRDSCREEN OVER END OF DUCT. BIRDSCREEN TO MATCH DUCT MATERIAL.
6 MATCH MATERIAL OF DUCTWORK.

HEAT RECOVERY FAN SCHEDULE

NO.	AREA SERVED	BLADE SWEEP	CFM	MTG HT	MOTOR V/PH	MOTOR W	MOTOR RPM	BASIS OF DESIGN	NOTES
HRF-1	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)
HRF-2	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)
HRF-3	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)
HRF-4	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)
HRF-5	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)
HRF-6	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)
HRF-7	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)
HRF-8	HATCHERY	36"	12,500	9' AFF	120/1	75	395	LEADING EDGE 36201	(1)

(1) PROVIDE VARIABLE SPEED CONTROLLER

ELECTRIC RADIANT HEATER SCHEDULE

NO.	AREA SERVED	KW	CHAR	MANUFACTURER	NOTES
ERH-1	UTILITY MEZZ	4.5	480/3ø	'MARKEL' 1P3504 A	(1)
ERH-1	UTILITY MEZZ	4.5	480/3ø	'MARKEL' 1P3504 A	(1)

(1) PROVIDE W/CONTROL PANEL INCLUDING THERMOSTAT, ENCLOSURE, CONTACTORS, STEP DOWN TRANSFORMER, AND SECONDARY FUSING FOR 120V CONTROLS.

VVT ZONE AND BYPASS DAMPERS

NO.	CFM	INLET	OUTLET	BASIS OF DESIGN	TYPE
VV-1	650	8X14	8X14	CARRIER RD0814	ZONE
VV-2	250	6ø	6ø	CARRIER ZD-06	ZONE
VV-3	550	8X14	8X14	CARRIER RD0814	ZONE
VV-4	1250	8X24	8X24	CARRIER RD0824	ZONE
VV-B	2700	16ø	16ø	CARRIER ZD-16	BYPASS

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REGISTERED PROFESSIONAL ENGINEER — 46968PE — OREGON — LARRY T. BALL — EXPIRES 12/31/07
Engineer Seal

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MECHANICAL SCHEDULES
HVAC

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WATER HEATER SCHEDULE

SYMBOL	DESCRIPTION	SYSTEM SERVED	LOCATION	CAPACITY DEG F RISE	CAPACITY RECOVERY GPH	CAPACITY STORAGE GAL	HEATING MEDIA DATA ELECTRIC KW	CONNECTION SIZE IN CW	CONNECTION SIZE IN HW	FULL WEIGHT LBS	BASIS OF DESIGN
DWH-1	WATER HEATER	ALL	STORAGE	100	36.9	50	9	1 1/4	1 1/4	900	A.O.SMITH, MODEL DRE-52-9KW.
DWH-2	WATER HEATER	GARAGE	TOILET RM				8.3	1/2	1/2		CHRONOMITE SR-40

NOTES:
1. COORDINATE ELECTRICAL REQUIREMENTS WITH DIV. 16.
2. SET THERMOSTATS FOR 120 DEG LWT MAX.

PLUMBING PUMP SCHEDULE

SYMBOL	LOCATION	SERVES	TYPE	FLOW GPM	HEAD FT WG	MAX OPER. PRES. PSI	MOTOR DATA HP	MOTOR DATA WATTS	MOTOR DATA V/PH	TEMP RANGE DEG F	BASIS OF DESIGN	NOTE
DHWP-1	STORAGE	DHW-1	IN-LINE	3	12	145	1/25	60	115/1	36-230	GRUNDFOS MODEL UP-15-18BUC5	1

NOTES:
1. COORDINATE ELECTRICAL REQUIREMENTS WITH DIV. 16.

PLUMBING FIXTURE CONNECTION SCHEDULE

SYMBOL	FIXTURE DESCRIPTION	CONNECTION SIZE (IN) CW	HW	WASTE	VENT	NOTE
FD-1	DRAIN, FLOOR	1/2		3 (UNO)	2	PROVIDE TRAP PRIMER. SEE NOTE 1.
DF-1	DRINKING FOUNTAIN	1/2		1-1/2	1-1/2	BI-LEVEL, ADA COMPLIANT.
HB	HOSE BIBB	3/4				INTERIOR W/BFP
WH	WALL HYDRANT	3/4				EXTERIOR; NON-FREEZE IN WALL BOX
LV-1	LAVATORY, ADA,	1/2	1/2	1-1/4	1-1/4	VITREOUS CHINA, WALL HUNG, SINGLE LEVER HANDLE, RIGID GOOSE NECK
S-1	SINK, SINGLE-ADA	1/2	1/2	1-1/2	1-1/2	STAINLESS STEEL, IN COUNTER, FOOD DISPOSER, SWING GOOSE NECK FAUCET W/WRIST BLADE HANDLES.
S-2	SINK, DOUBLE	1/2	1/2	1-1/2	1-1/2	STAINLESS STEEL, IN COUNTER, SWING GOOSE NECK FAUCET W/WRIST BLADE HANDLES.
S-3	SINK, DOUBLE					STAINLESS STEEL, W/DOUBLE DRAINBOARD. NOTE 3
S-4	SINK, UTILITY	1/2	1/2	1-1/2	1-1/2	FREESTANDING, FIBERGLASS W/WALL MTD FOUCET.
MV-1	MIXING VALVE	1/2	1/2			SERVING EW-1
UR-1	URINAL	3/4		2	1-1/2	WALL MOUNT
WC-1	WATER CLOSET-ADA	1		4	2	FLOOR MOUNT, FLUSH VALVE
EW-1	EMERGENCY EYE/FACE WASH					1/2" TEMPERED WATER; WALL MOUNT
EW-2	EMERGENCY EYEWASH/BODY SPRAY					PORTABLE 37 GAL SS TANK, UNIT W/CART, NOTE 2
WB-1	WALL BOX	1/2	1/2	2		CLOTHES WASHER, N.I.C.
DW-1	DISHWASHER		1/2			ROUTE HW FROM SINK AND CONNECT WASTE TO FOOD DISPOSER DISHWASHER N.I.C.

NOTES:
1. ROUTE TRAP PRIMER (TP) – LINE FROM NEAREST FLUSH VALVE WHEREVER POSSIBLE. ELSEWHERE USE AUTOMATIC TRAP PRIMER VALVES.
2. PROVIDE (1) UNIT AT SPAWNING BLDG, (1) UNIT IN EACH PRODUCTION AND FORMALIN ROOM-HATCHERY BLDG. LOCATIONS TO BE FIELD VERIFIED.
3. PROVIDE SINK ONLY. FAUCET, DRAIN, PIPING, AND UTILITIES UNDER OTHER DIVISION.

