



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

**RE: Petition of Bloom Energy Corporation, as agent for Home Depot, for a Declaratory Ruling for the Location and Construction of a 300 kilowatt (net) Fuel Cell and Auxiliary Battery System (ABS) Customer Side Distributed Resource at 440 Boston Post Road, Orange, CT.**

Dear Chairman Robert Stein:

We are submitting an original and fifteen (15) copies of the above-captioned Petition, together with the filing fee of \$625.

In the Petition, Bloom Energy Corporation ("Bloom"), as agent for Home Depot, requests the Connecticut Siting Council approve the location and construction of a 200 kilowatt (kW) fuel cell, an auxiliary battery system ("ABS"), and associated equipment (the "Facility"). When discharging, the ABS sends power through the fuel cell inverters, such that the maximum combined grid tied power output is 300kW. The Facility will be located on the site of the Home Depot building at 440 Boston Post Road, Orange, CT (the "Site"). Electricity generated by the Facility will be consumed at the Site, and any excess electricity will be exported to the electric grid. The Facility will be fueled by natural gas.

Should you have any questions, concerns, or require additional information, please contact me at (860) 839-8373.

Sincerely,  
Bloom Energy

A handwritten signature in black ink, appearing to read "Justin Adams".

Justin Adams  
[justin.adams@bloomenergy.com](mailto:justin.adams@bloomenergy.com)  
(860) 839-8373

**STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL**

PETITION OF BLOOM ENERGY CORPORATION	: PETITION NO. ____
AS AGENT FOR HOME DEPOT FOR A	:
DECLARATORY RULING FOR THE LOCATION	:
AND CONSTRUCTION OF A 200-KILOWATT	:
FUEL CELL & 100-KILOWATT AUXILIARY	:
BATTERY SYSTEM CUSTOMER-SIDE	:
DISTRIBUTED RESOURCE AT 440 BOSTON POST	:
ROAD, ORANGE, CT 06477.	: April 17, 2017

PETITION OF BLOOM ENERGY CORPORATION AS AGENT FOR HOME DEPOT  
FOR A DECLARATORY RULING

Pursuant to Conn. Gen. Stat. §§ 4-176 and 16-50k(a) and Conn. Agencies Regs. § 16-50j-38 et seq., Bloom Energy Corporation (“Bloom”), as agent for Home Depot, requests that the Connecticut Siting Council (“Council”) approve by declaratory ruling the location and construction of a customer-side distributed resources “Facility” comprised of a one (1) new ES-5 Bloom Energy Server solid oxide fuel cells, two (2) auxiliary batteries systems (“ABS”), and associated equipment. The Facility would provide 300-kilowatts (“kW”) (max) of power to the Home Depot building located at 440 Boston Post Road, Orange, Connecticut (the “Site”). *See* Exhibit 1A and Exhibit 1B. The Facility will be installed, maintained and operated by Bloom. It will be owned by a third party financing source of Bloom under an agreement with Home Depot.

Conn. Gen. Stat. § 16-50k(a) provides that:

Notwithstanding the provisions of this chapter or title 16a, the council shall, in the exercise of its jurisdiction over the siting of generating facilities, approve by declaratory ruling . . . (B) the construction or location of any fuel cell, unless the



council finds a substantial adverse environmental effect or of any customer-side distributed resources project or facility . . . with a capacity of not more than sixty-five megawatts, as long as such project meets air and water quality standards of the Department of Energy and Environmental Protection.”

The proposed Facility will be a customer-side distributed resources facility under 65MW that complies with the air and water quality standards of the Department of Energy and Environmental Protection (“DEEP”). Bloom submits that no Certificate is required because the proposed modifications would not have a substantial adverse environmental effect in the immediate vicinity of the Facility as well as in the State of Connecticut.

## **I. COMMUNICATIONS**

Correspondence and other communication regarding this petition should be directed to the following parties:

Justin Adams  
Bloom Energy Corporation  
1299 Orleans Drive  
Sunnyvale, CA 94089  
Telephone: (860) 839-8373  
Fax: (408) 543-1501  
Email: [justin.adams@bloomenergy.com](mailto:justin.adams@bloomenergy.com)

Paul Evan  
Bloom Energy Corporation  
1299 Orleans Drive  
Sunnyvale, CA 94089  
Telephone: (850) 9805179  
Fax: (408) 543-1501  
Email: [paul.evan@bloomenergy.com](mailto:paul.evan@bloomenergy.com)

## **II. DISCUSSION**

### **A. Project Description and Purpose**

The Facility will be a 300kW customer-side distributed resources consisting of a state-of-the-art Bloom Energy Server, an ABS, and associated equipment. The Facility will be interconnected to the existing switchboard located within the electrical room of the Home Depot building (the “Building”). *See* Exhibit 2.

The proposed Facility is a “customer-side distributed resources” project because it will be “a unit with a rating of not more than sixty-five megawatts [and is located] on the premises of an industrial end user within the transmission and distribution system including, but not limited to, fuel cells . . .” Conn. Gen. Stat. § 16-1(a)(40)(A). Further, in its Final Decision in Docket No. 12-02-09, dated September 12, 2012, the Connecticut Public Utilities Regulatory Authority (“PURA”) determined that Bloom’s Energy Server qualifies as a Class I renewable energy source fuel cell as defined in Conn. Gen. Stat. §16-1(a)(26)(A). *See* Exhibit 3.

The purpose of the proposed project is to replace the average baseload of the Building with a Class I renewable energy source, achieve corporate sustainability goals, and improve reliability of electrical systems and equipment. The meter interval data analysis conducted in 2016 (Exhibit 4) determined that the proposed Facility would offset 91% of the Building load. Electricity generated by the Facility will be consumed primarily at the Site, and any excess electricity will be exported to the grid.

## **B. The Facility**

The Facility will consist of one 200 kW ES5-BABAA0 model Bloom solid oxide fuel cell Energy Server, ABS-1 (1ABS-306FC) will be the 90kW and ABS-2 (1ABS-204FC) will be the 60kW, and associated equipment. The location and arrangement for the fuel cell, ABS systems and associated equipment is shown in Exhibit 2. The associated equipment includes a water deionizer, a telemetry cabinet, a disconnect switch and a utility cabinet. The concrete pads for the Facility and associated equipment will be protected from vehicle traffic by bollards. The Facility is enclosed, factory-assembled and tested prior to installation on the Site. Specification sheets for the Energy Server, the ABS systems and photos of typical installations are provided in



Exhibit 5. The Facility, the connections, and associated equipment will be installed in compliance with applicable building, plumbing, electrical, and fire codes.

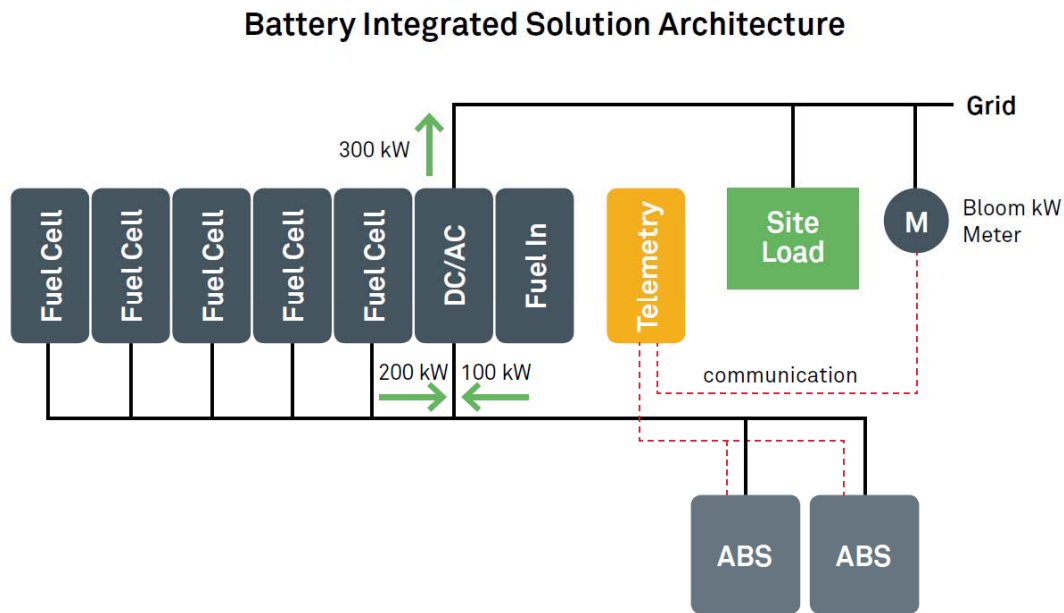
The operational life of the Facility is for the life of the 20 year contract and the solid oxide media in the fuel cells are exchanged at roughly 5 year intervals. The expected battery lifetime is 10 years, when it will be replaced if necessary. The options at the conclusion of the 20 year contract include; Home Depot may renew the contract, return the Facility at no cost, or buy the Facility at a fair market value. If the Facility is to be removed at the end of the contract or if there is a default in the contract; the Energy Servers, associated equipment and components will be dismantled and removed, the concrete pads will remain unless requested to be removed, and the site will be restored as nearly as practicable to its effective original condition.

The Facility will be capable of producing 300kW of continuous, reliable electric power. The Facility will interconnect to the Site's distribution system and operate in parallel with the grid to provide the Site's electrical requirements. Any electricity generated in excess of the Site's requirement will be exported to the grid in accordance with the United Illuminating's interconnection technical requirements. The Facility is designed to operate in parallel with the utility as well as in a standalone configuration utilizing the same base resource. Pairing Bloom's Energy Server with the ABS enables total optimization of energy usage in the following areas:

- Load Shifting: maximizes use of fuel cell generation by delivering power to facility during peak periods.
- Peak Shaving: maximize demand charge reduction by intelligently combining fuel cell and battery output.

- **Business Continuity:** ensures seamless operation during grid interruptions without investment in idle backup equipment.

During non-peak energy usage times, such as evenings, the Energy Server charges the integrated batteries. During peak energy usage times, such as the middle of business hours, the



batteries discharge, adding to the energy being produced by the Facility. Therefore, during peak hours, the Facility may export power up to the sum of the Energy Server and ABS nameplate power ratings (max 300 kW AC), as shown below.

The interconnection will be provided from the existing switchgear located inside the electrical room. The interconnection application for the Facility was submitted and under review at the time this petition was filed. The Facility will be fueled by natural gas supplied by Southern Connecticut Gas. When operating in the utility parallel mode, power from the Energy Server fuel cells supplements the electric utility service to power the building loads. The ABS connects to internal power distribution of the Energy Server in order to charge and discharge the

batteries in the ABS. When discharging, the ABS sends power through the Energy Server inverters, such that the maximum combined grid tied power output is 300kW at 480VAC. The grid-parallel output interconnects with the utility power system at the Building's main switchboard.

The Facility also has a second operating mode where the utility is disconnected and power is provided to the building in a standalone (islanded) mode. The utility disconnect will be managed at the main switchboard point of common coupling using a listed grid protection relay and associated circuit breaker.

The Energy Server is equipped with a UL-1741 listed inverter set that complies with IEEE-1547 standards for interconnection of inverter-based distributed generation. It is UL Recognized under UL Category QIKH2 and UL File Number E310552. It will be a 300-kW dual mode inverter which can continue to operate when the utility drops out. The ABS is under evaluation for UL listing to UL 1973. When complete, Model 1ABS-306FC and Model 1ABS-204FC will be UL Listed under UL Category BBFX, Batteries for Use in Light Electric Rail and Stationary Applications.

The Facility will have extensive hardware, software and operator safety control systems, designed in accordance with American National Standards Institute and Canadian Standards Association for Stationary Fuel Cell Power Systems ("ANSI/CSA"). It is listed by UL as a "Stationary Fuel Cell Power System" to ANSI/CSA FC1-2014 under UL Category IRGZ and UL File Number MH45102. The Facility would be controlled remotely and have internal sensors that continuously monitor system operation. If safety circuits detect a condition outside normal operating parameters, the fuel supply is stopped and individual system components are

automatically shut down. A Bloom Energy Remote Monitoring Control Center (RMCC) operator can also remotely initiate any emergency sequence. An emergency stop alarm initiates an automatic shutdown sequence that puts the system into “safe mode” and causes it to stop exporting power. Bloom operators can assess different situations and take the necessary actions to mitigate impacts on the fuel cells during maintenance work, shutdowns or outages and enable them to come back online smoothly and efficiently when the disruption is completed. In addition, Home Depot and its employees are provided with an Emergency Response Plan (Exhibit 6) to assist in the safe operation of the Facility.

The Facility will be installed in accordance with NFPA 853<sup>1</sup>. This standard provides fire prevention and fire protection requirements for safeguarding life and physical property associated with buildings or facilities that employ stationary fuel cell systems of all sizes. The risk of fire related to the operation of the Facility is therefore very low. Furthermore, in the Facility, natural gas is not burned; it is used in a chemical reaction to generate electricity. The natural gas is digested almost immediately upon entering the unit and is no longer combustible. As stated above, any variation in heat outside of the operational parameters will trigger an automatic shutdown of the energy server. Before commissioning, the fuel lines (pipe) are cleaned in accordance with Public Act 11-101<sup>2</sup>.

## **C. Existing Environment**

### **i. The Site**

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<sup>1</sup> Standard for the Installation of Stationary Fuel Cell Power Systems, 2015 Edition

<sup>2</sup> Public Act 11-101, An Act Adopting Certain Safety Recommendations of the Thomas Commission,

The Facility would be installed entirely within the property located at 440 Boston Post Road, Orange, Connecticut which is currently leased by Home Depot. Specifically, the Facility will be constructed on the 14.92-acre property that surrounds the Building. The Site is zoned as Commercial (“C-2”) under the zoning regulations of the Town of Orange (the “Town”). The parcels to the north, south, and west are also zoned C-2; the property to the east is zoned Residential (RES). The proposed Facility would be shielded from the closest residential property approximately 480 to the north, with Boston Post Road/Route 1 intervening.

The Facility would be located adjacent to the Building and on existing paved parking spaces provided by the shopping center. Photos of the proposed location are provided in Exhibit 7. The Home Depot Plaza currently has a reserve of 25 parking spaces. The proposed location would eliminate five (5) parking spaces and would not significantly impact the ratio of provided parking to required parking (see Exhibit 2). Bloom has discussed the proposal with the Town and informed them that five (5) parking spaces will be eliminated. The location of the Facility was strategically placed in proximity to the existing mechanical equipment to avoid impacting operational requirements of the Building.

#### ii. Wildlife and Habitat

A review of the publicly available Natural Diversity Database (NDDB) has shown no known occurrences of state-listed species within the proposed Site (see Exhibit 8); as such, no request for review was submitted to CTDEEP.

#### iii. Wetlands and Watercourse

The proposed Facility would be located on an area that was developed and disturbed during the construction of the Building and its access roads and parking areas. There are no

identified wetlands or watercourses within the proposed location of the Facility. According to CTDEEP data, inland wetland soils (“Poorly Drained and/or Very Poorly Drained Soils”) are located approximately 380 feet to the east of the proposed location, also within a developed area on the parcel. See Exhibit 9. Protection measures described in *Section E* will minimize the potential for soil erosion and the flow of sediments off site. Due to the distance of the proposed Facility from identified wetlands and watercourses and the implementation of construction protection measures, impacts to wetlands and watercourses are not anticipated during the construction and operation of the Facility.

#### iv. Cultural Resources

The Facility is proposed in a previously disturbed area and the construction and operation of the Facility will therefore not have a substantial adverse effect on cultural (archaeological and historical) resources.

#### v. Flood Zones, Aquifer Protection Area and Coastal Boundary

A review of the flood hazard mapping data from Federal Emergency Management Agency’s (“FEMA”) National Flood Insurance Program (“NFIP”) has shown the Facility would not be located within a 100- or 500-year flood zone. See Exhibit 10.

The Site was also reviewed for proximity to Aquifer Protection Areas. According to GIS data provided by CTDEEP, the closest Aquifer Protection Area is located approximately 6.8 miles to the northwest of the proposed Facility.

The location was also reviewed for proximity to the Coastal Boundary, which delineates the coastal boundary of Connecticut as defined in the Connecticut Coastal Management Act. As shown in Exhibit 8, the proposed Facility would not be located within the Coastal Boundary.

## **D. Environmental Effects and Mitigation**

### i. Natural Gas Desulfurization Process

The first step in the production of electricity in a Bloom Energy server is desulfurization – the removal of the sulfur compounds, which have been added to the natural gas as an odorant by the natural gas suppliers. This step occurs in the desulfurization unit – a canister which contains a catalyst made for this purpose. Sulfur is not “produced” in this process, but is separated from the natural gas in which it was contained. In this process, trace levels of sulfur oxides and other naturally occurring elements, may also absorb to the filter. In this process, the catalyst may also pick up some benzene and in some cases exceed the RCRA threshold. The catalysts are sent to a central location and processed by a qualified facility. Again, these are not “produced” from the process, but are separated from the natural gas in which they were contained. The catalyst is made up of inert materials, including copper.

The desulfurization process takes place entirely within desulfurization canisters. These are made of extruded aluminum or zinc-plated steel that are built to last for the life of the Energy Server and beyond. Because they are built to hold natural gas, their structural integrity is essential. That integrity is assured by around the clock monitoring of the Energy Servers to detect any leak. Were there a leak, the Server (including the desulfurization operation) would shut down automatically. There has never been a leak from one of the desulfurization canisters. The structural integrity and leak prevention continues after the desulfurization canisters are removed from service. At that point, the entry and exit points for the natural gas automatically seal shut. The desulfurization canister remains sealed and is not opened at the Site, or anywhere in the State of Connecticut.

Within days that a desulfurization canister is taken out of service, it is picked up by a Bloom contractor and taken to a licensed facility outside the State, where the desulfurization unit is opened and the contents are removed. As described above, the desulfurization unit has complete structural integrity. Its safety as a container for transporting has been certified by the Department of Transportation (DOT). This certification assures that the canisters are secure and have the structural integrity to transport the desulfurization materials safely and without risk of a release.

Bloom has been engaged and expects to have further follow up discussion with regulators on the proper management of materials found in all public pipeline natural gas supplied to homes and businesses, which we filter before that fuel is consumed by our product to produce clean, environmentally friendly electric power. Because our technology is relatively new, the 35 year old regulations do not address our situation, but we have been working with the regulators to obtain clarification.

#### ii. Water, Heat and Air Emissions

The construction and operation of the Facility will comply with DEEP's air and water quality standards and will not have a substantial adverse environmental effect.

With respect to water discharges, the Facility is designed to operate without water discharge under normal operating conditions. There are no connections or discharge points to the proposed Facility. Additionally, the Facility would use no water during normal operation beyond a 75-gallon injection at start up.

Heat generated by the proposed Facility is used internally to increase the electrical efficiency of the fuel cell system. As a result there is no useful waste heat generated by the fuel



cell. The minimal amount of thermal load present at the Site would preclude the efficient deployment of a combined heat and power application.

