

**VIA ELECTRONIC MAIL & FEDEX**

March 11, 2020

Melanie Bachman  
10 Franklin Square  
New Britain, CT 06051

RE: **PETITION NO. 1387** – Bloom Energy Corporation petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a grid-side 10-megawatt (MW) fuel cell facility and associated equipment to be located at Eversource Energy's existing Judd Brook electric distribution substation, 160 Old Amston Road, Colchester, Connecticut.

Dear Ms. Bachman:

Please see the attached responses to the D&M interrogatories provided to Bloom Energy March 4, 2020.

Sincerely,



Justin Adams  
Permitting Manager

**Bloomenergy**  
Connecticut  
860.839.8373  
[justin.adams@bloomenergy.com](mailto:justin.adams@bloomenergy.com)

**Petition No. 1387  
Bloom Energy Corporation  
160 Old Amston Road  
Colchester, CT  
D&M Plan  
Interrogatories**

1. Where would the construction laydown area be located?

**The Town of Colchester has provided use of its existing laydown area adjacent to the Airline Trail for use during construction. Due to the overall size of the equipment use of this laydown area will be minimal. See attached Overall Wetland map outlining the existing Town laydown area that will be used.**

2. Referencing Section (c) of Bloom Energy Corporation's (Bloom) Development and Management (D&M) Plan, why was the culvert replacement determined to not be necessary?

**During the constructability walk-down with the general contractor, it was determined that the culvert could be stabilized and remain in place during construction. Resulting in less impact to a properly functioning existing culvert.**

3. Explain how vehicles (e.g. maintenance or others) would exit the subject property. For example, would such vehicles turn around within the gated compound?

**A vehicle turning analysis was conducted and the facility was designed with sufficient space for service vehicles to enter and turn within the fenced area and exit the subject property.**

4. With vehicles entering the fenced compound, did Bloom consider the use of bollards to protect the equipment? Explain

**The MV Switch gear pad was shifted to the northeast to not impact vehicles entering the compound, see revised plan set dated March 10, 2020. Bollards are not required within the compound as all personnel entering the compound are specially trained personnel.**

5. The State of Connecticut has adopted the 2015 International Building Code as amended in the 2018 Connecticut State Building Code effective October 1, 2018. Provide the cover sheet Drawing No. G0.1 with updated code references.

**Please see the amended cover sheet, dated March 10, 2020.**

6. Clarify the date of construction drawings in the cover lever of the D&M Plan referencing December 20, 2019 compared to construction drawings dated December 18, 2019.

**The reference to December 20, 2019 in the cover letter was incorrect, December 18, 2019 is correct.**

REV	REVISION ISSUE	DATE
-	INITIAL RELEASE	01/03/2020
1	UPDATES PER CSZ DWM PLAN INTERROGATORIES	03/10/2020

DESIGNED BY	REVIEWED BY
KATE TAYLOR	CHAD FEARSON
DRAWN BY	APPROVED BY
SURESH KUMAR	GREENBERG FARROW

SHEET TITLE

COVER SHEET

DRAWING NUMBER

GO.1

BLOOM DOCUMENT

DOC-1010853

THIS DRAWING IS 24" X 36" AT FULL SIZE  
SITE ID: EVS000.0 SHEET 01 OF 18

PRIOR TO COMMENCING ANY EXCAVATION OR OTHER WORK, THE CONTRACTOR SHALL LOCATE ALL UTILITIES INCLUDING BUT NOT LIMITED TO ELECTRICAL, GAS, WATER, CABLE, AND TELEPHONE. REQUESTING A UTILITY MARK OUT AND AS NECESSARY RETAIN THE SERVICES OF A PRIVATE UTILITY MARK OUT COMPANY TO PERFORM SUCH MARK OUT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND VERIFY THE LOCATION OF ALL UTILITIES IN THE SITE LIGHTING AND ELECTRICAL WORK IN THE VICINITY OF THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR ANY AND ALL UTILITIES DAMAGED BY THE CONTRACTOR'S OPERATION AT NO ADDITIONAL EXPENSE.



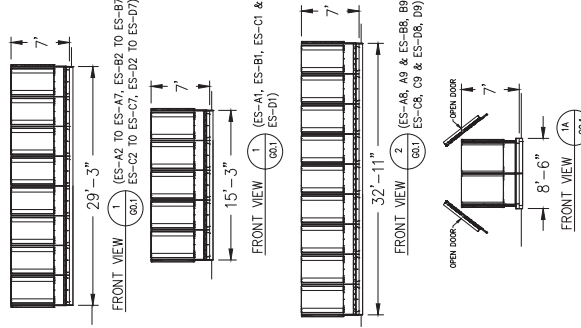
Know what's below.  
Call before you dig.

**BLOOM ENERGY FAQ'S**

- Q: WHAT IS A BLOOM ENERGY SERVER?
- A: THE BLOOM ENERGY SERVER IS A STATIONARY FUEL CELL POWER SYSTEM.
- Q: IS THE BLOOM PRODUCT LISTED OR CERTIFIED?
- A: YES. ES-5XXX SERIES.
  - THE FUEL CELL IS UL LISTED AS A "STATIONARY FUEL CELL POWER SYSTEM" TO ANSI/CSA AMERICA FC 1-2004.
  - IT IS UL LISTED UNDER UL CATEGORY IRGZ AND UL FILE NUMBER MH45102.
  - IT IS UL LISTED UNDER UL CATEGORY IRGZ AND UL FILE NUMBER MH45102.
  - IT IS UL LISTED UNDER UL CATEGORY IRGZ AND UL FILE NUMBER MH45102.
- Q: WHERE ARE FUEL CELLS COVERED IN THE NATIONAL ELECTRICAL CODE (NEC)?
- A: FUEL CELLS ARE COVERED IN ARTICLE 682 OF THE NEC (NFPA 70). FUEL CELLS HAVE BEEN INCORPORATED INTO THE NEC SINCE 2002.
- Q: WHAT IS THE MODEL NUMBER OF THIS PRODUCT?
- A: PLEASE SEE THE DATA SHEET PROVIDED WITH THIS FAQ.
- Q: WHAT IS THE NOISE LEVEL OF THE FUEL CELL SYSTEM?
- A: FOR SPECIFIC DB RANGES, PLEASE REFER TO THE DATA SHEET PROVIDED WITH THIS FAQ.
- Q: DO BLOOM FUEL CELL SYSTEMS PROVIDE LIFE SAFETY POWER?
- A: NO. WE ARE NOT LIFE SAFETY AND DO NOT PROVIDE LIFE SAFETY POWER, EVEN WHEN A UPM IS INSTALLED. WE ARE NOT ALTERING WHATEVER LIFE SAFETY IS CURRENTLY PRESENT AT THE FACILITY.
- Q: IS THE BLOOM FUEL CELL SYSTEM TAMPER-PROOF?
- A: YES. THE FUEL CELLS ARE SECURED IN PLACE AND DOORS ARE SECURED AND LOCKED. ONLY BLOOM SERVICE PERSONNEL HAS THE KEYS AND CAN BE ON-SITE WITHIN 24 HOURS.
- Q: WHAT HAPPENS TO THE CUSTOMER FACILITY POWER IF THE FUEL CELLS SHUT DOWN?
- A: THE FUEL CELL SYSTEM IS OPERATED IN GRID-PARALLEL MODE. IF THE UTILITY GRID IS OPERATIONAL, THE CUSTOMER FACILITY WILL RECEIVE POWER FROM THE GRID AND NOTICE NO DIFFERENCE.
- Q: WHAT HAPPENS TO THE FUEL CELL SYSTEM WHEN THE UTILITY POWER SHUTS DOWN?
- A: IF UTILITY PROVIDED POWER IS LOST FOR ANY REASON, THE FUEL CELL SYSTEM WILL ALSO STOP PRODUCING POWER. THE FUEL CELL SYSTEM WILL REMAIN IN STAND-BY MODE UNTIL IT AUTOMATICALLY SENSES THE UTILITY GRID HAS BEEN RESTORED.
- Q: WHAT HAPPENS TO THE FUEL CELL SYSTEM WHEN THE UTILITY GAS SHUTS DOWN?
- A: IF THE UTILITY GAS IS INTERRUPTED, THE FUEL CELL SYSTEM WILL AUTOMATICALLY SHUT DOWN AS WELL.
- Q: CAN THE FUEL CELL SYSTEM BE SHUT DOWN LOCALLY IN CASE OF AN EMERGENCY?
- A: YES. IF THE FUEL CELL MUST BE SHUT DOWN RIGHT AWAY--FOR EXAMPLE, IN CASE OF A BUILDING FIRE OR ELECTRICAL HAZARD--TWO SHUTOFF CONTROLS ARE INSTALLED AT THE FACILITY EXTERNAL TO THE SYSTEM. THE LOCATIONS OF THESE TWO CONTROLS SHOULD BE KNOWN TO THE FACILITIES MANAGER BEFORE OPERATION AND SHOULD BE NOTED ON THE SITE DIAGRAM THAT IS CREATED FOR EACH SITE DURING INSTALLATION. THE TWO SHUTOFFS ARE:
  - (1) THE ELECTRICAL DISCONNECT SWITCH AND
  - (2) THE MANUAL NATURAL GAS SHUTOFF VALVE. A THIRD SHUTOFF, AN EMERGENCY POWER OFF (EPO) BUTTON, MAY BE PROVIDED ON-SITE.
- Q: DOES THE BLOOM FUEL CELL SYSTEM OPERATE 24/7?
- A: YES.
- Q: ARE THE BLOOM FUEL CELL SYSTEMS MONITORED?
- A: YES. BLOOM FUEL CELL SYSTEMS ARE 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 OPERATOR CAN ALSO REMOTELY INITIATE AN 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. IF YOU HAVE QUESTIONS ABOUT ANY OF THESE SAFETY FEATURES, PLEASE CONTACT BLOOM ENERGY AT CUSTOMERCARE@BLOOMENERGY.COM.
- Q: WHAT ARE THE EMISSIONS GENERATED BY BLOOM FUEL CELL SYSTEMS?
- A: THE SPECIFIC PERCENTAGE OF CARBON EMISSION REDUCTIONS ARE DEPENDENT ON YOUR STATE'S GENERATION MIX, BUT BLOOM FUEL CELL SYSTEMS VIRTUALLY ELIMINATE NOX, SOX, AND OTHER CRITICAL AIR POLLUTANTS THAT ARE FOUND IN TRADITIONAL ELECTRICITY GENERATION METHODS. FOR SPECIFIC EMISSIONS RANGES, PLEASE REFER TO THE DATA SHEET PROVIDED WITH THIS FAQ.
- Q: WHAT IS THE SUSTAINABILITY IMPACT OF BLOOM FUEL CELL SYSTEMS?
- A: BLOOM FUEL CELL SYSTEMS GENERATE ELECTRICITY ON-SITE THROUGH AN EFFICIENT ELECTROCHEMICAL REACTION WITHOUT COMBUSTION. DUE TO THE HIGH EFFICIENCY (65%-53% COMPARED TO A COMBINED CYCLE NATURAL GAS PLANT WITH EFFICIENCY OF 40-45% OR COAL PLANTS AT 35%) BLOOM ENERGY SERVERS REDUCE CARBON EMISSIONS BY 20-50% COMPARED TO THE US GRID EMISSION RATES. THE VARIATION IN EMISSIONS REDUCTION IS DUE TO THE VARIATION IN HOW DIFFERENT STATES GENERATE ELECTRICITY. IN ADDITION, BLOOM FUEL CELL SYSTEMS USE NO WATER DURING NORMAL OPERATION.

**PROJECT DESCRIPTION**

THIS PROJECT CONSISTS OF THE INSTALLATION OF THIRTY SIX (36) BLOOM ENERGY ES5 OUTDOOR NATURAL GAS CLEAN ENERGY SERVERS. THE CLEAN ENERGY SERVERS ARE SUPPORTED ON CONCRETE PADS. THE WORK INCLUDES ALL ITEMS LISTED IN THE SCOPE OF WORK.



**SCOPE OF WORK**

- THE SCOPE OF THIS PROJECT WILL CONSIST OF THE FOLLOWING:
1. CIVIL WORK
    - CONTRACTOR TO REMOVE TREES AND CLEAR AREA FOR INSTALLATION OF ENERGY SERVERS AND ASSOCIATED EQUIPMENT.
    - EQUIPMENT UPGRADE AT LANDSCAPE REMOVAL WILL BE PREPARED FOR THE NEW EQUIPMENT WEIGHT.
    - NEW TRENCH FROM BLOOM ENERGY SERVER TO EXISTING SUBSTATION FOR GAS, WATER AND ELECTRICAL CONNECTIONS BETWEEN BLOOM ENERGY SERVER AND EXISTING SUBSTATION. TRENCH TO BE BACKFILLED AND NEW LANDSCAPE COVER TO BE PROVIDED.
    - NEW ENERGY SERVER PRECAST CONCRETE PADS AND CONCRETE PADS TO BE PLACED AT PREPARED SURFACE AT LANDSCAPE REMOVAL.
  2. ELECTRICAL WORK
    - NEW ELECTRICAL FEEDERS BETWEEN BLOOM ENERGY SERVER AND EXISTING MAIN SERVICE SWITCHBOARD.
  3. PLUMBING WORK
    - NEW WATER CONNECTION FROM NEW 8" WATER MAIN TO BLOOM ENERGY SERVER CONNECTION. NEW METER AND REGULATOR REQUIRED.

**CODES**

BUILDING	2015 INTERNATIONAL BUILDING CODE
BUILDING	2012 INTERNATIONAL BUILDING CODE
BUILDING	2018 CONNECTICUT STATE BUILDING CODE
ENERGY	2012 INTERNATIONAL ENERGY CONSERVATION CODE
PLUMBING	2012 INTERNATIONAL PLUMBING CODE
FUEL GAS	2012 INTERNATIONAL FUEL GAS CODE
ELECTRICAL	2014 NATIONAL ELECTRICAL CODE (NFPA 70)
FIRE	2016 CONNECTICUT STATE FIRE SAFETY CODE
MECHANICAL	2015 CONNECTICUT STATE FIRE PREVENTION CODE
MECHANICAL	2012 INTERNATIONAL MECHANICAL CODE

**PERMITTING INFORMATION**

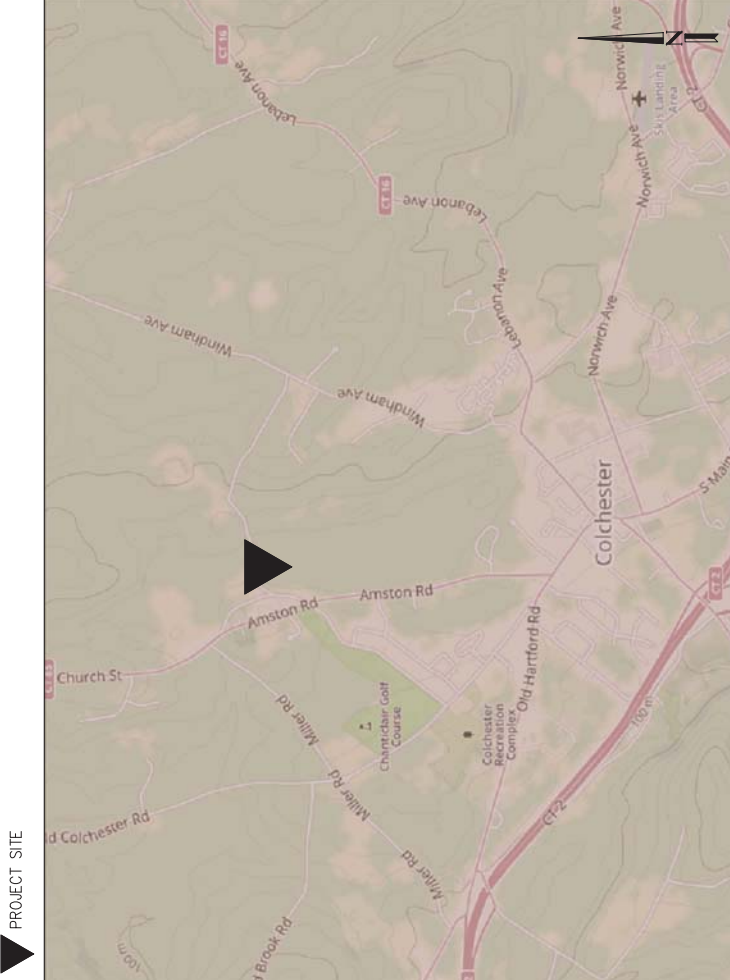
<b>MUNICIPAL AGENCY</b>	TOWN OF COLCHESTER
<b>DEPARTMENT</b>	TOWN OF COLCHESTER COLCHESTER FIRE DEPARTMENT
<b>UTILITY</b>	EVERSOURCE (CT) EVERSOURCE (CT) & WATER DEPARTMENT
<b>TYPE</b>	NATURAL GAS ELECTRICAL WATER

**SITE INFORMATION**

<b>PARCEL INFORMATION</b>	EVERSOURCE NEW LONDON 06-06
<b>PROPERTY OWNER</b>	EVERSOURCE
<b>TAX MAP #</b>	06-06
<b>PROPERTY DESCRIPTION</b>	12.7 ACRES
<b>DISTURBED AREA</b>	39,097 S.F.
<b>PARKING INFORMATION</b>	EXISTING PARKING* 0 REQUIRED PARKING* 0 REMOVED PARKING 0 ADDED PARKING 0 FINAL PARKING COUNT 0

\*BASED ON PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY, LAND OF CONNECTICUT LIGHT & POWER", PREPARED BY MARTIN SURVEY ASSOCIATES, LLC, DATED 09/25/2018.