EXPANSION TANK SCHEDULE

SYMBOL	LOCATION	SYSTEM SERVED	SYSTEM VOLUME GAL	TEMP RANGE DEG F MAX	TEMP RANGE DEG F MIN	PRESS RANGE PSI MAX	PRESS RANGE PSI MIN	BLADDER PRESS PSI	TANK VOLUME GAL	ACCEPTANCE VOLUME GAL	TANK SIZE DIA x H IN	BASIS OF DESIGN	NOTE
DET-1	STORAGE	DWH-1	50	200		150			2	0.9	8x12	BELL & GOSSET, PT-5	

NOTES:

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OREGON
LARRY T. BALL JR.
EXPIRES 12/31/07
Engineer Seal

HDR | FISHPRO

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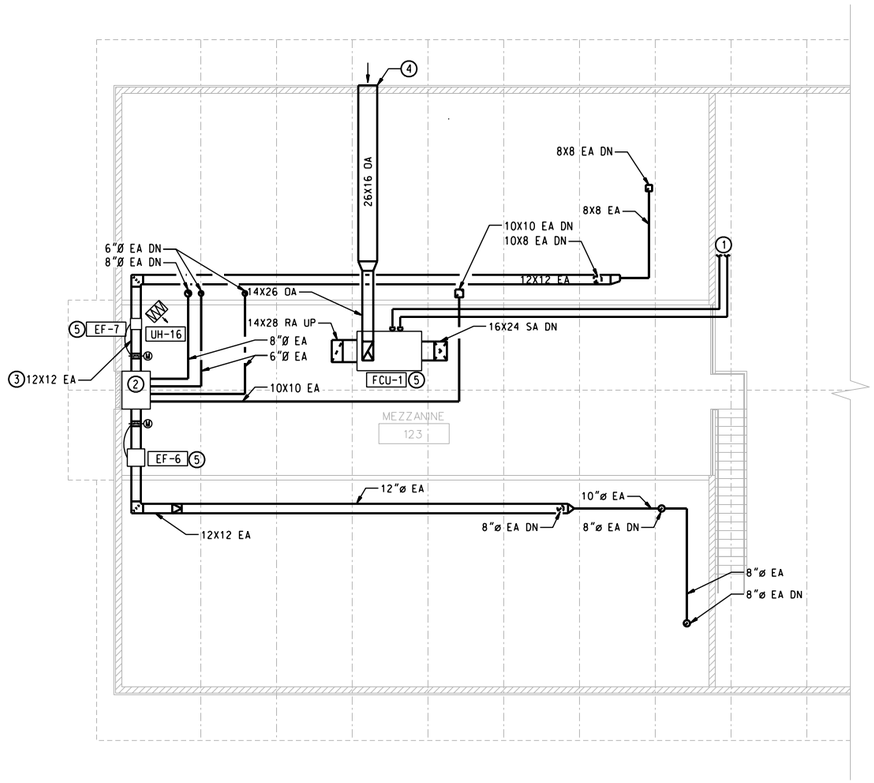
GENERAL NOTES

A. FOR LOUVER LOACATIONS SEE ARCHITECTURAL DRAWINGS.

B. SEE DRAWING M42 FOR DUCT CONTINUATION.

KEYED NOTES

1. SEE M47 FOR CONTINUATION OF REFRIGERANT LIQUID AND SUCTION PIPING.
2. PROVIDE 36" DEEP PLENUM BEHIND LOUVER.
3. ROUTE 12X12 EA INTO PLENUM AS LOW AS POSSIBLE.
4. COORDINATE PENETRATION HEIGHT LOCATION WITH CMU COURSES. PROVIDE WEATHER HOOD.
5. PROVIDE FLEXIBLE DUCT COUPLINGS AT INLET AND OUTLET OF UNIT.



HATCHERY BUILDING - MEZZANINE HVAC — 1 / M53

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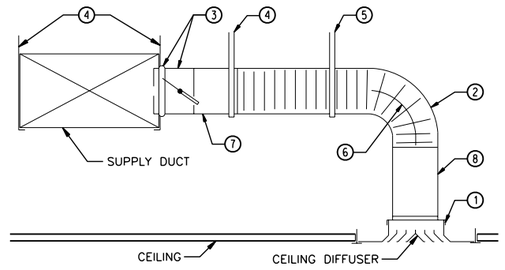
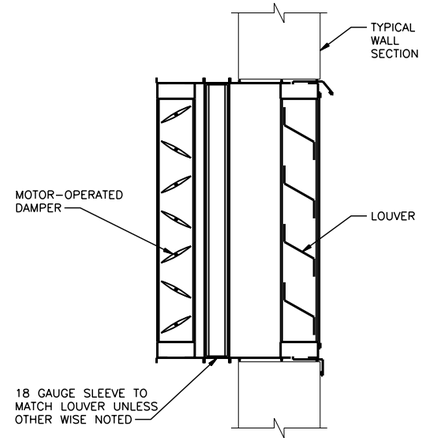


1. SQUARE-TO-ROUND ADAPTER IF DIFFUSER NECK IS SQUARE.
2. FLEXIBLE DUCT SAME DIAMETER AS DIFFUSER INLET, 7 FT. MAXIMUM LENGTH. STRETCH FLEXIBLE DUCT TO AT LEAST 90% OF FULLY EXTENDED LENGTH.
3. SPIN-IN BRANCH TAP FITTING, STRAIGHT SIDE, WITH MANUAL DAMPER. DAMPER SHAFT IN HORIZONTAL. INTEGRAL INSULATION GUARD SLEEVE REQUIRED FOR TAP FITTING TO MAIN DUCT WITH INTERNAL INSULATION.
4. DUCT STRAP HANGER. ATTACH TO STRUCTURE.
5. STRAP HANGER REQUIRED IF LENGTH OF FLEXIBLE DUCT IS LONGER THAN 4 FT.
6. MINIMUM CENTERLINE RADIUS EQUAL TO DUCT DIAMETER.
7. ROUND SHEETMETAL BRANCH DUCT.
8. PROVIDE 3 DUCT DIAMETERS OF VERTICAL STRAIGHT DUCT. LENGTH AY BE REDUCED TO MINIMUM 2 DUCT DIAMETERS IF 3 IS NOT PHYSICALLY ATTAINABLE.

