Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts and New York

March 16, 2023

Via Federal Express

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **PETITION NO. 1462** – Distributed Solar Operations, LLC and IKEA Property, Inc. notice of election to waive exclusion from Connecticut Siting Council jurisdiction, pursuant to Connecticut General Statutes §16-50k(e), and petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 0.90-megawatt AC solar photovoltaic electric generating facility located at IKEA, 450 Sargent Drive, New Haven, Connecticut and associated electrical interconnection

Dear Attorney Bachman:

Distributed Solar Operations, LLC and IKEA Property, Inc. (collectively the "Petitioner") filed a Petition for Declaratory Ruling ("Petition") with the Siting Council on August 20, 2021 for the approval of a 0.90 MW solar voltaic electric generating parking lot canopy facility to be constructed over a portion of the IKEA parking lot at 450 Sargent Drive in New Haven. The Council approved Petition No. 1462 on November 22, 2021. A copy of the Council's approval letter is included in Attachment 1.

Proposed Interconnection Service Modifications

Since the Council's approval, the Petitioner has decided to make some minor modifications to the electrical interconnection system, including interconnection routing between the solar canopy and IKEA's main electrical room in the southeast corner of the building. The proposed electrical interconnection modifications are shown on the "Overall AC Electrical Plan"

Sheet E-100 included in Attachment 2. Also included in Attachment 2 is the "Overall Site Plan" Sheet A-100 included in the Petition which shows the "approved" interconnection routing.

As shown on the Overall Site Plan Sheet A-100, the Petitioner originally planned install single electric transformer on a concrete pad within a landscaped island in the parking area on the westerly side of the IKEA building. Electrical interconnection service would then extend underground from the solar canopy through a portion of the paved parking lot to this transformer, then underground, within existing paved driveways and IKEA loading areas, along the west and south sides of the IKEA building to the main electrical room in the southeasterly corner of the building.

The modified electrical interconnection service line (shown on Overall Electrical Plan Sheet E-100) would extend underground from the solar canopy to a new step-up transformer located within the IKEA parking lot to the west of the canopy. The electric interconnection service line would then extend underground from this new transformer to the northwest corner of the IKEA building. From there, the line will extend up the side of the building to the roof, along the roof to the southeasterly corner of the building, and then down the outside wall of the building where it will connect with a new step-down transformer on the ground adjacent to IKEA's main electrical room.

These modifications will result in the reduction in the amount of disturbance of existing paved surfaces at the site and a more efficient interconnection system, preventing voltage drop and productivity loss that would otherwise occur from the lengthy interconnection run. The Petitioner respectfully requests staff approval of these interconnection service modifications.

Submission of TCLP Test Results

Pursuant to Condition No. 2 of the Council's approval, Attachment 3 contains the TCLP Report, provided by the Petitioner's solar panel vendor, for the Q.PEAK DUO L G5 modules, which is substantially similar to the Q.PEAK DUO L G8 module approved in the Petition. The solar panel manufacturer informed the Petitioner that a TCLP Report is not available for the Q.PEAK DUO L G8 module. The vendor however, confirmed that the Q.PEAK DUO L G5 TCLP Report will provide the Council with all of the necessary TCLP information. The only difference between the L G8 panel and the L G5 panel is cell size within each panel. The materials and composition of the two panels is otherwise identical. Also included in Attachment 3 is the TCLP EPA Limits document and a TCLP Fact Sheet explaining the TCLP testing procedures.

Robinson+Cole

Submission of Final Structural Design Drawing

Finally, in response to Condition No. 3 of the Council's approval, included in Attachment 4 is a set of final structural design drawings for the approved canopy system stamped and signed by a Connecticut Licensed Professional Engineer.

If you have any questions or need any additional information, please contact me.

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to: Justin Elicker, Mayor, City of New Haven

ATTACHMENT 1

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

November 22, 2021

Kenneth C. Baldwin, Esq.
Christopher Y. Eddy, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
kbaldwin@rc.com
ceddy@rc.com

RE: **PETITION NO. 1462** – Distributed Solar Operations, LLC and IKEA Property, Inc. notice of election to waive exclusion from Connecticut Siting Council jurisdiction, pursuant to Connecticut General Statutes §16-50k(e), and petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 0.90-megawatt AC solar photovoltaic electric generating facility located at IKEA, 450 Sargent Drive, New Haven, Connecticut, and associated electrical interconnection.

Dear Attorneys Baldwin and Eddy:

At a public meeting held on November 18, 2021, the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal meets air and water quality standards of the Department of Energy and Environmental Protection and would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k, would not require a Certificate of Environmental Compatibility and Public Need, with the following conditions:

1. Approval of any project changes be delegated to Council staff;

2. Submit solar module specification sheets and Toxicity Characteristic Leaching Procedure test results that indicate the modules would not be characterized as hazardous waste under current testing criteria;

3. Submit the final structural design for the canopy system stamped by a Professional Engineer duly licensed in the State of Connecticut prior to installation;

4. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable;

5. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the City of New Haven;

6. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;

7. The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v;

8. This Declaratory Ruling may be transferred, provided the facility owner/operator/transferor is current with payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v and the transferee provides written confirmation that the transferee agrees to comply with the terms, limitations and conditions contained in the Declaratory Ruling, including timely payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v; and

9. If the facility owner/operator is a wholly owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition dated August 20, 2021 and additional information received on September 30, 2021.

Enclosed for your information is a copy of the staff report on this project.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/RDM/lm

Enclosure: Staff Report dated November 18, 2021

c: Service List, dated August 20, 2021
The Honorable Justin Elicker, Mayor, City of New Haven (jelicker@newhavenct.gov)

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

Petition No. 1462
Distributed Solar Operations, LLC and IKEA Property, Inc.
450 Sargent Drive, New Haven, Connecticut

Staff Report
November 18, 2021

Introduction

On August 20, 2021, Distributed Solar Operations, LLC and IKEA Property, Inc. (collectively, the Petitioner) submitted a notice of election to waive exclusion from the Connecticut Siting Council's (Council) jurisdiction, pursuant to Connecticut General Statutes (CGS) §16-50k(e), and a petition for a declaratory ruling (petition) pursuant to CGS–§4-176 and §16-50k for the construction, operation and maintenance of a 0.90-megawatt (MW) AC solar photovoltaic electric generating facility located on a canopy over a portion of the existing parking lot at the IKEA property at 450 Sargent Drive, New Haven, Connecticut.

CGS §16-50k(e) states, "Any person intending to construct a facility excluded from one or more provisions of this chapter may, to the extent permitted by law, elect to waive such exclusion by delivering notice of such waiver to the council. Such provisions shall thereafter apply to each facility identified in such notice from the date of its receipt by the council." Under CGS §16-50i(a)(3), the Council has jurisdiction over electric generating facilities utilizing renewable energy sources with a generating capacity *of more than one megawatt*. (Emphasis added).

Pursuant to Regulations of Connecticut State Agencies (RCSA) §16-50j-40, on or about August 20, 2021, the Petitioner notified City of New Haven (City) officials, state officials and agencies, the property owner, and abutting property owners of the notice of election to waive exclusion from Council jurisdiction and the proposed project.

The Council issued interrogatories to the Petitioner on September 16, 2021. On September 30, 2021 the Petitioner submitted responses to the Council's interrogatories.

Pursuant to CGS §4-176(e) of the Uniform Administrative Procedure Act (UAPA), an administrative agency is required to take an action on a petition for a declaratory ruling within 60 days of receipt. On October 7, 2021, pursuant to CGS §4-176(e), the Council voted to set the date by which to render a decision on the Petition as no later than February 16, 2022, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

Municipal Consultation

Prior to filing the Petition with the Council, the Petitioner met remotely with City officials to discuss the Project. The City was receptive to the project and had no concerns. Additionally, during a July 26, 2021 remote meeting, the City Planner stated the project is consistent the City's Long Wharf Responsible Growth Plan.

On August 20, 2021, the Council sent correspondence to the City stating that the Council has received the Petition and invited the City to contact the Council with any questions or comments by September 9, 2021. No comments were received from the City.

State Agency Comments

On August 20, 2021, the Council sent correspondence requesting comments on the proposed project from the following state agencies by September 9, 2021: Department of Energy & Environmental Protection (DEEP); Department of Agriculture (DOAg); Department of Public Health (DPH); Council on Environmental Quality (CEQ); Public Utilities Regulatory Authority (PURA); Office of Policy and Management (OPM); Department of Economic and Community Development (DECD); Department of Emergency Services and Public Protection (DESPP); Department of Consumer Protection (DCP); Department of Labor (DOL); Department of Administrative Services (DAS); Department of Transportation (DOT); the Connecticut Airport Authority (CAA); and the State Historic Preservation Office (SHPO).

No state agencies provided written comment on the proposed project.

Public Act 17-218

Public Act 17-218 requires, "for a solar photovoltaic facility with a capacity of two or more megawatts, to be located on prime farmland or forestland, excluding any such facility that was selected by DEEP in any solicitation issued prior to July 1, 2017, pursuant to section 16a-3f, 16a-3g or 16a3j, the DOAg represents, in writing, to the Council that such project will not materially affect the status of such land as prime farmland or DEEP represents, in writing, to the Council that such project will not materially affect the status of land as core forest." The proposed facility has a generating capacity of 0.90 MW. Therefore, it is exempt from the provisions of Public Act 17-218.

Public Benefit

The project would be a distributed energy resource facility as defined in CGS § 16-1(a)(49). CGS § 16a-35k establishes the State's energy policy, including the goal to "develop and utilize renewable energy resources, such as solar and wind energy, to the maximum practicable extent." The 2018 Comprehensive Energy Strategy (2018 CES) highlights eight key strategies to guide administrative and legislative action over the next several years. Specifically, Strategy No. 3 is "Grow and sustain renewable and zero-carbon generation in the state and region." Furthermore, on September 3, 2019, Governor Lamont issued Executive Order No. 3, which calls for the complete decarbonization of the electric sector by 2040. The proposed facility will contribute to fulfilling the State's Renewable Portfolio Standard and Global Warming Solutions Act as a zero emission Class I renewable energy source.

IKEA maintains an existing rooftop solar array and fuel cell facility[1] with a combined output of approximately 1,095 kW that provides power to the IKEA store on the property. The existing rooftop solar array and fuel cell facility together with the proposed parking canopy solar facility are designed to be roughly equivalent to the peak load of the on-site IKEA store. If the total output of the existing rooftop solar array, fuel cell facility and parking canopy solar facility exceeds the energy consumption of the store, excess energy would be exported to the local United Illuminating Company (UI) electric distribution system through a net metering agreement.

A battery storage system is not proposed. The proposed facility is not designed to provide backup power to the IKEA store in the event of a power outage.

[1] On June 23, 2016, in Petition 1229, the Council issued a Declaratory Ruling to IKEA for construction, operation and maintenance of a customer-side 250-kilowatt fuel cell facility at the IKEA property at 450 Sargent Drive in New Haven. The fuel cell facility became operational on December 30, 2016.

Proposed Site

The Petitioner proposes to construct the solar facility on a 2.5-acre portion of a 16.7-acre parcel owned by IKEA. The property, zoned Planned Development District-100, is developed with an IKEA store and associated parking areas.

The Petitioner would develop the project in the northwest portion of the paved parking lot, north of the existing IKEA store.

Land use in the immediate area is urban, with commercial development to the north, west and south, and Interstate 95 to the east. The Pirelli Tire Building, located on a 1.8-acre parcel, abuts the IKEA parking lot to the south.

Pursuant to CGS §16-50p(g), the Council has no authority to compel a parcel owner to sell or lease property, or portions thereof, for the purpose of siting a facility.[2]

Proposed Project

The Project consists of a 0.9 MW AC solar photovoltaic facility comprised of 3,886 panels (420 Watt) installed on new overhead parking canopies. Two separate solar canopy areas would be developed.

The solar panels would comprise the roof of the canopies. The canopies would be supported by steel columns installed on 36-inch diameter concrete piers. The piers would be set into the ground to a depth of 12 to 15 feet depending on specific soil conditions. The canopies would be a minimum clearance height of 14.5 feet above grade allowing for enough clearance for passenger vehicles to enter unimpeded.

The canopies would be located over existing parking spaces with the columns located (to the extent practicable) on the painted parking markings to retain as much of the existing parking as possible. Light poles within the project footprint would be removed and would be replaced by new lights under the canopies.

The solar panels would be oriented towards the south at an angle of about five degrees from the horizontal with the top edge approximately 17.6 feet above ground level (agl). String inverters would be mounted on the canopy support columns at a height of 10 feet agl. Underground cable within a utility trench would connect the inverters to an equipment pad in the parking lot, then to a utility room on the south side of the building which is interconnected to UI's electric distribution system through an existing main service connection. No other electrical interconnection infrastructure is required.

The proposed solar facility would utilize existing access to the IKEA property. No new access drives would be constructed. Eight trees on existing landscape islands within the project footprint would be removed.

The Project's net capacity factor is estimated to be 23 percent with an estimated annual degradation of approximately 0.54 percent. Energy production estimates include losses due to dust, pollen, and weather events.

Construction is anticipated to commence in the first quarter of 2022 with site operation anticipated in the third quarter of 2022. Typical construction hours are Monday – Friday, 7:00 AM to 7:00 PM. Night work would occur from 11:00 PM to 3:00 AM, when necessary.

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[2] *Corcoran v. Connecticut Siting Council*, 284 Conn. 455 (2007); CGS §16-50p(g) (2019).

The estimated cost of the project is approximately $4.4 M.

Public Safety

The proposed project would comply with the National Electrical Code, the National Electrical Safety Code and any applicable National Fire Protection Association codes and standards. The Petitioner would discuss emergency response procedures with local emergency responders if requested.

Damage to the facility from a vehicle fire beneath the canopy would be reduced due to the construction material (concrete and steel) and the fire rating of the solar panels. The canopy height would provide enough clearance for most types of emergency response vehicles.

The proposed facility would have a protection system to shut down or isolate the facility in the event of a fault or abnormal electrical disturbance. Inverter strings would be able to disconnect independent of the other inverter strings if there was a string failure or if maintenance was required on certain sections of the facility. The inverters are programmed to monitor grid voltage, ground faults, and array imbalances and would shut down during abnormalities. Circuit breakers and the main disconnect at the electrical pad would also provide system protection.

The structural design of the facility would comply with the Connecticut State Building Code. The design wind speed for the solar panels is 125 mph. The panels would be bolted directly to structural framing using four bolts per panel.

Lighting under the canopies would comply with City building codes. IKEA would be responsible for monitoring security in the canopy area.

Rain, snow, and ice would not slide/fall onto vehicles or pedestrians due to a gutter system that would be installed between the canopy solar tilt angles. The gutter downspouts would discharge at grade.

The proposed project limits would be located approximately 2.5 miles southeast of the Tweed-New Haven Airport. Per Federal Aviation Administration (FAA) guidelines, there would be no impact on air navigation and a glare analysis is not required. The FAA required that the Petitioner must notify the Yale-New Haven Hospital (helipad) if temporary cranes are used for construction.

Due to the existing high levels of urban noise around the IKEA store, the operational noise levels at the property lines would be in compliance with DEEP Noise Control Standards. The inverters are the main source of noise when the solar facility is operational, emitting a noise level of 65 dBA at 3.3 feet. Due to the distance to the property lines and the lack of nearby residential use, noise from the inverters would not exceed regulatory criteria.

Construction-related noise is exempt from DEEP Noise Control Standards.

The Site is located within a Federal Emergency Management Agency designated 100-year flood zone. The panels and inverters would be installed above the flood zone level.

Subsurface soils were investigated and determined to be nonhazardous.

Environmental Effects and Mitigation Measures

Historic and Recreational Resources

The proposed site is within a half-mile of three historic districts listed on the National Register of Historic Places; however, due to the low height of the canopy and intervening urban development, the proposed facility would not be visible from these districts.

The Pirelli Tire Building, a multistory building constructed in 1970 that is listed on the National Register of Historic Places, abuts the IKEA property to the south. IKEA purchased the building in 2003 and demolished the low rise section of the building to create parking for the IKEA store. IKEA sold the building in 2019. Although the proposed facility would be visible from the west side of the building, there would be no adverse effect on the building due to its location in an urbanized area.

Based on a review of historic maps and aerial photographs, the site has been heavily altered from past urban development and has no potential to yield intact subsurface cultural deposits.

No public parks or other publicly accessible recreation resources are located adjacent to the site.

Visibility

The proposed project would be visible year-round from 53 acres and seasonally visible from an additional 12 acres within a half-mile of the site. The areas of visibility consist of an urban landscape with commercial and transportation-related development.

The project would not be visible from the City's Long Wharf Park located approximately 0.25 mile south of the site, across Interstate 95.

Air Quality

The Project would not produce air or water emissions as a result of operation. The solar project would not produce air emissions of regulated air pollutants or greenhouse gases during operation.

Water Quality

The site parcel is not within a DEEP-designated Aquifer Protection Area or a mapped Public Drinking Supply Watershed. Groundwater in the area is not suitable for human consumption.

There are no wetlands or watercourses on the site.

The project would not require a DEEP Stormwater Permit. Drainage from the canopy downspouts would be directed to existing on-site catch basins.

Fuel for construction vehicles/machinery would be delivered to the site by a fuel service. Rubber mats would be used in the re-fueling area and spill kits would be kept on-site.

Wildlife

The site has no wildlife value and is not within a DEEP Natural Diversity Database Area.

The red knot, a federally-listed Threatened Species, is known to occur along the shoreline in Connecticut. Although the site is within 0.25 mile of the shoreline, no suitable habitat is present on the site, and thus, there would be no impact to this bird species.

Operation and Maintenance

The canopy support structures would be inspected for maintenance purposes on an annual basis. The operation of the solar array system would be monitored remotely on a daily basis.

Module cleaning would be conducted on an as needed basis with deionized water.

Damage from shorebirds dropping shells on the solar panels is not expected as the glass covering the solar panels is designed to withstand hail with a diameter of one inch.

Conclusion

The project is a distributed energy resource with a capacity of not more than sixty-five megawatts, meets air and water quality standards of the DEEP, would not materially affect the status of prime farmland or core forest, and would not have a substantial adverse environmental effect. The proposed project will not produce air emissions, will not utilize water to produce electricity, was designed to minimize environmental impacts, and furthers the State's energy policy by developing and utilizing renewable energy resources and distributed energy resources.

