



FINAL CHANGE OF USE – WORK PLAN

**RER ENERGY GROUP, LLC
TOWN OF DEWITT LANDFILL
2.6MW SOLAR PV ARRAY
TOWN OF DEWITT, ONONDAGA COUNTY, NEW YORK**

July 2019

Prepared by

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd.
Syracuse, New York 13212

with



RER Energy Group, LLC
4700 Pottsville Pike
Reading, Pennsylvania 19605-9708

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1.0 INTRODUCTION

RER Energy Group, LLC (RER or Project Owner) proposes development of the Town of Dewitt Landfill – 2.6 megawatt (MW) Solar Photovoltaic (PV) Array (Project). The Project specifically involves installation of a grid-connected ballasted solar array atop of the closed landfill at 6330 Fisher Road in the Town of Dewitt, Onondaga County, New York (See Figure 1). The installation involves the use of non-penetrating ballast foundations to preserve the integrity of the membrane cap, which resides below the existing grade as a component of an engineered landfill-closure solution. The project requires a Change of Use approval from NYSDEC. This document is prepared to meet the NYSDEC requirements in order to obtain the necessary Change of Use.

The project footprint will cover an overall area of 11.15 acres, occurring in a repeating-row formation, alternating with 24 feet between each row. Solar panels will occupy 3.3 acres within the 11.15-acre footprint. Rows will encroach upon existing vent pipes at a distance not less than 30-feet in radius from each vent stack. The array will be connected to the local electrical grid by extension of an electrical cable to an inter connect location along Fisher Road. A 15kV cable will be placed in an aboveground conduit within the limits of the landfill cap system, and upon exiting the landfill limits, the electrical cable will extend along the Fisher Road easement to the inter connect location as depicted in the site plan drawings provided as Appendix A.

The Town of Dewitt has entered into a Power Purchase Agreement (PPA) with RER whereby the Town will purchase energy credits derived from the generation of solar energy at the site pursuant to New York State’s Net Metering Law PSL §66-j . This action by the Town provides opportunity for further implementation of clean energy initiatives identified in the Town of DeWitt’s Sustainability Plan adopted August 11, 2014. This use of closed landfill space leverages the limited development potential of NYS’s closed, capped landfills and brownfields in accordance with strategies identified to support NYS’s attainment of 70% renewable energy by 2030 as outlined in Governor Cuomo’s Reforming the Energy Vision Initiative (REV).

2.0 LANDFILL DISTURBANCE CONSIDERATIONS

The project design incorporates measures to avoid disturbance to the landfill cap system. The following measures are proposed:

- The system involves use of ballasted racking system designed by GameChange (See Appendix A), which does not require typical below ground structural supports that would require penetration of the cap system.
- Geotechnical investigation is completed that concludes the weight of the ballasted racking system will not result in significant impacts to the landfill cap system.
- The solar array may provide shaded areas and shelter for unwanted wildlife species. Invariably some shaded areas are created by the installation of solar panels or any other planar structure. Prior experience indicates incidental increases of wildlife occupation may occur within the array. Observed occurrences are limited primarily to bird nests being constructed in the racking structure. The protective mesh screening detail specific



Source: Google Maps

Not to Scale

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**Figure 1
Project Location Map**

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to this array will reduce the likelihood of bird nesting within the facility. Existing maintenance activities include review of the site for the presence of burrowing animals; this activity will continue post construction. The landfill observes limited mowing activities, and grass is typically at heights that provide shade and shelter for small mammals. The shade provided by the solar arrays is not anticipated to significantly increase small mammal (including burrowing animals) populations on site.

- Maintenance requirements are limited for this project. The limited maintenance requirements are preferred to avoid issues such as rutting or disturbance to the cap. The facility will be continuously monitored remotely throughout the life of the project. This will limit the number of physical visits to the site to likely 1-2 times per year. This excludes unanticipated truck-rolls dispatched in response to fault notifications from the data-acquisition system. The timing of planned maintenance intervals will be scheduled in coordination with the Town. Mowing activities are not expected to increase significantly beyond those currently observed on site.

3.0 GEOTECHNICAL INVESTIGATION

CME Associates, Inc. (CME) conducted a geotechnical evaluation for the project. Static load testing was performed in accordance with ASTM D1194-94 “Standard Test Method for Bearing Capacity of Soil for Static Load and Spread Footings” (See Appendix B). Three test locations were selected based on the project layout. At each test location, grass and topsoil were removed to expose undisturbed subgrade. The test load was applied in 200-pound increments and held for 15 minutes. Deflection was recorded at each interval. Upon completion of the test, the removed topsoil and sod were replaced and compacted. The GameChange design requires existing soil have a bearing capacity of at least 1,000 pounds per square foot with minimal soil deflection. The CME analysis indicates that on-site soils exceed this capacity.

4.0 CONSTRUCTION SEQUENCING

The following depicts the project’s general construction activities:

1. Mobilization
2. Install Stabilized Construction Entrance
3. Install compost filter sock
4. Prepare concrete washout area, staging area, and equipment storage
5. Deliver materials on site:
 - a. Material delivery on landfill cap to be completed with low ground pressure equipment
 - b. Equipment traversing landfill required to avoid re-use of travel access points/paths to minimize risk of compromising the landfill cap and avoiding tire rutting.
6. Erect racking system per GameChange Pour-In-Place™ design drawings (Appendix A).
7. Pour concrete in Pour-in-Place ballast tubs
 - a. Concrete pump trucks and/or skid-steers will fill ballasted structure components
8. Install solar racking onto ballasted system
9. Install Solar panels onto racking
10. Electrical equipment and wiring will be installed (including grounding)

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11. The primary electrical feed will be installed down the slope of the landfill and placed in a 4" conduit. Upon exiting the landfill cap, the electrical line will be connected to the Utility via placement of utility poles
12. Site restoration will occur upon completion of construction activities

5.0 CONSTRUCTION PHASING

Protection of the existing landfill cap and liner system during installation of the solar components is paramount. In order to protect the integrity of the landfill cap, access to the overall site is controlled with implementation of a controlled phasing/work plan. The following measures are incorporated into the project drawings:

- As affirmed from the geotechnical investigation, all equipment traversing the landfill cap shall be designated as low ground pressure equipment; specifically, no equipment that exceeds 10 pounds per square inch (PSI) per axle weight will be allowed on the landfill cap (excluding access ring road). Equipment that exceeds this threshold (i.e., concrete delivery trucks, concrete pumping equipment and other construction equipment) is limited to the existing perimeter road.
- The plan is to use pre-manufactured High Molecular Weight Polyethylene (HMWPE) containers that will be filled with poured in place concrete ballasts for the foundation system. The preferred method for delivering concrete to pour-in-place tubs will be via concrete pumper trucks. The drawings depict designated locations for concrete pumper trucks (labeled 1 through 4). These areas have been designated based on distances from the solar array and capability of concrete pumping equipment. Each designated location covers a quadrant of the proposed array.
- In the event concrete must be hauled onto the landfill to fill tubs, this must be completed by low ground pressure equipment; no equipment that exceeds 10 pounds per square inch (PSI) per axle weight is allowed on the landfill cap (excluding access ring road).
- All other low ground pressure equipment used shall traverse the site in such a manner as to not cause surface rutting and erosion.
- Excavation for the electrical concrete pads and equipment will be the only excavation to occur onsite. This work will involve the removal of approximately six inches of topsoil. The excavation will not encroach the liner or landfill cap.
- Prior to construction, the Contractor shall submit for review and approval to C&S shop drawings describing their operation, equipment to be used, proposed method of installation of all components at a minimum, and all technical supporting documentation. No work will occur until submittals are reviewed and approved based on performance standards depicted herein and on drawings provided in Appendix A.

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6.0 ADDITIONAL CONSIDERATIONS

6.1 New York State Environmental Quality Review

The New York State Environmental Quality Review Act (SEQR), 6 NYCRR 617, effective August 1, 1975, is a process that introduces the consideration of environmental factors into actions that are directly undertaken, funded or approved by local, regional and state agencies. An action defined under SEQR may be one or a combination of activities that an agency may have jurisdiction over. Upon review of the above referenced project, it is our understanding that the project can be classified as a Type II Action under SEQR 6 NYCRR 617, 617.5 (c)(14) which states the following:

- (14) installation of solar energy arrays where such installation involves 25 acres or less of physical alteration on the following sites:
 - (i) closed landfills...

The proposed project (i.e., action) does not exceed the thresholds for a Type I action established in 6 NYCRR 617.4. The project is therefore not subject to review consistent with SEQR regulations. There is no further review required with a Type II action.

6.2 Emergency Response Plan

Coordination with emergency services will be conducted prior to construction. Local emergency services will be provided with notification of the Project start date, and estimated duration of construction. The Project area is served by a number of emergency service providers including: Dewitt Fire Department, Dewitt Police Department, and East Area Volunteer Emergency Services, Inc. Equipment specifications will be provided to local emergency health providers as part of the notification process. In addition, signage warning of the risks associated with entry and the presence of electrical generation equipment, as required by the National Electrical Code (NEC) will be installed on-site.

6.3 Solar Array Project Security

The site is currently managed in collaboration with NYSDEC under an existing Operations, Maintenance, and Monitoring Plan. As such, public access is already restricted by the Town's previous installation and continued maintenance of locked gates on both the north and south points of entry, continuous fencing along the Old Erie Canal Trail, and signage informing the public of the restricted nature of this site. These measures will be supplemented by additional efforts including signage warning of the risks associated with entry and the presence of electrical generation equipment, as required by the National Electrical Code (NEC). High-voltage electrical equipment installed within this restricted space will be secured by the installation of fencing and other protective methods in accordance with the National Electrical Code and with the approval of NYSDEC.

6.4 Decommission Plan

The Town of Dewitt and RER have entered into an agreement for a term of 25 years. Upon termination or expiration of the agreement, RER (or the subsequent Project Owner), within 180

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days after the date of expiration, remove the system, and restore the site to its pre-existing condition (normal wear and tear excepted). The decommissioning involves recycling equipment and materials to the extent allowable at the time of removal. In the event the Town of Dewitt obtains ownership of the system, RER (or the subsequent Project Owner) will be relieved of the decommissioning obligation.

6.5 Vegetative Maintenance Plan

The Town of Dewitt will continue to provide maintenance for the landfill parcel in accordance with the terms of the Operations, Maintenance, and Monitoring Plan that is in effect for this site. The specific maintenance includes, at a minimum, mowing at an interval which insures that the maximum height attained by vegetation is less than the minimum height of the leading (lowest) edge of the solar modules at all points within the solar array. Training for personnel involved in mowing and maintenance activities adjacent to the solar facility shall be provided by RER at the request of the Town.

6.6 Stormwater Treatment

New York state stormwater regulations mandate that the owner or operator of a construction project that will involve soil disturbance of one or more acres must obtain coverage under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. The Project is designed to avoid soil disturbance, and therefore coverage under NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, General Permit Number GP-0-15-002, effective January 29, 2015 through January 28, 2020 is not required.

In addition to the requirements set forth in the NYSDEC SPDES General Permit GP-0-15-002, the NYSDEC issued a solar specific technical memorandum titled “Solar Panel Construction Stormwater Permitting/SWPPP Guidance” on April 5th, 2018. This memorandum outlines criteria that solar panels need to meet in order to be considered pervious area. If the solar panel design does not meet the criteria outlined within the memorandum, the solar panels are to be considered impervious area and treated for water quality and peak flow rate mitigation. This project is designed to construct the solar panels in a manner that will meet the criteria outlined within this memo and therefore negate the requirement to provide water quality volume treatment and peak flow rate mitigation.

6.7 Traffic Impact

Among the aspects that make this site nearly optimal for a solar array is its remote location and isolated access. Fisher Road is a dead-end road within an industrially-zoned area of the Town, with the majority of its length being a seasonally-maintained roadway. Transportation engineers “rule of thumb” for projects requiring a traffic impact study is when a development generates 100 new trips to the adjacent street network during peak-hour. The operation of the solar facility will require infrequent maintenance activities (i.e., mowing, technical support, etc.) estimated at a few times per year. Traffic generated from maintenance is far below the 100 trip per hour threshold; the project will not result in significant traffic related impacts. Traffic levels will increase during the anticipated two-month construction window. These temporary increases in observed traffic are temporary in nature, and are not considered significant.

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6.8 NYSDEC Article 24

C&S Engineers, Inc. (C&S) completed a site investigation of the project area, and there are no wetlands within the anticipated project limits. However, NYSDEC wetland SYE-22 is located adjacent the site. This wetland is classified as both palustrine forested (PFO) and palustrine emergent (PEM) as defined by the *United States Fish and Wildlife Service's Classification of Wetlands and Deepwater Habitats* of the United States publication. C&S provided the approximately wetland boundary limits of the wetland in the plans provided in Appendix A.

NYSDEC regulated wetlands are provided a 100-foot regulated adjacent area that extends from the boundary of the wetland. Permits are required for certain activities within the adjacent area. The proposed project involves placement of the electrical distribution line within the adjacent area. In this instance, the regulated buffer area within the limits of disturbance consists of both capped landfill, and access road fill material. Regardless, work within the regulated adjacent area requires a permit from the NYSDEC. A permit application is submitted, no work will commence until appropriate authorizations are received.

7.0 NYSDEC WORK PLAN APPROVAL

C&S submitted a draft Change of Use – Work Plan document March 7, 2019 for review and comment. On April 29, 2019, NYSDEC provided a request for additional information letter provided as Appendix C. C&S provided a response to comments on June 5, 2019 that is also included as Appendix C. NYSDEC issued final approval of the Change of Use – Work Plan on June 14, 2019 Appendix C). These letters, and information contained therein, are incorporated into the Final Change of Use – Work Plan.

APPENDIX A
ENGINEERING DRAWINGS

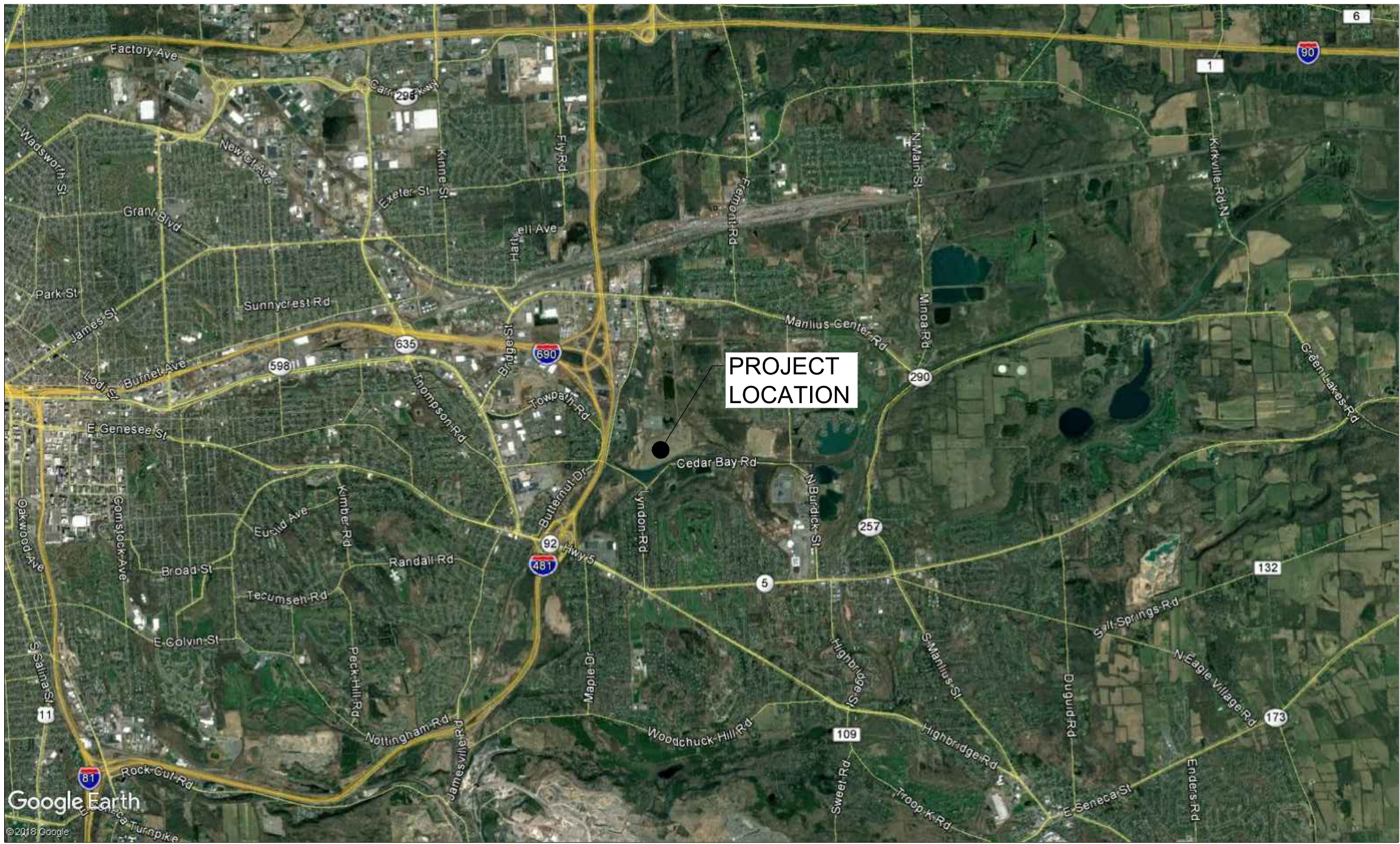


CONTRACT DRAWINGS
FOR THE CONSTRUCTION OF
**TOWN OF DEWITT LANDFILL
SOLAR GROUND ARRAY**



RER ENERGY GROUP

**6330 FISHER ROAD
EAST SYRACUSE, NY 13057**



DRAWING LIST	
SHEET NO.	SHEET NAME
G-001	TITLE SHEET
G-002	GENERAL NOTES AND LEGEND
CIVIL	
C-100	EXISTING CONDITIONS PLAN
C-101	SITE, EROSION AND SEDIMENTATION CONTROL PLAN
C-501	DETAILS

C&S PROJECT: V34.001.001

MARCH 2019



I CERTIFY THAT I AM CURRENTLY A NYS REGISTERED PROFESSIONAL ENGINEER AS DEFINED IN 6 NYCRR PART 375 AND THAT THIS WORK PLAN WAS PREPARED IN ACCORDANCE WITH ALL APPLICABLE STATUTES AND REGULATIONS AND IN SUBSTANTIAL CONFORMANCE WITH THE DER TECHNICAL GUIDANCE FOR SITE INVESTIGATION AND REMEDIATION (DER-10)

TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF THE PLANS AND SPECIFICATIONS FOR THIS PROJECT ARE IN COMPLIANCE WITH THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE AND THE BUILDING CODE OF NEW YORK STATE

NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

G-001

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D

C

B

A

GENERAL NOTES:

1. THE CONTRACTOR SHALL COORDINATE AND SCHEDULE HIS ACTIVITIES, WHERE NECESSARY, TO INTERFACE SMOOTHLY WITH WORK BEING PERFORMED ON SITE BY OTHER CONTRACTORS AND UTILITY COMPANIES.
2. THE CONTRACTOR'S STAGING AREA SHALL BE COORDINATED WITH THE OWNER PRIOR TO THE START OF WORK.
3. IT WILL BE THE CONTRACTOR'S OBLIGATION AND RESPONSIBILITY TO USE METHODS AND EQUIPMENT WHICH WILL INSURE THE SATISFACTORY COMPLETION OF THE REQUIRED WORK WITHIN THE CONTRACT TIME ALLOWED.
4. THE CONTRACTOR SHALL PROTECT HIS WORKERS AND OTHERS OCCUPYING THE SITE AT ALL TIMES IN CONFORMANCE WITH APPLICABLE OSHA REGULATIONS.
5. WHERE CONSTRUCTION DETAILS ARE SHOWN OR NOTED FOR ANY PART OF THE WORK, DETAILS SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
6. UNLESS DETAILS, SPECIFIED OR INDICATED OTHERWISE, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS ARE MEANT TO APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS OR IN SPECIFIC DRAWINGS.
7. CONTRACTOR IS RESPONSIBLE FOR SECURITY AND FOR THE SECURE STORAGE OF GOODS AND MATERIALS ONSITE.

UNDERGROUND UTILITIES:

1. THE APPROXIMATE LOCATION OF THE KNOWN UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE TRUE LOCATION AND ELEVATIONS OF ALL SHOWN UTILITIES BEFORE COMMENCING WORK. BEFORE ANY PIPE IS PLACED THE CONTRACTOR SHALL UNCOVER ALL UTILITIES AT PIPE CROSSINGS TO ENABLE THE ENGINEER TO VERIFY THAT THE PROPOSED PIPE WITH GRADES SHOWN ON THE PLANS IS NOT OBSTRUCTED BY EXISTING UTILITIES. IN ADDITION, THE CONTRACTOR SHALL PERFORM UTILITY TEST PIT EXCAVATIONS AT UTILITY CROSSINGS.
2. AS PART OF THIS PROJECT, CONTRACTOR SHALL RETAIN THE SERVICES OF AN ON-SITE UTILITY LOCATOR SERVICE. REFER TO SECTION 310100. CONTRACTOR SHALL NOTIFY DIG SAFELY NEW YORK AND ON-SITE UTILITY LOCATOR AT LEAST 72 HOURS PRIOR TO START OF WORK.
3. CONTRACTOR SHALL COORDINATE ALL UTILITY WORK WITH UTILITY COMPANIES AND THE TOWN OF DEWITT.
4. IN THE EVENT THAT THE CONTRACTOR DAMAGES ANY EXISTING UTILITIES, HE SHALL IMMEDIATELY NOTIFY THE OWNER AND THE AFFECTED UTILITIES REPRESENTATIVE OF SUCH DAMAGE. ANY DAMAGE SHALL PROMPTLY AND SATISFACTORILY BE REPAIRED BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES ENCOUNTERED IN THIS WORK. WHERE NECESSARY, THE CONTRACTOR SHALL PROVIDE TIMBER, PLANK OR OTHER APPROVED MATERIALS AND SECURELY BRACE AND PROTECT THESE UTILITIES

DRAINAGE:

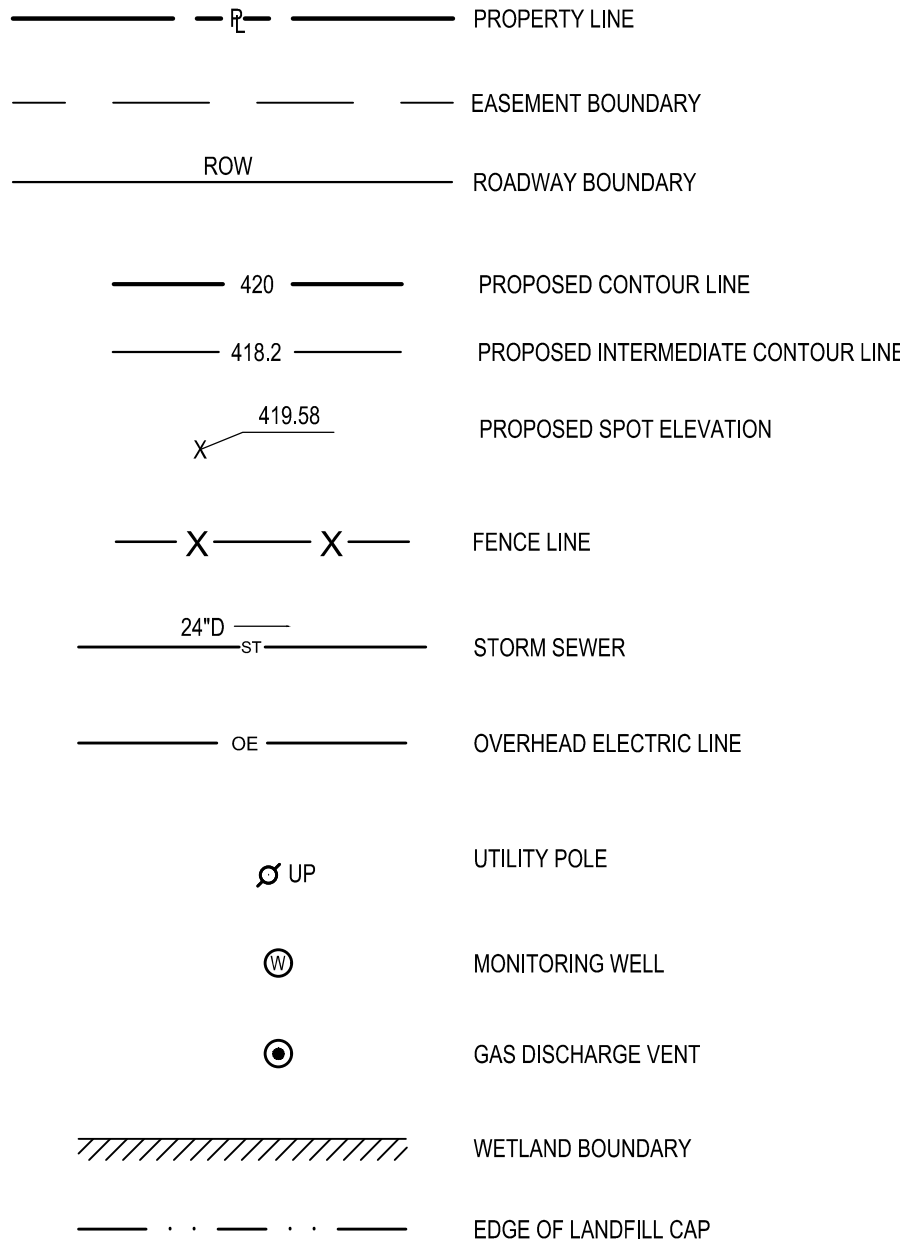
6. THE CONTRACTOR MUST BE ACQUAINTED WITH THE DRAINAGE CHARACTERISTICS OF THE AREA SO THAT HE WILL PROGRESS HIS WORK EFFICIENTLY WITH FULL KNOWLEDGE OF AND MITIGATION OF THE POTENTIAL DRAINAGE PROBLEMS.
7. ALL EXISTING DRAINAGE SYSTEMS, INCLUDING DITCHES AND CULVERTS, WITHIN THE CONTRACT LIMITS SHALL BE CLEANED AND KEPT CLEAN AND FREE FLOWING FOR THE DURATION OF THE CONTRACT.
8. ROADSIDE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES.
9. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SUPPORTS, BRACING AND OTHER DEVICES AS REQUIRED BY THE CONTRACTOR OR AS DIRECTED BY THE ENGINEER TO PROTECT ADJACENT STRUCTURES, ROADWAY AND UTILITIES.

