Date: June 19, 2019.

TO: Melanie Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

From: John T. Beauton
Greenskies Renewable Energy, LLC
180 Johnson Street
Middletown, CT. 06547

Project: North Haven Deep Project
700 Middletown Avenue
North Haven, Ct. 06473

Re: Petition # 1342- Development & Management Plan

Dear Melanie,

Per Council decision and staff report dated June 8th, 2018. Greenskies is required to provide the following documents for items a) through e) for Siting Council review and approval. Please see attached documents

a) D&M full set plan dated 11-16-18.
b) Vernal Pool & Box Turtle Report dated 11-29-18.
c) Final wildlife survey- Krinsky Ground Beetle Study.
d) Final landscape design in the full D&M set, drawings LL-1 to LL-3.
e) Final Erosion & Sedimentation Control Plan in the full D&M set, drawings EC-1 through EC-7

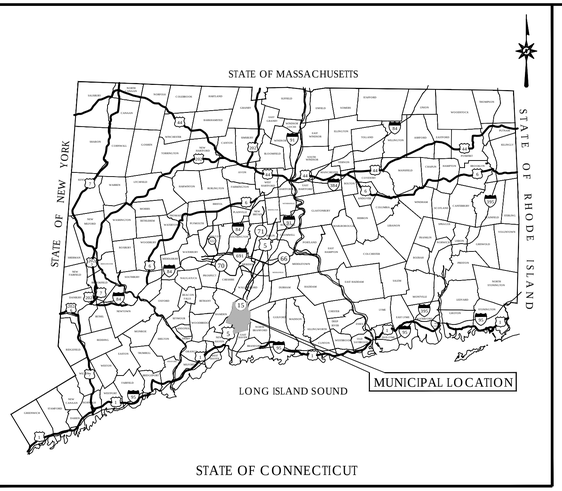
Please confirm that the documents sent in the box link file meet the requirements for Siting Council review, and approval to move forward with construction. Along with these requested documents, I have also provided the approved storm water permit dated May 1st, 2019, and the approval letter for the State Historical Preservation Office dated June 11th, 2019.

Kind Regards,

John T. Beauton

John T. Beauton
VP Construction
Greenskies Renewable Energy LLC.

Confidential
180 Johnson St
Middletown, CT 06457

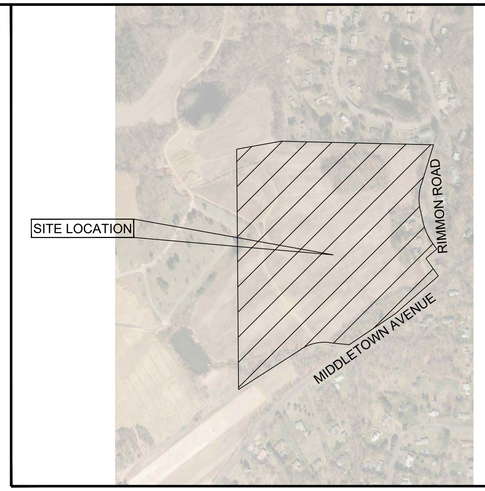


LOCATION MAP

N.T.S.

DEVELOPMENT AND MANAGEMENT PLAN SET FOR 4.98 MW (AC) PHOTOVOLTAIC INSTALLATION 700 MIDDLETOWN AVENUE NORTH HAVEN, CT

700 MIDDLETOWN AVENUE
MAP #48 LOTS 46, 47, 51
NORTH HAVEN, CT 06473



VICINITY MAP

SCALE: 1"=500'

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CAD FILE: CV17D351601
XREF(S): XXXXXXX

PREPARED FOR:

GREENSKIES RENEWABLE ENERGY
180 JOHNSON STREET
MIDDLETOWN, CT 06457

PREPARED BY:

BL Companies
ARCHITECTURE
ENGINEERING
ENVIRONMENTAL
LAND SURVEYING

355 RESEARCH PARKWAY
MERIDEN, CONNECTICUT 06450
(203) 630-1406
(203) 630-2615 Fax

DEVELOPER:
GREENSKIES RENEWABLE ENERGY
180 JOHNSON STREET
MIDDLETOWN, CT 06457
(860) 398-5408

OWNER:
CATHOLIC CEMETERY ASSOCIATION
700 MIDDLETOWN AVEMIE
NORTH HAVEN, CT 06473

SUBCONSULTANTS:

GEOTECHNICAL ENGINEER:
TERRACON
201 HAMMER MILL ROAD
ROCKY HILL, CT
203-610-9061

ENVIRONMENTAL CONSULTANT:
DAVISON ENVIRONMENTAL, LLC
10 MAPLE STREET
CHESTER, CT
860-803-0938

ARCHEOLOGICAL CONSULTANT
HERITAGE CONSULTANTS, LLC
DAVID R. GEORGE, M.A., R.P.A
100 MARKET SQUARE, SUITE 9
NEWINGTON, CT 06111
860-299-6328

DATES

SUBMISSION DATE: APRIL 6, 2018
REVISION: NOVEMBER 16, 2018

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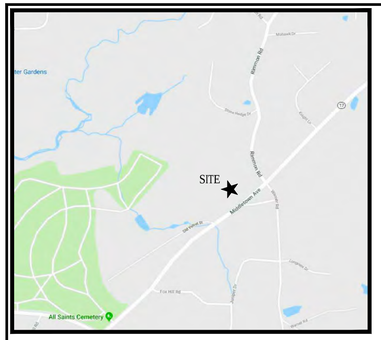
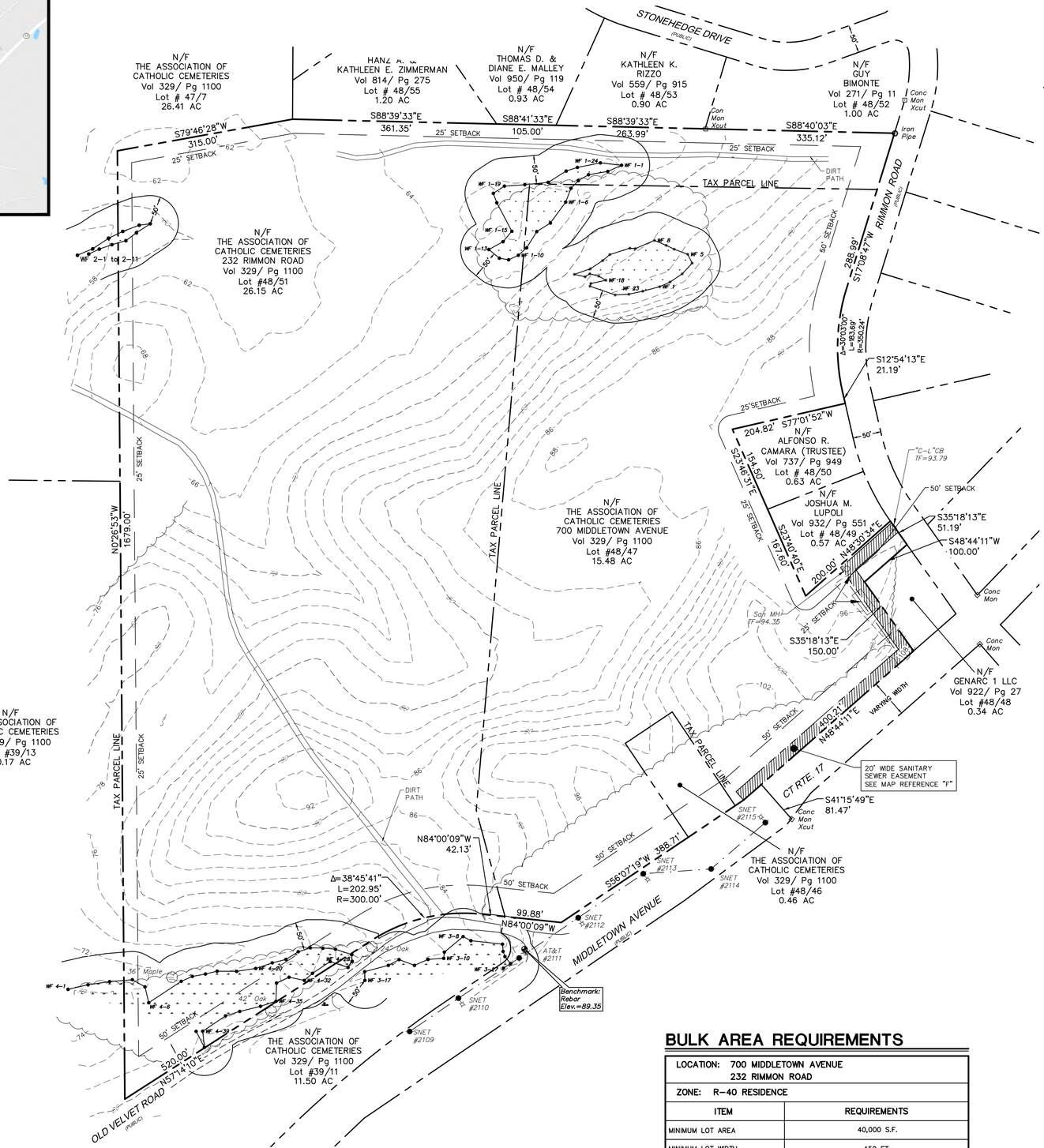


LOCATION MAP

NOT TO SCALE



BULK AREA REQUIREMENTS

LOCATION: 700 MIDDLETOWN AVENUE 232 RIMMON ROAD	
ZONE: R-40 RESIDENCE	
ITEM	**REQUIREMENTS**
MINIMUM LOT AREA	40,000 S.F.
MINIMUM LOT WIDTH	150 FT.
MINIMUM FRONT SETBACK	50 FT.
MINIMUM SIDE SETBACK	25 FT.
MINIMUM REAR SETBACK	25 FT.
MAXIMUM BUILDING HEIGHT	35 FT.
MAXIMUM BUILDING COVERAGE	15%

GRAPHIC SCALE

100 50 0 100

SCALE IN FEET

GENERAL NOTES

1. A) THIS MAP HAS BEEN PREPARED IN ACCORDANCE WITH THE REGULATIONS OF CONNECTICUT STATE AGENCIES, SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

   B) THIS PLAN CONFORMS TO HORIZONTAL ACCURACY CLASS A-2 AND A TOPOGRAPHIC ACCURACY CLASS T-2.

   C) BOUNDARY DETERMINATION IS BASED UPON A RESURVEY.

   D) THE TYPE OF SURVEY PERFORMED IS A PROPERTY SURVEY AND IS INTENDED TO DEPICT EXISTING CONDITIONS WITH RESPECT TO MONUMENTATION FOUND, STRUCTURES, EASEMENTS, ENCROACHMENTS, VISIBLE UTILITIES, ROADWAYS AND CONTOURS.

2. NORTH ARROW AND BEARINGS REFER TO NAD 83 AND ARE BASED ON GPS READINGS TAKEN ON JANUARY 25, 2018 USING ACORN.

   ELEVATIONS REFER TO NAVD 88 AND ARE BASED ON GPS OBSERVATIONS TAKEN ON JANUARY 25, 2018 USING ACORN.

3. PARCEL IS LOCATED IN AREA "X", (AREAS DETERMINED TO BE OUTSIDE 100/500-YEAR FLOOD) AS DEPICTED ON F.I.R.M. COMMUNITY PANEL NO. 09009C0452J PANEL 0452 OF 0635 REVISED: MAY 16, 2017.

4. THE UNDERGROUND UTILITIES DEPICTED HAVE BEEN PLOTTED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES DEPICTED COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES DEPICTED ARE IN THE EXACT LOCATION INDICATED THOUGH THEY ARE PLOTTED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY EXPOSED THE UNDERGROUND UTILITIES. PER CONNECTICUT STATE LAW THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF EXCAVATION. CALL BEFORE YOU DIG 1-800-922-4455.

MAP REFERENCE(S)

A. "CONNECTICUT STATE HIGHWAY DEPARTMENT, RIGHT OF WAY MAP, TOWN OF NORTH HAVEN, NEW HAVEN-MIDDLETOWN ROAD FROM VELVET LANE EASTERLY TO CLINTONVILE ROAD. ROUTE NO. 114, SCALE: 1"=40', DATE: APR. 30, 1930, REV: JANUARY 23, 1968. NUMBER 761, SHEET 2 OF 2."

B. "CONNECTICUT STATE HIGHWAY DEPARTMENT, RIGHT OF WAY MAP, TOWN OF NORTH HAVEN, MIDDLETOWN ROAD FROM THE CLINTONVILLE ROAD EASTERLY TO THE NORTH BRANFORD TOWN LINE. ROUTE NO. 114, SCALE:1"=40', DATE: APR. 30, 1929, REV: JANUARY 24, 1968. NUMBER 720, SHEET 1 OF 1."

C. "SUBDIVISION PLAN, PROPERTY OF ALBERT AND ANGELINA ANNUNZIATTA, RIMMON ROAD, NORTH HAVEN, CONN. DATE: MARCH 26, 1968, SCALE: 1"=100', SHEET 1 OF 2." PREPARED BY: JOSEPH B. BURNS, P.E. & L.S. (N.H.T.C. MAP NO. I-30 SHEET 1).

D. "SUBDIVISION PLAN, BUBBLING WELLS ACRES, SECTION TWO, PROPERTY TO BE CONVEYED TO CAMERA ASSOCIATES, RIMMON ROAD, NORTH HAVEN, CONNECTICUT, DATE: SEPT. 30, 1972, SCALE: 1"=50'." PREPARED BY: JOSEPH B. BURNS P.E. & L.S. (N.H.T.C. MAP NO. I-395).

E. "BUBBLING WELLS ACRES, RESUBDIVISION-LOT 2, SECTION ONE, PROPERTY OF HANS H. AND MARGARET . BOHLMANN, NORTH HAVEN, CONN. DATE: OCT. 1973 REV: MAY 1974, SCALE: 1"=50'." PREPARED BY: CHAS. H. MILLER, P.E. & L.S. (N.H.T.C. MAP NO. I-484).

F. "TOWN OF NORTH HAVEN, PERMANENT SANITARY SEWER EASEMENT ACROSS PROPERTY OF CATHOLIC CEMETARY ASSOCIATION OF THE ARCHDIOCESE OF HARTFORD INC., MIDDLETOWN AVE. NORTH HAVEN, CONN., DATE: APRIL 1, 1980, SCALE: 1"=40'." PREPARED BY: SALVATORE C. FAZZINO P.E. (N.H.T.C. MAP NO. I-886A).

LEGEND

- Property Line
- Property Line Abutter
- Easement Line
- Setback Line
- Limit of Wetlands
- Wetlands/Marsh
- Treeline
- Brushline
- Major Contour
- Minor Contour
- Guide Rail
- Overhead Wires
- Sanitary Sewer
- Storm Sewer
- Utility Pole
- Utility Pole w/ Light
- CB Catch Basin
- MH Manhole
- Sign
- Deciduous Tree
- Coniferous Tree

STATE OF CONNECTICUT
ROBERT H. ROPER
No. 18469
LICENSED LAND SURVEYOR

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

ROBERT H. ROPER L.S. #18469

NO CERTIFICATION IS EXPRESSED OR IMPLIED UNLESS THIS MAP BEARS THE ORIGINAL SIGNATURE AND EMBOSSED SEAL OF THE ABOVE NAMED LAND SURVEYOR.

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

LANDS OF THE ASSOCIATION OF CATHOLIC CEMETERIES
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS

No.	Date	Desc.

Surveyed	A.C.
Drawn	A.C.
Reviewed	R.R.
Scale	1"=100'
Project No.	17D3516
Date	03/30/18
Field Book	581
CAD File: BS17D3516O1	

Title

PROPERTY SURVEY MAP

Sheet No.

BS-1

Nov 21, 2018 9:48am anchavez G:\17D3516\17D3516 DWG\BS17D3516O1.dwg
Layout: BS-1 24X36

Xref G:\...XY17D3516O1 , XX04CXXXXXX

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SITE WORK GENERAL NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECT SPECIFICATION MANUAL; GREENSKIES RENEWABLE ENERGY, MUNICIPAL STANDARDS AND SPECIFICATIONS, AND CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS, 2010 ADA STANDARDS, AND STATE BUILDING CODE IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.

2. REFER TO OTHER PLANS BY OTHER DISCIPLINES, DETAILS AND PROJECT MANUAL FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT THE CIVIL ENGINEER IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS, SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE DEVELOPER'S CONSTRUCTION MANAGER PRIOR TO BIDDING.

3. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE OWNER OR OTHERS DURING OCCUPIED HOURS EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE OWNER AND THE LOCAL MUNICIPALITIES. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.

4. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE, AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORD DRAWINGS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES AND STORMWATER SYSTEM) TO THE DEVLOPER AT THE END OF CONSTRUCTION.

6. THE ENGINEER IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ENGINEER HAS NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OR TO SUPERVISE SAFETY AND DOES NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.

7. THE CONTRACTOR SHALL COMPLY WITH CFR 29 PART 1926 FOR EXCAVATION, TRENCHING, AND TRENCH PROTECTION REQUIREMENTS.

8. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY COMPANY AND MUNICIPAL OR COUNTY OR STATE RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE SYSTEMS ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UNDERGROUND AND OVERHEAD UTILITIES AND STORM DRAINAGE SYSTEMS INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT CT CALL BEFORE YOU DIG (CBYD) 72 HOURS BEFORE COMMENCEMENT OF WORK AT CT (800) 922-4455 OR AT 811 AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROPOSED UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.

9. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN OVER SCALED DIMENSIONS.

10. IF PLANS AND OR SPECIFICATIONS ARE IN CONFLICT, THE MOST COSTLY SHALL APPLY.

11. ALL CONTRACTORS AND SUBCONTRACTORS SHALL OBTAIN COMPLETE DRAWING PLAN SETS FOR BIDDING AND CONSTRUCTION. PLAN SETS OR PLAN SET ELECTRONIC POSTINGS SHALL NOT BE DISASSEMBLED INTO PARTIAL PLAN SETS FOR USE BY CONTRACTORS AND SUBCONTRACTORS OF INDIVIDUAL TRADES. IT SHALL BE THE CONTRACTOR'S AND SUBCONTRACTOR'S RESPONSIBILITY TO OBTAIN COMPLETE PLAN SETS OR COMPLETE PLAN SET ELECTRONIC POSTINGS FOR USE IN BIDDING AND CONSTRUCTION.

12. ALL NOTES AND DIMENSIONS DESIGNATED 'TYPICAL' APPLY TO ALL LIKE OR SIMILAR CONDITIONS THROUGHOUT THE PROJECT.

13. CONTRACTOR(S) TO TAKE AND VERIFY ALL DIMENSIONS AND CONDITIONS OF THE WORK AND BE RESPONSIBLE FOR COORDINATION OF SAME. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO START OF WORK.

14. BL COMPANIES HAS PREPARED THE FINAL CONSTRUCTION DOCUMENTS SUITABLE FOR BIDDING AND CONSTRUCTION. PROGRESS SETS OF THESE DOCUMENTS ARE NOT SUITABLE FOR THOSE PURPOSES. IF CLIENT ELECTS TO SOLICIT BIDS OR ENTER INTO CONSTRUCTION CONTRACTS UTILIZING CONSTRUCTION DOCUMENTS THAT ARE NOT YET FINAL, CONSULTANT SHALL NOT BE RESPONSIBLE FOR ANY COSTS OR DELAY ARISING AS A RESULT.

15. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS IS GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.

16. THE DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT AND OBTAIN FROM MUNICIPAL SOURCES ALL CONSTRUCTION PERMITS, INCLUDING STATE DOT PERMITS, AND ROADWAY CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK EXCEPT CTDOT ENCROACHMENT PERMIT BOND.

17. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS AND MATERIALS PER PLANS AND SPECIFICATIONS TO THE DEVELOPER AND CIVIL ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.

18. THE CONTRACTOR SHALL FOLLOW THE SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE SEDIMENT AND EROSION CONTROL PLAN AND THE STORMWATER POLLUTION CONTROL PLAN.

19. SHOULD ANY UNCHARTED OR INCORRECTLY CHARTED, EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE CIVIL ENGINEER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.

20. ALL SITE DIMENSIONS ARE REFERENCED TO THE FACE OF CURBS OR EDGE OF PAVING OR EDGE OF DRIVEWAY OR EDGE OF PV PANEL AS APPLICABLE UNLESS OTHERWISE NOTED.

21. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN TRAFFIC DEVICES FOR PROTECTION OF VEHICLES AND PEDESTRIANS CONSISTING OF DRUMS, BARRIERS, SIGNS, LIGHTS, FENCES, TEMPORARY WALKWAYS, TRAFFIC CONTROLLERS AND UNIFORMED TRAFFIC OFFICERS AS REQUIRED OR AS ORDERED BY THE ENGINEER OR AS REQUIRED BY THE LOCAL GOVERNING AUTHORITIES OR AS REQUIRED BY PERMIT STIPULATIONS OR AS REQUIRED BY THE DEVELOPER. CONTRACTOR SHALL MAINTAIN ALL TRAFFIC LANES AND PEDESTRIAN WALKWAYS FOR USE AT ALL TIMES UNLESS WRITTEN APPROVAL FROM THE APPROPRIATE GOVERNING AGENCY IS GRANTED.

22. TRAFFIC CONTROL SIGNAGE SHALL CONFORM TO THE STATE DOT STANDARD DETAIL SHEETS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. SIGNS SHALL BE INSTALLED PLUMB WITH THE EDGE OF THE SIGN 2' OFF THE FACE OF THE CURB, AND WITH 7' VERTICAL CLEARANCE UNLESS OTHERWISE DETAILED OR NOTED.

23. REFER TO DETAIL SHEETS FOR GRAVEL ACCESS ROAD AND BITUMINOUS DRIVE ENTRANCES INFORMATION.

24. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.

25. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, DRAINAGE STRUCTURE, PIPE, UTILITY, PAVEMENT, CURBS, SIDEWALKS, LANDSCAPED AREAS, SWALE, PAVEMENT MARKINGS, OR SIGNAGE DISTURBED DURING DEMOLITION AND/OR CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE CIVIL ENGINEER, AND TO THE SATISFACTION OF THE DEVELOPER AND TOWN OF NORTH HAVEN.

26. EXISTING BOUNDARY AND TOPOGRAPHY IS BASED ON DRAWING TITLED "LANDS OF THE ASSOCIATION OF CATHOLIC CEMETERIES, 700 MIDDLETOWN AVENUE, NORTH HAVEN, CONNECTICUT, PROPERTY SURVEY MAP, SHEET BS-1" SCALE 1"=100', DATED 03/30/2018, PREPARED BY BL COMPANIES INC.

27. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE DEVELOPER, CIVIL ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING PROCESS.

28. CTDOT ENCROACHMENT PERMIT, IF REQUIRED, SHALL BE OBTAINED BY CONTRACTOR WHO SHALL PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC PROTECTION NECESSARY FOR THE WORK. THE DEVELOPER SHALL POST CTDOT ENCROACHMENT PERMIT BOND.

29. AN EROSION CONTROL BOND IS REQUIRED TO BE POSTED BY THE CONTRACTOR BEFORE THE START OF ANY ACTIVITY ON OR OFF SITE. THE AMOUNT OF THE EROSION CONTROL BOND WILL BE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.

30. NO PART OF THE PROJECT PARCEL IS LOCATED WITHIN ANY FEMA DESIGNATED FLOOD HAZARD AREAS.

31. THERE ARE WETLANDS LOCATED ON THE SITE AS INDICATED BY FIELD REVIEW CONDUCTED BY ERIC DAVISON, CERTIFIED PROFESSIONAL WETLAND SCIENTIST, AND REGISTERED SOIL SCIENTIST, OF DAVIDSON ENVIRONMENTAL, ON 12/16/17 AND FIELD LOCATED BY BL COMPANIES.

32. CONSTRUCTION OCCURRING ON THIS SITE SHALL COMPLY WITH NFPA 241 STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION AND DEMOLITION OPERATIONS, AND CHAPTER 16 OF NFPA 1 UNIFORM FIRE CODE.

33. CONTRACTOR SHALL SECURE ANY PERMITS, PAY ALL FEES AND PERFORM CLEARING AND GRUBBING AND DEBRIS REMOVAL PRIOR TO COMMENCEMENT OF GRADING OPERATIONS. CLEARING AND GRUBBING OF EXISTING VEGETATION SHALL OCCUR FOR EACH PHASE AS OUTLINED ON THE SEDIMENTATION AND EROSION CONTROL PLANS.

34. SEDIMENT AND EROSION CONTROLS AS SHOWN ON THE SEDIMENT AND EROSION CONTROL PLAN SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO START OF CLEARING AND GRUBBING OPERATIONS FOR EACH PHASE.

35. REMOVE AND DISPOSE OF ANY SIDEWALKS, FENCES, STAIRS, WALLS, DEBRIS AND RUBBISH REQUIRING REMOVAL FROM THE WORK AREA IN AN APPROVED OFF SITE LANDFILL, BY AN APPROVED HAULER. HAULER SHALL COMPLY WITH ALL REGULATORY REQUIREMENTS.

36. THE CONTRACTOR SHALL SECURE ALL PERMITS FOR HIS DEMOLITION AND DISPOSAL OF HIS DEMOLITION MATERIAL TO BE REMOVED FROM THE SITE. THE CONTRACTOR SHALL POST BONDS AND PAY PERMIT FEES AS REQUIRED.

37. ASBESTOS OR HAZARDOUS MATERIAL, IF FOUND ON SITE, SHALL BE REMOVED BY A LICENSED HAZARDOUS MATERIAL CONTRACTOR.

38. THE CONTRACTOR SHALL PREPARE ALL MANIFEST DOCUMENTS AS REQUIRED PRIOR TO COMMENCEMENT OF DEMOLITION.

39. THE CONTRACTOR SHALL CUT AND PLUG, OR ARRANGE FOR THE APPROPRIATE UTILITY PROVIDER TO CUT AND PLUG ANY SERVICE PIPING AT THE STREET LINE OR AT THE MAIN, AS REQUIRED BY THE UTILITY PROVIDER, OR AS OTHERWISE NOTED OR SHOWN ON THE CONTRACT DRAWINGS. ALL SERVICES MAY NOT BE SHOWN ON THIS PLAN. THE CONTRACTOR SHALL INVESTIGATE THE SITE PRIOR TO BIDDING TO DETERMINE THE EXTENT OF SERVICE PIPING TO BE REMOVED, CUT OR PLUGGED. THE CONTRACTOR SHALL PAY ALL UTILITY PROVIDER FEES FOR ABANDONMENTS AND REMOVALS.

40. THE CONTRACTOR SHALL PROTECT ALL IRON PINS, MONUMENTS AND PROPERTY CORNERS DURING DEMOLITION AND CONSTRUCTION ACTIVITIES. ANY CONTRACTOR DISTURBED PINS, MONUMENTS, AND OR PROPERTY CORNERS, ETC. SHALL BE RESET BY A LICENSED LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.

41. THE SITE CONTRACTOR SHALL STABILIZE THE SITE AND KEEP EROSION CONTROL MEASURES IN PLACE UNTIL THE COMPLETION OF HIS WORK, AS REQUIRED OR DEEMED NECESSARY BY THE ENGINEER OR DEVELOPER'S REPRESENTATIVE. THE SITE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE MAINTENANCE OF EXISTING EROSION AND SEDIMENTATION CONTROLS AND FOR INSTALLATION OF ANY NEW SEDIMENT AND EROSION CONTROLS AS PER THE SEDIMENT AND EROSION CONTROL PLAN.

42. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE DEVELOPER AND/OR DEVELOPER'S ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE DEVELOPER AND/OR DEVELOPER'S ENVIRONMENTAL CONSULTANT.

43. BACK FILL DEPRESSIONS, COMPACT, FERTILIZE, SEED AND MULCH DISTURBED AREAS NOT SUBJECT TO FURTHER SITE CONSTRUCTION. EMPLOY WATERING EQUIPMENT FOR DUST CONTROL.

44. THE CONTRACTOR SHALL REPAIR PAVEMENTS BY INSTALLING TEMPORARY AND PERMANENT PAVEMENTS IN PUBLIC RIGHTS OF WAYS AS REQUIRED BY LOCAL GOVERNING AUTHORITIES AND THE STATE, AS NEEDED, AND PER PERMIT REQUIREMENTS.

45. NO WORK ON THIS SITE SHALL BE INITIATED BY THE CONTRACTOR UNTIL A PRE-CONSTRUCTION MEETING WITH DEVELOPER AND THE CIVIL ENGINEER IS PERFORMED. THE CONTRACTOR SHOULD BE AWARE OF ANY SITE INFORMATION AVAILABLE SUCH AS GEOTECHNICAL AND ENVIRONMENTAL REPORTS. THE CONTRACTOR SHALL HAVE CALL BEFORE YOU DIG MARK OUTS OF EXISTING UTILITIES COMPLETED PRIOR TO MEETING.

46. THE CONTRACTOR SHALL ARRANGE FOR AND INSTALL TEMPORARY OR PERMANENT UTILITY CONNECTIONS WHERE INDICATED ON PLAN OR AS REQUIRED. MAINTAIN UTILITY SERVICES TO BUILDINGS OR TO SERVICES TO REMAIN. CONTRACTOR TO COORDINATE WITH UTILITY PROVIDERS FOR INSTALLATION AND PAY UTILITY PROVIDER FEES.

47. THE CONTRACTOR SHALL NOT COMMENCE DEMOLITION OR UTILITY DISCONNECTIONS UNTIL AUTHORIZED TO DO SO BY THE DEVELOPER.

48. THE CONTRACTOR SHALL INSTALL TEMPORARY SHEETING OR SHORING AS NECESSARY TO PROTECT EXISTING AND NEW UTILITIES AND STRUCTURES AS NEEDED DURING CONSTRUCTION. SHEETING OR SHORING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER, LICENSED IN THIS STATE AND EVIDENCE OF SUCH SUBMITTED TO THE DEVELOPER PRIOR TO INSTALLATION.

49. NO SALVAGE SHALL BE PERMITTED UNLESS PAID TO THE DEVELOPER AS A CREDIT.

50. THE CONTRACTOR SHALL PRESERVE EXISTING VEGETATION WHERE POSSIBLE AND/OR AS NOTED ON DRAWINGS. REFER TO SEDIMENT AND EROSION CONTROL PLAN FOR LIMIT OF DISTURBANCE AND EROSION CONTROL NOTES.

51. TOPSOIL SHALL BE STRIPPED FROM GRAVEL ACCESS ROAD AREA AND STOCKPILED ON SITE FOR USE IN FINAL LANDSCAPING.

52. SUBGRADE SHALL BE FORMED WITH REMOVAL AND REPLACEMENT OF FILL AND REMOVAL AND REPLACEMENT OF UNSUITABLE AND SOFT SUBGRADE MATERIAL AS ORDERED BY THE GEOTECHNICAL ENGINEER. SEE GEOTECHNICAL REPORT AND EARTHWORK SPECIFICATIONS FOR FURTHER DESCRIPTION.

53. THE CONTRACTOR SHALL COMPACT FILL IN LIFT THICKNESS PER THE GEOTECHNICAL REPORT UNDER ALL PARKING, BUILDING, DRIVE, AND STRUCTURE AREAS TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 (MODIFIED PROCTOR TEST), OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER.

54. UNDERDRAINS SHALL BE ADDED, IF DETERMINED NECESSARY IN THE FIELD BY THE DEVELOPER/GEOTECHNICAL ENGINEER, AFTER SUBGRADE IS ROUGH GRADED.

55. VERTICAL DATUM IS NAVD 88.

56. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD AND APPROVED BY THE TOWN OF NORTH HAVEN AGENT PRIOR TO THE START OF WORK ON THE SITE.

57. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR WETLANDS IN ACCORDANCE WITH THE REGULATIONS OF THE CT DEEP AND THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION. IN ADDITION, THE CONTRACTOR SHALL STRICTLY ADHERE TO THE SEDIMENT AND EROSION CONTROL PLAN CONTAINED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY THE TOWN OF NORTH HAVEN, WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.

58. ALL SITE WORK, MATERIALS OR CONSTRUCTION, AND CONSTRUCTION METHODS FOR EARTHWORK AND STORM DRAINAGE WORK SHALL CONFORM TO THE SPECIFICATIONS AND DETAILS AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS MANUAL. OTHERWISE THIS WORK SHALL CONFORM TO THE CONNECTICUT DEPARTMENT OF TRANSPORTATION SPECIFICATIONS AND PROJECT GEOTECHNICAL REPORT IF THERE IS NO PROJECT SPECIFICATIONS MANUAL. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE PER THE ABOVE STATED APPLICABLE SPECIFICATIONS, AND/OR PROJECT GEOTECHNICAL REPORT, AND SHALL BE PLACED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER. MATERIAL SHALL BE COMPACTED IN LIFT THICKNESSES PER THE PROJECT GEOTECHNICAL REPORT TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 1557 AT MOISTURE CONTENT INDICATED IN PROJECT GEOTECHNICAL REPORT.

59. ALL DISTURBANCE INCURRED TO TOWN, AND STATE PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE MUNICIPALITY, AND STATE AS APPLICABLE FOR THE LOCATION OF THE WORK.

60. ALL CONSTRUCTION WITHIN A DOT RIGHT OF WAY SHALL COMPLY WITH ALL DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS.

61. THE UTILITY PLAN DETAILS SITE INSTALLED CONDUITS UP TO 5' FROM THE PROPOSED TRANSFORMER LOCATIONS. REFER TO PHOTOVOLTAIC AND SITE ELECTRICAL PLANS (SE & PV PLAN SERIES). SITE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT EXISTING UTILITY OR PIPE CONNECTION POINT.

62. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROPOSED STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE CIVIL ENGINEER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.

63. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.

64. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.

65. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.

66. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT. AFTER UTILITY INSTALLATION IS COMPLETED, THE CONTRACTOR SHALL INSTALL TEMPORARY AND/OR PERMANENT PAVEMENT REPAIR AS DETAILED ON THE DRAWINGS OR AS REQUIRED BY THE DEVELOPER OR TOWN OF NORTH HAVEN.

67. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.

68. RELOCATION OF UTILITY PROVIDER FACILITIES SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.

69. THE CONTRACTOR SHALL COMPACT THE PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION.

70. CONTRACTOR TO PROVIDE STEEL SLEEVES AND SWEEPS AND ANNULAR SPACE SAND FILL FOR UTILITY PIPE AND CONDUIT CONNECTIONS AT TRANSFORMERS, AND STEEL RISERS AT UTILITY POLES IN ACCORDANCE WITH THE REQUIREMENTS OF UNITED ILLUMINATING.

71. ALL PUBLIC UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.

72. A ONE-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELEPHONE LINES AND STORM PIPING SHALL BE PROVIDED. A SIX-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER WITH A CONCRETE ENCASEMENT. AN 18-INCH TO 6-INCH VERTICAL CLEARANCE BETWEEN SANITARY SEWER PIPING AND STORM PIPING SHALL REQUIRE CONCRETE ENCASEMENT OF THE PROPOSED PIPING.

73. THE CONTRACTOR SHALL ARRANGE AND COORDINATE WITH UTILITY PROVIDERS FOR WORK TO BE PERFORMED BY UTILITY PROVIDERS. THE CONTRACTOR SHALL PAY ALL UTILITY FEES UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATION MANUAL AND GENERAL CONDITIONS, AND REPAIR PAVEMENTS AS NECESSARY.

74. ELECTRIC, AND TELECOMMUNICATIONS SERVICES SHALL BE INSTALLED UNDERGROUND FROM SERVICE POLE SNET #2112 AT THE INTERSECTION OF OLD VELVET ROAD AND MIDDLETOWN AVENUE. THE CONTRACTOR SHALL PROVIDE AND INSTALL AND BACKFILL PVC CONDUITS FOR ELECTRIC SERVICE PRIMARY AND PVC CONDUITS FOR ELECTRICAL SECONDARY PER PHOTOVOLTAIC AND SITE ELECTRICAL PLANS (PLAN SERIES PV AND SE) (SCHEDULE 80 UNDER PAVEMENT, SCHEDULE 40 IN NON PAVEMENT AREAS). SERVICES MAY BE INSTALLED IN A COMMON TRENCH WITH 12" CLEAR SPACE BETWEEN. MINIMUM COVER IS 36" ON ELECTRIC CONDUITS. SERVICES SHALL BE MARKED WITH MAGNETIC LOCATOR TAPE AND SHALL BE BEDDED, INSTALLED, AND BACKFILLED IN ACCORDANCE WITH ELECTRIC UTILITY PROVIDER STANDARDS. GALVANIZED STEEL ELECTRICAL CONDUIT SHALL BE USED AT POLE AND TRANSFORMER LOCATIONS. INSTALL HANDHOLES AS REQUIRED TO FACILITATE INSTALLATION AND AS REQUIRED BY UTILITY PROVIDER. INSTALL TRAFFIC LOAD QUALIFIED HANDHOLES IN VEHICULAR AREAS. INSTALL CONCRETE ENCASEMENT ON PRIMARY ELECTRIC CONDUITS IF REQUIRED BY ELECTRIC UTILITY PROVIDER.

75. PIPING SHALL BE LAID FROM DOWNGRADIENT END OF PIPE RUN IN AN UPGRADIENT DIRECTION WITH BELL END FACING UPGRADE IN THE DIRECTION OF PIPE LAYING.

76. ALL RCP SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-76; ALL RCP SHALL BE CLASS V UNLESS OTHERWISE SHOWN. JOINTS SHALL CONFORM TO THE REQUIREMETNS OF ASTM C-443.

77. HIGH DENSITY POLYETHYLENE (HDPE) STORM SEWER 12" OR GREATER IN DIAMETER SHALL BE HI-Q SURE-LOK 10.8 PIPE AS MANUFACTURED BY HANCOR INC. OR APPROVED EQUAL. HDPE PIPE SHALL HAVE SMOOTH INTERIOR AND CORRUGATED EXTERIOR AND SHALL MEET THE REQUIREMENTS OF AASHTO M294, TYPE S. PIPE SECTIONS SHALL BE JOINED WITH BELL-AND-SPIGOT JOINT MEETING THE REQUIREMENTS OF AASHTO M294. THE BELL SHALL BE AN INTEGRAL PART OF THE PIPE AND PROVIDE A MINIMUM PULL-APART STRENGTH OF 400 POUNDS. THE JOINT SHALL BE WATERTIGHT ACCORDING TO THE REQUIREMENTS OF ASTM D3212. GASKETS SHALL BE MADE OF POLYISOPRENE MEETING THE REQUIREMENTS OF ASTM F477. ALTERNATIVE HDPE PIPE MAY BE USED IF APPROVED BY THE ENGINEER AND OWNER'S CONSTRUCTION MANAGER PRIOR TO ORDERING.

78. ALUMINIZED STEEL STORM SEWER PIPING SHALL BE CORRUGATED 16 GAUGE TYPE 2 ALUMINIZED STEEL PIPE. 'N'= .013 UP TO 36" DIAMETER AND SHALL BE 14 GAUGE TYPE 2 A.S.P. FOR PIPES 36" AND LARGER THAN 36" DIAMETER. ALL PIPE TO HAVE CONTINUOUS CORRUGATION BAND COUPLINGS WITH BAR AND STRAP CONNECTIONS AND GASKETS.

79. THESE PLANS ARE FOR CONSTRUCTION.

DEFINITIONS

MUNICIPALITY SHALL MEAN THE TOWN OF NORTH HAVEN

COUNTY SHALL MEAN NEW HAVEN COUNTY

STATE SHALL MEAN CONNECTICUT

WATER UTILITY PROVIDER SHALL MEAN SOUTH CENTRAL CONNECTICUT REGIONAL WATER AUTHORITY

SANITARY UTILITY PROVIDER SHALL MEAN TOWN OF NORTH HAVEN

GAS UTILITY PROVIDER SHALL MEAN SOUTHERN CONNECTICUT GAS

TELECOMMUNICATIONS UTILITY PROVIDER SHALL MEAN FRONTIER

ELECTRIC UTILITY PROVIDER SHALL MEAN UNITED ILLUMINATING CORPORATION

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PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

No.	Date	Description
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

REVISIONS

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	NONE
Project No.	17D3516
Date	04/06/2018
CAD File:	GN17D351601

Title: GENERAL NOTES

Sheet No.: GN-1

Xref (s) : 8D17D351601

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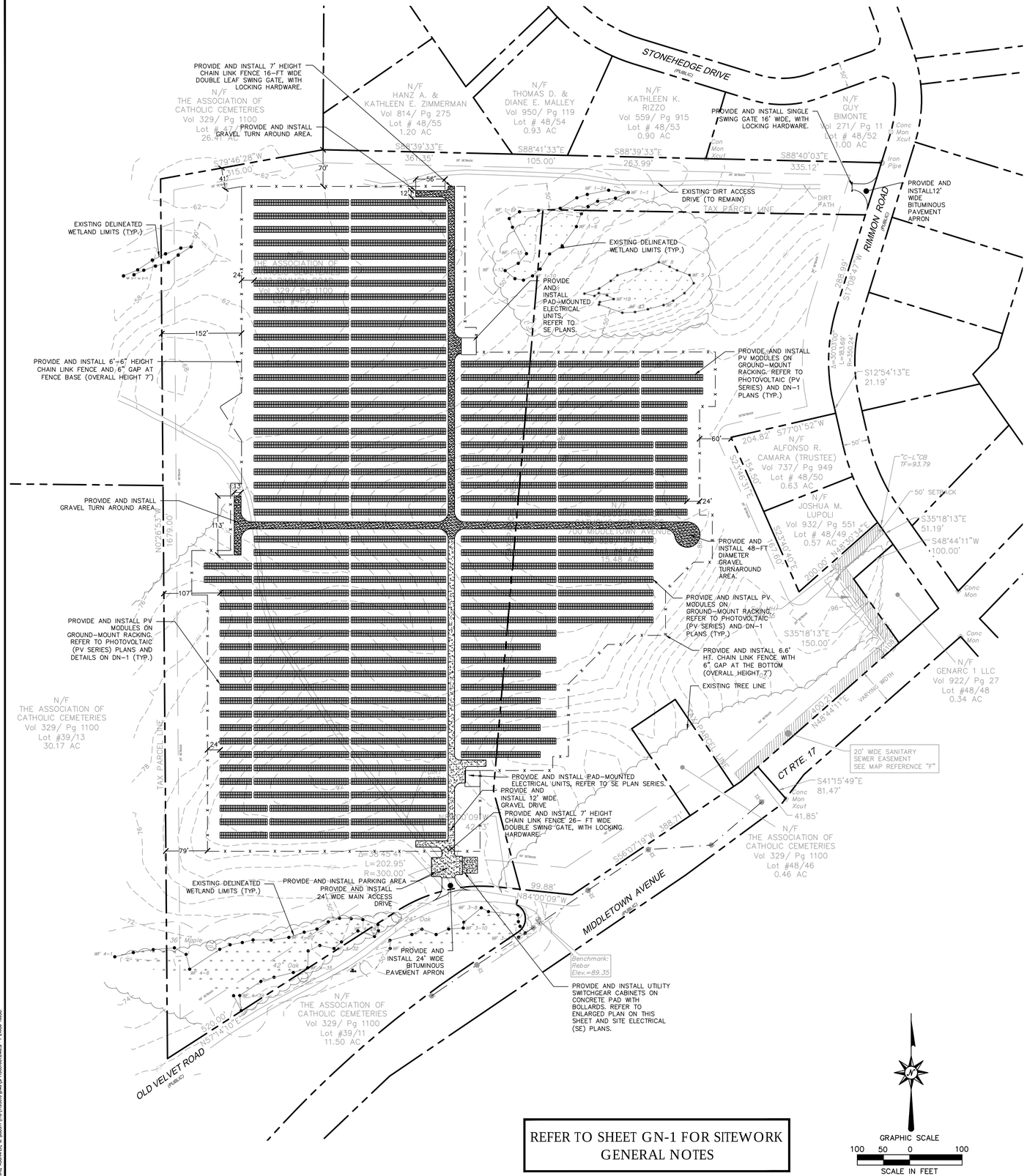
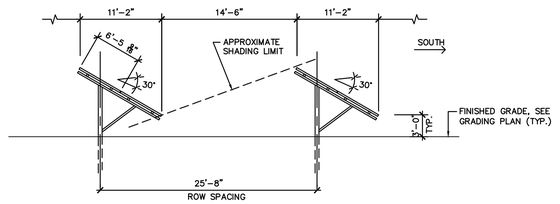


REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES



RACKING SECTION (DRIVEN POST)

N.T.S.

ARRAY SYSTEM INFORMATION

ITEM #	ITEM	PROPOSED
1	TOTAL WATTAGE	6.03 MW DC 4.98 MW AC
2	PANEL TYPE	365W
3	TOTAL PANELS	16,524
4	PANEL TILT	30°

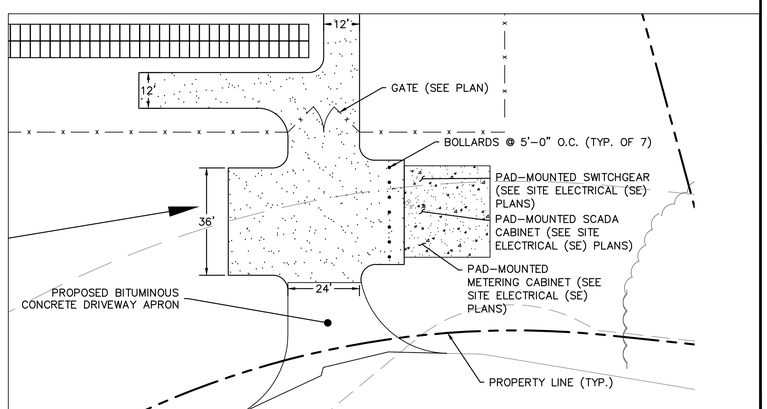
ZONING TABLE

LOCATION:	**700 MIDDLETOWN AVENUE, NORTH HAVEN, CONNECTICUT**			
ZONE:	**R-40 (RESIDENCE)**			
OTHER REGULATORY BOUNDARIES: NONE				
USE:	**SOLAR ENERGY FARM**			
ITEM #	**ITEM**	**REQUIREMENTS**	**EXISTING**	**PROPOSED**
1	MINIMUM LOT AREA	40,000 S.F.	1,139,094 S.F. + 674,309 = 1,813,403 S.F. (41.63 ACRES)	UNCHANGED
2	MINIMUM LOT WIDTH	150 FEET	–	UNCHANGED
3	MIN. FRONT SETBACK FOR BUILDING	50 FEET	–	UNCHANGED
4	MIN. SIDE SETBACK FOR BUILDING	25 FEET	–	UNCHANGED
5	MIN. REAR SETBACK FOR BUILDING	25 FEET	–	UNCHANGED
6	MAXIMUM BUILDING HEIGHT	35 FEET	–	UNCHANGED
7	MAXIMUM BUILDING COVERAGE	15%	±20,000SF = 1.10%	UNCHANGED

NOTES:
1. PROPERTY DATA BASED OFF INFORMATION OBTAINED FROM TOWN OF NORTH HAVEN ONLINE GIS DATA AND INTERPOLATIONS FROM ASSOCIATED MAPPING.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING TREE CANOPY
- PROPOSED TREE CANOPY
- E — PRIMARY ELECTRICAL LINE, REFER TO SE SERIES DRAWINGS
- x — CHAIN LINK FENCE
- GROUND MOUNTED PHOTOVOLTAIC (PV) MODULES
- GRAVEL DRIVE
- WETLAND FLAGS



ENTRANCE DETAIL

N.T.S.

