



Date: 11-15-2022

Melanie Bachman, Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: VFS, LLC. Notice of Exempt Modification Pursuant to RCSA 16-50j-57(a) to
Existing Energy Facility Site at The City of New Haven, 200 Orange Street, New Haven, CT 06510
("Notice of Exempt Modification")

Dear Ms. Bachman,

VFS, LLC. hereby gives notice to the Connecticut Siting Council of its intent to undertake an exempt modification in accordance with Section 16-50j-57(a) of the Regulations of Connecticut State Agencies ("RCSA") for the modification to VFS's fuel cell installation at The City of New Haven, 200 Orange Street, New Haven, CT 06510.

Proposed Modification

The proposed modification would take place within the existing fenced area at The City of New Haven, 200 Orange Street, New Haven, CT. The existing facility consists of a combined heat and power installation utilizing one Doosan 400 kW Fuel cell.

VFS, LLC. proposes the following modification to the facility:

- Removal of the existing fuel cell and associated cooling module.
- Installation of one (1) current generation Doosan Model 400 fuel Cells (direct replacement with the same GEN I nameplate)
- Installation of new cooling module.

The proposed modification would not have a substantial adverse environmental effect or cause a significant adverse change or alteration in the physical or environmental characteristics of the facility because:

- The modification would be made within the facilities existing fenced area and would not impair the structural integrity of the facility.
- The new equipment would be a direct replacement for the existing equipment and is dimensionally the same as the existing equipment and would not cause any significant adverse change in the physical or environmental characteristics of the facility.

The existing facility layout with proposed modification is shown on Attachment 1.

The proposed modification would not have a substantial adverse environmental effect or cause a significant adverse change or alteration in the physical or environmental characteristics of the facility because:


- The modification would be made within the facilities existing fenced area and would not impair the structural integrity of the facility.
- The new equipment would be a direct replacement for the existing equipment and is dimensionally the same as the existing equipment and would not cause any significant adverse change in the physical or environmental characteristics of the facility.
- The modifications would not affect waterways or wetlands and the facility is not in a flood zone.
- There are no endangered, threatened or special concern species in the vicinity of the facility as listed in the NDDB.
- Sound pressure levels will not increase because of the modifications.
- There would be no television or radio interference because of the modifications.
- Electric and magnetic field levels will not be affected by the modification due to low or no export of power from the site and the low voltage produced by the fuel cells.

VFS, LLC. proposes to commence work on the modification in January 2023 and scheduled to be complete by February 2023.

Pursuant to CSC rules VFS, LLC, will provide one copy of this filing and fifteen delivered copies of the filing along with a check for \$625.00 made payable to CT Siting Council.

A notice of this filing has been provided to the Mayor of New Haven and the property owners representative Giovanni Zinn via certified mail.

Please direct all communications regarding this filing to Steve Pearson at 248.417.0674 or via email spearson@vfsmi.com

Signed 

Steve Pearson

Installation Project Manager

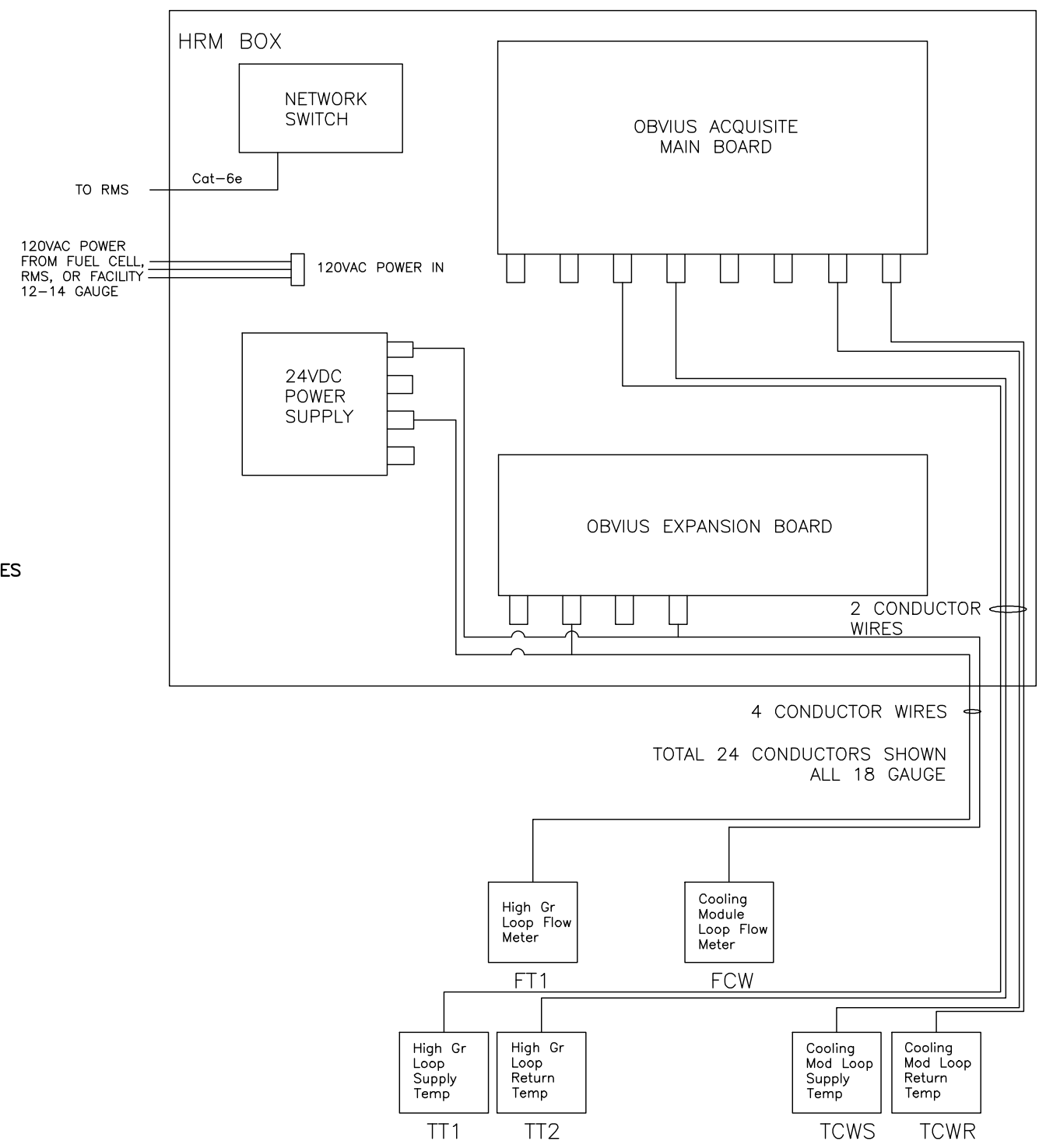
VFS, LLC.

NOTES:

- CONDUIT ROUTINGS SHOWN ARE SCHEMATIC IN NATURE. CONTRACTOR TO FIELD VERIFY ACTUAL ROUTINGS PRIOR TO THE START OF WORK.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO THE START OF WORK.

PLAN NOTES:

- PROVIDE POWER FOR "WI" AND "WO" PIPES HEAT TRACE. SEE NOTES #3 AND #4 ON DRAWING M-3. COORDINATE INSTALLATION WITH MECHANICAL CONTRACTOR.
- PROVIDE 1" C FROM MOTOR RELAY CONTROL BOX TO EACH PUMP (P1, P2, P3 & P5), TO PUMP P4 LOCATED IN THE OTHER BUILDING AND TO COOLING TOWER ON ROOF.