CEILING DIFFUSER DUCT CONNECTION — 2 / M47 M53



AIR INTAKE — 3 / M53

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Design KMS
Drawn JAH
Chkd LTB
Sub ---
Rec ---
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Appr ---
Date ---

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

MECHANICAL PARTIAL PLANS AND DETAILS - HVAC

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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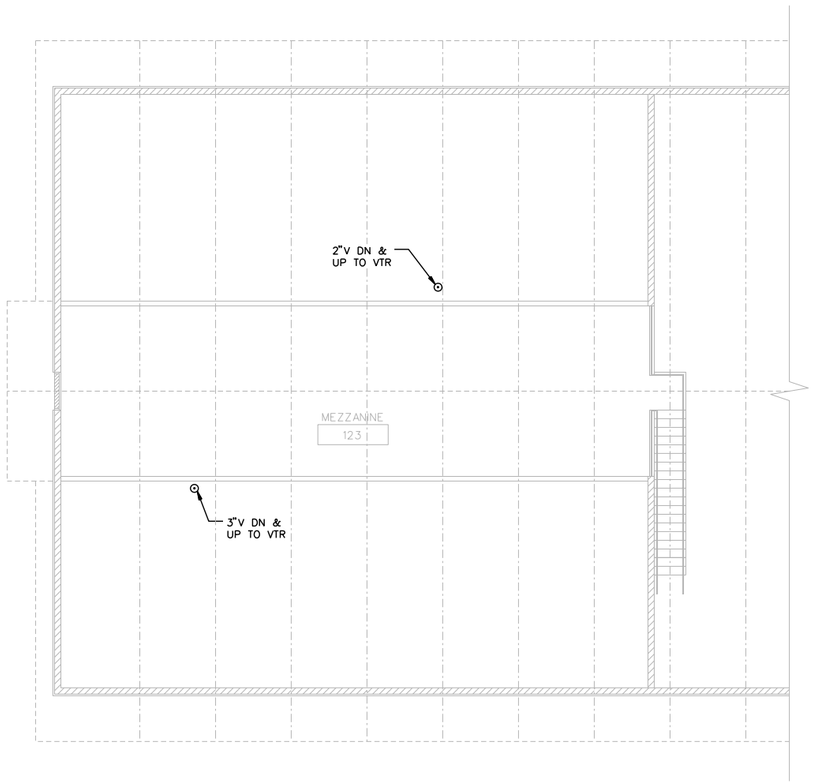
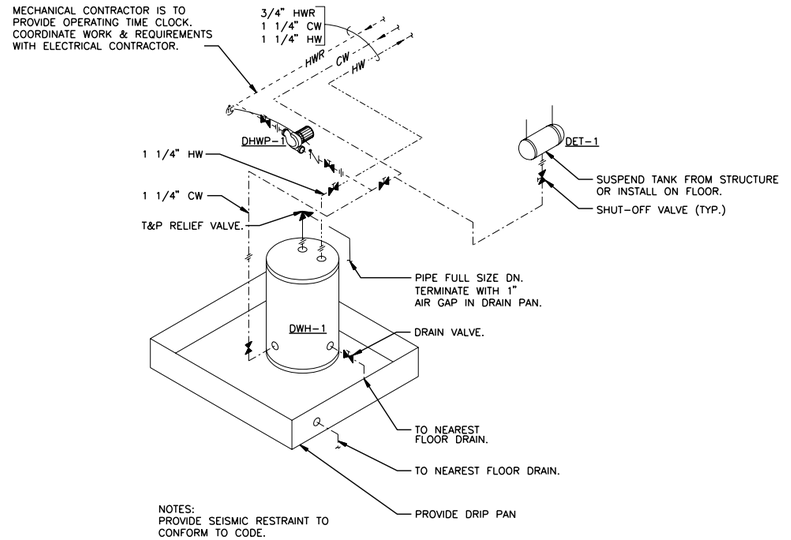


HATCHERY BUILDING -
MEZZANINE PLUMBING

1
M54

0 4 8 12 16 20 24 FT

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



WATER HEATER PIPING
SCHEMATIC (ELECTRIC)

D1
M48|M56

REGISTERED PROFESSIONAL ENGINEER
46968PE
OREGON
LARRY T. BALL JR.
EXPIRES 12/31/07
Engineer Seal

HDR | FISHPRO

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C-CONTRACT CONSTR., F.A-FORCE ACCOUNT CONSTR., R-RECORD FILE NAME: M54_NEOH.dgn

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UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
MECHANICAL PARTIAL PLANS AND DETAILS - PLUMBING

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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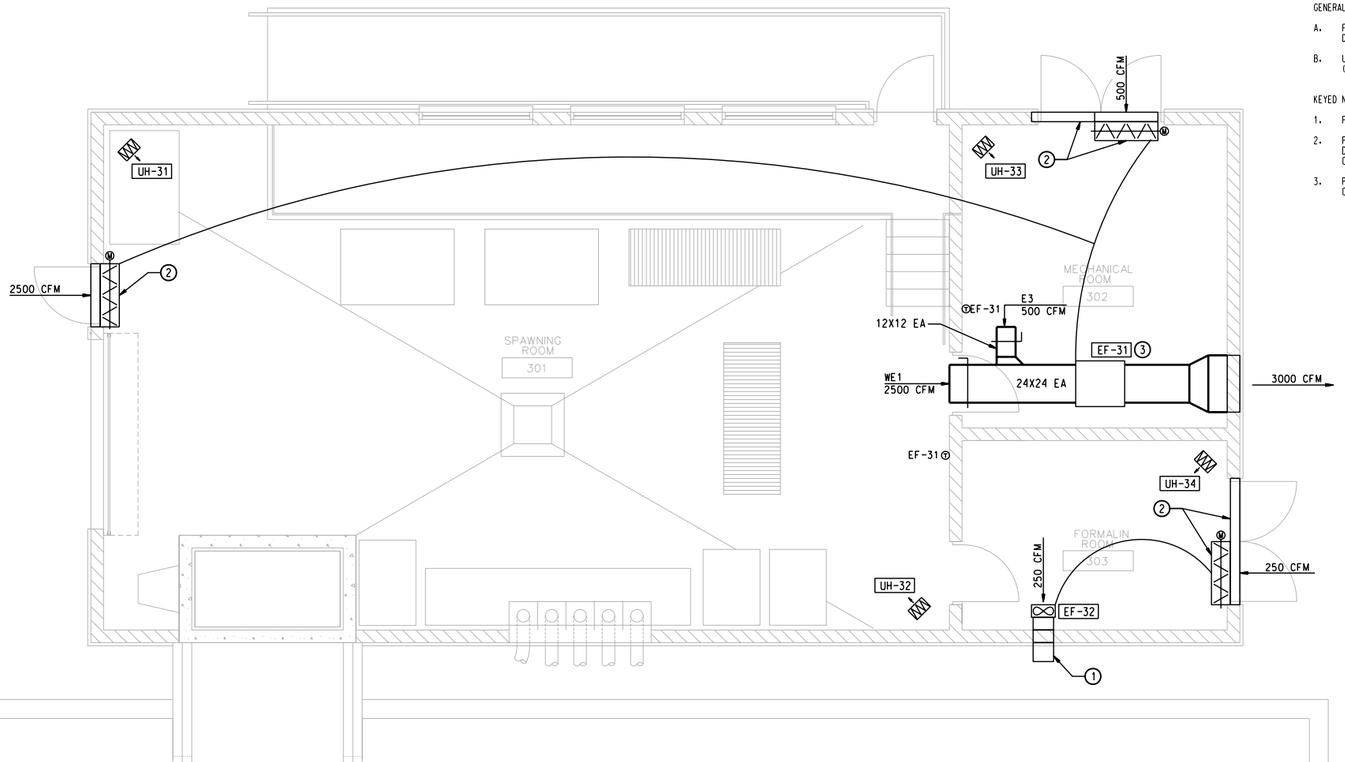

GENERAL NOTES

A. FOR LOUVER LOCATIONS SEE ARCHITECTURAL DRAWINGS.

B. UNIT HEATERS TO BE MOUNTED AT 10'-0" AFF (TYPICAL).

KEYED NOTES

1. PROVIDE WEATHER HOOD.
2. PROVIDE DAMPER TO MATCH LOUVER OPENING. SEE DETAIL 3/M53. SEE ARCHITECTURAL FOR BLANK OFF PANELS.
3. PROVIDE FLEXIBLE DUCT COUPLING AT INLET AND OUTLET OF FAN.

