

# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

August 5, 2011

Mark Hulshart, Principal  
Hulshart & Associates, LLC  
3009 Federal Hill Drive  
Falls Church, VA 22044

RE: **EM-SPRINT-086-110718** – Sprint Spectrum LP notice of intent to modify an existing telecommunications facility located at 57 Cook Drive, Montville, Connecticut.

Dear Mr. Hulshart:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated July 12, 2011. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Linda Roberts  
Executive Director

LR/CDM/laf

c: The Honorable Joseph W. Jaskiewicz, Mayor, Town of Montville  
Marcia Vlaun, Town Planner, Town of Montville  
Wireless Solutions



SPRINT - 086 - 110718

HULSHART & ASSOCIATES, LLC  
STRATEGIC CONSULTING TO THE COMMUNICATIONS INDUSTRY

3009 FEDERAL HILL DRIVE  
FALLS CHURCH, VIRGINIA 22044  
phone 703.533.1006

**TRANSMITTAL**

RECEIVED  
JUL 13 2011

CONNECTICUT  
SITING COUNCIL

**DATE:** July 12, 2011

**TO:** Chairman Robert Stein, Connecticut Siting Council,  
10 Franklin Square, New Britain, CT 06051

**SUBJECT:** Transmittal of Sprint Spectrum L.P.'s Notice of Intent to Make an Exempt Modification to an Existing Facility at 57 Cook Drive, Montville, CT 06382 (Site # CT23XC500)

Included with this transmittal are six packets (one original and five copies) of:

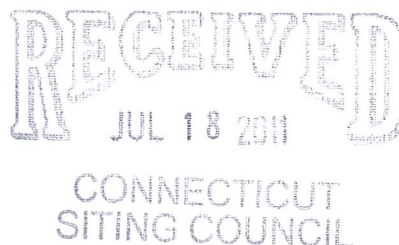
- Letter summarizing the installation.
- 8.5" x 14" PE-stamped drawings that illustrate the site plan, equipment cabinets and electrical diagrams.
- Altery's fuel cell specifications for model FPS-524-240.

Attached to this transmittal form is:

- One application fee check in the amount of \$625.

July 12, 2011

Chairman Robert Stein  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051



**SUBJECT: Sprint Spectrum L.P.'s Notice of Intent to Make an Exempt Modification to an Existing Facility at 57 Cook Drive, Montville, CT 06382 (Site # CT23XC500)**

Dear Chairman Stein:

Pursuant to R.C.S.A. Sections 16-50j-73 and 16-50j-72(b), Sprint Spectrum L.P. (Sprint) hereby gives notice to the Connecticut Siting Council (Council) and the Town of Montville of its intent to make an exempt modification to an existing telecommunications facility located at 57 Cook Drive, Montville, Connecticut.

Sprint plans to install a hydrogen fuel cell at its 57 Cook Drive facility to provide emergency backup power in the event of an electric outage. This planned installation does not constitute a modification subject to the Council's review as it falls within those activities provided for in R.C.S.A. Section 16-50j-72(b)(2). Specifically, this installation will not change the height of the existing tower, will not extend the boundaries of the existing compound, will not increase noise levels at the site by six decibels or more, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

#### PROPOSED INSTALLATION

Sprint plans to install a 5 kW Altery hydrogen fuel cell generator within the existing fenced equipment compound; the installation mounted to a new concrete pad. The fuel cell will be inside a cabinet measuring 3'6" x 2'2" x 6'0". The hydrogen cylinder storage cabinet has overall dimensions of 4'8" x 4'8" x 6'0".

Please contact me at 703.533.1006 or [Hulshart@earthlink.net](mailto:Hulshart@earthlink.net) should you have any questions about this planned modification.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark Hulshart".

Mark Hulshart  
Principal

cc: Mayor Joseph W. Jaskiewicz, Town of Montville  
Robert Kingsborough (property owner)

# Specifications



Alteryx Freedom Power™ 5 kW System installed in an FPS Power Cabinet		FPS-524-240	FPS-524-240-400	FPS-548-240	FPS-548-240-405
Physical	Dimensions (w x d x h)	26" x 42" x 72" [66 cm x 107 cm x 183 cm]			
	Weight	515 lb [234 kg]	706 lb [320 kg]	515 lb [234 kg]	706 lb [320 kg]
	Number of FPS Engines	1			
	Number of TPMs	0	1	0	1
Performance	Rated power	5 kW			
	Rated current	210 A		105 A	
	Operating voltage (nominal) <sup>1</sup>	24 VDC		48 VDC	
	Operating voltage (range) <sup>1</sup>	21 to 29 VDC		42 to 58 VDC	
	Standing Input Current (nominal)	1.92 A @ 24 VDC		0.96 A @ 48 VDC	
Operation	Ambient temperature <sup>2</sup>	- 4 °F to 104 °F [- 20 °C to +40 °C]			
	Relative humidity, noncondensing	5 to 100%			
	Location	Outdoor only			
	Auxiliary AC in <sup>2</sup>	120 V, 60 Hz, 10 A, single phase			
Storage	Ambient temperature	+ 40 °F to +113 °F [+4 °C to +45 °C]			
	Relative humidity, noncondensing	5 to 100%			
Fuel	Gaseous hydrogen purity	Hydrogen (H <sub>2</sub> ) 99.95% certified Industrial Grade			
	Supply pressure range	40 to 150 PSIG [2.8 to 10.5 kg/cm <sup>2</sup> ]			
	Typical operating pressure	100 PSIG [7.03 kg/cm <sup>2</sup> ]			
	Consumption	300 g/hour @ 5 kW			
Monitoring / Control	Standard	Ethernet, USB, Serial, 4 Dry Contacts			
	Optional	Wireless Telemetry			
	Rectifier Supply Voltage	n/a	27.0 ± 0.6 VDC	n/a	54.0 ± 0.6 VDC

<sup>1</sup>Polarity is determined by customer requirements and ground connections.

<sup>2</sup>For operation below +10 °C, the FPS must be connected to the grid and supplied with AC power until a grid failure, at which time the heat generated by the FPS will be sufficient to maintain operation of the FPS at temperatures between -20 °C and +10 °C.

# Sprint



**SITE NAME:** MOHEGAN HILL

**SITE NUMBER:** CT23XC500

**SITE ADDRESS:** 57 COOK DRIVE  
MONTVILLE, CT 06382

**SITE TYPE:** EXISTING 180' LATTICE SELF SUPPORT TOWER

**Sprint**

6580 SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251



**BLACK & VEATCH**

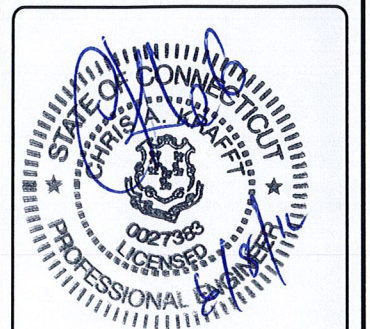
10950 GRANDVIEW DRIVE  
OVERLAND PARK, KANSAS 66210  
(913) 458-2000

PROJECT NO: 168202

DRAWN BY: MBG

CHECKED BY: BH

REV	DATE	DESCRIPTION
1	06/07/2011	CHANGE LEASE AREA DIM
0	05/25/2011	ISSUED FOR CONSTRUCTION



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

**MOHEGAN HILL  
CT23XC500  
57 COOK DRIVE  
MONTVILLE, CT 06382  
CO-LOCATION**

SHEET TITLE  
**TITLE SHEET &  
PROJECT DATA**

SHEET NUMBER  
**T-1**

**SITE INFORMATION**

**SITE ADDRESS:**  
57 COOK DRIVE  
MONTVILLE, CT 06382

**PROPERTY OWNER:**  
ROBERT KINGSBOROUGH  
WIRELESS SOLUTIONS  
PO BOX 284  
ATTN: KEN THOMAS, SITE MANAGER  
REFERENCE: MOHEGAN HILL  
OLD LYME, CT 06371

**KEN THOMAS**  
(860) 434 6363

**EQUIPMENT TYPE:**  
ALTERGY 5KW FUEL CELL

**EQUIPMENT SUPPLIER:**  
ALTERGY  
140 BLUE RAVINE ROAD  
FOLSOM, CA 95630

**JERRY MEYERS**  
913-461-3674  
jerry.meyers@altergy.com

**POWER COMPANY:**  
CONNECTICUT LIGHT AND POWER  
(800) 286-2000 OR (860) 947-2000

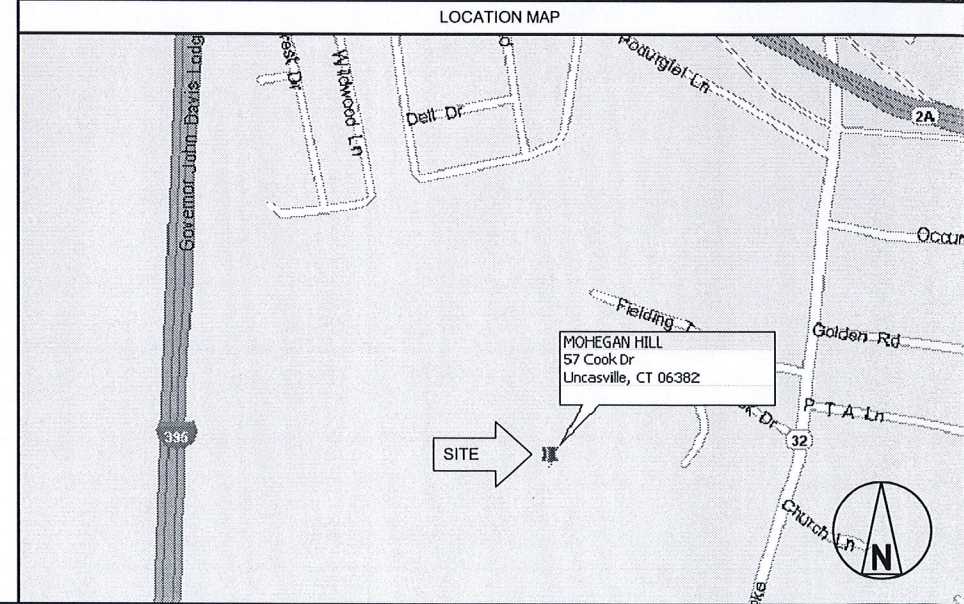
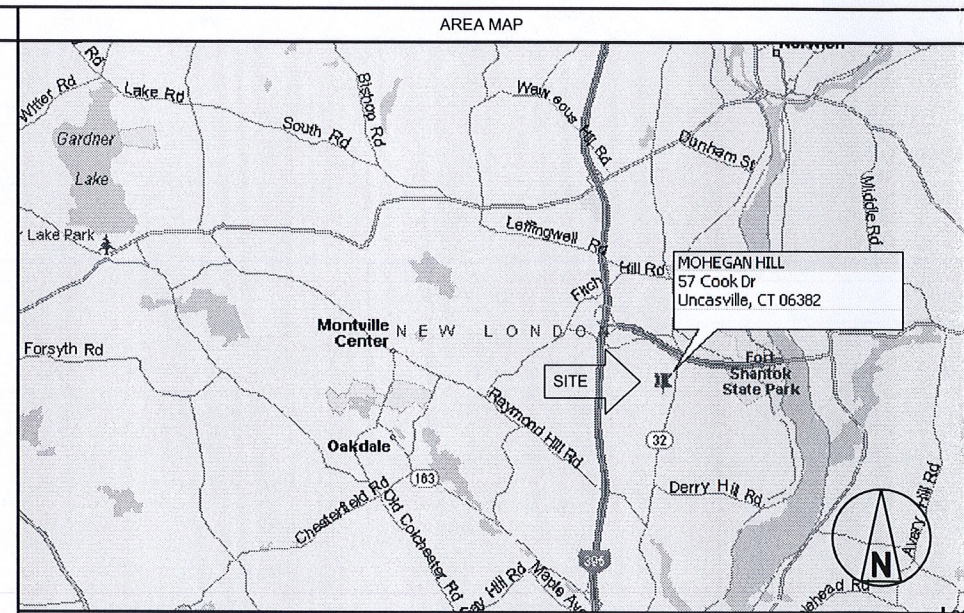
**TELCO COMPANY:**  
AT&T

**COUNTY:**  
NEW LONDON

**LATITUDE (NAD83):**  
41° 28' 29.719" N  
41.47492200

**LONGITUDE (NAD83):**  
-72° 6' 19.493" W  
-72.10541500

**CONTACT ENGINEER:**  
BRYAN HANSEN  
WORK: 913-458-7343  
E-MAIL: hansenbj@bv.com



**APPLICABLE CODES**

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

2003 INTERNATIONAL BUILDING CODE WITH 2005 STATE OF CONNECTICUT AMENDMENTS

2003 INTERNATIONAL MECHANICAL CODE WITH 2005 STATE OF CONNECTICUT AMENDMENTS

2003 INTERNATIONAL PLUMBING CODE WITH 2005 STATE OF CONNECTICUT AMENDMENTS

2005 NEC NATIONAL ELECTRICAL CODE

IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

**PROJECT DESCRIPTION**

INSTALL POWER BACK UP EQUIPMENT TO EXISTING SITE WITHIN EXISTING COMPOUND. INSTALL (1) NEW FUEL CELL WITH (1) FUEL STORAGE CABINET ON CONCRETE PAD AND CONNECT TO THE SITE'S DC POWER PLANT BUS.