Recommendations

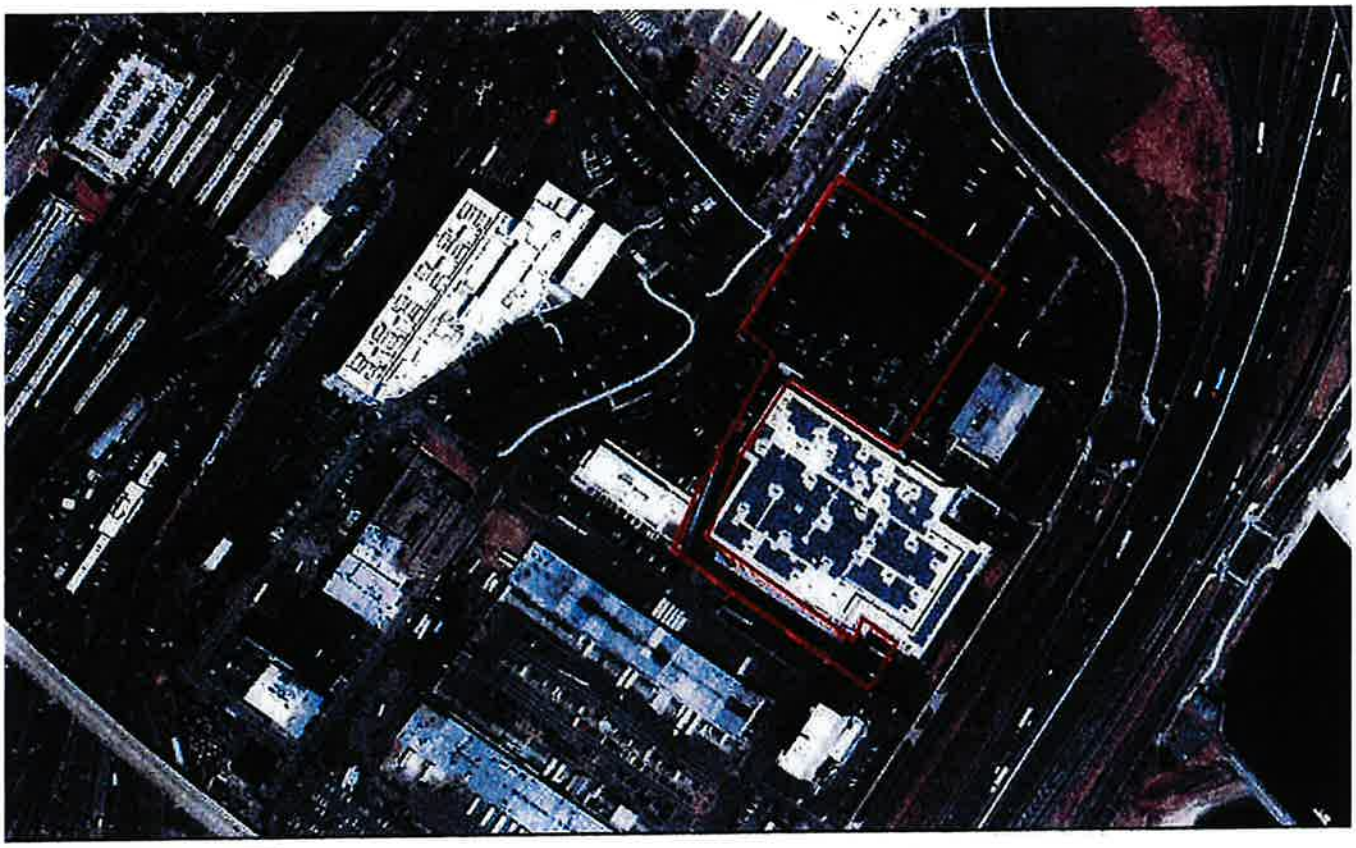
If approved, staff recommends the following conditions:

1. Approval of any project changes be delegated to Council staff;

2. Submit solar module specification sheets and Toxicity Characteristic Leaching Procedure test results that indicate the modules would not be characterized as hazardous waste under current testing criteria; and

3. Submit the final structural design for the canopy system stamped by a Professional Engineer duly licensed in the State of Connecticut prior to installation.

Site Location- Aerial View



Project Area

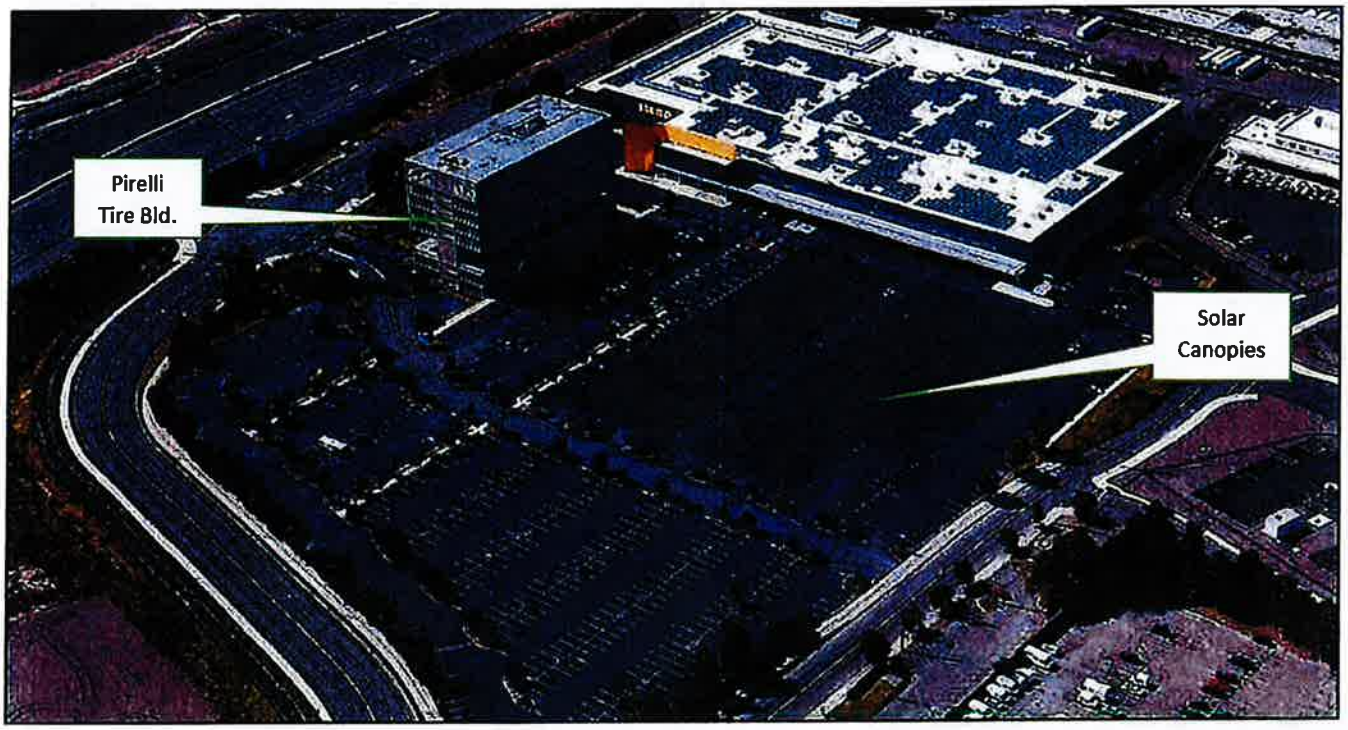
0 50 100 200 Meters

0 145 290 580 Feet

N
W E
S

IKEA Upgrade Project, Connecticut
Phase IA Cultural Resources Assessment Survey
May 2021

Site Location in IKEA Store Parking Lot



Photograph of a Similar Solar Canopy System

ATTACHMENT 2

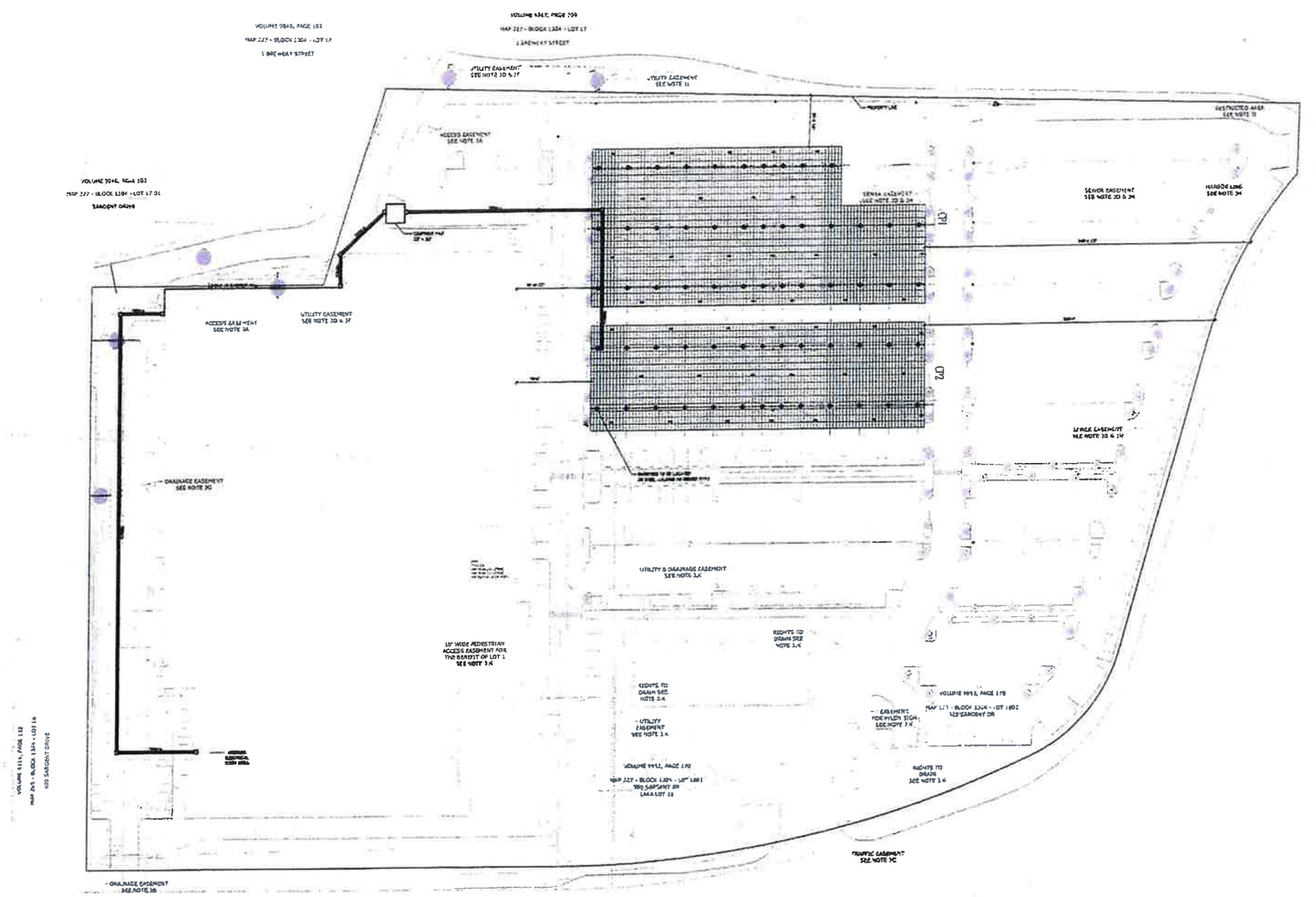
CANOPY ARRAY CHART

HANWHA Q CELLS, Q.PEAK DUO L-G6.3 420 (420W)

CANOPY NUMBER	PANELS	COLUMNS	POWER (KWSTC)	ARRAY TILT (°)	AZIMUTH
CP1	2238	36	934.9	5°	124° / 304°
CP2	1648	26	692.1	5°	124° / 304°
TOTALS	3886	62	1632.0		

LEGEND/ SYMBOLS

- EXISTING TREE TO REMAIN
- NEW TREE TO BE PLANTED
- EXISTING TREE TO BE DEMO
- NEW LIGHT FIXTURE
- EXISTING LIGHT FIXTURE TO BE DEMO
- EXISTING LIGHT FIXTURE TO REMAIN
- EXISTING FIRE HYDRANT TO BE REMAINED
- NEW FOUNDATION WITH STEEL COLUMN
- NEW CANOPY MODULES
- NEW STEEL BEAM/PURLINS
- NEW STEEL BEAM/RAFTER
- UNDERGROUND GAS UTILITY
- UNDERGROUND ELECTRIC UTILITY
- UNDERGROUND SANITARY UTILITY
- UNDERGROUND IRRIGATION UTILITY
- UNDERGROUND WATER UTILITY LINE
- UNDERGROUND STORM DRAIN LINE
- UNDERGROUND TELECOMMUNICATION LINE
- UNDERGROUND UNKNOWN LINE
- CHAIN LINK FENCE
- OUTLINE OF MODULES
- NEW LOW VOLTAGE ELECTRICAL TRENCH
- EASEMENT



64' 0' 64' 128'

GRAPHIC SCALE

IKEA

DSD

DISTRIBUTED SOLAR DEVELOPMENT, LLC
200 HARBORSIDE DRIVE, STE. 200
SCHENECTADY, NY 12305

APPLIED ENGINEERING CONSULTANTS, INC

SEAL & SIGNATURE

9/27/2021 10:40:34 AM

As design professional in responsible charge.

PROJECT NAME:
IKEA NEW HAVEN
PHOTOVOLTAIC SYSTEM

PROJECT ADDRESS:
450 SARGENT DRIVE
NEW HAVEN, CT
06511

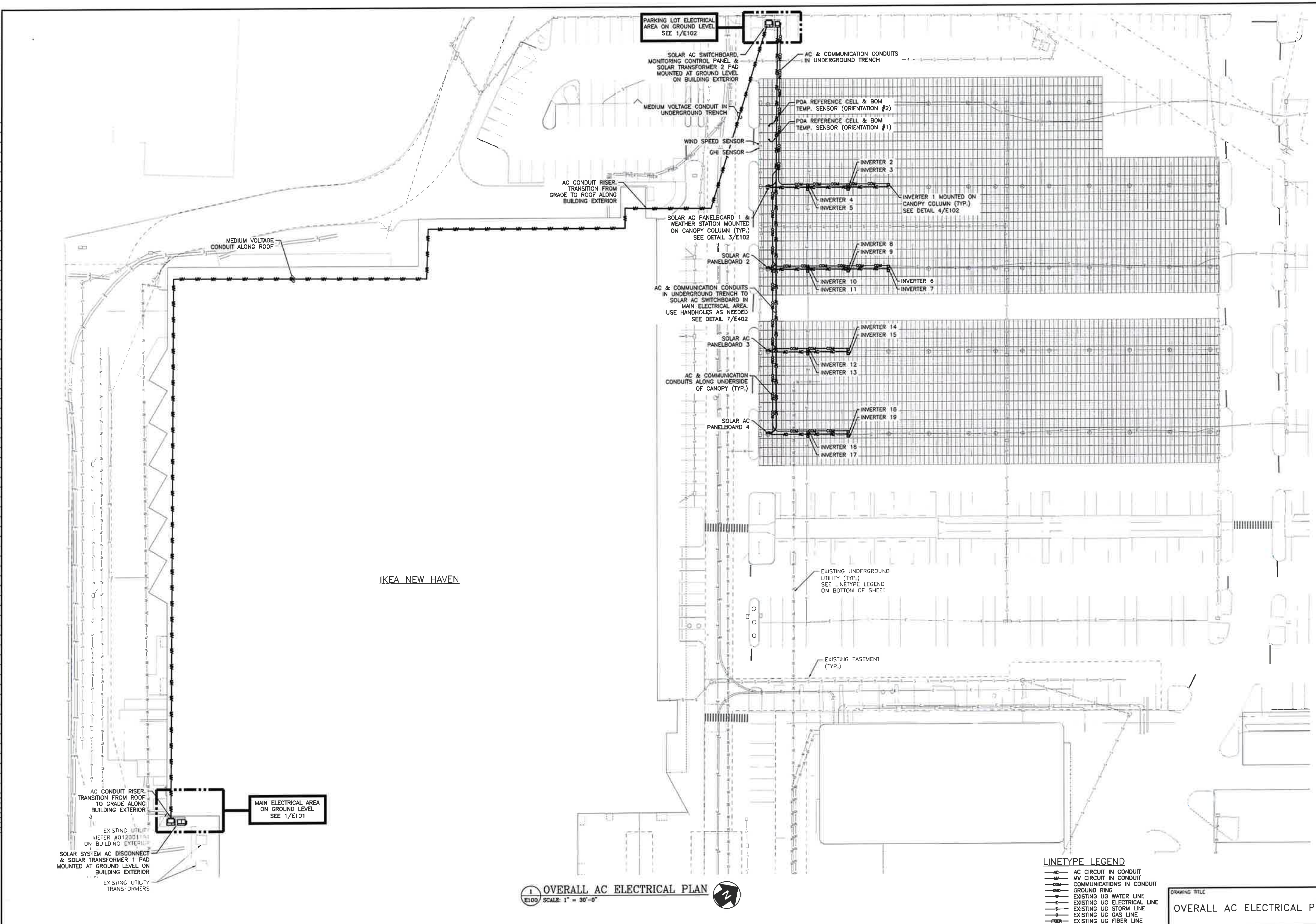
NO.	DATE:	REVISION DESCRIPTION:	DRAWN BY:	CHECK BY:
1	07-30-21	CT SITTING COUNCIL REV 1	CC	AN

SCALE: 0=0" = 1'-0"

SHEET TITLE:
OVERALL SITE PLAN

SHEET NO.
A-100

TOTAL NUMBER OF SHEETS:


PARKING LOT ELECTRICAL AREA ON GROUND LEVEL SEE 1/E102
SOLAR AC SWITCHBOARD, MONITORING CONTROL PANEL & SOLAR TRANSFORMER 2 PAD MOUNTED AT GROUND LEVEL ON BUILDING EXTERIOR
AC & COMMUNICATION CONDUITS IN UNDERGROUND TRENCH
MEDIUM VOLTAGE CONDUIT IN UNDERGROUND TRENCH
POA REFERENCE CELL & BOM TEMP. SENSOR (ORIENTATION #2)
POA REFERENCE CELL & BOM TEMP. SENSOR (ORIENTATION #1)
WIND SPEED SENSOR
GHI SENSOR
INVERTER 2
INVERTER 3
AC CONDUIT RISER. TRANSITION FROM GRADE TO ROOF ALONG BUILDING EXTERIOR
INVERTER 4
INVERTER 5
INVERTER 1 MOUNTED ON CANOPY COLUMN (TYP.) SEE DETAIL 4/E102
SOLAR AC PANELBOARD 1 & WEATHER STATION MOUNTED ON CANOPY COLUMN (TYP.) SEE DETAIL 3/E102
MEDIUM VOLTAGE CONDUIT ALONG ROOF
INVERTER 8
INVERTER 9
SOLAR AC PANELBOARD 2
INVERTER 10
INVERTER 11
INVERTER 6
INVERTER 7
AC & COMMUNICATION CONDUITS IN UNDERGROUND TRENCH TO SOLAR AC SWITCHBOARD IN MAIN ELECTRICAL AREA. USE HANDHOLES AS NEEDED SEE DETAIL 7/E402
INVERTER 14
INVERTER 15
SOLAR AC PANELBOARD 3
INVERTER 12
INVERTER 13
AC & COMMUNICATION CONDUITS ALONG UNDERSIDE OF CANOPY (TYP.)
INVERTER 18
INVERTER 19
SOLAR AC PANELBOARD 4
INVERTER 16
INVERTER 17
IKEA NEW HAVEN
EXISTING UNDERGROUND UTILITY (TYP.) SEE LINETYPE LEGEND ON BOTTOM OF SHEET
EXISTING EASEMENT (TYP.)
AC CONDUIT RISER. TRANSITION FROM ROOF TO GRADE ALONG BUILDING EXTERIOR
MAIN ELECTRICAL AREA ON GROUND LEVEL SEE 1/E101
EXISTING UTILITY METER #012001194 ON BUILDING EXTERIOR
SOLAR SYSTEM AC DISCONNECT & SOLAR TRANSFORMER 1 PAD MOUNTED AT GROUND LEVEL ON BUILDING EXTERIOR
EXISTING UTILITY TRANSFORMERS
LINETYPE LEGEND
AC — AC CIRCUIT IN CONDUIT
MV — MV CIRCUIT IN CONDUIT
COM — COMMUNICATIONS IN CONDUIT
GND — GROUND RING
W — EXISTING UG WATER LINE
E — EXISTING UG ELECTRICAL LINE
D — EXISTING UG STORM LINE
G — EXISTING UG GAS LINE
FIBER — EXISTING UG FIBER LINE
RULER IN INCHES:

1 / E100 OVERALL AC ELECTRICAL PLAN
SCALE: 1" = 30'-0"

DATE	REVISION DESCRIPTION	PM	ENG	CHK
07/05/2022	IFP REV1	CT	DVR	RI
10/29/2021	ISSUE FOR PERMIT	CT	DVR	RI
10/22/2021	DESIGN DEVELOPMENT	CT	DVR	RI

PUREPOWER ENGINEERING
111 RIVER STREET, HOBOKEN, NJ
WWW.PUREPOWER.COM
RICHARD A. IVINS
CT LICENSE No. 0029262

DEVELOPER
DSD
DISTRIBUTED SOLAR DEVELOPMENT
200 HARBORSIDE DRIVE, SUITE 200
SCHENECTADY, NY 12305

PAGE SIZE: 36" x 24"
PROJECT #: 02772.03

DC SYSTEM SIZE: 1,651.55 kW
AC SYSTEM SIZE: 900.00 kW
MODULE TYPE: Q.PEAK DUO L-G8.2 425W
MODULE QUANTITY: 3,886
ORIENTATION: 5° TILT, 124°/304° AZIM.