ADULT HOLDING AND SPAWNING BUILDING - HVAC

1 / -- M55

0 2 4 6 8 10 12 FT

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

Z

REGISTERED PROFESSIONAL ENGINEER 46968PE OREGON DECEMBER 9, 1983 HARRY T. BALL JR.

EXPIRES 12/31/07

Engineer Seal

HDR | FISHPRO

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BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY
ADULT HOLDING AND SPAWNING BUILDING - HVAC

SERIAL	SOURCE	SHEET NO.	SHEET	REVISION
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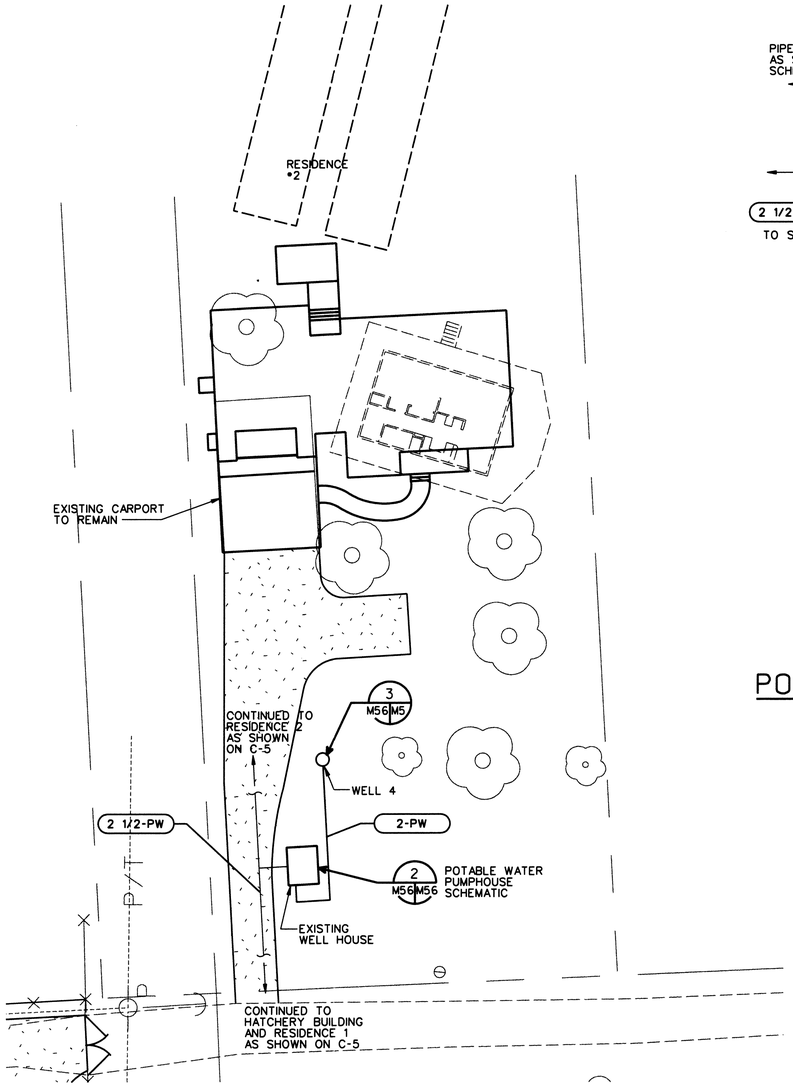
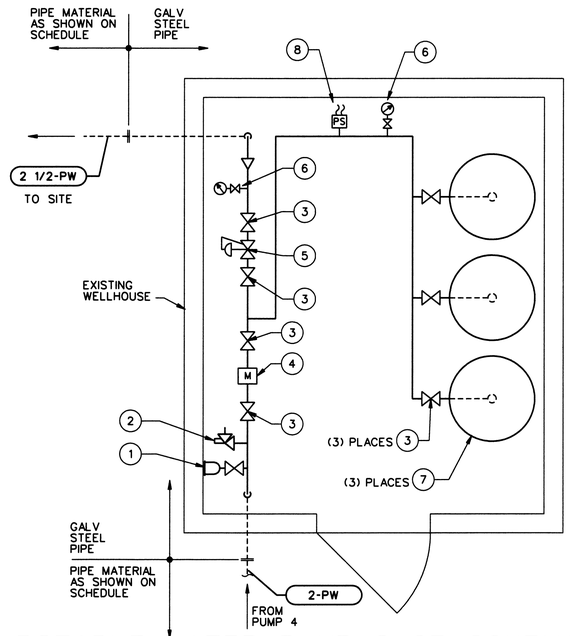


POTABLE WATER SUPPLY (1 -- M56)

0 10 20 40 60 FT

SCALE: 1"=20'



POTABLE WATER PUMPHOUSE SCHEMATIC (2 M56 M56)

0 1 2 4 6 FT

SCALE: ½"=1'-0"

COMPONENTS

1. ½" AIR RELEASE VALVE WITH ½" ISOLATION VALVE, ROUTE VENT OUTSIDE
2. PRESSURE RELIEF VALVE SET AT 100 PSI, SIZE FOR 40GPM AT SETPOINT. ROUTE DISCHARGE OUTSIDE BUILDING.
3. 2" GATE VALVE, IRON BODY
4. 2" PROPELLER FLOWMETER, INSTALL WITH A MINIMUM OF 20" OF STRIAGHT PIPE UPSTREAM AND 10" OF STRIAGHT PIPE DOWNSTREAM
5. COMBINATION FLOW AND PRESSURE REDUCING VALVE, SET FLOW AT 40 gpm MAX AND PRESSURE AT 35 psi
6. 0 - 200 psi GAGE WITH GAGE COCK
7. 211 GALLON BLADDER TYPE HYDROPNEUMATIC TANK, 200 psi RATED, ASME STAMPED
8. PRESSURE SWITCH, SET TO START PUMP AT 40 psi AND STOP PUMP AT 60 psi

NOTES:

1. REMOVE ALL EXISTING PIPING, TANKS AND PUMPING EQUIPMENT FROM BUILDING.
2. PIPING AND EQUIPMENT ARRANGEMENT ARE SCHEMATIC AND CAN BE ARRANGED AS REQ'D FOR INSTALLATION. NO ATTEMP HAS BEEN MADE TO SHOW ALL PIPING FITTINGS, APPURTENCES OR PIPE SUPPORTS REQ'D FOR INSTALLATION.
3. PW PIPING SHALL PENETRATE THROUGH WALL OR FLOOR OF STRUCTURE. CORE HOLE IN SLAB FOR SLAB PENETRATIONS, CUT HOLE IN WALL FOR WALL PENETRATIONS. SEAL PENETRATIONS WITH MASTIC. FOR WALL PENETRATIONS, EXPOSED AND BURIED PIPING SHALL BE INSULATED AND HEAT TRACED TO A 3' BURIAL DEPTH.