**DRIVING DIRECTIONS FROM NEAREST AIRPORT**

WESTERLY STATE AIRPORT: HEAD NORTH ON AIRPORT RD, ROAD NAME CHANGES TO SR-78 / WESTERLY BYPASS FOR 4.4 MILES, ENTER INTO CONNECTICUT, TURN RIGHT (NORTH) ONTO LIBERTY ST, ROAD NAME CHANGES TO SR-2 / LIBERTY ST FOR 1.4 MILES, TAKE RAMP (LEFT) ONTO I-95 FOR 14.1 MILES TOWARDS I-95 / NEW LONDON, TAKE EXIT 84S-N-E (RIGHT) TOWARDS CT-32 / DOWNTOWN NEW LONDON / NORWICH, KEEP RIGHT TO STAY ON RAMP TOWARDS CT-32 / NORWICH / STATE PIER/ HODGES SQ, TAKE RAMP (LEFT) ONTO SR-32 FOR 3.2 MILES TOWARDS CT-32 / NORWICH, TAKE MONTVILLE CONNECTOR (RIGHT) ONTO I-395 / GOVERNOR JOHN DAVIS LODGE TPKE FOR 5.3 MILES TOWARDS I-395 / NORWICH, TAKE EXIT 79A (RIGHT) ONTO SR-2A TOWARDS CT-2A / PRESTON / LEDYARD, TAKE EXIT 1 (RIGHT) TOWARDS CT-32 / NORWICH / UNCASVILLE, TURN RIGHT (SOUTH) ONTO SR-32 / NORWICH NEW LONDON TPKE FOR 0.4 MILES, TURN RIGHT (WEST) ONTO COOK DR, FOLLOW COOK DRIVE TO DESTINATION, LOOK FOR TOWER SITE ON RIGHT.

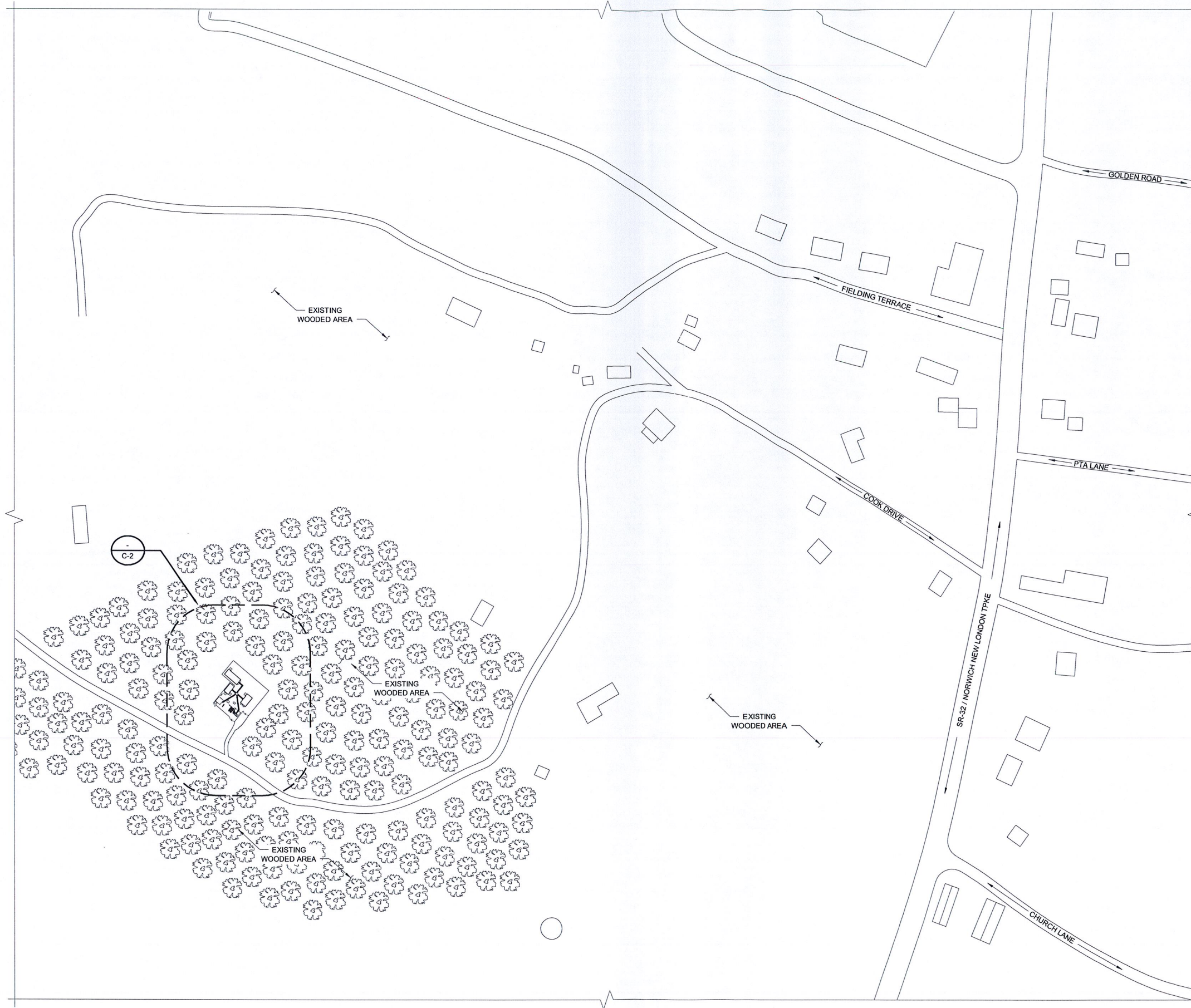
**DRAWING INDEX**

T-1	TITLE SHEET & PROJECT DATA
C-1	OVERALL SITE PLAN
C-2	SITE PLAN
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S-2	CONCRETE PAD DETAILS
M-1	HYDROGEN PIPING SCHEMATIC
E-1	ELECTRICAL ONE-LINE DIAGRAMS
E-2	OVERALL CONDUIT DETAILS
E-3	ELECTRICAL WIRING DIAGRAM
E-4	FUEL CELL INTERNAL WIRING DIAGRAM
G-1	GROUNDING PLAN AND DETAILS

**ENGINEER OF RECORD**

CHRISTOPHER ALAN KRAFFT  
PE # 080438

BLACK & VEATCH CORPORATION



**OVERALL SITE PLAN**  
NO SCALE



6580 SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251



**BLACK & VEATCH**

10950 GRANDVIEW DRIVE  
OVERLAND PARK, KANSAS 66210  
(913) 458-2000

PROJECT NO: 168202

DRAWN BY: MBG

CHECKED BY: BH

REV	DATE	DESCRIPTION
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0	05/25/2011	ISSUED FOR CONSTRUCTION



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**MOHEGAN HILL**  
**CT23XC500**  
**57 COOK DRIVE**  
**MONTVILLE, CT 06382**  
**CO-LOCATION**

SHEET TITLE  
**OVERALL SITE PLAN**

SHEET NUMBER  
**C-1**



6580 SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251



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MONTVILLE, CT 06382  
CO-LOCATION**

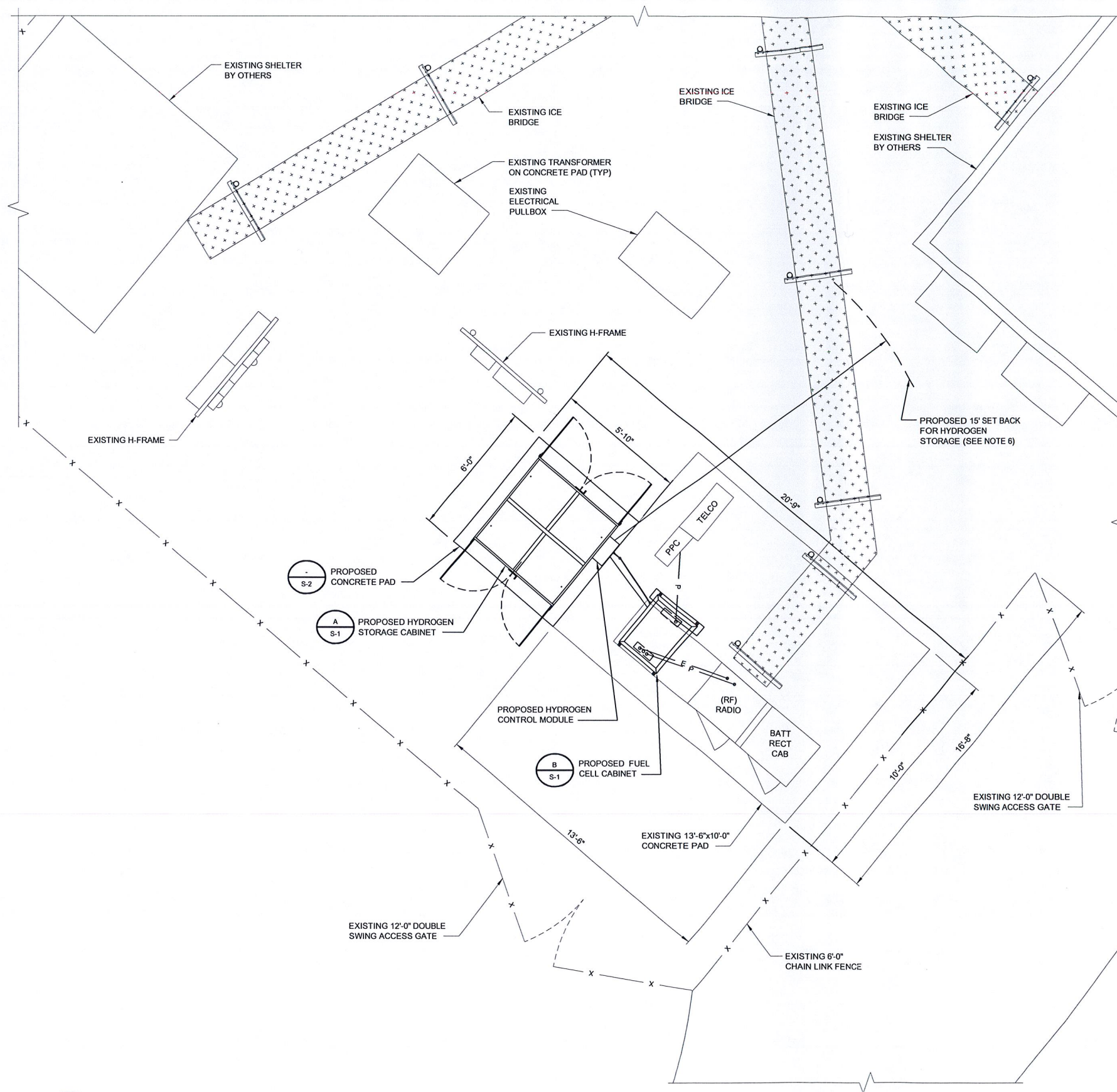
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**SITE PLAN**