PROJECT: 1,651.55 KW SOLAR CARPORT SYSTEM AT
IKEA – NEW HAVEN
450 SARGENT DRIVE
NEW HAVEN, CT 06511

DRAWING TITLE: OVERALL AC ELECTRICAL PLAN

DRAWING #: E100

ATTACHMENT 3

JONES ENVIRONMENTAL, INC.

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805-399-0060

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JONES ENVIRONMENTAL
LABORATORY RESULTS

Client:	Hanwha Q CELLS America Inc.	**Report date:**	4/4/2019
Client Address:	400 Spectrum Center Dr., Suite 1400 Irvine, CA 92618	**JEL Ref. No.:**	ST-13602
Attn:	Ralph Alvarado	**Date Sampled:**	4/1/2019
		Date Received:	4/1/2019
		Date Analyzed:	4/3-4/2019
		Physical State:	Solar Panel
			Q.PEAK DUO L-G5.2 XXX

ANALYSES REQUESTED

1. TCLP Metals by ICP-OES

Approval:

Angela Haar, Ph. D.
Mobile Lab Manager

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client: Hanwha Q CELLS America Inc.
Client Address: 400 Spectrum Center Dr., Suite 1400
Irvine, CA 92618

Attn: Ralph Alvarado

Report date: 4/4/2019
Jones Ref. No.: ST-13602

Date Sampled: 4/1/2019
Date Received: 4/1/2019
Date Analyzed: 4/3-4/2019
Physical State: Solar Panel - Q.PEAK DUO L-G5.2 XXX

Sample ID: **Sample 1** **Jones ID:** **ST-13602-01**

TCLP Metals by ICP-OES

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Analytes:							
Silver, Ag	**0.01**	1	TCLP_040219-01	4/2/2019	4/3/2019	0.01	mg/L
Arsenic, As	ND	1	"	"	"	0.01	mg/L
Barium, Ba	**0.10**	1	"	"	"	0.01	mg/L
Cadmium, Cd	ND	1	"	"	"	0.01	mg/L
Chromium, Cr	ND	1	"	"	"	0.01	mg/L
Selenium, Se	ND	1	"	"	"	0.01	mg/L
Lead, Pb	**1.48**	1	"	"	"	0.01	mg/L

EPA 7471A - Mercury by Cold Vapor Atomic Absorption

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Mercury, Hg	ND	1	TCLP_040219-01	4/2/2019	4/4/2019	0.1	µg/L

ND= Not Detected

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client: Hanwha Q CELLS America Inc.
Client Address: 400 Spectrum Center Dr., Suite 1400
Irvine, CA 92618

Attn: Ralph Alvarado

Report date: 4/4/2019
Jones Ref. No.: ST-13602

Date Sampled: 4/1/2019
Date Received: 4/1/2019
Date Analyzed: 4/3-4/2019
Physical State: Solar Panel - Q.PEAK DUO L-G5.2 XXX

Sample ID: **Sample 2** **Jones ID:** **ST-13602-02**

TCLP Metals by ICP-OES

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Analytes:							
Silver, Ag	ND	1	TCLP_040219-01	4/2/2019	4/3/2019	0.01	mg/L
Arsenic, As	ND	1	"	"	"	0.01	mg/L
Barium, Ba	**0.07**	1	"	"	"	0.01	mg/L
Cadmium, Cd	ND	1	"	"	"	0.01	mg/L
Chromium, Cr	ND	1	"	"	"	0.01	mg/L
Selenium, Se	ND	1	"	"	"	0.01	mg/L
Lead, Pb	**1.36**	1	"	"	"	0.01	mg/L

EPA 7471A - Mercury by Cold Vapor Atomic Absorption

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Mercury, Hg	ND	1	TCLP_040219-01	4/2/2019	4/4/2019	0.1	µg/L

ND= Not Detected

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client: Hanwha Q CELLS America Inc.
Client Address: 400 Spectrum Center Dr., Suite 1400
Irvine, CA 92618

Attn: Ralph Alvarado

Report date: 4/4/2019
Jones Ref. No.: ST-13602

Date Sampled: 4/1/2019
Date Received: 4/1/2019
Date Analyzed: 4/3-4/2019
Physical State: Solar Panel - Q.PEAK DUO L-G5.2 XXX

Sample ID: **Sample 3** **Jones ID:** **ST-13602-03**

TCLP Metals by ICP-OES

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Analytes:							
Silver, Ag	ND	1	TCLP_040219-01	4/2/2019	4/3/2019	0.01	mg/L
Arsenic, As	ND	1	"	"	"	0.01	mg/L
Barium, Ba	**0.12**	1	"	"	"	0.01	mg/L
Cadmium, Cd	ND	1	"	"	"	0.01	mg/L
Chromium, Cr	ND	1	"	"	"	0.01	mg/L
Selenium, Se	ND	1	"	"	"	0.01	mg/L
Lead, Pb	**1.07**	1	"	"	"	0.01	mg/L

EPA 7471A - Mercury by Cold Vapor Atomic Absorption

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Mercury, Hg	ND	1	TCLP_040219-01	4/2/2019	4/4/2019	0.1	µg/L

ND= Not Detected

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JONES ENVIRONMENTAL LABORATORY RESULTS

Client: Hanwha Q CELLS America Inc.
Client Address: 400 Spectrum Center Dr., Suite 1400
Irvine, CA 92618

Attn: Ralph Alvarado

Report date: 4/4/2019
Jones Ref. No.: ST-13602

Date Sampled: 4/1/2019
Date Received: 4/1/2019
Date Analyzed: 4/3-4/2019
Physical State: Solar Panel - Q.PEAK DUO L-G5.2 XXX

Sample ID: **Sample 4** **Jones ID:** **ST-13602-04**

TCLP Metals by ICP-OES

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Analytes:							
Silver, Ag	ND	1	TCLP_040219-01	4/2/2019	4/3/2019	0.01	mg/L
Arsenic, As	ND	1	"	"	"	0.01	mg/L
Barium, Ba	**0.11**	1	"	"	"	0.01	mg/L
Cadmium, Cd	ND	1	"	"	"	0.01	mg/L
Chromium, Cr	ND	1	"	"	"	0.01	mg/L
Selenium, Se	ND	1	"	"	"	0.01	mg/L
Lead, Pb	**1.04**	1	"	"	"	0.01	mg/L

EPA 7471A - Mercury by Cold Vapor Atomic Absorption

	Result	Dilution	Batch	Prepared	Analyzed	Reporting Limit	Units
Mercury, Hg	ND	1	TCLP_040219-01	4/2/2019	4/4/2019	0.1	µg/L

ND= Not Detected

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client: Hanwha Q CELLS America Inc.
Client Address: 400 Spectrum Center Dr., Suite 1400, Irvine, CA 92618

Attn: Ralph Alvarado

Report date: 4/4/2019
Jones Ref. No.: ST-13602

Date Sampled: 4/1/2019
Date Received: 4/1/2019
Date Analyzed: 4/3-4/2019
Physical State: Solar Panel - Q.PEAK DUO L-G5.2 XXX

BATCH: TCLP_040219-01 **Prepared:** 4/2/2019 **Analyzed:** 4/3/2019

TCLP Metals by ICP-OES

	Result	Spike Level	% REC	% REC Limits	% RPD	Reporting Limit	Units
METHOD BLANK:	**TCLP_040219-MB1**						
Analytes:							
Silver, Ag	ND					0.01	mg/L
Arsenic, As	ND					0.01	mg/L
Barium, Ba	ND					0.01	mg/L
Cadmium, Cd	ND					0.01	mg/L
Chromium, Cr	ND					0.01	mg/L
Selenium, Se	ND					0.01	mg/L
Lead, Pb	ND					0.01	mg/L

ND= Not Detected

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client: Hanwha Q CELLS America Inc.
Client Address: 400 Spectrum Center Dr., Suite 1400, Irvine, CA 92618

Attn: Ralph Alvarado

Report date: 4/4/2019
Jones Ref. No.: ST-13602

Date Sampled: 4/1/2019
Date Received: 4/1/2019
Date Analyzed: 4/3-4/2019
Physical State: Solar Panel - Q.PEAK DUO L-G5.2 XXX

BATCH: TCLP_040219-01 **Prepared:** 4/2/2019 **Analyzed:** 4/3/2019

TCLP Metals by ICP-OES

	Result	Spike Level	Source Result	% REC	% RPD	% REC Limits	Units
LCS:	**TCLP_040219-LCS1**						
Analytes:							
Silver, Ag	**5.10**	5.00		102%		80 - 120	mg/L
Arsenic, As	**5.93**	5.00		119%		80 - 120	mg/L
Barium, Ba	**5.32**	5.00		106%		80 - 120	mg/L
Cadmium, Cd	**5.26**	5.00		105%		80 - 120	mg/L
Chromium, Cr	**5.16**	5.00		103%		80 - 120	mg/L
Selenium, Se	**5.46**	5.00		109%		80 - 120	mg/L
Lead, Pb	**5.20**	5.00		104%		80 - 120	mg/L
LCSD:	**TCLP_040219-LCSD1**						
Silver, Ag	**5.13**	5.00	ND	103%	0.6%	80 - 120	mg/L
Arsenic, As	**5.96**	5.00	ND	119%	0.5%	80 - 120	mg/L
Barium, Ba	**5.22**	5.00	ND	104%	1.9%	80 - 120	mg/L
Cadmium, Cd	**5.17**	5.00	ND	103%	1.7%	80 - 120	mg/L
Chromium, Cr	**5.17**	5.00	ND	103%	0.2%	80 - 120	mg/L
Selenium, Se	**5.50**	5.00	ND	110%	0.7%	80 - 120	mg/L
Lead, Pb	**5.34**	5.00	ND	107%	2.7%	80 - 120	mg/L
CCV:	**TCLP_040219-CCV1**						
Silver, Ag	**0.95**	1.00	ND	95%		90-110	mg/L
Arsenic, As	**1.05**	1.00	ND	105%		90-110	mg/L
Barium, Ba	**0.96**	1.00	ND	96%		90-110	mg/L
Cadmium, Cd	**0.95**	1.00	ND	95%		90-110	mg/L
Chromium, Cr	**0.97**	1.00	ND	97%		90-110	mg/L
Selenium, Se	**1.00**	1.00	ND	100%		90-110	mg/L
Lead, Pb	**0.98**	1.00	ND	98%		90-110	mg/L

ND= Not Detected
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 15%

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JONES ENVIRONMENTAL QUALITY CONTROL INFORMATION

Client: Hanwha Q CELLS America Inc.
Client Address: 400 Spectrum Center Dr., Suite 1400, Irvine, CA 92618

Attn: Ralph Alvarado

Report date: 4/4/2019
Jones Ref. No.: ST-13602

Date Sampled: 4/1/2019
Date Received: 4/1/2019
Date Analyzed: 4/3-4/2019
Physical State: Solar Panel - Q.PEAK DUO L-G5.2 XXX

BATCH: TCLP_040219-01 **Prepared:** 4/2/2019 **Analyzed:** 4/4/2019

EPA 7471A - Mercury by Cold Vapor Atomic Absorption

	Result	Spike Level	Source Result	% REC	% RPD	% REC Limits	Units
METHOD BLANK:	**TCLP_040219-MB1**						
Analytes:							
Mercury, Hg	ND						µg/L
LCS:	**TCLP_040219-LCS1**						
Mercury, Hg	**4.82**	5.00		96%		80 - 120	µg/L
LCSD:	**TCLP_040219-LCSD1**						
Mercury, Hg	**5.01**	5.00	ND	100%	**3.9%**	80 - 120	µg/L
CCV:	**TCLP_040219-CCV1**						
Mercury, Hg	**5.05**	5.00	ND	101%		90-110	µg/L

ND= Not Detected
RPD = Relative Percent Difference; Acceptability range for RPD is ≤ 15%

Chain-of-Custody Record

JONES ENVIRONMENTAL, INC.
11007 Forest Pl.
Santa Fe Springs, CA 90670
(714) 449-9937
Fax (714) 449-9685
www.jonesenv.com

Turn Around Requested:
- ☐ Immediate Attention
- ☐ Rush 24 Hours
- X Rush 48 Hours
- ☐ Rush 72 Hours
- ☐ Normal

Report Options
EDD ____
EDF* - 10% Surcharge____
*Global ID _____

LAB USE ONLY
Jones Project #
ST-13602
Page 1 of 1

Sample Condition as Recieved:
Chilled ☐ yes ☐ no
Sealed ☐ yes ☐ no

Client	Hanwha Q Cells
Date	04/01/19
Project Name	
Client Project #	
Project Address	
Email	Ralph.Alvarado@HQCells.com
Phone	619-432-4100
Report To	DC Wai Lo
Sampler	

Sample Container / Preservative Abbreviations
AS - Acetate Sleeve
SS - Stainless Steel Sleeve
BS - Brass Sleeve
G - Glass
AB - Amber Bottle
P - Plastic
SOBI - Sodium Bisulfate
MeOH - Methanol
HCl - Hydrochloric Acid
HNO3 - Nitric Acid
O - Other (See Notes)

Analysis Requested

Sample ID	Date	Sample Collection Time	Laboratory Sample ID	Preservative	Sample Container	Sample Matrix: Soil (S), Sludge (SL), Aqueous (A), Free Product (FP)	TC LP	Hold	Number of Containers	Notes & Special Instructions
Sample 1			ST-13602-01				X			
Sample 2			ST-13602-02				X			
Sample 3			ST-13602-03				X			
Sample 4			ST-13602-04				X			

Relinquished By (Signature)	**Printed Name**		**Received By (Signature)**	**Printed Name**	
J. Ralph Alvarado	J. Ralph Alvarado			Chris Jones	Total Number of Containers:
Company	**Date**	**Time**	**Company**	**Date**	**Time**
Hanwha Q Cells	4/1/19	12:41 pm	JEC	04/01/19	1741
Relinquished By (Signature)	**Printed Name**		**Received By Laboratory (Signature)**	**Printed Name**	
Company	**Date:**	**Time**	**Company**	**Date**	**Time**

Client signature on this Chain of Custody form constitutes acknowledgement that the above analyses have been reqested, and the information provided herein is correct and accurate.

Toxicity Characteristic Leaching Procedure (TCLP) Regulatory Levels

METALS	TCLP Regulatory Level, mg/L	EPA Hazardous Waste Number	Recommended Test Method
Arsenic	5.0	D004	7061
Barium	100.0	D005	7080
Cadmium	1.0	D006	7130
Chromium	5.0	D007	7190
Lead	5.0	D008	7420
Mercury	0.2	D009	7471
Selenium	1.0	D010	7741
Silver	5.0	D011	7760

VOLATILE ORGANICS	TCLP Regulatory Level, mg/L	EPA Hazardous Waste Number	Recommended Test Method
Benzene	0.5	D018	8260B
Carbon Tetrachloride	0.5	D019	8260B
Chlorobenzene	100.0	D021	8260B
Chloroform	6.0	D022	8260B
1,4-Dichlorobenzene	7.5	D027	8260B
1,2-Dichloroethane	0.5	D028	8260B
1,1-Dichloroethylene	0.7	D029	8260B
Methyl Ethyl Ketone	200.0	D035	8260B
Tetrachloroethylene	0.7	D039	8260B
Trichloroethylene	0.5	D040	8260B
Vinyl Chloride	0.2	D043	8260B

SEMIVOLATILE ORGANICS	TCLP Regulatory Level, mg/L	EPA Hazardous Waste Number	Recommended Test Method
o-Cresol	[1] 200	D023	8270C
m-Cresol	[1] 200	D024	8270C
p-Cresol	[1] 200	D025	8270C
Cresol	[1] 200	D026	8270C
2,4-Dinitrotoluene	0.13	D030	8270C
Hexachlorobenzene	0.13	D032	8270C
Hexachlorobutadiene	0.5	D033	8270C
Hexachloroethane	3.0	D034	8270C
Nitrobenzene	2.0	D036	8270C
Pentachlorophenol	100.0	D037	8270C
Pyridine	2 5.0	D038	8270C
2,4,5-Trichlorophenol	400.0	D041	8270C
2,4,6-Trichlorophenol	2.0	D042	8270C

[1]If Cresols cannot be differentiated, total cresol may be used.

ORGANOCHLORINE PESTICIDES	TCLP Regulatory Level, mg/L	EPA Hazardous Waste Number	Recommended Test Method
Chlordane	0.03	D020	8081A
Endrin	0.02	D012	8081A
Heptachlor (and its Epoxide)	0.008	D031	8081A
Lindane	0.4	D013	8081A
Methoxychlor	10.0	D014	8081A
Toxaphene	0.5	D015	8081A

CHLOROPHENOXY ACID HERBICIDES	TCLP Regulatory Level, mg/L	EPA Hazardous Waste Number	Recommended Test Method
2,4-D	10.0	D016	8150
2,4,5-TP (Silvex)	1.0	D017	8150

Reference: 40 CFR 261, Appendix II, 1993 ed., as amended by 58 FR 46040, August 31, 1993.

TCLP- Toxicity Characteristic Leaching Procedure

Waste determination testing

Many products are classified as hazardous waste when they are disposed at the end of their useful life. These products contain materials that are corrosive, flammable, reactive or toxic. Some toxic chemicals, such as lead and mercury are persistent and bioaccumulative, meaning they remain in the environment indefinitely and accumulate in and harm living things. When products containing these toxic compounds are disposed in landfills, the toxic chemicals can leach into underground drinking water supplies.

Waste codes listed in 40 CFR 261.24

TCLP Metals and Volatile Organic Compounds, Pesticides, Semi-Volatile Organic Compounds and Herbicides

Metals			Volatile Organic Compounds		
Contaminant	**EPA HW #**	**Regulatory Level**	**Contaminant**	**EPA HW #**	**Regulatory Level**
Arsenic	D004	5.0 mg/L	Benzene	D018	0.5 mg/L
Barium	D005	100.0 mg/L	Carbon tetrachloride	D019	0.5 mg/L
Cadmium	D006	1.0 mg/L	Chlorobenzene	D021	100.0 mg/L
Chromium	D007	5.0 mg/L	Chloroform	D022	6.0 mg/L
Lead	D008	5.0 mg/L	1,2-Dichloroethane	D028	0.5 mg/L
Mercury	D009	0.2 mg/L	1,1-Dichloroethylene	D029	0.7 mg/L
Selenium	D010	1.0 mg/L	Methyl ethyl ketone	D035	200.0 mg/L
Silver	D011	5.0 mg/L	Tetrachloroethylene	D039	0.7 mg/L
			Trichloroethylene	D040	0.5 mg/L
			Vinyl chloride	D043	0.2 mg/L
Pesticides			**Semi-Volatile Organic Compounds**		
Contaminant	**EPA HW #**	**Regulatory Level**	**Contaminant**	**EPA HW #**	**Regulatory Level**
Chlordane	D020	0.03 mg/L	o-Cresol	D023	200.0 mg/L
Endrin	D012	0.02 mg/L	m-Cresol	D024	200.0 mg/L
Heptachlor (and its epoxide)	D031	0.008 mg/L	p-Cresol	D025	200.0 mg/L
Lindane	D013	0.4 mg/L	Cresol	D026	200.0 mg/L
Methoxychlor	D014	10.0 mg/L	1,4-Dichlorobenzene	D027	7.5 mg/L
Toxaphene	D015	0.5 mg/L	2,4-Dinitrotoluene	D030	0.13 mg/L
			Hexachlorobenzene	D032	0.13 mg/L
			Hexachlorobutadiene	D033	0.5 mg/L
			Hexachloroethane	D034	3.0 mg/L
Herbicides			Nitrobenzene	D036	2.0 mg/L
Contaminant	**EPA HW #**	**Regulatory Level**	Pentachlorophenol	D037	100.0 mg/L
2,4-D	D016	10.0 mg/L	Pyridine	D038	5.0 mg/L
2,4,5-TP (Silvex)	D017	1.0 mg/L	2,4,5-Trichlorophenol	D041	400.0 mg/L
			2,4,6-Trichlorophenol	D042	2.0 mg/L

The U.S. Environmental Protection Agency (EPA) has identified 40 toxic chemicals that can cause harm when products containing them are disposed in landfills and the chemicals leach out (40 CFR part 261). To determine the potential of specific wastes to leach dangerous concentrations of toxic chemicals into groundwater, the EPA developed a protocol known as the Toxicity Characteristic Leaching Procedure (TCLP).

