Doosan Fuel Cell America, Inc.
101 East River Dr
East Hartford, CT 06108
T - 860 727 2200

March 9, 2020

PETITION NO. 1393- Doosan Fuel Cell America, Inc. petition for a declaratory, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 440- kilowatt customer-side combined heat and power fuel cell facility and associated equipment to be located at Cherry Street Lofts, 375 Howard Ave, Bridgeport, Connecticut 06605.

RESPONSE TO COUNCIL INTERROGATORIES

Dear Ms. Bachman,

We are submitting an original and fifteen (15) copies of responses to the Council's interrogatories dated February 27, 2020.

Respectfully Submitted,
Doosan Fuel Cell America, Inc.

Donald Emanuel
Installation Project Manager
Donald.Emanuel@doosan.com
Doosan Fuel Cell America, Inc.

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RESPONSE TO COUNCIL INTERROGATORIES

Petition No. 1393

Proposed Site

1. Page 2 of Attachment No. 18 (PURA Approval of Sub-metering) references five tenant buildings. Please provide an aerial map/photo that identifies these buildings.
   Response R1: Refer to Attachment #20 – Aerial Map with Buildings Labeled.

2. How many of these buildings are currently functional and ready to receive power from the fuel cell?
   Response R2: All of the buildings are currently functional and ready to receive power form the fuel cell.

Site Components/ Interconnection

3. Please provide a detailed Site Plan of the proposed facility, including but not limited to, the dimensions and location of the proposed fuel cell facility, cooling module, concrete pads, fence design and bollards (if applicable) and utility connections.
   Response R11: Refer to Attachment #21 – Detailed site plan, showing the requested details.

4. The third photo in Attachment No. 2 shows a 500KVA transformer on the site. Is this a proposed interconnection for the facility?
   Response R3: This 500 kVA transformer is not the proposed electrical connection of the facility. Refer to Attachment #22 for the proposed electrical schematic of the facility. The fuel cell system will be interconnected with a 750 kVA transformer. The entire site will be metered at medium voltage using pad-mounted primary metering.

Energy Output

5. Would the fuel cell facility still be expected to provide 95% of the buildings energy needs as stated in PURA's decision in Attachment No. 18?
   Response R5: The estimated total electric consumption for the facility based on the consulting firms benchmark software platform was 3,805,620 kWh. The fuel cell system is estimated to produce 3,469,000 kWh annually, or 91.1% of the buildings energy needs.

6. Petition page 3 indicates that the facility will service internal loads needed to operate the fuel cell during an outage. Please explain further.
   Response R6: During a utility outage the fuel cell automatically disconnects from the electric grid by opening an internal circuit breaker, MCB_INV. The fuel cell system will continue to operate in Idle mode, providing power to all internal loads inside the fuel cell needed to maintain operation – pumps, blowers, fans, heaters, etc. Once the fuel cell senses the utility grid has returned to normal operation the fuel cell system will automatically reconnect after a 5 minute time delay.

7. Attachment No. 18, Pages 2 and 9 reference the installation of a 460-kilowatt fuel cell. This is inconsistent with the 440-kilowatt proposed in the Petition. Please clarify.
   Response R7: The proposed facility size under this siting council petition is 440 kW. NuPower has notified PURA of this changed, refer to Attachment #23 – Letter to PURA re Project Size.

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8. Petition page 14 states that "This project has been awarded a contract to sell Low Emission Energy Credits (LREC) to Eversource…" however, the petition references United Illuminating as the electric distribution company for the facility. Please clarify.
   Response R8: The fuel cell facility has been awarded a contract to sell Low Emission Energy Credits (LREC) to United Illuminating, Contract LL19384.

9. Petition page 11 references "utilization of the waste heat." Please explain.
   Response R7: The fuel cell produces up to 0.76 MMBtu/h of waste heat at 250°F. The waste heat is intended to go to the Great Oaks Charter school and provide heat to building heating and domestic hot water usage. This will offset heat currently provided by natural gas boilers.

Environmental

10. Petition page 10 references occasional water discharge from the fuel cell would be directed to a dry well located on the site. Please show the location of the dry well on the site plan as part of interrogatory No. 3.
    Response R10: Refer to Attachment #21 – Detailed site plan, showing the location of the dry well.