SHEET NUMBER

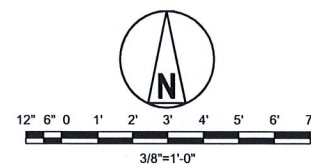
**C-2**

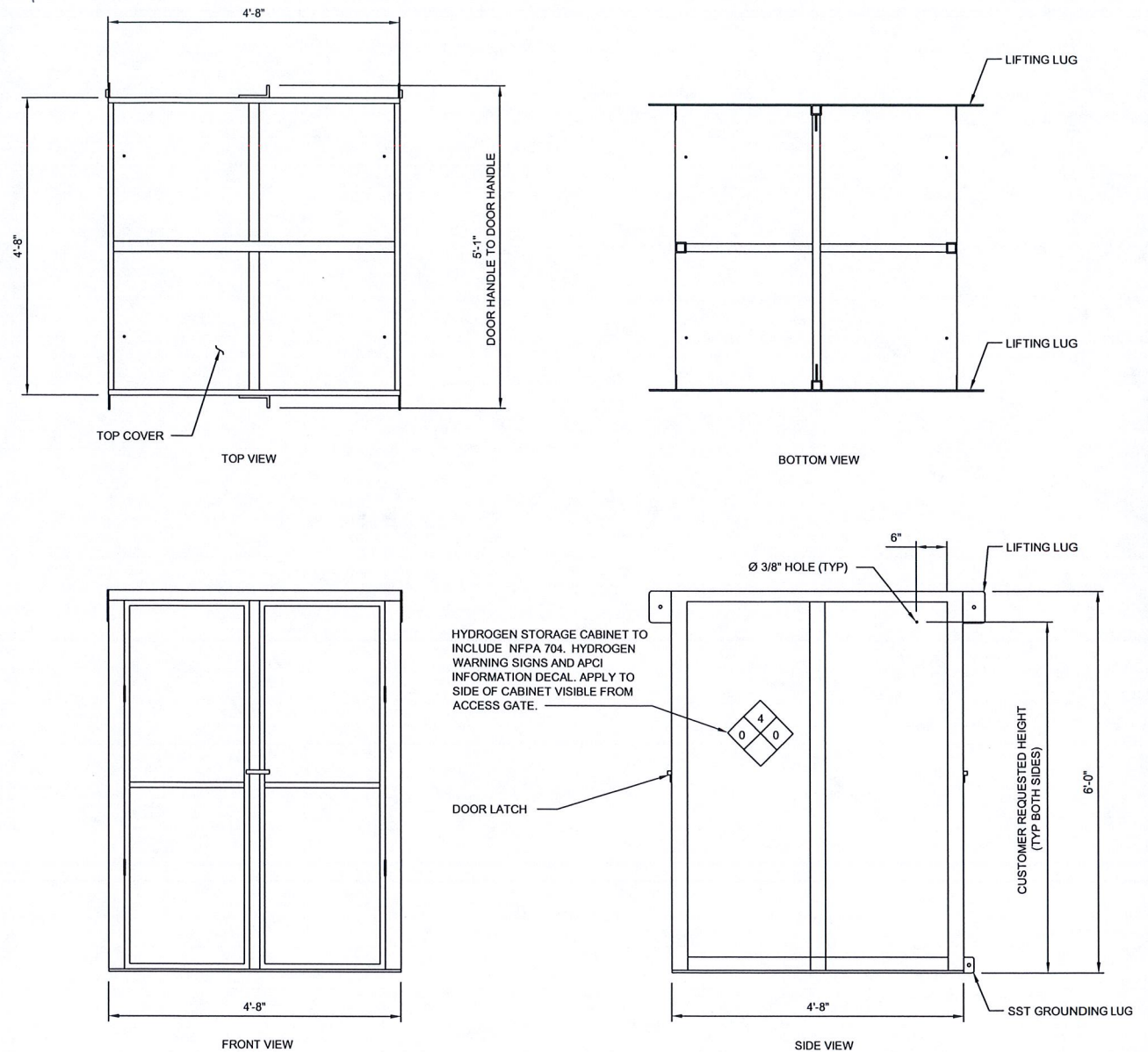
**GENERAL NOTES:**

1. CONTRACTOR SHALL GROUND ALL NEW EQUIPMENT TO THE NEAREST GROUND RING (SEE G-1).
2. CONTRACTOR SHALL ROUTE CONDUIT TO AVOID TRIP HAZARDS BY EITHER UTILIZING EXISTING CABLE TRAY, OVERHEAD ICE BRIDGE, UNDERNEATH RAISED PLATFORM, OR AROUND EDGE OF CONCRETE PAD.
3. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION OF ALL NEW EQUIPMENT.
4. CONTRACTOR SHALL VERIFY THE ALARM CABLES ARE OF SUFFICIENT LENGTH.
5. EXCESS CABLES SHALL BE LACED IN A NEAT AND ORGANIZED MANNER.
6. HYDROGEN STORAGE CABINET HAS A REQUIRED SET BACK OF 15' FROM IGNITION SOURCES & AIR INTAKES.

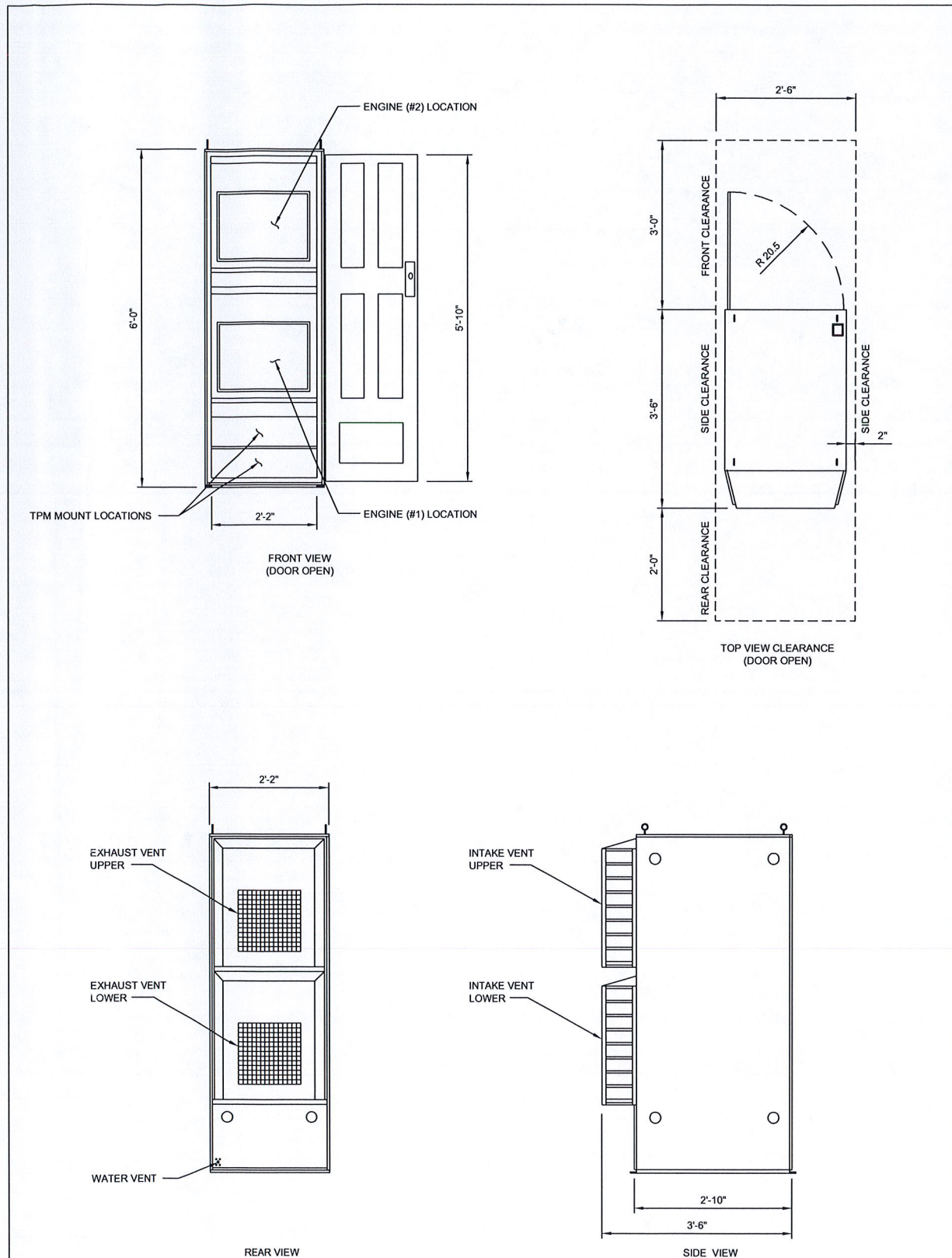


**SITE PLAN**





**DETAIL A**  
**HYDROGEN STORAGE CABINET**  
SCALE: 3/4" = 1'-0"



**DETAIL B**  
**FUEL CELL CABINET**  
SCALE: 3/4" = 1'-0"



6580 SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251



**BLACK & VEATCH**

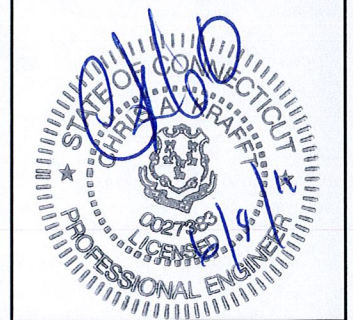
10950 GRANDVIEW DRIVE  
OVERLAND PARK, KANSAS 66210  
(913) 458-2000

PROJECT NO: 168202

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**MOHEGAN HILL**  
**CT23XC500**  
**57 COOK DRIVE**  
**MONTVILLE, CT 06382**  
**CO-LOCATION**

SHEET TITLE  
**EQUIPMENT CABINET**  
**DETAILS**

SHEET NUMBER

**S-1**





PROJECT NO: 168202

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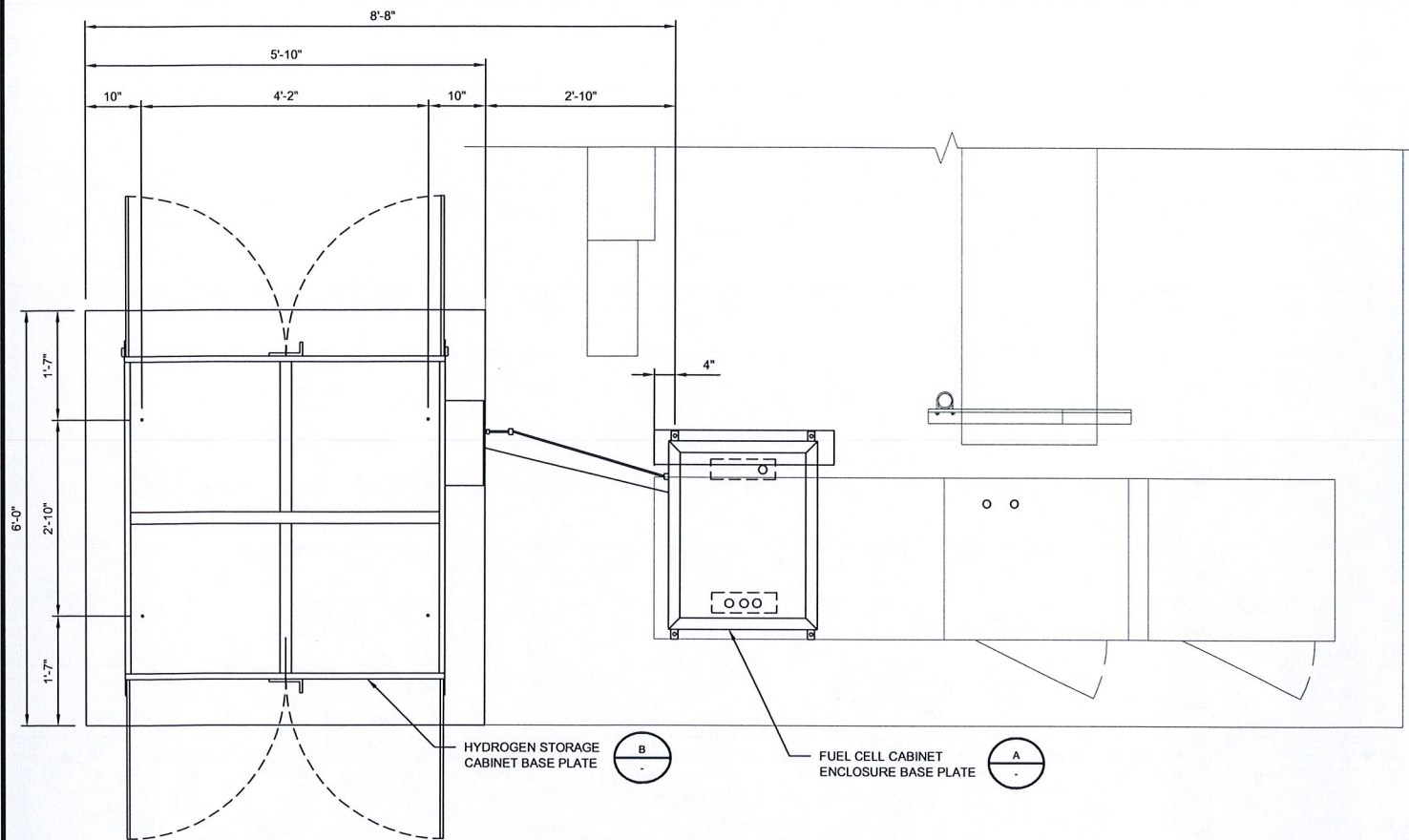


