CITY OF UNALASKA
POWER PRODUCTION 125VDC STATION SERVICE PROJECT
PROJECT NO. 17302

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MILITARY PETROLEUM FUEL LINES..... 552–2334
OR 552–5342
STATE STORM DRAINS & STREET LIGHTS..... 333–2411

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN–FARRELL/EARL GEORGE – EPS JOB #: 17–0049

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ENG. STAMP

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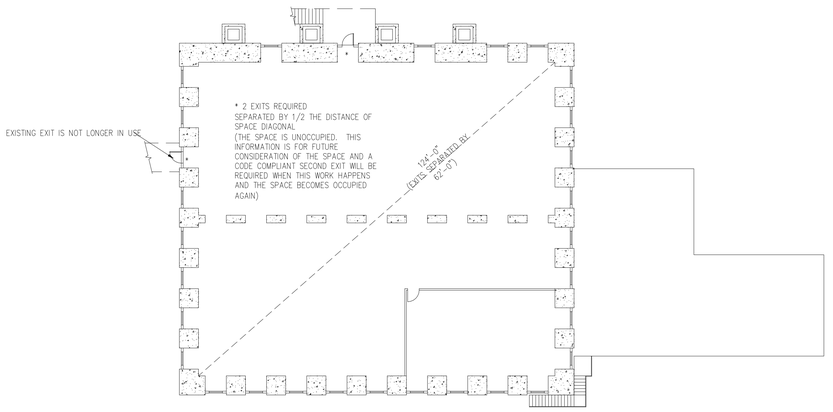
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
TITLE & DRAWING INDEX
t1.01.dwg

REF DWG(S):

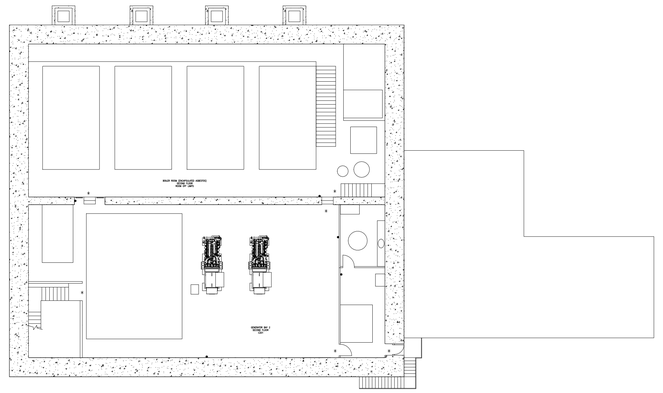
DRAWING NO.: T1.01

SHEET 1 OF 29



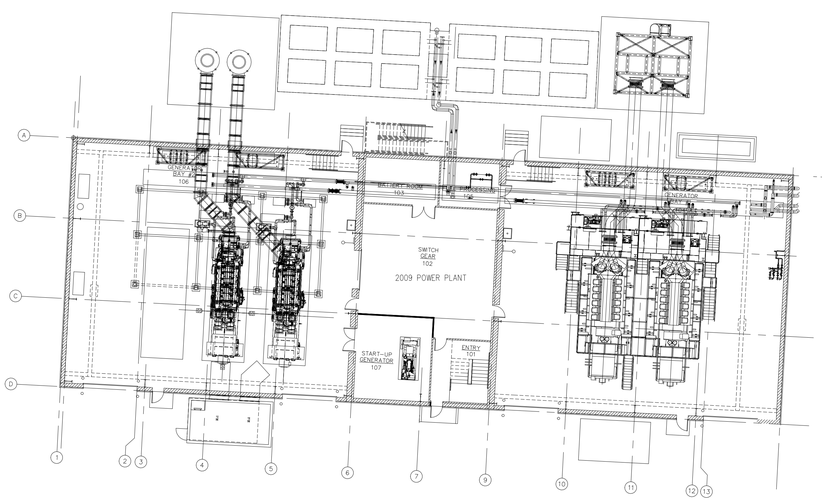
3 third floor code plan

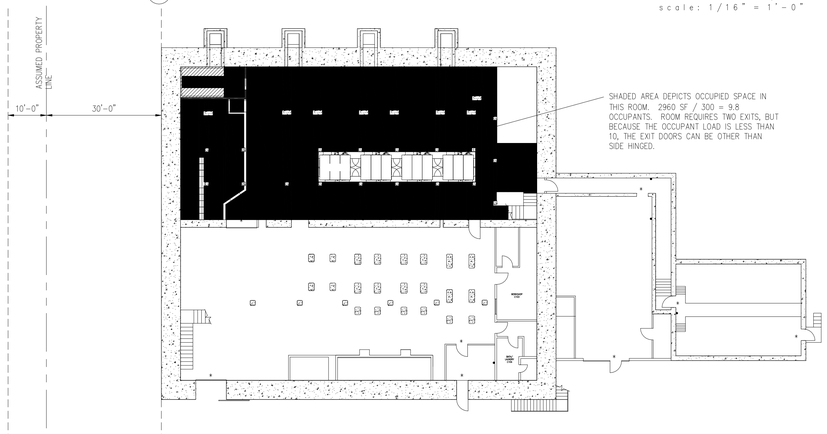
scale: 1/16" = 1'-0"



2 second floor code plan

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





1 first floor code plan

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

GENERAL NOTES

1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE 2012 IBC, LOCAL AMENDMENTS AND GOOD STANDARD PRACTICE. CONTRACTOR TO COORDINATE ALL DIMENSIONS, SIZING AND OPENINGS WITH ALL TRADES. CONTRACTOR TO VERIFY ALL CONNECTOR SIZES TO ENSURE PROPER FIT.

2. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND FINISH GRADES.

3. ALL MATERIALS AND WORK SHALL CONFORM TO ALL GOVERNING CODES AND REGULATIONS.

4. ALL MATERIALS AND PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

5. DIMENSIONS ARE TO FACE OF STUD, FACE OF CONCRETE, AND GRID LINES UNLESS OTHERWISE NOTED.

6. EXIT HARDWARE: OPEN FROM INSIDE WITH ONE MOTION, NO SPECIAL KNOWLEDGE OR EFFORT. NO THUMB TURNS OR SEPARATE DEADBOLTS. NO KEYED LOCKS EXCEPT FRONT MAIN ENTRANCE.

CODE ANALYSIS

2012 INTERNATIONAL BUILDING CODE
2012 INTERNATIONAL MECHANICAL CODE
2012 UNIFORM PLUMBING CODE
2012 INTERNATIONAL FIRE CODE
2014 NATIONAL ELECTRICAL CODE
2012 INTERNATIONAL ENERGY CONSERVATION CODE
2012 INTERNATIONAL EXISTING BUILDING CODE
2012 INTERNATIONAL FUEL GAS CODE
2010 ASME SAFETY CODE FOR ELEVATORS & ESCALATORS
2009 ICC/ANSI A117.1

CONSTRUCTION TYPE: IIIB NON-SPRINKLED

OCCUPANCY GROUP: F-1 (ELECTRIC GENERATION PLANT), FIRST AND SECOND FLOORS
B (OFFICE) THIRD FLOOR
H-2 (FUEL TANKS) FIRST FLOOR (783 SF)

503.1.2 BUILDINGS ON THE SAME LOT.
- WORK AREA (EXISTING 1942 ORIGINAL POWER PLANT BUILDING) HAS MORE THAN A 40' SEPARATION (30' AND 10' EACH SIDE OF ASSUMED PROPERTY LINE) FROM THE POWER PLANT ADDITION OF 2008-09, SO THE BUILDINGS ARE CONSIDERED SEPARATE BUILDINGS.

IBC TABLE 503, ALLOWABLE AREAS AND HEIGHTS:
2 FLOORS / 12,000 SF ALLOWED

ACTUAL SF (F-1 FIRE AREA) = 10,092 SF

- (SO NO RATINGS ARE REQUIRED AND NO SEPARATIONS ARE REQUIRED BASED ON ALLOWABLE HEIGHTS AND AREAS)

508.4 SEPARATED OCCUPANCIES.
- NO SEPARATION IS REQUIRED BETWEEN THE B AND F-1 OCCUPANCIES, SO THE THIRD FLOOR IS ALLOWED "AS-IS". THE B-OCCUPANCY ALLOWABLE HEIGHTS AND AREAS IS 3 FLOORS AND 19,000 SF. THE THIRD FLOOR OFFICE IS CURRENTLY UNOCCUPIED.
- THE SEPARATION BETWEEN THE H-2 AND F-1 (NS) OCCUPANCIES IS 3 HOURS. CURRENTLY THERE IS A 3-HOUR (MIN.) FIRE BARRIER IN PLACE. (DOORS NOT VERIFIED).

SECTION 509 INCIDENTAL USES
TABLE 509, STATIONARY STORAGE BATTERY SYSTEMS HAVING A LIQUID ELECTROLYTE CAPACITY OF MORE THAN 50 GALLONS FOR FLOODED LEAD-ACID, NICKEL CADMIUM OR VRLA, OR MORE THAN 1,000 POUNDS FOR LITHIUM-ION AND LITHIUM METAL UNINTERRUPTABLE POWER SUPPLIES.
- THE BATTERY ROOM IS REQUIRED TO HAVE A 1-HOUR FIRE BARRIER SEPARATION AND 1-HOUR HORIZONTAL SEPARATION.

IBC TABLE 601 FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS
TYPE IIIB CONSTRUCTION

PRIMARY STRUCTURAL FRAME	0 HOUR
BEARING WALLS	
EXTERIOR	2 HOUR
INTERIOR	0 HOUR
NONBEARING WALLS AND PARTITIONS	
EXTERIOR	PER TABLE 602
NONBEARING WALLS AND PARTITIONS	
INTERIOR	0 HOUR
FLOOR CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS	0 HOUR
ROOF CONSTRUCTION AND ASSOCIATED SECONDARY MEMBERS	0 HOUR

IBC TABLE 602 FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPERATION DISTANCE.
TYPE IIIB CONSTRUCTION

MORE THAN 5' AND LESS THAN 10'	1 HOUR
MORE THAN 10' AND LESS THAN 30'	1 HOUR
MORE THAN 30'	0 HOUR

IBC SECTION 1004 OCCUPANT LOAD.

USE	SF	/OCC	OCCUPANT LOAD
FIRST FLOOR			
GENERATOR BAY ROOM	2,960 SF	/300	9.8
SEA WATER ROOM	3,713 SF	/300	12.4
SECOND FLOOR			
POWER PLANT (GSF)	3,713 SF	/300	12.4
TOTAL OCCUPIED LOAD INTO FIRST FL. SEA WATER ROOM			34.6
THIRD FLOOR			
OFFICE/ CURRENTLY UNOCCUPIED SPACE	7,612 SF	/300	25.4
TOTAL BUILDING OCCUPANT LOAD:			60

SECTION 1008.1.10 PANIC AND FIRE EXIT HARDWARE.
"ELECTRICAL ROOMS WITH EQUIPMENT RATED 1,200 AMPERES OR MORE AND OVER 6' WIDE THAT CONTAIN OVER-CURRENT DEVICES, SWITCHING DEVICES OR CONTROL DEVICES WITH EXIT ACCESS DOORS MUST BE EQUIPPED WITH PANIC HARDWARE OR FIRE EXIT HARDWARE. DOORS SHALL SWING IN DIRECTION OF EGRESS TRAVEL."

**THERE IS NO EQUIPMENT RATED 1200 AMPERES OR MORE IN THIS ROOM. SO PANIC HARDWARE IS NOT REQUIRED.

TWO EXITS ARE REQUIRED BASED ON TRAVEL DISTANCE, HOWEVER, PER 1008.1.2 EXCEPTION 1, SIDE-HINGED SWINGING TYPE DOORS ARE NOT REQUIRED--SO THE EXISTING COILING DOOR IS CODE COMPLIANT AS AN EXIT WITH AN OCCUPANT LOAD OF 10 OR LESS.

CHAPTER 34 EXISTING BUILDINGS AND STRUCTURES

3404.1 GENERAL.
EXCEPT AS PROVIDED BY SECTION 3401.4 (5) (DANGEROUS CONDITIONS), ALTERATIONS TO ANY BUILDING OR STRUCTURE SHALL COMPLY WITH THE REQUIREMENTS OF THE CODE FOR NEW CONSTRUCTION. ALTERATIONS SHALL BE SUCH THAT THE EXISTING BUILDING OR STRUCTURE IS NO LESS COMPLYING WITH THE PROVISIONS OF THIS CODE THAN THE EXISTING BUILDING OR STRUCTURE WAS PRIOR TO THE ALTERATION.
- ALL MAIN SPACES ARE REQUIRED TO HAVE TWO EXITS. EXITS ARE REQUIRED TO BE SWINGING DOORS WITH NO LATCH OR PANIC HARDWARE PER 1008.1.10.

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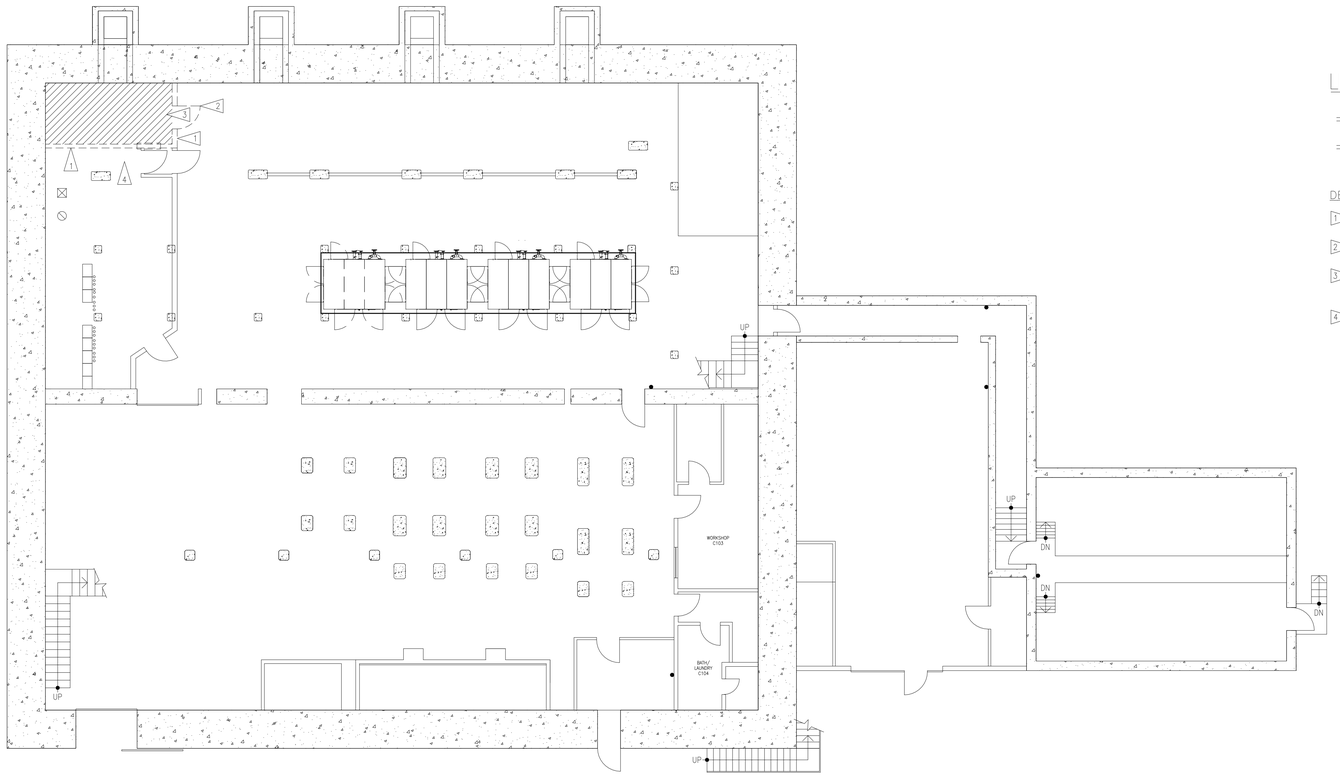
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
ARCHITECTURAL
COVER
a0.00.dwg

REF DWG(S):

DRAWING NO.: A0.00



LEGEND

EXISTING WALL ASSEMBLY

DEMOLISHED WALL ASSEMBLY

DEMOLITION KEY NOTES

1. REMOVE DASHED WALL
2. REMOVE DASHED DOOR
3. REMOVE DROP CEILING IN EXISTING SPACE UP TO UNDERSIDE OF CONCRETE FLOOR
4. EXISTING SOFFIT/DROPPED CEILING: MAINTAIN AND RECONNECT TO NEW WALL.

1 first floor demolition plan

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

DEMOLITION

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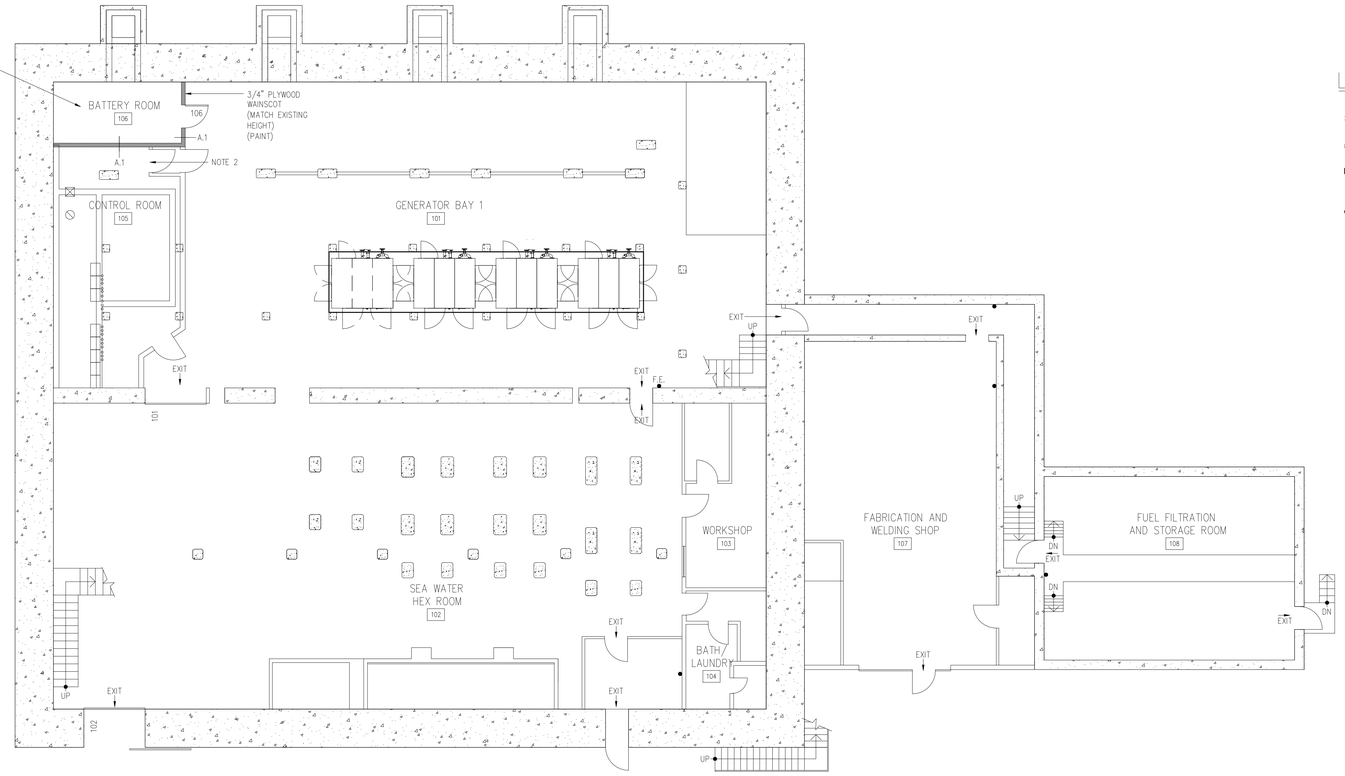
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
ARCHITECTURAL
FIRST FLOOR DEMOLITION PLAN
a1.01.dwg

REF DWG(S):

DRAWING NO.: A1.01

NOTES:

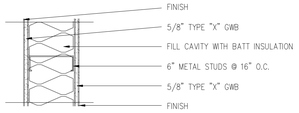
1. REPAIR OR BLOCKING OF ANY EXISTING OR NEW PENETRATION BETWEEN THE BATTERY ROOM AND CONTROL ROOM AND ADJOINING ROOMS OR EXTERIOR SHALL BE MADE AS TO BRING BACK TO EXISTING OR NEW CONSTRUCTION STANDARD, WHICHEVER IS MORE STRINGENT.
2. RECONNECT EXISTING DROPPED CEILING AND DOORS IN CONTROL ROOM TO NEW WALL. REPAIR FINISHES AS REQUIRED TO MATCH EXISTING.



