## CIVIL DRAWING INDEX

| | |
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| C000 | COVER SHEET |
| C001 | GENERAL NOTES |
| CD101 | EXISTING CONDITIONS AND DEMOLITION PLAN |
| C201 | SITE AND UTILITY PLAN |
| C401 | EROSION CONTROL PLAN |
| C501 | CONSTRUCTION DETAILS |
| C502 | CONSTRUCTION DETAILS |
| C503 | CONSTRUCTION DETAILS |
| L100 | LANDSCAPE PLAN |
| L101 | LANDSCAPE PLAN |
| L102 | LANDSCAPE DETAILS |

## ELECTRICAL DRAWING INDEX

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| E000 | COVER SHEET |
| E050 | ELECTRICAL NOTES |
| E101 | ELECTRICAL SITE PLAN |
| E501 | EQUIPMENT PAD DETAILS |
| E505 | CABLING DETAILS |
| E506 | RACKING DETAILS |
| E701 | THREE LINE DIAGRAM |
| E702 | ONE LINE DIAGRAM |
| E703 | GROUNDING DIAGRAM |
| E704 | DAS DIAGRAM |
| E801 | SYSTEM LABELS |
| E802 | SYSTEM LABELS |

## STRUCTURAL DRAWING INDEX

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|---|---|
| S001 | GENERAL NOTES |
| S002 | SPECIAL INSPECTION NOTES |
| S400 | EQUIPMENT PAD PLAN & SECTIONS |
| S401 | DETAILS & SECTIONS |
| S000A-600A | APA STRUCTURAL DRAWINGS - UNSTAMPED |

## CODES AND REGULATIONS

IEEE C2 NATIONAL ELECTRICAL SAFETY CODE

NFPA 70, NATIONAL ELECTRICAL CODE - 2017 EDITION

NATIONAL GRID ELECTRIC SYSTEM BULLETINS

## PROJECT TEAM CONTACT INFORMATION


**ENGINEERING**

LABELLA ASSOCIATES, DPC
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ROCHESTER, NY 14614

ENGINEERS OF RECORD:
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LCOSH@LABELLAPC.COM

**UTILITY**

NATIONAL GRID

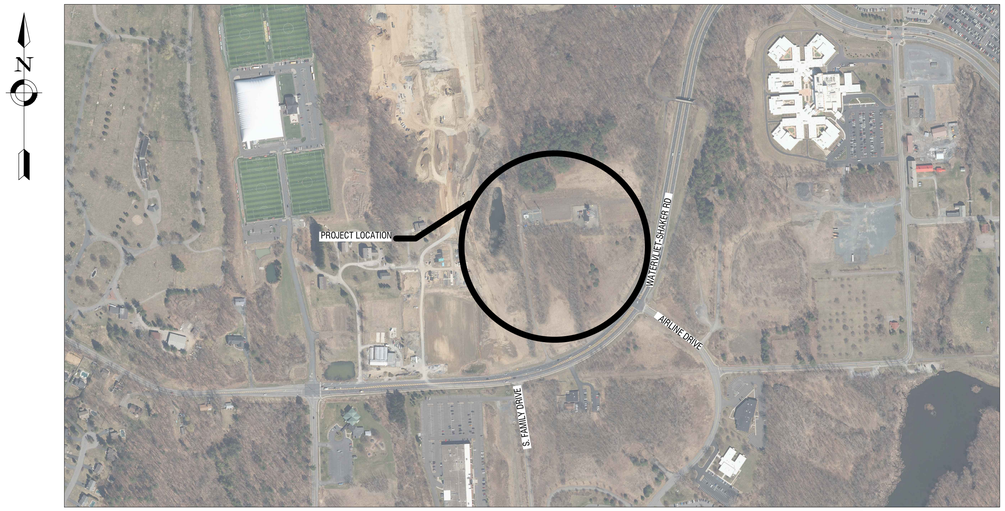

# ALBANY RADAR TOWER SOLAR ARRAY

SITE COORDINATES:

42.741013, -73.820589

ALBANY COUNTY

| SITE DATA | |
|---|---|
| SYSTEM PRODUCTION SUMMARY | |
| AC PLANT PEAK PRODUCTION: | 1.50 MW |
| DC PLANT PEAK PRODUCTION: | 2.065 MW |
| DC/AC POWER RATIO: | 1.38 |
| PV MODULE NOMINAL DC POWER: | 580 W |
| TOTAL PV MODULE QUANTITY: | 3,560 |
| TOTAL INVERTER QUANTITY: | 14 |




PROJECT LOCATION MAP

SIEMENS

## 1.50MW GROUND-MOUNTED PV DESIGN

897 WATERVLIET SHAKER ROAD

LATHAM, NY 12110

PROJECT NO: 2212336

JULY 2022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Latham, NY 12110
518-439-8235
labellapc.com


65% REVIEW SET

ALBANY RADAR TOWER PROJECT NO: 2222708

PHOTOVOLTAIC PLANT

## PROJECT DATA

### PARCEL INFORMATION

| | |
|---|---|
| APPLICANT | SIEMENS SMART INFRASTUCTURE |
| PARCEL ADDRESS | 925 WATERVLIET SHAKER RD ALBANY NY, 12205 |
| TAX NUMBER | 30.00-2-18 |
| GPS COORDINATES | N: 42.74067° N W: 73.82056° W |
| AVERAGE SITE ELEVATION | 345' |
| PARCEL AREA | ± 34.5 ACRES |
| DISTURBANCE AREA | ±5.73 ACRES |
| EQUIPMENT PAD AREA | ±380 SF |
| FENCED AREA | ±5.16 ACRES |
| DRIVEN POST CROSS SECTIONAL AREA | 4 SF |
| DRIVEN POST QUANTITY | ±255 |
| DRIVEN POST CROSS SECTIONAL AREA (TOTAL) | ±1,020 |
| SILT FENCE | ±1,105 FT |
| CHAIN LINK FENCE | ± 2,125 FT |
| GATE COUNT | 2 - 20' WIDE DOUBLE SWING GATE |

## SYSTEM SUMMARY (TOTAL)

| | |
|---|---|
| SYSTEM AC SIZE (MW) | 1.54 |
| SYSTEM DC SIZE (MW) | 2.06 |
| MODULE COUNT | 3,560 |
| INVERTER COUNT | 14 |
| SWITCH GEAR COUNT | 1 |
| TRANSFORMER COUNT | 1 |
| EQUIPMENT PAD COUNT | 1 |
| UTILITY POLE COUNT | 3 |

## ZONING INFORMATION

| | REQUIRED | PROPOSED |
|---|---|---|
| CODE APPLIED | TOWN OF COLONIE | |
| WEBSITE | HTTPS://ECODE360.COM/10402450 | |
| CLASSIFICATION | COMMERCIAL OFFICE (CO) | |
| FRONT SETBACK | 25 FT | 25 FT |
| SIDE SETBACK | 20 FT | 63 FT |
| REAR SETBACK | 20 FT | >1300 FT |
| RADAR SETBACK | 250 FT | 250 FT |
| MAX FENCE HEIGHT | 8 FT | 8 FT |
| LOT COVERAGE | 50% | 6% |

## DRAWING INDEX



## GENERAL NOTES

1. THE CONTRACTOR ALONE SHALL BE RESPONSIBLE TO LOCATE UTILITIES OUTSIDE THE RIGHT-OF-WAY INCLUDING PRIVATE ROADS.
2. SITE DRAINAGE, INCLUDING THE PROJECT SITE AND ADJACENT PRIVATE AND PUBLIC ROADWAYS, DRIVES, PARKING AREAS OR PROPERTIES SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ALL MATERIALS, TOOLS AND EQUIPMENT, INCLUDING SPECIAL CUTTING DEVICES, NECESSARY TO PERFORM THE WORK CONTAINED IN THIS CONTRACT.
4. THE SIZES AND MATERIAL OF CONSTRUCTION OF WATER MAINS, SANITARY SEWERS AND STORM SEWERS TO REMAIN ARE REPUTED. THE CONTRACTOR SHALL VERIFY SIZES OF ALL UTILITIES WHERE CONNECTIONS TO SAID EXISTING UTILITIES ARE REQUIRED. EXCAVATION TO VERIFY THESE UTILITIES SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER.
5. THE CONTRACTOR SHALL PROTECT ALL EXISTING SITE AMENITIES NOT DESIGNATED FOR REMOVAL.
6. UNLESS OTHERWISE INDICATED ON THE PLANS OR DIRECTED BY THE ARCHITECT/ENGINEER, THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING AND PROTECTING FROM DAMAGE ALL TREES, SHRUBS AND PLANTS IN THE VICINITY OF THE PROPOSED WORK.
7. THE CONTRACTOR SHALL PROTECT AND SUPPORT ALL EXISTING UTILITIES DESIGNATED TO REMAIN FOR THE DURATION OF THE CONTRACT.
8. ANY SITE AMENITY, UTILITY, STREET APPURTENANCE, OR OTHER ITEM WHICH BECOMES DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED IN-KIND BY THE CONTRACTOR AS DETERMINED BY THE PROJECT MANAGER OR ARCHITECT/ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER.