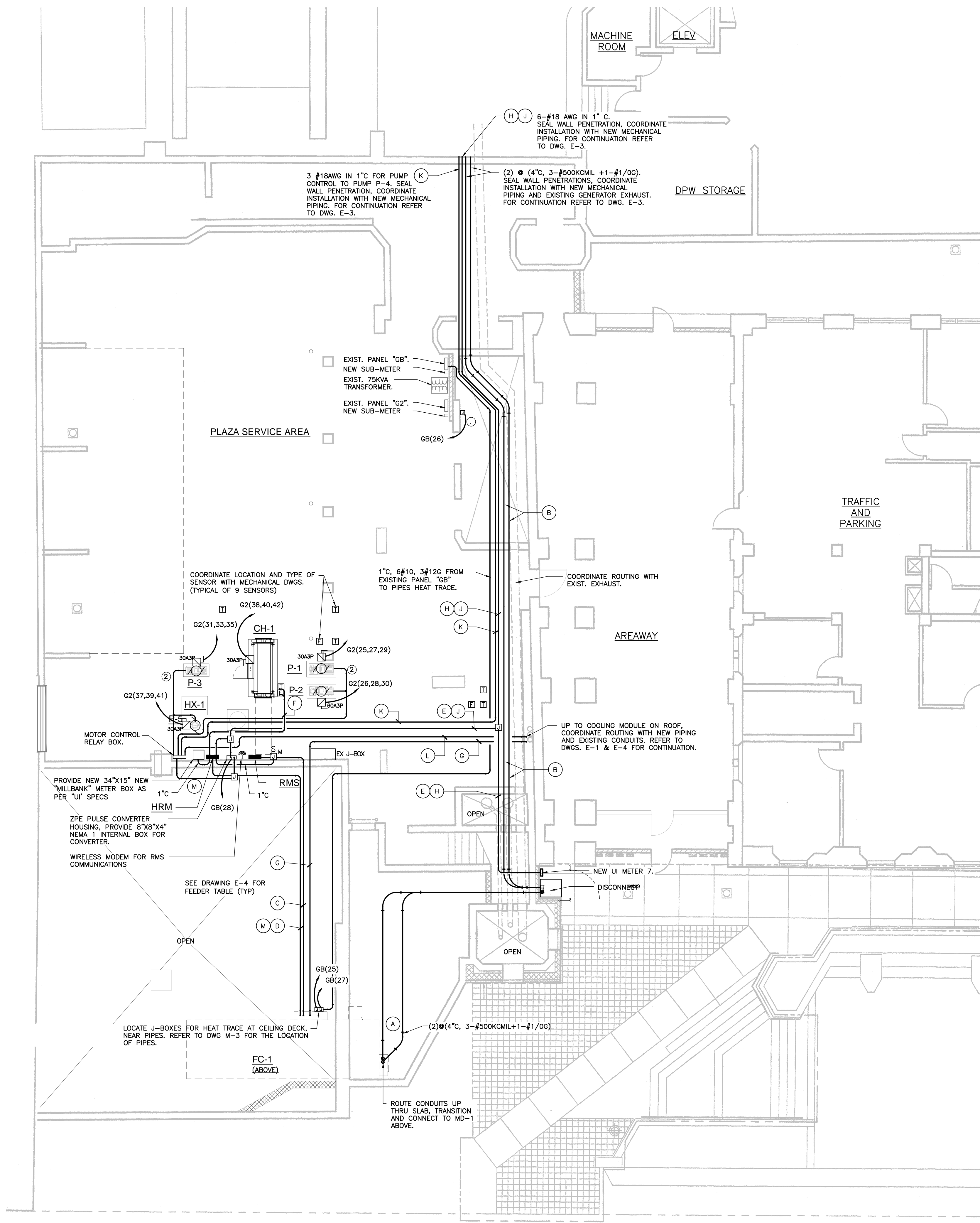


HRM FIELD WIRING DIAGRAM

NTS

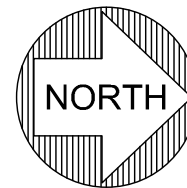
PANEL: G2 (EXISTING)															
MAIN CB SIZE: AMPS			MCB <input type="checkbox"/> MLO <input checked="" type="checkbox"/>			LOCATION: PLAZA SERVICE AREA					PHASE: 3				
PANEL SIZE: 200 AMPS			VOLTS: 480/277V			MTG: SURFACE					TYPE: BOLT- ON			WIRE: 4	
CKT. NO.	DESCRIPTION	WIRE SIZE	TRIP AMP	POLE	VA	CONN. LOAD VA B C			VA	POLE	TRIP AMP	WIRE SIZE	DESCRIPTION	CKT. NO.	
1	EXISTING LOAD					XXX							EXISTING LOAD	2	
3	EXISTING LOAD						XXX						EXISTING LOAD	4	
5	SPACE							XXX					SPACE	6	
7	SPACE					XXXX							SPACE	8	
9	SPACE						XXX						SPACE	10	
11	SPACE							XXXXX					SPACE	12	
13	SPACE					XXXX							SPACE	14	
15	SPACE						XXXX						SPACE	16	
17	SPACE							XXXX					SPACE	18	
19					200	XXXXX							SPACE	20	
21	SUBMETER	3#12+1#12G	20	3	200		XXXX						SPACE	22	
23					200			XXXX					SPACE	24	
25					2900	XXXXX			9000					26	
27	P-1 (7.5HP)	3#12+1#12G	20	3	2900	XXXX	XXXX		9000	3	50	3#8+1#10G 1" C	P-2 (25HP)	28	
29					2900			XXXX	9000					30	
31					2900	XXXXX								32	
33	P-3 (7.5HP)	3#12+1#12G	20	3	2900	XXXX	XXXX			3	20		SPARE	34	
35					2900			XXXX						36	
37					2000	XXX			1600					38	
39	P-5 (5HP)	3#12+1#12G	20	3	2000		XXX		1600	3	20	3#12+1#12G	CH (5.9A)	40	
41					2000			XXX	1600					42	
					CONN. VA/PHASE										
					TOTAL CONN. VA										
NOTES:															
1. PROVIDE NEW CIRCUIT BREAKERS FOR NEW EQUIPMENT TO MATCH EXISTING.															
2. EXISTING LOAD SHOULD REMAIN IN PLACE. DO NOT USE THE EXISTING SPARE CIRCUIT BREAKERS															

PANEL: GB																(EXISTING)			
MAIN CB SIZE: 225 AMPS				MCB <input checked="" type="checkbox"/> MLO <input type="checkbox"/>				LOCATION: PLAZA SERVICE AREA						PHASE: 1					
PANEL SIZE: 225 AMPS				VOLTS: 120/240V				MTG: SURFACE				TYPE: BOLT- ON				WIRE: 3			
CKT. NO.	DESCRIPTION	WIRE SIZE	TRIP AMP	POLE	VA	CONN. LOAD VA		VA	POLE	TRIP AMP	WIRE SIZE	DESCRIPTION	CKT. NO.						
1	EXSITING LOAD					XXX	A B					EXSITING LOAD	2						
3	EXSITING LOAD						XXX					EXSITING LOAD	4						
5	EXSITING LOAD											EXSITING LOAD	6						
7	EXSITING LOAD					XXXX						EXSITING LOAD	8						
9	EXSITING LOAD						XXX					EXSITING LOAD	10						
11	EXSITING LOAD											EXSITING LOAD	12						
13	EXSITING LOAD					XXXX						EXSITING LOAD	14						
15	EXSITING LOAD						XXXX					EXSITING LOAD	16						
17	EXSITING LOAD							XXXX				EXSITING LOAD	18						
19	EXSITING LOAD					XXXXX						SPARE	20						
21	EXSITING LOAD						XXXX					SPARE	22						
23	EXSITING LOAD							XXXX				SPARE	24						
25	HEAT TRACE (CHILLED WTR PIPE)	2#10	20	1	600	XXXXX		800	1	20	2#12	HEAT TRACE (WO PIPING)	26						
27	HEAT TRACE (CONDENS. DRAIN)	2#10	20	1	600	XXXX		200	1	20	2#12	ZPE CONVERTER	28						
29					200		XXXX		1	20		SPARE	30						
31	SUBMETER	3#12+1#12G	20	3	200	XXXXX			1	20		SPARE	32						
33					200		XXXX		1	20		SPARE	34						
35	SPARE		20	1				XXXX	1	20		SPARE	36						
37						XXX							38						
39							XXX						40						
41								XXX					42						
CONN. VA/PHASE																			
TOTAL CONN. VA																			
NOTES:																			
1. PROVIDE NEW CIRCUIT BREAKERS FOR NEW EQUIPMENT TO MATCH EXISTING.																			
2. EXISTING LOAD SHOULD REMAIN IN PLACE. DO NOT USE THE EXISTING SPARE CIRCUIT BREAKERS																			



1 GROUND FLOOR LEVEL ELECTRICAL PLAN

1/8" = 1'-0"



GOVERNMENTAL CENTER FUEL CELL
200 Orange Street, New Haven CT 06510,
CNH PROJECT #10-160-01

ELECTRICAL PLAN
GROUND FLOOR LEVEL



DRAWING

E-2

SHEET NO. 21

NO. OF SHEETS 26

Loureiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
Phone: 860-747-6181 / fax: 860-747-8822
An Employee Owned Company • email: info@loureiro.com