DOOR NUMBER 106:
45 MIN. RATED DOOR

DOOR TO BE:
HM FRAME (PAINT) STEEL FLUSH DOOR (PAINT)

HARDWARE:
3 HINGES
CLOSER
LEVER LOCKSET (STORAGE FUNCTION)
SMOKE SEALS
FLOOR/WALL STOP



A.1 1-HOUR RATED PER GA FILE NO: WP1057; UL DESIGN NO: U419
ALL PENETRATIONS IN WALL (AND RATED FLOOR/CEILING ASSEMBLIES) TO BE 1-HOUR RATED

LEGEND

- EXISTING WALL ASSEMBLY
- NEW CONSTRUCTION
- ■ F.E.C. 2A10BC FIRE EXTINGUISHER AND SEMI-RECESSED CABINET (5 LBS)
- ● F.E. 2A10BC FIRE EXTINGUISHER (5 LBS)

② wall assemblies
scale: 1 1/2" = 1'-0"

① first floor plan
scale: 1/8" = 1'-0"

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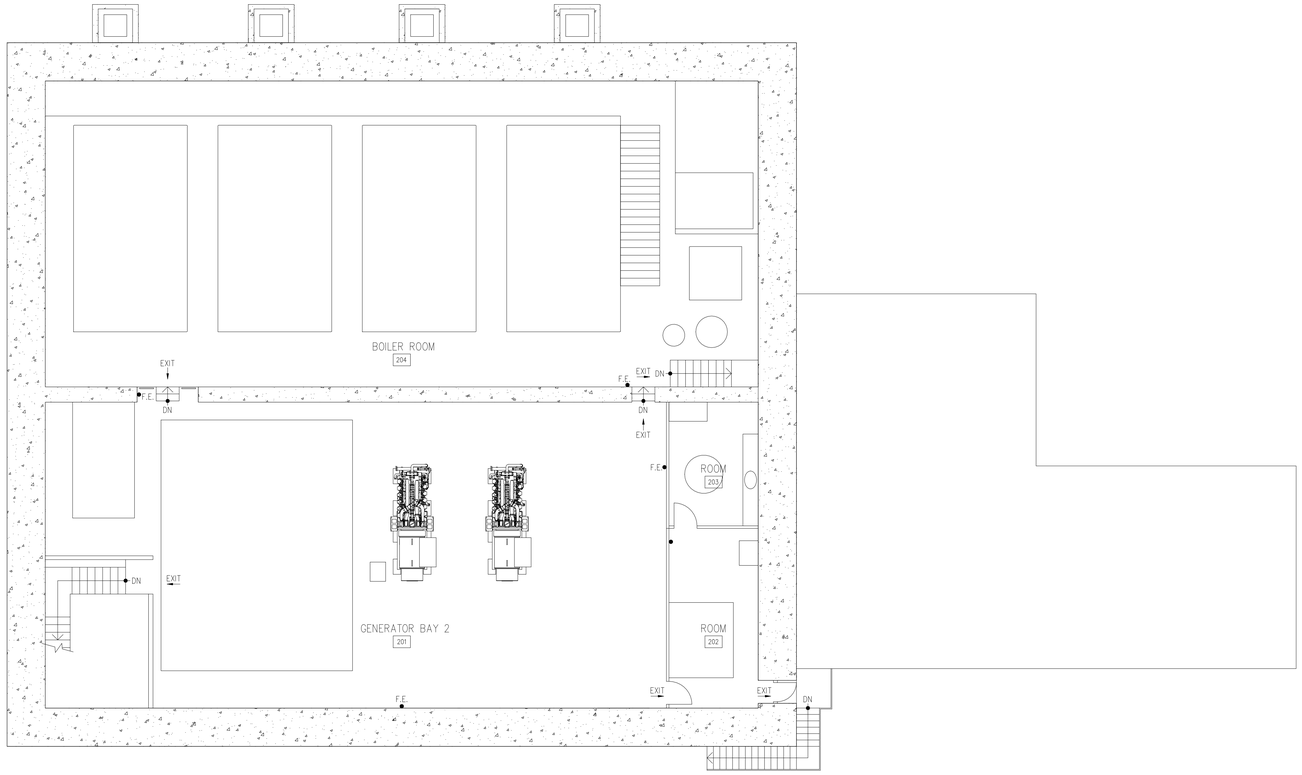
ARCHITECTURAL
FIRST FLOOR PLAN
a1.02.dwg

REF DWG(S):

DRAWING NO.: A1.02

SHEET 4 OF 29



LEGEND

- EXISTING WALL ASSEMBLY
- NEW CONSTRUCTION
- ■ F.E.C. 2A10BC FIRE EXTINGUISHER AND SEMI-RECESSED CABINET (5 LBS)
- ● F.E. 2A10BC FIRE EXTINGUISHER (5 LBS)

1 second floor plan

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

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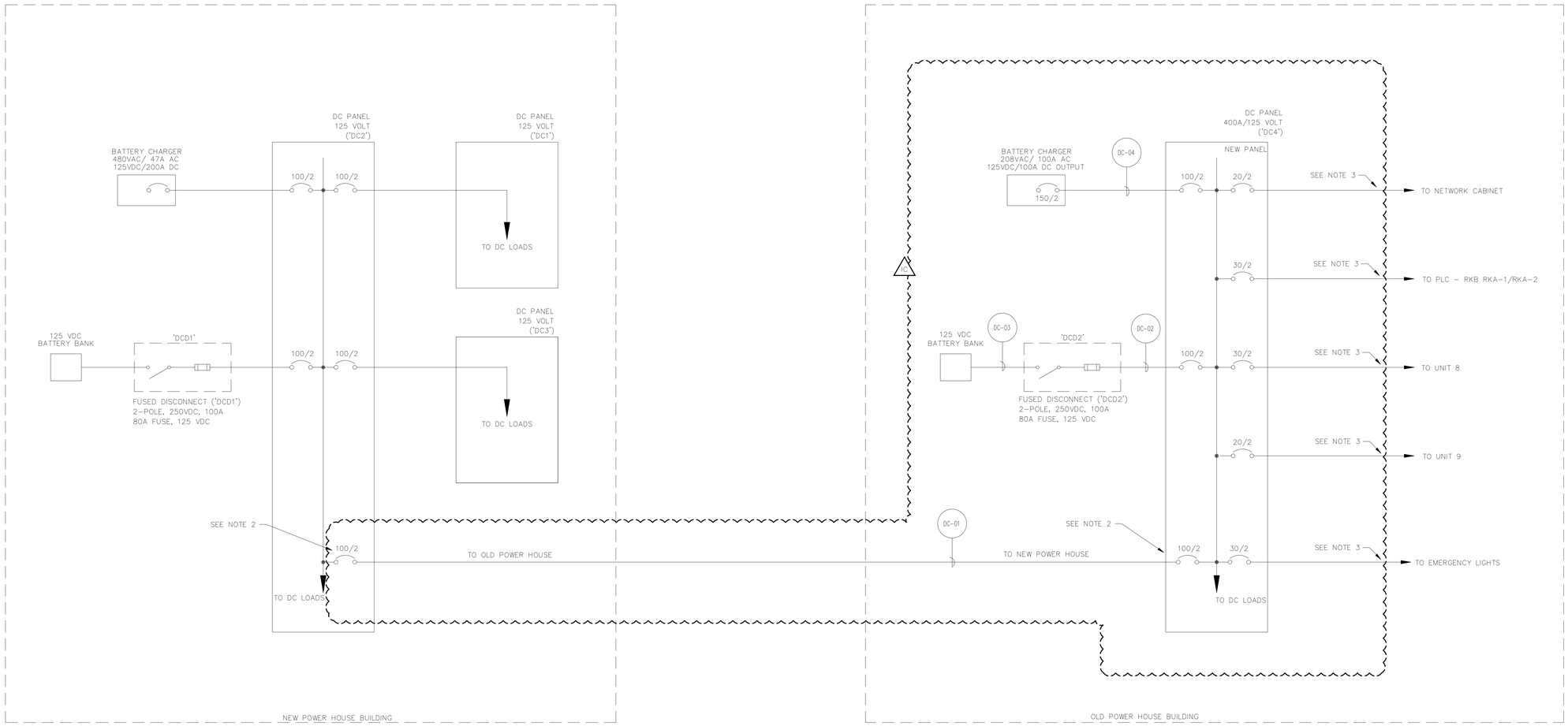
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
ARCHITECTURAL
SECOND FLOOR PLAN
a1.03.dwg

REF DWG(S):

DRAWING NO.: A1.03

SHEET 5 OF 29



NOTES:

1. NOT ALL NEW BREAKERS SHOWN. SEE "DC4" PANEL SCHEDULE FOR BREAKER SIZE, LOCATION AND QUANTITY REQUIREMENTS.
2. BREAKERS TO REMAIN NORMALLY OPEN. BATTERY CHARGERS ARE NOT TO BE OPERATED IN PARALLEL.
3. INSTALL JUNCTION BOXES OR GUTTER ABOVE NEW PANEL IN ORDER TO COMPLETE THE NEW PANEL INSTALLATION AND CONNECTIONS TO FIELD BRANCH CIRCUITS. WORK NOT SHOWN ON CABLE SCHEDULE.

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ONE LINE DIAGRAM
e1.01.dwg

REF DWG(S):

DRAWING NO.: E1.01

CABLE OR WIRE NO.	CATALOG NUMBER	ESTIMATED LENGTH (FT)	FROM	TO	FUNCTION	VIA	DRAWING NUMBER
DC-01	HW010 20101 (2/0, 2/C, XLP)	325	PANEL DC2	PANEL DC4	INTERCONNECTION CIRCUIT	CONDUIT 'C-001, C-002, C-003'	E1.01
DC-02	HW010 00201 (2 AWG, 2/C, XLP)	30	PANEL DC4	DCD2 DISCONNECT	125 VDC CIRCUIT	CONDUIT 'C-004'	E1.01
DC-03	HW010 00201 (2 AWG, 2/C, XLP)	20	DCD2 DISCONNECT	BATTERY BANK	125 VDC CIRCUIT	CONDUI 'C-005'	E1.01
DC-04	HW010 10101 (1/0 AWG, 2/C, XLP)	15	PANEL DC4	BATTERY CHARGER	125 VDC CIRCUIT	CONDUIT 'C-006'	E1.01
DC-05	HW010 00201 (2 AWG, 1/C, XLP)	15	BATTERY STRING PART A	BATTERY STRING PART B	BATTERY BANK JUMPERS	CONDUIT 'C-007'	E3.02
DC-06	HW010 01201 (12 AWG, 2/C, XLP)	30	PANEL 'DC-4'	PLC SUB PANEL 'PLCP'	125 VDC POWER	CONDUIT 'C-008'	E5.00
DC-07	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	50	PLC SUB PANEL 'PLCP'	HYDROGEN DETECTOR	24 VDC POWER	CONDUIT 'C-009'	E5.04
DC-08	HW120 01401 (14AWG, 1 PAIR, 2/C, XLP)	75	PLC SUB PANEL 'PLCP'	AHU-1 DAMPERS	24 VDC POWER	CONDUIT 'C-010'	E5.04
AC-01	2 AWG, 3/C & 4 AWG, 1/C	40	120/208VAC PANEL 'AC-7'	BATTERY CHARGER	CHARGER POWER CIRCUIT	CONDUIT 'C-101'	E5.04
AC-02	HW010 01201 (12AWG, 7 STRAND, 3/C, XLP)	50	120/240VAC PANEL	THERMOSTAT, UNIT HEATER	UNIT HEATER 'UH-1' CIRCUIT	CONDUIT 'C-102', 'C-103'	E3.00
AC-03	NOT USED	--	--	--	--	--	--
AC-04	HW010 01201 (12AWG, 7 STRAND, 3/C, XLP)	50	120/240VAC PANEL	BATTERY ROOM LIGHT SWITCH	LIGHTING CIRCUIT	CONDUIT 'C-104'	E3.00
AC-05	HW010 01201 (12AWG, 7 STRAND, 3C, XLP)	30	BATTERY ROOM LIGHT SWITCH	LIGHT FIXTURE, BATTERY ROOM	LIGHTING CIRCUIT	CONDUIT 'C-105'	E3.00
AC-06	HW010 01201 (12AWG, 7 STRAND, 3/C, XLP)	75	120/240VAC PANEL 'MCC-1'	HOT WATER HEATER	WATER HTR CONTROL CIRCUIT	CONDUIT 'C-106'	E3.00
AC-07	HW010 01201 (12AWG, 7 STRAND, 3/C, XLP)	50	120/240VAC PANEL 'MCC-1'	EXHAUST FAN 'EF-1'	EXHAUST FAN POWER CIRCUIT	CONDUIT 'C-107'	E5.04
AC-08	HW010 01201 (12AWG, 7 STRAND, 3/C, XLP)	50	120/208VAC PANEL 'AC-7'	SAC-1	SAC POWER CIRCUIT	CONDUIT 'C-108'	E5.04
AC-09	HW010 01201 (12AWG, 7 STRAND, 3/C, XLP)	50	120/240VAC PANEL 'MCC-1'	SUPPLY AIR FAN 'SF-1'	SUPPLY FAN POWER CIRCUIT	CONDUIT 'C-109'	E5.04
AC-10	HW010 01201 (12AWG, 7 STRAND, 3/C, XLP)	75	SAC-1	SAC-1B	POWER CIRCUIT	CONDUIT 'C-110'	E5.04
CC-01	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	50	HYDROGEN DETECTION 1%	PLC	HYDROGEN ALARM CIRCUIT	CONDUIT 'C-201'	E5.01
CC-02	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	50	HYDROGEN DETECTION 2%	PLC	HYDROGEN ALARM CIRCUIT	CONDUIT 'C-201'	E5.01
CC-03	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	15	BATTERY CHARGER	PLC	BATTERY ALARM CIRCUIT	CONDUIT 'C-202'	E5.01
CC-04	HW120 01604 (16AWG, 4 PAIR, 2/C, XLP)	50	AHU-1	PLC	TEMP SWITCH 'TS' CIRCUIT	CONDUIT 'C-203'	E5.01
CC-04		--	--	--	SPARE	CONDUIT 'C-203'	E5.02
CC-04		50	AHU-1	PLC	TEMP. TRANS. 'TT' CIRCUIT	CONDUIT 'C-203'	E5.02
CC-04		50	AHU-1	PLC	FILTER DIFF. PRESSURE	CONDUIT 'C-203'	E5.02
							E5.02
CC-09	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	40	CONTROL ROOM	PLC	CONTROL RM. DIFF. PRESSURE #1	CONDUIT 'C-204'	E5.02
CC-10	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	40	CONTROL ROOM	PLC	CONTROL RM. DIFF. PRESSURE #2	CONDUIT 'C-205'	E5.02
CC-11	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	50	BATTERY ROOM	PLC	BATTERY ROOM TEMP. TRANS.	CONDUIT 'C-201'	E5.02
CC-12	HW120 01604 (16AWG, 4 PAIR, 4/C, XLP)	50	PLC	AHU-1 J-BOX	DAMPER CIRCUITS	CONDUIT 'C-207'	E5.03
CC-13	HW120 01604 (16AWG, 4 PAIR, 4/C, XLP)	50	AHU-1 J-BOX	AHU-1	DAMPER CIRCUITS	CONDUIT 'C-208'	E5.03
CC-14	HW120 01601 (16AWG, 1 PAIR, 2/C, XLP)	50	SAC-1	SAC-1 REMOTE CONTROLLER	SAC CONTROL CIRCUIT	CONDUIT 'C-206'	E5.03
CC-100	CAT5E	50	ORC PLC PANEL	PLC	COMMUNICATIONS	CONDUIT 'C-300'	E5.03

SEE NOTE 1

SEE NOTE 1

NOTES:

1. EXISTING CIRCUIT TO BE RELOCATED. CONTRACTOR TO ASSUME REPLACEMENT OF ALL CONDUCTORS AND CONDUIT FOR BIDDING PURPOSES.
2. CABLE AND CONDUIT LENGTHS ARE ALL ESTIMATES. CONTRACTOR TO VERIFY ACTUAL LENGTHS.
3. ALL EQUIPMENT GROUNDS SHALL BE #8 AND SHALL BE GROUNDED TO EXISTING GROUND GRID.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	ISSUED FOR BID	KER/06-19-2018	WBF/06-19-2018

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WEB: WWW.EPSINC.COM

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
CABLE SCHEDULE
e1.10.dwg

REF DWG(S):

DRAWING NO.: E1.10

CONDUIT NO.	CONDUIT SIZE	EST. CONDUIT LENGTH (FT.)	TYPE	FROM	TO	FUNCTION	DRAWING NO.
C-001	1 1/2"	40	EMT	PANEL DC2	NPH BATTERY ROOM	125VDC INTERCONNECT	E3.10
C-002	1 1/2"	60	EMT/RGS	WARTSILLA BAY	NPH EXTERIOR WALL	125VDC INTERCONNECT	E3.10
C-003	1 1/2"	50	EMT	OPH J-BOX	PANEL DC4	125VDC INTERCONNECT	E3.10, E3.11
C-004	1 1/2"	20	EMT	PANEL DC4	DCD2 DISCONNECT	125 VDC CIRCUIT	E3.11
C-005	1 1/2"	10	EMT	DCD2 DISCONNECT	BATTERY BANK	125 VDC CIRCUIT	E3.11
C-006	1 1/2"	20	EMT	PANEL DC4	BATTERY CHARGER	125 VDC CIRCUIT	E3.11
C-007	1 1/2"	100	EMT	BATTERY STRING PART A	BATTERY STRING PART B	125 VDC CIRCUIT	E3.11
C-008	3/4"	100	EMT	PANEL DC4	PLC SUB PANEL 'PLCP'	125 VDC CIRCUIT	E3.11
C-009	3/4"	50	EMT	PLC SUB PANEL 'PLCP'	HYDROGEN DETECTOR	24 VDC CIRCUIT	E3.11
C-010	3/4"	75	EMT	PLC SUB PANEL 'PLCP'	AHU-1 DAMPERS	24 VDC CIRCUIT	E3.11
C-101	2"	60	EMT	120/208VAC PANEL 'AC-7'	BATTERY CHARGER	208 VAC FEEDER	E3.11
C-102	3/4"	60	EMT	120/240VAC PANEL 'MCC-1'	THERMOSTAT	120 VAC CIRCUIT	E3.11
C-103	3/4"	60	EMT	THERMOSTAT	UNIT HEATER 'UH-1'	120 VAC CIRCUIT	E3.11
C-104	3/4"	60	EMT	120/240VAC PANEL	BATTERY ROOM LIGHT SWITCH	120 VAC CIRCUIT	E3.11
C-105	3/4"	60	EMT	BATTERY ROOM LIGHT SWITCH	LIGHT FIXTURE, BATTERY ROOM	120 VAC CIRCUIT	E3.11
C-106	3/4"	60	EMT	120/240VAC PANEL 'MCC-1'	HOT WATER HEATER	120 VAC CIRCUIT	E3.11
C-107	3/4"	60	EMT	120/240VAC PANEL 'MCC-1'	EXHAUST FAN 'EF-1'	120 VAC CIRCUIT	E3.11
C-108	3/4"	60	EMT	120/208VAC PANEL 'AC-7'	SAC-1	208 VAC CIRCUIT	E3.11
C-109	3/4"	60	EMT	120/240VAC PANEL 'MCC-1'	SUPPLY AIR FAN 'SF-1'	120 VAC CIRCUIT	E3.11, E3.12
C-110	3/4"	60	EMT	SAC-1	SAC-1B	208 VAC CIRCUIT	E3.11
C-201	3/4"	60	EMT	HYDROGEN ALARM	PLC	ALARM CIRCUITS	E3.11
C-202	1/2"	60	EMT	BATTERY CHARGER	PLC	ALARM CIRCUIT	E3.11
C-203	2"	60	EMT	AHU-1	PLC	AHU-1 CONTROL CIRCUITS	E3.11 E3.12
C-204	1/2"	60	EMT	CONTROL ROOM	PLC	CONTROL CIRCUIT	E3.11
C-205	1/2"	60	EMT	CONTROL ROOM	PLC	CONTROL CIRCUIT	E3.11
C-206	1/2"	60	EMT	SAC-1	SAC-1 REMOTE CONTROLLER	CONTROL CIRCUIT	E3.11
C-207	1"	60	EMT	CONTROL ROOM	AHU-1 J-BOX	CONTROL CIRCUIT	E3.11
C-208	1"	20	EMT	AHU-1 J-BOX	AHU-1	CONTROL CIRCUIT	E3.11
C-300	1/2"	60	EMT	ORC PLC CABINET	PLC	COMMUNICATIONS CIRCUIT	E3.11

NOTES:

1. RGS CONDUIT REQUIRED FOR EXTERIOR RUNS. PROVIDE CONDUIT TRANSITION FITTINGS AND PULL BOXES AS REQUIRED.
2. CABLE AND CONDUIT LENGTHS ARE ALL ESTIMATES. CONTRACTOR TO VERIFY ACTUAL LENGTHS.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	ISSUED FOR BID	KER/06-19-2018	WBF/06-19-2018

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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
CONDUIT SCHEDULE
e1.11.dwg

REF DWG(S):

DRAWING NO.: E1.11

125 VDC PANEL #2 (DC2)

SIZE 100 AMPS | MAIN LUGS 100 AMPS | MOUNT/LOCATION SURFACE/NPH CONTROL BUILDING

CKT #	WIRE QTY/ SIZE	CIRCUIT DESCRIPTION	BKR AMP/ POLE	+	−	BKR AMP/ POLE	CIRCUIT DESCRIPTION	WIRE QTY/ SIZE	CKT #	CABLE
1	2#2	BATTERY CHARGER	100/2			100/2	BATTERY BANK	2#2	2	
3									4	
5	2#2	DC1	100/2			100/2	DC3	2#2	6	
7									8	
9	2#10	SWITCHGEAR CUBICLE B7	30/2			30/2	SWITCHGEAR CUBICLE B8	2#10	10	DC8
11									12	
13	2#10	SWITCHGEAR CUBICLE B9	30/2			30/2	SWITCHGEAR CUBICLE B10	2#10	14	DC−
15									16	B10
17	2#10	SWITCHGEAR CUBICLE B11	30/2			30/2	SWITCHGEAR CUBICLE B12	2#10	18	DC−
19									20	B12
21		DC4 − OLD POWERHOUSE INTERTIE	100/2				SPARE		22	
23									24	
25		SPARE					SPARE		26	
27									28	
29		SPARE					SPARE		30	
31									32	
33		SPARE					SPARE		34	
35									36	
37		SPARE					SPARE		38	
39									40	
41		SPARE					SPARE		42	

SEE NOTE 1

IC

1 DC PANEL 'DC2' SCHEDULE (EXISTING)

1. 'PANEL 'DC2' IS LOCATED IN NEW POWER HOUSE.

125 VDC PANEL #4 (DC4)

IC

SIZE 100 AMPS | MAIN LUGS 100 AMPS | MOUNT/LOCATION SURFACE/OPH CONTROL ROOM

CKT #	WIRE QTY/ SIZE	CIRCUIT DESCRIPTION	BKR AMP/ POLE	+	−	BKR AMP/ POLE	CIRCUIT DESCRIPTION	WIRE QTY/ SIZE	CKT #
1	2#2	BATTERY CHARGER	100/2			100/2	BATTERY BANK	2#2	2
3									4
5	2#10	EMERGENCY LIGHTS	30/2			100/2	DC2	2#2	6
7									8
9	2#10	ENGINE #8	30/2			20/2	NETWORK CABINET	2#12	10
11									12
13	2#10	ENGINE #9	30/2			30/2	PLC − RKB	2#10	14
15									16
17		SPARE	100/2			30/2	PLC CONTROL PANEL 'PLCP'	2#10	18
19									20
21		SPARE	30/2			20/2	SPARE		22
23									24
25		SPACE					SPACE		26
27									28
29		SPACE					SPACE		30
31									32
33		SPACE					SPACE		34
35									36
37		SPACE					SPACE		38
39									40
41		SPACE					SPACE		42

2 DC PANEL 'DC4' SCHEDULE (NEW)

1. 'PANEL 'DC4' IS TO BE LOCATED IN OLD POWER HOUSE.