**VICINITY MAP (NTS)**



**PROJECT SITE**

DRAWING INDEX	REV #	DATE
01 G0.1 COVER SHEET	-	03/10/2020
02 G0.2 GENERAL CONSTRUCTION NOTES	-	01/03/2020
03 G1.1 OVERALL SITE PLAN	-	3/10/2020
04 C1.1 DETAILED SITE PLAN	-	3/10/2020
05 C1.2 GRADING PLAN	-	01/03/2020
06 C2.1 DETAILS SHEET 1	-	01/03/2020
07 C2.2 DETAILS SHEET 2	-	01/03/2020
08 C2.3 DETAILS SHEET 3	-	01/03/2020
09 C2.4 SOIL EROSION AND SEDIMENT CONTROL DETAILS	-	3/10/2020
10 S0.1 EQUIPMENT PAD GENERAL NOTES AND DETAILS	-	01/03/2020
11 S1.1 EQUIPMENT PAD DETAILS-1	-	01/03/2020
12 S1.2 EQUIPMENT PAD DETAILS-2	-	01/03/2020
13 E1.1A ELECTRICAL CONDUIT LAYOUT AND DUCT BANK DETAILS	-	3/10/2020
14 E1.1B GROUNDING PLAN	-	3/10/2020
15 E3.1A ELECTRICAL SINGLE LINE DIAGRAM STAMP A & B	-	01/03/2020
16 E3.1B ELECTRICAL SINGLE LINE DIAGRAM STAMP C & D	-	01/03/2020
17 M1.1 PLACARD PLAN	-	01/03/2020
18 R0.1 BLOOM ENERGY PRODUCT DATA SHEET	-	01/03/2020

**GENERAL CONSTRUCTION NOTES**

- IN THE EVENT OF DISCREPANCIES BETWEEN THE DRAWINGS, SPECIFICATIONS, OR SCOPE OF WORK SUMMARY IN THIS PACKAGE, NOTIFY BLOOM ENERGY IMMEDIATELY. REFERENCE SEPARATE BLOOM ENERGY DOC-1008337 FOR ASSOCIATED ENERGY SERVER INSTALLATION SPECIFICATIONS.
- THE EXISTING SITE PLAN FEATURES ARE BASED ON DESIGN DRAWINGS, AS-BUILT PLANS, AERIAL PHOTOGRAPHS AND FIELD MEASUREMENTS UNLESS OTHERWISE NOTED. THE LOCATIONS OF ALL FEATURES AND STRUCTURES ON THE PLANS ARE APPROXIMATE.
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORK IS DONE IN ACCORDANCE WITH CURRENT REGULATORY REQUIREMENTS AND ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK.
- THE CONTRACTOR SHALL PROTECT ALL EXISTING ITEMS AND FACILITIES TO REMAIN THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL REPAIR AND/OR REPLACE AT CONTRACTOR'S EXPENSE ANY EXISTING ITEMS AND FACILITIES TO REMAIN THAT ARE DAMAGED BY THE CONTRACTOR'S OPERATIONS, TO THE SATISFACTION OF PROPERTY OWNER AND BLOOM ENERGY.
- UNLESS DELIVERY IS SPECIFIED BY BLOOM ENERGY TO THE JOB SITE, CONTRACTOR SHALL DELIVER ALL EQUIPMENT, DAMAGE-FREE TO THE JOB SITE.
- PRIOR TO COMMENCING ANY EXCAVATION OR DEMOLITION, THE CONTRACTOR SHALL CONTACT LOCAL UTILITIES, INCLUDING BUT NOT LIMITED TO, ELECTRICAL, GAS, WATER, CABLE, AND TELEPHONE. CONTRACTOR SHALL REQUEST A UTILITY MARK OUT AND AS NECESSARY RETAIN THE SERVICES OF A PRIVATE UTILITY MARK OUT COMPANY TO PERFORM SUCH MARK OUT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO EXCAVATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY AND ALL UTILITIES DAMAGED BY THE CONTRACTOR'S OPERATION AT NO ADDITIONAL EXPENSE.
- BLOOM ENERGY WILL PROVIDE THE CONTRACTOR WITH COPIES OF ALL PERMITS AND PROVIDE THE CONTRACTOR ANY CONDITIONS OF APPROVAL BY THE PLANNING DEPARTMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING JURISDICTIONS AS REQUIRED FOR INSPECTIONS.
- THE CONTRACTOR SHALL PROVIDE BLOOM ENERGY WITH:
  - A CONSTRUCTION SCHEDULE PRIOR TO STARTING THE WORK
  - COMPLETED JOB SUPERINTENDENT THROUGHOUT THE WORK
  - PHOTOS SHOWING TRENCHES PRIOR TO BACKFILL, SLOPE OF STEEL OR PRECAST PADS
  - FINAL AS BUILT DRAWINGS OF ALL UNDERGROUND CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE BARRICADES AND SAFETY SIGNS PER OSHA REQUIREMENTS.
- THE CONTRACTOR IS RESPONSIBLE FOR OVERALL CONSTRUCTION SITE CLEANLINESS, INCLUDING PROVISIONS OF A DEBRIS BOX WITH WEEKLY SERVICING, REMOVAL OF ALL CONTRACTOR/SUBCONTRACTOR REFUSE AND DEBRIS, AND SWEEPING OF THE ENTIRE YARD AREA AT THE COMPLETION OF THE WORK.
- UNLESS STATED OTHERWISE IN THE SCOPE OF WORK SUMMARY, ALL OTHER PROCEDURES, TESTING, MATERIALS AND EQUIPMENT SHOWN ON THE PLANS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- THE PLAN VIEW DRAWINGS PROVIDED IN THIS SET INCLUDE A ROUGH SCALE REPRESENTATION OF EXISTING AND PROPOSED CONDITIONS AND SHOULD NOT BE SCALED. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS ON SITE. ALL DRAWINGS MARKED "N15" HAVE NO RELATIVE SCALE AND ONLY LISTED DIMENSIONS SHOULD BE USED.
- EACH CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF DAMAGE TO THE WORK OF OTHER TRADES CAUSED BY THEIR OPERATIONS. ALL REPAIRS SHALL BE PERFORMED AT THE COST OF THE CONTRACTOR RESPONSIBLE FOR THE DAMAGES. WORK SHALL ONLY BE PERFORMED AFTER APPROVAL OF A REPRESENTATIVE OF THE TRADE WHOSE WORK WAS DAMAGED.
- THE CONTRACTOR SHALL NOTIFY BLOOM ENERGY IF SITE CONDITIONS OR DIMENSIONS DISAGREE WITH INFORMATION SHOWN ON THE DRAWINGS. WORK IS NOT TO PROCEED UNTIL SUCH DIFFERENCES ARE RESOLVED.
- THE CONTRACTOR SHALL EXAMINE THE SITE AND FAMILIARIZE THEMSELVES WITH ALL EXISTING CONDITIONS, AND BE PREPARED TO PERFORM THE WORK WITHIN THE EXISTING CONDITIONS.
- THE CONTRACTOR AND EACH SUBCONTRACTOR SHALL INSPECT WORK PREVIOUSLY PREPARED OR INSTALLED BY OTHERS BEFORE APPLYING SUBSEQUENT MATERIALS OR FINISHES. IF UNSATISFACTORY, NOTIFY BLOOM ENERGY. DO NOT PROCEED UNTIL THE DEFECTIVE WORK HAS BEEN CORRECTED.
- THE CONTRACTOR REMAINS RESPONSIBLE FOR FAULTY MATERIALS OR WORKMANSHIP FOR A PERIOD OF ONE YEAR AFTER FINAL PROJECT PAYMENT IS MADE. ANY DEFECT OR DAMAGE FOUND EVEN AFTER THE FINAL PAYMENT SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. REPAIRS OR REPLACEMENTS REQUIRED WILL SUBSEQUENTLY BE WARRANTED FOR ONE YEAR AFTER WORK COMPLETION AND ACCEPTANCE.
- IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES AND OSHA REQUIREMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND WILL NOT BE LIMITED TO NORMAL WORKING HOURS.
- THE CONTRACTOR IS RESPONSIBLE FOR RESTORING ANY LANDSCAPED AREAS TO PRE-CONSTRUCTION CONDITION AS REQUESTED BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK.
- GENERAL HOUSEKEEPING OF THE SITE, INCLUDING SWEEPING AND CONTROL OF SEDIMENT, TRASH, AND DEBRIS SHALL BE PERFORMED DAILY OR IMMEDIATELY UPON THE OCCURRENCE.
- DURING CONSTRUCTION ALL EXITS AND DOORWAYS MUST REMAIN UNOBSTRUCTED.
- THE TRENCH, LOCATION, SIZE, AND/OR DEPTHS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY THE LOCATION, SIZE, AND/OR DEPTHS OF SUCH UTILITIES PRIOR TO EXCAVATION. CONTRACTOR SHALL NOTIFY BLOOM ENERGY IF WORK CANNOT PROCEED AS PROPOSED.

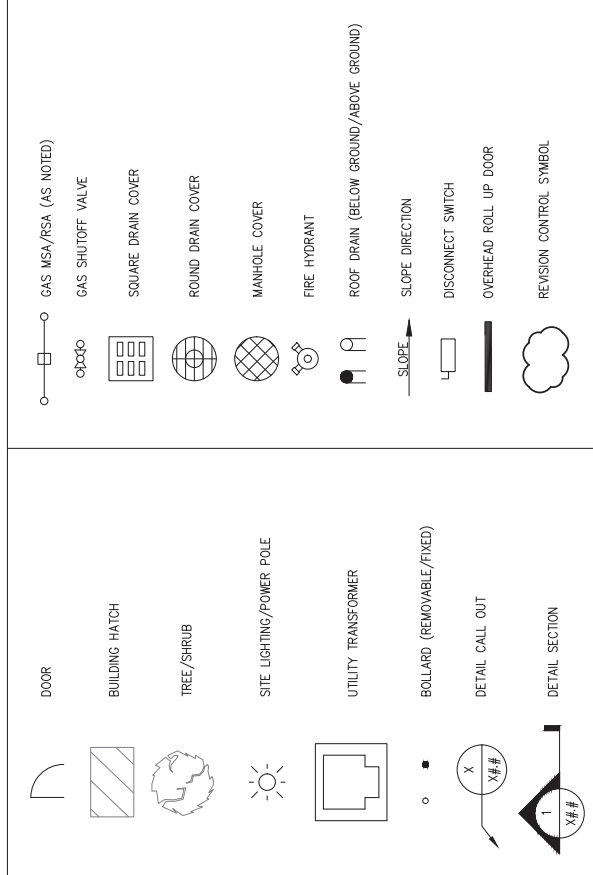
**SITE SPECIFIC CONSTRUCTION NOTES**

- CONSTRUCTION SUPERINTENDENT SHALL CONTACT THE CUSTOMER REPRESENTATIVE FOR A PRE-CONSTRUCTION CONFERENCE TWO WEEKS PRIOR TO THE START OF THE WORK. THE SCOPE OF WORK AND TIMELINE SHALL BE DISCUSSED WITH RESPECT TO ANY COORDINATION ISSUES WHICH SHALL BE IDENTIFIED AND RESOLVED PRIOR TO THE START OF THE WORK. THE CONTRACTOR SHALL REPORT TO THE CUSTOMER REPRESENTATIVE ANY CHANGES TO THE WORK PLAN. THE CUSTOMER REPRESENTATIVE SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THE CUSTOMER REPRESENTATIVE SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK. THE CUSTOMER REPRESENTATIVE SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS PRIOR TO STARTING THE WORK.
- TRENCHING:
  - UTILITY TRENCH WORK IN ROADWAY SHALL BE DONE AT NIGHT BETWEEN 10PM AND 6 AM.
  - 2.1 TRENCHING SHOULD BE DONE IN STAGES, TO ENSURE TRAFFIC FLOW IS NOT IMPEDED.
  - 2.3 WHEN THE TRENCH IS OPEN, IT SHALL BE COVERED DURING THE DAY (6 AM - 10 PM) WITH PLATES THAT ARE CAPABLE OF SUPPORTING THE WEIGHT OF TRUCK TRAFFIC.
- UTILITY CONNECTIONS THAT REQUIRE TAPPING ON LIVE LINES SHALL BE PERFORMED AT NIGHT AND BE COORDINATED WITH AND APPROVED BY THE CUSTOMER PRIOR TO MAKING UTILITY CONNECTIONS. ANY PRECAUTIONARY MEASURES REQUIRED DUE TO UTILITY SHUT-OFF NEED TO BE COMPLETED BY CONTRACTOR.
- STABILIZATION:
  - 3.1. SEDIMENT EROSION AND TRASH CONTROL SHALL BE PERFORMED AT ALL TIMES. BEST MANAGEMENT PRACTICES (BMPs) SHALL BE INSTALLED PRIOR TO WORK START AND REMOVED ONLY WHEN THE SITE IS FULLY STABILIZED.
  - 3.2. THE SITE SHALL BE CONSIDERED "FULLY STABILIZED" WHEN THE CUSTOMER REPRESENTATIVES HAS REVIEWED SUBMITTED PICTURES AND ACCEPT THE STABILIZATION.
- ALL SITE RELATED IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO PAVEMENT RESTORATION, CURB INSTALLATION, AND TURF RESTORATION SHALL BE IN CONFORMANCE TO THE AHJ SITE DEVELOPMENT STANDARDS, SPECIFICATIONS, AND DETAILS, UNLESS MORE STRINGENTLY SPECIFIED HEREIN.