Conn. Agencies Regs. § 22a-174-42, which governs air emissions from new distributed generators, exempts fuel cells from air permitting requirements. Accordingly, no permits, registrations, or applications are required based on the actual emissions from the Facility<sup>3</sup>. Even though the fuel cell systems are exempt from the emissions requirements, Bloom Energy fuel cells do meet the emissions standards of Section 22a-174-42. Per Section 22a-174-42(e)(1)(A) a certification by the California Air Resources Board (CARB) pursuant to Title 17, sections 94200 through 94214 of the California Code of Regulations meets the requirements of Conn. Agencies Regs. § 22a-174-42. The Bloom Energy fuel cells are certified under the CARB distributed generation program. A current list of certified application is provided on the CARB's distributed generation certification website (<http://www.arb.ca.gov/energy/dg/eo/eo-current.htm>). The Facility will also meet state criteria thresholds for all greenhouse gases defined in Section 22a-174-1(49). Table 1 lists thresholds set by the Low and Zero Emissions Renewable Energy Credit (LREC/ZREC) program, and compares them to emissions generated from the proposed Facility. By virtue of the non-combustion process the Bloom Energy fuel cells virtually eliminate NO<sub>x</sub>, SO<sub>x</sub>, CO, VOCs and particulate matter emissions from the energy production process. Similarly, there are no CH<sub>4</sub>, SF<sub>6</sub>, HFC or PFC emissions. The CH<sub>4</sub> is broken down in the reforming process. Reforming is the type of process where if you have sufficient catalyst, the reaction can go all the way to completion. That is the case for the Bloom Energy Server. The fuel is reformed in the hot box – with a significant excess catalyst for reaction.

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<sup>3</sup> See Conn. Agencies Regs. §§ 22a-174-42(b) and (e).

**Table 1: Connecticut Thresholds for Greenhouse Gases**

<b>Emission Type</b>	<b>Bloom Output</b>	<b>LREC allowance</b>
Nitrous Oxides (NOx)	<0.01 lbs/MWh	0.07 lbs/MWh
Carbon Monoxide (CO)	<0.05 lbs/MWh	0.10 lbs/MWh
Sulfur Oxides (SOx)	Negligible	Not Listed
Volatile Organic Compounds (VOCs)	<0.02 lbs/MWh	0.02 lbs/MWh
Carbon Dioxide (CO <sub>2</sub> ) <sup>4</sup>	679-833 lbs/MWh	Not Listed

The proposed Facility will ultimately displace less efficient fossil fueled marginal generation on the ISO New England system. Based upon US Environmental Protection Agency (EPA) “eGrid” data the proposed facility is expected to reduce carbon emissions by more than 25% while essentially eliminating local air pollutants like NOx, SOx, and particulate matter.

### iii. Sound Levels

The nearest parcel boundary is with a commercial property located approximately 180 linear feet to the west and defined as a Class B noise zone<sup>5</sup>. The proposed Facility would face Boston Post Road to the north and be shielded by the Building to the south. The nearest Class A residential property is located approximately 480 linear feet to the north and on the opposite side of the Route 1 commercial corridor. The residential properties will therefore be shielded from any sound generating from the Facility. The results of the sound model predicting noise levels at

<sup>4</sup> Carbon Dioxide is measured at Bloom’s stated lifetime efficiency level of 53-60%.

<sup>5</sup> Sec. 22a-69-2.3. Noise zone standards

the property boundary located 480 feet to the north are provided as Exhibit 11. The proposed Facility would be defined as “Scenario 1” in the model. Scenario 1 models noise for a Bloom Energy Server installed close to a building or tall wall which reflects the noise produced to the opposite side of the Energy Server and increases the noise levels. The results of the Scenario 1 sound model at 480 feet are 35.1 dBA, which is in compliance with noise criteria set forth in Connecticut regulations for the Control of Noise<sup>6</sup> and the Town of Orange Code<sup>7</sup>.

#### iv. Visual Effects

The overall visual effect would be mitigated by locating the Facility on the north side of Building. The Facility would only be visible from the north and west, in the area of the Boston Post Road-South Orange Center Road intersection; visibility to the west would be mitigated by existing vegetative screening. Visibility would be shielded from the parking and pedestrian traffic on the east and south sides of the building.

### **E. Project Construction and Maintenance**

Bloom anticipates construction to start in the third quarter of 2017 with 6-8 weeks of total construction time (2 weeks of site prep, 2 weeks of installation, and 2 weeks of commissioning). Orange permits noise generated from construction during daytime hours only. It defines daytime hours between 7:00 a.m. and 9:00 p.m., Monday through Saturday, and the hours between 9:00 a.m. and 9:00 p.m. on Sundays. We anticipate site work construction to only occur during daytime hours Monday through Friday.

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<sup>6</sup> Sec. 22a-69-3.5. Noise zone standards

<sup>7</sup> Chapter 290: Noise.

During construction, appropriate erosion and sedimentation (E&S) controls will be installed and areas of disturbance will be promptly stabilized in order to minimize the potential for soil erosion and the flow of sediments off site. Temporary E&S control measures will be maintained and inspected throughout construction to ensure their integrity and effectiveness. The temporary E&S control measures will remain in place until the work is complete and all disturbed areas have been stabilized. No effect to drainage patterns or stormwater discharges are anticipated. Due to the limited disturbance required for the Facility's installation, no construction-related storm water permits will be required.

Soils that are generated during construction activities would not be stored or stockpiled inside of wetlands or adjacent to a watercourse. Any excavated soils compatible for reuse will be used as backfill in proximity to the same excavation area from where it originated. Any excess excavated soils not suitable for reuse would be trucked off-site and managed in accordance with applicable regulations. Rock, concrete and other debris would be removed and trucked off-site.

Areas affected by construction would be re-graded as practical and stabilized using revegetation or other measures before removing temporary E&S controls. Construction-related impacts will therefore be minimal.

### **III. COMMUNITY OUTREACH**

Bloom has provided notice of this petition via certified mail to all persons and appropriate municipal officials and governmental agencies (Orange) to whom notice is required

to be given pursuant to Conn. Agencies Regs. § 16-50j-40(a)<sup>8</sup>. A copy of the notice letter and a service list are provided in Exhibit 12 and the corresponding abutters map is provided in Exhibit 13. Additionally, prior to filing this petition, representatives from Bloom briefly discussed the proposed Facility with the Town of Orange Zoning Administrator and Enforcement Officer. The preliminary site plan has been provided to the Zoning Administrator for review.

#### **IV. BASIS FOR GRANTING OF THE PETITION**

Under Conn. Gen. Stat. § 16-50k(a), the Council is required to approve by declaratory ruling the construction or location of a customer-side distributed resources project or facility with a capacity of not more than 65 MW, as long as the facility meets DEEP air and water quality standards. The proposed Facility meets each of these criteria. The Facility is a “customer-side distributed resources” project, as defined in Conn. Gen. Stat. § 16-1(a)(40)(A), because the Facility is “a unit with a rating of not more than sixty-five megawatts [and is located] on the premises of a retail end user within the transmission and distribution system including, but not limited to, fuel cells” and, as demonstrated herein, will meet DEEP air and water quality standards. In addition, as demonstrated above, the construction and operation of the Facility will not have a substantial adverse environmental effect in the State of Connecticut.

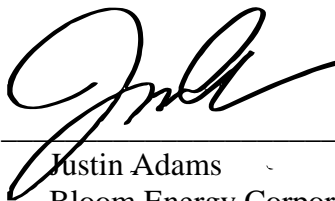
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<sup>8</sup> Conn. Agencies Regs. § 16-50j-40(a) requires that “[p]rior to submitting a petition for a declaratory ruling to the Council, the petitioner shall, where applicable, provide notice to each person other than the petitioner appearing of record as an owner of property which abuts the proposed primary or alternative sites of the proposed facility, each person appearing of record as an owner of the property or properties on which the primary or alternative proposed facility is to be located, and the appropriate municipal officials and government agencies [listed in Section 16-50l of the Connecticut General Statutes].”

**V. CONCLUSION**

For the reasons stated above, Bloom, as agent for Home Depot, respectfully requests that the Council approve the location and construction of the Facility by declaratory ruling.

Respectfully submitted,  
Bloom Energy Corporation

By:  \_\_\_\_\_

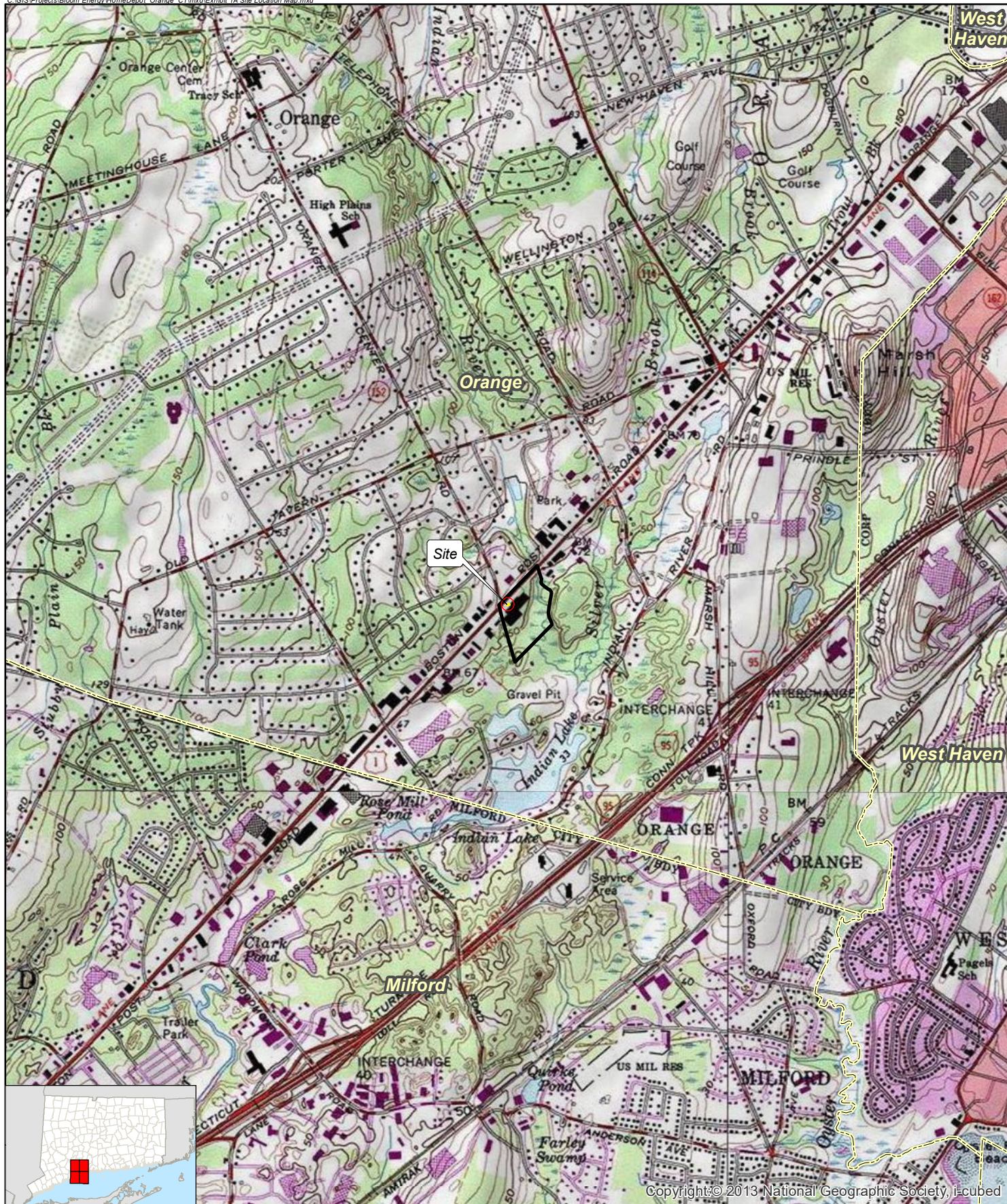
Justin Adams  
Bloom Energy Corporation  
1299 Orleans Drive  
Sunnyvale, CA 94089  
Telephone: (408) 338-7452  
Email: [justin.adams@bloomenergy.com](mailto:justin.adams@bloomenergy.com)

## EXHIBITS

- Exhibit 1: Site Location Map
- Exhibit 2: Site Plan
- Exhibit 3: Final Decision, PURA Docket No. 12-02-09, *Petition of Bloom Energy Corporation for a Declaratory Ruling that Its Solid Oxide Fuel Cell Energy Server Will Qualify as a Class I Renewable Energy Source* (Sept. 12, 2012)
- Exhibit 4: Meter interval data
- Exhibit 5: Bloom Energy Server Product Datasheet and General Installation Overview Meter
- Exhibit 6: Emergency Response Plan
- Exhibit 7: Photos of the proposed location
- Exhibit 8: Coastal Boundary, Natural Diversity Data Base (NDDDB) and Critical Habitat Map
- Exhibit 9: Wetlands and Watercourse Map
- Exhibit 10: Flood Zones
- Exhibit 11: Sound Model
- Exhibit 12: Notice Pursuant to Conn. Agencies Regs. § 16-50j-40(a)
- Exhibit 13: Abutters Map

## Exhibit 1A





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#### Legend

- Subject Property
- Site
- Municipal Boundary

**Map Notes:**  
 Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps:  
 Ansonia (1984), New Milford (1984), Milford (1984) and Woodmont (1971), CT  
 Map Scale: 1:24,000  
 Map Date: April 2017



1,000 500 0 1,000  
 Feet

#### Exhibit 1A Site Location Map

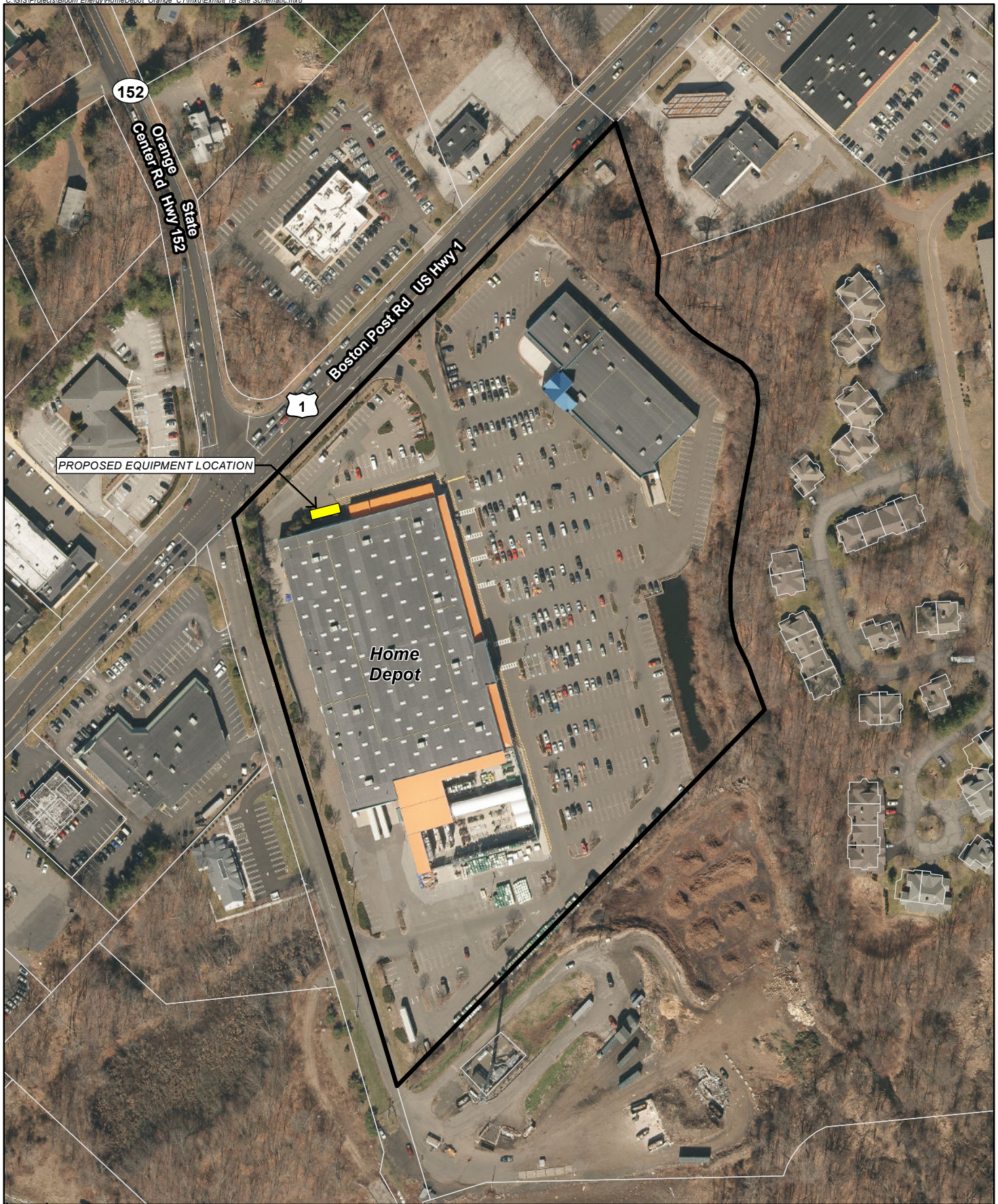
Proposed Bloom Energy Facility  
 Home Depot Building  
 440 Boston Post Road  
 Orange, Connecticut









## Exhibit 1B





#### Legend

-  Subject Property
-  Site
-  Approximate Assessor Parcel Boundary (CTDEEP)
-  CTDEEP Waterbody

