May 19, 2026

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

Re: **PETITION NO. 1682- VCP Groton LF, LLC** petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 4.95-megawatt AC solar photovoltaic generating facility located at the former Mansfield Landfill, 221 Warrenville Road, Mansfield, Connecticut, and associated electrical connection.

Compliance with Conditions of Approval Nos. 1, 2, 3, & 9

Dear Attorney Bachman:

In accordance with the Siting Council's January 9, 2026, approval of the above-referenced Petition for Declaratory Ruling, we are providing several materials related to conditions No. 1, 2, 3, and 9 of the approval that accompany this document or that may be downloaded via this link Conditions of Approval and an explanation of how each condition is being addressed herewith.

Condition No. 1 – In accordance with condition #1, all changes must be approved by Council Staff. As such, attached are revised site plans that reflect some adjustments to the system design. The design adjustments are as follows:

The equipment pad area design has been adjusted to eliminate the originally proposed block retaining wall in favor of the proposed grading that is now depicted. The design of the roadway to access this area has been adjusted accordingly and a new small section of roadway has been added to allow for the array to now be accessed directly from the equipment pad area. The addition of this new road will allow for two points of access to the array during construction and will remain in place for the life of the project. This will allow for access to the array during construction and during operations that will conflict less with town operation of the adjacent transfer station facility. The fence line has also been adjusted in this area to incorporate those changes.

The overhead pole line connection to the Eversource grid has been adjusted. Eversource has incorporated their poles that are required for the new service devices (meter and recloser) into the design of the line upgrades that are being performed in the public right of way, up to the site entrance. The same number of customer poles as before (three) will be installed but will be spaced out over a greater distance as opposed to being clustered together in the previous design.

The AC design of the system has been reduced slightly from 4.975 MW to 4.95 MW, with the inverter design changing from 39 CPS 600V 125kW (SCH125KTL-DO/US-600) and 1 CPS 600V 100kW (SCH100KTL-DO/US-600) inverters to 34 CPS 600V 125kW (SCH125KTL-DO/US-600) and 7 CPS 600V 100kW (SCH100KTL-DO/US-600) inverters. This slight adjustment was necessary to optimize system design efficiency. The design of the switch gear and transformers in the equipment pad area remains consistent with the prior design.

Lastly, the DC design of the system has been adjusted slightly within the same fence limits. The previously approved design set forth the installation of 14,088 First Solar Model FS-6465A-P-B, 465-Watt modules for a total system size of 6,550.92 kW DC. The proposed new design amends that to an installation of 6,108 First Solar Model FS-6465A-P-B, 465-Watt modules, 2,280 First Solar Model FS-6460A-P-B, 460-Watt modules, and 5,328 Phono Solar Model PS590M8GFH/THN, 590-watt modules for a new total system size of 7,032.54 kW DC. A data sheet and TCLP report for the newly proposed Phono modules are included herewith.

Condition No. 2 – A copy of the DEEP Stormwater Permit approval letter is being provided herewith.

Condition No. 3 - A copy of the final structural design for the racking system stamped by a Professional Engineer duly licensed in the State of Connecticut is being provided herewith. These structural design plans are consistent with current design plans.

Condition No. 9 – This letter shall serve as notice that we intend to commence construction on or around June 3, 2026.

The remaining conditions of approval that must be addressed before facility operations commence or post-construction will be addressed at later dates as appropriate, under separate cover.

If you have any questions concerning this letter or any of the materials provided, please contact me.

Sincerely,

James Cerkanowicz

James Cerkanowicz, PE.
VCP Groton LF, LLC

Electronic Cc:
Bryan Fitzgerald, VCP Groton LF, LLC
Bradley Parsons, PE. PMP., VCP Groton LF, LLC
John M. Daly, Esq., VCP Groton LF, LLC

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Bureau of Materials Management and Compliance Assurance

Notice of Permit Authorization

August, 29 2025

William Herchel
VCP Groton LF, LLC
124 Lasalle Rd
West Hartford, CT 06107-2317

Subject: General Permit Registration for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities
Application NO.: 202504923

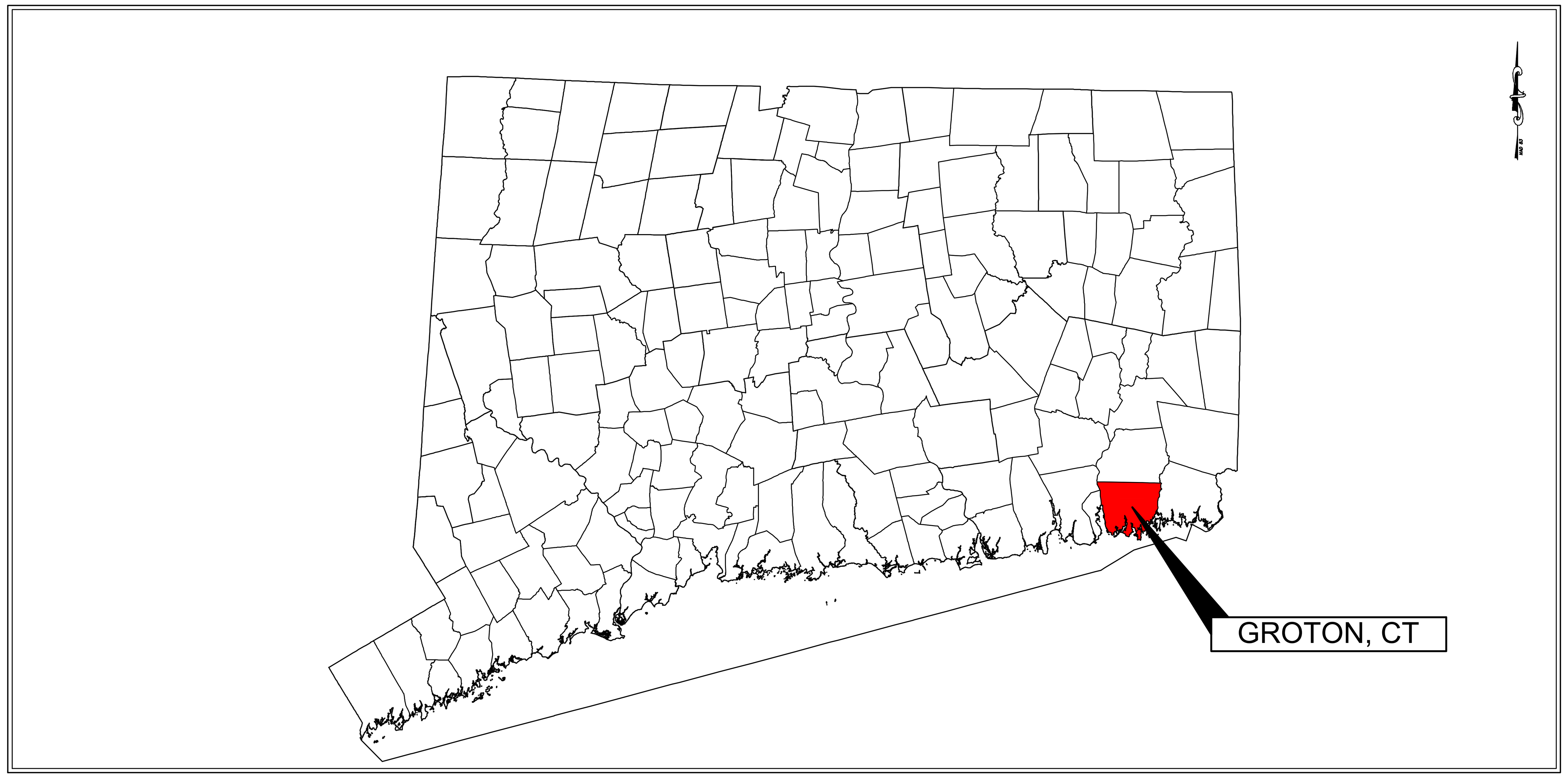
William Herchel:

The Department of Energy and Environmental Protection, Water Permitting and Enforcement Division of the Bureau of Materials Management and Compliance Assurance, has completed the review of the Town of Groton Landfill (located at 685 Flanders Rd, Groton) registration for the **General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, effective 12/31/2020, modified 11/25/2022 (general permit)** . The project is compliant with the requirements of the general permit and the discharge(s) associated with this project is (are) authorized to commence as of the date of this letter. Permit No. GSN004243 has been assigned to authorize the stormwater discharge(s) from this project.

Questions can be emailed to deep.stormwater@ct.gov.

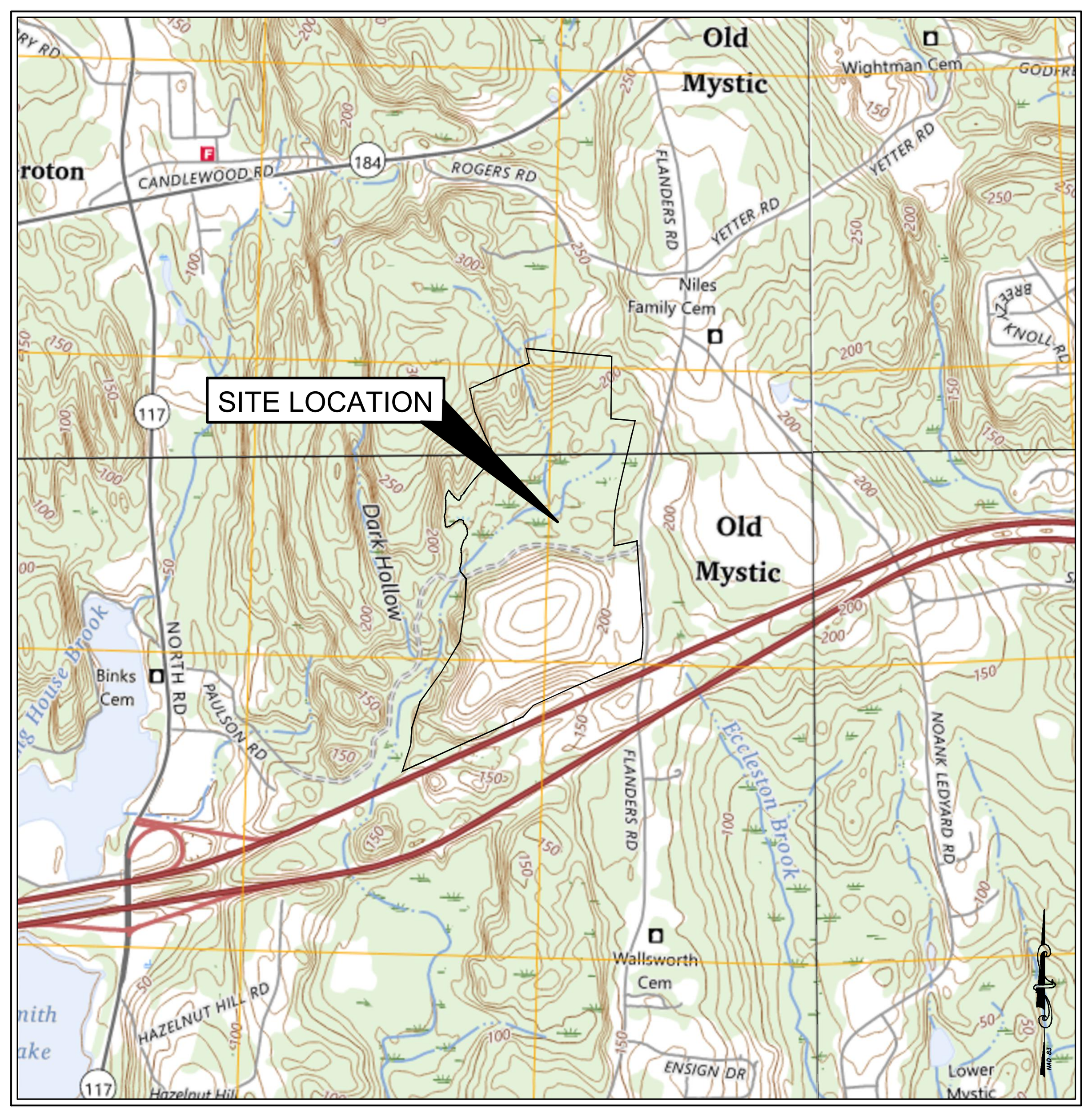
TOWN OF GROTON LANDFILL SOLAR (PV) DEVELOPMENT

685 FLANDERS ROAD, GROTON CONNECTICUT



CONNECTICUT MUNICIPAL MAP

NOT TO SCALE



SITE LOCUS MAP

1" = 1,500'

SITE AERIAL MAP

1" = 1,000'

DRAWING INDEX	
SHEET NUMBER	SHEET TITLE
GENERAL	
G001	COVER SHEET
SURVEY	
	PLAN OF LAND IN GROTON, CT
CIVIL	
C001	NOTES AND SPECIFICATIONS
C101	EROSION & SEDIMENTATION CONTROL PLAN
C102	PROPOSED SITE PLAN
C501	DETAILS I
C502	DETAILS II

ZONING	
ZONING DISTRICT	INDUSTRIAL, MIXED USE (IM)
MINIMUM LOT AREA	30,000 SQUARE FEET
MINIMUM LOT WIDTH	100 FEET
MINIMUM FRONT YARD SETBACK	30-FEET
MINIMUM SIDE YARD SETBACK	25-FEET
MINIMUM REAR YARD SETBACK	30-FEET
HEIGHT *	75-FEET / 6 STORIES
BUILDING COVERAGE	40%

* ANY BUILDING EXCEEDING 40 FT IN HEIGHT MUST BE SET BACK FROM ITS FRONT, SIDE, AND REAR LOT LINES AN ADDITIONAL ONE FOOT FOR EACH FOOT IN HEIGHT OVER 40 FT.

LAND OWNER:

Town of Groton
45 Fort Hill Road
Groton, CT 06340
Tel: (860) 441-6640
www.groton-ct.gov

PROJECT DEVELOPER:

VEROGY

VCP Groton LF, LLC
124 LaSalle Road
2nd Floor
West Hartford, CT 06107
Tel: (860) 288-7215
www.verogy.com

CONSULTANT:

Weston & Sampson

Weston & Sampson Engineers, INC.
712 Brook Street, Suite 103
Rocky Hill, CT 06067
860.513.1473
800.SAMPSON
www.westonandsampson.com

REV #	DESCRIPTION	DATE
5	ADDED ACCESS DRIVE & MSW WASTE LINE	04/07/2026
4	EQUIPMENT LAYOUT / GRADING	01/30/2026
3	PANEL AND UTILITY IX UPDATE	12/11/2025
2	CSC PETITION SUBMITTAL	07/14/2025
1	NO CHANGES THIS SHEET	05/30/2025
0	ISSUED FOR PERMITTING	05/05/2025

Seal:

CBYD.com 811 Call Before You Dig, Inc.

Issued For:	PERMITTING
Original Issued Date:	05/05/2025
Drawing Title:	COVER SHEET

Drawn By:	DED
Reviewed By:	MRC
Approved By:	RJB
Job No:	ENG25-0020
Sheet Number:	G001

GENERAL NOTES:

1. THE CONTRACTOR SHALL ABIDE BY ALL LOCAL, STATE, AND FEDERAL LAWS, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS, INCLUDING STATE AND FEDERAL REQUIREMENTS WITH RESPECT TO STORMWATER DISCHARGE.
2. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITY LINES WITHIN OR ADJACENT TO THE CONSTRUCTION AREA. ANY DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION ACTIVITY SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. CONSTRUCTION SHALL NOT OCCUR IN ANY PUBLIC RIGHTS OF WAY, PUBLIC OR PRIVATE EASEMENTS, BEYOND THE LIMITS OF DISTURBANCE, OR OUTSIDE THE PROPERTY LIMITS WITHOUT NECESSARY PERMITS. ANY PUBLIC OR PRIVATE PROPERTY OR IMPROVEMENTS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AND TOWN OF GROTON AT THE COST OF THE CONTRACTOR.
4. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL WITHIN THE PUBLIC RIGHT OF WAY. OVERNIGHT PARKING OF CONSTRUCTION VEHICLES ON PRIVATE PROPERTY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. PARKING ALONG UPPER ROAD IS STRICTLY PROHIBITED.
5. ALL PROPERTY CORNERS OR MONUMENTS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ALL PROPERTY CORNERS MUST BE RESET BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF CONNECTICUT.
6. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS CONTROLLING THE POLLUTION OF THE ENVIRONMENT.
7. CONTRACTOR TO ENSURE ALL WORK PERFORMED IS IN ACCORDANCE WITH EXISTING PROJECT PERMITS, STUDIES, AND REPORTS PROVIDED IN THE CONTRACT DOCUMENTS.
8. IT IS THE INTENT OF THESE PLANS THAT THE CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE THE IDENTIFIED PROJECT BOUNDARIES AND CLEARING LIMITS.
9. CONTRACTOR TO AVOID THE DELINEATED WETLAND AREAS AND NATURAL RESOURCES ONSITE.
10. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THE PROJECT.
11. ALL WORK IN THE PUBLIC RIGHTS OF WAY SHALL CONFORM WITH THE CONNECTICUT DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS."
12. HERBICIDES SHALL NOT BE USED FOR VEGETATION MANAGEMENT.
13. THE CONTRACTOR SHALL PROPERLY DISPOSE OF ALL REFUSE IN A TIMELY AND SAFE MANNER.
14. THE SITE SHALL EMPLOY BEST MANAGEMENT PRACTICES FOR SOIL EROSION AND SEDIMENTATION CONTROL.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL "CALL BEFORE YOU DIG" AT 811 OR 1-800-922-4455 AT LEAST 72 HOURS, SATURDAYS, SUNDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIG SAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.
2. LOCATIONS OF EXISTING PIPES, CONDUITS, UTILITIES, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS ARE NOT WARRANTED TO BE CORRECT AND THE CONTRACTOR SHALL HAVE NO CLAIM ON THAT ACCOUNT SHOULD THEY BE OTHER THAN SHOWN.
3. STONE WALLS, FENCES, CURBS, ETC., SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK. UNLESS OTHERWISE INDICATED, ALL SUCH WORK SHALL BE INCIDENTAL TO CONSTRUCTION OF THE PROJECT.
4. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE PROJECT AREA SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
5. NOTHING SHOWN OR OMITTED FROM THE DOCUMENTS PROVIDED SHALL RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH ALL APPLICABLE CODES, REGULATIONS, BYLAWS, AND ORDINANCES.
6. TOPSOIL SHALL NOT BE MIXED WITH SUBGRADE MATERIALS. TOPSOIL SHALL NOT BE BURIED.

MATERIAL SPECIFICATIONS AND PLACEMENT REQUIREMENTS:

1.1 COURSE AGGREGATE (2-1/2-INCH STONE)

THIS MATERIAL SHALL MEET THE REQUIREMENTS OF CTDOT M.01.02 COARSE AGGREGATES NO.3.

SIEVE DESIGNATION	PERCENT PASSING
2-1/2 INCH	100
2-INCH	90-100
1-1/2-INCH	35-70
1-INCH	0-15
1/2-INCH	0-5

1.2 DENSE GRADED CRUSHED STONE

THIS MATERIAL SHALL CONSIST OF CLEAN HARD, DURABLE CRUSHED ROCK OR CRUSHED GRAVEL STONE, FREE FROM LOAM AND CLAY AND DELETERIOUS MATERIAL. THIS MATERIAL SHALL MEET THE FOLLOWING GRADATION: NOTE THIS MATCHES CTDOT FORM 818 M.02.01 GRANULAR FILL - BROKEN/CRUSHED STONE WITH GRADATION M.02.06 "A".

SIEVE DESIGNATION	PERCENT PASSING
3.5-INCH	100
1.5-INCH	55-100
1/4-INCH	25-60
NO. 10	15-45
NO. 40	5-25
NO. 100	0-10
NO. 200	0-5

PRIOR TO USE, THE DENSE GRADED CRUSHED STONE SHALL BE TESTED FOR APPROVAL AS DESCRIBED BELOW IN SECTION 2.0 AND SHALL BE PLACED AS DESCRIBED BELOW IN SECTION 3.0.

1.3 3/4" CRUSHED STONE

THIS MATERIAL SHALL CONSIST OF SOUND, TOUGH, DURABLE BROKEN STONE AND BE FREE OF LOAM, CLAY, AND OTHER DELETERIOUS MATERIAL. THE MATERIAL SHALL SATISFY THE AASHTO SPECIFICATION FOR #67 STONE (3/4-INCH STONE).

PRIOR TO USE, THE 3/4" CRUSHED STONE SHALL BE TESTED FOR APPROVAL AS DESCRIBED BELOW IN SECTION 2.0 AND SHALL BE PLACED AS DESCRIBED BELOW IN SECTION 3.0. NOTE FORM 818 CALLS FOR GRADING "A" EXCEPT FOR TOP COURSE SHALL BE "C".

1.4 GRANULAR BASE MATERIAL

GRANULAR FILL SHALL CONSIST OF CTDOT MATERIAL M.02.03, GRANULAR BASE, OR APPROVED EQUAL. THIS MATERIAL SHALL MEET THE FOLLOWING GRADATION FOR CTDOT M.02.06 GRADING "C":

SIEVE DESIGNATION	PERCENT PASSING
1.5-INCH	100
3/4-INCH	45-80
1/4-INCH	25-60
NO. 10	15-45
NO. 40	5-25
NO. 100	0-10
NO. 200	0-5

PRIOR TO USE, THE GRANULAR BASE SHALL BE TESTED FOR APPROVAL AS DESCRIBED IN SECTION 2.0 AND SHALL BE PLACED AS DESCRIBED IN SECTION 3.0.

1.5 TOPSOIL

TOPSOIL SHALL CONSIST OF CTDOT MATERIAL M.13.01, TOPSOIL, OR APPROVED EQUAL. TOPSOIL SHALL NOT CONTAIN LESS THAN 5% NOR MORE THAN 20% ORGANIC MATERIAL AS DETERMINED BY LOSS ON IGNITION OF OVEN-DRIED SAMPLES DRIED AT 221 DEG. F (105 DEG C). TOPSOIL SHALL BE LOOSE AND FRIABLE AND FREE OF FROM REFUSE, STUMPS, ROOTS, BRUSH, WEEDS, ROCKS AND STONES OVER 1-1/4-INCHES IN DIAMETER. TOPSOIL SHALL ALSO BE FREE FROM ANY MATERIAL THAT WILL PRVENT THE FORMATION OF A SUITABLE SEEDBED OR PREVENT SEED GERMINATION AND PLANT GROWTH.

1.6 GEOSYNTHETICS:

1. GENERAL:
   INSTALLATION OF GEOTEXTILE FABRICS SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND SPECIFIC LAYOUT PLANS AND DETAILS REVIEWED BY ENGINEER.
2. WOVEN GEOTEXTILE:
   THE WOVEN GEOTEXTILE SHALL BE MIRAFI HP 270 FABRIC, BY MIRAFI INC., OR APPROVED EQUIVALENT. THE WOVEN GEOTEXTILE SHALL BE COMPOSED OF POLYPROPYLENE STABILIZED WITH CARBON BLACK TO RESIST ULTRAVIOLET DEGRADATION AND BE RESISTANT TO BIOLOGICAL AND CHEMICAL DEGRADATION DUE TO ALL NATURALLY OCCURRING ORGANISMS OR REAGENTS NORMALLY ENCOUNTERED IN NATURAL SOIL ENVIRONMENTS.
3. NON-WOVEN GEOTEXTILE:
   THE NON-WOVEN GEOTEXTILE SHALL BE MIRAFI 140N FABRIC, BY MIRAFI INC., OR APPROVED EQUIVALENT. THE NON-WOVEN GEOTEXTILE SHALL BE COMPOSED OF POLYPROPYLENE FIBERS AND SHALL BE INERT TO BIOLOGICAL DEGRADATION AND RESISTANT TO NATURALLY ENCOUNTERED CHEMICALS, ALKALIS, AND ACIDS.

2.0 BORROW SOURCE TESTING REQUIREMENTS

PRIOR TO USE, BORROW SOURCE TESTING, INCLUDING GEOTECHNICAL CHARACTERIZATION REQUIREMENTS, SHALL BE CONDUCTED ON ALL SOIL MATERIALS PROPOSED FOR CONSTRUCTION AND SUBMITTED TO THE ENGINEER TO ASSESS CONFORMANCE TO MATERIAL SPECIFICATIONS.

3.0 MATERIAL PLACEMENT AND FIELD QUALITY CONTROL REQUIREMENTS

1. DO NOT PLACE FILL MATERIAL ON SURFACES THAT ARE MUDDY, FROZEN, OR CONTAIN FROST OR ICE.
2. SURFACES ON WHICH THE GEOTEXTILE WILL BE PLACED SHALL BE PREPARED TO A RELATIVELY SMOOTH SURFACE CONDITION. SURFACES SHALL BE FREE FROM OBSTRUCTION, DEBRIS, DEPRESSIONS, OR EROSION FEATURES. VEGETATION SHALL BE MOWED AS SHORT AS POSSIBLE PRIOR TO PLACEMENT OF GEOTEXTILE FABRIC. ANY IRREGULARITIES SHALL BE REMOVED SO AS TO ENSURE CONTINUOUS, INTIMATE CONTACT OF THE GEOTEXTILE WITH THE SURFACE. ANY LOOSE MATERIAL, SOFT OR LOW DENSITY POCKETS OF MATERIAL, SHALL BE REMOVED, FILLED WITH SUITABLE SUBGRADE FILL, AND COMPACTED. EROSION FEATURES SUCH AS RILLS AND GULLIES MUST BE GRADED OUT OF THE SURFACE BEFORE GEOTEXTILE PLACEMENT.
3. AT THE TIME OF INSTALLATION, FABRIC SHALL BE REJECTED IF IT HAS DEFECTS, RIPS, HOLES, FLAWS, DETERIORATION OR DAMAGE INCURRED DURING MANUFACTURE, TRANSPORTATION OR STORAGE.
4. PLACE FABRIC WITH THE LONG DIMENSION PARALLEL TO THE CENTERLINE OF THE ACCESS ROAD AND LAY SMOOTH AND FREE OF TENSION, STRESS, FOLDS, WRINKLES, OR CREASES.
5. THE CONTRACTOR SHALL PLACE AND COMPACT MATERIALS IN CONTINUOUS HORIZONTAL LAYERS UNTIL FIRM. LIFT THICKNESSES SHALL NOT EXCEED THE FOLLOWING THICKNESS:

   ACCESS ROADS: 6-INCHES
   EQUIPMENT PADS: 6-INCHES
6. IF THE MATERIAL REMOVED FROM THE EXCAVATION IS SUITABLE FOR BACKFILL WITH THE EXCEPTION THAT IT CONTAINS STONES LARGER THAN PERMITTED, THE CONTRACTOR HAS THE OPTION TO REMOVE THE OVERSIZED STONES AND USE THE MATERIAL FOR BACKFILL OR TO PROVIDE REPLACEMENT BACKFILL AT NO ADDITIONAL COST TO THE OWNER.

EROSION AND SEDIMENTATION CONTROL PLAN:

THIS PLAN HAS BEEN DEVELOPED TO PROVIDE A STRATEGY FOR CONTROLLING SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION OF THE PROPOSED PROJECT.

THIS PLAN IS BASED ON STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION IN DEVELOPING AREAS AS CONTAINED IN THE MOST CURRENT VERSION OF THE CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.

1. EROSION AND SEDIMENTATION CONTROLS SHALL BE INSPECTED AT LEAST ONCE EVERY 7 CALENDAR DAYS, OR EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.50 INCHES OR GREATER. ALL STRUCTURES DAMAGED BY CONSTRUCTION EQUIPMENT, VANDALS, OR THE ELEMENTS SHALL BE REPAIRED IMMEDIATELY. ALL DAMAGED STRUCTURES SHALL BE REPAIRED AND/OR ADDITIONAL EROSION CONTROL STRUCTURES SHALL BE INSTALLED PRIOR TO CONTINUING THE CONSTRUCTION. TRAPPED SEDIMENT SHALL BE REMOVED BEFORE IT HAS ACCUMULATED TO ONE-HALF FOOT DEEP AT THE INSTALLED SEDIMENT BARRIER. DEVICES NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION SHALL ALSO BE REPAIRED AND/OR REPLACED AS REQUIRED. RUTTING OR EXPOSED SOIL SHALL BE REPAIRED TO PREVENT EROSION AND OTHERWISE MITIGATED AS NECESSARY TO MINIMIZE FUTURE EROSION.
2. ACCUMULATED SEDIMENT SHALL BE REMOVED FROM BEHIND FEATURE WHEN ACCUMULATIONS HAVE ADVERSELY AFFECTED IT'S FUNCTION.
3. ALL DISTURBED AREAS SHALL BE STABILIZED PER THESE SPECIFICATIONS TO MAINTAIN VIGOROUS, DENSE VEGETATION. THE TOTAL DISTURBED AREA SHALL NOT BE GREATER THAN 5 ACRES AT ANY ONE TIME DURING CONSTRUCTION. ANY ERODED SLOPE OR GROUND SURFACE SHALL BE REPAIRED BY REAPPLYING TOPSOIL RESEEDING AND STABILIZING AREA AS REQUIRED FOR PERMANENT OR TEMPORARY MEANS USING CT DEEP PERMANENT SEED MIX NO. 1. REPAIR SOIL AREAS DAMAGED BY EROSION OR CONSTRUCTION EQUIPMENT.
4. IMMEDIATELY REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION EQUIPMENT, MAINTENANCE OR OTHER ACTIVITY TO ANY EROSION AND SEDIMENTATION CONTROL MEASURE, BEST MANAGEMENT PRACTICE (BMP) OR DEVICE.
5. THE PRIME CONTRACTOR IS RESPONSIBLE FOR THE PERFORMANCE AND COMPLIANCE OF ITS SUBCONTRACTORS ACTIVITIES RELATING TO THE SWPCP. THEY SHALL MAKE FREQUENT INSPECTIONS OF THEIR WORK AND COORDINATE APPROPRIATE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROL DEVICES.
6. EMPLOY POLLUTION PREVENTION MEASURES TO CONTROL LITTER, CONSTRUCTION CHEMICALS, SEDIMENT AND CONSTRUCTION DEBRIS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING: SALVAGE AND REUSE OF MATERIALS, MINIMIZING PACKAGING WASTE, RECYCLING, PROPER DISPOSAL AT FREQUENT INTERVALS IN ACCORDANCE WITH PREVAILING LAWS, ONSITE INSTRUCTION REGARDING APPROPRIATE SEPARATION / HANDLING / RECYCLING, PROPER MAINTENANCE OF SEDIMENT / EROSION CONTROL SYSTEMS, ROUTINE AND EVENT RELATED INSPECTIONS BMPS, PROVIDE APPROPRIATE SANITARY FACILITIES FOR ONSITE PERSONNEL, PICK UP TRASH AND DEBRIS FREQUENTLY AND USE DUST CONTROL MEASURES AS NEEDED.
7. FOLLOWING THE FINAL SEEDING, THE SITE SHALL BE INSPECTED TO ENSURE THAT THE VEGETATION HAS BEEN ESTABLISHED (70% COVER ACHIEVED). IN THE EVENT OF ANY UNSATISFACTORY GROWTH, RESEEDING WILL BE CARRIED OUT, WITH FOLLOW-UP INSPECTION.
8. AFTER THE CONSTRUCTION INSPECTOR HAS DETERMINED THAT THE PROJECT AREA HAS BEEN STABILIZED, THE CONTRACTOR SHALL REMOVE ALL SEDIMENT BARRIERS, TEMPORARY SEDIMENTATION CONTROL RISERS, AND ANY OTHER TEMPORARY EROSION CONTROL MEASURES.

TYPICAL SEQUENCE OF CONSTRUCTION:

PRIOR TO THE DEVELOPMENT OF THE SITE, EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED AS NOTED ON THE PLANS. SITE DEVELOPMENT SCHEDULING SHALL TAKE INTO CONSIDERATION THE GROWING SEASON, SUCH THAT BULK OF THE EARTHWORK IS NOT INITIATED DURING A PERIOD WHEN VEGETATIVE STABILIZATION CANNOT BE ACHIEVED WITHIN 14 DAYS OF COMPLETING THE EARTHWORK IN A GIVEN AREA. A TYPICAL SEQUENCE OF CONSTRUCTION IS:

1. CONTRACTOR SHALL CONFIRM FLAGGING FOR WETLANDS, BUFFERS, STREAMS, AND /OR OTHER CRITICAL AREAS. IF FLAGGING IS NOT AVAILABLE, CONTRACTORS OR CONTRACTOR'S REPRESENTATIVE SHALL FLAG WETLANDS, BUFFERS, STREAMS AND/OR OTHER CRITICAL AREAS PRIOR TO STARTING ANY WORK ON SITE.
2. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS. THE CONTRACTOR SHALL OBTAIN ALL PERMITS, NOTIFY APPROPRIATE OFFICIALS OF CONSTRUCTION COMMENCEMENT, AND SUBMIT CONSTRUCTION TIMETABLE.
3. ON-SITE CONSTRUCTION SHALL START WITH THE INSTALLATION OF EROSION AND SEDIMENTATION CONTROL MEASURES AS NOTED ON SHEET C101. THIS INCLUDES SEDIMENT BARRIERS, CONSTRUCTION ENTRANCE/EXIT, AND OTHER MEASURES NOTED ON THE PLAN. NO WORK SHALL TAKE PLACE UNTIL THE ENGINEER HAS INSPECTED AND APPROVED INSTALLED MEASURES.
4. CONTRACTOR SHALL INSTALL THE LANDFILL VENT PROTECTIVE BARRIERS.
5. REMOVE AND STOCKPILE TOPSOIL AS REQUIRED. NO TOPSOIL SHALL BE REMOVED WITHIN THE LIMITS OF THE LANDFILL CAP. STOCKPILED TOPSOIL SHALL BE SEEDED AND MULCHED WHEN IT IS TO BE STORED MORE THAN 30 DAYS FROM TIME OF STOCKPILING. STOCKPILES SHALL NOT BE PLACED WITHIN THE WETLAND BUFFER ZONE. SEE SHEET C501 FOR A TYPICAL TEMPORARY STOCKPILE DETAIL. THE CONTRACTOR SHALL COORDINATE STOCKPILE LOCATIONS WITH THE LANDOWNER.
6. PROCEED WITH SOLAR PHOTOVOLTAIC (PV) SYSTEM INSTALLATION/CONSTRUCTION WORK.
7. REPAIR ALL DISTURBED AREAS AND REAPPLY LOAM WHERE NECESSARY.
8. SEED ALL AREAS WITH CT DEEP PERMANENT SEED MIX NO.1 AND STABILIZE SLOPES IN ACCORDANCE WITH THE CONSTRUCTION SITE PLAN DRAWINGS EROSION AND SEDIMENT CONTROL PLAN.
9. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL AFTER THE SITE IS STABILIZED IN ACCORDANCE WITH THE SWPCP.

FROST PROTECTION AND SNOW REMOVAL:

1. THE CONTRACTOR SHALL, AT ITS OWN EXPENSE, KEEP EARTHWORK OPERATIONS CLEAR AND FREE OF ACCUMULATIONS OF SNOW AS REQUIRED TO CARRY OUT THE WORK.
2. THE CONTRACTOR SHALL PROTECT THE SUBGRADE BENEATH NEW STRUCTURES AND PIPES FROM FROST PENETRATION WHEN FREEZING TEMPERATURES ARE EXPECTED.

SOIL STABILIZATION NOTES:

1. THE MAXIMUM ALLOWABLE SLOPE IS 3:1. ALL 3:1 SLOPES SHALL BE STABILIZED WITH A TEMPORARY EROSION CONTROL BLANKET (SEE SHEET C501).
2. ALL DISTURBED AREAS SHALL HAVE LOAM AND SEED AND STABILIZED WITH GRASS COVER (SEE SHEET C501).
3. IF SUFFICIENT STABILIZATION CANNOT BE ACCOMPLISHED AFTER SEEDING, AT THE CONTRACTOR'S SOLE EXPENSE, SHALL BE RESPONSIBLE FOR ADDING THE NECESSARY SOIL AMENDMENTS AND/OR LOAM UNTIL STABILIZATION IS ACHIEVED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT STORMWATER POLLUTION CONTROL PLAN (SWPCP).

EQUIPMENT:

1. THE CONTRACTOR SHALL PROVIDE A LIST OF ALL EQUIPMENT PROPOSED TO BE WORKING ON THE LANDFILL. THE LIST SHALL INCLUDE THE EQUIPMENT WEIGHT, GROUND PRESSURE, AND ANY RESTRICTIONS THAT WILL BE IMPOSED ON THE VEHICLE (I.E., LIMITED TO TEMPORARY ACCESS ROADS, LIMITED TO CARRYING 1/2 LOADS, ETC.).
2. ALL EQUIPMENT IS SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. AS A GENERAL RULE, EQUIPMENT SHALL HAVE A MAXIMUM GROUND PRESSURE OF LESS THAN 10 PSI ON THE EXISTING LANDFILL SYSTEM.

SPECIFICATIONS FOR WORK ON LANDFILL:

1. THE CONTRACTOR SHALL BE AWARE THAT THE WORK IS LOCATED ON A LANDFILL AND IS SUBJECT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES (RCSA) 22A-209-7.
2. THE CONTRACTOR SHALL BE AWARE THAT THE WORK IS TO TAKE PLACE ABOVE A LANDFILL COVER SYSTEM. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO NOT DISRUPT THE LANDFILL CAP PROFILE.
3. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION (CTDEEP) "AUTHORIZATION FOR THE DISRUPTION AND POST CLOSURE USE OF A CLOSED SOLID WASTE DISPOSAL AREA" APPROVAL DATED DECEMBER 15, 2025.
4. THE CONTRACTOR SHALL HAVE A HEALTH AND SAFETY PLAN WHILE WORKING ON THE LANDFILL.
5. THE CONTRACTOR SHALL USE ACCESS PATHS AS SHOWN ON THE PLANS. DIVERSION BERMS ASSOCIATED WITH THE LANDFILLS CAPPING SYSTEM SHALL NOT BE USED FOR VEHICLE OR EQUIPMENT ACCESS, AND SHALL BE PROTECTED AT ALL TIMES.

GENERAL EROSION AND SEDIMENTATION CONSTRUCTION DETAIL NOTES:

DURING CONSTRUCTION THE CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO SCHEDULE EARTHWORK OPERATIONS SUCH THAT THE AREA OF EXPOSED AND DISTURBED SOIL IS MINIMIZED. CONSTRUCTION SHALL BE PHASED TO REDUCE THE AREA OF DISTURBED SOIL AT ANY ONE TIME. UPGRADIENT STORMWATER DIVERSION AND DISPERSION MEASURES SHALL BE INSTALLED WHERE APPROPRIATE.SHOULD SOIL DISTURBANCE OCCUR, PRIOR TO CONTINUING WORK,THE CONTRACTOR SHALL STABILIZE DISTURBED AREAS BY LAYING DOWN TEMPORARY MULCH UNTIL FINAL GRADE IS REACHED. ALL CUT AND FILL SLOPES SHALL BE STABILIZED UPON COMPLETION. THE FOLLOWING MEASURES WILL BE UNDERTAKEN TO PROVIDE MAXIMUM PROTECTION TO THE SOIL, WATER, AND ABUTTING LANDS:

1. SEDIMENT BARRIERS, OR OTHER APPROPRIATE BEST MANAGEMENT PRACTICE (BMP) SHALL BE INSTALLED ACROSS THE SLOPE ON THE CONTOUR AT THE DOWNHILL LIMIT OF THE WORK AS PROTECTION AGAINST CONSTRUCTION RELATED EROSION. INSTALL ALL NECESSARY STORMWATER DIVERSIONS AND DISPERSION MEASURES.
2. PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN FOURTEEN (14) CALENDAR DAYS AFTER FINAL GRADING HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE OR PRACTICAL TO PERMANENTLY STABILIZE DISTURBED LAND, TEMPORARY EROSION CONTROL MEASURES SHALL BE IMPLEMENTED ON DISTURBED AREAS INCLUDING STOCKPILES WITHIN FOURTEEN (14) CALENDAR DAYS OF EXPOSURE OF SOIL OR FORMATION OF PILES UNLESS THESE AREAS ARE TO BE SUBSEQUENTLY SURFACED. ALL DISTURBED AREAS SHALL BE MULCHED FOR EROSION CONTROL UPON COMPLETION OF ROUGH GRADING.
3. ANY EXPOSED SLOPES 3:1 OR GREATER SHALL BE STABILIZED WITH EROSION CONTROL BLANKET TO PREVENT EROSION DURING CONSTRUCTION AND TO FACILITATE REVEGETATION AFTER TOPSOILING AND SEEDING. SEE DETAIL 4 ON C501.
4. EXISTING TOPSOIL SHALL BE SAVED, STOCKPILED, AND REUSED AS MUCH AS POSSIBLE ON SITE. SEDIMENT BARRIER SHALL BE INSTALLED AT THE BASES OF STOCKPILES AT THE DOWNHILL LIMITS TO PROTECT AGAINST EROSION. STOCKPILES SHALL BE STABILIZED BY SEEDING AND MULCHING UPON FORMATION OF THE PILES. UPGRADIENT OF THE STOCKPILES, STABILIZED DITCHES AND/OR BERMS SHALL BE CONSTRUCTED TO DIVERT STORMWATER RUNOFF AWAY FROM THE PILES.
5. INTERCEPTED SEDIMENT SHALL BE REMOVED AND SHALL BE DEPOSITED TO AN AREA THAT SHALL NOT CONTRIBUTE TO OFF-SITE SEDIMENTATION, AND SHALL BE PERMANENTLY STABILIZED.
6. ADDITIONAL EROSION CONTROL METHODS SHALL BE IMPLEMENTED IF CONSTRUCTION OCCURS AFTER DECEMBER 15TH. ALL DISTURBED AREAS SHALL BE MINIMIZED TO THE EXTENT POSSIBLE. PRIOR TO FREEZING, ADDITIONAL EROSION CONTROL DEVICES SHALL BE INSTALLED AS APPROVED BY THE ENGINEER. INSPECTION OF THESE EROSION CONTROL ITEMS SHALL BE FREQUENT, WITH PARTICULAR ATTENTION PAID TO WEATHER PREDICTIONS TO ENSURE THAT THESE MEASURES ARE PROPERLY IN PLACE TO HANDLE LARGE QUANTITIES OF RUNOFF RESULTING FROM HEAVY RAINS AND/OR EXCESSIVE THAWS.
7. GENERAL EROSION AND SEDIMENTATION CONTROL ACTIONS SHALL INCLUDE THE FOLLOWING:
   - MARK SOIL DISTURBANCE LIMITS
   - INSTALL SEDIMENT BARRIERS BEFORE COMMENCING CONSTRUCTION
   - DIVERT AND DISPERSE STORM WATER RUNOFF TO UNDISTURBED AREAS WHEREVER POSSIBLE
   - MULCH DISTURBED AREAS
   - PROTECT STEEP SLOPES
   - INSPECT AND REPAIR EROSION CONTROLS AND SEDIMENT BARRIERS
   - REMOVE ACCUMULATED SEDIMENT

DUST CONTROL:

1. CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED SO THAT A MINIMUM AMOUNT OF OF DISTURBED SOIL IS EXPOSED AT ONE TIME.
2. DUST SHALL BE CONTROLLED ON CONSTRUCTION ROUTES AND OTHER DISTURBED AREAS SUBJECT TO SURFACE DUST MOVEMENT AND DUST BLOWING.
3. MAINTAIN DUST CONTROL MEASURES PROPERLY THROUGH DRY WEATHER PERIODS UNTIL ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
4. DUST CONTROL METHODS SHALL INCLUDE VEGETATIVE COVER, MULCH, WATER SPRINKLING, STONE, AND BARRIERS.
5. VEGETATIVE COVER - FOR DISTURBED AREAS NOT SUBJECT TO TRAFFIC, VEGETATION PROVIDES THE MOST PRACTICAL METHOD OF DUST CONTROL.
6. MULCH - WHEN PROPERLY APPLIED, MULCH OFFERS A FAST, EFFECTIVE MEANS OF CONTROLLING DUST.
7. SPRINKLING - THE SITE MAY BE SPRINKLED WITH WATER UNTIL THE SURFACE IS WET. SPRINKLING IS ESPECIALLY EFFECTIVE FOR DUST CONTROL ON HAUL ROADS AND OTHER TRAFFIC ROUTES. THE GROUND SURFACE SHALL NOT BE WATERED EXCESSIVELY, RUNOFF SHALL NOT OCCUR.
8. STONE - USED TO STABILIZE CONSTRUCTION ROADS; CAN ALSO BE EFFECTIVE FOR DUST CONTROL.
9. BARRIERS - A BOARD FENCE, WIND FENCE, SEDIMENT FENCE, OR SIMILAR BARRIER CAN CONTROL AIR CURRENTS AND BLOWING SOIL. ALL OF THESE FENCES ARE NORMALLY CONSTRUCTED OF WOOD AND THEY PREVENT EROSION BY OBSTRUCTING THE WIND NEAR THE GROUND AND PREVENTING THE SOIL FROM BLOWING OFFSITE.