MAIN BREAKER = 400AF/300AT
BUS. RATING = 400A
SERVICE VOLTAGE = 208V/120V AC
TYPE = 3 PHASE, 4 WIRE
ENCLOSURE = NEMA 1
MOUNTING = SURFACE

PANEL NO. = AC3
SERVICE = NORMAL/EMERGENCY POWER
LOCATION = OLD POWERHOUSE
PLAN DRAWING = E3.00

SOURCE = MCC−06RA
FEEDER SIZE = 400A
22KAIC (SYMMETRICAL)

DESCRIPTION	BKR POLE	BKR AMP	KVA A	KVA B	KVA C	CKT NO	BUS CONN A B C	CKT NO	KVA A	KVA B	KVA C	BKR POLE	BKR AMP	DESCRIPTION
PERSONNEL LOCATOR	1	20				1		2				1	20	24VDC BATTERY CHARGER
UNKNOWN	1	20				3		4				1	20	UNKNOWN (OFF)
UNKNOWN	1	20				5		6				1	20	UNKNOWN (OFF)
SUBPANEL FIRST FLOOR	3	225				7		8				3	225	2ND FLOOR SUBPANEL
−−	3	225				9		10				3	225	−−
−−	3	225				11		12				3	225	−−
125VDC BATTERY CHARGER	3	100				13		14				3	20	(OLD RECEPT.)
−−	3	100				15		16				3	20	−−
−−	3	100				17		18				3	20	−−
UNKNOWN (OFF)	1	20				19		20				3	225	WELDING ROOM SUBPANEL
UNKNOWN (OFF)	1	20				21		22				3	225	−−
UNKNOWN (OFF)	1	20				23		24				3	225	−−
SPARE	3	70				25		26				1	20	UNKNOWN (OFF)
−−	3	70				27		28				1	20	UNKNOWN (OFF)
−−	3	70				29		30				2	20	MINI SPLIT HEAT PUMP
						31		32				2	20	−−
						33		34						
						35		36						
						37		38						
						39		40						
						41		42						
TOTAL			−−	−−	−−				−−	−−	−−	TOTAL		

BUS A −− KVA
BUS B −− KVA
BUS C −− KVA
TOTAL −− KVA

NOTE 1: ESTIMATED DIVERSIFIED LOAD IS −− KVA

SEE NOTE 2

IC

SEE NOTE 2

IC

SEE NOTE 3

1 AC PANEL 'AC−7' PANEL SCHEDULE (EXISTING)

1. 'PANEL 'AC−7' IS LOCATED IN OLD POWER HOUSE.

IC IN CONTRACT

NOTES:

1. PROVIDE AND INSTALL 100A 2P BREAKER FOR EXISTING GE A SERIES II 125/250VDC PANEL (PANEL DC2).
2. PROVIDE AND INSTALL 100A 3P AND 20A 2P BREAKERS IN EXISTING SQUARE D I−LINE SERIES E1 PANEL 'AC−7'. PANEL CATALOG NUMBER HCN 2374−4M. NEW BREAKER REPLACES EXISTING 80A 3P BREAKER FOR OPH BATTERY CHARGER. REMOVE RETIRED BREAKER AND CONDUCTORS FOR EXISTING CHARGER FEEDER.
3. PANEL SCHEDULES REFLECT THE BEST KNOWN INFORMATION AVAILABLE AT THE TIME OF FIELD INVESTIGATIONS. ACTUAL LOADS ON EXISTING PANELS ARE UNKNOWN. NEW LOAD CALCULATIONS OR MEASUREMENTS WERE NOT WITHIN THE SCOPE OF THIS PROJECT.

IC

LIGHTING SCHEDULE

TAG	DESCRIPTION	VOLTAGE	NOMINAL LUMENS	DISTRIBUTION	MANUFACTURER	CATALOG NO.	REMARKS
A1	LED LINEAR BAY, MULTIVOLTAGE	120	7246	WIDE	EATON/COOPER LIGHTING	CPL 4ILED−LD4−14−W−UNV−L840−CD2−U	SUSPENDED

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DESIGNER/PROJECT ENGINEER: WILLIAM BROWN−FARRELL/EARL GEORGE − EPS JOB #: 17−0049

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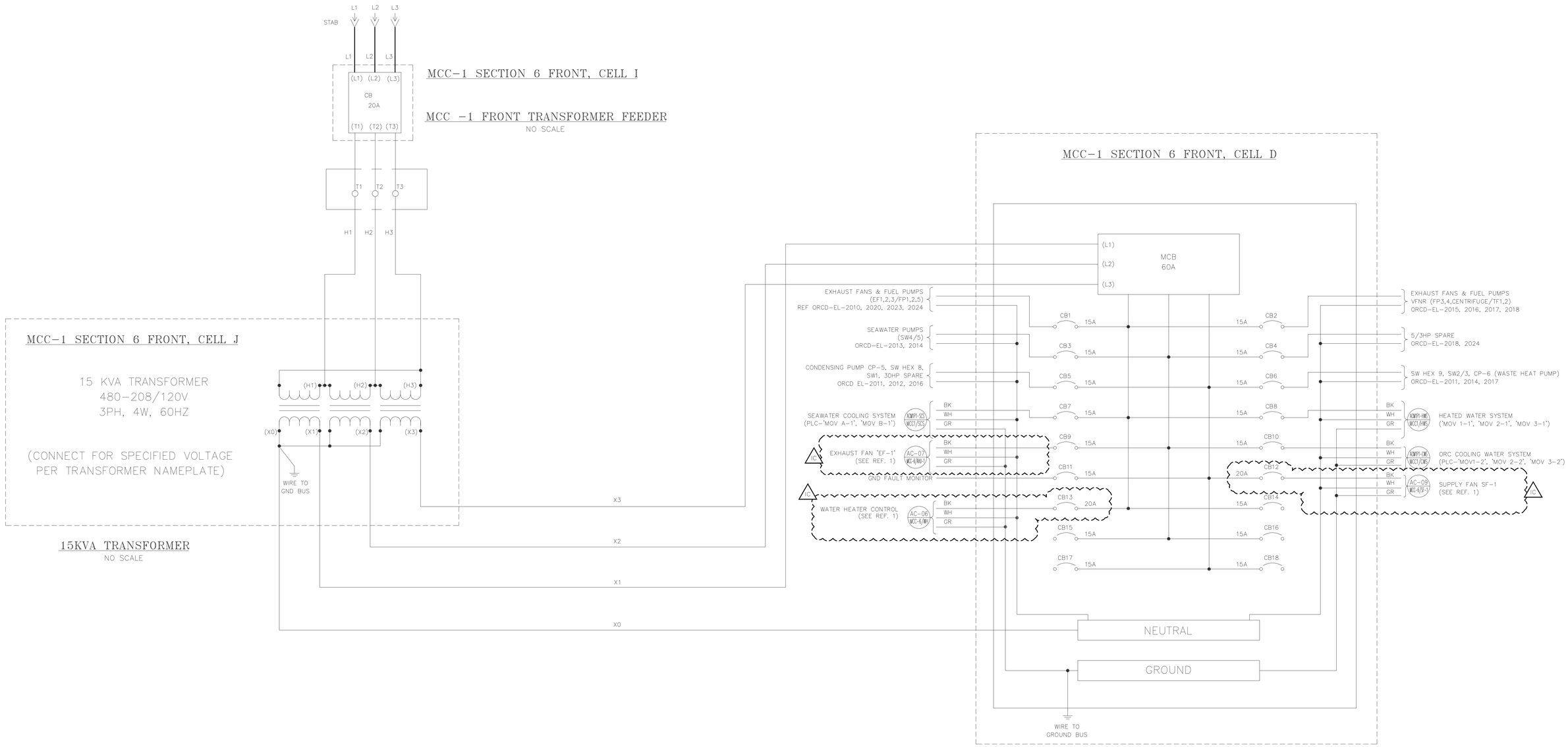
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
ELECTRICAL PANEL SCHEDULES

e1.19.dwg

REF. DWG(S):

DRAWING NO.: E1.19



PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

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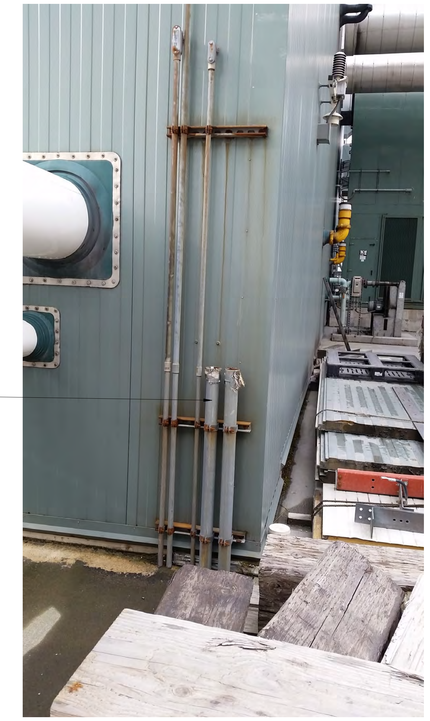
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E5.04	AC SCHEMATICS

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
ELECTRICAL PANEL SCHEDULES
MCC 1 PANEL 6
e1.20.dwg

REF DWG(S):
orcd-el-2015_2

DRAWING NO.:
E1.20



PICTURE 1: NEW POWERHOUSE SPARE CONDUITS

NOTES

1. SEE REFERENCE 1 FOR LOCATIONS OF CONDUITS SHOWN. TYPICAL OF PHOTOS 1, 2 AND 3.
2. EXISTING SPARE CONDUITS ARE 2" RGS. PROVIDE FITTINGS AS NEEDED TO INTERCEPT INSIDE CONDUIT RUN.

PICTURE 2: OLD POWERHOUSE SPARE CONDUITS

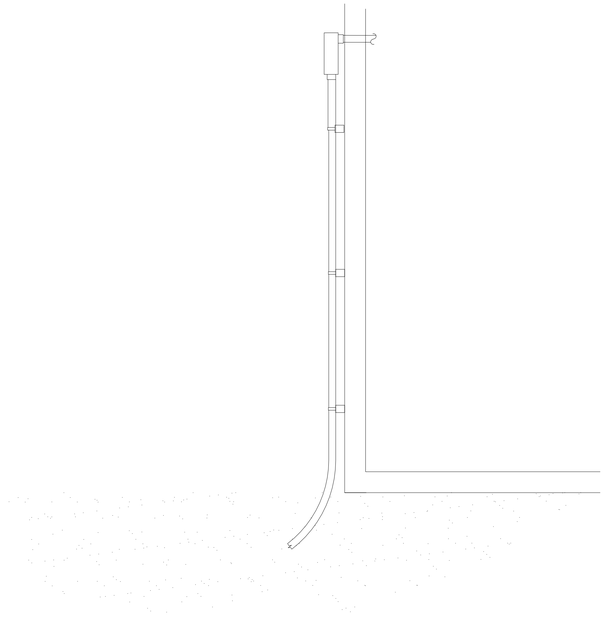
NOTES

1. CONDUIT RUN IS INSTALLED FROM THE LOCATION SHOWN IN PICTURE 1. CONDUIT CONTINUES UP OLD POWER HOUSE WALL AND ENDS IN THE LOCATION SHOWN ON PICTURE 3.

PICTURE 3: OLD POWERHOUSE SECOND FLOOR

NOTES

1. NEW CONDUIT TO BE INSTALLED FROM PULLING POINT SHOWN IN PICTURE 3 TO PANEL "DC4" IN CONTROL ROOM.



DETAIL 1: NEW POWERHOUSE CONDUIT RISER

NOTES

1. COMPLETE CONDUIT RISER AND BUILDING PENETRATION. SUPPORT PER APPLICABLE CODE REQUIREMENTS.

PICTURE 4: OLD POWERHOUSE DC EQUIPMENT

NOTES

1. INSTALL NEW EQUIPMENT IN LOCATIONS SHOWN. COORDINATE FINAL LOCATION WITH OWNER. CONDUIT ROUTING TO NEW EQUIPMENT TO BE DETERMINED IN THE FIELD.
2. ADDITIONAL J-BOX(ES) OR GUTTER REQUIRED FOR RETIREMENT OF 24 VDC CHARGER. SEE SHEET E3.03, PICTURE 4, NOTE 2 FOR MORE DETAILS. FIELD LOCATE TO ALLOW INSTALLATION OF NEW EQUIPMENT.

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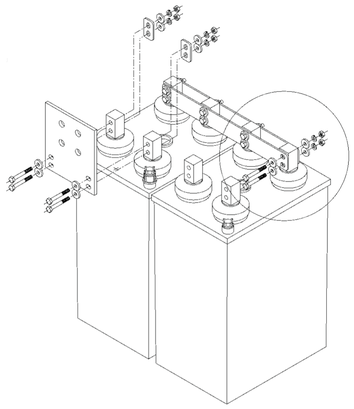
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E3.10	SITE AND CONDUIT ROUTING PLAN

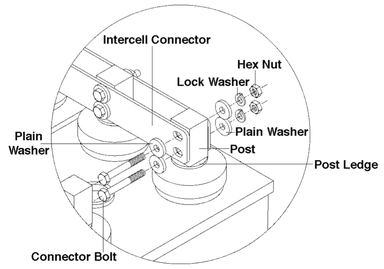
DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE DETAILS
e3.01.dwg

REF DWG(S):

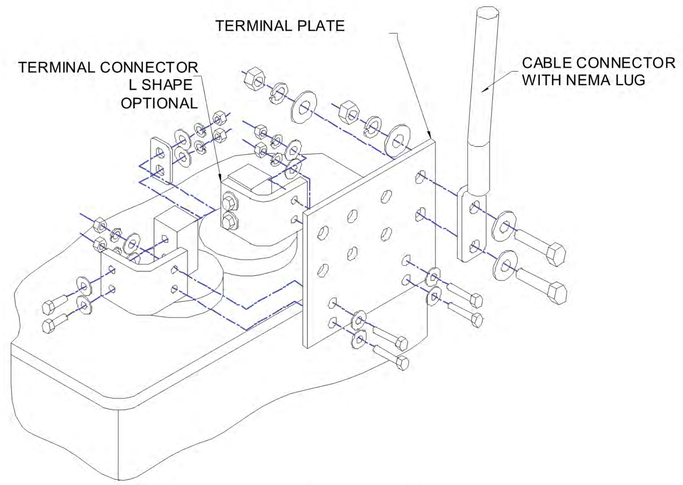
DRAWING NO.: E3.01



1 BATTERY CONNECTIONS, TYPICAL
N.T.S.



2 BATTERY CONNECTIONS, DETAIL, TYPICAL
N.T.S.



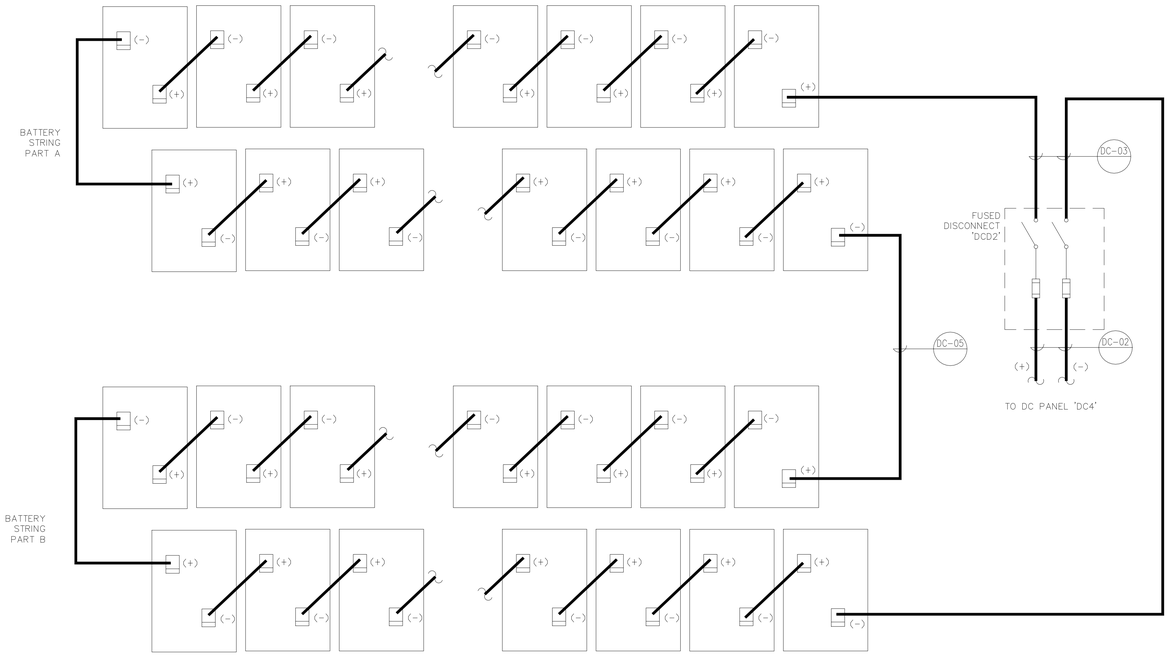
3 BATTERY TERMINAL PLATE INSTALLATION, TYPICAL
N.T.S.

Item No.	UNIT	EST. QTY.	TYPE/DESCRIPTION	MANUFACTURER	PART NUMBER
1	EA	60	BATTERY	ENERSYS	EC-15
2	EA	1	THERMOMETER, 30-130F/0-55C	ENERSYS	88330
3	EA	1	HYDROMETER, 1100-1300 S.G.	ENERSYS	81332
4	EA	60	FLAME ARRESTOR	ENERSYS	96300
5	EA	1	RACK RAIL LUBRICANT	ENERSYS	PRO-SLIDE
6	EA	1	CELL LIFTING DEVICE	ENERSYS	80136
7	EA	112	CONNECTOR, 8 HOLE	ENERSYS	93256TP
8	EA	TBD	HARDWARE PACKAGE 1/4X20	ENERSYS	803965
9	EA	4	CABLE ASSEMBLY, 1/0 (2) 2 HOLE 1/2 NEMA LUG, 48"	ENERSYS	90886-048
10	EA	8	TERMINAL PLATE, PKG 4	ENERSYS	802420TP
11	EA	1	INSTRUCTION MANUAL	ENERSYS	US-FL-IOM
12	EA	1	CELL NUMBERS, LARGE, 1-60	ENERSYS	802362
13	EA	1	NO-OX GREASE, 16 OZ	ENERSYS	82854
14	EA	2	RACK, ZONE 4L, 2 TIER, 132" LONG	ENERSYS	UE4L2T132A3RP
15	EA	2	SPILL CONTAINMENT, UL SYSTEM, 23" W X 136" L	ENERSYS	WUL 23-136
16	EA	21	CONNECTOR COVERS, 48" LONG	ENERSYS	827440
17	FT	8	TERMINAL PLATE COVERS	ENERSYS	825470
18	EA	1	AT-30 BATTERY CHARGER, 125VDC, 150A DC BREAKER	ENERSYS	AT30-130-100-E-208-H-X-H-X-X-G-X-X-X

4 BATTERY BANK AND RACK BILL OF MATERIALS
N.T.S.

NOTES

1. CONTRACTOR IS TO FOLLOW ALL BATTERY MANUFACTURER'S INSTALLATION INSTRUCTIONS. DETAILS PROVIDED ARE TYPICAL AND MAY VARY FROM ACTUAL INSTALLATION REQUIREMENTS.
2. COMBINE BATTERY CELLS IN SERIES (POSITIVE TERMINAL IN ONE BATTERY CONNECTED TO THE NEGATIVE TERMINAL IN THE NEXT) IN ORDER TO BUILD A 125 VDC BANK. SEE DETAIL 5 ON THIS SHEET FOR CONNECTIONS.
3. THE BASIS OF DESIGN IS ENERSYS BATTERIES AND MATERIALS INCLUDING RACKS, CONTAINMENT AND OTHER ACCESSORIES TO PROVIDE A COMPLETE BATTERY SYSTEM. OTHER BATTERIES OF EQUAL CAPACITY AND QUALITY ARE ACCEPTABLE IF APPROVED BY THE ENGINEER.
4. CONTRACTOR TO PROVIDE, INSTALL, SECURE AND SEISMIC BRACE BATTERY INSTALLATION PER ALL MANUFACTURER GUIDELINES AND RECOMMENDATIONS BASED ON THE RACK AND THE SEISMIC ZONE OF THE INSTALLATION.
5. THE BILL OF MATERIALS DOES NOT INCLUDE ALL ITEMS FOR THE PROJECT. THE REMAINDER OF THE MATERIALS REQUIRED ARE TO BE DETERMINED BY THE CONTRACTOR.



5 125 VDC BATTERY BANK CONNECTION DIAGRAM
N.T.S.

NOTES – DETAIL 5

1. CONNECT 60 BATTERIES IN SERIES TO CREATE 125 VDC BATTERY BANK.
2. NOT ALL BATTERIES ARE SHOWN FOR CLARITY.

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DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE – EPS JOB #: 17-0049

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DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
BATTERY BANK DETAILS
e3.02.dwg

REF DWG(S):

DRAWING NO.: E3.02

PICTURE 1: BATTERY ROOM

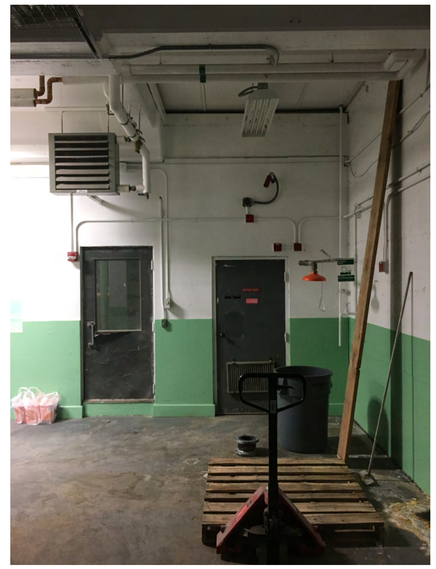
NOTES

1. DEMO 125 VDC BATTERY BANK AND ALL ASSOCIATED COMPONENTS AND ELECTRICAL CONDUIT AND WIRE TO ALLOW THE REMOVAL OF THE EXISTING WALLS AND CEILING. COORDINATE WITH OTHER TRADES AS REQUIRED.
2. DISPOSAL OF BATTERIES ONLY WILL BE BY THE CITY OF UNALASKA. CONTRACTOR IS TO PREPARE BATTERIES FOR LOCAL TRUCK TRANSPORT.
3. DISPOSAL OF ALL OTHER REMAINING MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR.

PICTURE 2: BATTERY ROOM CEILING

NOTES

1. PICTURE 2 SHOWS A TYPICAL PORTION OF THE CEILING FOR THE BATTERY ROOM. DEMO ALL CONDUITS AS REQUIRED TO ALLOW RECONSTRUCTION OF THE ENTIRE ROOM.



PICTURE 3: OLD POWERHOUSE BATTERY ROOM ENTRANCE

NOTES

1. REMOVE AND REINSTALL FIRE ALARM DEVICES, CONDUIT AND WIRE. COORDINATE WITH MECHANICAL CONTRACTOR.
2. TEST ALL RELOCATED ALARM DEVICES AS REQUIRED BY AHJ IN ORDER TO RE-CERTIFY ALARM SYSTEM.

PICTURE 4: OLD POWERHOUSE DC EQUIPMENT - DEMO

NOTES

1. REMOVE BATTERY CHARGER, CHARGER STAND AND DC PANEL IN ENTIRETY. CONDUIT TO PANEL "AC-7" IS AVAILABLE FOR REUSE AND MUST BE RECONFIGURED FOR INSTALLATION OF NEW CHARGER.
2. REMOVE 24 VDC BATTERY CHARGER AND JUNCTION BOX. RETIRE ASSOCIATED CONDUITS TO ALLOW INSTALLATION OF NEW EQUIPMENT. CIRCUITS WILL BE RECONNECTED BY OWNER AFTER PROJECT IS COMPLETE. INSTALL JUNCTION BOX(S) OR GUTTER(S) TO PRESERVE THE CONDUCTORS. LABEL ALL CIRCUITS. COORDINATE WORK WITH OWNER PRIOR TO STARTING DEMOLITION.