LAWS, PERMITS AND LICENSES:

10. THE CONTRACTOR SHALL CONDUCT ITS OPERATIONS IN COMPLIANCE WITH ALL THE LAWS AND REGULATIONS OF THE UNITED STATES, STATE OF NEW YORK AND PUBLIC AUTHORITIES AND THE APPLICABLE ORDINANCES OF ONONDAGA COUNTY, AND THE TOWN OF DEWITT. THE NYSDEC ARTICLE 24 FRESHWATER WETLANDS PERMIT OUTLINES RULE, REGULATIONS, AND CONDITIONS THAT MUST BE COMPLIED WITH THAT MAY EFFECT THE CONTRACTORS OPERATIONS ON THIS PROJECT. THIS INFORMATION IS PROVIDED AS A CONVENIENCE TO BIDDERS. IT IS NOT INTENDED TO BE ALL INCLUSIVE AND DOES NOT RELIEVE THE CONTRACTORS OF THEIR RESPONSIBILITY TO DETERMINE WHICH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS APPLY TO THEIR OPERATIONS ON THIS CONTRACT, AND TO COMPLY WITH THEM.

WETLANDS AND EROSION CONTROL:

11. WETLANDS SHALL BE PROTECTED BY THE CONTRACTOR. HEAVY EQUIPMENT OPERATION IN THE WETLANDS IS PROHIBITED WITH BACKHOES, EXCAVATORS, OR OTHER SIMILAR EQUIPMENT.
12. ALL STORM DRAINAGE OUTLETS SHALL BE STABILIZED, AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
13. DURING CONSTRUCTION, NO WET OR FRESH CONCRETE OR LEACHATE SHALL BE ALLOWED TO ESCAPE TO ANY WATERS NOR SHALL WASHINGS FROM CONCRETE TRUCKS, MIXERS, OR OTHER DEVICES BE ALLOWED TO ENTER ANY WATERS.
14. ALL ROADS SHALL BE KEPT CLEAN OF MUD, SEDIMENT AND DEBRIS AT ALL TIMES.
15. CONTRACTOR SHALL TOPSOIL (4" MIN.), SEED, FERTILIZE AND MULCH ALL DISTURBED AREAS.



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Fax: 315-455-9667
www.cscos.com



RER ENERGY GROUP
TOWN OF DEWITT LANDFILL
SOLAR GROUND ARRAY
6330 FISHER ROAD
EAST SYRACUSE, NY 13057

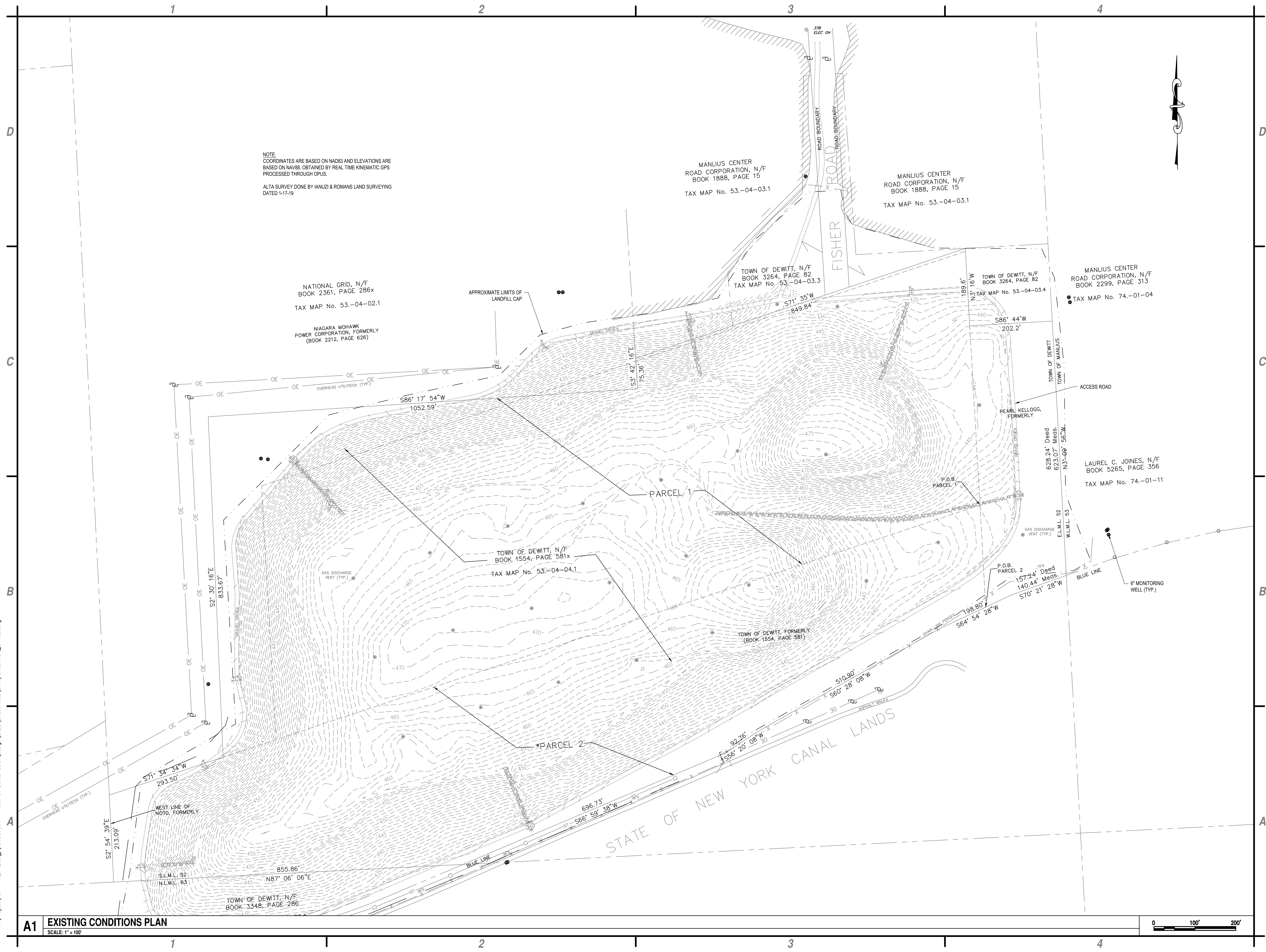
MARK	DATE	DESCRIPTION
REVISIONS		
PROJECT NO: V34.001.001		
DATE: MARCH 2019		
DRAWN BY: B. BUCKINGHAM		
DESIGNED BY: M. FRATESCHI		
CHECKED BY:		
NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK EDUCATION LAW		

GENERAL NOTES
AND LEGEND

G-002

A1 NOTES AND LEGEND
NOT TO SCALE

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NOTE:
COORDINATES ARE BASED ON NAD83 AND ELEVATIONS ARE
BASED ON NAV88, OBTAINED BY REAL TIME KINEMATIC GPS
PROCESSED THROUGH OPUS.

ALTA SURVEY DONE BY IANUZI & ROMANS LAND SURVEYING
DATED 1-17-19

NATIONAL GRID, N/F
BOOK 2361, PAGE 286x
TAX MAP No. 53.-04-02.1

NIAGARA MOHAWK
POWER CORPORATION, FORMERLY
(BOOK 2212, PAGE 626)

MANLIUS CENTER
ROAD CORPORATION, N/F
BOOK 1888, PAGE 15
TAX MAP No. 53.-04-03.1

MANLIUS CENTER
ROAD CORPORATION, N/F
BOOK 1888, PAGE 15
TAX MAP No. 53.-04-03.1

TOWN OF DEWITT, N/F
BOOK 3264, PAGE 82
TAX MAP No. 53.-04-03.3

TOWN OF DEWITT, N/F
BOOK 3264, PAGE 82
TAX MAP No. 53.-04-03.4

MANLIUS CENTER
ROAD CORPORATION, N/F
BOOK 2299, PAGE 313
TAX MAP No. 74.-01-04

LAUREL C. JOINES, N/F
BOOK 5265, PAGE 356
TAX MAP No. 74.-01-11

TOWN OF DEWITT, N/F
BOOK 1554, PAGE 581x
TAX MAP No. 53.-04-04.1

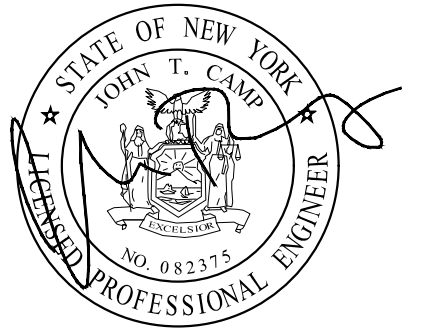
TOWN OF DEWITT, FORMERLY
(BOOK 1554, PAGE 581)

A1 EXISTING CONDITIONS PLAN
SCALE: 1" = 100'

0 100' 200'



C&S Engineers, Inc.
499 Col. Eileen Collins Blvd.
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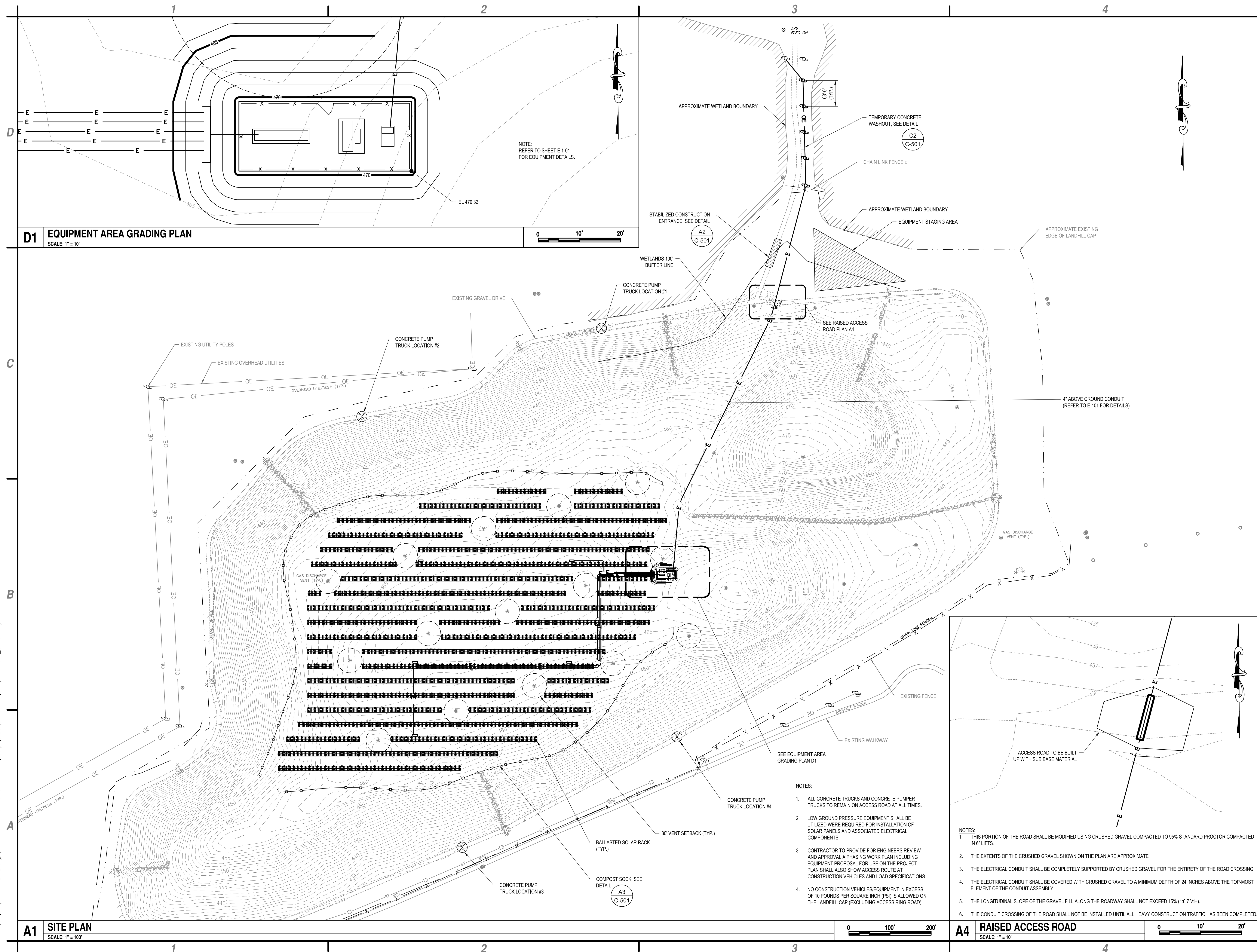


**RER ENERGY GROUP
TOWN OF DEWITT LANDFILL
SOLAR GROUND ARRAY
6330 FISHER ROAD
EAST SYRACUSE, NY 13057**

MARK	DATE	DESCRIPTION
REVISIONS		
PROJECT NO: V34.001.001		
DATE: MARCH 2019		
DRAWN BY: B. BUCKINGHAM		
DESIGNED BY: M. FRATESCHI, P.E.		
CHECKED BY: J. CAMP, P.E.		
NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK EDUCATION LAW		

**EXISTING
CONDITIONS PLAN**

C-100



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D1

NOT USED

SCALE: X" = 1'-0"

C

TEMPORARY TOPSOIL STOCKPILE NOTES:

1.

REFER TO COMPOST SOCK DETAIL FOR MATERIALS AND INSTALLATION METHODS.

2.

IF THE STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS, IT SHALL BE STABILIZED WITH BURLAP MATTING OR SEEDED WITHIN 7 DAYS OF COMPLETION TO MINIMIZE EROSION.

3.

INSPECTION OF COMPOST SOCK SHALL BE AT LEAST ONCE PER WEEK AND AFTER RAIN EVENTS IN EXCESS OF 1/2". REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

4.

SEDIMENT TRAPPED BY THE COMPOST SOCK SHALL BE REMOVED AND PROPERLY DISPOSED OF WHENEVER SIGNIFICANT ACCUMULATION OCCURS.

5.

COMPOST SOCK SHALL BE MAINTAINED IN PLACE UNTIL TOPSOIL STOCKPILE HAS BEEN ELIMINATED AND SHALL BE REMOVED ONLY WHEN DIRECTED BY THE ENGINEER.

6.

TOPSOIL STOCKPILE LOCATION SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE OWNER OR AN AUTHORIZED REPRESENTATIVE

B1

TEMPORARY TOPSOIL STOCKPILE DETAIL (IF APPLICABLE)

NOT TO SCALE

A

TYPICAL GRASS RESTORATION DETAIL

NOT TO SCALE

2

CONSTRUCTION SPECIFICATIONS

1.

LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC. CONCRETE WASHOUT WILL BE PERMITTED UNDER THE ARTICLE 24, PERMIT TO BE PLACED WITHIN WETLAND BUFFER.

2.

SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 1 FOOT OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.

3.

PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.

4.

PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.

5.

KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER.

6.

PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

C2

TEMPORARY CONCRETE WASHOUT FACILITY DETAIL

NOT TO SCALE

A2

TEMPORARY STABILIZED CONSTRUCTION ENTRANCE DETAIL

NOT TO SCALE

A3

COMPOST FILTER SOCK DETAIL

NOT TO SCALE

3

COMPOST FILTER SOCK DETAIL

NOT TO SCALE

A4

NOT USED

SCALE: X" = 1'-0"

D4

NOT USED

SCALE: X" = 1'-0"

C4

NOT USED

SCALE: X" = 1'-0"

B4

NOT USED

SCALE: X" = 1'-0"

A4

NOT USED

SCALE: X" = 1'-0"

C&S Engineers, Inc.
499 Col. Eileen Collins Blvd.
Syracuse, New York 13212
Phone: 315-455-2000
Fax: 315-455-9667
www.cscos.com

RER ENERGY GROUP
TOWN OF DEWITT LANDFILL
SOLAR GROUND ARRAY
6330 FISHER ROAD
EAST SYRACUSE, NY 13057

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO: V34.001.001

DATE: MARCH 2019

DRAWN BY: B. BUCKINGHAM

DESIGNED BY: M. FRATESCHI

CHECKED BY:

NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK EDUCATION LAW

DETAILS

C-501

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2664.09 KW GROUND MOUNTED SOLAR ARRAY TOWN OF DEWITT

PREPARED FOR

RER ENERGY GROUP

BY

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1047 North Park Road
PO Box 6307
Reading, PA 19610-0307
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F. 610.621.2001
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Roma Corporate Center, Suite 106
1605 North Cedar Crest Boulevard
Allentown, PA 18104
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701 Creekside Lane
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F. 610.621.2001



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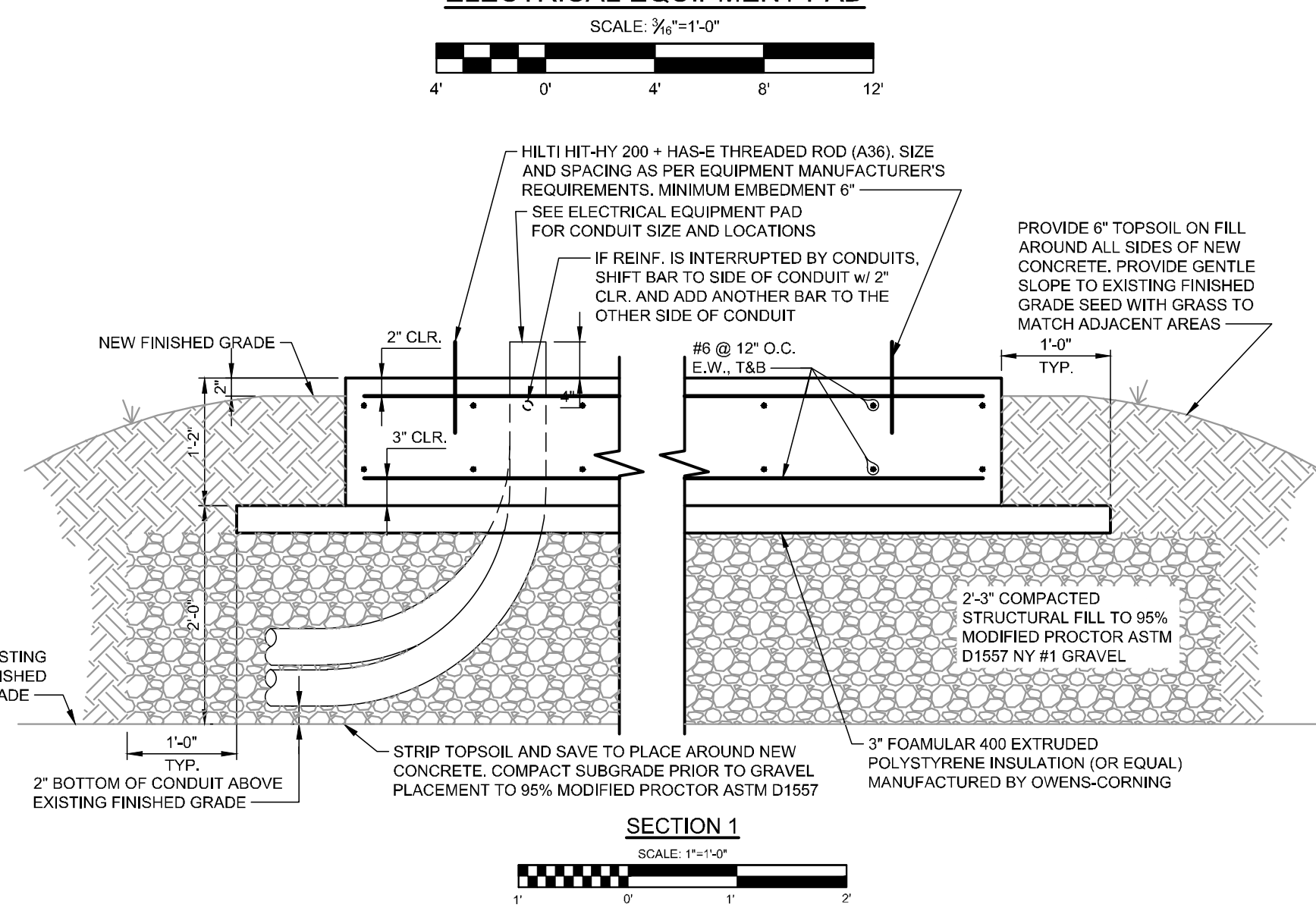
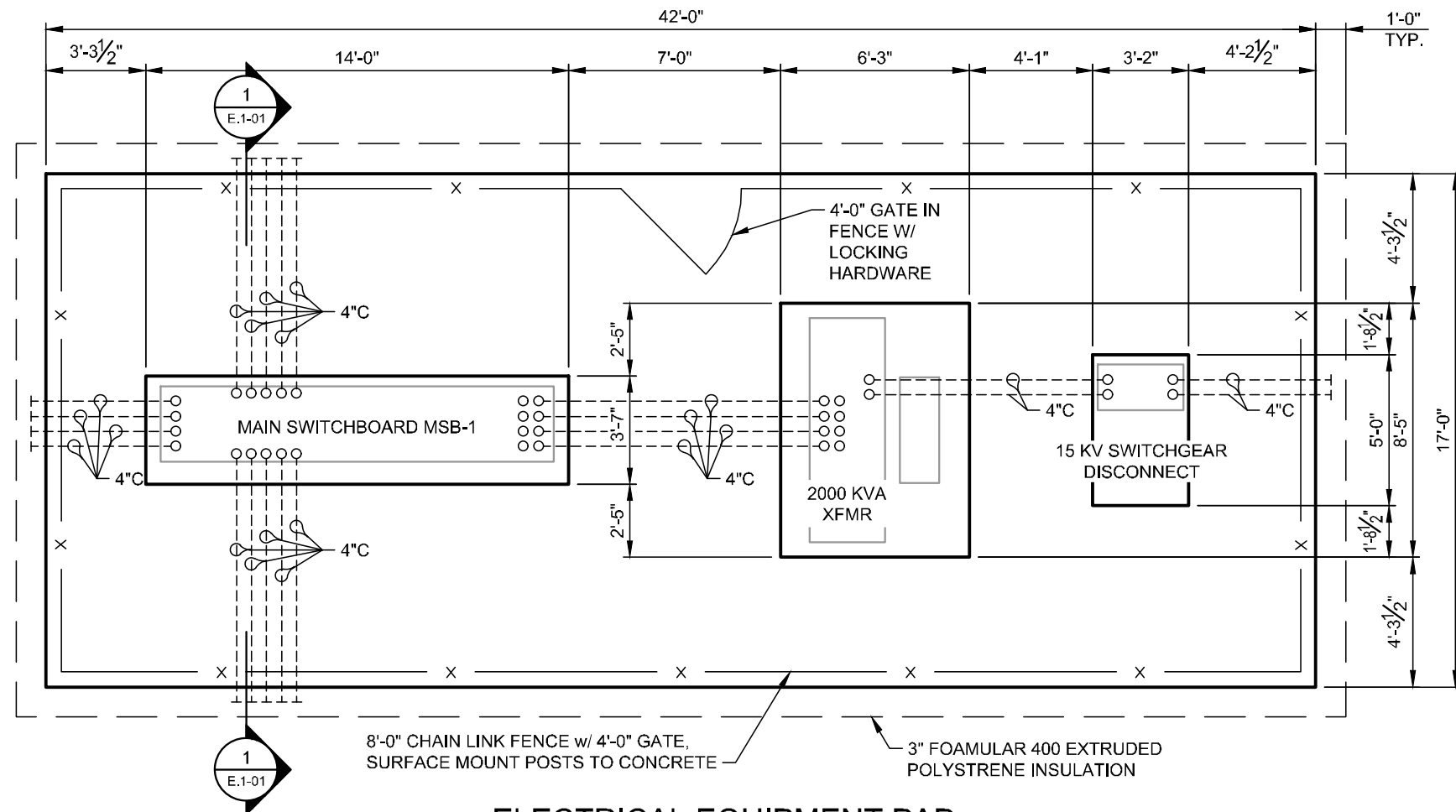
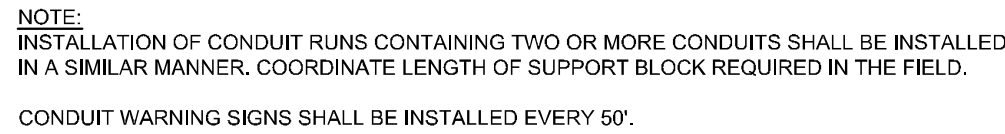
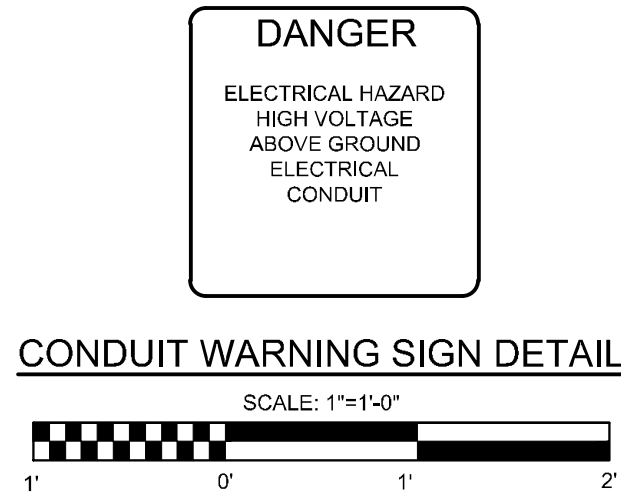
INDEX TO DRAWINGS	
DWG NO.	DESCRIPTION
G.0-00	COVER SHEET
E.1-01	SITE PLAN
E.5-01	SINGLE LINE DIAGRAM
E.5-02	THREE LINE DIAGRAM
E.5-03	DETAILS