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PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS
No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	M.P.S.
Scale	1"=100'
Project No.	17D3516
Date	04/06/2018
CAD File:	SP17D351601

Title: SITE PLAN

Sheet No.
SP-1

Xref (s) : X17D351601 : X17D351601 : B17D351601 : X17D351601

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GRADING AND DRAINAGE LEGEND

PROPERTY LINE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
STORM LINE FLARED END	
END WALL OR HEADWALL	
PROPOSED CONTOUR LINE	228
PROPOSED SPOT ELEVATION	x 100.00
PROPOSED SURFACE SLOPE	2%
ELECTRIC LINE	E E
ELECTRIC AND TELECOMMUNICATIONS LINES	E/T
OVERHEAD LINE	OH OH
TRANSFORMER	T
HYDRANT	
UTILITY POLE	
RIPRAP PROTECTION	

NOTE:

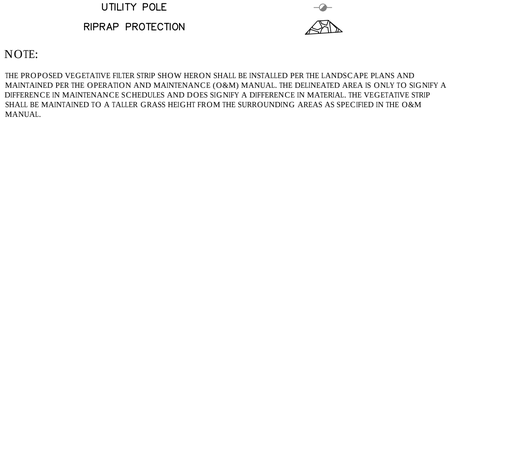
THE PROPOSED VEGETATIVE FILTER STRIP SHOW HERON SHALL BE INSTALLED PER THE LANDSCAPE PLANS AND MAINTAINED PER THE OPERATION AND MAINTENANCE (O&M) MANUAL. THE DELINEATED AREA IS ONLY TO SIGNIFY A DIFFERENCE IN MAINTENANCE SCHEDULES AND DOES SIGNIFY A DIFFERENCE IN MATERIAL. THE VEGETATIVE STRIP SHALL BE MAINTAINED TO A TALLER GRASS HEIGHT FROM THE SURROUNDING AREAS AS SPECIFIED IN THE O&M MANUAL.

STORM PIPE LENGTH CHART

PIPE TABLE				
LINE ID	STRUCTURE TO STRUCTURE	LENGTH	SLOPE	SIZE & TYPE
PIPE – 1	FES–01A TO FES–01B	76 LF	2.90%	12" RCP CLASS 5
PIPE – 2	FES–02A TO FES–02B	29 LF	1.36%	24" RCP CLASS 5
PIPE – 3	FES–03A TO FES–03B	38 LF	1.85%	30" RCP CLASS 5
PIPE – 4	FES–04A TO FES–04B	37 LF	1.13%	24" RCP CLASS 5

STORM STRUCTURE CHART

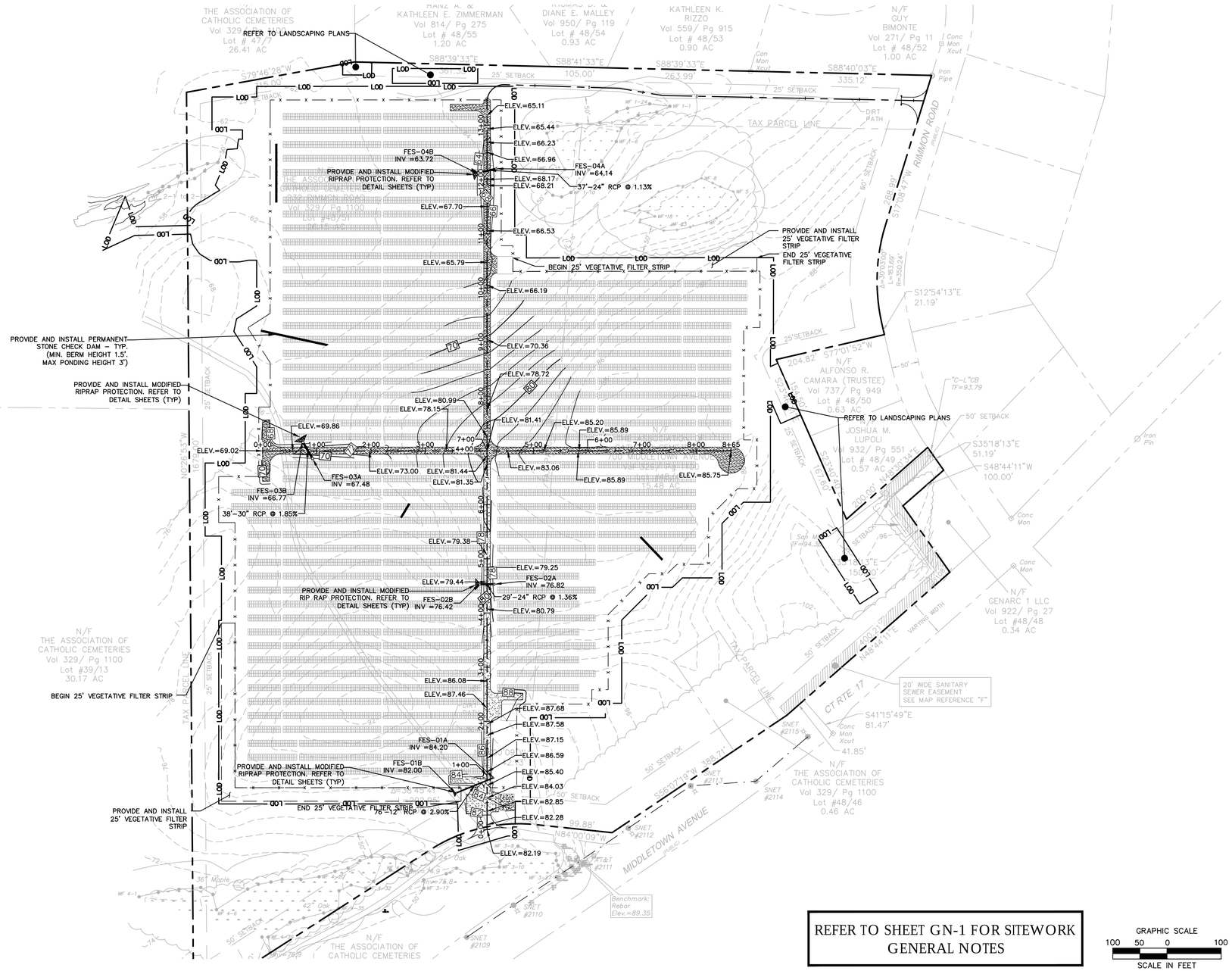
STRUCTURE TABLE	
STRUCTURE ID	STRCUTURE DETAILS
FES–01A	INV = 84.20
FES–01B	INV = 82.00
FES–02A	INV = 76.82
FES–02B	INV = 76.42
FES–03A	INV = 67.48
FES–03B	INV = 66.77
FES–04A	INV = 64.14
FES–04B	INV = 63.72



*THE CROSS SLOPE WITHIN THE GRAVEL DRIVE VARIES ALONG THE LENGTH OF EACH GRAVEL DRIVE. THE CONTRACTOR SHALL ENSURE THAT ALL STORMWATER RUNOFF IS DIRECTED EITHER ACROSS THE GRAVEL DRIVE OR TO A CULVERT CROSSING UNDERNEATH THE DRIVE AS SHOWN WITHIN THE GRADING PLAN. NO STORMWATER RUNOFF SHALL BE ALLOWED TO IMPOUND BEHIND THE PROPOSED GRAVEL DRIVE WITHOUT AN OUTFALL.

TYPICAL GRAVEL DRIVE CROSS SECTION

N.T.S



REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

GRAPHIC SCALE
100 50 0 100
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE

NORTH HAVEN, CONNECTICUT

REVISIONS

No.	Date	Desc
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=100'
Project No.	17D3516
Date	04/06/2018
CAD File:	GD17D3516O1

Title

GRADING AND DRAINAGE PLAN

Sheet No.

GD-1

Xref (s) : BD17D3516-01-24x36 : XX17D351601 : XC17D351601 : XC17D351602 : XC17D351601 : XC17D351604

11/29/2018, ASCHAFER, G:\JOBS\17\D\17D3516\DWG\BD\17D3516BD.DWG,GD-1 24X36, 1:1

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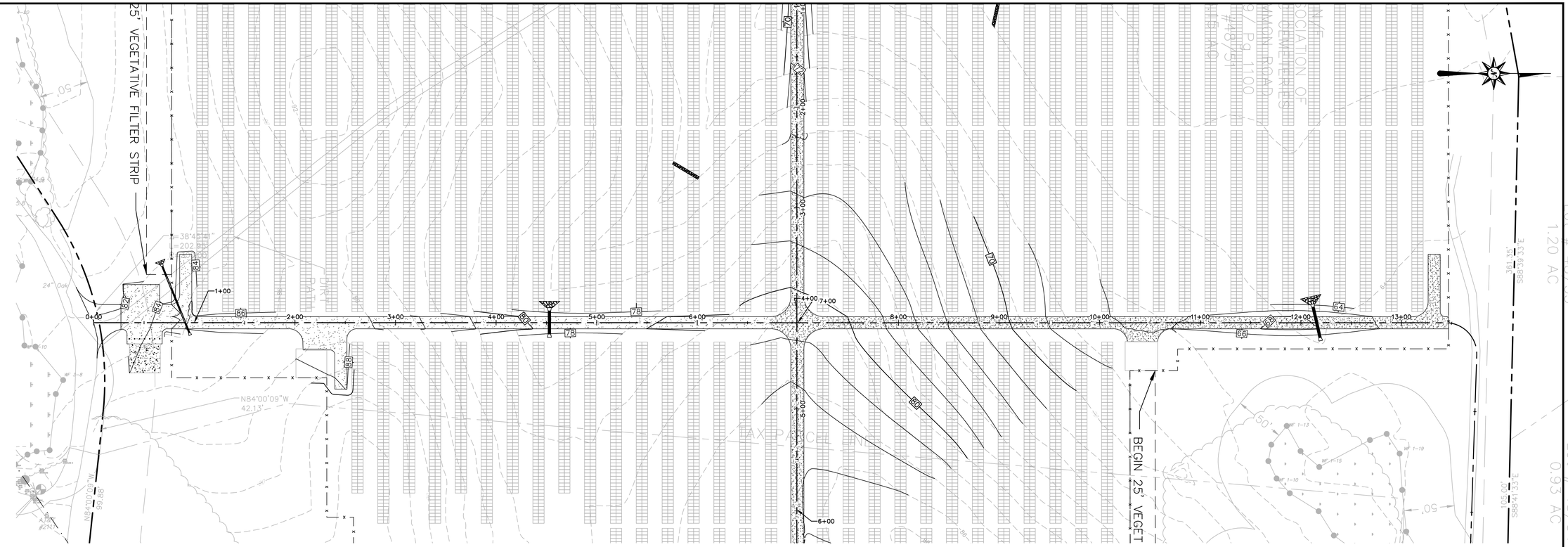

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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VERT. 5 2.5 0 5
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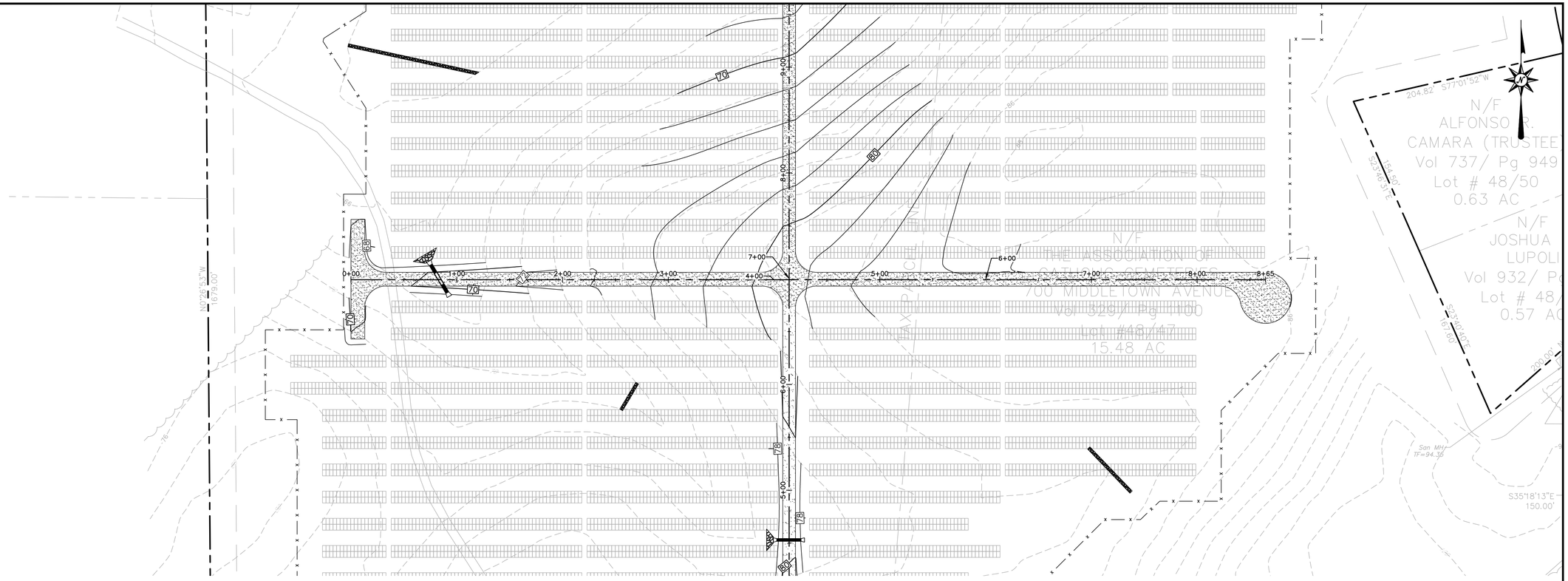
REVISIONS
No. Date Desc.
1. 07/13/2018 UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2. 11/16/2018 D & M SET

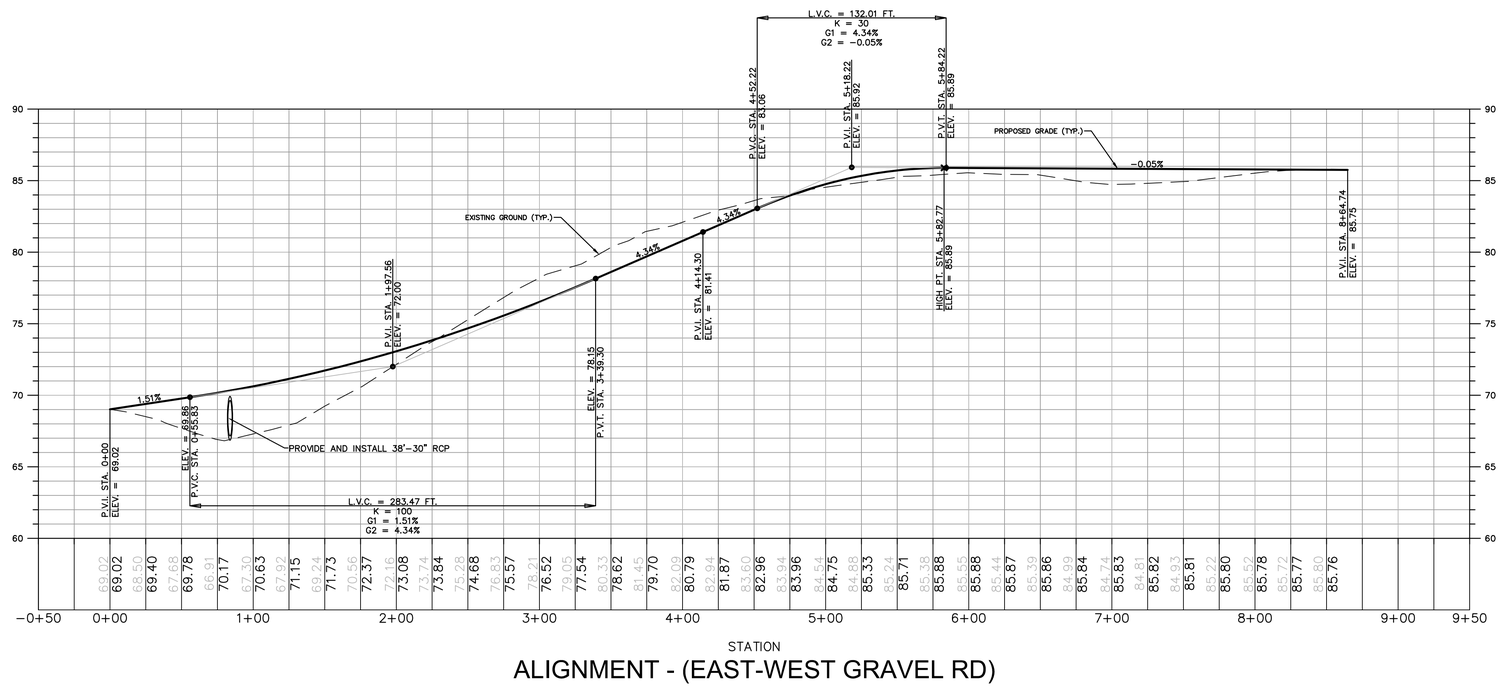
Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=50' H; 1"=5' V
Project No.	17D3516
Date	04/06/2018
CAD File:	GD17D351601

Title
NORTH-SOUTH GRAVEL DRIVE PLAN AND PROFILE

Sheet No.
GD-2

Xref (s): I:\17D3516-01-24x36\...\X17D351601.dwg; X17D351603.dwg; X17D351604.dwg; X17D351605.dwg; X17D351606.dwg; X17D351607.dwg; X17D351608.dwg; X17D351609.dwg; X17D351610.dwg; X17D351611.dwg; X17D351612.dwg; X17D351613.dwg; X17D351614.dwg; X17D351615.dwg; X17D351616.dwg; X17D351617.dwg; X17D351618.dwg; X17D351619.dwg; X17D351620.dwg; X17D351621.dwg; X17D351622.dwg; X17D351623.dwg; X17D351624.dwg; X17D351625.dwg; X17D351626.dwg; X17D351627.dwg; X17D351628.dwg; X17D351629.dwg; X17D351630.dwg; X17D351631.dwg; X17D351632.dwg; X17D351633.dwg; X17D351634.dwg; X17D351635.dwg; X17D351636.dwg; X17D351637.dwg; X17D351638.dwg; X17D351639.dwg; X17D351640.dwg; X17D351641.dwg; X17D351642.dwg;





ALIGNMENT - (EAST-WEST GRAVEL RD)

REFER TO SHEET GN-1 FOR SITEWORK GENERAL NOTES

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE

NORTH HAVEN, CONNECTICUT

REVISIONS		
No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=50' H; 1"=5' V
Project No.	170316
Date	04/06/2018
CAD File:	GD170351601

Title
EAST-WEST GRAVEL DRIVE PLAN AND PROFILE

Sheet No.
GD-3

Xref (s): : B0170316-01-24x36 : : X0170351601 : X0170351602 : : X0170351601 : X0170351604

11/29/2018, ADSHAFER, G:\JOBS\Y17\170316\DWG\GD170351601.DWG, D-3 24X36 XREF.

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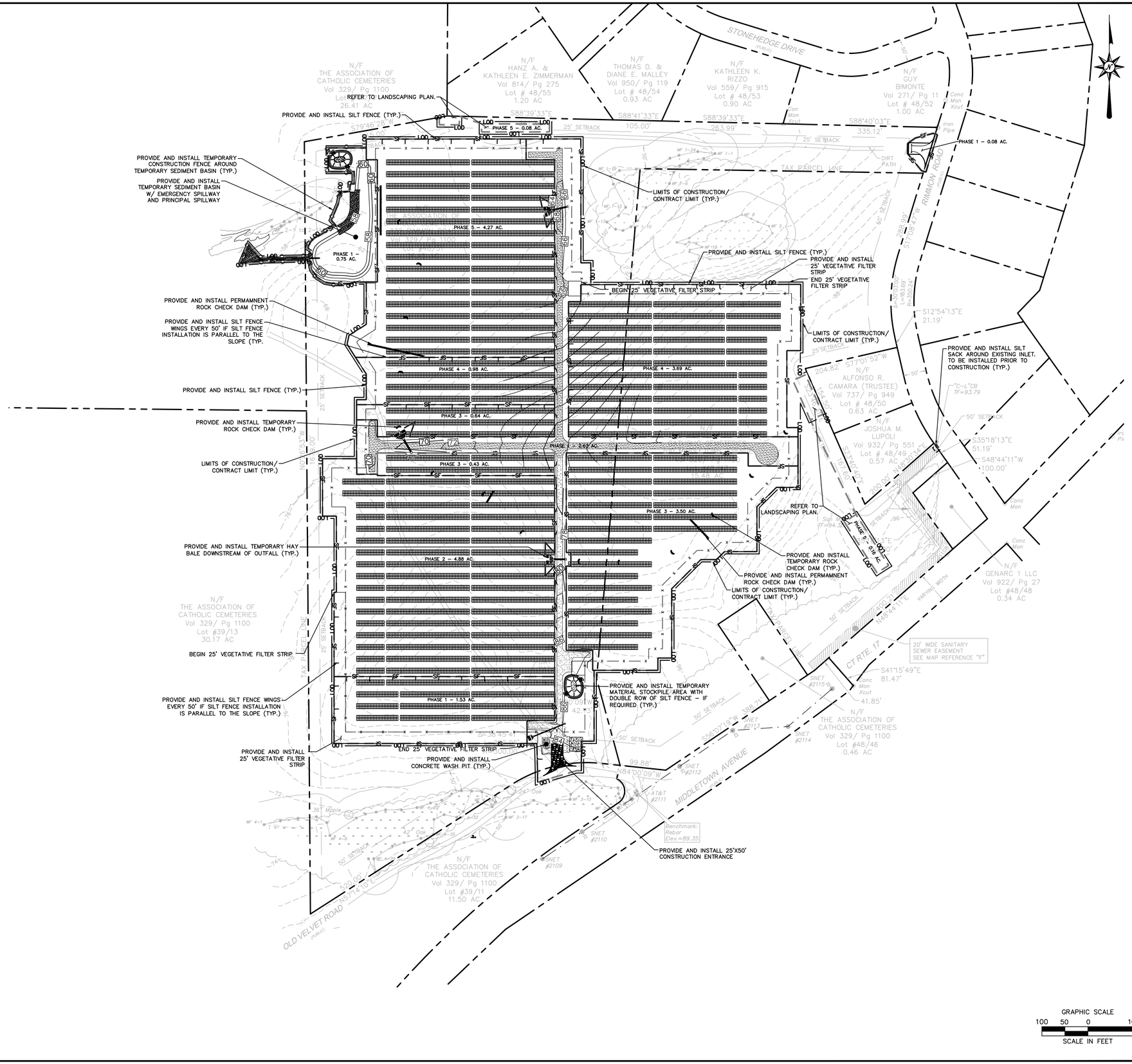
EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
STONE CHECK DAMS	
SILT FENCE	SF
CONSTRUCTION ENTRANCE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
STOCKPILE AREA WITH DOUBLE ROW OF SILT FENCE (IF REQUIRED)	
SILT SACK AT CATCH BASINS	
HAY BALES	



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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS		
No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=100'
Project No.	17D3516
Date	04/06/2018
CAD File:	EC17D351601

Title

OVERALL SEDIMENT AND EROSION CONTROL PLAN

Sheet No.

EC-1

Xref (s): : B017D3516-01-2ALT6 : XC17D351601 : XH17D351601 : XC17D351604 : XC17D351602 : XZ17D351601

11/27/2018, ADSHAFER, G:\ARBY\PJTS\17D3516\DWG\EC17D351601.DWG<EC-1 (OVERALL) 24X36 100%>

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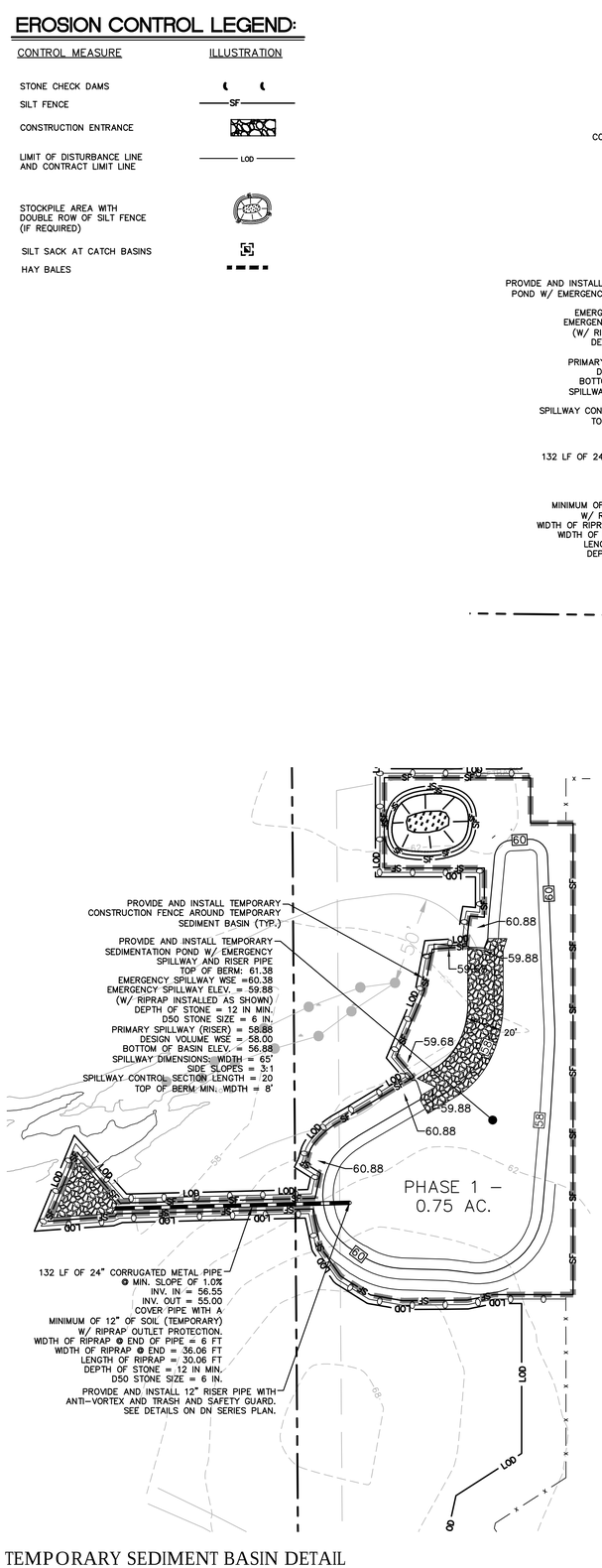
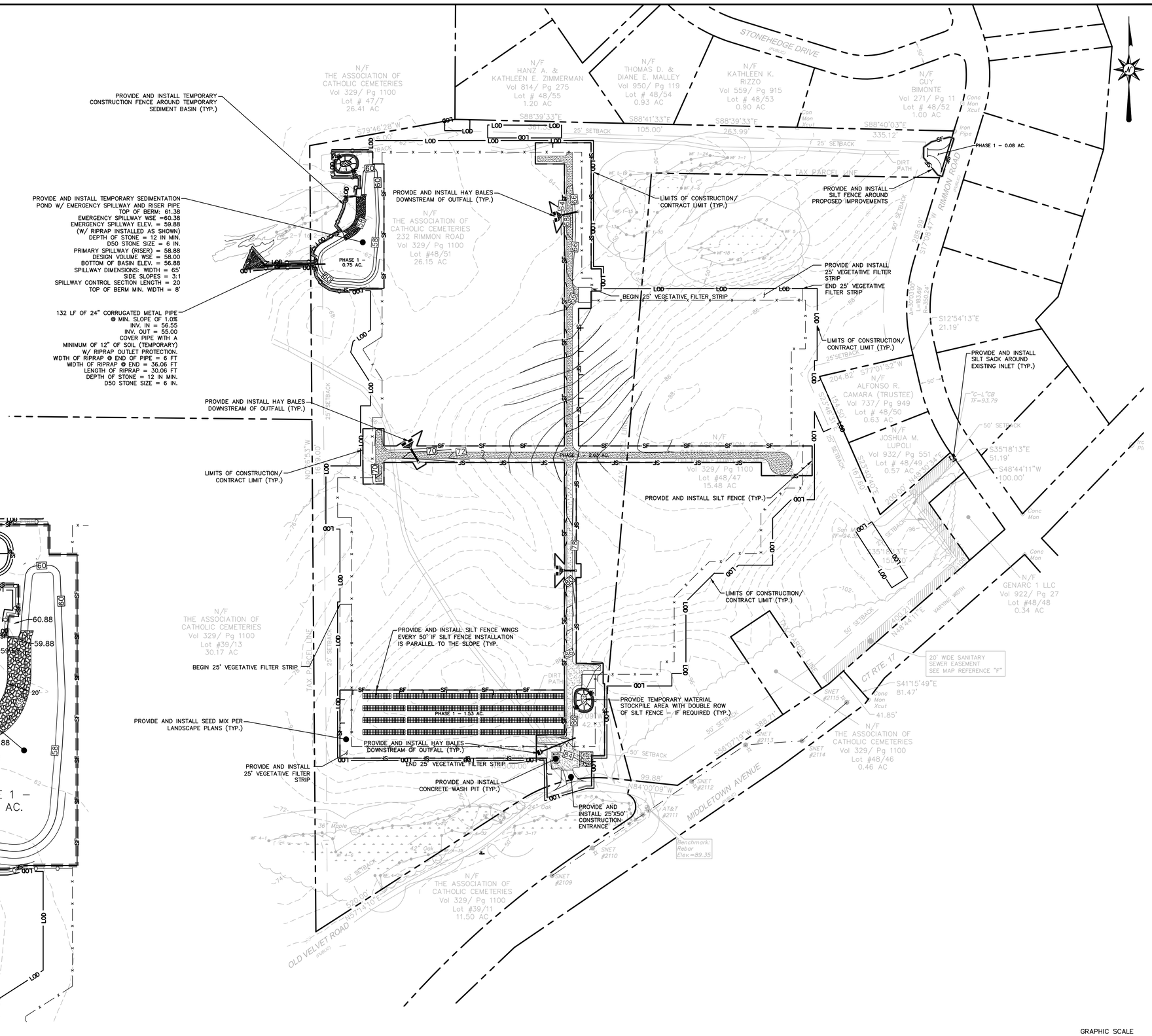
EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
STONE CHECK DAMS	
SILT FENCE	SF
CONSTRUCTION ENTRANCE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
STOCKPILE AREA WITH DOUBLE ROW OF SILT FENCE (IF REQUIRED)	
SILT SACK AT CATCH BASINS	
HAY BALES	



TEMPORARY SEDIMENT BASIN DETAIL

1" = 40'



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REVISIONS
No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=100'
Project No.	17D3516
Date	04/06/2018
CAD File:	EC17D351601

Title
PHASE I
SEDIMENT AND
EROSION
CONTROL PLAN

Sheet No.
EC-2

Xref Path: I:\BD\17D3516-01-24x36 - 17D3516601 - 17D3516602 - 17D3516604 - 17D3516605 - 17D3516606 - 17D3516607 - 17D3516608 - 17D3516609 - 17D3516610 - 17D3516611 - 17D3516612 - 17D3516613 - 17D3516614 - 17D3516615 - 17D3516616 - 17D3516617 - 17D3516618 - 17D3516619 - 17D3516620 - 17D3516621 - 17D3516622 - 17D3516623 -

EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
STONE CHECK DAMS	
SILT FENCE	SF
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
HAY BALES	

REFERENCE LINE - SEE SHEET EC-4 & EC-6

MATCHLINE - SEE SHEET EC-4 & EC-6

MATCHLINE - SEE SHEET EC-4 & EC-6

PHASE 1 – 2.63 AC.

PHASE 2 – 4.88 AC.

PROVIDE AND INSTALL PERMANENT STONE CHECK DAM (MIN. 1' HEIGHT. MAXIMUM HEIGHT 3' (TYP.)

PROVIDE AND INSTALL SEED MIX PER LANDSCAPE PLANS (TYP.)

PROVIDE AND INSTALL SILT FENCE (TYP.)

PROVIDE AND INSTALL SILT FENCE WINGS EVERY 50' IF SILT FENCE INSTALL PARALLEL WITH THE SLOPE (TYP.)

PROVIDE AND INSTALL SILT FENCE (TYP.)

GRAPHIC SCALE
40 20 0 40
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS		
No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D. & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	17D3516
Date	04/06/2018
CAD File:	EC17D351601

Title

PHASE 2
SEDIMENT AND
EROSION
CONTROL PLAN

Sheet No.

EC-3

11/20/2018, ASCHMITZ, R:\JOBS\17\D3516\SHEETS\D3516EC-3 (PHASE 2) 24X36 ANSI

Xref (s) : B017D3516-01-24x36 ; XC17D351601 ; XC17D351601 ; XC17D351604 ; XC17D351602 ; XC17D351601

EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
STONE CHECK DAMS	
SILT FENCE	SF
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
HAY BALES	

REFERENCE LINE - SEE SHEET EC-6

MATCHLINE - SEE SHEET EC-6

MATCHLINE - SEE SHEET EC-6

PROVIDE AND INSTALL SEED MIX PER LANDSCAPE PLANS (TYP.)

PROVIDE AND INSTALL SILT FENCE (TYP.)

PROPERTY LINE (TYP.)

RACKING SYSTEM AND PROPOSED PHOTOVOLTAIC PANELS SHOWN OUTSIDE OF THE PHASE LINE SHALL BE CONSTRUCTED DURING THE PHASE SHOWN HEREON.

PHASE 3 – 0.64 AC.

PHASE 3 – 0.43 AC.

PROVIDE AND INSTALL TEMPORARY ROCK CHECK DAM (TYP.)

PHASE 3 – 2.83 AC.

PHASE 3 – 3.50 AC.

PROVIDE AND INSTALL PERMANENT STONE CHECK DAM MINIMUM 1' HEIGHT, MAXIMUM HEIGHT 3' (TYP.)

PROVIDE AND INSTALL SILT FENCE (TYP.)

LIMITS OF CONSTRUCTION/ CONTRACT LIMIT (TYP.)

PROVIDE AND INSTALL SEED MIX PER LANDSCAPE PLANS (TYP.)

PROVIDE AND INSTALL TEMPORARY ROCK CHECK DAM (TYP.)

LIMITS OF CONSTRUCTION/ CONTRACT LIMIT (TYP.)

PROVIDE AND INSTALL SEED MIX PER LANDSCAPE PLANS (TYP.)

PROVIDE AND INSTALL SILT FENCE (TYP.)

RACKING SYSTEM AND PROPOSED PHOTOVOLTAIC PANELS SHOWN OUTSIDE OF THE PHASE LINE SHALL BE CONSTRUCTED DURING THE PHASE SHOWN HEREON.

PHASE 2 – 4.88 AC.

PHASE 5 – 0.16 AC.

ALL IMPROVEMENTS WITHIN THIS AREA SHALL BE CONSTRUCTED DURING PHASE 5 AND IN CONJUNCTION WITH SHEET EC-6. REFER TO LANDSCAPING PLANS (LL SERIES) FOR PROPOSED IMPROVEMENTS.

DIRT PATH

CT RTE. 17

GRAPHIC SCALE
40 20 0 40
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
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No.	Date	Desc.
REVISIONS		
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	O & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	A.J.S.
Scale	1"=40'
Project No.	17D3516
Date	04/06/2018
CAD File:	EC17D351601

Title

PHASE 3
SEDIMENT AND
EROSION
CONTROL PLAN

Sheet No.

EC-4

Xref Dgb: ; BD17D3516-01-24x36 ; XX17D351601 ; XX17D351604 ; XC17D351601 ; XC17D351602 ; XZ17D351601

11/29/2018, ASCHAFTA, G:\JOBS\TV\17D3516\PV\SHEETS\D3516EC1.DWG, EC1-TD3516EC1.DWG, EC1-4 (PHASE 3), ASCHAFTA, 40SC

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EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
STONE CHECK DAMS	
SILT FENCE	SF
CONSTRUCTION ENTRANCE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
HAY BALES	

REFER TO SHEET EC-1& EC-2

REFERENCE LINE - SEE SHEET EC-4

PROVIDE AND INSTALL TEMPORARY ROCK CHECK DAM (TYP.)

PROVIDE AND INSTALL SILT FENCE WINGS EVERY 50' IF SILT FENCE INSTALLATION IS PARALLEL TO THE SLOPE (TYP.)

PHASE 4 – 0.98 AC.

PHASE 3 – 0.64 AC.

MATCHLINE - SEE SHEET EC-4

LIMITS OF CONSTRUCTION/ CONTRACT LIMIT (TYP.)

PROVIDE AND INSTALL SILT FENCE WINGS EVERY 50' LF SILT FENCE INSTALLATION IS PARALLEL TO THE SLOPE (TYP.)

PROVIDE AND INSTALL SEED MIX PER LANDSCAPE PLANS (TYP.)

PROVIDE AND INSTALL SILT FENCE (TYP.)

PHASE 4 – 3.69 AC.

PROVIDE AND INSTALL ROCK CHECK DAM (TYP.)

MATCHLINE - SEE SHEET EC-4

25' SETBACK

GRAPHIC SCALE
40 20 0 40
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE

NORTH HAVEN, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	17D3516
Date	04/06/2018
CAD File:	EC17D3516O1

Title

PHASE 4 SEDIMENT AND EROSION CONTROL PLAN

Sheet No.

EC-5

Xref (s) : B17D3516-01-24x36 ; XX17D3516O1 ; XX17D3516O2 ; XX17D3516O3 ; XX17D3516O4 ; XX17D3516O5

11/29/2018, ASHARTA, G:\PROJECTS\2017\D3516\DWG\[EC17D3516O1]EC-5 PHASE 4].DWG, EC-5

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EROSION CONTROL LEGEND:

CONTROL MEASURE	ILLUSTRATION
STONE CHECK DAMS	
SILT FENCE	SF
CONSTRUCTION ENTRANCE	
LIMIT OF DISTURBANCE LINE AND CONTRACT LIMIT LINE	LOD
HAY BALES	

REFER TO LANDSCAPE PLANS FOR PROPOSED IMPROVEMENTS. ALL IMPROVEMENTS WITHIN THIS ZONE SHALL BE CONSTRUCTED DURING PHASE 5 PER THE APPROVED LANDSCAPE PLANS.

PROVIDE AND INSTALL REMAINING PERMANENT CHAIN LINK PERIMETER FENCE AFTER ENTIRE SITE HAS BEEN STABILIZED AND TEMPORARY SEDIMENT BASIN HAS BEEN REMOVED TO MATCH EXISTING GRADES.

PHASE 5 – 0.08 AC.

PROVIDE AND INSTALL SILT FENCE (TYP.)

PROVIDE AND INSTALL SEED MIX PER LANDSCAPE PLANS (TYP.)

LIMITS OF CONSTRUCTION/ CONTRACT LIMIT (TYP.)

PROVIDE AND INSTALL PERMANENT STONE CHECK DAM. MINIMUM HEIGHT 1', MAXIMUM HEIGHT 3' (TYP.)

RACKING SYSTEM AND PROPOSED PHOTOVOLTAIC PANELS SHOWN OUTSIDE OF THE PHASE LINE SHALL BE CONSTRUCTED DURING THE PHASE SHOWN HEREON.

PROVIDE AND INSTALL SILT FENCE WINGS EVERY 50' IF SILT FENCE INSTALLATION IS PARALLEL TO THE SLOPE (TYP.)

PHASE 5 – 4.27 AC.

PROVIDE AND INSTALL TEMPORARY ROCK CHECK DAM (TYP.)

PROVIDE AND INSTALL SEED MIX PER LANDSCAPE PLANS (TYP.)

PROVIDE AND INSTALL PERMANENT STONE CHECK DAM. MAXIMUM HEIGHT 3' (TYP.)

PROVIDE AND INSTALL SILT FENCE WINGS EVERY 50' LF SILT FENCE INSTALLATION IS PARALLEL TO THE SLOPE (TYP.)

REFERENCE LINE - SEE SHEET EC-4

MATCHLINE - SEE SHEET EC-4

MATCHLINE - SEE SHEET EC-4

REFER TO LANDSCAPE PLANS FOR PROPOSED IMPROVEMENTS. ALL IMPROVEMENTS WITHIN THIS ZONE SHALL BE CONSTRUCTED DURING PHASE 5 PER THE APPROVED LANDSCAPE PLANS.

NOTE: CONTRACTOR SHALL INSTALL ALL SHRUBS AND TREES DURING PHASE 5 IN ADDITION TO THE IMPROVEMENTS AND EROSION CONTROL MEASURES SHOWN HEREON. CONTRACTOR SHALL REFER TO LANDSCAPE PLANS AND THE OVERALL EROSION CONTROL PLAN EC-1 FOR LANDSCAPED AREAS NOT SHOWN ON THIS SHEET.

GRAPHIC SCALE
40 20 0 40
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS		
No.	Date	Desc
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	1"=40'
Project No.	17D3516
Date	04/06/2018
CAD File:	EC17D351601

Title
PHASE 5
SEDIMENT AND
EROSION
CONTROL PLAN

Sheet No.
EC-6

Xref (s): : BD17D3516-01-24x36 : XX17D351601 : XX17D351601 : XX17D351604 : XX17D351602 : XX17D351603

11/29/2018, ASHARTE, G:\PROJECTS\D17D3516\DWG\ES\D3516ES01DWG\EC-6 (PHASE 5) 24X36 ARCH

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SEDIMENT AND EROSION CONTROL NOTES

SEDIMENT AND EROSION CONTROL NOTES – CONNECTICUT

SEDIMENT & EROSION CONTROL NARRATIVE
THE SEDIMENT AND EROSION CONTROL PLAN WAS DEVELOPED TO PROTECT THE EXISTING ROADWAY AND STORM DRAINAGE SYSTEMS, ADJACENT PROPERTIES, AND ANY ADJACENT WETLAND AREA AND ANY ADJACENT WATER COURSE FROM SEDIMENT LADEN SURFACE RUNOFF AND EROSION. A CONSTRUCTION SEQUENCE IS PROVIDED TO PROVIDE SURFACE RUNOFF EROSION CONTROLS PRIOR TO THE BEGINNING OF PROJECT DEMOLITION AND/OR CONSTRUCTION.

CONSTRUCTION SCHEDULE
THE ANTICIPATED STARTING DATE FOR CONSTRUCTION IS LATE 2018,WITH COMPLETION ANTICIPATED LATE SPRING 2019. APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES AS DESCRIBED HEREIN SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF ALL CONSTRUCTION ACTIVITY PER PHASE. SCHEDULE WORK TO MINIMIZE THE LENGTH OF TIME THAT BARE SOIL WILL BE EXPOSED.

CONTINGENCY EROSION PLAN
THE CONTRACTOR SHALL INSTALL ALL SPECIFIED SEDIMENT AND EROSION CONTROL MEASURES AND WILL BE REQUIRED TO MAINTAIN THEM IN THEIR INTENDED FUNCTIONING CONDITION. THE AGENTS OF THE TOWN OF NORTH HAVEN AND/OR CIVIL ENGINEER SHALL HAVE THE AUTHORITY TO REQUIRE SUPPLEMENTAL MAINTENANCE OR ADDITIONAL MEASURES IF FIELD CONDITIONS ARE ENCOUNTERED BEYOND WHAT WOULD NORMALLY BE ANTICIPATED.

GENERAL CONSTRUCTION SEQUENCE
REFER TO INDIVIDUAL PHASE SEQUENCE ON THIS SHEET FOR SPECIFIC INFORMATION.

THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

1. CONTACT TOWN OF NORTH HAVEN AGENT AT LEAST FORTY–EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION OR REGULATED ACTIVITY ON THIS PROJECT.

2. CLEARING LIMITS SHALL BE PHYSICALLY MARKED IN THE FIELD AND APPROVED BY THE TOWN OF NORTH HAVEN AGENT PRIOR TO THE START OF WORK ON THE SITE. INSTALL TREE PROTECTION AND PERIMETER SILT FENCE.

3. CONSTRUCT STONE CONSTRUCTION ENTRANCE ANTI–TRACKING PADS AT CONSTRUCTION ENTRANCES/EXITS AND INSTALL FILTER FABRIC AROUND GRATES OF CATCH BASINS OR INSTALL SILT SACKS ON CATCH BASIN INLETS ON OFF SITE ROADS. INSTALL SILT FENCE AND OTHER EROSION CONTROL DEVICES INDICATED ON THESE PLANS AT PERIMETER OF PROPOSED SITE DISTURBANCE AND INSTALL ALL EROSION CONTROL MEASURES AND TREE PROTECTION INDICATED ON THESE PLANS. INSTALL SEDIMENT BASINS AND SEDIMENT TRAPS IF REQUIRED AT LOW AREAS OF SITE OR AS ORDERED BY THE ENGINEER OR AS SHOWN ON THESE PLANS. FOLLOW PHASED CONSTRUCTION SEQUENCE.

4. INSTALL PHASE I SILT FENCE, CONSTRUCT DIVERSION SWALES AS NEEDED. COMMENCE INSTALLATION OF STORM DRAINAGE CULVERTS.

5. CLEAR AND GRUB PHASE I. STOCKPILE CHIPS. STOCKPILE TOPSOIL FROM GRAVEL ACCESS ROAD AREA. INSTALL SEDIMENT AND EROSION CONTROLS AT STOCKPILES.

6. CONSTRUCTION STAKING OF FENCING, UTILITIES, ACCESS DRIVES, AND PARKING AREAS.

7. COMMENCE BOX OUT OF GRAVEL ACCESS ROAD EARTHWORK. INSTALL ADDITIONAL SEDIMENT AND EROSION CONTROLS AS WORK PROGRESSES AND CONTINUE STORM DRAINAGE SYSTEM CONSTRUCTION, TOPSOIL AND SEED SLOPES WHICH HAVE ACHIEVED FINAL SITE GRADING.

8. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

9. BEFORE DISPOSING OF SOIL OR RECEIVING BORROW FOR THE SITE, THE CONTRACTOR MUST PROVIDE EVIDENCE THAT EACH SPOIL OR BORROW AREA HAS A SEDIMENT AND EROSION CONTROL PLAN APPROVED BY THE MUNICIPALITY AND WHICH IS BEING IMPLEMENTED AND MAINTAINED. THE CONTRACTOR SHALL ALSO NOTIFY THE MUNICIPALITY IN WRITING OF ALL RECEIVING SPOIL AND BORROW AREAS WHEN THEY HAVE BEEN IDENTIFIED.

10. THROUGHOUT CONSTRUCTION SEQUENCE, REMOVE SEDIMENT FROM BEHIND SILT FENCES, HAY BALES AND OTHER EROSION CONTROL DEVICES, AND FROM SEDIMENT BASINS AND SEDIMENT TRAPS AS REQUIRED. REMOVAL SHALL BE ON A PERIODIC BASIS (EVERY SIGNIFICANT RAINFALL OF 0.25 INCH OR GREATER). INSPECTION OF SEDIMENT AND EROSION CONTROL MEASURES SHALL BE ON A WEEKLY BASIS AND AFTER EACH RAINFALL OF 0.25 INCHES OR GREATER. SEDIMENT COLLECTED SHALL BE DEPOSITED AND SPREAD EVENLY UPLAND ON SLOPES DURING CONSTRUCTION.