**Map Notes:**  
 Base Map Source: CTECO 2016 Aerial Photograph  
 Map Scale: 1 inch = 200 feet  
 Map Date: April 2017



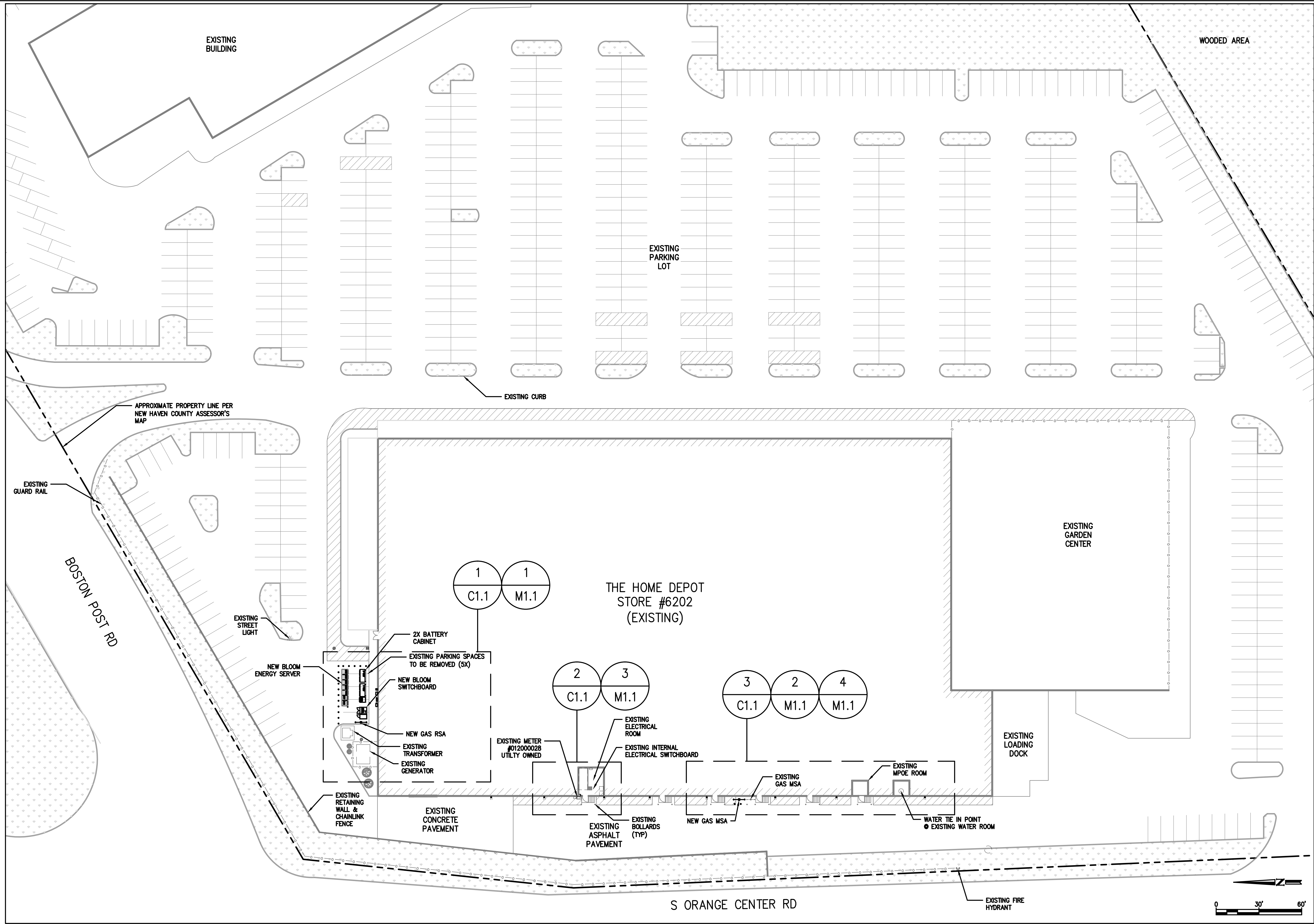
#### Exhibit 1B Site Schematic

Proposed Bloom Energy Facility  
 Home Depot Building  
 440 Boston Post Road  
 Orange, Connecticut





## Exhibit 2



OVERALL SITE PLAN

SCALE: 1" = 30'

1  
G1.1

Bloomenergy®

1299 ORLEANS DRIVE  
SUNNYVALE, CA 94089

PROPRIETARY AND CONFIDENTIAL

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SEAL

GreenbergFarrow

153 Cordaville Road, Suite 210  
Southborough, MA 01772  
t: 508 229 0032

ENGINEER OF RECORD  
STEPHEN POWERS, P.E.  
LICENSE # 0030199

CUSTOMER SITE

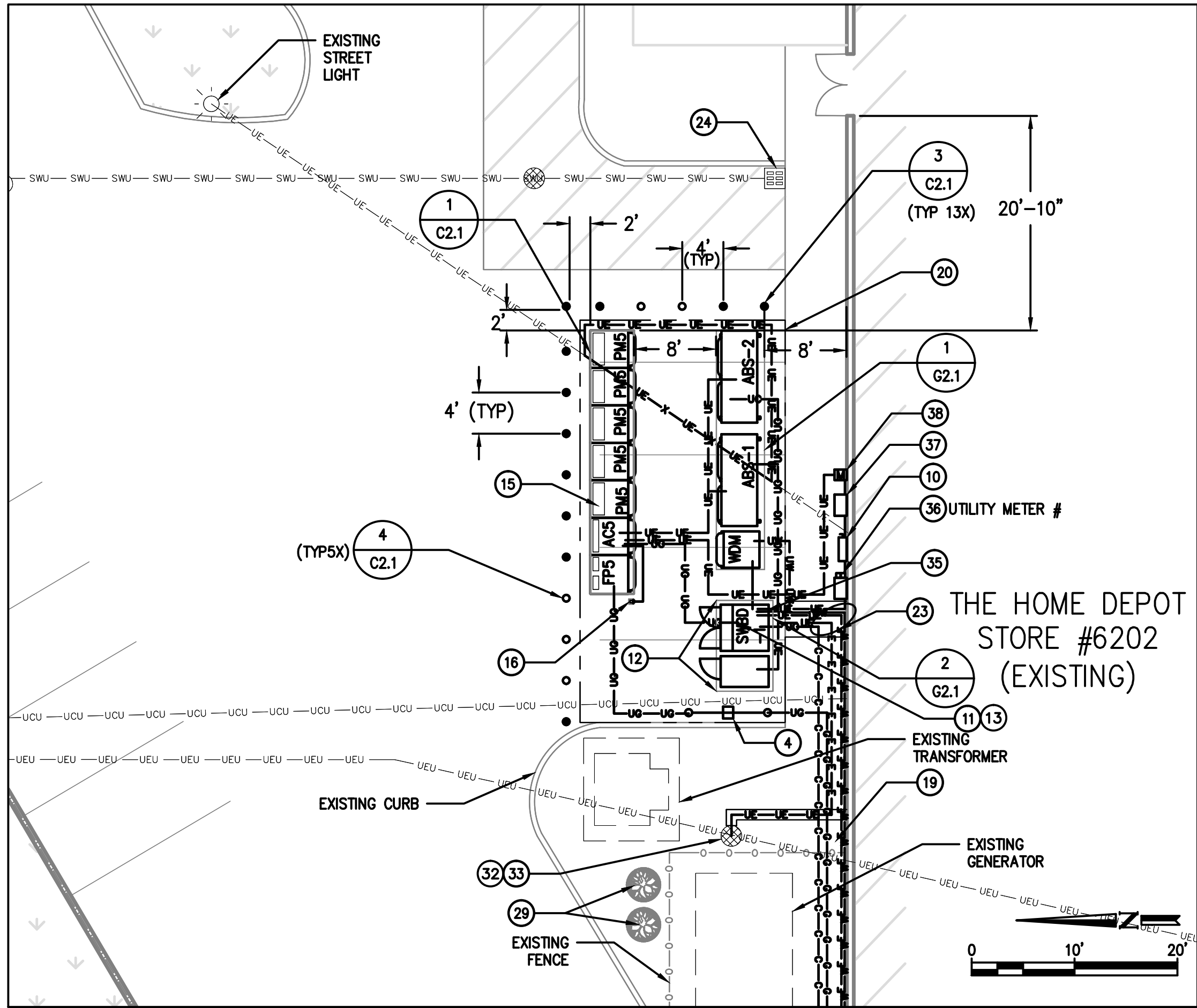
THE HOME DEPOT  
STORE #6202  
440 BOSTON POST RD,  
ORANGE, CT 06477



REVISION HISTORY		
REV	REVISION ISSUE	DATE
01	RELEASED PER IGN-XXXXX	04/06/2017
DESIGNED BY	BRIAN CURTIS	DATE 04/06/2017
DRAWN BY	KEERTHANA.R	DATE 04/06/2017
REVIEWED BY		DATE
APPROVED BY		DATE

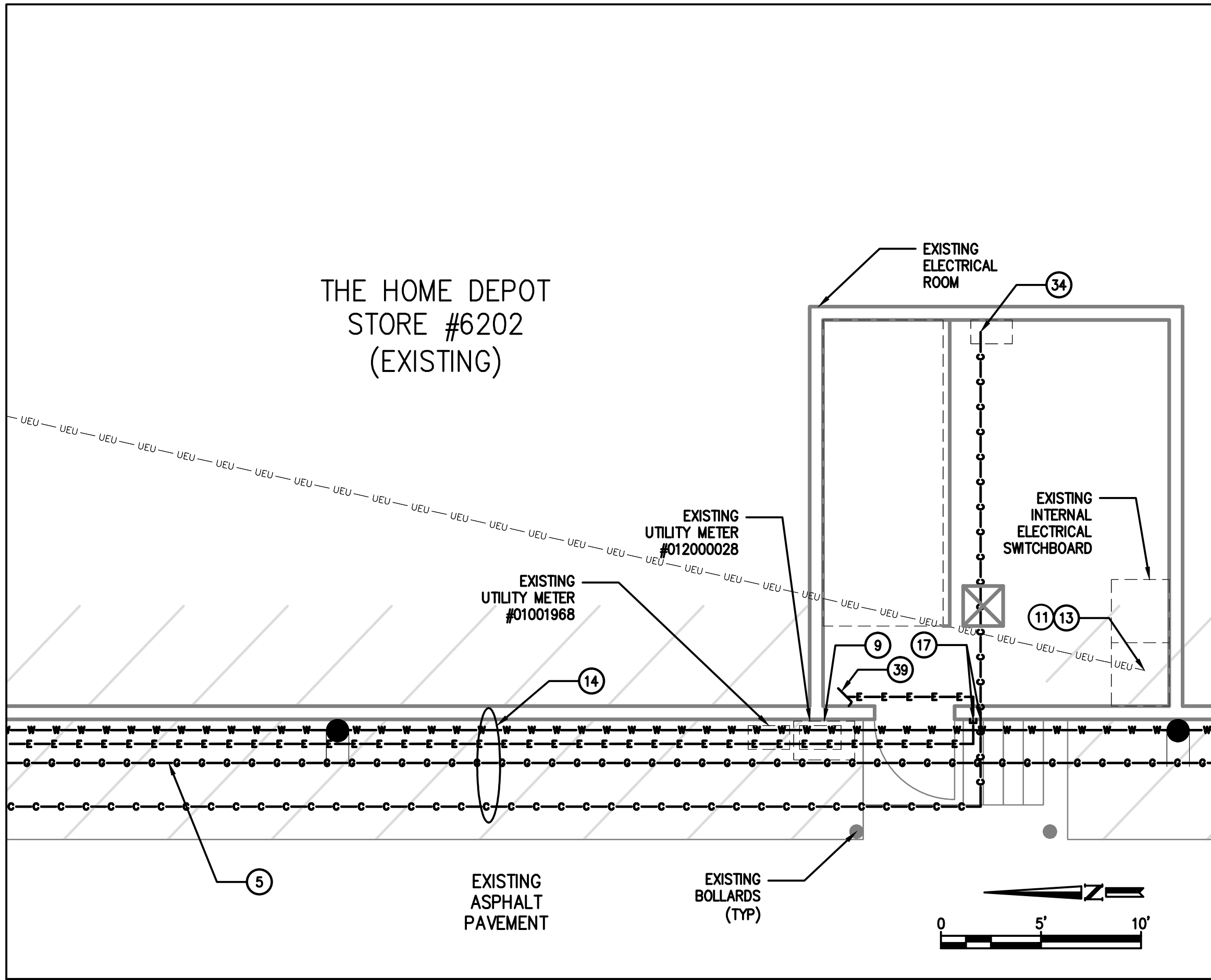
SHEET TITLE	
OVERALL SITE PLAN	
DRAWING NUMBER	G1.1
BLOOM DOCUMENT	DOC-1009225
THIS DRAWING IS 24" X 36" AT FULL SIZE	
SITE ID: HDP043.0	SHEET 04 OF 16





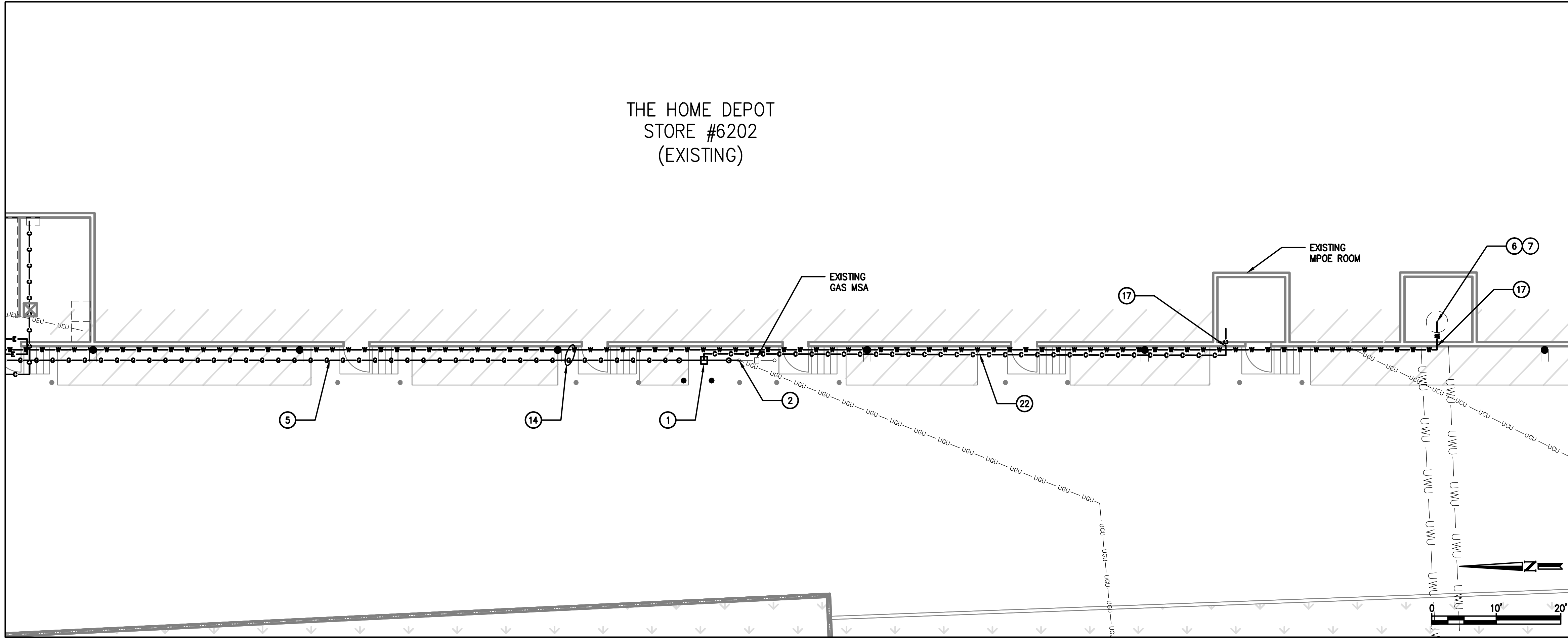
DETAILED SITE PLAN  
SCALE: 1" = 10'

1  
C1.1



DETAILED SITE PLAN  
SCALE: 1" = 10'

2  
C1.1



DETAILED SITE PLAN  
SCALE: 1" = 10'

3  
C1.1

### GENERAL NOTES

- CLEAN AND PRIME ALL NEW WIRE MOUNTED PIPING AND CONDUIT. PIPING AND CONDUIT SHALL BE PAINTED WITH EXTERIOR GRADE PAINT TO MATCH EXISTING.
- CONDUITS AND PIPES MOUNTED TO BUILDING WALL SHALL BE SUPPORTED AS PER LOCAL CODE, RUN AT HEIGHT ABOVE DOORWAYS, AND STAND OFF WALL TO AVOID EXISTING CONDUITS AND PIPES.
- SLOPE LINES SHOWN ARE APPROXIMATE AND INTENDED TO SHOW THE GENERAL DIRECTION OF WATER RUN OFF; SLOPE LINES ARE DRAWN PER VISUAL SURVEY OF SURROUNDING AREA.
- FOR UTILITY CONNECTIONS FROM ANCILLARY EQUIPMENT TO SYSTEM SEE PRODUCT INSTALLATION DRAWINGS.