LOCATION MAP



"I CERTIFY THAT I AM CURRENTLY A NYS REGISTERED PROFESSIONAL ENGINEER AS DEFINED IN 6 NYCRR PART 375 AND THAT THIS WORK PLAN WAS PREPARED IN ACCORDANCE WITH ALL APPLICABLE STATUTES AND REGULATIONS AND IN SUBSTANTIAL CONFORMANCE WITH THE DER TECHNICAL GUIDANCE FOR SITE INVESTIGATION AND REMEDIATION (DER-10)"





NOTES:

NO EQUIPMENT SHALL BE LOCATED WITHIN THE 30' RADIUS OF THE VENTS TO PREVENT ANY RISK OF LAND FILL GAS ACCUMULATION.

[illegible]

READING
1047 North Park Road
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HARRISBURG
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Camp Hill, PA 17011
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RER ENERGY GROUP
 GES SOLAR PROJECT
 ROAD, TOWN OF DEWITT, EAST SYRACUSE STATE OF NEW YORK
 39 KW DC GROUND MOUNTED SOLAR ARRAY
 ELECTRICAL
 SITE PLAN
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01/16/19	101644.0035 E.1-01
DATE	DIGITAL FILENAME
101644.0035	
WORK ORDER NUMBER	
E.1-01	
DRAWING NUMBER	



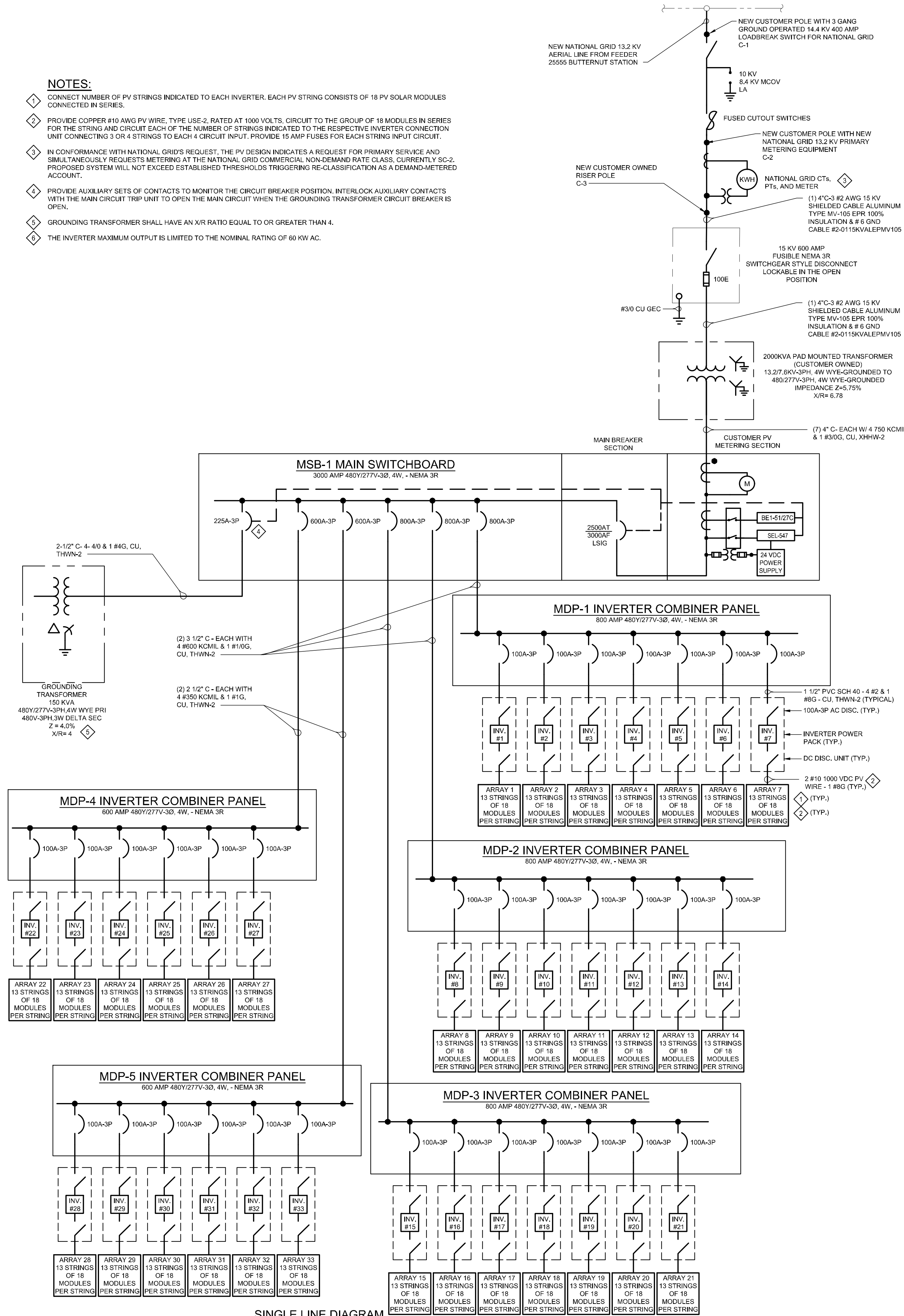
RER
Energy Group

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PA 19605
Regional offices serving CT, DE, MD, NJ,
NY, PA, and Mexico

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NOTES:

- CONNECT NUMBER OF PV STRINGS INDICATED TO EACH INVERTER, EACH PV STRING CONSISTS OF 18 PV SOLAR MODULES CONNECTED IN SERIES.
- PROVIDE COPPER #10 AWG PV WIRE, TYPE USE-2, RATED AT 1000 VOLTS, CIRCUIT TO THE GROUP OF 18 MODULES IN SERIES FOR THE STRING AND CIRCUIT EACH OF THE NUMBER OF STRINGS INDICATED TO THE RESPECTIVE INVERTER CONNECTION UNIT CONNECTING 3 OR 4 STRINGS TO EACH 4 CIRCUIT INPUT. PROVIDE 15 AMP FUSES FOR EACH STRING INPUT CIRCUIT.
- IN CONFORMANCE WITH NATIONAL GRID'S REQUEST, THE PV DESIGN INDICATES A REQUEST FOR PRIMARY SERVICE AND SIMULTANEOUSLY REQUESTS METERING AT THE NATIONAL GRID COMMERCIAL, NON-DEMAND RATE CLASS, CURRENTLY SC-2. PROPOSED SYSTEM WILL NOT EXCEED ESTABLISHED THRESHOLDS TRIGGERING RE-CLASSIFICATION AS A DEMAND-METERED ACCOUNT.
- PROVIDE AUXILIARY SETS OF CONTACTS TO MONITOR THE CIRCUIT BREAKER POSITION. INTERLOCK AUXILIARY CONTACTS WITH THE MAIN CIRCUIT TRIP UNIT TO OPEN THE MAIN CIRCUIT WHEN THE GROUNDING TRANSFORMER CIRCUIT BREAKER IS OPEN.
- GROUNDING TRANSFORMER SHALL HAVE AN X/R RATIO EQUAL TO OR GREATER THAN 4.
- THE INVERTER MAXIMUM OUTPUT IS LIMITED TO THE NOMINAL RATING OF 60 KW AC.

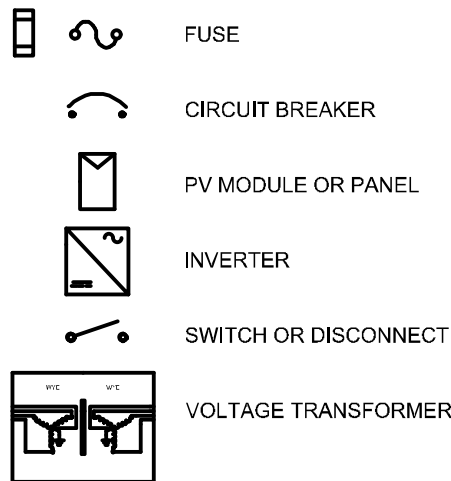


SINGLE LINE DIAGRAM
NO SCALE

NATIONAL GRID CONTACT INFORMATION:

CENTRAL REGION
JOB NUMBER:
10019444738

ELECTRICAL LEGEND



LABELS

AC SYSTEM RATING - 690.54

ALL INTERACTIVE SYSTEM(S) POINTS OF CONNECTION WITH OTHER SOURCES - INVERTER OUTPUT CONNECTION AT AC DISCONNECTS AND SERVICE PANEL DOOR

WARNING THIS PANEL HAS SECONDARY POWER SOURCE FROM PHOTOVOLTAIC SYSTEM. TURN-OFF PHOTOVOLTAIC SYSTEM BREAKER PRIOR TO SERVICING PANEL. MAX AC OUTPUT CURRENT: XXXX AMPS OPERATING AC VOLTAGE XXXV

OPEN CIRCUIT VOLTAGE

DC DISCONNECTS - 690.17

WARNING ELECTRIC SHOCK HAZARD. DO NOT TOUCH TERMINALS. TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.

EQUIPMENT SCHEDULE

PART NO.	NAME	QUANTITY	DESCRIPTION
1	PV MODULE	7722	345 W MODULES 1000VDC
2	60 KW INVERTER	33	60 KW INVERTER @ 480/277VAC 1000VDC
3	AC MAIN DISTRIBUTION PANEL	5	480/277 VAC, 3Φ, 4W, 600A MLO DISTRIBUTION PANEL, NEMA 3R, WITH 6 TO 7 100A-3 POLE BREAKERS
4	AC MAIN SWITCHBOARD	1	480/277 VAC, 3Φ, 4W, 3000A SWITCHBOARD, NEMA 3R, 2500AT/3000AF ELECTRICALLY OPERATED MAIN CIRCUIT BREAKER
5	PV REVENUE METER	1	480 VAC, 3Φ, 2500:5 CTS IN SWITCHBOARD SECTION
6	TRANSFORMER	1	2000 KVA PAD MOUNTED 13.27.6 KV - 3 PH, 4W WYE-GROUNDED TO 480/277 V - 3 PH, 4W WYE GROUNDED
7	UTILITY ACCESSIBLE MAIN AC DISCONNECT	1	15 KV, 600A, FUSED SWITCHGEAR STYLE LOADBREAK RATED SWITCH, 100E FUSE
8	PRIMARY CONDUIT AND CABLE	-	15 KV SHIELDED CABLE ALUMINUM TYPE MV-105 EPR 100% INSULATION & # 6 GND CABLE #2-0115KVALEPMV105
9	UTILITY PRIMARY METER	1	NATIONAL GRID PRIMARY METER, CT & PT METERING EQUIPMENT, MOUNTED ON METERING POLE

EQUIPMENT SPECIFICATIONS

PHOTOVOLTAIC SOLAR MODULE (PANEL) - CSUN 345-72M	345 W	
MAXIMUM POWER	P_max	345 W
MAXIMUM POWER CURRENT	I_mp	8.99 A
SHORT CIRCUIT CURRENT	I_sc	9.46 A
OPEN CIRCUIT VOLTAGE	V_oc	47.28 V

INVERTER - SUNGROW SG 60KU-M	60 KW
MAXIMUM POWER OUTPUT	66,000 W
PEAK POWER TRACKING (MPPT)	550-850 VDC
DC MAXIMUM VOLTAGE	1000 VDC
OUTPUT VOLTAGE RANGE	422-528 VAC
OUTPUT VOLTAGE	480/277 VAC
AC MAXIMUM AMPERAGE	80 A
CEC EFFICIENCY	98.5%

TRIP SETTINGS TABLE

PROTECTIVE ELEMENT	EVENT	TYPICAL SETTINGS	THRESHOLD	TIME (SEC)
27	UNDER-VOLTAGE	27-1	0.50 pu V (240 VOLTS)	0.16
		27-2	0.88 pu V (423 VOLTS)	2.00
59	OVER-VOLTAGE	59-1	1.20 pu V (576 VOLTS)	0.16
		59-2	1.10 pu V (520 VOLTS)	1.00
81o	OVER-FREQUENCY	81O-1	60.5 Hz	0.16
81u	UNDER-FREQUENCY	81U-1	57.0 Hz	0.16
51C	VOLTAGE CONTROLLED OVER CURRENT			

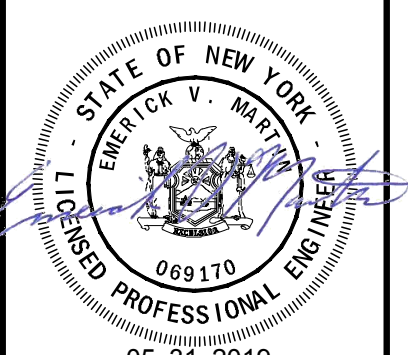
PV SYSTEM SUMMARY

SYSTEM	BALLASTED GROUND MOUNTED
PV MODULE MODEL	CSUN 345-72M
PV MODULE STC DC RATING	345 W
PV MODULES PER SOURCE CIRCUIT (STRINGS)	18
TOTAL PV MODULE COUNT	7722
TOTAL STC DC SYSTEM SIZE	2664.09
TOTAL AC SYSTEM SIZE	1980
DC/AC RATIO	1.35
INVERTER MODEL	SUNGROW SG 60KU-M
NUMBER OF INVERTERS	33

GENERAL NOTES:

- ALL CONDUCTORS WILL ENTER ENCLOSURES PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- WIRE DERATES ARE CALCULATED BASED ON NEC CONDUIT FILL PER NEC TABLE 310.15(B)(3)(a) MULTIPLIED BY AMBIENT TEMPERATURE CORRECTION OF NEC TABLE 310.15(B)(2)(a). CONDUITS MUST BE DERATED FOR EXPOSURE TO SUNLIGHT.
- CONDUCTORS NOT TO EXCEED 90 DEGREE C AND ARE THEREFORE DERATED PER NEC TABLE 310.15(B)(2)(a).
- MAXIMUM AND MINIMUM AMBIENT TEMPERATURES ARE 93 AND 0 DEGREE F RESPECTIVELY.
- MAXIMUM SYSTEM OPEN CIRCUIT VOLTAGE IS NOT ANTICIPATED TO EXCEED 1000 VDC UNDER ANY CONDITIONS.
- PV CONDUCTORS NOT ANTICIPATED TO OPERATE AT TEMPERATURES GREATER THAN 90 DEGREE C.
- ALL ELECTRICAL CONDUCTORS AND FITTINGS SHALL BE INSTALLED BY AN APPROPRIATELY LICENSED AND INSURED MASTER ELECTRICIAN REGISTER TO PERFORM THE WORK ACCORDANCE WITH THE AHJ'S REGULATIONS

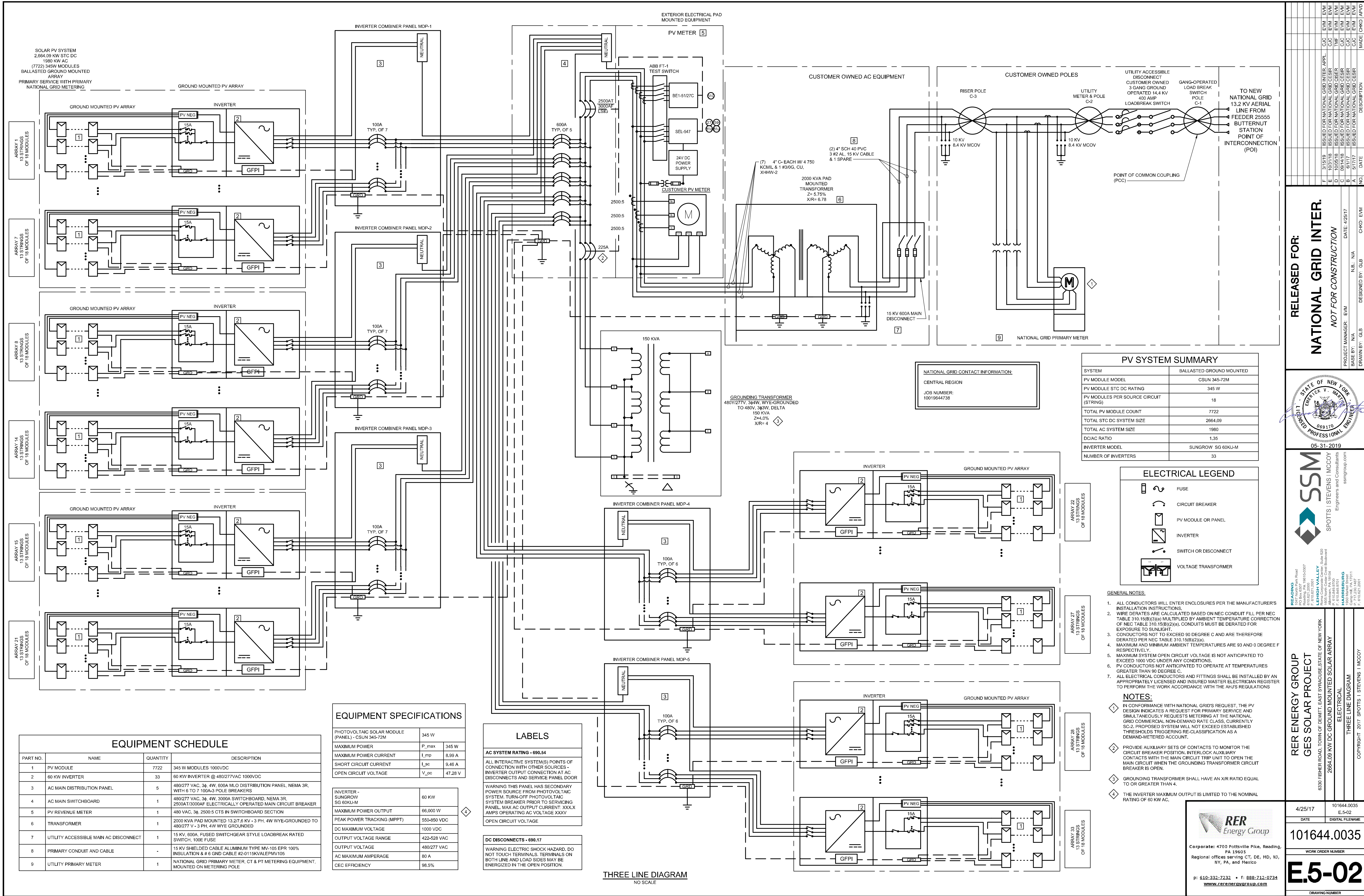
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6330 FISHER ROAD, TOWN OF DEWITT, EAST SYRACUSE STATE OF NEW YORK
2664.09 KW DC GROUND MOUNTED SOLAR ARRAY

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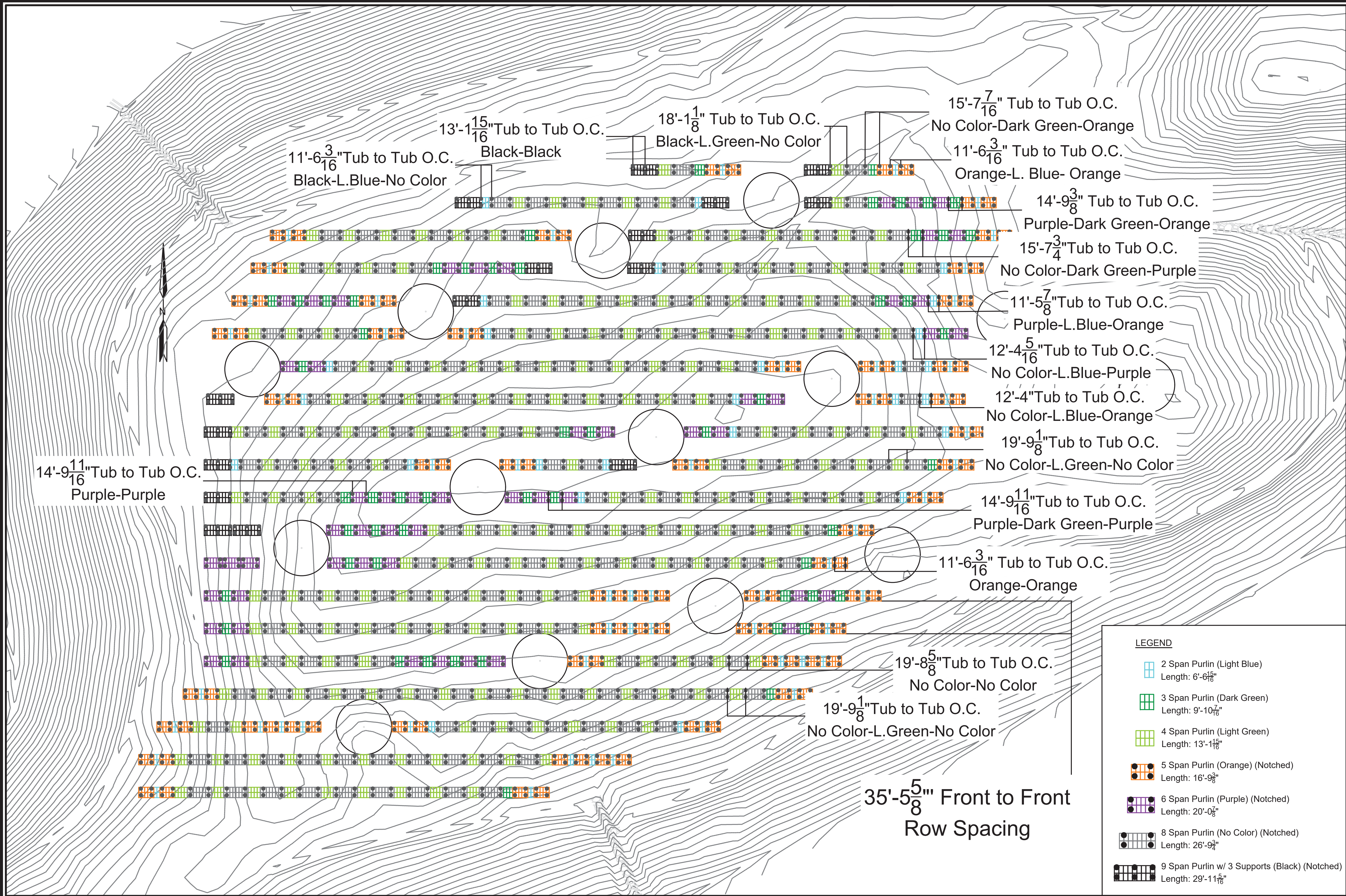
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6330 FISHER ROAD, TOWN OF DEWITT, EAST SYRACUSE STATE OF NEW YORK
2664.09 KW DC GROUND MOUNTED SOLAR ARRAY
ELECTRICAL
THREE LINE DIAGRAM
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AERIAL VIEW