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LIST OF ATTACHMENTS:

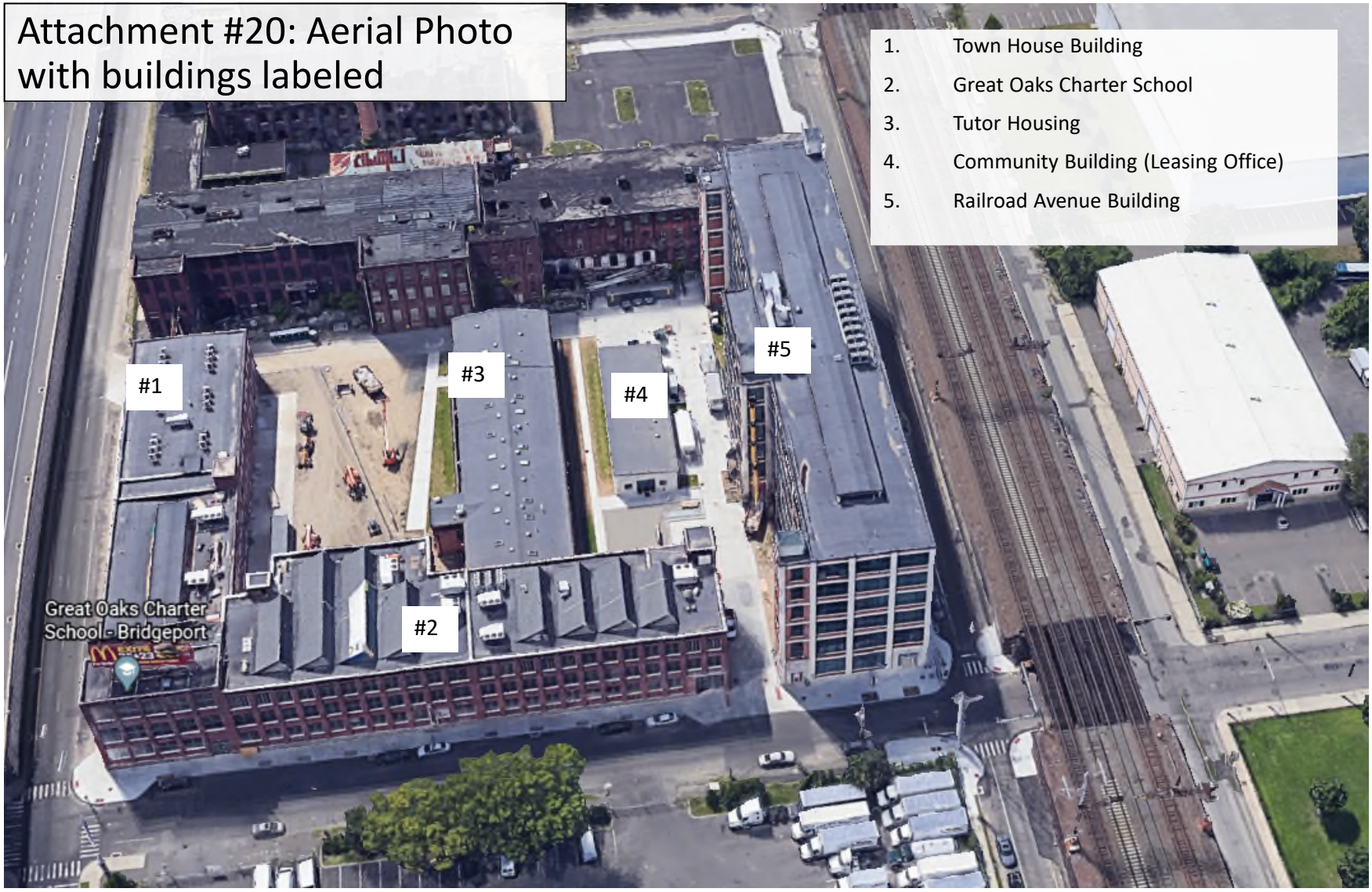
Attachment 20: Aerial Map with Buildings Labeled