### REFERENCE SHEET NOTES

- NEW UTILITY PROVIDED AND INSTALLED GAS METER ASSEMBLY WITH SHUT-OFF VALVE. CONTRACTOR SHALL PROVIDE PAD PER DETAILS IF REQUIRED BY UTILITY COMPANY. COORDINATE ALL CONNECTIONS WITH GAS UTILITY.
- NEW UNDERGROUND GAS SERVICE TAP BY UTILITY COMPANY. COORDINATE WITH GAS UTILITY. CONTRACTOR SHALL PERFORM COMPACTION AND MATCH EXISTING SURFACE AND GRADE. CONTRACTOR SHALL COORDINATE GAS PIPE SIZING AND INSTALLATION REQUIREMENTS WITH UTILITY.
- NEW PRIVATE GAS REGULATOR SET ASSEMBLY FOR ENERGY SERVER WITH SHUT-OFF VALVE. REFER TO GAS RISER DETAIL FOR ADDITIONAL REQUIREMENTS.
- NEW GAS PIPE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. REFER TO GAS RISER DETAIL FOR ADDITIONAL REQUIREMENTS.
- TAP EXISTING WATER LINE AT NEAREST ACCESSIBLE LOCATION IN BUILDING AS SHOWN WITH A LOCAL SHUT-OFF VALVE. REFER TO DOMESTIC WATER CONNECTION DETAIL FOR ADDITIONAL REQUIREMENTS.
- NEW WATER PIPE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. REFER TO WATER RISER DETAIL FOR ADDITIONAL REQUIREMENTS.
- EXISTING UTILITY ELECTRIC METER TO BE RELOCATED. COORDINATE METER RELOCATION WITH UTILITY. REFER TO ELECTRICAL SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- NEW BLOOM PROVIDED, CONTRACTOR INSTALLED, DISCONNECT SWITCH. MOUNT TO WALL PER MANUFACTURER AND UTILITY SPECIFICATIONS.
- CONTRACTOR SHALL TERMINATE ELECTRIC FEEDER AS SHOWN. REFER TO ELECTRICAL SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE TWO GROUNDING RODS TO BE PLACED 6' APART MINIMUM. REFER TO ELECTRICAL SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- NEW ELECTRICAL FEEDER SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. REFER TO ELECTRICAL SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- MOUNT NEW CONDUIT/PIPE TO EXTERIOR WALL. COORDINATE EXACT ROUTING WITH CUSTOMER REPRESENTATIVE IN THE FIELD. REFER TO WALL MOUNTING DETAIL FOR ADDITIONAL REQUIREMENTS.
- NEW BLOOM ENERGY SERVER. REFER TO BLOOM STANDARD INSTALLATION DRAWING SET FOR ADDITIONAL ENERGY SERVER DETAILS.
- STRUT MOUNTED STANDALONE ENERGY SERVER EMERGENCY POWER-OFF SWITCH (EPO). BLOOM PROVIDED, CONTRACTOR INSTALLED.
- CONTRACTOR SHALL CORE CONDUIT AND/OR PIPE THROUGH WALL. SCAN WALL PRIOR TO CORING TO AVOID COLLATERAL DAMAGE TO EXISTING PLUMBING AND WIRING. REFER TO WALL PENETRATION DETAIL FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE SAWCUT TRENCH FOR UNDERGROUND UTILITIES IN THIS LOCATION AND HAND DIG TRENCHES WHERE THEY CROSS EXISTING UTILITIES. REFER TO UNDERGROUND/TRENCH CONDUIT AND PIPING DETAIL FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL SAWCUT TO ALLOW FOR EXCAVATION UNDER ENERGY SERVER AND ANOILLARY PAD LOCATIONS. REFER TO PAD DETAIL FOR ADDITIONAL EXCAVATION AND BACKFILL REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE NEW CONDUIT AND CABLE FROM NEW UTILITY GAS MSA TO CUSTOMER MPOE FOR UTILITY BILLING. REFER TO BLOOM ENERGY PRODUCT INSTALLATION DRAWINGS FOR CONNECTION REQUIREMENTS.
- CONTRACTOR SHALL TRANSITION ALL ABOVEGROUND NEW LINES TO UNDERGROUND TOWARD ENERGY SERVER AND BATTERY MODULE. ABOVE GROUND UTILITIES SHALL BE PROTECTED AS NECESSARY, THEN ROUTED UNDERGROUND TO EQUIPMENT SUB-UP LOCATIONS PER MECHANICAL DETAIL.
- PROVIDE "DANDY SACK" OR EQUAL WITH OUTFLOW PORTS AT STORM DRAIN INLET. REFER TO EROSION CONTROL DETAIL FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR SHALL PROVIDE TREE PROTECTION. REFER TO TREE PROTECTION DETAIL FOR ADDITIONAL REQUIREMENTS.
- CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING UNDERGROUND UTILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF ANY FIELD CONDITIONS ENCOUNTERED DIFFER FROM THOSE REPRESENTED HEREON. SUCH CONDITIONS COULD RENDER THE DESIGNS HEREON INAPPROPRIATE AND MAY REQUIRE ADJUSTMENTS TO AVOID CONFLICTS.
- CONTRACTOR SHALL INTERCEPT EXISTING UNDERGROUND SERVICE CONDUIT AND INSTALL ANY HANDHOLES AS NECESSARY. REFER TO SINGLE LINE DIAGRAM FOR MORE INFORMATION.
- CONTRACTOR SHALL PROVIDE NEW CONDUIT FROM NEW SWBD-1 TELEMETRY TO EXISTING FACILITY ENERGY MANAGEMENT SYSTEM (NOVAR OPUS).
- NEW BLOOM PROVIDED, CONTRACTOR INSTALLED ELECTRICAL SWITCHBOARD, PAD MOUNTED PER MANUFACTURER AND UTILITY SPECIFICATIONS.
- PROPOSED LOCATION OF RELOCATED UTILITY ELECTRICAL METER. COORDINATE METER LOCATION WITH UTILITY. REFER TO ELECTRICAL SINGLE LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
- NEW UTILITY APPROVED CT CABINET IN NEMA 3R ENCLOSURE. MOUNT TO WALL PER MANUFACTURER SPECIFICATIONS. ENSURE LOCATIONS MEETS ALL REQUIRED NEC. CLEARANCES. PROVIDE MODEL NUMBER ON OUTSIDE OF THE FRONT PANEL.
- NEW UTILITY APPROVED LREC METER. MOUNT TO WALL PER MANUFACTURER SPECIFICATIONS ENSURE LOCATION MEETS ALL REQUIRED N.E.C. CLEARANCES. PROVIDE MODEL NUMBER ON THE OUTSIDE OF THE FRONT PANEL.
- CONTRACTOR TO FEED RECEPTACLE IN CT CABINET FOR LREC METER FROM EXISTING PANEL WITH SPARE, DEDICATED 120V,20A BREAKER.

**Bloomenergy**

1299 ORLEANS DRIVE  
SUNNYVALE, CA 94089

PROPRIETARY AND CONFIDENTIAL

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SEAL

**GreenbergFarrow**

153 Cordaville Road, Suite 210  
Southborough, MA 01772  
t: 508 229 0032

ENGINEER OF RECORD  
STEPHEN POWERS, P.E.  
LICENSE # 0030199

CUSTOMER SITE

THE HOME DEPOT  
STORE #6202  
440 BOSTON POST RD,  
ORANGE, CT 06477



### REVISION HISTORY

REV	REVISION ISSUE	DATE
01	RELEASED PER IGN-XXXXX	04/06/2017

DESIGNED BY BRIAN CURTIS	DATE 04/06/2017
DRAWN BY KEERTHANA.R	DATE 04/06/2017
REVIEWED BY	DATE
APPROVED BY	DATE

SHEET TITLE

DETAILED  
SITE PLAN

DRAWING NUMBER

C1.1

BLOOM DOCUMENT

DOC-1009225

THIS DRAWING IS 24" X 36" AT FULL SIZE  
SITE ID: HDP043.0 SHEET XX OF 16

## Exhibit 3



# STATE OF CONNECTICUT

DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION  
PUBLIC UTILITIES REGULATORY AUTHORITY  
TEN FRANKLIN SQUARE  
NEW BRITAIN, CT 06051

**DOCKET NO. 12-02-09    PETITION OF BLOOM ENERGY CORPORATION FOR A  
DECLARATORY RULING THAT ITS SOLID OXIDE FUEL  
CELL ENERGY SERVER WILL QUALIFY AS A CLASS I  
RENEWABLE ENERGY SOURCE**

September 12, 2012

By the following Directors:

Arthur H. House  
John W. Betkoski, III

## **DECISION**

### **I.     INTRODUCTION**

By Petition dated February 14, 2012, pursuant to Section 4-176 in the General Statutes of Connecticut (Conn. Gen. Stat.) and Section 16-1-113 in the Regulations of Connecticut State Agencies, Bloom Energy Corporation requests that the Public Utilities Regulatory Authority (Authority) issue a declaratory ruling that its solid oxide fuel cell energy server qualifies as a Class I renewable energy source.



## II. PETITIONER'S EVIDENCE

Bloom Energy Corporation (Bloom) has commercialized a scalable, modular fuel cell using Bloom's patented solid oxide fuel cell (SOFC) technology. A fuel cell is a device that uses a fuel and oxygen to create electricity by an electrochemical process. A single fuel cell consists of an electrolyte and two catalyst-coated electrodes (an anode cathode). Fuel cells are generally categorized by the type of electrolyte used. Petition, pp. 2 and 3.

Each Bloom Energy Server consists of thousands of Bloom's patented SOFCs. Each fuel cell is a flat, solid ceramic square capable of producing at least 25 watts. In an energy server, Bloom "sandwiches" the SOFCs between metal interconnect plates into a fuel cell "stack." Bloom aggregates multiple fuel cell stacks together into a "power module," and then multiple power modules, along with a common fuel input and electrical output, are assembled as a complete energy server fuel cell. Id., p. 3.

The Bloom Energy Server converts the chemical energy contained in fuel, such as natural gas, into electricity at an efficiency of approximately 50% - 60% (lower heating value net AC) without any combustion or multi-stage conversion loss. Fuel entering the energy server is processed using a proprietary catalytic method to yield a reformat gas stream, and the gaseous product and preheated air are introduced into the fuel cell stacks. Within the stacks, ambient oxygen reacts with the fuel to produce direct current (DC) electricity. The DC power produced by the energy server system is converted into 480-volt AC power using an inverter, and delivered to the host facility's electrical distribution system. Id.

SOFCs operate at very high temperatures, obviating the need for expensive metal catalysts. With low cost ceramic materials, and extremely high electrical efficiencies, SOFCs can deliver attractive economies without relying on combined heat and power. Id.

Bloom Energy Servers are a fraction of the size of a traditional base load power source, with each server occupying a space similar to that of a parking space. This small, low-impact, modular form of base load power does not pose the environmental challenges associated with a traditional base load power plant, significantly reducing environmental impacts. Moreover, Bloom's innovative design requires only an initial input of 120 gallons of water per 100 kW, after which no additional water is consumed during normal operation. Id., pp. 3 and 4.

Bloom Energy Servers deliver significant environmental benefits over conventional base load technologies. In addition to significant CO<sub>2</sub> reductions due to its high efficiency, the energy server emits virtually no NO<sub>x</sub>, SO<sub>x</sub>, or other smog forming particulates since the conversion of gas to electricity in a Bloom Energy Server is done through an electrochemical reaction rather than combustion. Id., p. 4.

### III. AUTHORITY ANALYSIS

Conn. Gen. Stat. §16-1(a)(26) defines a Class I renewable energy source as:

(A) energy derived from solar power; wind power; a fuel cell; methane gas from landfills; ocean thermal power; wave or tidal power; low emission advanced renewable energy conversion technologies; a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow, and began operation after the effective date of this section; or a biomass facility, including, but not limited to, a biomass gasification plant that utilizes land clearing debris, tree stumps or other biomass that regenerates or the use of which will not result in a depletion of resources, provided such biomass is cultivated and harvested in a sustainable manner and the average emission rate for such facility is equal to or less than .075 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, except that energy derived from a biomass facility with a capacity of less than five hundred kilowatts that began construction before July 1, 2003, may be considered a Class I renewable energy source, provided such biomass is cultivated and harvested in a sustainable manner; or (B) any electrical generation, including distributed generation, generated from a Class I renewable energy source.

Based on Bloom's assertions, the Authority finds that its Bloom Energy Server qualifies as a Class I renewable energy source "fuel cell" as defined in Conn. Gen. Stat. §16-1(a)(26)(A).

The Authority has created an electronic application process for generation owners to apply for a Connecticut Renewable Portfolio Standards registration. The application is available on the Authority's website at the web address <http://www.ct.gov/pura>. The application should be submitted electronically along with a single hard-copy filing. While the Authority concludes in this Decision that the Bloom Energy Server would qualify as a Class I renewable energy source pursuant to Conn. Gen. Stat. §16-1(a)(26), Bloom must still apply for registration of the aforementioned system once the facility becomes operational and is registered in the New England Generation Information System.

#### **IV. CONCLUSION**

Based upon the project as described herein, the Authority finds that, as proposed, the Bloom Energy Server would qualify as a Class I renewable energy source. However, since the energy server is not yet operational, it should apply for Class I registration once it begins operations.

**The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to requirements of the Americans with Disabilities Act. Any person with a disability who may need information in an alternative format may contact the agency's ADA Coordinator at 860-424-3194, or at [deep.hrmed@ct.gov](mailto:deep.hrmed@ct.gov). Any person with limited proficiency in English, who may need information in another language, may contact the agency's Title VI Coordinator at 860-424-3035, or at [deep.aaoffice@ct.gov](mailto:deep.aaoffice@ct.gov). Any person with a hearing impairment may call the State of Connecticut relay number – 711. Discrimination complaints may be filed with DEEP's Title VI Coordinator. Requests for accommodations must be made at least two weeks prior to any agency hearing, program or event.**

**DOCKET NO. 12-02-09    PETITION OF BLOOM ENERGY CORPORATION FOR A  
DECLARATORY RULING THAT ITS SOLID OXIDE FUEL  
CELL ENERGY SERVER WILL QUALIFY AS A CLASS I  
RENEWABLE ENERGY SOURCE**

This Decision is adopted by the following Directors:

Arthur H. House

John W. Betkoski, III

**CERTIFICATE OF SERVICE**

The foregoing is a true and correct copy of the Decision issued by the Public Utilities Regulatory Authority, State of Connecticut, and was forwarded by Certified Mail to all parties of record in this proceeding on the date indicated.



---

Kimberley J. Santopietro  
Executive Secretary  
Department of Energy and Environmental Protection  
Public Utilities Regulatory Authority

September 12, 2012

---

Date

## Exhibit 4

INPUTS	
BE Output Factor	95%
Select Utility ----->	United Illuminating
Customer Name	Home Depot HDP043.0
Utility Account Number	
Meter Number	012000028

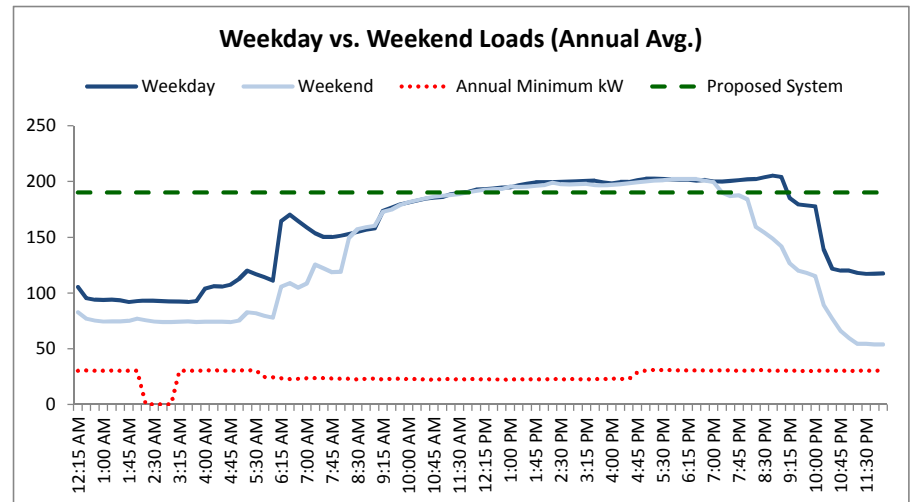
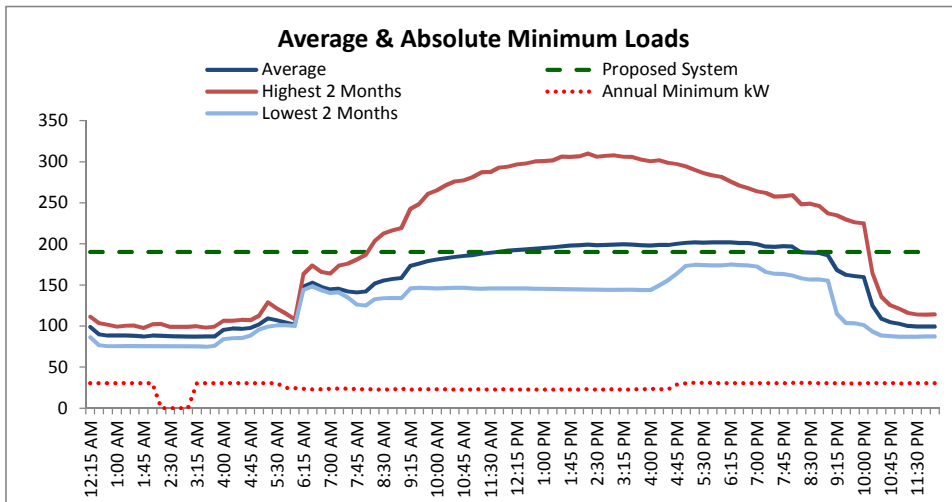
<b>Absolute Minimum kW</b>	<b>0 kW</b>
<b>Recurring Minimum Baseload</b>	<b>32 kW</b>
<b>Average Baseload</b>	<b>84 kW</b>
<b>Proposed System Size*</b>	<b>200 kW</b>

<---\*Manually enter new size to see updated DETAILS and CHARTS.

SYSTEM DETAILS	
% Exported	25.9%
% of Load Offset	91%
<b>Utility Exports</b>	
Peak Hours	67,208 kWh
Partial Peak Hours	103,636 kWh
Off-Peak Hours	260,730 kWh
Total kWh Exported	431,574 kWh
CUSTOMER DETAILS	
Total Days of Data	365
Annual Load Factor	71%
Total Customer Usage	1,354,059 kWh
Average Hourly kWh	155 kWh
Daily Avg. Peak Demand	227 kW

SYSTEM SIZE SENSITIVITY		
Size	% NEM	% Load Offset
--	#DIV/0!	0.0%
--	#DIV/0!	0.0%
--	#DIV/0!	0.0%
200	26%	91%
300	46%	99%
400	59%	100%
500	67%	100%

Manually enter new size to see different range of sensitivities.  
(NOTE: Charts do not change based on sensitivity table.)



## Exhibit 5



## Energy Server 5

*Clean, Reliable, Affordable Energy*



### **CLEAN, RELIABLE POWER ON DEMAND**

Bloom Energy's Energy Server 5 delivers clean power that reduces emissions and energy costs. The modular architecture enables the installation to be tailored to the actual electricity demand, with a flexibility to add servers as the load increases. The Energy Server 5 actively communicates with Bloom Energy's network operations centers so system performance can be monitored and maintained 24 hours per day, 365 days per year.

### **INNOVATIVE TECHNOLOGY**

Utilizing patented solid oxide fuel cell (SOFC) technology, the Energy Server 5 produces combustion-free power at unprecedented efficiencies, meaning it consumes less fuel and produces less CO<sub>2</sub> than competing technologies. Additionally, no water is needed under normal operating conditions.

### **ALL-ELECTRIC POWER**

The Energy Server 5, which operates at a very high electrical efficiency, eliminates the need for complicated and costly CHP systems. Combining the standard electrical and fuel connections along with compact footprint and sleek design, the Energy Server 5 is the most deployable fuel cell on the market.

### **CONTROLLED AND PREDICTABLE COST**

By providing efficient on-site power generation, the economic and environmental benefits are central to the Energy Server 5 value proposition. Bloom Energy customers can lock in their long term energy costs and mitigate the risk of electricity rate increases. The Energy Server 5 has been designed in compliance with a variety of safety standards and is backed by a comprehensive warranty.

### **About Bloom Energy**

Bloom Energy is making clean, reliable energy affordable. Our unique on-site power generation systems utilize an innovative fuel cell technology with roots in NASA's Mars program. By leveraging breakthrough advances in materials science, Bloom Energy systems are among the most efficient energy generators, providing for significantly reduced operating costs and dramatically lower greenhouse gas emissions. Bloom Energy Servers are currently producing power for many Fortune 500 companies including Apple, Google, Walmart, AT&T, eBay, Staples, as well as notable non-profit organizations such as Caltech and Kaiser Permanente.