11. INSTALL UTILITIES. COMPLETE STORM DRAINAGE SYSTEM.

12. CONSTRUCT GRAVEL ACCESS ROAD, TURNAROUND AREAS, AND PARKING AREAS SUBGRADE.

13. CONSTRUCT ENTRANCE APRON.

14. PLACE 4" TOPSOIL ON SLOPES OF DISTURBED AREAS AFTER ACCESS ROAD IS COMPLETED. FERTILIZE AND SEED. SEED MIXTURE TO BE INSTALLED APRIL 15, – JUNE 1 USE EROSION CONTROL BLANKETS AS REQUIRED OR ORDERED FOR SLOPES GREATER THAN 3:1 AND AS SHOWN ON LANDSCAPE PLANS OR EROSION CONTROL PLANS. FOR TEMPORARY STABILIZATION BEYOND SEEDING DATES USE ANNUAL RYE AT 4.0 LBS/1,000 S.F. FERTILIZE WITH 10–10–10 AT 1.0 LBS. OF NITROGEN PER 1,000 S.F. AND LIME AT 100 LBS/1,000 S.F. (MAX.).

15. CONTINUE PHASE 2 THROUGH PHASE 5 CONSTRUCTION. REPEAT STEPS 4, 8, 9, 10, 11, 14, FOR EACH PHASE. CLEAR AND GRUB EACH PHASE. MAINTAIN TOPSOIL IN EACH PHASE.

16. LANDSCAPE INTERIOR NON–PAVED AREAS, AND PERIMETER AREAS.

17. CLEAN STORM DRAINAGE PIPE OF DEBRIS AND SEDIMENT.

18. UPON DIRECTION OF THE TOWN OF NORTH HAVEN AGENT, SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED FOLLOWING STABILIZATION OF THE SITE.

OPERATION REQUIREMENTS

CLEARING AND GRUBBING OPERATIONS
1. ALL SEDIMENT AND EROSION CONTROL MEASURES, INCLUDING THE CONSTRUCTION OF TEMPORARY SEDIMENTATION BASINS AND STONE CONSTRUCTION ENTRANCE ANTI–TRACKING PADS, WILL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING OPERATIONS.

2. FOLLOWING INSTALLATION OF ALL SEDIMENT AND EROSION CONTROL MEASURES, THE CONTRACTOR SHALL NOT PROCEED WITH GRADING, FILLING OR OTHER CONSTRUCTION OPERATIONS UNTIL THE ENGINEER HAS INSPECTED AND APPROVED ALL INSTALLATIONS.

3. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CLEARING AND GRUBBING OPERATIONS SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR SEDIMENT AND EROSION CONTROL DEVICES.

4. FOLLOWING THE COMPLETION OF CLEARING AND GRUBBING OPERATIONS, ALL AREAS SHALL BE STABILIZED WITH TOPSOIL AND SEEDING OR CRUSHED STONE AS SOON AS PRACTICAL.

GRAVEL ACCESS ROAD OPERATIONS

1. DURING THE REMOVAL AND/OR PLACEMENT OF EARTH AS INDICATED ON THE GRADING PLAN, TOPSOIL SHALL BE STRIPPED FROM THE PROPOSED GRAVEL ACCESS ROAD AREA AND APPROPRIATELY STOCKPILED FOR REUSE.

2. ALL STOCKPILED TOPSOIL SHALL BE SEEDED, MULCHED WITH HAY, AND ENCLOSED BY A SILTATION FENCE.

FILLING OPERATIONS

1. PRIOR TO FILLING, ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE PROPERLY IMPLEMENTED, MAINTAINED AND FULLY INSTALLED, AS DIRECTED BY THE ENGINEER AND AS SHOWN ON THIS PLAN.

2. ALL FILL MATERIAL ADJACENT TO ANY WETLAND AREAS, IF APPLICABLE TO THIS PROJECT, SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN LIFT THICKNESSES NOT GREATER THAN THAT SPECIFIED IN PROJECT SPECIFICATIONS AND/OR THE PROJECT GEOTECHNICAL REPORT. LIFTS SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS OR IN THE GEOTECHNICAL REPORT.

3. AS GENERAL GRADING OPERATIONS PROGRESS, ANY TEMPORARY DIVERSION DITCHES SHALL BE RAISED OR LOWERED, AS NECESSARY, TO DIVERT SURFACE RUNOFF TO THE SEDIMENT BASINS OR SEDIMENT TRAPS.

PLACEMENT OF STORM DRAINAGE AND UTILITIES OPERATIONS.

1. SILT FENCES SHALL BE INSTALLED AT THE DOWNHILL SIDES OF EXCAVATIONS, MUD PUMP DISCHARGES, AND UTILITY TRENCH MATERIAL STOCKPILES. HAY BALES/STRAW BALES MAY BE USED IF SHOWN ON THE SEDIMENT AND EROSION CONTROL PLANS OR IF DIRECTED BY THE CIVIL ENGINEER.

FINAL GRADING AND PAVING OPERATIONS

1. ALL INLET AND OUTLET PROTECTION SHALL BE PLACED AND MAINTAINED AS SHOWN ON SEDIMENT AND EROSION CONTROL PLANS AND DETAILS, AND AS DESCRIBED IN SPECIFICATIONS AND AS DESCRIBED HEREIN.

2. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS, OR JUTE MESH AND VEGETATION. ALL SLOPES SHALL BE SEEDED, AND ANY ROAD OR DRIVEWAY SHOULDER AND BANKS SHALL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.

3. PAVEMENT SUB–BASE AND BASE COURSES SHALL BE INSTALLED OVER AREAS TO BE PAVED AS SOON AS FINAL SUB–GRADES ARE ESTABLISHED AND UNDERGROUND UTILITIES AND STORM DRAINAGE SYSTEMS HAVE BEEN INSTALLED.

4. AFTER CONSTRUCTION OF PAVEMENT, TOPSOIL, FINAL SEED, MULCH AND LANDSCAPING, REMOVE ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ONLY AFTER ALL AREAS HAVE BEEN PAVED AND/OR GRASS HAS BEEN WELL ESTABLISHED AND THE SITE IS STABLE AND HAS BEEN INSPECTED AND APPROVED BY THE MUNICIPALITY AND/OR COUNTY SOILS CONSERVATION DISTRICT AND/OR INLAND WETLANDS COMMISSION.

INSTALLATION OF SEDIMENTATION AND EROSION CONTROL MEASURES

I. SILTATION FENCE
A. DIG A SIX INCH TRENCH ON THE UPHILL SIDE OF THE DESIGNATED FENCE LINE LOCATION.

B. POSITION THE POST AT THE BACK OF THE TRENCH (DOWNHILL SIDE), AND HAMMER THE POST AT LEAST 1.5 FEET INTO THE GROUND.

C. LAY THE BOTTOM SIX INCHES OF THE FABRIC INTO THE TRENCH TO PREVENT UNDERMINING BY STORM WATER RUN–OFF.

D. BACKFILL THE TRENCH AND COMPACT.

II. HAY BALES/STRAW BALES
A. BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE, ORIENTED PARALLEL TO THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.

B. BALES SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED THE WIDTH OF A BALE AND THE LENGTH OF THE PROPOSED BARRIER TO A MINIMUM DEPTH OF FOUR INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AGAINST THE BARRIER.

C. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST TWO (2) STAKES.

D. THE GAPS BETWEEN BALES SHALL BE WEDGED WITH STRAW TO PREVENT WATER LEAKAGE.

E. THE BARRIER SHALL BE EXTENDED TO SUCH A LENGTH THAT THE BOTTOMS OF THE END BALES ARE HIGHER IN ELEVATION THAN THE TOP OF THE LOWEST MIDDLE BALE, TO ENSURE THAT RUN–OFF WILL FLOW EITHER THROUGH OR OVER THE BARRIER, BUT NOT AROUND IT.

OPERATION AND MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES
I. SILTATION FENCE
A. ALL SILTATION FENCES SHALL BE INSPECTED AS A MINIMUM WEEKLY OR AFTER EACH RAINFALL. ALL DETERIORATED FABRIC AND DAMAGED POSTS SHALL BE REPLACED AND PROPERLY REPOSITIONED IN ACCORDANCE WITH THIS PLAN.

B. SEDIMENT DEPOSITS SHALL BE REMOVED FROM BEHIND THE FENCE WHEN THEY EXCEED A HEIGHT OF ONE FOOT.

II. HAY BALES/STRAW BALES
A. ALL HAY BALE/STRAW BALE RINGS SHALL BE INSPECTED FOLLOWING EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE PROMPTLY MADE AS NEEDED.

B. DEPOSITS SHALL BE REMOVED AND CLEANED–OUT IF ONE HALF OF THE ORIGINAL HEIGHT OF THE BALES BECOMES FILLED WITH SEDIMENT.

III. SEDIMENT BASINS/SEDIMENT TRAPS,
A. CONTRACTOR TO KEEP WEEKLY CHECKLIST LOGS FOR INSPECTIONS OF ALL SEDIMENT AND EROSION CONTROL DEVICES AND HAVE THEM READILY AVAILABLE ON–SITE AT ALL TIMES FOR INSPECTION BY THE TOWN OF NORTH HAVEN AUTHORITIES OR ENGINEER.

B. ALL SEDIMENT BASINS AND/OR SEDIMENT TRAPS, IF NEEDED, SHALL BE INSPECTED FOLLOWING EACH RAINFALL. REPAIR OF SLOPES SHALL BE PROMPTLY MADE AS NEEDED.

C. SEDIMENT DEPOSITS SHALL BE REMOVED FROM SEDIMENT BASINS AND/OR SEDIMENT TRAPS WHEN THEY EXCEED A HEIGHT OF ONE FOOT UNLESS OTHERWISE INDICATED ON THE EROSION CONTROL PLANS AND DETAILS TO BE AT A SPECIFIC ELEVATION PER CLEAN OUT MARKERS.

D. SEDIMENT SHALL BE DISPOSED OF ON–SITE OR AS DIRECTED BY THE ENGINEER AND LOCAL GOVERNING OFFICIALS. SEE SEDIMENT AND EROSION CONTROL NOTES HEREIN REGARDING DISPOSAL REQUIREMENTS FOR OFF SITE SPOIL DISPOSAL.

SEDIMENT AND EROSION CONTROL PLAN
1. HAY BALE/STRAW BALE FILTERS WILL BE INSTALLED AT ALL CULVERT OUTLETS IF CULVERT OUTLETS ARE APPLICABLE TO THIS PROJECT AND SILTATION FENCE INSTALLED ALONG THE TOE OF ALL CRITICAL CUT AND FILL SLOPES.

2. CULVERT DISCHARGE AREAS WILL BE PROTECTED WITH RIP RAP CHANNELS. ENERGY DISSIPATORS WILL BE INSTALLED AS SHOWN ON THESE PLANS AND AS NECESSARY.

3. CATCH BASINS WILL BE PROTECTED WITH HAY BALE/STRAW BALE FILTERS, SILT SACKS, SILTATION FENCE, OR OTHER INLET PROTECTION DEVICES PER DETAILS, THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL ALL DISTURBED AREAS ARE THOROUGHLY STABILIZED.

4. ALL SEDIMENT AND EROSION CONTROL MEASURES WILL BE INSTALLED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE CTDEEP 2004 GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL LATEST EDITION.

5. SEDIMENT AND EROSION CONTROL MEASURES WILL BE INSTALLED PRIOR TO CONSTRUCTION WHENEVER POSSIBLE.

6. ALL CONTROL MEASURES WILL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE DEMOLITION AND CONSTRUCTION PERIOD UNTIL THE SITE IS DETERMINED TO BE STABILIZED BY THE AUTHORITY HAVNG JURISDICTION.

7. ADDITIONAL CONTROL MEASURES WILL BE INSTALLED DURING THE CONSTRUCTION PERIOD, IF NECESSARY OR REQUIRED OR AS DIRECTED BY THE CIVIL ENGINEER OR BY THE AUTHORITY HAVING JURISDICTION.

8. SEDIMENT REMOVED FROM EROSION CONTROL STRUCTURES WILL BE DISPOSED IN A MANNER WHICH IS CONSISTENT WITH THE INTENT AND REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLANS, NOTES, AND DETAILS.

9. GREENSKIES RENEWABLE ENERGY IS ASSIGNED THE RESPONSIBILITY FOR IMPLEMENTING THIS SEDIMENT AND EROSION CONTROL PLAN. THIS RESPONSIBILITY INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, NOTIFICATION OF THE MUNICIPALITY OR AUTHORITY HAVING JURISDICTION OF ANY TRANSFER OF THIS RESPONSIBILITY AND FOR CONVEYING A COPY OF THE SEDIMENT AND EROSION CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.

SEDIMENT AND EROSION CONTROL NOTES
1. THE SEDIMENT AND EROSION CONTROL PLAN IS ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL TREATMENT FOR THIS SITE. SEE SEDIMENT AND EROSION CONTROL DETAILS AND CONSTRUCTION SEQUENCE. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.

2. CHRIS PALMER OF GREENSKIES RENEWABLE ENERGY IS RESPONSIBLE FOR IMPLEMENTING THIS SEDIMENT AND EROSION CONTROL PLAN, AND CAN BE REACHED AT #860–398–5408. THIS RESPONSIBILITY INCLUDES THE PROPER INSTALLATION AND MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED WITH CONSTRUCTION ON THE SITE OF THE REQUIREMENTS AND OBJECTIVES OF THIS PLAN, INFORMING THE TOWN OF NORTH HAVEN OR INLAND WETLANDS AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY, AND FOR CONVEYING A COPY OF THE SEDIMENT & EROSION CONTROL PLAN IF THE TITLE TO THE LAND IS TRANSFERRED.

3. AN EROSION CONTROL BOND IS REQUIRED TO BE POSTED WITH THE TOWN OF NORTH HAVEN TO ENSURE IMPLEMENTATION OF THE SEDIMENT AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF THIS BOND AND FOR INQUIRIES TO THE TOWN OF NORTH HAVEN FOR INFORMATION ON THE METHOD, TYPE AND AMOUNT OF THE BOND POSTING UNLESS OTHERWISE DIRECTED BY THE OWNER.

4. VISUAL SITE INSPECTIONS SHALL BE CONDUCTED WEEKLY, AND AFTER EACH MEASURABLE PRECIPITATION EVENT OF 0.25 INCHES OR GREATER BY QUALIFIED PERSONNEL, TRAINED AND EXPERIENCED IN SEDIMENT AND EROSION CONTROL, TO ASCERTAIN THAT THE SEDIMENT AND EROSION CONTROL (E&S) BMPS ARE OPERATIONAL AND EFFECTIVE IN PREVENTING POLLUTION. A WRITTEN REPORT OF EACH INSPECTION SHALL BE KEPT, AND INCLUDE:
A) A SUMMARY OF THE SITE CONDITIONS, E&S BMPS, AND COMPLIANCE; AND
B) THE DATE, TIME, AND THE NAME OF THE PERSON CONDUCTING THE INSPECTION
C) TURBIDITY TESTING AS REQUIRED BY THE GENERAL PERMIT (NPDES)

5. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE CTDEEP 2004 GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL LATEST EDITION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE TOWN OF NORTH HAVEN. THE CONTRACTOR SHALL KEEP A COPY OF THE GUIDELINES ON–SITE FOR REFERENCE DURING CONSTRUCTION.

6. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, DEVELOPER, SITE ENGINEER, TOWN OF NORTH HAVEN, OR GOVERNING AGENCIES. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED.

7. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS BEFORE AND AFTER EACH STORM (0.25 INCHES OR GREATER RAINFALL), OR AT LEAST WEEKLY, TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS WHERE NECESSARY.

8. THE CONTRACTOR SHALL KEEP AN ADEQUATE SUPPLY OF SEDIMENT AND EROSION CONTROL MATERIAL (HAY BALES, SILT FENCE, JUTE MESH, RIP RAP, ETC.) ON–SITE FOR MAINTENANCE AND EMERGENCY REPAIRS.

9. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING AT THE DRIP LINE OR AS SHOWN WITH SNOW FENCE, ORANGE SAFETY FENCE, OR EQUIVALENT FENCING. ANY LIMB TRIMMING SHOULD BE DONE BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.

10. INSTALL PERIMETER SEDIMENT AND EROSION CONTROLS PRIOR TO CLEARING OR CONSTRUCTION. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SILT FENCE UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE FENCE.

11. STONE CONSTRUCTION ENTRANCE ANTI–TRACKING PADS SHALL BE INSTALLED AT START OF CONSTRUCTION AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED.

12. TOPSOIL FROM THE GRAVEL ACCESS ROAD AREA SHALL BE STRIPPED AND STOCKPILED FOR USE IN FINAL LANDSCAPING. ALL EARTH STOCKPILES SHALL HAVE HAY BALES OR SILT FENCE AROUND THE LIMIT OF PILE. PILES SHALL BE TEMPORARILY SEEDED IF PILE IS TO REMAIN IN PLACE FOR MORE THAN ONE (1) MONTH.

13. SEDIMENT BASINS AND SEDIMENT TRAPS SHALL PROVIDE 134 CUBIC YARDS OF SEDIMENT STORAGE PER DISTURBED ACRE CONTRIBUTING TO THE BASIN. PROVIDE BASIN VOLUMES FOR ALL DISTURBANCE ON SITE.

14. COMPLY WITH REQUIREMENTS OF CGS SECTION 22A 430B, FOR STORMWATER DISCHARGE FROM CONSTRUCTION ACTIVITIES AND WITH CTDEEP RECORD KEEPING AND INSPECTION REQUIREMENTS.

15. STONE CONSTRUCTION ENTRANCE ANTI–TRACKING PADS SHALL BE INSTALLED PRIOR TO ANY ON SITE EXCAVATION AND SHALL BE MAINTAINED DURING ALL DEMOLITION, EXCAVATION AND CONSTRUCTION ACTIVITIES.

16. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (ONE WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.

17. MAINTAIN EXISTING PAVED AREAS FOR CONSTRUCTION STAGING FOR AS LONG AS POSSIBLE.

18. SILT FENCE AND OTHER SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH CONTRACT DRAWINGS AND MANUFACTURER'S RECOMMENDATIONS PRIOR TO WORK IN ANY UPLAND AREAS.

19. EXCAVATED MATERIAL FROM TEMPORARY SILT TRAPS MUST BE STOCKPILED ON UPHILL SIDE OF SILT FENCE.

20. INSTALL SILT FENCE ACCORDING TO MANUFACTURER'S INSTRUCTION, PARTICULARLY, BURY LOWER EDGE OF FABRIC INTO GROUND. SILT FENCE SHALL BE TENCATE ENVIROFENCE, PROPEX GEOTEX OR EQUIVALENT APPROVED BY THE CIVIL ENGINEER. FILTER FABRIC USED SHALL BE MIRAFI 100X OR APPROVED EQUIVALENT. SEE SPECIFICATIONS FOR FURTHER INFORMATION.

21. WHERE INDICATED ON SEDIMENT AND EROSION CONTROL PLANS USE NEW HAY/STRAW BALES AND REPLACE THEM WHENEVER THEIR CONDITION DETERIORATES BEYOND REASONABLE USABILITY. STAKE BALES SECURELY INTO GROUND AND BUTT TIGHTLY TOGETHER TO PREVENT UNDERCUTTING AND BYPASSING.

22. INSTALL TEMPORARY DIVERSION DITCHES, PLUNGE POOLS, SEDIMENT BASINS, SEDIMENT TRAPS, CONCRETE WASH PITS AND DEWATERING PITS AS SHOWN AND AS NECESSARY DURING VARIOUS PHASES OF CONSTRUCTION TO CONTROL RUNOFF UNTIL UPHILL AREAS ARE DETERMINED TO BE STABILIZED BY THE AUTHORITY HAVING JURISDICTION. LOCATION OF ADDITIONAL TEMPORARY SEDIMENT BASINS WILL REQUIRE REVIEW AND APPROVAL BY THE CIVIL ENGINEER AND AUTHORITY HAVING JURISDICTION.

23. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE SUCH AS TEMPORARY PITS, SEDIMENT TRAP, SEDIMENT BASINS OR GRASS FILTERS WITHIN THE APPROVED LIMIT OF DISTURBANCE. DISCHARGE TO STORM DRAINAGE SYSTEM OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR.

24. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. OTHER DUST CONTROL MEASURES TO BE USED AS NECESSARY INCLUDE WATERING DOWN DISTURBED AREAS, USING CALCIUM CHLORIDE, AND COVERING LOADS ON DUMP TRUCKS.

25. PERIODICALLY CHECK ACCUMULATED SEDIMENT LEVELS IN THE SEDIMENT BASINS AND SEDIMENT TRAPS DURING CONSTRUCTION AND CLEAN ACCUMULATED SILT WHEN NECESSARY OR WHEN ONE FOOT OF SEDIMENT HAS ACCUMULATED OR PER SPECIFIC CLEANOUT MARKER ELEVATION. CLEAN ACCUMULATED SEDIMENT FROM CATCH BASIN SUMPS AS NECESSARY AND AS DIRECTED BY THE CIVIL ENGINEER OR OWNER'S CONSTRUCTION REPRESENTATIVE. REMOVE ACCUMULATED SEDIMENT FROM BEHIND HAY/STRAW BALES AND SILT FENCE WHEN LEVEL REACHES HALF THE HEIGHT OF THE BALE OR ONE FOOT AT SILT FENCE. DISPOSE OF SEDIMENT LEGALLY EITHER ON OR OFF SITE.

26. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

27. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER UNDISTURBED VEGETATED AREAS.

28. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF UTILITY AND STORM PIPE TRENCHES SO AS TO ALLOW THE TRENCH TO INTERCEPT ALL SILT LADEN RUNOFF.

29. CONTRACTOR SHALL ONLY EXCAVATE AS MUCH UTILITY AND STORM PIPE TRENCH WORK AS CAN BE COMPLETED, BACKFILLED AND STABILIZED IN ONE DAY SO AS TO LIMIT THE AMOUNT OF OPEN, DISTURBED TRENCHING.

30. ANY STOCKPILES OF STRIPPED MATERIALS ARE TO BE PERIODICALLY SPRAYED WITH WATER OR A CRUSTING AGENT TO STABILIZE POTENTIALLY WIND–BLOWN MATERIAL. HAUL ROADS BOTH INTO AND AROUND THE SITE ARE TO BE SPRAYED AS NEEDED TO SUPPRESS DUST. TRUCKS HAULING IMPORT FILL MATERIAL ARE TO BE TARPED TO AID IN THE CONTROL OF AIRBORNE DUST. DURING HIGH WIND EVENTS (20 TO 30 MPH SUSTAINED) CONSTRUCTION ACTIVITY SHALL BE LIMITED OR CEASED IF DUST CANNOT BE CONTROLLED BY WETTING.

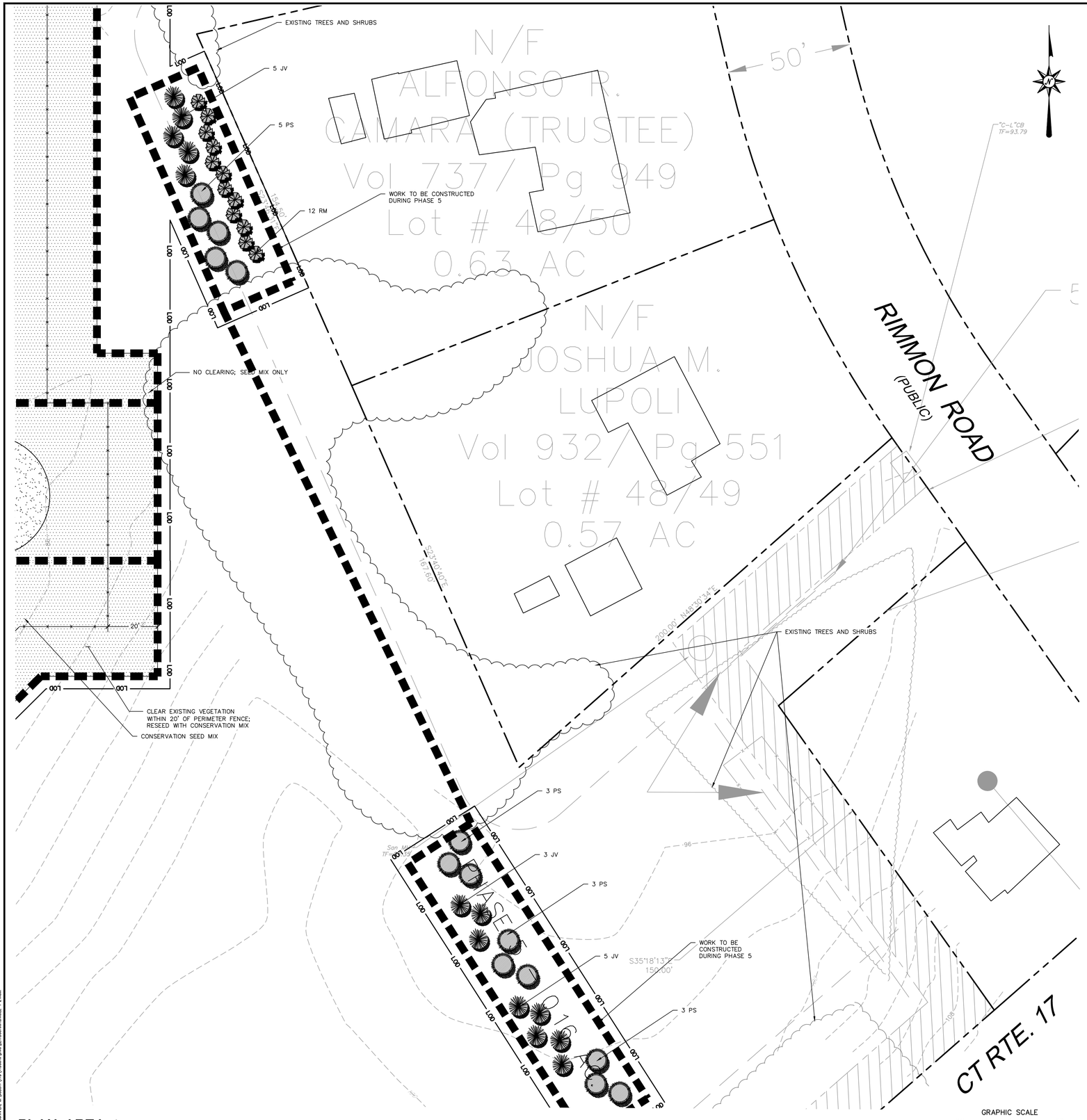
31. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM OF 70% UNIFORM PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON–VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING OR OTHER MOVEMENTS UNLESS OTHERWISE DETERMINED BY THE AUTHORITY HAVING JURISDICTION.

32. MAINTAIN ALL PERMANENT AND TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP PARKING LOT AND REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROLS WHEN AUTHORIZED BY AUTHORITY HAVING JURISDICTION. FILE NOT (NOTICE OF TERMINATION) WITH AUTHORITY HAVING JURISDICTION RESPONSIBLE FOR REGULATING STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES PER NPDES.

PHASING CONSTRUCTION SEQUENCING

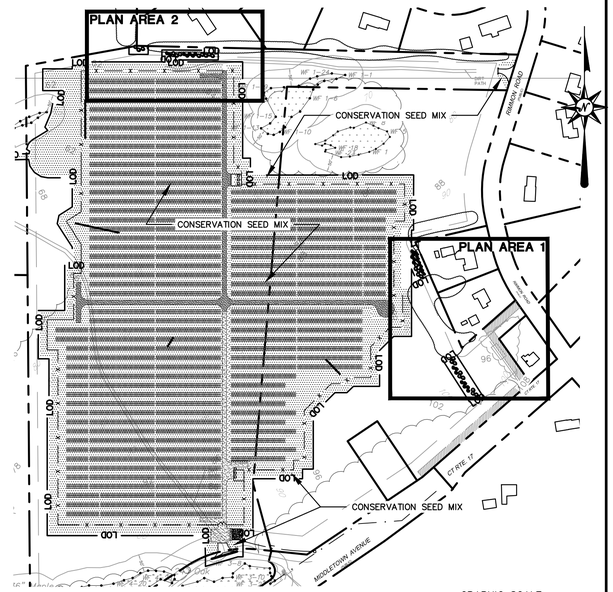
1. CONDUCT A PRECONSTRUCTION MEETING

2. PHASE I – INSTALLATION OF GRAVEL ACCESS ROAD AND SOLAR ARRAY SYSTEM
   - 2.1. INSTALL EROSION CONTROL SILT FENCE NEAR THE DRIVEWAY ENTRANCE ON OLD VELVET ROAD.
   - 2.2. INSTALL EROSION CONTROL ANTI–TRACKING PAD AT PROPOSED CONSTRUCTION ENTRANCES AS MENTIONED ABOVE.
   - 2.3. INSTALL EROSION CONTROL SILT FENCE OUTSIDE OF THE LIMITS OF GRADING ASSOCIATED WITH THE PROPOSED GRAVEL ACCESS ROAD AND FIRST SECTION OF THE SOLAR ARRAY SYSTEM.
   - 2.4. INSTALL TEMPORARY SEDIMENT BASIN AT THE NORTHEASTERN CORNER OF THE SITE WITH TEMPORARY CONSTRUCTION FENCE AROUND THE PERIMETER OF THE BASIN.
   - 2.5. PERFORM CLEARING AND GRUBBING ACTIVITIES WITHIN THE LIMITS OF THE SILT FENCE FOR PHASE 1.
   - 2.6. INSTALL CHAIN–LIN



PLAN AREA 1

1" = 20'



OVERALL PLAN

1" = 200'

LANDSCAPE PLANT SCHEDULE

TREES

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENTS
JV	20	Juniperus virginiana	Eastern Red Cedar	B&B	8'–10' HT. MIN.	FULL
PS	25	Pinus strobus	Eastern White Pine	B&B	8'–10' HT. MIN.	FULL
SHRUBS						
RM	12	Rhododendron maximum	Rosebay Rhododendron	B&B	4' HT. MIN.	FULL

LEGEND

PATTERN	DESCRIPTION
	CONSERVATION SEED MIX (REFER TO SEED MIX ON SHEET LL–3)

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

STATE OF CONNECTICUT — JOHN P. EVANGELISTA — No. 1235 — REGISTERED LANDSCAPE ARCHITECT

PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	J.P.E.
Drawn	J.P.E.
Reviewed	M.P.S.
Scale	1"=20'
Project No.	17D3516
Date	04/06/2018
CAD File:	LL17D351601

Title

LANDSCAPE PLAN

Sheet No.

LL-1

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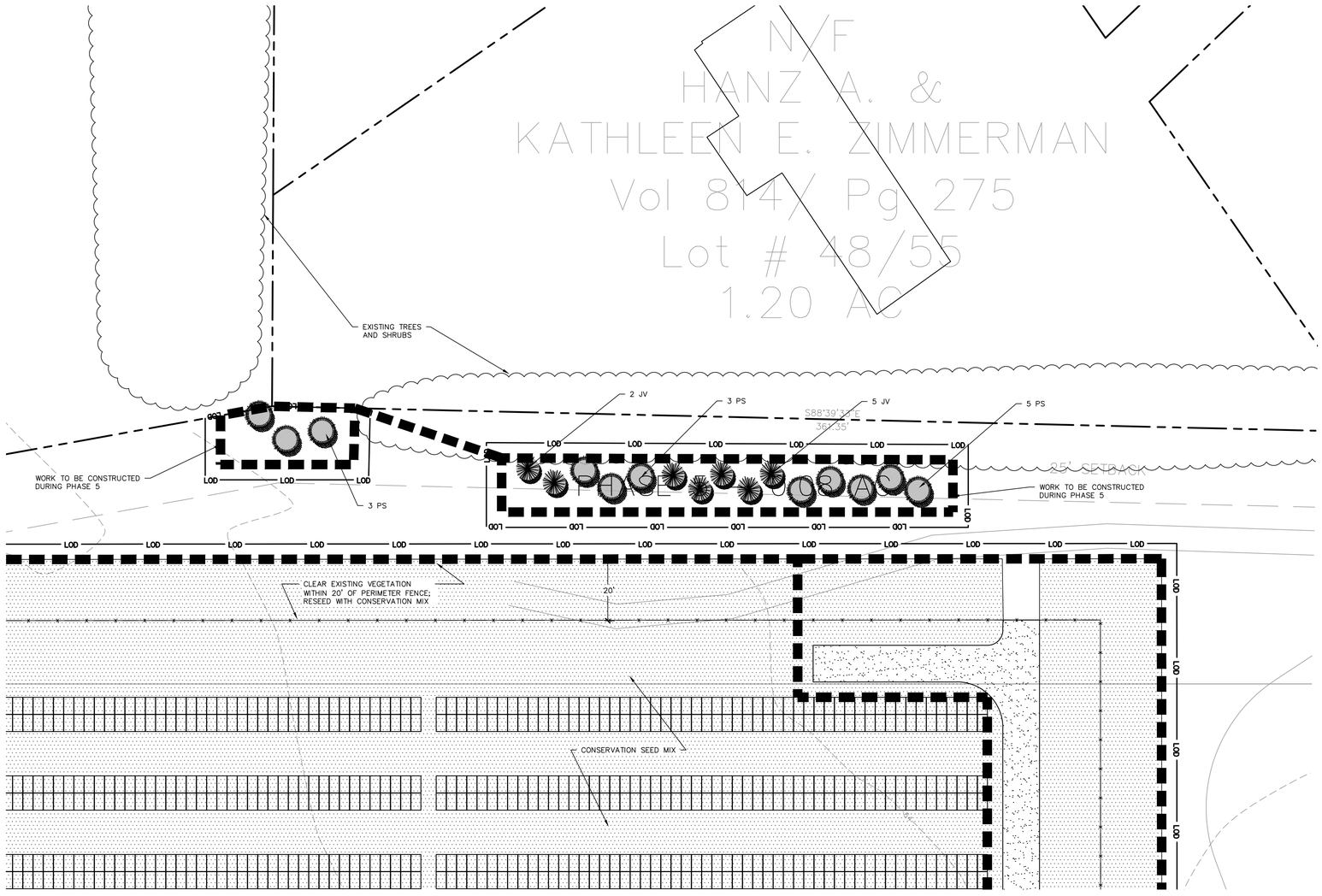
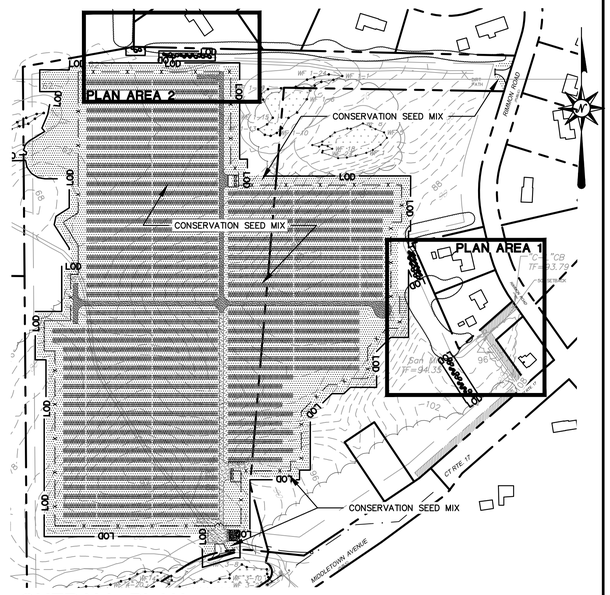


PLAN AREA 2

1" = 20'



OVERALL PLAN

1" = 200'

GRAPHIC SCALE
200 100 0 200
SCALE IN FEET

LANDSCAPE PLANT SCHEDULE

TREES

KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	COMMENTS
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LEGEND

PATTERN	DESCRIPTION
	CONSERVATION SEED MIX (REFER TO SEED MIX ON SHEET LL–3)

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

STATE OF CONNECTICUT — ENTIRE SHEET — No. 1235 — REGISTERED LANDSCAPE ARCHITECT

PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS
No. Date Desc
1. 07/13/2018 UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2. 11/16/2018 D & M SET

Designed	J.P.E.
Drawn	J.P.E.
Reviewed	M.P.S.
Scale	1"=20'
Project No.	1703516
Date	04/06/2018
CAD File:	LL1703516O1

Title

LANDSCAPE PLAN

Sheet No.

LL-2

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LANDSCAPE NOTES

1. THE LANDSCAPE PLAN AND DETAIL SHEET ARE FOR LANDSCAPING INFORMATION ONLY. REFER TO THE OTHER PLANS FOR ALL OTHER INFORMATION.

2. COORDINATE PLANT MATERIAL LOCATIONS WITH SITE UTILITIES. UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. EXERCISE CARE WHEN DIGGING IN AREAS OF POTENTIAL CONFLICT WITH UNDERGROUND OR OVERHEAD UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE DUE TO CONTRACTOR'S NEGLIGENCE AND SHALL REPLACE OR REPAIR ANY DAMAGE AT CONTRACTOR'S EXPENSE. PRIOR TO DIGGING AND INSTALLATION OF PLANT MATERIAL, THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" 72 HOURS BEFORE COMMENCEMENT OF WORK AT "(800) 922-4455" AND VERIFY ALL UTILITY SYSTEM LOCATIONS.

3. THE LOCATIONS FOR PLANT MATERIAL ARE APPROXIMATE AND ARE SUBJECT TO FIELD ADJUSTMENT DUE TO UTILITY LOCATIONS AND SITE CONDITIONS. THE CONTRACTOR SHALL ACCURATELY STAKE OUT THE LOCATIONS FOR ALL PLANTS FOR THE REVIEW, ADJUSTMENT, AND APPROVAL OF OWNER OR LANDSCAPE ARCHITECT PRIOR TO PLANTING.

4. THE CONTRACTOR SHALL GUARANTEE THAT ALL PLANTS SHALL BE HEALTHY AND FREE OF DISEASE FOR A PERIOD OF ONE YEAR OR JUNE 1ST OF THE YEAR FOLLOWING INSTALLATION, WHICHEVER IS LONGER, AFTER SUBSTANTIAL COMPLETION AND ACCEPTANCE BY OWNER OR LANDSCAPE ARCHITECT. CONTRACTOR SHALL REPLACE ANY DEAD OR UNHEALTHY PLANTS AT CONTRACTOR'S EXPENSE. PLANT MATERIAL REPLACEMENTS SHALL BE GUARANTEED FOR ONE FULL YEAR FROM DATE OF REPLACEMENT. REPLACEMENT PLANTS SHALL BE THE SAME AS SPECIFIED FOR THE ORIGINAL PLANTING. REPLACEMENTS SHALL BE MADE AS MANY TIMES AS NECESSARY TO ENSURE HEALTHY PLANTS. FINAL ACCEPTANCE SHALL BE MADE IF ALL PLANTS MEET THE GUARANTEE REQUIREMENTS INCLUDING MAINTENANCE. MAINTENANCE RESPONSIBILITIES INCLUDE CULTIVATING, SPRAYING, WEEDING, WATERING, TIGHTENING GUYS, PRUNING, FERTILIZING, MULCHING, AND ANY OTHER OPERATIONS NECESSARY TO MAINTAIN PLANT VIABILITY. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING AND CONTINUE UNTIL THE END OF THE GUARANTEE PERIOD.

5. THE CONTRACTOR SHALL SUPPLY ALL LABOR, PLANTS, AND MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND LISTED IN THE PLANT SCHEDULE. IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN IN THE PLANT SCHEDULE AND THOSE REQUIRED BY THE DRAWINGS, THE LARGER SHALL APPLY. ALL PLANTS SHALL BE ACCLIMATED BY THE SUPPLY NURSERY TO THE LOCAL HARDINESS ZONE AND BE CERTIFIED THAT THE PLANTING MATERIAL HAS BEEN GROWN FOR A MINIMUM OF TWO YEARS AT THE SOURCE AND OBTAINED WITHIN 200 MILES OF PROJECT SITE UNLESS OTHERWISE APPROVED BY OWNER OR LANDSCAPE ARCHITECT.

6. PLANTS SHALL HAVE TAGS THAT IDENTIFY PLANT GENUS, SPECIES, CULTIVAR (IF APPLICABLE), PLANT COMMON NAME, NAME OF SOURCE NURSERY, AND SIZE OF PLANT FOR REVIEW OF OWNER OR LANDSCAPE ARCHITECT.

7. NO PLANT SHALL BE PLACED IN THE GROUND BEFORE ROUGH GRADING HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT. STAKING THE LOCATION OF ALL TREES AND SHRUBS SHALL BE COMPLETED PRIOR TO PLANTING FOR APPROVAL BY THE OWNER OR LANDSCAPE ARCHITECT.

8. FINAL GRADES SHALL BLEND SMOOTHLY WITH EXISTING GRADES, AND TOP AND BOTTOM OF SLOPES SHALL BE ROUNDED.

9. ALL TREE AND SHRUB MASSINGS SHALL BE MULCHED TO A DEPTH OF 3". MULCH SHALL BE UNCOLORED TRIPLE-SHREDDED HARDWOOD BARK MULCH, AGED AT LEAST 6 MONTHS.

10. IF TREE STAKING IS PROPOSED, TREE STAKING MUST BE COMPLETED THE SAME DAY AS THE TREE IS INSTALLED. ALL TREES SHALL BE STAKED OR GUYED PER DETAIL.

11. LANDSCAPE PLANTING AREAS MUST BE FREE DRAINING. PAVEMENT, COMPACTED SUBGRADE, DEAD OR DYING PLANT MATERIAL, BLASTED ROCK, STONES GREATER THAN 1" IN DIAMETER, AND ANY OTHER MATERIAL HARMFUL TO PLANT GROWTH AND DEVELOPMENT SHALL BE REMOVED FROM AREAS TO BE LANDSCAPED AS REQUIRED BY PLANTING DETAILS OR SPECIFICATIONS.

12. PLANTING SOIL:

DEPTH: PLANTING SOIL SHALL BE INSTALLED AT A MINIMUM DEPTH OF 4" OR AS NOTED IN THE LANDSCAPE DETAILS. PLANTING SOIL SHALL BE UTILIZED IN ALL PLANTING AREAS INCLUDING SEEDED AREAS.

TESTING: CONTRACTOR SHALL SUBMIT (2) SOIL SAMPLES PER SOIL STOCKPILE TO A CERTIFIED TESTING LABORATORY TO DETERMINE ACIDITY, ORGANIC CONTENT, MECHANICAL ANALYSIS, AVAILABLE NUTRIENTS (N,P,K,Ca,Mg,S,Fe,Mn,Zn,Cu,B,Al,Pb) AND NECESSARY AMENDMENTS TO SOIL. THE CONTRACTOR SHALL SUBMIT THE TEST RESULTS TO THE OWNER OR LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL. TEST RESULTS SHALL RECOMMEND AMENDMENTS THAT WILL ALTER THE SOIL CHARACTERISTICS SUCH THAT THE CHARACTERISTICS DESCRIBED BELOW ARE ACHIEVED AND THE SPECIFIED PLANTS (CONTRACTOR TO PROVIDE LIST TO TESTING LABORATORY) WILL ACHIEVE PROPER GROWTH THAT IS NEITHER DEFICIENT NOR EXCESSIVE. THE CONTRACTOR SHALL INCORPORATE THESE AMENDMENTS AT NO INCREASE IN CONTRACT PRICE.

CHARACTERISTICS: PLANTING SOIL MAY CONSIST OF EXISTING ON-SITE SOILS, AMENDED ON-SITE SOILS, OR IMPORTED SOILS MEETING THE FOLLOWING CRITERIA:

A. NOT TO CONTAIN MATERIALS HARMFUL TO PLANT LIFE, TO BE CLEAN, FERTILE, FRIABLE, AND WELL DRAINING. ALL PLANTING SOIL SHALL BE FREE OF ANY SUBSOIL EARTH CLODS, SODS, STONES OVER 1" IN ANY DIMENSION, STICKS, ROOTS, WEEDS, LITTER AND OTHER DELETERIOUS MATERIAL. PLANTING SOIL SHALL BE UNIFORM IN QUALITY AND TEXTURE.
B. PLANTING SOIL SHALL HAVE THE FOLLOWING OPTIMUM RANGES UNLESS OTHERWISE APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT.

ORGANIC CONTENT (BY LOSS OF IGNITION AT 375 C METHOD OF TESTING)	3% – 6% FOR LAWN OR GRASS AREAS. 4% – 8% FOR TREE AND SHRUB PLANTERS.
PH	6.0 – 7.3

C. NUTRIENT LEVELS SHALL BE ACHIEVED BY THE CONTRACTOR'S ADDITION OF AMENDMENTS TO THE PLANTING SOIL TO MEET THE OPTIMUM NUTRIENT LEVELS SPECIFIED IN THE TESTING LABORATORY REPORT FOR EACH OF PLANTS TO BE INSTALLED.
D. SOIL SHALL BE COMPACTED TO A SURFACE PENETRATION RESISTANCE OF 75-125 LBS/SQ.IN.
E. SOIL MAY BE TREATED FOR WEEDS WITH PRE-EMERGENT OR POST-EMERGENT HERBICIDE, AS NEEDED AND AS APPROPRIATE FOR THE APPLICATION SEASON OR LOCATION, OR ELIMINATE GROWTH OF UNWANTED PLANT MATERIAL. APPLY HERBICIDES IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. HERBICIDE APPLICATOR MUST BE LICENSED IN THE STATE OF CONNECTICUT, AND PERFORM APPLICATIONS IN ACCORDANCE WITH LOCAL REQUIREMENTS, PERMITTING STIPULATIONS, AND ANY OTHER RESTRICTIONS INCLUDING AND IN EXCESS OF STATE AND FEDERAL REGULATIONS.
F. PROPOSED TOPSOIL SHALL MEET THE USDA SOILS TEXTURAL PERCENTAGES OF SAND, SILT, AND CLAY FOR FOLLOWING CLASSIFICATIONS:
   - LOAM
   - SANDY LOAM WHERE SAND DOES NOT EXCEED 70% AND CLAY IS NOT LESS THAN 5%
   - SANDY CLAY LOAM WHERE SAND DOES NOT EXCEED 70% AND CLAY IS LESS THAN 28%
G. BIORETENTION SOILS: SOIL TO BE INSTALLED IN RETENTION BASINS, PONDS, OR OTHER STORMWATER MANAGEMENT ENVIRONS SHALL MEET THE ABOVE DESCRIBED CHARACTERISTICS AND AS FOLLOWS:
   - SOIL SHALL NOT CONTAIN MORE THAN 20% CLAY AND LESS THAN 40% SILT.
   - SOIL SHALL HAVE AN INFILTRATION RATE BETWEEN 1/2" AND 3" PER HOUR.
H. MODIFICATION TO THE PLANTING SOIL CHARACTERISTICS DESCRIBED ABOVE MAY BE SUBMITTED FOR APPROVAL BY THE LANDSCAPE ARCHITECT. CONTRACTOR MUST DEMONSTRATE PROPOSED CHARACTERISTICS ARE EQUAL TO OR SUPERIOR TO THE SPECIFIED CHARACTERISTICS WITH RESPECT TO SUPPORTING PLANT GROWTH, AND STORMWATER MANAGEMENT.

12. PLANTING AMENDMENTS:
APPLY FERTILIZER AND OTHER AMENDMENTS AS RECOMMENDED FOR EACH PLANTING AREA BY SOIL ANALYSIS. APPLY AMENDMENTS IN A MANNER CONSISTENT WITH MANUFACTURER'S RECOMMENDATIONS. ANY ORGANIC AMENDMENTS SHALL HAVE A pH BETWEEN 4.5 AND 5.5 UNLESS OTHERWISE RECOMMENDED.