SEEDING AND REVEGETATION PLAN:

UPON COMPLETION OF SITE CONSTRUCTION, ALL AREAS PREVIOUSLY DISTURBED SHALL BE TREATED AS STATED BELOW. THESE AREAS WILL BE CLOSELY MONITORED BY THE CONTRACTOR UNTIL SUCH TIME AS A SATISFACTORY GROWTH OF VEGETATION IS ESTABLISHED. SATISFACTORY GROWTH SHALL MEAN A MINIMUM OF 80% OF THE AREA IS VEGETATED WITH VIGOROUS GROWTH.

1. TOPSOIL WILL BE SPREAD OVER ALL DISTURBED AREAS TO BE REVEGETATED AND SHALL BE GRADED TO A DEPTH OF FOUR (4) TO SIX (6) INCHES.
2. FERTILIZER AT A 10-10-10 PROPORTION SHALL BE MIXED WITH HYDROSEED (AND LIME, IF REQUIRED) AT A RATE OF 300 LBS. PER ACRE.
3. WOOD FIBER MULCH SHALL BE APPLIED AT A RATE OF 2,000 LBS. PER ACRE FOR MAXIMUM MOISTURE RETENTION RESULTS.
4. NO SEEDING OR SOIL PREPARATION SHALL BE DONE IF SOILS ARE MUDDY, DRY, AND/OR COMPACTED. BARE SOILS SHALL BE RAKED TO REMOVE STILL CLODS. LUMPS, BRUSH, ROOTS, STUMPS, LITTLE AND OTHER FOREIGN MATTER. MAJOR RUTTS AND DEPRESSIONS FROM CONSTRUCTION ACTIVITIES SHALL BE FILLED WITH ADDITIONAL LOAM AND THE SOIL SHALL BE RE-GRADED TO A RELATIVELY SMOOTH FINISH CORRESPONDING TO THE REQUIRED GRADES.
5. DISTURBED AREAS SHALL BE SEEDED USING ONE OF THE FOLLOWING MIXES AS DIRECTED BY THE OWNER AND ENGINEER DEPENDING ON THE TIME OF YEAR AND AMOUNT OF SEEDING REQUIRED:
   - 5.1 CT PERMANENT SEED MIX: AT THE RATE OF 1 LB. PER 1,000 SQ. FT. OF THE FOLLOWING MIXTURE: 45% KENTUCKY BLUEGRASS, 45% CREEPING RED FESCUE, AND 10% PERENNIAL RYEGRASS (CTDEEP PERMANENT SEED MIX. NO. 1).
   - 5.2 SEEDING SHOULD BE PLANTED TO A DEPTH OF 1/4 TO 1/2 INCHES.
   - 5.3 SEEDING METHODS MAY BE DRILL SEEDINGS, BROADCASTS AND ROLLED, CULTIPACKED, OR TRACKED WITH A SMALL TRACK PIECE OF CONSTRUCTION EQUIPMENT, OR HYDROSEEDING, WITH SUBSEQUENT TRACKING. TACKIFIER SHALL BE USED IN HYDROSEED TO HELP IT ADHERE TO THE SOIL AND ANY SLOPES PROPERLY.
6. SEEDING SHALL BE COMPLETED BETWEEN THE DATES OF APRIL 1 THROUGH JUNE 15 AND AUGUST 15 THROUGH OCTOBER 1. WATERING MAY BE REQUIRED DURING DRY PERIODS.
7. WINTER EROSION CONTROL SHALL CONSIST OF TEMPORARY SEEDING USING THE CT PERMANENT SEED MIX NO. 1 WITH WINTER RYE ADDED, AND EROSION CONTROL BLANKET, AS NEEDED.
8. STEEP SLOPES (3:1 AND STEEPER), IF ENCOUNTERED, SHALL BE STABILIZED BY INSTALLING EROSION CONTROL BLANKET (NORTH AMERICAN GREEN, BIONET SC150BN OR EQUAL. ECB SHALL BE INSTALLED USING STAPLE PATTERN C IN ACCORDANCE WITH THE INSTALLATION DETAIL INCLUDED ON C501).
9. IF FINAL SEEDING OF THE DISTURBED AREA IS NOT COMPLETED BY OCTOBER 1ST OF THE YEAR OF CONSTRUCTION THEN, WITHIN THE NEXT 10 CALENDAR DAYS, THESE AREAS SHALL BE GRADED AND SMOOTHED, THEN SEEDED TO A WINTER COVER CROP OF WINTER RYE AT A RATE OF 3 LBS. PER 1,000 SQ. FT. THE FOLLOWING SHALL BE INCORPORATED INTO THE SOIL PRIOR TO WINTER RYE SEEDING: GROUND LIMESTONE AT A RATE OF 100 LBS. PER 1,000 SQ. FT., FOLLOWED BY A 10-10-10 FERTILIZER AT A RATE OF 14 LBS. PER 1,000 SQ. FT. HAY MULCH SHALL BE APPLIED AT A RATE OF 100 LBS. PER 1,000 SQ. FT. FOLLOWING SEEDING. IF THE WINTER RYE SEEDING CANNOT BE COMPLETED BY OCTOBER 1, OR DOES NOT MAKE ADEQUATE GROWTH BY NOVEMBER 1, THEN ON THAT DATE, HAY MULCH SHALL BE APPLIED AT THE RATE OF 100 LBS. PER 1,000 SQ. FT. A SUITABLE BINDER SUCH AS CURASOL OR RMB PLUS SHALL BE USED ON HAY MULCH FOR WIND CONTROL. EROSION CONTROL BLANKET WILL BE INSTALLED ON STEEP SLOPES (3:1 AND STEEPER) AND ON AREAS OF CONCENTRATED FLOWS.
10. INSPECT SEEDED AREAS FOR FAILURE AND MAKE NECESSARY REPAIRS AND RESEED IMMEDIATELY. CONDUCT A FOLLOW-UP SURVEY AFTER ONE YEAR AND RESEED USING CT DEEP PERMANENT SEED MIX NO. 1 WHERE NECESSARY TO ESTABLISH PERMANENT SEEDING AND STABILIZATION.
11. IF THERE ARE AREAS WITH LESS THAN 40% COVER, REEVALUATE CHOICE OF PLANT MATERIALS AND QUANTITIES OF LIME AND FERTILIZER. IF THE SEASON PREVENTS RESOWING, MULCH OR JUTE NETTING IS AN EFFECTIVE TEMPORARY COVER.
12. SEEDED AREAS SHOULD BE FERTILIZED DURING THE SECOND GROWING SEASON.
13. LIME AND FERTILIZE THEREAFTER AT PERIODIC INTERVALS, AS NEEDED.
14. ALL SEDIMENT CONTROL STRUCTURES WILL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED. ESTABLISHED MEANS A MINIMUM OF 80%, OF THE AREA IS VEGETATED WITH VIGOROUS GROWTH AS DETERMINED BY THE ENGINEER.
15. THE CONTRACTOR SHALL MAINTAIN THE ENTIRE SEEDED AREAS UNTIL FINAL ACCEPTANCE AT THE COMPLETION OF THE PROJECT OR FOR 90 DAYS, WHICHEVER IS LONGER. MAINTENANCE SHALL INCLUDE WATERING ON AN AS-NEEDED BASIS SUCH THAT ESTABLISHMENT OF AT LEAST 80% OF THE SEEDED AREAS IS ACHIEVED AFTER ONE GROWING SEASON. THE CONTRACTOR SHALL FURNISH ALL REQUIRED WATER AT NO EXPENSE TO THE OWNER.
16. ALL BARE SPOTS, WHICH BECOME APPARENT AS THE GRASS GERMINATES, SHALL BE RESEEDED BY THE CONTRACTOR AT HIS/HER OWN EXPENSE AS MANY TIMES AS NECESSARY TO SECURE AN ADEQUATE GROWTH, AND THE ENTIRE AREA SHALL BE MAINTAINED AND CUT UNTIL ALL WORK HAS BEEN COMPLETED AND FINAL ACCEPTANCE HAS OCCURRED. RESEDEEING SHALL BE ACCOMPLISHED BY MECHANICAL MEANS AS DETERMINED BY THE AREA OF RESEEDING TO BE ACCOMPLISHED.
17. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES ARE NECESSARY TO PROTECT THE GRASS WHILE IT IS GERMINATING. THESE MEASURES SHALL INCLUDE SPRINKLING STRAW OR WOOD FIBER MULCH TO COVER THE AREA, AND/OR FURNISHING OF WARNING SIGNS, BARRIERS, TEMPORARY FENCE OR ANY OTHER NECESSARY MEASURES OF PROTECTION.
18. CONTRACTOR SHALL FURNISH, PROTECT, AND MAINTAIN ALL TEMPORARY BARRIERS UNTIL FINAL ACCEPTANCE OF THE SEEDED AREAS BY THE OWNER AND SHALL REMOVE THEM UPON SUCH FINAL ACCEPTANCE, THE BARRIERS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AT ALL TIMES.
19. AFTER THE ENGINEER HAS DETERMINED THAT THE PROJECT AREA HAS STABILIZED, THE CONTRACTOR SHALL REMOVE ALL SEDIMENT BARRIERS AND ANY OTHER TEMPORARY EROSION CONTROL MEASURES WITHIN 30 DAYS.

NOT FOR CONSTRUCTION

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Project:

GROTON LANDFILL
SOLAR PV DEVELOPMENT

685 FLANDERS ROAD
GROTON, CT 06340

Weston & Sampson
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CBYD.com 811
Call Before You Dig, Inc.

Revisions:

No.	Date	Description
5	04/07/2026	ADDED ACCESS DRIVE & MSW WASTE LINE
4	01/30/2026	EQUIPMENT LAYOUT / GRADING
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1	05/30/2025	NO CHANGES THIS SHEET
0	05/05/2025	ISSUED FOR PERMITTING

Seal:

Issued For:

PERMITTING

Scale: AS SHOWN

Date Created: 05/05/2025
Drawn By: DED
Reviewed By: MRC
Approved By: RJB

W&S Project No.: ENG25-0020
W&S File No.: Verogy Groton

Drawing Title:

NOTES AND SPECIFICATIONS

Sheet Number:

C001

NOTES:

1. THE CONSTRUCTION ENTRANCE SHALL BE REMOVED UPON SUBSTANTIAL COMPLETION OF THE PROJECT.
2. CONTRACTOR SHALL USE EXISTING OR PROPOSED ACCESS ROADS AS SHOWN ON THE PLAN. DIVERSION BERMS ASSOCIATED WITH THE EXISTING LANDFILL CAPPING SYSTEM SHALL NOT BE USED FOR ACCESS AND SHALL REMAIN PROTECTED AT ALL TIMES. EXISTING DIRT ACCESS DRIVES SHALL BE UPGRADED WITH GRAVEL, AS NEEDED, TO MAINTAIN THE INTEGRITY OF THE LANDFILL CAP.
3. APPROXIMATE MSW WASTE LINE TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS PLAN FLANDERS ROAD LANDFILL WITH PROPOSED MONITORING WELL LOCATIONS", PREPARED BY CAMP DRESSER & MCKEE INC., DATE UNKNOWN.
4. APPROXIMATE BULKY WASTE LINE TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS PLAN FLANDERS ROAD LANDFILL WITH PROPOSED MONITORING WELL LOCATIONS", PREPARED BY CAMP DRESSER & MCKEE INC., DATE UNKNOWN.
5. TEMPORARY ACCESS PATHS SHALL BE CONSTRUCTED FOLLOWING THE TEMPORARY ACCESS DRIVE DETAIL ON C501, AS NEEDED, ON THE LANDFILL CAP FOR ADDITIONAL ACCESS TRAVEL WAYS.

LEGEND:

- PROPERTY LINE
- ABUTTER'S PROPERTY LINE
- INTERIOR LOT LINES
- MAJOR CONTOUR
- MINOR CONTOUR
- APPROXIMATE LIMIT OF BULKY WASTE
- APPROXIMATE LIMIT OF MSW WASTE
- FEMA LINE
- WETLANDS LINE
- 100' UPLAND REVIEW AREA
- TREE LINE
- TRUNK LINE
- BERM (NO ACCESS, SEE NOTE 2)
- DRAINAGE PIPE
- STONEWALL
- FENCE
- OVERHEAD WIRES
- RETAINING WALL
- CONCRETE
- DIRT ACCESS WAY
- PAVEMENT
- STRUCTURE
- WETLAND FLAG WITH IDENTIFIER
- GUY WIRE
- TREE

LEGEND:

- LIMIT OF DISTURBANCE
- FENCE (2/C502)
- ABOVE GROUND ELECTRIC CONDUIT
- OVERHEAD ELECTRIC
- UTILITY POLE
- SOLAR PV RACK AND PANELS (1/C502)
- SEDIMENT BARRIER (3/C501)
- TREE LINE
- VENT PROTECTIVE BARRIER
- LAYDOWN AREA

0 50' 100' 200'
1" = 100' HORIZONTAL

NOT FOR CONSTRUCTION

Project:
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SOLAR PV DEVELOPMENT

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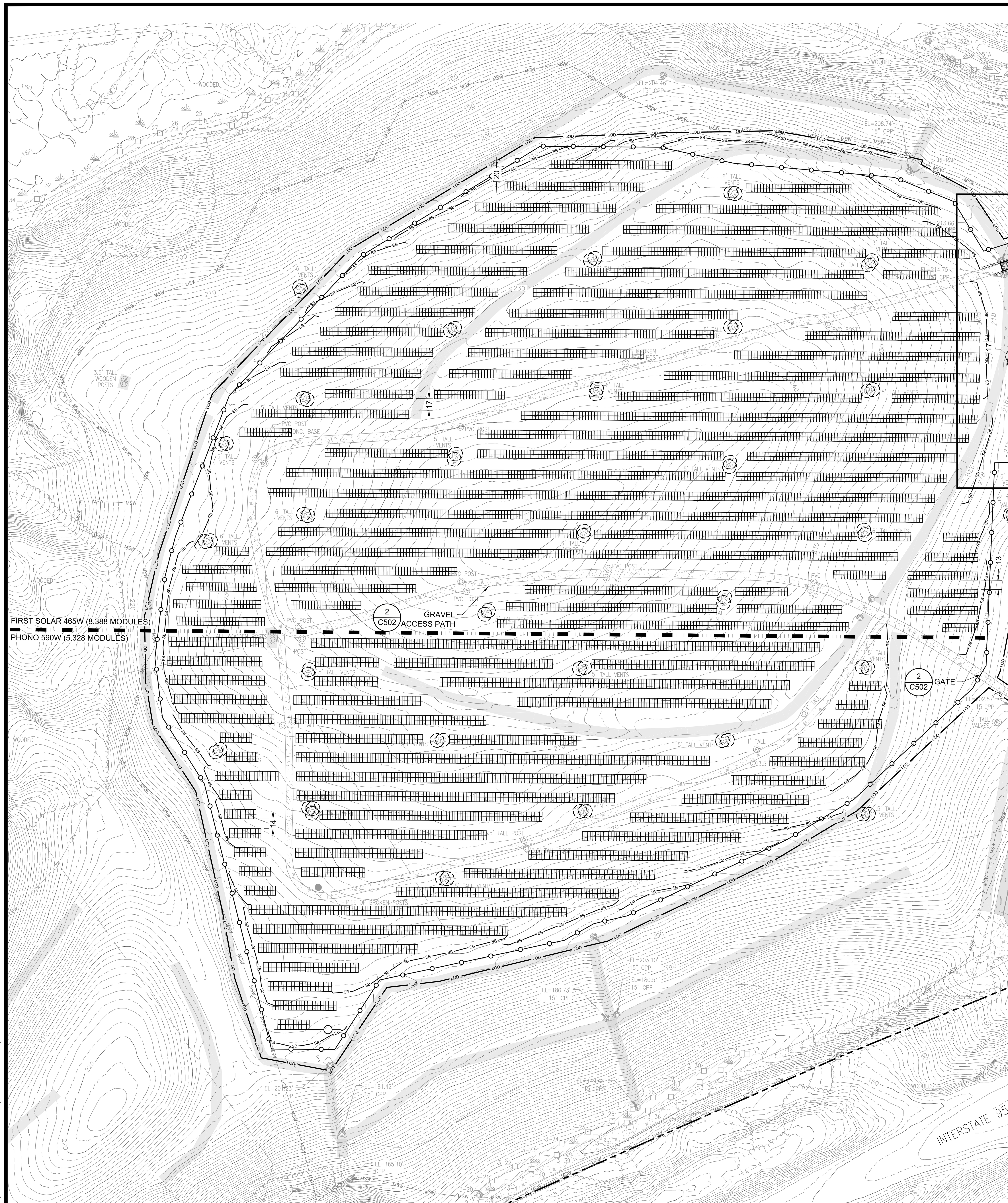
Seal:

Issued For:
PERMITTING

Scale: AS SHOWN
Date Created: 05/05/2025
Drawn By: DED
Reviewed By: MRC
Approved By: RJB
W&S Project No.: ENG25-0020
W&S File No.: Verogy Groton

Drawing Title:
EROSION & SEDIMENTATION CONTROL PLAN

Sheet Number:
C101



0 40' 80' 160'
1" = 80' HORIZONTAL

LEGEND:

- LIMIT OF DISTURBANCE
- FENCE (2 / C502)
- ABOVE GROUND ELECTRIC CONDUIT
- OVERHEAD ELECTRIC
- UTILITY POLE
- SOLAR PV RACK AND PANELS (1 / C502)
- SEDIMENT BARRIER (3 / C501)
- TREE LINE
- VENT PROTECTIVE BARRIER
- LAYDOWN AREA

NOTES:

1. ELECTRICAL DESIGN, INCLUDING UTILITY POLES, PERFORMED BY OTHERS. ELECTRICAL EQUIPMENT AND COMPONENTS SHOWN TO ILLUSTRATE LOCATIONS ONLY. REFER TO ELECTRICAL DRAWINGS FOR DETAILED ELECTRICAL SYSTEM INFORMATION.
2. SOLAR ARRAY LAYOUT AND CAPACITY IS SUBJECT TO FINAL DESIGN (BY OTHERS) BUT WILL REMAIN WITHIN THE PROPOSED LIMITS OF WORK. PROPOSED FENCE MAY BE RELOCATED BEYOND THE LIMIT OF WORK PENDING FINAL DESIGN.
3. CONTRACTOR SHALL PERFORM HAND-EXCAVATED TEST PITS AT PROPOSED UTILITY POLE AND UNDERGROUND ELECTRIC LOCATIONS TO CONFIRM THE LOCATIONS ARE OFF THE LANDFILL CAP.
4. CABLE TRAY CROSSING SHALL BE OLD CASTLE PLASTIBETON CABLE TRENCH OR EQUIVALENT, FINAL DESIGN BY OTHERS PRIOR TO CONSTRUCTION.
5. REFER TO SHEET C101 FOR ALLOWABLE ACCESS PATHS DURING CONSTRUCTION. DIVERSION BERMS ASSOCIATED WITH THE EXISTING LANDFILL SHALL NOT BE USED FOR ACCESS, NOR TRAVEL/STAGING OF CONSTRUCTION EQUIPMENT/VEHICLES.
6. APPROXIMATE MSW WASTE LINE TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS PLAN FLANDERS ROAD LANDFILL WITH PROPOSED MONITORING WELL LOCATIONS", PREPARED BY CAMP DRESSER & McKEE INC., DATE UNKNOWN.
7. APPROXIMATE BULKY WASTE LINE TAKEN FROM A PLAN ENTITLED "EXISTING CONDITIONS PLAN FLANDERS ROAD LANDFILL WITH PROPOSED MONITORING WELL LOCATIONS", PREPARED BY CAMP DRESSER & McKEE INC., DATE UNKNOWN.

LEGEND:

- PROPERTY LINE
- ABUTTER'S PROPERTY LINE
- INTERIOR LOT LINES
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- MINOR CONTOUR
- APPROXIMATE LIMIT OF BULKY WASTE
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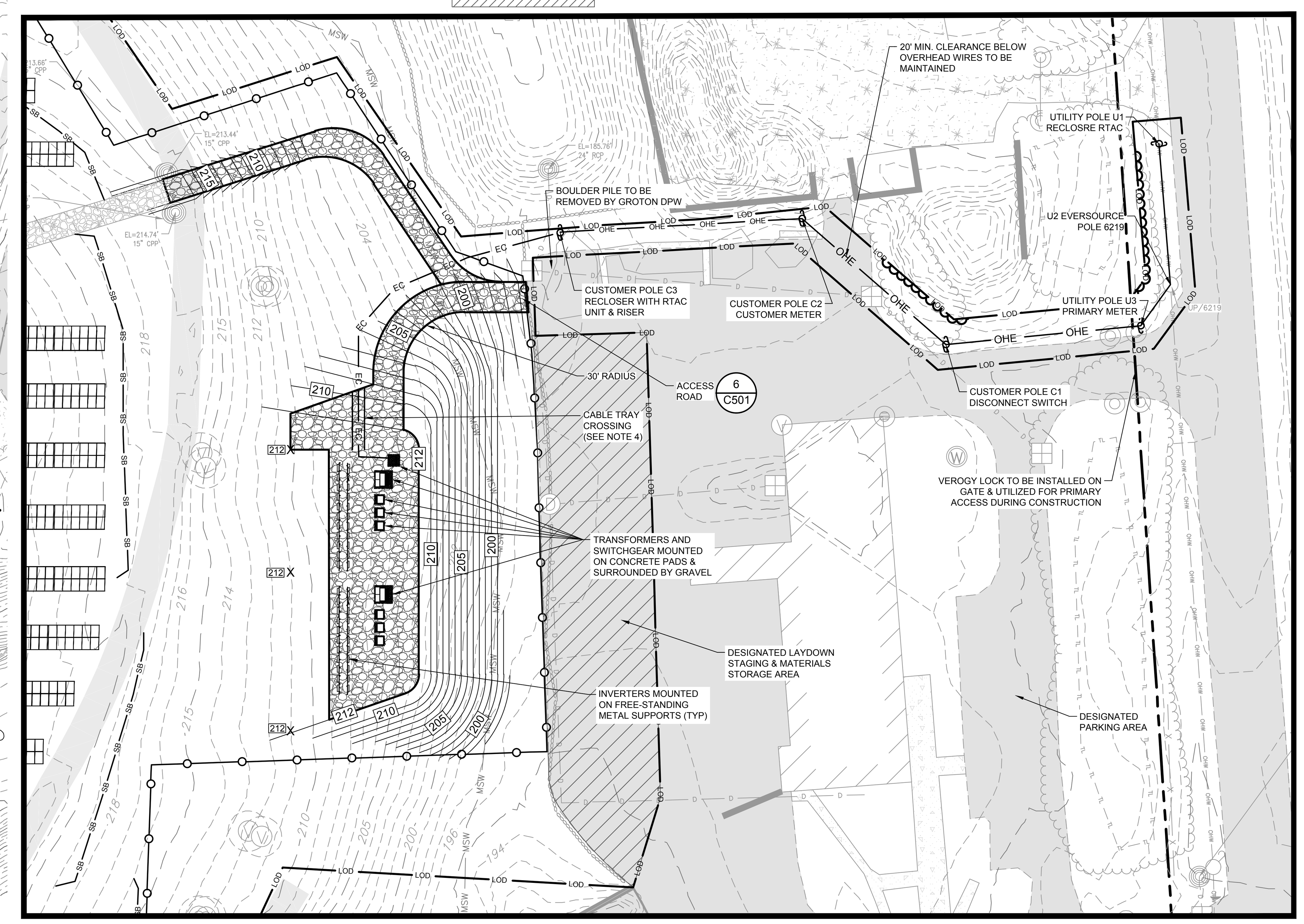

0 25' 50' 100'
1" = 50' HORIZONTAL

1 INSET
SCALE: AS SHOWN

NOT FOR CONSTRUCTION

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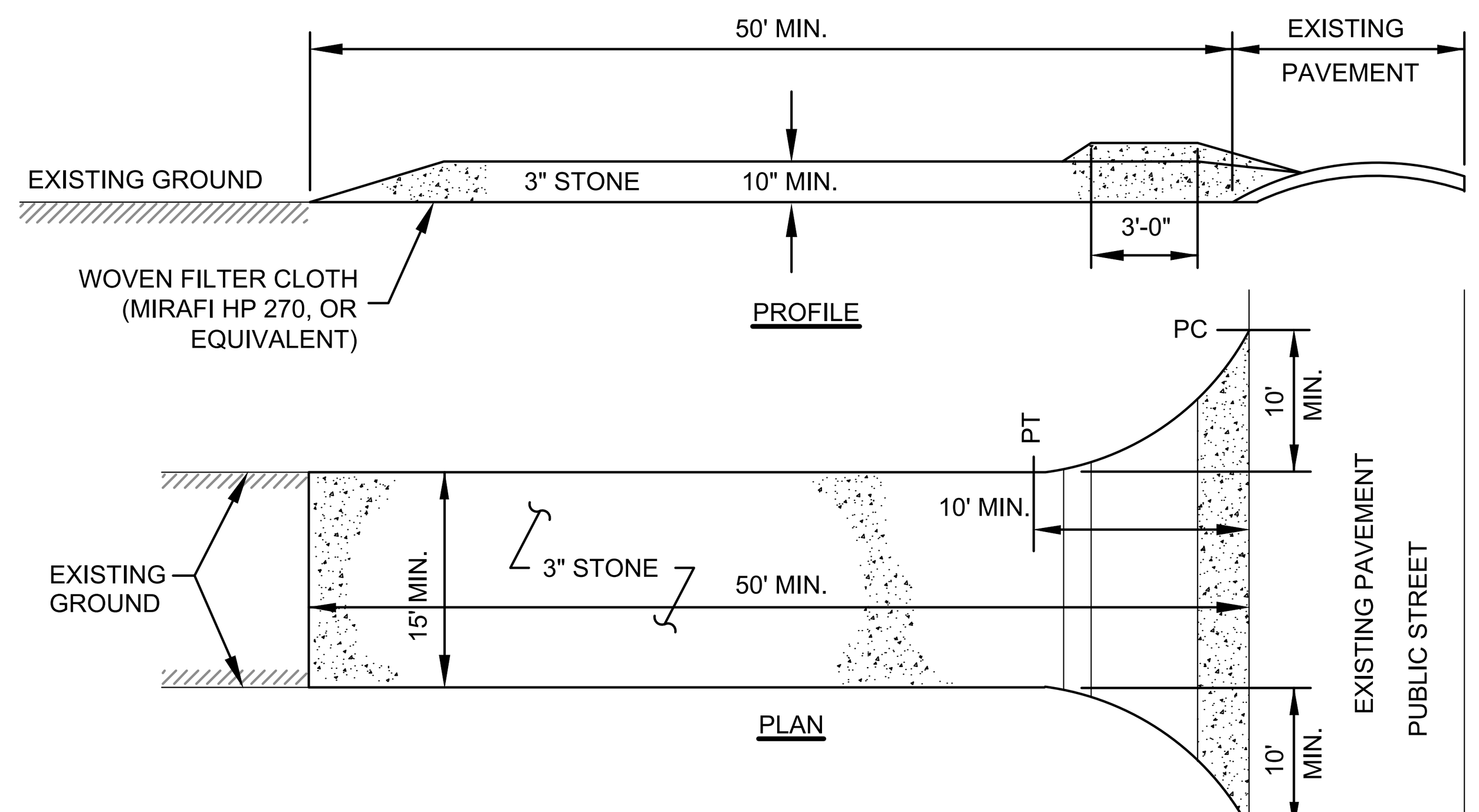
Drawn By: DED
Reviewed By: MRC
Approved By: RJB

W&S Project No.: ENG25-0020
W&S File No.: Verogy Groton

Drawing Title:
PROPOSED SITE PLAN

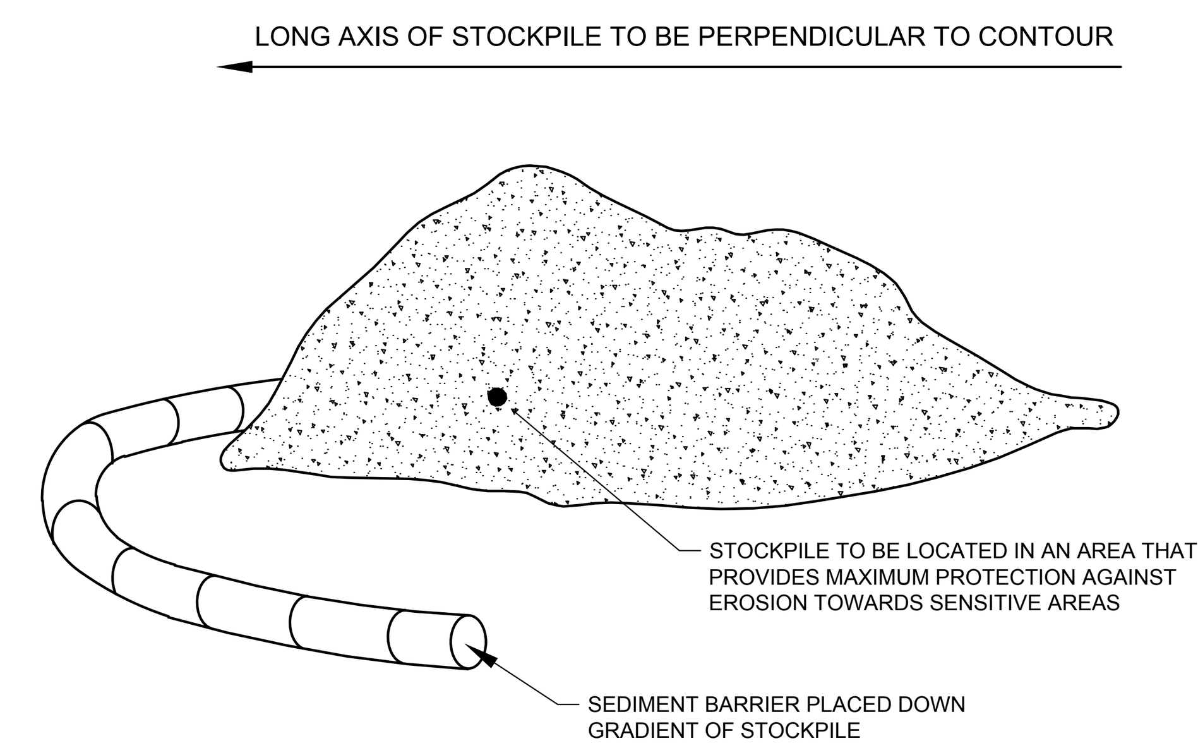
Sheet Number:
C102



STABILIZED CONSTRUCTION ENTRANCE NOTES:

1. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA FOLLOWING GRADING (AS NEEDED) TO LEVEL PAD PRIOR TO PLACING OF STONE.
2. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
3. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED BY THE CONTRACTOR IMMEDIATELY.
4. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
5. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
6. AT THE CONCLUSION OF PROJECT, ANY ACCUMULATED SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. REMOVAL OF ANTI-TRACKING PAD SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
7. P.C. = POINT OF CURVATURE
8. P.T. = POINT OF TANGENCY

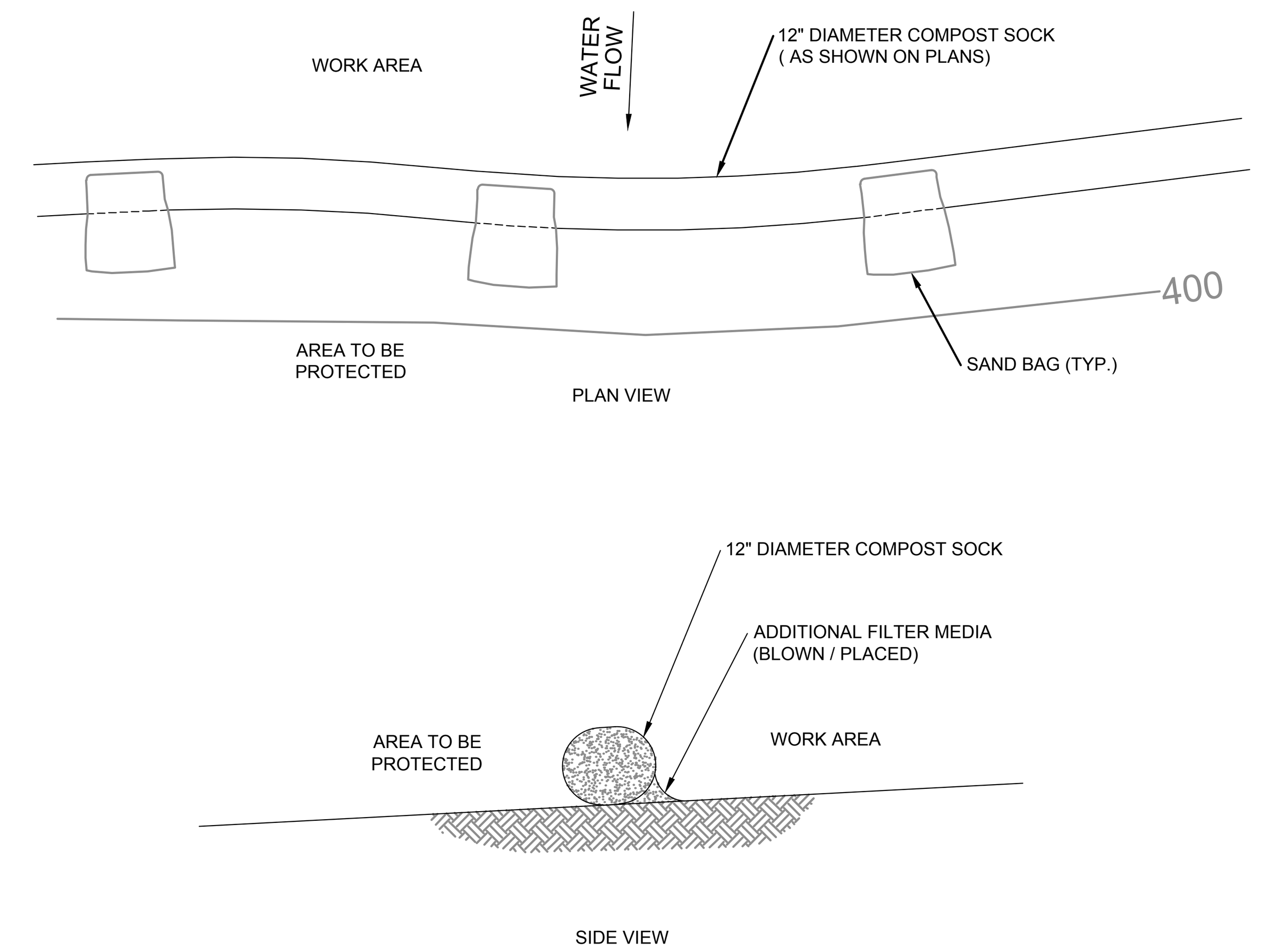
1 CONSTRUCTION ENTRANCE
SCALE: N.T.S.



NOTES:

1. STOCKPILE AREAS SHALL BE LOCATED OUTSIDE OF WETLANDS AND 50FT UPLAND REVIEW AREA.

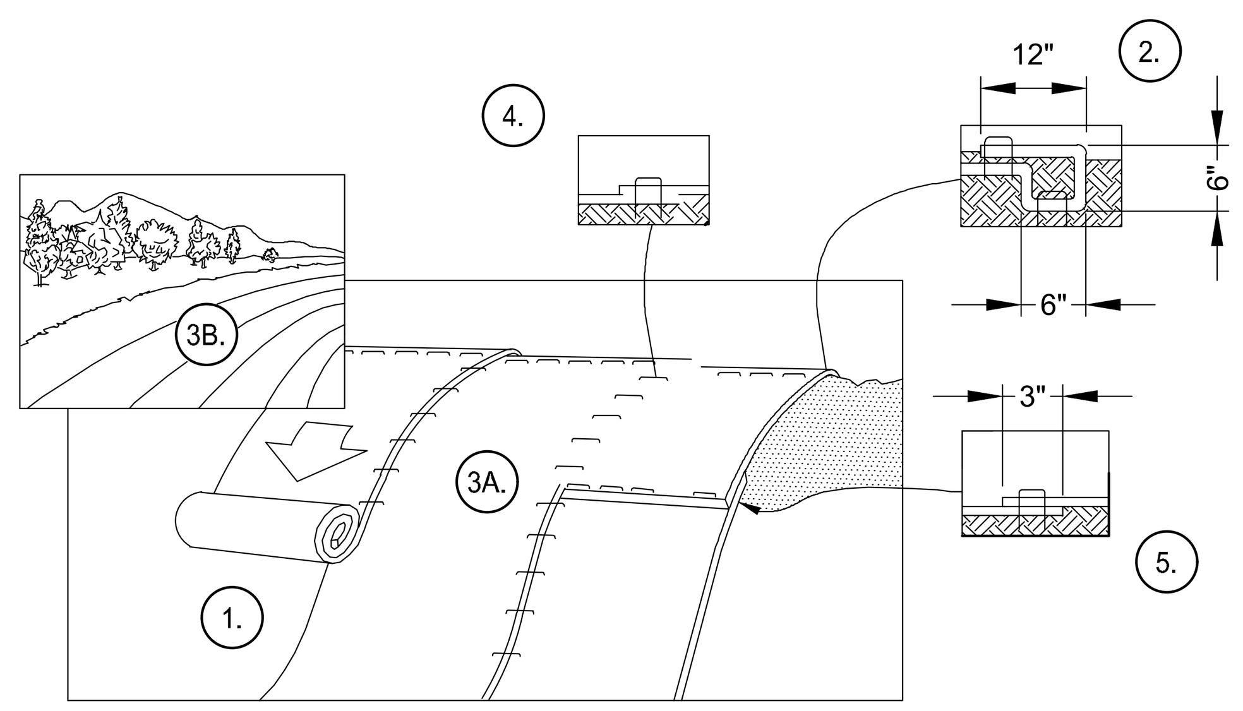
2 TEMPORARY STOCKPILE
SCALE: N.T.S.



NOTES:

1. SUPPORT POSTS OR STAKES ARE PROHIBITED FOR USE TO SECURE SEDIMENT BARRIER OVER THE EXISTING LANDFILL CAP. NO EROSION/SEDIMENTATION CONTROL DEVICE SHALL PENETRATE THE EXISTING LANDFILL CAP MATERIAL.
2. SAND BAGS TO BE SPACED EQUALLY TO SECURE COMPOST SOCKS IN PLACE, IF REQUIRED.
3. UPON COMPLETION, COMPOST MATERIAL TO BE DISPERSED ON SITE AS DETERMINED BY ENGINEER.

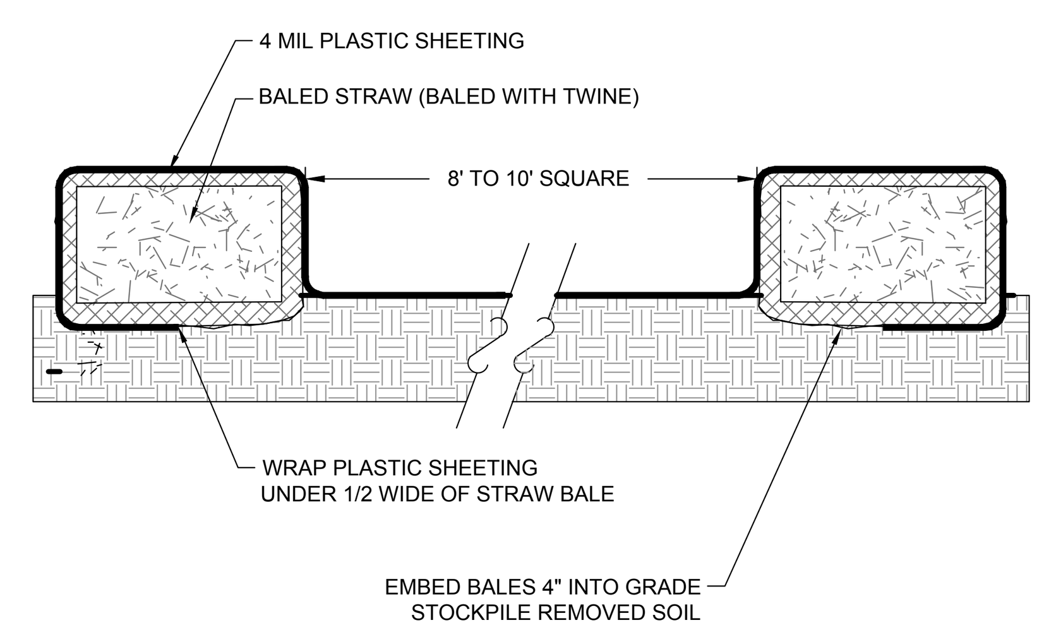
3 COMPOST SOCK SEDIMENT CONTROL BARRIER
SCALE: N.T.S.



NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
6. ALL 3H:1V SLOPES SHALL BE STABILIZED WITH EROSION CONTROL BLANKETING. BLANKETING SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
7. ALL SLOPES STEEPER THAN 3H:1V SHALL BE STABILIZED WITH PERMANENT TURF REINFORCEMENT MATTING OR RIPRAP.

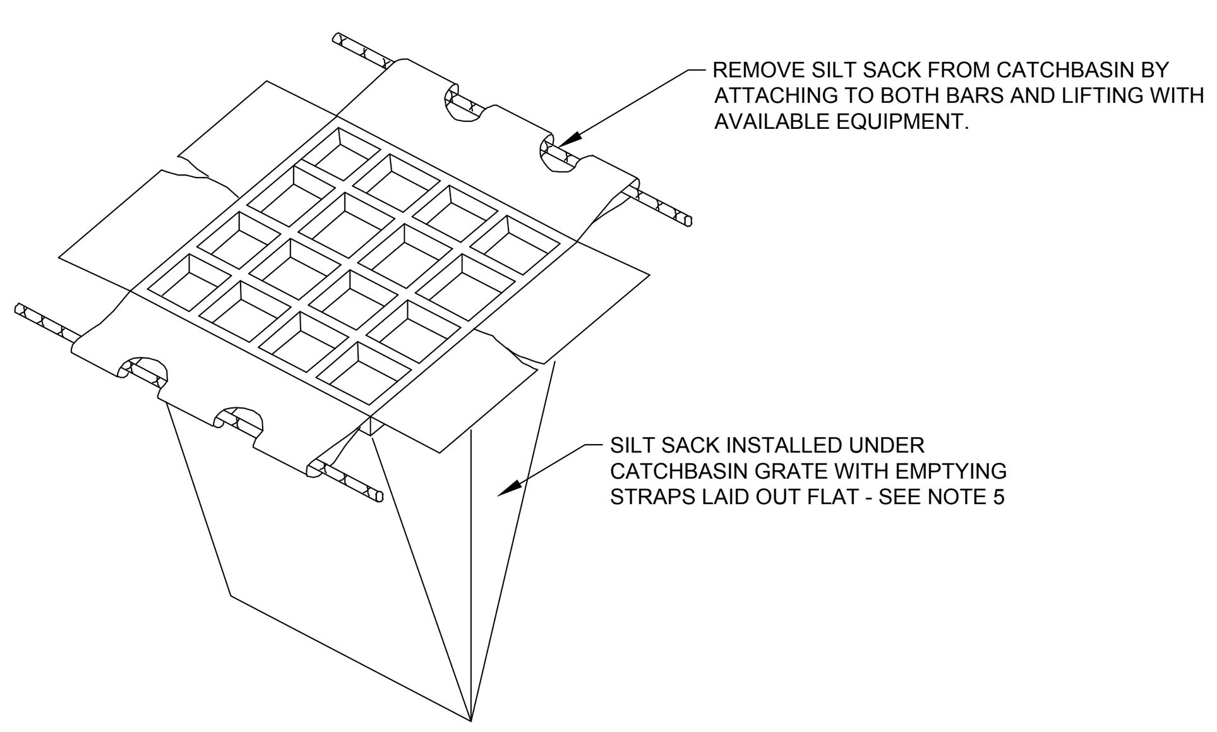
4 TEMPORARY EROSION CONTROL BLANKET
SCALE: N.T.S.



NOTES:

1. PLASTIC SHEETING SHALL BE FREE OF TEARS OR HOLES. AFTER BASIN IS USED, WASHWATER FROM WASHOUT BASIN SHALL EVAPORATE OR BE VACUUMED OUT. REMOVE REMAINING HARDENED SOLIDS. REPLACE PLASTIC SHEETING AND STRAWBALES AS REQUIRED.

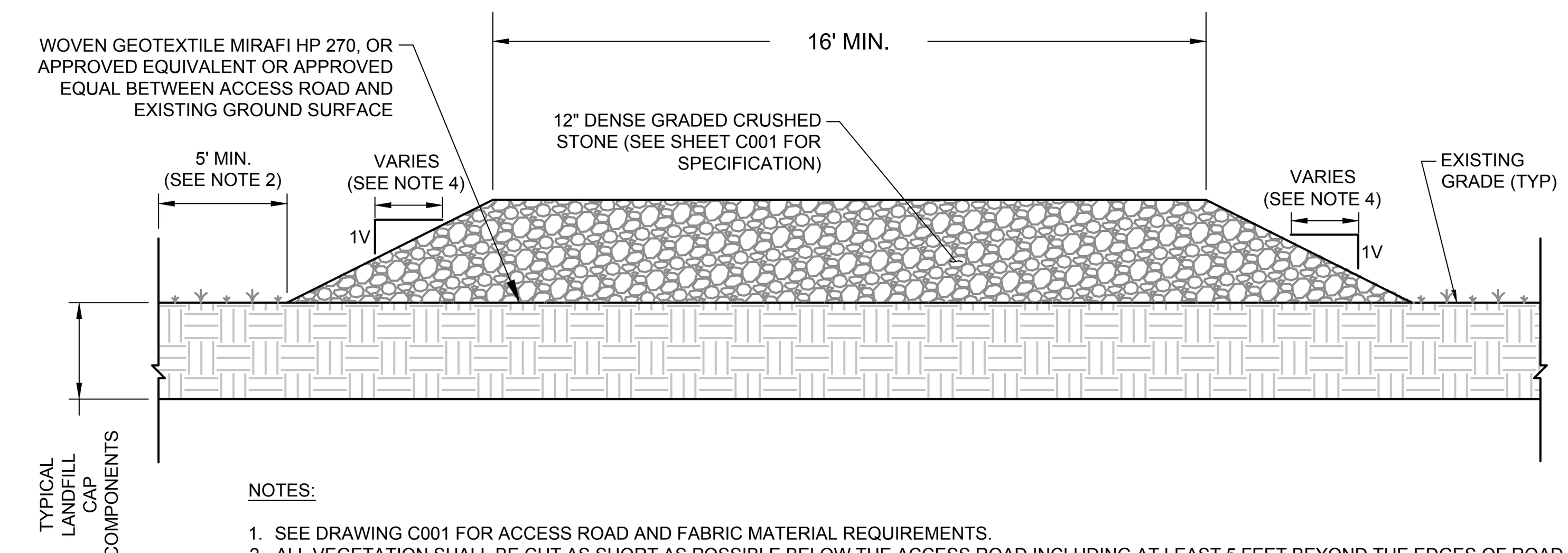
5 CONCRETE WASHOUT BASIN
SCALE: N.T.S.



NOTES:

1. REMOVE DRAIN GRATE AND INSERT SILT SACK, MAKING SURE EMPTYING STRAPS ARE LAID FLAT OUTSIDE OF BASIN.
2. REPLACE DRAIN GRATE TO HOLD SILT SACK INTO POSITION.
3. AS SILT SACK BECOMES FULL OF SEDIMENT, REMOVE WITH FRONT END LOADER (OR OTHER SUITABLE EQUIPMENT) AND EMPTY IN AN APPROVED LOCATION.
4. REPLACE EMPTIED SILT SACK BACK INTO CATCH BASIN.
5. PRODUCT SHALL BE ACF ENVIRONMENTAL TYPE A SILT SACK OR APPROVED EQUAL. INSTALL PER MANUFACTURER'S SPECIFICATIONS.

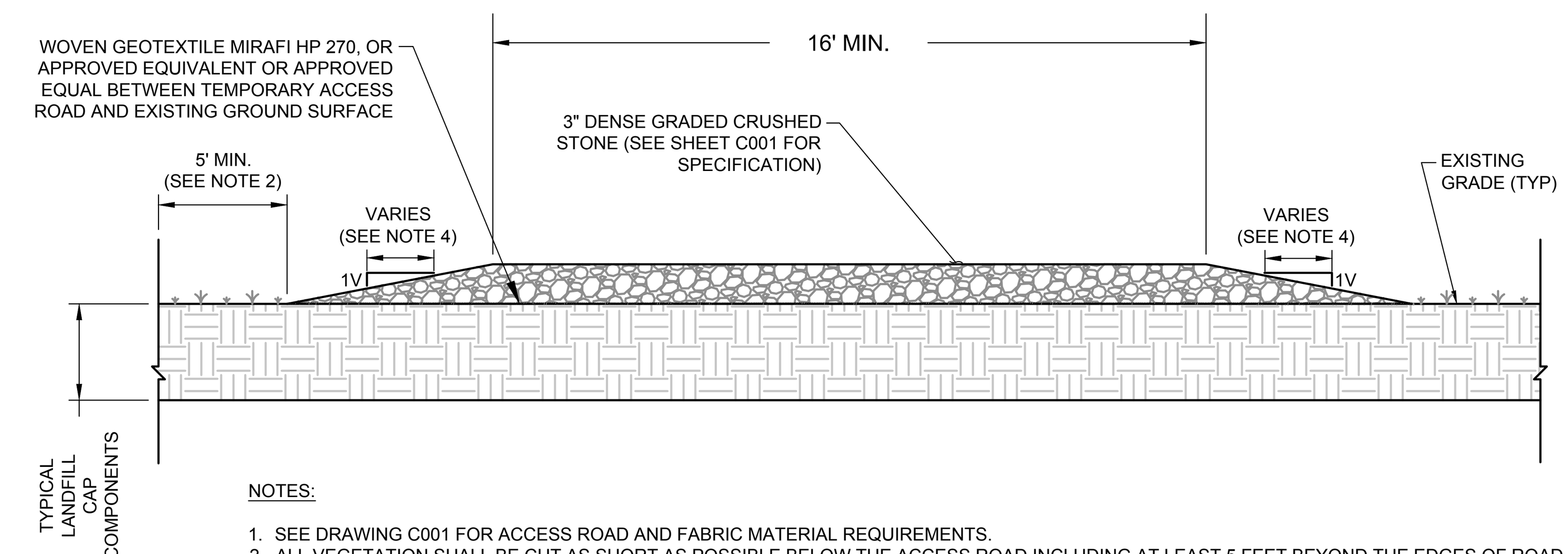
7 SILT SACK INSTALLATION IN CATCH BASIN
SCALE: N.T.S.



NOTES:

1. SEE DRAWING C001 FOR ACCESS ROAD AND FABRIC MATERIAL REQUIREMENTS.
2. ALL VEGETATION SHALL BE CUT AS SHORT AS POSSIBLE BELOW THE ACCESS ROAD INCLUDING AT LEAST 5 FEET BEYOND THE EDGES OF ROAD.
3. CABLE TRAY CROSSING FOR UTILITIES SHALL BE OLD CASTLE PLASTIBETON CABLE TRENCH OR EQUIVALENT, FINAL DESIGN BY OTHERS PRIOR TO CONSTRUCTION.
4. ACCESS ROAD SIDE SLOPES SHALL BE A MAXIMUM OF 2:1 AS SHOWN ON THE GRADING PLAN.

6 ACCESS ROAD DETAIL
SCALE: N.T.S.



NOTES:

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2. ALL VEGETATION SHALL BE CUT AS SHORT AS POSSIBLE BELOW THE ACCESS ROAD INCLUDING AT LEAST 5 FEET BEYOND THE EDGES OF ROAD.
3. CABLE TRAY CROSSING FOR UTILITIES SHALL BE OLD CASTLE PLASTIBETON CABLE TRENCH OR EQUIVALENT, FINAL DESIGN BY OTHERS PRIOR TO CONSTRUCTION.
4. ACCESS ROAD SIDE SLOPES SHALL BE A MAXIMUM OF 2:1 AS SHOWN ON THE GRADING PLAN.
5. TEMPORARY GRAVEL ACCESS PATHS SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION TO PROVIDE A STABLE NON-YIELDING SURFACE FOR EQUIPMENT. CONTRACTOR SHALL MAINTAIN ACCESS PATHS THROUGHOUT CONSTRUCTION. AT THE COMPLETION OF CONSTRUCTION TEMPORARY ACCESS PATHS, OUTSIDE OF EXISTING ACCESS PATH LOCATIONS, SHALL BE REMOVED AND AREAS SHALL BE DECOMPACTED, RESTORED WITH TOPSOIL AND SEEDED.

8 TEMPORARY ACCESS ROAD DETAIL
SCALE: N.T.S.

NOT FOR CONSTRUCTION

Project:
GROTON LANDFILL
SOLAR PV DEVELOPMENT

685 FLANDERS ROAD
GROTON, CT 06340

Weston & Sampson
WESTON & SAMPSON ENGINEERS, INC.
712 BROOK STREET, SUITE 103
ROCKY HILL, CT 06067
860.513.1473 800.SAMPSON
www.westonandsampson.com

Applicant:
VEROGY
VCP Groton LF, LLC
124 LaSalle Road
2nd Floor
West Hartford, CT 06107
Tel: (860) 288-7215
www.verogy.com

CBYD.com 811
Call Before You Dig, Inc.

Revisions:

No.	Date	Description
5	04/07/2026	ADDED ACCESS DRIVE & MSW WASTE LINE
4	01/30/2026	EQUIPMENT LAYOUT / GRADING
3	12/11/2025	PANEL AND UTILITY IX UPDATE
2	07/21/2025	CSC PETITION SUBMITTAL
1	05/30/2025	UPDATED UTILITY POLE AND ELECTRICAL EQUIPMENT LOCATIONS
0	05/05/2025	ISSUED FOR PERMITTING

Seal:

Issued For:
PERMITTING

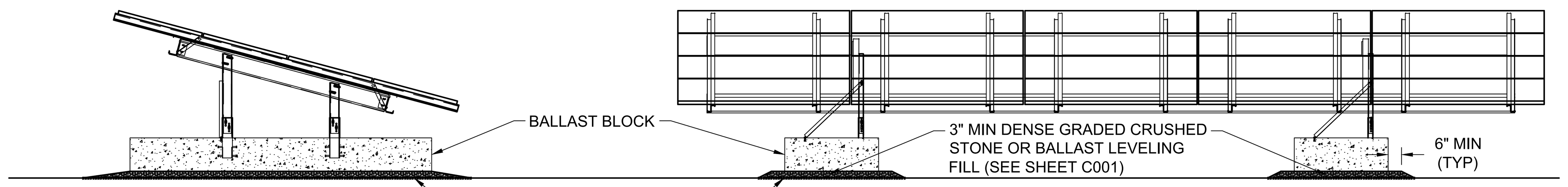
Scale: AS SHOWN

Date Created: 05/05/2025
Drawn By: DED
Reviewed By: MRC
Approved By: RJB

W&S Project No.: ENG25-0020
W&S File No.: Verogy Groton

Drawing Title:
DETAILS I

Sheet Number:
C501



NOTES:

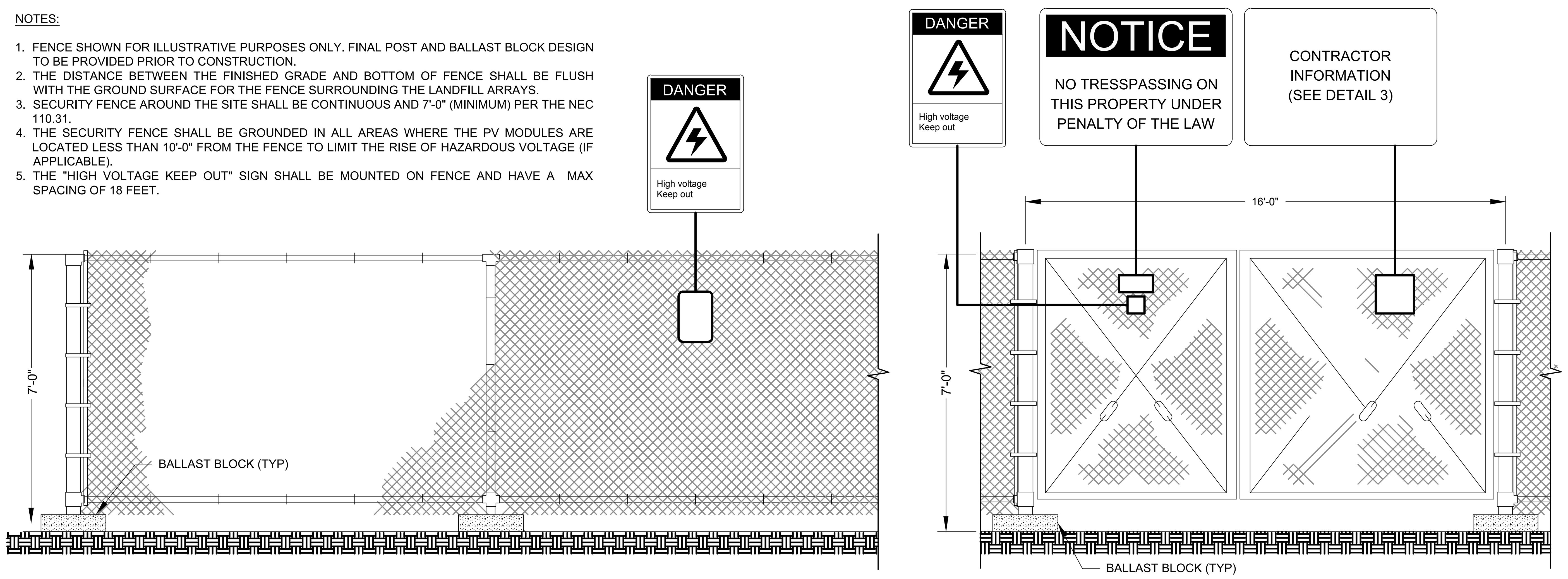
1. DESIGN FOR FOUNDATIONS, RACKING, AND MODULES BY OTHERS. DETAILS SHOWN FOR ILLUSTRATION PURPOSES ONLY.

1 BALLAST MOUNTED SOLAR PV ARRAY

SCALE: N.T.S.

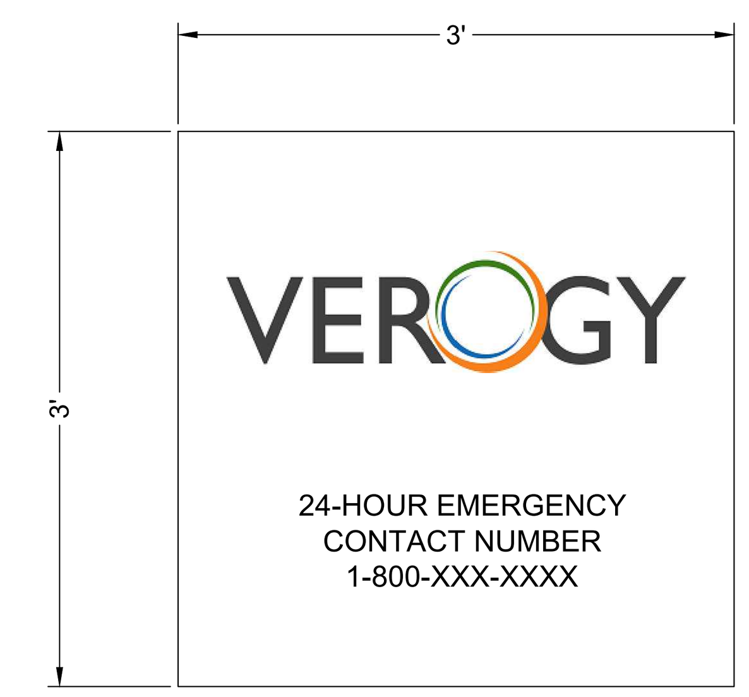
NOTES:

1. FENCE SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. FINAL POST AND BALLAST BLOCK DESIGN TO BE PROVIDED PRIOR TO CONSTRUCTION.
2. THE DISTANCE BETWEEN THE FINISHED GRADE AND BOTTOM OF FENCE SHALL BE FLUSH WITH THE GROUND SURFACE FOR THE FENCE SURROUNDING THE LANDFILL ARRAYS.
3. SECURITY FENCE AROUND THE SITE SHALL BE CONTINUOUS AND 7'-0" (MINIMUM) PER THE NEC 110.31.
4. THE SECURITY FENCE SHALL BE GROUNDED IN ALL AREAS WHERE THE PV MODULES ARE LOCATED LESS THAN 10'-0" FROM THE FENCE TO LIMIT THE RISE OF HAZARDOUS VOLTAGE (IF APPLICABLE).
5. THE "HIGH VOLTAGE KEEP OUT" SIGN SHALL BE MOUNTED ON FENCE AND HAVE A MAX SPACING OF 18 FEET.



2 BALLAST CHAIN LINK FENCE AND GATE

SCALE: N.T.S.



NOTES:

1. CONTRACTOR SHALL VERIFY CONTACT INFORMATION PRIOR TO CONSTRUCTION.

3 CONTRACTOR INFORMATION SIGN

SCALE: N.T.S.

NOT FOR CONSTRUCTION

Project:

GROTON LANDFILL
SOLAR PV DEVELOPMENT

685 FLANDERS ROAD
GROTON, CT 06340

WESTON & SAMPSON ENGINEERS, INC.
712 BROOK STREET, SUITE 103
ROCKY HILL, CT 06067
860.513.1473 800.SAMPSON
www.westonandsampson.com

Applicant:

VCP Groton LF, LLC
124 LaSalle Road
2nd Floor
West Hartford, CT 06107
Tel: (860) 288-7215
www.verogy.com

CBYD.com 811 Call Before You Dig, Inc.

Revisions:

No.	Date	Description
5	04/07/2026	ADDED ACCESS DRIVE & MSW WASTE LINE
4	01/30/2026	EQUIPMENT LAYOUT / GRADING
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0	05/05/2025	ISSUED FOR PERMITTING

Seal:

Issued For:

PERMITTING

Scale:	AS SHOWN
Date Created:	05/05/2025
Drawn By:	DED
Reviewed By:	MRC
Approved By:	RJB
W&S Project No.:	ENG25-0020
W&S File No.:	Verogy Groton

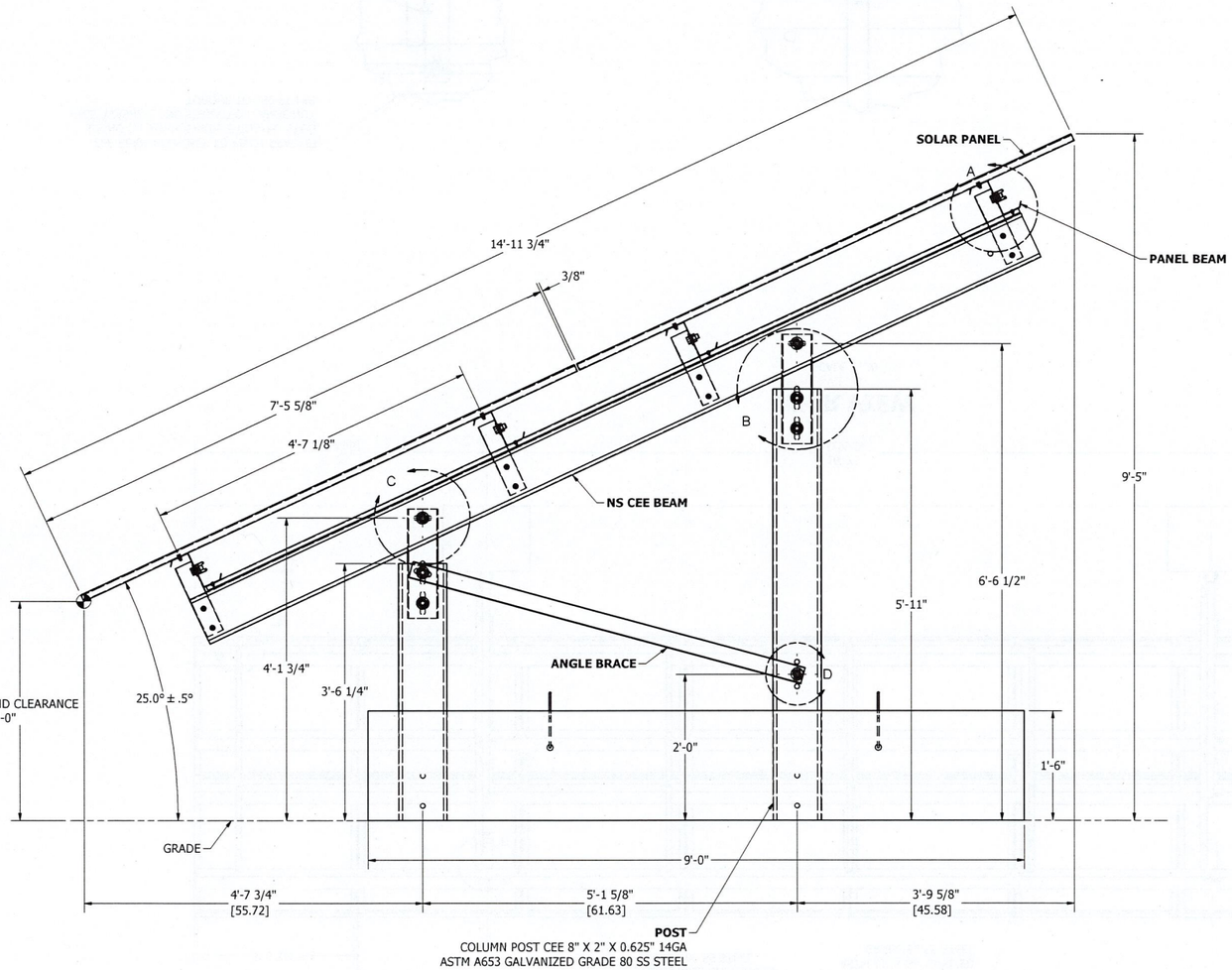
Drawing Title:

DETAILS II

Sheet Number:

C502

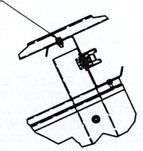
APPENDIX- A
STRUCTURAL DETAIL DRAWING



SIDE VIEW
VIEW1
SCALE 1 : 12

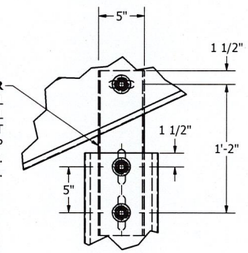
ALL PANEL MOUNTING HARDWARE CALLED OUT BELOW WILL BE PROVIDED BY DCE SOLAR. ANY CUSTOMIZED PANEL MOUNTING HARDWARE PROVIDED BY OTHERS MAY VOID DCE SOLAR'S UL2703 CERTIFICATION.

PANEL ATTACHES TO PANEL BEAMS WITH (4) 5/16-18 X 3/4" SERRATED FLANGE CAP SCREWS AND 5/16-18 SERRATED FLANGE NUTS. TORQUE TO 15 FT-LBS.



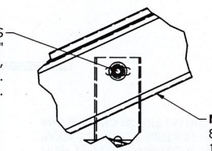
DETAIL A
SCALE 1 / 8

TOP BEAM ADAPTER
5" X 1.75" X 18" X 8G CHANNEL
ASTM A653 GALVANIZED GRADE 50 SS STEEL
ATTACHES TO NS BEAM AND COLUMN POST WITH (3) 3/4-10 X 1.5" SERRATED FLANGE CAP SCREW, WASHER, AND SERRATED FLANGE NUT. TORQUE TO 250 FT-LB.



DETAIL B
SCALE 1 / 8

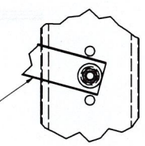
ANGLE BRACE ATTACHES TO NS BEAM WITH (1) 3/4-10 X 1.5" GRADE 5 STEEL HHCS, WASHER, AND SERRATED FLANGE NUT. TORQUE TO 250 FT-LBS.



NS BEAM
8" X 2" X 0.625"
14 GAUGE
ASTM A653 GALVNAIZED
GRADE 80 SS STEEL

DETAIL C
SCALE 1 / 8

ANGLE BRACE
2.75" X 1.75" U-CHANNEL,
14 GAUGE
ASTM A653 GALVANIZED
GRADE 50 SS STEEL



DETAIL D
SCALE 1 / 6

PROJECT INFORMATION
INSTALLATION ADDRESS:
685 Flanders Road, Groton, CT 06340

Structural General Notes

1. The contractor will be solely responsible for all construction means, methods, techniques, sequences and procedures and shall at all times take reasonable precautions for the safety of its employees on the project, and shall comply with all applicable provisions of federal, state, and municipal safety laws and building construction codes.

2. If existing conditions make it necessary to revise structural details, consult DCE Solar before proceeding with any change.

3. These drawings and notes are for this specific project and no other use is authorized.

4. Structure designed in accordance with the 2024 International Building Code. ASCE 7-22, AISC 360-16 (14th Edition), and AISI S100-20: ASD
Snow Loads:
-Ground Snow Load pg = 42 psf
-Importance Factor Is = 1.0
-Exposure Factor Ce = 0.9
-Slope Snow Load ps = 25.98 psf

Wind Loads:
-MRI Factor = 1.00
-Basic Wind Speed V = 130 mph
-Iw = 1
-Exposure = C
-Wind Design performed in accordance with the requirements of ASCE - Wind Tunnel Procedure. Refer to Wind Tunnel Report by UWO BLWT Laboratory dated 12/11/14.

Seismic Loads:
-SMS = 0.240g, SM1 = 0.097g
-Site Class = D
-SDS = 0.160g, SD1 = 0.060g
-Seismic Design Category = A
-Ordinary Steel Cantilever Column System

5. Material strengths:
-Hot-rolled structural steel ASTM A992 GR50.
-Cold Formed Steel Sections comply w/ASTM A1003, structural grade, galvanized to Grade as noted.
-Formed Steel Brackets - ASTM A653 Galvanized Grade 50 SS
-I-Beams - A992, 50 ksi, Hot Dip Galvanized to ASTM 123 Grade 85
-Plate - A36 Steel, Hot Dip Galvanized
-Connectors - Stainless Steel unless otherwise noted.

6. Members and connections have been designed for worst-case loading associated with exterior zones of the array per the wind tunnel report.

7. For the purposes of this project, all arrays are classified as Exterior Arrays.

8. Scope of work by Structural Engineer includes member design, connection design, and determination of design base reactions only. Layout of PV arrays such that they do not conflict with existing site obstructions, determination of site-specific foundation and geotechnical parameters, and all other work not specifically noted is by others.

Engineer of Record

2026.04.23
16:14:26 -07'00'

REVISION HISTORY			
REV	DESCRIPTION	DESIGNER	DATE
0	STRUCTURAL DETAIL DRAWING	CPATTERSON	3/19/2026
1	REVISED FIRST SOLAR MODULE WATTAGE	CPATTERSO	4/16/2026

DIMENSIONS ARE IN INCHES
UNLESS OTHERWISE NOTED
TOLERANCES ARE AS FOLLOWS:

.X = ± 0.100" (2.54mm)
.XX = ± 0.030" (0.76mm)
.XXX = ± 0.010" (0.25mm)

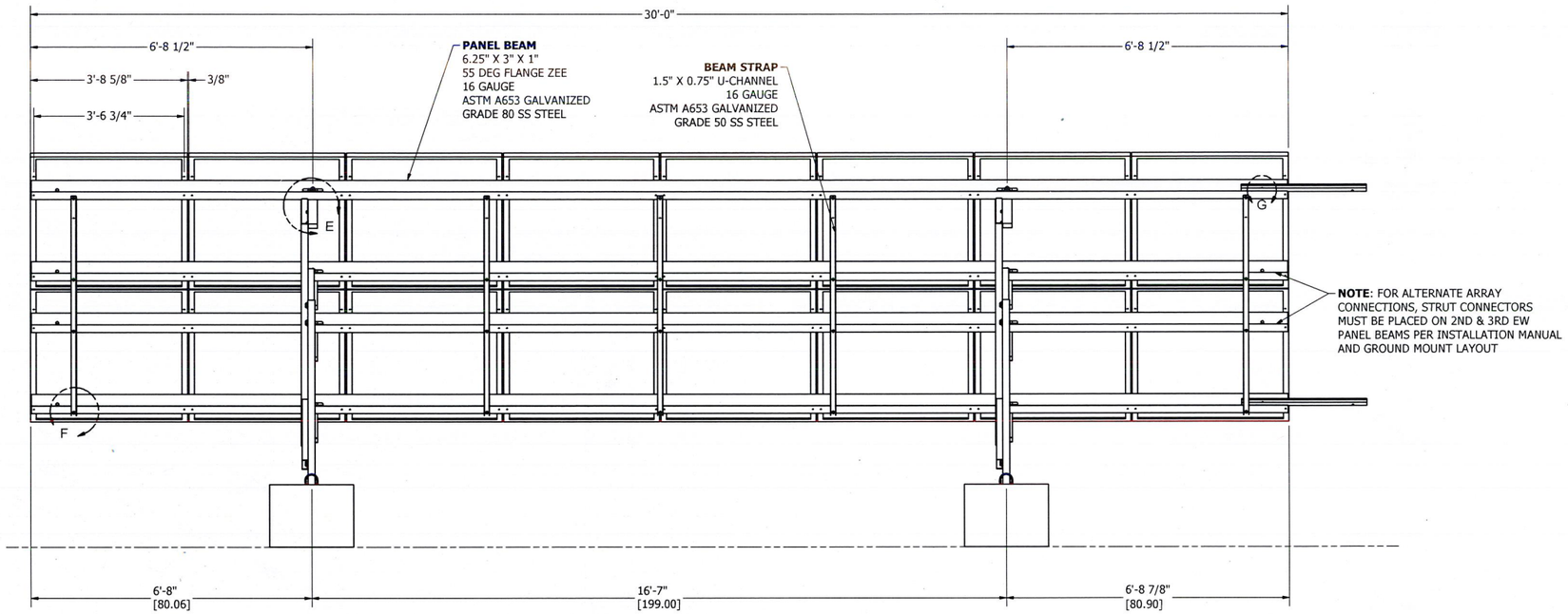
ANGLE = ± 5°
MIN. BREAK = 0.012" (0.3mm)
SURFACE FINISH = 63 (US)

Material:
Weight: 9824.210 lbmass
Description: **CT-LS-DC-B, PHONO SOLAR PS590M8GFH-24/TNH, 2x8, 25 DEG, GROTON LANDFILL (PHONO 590W), VEROGY HOLDING, LLC**
Project: GROTON LANDFILL (PHONO 590W)
Drawn: CPATTERSON
Date: 4/16/2026
Scale:
Sheet: 1 of 9

DCE SOLAR
Directing the Future for Solar — Made in America
19410 Jetton Rd, Ste 220
Cornelius, NC, 28031
www.dcesolar.com
Phone:1-704-659-7474

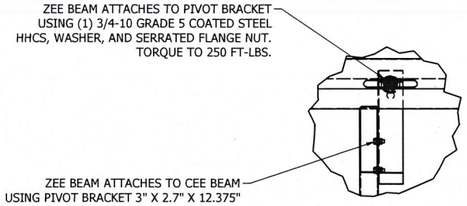
Format: D
Part Number: **6796**
Rev: 1

STRUCTURAL DETAIL DRAWING - REAR

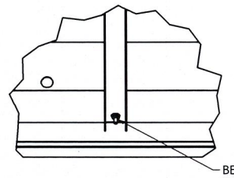


REAR VIEW

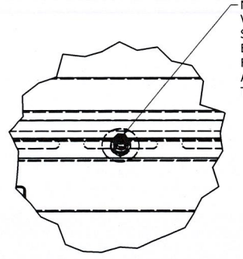
VIEW3
SCALE 1 /20



DETAIL E
SCALE 1 / 8



DETAIL F
SCALE 1 / 5



DETAIL G
SCALE 1 / 3

PROJECT INFORMATION

INSTALLATION ADDRESS:
685 Flanders Road, Groton, CT 06340

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-I-Beams - A992, 50 ksi, Hot Dip Galvanized to ASTM 123 Grade 85
-Plate - A36 Steel, Hot Dip Galvanized
-Connectors - Stainless Steel unless otherwise noted.

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Engineer of Record

STATE OF CONNECTICUT · WOLFGANG U. FRITZ · No. 27915 · LICENSED PROFESSIONAL ENGINEER

2026.04.23
16:14:36 -07'00'

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
TOLERANCES ARE AS FOLLOWS:
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MIN. BREAK = 0.012" (0.3mm)
SURFACE FINISH = 63 (US)

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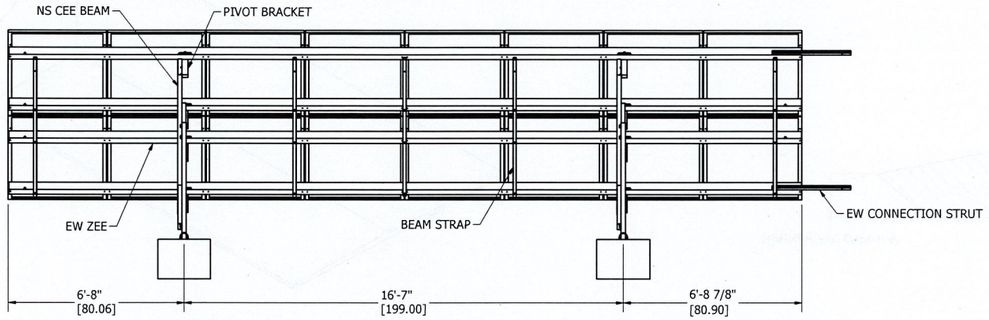
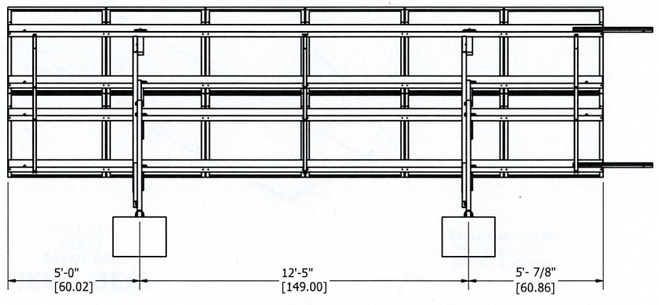
Weight: 9824.210 lbmass
Description: **CT-LS-DC-B, PHONO SOLAR PS590M8GFH-24/TNH, 2x8, 25 DEG, GROTON LANDFILL (PHONO 590W), VEROGY HOLDING, LLC**
Project: GROTON LANDFILL (PHONO 590W)
Drawn: CPATTERSON
Date: 4/16/2026
Scale:
Sheet: 2 of 9

DCE SOLAR
19410 Jetton Rd, Ste 220
Cornelius, NC, 28031
www.dcesolar.com
Phone:1-704-659-7474

Format: D
Part Number: 6796
Rev: 1



REAR VIEW
2X8 ARRAY
VIEW13
SCALE 0.03 : 1



REAR VIEW
2X6 ARRAY
VIEW27
SCALE 0.03 : 1

PANEL SPECIFICATION	
NAME	DESCRIPTION
MANUFACTURER	PHONO SOLAR
MODEL	PS590M8GFH-24/TNH
LENGTH (mm)	2278
WIDTH (mm)	1134
THICKNESS (mm)	30

MATERIAL DESCRIPTION

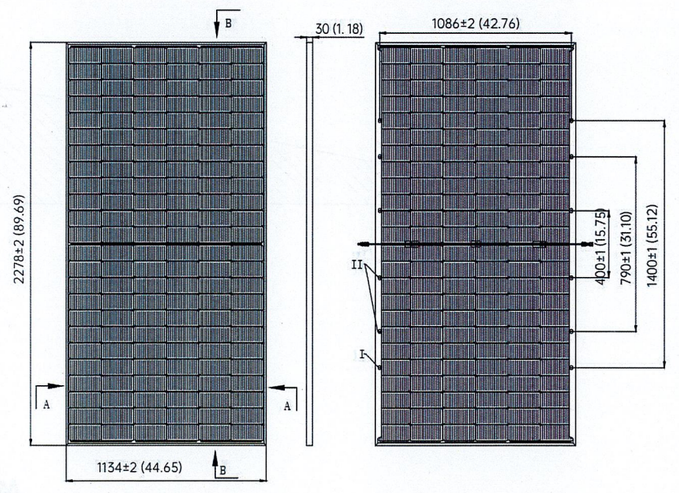
MEMBER	SHAPE	MATERIAL	GAGE
PANEL BEAM	6.25Z3X1X55DEG	A653 SS Gr80	16GA
NS CEE BEAM	8CS2X0.625	A653 SS Gr80	14GA
KICKER BRACE	2.75CU1.75	A653 SS Gr50	14GA
BEAM BRACE	1.5CU0.75	A653 SS Gr50	16GA
POST	CEE POST 8 X 2 X .625	A653 SS Gr80	14GA

NOTES

*ADJUSTED UPLIFT IS ASSUMED AS 70% OF THE DOWNWARD LOAD. IT'S RECOMMENDED TO USE THIS LOAD FOR PULL TEST IN CASE PUSH TEST CANNOT BE PERFORMED.
1: USE ADJUSTED UPLIFT IF NO REFUSAL IS ENCOUNTERED.
2: USE UPLIFT FORCE IN CASE OF REFUSAL.
3: FOR UPLIFT AND LATERAL FORCES USE SAFETY FACTOR OF 1.5 AND 2, RESPECTIVELY.

IN-FIELD PILE REMEDIATION

ANY IN-FIELD REMEDIATION REQUIRING THE CUTTING OR DRILLING OF GALVANIZED MATERIAL SHOULD FOLLOW ONE OF THESE TWO GUIDELINES TO COAT AND TREAT METALS THAT ARE EXPOSED TO GALVANIZATION DAMAGE:
1. USE PAINTS CONTAINING ZINC DUST (IN ACCORDANCE WITH "ASTM A 780-01" SECTION A2)
2. USE ZINC SPRAY (IN ACCORDANCE WITH "ASTM A 780-01" SECTION A3) ONE OF THE ABOVE GUIDELINES MUST BE FOLLOWED TO MAINTAIN THE DCE WARRANTY REQUIREMENTS.