DEMOLITION

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	ISSUED FOR BID	KER/06-19-2018	WBF/06-19-2018

ENG. STAMP

Electric Power Systems Inc.
Consulting Engineers
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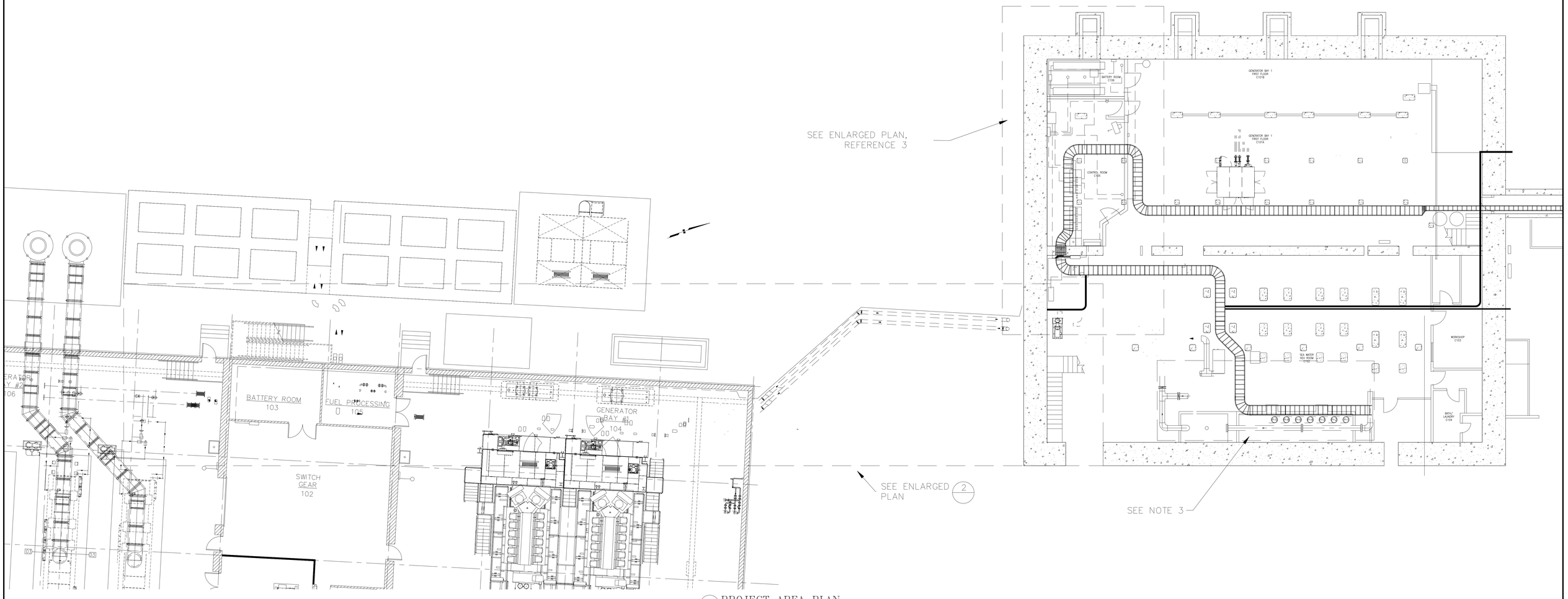
FAX: (907) 522-1182
WEB: WWW.EPSINC.COM

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
DETAILS - DEMO
e3.03.dwg

REF DWG(S):

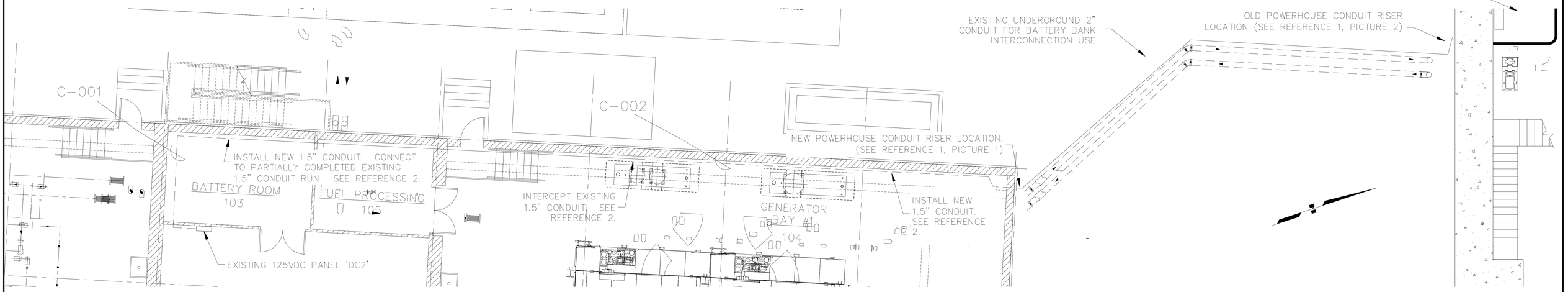
DRAWING NO.: E3.03



1 PROJECT AREA PLAN

NOTES:

1. CONDUIT ROUTING SHOWN MAY BE FIELD ADJUSTED BY CONTRACTOR AFTER COORDINATION WITH THE OWNER. REFER TO CONDUIT SCHEDULE FOR ESTIMATED LENGTHS. CONDUIT RUNS MAY NOT BE SHOWN IN ENTIRETY ON DRAWING.
2. CONTRACTOR TO ADD PULL BOXES AS NECESSARY.
3. RGS OR PVC CONDUIT ONLY IN THIS AREA. EMT NOT PERMITTED.



2 NEW POWERHOUSE BATTERY ROOM, WARTSILLA BAY AND INTERCONNECT TO OLD POWERHOUSE ENLARGED PLAN

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

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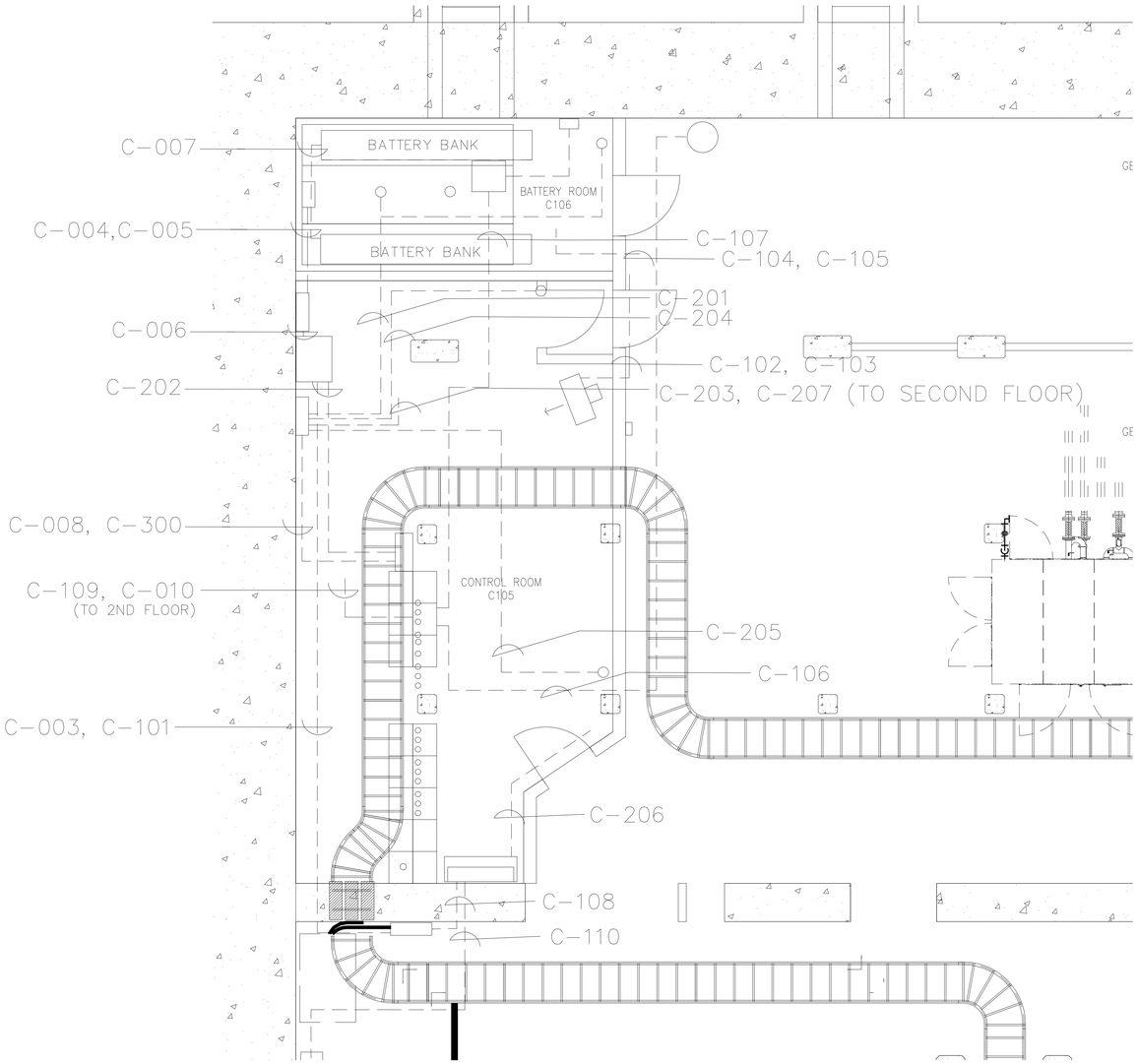
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E3.01	DETAILS
2	E0.10	CABLE AND CONDUIT SCHEDULE
3	E3.11	SITE AND CONDUIT ROUTING PLAN

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE SITE AND CONDUIT ROUTING PLAN

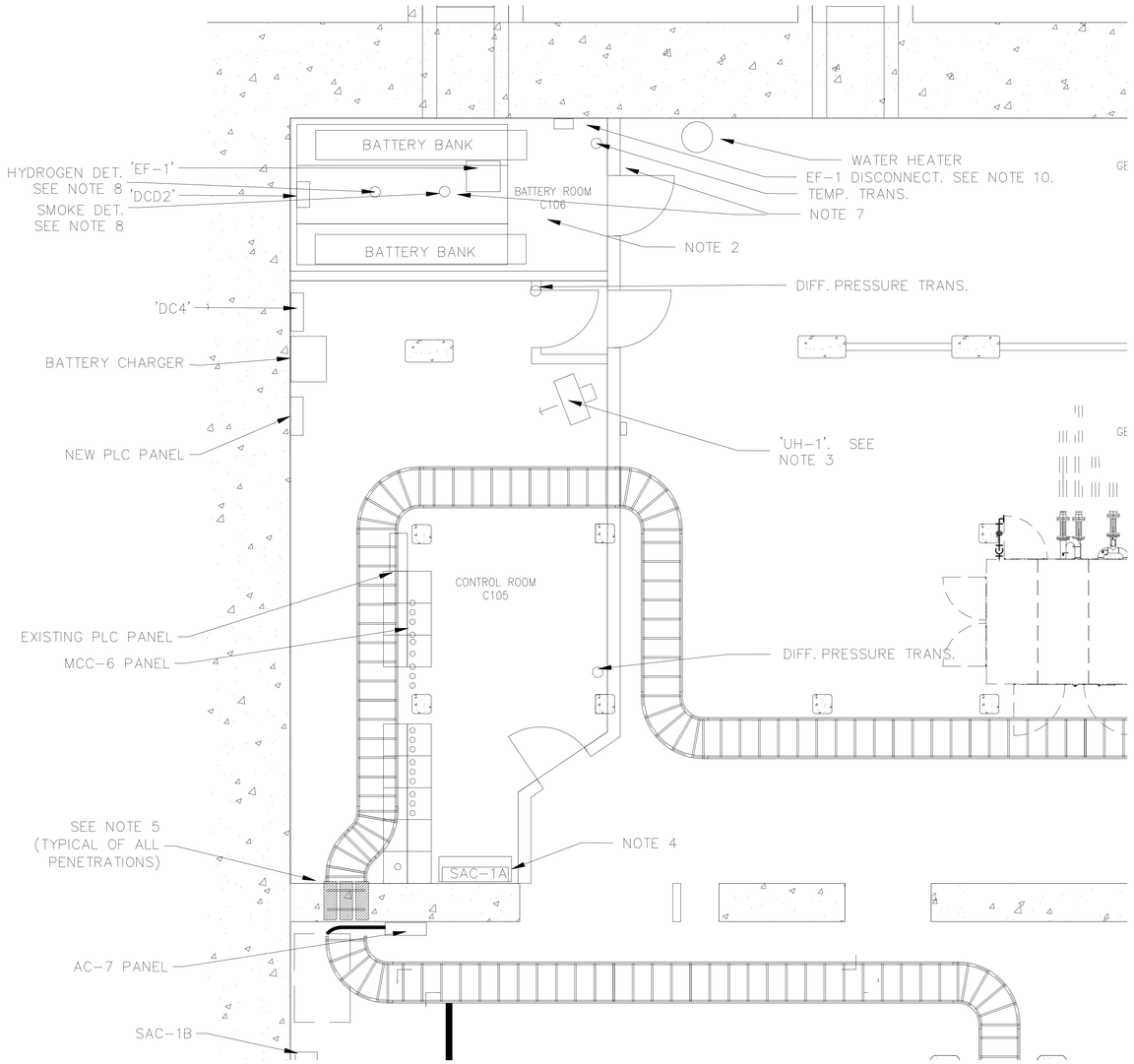
e3.10.dwg

REF. DWG(S):

DRAWING NO.: E3.10



1 OLD POWERHOUSE BATTERY AND CONTROL ROOMS CONDUIT PLAN



2 OLD POWERHOUSE BATTERY AND CONTROL ROOMS EQUIPMENT LOCATION PLAN

NOTES:

1. CONDUIT ROUTING SHOWN MAY BE FIELD ADJUSTED BY CONTRACTOR AFTER COORDINATION WITH THE OWNER. REFER TO CONDUIT SCHEDULE FOR ESTIMATED LENGTHS. CONDUIT RUNS MAY NOT BE SHOWN IN ENTIRETY ON DRAWING.
2. UTILIZE EXISTING LIGHTING CIRCUIT FOR NEW BATTERY ROOM LIGHTING. NEW SWITCH TO BE LOCATED ON EXTERIOR OF THE BATTERY ROOM. PROVIDE AND INSTALL TWO EATON/COOPER LUMINAIRES PER LIGHTING SCHEDULE. FIELD LOCATE FIXTURES IN COORDINATION WITH MECHANICAL CONTRACTOR AND OWNER.
3. UNIT HEATER UH-1 IS TO BE RELOCATED. SEE MECHANICAL FOR ADDITIONAL DETAILS. INSTALL LINE VOLTAGE THERMOSTAT. COORDINATE FINAL LOCATION, CONDUIT ROUTING WITH OWNER AND MECHANICAL CONTRACTOR.
4. PROVIDE NEW CIRCUIT FOR MINI-SPLIT UNIT SAC-1. SEE MECHANICAL FOR ADDITIONAL DETAILS. INSTALL CONTROLLER. COORDINATE FINAL LOCATION OF CONTROLS WITH OWNER AND MECHANICAL CONTRACTOR.
5. CONTRACTOR TO SEAL ALL WALL PENETRATIONS (CONDUIT, CABLE, UNUSED, ETC.) WITHIN ROOM WITH INSULATION AND FLASHING (BOTH SIDES).
6. PROVIDE POWER AND CONTROLS CIRCUITS TO AHU-1, LOCATED ON SECOND FLOOR ABOVE CONTROL ROOM. CONDUIT ROUTING IS TO BE DETERMINED IN THE FIELD BY CONTRACTOR. SEE REFERENCE 3 FOR CONTINUATION.
7. RELOCATE CONDUITS FOR EXISTING FIRE ALARM AND LIGHTING CIRCUIT INSIDE BATTERY ROOM AND ON THE FACE OF THE ENTRY WALL TO THE BATTERY ROOM. RETAIN ALL DETECTION AND ALARM DEVICES AND REINSTALL ON NEW WALL AND CEILING IN SAME LOCATION AS PREVIOUSLY INSTALLED.
8. INSTALL HYDROGEN DETECTION AND FIRE DETECTION DEVICES INSIDE OF NEW BATTERY ROOM. TEST ALL NEW AND REINSTALLED FIRE SYSTEM COMPONENTS TO ENSURE ENTIRE SYSTEM IS PROPERLY CERTFIED BY THE AUTHORITY HAVING JURISDICTION.
9. CONTRACTOR TO ADD PULL BOXES AS NECESSARY.
10. FIELD LOCATE EF-1 AND AHU-1 MAINTENANCE DISCONNECTS WITHIN SIGHT OF FAN MOTOR.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

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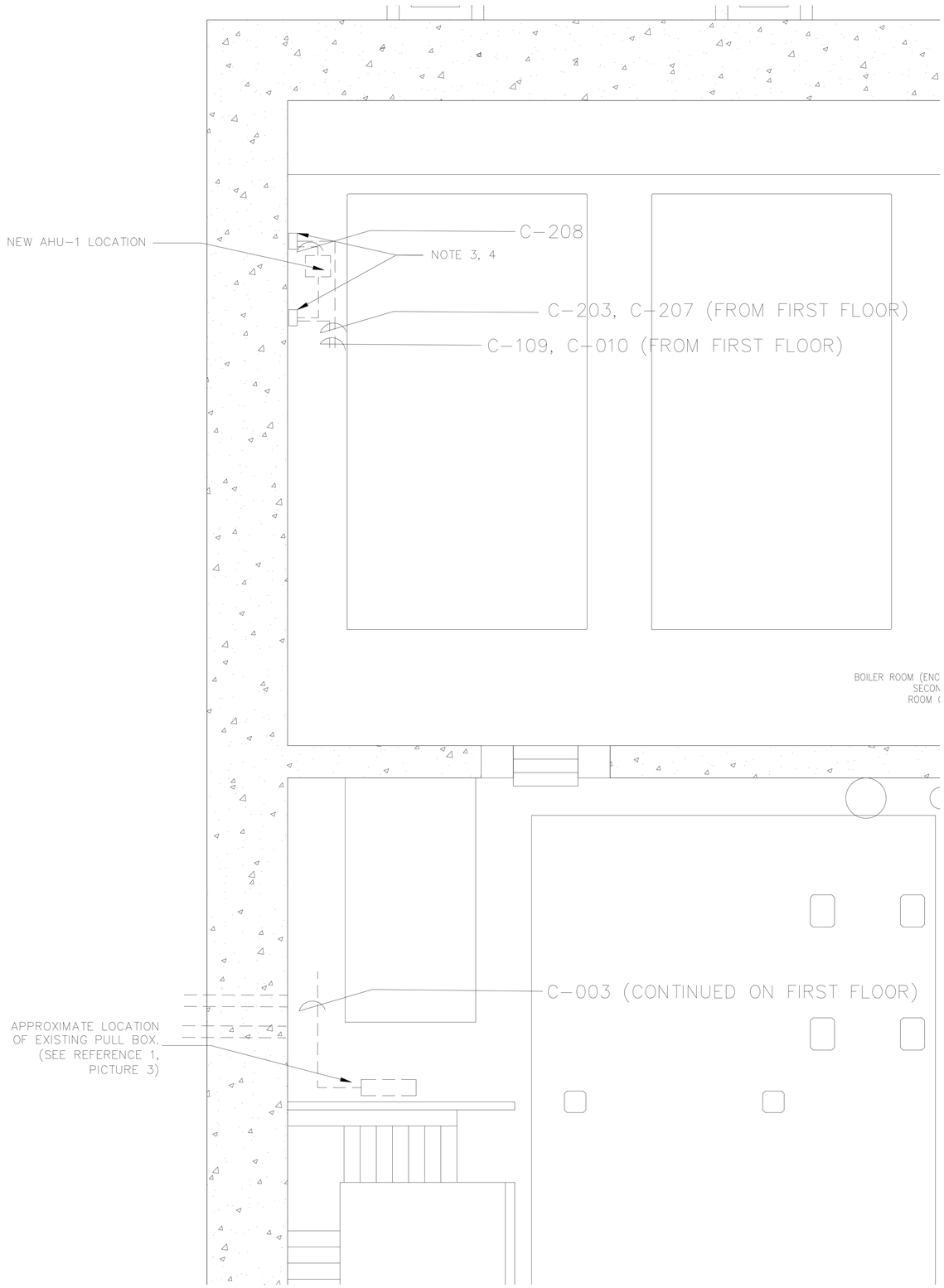
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E3.01	DETAILS
2	E0.10	CABLE AND CONDUIT SCHEDULE
3	E3.12	SITE AND CONDUIT ROUTING PLAN

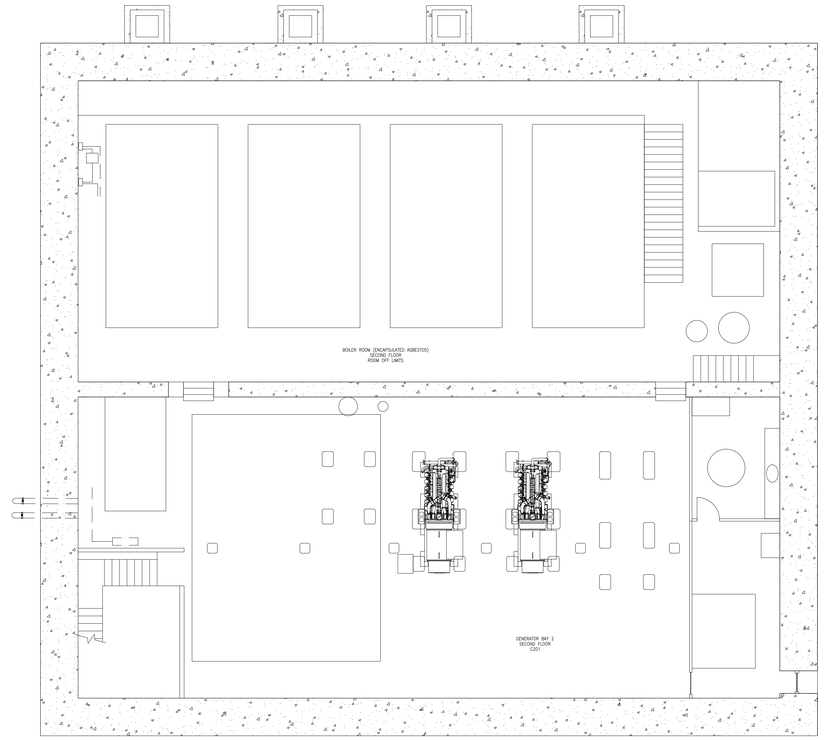
DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
SITE AND CONDUIT ROUTING PLAN
e3.11.dwg

REF DWG(S):