## SURVEY NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO BID. NO ALLOWANCE WILL BE MADE FOR ADDITIONAL COSTS DUE TO CONTRACTOR'S FAILURE TO VERIFY EXISTING CONDITIONS.
2. THE CONTRACTOR SHALL LOCATE, MARK, SAFEGUARD AND PRESERVE ALL SURVEY MARKERS AND RIGHT-OF-WAY MARKERS IN THE AREA OF CONSTRUCTION.
3. ANY IRON PINS, MONUMENTS OR OTHER ITEMS DEFINING PROPERTY LINES WHICH ARE DISTURBED BY CONSTRUCTION OPERATIONS SHALL BE PROPERLY TIED AND ACCURATELY RESET BY A NYS LICENSED SURVEYOR UPON COMPLETION OF THE WORK.
4. HORIZONTAL DATUM BASED OFF NORTH AMERICAN DATUM 83 (NAD83) STATE PLANE NEW YORK EAST.
5. VERTICAL BASED OFF OF NORTH AMERICAN DATUM 88 (NAVD88).

## DEMOLITION NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO BID. NO ALLOWANCE WILL BE MADE FOR ADDITIONAL COSTS DUE TO CONTRACTOR'S FAILURE TO VERIFY EXISTING CONDITIONS AND DIMENSIONS.
2. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY DIG SAFE NEW YORK AT 811 TO REQUEST UTILITY STAKEOUT OF ALL PUBLIC UTILITIES.
3. WORK ASSOCIATED WITH THIS CONTRACT WILL OCCUR AT AN ACTIVE AND FUNCTIONAL FACILITY. CONTRACTOR SHALL COORDINATE WITH THE OWNER TO MINIMIZE DISRUPTION TO THE OPERATIONS OF THE FACILITY. CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO PROVIDE A SAFE WORK SITE AND TO PROTECT THE PUBLIC, VISITORS AND EMPLOYEES FROM HARM AS A RESULT OF HIS CONSTRUCTION ACTIVITIES.
4. THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING ABOVE GROUND AND BELOW GROUND UTILITIES, STRUCTURES, AND APPURTENANCES SHOWN ON THE PLANS ARE APPROXIMATE AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES, STRUCTURES, AND APPURTENANCES IN THE PATH OF AND ADJACENT TO THE PROPOSED WORK.
5. SITE DRAINAGE, INCLUDING THE PROJECT SITE AND ADJACENT PRIVATE AND PUBLIC ROADWAYS, DRIVES, PARKING AREAS OR PROPERTIES SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
6. CONTRACTOR SHALL PROTECT AND SUPPORT ALL EXISTING UTILITIES DESIGNATED TO REMAIN FOR THE DURATION OF THE CONTRACT.
7. THE CONTRACTOR SHALL NOTIFY THE LOCAL GOVERNMENT, LOCAL FIRE DEPARTMENT AND THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) AS NECESSARY AND SHALL OBTAIN ANY REQUIRED PERMITS PRIOR TO BEGINNING WORK. COPIES OF ANY REQUIRED PERMITS SHALL BE PROVIDED TO THE OWNER PRIOR TO BEGINNING THE WORK.
8. CONTRACTOR SHALL REMOVE FROM SITE, MATERIALS NOT INDICATED TO BE SALVAGED INCLUDING ALL DEBRIS. ALL REMOVED MATERIALS SHALL BECOME THE PROPERTY OF CONTRACTOR WHO SHALL LEGALLY DISPOSE OF SAME.
9. ALL TREES, SHRUBS AND PLANTS DESIGNATED TO REMAIN AND DISTURBED BY CONSTRUCTION OPERATIONS, SHALL BE REPLACED IN-KIND AS DIRECTED BY THE ARCHITECT/ENGINEER AND/OR OWNER'S DESIGNATED REPRESENTATIVE AT NO ADDITIONAL COST TO THE OWNER.
10. THE CONTRACTOR SHALL MAINTAIN SAFE VEHICULAR AND PEDESTRIAN ACCESS TO THE EXISTING BUILDINGS FOR THE DURATION OF THE CONTRACT.
11. WHEN EXISTING CONSTRUCTION WHICH IS TO REMAIN IS DAMAGED DURING THE COURSE OF CONSTRUCTION AS A RESULT OF CONTRACTORS WORK, IT SHALL BE REPAIRED AND/OR REPLACED WITH SIMILAR OR LIKE MATERIALS AS MUCH AS POSSIBLE, AT NO COST TO THE OWNER, ALL REPAIRS AND/OR REPLACEMENTS WILL BE SUBJECT TO OWNERS APPROVAL.
12. COORDINATE LOCATION OF TEMPORARY CONSTRUCTION FENCE AND TEMPORARY STONE STAGING AREA WITH OWNER