PROJECT INFORMATION

INSTALLATION ADDRESS:
685 Flanders Road, Groton, CT 06340

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-Seismic Design Category = A
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5. Material strengths:
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-Cold Formed Steel Sections comply w/ASTM A1003, structural grade, galvanized to Grade as noted.
-Formed Steel Brackets - ASTM A653 Galvanized Grade 50 SS
-I-Beams - A992, 50 ksi, Hot Dip Galvanized to ASTM 123 Grade 85
-Plate - A36 Steel, Hot Dip Galvanized
-Connectors - Stainless Steel unless otherwise noted.

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Engineer of Record

STATE OF CONNECTICUT
WOLFGANG U. PREIT
No. 27915
LICENSED PROFESSIONAL ENGINEER

2026.04.23
16:14:43 -07'00'

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.XXX = ± 0.010" (0.25mm)
ANGLE = ± 5°
MIN. BREAK = 0.012" (0.3mm)
SURFACE FINISH = 63 (US)

Material:
Weight: 9824.210 lbmass
Description: **CT-LS-DC-B, PHONO SOLAR PS590M8GFH-24/TNH, 2x8, 25 DEG, GROTON LANDFILL (PHONO 590W), VEROGY HOLDING, LLC**
Project: GROTON LANDFILL (PHONO 590W)
Drawn: CPATTERSON
Date: 4/16/2026
Scale:
Sheet: 3 of 9

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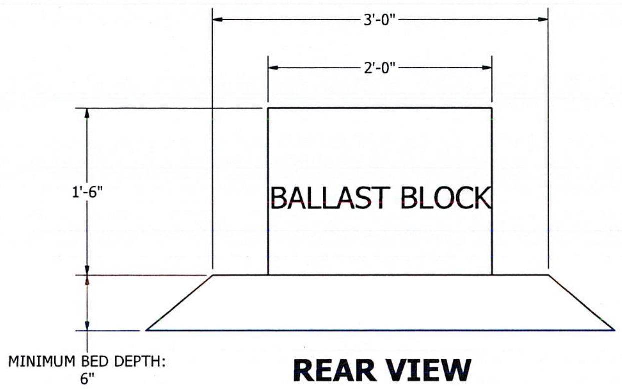
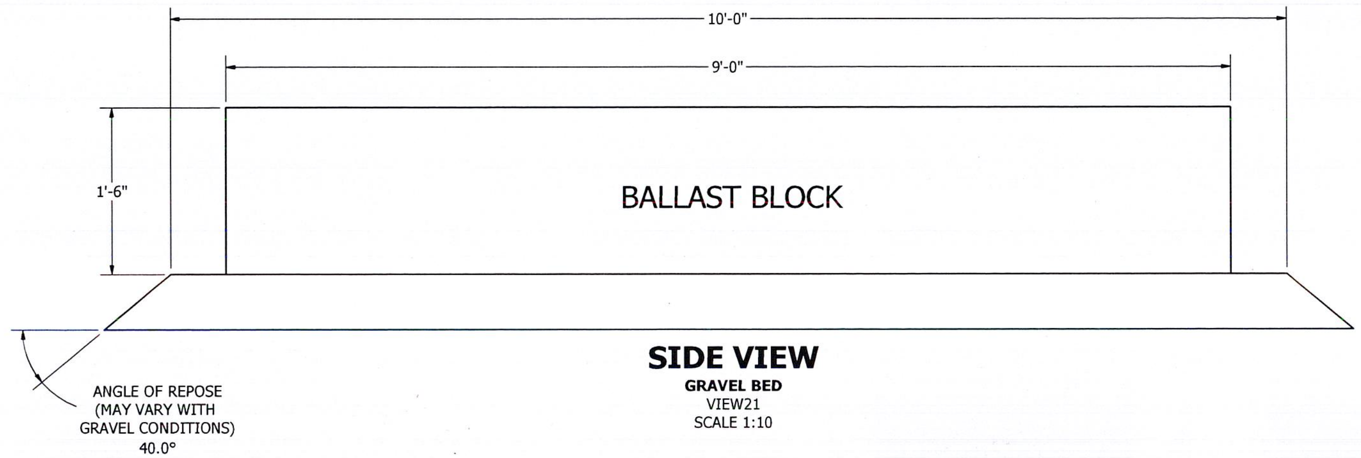
Powering the Future for Solar
19410 Jetton Rd, Ste 220
Cornelius, NC, 28031
www.dcesolar.com
Phone:1-704-659-7474

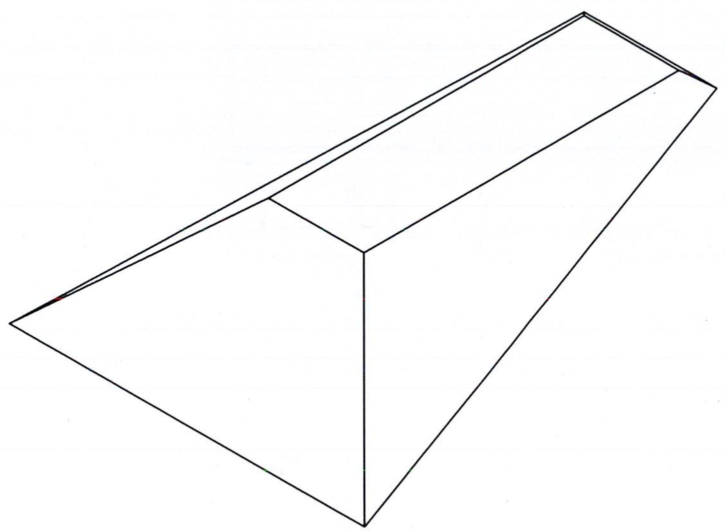
Format: D
Part Number: 6796
Rev: 1



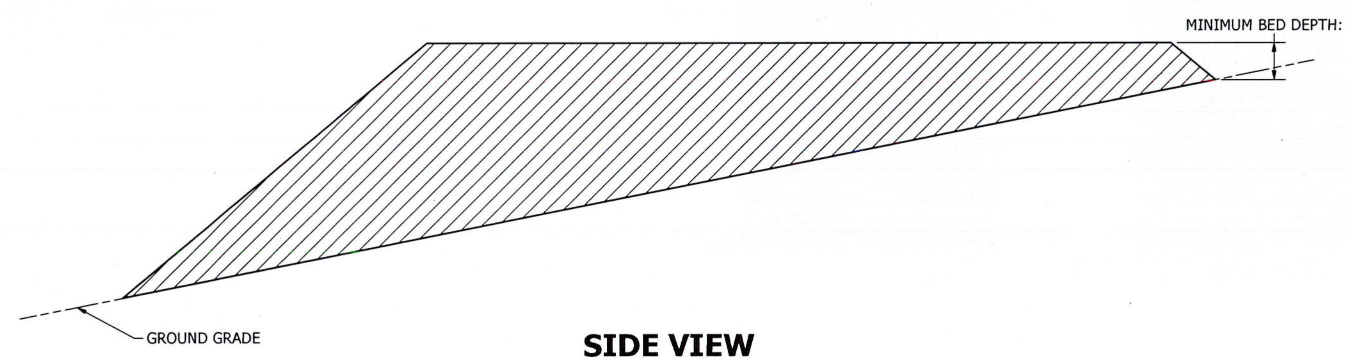
REAR VIEW
GRAVEL BED
VIEW20
SCALE 1:10



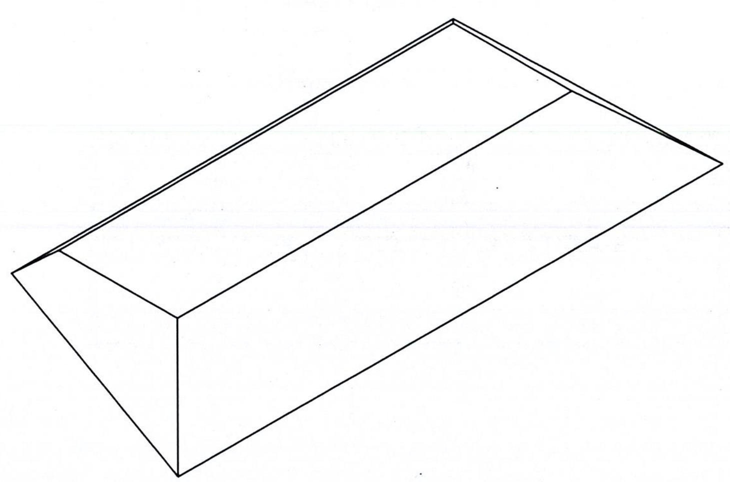
SIDE VIEW
GRAVEL BED
VIEW21
SCALE 1:10



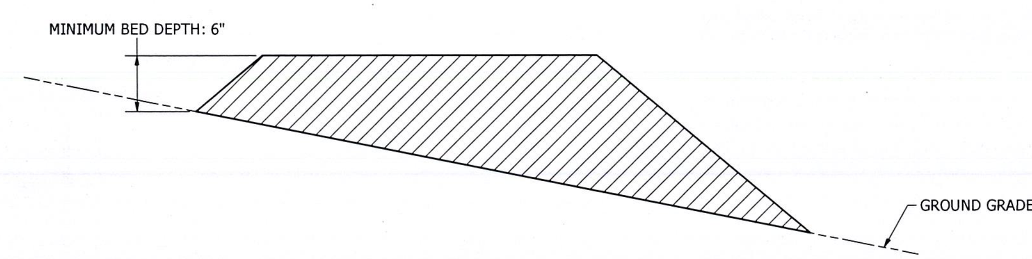
ISO VIEW
NORTH OR SOUTH GRADE OF 20%
VIEW23
SCALE 1:25



SIDE VIEW
NORTH OR SOUTH GRADE OF 20%
AB-AB
SCALE 1:15



ISO VIEW
EAST OR WEST GRADE OF 20%
VIEW24
SCALE 1:20



FRONT VIEW
EAST OR WEST GRADE OF 20%
AC-AC
SCALE 1:10

PROJECT INFORMATION

INSTALLATION ADDRESS:
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STATE OF CONNECTICUT · WOLFGANG U. FRITZ · No. 27915 · LICENSED · PROFESSIONAL ENGINEER

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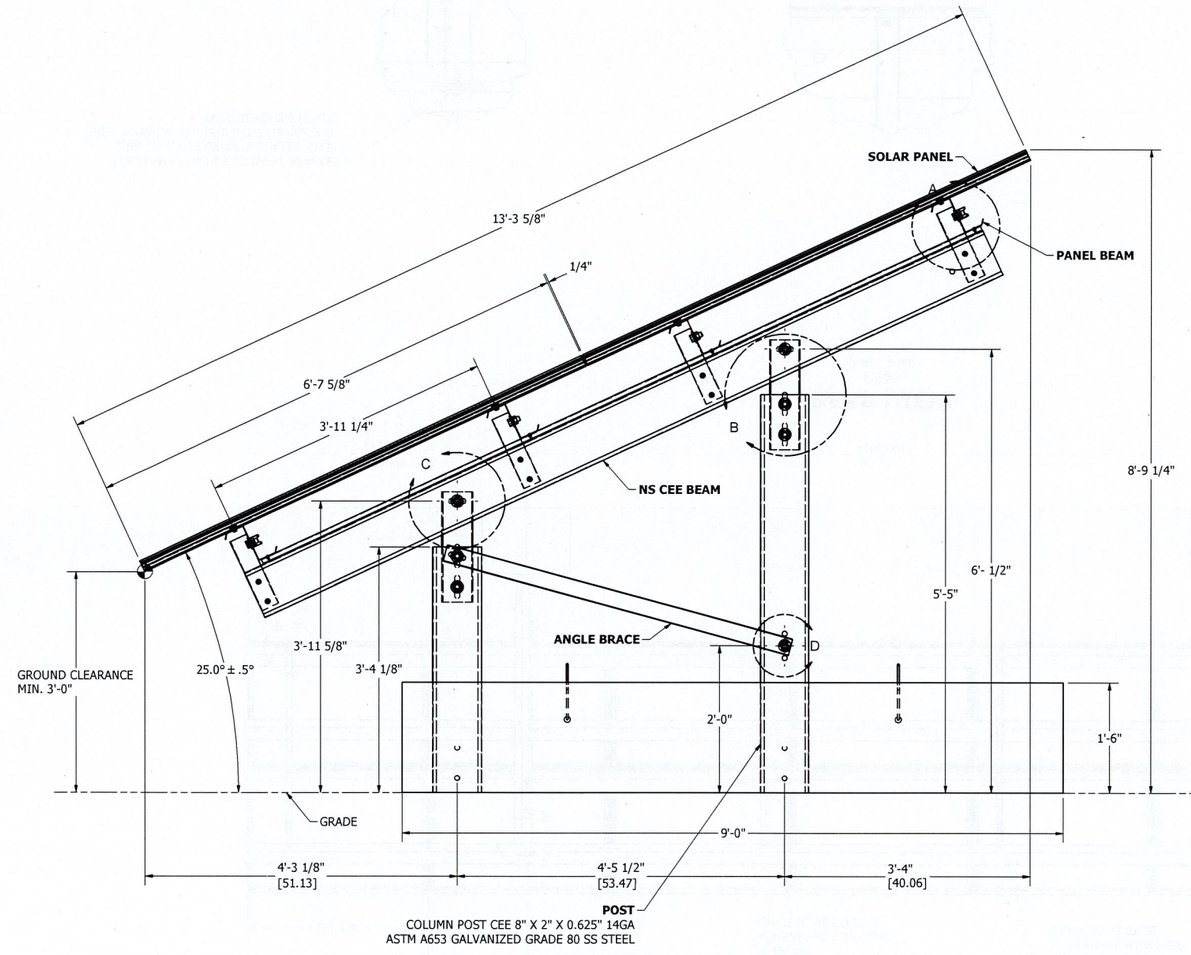
19410 Jetton Rd, Ste 220
Cornelius, NC, 28031
www.dcesolar.com
Phone:1-704-659-7474

Material:	
Weight:	5250.649 lbmass
Description:	**CT-LS-DC-B, PHONO SOLAR PS590M8GFH-24/TNH, 2x8, 25 DEG, GROTON LANDFILL (PHONO 590W), VEROGY HOLDING, LLC**
Project:	GROTON LANDFILL (PHONO 590W)
Drawn:	CPATTERSON
Date:	4/16/2026
Scale:	
Sheet:	4 of 9
Format:	D
Part Number	**GRAVEL BED WITH BLOCK**
Rev:	1

APPENDIX- A
STRUCTURAL DETAIL DRAWING

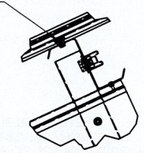


COLUMN POST CEE 8" X 2" X 0.625" 14GA
ASTM A653 GALVANIZED GRADE 80 SS STEEL

SIDE VIEW
VIEW1
SCALE 1 : 12

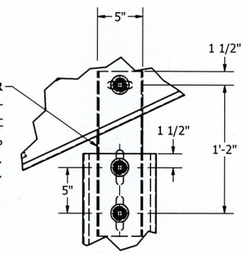
ALL PANEL MOUNTING HARDWARE CALLED OUT BELOW WILL BE PROVIDED BY DCE SOLAR. ANY CUSTOMIZED PANEL MOUNTING HARDWARE PROVIDED BY OTHERS MAY VOID DCE SOLAR'S UL2703 CERTIFICATION.

PANEL ATTACHES TO PANEL BEAMS WITH (4) MODURACK BULL CLIPS, AND 5/16-18 X 1" CARRIAGE BOLTS AND 5/16-18 HEX SERRATED FLANGE NUTS. TORQUE TO 15 FT-LBS.



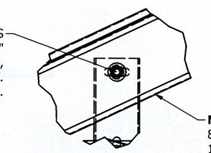
DETAIL A
SCALE 1 / 8

TOP BEAM ADAPTER
5" X 1.75" X 18" X 8G CHANNEL
ASTM A653 GALVANIZED GRADE 50 SS STEEL
ATTACHES TO NS BEAM AND COLUMN POST WITH (3) 3/4-10 X 1.5" SERRATED FLANGE CAP SCREW, WASHER, AND SERRATED FLANGE NUT. TORQUE TO 250 FT-LB.



DETAIL B
SCALE 1 / 8

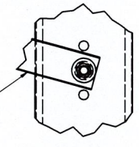
ANGLE BRACE ATTACHES TO NS BEAM WITH (1) 3/4-10 X 1.5" GRADE 5 STEEL HHCS, WASHER, AND SERRATED FLANGE NUT. TORQUE TO 250 FT-LBS.



NS BEAM
8" X 2" X 0.625"
14 GAUGE
ASTM A653 GALVANIZED
GRADE 80 SS STEEL

DETAIL C
SCALE 1 / 8

ANGLE BRACE
2.75" X 1.75" U-CHANNEL,
14 GAUGE
ASTM A653 GALVANIZED GRADE
50 SS STEEL



DETAIL D
SCALE 1 / 6

PROJECT INFORMATION
INSTALLATION ADDRESS:
685 Flanders Road, Groton, CT 06340
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Engineer of Record

STATE OF CONNECTICUT · WOLFGANG U. PRITZ · No. 27915 · LICENSED · PROF ENGR

2026.04.23
16:14:58 -07'00'

REVISION HISTORY			
REV	DESCRIPTION	DESIGNER	DATE
0	STRUCTURAL DETAIL DRAWING	CPATTERSON	3/19/2026
1	REVISED FIRST SOLAR MODULE WATTAGE	CPATTERSON	4/16/2026

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
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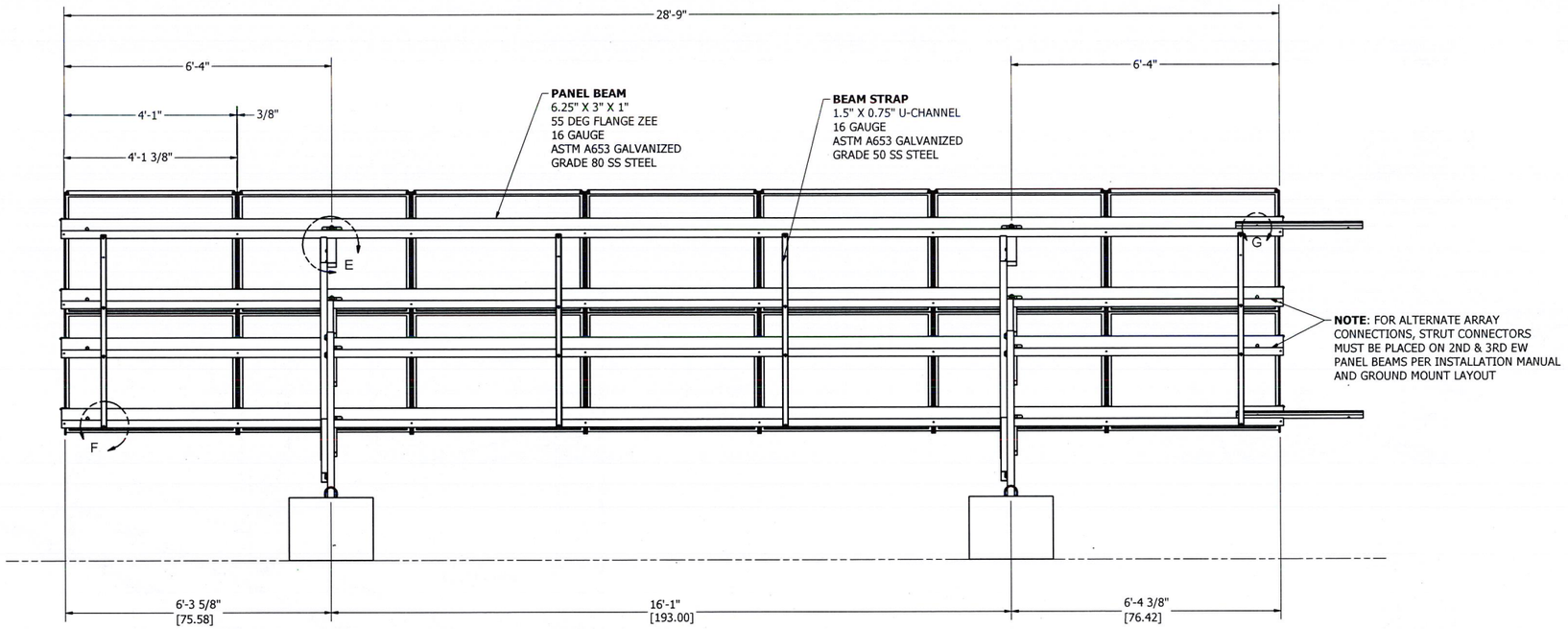
DCE SOLAR — Elevating the Future for Solar — Made in America
19410 Jetton Rd, Ste 220
Cornelius, NC, 28031
www.dcesolar.com
Phone:1-704-659-7474

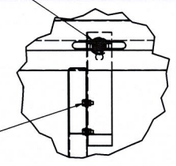
Material:	
Weight:	9704.803 lbmass
Description:	**CT-LS-DC-B, FIRST SOLAR FS6460/465-P-B, 2x7, 25 DEG, GROTON LANDFILL (FS6 460 & 465W), VEROGY HOLDING, LLC**
Project:	GROTON LANDFILL (FS6 460 & 465W)
Drawn:	CPATTERSON
Date:	4/16/2026
Scale:	
Sheet:	5 of 9
Format:	D
Part Number	**6797**
Rev:	1

STRUCTURAL DETAIL DRAWING - REAR

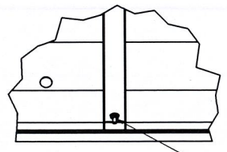


REAR VIEW

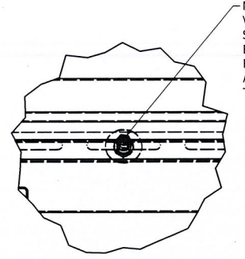
VIEW3
SCALE 1 /20



DETAIL E
SCALE 1 / 8



DETAIL F
SCALE 1 / 5



DETAIL G
SCALE 1 / 3

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PROJECT INFORMATION

INSTALLATION ADDRESS:
685 Flanders Road, Groton, CT 06340

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Project: GROTON LANDFILL (FS6 460 & 465W)
Drawn: CPATTERSON
Date: 4/16/2026
Scale:
Sheet: 6 of 9

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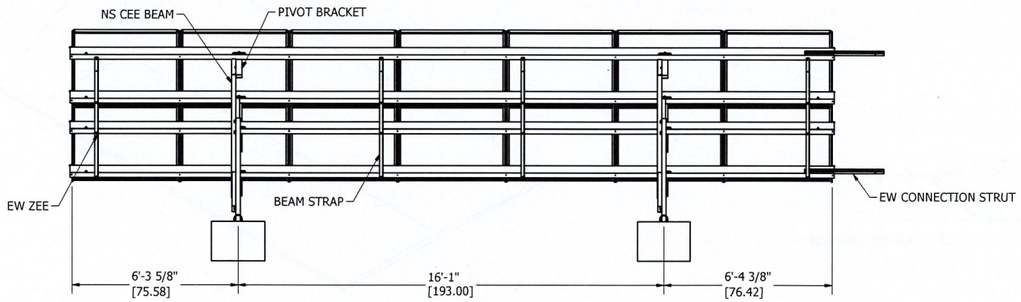
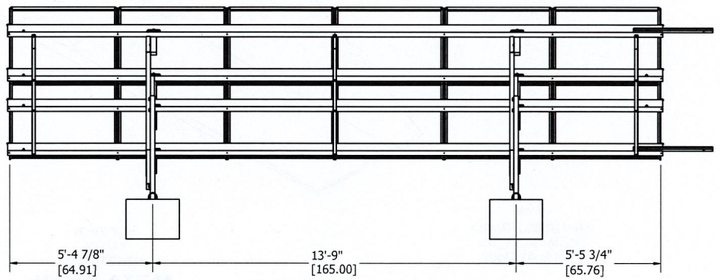


REAR VIEW
2X7 ARRAY
VIEW13
SCALE 0.03 : 1



REAR VIEW
2X6 ARRAY
VIEW27
SCALE 0.03 : 1

PANEL SPECIFICATION	
NAME	DESCRIPTION
MANUFACTURER	FIRST SOLAR
MODEL	FS6465-P-B
LENGTH (mm)	2024
WIDTH (mm)	1245
THICKNESS (mm)	35

MATERIAL DESCRIPTION

MEMBER	SHAPE	MATERIAL	GAGE
PANEL BEAM	6.25Z3X1X55DEG	A653 SS Gr80	16GA
NS CEE BEAM	8CS2X0.625	A653 SS Gr80	14GA
KICKER BRACE	2.75CU1.75	A653 SS Gr50	14GA
BEAM BRACE	1.5CU0.75	A653 SS Gr50	16GA
POST	CEE POST 8 X 2 X .625	A653 SS Gr80	14GA

NOTES

*ADJUSTED UPLIFT IS ASSUMED AS 70% OF THE DOWNWARD LOAD. IT'S RECOMMENDED TO USE THIS LOAD FOR PULL TEST IN CASE PUSH TEST CANNOT BE PERFORMED.
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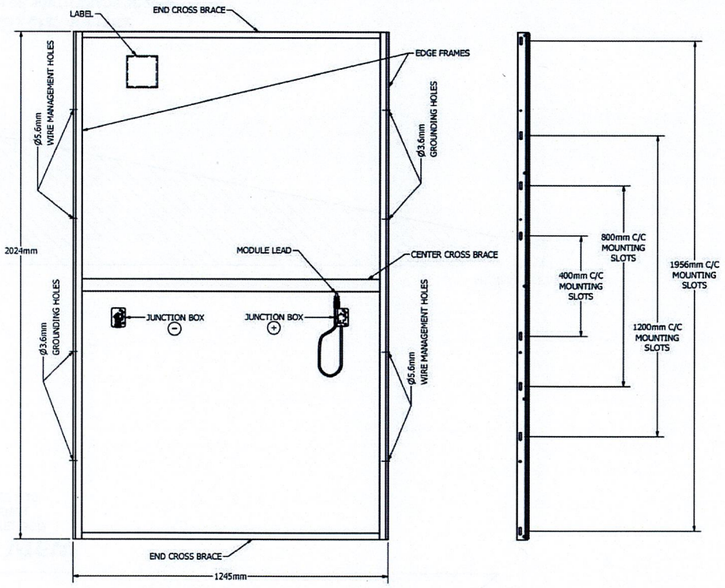

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4. Structure designed in accordance with the 2024 International Building Code. ASCE 7-22, AISC 360-16 (14th Edition), and AISI S100-20: ASD
Snow Loads:
-Ground Snow Load pg = 42 psf
-Importance Factor Is = 1.0
-Exposure Factor Ce = 0.9
-Slope Snow Load ps = 25.98 psf

Wind Loads:
-MRI Factor = 1.00
-Basic Wind Speed V = 130 mph
-Iw = 1
-Exposure = C
-Wind Design performed in accordance with the requirements of ASCE - Wind Tunnel Procedure. Refer to Wind Tunnel Report by UWO BLWT Laboratory dated 12/11/14.

Seismic Loads:
-SMS = 0.240g, SM1 = 0.097g
-Site Class = D
-SDS = 0.160g, SD1 = 0.060g
-Seismic Design Category = A
-Ordinary Steel Cantilever Column System

5. Material strengths:
-Hot-rolled structural steel ASTM A992 GR50.
-Cold Formed Steel Sections comply w/ASTM A1003, structural grade, galvanized to Grade as noted.
-Formed Steel Brackets - ASTM A653 Galvanized Grade 50 SS
-I-Beams - A992, 50 ksi, Hot Dip Galvanized to ASTM 123 Grade 85
-Plate - A36 Steel, Hot Dip Galvanized
-Connectors - Stainless Steel unless otherwise noted.

6. Members and connections have been designed for worst-case loading associated with exterior zones of the array per the wind tunnel report.

7. For the purposes of this project, all arrays are classified as Exterior Arrays.

8. Scope of work by Structural Engineer includes member design, connection design, and determination of design base reactions only. Layout of PV arrays such that they do not conflict with existing site obstructions, determination of site-specific foundation and geotechnical parameters, and all other work not specifically noted is by others.

Engineer of Record

STATE OF CONNECTICUT WOLFGANG U. TIMPE No. 27915 LICENSED PROFESSIONAL ENGINEER

2026.04.23
16:15:13 -07'00'

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED
TOLERANCES ARE AS FOLLOWS:
.X = ± 0.100" (2.54mm)
.XX = ± 0.030" (0.76mm)
.XXX = ± 0.010" (0.25mm)
ANGLE = ± 5°
MIN. BREAK = 0.012" (0.3mm)
SURFACE FINISH = 63 (US)

Material:
Weight: 9704.803 lbmass
Description: **CT-LS-DC-B, FIRST SOLAR FS6460/465-P-B, 2x7, 25 DEG, GROTON LANDFILL (FS6 460 & 465W), VEROGY HOLDING, LLC**
Project: GROTON LANDFILL (FS6 460 & 465W)
Drawn: CPATTERSON
Date: 4/16/2026
Scale:
Sheet: 7 of 9

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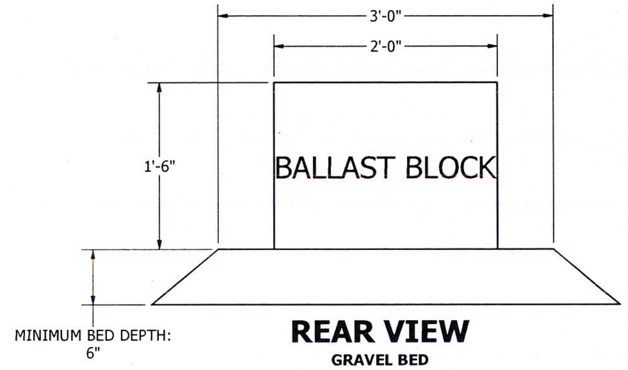
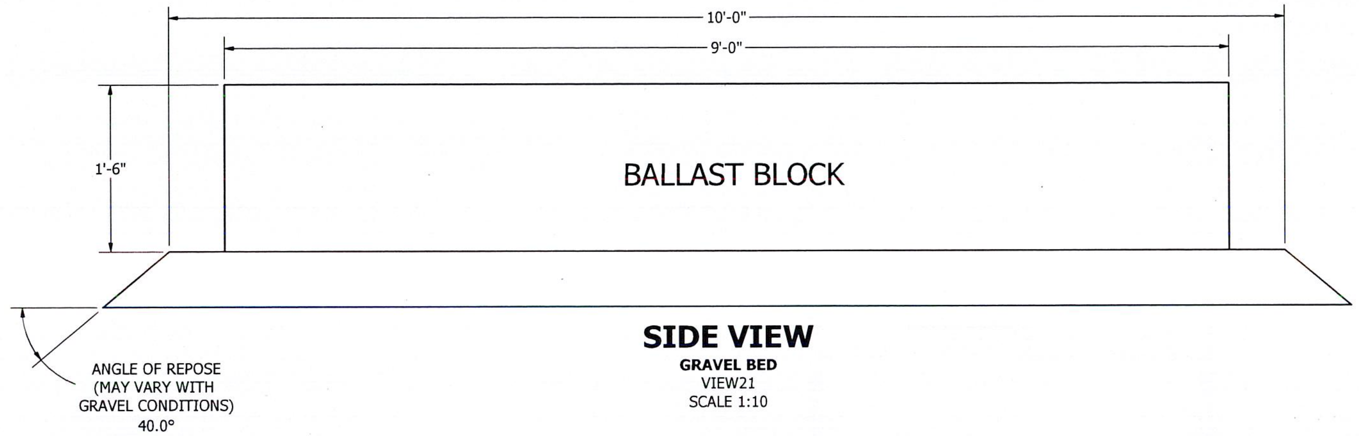
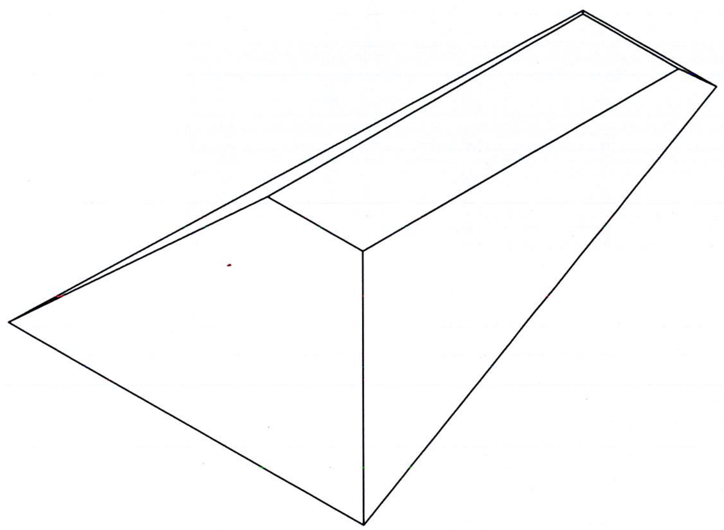
Format: D
Part Number: **6797**
Rev: 1



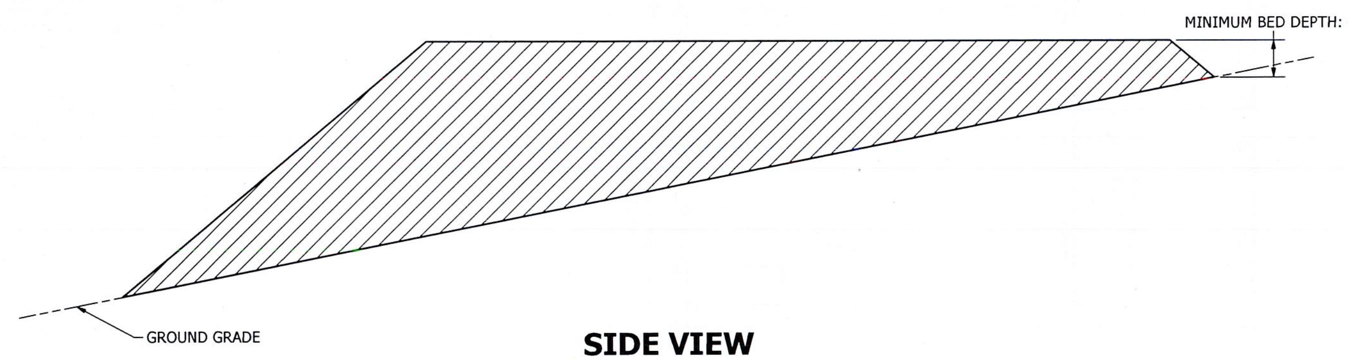
REAR VIEW
GRAVEL BED
VIEW20
SCALE 1:10



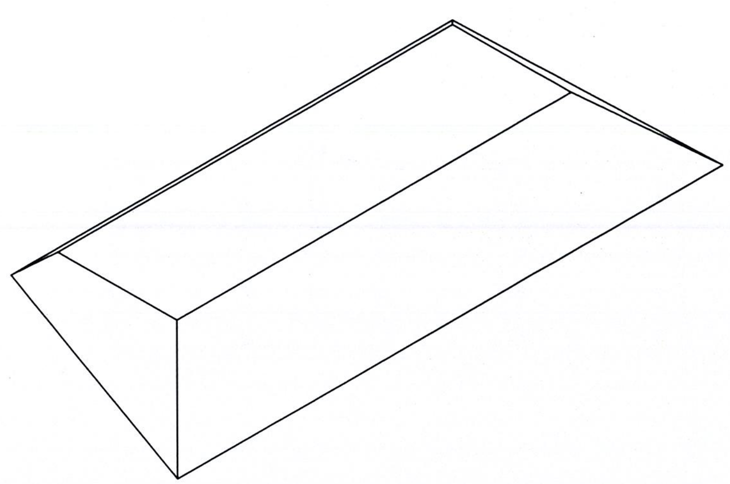
SIDE VIEW
GRAVEL BED
VIEW21
SCALE 1:10



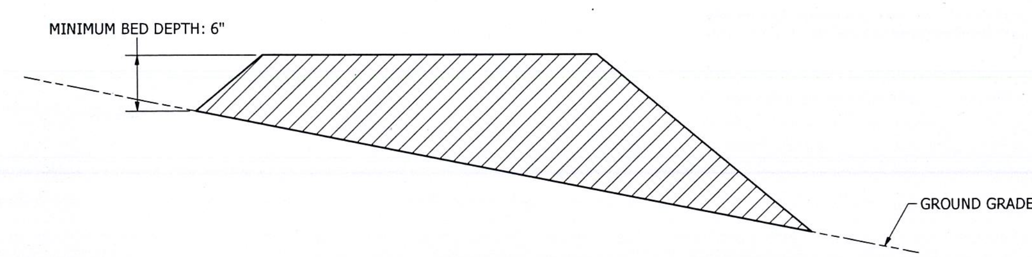
ISO VIEW
NORTH OR SOUTH GRADE OF 20%
VIEW23
SCALE 1:25



SIDE VIEW
NORTH OR SOUTH GRADE OF 20%
AB-AB
SCALE 1:15



ISO VIEW
EAST OR WEST GRADE OF 20%
VIEW24
SCALE 1:20



FRONT VIEW
EAST OR WEST GRADE OF 20%
AC-AC
SCALE 1:10

PROJECT INFORMATION

INSTALLATION ADDRESS:
685 Flanders Road, Groton, CT 06340

Structural General Notes

1. The contractor will be solely responsible for all construction means, methods, techniques, sequences and procedures and shall at all times take reasonable precautions for the safety of its employees on the project, and shall comply with all applicable provisions of federal, state, and municipal safety laws and building construction codes.

2. If existing conditions make it necessary to revise structural details, consult DCE Solar before proceeding with any change.

3. These drawings and notes are for this specific project and no other use is authorized.

4. Structure designed in accordance with the 2024 International Building Code. ASCE 7-22, AISC 360-16 (14th Edition), and AISI S100-20: ASD
Snow Loads:
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-Iw = 1
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-I-Beams - A992, 50 ksi, Hot Dip Galvanized to ASTM 123 Grade 85
-Plate - A36 Steel, Hot Dip Galvanized
-Connectors - Stainless Steel unless otherwise noted.

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Engineer of Record

STATE OF CONNECTICUT · WOLFGANG U. FRITZ · No. 27915 · PROFESSIONAL ENGINEER · LICENSED

2026.04.23
16:15:20 -07'00'

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SURFACE FINISH = 63 (US)

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www.dcesolar.com
Phone:1-704-659-7474

Material:	
Weight:	5250.649 lbmass
Description:	**CT-LS-DC-B, FIRST SOLAR FS6460/465-P-B, 2x7, 25 DEG, GROTON LANDFILL (FS6 460 & 465W), VEROGY HOLDING, LLC**
Project:	GROTON LANDFILL (FS6 460 & 465W)
Drawn:	CPATTERSON
Date:	4/16/2026
Scale:	
Sheet:	8 of 9
Format:	D
Part Number	**GRAVEL BED WITH BLOCK**
Rev:	1

Contour ™

PROJECT INFORMATION	
PROJECT NAME	GROTON LANDFILL (FS6 465W)
INSTALLATION ADDRESS	685 FLANDERS ROAD, GROTON, CT 06340
CLIENT	VEROGY HOLDING, LLC

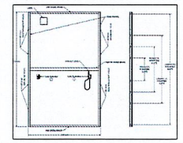
SITE SPECIFICATION		
WIND SPEED (MPH)	130	ASCE 7-22
SNOW LOAD (PSF)	42	ASCE 7-22
EXPOSURE CATEGORY	C	ASCE 7-22
RISK CATEGORY	II	ASCE 7-22

PANEL SPECIFICATION	
MODELS	FIRST SOLAR FS-6460-P-B / FIRST SOLAR FS-6465-P-B / PHONO SOLAR PS590M8GFH-24/TNH
LENGTH (mm)	2024 / 2024 / 2278
WIDTH (mm)	1245 / 1245 / 1134
WEIGHT (lb)	75 / 75 / 70.55
PANEL WATTAGE (W)	460 / 465 / 590
PROJECT PANEL COUNT	2040 / 6348 / 5328

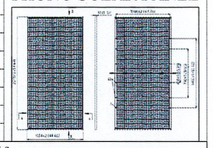
SYSTEM INFORMATION	
ARRAY CONFIGURATION	2X8, 2X7, 2X6
SYSTEM SIZE (W)	7,033,740
ARRAY TILT (°)	25
GROUND CLEARANCE (in)	36

PANEL SPECSHEET

FIRST SOLAR PANEL



PHONO SOLAR PANEL



ARRAY DETAILS		
ITEM	QUANTITY (FIRST SOLAR)	QUANTITY (PHONO SOLAR)
2X8 TABLES	0	288
2X7 TABLES	432	0
2X6 TABLES	195	60
BALLAST BLOCKS	1254	696
ALTERNATE ARRAY CONNECTIONS	88	47

CAD BLOCK

GENERAL NOTES

1. **PROPRIETARY AND CONFIDENTIAL**

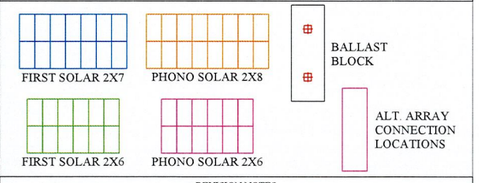
THIS DRAWING AND ALL INFORMATION THERE IN IS THE PROPERTY OF DCE SOLAR AND IS CONFIDENTIAL AND MUST NOT BE MADE PUBLIC OR COPIED UNLESS AUTHORIZED BY DCE SOLAR AND IS SUBJECT TO RETURN UPON REQUEST.

2. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND SHALL AT ALL TIMES TAKE REASONABLE PRECAUTIONS FOR THE SAFETY OF ITS EMPLOYEES ON THE PROJECT, AND SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF FEDERAL, STATE, AND MUNICIPAL SAFETY LAWS AND BUILDING CONSTRUCTIONS CODES.