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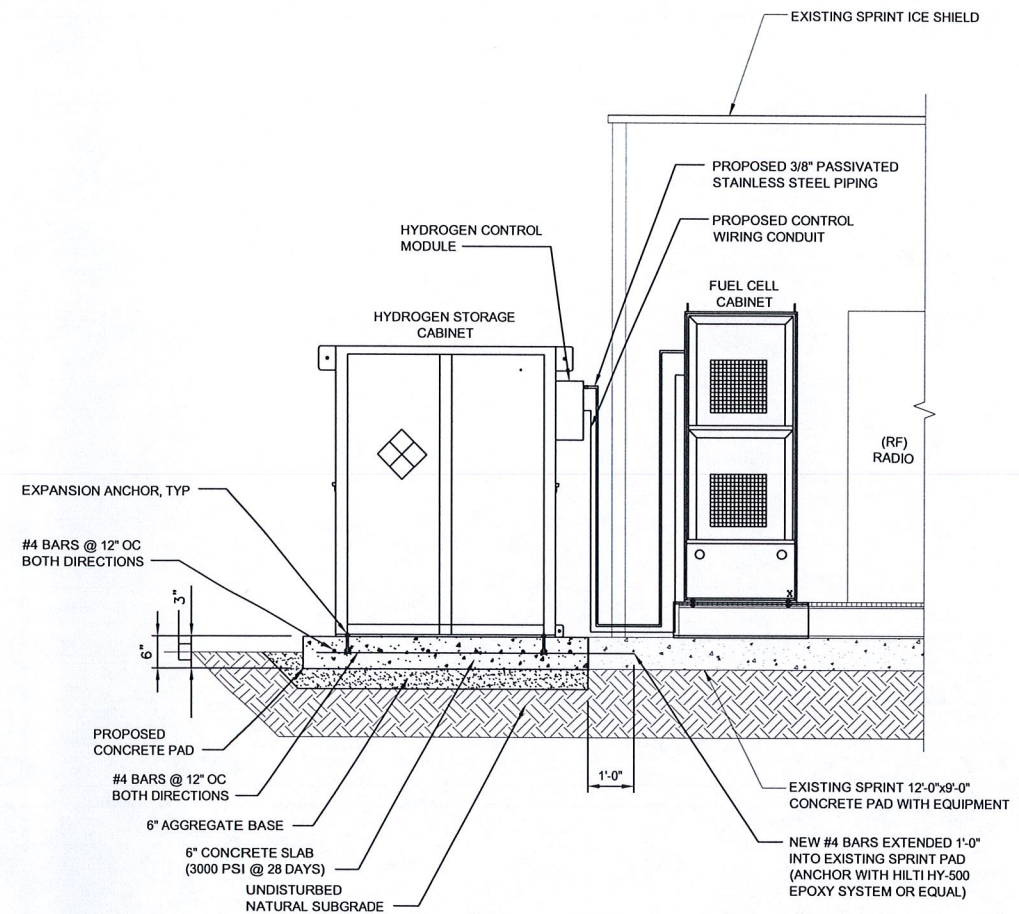
**MOHEGAN HILL  
CT23XC500  
57 COOK DRIVE  
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CO-LOCATION**

SHEET TITLE  
**CONCRETE PAD DETAILS**

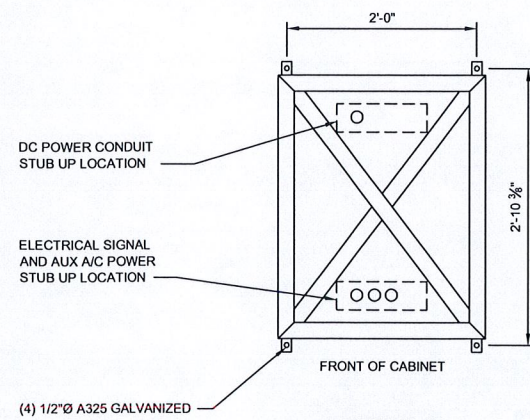
SHEET NUMBER  
**S-2**



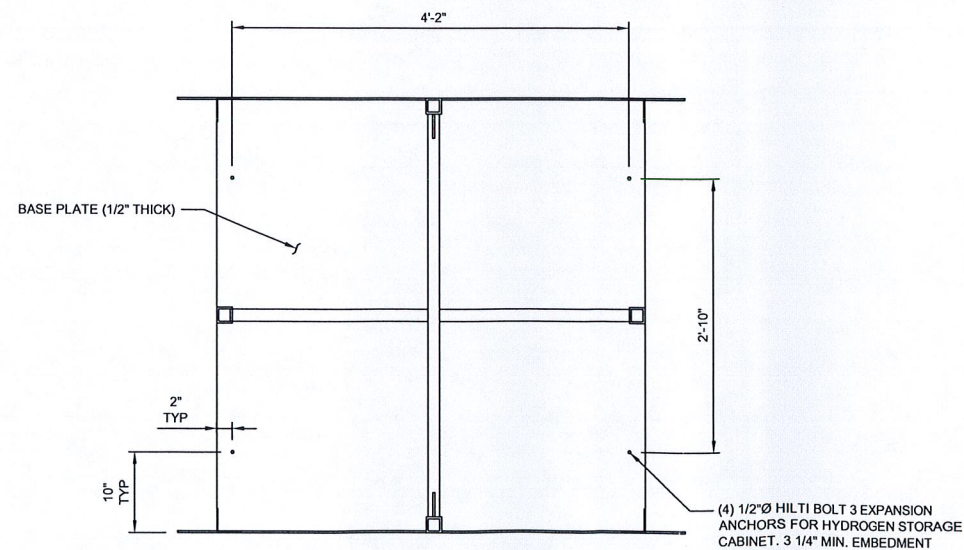
**PLAN VIEW CONCRETE PAD**  
SCALE: 3/4" = 1'-0"



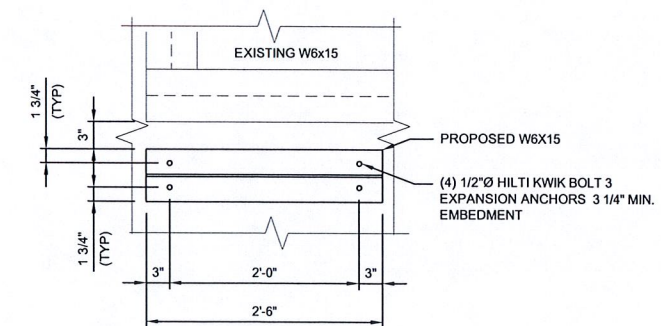
**ELEVATION VIEW CONCRETE PAD**  
SCALE: 3/4" = 1'-0"



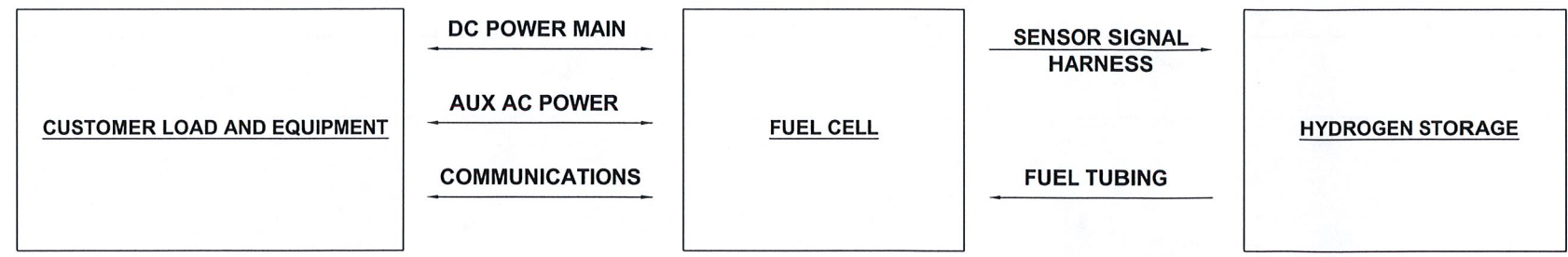
**DETAIL A  
CABINET  
BOLT PATTERN**  
SCALE: 1" = 1'-0"



**DETAIL B  
HYDROGEN STORAGE CABINET  
BOLT PATTERN**  
SCALE: 1" = 1'-0"



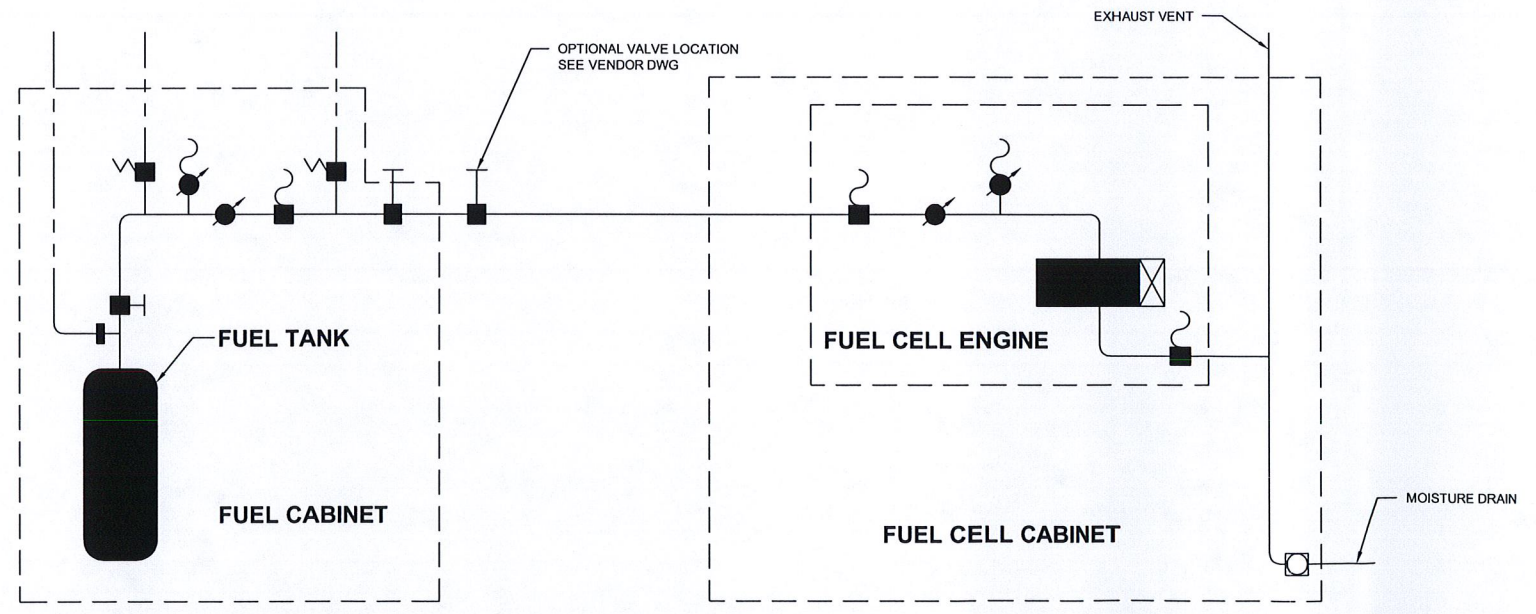
**PLAN VIEW STEEL FRAMING FOR  
FUEL CELL CABINET**  
SCALE: 1" = 1'-0"



TYPICAL CONNECTION DIAGRAM

**HYDROGEN CONNECTION NOTES:**

- STEP 1. ROUTE HYDROGEN GAS LINE AND CONNECT TO THE FPS POWER CABINET.
1. IDENTIFY THE KNOCKOUT LOCATION TO BE USED FOR THE SENSOR / SIGNAL HARNESS AND FUEL TUBING ROUTING. OPEN KNOCKOUT LOCATION IN THE FPS POWER CABINET.
  2. INSTALL CONDUIT AND ROUTE TUBING FROM THE HYDROGEN STORAGE MODULE TO THE FPS POWER CABINET.
  3. CONNECT THE HYDROGEN LINE TO THE 3/8" TO 1/4" REDUCER COMPRESSION (PROVIDED) FITTING IN THE FPS POWER CABINET. TIGHTEN FITTING 1 1/4 TURNS PAST HAND TIGHT. THE LINE IS LOCATED IN THE LOWER REAR SECTION OF FPS POWER CABINET.
- STEP 2. ROUTE THE SENSOR / SIGNAL HARNESS FROM THE FPS POWER CABINET TO THE HYDROGEN STORAGE MODULE.
1. ROUTE THE SENSOR / SIGNAL HARNESS THROUGH THE CONDUIT USED FOR THE HYDROGEN TUBING.
  2. CONNECT THE PRESSURE TRANSDUCER, HYDROGEN SOLENOID VALVE, AND DOOR ALARM (IF EQUIPPED) TO THE SENSOR / SIGNAL HARNESS.