Attachment 21: Detailed Site Plan

Attachment 22: Electrical Schematics

Attachment 23: Letter to PURA re Project Size

Attachment #20: Aerial Photo with buildings labeled



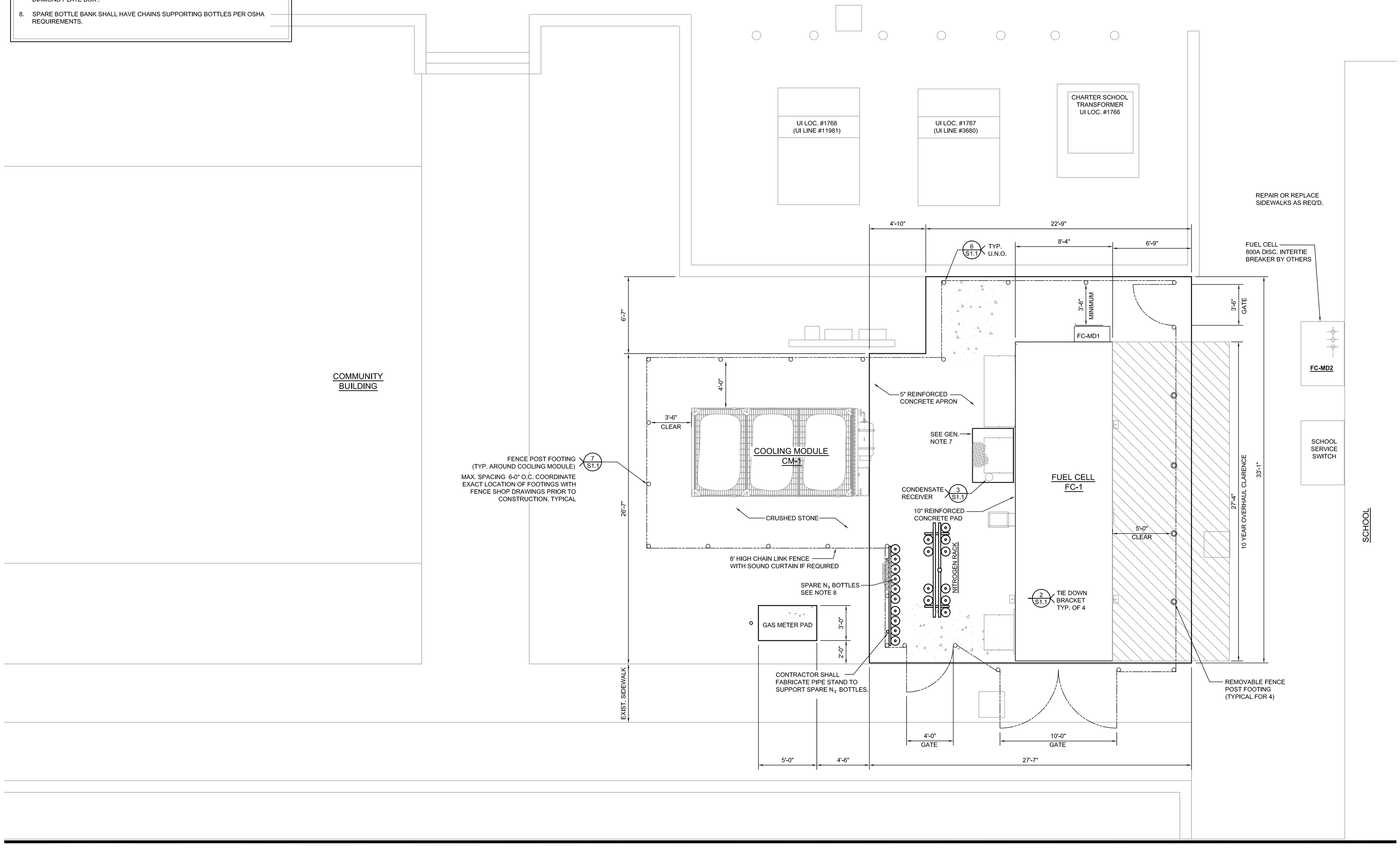
Attachment #21 - Detailed Site Plan

GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY ALL SITE DIMENSIONS, EASEMENTS, EASEMENT LOCATIONS ETC.
2. CONTRACTOR SHALL HAND DIG IN ALL LOCATIONS WHERE POWER CONDUITS, CONTROL CONDUITS, AND PIPING CROSS THE UNDERGROUND PRIMARY FEEDERS, WATER LINES AND GAS LINES.
3. CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AND A PRIVATE UTILITY LOCATOR SERVICE PRIOR TO START OF WORK.
4. PROVIDE A MINIMUM CLEARANCE OF 5'-0" AROUND FUEL CELL UNLESS OTHERWISE NOTED.
5. EXISTING UTILITIES ARE PRESENT ON THIS SITE. CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN EXCAVATING AND DIGGING TRENCHES.
6. COORDINATE NEW GAS SERVICE AND GAS METER PAD SIZE AND INSTALLATION REQUIREMENTS WITH SOUTHERN CONNECTICUT GAS PRIOR TO CONSTRUCTION.
7. CONTRACTOR SHALL FABRICATE ALUMINUM DIAMOND PLATE BOX TO COVER CM AND WATER MAKE UP PIPING TO PROTECT PIPING AND INSULATION. BOX SHALL BE REMOVABLE TO ALLOW ACCESS TO VALVES BELOW AND MUST NOT OBSTRUCT FUEL CELL DOOR SWING CLEARANCE. PROVIDE DETAILED SHOP DRAWING OF DIAMOND PLATE BOX .