### **Headquarters:**

Sunnyvale, California

### **For More Information:**

[www.bloomenergy.com](http://www.bloomenergy.com)



# Energy Server 5

## Technical Highlights (ES5-BABAA0)

### Outputs

Nameplate power output (net AC)	210 kW
Base load output (net AC)	200 kW
Electrical connection	480 V, 3-phase, 60 Hz

### Inputs

Fuels	Natural gas, directed biogas
Input fuel pressure	10-18 psig (15 psig nominal)
Water	None during normal operation

### Efficiency

Cumulative electrical efficiency (LHV net AC)*	65-53%
Heat rate (HHV)	5,811-7,127 Btu/kWh

### Emissions

NO <sub>x</sub>	< 0.01 lbs/MWh
SO <sub>x</sub>	Negligible
CO	< 0.05 lbs/MWh
VOCs	< 0.02 lbs/MWh
CO <sub>2</sub> @ stated efficiency	679-833 lbs/MWh on natural gas; carbon neutral on directed biogas

### Physical Attributes and Environment

Weight	12.6 tons
Dimensions (variable layouts)	14'9" x 8'8" x 7'0" or 25'9" x 4'5" x 7'5"
Temperature range	-20° to 45° C
Humidity	0% - 100%
Seismic vibration	IBC site class D
Location	Outdoor
Noise	< 70 dBA @ 6 feet

### Codes and Standards

Complies with Rule 21 interconnection and IEEE1547 standards

Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards

An Energy Server is a Stationary Fuel Cell Power System. It is Listed by Underwriters Laboratories, Inc. (UL) as a 'Stationary Fuel Cell Power System' to ANSI/CSA FC1-2014 under UL Category IRGZ and UL File Number MH45102.

### Additional Notes

Access to a secure website to monitor system performance & environmental benefits

Remotely managed and monitored by Bloom Energy

Capable of emergency stop based on input from the site

\* 65% LHV efficiency verified by ASME PTC 50 Fuel Cell Power Systems Performance Test



Bloom Energy Corporation  
1299 Orleans Drive  
Sunnyvale CA 94089  
T 408 543 1500  
www.bloomenergy.com

# Auxiliary Battery System – Fuel Cell

*Robust, Intelligent, Affordable Storage*



## Reliable, Intelligent Storage Enhances Fuel Cell Performance

PowerSecure's Auxiliary Battery System (ABS) pairs with Bloom Energy's Energy Server® fuel cell systems to optimize flexibility and system payback. The ABS modular architecture can be tailored for each fuel cell system, load characteristics, and utility tariff structure. The ABS communicates with Bloom Energy's network operations centers 24 hours a day to optimize performance and minimize downtime.

## Innovative Technology

Fuel cells efficiently generate clean electrical power day and night at a steady rate. The ABS stores and discharges energy to make the most of what the fuel cells generate. It does this by shifting loads from daytime peaks to night time valleys, predicting each day's load curves, and using stored energy to reduce the peak load each day.

ABS features rugged and reliable state-of-the-art lithium-ion batteries with layered safety features and proven performance throughout the globe.

## Controlled and Predictable Cost

By shifting loads and reducing peak loads, the ABS reduces charges from the serving electric utility. Customers benefit from lower and more predictable energy costs.

## About PowerSecure

PowerSecure provides energy technologies and services to electric utilities and their large industrial, commercial, institutional and municipal customers.

## Headquarters:

Wake Forest, NC

## For More Information:

[www.powersecure.com](http://www.powersecure.com)

# Auxiliary Battery System – Fuel Cell

Technical Highlights (1ABS-306 FC)	
Outputs	
Nameplate power output (Discharge)	90 kW
Electrical connection	+/- 390 VDC
Inputs	
Nameplate power output (Charge)	50 kW
Capacity	
Nominal usable electrical storage capacity	220 kWh
Emissions	
None	
Physical Attributes and Environment	
Weight (without batteries)	4,400 lbs
Weight (with batteries)	8,000 lbs
Dimensions	91.33" (H) x 107.33" (L) x 39.33" (D)
Temperature range	-20° to 45° C
Humidity	0% - 100%
Seismic vibration	IBC site class D
Location	Outdoor
Noise	< 70 dBA @ 6 feet
Codes and Standards	
ABS is designed as a Storage Battery System to ANSI/UL 1973-2013	
Additional Notes	
Interconnect achieved through fuel cell system	
Access to a secure website to monitor system performance & benefits	
Remotely managed	
Multiple ABSs can work together to achieve the optimal capacity for each application	



PowerSecure International, Inc.  
1609 Heritage Commerce Ct  
Wake Forest, NC 27587  
T: 919-556-3056

# Auxiliary Battery System – Fuel Cell

*Robust, Intelligent, Affordable Storage*



## Reliable, Intelligent Storage Enhances Fuel Cell Performance

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## Headquarters:

Wake Forest, NC

## For More Information:

[www.powersecure.com](http://www.powersecure.com)

# Auxiliary Battery System – Fuel Cell

Technical Highlights (1ABS-204FC)	
Outputs	
Nameplate power output (Discharge)	60 kW
Electrical connection	+/- 390 VDC
Inputs	
Nameplate power output (Charge)	36 kW
Capacity	
Nominal usable electrical storage capacity	150 kWh
Emissions	
None	
Physical Attributes and Environment	
Weight (without batteries)	4,400 lbs
Weight (with batteries)	5,600 lbs
Dimensions	91.33" (H) x 107.33" (L) x 39.33" (D)
Temperature range	-20° to 45° C
Humidity	0% - 100%
Seismic vibration	IBC site class D
Location	Outdoor
Noise	< 70 dBA @ 6 feet
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ABS is designed as a Storage Battery System to ANSI/UL 1973-2013	
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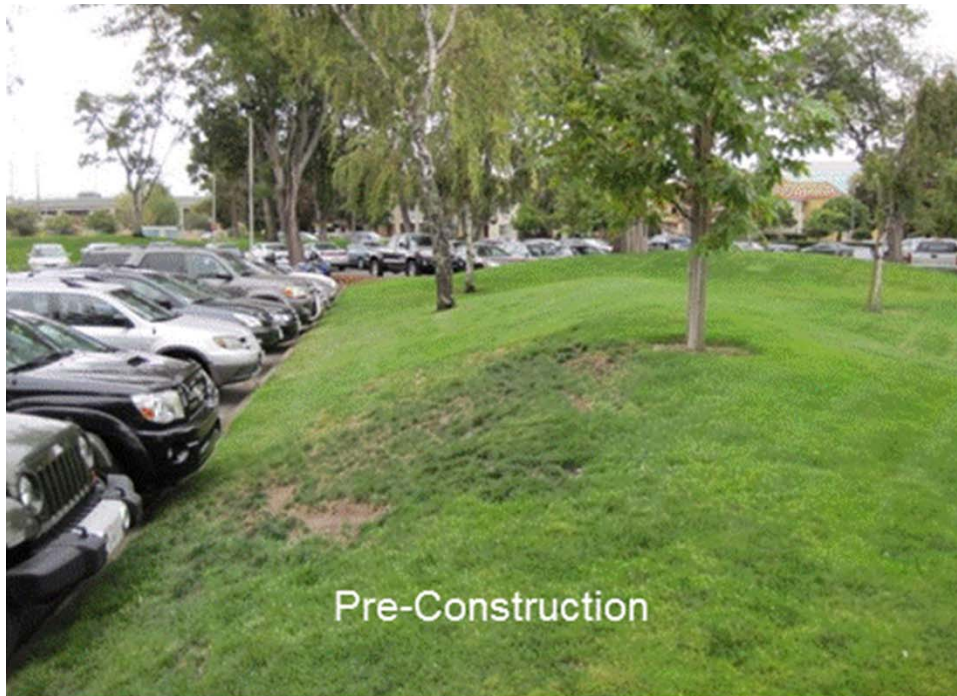
PowerSecure International, Inc.  
1609 Heritage Commerce Ct  
Wake Forest, NC 27587  
T: 919-556-3056



# Bloom Energy Server







Pre-Construction



Install Preparations – Trenching & Underground Utility



Set Pads



Site Completion



# Bloom Energy Server Installation





# Representative Installations



## Exhibit 6



## *Fire Prevention and Emergency Planning*

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Bloom Energy Corporation, 1299 Orleans Drive, Sunnyvale, CA 94089 USA

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2. Fuel Cell Installation Safety Features
3. Emergency Notification Procedures
4. Fire and Smoke Procedures
5. Medical Emergency Procedures
6. Materials Release Procedures
7. Natural Disasters and Severe Weather
  - 7.1 Earthquake
  - 7.2 Flood
8. Utility Outage
9. Good Housekeeping and Maintenance
  - 9.1 Good Housekeeping
  - 9.2 Maintenance
10. Training

## 1. FIRE PREVENTION AND EMERGENCY PLANNING OVERVIEW

---

The following document is provided only as a guide to assist you in complying with national and local codes and requirements, as well as to provide other helpful information. It is not intended to supersede the requirements of any standard. You should review the standards for particular requirements that are applicable to your individual situation, and make adjustments to this program that are specific to your company. You will need to add information relevant to your facility in order to develop an effective, comprehensive program.

## 2. FUEL CELL SYSTEM INSTALLATION SAFETY FEATURES

---

The fuel cell system has redundant safety features and in-system checks to ensure that the system will not harm certified technicians or bystanders near the unit. While the actual fuel cells operate at high temperatures, these components do not move, and are contained within many layers of insulation. During normal operation, the unit is cool to the touch and operates quietly.

The fuel cell system is controlled electronically and has internal sensors that continuously measure system operation. If safety circuits detect a condition outside normal operating parameters, the fuel supply is stopped and individual system components are automatically shut down. A Bloom Energy Remote Monitoring and Control Center (RMCC) operator can also remotely initiate any emergency sequence. An Emergency Stop alarm condition initiates an automatic shutdown sequence that puts the fuel cell system into “safe mode” and causes it to stop exporting power. If you have questions about any of these safety features, please contact Bloom Energy.

**If you have to shut down your fuel cell system right away**—for example, in case of a building fire or electrical hazard—three shutoff controls are installed at your facility external to the system. The locations of these three controls should be known to your facilities manager before operation, and should be noted on your facility diagram that you created with your Bloom Energy account manager. The three shutoffs are the **EPO button**, the **electrical disconnect**, and the **natural gas shutoff valve**.

- An **Emergency Power Off (EPO) Button** cuts all power to all systems and stops them from exporting power to your building. All natural gas flow is also stopped within the systems. (The EPO button is on the front/side of the EDM, if an EDM is installed.) Lift the protective cover and break the glass seal that covers the button with the attached hammer. After the glass seal is broken, the shutdown sequence will automatically begin.



Figure 1: Emergency Power Off Button

- An **electrical disconnect** manually disconnects systems from the grid if needed. Pressing the EPO button should already stop any power transmission, but it does not hurt the systems to also open this disconnect if you believe it is needed. The location of this disconnect will vary, however it is typically located near the point of interconnection where the wires from the fuel cell installation meet the facility's electrical framework. This may be inside your facility's electrical room, or if the fuel cell installation is near the electrical room, it may be found within the switchgear that Bloom Energy installs. This location of this disconnect is shown on the Site Map (see below) and is labeled "(name of electrical utility) Lockable Visible Generator Disconnect Switch".



Figure 2: Electrical Disconnect

- A **manual natural gas valve** shuts down all natural gas to the system. If the valve operator is perpendicular to the pipe, the valve is shut. If it is parallel with the pipe, the valve is open.





Figure 3: Manual Natural Gas Valve

### Site map:

- An overhead site map showing the location of all safety features will be posted throughout the fuel cell installation
- Electronic copies are available to you for use in your site planning

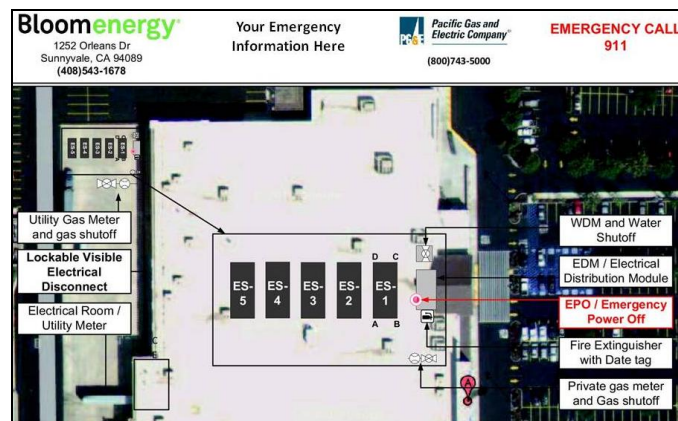


Figure 4: Sample Site Map

### Manual controls:

- Clearly marked emergency stop button labeled “Fuel Cell Emergency Shut Down” located at site
- Two manual fuel shutoff valves outside the system, and two isolation valves inside the system

### Fire hazard mitigation:

- System is plumbed directly to utility-provided natural gas
- If system input gas pressure is compromised, a pressure switch triggers an emergency system shutdown and fuel input is isolated
- System does not use fuel compressors or pumps
- System has virtually no stored fuel (internal capacity is < 5 scf)

### Electrical hazard and mitigation:



- System operates at 480V
- Signs inside the system warn of the risk of electric shock
- System has backfeed protection
- System inverter prevents grid backfeed during a power outage

**Mechanical hazard and mitigation:**

- Finger/hand guard protection is provided on all fans
- All moving parts are located behind secured doors

**Material hazard mitigation:**

- Desulfurizer bed (to remove fuel impurities) are fully enclosed
- Maintained and serviced by licensed vendors

### 3. EMERGENCY NOTIFICATION PROCEDURES

---

**Life-Threatening Emergencies**

To report life-threatening emergencies, immediately call:

<b>Fire:</b>	<b>911</b>
<b>Ambulance:</b>	<b>911</b>
<b>Police:</b>	<b>911</b>

Conditions that require automatic emergency notification include:

- Unconscious Victim
- Seizure
- Major Trauma
- Chest Pains
- Difficulty Breathing
- Flames

**Non-Life-Threatening Emergencies**

For non-life-threatening emergencies, report the incident to the local safety control center.

When you report an emergency, give the following information:

- Exact nature of the emergency (describe as clearly and accurately as possible).
- Exact location (i.e., address, building, floor, area, department, etc.).
- Telephone number from which you are calling.
- Your full name.
- ***Do not hang up***, as additional information may be needed.

To assist in any subsequent investigation or determination of corrective actions, it is recommended to record the following items as close to the incident time as possible:

- Summary of any violation

- Identification of responsible parties
- Identification of victims and witnesses
- Description of evidence
- Description of general conditions
- Description of any vehicles involved
- Narratives from witnesses
- Any photographs

## 4. FIRE OR SMOKE PROCEDURES

---

This section describes the procedures involving a fire or smoke. A major fire is one that requires the use of more than one fire extinguisher or takes more than one minute to extinguish.

If you discover a fire or smoke:

1. Activate the nearest fire alarm if not activated already.
2. Activate the fuel cell Emergency Stop if possible.
3. Shut off the fuel cell installation natural gas line if possible.
4. If the fire is small and does not pose an immediate risk to personal safety, you may attempt to extinguish it with a portable fire extinguisher **only if trained to do so**.
5. Avoid using water on electrical fires.
6. Report every fire, regardless of size, immediately. Smoke or the smell of smoke should be reported.
  - From a safe location dial **911**.
  - Report the incident to the local security safety center.

## 5. MEDICAL EMERGENCY PROCEDURES

---

This section describes the necessary procedures for injuries or illnesses that may occur under extreme conditions.

A serious injury can be life-threatening and will require immediate medical attention. Injuries can include head injuries, spine injuries, broken bones, heart attack, stroke, loss of consciousness, excessive bleeding, chemical exposure, etc.

A non-serious injury is not immediately life-threatening but may still require the attention of a medical doctor. These can include headaches, nausea, itching, cuts, burns, etc.

### Life-Threatening Medical Emergency

1. Remain calm.
2. Immediately dial 911.
3. Report the incident to local security safety center.
4. Do not move the victim unless it is absolutely necessary.
5. Call out for personnel trained in first aid and/or CPR which may include Building Evacuation or Emergency Response team members.

6. Ask someone to bring the area first aid kit and Automated External Defibrillator.
7. Assist if capable or asked to do so.

### **Non-Life-Threatening Medical Emergency**

1. Remain calm.
2. Report the incident to the local security safety center.
3. Do not move the victim unless it is absolutely necessary.
4. Call out for personnel trained in first aid.
5. Ask someone to bring the area first aid kit.
6. If the victim requires further medical attention, then direct them to the nearest approved medical clinic or hospital – Contact Security or Human Resources for assistance if needed.
7. The injured employee's supervisor/manager is responsible for ensuring injury forms are properly filled out. Complete the forms within 24 hours of incident and submit to the injury reporting system for follow-up. Follow company protocols.

## **6. MATERIALS RELEASE PROCEDURES**

---

The fuel cell system does not pose a hazard to health or environment. However, some internal materials when released, may pose a irritation risk to people and a possible risk of fire if not properly handled. This section was designed to address potential material release events:

In case of a material release that poses a direct threat to health, safety, or the environment:

1. Report the incident to local safety/security office.
2. If extremely life-threatening immediately dial **911** followed with a call to Security.
3. Contain the spill.
4. Evacuate the area or building if the material release is determined to be life-threatening.

In the event of an unknown indoor smell or odor, report the incident to authorities responsible for HAZMAT and spills.

## **7. NATURAL DISASTERS AND SEVERE WEATHER**

---

### **7.1 Earthquake**

This section provides information and procedures for earthquake emergencies.

The fuel cell system is designed to automatically shut off if the natural gas supply is compromised.

The natural gas supply line has an external, manual shut-off valve that should be activated if it is safe to do so. This valve will be labeled, "Notice – Fuel Cell Gas Shut

Off". The natural gas line will be labeled with the word "gas" on a yellow background with an arrow pointing in the direction of flow.

The nearby Emergency Stop can be activated to stop the flow of fuel and power to/from the fuel cell system.

A Bloom Energy Field Engineer will validate site safety and system operation during/after severe weather as necessary.

## **7.2 Flood**

The fuel cell system support pad is designed to divert water flow. However, if flooding conditions exist, or threaten to exist due to heavy rainfall, creek bank overflows, or pipe breakage, then immediately report the incident to the local safety/security office.

Do not use the fuel cell power system if any part has been under water. If it is safe to reach the Emergency Power Off button for the site without entering the water, stop all systems until a Bloom Energy representative can assess the site.

Precautions to follow after a flood:

- Stay out of flooded areas. Flooded areas remain unsafe. Entering a flooded area places you at risk.
- Notify Bloom Energy. A Bloom Energy Field Engineer will validate site safety and system operation during/after severe weather as necessary

## **8. UTILITY OUTAGE**

---

The fuel cell system is operated in "Grid-Parallel" mode. If utility provided power is lost for any reason, the fuel cell system will go "off-line". The fuel cell system will remain in stand-by mode until it automatically senses the utility grid has been restored. If utility gas is shut down, the fuel cell system will begin to shut down completely.

The Bloom Energy Remote Monitoring Control Centers monitor the fuel cells 24 hours per day and will be alerted to utility grid interruptions via its controls software. A Field Service Engineer will be dispatched to restart the fuel cell system if necessary. Customer personnel should NOT attempt to start up or operate the fuel cell system.