13. PLANT REQUIREMENTS: ALL PLANTS SHALL CONFORM IN SIZE AND GRADE TO THE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z60.1 (LATEST EDITION). ALL PLANTS SHALL MEET THE ADDITIONAL REQUIREMENTS SET FORTH BELOW AND IN WRITTEN SPECIFICATIONS AS APPLICABLE. ALL TREES AND SHRUBS SHALL HAVE BEEN GROWN AT A COMMERCIAL NURSERY WITHIN 200 MILES OF THE PROJECT SITE UNLESS OTHERWISE APPROVED BY OWNER OR LANDSCAPE ARCHITECT. THEY SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY. THEY SHALL BE HEALTHY, SYMMETRICAL, EVENLY AND DENSELY BRANCHED, AND DENSELY FOLIATED WHEN IN LEAF. THEY SHALL BE FREE OF BARK INJURY, DISEASE, AND INSECT PESTS. ALL TREES SHALL HAVE A STRAIGHT TRUNK WITH A SINGLE MAIN LEADER UNLESS OTHERWISE CHARACTERISTIC OF THE SPECIES OR VARIETY. THE OWNER OR LANDSCAPE ARCHITECT WILL ALLOW SUBSTITUTIONS ONLY UPON WRITTEN APPROVAL. SIZES SHALL CONFORM TO THE MEASUREMENT SPECIFIED ON THE DRAWINGS. PLANTS LARGER THAN SPECIFIED MAY BE USED IF APPROVED, BUT THE USE OF SUCH PLANTS SHALL NOT INCREASE THE CONTRACT PRICE. ALL OVERSTORY TREES PLANTED ALONG PARKING AREAS, SIDEWALKS AND PEDESTRIAN ACCESSES SHALL NOT BRANCH BELOW 7' FEET IF THE TREE CALIPER IS 3" INCHES OR GREATER. ALL PLANT MATERIALS ARE SUBJECT TO INSPECTION AND ACCEPTANCE BY THE OWNER OR LANDSCAPE ARCHITECT AT THE NURSERY SOURCE. THE CONTRACTOR SHALL COORDINATE SOURCE VISITS WITH THE LANDSCAPE ARCHITECT AND SHALL ACCOMPANY THE OWNER AND/OR LANDSCAPE ARCHITECT FOR ALL INSPECTIONS. CERTIFICATES OF COMPLIANCE WITH SPECIFICATIONS ARE REQUIRED FOR ALL PLANTS.

14. INSPECTION AND REVIEW:
ALL PLANT MATERIAL SHALL BE SUBJECT TO INSPECTION AND ACCEPTANCE BY THE OWNER OR LANDSCAPE ARCHITECT AT THE NURSERY SOURCE OR PLACE OF GROWTH. THE CONTRACTOR SHALL COORDINATE WITH THE LANDSCAPE ARCHITECT ON A SCHEDULE FOR SOURCE VISITS AND ACCOMPANY THE OWNER OR LANDSCAPE ARCHITECT FOR ALL SOURCE INSPECTIONS. CERTIFICATES OF COMPLIANCE ARE REQUIRED FOR ALL PLANT MATERIALS.
PHOTOGRAPHIC REVIEW OF PLANT MATERIAL IS ACCEPTABLE IF APPROVED BY LANDSCAPE ARCHITECT. PHOTOGRAPHS MUST BE PROVIDED IN QUANTITY AND VARIETY TO ALLOW LANDSCAPE ARCHITECT SUFFICIENT INFORMATION TO MAKE A REASONABLE DETERMINATION AS TO THE PLANTS' QUALITY. OWNER AND LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT PLANT MATERIAL DELIVERED TO THE SITE BUT PREVIOUSLY ACCEPTED IF DAMAGED OR NOT PROPERLY MAINTAINED DURING THE DELIVERY PROCESS.

15. PLANTING SEASONS (UNLESS OTHERWISE APPROVED BY THE OWNER OR LANDSCAPE ARCHITECT)

	SPRING	FALL
EVERGREEN TREES AND SHRUBS	APRIL 1 TO JUNE 15	SEPTEMBER 1 TO OCTOBER 15
SEED MIXES	APRIL 15 TO JUNE 30	AUGUST 15 TO OCTOBER 1

PER MANUFACTURERS RECOMMENDATIONS OR AS LISTED IN SEED MIX NOTES

16. SEEDING MIXTURES:
SEE SEED MIX NOTES. SEEDED AREA SHALL BE ACCEPTED WHEN SEED AREA ACHIEVES 90% COVERAGE.

17. ALL SLOPES STEEPER THAN 3:1 RECEIVING A SEED MIX SHALL BE COVERED WITH AN EROSION CONTROL BLANKET OF STRAW FIBER AND BIODEGRADABLE OR PHOTODEGRADABLE NETTING.

18. UNLESS OTHERWISE NOTED IN DRAWING SET, NEW TREELINES SHALL EQUAL CLEARING AND GRUBBING LIMIT FOR CONSTRUCTION.

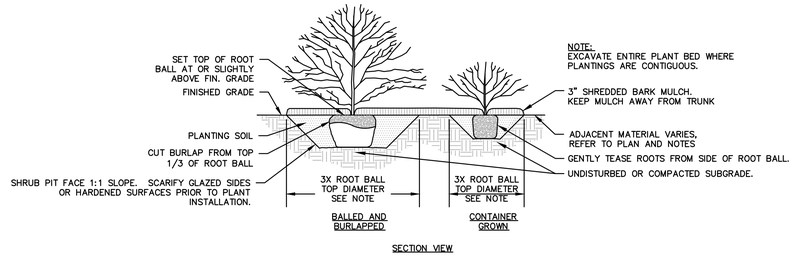
ALL DISTURBED AREAS NOT OTHERWISE DEVELOPED SHALL BE SEEDED WITH THE CONSERVATION SEED MIX.

SEED MIX NOTES

CONSERVATION SEED MIX –
NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DRY SITES
NEW ENGLAND WETLAND PLANTS INC. OR APPROVED EQUAL

SPECIES: VIRGINIA WILD RYE (ELYMUS VIRGINICUS), LOLIUM MULTIFLORUM (ANNUAL RYEGRASS), LOLIUM PERENNE (PERENNIAL RYEGRASS), LITTLE BLUESTEM (SCHIZACHYRIUM SCOPARIUM), RED FESCUE (FESTUCA RUBRA), SWITCH GRASS (PANICUM VIRGATUM), INDIAN GRASS (SORGHASTRUM NUTANS), UPLAND BENTGRASS (AGROSTIS PERENNANS).

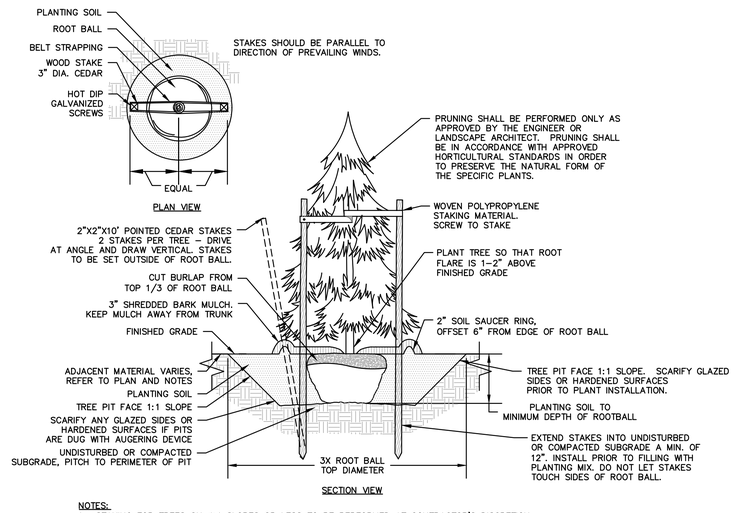
APPLICATION RATE: 35 LBS/ ACRE (1 LB PER 1,250 SF)



SECTION VIEW

SHRUB PLANTING

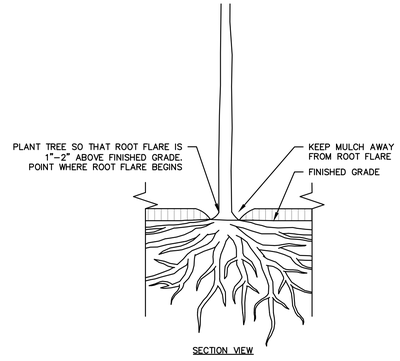
N.T.S



NOTES:
1. STAKING FOR TREES ON 4:1 SLOPES OR LESS TO BE PERFORMED AT CONTRACTOR'S DISCRETION.
2. WOVEN POLYPROPYLENE STAKING MATERIAL SHALL BE DEEPROOT ARBORTIE (GREEN) OR APPROVED EQUIVALENT. MATERIAL SHALL BE LOOPED AROUND TREE THROUGH EACH OTHER, TWISTED, AND SECURED TO THE STAKE. INSTALL SPECIFIED MATERIAL IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS.
3. BEFORE IN HOLE, REMOVE BOTTOM OF CAGE. ONCE IN HOLE, REMOVE REST OF CAGE FROM ROOT BALL. REMOVE TWINE AND BURLAP FROM TOP 1/3 OF ROOT BALL – SCORE REMAINING 2/3 OF BURLAP. IF BURLAP IS SYNTHETIC OR HAS BEEN TREATED WITH ANTI-DESSICENT, COMPLETELY REMOVE IT FROM ROOT BALL.

EVERGREEN TREE PLANTING

N.T.S



ROOT FLARE DIAGRAM

N.T.S

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

STATE OF CONNECTICUT – KARRE E. PRATT – NO. 1235 – LANDSCAPE ARCHITECT

PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	J.P.E.
Drawn	J.P.E.
Reviewed	M.P.S.
Scale	M.P.S.
Project No.	17D3516
Date	04/06/2018
CAD File:	LL17D351601

Title
LANDSCAPE NOTES AND DETAILS

Sheet No.
LL-3

Xref: {d} : XX17D351601 : XX17D351601 : B17D351601 : X17D351601 : X17D351604

11/21/2018, ADAMITA, G:\PROJECTS\17D3516\DWG\LL17D351601.DWG, LL-3 ANSI

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SUBSTATION 1 INVERTER/COMBINER BOX SCHEDULE FOR NORTH HAVEN DEEP

COMBINER BOX	PANELS/ STRING	STRINGS/ CIRCUIT	PANEL WATTS	INVERTER CIRCUITS	PANEL QUANTITY	STRING WATTS	CIRCUIT WATTS	INVERTER WATTS	PANEL VOLTS	CIRCUIT DC VOLTS	STRING CURRENT	CIRCUIT CURRENT	INVERTER MAX DC CURRENT	COMBINER BOX & DC DISCONNECT
INV-7-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-7-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-7-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-7-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-7-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-7-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-7-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-8-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-8-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-8-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-8-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-8-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-8-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-8-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-9-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-9-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-9-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-9-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-9-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-9-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-9-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-10-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-10-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-10A-3	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-10A-4	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-10A-5	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-10A-6	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-11-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-11-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-11-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-11-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-11-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-11-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-11-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-12A-1	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-12A-2	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-12A-3	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-12A-4	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-12A-5	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
		TOTALS:	**459**		**8262**			**3015630**			SYSTEM CURRENT:		**5655.0**	(I_{SC})

LOCATION TEMPERATURE (DEGREES C): -10 TEMPERATURE COEFFICIENT OF Voc (%/DEGREE C): -0.318

SUBSTATION 2 INVERTER/COMBINER BOX SCHEDULE FOR NORTH HAVEN DEEP

COMBINER BOX	PANELS/ STRING	STRINGS/ CIRCUIT	PANEL WATTS	INVERTER CIRCUITS	PANEL QUANTITY	STRING WATTS	CIRCUIT WATTS	INVERTER WATTS	PANEL VOLTS	CIRCUIT DC VOLTS	STRING CURRENT	CIRCUIT CURRENT	INVERTER MAX DC CURRENT	COMBINER BOX & DC DISCONNECT
INV-1-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-1-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-1-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-1-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-1-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-1-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-1-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-2-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-2-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-2-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-2-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-2-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-2-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-2-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-3-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-3-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-3-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-3-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-3-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-3-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-3-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-4-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-4-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-4-3	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-4-4	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-4-5	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-4-6	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-4-7	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-5-1	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-5-2	18	1	365	12	216	6570	6570	78840	47.67	953.6	9.84	9.84	148	INTEGRAL
INV-5A-3	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-5A-4	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-5A-5	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-5A-6	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-6A-1	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-6A-2	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-6A-3	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-6A-4	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
INV-6A-5	18	1	365	11	198	6570	6570	72270	47.67	953.6	9.84	9.84	135	INTEGRAL
		TOTALS:	**459**		**8262**			**3015630**			SYSTEM CURRENT:		**5655.0**	(I_{SC})

LOCATION TEMPERATURE (DEGREES C): -10 TEMPERATURE COEFFICIENT OF Voc (%/DEGREE C): -0.318

PV MODULE SPEC

MANUFACTURER	NEO SOLAR POWER
MODEL	D6M265E4A
PEAK POWER WATTS	365W
MAXIMUM POWER VOLTAGE	39.38V
MAXIMUM POWER CURRENT	9.27A
OPEN CIRCUIT VOLTAGE	47.67V
SHORT CIRCUIT CURRENT	9.84A

PV STRING FEEDER SCHEDULE

USE COPPER WIRE TYPE RHW-2 OR USE-2, 1000V RATED FOR 90°C

Cu WIRE SIZE (AWG)	MIN RUN LENGTH (FT)	MAX RUN LENGTH(FT)
#10	0	600
#8	600+	900

60KW INVERTER SPECS.

MANUFACTURER	SOLECTRIA RENEWABLES
MODEL	XGI 1000-60
DC RATING	
V-MAX	1000 V
I - MAX OPERATING	26.4A PER MPPT (105.6A)
STRING FUSE RATING	15A, 1000VDC, FAST ACTING
AC RATING	
P-OUT	60 KW
V-NOM	480 V 3-PH, 4 WIRE, WYE
I-OUT	72.2 A

65KW INVERTER SPECS.

MANUFACTURER	SOLECTRIA RENEWABLES
MODEL	XGI 1000-65
DC RATING	
V-MAX	1000 V
I - MAX OPERATING	27.65A PER MPPT (110.6A)
STRING FUSE RATING	15A, 1000VDC, FAST ACTING
AC RATING	
P-OUT	65 KW
V-NOM	480 V 3-PH, 4 WIRE, WYE
I-OUT	78.2 A

INVERTER BANK AC FEEDER SCHEDULE (100A RATED)

USE COPPER OR ALUMINUM WIRE TYPE THWN-2 FOR 90°C

Cu WIRE SIZE (AWG)	MIN RUN LENGTH (FT)	MAX RUN LENGTH(FT)
4#3, 1#8 GND IN 1-1/4"C.	0	280
4#2, 1#6 GND IN 1-1/4"C.	280+	355
4#1, 1#4 GND IN 1-1/2"C.	355+	440
4#1/0, 1#4 GND IN 2"C.	440+	590
AL WIRE SIZE (AWG)		
4#1, 1#6 GND IN 1-1/2"C.	0	280
4#1/0, 1#4 GND IN 2"C.	280+	355
4#2/0, 1#4 GND IN 2"C.	355+	440
4#3/0, 1#3 GND IN 2"C.	440+	545

GENERAL ELECTRICAL NOTES

1. INSTALL A COMPLETELY OPERABLE ELECTRICAL SYSTEM INCLUDING THE RECONNECTION OF ANY EXISTING EQUIPMENT DISTURBED DURING SOLAR PHOTOVOLTAIC ARRAY INSTALL.
2. THESE DRAWINGS ARE DIAGRAMMATICAL AND DO NOT SHOW ALL MATERIALS NEEDED. CONTRACTOR IS REQUIRED TO PROVIDE ANY AND ALL CONDUITS, CABLE TRAYS, CONNECTORS, SWEEPS, FITTINGS, HANGERS, SUPPORTS, PULL BOXES, JUNCTION BOXES AND COVER PLATES REQUIRED TO COMPLETE THE ELECTRICAL SYSTEMS IN ACCORDANCE WITH THE NEC.
3. CONTRACTOR IS REQUIRED TO SURVEY AND INSPECT ALL AREAS PRIOR TO PERFORMING SERVICES TO INSURE CLEARANCES CAN BE MET AND NO INTERFERENCES EXIST. NO CUTTING OR DRILLING IS TO BE PERFORMED PRIOR TO LOCATING EXISTING STRUCTURAL MEMBERS AND UTILITIES.
4. ELECTRICAL RUNS SHOWN ON PLANS, INCLUDING CONDUIT AND CABLE TRAY ROUTING, REPRESENT A GENERAL LAYOUT. THE CONTRACTOR IS REQUIRED TO DETERMINE ACTUAL LAYOUT IN THE FIELD PRIOR TO INSTALLATION.
5. SERVICE ENTRANCE RATED EQUIPMENT, CT CABINETS AND METER SOCKETS ARE TO BE APPROVED FOR USE BY THE LOCAL UTILITY COMPANY.
6. ELECTRICAL EQUIPMENT INSTALLED MUST BE LABELED, UL LISTED AND INSTALLED ACCORDINGLY.
7. REQUIRED PERMITS AND INSPECTIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE COORDINATED WITH THE AUTHORITY HAVING JURISDICTION (AHJ).
8. ALL WORK IS TO BE PERFORMED BY LICENSED WORKMEN AND COMPLETED IN ACCORDANCE TO THE 2014 NFPA 70 NEC AND STATE AND LOCAL AMENDMENTS.
9. ALL PENETRATIONS THROUGH FIRE AND SMOKE RATED PARTITIONS MUST BE SEALED WITH A FIRE RATED MATERIAL EQUIVALENT IN RATING TO THE PARTITION PENETRATED.
10. COORDINATE WITH BUILDING OWNER AND STORE MANAGER FOR STAGING AREAS, ROOF ACCESS AND SCHEDULED ELECTRICAL SHUTDOWNS AND INTERRUPTIONS.
11. COORDINATE WITH THE UTILITY COMPANY FOR INTERCONNECTIONS AND METERING.
12. THE SOLAR PV SYSTEM EQUIPMENT ON THE DC SIDE IS RATED FOR 1000V IN COMPLIANCE WITH NEC 690.80. THE INVERTERS, MODULES, STRING FEEDERS AND RELATED COMPONENTS ARE RATED AND LABELED AS 1000V.
13. EMT CONDUIT IS ALLOWED IN EXTERIOR LOCATIONS WHEN RAIN-TIGHT CONNECTORS AND FITTINGS ARE USED, AND THE CONDUIT IS NOT EXPOSED TO ANY POTENTIAL PHYSICAL DAMAGE. ALL SUPPORTS, BOLTS, STRAPS, SCREWS SHALL BE CORROSION RESISTANT.
14. ALL RACEWAYS ARE TO BE METALLIC. PVC IS NOT ACCEPTABLE. APPLY AN ADHESIVE LABEL ALONG ALL RACEWAYS CARRYING PV SYSTEM FEEDERS (DC ONLY) AS "PHOTOVOLTAIC POWER SOURCE". REFER TO DETAIL 14 ON DRAWING PV-4B. LABEL SHALL BE APPLIED EVERY 10', AT EVERY TURN AND ABOVE AND BELOW ALL PENETRATIONS.
15. ALL PANELBOARDS SHALL BE PROVIDED WITH A RECESSED KEYED LATCH, GROUND AND NORMAL BUS AND TYPED CIRCUIT CARD IN ACCORDANCE WITH NEC 408.4.
16. IDENTIFY AND GROUP PV SOURCE AND OUTPUT CIRCUIT IN ACCORDANCE WITH NEC 690.31(B).
17. SECURE ALL PADMOUNTED EQUIPMENT WITH STAINLESS STEEL HARDWARE PER MANUFACTURERS REQUIREMENTS.
18. RIGID METAL CONDUIT SHALL BE USED FOR ALL CONDUIT SWEEPS FROM BELOW GRADE TO ABOVE GRADE. ALL CONDUITS AND FITTINGS SHALL BE GALVANIZED STEEL.
19. UNISTRUT SUPPORTS AND ASSOCIATED HARDWARE FOR PANELBOARDS, INVERTERS, METERING EQUIPMENT, ETC, SHALL BE GALVANIZED STEEL.
20. PROVIDE EXPANSION FITTING IN ABOVE GROUND RACEWAY LOCATIONS WHERE UNDERGROUND RACEWAY SYSTEM IS EXTENDED TO ABOVE-GROUND ENCLOSURE TYPICAL. EXPANSION FITTING TO BE SIMILAR TO OZ GEDNEY TYPE TX WITH BONDING JUMPER ON EQUIVALENT, EXCEPT AT PV GROUND MOUNT ARRAY LOCATIONS WHERE PVC EXPANSION FITTINGS ARE ACCEPTABLE.
21. ALL SWITCHES AND CIRCUIT BREAKERS SHALL BE INSTALLED IN ACCESSIBLE LOCATION PER NEC 404.8. MAXIMUM HEIGHT TO TOP OF METERING EQUIPMENT SHALL BE 5 FEET MAXIMUM ABOVE FINISHED GRADE.
22. PROVIDE MODIFICATIONS TO EXISTING SWITCHBOARD INCLUDING, BUT NOT LIMITED TO, MODIFICATIONS TO BUSSING, ENCLOSURE, ETC. REQUIRED FOR THE INSTALLATION OF NEW PV SYSTEM AC FEEDER.
23. PROVIDE REQUIRED WORKING CLEARANCES IN FRONT OF ALL ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC 110.26 (UNDER 600V) AND 110.34 (OVER 600V); FIELD COORDINATE EXACT REQUIREMENTS.
24. PROVIDE SUITABLE GUARDS (I.E. BOLLARDS, CONCRETE BARRIERS, ETC) AROUND ELECTRICAL EQUIPMENT, WHERE EQUIPMENT MAY BE EXPOSED TO DAMAGE FROM VEHICULAR TRAFFIC OR OTHER HAZARDS; FIELD COORDINATE EXACT REQUIREMENTS.
25. CONTRACTOR SHALL PROVIDE WEATHERTIGHT SEAL FOR ALL PENETRATIONS THRU EXTERIOR WALL.
26. CONTRACTOR SHALL BE RESPONSIBLE FOR CUTTING AND PATCHING OF WALLS, CEILINGS, AND/OR FLOORS REQUIRED FOR THE INSTALLATION OF WIRING SPECIFIED IN THESE DOCUMENTS. CONTRACTOR SHALL MATCH EXISTING FINISHES.
27. CONTRACTOR SHALL REMOVE AND REINSTALL CEILING TILES REQUIRED FOR THE INSTALLATION OF INTERIOR WIRING SPECIFIED. CONTRACTOR SHALL BE RESPONSIBLE TO STORE CEILING TILES AS REQUIRED, AND SHALL CARRY A CONTINGENCY TO REPLACE CEILING TILES BROKEN AS PART OF THIS PROJECT WITH NEW TO MATCH EXISTING.
28. ALL ELECTRICAL EQUIPMENT AND COMPONENTS SHALL BE INSTALLED 2FT ABOVE THE 500 YEAR FLOOD ZONE ELEVATION.

PRIMARY SWITCH VOLTAGE TRIP SETTINGS

BASE VOLTAGE	PROTECTIVE RELAY	TRIP SETTING	VOLTAGE (VAC)	CLEARING TIME (s)
120V	OV2	120%	144.0V	0.16
	OV1	110%	132.0V	2.00
	UV1	88%	105.6V	2.00
	UV2	50%	60.0V	1.1

PRIMARY SWITCH VOLTAGE TRIP SETTINGS

SYSTEM SIZE	PROTECTIVE RELAY	FREQUENCY (Hz)	CLEARING TIME (s)
4.98MW	OF2	62.0	0.16
	OF1	61.2	2.00
	UF1	58.5	2.00
	UF2	56.5	1.1

INVERTER VOLTAGE TRIP SETTINGS

BASE VOLTAGE	PROTECTIVE RELAY	TRIP SETTING	CLEARING TIME (s)
480V	OV2	576V 120%	0.16
	OV1	528V 110%	2.00
	UV1	422V 88%	2.00
	UV2	240V 50%	1.1

SHALL TRIP - IEEE Std 1547-2018 (2nd ED.) CATEGORY II

PRIMARY SWITCH VOLTAGE TRIP SETTINGS

SYSTEM SIZE	PROTECTIVE RELAY	FREQUENCY (Hz)	CLEARING TIME (s)
60KW AND 65KW	OF2	62.0	0.16
	OF1	61.2	300
	UF1	58.5	300
	UF2	56.5	.16

PV SYSTEM AC FEEDER SCHEDULE (500A RATED)

USE COPPER WIRE TYPE XHHW-2 FOR 90°C

Cu WIRE SIZE (AWG)	MIN RUN LENGTH (FT)	MAX RUN LENGTH(FT)
2 SETS: 4#250 KCMIL, 1#2 GND IN 3"C	0	530
2 SETS: 4#300 KCMIL, 1#1 GND IN 3"C	530+	640
2 SETS: 4#350 KCMIL, 1#1/0 GND IN 3"C	640+	750
2 SETS: 4#400 KCMIL, 1#2/0 GND IN 3 1/2"C	750+	860
AL WIRE SIZE (AWG)		
2 SETS: 4#350 KCMIL, 1#1/0 GND IN 3"C	0	450
2 SETS: 4#400 KCMIL, 1#1/0 GND IN 3 1/2"C	450+	520
2 SETS: 4#500 KCMIL, 1#2/0 GND IN 3 1/2"C	520+	650

PV SYSTEM AC FEEDER SCHEDULE (600A RATED)

USE COPPER WIRE TYPE XHHW-2 FOR 90°C

Cu WIRE SIZE (AWG)	MIN RUN LENGTH (FT)	MAX RUN LENGTH(FT)
2 SETS: 4#350 KCMIL, 1#1 GND IN 3"C	0	625
2 SETS: 4#400 KCMIL, 1#1 GND IN 3 1/2"C	625+	715
2 SETS: 4#500 KCMIL, 1#2/0 GND IN 3 1/2"C	715+	890
2 SETS: 4#600 KCMIL, 1#3/0 GND IN 4"C	890+	1075
AL WIRE SIZE (AWG)		
2 SETS: 4#500 KCMIL, 1#2/0 GND IN 3 1/2"C	0	540
2 SETS: 4#600 KCMIL, 1#3/0 GND IN 4"C	540+	650
2 SETS: 4#750 KCMIL, 1#4/0 GND IN 5"C	650+	815

PV SYSTEM AC FEEDER SCHEDULE (700A RATED)

USE COPPER WIRE TYPE XHHW-2 FOR 90°C

Cu WIRE SIZE (AWG)	MIN RUN LENGTH (FT)	MAX RUN LENGTH(FT)
2 SETS: 4#500 KCMIL, 1#1/0 GND IN 3 1/2"C.	0	765
2 SETS: 4#600 KCMIL, 1#2/0 GND IN 4"C.	765+	920
2 SETS: 4#750 KCMIL, 1#3/0 GND IN 5"C.	920+	1155
AL WIRE SIZE (AWG)		
2 SETS: 4#600 KCMIL, 1#3/0 GND IN 4"C	0	560
2 SETS: 4#750 KCMIL, 1#4/0 GND IN 5"C	560+	700
3 SETS: 4#600 KCMIL, 1#300 KCMIL GND IN 4"C	700+	840

SYSTEM INFORMATION

PROJECT TITLE	SOLAR INSTALLATION
AC SYSTEM/DC SYSTEM	4.98 MW AC/ 6.031 MW DC
INVERTER	65kW and 60kW

UTILITY INFORMATION

UTILITY SUBSTATION	VOLTAGE	CIRCUIT NUMBER
QUINNIPIAC	13.8 KV	#1542

LEGEND

- (ST) SHUNT TRIP
- (R) RELAY
- (M) MOTOR OPERATOR
- (GF) GROUND FAULT
- (SPD) SURGE PROTECTION DEVICE
- (T) TRANSFORMER
- 1-POLE C/B
- 2-POLE C/B
- 3-POLE C/B
- (M) MOTOR OPERATOR
- T.S. TEST SWITCH BLOCK
- SB SHORTING BLOCK
- FUSE
- DEAD-FRONT FUSE HOLDER
- (T) THERMOSTATICALLY CONTROLLED STRIP HEATER
- (U) UTILITY METER
- (CM) CUSTOMER METER
- G NETURAL BUS
- N GROUND BUS
- GROUND
- CURRENT TRANSFORMER
- 3-POLE SWITCH

ABBREVIATIONS

ABB.	DESCRIPTION	ABB.	DESCRIPTION
A	AMPERES	NEMA	NATIONAL ELECTRICAL MANUFACTURERS
AC	ALTERNATING CURRENT	NEUT	NEUTRAL
AFCI	ARC FAULT CIRCUIT INTERRUPTER	NF	NON-FUSED
AI	ALUMINUM	NTS	NOT TO SCALE
ATS	AUTOMATIC TRANSFER SWITCH	P	POLE
AWG	AMERICAN WIRE GAUGE	PH	PHASE
C	CONDUIT	PNL	PANEL
CB	COMBINER BOX	PRIM	PRIMARY
CIR	CIRCUIT	PSF	POUNDS PER SQUARE FEET
CT	CURRENT TRANSFORMER	PSI	POUNDS PER SQUARE INCH
Cu	COPPER	PT	POWER TRANSFORMER
DC	DIRECT CURRENT	PV	PHOTOVOLTAIC
DWG	DRAWING	PVC	POLYVINYL CHLORIDE
ECB	ENCLOSED CIRCUIT BREAKER	RGS	RIGID GALVANIZED STEEL
EGC	EQUIPMENT GROUNDING CONDUCTOR	RT	RAIN-TIGHT
EMT	ELECTRIC METALLIC TUBING	SE	SERVICE EQUIPMENT
EQUIP	EQUIPMENT	SEC	SECONDARY
EX	EXISTING TO REMAIN	ST	SHUNT TRIP
FT	FOOT	TYP	TYPICAL
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	UG	UNDERGROUND
GND	GROUND	UL	UNDERWRITER'S LABRATORY
HD	HAND-HOLE	UTIL	UTILITY
IN	INCHES	V	VOLTS
J	JUNCTION	W	WATTS
KAIC	KILO-VOLT AMPERES INTERRUPT CURRENT	WP	WATERPROOF
KV	KILOVOLTS	WT	WATERTIGHT
KW	KILOWATTS	X	REMOVE
M	METER	XFMR	TRANSFORMER
MCB	MAIN CIRCUIT BREAKER	%	PERCENT
MDP	MAIN DISTRIBUTION PANEL	#	NUMBER
MLO	MAIN LUG ONLY	'	FEET
NEC	NATIONAL ELECTRIC CODE	"	INCHES

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PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

No.	REVISIONS Description	Date
1.	Desc. D & M SET.	11/16/2018

Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	17D3516
Date	10/29/2018
CAD File:	PV17D3516-PV1

Title
ABBREVIATIONS, SCHEDULES, LEGENDS, AND NOTES

Sheet No.
PV-1

Xref (s) : BREEC-17D3560

11/29/2018, JANETE, G:\JOBS\17D3516\17D3516_PV\PV17D3516-PV 2NDCP+1.
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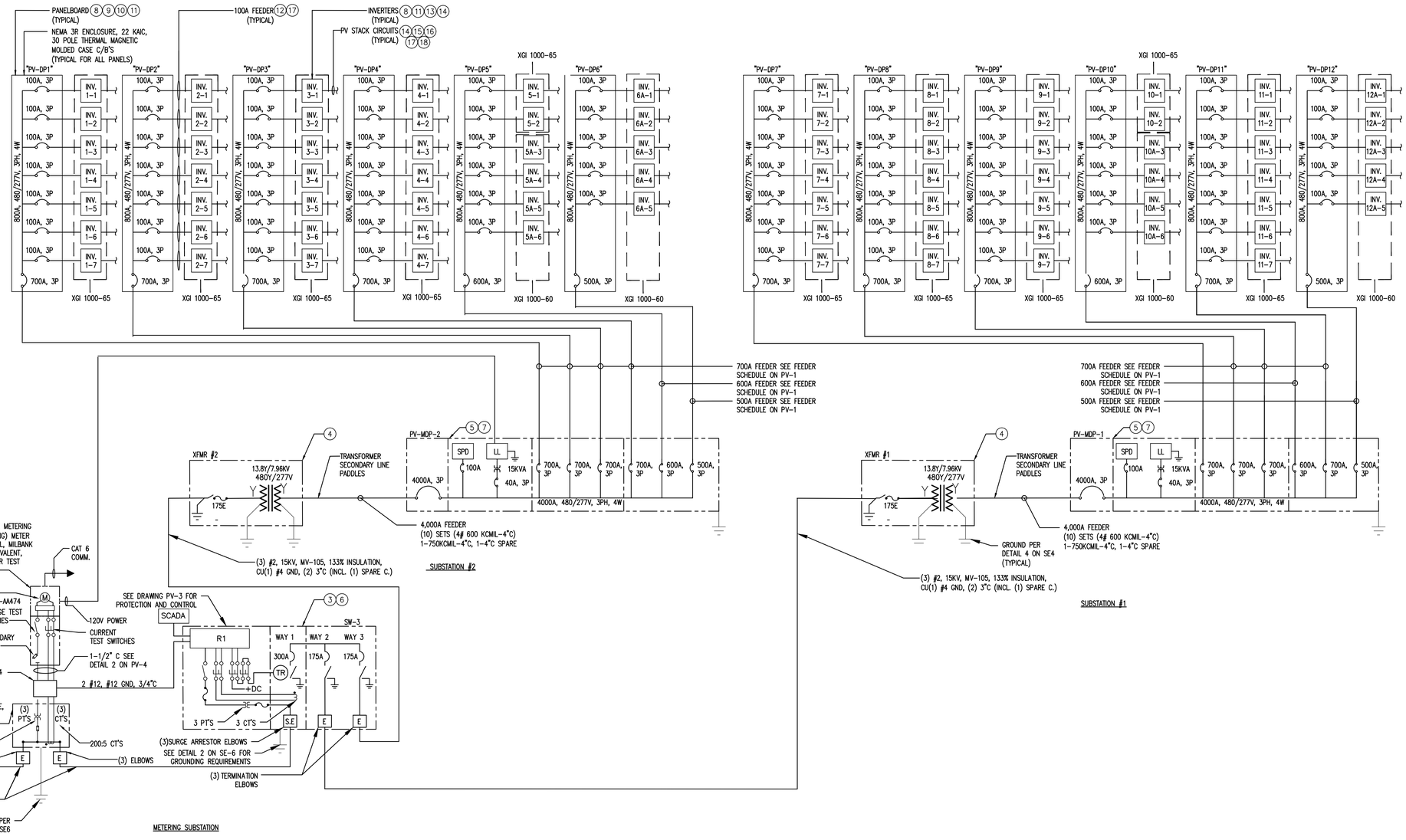
LEGEND

	CIRCUIT BREAKER
	TRANSFORMER
PT'S	POTENTIAL TRANSFORMER
CT'S	CURRENT TRANSFORMER
	GROUND
	FAULT INTERUPTER
(R)	RELAY: (27) PROTECTIVE RELAY – UNDER VOLTAGE (UV#) (59) PROTECTIVE RELAY – OVER VOLTAGE (OV#) (81O) PROTECTIVE RELAY – OVER FREQUENCY (OF#) (81U) PROTECTIVE RELAY – UNDER FREQUENCY (UF#) (86) PROTECTIVE RELAY – MANUAL RESET LOCKOUT RELAY
R	RELAY
M	MOTOR OPERATOR
INV	INVERTER
A	AMPERES
P	POLES
ø	PHASE
W	WIRE
V	VOLTS
KV	VOLTS x1000
SPD	SURGE PROTECTION DEVICE
LL	LOAD CENTER PANELBOARD– 60A, 208/120V, 3 PHASE, 4 WIRE
KVA	KILO–VOLT AMPERES
	FUSE
TR	TRIP RELAY
#	KEY NOTE–REFER TO RISER DIAGRAM NOTE
	NEW ELECTRICAL EQUIPMENT
	EQUIPMENT ENCLOSURE
E	ELASTIMOLD TERMINATION ELBOWS. SEE TABLE ON E3B
S.E	MOV SURGE ARRESTOR. SEE TABLE ON E3B



1 ONE LINE POWER DIAGRAM
SCALE: N.T.S.

RISER DIAGRAM KEY NOTES:

1. PROVIDE PADMOUNTED METERING ENCLOSURE PER UTILITY COMPANY REQUIREMENTS, 15KV NOMINAL VOLTAGE, 600 AMPERE CONTINUOUS RATING, 95KV BIL, DEADFRONT, SHALLBETTER DRAWING NUMBER Q217131–1 ASSEMBLY, MODEL NUMBER SPMD–31511–66–SS–BFE OR EQUIVALENT MEETING UI SPECIFICATIONS. CT RATED TO BE 200:5 WITH 0.3% ACCURACY AND THE PT RATED TO BE 8KV:120V. REFER TO DETAIL 2, ON DRAWING PV–6.
2. PROVIDE METER WITH NEW NET REVENUE METER (COLD SEQUENCE) PER UTILITY COMPANY REQUIREMENTS. COORDINATE WITH LOCAL UTILITY COMPANY. PROVIDE SIGNAGE STATING PRESENCE OF ALTERNATE POWER SOURCE. REFER TO DRAWING PV–6. REFER TO DETAIL 1 ON PV–4 FOR TYPICAL WIRING REQUIREMENT.
3. PADMOUNTED UNDERGROUND DISTRIBUTION SWITCHGEAR S&C VISTA SWITCHGEAR OR EQUIVALENT, 15KV SYSTEM CLASS, 95BIL, 3 PHASE, 600A MAXIMUM CONTINUOUS CURRENT. SEE ONE–LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS.
4. PROVIDE PADMOUNTED UTILITY TRANSFORMER: PROVIDE CONCRETE PAD, BOLLARDS, GROUND LOOP PER DESIGN REQUIREMENTS. EXTEND PRIMARY CONDUIT TO NEW PAD LOCATION. COORDINATE REMOVAL OF EXISTING PAD MOUNTED TRANSFORMER WITH UTILITY COMPANY. 2500 KVA TRANSFORMER, 13.8Y/7.97 KV (PRIMARY), 480Y/277 (SECONDARY), GROUNDED WYE–WYE, 60 HZ, 95 KV BIL, 5.75% IMPEDANCE, BAYONET EXPULSION FUSE IN SERIES WITH CURRENT LIMITING FUSE, RADIAL LOAD BREAK SWITCH, ALUMINUM WINDINGS, VISIBLE BREAK WINDOW. PROVIDE GROUND LOOP. PROVIDE A MINIMUM OF (4) ¾"X10' COPPER CLAD GROUND RODS AND #3/0 BARE COPPER GROUND LOOP AROUND PERIMETER OF NEW PAD MOUNTED TRANSFORMER; SPACING OF GROUND RODS SHALL BE A MINIMUM OF 10 FEET IN ALL DIRECTIONS. BOND BARE COPPER GROUNDING ELECTRODE CONDUCTOR TO GROUND RODS BY EXOTHERMIC WELD, AND TO NEUTRAL BUS BY MECHANICAL MEANS. PROVIDE #3/0 INSULATED GROUND.
5. PROVIDE A 4000A, 480Y/277V, 3 PHASE, 4 WIRE MAIN SWITCHBOARD, 4000A PHASE AND NEUTRAL BUS IN ALL SECTIONS, 4000AF/4000AT, 3P INSULATED CASE MAIN CIRCUIT BREAKER WITH LSIG TRIP UNIT MAIN SERVICE DISCONNECT SWITCH, CT/METERING SECTION PER UTILITY COMPANY REQUIREMENTS, AND DISTRIBUTION SECTION WITH ELECTRONIC–TRIP, MOLDED CASE CIRCUIT BREAKERS WITH LSI TRIP UNITS. PROVIDE EACH SECTION WITH 250W, THERMOSTATICALLY CONTROLLED ENCLOSURE HEATERS, AND ASSOCIATED TRANSFORMER, AND FEEDER REQUIREMENTS INSTALLED ON LOAD SIDE OF METERING.PROVIDE SPD IN DISTRIBUTION SECTION; SPD SHALL CONSIST OF 250 KA PER PHASE RATING, INTEGRAL DISCONNECT, SURGE COUNTER, AND ALARMS. THE LSI AND LSIG TRIP UNITS SHALL INCLUDE AN ENERGY–REDUCING MAINTENANCE SETTING TO COMPLY WITH NEC 240.87. THE SWITCHBOARD BUSSING SHALL BE COPPER PHASE, NEUTRAL, AND GROUND BUSSING, AND 65 KAIC BUS BRACING AND CIRCUIT BREAKER RATING. THE SWITCHBOARD SHALL BE SERVICE ENTRANCE RATED. THE SWITCHBOARD ENCLOSURES SHALL BE NEMA 3R, AND EACH SECTION SHALL BE LOCKABLE WITH PADLOCK. THE MAIN SWITCH SECTION SHALL BE LABELED: "SERVICE DISCONNECT"; CT/METERING SECTION SHALL BE LABELED " UTILITY METERING"; AND THE DISTRIBUTION SECTION SHALL BE LABELED "MAIN DISTRIBUTION". PROVIDE NAMEPLATE'S ON SWITCHBOARD AS INDICATED ON PV–6.
6. SET PRIMARY SWITCH OVER/UNDER FREQUENCY SETTINGS AND OVER/UNDER VOLTAGE SETTINGS TO VALUES NOTED IN TABLES ON PV–1.
7. PROVIDE A MINIMUM OF (3) ¾" X10' COPPER CLAD GROUND RODS AND #3/0 BARE COPPER GROUND LOOP AROUND PERIMETER OF NEW ELECTRICAL SWITCHBOARD; SPACING OF GROUND RODS SHALL BE A MINIMUM OF 10 FEET IN ALL DIRECTIONS. BOND BARE COPPER GROUNDING ELECTRODE CONDUCTOR TO GROUND RODS BY EXOTHERMIC WELD, AND TO NEUTRAL BUS BY MECHANICAL MEANS. PROVIDE #3/0 INSULATED GROUND. SEE DETAIL 4 ON SE–4 FOR ADDITIONAL GROUNDING REQUIREMENTS.
8. PROVIDE INVERTERS AND PANELBOARDS, INCLUDING STRUCTURAL SUPPORTS FOR MOUNTING.
9. PROVIDE PV DISTRIBUTION PANEL AND BREAKER TYPE AND QUANTITY AS SPECIFIED ON RISER. PROVIDE NAMEPLATE ON PV DISTRIBUTION PANEL. LABEL EACH BREAKER BY ITS CORRESPONDING INVERTER BANK. BRANCH CIRCUIT BREAKERS SHALL BE RATED FOR REVERSE FEED. LABEL EACH SPARE CIRCUIT BREAKER SPACE "DO NOT INSTALL BRANCH CIRCUIT BREAKER IN THIS SPACE".
10. PROVIDE NAMEPLATE AS WELL AS SIGNAGE ON PV DISTRIBUTION PANEL AS OUTLINED IN DRAWING PV–6. LABEL EACH SPARE CIRCUIT BREAKER SPACE "DO NOT INSTALL BRANCH CIRCUIT BREAKER IN THIS SPACE". BRANCH CIRCUIT BREAKERS SHALL BE RATED FOR REVERSE FEED.
11. PROVIDE FEEDERS TO THE INVERTER PANELS FROM THE PV DIST. PANEL UNISTRUT MOUNTED AT THE PV ARRAY. REFER TO INVERTER BANK FEEDER SCHEDULE ON PV–1 FOR CONDUCTOR SIZES. PROVIDE LIQUID TYPE FITTINGS FOR FEEDER. PROVIDE SIGNAGE AS INDICATED PV–6.
12. REFER TO INVERTER BANK FEEDER SCHEDULE ON PV–1 FOR REQUIREMENTS. WHERE CONDUCTOR SIZE EXCEEDS INVERTER LUG RATING CONTRACTOR SHALL PROVIDE NEMA 3R JUNCTION BOX DIRECTLY BELOW INVERTER AND SHALL SPLICE FEEDER TO CONDUCTOR SIZED TO MATCH MAXIMUM RATING OF INVERTER AC TERMINATION LUG AND EXTEND AND TERMINATE AT INVERTER.
13. SET INVERTER OVER/UNDER FREQUENCY SETTINGS AND OVER/UNDER VOLTAGE SETTINGS TO VALUES NOTED IN TABLES ON PV–1.
14. PROVIDE GROUND ON AC SIDE OF THE INVERTER ONLY.
15. PROVIDE SIGNAGE ON EACH INVERTER IN COMPLIANCE WITH NEC 690.53 LABELING REQUIREMENTS. AFFIX THE LABEL ADJACENT TO THE DC DISCONNECT OF EACH INVERTER REFER TO DETAILS ON DRAWING PV–6. PROVIDE SIGNAGE ON EACH INVERTER IN COMPLIANCE WITH NEC 690.5(C) LABELING REQUIREMENTS. AFFIX THE LABEL NEAR THE GROUND FAULT INDICATOR AT A VISIBLE LOCATION OF EACH INVERTER; REFER TO DETAILS ON DRAWING PV–6.
16. PROVIDE NEMA 3R WIREWAY BELOW PANELBOARD. ROUTE FEEDERS FROM INVERTERS ON GROUND TO WIREWAY. SIZE CONDUIT NIPPLES BETWEEN WIREWAY AND PANEL ENCLOSURE FOR 60% FILL PER NEC REQUIREMENTS. WHERE CONDUCTOR SIZE FROM INVERTER EXCEEDS CIRCUIT BREAKER LUG RATING CONTRACTOR SHALL SPLICE FEEDER FROM INVERTER TO A CONDUCTOR SIZED TO MATCH MAXIMUM RATING OF CIRCUIT BREAKER LUG AND EXTEND AND TERMINATE AT CIRCUIT BREAKER.
17. REFER TO "PV STRING FEEDER SCHEDULE" ON PV–1 FOR ADDITIONAL INFORMATION.
18. SOLAR PV ARRAY STRING FEEDERS ROUTED THROUGH CONDUIT BELOW GRADE, AND IN WIRE TROUGHS (PROVIDED WITH MODULE SUPPORT STRUCTURE). REFER TO LAYOUTS ON SITE PLAN FOR ADDITIONAL INFORMATION. REFER TO "PV STRING FEEDER SCHEDULE" ON PV–1 FOR WIRE TYPE AND SIZING BASED ON LENGTH OF RUN. REFER TO SE SERIES FOR ADDITIONAL REQUIREMENTS.

GENERAL NOTES:

1. REFER TO DRAWING PV–1 FOR LEGEND, GENERAL NOTES, ABBREVIATIONS AND FEEDER SCHEDULES.
2. WORK ASSOCIATED WITH THIS SCOPE SHALL BE PERFORMED BY A CONTRACTOR WHO IS LICENSED IN THE STATE OF THE PROJECT TO INSTALL PHOTOVOLTAIC SYSTEMS.
3. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE LATEST ADOPTED VERSIONS OF ALL LOCAL, STATE, AND NATIONAL CODES, INCLUDING ALL ORDINANCES AND LAWS APPLICABLE TO THIS JURISDICTION.
4. ALL CONNECTIONS AND CONFIGURATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WIRING DIAGRAMS AND INSTALLATION INSTRUCTIONS.
5. POLARITY OF ALL COMPONENTS SHALL MATCH DESIGNATIONS AS DIRECTED BY MANUFACTURER'S REPRESENTATIVE.

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PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS
No. Date Desc
1. 11/16/2018 D & M SET.