SCALE
AS NOTED
COM. NO.
88FB102
DATE
11/29/11
DRAWN BY
DN
APPROVED BY
DN

DATE
11/29/11
DATE
11/29/11

ISSUED FOR CONSTRUCTION
REV. 0
DESCRIPTION OF REVISION

DATE
11/29/11
DATE
11/29/11

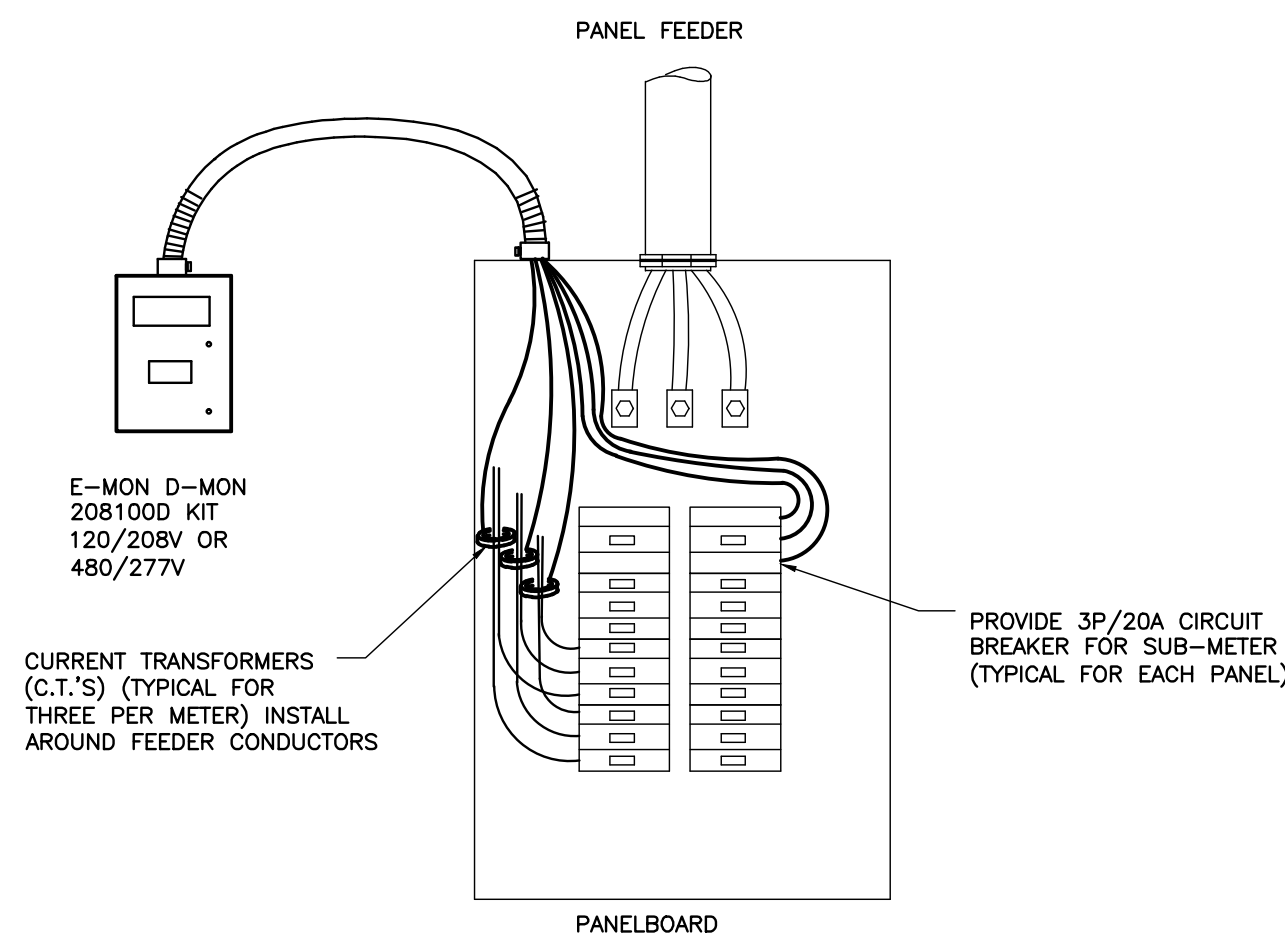
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- ① COORDINATE CONDUIT ROUTING WITH MECHANICAL PIPING. RUN CONDUIT CLOSE TO THE CEILING DECK. PROVIDE CONDUIT SUPPORTS AS REQUIRED FOR SEISMIC RESTRAINTS.
- ② EXISTING PANEL "1A1" LOCATED IN ELECTRICAL GLOVE ACCESSSED FROM MEN'S ROOM 113 LOCATED ON FIRST FLOOR ABOVE. FIELD VERIFY EXIST LOCATION. PANEL IS 100A, 3 PH, 480/277V. PROVIDE 15A/3P C/B FOR PUMP #4 AND 20A/3P C/B FOR SUB-METER. LOCATE SUB-METER UNDER THE PANEL. SEE SUB-METER DETAIL ON DRAWING E-4

1. CONDUIT ROUTINGS SHOWN ARE SCHEMATIC IN NATURE, CONTRACTOR TO FIELD VERIFY ACTUAL ROUTINGS PRIOR TO THE START OF WORK.
2. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO THE START OF WORK.

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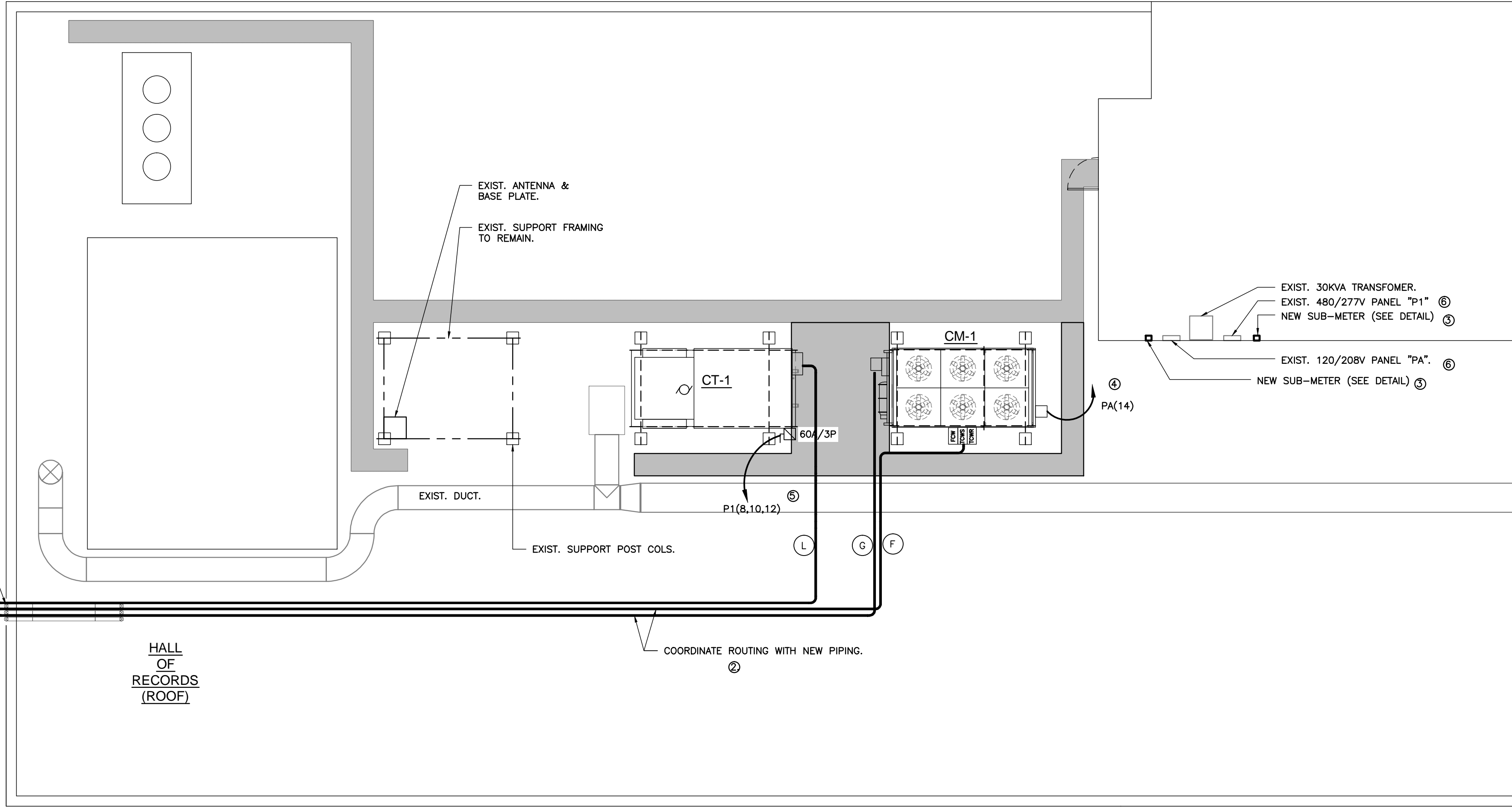


SUBMETERING DETAIL

PLAN NOTES

- VERTICAL CONDUIT TO BE INSTALLED ON THE SIDE OF THE BUILDING DOWN TO PLAZA SERVICE AREA. COORDINATE ROUTING WITH NEW PIPING AND EXISTING CONDUITS. REFER TO DRAWINGS E-1 & E-2 FOR CONTINUATION. THIS IS A FIVE-STORIES BUILDING WITH AN ESTIMATED HEIGHT OF ABOUT 70 FEET. FIELD VERIFY THE VERTICAL RUN. PROVIDE APPROPRIATE SUPPORTS FOR THE CONDUITS.
- RUN CONDUITS ALONG THE PIPING. PROVIDE SUPPORTS FOR THE ROOF. COORDINATE WITH MECHANICAL CONTRACTOR AND WITH OWNER REPRESENTATIVE FOR THE TYPE OF SUPPORTS NEEDED TO PROTECT THE ROOF MEMBRANE.
- PROVIDE SUB-METERS, ONE FOR EACH PANEL "P1" AND "PA". PROVIDE 20A3P CIRCUIT BREAKERS AND 3 #12, 1 #12G IN 3/4" C FOR METERS.
- PROVIDE POWER FOR HEAT TRACE FOR FUEL CELL AND COOLING TOWER COLD WATER MAKE-UP PIPING: 2#12, 1#12G IN 3/4" C AND 20A1P C/B IN PANEL "PA"
- PROVIDE POWER FOR COOLING TOWER "CT-1": 3#6, 1#6G IN 1" C AND 90A3P C/B IN PANEL "P1".
- PROVIDE ALL NEW CIRCUIT BREAKERS FOR THE NEW EQUIPMENT. DO NOT USE THE EXISTING SPARES

DOWN TO PLAZA SERVICE AREA, COORDINATE ROUTING WITH NEW PIPING AND EXISTING CONDUITS. REFER TO DWGS. E-1 & E-2 FOR CONTINUATION.



ELECTRICAL ROOF PLAN

NOTES:

- CONDUIT ROUTINGS SHOWN ARE SCHEMATIC IN NATURE. CONTRACTOR TO FIELD VERIFY ACTUAL ROUTINGS PRIOR TO THE START OF WORK.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES PRIOR TO THE START OF WORK.