### **Before a Planned Outage**

- Notify the Bloom Energy Remote Monitoring Control Center at 1-408-543-1678 at least 24 hours before planned outage.
- Bloom Energy Remote Monitoring Engineers will reduce power generated by the fuel cell system and take the fuel cell off-line.
- Abrupt fuel cell system shutdowns may cause significant system damage.

### During a Utility Power Loss

- The fuel cell system will automatically go off-line.
- The Bloom Energy Remote Monitoring Control Centers will monitor the fuel cell system.
- Bloom Energy Field Service will be dispatched to start up the fuel cell system as necessary.
- If the fuel cell system has been automatically shut down and utility power is restored, there will be no impact to building power delivery: primary power will come from the utility rather than the fuel cells.

## 9. GOOD HOUSEKEEPING AND MAINTENANCE

---

### 9.1 Good Housekeeping

Although extremely unlikely, to minimize the risk of fire and any incidents, Facility Managers should take the following precautions around the fuel cell installation:

- What to do if you smell gas:
  - Do not try to light any appliance
  - Do not touch any electrical switch; do not use any phone in the area
  - Leave the area immediately
  - Immediately call your gas supplier. Follow the gas supplier's instructions.
  - If you cannot reach your gas supplier, call the fire department
- Notify Bloom Energy Remote Monitoring Control Center at 1-408-543-1678 of any condition that would impair the safety of the fuel cell installation so that mitigation measures could be determined and placed into effect.
- Prohibit smoking within the area of the fuel cell installation. Bloom Energy will furnish No Smoking signs for the area.
- Ensure only Bloom Energy Service Providers are permitted access inside the system.
- Keep the area around the fuel cell installation clear for ten feet in all directions, for safety and ease of maintenance.
- Keep the area around the fuel cell power system clear and free of combustible materials, gasoline, and other flammable vapors and liquids.
- Shut the system down and call Bloom Energy immediately if you suspect a fuel line rupture.
- **Never enclose an operating system** in a tarp, tent, shed, or other structure that would allow air to become trapped. This system runs on natural gas, and produces trace amounts of CO and CO<sub>2</sub>. The amounts of these gases are safe for normal outdoor operation but could gather in an enclosed place.
- Do not block or obstruct air openings on the fuel cell power system. This system requires air flow in order to operate.

- Do not use this fuel cell power system if any part has been under water. Immediately call qualified service personnel to inspect the fuel cell power system and to replace any functional part which has been under water.
- Please contact Bloom Energy at 408-543-1678 with as much advance notice as possible if you plan, detect, or suspect a prolonged Internet outage.
- The Bloom Energy Field Service team will periodically clean the equipment; do not spray with pressurized hoses.

## **9.2 Maintenance**

Your site has specific Field Service personnel assigned to it for both routine maintenance and troubleshooting. Your site project manager will introduce you to the designated Bloom Energy Field Service team assigned to your site prior to operation.

Bloom Energy Field Service personnel are trained in state Safety Law. They are trained in all the procedures required for the fuel cell installation, and their toolkit includes all the safety equipment required to work around the fuel components and high voltage in our system (480VAC).

Bloom Energy also requires its employees to follow all necessary safety precautions, including:

- Every time a Field Service technician arrives at a site for the first time and opens a service panel, the technician will use a leak detector to determine whether there is any gas buildup in the system and determine that it is safe to work on it.
- Whenever a Field Service technician is removing and replacing a component on a fuel or exhaust line, the technician must keep a CO detector nearby to make sure that no CO is present in the line even after the system has been shut down.

The Field Service team expects to conduct quarterly and yearly preventative maintenance for certain types of consumable or cleanable components such as replacement of air filters, water filters, and desulfurizer beds. Other maintenance will be performed as required. During such times, inspections for any hazards will be conducted including quarterly fire extinguisher inspection (if applicable).

## **10. TRAINING**

---

Prior to system startup, a Bloom Energy representative will provide training on the fuel cell installation to include the location and operation of safety features as well as actions to take during emergencies. We desire this training to provide lasting value and are more than happy to work with you to customize the experience to suit your needs.



# *Supplement 1: Fire Prevention and Emergency Planning For Fuel Cell Auxiliary Battery System*

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PowerSecure Inc., 1609 Heritage Commerce Ct. Wake Forest, NC 27587



## **Table of Contents**

1. Fuel Cell Auxiliary Battery System Overview
2. Auxiliary Battery System Installation Safety Features
3. Emergency Notification Procedures
4. Fire and Smoke Procedures
5. Medical Emergency Procedures
6. Materials Release Procedures
7. Natural Disasters and Severe Weather
  - 7.1 Earthquake
  - 7.2 Flood
8. Utility Outage
9. Good Housekeeping and Maintenance
  - 9.1 Good Housekeeping
  - 9.2 Maintenance
10. Training

Appendix A: Battery Safety Features

Appendix B: Battery Handling

Appendix C: Battery MSDS

## 1. FUEL CELL AUXILIARY BATTERY SYSTEM OVERVIEW

---

The Fuel Cell Auxiliary Battery System (ABS-FC) is always installed in conjunction with an Energy Server® fuel cell system from Bloom Energy. The ABS-FC consists of one or more enclosures each containing three battery racks and a compartment for electrical components as depicted in Figure 1. The interior of the enclosure should only be accessed by trained personnel. With batteries installed, each ABS-FC cabinet weighs approximately 4,400 lbs without batteries. With batteries, a 1ABS306FC unit weighs approximately 8,000 lbs and a 1ABS204FC unit weighs approximately 5,600 lbs. Each unit is approximately 9ft long, 8ft high, and 4ft deep. Lifting provisions are provided on the end corners of each enclosure.

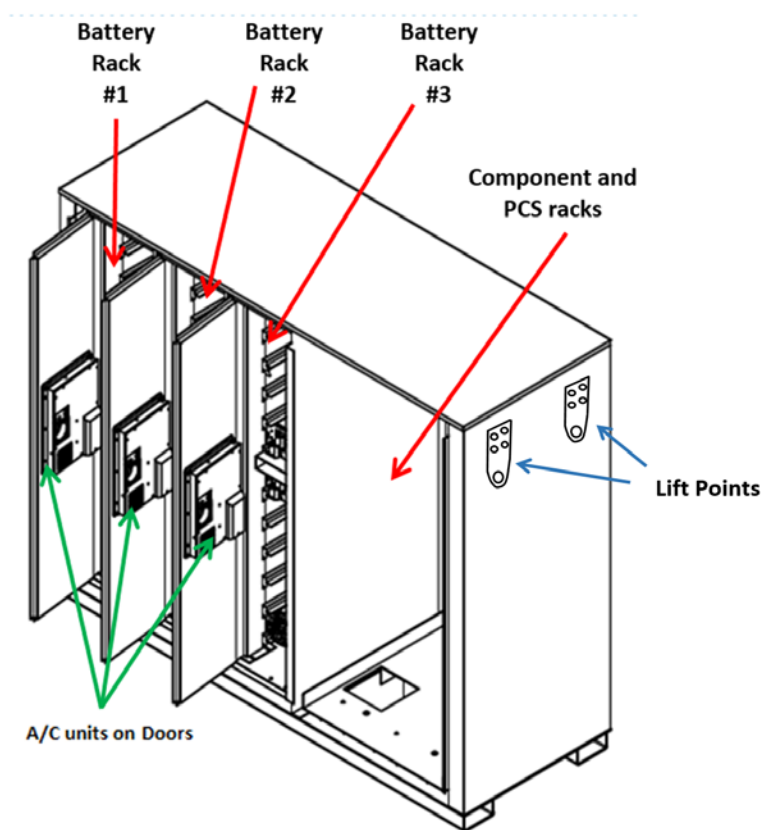


Figure 1: ABS-FC Enclosure

## 2. AUXILIARY BATTERY SYSTEM INSTALLATION SAFETY FEATURES

---

As a compliment to the Bloom Energy fuel cell system, the ABS-FC benefits from safety features of the fuel cell system in addition to its stand-alone safety features. The ABS-FC is controlled electronically and has internal sensors that continuously measure

system operation. If sensors or safety circuits detect a condition outside normal operating parameters, the ABS-FC will shut down automatically. A Bloom Energy Remote Monitoring Control Center (RMCC) operator can also remotely initiate any emergency sequence. An Emergency Stop alarm condition initiates an automatic shutdown sequence that disables the ABS-FC. If you have questions about any of these safety features, please contact Bloom Energy.

**If you have to shut down your ABS-FC system right away, you can do so by pressing the EPO button or by shutting off the natural gas valve.**

### Site map:

The ABS-FC will be included in the overhead site map showing the location of all safety features.

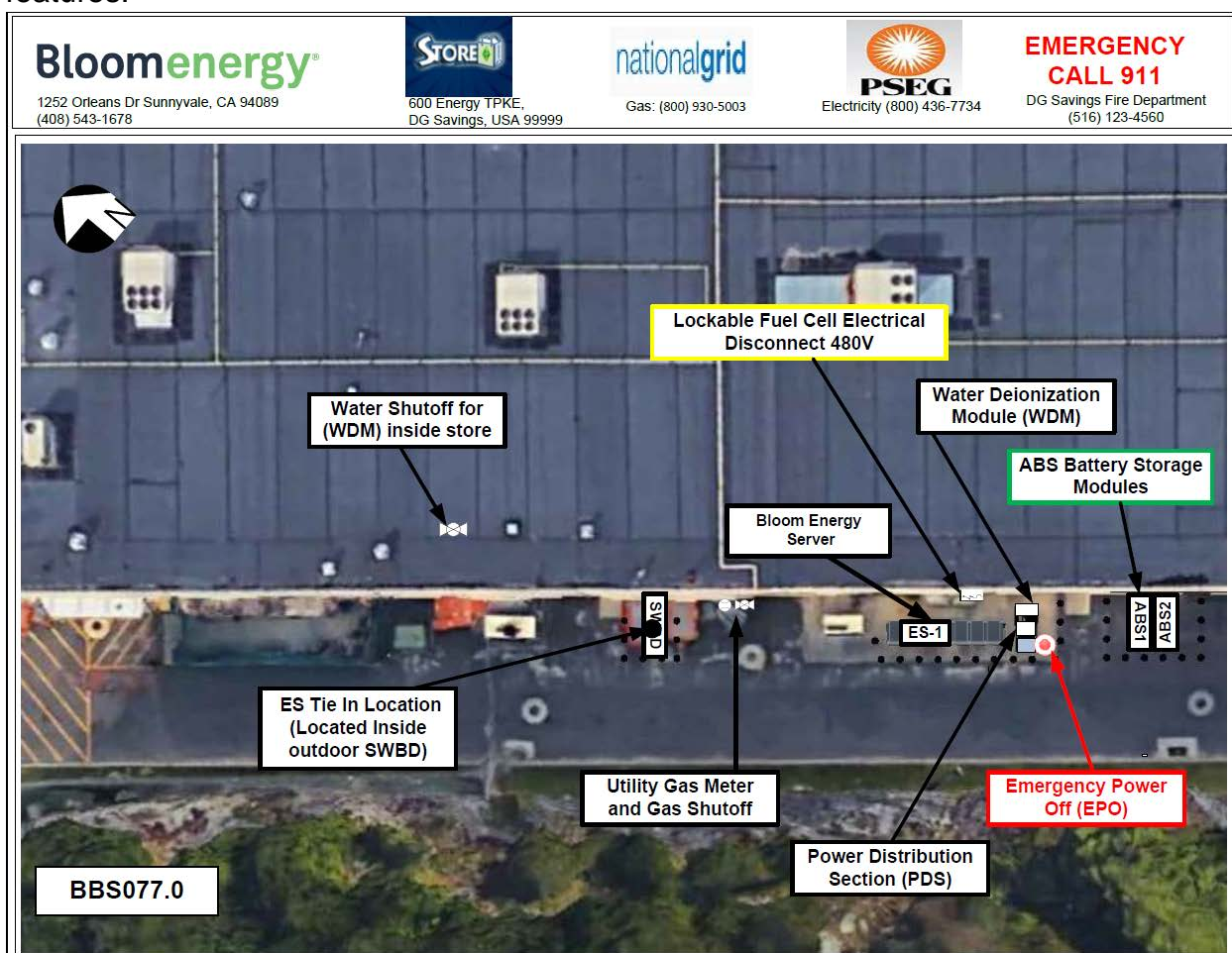


Figure 2: Sample Site Map with Fuel Cell and ABS-FC systems

### Manual controls:

- A clearly marked emergency stop button labeled "Fuel Cell Emergency Shut Down" located at site will also de-activate the ABS-FC

**Electrical hazard and mitigation:**

- System operates at +/- 390 VDC
- Signs inside the system warn of the risk of electric shock
- System has backfeed protection
- System inverter prevents grid backfeed during a power outage

**Mechanical hazard and mitigation:**

- Finger/hand guard protection is provided on all fans
- All moving parts are located behind secured doors
- Enclosure doors should be opened only by specially trained service technicians and first responders

**Material hazard mitigation:**

- Do not discharge into the drains/surface waters/groundwater
- Take up mechanically and send for disposal
- Maintained and serviced by licensed vendors

### **3. EMERGENCY NOTIFICATION PROCEDURES**

---

Follow the same procedures outlined in Section 3 of the Bloom Energy Fire Prevention and Emergency Planning document.

### **4. FIRE OR SMOKE PROCEDURES**

---

Follow the same procedures outlined in Section 4 of the Bloom Energy Fire Prevention and Emergency Planning document. Activating the fuel cell Emergency Stop will also disable the ABS-FC.

**Fire hazard mitigation:**

- In the event that a battery has been ruptured, the electrolyte solution contained within the battery WILL BE flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat and could result in the release of flammable or corrosive materials. If heated above 125°C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated.
- Extinguishing Media: **Trained and authorized emergency response personnel** can use water, carbon dioxide, dry chemical or appropriate foam to extinguish fire.
- **Special Fire Fighting Procedures:** Fires involving lithium batteries can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this

situation, smothering agents are recommended to extinguish the fire. Ruptured cells may emit irritating and/or toxic fumes under fire conditions.

- **Protective Equipment and Precautions for Firefighters:** Wear NIOSH/MSHA approved self-contained breathing apparatus (SCBA) and protective clothing when fighting chemical fires.

## 5. MEDICAL EMERGENCY PROCEDURES

---

Follow the same procedures outlined in Section 5 of the Bloom Energy Fire Prevention and Emergency Planning document.

## 6. MATERIALS RELEASE PROCEDURES

---

The ABS-FC system does not pose a hazard to health or environment. However, some internal materials when released, may pose an irritation risk to people and a possible risk of fire if not properly handled.

### **Personal precautions**

- Use personal protective clothing.
- Avoid contact with skin, eyes and clothing.
- Avoid breathing fume and gas.

### **Environmental precautions and clean up**

- As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use. However, cell damage could result in release of dangerous substances.
- Do not discharge into the drains/surface waters/groundwater.
- 
- Recover any spilled and/or fire extinguishing contaminated material by pumping, vacuuming, skimming, or absorbing liquids and removing it from the site.
- Remove and properly dispose of any contaminated soil.

## 7. NATURAL DISASTERS AND SEVERE WEATHER

---

### **7.1 Earthquake**

This section provides information and procedures for earthquake emergencies.

The ABS-FC is designed to automatically shut off if abnormal flows of energy are detected such as a ground fault or electrical short.

The nearby Emergency Stop can be activated to stop the flow of fuel and power to/from the fuel cell system and shut down the ABS-FC.

A Bloom Energy and PowerSecure Field Engineer will validate site safety and system operation after an earthquake as necessary.

## **7.2 Flood**

The ABS-FC system support pad is designed to divert water flow. However, if flooding conditions exist, or threaten to exist due to heavy rainfall, creek bank overflows, or pipe breakage, then immediately report the incident to the local safety/security office.

Do not use the ABS-FC system if any part has been under water. If it is safe to reach the Emergency Power Off button for the site without entering the water, stop all systems until a Bloom Energy representative can assess the site.

Follow the same precautions outlined in Section 7.2 of the Bloom Energy Fire Prevention and Emergency Planning document.

## **8. UTILITY OUTAGE**

---

Follow the same procedures outlined in Section 8 of the Bloom Energy Fire Prevention and Emergency Planning document.

## **9. GOOD HOUSEKEEPING AND MAINTENANCE**

---

### **9.1 Good Housekeeping**

Although extremely unlikely, to minimize the risk of fire and any incidents, Facility Managers should take the following precautions around the ABS-FC installation:

- Notify Bloom Energy Remote Monitoring Control Center at 1-408-543-1678 of any condition that would impair the safety of the ABS-FC installation so that mitigation measures could be determined and placed into effect.
- Prohibit smoking within the area of the ABS-FC installation. Bloom Energy will furnish No Smoking signs for the area.
- Ensure only Bloom Energy and PowerSecure Service Providers are permitted access inside the system.
- Keep the area around the ABS-FC installation clear for ten feet in all directions, for safety and ease of maintenance.
- Keep the area around the ABS-FC system clear and free of combustible materials, gasoline, and other flammable vapors and liquids.

- **Never enclose an operating system** in a tarp, tent, shed, or other structure that would allow air to become trapped. This system requires free flowing ventilation to maintain proper internal operating temperatures.
- Do not block or obstruct air openings on the ABS-FC system.
- Do not use this ABS-FC system if any part has been under water. Immediately call qualified service personnel to inspect the fuel cell power system and to replace any functional part which has been under water.
- Please contact Bloom Energy at 408-543-1678 with as much advance notice as possible if you plan, detect, or suspect a prolonged Internet outage.
- The Bloom Energy Field Service team will periodically clean the equipment; do not spray with pressurized hoses.

## 9.2 Maintenance

Your site has specific Field Service personnel assigned to it for both routine maintenance and troubleshooting. Your site project manager will introduce you to the designated Bloom Energy Field Service team assigned to your site prior to operation.

Bloom Energy Field Service personnel are trained in state Safety Law. They are trained in all the procedures required for the ABS-FC installation, and their toolkit includes all the safety equipment required to work around the components and high voltage in our system (+/- 450 VDC).

Bloom Energy also requires its employees to follow all necessary safety precautions, including:

The Field Service team expects to conduct quarterly and yearly preventative maintenance for certain types of consumable or cleanable components such as replacement of air filters. Other maintenance will be performed as required. During such times, inspections for any hazards will be conducted including quarterly fire extinguisher inspection (if applicable).

## 10. TRAINING

---

Prior to system startup, a Bloom Energy representative will provide training on the ABS-FC installation to include the location and operation of safety features as well as actions to take during emergencies. We desire this training to provide lasting value and are more than happy to work with you to customize the experience to suit your needs.