DRAWING NO.: E3.11



1 OLD POWERHOUSE SECOND FLOOR PLAN



2 OLD POWERHOUSE SECOND FLOOR PROJECT AREA PLAN

NOTES:

1. CONDUIT ROUTING SHOWN MAY BE FIELD ADJUSTED BY CONTRACTOR AFTER COORDINATION WITH THE OWNER.
2. CONTRACTOR TO SEAL ALL WALL PENETRATIONS (CONDUIT, CABLE, UNUSED, ETC.) WITHIN CONTROL ROOM WITH INSULATION AND FLASHING (BOTH SIDES).
3. PROVIDE POWER AND CONTROLS CIRCUITS TO AHU-1, LOCATED ON SECOND FLOOR ABOVE CONTROL ROOM. CONDUIT ROUTING IS TO BE DETERMINED IN THE FIELD BY CONTRACTOR.
4. FIELD LOCATE AHU-1 MAINTENANCE DISCONNECT WITHIN SIGHT OF FAN MOTOR.
5. CONTRACTOR TO ADD PULL BOXES AS NECESSARY.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E3.01	DETAILS
2	E0.10	CABLE AND CONDUIT SCHEDULE

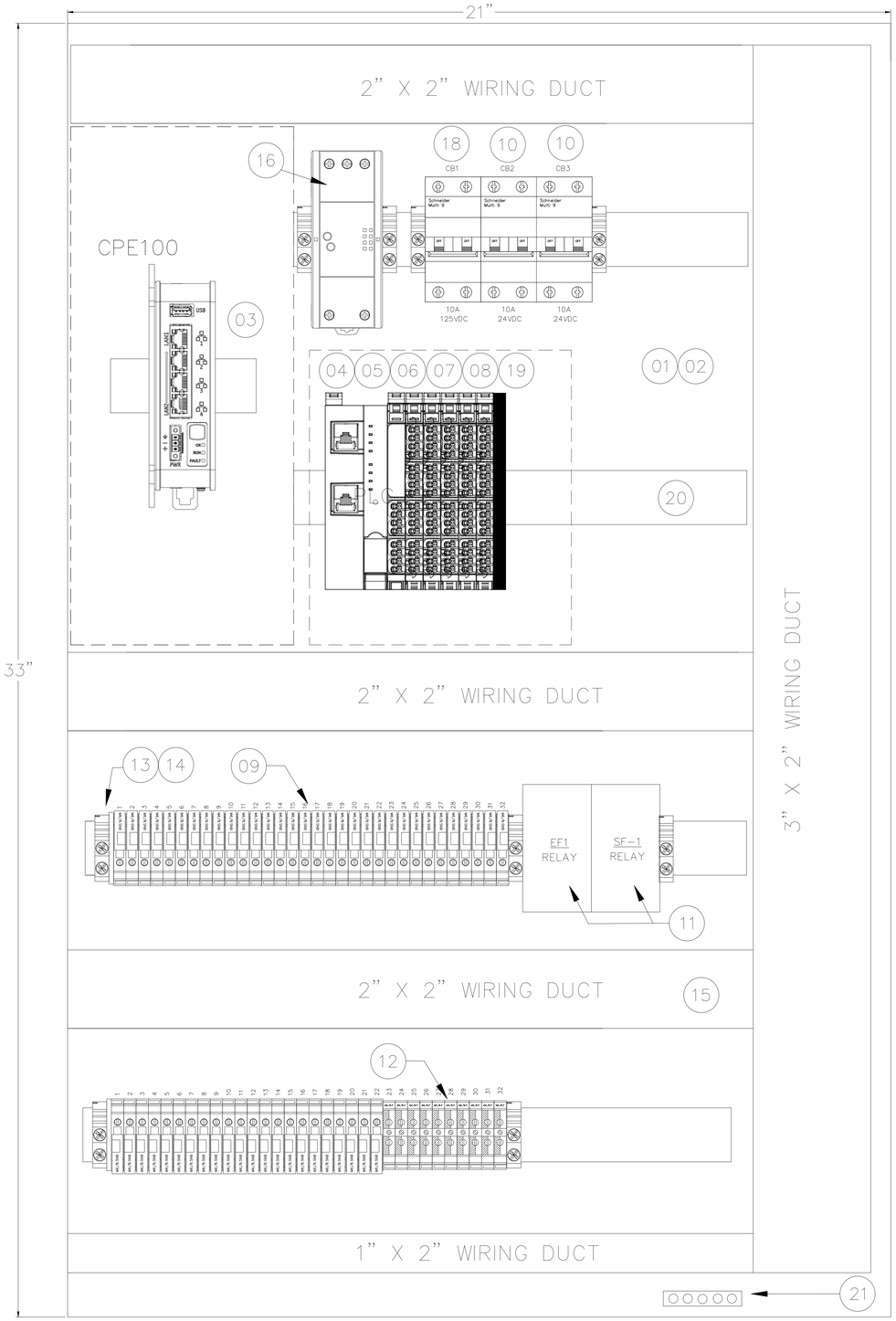
DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
SITE AND CONDUIT ROUTING PLAN
e3.12.dwg

REF DWG(S):

DRAWING NO.: E3.12

BILL OF MATERIAL FOR PLC CONTROL PANEL 'PLCP'

REF. NO.	UNIT	EST. QTY.	DESCRIPTION	MFGR./CATALOG NO.
01	EA	1	WALL MOUNT ENCLOSURE, NEMA 12 WITH WALL-MOUNTING BRACKETS KIT	HOFFMAN/CSD362412LG
02	EA	1	ENCLOSURE SUB-PANEL, CONDUCTIVE	HOFFMAN/CP3624G
03	EA	1	COMPACT CONTROLLER	GENERAL ELECTRIC/CPE100
04	EA	1	REMOTE I/O CONTROLLER	GENERAL ELECTRIC/EPXPNS001
05	EA	1	24VDC DISCRETE INPUT, 8 POINTS	GENERAL ELECTRIC/EP-1218
06	EA	1	24VDC DISCRETE OUTPUT, 4 POINTS	GENERAL ELECTRIC/EP-2614
07	EA	1	ANALOG INPUT, ISOLATED, 8 CHANNELS	GENERAL ELECTRIC/EP-3368
08	EA	1	ANALOG OUTPUT, ISOLATED, 4 CHANNELS	GENERAL ELECTRIC/EP-4264
09	EA	54	TERMINAL, SWITCH BLOCK, TYPE M6/8.SNB	ABB/1SNA 115 688 R2500
10	EA	2	24VDC 5A BREAKER	EATON/FAZ-C10-2-DC
11	EA	2	1/3 HP 24VDC COIL NON-REVERSING CONTACTOR	IDEC/YS3N-9FG210D024
12	EA	7	GROUND BLOCK, TYPE M6/8.P	ABB/1SNA 165 114 R1700
13	EA	9	END STOPS	ABB/1SNA 103 002 R2600
14	EA	2	END SECTION	ABB/
15	EA		WIRING DUCT (QTY. AS REQUIRED)	COMMODITY
16	EA	1	POWER SUPPLY, 24 VDC, 120W	IDEC/PS5R-VF24
17	EA	1	END CAPS, FOR PLC INSTALLATION	GENERAL ELECTRIC
18	EA	1	125VDC 10A 2P BREAKER	EATON/FAZ-C10-2-DC
19	EA	1	ANALOG INPUT, ISOLATED, 4 CHANNELS	GENERAL ELECTRIC/EP-3264
20	EA	1	DIN RAIL (QTY. AS REQUIRED)	COMMODITY
21	EA	1	GROUND BAR	SCHNEIDER ELECTRIC/PK4GTA
22	EA	2	END BRACKET, FOR PLC INSTALLATION	GENERAL ELECTRIC



NOTES:

1) ALL WIRING TO BE #14 GRAY SIS UNLESS MARKED OTHERWISE.
2) ALL TWISTED SHIELDED CABLE TO BE 16-18 AWG.

1\ CONSTRUCTION NOTES:

1. THE PANEL SHOWN IN THIS DRAWING IS OWNER FURNISHED. CONSTRUCTION CONTRACTOR IS TO INSTALL THIS PANEL IN THE OLD POWER HOUSE AND PROVIDE ALL FIELD CONNECTIONS.

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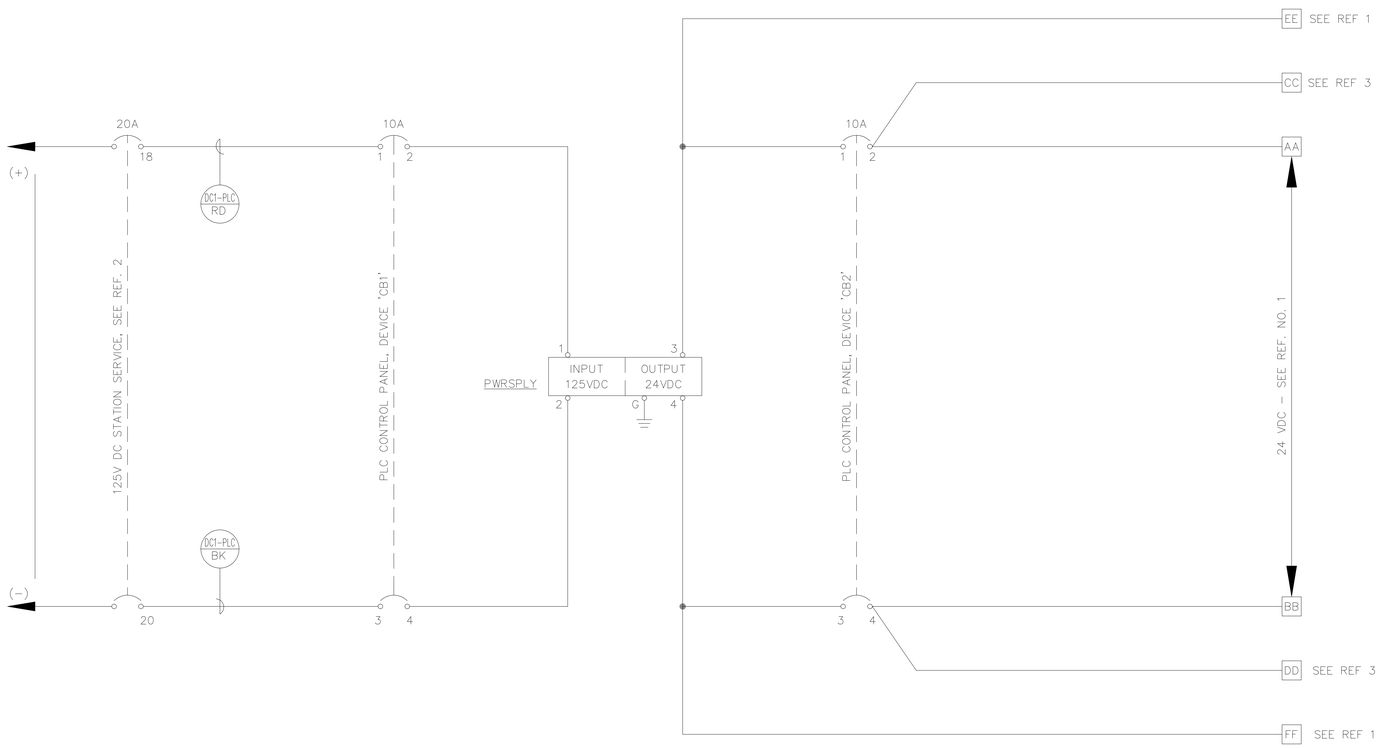
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
PLC PANEL ELEVATION AND
BILL OF MATERIALS
e4.00.dwg

REF DWG(S):

DRAWING NO.: E4.00



PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	ISSUED FOR BID	KER/06-19-2018	WBF/06-19-2018

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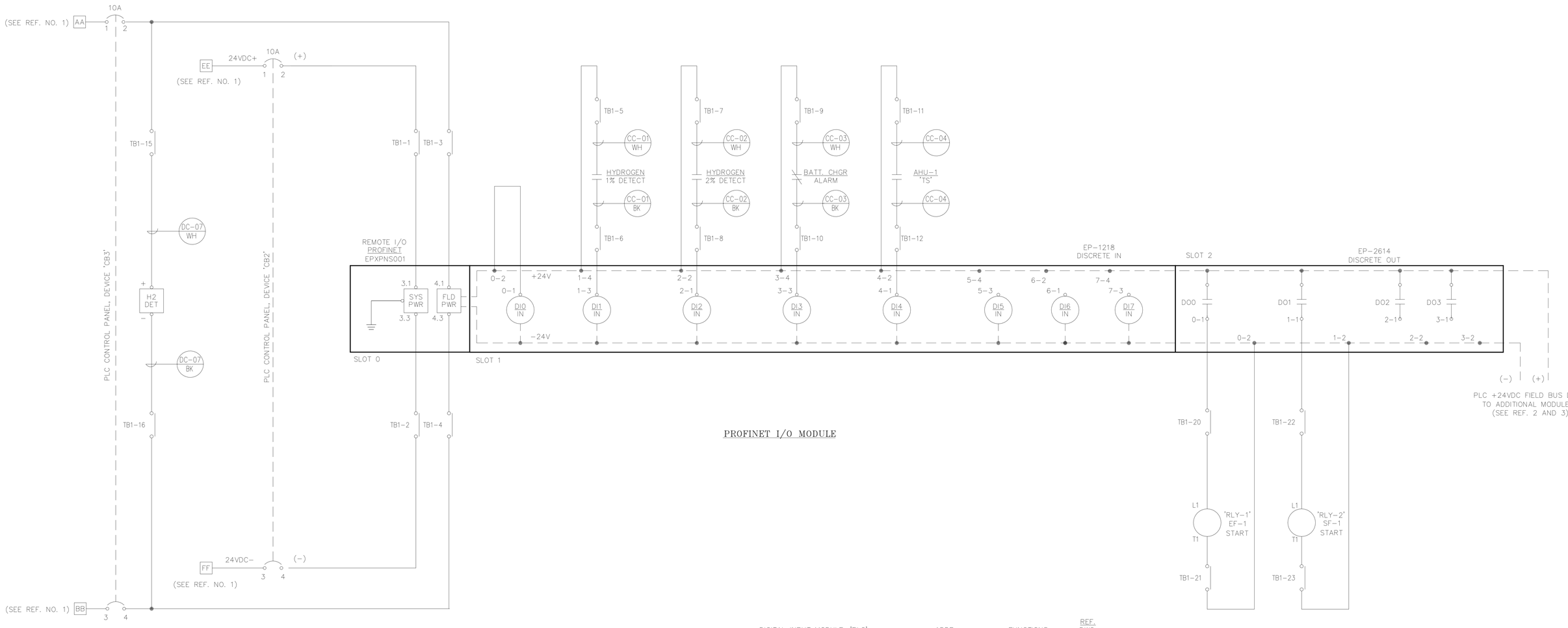
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E5.01	PLC DISCRETE INPUT AND OUTPUT SCHEMATIC
2	E1.19	ELECTRICAL PANEL SCHEDULES
3	E5.04	HVAC AND BATTERY CHARGER SCHEMATIC

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
PLC PANEL POWER SUPPLY
e5.00.dwg

REF DWG(S):

DRAWING NO.: E5.00

SHEET 18 OF 29



PROFINET I/O MODULE

DIGITAL INPUT MODULE, 'PLC'	ADDR	FUNCTIONS	REF. DWG.
24VDC 0-2 — 0-1 — DI 0	--	24 VDC MONITOR	-
TB1-6 — 1-3 — DI 1	--	HYDROGEN 1% DETECT	-
TB1-8 — 2-1 — DI 2	--	HYDROGEN 2% DETECT	-
TB1-10 — 3-3 — DI 3	--	BATTERY CHARGER ALARM	-
TB1-12 — 4-1 — DI 4	--	AHU-1 TEMP SWITCH TS	-
5-3 — DI 5	--	SPARE	-
6-1 — DI 6	--	SPARE	-
7-3 — IN7	--	SPARE	-

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

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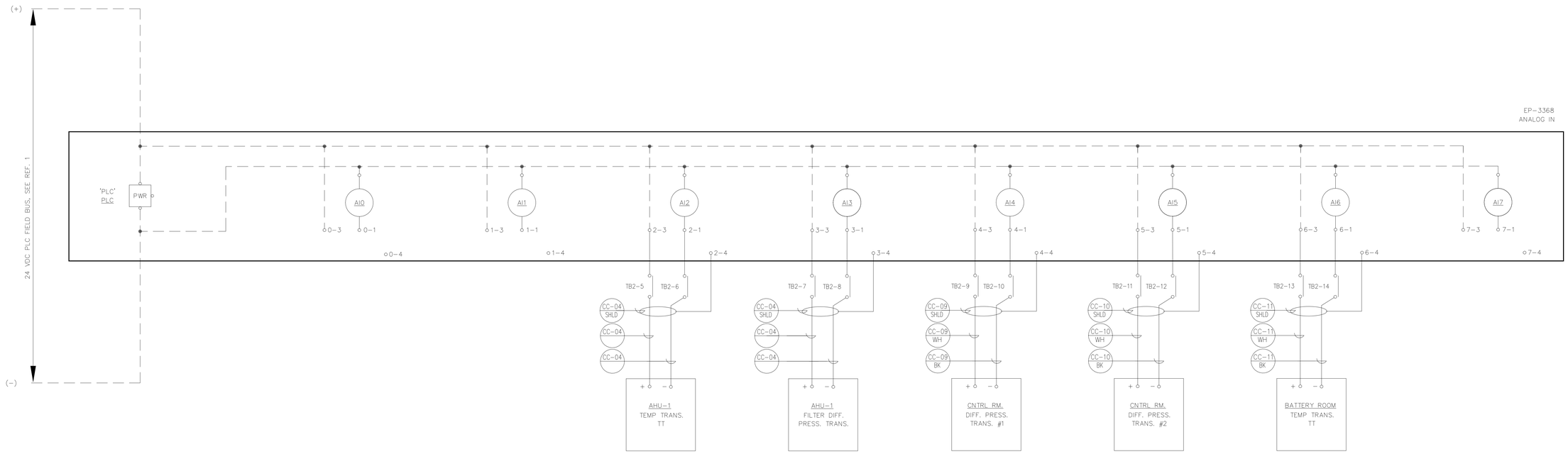
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E5.00	PLC PANEL POWER SUPPLY
2	E5.02	PLC ANALOG INPUT SCHEMATIC
3	E5.03	PLC ANALOG INPUT AND OUTPUT SCHEMATIC

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
PLC DISCRETE INPUT AND OUTPUT SCHEMATIC
e5.01.dwg

REF. DWG(S):

DRAWING NO.: E5.01



1 PLC ANALOG INPUTS
N.T.S.

ANALOG INPUT MODULE, 'PLC'	ADDR	FUNCTIONS	REF. DWG.
AI1 0-1	----	SPARE	-
AI2 1-1	----	SPARE	-
AI3 2-1 TB2-6	----	AHU-1 TEMP TRANS. TT	-
AI4 3-1 TB2-8	----	AHU-1 FILTER DIFF. PRESS. TRANS.	-
AI5 4-1 TB2-10	----	CNTRL RM. DIFF. PRESS. TRANS. #1	-
AI6 5-1 TB2-12	----	CNTRL RM. DIFF. PRESS. TRANS. #2	-
AI5 6-1 TB2-14	----	BATT. RM TEMP TRANS. #1	-
AI5 7-1	----	SPARE	-

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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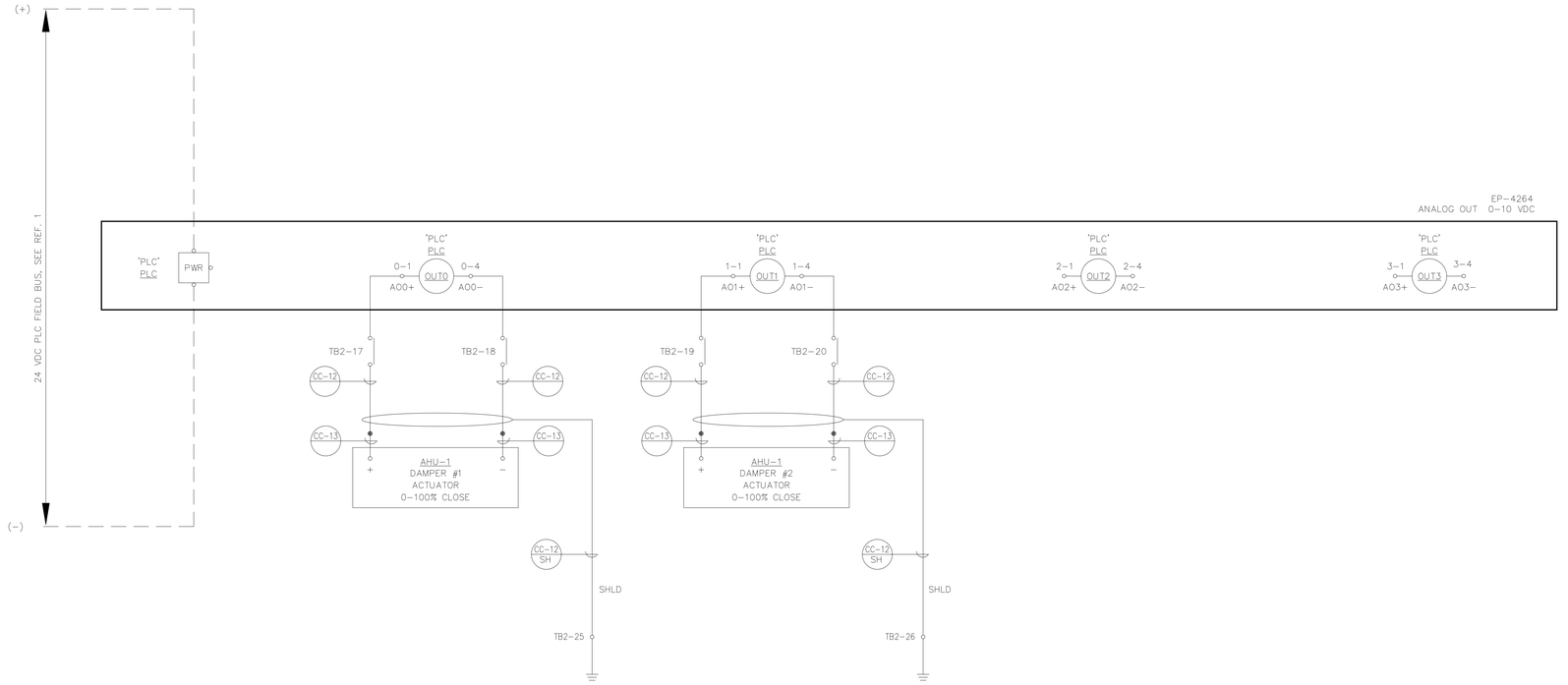
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E5.01	PLC DISCRETE INPUT AND OUTPUT SCHEMATIC