3. CUSTOMER PROVIDED SITE LAYOUTS WERE USED TO GENERATE THE LAYOUT AS SHOWN.

4. ANY CHANGES TO THE LAYOUT SHOWN THAT MAY CAUSE ERRORS DURING INSTALLATION ARE NOT THE RESPONSIBILITY OF DCE SOLAR.

LEGEND DETAILS



REVISION NOTES

REV	DESCRIPTION	PREPARED BY	DATE
0	GROUND MOUNT LAYOUT	CPATTERSON	3/19/2026
1	REVISED FIRST SOLAR MODULE WATTAGE	CPATTERSON	4/16/2026
2			
3			
4			

REFERENCE ELECTRICAL DRAWINGS BY PPE FOR SPECIFIC LOCATIONS OF 460W VS. 465W MODULES

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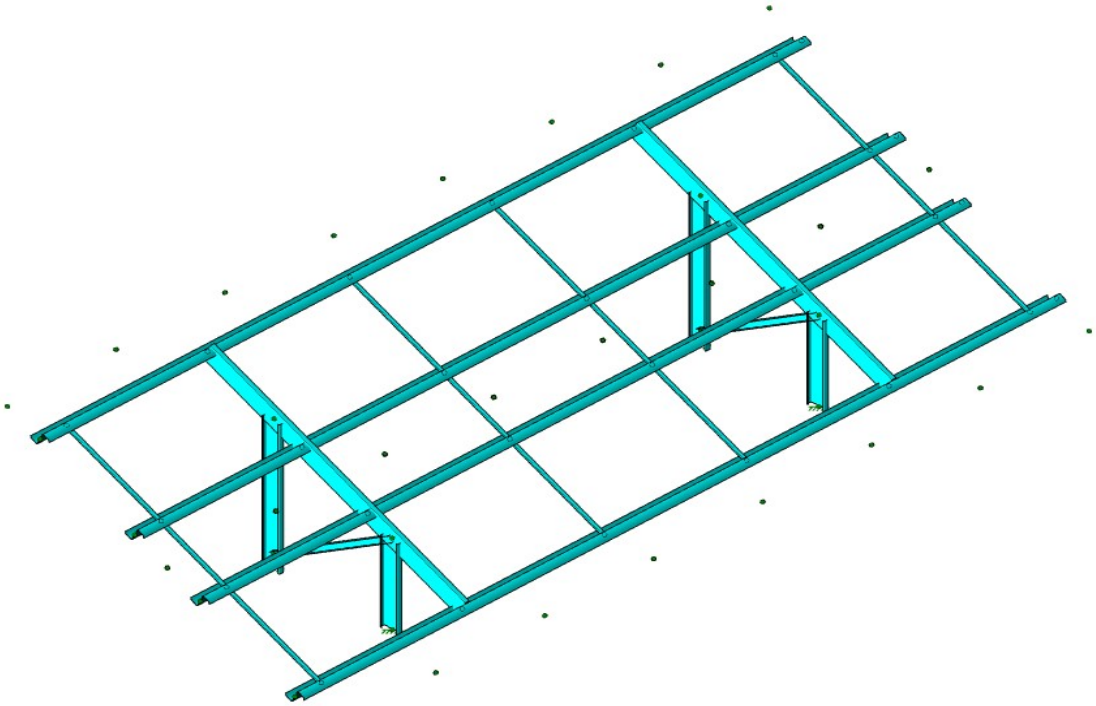
Phone: 1-704-650-7474

Format: D

SHEET: 9 OF 9

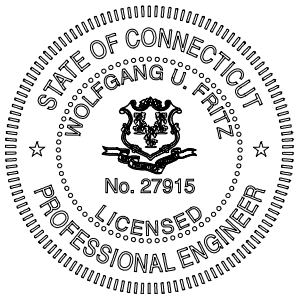


STRUCTURAL CALCULATION REPORT

Project Name:

GROTON LANDFILL (FS6 460 & 465W)

Installation Address:
685 Flanders Road, Groton, CT 06340



Contour-LS™

19410 Jetton Rd Ste 220
Cornelius, NC 28031
p. 704-659-7474
f. 704-875-0781
info@dcesolar.com
www.dcesolar.com

INDEX SHEET

GENERAL

Project Information

.Customer:	Verogy Holding, LLC
.Project Name:	Groton Landfill (FS6 460 & 465W)
.Project Location:	685 Flanders Road, Groton, CT 06340
.Project Wattage (W):	

Module Specifications

.Module Manufacturer:	First Solar
.Module Model No:	FS-6465-P-B
.Module Wattage (W):	
.Module Length (mm):	2,024
.Module Width (mm):	1,245
.Module Thickness (mm):	35
.Module Area (ft^2):	27.12
.Module Weight (lbs):	75.00

System Information

.Product Type:	Contour-LS
.Module Orientation:	Portrait
.Array Configuration:	2x7
.System Ground Clearance (in):	36.00
.System Tilt (degrees):	25.00
.System Length EW Dir. (ft):	28.87
.System Width NS Dir. (ft):	13.77
.System Area (ft^2):	397.48

Design Criteria

.Foundation Type:	Ballast
Pile Embedmend Depth (ft):	N/A

Criteria as per requirements by CT- licensed geotechnical engineer

SYSTEM LAYOUT

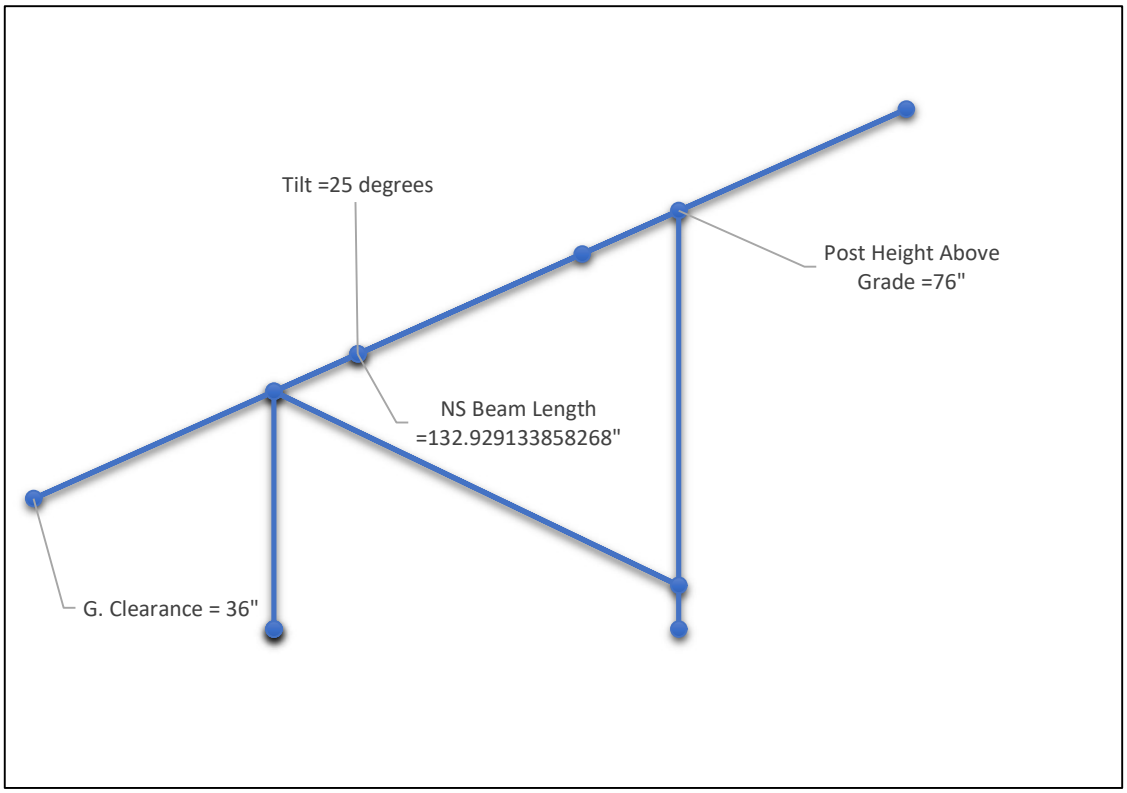


Figure 1: ***System Cross-Section***

Member Shapes

.Post:	8CS2X14GA-0.625
.NS Cee Beam:	8CS2X14GA-0.625
.EW Zee Beam:	6.25Z3X1X16GAX55DEG
..Number of Zee Beams:	Four
.Kicker Brace:	2.75CU1.75X14ga_CFA
..Number of Kicker Braces:	One
.Beam Brace:	1.5CU0.75X0.058
..Number of Beam Braces:	Four
.Screw:	KSF G 76x2100-3xM16

.NS Segment 1 (in):	35.00
.NS Segment 2 (in):	59.00
.NS Segment 3 (in):	32.93

MATERIAL SPECIFICATIONS AND STRENGTHS

Hot-Rolled Steel

.Structural Steel
.ASTM A992, F_y = 52ksi U.N.O.
.ASTM A123 Gr. 85 HDG

Cold-Formed Steel

.Structural Steel
.ASTM A653 Gr. 50 Class 3 G115 U.N.O.
.ASTM A653 Gr. 80 Class 3 G115 U.N.O.

Bolts

.ASTM A325
.ASTM F593

CODES & REFERENCES

2024 International Building Code (IBC)
.ASCE 7-22 Minimum Design Loads for Buildings and Other Structures
.AISC ASD/LRFD - Fourteen Edition (2016) / AISC 360-16
.AISI S100-20 ASD- North America Specification for the Design of Cold-Formed Structural Members

DESIGN SOFTWARE

.RISA 3D v.20

SYSTEM LOADS

Dead Load

.A) Module Dead Load (psf):	2.77
.B) Self Weight of Structure (psf):	4.58
.C) Electr./Misc. Equipment (psf):	0.61
.D) Total Dead Load [A + B + C] (psf):	7.96

**** Actual System Self Weight is Determined by RISA 3D ****

Live Load

.Live Load (psf): **** Live Load Not Considered ****

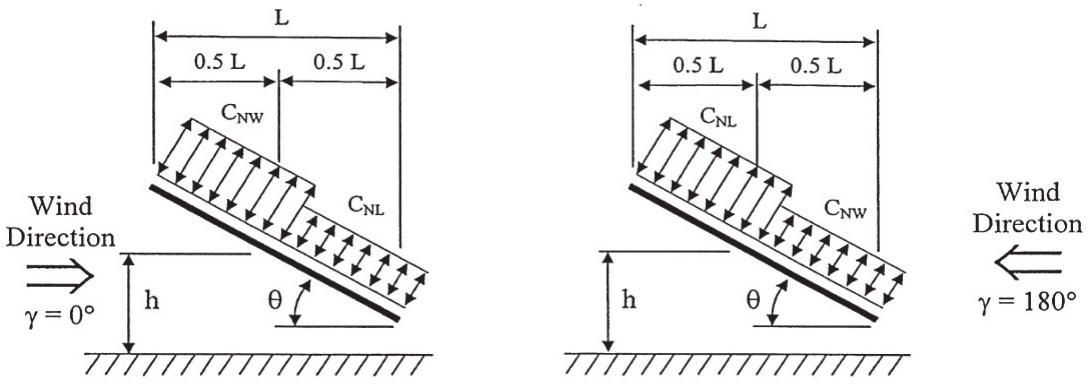
Snow Load

.Ground Snow Load (psf):	42	*per ASCE 7-22 Figure 7-1*
.Exposure Category	C	*per ASCE 7-22 Section 26.7*
.Importance Factor Snow, I_s:	1.00	*per ASCE 7-22 Table 1.5-2*
.Thermal Factor, C_t:	1.20	*per ASCE 7-22 Table 7-3*
.Exposure Factor, C_e:	0.90	*per ASCE 7-22 Table 7-2*
.Flat Snow Load, p_f (psf)	31.75	*per ASCE 7-22 Equation 7.3-1*
.Min. Snow Load, p_m min (psf):	31.75	*per ASCE 7-22 Section 7.3.4*
.Tilt Angle Factor, Cs:	0.82	*per ASCE 7-22 Figure 7-2*
.Tilt Angle Snow Load, p_s (psf):	25.98	*per ASCE 7-22 Equation 7.4-1*
.Rain-on-Snow Surcharge:	0.00	*per ASCE 7-22 Section 7.10*
.Total Snow Load (psf):	25.98	

SYSTEM LOADS

Wind Loads

.Wind Speed (3s-gust) V, (mph):	130	*per ASCE 7-22 Figure 26.5-1a*
..MRI Factor	1.00	*per ASCE 7-22 Section C26.5-2*
.Risk Category:	II	*per ASCE 7-22 Table 1.5-1*
.Wind Importance Factor:	1.00	per ASCE 7-22 Table 1.5-2
.Exposure Category:	C	*per ASCE 7-22 Section 26.7*
.Topographic Factor, k_{zt}:	1.00	*per ASCE 7-22 Figure 26.8*
.Vel. Press. Exp. Coeff., k_h (MWFRS):	0.85	*per ASCE 7-22 Table 26.10-1*
..3-sec gust-speed, α	9.5	*per ASCE 7-22 Table 26.11-1*
..Nominal height, Zg	900	*per ASCE 7-22 Table 26.11-1*
.Directionality Factor, k_d:	0.85	*per ASCE 7-22 Table 26.6-1*
.Roof Velocity Pressure, q_h (psf):	31.26	*per ASCE 7-22 Equation 26.10-1*
.Roof Pressures, $P = q_h GC_N$:	Clear Wind Flow	*per ASCE 7-22 Section 30.7.2*



ASCE 7-22 Figure 27.3-4

Table 1: Downward Wind Pressure Coefficients GCN (DCE Solar GM Wind Tunnel Report):

Location	DAF	GC_{NW}	GC_{NL}	P_W (psf)	P_L (psf)
E/W EDGE	1.09	0.69	0.69	15.51	8.06
NORTH	1.09	0.39	0.39	8.00	5.38
INTERIOR	1.09	0.33	0.33	6.58	4.83
SOUTH	**1.09**	**0.80**	**0.80**	**21.63**	**5.57**

Table 2: Upward Wind Pressure Coefficients GCN (DCE Solar GM Wind Tunnel Report):

Location	DAF	GC_{NW}	GC_{NL}	P_W (psf)	P_L (psf)
E/W EDGE	1.12	-0.74	-0.74	-25.53	-0.31
NORTH	**1.12**	**-0.80**	**-0.80**	**-22.58**	**-5.51**
INTERIOR	1.12	-0.56	-0.56	-18.49	-0.99
SOUTH	1.12	-0.67	-0.67	-25.42	1.84

SYSTEM LOADS

Seismic Loads

.Spectral Response, short period, S_s	0.2	*per ASCE 7-22 Figure 22-1*
.Spectral Response, 1-sec period, S_1	0.046	*per ASCE 7-22 Figure 22-2*
.Long Period Transition Period, T_L (s):	6	*per ASCE 7-22 Figure 22-14*
.Site Class:	D	*per ASCE 7-22 Section 20.3*
.Seismic Design Category:	A	per ASCE 7-22 Table 11.6-1
.Occupancy Importance Factor, I:	1.00	per ASCE 7-22 Table 1.5-2
.Site Coefficient for short period, F_a:	0.00	*per ASCE 7-22 Table 11.4-1*
.Site Coefficeint for 1-sec period, F_v:	0.00	*per ASCE 7-22 Table 11.4-2*
Max. Considered Earthquake (MCE) Parameters:		
..MCE_R, short period, S_{MS}	0.240	*per ASCE 7-22 Equation 11.4-1*
..MCE_R, 1-sec period, S_{M1}	0.097	*per ASCE 7-22 Equation 11.4-2*
Design Base Earthquake (DBE) Parameters:		
..Spectral Response, short period, S_{DS}	0.160	*per ASCE 7-22 Equation 11.4-3*
..Spectral Response, 1-sec period, S_{D1}	0.060	*per ASCE 7-22 Equation 11.4-4*
.Period, T_0 (s):	0.075	*per ASCE 7-22 Section 11.4.5*
.Period, T_s (s):	0.375	*per ASCE 7-22 Section 11.4.5*
.Approx. Fundamental Period. "T" T_a (s):	0.076	*per ASCE 7-22 Equation 12.8-7*
..Peridod Parameters, C_t:	0.020	*per ASCE 7-22 Table 12.8-2*
..Period Parameters, x:	0.750	*per ASCE 7-22 Table 12.8-2*
..Effective Height, h_m(ft):	5.910	*per ASCE 7-22 Section 11.2*
.Structure Type:	All Other Self Supporting Structure	
..Response Modification Factor, R:	1.25	*per ASCE 7-22 Table 12.2-1*
..System Over strength Factor, Ω_0:	2	*per ASCE 7-22 Table 12.2-1*
..Deflection Amp. Factor, C_d:	2.5	*per ASCE 7-22 Table 12.2-1*
.Seismic Response Coefficient, C_s:	0.128	*per ASCE 7-22 Equation 12.8-2*
..$C_{s\text{-}max}$:	0.633	*per ASCE 7-22 Equation 12.8-3*
..$C_{s\text{-}min}$:	0.010	*per ASCE 7-22 Equation 12.8-5*
.Redundancy Factor, ρ	1.000	*per ASCE 7-22 Section 11.3.4*
.Seismic Base Shear, V:		
.. Vx:	0.128 * W	*per ASCE 7-22 Equation 12.8-1*
.. Vz:	0.128 * W	*per ASCE 7-22 Equation 12.8-1*

LOAD COMBINATION

Legend

.D = Dead Load
.L = Live Load (not applicable)
.LR = Roof Live Load (not applicable)
.S = Snow Load
.W1 = Wind Downward Load
.W2 = Wind Uplift Load
.Ex = Seismic Load (NS Direction)
.Ez = Seismic Load (EW Direction)

ASD Load Combination per ASCE 7-22

. 1) "D"
. 2) "D+S"
. 3) "D+0.6W1"
. 4) "D+0.45W1+0.75S"
. 5) "0.6D+0.6W2"
. 6) "(1+0.14Sds)D+0.7Ex"
. 7) "(1+0.105Sds)D+0.525Ex+0.75S"
. 8) "(0.6-0.14Sds)D+0.7Ex"
. 9) "(1+0.14Sds)D+0.7Ez"
.10) "(1+0.105Sds)D+0.525Ez+0.75S"
.11) "(0.6-0.14Sds)D+0.7Ez"

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (FS 465W)

Member Information

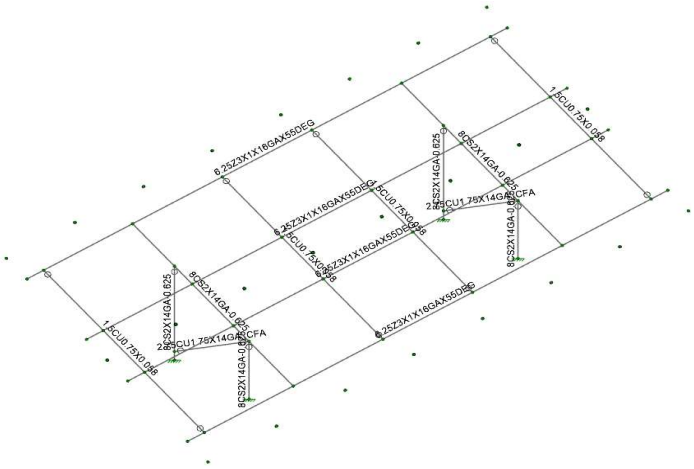
Member	Label	Shape	Node i	Node j	Rotation	Material
M1	Column	8CS2X14GA-0.625	1	3	0	2
M2	Column	8CS2X14GA-0.625	2	4	0	2
M3	NS CEE Beam	8CS2X14GA-0.625	6	5	180	2
M4	NS CEE Beam	8CS2X14GA-0.625	8	7	180	2
M5	Kicker Brace	2.75CU1.75X14ga_CFA	9	10	0	2
M6	Kicker Brace	2.75CU1.75X14ga_CFA	11	12	0	2
M7	Panel Beam	6.25Z3X1X16GAX55DEG	13	14	25	2
M8	Panel Beam	6.25Z3X1X16GAX55DEG	15	16	25	2
M9	Panel Beam	6.25Z3X1X16GAX55DEG	17	18	25	2
M10	Panel Beam	6.25Z3X1X16GAX55DEG	19	20	25	2
M11	Beam Brace	1.5CU0.75X0.058	21	24	90	2
M12	Beam Brace	1.5CU0.75X0.058	25	28	90	2
M14	Beam Brace	1.5CU0.75X0.058	42	39	90	2
M15	Beam Brace	1.5CU0.75X0.058	29	32	90	2
M19	Column	8CS2X14GA-0.625	34	12	0	2
M20	Column	8CS2X14GA-0.625	33	10	0	2

Boundary Conditions

Node	Fx	Fy	Fz	Mx	My	Mz
N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
N43	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
N44	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (FS 465W)

Member Shapes Layout



Member Area Loading Table

Node A	Node B	Node C	Node D	Direction	Load D.	Panel	Snow	Wind -	Wind +
T8	T4	T3	T7	Y	B-C	-2.77	-25.98	5.57	-22.58
T6	T2	T1	T5	Y	B-C	-2.77	-25.98	21.63	-5.51
T16	T12	T11	T15	Y	B-C	-2.77	-25.98	5.57	-22.58
T14	T10	T9	T13	Y	B-C	-2.77	-25.98	21.63	-5.51
T24	T20	T19	T23	Y	B-C	-2.77	-25.98	5.57	-22.58
T22	T18	T17	T21	Y	B-C	-2.77	-25.98	21.63	-5.51
T32	T28	T27	T31	Y	B-C	-2.77	-25.98	5.57	-22.58
T30	T26	T25	T29	Y	B-C	-2.77	-25.98	21.63	-5.51
T40	T36	T35	T39	Y	B-C	-2.77	-25.98	5.57	-22.58
T38	T34	T33	T37	Y	B-C	-2.77	-25.98	21.63	-5.51
T48	T44	T43	T47	Y	B-C	-2.77	-25.98	5.57	-22.58
T46	T42	T41	T45	Y	B-C	-2.77	-25.98	21.63	-5.51
T56	T52	T51	T55	Y	B-C	-2.77	-25.98	5.57	-22.58
T54	T50	T49	T53	Y	B-C	-2.77	-25.98	21.63	-5.51

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (FS 465W)

Global Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation ?	Yes
Increase Nailing Capacity for Wind ?	Yes
Include Warping ?	Yes
Trans Load Btwn Intersecting Wood Wall ?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	0.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.17
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-16): ASD
Adjust Stiffness?	Yes (Iterative)
RISAConnection Code	None
Cold Formed Steel Code	AISI S100-20: ASD
Wood Code	None
Wood Temperature	<100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None
Stainless Steel Code	None

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (FS 465W)

Hot Roll Steel Section Sets

	Label	E (ksi)	G (ksi)	Nu	Thermal	Density	Yield (ksi)	Fu (ksi)
1	A992	29000	11154	0.3	0.65	0.49	50	65
2	A36 Gr. 36	29000	11154	0.3	0.65	0.49	36	58

	Label	Shape	Type	Material	A(in2)	Iyy (in4)	Izz (in4)	J (in4)
1	Pipe	HSS2.375x0.154	Column	00 Gr. C RI	1	0.627	0.627	1.25
2	Column	W6x8.5	Column	A992	2.52	1.99	14.9	0.33

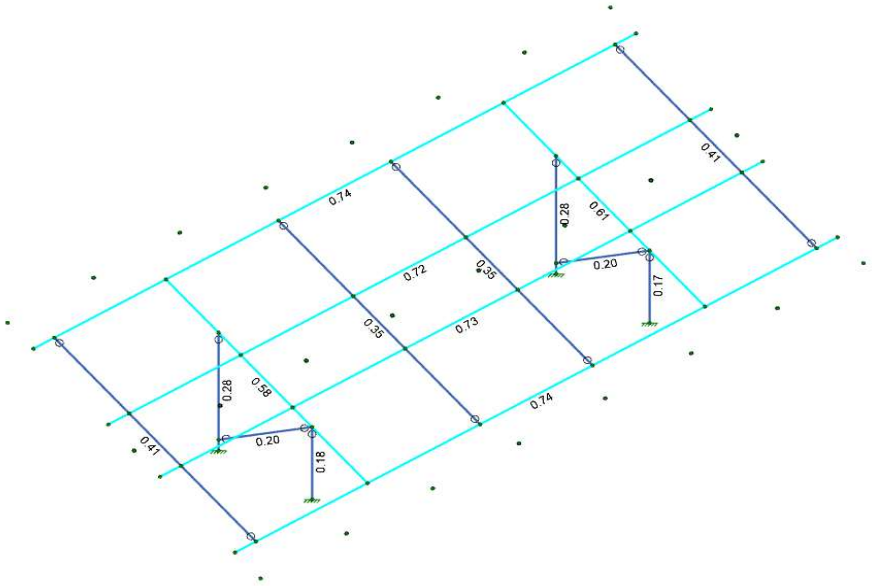
Cold-Formed Steel Section Sets

	Label	E (ksi)	G (ksi)	Nu	Thermal	Density	Yield (ksi)	Fu (ksi)
1	A653 SS Gr50	29500	11346	0.3	0.65	0.49	50	65
2	A653 SS Gr80	29500	11346	0.3	0.65	0.49	80	82

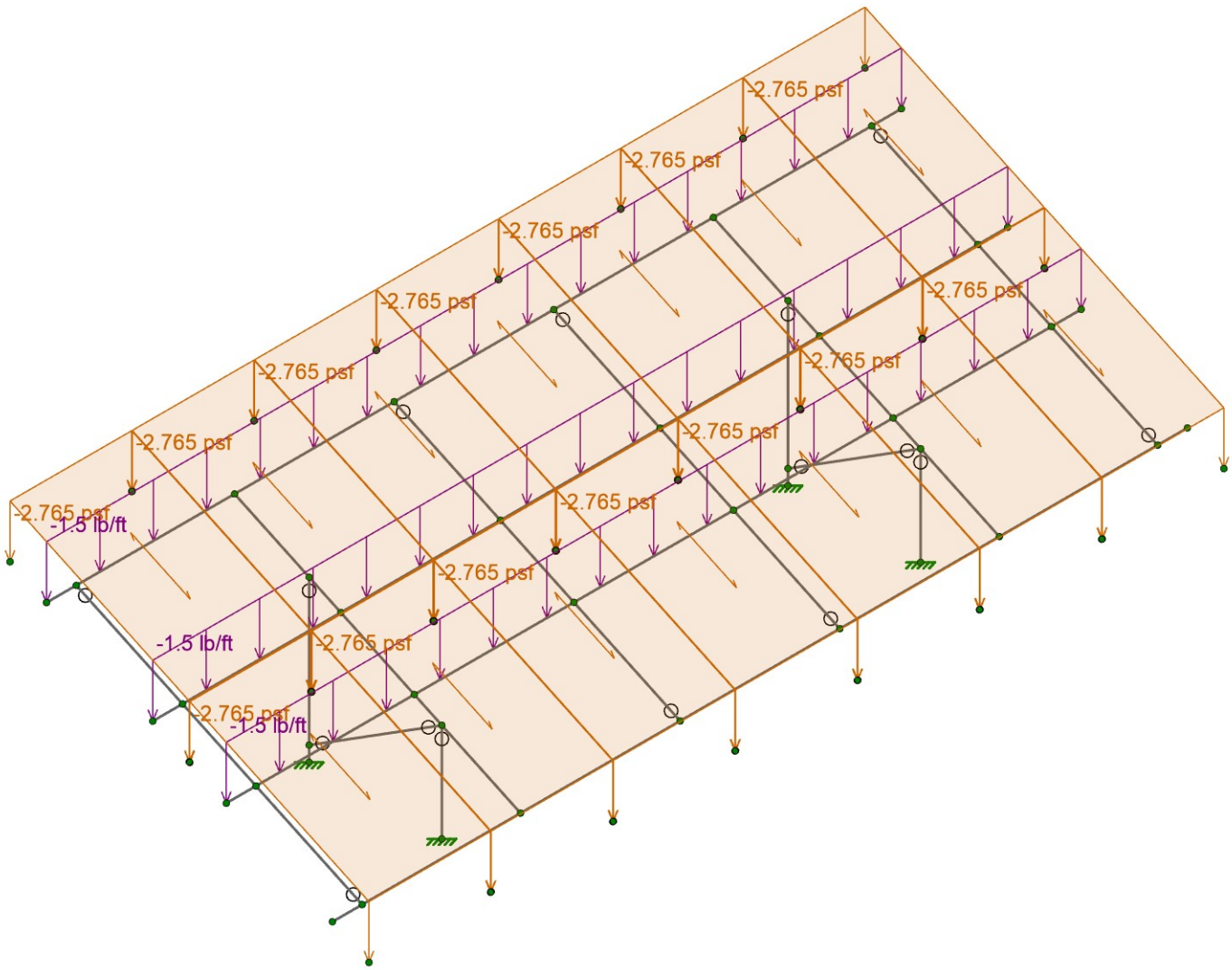
	Label	Shape	Type	Material	A(in2)	Iyy (in4)	Izz (in4)	J (in4)
1	Panel Bea	6.25Z3X1X16GAX55DE	Beam	A653 SS Gr8	0.883	2.393	5.633	0.001
2	NS CEE Be	8CS2X14GA-0.625	Beam	A653 SS Gr5	0.987	0.455	8.718	0.002
3	Kicker Brac	2.75CU1.75X14ga_CF/	HBrace	A653 SS Gr5	0.46	0.146	0.566	0.000956
4	Beam Brac	1.5CU0.75X0.058	HBrace	A653 SS Gr5	0.155	0.008	0.051	0.000174
5	CEE Post	8CS2X14GA-0.625	Column	A653 SS Gr5	1.97	1.97	17.225	0.009

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (FS 465W)

Member Utilization Ration

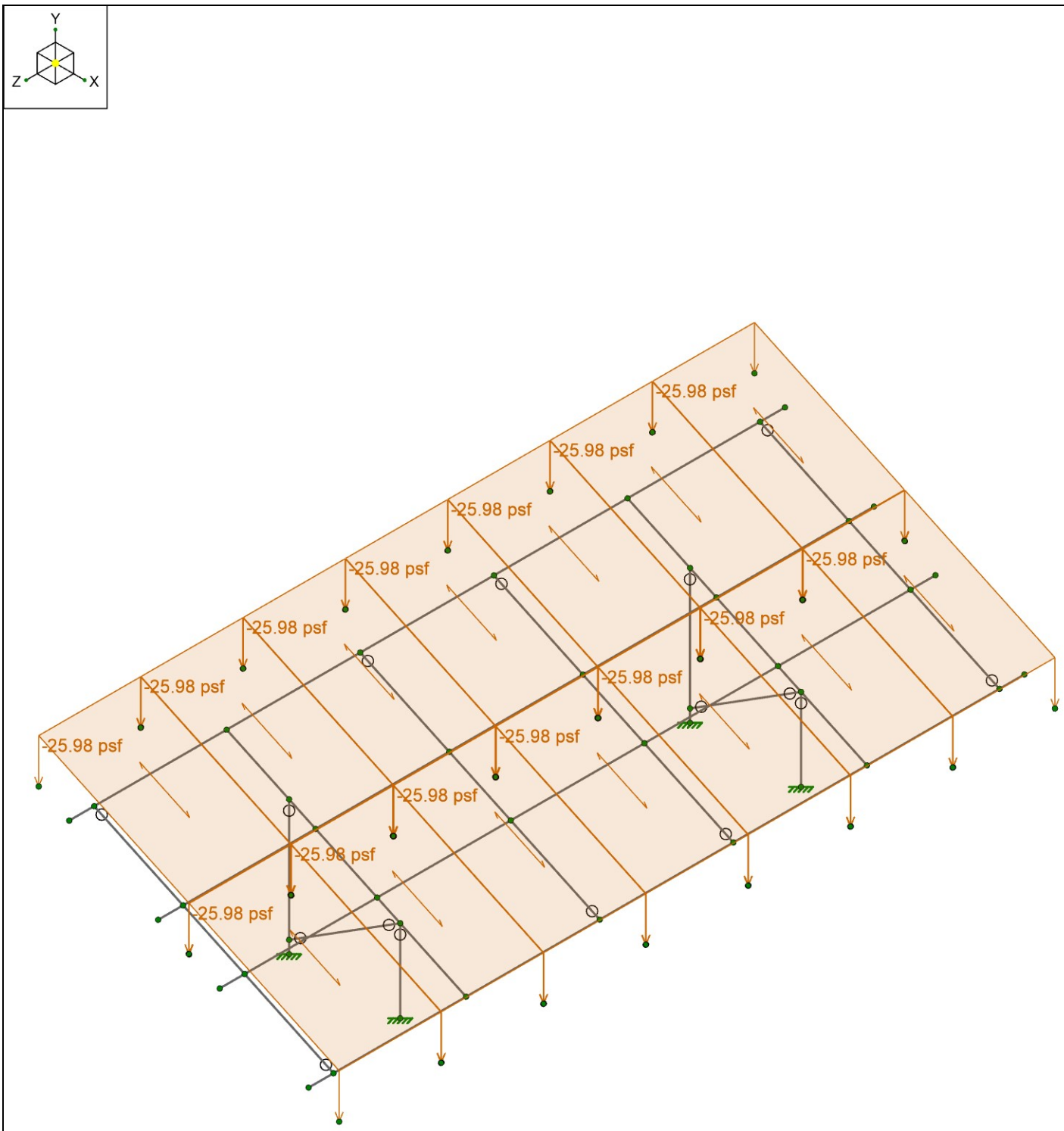


		Bending		Shear				
Member	**Shape**	**Code Check**	**LC**	**Code Check**	**LC**	**M_{nzz}** [in-kips]	**C_b**	**Eqn**
M1	8CS2X14GA-0.625	0.36	4	0.122	5	5181.693	5927.241	H1.2-1
M2	8CS2X14GA-0.625	0.361	4	0.122	5	5181.088	5927.241	H1.2-1
M3	8CS2X14GA-0.625	0.79	4	0.31	4	7084.3	5927.241	H1.2-1
M4	8CS2X14GA-0.625	0.794	4	0.309	4	7054.224	5927.241	H1.2-1
M5	2.75CU1.75X14ga_CF/	0.256	3	0.002	6	630.59	3187.65	H1.2-1
M6	2.75CU1.75X14ga_CF/	0.256	3	0.002	6	630.59	3187.65	H1.2-1
M7	6.25Z3X1X16GAX55DE	0.866	2	0.197	2	5563.598	4105.434	H1.1-2
M8	6.25Z3X1X16GAX55DE	0.884	2	0.199	2	5563.598	4105.434	H1.1-2
M9	6.25Z3X1X16GAX55DE	0.901	2	0.227	4	5563.598	4105.434	H1.2-1
M10	6.25Z3X1X16GAX55DE	0.861	2	0.221	4	5563.598	4105.434	H1.2-1
M11	1.5CU0.75X0.058	0.604	2	0.052	2	154.955	1028.775	H1.2-1

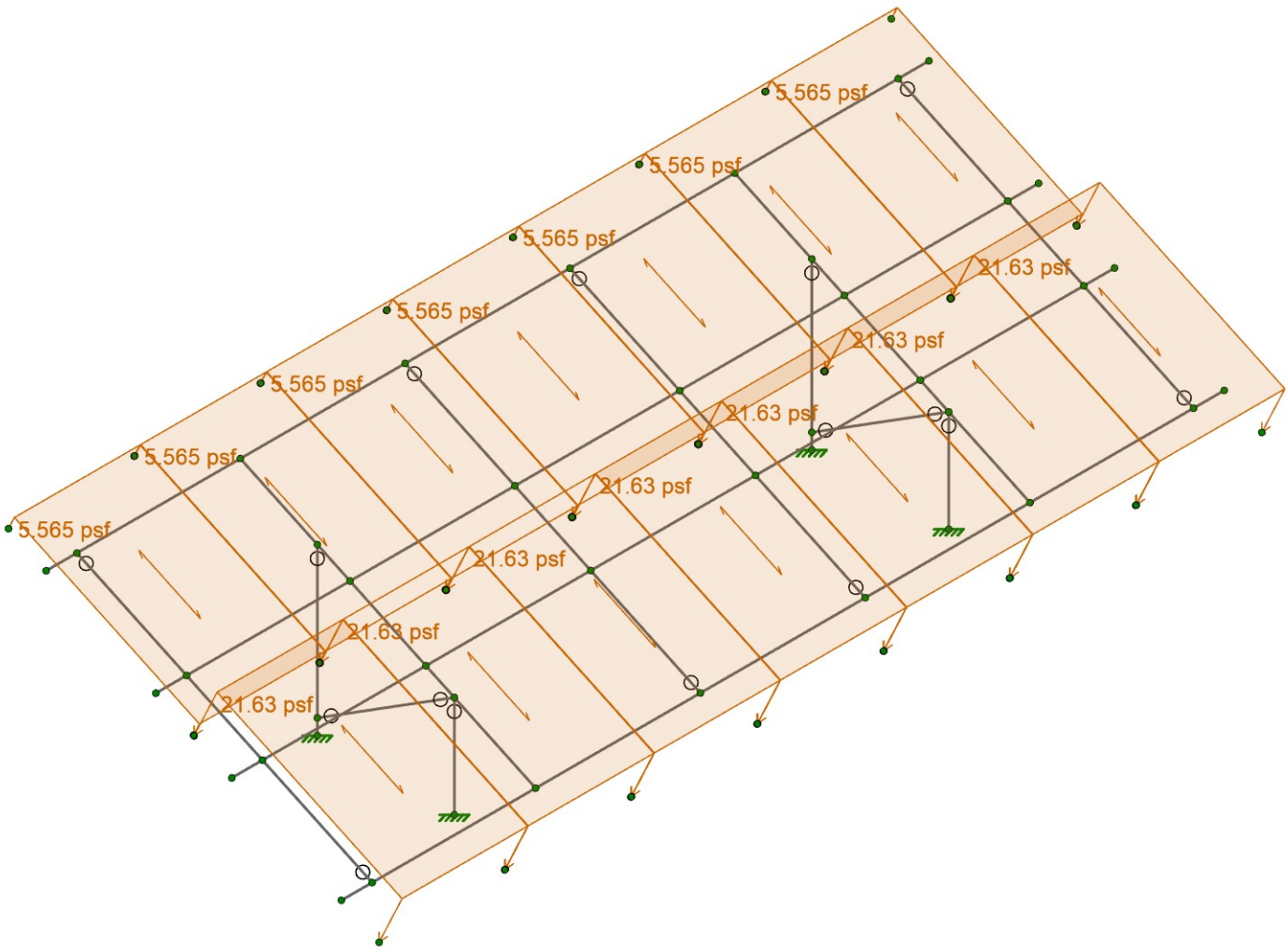


Loads: BLC 1, D
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (FS 465W)	SK-1
	J. Speidel		Mar 19, 2026 at 04:13 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (FS…



Loads: BLC 2, S
Envelope Only Solution



Loads: BLC 3, W1
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (FS 465W)	SK-3
	J. Speidel		Mar 19, 2026 at 04:14 PM
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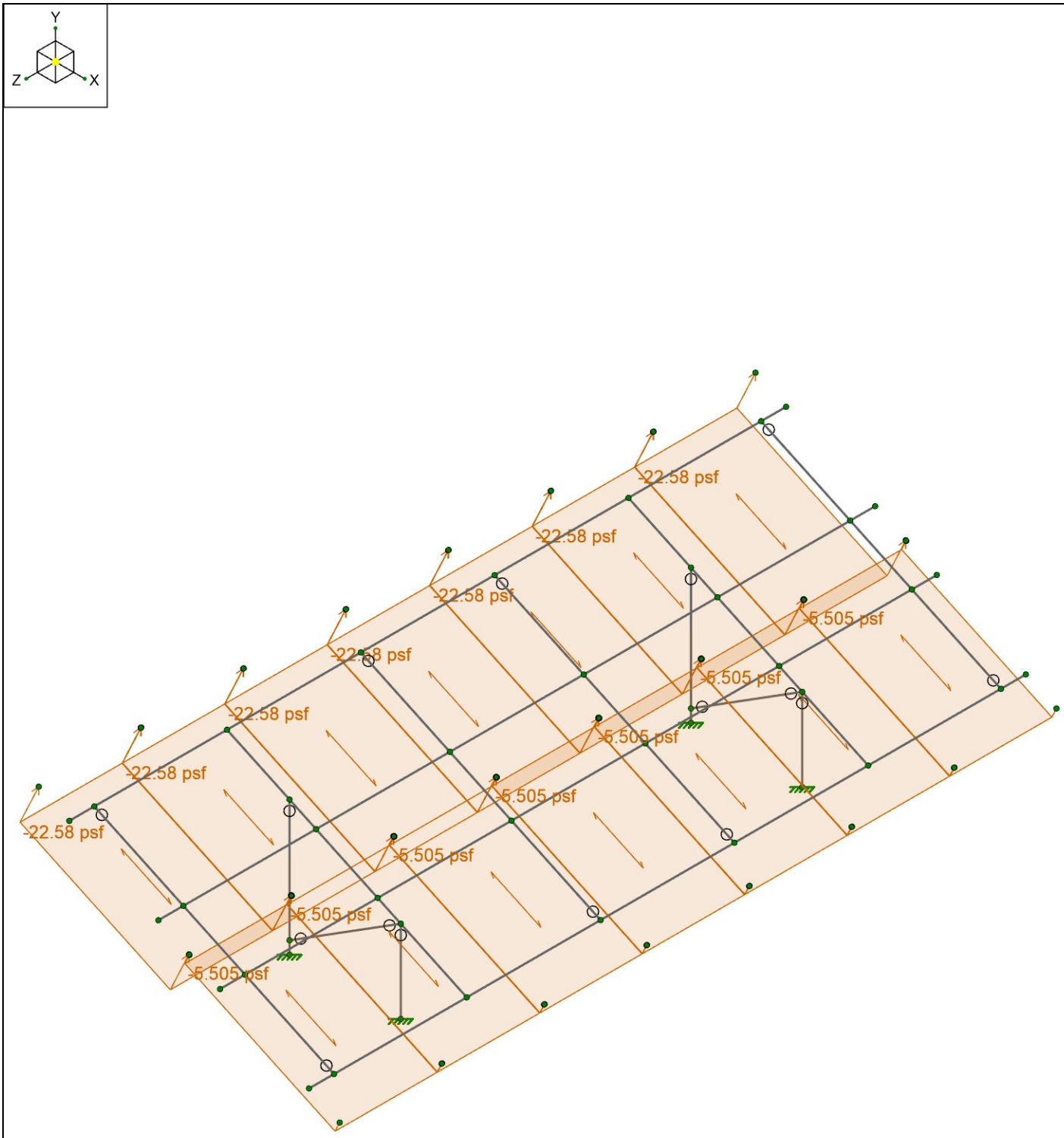

