

**DRAWING LIST**  
Number Revision Description

- G-002 C General – Site – Key Plan and Drawing List
- G-003 0 General – Site – Site Plan and Notes
- M-002 0 Mechanical – Aeration Building – Piping Demolition
- M-003 0 Mechanical – Aeration Building – Piping Plan, Sections & Bill of Materials
- M-004 0 Mechanical – Aeration Building – Ventilation – Plan & Details
- M-005 0 Mechanical – Aeration Building – Turbine & Piping Details
- P-001 0 Process – Aeration Building - Schematic and Control Strategy
- P-002 0 Process – Aeration Building – Process and Instrumentation Diagram
- S-002 0 Structural - Aeration Building - Control Room Partition Wall
- E-001 F Electrical – Hatchery & Aeration Buildings – Single Line Diagram
- E-002 D Electrical – Hatchery & Aeration Buildings – Wall Elevations
- E-003 C Electrical – Aeration Building – Control Cabinet Layout
- E-004 E Electrical – Aeration Building – Control Cabinet Power
- E-005 E Electrical – Aeration Building – Control Cabinet I/O-1
- E-006 E Electrical – Aeration Building – Control Cabinet I/O-2
- E-007 B Electrical – Aeration Building – Control Cabinet I/O-3
- E-008 D Electrical – Aeration Building – Control Cabinet I/O-4
- E-009 C Electrical – Aeration Building – Control Cabinet I/O-5
- E-010 B Electrical – Conduit Section Details
- E-011 D Electrical – Aeration Building – Electrical Equipment Layout
- E-012 B Electrical – Aeration Building – Induction Generator Protection & Control Schematic
- E-100 B Cable Schedule

Plotted by: Andrea Path Date: 21-Jun-16 Path: \\hmc-c:\working\Projects\WEL\PUNTLEDGE\18-5000\Rev\18-5000\REV18.dwg Size: 11111

SCALE 1:1000 0 25 50 75 100m.

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DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS

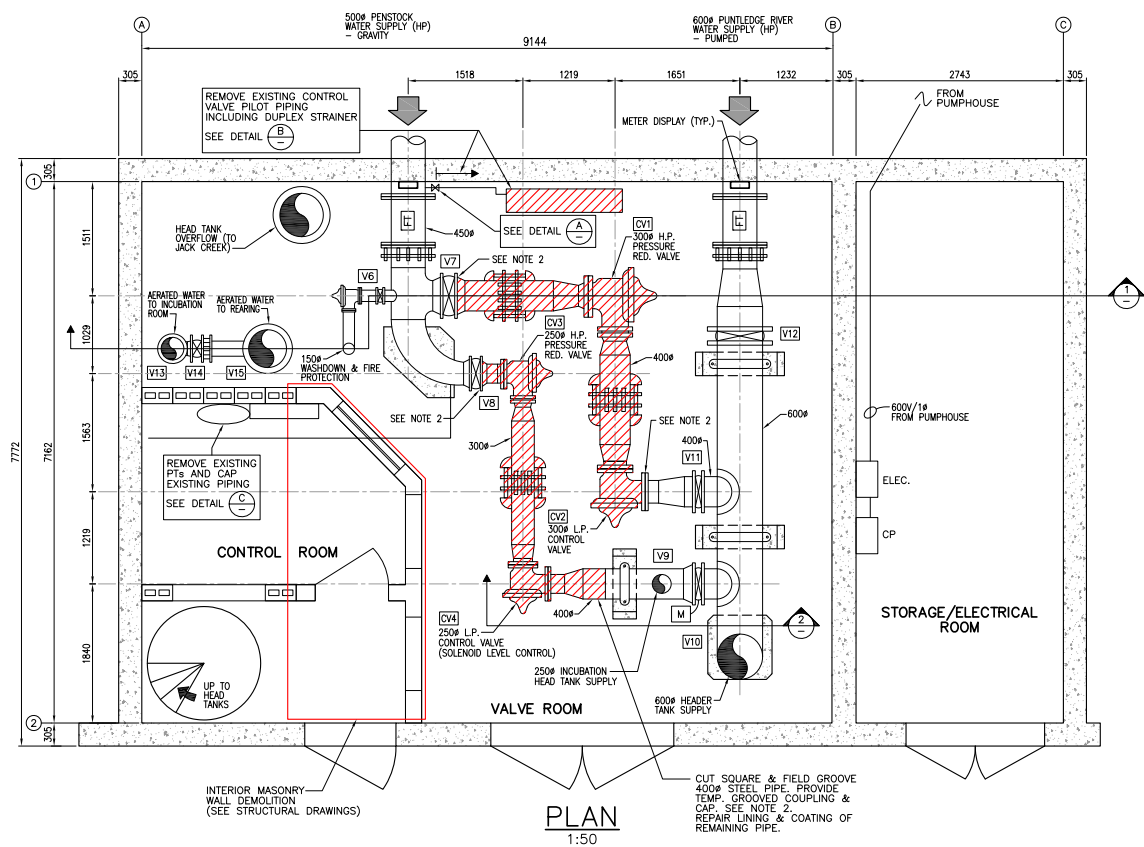
DESIGNED N. WHITESIDE
DRAWN A. VIZNAR
CHECKED N. WHITESIDE
RECOMMENDED
APPROVED
APPROVED

**PUNTLEDGE RIVER HATCHERY**  
**WATER SUPPLY ENERGY RECOVERY**  
**GENERAL**  
**SITE**  
**KEY PLAN & DRAWING LIST**

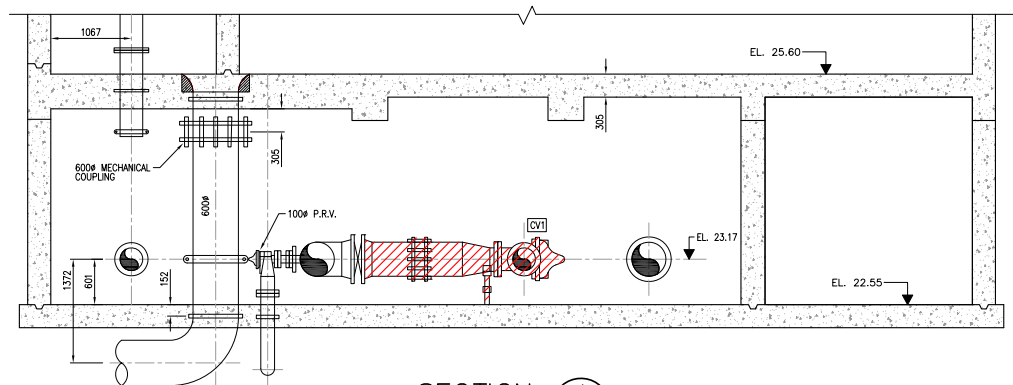
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DATE 21-Jun-16
DRAWING NUMBER <b>G-002</b>
REVISION <b>C</b>

**C 16-NOV-2016 DRAWING LIST REVISED**  
 B 21-JUN-2016  
 O 14-APR-2016  
 DRAWING LIST REVISED  
 ISSUED FOR TENDER





PLAN  
SCALE: 1:50

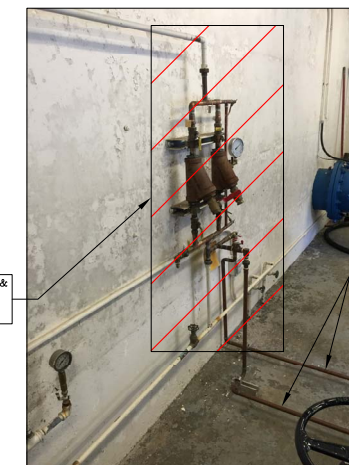


SECTION 1  
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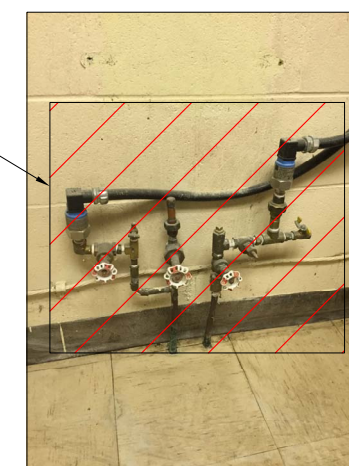
PILOT SYSTEM SUPPLY

DETAIL A  
SCALE: N.T.S.



PILOT SYSTEM DUPLEX STRAINERS

DETAIL B  
SCALE: N.T.S.



PRESSURE TRANSMITTERS  
IN CONTROL ROOM

DETAIL C  
SCALE: N.T.S.

REMOVE ELECTRIC SOLENOID VALVE POSITIONING SYSTEM, TYPICAL FOR CV2 AND CV4.



SECTION 2  
SCALE: N.T.S.

REMOVE 400P PIPING AS PER PLAN.

TERMINATE PT PIPING AT FLOOR LEVEL, REMOVE PIPING, PTs TO BE SALVAGED FOR USE AS SPARES FOR FUTURE USE.

NOTES:

1. ISOLATE PENSTOCK WATER SUPPLY AND PUNLEDGE RIVER WATER SUPPLIES AT SOURCE AND DRAIN AERATION BUILDING PIPING PRIOR TO STARTING WORK.
2. PROVIDE TEMPORARY BLIND FLANGES/CAPS AT 4 LOCATIONS IMMEDIATELY FOLLOWING DEMOLITION WORK UNTIL PERMANENT PIPING IS IN PLACE.
3. REMOVE PIPING, VALVES AND SUPPORTS AS INDICATED BY HATCHING.
4. SEE SECTION 01 11 00 FOR SHUTDOWN/WORK SEQUENCE RESTRICTIONS

SCALE 1:50

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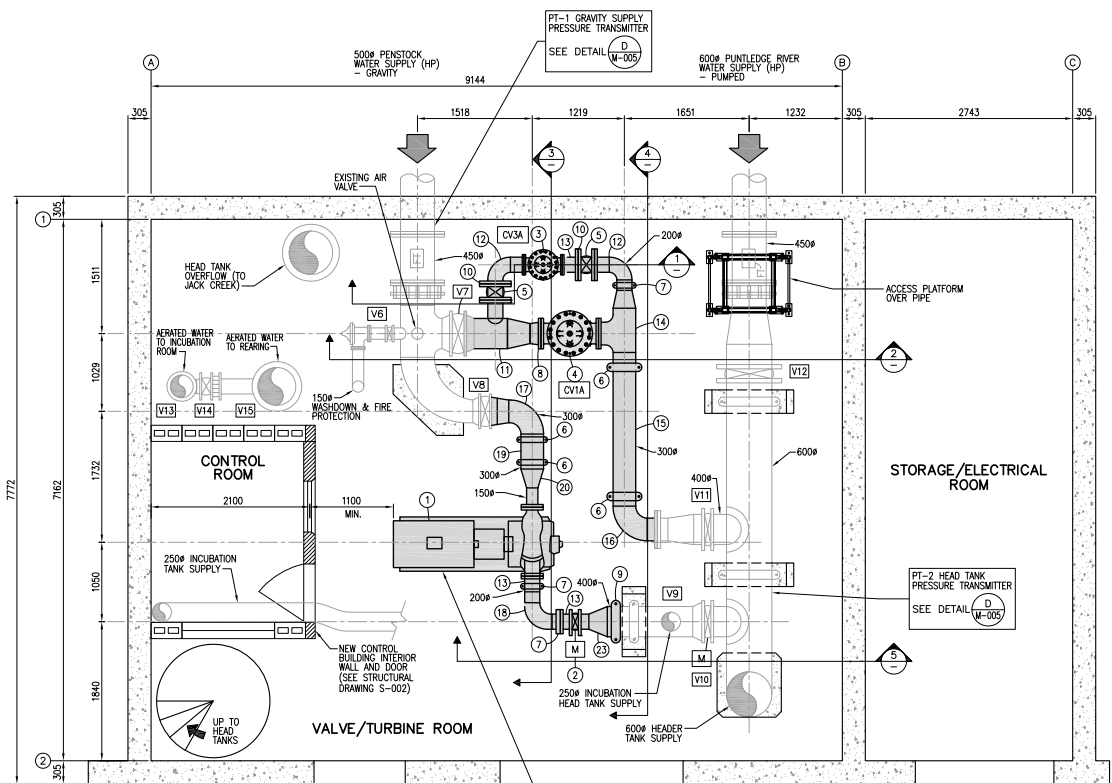


FISHERIES AND OCEANS CANADA  
REAL PROPERTY AND TECHNICAL SUPPORT

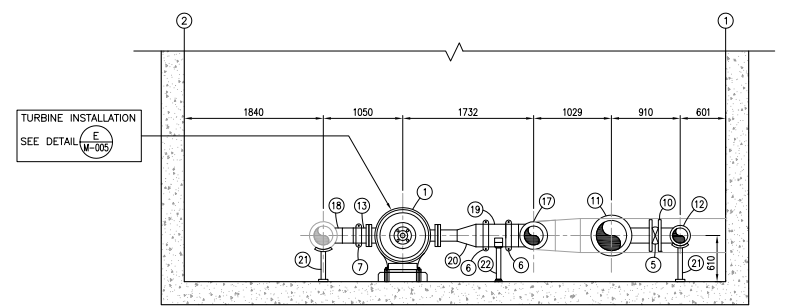
Plot Date: 13-Apr-16 Plot Path: \\server\projects\2016\2016-04-13\2016-04-13\001\Punledge-River-Hatchery-Mechanical-Piping-Demolition.dwg Sheet 01 of 01

DWG. NO.	DRAWING REFERENCES	NOTES	0	14-APR-2016	ISSUED FOR TENDER	DESIGNED N. WHITESIDE	DRAWN A. VIZNAR	CHECKED N. WHITESIDE	RECOMMENDED	APPROVED	APPROVED	SCALE AS NOTED	DATE 13-Apr-16	DRAWING NUMBER <b>M-002</b>	REVISION	0
			NO.	DATE	REVISIONS											APPROVED

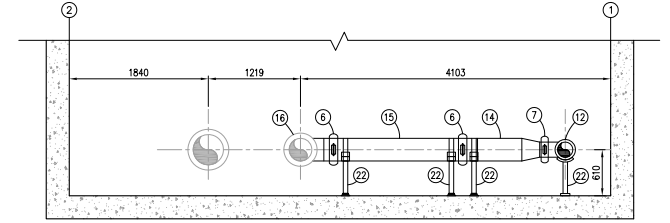
PUNLEDGE RIVER HATCHERY WATER SUPPLY ENERGY RECOVERY MECHANICAL AERATION BUILDING PIPING DEMOLITION	
SCALE AS NOTED	DATE 13-Apr-16
DRAWING NUMBER <b>M-002</b>	REVISION 0



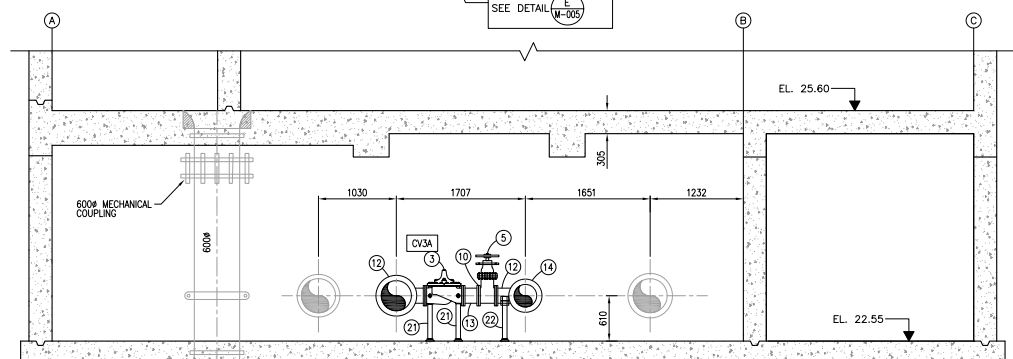
PLAN  
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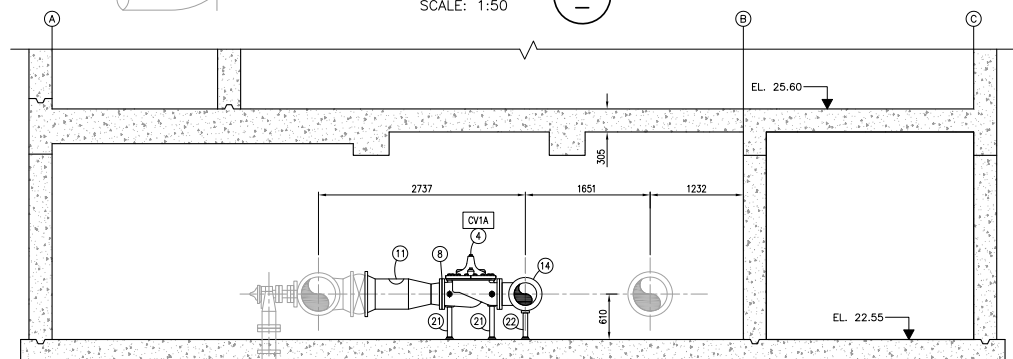
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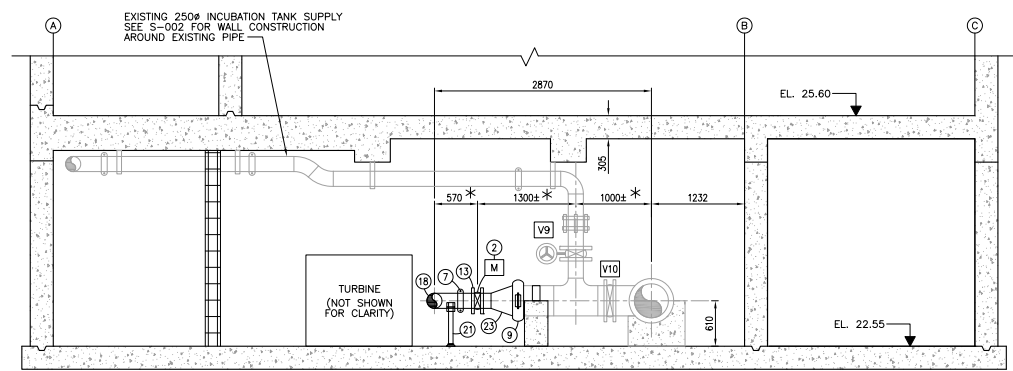
SECTION 4  
SCALE: 1:50



SECTION 1  
SCALE: 1:50



SECTION 2  
SCALE: 1:50



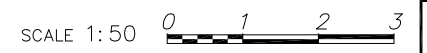
SECTION 5  
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\* CONFIRM DIMENSION IN FIELD

BILL OF MATERIALS			
ITEM	QTY	NOM. Ø / END CONNECTIONS	DESCRIPTION
1	1	150 F x 200 F	TURBINE-GENERATOR UNIT
2	1	200 LVG STYLE	TURBINE CONTROL VALVE - MOTORIZED BUTTERFLY VALVE (MOUNT WITH VALVE SHAFT IN HORIZONTAL PLANE)
3	1	200 F	CV3A - LOW-FLOW TANK CONTROL VALVE - SOLENOID GLOBE VALVE WITH DUAL SOLENOID VALVES
4	1	300 F	CV1A - HIGH-FLOW TANK CONTROL VALVE - SOLENOID GLOBE VALVE WITH DUAL SOLENOID VALVES
5	2	200 F	GATE VALVE
6	4	300 GRV	GROOVED FLEXIBLE COUPLING
7	3	200 GRV	GROOVED FLEXIBLE COUPLING
8	1	300 GRV x F	GROOVED FLANGE ADAPTER
9	1	400 GRV	GROOVED FLEXIBLE COUPLING
10	2	200 GRV x F	GROOVED FLANGE ADAPTER
11	1	400 F x 300 GRV x 200 F	STEEL SPECIAL WITH 400 SPOOL, 400 x 300 REDUCER AND 250 BRANCH
12	2	200 GRV x F	STEEL SPECIAL WITH 200 ELBOW
13	3	200 GRV x F	STEEL SPOOL
14	1	300 GRV x 200 GRV x 300 F	STEEL SPECIAL WITH 300 TEE, 300 x 200 REDUCER
15	1	300 GRV	STEEL SPOOL
16	1	300 F x 300 GRV	STEEL SPECIAL WITH 300 ELBOW
17	1	300 F x 300 F	STEEL SPECIAL WITH 300 ELBOW
18	1	200 GRV	STEEL SPECIAL WITH 200 ELBOW
19	1	300 GRV	STEEL SPOOL
20	1	300 GRV x 150 F	STEEL SPECIAL WITH 300 x 150 REDUCER
21	5	-	PIPE SUPPORT TYPE A WITHOUT TOP STRAP SEE DETAIL  M-005
22	5	-	PIPE SUPPORT TYPE B WITH TOP STRAP SEE DETAIL  M-005
23	1	400 GRV x 200 F	STEEL SPECIAL WITH 400 x 200 CONCENTRIC REDUCER