8. SPARE BOTTLE BANK SHALL HAVE CHAINS SUPPORTING BOTTLES PER OSHA REQUIREMENTS.

SITE NOTES:

1. PRIOR TO THE CONTRACTOR SUBMITTING A BID, THE CONTRACTOR MUST VISIT THE SITE TO THOROUGHLY UNDERSTAND / INVESTIGATE THE EXISTING CONDITIONS OF THIS SITE.
2. CONTRACTOR'S PRICE SHALL BE ALL INCLUSIVE FOR SITE DEMOLITION / PREPARATION AND FINAL GRADING AROUND THE FUEL CELL YARD.
3. THE CONTRACTOR SHALL CLEAR AREA OF FUEL CELL YARD AS REQUIRED AND DISPOSE OF ALL ROCKS, SOIL ETC. PROPERLY.
4. THE OVERALL SCOPE IS CLEARLY DEFINED WITHIN THE CONTRACT DRAWINGS TO REFLECT THE INSTALLATION OF THE FUEL CELL, ELECTRICAL EQUIPMENT, AND ANCILLARY FUEL CELL COMPONENTS.
5. THERE ARE NOT ANY PROPOSED CHANGES TO THE EXISTING SITE DRAINAGE.
6. CONTRACTOR SHALL BE RESPONSIBLE TO RE-GRADE AS NECESSARY TO ALLOW FOR LEVEL FUEL CELL AREA AND PROPER DRAINAGE.



Rev.	Date	Description
A	03/09/20	ISSUED FOR PERMIT

STATE OF CONNECTICUT ☆ REGISTERED ☆ PROFESSIONAL ENGINEER

419A Whitfield Street
Guilford, CT 06437
Phone:(203) 453-8596
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ICDS
Innovative Construction & Design Solutions, LLC