## SITE NOTES

1. WELL COMPACTED SUBGRADE SHALL BE UTILIZED UNDERNEATH CONSTRUCTION OF PAVEMENT AND CONCRETE BASES.
2. ALL STAKEOUT FOR THE PROPOSED SITE IMPROVEMENTS SHALL BE COMPLETED BY A NEW YORK STATE LICENSED LAND SURVEYOR.
3. IF ANY DISCREPANCIES ARE NOTED BETWEEN THESE CONSTRUCTION DOCUMENTS AND INFORMATION PROVIDED OR AN ERROR IS SUSPECT, IT SHALL BE IMMEDIATELY REPORTED TO THE CONSTRUCTION MANAGER AND LABELLA ASSOCIATES PROJECT MANAGER IN WRITING.
4. ANY PROOF-ROLLING OF EXPOSED SUBBASE BY A MINIMUM 10 TON SMOOTH DRUM ROLLER SHALL BE DONE UNDER THE GUIDANCE OF, AND OBSERVED BY, QUALIFIED ENGINEERING PERSONNEL PRIOR TO PLACEMENT OF SUBBASE MATERIAL. THE ROLLER SHOULD BE OPERATED IN THE STATIC MODE AND COMPLETE AT LEAST TWO (2) PASSES OVER THE EXPOSED SUBGRADES.
5. PARCEL LINES AS SHOWN BY ALBANY COUNTY GIS DATABASE, FOR THE TOWN OF COLONIE.

## UTILITY NOTES

1. CONTRACTOR SHALL COORDINATE INSTALLATION OF WATER MAIN / WATER SERVICE WITH MONROE COUNTY WATER AUTHORITY (MCWA) AND THE MONROE COUNTY HEALTH DEPARTMENT (MCDOH). NO WORK SHALL BEGIN ON THE WATER MAIN / WATER SERVICE WITHOUT MCWA AND MCDOH SIGNATURES ON THE UTILITY PLAN.
2. CONTRACTOR SHALL COORDINATE INSTALLATION OF SANITARY MAIN / SANITARY SERVICE WITH MONROE COUNTY PURE WATERS (MCPW). NO WORK SHALL BEGIN ON THE SANITARY MAIN / SANITARY SERVICE WITHOUT MCPW SIGNATURE ON THE UTILITY PLAN.