FEEDERS AND CONDUIT TABLE

UG. PWR FEED	SIZE	FROM:	TO:	WIRE SIZE:	REMARKS:
A	2-4" C	MDT AT THE FC	SWGR (UI METER SEC.)	(2) @ 4" C-3#500KCMIL & 1 #1/0G	
B	2-4" C	SWGR (UI METER SEC.)	HS NORMAL PWR. SWBD.	(2) @ 4" C-3#500KCMIL & 1 #1/0G	
C	1-1" C	HRM INSIDE BLDG.	FUEL CELL UPS	2 #12 AWG & 1 #12G IN 1" C	120V
D	1-1" C	RMS & ZPE	FUEL CELL - CC BOX	CAT 5E OR BETTER & AS REQUIRED	ETHERNET & ZPE INPUT
E	1-1" C	HRM	M7(DG)	(3) SETS OF 3 #18AWG SHIELDED, 1" C	
F	1-1" C	HRM	COOLING MOD. PIPE IN BSMT.	10-#18 AWG IN 1" C	
G	1-1" C	FC INTERNAL LOADS	COOLING MOD. ON ROOF	3-#6 AWG, 1 #10G IN 1-1/4" C	
H	1-1" C	M7 (DG)	M6 (TOTALIZER)	6-#18 AWG IN 1" C	KYZ SIGNALS see note 2
J	1-1" C	ZPE	M1	3-#18 AWG IN 1" C	
K	1-1" C	MOT.CNTRL. RELAY BOX	PUMP P-4	3-#18 AWG IN 1" C	PUMP #4 CONTROLS
L	1-1" C	MOT.CNTRL. RELAY BOX	COOLING TOWER ON ROOF	3-#18 AWG IN 1" C	COOLING TOWER CONTROLS
M	1-1" C	MOT.CNTRL. RELAY BOX	FUEL CELL CC	2-#16 AWG IN 1" C	24V DC

- NOTES:
- RUN THE INSIDE PART OF THE CONDUITS CONCEALED OR CLOSE TO CEILING AND WALLS, PARALLEL WITH EACH OTHER.
 - SHIELD THE KYZ SIGNALS (IN "H" CONDUITS) WITH SHIELD TERMINATED TO GROUND AT SIGNAL SOURCE END ONLY.
 - SEE DRAWING E-6 FOR CONDUIT PLAN DIAGRAM
 - NOT ALL CONDUITS ON THE DRAWINGS ARE LABELED WITH LETTERS.
 - FEEDERS E, H AND J CAN SHARE THE SAME 1" CONDUIT WHEN RUNNING IN PARALLEL, PROVIDE J-BOXES AS REQ'D.

MECHANICAL EQUIPMENT SCHEDULE

No.	EQUIP.	LOCATION	VOLT	PH	AMPS	KW	MOTOR HP	FEEDER SIZE	GND	CONDUIT	CIRCUIT BREAKER	DISC SIZE	REMARKS
1	CH	UNDER PLAZA	480	3	5.9			3 #12	1 #12	3/4"	20A/3P	30A/3P	
2	CT	ROOF	480	3	46.8	38.9		3 #6	1 #8	1"	90A/3P	60A/3P	
3	P-1	UNDER PLAZA	480	3		8.8	7.5	3 #12	1 #12	3/4"	20A/3P	30A/3P	NOTE 1
4	P-2	UNDER PLAZA	480	3		27.1	25	3 #8	1 #10	1"	50A/3P	60A/3P	NOTE 1
5	P-3	UNDER PLAZA	480	3		8.8	7.5	3 #12	1 #12	3/4"	20A/3P	30A/3P	NOTE 3
6	P-4	BSMT. CITY HALL	480	3		3.8	3	3 #10	1 #10	3/4"	15A/3P	30A/3P	NOTE 2
7	P-5	UNDER PLAZA	480	3		6.1	5	3 #12	1 #12	3/4"	20A/3P	30A/3P	NOTE 2

NOTE:

- PUMPS P-1 AND P-2 RUN IN THE SUMMER WITH THE CHILLER AND IT IS MANUALLY TURNED OFF IN THE WINTER TIME. PROVIDE SUMMER/WINTER SWITCH.
- PUMPS P-4 AND P-5 RUN IN THE WINTER WITH PUMP P-3 AND IT IS MANUALLY TURNED OFF IN THE SUMMER TIME. PROVIDE SUMMER/WINTER SWITCH.
- PROVIDE SUMMER/WINTER SWITCH FOR PUMP P-3. P-3 IS STARTED BY FUEL CELL, IT WILL RUN CONTINUOUSLY AND IT IS CONTROLLED BY THE CHILLER DURING THE SUMMER. PROVIDE CONTROLLING MEANS.

GOVERNMENTAL CENTER FUEL CELL
200 Orange Street, New Haven CT 06510,
CNH PROJECT #10-160-01

ELECTRICAL ROOF PLAN

LEA
An Employee Owned Company

DRAWING
E-4

SHEET NO. 23 NO. OF SHEETS 26

Loireiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
Phone: 860-747-6181 / fax: 860-747-8822
An Employee Owned Company • email: info@loireiro.com



SCALE
AS NOTED
CONSTR. NO.
88FB102
DATE
11/29/11
DRAWN BY
DN
APPROVED BY
DN

ISSUED FOR CONSTRUCTION
REV. 0
DESCRIPTION OF REVISION
DATE
11/29/11
APPR.



NOTES:

1. THE AIC RATING OF THE SITE ELECTRICAL INTERFACE MUST BE COMPARED WITH THE AIC RATING OF THE POWER PLANT CIRCUIT BREAKER (65,000 AIC).
2. CIRCUIT BREAKER (CB) MUST HAVE GFI PROTECTION AND BE SUITABLE FOR BACKFEEDING. THE C/B IS IN SEPARATE ENCLOSURE ON SIDE OF ELECTRICAL ROOM ON A NEW PLATFORM.
3. FUEL CELL POWER FACTOR IS ADJUSTABLE BETWEEN 0.85 LEADING AND LAGGING (DEFAULT PF=1.0). CUSTOMER SHOULD EVALUATE THE BUILDING LOADS TO DETERMINE APPROPRIATE FUEL CELL PF SETTING.
4. ALL SITE ELECTRICAL INSTALLATION DESIGNS INCLUDING SWITCHGEAR, WIRING, CONDUIT, ETC. MUST COMPLY WITH LOCAL AND NATIONAL ELECTRICAL CODES.

GROUNDING NOTES:

1. THE FUEL CELL GROUND LUG INSIDE DISCONNECT SWITCH MDS001 SHALL BE CONNECTED TO AN EXTERNAL #1/0 EQUIPMENT GROUNDING CONDUCTOR FROM THE CUSTOMER MAIN SERVICE PANEL'S "GROUNDED CONDUCTOR" PER NEC ART 692.44, IN ORDER TO PROVIDE THE REQUIRED SINGLE POINT GROUND PER NEC ART 250.24.A & D.
2. NOTE THAT THE FUEL CELL GROUND LUG INSIDE MDS001 IS BONDED TO ALL METALLIC NON-CURRENT CARRYING METAL PARTS BOTH INSIDE THE FUEL CELL AND ALSO AT EXTERNAL FUEL CELL SUBASSEMBLIES SUCH AS THE COOLING MODULE, SO ALL FUEL CELL PARTS ARE CONNECTED TO THE EQUIPMENT GROUNDING CONDUCTOR AS REQUIRED BY ART 250.110.
3. NOTE ALSO THAT THERE IS TO BE NO OTHER GROUNDING ELECTRODE AT THE FUEL CELL OR ANY OF ITS EXTERNAL SUBASSEMBLIES SUCH AS THE SWITCHGEAR ROOM. ALL OF THESE SUBASSEMBLIES ARE TO BE CONNECTED TO THE EQUIPMENT GROUNDING CONDUCTOR INCLUDED WITH THE CIRCUIT CONDUCTORS FROM THE FUEL CELL PER ART 250.134.B, WHERE THE FUEL CELL GROUND LUG IN MDS001 CARRIES THESE GROUND WIRES BACK TO THE GROUNDED SERVICE CONDUCTOR AT THE CUSTOMER MAIN SERVICE PANEL.
4. ANY SUBASSEMBLY ELECTRICAL PANELS CONNECTED TO THE FUEL CELL SHALL BE GROUNDED TO THE EQUIPMENT GROUNDING CONDUCTOR FROM THE FUEL CELL PER ART 250.148 AND SHALL NOT HAVE THEIR OWN GROUND ELECTRODE.

TABLE A PROTECTIVE SETTINGS AS PER IEEE 1547/UL 1741					
ANSI C37 DEVICE NUMBER	PROTECTION FUNCTION	MAGNITUDE PARAMETER NUMBER	MAGNITUDE SETTING (RANGE)	TIME PARAMETER NUMBER	TIME SETTING (RANGE)
27	UNDER VOLTAGE	41.26	88% (88-98)	41.27	120 CYCLES (30-120)
27	FAST UNDER VOLTAGE	41.19	50% (50-98)	41.20	10 CYCLES (6-10)
59	OVER VOLTAGE	41.24	110% (102-110)	41.25	60 CYCLES (30-60)
59	FAST OVER VOLTAGE	41.17	120% (102-120)	41.18	10 CYCLES (6-10)
81	SLOW UNDER FREQUENCY	41.15	58.8 HZ (59.8-57)	41.16	300 SECONDS (0.16-300)
81	UNDER FREQUENCY	41.11	57 HZ (59.5-57)	41.23	10 CYCLES (6-10)
81	OVER FREQUENCY	41.10	60.5 HZ (59.8-60.5)	41.22	10 CYCLES (6-10)
79	RECLOSE TIME DELAY RELAY		OPEN TO TRIP	36.14	300 SECONDS (1-1000)
32	DIRECTIONAL POWER RELAY	N/A	0.1 PER UNIT OR UTILITY MINIMUM	N/A	120 CYCLES

NOTE: THESE ARE SETTINGS INTERNAL TO THE FUEL CELL. EXCEPT FUNCTION 32 WHICH IS ONLY AVAILABLE THROUGH AN EXTERNAL PROTECTION RELAY.