F FLANGED TO ANSI/ASME B16.5  
FW FIELD WELD  
GRV GROOVED END TO SPECIFICATIONS

EXISTING PIPING  
 PROPOSED PIPING AND MECHANICAL EQUIPMENT



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PUNTLEDGE RIVER HATCHERY  
WATER SUPPLY ENERGY RECOVERY  
MECHANICAL  
AERATION BUILDING  
PIPING PLAN, SECTIONS & BILL OF MATERIALS

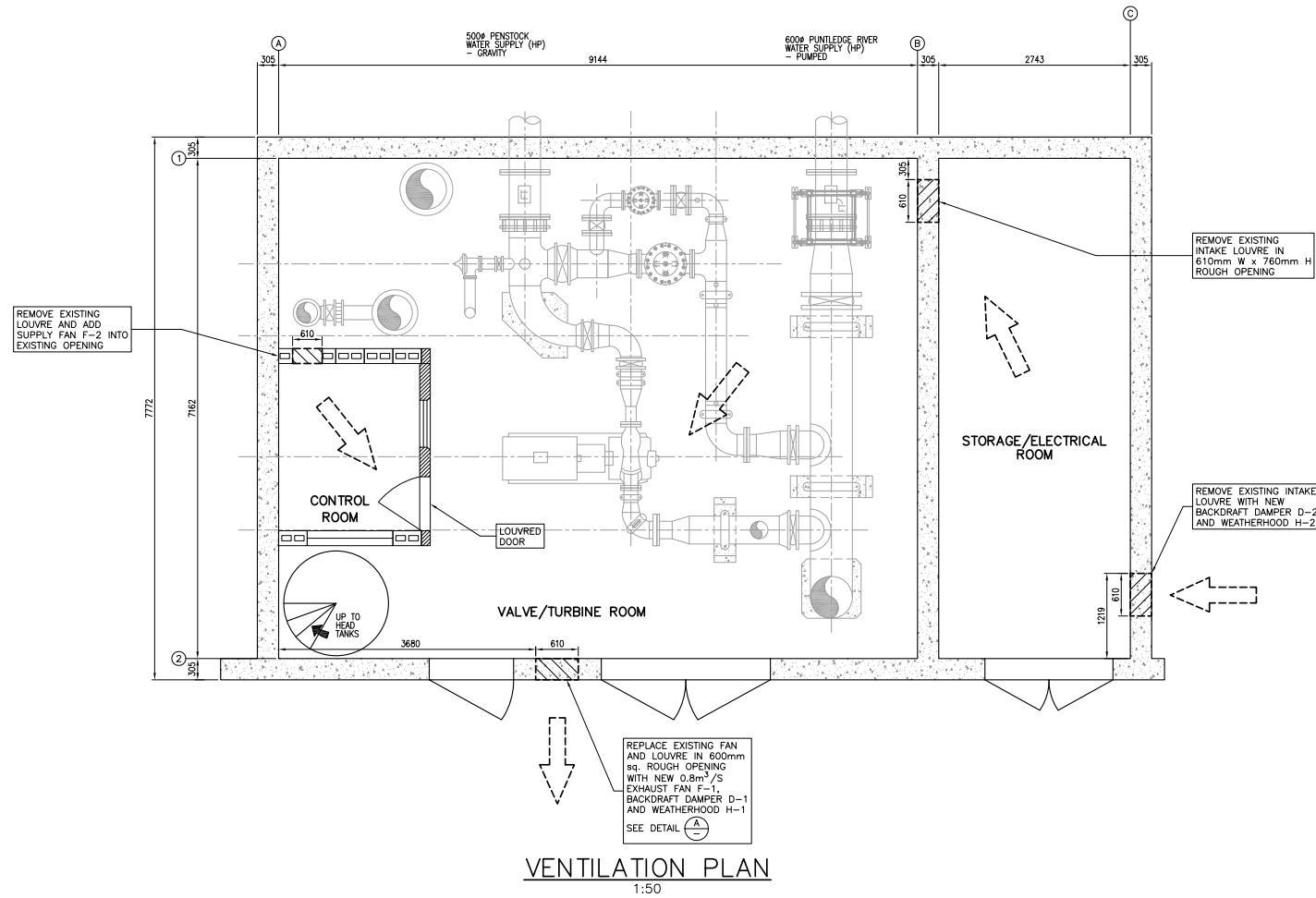
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DATE	13-APR-16
DRAWING NUMBER	M-003
REVISION	0

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0	14-APR-2016	ISSUED FOR TENDER
NO.	DATE	REVISIONS

NOTES

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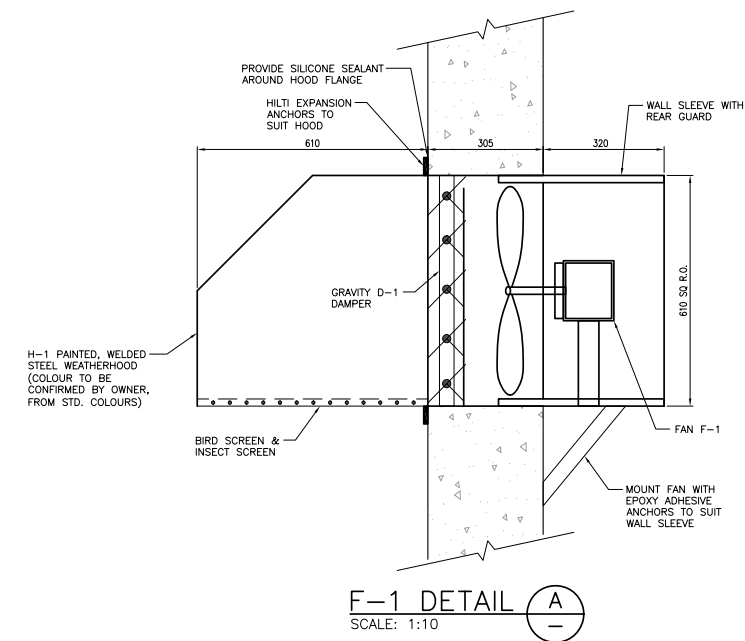


FAN SCHEDULE						
TAG	DESCRIPTION	RATED AIRFLOW	HEAD	R.O. SIZE	MOTOR	OPTIONS
F-1	MAIN EXHAUST FAN	0.85 cu.m./s (1800 cfm)	93 Pa (0.375" WC)	610mm sq.	0.25 hp/1140 rpm/230V/1ph	WITH WALL SLEEVE, D-1 & H-1, EPOXY POWDER COAT
F-2	CONTROL ROOM SUPPLY FAN	0.18 cu.m./s (380 cfm)	38 Pa (0.15" WC)	610mm sq.	80 W/1050 rpm/115V/1ph	SLIP-IN FAN PAK

DAMPER AND WEATHERHOOD SCHEDULE						
TAG	DESCRIPTION	RATED AIRFLOW	HEAD	R.O. SIZE	MOTOR	OPTIONS
D-1	MAIN ROOM EXHAUST GRAVITY WALL SHUTTER	0.85 cu.m./s (1800 cfm)	30 Pa (0.12" WC)	610mm sq.		GRAVITY OPERATION
D-2	STORAGE ROOM INLET GRAVITY BACKDRAFT DAMPER	0.85 cu.m./s (1800 cfm)	30 Pa (0.12" WC)	610mm W x 760mm H		COUNTER BALANCED WITHOUT SPRINGS
H-1	MAIN ROOM EXHAUST WEATHERHOOD	0.85 cu.m./s (1800 cfm)	15 Pa (0.06" WC)	610mm sq.		16 GA. WELDED STEEL CONST., POWDER COATED WITH BIRD SCREEN & INSECT SCREEN, FLANGE MOUNTED
H-2	STORAGE ROOM INLET WEATHERHOOD	0.85 cu.m./s (1800 cfm)	15 Pa (0.06" WC)	610mm W x 760mm H		16 GA. WELDED STEEL CONST., POWDER COATED WITH BIRD SCREEN & INSECT SCREEN, FLANGE MOUNTED, OVERSIZED TO LIMIT VELOCITY

**NOTE:**  
CONFIRM ALL EXISTING ROUGH OPENING SIZES PRIOR TO ORDERING FAN, DAMPERS & WEATHERHOODS. FRAME IN ROUGH OPENINGS AS REQUIRED TO SUIT EQUIPMENT.

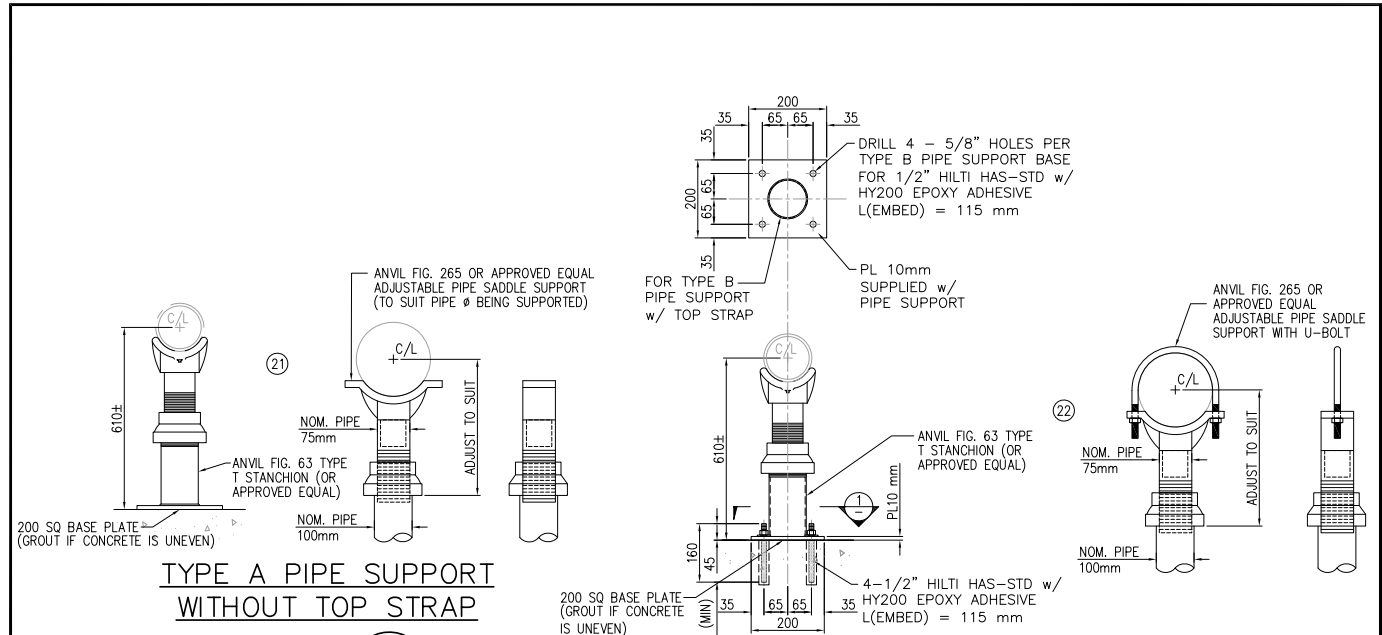


**NOTE:**  
MOUNTING OF D-2 AND H-2 SIMILAR.

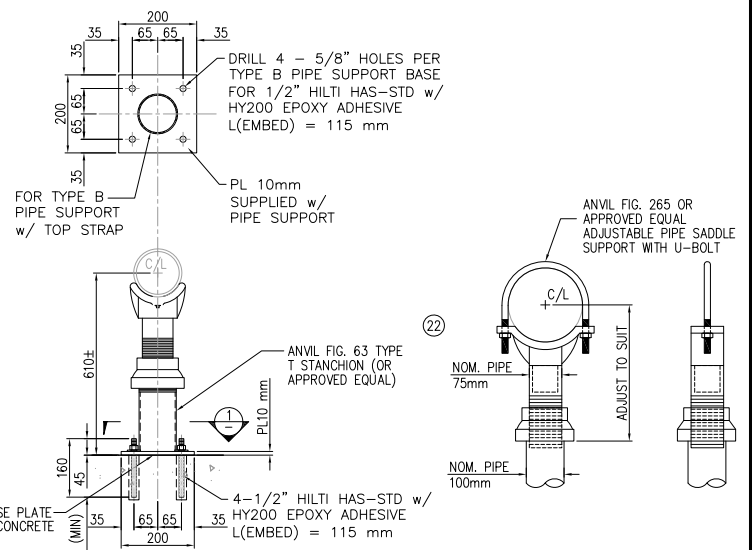


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DWG. NO. DRAWING REFERENCES NOTES NO. DATE 0 14-APR-2016	DESIGNED N. WHITESIDE DRAWN A. VIZNAR CHECKED N. WHITESIDE RECOMMENDED APPROVED APPROVED	<b>PUNTLEDGE RIVER HATCHERY</b> <b>WATER SUPPLY ENERGY RECOVERY</b> <b>MECHANICAL</b> <b>AERATION BUILDING</b> <b>VENTILATION</b> <b>PLAN &amp; DETAILS</b>	
ISSUED FOR TENDER		SCALE AS NOTED DATE 13-Apr-16 DRAWING NUMBER <b>M-004</b> REVISION 0	REVISION 0

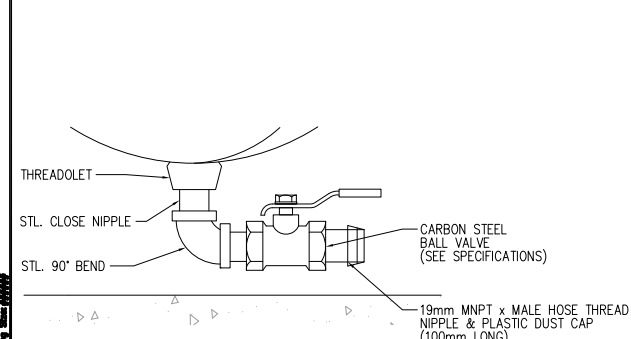
Plotted by: Andrea Plot date: 13-Apr-16 Path: \\msc01\projects\2016\13-APR-16-Puntledge River Hatchery\Drawings\Mechanical\Aeration Building Ventilation Plan & Details.dwg Scale: 1:50



**TYPE A PIPE SUPPORT WITHOUT TOP STRAP**  
**DETAIL A**  
 SCALE: N.T.S. M-003  
 (5 REQUIRED)

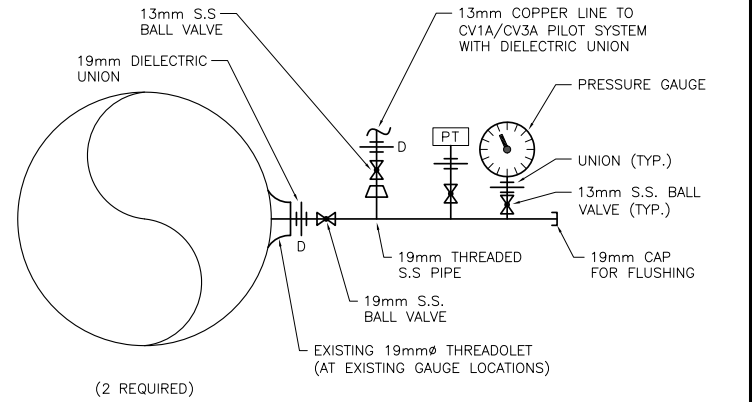


**TYPE B PIPE SUPPORT WITH TOP STRAP**  
**DETAIL B**  
 SCALE: N.T.S. M-003  
 (5 REQUIRED)  
 LOAD CAPACITY 17kN EACH



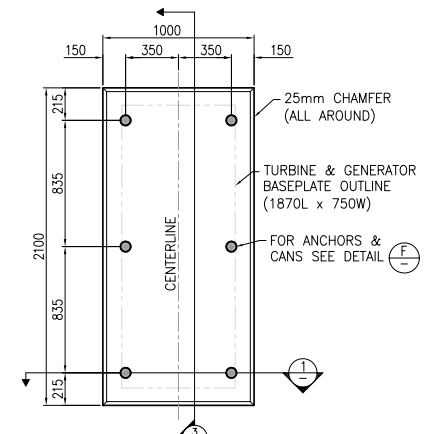
DRAIN SIZE	No. REQ'D	No. REQ'D
19ø	4	PIPE SPECIALS 11, 15, 17, 18

**PIPE DRAIN**  
**DETAIL C**  
 SCALE: N.T.S. M-003

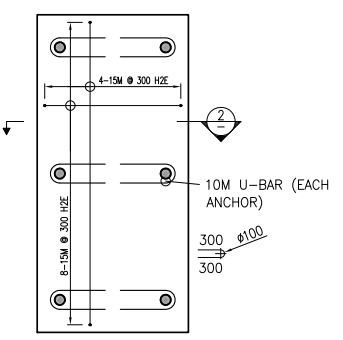


**PRESSURE GAUGE DETAIL D**  
 SCALE: N.T.S. M-003

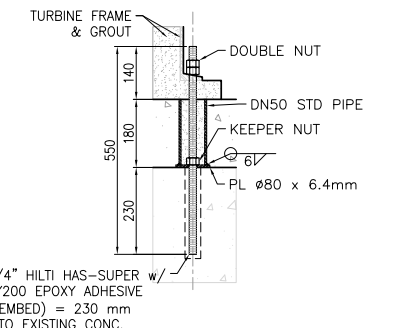
TAG	DESCRIPTION	LOCATION	PRESSURE GAUGE/TRANSMITTER RANGE (psig)
PT-1	GRAVITY SUPPLY PRESSURE	UPSTREAM OF FLOW METER	0-200 psig (1379kPa)
PT-2	HEAD TANK PRESSURE	600ø HEADER TO REARING HEAD TANK	0-30 psig (207kPa)



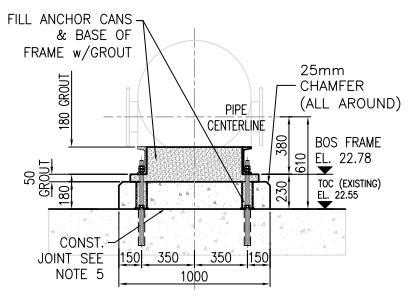
**PLAN - STRUCTURE OUTLINE**  
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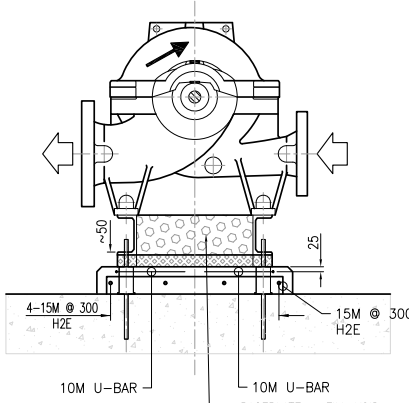
**PLAN - REINFORCEMENT**  
 SCALE: 1:25



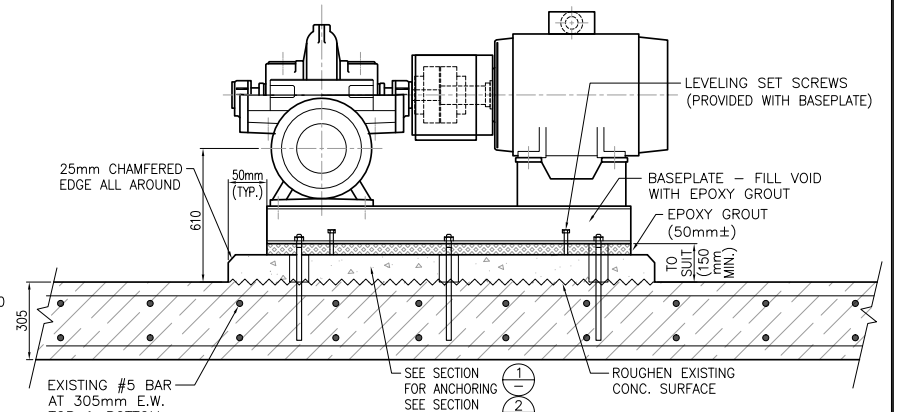
**DETAIL F**  
 SCALE: 1:10



**SECTION 1**  
 SCALE: 1:25



**SECTION 2**  
 SCALE: N.T.S.



**SECTION 3**  
 SCALE: N.T.S.

**TURBINE INSTALLATION DETAIL E**  
 SCALE: N.T.S. M-003

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NOTES:

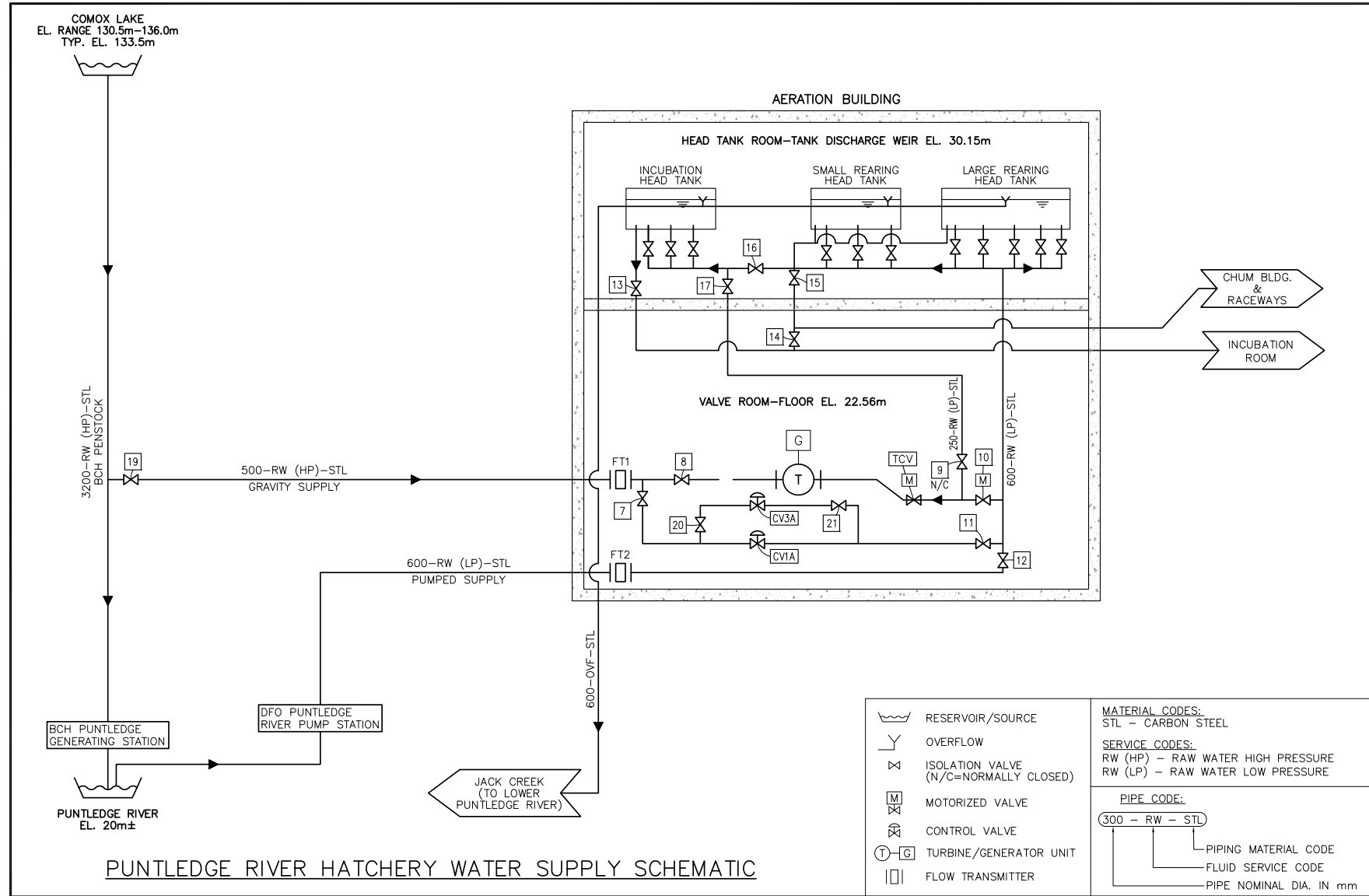
- DESIGN CRITERIA
  - CODES AND STANDARDS
    - BRITISH COLUMBIA BUILDING CODE OF CANADA, 2012
    - CAN/CSA A23.3 - DESIGN OF CONCRETE STRUCTURES
  - PERMISSIBLE DESIGN LOADS
    - SEISMIC LOAD: PGA = 0.30, Sa(0.2) = 0.65, Ie = 1.0
    - WET WEIGHT: 18.1 kN
    - MAX PUMP THRUST: 100 kN
    - MAX PUMP TORQUE: 1.6 kN\*m
    - MAX MOTOR START-UP TORQUE: 4.0 kN\*m
- CONCRETE: 28 DAY COMPRESSIVE STRENGTH  $f_c' = 35 \text{ MPa}$
- REINFORCEMENT: DEFORMED BARS TO CSA G30.18, GRADE 400W  $F_y = 400 \text{ MPa}$
- ALL EMBEDDED METALS SHOULD BE GALVANIZED. ROUGHEN CONSTRUCTION JOINT TO AN AMPLITUDE OF 5 MM. LAITANCE AND THE COARSE AGGREGATE EXPOSED. AFTER ROUGHENING, CLEAN AND WET THE SURFACE THOROUGHLY. PRIOR TO CASTING NEW CONCRETE, THE SURFACE MUST BE DAMP BUT WITH NO MOISTURE "SHEEN". APPLY BONDING AGENT TO THE ROUGHENED SURFACE JUST PRIOR TO CONCRETING.

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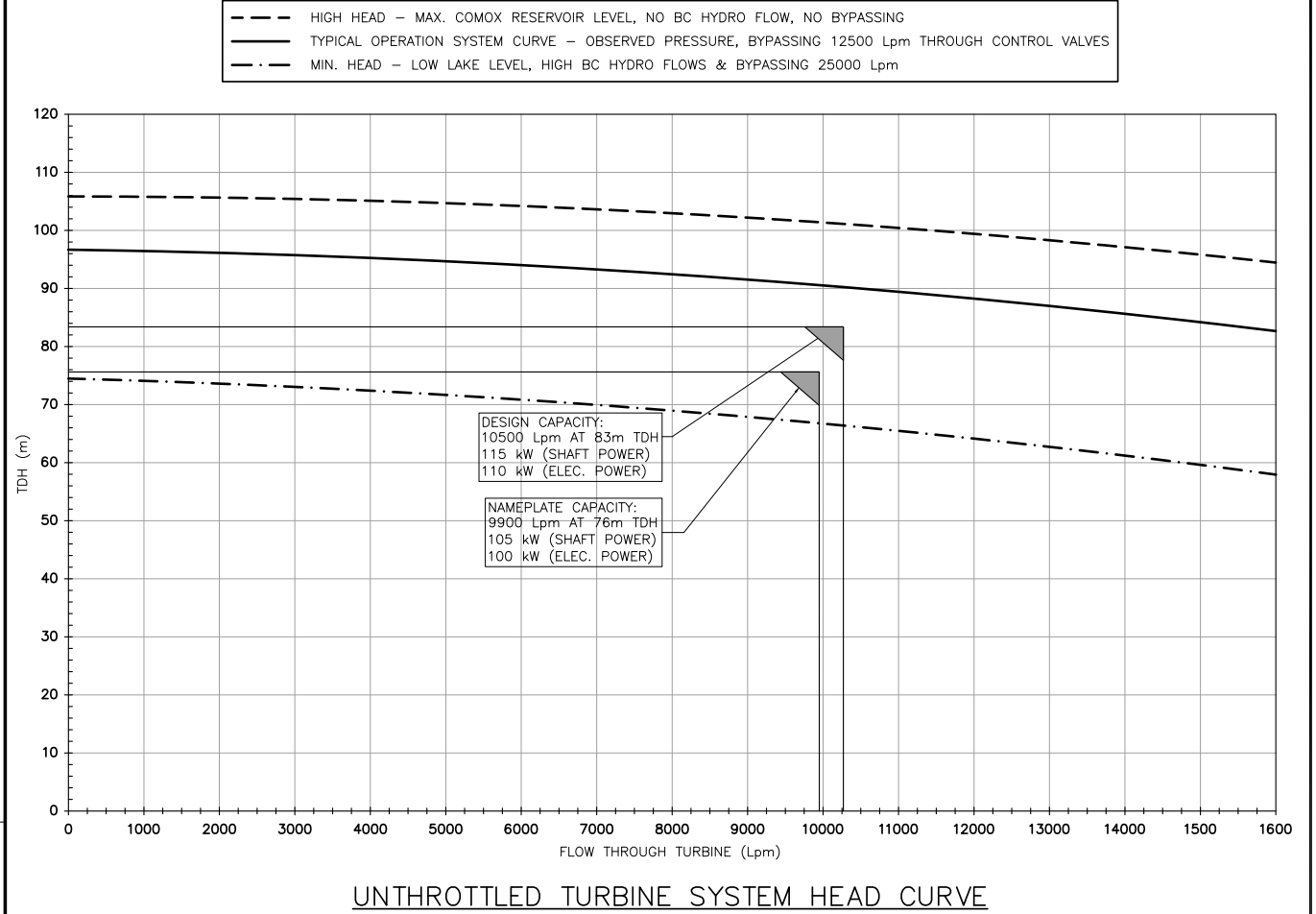
**PUNTLEDGE RIVER HATCHERY**  
**WATER SUPPLY ENERGY RECOVERY**  
**MECHANICAL**  
**AERATION BUILDING**  
**TURBINE & PIPING DETAILS**

SCALE AS NOTED
DATE 19-APR-16
DRAWING NUMBER <b>M-005</b>
REVISION 0



PUNTLEDGE RIVER HATCHERY WATER SUPPLY SCHEMATIC

RESERVOIR/SOURCE OVERFLOW ISOLATION VALVE (N/C=NORMALLY CLOSED) MOTORIZED VALVE CONTROL VALVE TURBINE/GENERATOR UNIT FLOW TRANSMITTER	<b>MATERIAL CODES:</b> STL - CARBON STEEL  <b>SERVICE CODES:</b> RW (HP) - RAW WATER HIGH PRESSURE RW (LP) - RAW WATER LOW PRESSURE  <b>PIPE CODE:</b> 300 - RW - STL PIPING MATERIAL CODE FLUID SERVICE CODE PIPE NOMINAL DIA. IN mm
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UNTHROTTLLED TURBINE SYSTEM HEAD CURVE

VALVE TAG	PHYSICAL DESCRIPTION	UPSTREAM PRESSURE (psi)	DOWNSTREAM PRESSURE (psi)	FUNCTION
CV1A	300mm∅ ANGLE-STYLE GLOBE VALVE WITH SOLENOID PILOTING FOR LEVEL CONTROL & VALVE POSITION TRANSMITTER	125 to 155	10	CONTROLLED TO MAINTAIN DOWNSTREAM TANK LEVEL
CV3A	200mm∅ ANGLE-STYLE GLOBE VALVE WITH SOLENOID PILOTING FOR LEVEL CONTROL & VALVE POSITION TRANSMITTER	125 to 155	10	CONTROLLED TO MAINTAIN DOWNSTREAM TANK LEVEL
TCV	300mm∅ HIGH PERFORMANCE BUTTERFLY VALVE	15 to 155	10	OPENS TO ALLOW TURBINE TO OPERATE, MAY BE THROTTLED TO REDUCE TURBINE OUTPUT POWER TO MAX. ALLOWED OR TO MAINTAIN TANK LEVEL

FLOW RANGE (Lpm) <sup>1,2</sup>	WATER SUPPLY SYSTEM OPERATION
< 7,500	TURBINE OFF, CV1A MODULATING TO MAINTAIN TANK LEVEL.
7,500 - 10,500	TURBINE ON PROVIDING 100% OF FLOW, TCV THROTTLED TO MAINTAIN TANK LEVEL.
10,500 - 20,000	TURBINE ON PROVIDING 10,500 Lpm±, CV3A TO PROVIDE REMAINDER OF FLOW MODULATING TO MAINTAIN TANK LEVEL, TCV MODULATED AS REQUIRED TO LIMIT POWER OUTPUT FROM GENERATOR TO MAXIMUM ALLOWED.
20,000 - 35,000	TURBINE ON PROVIDING 10,500 Lpm±, CV1A TO PROVIDE REMAINDER OF FLOW MODULATING TO MAINTAIN TANK LEVEL, TCV MODULATED AS REQUIRED TO LIMIT POWER OUTPUT FROM GENERATOR TO MAXIMUM ALLOWED.
> 35,000	TURBINE ON PROVIDING 10,500 Lpm±, CV1A PROVIDING 24,500 Lpm FULL OPEN, CV3A MODULATING TO MAINTAIN REMAINDER OF FLOW, MODULATING TO MAINTAIN TANK LEVEL, TCV MODULATED AS REQUIRED TO LIMIT POWER OUTPUT FROM GENERATOR TO MAXIMUM ALLOWED.

**NOTES:**

1. FLOW RANGES ARE APPROXIMATE, SUBJECT TO REFINEMENT BASED ON OBSERVED HYDRAULICS DURING COMMISSIONING.
2. MAXIMUM FLOW FOR TURBINE OF 10,500 SUBJECT TO TURBINE CURVES AND OUTPUT POWER LIMIT IMPOSED BY BC HYDRO (NOMINALLY 110kW WIRE POWER).

Plotted by: Andrea Plot date: 13-Apr-16 Path: \\C:\ProgramData\WhiteSide\Projects\2016\04\16\000001\Puntledge\_River\_Hatchery\00001.dwg  
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 Title: PUNTLEDGE RIVER HATCHERY WATER SUPPLY SCHEMATIC AND CONTROL STRATEGY  
 Project: PUNTLEDGE RIVER HATCHERY WATER SUPPLY SCHEMATIC AND CONTROL STRATEGY  
 Date: 13-Apr-16  
 Version: 1

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PUNTLEDGE RIVER HATCHERY  
WATER SUPPLY ENERGY RECOVERY  
PROCESS  
AERATION BUILDING  
SCHEMATIC AND CONTROL STRATEGY

SCALE	AS NOTED
DATE	13-Apr-16
DRAWING NUMBER	P-001
REVISION	0

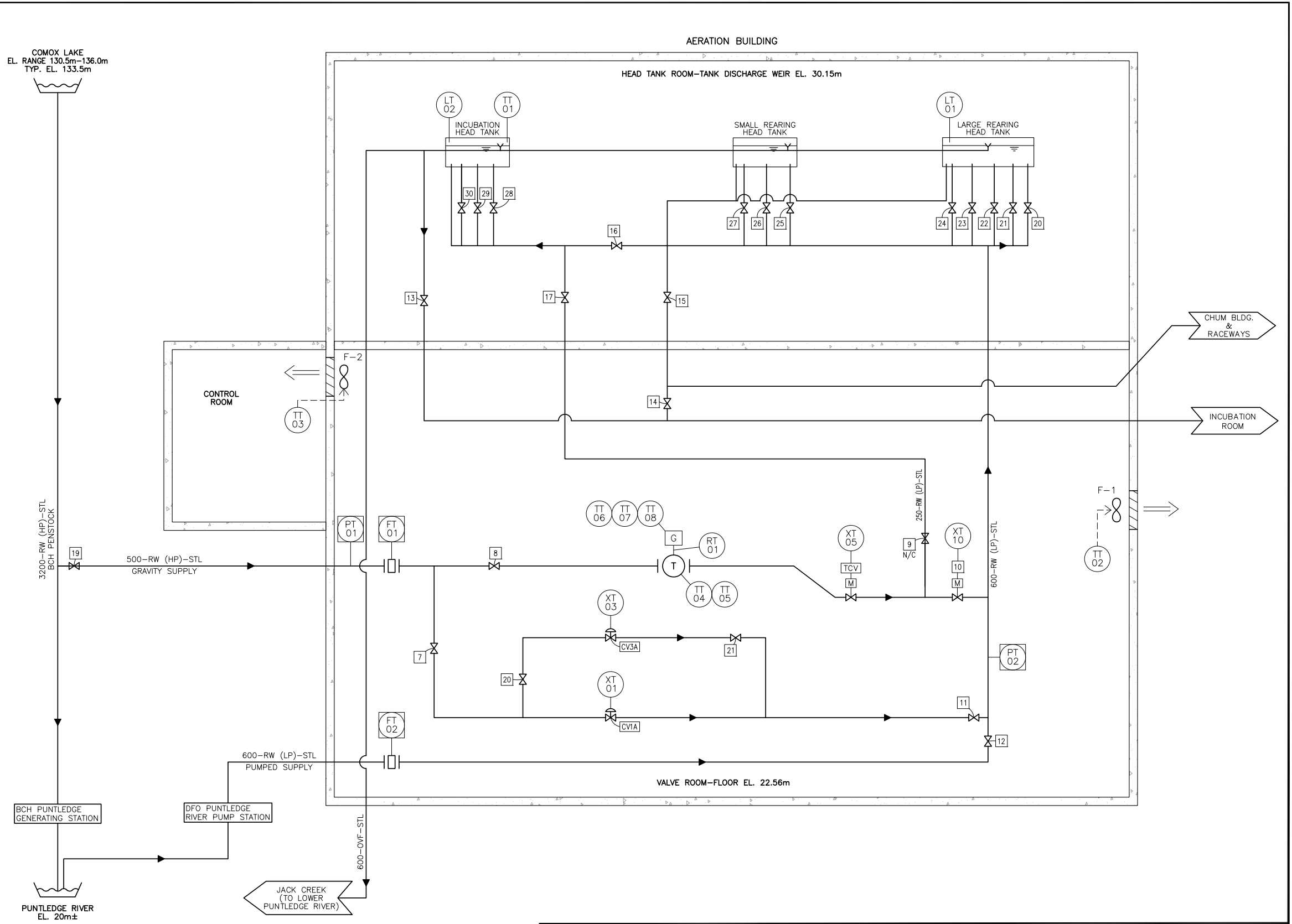
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			0	14-APR-2016		

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APPROVED	
APPROVED	

	RESERVOIR/SOURCE	<b>MATERIAL CODES:</b> STL - CARBON STEEL
	OVERFLOW	<b>SERVICE CODES:</b> RW (HP) - RAW WATER HIGH PRESSURE RW (LP) - RAW WATER LOW PRESSURE OVF - OVERFLOW
	ISOLATION VALVE (N/C=NORMALLY CLOSED)	<b>PIPE CODE:</b> 300 - RW - STL
	MOTORIZED VALVE	— PIPING MATERIAL CODE
	CONTROL VALVE	— FLUID SERVICE CODE
	TURBINE/GENERATOR UNIT	— PIPE NOMINAL DIA. IN mm
	FLOW TRANSMITTER	

- NOTES:**
- SEE PROCESS NARRATIVE FOR INSTRUMENT TAGS.
  - ALL INSTRUMENTS PROVIDE SIGNALS TO CONTROL ROOM PLC UNLESS NOTED OTHERWISE (WITH HMI DISPLAY)
- FIELD MOUNTED INSTRUMENT (NO DISPLAY)
  - FIELD MOUNTED INSTRUMENT (WITH DISPLAY)
  - ELECTRICAL SIGNAL

LIST OF INSTRUMENTATION FOR WATER SUPPLY SYSTEM IN AERATION BUILDING				
TAG	DESCRIPTION	EXISTING?	RANGE	USE
FT-01	PENSTOCK FLOW METER	EXISTING	0-56,775 LPM	MEASURES HIGH PRESSURE GRAVITY FLOW FROM PENSTOCK (COMOX LAKE)
FT-02	RIVER SUPPLY FLOW METER	EXISTING	0-56,775 LPM	MEASURES PUMPED FLOW FROM PUNTLEDGE RIVER
LT-01	REARING HEAD TANK LEVEL	EXISTING	0-100%	ALARM, USED TO CONTROL CONTROL VALVES (CV1A, CV3A, OR TCV AS APPROPRIATE)
LT-02	INCUBATION TANK LEVEL	EXISTING	0-100%	ALARM, ALTERNATE SIGNAL USED TO CONTROL CONTROL VALVES (CV1A, CV3A, OR TCV)
PT-01	PENSTOCK SUPPLY PRESSURE	REPLACEMENT	0-200 psi	SHUTDOWN TURBINE IF READING IS LESS THAN SETPOINT (100 psi). ALARM.
PT-02	HEADER PRESSURE	REPLACEMENT	0-30 psi	MONITOR ONLY
RT-01	TURBINE ROTATING SPEED	NEW	0-1800 RPM	USED TO MONITOR SHAFT ROTATIONAL SPEED ESP. AT STARTUP/SHUTDOWN. NORMAL VALUE 1220 RPM. ALARM AT OVERSPEED (VALUE TBD).
TT-01	WATER TEMPERATURE	EXISTING		INCUBATION TANK WATER TEMPERATURE
TT-02	VALVE ROOM THERMOSTAT	REPLACEMENT	0-40°C	TURNS ON MAIN VENTILATION FAN
TT-03	CONTROL ROOM THERMOSTAT	NEW	0-40°C	TURNS ON CONTROL ROOM VENTILATION FAN
TT-04	TURBINE INSIDE BEARING RTD PROBE	NEW	TBD	RTD ON INSIDE BEARING (BETWEEN TURBINE AND GENERATOR)
TT-05	TURBINE BEARING RTD PROBE 2	NEW	TBD	RTD ON OUTSIDE BEARING
TT-06	GENERATOR TEMPERATURE RTD PROBE (PHASE A)	NEW	TBD	RTDs EMBEDDED IN GENERATOR WINDINGS
TT-07	GENERATOR TEMPERATURE RTD PROBE (PHASE B)	NEW	TBD	RTDs EMBEDDED IN GENERATOR WINDINGS
TT-08	GENERATOR TEMPERATURE RTD PROBE (PHASE C)	NEW	TBD	RTDs EMBEDDED IN GENERATOR WINDINGS
XT-01	CV1A VALVE POSITION	REPLACEMENT	0-100% VALVE TRAVEL	MONITOR % OPEN OF VALVE AS MEASURED BY VALVE STEM TRAVEL
XT-03	CV3A VALVE POSITION	REPLACEMENT	0-100% VALVE TRAVEL	MONITOR % OPEN OF VALVE AS MEASURED BY VALVE STEM TRAVEL
XT-05	TCV VALVE POSITION	NEW	0-100%	MONITOR BUTTERFLY VALVE POSITION (% OPEN)
XT-10	VALVE 10 VALVE POSITION	EXISTING	OPEN/CLOSED	BYPASS VALVE, N/O ALLOWS FOR ISOLATION OF REARING HEAD TANKS FROM INCUBATION TANKS