Products containing one or more of the listed toxins are assessed using the TCLP to estimate how much of their toxic contents would be released into landfill leachate under ordinary conditions. If the amount of a particular chemical released under test conditions exceeds regulatory limits, the waste qualifies as hazardous and must be handled according to regulations governing hazardous waste, such as handling by certified disposal agents and recycling or disposing in specially designated landfills and incinerators. Products that do not leach toxic materials at levels exceeding regulatory limits are termed TCLP compliant.

Iowa Department of Natural Resources | 502 E. 9th St. Des Moines, IA 50319 | (515) 725-8200

www.iowadnr.gov

TCLP- Toxicity Characteristic Leaching Procedure

Waste determination testing

It is the generator's responsibility to make this determination, but generators often contract outside labs to perform the TCLP test.

The following questions and answers may be helpful to generators.

Question: What is the effect on the TCLP results if we miss any of the holding times specified in the method, or if we do not perform the procedure exactly as written?

Answer: The TCLP is a method-defined parameter and, therefore, it must be performed as written. This includes meeting all specifications for holding and tumbling times. If the method is not performed as written, the results are not valid for the purposes of determining whether the waste is hazardous based on the toxicity characteristic.

However, if the holding times are not met *and* the results for the analyses are *over* the numerical limits in the toxicity characteristic (40 CFR 261.24), the data can be used by the generator to demonstrate that the waste failed the toxicity characteristic and therefore *must* be managed as a hazardous waste.

Question: What are the holding times for the samples before leaching, the leachates before extraction, and the extracts before analysis?

Answer: Three types of holding times are summarized in Sec. 8.5 of Method 1311. For the leachate that will be analyzed for:

- Organics (including volatiles, semivolatiles, and the herbicides), you have 14 days from the collection of the original sample until you have to start the leaching (extraction).
- For metals, you have 180 days from collection until leaching, except for mercury, where leaching must start within 28 days.
- Herbicides are grouped with the "semivolatiles" in Sec. 8.5 of the method, since both types of analytes are extracted with an organic solvent. Extraction of semivolatiles and herbicides from the leachate must start within seven days of completion of the leaching procedure.

The instrumental (determinative) analyses for:

- Semivolatiles and herbicides must be completed within 40 days of the completion of the solvent extractions. The determinative analyses for the volatiles must be completed within 14 days of the completion of the leaching procedure.
- Metals must be completed within 180 days of the completion of the leaching procedure, except for mercury, where analyses must be completed within 28 days of the completion of the leaching procedure.

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TCLP- Toxicity Characteristic Leaching Procedure

Waste determination testing

It passes lab testing, now what?

Question: My waste passes the TCLP, does that mean my waste is not hazardous?
Answer: The waste could still be hazardous due to another characteristic (flammable, corrosive, reactive), or it may be a listed hazardous waste. To find step-by-step assistance on how to make a waste determination, see ***www.fedcenter.gov/assistance/facilitytour/hazardous/whatis/flowchart/***

Total Constituent Analysis instead of TCLP Analysis

Question: Is it acceptable to perform a total constituent analysis instead of a TCLP analysis and then divide the total concentration by 20 to determine if a waste is non-hazardous, as is implied in Section 1.2 of Method 1311, TCLP?

Answer: Section 1.2 of the TCLP *does* allow for a total constituent analysis in lieu of the TCLP extraction. If a waste is 100 percent solid, as defined by the TCLP method, then the results of the total constituent analysis may be divided by 20 to convert the total results into the maximum leachable concentration. This factor is derived from the 20:1 liquid-to-solid ratio employed in the TCLP. If a waste has filterable liquid, then the concentration of the analyte in each phase (liquid and solid) must be determined. The following equation may be used to calculate this value:

$$\frac{[A \times B] + [C \times D]}{B + [20\ (L/kg) \times D]} = E$$

Where:

- A = Concentration of the analyte in liquid portion of the sample (mg/L)
- B = Volume of the liquid portion of the sample (L).
- C = Concentration of the analyte in solid portion of the sample (mg/kg)
- D = Weight of the solid portion of the sample (kg)
- E = Maximum theoretical concentration in leachate (mg/L)

The value obtained (E) can be used to show that the maximum theoretical concentration in a leachate from the waste could not exceed the concentration specified in the toxicity characteristic (TC) (40 CFR 261.24). In addition, if the total constituent analysis results are below the TC limits without dividing by 20, then the same argument holds true, i.e., the maximum theoretical concentration in the leachate could not exceed the TC limits.

Do I have to test for all the chemicals listed in 40 CFR 261.24?

Waste streams should be tested for constituents that are reasonably expected to be present. For example, if a facility had a parts washer, the parts washer may reasonably be expected to contain leachable metals. (Chromium or cadmium is often a coating or constituent from bearings, pistons, or other metal products.) Since pesticides would not reasonably be expected to be present in normal parts washer operations, do not test for any of the pesticides that are in 40 CFR 261.24.

If you have a waste that is absolutely unknown, you will need to test for all the TC constituents listed in 40 CFR 261.24. This situation could occur, for example, if a 55 gallon drum of unknown liquid was abandoned on your property and you could not find the original owner. This waste would need a full determination for the TC constituents and other characteristics.

ATTACHMENT 4

IKEA NEW HAVEN

PHOTOVOLTAIC SYSTEM - CARPORT SHADE STRUCTURES

450 SARGENT DRIVE, NEW HAVEN, CT 06511

SYSTEM SPECIFICATIONS	
PANEL MODEL	Q. PEAK DUO L-G6.3 420
NUMBER OF MODULES	3,886
SYSTEM POWER, KWSTC	1,632.12
TILT	5°
AZIMUTH	124° / 304°
CANOPY ARRAY SQUARE FOOTAGE	90,998
UTILITY	UNITED ILLUMINATING CORP
PERMITTING AUTHORITY	CT SITING COUNCIL
ZONING	PDD 100

SHEET INDEX:

PROJECT TEAM

CLIENT:
IKEA PROPERTY, INC.
420 ALAN WOOD RD.
CONSHOHOCKEN, PA 19428

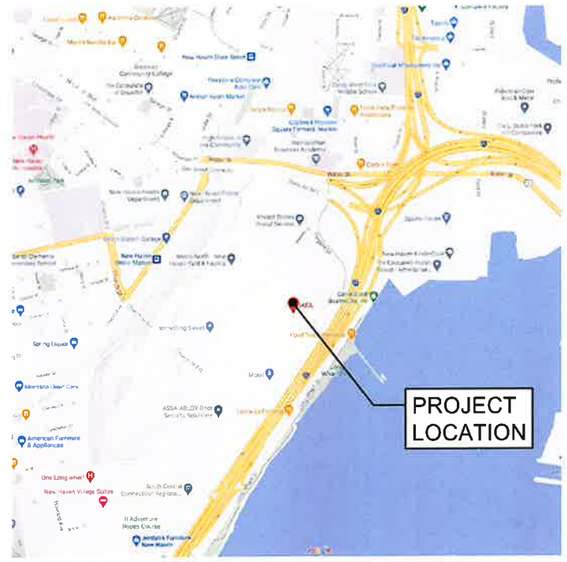
GENERAL CONTRACTOR:
DISTRIBUTED SOLAR OPERATIONS, LLC
DBA DSD CONSTRUCTION
200 HARBORSIDE DRIVE
SUITE 200
SCHENECTADY, NY 12305

ENVIRONMENTAL CONSULTANT:
ALL-POINTS TECHNOLOGY CORPORATION, P.C.
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CONNECTICUT 06385

SURVEYOR:
LOUREIRO ENGINEERING ASSOCIATES, INC.
100 FORT HILL RD., STE. 3
GROTON, CT 06340

DESIGN PROFESSIONAL IN CHARGE:
REX ARASHI, P.E.
APPLIED ENGINEERING CONSULTANTS, INC.
10360 CAREY DR.
GRASS VALLEY, CA 95945

GEOTECHNICAL FIRM:
DOWN TO EARTH CONSULTING, LLC
122 CHURCH STREET
NAUGATUCK, CONNECTICUT 06770



DISTRIBUTED SOLAR DEVELOPMENT, LLC
200 HARBORSIDE DRIVE, STE. 200
SCHENECTADY, NY 12305

APPLIED ENGINEERING CONSULTANTS, INC.

SEAL & SIGNATURE:

8/2/2021, 10:40:34 AM

As design professional in responsible charge.

PROJECT NAME:
IKEA NEW HAVEN
PHOTOVOLTAIC SYSTEM

PROJECT ADDRESS:
450 SARGENT DRIVE
NEW HAVEN, CT
06511

NO.	DATE:	REVISION DESCRIPTION:	DRAWN BY:	CHECK BY:
1	07-30-21	CT SITTING COUNCIL REV 1	CC	AN

SCALE:

SHEET TITLE:
TITLE SHEET

SHEET NO.
G-001

TOTAL NUMBER OF SHEETS:

TIMBER PILES:

1. TIMBER PILES SHALL CONFORM IN SIZE, QUALITY AND ALL OTHER REQUIREMENTS FOR CLASS B TIMBER PILES INTENDED FOR PRESERVATIVE TREATMENT AS SET FORTH IN THE AMERICAN SOCIETY FOR TESTING MATERIALS FOR ROUND TIMBER PILES, ASTM DESIGNATION D25-12. TIMBER SPECIES SHALL BE SOUTHERN PINE.

2. PILES MAY NOT BE SPLICED.

3. ALL PILES SHALL BE PRESSURE TREATED IN ACCORDANCE WITH THE LATEST SPECIFICATIONS OF THE AMERICAN WOOD PRESERVERS ASSOCIATION.

4. PILES SHALL PROVIDE A MINIMUM 33 KIPS VERTICAL LOAD CAPACITY (COMPRESSION) AND 7KIPS UPLIFT. CAPACITIES ARE ALLOWABLE CAPACITIES. ULTIMATE CAPACITIES NEED TO BE HIGHER.

5. TEST PILES WHICH ARE FURNISHED AND DRIVEN BY THE CONTRACTOR TO DETERMINE LENGTH OFPILES, MAY BE LOCATED, CUT OFF AND BECOME PART OF THE FOUNDATION SYSTEM PROVIDED THEY CONFORM TO THE CONTRACT REQUIREMENTS.

6. PILES SHALL BE DRIVEN IN FIXED LEADS, HELD PLUMB WITHOUT BATTER AND FINAL LOCATION AT DESIGN CUT OFF WITHIN A TOLERANCE OF NOT MORE THAN 6 INCHES FROM DESIGN LOCATION.

7. THE TOPS OF PILES SHALL BE CUT TO A TRUE PLANE AND AT THE ELEVATIONS INDICATED ON THE PLANS.

8. THE CONTRACTOR SHALL ESTABLISH A REFERENCE SYSTEM FOR IDENTIFYING THE PILES, AND IF REQUIRED, SHALL MAINTAIN ACCURATE AND COMPLETE PILE DRIVING LOGS, AND SHALL PROVIDE AND MAINTAIN ALL INFORMATION REGARDING EQUIPMENT USED TO INSTALL THE PILES INCLUDING ITS OPERATIONAL EFFICIENCY.

9. WITHIN 48 HOURS OF COMPLETING A SINGLE PILE OR PILE GROUP, SUBMIT A LOCATION DRAWING TO ENGINEER SHOWING LOCATION OF ALL PILES AND THEIR DEVIATION FROM DESIGNED LOCATION. LOCATION PLAN TO BE CERTIFIED BY LICENSED SURVEYOR.

10. PILES SHALL BE SUFFICIENTLY STRAIGHT SO THAT A LINE DRAWN FROM THE CENTER OF THE BUTT END TO THE POINT WILL BE WHOLLY WITHIN THE PILE.

11. PILE DRIVING CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURATE LOCATION OF THE PILES.

12. DRIVE PILES TO REQUIRED LOAD CAPACITY SHOWN USING PILE DRIVING EQUIPMENT OPERATED AT MANUFACTURER'S SPECIFIED RATE, TO DEVELOP REQUIRED RATE ENERGY PER BLOW. AVOID DAMAGING PILES BY OVERDRIVING.

13. MARK EACH PILE'S LENGTH WITH A HORIZONTAL LINE AT 1'-0" INTERVALS AND THE NUMBER OF FEET FROM PILE POINT AT 5'-0" INTERVALS.

14. IF REQUESTED, THE CONTRACTOR SHALL SUBMIT COPIES OF PILE DRIVING RECORD OF EACH PILE TO THE ENGINEER NO LATER THEN 2 DAYS AFTER DRIVING. INCLUDE PROJECT NAME, NAME OF CONTRACTOR, PILE LOCATION AND NUMBER COMPUTED PILE CAPACITY, TYPE, SIZE AND OPERATIONAL EFFICIENCY OF HAMMER USED AND CONTINUOUS RECORD OF NUMBER OF BLOWS PER FOOT FOR ENTIRE LENGTH OF PILE AND SET FOR LAST 10 BLOWS.

15. PILES SHALL BE DRIVEN IN THE PRESENCE OF THE DESIGN ENGINEER, WHO SHALL PREPARE A PILE DRIVING RECORD FOR EACH PILE INSTALLED.

16. CONTRACTOR'S SURVEYOR IS RESPONSIBLE FOR OBTAINING HEAVE MEASUREMENTS ON COMPLETED PILES. RE-DRIVE PILES THAT HEAVE 1/2" OR MORE.

DESIGN LOADS:

1. VERTICAL COMPRESSION = 88.5 KIPS

2. VERTICAL TENSION (UPLIFT) = 23.6 KIPS

3. OVERTURNING MOMENT 41 KIP-FT

4. SHEAR = 2.8 KIPS

5. VERTICAL AND OVERTURNING LOADS MAY ACT CONCURRENTLY

6. LOADS GIVEN REPRESENT THE MAX NOMINAL LOADS.

7. ASD LOAD FACTORS HAVE BEEN APPLIED TO THE LOADS ABOVE PER THE AISC BASIC LOAD COMBINATIONS FOR DESIGN OF THE FOUNDATIONS.

8. LOADS ARE PER COLUMN.

NOTES:

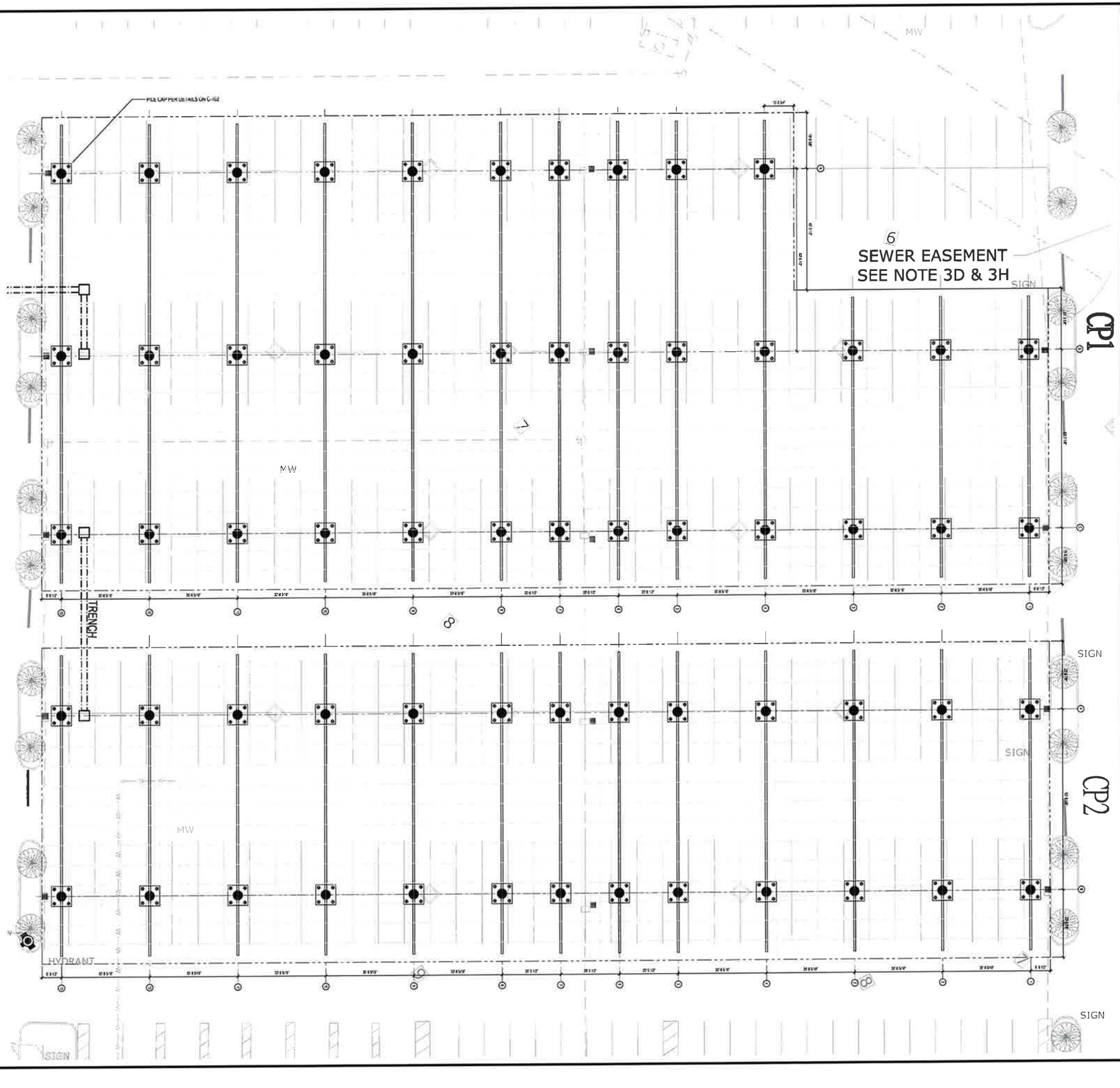
1. LAYOUT PILE CAP SO THAT CANOPY COLUMN IS AT CENTER OF CAP. COORDINATE ANCHOR BOLTS WITH CANOPY DESIGNER.

2. SEE SITE/CIVIL AND SOLAR CANOPY DRAWINGS FOR LAYOUT DIMENSIONS.

3. PRIOR TO FORMING PILE CAPS, PROVIDE STRUCTURAL ENGINEER WITH A SURVEY OF INSTALLED PILE LOCATIONS WHICH NOTE DEVIATIONS FROM INTENDED PILE LOCATIONS AND DIAMETER AT TOP OF PILE.