CERTIFICATION:

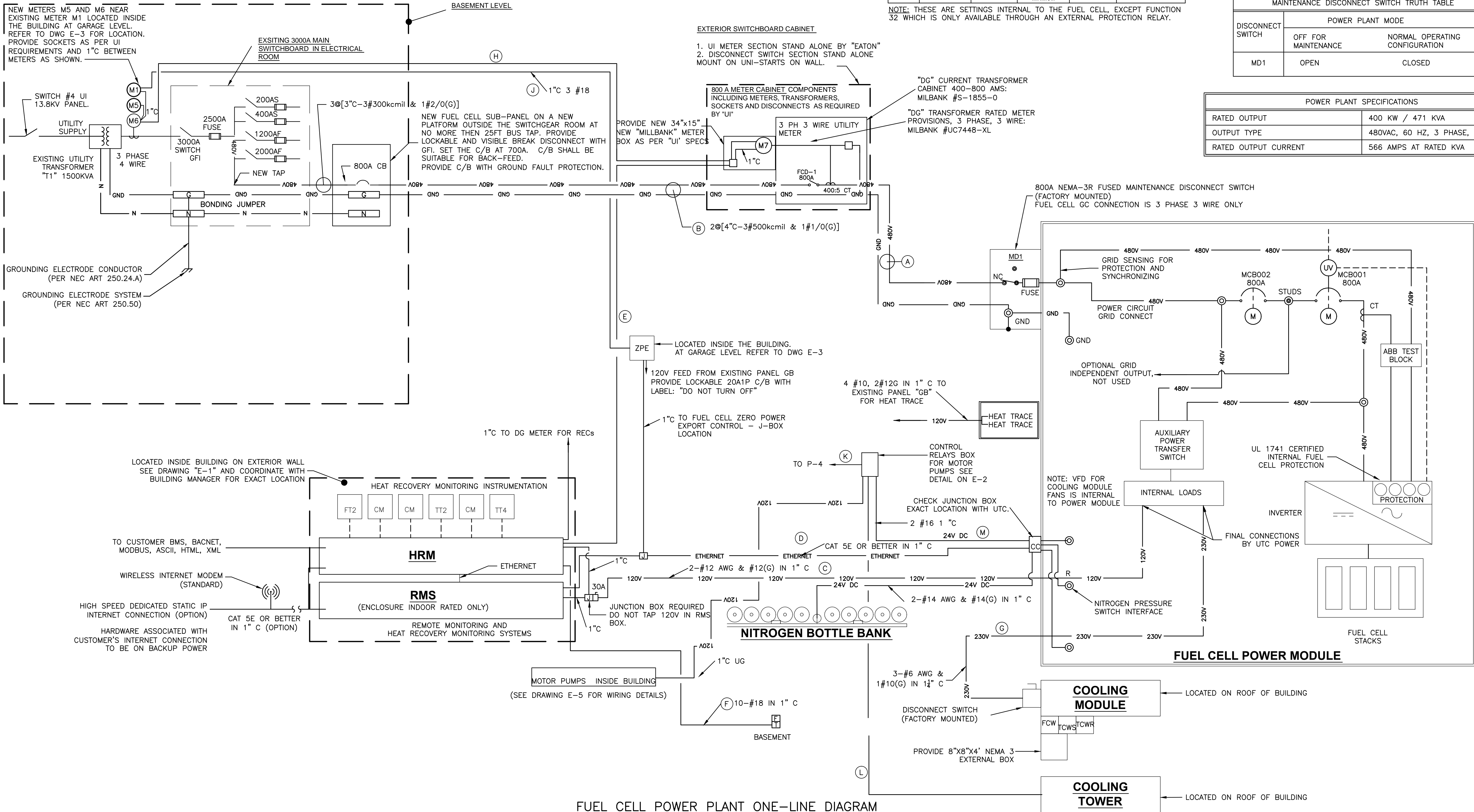
POWER PLANT IS CERTIFIED TO: ANSI/CSA AMERICA FC 1 - 2004 (FORMALLY ANSI Z21.L83) "AMERICAN NATIONAL STANDARD FOR STATIONARY FUEL CELL POWER SYSTEM" INCLUDING,

- UL1741 "INVERTERS, CONVERTERS AND CONTROLLERS FOR USE IN INDEPENDENT POWER SYSTEMS - GRID CONNECTION"
- IEEE 1547 "STANDARD FOR INTERCONNECTING DISTRIBUTED RESOURCES WITH ELECTRIC POWER SYSTEMS."
- NFPA 70 NATIONAL ELECTRIC CODE (FOR INTERFACES TO CUSTOMER WIRING AND WIRING BETWEEN MODULES).

FUEL CELL OUTPUT CIRCUIT BREAKER TRUTH TABLE		
CIRCUIT BREAKER	POWER PLANT MODE	
	OFF/IDLE	GRID CONNECT (GC)
MCB001	OPEN	CLOSED
MCB002	CLOSED	CLOSED

MAINTENANCE DISCONNECT SWITCH TRUTH TABLE		
DISCONNECT SWITCH	POWER PLANT MODE	
	OFF FOR MAINTENANCE	NORMAL OPERATING CONFIGURATION
MD1	OPEN	CLOSED

POWER PLANT SPECIFICATIONS	
RATED OUTPUT	400 KW / 471 KVA
OUTPUT TYPE	480VAC, 60 HZ, 3 PHASE, 3 WIRE
RATED OUTPUT CURRENT	566 AMPS AT RATED KVA