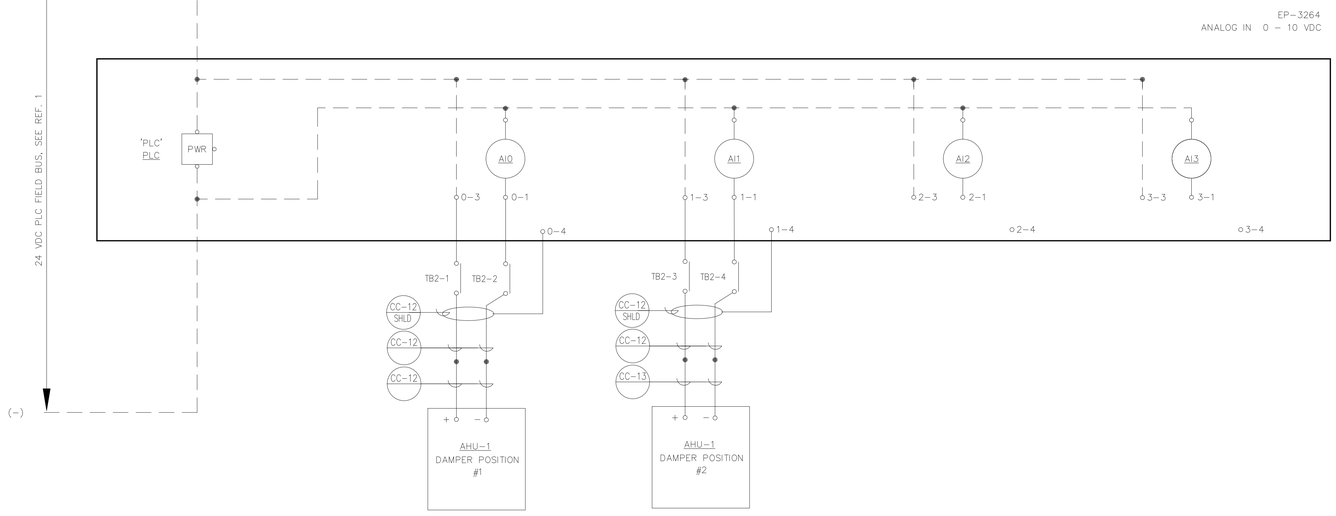
DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
PLC ANALOG INPUT SCHEMATIC
e5.02.dwg

REF DWG(S):

DRAWING NO.: E5.02



ANALOG OUTPUT MODULE, 'PLC'	ADDR	FUNCTIONS	REF. DWG.
0-1 OUT0 0-4 — TB2-17 / TB2-18	--	DAMPER #1 ACTUATOR 0-100% CLOSE	-
1-1 OUT1 1-4 — TB2-19 / TB2-20	--	DAMPER #2 ACTUATOR 0-100% CLOSE	-
2-1 OUT2 2-4	--	SPARE	-
3-1 OUT3 3-4	--	SPARE	-



ANALOG INPUT MODULE, 'PLC'	ADDR	FUNCTIONS	REF. DWG.
IN1 0-1 — TB2-2	----	AHU-1 DAMPER POSITION #1	-
IN2 1-1 — TB2-4	----	AHU-1 DAMPER POSITION #2	-
IN3 2-1	----	SPARE	-
IN4 3-1	----	SPARE	-

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

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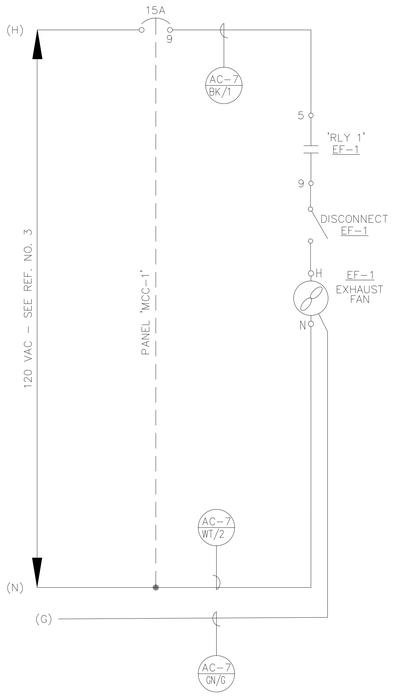
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E5.02	PLC ANALOG INPUT SCHEMATIC

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
PLC ANALOG INPUT AND OUTPUT SCHEMATIC
e5.03.dwg

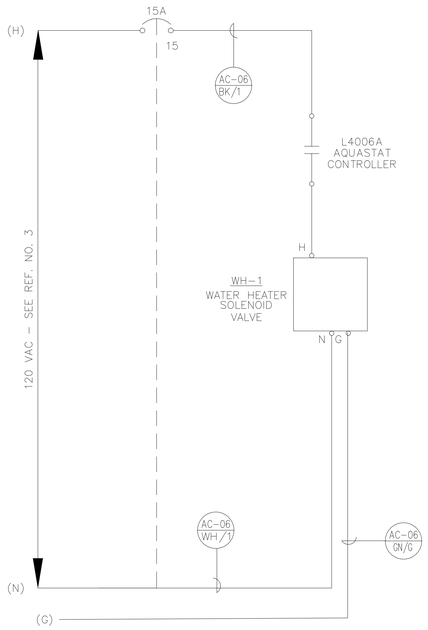
REF DWG(S):

DRAWING NO.: E5.03



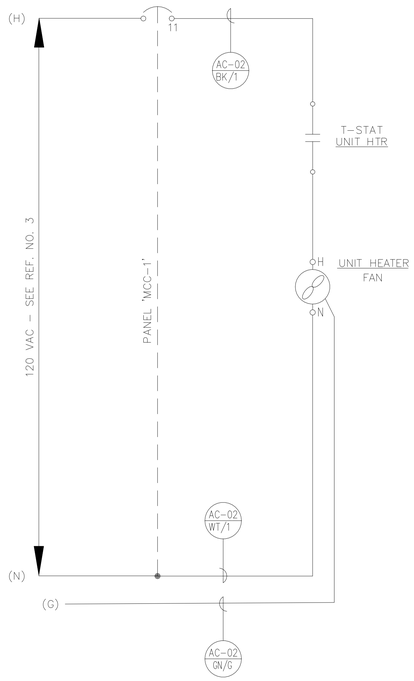
1 EF-1 SCHEMATIC

N.T.S.



2 WATER HEATER ZONE VALVE

N.T.S.

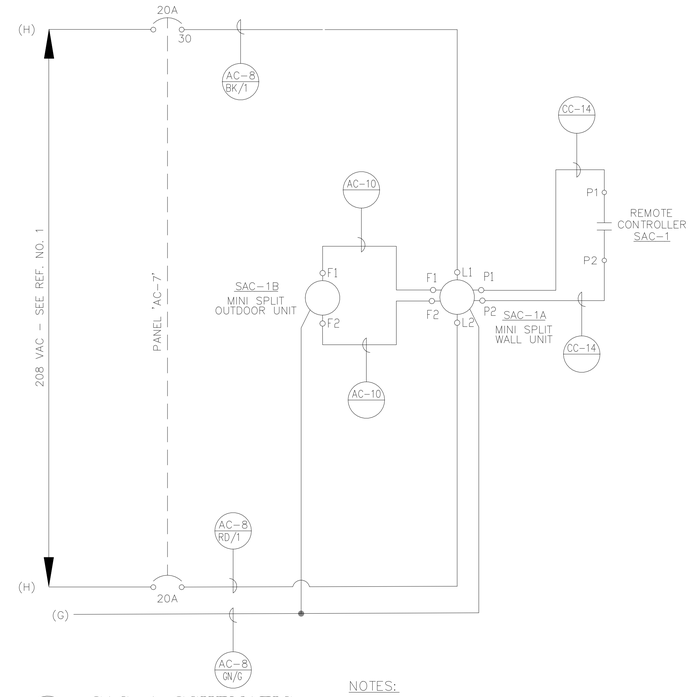


3 UNIT HEATER SCHEMATIC

N.T.S.

NOTES:

(1) UNIT HEATER IS EXISTING AND IS TO BE RELOCATED. REROUTE CONDUITS AND REINSTALL DEVICES AS REQUIRED TO COMPLETE CONTROL CIRCUIT.

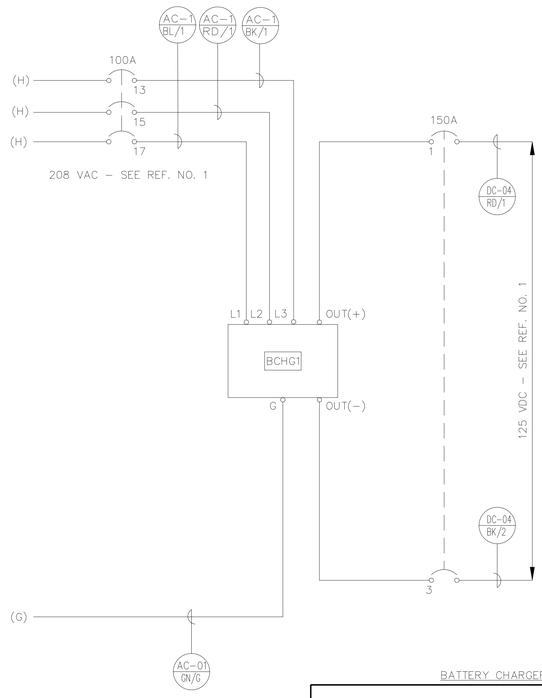


4 SAC-1 SCHEMATIC

N.T.S.

NOTES:

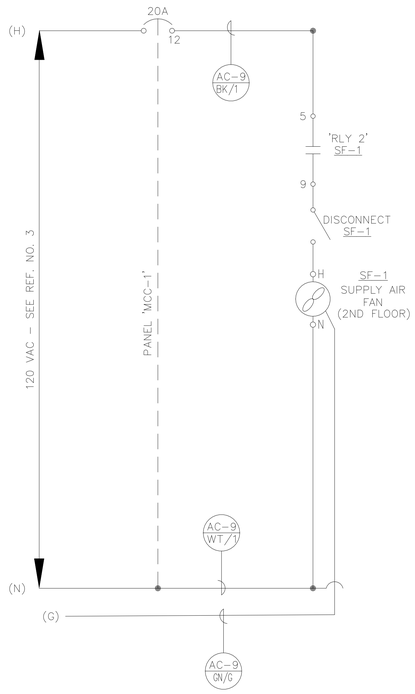
(1) REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR ADDITIONAL WIRING AND TERMINATION DETAILS.



5 BATTERY CHARGER

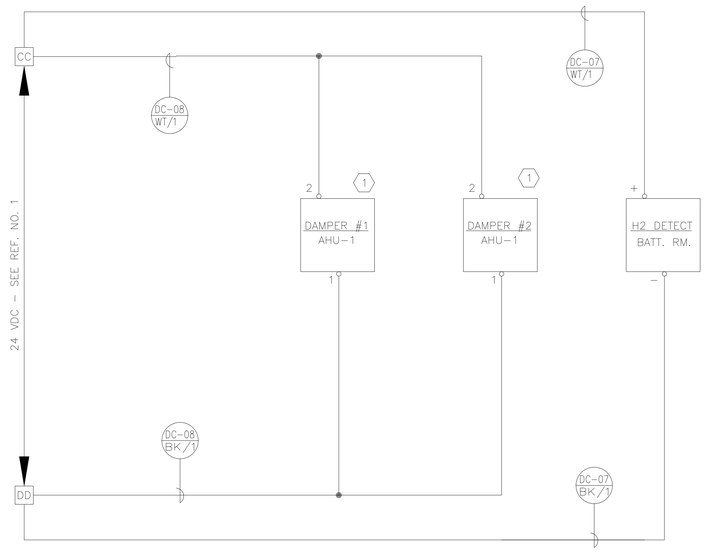
NO SCALE

BATTERY CHARGER	FUNCTIONS	REF. DWG.
ALARM TB1-9 TB3-NC TB3-C TB1-10	BATTERY CHARGER ALARM	2



6 SF-1 SCHEMATIC

N.T.S.



NOTES:

(1) SEE REFERENCE 4 AND 5 FOR DAMPER CONTROL AND FEEDBACK.

7 FIELD DEVICE DC SCHEMATIC

N.T.S.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	ISSUED FOR BID	KER/06-19-2018	WBF/06-19-2018

ENG. STAMP

Electric Power Systems Inc.
Consulting Engineers
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WEB: WWW.EPSINC.COM

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
1	E1.19	ELECTRICAL PANEL SCHEDULES
2	E5.01	PLC DISCRETE INPUT AND OUTPUT SCHEMATIC
3	E1.20	ELECTRICAL PANEL SCHEDULE MCC 1 PANEL 6
4	E5.02	PLC ANALOG INPUT SCHEMATIC
5	E5.03	PLC ANALOG INPUT AND OUTPUT SCHEMATIC

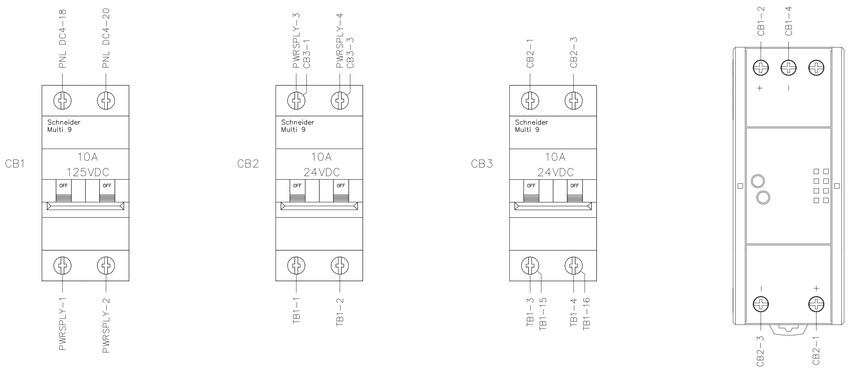
DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
HVAC AND BATTERY CHARGER SCHEMATIC

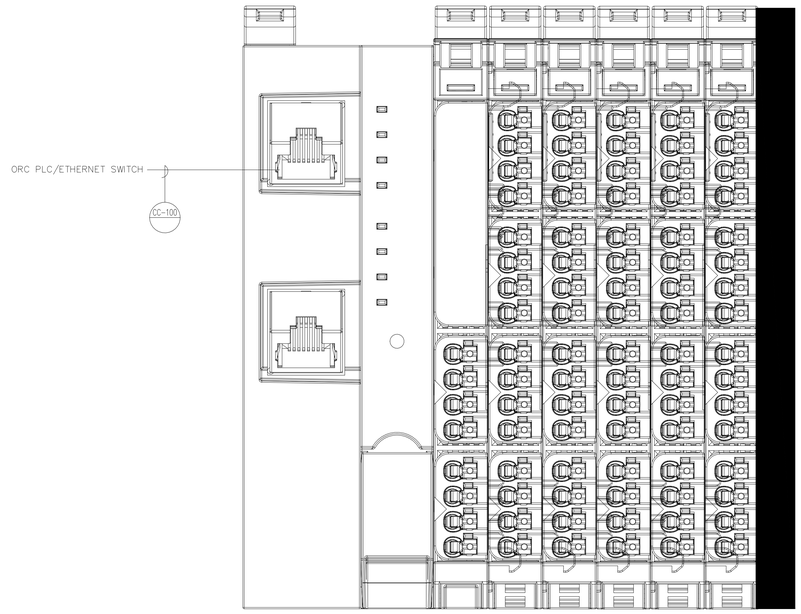
e5.04.dwg

REF DWG(S):

DRAWING NO.: E5.04

SHEET 22 OF 29





EF-1 START [RLY-1]
24VDC COIL
1/3 HP

SF-1 START [RLY-2]
24VDC COIL
1/3 HP

RLY-1
L1-PANEL MCC-1, CKT 9
T1-DISCONNECT 'EF-1'
A1-TB1-20
A2-TB1-21

RLY-2
L1-PANEL MCC-1, CKT 12
T1-DISCONNECT 'SF-1'
A1-TB1-22
A2-TB1-23

PLC

3.1	= TB1-1
3.3	= TB1-2
4.1	= TB1-3
4.3	= TB1-4

EP-1218

0-1	= EP-1218/0-2
0-2	= EP-1218/0-1
1-3	= TB1-6
1-4	= TB1-5
2-1	= TB1-8
2-2	= TB1-7
3-3	= TB1-10
3-4	= TB1-9
4-1	= TB1-12
4-2	= TB1-11

EP-2614

0-1	= TB1-20
0-2	= TB1-21
1-3	= TB1-22
1-4	= TB1-23

EP-3368

2-1	= TB2-6
2-3	= TB2-5
2-4	= SHIELD
3-1	= TB2-8
3-3	= TB2-7
3-4	= SHIELD
4-1	= TB2-10
4-3	= TB2-9
4-4	= SHIELD
5-1	= TB2-12
5-3	= TB2-11
5-4	= SHIELD
6-1	= TB2-14
6-3	= TB2-13
6-4	= SHIELD

EP-3264

0-1	= TB2-2
0-3	= TB2-1
0-4	= SHIELD
1-1	= TB2-4
1-3	= TB2-3
1-4	= SHIELD

EP-4264

0-1	= TB2-17
0-4	= TB2-18
1-1	= TB2-19
1-4	= TB2-20

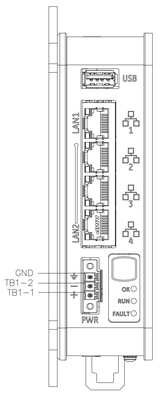
TB-1

CB2-2	1	24 VDC+	G	CPE-100 + PLC - 3.1
CB2-4	2	DC-	G	CPE-100 - PLC - 3.4
CB3-2	3	DC+	G	PLC - 4.1
CB3-4	4	DC-	G	PLC - 4.3
EP-1218/1-4	5	DC+	G	HYDROGEN ALARM 1%
EP-1218/1-3	6	IN01	G	HYDROGEN ALARM 1%
EP-1218/2-2	7	DC+	G	HYDROGEN ALARM 2%
EP-1218/2-1	8	IN02	G	HYDROGEN ALARM 2%
EP-1218/3-4	9	DC+	G	BATTERY CHARGER ALARM
EP-1218/3-3	10	IN03	G	BATTERY CHARGER ALARM
EP-1218/4-2	11	DC+	G	AHU-1 'TS'-12
EP-1218/4-1	12	IN04	G	AHU-1 'TS'-11
	13	SPARE	G	
	14	SPARE	G	
CB3-2	15	DC+	G	HYDROGEN DETECTOR/DC+
CB3-4	16	DC-	G	HYDROGEN DETECTOR/DC-
	17	DC+	G	AHU-1 DAMPER/DC+ (TB-AHU/1)
	18	DC-	G	AHU-1 DAMPER/DC- (TB-AHU/2)
	19	SPARE	G	
RLY-1 - 13	20	D.O.00	G	EP-2614/0-1
RLY-1 - 14	21	DC-	G	EP-2614/0-2
RLY-2 - 13	22	D.O.01	G	EP-2614/1-1
RLY-2 - 14	23	DC-	G	EP-2614/2-2
	24	SPARE	G	
	25	SPARE	G	
	26	SPARE	G	
	27	SPARE	G	
	28	SPARE	G	
	29	SPARE	G	
	30	SPARE	G	
	31	SPARE	G	
	32	SPARE	G	

TB-2

EP-3264/0-3	1	AIN 0	G	AHU-1 DAMPER #1 + (TB-AHU/7)
EP-3264/0-1	2	DC-	G	AHU-1 DAMPER #1 - (TB-AHU/8)
EP-3264/1-3	3	AIN 1	G	AHU-1 DAMPER #2 + (TB-AHU/11)
EP-3264/0-1	4	DC-	G	AHU-1 DAMPER #2 - (TB-AHU/12)
EP-3368/2-3	5	AIN 2	G	AHU-1 TEMP TRANS. +
EP-3368/2-1	6	DC-	G	AHU-1 TEMP TRANS. -
EP-3368/3-3	7	AIN 3	G	AHU-1 FILTER DIFF. +
EP-3368/3-1	8	DC-	G	AHU-1 FILTER DIFF. -
EP-3368/4-3	9	AIN 4	G	CONTROL RM. DIFF #1 +
EP-3368/4-1	10	DC-	G	CONTROL RM. DIFF #1 -
EP-3368/5-3	11	AIN 5	G	CONTROL RM. DIFF #2 +
EP-3368/5-1	12	DC-	G	CONTROL RM. DIFF #2 -
EP-3368/6-3	13	AIN 6	G	BATT. ROOM TEMP +
EP-3368/6-1	14	DC-	G	BATT. ROOM TEMP -
	15	SPARE	G	
	16	SPARE	G	
EP-4264/0-1	17	AO 01	G	AHU-1 DAMPER #1 + (TB-AHU/9)
EP-4264/0-4	18	DC-	G	AHU-1 DAMPER #1 - (TB-AHU/10)
EP-4264/1-1	19	AO 02	G	AHU-1 DAMPER #2 + (TB-AHU/13)
EP-4264/1-4	20	DC-	G	AHU-1 DAMPER #2 - (TB-AHU/14)
	21	SPARE	G	
	22	SPARE	G	
	23	SHIELD	G	AHU-1 DAMPER #1 SHLD.
	24	SHIELD	G	AHU-1 DAMPER #2 SHLD.
	25	SHIELD	G	AHU-1 DAMPER #1 SHLD.
	26	SHIELD	G	AHU-1 DAMPER #2 SHLD.
	27	SHIELD	G	
	28	SHIELD	G	
	29	SHIELD	G	
	30	SHIELD	G	
	31	SHIELD	G	
	32	SHIELD	G	

CPE100



GB
GROUND BUS

- G — CPE-100
- G — BUILDING GROUND (#8 AWG)

NOTES:

1) ALL WIRING TO BE #14 GRAY SIS UNLESS MARKED OTHERWISE.
2) ALL TWISTED SHIELDED CABLE TO BE 16-18 AWG.
3) PANEL IS OWNER FURNISHED. CONTRACTOR TO INSTALL ALL FIELD WIRING.