HYDROGEN PIPING SCHEMATIC

**HYDROGEN PIPING LEGEND**

- PRESSURE TRANSDUCER
- PRESSURE REGULATOR
- MANUAL VALVE
- RELIEF VALVE
- NORMALLY CLOSED UL RATED SAFTY VALVE

6580 SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251

10950 GRANDVIEW DRIVE  
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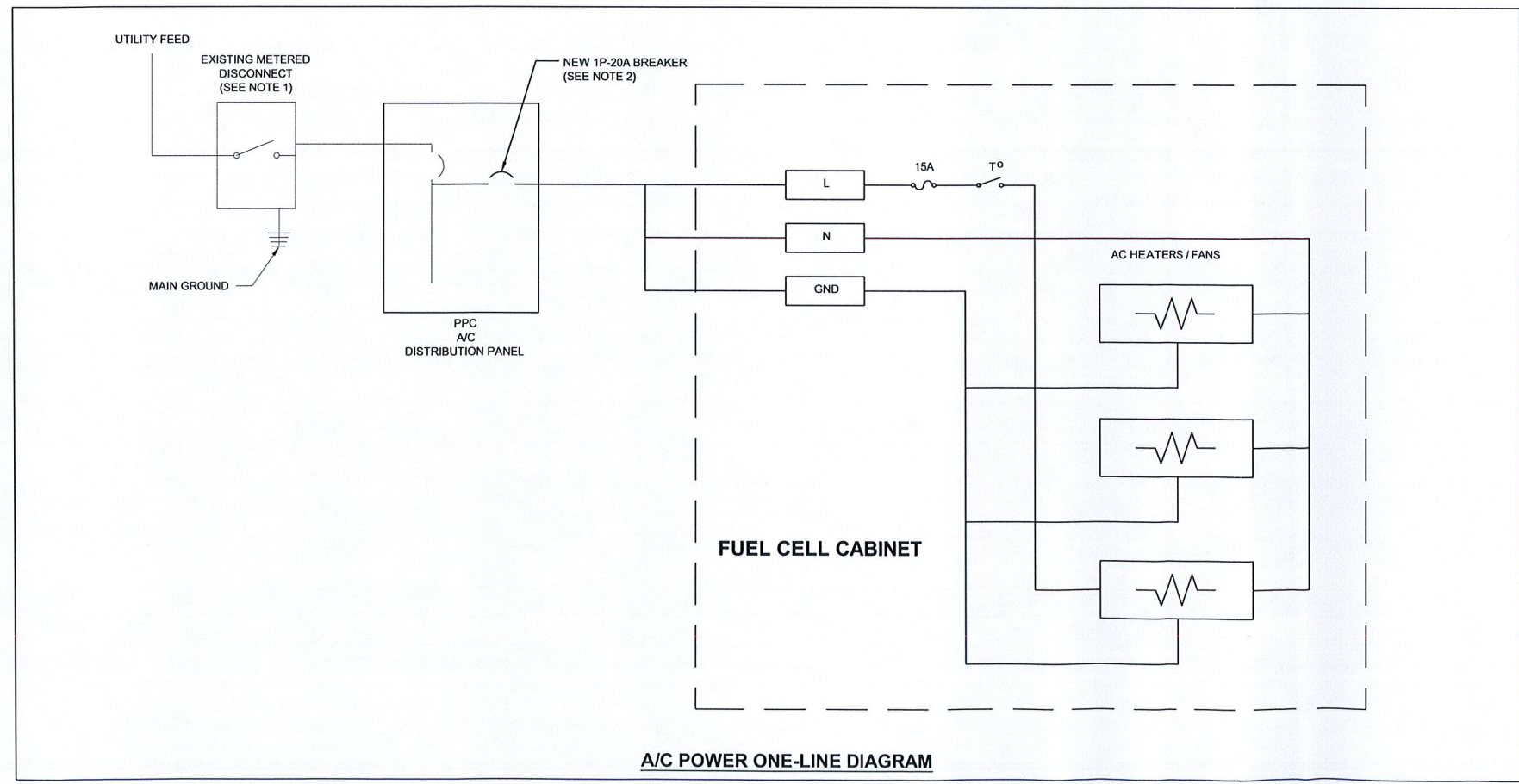
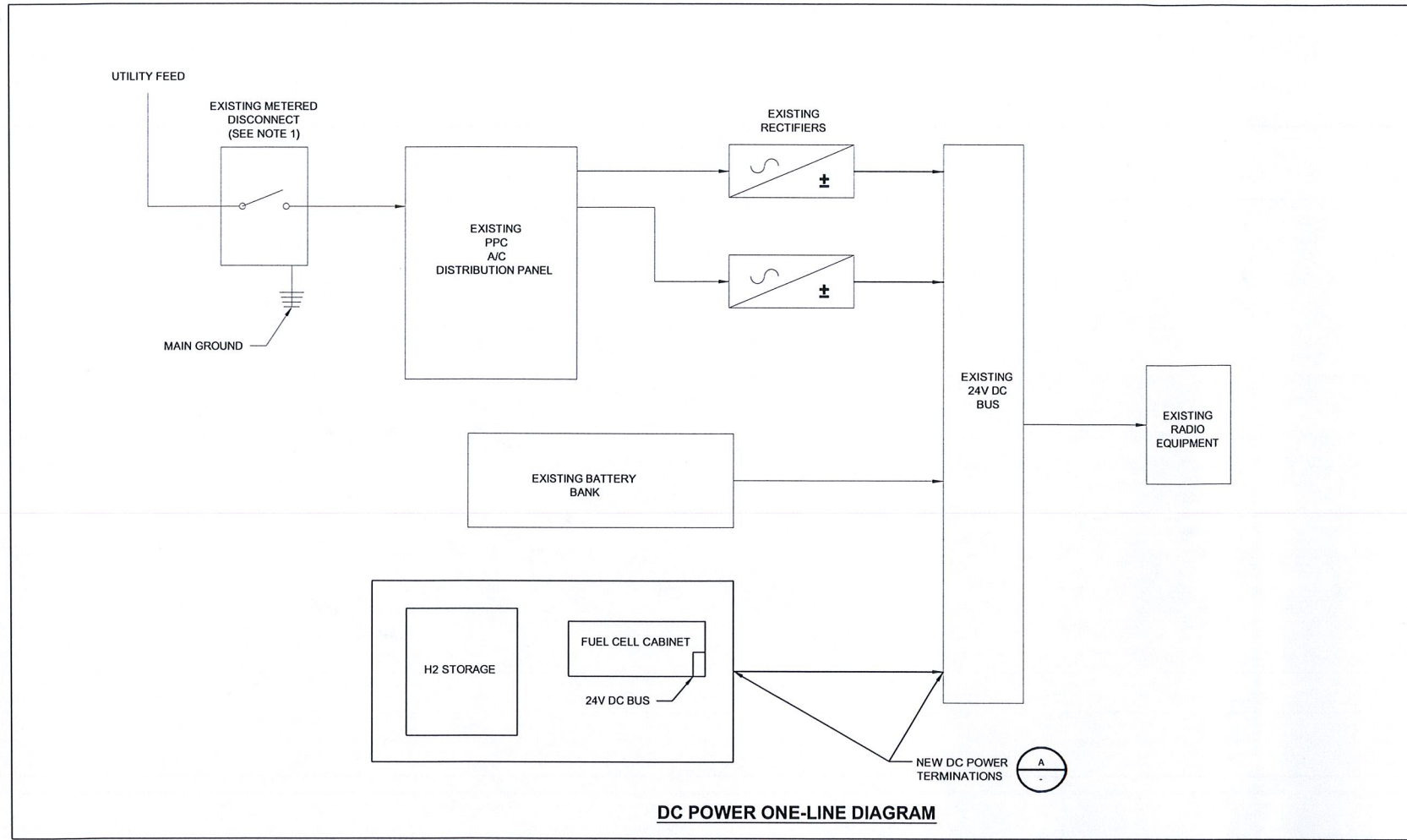


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SHEET TITLE  
**HYDROGEN PIPING SCHEMATIC**

SHEET NUMBER  
**M-1**

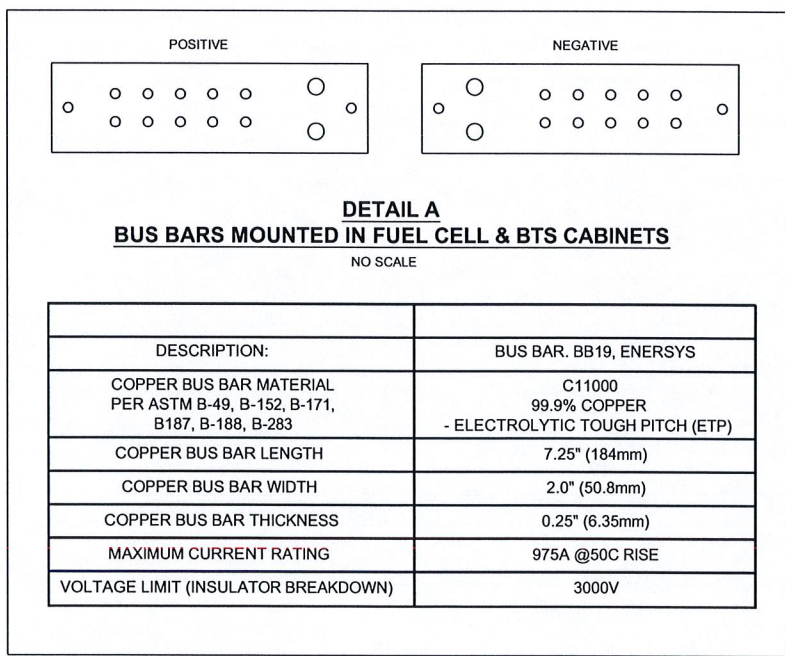


**GENERAL ELECTRICAL NOTES:**

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), AND LOCAL CODES.
2. ALL ELECTRICAL MATERIALS, EQUIPMENT AND INSTALLATION PROCEDURES SHALL CONFORM WITH SPRINT'S STANDARD CONSTRUCTION SPECIFICATIONS.
3. ALL MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA NFPA, AND "UL" LISTED.
4. THE ELECTRICAL PLANS, DETAILS, AND DIAGRAMS SHOWN ON THESE DRAWINGS ARE DIAGRAMMATIC ONLY. ACTUAL FIELD CONDITIONS AND SITE REQUIREMENTS SHALL DICTATE THE AMOUNT AND LOCATION OF EQUIPMENT.
5. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY THE NEC AND ALL APPLICABLE LOCAL CODES.
6. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE A MINIMUM INTERRUPTING RATING OF 65,000 AIC (UNLESS NOTED OTHERWISE).
7. REFER TO THE VENDOR DRAWINGS OF THE PPC CABINET, BATTERY, AND BTS CABINETS FOR COMPLETE INTERNAL WIRING AND ARRANGEMENT.
8. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL INSTALLATION.
9. LABEL ALL ELECTRICAL EQUIPMENT PER SPRINT'S SPECIFICATIONS.
10. ALL SINGLE-PHASE SELF-CONTAINED METER CONNECTION DEVICES MUST INCLUDE HORN TYPE BYPASS PROVISIONS SO THAT SERVICE WILL NOT BE INTERRUPTED WHEN A METER IS REMOVED FROM THE SOCKET.
11. USE METER CONNECTION DEVICES LABELED BY THE MANUFACTURER WITH THE LETTERS "CECHA".
12. ALL INTERIOR CONDUITS AND BUSHINGS SHALL BE EMT. ALL EXTERIOR SHALL BE PVC UNLESS NOTED OTHERWISE (SEE SPRINT'S STANDARD CONSTRUCTION SPECIFICATIONS).
13. PROVIDE 2 PULL STRINGS SECURELY FASTENED AT EACH END OF ALL CONDUITS. THE PULL STRINGS ARE TO BE 200 LB. TEST POLYETHYLENE GORD. PROVIDE CAP ON THE END OF EACH CONDUIT AND MARK AS SHOWN ON THIS SITE PLAN.
14. THE CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING UNDERGROUND POWER, TELCO, GROUNDING CONDUITS, AND ALL OTHER UTILITIES EASEMENTS AND/OR WIRES PRIOR TO TRENCHING. ANY DAMAGE CAUSED TO THE EXISTING UNDERGROUND SERVICES OR SYSTEMS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. VERIFY WITH UTILITY NEW SERVICE HAS BEEN APPLIED FOR. THERE SHALL BE NO SPLICING OF GROUND CONDUCTORS BELOW GRADE.
15. UTILITY RACK AND CONDUIT SIZES TO BE FIELD DETERMINED BY CONTRACTOR IN ACCORDANCE WITH THE LOCAL JURISDICTION.
16. ALL WORK SHALL MEET OR EXCEED ALL APPLICABLE LOCAL AND NATIONAL ELECTRICAL CODE REQUIREMENTS.
17. ALL INSTALLATION AND EQUIPMENT SHALL MEET OR EXCEED SPRINT CONSTRUCTION SPECIFICATIONS.