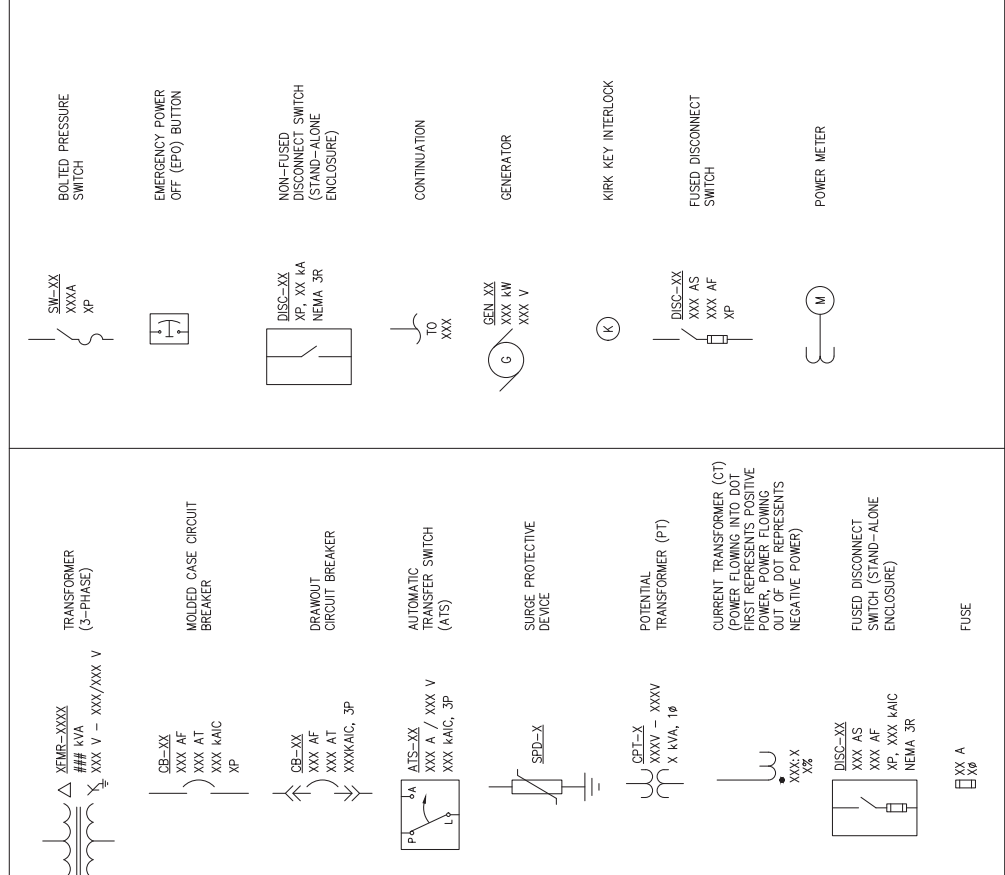
**ABBREVIATIONS**

C	DEGREES CELSIUS
F	DEGREES FAHRENHEIT
A	AMPS
AC	ALTERNATING CURRENT, ASPHALT CONCRETE
ACS	AC POWER SECTION
AHJ	AUTHORITIES HAVING JURISDICTION
AL	ALUMINUM
ASTM	AMERICAN SOCIETY OF THE INTERNATIONAL ASSOCIATION FOR TESTING AND MATERIALS
ATM	ATMOSPHERE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BC	BEST MANAGEMENT PRACTICES
BMPs	BEST MANAGEMENT PRACTICES
C	CONDUIT
CJ	CAST IN PLACE
CP	CONTROL JOINT
CL	CENTER LINE
CLR	CLEAR
CMC	CONCRETE
CMU	CONCRETE MASONRY UNIT
CPT	CONTROL POWER TRANSFORMER
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DI	DEIONIZED
EDM	ELECTRICAL COMBINATION MODULE
EDM	ELECTRICAL DISTRIBUTION MODULE
ELEV	ELEVATION
EMT	ELECTRICAL METAL TUBING
EPO	EMERGENCY POWER OFF
ES	ENERGY SERVER
FNPT	FEMALE NATIONAL PIPE THREAD
FP5	ESS FUEL PROCESSING MODULE
FBM	FUEL CELL POWER MODULE
G	GROUND
GAL	GALLON
GF	GROUND FAULT
GFEP	GROUND FAULT EQUIPMENT PROTECTION
GND	GROUND
HDD	HORIZONTAL DIRECTIONAL DRILLING
HDPE	HIGH DENSITY POLYETHYLENE
HR	HERTZ
HZ	HERTZ
ID	INNER DIAMETER
IEEE	INSTITUTE FOR ELECTRICAL & ELECTRONIC ENGINEERING
IOM	INPUT OUTPUT MODULE
ISC	SHORT CIRCUIT CURRENT
ISS	INTEGRATED STEEL SKID
K	KILO
KA	KILOAMPERE
KIAC	KILOAMPERE INTERRUPTING CAPACITY
KVA	KILOVOLT-AMPS
KW	KILOWATTS
LBS	POUNDS
LSG	LONG, SHORT, INSTANTANEOUS, GROUND FAULT
MA	MILLIAMPERES
MDPE	MEDIUM DENSITY POLYETHYLENE
MIN	MINUTE/MINIMUM
MMBTU	MILLION BRITISH THERMAL UNITS
MNPT	MALE NATIONAL PIPE THREAD
MSA	METER SET ASSEMBLY
MTS	MANUAL TRANSFER SWITCH
NW	MEGAWATTS
NEW	NEW
NEC	NATIONAL ELECTRIC CODE
NFPA	NATIONAL FIRE PROTECTION AGENCY
NPS	NOT TO SCALE
OC	ON CENTER
OD	OUTER DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMIN.
P	POLE
PEX	CROSS-LINKED POLYETHYLENE
PDS	POWER DISTRIBUTION SECTION
PH	PHASE
PH5	50S POWER MODULE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAGE
PV	PHOTOVOLTAC
PVC	POLYVINYL CHLORIDE
PWM	POWER MODULE
QDC	QUICK DISCONNECT
RSA	REGULATOR SET ASSEMBLY
RMG	RIGID METAL CONDUIT
SD	STORM DRAIN
SF	SQUARE FEET
SPD	SURGE PROTECTIVE DEVICE
SS	STAINLESS STEEL, SANITARY SEWER

**SITE PLAN SYMBOLS**



**ELECTRICAL SINGLE LINE SYMBOLS**



**ABBREVIATIONS (CONTINUED)**

SWPP	STORM WATER POLLUTION PROTECTION
TBD	TO BE DETERMINED
TC	TELEMETRY CABINET
TMF	TAX MAP NUMBER
UBC	TYPICAL
UL	UNDERWRITER'S LABORATORY
UPM	UNINTERRUPTIBLE POWER MODULE
V	VOLTS
VAC	VOLTS (AC)
VDC	VOLTS (DC)
VF	VERIFY IN FIELD
W	WIRE
WDM	WATER DISTRIBUTION MODULE
XFMR	TRANSFORMER

**LINETYPES**

UTILITY	NEW	EXISTING	DEMOLISH
UNKNOWN UTILITY - UNDERGROUND	UTL	UTL	UTL
COMMUNICATIONS UTILITY - OVERHEAD	OCU	OCU	OCU
COMMUNICATIONS UTILITY - UNDERGROUND	UCU	UCU	UCU
ELECTRICAL UTILITY - OVERHEAD	OEU	OEU	OEU
ELECTRICAL UTILITY - UNDERGROUND	UEU	UEU	UEU
GAS UTILITY - OVERHEAD	UGU	UGU	UGU
GAS UTILITY - UNDERGROUND	UGU	UGU	UGU
WATER UTILITY - OVERHEAD	UWU	UWU	UWU
WATER UTILITY - UNDERGROUND	UWU	UWU	UWU
SANITARY SEWER UTILITY	SSU	SSU	SSU
STORM WATER UTILITY	SWU	SWU	SWU
COMMUNICATIONS FEEDER - ABOVE GROUND	C	C	C
COMMUNICATIONS FEEDER - OVERHEAD	OC	OC	OC
COMMUNICATIONS FEEDER - UNDERGROUND	UC	UC	UC
ELECTRICAL FEEDER - ABOVE GROUND	E	E	E
ELECTRICAL FEEDER - OVERHEAD	OE	OE	OE
ELECTRICAL FEEDER - UNDERGROUND	UE	UE	UE
FIBER OPTIC - ABOVE GROUND	FO	FO	FO
FIBER OPTIC - OVERHEAD	OFO	OFO	OFO
FIBER OPTIC - UNDERGROUND	UFO	UFO	UFO
GAS PIPING - ABOVE GROUND	G	G	G
GAS PIPING - UNDERGROUND	UG	UG	UG
WATER PIPING - ABOVE GROUND	W	W	W
WATER PIPING - UNDERGROUND	UW	UW	UW
PETROLEUM PIPING - ABOVE GROUND	P	P	P
PETROLEUM PIPING - UNDERGROUND	UP	UP	UP
CURBS	---	---	---
FENCING	---	---	---
PARKING	---	---	---
EASEMENT BOUNDARY	---	---	---
PROPERTY LINE	---	---	---
TRENCHING BOUNDARY	---	---	---
WATER BOUNDARY	---	---	---
FLOOD LINE	---	---	---
SETBACK LINE	---	---	---
SHRUB/BUSH LINE	---	---	---
10" COMPOST FILTER SOCK	---	---	---

**HATCH**



**ESS-YABAAAN ENERGY SERVER SYSTEM X 8 (ES-A8, A9 & A17, A18, B8, B9, B17 & B18)**

GROSS OUTPUT POWER	300 kW	TOTAL SYSTEM WEIGHT (LESS PAD)	29,761 LBS
NET OUTPUT POWER	300 kW	WEIGHT - POWER MODULE PM5	3,577 LBS
VOLTAGE	480 VAC	WEIGHT - AC MODULE AC5	3,161 LBS
MAXIMUM OUTPUT CURRENT	361 Amps	WEIGHT - FUEL PROCESSING MODULE FP5	2,569 LBS
FREQUENCY	60 Hz	WEIGHT - ANCILLARY EQUIPMENT (VOM, PDS, & TO) (LESS PAD)	3,130 LBS
		WEIGHT - PRECAST LINER SERVER PAD	SEE STRUCTURAL DRAWINGS

**ESS-YAIAAN ENERGY SERVER SYSTEM X 12 (ES-A5, A7, A14, A16, B5, B7, B14, B16)**

GROSS OUTPUT POWER	300 kW	TOTAL SYSTEM WEIGHT (LESS PAD)	27,192 LBS
NET OUTPUT POWER	300 kW	WEIGHT - POWER MODULE PM5	3,577 LBS
VOLTAGE	480 VAC	WEIGHT - AC MODULE AC5	3,161 LBS
MAXIMUM OUTPUT CURRENT	361 Amps	WEIGHT - FUEL PROCESSING MODULE FP5	2,569 LBS
FREQUENCY	60 Hz	WEIGHT - PRECAST LINER SERVER PAD	SEE STRUCTURAL DRAWINGS

**ESS-AAZAAAN ENERGY SERVER SYSTEM X 16 (ES-A1, A4, A10, A13, B1, B4, B10, B13)**

GROSS OUTPUT POWER	262.5 kW	TOTAL SYSTEM WEIGHT (LESS PAD)	27,192 LBS
NET OUTPUT POWER	250 kW	WEIGHT - POWER MODULE PM5	3,577 LBS
VOLTAGE	480 VAC	WEIGHT - AC MODULE AC5	3,161 LBS
MAXIMUM OUTPUT CURRENT	316 Amps	WEIGHT - FUEL PROCESSING MODULE FP5	2,569 LBS
FREQUENCY	60 Hz	WEIGHT - PRECAST CLASSIC SERVER PAD	SEE STRUCTURAL DRAWINGS

**FUEL REQUIREMENTS**

CONNECTION	2" FLANGE	PRESSURE	15 (+3/-5) psig
FUEL TYPE	NATURAL GAS	AVERAGE CONSUMPTION RATE (60°F, 1 atm)	1.686 MMBtu/hr
PIPE SIZE - SUPPLY	SIZE SITE DEPENDENT	MAX CONSUMPTION RATE (60°F, 1 atm)	1.871 MMBtu/hr
<b>WATER REQUIREMENTS</b>			
CONNECTION	1/2" MNPT	FLOW - STARTUP	0.8 gal/min MAXIMUM
WATER TYPE	MUNICIPAL GRADE	FLOW - CONTINUOUS	0 gal/min
MINIMUM PRESSURE	35 psi	WATER DISCHARGE	0 gal/min
MAXIMUM PRESSURE	150 psi	PIPE SIZE - SUPPLY	SIZE SITE DEPENDENT USE STAINLESS STEEL OR PVC



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

CUSTOMER SITE  
EVERSOURCE  
160 OLD AMSTON ROAD  
COLCHESTER, CT 06415



REV	REVISION ISSUE	DATE
-	INITIAL RELEASE	01/03/2020

DESIGNED BY	KATE TAYLOR	REVIEWED BY	CHAD PEARSON
DRAWN BY	SURESH KUMAR	APPROVED BY	GREENBERG FARROW

SHEET TITLE  
GENERAL CONSTRUCTION NOTES

DRAWING NUMBER  
G0.2

BLOOM DOCUMENT  
DOC-1010853

THIS DRAWING IS 24" X 36" AT FULL SIZE  
SITE ID: EYS000.0 SHEET 02 OF 18

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 COLCHESTER, CT 06415

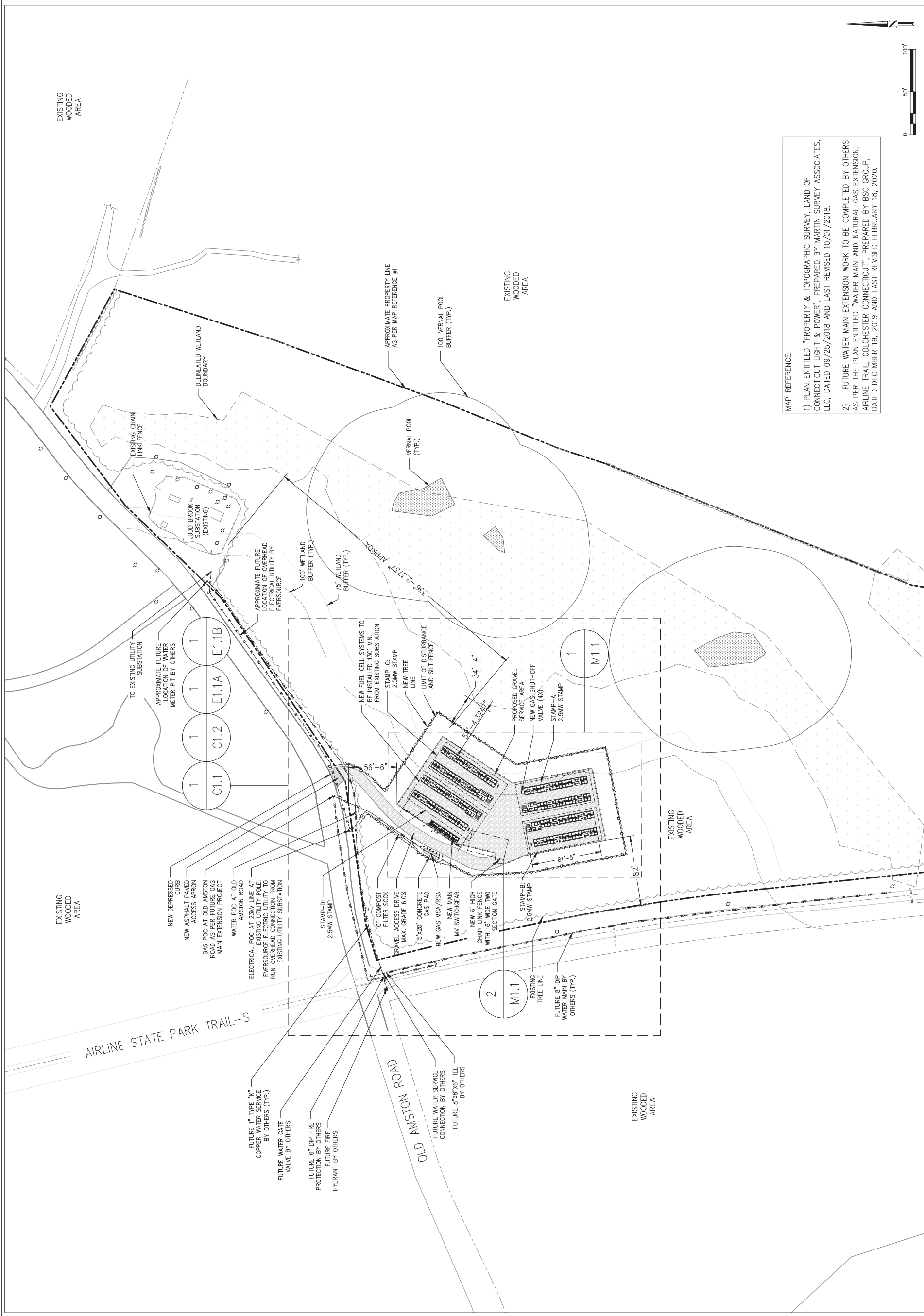


REVISION HISTORY	
REV	DATE
-	01/03/2020
1	03/10/2020

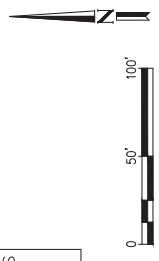
DESIGNED BY: KATE TAYLOR  
 DRAWN BY: SURESH KUMAR  
 REVIEWED BY: CHAD PEARSON  
 APPROVED BY: GREENBERG FARROW

SHEET TITLE  
 OVERALL SITE PLAN  
 DRAWING NUMBER  
 G1.1

BLOOM DOCUMENT  
 DOC-1010853  
 THIS DRAWING IS 24" X 36" AT FULL SIZE  
 SITE ID: EYS000.0 SHEET 03 OF 18



MAP REFERENCE:  
 1) PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY, LAND OF CONNECTICUT LIGHT & POWER", PREPARED BY MARTIN SURVEY ASSOCIATES, LLC, DATED 09/25/2018 AND LAST REVISED 10/01/2018.  
 2) FUTURE WATER MAIN EXTENSION WORK TO BE COMPLETED BY OTHERS AS PER THE PLAN ENTITLED "WATER MAIN AND NATURAL GAS EXTENSION, AIRLINE TRAIL, COLCHESTER CONNECTICUT", PREPARED BY BSC GROUP, DATED DECEMBER 19, 2019 AND LAST REVISED FEBRUARY 18, 2020.