CHERRY STREET LOFTS
375 HOWARD AVE, BRIDGEPORT, CT
FUEL CELL INSTALLATION

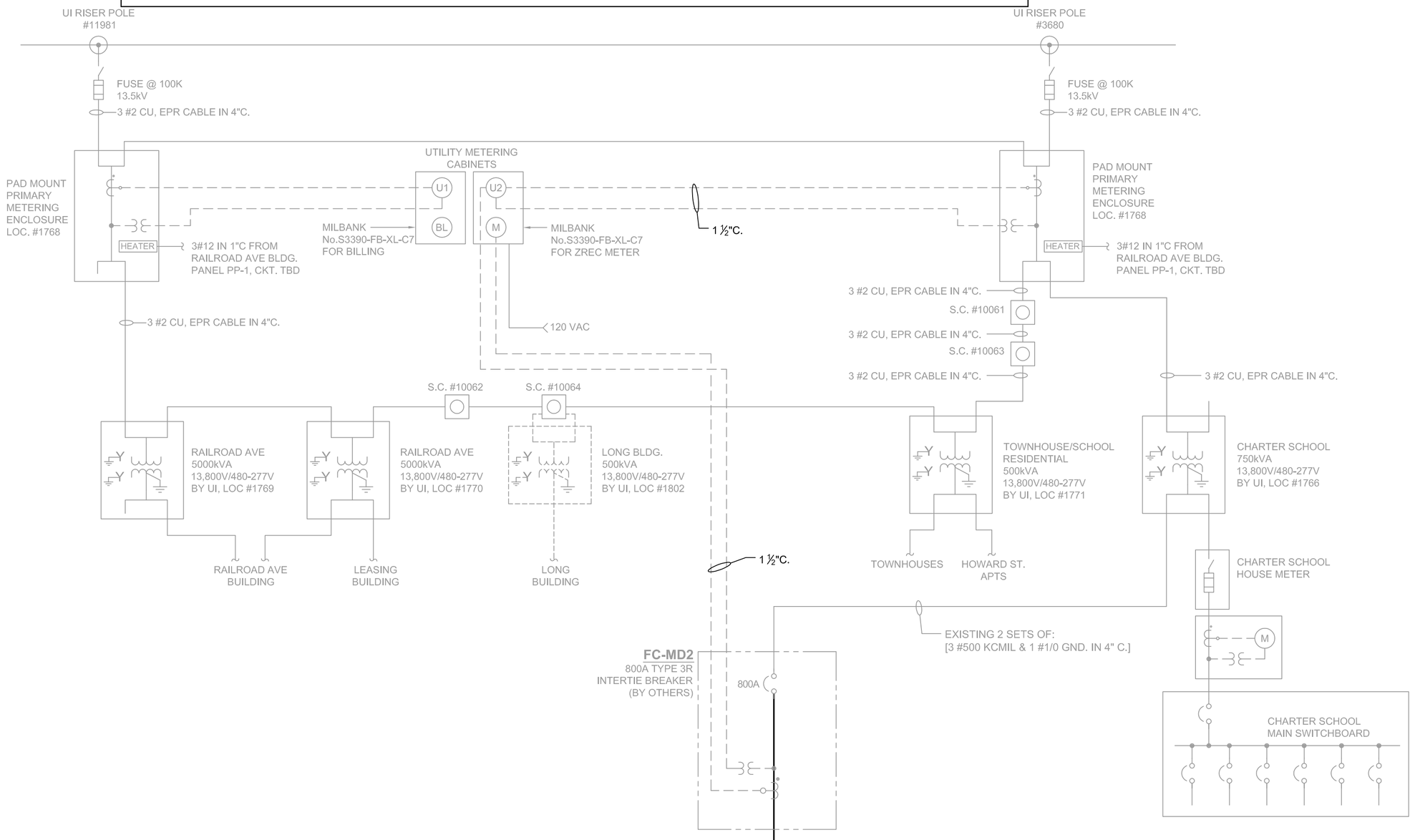
GENERAL ARRANGEMENT

Project No.:	Drawn By: KFH
Date: 03/09/20	Design By: KFH
Scale:	Check By: DSF

Drawing No.:

GA1.0

Attachment #22 - Electrical Schematics



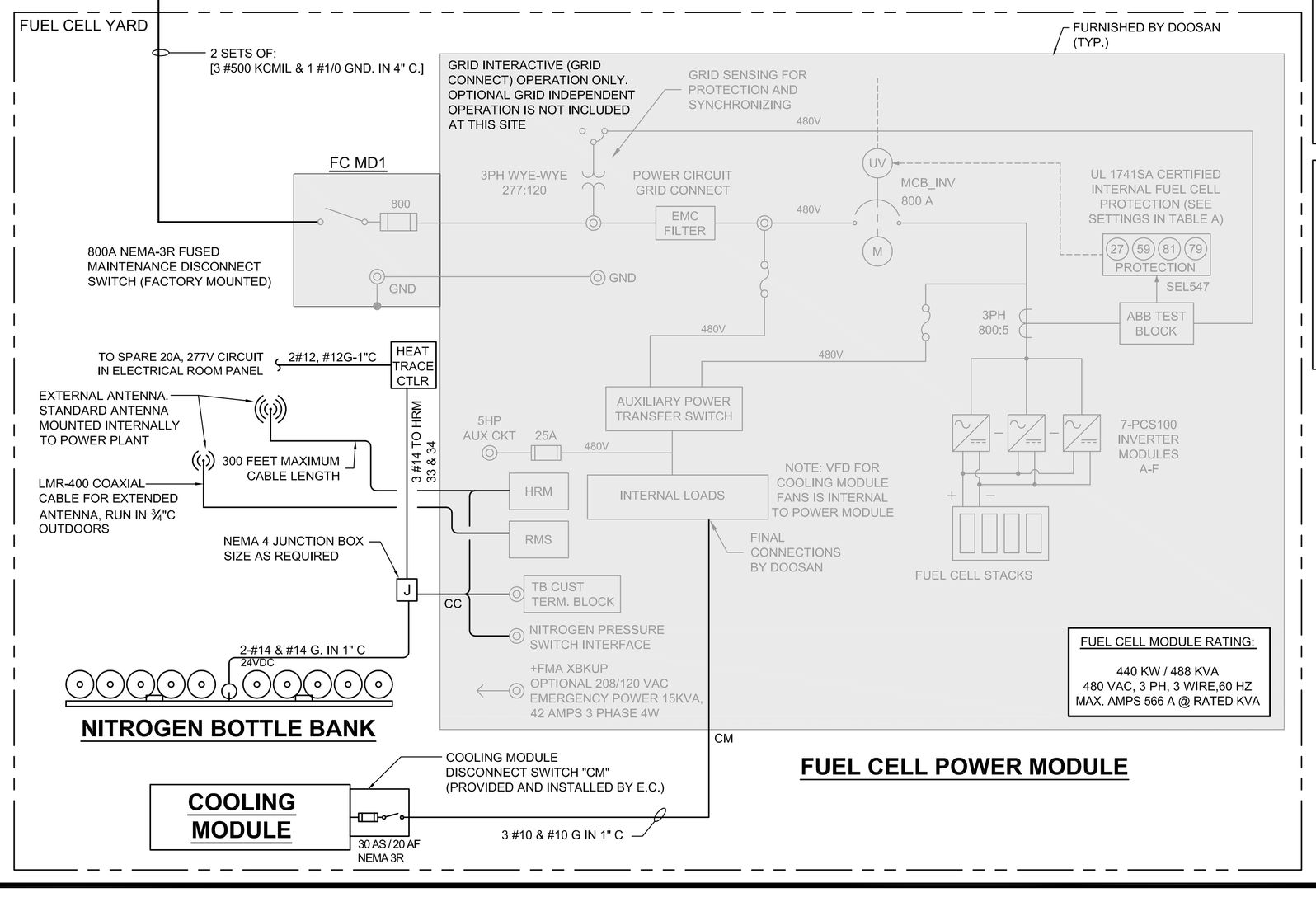


TABLE A - SEL547 RELAY
IEEE1547 / UL 1741 GRID PROTECTION PARAMETER SETTINGS

THE REQUIRED GRID PROTECTION FUNCTIONS AND SETTINGS PER UL1741/IEEE1547 RESIDE IN THE INTERNAL SEL547 RELAY WITH SETTING NAMES AS SHOWN BELOW.

NOTE KEY	SETTING NAME	DESCRIPTION	GROUP 1 60 Hz SETTING 277:120 V, PTS Tx RATIO 2.31 : 1	GROUP 2 60 Hz SETTING 277:120V, PTS Tx RATIO 2.31 : 1	ANSI C37 DEVICE NUMBER
	27P1P	FAST UNDER VOLTAGE LEVEL (V)	60	60	27
	27P2P	SLOW UNDER VOLTAGE LEVEL (V)	106	106	27
	SV7PU	FAST UNDER VOLTAGE CLEARING TIME (CYCLES)	*3	*3.5	
	SV8PU	SLOW UNDER VOLTAGE CLEARING TIME (CYCLES)	112	114	
	59P1P	SLOW OVER VOLTAGE LEVEL (V)	132	132	59
	59P2P	FAST OVER VOLTAGE LEVEL (V)	144	144	59
	SV9PU	SLOW OVER VOLTAGE CLEARING TIME (CYCLES)	52	54	
	SV10PU	FAST OVER VOLTAGE CLEARING TIME (CYCLES)	*3	*3	
	81D1P	FAST UNDER FREQUENCY LEVEL (Hz)	57	57	81U
**	81D2P	SLOW UNDER FREQUENCY LEVEL (Hz)	57.5	57.5	81U
	81D3P	OVER FREQUENCY LEVEL	60.5	60.5	81O
	SV14PU	BREAKER CLEARING TIME (CYCLES)	2	2	
	SV15PU	FAST UNDER FREQUENCY CLEARING TIME (CYCLES)	*1	*1.5	
**	SV4PU	SLOW UNDER FREQUENCY CLEARING TIME (CYCLES)	660	660	
	SV11PU	OVER FREQUENCY CLEARING TIME (CYCLES)	*1	*1.5	
	SV3DO	RECONNECTION TIME DELAY (CYCLES)	18000	18000	79