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT 17, 1987 EDWARD E. DONAHUE
Expires 12/31/09
Engineer Seal

HDR | FISHPRO

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UNITED STATES DEPARTMENT OF ENERGY
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HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

POTABLE WATER PUMPHOUSE SCHEMATIC PLAN AND NOTES

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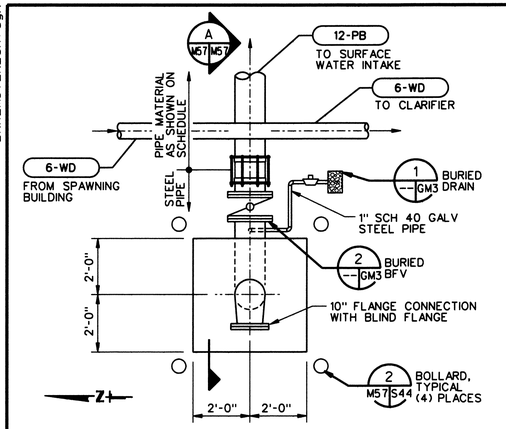
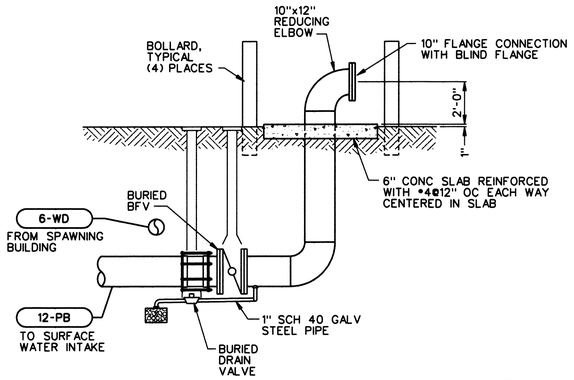


PUMPBACK STATION PLAN (1 M2 M57)

0 2 4 8 FT

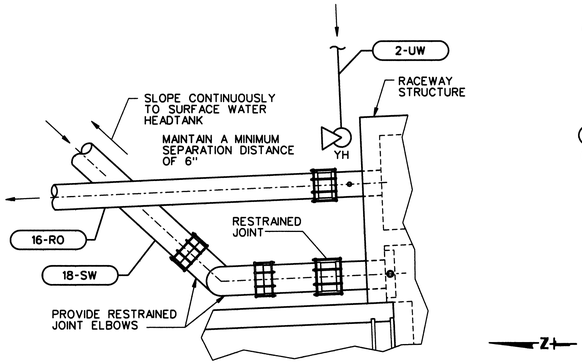
SCALE: 3/8"=1'-0"



PUMPBACK STATION SECTION (A M57 M57)

0 2 4 8 FT

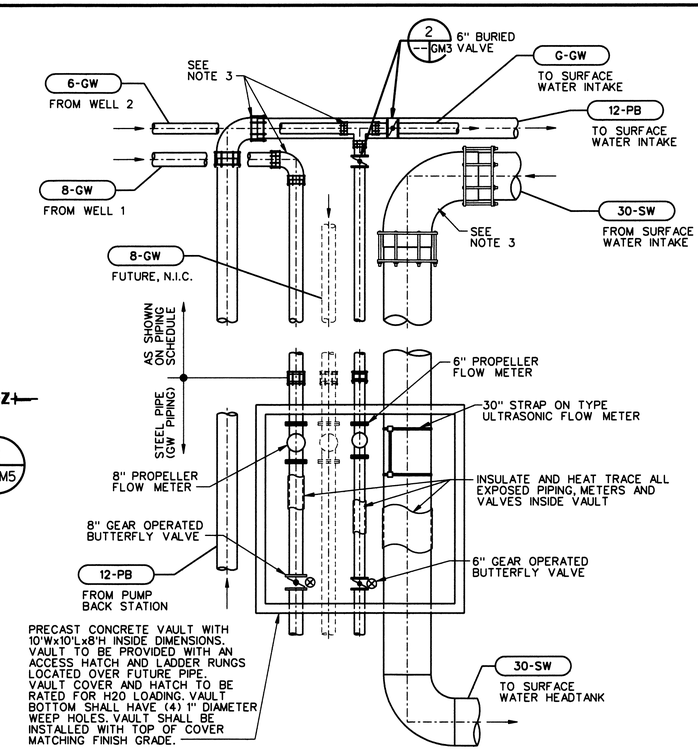
SCALE: 3/8"=1'-0"



RACEWAY PIPING PARTIAL PLAN (2 M3 M5)

0 4 8 12 FT

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



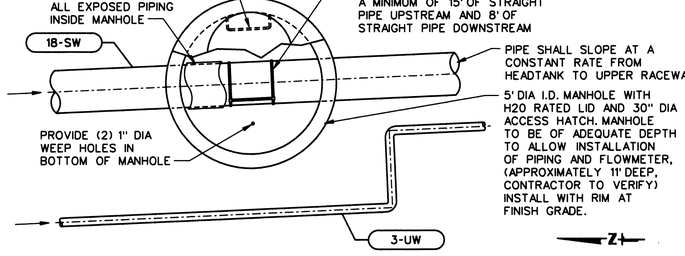
NOTES:

1. SUPPORT PIPING AS REQUIRED INSIDE VAULT.
2. INSTALL FLOW METERS WITH A MINIMUM OF 10 DIAMETERS UPSTREAM AND 5 DIAMETERS DOWNSTREAM OF STRAIGHT RUN PIPING.
3. PROVIDE RESTRAINED JOINT FITTINGS SUITABLE FOR THE PRESSURE RATING OF THE PIPING USED AS RECOMMENDED BY THE PIPE MANUFACTURER.