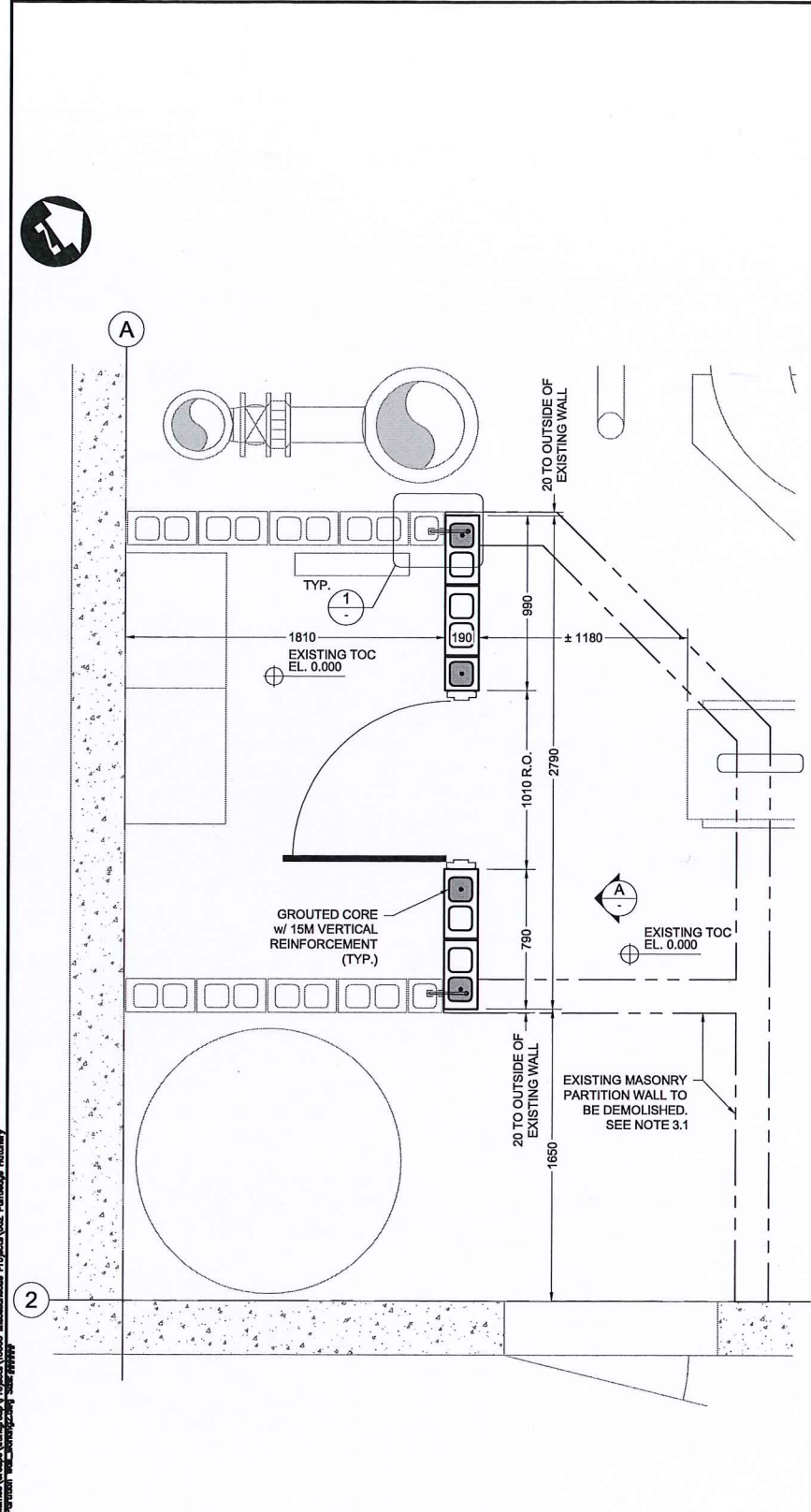


DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS
			0	09-MAY-2016	ISSUED FOR TENDER

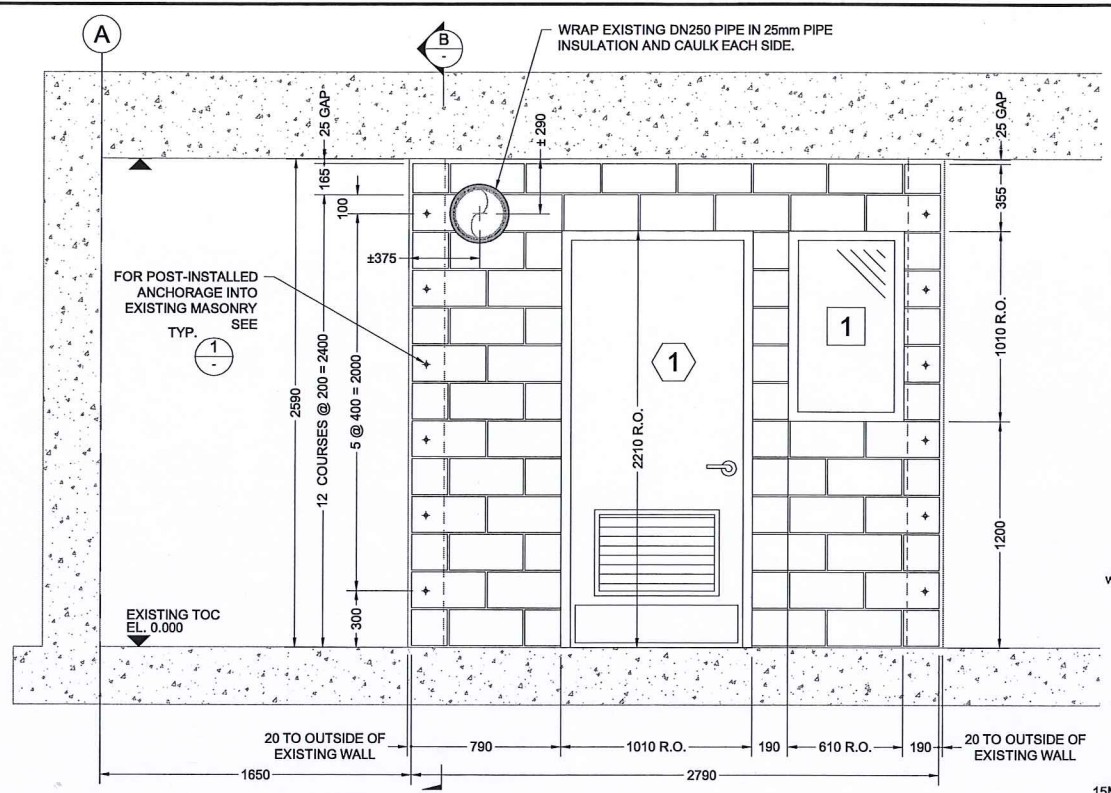
<b>WHITESIDE ENGINEERING LTD.</b> WATER UTILITY CONSULTING	<b>FISHERIES AND OCEANS CANADA</b> REAL PROPERTY AND TECHNICAL SUPPORT	<b>PUNTLEDGE RIVER HATCHERY</b> <b>WATER SUPPLY ENERGY RECOVERY</b> <b>PROCESS</b> <b>AERATION BUILDING</b> <b>PROCESS AND INSTRUMENTATION</b> <b>DIAGRAM</b>	SCALE AS NOTED DATE 15-May-16 DRAWING NUMBER <b>P-002</b>
		DESIGNED N. WHITESIDE	REVISION 0
		DRAWN A. VIZNAR	
		CHECKED N. WHITESIDE	
		RECOMMENDED APPROVED APPROVED	

Plotted by: Andrea Plot date: 15-May-16 Path: \\P:\Projects\2016\20160515\_Puntledge\_River\_Hatchery\Aeration\_Building\_Process\_and\_Instrumentation\_Diagram.dwg

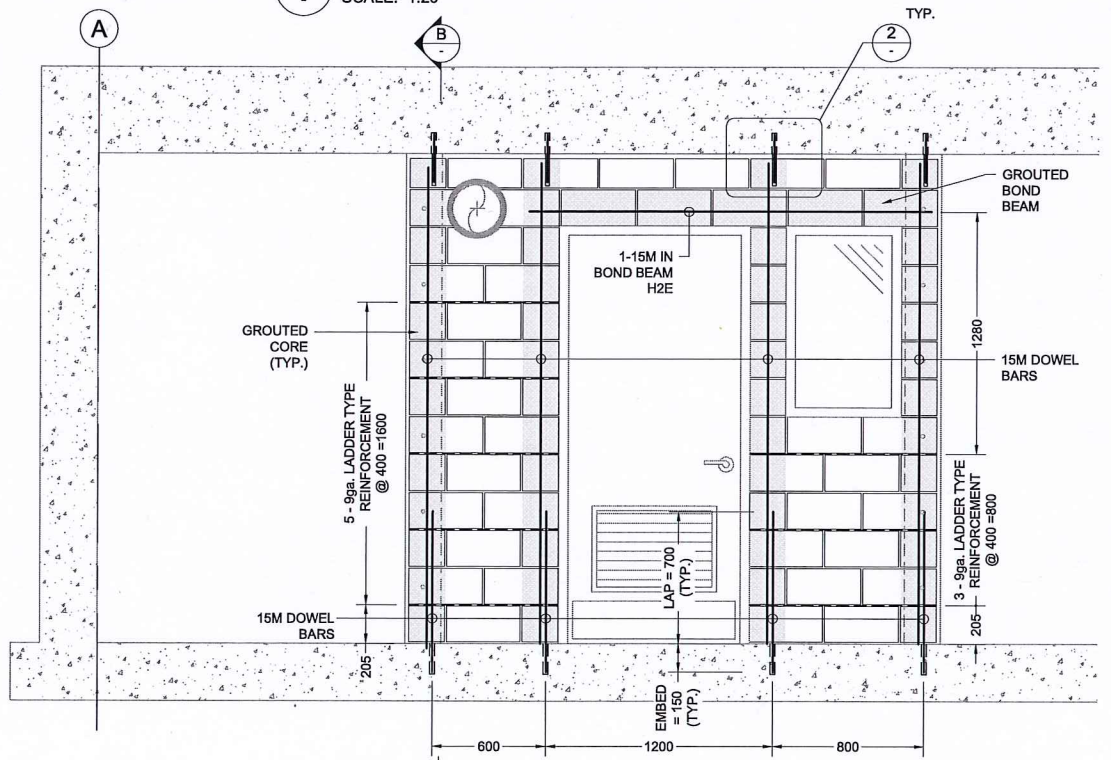




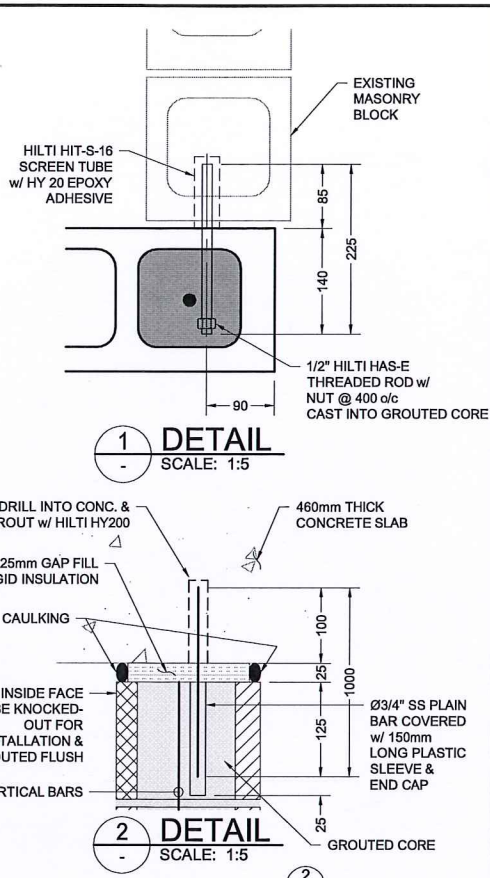
**PLAN - MASONRY PARTITION WALL**  
SCALE: 1:20



**ELEVATION - STRUCTURE OUTLINE**  
SCALE: 1:20

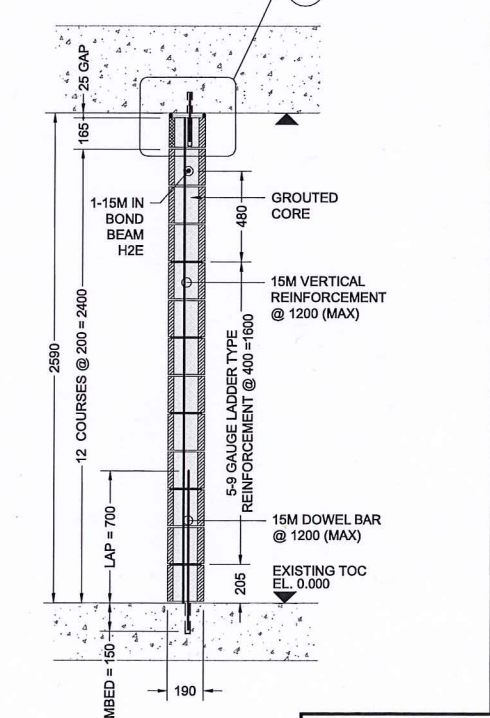


**ELEVATION - REINFORCEMENT**  
SCALE: 1:20



**DETAIL 1**  
SCALE: 1:5

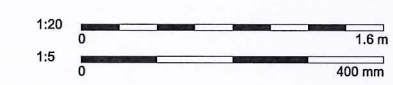
**DETAIL 2**  
SCALE: 1:5



**SECTION B**  
SCALE: 1:20

**NOTES:**

- GENERAL**
  - FOR RECORD DRAWINGS REFER TO DFO DRAWING #31-6-204 TO 31-6-299.
  - LOCAL REFERENCE ELEVATIONS RELATIVE TO TOP OF CONCRETE FLOOR. (TOC FLOOR EL. 0.000m = EL. 22.555m UTM)
  - DESIGN CRITERIA**
    - CODES AND STANDARDS**
      - BRITISH COLUMBIA BUILDING CODE OF CANADA, 2012
      - CAN/CSA S304-14 DESIGN OF MASONRY STRUCTURES
    - PERMISSIBLE DESIGN LOADS**
      - USAGE LOAD (GREATER OF): 0.5 kPa OR 1.0 kN
      - SEISMIC LOAD: PGA = 0.30, Sa(0.2) = 0.65, Ia = 1.0
- MATERIALS**
  - UNIT MASONRY:**
    - TYPE H/7.5/A/M (COMPRESSIVE STRENGTH ON NET AREA) f<sub>m</sub> = 15MPa
  - MORTAR:**
    - TO CSA A179, TYPE S f<sub>m</sub> = 7.5MPa
  - STAINLESS STEEL ROUND BAR:**
    - TO ASTM A276, TYPE 304 F<sub>y</sub> = 205 MPa
  - REINFORCEMENT:**
    - DEFORMED BARS TO CSA G30.18, GRADE 400W F<sub>y</sub> = 400 MPa
    - LADDER TYPE TO CSA A371 & CSA G30.3 F<sub>y</sub> = 400 MPa
- EXECUTION**
  - REFER TO FIGURE 5 FOR LIMITS OF DEMOLITION OF EXISTING MASONRY PARTITION WALL.



**DOOR SCHEDULE:**

DOOR NO.	LOCATION	ROUGH OPENINGS WIDTH (mm)	ROUGH OPENINGS HEIGHT (mm)	THICKNESS (mm)	DOOR TYPE
1	CONTROL ROOM	1010	2210	48	LH

**DOOR TYPES:**

# INDICATES DOOR NUMBERS WHICH APPLY TO EACH FRAME

DOOR	FRAME
1	FROM 14ga. SHEET STEEL - FULL MORTISE, 4 1/2 x 4 NRP
	FLUSH FACED - WRAP TYPE JAMB
	PAINT FINISH
	610mm(W) x 405mm(H) LOUVER

**HARDWARE (SATIN STAINLESS STEEL FINISH)**

- 3 BUTT HINGE (STANLEY - FULL MORTISE, 4 1/2 x 4 NRP)
- 1 LATCH SET (BEST UNIVERSAL - 5K SERIES COMMERCIAL LOCK)
- 1 FLOOR OR WALL STOP
- 2 SS KICK PLATES
- 1 CLOSER (STANLEY - D3550 COMMERCIAL DOOR CLOSER)
- 1 THRESHOLD (PEMCO - 172 SERIES)

**WINDOW SCHEDULE:**

WINDOW NO.	LOCATION	ROUGH OPENINGS WIDTH (mm)	ROUGH OPENINGS HEIGHT (mm)
1	CONTROL ROOM	610	1010

**WINDOW TYPES:**

# INDICATES WINDOW NUMBERS WHICH APPLY TO EACH TYPE

1

WHITESIDE ENGINEERING LTD.  
WATER UTILITY CONSULTING  
Phone: 604-738-8876 www.whiteside.co

**GEA** Gygax Engineering Associates Ltd.  
105-1118 Commercial Drive  
Vancouver, B.C., Canada V6C 4A3  
Tel: (604) 254-3914 Fax: (604) 254-3939  
e-mail: mail@gea.ca

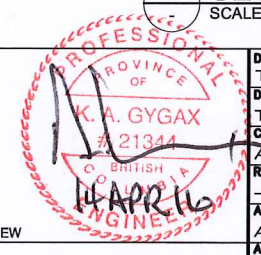
**FISHERIES AND OCEANS CANADA**  
REAL PROPERTY AND TECHNICAL SUPPORT

**PUNTLEDGE RIVER HATCHERY**  
**WATER SUPPLY ENERGY RECOVERY**  
**STRUCTURAL**  
**AERATION BUILDING**  
**CONTROL ROOM PARTITION WALL**