* NOTE 1: SEL 547 RELAY CLEARING TIME FOR FAST PROTECTION EQUALS SETTING TIME PLUS 5 CYCLE BREAKER TRIPPING TIME.
NOTE 2: SLOW UNDER FREQUENCY (UF) SETTING OF 57.5Hz FOR 11 SECONDS REVISION PER NPCC-A03
** NOTE 3: THESE SETTINGS ARE INTERNAL TO THE FUEL CELL
NOTE 4: THE FUEL CELL PROTECTIVE RELAY DOES NOT HAVE THE FUNCTIONALITY FOR A THIRD UNDER FREQUENCY SETTING.
NOTE 5: THE PURECELL MODEL 400 UNIT AT CHERRY ST. LOFTS SHALL BE EMPLOYED ONLY AS A GRID CONNECTED SYSTEM, WHICH USES GROUP 2 SETTINGS TO TRIP BREAKER MCB_INV.

GENERAL NOTES

1. PROVIDE SIGNAGE AS REQUIRED BY CODE AND AS INDICATED ON DWG E2.0.
2. CONSULT DOOSAN MODEL 400 INSTALLATION DESIGN GUIDE (FUEL CELL POWER PLANT) AND STANDARD INSTALLATION DRAWINGS FOR TECHNICAL REFERENCE.

SCOPE OF WORK:

1. PROVIDE AND INSTALL ALL NEW ELECTRICAL WORK INDICATED ON DRAWINGS UNLESS OTHERWISE NOTED. INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   - A. PROVIDE ALL POWER WIRING IN CONDUIT FROM CUSTOMER INTERTIE BREAKER TO FUEL CELL DISCONNECT - PROVIDE MEGGER TEST REPORT.
   - B. FURNISH AND INSTALL CM POWER WIRING IN CONDUIT FROM DISCONNECT SWITCH ON CM TO FC INTERFACE AND LEAVE 15FT OF WIRE IN THE FUEL CELL FOR DOOSAN TO TERMINATE.
   - C. FURNISH AND INSTALL NITROGEN PRESSURE SWITCH WIRING AND CONDUIT FROM NITROGEN MANIFOLD TO THE FUEL CELL AND LEAVE 15FT OF WIRE IN THE FUEL CELL FOR DOOSAN TO TERMINATE. FURNISH AND INSTALL CONDUIT TO PRESSURE SWITCH.
   - D. FURNISH AND INSTALL SELF REGULATED HEAT TRACE WITH AMBIENT THERMOSTAT CALIBRATED TO TO 40°F. POWER SOURCE FOR HEAT TRACE SHALL BE AS INDICATED ON DETAIL 2/E3.1. REFER TO MECHANICAL DRAWINGS FOR PIPING LAYOUT / HEAT TRACE REQUIREMENTS AND COORDINATE WITH MECHANICAL CONTRACTOR.
   - E. FURNISH AND INSTALL PULL BOXES AS REQUIRED PER NEC.
   - F. CONTRACTOR SHALL PROVIDE TYPED PANEL SCHEDULES FOR ALL PANELS EFFECTED BY NEW WORK.
   - G. FURNISH AND INSTALL NEW 20A, 208V, 2 POLE, GFP BREAKER IN EXISTING COMMUNITY BLDG. PANEL FOR HEAT TRACE CIRCUIT. DETAIL 2/E3.1.
   - H. FURNISH AND INSTALL NEW 20A, 120V, 1 POLE, BREAKER IN EXISTING COMMUNITY BLDG. PANEL FOR RECEPTACLE CIRCUIT.
   - 1. FIRESTOP ALL CONDUIT PENETRATIONS PER APPLICABLE CODE.
2. REFERENCE DRAWING E2.0 FOR PLAN LOCATIONS AND REQUIRED SIGNAGE. ALL SIGNAGE SHALL BE ON 3 PLY PHENOLIC NAMEPLATES.
3. ALL FITTINGS SHALL BE THREADED OR COMPRESSION TYPE. NO SET-SREW FITTINGS SHALL BE USED.
4. CONDUIT SUPPORTS SHALL BE "U" BOLT TYPE, KINDORF OR APPLETON CLAMPS. MINIMUM 1/2" DIAMETER THREADED RODS SHALL BE USED
5. ARMORED CABLES OR FLEX STEEL CONDUITS ARE NOT PERMITTED TO BE USED. WHERE TERMINATING TO EQUIPMENT THAT MOVES OR VIBRATES (IE. TRANSFORMERS) USE SEALTITE.
6. COLLECT AND PROVIDE APPLICABLE AND REQUESTED FIELD DATA TO THE ENGINEER PERFORMING ARC FLASH STUDY. AFFIX ARC FLASH LABELS, SUPPLIED BY THE ARC FLASH STUDY PROVIDER ,TO APPLICABLE EQUIPMENT.