**ELECTRICAL NOTES:**

1. LIGHT SHADED LINES INDICATE EXISTING CONSTRUCTION.
2. CONTRACTOR TO VERIFY POWERWAVE MODEL AND ASSOCIATED POWER REQUIREMENTS. IF LARGER CIRCUIT BREAKERS ARE REQUIRED, CONTRACTOR SHALL PROVIDE CORRECT ELECTRICAL CONDUCTOR SIZES.



6580 SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251



**BLACK & VEATCH**

10950 GRANDVIEW DRIVE  
OVERLAND PARK, KANSAS 66210  
(913) 458-2000

PROJECT NO: 168202

DRAWN BY: MBG

CHECKED BY: BH

REV	DATE	DESCRIPTION
1	06/07/2011	CHANGE LEASE AREA DIM
0	05/25/2011	ISSUED FOR CONSTRUCTION

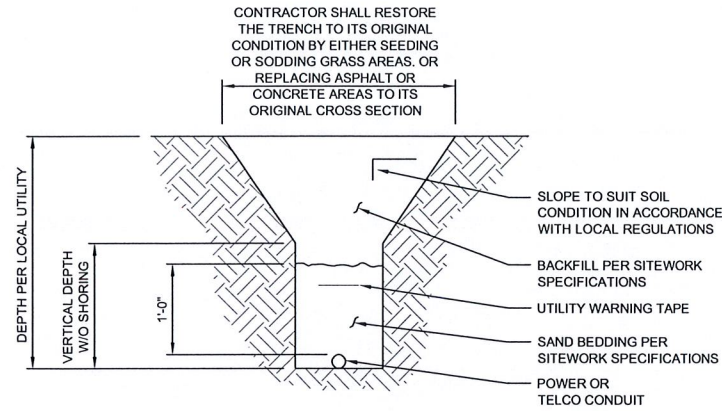


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**MOHEGAN HILL  
CT23XC500  
57 COOK DRIVE  
MONTVILLE, CT 06382  
CO-LOCATION**

SHEET TITLE  
**ELECTRICAL ONE-LINE  
DIAGRAMS**

SHEET NUMBER  
**E-1**



**TYPICAL UTILITY TRENCH DETAIL**  
NO SCALE

\* ONE CALL\* SERVICE SHALL BE CALLED PRIOR TO EXCAVATION

**GENERAL NOTES:**

1. MATERIALS: ALL HANGERS, SUPPORTS, FASTENERS AND HARDWARE SHALL BE ZINC COATED OR OF EQUIVALENT CORROSION RESISTANCE BY TREATMENT OR INHERENT PROPERTY, AND SHALL BE MANUFACTURED PRODUCTS DESIGNED FOR THE APPLICATION. PRODUCTS FOR OUTDOOR USE SHALL BE HOT DIP GALVANIZED.
2. CONDUIT SEALS: INSTALL CONDUIT SEAL FOR EACH CONDUIT PENETRATING AN EXTERIOR BUILDING WALL BELOW GRADE (UNLESS PENETRATION IS BELOW LOWEST BUILDING FLOOR SLAB), AND ELSEWHERE AS INDICATED, AND SO AS TO ACHIEVE A SEALED WATERTIGHT INSTALLATION. MATCH EXISTING CONDITIONS AND MEET OR EXCEED INTEGRITY OF WALLS.
3. INSTALLATION: RIGIDLY SUPPORT AND SECURE ALL MATERIALS, RACEWAY AND EQUIPMENT TO BUILDING STRUCTURE USING HANGERS, SUPPORTS AND FASTENERS, SUITABLE FOR THE USE, MATERIALS AND LOADS ENCOUNTERED. PROVIDE ALL NECESSARY HARDWARE. PROVIDE CONDUIT SUPPORTS AT MAXIMUM 5 FT. O.C.
4. STRUCTURAL MEMBERS: DO NOT CUT, DRILL OR WELD ANY STRUCTURAL MEMBER EXCEPT AS SPECIFICALLY APPROVED BY THE ENGINEER.
5. INDEPENDENT SUPPORT: DO NOT SUPPORT MATERIALS OR EQUIPMENT FROM OTHER EQUIPMENT, PIPING, DUCTWORK OR SUPPORTS FOR SAME.
6. MISCELLANEOUS SUPPORTS: PROVIDE ANY ADDITIONAL STRUCTURAL SUPPORT STEEL BRACKETS ANGLES, FASTENERS AND HARDWARE AS REQUIRED TO ADEQUATELY SUPPORT ALL ELECTRICAL MATERIALS AND EQUIPMENT.
7. ONE HOLE STRAPS SHALL NOT BE USED FOR CONDUITS LARGER THAN 3/4"Ø.



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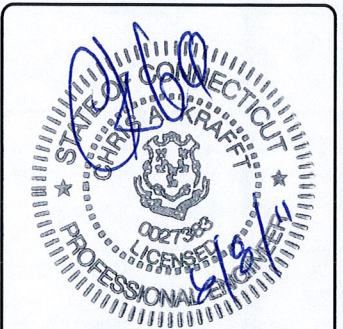


**BLACK & VEATCH**

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OVERLAND PARK, KANSAS 66210  
(913) 458-2000

PROJECT NO: 168202  
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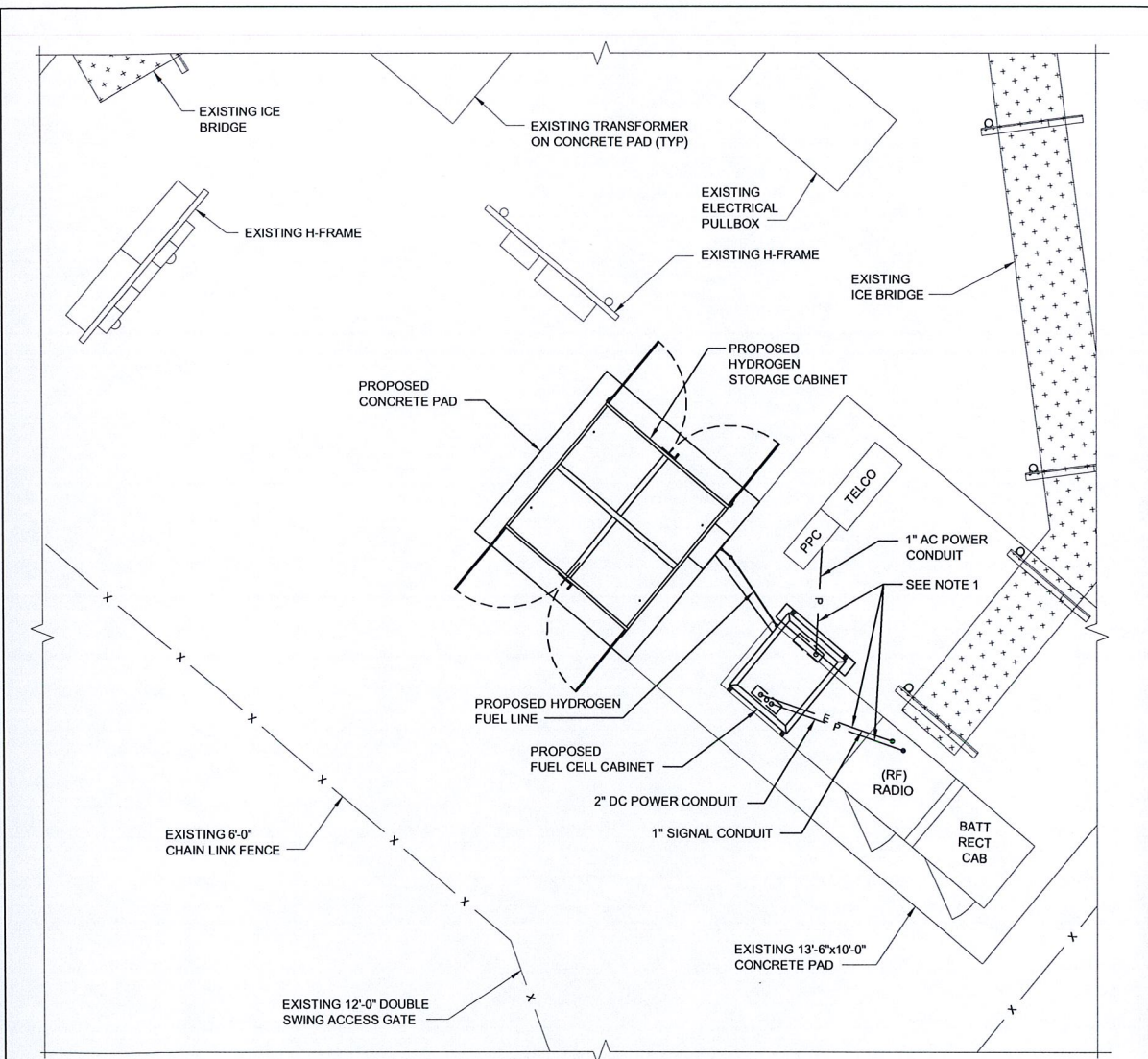


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**MOHEGAN HILL  
CT23XC500  
57 COOK DRIVE  
MONTVILLE, CT 06382  
CO-LOCATION**

SHEET TITLE  
**OVERALL CONDUIT  
DETAILS**

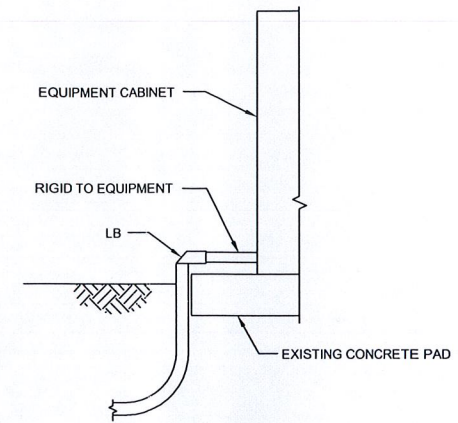
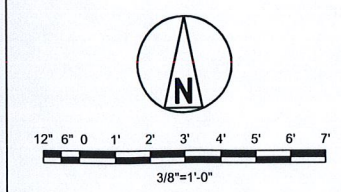
SHEET NUMBER  
**E-2**