Loads: BLC 4, W2
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (FS 465W)	SK-4
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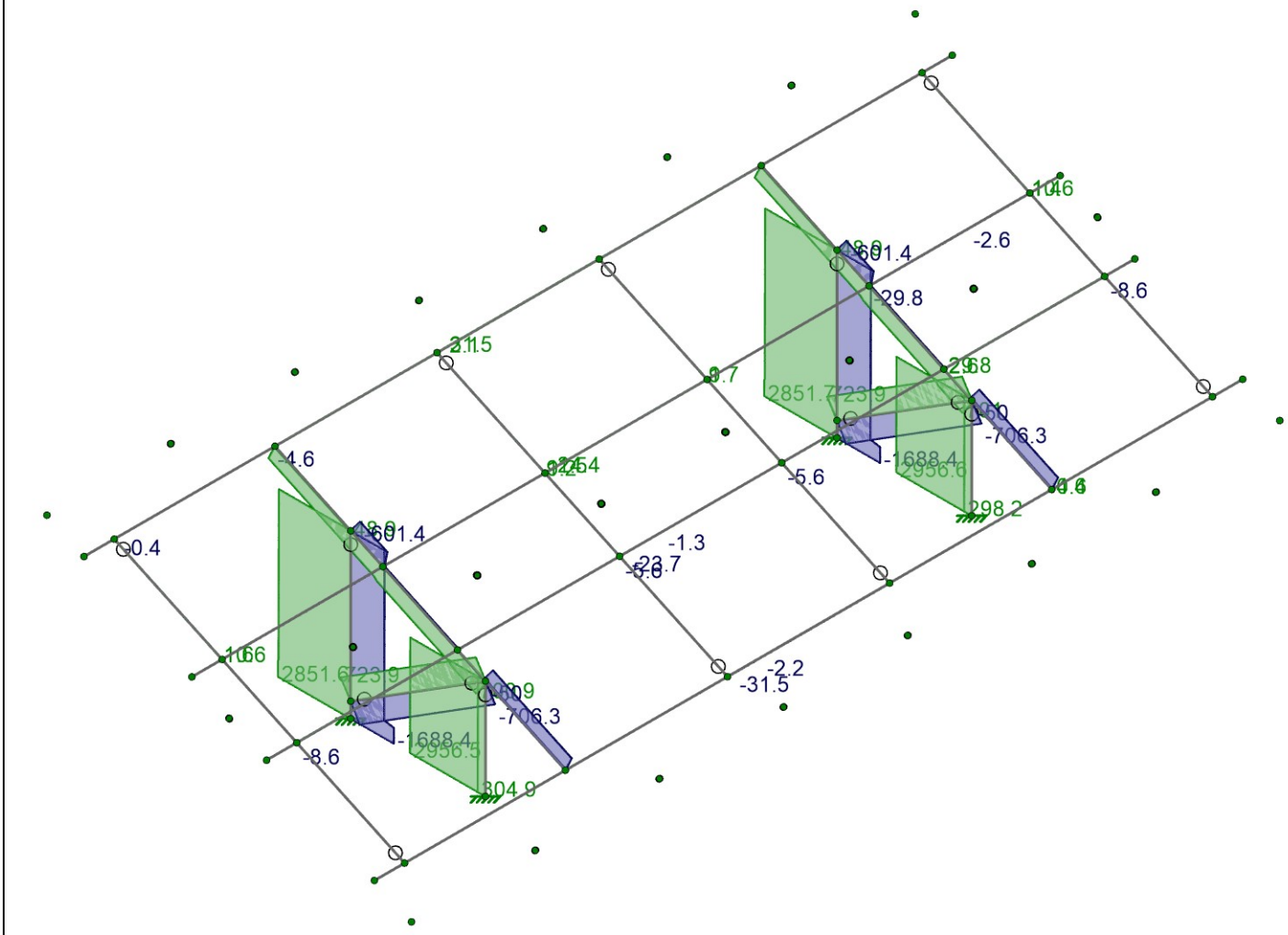
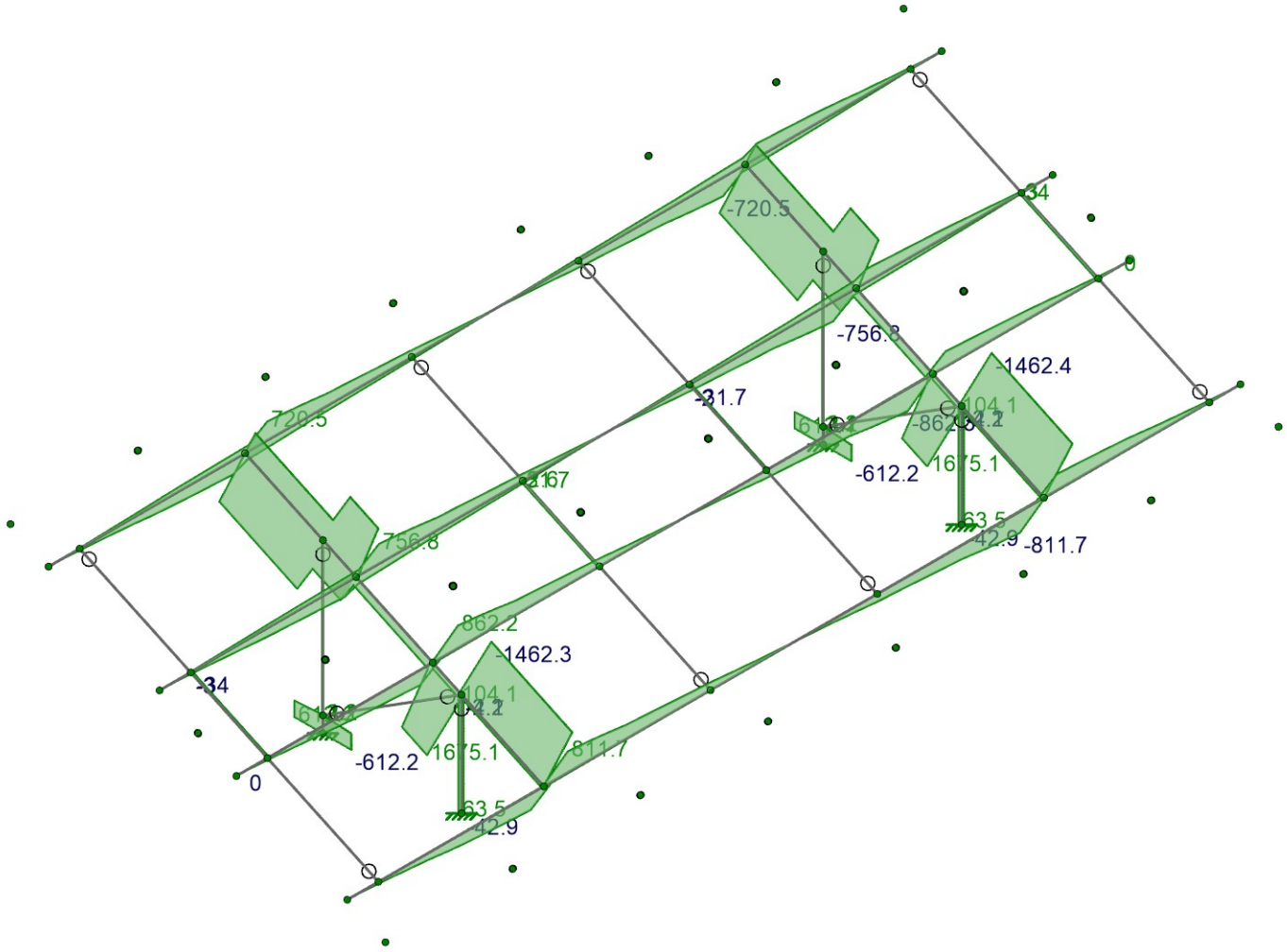


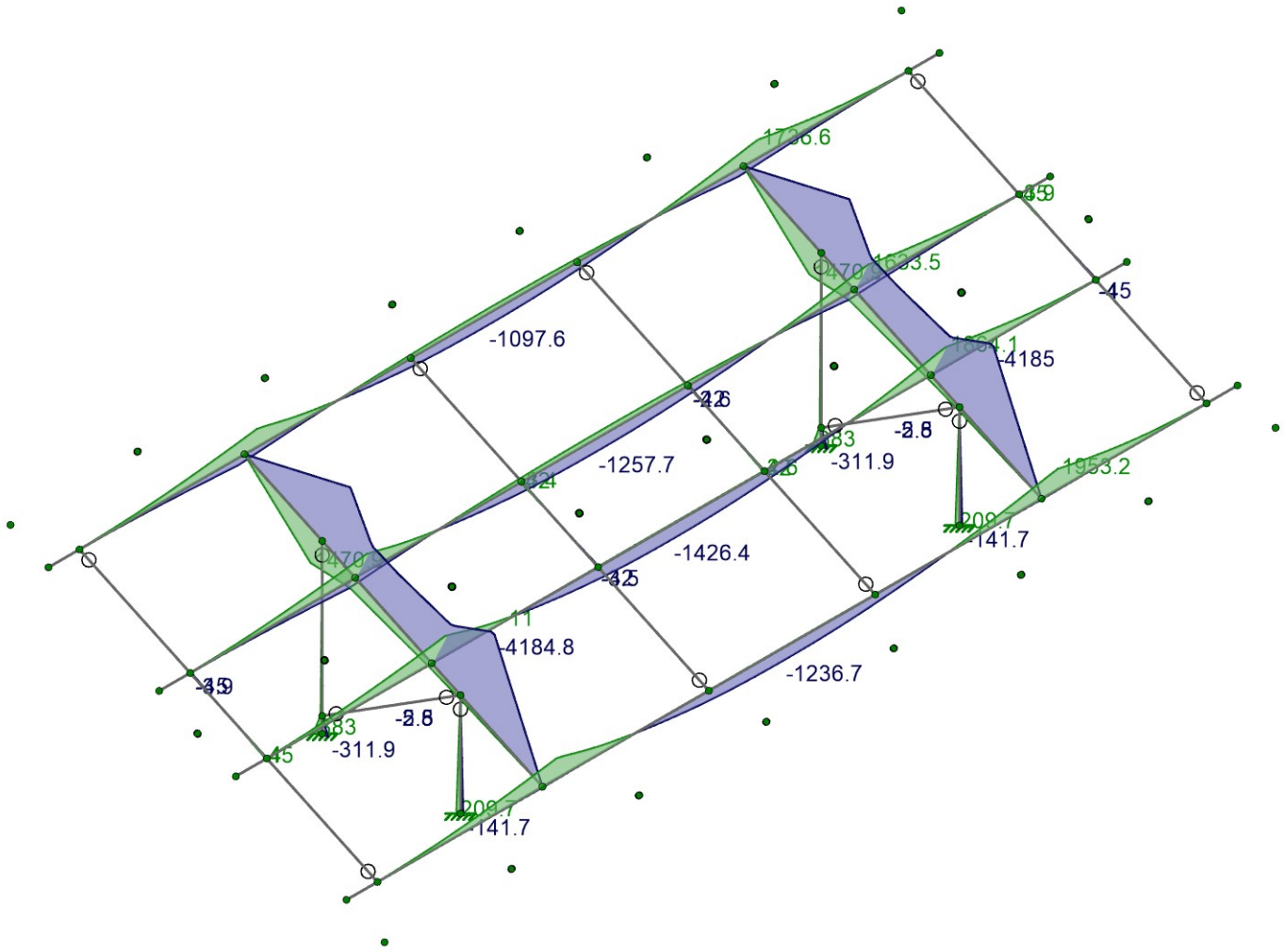
Envelope Only Solution
Member Axial Forces (lbs) (Enveloped)

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (FS 465W)	SK-5
	J. Speidel		Mar 19, 2026 at 04:14 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (FS…



Envelope Only Solution
Member y Shear Forces (lbs) (Enveloped)

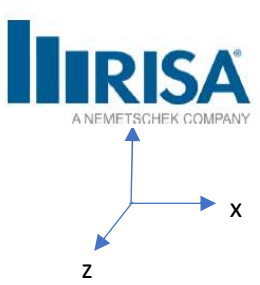
IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (FS 465W)	SK-6
	J. Speidel		Mar 19, 2026 at 04:14 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (FS…

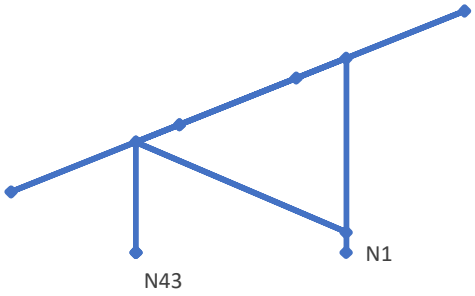


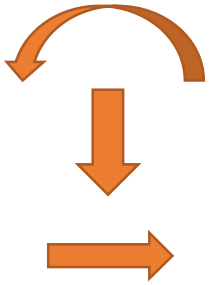
Envelope Only Solution
Member z Bending Moments (lb-ft) (Enveloped)

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (FS 465W)	SK-7
	J. Speidel		Mar 19, 2026 at 04:14 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (FS…

FOUNDATION DESIGN REACTIONS







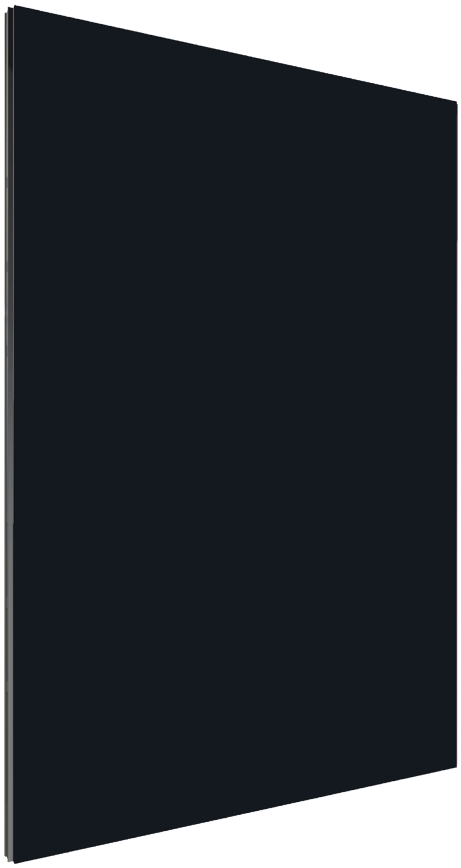
LC #	Description	Node	Lateral X (kips)	Vertical Y (kips)	Moment Mzz (kip-ft)
1	D	N1	0.003	0.486	-0.001
2	D+S	N1	0.021	3.402	-0.003
3	D+0.6W1	N1	0.698	1.048	-0.356
4	D+0.45W1+0.75S	N1	0.538	3.094	-0.268
5	0.6D+0.6W2	N1	-0.724	-2.035	0.446
6	(1+0.14Sds)D+0.7Ex	N1	-0.019	0.537	0.012
7	(1+0.105Sds)D+0.525E	N1	0.000	2.709	0.008
8	(0.6-0.14Sds)D+0.7Ex	N1	-0.020	0.342	0.013
9	(1+0.14Sds)D+0.7Ez	N1	-0.001	0.552	0.001
10	(1+0.105Sds)D+0.525E	N1	0.013	2.720	0.000
11	(0.6-0.14Sds)D+0.7Ez	N1	-0.002	0.357	0.001

LC #	Description	Node	Lateral X (kips)	Vertical Y (kips)	Moment Mzz (kip-ft)
1	D	N43	-0.003	0.425	0.009
2	D+S	N43	-0.021	3.289	0.075
3	D+0.6W1	N43	0.045	1.456	-0.159
4	D+0.45W1+0.75S	N43	0.019	3.346	-0.068
5	0.6D+0.6W2	N43	-0.068	0.884	0.236
6	(1+0.14Sds)D+0.7Ex	N43	-0.006	0.501	0.018
7	(1+0.105Sds)D+0.525E	N43	-0.019	2.631	0.065
8	(0.6-0.14Sds)D+0.7Ex	N43	-0.005	0.332	0.014
9	(1+0.14Sds)D+0.7Ez	N43	-0.003	0.488	0.012
10	(1+0.105Sds)D+0.525E	N43	-0.017	2.623	0.061
11	(0.6-0.14Sds)D+0.7Ez	N43	-0.002	0.318	0.008

First Solar

Series 6 *Plus* Bifacial.

455-480 Watt Thin Film Solar Module



First Solar is once again setting the industry benchmark for reliable energy production, optimized design and environmental performance with Series 6 *Plus* Bifacial - the world's first bifacial thin film CdTe module. The advanced design signficantly reduces balance of system, shipping, and operating costs while delivering more energy per nameplate watt.

More Lifetime Energy per Nameplate Watt

- Industry's best (0.3%) warranted degradation rate
- Superior temperature coefficient, spectral response and shading behavior
- Unlike crystalline silicon modules, First Solar's thin film technology does not experience losses from LID or LeTID
- Anti-reflective coated glass enhances energy production
- Added bifacial energy yield

Innovative Module Design

- Under-mount frame provides the cleaning and snowshedding benefits of a frameless module while protecting edges against breakage
- Innovative SpeedSlots combine the robustness of bottom mounting with the speed of top clamping while utilizing fewer fasteners to achieve the industry's fastest installation times and lowest mounting hardware costs
- Dual junction box design reduces wire management complexity and cost

Best In-Class Reliability & Durability

- Manufactured under one roof with 100% traceable QA/QC
- Independently tested and certified for reliable performance that exceeds IEC standards in high temperature, high humidity, extreme desert and coastal applications
- Inherently immune to and warranted against power loss from cell cracking
- Durable glass/glass construction

Best Environmental Profile

- Fastest energy payback time in the industry
- Carbon footprint that is 2.5X lower and a water footprint that is 3X lower than mono crystalline silicon panels on a life cycle basis
- Global PV module recycling services available through First Solar or customer-selected third-party

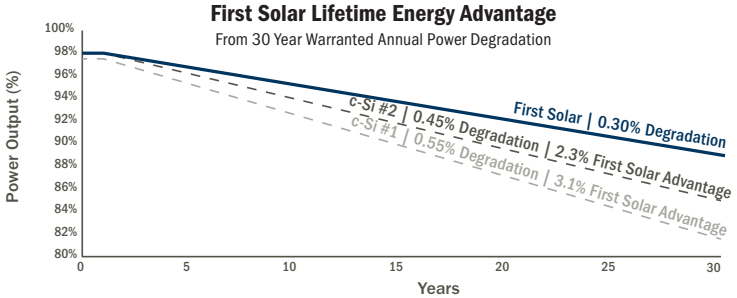
19.0%
HIGH BIN EFFICIENCY

30YR
LINEAR PERFORMANCE WARRANTY

98%
WARRANTY START POINT

0.3%
WARRANTED ANNUAL DEGRADATION RATE[1]

First Solar Lifetime Energy Advantage
From 30 Year Warranted Annual Power Degradation



Learn more about First Solar and Series 6 *Plus* Bifacial at firstsolar.com/S6

MPD-00745-06-PB | Jul 2023

Series 6 *Plus* Bifacial.

First Solar

Electrical Specifications

RATINGS AT STANDARD TEST CONDITIONS (1000W/m², AM 1.5, 25°C)[2]

SERIES 6 PLUS BIFACIAL MODEL TYPES: FS-6XXX-P-B / FS-6XXXA-P-B (XXX = NOMINAL POWER)

Nominal Power[3] (-0/+5%)	P_{MAX} (W)	455		460		465		470		475		480	
		STC[4]	BNPI[5]	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI
Nominal Power	P_{MAX} (W)	455	464	460	469	465	474	470	479	475	485	480	490
Voltage at P_{MAX}	V_{MAX} (V)	187.8	187.8	188.8	188.8	189.8	189.8	191.1	191.1	191.5	191.5	192.8	192.8
Current at P_{MAX}	I_{MAX} (A)	2.42	2.47	2.44	2.49	2.45	2.50	2.46	2.50	2.48	2.53	2.49	2.54
Open Circuit Voltage	V_{OC} (V)	222.0	222.0	222.9	222.9	223.8	223.8	224.3	224.3	224.8	224.8	225.4	225.4
Short Circuit Current	I_{SC} (A)	2.58	2.63	2.59	2.64	2.60	2.65	2.61	2.66	2.61	2.66	2.62	2.67
Efficiency (%)	%	18.1		18.3		18.5		18.7		18.9		19.0	
Maximum System Voltage	V_{SYS} (V)	1500[6]											
Limiting Reverse Current	I_R (A)	5.0											
Maximum Series Fuse	I_{CF} (A)	5.0											

TEMPERATURE CHARACTERISTICS

Module Operating Temperature Range	°C	-40 to +85
Temperature Coefficient of P_{MAX}	T_K (P_{MAX})	-0.32%/°C [Temperature Range: 25°C to 75°C]
Temperature Coefficient of V_{OC}	T_K (V_{OC})	-0.28%/°C
Temperature Coefficient of I_{SC}	T_K (I_{SC})	+0.04%/°C
Nominal Operating Cell Temperature	°C	43
Bifaciality Factor	%	15±5

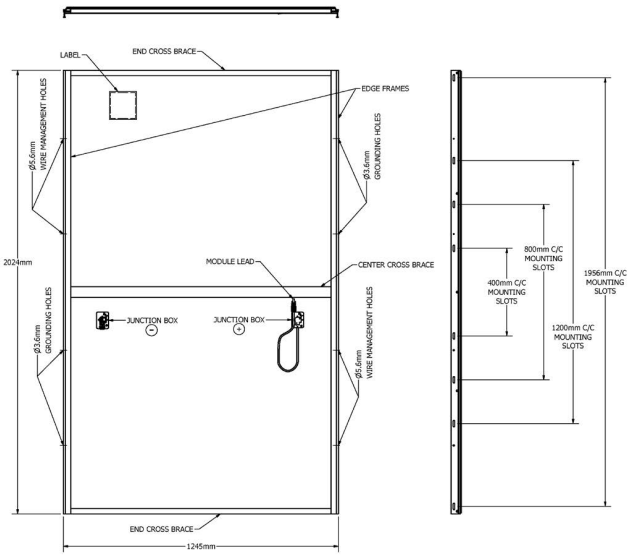
PACKAGING INFORMATION

Model Type	Modules Per Pack	Packs per 40' Container
FS-6XXX-P-B / FS-6XXXA-P-B	27	18

MECHANICAL DESCRIPTION

Module/Glass Length	2024mm/2016mm
Module/Glass Width	1245mm/1216mm
Module/Glass Area	2.52m²/2.45m²
Module Weight	34.0kg
Leadwire[7]	2.5mm², 733mm (+) & Bulkhead (-)
Connectors	TE Connectivity PV4-S, or alternate
Junction Box	IP68 Rated
Bypass Diode	N/A
Cell Type	Thin film CdTe semiconductor, up to 268 cells
Frame Material	Anodized Aluminum
Front Glass	Heat strengthened
Back Glass	Heat strengthened
Encapsulation	Laminate material with edge seal
Frame to Glass Adhesive	Silicone
Load Rating[8]	+/-2400Pa

Mechanical Specifications



Install in portrait only

Certifications & Tests[9]

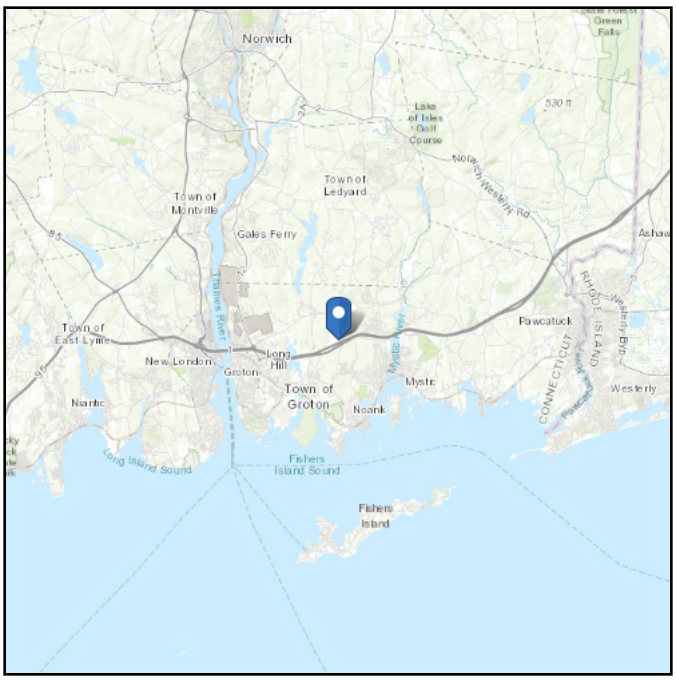
CERTIFICATIONS AND LISTINGS	EXTENDED DURABILITY TESTS	QUALITY & EHS
IEC 61215:2021 & 61730-1:2016[6], CE	IEC TS 63209-1 Extended Stress Test	ISO 9001:2015
IEC 61701 Salt Mist Corrosion	Long-Term Sequential	ISO 14001:2015
IEC 60068-2-68 Dust and Sand Resistance	Thresher Test	ISO 45001:2018
UL 61730	PID Resistant	ISO 14064-3:2006
		EPEAT Silver Registered

1 Limited power output and product warranties subject to warranty terms and conditions
2 All ratings ±10%, unless specified otherwise. Specifications are subject to change
3 Measurement uncertainty applies
4 Frontside electrical ratings
5 Bifacial Name Plate Irradiance, as per IEC 61215:2021
6 IEC 61730-1: 2016 Class II
7 Leadwire length from junction box exit to connector mating surface
8 1500Pa tentative load rating for 1956mm mounting slots. Higher loads may be acceptable,subject to testing
9 Testing Certifications/Listings pending

ASCE Hazards Report

Address:
685 Flanders Rd
Mystic, Connecticut
06355

Standard:	ASCE/SEI 7-22	**Latitude:**	41.36933
Risk Category:	II	**Longitude:**	-72.008104
Soil Class:	Default	**Elevation:**	191.56476631379937 ft (NAVD 88)



Wind

Results:

Wind Speed	123 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	95 Vmph
100-year MRI	105 Vmph
300-year MRI	115 Vmph
700-year MRI	123 Vmph
1,700-year MRI	131 Vmph
3,000-year MRI	136 Vmph
10,000-year MRI	146 Vmph
100,000-year MRI	163 Vmph
1,000,000-year MRI	186 Vmph

Data Source: ASCE/SEI 7-22, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue Dec 02 2025

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-22 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years). Values for 10-year MRI, 25-year MRI, 50-year MRI and 100-year MRI are Service Level wind speeds, all other wind speeds are Ultimate wind speeds.

Site is in a hurricane-prone region as defined in ASCE/SEI 7-22 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Seismic

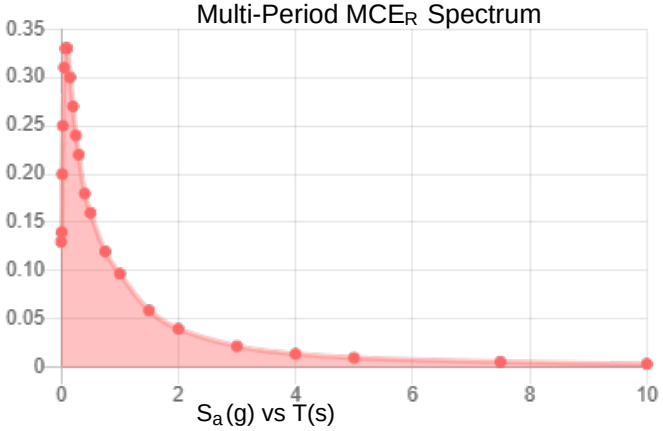
Site Soil Class: Default

Results:

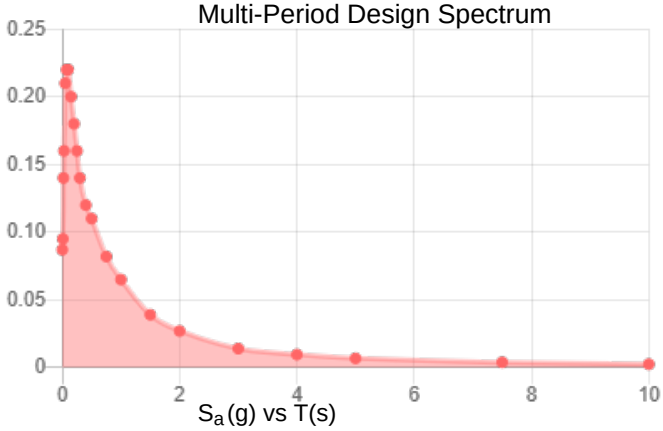
PGA_M :	0.12	T_L :	6
S_{MS} :	0.24	S_S :	0.2
S_{M1} :	0.097	S_1 :	0.046
S_{DS} :	0.16	V_{S30} :	260
S_{D1} :	0.065		

Seismic Design Category: A

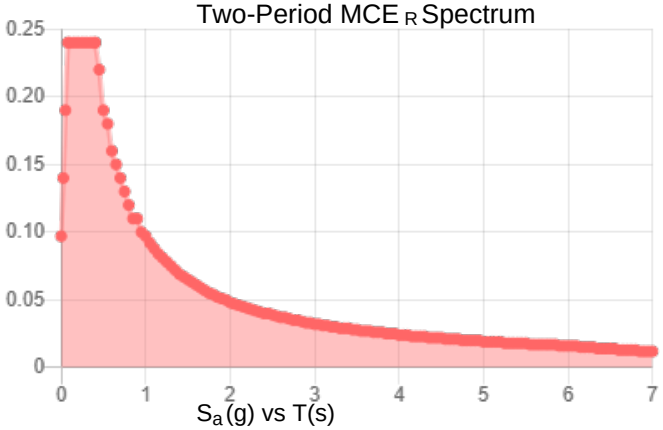
Multi-Period MCE_R Spectrum



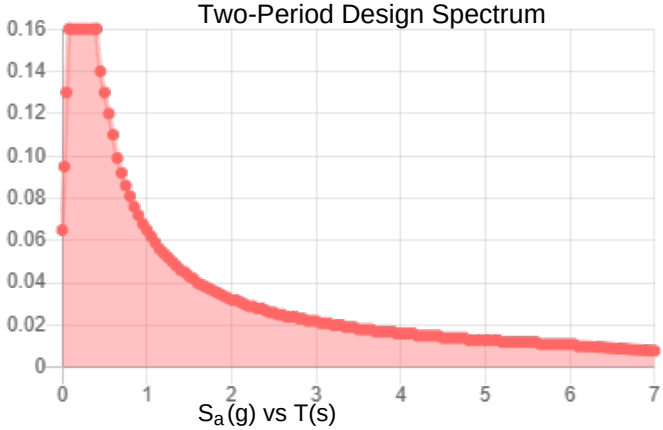
Multi-Period Design Spectrum



Two-Period MCE_R Spectrum



Two-Period Design Spectrum



MCE_R Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

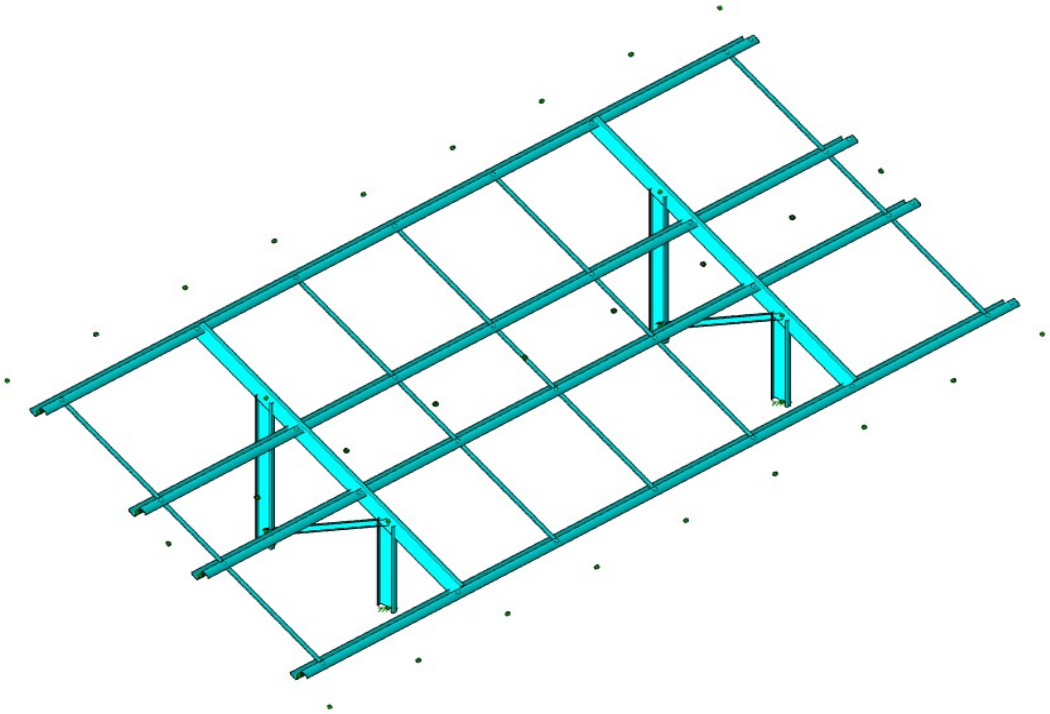
Data Accessed: **Tue Dec 02 2025**

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

Snow

Results:

Ground Snow Load, p_g :	42 lb/ft^2
20-year MRI Value:	17.47 lb/ft^2
Winter Wind Parameter:	0.55
Mapped Elevation:	112.6 ft
Data Source:	ASCE/SEI 7-22, Figures 7.6-1 and 7.6-2 A-D
Date Accessed:	Tue Dec 02 2025
	Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.
	Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported ‘elevation’ and ‘mapped elevation’ differ significantly from each other.
Ground Snow Loads for IRC only, $p_{g(asd)}$:	29.4 lb/ft^2

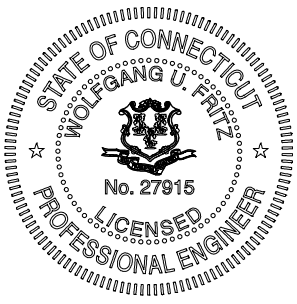


STRUCTURAL CALCULATION REPORT

Project Name:

GROTON LANDFILL (PHONO 590W)

Installation Address:
685 Flanders Road, Groton, CT 06340



Contour-LS™

19410 Jetton Rd Ste 220
Cornelius, NC 28031
p. 704-659-7474
f. 704-875-0781
info@dcesolar.com
www.dcesolar.com

INDEX SHEET

GENERAL

Project Information

.Customer:	Verogy Holding, LLC
.Project Name:	Groton Landfill (Phono 590W)
.Project Location:	685 Flanders Road, Groton, CT 06340
.Project Wattage (W):	

Module Specifications

.Module Manufacturer:	Phono Solar
.Module Model No:	PS590M8GFH-24/TNH
.Module Wattage (W):	
.Module Length (mm):	2,278
.Module Width (mm):	1,134
.Module Thickness (mm):	30
.Module Area (ft^2):	27.81
.Module Weight (lbs):	70.55

System Information

.Product Type:	Contour-LS
.Module Orientation:	Portrait
.Array Configuration:	2x8
.System Ground Clearance (in):	36.00
.System Tilt (degrees):	25.00
.System Length EW Dir. (ft):	29.96
.System Width NS Dir. (ft):	15.45
.System Area (ft^2):	462.88

Design Criteria

.Foundation Type:	Ballast
Pile Embedmend Depth (ft):	N/A

Criteria as per requirements by CT- licensed geotechnical engineer

SYSTEM LAYOUT

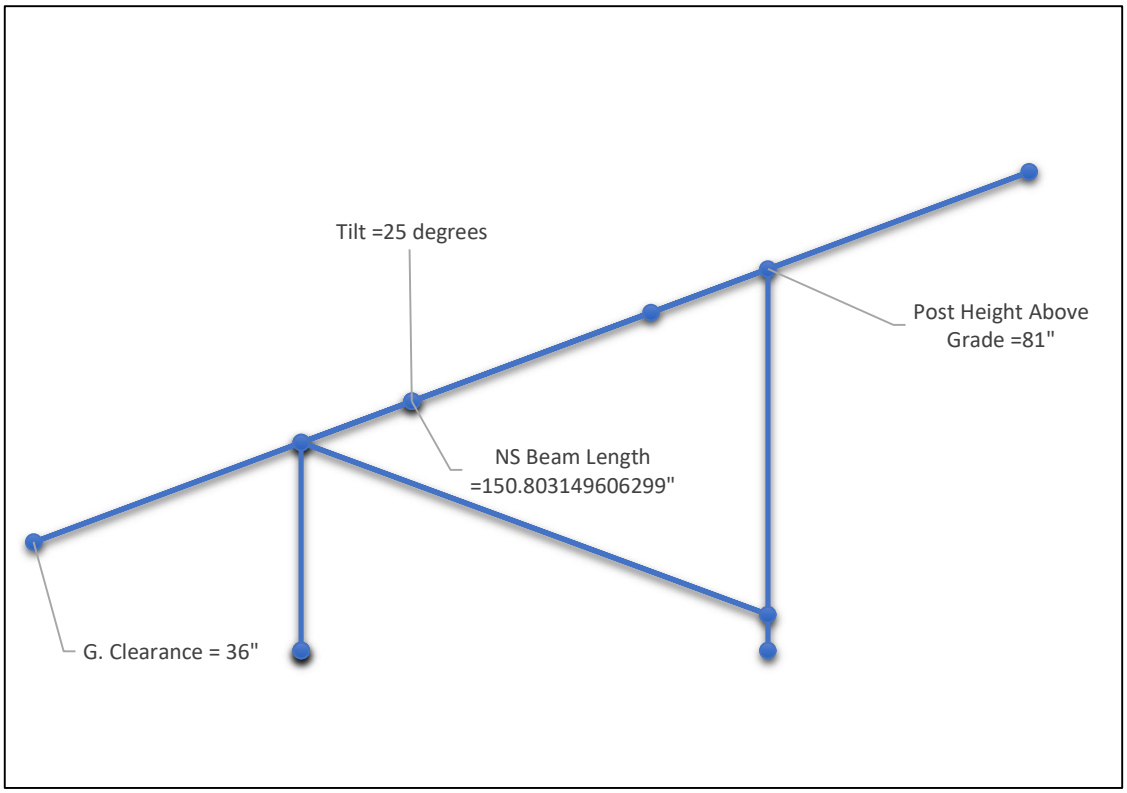


Figure 1: ***System Cross-Section***

Member Shapes

.Post:	8CS2X14GA-0.625
.NS Cee Beam:	8CS2X14GA-0.625
.EW Zee Beam:	6.25Z3X1X16GAX55DEG
..Number of Zee Beams:	Four
.Kicker Brace:	2.75CU1.75X14ga_CFA
..Number of Kicker Braces:	One
.Beam Brace:	1.5CU0.75X0.058
..Number of Beam Braces:	Five
.Screw:	KSF G 76x2100-3xM16

.NS Segment 1 (in):	39.00
.NS Segment 2 (in):	68.00
.NS Segment 3 (in):	37.80

MATERIAL SPECIFICATIONS AND STRENGTHS

Hot-Rolled Steel

.Structural Steel
.ASTM A992, F_y = 52ksi U.N.O.
.ASTM A123 Gr. 85 HDG

Cold-Formed Steel

.Structural Steel
.ASTM A653 Gr. 50 Class 3 G115 U.N.O.
.ASTM A653 Gr. 80 Class 3 G115 U.N.O.