OVERALL SITE PLAN  
 SCALE: 1" = 50'

1  
 G1.1

REV	REVISION ISSUE	DATE
-	INITIAL RELEASE	07/03/2020
1	UPDATES PER CSC DMI PLAN INTERCHANGES	03/10/2020

DESIGNED BY	REVIEWED BY
KATE TAYLOR	CHAD PEARSON
SURESH KUMAR	APPROVED BY
	GREENBERG FARROW

SHEET TITLE

DETAILED  
SITE PLAN

DRAWING NUMBER  
C1.1

BLOOM DOCUMENT

DOC-1010853

THIS DRAWING IS 24" X 36" AT FULL SIZE  
SITE ID: EVS000.0 SHEET 04 OF 18

**GENERAL NOTES**

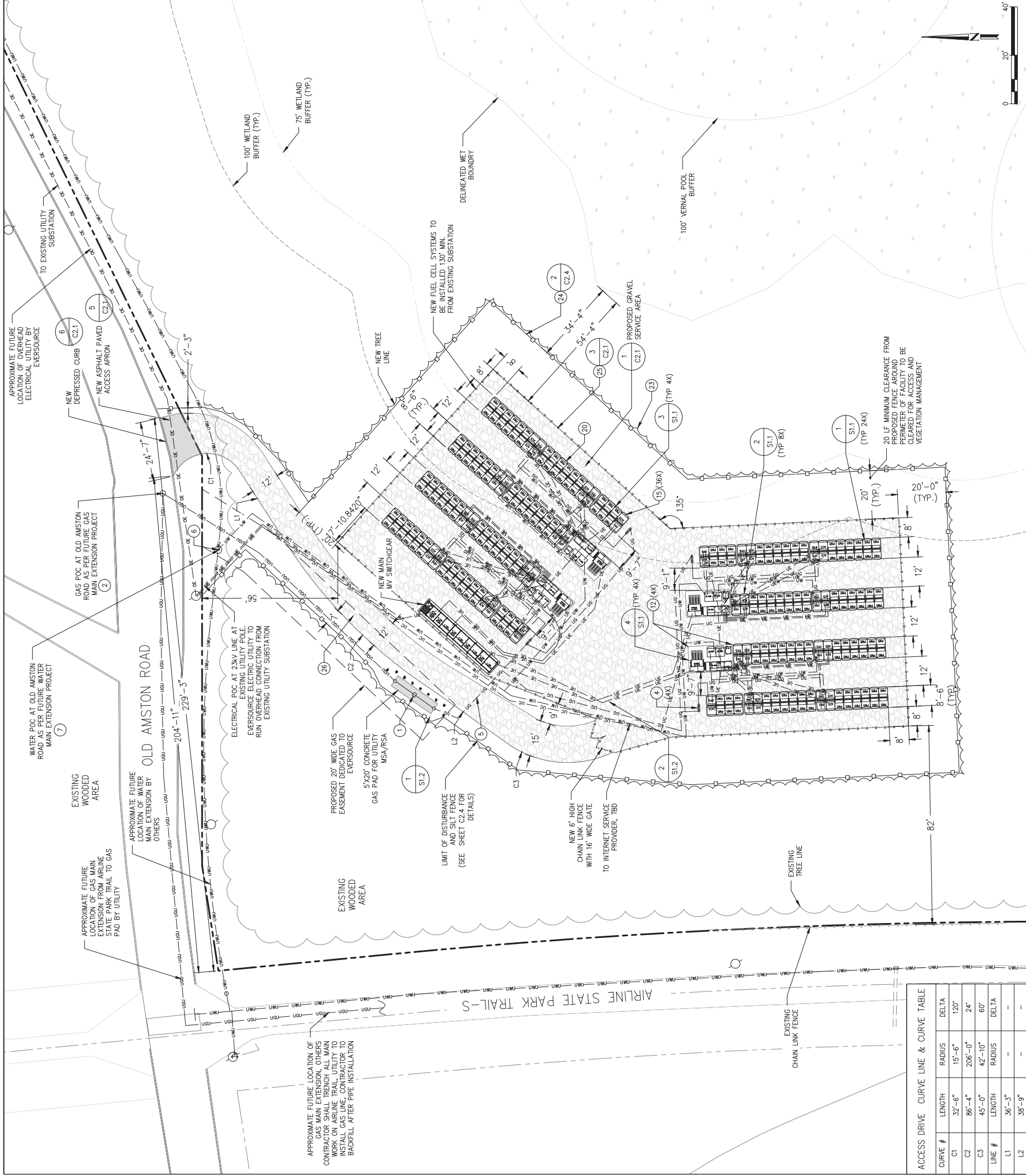
- CLEAN AND PRIME ALL NEW WIRE MOUNTED PIPING AND CONDUIT. PIPING SHALL BE PAINTED WITH EXTERIOR GRADE PAINT TO MATCH EXISTING.
- CONDUITS AND PIPES MOUNTED TO BUILDING WALL SHALL BE SUPPORTED AS PER LOCAL CODE. RUN AT HEIGHT ABOVE DOORWAYS, AND STAND OFF WALL TO AVOID EXISTING CONDUITS AND PIPES.
- 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.
- SEE BLOOM ENERGY PRODUCT INSTALLATION DRAWINGS FOR UTILITY CONNECTIONS TO ANCILLARY EQUIPMENT AND ENERGY SERVER.
- ALL ABOVE FROST LINE SECTIONS OF WATER PIPES SHALL HAVE POWERED HEAT TRACE AND INSULATION. ENSURE UNDERGROUND WATER PIPE DEPTHS ARE BELOW FROST LINE.
- VAULTS/PULL BOXES SHOWN OR NOT SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL FURNISH ANCHORS AND BRACKETS TO BRACE EXACT LOCATION WITH CUSTOMER REPRESENTATIVE IN THE FIELD. CONTRACTOR SHALL SIZE VAULT/PULL BOX IN COMPLIANCE WITH NEC CODE REQUIREMENTS. ALL VAULTS AND COVERS IN DRIVE AISLES SHALL BE HEAVY DUTY IN CONFORMANCE WITH AASHTO H20 LOADING.

**REFERENCE SHEET NOTES**

- NEW UTILITY PROVIDED AND INSTALLED GAS METER & REGULATOR 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 COMPACT AND MATCH EXISTING SURFACE AND GRADE. CONTRACTOR SHALL COORDINATE GAS PIPE SIZING AND INSTALLATION REQUIREMENTS WITH UTILITY. UTILITY TO INSTALL 8" MAIN IN STREET AND 6" GAS LINE ON PROPERTY TO GAS PAD.
- NEW PRIVATE GAS 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 WATER METER PIT 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.
- 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.
- NEW BLOOM ENERGY SERVER. REFER TO BLOOM STANDARD INSTALLATION DRAWING SET FOR ADDITIONAL ENERGY SERVER DETAILS.
- FACTORY WIRE ENERGY SERVER EMERGENCY POWER-OFF SWITCH (EPO).
- CONTRACTOR SHALL EXCAVATE UNDER ENERGY SERVER AND ANCILLARY PAD LOCATIONS. REFER TO PAD DETAIL FOR ADDITIONAL EXCAVATION AND BACKFILL REQUIREMENTS.
- CONTRACTOR TO REMOVE TREES AND CLEAR AREA FOR INSTALLATION OF ENERGY SERVERS AND ASSOCIATED EQUIPMENT. PROVIDE 10' MINIMUM CLEARANCE FROM PROPOSED ENERGY SERVER TO DRIP LINE OF ANY EXISTING TREES.
- PROPOSED LIMIT OF DISTURBANCE AND SEDIMENT CONTROL BARRIER.
- NEW 6" HIGH CHAIN LINK FENCE WITH PRIVACY SCREENING.
- PROPOSED GRAVEL ACCESS DRIVE (MAX GRADE 6%) FOR SERVICE VEHICLES. SEE DETAIL 1/C2.1 FOR ADDITIONAL INFORMATION.

EXISTING UTILITY NOTES:  
THE LOCATION OF EXISTING UTILITIES IS SHOWN FOR THE CONTRACTOR'S REFERENCE. EXACT LOCATION, DEPTH AND SIZE OF ALL EXISTING UTILITIES IS NOT KNOWN. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ALL EXISTING UTILITIES NOT SHOWN ON THESE DRAWINGS. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING UNDERGROUND UTILITIES AND PROTECT THE EXISTING UNDERGROUND UTILITIES FROM DAMAGE WHEN CROSSING WITH NEW UNDERGROUND UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF EXISTING UTILITIES DAMAGED BY NEW UNDERGROUND UTILITIES. THE ENGINEER IMMEDIATELY IF ANY FIELD CONDITIONS ENCOUNTERED OTHER FROM THOSE REPRESENTED HEREON. SUCH CONDITIONS COULD RENDER THE DESIGNS HEREON IN APPROPRIATE AND MAY REQUIRE ADJUSTMENTS TO AVOID CONFLICTS.

MAP REFERENCE:  
1) PLAN ENTITLED "PROPERTY & TOPOGRAPHIC SURVEY, LAND OF CONNECTICUT LIGHT & POWER", PREPARED BY MARTIN SURVEY ASSOCIATES, LLC, DATED 09/25/2018 AND LAST REVISED 10/01/2018.  
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CURVE #	LENGTH	RADIUS	DELTA
C1	32'-6"	15'-6"	120°
C2	86'-4"	206'-0"	24°
C3	45'-0"	42'-10"	60°
LINE #	LENGTH	RADIUS	DELTA
L1	36'-3"	-	-
L2	38'-9"	-	-

1  
C1.1  
SCALE: 1" = 20'  
DETAILED SITE PLAN

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REV	REVISION ISSUE	DATE
-	INITIAL RELEASE	07/05/2020
1	UPDATES PER CSC DMI PLAN INTERCHANGES	03/10/2020

DESIGNED BY  
 KATE TAYLOR  
 DRAWN BY  
 SURESH KUMAR

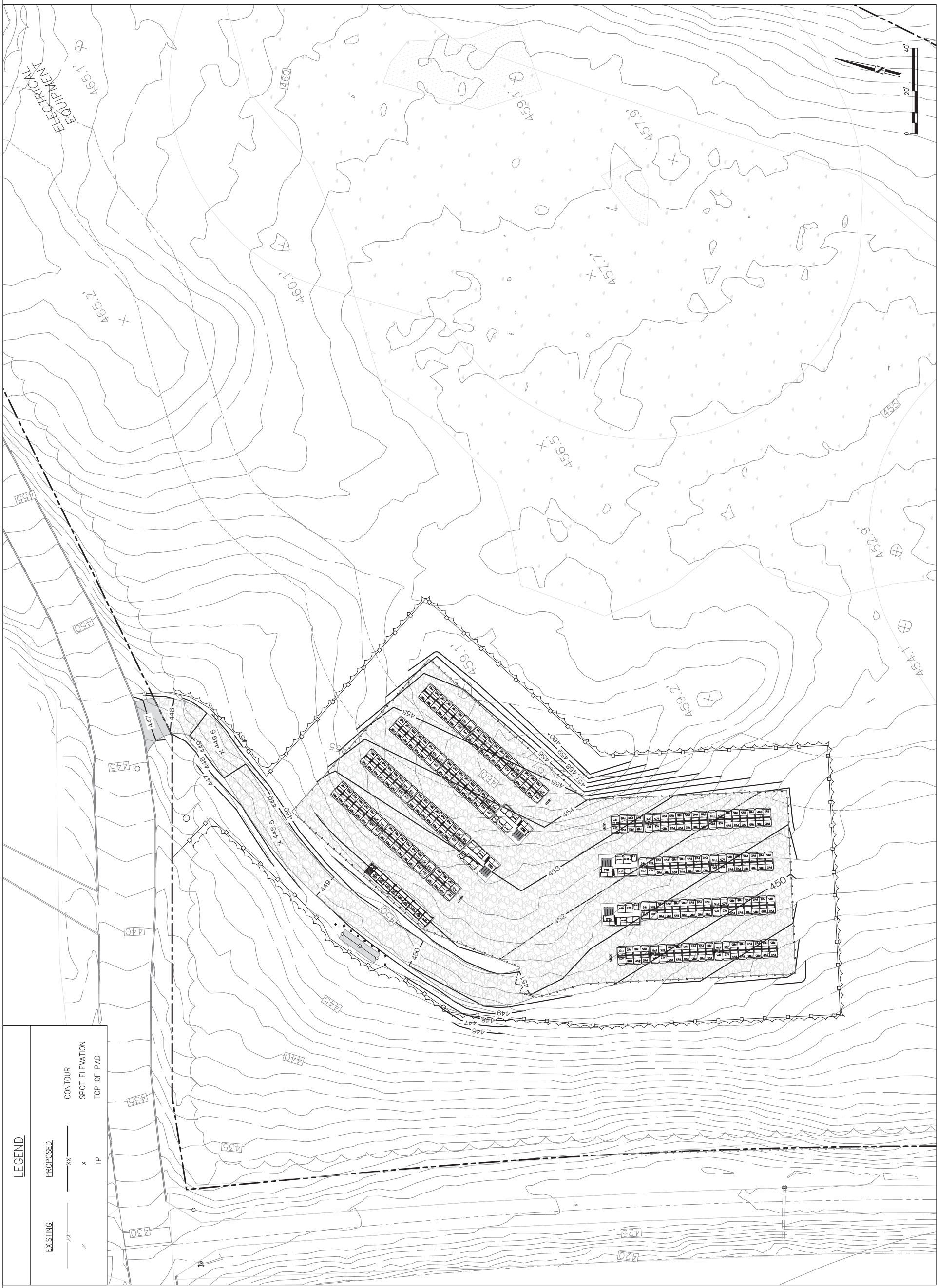
REVIEWED BY  
 CHAD PEARSON  
 APPROVED BY  
 GREENBERG FARROW

SHEET TITLE  
 GRADING  
 PLAN

DRAWING NUMBER  
 C1.2

BLOOM DOCUMENT  
 DOC-1010853

THIS DRAWING IS 24" X 36" AT FULL SIZE  
 SITE ID: EYS000.0 SHEET 05 OF 18



**LEGEND**

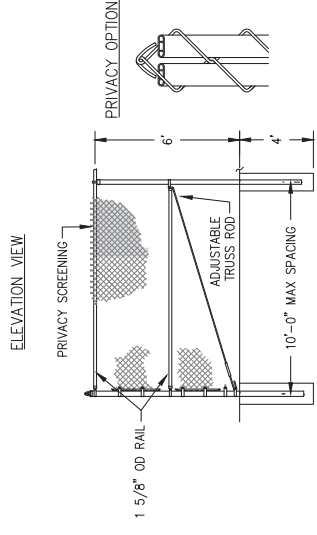
EXISTING	PROPOSED	CONTOUR	SPOT ELEVATION	TOP OF PAD
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1  
 GRADING PLAN  
 SCALE: 1" = 20'

REV	REVISION ISSUE	DATE
-	INITIAL RELEASE	01/03/2020

DESIGNED BY KATE TAYLOR	REVIEWED BY CHAD PERSON
DRAWN BY SURESH KUMAR	CHECKED BY GREENBERG FARROW

SHEET TITLE DETAILS SHEET 1
DRAWING NUMBER C2.1
BLOOM DOCUMENT DOC-1010853
THIS DRAWING IS 24" X 36" AT FULL SIZE SITE ID: EVS000.0



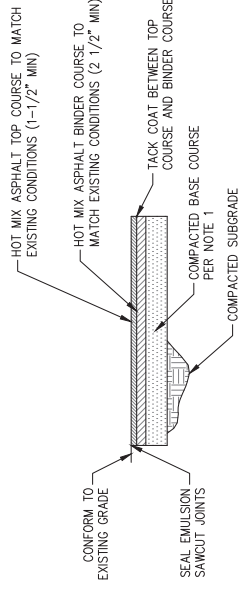
DETAIL NOTES:  
 1. FOOTING WIDTH TO BE (4)X POST WIDTH. MINIMUM DEPTH 48".

**CHAIN LINK FENCE**

SCALE: NTS

3

C2.1



DETAIL NOTES:  
 1. REFER TO UNDERGROUND/TRENCH CONDUIT AND PIPING DETAIL OR ENERGY SERVER AND ANCILLARY PRECAST PAD GRADING FOR COMPACTED BASE COURSE REQUIREMENTS.  
 2. ASPHALT BINDER COURSE IN ACCORDANCE WITH CURRENT APPLICABLE NATIONAL STATE AND LOCAL CODES.

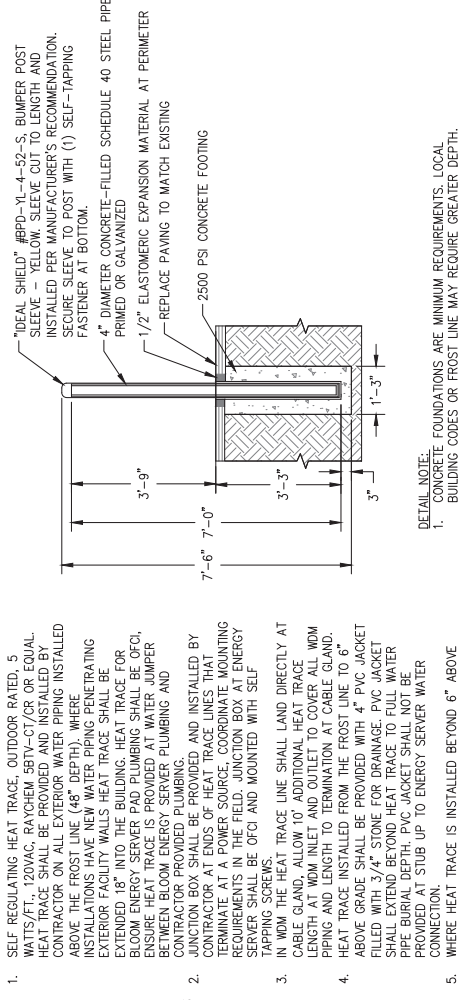
**ASPHALT PAVING**

SCALE: NTS

5

C2.1

DETAIL NOTES:



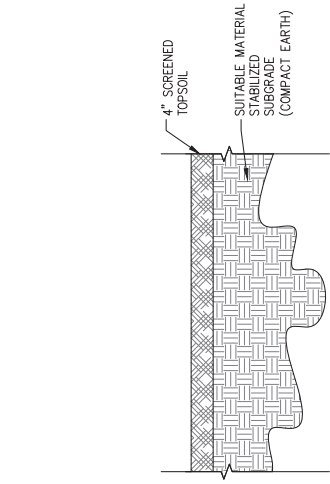
DETAIL NOTE:  
 1. CONCRETE FOUNDATIONS ARE MINIMUM REQUIREMENTS. LOCAL BUILDING CODES OR FROST LINE MAY REQUIRE GREATER DEPTH.