Designed SC/CKPA
Drawn CKPA
Reviewed EEC
Scale AS SHOWN
Project No. 17D3516
Date 10/29/2018
CAD File: PV17D3516–PV2

Title
PHOTOVOLTAIC ONE LINE POWER DIAGRAM

Sheet No.
PV-2

Ref (s) : BGELEC-17D35601

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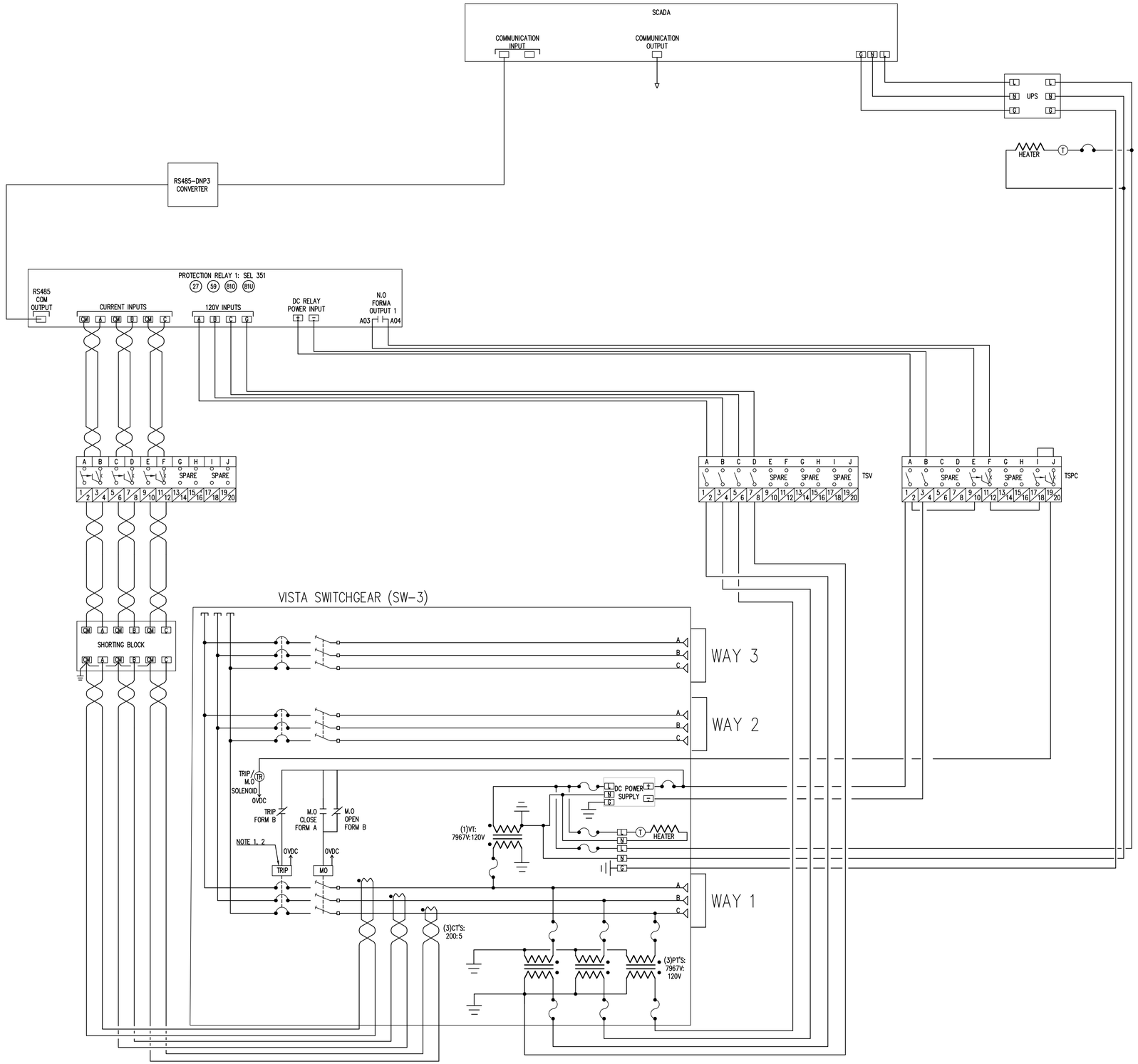
12/7/2018, JPRETE, G:\JOBS\17D3516\SHEETS\17D3516-PV2.DWG



1 **PROTECTION, CONTROL, SCADA SCHEMATIC**
SCALE: N.T.S.

LEGEND -SCADA SCHEMATIC

L	LINE
N	NEUTRAL
G	GROUND
⊣ ⊢	CONTACT
V	VOLTS
T	RESISTIVE HEATER AND THERMOSTAT
CT	CURRENT TRANSFORMER
PT	POTENTIAL TRANSFORMER
VT	VOLTAGE TRANSFORMER
	GROUND
	FUSE
	RELAY COIL
SOL	SOLENOID
MO	MOTOR OPERATOR
	FAULT INTERRUPTER
TSC	TEST SWITCH: CURRENT
TSV	TEST SWITCH: VOLTAGE
TSPC	TEST SWITCH: PROTECTION AND CONTROL
CM	COMMON
A	PHASE A
B	PHASE B
C	PHASE C
	SHORTING SWITCH
	VOLTAGE SWITCH
DC	DIRECT CURRENT

NOTES:

1. ELECTROMECHANICAL SOLENOID TO OPEN/CLOSE MV CIRCUIT BREAKER. WHEN PROTECTION RELAY IS POWERED, OUTPUT 1 IS CLOSED, VOLTAGE IS SUPPLIED TO ELECTROMECHANICAL SOLENOID, AND WAY 1 CIRCUIT BREAKER IS MAINTAINED CLOSED.
2. WHEN PROTECTION RELAY LOSES POWER, OR OUTPUT 1 IS OPEN DUE TO A PROTECTION ELEMENT FAULT, OR TRANSFER TRIP RELAY IS OPEN DUE TO UTILITY SIGNAL, VOLTAGE IS REMOVED FROM THE ELECTROMECHANICAL SOLENOID, AND WAY 1 CIRCUIT BREAKER IS OPENED FOR FAIL SAFE OPERATION.
3. THE SEL 351 RELAY TRIPS THE VACUUM BOTTLE BY OPENING OUTPUT 1.
4. THE SEL RELAY INPUT AND OUTPUT CONTACTS ARE WIRED TO THE MOTOR FOR STATUS AND COMMAND REQUIREMENTS. THE SEL RELAY GIVES THE COMMAND TO OPEN THE MOTOR AFTER THE RELAY TARGET HAS OCCURRED, AND THE VACUUM BOTTLE HAS TRIPPED, WHICH THEN RESETS THE VACUUM BOTTLE CONTACTS.
5. ONCE THE RELAY TARGET HAS BEEN RESET FOR A SPECIFIED TIME PERIOD THE MOTOR CAN CLOSE THE SWITCH AUTOMATICALLY.
6. IF A FAULT TARGET OCCURS THE MOTOR WILL OPEN THE SWITCH AND THE SWITCH WILL RE-CLOSE MANUALLY.

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PHOTOVOLTAIC INSTALLATION

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NORTH HAVEN, CONNECTICUT

REVISIONS		
No.	Date	Desc.
1.	11/16/2018	D & M SET.

Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	17D3516
Date	10/29/2018
CAD File:	PV17D3516-PV3

Title
PROTECTION, CONTROL AND SCADA SCHEMATIC

Sheet No.
PV-3

Xref (s) : BIBELEC-17D3516R1

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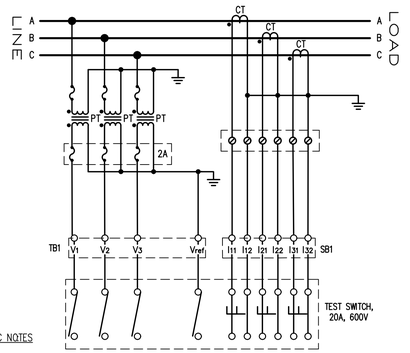
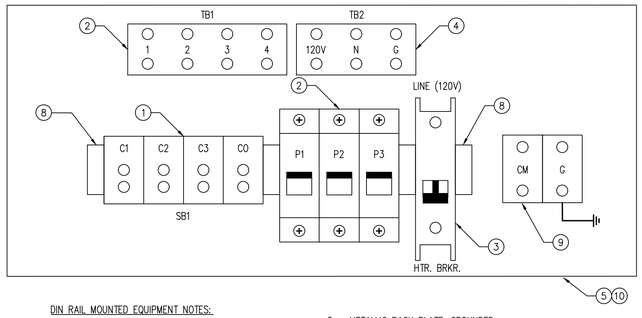


SCHEMATIC NOTES

1. (3) CT'S: 200/5 CT'S, EXTENDED RANGE, +/- .15% ACCURACY FROM 1% NOMINAL CURRENT THROUGH RATING FACTOR, ABB MODEL KON11ER OR EQUIVALENT. CONSULT UI METER ENGINEERING FOR OTHER AVAILABLE OPTIONS.
2. (3) INDOOR FUSED PT'S: 70/1, ACCURACY NO. 1, 110KV BIL, 1A, 14.4KV, PRIMARY FUSING, GE MODEL JVM-SC, CAT. #765X121049 OR EQUIVALENT. CONSULT UI METER ENGINEERING FOR OTHER AVAILABLE OPTIONS.
3. CT WIRING: #10 AWG TWISTED PAIR; TYPICAL
   PT WIRING: #12 AWG TYPICAL

1 / PV-4 **TYPICAL 3 LINE UTILITY METERING WIRING SCHEMATIC**

NOT TO SCALE

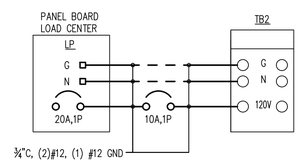


DIN RAIL MOUNTED EQUIPMENT NOTES:

1. (4) POSITION SHORTING BLOCK FOR THE CT WIRES AND RETURN, DIN RAIL MOUNTED.
2. (3) POSITION FUSE WITH INDICATOR, AND (4) POSITION TERMINAL BLOCK, DIN RAIL MOUNTED, FERRAZ SHAWMUT USM31 WITH MIDGET 10 X 38 FUSES.
3. (1) SINGLE BREAKER FOR AUX POWER, EATON WMZTIC10.
4. (3) POSITION TERMINAL BLOCK FOR 120VAC, NEUTRAL AND GROUND.
5. METALLIC BACK PLATE, GROUNDED.
6. SEE DETAIL 1 AND 3 ON THIS SHEET FOR ADDITIONAL REQUIREMENTS.
7. LABELS ON EACH ITEM AS INDICATED.
8. 35mm DIN RAIL WITH (2) END STOPS AND SPACER BETWEEN FUSE HOLDER AND BREAKERS.
9. (2) POSITION TERMINAL BLOCK FOR VOLTAGE RETURN AND GROUND.
10. MILBANK STAINLESS STEEL POLYPHASE ENCLOSURE S3390-FB-XL-C7, 2 POSTION, 11" X 28" X 34"

2 / PV-4 **PRIMARY NET METERING HARDWARE LAYOUT**

NOT TO SCALE

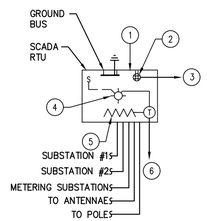


NOTES:

1. PROVIDE AND INSTALL EQUIPMENT AND WIRING PER UTILITY COMPANY REQUIREMENTS.
2. SEE DETAIL 2 ON THIS SHEET FOR ADDITIONAL INFORMATION.

3 / PV-4 **TYPICAL EQUIPMENT WIRING SCHEMATIC**

NOT TO SCALE



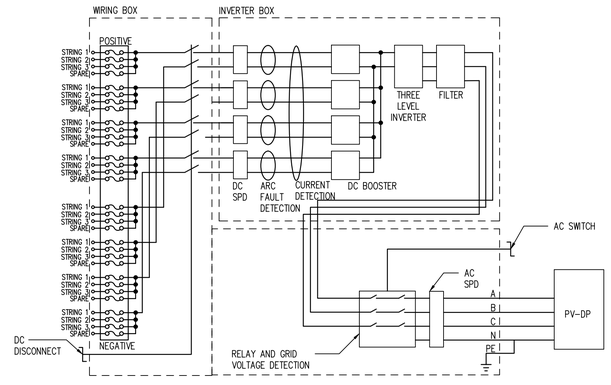
HEATER CONTROL WIRING KEY NOTES

1. SCADA RTU ENCLOSURE – SEE PV-3 FOR REQUIREMENTS. PROVIDE 12"X2"X1/4" COPPER GROUND BUS AND BOND TO ENCLOSURE AND GROUND RING; BOND LARGEST CIRCUIT GROUND CONDUCTOR FROM BAY 2 TO GROUND BUS.
2. NEMA 5-20R QUAD RECEPTACLE IN SURFACE-MOUNTED BACKBOX.
3. (2)#12, (1)#12 GND FROM SCADA ENCLOSURE TO NEW 20A, 1P C/B IN PANELBOARD IN SWITCHGEAR BAY 2; CIRCUIT BREAKER TO MATCH EXISTING MANUFACTURER AND AIC RATING. SEE PV-2 FOR UNDERGROUND RACEWAY REQUIREMENTS.
4. LED VAPORTIGHT FIXTURE, CEILING MOUNT, WIRE GUARD; CIRCUIT TO 20A, 120-277V, S.P.S.T. WALL SWITCH.
5. 250W, 120V THERMOSTATICALLY CONTROLLED STRIP HEATER.
6. (2)#12, (1)#12GND FROM SCADA ENCLOSURE TO NEW 20A, 1P C/B IN PANELBOARD IN SWITCHGEAR BAY 2; CIRCUIT BREAKER TO MATCH EXISTING MANUFACTURER AND AIC RATING. SEE PV-2 FOR UNDERGROUND RACEWAY REQUIREMENTS.

5 / PV-4 **HEATER CONTROL WIRING SCHEMATIC**

NOT TO SCALE

SECTION A. – TYPICAL WIRING SCHEMATIC



NOTES:

1. INVERTER SHALL BE INVERTER SOLECTRIA XGI 1000 MODEL 65KW & 60KW. REFER TO SINGLE LINE DIAGRAM PV-2 FOR QUANTITY.
2. CONTRACTOR SHALL PROVIDE ENOUGH SLACK IN THE CONDUCTORS TO ALLOW FOR AM-PROVE TESTING IN THE FUTURE. AVOID ADDING LOOPS IN THE CONDUCTORS PRIOR TO TERMINATION.
3. PROVIDE CONDUCTOR ID LABELS PER SPEC REQUIREMENTS.
4. REFER TO RISER DIAGRAM ON PV-2 FOR CONDUCTOR SIZING.
5. CONDUIT SIZE AND QUANTITY PER NEC REQUIREMENTS. QUANTITY AND CONFIGURATION OF STRING CONDUITS SHOWN IS DIAGRAMMATICAL.
6. A WIRE FERRULE SHALL BE USED TO MAKE EITHER AC OR DC CONDUCTOR TERMINATIONS IN INVERTER WHERE ALUMINUM CONDUCTORS ARE USED.
7. CONTRACTOR SHALL PROVIDE STRING LABELS ON EACH CONDUCTOR (TYPICAL).
8. PROVIDE LIQUID-TIGHT FLEXIBLE CONDUIT CONNECTIONS INTO INVERTER ENCLOSURES (TYP. FOR AC AND DC CONDUCTORS).
9. AMPHENEL H4 DC CONNECTORS.
10. WATERPROOF PG TERMINAL AND OT CONNECTORS.
11. PROVIDE WEATHERPROOF MC4 CONNECTORS AND IN-LINE FUSES FOR ALL POSITIVE DC CONDUCTORS (TYP.). INSTALL WITHIN 5'-0" OF INVERTER TERMINALS.

4 / PV-4 **SOLECTRIA XGI 1000**

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

No.	REVISIONS Date	Desc.
1.	11/16/2018	D & M SET.

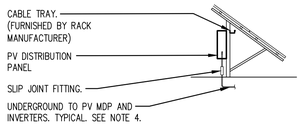
Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	17D3516
Date	10/29/2018
CAD File:	PV17D3516-PV4-5-6

Title: ELECTRICAL DETAILS 1

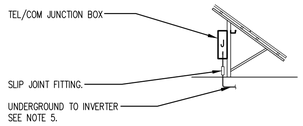
Sheet No.

PV-4

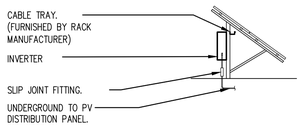
Xref (s) : BB1BD5920D-1 : BGELEC-17D3516D1
11/29/2018, JPRETE, T:\BLUEBEAM\MES.COM\JPS\PROJ\JOBS\17\D3\516\D\MEP\PV17D3516-PV4-5-6.DWG\PV4



TYPICAL PHOTOVOLTAIC SECTION



TYPICAL PHOTOVOLTAIC SECTION



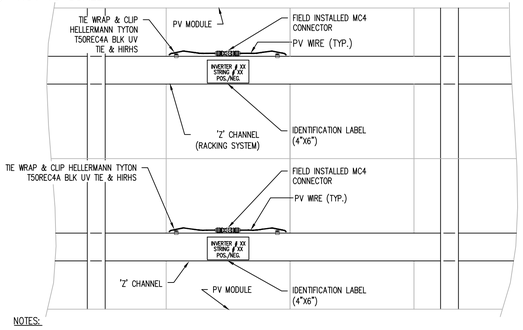
TYPICAL PHOTOVOLTAIC SECTION

NOTES :

1. INVERTER AND TEL/COM JUNCTION BOX TO BE INSTALLED 4' AFG TO BOTTOM OF BOX TYPICAL. PANELBOARDS TO BE INSTALLED SUCH THAT UPPER MOST C/B IS NOT GREATER THAN 78" AFG. PROVIDE ALL REQUIRED SUPPORT HARDWARE TO SECURE PV DISTRIBUTION PANEL, INVERTER, AND TEL/COM JUNCTION BOX TO POST.
2. STRING CIRCUIT CABLES SHALL EXIT BOTTOM OF BOX TO CABLE TRAY. PROVIDE WEATHER PROOF SEALING BUSHING FOR EXITING CABLES.
3. INVERTER BOX OUTPUT AC FEEDER TYPICAL.
4. PV DISTRIBUTION PANEL AC FEEDERS TYPICAL.
5. MODBUS CABLE AND CONDUIT TYPICAL.

1 PV-5 TYPICAL PANELBOARD, INVERTER AND TEL/COM JUNCTION BOX INSTALLATION

NOT TO SCALE

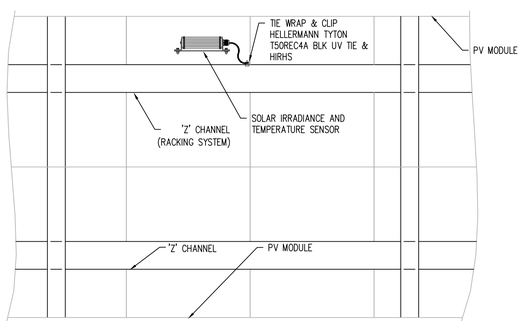


NOTES:

1. IF A FIELD INSTALLED (NON-FACTORY) MC4 TYPE CONNECTOR IS USED IT MUST BE MOUNTED TO THE GROUND SUPPORT RACK 'Z' CHANNEL.
2. SECURE THE MC4 CONNECTOR ON THE 'Z' CHANNEL WITH UV RATED TIE WRAPS AND THE CLIPS SHOWN IN DETAIL.
3. INSTALL MANUFACTURED LABEL ADJACENT TO THE MC4 CONNECTOR IDENTIFYING THE INVERTER AND STRING NUMBER. LABEL MUST HAVE RED BACKGROUND FOR POSITIVE OR BLACK BACKGROUND FOR NEGATIVE. TEXT SHALL BE WHITE WITH A HEIGHT OF 3/4".
4. NO CROSS MATING OF CONNECTORS IS AUTHORIZED. BOTH MALE AND FEMALE CONNECTOR ENDS MUST BE OF THE SAME MANUFACTURER TO ENSURE UL COMPLIANCE. ACCEPTABLE MANUFACTURER INCLUDE AMPENOL, MC4 AND TYCO. THE MANUFACTURER SPECIFIC TOOL KIT MUST BE USED WHILE MAKING FIELD CONNECTIONS.
5. MOUNTING DETAIL APPLIES TO ALL RACKING PRODUCTS.

2 PV-5 FIELD INSTALLED MC4 TYPE CONNECTOR MOUNTING LOCATION (GROUND SUPPORT RACK)

NOT TO SCALE

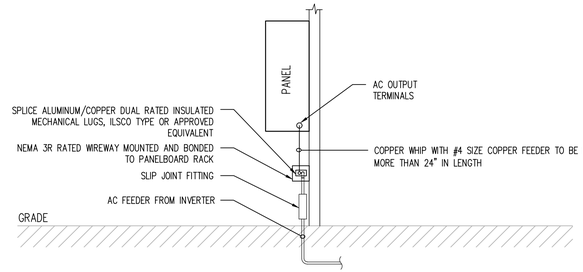


NOTES:

1. INSTALL THE WEATHER STATION AT A CENTRAL LOCATION WITHIN THE ARRAY USING THE MANUFACTURER SUPPLIED MOUNT.
2. THE WEATHER STATION SHALL BE INSTALLED AT THE SAME TILT AS THE MODULES.
3. MOUNT THE CELL TEMPERATURE PROBE TO THE UNDERSIDE OF THE ADJACENT MODULE.
4. PROVIDE DC POWER SUPPLY TO THE WEATHER STATION FROM THE SMA CONTROLLER IN ACCORDANCE TO MANUFACTURER SPECS.
5. PROVIDE DATA COMMUNICATION LINK FROM THE WEATHER STATION TO THE SMA CONTROLLER WITH A TWISTED SHIELDED PAIR. REFER TO MANUFACTURER'S SPEC FOR ADDITIONAL INFORMATION.

3 PV-5 WEATHER STATION MOUNTING DETAIL

NOT TO SCALE

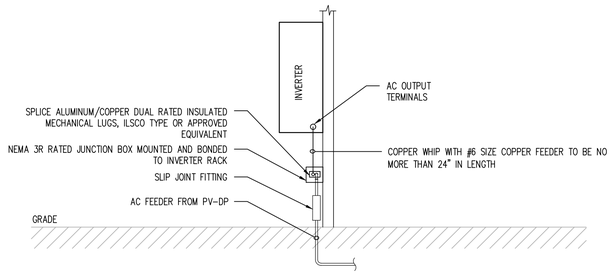


NOTES:

1. THIS DETAIL PERTAINS TO AC TERMINATIONS OF THE CONDUCTORS INTO THE PV DISTRIBUTION CIRCUIT BREAKER IF THE WIRE SIZE EXCEEDS THE MAXIMUM ALLOWABLE TERMINATION WIRE SIZE FOR CIRCUIT BREAKER.
2. WIREWAY SHALL BE SIZED PER NEC 376 FILL REQUIREMENTS.
3. SPLICE A COPPER WHIP WITH #4 SIZE COPPER FEEDER TO THE FEEDER FROM THE PV DISTRIBUTION PANELBOARD VIA MECHANICAL LUGS.
4. TERMINATE THE FEEDER FROM THE PV DISTRIBUTION PANELBOARD INTO THE WIREWAY.
5. TERMINATE ONE END OF THE COPPER WHIP INTO THE WIREWAY AND THE OTHER INTO THE CIRCUIT BREAKER TERMINATION LUGS.
6. EXACT MOUNTING LOCATION OF WIREWAY TO BE DETERMINED IN THE FIELD AS TO AVOID INTERFERENCE WITH OTHER CONDUCTOR RUNS.

4 PV-5 PANELBOARD AC OUTPUT SPLICE

NOT TO SCALE

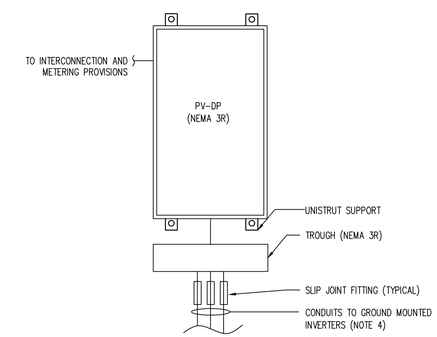


NOTES:

1. THIS DETAIL PERTAINS TO AC TERMINATIONS OF THE CONDUCTORS INTO THE INVERTER IF THE WIRE SIZE EXCEEDS THE MAXIMUM ALLOWABLE TERMINATION WIRE SIZE OF #6 AWG.
2. JUNCTION BOX SHALL BE SIZED PER NEC FILL REQUIREMENTS.
3. SPLICE A COPPER WHIP WITH #6 SIZE COPPER FEEDER TO THE FEEDER FROM THE PV DISTRIBUTION PANELBOARD VIA MECHANICAL LUGS.
4. TERMINATE THE FEEDER FROM THE PV DISTRIBUTION PANEL INTO THE JUNCTION BOX.
5. TERMINATE ONE END OF THE COPPER WHIP INTO THE JUNCTION BOX AND THE OTHER INTO THE AC OUTPUT TERMINALS OF THE INVERTER.
6. EXACT MOUNTING LOCATION OF JUNCTION BOX TO BE DETERMINED IN THE FIELD AS TO AVOID INTERFERENCE WITH OTHER CONDUCTOR RUNS.

5 PV-5 INVERTER AC OUTPUT SPLICE DETAIL

NOT TO SCALE



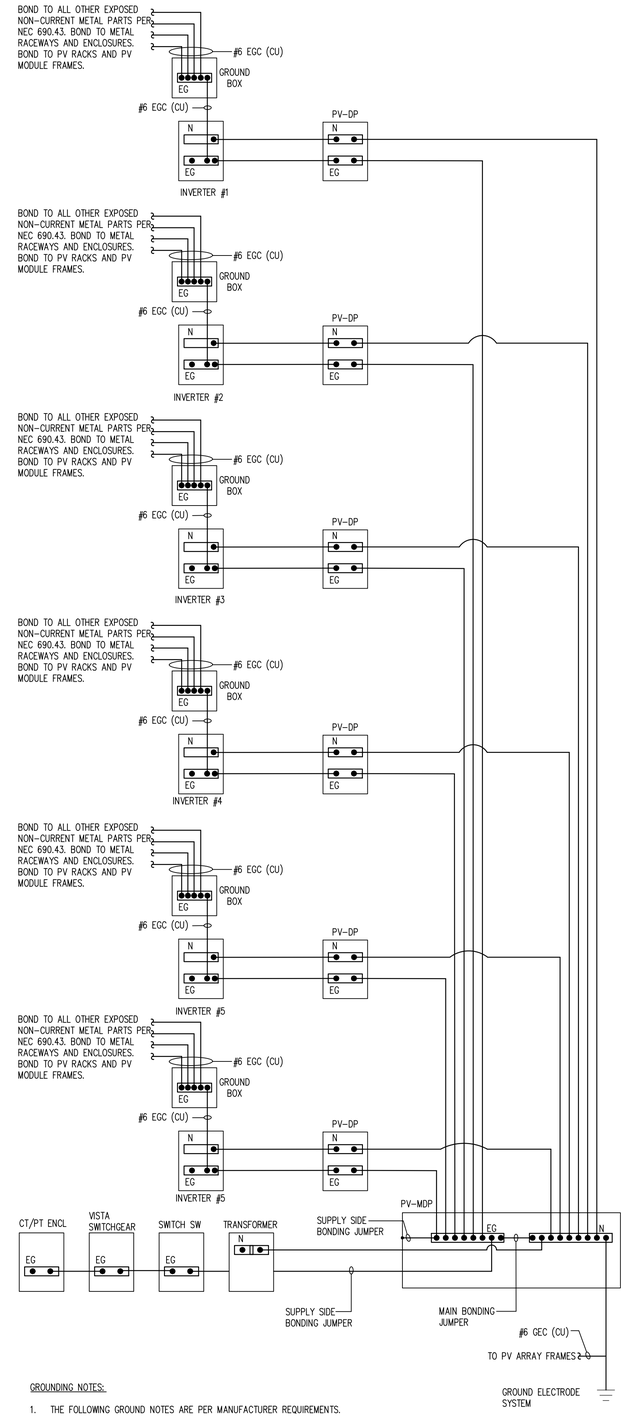
SOLAR PV DESIGN UTILIZING ONE (1) PV DISTRIBUTION PANEL

NOTES:

1. THERE SHALL BE NO PENETRATIONS IN THE TOP OF THE PV DISTRIBUTION PANEL(S).
2. TROUGH TO BE SIZED PER NEC REQUIREMENTS.
3. PROVIDE LIQUID-TIGHT CONDUIT AND FITTINGS FOR ALL EXTERIOR CONDUIT AND TERMINATIONS.
4. ROUTE CONDUITS UNDERGROUND TO INVERTER LOCATIONS.

6 PV-5 TROUGH INSTALLATION DETAIL

NOT TO SCALE



GROUNDING NOTES:

1. THE FOLLOWING GROUND NOTES ARE PER MANUFACTURER REQUIREMENTS.
2. INVERTER REQUIRES ONE SYSTEM GROUND ON THE AC SIDE. PROVIDE A FIVE CONDUCTOR RUN, SIZED AS SHOWN ON THE RISER DIAGRAM (L1, L2, L3, N, G). THE AC NEUTRAL – GROUND BOND SUFFICES AS THE SYSTEM GROUND BOND FOR THE INVERTER.
3. DC SIDE DOES NOT REQUIRE A SYSTEM BOND.
4. ENSURE THE MAIN DISTRIBUTION SWITCHGEAR CONTAINS A NEUTRAL TO GROUND BOND.
5. TO AVOID POTENTIAL GROUND LOOPS THE EQUIPMENT BOND MUST BE CONNECTED TO THE AC GROUNDING SCHEME.
6. THE NEUTRAL AND GROUND IN THE PV DISTRIBUTION PANELBOARD AND THE INVERTER BANK SUB-PANELS SHOULD BE ISOLATED.

7 PV-5 TYPICAL GROUNDING SCHEMATIC

NOT TO SCALE

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

No.	REVISIONS Date	Desc.
1	11/16/2018	D & M SET.

Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	17035516
Date	10/29/2018
CAD File:	PV17035516-PV4-5-6

Title: ELECTRICAL DETAILS 2

Sheet No.

PV-5

Xref (s) : B018263201-1 ; BBELEC-17035601

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PHOTOVOLTAIC SYSTEM
AC DISCONNECT

1 PV-6 **AC SOLAR DISCONNECT SIGN**
NOT TO SCALE

THE MAIN SERVICE DISCONNECT IS
LOCATED AT THE METERING
SUBSTATION

2 PV-6 **MAIN SERVICE DISCONNECT SIGN**
NOT TO SCALE

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

3 PV-6 **ELECTRIC SHOCK HAZARD SIGN**
NOT TO SCALE

ALL UTILITY
INTERACTIVE INVERTERS ARE
LOCATED AT THE ARRAY

4 PV-6 **ELECTRICAL POWER SOURCE DIRECTORY**
NOT TO SCALE

WARNING!
ELECTRIC SHOCK HAZARD.
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE
UNGROUNDED AND MAY BE ENERGIZED.

5 PV-6 **DC DISCONNECT INVERTER PLAQUE**
NOT TO SCALE

PHOTOVOLTAIC SYSTEM DC DISCONNECT	
RATED MAX. POWER-POINT CURRENT: (MPP1)	27.81 ADC
RATED MAX. POWER-POINT CURRENT: (MPP2)	27.81 ADC
RATED MAX. POWER-POINT CURRENT: (MPP3)	27.81 ADC
RATED MAX. POWER-POINT CURRENT: (MPP4)	18.54 ADC
RATED MAX. POWER-POINT VOLTAGE:	716.4 VDC
MAXIMUM SYSTEM VOLTAGE:	953.6 VDC
RATED MAX. CIRCUIT CURRENT: (MPP1)	36.9 ADC
RATED MAX. CIRCUIT CURRENT: (MPP2)	36.9 ADC
RATED MAX. CIRCUIT CURRENT: (MPP3)	36.9 ADC
RATED MAX. CIRCUIT CURRENT: (MPP4)	24.6 ADC

6 PV-6 **DC DISCONNECT INVERTER PLAQUE (SOLECTRIA XGI-1000 60KW 11 STRINGS)**
NOT TO SCALE

WARNING!
ELECTRIC SHOCK HAZARD. IF A GROUND
FAULT IS INDICATED NORMALLY
GROUNDED CONDUCTORS MAY BE
UNGROUNDED AND ENERGIZED.

7 PV-6 **INVERTER ELECTRIC SHOCK HAZARD SIGN**
NOT TO SCALE

WARNING:
INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED.
THE PHOTOVOLTAIC SYSTEM AC DISCONNECT IS LOCATED
AT THE METERING SUBSTATION OUTSIDE THE MAIN GATE.

8 PV-6 **PHOTOVOLTAIC DISCONNECT SIGN**
NOT TO SCALE

ALL UTILITY INTERACTIVE INVERTERS
ARE LOCATED AT THE ARRAY

9 PV-6 **ELECTRICAL POWER SOURCE DIRECTORY**
NOT TO SCALE

WARNING:
INVERTER OUTPUT CONNECTION.
DO NOT RELOCATE THIS OVERCURRENT DEVICE.

10 PV-6 **CIRCUIT BREAKER LABEL**
NOT TO SCALE

INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED.

RATED AC SYSTEM 1 OUTPUT CURRENT: 2995.8 A
RATED AC SYSTEM 2 OUTPUT CURRENT: 2995.8 A
NOMINAL OPERATING AC VOLTAGE: 480V,3Ø

11 PV-6 **CIRCUIT BREAKER LABEL**
NOT TO SCALE

PHOTOVOLTAIC SYSTEM DC DISCONNECT	
RATED MAX. POWER-POINT CURRENT: (MPP1)	27.81 ADC
RATED MAX. POWER-POINT CURRENT: (MPP2)	27.81 ADC
RATED MAX. POWER-POINT CURRENT: (MPP3)	27.81 ADC
RATED MAX. POWER-POINT CURRENT: (MPP4)	27.81 ADC
RATED MAX. POWER-POINT VOLTAGE:	716.4 VDC
MAXIMUM SYSTEM VOLTAGE:	953.6 VDC
RATED MAX. CIRCUIT CURRENT: (MPP1)	36.9 ADC
RATED MAX. CIRCUIT CURRENT: (MPP2)	36.9 ADC
RATED MAX. CIRCUIT CURRENT: (MPP3)	36.9 ADC
RATED MAX. CIRCUIT CURRENT: (MPP4)	36.9 ADC

DC DISCONNECT INVERTER PLAQUE
(SOLECTRIA XGI-1000 65KW 12 STRINGS)

PV SYSTEM LABEL DESCRIPTIONS
NOT TO SCALE.

SOLAR PHOTOVOLTAIC POWER
SOURCE LOCATED ON PREMISES

12 PV-6 **MAIN ENTRANCE SIGN**
NOT TO SCALE

WARNING:
PHOTOVOLTAIC POWER SOURCE

13 PV-6 **RACEWAY LABEL**
NOT TO SCALE

THE MAIN SERVICE DISCONNECT IS LOCATED AT THE
METERING SUBSTATION OUTSIDE THE MAIN GATE.

THE PHOTOVOLTAIC SYSTEM AC DISCONNECTS ARE LOCATED
INSIDE THE MAIN GATE AT SUBSTATIONS 1 & SUBSTATION 2.

14 PV-6 **MAIN ENTRANCE SIGN**
NOT TO SCALE

WARNING:
INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED.
THE INVERTER AC DISCONNECT IS LOCATED AT
SWITCHBOARD PV-MDP AT SUBSTATION #1

NOTE:
SUBSTITUTE SUBSTATION #1 WITH SUBSTATION #2 RESPECTIVELY.

16 PV-6 **INVERTER DISCONNECT SIGN**
NOT TO SCALE

CIRCUIT CONDUCTOR	CONDUCTOR COLOR
PHASE A	BROWN
PHASE B	ORANGE
PHASE C	YELLOW
NEUTRAL	GREY
GROUND	GREEN

NOTE:
PROVIDE NAMEPLATE AT EACH CONDUCTOR END AND AT EACH HANDHOLE/MANHOLE. THE NAMEPLATE SHALL BE A YELLOW LAMICOID NAMEPLATE WITH BLACK LETTERS INDICATING THE FOLLOWING: VOLTAGE, PHASE SOURCE. SECURE THE NAMEPLATE TO THE CABLE WITH TIE WRAP.

17 PV-6 **TYPICAL 480/277V PANELBOARD/SWITCHBOARD CONDUCTOR IDENTIFICATION NAMEPLATE**
NOT TO SCALE

CIRCUIT CONDUCTOR	CONDUCTOR COLOR
PHASE A	BLACK
PHASE B	RED
PHASE C	BLUE
NEUTRAL	WHITE
GROUND	GREEN

NOTE:
PROVIDE NAMEPLATE AT EACH CONDUCTOR END AND AT EACH HANDHOLE/MANHOLE. THE NAMEPLATE SHALL BE A YELLOW LAMICOID NAMEPLATE WITH BLACK LETTERS INDICATING THE FOLLOWING: VOLTAGE, PHASE SOURCE. SECURE THE NAMEPLATE TO THE CABLE WITH TIE WRAP.

18 PV-6 **TYPICAL 208/120V PANELBOARD/SWITCHBOARD CONDUCTOR IDENTIFICATION NAMEPLATE**
NOT TO SCALE

CIRCUIT CONDUCTOR	CONDUCTOR COLOR
PHASE A	YELLOW TAPE (ONE STRIPE)
PHASE B	YELLOW TAPE (TWO STRIPE)
PHASE C	YELLOW TAPE (THREE STRIPE)

NOTE:
PROVIDE NAMEPLATE AT EACH CONDUCTOR END AND AT EACH HANDHOLE/MANHOLE. THE NAMEPLATE SHALL BE A YELLOW LAMICOID NAMEPLATE WITH BLACK LETTERS INDICATING THE FOLLOWING: VOLTAGE, PHASE SOURCE. SECURE THE NAMEPLATE TO THE CABLE WITH TIE WRAP.

19 PV-6 **13.2/7.62 KV SWITCHGEAR**
NOT TO SCALE

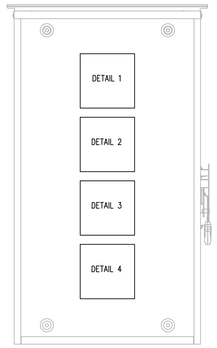

FIGURE 1. AC DISCONNECT
NOT TO SCALE

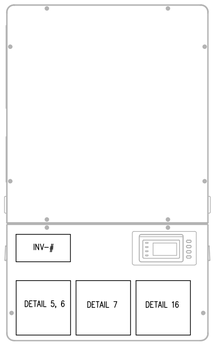

FIGURE 2. TYPICAL INVERTER
NOT TO SCALE

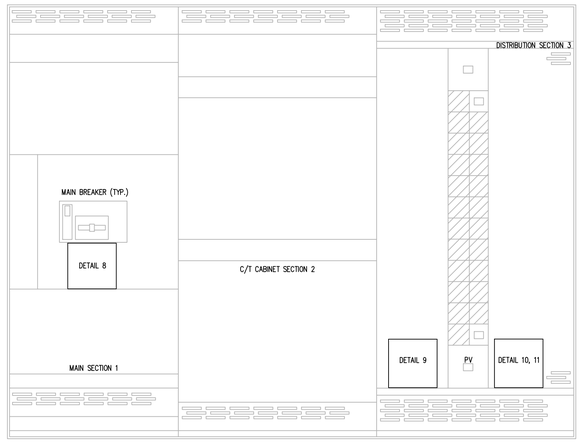

FIGURE 3. TYPICAL SWITCHGEAR
NOT TO SCALE
NOTE: SWITCHGEAR MAY BE CONFIGURED DIFFERENTLY (E.G., NO MAIN BREAKER, TWO SECTION SWITCHGEAR, BREAKER TYPES, ETC.).
CONTRACTOR SHALL ADJUST SIGNAGE IN THE FIELD IF NEEDED PER NEC.

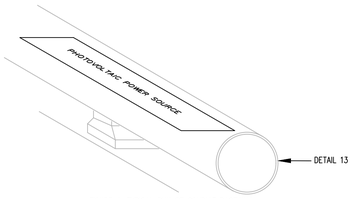

FIGURE 4. TYPICAL RUN OF CONDUIT RACEWAY
NOT TO SCALE

PV SYSTEM LABEL PLACEMENT
NOT TO SCALE

NOTES NAMEPLATE

1. NAMEPLATE MATERIAL SHALL BE A 2-PLY LAMINATED, IMPACT RESISTANT ACRYLIC ENGRAVING STOCK, FINGERPRINT RESISTANT, UV STABLE, OUTDOOR WEATHERABLE, NON GLARE MATTE FINISH.
2. NAMEPLATE SHALL BE RED BACKGROUND WITH WHITE ENGRAVED LETTERS.
3. LETTERS SHALL BE ALL CAPITALIZED, 3/8 INCH MINIMUM HEIGHT, AND NON SERIF FONT UNLESS OTHERWISE NOTED.
4. LETTERS SHALL BE ALL CAPITALIZED, 3/4 INCH MINIMUM HEIGHT, AND NON SERIF FONT.

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Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	1703516
Date	10/29/2018
CAD File:	PV1703516-PV4-5-6

Title
ELECTRICAL
DETAIL 3 - SINAGE
AND LABELING

Sheet No.
PV-6

Xref (s) : B018263920-1 : BBELEC-1703516R1

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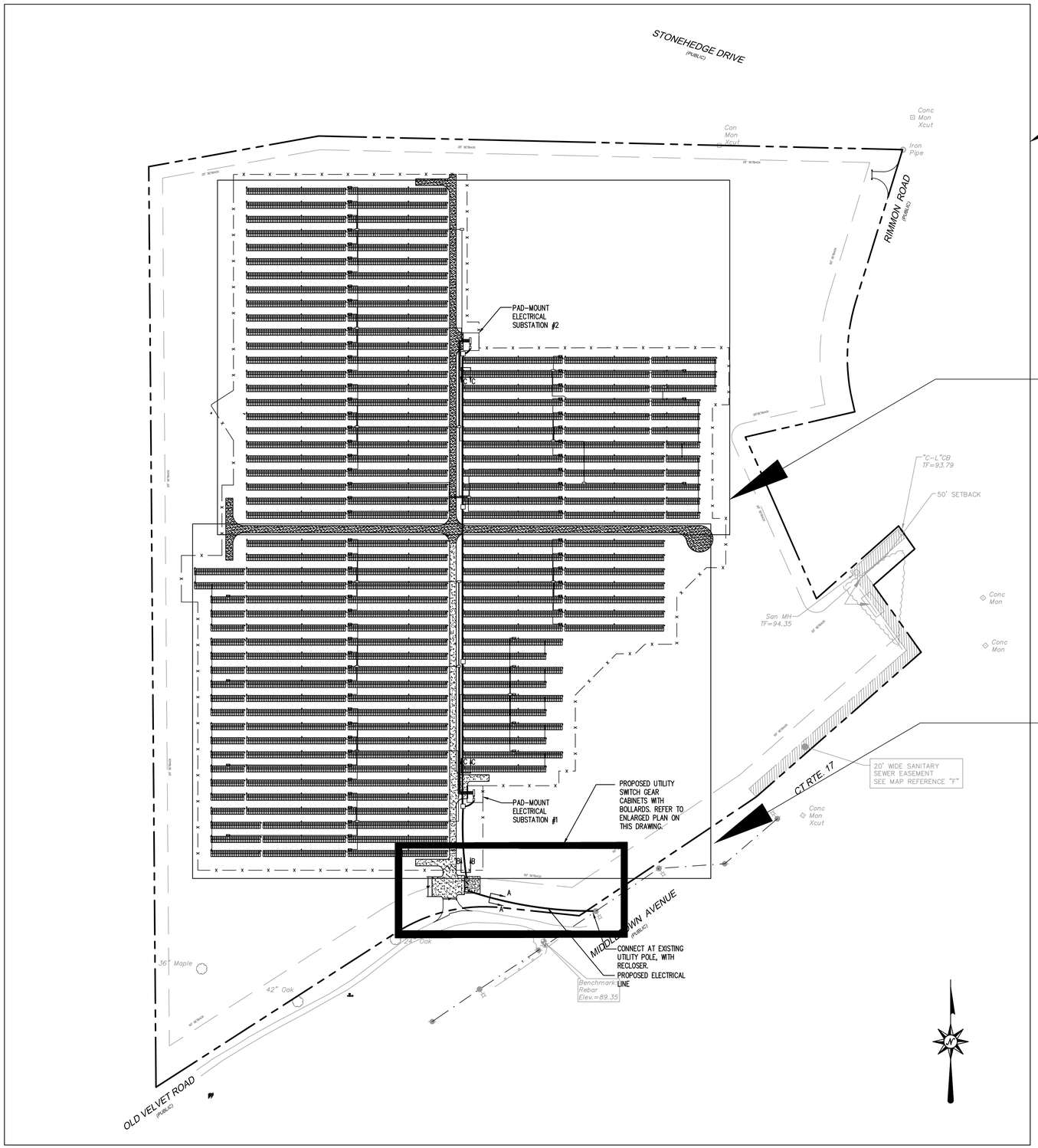


SHEET SE-1

SHEET SE-2

SHEET SE-3

PV MODULE SCHEDULE

SUBSTATION #1

PANEL MODEL	NEO SOLAR POWER
QUANTITY OF MODULES	8,262
POWER PER MODULE	365 WATTS
TOTAL ARRAY SIZE (DC)	3015.63 MWDC
PANELS IN SERIES	18
INVERTER'S 65KW	30
INVERTER'S 60KW	9

SUBSTATION #2

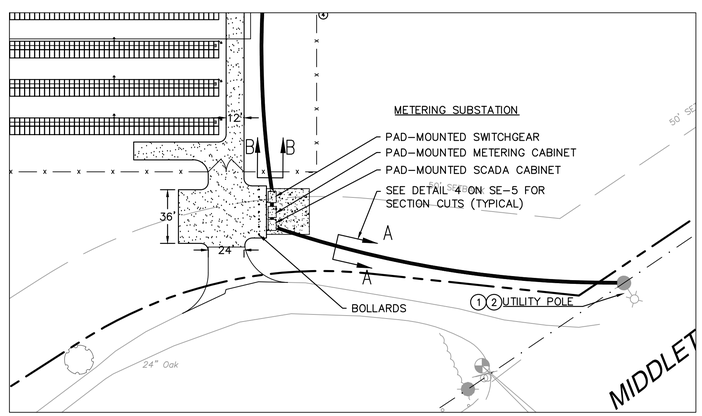
PANEL MODEL	NEO SOLAR POWER
QUANTITY OF MODULES	8,262
POWER PER MODULE	365 WATTS
TOTAL ARRAY SIZE (DC)	3015.63 MWDC
PANELS IN SERIES	18
INVERTER'S 65KW	30
INVERTER'S 60KW	9

SYSTEM TOTAL

QUANTITY OF MODULES	16,524
TOTAL ARRAY SIZE (DC)	6.03126 MWDC

KEY NOTES:

1. UTILITY POLE PROVIDED BY UTILITY COMPANY. (TYPICAL).
2. OVERHEAD 13.8KV, 3ø SERVICE CONDUCTORS AND ASSOCIATED SUPPORT EQUIPMENT PROVIDED BY UTILITY COMPANY. (TYPICAL).