FUEL CELL POWER PLANT ONE-LINE DIAGRAM
NOT TO SCALE

GENERAL NOTES:			DIVISION 1000 – STRUCTURAL STEEL NOTES:			DIVISION 15000 – MECHANICAL			DIVISION 16000 – ELECTRICAL			2.7 PHOTOELECTRIC CONTROLS		
1. THE STRUCTURAL PLANS AND SPECIFICATIONS, TO THE BEST OF OUR KNOWLEDGE, COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, 2003 EDITION AS SUPPLEMENTED, AMENDED, AND ADOPTED BY THE STATE OF CONNECTICUT.			1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "MANUAL OF STEEL CONSTRUCTION" (LATEST EDITION) OR THE "MANUAL FOR STEEL CONSTRUCTION, LOAD AND RESISTANCE FACTOR DESIGN" (LATEST EDITION).			PART 1 – GENERAL			PART 1 GENERAL			A. DESCRIPTION: CADMIUM SULFIDE CELL, 1 INCH DIAMETER IN A DIE-CAST ZINC ENCLOSURE WITH CONTROL CONTACTS IN A WEATHER-PROOF ENCLOSURE.		
2. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE, 2003 EDITION AND ALL APPLICABLE FEDERAL AND STATE CODES, STANDARDS, REGULATIONS, AND LAWS.			2. ALL STEEL DETAILS AND CONNECTIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AISC "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN", (LATEST EDITION) OR THE "MANUAL FOR STEEL CONSTRUCTION, LOAD AND RESISTANCE FACTOR DESIGN", (LATEST EDITION). BRACED FRAME CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AISC "SEISMIC PROVISIONS FOR STRUCTURAL BUILDINGS" 2002 EDITION.			1.1 DESCRIPTION			A. NEW POWER DISTRIBUTION SYSTEM			B. OPERATING TEMPERATURE RANGE: -40°F TO +120°F.		
3. ALL REFERENCED STANDARDS REFER TO THE EDITION IN FORCE AT THE TIME THESE PLANS AND SPECIFICATIONS ARE ISSUED FOR PERMIT.			3. ALL ROLLED SHAPES SHALL CONFORM TO ASTM STANDARD A572, GRADE 50 UNLESS SPECIFICALLY INDICATED ELSEWHERE ON OTHER DRAWINGS.			1.2 CONFORM TO THE REQUIREMENTS OF THE CONNECTICUT STATE BUILDING AND FIRE SAFETY CODES, INCLUDING BUT NOT LIMITED TO, THE FOLLOWING:			A. NFPA 70 – NATIONAL ELECTRICAL CODE (NEC).			C. CONTACTS: SPST, 1800VA BALLAST LOAD AT 120 VOLTS. NORMALLY CLOSED CONTACT (FAILS IN THE ON POSITION).		
4. WORK NOT INDICATED ON A PART OF THE DRAWINGS BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES SHALL BE REPEATED.			4. ALL CONNECTION MATERIAL, BASE PLATES, ANGLES AND MISCELLANEOUS FRAMING SHALL CONFORM TO ASTM STANDARD A-36 UNLESS OTHERWISE NOTED.			A. NFPA 70E – STANDARD FOR ELECTRICAL SAFETY IN THE WORKPLACE.			C. NFPA 101 – LIFE SAFETY CODE.			D. TURN ON AT 1.5 TO 5 FOOTCANDLES; TURN OFF AT APPROXIMATELY 3 TIMES TURN ON.		
5. IN ANY CASE OF CONFLICT BETWEEN THE NOTES, DETAILS AND SPECIFICATIONS, THE MOST RIGID REQUIREMENTS SHALL GOVERN. CONTRACTOR SHALL MAKE NO DEVIATION FROM DESIGN DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ARCHITECT.			5. SHOP AND FIELD CONNECTIONS NOT SPECIFICALLY DETAILED ON THE DRAWINGS MAY BE BOLTED OR WELDED.			E. HEAT TRACE ALL EXTERIOR/UNHEATED SPACE COLD WATER SUPPLY PIPING, ALL EXTERIOR/UNHEATED SPACE CONDENSATE DRAIN PIPING AND FUEL CELL W/O PIPING AND ALL CHILLED WATER PIPING THAT RUNS IN UNHEATED SPACES.			1.3 ALL ELECTRICAL EQUIPMENT FURNISHED BY THE CONTRACTOR SHALL BE LISTED AS SUITABLE FOR THE PURPOSE BY UNDERWRITERS' LABORATORIES OR FACTORY MUTUAL.			E. EQUAL TO TORK MODEL NO. 2101.		
6. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AND COORDINATE WITH ARCHITECTURAL DRAWINGS, DRAWINGS FROM OTHER CONSULTANTS, PROJECT SHOP DRAWINGS AND FIELD CONDITIONS.			6. WHEN NOT SPECIFICALLY DETAILED ELSEWHERE ON THE DRAWINGS, ALL BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS SHALL BE TWO SIDED WELD ANGLE CONNECTIONS.			PART 2 PRODUCTS			1.4 POWER AT 480/277V, 3 PHASE, 4 WIRE AND 208/120V, 3 PHASE, 4 WIRE IS AVAILABLE FROM EXISTING PANELS AS SHOWN ON THE DRAWINGS.			2.8 FUSES		
7. THE CONTRACTOR SHALL PROTECT EXISTING FACILITIES, STRUCTURES, AND UTILITY LINES FROM ALL DAMAGE.			7. ALTERNATE CONNECTIONS WILL BE ACCEPTED ONLY WITH THE WRITTEN APPROVAL OF THE ENGINEER. HOWEVER, THE ENGINEER SHALL BE THE SOLE JUDGE OF ACCEPTABILITY AND THE CONTRACTOR'S BID SHALL ANTICIPATE THE USE OF THOSE SPECIFIC DETAILS SHOWN ON THE DRAWINGS. IN ANY EVENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF SUCH ALTERNATE DETAILS WHICH HE PROPOSES.			2.1 WIRE AND CABLE			2.9 ACCEPTABLE MANUFACTURER'S LIST			A. FUSES 600 VOLTS SHALL BE DUAL ELEMENT, TIME DELAY, CURRENT LIMITING, UL TYPE RK 1, 200,000 AMPS RMS SYMMETRICAL SHORT CIRCUIT RATING. FUSES SHALL BE EQUAL TO BUSSMANN LPS-RK.		
8. JOB SAFETY AND CONSTRUCTION PROCEDURES ARE THE RESPONSIBILITY OF THE CONTRACTOR.			8. WHEN INDICATED AS BOLTED ON THE DRAWINGS, ALL SHOP OR FIELD BOLTED BEAM TO BEAM CONNECTIONS SHALL BE BOLTED CONNECTIONS USING 3/4 INCH DIAMETER A325 BEARING BOLTS IN STANDARD HOLES UNLESS SPECIFICALLY NOTED OTHERWISE.			A. 600 VOLT WIRE SHALL HAVE STRANDED (CLASS B) SOFT, ANNEALED COPPER CONDUCTORS. INSULATION SHALL BE 600V, THHN/THWN, 75°C FOR NO. 6 AND SMALLER; XHHW, 75°C, FOR NO. 4 AND LARGER.			A. ELECTRICAL EQUIPMENT SCHEDULE WITH SIZES, PERFORMANCE, ETC., IS SHOWN ON DRAWINGS. ALL EQUIPMENT SHALL BE EQUAL IN GRADE, STYLE AND QUALITY TO THAT INDICATED, SPECIFIED OR SCHEDULED, AND SHALL BE LIMITED TO MANUFACTURERS LISTED BELOW:			A. FUSES 600 VOLTS SHALL BE DUAL ELEMENT, TIME DELAY, CURRENT LIMITING, UL TYPE RK 1, 200,000 AMPS RMS SYMMETRICAL SHORT CIRCUIT RATING. FUSES SHALL BE EQUAL TO BUSSMANN LPS-RK.		
DIVISION 3000 – REINFORCED CONCRETE NOTES:			9. ALL BEAMS AND GIRDERS SHALL BE CONNECTED FOR 115% OF REACTION DENOTED BY THE SYMBOL V ON PLAN.			2.2 CONDUIT			B. INTERMEDIATE METAL CONDUIT (IMC) SHALL BE ZINC COATED STEEL.			1) TRANSFORMERS: GENERAL ELECTRIC, SIEMENS, SQUARE D, SORGEL, WESTINGHOUSE.		
1. STRUCTURAL CONCRETE AND CONCRETING PRACTICES SHALL CONFORM WITH ACI-318-02, "AMERICAN CONCRETE INSTITUTE, BUILDING CODE FOR REINFORCED CONCRETE." DETAILS SHALL BE IN ACCORDANCE WITH ACI-135, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" UNLESS OTHERWISE NOTED ON THE DRAWINGS.			10. ALL BEAM AND GIRDER CONNECTIONS SHALL BE A LEAST CAPABLE OF DEVELOPING THE UNIFORMLY DISTRIBUTED LOAD CAPACITY OF THE MEMBER USING THE REACTION FROM THE ALLOWABLE LOAD OF BEAM AS TABULATED IN THE MANUAL OF STEEL CONSTRUCTION PART 2, (LATEST EDITION) UNLESS NOTED OTHERWISE.			A. RIGID METAL CONDUIT (RMC) SHALL BE ZINC COATED STEEL OR RIGID ALUMINUM.			C. ELECTRIC METALLIC TUBING (EMT) SHALL BE ZINC COATED STEEL.			2) SWITCHBOARDS: SQUARE D, CUTLER-HAMMER, GENERAL ELECTRIC, SIEMENS.		
2. ALL STRUCTURAL CONCRETE SHALL BE NORMAL WEIGHT STONE CONCRETE. CONCRETE FOR SLABS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS UNLESS OTHERWISE NOTED ON THE DRAWINGS.			11. OVERSIZED OR SLOTTED HOLES SHALL NOT BE USED FOR ANY CONNECTIONS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER.			B. INTERMEDIATE METAL CONDUIT (IMC) SHALL BE ZINC COATED STEEL.			D. RIGID NON-METALLIC CONDUIT (RNC) SHALL BE PVC SCHEDULE 40.			3) 600V WIRES AND CABLES: ANACONDA, ESSEX WIRE AND CABLE, GENERAL CABLE, NATIONAL.		