HEADTANK SUPPLY METER VAULT AND SUPPLY PIPING (5 M2 M57)

0 4 8 12 FT

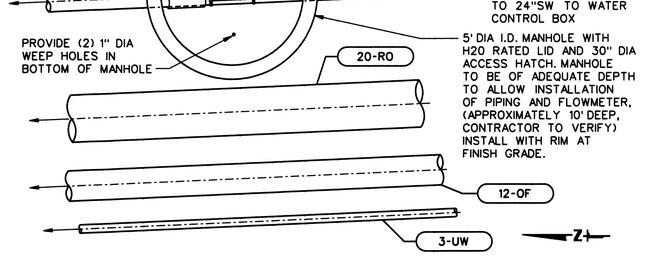
SCALE: 1/4"=1'-0"



RACEWAY SUPPLY METER VAULT (3 M2 M57)

0 2 4 8 FT

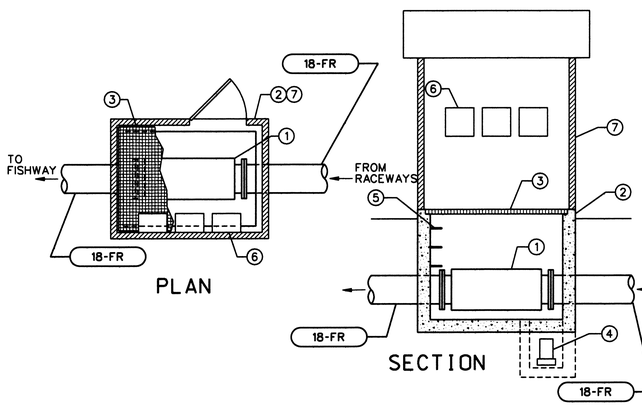
SCALE: 3/8"=1'-0"



ADULT HOLDING SUPPLY METER VAULT (4 M2 M57)

0 2 4 8 FT

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



1. P.I.T. READER DESIGNED FOR INSTALLATION ON 18" PIPE.
2. CONCRETE SUMP DEPTH TO BE ADEQUATE FOR INSTALLATION OF P.I.T. READER (APPROXIMATE DEPTH = 8', TO BE VERIFIED BY CONTRACTOR) SIZE OF SUMP TO BE DETERMINED BY P.I.T. READER MANUFACTURER, SEE NOTE.
3. REMOVABLE GRATING PANELS.
4. SUMP PUMP WITH SUMP. PUMP DISCHARGE TO BE PUMPED TO TOP OF 18"FR PIPE DOWNSTREAM OF P.I.T. READER.
5. ACCESS LADDER RUNGS.
6. WALL MOUNTED ELECTRICAL AND MONITORING EQUIPMENT INSTALLED IN COMPLIANCE WITH NEC AND ALL OTHER APPLICABLE BUILDING CODES.
7. P.I.T. READER EQUIPMENT BUILDING SIZED BY P.I.T. EQUIPMENT MANUFACTURER. BUILDING MAY BE PREFABRICATED OR BUILT ON SITE AND SHALL COMPLY WITH ALL APPLICABLE LOCAL AND NATIONAL BUILDING CODES. BUILDING TO BE HEATED, VENTILATED AND COOLED AS RECOMMENDED BY THE P.I.T. READER EQUIPMENT MANUFACTURER, SEE NOTE.

NOTE:

BUILDING AND SUMP WEIGHT SHALL BE ADEQUATE TO PREVENT FLOATATION OF STRUCTURE UNDER HIGH GROUND WATER CONDITIONS. FOR PURPOSES OF DESIGN, THE MAXIMUM GROUND WATER DEPTH SHALL BE ASSUMED TO BE 6" BELOW GRADE.

FUTURE P.I.T. READER STATION (NOT IN CONTRACT) (6 M3 M57)

NO SCALE

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1981 EDWARD E. DONAHUE Expires 12/31/07

Engineer Seal

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UNITED STATES DEPARTMENT OF ENERGY
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HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

MISC PIPING DETAILS 2

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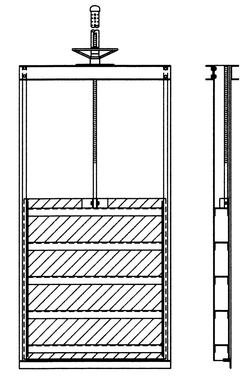
LOSTINE HATCHERY
GATE SCHEDULE