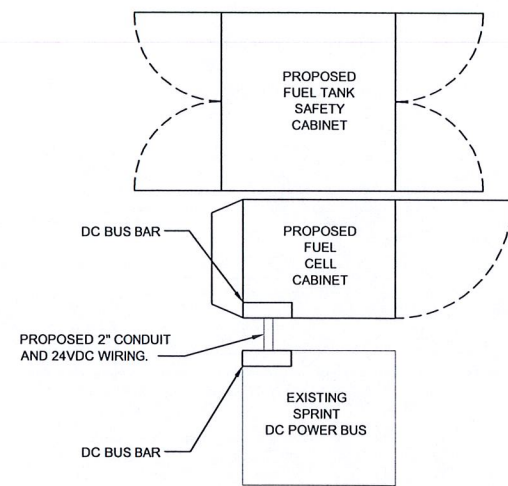
**CONDUIT ROUTING**

**NOTES:**

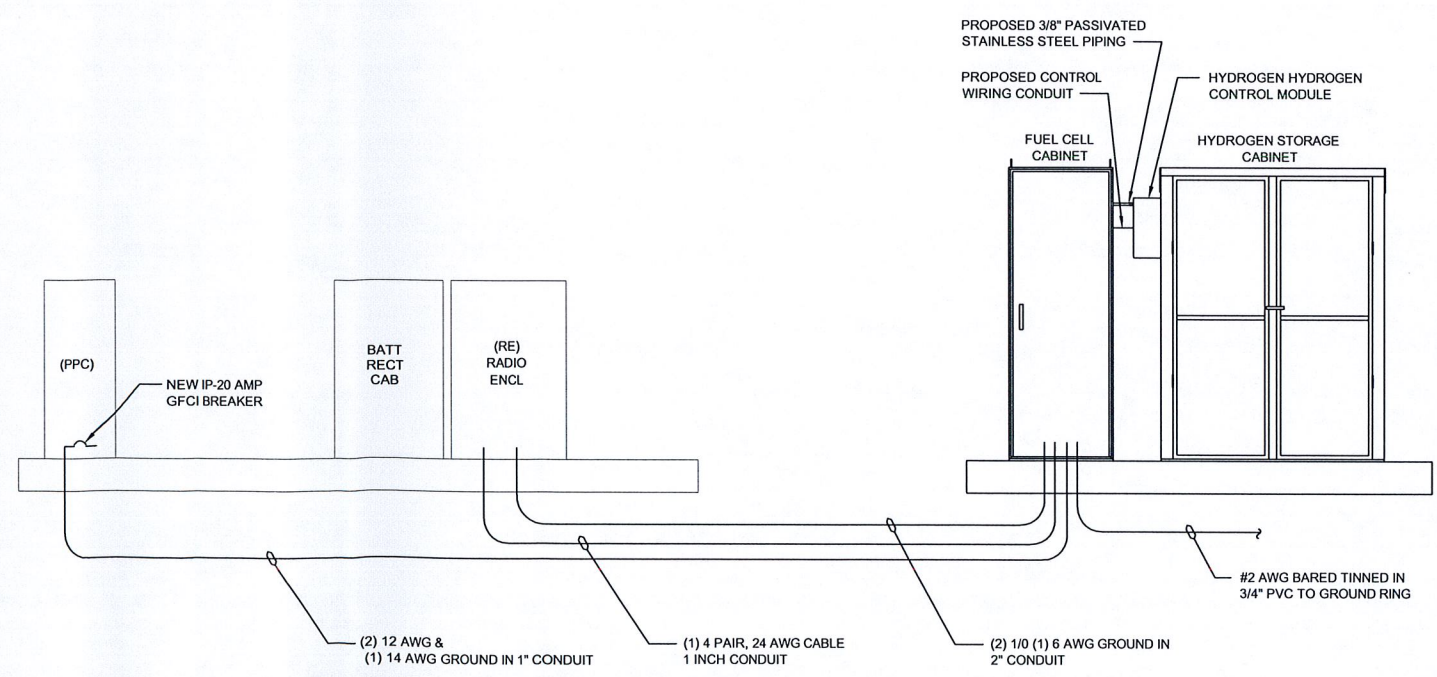
1. FOR CONDUIT STUB UP LOCATIONS AND DETAILS, REFER TO DETAIL A (THIS SHEET) AND SHEET S-2.



**DETAIL A  
STUB UP DETAIL**  
NO SCALE



**24 VDC CONNECTION**



**ELECTRICAL & SIGNAL RISER DIAGRAM**

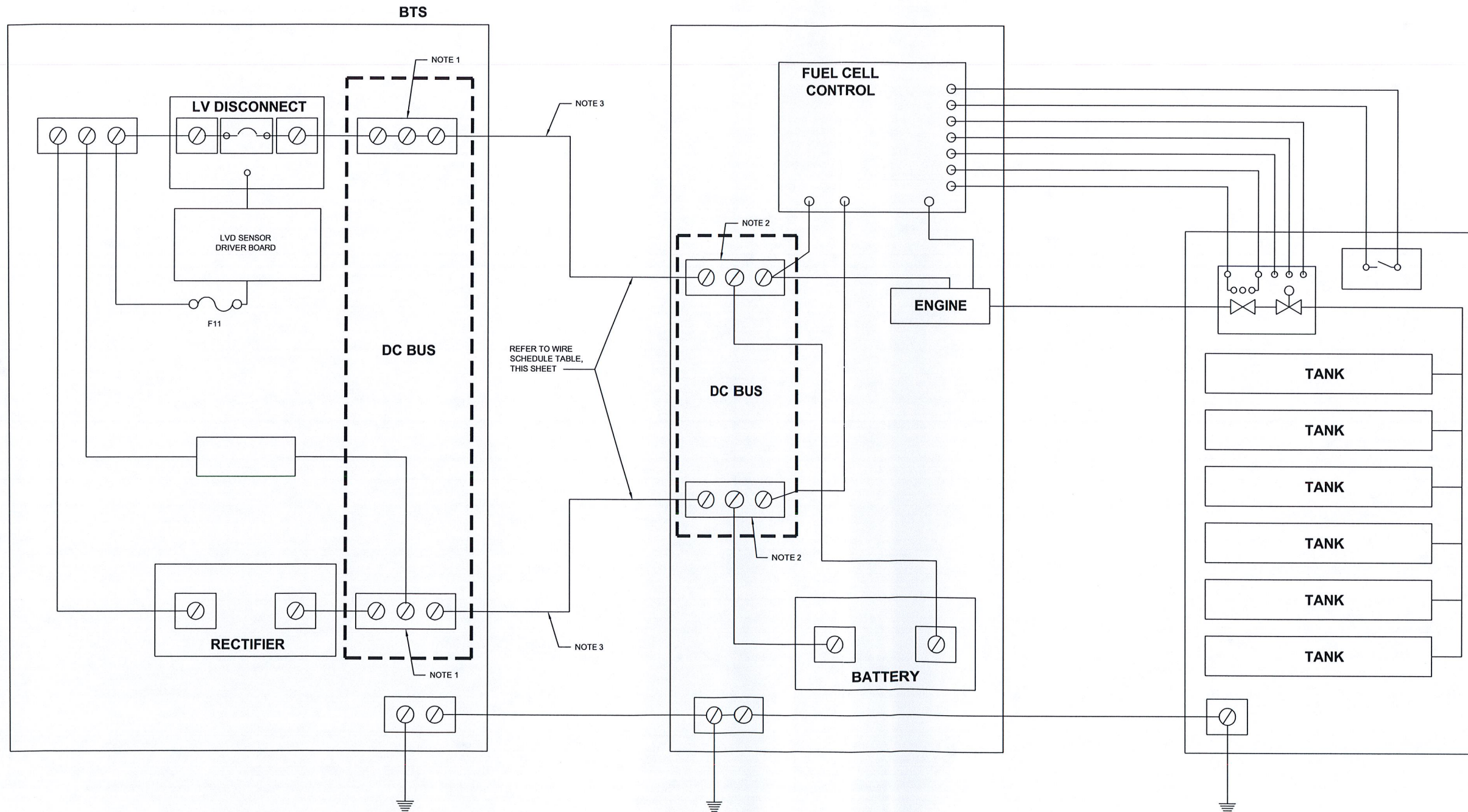
DC WIRE SIZE GUIDE		
BATTERY DISTANCE FROM FUEL CELL	48V ALTERGY @ 5KW (105A)	48V ALTERGY @ 10KW (105A)
10'	#1 AWG	3/0 AWG
20'	#1 AWG	4/0 AWG
30'	1/0 AWG	4/0 AWG
40'	1/0 AWG	4/0 AWG
50'	2/0 AWG	250 MCM
>50'	INSTALLER WILL NEED TO DETERMINE WIRE SIZE IN SITUATIONS WHERE THE DISTANCE FROM THE FUEL CELL TO THE BATTERY BANK IS GREATER THAN 50'	

THIS GUIDE IS FOR REFERENCE ONLY. THE INSTALLER IS RESPONSIBLE FOR SELECTING THE PROPER WIRE FOR EACH INSTALLATION IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC)

WIRE SCHEDULE TABLE

NOTES:

1. BTS BUS BAR LUGS-TWO HOLE, 1/4" HOLE, 5/8" SPACING.
2. ALTERGY FUEL CELL BUS LUGS - TWO HOLE, 1/4" HOLE, 5/8" SPACING.
3. RECOMMENDED CABLE - POWERFLEX 1000, SIZED PER APPLICATION.



WIRING DIAGRAM



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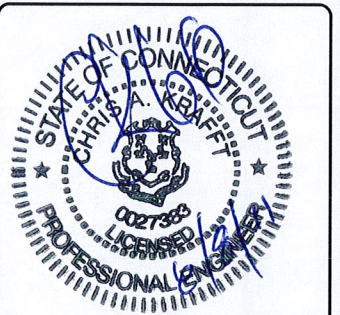


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10950 GRANDVIEW DRIVE  
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CT23XC500  
57 COOK DRIVE  
MONTVILLE, CT 06382  
CO-LOCATION

SHEET TITLE  
**ELECTRICAL  
WIRING DIAGRAM**

SHEET NUMBER

**E-3**



6580 SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251



**BLACK & VEATCH**

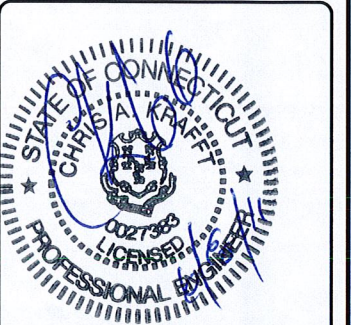
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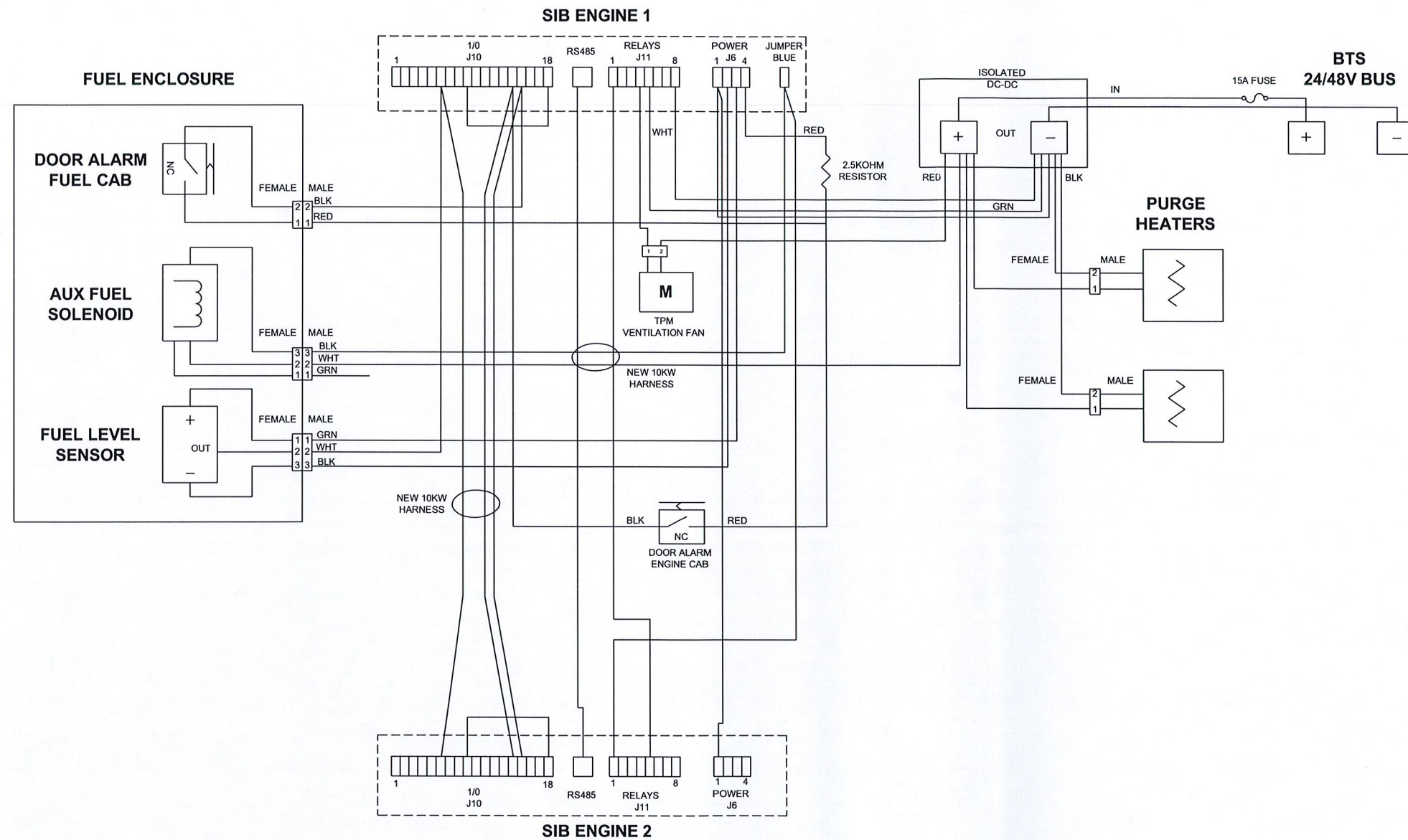


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MONTVILLE, CT 06382  
CO-LOCATION**







SHEET TITLE  
**FUEL CELL INTERNAL  
WIRING DIAGRAM**

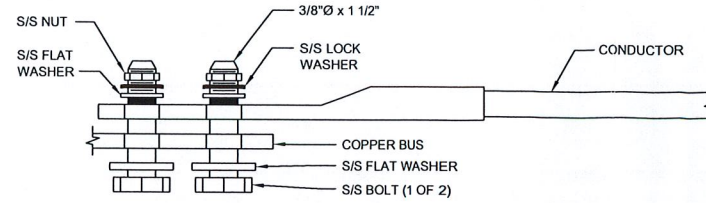
SHEET NUMBER  
**E-4**



**WIRING SCHEMATIC**

THE DETAILS ON THIS SHEET APPLY ONLY AS CALLED OUT ON SITE PLANS OR SITE SPECIFIC DRAWINGS.