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Engineer's Seal:

Site Key Plan:

Rev:	By:	Date:	Description:
1	SH	10-13-2017	Preliminary Layout
...	...	...	...
5	SF	06-29-2018	Revised Panel: CSUN345
6	SF	09-04-2018	Revised Layout/Panel Count
7	SF	09-05-2018	Revised Total Dead Load
8	GF	05-09-2019	Issued for Client Approval
9	SC	05-15-2019	Revised Assembly/874 Count

Array Information		
	PV Modules	Racking
Manufacturer	CSUN	Gamechange Solar
Model	CSUN345-72M	30-Degree Pour-In-Place
Dimensions	76.98" x 38.96" x 1.57"	
Weight	46.3 lbs	
Quantity	7722	790 Pairs of Tubs
Ground Clearance	30 in	

7722 modules at 345W
2.66 MW

Customer:**RER Energy Group**

Project:**Dewitt Landfill**

Location:**6330 Fischer Rd, East Syracuse, NY 13057**

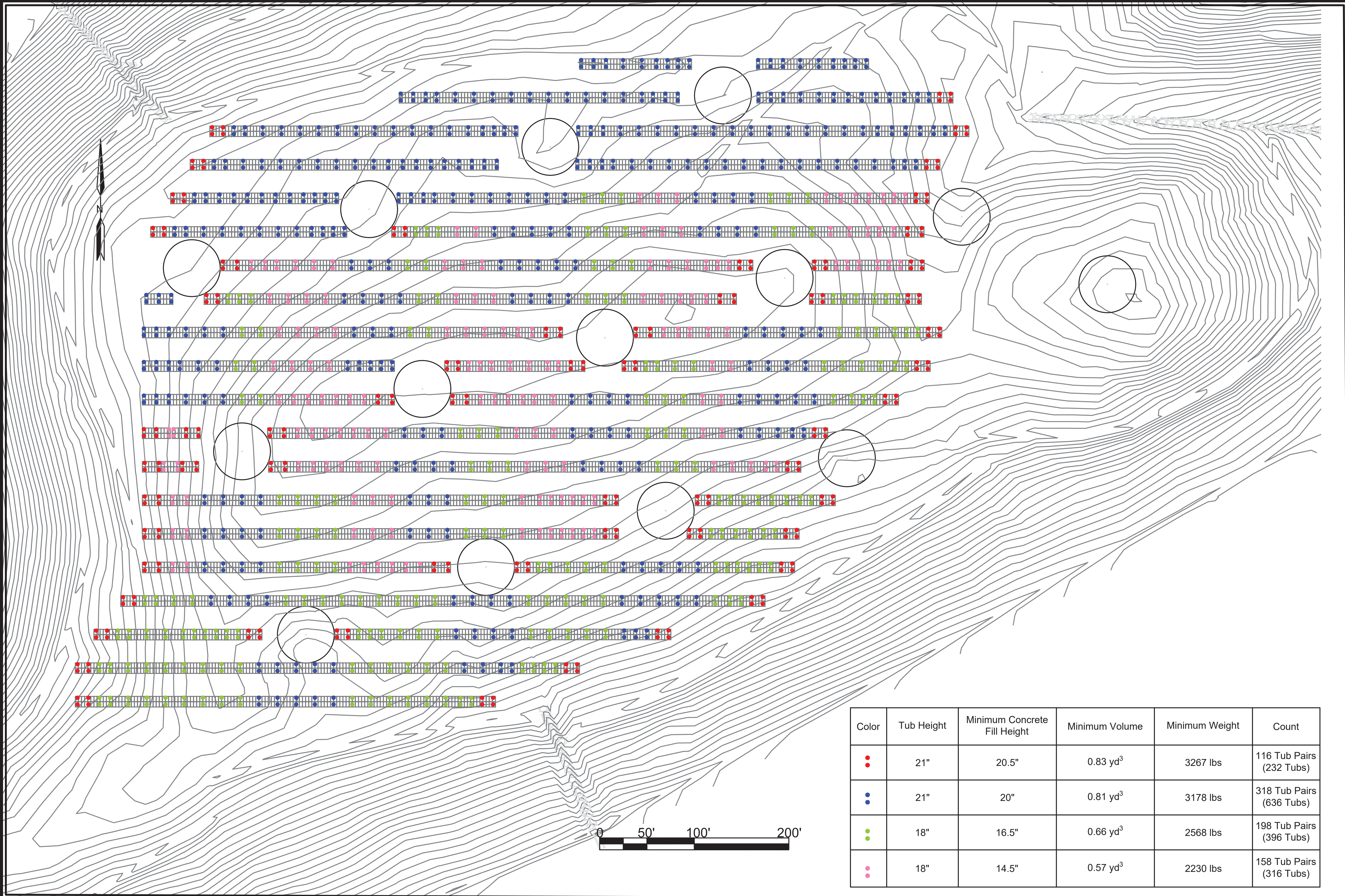
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- Install foundations at specified distances along slope line, Not by plane view. See Detail Sheets for additional info

Design Information					
Building Occupancy Category	I	Area of Array	10.88 acres	Dead Load	12.5 psf
Wind Exposure Category	C	No. of rows	39	Seismic Site Class	D
Design Wind Speed	105 mph ASCE7-10	Distance to Saltwater	>30 miles	S _s	0.144 g
Design Snow Load	50 psf	Years Since Landfill Capped	25 years	S ₁	0.062 g

SITE PLAN

Sheet #:
1 of 9



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RER Energy Group

Project:
Dewitt Landfill

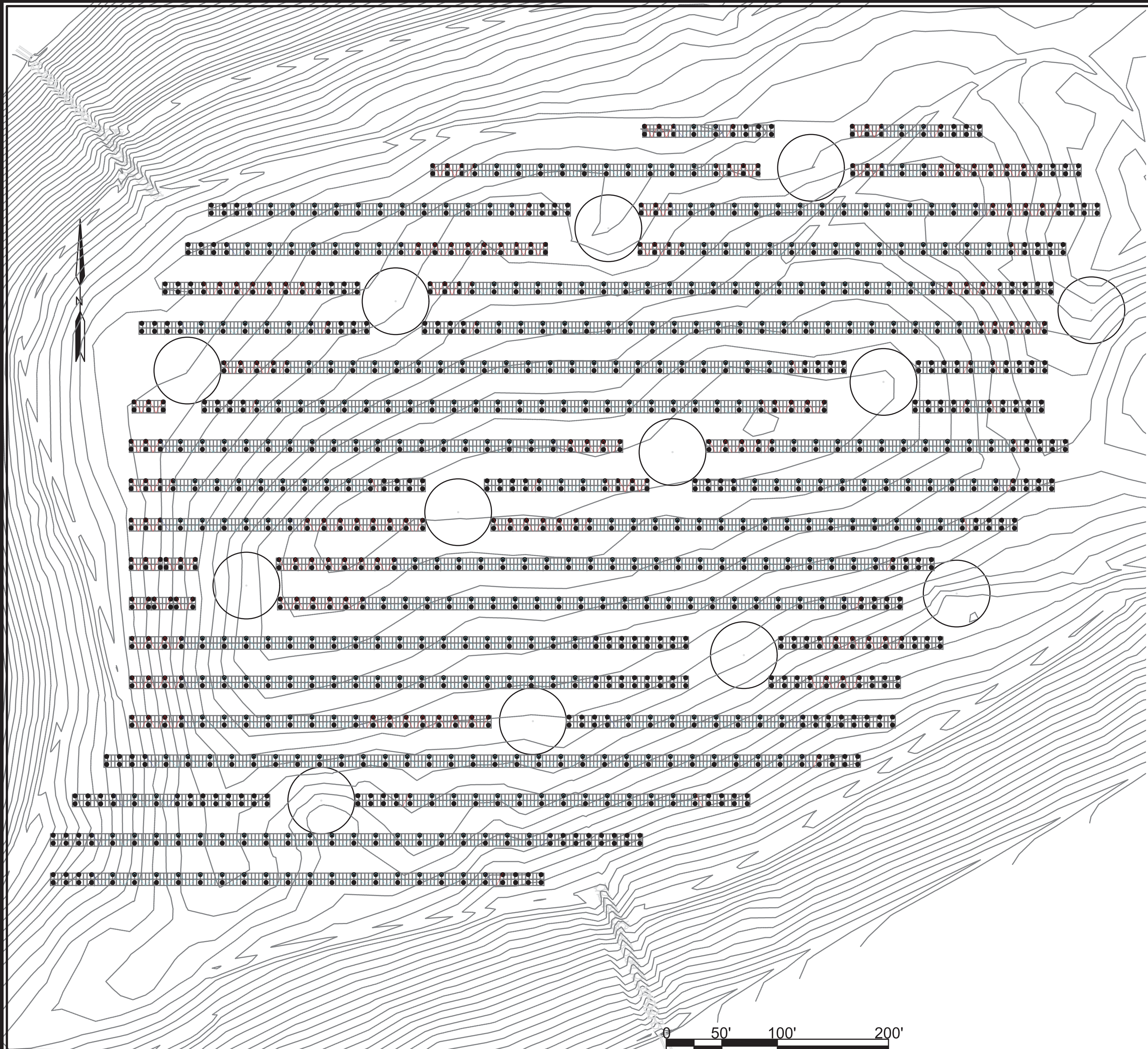
Location:
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SITE PLAN

Sheet #:
2 of 9

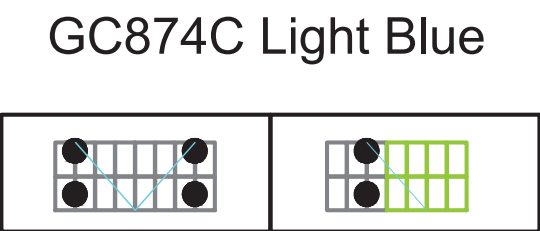
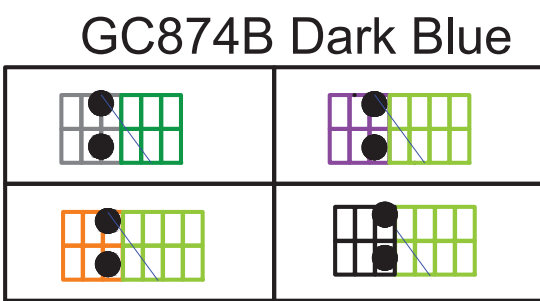
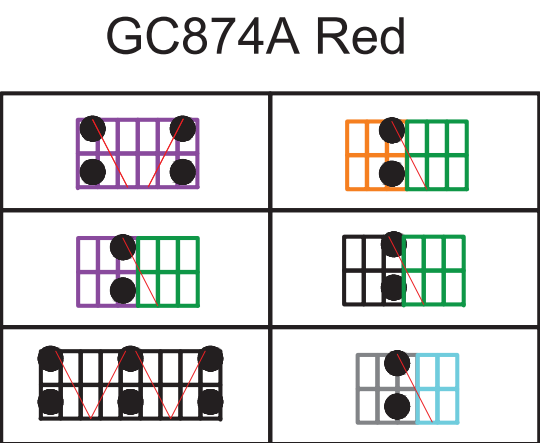
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Design Wind Speed	105 mph ASCE7-10	Distance to Saltwater	>30 miles	S _s	0.144 g
Design Snow Load	50 psf	Years Since Landfill Capped	25 years	S ₁	0.062 g



Purlin Angle Key

Note:
-The following Purlin Angles (GC874), Bend Straps (GC871) will be used in these locations.
-All other locations do not require Purlin Angles (GC874), Bends Straps (GC871)



AERIAL VIEW

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Engineer's Seal:

Site Key Plan:

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Ground Clearance	30 in	

7722 modules at 345W

2.66 MW

Customer: RER Energy Group

Project: Dewitt Landfill

Project #:

Location: 6330 Fischer Rd, East Syracuse, NY 13057

SITE PLAN

Sheet #: 3 of 9

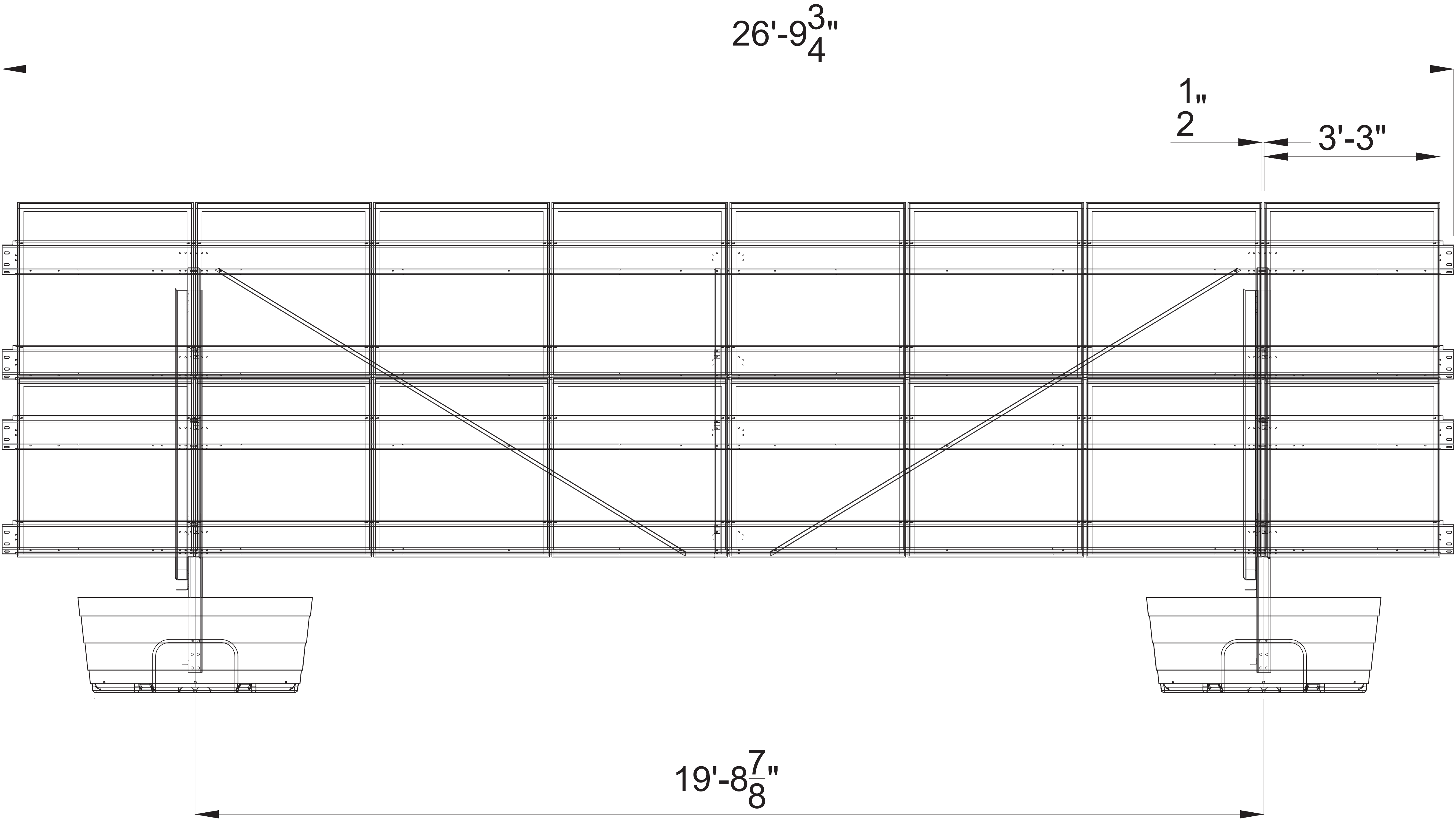
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2019-05-14 SC
DeWitt
RER Energy Group
CSUN



AERIAL VIEW





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7722 modules at 345W

2.66 MW

Customer: RER Energy Group

Project: Dewitt Landfill

Location: 6330 Fischer Rd, East Syracuse, NY 13057

Assembly Drawing

Sheet #: 4 of 9

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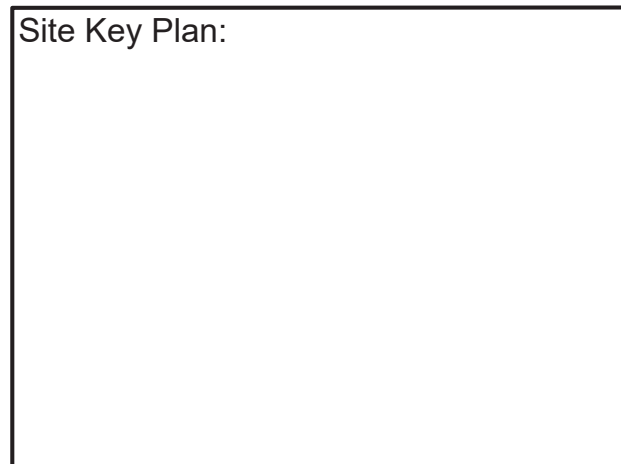
AERIAL VIEW



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REPOWERING THE PLANET

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8	GF	05-09-2019	Issued for Client Approval
9	SC	05-15-2019	Revised Assembly/874 Count

Array Information

	PV Modules	Racking
Manufacturer	CSUN	Gamechange Solar
Model	CSUN345-72M	30-Degree Pour-In-Place
Dimensions	76.98" x 38.96" x 1.57"	
Weight	46.3 lbs	
Quantity	7722	790 Pairs of Tubs
Ground Clearance	30 in	

7722 modules at 345W

2.66 MW

Customer:
RER Energy Group

Project:
Dewitt Landfill

Project #:

Location: 6330 Fischer Rd,
East Syracuse, NY 13057

Assembly Drawing

Sheet #:

5 of 9

2'-6" MIN. GROUND CLEARANCE TO PANEL

Dimensions and angles shown in the diagram include:

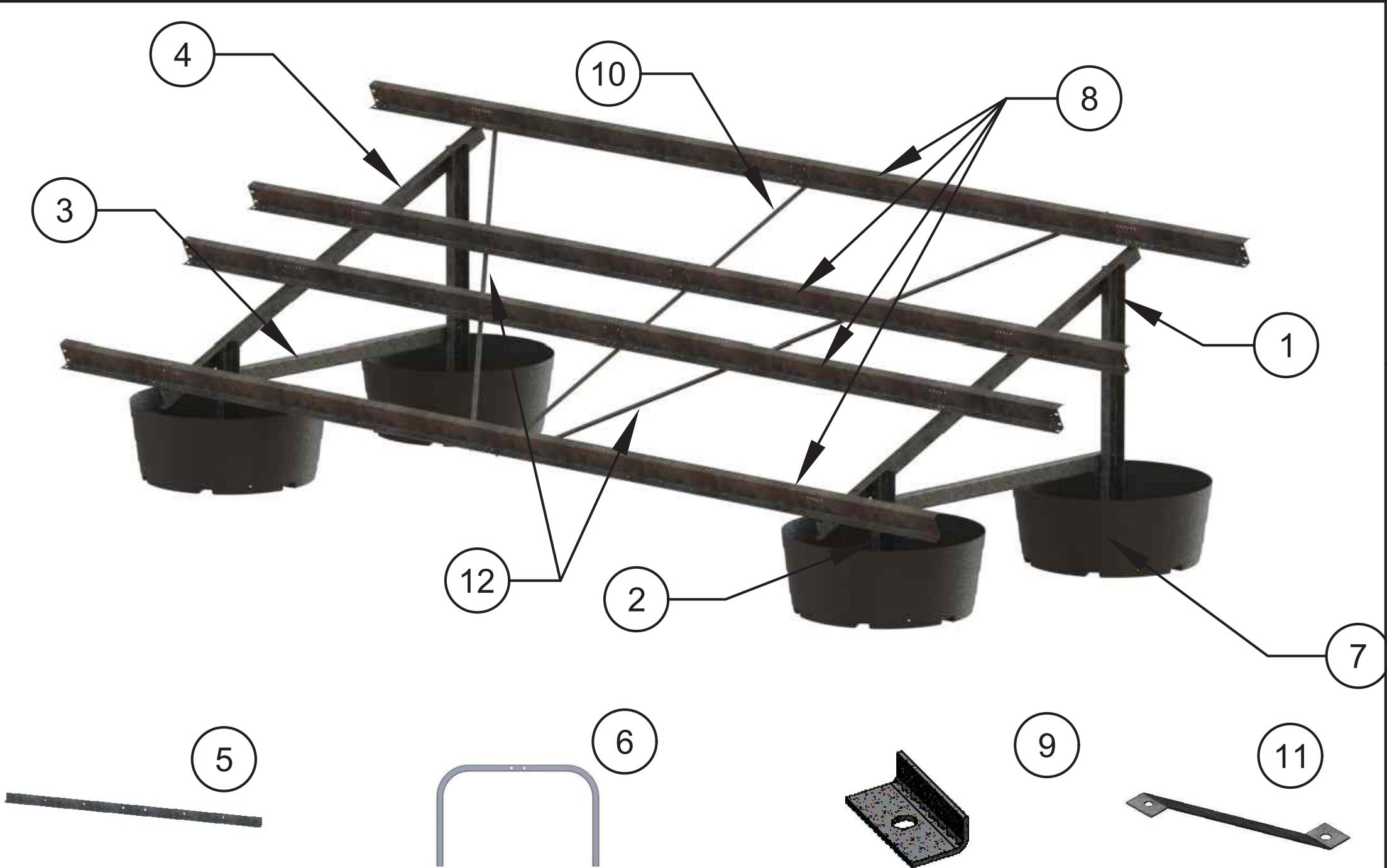
- Panel length: 6'-5"
- Panel width: 3'-10⁵/₁₆"
- Panel thickness: 1¹/₂" TYP.
- Panel spacing: 8"
- Panel angle: 30°
- Panel height: 9'-0¹/₂"
- Panel width (bottom): 7'-0³/₄"
- Panel length (bottom): 10'-8¹/₁₆"
- Panel width (bottom): 2'-11⁵/₁₆"
- Panel length (bottom): 7'-1¹/₂"
- Panel width (bottom): 2'-8¹/₂"
- Panel length (bottom): 7'-7¹/₂"
- Panel width (bottom): 2'-11⁵/₁₆"

GENERAL NOTES

- The layout shown herein is based on site layout geometry provided to GameChange Solar by the customer.
- Any changes to the site that may affect the solar PV arrays depicted herein shall be notified to GameChange Solar.
- The layouts and details shown herein are a custom design for this project and are specific to the PV module(s) shown in the Array Information table.

- GameChange Solar cannot be responsible for errors during installation caused by changes that impact the layout as shown
- Install foundations at specified distances along slope line, Not by plane view. See Detail Sheets for additional info

Design Information					
Building Occupancy Category	I	Area of Array	10.88 acres	Dead Load	12.5 psf
Wind Exposure Category	C	No. of rows	39	Seismic Site Class	D
Design Wind Speed	105 mph ASCE7-10	Distance to Saltwater	>30 miles	S _s	0.144 g
Design Snow Load	50 psf	Years Since Landfill Capped	25 years	S ₁	0.062 g



PARTS LIST

Item No.	Description	Part No.	Material
1	North Post	GC361WP-N	Galvanized Steel G90
2	South Post	GC361WP-S	Galvanized Steel G90
3	Horizontal Channel	GC361WP-H	Galvanized Steel G90
4	NS Beam	GC862MT	Galvanized Steel G90
5	Horizontal Angle	GC275	Galvanized Steel G90
6	Base Bracket	GC999T	Galvanized Steel G90
7	Round Tub	GC281	HMWPE
8	EW Purlin	GC63 / GC63N	Galvanized Steel G90
9	Purlin Washer	GC126	Galvanized Steel G90
10	Bend Strap	GC871	Galvanized Steel G90
11	Roll Strap	GC873	Galvanized Steel G90
12	Purlin Angle	GC874	Galvanized Steel G90
13a	3/8-16 x 1" Hex Bolt		Magnicoat
13b	3/8-16 x 1½" Hex Bolt		Magnicoat
13c	3/8 ID x 1" OD Washer		HDG or Magnicoat
13d	3/8 ID x 1½" OD Washer		HDG or Magnicoat
13e	3/8-16 Serrated Flange Nut		Magnicoat
14a	1/4-20 Hex Bolt		Stainless Steel or Magnicoat
14b	1/4 Washer		HDG or Magnicoat
14c	1/4-20 Hex Nut		Stainless Steel or Magnicoat
15	Star Washer		Stainless Steel

TOP TIPS:

1. Use vertical adjustability provided to make Mounting Purlins level, and the site install look great.
2. If pouring concrete in areas with freezing winters, make sure to use freeze thaw additives and frost blankets if possible. If accelerators are used, they shall NOT contain calcium chloride.