OVERALL SITE ELECTRICAL PLAN

SCALE: 1"=100'

GRAPHIC SCALE
100 50 0 100
SCALE IN FEET

ENLARGED SERVICE EQUIPMENT PLAN

SCALE: 1/4"=1'-0"

GRAPHIC SCALE
1/4" 1/8" 0 1/4"
SCALE IN FEET

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PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

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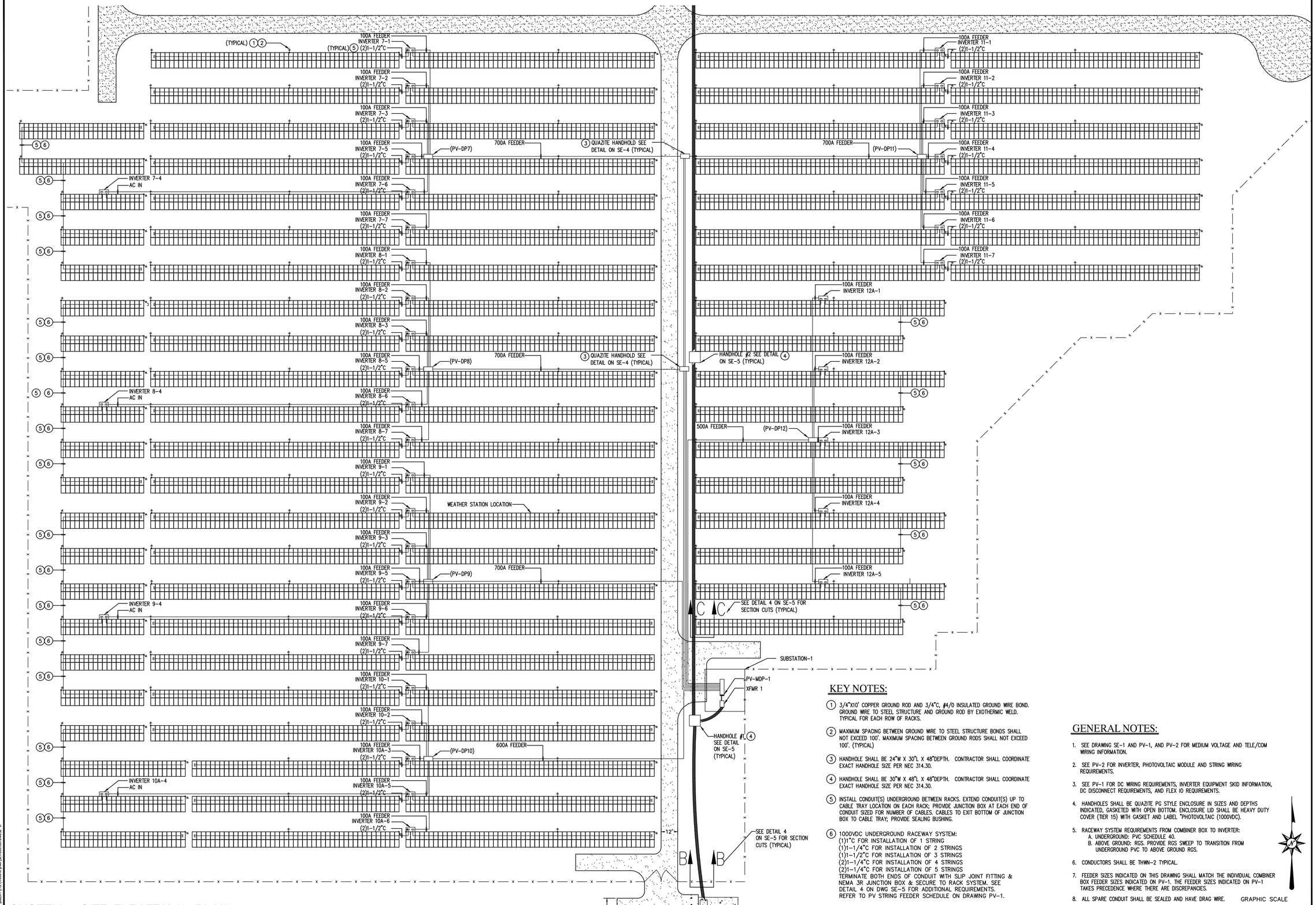
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	17D3516
Date	10/29/2018
CAD File:	SE17D351601

Title
OVERALL SITE ELECTRICAL AND SERVICE EQUIPMENT PLAN

Sheet No.
SE-1

11/21/2018, JPIRTLE, G:\JOBS\17D3516\DWG\SET\D3516SE1.DWG SE-1
Xref (s): ; XH17D351601 ; XG17D351601 ; B017D351601 ; XE17D351601 ; BEGELEC-17D351601 ; B006CT625201 ; X006CT625201 ; X006CT625203 ; SE006CT625201



SYSTEM-2 SITE ELECTRICAL PLAN

SCALE: 1"=30'

KEY NOTES:

1. 3/4"X10' COPPER GROUND ROD AND 3/4"C, #4/0 INSULATED GROUND WIRE BOND. GROUND WIRE TO STEEL STRUCTURE AND GROUND ROD BY EXOTHERMIC WELD. TYPICAL FOR EACH ROW OF RACKS.
2. MAXIMUM SPACING BETWEEN GROUND WIRE TO STEEL STRUCTURE BONDS SHALL NOT EXCEED 100'. MAXIMUM SPACING BETWEEN GROUND RODS SHALL NOT EXCEED 100'. (TYPICAL)
3. HANDHOLE SHALL BE 24"W X 30"L X 48"DEPTH. CONTRACTOR SHALL COORDINATE EXACT HANDHOLE SIZE PER NEC 314.30.
4. HANDHOLE SHALL BE 30"W X 48"L X 48"DEPTH. CONTRACTOR SHALL COORDINATE EXACT HANDHOLE SIZE PER NEC 314.30.
5. INSTALL CONDUIT(S) UNDERGROUND BETWEEN RACKS. EXTEND CONDUIT(S) UP TO CABLE TRAY LOCATION ON EACH RACK; PROVIDE JUNCTION BOX AT EACH END OF CONDUIT SIZED FOR NUMBER OF CABLES. CABLES TO EXIT BOTTOM OF JUNCTION BOX TO CABLE TRAY; PROVIDE SEALING BUSHING.
6. 1000VDC UNDERGROUND RACEWAY SYSTEM:
   (1)1"C FOR INSTALLATION OF 1 STRING
   (1)1-1/4"C FOR INSTALLATION OF 2 STRINGS
   (1)1-1/2"C FOR INSTALLATION OF 3 STRINGS
   (2)1-1/4"C FOR INSTALLATION OF 4 STRINGS
   (2)1-1/4"C FOR INSTALLATION OF 5 STRINGS
   TERMINATE BOTH ENDS OF CONDUIT WITH SLIP JOINT FITTING & NEMA 3R JUNCTION BOX & SECURE TO RACK SYSTEM. SEE DETAIL 4 ON DWG SE-5 FOR ADDITIONAL REQUIREMENTS. REFER TO PV STRING FEEDER SCHEDULE ON DRAWING PV-1.

GENERAL NOTES:

1. SEE DRAWING SE-1 AND PV-1, AND PV-2 FOR MEDIUM VOLTAGE AND TELE/COM WIRING INFORMATION.
2. SEE PV-2 FOR INVERTER, PHOTOVOLTAIC MODULE AND STRING WIRING REQUIREMENTS.
3. SEE PV-1 FOR DC WIRING REQUIREMENTS, INVERTER EQUIPMENT SKID INFORMATION, DC DISCONNECT REQUIREMENTS, AND FLEX IO REQUIREMENTS.
4. HANDHOLES SHALL BE QUAZITE PG STYLE ENCLOSURE IN SIZES AND DEPTHS INDICATED, GASKETED WITH OPEN BOTTOM. ENCLOSURE LID SHALL BE HEAVY DUTY COVER (TIER 15) WITH GASKET AND LABEL "PHOTOVOLTAIC (1000VDC).
5. RACEWAY SYSTEM REQUIREMENTS FROM COMBINER BOX TO INVERTER:
   A. UNDERGROUND: PVC SCHEDULE 40.
   B. ABOVE GROUND: RGS. PROVIDE RGS SWEEP TO TRANSITION FROM UNDERGROUND PVC TO ABOVE GROUND RGS.
6. CONDUCTORS SHALL BE THWN-2 TYPICAL.
7. FEEDER SIZES INDICATED ON THIS DRAWING SHALL MATCH THE INDIVIDUAL COMBINER BOX FEEDER SIZES INDICATED ON PV-1. THE FEEDER SIZES INDICATED ON PV-1 TAKES PRECEDENCE WHERE THERE ARE DISCREPANCIES.
8. ALL SPARE CONDUIT SHALL BE SEALED AND HAVE DRAG WIRE.

GRAPHIC SCALE
30 15 0 30
SCALE IN FEET

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NORTH HAVEN, CONNECTICUT

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No.	Date	Desc.
1.	11/16/2018	D & M SET.

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Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	1703516
Date	10/29/2018
CAD File:	SE17D351601

Title: SUBSTATION-1 SITE ELECTRICAL PLAN

Sheet No.: SE-2

Xref (s): ; XH17D35601 ; XC17D35601 ; BV17D35601 ; BXELEC-17D35601 ; BD0616252501 ; XC0616252501 ; XC0616252503 ; SE0616252501

11/27/2018, JPIETE, G:\JOBS\17\VD\D35\DWG\SW\SE17D35601SW.DWG,E-2

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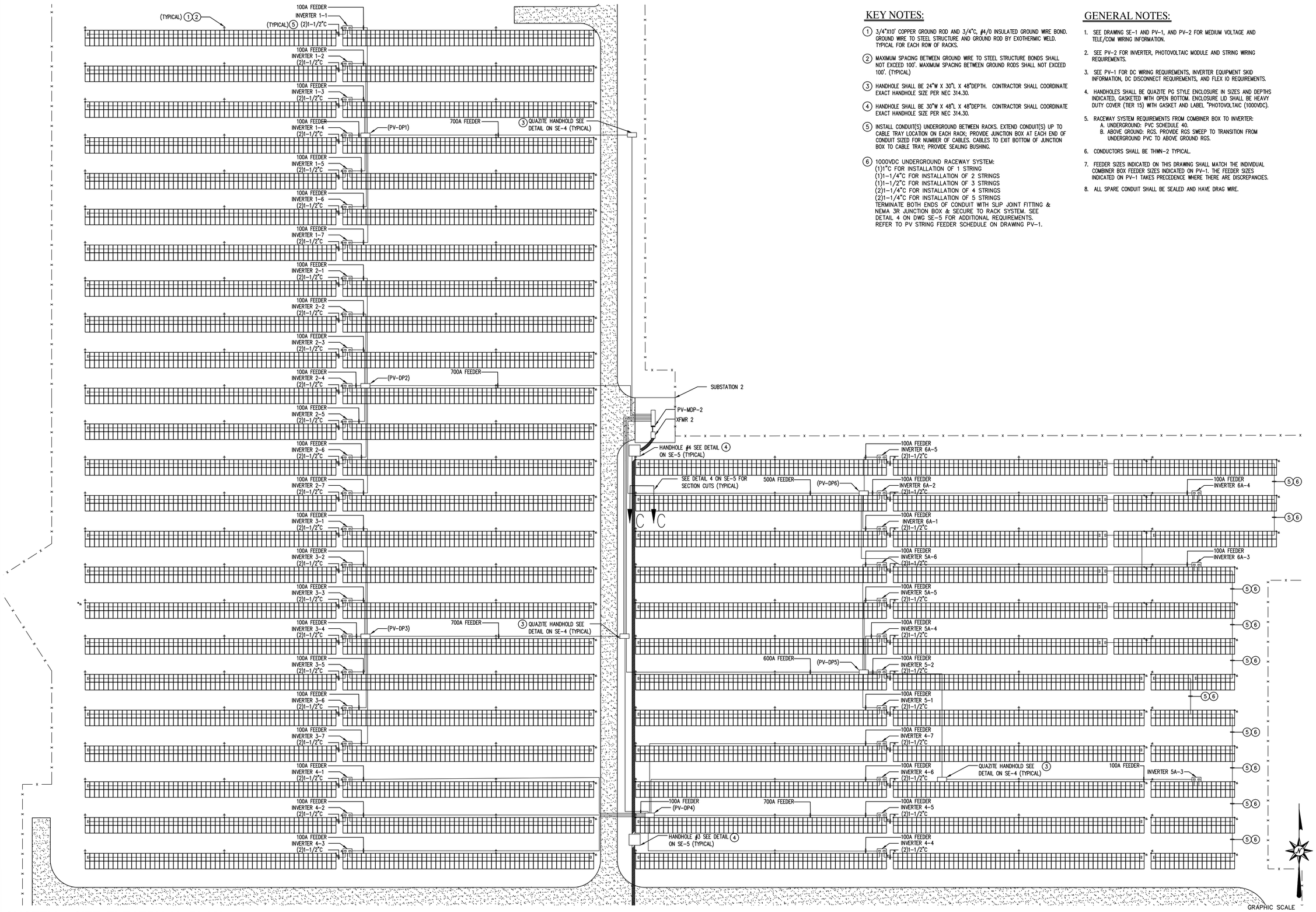

SYSTEM-1 SITE ELECTRICAL PLAN

SCALE: 1"=30'

KEY NOTES:

1. 3/4"X10' COPPER GROUND ROD AND 3/4"C, #4/0 INSULATED GROUND WIRE BOND. GROUND WIRE TO STEEL STRUCTURE AND GROUND ROD BY EXOTHERMIC WELD. TYPICAL FOR EACH ROW OF RACKS.
2. MAXIMUM SPACING BETWEEN GROUND WIRE TO STEEL STRUCTURE BONDS SHALL NOT EXCEED 100'. MAXIMUM SPACING BETWEEN GROUND RODS SHALL NOT EXCEED 100'. (TYPICAL)
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6. 1000VDC UNDERGROUND RACEWAY SYSTEM:
   (1)1"C FOR INSTALLATION OF 1 STRING
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   (1)1-1/2"C FOR INSTALLATION OF 3 STRINGS
   (2)1-1/4"C FOR INSTALLATION OF 4 STRINGS
   (2)1-1/4"C FOR INSTALLATION OF 5 STRINGS
   TERMINATE BOTH ENDS OF CONDUIT WITH SLIP JOINT FITTING & NEMA 3R JUNCTION BOX & SECURE TO RACK SYSTEM. SEE DETAIL 4 ON DWG SE-5 FOR ADDITIONAL REQUIREMENTS.
   REFER TO PV STRING FEEDER SCHEDULE ON DRAWING PV-1.

GENERAL NOTES:

1. SEE DRAWING SE-1 AND PV-1, AND PV-2 FOR MEDIUM VOLTAGE AND TELE/COM WIRING INFORMATION.
2. SEE PV-2 FOR INVERTER, PHOTOVOLTAIC MODULE AND STRING WIRING REQUIREMENTS.
3. SEE PV-1 FOR DC WIRING REQUIREMENTS, INVERTER EQUIPMENT SKID INFORMATION, DC DISCONNECT REQUIREMENTS, AND FLEX IO REQUIREMENTS.
4. HANDHOLES SHALL BE QUAZITE PG STYLE ENCLOSURE IN SIZES AND DEPTHS INDICATED, GASKETED WITH OPEN BOTTOM. ENCLOSURE LID SHALL BE HEAVY DUTY COVER (TIER 15) WITH GASKET AND LABEL "PHOTOVOLTAIC (1000VDC).
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6. CONDUCTORS SHALL BE THWN-2 TYPICAL.
7. FEEDER SIZES INDICATED ON THIS DRAWING SHALL MATCH THE INDIVIDUAL COMBINER BOX FEEDER SIZES INDICATED ON PV-1. THE FEEDER SIZES INDICATED ON PV-1 TAKES PRECEDENCE WHERE THERE ARE DISCREPANCIES.
8. ALL SPARE CONDUIT SHALL BE SEALED AND HAVE DRAG WIRE.

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PHOTOVOLTAIC INSTALLATION
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NORTH HAVEN, CONNECTICUT

REVISIONS
No. | Description | Date
1 | D & W SET | 11/16/2018

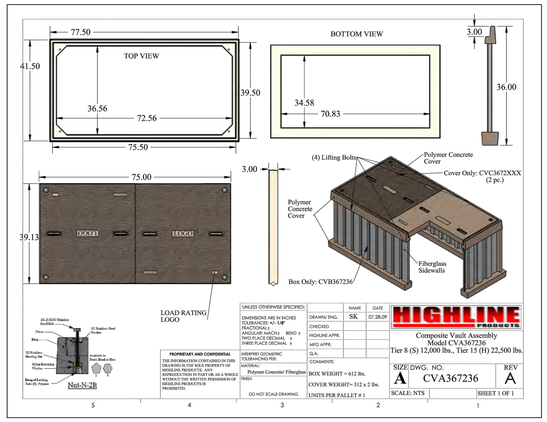
Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	1703516
Date	10/29/2018
CAD File:	SE1703516O1

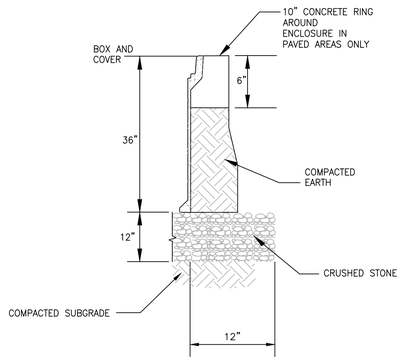
Title: SUBSTATION-2 SITE ELECTRICAL PLAN

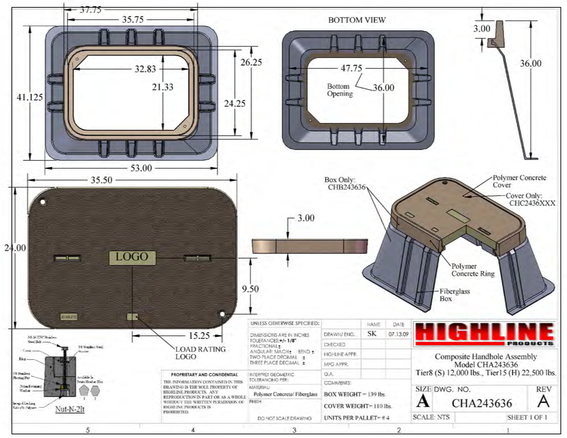
Sheet No.: SE-3

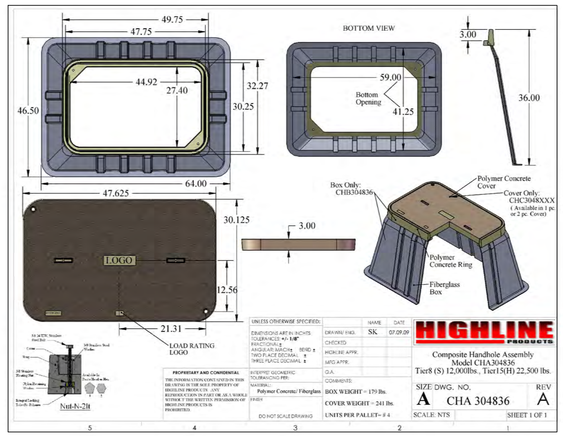
Xref (s): ; X:\1703516O1 ; X:\1703516O1 ; B01703516O1 ; X:\1703516O1 ; B0ELEC-1703516O1 ; X:\2062162502\1 ; X:\2062162502\2 ; SE2062162502

11/29/2018, JPRETE, G:\JOBS\17\1703516O1\DWG\SE\1703516O1SNC-SE-3.









NOTES:

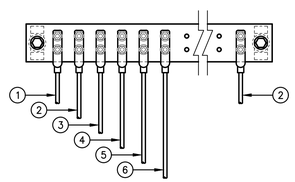
1. SEE DETAILS 3 AND 4/SE-6 AND 1/SE-7 FOR ADDITIONAL INFORMATION (FOR CVA367236 ONLY)

① TYPICAL HANDHOLE DETAIL

SCALE: N.T.S.

TYPICAL HANDHOLE GROUND BAR GROUNDING DETAIL

1. #4/0 AWG UNINSULATED COPPER GROUNDING ELECTRODE CONDUCTOR FROM GROUNDING ELECTRODE TO GROUND BAR. TERMINATE TO GROUNDING ELECTRODE BY EXOTHERMIC WELD AND GROUND BAR BY APPROVED MECHANICAL MEANS.
2. #4/0 AWG. UNINSULATED COPPER GROUND RING AROUND INTERIOR PERIMETER OF HANDHOLE. TERMINATE TO GROUND RING BY EXOTHERMIC WELD.
3. SPLICE TOGETHER EACH FEEDER EQUIPMENT GROUNDING CONDUCTOR BY EXOTHERMIC WELD, EXTEND #4/0 AWG. UNINSULATED FEEDER EQUIPMENT GROUNDING CONDUCTOR FROM SPLICE TO GROUND BAR AND TERMINATE BY APPROVED MECHANICAL MEANS.
4. EXTEND 4/0 AWG. UNINSULATED COPPER DUCT BANK UFER FROM DUCTBANK TO GROUND BAR AND TERMINATE BY APPROVED MECHANICAL MEANS.
5. SPLICE TOGETHER EACH CABLE SPLICE SHIELD GROUND BY EXOTHERMIC WELD, EXTEND #6 AWG. UNINSULATED COPPER GROUNDING CONDUCTOR FROM CABLE SPLICE SHIELD GROUND(S) TO GROUND BAR. TERMINATE TO SHIELD GROUNDS BY EXOTHERMIC WELD AND TO GROUND BAR BY APPROVED MECHANICAL MEANS. SUPPORT CONDUCTORS 18"O.C. BY HARGER CCC2 WIRE CLIPS WITH STAINLESS STEEL ANCHORS.
6. #4 AWG UNINSULATED COPPER GROUNDING CONDUCTOR FROM EXPOSED METAL PARTS OF HANDHOLE INTERIOR (INCLUDING BUT NOT LIMITED TO METAL INSERTS, METAL ENCLOSURE, METAL RACEWAYS, HANDHOLE COVER FRAMES, PULLING IRONS, LIFTING IRONS, DRAINS, ETC.) TO GROUND BAR. TERMINATE TO EXPOSED METAL PARTS BY EXOTHERMIC WELD AND GROUND BAR BY APPROVED MECHANICAL MEANS.
7. SUPPORT ALL GROUNDING CONDUCTORS WITH HARGER CCC3 AND/OR CCC2 WIRE CLIPS WITH STAINLESS STEEL ANCHORS 18"O.C. TYPICAL.

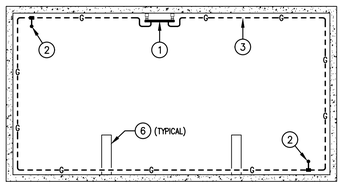


② TYPICAL HANDHOLE GROUND BAR GROUNDING DETAIL

SCALE: N.T.S.

TYPICAL HANDHOLE GROUNDING AND CABLE RACK DETAIL

1. HARGER "J" PATTERN GBI14412J COPPER GROUND BAR. ANCHOR TO WALL WITH (2) STAINLESS STEEL BRACKETS, INSULATORS AND (4) STAINLESS STEEL ANCHORS. INSTALL AT DIAGONAL CORNERS OF MANHOLE, FIELD COORDINATE EXACT LOCATION. SEE TYPICAL MANHOLE GROUND BAR GROUNDING DETAIL.
2. GROUNDING ELECTRODE (GROUND ROD).
3. COPPER GROUND RING. SUPPORT TO MANHOLE WALLS 18" O.C. WITH HARGER CCC3 WIRE CLIPS; ANCHOR TO WALL WITH STAINLESS STEEL ANCHORS.
4. SEE SPECIFICATION 260526 FOR ADDITIONAL INFORMATION.
5. SUPPORT ALL GROUND BARS AND GROUND CONDUCTORS A MINIMUM OF 18" ABOVE THE FLOOR OF THE MANHOLE OR 12" ABOVE THE HIGHEST POINT OF THE DRAIN PIPE (WHICHEVER IS HIGHER). FIELD COORDINATE EXACT REQUIREMENTS.
6. CABLE RACK. PROVIDE 2 NON METALLIC CABLE RACKS PER NEW HANDHOLE. FIELD COORDINATE EXACT REQUIREMENTS. PROVIDE A MINIMUM OF 2 CABLE ARMS PER RACK.



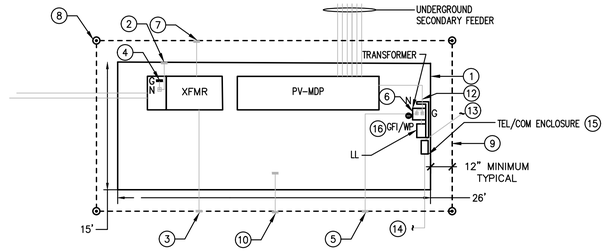
HANDHOLE GROUNDING DETAIL - PLAN VIEW

③ TYPICAL HANDHOLE GROUNDING AND CABLE RACK DETAIL

SCALE: N.T.S.

PHOTOVOLTAIC EQUIPMENT SUBSTATION GROUND NOTES:

1. CONCRETE EQUIPMENT PAD. PROVIDE CONCRETE ENCASED ELECTRODE WITHIN CONCRETE PAD FOOTING IN ACCORDANCE WITH NEC 250.52 (A)(3): ELECTRICALLY CONDUCTIVE STEEL BAR SHALL BE NOT LESS THAN 1/2" DIAMETER AND INSTALL ONE 20' CONTINUOUS LENGTH (OR MADE CONTINUOUS BY WELDING ON TIE WIRE), ENCASED IN A MINIMUM OF 2" OF CONCRETE, AND CONCRETE SHALL BE IN DIRECT CONTACT WITH EARTH.
2. 1"C., #4/0 BARE COPPER GEC. BOND TO MAIN SWITCH BY APPROVED MECHANICAL MEANS. BOND TO GROUND RING BY EXOTHERMIC WELD.
3. 1"C., #4/0 BARE COPPER GEC. BOND TO TRANSFORMER ENCLOSURE BUS BY APPROVED MECHANICAL MEANS. BOND TO GROUND RING BY EXOTHERMIC WELD.
4. #750 KCMIL BARE COPPER NEUTRAL TO GROUND BONDING JUMPER PER MANUFACTURER'S REQUIREMENTS FOR SERVICE ENTRANCE RATED EQUIPMENT.
5. 3/4"C., #4 BARE COPPER GEC. BOND TO NEUTRAL BUS OF 15KVA TRANSFORMER BY APPROVED MECHANICAL MEANS AND TO GROUND RING BY EXOTHERMIC WELD.
6. #8 BARE COPPER NEUTRAL TO GROUND BONDING JUMPER.
7. 1"C, #4/0 BARE COPPER GEC. BOND TO TRANSFORMER ENCLOSURE APPROVED MECHANICAL MEANS. BOND TO GROUND RING BY EXOTHERMIC WELD.
8. GROUNDING ROD TYPICAL
9. #4/0 AWG; UNINSULATED COPPER GROUND RING ELECTRODE CONDUCTOR. GROUND RING SHALL BE BURIED A MINIMUM OF 30" BFG. TERMINATE TO GROUND RODS BY EXOTHERMIC WELD.
10. 1"C, #4/0 BARE COPPER GEC. BOND TO CONCRETE ENCASED ELECTRODE AS SPECIFIED IN KEYNOTE 1 ABOVE.
11. #4/0 BARE COPPER BONDING JUMPER; BOND TO ENCLOSURE PER MANUFACTURER'S REQUIREMENTS.
12. UNDERGROUND FEEDER TO TRANSFORMER. PROVIDE LFMC CONNECTION AT TRANSFORMER.
13. (2) 1" UNDERGROUND TEL/COM CONDUITS FROM INVERTERS TO TEL/COM ENCLOSURE; SEE DRAWINGS SE-2 AND SE-3 FOR CONTINUATION. TERMINATE TO ENCLOSURE AT BOTH ENDS WITH SLIP JOINT FITTING.
14. (2) 2" UNDERGROUND TEL/COM CONDUITS FROM TEL/COM ENCLOSURE TO METERING SUBSTATION; SEE DRAWING SE-2 AND SE-3 FOR CONTINUATION.
15. NEMA 3R HINGED ENCLOSURE MOUNTED AT 48" ABOVE CONCRETE TO TOP OF ENCLOSURE WITH UNISTRUT SUPPORT; ENCLOSURE SHALL BE 24"x24"x4" MINIMUM. PROVIDE NEMA 5-20R DUPLEX RECEPTACLE WITHIN ENCLOSURE FOR POWER TO REPEATER; HOMERUN CIRCUIT TO LP1: 3/4"C, 2#12, 1#12GND (THHN/THWN-2 CU) PROVIDE COMMFRONT RPT-485, RS485 REPEATER OR EQUIVALENT WITHIN ENCLOSURE AND INSTALL PER MANUFACTURER'S REQUIREMENTS.
16. PROVIDE NEMA 5-20R GFI RECEPTACLE WITH WEATHERPROOF ENCLOSURE, AND HOMERUN CIRCUIT TO LP1: 3/4"C, 2#12, #12GND(THHN/THWN-2 CU)

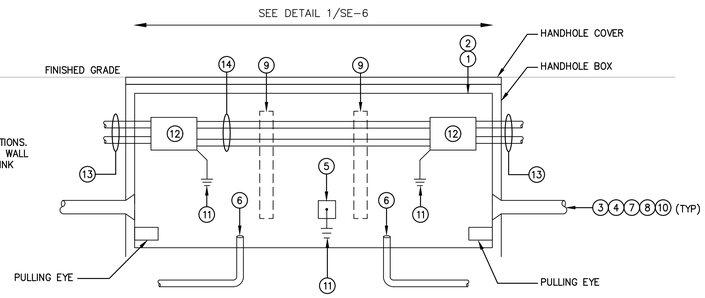


NOTES:

1. SEE DETAIL SE-6 FOR TYPICAL PHOTOVOLTAIC SYSTEM CONCRETE PAD REQUIREMENTS
2. SEE PV-1 AND PV-2 FOR ADDITIONAL INFORMATION AND REQUIREMENTS
3. RACEWAYS INTO EQUIPMENT BASES SHALL BE WITH RMC CONDUIT, GALVANIZED BELL END FITTING AND GROUNDING BUSHING, BONDED TO EQUIPMENT ENCLOSURE TYPICAL.
4. SUPPORT TRANSFORMER AND PANELBOARD FROM UNISTRUT APPROXIMATELY 24" ABOVE CONCRETE TO BOTTOM OF ENCLOSURE.

④ TYPICAL PHOTOVOLTAIC SYSTEM EQUIPMENT PLATFORM GROUND GRID

SCALE: N.T.S.



NOTES:

1. SEE SE-1 FOR APPROXIMATE LOCATIONS.
2. SEAL ALL PENETRATIONS INTO SIDE WALL OF HAND HOLE ENCLOSURE WITH LINK SEAL TYPICAL.

DETAIL KEY NOTES:

1. FIBERGLASS/POLYMER CONCRETE ELECTRICAL HANDHOLE/PULL BOX, OPEN BOTTOM, TIER 8 LOAD RATING. POLYMER ONE-PIECE ENCLOSURE TOP WITH STAINLESS STEEL PENTA HEAD HARDWARE; SEE DETAIL ON DRAWING SE-6 FOR DIMENSIONS. PROVIDE HANDHOLE WITH CABLE RACKS, PULLING EYES, CONDUIT BELL END TERMINATIONS, AND FACTORY INSTALLED KNOCKOUT LOCATIONS.
2. LABEL ENCLOSURE: "DANGER-HIGH VOLTAGE- KEEP OUT" PER NEC 314.72 (E).
3. CONDUIT ENTRY INTO ENCLOSURE SHALL BE PARALLEL WITH LONG DIMENSION OF HANDHOLE TYPICAL; WHERE CONDUITS ARE TO EXIT THE HANDHOLE PARALLEL WITH THE SHORT WALL THE CONDUITS SHALL EXIT THE HANDHOLE ON THE LONG WALL OPPOSITE THE CABLE RACKS AND AS CLOSE AS PRACTICABLE TO THE SHORT WALL. TERMINATE ENDS OF CONDUIT WITH GALVANIZED STEEL BELL END FITTINGS. PROVIDE EXPANSION/DEFLECTION FITTING, WITHIN EACH CONDUIT RUN, ADJACENT TO HANDHOLE.
4. SEAL ACTIVE AND SPARE CONDUITS WITH RAYCHEM ROSS RAYFLATE DUCT SEAL SYSTEM AFTER CABLE INSTALLATION.
5. COPPER GROUND BAR (HARGER J PATTERN OR EQUIVALENT WITH S.S. MOUNTING BRACKETS AND INSULATORS). FIELD COORDINATE EXACT LOCATION.
6. 1" RMC CONDUIT TO DUCTBANK. EXTEND #4/0 AWG. UNINSULATED DUCTBANK UFER THRU CONDUIT, INTO PULL BOX AND TERMINATE AT GROUND BUS BY MECHANICAL MEANS. FIELD COORDINATE EXACT LOCATION FOR CONDUIT PENETRATION.
7. EXTEND #4/0 AWG., 600V EQUIPMENT GROUND CONDUCTOR FROM EACH FEEDER TO GROUND BUS BY MECHANICAL MEANS.
8. BOND #4/0 AWG. UNINSULATED GROUND CONDUCTOR TO EACH GROUNDING BUSHING AND TERMINATE TO GROUNDING BUS BY APPROVED MECHANICAL MEANS.
9. PROVIDE FIBERGLASS CABLE RACKS TO SUPPORT CABLES AND/OR SPLICE ASSEMBLIES.
10. SPARE CONDUITS ENTERING PULL BOX SHALL HAVE NEPTCO WL 1800 WOVEN 3/8" (ARAMID) MULE TAPE AND SHALL BE SEALED FOR WATERTIGHT SEAL AT BOTH ENDS OF CONDUIT.
11. SEE HANDHOLE GROUNDING DETAILS 3/SE-6 AND 4/SE-6 FOR ADDITIONAL INFORMATION.
12. 18"x18"x4" NEMA 4X ENCLOSURE. PULLBOX FOR TEL/COM WIRING BETWEEN SOLAR ARRAY AND DECK MONITOR AT CADY BUILDING. MOUNT APPROXIMATELY 6" BELOW TOP OF HANDHOLE TO TOP OF ENCLOSURE.
13. TEL/COM CONDUITS; SEE DETAIL 4 THIS DRAWING FOR ADDITIONAL INFORMATION. TRANSITION TO RMC CONDUIT WITHIN ENCLOSURE. EXTEND AND TERMINATE TO SIDE OF ENCLOSURE WITH CONDUIT HUBS.
14. (2) 2" RMC CONDUIT. EXTEND AND TERMINATE TO SIDE OF ENCLOSURE WITH CONDUIT HUBS.

⑤ TYPICAL BELOW GRADE MEDIUM VOLTAGE HANDHOLE PULL BOX

SCALE: N.T.S.

Architecture
Engineering
Environmental
Land Surveying

BL Companies

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Meriden, CT 06450
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PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

Desc.
D & M SET.

REVISIONS
No. Date
1. 11/16/2018

Designed JCP
Drawn JCP
Reviewed PB
Scale AS NOTED
Project No. 17D3516
Date 10/29/2018

CAD File: SE17D3516101

Title
ELECTRICAL DETAILS, AND GROUNDING

Sheet No.
SE-4

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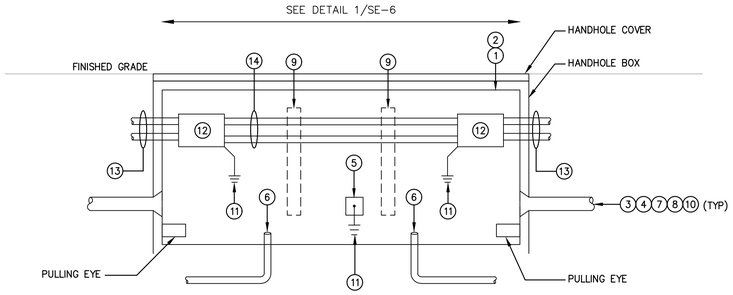

① TYPICAL BELOW GRADE MEDIUM VOLTAGE HANDHOLE PULL BOX
N.T.S.

NOTES:
1. SEE SE-1 FOR APPROXIMATE LOCATIONS.
2. SEAL ALL PENETRATIONS INTO SIDE WALL OF HAND HOLE ENCLOSURE WITH LINK SEAL TYPICAL.

DETAIL KEY NOTES:

1. FIBERGLASS/POLYMER CONCRETE ELECTRICAL HANDHOLE/PULL BOX, OPEN BOTTOM, TIER 8 LOAD RATING. POLYMER ONE-PIECE ENCLOSURE TOP WITH STAINLESS STEEL PENTA HEAD HARDWARE, SEE DETAIL ON DRAWING SE-6 FOR DIMENSIONS. PROVIDE HANDHOLE WITH CABLE RACKS, PULLING EYES, CONDUIT BELL END TERMINATIONS, AND FACTORY INSTALLED KNOCKOUT LOCATIONS.
2. LABEL ENCLOSURE: "DANGER-HIGH VOLTAGE- KEEP OUT" PER NEC 314.72 (E).
3. CONDUIT ENTRY INTO ENCLOSURE SHALL BE PARALLEL WITH LONG DIMENSION OF HANDHOLE TYPICAL; WHERE CONDUITS ARE TO EXIT THE HANDHOLE PARALLEL WITH THE SHORT WALL THE CONDUITS SHALL EXIT THE HANDHOLE ON THE LONG WALL OPPOSITE THE CABLE RACKS AND AS CLOSE AS PRACTICABLE TO THE SHORT WALL. TERMINATE ENDS OF CONDUIT WITH GALVANIZED STEEL BELL END FITTINGS. PROVIDE EXPANSION/DEFLECTION FITTING, WITHIN EACH CONDUIT RUN, ADJACENT TO HANDHOLE.
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7. EXTEND #4/0 AWG., 600V EQUIPMENT GROUND CONDUCTOR FROM EACH FEEDER TO GROUND BUS BY MECHANICAL MEANS.
8. BOND #4/0 AWG. UNINSULATED GROUND CONDUCTOR TO EACH GROUNDING BUSHING AND TERMINATE TO GROUNDING BUS BY APPROVED MECHANICAL MEANS.
9. PROVIDE FIBERGLASS CABLE RACKS TO SUPPORT CABLES AND/OR SPLICE ASSEMBLIES.
10. SPARE CONDUITS ENTERING PULL BOX SHALL HAVE NEPTCO WL 1800 WOVEN 3/8" (ARAMID) MULE TAPE AND SHALL BE SEALED FOR WATERTIGHT SEAL AT BOTH ENDS OF CONDUIT.
11. SEE HANDHOLE GROUNDING DETAILS ON THIS DRAWING.
12. 18"x18"x4" NEMA 4X ENCLOSURE. PULLBOX FOR TEL/COM WIRING BETWEEN SOLAR ARRAY AND DECK MONITOR AT CADY BUILDING. MOUNT APPROXIMATELY 6" BELOW TOP OF HANDHOLE TO TOP OF ENCLOSURE.
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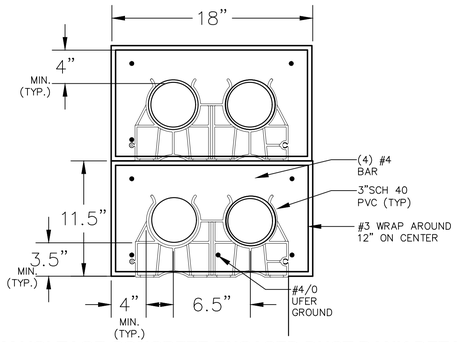
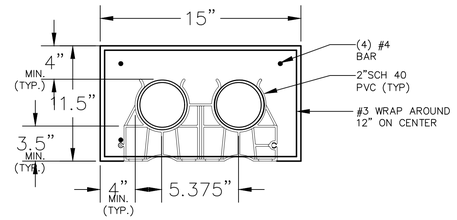
14. (2) 2" RMC CONDUIT. EXTEND AND TERMINATE TO SIDE OF ENCLOSURE WITH CONDUIT HUBS.



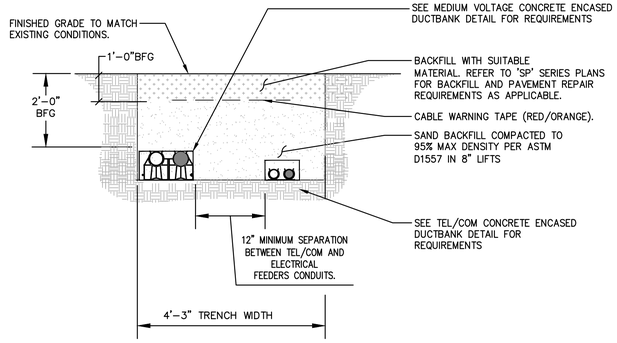
② MEDIUM VOLTAGE CONCRETE ENCASED DUCT BANK DETAIL
N.T.S.

CONCRETE ENCASED DUCT BANK DETAIL NOTES:

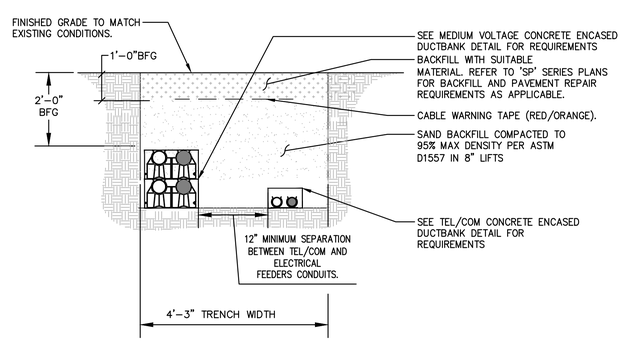
1. DUCT BANK SHALL BE ENCASED IN CONCRETE WITH AT LEAST FOUR INCHES OF CONCRETE AT THE TOP AND FOUR INCHES ON EACH SIDE AND THREE INCHES ON BOTTOM. A HORIZONTAL AND VERTICAL SEPARATION BETWEEN THE DUCTS OF THREE INCHES SHALL BE MAINTAINED BY INSTALLING HIGH IMPACT POLYSTYRENE SPACERS. SPACERS SHALL BE INTERLOCKED HORIZONTALLY ONLY. ALONG THE DUCT RUN SPACERS SHALL BE STAGGERED VERTICALLY AND SHALL BE PLACED AT AN INTERVAL OF FOUR SPACERS PER 20 FEET (5 FEET APART).
2. THE CONCRETE SHALL INCORPORATE 3/8" AGGREGATE WITH A NOMINAL 28 DAY COMPRESSIVE STRENGTH OF 3,000 LBS. PER SQUARE INCH. THE SLUMP SHALL BE AT THE UPPER END OF THE RANGE, PREFERABLY 7 TO 8 INCHES. IT SHOULD HAVE JUST ENOUGH SLUMP TO FLOW TO THE BOTTOM OF THE DUCT BANK AND YET NOT BE SO WET AT TO CAUSE THE CONDUITS TO FLOAT EXCESSIVELY.
3. WHEN PLACING CONCRETE AROUND CONDUITS ADJUST THE DELIVERY CHUTE SO THE FALL OF THE CONCRETE INTO THE TRENCH IS MINIMAL. POUR THE CONCRETE SLOWLY AND DISTRIBUTE IT EVENLY SO AS NOT TO DISLODGE THE SPACERS.
4. THE CONCRETE ENCASEMENT SHALL BE MONOLITHIC OR HAVE THE MINIMUM NUMBER OF JOINTS REQUIRED TO PREVENT DAMAGE DUE TO TEMPERATURE CHANGE.
5. PLASTIC WARNING TAPE SHALL BE "EXTRA-STRETCH" 6" WIDE AS MANUFACTURED BY TERRA-TAPE OR APPROVED EQUAL. COLOR CODE SHALL BE AS FOLLOWS: RED-ELECTRIC, ORANGE-COMMUNICATIONS. IMPRINTED TEXT IDENTIFY DUCT BANK SERVICE. UTILIZE NON-DETECTABLE TAPE FOR ELECTRIC DUCTS AND METALLIZED DETECTABLE TAPE FOR COMMUNICATION DUCTS.
6. DETAIL SHOWS TYPICAL LAYOUT FOR (2) 3" CONDUITS (MEDIUM VOLTAGE DUCTBANK) AND (2) 2" CONDUITS (TEL/COM DUCTBANK). SPACING SHOWN ON THIS DETAIL BETWEEN CONDUITS AND CONCRETE ENVELOPE AROUND CONDUITS IS TYPICAL FOR ALL CONDUIT TYPES AND SIZES.
7. BROADCAST RED DYE TO THE TOP SURFACE OF THE ELECTRICAL DUCTBANK WHILE CONCRETE IS STILL WET.
8. RUN #4/0 BARE COPPER GROUND WIRE ALONG BOTTOM OF ENTIRE DUCTBANK (BOTH CONCRETE ENCASED AND NON-CONCRETE ENCASED). PROVIDE 20' SLACK AT BOTH ENDS IN HANDHOLE & EQUIPMENT BASES.



③ TEL/COM CONCRETE ENCASED DUCT BANK DETAIL
N.T.S.



SECTION A-A
SCALE: N.T.S.



SECTION B-B
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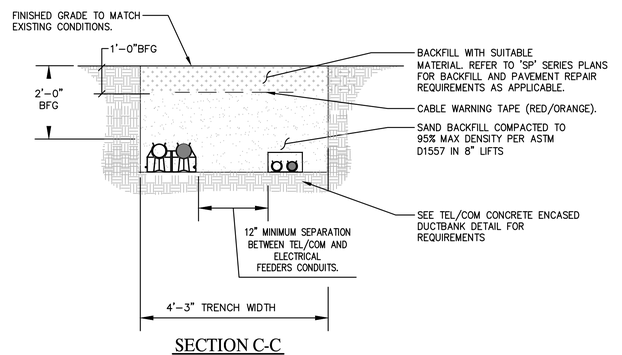
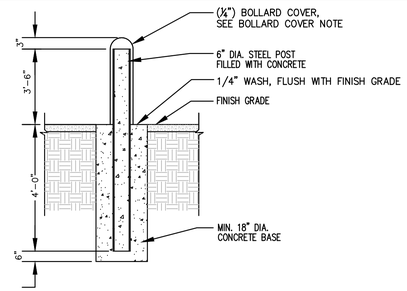


SECTION C-C
SCALE: N.T.S.

UNDERGROUND CONDUIT TRENCH GENERAL NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, PEAT, WOOD, PLASTIC, CONSTRUCTION DEBRIS, METAL, ENVIRONMENTALLY IMPACTED SOIL, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3. PROVIDE SEPARATION OF CONDUITS OF DIFFERENT SYSTEMS (I.E., ELECTRIC, CATV & TELEPHONE) PER NEC REQUIREMENTS. COORDINATE ROUTING OF CONDUITS WITH OTHER TRADES TO MAINTAIN REQUIRED SEPARATION WITH GAS, WATER, ETC., SERVICES.
4. PROVIDE CONDUIT SPACERS 5' O.C. ALL ELBOWS SHALL BE INDEPENDENTLY SUPPORTED.
5. REFER TO PV DRAWINGS FOR EXACT CONDUIT TYPE, SIZE AND QUANTITY, AND FEEDER REQUIREMENTS.

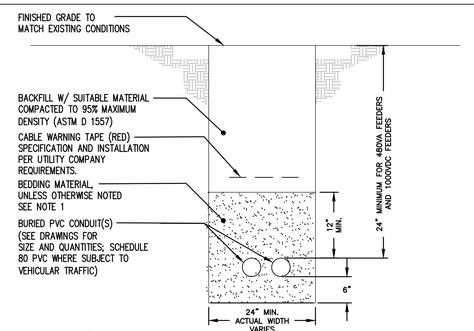
④ SOLAR ARRAY UNDERGROUND CONDUIT TRENCH DETAILS
N.T.S.



BOLLARD COVER NOTE:
MANUFACTURER: IDEALSHIELD® OR APPROVED EQUAL
ADDRESS: 2525 CLARK
STREET, DETROIT, MI 48209
PHONE: 1-866-825-8659
MODULE COVER COLOR: (⅛") 6" BOLLARD
OWNER HEIGHT: AS APPROVED BY
42"

LAYOUT NOTE:
SPACE BOLLARDS 4' O.C., OFFSET 2' O.C. FROM EDGE OF CONCRETE PADS. REFER TO SP-1AND SU-1 PLANS FOR BOLLARD LOCATIONS.

⑤ BOLLARD AT CONCRETE PAD DETAIL
N.T.S.