**BOLLARD - FIXED**

SCALE: NTS

10

C2.1



DETAIL NOTES:  
 1. 1" MAX. CONSTRUCTION PRESSURE TREATED, GROUND CONTACT RATED WOOD STAKES OR APPROVED EQUIVALENT @ 48" OC MAX. CUT 1" BELOW HEADER ON 45° BEVEL, NAIL W/ MIN. OF 10D HOG COMMON NAILS INTO 2X4 HEADER.  
 2. TWO (2) STAKES AT ALL JOINTS 18" EACH SIDE OF JOINT.

**GRAVEL SERVICE AREA**

SCALE: NTS

2

C2.1

**LANDSCAPE RESTORATION**

SCALE: NTS

**DETAIL NOTES**

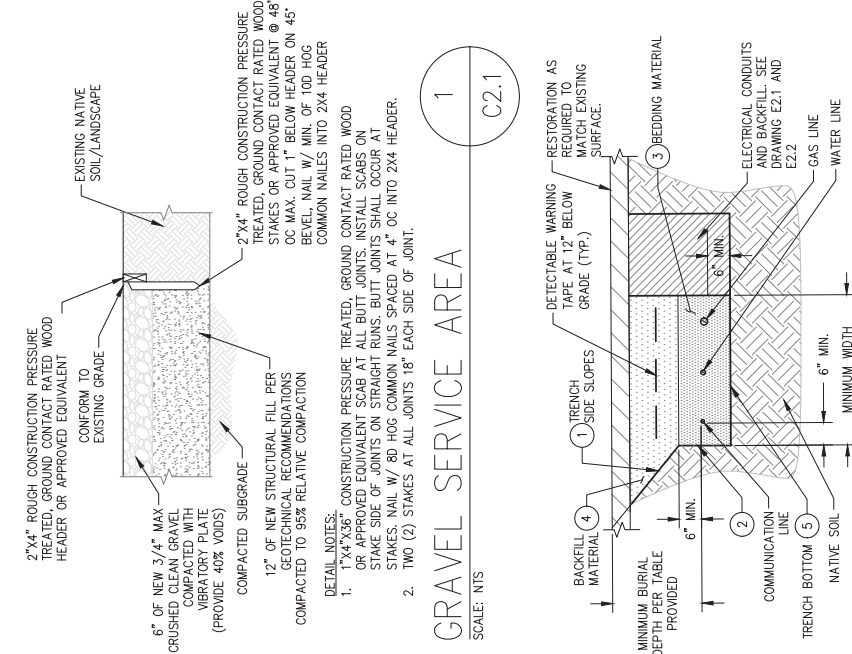
- CONTRACTOR SHALL HIRE A THIRD PARTY SOILS INSPECTION AND TESTING AGENCY TO ASSURE COMPLIANCE OF MATERIALS AND PLACEMENT PROCEDURES WITH DESIGN DRAWINGS, SPECIFICATIONS, AND LOCAL CODES. WORK SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:  
 -PHOTOGRAPH EXCAVATION BOTTOM  
 -VERIFY SOIL SUITABILITY  
 -VERIFY AND REPORT COMPACTION  
 -SUBMIT INSPECTION REPORTS DATED AND SIGNED BY TESTING AGENCY
- TESTING SERVICE DOCUMENTATION SHALL INCLUDE THE FOLLOWING:  
 -DAILY RECORDS AND REPORT  
 -TESTING RECORDS AND DATA SHEETS  
 -PHOTOGRAPHIC RECORDS  
 -FINAL REPORT

ALL RECORDS SHALL AT A MINIMUM BEAR THE PROJECT NAME, LOCATION, DATE, WRITTEN DESCRIPTION OF VISUAL OBSERVATIONS, AND SIGNATURE OF PREPARED OR DESIGNATED AUTHORITY.

- ALL CLEARANCES ARE EDGE TO EDGE AND NOT CENTER TO CENTER.
- ANY DEVIATION FROM HORIZONTAL OR VERTICAL UTILITY SEPARATION DISTANCES TO ACCOMMODATE FIELD CONDITIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO BLOOM ENERGY FOR APPROVAL PRIOR TO UTILITY PLACEMENT.

**DETAIL REFERENCE NOTES**

- TRENCH SHALL BE EXCAVATED AND PROTECTED PER OSHA STANDARD 1926 SUBPART P. OPEN TRENCHES SHALL NOT EXCEED OSHA MAXIMUM SIDE SLOPES. CONTRACTOR TO SHORE AND PROTECT ALL VERTICAL EXCAVATIONS AS REQUIRED BY OSHA. TRENCH WALLS SHALL BE VERTICAL FROM BOTTOM OF EXCAVATION TO TOP OF PIPE OR CONDUIT.
- TRENCH WALLS SHALL BE VERTICAL FROM BOTTOM OF EXCAVATION TO TOP OF PIPE OR CONDUIT BACKFILL.
- BEDDING MATERIALS SHALL BE PLACED IN 6" MAXIMUM LIFTS AND MATCH ADJACENT DUCT BANK BEDDING MATERIALS WHERE APPLICABLE. ACCEPTABLE BEDDING GRADATIONS ARE:  
 a. 3/4" MAXIMUM AGGREGATE BASE.  
 b. ASTM C-33-FINE CONCRETE AGGREGATE (WELL GRADED SAND).  
 c. ASTM C-33-GRADATION NO. 67 OR NO. 7.  
 d. GRADATIONS SIMILAR TO WELL GRADED FINE ROAD BASE MATERIAL ASTM D-1241 GRADATION C AND D.
- BACKFILL MATERIALS SHALL BE 3/4" MAX AGGREGATE BASE MATERIAL ASTM C33 SAND, OR NATIVE SOIL IF APPROVED BY GEOTECHNICAL ENGINEER. AS NOTED PLACE BACKFILL IN 6" MAX LIFTS AND TO BE COMPACTED TO 95% RELATIVE COMPACTION AT ± 2% OPTIMAL MOISTURE CONTENT PER ASTM D1557. SAND LAYER BELOW CONDUIT SHALL BE A MINIMUM DEPTH OF 3".
- IF THE BOTTOM OF THE TRENCH IS SOFT AND COMPACTION CANNOT BE ACHIEVED, CONTRACTOR TO OBTAIN RECOMMENDATION FROM THIRD PARTY SOILS TESTING AND INSPECTION AGENCY AND SUBMIT RECOMMENDATION TO ENGINEER OF RECORD FOR CONFIRMATION.



**MINIMUM BURIAL DEPTHS AND CLEARANCES TABLE**

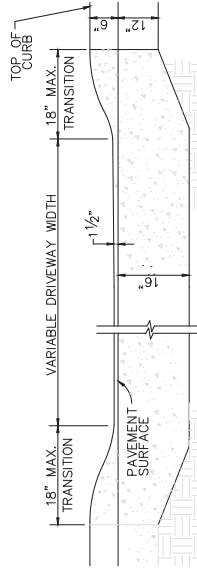
UTILITY	MINIMUM HORIZONTAL DISTANCE TO DIFFERING UTILITY	MINIMUM VERTICAL DISTANCE TO DIFFERING UTILITY	VERTICAL DISTANCE TO DIFFERING UTILITY
COMMUNICATION	6"	12"	12"
GAS	6"	12"	12"
WATER	48"	6"	12"

**UTILITY TRENCH EXCAVATION SPACING & BACKFILL DETAIL**

SCALE: NTS

4

C2.1

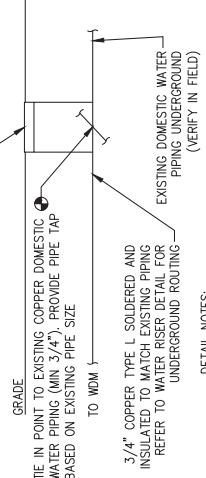


**DEPRESSED CURB DETAIL**

SCALE: NTS

6

C2.1



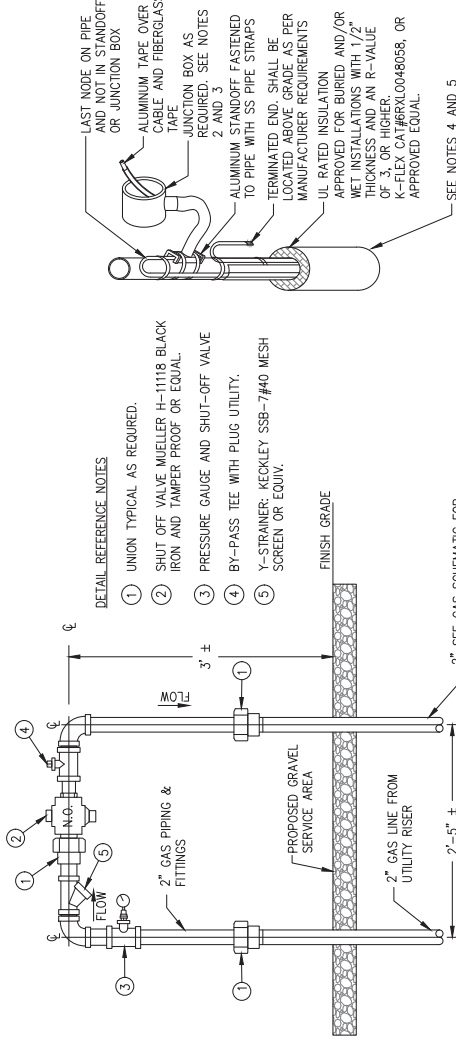
DETAIL NOTES:  
 1. WHERE WATER PRESSURE EXCEEDS 150PSI A PRESSURE REGULATOR MUST BE PROVIDED AND INSTALLED BETWEEN THE POINT OF CONNECTION AND THE WDM.

**DOMESTIC WATER CONNECTION**

SCALE: NTS

7

C2.1



**GAS SHUTOFF VALVE**

SCALE: NTS

8

C2.1

**HEAT TRACE**

SCALE: NTS

9

C2.1

**BOLLARD - FIXED**

SCALE: NTS

10

C2.1









**STRUCTURAL GENERAL NOTES**

**MISCELLANEOUS:**

- THESE GENERAL NOTES SUPPLEMENT THE PROJECT SPECIFICATIONS. REFER TO PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
- STRUCTURAL DRAWINGS ARE INTENDED TO BE USED WITH CIVIL MECHANICAL AND ELECTRICAL DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SUCH REQUIREMENTS INTO THEIR SHOP DRAWINGS AND CONSTRUCTION.
- NO OPENINGS SHALL BE MADE/MODIFIED IN ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE PROFESSIONAL OF RECORD.
- NO CHANGE IN SIZE, MATERIAL OR DIMENSION OF STRUCTURAL MEMBERS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE PROFESSIONAL OF RECORD.
- THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL SUPPORT. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN LOADS SPECIFIED AT THE POINTS OF APPLICATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF CONTRACTORS CONSTRUCTION METHODS AND/OR SEQUENCES.
- DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS.
- CONTRACTOR'S CONSTRUCTION AND/OR ERECTION SEQUENCES SHALL RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.
- THE CONTRACTOR SHALL INFORM THE PROFESSIONAL OF RECORD IN WRITING OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY OF SUCH DEVIATION BY THE PROFESSIONAL OF RECORD. REVISED DRAWINGS, PRODUCT DATA, ETC., UNLESS THE PROFESSIONAL OF RECORD HAS SPECIFICALLY APPROVED THE REVISIONS, SHALL BE CONSIDERED AS NOT VALID AT THE TIME OF SUBMISSION, AND THE PROFESSIONAL OF RECORD HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.
- CONNECTIONS OF ALL ITEMS SUPPORTED BY THE STRUCTURE ARE THE RESPONSIBILITY OF THE DISCIPLINES WHO ARE MAKING THESE ATTACHMENTS. THESE ATTACHMENTS SHALL BE DESIGNED TO RESIST ALL GRAVITY, WIND, WIND UPLIFT, SEISMIC, THERMAL LOADS, ETC.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS.
- UNLESS OTHERWISE NOTED, SUBMIT SHOP DRAWINGS OF ALL FABRICATED MATERIALS TO THE PROFESSIONAL OF RECORD FOR REVIEW AND APPROVAL. THE PROFESSIONAL OF RECORD SHALL BEAR THE INITIAL OF THE CHECKER AND ARE STAMPED "APPROVED" BY THE GENERAL CONTRACTOR.

**DESIGN BASIS**

BUILDING CODE: INTERNATIONAL BUILDING CODE: 2015 EDITION (IBC)

1. DESIGN GRAVITY LOADS = 150 PCF

A. DEAD LOADS = 30 PSF

B. LIVE LOADS = 250 PSF

2. WIND DESIGN BASIC WIND SPEED (3 SECOND GUST) = 108 MPH (ULT)

ULTIMATE WIND SPEED = 139 MPH (ULT)

WIND IMPORTANCE FACTOR (I<sub>e</sub>) = 1.00

EXPOSURE = C

3. SEISMIC DESIGN S<sub>s</sub> = 0.174 s<sub>m</sub> = 0.186

S<sub>1</sub> = 0.062 s<sub>d</sub> = 0.099

SEISMIC IMPORTANCE FACTOR (I<sub>p</sub>) = 1.5

SEISMIC SITE CLASS = D (ASSUMED)

SEISMIC DESIGN CATEGORY = B

MECHANICAL EQUIPMENT SEISMIC FORCE (FP) = 0.3S<sub>08</sub>W

**FOUNDATIONS**

1. CAST IN PLACE PADS SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST IBC, CH 18 AND RECOMMENDATIONS MADE IN THE GEOTECHNICAL INVESTIGATION REPORT (#6JB16027.000) PREPARED BY WHITESTONE ASSOCIATES, INC. DATED 11-21-2018, WITH THE FOLLOWING PARAMETERS:

ALLOWABLE SOIL BEARING CAPACITY = 1500 psf (ASSUMED)

MODULUS OF SUBGRADE REACTION = 150 psf/in

SOIL FRICTION COEFFICIENT = 0.35

2. ALL BEARING MATERIAL SHALL BE INSPECTED BY GEOTECHNICAL ENGINEER OR INDEPENDENT TESTING AGENCY PRIOR TO CONCRETE PLACEMENT. THE GEOTECHNICAL ENGINEER SHALL VERIFY THE BEARING MATERIAL FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE ADJUSTED AS REQUIRED.

**CONCRETE AND REINFORCING STEEL:**

1. CONCRETE SHALL CONFORM TO ACI BUILDING CODE (318R-14) AND SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH AND DENSITY, IN ACCORDANCE WITH THE FOLLOWING (UNLESS OTHERWISE NOTED):

STRENGTH = 4500 psf

DENSITY = 145 pcf

MAX. W/C RATIO = 0.45

**EXTERIOR SLABS**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE TEST AND INSPECTION FIRM WITH A SCHEDULE TO FACILITATE THE PROPER COORDINATION OF THE WORK. DELIVER THE SPECIAL INSPECTION REPORTS TO THE OWNER'S REPRESENTATIVE.

2. REINFORCED CONCRETE PADS SHALL BE AIR ENTRAINED (8% ±1.5%) AND SHALL CONFORM TO THE RECOMMENDATIONS MADE IN ACI-318 FOR EXPOSURE CLASS F-2 CONCRETE. REBAR SHALL CONFORM TO ASTM A615, GRADE 60. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185, UNLESS OTHERWISE NOTED.

3. MINIMUM CONCRETE COVER, UNLESS OTHERWISE NOTED, UNFORMED SURFACE IN CONTACT WITH THE GROUND: #6 BARS AND LARGER 1-1/2 IN. #5 BARS AND SMALLER 1-1/2 IN.

4. LAP SPLICES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLES, UNLESS OTHERWISE NOTED. WHERE CLASSES ARE NOT CALLED OUT ON DRAWINGS, USE CLASS "B". SPLICES SHALL BE STAGGERED AT LEAST 24 INCHES.

COMPRESSION SPLICES		TENSION SPLICES (INCHES)	
BAR SIZE	OTHER BARS	(INCHES)	
#3	"A"	"B"	"B"
#4	16	21	12
#5	21	28	16
#6	27	35	21
#7	35	46	27
#8	46	62	37
#9	63	82	48
#10	83	104	61
#11	101	131	78
#12	125	162	96
#13	151	201	125

FORMED SURFACE NOT EXPOSED TO EARTH OR WEATHER: BEAMS, GIRDERS AND COLUMNS 1-1/2 IN. SLABS, WALLS AND JOISTS #11 BARS AND SMALLER 3/4 IN. #14 AND #18 BARS 1-1/2 IN.

5. LAP SPLICES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLES, UNLESS OTHERWISE NOTED. WHERE CLASSES ARE NOT CALLED OUT ON DRAWINGS, USE CLASS "B". SPLICES SHALL BE STAGGERED AT LEAST 24 INCHES.