- 1) Make sure ground is free from debris.
- 2) Existing soil must have a minimum soil bearing capacity of at least 1,000 pounds per square foot. Installation of the System on very loose soil which will have substantial movement over time could result in structural damage to the racks if this movement is not countered by adjusting racking to compensate. This could lead to voiding the warranty. See Installation Manual for recommended remediation options for loose soils.
- 3) If ground slopes from east to west or from north to south so that amount of concrete in tub will not meet the requirement specified in install manual, then place crushed stone or gravel to level the area directly under where Tub will be placed as well as 6 inches outside of this footprint. If the AHJ or DEP has determined that materials coming onto the site must be controlled, it is recommended that crushed stone or gravel fill for local leveling under the tubs be approved prior to the start of construction.

- 4) Attach Horizontal Channel to North and South Posts using two 3/8"-16 x 1" bolts and 3/8 flange nuts per connection. Make sure Horizontal Channel is perpendicular to posts. Torque to Spec.

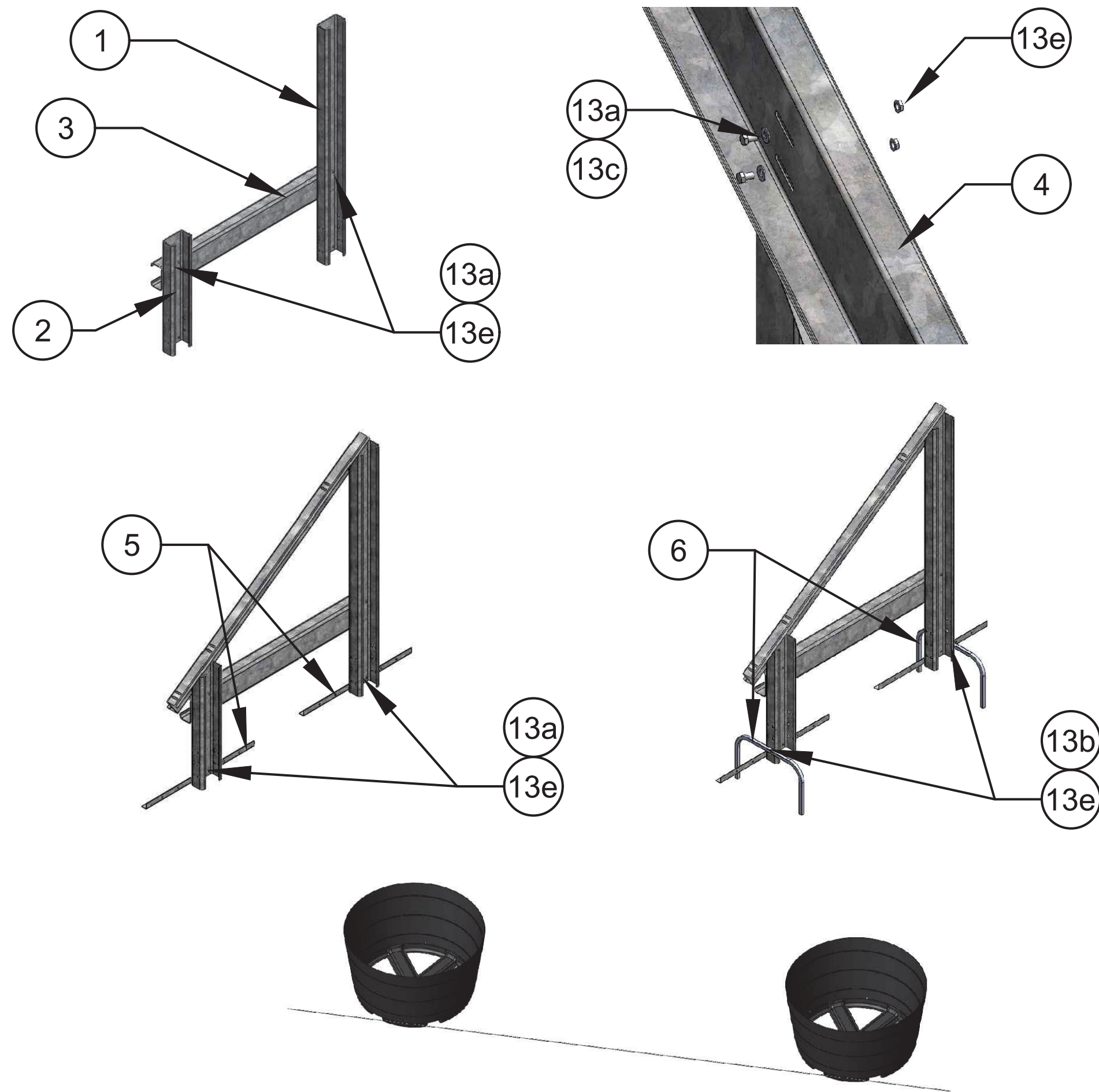
- 5) Attach NS Beam to posts midway on slots both vertically and horizontally using 3/8-16 x1" hex bolt with 3/8 x 1" OD washers on NS Beam side and 3/8 flange nuts on Post side. Make sure NS Beam is at proper tilt angle. Torque to Spec

- 6) Attach Horizontal Angle using two 3/8-16 x 1" hex bolt and flange nuts per connection. Toque to spec.

- 7) Install Base Brackets to the middle set of holes approximately 4 inches up from bottom of North Post and South Post using 3/8"-16 x 1-1/2" long hex bolts and serrated flange nuts. Leave hardware finger tight.

As an alternative, the Base Brackets may be installed after the purlin support assemblies are positioned within the tubs.

- 8) Find the edges of the array according to project the layout sheets. Drop a string line on the southern edge of the row to be installed. The string line should align with the south edge of the south tubs in the row. Place Round Tubs per spacing shown in layout sheets with the south end of the south Round Tub touching the string for North-South alignment.



GC Pour-in-Place (Steel) System

- Use only GameChange parts. Use of other parts to complete the installation as substitutes may void the warranty.
- Make sure the ground structure (notably in the case of a capped landfill) is inspected and can support the loading resulting from the GC Pour-n-Place Ground System and provided PV modules.
- Comply with all relevant local, state and national safety laws and standards for both for mechanical and electrical aspects of the solar PV array installation.
- When encountering undocumented or unexpected obstacles requiring a work around, work arounds should be brought to the attention of GameChange personnel prior to being attempted. If approved by GameChange, work arounds shall be noted on project as-built drawings. Work arounds should be completed in a manner that ensures that the remainder of the array is not affected.
- Customers are responsible for grade variations and making sure slope tolerances support GameChange System. GC Pour-in-Place Ground System ideally should be installed on flat, level and pre-compacted ground. This is to avoid system settlement over time. Topsoil with loam content and organics should be removed, and soil scraped down to subsoil level. If the system is installed on new fill, the soil should be compacted with a compacting roller prior to installation. However, due to vertical adjustability of the NS Beams on the Posts, the GC Pour-in-Place System may be erected on less than ideally prepared grounds when site conditions preclude removal of topsoil. In that scenario, the rails should be adjusted to appropriate heights on Posts during periods of operation and maintenance visits.
- Reference Install Manual for installation. Not following Install Manual may result in voiding warranty.
- Ballast forms (tubs) are provided for each site by GameChange. See installation manual for concrete specifications.

It is a requirement for installation crews including EPC, installer, foundation installation vendor and surveyor to be trained by GameChange personnel (complete page turn review of install manual and construction drawing, building the golden row, as well as walking the site prior to foundation surveying) in person or at a minimum via video conference.

Tool Required

- String line
- 48 inch long level
- 30 foot tape measure
- Inclinator with digital degree read out
- Impact Drill with interchangeable drivers
- 1/4" Drill Bit
- Wrenches and driver sockets, both standard and deep, in the following sizes:
 - o 7/16 inch (for 1/4-inch hex bolts and nuts),
 - o 9/16 inch (for 3/8-inch hex bolts and nuts),
- Torque Wrench. Torque bolt to appropriate torque range
 - o 1/4" Stainless hardware use 6-7 ft-lbs (72-84 in-lbs)
 - o 1/4" Magni hardware use 9-10 ft-lbs (108-120 in-lbs)
 - o 3/8" hardware use 29-31 ft-lbs
- Concrete mixture (weather and freeze-thaw resistant if required). See Pour-in-Place Installation Manual for concrete specifications
- Rack assembly jig made of plywood and 2"x4" wood.

Preventative Maintenance

- It is best practice to unbundle loads and install parts within several weeks of delivery so air is able to flow around parts and thus prevent white rust formation. In order to maintain the longest life possible for the protective zinc coating under the warranty, it is important to monitor for any severe white rust developments prior to installation and if this condition appears to take proper maintenance steps to remediate it. See the Pour-in-Place Installation Manual for more information.
- After Installation, installer must annually monitor for any surface rust that may occur over time. Identify any rust areas, wire brush area to remove rust, and coat with 80% zinc rich paint, or equivalent field life paint. This step is not required if rust is limited to edges which were cut during fabrication.
- Maintenance checks should be performed annually or after severe wind events. Please refer to Install Manual for more details.
- Proper preventative maintenance must be conducted or warranty may be voided. The Install Manual provides required maintenance steps and diagnostic procedure for malfunctions. Follow steps and consult with GameChange in case of maintenance issues.



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152 West 57th St, Fl 17, New York, NY 10019
Tel:212-388-5160
www.gamechangesolar.com

Engineer's Seal:



Site Key Plan:

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7722 modules at 345W

2.66 MW

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Dewitt Landfill

Project #:

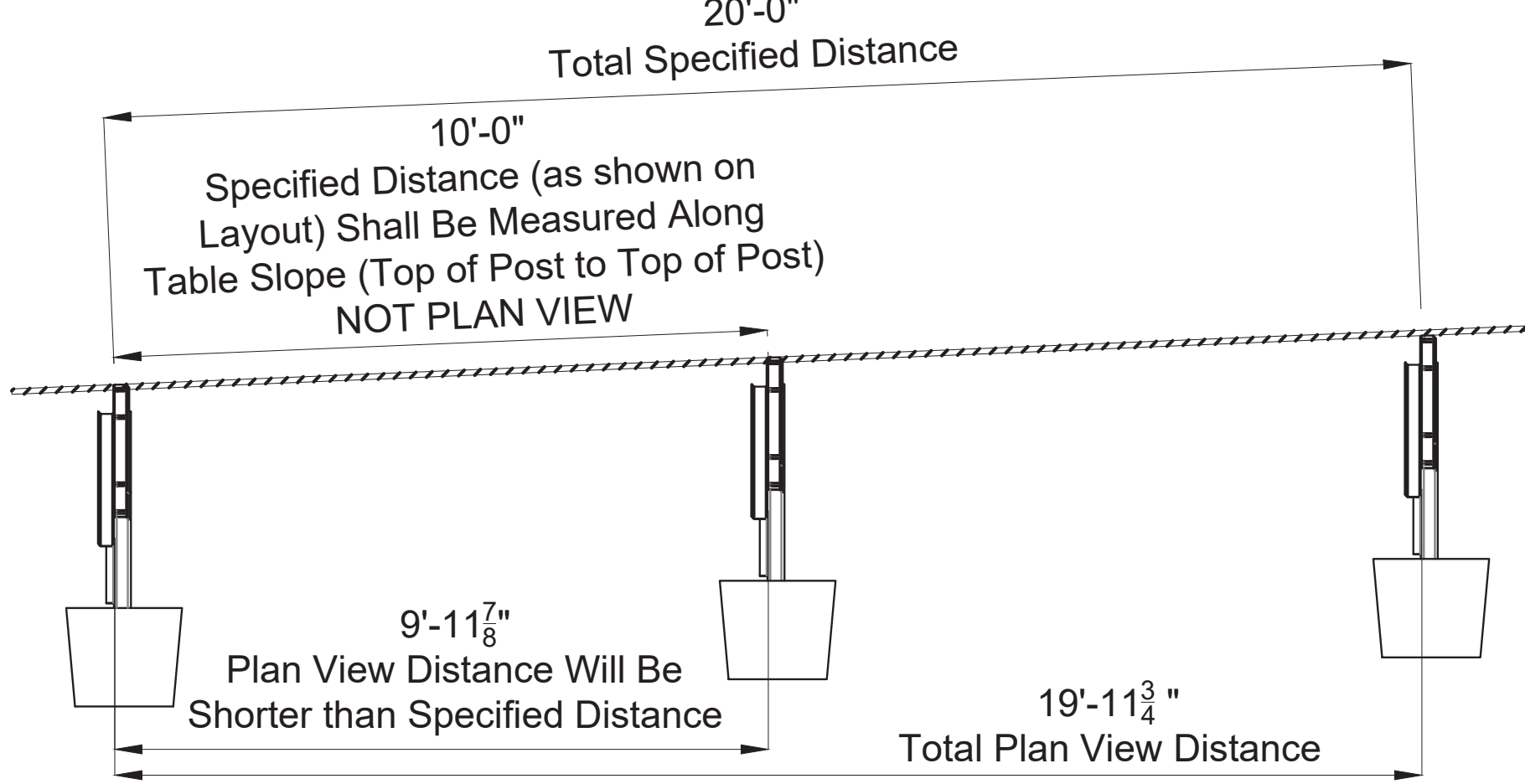
Location: 6330 Fischer Rd,
East Syracuse, NY 13057

Pour-In-Place™
Ballasted
Ground

Sheet #:

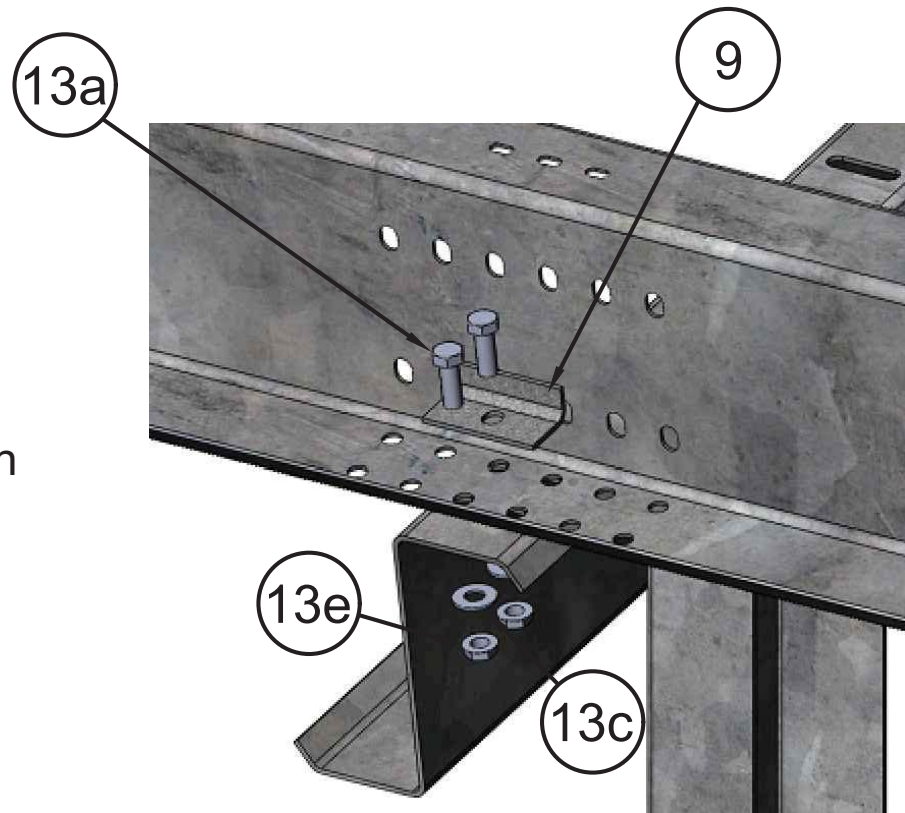
6 of 9

10) When placing Purlin Support Assemblies at specific distances away from each other to match the positions on the layout, it is important that the tops of the assemblies are in a straight line. The line may be at a slope, but be sure the slope is maintained continuously as shown in the figure below.



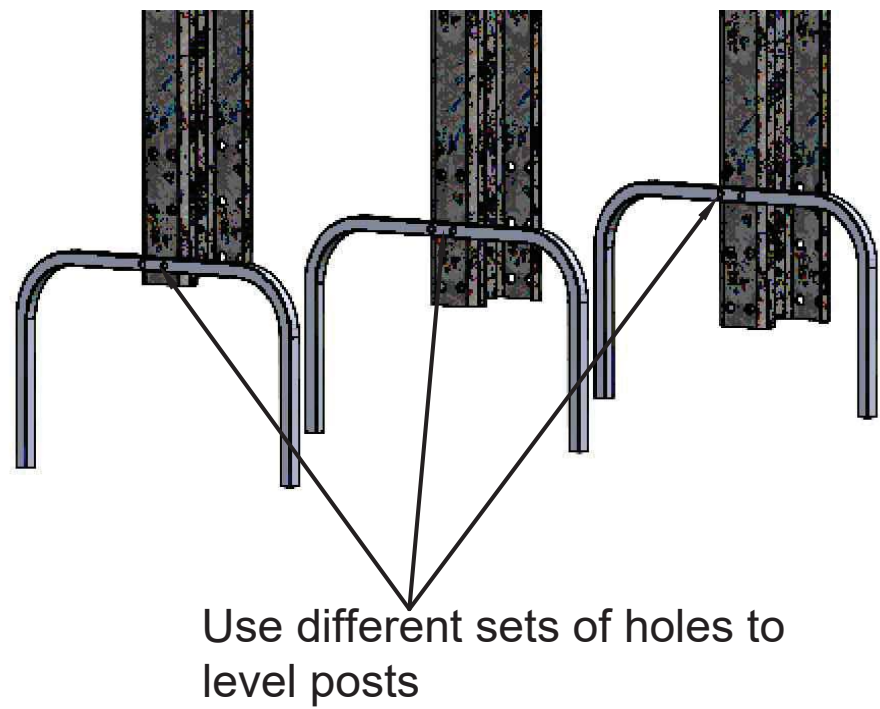
PURLIN SUPPORT ASSEMBLIES MUST BE AT SPECIFIED DISTANCE ALONG THE SLOPE LINE, NOT BY PLAN VIEW, OTHERWISE PURLINS MAY NOT FIT. DIMENSIONS SHOWN ABOVE ARE EXAMPLE DIMENSIONS TO ILLUSTRATE DIFFERENCE BETWEEN SPECIFIED DISTANCE AND PLAN VIEW DISTANCE. PROJECT SPECIFIC DIMENSIONS SHALL BE USED PER LAYOUT.

11) Attach first table EW Purlins at southernmost position on the NS Beams using center set of holes for Table Purlin to NS Beam attachment. Attach EW Purlins to NS Beams using two 3/8" bolts. Under the bolt closest to the NS Purlin wall, place a Purlin Washer under the bolt head with the bent flange bearing against the Purlin wall. Both bolts will be attached on the underside using a 1" OD washer and a flange nut. Finger tight on hardware. Once Panels are mounted torque all hardware to specifications.

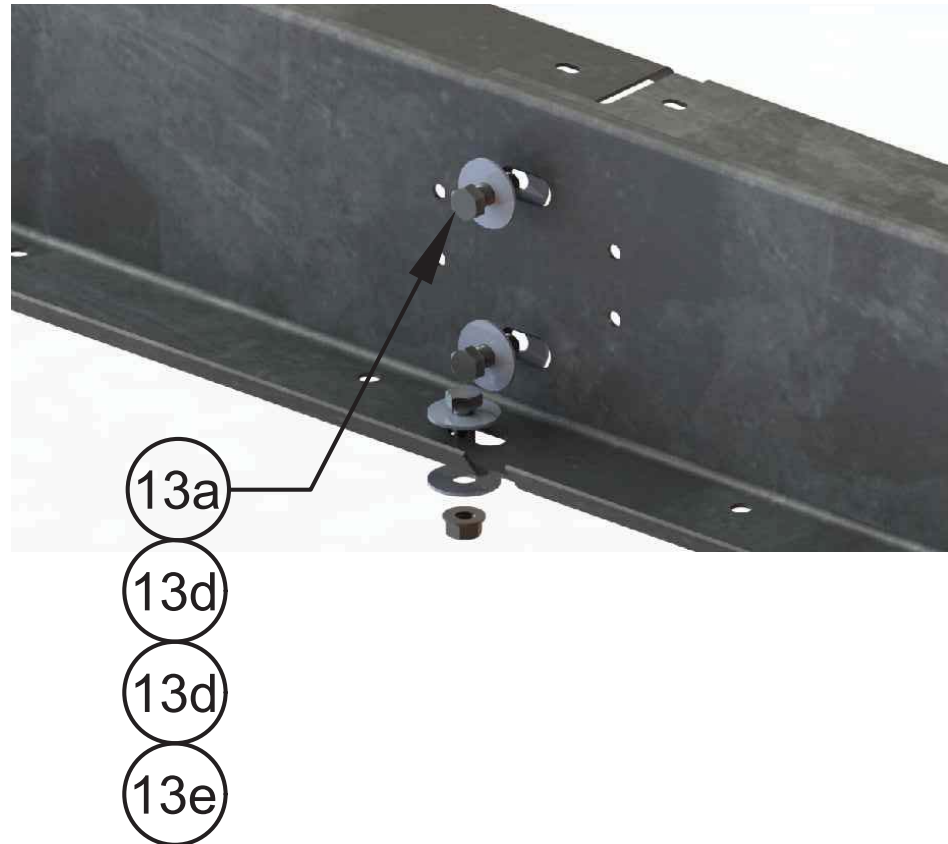


12) Repeat Purlin Support Assembly and installation for adjacent Round Tubs. Position Purlin Support Assembly and Round Tubs to the appropriate distance apart as required by layout

13) For leveling, after EW Purlins have been installed, choose 1 of 3 sets of holes on the posts to attach the Base Brackets to in order to set the height of the system at each post location to even out ups and downs in the system caused by uneven ground conditions. Once preferable height has been obtained, tighten hardware to spec.



14) For continuous configurations, Connector Purlin are connected to Table Purlins using three sets of 3/8" flange bolt, washers (1-1/2" OD), and serrated flange nuts at each end of the Purlins. Torque to specifications. **It is important that the correct washers are used.**



15) Attach the alternating table EW Purlins and connector EW Purlins starting at one end of the row and continue to the other end of the row.