LEGEND:

- (C) ENTRELEC GATE BLOCK
- (S) MARATHON 30 AMP CURRENT SHORTING BLOCK
- (F) ENTRELEC FUSE BLOCK
- (FT) ENTRELEC FEED-THRU BLOCK
- (T) MARATHON 30 AMP 12-POLE TERMINAL BLOCK

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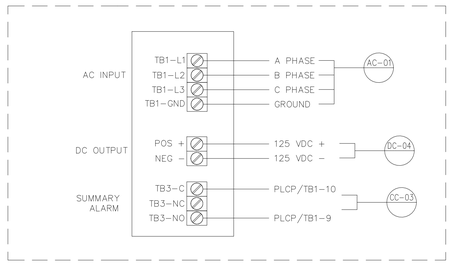
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
PLC PANEL 'PLCP'
WIRING DIAGRAM
e5.10.dwg

REF. DWG(S):

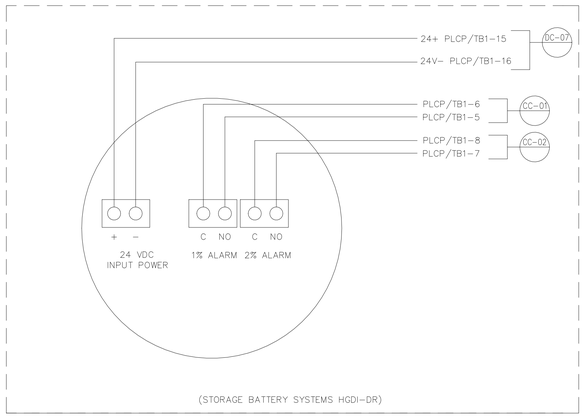
DRAWING NO.: E5.10

SHEET 23 OF 29



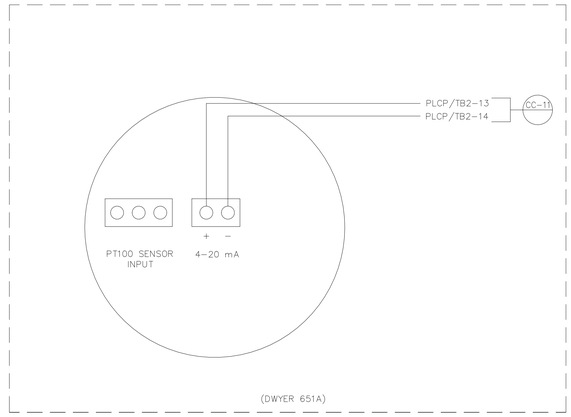
BATTERY CHARGER

WIRING DIAGRAM
NO SCALE



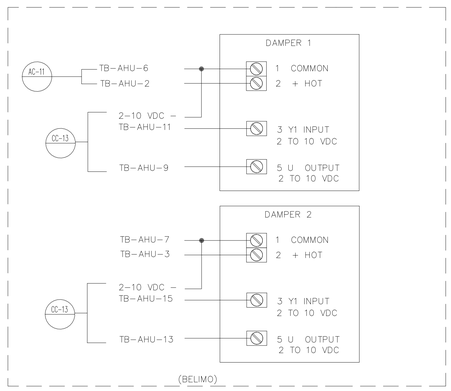
HYDROGEN DETECTOR

WIRING DIAGRAM
NO SCALE



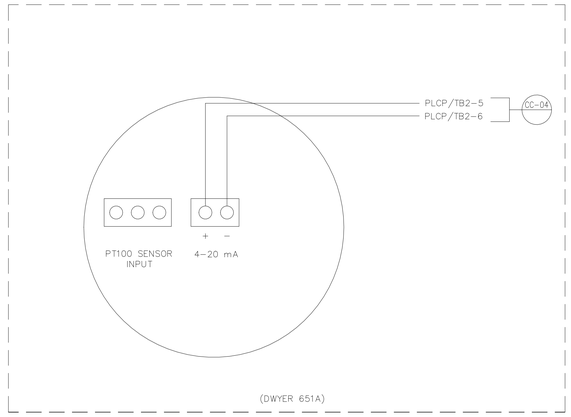
TEMPERATURE TRANSMITTER - BATTERY ROOM

WIRING DIAGRAM
NO SCALE



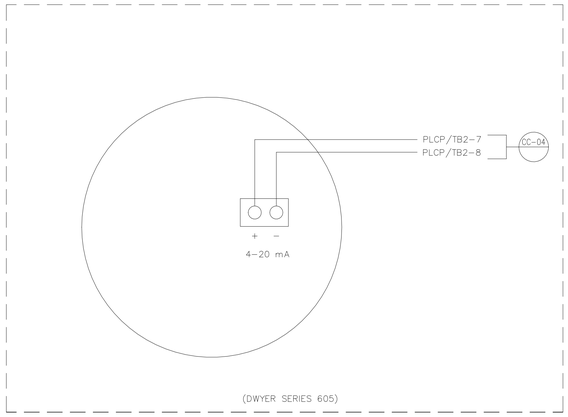
DAMPER ACTUATORS - AHU-1

WIRING DIAGRAM
NO SCALE



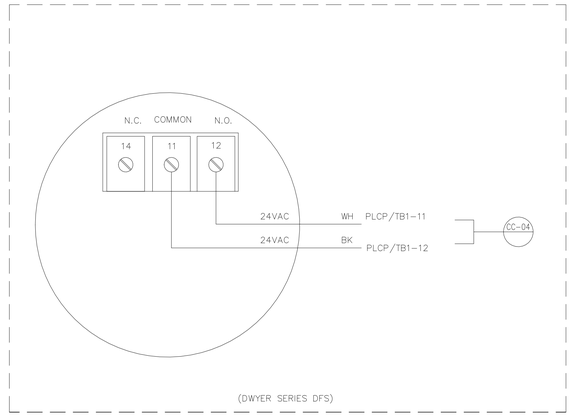
TEMPERATURE TRANSMITTER 'TT'

WIRING DIAGRAM
NO SCALE



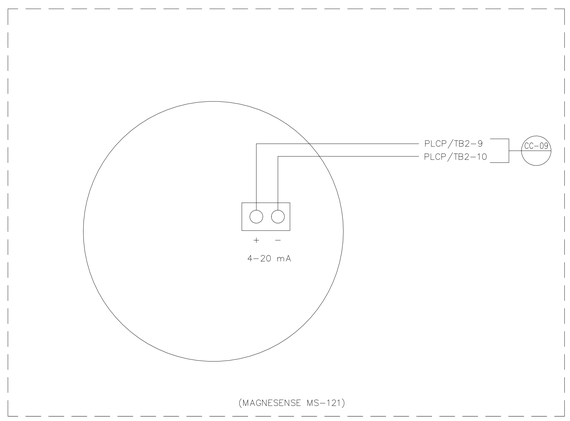
DIFFERENTIAL PRESSURE TRANSMITTER - AHU-1 FILTER

WIRING DIAGRAM
NO SCALE



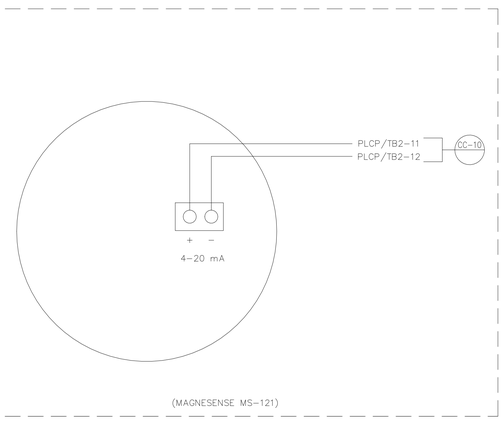
AHU-1 TEMPERATURE SWITCH 'TS'

WIRING DIAGRAM
NO SCALE



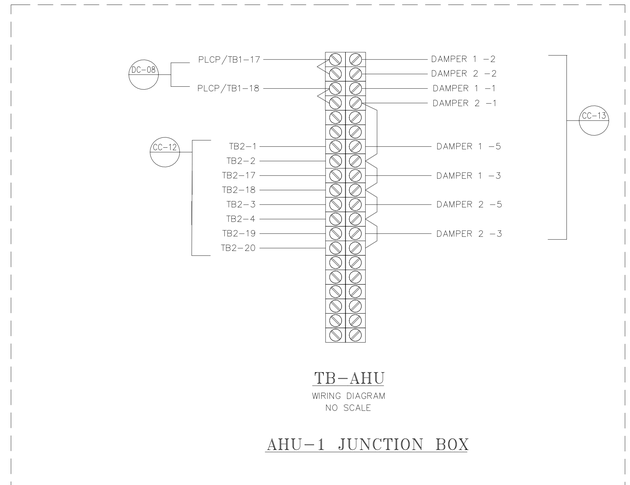
DIFFERENTIAL PRESSURE TRANSMITTER - CONTROL RM (#1)

WIRING DIAGRAM
NO SCALE



DIFFERENTIAL PRESSURE TRANSMITTER - CONTROL RM (#2)

WIRING DIAGRAM
NO SCALE



TB-AHU

WIRING DIAGRAM
NO SCALE

AHU-1 JUNCTION BOX

NOTES:

(1) CONTRACTOR TO VERIFY ALL CONDUIT SIZINGS TO EACH FIELD DEVICE.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
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NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
AUXILLARY DEVICES
WIRING DIAGRAM
e5.11.dwg

REF. DWG(S):

DRAWING NO.: E5.11

ABBR. - GENERAL/P&ID

AAV	AUTOMATIC AIR VENT
AF	AIR FLOW SWITCH
AFF	ABOVE FINISH FLOOR
AI	ANALOG INPUT
ARCH	ARCHITECT/ARCHITECTURAL
AO	ANALOG OUTPUT
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AUX	AUXILIARY
BDD	BACKDRAFT DAMPER
BLDG	BUILDING
BTU	BRITISH THERMAL UNIT
BV	BALANCING VALVE
CFM	CUBIC FEET PER MINUTE
CMU	CONCRETE MASONRY UNIT
CONC	CONCRETE
CO	CLEANOUT
CW	COLD WATER
Ø	DIAMETER OR PHASE
DEG	DEGREE
DEMO	DEMOLISH
DFU	DRAINAGE FIXTURE UNIT
DG	DIESEL GENERATOR
DI	DIGITAL INPUT
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DO	DIGITAL OUTPUT
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ELEV.	ELEVATION
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
EXH	EXHAUST
EXIST	EXISTING
°F	FAHRENHEIT
FACP	FIRE ALARM CONTROL PANEL
FCO	FLOOR CLEAN OUT
FD	FIRE DAMPER
FD	FLOOR DRAIN
FF	FINISH FLOOR
FT	FLASH TANK OR FEET
GA	GAUGE
GAL	GALLONS
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
HGS	HEATING GLYCOL FLUID SUPPLY
HGR	HEATING GLYCOL FLUID RETURN
HPV	HIGH POINT VENT
HR	HOUR
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HW	HOT WATER
HX	HEAT EXCHANGER
Hz	HERTZ
IN	INCHES
IPS	IRON PIPE SIZE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LFT	LEAVING FLUID TEMPERATURE
LPD	LOW POINT DRAIN
MAX	MAXIMUM
MBH	THOUSANDS BTU PER HOUR
MIN	MINIMUM OR MINUTES
MNPT	MALE NOMINAL PIPE THREAD
MOD	MOTOR OPERATED DAMPER
MS	MOTOR STARTER
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPT	NOMINAL PIPE THREAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
PDI	PRESSURE DIFFERENTIAL INDICATOR
PH	PHASE
PI	PRESSURE INDICATOR
PS	PIPE SUPPORT
PSI	POUNDS PER SQUARE INCH
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SAFETY VALVE
RA	RETURN AIR/RELIEF AIR
RED	REDUCER/REDUCING
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SD	SMOKE DETECTOR
SP	STATIC PRESSURE
T	TEMPERATURE
TCV	TEMPERATURE CONTROL VALVE
THRD	THREADED
TI	TEMPERATURE INDICATOR
TT	TEMPERATURE TRANSMITTER
TYP	TYPICAL
TUH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
VAC	VOLTAGE ALTERNATING CURRENT
VDC	VOLTAGE DIRECT CURRENT
W/	WITH
W/IN	WITHIN
WC	WATER COLUMN
WH	WATER HEATER

REFERRING LEGEND - GENERAL

- SHEET NOTE TAG
- ADDENDUM / REVISION TAG
- VAV TERMINAL TAG
- VAV TRUNK SECTION TAG
- INSTRUMENTATION TAG
- EQUIPMENT TAG – (SEE EQUIPMENT SCHEDULES)
- EQUIPMENT TAG – (SEE EQUIPMENT LIST)
- EQUIPMENT NUMBER – (SEE EQUIPMENT LIST)
- DETAIL NUMBER
- SHEET LOCATED ON
- DETAIL NUMBER
- SHEET LOCATED ON
- DIRECTION OF VIEW
- POINT OF NEW CONNECTION
- REMOVAL – (REMOVE DARKSIDE; LIGHT SIDE TO REMAIN)
- RADIATION DESIGNATOR (SEE SCHEDULES)
- FINTUBE LENGTH
- FLOW RATE (GPM)
- SECTION TAIL

CONTROL LEGEND - HVAC/PLUMBING

- THERMOWELL
- P/T PLUG
- POINT-SENSING ELEMENT
- MOTORIZED DAMPER
- SMOKE DETECTOR
- DUCT SMOKE DETECTOR
- 135°F HEAT DETECTOR
- POWER & STARTER DISCONNECT
- THERMOSTAT OR WALL SENSOR
- R RELAY/CONTACTOR
- CS CURRENT SENSOR OR SWITCH
- PT PRESSURE TRANSMITTER
- TS TEMPERATURE SWITCH
- TT TEMPERATURE TRANSMITTER
- DPT DIFFERENTIAL PRESS. TRANSMITTER
- CONTROL WIRE HOMERUN
- M OR MOTOR – (MOTORIZED ACTUATOR OR MOTOR)

VENTILATION LEGEND - HVAC

- CEILING DIFFUSER OR REGISTER (SA/RA/EA)
- SUPPLY AIR DUCT UP & DOWN
- RETURN AIR DUCT UP & DOWN
- EXHAUST AIR DUCT UP & DOWN
- ROUND DUCT UP & DOWN
- XX FIRE DAMPER (SEE ABBREVIATION FOR TYPE)
- FLOW ARROW
- AD ACCESS DOOR
- DRAIN
- FILTER
- FAN
- UNIT HEATER – (HORIZONTAL)

VALVE LEGEND - GENERAL/P&ID

- AUTO FLOW CONTROL VALVE
- BALL VALVE
- DOUBLE BLOCK AND BLEED VALVE
- BALANCE / SHUTOFF VALVE
- BUTTERFLY VALVE
- CHECK OR FOOT VALVE
- DOUBLE CHECK VALVE
- DIAPHRAM VALVE
- EMERGENCY SHUT-DOWN
- FUSIBLE VALVE
- GATE VALVE
- GLOBE VALVE
- NEEDLE VALVE
- OS&Y VALVE
- PLUG VALVE
- LUBRICATED PLUG VALVE
- PRESSURE/FLOW CONTROL VALVE
- REDUCED PRESSURE BACKFLOW PREVENTER
- Y STRAINER – (NO BLOWDOWN)
- Y STRAINER – (W/ BLOWDOWN)
- T STRAINER – (NO BLOWDOWN)
- T STRAINER – (W/ BLOWDOWN)
- PRESSURE REDUCING REGULATOR (SELF-CONTAINED)
- BACK PRESSURE REGULATOR (SELF-CONTAINED)
- BACK PRESSURE REGULATOR W/ EXTERNAL TAP
- PRESSURE REDUCING REGULATOR W/ EXTERNAL TAP
- 2-WAY CONTROL VALVE; MOTORIZED, THERMOSTATIC, SOLENOID, PNEUMATIC
- 3-WAY CONTROL VALVE; MOTORIZED, THERMOSTATIC, SOLENOID, PNEUMATIC
- PRESSURE AND VACUUM RELIEF VALVE
- PRESSURE SAFETY VALVE
- RUPTURE DISC
- PLUG
- REDUCER – (CONCENTRIC)
- REDUCER – (ECCENTRIC)
- SLOPE – (DOWNSLOPE DIRECTION)
- EHOH / EPOH DRAIN W/ CAP – (VALVE AS SHOWN)

PIPING LEGEND - HVAC/PLUMBING

- DENOTES DEMOLITION
- VENT PIPING
- COLD WATER PIPING
- HOT WATER PIPING
- HOT WATER CIRCULATED PIPING
- XXX SEE ABBREVIATIONS FOR MEDIA
- TEE UP
- TEE DOWN
- PIPE UP
- PIPE DOWN
- P-TRAP
- PIPE CAP
- HOSE BIBB
- PIPE BREAK / CONTINUATION
- HOSE COUPLING
- REDUCER – (CONCENTRIC)
- REDUCER – (ECCENTRIC)
- SLOPE SLOPE – (DOWNSLOPE DIRECTION)
- UNION
- DIRECTION OF FLOW
- PIPE GUIDE
- PIPE ANCHOR
- THERMOWELL
- FLEXIBLE PIPING CONNECTOR
- RAINLEADER DOWNSPOUT
- CLEANOUT
- FIRE DEPARTMENT CONNECTION
- WATER HAMMER ARRESTOR
- FLOOR CLEANOUT
- FLOOR DRAIN – (ROUND & SQUARE STRAINER)
- ROOF DRAIN – (ROOF DRAIN & OVERFLOW)
- FLOOR SINK
- PRESSURE GAUGE W/ ISOLATION COCK
- AIR VENT – (MANUAL)
- OR AAV AIR VENT – (AUTO)
- THERMOMETER – (BI-METAL)
- THERMOMETER – (LIQUID GLASS)
- PUMP

UNIT HEATER SCHEDULE

TAG	TYPE	COIL			FAN				TOP MOUNT HT (FT)	BASIS OF DESIGN		REMARKS
		MBH*	GPM	WPD	CFM	VOLTS	PHASE	HP		MANUFACTURER	MODEL	
UH-1	HORIZONTAL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	EXIST	EXIST	EXIST, RELOCATED
–	–	–	–	–	–	–	–	–	–	–	–	–

*OUTPUT BASED ON 180° EWT, 160° LWT, 60° EAT.

EQUIPMENT/INSTRUMENT SCHEDULE

TAG	TYPE	BASIS OF DESIGN		REMARKS
		MANUFACTURER	MODEL	
WH-3	WATER HEATER	PEERLESS	PARTNER PP-120	INDIRECT-FIRED, 120 GAL S.S. TANK, 1-1/2" DOMESTIC WATER CONNECTIONS, 12 GPM HEATING WATER @ 9.1 FT PRESS DROP, WITH AQUASTAT.
RPBFP-1	BACKFLOW PREVENTER	WATTS	009-M2QTS	REDUCED PRESSURE PRINCIPLE, BALL VALVE SHUTOFFS, STRAINER, WITH AIR GAP DISCHARGE CHANNEL
SAC-1A/B	SPLIT AC HVAC	DAIKIN	FAQ24PVJURZR24PVJU	MINI SPLIT, COOLING ONLY, HVAC UNIT, WALL MOUNT INDOOR UNIT, OUTDOOR UNIT WALL MOUNTED 6' AFF, 24,000 BTU/HR COOLING,
FD-1	FIRE DAMPER	RUSKIN	DIBD2GA	1.5HR, DYNAMIC/STATIC, 165°F FUSIBLE LINK, 12"(W)x12"(H), CURTAIN TYPE.
FILTER	PLEATED PANEL	CAMFIL	30/30 054862-012	PLEATED PANEL FILTER, MERV 8, 16"x16"x1", FINAL DIRTY PRESSURE DROP: 1"
DAMPER	CONTROL DAMPER (TYPICAL OF 2)	RUSKIN	CDRS25	12" DIA, ULTRA LOW LEAK, ROUND, MAX SYSTEM PRESS. 8" WC, FACTORY INSTALLED ACTUATOR, NFB24-SR-S-IND-AFB AND 120/24v TRANSFORMER
SAC-1A/B	SPLIT AC HVAC	DAIKIN	FAQ24PVJURZR24PVJU	MINI SPLIT, COOLING ONLY, HVAC UNIT, WALL MOUNT INDOOR UNIT, OUTDOOR UNIT WALL MOUNTED 6' AFF, 24,000 BTU/HR COOLING, W/ WIRED TYP CONTROLLER (MODEL BRC1C71)

* INDICATES PRODUCT SUBMITTAL REQUIRED AT CONSTRUCTION BID PHASE

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	CONNECTIONS (IN)				BASIS OF DESIGN		REMARKS
		CW	HW	W	V	MANUFACTURER	MODEL	
EWS-1	HORIZONTAL	1	1	2	1-1/2	GUARDIAN	GBF2173PCC	18 GA S.S. SURFACE MOUNT ENCLOSURE WITH PULL-DOWN EYEWASH, 10" S.S. SHOWER HEAD. GUARDIAN #G3800 THERMOSTATIC MIXING VALVE WITH 1" CONNECTIONS, COLD WATER BYPASS AND THERMOMETER.