4. OVERALL PILE CAP DIMENSIONS MAY NEED TO BE INCREASED TO ACCOMODATE MISALIGNED PILES.

5. RE-TREAT PILES ENDS WITH PRESERVATIVE AFTER THEY ARE CUT TO FINAL ELEVATION



CLIENT:

IKEA

DSD

DISTRIBUTED SOLAR DEVELOPMENT, LLC
200 HARBORSIDE DRIVE, STE. 200
SCHENECTADY, NY 12305

FOUNDATION ENGINEER:

APPLIED ENGINEERING CONSULTANTS, INC.
10360 CAREY DRIVE
GRASS VALLEY, CA 95945
Tel: 530-838-5358
AEC JOB #: 2021-DSD011

STRUCTURAL ENGINEER:

CALSTL, LLC
98 SEAN AVENUE
MOUNTAIN HOUSE, CA 95391
TEL: 203-676-1846

ELECTRICAL ENGINEER:

CIVIL ENGINEER:

STAMPS & SIGNATURES:

3/11/2022, 3:00:47 PM

PROJECT NAME:

IKEA NEW HAVEN
PHOTOVOLTAIC SYSTEM

PROJECT ADDRESS:

450 SARGENT DRIVE
NEW HAVEN, CT
06511

NO	DATE	REVISION DESCRIPTION	DRAWN BY:	CHECK BY:
1	03-10-22	PERMIT	CC	AN

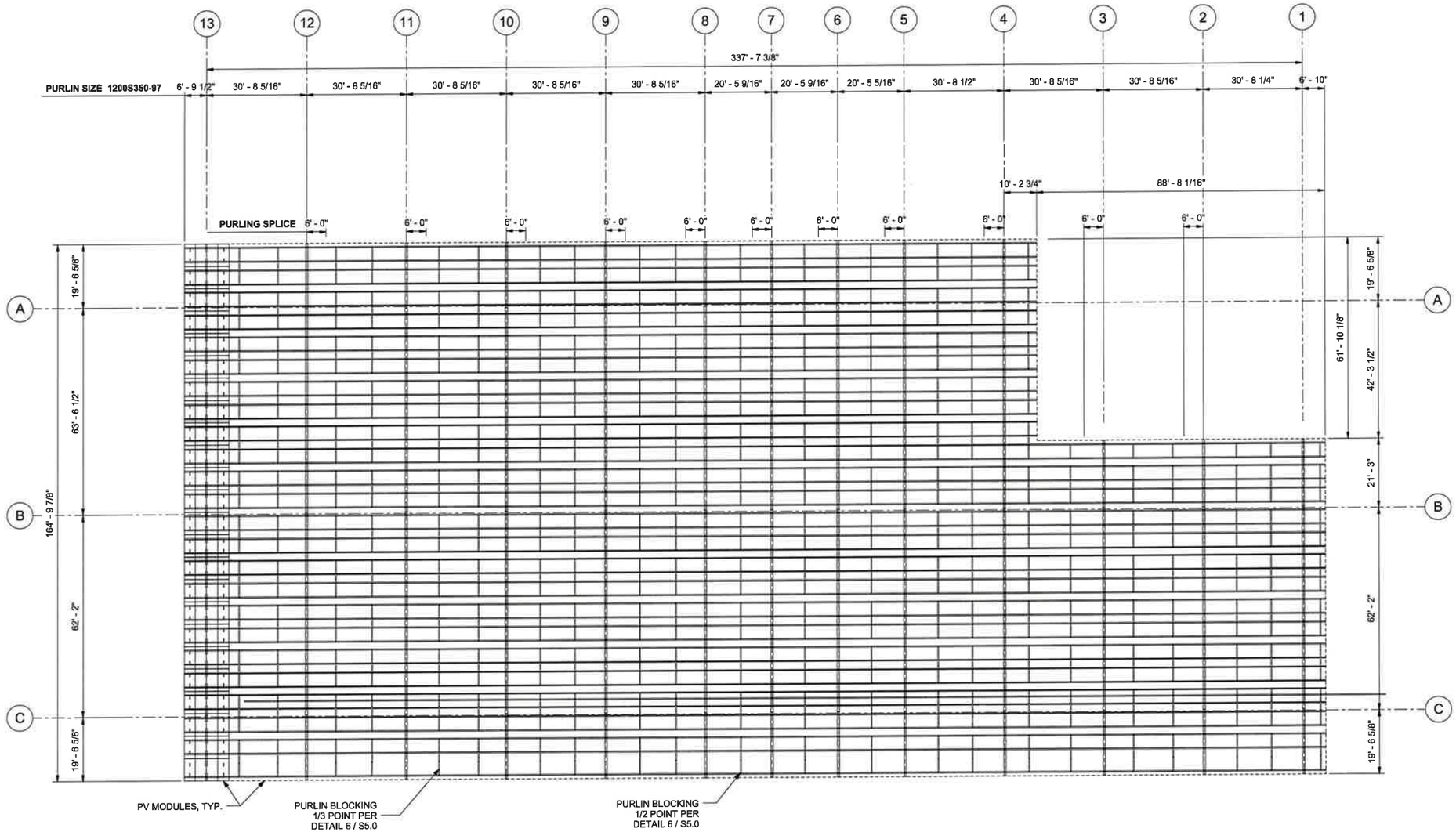
SCALE: 1/16" = 1'-0"

SHEET TITTLE:

SOLAR CANOPY FOUNDATIONS

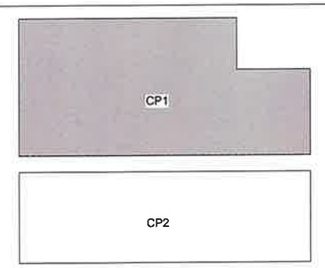
C-101

SHEET NO.



1 SECONDARY ROOF FRAMING PLAN - CP1
1/16" = 1'-0"

KEY PLAN



CALSTL, LLC

ANSHUMAN SEHUEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 999 - 0

03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN,
CT. SOLAR CANOPY

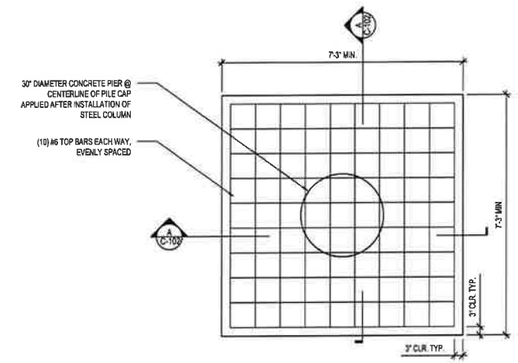
450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale As indicated

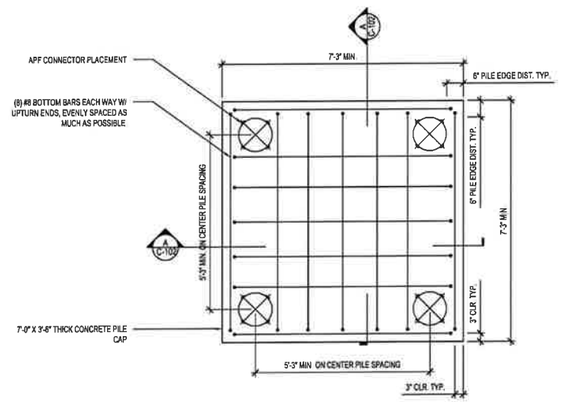
SECONDARY ROOF
FRAMING PLAN -
CP1

S1.1

Sheet No. ©2021



1 PILE CAP PLAN VIEW @ TOP
1/2" = 1'-0"

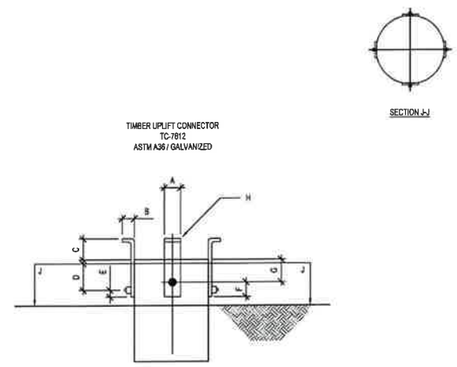


2 PILE CAP PLAN VIEW @ BOTTOM
1/2" = 1'-0"

DIMENSION KEY	
A	4"
B	3"
C	6"
D	9 5"
E	1 5"
F	4"
G	7"
H	0 5" THICK

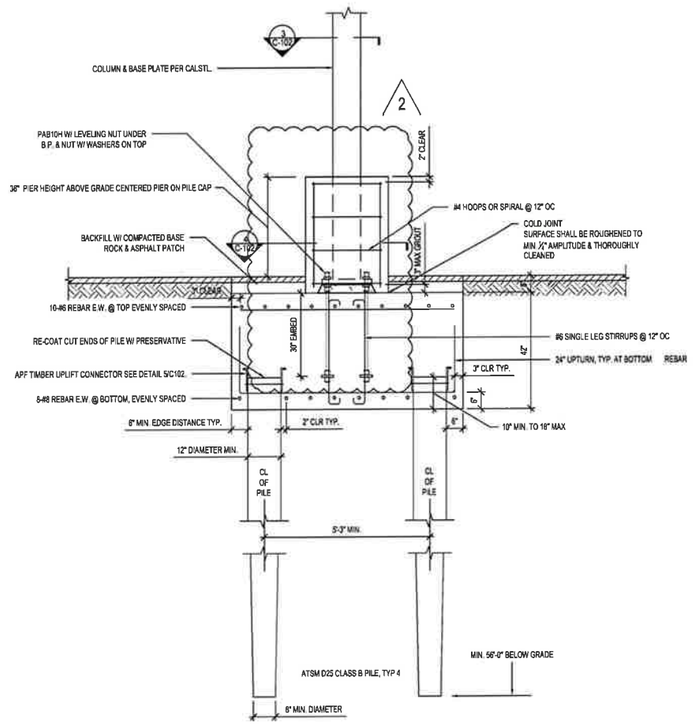
EACH ASSEMBLY INCLUDES:
(4) UPLIFT ANCHORS
(4) 1" DIAMETER NUTS
(4) 1" WASHERS
(4) 1" THREADED BAR, 18" LONG

UPLIFT CAPACITY
4-ANCHOR: 12 TONS



SECTION J-J

5 PILE CAP PLAN VIEW @ TOP
1/2" = 1'-0"



A PILE FOUNDATION SECTION
1/2" = 1'-0"

FOUNDATION GENERAL NOTES:

1. 2018 CONNECTICUT STATE BUILDING CODE, 2015 IBC, ASCE7-10, ACI318-14
2. BASED ON SOIL REPORT BY GZA (PROJECT NUMBER: 05 0046921.00, DATED 3/17/22. 12" TO 8" TAPERED TIMBER PILE CAPACITIES WHEN EMBEDDED TO A DEPTH OF 56' BELOW GRADE PA = 33 KIPS, TA = 7 KIPS, VA = 1 KIP.
3. CONCRETE TO OBTAIN A MINIMUM COMPRESSIVE STRENGTH OF FC' = 5,000 PSI AT 28 DAYS. MINIMUM 6% AIR ENTRAINMENT.
4. ALL REBAR TO BE GRADE 60
5. CONCRETE TO REACH 2,000 PSI PRIOR TO ERECTION OF STEEL FRAMING.
6. CONCRETE TO REACH 3,500 PSI PRIOR TO INSTALLATION OF SOLAR PANELS
7. PILE CAP EXCAVATION SHALL BE CLEAN OF ALL DELETERIOUS MATERIAL, INCLUDING LOOSE SOIL, PRIOR TO POURING CONCRETE.
8. SHOULD ANY PILE HIT REFUSAL, CONTACT GZA FOR REMEDIAL RECOMMENDATIONS.
9. STRUCTURAL NON-SHRINK GROUT: ASTM C1107 OR BETTER TO REACH A 28 DAY COMPRESSIVE STRENGTH OF 9000 PSI IN PLASTIC CONDITION.
10. ALL REBAR TO BE A615 GRADE 60.
11. PILES MUST EMBED A MINIMUM OF 6'-0" INTO NATURAL SAND LAYER
12. PILE CONTRACTOR TO COORDINATE WITH GZA REGARDING MINIMUM BLOW COUNT AND WEAP METHOD.

TESTING & INSPECTIONS:

TESTS AND INSPECTION SHALL BE PROVIDED BY A QUALIFIED TESTING AGENCY AS REQUIRED BELOW AND SHALL CONFORM TO THE REQUIREMENTS OF THE 2018 CONNECTICUT STATE BUILDING CODE. TESTING AND INSPECTION RECORDS SHALL BE KEPT FOR ALL STRUCTURAL CONCRETE

PILE INSTALLATION SHALL BE INSPECTED AND APPROVED BY GZA PRIOR TO PLACEMENT OF CONCRETE PILE CAP.

TESTS:

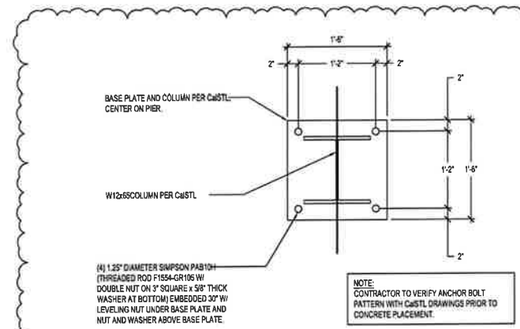
- ☐ FILL COMPACTION
- ☐ REINFORCING STEEL **
- ■ CONCRETE
- ☐ STRUCTURAL STEEL **
- ☐ MASONRY
- ☐ GROUT AND MORTAR
- ☐ EPOXY & EXPANSION ANCHORS
- ☐ SHOTCRETE

** SUBMIT MILL CERTIFICATES TO VERIFY MATERIAL

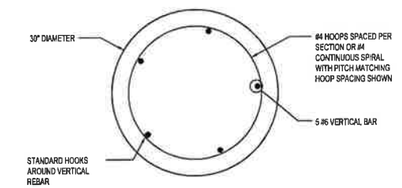
INSPECTIONS:

- ■ FOOTING EXCAVATION
- ■ PILE / PIER INSTALLATION
- ■ REINFORCEMENT PLACEMENT
- ■ CONCRETE PLACEMENT
- ☐ SHOP WELDING *
- ☐ FIELD WELDING
- ☐ HIGH STRENGTH BOLTING
- ☐ MASONRY PLACEMENT & GROUTING
- ☐ SHEAR STUD INSTALLATION
- ☐ EPOXY & EXPANSION ANCHORS
- ■ ANCHOR BOLTS EMBEDDED IN CONCRETE OR MASONRY
- ☐ SHOTCRETE

* WELDING MUST BE PERFORMED IN A SHOP APPROVED BY THE BUILDING OFFICIAL AND STRUCTURAL ENGINEER
** GEOTECHNICAL ENGINEER TO OBSERVE PIER EXCAVATIONS IN ACCORDANCE WITH SOILS REPORT.

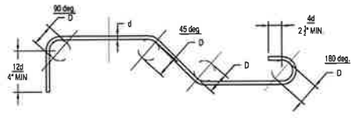


3 COLUMN BASE PLATE DETAIL
1" = 1'-0"

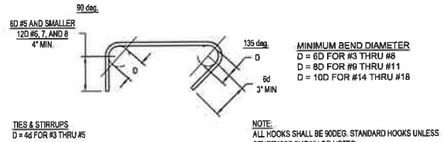


4 TYPICAL PIER PLAN VIEW
1" = 1'-0"

2



TYPICAL HOOKS AND BENDS



8 STANDARD REBAR HOOKS AND BENDS
1" = 1'-0"

CLIENT
IKEA

DSDII
DISTRIBUTED SOLAR DEVELOPMENT, LLC
200 HARBORSIDE DRIVE, STE. 200
SCHENECTADY, NY 12305

DESIGN PROFESSIONAL IN CHARGE
APPLIED ENGINEERING CONSULTANTS, INC.
10360 CAREY DRIVE
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Tel: 530-838-5358
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STRUCTURAL ENGINEER
CALSTL, LLC
98 SEAN AVENUE
MOUNTAIN HOUSE, CA 95391
TEL: 203-676-1846

ELECTRICAL ENGINEER
PURE POWER ENGINEERING
111 RIVER STREET, SUITE 110
HOBOKEN, NJ 07030

STAMPS & SIGNATURES
12/13/2022, 10:31:33 AM

PROJECT NAME
IKEA NEW HAVEN PHOTOVOLTAIC SYSTEM

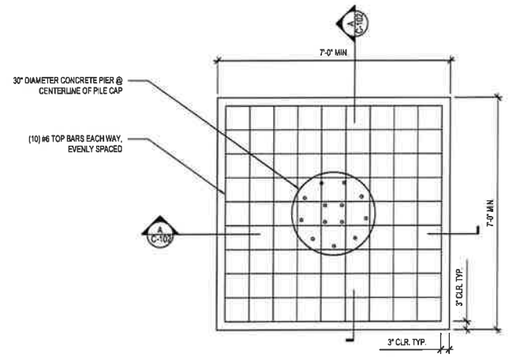
PROJECT ADDRESS
450 SARGENT DRIVE
NEW HAVEN, CT
06511

NO.	DATE:	REVISION DESCRIPTION	DRAWN BY:	CHECK BY:
1	03-10-22	PERMIT	CC	AN
2	11-08-22	PIER REVISION	CC	AN

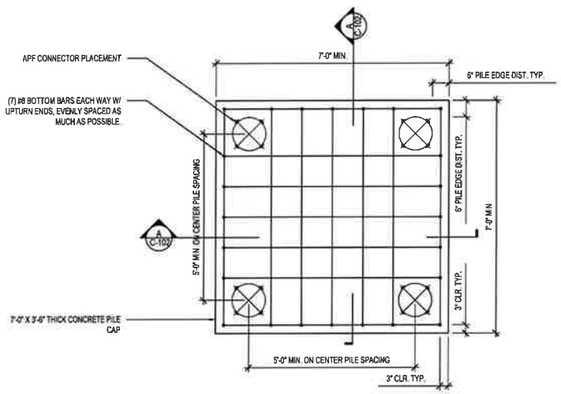
SCALE AS NOTED

SHEET TITLE
FOUNDATION DETAILS AT ALL COLUMN LINES

C-102
SHEET NO



1 PILE CAP PLAN VIEW @ TOP
1/2" = 1'-0"



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A	4"
B	3"
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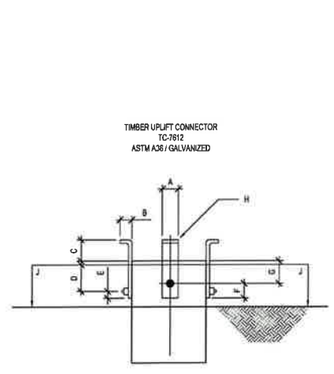
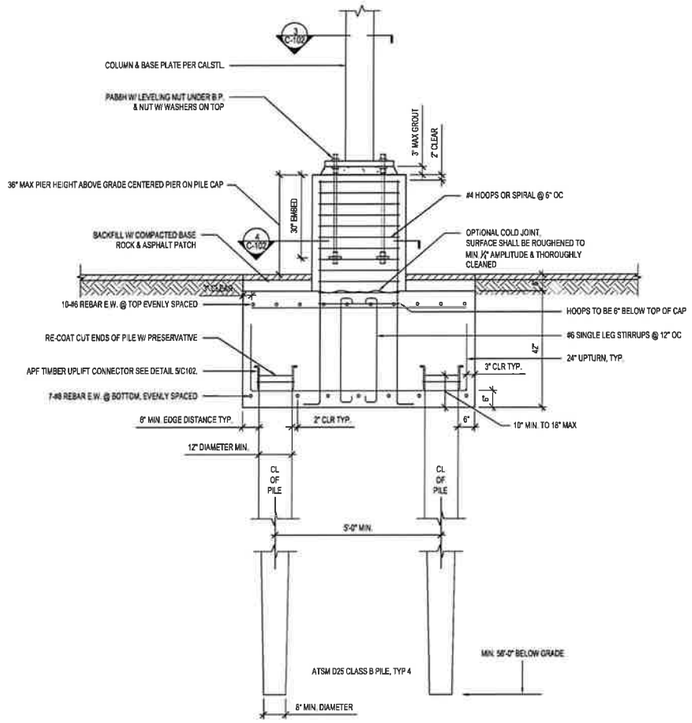


SECTION J-J

5 PILE CAP PLAN VIEW @ TOP
1/2" = 1'-0"



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FOUNDATION GENERAL NOTES:

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TESTS:

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- ■ CONCRETE
- ☐ STRUCTURAL STEEL **
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** SUBMIT MILL CERTIFICATES TO VERIFY MATERIAL

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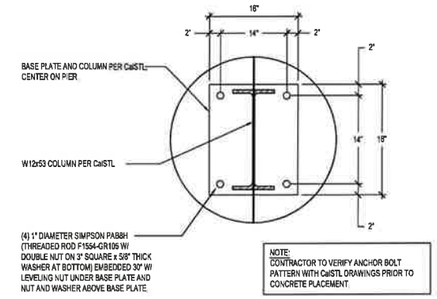
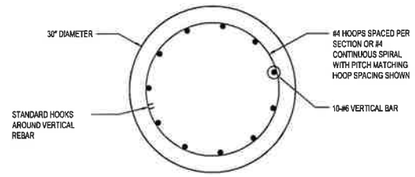
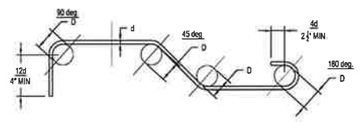
** GEOTECHNICAL ENGINEER TO OBSERVE PIER EXCAVATIONS IN ACCORDANCE WITH SOILS REPORT.