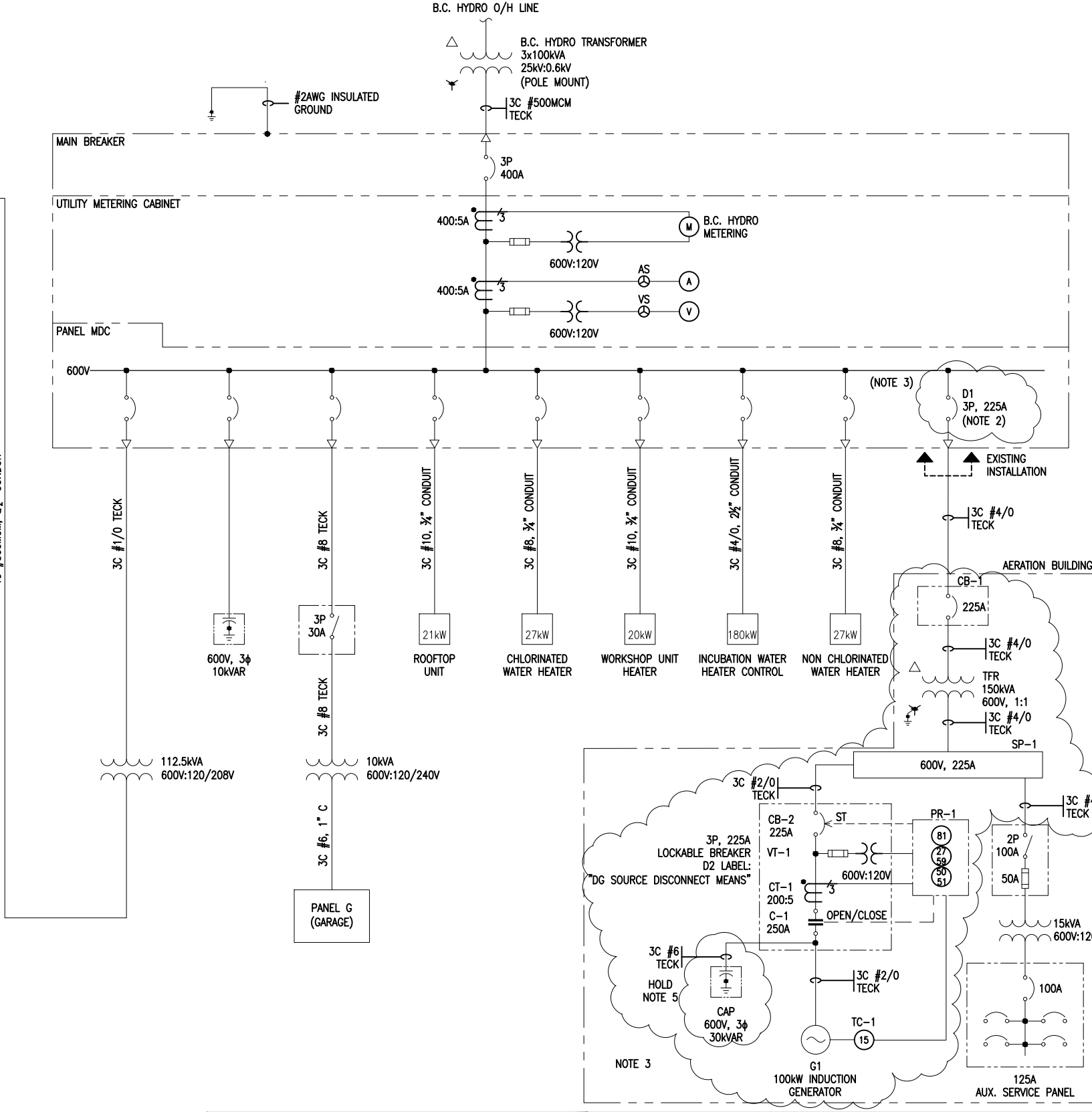
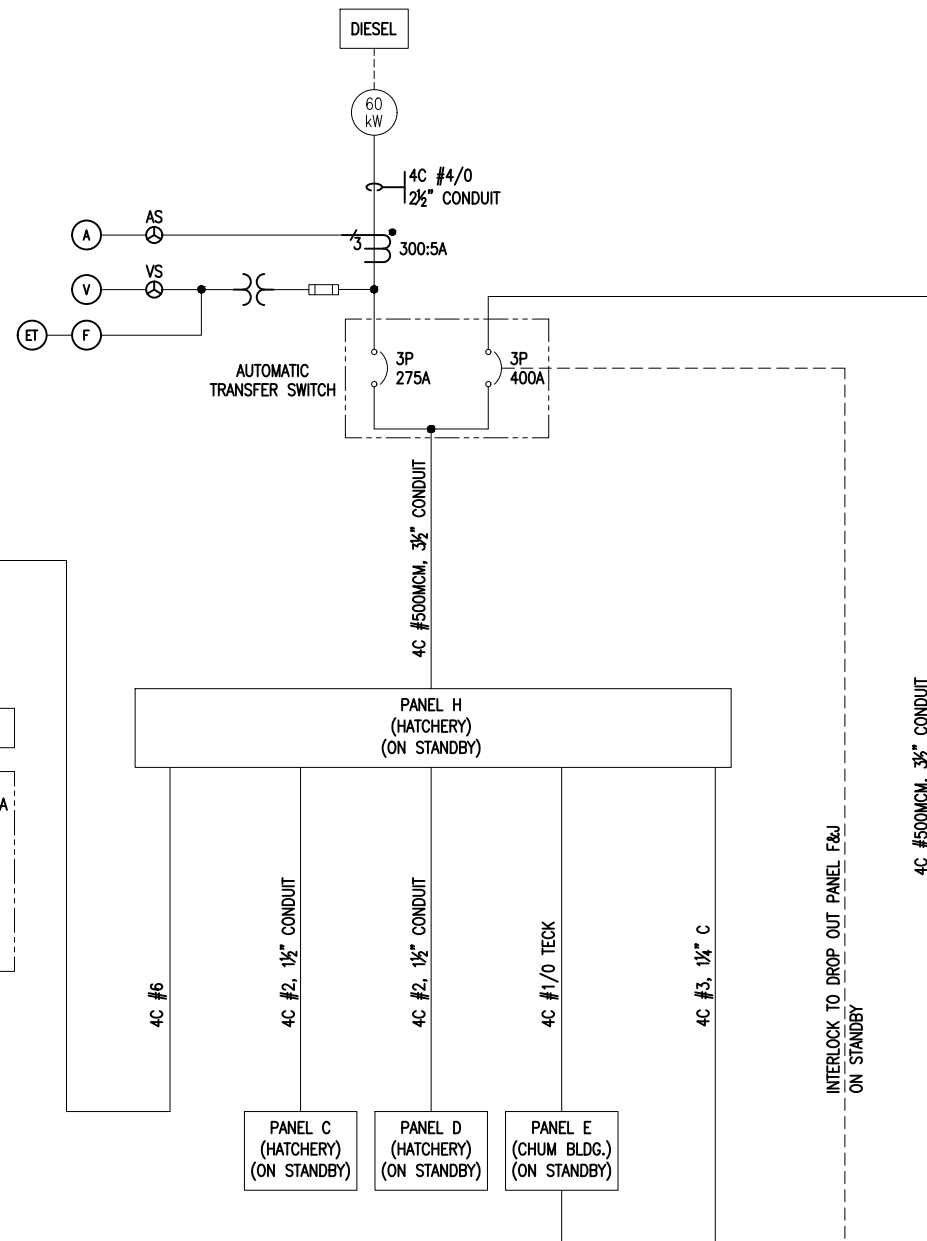
SCALE AS SHOWN  
DATE 09MAR2016  
DRAWING NUMBER **S-002**  
REVISION **0**

Project: Puntledge River Hatchery Water Supply Energy Recovery Structural Aeration Building Control Room Partition Wall  
 Drawing No. S-002  
 Date: 09MAR2016  
 Designer: T. Lovric  
 Drafter: T. Lovric  
 Checker: A. Gygax  
 Recommended: A. Gygax  
 Approved: A. Gygax

NO.	DATE	REVISIONS
0	15APR2016	ISSUED FOR TENDER
B	23MAR2016	ISSUED FOR REVIEW
A	09MAR2016	ISSUED FOR INTERNAL REVIEW



**PRELIMINARY**  
NOT FOR CONSTRUCTION



**BILL OF MATERIAL (NOTE 4)**

ITEM	DESCRIPTION	PART NUMBER (OR APPROVED EQUAL)
PR-1	SCHWEITZER SEL-710 PROTECTION RELAY	071001A1B1B71850200
CAP	600 V, 3P, 30KVAR CAPACITOR C/W NEMA 1 ENCLOSURE	ABB C605G30
CB-1	225 A CIRCUIT BREAKER C/W ENCLOSURE	SIEMENS FD63B225, RITTAL WM201608NC SIEMENS CRHOFVD
CB-2	ENCLOSURE (CSA CERTIFICATION REQUIRED)	RITTAL WALL-MOUNT, NEMA 1
C-1	225 A LOCKABLE BREAKER C/W SHUNT TRIP	SIEMENS FD63B225, SIEMENS CRHOFVD
CT-1	200 HP CONTACTOR, NEMA SIZE 5	SIEMENS 40LP32AF
VT-1	200:5A CURRENT XFMRS, 600:120V INSTRUMENT XFMRS	GE 180SHT-201, HPS SP100ACP
SP-1	36" SPLITTER; 600 V, 225 A	
TFR	150 kVA 600:600V (1:1) DRY TYPE TRANSFORMER; DELTA-WYE SOLIDLY GROUNDED, NEMA 2	HAMMOND, DELTA, EATON
UPS	3000 VA UPS, 120/240V INPUT/OUTPUT	ALPHA TECHNOLOGIES CFR3000

- THE INFORMATION CONTAINED IN THESE DRAWINGS FOR THE EXISTING INSTALLATION IS BASED ON THE ORIGINAL PROJECT DRAWINGS (DWG 31-6-289). DESIGN AND CALCULATION ARE BY OTHERS.
- NEW 3P, 225A LOCKABLE CIRCUIT BREAKER D1 LABEL "DG SYSTEM DISCONNECT MEANS".
- NEW EQUIPMENT REQUIRED FOR NET METERING GENERATION PROJECT SHOWN INSIDE REVISION CLOUD.
- BILL OF MATERIALS ITEMS MAY BE SUBSTITUTED WITH EQUIVALENT PRODUCTS WITH APPROVAL FROM OWNER OR ENGINEER.
- POWER FACTOR CORRECTION CAPACITOR TO BE FINALIZED AFTER PUMP (PAT) MODEL HAS BEEN DETERMINED.
- INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC-22.1-15
- ALL CONDUCTORS ARE SIZED BASED ON 90°C AMPACITY. IF EQUIPMENT IS MARKED WITH A LOWER "MAXIMUM CONDUCTOR TERMINATION TEMPERATURE", THEN THE CABLE MUST BE SIZED IN ACCORDANCE WITH C22.1 FOR THAT TEMPERATURE

NO.	DATE	REVISIONS
F	15-NOV-2016	ADDED UPS TO BOM
E	09-NOV-2016	REVISED TO 100KW FOR TENDER
D	05-MAY-2016	REVISED FOR TENDER
C	31-MAR-2016	ISSUED FOR TENDER
B	17-MAR-2016	UPDATED EQUIPMENT DETAILS
A	25-MAR-2016	ISSUED FOR REVIEW



**PUNTLEDGE RIVER HATCHERY**  
**WATER SUPPLY ENERGY RECOVERY**  
**HATCHERY AND AERATION BUILDINGS**  
**SINGLE LINE DIAGRAM**

DWG. NO. DRAWING REFERENCES

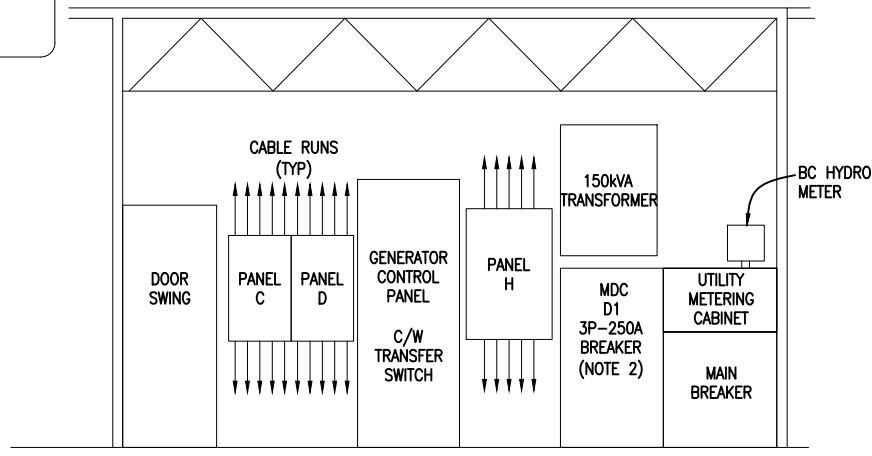
NOTES

NO. DATE REVISIONS

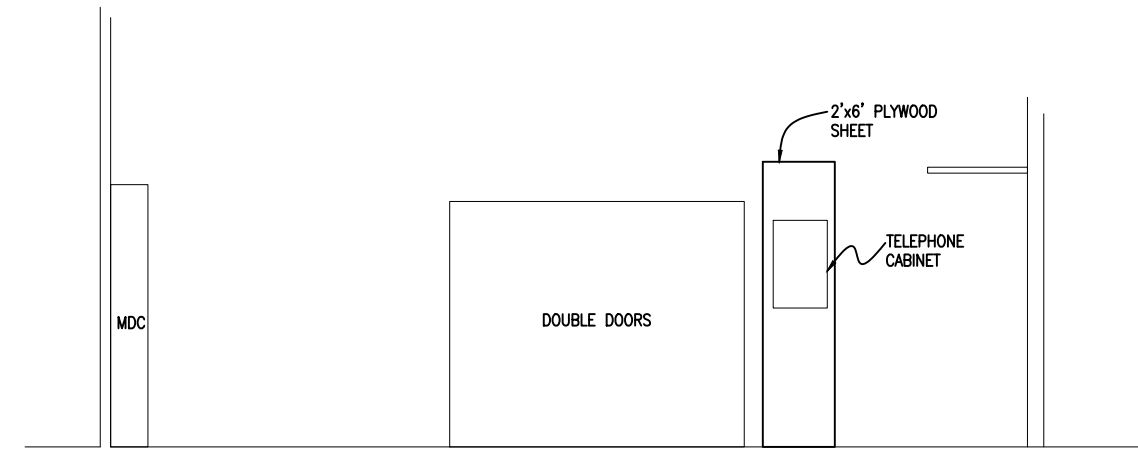
SCALE N.T.S.  
DATE 31-MAR-2016  
DRAWING NUMBER E-001  
REVISION F

Plotted by: Billy Daulton, Plot date: 16-Nov-16 Path: \\nas001\c\Users\B.Daulton\Documents\Projects\2016\2016\_Puntledge\_River\_Hatchery\_Energy\_Recovery\_Facility\08\_Drawing\STS\_Drawing\11116\_E001 - E001\_Puntledge\_River\_Hatchery.dwg  
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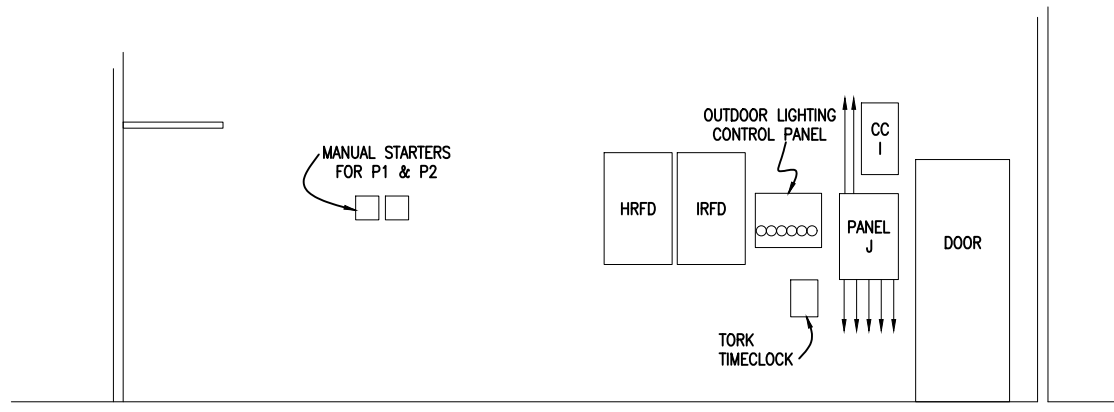
**PRELIMINARY**  
NOT FOR CONSTRUCTION



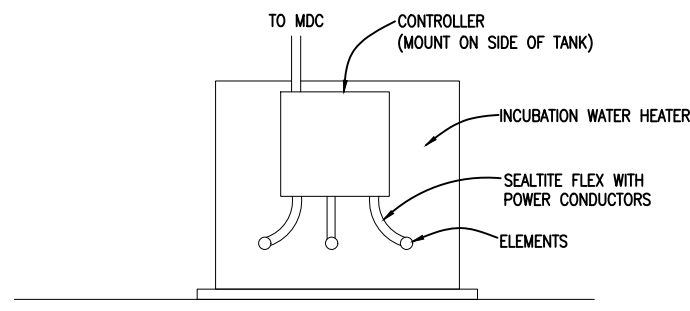
ELEVATION-MECHANICAL ROOM - WEST WALL  
SCALE: N.T.S



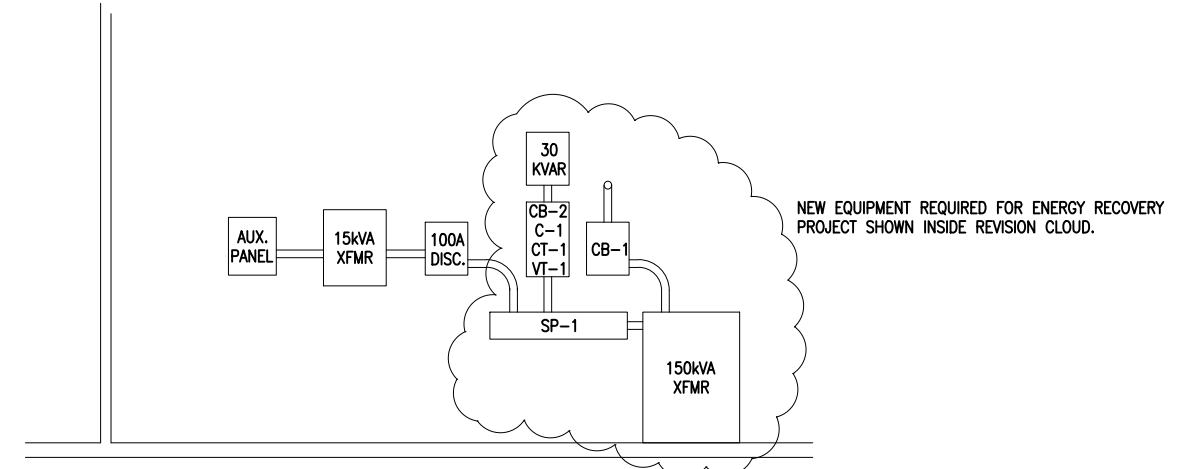
ELEVATION-MECHANICAL ROOM - NORTH WALL  
SCALE: N.T.S



ELEVATION-MECHANICAL ROOM - SOUTH WALL  
SCALE: N.T.S



ELEVATION-INCUBATION WATER HEATER  
SCALE: N.T.S



E ELEVATION-AERATION ELECTRICAL (STORAGE ROOM)  
E-011 SCALE: N.T.S



**FISHERIES AND OCEANS CANADA**  
REAL PROPERTY AND TECHNICAL SUPPORT

- THE INFORMATION CONTAINED IN THESE DRAWINGS FOR THE EXISTING INSTALLATION IS BASED ON THE ORIGINAL PROJECT DRAWINGS (DWG 31-6-289). DESIGN AND CALCULATION ARE BY OTHERS.
- NEW 3P, 250A, LOCKABLE CIRCUIT BREAKER INSTALLED IN EXISTING 'MDC' FEEDER PANEL LABELLED AS 'DG SYSTEM DISCONNECT MEANS'

D	09-NOV-2016	REVISED FOR TENDER
C	05-MAY-2016	REVISED FOR TENDER
B	31-MAR-2016	ISSUED FOR TENDER
A	11-FEB-2016	ISSUED FOR REVIEW

DESIGNED	RD
DRAWN	RB
CHECKED	RD
RECOMMENDED	
APPROVED	
APPROVED	

**PUNTLEDGE RIVER HATCHERY**  
WATER SUPPLY ENERGY RECOVERY  
ELECTRICAL  
HATCHERY AND AERATION BUILDINGS  
WALL ELEVATIONS