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- Tool Required**
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 - Inclinometer with digital degree read out
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 - 1/4" Drill Bit
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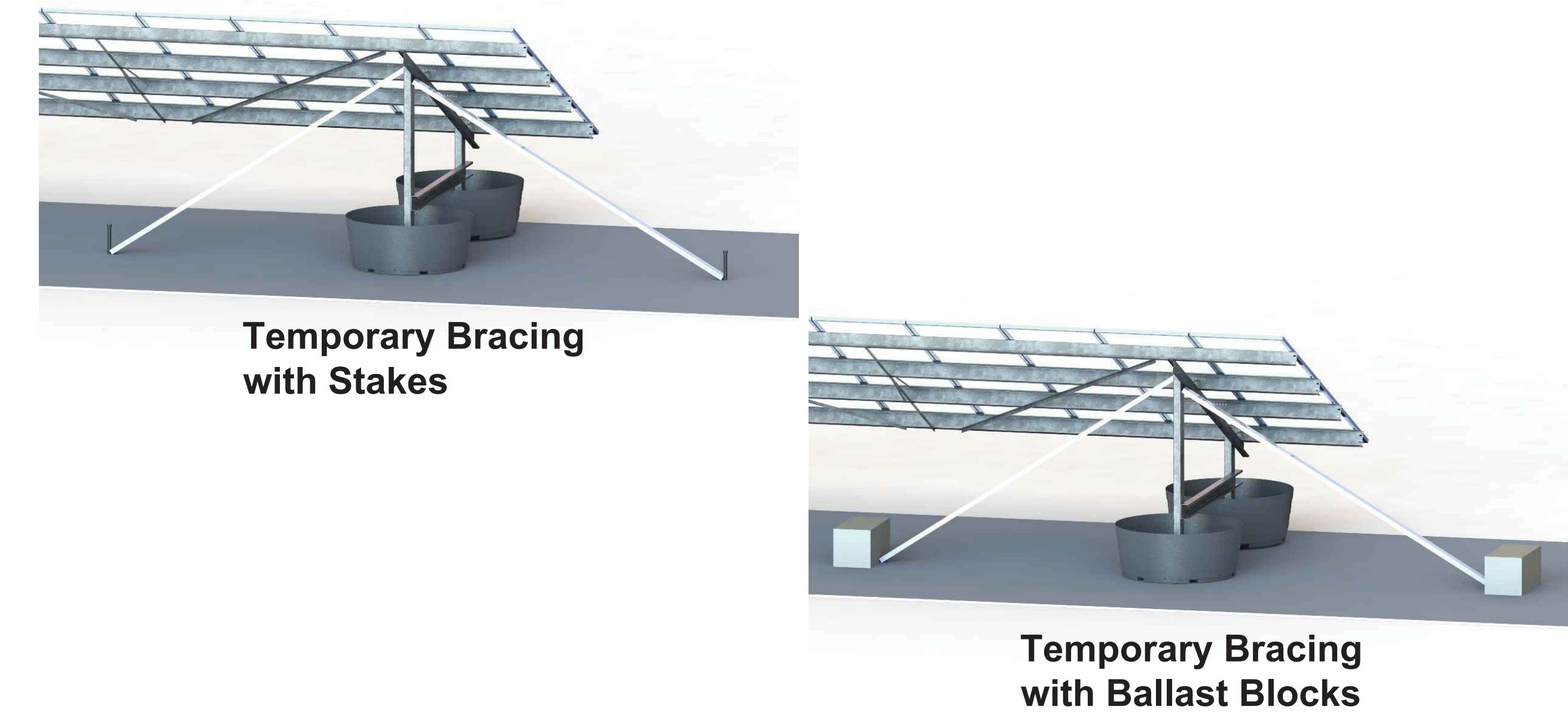
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Pour-In-Place™
Ballasted
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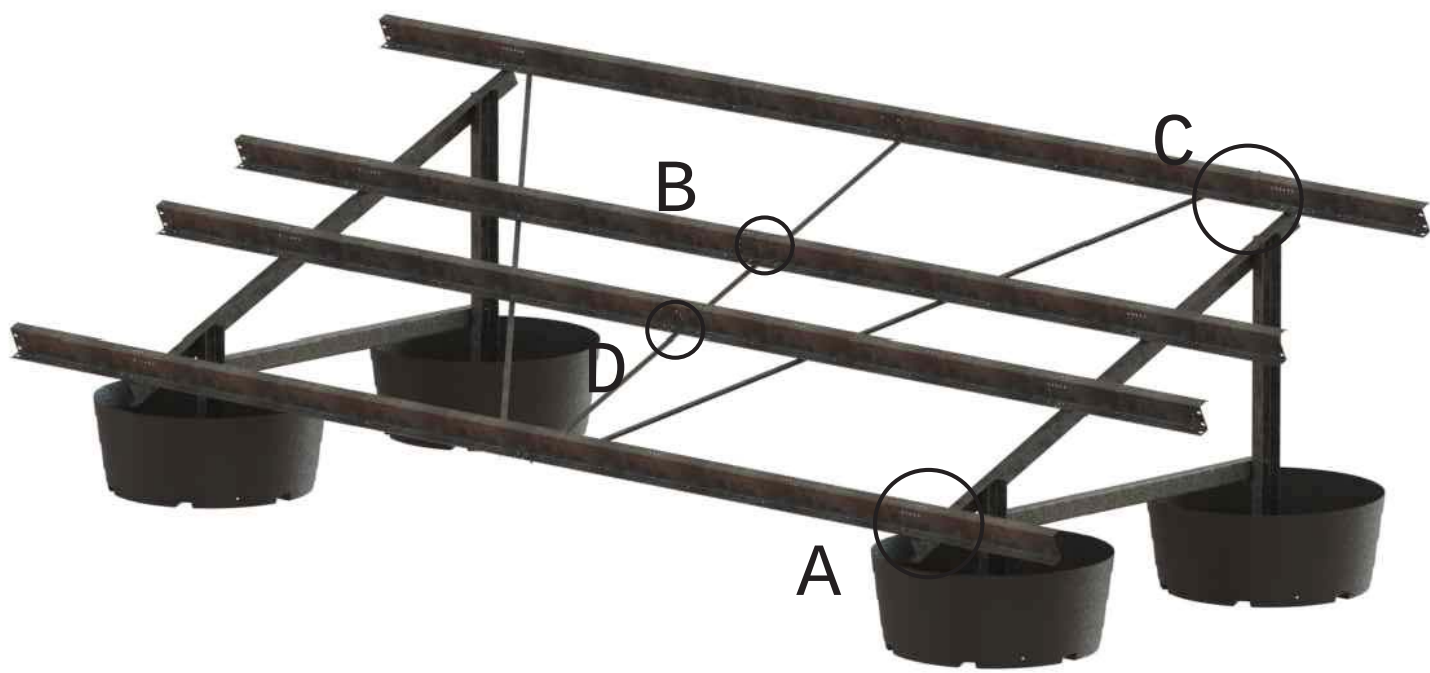
7 of 9

- 16) **Required Temporary Staking and Ballasting as Precautionary Safety Measure**
At the end of each row, install temporary manual bracing to keep the posts plumb and also to allow for a sturdy foundation. Temporary manual bracing shall consist of 2x4's jammed between the nooks of the Purlin Support Assembly and stakes in the ground (or 50+ lb ballast blocks for sites where stakes will not hold or penetration is not allowed).
- Install temporary bracing on the first Purlin Support Assembly of each row.
 - Pour concrete into tubs under the first 2 tables (4 pairs of tubs) of each row.
 - Add temporary bracing on every 8th Purlin Support Assembly as the row is installed.
 - When done with each row, add temporary bracing on the last Purlin Support Assembly.



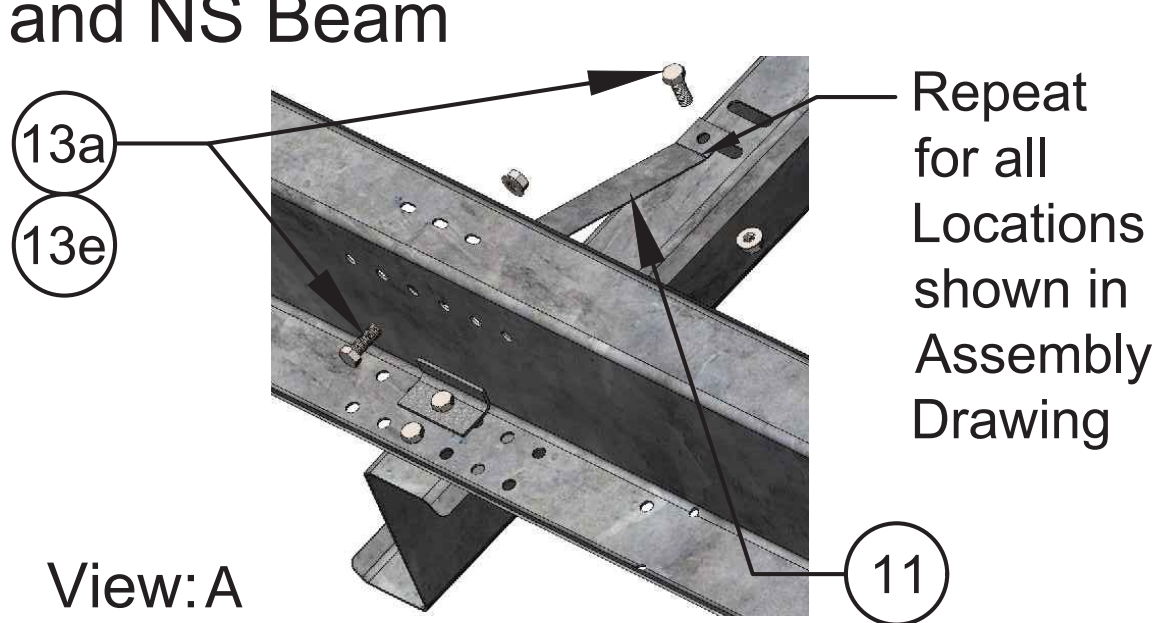
- 17) Make sure to pour concrete immediately if heavy wind (over 22mph) expected as it may blow assembled Purlins and Purlin Support Assemblies over and may be a safety hazard as well as causing damage or wasting time to set up again. At a minimum, make sure to pour a few Round Tubs (or place heavy rocks to hold the Horizontal Angles and Base Brackets) at the end of each row to prevent heavy wind (over 22 mph) from tipping over unfilled Round Tubs/racking.
- 18) After installation of Purlins has been completed, run a string along Upper and Lower Purlins from east to west across array, or use visual line of sight method to check for flatness of row. Elevate the Purlin Support Assemblies to level purlins where required by either of the following options:
- Adjusting Base Brackets (connect Base Bracket to Bottom sets of holes to raise Purlin Support Assembly, connect Base Bracket to top sets of holes to lower Purlin Support Assembly)
 - Placing handfuls of additional riprap or 1 ½ inch minus stone under tub to raise tub and Purlin Support Assembly.

- 19) Install Bend Strap, Roll Straps, and Purlin Angles using 3/8" bolts and flange nuts. Racks should "square up" when Purlin Angles are installed. Torque to specifications.
It is very important that Roll Straps are taut.

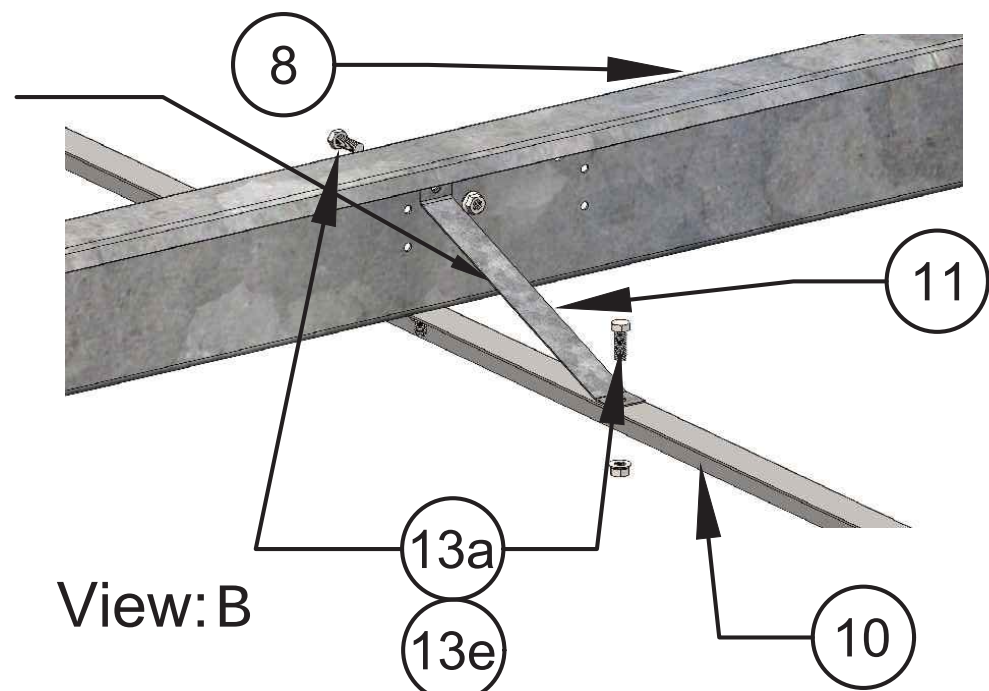


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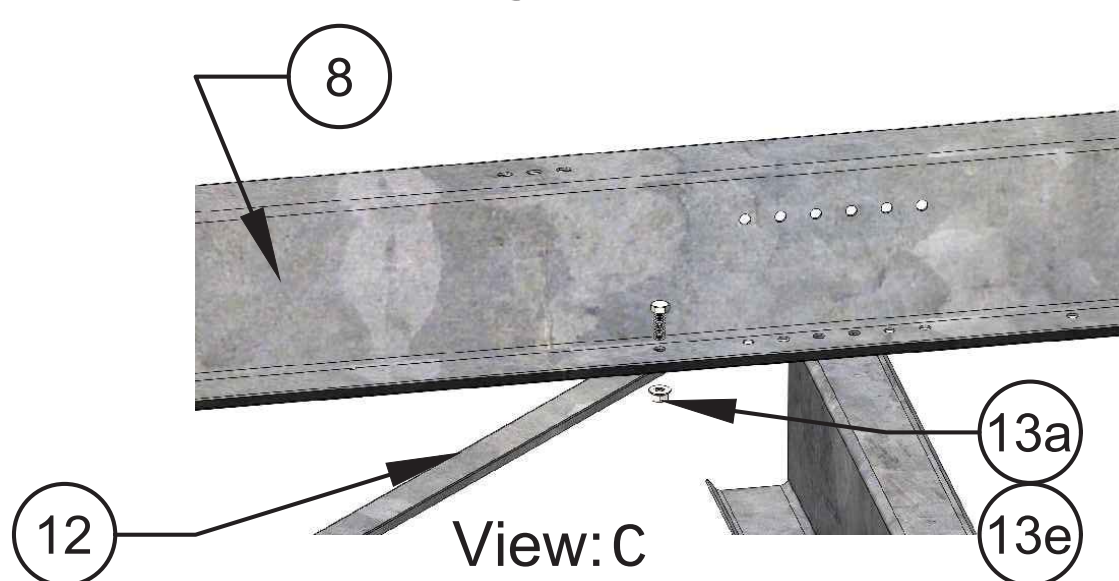
Roll Strap to EW Purlin and NS Beam



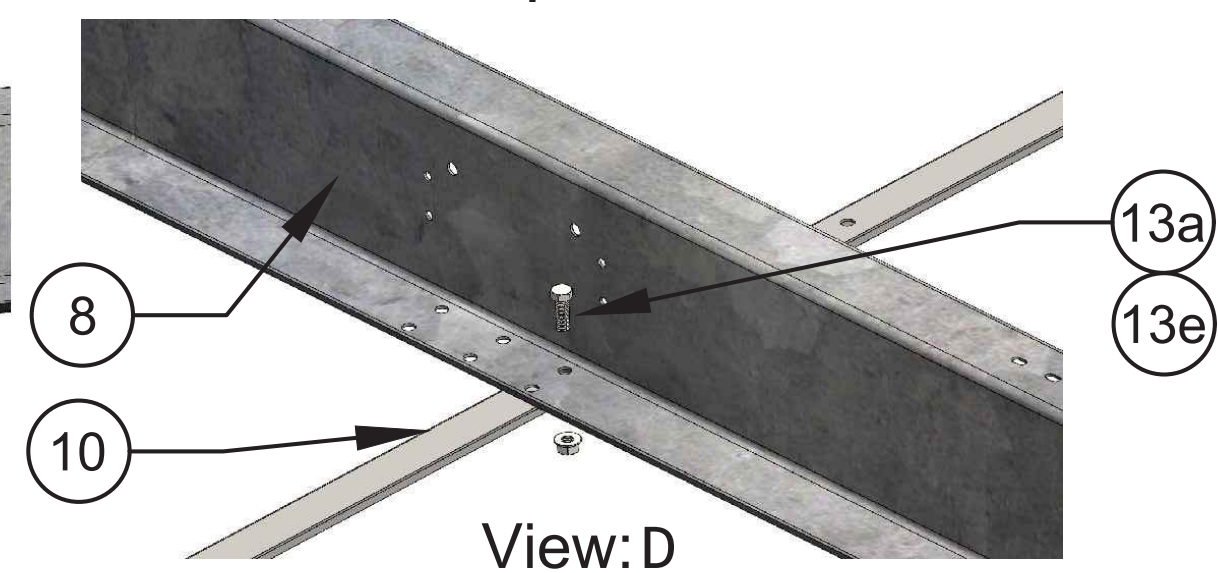
Roll Strap to Bend Strap/EW Purlin



Purlin Angle to EW Purlin



Bend Strap to EW Purlin



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 - Rack assembly jig made of plywood and 2"x4" wood.

- Preventative Maintenance**
- It is best practice to unbundle loads and install parts within several weeks of delivery so air is able to flow around parts and thus prevent white rust formation. In order to maintain the longest life possible for the protective zinc coating under the warranty, it is important to monitor for any severe white rust developments prior to installation and if this condition appears to take proper maintenance steps to remediate it. See the Pour-in-Place Installation Manual for more information.
 - After Installation, installer must annually monitor for any surface rust that may occur over time. Identify any rust areas, wire brush area to remove rust, and coat with 80% zinc rich paint, or equivalent field life paint. This step is not required if rust is limited to edges which were cut during fabrication.
 - Maintenance checks should be performed annually or after severe wind events. Please refer to Install Manual for more details.
 - Proper preventative maintenance must be conducted or warranty may be voided. The Install Manual provides required maintenance steps and diagnostic procedure for malfunctions. Follow steps and consult with GameChange in case of maintenance issues.

CRITICAL INFORMATION INDICATOR
This icon indicates critical and important information that MUST be followed for proper installation. Disregarding it may lead to serious injury and/or irreparable damage to equipment, tools, or components; it will compromise GameChange warranty. Information indicated with this icon must be followed to meet quality requirements.



152 West 57th St, Fl 17, New York, NY 10019
Tel:212-388-5160
www.gamechangesolar.com

Engineer's Seal:



Site Key Plan:

Rev:	By:	Date:	Description:
1	SH	10-13-2017	Preliminary Layout
...	...	...	...
5	SF	06-29-2018	Revised Panel: CSUN345
6	SF	09-04-2018	Revised Layout/Panel Count
7	SF	09-05-2018	Revised Total Dead Load
8	GF	05-09-2019	Issued for Client Approval
9	SC	05-15-2019	Revised Assembly/874 Count

Array Information

	PV Modules	Racking
Manufacturer	CSUN	Gamechange Solar
Model	CSUN345-72M	30-Degree Pour-In-Place
Dimensions	76.98" x 38.96" x 1.57"	
Weight	46.3 lbs	
Quantity	7722	790 Pairs of Tubs
Ground Clearance	30 in	

7722 modules at 345W

2.66 MW

Customer:

RER Energy Group

Project:

Dewitt Landfill

Project #:

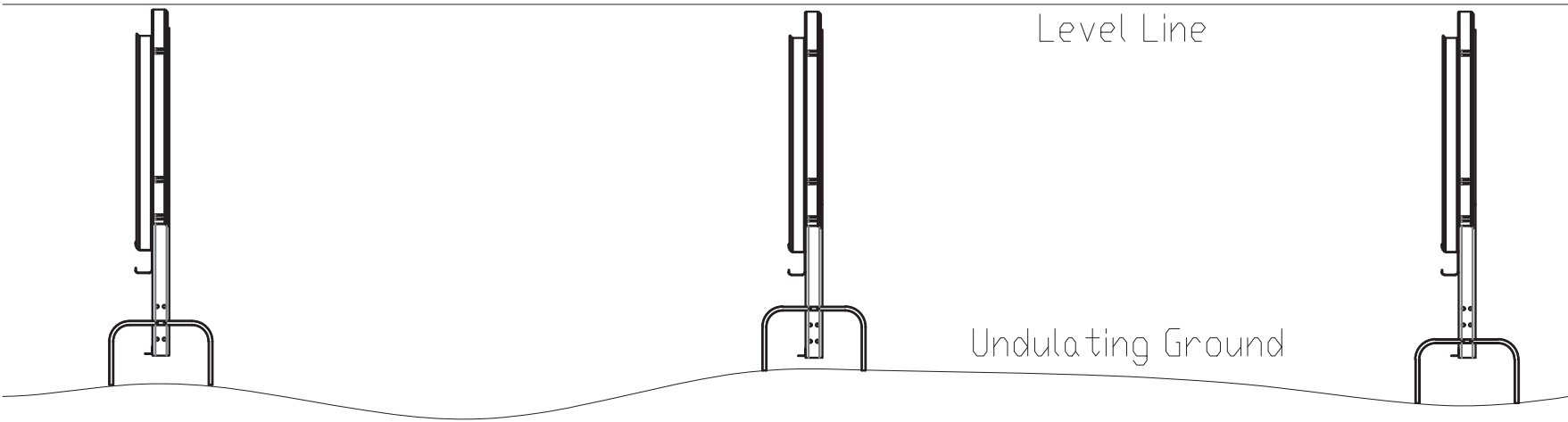
Location: **6330 Fischer Rd,
East Syracuse, NY 13057**

**Pour-In-Place™
Ballasted
Ground**

Sheet #:

8 of 9

20) Vertical adjustability is set prior to pouring concrete. After Purlin installation is complete run a string along Upper and Lower Purlins, in the east west direction. Evaluate Purlin level.

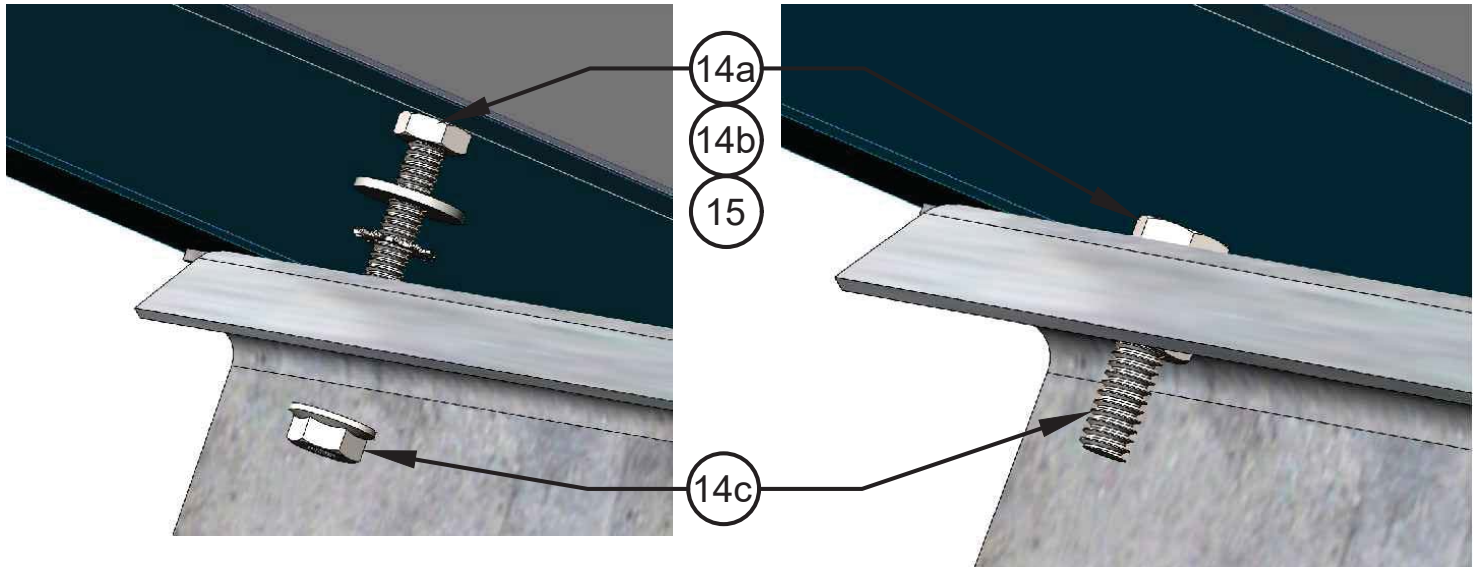


21) Pour Concrete. Concrete should first be poured in the center of the Round Tub, then use shovels to push to the ends. See Installation Manual for concrete specifications and best practices when pouring concrete. Use vibrator per industry standards to ensure concrete does not contain voids. **Do not allow vibrator or anything else touch the sides of the tub.** Use magnesium trowel to trowel wash around Posts so precipitation does not collect.

For best pouring results, it is recommended that tub locations be as close to level as practical. Make sure Round Tubs are level with +/- 3% N-S and +/- 3% E-W.

22) Once tubs are filled, true up Posts and Purlins. Check tilt angle of NS Beam. Use vertical and lateral tolerance in Post to NS Beam connections to correct tilt angle as required.