WEDGE ANCHOR EXPANSION BOLTS - HILTI KWIK BOLT TZ		TORQUE TEST PER MANUFACTURER RECOMMENDATIONS (FT-LBS.)	
ANCHOR DIA (IN.)	MINIMUM EMBEDMENT (IN.)	(CONCRETE)	
3/8"	3	15	25
1/2"	3-3/4	25	40
5/8"	4	40	60
3/4"	4-3/4	60	110

6. SEC. 1901.3.4.4. TEST LOAD: REQUIRED TEST LOADS ARE DETERMINED BASED ON MANUFACTURER'S RECOMMENDED INSTALLATION TORQUE BASED ON APPROVED EVALUATION REPORT.

7. SEC. 1901.3.4.3. TEST FREQUENCY: 50 PERCENT OF THE ALL EXPANSION-TYPE ANCHORS SHALL BE TESTED BY OWNERS TESTING LABORATORY FOR THE TORQUE VALUES AS INDICATED IN TABLES BELOW PER SEC. 1901.3.4.2. TESTING PROCEDURE. IF ANY ANCHOR FAILS TESTING, ALL ANCHORS OF THE SAME TYPE SHALL BE TESTED, WHICH ARE INSTALLED BY THE SAME TRADE, NOT PREVIOUSLY TESTED UNTIL TWENTY CONSECUTIVE ANCHORS PASS, THEN RESUME THE INITIAL TEST FREQUENCY.

8. SEC. 1901.3.4.5. TEST ACCEPTANCE CRITERIA: ACCEPTANCE CRITERIA FOR POST INSTALLED ANCHORS SHALL BE BASED ON TORQUE WRENCH METHOD. ANCHORS TESTED WITH A CALIBRATED TORQUE WRENCH MUST ATTAIN THE SPECIFIED TORQUE WITHIN 1/2 TURN OF THE NUT OR ONE-QUARTER (1/4) TURN OF THE NUT FOR A 3/8" SLEEVE ANCHOR ONLY.

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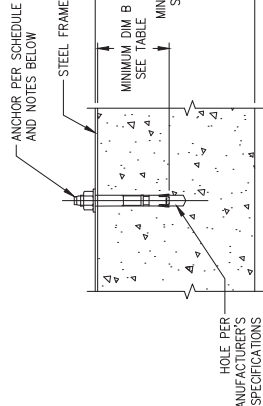
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ANCHOR SCHEDULE				
PAD TYPES	DIM A	BOLT SIZE	DIM B - BOLT MIN EMBEDMENT	MIN CLR TO SLAB EDGE OR OPENING
ANCILLARY EQUIPMENT (POS. WDM & TO)	12"	1/2"	3 1/4"	3"
MEDIUM VOLTAGE SWITCHGEAR TRANSFORMER (3750KVA)	12"	3/4"	4 3/4"	9"
	12"	3/4"	4 3/4"	10"

**ANCHOR NOTES:**

- ALL ANCHORS IN CONCRETE SHALL BE 316 STAINLESS STEEL HILTI KWIK BOLT TZ ICC ESR-1917 ANCHOR (OR APPROVED EQUIVALENT), UNLESS NOTED OTHERWISE.
- MINIMUM ANCHOR SPACING (AS) AND ANCHOR EDGE DISTANCE (ED) SHALL BE AS PUBLISHED BY THE MOST CURRENT APPROVED HILTI REPORT IN ORDER TO DEVELOP MAXIMUM WORKING LOAD. UNLESS NOTED OTHERWISE.
- ALL ANCHORS SHALL BE INSTALLED AS PER MANUFACTURERS' INSTRUCTIONS IN ORDER TO DEVELOP THE PUBLISHED WORKING LOADS. NO REINFORCING SHALL BE CUT OR DAMAGED UPON INSTALLATION OF ANY ANCHORS. SPECIAL INSPECTIONS SHALL BE PROVIDED IN ACCORDANCE WITH BUILDING CODE AND IN ACCORDANCE WITH THE HILTI REPORT. MINIMUM CONCRETE COMPRESSIVE STRENGTH REQUIRED AT THE TIME OF INSTALLATION OF ANY ANCHORS SHALL BE 2500 PSI.

**TYPICAL ANCHOR DETAIL (APPLIES TO ALL CAST-IN-PLACE PADS)**

SCALE: NTS

1

S0.1

GRANUL SERVICE AREA. REFER TO CIVIL PLAN AND SURFACE RESTORATION DETAIL (TYP ALL SIDES)

VARIES REFER TO PAD DETAIL CONCRETE PAD. SEE PAD DETAIL DRAWING SHEET FOR MORE INFORMATION

TOP OF PAD 1" MAX ABOVE FINISHED GRADE

1'-0" MIN ALL SIDES (TYP)

24" THICK (MIN) OVER EXCAVATE AND BACKFILL WITH ENGINEERED FILL. BACKFILL TO BE INSTALLED IN 6" (MAX) LIFTS AND COMPACTED TO 95% RELATIVE COMPACTION IN ACCORDANCE WITH ASTM D1557 WITH 2% ABOVE OPTIMAL SOIL MOISTURE CONTENT.

ENGINEERED FILL MATERIALS SHALL BE: - CLEAN AND NON-EXPANSIVE ENGINEERED FILL COMPRISING SILTY SAND OR POORLY GRADED SAND (SM OR SP PER USCS) WITH 3/4" MAX IN SIZE, AN EXPANSION INDEX OF LESS THAN 20 AND LESS THAN 3% ORGANIC MATTER BY WEIGHT.

ON-SITE SOIL VERIFIED AND TESTED BY GEOTECHNICAL ENGINEER TO MEET THE REQUIREMENTS ABOVE.

CONTRACTOR SHALL VERIFY AND REPORT SITE CONDITIONS AT PAD AND INFORM E.O.R OF SUCH CONDITIONS

CONTRACTOR TO STOP WORK IMMEDIATELY AND CONTACT THE ENGINEER OF RECORD IF ANY OF THE FOLLOWING CONDITIONS ARE PRESENT:

A) CONTAMINATED SOIL INDICATED BY ODOR, DARK SOIL OR THE PRESENCE OF TAR LIKE SUBSTANCES;

B) INDICATIONS THAT THE WATER TABLE IS WITHIN 5' OF THE SOIL SURFACE.

C) ANY OTHER CONDITIONS THAT MAY BE DEEMED HAZARDOUS BY THE CONTRACTOR.

CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE FOR DIRECTION IN THE EVENT PADS ARE LOCATED WITHIN 15' OF SLOPES EXCEEDING 5' IN HEIGHT.

SUBGRADE AND AGGREGATE BASE SHALL BE SAMPLED AND TESTED TO VERIFY COMPLIANCE WITH THE PROJECT PLANS. IN ADDITION, IN-PLACE EQUIPMENT TEST SHOULD BE CONDUCTED FOR THE SUBGRADE.

EQUIPMENT PAD SLOPE SHALL HAVE A MAXIMUM 2% GRADE IN ANY DIRECTION.

CONTRACTOR SHALL HIRE A THIRD PARTY SOILS INSPECTION AND TESTING AGENCY TO PHOTOGRAPH BOTTOM OF EXCAVATION. VERIFY SOILS ARE SUITABLE. AND VERIFY AND REPORT COMPACTION PER LOCAL CODE. TEST REPORTS AND INSPECTION REPORTS SHALL BE STAMPED BY A PROFESSIONAL ENGINEER.





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SAN JOSE, CA 95134

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ENGINEER OF RECORD  
BILL BORNHORST, P.E.  
LICENSE # 16562

CUSTOMER SITE

EVERSOURCE  
160 OLD AMSTON ROAD  
COLCHESTER, CT 06415



REVISION HISTORY	
REV	DATE
-	INITIAL RELEASE 01/03/2020

DESIGNED BY KATE TAYLOR	REVIEWED BY CHAD FEARSON
DRAWN BY SURESH KUMAR	APPROVED BY GREENBERG FARROW

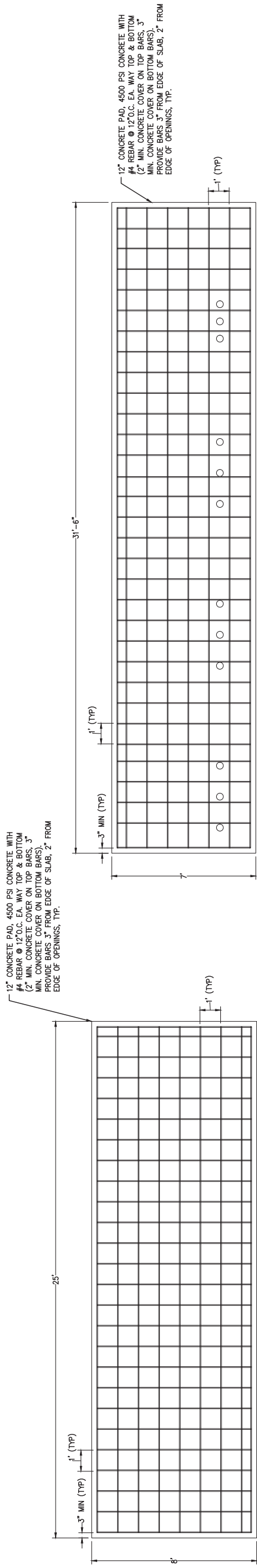
SHEET TITLE

EQUIPMENT PAD  
DETAILS-2

DRAWING NUMBER  
S1.2

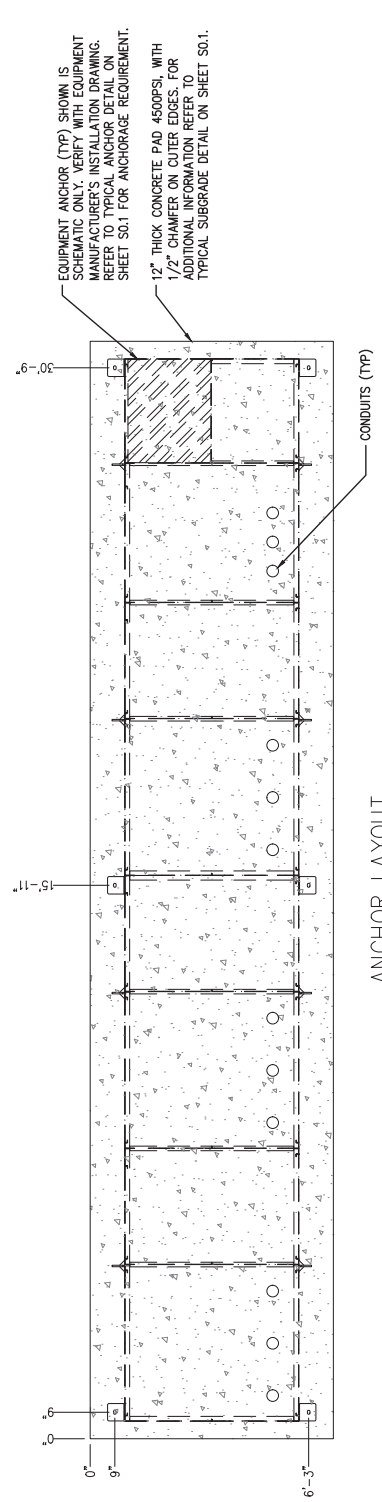
BLOOM DOCUMENT  
DOC-1010853

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SITE ID: EYS000.0 SHEET 12 OF 18