GROUNDING NOTES:

1. THE FUEL CELL GROUND LUG INSIDE DISCONNECT SWITCH MD-1 SHALL BE CONNECTED TO AN EXTERNAL #1/0 COPPER EQUIPMENT GROUNDING CONDUCTOR FROM MAIN SWITCHBOARD'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 MD-1 IS BONDED TO ALL METALLIC NON-CURRENT CARRYING METAL PARTS BOTH INSIDE THE FUEL CELL AND ALSO AT EXTERNAL FUEL CELL ASSEMBLIES 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 COOLING MODULE. ALL OF THE 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 MD-1 CARRIES THESE GROUND WIRES BACK TO THE GROUNDED SERVICE CONDUCTOR AT THE MAIN SWITCHBOARD.
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.

CERTIFICATION:

POWER PLANT IS CERTIFIED TO: ANSI/CSA AMERICA FC 1 - 2014 (FORMALLY ANSI Z21.L83) "AMERICAN NATIONAL STANDARD FOR STATIONARY FUEL CELL POWER SYSTEM" INCLUDING,

- A. UL1741 "INVERTERS, CONVERTERS, CONTROLLERS AND INTERCONNECTION SYSTEM EQUIPMENT FOR USE WITH DISTRIBUTED ENERGY RESOURCES."
- B. IEEE 1547 "STANDARD FOR INTERCONNECTING DISTRIBUTED RESOURCES WITH ELECTRIC POWER SYSTEMS."
- C. NFPA 70 NATIONAL ELECTRIC CODE (FOR INTERFACES TO CUSTOMER WIRING AND WIRING BETWEEN MODULES).

POWER PLANT SPECIFICATIONS

RATED POWER OUTPUT	440 kW / 488 kVA
OUTPUT TYPE	480VAC, 60 HZ, 3 PHASE, 3 WIRE
RATED OUTPUT CURRENT	566 AMPS AT RATED kVA

LEGEND

LIGHT INDICATES EXISTING
BOLD INDICATES NEW

ISSUED FOR DOOSAN INTERNAL REVIEW ONLY 02/28/20

Rev.	Date	ISSUED FOR: Description
A	X	

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CHERRY STREET LOFTS
375 HOWARD AVE, BRIDGEPORT, CT
FUEL CELL INSTALLATION

ELECTRICAL ONE-LINE DIAGRAM

Project No.:	Drawn By: KFH
Date: 02/ /20	Design By: KFH
Scale:	Check By: DSF

Drawing No.: E1.0

Attachement #23 - Letter to PURA re: Project Size

MURTHA CULLINA
ATTORNEYS AT LAW

BRUCE L. MCDERMOTT
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860.240.5723 DIRECT FACSIMILE
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March 4, 2020

VIA ELECTRONIC MAIL

Jeffrey R. Gaudiosi, Esq.
Executive Secretary
Public Utilities Regulatory Authority
Ten Franklin Square
New Britain, CT 06051

Re: Docket No. 19-02-44 - Application of NuPower Cherry Street FC LLC for Approval to Install and Use an Electricity Submetering System at Various Locations on Railroad Ave. and Howard St., Bridgeport, CT

Dear Mr. Gaudiosi:

In the Final Decision issued on August 14, 2019, by the Public Utilities Regulatory Authority ("Authority" or "PURA") in Docket No. 19-02-44, the Authority noted that NuPower Cherry Street FC LLC ("NuPower") "planned to install a 460 kW fuel cell as a Class I renewable energy resource at the Facility." Final Decision at 2; *see also* Findings of Fact #10 at 9. Discussions with the fuel cell manufacturer identified a possible delay in delivery of the 460 kW fuel so NuPower has decided to utilize a 440 kW fuel cell which is available for installation consistent with the project construction schedule. All other aspects of the project remain unchanged.

I certify that a copy hereof has been furnished on this date via electronic mail and/or first class mail, postage prepaid, to all parties, intervenors and participants of record according to the Authority's service list for this docket as of this date. A copy has also been filed with the Authority as an electronic web filing and is complete.

Very truly yours,

Bruce L. McDermott

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