Bolts

.ASTM A325
.ASTM F593

CODES & REFERENCES

2024 International Building Code (IBC)
.ASCE 7-22 Minimum Design Loads for Buildings and Other Structures
.AISC ASD/LRFD - Fourteen Edition (2016) / AISC 360-16
.AISI S100-20 ASD- North America Specification for the Design of Cold-Formed Structural Members

DESIGN SOFTWARE

.RISA 3D v.20

SYSTEM LOADS

Dead Load

.A) Module Dead Load (psf):	2.54
.B) Self Weight of Structure (psf):	3.94
.C) Electr./Misc. Equipment (psf):	0.61
.D) Total Dead Load [A + B + C] (psf):	7.08

**** Actual System Self Weight is Determined by RISA 3D ****

Live Load

.Live Load (psf): **** Live Load Not Considered ****

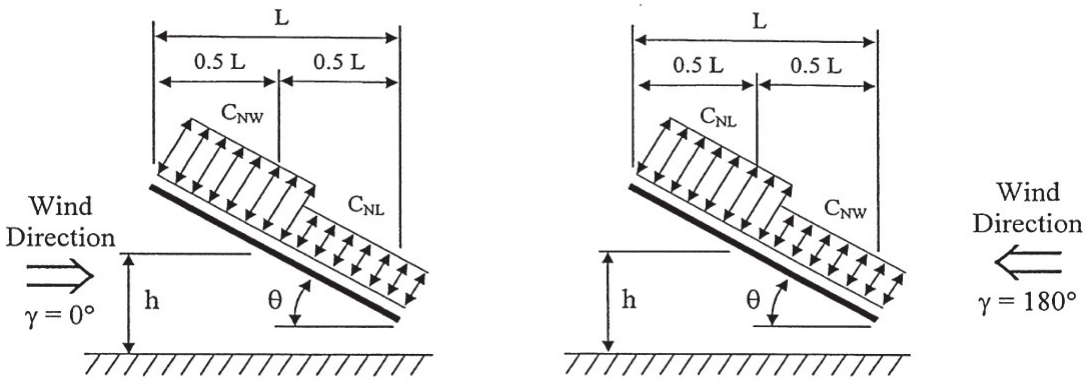
Snow Load

.Ground Snow Load (psf):	42	*per ASCE 7-22 Figure 7-1*
.Exposure Category	C	*per ASCE 7-22 Section 26.7*
.Importance Factor Snow, I_s:	1.00	*per ASCE 7-22 Table 1.5-2*
.Thermal Factor, C_t:	1.20	*per ASCE 7-22 Table 7-3*
.Exposure Factor, C_e:	0.90	*per ASCE 7-22 Table 7-2*
.Flat Snow Load, p_f (psf)	31.75	*per ASCE 7-22 Equation 7.3-1*
.Min. Snow Load, p_m min (psf):	31.75	*per ASCE 7-22 Section 7.3.4*
.Tilt Angle Factor, Cs:	0.82	*per ASCE 7-22 Figure 7-2*
.Tilt Angle Snow Load, p_s (psf):	25.98	*per ASCE 7-22 Equation 7.4-1*
.Rain-on-Snow Surcharge:	0.00	*per ASCE 7-22 Section 7.10*
.Total Snow Load (psf):	25.98	

SYSTEM LOADS

Wind Loads

.Wind Speed (3s-gust) V, (mph):	130	*per ASCE 7-22 Figure 26.5-1a*
..MRI Factor	1.00	*per ASCE 7-22 Section C26.5-2*
.Risk Category:	II	*per ASCE 7-22 Table 1.5-1*
.Wind Importance Factor:	1.00	per ASCE 7-22 Table 1.5-2
.Exposure Category:	C	*per ASCE 7-22 Section 26.7*
.Topographic Factor, k_{zt}:	1.00	*per ASCE 7-22 Figure 26.8*
.Vel. Press. Exp. Coeff., k_h (MWFRS):	0.85	*per ASCE 7-22 Table 26.10-1*
..3-sec gust-speed, α	9.5	*per ASCE 7-22 Table 26.11-1*
..Nominal height, Zg	900	*per ASCE 7-22 Table 26.11-1*
.Directionality Factor, k_d:	0.85	*per ASCE 7-22 Table 26.6-1*
.Roof Velocity Pressure, q_h (psf):	31.26	*per ASCE 7-22 Equation 26.10-1*
.Roof Pressures, $P = q_h GC_N$:	Clear Wind Flow	*per ASCE 7-22 Section 30.7.2*



ASCE 7-22 Figure 27.3-4

Table 1: Downward Wind Pressure Coefficients GCN (DCE Solar GM Wind Tunnel Report):

Location	DAF	GC_{NW}	GC_{NL}	P_W (psf)	P_L (psf)
E/W EDGE	1.09	0.68	0.68	15.95	7.33
NORTH	1.09	0.39	0.39	8.29	4.97
INTERIOR	1.09	0.33	0.33	6.69	4.48
SOUTH	**1.09**	**0.77**	**0.77**	**21.43**	**4.92**

Table 2: Upward Wind Pressure Coefficients GCN (DCE Solar GM Wind Tunnel Report):

Location	DAF	GC_{NW}	GC_{NL}	P_W (psf)	P_L (psf)
E/W EDGE	1.12	-0.74	-0.74	-26.21	0.39
NORTH	**1.12**	**-0.80**	**-0.80**	**-22.95**	**-5.12**
INTERIOR	1.12	-0.56	-0.56	-19.09	-0.37
SOUTH	1.12	-0.69	-0.69	-26.48	2.52

SYSTEM LOADS

Seismic Loads

.Spectral Response, short period, S_s	0.2	*per ASCE 7-22 Figure 22-1*
.Spectral Response, 1-sec period, S_1	0.046	*per ASCE 7-22 Figure 22-2*
.Long Period Transition Period, T_L (s):	6	*per ASCE 7-22 Figure 22-14*
.Site Class:	D	*per ASCE 7-22 Section 20.3*
.Seismic Design Category:	A	per ASCE 7-22 Table 11.6-1
.Occupancy Importance Factor, I:	1.00	per ASCE 7-22 Table 1.5-2
.Site Coefficient for short period, F_a:	0.00	*per ASCE 7-22 Table 11.4-1*
.Site Coefficeint for 1-sec period, F_v:	0.00	*per ASCE 7-22 Table 11.4-2*
Max. Considered Earthquake (MCE) Parameters:		
..MCE_R, short period, S_{MS}	0.240	*per ASCE 7-22 Equation 11.4-1*
..MCE_R, 1-sec period, S_{M1}	0.097	*per ASCE 7-22 Equation 11.4-2*
Design Base Earthquake (DBE) Parameters:		
..Spectral Response, short period, S_{DS}	0.160	*per ASCE 7-22 Equation 11.4-3*
..Spectral Response, 1-sec period, S_{D1}	0.060	*per ASCE 7-22 Equation 11.4-4*
.Period, T_0 (s):	0.075	*per ASCE 7-22 Section 11.4.5*
.Period, T_s (s):	0.375	*per ASCE 7-22 Section 11.4.5*
.Approx. Fundamental Period. "T" T_a (s):	0.079	*per ASCE 7-22 Equation 12.8-7*
..Peridod Parameters, C_t:	0.020	*per ASCE 7-22 Table 12.8-2*
..Period Parameters, x:	0.750	*per ASCE 7-22 Table 12.8-2*
..Effective Height, h_m(ft):	6.260	*per ASCE 7-22 Section 11.2*
.Structure Type:	All Other Self Supporting Structure	
..Response Modification Factor, R:	1.25	*per ASCE 7-22 Table 12.2-1*
..System Over strength Factor, Ω_0:	2	*per ASCE 7-22 Table 12.2-1*
..Deflection Amp. Factor, C_d:	2.5	*per ASCE 7-22 Table 12.2-1*
.Seismic Response Coefficient, C_s:	0.128	*per ASCE 7-22 Equation 12.8-2*
..$C_{s\text{-}max}$:	0.606	*per ASCE 7-22 Equation 12.8-3*
..$C_{s\text{-}min}$:	0.010	*per ASCE 7-22 Equation 12.8-5*
.Redundancy Factor, ρ	1.000	*per ASCE 7-22 Section 11.3.4*
.Seismic Base Shear, V:		
.. Vx:	0.128 * W	*per ASCE 7-22 Equation 12.8-1*
.. Vz:	0.128 * W	*per ASCE 7-22 Equation 12.8-1*

LOAD COMBINATION

Legend

.D = Dead Load
.L = Live Load (not applicable)
.LR = Roof Live Load (not applicable)
.S = Snow Load
.W1 = Wind Downward Load
.W2 = Wind Uplift Load
.Ex = Seismic Load (NS Direction)
.Ez = Seismic Load (EW Direction)

ASD Load Combination per ASCE 7-22

. 1) "D"
. 2) "D+S"
. 3) "D+0.6W1"
. 4) "D+0.45W1+0.75S"
. 5) "0.6D+0.6W2"
. 6) "(1+0.14Sds)D+0.7Ex"
. 7) "(1+0.105Sds)D+0.525Ex+0.75S"
. 8) "(0.6-0.14Sds)D+0.7Ex"
. 9) "(1+0.14Sds)D+0.7Ez"
.10) "(1+0.105Sds)D+0.525Ez+0.75S"
.11) "(0.6-0.14Sds)D+0.7Ez"

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (PHONO 590W)

Member Information

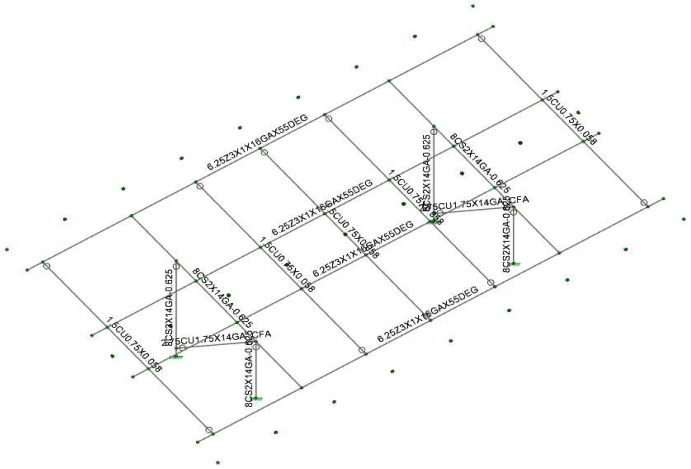
Member	Label	Shape	Node i	Node j	Rotation	Material
M1	Column	8CS2X14GA-0.625	1	3	0	2
M2	Column	8CS2X14GA-0.625	2	4	0	2
M3	NS CEE Beam	8CS2X14GA-0.625	6	5	180	2
M4	NS CEE Beam	8CS2X14GA-0.625	8	7	180	2
M5	Kicker Brace	2.75CU1.75X14ga_CFA	9	10	0	2
M6	Kicker Brace	2.75CU1.75X14ga_CFA	11	12	0	2
M7	Panel Beam	6.25Z3X1X16GAX55DEG	13	14	25	2
M8	Panel Beam	6.25Z3X1X16GAX55DEG	15	16	25	2
M9	Panel Beam	6.25Z3X1X16GAX55DEG	17	18	25	2
M10	Panel Beam	6.25Z3X1X16GAX55DEG	19	20	25	2
M11	Beam Brace	1.5CU0.75X0.058	21	24	90	2
M12	Beam Brace	1.5CU0.75X0.058	25	28	90	2
M13	Beam Brace	1.5CU0.75X0.058	29	32	90	2
M14	Beam Brace	1.5CU0.75X0.058	46	43	90	2
M15	Beam Brace	1.5CU0.75X0.058	33	36	90	2
M19	Column	8CS2X14GA-0.625	38	12	0	2
M20	Column	8CS2X14GA-0.625	37	10	0	2

Boundary Conditions

Node	Fx	Fy	Fz	Mx	My	Mz
N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
N2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
N43	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
N44	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (PHONO 590W)

Member Shapes Layout



Member Area Loading Table

Node A	Node B	Node C	Node D	Direction	Load D.	Panel	Snow	Wind -	Wind +
T8	T4	T3	T7	Y	B-C	-2.54	-25.98	4.92	-22.95
T6	T2	T1	T5	Y	B-C	-2.54	-25.98	21.43	-5.12
T16	T12	T11	T15	Y	B-C	-2.54	-25.98	4.92	-22.95
T14	T10	T9	T13	Y	B-C	-2.54	-25.98	21.43	-5.12
T24	T20	T19	T23	Y	B-C	-2.54	-25.98	4.92	-22.95
T22	T18	T17	T21	Y	B-C	-2.54	-25.98	21.43	-5.12
T32	T28	T27	T31	Y	B-C	-2.54	-25.98	4.92	-22.95
T30	T26	T25	T29	Y	B-C	-2.54	-25.98	21.43	-5.12
T40	T36	T35	T39	Y	B-C	-2.54	-25.98	4.92	-22.95
T38	T34	T33	T37	Y	B-C	-2.54	-25.98	21.43	-5.12
T48	T44	T43	T47	Y	B-C	-2.54	-25.98	4.92	-22.95
T46	T42	T41	T45	Y	B-C	-2.54	-25.98	21.43	-5.12
T56	T52	T51	T55	Y	B-C	-2.54	-25.98	4.92	-22.95
T54	T50	T49	T53	Y	B-C	-2.54	-25.98	21.43	-5.12
T64	T60	T59	T63	Y	B-C	-2.54	-25.98	4.92	-22.95
T62	T58	T57	T61	Y	B-C	-2.54	-25.98	21.43	-5.12

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (PHONO 590W)

Global Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation ?	Yes
Increase Nailing Capacity for Wind ?	Yes
Include Warping ?	Yes
Trans Load Btwn Intersecting Wood Wall ?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	0.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.17
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-16): ASD
Adjust Stiffness?	Yes (Iterative)
RISAConnection Code	None
Cold Formed Steel Code	AISI S100-20: ASD
Wood Code	None
Wood Temperature	<100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None
Stainless Steel Code	None

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (PHONO 590W)

Hot Roll Steel Section Sets

	Label	E (ksi)	G (ksi)	Nu	Thermal	Density	Yield (ksi)	Fu (ksi)
1	A992	29000	11154	0.3	0.65	0.49	50	65
2	A36 Gr. 36	29000	11154	0.3	0.65	0.49	36	58

	Label	Shape	Type	Material	A(in2)	Iyy (in4)	Izz (in4)	J (in4)
1	Pipe	HSS2.375x0.154	Column	00 Gr. C RI	1	0.627	0.627	1.25
2	Column	W6x8.5	Column	A992	2.52	1.99	14.9	0.33

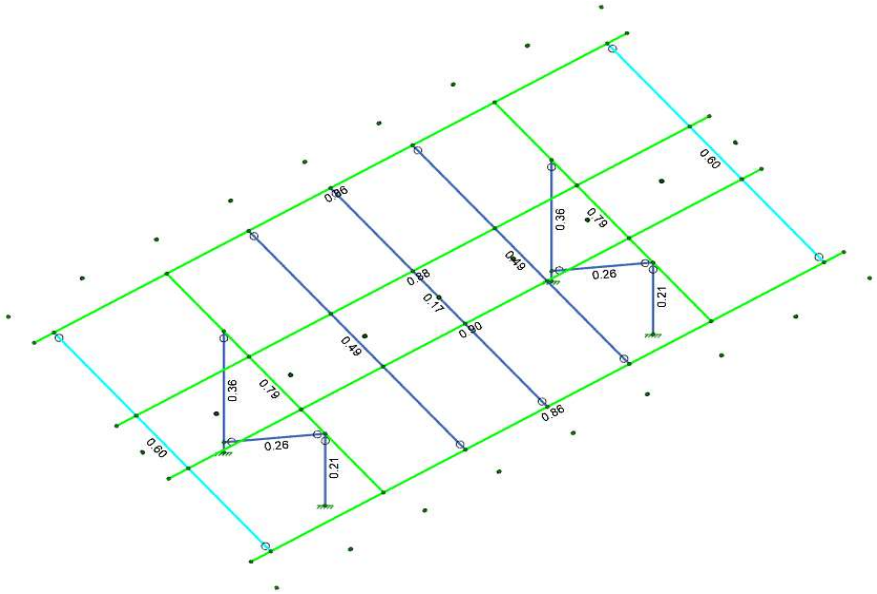
Cold-Formed Steel Section Sets

	Label	E (ksi)	G (ksi)	Nu	Thermal	Density	Yield (ksi)	Fu (ksi)
1	A653 SS Gr50	29500	11346	0.3	0.65	0.49	50	65
2	A653 SS Gr80	29500	11346	0.3	0.65	0.49	80	82

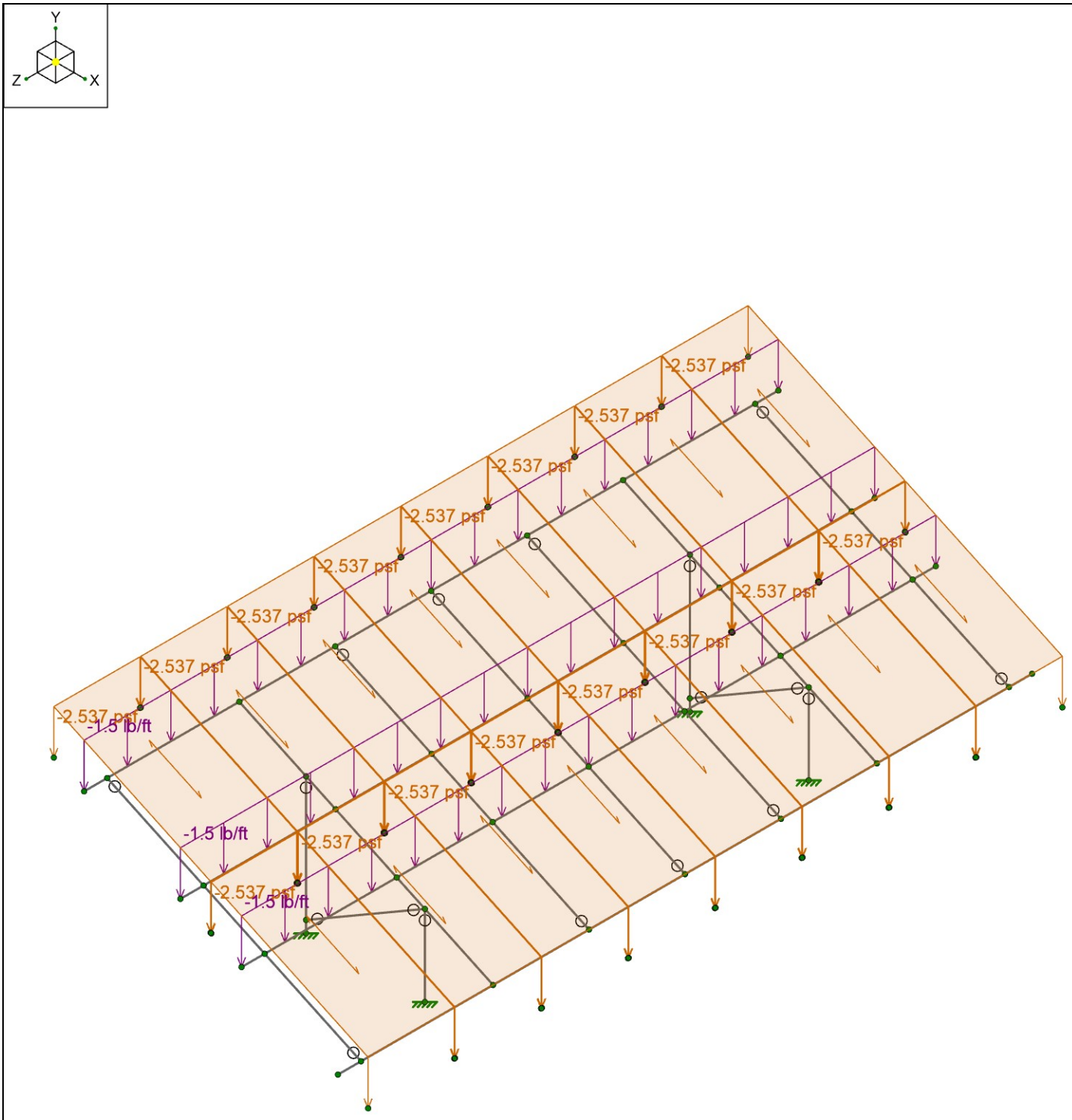
	Label	Shape	Type	Material	A(in2)	Iyy (in4)	Izz (in4)	J (in4)
1	Panel Bea	6.25Z3X1X16GAX55DE	Beam	A653 SS Gr8	0.883	2.393	5.633	0.001
2	NS CEE Be	8CS2X14GA-0.625	Beam	A653 SS Gr5	0.987	0.455	8.718	0.002
3	Kicker Brac	2.75CU1.75X14ga_CF/	HBrace	A653 SS Gr5	0.46	0.146	0.566	0.000956
4	Beam Brac	1.5CU0.75X0.058	HBrace	A653 SS Gr5	0.155	0.008	0.051	0.000174
5	CEE Post	8CS2X14GA-0.625	Column	A653 SS Gr5	1.97	1.97	17.225	0.009

Designer: J. Speidel
Job Number:
Model Name: GROTON LANDFILL (PHONO 590W)

Member Utilization Ration

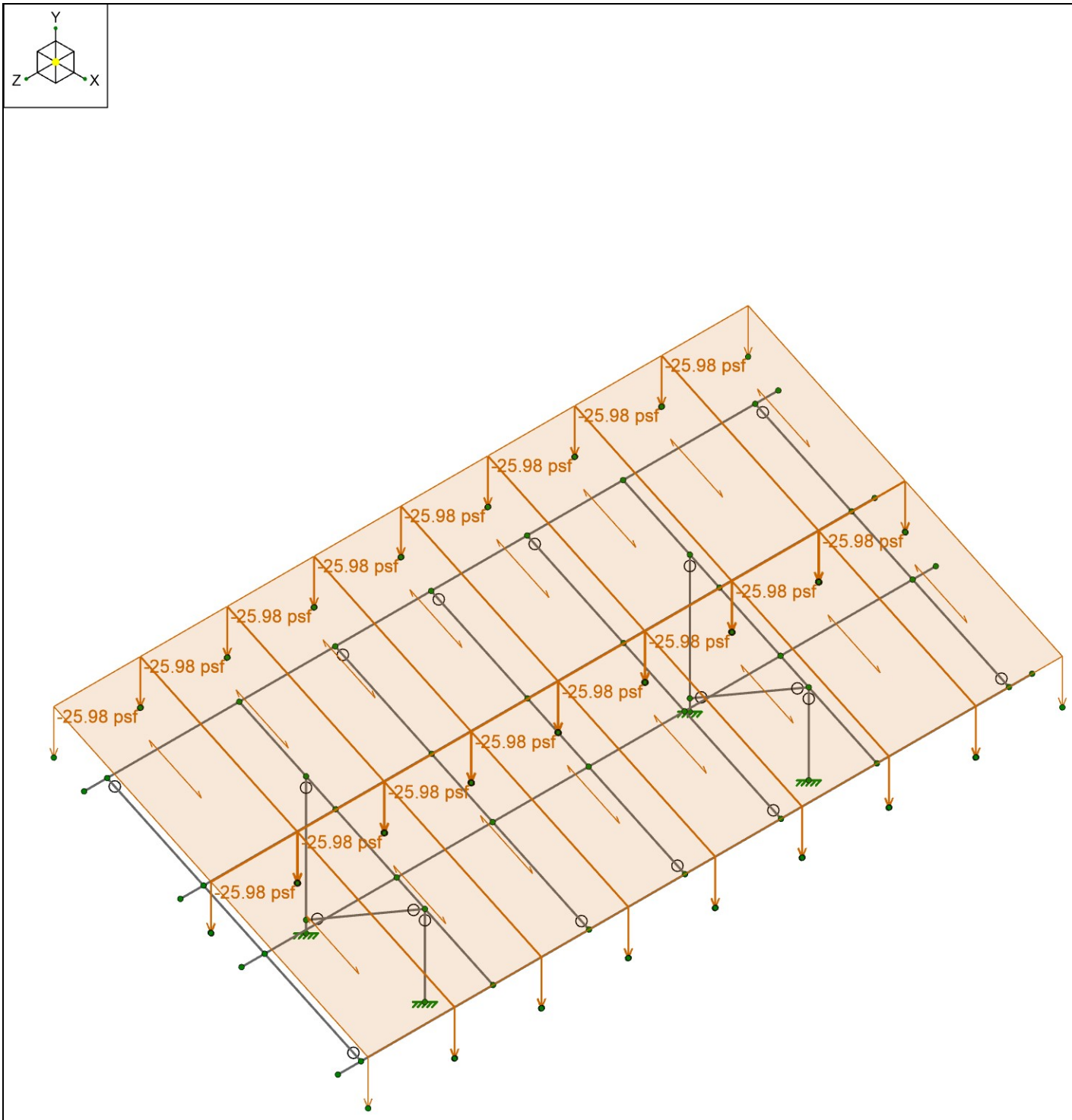


		Bending		Shear				
Member	**Shape**	**Code Check**	**LC**	**Code Check**	**LC**	**M_{nzz}** [in-kips]	**C_b**	**Eqn**
M1	8CS2X14GA-0.625	0.359	4	0.122	5	5184.435	5927.241	H1.2-1
M2	8CS2X14GA-0.625	0.36	4	0.122	5	5183.723	5927.241	H1.2-1
M3	8CS2X14GA-0.625	0.791	4	0.315	4	7083.023	5927.241	H1.2-1
M4	8CS2X14GA-0.625	0.791	4	0.315	4	7052.699	5927.241	H1.2-1
M5	2.75CU1.75X14ga_CF/	0.259	3	0.002	6	625.612	3187.65	H1.2-1
M6	2.75CU1.75X14ga_CF/	0.259	3	0.002	6	625.612	3187.65	H1.2-1
M7	6.25Z3X1X16GAX55DE	0.866	2	0.197	2	5563.598	4105.434	H1.1-2
M8	6.25Z3X1X16GAX55DE	0.883	2	0.199	2	5563.598	4105.434	H1.1-2
M9	6.25Z3X1X16GAX55DE	0.902	2	0.228	4	5563.598	4105.434	H1.2-1
M10	6.25Z3X1X16GAX55DE	0.861	2	0.221	4	5563.598	4105.434	H1.2-1
M11	1.5CU0.75X0.058	0.603	2	0.052	2	154.956	1028.775	H1.2-1



Loads: BLC 1, D
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (Phono 590W)	SK-1
	J. Speidel		Mar 19, 2026 at 04:20 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (Ph…



Loads: BLC 2, S
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (Phono 590W)	SK-2
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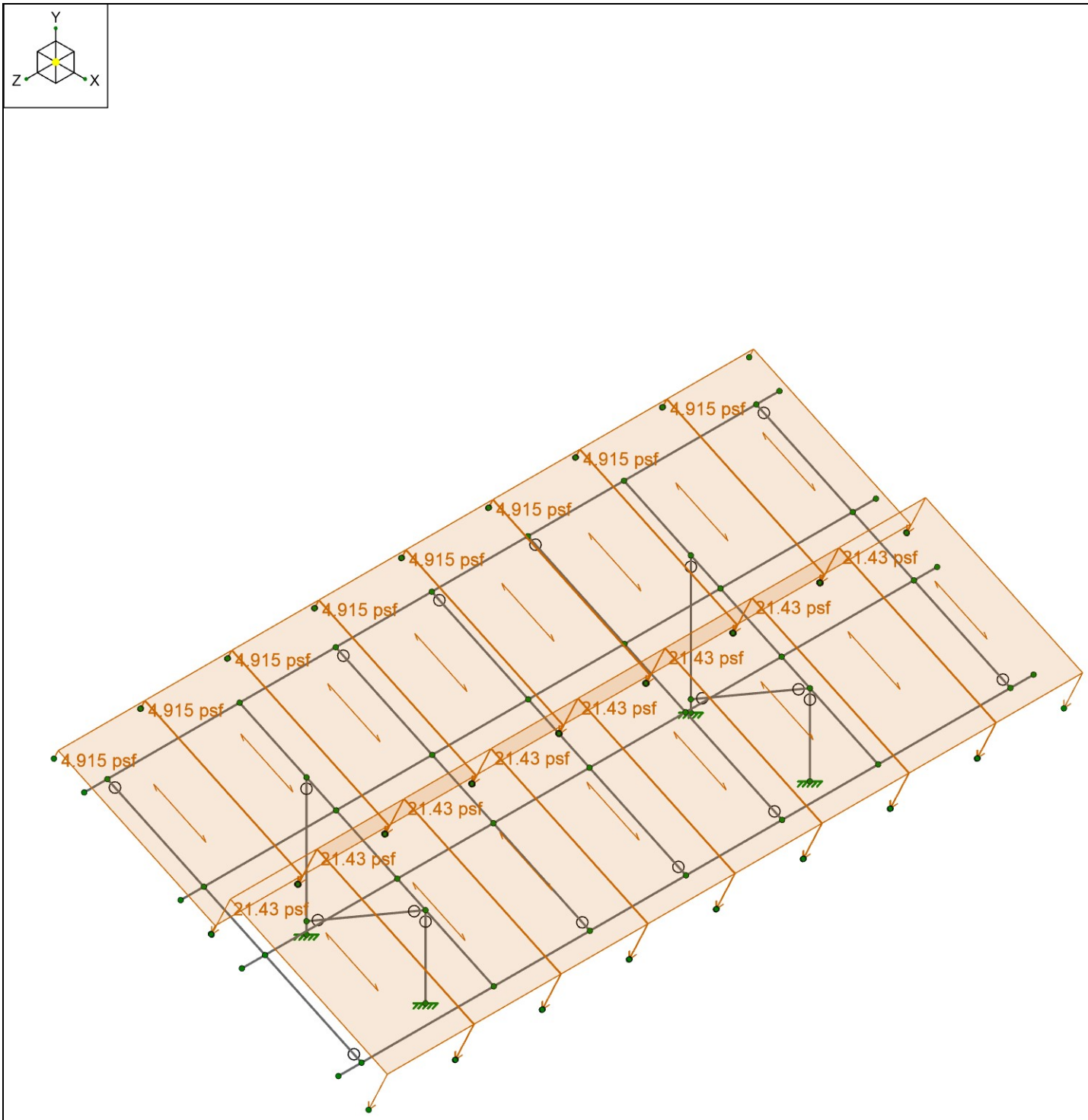
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (Ph…



Loads: BLC 3, W1
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (Phono 590W)	SK-3
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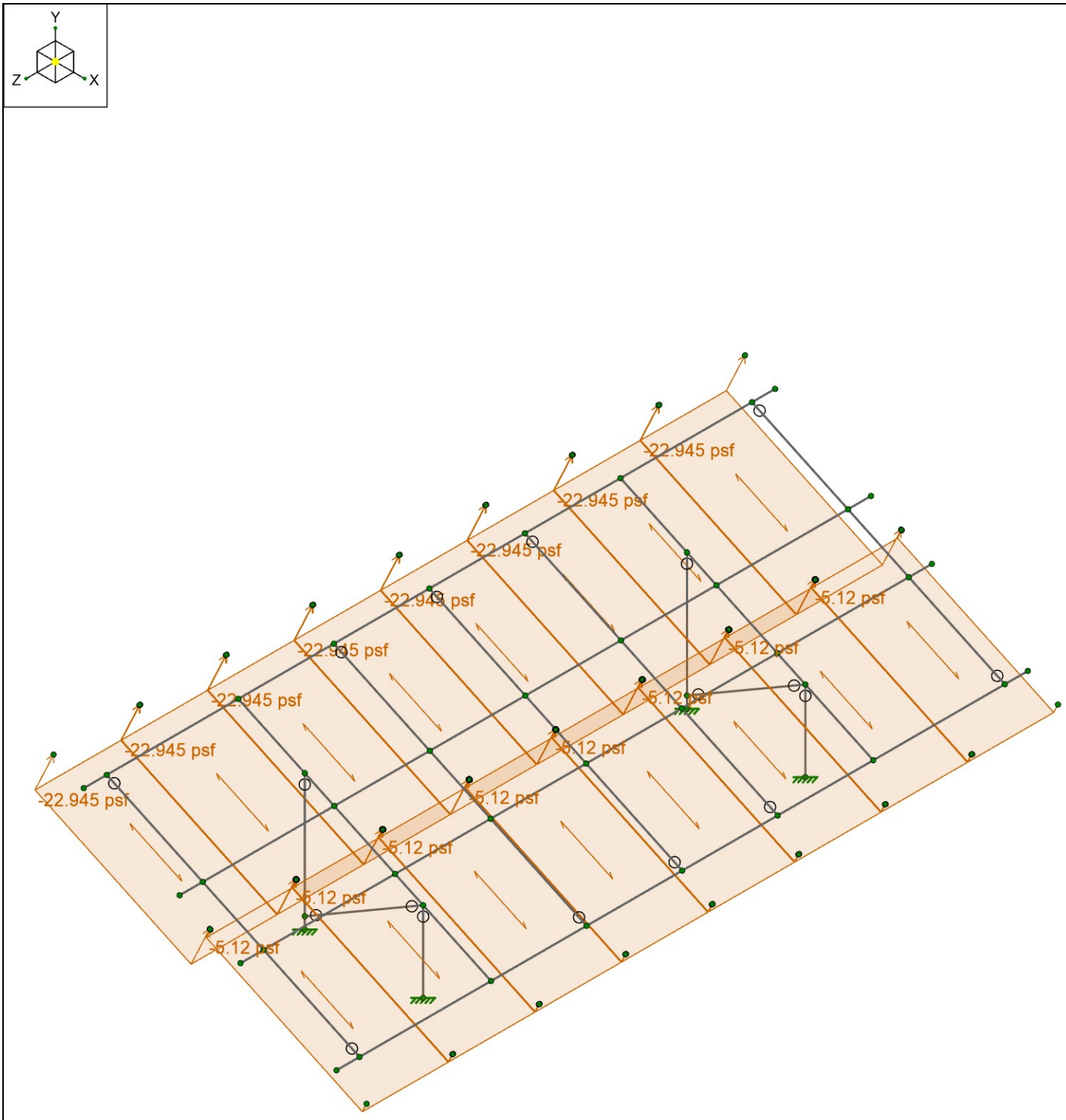
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (Ph…



Loads: BLC 4, W2
Envelope Only Solution

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (Phono 590W)	SK-4
	J. Speidel		Mar 19, 2026 at 04:20 PM
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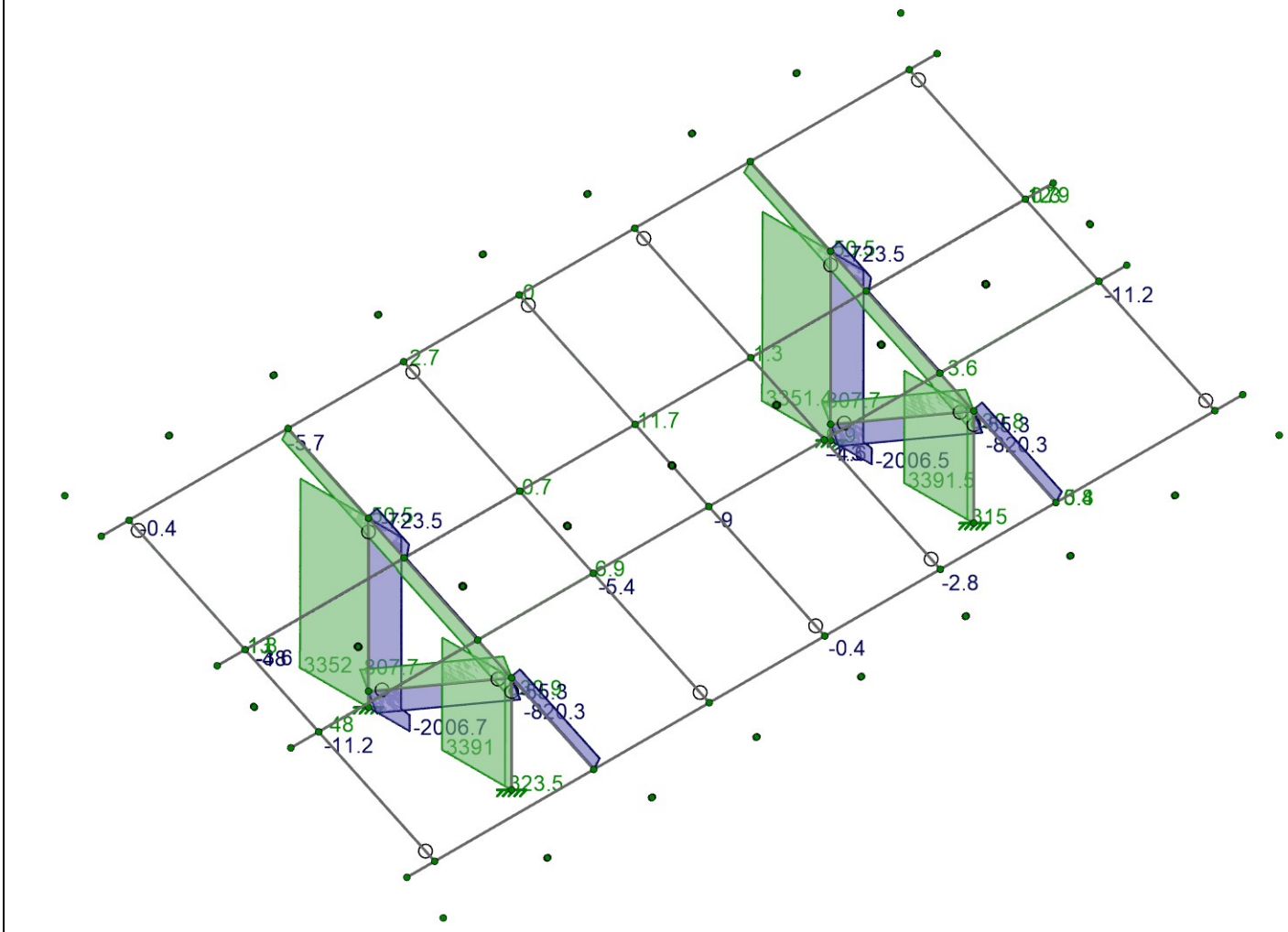
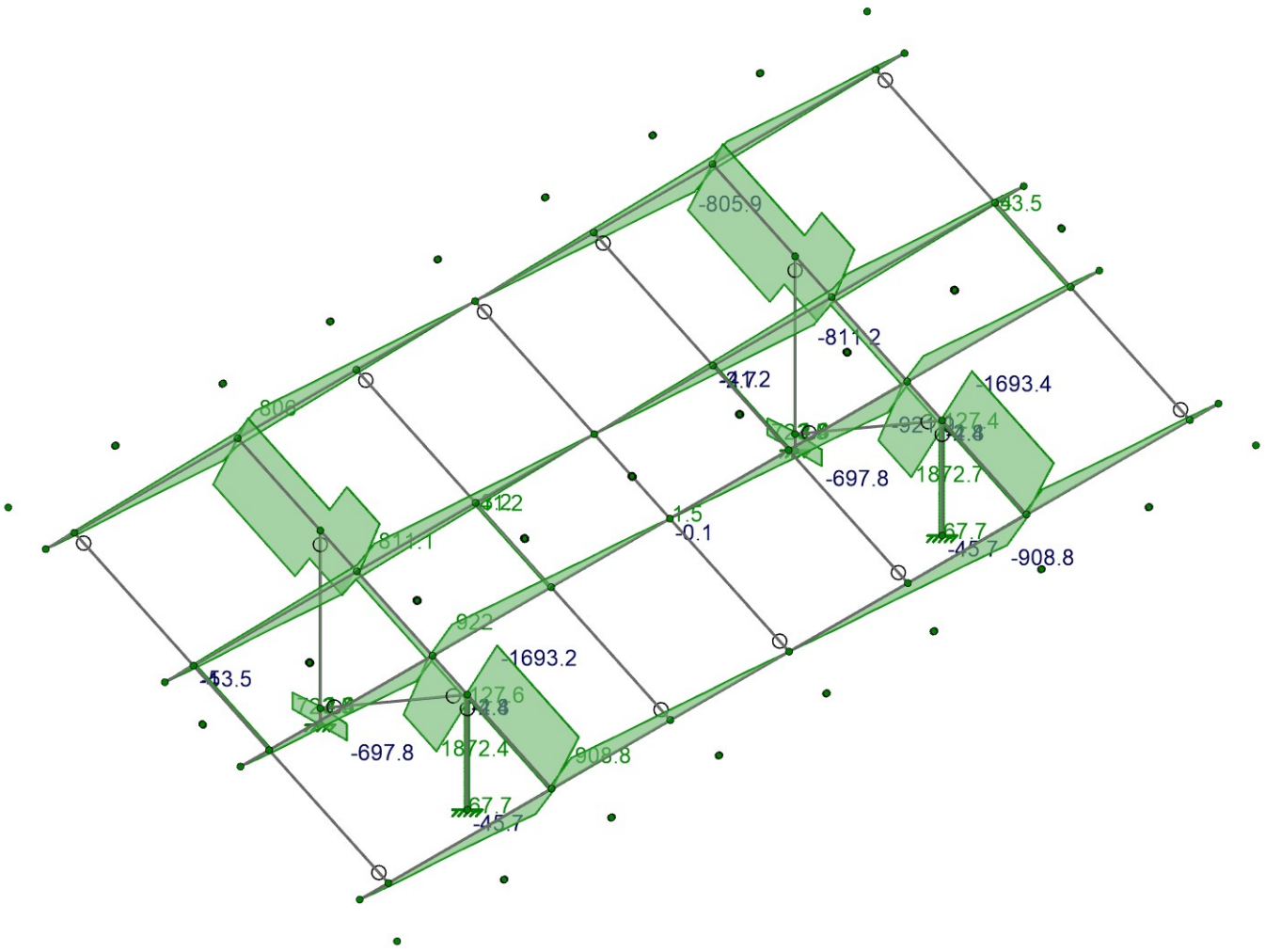


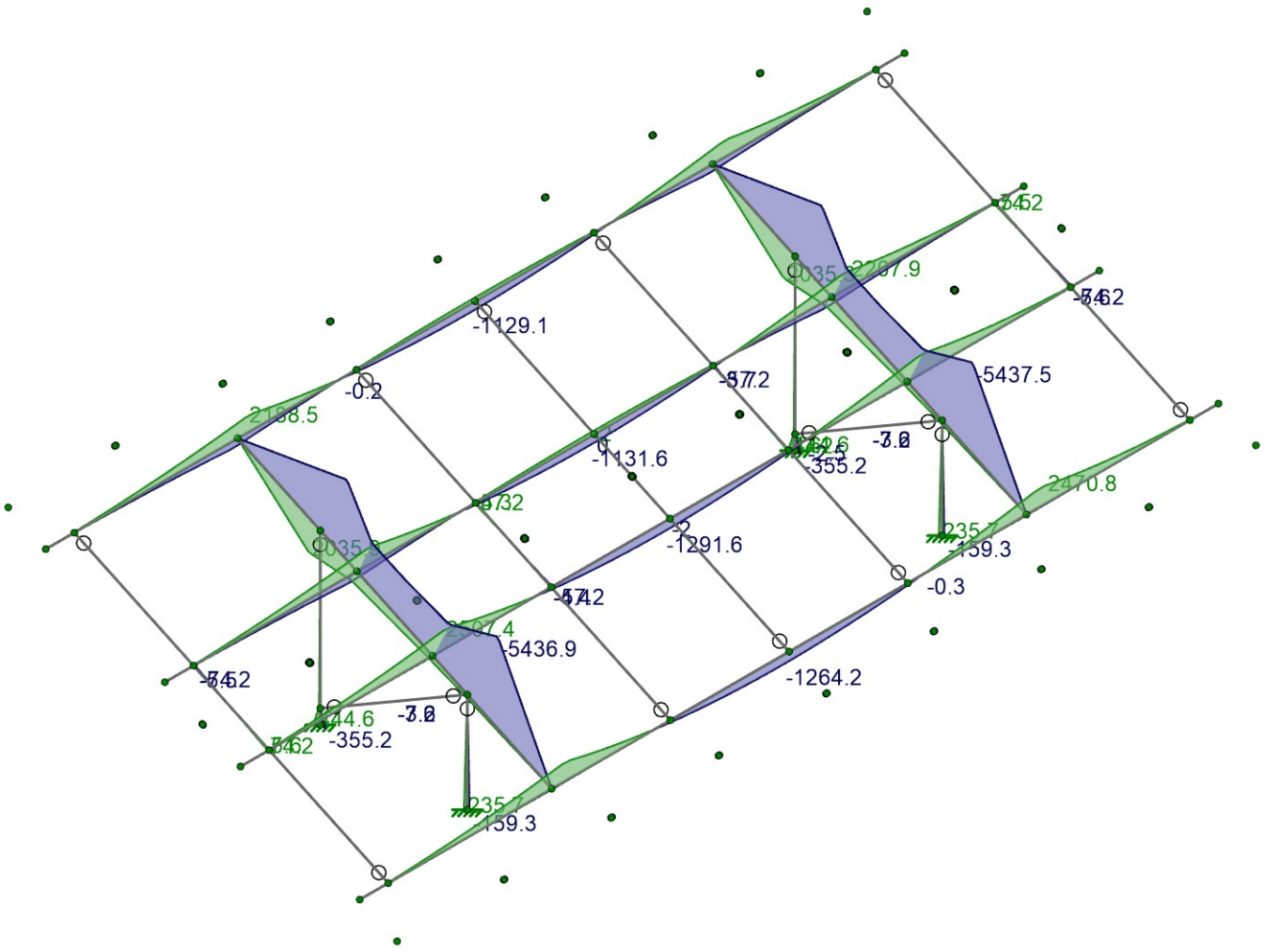
Envelope Only Solution
Member Axial Forces (lbs) (Enveloped)