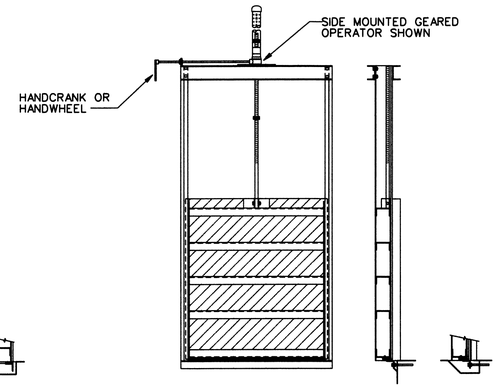
LOCATION	GATE REFERENCE NUMBER	TYPE OF GATE	SIZE OF GATE OPENING W x H	INVERT ELEVATION	HEAD IN FT OF WATER MAX HEAD SEAT	MAX HEAD UNSEAT	TYPE OF FRAME	FRAME HEIGHT	LIFT DEVICE TYPE	LIFT DEVICE STEM	TOP OF OPERATING NUT (ELEV)	OPERATOR ELEVATION	REMARKS
LOSTINE INTAKE													
SW	SWI1	SLIDE GATE	30 x 30	3728	7	0	FB	3736	T-HANDLE	NRS	3736.9		FM, WITH J-BULB SEAL
UPPER RACEWAY													
SW	URW1	SLIDE GATE	16 x 16	3698.4	5.6	18.6	FB	3704.7	T-HANDLE	NRS	3704.8		FM, WITH J-BULB SEAL
RO	URW2	SLIDE GATE	12 x 24	3698.4	5.6	10.6	FB	3704.7	T-HANDLE	NRS	3704.8		FM, WITH J-BULB SEAL
RO TO LOWER RCWY	URW3	SLIDE GATE	30 x 30	3696.9	5.1	5.1	FB		HANDWHEEL	RS	N/A	3705.2	FM, WITH J-BULB SEAL
OF (MAIN)	URW4	SLIDE GATE	24 x 27	3696.9	5.6	0	FB		SIDE HANDWHEEL	RS	N/A	3705.2	FM, WITH J-BULB SEAL
FR	URW5	SLIDE GATE	8 x 24	3696.9	5.5	0	FB		SIDE HANDWHEEL	RS	N/A	3705.2	FM, WITH J-BULB SEAL
D	URW6	SLIDE GATE	12 x 12	3698.3	5.7	10	FB	3704.7	T-HANDLE	NRS	3704.8		FM, WITH J-BULB SEAL
LOWER RACEWAY													
SW	LRW1	SLIDE GATE	16 x 16	3696.4	5.6	20.6	FB	3702.3	T-HANDLE	NRS	3702.8		FM, WITH J-BULB SEAL
RO	LRW2	SLIDE GATE	12 X 24	3696.4	5.6	12.6	FB	3702.3	T-HANDLE	NRS	3702.8		FM, WITH J-BULB SEAL
RO TO CONTROL BOX	LRW3	SLIDE GATE	30 x 30	3694.9	5.1	4.1	FB		HANDWHEEL	RS	N/A	3703.2	FM, WITH J-BULB SEAL
OF (MAIN)	LRW4	SLIDE GATE	24 x 27	3694.9	5.6	0	FB		SIDE HANDWHEEL	RS	N/A	3703.2	FM, WITH J-BULB SEAL
FR	LRW5	SLIDE GATE	8 x 24	3694.9	5.5	0	FB		SIDE HANDWHEEL	RS	N/A	3703.2	FM, WITH J-BULB SEAL
D	LRW5	SLIDE GATE	12 x 12	3696.3	5.7	10	FB	3702.3	T-HANDLE	NRS	3702.8		FM, WITH J-BULB SEAL
QUARANTINE RACEWAY													
SW	QRW1	SLIDE GATE	8 x 8	3697.7	5.3	19.3	FB		HANDWHEEL	RS	N/A	3705.2	FM, WITH J-BULB SEAL
OF	QRW2	SLIDE GATE	12 x 24	3697.1	5.9	0	FB		SIDE HANDWHEEL	RS	N/A	3705.2	FM, WITH J-BULB SEAL
FR	QRW3	SLIDE GATE	8 x 24	3697.1	5.9	0	FB		SIDE HANDWHEEL	RS	N/A	3705.2	FM, WITH J-BULB SEAL
CONTROL BOX													
RO	GC1	SLIDE GATE	30 x 30	3688	11	4	FB		HANDWHEEL	RS	N/A	3701.7	FM, WITH J-BULB SEAL
SW/RO	GC2	SLIDE GATE	18 x 18	3688	11	4	FB		HANDWHEEL	RS	N/A	3701.7	FM, WITH J-BULB SEAL
DRAIN	GC3	SLIDE GATE	6 x 6	3688	4	11	FB		Cable/Rod	RS	N/A	3701.7	FM
DRAIN	GC3	SLIDE GATE	6 x 6	3688	4	11	FB		Cable/Rod	RS	N/A	3701.7	FM
ADULT REARING													
ADULT HOLDING PONDS	AH1	SLIDE GATE	48 x 24	3693.5	5	5	FB	3701.2	T-HANDLE	NRS	3701.4		FM, WITH J-BULB SEAL
ADULT HOLDING PONDS	AH2	SLIDE GATE	48 x 24	3693.5	5	5	FB	3701.2	T-HANDLE	NRS	3701.4		FM, WITH J-BULB SEAL
ADULT HOLDING PONDS	AH3	SLIDE GATE	48 x 24	3693.5	5	5	FB	3701.2	T-HANDLE	NRS	3701.4		FM, WITH J-BULB SEAL
ADULT HOLDING PONDS	AH4	SLIDE GATE	48 x 24	3693.5	5	5	FB	3701.2	T-HANDLE	NRS	3701.4		FM, WITH J-BULB SEAL
ADULT HOLDING PONDS	AH5	SLIDE GATE	48 x 24	3693.5	5	5	FB	3701.2	T-HANDLE	NRS	3701.4		FM, WITH J-BULB SEAL
ADULT HOLDING PONDS	AH6	SLIDE GATE	48 x 24	3693.5	5	5	FB	3701.2	T-HANDLE	NRS	3701.4		FM, WITH J-BULB SEAL

NOTES:

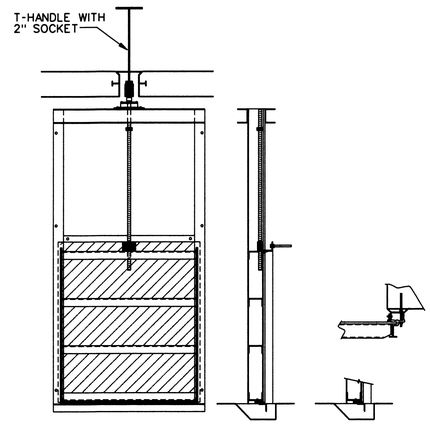
FB - FLAT BACK MOUNT
FM - FLUSH MOUNT TO WALL
NRS - NON-RISING STEM
RS - RISING STEM
GATES MAY BE EITHER ALUMINUM OR 304L STAINLESS STEEL



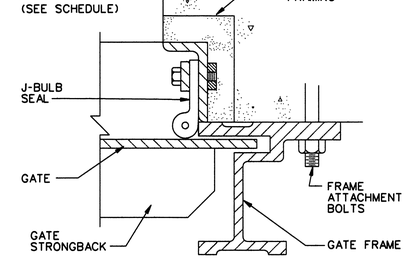
ALUMINUM SLIDE GATE (X / XX|XX)



ALUMINUM SLIDE GATE (X / XX|XX)



ALUMINUM SLIDE GATE WITH NONRISING STEM (X / XX|XX)



DETAIL-SPIGOT BACK WITH SEALS (X / XX|XX)
NO SCALE

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REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT 17, 1987 EDWARD E. DONAHUE Expires 12/31/07
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LOSTINE RIVER HATCHERY