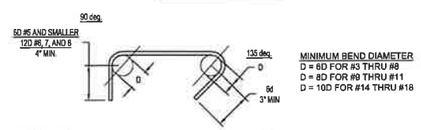
3 COLUMN BASE PLATE DETAIL
1" = 1'-0"



4 TYPICAL PIER PLAN VIEW
1" = 1'-0"



TYPICAL HOOKS AND BENDS



TIES & STIRRUPS
D = 4d FOR #3 THRU #5
D = 6d FOR #6 THRU #8

MINIMUM BEND DIAMETER
D = 6D FOR #3 THRU #8
D = 8D FOR #9 THRU #11
D = 10D FOR #14 THRU #18

NOTE:
ALL HOOKS SHALL BE 90DEG. STANDARD HOOKS UNLESS OTHERWISE SHOWN OR NOTED.

6 STANDARD REBAR HOOKS AND BENDS
1" = 1'-0"

CLIENT:
IKEA

DSD
DISTRIBUTED SOLAR DEVELOPMENT, LLC
200 HARBORSIDE DRIVE, STE. 200
SCHENECTADY, NY 12305

FOUNDATION ENGINEER:
APPLIED ENGINEERING CONSULTANTS, INC.
10360 CAREY DRIVE
GRASS VALLEY, CA 95945
Tel: 530-838-5358
AEC JOB #: 2021-DSD011

STRUCTURAL ENGINEER:
CALSTL, LLC
98 SEAN AVENUE
MOUNTAIN HOUSE, CA 95391
TEL: 203-676-1846

ELECTRICAL ENGINEER:

CIVIL ENGINEER:

STAMPS & SIGNATURES:

3/11/2022, 3:00:47 PM

PROJECT NAME:
IKEA NEW HAVEN PHOTOVOLTAIC SYSTEM

PROJECT ADDRESS:
450 SARGENT DRIVE
NEW HAVEN, CT
06511

NO.	DATE:	REVISION DESCRIPTION	DRAWN BY:	CHECK BY:
1	03-10-22	PERMIT	CC	AN

SCALE: AS NOTED

SHEET TITTLE:
FOUNDATION DETAILS AT ALL COLUMN LINES

C-102
SHEET NO.

VACINITY MAP

SHEET INDEX

BUILDING INFORMATION

BUILDING DATA:

CONSTRUCTION TYPE

TYPE OF CONSTRUCTION	II-B
DESCRIPTION OF USE	SOLAR SUPPORT STRUCTURES
OCCUPANCY	GENERAL IN RESPONSIBLE CHARGE TO PROVIDE CODE ANALYSIS

INSPECTIONS -

1. SHOP WELDING INSPECTION MAY NOT BE REQUIRED IF THE FABRICATOR IS AISC CERTIFIED. THE JURISDICTION HAVING AUTHORITY OR THE PROJECT OWNER MAY STILL REQUIRED SHOP WELDING INSPECTION.

2. SPECIAL INSPECTION IS REQUIRED FOR HIGH STRENGTH BOLTS. THE TURN OF THE NUT METHOD OF TIGHTENING IS RECOMMENDED, UNDER THE SUPERVISION OF AN INDEPENDENT TESTING LABORATORY. ALTERNATE METHODS OF TIGHTENING MAY BE USED AS PERMITTED BY THE AISC SPECIFICATION.

BUILDING CODE & LOADS

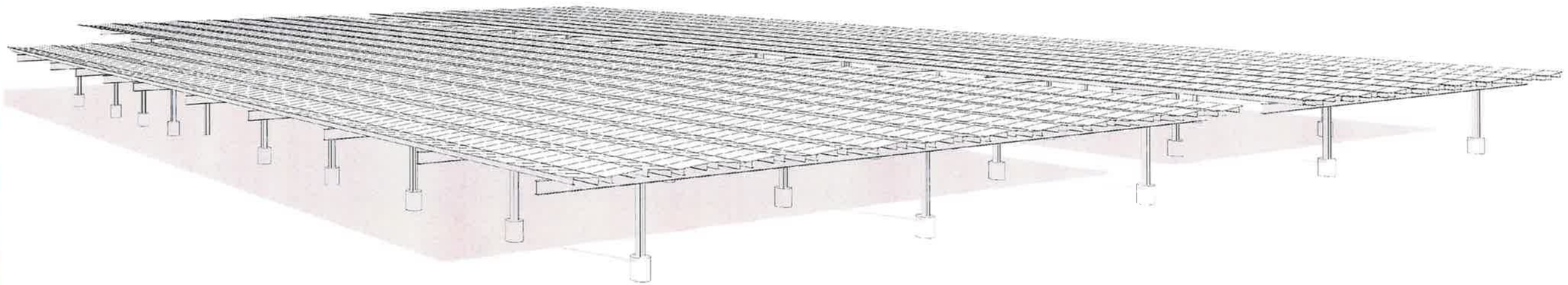
DESIGN LOADS -

BUILDING CODE -		
ASCE 7-10		
IBC 2015, 2018 CONNECTICUT STATE BUILDING CODE		
STRUCTURE PARAMETERS -		
CONSTRUCTION TYPE =	S-2	
RISK CATEGORY =	II	
ROOF SLOPE =	0 DEG	5 DEG MODULE
PURLIN =	COLD-FORM	
RAFTER =	WF	W/RAFTER END CUTS
COLUMN =	WF	W/BASE PLATE
DEAD LOADS -		
GLAZING =	3.0 PSF	SOLAR MODULES & RAIL STRUCT. ITEMS
STEEL STRUCTURE =	4.0 PSF	
ROOF LIVE LOAD -		
WITH SOLAR MODULES =	0.0 PSF	
WITHOUT SOLAR MODULES =	12 PSF	NO FIXING ENGINEERING MAY BE APPLIED OF THE SNOW GRID PLANING
CONCENTRATED LOAD =	300 LB	
SNOW LOAD -		
GROUND SNOW, Pg =	30 PSF	
Ce =	1.0	
Ct =	1.2	
Is =	1.0	
ROOF SNOW, Pf = 0.7*Ce*Ct*Is*Pg	25.2 PSF	
MINIMUM ROOF SNOW, Pf =	30 PSF	*PROJECTION ANNOTED
WIND LOAD -		
Vult =	125 MPH	
Vasd=	96.8 MPH	
Is =	1.0	
STRUCTURE HEIGHT ABV GRADE =	0 FT	(C FT = ON GROUND STRUCTURE)
ENCLOSURE CLASSIFICATION =	OPEN	- CLEAR FLOW
EXPOSURE:	D	
SEISMIC LOAD -		
Ss =	0.186	
S1 =	0.062	
Ieq =	1.0	
SITE CLASS =	E - SOFT CLAY SOIL	
SEISMIC DESIGN CATEGORY =	C	
ANALYSIS PROCEDURE =	EQUIVALENT LATERAL FORCE ANALYSIS	

SEISMIC FORCE RESISTING SYSTEM -

DIRECTION	SYSTEM	R	CMDOA	Cd
FRAME	STEEL ORDINARY	1.25	1.25	1.25
DIR'N =	CANTILEVER COLUMN SYSTEM			
LONG.	STEEL ORDINARY	1.25	1.25	1.25
DIR'N =	CANTILEVER COLUMN SYSTEM			

3D VIEW



CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 2020.0

STATE OF CONNECTICUT — ANSHUMAN SEHDEV — No. 31789 — REGISTERED PROFESSIONAL ENGINEER

03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN,
CT. SOLAR CANOPY

450 SARGENT DRIVE
NEW HAVEN, CT 06511

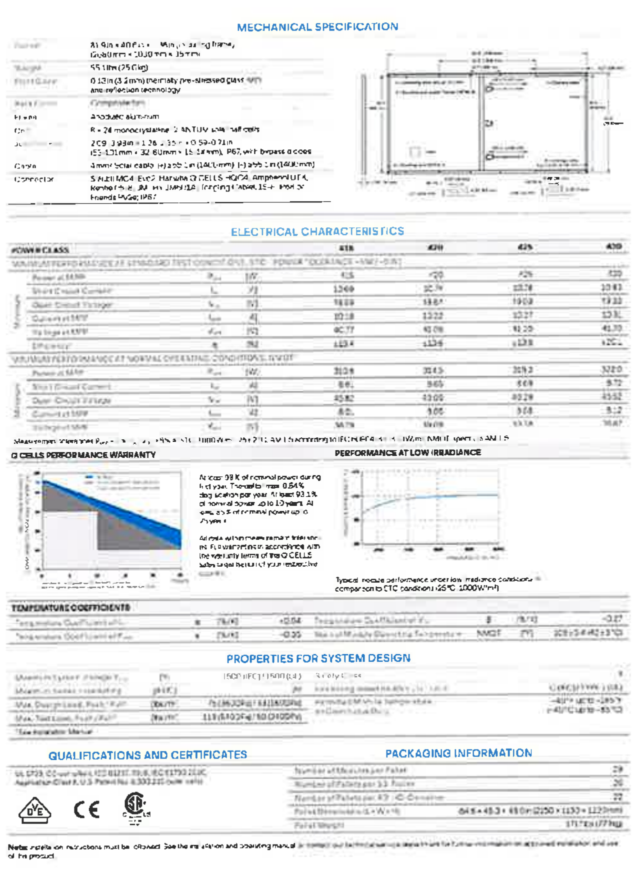
Scale: 1/8" = 1'-0"

COVER

S0.1

Sheet No.

MODULE INFORMATION



MATERIAL SPECIFICATION / FINISH SCHEDULE

MATERIAL/FINISH SCHEDULE:

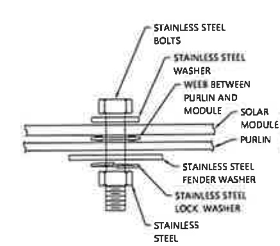
ITEM	MATERIAL SPEC	FINISH
PRIMARY FRAMING: COLUMNS (FC) RAFTERS (FR) NELSON STUDS CLIPS (AC)	WEB PLATES (PLATE): ASTM A529, A572 GR-55 WF SHAPES A992, GR 50 ANGLE ASTM A572 50 KSI FLANGES & CONNECTION PLATES (FLAT BAR): 5"-12" WIDE ≤ 1" THICK: ASTM A529, A572 GR-55 OTHERS: ASTM A529, A572 GR-50 HSS TUBE ASTM A500, GR-B NELSON STUDS: ASTM A108 H4L MS PER ESR-2856	☐ BARE** ☐ ZINC-RICH SHOP COAT (RED OR GRAY COLOR)* ☐ HOT-DIP GALVANIZE (MIN ASTM A123 OR A153, CLASS D)** ☒ PAINT
COLD FORMED STEEL: PURLINS BLOCKING CAP CHANNEL FLANGE BRACE CLIPS MISC.	ASTM A653, GR-55 MIN YIELD 55 ksi	55% ALUMINUM-ZINC ALLOY (G90 COATING) ASTM A792/A792M
STRUCTURAL BOLTS: (RAFTER/COLUMN CONNECTION)	BOLTS: ☒ ASTM F3125 (GR-A325 HEAVY HEX OR GR-A490 HEAVY HEX) ☐ ASTM F3125 (GR-F1852 TENSION CONTROL OR GR-F2280 TENSION CONTROL) (NOT VAILABLE FOR HSS COLUMN OPTION) WASHERS: F436 NUTS: A563 (LUBRICATED)	MECHANICALLY GALVANIZED ASTM B695, CLASS 55 - OR- HOT-DIP GALVANIZE (ASTM A153, CLASS D MIN OR ASTM F2329)
COMMON BOLTS: (COLD FORMED STEEL CONNECTION)	ASTM A307, GR-A	MECHANICALLY GALVANIZED ASTM B695 - OR- HOT-DIP GALVANIZE (ASTM A153, CLASS C MIN OR ASTM F2329)
SOLAR MODULE CONNECTION BOLTS	ASTM F593C	STAINLESS STEEL
REINFORCING STEEL	ASTM A-615 GR-60	BARE
CONCRETE ANCHORS	EXPANSION ANCHORS FOR EQUIPMENT: HILTI KB-TZ, ESR1917	STAINLESS STEEL AND/OR ZINC PLATING
ANCHOR BOLT ROD	F1554 GRADE 55	MECHANICALLY GALVANIZED ASTM B695 - OR-HOT-DIP GALVANIZE (ASTM A153, CLASS C MIN OR ASTM F2329)

MATERIAL THICKNESS (COLD FORMED STEEL DESIGN PER 2017 AISI COLD FORMED STEEL STANDARD) :

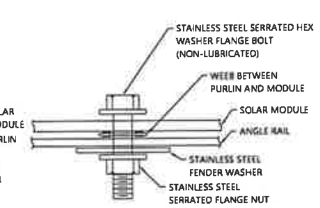
ALL CALCULATED MEMBER PROPERTIES PER AISI SPECIFICATIONS ARE BASED ON THE FOLLOWING THICKNESS:

GA.	DESIGN THICKNESS	YIELD	TENSILE
16	0.060"	55ksi	70ksi
15	0.067"	55ksi	70ksi
14	0.075"	55ksi	70ksi
13	0.089"	55ksi	70ksi
12	0.099"	55ksi	70ksi
11	0.012"	55ksi	70ksi
10	0.0133"	55ksi	70ksi

SOLAR MODULE BOLTING OPTIONS



☐ OPTION 1



☒ OPTION 2

1. SECURE THE SOLAR MODULE TO THE STRUCTURE BY USING THE FACTORY MOUNTING HOLES.
2. STAINLESS STEEL BOLT ASSEMBLY IS AS SHOWN OR AS RECOMMENDED PER SOLAR MODULE MANUFACTURER
3. THE MODULE MAY BE FASTENED TO A SUPPORT BY USING BOTH THE INNER AND OUTER BOLT HOLES OF THE FRAME.
4. EACH MODULE SHOULD BE SECURELY FASTENED AT A MINIMUM 4 POINTS ON TWO OPPOSITE SIDES.
5. TIGHTEN THE BOLT SECURELY BASED ON TORQUE SCHEDULE BELOW.

TORQUE SCHEDULE

BOLT DIA. (IN)	STAINLESS BOLT GRADE	THREAD PITCH THREADS/IN	TORQUE (LB-IN)	
			MIN.	MAX
1/4"	F593C	20	63.0	78.8
1/4"	F593C	28	79.2	99
5/16"	F593C	18	110.4	138
5/16"	F593C	24	117.6	147
3/8"	F593C	16	197.6	247
3/8"	F593C	24	216.8	271

GENERAL NOTES

1. CALSTL, LLC IS NOT THE ENGINEER OF RECORD FOR THIS PROJECT.
2. NO FUTURE STRUCTURAL ROOF DECK OR SHEATHING MAY BE APPLIED TO THE OPEN GRID.
3. DESIGN CONFORMS TO APPLICABLE CODES.
4. SCREWS TO BE ITW BUILDEX "TEKS" PER ICC ESR-1976 OR EQUIVALENT.
5. GRADING PLANS, DRAINAGE IMPROVEMENTS, ROAD AND ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY WITH ALL LOCAL ORDINANCES.
6. ALL BOLTED CONNECTIONS THAT ARE NOT FULLY PRETENSIONED SHALL USE SPRING WASHERS, SERRATED WASHERS OR SIMILAR LOCK WASHER TO PREVENT NUTS FROM LOOSENING.
7. SOLAR MODULE OR SOLAR MODULE FRAME STRUCTURAL DESIGN IS NOT PART OF THIS DESIGN PACKAGE. ELECTRICAL DESIGN IS NOT INCLUDED.

STRUCTURAL STEEL AND MISCELLANEOUS IRON:

1. WORK DONE UNDER THIS SECTION SHALL CONFORM TO THE REQUIREMENTS OF THE AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE, AISC 360-16.
   A. BOLT HOLES SHALL BE STANDARD HOLE SIZE (I.E. BOLT DIA + 1/16") UNLESS NOTED OTHERWISE.
   B. ALL SCREWS SHALL EXTEND THROUGH THE STEEL CONNECTION WITH A MINIMUM OF 3 EXPOSED THREADS, SEE AISI.
2. ALL STEEL MATERIAL AND ASSEMBLIES FOR ALL WEATHER-EXPOSED STEEL MEMBERS (STRUCTURAL STEEL AND COLD FORMED STEEL) IN THE COMPLETED STRUCTURE SHALL BE GALVANIZED OR PAINTED IN ACCORDANCE WITH PER APPLICABLE BUILDING CODE
3. FIELD WELDING SHALL BE DONE BY WELDERS CERTIFIED FOR THE WELDS TO BE MADE USING E70XX ELECTRODES IN CONFORMANCE WITH THE REQUIREMENTS OF AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE OR AWS D1.1 "STRUCTURAL WELDING CODE."
4. ALL BOLTS SHALL BE INSTALLED WITH STEEL WASHERS. ALL WASHER SIZE AND THICKNESS PER LATEST AISC MANUEL.
5. WHERE MINIMUM AISC FILLET WELD THICKNESS REQUIREMENT EXCEEDS WELDS SHOWN ON DETAILS, PROVIDE MINIMUM AISC WELD PER LATEST AISC.
6. AFTER FABRICATION, ALL STEEL SHALL BE CLEANED FREE OF RUST, LOOSE MILL, SCALE AND OIL.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF ALL ERECTION PROCEDURES AND SEQUENCES WITH RELATION TO TEMPERATURE DIFFERENTIALS AND WELD SHRINKAGE.
8. ALL SOLAR ROOF CARPORTS ARE OPEN T OR OFF-T STRUCTURES, AND CLASSIFIED AS RISK CATEGORY, RC II STRUCTURES. THERE IS NO REQUIREMENT ON THE DRIFT LIMIT PER PER APPLICABLE BUILDING CODE THE MAXIMUM CALCULATED INELASTIC DRIFT UNDER ANY SEISMIC LOADCASES OR LOAD COMBINATIONS IS NOT MORE THAN 6".
9. MOMENT-RESISTING BEAM TO COLUMN CONNECTIONS:
   A. THE MOMENT-RESISTING BEAM TO COLUMN CONNECTIONS (BOLTED END PLATE MOMENTCONNECTIONS) ARE PRETENSIONED CONNECTIONS AND SHALL BE INSTALLED USING PRETENSIONED HIGH-STRENGTH BOLTS. THE MOMENT CONNECTIONS ARE ALSO ELIGIBLE FOR EXEMPTION FROM SLIP-CRITICAL CLASS A FAYING SURFACE REQUIREMENT PER AISC 341-16 (SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS) SECTION D2.2, EXEMPTION (2).
   B. THE AVAILABLE SHEAR STRENGTH OF THE PRETENSIONED HIGH-STRENGTH BOLT MOMENT CONNECTIONS USING STANDARD HOLES IS CALCULATED AS THAT FOR BEARING-TYPECONNECTIONS.
   C. THE FINGER SHIMS WITH SLOTS CUT THROUGH THE EDGE AS SHOWN ON SHIM DETAIL PRETENSIONED HIGH-STRENGTH BOLT MOMENT CONNECTIONS.
   D. FINGER SHIMS UP TO ¼" ARE PERMITTED IN THE CONNECTIONS WITHOUT REDUCING THENOMINAL SHEAR STRENGTH OF THE BOLTS PER AISC SECTION J3.2. (C), AND J5.2.
   E. THE BOLTED END PLATE BEAM-COLUMN CONNECTIONS SHALL HAVE NO SPACES BETWEEN THEM WITHIN A CIRCLE THREE TIMES THE NOMINAL DIAMETER OF THE BOLT PER AISC RCSC FIGURE C-3.1. GAP IN EXCESS OF 1/16 INCH IN THESE AREAS SHALL BE SHIMMED. GAPOUTSIDE OF THESE AREAS NEED NO CORRECTIVE ACTION.
10. ERECTION TOLERANCES ARE PER AISC CODE OF STANDARD PRACTICE (AISC 303) SECTION 7. INDIVIDUAL STRUCTURAL MEMBERS ARE CONSIDERED PLUM, LEVEL, AND ALIGNED IF THEDEVIATION FROM PLUM DOES NOT EXCEED 1:500.