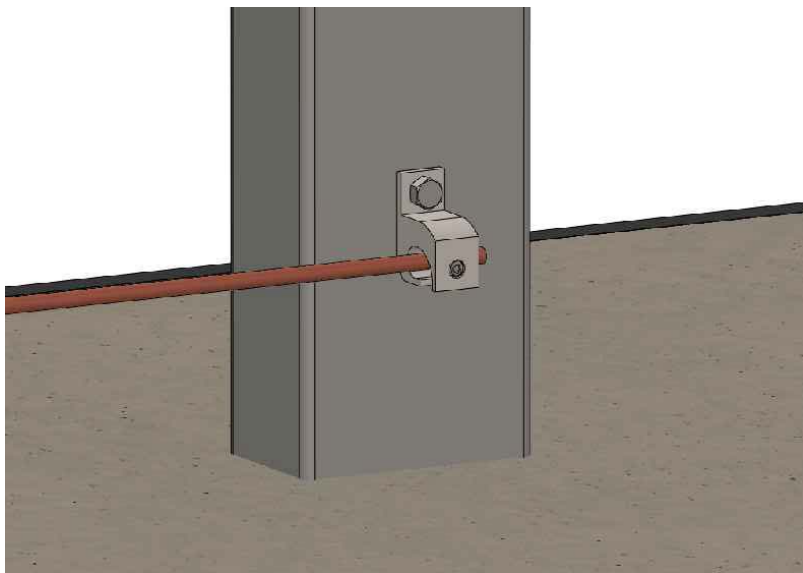
23) Insert hex bolt through a 1/4" washer, the star washer, the mounting hole on the back of the panel, and then through the Purlin. Place a star washer at one mounting location per panel. Attach with a serrated flange nut. The bolt head should be on top and the serrated flange nut should be below the Purlin. Check again to make sure star washer is still in place. Torque to specifications. Repeat for all panels.



Check the install manual for the module you are installing to make sure that the panel mounting hardware and installation methodology recommended by GameChange mentioned below is acceptable. Otherwise you may risk voiding the warranty for your modules. It is also recommended to check that the panels are listed per UL 1703.

24) If weep holes are not present in tub walls, at least three days after concrete is poured, drill half inch (1/2") diameter weep holes on each side of the Tub, centered 2" above the ground level. This enables water to drain out.

25) The modules, EW Purlins and NS Beams are all bonded together, left to right, so that each row form one single structure. To achieve grounding of the system, GameChange recommends installing Cooper, Burndy, or Eaton UL approved grounding lug(s) with 1/4-inch bolts as in accordance with NEC Article 690 to the Post below the last EW Purlin which has panels attached to it which are to be bonded, using 8 gauge copper wire or larger.



The Purlin to Purlin bonded connection is rated for up to 30 amps. Therefore, conductors with expected currents greater than 30 amps may not be installed on the racking system without installing additional grounding measures.

The entire system needs to be grounded from a single point to an appropriate grounding source.

Please confirm with an electrician, as this is their responsibility

PARTS LIST

Item No.	Description	Part No.	Material
1	North Post	GC361WP-N	Galvanized Steel G90
2	South Post	GC361WP-S	Galvanized Steel G90
3	Horizontal Channel	GC361WP-H	Galvanized Steel G90
4	NS Beam	GC862MT	Galvanized Steel G90
5	Horizontal Angle	GC275	Galvanized Steel G90
6	Base Bracket	GC999T	Galvanized Steel G90
7	Round Tub	GC281	HMWPE
8	EW Purlin	GC63 / GC63N	Galvanized Steel G90
9	Purlin Washer	GC126	Galvanized Steel G90
10	Bend Strap	GC871	Galvanized Steel G90
11	Roll Strap	GC873	Galvanized Steel G90
12	Purlin Angle	GC874	Galvanized Steel G90
13a	3/8-16 x 1" Hex Bolt		Magnicoat
13b	3/8-16 x 1½" Hex Bolt		Magnicoat
13c	3/8 ID x 1" OD Washer		HDG or Magnicoat
13d	3/8 ID x 1½" OD Washer		HDG or Magnicoat
13e	3/8-16 Serrated Flange Nut		Magnicoat
14a	1/4-20 Hex Bolt		Stainless Steel or Magnicoat
14b	1/4 Washer		HDG or Magnicoat
14c	1/4-20 Hex Nut		Stainless Steel or Magnicoat
15	Star Washer		Stainless Steel



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Tel:212-388-5160
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Engineer's Seal:



Site Key Plan:

Rev:	By:	Date:	Description:
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7722 modules at 345W

2.66 MW

Customer:

RER Energy Group

Project:

Dewitt Landfill

Project #:

Location: 6330 Fischer Rd,
East Syracuse, NY 13057

Pour-In-Place™
Ballasted
Ground

Sheet #:

9 of 9

GC Pour-in-Place (Steel) System

- Use only GameChange parts. Use of other parts to complete the installation as substitutes may void the warranty.
- Make sure the ground structure (notably in the case of a capped landfill) is inspected and can support the loading resulting from the GC Pour-n-Place Ground System and provided PV modules.
- Comply with all relevant local, state and national safety laws and standards for both for mechanical and electrical aspects of the solar PV array installation.
- When encountering undocumented or unexpected obstacles requiring a work around, work arounds should be brought to the attention of GameChange personnel prior to being attempted. If approved by GameChange, work arounds shall be noted on project as-built drawings. Work arounds should be completed in a manner that ensures that the remainder of the array is not affected.
- Customers are responsible for grade variations, and making sure slope tolerances support GameChange System. GC Pour-in-Place Ground System ideally should be installed on flat, level and pre-compacted ground. This is to avoid system settlement over time. Topsoil with loam content and organics should be removed, and soil scraped down to subsoil level. If the system is installed on new fill, the soil should be compacted with a compacting roller prior to installation. However, due to vertical adjustability of the NS Beams on the Posts, the GC Pour-in-Place System may be erected on less than ideally prepared grounds when site conditions preclude removal of topsoil. In that scenario, the rails should be adjusted to appropriate heights on Posts during periods of operation and maintenance visits.
- Reference Install Manual for installation. Not following Install Manual may result in voiding warranty.
- Ballast forms (tubs) are provided for each site by GameChange. See installation manual for concrete specifications.

It is a requirement for installation crews including EPC, installer, foundation installation vendor and surveyor to be trained by GameChange personnel (complete page turn review of install manual and construction drawing, building the golden row, as well as walking the site prior to foundation surveying) in person or at a minimum via video conference.

Tool Required

- String line
- 48 inch long level
- 30 foot tape measure
- Inclinometer with digital degree read out
- Impact Drill with interchangeable drivers
- 1/4" Drill Bit
- Wrenches and driver sockets, both standard and deep, in the following sizes:
 - 7/16 inch (for 1/4-inch hex bolts and nuts),
 - 9/16 inch (for 3/8-inch hex bolts and nuts),
- Torque Wrench. Torque bolt to appropriate torque range
 - 1/4" Stainless hardware use 6-7 ft-lbs (72-84 in-lbs)
 - 1/4" Magni hardware use 9-10 ft-lbs (108-120 in-lbs)
 - 3/8" hardware use 29-31 ft-lbs
- Concrete mixture (weather and freeze-thaw resistant if required). See Pour-in-Place Installation Manual for concrete specifications
- Rack assembly jig made of plywood and 2"x4" wood.

Preventative Maintenance

- It is best practice to unbundle loads and install parts within several weeks of delivery so air is able to flow around parts and thus prevent white rust formation. In order to maintain the longest life possible for the protective zinc coating under the warranty, it is important to monitor for any severe white rust developments prior to installation and if this condition appears to take proper maintenance steps to remediate it. See the Pour-in-Place Installation Manual for more information.
- After Installation, installer must annually monitor for any surface rust that may occur over time. Identify any rust areas, wire brush area to remove rust, and coat with 80% zinc rich paint, or equivalent field life paint. This step is not required if rust is limited to edges which were cut during fabrication.
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APPENDIX B
CME GEOTECHNICAL INVESTIGATION



CME
Associates, Inc.

6035 Corporate Drive
East Syracuse, New York 13057
(315) 701-0522
(315) 701-0526 (Fax)

www.cmeassociates.com

Transmittal

December 12, 2018

C&S Companies
499 Col. Eileen Collins Blvd.
Syracuse, New York 13212

Attn: Mr. Bryan Bayer

Re: RER Energy Group (RER) – Town of Dewitt Landfill 2.6 MW Solar PV Array
Dewitt, New York
CME Project No.: 27445-05

Gentlepeople:

Enclosed you will find....

Number of Copies

1

Report Number

27445Y-01

Respectfully submitted,
CME Associates, Inc.

Anas N. Anasthas, P.E.
Geotechnical Engineer
AA.tam



CME
Associates, Inc.

6035 Corporate Drive
East Syracuse, New York 13057
(315) 701-0522
(315) 701-0526 (Fax)
www.cmeassociates.com

DAILY PROGRESS REPORT

PROJECT:	RER Energy Group (RER) – Town of Dewitt Landfill 2.6 MW Solar PV Array, Dewitt New York	PAGE: 1 of 8	REPORT NO.: 27445Y-01
CLIENT:	C&S Companies	REPRESENTATIVE:	D. Stabile, MSI / N. Smith, P.G.
DATE:	12/04/18- 12/05/18	WEATHER:	Overcast/Clear
		TEMPERATURE:	25 ° F (12/4/18) 20 ° F (12/5/18)

The above referenced CME representatives were on site at the subject project to perform Static Load Tests.

Static Load tests were performed in general conformance with ASTM D1194-94 "Standard Test Method for Bearing Capacity of Soil for Static Load and Spread Footings" with the following exceptions:

1. A 20-ton jack assembly was utilized in lieu of the 50-ton jack assembly specified in the referenced ASTM standard, Section 3.2. The 20-ton jack assembly used was more than sufficient for the relatively small test load (1-ton) specified by client.
2. The reference beam utilized was 8' total length, and therefore was supported at lengths of 4' from the center of the loaded area. The referenced ASTM standard, Section 4.5 calls for reference beam supports at 8' from the center. This change, in CME's professional opinion, will not adversely affect the test readings due to the relatively small test load being used.
3. The test method calls for the load to be decreased incrementally so that rebound can be measured. However, due to the utilization of a hydraulic ram and jack, the test load could not be incrementally reduced and therefore, no rebound measurements could be made.

Three test locations were selected during a site visit with representatives from Client, CME, and Gamechange Solar. Please reference page 8 of this report for approximate test locations, selected by Client.

At each test location, grass and topsoil were removed to expose undisturbed subgrade. A 1" thick, 12" x 12" plate was set on subgrade and leveled. A dial indicator affixed to a separate reference beam was then placed and zeroed. The test load was then applied to the plate in 200 lbs. ($\frac{1}{10}$ th of the test load) increments and held for 15 minutes. Deflection was recorded during each loading increment. After the termination of each test, the removed topsoil and grass were placed and compacted back into the hole.

Please reference the attached pages of this report for test results and details.

Test No. 1

Test elevation = 7.5" below existing grade / Ambient Temp = 25°F / Soil Temp = 40°F

Groundwater entered the surface after applying the 400 lb. load. As test load was increased, groundwater continued to rise to about 1-1/8" above test surface.

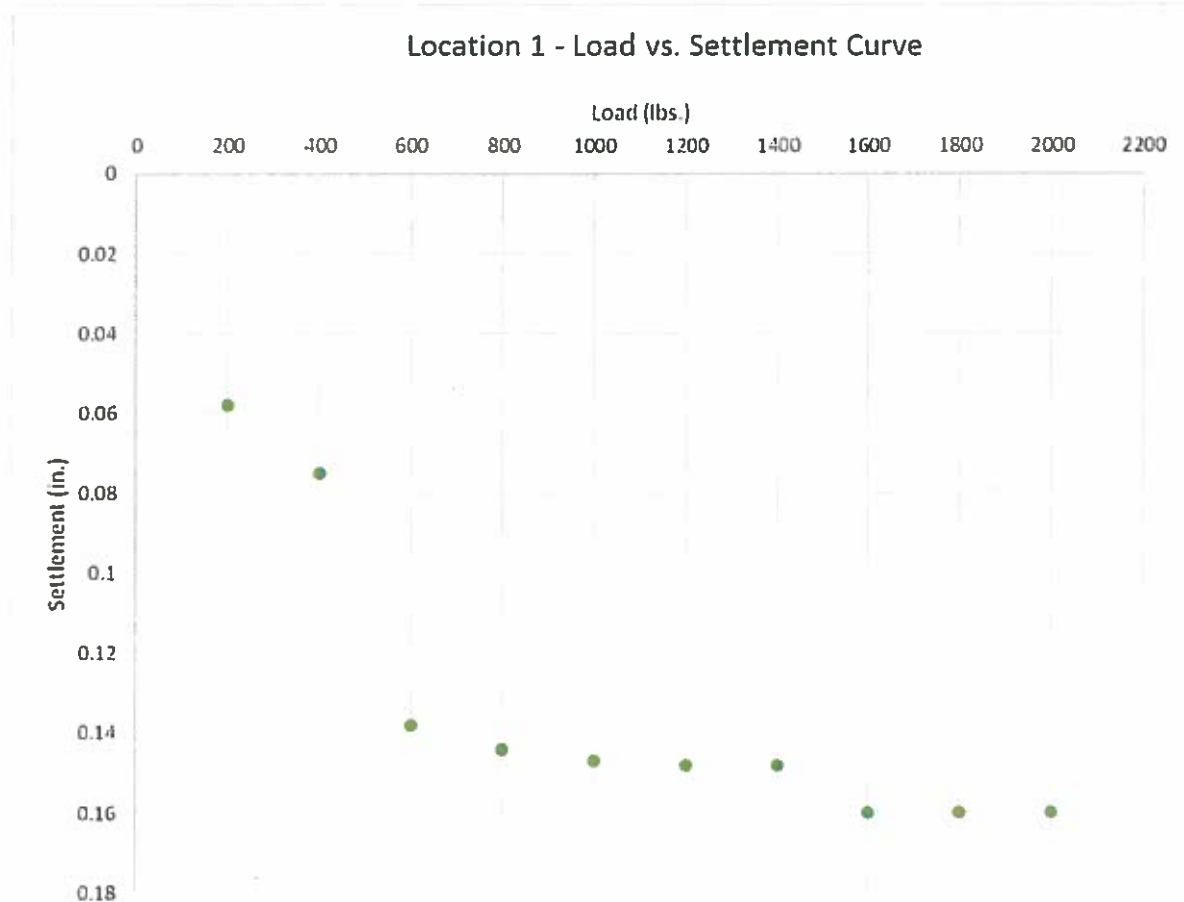


Photographs of Test No. 1 Setup

Test No. 1 – Load vs. Settlement Data

Test 1- Time, Load and Settlement Data						
Load (lbs)	Settlement (in.)					
	0.5 min	1 min	2 min	4 min	8 min	15 min
200	0.058	0.058	0.058	0.058	0.058	0.058
400	0.058	0.058	0.058	0.060	0.075	0.075
600	0.099	0.100	0.100	0.134	0.138	0.138
800	0.140	0.140	0.140	0.144	0.144	0.144
1000	0.144	0.144	0.144	0.144	0.145	0.147
1200	0.148	0.148	0.148	0.148	0.148	0.148
1400	0.148	0.148	0.148	0.148	0.148	0.148
1600	0.154	0.154	0.160	0.160	0.160	0.160
1800	0.160	0.160	0.160	0.160	0.160	0.160
2000	0.160	0.160	0.160	0.160	0.160	0.160

Test No. 1- Load vs. Settlement Curve



Test No. 2

Test elevation = 7" below existing grade / Ambient Temp = 30°F / Soil Temp = 40°F

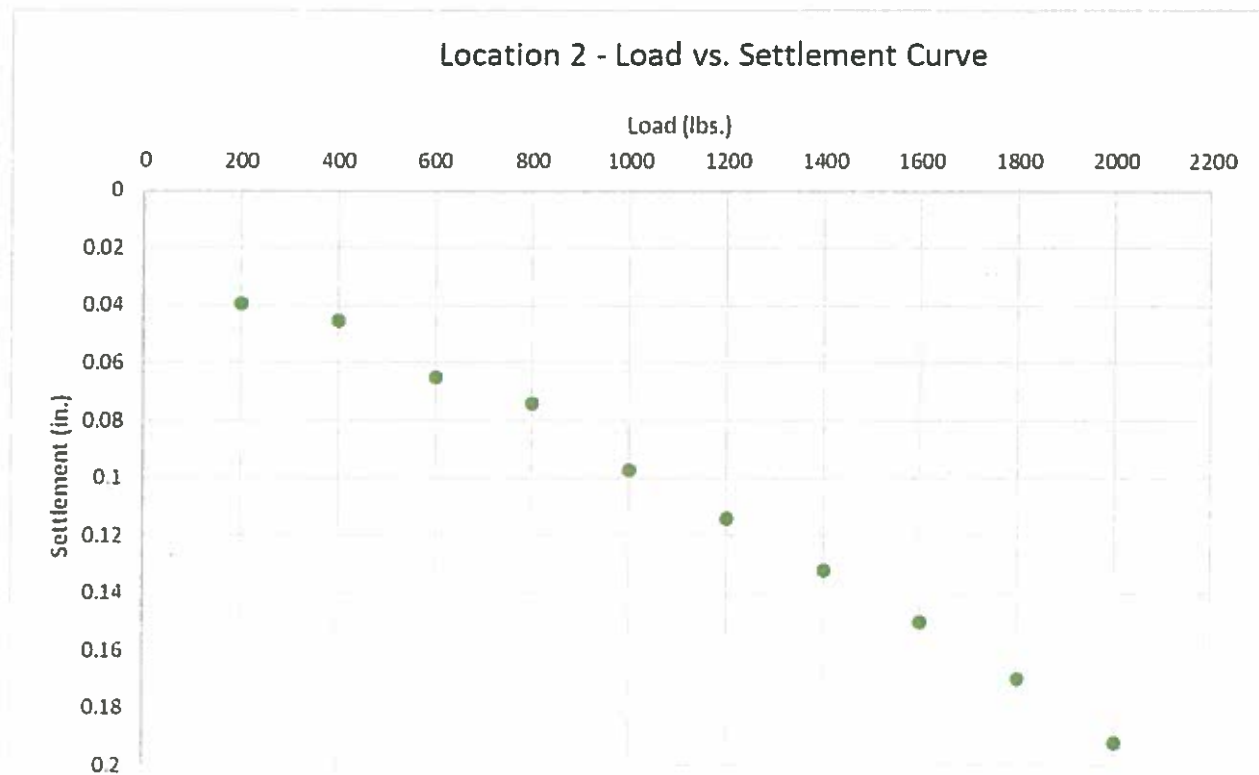


Photographs of Test No. 2 Setup

Test No. 2 – Load vs. Settlement Data

Test 2- Time, Load and Settlement Data						
Load (lbs)	Settlement (in.)					
	0.5 min	1 min	2 min	4 min	8 min	15 min
200	0.020	0.024	0.030	0.030	0.035	0.039
400	0.039	0.041	0.043	0.043	0.045	0.045
600	0.056	0.058	0.061	0.061	0.065	0.065
800	0.072	0.072	0.072	0.073	0.073	0.074
1000	0.087	0.090	0.092	0.095	0.097	0.097
1200	0.098	0.102	0.107	0.109	0.112	0.114
1400	0.121	0.123	0.125	0.127	0.132	0.132
1600	0.138	0.141	0.145	0.147	0.148	0.150
1800	0.154	0.160	0.163	0.165	0.170	0.170
2000	0.175	0.177	0.180	0.182	0.190	0.192

Test No. 2 – Load vs. Settlement Curve



Test No. 3

Test elevation = 8" below existing grade / Ambient Temp = 20°F / Soil Temp = 40°F

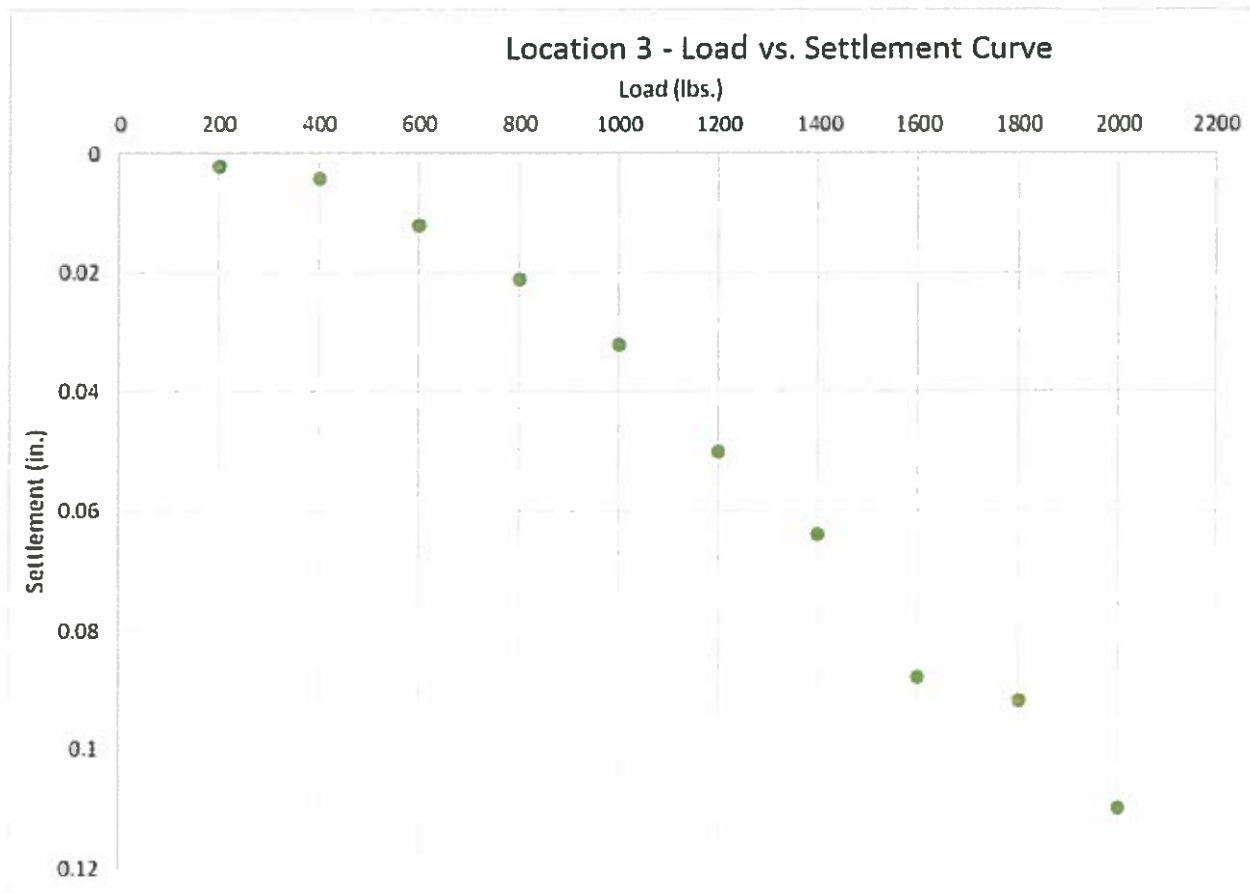


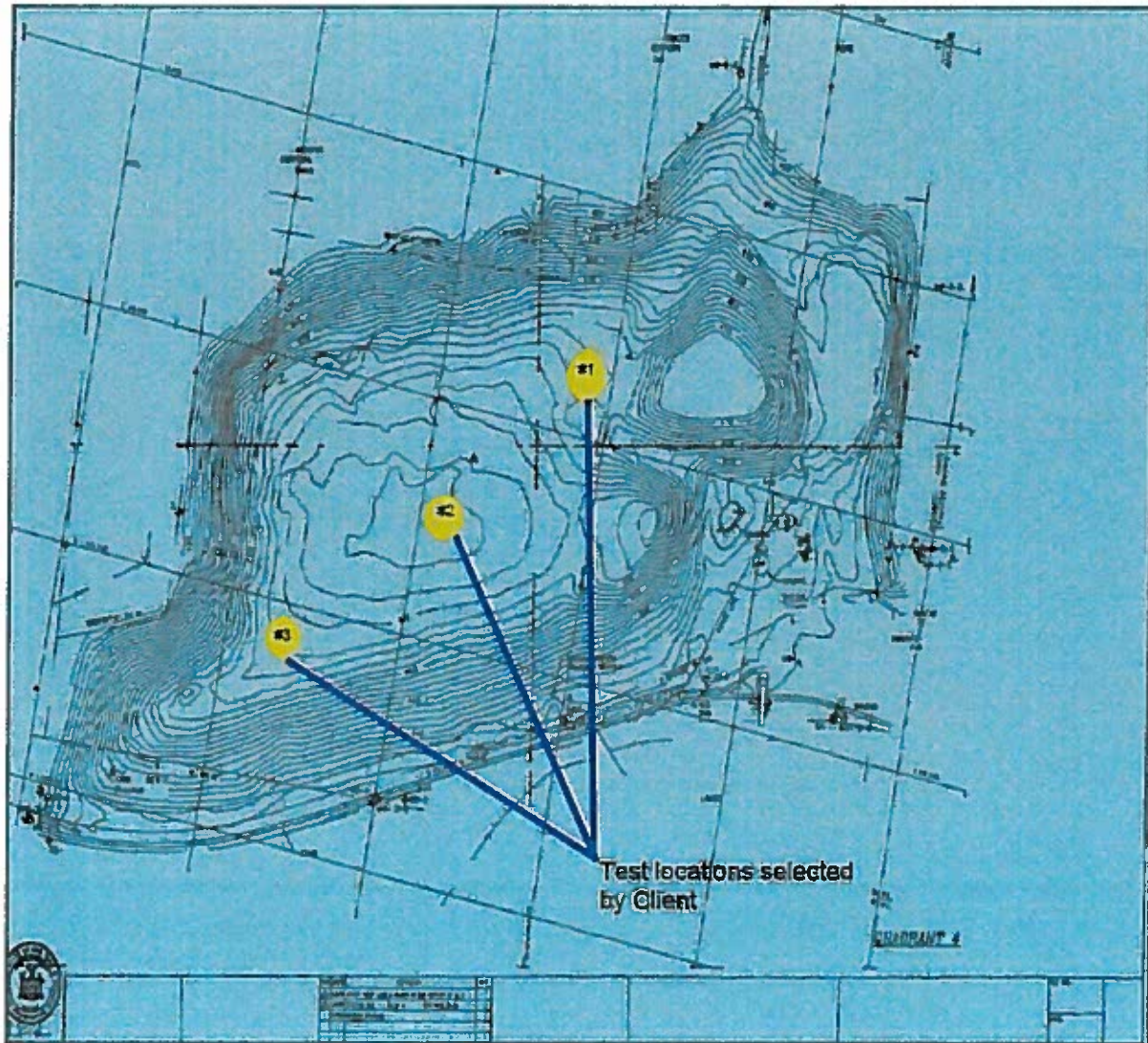
Photographs of Test No. 3 Setup

Test No. 3 – Load vs. Settlement Data

Test 3- Time, Load and Settlement Data						
Load (lbs)	Settlement (in.)					
	0.5 min	1 min	2 min	4 min	8 min	15 min
200	0.002	0.002	0.002	0.002	0.002	0.002
400	0.004	0.004	0.004	0.004	0.004	0.004
600	0.005	0.007	0.008	0.010	0.012	0.012
800	0.014	0.016	0.018	0.018	0.020	0.021
1000	0.022	0.023	0.024	0.027	0.031	0.032
1200	0.038	0.040	0.042	0.045	0.050	0.050
1400	0.054	0.055	0.057	0.059	0.060	0.064
1600	0.099	0.101	0.102	0.102	0.096	0.088
1800	0.090	0.090	0.090	0.092	0.092	0.092
2000	0.095	0.097	0.097	0.097	0.100	0.110