GATE SCHEDULE

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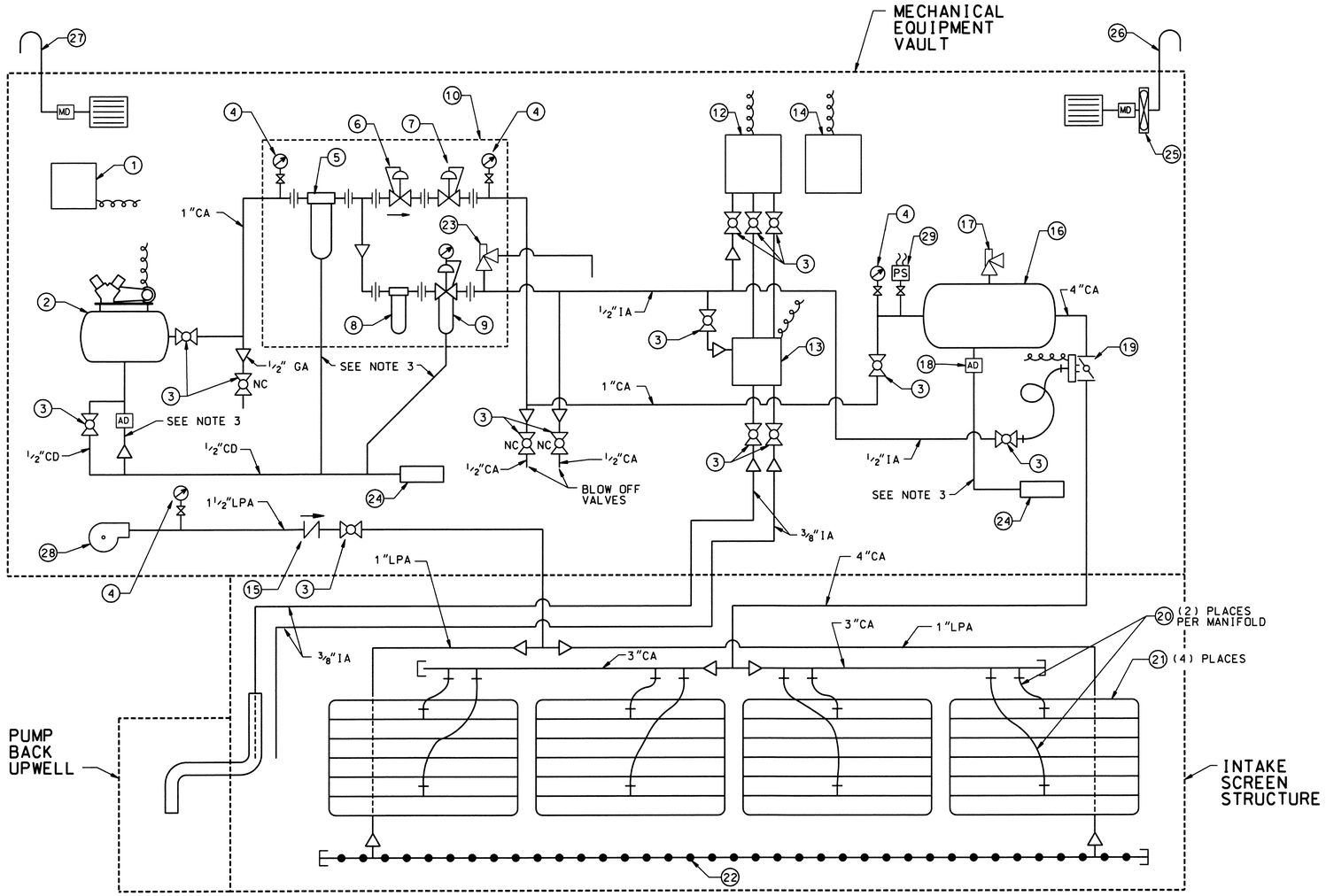

LEGEND

- FILTER OR CARTRIDGE DRIER
- BACK PRESSURE MAINTAINING VALVE
- PRESSURE REGULATING VALVE
- FILTER/REGULATOR WITH PRESSURE GAUGE
- PS — PRESSURE SWITCH
- PIPE REDUCER
- PNEUMATICALLY ACTUATED BUTTERFLY VALVE
- SAFETY RELIEF VALVE
- PRESSURE GAUGE WITH GAUGE COCK
- CHECK VALVE
- UNION
- BALL VALVE
- EXHAUST FAN
- LOW PRESSURE AIR BLOWER
- SUCTION OR EXHAUST REGISTER

AD – AUTOMATIC DRAIN
NC – NORMALLY CLOSED
CA – COMPRESSED AIR PIPING
IA – INSTRUMENT AIR PIPING
CD – CONDENSATE DRAIN PIPING
MD – MOTORIZED DAMPER

COMPONENTS

1. POWER DISTRIBUTION PANEL (SEE ELECTRICAL DRAWINGS)
2. 20HP AIR COMPRESSOR, RATED FOR 76scfm @ 175 PSI SET TO LOAD AT 150PSI AND UNLOAD AT 175 PSI
3. BALL VALVE, SIZE AS REQUIRED TO MATCH PIPING
4. PRESSURE GAUGE WITH GAGE COCK (0-200 PSI FOR CA PIPING, 0-15 PSI FOR LPA PIPING)
5. COALESCING FILTER
6. 1" BACK PRESSURE MAINTAINING VALVE, SET AT 90PSI
7. 1" PRESSURE REGULATING VALVE, SET AT 110PSI
8. CARTRIDGE TYPE DESICCANT DRIER
9. 1/2" FILTER REGULATOR, SET AT 80PSI
10. FILTER/CONTROL VALVE PANEL
11. 1/2" SAFETY RELIEF VALVE, SET AT 120 PSI
12. DIFFERENTIAL LEVEL MEASUREMENT PANEL
13. BLOW DOWN PANEL, SEE NOTE 4
14. AIR BACKWASH CONTROL PANEL (SEE ELECTRICAL DRAWINGS)
15. 1 1/2" CHECK VALVE
16. 650 GALLON AIR RECEIVER, RATED FOR 200 PSI
17. 3/4" SAFETY RELIEF VALVE, SET AT 175 PSI
18. AUTOMATIC DRAIN VALVE
19. 4" PNEUMATICALLY ACTUATED BUTTERFLY VALVE
20. 1 1/2" STAINLESS STEEL AIR HOSE, LENGTH AS REQUIRED
21. AIR BACKWASH MANIFOLD
22. 2" FINE BUBBLE DIFFUSER PIPING
23. PRESURE SWITCH, SET AT 80 PSI
24. CONDENSATE DRAIN COLLECTOR, SEE DETAIL 2 ON SHEET M7
25. EXHAUST FAN RATED FOR 950 cfm @ 0.2 IN WC.
26. 10" DIA SCH 40 STEEL PIPE
27. 12" DIA SCH40 STEEL PIPE
28. 5 HP LOW PRESSURE AIR BLOWER RATED FOR 40 scfm @ 350 IN WC.

NOTES:

1. THE COMPRESSED AIR DIAGRAM AND MECHANICAL DRAWINGS MAY NOT CALL OUT ALL OF THE FITTINGS, BUSHINGS, PIPING APPURTENANCES AND SUPPORT EQUIPMENT REQUIRED FOR THE INSTALLATION. EQUIPMENT SHALL BE INSTALLED WHETHER OR NOT SHOWN ON THE DRAWINGS OR DIAGRAM.
2. WHERE PIPING COMES IN CONTACT WITH DISSIMILAR METAL, ISOLATING MATERIALS SHALL BE USED AT THE CONNECTION TO PREVENT DIRECT CONTACT UNLESS APPROVED BY THE ENGINEER.
3. CONDENSATE DRAIN PIPING NOTED SHALL MATCH SIZE OF COMPONENT CONNECTION.
4. AT DIFFERENTIAL LEVEL SENSOR PANEL BUILDER'S OPTION, BLOW DOWN PANEL FOR THE DIFFERENTIAL MEASUREMENT SYSTEM MAY BE INCORPORATED INTO THE DIFFERENTIAL MEASUREMENT PANEL, ITEM 13.

REGISTERED PROFESSIONAL ENGINEER 13,797 OREGON SEPT. 17, 1987 EDWARD E. DONHAUE Expires 12/31/07
Engineer Seal

HDR | FISHPRO

NO.	W/O	COMPUTER REVISION ONLY	BY	DATE	APPROVED

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Date 04/10/06

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
HEADQUARTERS, PORTLAND, OREGON

NORTHEAST OREGON HATCHERY PROGRAM
LOSTINE RIVER HATCHERY

AIR BACKWASH SYSTEM PROCESS AND INSTRUMENTATION DIAGRAM

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