INSPECTIONS

1. AS REQUIRED BY APPLICABLE BUILDING CODE OR AUTHORITY HAVE JURISDICTION.
2. SHOP WELDING INSPECTION MAY NOT BE REQUIRED IF THE FABRICATOR IS AISC CERTIFIED. THE JURISDICTION HAVING AUTHORITY OR THE PROJECT OWNER MAY STILL REQUIRED SHOP WELDING INSPECTION.
3. SPECIAL INSPECTION IS REQUIRED FOR HIGH STRENGTH BOLTS. THE TURN OF THE NUT METHOD OF TIGHTENING IS RECOMMENDED, UNDER THE SUPERVISION OF AN INDEPENDENT TESTING LABORATORY. ALTERNATE METHODS OF TIGHTENING MAY BE USED AS PERMITTED BY THE AISC SPECIFICATION.

CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.676.1846

01/11/2022

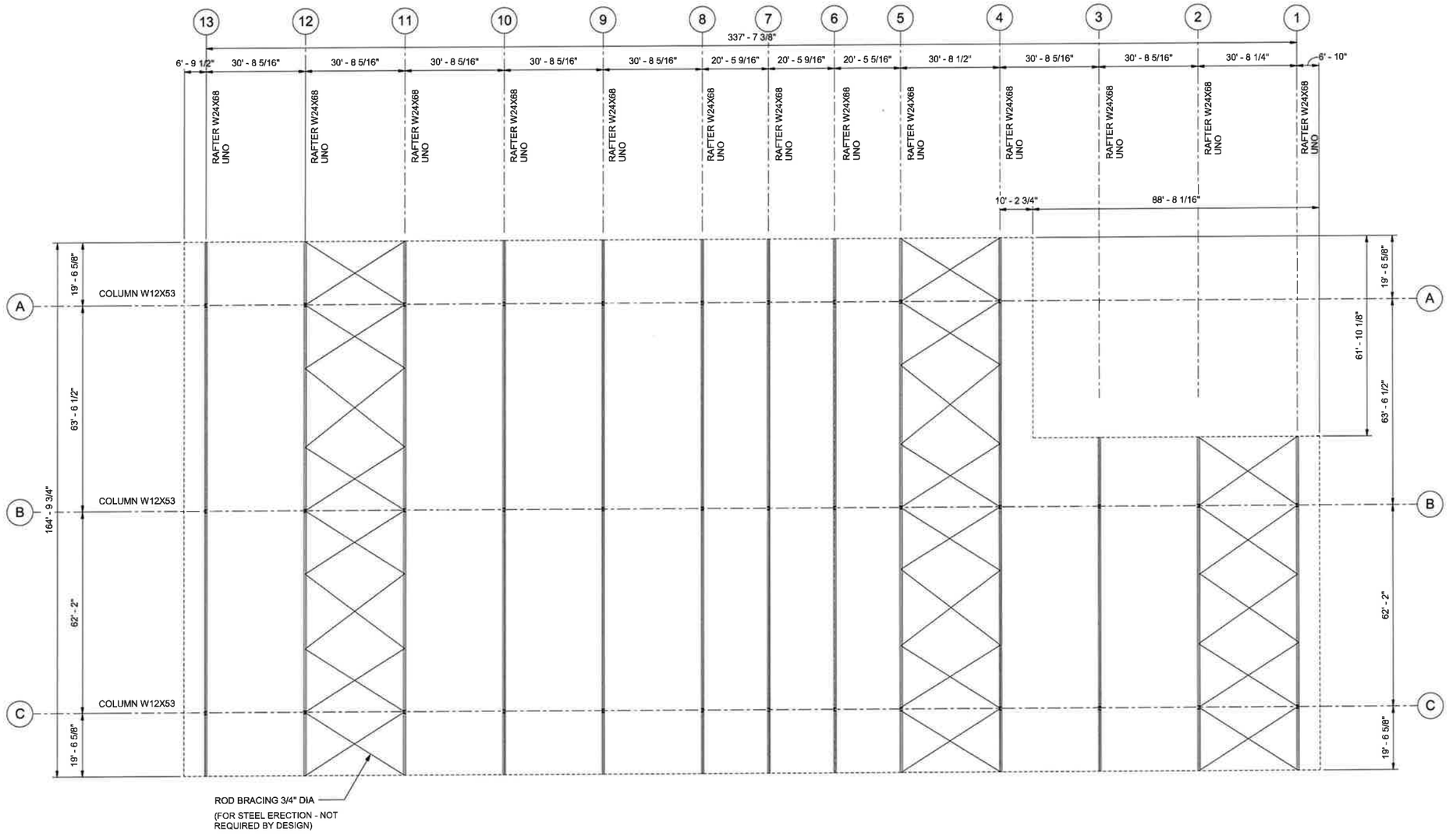
IKEA NEW HAVEN, CT. SOLAR CANOPY

450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale 1/8" = 1'0"

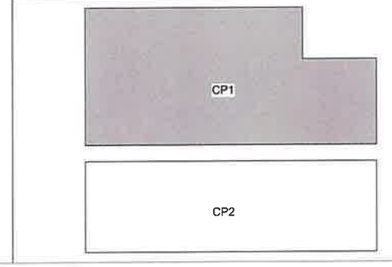
GENERAL NOTES

S0.2



1 PRIMARY ROOF FRAMING PLAN - CP1
1/16" = 1'-0"

KEY PLAN



CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 998-0

STATE OF CONNECTICUT
ANSHUMAN SEHDEV
No. 31299
REGISTERED PROFESSIONAL ENGINEER
03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN, CT. SOLAR CANOPY

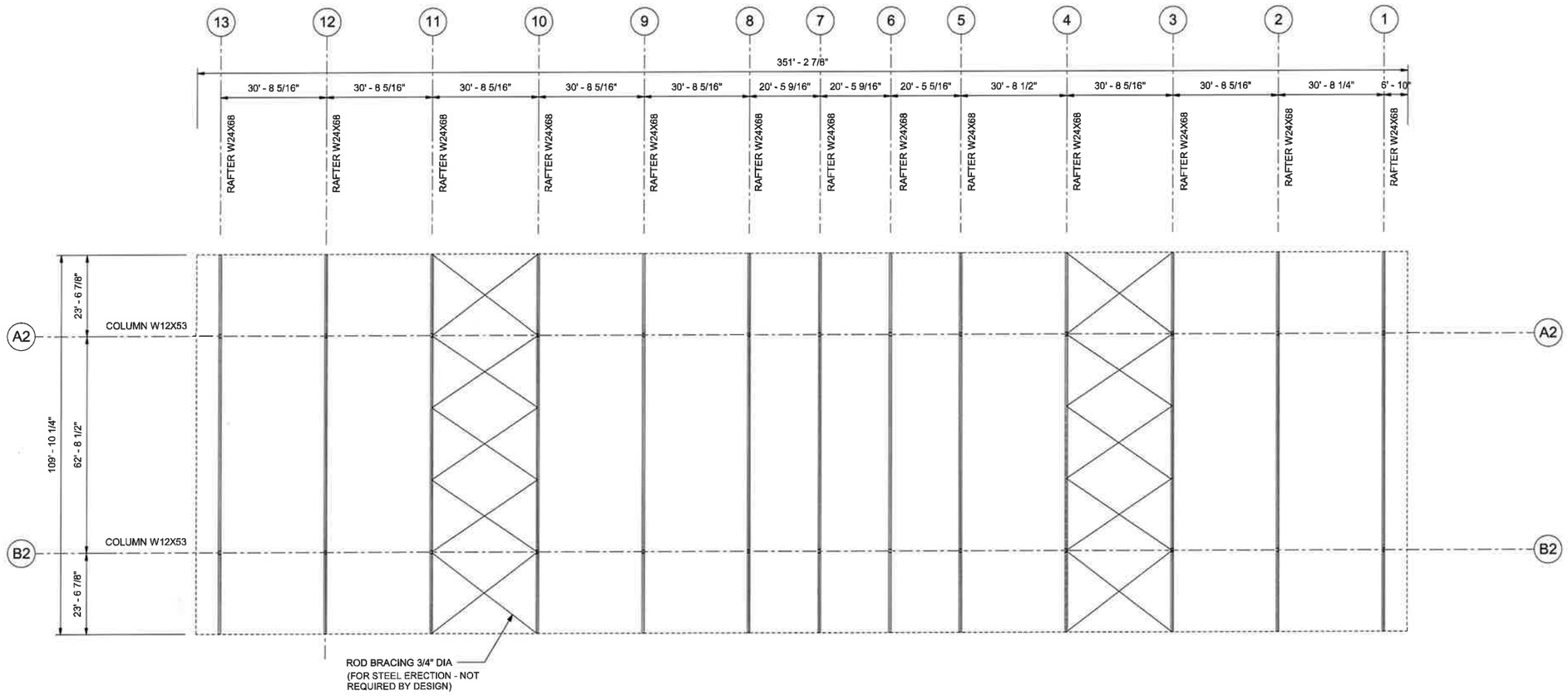
450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale As indicated

PRIMARY ROOF FRAMING PLAN - CP1

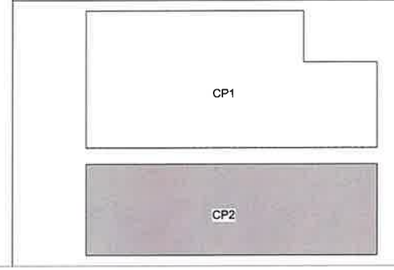
S1.0

Sheet No.



1 PRIMARY ROOF FRAMING PLAN - CP2
1/16" = 1'-0"

KEY PLAN



CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.576.1846

Project No. 999-0

03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN,
CT. SOLAR CANOPY

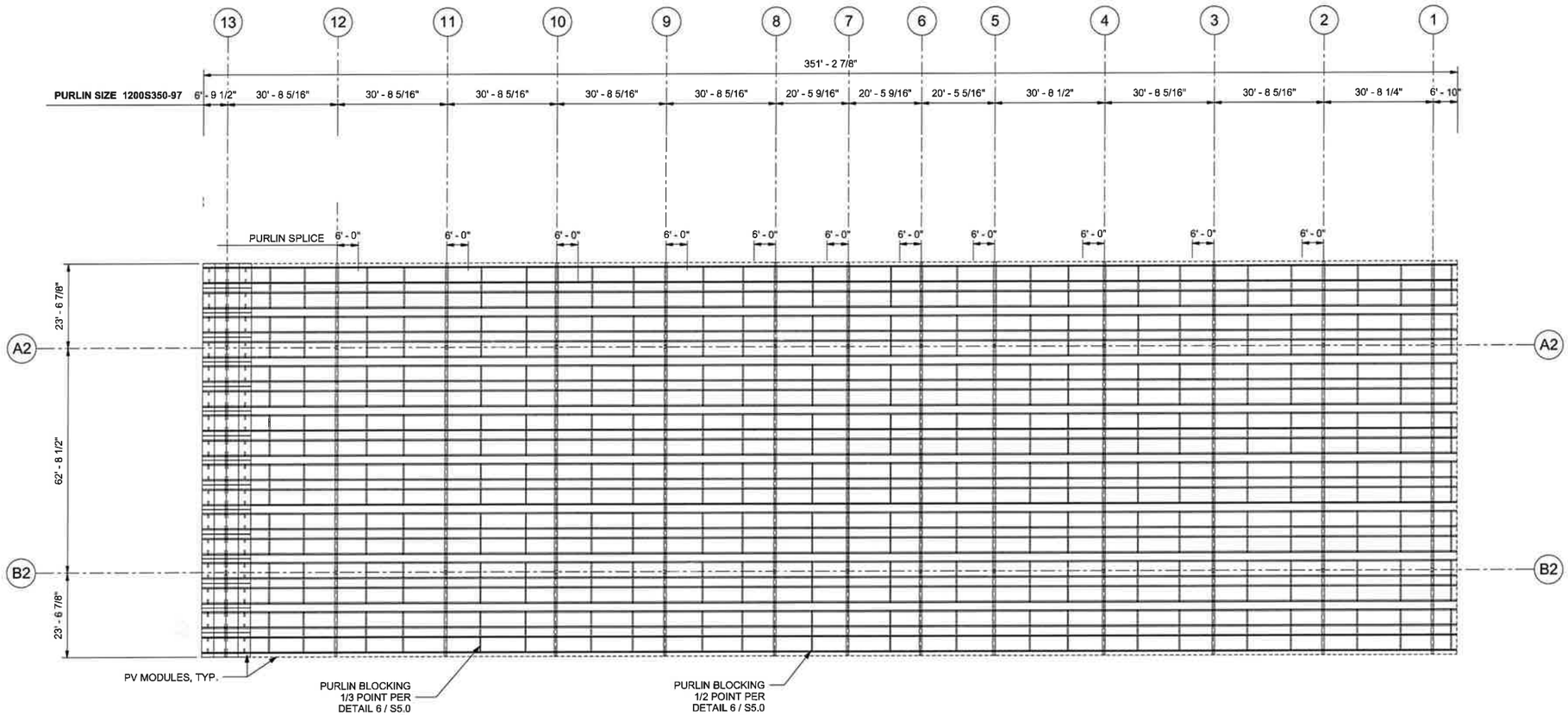
450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale As indicated

PRIMARY ROOF
FRAMING PLAN -
CP2

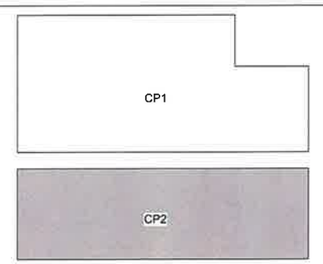
S1.2

Sheet No. ©2021



1 SECONDARY ROOF FRAMING PLAN - CP2
1/16" = 1'-0"

KEY PLAN



CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 898-0

STATE OF CONNECTICUT
ANSHUMAN SEHDEV
No. 31289
PROFESSIONAL ENGINEER

03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN,
CT. SOLAR CANOPY

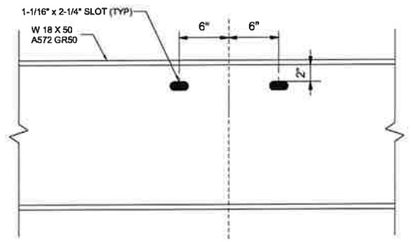
450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale As indicated

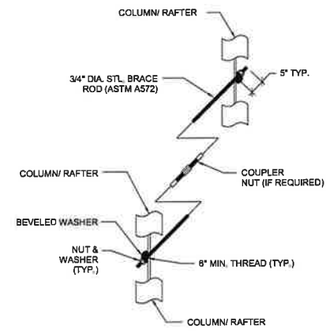
SECONDARY ROOF
FRAMING PLAN -
CP2

S1.3

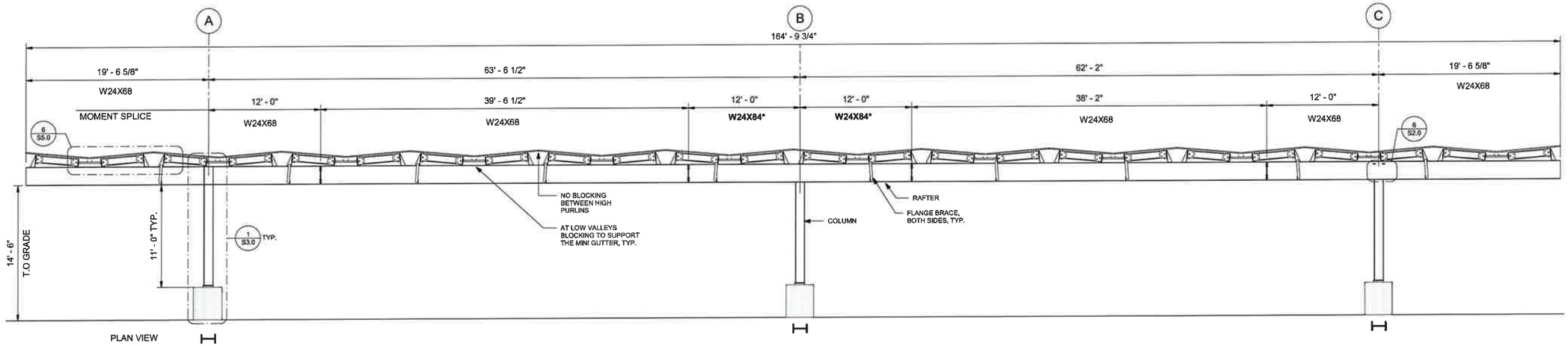
Sheet No.