Test No. 3 – Load vs. Settlement Curve





APPENDIX C
CORRESPONDENCE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 7
615 Erie Boulevard West, Syracuse, NY 13204-2400
P: (315) 426-7519, (315) 426-7551 | F: (315) 426-2653
www.dec.ny.gov

June 14, 2019

Andrew Biederman
4700 Pottsville Pike
Reading, PA 19605

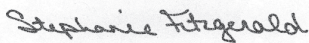
**Subject: Dewitt Landfill, Site #734012
Change of Use- Work Plan; March 2019
Village of Dewitt, Onondaga County**

Dear Ms. Biederman:

The New York State Department of Environmental Conservation (Department) has reviewed the Work Plan Response to Comments dated June 5, 2019 submitted by Bryan Bayer, Managing Environmental Scientist at C&S Companies, in response to the Department's letter dated April 29, 2019 regarding the Change of Use PV Array Work Plan at the Town of Dewitt Landfill Site. C&S Companies response is approved.

If you have any questions, please do not hesitate to contact me at 315-426-7525 or stephanie.fitzgerald@dec.ny.gov.

Sincerely,



Stephanie Fitzgerald
Project Manager

Digitally signed by Stephanie
Fitzgerald
DN: cn=Stephanie Fitzgerald,
o=NYSDEC, ou=Remediation,
email=stephanie.fitzgerald@dec.
ny.gov, c=US
Date: 2019.06.14 09:33:40 -04'00'

cc: Town of Dewitt
Bryan Bayer (C&S Companies)



Department of
Environmental
Conservation



C&S Companies
499 Col. Eileen Collins Blvd.
Syracuse, NY 13212
p: (315) 455-2000
f: (315) 455-9667
www.cscos.com

June 5, 2019

Ms. Stephanie Fitzgerald
Division of Environmental Remediation – Region 7
615 Erie Boulevard West
Syracuse, New York 13204

Re: RER Energy Group, LLC, Town of DeWitt Landfill 2.6MW Solar PV Array
DeWitt Landfill, Site #734012
Change of Use – Work Plan, March 2019
Town of DeWitt, Onondaga County, New York

Dear Ms. Fitzgerald,

C&S Engineers, Inc., on behalf of RER Energy Group, LLC, is providing this letter in response to your April 29, 2019 request for additional information regarding the proposed Town of DeWitt Landfill 2.6MW Solar PV Array Change of Use – Work Plan. The following information is prepared in order to receive authorization from the New York State Department of Environmental Conservation to proceed with the proposed project.

DEC Request: The following certification must be included on the title page of all submissions of the document and must be fully executed when a submission of the document is made by the remedial party to NYSDEC Division of Environmental Remediation (DER) for approval:

"I certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10)"

C&S Response: Attached are revised plans that are amended consistent with your request.

DEC Request: Discuss the findings of the hand dug test pits performed on December 12, 2019 to investigate the landfill cap.

C&S Response: C&S conducted test pits on the landfill to determine the amount of soil cover overtop the geomembrane landfill liner. The test pits were conducted on December 13, 2018, and six hand dug pits were examined in total. Attached with this letter is a map that depicts the test pit locations. C&S personnel used a flat blade shovel to hand dig the observation holes. The three southern most test pits found the liner to be at depths between 29 and 29.5 inches below grade. The soil material was generally a sandy clay texture. The two test pits located proximate to the ring road were unable to identify the depth of the liner due to refusal. Soils in this area were very

gravelly and compact. Lastly, the test pit located nearest the gate found the geomembrane at 27.5 inches below grade.

DEC Request: Section 3.0, Geotechnical Investigation of the Work Plan (WP) requires further discussion of the tests performed and an evaluation as to whether the engineered cap system will support the proposed infrastructure. Define "minimal" as used in the 7th sentence. This section must include a statement as to whether the test was performed in accordance with the ASTM standard, must discuss any deviations from the standard, and state whether the test results are usable given any deviations. Test No. 1 indicated water entered the testing area. Test No. 2 and Test No. 3 graphs indicate that settling was continuing to occur at these locations at the completion of the test. The WP must include a settling assessment which discusses the potential for future settling and the impacts which may occur.

C&S Response: CME Associates, Inc. (CME) conducted limited geotechnical work at the project site. Static load testing was performed below topsoil at three locations in general conformance with ASTM D1194-94 "Standard Test Method for Bearing Capacity of Soil for Static Load and Spread Footings" with the following exceptions:

- 1.) A 20-ton jack assembly was used in lieu of the 50-ton jack assembly specified in the referenced ASTM standard, Section 3.2 According to CME Associates, the 20-ton jack assembly used was more than sufficient for the relatively small test load (1 – ton).
- 2.) The reference beam utilized was 8-feet total length, and therefore was supported at lengths of 4-feet from the center of the loaded area. The referenced ASTM standard, Section 4.5 calls for reference beam supports at 8-feet from the center. According to CME, the change does not adversely affect the test readings due to the relatively small test load being used.
- 3.) The test method calls for the load to be decreased incrementally so that rebound can be measured. However, due to the utilization of a hydraulic ram and jack, the test load could not be incrementally reduced and therefore, no rebound measurements could be made.

As you have stated, water was observed in test pit number 1 during the test. The test occurred during periods of precipitate (snow), and it is our opinion that water observed is a result of precipitation.

Test Nos. 2 and 3 graphs do indicate that settling was continuing to occur at these locations at the end of the fifteen minutes at two times the service load. However, it should be noted that settling was not continuing to be observed at the 1000-pound load that is the service load as specified by the GameChange pre-engineered ballast system. In addition, the settlement observed at 2,000 pounds in test 2 from 8 to 15 minutes was 2/1000's of an inch and in test 3 over the same time period was 10/1000's of an inch. The settlement observed is minimal. The testing results indicate that some foundation settlement will likely be observed over the life of the project; however, based

on the test results we do not anticipate that settlement would jeopardize the landfill cap system. The proposed infrastructure is tolerant to moderate settlement; the geomembrane liner is also tolerant to moderate settlement.

It should also be noted that the electrical pad with the switchboard, transformer, and disconnect switch will provide 221 pounds per square foot (psf) load on the capped landfill. The electrical pad will be located on top of compacted structural fill, which will add an additional 240 psf. The total load below the stone will be approximately 470 psf.

The geotechnical evaluation provides the best practical method of determining whether the landfill cap will support the solar project. The site is a non-natural setting (i.e. man-made), we cannot assume homogeneity within the entire solar array footprint. Major differences in the bearing capacity of the landfill cap is not anticipated. Settling may occur at differing rates within the project limits. Observation of settling rates will occur during annual inspection efforts. In the event localized failures are observed during inspections, corrective measures will be taken.

DEC Request: The potential for landfill gas (LFG) accumulation within system components must be evaluated. Components with the potential for LFG accumulation must be equipped with LFG monitoring or air ventilation systems to avoid LFG accumulation.

C&S Response: System equipment is located at a minimum 30-foot separation distance from vent stacks. The vent stack outlets occur at a height above the installed height of the inverters. Landfill gases are lighter than air and disperse quickly in free air. As such, LFG migration to the inverters is unlikely due to the substantial vertical and horizontal separation between these components.

DEC Request: The WP should include an assessment of the impact of the installed photovoltaic (PV) system on drainage and soil stability. Specifically, the assessment should discuss: impacts due to removal of vegetation, increase in runoff due to impervious surface area, and degradation of the cap vegetation due to shading. In addition, a contingency plan must also be included with a section that addresses mitigation of large-scale drainage changes, vegetation loss, and soil loss, including the submission of a reparation WP should such events take place. A contingency plan must also include Department notification should the cap be damaged at any time during construction or found to be damaged during any inspections

C&S Response: Site drainage patterns will not be affected as a result of the proposed project. The project does not involve grading activities. The panels will follow the existing contours of the landfill.

We do not anticipate an increase in stormwater runoff as a result of this project. The NYSDEC issued a solar specific technical memorandum titled “Solar Panel Construction Stormwater Permitting/SWPPP Guidance” on April 5th, 2018. The NYSDEC Department of Water considers solar panel projects designed and constructed with the following criteria to be a “land clearing and

grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields)” type project and therefore the Stormwater Pollution Prevention Plan typically only need to address erosion and sediment controls:

- 1.) Solar panels are constructed on post or rack systems and elevated off the ground surface.
- 2.) The panels are spaced apart so that rain water can flow off the down gradient side of the panel and continue as sheet flow across the ground surface.
- 3.) For solar panels constructed on slopes, the individual rows of solar panels are generally installed along the contour so rain water sheet flows down slope.
- 4.) The ground surface below the panels consist of a well-established vegetative cover.
- 5.) The project does not include construction of traditional impervious areas.
- 6.) Construction of the solar panels will not alter the hydrology from pre-to post development conditions.

This memorandum generally outlines criteria that solar panels need to meet in order to be considered pervious area. If the solar panel design does not meet the criteria outlined within the memorandum, the solar panels are to be considered impervious area and treated for water quality and peak flow rate mitigation. The proposed project is designed to construct the solar panels in a manner that will meet the criteria defined above, and therefore negates the requirement to provide water quality volume treatment and peak flow rate mitigation. Specifically, our project involves a rack system that is elevated off the ground surface. The panels are spaced apart according to the memorandum; the NYSDEC memorandum states that in situations where average slope is less than or equal to 5%, then spacing between solar panel rows should be equal to or greater than the width of the solar panels themselves to effectively treat runoff from 1.0 inch of rainfall. This spacing is observed in the project design. The panels are designed to naturally follow the existing landfill contours as well. The existing landfill vegetation is dense and well established. This provides a higher Manning’s n-value and therefore runoff velocities are lower as compared to newly seeded sites. No traditional impervious areas are proposed as part of project efforts. Lastly, no alteration of hydrology from pre- to post conditions.

The ballasted system will result in a loss of vegetation beneath each tub structure. It is not anticipated that this loss of vegetation will result in an increase in soil erosion as the tub will provide a cap to these areas.

Loss of vegetation as a result of shading from the panels is not anticipated to occur. Full shading will not be observed as the minimum clearance above grade of the panels is 30 inches. In addition, the landfill groundcover is dense/tall meadow that has been established for over 25 years.

Regardless, landfill inspections will involve review of the project site to determine whether erosion or loss of vegetation is occurring. If observed, the following measures will be undertaken:

- 1.) Vegetation loss will be corrected via seeding and mulching. A determination will be made as to the probable cause of vegetation loss, and an appropriate seed mix will be used for restoration.
- 2.) In the event soil erosion is observed around the ballast tubs, soils will be backfilled and the area will be seeded and mulched.
- 3.) In the event erosion rills or scars are observed due to sheet flow runoff from the panels, corrective measures will be taken including, but not limited to, placement of an erosion control blanket or mesh followed by top-soiling, re-seeding, and mulching to prevent future erosion.

DEC Request: The WP states that electrical conduits will be placed above grade and installed down the slope. The WP must specify the measures needed to protect the conduit and how routine maintenance will be affected as a result of the conduit location.

C&S Response: Electrical hazardous warning signs will be mounted 4-feet high on the conduit support. The hazardous warning sign will be approximately 5-feet above finished grade including the conduit support height. Sign details are provided in the attached drawings.

No significant changes in routine maintenance will occur as a result of the conduit location. Mowing patterns will be adjusted, however this is not considered a significant change to maintenance operations.

DEC Request: As a part of continued site management, the site owner will need to include a site inspection form/list specific to the PV area. This form/list will be included in addition to the site wide quarterly monitoring reports. The form/list should include PV area specific issues such as:

- Changes in ballast elevation
- Loss of vegetation
- Regional pooling or depressions
- Integrity of ballasts

Once redevelopment has been completed at the site, the PV inspection form/list will become a part of the site management plan.

C&S Response: Attached, please find a copy of the RER Energy Group – Performance Checklist. The attached checklist includes changes in ballast elevation, loss of vegetation, regional pooling or depressions, and integrity of ballasts.

DEC Request: The WP must state that as-built drawings and a construction completion report (CCR) will be submitted at the completion of the construction project along with a timeframe for submission. The CCR will include the details of the installation, any variances from the original WP, and any issue and/or corrective measures employed during the installation (i.e. cap repair).

Ms. Fitzgerald

June 5, 2019

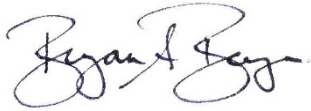
Page 6

C&S Response: RER will provide as-built drawings and a construction completion report at the conclusion of construction.

If you have any additional questions or comments, please do not hesitate to contact me at (315) 455-2000. Thank you for your time and consideration.

Sincerely,

C&S ENGINEERS, INC.



Bryan A. Bayer, PWS, CE
Managing Environmental Scientist

/bab

cc: Mike Barnes, RER
Mike Roach, RER
Andrew Biederman, RER
Gordon Smith, RER
Emerick Martin, SSM
Sam Gordon, Town of DeWitt



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Corporate: 4700 Pottsville Pike, Reading, PA 19605
Regional offices serving United State and Latin America
610.332.7232 • f: 888.712.0734
www.rerenergygroup.com

RER Energy Group - Performance Checklist

Name:

Contact:

Site:

Technician:

Date of Service:

Summary of Services:

RER solar technicians have been on-site and performed the annual technical checks and maintenance.

Production for year was (____)% of expected.

Notes:



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Maintenance Report Master Checklist - Overall

Project:

Inverter:

Modules:

Monitoring:

Data Access:

Service Provider:

Actions Taken	Yes	No	Notes
Project preventative maintenance report complete			
Inspect modules for signs of physical damage			
Inspect all modules for dirt or other detrimental surface deposits			
Inspect combiner box enclosures for signs of physical damage or failure to perform as rated for environmental conditions(e.g. rainproof, dustproof, etc.)			
Inspect DAS and all associated sensors, hardware, and wiring; clean as necessary			
Inspect ballast tubs/blocks for signs of unusual settling, changes in elevation, and structural integrity (cracking, breakage).			
Review ground conditions for soil depressions or regional pooling of water.			
Review ground conditions for loss of vegetation.			
Inspect inverter for signs of physical damage, failure to perform as rated for environmental conditions			
Clean inverter exhaust/intake filters			
Shut down, start-up of inverter to verify timely function of wake-up procedure and maximum power-point tracking			
Perform other maintenance tasks reasonably recommended by the inverter manufacturer			
Clean area immediately around inverters as necessary for performance and safety			



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Check all DC fuses for continuity and replace any blown or bad fuses			
Measure and record the open-circuit voltage and maximum operating current of all DC strings			
Terminations torqued and marked			
Perform spot check of torque on clamping devices and wire connections -including clamping devices and wire connections in junction boxes, combiner and recombiner boxes, AC and DC disconnects, switchgear, and inverters. Perform and thorough torque check in any section in which a spot check reveals a deficiency. Correct deficiencies by re-torquing to specification.			

Maintenance Report Master Checklist -System Grounding

Project:

Actions Taken	Yes	No	Notes
Module grounding thoroughly checked			
Racking system grounding and bonding checked throughout the entire array			
Grounding jumpers still intact			
Combiner box grounding checked			
DC disconnect grounding checked			
AC disconnect grounding checked			
Inverter grounding checked (ground ufer rods and building steel)			
Check all factory grounding at the inverter interior			
Utility interconnect disconnect grounding checked			
Grounding at POCC still intact (Grid Tie)			
Check all ground wiring for neatness and supports at array			
Identify all ground wires as green or bare copper			



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Maintenance Report Master Checklist - Inverter

Project:

Manufacturer:

Model #:

Quantity:

Designation #:

Location:

Name Plate Rating:

Voltage:

Serial #:

Actions Taken	Yes	No	Notes
DC Disconnect wiring torqued and marked			
AC Disconnect wiring torqued and marked			
Terminations torqued and marked			
Control wiring seated in terminals			
Open circuit voltage recorded & checked to be within inverter operating range			
All fuses checked for continuity			
Phase rotation is correct			
Inverter mounting intact			
Control boards checked			
Conductors Still intact/ look good			



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Maintenance Report Master Checklist - Racking and Array

Project:

Actions Taken	Yes	No	Notes
Visual Inspection of racking for damage and deterioration			
Racking and Support structure bolts spot-checked			
Grounding devices checked			
Solar modules checked for damage, bad cells, etc.			
Expansion joints checked for proper positioning			
Conduits still supported as per NEC			
Module mounting hardware checked			
Junction boxes checked for weather tightness			
Array wiring properly supported and professional in appearance			
All array wiring inspected to avoid damage from sharp edges			
Conduits supports still in place			
Terminations torqued and marked			
Slip sheets inspected and maintained			
Site is free of debris and fire hazards			



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Maintenance Report Master Checklist - System Labeling

Project:

Actions Taken	Yes	No	Notes
Arc flash notification at junction boxes, combiner boxes and disconnects			
Junction box designation labels (junction box A1, A2, Etc.)			
DC string circuits labeled at junction boxes			
DC string circuits labeled at combiner boxes			
Combiner box designation labels (combiner A, B, Etc.)			
Inverter designation labels (inverter 1, 2, Etc.)			
Photovoltaic Danger plaques at junction boxes			
Photovoltaic Danger plaques at combiner boxes			
Photovoltaic Danger plaques at disconnects			
Customer Generated Electricity Danger plaques at utility disconnect			
Utility notification plaque at interconnection location			
Termination torqued and marked			
Phase tape correctly identifying phases at AC disconnects and interconnection point			
DC negative wire identified (white) throughout system and at all termination points			
Mark homerun locations for each string on the module frame where the circuit starts			
At the inverter, identify the combiner box where the DC output circuit originates			

Thank you for choosing RER Energy Group
as your solar service provider.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 7
615 Erie Boulevard West, Syracuse, NY 13204-2400
P: (315) 426-7519, (315) 426-7551 | F: (315) 426-2653
www.dec.ny.gov

April 29, 2019

Andrew Biederman
RER Energy Group
4700 Pottsville Pike
Reading, PA 19605

**Subject: Dewitt Landfill, Site #734012
Change of Use- Work Plan; March 2019
Town of Dewitt, Onondaga County**

Dear Mr. Biederman:

The New York State Department of Environmental Conservation (Department) has completed its review of the site Change of Use Work Plan – Solar PV Array, submitted on March 8, 2018 for the Dewitt Landfill site, which was prepared by C&S Companies, Inc. The following modifications are requested:

1. The following certification must be included on the title page of all submissions of the document and must be fully executed when a submission of the document is made by the remedial party to DER for approval:

"I _____ certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10)"

2. Discuss the findings of the hand dug test pits performed on December 12, 2019 to investigate the landfill cap.



Department of
Environmental
Conservation

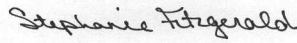
3. Section 3.0, Geotechnical Investigation of the Work Plan (WP) requires further discussion of the tests performed and an evaluation as to whether the engineered cap system will support the proposed infrastructure. Define “minimal” as used in the 7th sentence. This section must include a statement as to whether the test was performed in accordance with the ASTM standard, must discuss any deviations from the standard, and state whether the test results are usable given any deviations. Test No. 1 indicated water entered the testing area. Test No. 2 and Test No. 3 graphs indicate that settling was continuing to occur at these locations at the completion of the test. The WP must include a settling assessment which discusses the potential for future settling and the impacts which may occur.
4. The potential for landfill gas (LFG) accumulation within system components must be evaluated. Components with the potential for LFG accumulation must be equipped with LFG monitoring or air ventilation systems to avoid LFG accumulation.
5. The WP should include an assessment of the impact of the installed PV system on drainage and soil stability. Specifically, the assessment should discuss: impacts due to removal of vegetation, increase in runoff due to impervious surface area, and degradation of the cap vegetation due to shading. In addition, a contingency plan must also be included with a section that addresses mitigation of large-scale drainage changes, vegetation loss, and soil loss, including the submission of a reparation WP should such events take place. A contingency plan must also include Department notification should the cap be damaged at any time during construction or found to be damaged during any inspections.
6. The WP states that electrical conduits will be placed above grade and installed down the slope. The WP must specify the measures needed to protect the conduit and how routine maintenance will be affected as a result of the conduit location.
7. As a part of continued site management, the site owner will need to include a site inspection form/list specific to the PV area. This form/list will be included in addition to the site wide quarterly monitoring reports. The form/list should include PV area specific issues such as:
 - Changes in ballast elevation
 - Loss of vegetation
 - Regional pooling or depressions
 - Integrity of ballasts

Once redevelopment has been completed at the site, the PV inspection form/list will become a part of the site management plan.

8. The WP must state that as-built drawings and a construction completion report (CCR) will be submitted at the completion of the construction project along with a timeframe for submission. The CCR will include the details of the installation, any variances from the original WP, and any issue and/or corrective measures employed during the installation (i.e. cap repair).

The Department recognizes and appreciates the efforts being made toward sustainability and the clean energy initiative. If you have any questions, please do not hesitate to contact me at 315-426-7525 or stephanie.fitzgerald@dec.ny.gov.

Sincerely,



Digitally signed by Stephanie
Fitzgerald
DN: cn=Stephanie Fitzgerald,
o=NYSDEC, ou=Remediation,
email=stephanie.fitzgerald@dec.
ny.gov, c=US
Date: 2019.04.29 08:35:18 -04'00'

Stephanie Fitzgerald
Project Manager

cc: Town of Dewitt
Bryan Bayer (C&S Companies)