## Appendix A: Battery Safety Features

- Safety Function Layer: Maintains electrical separation even damage to the polymer separator.
- Positive polarity of the aluminum enclosure: Prevents surface corrosion that could result in electrolyte leakage after long-term use
- Overcharge Safety Device: Prevents current flow after activation of OSD
- Vent: Effectively releases any gasses that could result in increased internal pressure caused by abuse conditions
- Fuse: Cuts the current path when abnormally high current flows

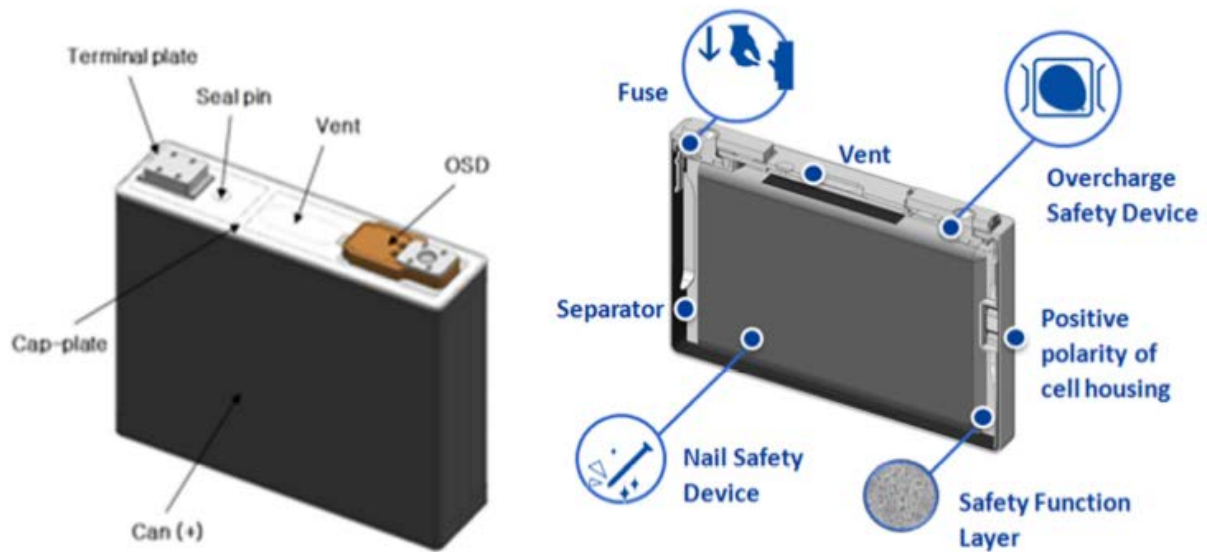


Figure A.1: Safety Features of ABS-FC Batteries



## Exhibit 7

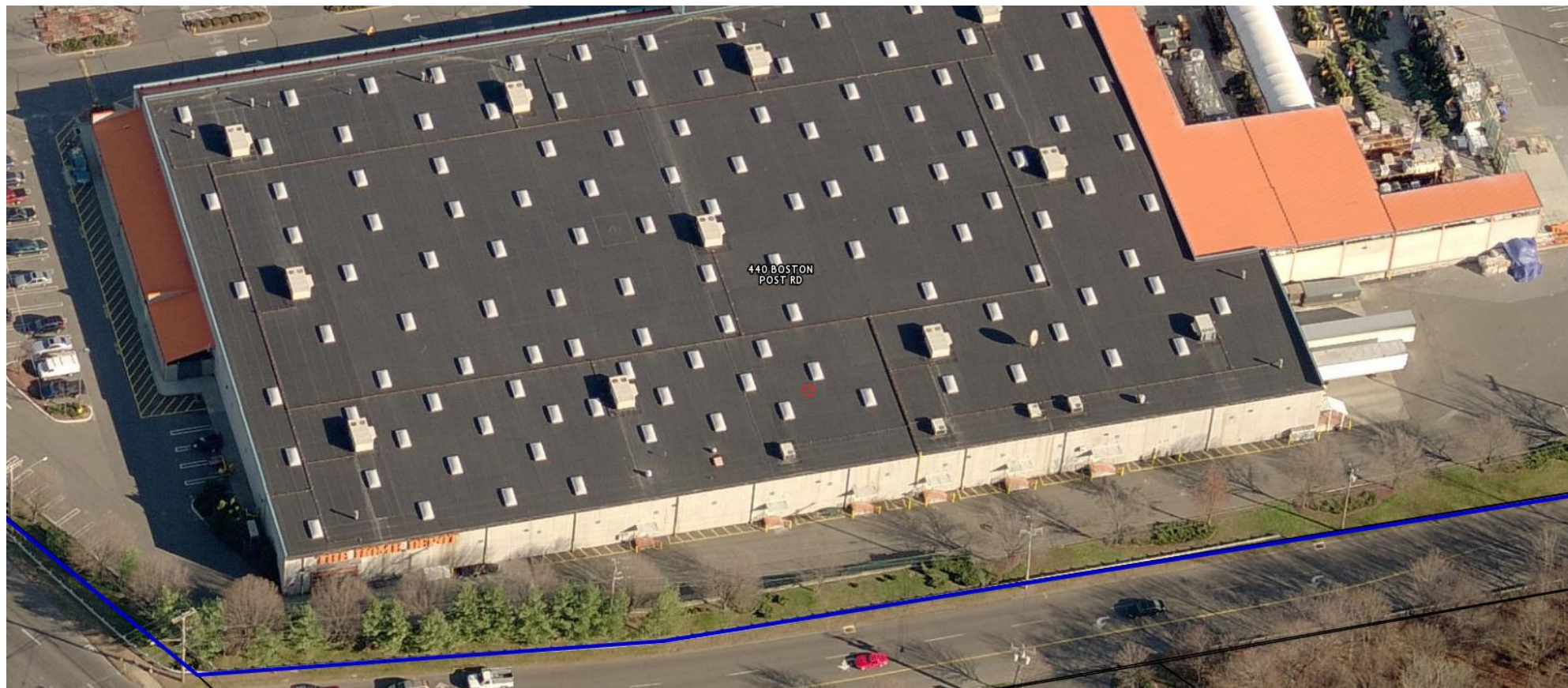


FIGURE 1: REAR OF STORE

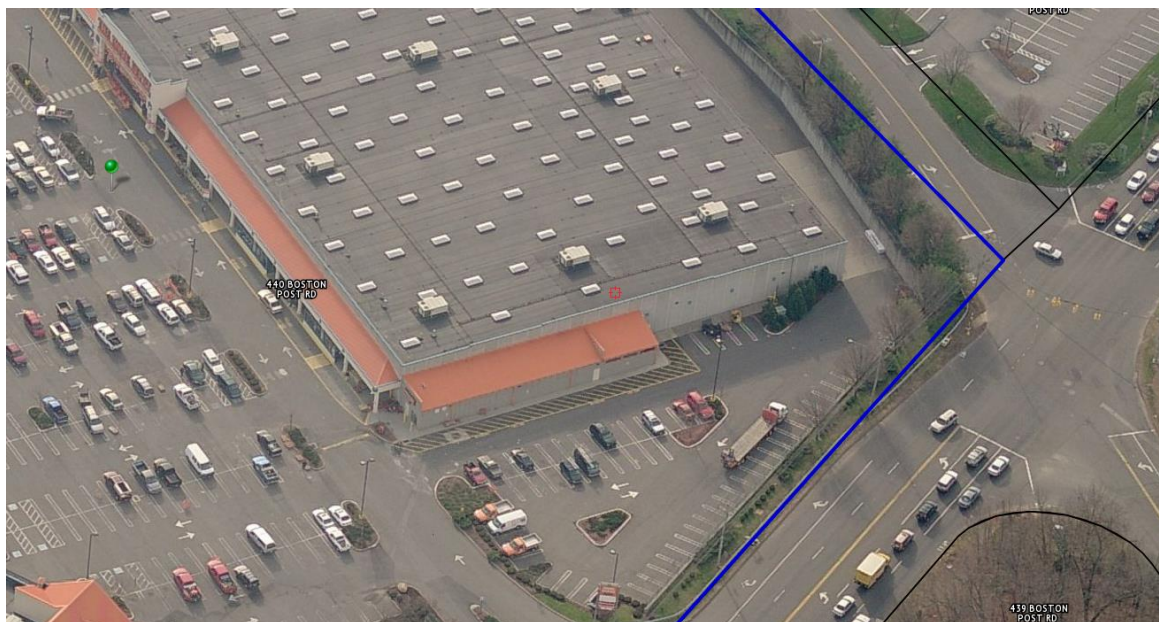


FIGURE 2: ARIAL VIEW OF PROPOSED INSTALLATION AREA





FIGURE 3: FRONT OF PREFERRED FUEL CELL LOCATION

FIGURE 4: NO IMAGE



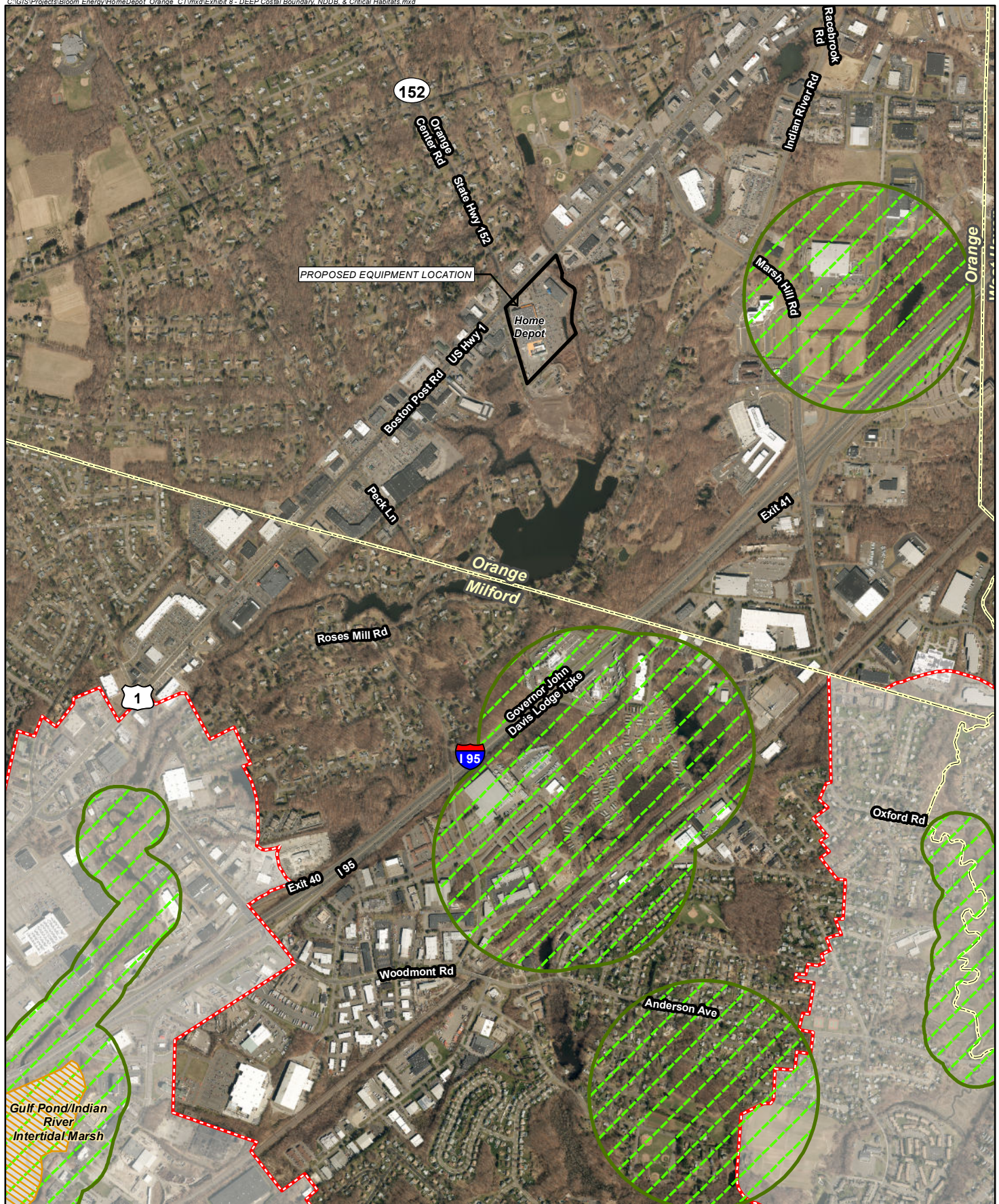
FIGURE 5: LEFT OF PREFERRED FUEL CELL LOCATION



FIGURE 6: RIGHT OF PREFERRED FUEL CELL LOCATION

## Exhibit 8





#### Legend

- Subject Property
- Coastal Boundary (CTDEEP)
- CTDEEP Natural Diversity Database (updated Dec. 2016)
- CTDEEP Critical Habitat
- Municipal Boundary

**Map Notes:**  
 Base Map Source: CTECO 2016 Aerial Photograph  
 Map Scale: 1 inch = 1,500 feet  
 Map Date: April 2017



### Exhibit 8 CTDEEP Costal Boundary, NDDB, & Critical Habitats

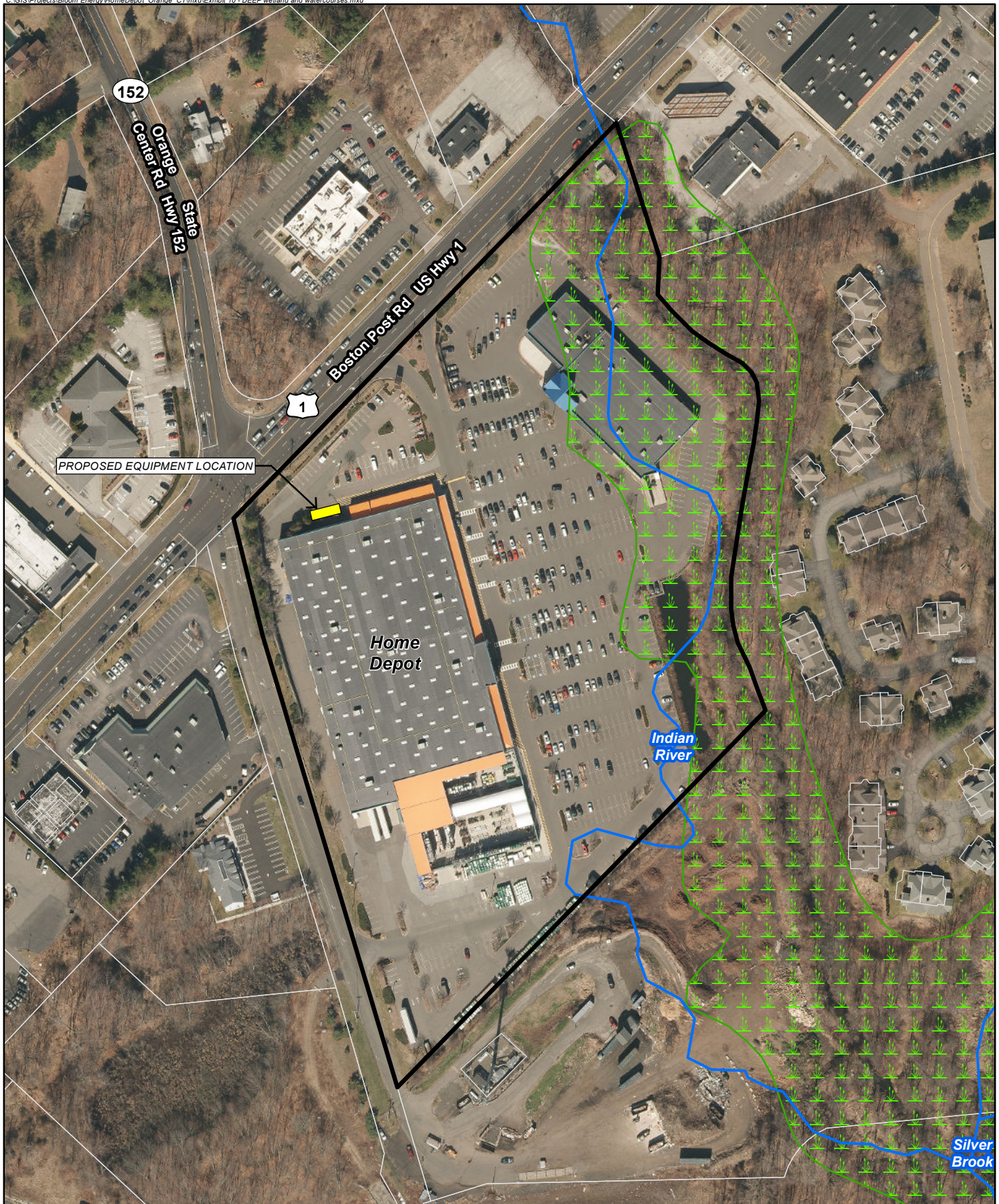
Proposed Bloom Energy Facility  
 Home Depot Building  
 440 Boston Post Road  
 Orange, Connecticut











## Exhibit 9





#### Legend

-  Subject Property
-  Site
-  Approximate Assessor Parcel Boundary (CTDEEP)
-  CTDEEP Wetlands
-  CTDEEP Waterbody
-  CTDEEP Watercourse