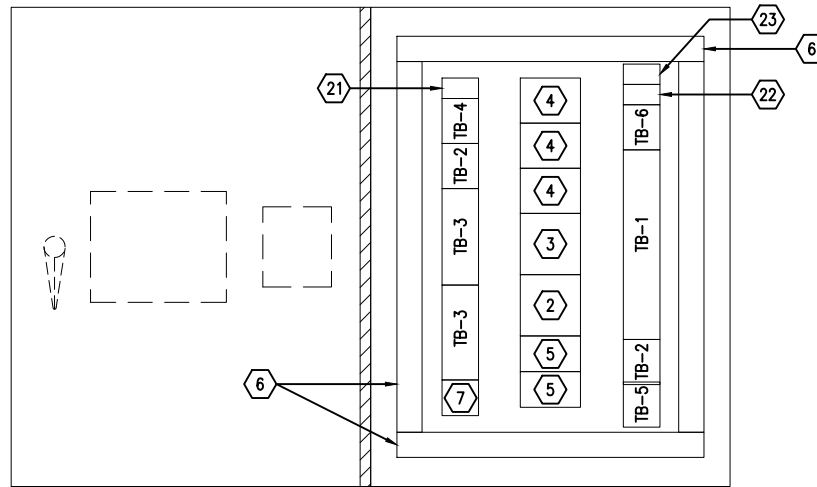
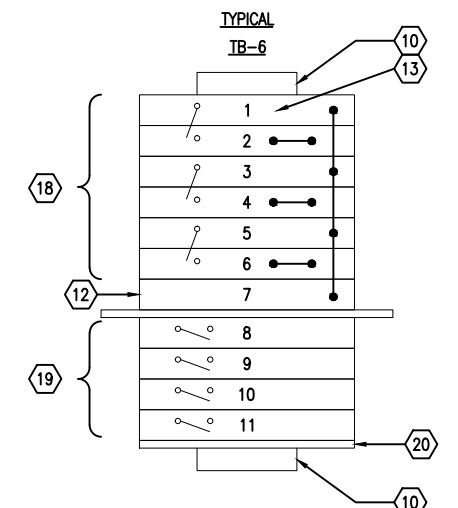
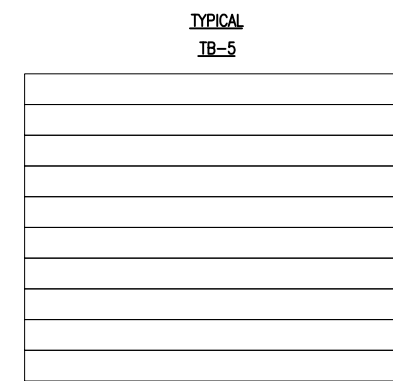
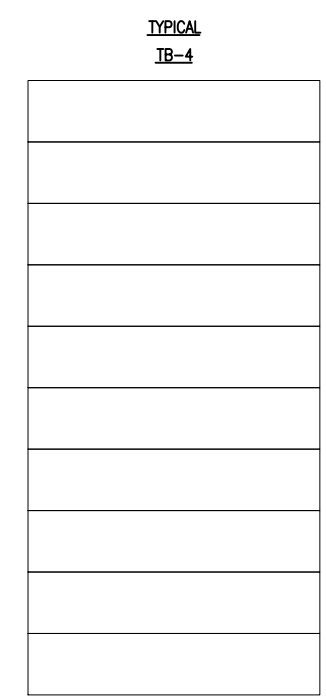
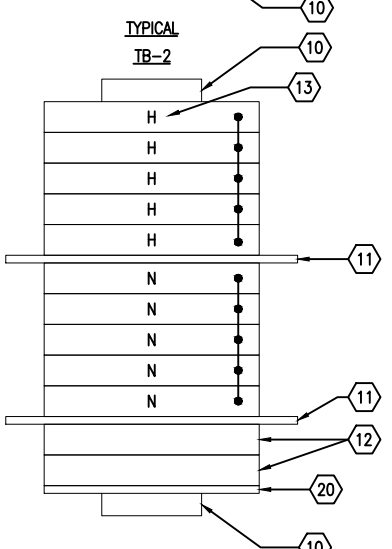
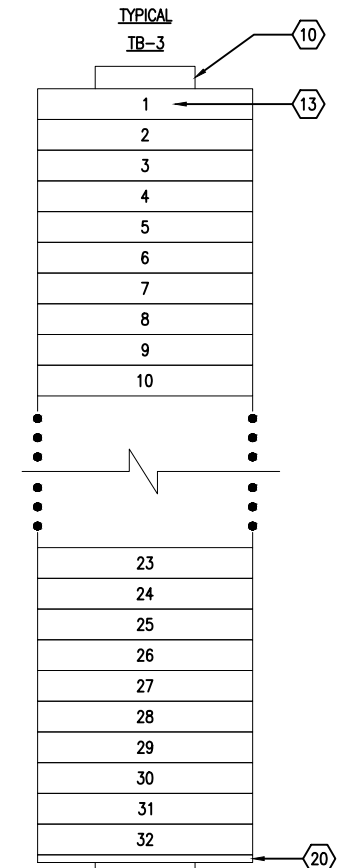
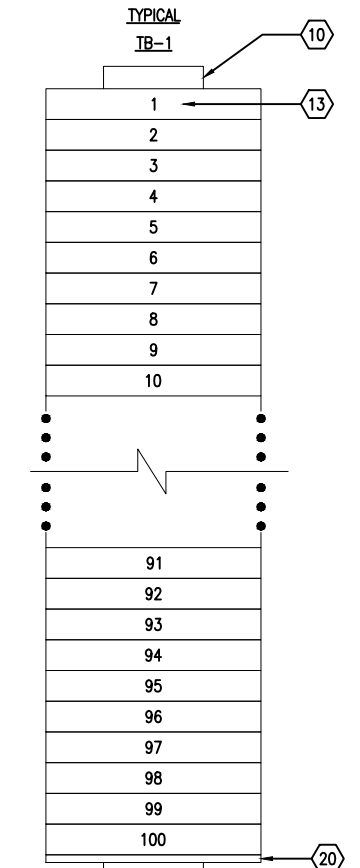
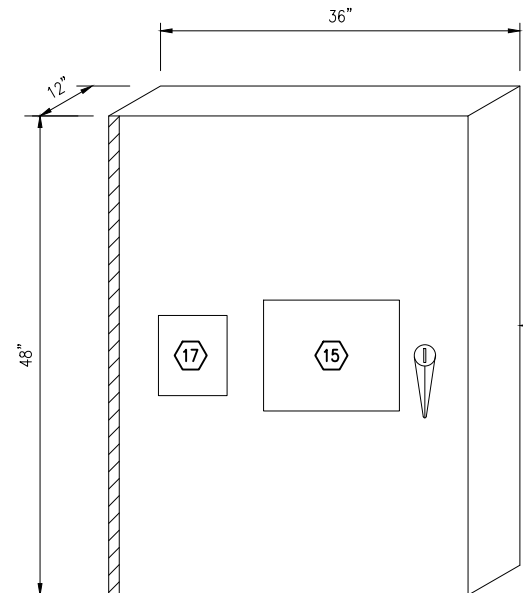
SCALE	N.T.S
DATE	31-MAR-16
DRAWING NUMBER	E-002
REVISION	D

DWG. NO. DRAWING REFERENCES

NOTES

NO. DATE REVISIONS

**PRELIMINARY**  
NOT FOR CONSTRUCTION



BILL OF MATERIAL		
ITEM	DESCRIPTION	PART NUMBER
1	WALL MOUNT HOFFMAN NEMA 12 ENCLOSURE	A48H36DLP3PT
2	SCHNEIDER SCADAPACK3Q	PBUP4B-102-01-1-1
3	SCHNEIDER DIGITAL I/O EXPANSION	MODULE 5402
4	SCHNEIDER DIFFERENTIAL ANALOG INPUTS	MODULE 5502
5	30W POWER SUPPLY 24VDC	QUINT-PS/3AC/24VDC/40
6	3x4 PANDUIT	F3X4LG6
7	DUPLX RECEPTACLE 125VAC, 20A	HBL420HR
8	PHOENIX CONTACT FEED-THROUGH TERMINAL BLOCK (SPRING CAGE CONNECTION) AND FUSED TERMINAL BLOCKS	3031212, 3036369
9	PHOENIX CONTACT DISCONNECT TERMINAL BLOCK	3035140
10	PHOENIX CONTACT END CLAMP	1201675
11	PHOENIX CONTACT SEPARATE PLATE	0701105
12	PHOENIX CONTACT GROUND TERMINAL BLOCK	3212202
13	PHOENIX CONTACT TERMINAL BLOCK LABLES	0805807
14	FERRAZ SHAWMUT FUSE HOLDER 1 POLE	USCC11
15	15" PANELMOUNT PC C/W TOUCHSCREEN	ADVANTECH PPC-3150
16	PHOENIX CONTACT INTERPOSING RELAY 24 VDC	2900320
17	SEL-710 PROTECTION RELAY	071001A1B1B71850200
18	PHOENIX CONTACT SHORTING TEST DISCONNECT TERMINAL BLOCK	3212300
19	PHOENIX CONTACT ISOLATING TEST DISCONNECT TERMINAL BLOCK	3046456
20	PHOENIX CONTACT END COVER	3047141
21	MOORE INDUSTRIES SST ISOLATOR SPLITTER	SST / 4-20MA / 4-20MA / 12-42DC / -2HART [DIN]
22	TACHOMETER	Ai-Tek INSTRUMENTS TACHPAK30 T77530
23	VOLTAGE MONITOR	TIMEMARK 16-1-H-S

1. ALL BILL OF MATERIALS ITEMS MAY BE REPLACED WITH AN EQUIVALENT ITEM EXCEPT ITEMS 2, 3, 4, & 21. (SCADAPACK 32, ITS EXPANSION MODULES, & ANALOG SPLITTERS) WITH APPROVAL FROM OWNER OR ENGINEER.

C	15-NOV-2016	REVISED BOM FOR TENDER
B	31-MAR-2016	ISSUED FOR TENDER
A	08-MAR-2016	ISSUED FOR REVIEW



**FISHERIES AND OCEANS CANADA**  
REAL PROPERTY AND TECHNICAL SUPPORT

**PUNTLEDGE RIVER HATCHERY**  
**WATER SUPPLY ENERGY RECOVERY**  
**ELECTRICAL**  
**AERATION BUILDING**  
**CONTROL CABINET LAYOUT**

SCALE	N.T.S.
DATE	31-MAR-16
DRAWING NUMBER	E-003
REVISION	C

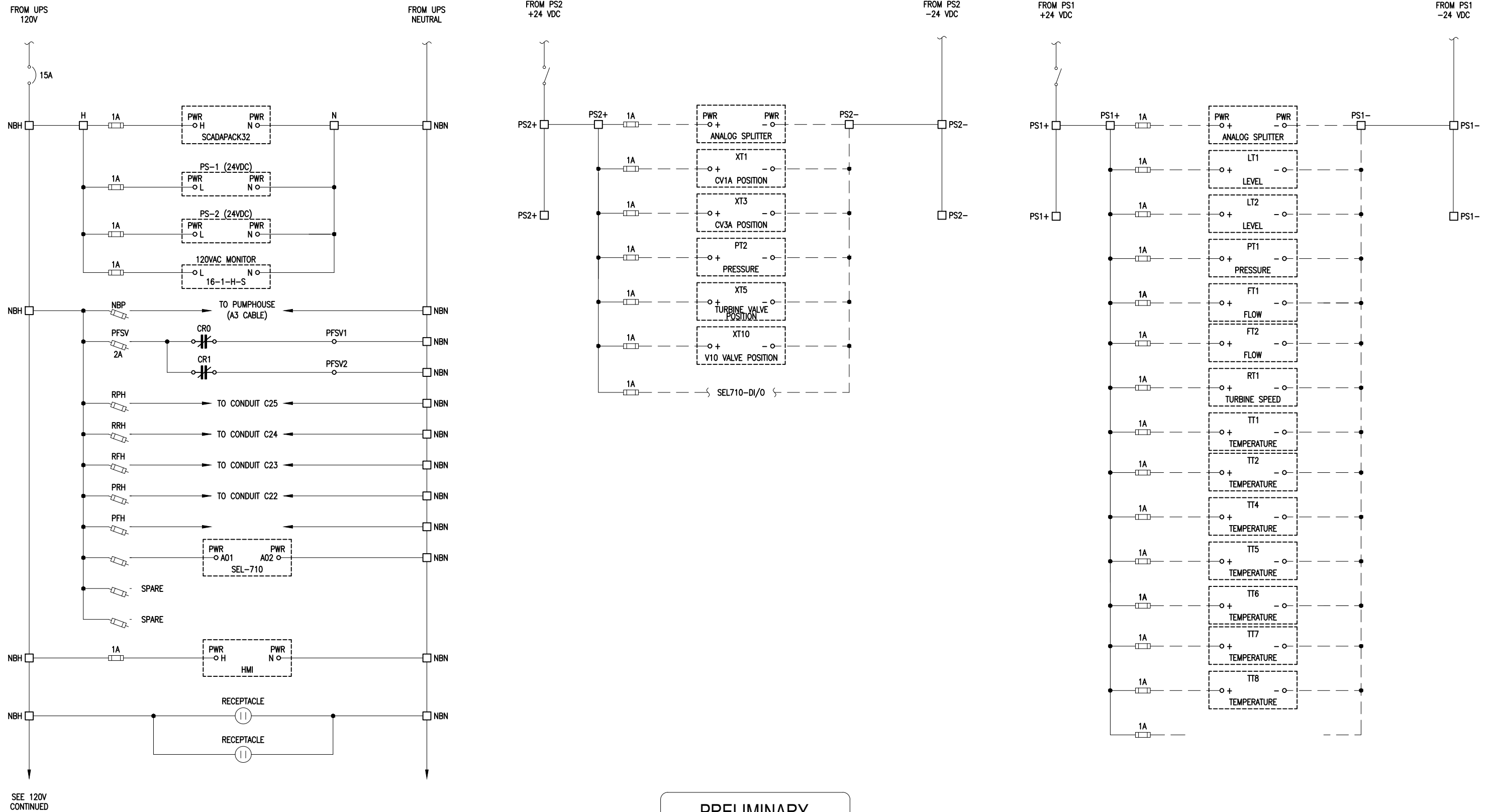
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DWG. NO. DRAWING REFERENCES

NOTES

NO. DATE REVISIONS

DESIGNED  
JRB  
DRAWN  
SK  
CHECKED  
JRB  
RECOMMENDED  
APPROVED  
APPROVED



**PRELIMINARY**  
NOT FOR CONSTRUCTION



**FISHERIES AND OCEANS CANADA**  
REAL PROPERTY AND TECHNICAL SUPPORT

**PUNTLEDGE RIVER HATCHERY  
WATER SUPPLY ENERGY RECOVERY  
ELECTRICAL  
AERATION BUILDING  
CONTROL CABINET-POWER**

SCALE	N.T.S.
DATE	31-MAR-16
DRAWING NUMBER	<b>E-004</b>
REVISION	E

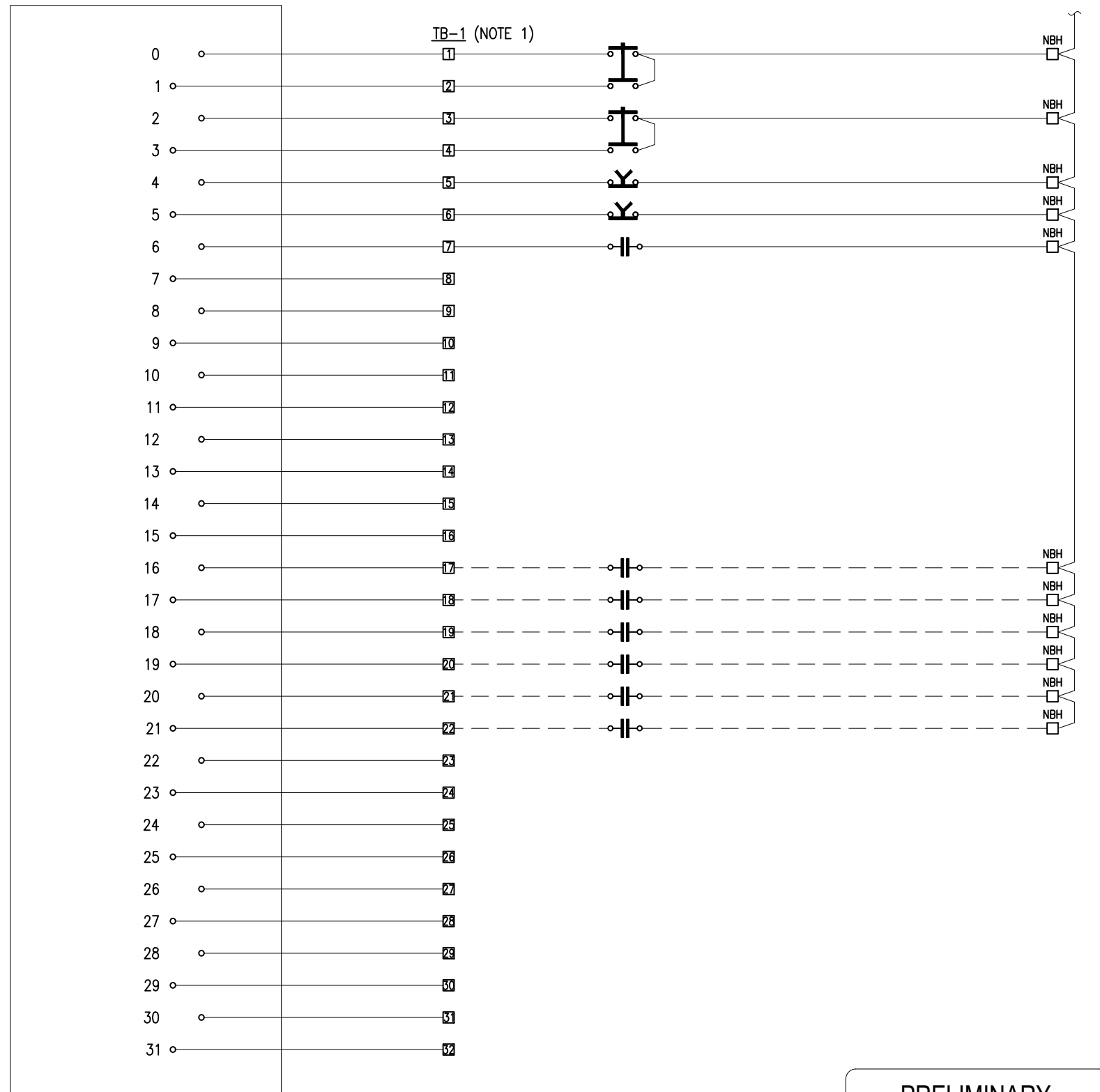
NO.	DATE	REVISIONS
E	16-NOV-2016	ADDED UPS
D	09-NOV-2016	REVISED FOR TENDER
C	05-MAY-2016	ADDED TACHOMETER
B	31-MAR-2016	ISSUED FOR TENDER
A	08-MAR-2016	ISSUED FOR REVIEW

DESIGNED	JRB
DRAWN	RB
CHECKED	JRB
RECOMMENDED	
APPROVED	
APPROVED	

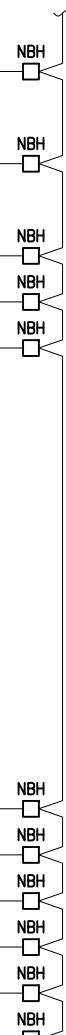
DWG. NO.	DRAWING REFERENCES	NOTES

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DIGITAL INPUTS



FROM UPS  
120V



LEGEND:  
□ - TERMINAL BLOCK

- CV3A - 8" VALVE AUTO MODE
- CV3A - 8" VALVE MANUAL MODE
- CV1A - 12" VALVE AUTO MODE
- CV1A - 12" VALVE MANUAL MODE
- SELECT POSITION FOR V10 OPEN/CLOSE
- LEAD VALVE SELECTOR - CV1A (10") OR CV3A (12")
- SEL-710 'ALARM'
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- V10 - VALVE OPEN POSITION
- V10 - VALVE CLOSED POSITION
- TURBINE CONTROL VALVE - OPEN POSITION
- TURBINE CONTROL VALVE - CLOSED POSITION
- V8 - VALVE OPEN POSITION
- V8 - VALVE CLOSED POSITION
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE

SCADARACK\_32  
PBUP4B-102-01-1-1

PRELIMINARY  
NOT FOR CONSTRUCTION

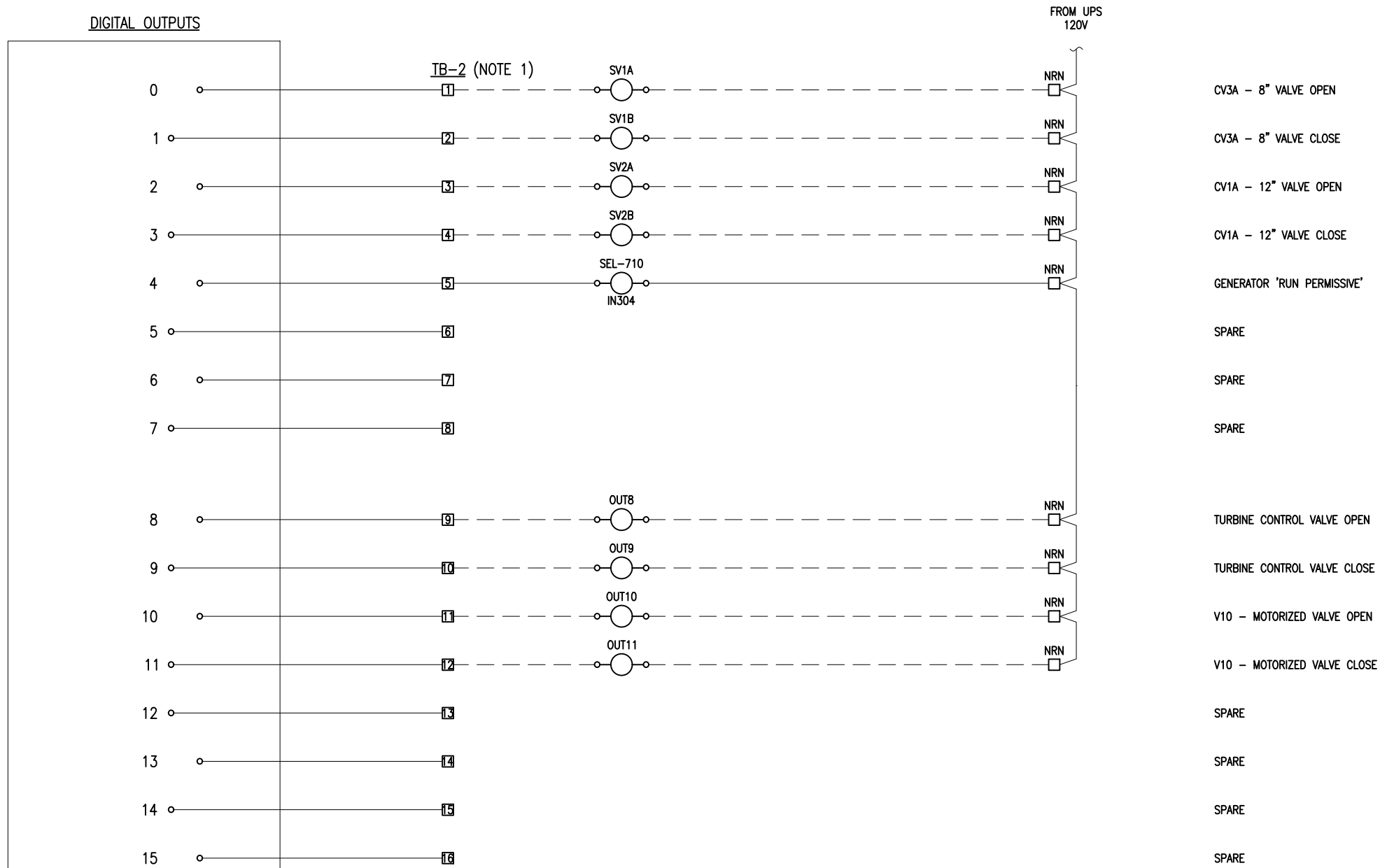


FISHERIES AND OCEANS CANADA  
REAL PROPERTY AND TECHNICAL SUPPORT

DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS	DESIGNED JRB	SCALE N.T.S.
						DRAWN RB	
		1. SEE DWG E-003 TYPICAL TB-3 FOR LAYOUT IN PANEL	E	16-NOV-16	ADDED UPS	CHECKED JRB	DRAWING NUMBER E-005
			D	09-NOV-2016	REVISED FOR TENDER	RECOMMENDED	REVISION
			C	05-MAY-2016	REVISED FOR TENDER	APPROVED	E
			B	31-MAR-2016	ISSUED FOR TENDER	APPROVED	
			A	08-MAR-2016	ISSUED FOR REVIEW	APPROVED	