TYPICAL TRENCHING NOTES:

1. THE BEDDING MATERIAL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, PEAT, WOOD, PLASTIC, CONSTRUCTION DEBRIS, METAL, ENVIRONMENTALLY IMPACTED SOIL, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3. PROVIDE SEPARATION OF CONDUITS OF DIFFERENT SYSTEMS (I.E., ELECTRIC, CATV & TELEPHONE). COORDINATE ROUTING OF CONDUITS WITH OTHER TRADES TO MAINTAIN REQUIRED SEPARATION WITH DIFFERENT SYSTEMS. PROVIDE A MINIMUM OF 12" OF SEPARATION BETWEEN ELECTRIC AND TEL/COM.

⑥ TYPICAL TRENCHING DETAIL (480 VAC FEEDERS, 1000 VDC FEEDERS AND TELE/COM)
N.T.S.

Architecture
Engineering
Environmental
Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

No.	REVISIONS Description	Date
1.	Desc. D & M SET.	11/16/2018

Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	17D3516
Date	10/29/2018
CAD File:	SE17D351601

Title: ELECTRICAL MANHOLE AND DUCT DETAILS

Sheet No. SE-5

Xref (s): X17D351601 ; XC17D351601 ; XB07D351601 ; XE17D351601 ; XB06D625201 ; XX06D625203 ; SE06D625201

1/29/2018, JPRITE, G:\JOBS\17\17D3516\DWG\SET\D3516SE1.DWG SE-5,
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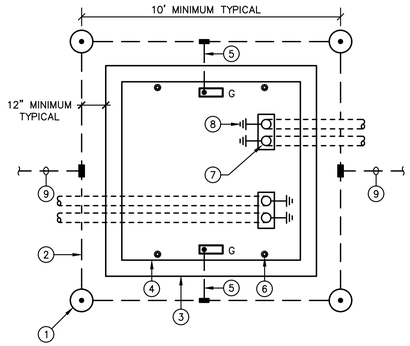
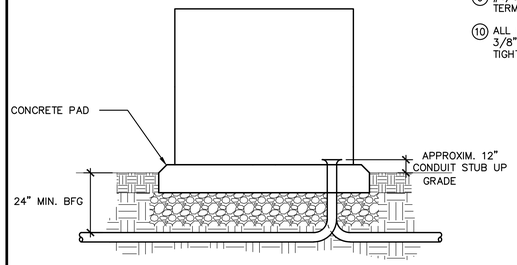


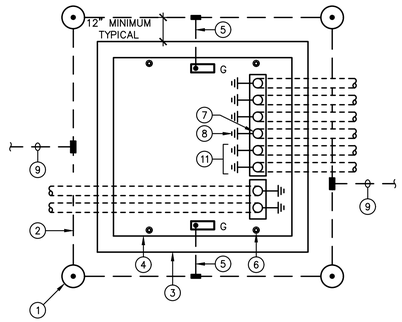
TYPICAL CT/PT CABINET DETAIL - PLAN VIEW

TYPICAL PAD MOUNTED CT/PT CABINET:

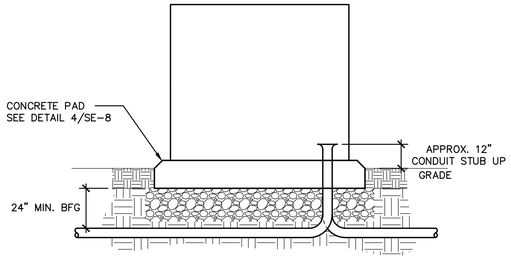
1. GROUNDING ELECTRODE (TYPICAL).
2. #4/0 AWG., UNINSULATED COPPER GROUND RING ELECTRODE CONDUCTOR. GROUND RING SHALL BE BURIED A MINIMUM OF 30" BFG. TERMINATE TO GROUND RODS BY EXOTHERMIC WELD.
3. CONCRETE EQUIPMENT PAD TYPICAL.
4. CT/PT CABINET.
5. #4/0 AWG., UNINSULATED COPPER GEC. TERMINATE TO GROUND RING ELECTRODE BY EXOTHERMIC WELD. TERMINATE TO EQUIPMENT GROUND BUS BY APPROVED MECHANICAL MEANS.
6. EQUIPMENT ANCHOR LOCATIONS (TYPICAL OF 4). SEE TYPICAL PADMOUNTED ELECTRICAL EQUIPMENT ANCHOR BOLT DETAIL FOR ADDITIONAL INFORMATION.
7. RGS CONDUIT SWEEP INTO EQUIPMENT BASE TYPICAL. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS. CONDUIT STUB UPS SHALL BE ARRANGED TO CENTER OF EQUIPMENT COMPARTMENT OPENING AND CLOSEST TO FRONT AS POSSIBLE. COORDINATE REQUIREMENTS WITH APPROVED EQUIPMENT SHOP DRAWINGS. PROVIDE BELL END FITTING AT THE END OF EACH CONDUIT SWEEP.
8. GROUNDING BUSHING AT END OF RGS CONDUIT SWEEP. #2 BARE COPPER GROUNDING CONDUCTOR. BOND TO CONDUIT GROUNDING BUSHING AND EQUIPMENT GROUND BUS BY MECHANICAL MEANS. (TYPICAL FOR EACH CONDUIT).
9. #4/0 AWG., UNINSULATED COPPER UFER IN DUCT BANK. TERMINATE TO GROUND RING BY EXOTHERMIC WELD.
10. ALL SPARE CONDUITS SHALL HAVE NEPTCO WL 1800 WOVEN 3/8" (ARAMID) MULE TAPE AND SHALL BE SEALED FOR WATER TIGHT SEAL AT BOTH ENDS OF CONDUIT.



TYPICAL CT/PT CABINET DETAIL - ELEVATION



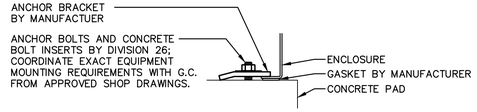
TYPICAL PADMOUNTED SWITCHGEAR DETAIL - PLAN VIEW



TYPICAL PADMOUNTED SWITCHGEAR DETAIL - ELEVATION

TYPICAL PADMOUNTED SWITCHGEAR KEY NOTES:

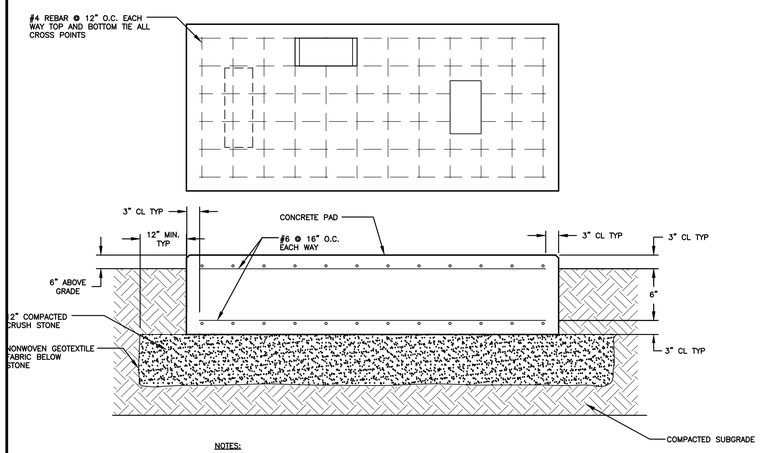
1. GROUNDING ELECTRODE (TYPICAL).
2. #4/0 AWG., UNINSULATED COPPER GROUND RING ELECTRODE CONDUCTOR. GROUND RING SHALL BE BURIED A MINIMUM OF 30" BFG. TERMINATE TO GROUND RODS BY EXOTHERMIC WELD.
3. CONCRETE BASE.
4. PAD MOUNTED SWITCHGEAR.
5. #4/0 AWG., UNINSULATED COPPER GEC. TERMINATE TO GROUND RING ELECTRODE BY EXOTHERMIC WELD. TERMINATE TO EQUIPMENT GROUND BUS BY APPROVED MECHANICAL MEANS.
6. EQUIPMENT ANCHOR LOCATIONS (TYPICAL OF 4). SEE TYPICAL PADMOUNTED ELECTRICAL EQUIPMENT ANCHOR BOLT DETAIL FOR ADDITIONAL INFORMATION.
7. RGS CONDUIT SWEEP INTO EQUIPMENT BASE TYPICAL. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS. CONDUIT STUB UPS SHALL BE ARRANGED TO CENTER OF EQUIPMENT COMPARTMENT OPENING AND CLOSEST TO FRONT AS POSSIBLE. COORDINATE REQUIREMENTS WITH APPROVED EQUIPMENT SHOP DRAWINGS. PROVIDE BELL END FITTING AT THE END OF EACH CONDUIT SWEEP.
8. GROUNDING BUSHING AT END OF RGS CONDUIT SWEEP. #2 BARE COPPER GROUNDING CONDUCTOR. BOND TO CONDUIT GROUNDING BUSHING AND EQUIPMENT GROUND BUS BY MECHANICAL MEANS. (TYPICAL FOR EACH CONDUIT).
9. #4/0 AWG., UNINSULATED COPPER UFER IN DUCT BANK. TERMINATE TO GROUND RING BY EXOTHERMIC WELD.
10. ALL SPARE CONDUITS SHALL HAVE NEPTCO WL 1800 WOVEN 3/8" (ARAMID) MULE TAPE AND SHALL BE SEALED FOR WATER TIGHT SEAL AT BOTH ENDS OF CONDUIT.
11. RGS CONDUIT SWEEP INTO EQUIPMENT BASE FOR SPARE WAY; EXTEND RACEWAYS OUT 5' BEYOND CONCRETE BASE AND CAP. CONDUIT STUB UPS SHALL BE ARRANGED TO CENTER OF EQUIPMENT COMPARTMENT OPENING AND CLOSEST TO FRONT AS POSSIBLE. COORDINATE REQUIREMENTS WITH APPROVED EQUIPMENT SHOP DRAWINGS. PROVIDE BELL END FITTING AT THE END OF EACH CONDUIT SWEEP.



① TYPICAL PADMOUNTED CT/PT CABINET GROUNDING AND INSTALLATION ⑩
N.T.S.

② TYPICAL PADMOUNTED SWITCHGEAR GROUNDING AND INSTALLATION
N.T.S.

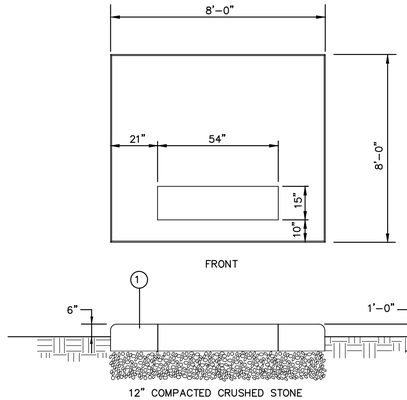
③ TYPICAL PAD MOUNTED ELEC EQUIPMENT ANCHOR BOLT DETAIL
N.T.S.



NOTES:

1. INSPECT AND COMPACT ALL SOIL. PROVIDE 12" BASE 3/4" BROKEN STONE, COMPACTED.
2. ALL EXPOSED EDGES SHALL BE 3/4" CHAMFER.
3. CONCRETE SHALL BE AIR ENTRAINED 5-7%, 4000 PSI @ 28 DAY.
4. LENGTH AND WIDTH OF PAD TO BE AS INDICATED.
5. ANCHOR EQUIPMENT TO CONCRETE PAD WITH 8-1/2"ø HILTI STAINLESS STEEL KWIK BOLT TZ. PROVIDE QUANTITY OF ANCHORS SPACED EVENLY ON EACH SIDE OF EQUIPMENT AS REQUIRED.
6. THE TOP SURFACE SHALL BE SMOOTH AND LEVEL.
7. THE FOUNDATION SHALL BE INSTALLED ON A FIRM, LEVEL, AND COMPACTED BASE OF 12" OF CRUSHED STONE.

④ TYPICAL PHOTOVOLTAIC SYSTEM EQUIPMENT CONCRETE PAD DETAIL
N.T.S.



LIST OF MATERIALS		
ITEM	QTY.	DESCRIPTION
1	1	FOUNDATION

NOTES:

A. CT/PT CABINET AND PADMOUNTED SWITCHGEAR FOUNDATION

THE FOUNDATION SHALL COMPRISE A STEEL REINFORCED CONCRETE PAD 96" x 84" x 12" DEEP WITH A MINIMUM STRENGTH OF 3000 PSI.

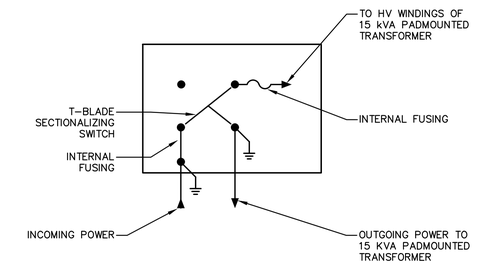
THE REINFORCING STEEL SHALL BE #5 BARS, GRADE NO. 60 STEEL.

THE TOP SURFACE SHALL BE SMOOTH AND LEVEL WITH A 1" CHAMFER ALONG THE UPPER EDGES.

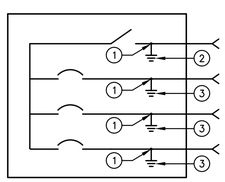
THE FOUNDATION SHALL BE INSTALLED WITH THE TOP SURFACE APPROX. 6" ABOVE FINAL GRADE, ON A FIRM, LEVEL AND COMPACTED BASE OF 12" OF CRUSHED STONE.

COORDINATE EXACT PAD DIMENSIONS AND OPENING REQUIREMENTS WITH APPROVED EQUIPMENT SHOP DRAWINGS.

TYPICAL PADMOUNTED CT/PT CABINET AND PADMOUNTED SWITCHGEAR CONCRETE PAD DETAIL
⑤ N.T.S.



⑥ 15KVA PADMOUNTED TRANSFORMER SCHEMATIC
N.T.S.



1. (3) 15KV, 600A TERMINATIONS PER WAY. SEE ONE LINE DIAGRAM FOR ADDITIONAL INFORMATION. SEE TERMINATION SCHEDULE FOR REQUIREMENTS: CABLE TERMINATION #CBLT2.
2. #4 AWG., UNINSULATED GROUND WIRE FROM CABLE TERMINATION SHIELDED GROUND TO EQUIPMENT GROUND BUS (TYPICAL OF 3 PER WAY). BOND TO TERMINATION SHIELD GROUND BY EXOTHERMIC WELD. BOND TO EQUIPMENT GROUND BUS BY APPROVED MECHANICAL MEANS.
3. #4 AWG., UNINSULATED GROUND WIRE FROM CABLE TERMINATION SHIELDED GROUND TO EQUIPMENT GROUND BUS (TYPICAL OF 3 PER WAY). BOND TO TERMINATION SHIELD GROUND BY EXOTHERMIC WELD. BOND TO EQUIPMENT GROUND BUS BY APPROVED MECHANICAL MEANS.

⑦ TYPICAL PADMOUNTED SWITCHGEAR TERMINATION
N.T.S.

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Environmental
Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

No.	REVISIONS Date	Desc.
1.	11/16/2018	D & M SET.

Designed	JCP
Drawn	JCP
Reviewed	PB
Scale	AS NOTED
Project No.	17035516
Date	10/29/2018
CAD File:	SE17D351601

Title: ELECTRICAL PAD MOUNT DETAILS

Sheet No.: SE-6

Xref (s): - XYI17D351601 : XU17D351601 : BI17D351601 : XGELEC-17D351601 : BD90C1625201 : XC06C1625203 : SE90C1625201

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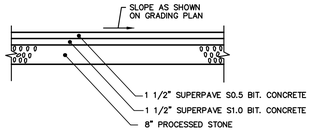
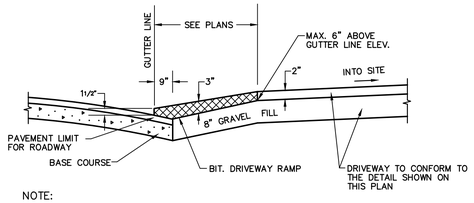


BITUMINOUS CONCRETE PAVEMENT

N.T.S. ZPC-018



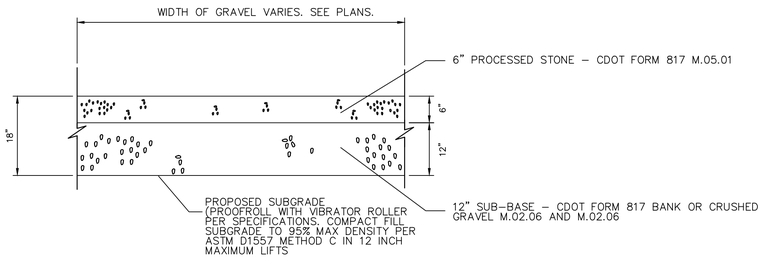
NOTE:

COMPACTION TO BE COMPLETED IN 4" LIFTS

DEPTHS SHOWN ARE AFTER COMPACTION

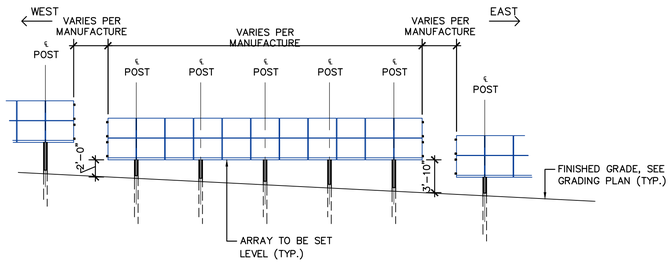
BITUMINOUS CONCRETE DRIVEWAY APRON DETAIL

N.T.S. ZPC-011

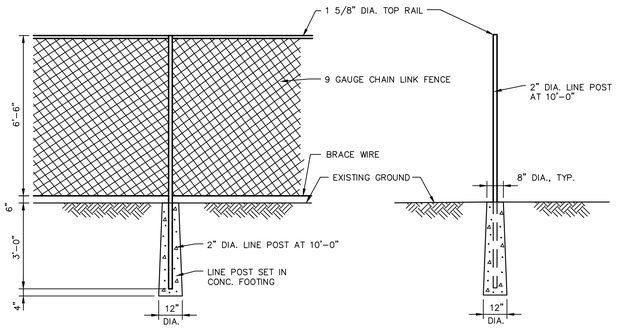


PROPOSED GRAVEL DRIVEWAY

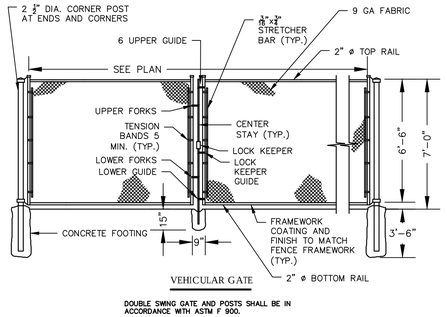
N.T.S



PHOTOVOLTAIC SOUTH ELEVATION –SLOPE VARIES



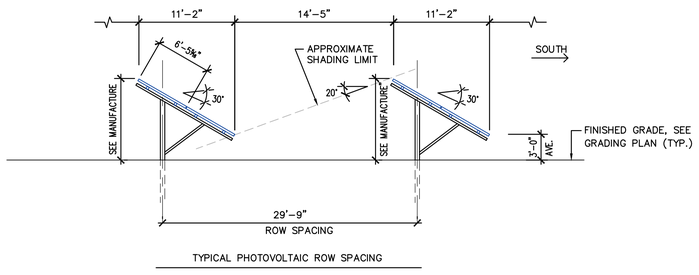
FRONT VIEW SIDE VIEW



DOUBLE SWING GATE AND POSTS SHALL BE IN ACCORDANCE WITH ASTM F 900.

MAIN ENTRANCE DOUBLE SWING CHAIN LINK GATE (TOTAL HEIGHT 7')

N.T.S



TYPICAL PHOTOVOLTAIC ROW SPACING

SOLAR PANEL CLUSTER DETAIL

N.T.S

CHAIN LINK FENCE DETAIL (7' TOTAL HEIGHT)

N.T.S

GENERAL NOTES

DESIGNED IN ACCORDANCE WITH THE CONNECTICUT STATE BUILDING CODE, CONSISTING OF THE 2003 IBC WITH STATE AMENDMENTS.

IF ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THESE DRAWINGS AND/OR CONDITIONS SPECIFIED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH THE AFFECTED WORK.

TYPICAL DETAILS AND NOTES SHOWN HEREIN SHALL APPLY UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE. CONSTRUCTION DETAILS NOT FULLY SHOWN OR NOTED SHALL BE SIMILAR TO DETAILS SHOWN FOR SIMILAR CONDITIONS.

ALL UNDERGROUND UTILITY LOCATIONS SHALL BE VERIFIED PRIOR TO STARTING EXCAVATION WORK. CALL BEFORE YOU DIG (ONE-CALL) 72 HOURS MINIMUM PRIOR TO STARTING ANY EXCAVATION AT 811.

WORK AREAS SHALL BE MARKED, FENCED, AND OTHERWISE SECURED SO AS TO PROVIDE PROPER PROTECTION FOR THE PUBLIC, AND AS REQUIRED BY THE BUILDING INSPECTOR.

CONCRETE PAD DESIGN BASED ON PRESUMPTIVE BEARING VALUES OF THE ANTICIPATED SOILS.

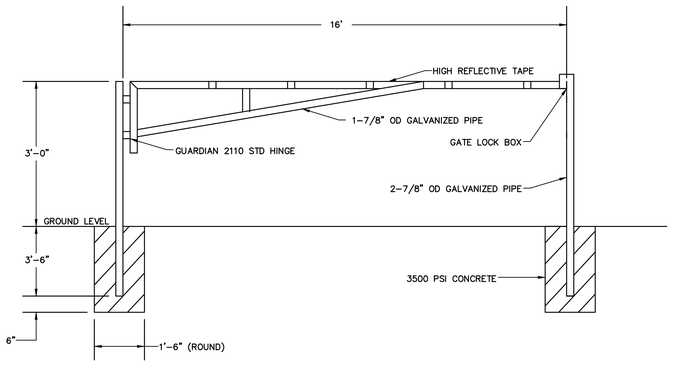
RACKING LOADS:
PROPOSED RACKING SHALL BE DESIGNED BY THE RACKING MANUFACTURER, UTILIZING THE FOLLOWING LOADS:

PROPOSED SOLAR MODULES – 2.5 POUNDS PER SQUARE FOOT

SNOW LOADS:
GROUND SNOW LOAD = 30 PSF (PER CT SUPPLEMENT)
FLAT ROOF SNOW LOAD = 30 PSF (MIN. PER CT SUPPLEMENT)
SLOPED ROOF SNOW LOAD – PER ASCE 7-02
UNBALANCED SNOW LOAD – PER ASCE 7-02

WIND LOADS:
BASIC WIND SPEED (3-SEC. GUST) = 115 MPH (CT AMMENDMENT)
IMPORTANCE FACTOR = 1.0
EXPOSURE = "C"

SEISMIC LOADS:
SEISMIC CATEGORY "B"



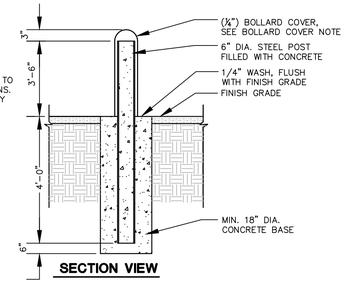
SINGLE SWING GATE (SECONDARY ACCESS) DETAIL

N.T.S

BOLLARD COVER NOTE:
MANUFACTURER: IDEALSHIELD®
ADDRESS: 2525 CLARK STREET, DETROIT, MI 48209
PHONE: 1-866-825-8659
MODULE: (¼") 6" BOLLARD COVER
COLOR: WHITE
HEIGHT: 42"

OR APPROVED EQUAL

LAYOUT NOTE:
SPACE BOLLARDS 4' O.C., OFFSET 2' O.C. FROM EDGE OF CONCRETE PADS. REFER TO SE SERIES PLANS FOR BOLLARD LOCATIONS. CONTRACTOR TO COORDINATE WITH UTILITY PROVIDER.



BOLLARD AT CONCRETE PADS

N.T.S

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S
Scale	NONE
Project No.	17D3516
Date	04/06/2018
CAD File:	DN17D351601

Title

DETAIL SHEET

Sheet No.

DN-1

Xref (s): : I:\17D3516-01-24x36

10/25/2018, ASCHAFER, G:\JOBS\17\17D3516\COMPLIANT\DS\DN17D351601.DWG,DN-1 - 24X36,

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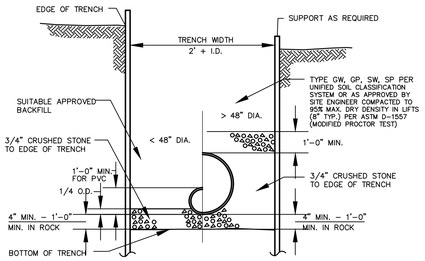
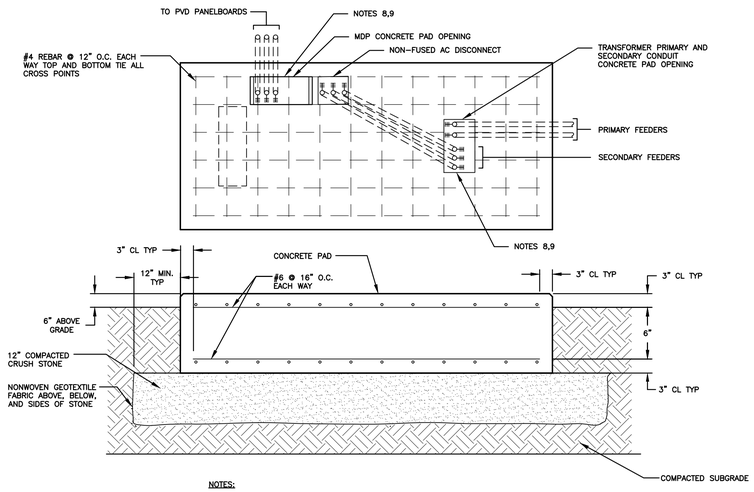


TYPICAL STORM SEWER TRENCH SECTION

N.T.S



NOTES:

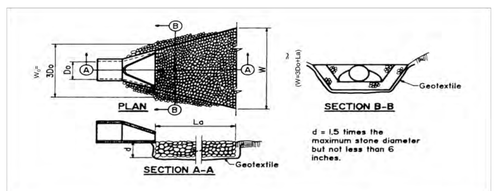
1. REFER TO SITE ELECTRICAL (SE) AND PHOTOVOLTAIC (PV) SERIES PLANS. SUCH PLANS (SE & PV SERIES) SHALL GOVERN OVER THE DETAIL SHOWN ABOVE. ALL CONCRETE PADS SHALL BE CONSTRUCTED PER MANUFACTURE SPECIFICATIONS.
2. INSPECT AND COMPACT ALL SOIL. PROVIDE 12" BASE 3/4" CRUSHED STONE, COMPACTED.
3. ALL EXPOSED EDGES SHALL BE 3/4" CHAMFER.
4. CONCRETE SHALL BE AIR ENTRAINED 5-7%, 4000 PSI @ 28 DAY.
5. LENGTH AND WIDTH OF PAD TO PER MANUFACTURE REQUIREMENTS.
6. ANCHOR EQUIPMENT TO CONCRETE PAD WITH 8-1/2"ø HILTI STAINLESS STEEL KWIK BOLT TZ. PROVIDE QUANTITY OF ANCHORS SPACED EVENLY ON EACH SIDE OF EQUIPMENT AS REQUIRED.
7. THE TOP SURFACE SHALL BE SMOOTH AND LEVEL.
8. THE FOUNDATION SHALL BE INSTALLED ON A FIRM, LEVEL, AND COMPACTED BASE OF 12" OF CRUSHED STONE.
9. RGS CONDUIT SWEEP (36" MIN. BEND RADIUS) INTO EQUIPMENT BASE TYPICAL. SEE ONE-LINE DIAGRAM FOR ADDITIONAL REQUIREMENTS. CONDUIT STUB UPS SHALL BE ARRANGED TO CENTER OF EQUIPMENT COMPARTMENT OPENING AND CLOSEST TO FRONT AS POSSIBLE. COORDINATE REQUIREMENTS WITH APPROVED EQUIPMENT SHOP DRAWINGS. PROVIDE BELL END FITTING AT THE END OF EACH CONDUIT SWEEP.
10. GROUNDING BUSHING AT END OF RGS CONDUIT SWEEP. #2 BARE COPPER GROUNDING CONDUCTOR. BOND TO CONDUIT GROUNDING BUSHING AND EQUIPMENT GROUND BUS BY MECHANICAL MEANS. (TYPICAL FOR EACH CONDUIT).
11. COORDINATE EXACT CONCRETE PAD OPENINGS WITH APPROVED EQUIPMENT SHOP DRAWINGS.
12. ALL SPARE CONDUITS SHALL HAVE NEPTCO WL 1800 WOVEN 3/8" (ARAMID) MULE TAPE AND SHALL BE SEALED FOR WATER TIGHT SEAL AT BOTH ENDS OF CONDUIT.

TYPICAL PHOTOVOLTAIC SYSTEM EQUIPMENT CONCRETE PAD DETAIL

N.T.S

Riprap Apron Outlet Protection (Maximum Tailwater Condition)

PROJECT NAME:	Greenskies Renewable Energy		
LOCATION:	North Haven, CT		
PREPARED BY:	A. Schafer	DATE:	3/22/2018
LAST REVISED BY:		DATE:	

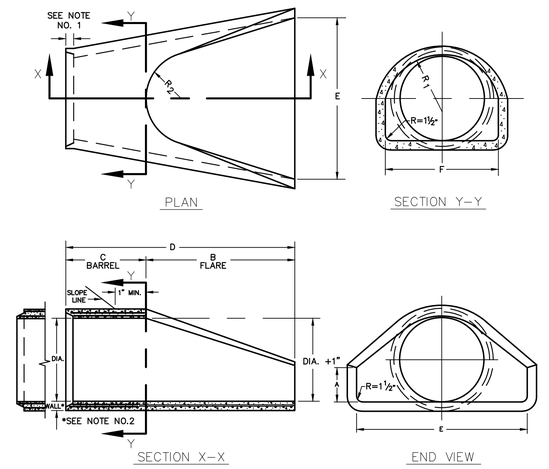


OUTLET NO.	PIPE DIA. Do (in.)	Q (CFS)	W_0 (in)	d_{50} STONE SIZE (IN.)	q	La (ft)	W (ft)	T_w	d_{MAX} (in)	INV.
FES-01B	12	3.38	36	3	1.1	3.4	10.4	3.60	5	82.00
FES-02B	24	18.03	72	3	3.0	6.4	20.5	3.03	5	76.42
FES-03B	30	28.86	90	3	3.8	7.3	25.4	1.12	5	66.77
FES-04B	24	21.55	72	3	3.6	7.6	21.0	3.53	5	63.72

The design Q used shall be the 50-year storm discharge rate

RIPRAP OUTLET PROTECTION

N.T.S



NOTES

1. JOINT SHALL BE TONGUE AND GROOVE OR BELL AND SPIGOT AS REQUIRED TO CONFORM TO PIPE INSTALLED.
2. WALL THICKNESS SHALL CONFORM TO PIPE THICKNESS.

DIMENSIONS FOR REINFORCED CONCRETE CULVERT END								FLARE REINFORCEMENT ONE LAYER ONLY IN CENTER OF WALL	
DIA.	A	B	C	D	E	F	R_1	R_2	MIN. AREA OF LONGITUDINAL STEEL SQ. IN PER FT.	MIN. AREA OF TRANSVERSE STEEL SQ. IN PER FT.
12"	4"	2'-0"	1'-03⅜"	0'-03⅜"	2'-0"	2'-7⅝"	10¼"	9"	0.048	0.048
15"	6"	2'-3"	1'-10"	1'-1"	2'-6"	2'-09⅝"	11'-03½"	11"	0.054	0.054
18"	9"	2'-3"	1'-10"	1'-1"	3'-0"	2'-3"	1'-3½"	1'-0"	0.060	0.060
21"	9"	2'-11"	2'-2"	1'-1"	3'-6"	2'-7½"	1'-4"	1'-1"	0.066	0.066
24"	9½"	3'-7½"	2'-6"	1'-1½"	4'-0"	2'-9¾"	1'-44⅜"	1'-2"	0.072	0.072
30"	1'-0"	4'-6"	1'-7½"	1'-1½"	5'-0"	3'-1"	1'-6½"	1'-3"	0.084	0.084
36"	1'-3"	5'-3"	2'-10⅝"	1'-1⅝"	6'-0"	3'-11⅛"	2'-09⅜"	1'-6"	0.096	0.096
42"	1'-9"	5'-3"	2'-11"	1'-2"	6'-6"	4'-5⅞"	3'-3½"	1'-10"	0.108	0.108
48"	2'-0"	6'-0"	3'-2"	1'-2"	7'-0"	4'-8"	3'-5½"	1'-10"	0.120	0.120
54"	2'-3"	5'-5"	2'-11"	1'-4"	7'-6"	5'-5½"	2'-9¼"	2'-0"	0.132	0.132
60"	2'-6"	5'-0"	3'-3"	1'-3"	8'-0"	6'-0½"	3'-0¾"	2'-0"	0.144	0.144

REINFORCED CONCRETE CULVERT END

N.T.S

Architecture
Engineering
Environmental
Land Surveying

BL Companies

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION

700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS

No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S.
Scale	NONE
Project No.	17D3516
Date	04/06/2018
CAD File:	DN17D3516O1

Title

DETAIL SHEET

Sheet No.

DN-2

Xref (s): I:\BD\17D3516-01-24x36

10/25/2018, ASCHAFER, G:\JOBS\17\D3516\CNP\DWT\D3516D.DWG,Dn-2 24X36,

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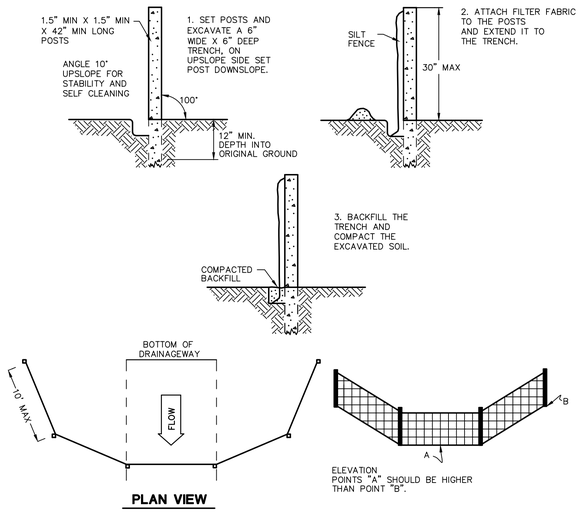
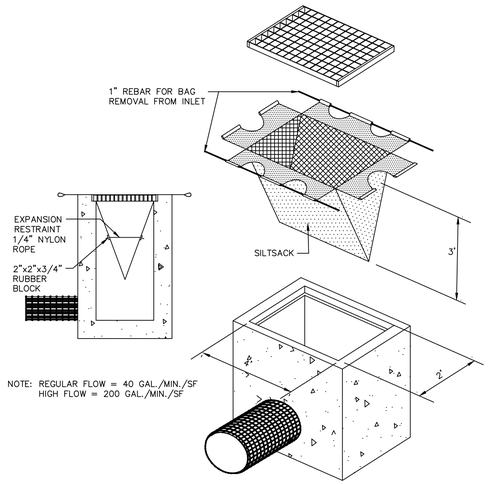


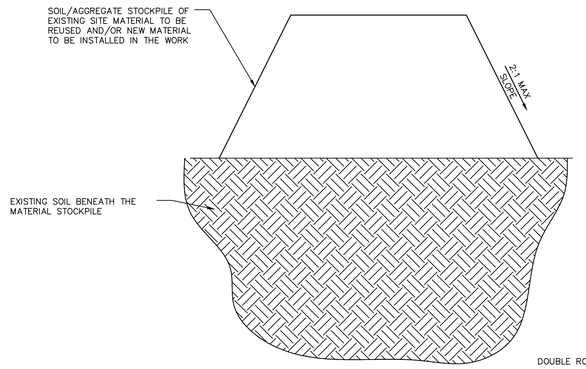
SILT FENCE BARRIER

N.T.S



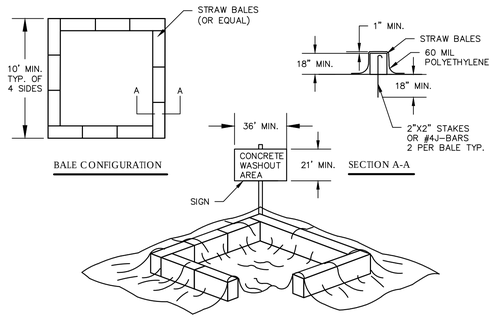
SILTSACK DETAIL

N.T.S. BLEC-005



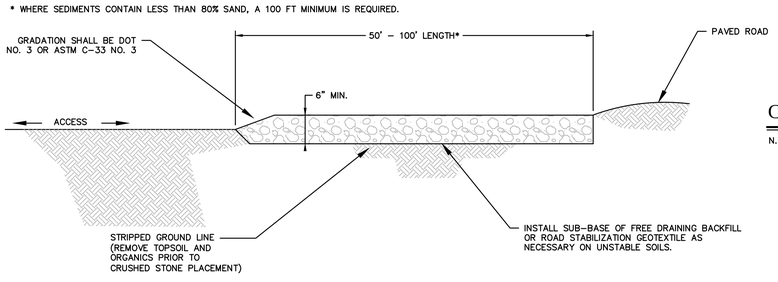
MATERIALS STOCKPILE DETAILS

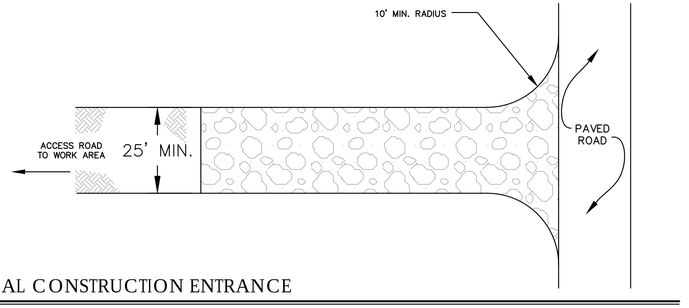
N.T.S



CONCRETE WASH PIT

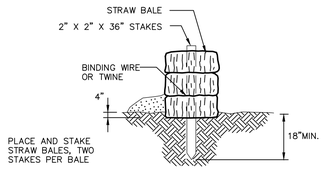
N.T.S





TYPICAL CONSTRUCTION ENTRANCE

N.T.S



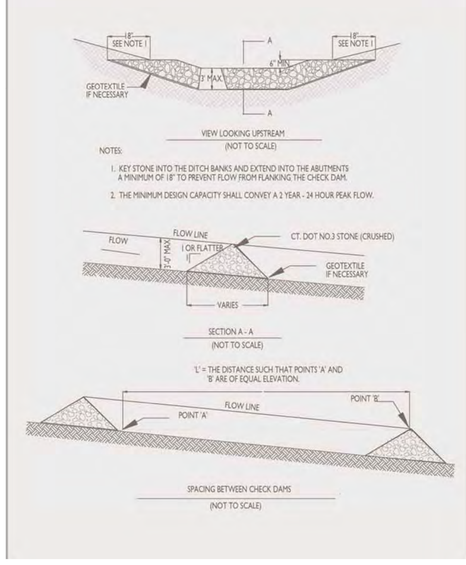
STRAW BALE BARRIERS SHOULD NOT BE USED FOR MORE THAN 3 MONTHS

SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE ABOVE GROUND HEIGHT OF THE BARRIER.

ANY SECTION OF STRAW BALE BARRIER WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.

STRAW BALE DETAIL

N.T.S



TEMPORARY AND PERMANENT STONE (ROCK) CHECK DAM DETAIL

N.T.S

Architecture
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Environmental
Land Surveying
BL Companies
355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

REVISIONS
No. Date
1. 07/13/2018
2. 11/16/2018

Desc: UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
O & M SET

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S
Scale	NONE
Project No.	17D3516
Date	04/06/2018
CAD File:	DN17D351601

Title
DETAIL SHEET

Sheet No.
DN-3

Xref Dgb: : I:\17D3516-01-24x36

11/29/2018, ASCHAFER, G:\JOBS\17\D3516\DWG\DN17D351601.DWG, DN-3 24X36.

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Figure SB-6 Sediment Basin Schematic Elevations

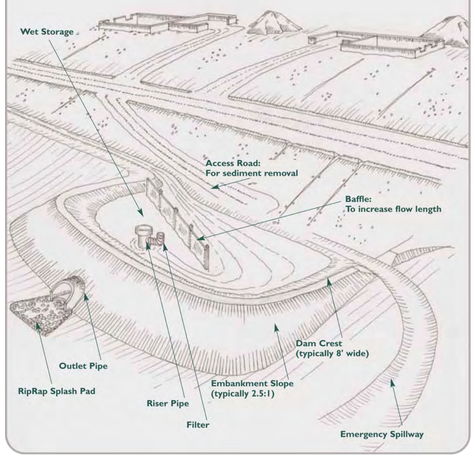
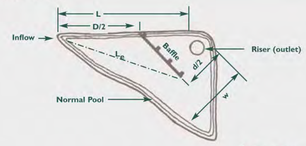


Figure SB-7 Sediment Basin Baffle Details

Examples: Plan Views – not to scale

A

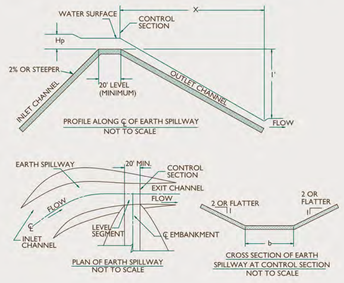


L_e = Total distance from the point of inflow around the baffle to the riser.

Figure SB-10 Design Data for Earth Spillways

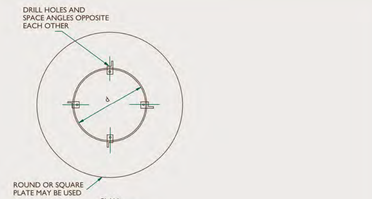
LEGEND
n = MANNING'S COEFFICIENT OF ROUGHNESS.
H_p = DIFFERENCE IN ELEVATION BETWEEN CREST OF EARTH SPILLWAY AT THE CONTROL SECTION AND WATER SURFACE IN RESERVOIR, IN FEET.
b = BOTTOM WIDTH OF EARTH SPILLWAY AT THE CONTROL SECTION, IN FEET.
Q = TOTAL DISCHARGE, IN C.F.S.
V = VELOCITY, IN FEET PER SECOND, THAT WILL EXIST IN CHANNEL BELOW CONTROL SECTION, AT DESIGN Q, IF CONSTRUCTED TO SLOPE (S) THAT IS SHOWN.
S = FLATTEST SLOPE (S), IN % ALLOWABLE FOR CHANNEL BELOW CONTROL SECTION.
X = MINIMUM LENGTH OF CHANNEL BELOW CONTROL SECTION, IN FEET.
z = SIDE SLOPE RATIO (2:1).

NOTES:
1. FOR A GIVEN H_p A DECREASE IN THE EXIT SLOPE FROM S AS GIVEN IN THE TABLE DECREASES SPILLWAY DISCHARGE, BUT INCREASING THE EXIT SLOPE FROM S DOES NOT INCREASE DISCHARGE. IF AN EXIT SLOPE (Se) STEEPER THAN S IS USED, THEN THE VELOCITY (Ve) IN THE EXIT CHANNEL WILL INCREASE ACCORDING TO THE FOLLOWING RELATIONSHIP: $Ve = V \left(\frac{Se}{S}\right)^{0.3}$
2. DATA TO RIGHT OF HEAVY VERTICAL ON FIGURE SB-11 SHOULD BE USED WITH CAUTION, AS THE RESULTING SECTIONS WILL BE EITHER POORLY PROPORTIONED OR HAVE VELOCITIES IN EXCESS OF 6 FT/SEC.



Source: USDA-NRCS

Figure SB-8 Anti-Vortex - Trash and Safety Guard Diagram

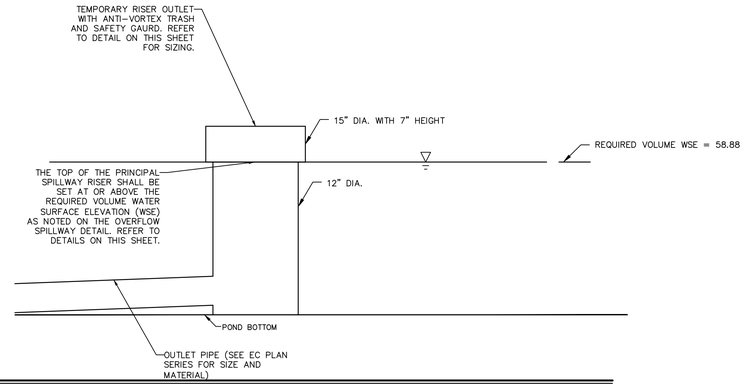


INLET d DIA. INCHES	BARREL DIA. INCHES	H INCHES
12	6	6
12	8	6
15	10	6
15	12	7
18	12	6
24	15	7 1/2
24	18	10
* 30	18	8 1/2
* 30	24	13 1/2
* 36	24	12

RISER & ANTI-VORTEX SIZE

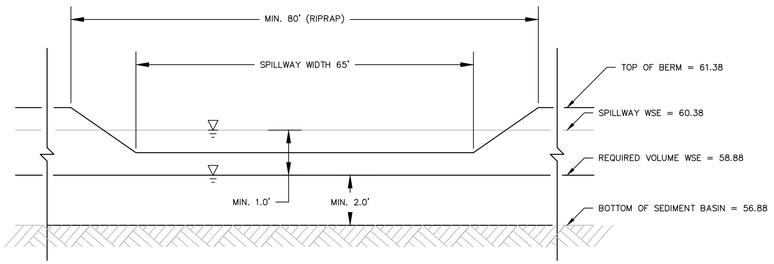
* USE ANGLE IRON STIFFENERS ON PLATE AS SPECIFIED.

Source: USDA-NRCS



TEMPORARY SEDIMENT BASIN DETAIL (SEE EC PLAN SERIES)

N.T.S



TEMPORARY SEDIMENT BASIN OVERFLOW SPILLWAY

N.T.S

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(203) 630-1406
(203) 630-2615 Fax

PHOTOVOLTAIC INSTALLATION
700 MIDDLETOWN AVENUE
NORTH HAVEN, CONNECTICUT

No.	Date	Desc.
1.	07/13/2018	UPDATED WETLAND DELINEATION AND REVISED SITE PLAN
2.	11/16/2018	D & M SET

REVISIONS

Designed	A.J.S.
Drawn	A.J.S.
Reviewed	J.J.S
Scale	NONE
Project No.	17D3516
Date	04/06/2018
CAD File:	DN17D351601

Title

DETAIL SHEET

Sheet No.

DN-4

Xref (s) : 18D7D3516-01-24x36

11/21/2018, ASCHAFER, G:\ARBUTY\17D\17D3516\PLANSET\DWG\17D3516DN01.DWG,DN-4 24x36,

Entomological Survey of Proposed Solar Panel Complex in North Haven, Connecticut

PURPOSE OF STUDY: A survey for beetles and other insects was done on an old field where a solar panel complex development has been proposed in North Haven, CT. Pitfall trapping, hand collecting and personal observations of insects were made during a three week period in May- June 2018. The survey was conducted at the request of the CT DEEP to determine if a particular ground beetle (Carabidae: *Loxandrus vulneratus* Casey), a species listed as "of special concern" in the State List of Endangered, Threatened and Species of Special Concern, is present.