**Map Notes:**  
 Base Map Source: CTECO 2016 Aerial Photograph  
 Map Scale: 1 inch = 200 feet  
 Map Date: April 2017



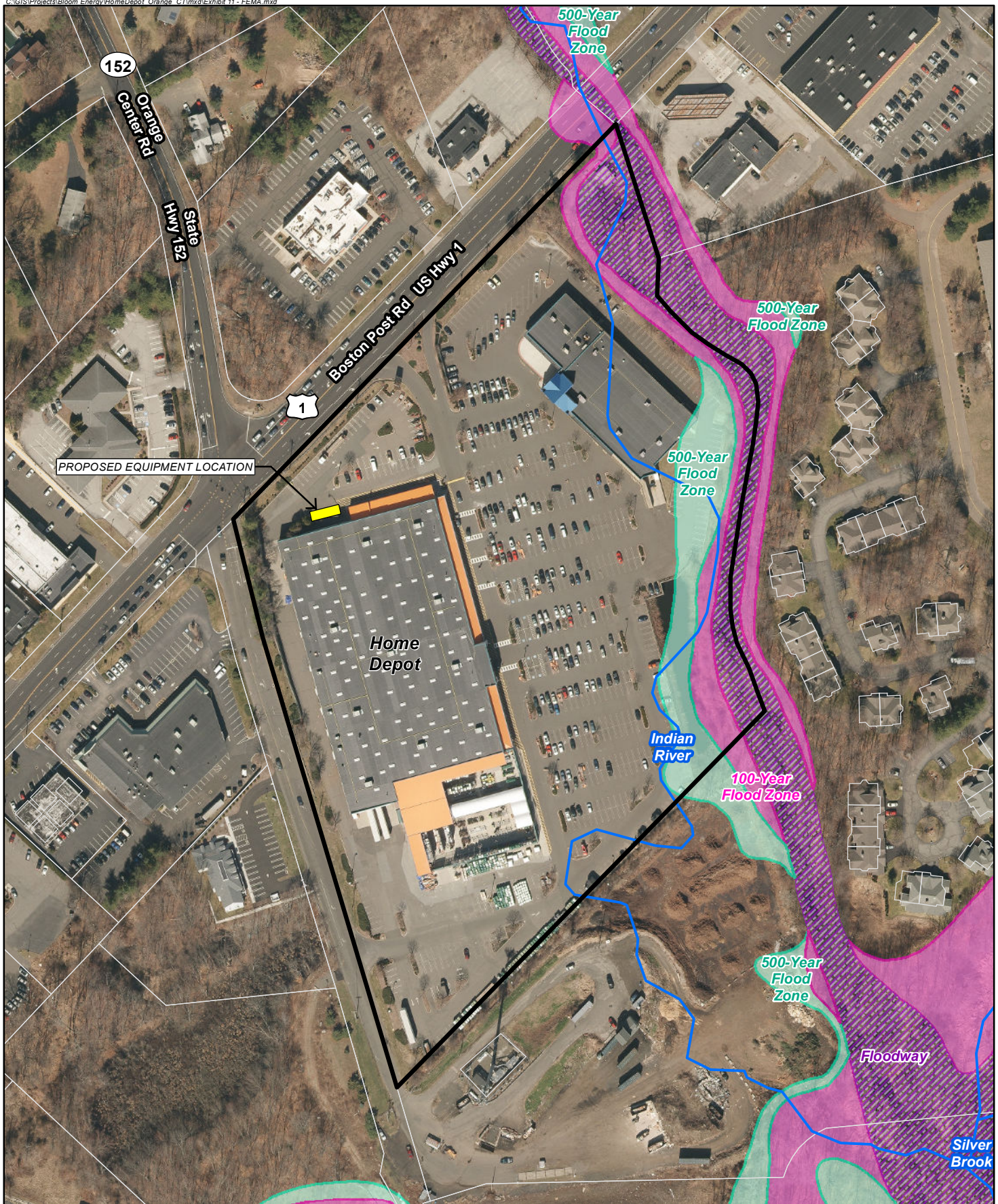
## Exhibit 9 CTDEEP Wetland and Watercourses

Proposed Bloom Energy Facility  
 Home Depot Building  
 440 Boston Post Road  
 Orange, Connecticut



## Exhibit 10





#### Legend

- Subject Property
- Site
- Approximate Assessor Parcel Boundary (CTDEEP)
- CTDEEP Waterbody
- CTDEEP Watercourse

#### FEMA Flood Zones (FEMA NFHL)

- 100-Year Flood Zone
- 500-Year Flood Zone
- Floodway

Map Notes:  
Base Map Source: CTECO 2016 Aerial Photograph  
Map Scale: 1 inch = 200 feet  
Map Date: April 2017



## Exhibit 10 FEMA Flood Zones

Proposed Bloom Energy Facility  
Home Depot Building  
440 Boston Post Road  
Orange, Connecticut



## Exhibit 11

# Calculation of Yuma Sound Pressure Based On Distance

By Bob Hintz 1/16

All calculations are based on the following formula for sound pressure level ( $L_p$ ):

$$L_p = L_w - 10 \cdot \log \left( \frac{Q}{4\pi \cdot r^2} \right)$$

Sound power value ( $L_w$ ) attained from V1 Yuma linear in DE reported on Feb. 4, 2015 by Mei Wu.

## Scenario 1

ES is installed close to a building or tall wall so noise from the ES is reflected off of the structure and added to the noise from the other side of the ES making it sound louder than normal. This is represented by a directivity factor  $Q = 4$

**$L_p = 38.1$  dB**

Where:

$L_w = 86.4$  dB

$Q = 4$

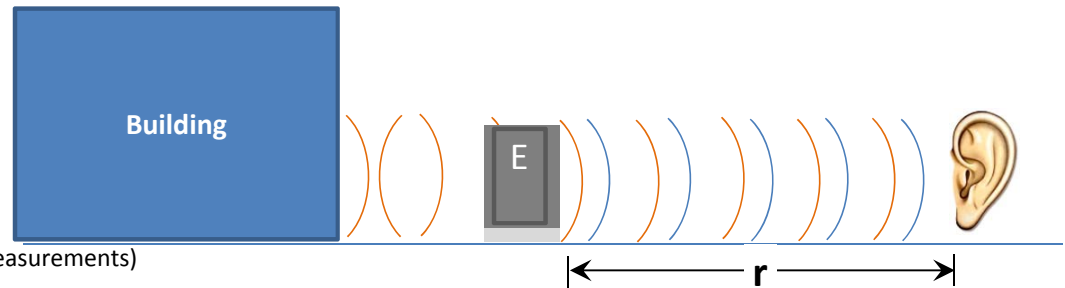
$r = 480$  Feet

ES sound power (Calc. from measurements)

Directivity factor

**Enter value here for both Scenarios**

**Input various values for  $r$  to approximate the perceived sound pressure at that distance from the ES door**



## Scenario 2

ES is installed with no structures behind it to reflect sound from either side. This is represented by a directivity factor  $Q = 2$

**$L_p = 35.1$  dB**

Where:

$L_w = 86.4$  dB

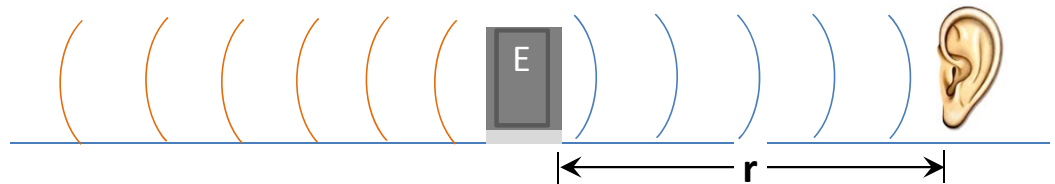
$Q = 2$

$r = 480$  Feet

ES sound power (Calc.)

Directivity factor

**Input various values for  $r$  to approximate the perceived sound pressure at that distance from the ES door**



## Exhibit 12

## Notice and Service List Pursuant to Conn. Agencies Regs. § 16-50j-40(a)

### Municipal and Elected Officials

Last Name	First Name	Title	Address	City	State	Postal Code
Zeoli	James	First Selectman, Town of Orange	617 Orange Center Road	Orange	CT	06477
Dinice	Paul	Zoning Administrator & Enforcement Officer	617 Orange Center Road	Orange	CT	06477
		Planning and Zoning Commission	617 Orange Center Road	Orange	CT	06477
		Conservation Commission	617 Orange Center Road	Orange	CT	06477
		Inland Wetlands Commission	617 Orange Center Road	Orange	CT	06477
Blake	Benjamin	Mayor, City of Milford	110 River St	Milford	CT	06460
Sulkis	David	City Planner	70 West River St	Milford	CT	06460
Blumenthal	Richard	U.S. Senator	702 Hart Senate Office Building	Washington	DC	20510
Murphy	Chris	U.S. Senator	B40A Dirksen Senate Office Building	Washington	DC	20510
DeLauro	Rosa	U.S. Representative	2413 Rayburn House Office Building	Washington	DC	20515
Slossberg	Gayle	State Senator, 14th	Legislative Office Building, Room 3300	Hartford	CT	06106- 1591
Ferraro	Charles	State Representative, 117th	Legislative Office Building, Room 4005	Hartford	CT	06106- 1591
Staneski	Pam	State Representative, 119th	Legislative Office Building, Room 4005	Hartford	CT	06106- 1591
Jepsen	George	Connecticut Attorney General	55 Elm Street	Hartford	CT	06106
Klee	Rob	Commissioner, Department of Energy and Environmental Protection	79 Elm Street	Hartford	CT	06106

Dykes	Katie	Chairman, Public Utilities Regulatory Authority	10 Franklin Square	New Britain	CT	06051
Rino	Raul	Commissioner, Department of Public Health Protection	410 Capitol Avenue, PO Box 340308	Hartford	CT	06134
Merrow	Susan	Chair, Council on Environmental Quality	79 Elm Street	Hartford	CT	06106
Revicky	Steven	Commissioner, Department of Agriculture	165 Capitol Avenue	Hartford	CT	06106
Barnes	Benjamin	Secretary, Office of Policy and Management	450 Capitol Avenue	Hartford	CT	06106
Redeker	James	Commissioner, Department of Transportation	2800 Berlin Turnpike	Newington	CT	06111
Smith	Catherine	Commissioner, Department of Economic and Community Development	501 Hudson Street	Hartford	CT	06106
Hacket	William	Acting Deputy Commissioner, Division of Emergency Management and Homeland Security (DEMHS)	25 Sigourney Street, 6th Floor	Hartford	CT	06106
Harris	Jonathan	Commissioner, Department of Consumer Protection	450 Columbus Boulevard	Hartford	CT	06103
Currey	Melody	Commissioner, Department of Administrative Services	165 Capitol Ave # 3	Hartford	CT	06106
Jackson	Scott	Commissioner, Department of Labor	200 Folly Brook Boulevard	Wethersfield	CT	06109
		South Central Regional Council of Governments	127 Washington Ave., 4 <sup>th</sup> Floor West	North Haven	CT	06473

## Abutter Properties

Map ID Number	Site Address	Owner Name	Street	City	State	Zip
14-2-4	404 Boston Post Rd	Alliance Energy Corp.	Attn: Tax Department, 36 East Industrial Rd.	Branford	CT	06405
14-1-1	401 Boston Post Rd	OSJ of Orange LLC	375 Commerce Park Rd	North Kingstown	RI	02852
13-6-8A	435 Boston Post Rd	Benvenuto, Linda J. Spray Trust et al.	c/o Suzanne Letso, 93 Poverty Hollow Rd	Newtown	CT	06470
13-6-8	439 Boston Post Rd	Sell, Mary and Property Tax Department Restaurant #0021	PO Box 695019	Orlando	FL	32869-9901
13-1-4	445 Boston Post Rd	Fleet National Bank of Connecticut NC1-0 & Bank of America	Attn: Corp Re Assts, 101 N. Tryon St	Charlotte	NC	28255
13-7-2&3	464 Boston Post Rd	Leveraged Equities Limited	c/o Consolidated Mgmt Group, 263 Boston Post Rd.	Orange	CT	06477
6-4-11	100 S Orange Center Rd	Oak Tree Development LLC	1000 Route 80	Guilford	CT	06437
13-7-5	200 S Orange Center Rd	South Orange Center Rd Holding Co LLC	c/o Richard Restifo, 620 Racebrook Rd	Orange	CT	06477
13-7-1A&B-20E	20 Red Cedar Cir	Roberta C & Stephen P Krawczyk	4121 Bayhead Dr	Bonita Springs	FL	34134
13-7-1A&B-21A	21 Red Cedar Cir	David O'Sullivan	21 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-22E	22 Red Cedar Cir	Vincent J. Farricielli	22 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-23B	23 Red Cedar Cir	Robert W. & Joan Marshall Family Trust	23 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-24B	24 Red Cedar Cir	Theresa A. Azoti	24 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-25D	25 Red Cedar Cir	Daniel Jr. & Pandora Geremia, 100% LU	25 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-26A	26 Red Cedar Cir	Dorothy A. Molnar	26 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-27D	27 Red Cedar Cir	Suzanne Ucci	27 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-28A	28 Red Cedar Cir	Barbara A. Cronenberg	28 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-29B	29 Red Cedar Cir	Angelo & Christine Rolli	29 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-30B	30 Red Cedar Cir	Ruth E. Papp	30 Red Cedar Cir	Orange	CT	06477

13-7-1A&B-31C	31 Red Cedar Cir	Angel P. & Matilde G. Campos	31 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-32B	32 Red Cedar Cir	Lucia C. Pannella	32 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-33C	33 Red Cedar Cir	Richard & Maryann Pittu	33 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-34A	34 Red Cedar Cir	Doris H. Jamison Rev. Trust, Doris H. Jamison Trustee	34 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-35B	35 Red Cedar Cir	Emilia E. Peluso Revoc. Trust, Emilia E. Peluso Trustee	35 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-36B	36 Red Cedar Cir	Lucille Ceruzzi	36 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-37D	37 Red Cedar Cir	Benz, George W. Est of & Mary Ann et als.	37 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-38C	38 Red Cedar Cir	Patrcia A. Mazeau Life Use & Arthur Mazeau et als.	38 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-39D	39 Red Cedar Cir	Zewita Dellaero	39 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-40E	40 Red Cedar Cir	Phyllis Farace	40 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-41E	41 Red Cedar Cir	Ernest M. & Hope A. Leoni	41 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-42B	42 Red Cedar Cir	Anna M. Weiss Revoc. Trust, Anna M. Weiss & Alan J. Weiss, Co-Trustees	42 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-44C	44 Red Cedar Cir	Jean A. Hine	44 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-45D	45 Red Cedar Cir	Antonina Busetta	45 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-46C	46 Red Cedar Cir	Lucienne Smith	46 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-47D	47 Red Cedar Cir	Susan Lucia L.U. & Diane E. Cerretta & Glenn M. Lucia	47 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-48B	48 Red Cedar Cir	Mary C. Parmelee	48 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-49E	49 Red Cedar Cir	Marilyn E. Archambault	49 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-51D	51 Red Cedar Cir	Leela A. Wojczak	51 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-53D	53 Red Cedar Cir	Leo T. & Sandra Moran	53 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-55B	55 Red Cedar Cir	Carol Milne	55 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-57C	57 Red Cedar Cir	Norman H. & Hannelore Lotz	57 Red Cedar Cir	Orange	CT	06477



13-7-1A&B-59C	59 Red Cedar Cir	S&P Mecca Living Trust, Salvatore & J. Patricia Mecca, Trustees	59 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-61B	61 Red Cedar Cir	Richard E. Sr. & Adrienne Mallette, Trustees and Mallette, Richard Sr. & Adrienne Liv Trust	61 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-63E	63 Red Cedar Cir	Kenneth Matloff	63 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-65B	65 Red Cedar Cir	Mary M. Newell	65 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-67C	67 Red Cedar Cir	Marion Carlucci et al.	67 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-69B	69 Red Cedar Cir	Elia H. & Phyllis L. Mikhail	69 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-71C	71 Red Cedar Cir	Giovanna Ambrusco	71 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-73C	73 Red Cedar Cir	John F. & Deborah L. O'Meara	73 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-75B	75 Red Cedar Cir	Louise B. Murphy	75 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-77B	77 Red Cedar Cir	Harry B. & Susan Richardson	77 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-79C	79 Red Cedar Cir	Linda Milano - Life Use & Peter & Lois P. Milano	79 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-81E	81 Red Cedar Cir	Warren L. Mulston	81 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-83B	83 Red Cedar Cir	Lacko John M. Rev. Trust U/T/D 11/13/13 - John M. Lacko, Trustee	83 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-85A	85 Red Cedar Cir	Ellen R. Alpert	85 Red Cedar Cir	Orange	CT	06477
13-7-1A&B-19B	19 Red Cedar Rd	Secretary of Housing & Urban Development	451 7th Street SW	Washington	DC	20410
13-7-1A&B-17A	17 Red Cedar Rd	Marcella Larue	17 Red Cedar Rd	Orange	CT	06477
13-7-1A&B-15A	15 Red Cedar Rd	William W. Swords Family Trust, William W. Swords Trustee	15 Red Cedar Rd	Orange	CT	06477
13-7-1A&B-13B	13 Red Cedar Rd	Robert J. Sr. & Carol J. Maley	13 Red Cedar Rd	Orange	CT	06477
13-7-1A&B-11B	11 Red Cedar Rd	Philip & Frances M. Pilletere	11 Red Cedar Rd	Orange	CT	06477

13-7-1A&B-9A	9 Red Cedar Rd	Chester R. & Phyllis J. Iannone LU & Michele Nicoletti	9 Red Cedar Rd	Orange	CT	06477
13-7-1A&B-3A	3 Red Cedar Rd	Foyer Family Limited Partnership	352 Valleybrook Rd	Orange	CT	06477
13-7-1A&B-1B	1 Red Cedar Rd	Julia T. Strawhince	1 Red Cedar Rd	Orange	CT	06477
13-7-1A&B-7A	7 Red Cedar Rd	Rose M. Russo	7 Red Cedar Rd	Orange	CT	06477
13-7-1A&B-5B	5 Red Cedar Rd	Casola Living Trust, Arnold J. Casola, Trustee	5 Red Cedar Rd	Orange	CT	06477
13-7-1A-1Y	100 Red Cedar Rd	Town of Orange	617 Orange Center Rd	Orange	CT	06477
13-7-1A-1X	Red Cedar Rd	Town of Orange	617 Orange Center Rd	Orange	CT	06477
13-7-2A	Boston Post Rd	Town of Orange	617 Orange Center Rd	Orange	CT	06477



VIA CERTIFIED MAIL

04/14/2017

RE: Application for Bloom Energy, as agent for Home Depot, for the construction of one (1) new ES-5 Bloom Energy Server solid oxide fuel cell and an auxiliary battery system which would provide 300 kilowatt (max) of Customer-Side Distributed Resource at – 440 Boston Post Road, Orange, CT.

Dear Ladies and Gentlemen:

Pursuant to Section §16-50j-40 of the Connecticut Siting Council's (the "Council") regulations, we are notifying you that Home Depot intends to file in the next two weeks a petition for declaratory ruling with the Council. The petition will request the Council's approval of the location and construction of a 200 kilowatt (kW) fuel cell, an auxiliary battery system ("ABS"), and associated equipment. When discharging, the ABS sends power through the fuel cell inverters, such that the maximum combined grid tied power output is 300kW. The Facility will be located on the site of the Home Depot building at 440 Boston Post Road, Orange, Connecticut (the "Site").

The purpose of the proposed Facility is to replace the average baseload of the building with a renewable energy source<sup>1</sup> and improve reliability of electrical systems and equipment. Electricity generated by the Facility will be consumed primarily at the Site, and any excess electricity will be exported to the electric grid. The Facility will be fueled by natural gas.

Keeping the lines of communication open is an important part of our work in your community. If you have questions about this work, please contact the undersigned or the Council.

Respectfully,



Justin Adams  
[justin.adams@bloomenergy.com](mailto:justin.adams@bloomenergy.com)

The "Be" logo, with "B" in dark blue and "e" in green.

<sup>1</sup>Connecticut General Statutes §16-1(a)(26)(A) identifies fuel cells as a "Class I renewable energy source"

## Exhibit 13





#### Legend

- Subject Property
- Site
- Abutting Property
- Approximate Assessor Parcel Boundary (CTDEEP)

**Map Notes:**  
 Base Map Source: CTECO 2016 Aerial Photograph  
 Map Scale: 1 inch = 250 feet  
 Map Date: April 2017



350 175 0 350 Feet

### Exhibit 13 Abutters Map

Proposed Bloom Energy Facility  
 Home Depot Building  
 440 Boston Post Road  
 Orange, Connecticut