PUNTLEDGE RIVER HATCHERY  
WATER SUPPLY ENERGY RECOVERY  
ELECTRICAL  
AERATION BUILDING  
CONTROL CABINET I/O-1

DIGITAL OUTPUTS



LEGEND:  
 □ - TERMINAL BLOCK

SCADARACK\_32  
 PBUP4B-102-01-1-1

PRELIMINARY  
 NOT FOR CONSTRUCTION



FISHERIES AND OCEANS CANADA  
 REAL PROPERTY AND TECHNICAL SUPPORT

PUNTLEDGE RIVER HATCHERY  
 WATER SUPPLY ENERGY RECOVERY  
 ELECTRICAL  
 AERATION BUILDING  
 CONTROL CABINET I/O-2

SCALE	N.T.S.
DATE	31-MAR-16
DRAWING NUMBER	E-006
REVISION	E

1. SEE DWG E-003 TYPICAL TB-3 FOR LAYOUT IN PANEL		
NO.	DATE	REVISIONS

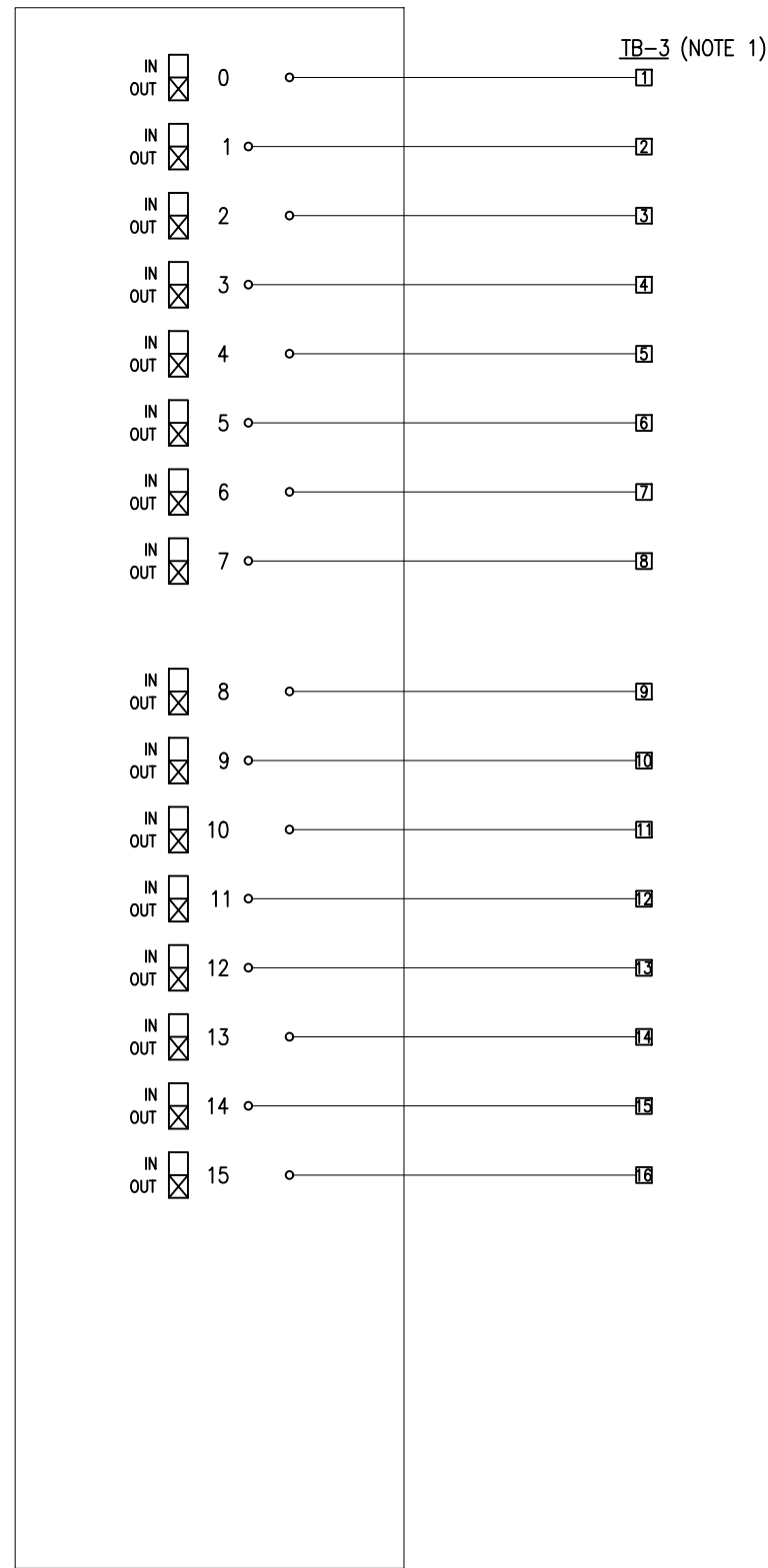
E	16-NOV-2016	ADDED UPS
D	09-NOV-2016	REVISED FOR TENDER
C	05-MAY-2016	REVISED FOR TENDER
B	31-MAR-2016	ISSUED FOR TENDER
A	08-MAR-2016	ISSUED FOR REVIEW

DESIGNED	JRB
DRAWN	RB
CHECKED	JRB
RECOMMENDED	JRB
APPROVED	
APPROVED	

Plotted by: Billy Daulton, Plot date: 16-Nov-16 Path: \\msname01\c\clients\pfo\1608 Puntledge Energy Recovery Facility\08 Drawings\STS Drawings\161116 E001 - E006 Puntledge.dwg Size: 44444

DWG. NO.	DRAWING REFERENCES
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CONFIGURABLE  
DIGITAL INPUTS/OUTPUTS





MODULE 5402

LEGEND:  
□ - TERMINAL BLOCK

SPARE  
SPARE  
SPARE  
SPARE  
SPARE  
SPARE  
SPARE  
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PRELIMINARY  
NOT FOR CONSTRUCTION

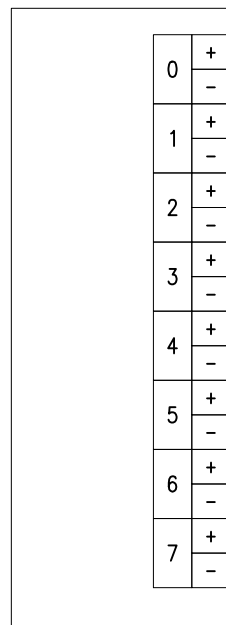
Plotted by: Billy Daulton, Plot date: 16-Mar-16 Path: \\msname01\c\Users\B\Documents\Projects\1608 Puntledge Energy Recovery Facility\08 Drawings\STS Drawings\161116 E-001 - E-008 Puntledge.dwg Size: 44444

DWG. NO.		DRAWING REFERENCES		NOTES		NO.		DATE		REVISIONS				 <b>FISHERIES AND OCEANS CANADA</b> REAL PROPERTY AND TECHNICAL SUPPORT		DESIGNED JRB DRAWN SK CHECKED JRB RECOMMENDED APPROVED APPROVED		SCALE N.T.S. DATE 31-MAR-16 DRAWING NUMBER E-007 REVISION B	
				1. SEE DWG E-003 TYPICAL TB-3 FOR LAYOUT IN PANEL		B		31-MAR-16		ISSUED FOR TENDER		PUNTLEDGE RIVER HATCHERY WATER SUPPLY ENERGY RECOVERY ELECTRICAL AERATION BUILDING CONTROL CABINET I/O-3							
						A		08-MAR-16		ISSUED FOR REVIEW									



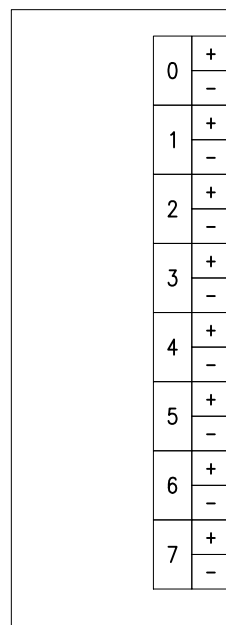
CONTROL PANEL

DIFFERENTIAL ANALOG INPUTS

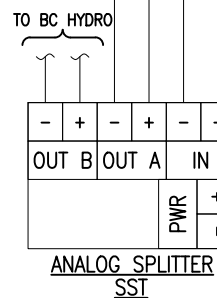
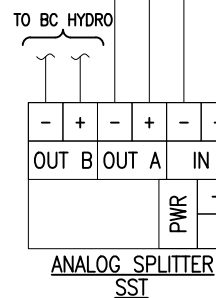


MODULE 5502

DIFFERENTIAL ANALOG INPUTS



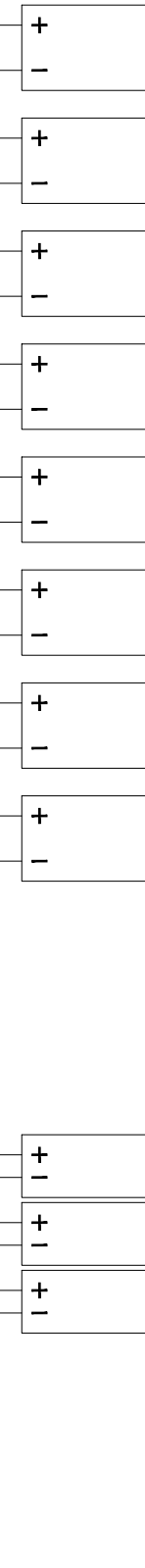
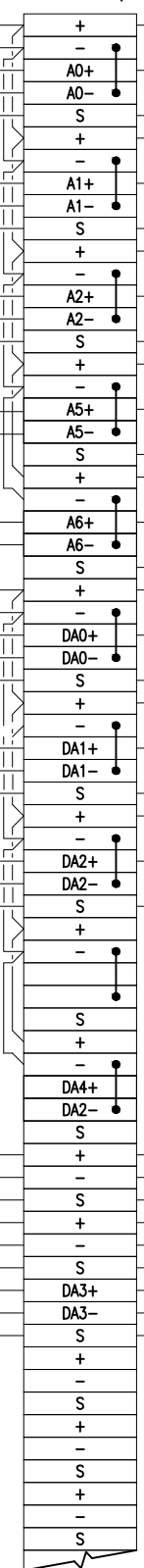
MODULE 5502



PS2 -24VDC +24VDC PS1 -24VDC +24VDC

TB-4 (NOTE 1)

FIELD



- LT1 LEVEL - TANK 1 (MAIN TANK)
- LT2 LEVEL - TANK 2 (INCUBATION TANK)
- PT1 PRESSURE - SUPPLY WATER
- VIBRATION MONITOR No.1
- VIBRATION MONITOR No.2
- XT-03, 8" VALVE (CV3A)
- XT-01, 12" VALVE (CV1A)
- PT-02, HEADER PRESSURE
- SPARE
- SPARE
- FT-2 FLOW - RIVER SUPPLY
- FT-1 FLOW - PENSTOCK SUPPLY
- RT-1 SPEED - TURBINE TACHOMETER
- SPARE
- SPARE
- SPARE

**PRELIMINARY**  
NOT FOR CONSTRUCTION

1. SEE DWG E-003 TYPICAL TB-1 FOR LAYOUT IN PANEL



FISHERIES AND OCEANS CANADA  
REAL PROPERTY AND TECHNICAL SUPPORT

PUNTLEDGE RIVER HATCHERY  
WATER SUPPLY ENERGY RECOVERY  
ELECTRICAL  
AERATION BUILDING  
CONTROL CABINET I/O-4

SCALE	N.T.S.
DATE	31-MAR-16
DRAWING NUMBER	E-008
REVISION	D

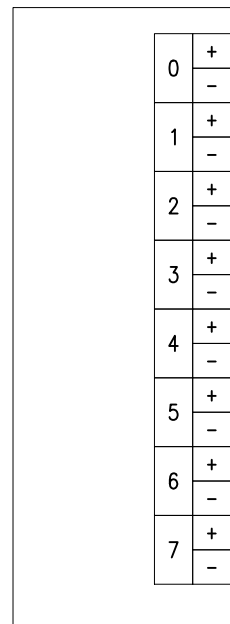
NO.	DATE	REVISIONS	DESIGNED	DRAWN	SK	CHECKED	JRB	RECOMMENDED	APPROVED
D	09-NOV-2016	REVISED FOR TENDER							
C	05-MAY-2016	ADDED VIBRATION MONITORS							
B	31-MAR-2016	ISSUED FOR TENDER							
A	08-MAR-2016	ISSUED FOR REVIEW							

DWG. NO.	DRAWING REFERENCES	NOTES

Plotted by: Billy Daulton, Plot date: 16-Nov-16 Path: \\msname01\Users\B\Documents\Projects\1608\_Puntledge\_Energy\_Recovery\_Facility\08\_Drawing\STS\_Drawing\161116\_E001 - E008\_Puntledge\_Eng\_Sas.dwg

CONTROL PANEL

DIFFERENTIAL  
ANALOG INPUTS

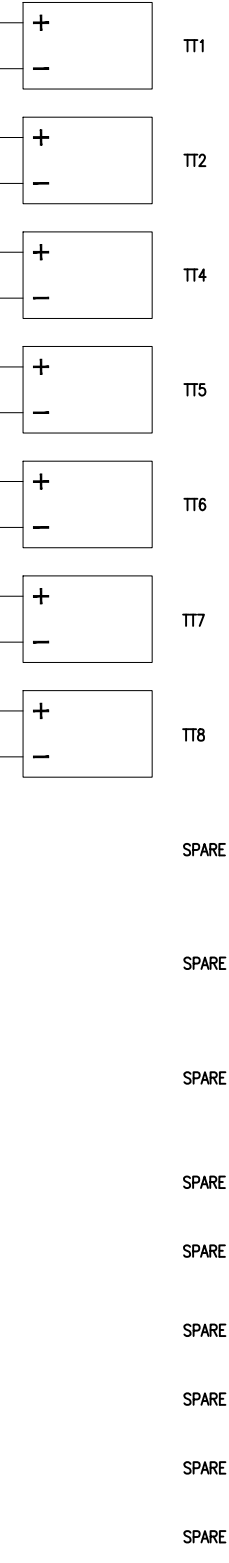
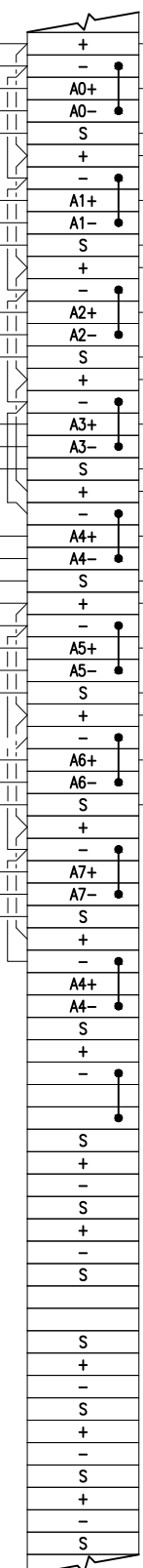