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (Phono 590W)	SK-5
	J. Speidel		Mar 19, 2026 at 04:20 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (Ph…



Envelope Only Solution
Member y Shear Forces (lbs) (Enveloped)

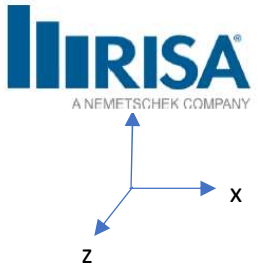
IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (Phono 590W)	SK-6
	J. Speidel		Mar 19, 2026 at 04:20 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (Ph…

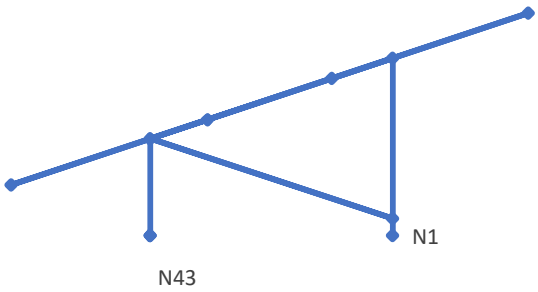


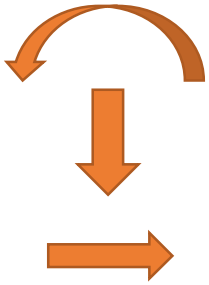
Envelope Only Solution
Member z Bending Moments (lb-ft) (Enveloped)

IRISA A NEMETSCHEK COMPANY	DCE SOLAR	(Rev. A) - Groton Landfill (Phono 590W)	SK-7
	J. Speidel		Mar 19, 2026 at 04:20 PM
	Customer: Verogy Holding…		(REV-A) - Groton Landfill (Ph…

FOUNDATION DESIGN REACTIONS

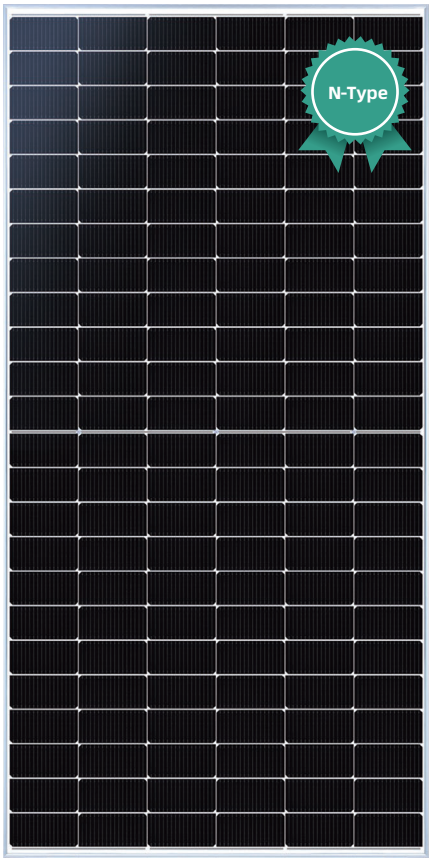






LC #	Description	Node	Lateral X (kips)	Vertical Y (kips)	Moment Mzz (kip-ft)
1	D	N1	0.003	0.480	-0.001
2	D+S	N1	0.021	3.358	-0.002
3	D+0.6W1	N1	0.698	1.034	-0.355
4	D+0.45W1+0.75S	N1	0.538	3.055	-0.268
5	0.6D+0.6W2	N1	-0.724	-2.009	0.445
6	(1+0.14Sds)D+0.7Ex	N1	-0.019	0.530	0.012
7	(1+0.105Sds)D+0.525E	N1	0.000	2.675	0.008
8	(0.6-0.14Sds)D+0.7Ex	N1	-0.020	0.338	0.013
9	(1+0.14Sds)D+0.7Ez	N1	-0.001	0.545	0.001
10	(1+0.105Sds)D+0.525E	N1	0.013	2.686	0.001
11	(0.6-0.14Sds)D+0.7Ez	N1	-0.002	0.353	0.002

LC #	Description	Node	Lateral X (kips)	Vertical Y (kips)	Moment Mzz (kip-ft)
1	D	N43	-0.003	0.431	0.009
2	D+S	N43	-0.021	3.332	0.075
3	D+0.6W1	N43	0.045	1.470	-0.159
4	D+0.45W1+0.75S	N43	0.019	3.386	-0.068
5	0.6D+0.6W2	N43	-0.067	0.858	0.236
6	(1+0.14Sds)D+0.7Ex	N43	-0.006	0.508	0.018
7	(1+0.105Sds)D+0.525E	N43	-0.019	2.666	0.065
8	(0.6-0.14Sds)D+0.7Ex	N43	-0.005	0.336	0.014
9	(1+0.14Sds)D+0.7Ez	N43	-0.003	0.495	0.012
10	(1+0.105Sds)D+0.525E	N43	-0.017	2.657	0.061
11	(0.6-0.14Sds)D+0.7Ez	N43	-0.002	0.323	0.008



580-600w

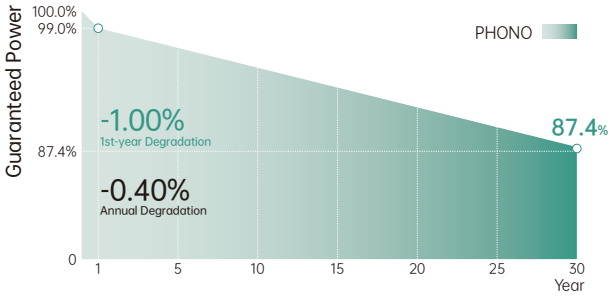
Draco Module Series

N-Type HIGH EFFICIENCY 144-16BB-W-WG

Bloomberg NEW ENERGY FINANCE Tier1 TOP PERFORMER 2025 kiwa PV MODULE RELIABILITY SCORECARD

Extraordinary Product Performance

- Up to 30% additional power yield benefited from bifacial technology and up over 80% cell bifaciality
- Competitive high-temperature performance with ameliorated temperature coefficient
- Better weak illumination response, higher power generation with N-Type technology



15-year Product Warranty

30-year Linear Performance Warranty

Higher Quality Reliability

- N-Type with lower LID and LeTID
- Industry-leading cell processing technology and dual glass contributes to excellent anti-PID characteristic
- First-year degradation is less than 1.0%, with linear degradation of 0.4% per year for 30 years

Wider Application Conditions

- BIPV, vertical installation, snowfield, high-humid area, windy and dusty area
- Safer and easier handling during transportation and installation

MANAGEMENT SYSTEM CERTIFICATES

IEC 61215, IEC 61730, UL 61730

ISO 9001
2015 / Quality management system

ISO 14001
2015 / Standards for environmental management system

ISO 45001
2018 / International standards for occupational health & safety

us.phonosolar.com / usa@phonosolar.com

Electrical Typical Values

Model	PS580M8GFH-24/TNH		PS585M8GFH-24/TNH		PS590M8GFH-24/TNH		PS595M8GFH-24/TNH		PS600M8GFH-24/TNH	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Rated Power (Pmpp)	580	444	585	448	590	452	595	456	600	459
Rated Current (Impp)	13.42	10.81	13.48	10.86	13.54	10.91	13.60	10.95	13.66	11.00
Rated Voltage (Vmpp)	43.22	41.09	43.40	41.26	43.58	41.43	43.75	41.59	43.93	41.76
Short Circuit Current (Isc)	14.11	11.36	14.18	11.42	14.25	11.48	14.32	11.53	14.39	11.59
Open Circuit Voltage (Voc)	52.20	49.98	52.44	50.21	52.68	50.44	52.92	50.67	53.05	50.80
Module Efficiency (%)	22.45		22.65		22.84		23.03		23.23	

STC (Standard Testing Conditions): Irradiance 1000W/m², AM 1.5, Cell Temperature 25°C

NOCT (Nominal Operation Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C , Spectra at AM1.5, Wind at 1m/s

BNPI

Maximum Power (Pmax)	639	644	650	655	661
Optimum Operating Current (Impp)	14.79	14.84	14.92	14.98	15.05
Optimum Operating Voltage (Vmpp)	43.22	43.40	43.58	43.75	43.93
Short Circuit Current (Isc)	15.57	15.62	15.70	15.75	15.85
Open Circuit Voltage (Voc)	52.20	52.44	52.68	52.92	53.05

BNPI:Front Side Irradiation 1000W/m², Back Side Reflection Irradiation 135W/m² , AM 1.5, Ambient Temperature 25°C

Mechanical Characteristics

Cell Type	N Type Monocrystalline
Dimension (L × W × H)	Length: 2278mm (89.69 inch) Width: 1134mm (44.65 inch) Height: 30mm (1.18 inch)
Weight	32.0kg (70.55 lbs)
Glass	2.0mm/2.0mm Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Cable (Including Connector)	12AWG(UL)/4mm² (IEC), 1350mm or Customized Length
Connector	Original Stäubli MC4
Junction Box	IP 68 Rated

Temperature Ratings

Voltage Temperature Coefficient	-0.25%/°C
Current Temperature Coefficient	+0.04%/°C
Power Temperature Coefficient	-0.29%/°C
Power Tolerance	0~+3%
NOCT	42±2°C
Bifaciality	80±5%

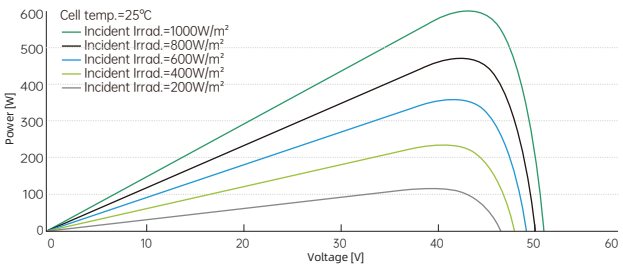
Absolute Maximum Rating

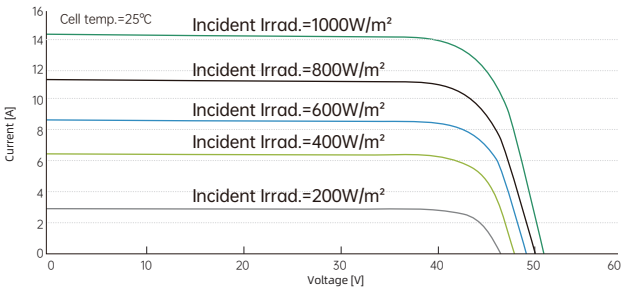
Operating Temperature	From -40 to + 85°C
Hail Diameter @ 80km/h	Up to 25mm
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Maximum Series Fuse Rating	30A
PV Module Classification	II
Fire Rating (UL 61730)	Type29
Maximum System Voltage	DC 1500V

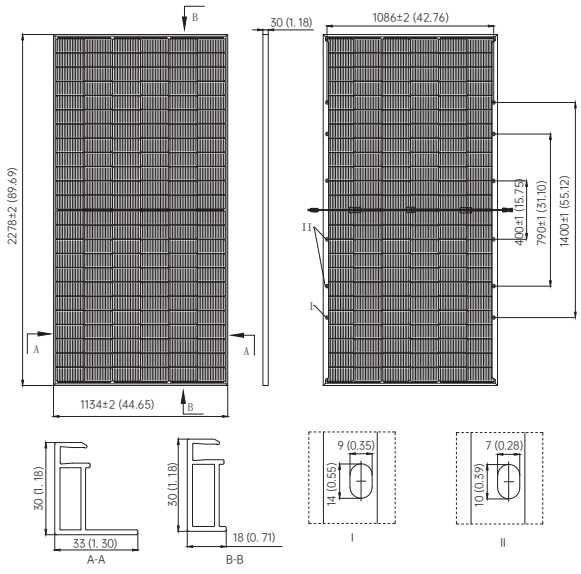
Packaging Configuration

Container	20' GP	40' HQ
Pcs/Container	180	720
Pcs/Pallet	36	36
Pallets/Container	5	20

Electrical Characteristics







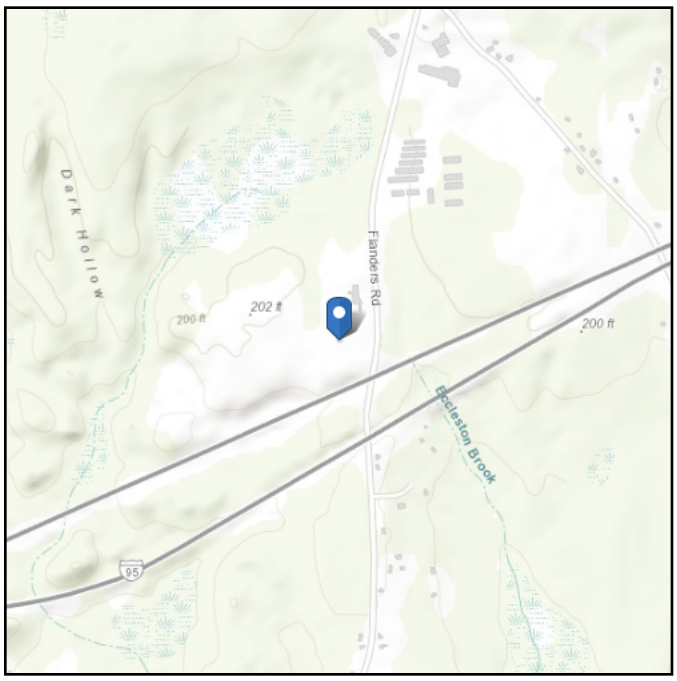
Note:mm (inch)

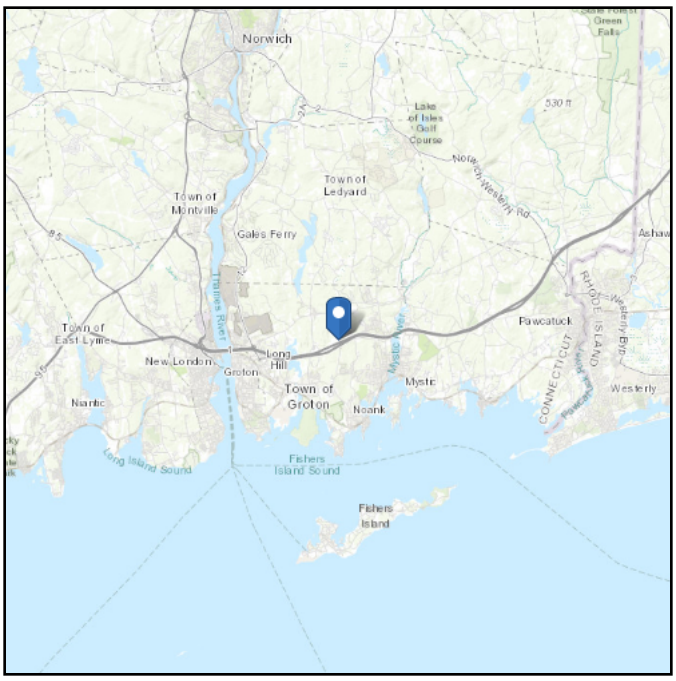
ASCE Hazards Report

Address:
685 Flanders Rd
Mystic, Connecticut
06355

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: Default

Latitude: 41.36933
Longitude: -72.008104
Elevation: 191.56476631379937 ft (NAVD 88)





Wind

Results:

Wind Speed	123 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	95 Vmph
100-year MRI	105 Vmph
300-year MRI	115 Vmph
700-year MRI	123 Vmph
1,700-year MRI	131 Vmph
3,000-year MRI	136 Vmph
10,000-year MRI	146 Vmph
100,000-year MRI	163 Vmph
1,000,000-year MRI	186 Vmph

Data Source: ASCE/SEI 7-22, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue Dec 02 2025

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-22 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years). Values for 10-year MRI, 25-year MRI, 50-year MRI and 100-year MRI are Service Level wind speeds, all other wind speeds are Ultimate wind speeds.

Site is in a hurricane-prone region as defined in ASCE/SEI 7-22 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Seismic

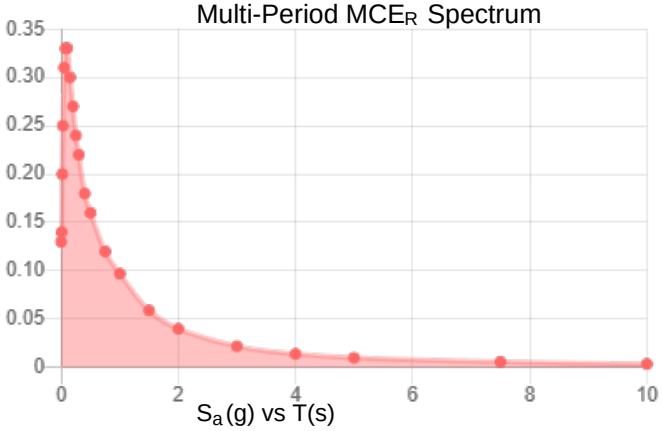
Site Soil Class: Default

Results:

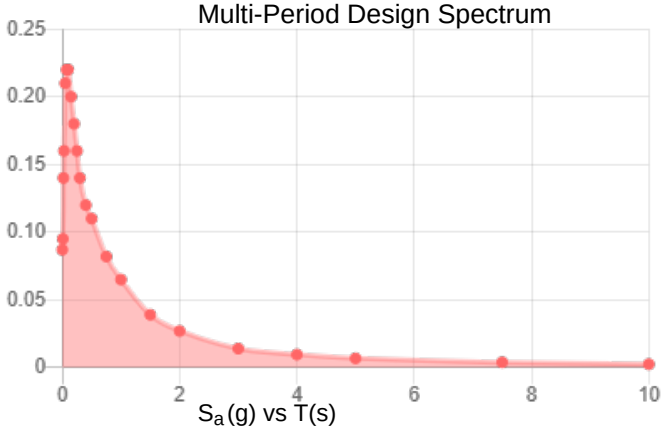
PGA_M :	0.12	T_L :	6
S_{MS} :	0.24	S_S :	0.2
S_{M1} :	0.097	S_1 :	0.046
S_{DS} :	0.16	V_{S30} :	260
S_{D1} :	0.065		

Seismic Design Category: A

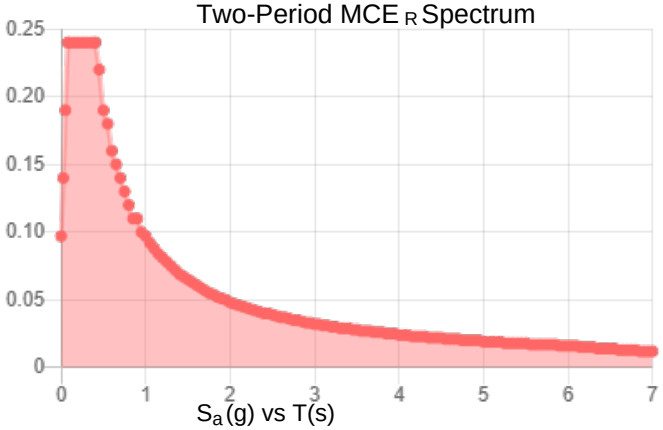
Multi-Period MCE_R Spectrum



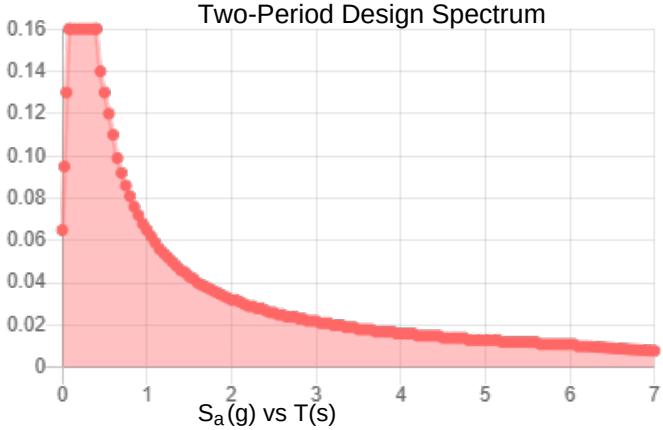
Multi-Period Design Spectrum



Two-Period MCE_R Spectrum



Two-Period Design Spectrum



MCE_R Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

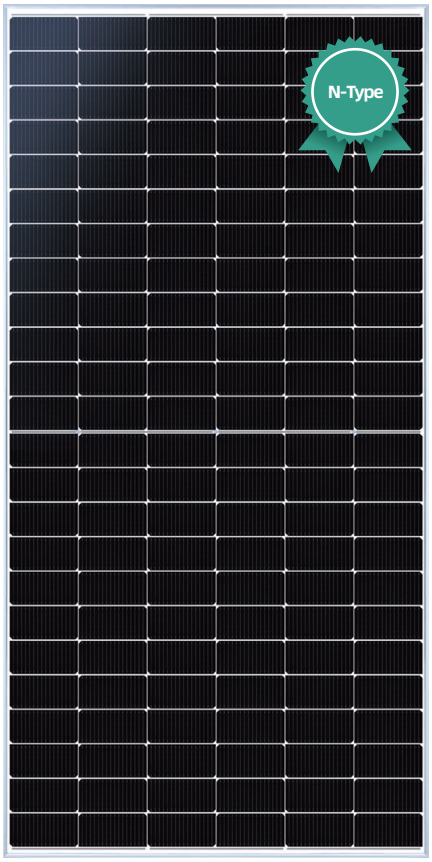
Data Accessed: **Tue Dec 02 2025**

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

Snow

Results:

Ground Snow Load, p_g :	42 lb/ft^2
20-year MRI Value:	17.47 lb/ft^2
Winter Wind Parameter:	0.55
Mapped Elevation:	112.6 ft
Data Source:	ASCE/SEI 7-22, Figures 7.6-1 and 7.6-2 A-D
Date Accessed:	Tue Dec 02 2025
	Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.
	Snow load values are mapped to a 0.5 mile resolution. This resolution can create a mismatch between the mapped elevation and the site-specific elevation in topographically complex areas. Engineers should consult the local authority having jurisdiction in locations where the reported ‘elevation’ and ‘mapped elevation’ differ significantly from each other.
Ground Snow Loads for IRC only, $p_{g(asd)}$:	29.4 lb/ft^2



575-595W

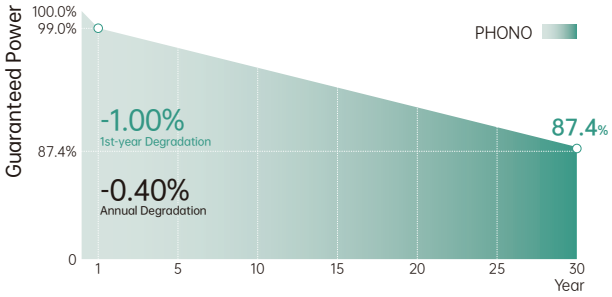
Draco Module Series

N-Type HIGH EFFICIENCY MONO 144-16BB-W-WG

Bloomberg NEW ENERGY FINANCE Tier 1 TOP PERFORMER 2024 kiwa PVEL PV MODULE RELIABILITY SCORECARD

Extraordinary Product Performance

- Up to 30% additional power yield benefited from bifacial technology and up over 80% cell bifaciality
- Competitive high-temperature performance with ameliorated temperature coefficient
- Better weak illumination response, higher power generation with N-Type technology



15-year Product Warranty

30-year Linear Performance Warranty

Higher Quality Reliability

- N-type with lower LID and LeTID
- Industry-leading cell processing technology and dual glass contributes to excellent anti-PID characteristic
- First-year degradation is less than 1.0%, with linear degradation of 0.4% per year for 30 years

Wider Application Conditions

- BIPV, vertical installation, snowfield, high-humid area, windy and dusty area
- Safer and easier handling during transportation and installation

MANAGEMENT SYSTEM CERTIFICATES

IEC 61215, IEC 61730, UL 61730

ISO 9001
2015 / Quality management system

ISO 14001
2015 / Standards for environmental management system

ISO 45001
2018 / International standards for occupational health & safety

us.phonosolar.com / usa@phonosolar.com

Electrical Typical Values

Model	1000V	PS575M8GF-24/TNH		PS580M8GF-24/TNH		PS585M8GF-24/TNH		PS590M8GF-24/TNH		PS595M8GF-24/TNH	
	1500V	PS575M8GFH-24/TNH		PS580M8GFH-24/TNH		PS585M8GFH-24/TNH		PS590M8GFH-24/TNH		PS595M8GFH-24/TNH	
Testing Condition		STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Rated Power (Pmpp)		575	440	580	444	585	448	590	452	595	456
Rated Current (Impp)		13.36	10.76	13.42	10.81	13.48	10.86	13.54	10.91	13.60	10.95
Rated Voltage (Vmpp)		43.04	40.92	43.22	41.09	43.40	41.26	43.58	41.43	43.75	41.59
Short Circuit Current (Isc)		14.04	11.31	14.11	11.36	14.18	11.42	14.25	11.48	14.32	11.53
Open Circuit Voltage (Voc)		51.97	49.76	52.20	49.98	52.44	50.21	52.68	50.44	52.92	50.67
Module Efficiency (%)		22.26		22.45		22.65		22.84		23.03	

STC(Standard Testing Conditions): Irradiance 1000W/m², AM 1.5, Cell Temperature 25°C

NOCT (Nominal Operation Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C , Spectra at AM1.5, Wind at 1m/s

BNPI

Maximum Power (Pmax)	633	639	644	650	655
Optimum Operating Current (Impp)	14.71	14.97	14.84	14.92	14.98
Optimum Operating Voltage (Vmpp)	43.04	43.22	43.40	43.58	43.75
Short Circuit Current (Isc)	15.49	15.58	15.62	15.70	15.75
Open Circuit Voltage (Voc)	51.97	52.20	52.44	52.68	52.92

BNPI:Front Side Irradiation 1000W/m², Back Side Reflection Irradiation 135W/m² , AM 1.5, Ambient Temperature 25°C

Mechanical Characteristics

Cell Type	N Type Monocrystalline
Dimension (L × W × H)	Length: 2278mm (89.69 inch) Width: 1134mm (44.65 inch) Height: 30mm (1.18 inch)
Weight	32.0kg (70.55 lbs)
Glass	2.0mm/2.0mm Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Cable (Including Connector)	12AWG(UL)4mm² (IEC), (+): 450mm,(-): 250mm or Customized Length
Junction Box	IP 68 Rated

Temperature Ratings

Voltage Temperature Coefficient	-0.25%/°C
Current Temperature Coefficient	+0.04%/°C
Power Temperature Coefficient	-0.29%/°C
Power Tolerance	0~+3%
NOCT	42±2°C
Bifaciality	80±5%

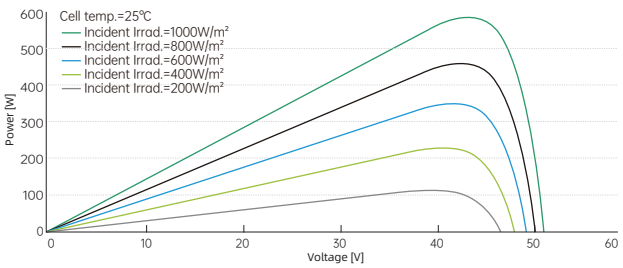
Absolute Maximum Rating

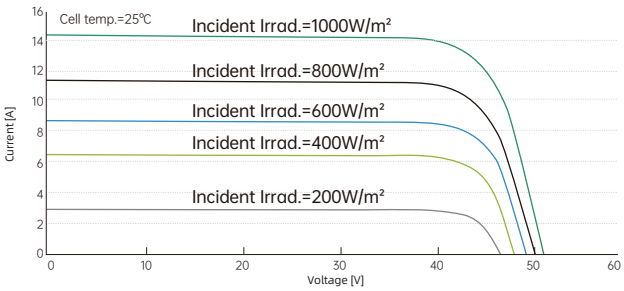
Operating Temperature	From -40 to + 85°C
Hail Diameter @ 80km/h	Up to 25mm
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Maximum Series Fuse Rating	30A
PV Module Classification	II
Fire Rating (UL 61730)	Type29
Maximum System Voltage	DC 1000V/1500V

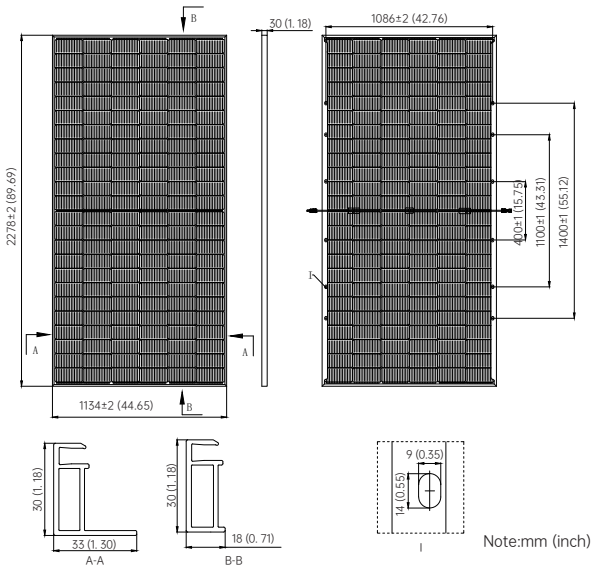
Packing Configuration

Container	20' GP	40' HQ
Pieces/Container	180	720
Pcs/Pallet	36	36
Pallets/Container	5	20

Electrical Characteristics







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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-122464-1
Client Project/Site: Solar Module TCLP

For:
SUMEC Energy Holdings Co. Ltd.
No.1 Xinghuo Road
Nanjing Hi-tesh Zone
Nanjing, China 210061

Attn: Mr. Chester Chen

Authorized for release by:
12/3/2019 7:25:49 PM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: SUMEC Energy Holdings Co. Ltd.
Job ID: 240-122464-1
Project/Site: Solar Module TCLP

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 240-122464-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: SUMEC Energy Holdings Co. Ltd.

Project: Solar Module TCLP

Report Number: 240-122464-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The sample was received on 11/18/2019 11:10 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 13.8º C.

TCLP METALS (ICP)

Sample SOLAR PANEL (240-122464-1) was analyzed for TCLP metals (ICP) in accordance with EPA SW-846 Methods 1311/6010B. The sample was leached on 11/25/2019, prepared on 11/26/2019 and analyzed on 11/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP MERCURY

Sample SOLAR PANEL (240-122464-1) was analyzed for TCLP mercury in accordance with EPA SW-846 Methods 1311/7470A. The sample was leached on 11/25/2019, prepared on 11/26/2019 and analyzed on 11/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Method Summary

Client: SUMEC Energy Holdings Co. Ltd.
Project/Site: Solar Module TCLP

Job ID: 240-122464-1

Method	Method Description	Protocol	Laboratory
6010B	Metals (ICP)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
1311	TCLP Extraction	SW846	TAL CAN
3010A	Preparation, Total Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
Part Size Red	Particle Size Reduction Preparation	None	TAL CAN

Protocol References:

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: SUMEC Energy Holdings Co. Ltd.
Project/Site: Solar Module TCLP

Job ID: 240-122464-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-122464-1	SOLAR PANEL	Solid	11/14/19 00:00	11/18/19 11:10	

Detection Summary

Client: SUMEC Energy Holdings Co. Ltd.
Project/Site: Solar Module TCLP

Job ID: 240-122464-1

Client Sample ID: SOLAR PANEL

Lab Sample ID: 240-122464-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lead	4.3		0.050		mg/L	1		6010B	TCLP

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SUMEC Energy Holdings Co. Ltd.
Project/Site: Solar Module TCLP

Job ID: 240-122464-1

Client Sample ID: SOLAR PANEL
Date Collected: 11/14/19 00:00
Date Received: 11/18/19 11:10

Lab Sample ID: 240-122464-1
Matrix: Solid

Method: 6010B - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.050		mg/L		11/26/19 14:00	11/27/19 10:08	1
Barium	ND		0.50		mg/L		11/26/19 14:00	11/27/19 10:08	1
Cadmium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 10:08	1
Chromium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 10:08	1
Lead	**4.3**		0.050		mg/L		11/26/19 14:00	11/27/19 10:08	1
Selenium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 10:08	1
Silver	ND		0.050		mg/L		11/26/19 14:00	11/27/19 10:08	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0020		mg/L		11/26/19 14:00	11/27/19 18:19	1

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 240-412722/2-A
Matrix: Solid
Analysis Batch: 412928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 412722

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:59	1
Barium	ND		0.50		mg/L		11/26/19 14:00	11/27/19 09:59	1
Cadmium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:59	1
Chromium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:59	1
Lead	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:59	1
Selenium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:59	1
Silver	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:59	1

Lab Sample ID: LCS 240-412722/3-A
Matrix: Solid
Analysis Batch: 412928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 412722

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	2.00	2.15		mg/L		108	50 - 150
Barium	2.00	2.00		mg/L		100	50 - 150
Cadmium	1.00	1.05		mg/L		105	50 - 150
Chromium	1.00	1.01		mg/L		101	50 - 150
Lead	1.00	0.900		mg/L		90	50 - 150
Selenium	2.00	2.13		mg/L		106	50 - 150
Silver	0.100	0.107		mg/L		107	50 - 150

Lab Sample ID: LB 240-412574/1-B
Matrix: Solid
Analysis Batch: 412928

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 412722

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:54	1
Barium	ND		0.50		mg/L		11/26/19 14:00	11/27/19 09:54	1
Cadmium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:54	1
Chromium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:54	1
Lead	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:54	1
Selenium	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:54	1
Silver	ND		0.050		mg/L		11/26/19 14:00	11/27/19 09:54	1

Lab Sample ID: 240-122464-1 MS
Matrix: Solid
Analysis Batch: 412928

Client Sample ID: SOLAR PANEL
Prep Type: TCLP
Prep Batch: 412722

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		5.00	5.46		mg/L		109	75 - 125
Barium	ND		50.0	51.9		mg/L		103	75 - 125
Cadmium	ND		1.00	1.12		mg/L		112	75 - 125
Chromium	ND		5.00	5.38		mg/L		108	75 - 125
Lead	4.3		5.00	9.84		mg/L		110	75 - 125
Selenium	ND		1.00	1.14		mg/L		114	75 - 125
Silver	ND		1.00	1.07		mg/L		107	75 - 125

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 240-122464-1 MSD — **Client Sample ID: SOLAR PANEL**
Matrix: Solid — **Prep Type: TCLP**
Analysis Batch: 412928 — **Prep Batch: 412722**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		5.00	5.59		mg/L		112	75 - 125	2	20
Barium	ND		50.0	54.0		mg/L		108	75 - 125	4	20
Cadmium	ND		1.00	1.14		mg/L		114	75 - 125	2	20
Chromium	ND		5.00	5.43		mg/L		109	75 - 125	1	20
Lead	4.3		5.00	9.95		mg/L		112	75 - 125	1	20
Selenium	ND		1.00	1.16		mg/L		116	75 - 125	2	20
Silver	ND		1.00	1.09		mg/L		109	75 - 125	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-412725/2-A — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 413058 — **Prep Batch: 412725**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0020		mg/L		11/26/19 14:00	11/27/19 18:15	1

Lab Sample ID: LCS 240-412725/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 413058 — **Prep Batch: 412725**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00500	0.00549		mg/L		110	80 - 120

Lab Sample ID: LB 240-412574/1-D — **Client Sample ID: Method Blank**
Matrix: Solid — **Prep Type: TCLP**
Analysis Batch: 413058 — **Prep Batch: 412725**

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.0020		mg/L		11/26/19 14:00	11/27/19 18:13	1

Lab Sample ID: 240-122464-1 MS — **Client Sample ID: SOLAR PANEL**
Matrix: Solid — **Prep Type: TCLP**
Analysis Batch: 413058 — **Prep Batch: 412725**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		0.00500	0.00564		mg/L		113	80 - 120

Lab Sample ID: 240-122464-1 MSD — **Client Sample ID: SOLAR PANEL**
Matrix: Solid — **Prep Type: TCLP**
Analysis Batch: 413058 — **Prep Batch: 412725**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.00500	0.00563		mg/L		113	80 - 120	0	20

Metals

Processed Batch: 412195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-122464-1	SOLAR PANEL	TCLP	Solid	Part Size Red	
240-122464-1 MS	SOLAR PANEL	TCLP	Solid	Part Size Red	
240-122464-1 MSD	SOLAR PANEL	TCLP	Solid	Part Size Red	

Leach Batch: 412574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-122464-1	SOLAR PANEL	TCLP	Solid	1311	412195
LB 240-412574/1-B	Method Blank	TCLP	Solid	1311	
LB 240-412574/1-D	Method Blank	TCLP	Solid	1311	
240-122464-1 MS	SOLAR PANEL	TCLP	Solid	1311	412195
240-122464-1 MSD	SOLAR PANEL	TCLP	Solid	1311	412195

Prep Batch: 412722

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-122464-1	SOLAR PANEL	TCLP	Solid	3010A	412574
LB 240-412574/1-B	Method Blank	TCLP	Solid	3010A	412574
MB 240-412722/2-A	Method Blank	Total/NA	Solid	3010A	
LCS 240-412722/3-A	Lab Control Sample	Total/NA	Solid	3010A	
240-122464-1 MS	SOLAR PANEL	TCLP	Solid	3010A	412574
240-122464-1 MSD	SOLAR PANEL	TCLP	Solid	3010A	412574

Prep Batch: 412725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-122464-1	SOLAR PANEL	TCLP	Solid	7470A	412574
LB 240-412574/1-D	Method Blank	TCLP	Solid	7470A	412574
MB 240-412725/2-A	Method Blank	Total/NA	Solid	7470A	
LCS 240-412725/3-A	Lab Control Sample	Total/NA	Solid	7470A	
240-122464-1 MS	SOLAR PANEL	TCLP	Solid	7470A	412574
240-122464-1 MSD	SOLAR PANEL	TCLP	Solid	7470A	412574

Analysis Batch: 412928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-122464-1	SOLAR PANEL	TCLP	Solid	6010B	412722
LB 240-412574/1-B	Method Blank	TCLP	Solid	6010B	412722
MB 240-412722/2-A	Method Blank	Total/NA	Solid	6010B	412722
LCS 240-412722/3-A	Lab Control Sample	Total/NA	Solid	6010B	412722
240-122464-1 MS	SOLAR PANEL	TCLP	Solid	6010B	412722
240-122464-1 MSD	SOLAR PANEL	TCLP	Solid	6010B	412722

Analysis Batch: 413058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-122464-1	SOLAR PANEL	TCLP	Solid	7470A	412725
LB 240-412574/1-D	Method Blank	TCLP	Solid	7470A	412725
MB 240-412725/2-A	Method Blank	Total/NA	Solid	7470A	412725
LCS 240-412725/3-A	Lab Control Sample	Total/NA	Solid	7470A	412725
240-122464-1 MS	SOLAR PANEL	TCLP	Solid	7470A	412725
240-122464-1 MSD	SOLAR PANEL	TCLP	Solid	7470A	412725

Lab Chronicle

Client: SUMEC Energy Holdings Co. Ltd.
Project/Site: Solar Module TCLP

Job ID: 240-122464-1

Client Sample ID: SOLAR PANEL

Date Collected: 11/14/19 00:00
Date Received: 11/18/19 11:10

Lab Sample ID: 240-122464-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Processed	Part Size Red			412195	11/22/19 08:42	POP	TAL CAN
TCLP	Leach	1311			412574	11/25/19 16:55	DRJ	TAL CAN
TCLP	Prep	3010A			412722	11/26/19 14:00	MRL	TAL CAN
TCLP	Analysis	6010B		1	412928	11/27/19 10:08	WKD	TAL CAN
TCLP	Processed	Part Size Red			412195	11/22/19 08:42	POP	TAL CAN
TCLP	Leach	1311			412574	11/25/19 16:55	DRJ	TAL CAN
TCLP	Prep	7470A			412725	11/26/19 14:00	MRL	TAL CAN
TCLP	Analysis	7470A		1	413058	11/27/19 18:19	SLD	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: SUMEC Energy Holdings Co. Ltd. Job ID: 240-122464-1
Project/Site: Solar Module TCLP

Laboratory: Eurofins TestAmerica, Canton

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
California	State Program	2927	02-23-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
7470A	7470A	Solid	Mercury

13.1/13.8

SUMEC

SUMEC ENERGY HOLDINGS CO.,LTD.
江苏苏美达能源控股有限公司

致TO Eurofins TestAmerica

4101 Shuffel Street NW, North Canton, OH 44720, USA

发票编号 INV.NO. SUMEC-EUROFINS-20191114

日期 DATE 2019/11/14

发　　票
COMMERCIAL INVOICE

L/C NO.

唛头及编号 Mark && Numbers	品名 Descriptions	数量 Quantities	单价 Unit Price	总价 Amount
N/M			USD	USD
	raw material sample of solar module	2 SET	5.00	10
		2 SET		10.00

TOTAL:PACKED IN: 1 CARTON

G/W: 1 KGS

N/W: 0.9 KGS

SUMEC ENERGY HOLDINGS CO.,LTD.
NO.1 XINGHUO ROAD, NATIONAL LEVEL NANJING
HI-TECH ZONE, NANJING, 210061 P.R. CHINA

江苏苏美达能源控股有限公司
SUMEC ENERGY HOLDINGS CO.,LTD

Accepted by Lab
11/18/19
KAC ETA 1110

240-122464 Chain of Custody

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 122464**
Canton Facility

Client Sunec Energy Holdings Inc Site Name _____ Cooler unpacked by: Ryan Cribler

Cooler Received on 11-18-19 Opened on 11-18-19 1110

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other DHL

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-10 (CF +0.7 °C) Observed Cooler Temp. 13.1 °C Corrected Cooler Temp. 13.8 °C
   IR GUN #IR-11 (CF +0.9°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels be reconciled with the COC?	Yes	No
9. Were correct bottle(s) used for the test(s) indicated?	Yes	No
10. Sufficient quantity received to perform indicated analyses?	Yes	No
11. Are these work share samples?	Yes	No
If yes, Questions 12-16 have been checked at the originating laboratory.		
12. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC995364
13. Were VOAs on the COC?	Yes	No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
16. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

Will log ID as "Solar Panel" sample date as 11/14/19 (date at top of COC/letter), no sample time. Will log TCLP metals w/ PSR per PM.

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____