6 BRACING HOLE PUNCH DETAIL
1 1/2" = 1'-0"

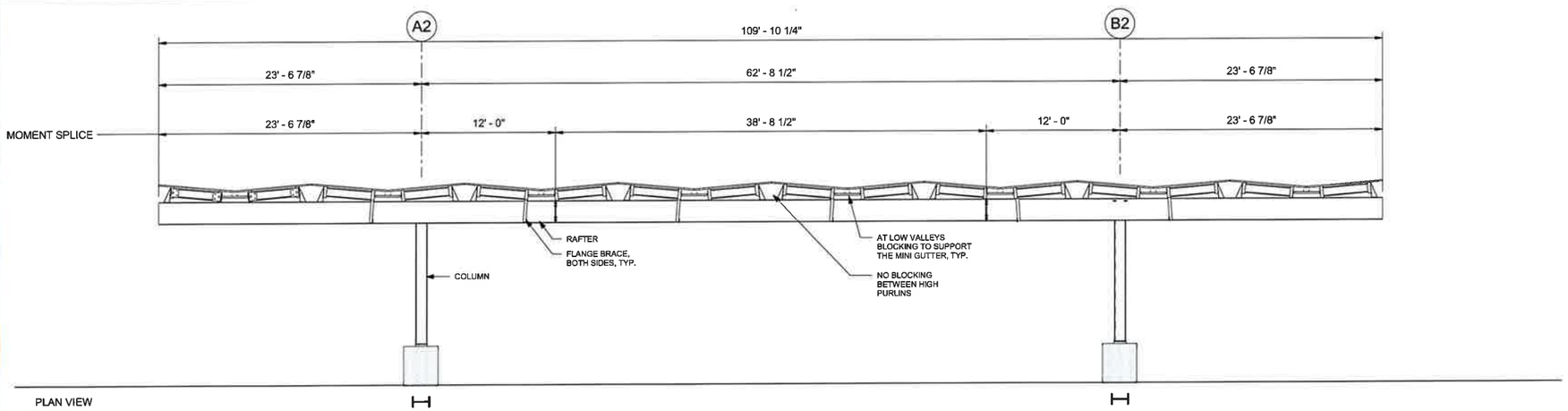


3 ROD BRACE DETAIL
3/4" = 1'-0"



5 CROSS SECTION @ CP1
3/16" = 1'-0"

NOTE: " * " INDICATES SPECIAL SIZES



4 CROSS SECTION @ CP2
3/16" = 1'-0"

CALSTL, LLC
ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.675.1846

Project No. 055-0

03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN, CT. SOLAR CANOPY

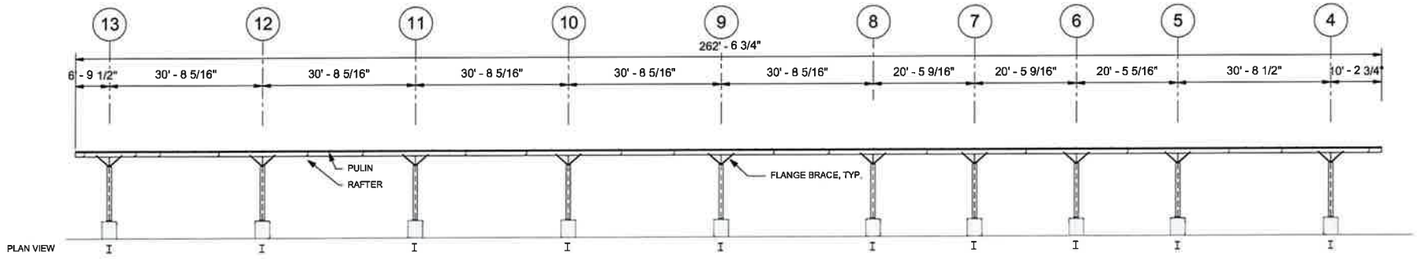
450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale: As indicated

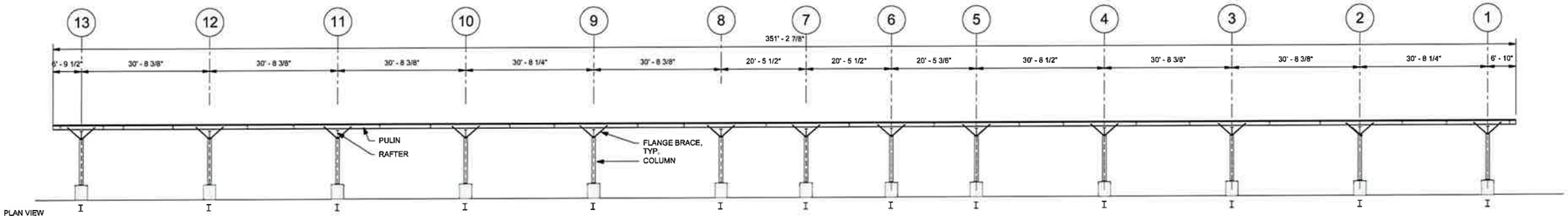
CROSS SECTION

S2.0

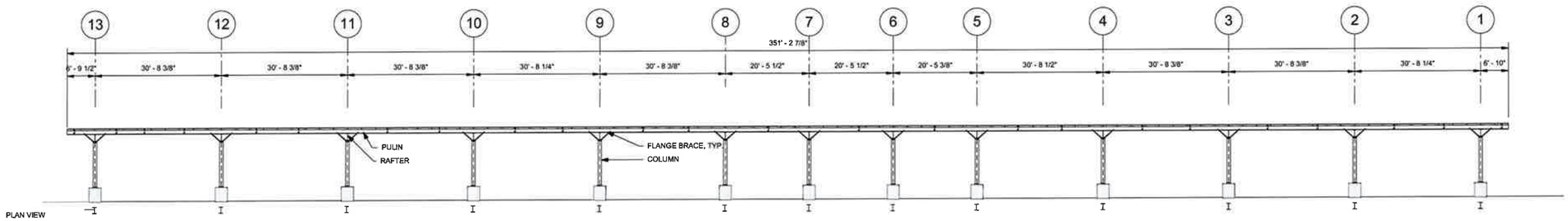
Sheet No. 03031



1 SECTION THRU GRID LINE "A" - CP1
1 : 160



2 SECTION THRU GRID LINE "B & C" - CP1
1 : 160



3 SECTION THRU GRID LINE "A2 & B2" - CP2
1 : 160

CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 898 - 0

03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN,
CT. SOLAR CANOPY

450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale 1 : 160

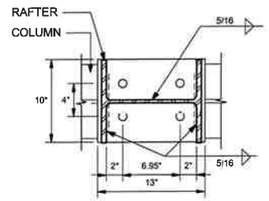
CROSS SECTION

S2.1

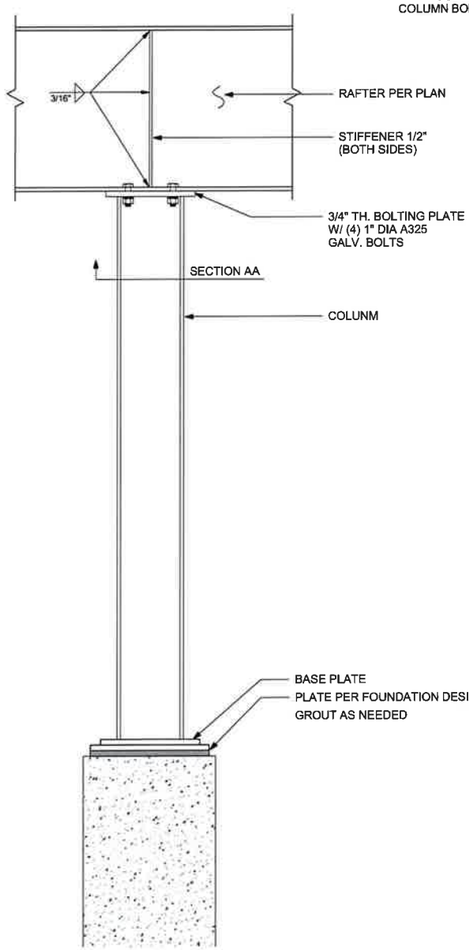
Sheet No. ©2021

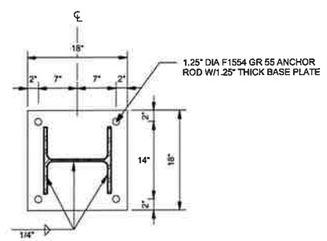
GENERAL NOTES

- THE ANCHOR BOLT AND BASE PLATE SIZES ARE PROVIDED BASED ON STEEL DESIGN ONLY.
- THE FINAL DESIGN AND SPECIFICATION OF THE ANCHOR BOLT, BASE PLATE AND GROUT IS THE RESPONSIBILITY OF FOUNDATION ENGINEER. SEE FOUNDATION DRAWINGS.
- THE WELDING OF THE BASE PLATE TO LEVELING OR CAP PLATE IS PER FOUNDATION ENGINEER
- TYP ALL PLACES:
  EDGE DISTANCE CAN BE ADJUSTED AS NEEDED



SECTION AA
COLUMN BOLTING PLATE





COLUMN BASE PLATE

1 COLUMN BEAM AND BASE DETAILS
1" = 1'-0"

CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 998.0

STATE OF CONNECTICUT
ANSHUMAN SEHDEV
No. 31399
REGISTERED
PROFESSIONAL ENGINEER

03/11/2022

01/11/2022

Revisions

IKEA NEW HAVEN,
CT. SOLAR CANOPY

450 SARGENT DRIVE
NEW HAVEN, CT 06511

Scale: As indicated

COLUMN DETAILS

S3.0

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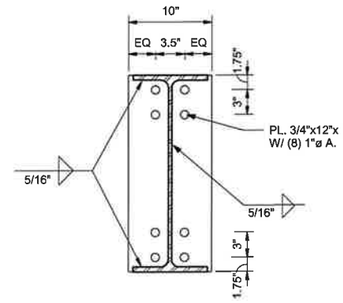
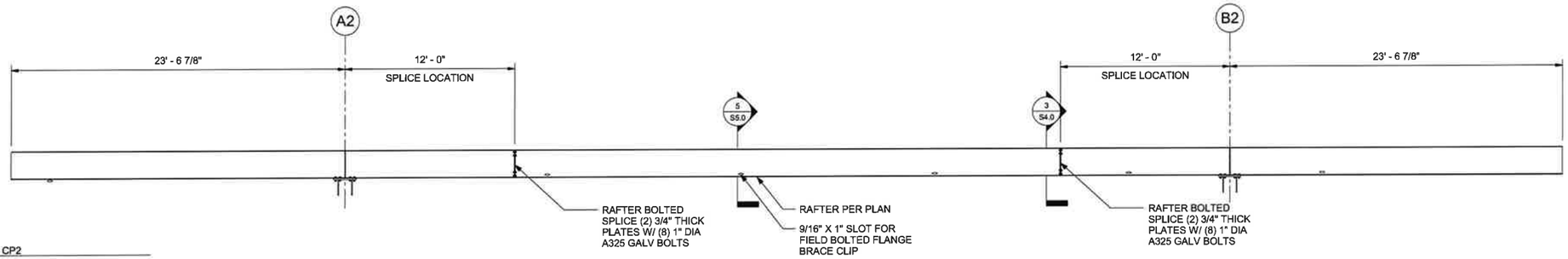
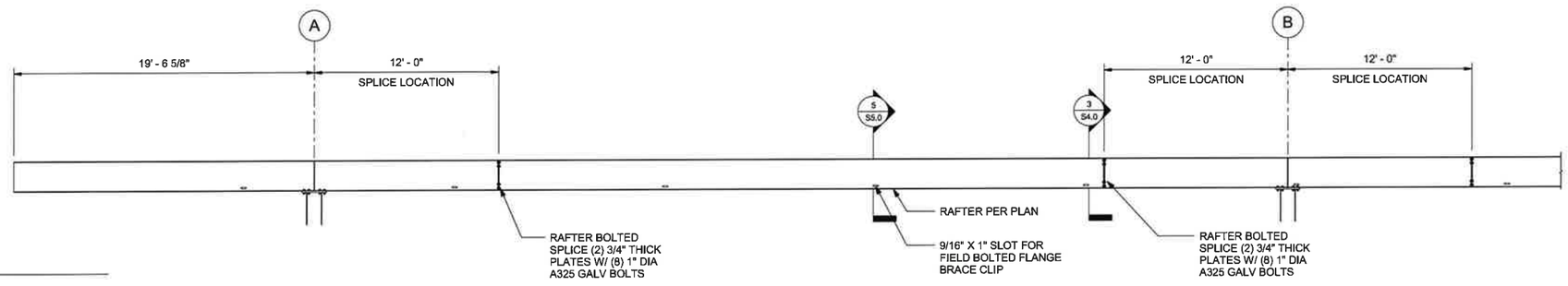


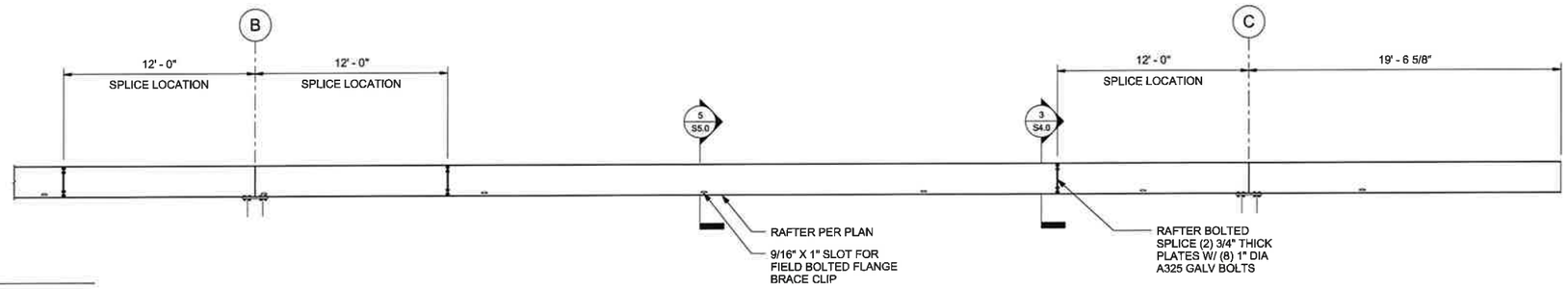
3 RAFTER BOLTED SPLICE DETAIL
1 1/2" = 1'-0"



1 RAFTER DETAIL - CP2
1/4" = 1'-0"



11 RAFTER DETAIL - CP1
1/4" = 1'-0"



10 RAFTER DETAIL - CP1
1/4" = 1'-0"

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ANSHUMAN SENDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 668-0

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RAFTER DETAILS

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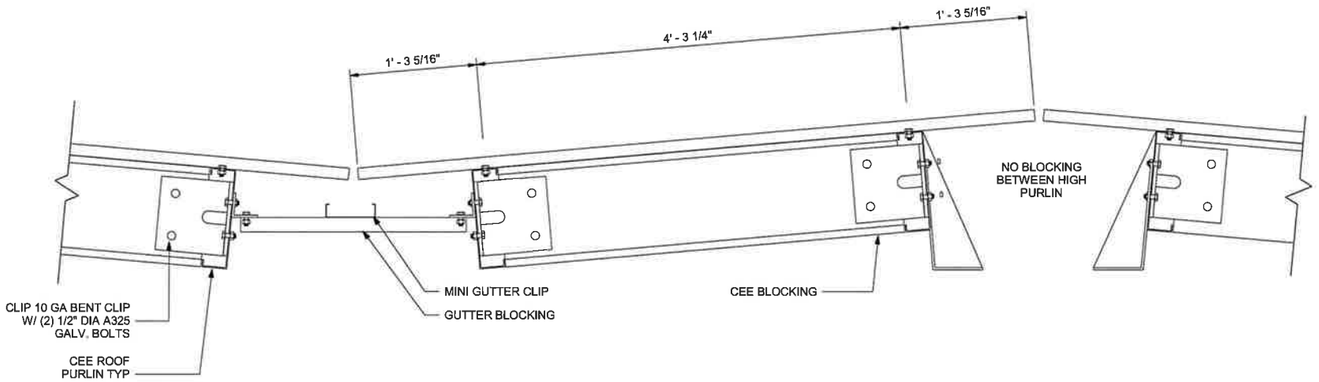
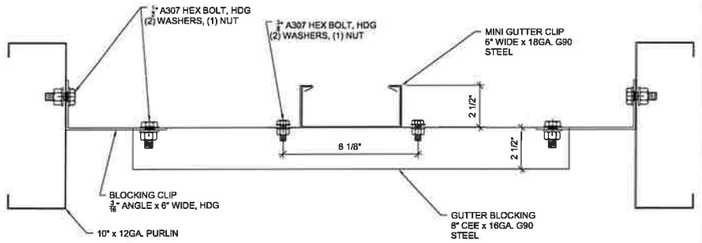
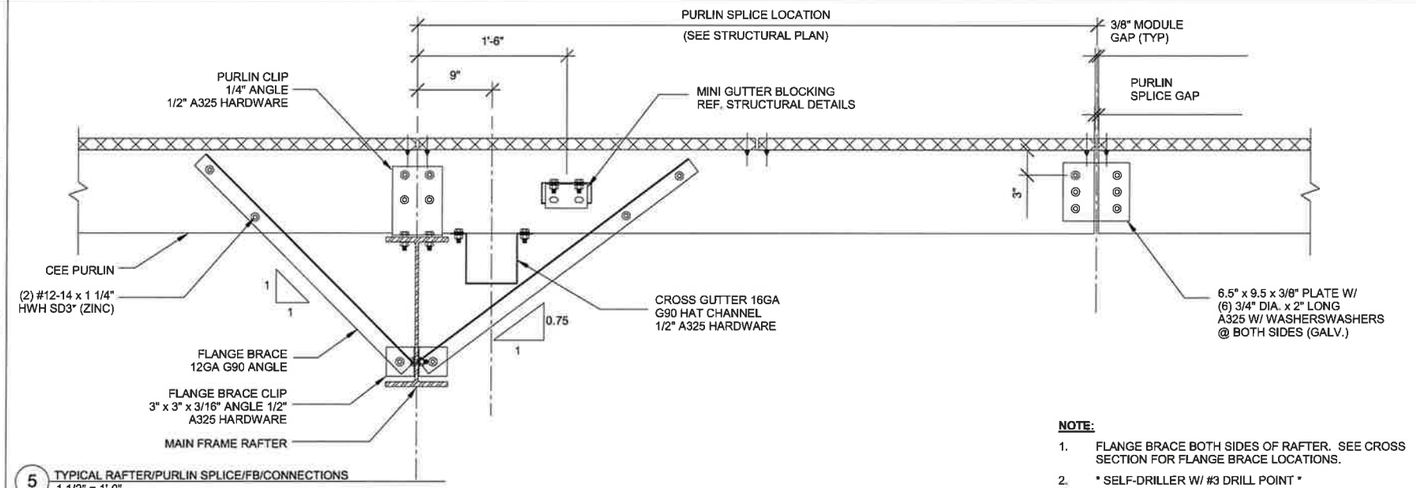


6 MUDULE TO ANGLE RAILS
1 1/2" = 1'-0"



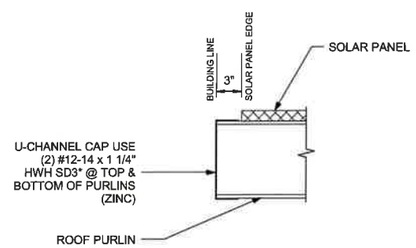
8 MINI GUTTER BLOCKING DETAIL
3" = 1'-0"



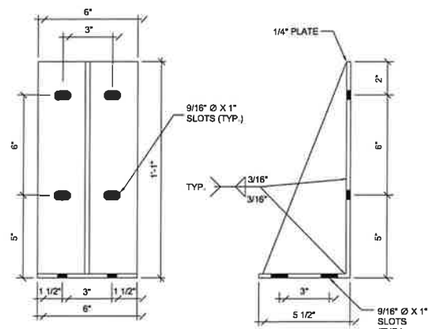
5 TYPICAL RAFTER/PURLIN SPLICE/FB/CONNECTIONS
1 1/2" = 1'-0"

NOTE:

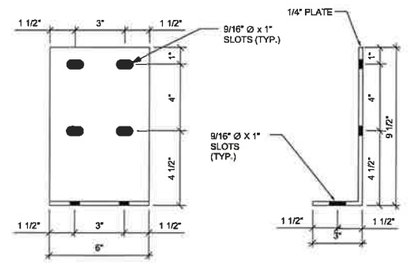
1. FLANGE BRACE BOTH SIDES OF RAFTER. SEE CROSS SECTION FOR FLANGE BRACE LOCATIONS.
2. * SELF-DRILLER W/ #3 DRILL POINT *



7 CHANNEL CAP DETAIL
1 1/2" = 1'-0"



4 PURLIN CLIP DETAIL
3" = 1'-0"



1 PURLIN CLIP DETAIL
3" = 1'-0"

CALSTL, LLC

ANSHUMAN SEHDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. SPR-0

STATE OF CONNECTICUT
ANSHUMAN SEHDEV
No. 31399
REGISTERED
PROFESSIONAL ENGINEER

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Revisions

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PURLIN DETAILS

S5.0

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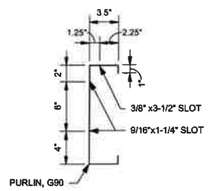
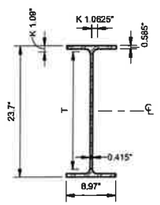
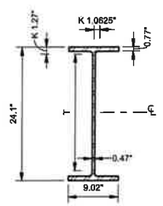
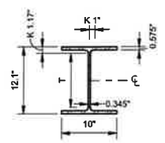
PURLIN	 1200S350-97							
RAFTER	 W24X68	 W24X84						
COLUMNS	 W12X53							

CALSTL, LLC

ANSHUMAN SENDEV
ENGINEERING@CAL-STL.COM
209.676.1846

Project No. 999.0

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MEMBER SIZES

S5.1

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