REBAR LAYOUT

GAS PAD DETAIL  
CAST-IN-PLACE CONCRETE PAD  
SCALE: NTS  
1  
S1.2



ANCHOR LAYOUT

NEW MV SWITCHGEAR  
CAST-IN-PLACE CONCRETE PAD  
SCALE: NTS  
2  
S1.2

REV	REVISION HISTORY	DATE
-	INITIAL RELEASE	01/03/2020
1	UPDATES PER CSZ DMI PLAN INTERCHANGES	03/10/2020

DESIGNED BY	REVIEWED BY
KATE TAYLOR	CHAD PEARSON
DRAWN BY	APPROVED BY
SURESH KUMAR	GREENBERG FARROW

SHEET TITLE  
**ELECTRICAL CONDUIT LAYOUT AND DUCT BANK DETAILS**

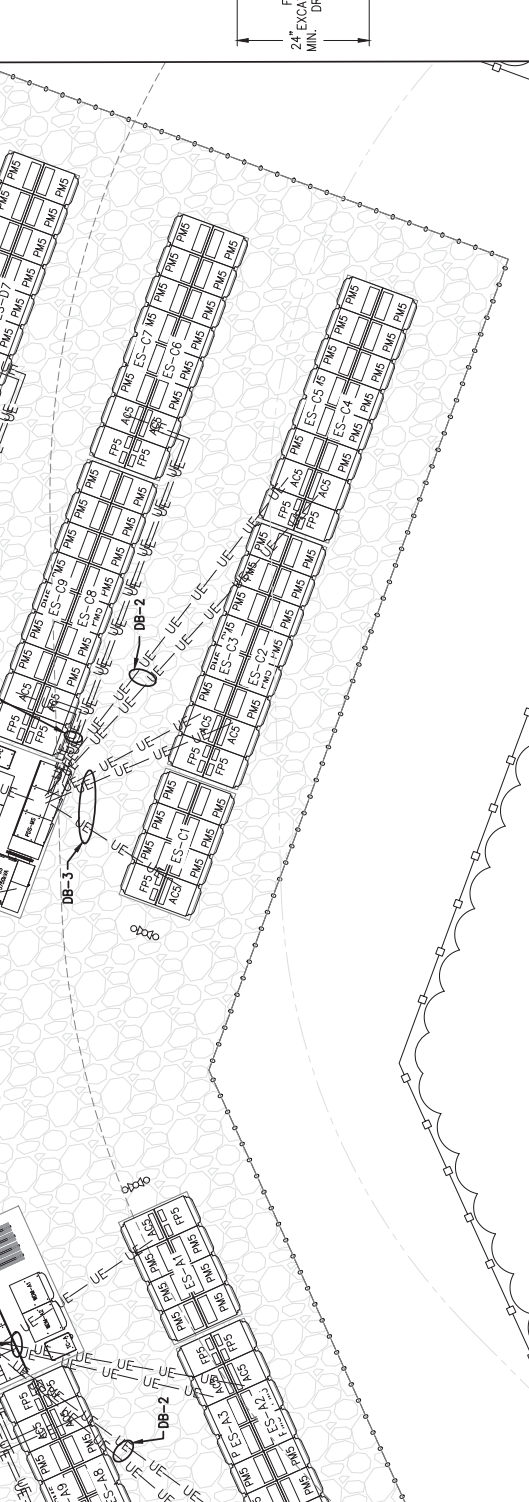
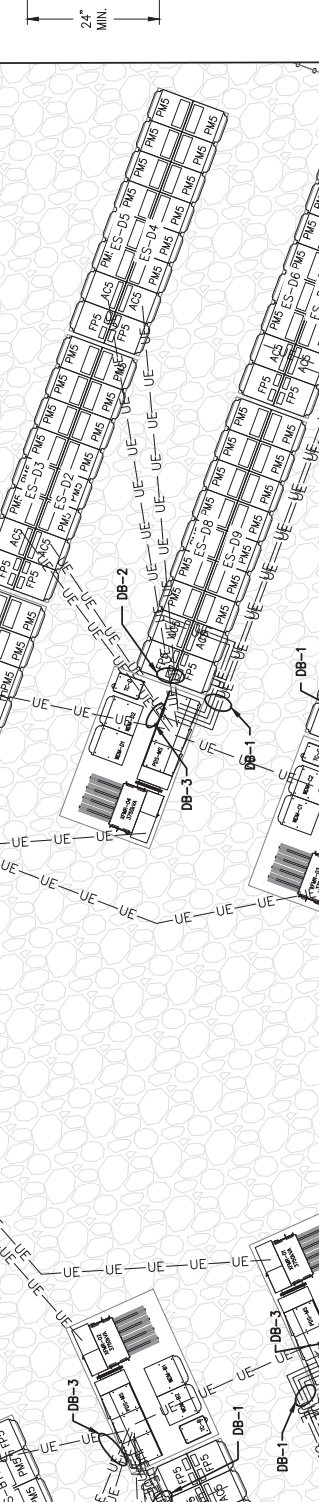
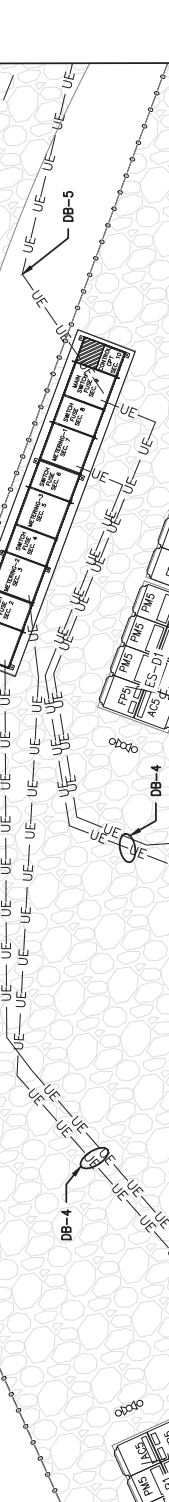
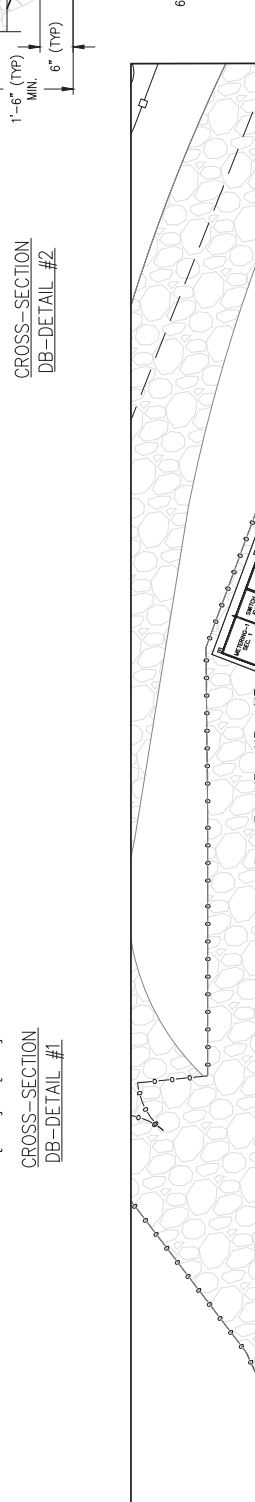
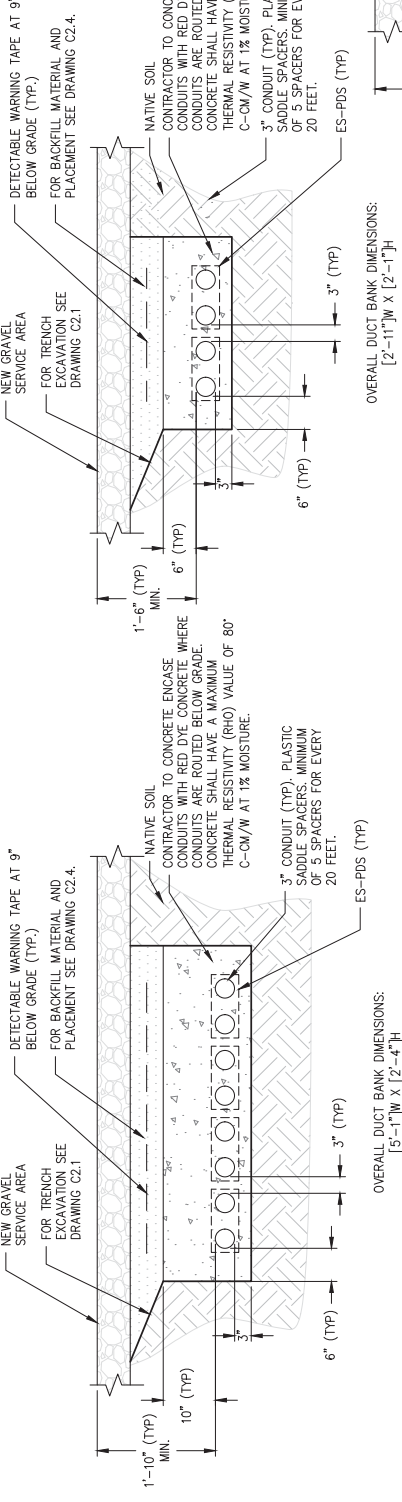
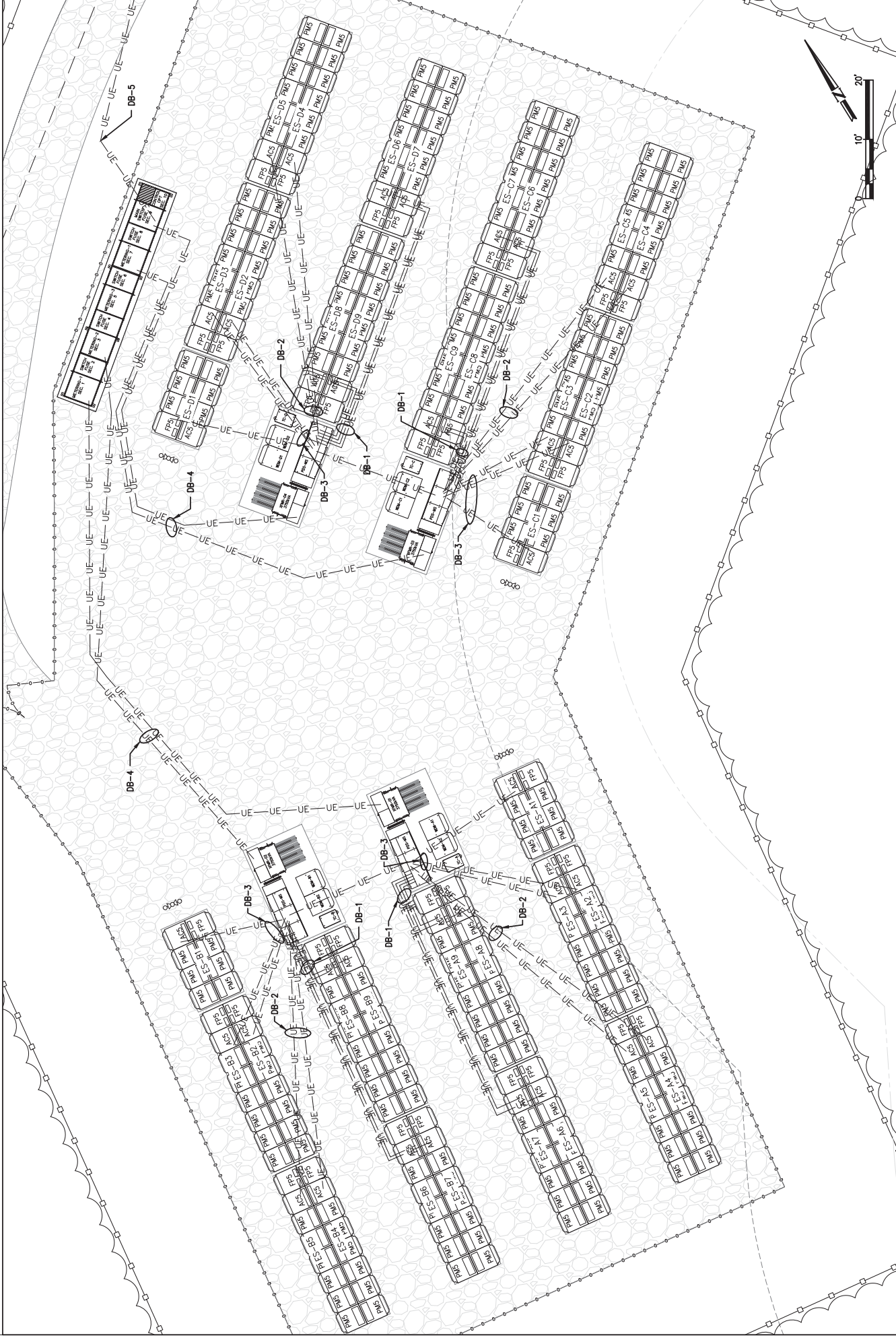
DRAWING NUMBER  
E1.1A

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DOC-1010853

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SITE ID: EYS000.0 SHEET 13 OF 18

- 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.
  - SEE BLOOM ENERGY PRODUCT INSTALLATION DRAWINGS FOR UTILITY CONNECTIONS TO ANCILLARY EQUIPMENT AND ENERGY SERVER.
  - SEE SHEETS C1.1, C1.2 FOR DETAILED WATER, GAS AND COMMUNICATION CONDUIT RUNS AND GENERAL ELECTRICAL CONDUIT RUNS.
  - CONTRACTOR SHALL PROVIDE PULL BOX WHERE ELECTRICAL CONDUIT RUNS EXCEED 360-DEG BENDS.

ANTICIPATED DUCT BANKS SHOWN FOR INFORMATION PURPOSES ONLY. CONTRACTOR SHALL PROVIDE ACTUAL DUCT BANK LAYOUT AND SECTIONS FOR APPROVAL BY ENGINEER PRIOR TO INSTALLATION.



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 LICENSE # 32113

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REV	REVISION ISSUE	DATE
-	INITIAL RELEASE	01/03/2020
1	UPDATES PER CSC DMI PLAN INTERCHANGES	03/10/2020

DESIGNED BY  
 KATE TAYLOR

DRAWN BY  
 SURESH KUMAR

REVIEWED BY  
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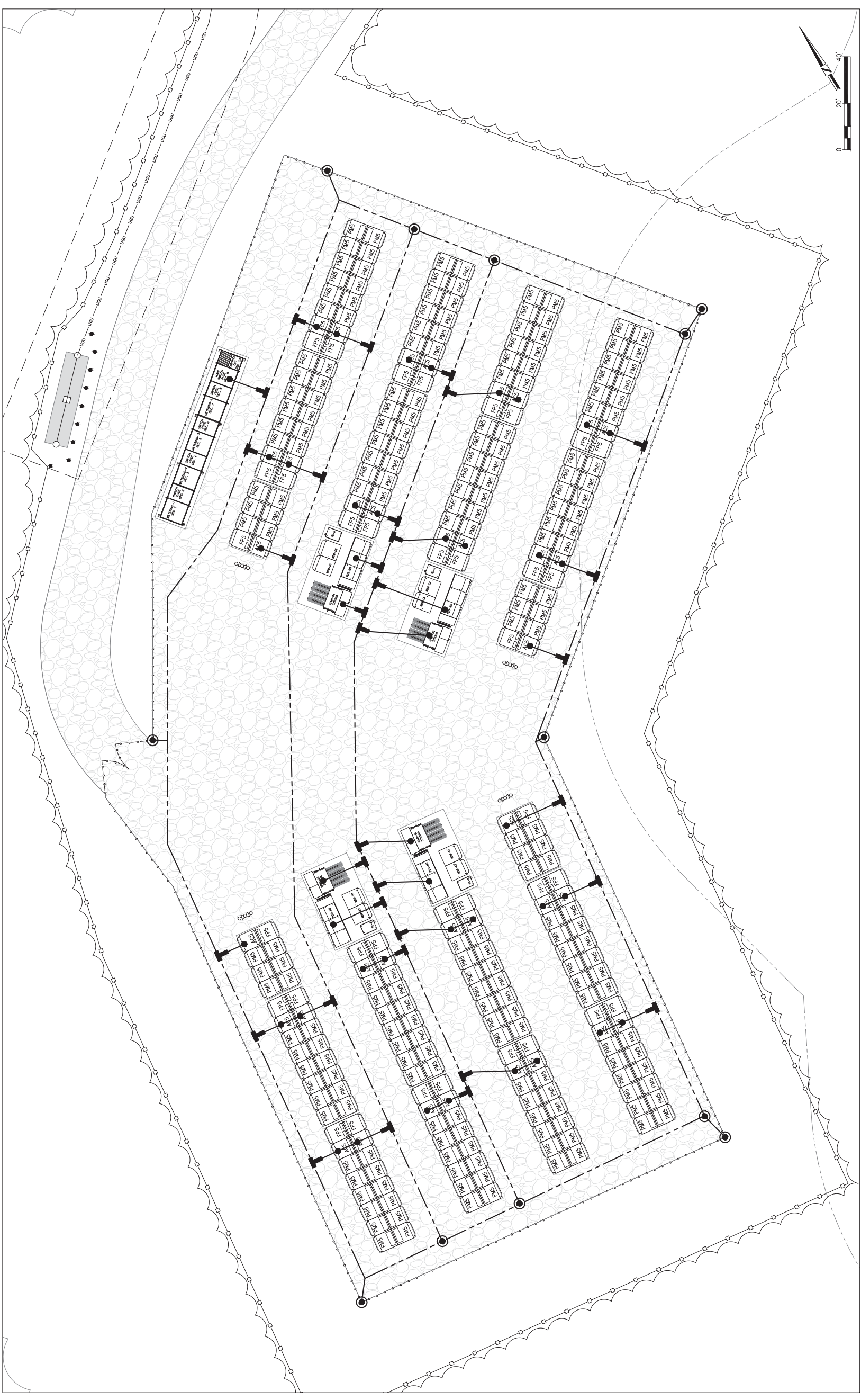
APPROVED BY  
 GREENBERG FARROW

SHEET TITLE  
 GROUNDING  
 PLAN

DRAWING NUMBER  
 E1.1B

BLOOM DOCUMENT  
 DOC-1010853

THIS DRAWING IS 24" X 36" AT FULL SIZE  
 SITE ID: EYV0000.0 SHEET 14 OF 18



1  
 E1.1B

GROUNDING PLAN  
 SCALE: 1" = 10'

REFERENCE SHEET NOTES

GENERAL NOTES

1. DEPTH OF GROUND RING SHALL BE MINIMUM 18" BELOW GRADE.
2. GROUND RING SHALL BE EXOTHERMICALLY WELDED TO GROUND RODS

LEGEND

- #4/0 AWG BARE STRANDED COPPER
- GROUND ROD, 3/4"D X 10'L
- ⊥ GROUND GRID TEE EXOTHERMIC CONNECTION
- BONDING CONNECTION POINT FROM GROUND GRID TO EQUIPMENT
- ) #4/0 AWG BARE STRANDED COPPER



REV	REVISION ISSUE	DATE
-	INITIAL RELEASE	01/03/2020

DESIGNED BY KATE TAYLOR	REVIEWED BY CHAD FEARSON
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SHEET TITLE ELECTRICAL SINGLE LINE DIAGRAM STAMP A & B
DRAWING NUMBER E3.1A

BLOOM DOCUMENT DOC-1010853
THIS DRAWING IS 24" X 36" AT FULL SIZE SITE ID: EYS000.0 SHEET 15 OF 18

**GENERAL NOTES**

- FEEDER SHALL NOT BE ROUTED THROUGH THE UTILITY PULL OR UTILITY METER SECTIONS. FEEDER SHALL NOT BE ROUTED THROUGH ANY OTHER SECTION THAN THAT IN WHICH IT TERMINATES UNLESS BARRIERS ARE PROVIDED PER NEC 408.3.
- THE ENERGY SERVER INVERTER OUTPUT CHARACTERISTICS SHALL BE IN ACCORDANCE WITH NEC 705.14.
- INTERCONNECTIONS SHALL BE IN ACCORDANCE WITH NEC 705.10.
- THE ENERGY SERVER OUTPUT IS EQUIPPED WITH UTILITY-INTERACTIVE INVERTERS RECOGNIZED BY UL TO UL1741 AND IEEE 1547 AND COMPLIES WITH NEC 692.62. INVERTER SETTINGS PER THE PROVIDED TABLE BELOW.
- THE ENERGY SERVER IS NOT A SEPARATELY DERIVED SYSTEM PER NEC 250.30 [ART. 100]