CADWELD CONNECTIONS OR APPROVED EQUAL		BURNDY CONNECTIONS OR APPROVED EQUAL
 PARALLEL HORIZONTAL CONDUCTORS PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES TYPE PT	 HORIZONTAL STEEL SURFACE TO FLAT STEEL SURFACE OR HORIZONTAL PIPE TYPE HS	 BOND JUMPER FIELD FABRICATED GREEN STRANDED INSULATED TYPE 2-YA-2
 THROUGH CABLE TO GROUND ROD THROUGH CABLE TO TOP OF GROUND ROD TYPE GT	 VERTICAL STEEL SURFACE CABLE DOWN AT 45° TO VERTICAL STEEL SURFACE INCLUDING PIPE TYPE VS	 COPPER LUGS TWO HOLE - LONG BARREL LENGTH TYPE YA-2



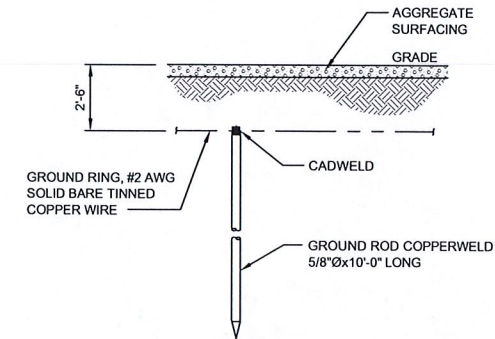
LUG DETAIL  
NO SCALE

NOTES:

- ALL HARDWARE 18-8 STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
- FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL. COAT ALL SURFACES WITH ANTI-OXIDATION COMPOUND (BURNDY PENETROX E, OR THOMAS & BETTS KOPR-SHIELD).

GROUNDING NOTES:

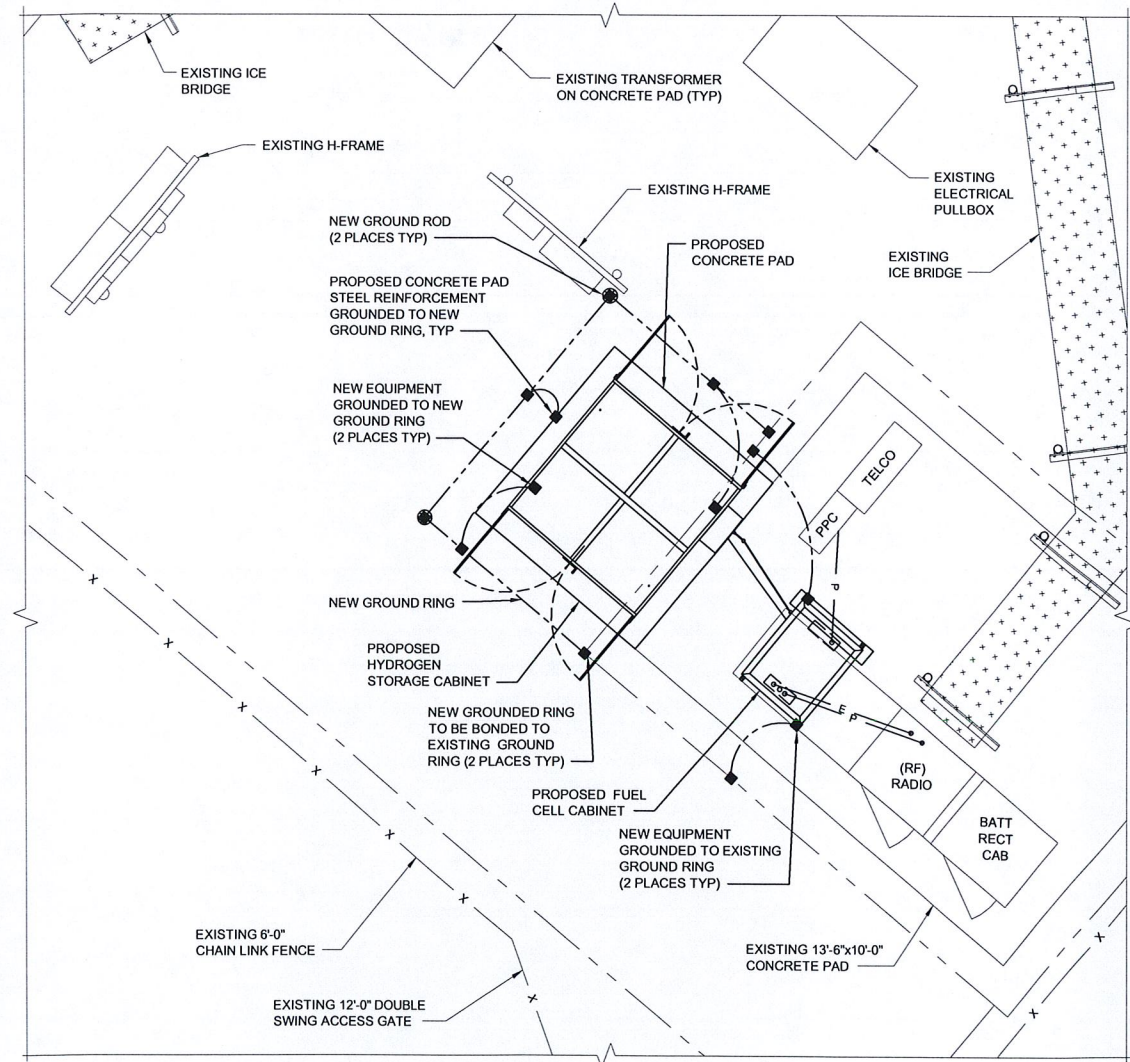
- THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
- ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR & EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
- ALL EXTERIOR GROUNDING CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- ALL EXTERIOR GROUNDING CONDUCTORS SHALL BE 2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
- CONNECTIONS TO THE GROUNDING BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
- MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS. TESTING SHALL BE PERFORMED IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR FACILITY GROUNDING, USING FALL OF POTENTIAL METHOD.



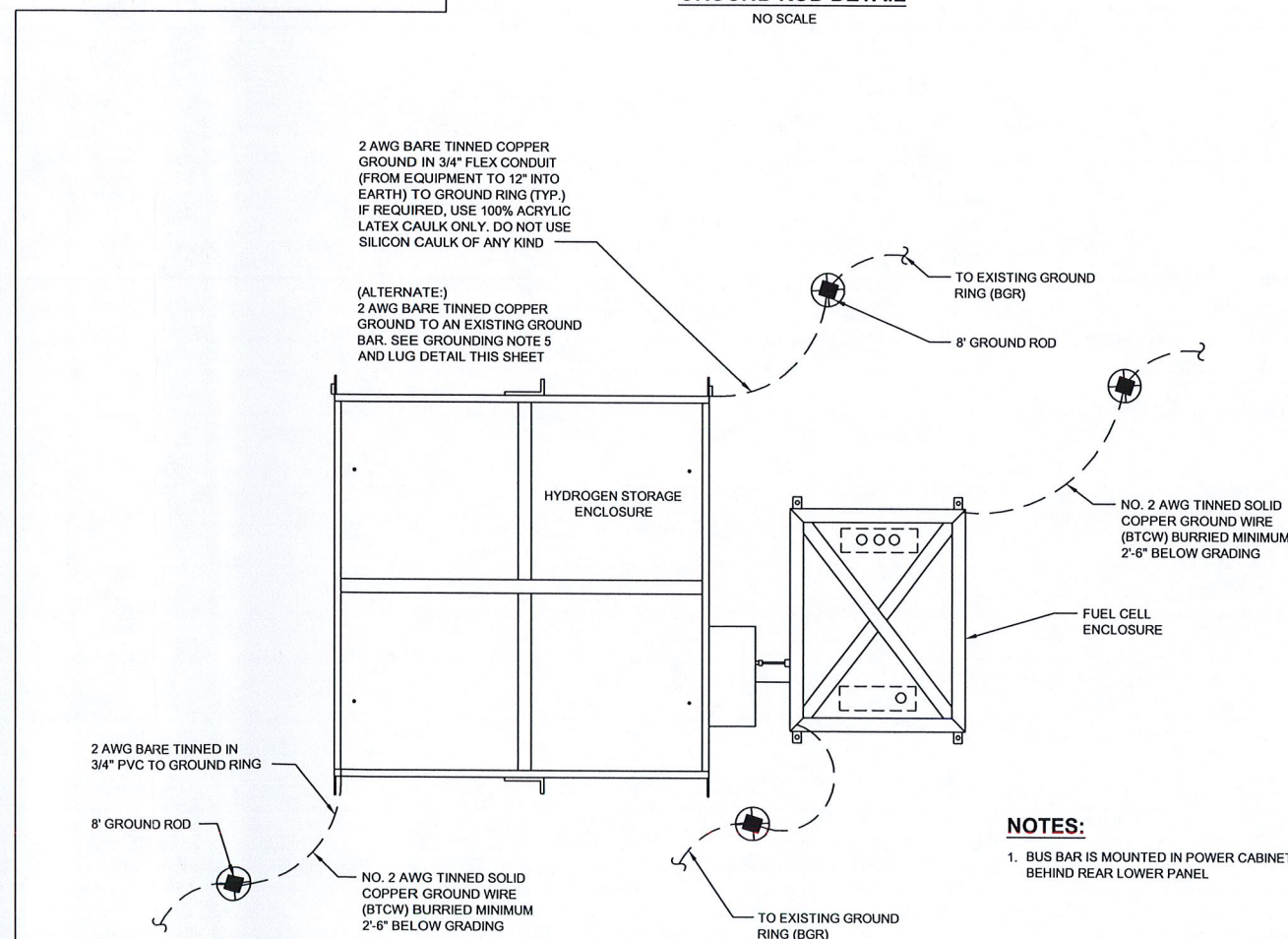
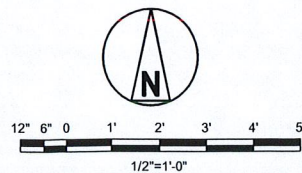
GROUND ROD DETAIL  
NO SCALE

GROUNDING LEGEND

- EXISTING GROUND RING
- ⊗ NEW GROUND ROD
- CADWELD CONNECTION (EXOTHERMIC WELD)
- NEW GROUND RING



GROUNDING PLAN



HYDROGEN TANKS AND ENGINE STAND ALONE  
GROUNDING DETAIL (IF APPLICABLE)

NOTES:

- BUS BAR IS MOUNTED IN POWER CABINET BEHIND REAR LOWER PANEL



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57 COOK DRIVE  
MONTVILLE, CT 06382  
CO-LOCATION

SHEET TITLE  
GROUNDING PLAN  
AND DETAILS

SHEET NUMBER

G-1