KNOWN DISTRIBUTION AND HABITAT OF THE CARABID SPECIES: The carabid, *L. vulneratus,* was collected in the past on four occasions in Connecticut: in October, 1991, March, 1992, April, 1991 and 1992 in North Haven (1), within about 3/4 mile of the presently proposed solar panel complex development site. Subsequent visits to the original collection site failed to reveal the presence of the species. The only other known CT specimen was collected in a blacklight trap on July 4, 2013 north of the center of North Haven, about 6 miles north of the solar complex development site. The species is known to exist in the following other geographic areas: AL, AR, DC, IL, IN, LA, MD, MO, MS, NC, OH, PA, SC, TN, and VA (2). It is not known if the species continues to exist in CT because the original collecting locale (under rocks at the edge of a farm pond) has now changed; the farm pond has been filled in and no open wetland exists at the site. If the species is still present in CT, it would represent the most northern and eastern locality within its distribution in the country.

Loxandrus vulneratus in other states has been found in lowlands, on river banks, in wet soil and sheltering during the day under debris in January, March to July, September and December. It has been collected in pitfall traps and by turning over debris (3).

PROPOSED DEVELOPMENT SITE IN NORTH HAVEN: The site is a formerly cultivated old field north of Route 17 (Middletown Avenue), bordered on the north by Stonehedge Drive, on the east by Rimmon Road, and to the west by the Muddy River. The field, composed of dry, sandy soil, has scattered open areas with sparse vegetation and is otherwise overgrown with weedy vegetation, with a preponderance of ragweed and some patches of clover. In the northeast section, there is a seep area that retains water after rains. The latter area has a few small poplar trees.

PITFALL TRAPPING, VISUAL OBSERVATIONS OF INSECTS: Pitfall traps were placed within the boundaries of the site in areas where carabid beetles and other insects were observed under rocks and debris. Two traps were placed close to the border of the Muddy River, beyond the boundary of the development site, to assay for the presence of insects occupying an area of wetter soil, more similar to the known habitat of *L. vulneratus* than the very dry sandy soil at the other trap sites. In addition, a trap was placed in the seep site in wetter soil conditions to assess whether beetle species might occur there that would not be found at the dry sites. In traversing the site at each visit, the soil under rocks and debris was examined for the presence of beetles and other insects.

RESULTS: Other than arthropods of little interest in this survey (*i.e.* Collembola, Araneae, Opiliones) that were found in the pitfalls, the majority of insects collected were beetles, with the greatest numbers being carabids (17 species of 25 species). **No *Loxandrus vulneratus* were observed or collected.** In addition to the carabids collected, the common tiger beetle, *Cicindela repanda repanda* Dejean was abundant, seen landing and mating on the dirt road that runs through the site. All of the carabid species collected and/or directly observed

under debris, in the sites other than by the river or in the seep area, were species well known to occur in dry, sandy soil, covered with sparse vegetation. All of the carabid species from the whole site had been frequently collected in CT in the past.

The beetles that were collected are listed below:

CARABIDAE -

Agonoleptus conjunctus (Say) - 3
Agonum ferreum Haldeman - 1 [by Muddy River]
Amara rubrica Haldeman - 8
Anisodactylus harrisii (LeConte) - 1 [in seep area]
Anisodactylus rusticus (Say) - 1
Chlaenius impunctifrons Say - 1 [by Muddy RIver]
Chlaenius tomentosus tomentosus (Say) - 3
Chlaenius tricolor tricolor Dejean - 2 [by Muddy River]
Elaphropus incurvus (Say) - 1
Harpalus affinis (Schrank) - 9
Notiobia terminata (Say) - 43
Omophron americanus Dejean - 1 [by Muddy River]
Patrobus longicornis (Say) -1 [by Muddy River]
Scarites subterraneus L. - 3 [by Muddy River and another site]
Selenophorus ellipticus Dejean -2
Selenophorus pedicularius Dejean - 3
Stenolophus ochropezus (Say) - 1

CURCULIONIDAE - 1

CHRYSOMELIDAE - *Disonycha glabrata* (F.) - 1
Microrhopala vittata (F.) - 1

ELATERIDAE - *Negastrinus choria* (Say) - 1

MELANDRYIDAE- *Spilotus quadripunctulatus* (Melsheimer) - 1

NITIDULIDAE - *Glischrochilus quadrisignatus* (Say) - 2 [in seep area]

SCARABAEiDAE - *Onthophagus hecate hecate* (Panzer) - 9 [mostly in seep area]

STAPHYLINIDAE - *Ocypus nitens* (Schrank) - 1

DISCUSSION: The survey of beetles at the proposed solar panel complex development site in North Haven, Connecticut failed to reveal the presence of the carabid beetle “of special concern”, *Loxandrus vulneratus* Casey, or of any other beetles considered unusual, rare or endangered. Even in the absence of the collection data, an assessment of the edaphic conditions and the dry, sandy soil habitat suggested that the terrain would not be suitable for the presence

of the carabid beetle of interest. Sampling in the wetter area outside the site, where the conditions might be considered possibly more conducive to the survival of *Loxandrus vulneratus,* the beetle was not found, and given the question of whether the species is still present in the State, the likelihood of finding it is remote at best.

References cited:

1. Krinsky, W. L. & Oliver, M. K. (2001) - Ground Beetles of Connecticut (Coleoptera; Carabidae, excluding Cicindelini) An Annotated Checklist. Bulletin 117 State Geological and Natural History Survey, Hartford, 308 pp.

2. Bousquet, Y. (2012) - Catalogue of Geadephaga (Coleoptera, Adephaga) of America, north of Mexico - Part 2 - Bembidini - Harpalini. Pensoft, Sofia, pp. 764-765

3. Larochelle, A. & Lariviere, M.- C. (2003) - A Natural History of the Ground-Beetles (Coleoptera: Carabidae) of America north of Mexico. Pensoft, Sofia, 583 pp.

William L. Krinsky, M.D., Ph.D.
Division of Entomology
Peabody Museum of Natural History
Yale University
P.O. Box 208118
New Haven, CT 06520-8118

Connecticut

Department of Economic and Community Development

State Historic Preservation Office

June 11, 2019

Mr. David R. George
Heritage Consultants
PO Box 310249
Newington, CT 06131

Subject: Phase IB Cultural Resource Reconnaissance Survey
Proposed Solar Center
700 Middletown Avenue
North Haven, Connecticut
ENV-19-0558

Dear Mr. George:

The State Historic Preservation Office (SHPO) has reviewed the archeological survey report prepared by Heritage Consultants, LLC (Heritage), dated May 2019. The proposed activities are under the jurisdiction of the Connecticut Siting Council and are subject to review by this office pursuant to the Connecticut Environmental Policy Act (CEPA). The proposed facility and Limit of Work (LOW) is located within a 41.7 acre study area, roughly bounded to the south by Middletown Avenue and Old Velvet Street, to the east by Rimmon Road, to the north by forested areas, and to the west by All Saints Cemetery. The proposed facility includes photovoltaic (PV) solar panels, racking, access roads, and related ancillary equipment. The submitted report is well-written, comprehensive, and meets the standards set forth in the *Environmental Review Primer for Connecticut's Archaeological Resources*.

One previously identified archaeological site is located within 1 mile of the project area; however, it will not be impacted by the undertaking. One listed National Register of Historic Places property, the Rising Sun Tavern (NR# 79002638), is located within 1 mile of the project area; however, due to intervening vegetative screening, it will not be adversely impacted by the undertaking.

Phase IB of the reconnaissance survey consisted of subsurface testing of areas deemed to have moderate to high archaeological sensitivity, and that would be subject to ground disturbing impacts as part of the proposed undertaking. A total of 212 of 222 planned shovel tests were excavated successfully throughout the proposed work area; 10 unexcavated shovel tests fell within areas characterized by substantial previous disturbance.

The reconnaissance survey identified one, non-site cultural resources Loci (Locus 1), which resulted in the collection of a single basalt secondary thinning flake, recovered from Stratum I, and lacking diagnostic characteristics. 200 historic period artifacts were recovered from throughout the LOW, dating from between the 19th century and the mid-20th century, the majority of which were recovered from the plow zone, were not associated with any structural remains or cultural features, and are typical of field scatter.

As a result of the information submitted, SHPO concurs with the findings of the report that additional archeological investigations of the project areas are not warranted and that there will be no adverse effects to historic properties by the proposed activities.

This office appreciates the opportunity to review and comment upon this project. For additional information, please contact Marena Wisniewski, Environmental Reviewer, at (860) 256-2754 or marena.wisniewski@ct.gov.

Sincerely,

Mary B. Dunne

Mary B. Dunne
State Historic Preservation Officer

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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Bureau of Materials Management and Compliance Assurance

Notice of Permit Authorization

May, 01 2019

Paul Chip Florio
GREENSKIES RENEWABLE ENERGY LLC
180 Johnson St
Middletown, CT 06457-2247

Subject: General Permit Registration for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities
Application NO.: 201903486

Paul Chip Florio:

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 Proposed 4.98MW Photovoltaic Solar Array (located at 700 Middletown Avenue , Town Of North Haven) registration for the **General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, effective 10/1/13 (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. GSN003443 has been assigned to authorize the stormwater discharge(s) from this project.

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

Eastern Box Turtle and Vernal Pools Survey Results

700 Middletown Avenue
North Haven

Submitted To:
Chris Albino
BL Companies

Prepared By:
Eric Davison
Davison Environmental, LLC

November 29, 2018

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1. NDDB response letter dated March 22, 2018
2. Wetlands and Watercourses Delineation Report
3. Resumes of Eric Davison and Dennis Quinn

INTRODUCTION

Davison Environmental, LLC conducted vernal pool surveys as well as targeted surveys for the eastern box turtle (*Terrapene carolina*). The survey area is located at 700 Middletown Avenue in North Haven (the "site" hereinafter, see Figures 1 and 2). This work builds upon our initial work at the site which consisted of delineating wetlands and watercourses. See Attachment 2, *Wetlands/Watercourses Delineation Report.*

SITE CHARACTERISTICS

The site totals ±42 acres. Until 2014, much of the site (38 acres) was cropland (see photo 1). The crop type is unknown but based on a 2013 aerial photograph of the site (photo 1) it appears it was an intensive vegetable row crop based on the presence of multiple interior access roads.

Photo 1: aerial photograph from 2013 showing active cropland.

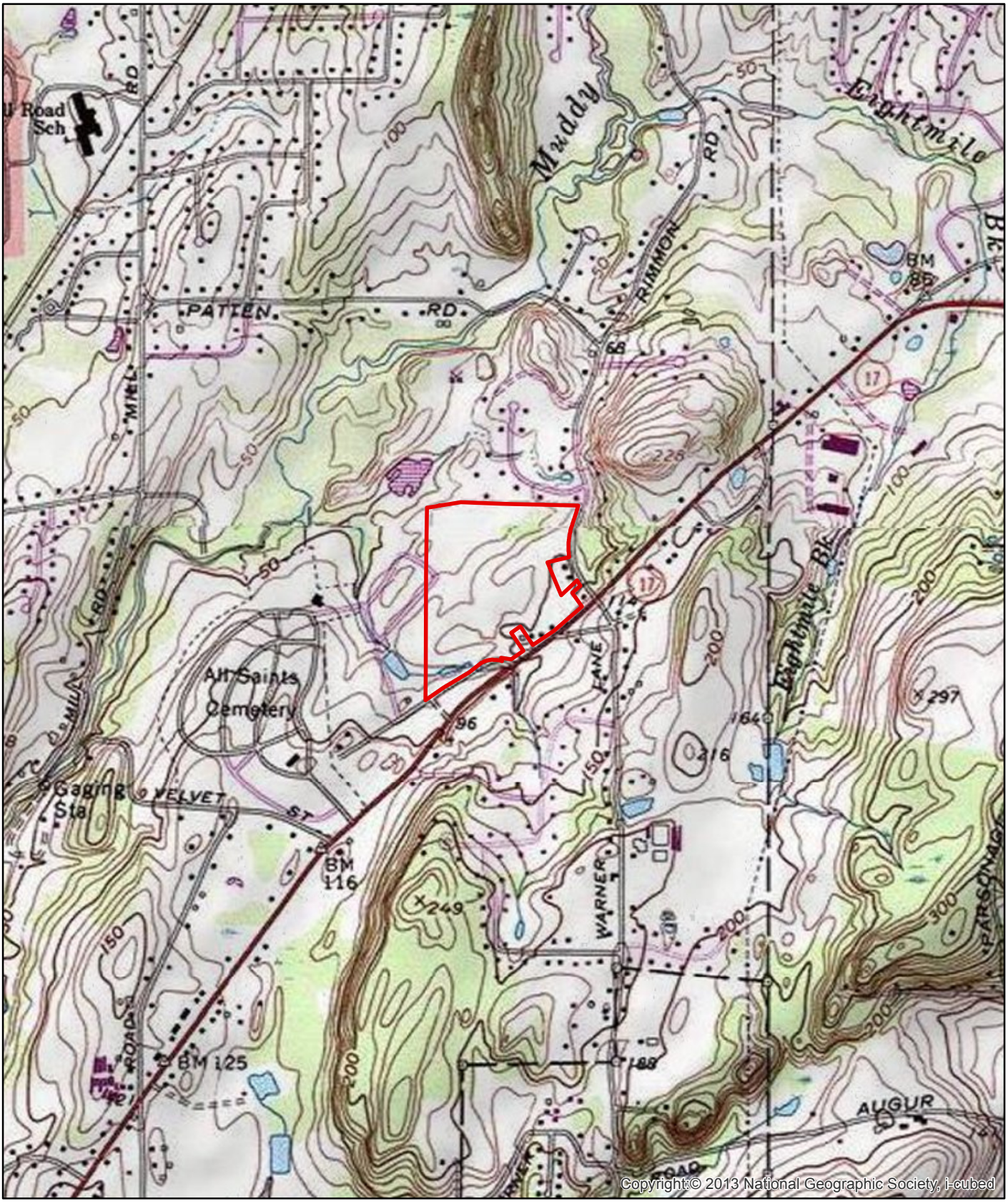


FIGURE 1:
Location Plan
700 Middletown Avenue
North Haven, CT

Property Boundary (approximate)

Topographic map (USGS) showing the approximate location of the parcel boundary as taken from the CT DEEP parcel dataset. This map is intended for general planning purposes only. It contains no authoritative data.

N

0 250 500 1,000
Feet

Davison Environmental, LLC
10 Maple Street
Chester, CT
860-803-0938
www.davisonenvironmental.com

FIGURE 2:
Aerial Map
700 Middletown Avenue
North Haven, CT

Property Boundary (approximate)

CT Orthophotography (2016) showing the approximate location of the parcel and watercourse boundaries as taken from the CT DEEP Parcel and Hydrography datasets respectively. This map is intended for general planning purposes only. It contains no authoritative data.

N

0 100 200 400 Feet

Davison Environmental, LLC
10 Maple Street
Chester, CT
860-803-0938
www.davisonenvironmental.com

The remaining ± 4 acres consists of two small wooded swamps located in the northeast corner of the site, and a stream located in the southwest corner (see Figure 2).

At present the former vegetable field is fallow and revegetating. The dominant plant present is the invasive, non-native mugwort (*Artemesia vulgaris*), along with some native early old field pioneer species such as goldenrods (*Solidago sp.*) and clover (see photo 2).

Photo 2: view east across the site; note newly revegetating field dominated by mugwort

Two small wooded areas are present on the site and consist largely of wetlands. In the northeast corner lies two small wooded swamps (see photo 3). A perennial stream flows through southwest corner of the site. Wetland vegetation consists of red maple (*Acer rubrum*) and swamp white oak (*Quercus bicolor*), in the tree canopy. Shrub and herbaceous vegetation consist of Asiatic bittersweet (*Celastrus orbiculatus*), winterberry (*Ilex verticillata*), skunk cabbage (*Symplocarpus foetidus*), sensitive fern (*Onoclea sensibilis*), royal fern (*Osmunda regalis*), cinnamon fern (*Osmunda cinnamomea*), jack-in-the-pulpit (*Arisaema triphyllum*) and clearweed (*Pilea pumila*).

Upland (non-wetland) treed areas are limited to the areas around the margins of the wetlands and stream. Dominant tree species consisting of dominated by hickory (*Carya sp.*) and cherry (*Prunus serotina*).

Photo 3: two small wooded swamps are located in the northeast corner of the site

VERNAL POOLS

Site wetlands were assessed for vernal pools and none were observed. Five wetland areas are present on the site as delineated by Davison Environmental (see Figure 3). During our initial work on the site in December of 2017, none of these wetlands were considered to have suitable hydrology to support breeding by vernal pool indicator species. Nevertheless, follow-up surveys were conducted on April 14th and May 9th to re-inspect wetland areas for amphibian breeding (i.e., egg masses and larvae).

Noe of the wetlands contained standing water capable of supporting amphibian breeding, and no egg masses were observed. Wetland 1 is a small ditch that captures runoff from the agricultural field. It has a Temporarily flooded hydrology[1] with no forest cover. Wetlands 3 and 4

[1] Wetlands that are flooded for brief periods during the growing season, but water table is otherwise well below surface

consist of two perennial stream segments and therefore do not contain areas of prolonged standing water. Wetlands 1 and 5 are lie in the small wooded area in the northeast corner of the site. These areas are gently sloping and lack significant concavity to support seasonal flooding. Both wetlands have a saturated[2] hydrology. During both the April and May visits, standing water was limited in extent, and the maximum depth observed was 1-2 inches in rills and groundwater seeps. No areas of prolonged standing water were present.

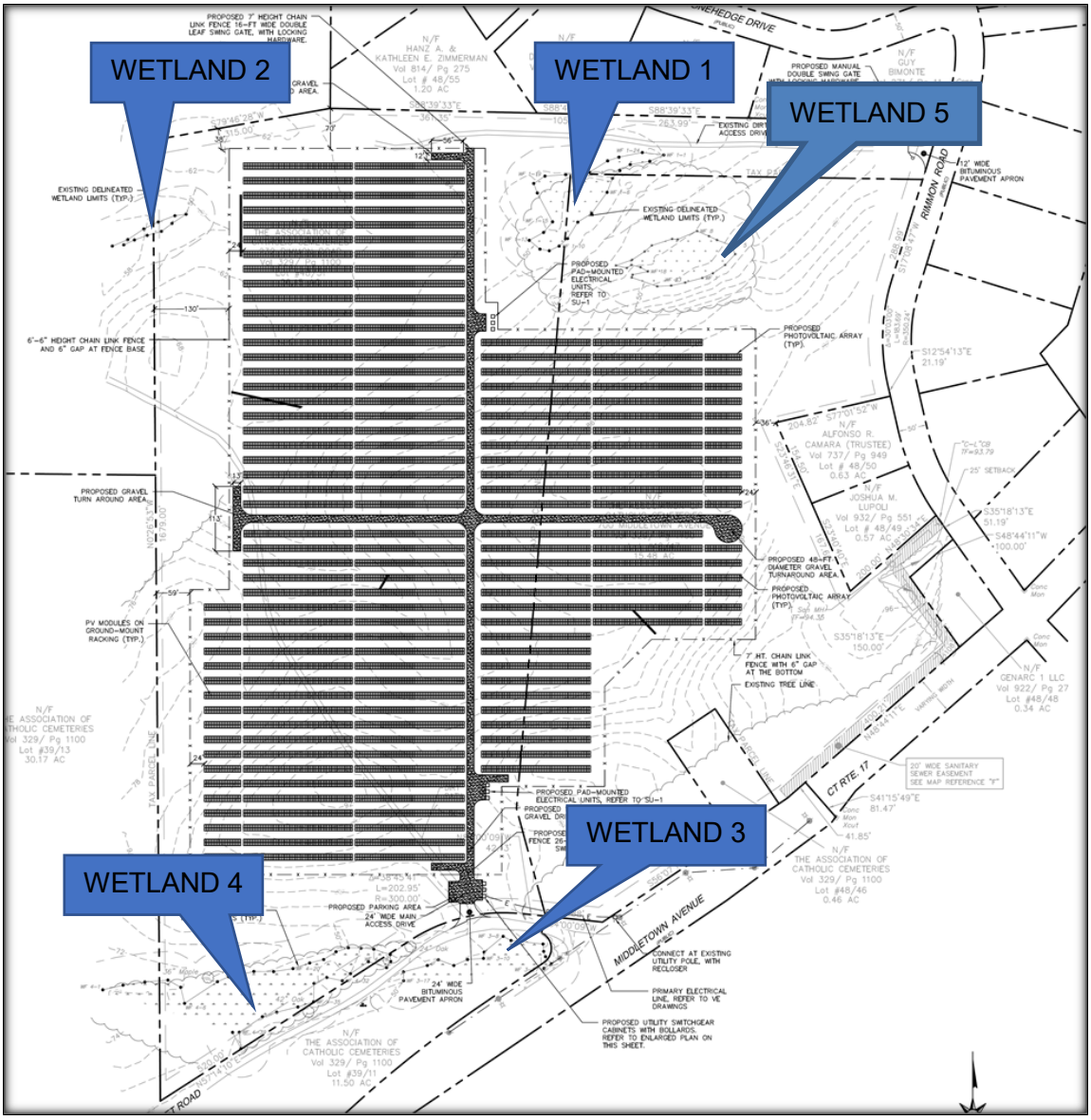


Figure 3: wetlands map

[2] Refers to wetlands where the substrate is saturated for extended periods during the growing season, but standing water is rarely present.

BOX TURTLE SURVEYS

The box turtle is a state-listed species of special concern in Connecticut. Surveys of the site for box turtle were prompted by a Natural Diversity Database (NDDB) request for survey as part of a query to the NDDB in March 2018 (see attached response letter, NDDB assessment #201802831).

Box turtle are widespread throughout the low-lying portions of Connecticut. They favor old field habitat and deciduous forest ecotones, including powerline cuts and logged over woodland (Klemens, 1993). Box turtles utilize different habitat types at different times of the year (Dodd, 2001). Early-successional habitats are generally inhabited during months with moderate temperate while forested habitats are utilized during the heat of the summer as well as for hibernation (Erb, 2011).

SURVEY METHODS

Field surveys were conducted by Eric Davison, Dennis Quinn and a field technician with experience conducting box turtle surveys. Surveys were conducted on May 9, June 5, 7 and 28, 2018. Weather during field visits included temperatures in the mid-60s to mid-70s under sunny skies, but searches were also conducted during humid and wet weather which often triggers box turtle activity, particularly movement of nesting females.

Visual surveys were conducted by searching largely along field edges (i.e., ecotones) for basking turtles, as well as within suitable nesting habitat in the form of scarified sparsely vegetated areas. Because the site consists nearly entirely of a crop field, in order to adequately search the edges associated with the site we conducted edge searches on some of the immediately adjacent parcels.

RESULTS

No box turtles were observed on the site. Amphibian and reptile species observed on the site are listed in Table 1.

Table 1: Species observed

Common Name	Scientific Name
Two-lined Salamander	*Eurycea bislineata*
Gray Treefrog	*Hyla versicolor*
Green Frog	*Lithobates clamitans*
Bullfrog	*Lithobates catesbeianus*
Painted Turtle	*Chrysemys picta*
Snapping Turtle	*Chelydra serpentina*

The only species observed onsite include green frog and two-lined salamander. The remainder of species noted in Table 1 were observed in the pond just west of the site. One noteworthy observation included a xanthic two-lined salamander located within the stream in the southwest corner of the site (see photo 4).

Photo 4: xanthic two-lined salamander

DISCUSSION

Agricultural lands represent suitable habitat for box turtle, as the scarified and sparsely vegetated soils that occur because of agricultural activities create areas suitable for nesting, and field edges are often used for basking.

Most of the site consists of field "interior" (as opposed to edge habitat), and field interiors are not often frequented by box turtle. Furthermore, there is a lack of habitat diversity present on the site. Optimal early-successional habitats (e.g., old fields) are lacking and there are little forested areas present, which are utilized by box turtle at various times during the year, most importantly for hibernation.

The intensity of the agricultural use, as is clearly visible from the 2013 aerial photograph (photo 1) precludes use by box turtle during that period. Had the site remained fallow for several more years, and old field vegetation more fully developed, the habitat quality for this species would have been far better than what is present today.

When considering the landscape context, including undeveloped areas to the north and west, the site is part of a habitat matrix that includes small woodlands, wetlands, agricultural lands and a cemetery, and this larger habitat matrix represents lands capable of supporting a box turtle population. While it is reasonable to assume that box turtle are present within the larger landscape, the site itself represents suboptimal habitat for box turtle.

RECOMMENDATIONS

When box turtles are observed on a site or are likely to occur based on the presence of suitable habitat it is prudent to adhere to protection measures to avoid mortality during construction (e.g., turtles or nest being crushed during construction). Such measures include exclusion fencing to exclude and inspections to remove turtles from the construction zone.

In this case, I do not believe that such measures are necessary given that no turtles were observed and construction is limited largely to the formerly active cropland where turtles are unlikely to be found. However, the presence of box turtle cannot be ruled out entirely, particularly as these habitats begin to naturalize. Should your follow-up correspondence with the NDDB result in a requirement of standard protection measures, I would be happy to assist you in implementing them.

REFERENCES

Erb, Lori. 2011. Eastern Box Turtle Conservation Plan for Massachusetts. Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program. 1 Rabbit Hill Road, Westborough, MA 01581.

Klemens, M.W. 1993. Amphibians of Connecticut and Adjacent Regions. State Geological and Natural History Survey of Connecticut, Bulletin 112.

Attachments

1. NDDB response letter dated March 22, 2018
2. Wetlands and Watercourses Delineation Report
3. Resumes of Eric Davison and Dennis Quinn

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

March 22, 2018

Mr. Eric Davison
Davison Environmental, LLC
10 Maple Street
Chester, CT 06412
eric@davisonenvironmental.com

Project: Preliminary Site Assessment for a Solar Facility at All Saints Cemetery, 700 Middletown Ave, North Haven, Connecticut

NDDB Preliminary Assessment No.: 201802831

Dear Eric Davison,

I have reviewed Natural Diversity Data Base maps and files regarding the Preliminary Site Assessment for a Solar Facility at All Saints Cemetery, 700 Middletown Ave, North Haven, Connecticut. According to our information there are known extant populations of State Special Concern *Terrapene carolina carolina* (Eastern box turtle) and *Loxandrus vulneratus* (Ground beetle) that occur within or close to the boundaries of this property.

Please be advised that this is a preliminary review and not a final determination. A more detailed review will be necessary to move forward with any subsequent environmental permit applications submitted to DEEP for the proposed project. **This preliminary assessment letter cannot be used or submitted with your permit applications at DEEP**. This letter is valid for one year.

To prevent impacts to State-listed species, field surveys of the site should be performed by a qualified biologist when these target species are identifiable. A report summarizing the results of such surveys should include:

1. Survey date(s) and duration
2. Site descriptions and photographs
3. List of component species within the survey area (including scientific binomials)
4. Data regarding population numbers and/or area occupied by State-listed species
5. Detailed maps of the area surveyed including the survey route and locations of State-listed species
6. Conservation strategies or protection plans that indicate how impacts may be avoided for all state-listed species present on the site. This is described in more detail below.
7. Statement/résumé indicating the biologist's qualifications. Please be sure when you hire a consulting qualified biologist to help conduct this site survey that they have the proper experience with target taxon and have a CT scientific collectors permit to work with state listed species for this specific project.

The site surveys reports and management plans to protect these species should be sent to our CT DEEP-NDDB Program (deep.nddbrequest@ct.gov) for further review by our program biologists along with an updated request for another NDDB review.

In order to receive a final determination letter from our program that may be required for DEEP permits or registrations, please also submit the following information to the NDDB program (deep.nddbrequest@ct.gov) for further review:

1. A conservation or protection plan designed to minimize adverse effects on the attached list of species known from this location, or an explanation why no plan is needed for this site. This document should be developed by a qualified biologist specializing in these species. A DEEP scientific collection permit will be required by the biologist to conduct surveys and/or conduct mitigation work; you should ask if your biologist has one.

The conservation/protection plan should include the following elements:
a. Anticipated impacts to these state-listed species from this project.
b. Any planned mitigation or management practices that will be employed to protect or avoid impacts to state listed species.
c. Habitat descriptions of the area surveyed.
d. A Statement, CV or Resume of the qualified biologist's qualifications to work with these species.
Please note that insufficient surveys and mitigation plans may not be accepted.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov .
Thank you for consulting the Natural Diversity Data Base.
Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

DAVISON ENVIRONMENTAL

10 Maple Street
Chester, CT 06412
860-803-0938
www.davisonenvironmental.com

Biodiversity Studies • Wetland Delineation & Assessment • Habitat Management • GIS Mapping • Permitting • Forestry

WETLANDS / WATERCOURSES DELINEATION REPORT

Date of Work: *12/17 through 5/18*

Project Location: *700 Middletown Avenue, North Haven*

Client:
Bill Fries
BL Companies

IDENTIFICATION OF WETLANDS AND WATERCOURSES RESOURCES

Wetlands and watercourses present on property? Yes ☒ No ☐

Wetlands:		Watercourses:		Identification Method:	
Inland Wetlands	☒	Perennial Streams	☒	Auger and Spade	☒
Tidal Wetlands	☐	Intermittent Watercourses	☐	Backhoe Pits	☐

Numbering Sequences:

1-1 – 1-24	5-1 – 5-23
2-1 – 2-11	
3-1 – 3-27	
4-1 – 4-28	
4-29 – 4-53	

Wetland Plant Communities Present:

Forest ☒
Sapling/Shrub ☒
Wet Meadow ☒
Marsh ☐
Upland/Streamside ☐

Definitions and methodology for identification of state regulated wetlands & watercourses

Wetlands and watercourses are regulated in the State of Connecticut General Statutes, Chapter 440, sections 22a-28 to 22a-45. The Statutes are divided into the Inland Wetlands and Watercourses Act (sections 22a-36 to 22a-45) and the Tidal Wetlands Act (sections 22a-28 to 22a-35). Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the National Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15). Watercourses "means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private which are contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation" section 22a-38(16). Tidal Wetlands are defined as "those areas which border on or lie beneath tidal waters, such as, but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some, but not necessarily all of the following" (includes plant list) section 22a-29(2).

WETLAND SOIL TYPES

Wetland soils on the site consist of the Raypol series. The Raypol series consists of very deep, poorly drained soils formed in loamy over sandy and gravelly glacial outwash. They are nearly level to gently sloping soils in shallow drainageways and low-lying positions on terraces and plains. The soils have a water table at or near the surface much of the year.

NON-WETLAND SOILS

The non-wetland soils were not examined in detail, except as was necessary to determine the wetland boundary. Non-wetland soils consist of the Ellington as well as the Manchester series.

The Ellington series consists of very deep, moderately well drained soils formed in loamy over sandy and gravelly glacial outwash. They are nearly level to strongly sloping soils on glaciofluvial landforms, typically in slight depressions and broad drainageways. Slope ranges from 0 to 15 percent. Permeability is moderate or moderately rapid in the surface layer and subsoil, and rapid or very rapid in the substratum.

The Manchester series consists of very deep, excessively drained soils formed in sandy and gravelly outwash and stratified drift. They are nearly level to steep soils on outwash plains, terraces, kames, deltas and eskers. Slope ranges from 0 to 45 percent. Permeability is rapid in the surface layer, rapid or very rapid in the subsoil, and very rapid in the substratum.

NOTES:

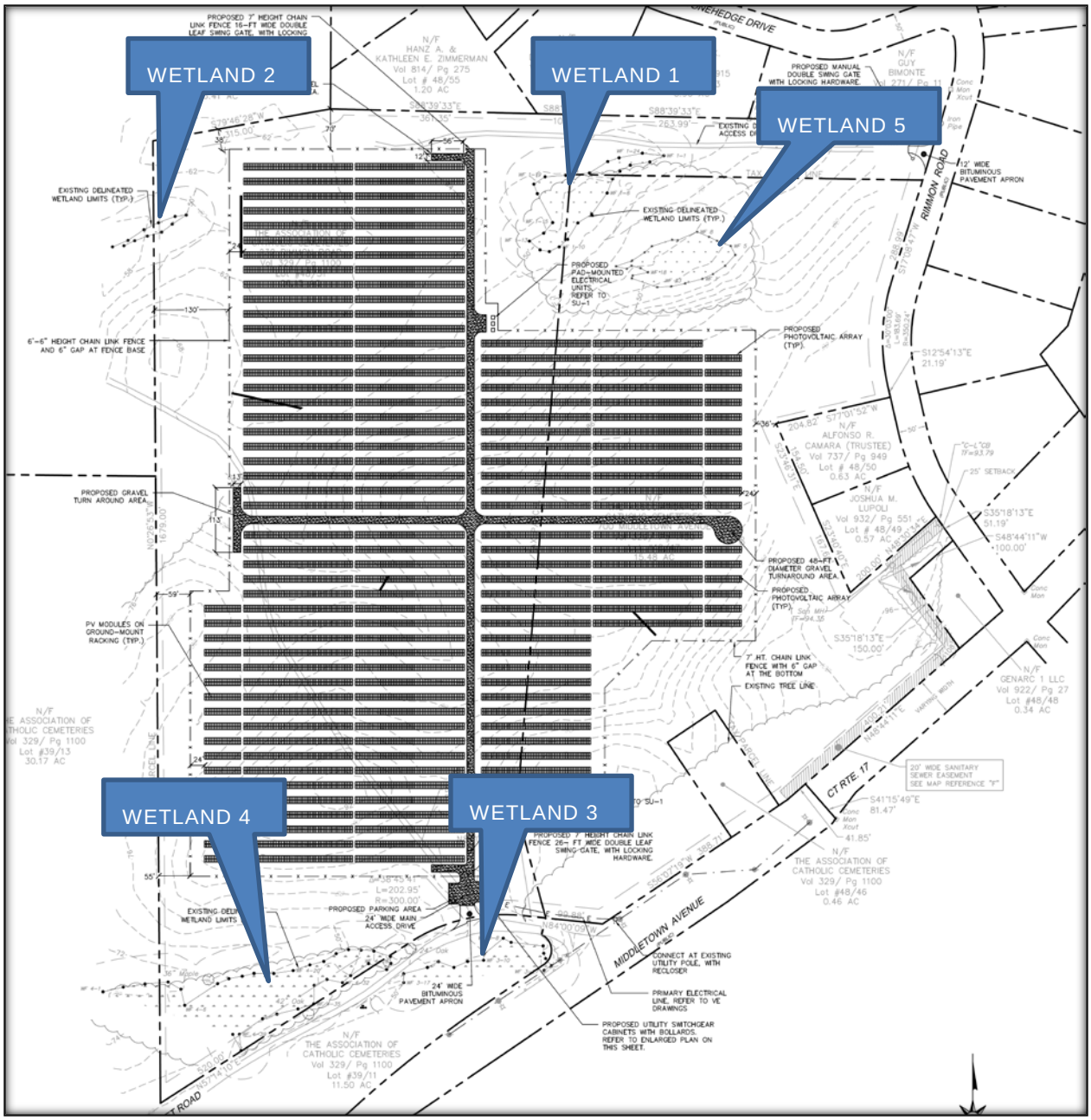
Five wetlands were delineated. Wetlands 1, 2 and 5 are isolated wetlands. Wetlands 3 and 4 are hydrologically contiguous wetlands that are bisected by the existing culverted road. A sketch map illustrating the delineated wetlands and watercourses is attached. This map is intended for illustrative purposes only.

Respectfully submitted,

Eric Davison

Eric Davison
Certified Professional Wetland Scientist
Registered Soil Scientist

WETLAND FLAGGING SKETCH MAP



Dennis P. Quinn

40 Pine Street
Plantsville, CT 06479
Phone: (203) 430-7830
E-mail: ctherpconsultant@gmail.com
www.ctherpconsultant.com

EDUCATION

University of Massachusetts, Amherst, MA.

- New England Regional Soil Science Certificate Program. (2014)

Central Connecticut State University (CCSU), New Britain, CT.

- Masters in Ecology and Environmental Science. Thesis research: Radio-telemetry of eastern box turtles to determine home-range, habitat use and hibernacula selection in CT. (2008)
- Bachelors in Biology with a concentration in Ecology, Biodiversity and Evolutionary Biology. (2002)

Recognized Qualified Bog Turtle Surveyor - Housatonic/Hudson Recovery Unit - United States Fish & Wildlife Sevice

PADI Certified Scuba Diver. (1999)

EMPLOYMENT

Owner – CTHerpConsultant, LLC. Plantsville, CT. (2007 – present)

CTHerpConsultant, LLC was founded in 2007 to facilitate the pursuit and passion I have for amphibian and reptile research, conservation and preservation. A wide variety of ecological services are offered by my company, ranging from general wildlife and habitat characterization surveys, to detailed environmental impact assessments complete with land use planning, mitigation design and monitoring. I have worked directly with a variety of State and Federally threatened and endangered species, ranging from the diploid blue-spotted salamander and spadefoot toad, to the bog turtle. I currently serve as the consulting herpetologist for the Connecticut Department of Energy and Environmental Protection where I coordinate state and northeast regional amphibian and reptile research and conservation projects associated with both the Regional Conservation Needs and State Wildlife Grant programs.

Clients:

CT Department of Energy and Environmental Protection
CT Department of Transportation
Farmington River Watershed Association
Fitzgerald & Halliday, Inc.
Michael W. Klemens, LLC
O & G Industries, Inc.
Regional Water Authority
Simsbury Land Trust
Wildlife Management Institute
Steep Rock Association
MA Division of Fisheries & Wildlife, NHESP
Parsons Corporation

Creator and maintainer of www.ctherpetolgy.com: A photographic atlas to the amphibians and reptiles of Connecticut.

Wildlife Photographer – photographs can be viewed at www.dennisquinnphotography.com

Associate Scientist, Parsons Corporation East Berlin, CT. (2005 - 2007)

- Radio-telemetric study of eastern box turtles and eastern hog-nosed snakes for ConnDOT CT Route 7 Bypass. Responsible for data collection, terrestrial mitigation design, assist with culvert design and placement, data analysis, and report preparation.
- Northern slimy salamander presence/absence survey for ConnDOT CT Route 7 Bypass. Responsibilities included field surveys and assist in report preparation.

Environmental Scientist, Maguire Group Inc. New Britain, CT. (2005)

- Field surveys for proposed Route 11 corridor and assisted in preparation of the environmental impact statement.
- Impact Assessment for emergency by-pass pipeline, data analysis, technical writing and mitigation planning.

Herpetological Field Surveyor, Farmington River Watershed and Wildlife Conservation Society (2002)

- Surveyed local reptile and amphibian populations throughout the Farmington River Valley. Identification, data collection, photography.

EMPLOYMENT IN EDUCATION

Adjunct Instructor, Naugatuck Valley Community College Waterbury, CT. (2004 - present)
Courses Taught:

Bio 105 Introductory Biology - Lec/Lab
Bio 171 Field Biology - Lec/Lab

Bio 145 General Zoology - Lec/Lab

Technical Advisor, CCSU New Britain, CT. (2011 - present)

- Serve as a technical research advisor to undergraduate and graduate students working on research in the field of herpetology.
- Graduate Thesis Committee – serve as an expert external committee member for herpetological theses.

Environmental Science Instructor, Post University Waterbury, CT. (2006)
Courses Taught:

Bio 134 General Biology - Lab
Bio 200 Ecology - Lec
Env 200 Sustainable Development - Lec
Env 230 Environmental Policy - Lec

Received honors for outstanding service to students in environmental science instruction.

Graduate Teaching Assistant, CCSU New Britain, CT. (2003)
Courses Taught:

Bio 121 General Biology I - Lab
Bio 202 Principles of Ecology and Evolution - Lab

PUBLICATIONS

- Quinn, D. 2016. *Macrophotography: Capture Larger-Than-Life Photographs of Nature's Smallest Subjects.* Amherst Media, Inc. Buffalo, NY.
- Gruner, H. and Quinn, D. 2012. Project 18-113/129 U.S. Route 7 Bypass Brookfield, Connecticut, Slimy Salamander (*Plethodon glutinosus*) Ridge-wide Habitat Study, Kent to Bethel, Connecticut. Connecticut Department of Transportation, Newington, CT.
- Quinn, D. 2011. The Timber Rattlesnake: A Modern Day Legend. *Connecticut Wildlife*. Volume 31, No. 1, Jan/Feb 2011.
- Quinn, D. and Gruner, H. 2010. Project 18-113 U.S. Route 7 Bypass Brookfield, Connecticut, Eastern Box Turtle and Eastern Hog-nosed Snake Monitoring Report 2009. Connecticut Department of Transportation, Newington, CT.
- Quinn, D. 2009. Project 131-190 Removal of Bridge No. 00518 and Intersection Improvements Route 10 and Route 322 Southington, Connecticut: Eastern Box Turtle and Wood Turtle Presence/Absence Surveys and Report. Connecticut Department of Transportation, Newington, CT.
- Quinn, D. 2008. A radio-telemetric study of the Eastern Box Turtle (*Terrapene carolina carolina*) home range, habitat use, and hibernacula selection in Connecticut. M. Sc Thesis. Central Connecticut State University, New Britain, CT. 84 pp.

PRESENTATIONS, RADIO and VOLUNTEER WORK

Seminars:

- Mystic Aquarium. CT Amphibians and Reptiles and their Conservation Challenges. (2015)
- WNPR Where We Live hosted by John Dankosky Everything You Want to Know About Turtles. (2014)
- WNPR An Atlas to Track Connecticut Critters that Slither, Hop and Crawl. (2014)
- UCONN Department of Pathobiology and Veterinary Science Seminar Series. CT Amphibians and Reptiles and their Conservation Challenges. (2014)
- CT Department of Energy and Environmental Protection. CT Salamanders and their Conservation Challenges. (2014)
- CT Department of Energy and Environmental Protection. *Natural History of the Northern Copperhead. (2013)*
- CT Department of Energy and Environmental Protection. *Natural History of the Hog-nosed Snake. (2013)*
- Simsbury Land Trust 25th Anniversary Celebration. *Connecticut Reptiles and Amphibians.* (2006)
- Biological Sciences Seminar Series. CCSU. *Land Management and Conservation Strategies for the Reptiles and Amphibians of the Farmington River Valley* (2002)

Volunteer:

Nutmeg Big Brothers Big Sisters. Big Brother Mentor. (2007 – 2010)
Regional Water Authority. A Walk with Connecticut's Reptiles and Amphibians. Pine Hill Recreational Area. (2010)
Connecticut Bio Blitz.

- Keney Park and Goodwin College. Hartford, CT. (2009)
- Wilbert Snow School. Middletown, CT. (2007)
- Two Rivers Magnet School. East Hartford, CT. (2005)

Wethersfield Nature Center. Reptile Day. Gave interactive talk with school children on reptiles and amphibians. (2005)
Simsbury Land Trust. Educational walk on vernal pools and the fauna that depend on them for survival. (2003, 2004 & 2005)

COMPUTER EXPERIENCE

Microsoft Office: Word, Excel, Access, Power Point; PC-ORD, ArcGIS, Graphical Analysis, Sigma Plot, Adobe Photoshop.

AWARDS and HONORS

Leeds M. Carluccio Award: For outstanding student service and leadership in Biological Sciences (2002)
Member Tri-beta National Honor Society (2002)

REFERENCES

Dr. Michael Klemens. Research Associate in Herpetology. American Museum of Natural History. fenbois@aol.com. (203) 448-8068. New York, NY 10024

Hank Gruner, Vice President of Programs. Connecticut Science Center, Hartford, CT. 06106. hgruner@ctsciencecenter.org (860) 712-1308.

Dr. Barbra Nicholson, Professor. Central Connecticut State University, New Britain, CT. 06050. nicholsonb@ccsu.edu. (860) 832-2706.

Cynthia Donaldson, Naugatuck Valley Community College, Waterbury, CT. 06708. cdonaldson@nvcc.commnet.edu (203) 596-8703.

Eric Davison, CSS, CPWS

10 Maple Street, Chester, CT 06412
Phone: 860-803-0938
Email: eric@davisonenvironmental.com
Web: www.davisonenvironmental.com

EDUCATION

- New England Regional Soil Science Certificate Program
  University of Massachusetts, Amherst, MA, 2000

- Bachelor of Science, Wildlife Conservation & Management
  University of Massachusetts, Amherst, MA, 1998

WORK EXPERIENCE

Davison Environmental, LLC, Chester, CT (owner/operator)
Wildlife Biologist, Wetland Scientist and Soil Scientist
(2002-present)

Provided the following consulting services to clients:

- Herpetological surveys
- Vernal pool inventory and impact assessment
- Breeding bird surveys
- Wetland delineation and soil mapping
- Local, state and federal wetland permitting assistance
- Wetland impact assessments
- Wetland restoration and mitigation plans
- Land management planning
- Wetland functions and values assessments
- GIS based environmental assessments

Metropolitan Conservation Alliance, Cary Institute of Ecosystem Studies, Millbrook, NY
Biodiversity Specialist
2009-2011 (three-year grant funded position)

- Conducted biodiversity studies throughout Connecticut and eastern New York under the direct supervision of program founder Dr. Michael W. Klemens
- Conduct herpetological surveys using a variety of techniques to identify amphibians and reptiles in aquatic and terrestrial environments including audial and visual surveys, dip-net surveys and cover-searching as well as various live-trap techniques such as minnow, hoop-net and pit-fall traps
- Characterize and map upland and wetland habitats, soils, geology and other natural resources
- Catalogue breeding bird species via visual identification and song
- Collect field data using GPS equipment and compile data collected using GIS software (ArcMap); create GIS maps and files of all field data collected

Northwest Park and Nature Center, Windsor, CT
Naturalist -Land Manager
(2000-2002)

- Responsible for habitat management and wildlife monitoring at 473-acre municipal park, with a focus on early-successional habitat management and monitoring of rare and state-listed grassland and shrubland wildlife
- Conducted conservation-related public outreach
- Staff liaison for the Town of Windsor Conservation Commission

Certifications

- Certified Soil Scientist (Society of Soil Scientists of Southern New England)
- Certified Professional Wetland Scientist (Society of Wetland Scientists)

Relevant Publications & Projects

Publications

- Audubon Connecticut Important Bird Area Conservation Plan, Greenwich Point Park, Greenwich, CT 2016
- Town of Ridgefield Natural Resource Inventory, 2012 (co-author)
- Audubon Connecticut Important Bird Area Conservation Plan, Bent of the River Sanctuary, Southbury, CT, 2011
- Haines Pond Management Plan, Brewster, NY, 2010 (field biologist and co-author)
- Eastern Westchester Biotic Corridor: Northern Terminus Addendum, North Salem and Southeast, NY, 2010 (field biologist and co-author)
- Haines Pond Biodiversity Study, Brewster, NY, 2009
- Eastern Westchester Biotic Corridor: Titicus Reservoir, North Salem, NY, 2009 (field biologist and co-author)
- Audubon Connecticut Important Bird Area Conservation Plan, Northwest Park, Windsor, CT, 2007
- Town of Windsor Natural Resource Inventory, 2005 (field biologist and co-author)

Projects

- Breeding bird point-count surveys for CT Audubon, multiple sites in Connecticut and Rhode Island in 2010 and 2011
- Wetland delineation and biological surveys (of wildlife, vernal pool herpetofauna and breeding birds), including GPS and GIS mapping, on the following linear utility projects in 2015:
    - Frost Bridge to Campville 115-kV Project, Watertown to Harwinton
    - 3424 Line Reclamation Project, Portland and Glastonbury
    - 1779 Line Rebuild Project, East Hartford and South Windsor
    - 1770-1622 Line Maintenance Project, Southbury
    - 364 Line Maintenance Project, Haddam and East Haddam
    - 352 Line Reclamation Project, Woodbury to New Milford
    - 1682-1470 Lines (SW CT), Norwalk to Ridgefield
    - Distribution Line Removal, Branford to Guilford
    - 1900-1732 Line Maintenance Project, Torrington and Harwinton

Professional Affiliations

- Commissioner - Inland Wetlands and Watercourses Commission, Town of Chester, CT
- Board Member - Connecticut River Coastal Conservation District
- Member - Society of Soil Scientists of Southern New England
- Member - Society of Wetland Scientists