3. ALL EXPOSED CONCRETE SHALL HAVE AN AIR ENTRAINING AGENT.			12. ALL WELDS INDICATED SHALL MEET THE MINIMUM WELD SIZE SPECIFIED BY THE CURRENT AISC MANUAL OF STEEL DESIGN.			C. ELECTRIC METALLIC TUBING (EMT) SHALL BE ZINC COATED STEEL.			E. FLEXIBLE METAL CONDUIT (FMC) SHALL BE METALLIC WITH OR WITHOUT A WATERPROOF PVC JACKET AS REQUIRED.			4) METAL CONDUIT: KAISER, NATIONAL, PITTSBURGH, REPUBLIC, ROBE, TRIANGLE.		
4. ALL REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60.			13. ALL WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS IN ACCORDANCE WITH A.W.S. SPECIFICATIONS, (LATEST EDITIONS). ALL WELDING ELECTRODES SHALL CONFORM TO A.W.S. A5.1 GRADE E-70, BARE ELECTRODES AND GRANULAR FLUX SHALL CONFORM TO A.W.S. A5.17, F70 A.W.S. FLUX CLASSIFICATION.			D. RIGID NON-METALLIC CONDUIT (RNC) SHALL BE PVC SCHEDULE 40.			F. USE THREADED COUPLINGS FOR RIGID AND INTERMEDIATE STEEL CONDUIT. USE COMPRESSION TYPE COUPLINGS FOR EMT.			5) FITTINGS: APPLETON, CROUSE-HINDS, NATIONAL, O/Z GEDNEY, STEEL CITY, THOMAS & BETTS.		
5. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. CHAIR OR LIFT WIRE FABRIC DURING CONCRETE PLACEMENT TO INSURE PROPER POSITION IN SLAB.			14. PROVIDE WELDED STIFFENER PLATES ON BOTH SIDES OF THE WEB OF BEAMS AT POINTS OF CONCENTRATED LOAD.			E. FLEXIBLE METAL CONDUIT (FMC) SHALL BE METALLIC WITH OR WITHOUT A WATERPROOF PVC JACKET AS REQUIRED.			G. MINIMUM SIZE CONDUIT SHALL BE 3/4".			6) CONNECTORS (WIRE & CABLE): BUCHANAN, BURNDY, SKOTCHLOK, T & B, TREGO.		
6. ALL REINFORCEMENT SHALL BE SECURELY HELD IN PLACE WHILE PLACING CONCRETE. IF REQUIRED ADDITIONAL BARS OR STIRRUPS SHALL BE PROVIDED BY THE CONTRACTOR TO FURNISH SUPPORT OR ALL BARS.			15. THE FILLER BEAMS SHOULD BE SPACED EQUALLY BETWEEN THE SUPPORTS IF NOT OTHERWISE NOTED ON THE DRAWINGS.			F. USE THREADED COUPLINGS FOR RIGID AND INTERMEDIATE STEEL CONDUIT. USE COMPRESSION TYPE COUPLINGS FOR EMT.			2.3 BOXES			7) OUTLET BOXES: APPLETON, BELL, NATIONAL, RUSSELLSTOLL, STEEL CITY.		
7. MINIMUM CONCRETE COVER SHALL BE 3/4 INCH FOR SLABS, 1 INCH FOR WALLS AND 1-1/2 INCHES FOR COLUMNS. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE 1 INCH FOR SLABS ON GRADE AND WALLS. ALL CONCRETE EXPOSED TO WEATHER OR EARTH SHALL HAVE MINIMUM CONCRETE COVER OF 2 INCHES FOR BARS LARGER THAN #6, 1-1/2 INCHES FOR #5 BARS OR SMALLER. FOR ALL CONCRETE CAST AGAINST EARTH PROVIDE 3 INCHES COVER. ALL CONCRETE PLACED AGAINST PERMANENT SHEETING SHALL HAVE 4 INCHES COVER.			16. CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.			G. MINIMUM SIZE CONDUIT SHALL BE 3/4".			A. OUTLET BOXES FOR SURFACE MOUNTED SWITCHES AND RECEPTACLES SHALL BE TYPE FD, CAST FERROALLOY WITH THREADED HUBS. PROVIDE GASKETED COVER AS REQUIRED.			8) PULL AND JUNCTION BOXES: COLUMBIA, FULLMAN, HOPE, KEYSTONE, LEE, SUN.		
8. NO CONCRETE TEST WILL BE ACCEPTED IF CONCRETE IS TAMPERED WITH IN ANY WAY AFTER S&D TEST IS PERFORMED. REPEAT TEST IF WATER IS ADDED AFTER INITIAL SAMPLING.			17. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND DRAWINGS RELATED TO OTHER TRADES. THE GENERAL CONTRACTOR IS RESPONSIBLE TO CHECK AND COORDINATE DIMENSIONS, CLEARANCES, ETC., WITH THE WORK OF OTHER TRADES.			B. SWITCHBOARDS: SQUARE D OR GE CIRCUIT BREAKER SWITCHBOARD, 480 VOLT, 3 PHASE, 3 WIRE, SOLIDLY GROUND.			B. MANUFACTURERS, DUPLEX GFI, WATERPROOF:			9) CHANNELS, SUPPORTS AND RACEWAY: B-LINE, GRINNELL, SUPERSTRUT, UNISTRUT.		
9. THE GENERAL CONTRACTOR SHALL PROVIDE REINFORCING STEEL ERECTOR WITH A SET OF STRUCTURAL PLANS FOR FIELD USE.			18. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH SHOP DRAWINGS TO BE APPROVED PRIOR TO FABRICATING STEEL.			C. MINIMUM SHORT CIRCUIT RATING: 65,000 AMPERES RMS SYMMETRICAL FOR 480 VOLT SWITCHBOARDS.			1) HUBBELL 2) LEVITON 3) PASS & SEYMOUR			10) CONDUIT SEALS: APPLETON, KILLARK, O/Z GEDNEY.		
10. ALL ADJOINING SURFACES NOT CAST MONOLITHICALLY SHALL BE ROUGHENED TO 1/4 INCH AMPLITUDE FOR THE ENTIRE INTERSECTING SURFACE ACCORDING TO ACI RECOMMENDATIONS.			1. ABOVE GROUND PIPE INSULATION SHALL BE RIGID, HEAVY DENSITY, PREFORMED GLASS FIBER, WITH ALL SERVICE JACKET. JACKET SHALL HAVE PRESSURE SENSITIVE TAPE CLOSURE. BUTT JOINTS SHALL HAVE 3" WIDE TAPE OF SAME MATERIAL. VALVES AND FITTINGS SHALL BE INSULATED WITH ZESTON, OR APPROVED EQUAL INSULATED PVC, ONE PIECE, SWAP-TYPE COVERS AND ZESTON 1 1/2" Z-TAPE, 10 MIL. EXTERIOR PIPE SHALL BE PROVIDED WITH AN 0.016" ALUMINUM JACKET. INSULATION THICKNESS AS FOLLOWS:			D. MOLDED CASE CIRCUIT BREAKERS: SQUARE D OR GE, SOLID STATE, 5-CYCLE CLOSING.			A. DESCRIPTION: SPECIFICATION GRADE, 120VAC, NEMA 5-20R. COLOR SHALL BE IVORY.			A. ALL WIRING SHALL BE INSTALLED IN ACCORDANCE WITH NEC.		
11. CONTRACTOR SHALL VERIFY DIMENSIONS AND LOCATIONS OF ALL OPENINGS, PIPE SLEEVES, CURBS ETC. AS REQUIRED BY OTHER TRADES BEFORE CONCRETE IS PLACED.			2. SYSTEM INSULATION THICKNESS			E. ENCLOSURE TYPE: NEMA 3R FREE STANDING, STRIP HEATER WITH THERMOSTAT, PAD LOCKING ATTACHMENTS.			B. MANUFACTURERS, DUPLEX GFI, WATERPROOF:			B. JOINTS OR TERMINATIONS SHALL BE MADE WITH SOLDERLESS POSITIVE PRESSURE CONNECTIONS. JOINTS AND FREE ENDS, UNLESS PROPERLY INSULATED BY CONNECTORS, SHALL BE WRAPPED WITH TAPE IN A MANNER THAT MAKES THEIR INSULATION EQUAL TO THE ORIGINAL INSULATION OF THE CONDUCTOR.		
12. FOR LOCATION OF FLOOR DRAINS, CONCRETE PADS AND FLOOR DEPRESSIONS SEE ARCHITECTURAL AND MECHANICAL DRAWINGS.			3. SEQUENCE OF OPERATION:			F. PROVIDE CTS AND PT'S AS REQUIRED FOR METERING. SEE DRAWINGS FOR METERING DETAILS.			1) HUBBELL 2) LEVITON 3) PASS & SEYMOUR			C. MINIMUM SIZED CONDUIT, UNLESS NOTED, SHALL BE 3/4". TYPE OF CONDUIT SHALL BE AS FOLLOWS:		
13. CONTRACTOR SHALL USE RIGID TEMPLATES TO INSTALL ANCHOR BOLTS.			4. REFERENCE TO DRAWING M-8.			G. PROVIDE CTS AND PT'S AS REQUIRED FOR METERING. SEE DRAWINGS FOR METERING DETAILS.			A. SWITCHBOARDS: SQUARE D OR GE CIRCUIT BREAKER SWITCHBOARD, 480 VOLT, 3 PHASE, 3 WIRE, SOLIDLY GROUND.			D. ALL RIGID AND INTERMEDIATE CONDUIT JOINTS SHALL BE WRENCH TIGHT.		
14. PIPES OR CONDUITS ARE NOT PERMITTED TO BE PLACED IN SLAB.			5. HEAT COMMISSIONING:			H. SEE DRAWINGS FOR RATINGS OF SWITCHBOARDS.			B. SWITCHBOARD BUS: SILVER PLATED COPPER, RATINGS AS INDICATED. PROVIDE COPPER GROUND BUS IN EACH SECTION.			E. PULL AND JUNCTION BOXES SHALL BE INSTALLED AS REQUIRED BY CODE AND CONTRACTOR'S CONVENIENCE AS NECESSARY TO PULL IN WIRES, WHETHER SHOWN ON DRAWINGS OR NOT.		
15. TYPICAL PEDESTRIAN SLAB REINFORCING SHALL BE AS FOLLOWS: TEMPERATURE REINFORCING 6 X 6 – W2.9 X W2.9 WELDED WIRE FABRIC.			6. FACTORY START-UP OF ALL EQUIPMENT MUST HAVE BEEN CARRIED OUT AS WELL AS CONTROL SYSTEM COMPLETION AND SYSTEM CHECKOUT. AIR AND WATER BALANCING REPORTS MUST HAVE BEEN SUBMITTED AND APPROVED BY THE DESIGN ENGINEER.			A. MAGNETIC STARTER SHALL BE COMBINATION FUSIBLE SWITCH/ MAGNETIC STARTERS. STARTERS SHALL HAVE THERMAL OVERLOAD PROTECTION IN ALL THREE PHASES; 120V CONTROL POWER FROM FUSED CONTROL TRANSFORMER; "GREEN RUNNING LIGHTS" AUXILIARY CONTACTS AND CONTROL MODIFICATIONS AS REQUIRED BY DRAWINGS. FUSIBLE SWITCH SHALL ACCEPT ONLY UL CLASS R FUSES. FUSES SHALL BE UL CLASS RK-1, TIME-DELAY.			C. MINIMUM SHORT CIRCUIT RATING: 65,000 AMPERES RMS SYMMETRICAL FOR 480 VOLT SWITCHBOARDS.			F. WIRING IN PANELS, WIREWAYS, STARTERS, ETC. SHALL BE NEATLY TRAINED AND SECURED WITH PLASTIC CABLE TIES. CONNECTIONS TO TERMINALS SHALL BE WITH SQUARE BEND AND SERVICE LOOP.		