FAN SCHEDULE

TAG	LINE	TYPE	CFM	EXT. SP	DRIVE	MOTOR			MANUFACTURER	MODEL	MAX INLET SONES
						HP	FAN RPM	VOLTAGE			
SF-1	REX-1	COMMERCIAL	220	1.50	B – BELT	1/3 HP	1581	115V	PENNBARRY	REX12B	10.5
EF-1	REX-1	COMMERCIAL	160	0.50	B – BELT	1/4 HP	997	115V	PENNBARRY	REX12B	6.2

NOTE: NOT ALL SYMBOLS AND ABBREVIATIONS USED ON THIS PROJECT.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WARREN TAYLOR – EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	ISSUED FOR BID	KER/06-19-2018	WBT/06-19-2018

ENG. STAMP

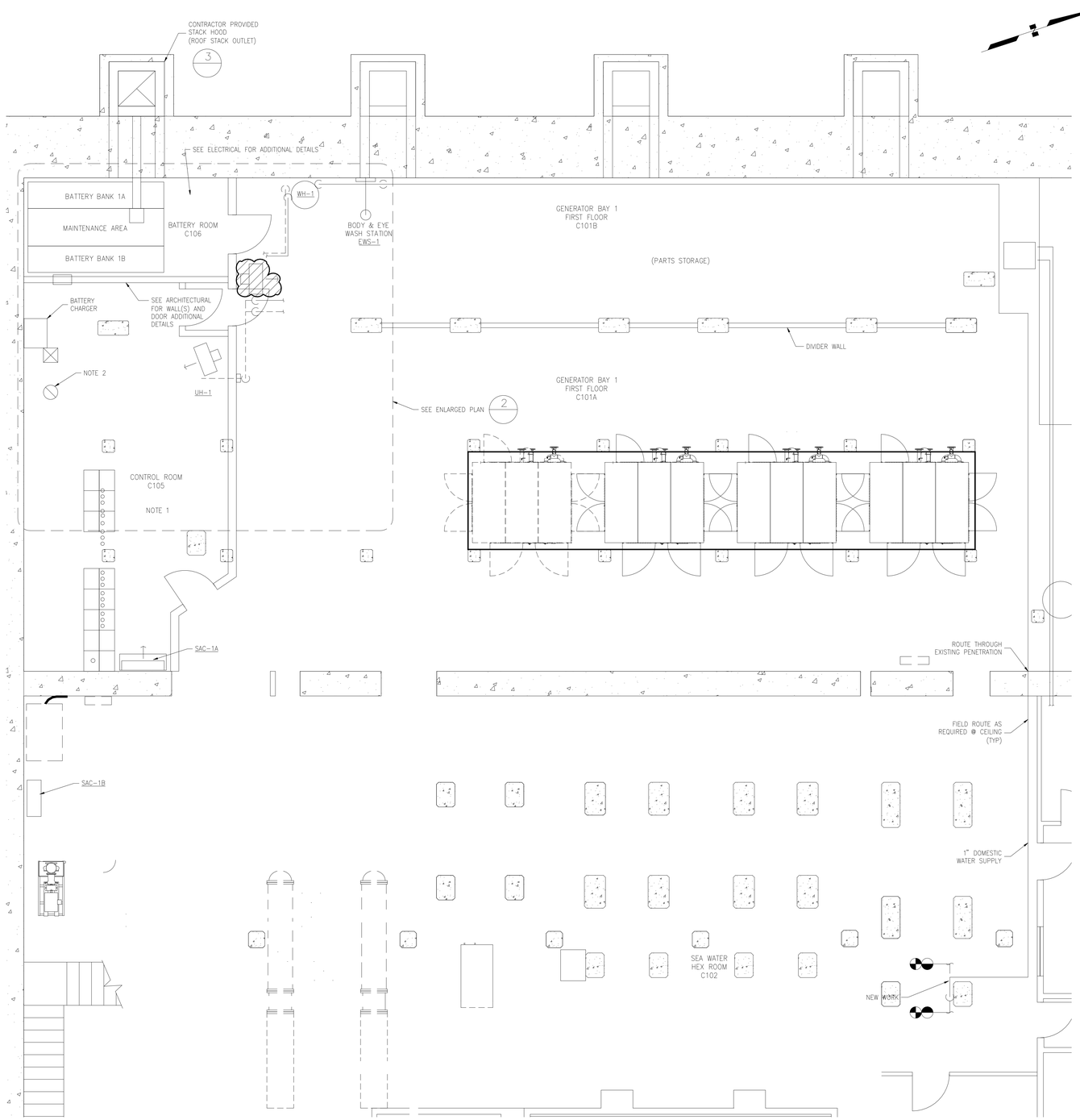
Electric Power Systems Inc.
Consulting Engineers
TEL: (907) 522-1953
FAX: (907) 522-1182
WEB: WWW.EPSINC.COM

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

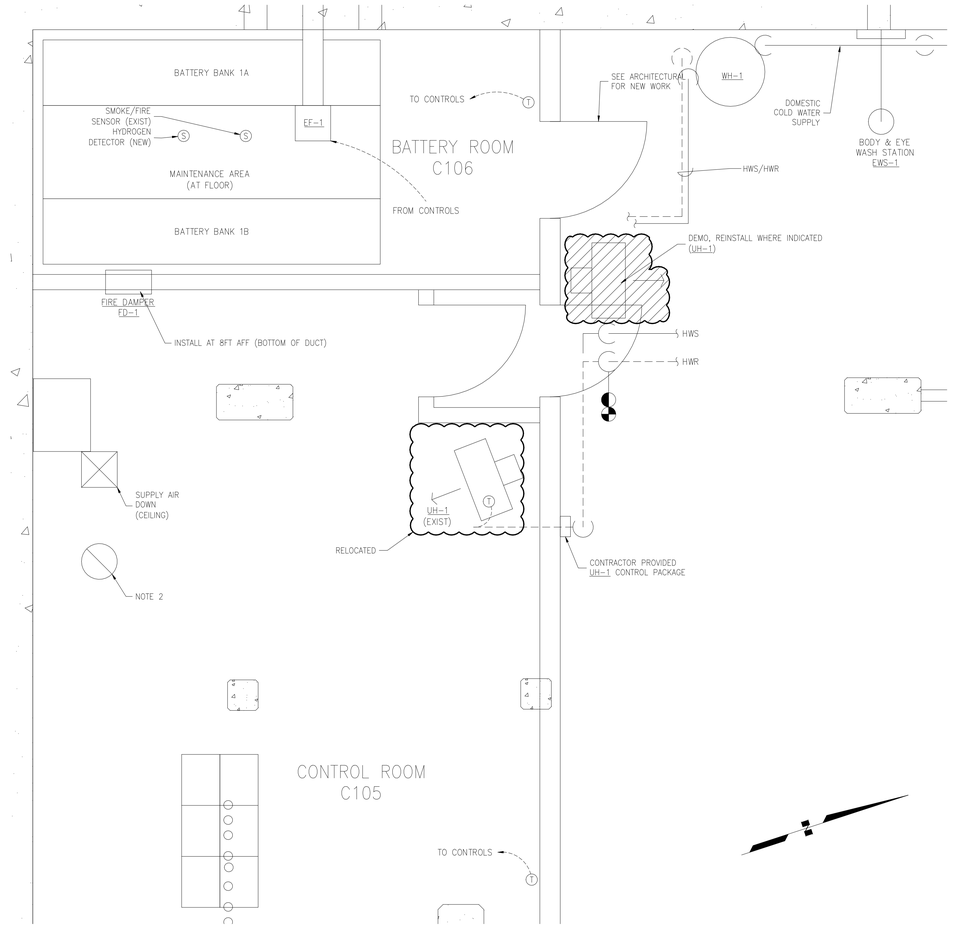
DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
LEGENDS, ABBREVIATIONS, & EQUIP. LIST
CONCRETE BUILDING
m0.11.dwg

REF DWG(S):

DRAWING NO.: M0.11



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



2 MECHANICAL ENLARGED PLAN
SCALE: 1/2" = 1'-0"

NOTES:

1. CONTRACTOR TO SEAL ALL WALL PENETRATIONS (CONDUIT, CABLE, UNUSED, ETC.) WITHIN ROOM WITH INSULATION AND FLASHING (BOTH SIDES)
2. SEAL PENETRATION, SEE SHEET M2.08 FOR DETAILS
3. USE FIRE SAFING MATERIAL AT RATED WALLS,

GRAPHIC SCALE

2' 0 2' 4' 6'
GRAPHIC SCALE: 1/2" = 1'-0"

4' 0 4' 8' 12'
GRAPHIC SCALE: 1/4" = 1'-0"

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WARREN TAYLOR - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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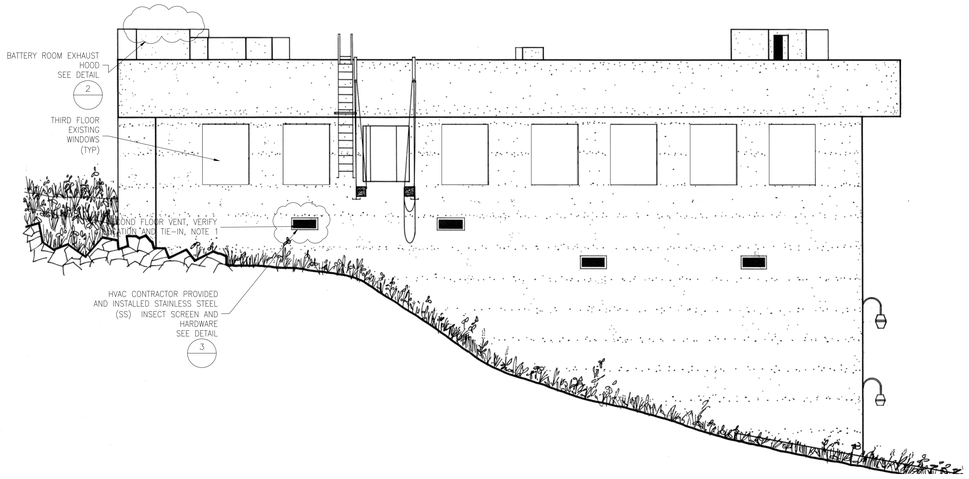
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION
3	M1.02	REFER TO DETAIL "2"

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
HVAC AND PLUMBING PLANS
CONCRETE BUILDING
m1.01.dwg

REF DWG(S):

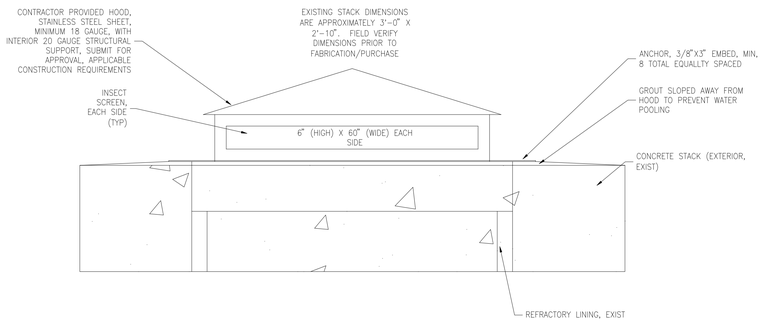
DRAWING NO.: M1.01

SHEET 26 OF 29

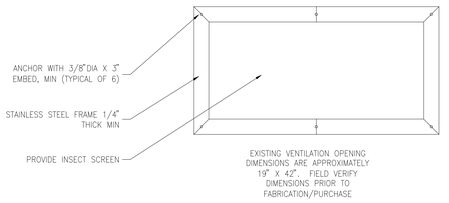


NOTES:
1. CONTRACTOR TO PROVIDE DUCT/WALL TRANSITION TO CONTRACTOR PROVIDED DUCT WORK DOWN TO CONTROL ROOM HVAC AS INDICATED ON SHEET M2.08.
2. INTERIOR ACCESS TO SECOND FLOOR IS THROUGH FIRST FLOOR STAIR ACCESS IN FRONT OF PLANT.

1 MECHANICAL SOUTH ELEVATION
N.T.S.



2 BATTERY EXHAUST HOOD DETAIL
N.T.S.



NOTES:
1. CONTRACTOR TO PROVIDE DUCT/WALL TRANSITION TO CONTRACTOR PROVIDED DUCT WORK DOWN TO CONTROL ROOM HVAC AS INDICATED ON SHEET M2.08.
2. INTERIOR ACCESS TO SECOND FLOOR IS THROUGH FIRST FLOOR STAIR ACCESS IN FRONT OF PLANT.

3 EXTERIOR OUTSIDE AIR INLET SCREEN
N.T.S.

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WARREN TAYLOR – EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
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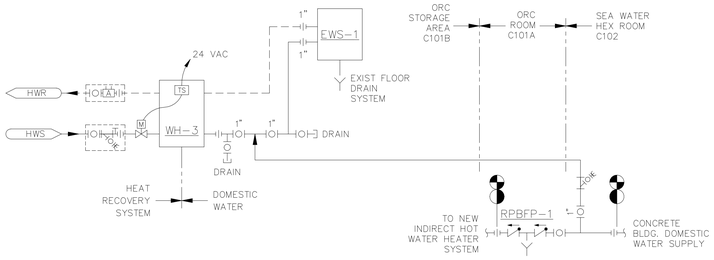
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

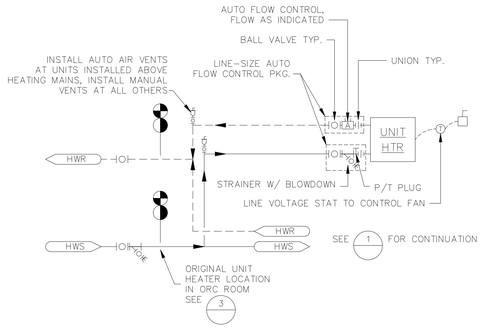
DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
EXTERIOR ELEVATION
CONCRETE BUILDING
m1.02.dwg

REF DWG(S):

DRAWING NO.: M1.02



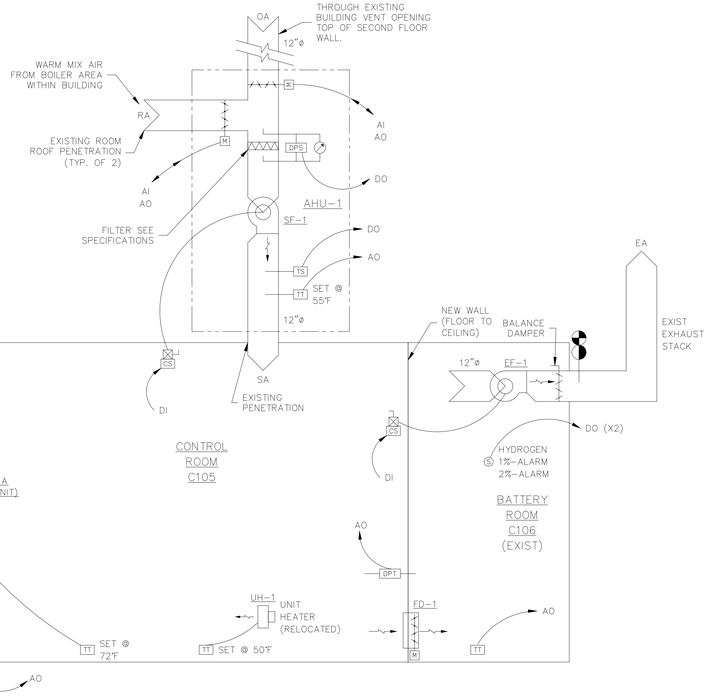
1 PLUMBING SCHEMATIC
N.T.S.



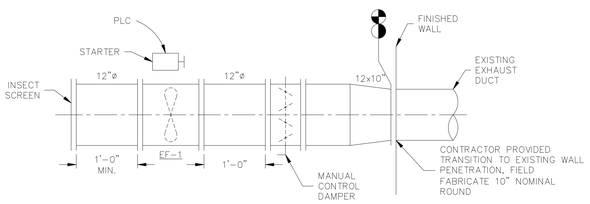
2 HEATING SCHEMATIC
N.T.S.

3 ORIGINAL UNIT HEATER (DEMO)
N.T.S.

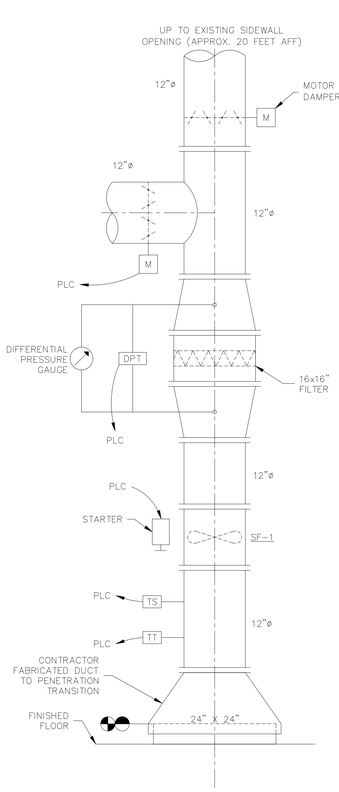
8 CONTROL ROOM EXIST AHU DEMO
N.T.S.



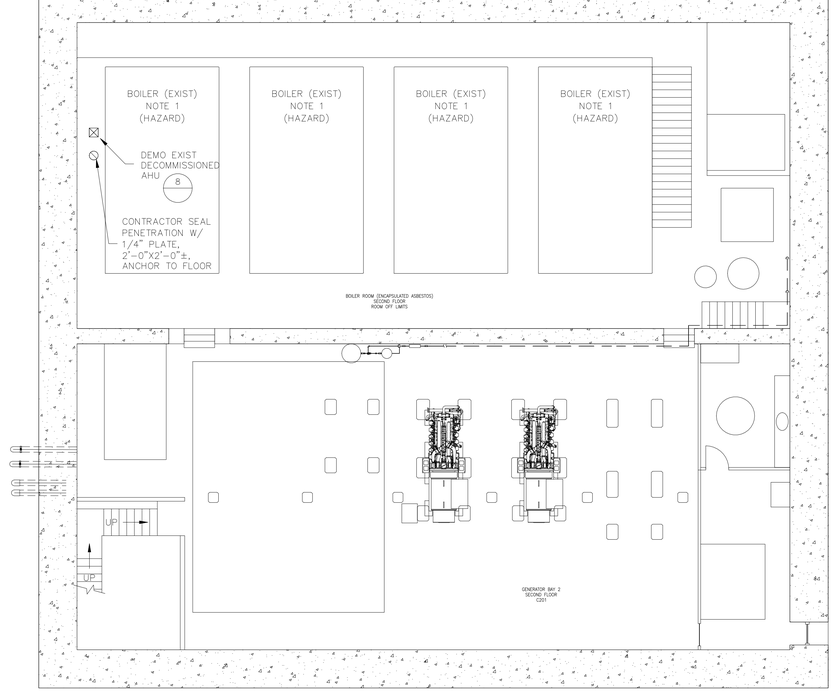
4 HVAC SCHEMATIC
N.T.S.



5 EXHAUST FAN
N.T.S.



6 SUPPLY AIR
N.T.S.



7 SECOND FLOOR MECHANICAL PLAN DETAIL
N.T.S.

NOTES:

1. CONTRACTOR TO SEAL ALL WALL PENETRATIONS (CONDUIT, CABLE, UNUSED, ETC.) WITHIN ROOM WITH INSULATION AND FLASHING (BOTH SIDES)

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WARREN TAYLOR - EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	ISSUED FOR BID	KER/06-19-2018	WBT/06-19-2018

ENG. STAMP

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Consulting Engineers
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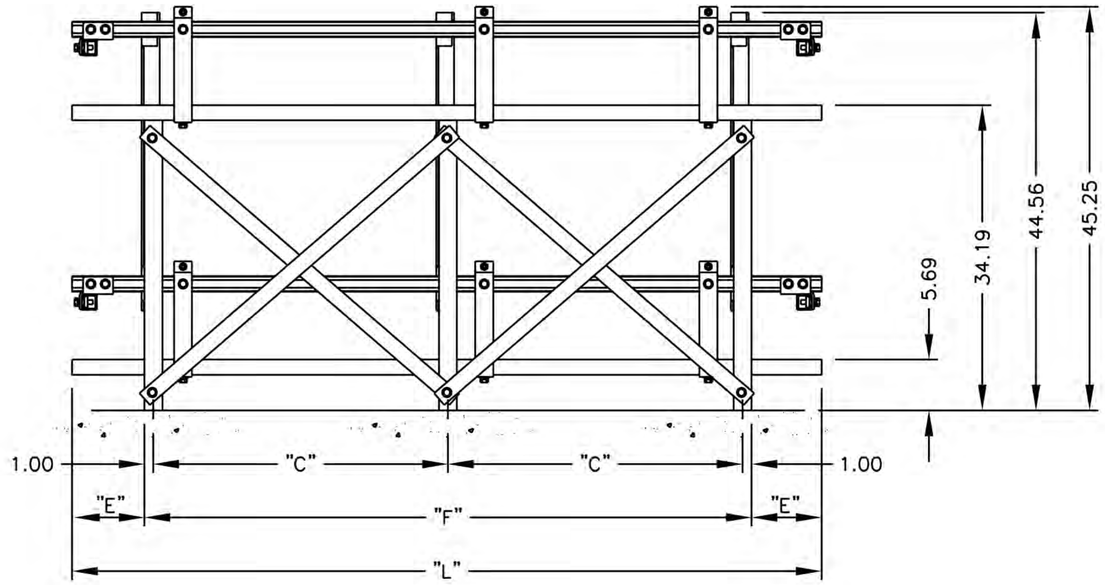
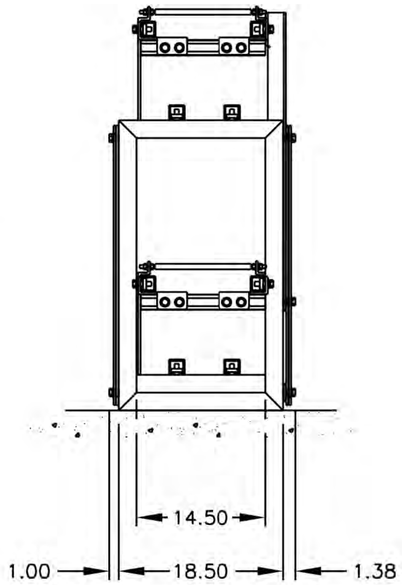
NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
HVAC AND PLUMBING DIAGRAMS
CONCRETE BUILDING
m2.08.dwg

REF DWG(S):

DRAWING NO.: M2.08





CATALOG NO.	AZMS NO.	"L" (in.)	"F" (in.)	"E" (in.)	"C" (in.)	WT. (lbs.)	# FRAMES
UE4L2T036A	UJ32-036	36.00	26.00	5.00	24.00	263	2
UE4L2T048A	UJ32-048	48.00	32.00	8.00	30.00	283	
UE4L2T060A	UJ32-060	60.00	38.00	11.00	36.00	300	
UE4L2T072A	UJ32-072	72.00	56.00	8.00	27.00	409	3
UE4L2T084A	UJ32-084	84.00	68.00	8.00	33.00	436	
UE4L2T096A	UJ32-096	96.00	68.00	14.00	33.00	453	
UE4L2T108A	UJ32-108	108.00	92.00	8.00	30.00	561	4
UE4L2T120A	UJ32-120	120.00	101.00	9.50	33.00	582	
UE4L2T132A	UJ32-132	132.00	110.00	11.00	36.00	603	
UE4L2T144A	UJ32-144	144.00	122.00	11.00	30.00	711	5
UE4L2T156A	UJ32-156	156.00	134.00	11.00	33.00	736	
UE4L2T168A	UJ32-168	168.00	146.00	11.00	36.00	758	
UE4L2T180A	UJ32-180	180.00	152.00	14.00	30.00	865	6
UE4L2T192A	UJ32-192	192.00	167.00	12.50	33.00	882	
UE4L2T204A	UJ32-204	204.00	182.00	11.00	36.00	905	
UE4L2T216A	UJ32-216	216.00	200.00	8.00	33.00	1011	7
UE4L2T228A	UJ32-228	228.00	200.00	14.00	33.00	1036	
UE4L2T240A	UJ32-240	240.00	218.00	11.00	36.00	1060	

RAIL OPTIONS, IDENTIFIED BY CATALOG NO. SUFFIX:
A – 2 GALVANIZED RAILS PER TIER (STANDARD)
AP – 2 PAINTED RAILS PER TIER
A3R – 3 GALVANIZED RAILS PER TIER
A3RP – 3 PAINTED RAILS PER TIER

TITLE: RACK, UBC ZONE 4L, 2 TIER

EnerSys
PowerFull Solutions

RESERVE POWER
READING, PA. 19605

BATTERY:	CODE:	REF.:
EA, EC, ES	UJ32	N/A

RACK FAMILY: UE4L2TxxxA — REV. A

DO NOT SCALE DRAWING — DATE: 06/15/2009

ISSUED FOR REFERENCE ONLY
– DO NOT EDIT –

PROJECT: POWER PRODUCTION 125 VDC STATION SERVICE REPLACEMENT
DESIGNER/PROJECT ENGINEER: WILLIAM BROWN-FARRELL/EARL GEORGE – EPS JOB #: 17-0049

NO.	DESIGN/CONSTRUCTION/ASBUILT REVISION	DWN BY/DATE	REVIEWED BY/DATE
0	MANUFACTURER'S DRAWING	06-15-2009	

ENG. STAMP

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Consulting Engineers
TEL: (907) 522-1953
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WEB: WWW.EPSINC.COM

NO.	DRAWING NO./SHEET	REFERENCE DRAWING/DETAIL/PLAN/SECTION DESCRIPTION

DRAWING NAME:
CITY OF UNALASKA
OLD POWERHOUSE 125VDC STATION SERVICE
BATTERY RACK
ELEVATIONS
eq1.01.dwg

REF DWG(S):

DRAWING NO.: EQ1.01