MODULE 5502

PS2 -24VDC +24VDC  
PS1 -24VDC +24VDC

TB-4

FIELD



**PRELIMINARY**  
NOT FOR CONSTRUCTION



**FISHERIES AND OCEANS CANADA**  
REAL PROPERTY AND TECHNICAL SUPPORT

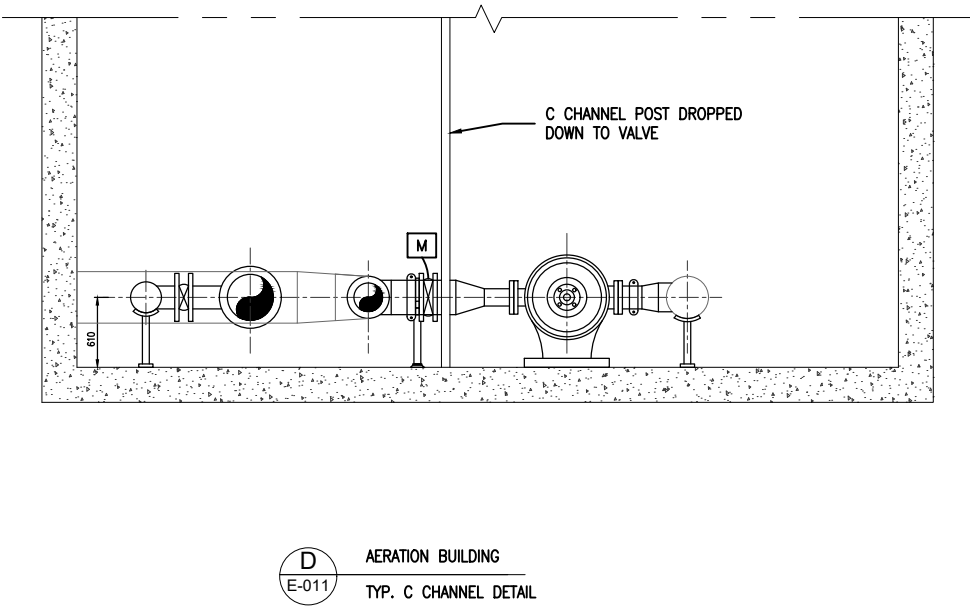
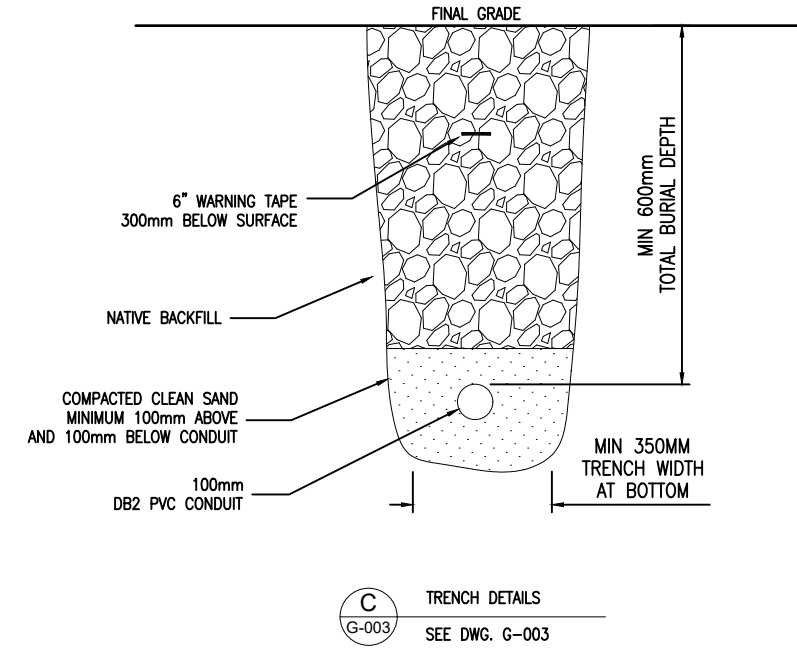
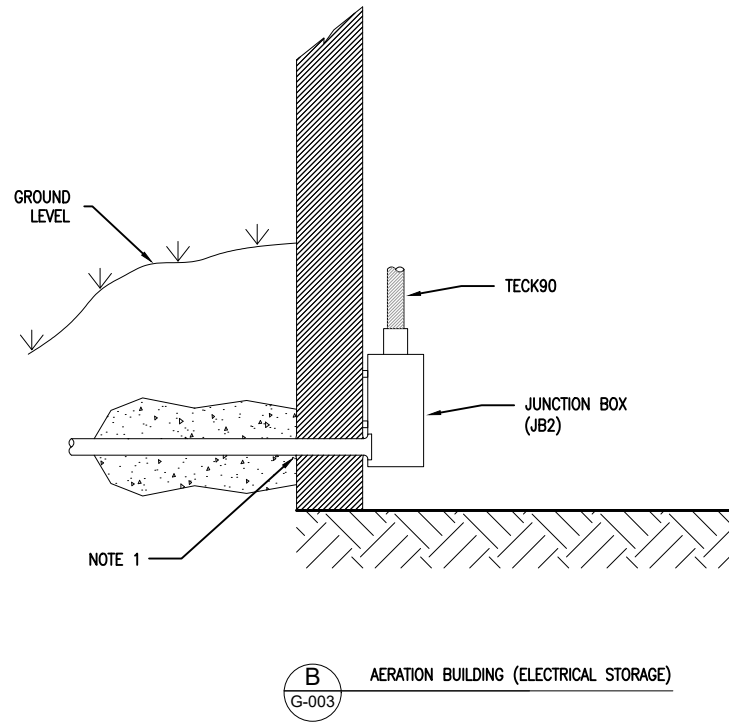
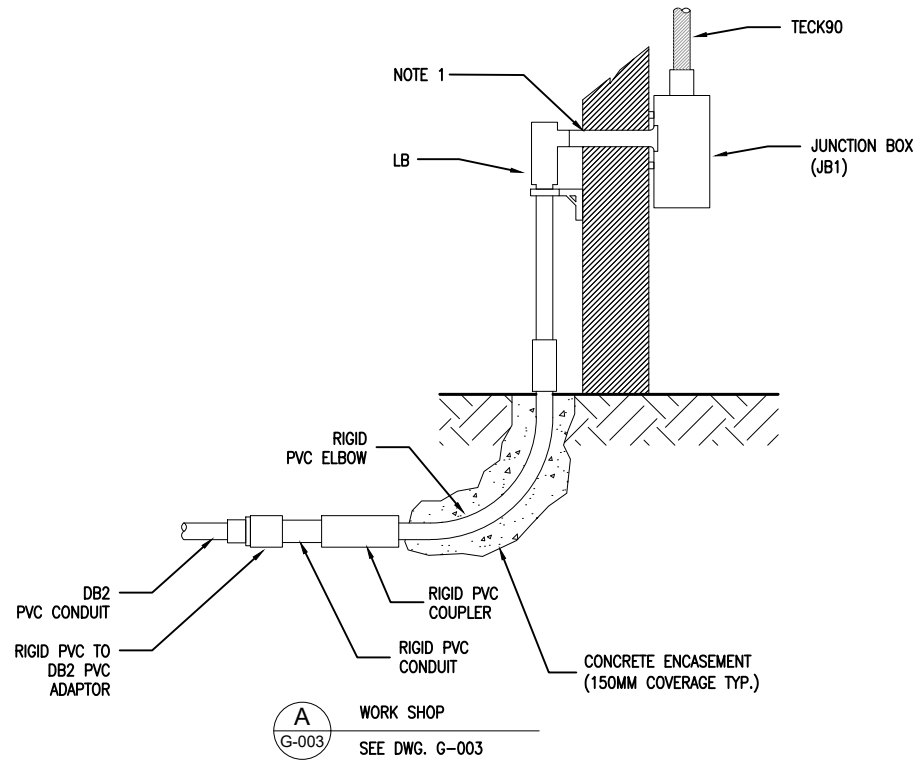
**PUNTLEDGE RIVER HATCHERY**  
**WATER SUPPLY ENERGY RECOVERY**  
**ELECTRICAL**  
**AERATION BUILDING**  
**CONTROL CABINET I/O-5**

SCALE	N.T.S.
DATE	31-MAR-16
DRAWING NUMBER	E-009
REVISION	C

NO.	DATE	REVISIONS	DESIGNED	RD	DRAWN	RB	CHECKED	RD	RECOMMENDED	APPROVED
C	09-NOV-2016	REVISED FOR TENDER								
B	31-MAR-2016	ISSUED FOR TENDER								
A	18-MAR-2016	ISSUED FOR REVIEW								

DWG. NO.	DRAWING REFERENCES	NOTES

Plotted by: Billy Duffin, Plot date: 18-Nov-16 Path: \\msname01\c\Users\B\Documents\Projects\1608 Puntledge Energy Recovery Facility\1608 Puntledge\161116 E001 - E009 Puntledge\161116 E001 - E009 Puntledge.dwg Size: 44444



PRELIMINARY  
NOT FOR CONSTRUCTION

- CONDUIT ENTRANCE THROUGH BUILDING WALL MUST BE SEALED WATER TIGHT
- INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC-22.1-15



FISHERIES AND OCEANS CANADA  
REAL PROPERTY AND TECHNICAL SUPPORT

PUNTLIDGE RIVER HATCHERY  
WATER SUPPLY ENERGY RECOVERY  
ELECTRICAL  
CONDUIT SECTION DETAILS

SCALE	N.T.S.
DATE	31-MAR-16
DRAWING NUMBER	E-010
REVISION	B

DESIGNED	RD
DRAWN	HSG
CHECKED	RD
RECOMMENDED	
APPROVED	
APPROVED	

B	31-MAR-2016	ISSUED FOR TENDER
A	18-MAR-2016	ISSUED FOR REVIEW

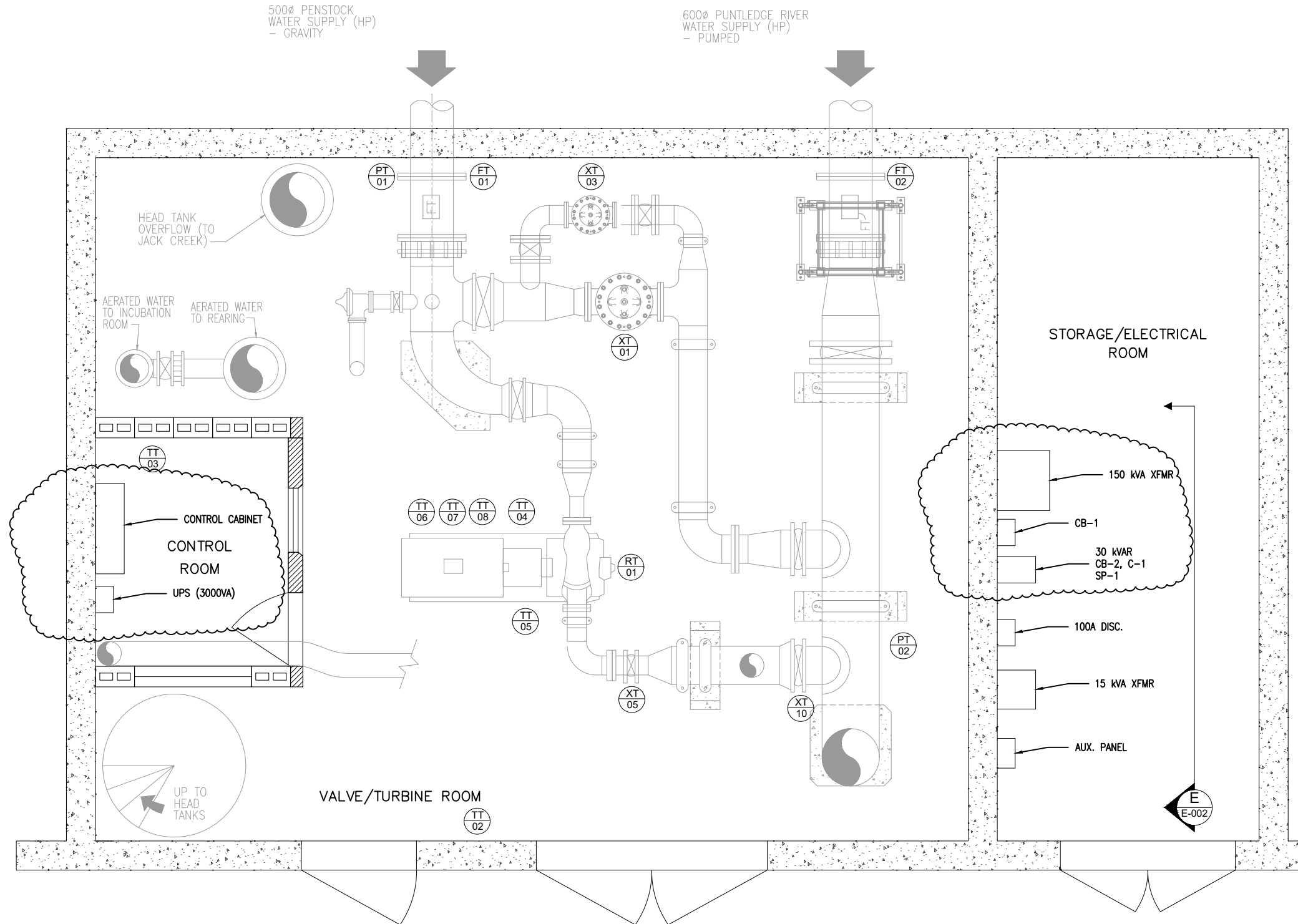
DWG. NO. DRAWING REFERENCES

NOTES

NO. DATE REVISIONS

Plotted by: Billy Daulton, Plot date: 16-Nov-16 Path: \\resources\S\Victoria\GPO\1608 Puntledge Energy Recovery Facility\1608 Puntledge Energy Recovery Facility\161116 E-011 - E009 Puntledge.dwg Size: 444444

BILL OF MATERIAL		
ITEM	TAG	DESCRIPTION
1	FT-01	PENSTOCK FLOW METER
2	FT-02	RIVER SUPPLY FLOW METER
3	PT-01	PENSTOCK SUPPLY PRESSURE
4	PT-02	HEADER PRESSURE
5	RT-01	TURBINE ROTATING SPEED
6	TT-02	VALVE ROOM THERMOSTAT
7	TT-03	CONTROL ROOM THERMOSTAT
8	TT-04	TURBINE INSIDE BEARING RTD
9	TT-05	TURBINE BEARING RTD
10	TT-06	GENERATOR RTD - PHASE A
11	TT-07	GENERATOR RTD - PHASE B
12	TT-08	GENERATOR RTD - PHASE C
13	XT-01	CV1A VALVE POSITION
14	XT-03	CV3A VALVE POSITION
15	XT-05	TCV VALVE POSITION
16	XT-10	VALVE 10 POSITION



**PRELIMINARY**  
 NOT FOR CONSTRUCTION



**FISHERIES AND OCEANS CANADA**  
 REAL PROPERTY AND TECHNICAL SUPPORT

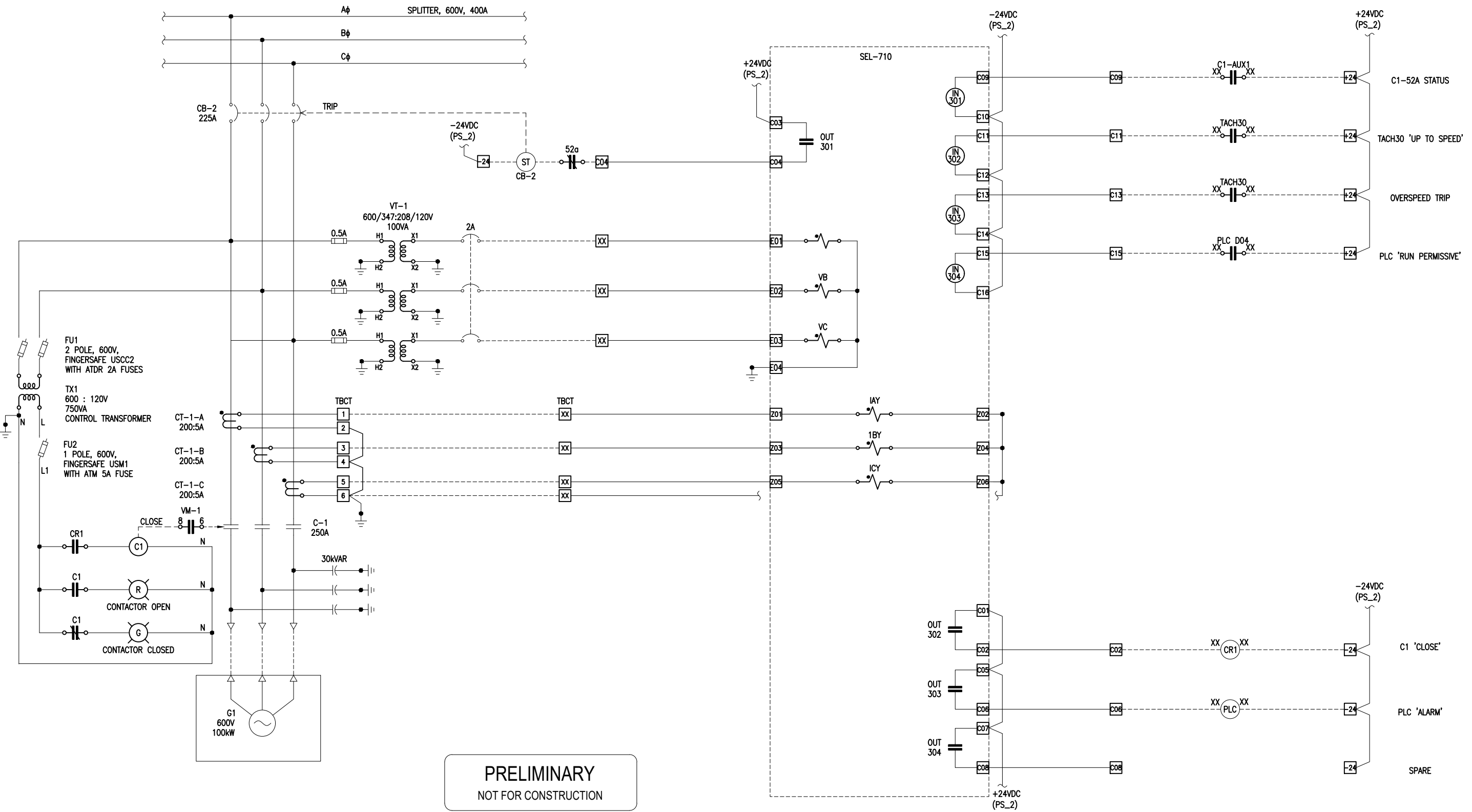
DWG. NO.	DRAWING REFERENCES	NOTES	NO.	DATE	REVISIONS
			D	16-NOV-2016	ADDED UPS
			C	09-NOV-2016	REVISED FOR TENDER
			B	30-MAY-2016	ADDED INSTRUMENTS
			A	31-MAR-2016	ISSUED FOR TENDER

DESIGNED	RD
DRAWN	RB
CHECKED	RD
RECOMMENDED	
APPROVED	
APPROVED	

**PUNTLEDGE RIVER HATCHERY**  
**WATER SUPPLY ENERGY RECOVERY**  
**AERATION BUILDING**  
**ELECTRICAL EQUIPMENT**  
**LAYOUT**

SCALE	N.T.S.
DATE	31-MAR-16
DRAWING NUMBER	E-011
REVISION	D

Plotted by: Billy Duffin, Plot date: 18-Nov-16 Path: \\msname-s1\cdata\pfd\1608\_Puntledge Energy Recovery Facility\08 Drawings\SIS Drawings\11116 E012 - E012\_Puntledge.sch Size: 4444H



**PRELIMINARY**  
 NOT FOR CONSTRUCTION

		 <b>FISHERIES AND OCEANS CANADA</b> REAL PROPERTY AND TECHNICAL SUPPORT	
	DESIGNED RD DRAWN RB CHECKED RD RECOMMENDED RB APPROVED RD APPROVED RB	<b>PUNTLEDGE RIVER HATCHERY</b> <b>WATER SUPPLY ENERGY RECOVERY</b> <b>AERATION BUILDING</b> <b>INDUCTION GENERATOR</b> <b>PROTECTION &amp; CONTROL SCHEMATIC</b>	SCALE N.T.S. DATE 31-MAR-16 DRAWING NUMBER <b>E-012</b> REVISION B
NO.    DATE    REVISIONS	B    09-NOV-2016    REVISED FOR TENDER A    05-MAY-2016    ISSUED FOR TENDER		
DWG. NO.	DRAWING REFERENCES	NOTES	

E-100 Rev B	Date : 16 NOV 2016	PUNLEDGE RIVER HATCHERY - CABLE SCHEDULE		ISSUED FOR TENDER
Drawing #	Cable Type & Size	From	To	Remarks
Location		Equipment	Equipment	
E-001	3c #4/0 TECK	Mechanical/Electrical Room - MDC Feeder Panel	Junction Box - JB1	
E-001	3c #4/0	Junction Box - JB1	Junction Box - JB2	Underground in Conduit
E-001	3c#4/0 TECK	Junction Box - JB2	Aeration Building - CB-1	
E-001	3c #4/0 TECK	Aeration Building - CB-1	Aeration Building - TFR (150kVA)	
E-001	3c #4/0 TECK	Aeration Building - TFR (150kVA)	Aeration Building - SP-1	
E-001	3c #2/0 TECK	Aeration Building - SP-1	Aeration Building - D2 (CB-2)	
E-001	3c #6 TECK	Aeration Building - Power Factor Correction Capacitor (PFCC)	Aeration Building - D2	
E-001	3c #2/0 TECK	Aeration Building - G1	Aeration Building - D2	
E-001	3c #4 TECK	Aeration Building - SP-1	Aeration Building - 100A Fused Disconnect	
E-004	2c #14 TECK	Aeration Building - Control Panel	Pumphouse (A3 Cable)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - XT1 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - XT3 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - PT2 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - XT5 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - XT10 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	LT1 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	LT2 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - PT1 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - FT1 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - FT2 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - RT1 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	TT1 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - TT2 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - TT4 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - TT5 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - TT6 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - TT7 (Power)	
E-004	2c #14 TECK	Aeration Building - Control Panel	Aeration Building - TT8 (Power)	
E-005	2c #14 TECK	Aeration Building - Control Panel (TB-1)	V10 (Valve Open Position)	
E-005	2c #14 TECK	Aeration Building - Control Panel (TB-1)	V10 (Valve Closed Position)	
E-005	2c #14 TECK	Aeration Building - Control Panel (TB-1)	Turbine Control Valve (Open Position)	
E-005	2c #14 TECK	Aeration Building - Control Panel (TB-1)	Turbine Control Valve (Closed Position)	
E-005	2c #14 TECK	Aeration Building - Control Panel (TB-1)	V8 (Valve Open Position)	
E-005	2c #14 TECK	Aeration Building - Control Panel (TB-1)	V8 (Valve Closed Position)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	CV3A (8" Valve Open)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	CB3A (8" Valve Close)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	CV1A (12" Valve Open)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	CV1A (12" Valve Close)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	Turbine (Control Valve Open)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	Turbine (Control Valve Close)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	V10 (Motorized Valve Open)	
E-006	2c #14 TECK	Aeration Building - Control Panel (TB-2)	V10 (Motorized Valve Close)	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	LT1 (Level - Tank 1 (Main Tank))	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	LT2 (Level - Tank 2 (Incubation Tank))	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	PT1 (Pressure - Supply Water)	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	Vibration Monitor No. 1	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	Vibration Monitor No. 2	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	XT-03, 8" Valve (CV3A)	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	XT-01, 12" Valve (CV1A)	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	PT-02 (Header Pressure)	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	FT-2 (Flow - River Supply)	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	FT-1 (Flow - Penstock Supply)	
E-008	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	RT-1 (Speed - Turbine Tachometer)	
E-009	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	TT1	
E-009	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	TT2	
E-009	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	TT4	
E-009	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	TT5	
E-009	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	TT6	
E-009	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	TT7	
E-009	1PR SHLD Teck	Aeration Building - Control Panel (TB-4)	TT8	
E-012	4c #10 Teck	Aeration Building - D2 (CT-1)	Aeration Building - Control Panel (SEL-710)	
E-012	4c #10 Teck	Aeration Building - D2 (VT-1)	Aeration Building - Control Panel (SEL-710)	
E-011	3C #12 Teck	125A Auxiliary Service Panel	UPS	