			7. OPERATION AND MAINTENANCE MANUALS, AS-BUILTS, TAB REPORTS AND ANY OTHER ITEMS AS MAY BE SPECIFIED SHALL BE SUBMITTED FOR REVIEW AND COMMENT.			B. IDENTIFY ALL CONDUCTORS AT ORIGIN, TERMINATION AND AT INTERMEDIATE BOXES BY MEANS OF "BRADY" TYPE, PRESSURE SENSITIVE, PLASTIC COATED TAPE. STICK-ON LABELS EXCEPT FEEDING SHALL HAVE PHENOLIC TAGS ENGRAVED WITH CIRCUIT DESIGNATIONS AND ATTACHED WITH PLASTIC TIE-WRAPPS.			D. MOLDED CASE CIRCUIT BREAKERS: SQUARE D OR GE, SOLID STATE, 5-CYCLE CLOSING.			D. ALL RIGID AND INTERMEDIATE CONDUIT JOINTS SHALL BE WRENCH TIGHT.		
			8. BEFORE ANY SYSTEM START-UPS BEGIN, THE CONTRACTOR(S) SHALL CONDUCT A FINAL INSTALLATION VERIFICATION AUDIT FOR THEIR WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETION OF ALL WORK INCLUDING CHANGE ORDERS AND PUNCH LIST ITEMS TO THE OWNER'S SATISFACTION. THIS VISUAL CHECK OF THE VARIOUS SYSTEMS TO BE COMMISSIONED SHALL VERIFY THAT ALL COMPONENTS ARE PROPERLY INSTALLED.			C. IDENTIFY ALL CONDUCTORS AT ORIGIN, TERMINATION AND AT INTERMEDIATE BOXES BY MEANS OF "BRADY" TYPE, PRESSURE SENSITIVE, PLASTIC COATED TAPE. STICK-ON LABELS EXCEPT FEEDING SHALL HAVE PHENOLIC TAGS ENGRAVED WITH CIRCUIT DESIGNATIONS AND ATTACHED WITH PLASTIC TIE-WRAPPS.			E. ENCLOSURE TYPE: NEMA 3R FREE STANDING, STRIP HEATER WITH THERMOSTAT, PAD LOCKING ATTACHMENTS.			E. PULL AND JUNCTION BOXES SHALL BE INSTALLED AS REQUIRED BY CODE AND CONTRACTOR'S CONVENIENCE AS NECESSARY TO PULL IN WIRES, WHETHER SHOWN ON DRAWINGS OR NOT.		
			9. THE CONTRACTOR SHALL COMMENCE WITH SYSTEM START-UP AFTER APPROVAL HAS BEEN GIVEN TO THE START-UP PLAN AND AFTER THE PRESTART-UP INSPECTION HAS BEEN COMPLETED.			D. ALL STARTERS SHALL HAVE FACTORY INSTALLED HEATERS SIZED FOR HORSEPOWER SHOWN ON DRAWINGS. CONTRACTOR SHALL CHECK ACTUAL INSTALLED MOTOR NAMEPLATE AMPERE RATING AND CHANGE HEATERS AS REQUIRED IN THE FIELD TO AGREE WITH STARTER MANUFACTURER'S RECOMMENDED SIZING.			F. PROVIDE CTS AND PT'S AS REQUIRED FOR METERING. SEE DRAWINGS FOR METERING DETAILS.			F. WIRING IN PANELS, WIREWAYS, STARTERS, ETC. SHALL BE NEATLY TRAINED AND SECURED WITH PLASTIC CABLE TIES. CONNECTIONS TO TERMINALS SHALL BE WITH SQUARE BEND AND SERVICE LOOP.		
			10. FUNCTIONAL PERFORMANCE TESTING WILL COMMENCE AS SYSTEMS ARE BROUGHT TO SUBSTANTIAL COMPLETION AND WILL BE DONE ON A SYSTEM BY SYSTEM BASIS. THE RESULTS OF THESE TESTS WILL BE DOCUMENTED AND SUBMITTED TO THE OWNER/ENGINEER FOR A FINAL SYSTEM ACCEPTANCE.			E. ENCLOSURE TYPE: NEMA 3R FREE STANDING, STRIP HEATER WITH THERMOSTAT, PAD LOCKING ATTACHMENTS.			G. PROVIDE GFI ON MAIN CIRCUIT BREAKER.			2.11 IDENTIFICATION		
			11. THE OWNER, CONTRACTOR, ENGINEER, OWNER'S CONSULTANT, AND UTC POWER PERSONNEL SHALL ATTEND THE FINAL COMMISSIONING.			F. PROVIDE CTS AND PT'S AS REQUIRED FOR METERING. SEE DRAWINGS FOR METERING DETAILS.			H. SEE DRAWINGS FOR RATINGS OF SWITCHBOARDS.			A. PROVIDE AND INSTALL MARKERS FOR ALL CONDUITS. MARKERS SHALL BE "BRADY" TYPE ADHESIVE-BACKED, PLASTIC-FACED OF SUITABLE COLOR. MARKER SHALL IDENTIFY SYSTEM AND ELECTRICAL CHARACTERISTICS. INSTALL MARKERS AT POINT OF ORIGIN, TERMINATION, ADJACENT TO EACH INTERMEDIATE SPLICE, AND ALL BOXES IN RUN.		
			12. FLOW RATES AND INLET/OUTLET TEMPERATURES AT EACH PIECE OF EQUIPMENT SHALL BE DOCUMENTED BY THE COMMISSIONING AGENT AND PROVIDED TO THE TEAM (ITEM F) FOR REVIEW.			G. PROVIDE CTS AND PT'S AS REQUIRED FOR METERING. SEE DRAWINGS FOR METERING DETAILS.			A. SWITCHBOARDS: SQUARE D OR GE CIRCUIT BREAKER SWITCHBOARD, 480 VOLT, 3 PHASE, 3 WIRE, SOLIDLY GROUND.			B. IDENTIFY ALL CONDUCTORS AT ORIGIN, TERMINATION AND AT INTERMEDIATE BOXES BY MEANS OF "BRADY" TYPE, PRESSURE SENSITIVE, PLASTIC COATED TAPE. STICK-ON LABELS EXCEPT FEEDING SHALL HAVE PHENOLIC TAGS ENGRAVED WITH CIRCUIT DESIGNATIONS AND ATTACHED WITH PLASTIC TIE-WRAPPS.		
			13. COORDINATION AND SHOP DRAWINGS:			H. SEE DRAWINGS FOR RATINGS OF SWITCHBOARDS.			B. SWITCHBOARD BUS: SILVER PLATED COPPER, RATINGS AS INDICATED. PROVIDE COPPER GROUND BUS IN EACH SECTION.			C. MINIMUM SIZED CONDUIT, UNLESS NOTED, SHALL BE 3/4". TYPE OF CONDUIT SHALL BE AS FOLLOWS:		
			A. THE CONTRACTOR SHALL PROVIDE EQUIPMENT AND PIPING COORDINATION DRAWINGS FOR THE OWNER'S REVIEW PRIOR TO FABRICATION. SHOP DRAWINGS FOR ALL EQUIPMENT NOT PROVIDED BY UTC POWER SHALL BE PROVIDED FOR THE OWNER'S REVIEW.			A. MAGNETIC STARTER SHALL BE COMBINATION FUSIBLE SWITCH/ MAGNETIC STARTERS. STARTERS SHALL HAVE THERMAL OVERLOAD PROTECTION IN ALL THREE PHASES; 120V CONTROL POWER FROM FUSED CONTROL TRANSFORMER; "GREEN RUNNING LIGHTS" AUXILIARY CONTACTS AND CONTROL MODIFICATIONS AS REQUIRED BY DRAWINGS. FUSIBLE SWITCH SHALL ACCEPT ONLY UL CLASS R FUSES. FUSES SHALL BE UL CLASS RK-1, TIME-DELAY.			C. MINIMUM SHORT CIRCUIT RATING: 65,000 AMPERES RMS SYMMETRICAL FOR 480 VOLT SWITCHBOARDS.			D. ALL RIGID AND INTERMEDIATE CONDUIT JOINTS SHALL BE WRENCH TIGHT.		
			B. AS-BUILT DRAWINGS:			B. IDENTIFY ALL CONDUCTORS AT ORIGIN, TERMINATION AND AT INTERMEDIATE BOXES BY MEANS OF "BRADY" TYPE, PRESSURE SENSITIVE, PLASTIC COATED TAPE. STICK-ON LABELS EXCEPT FEEDING SHALL HAVE PHENOLIC TAGS ENGRAVED WITH CIRCUIT DESIGNATIONS AND ATTACHED WITH PLASTIC TIE-WRAPPS.			D. MOLDED CASE CIRCUIT BREAKERS: SQUARE D OR GE, SOLID STATE, 5-CYCLE CLOSING.			E. PULL AND JUNCTION BOXES SHALL BE INSTALLED AS REQUIRED BY CODE AND CONTRACTOR'S CONVENIENCE AS NECESSARY TO PULL IN WIRES, WHETHER SHOWN ON DRAWINGS OR NOT.		
			A. THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS OF ALL WATER SYSTEMS AND CONTROL SYSTEMS FOR THIS PROJECT.			C. IDENTIFY ALL CONDUCTORS AT ORIGIN, TERMINATION AND AT INTERMEDIATE BOXES BY MEANS OF "BRADY" TYPE, PRESSURE SENSITIVE, PLASTIC COATED TAPE. STICK-ON LABELS EXCEPT FEEDING SHALL HAVE PHENOLIC TAGS ENGRAVED WITH CIRCUIT DESIGNATIONS AND ATTACHED WITH PLASTIC TIE-WRAPPS.			E. ENCLOSURE TYPE: NEMA 3R FREE STANDING, STRIP HEATER WITH THERMOSTAT, PAD LOCKING ATTACHMENTS.			F. WIRING IN PANELS, WIREWAYS, STARTERS, ETC. SHALL BE NEATLY TRAINED AND SECURED WITH PLASTIC CABLE TIES. CONNECTIONS TO TERMINALS SHALL BE WITH SQUARE BEND AND SERVICE LOOP.		
			END OF SECTION			D. ALL STARTERS SHALL HAVE FACTORY INSTALLED HEATERS SIZED FOR HORSEPOWER SHOWN ON DRAWINGS. CONTRACTOR SHALL CHECK ACTUAL INSTALLED MOTOR NAMEPLATE AMPERE RATING AND CHANGE HEATERS AS REQUIRED IN THE FIELD TO AGREE WITH STARTER MANUFACTURER'S RECOMMENDED SIZING.			F. PROVIDE CTS AND PT'S AS REQUIRED FOR METERING. SEE DRAWINGS FOR METERING DETAILS.			2.10 GENERAL WIRING REQUIREMENTS		

GOVERNMENTAL CENTER FUEL CELL 200 Orange Street, New Haven CT 06510 CNH PROJECT #10-160-01			SPECIFICATIONS			11/29/11			11/29/11		
SCALE NONE			DATE 11/29/11			DATE 11/29/11			DATE 11/29/11		
DRAWN BY JIP/DN			APPROVED BY JIP/DN			DATE 11/29/11			DATE 11/29/11		
SHEET NO. 26			SHEET NO. 26			SHEET NO. 26			SHEET NO. 26		