**REFERENCE SHEET NOTES**

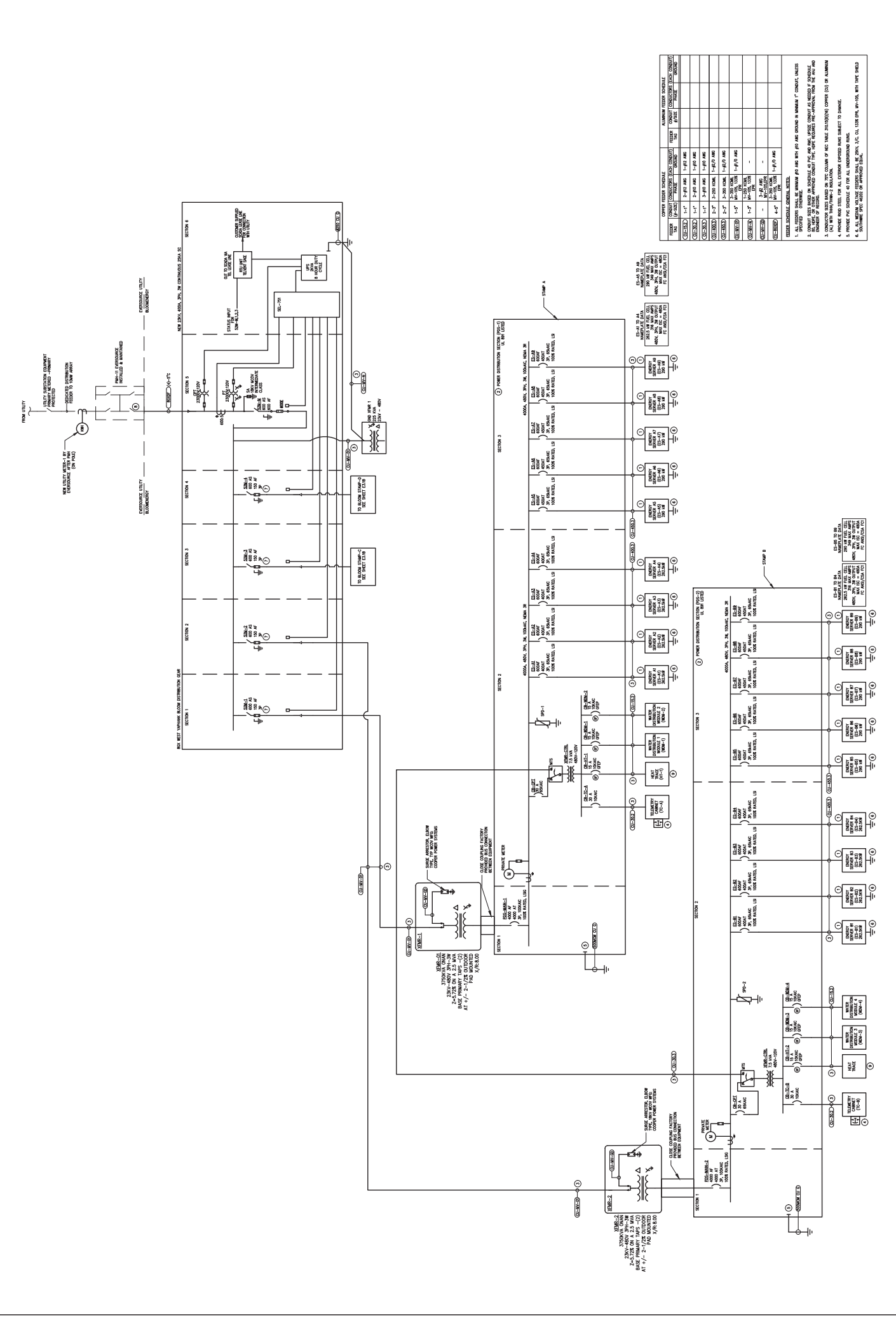
- ALL CONNECTIONS FROM FUEL CELLS TO INVERTER ARE FACTORY WIRED AND ALL MAINTENANCE CABINETS ARE ACTIVELY PRESSURIZED; THEREFORE, NO CLASS 1, DIVISION 2 WIRING IS REQUIRED.
- ALL COMPONENTS SHOWN IN THIS BOUNDARY SHALL BE UL LISTED TOGETHER AS A SINGLE COMPLETE. ALL INCLUSIVE UNIT. ALL ELECTRICAL CONDUIT/CABLE CONNECTIONS WITHIN THIS BOUNDARY SHALL BE FACTORY INSTALLED WITH SOME FINAL CONNECTIONS TO BE COMPLETED BY THE CONTRACTOR IN THE FIELD. REFER TO BLOOM INSTALLATION MANUAL FOR ALL FINAL TERMINATION POINTS.
- CONTRACTOR SHALL PROVIDE CONDUIT AND CONDUCTORS AS INDICATED. SECTION OF CONDUIT SHALL BE PER THE BLOOM INSTALLATION MANUAL. TO BLOOM INSTALLATION MANUAL FOR ALL FINAL TERMINATION POINTS AT BLOOM PROVIDED EQUIPMENT.
- MANUFACTURER INSTALLED, PRE-WIRED EPO BUTTON LOCATED IN READILY ACCESSIBLE LOCATION AT ENERGY SERVER PLATFORM AND CONNECTED TO TELEMETRY CABINET TERMINAL STRIP.
- PROVIDE NEW GROUND CONDUCTOR FROM THE POWER DISTRIBUTION SECTION TO THE UFER GROUND ROD IN THE PRE-CAST ANCHORAGE PAD.
- PROVIDE (1) #1/0 AWG CU FROM ENERGY SERVER GROUND TO UFER GROUND IN ENERGY SERVER PAD, TYP.
- THE UTILITY-INTERACTIVE INVERTER POINT OF CONNECTION SHALL BE IN ACCORDANCE WITH NEC 705.12.
- CONTRACTOR TO INSTALL FEEDER TO EXISTING PMH-11, TERMINATIONS BY UTILITY.
- ONE 15A GFCI CIRCUIT FOR EVERY TWO ENERGY SERVER PAIR.

**MANUFACTURER SUPPLIED INVERTER SETTINGS**

FUNCTION	TRIP VALUE	TRIP TIME	OPERATING MODE
UNDERVOLTAGE (27-1)	423V (88%)	2.00 SECONDS (66 CYCLES)	MO
UNDERVOLTAGE (27-2)	240V (<50%)	1.10 SECONDS (120 CYCLES)	MC
OVERVOLTAGE (59-1)	528V (>110%)	2.00 SECONDS (120 CYCLES)	MC
OVERVOLTAGE (59-2)	576V (>120%)	0.16 SECONDS (10 CYCLES)	NA
UNDERFREQUENCY 1 (81U-1)	58.5 HZ	300 SECONDS (18,000 CYCLES)	MO
UNDERFREQUENCY 2 (81U-2)	56.5 HZ	0.16 SECONDS (10 CYCLES)	NA
OVERFREQUENCY 1 (81O-1)	61.2 HZ	300 SECONDS (18,000 CYCLES)	MO
OVERFREQUENCY 2 (81O-2)	62.0 HZ	0.16 SECONDS (10 CYCLES)	NA
RECONNECT TIMER (79)	N/A	5.00 MINUTES (36,000 CYCLES)	NA

**INVERTERS VOLTAGE RIDE-THROUGH CAPABILITY AND OPERATIONAL REQUIREMENTS**

VOLTAGE RANGE (p.u.)	OPERATING MODE / RESPONSE	MIN. RIDE THROUGH TIME(S) (DESIGN CRITERIA)	MIN. RESPONSE TIME(S) (DESIGN CRITERIA)
V > 1.20	PERMISSIVE OPERATION	N/A	0.16
1.175 < V ≤ 1.20	PERMISSIVE OPERATION	0.2	N/A
1.15 < V ≤ 1.175	PERMISSIVE OPERATION	0.5	N/A
1.10 < V ≤ 1.15	PERMISSIVE OPERATION	1	N/A
0.88 ≤ V ≤ 1.10	CONTINUOUS OPERATION	INFINITE	N/A
0.65 ≤ V < 0.88	MANDATORY OPERATION	LINEAR SLOPE OF 8.7 S/1 P.U. VOLTAGE STARTING AT 3 S @ 0.65 P.U.; T <sub>VRT</sub> = 3 S + $\frac{V-0.65}{0.05}$	N/A
0.45 ≤ V < 0.65	PERMISSIVE OPERATION	0.32	N/A
0.30 ≤ V < 0.45	PERMISSIVE OPERATION	0.16	N/A
V ≤ 0.30	CEASE TO ENERGIZE	N/A	0.16



1  
E3.1A

SINGLE LINE DIAGRAM  
SCALE: NTS

S.NO.	FROM	TO	VOLTAGE	FEEDER TAG	FEEDER SIZE	# OF PARALLEL FEEDERS	FEEDER LENGTH in ft	*RESISTANCE R Ω	*REACTANCE X Ω	*IMPEDANCE ZL Ω
1	POC	NEW MV SWGR	23kV	80XDF	3-1C x 350KCMIL	4	650	0.0061	0.0073	0.0095
2	NEW MV SWGR	XFMR-1	23kV	CU-MV-01	3-1C x 350KCMIL	1	60	0.0023	0.0007	0.0023
3	NEW MV SWGR	XFMR-2	23kV	CU-MV-01	3-1C x 350KCMIL	1	45	0.0017	0.0005	0.0018
4	XFMR	PDS	480V	BUS BAR	XFMR and PDS are close coupled. Length of bus bar connecting XFMR and PDS are very small. Impedance is negligible.					
5	PDS-1	ES-A1:ES-A4	480V	CU-350.3	3-1C x 250KCMIL	2	50	0.0014	0.0005	0.0007
6	PDS-1	ES-A5:ES-A8	480V	CU-450.3	3-1C x 350KCMIL	2	60	0.0014	0.0006	0.0007
7	PDS-2	ES-B1:ES-B4	480V	CU-350.3	3-1C x 250KCMIL	2	50	0.0014	0.0005	0.0007
8	PDS-2	ES-B5:ES-B8	480V	CU-450.3	3-1C x 350KCMIL	2	60	0.0014	0.0006	0.0007

2  
E3.1A

CONDUCTOR/FEEDER IMPEDANCE TABLE  
SCALE: NTS

- NOTES:
- MAXIMUM FEEDER LENGTH BETWEEN ES AND PDS ARE CONSIDERED FOR CALCULATION.
  - FEEDER RESISTANCE AND REACTANCE ARE TAKEN FOR THE THIN-2 CONDUCTORS WITH 3-1/C+G CONFIGURATION WITH NON MAGNETIC DUCT.
  - RESISTANCE, REACTANCE AND IMPEDANCE VALUE SHOWN ARE FOR TOTAL NUMBER OF PARALLEL CONDUCTORS AND FOR SPECIFIED LENGTH.





# Energy Server™ 5

Always On, Clean Energy  
Using Patented Solid Oxide  
Fuel Cell Technology

PRODUCT DATASHEET



## The Energy Server 5 provides combustion-free electric power with these benefits

**Clean**  
Our systems produce near zero criteria pollutants (NOx, SOx, and particulate matter) and far fewer carbon emissions than legacy technologies.

**Reliable**  
Bloom Energy Servers are designed around a modular architecture of simple repeating elements. This enables us to generate power 24 x 7 x 365 and can be configured to eliminate the need for traditional backup power equipment.

**Resilient**  
Our system operates at very high availability due to its fault-tolerant design and use of the robust natural gas pipeline system. Bloom Energy Servers have survived extreme weather events and other incidences and have continued providing power to our customers.

**Simple Installation and Maintenance**  
Our Energy Servers are plug and play and have been designed in compliance with a variety of safety standards. Bloom Energy manages all aspects of installation, operation and maintenance of the systems.

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## Energy Server 5 Technical Highlights (ES5-AA2AAN)

<b>Outputs</b>	<ul style="list-style-type: none"> <li>Nameplate power output (net AC) 262.5 kW</li> <li>Load output (net AC) 250 kW</li> <li>Electrical connection 480V, 3-phase, 60 Hz</li> </ul>
<b>Inputs</b>	<ul style="list-style-type: none"> <li>Fuels Natural gas, directed biogas</li> <li>Input fuel pressure 10-18 psig (15 psig nominal)</li> <li>Water None during normal operation</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>Cumulative electrical efficiency (LHV net AC)<sup>1</sup> 65-53%</li> <li>Heat rate (HHV) 5,811-7,127 Btu/kWh</li> </ul>
<b>Emissions<sup>2</sup></b>	<ul style="list-style-type: none"> <li>NOx 0.0017 lbs/MWh</li> <li>SOx Negligible</li> <li>CO 0.024 lbs/MWh</li> <li>VOCs 0.0159 lbs/MWh</li> <li>CO<sub>2</sub> @ stated efficiency 679-833 lbs/MWh on natural gas, carbon neutral on directed biogas</li> </ul>
<b>Physical Attributes and Environment</b>	<ul style="list-style-type: none"> <li>Weight 13.6 tons</li> <li>Dimensions (variable layouts) 14'4" x 8'8" x 6'9" or 28'8" x 4'4" x 7'2"</li> <li>Temperature range -20° to 45° C</li> <li>Humidity 0% - 100%</li> <li>Seismic vibration IBC site class D</li> <li>Location Outdoor</li> <li>Noise &lt; 70 dBA @ 6 feet</li> </ul>
<b>Codes and Standards</b>	<ul style="list-style-type: none"> <li>Complies with Rule Z1 interconnection and IEEE1547 standards</li> <li>Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards</li> <li>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.</li> </ul>
<b>Additional Notes</b>	<ul style="list-style-type: none"> <li>Access to a secure website to monitor system performance &amp; environmental benefits</li> <li>Remotely managed and monitored by Bloom Energy</li> <li>Capable of emergency stop based on input from the site</li> </ul>

<sup>1</sup> 65% LHV efficiency verified by ASME PTC 10 Fuel Cell Power Systems Performance Test

<sup>2</sup> NOx and CO measured per CARB Method 100, VOCs measured as tracked by SCADA Method 35.3

## About Bloom Energy

Bloom Energy's mission is to make reliable, clean energy affordable for everyone in the world. The company's product, the Bloom Energy Server, delivers highly reliable and resilient, Always On electric power that is clean and sustainable. Bloom's customers include twenty-five of the Fortune 100 companies and leaders in cloud services and data centers, healthcare, retail, financial services, utilities and many other industries.

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## Energy Server 5 Technical Highlights (ES5-YABAAN)

<b>Outputs</b>	<ul style="list-style-type: none"> <li>Nameplate power output (net AC) 300 kW</li> <li>Load output (net AC) 300 kW</li> <li>Electrical connection 480V, 3-phase, 60 Hz</li> </ul>
<b>Inputs</b>	<ul style="list-style-type: none"> <li>Fuels Natural gas, directed biogas</li> <li>Input fuel pressure 10-18 psig (15 psig nominal)</li> <li>Water None during normal operation</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>Cumulative electrical efficiency (LHV net AC)<sup>1</sup> 65-53%</li> <li>Heat rate (HHV) 5,811-7,127 Btu/kWh</li> </ul>
<b>Emissions<sup>2</sup></b>	<ul style="list-style-type: none"> <li>NOx 0.0017 lbs/MWh</li> <li>SOx Negligible</li> <li>CO 0.024 lbs/MWh</li> <li>VOCs 0.0159 lbs/MWh</li> <li>CO<sub>2</sub> @ stated efficiency 679-833 lbs/MWh on natural gas, carbon neutral on directed biogas</li> </ul>
<b>Physical Attributes and Environment</b>	<ul style="list-style-type: none"> <li>Weight 15.8 tons</li> <li>Dimensions (variable layouts) 17'1" x 8'8" x 6'9" or 32'3" x 4'4" x 7'2"</li> <li>Temperature range -20° to 45° C</li> <li>Humidity 0% - 100%</li> <li>Seismic vibration IBC site class D</li> <li>Location Outdoor</li> <li>Noise &lt; 70 dBA @ 6 feet</li> </ul>
<b>Codes and Standards</b>	<ul style="list-style-type: none"> <li>Complies with Rule Z1 interconnection and IEEE1547 standards</li> <li>Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards</li> <li>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.</li> </ul>
<b>Additional Notes</b>	<ul style="list-style-type: none"> <li>Access to a secure website to monitor system performance &amp; environmental benefits</li> <li>Remotely managed and monitored by Bloom Energy</li> <li>Capable of emergency stop based on input from the site</li> </ul>

<sup>1</sup> 65% LHV efficiency verified by ASME PTC 10 Fuel Cell Power Systems Performance Test

<sup>2</sup> NOx and CO measured per CARB Method 100, VOCs measured as tracked by SCADA Method 35.3

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## Energy Server 5 Technical Highlights (ES5-YA1AAN)

<b>Outputs</b>	<ul style="list-style-type: none"> <li>Nameplate power output (net AC) 300 kW</li> <li>Load output (net AC) 300 kW</li> <li>Electrical connection 480V, 3-phase, 60 Hz</li> </ul>
<b>Inputs</b>	<ul style="list-style-type: none"> <li>Fuels Natural gas, directed biogas</li> <li>Input fuel pressure 10-18 psig (15 psig nominal)</li> <li>Water None during normal operation</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>Cumulative electrical efficiency (LHV net AC)<sup>1</sup> 65-53%</li> <li>Heat rate (HHV) 5,811-7,127 Btu/kWh</li> </ul>
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<b>Physical Attributes and Environment</b>	<ul style="list-style-type: none"> <li>Weight 13.6 tons</li> <li>Dimensions (variable layouts) 14'4" x 8'8" x 6'9" or 28'8" x 4'4" x 7'2"</li> <li>Temperature range -20° to 45° C</li> <li>Humidity 0% - 100%</li> <li>Seismic vibration IBC site class D</li> <li>Location Outdoor</li> <li>Noise &lt; 70 dBA @ 6 feet</li> </ul>
<b>Codes and Standards</b>	<ul style="list-style-type: none"> <li>Complies with Rule Z1 interconnection and IEEE1547 standards</li> <li>Exempt from CA Air District permitting; meets stringent CARB 2007 emissions standards</li> <li>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.</li> </ul>
<b>Additional Notes</b>	<ul style="list-style-type: none"> <li>Access to a secure website to monitor system performance &amp; environmental benefits</li> <li>Remotely managed and monitored by Bloom Energy</li> <li>Capable of emergency stop based on input from the site</li> </ul>

<sup>1</sup> 65% LHV efficiency verified by ASME PTC 10 Fuel Cell Power Systems Performance Test

<sup>2</sup> NOx and CO measured per CARB Method 100, VOCs measured as tracked by SCADA Method 35.3

## About Bloom Energy

Bloom Energy's mission is to make reliable, clean energy affordable for everyone in the world. The company's product, the Bloom Energy Server, delivers highly reliable and resilient, Always On electric power that is clean and sustainable. Bloom's customers include twenty-five of the Fortune 100 companies and leaders in cloud services and data centers, healthcare, retail, financial services, utilities and many other industries.

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CUSTOMER SITE

EVERSOURCE

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COLCHESTER, CT 06415



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DESIGNED BY KATE TAYLOR	REVIEWED BY CHAD FEARSON
DRAWN BY SURESH KUMAR	APPROVED BY GREENBERG FARROW

SHEET TITLE

BLOOM ENERGY PRODUCT  
DATA SHEET

DRAWING NUMBER

R0.1

BLOOM DOCUMENT

DOC-1010853

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