## GRADING NOTES

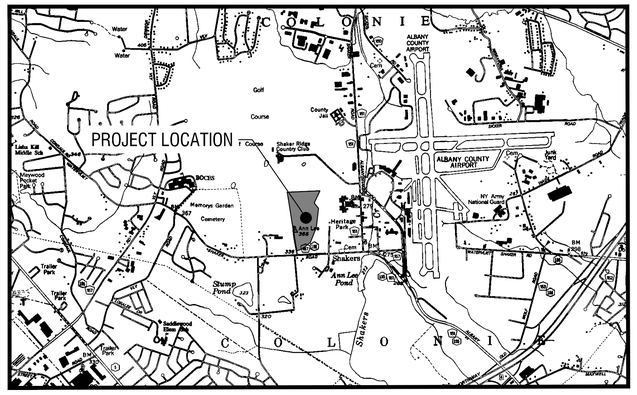
1. THE CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF OSHA, AND ANY OTHER AGENCY HAVING JURISDICTION WITH REGARD TO SAFETY PRECAUTIONS WITH TRENCHING OPERATIONS. THE REQUIREMENTS SET FORTH HEREIN ARE INTENDED TO SUPPLEMENT REQUIREMENTS ESTABLISHED BY THESE AGENCIES. IN THE CASE OF A CONFLICT BETWEEN REQUIREMENTS OF OTHER JURISDICTIONAL AGENCIES AND THESE DOCUMENTS, THE MORE STRINGENT REQUIREMENT ON THE CONTRACTOR SHALL APPLY.
2. SHEETING, IF REQUIRED DURING CONSTRUCTION, IS CONSIDERED TO BE PART OF THIS CONTRACT AND SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
3. ALL TRENCHES THROUGH PAVEMENT SHALL BE SAW CUT PRIOR TO EXCAVATION AND AGAIN PRIOR TO PAVEMENT RESTORATION.
4. CONTRACTOR SHALL ADJUST THE RIMS OF ALL MANHOLES, CATCH BASINS, VALVE BOXES AND OTHER UTILITY SITE STRUCTURES TO MEET FINISHED GRADE IN AREAS REQUIRING REPAVING OR REGRADING AS PART OF THE WORK, INCLUDING THOSE THAT MAY NOT BE SHOWN ON THE PLANS.
5. VOIDS LEFT BY UTILITY OR STRUCTURE REMOVAL OR GRUBBING OPERATIONS SHALL BE BACKFILLED AND PROPERLY COMPACTED WITH STRUCTURAL FILL (NYSDOT ITEM 304.12) IN AREAS UNDER AND WITHIN 5 FEET HORIZONTALLY OF ALL STRUCTURES, BUILDINGS AND PAVEMENTS. IN GRASSED AREAS, VOIDS LEFT SHALL BE FILLED AND PROPERLY COMPACTED WITH SUITABLE ON-SITE OR IMPORTED EARTHEN BACKFILL. ALL DISTURBED AREAS SHALL BE RESTORED.
6. THE CONTRACTOR SHALL DEWATER ALL EXCAVATIONS TO PREVENT THE INTRODUCTION OF GROUNDWATER INTO THE TRENCHES/EXCAVATIONS. PROVIDE ALL EQUIPMENT NECESSARY TO MAINTAIN THE GROUNDWATER LEVEL AS NECESSARY.
7. THE CONTRACTOR SHALL PLACE AT MINIMUM 6 INCHES OF CLEANED SCREENED TOPSOIL IN ALL DISTURBED AREAS PRIOR TO SEEDING.

## EROSION AND SEDIMENT CONTROL NOTES

1. ALL EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, AND LOCAL GOVERNING SOIL AND WATER CONSERVATION AGENCY RECOMMENDATIONS AND STANDARDS. CONTRACTOR SHALL SUBMIT PROPOSED EROSION CONTROL PLAN INCLUDING SEQUENCING OF WORK TO THE ENGINEER FOR REVIEW PRIOR TO START OF WORK.
2. UTILIZE CONSTRUCTION METHODS/TECHNIQUES, WHICH WILL LIMIT THE EXPOSED EARTHEN AREAS AND MINIMIZE THE EFFECT OF EARTH DISTURBANCE ACTIVITIES ON SOIL EROSION. THE AREA OF DISTURBANCE SHALL BE LIMITED TO A MAXIMUM OF 5 ACRES UNLESS OTHERWISE APPROVED BY THE ENGINEER.
3. ALL SEDIMENTATION BARRIERS AND OTHER TEMPORARY OR PERMANENT MEASURES SHALL BE IN PLACE PRIOR TO THE START OF CONSTRUCTION. PLANS SHOW THE SUGGESTED MINIMUM MEASURES REQUIRED.
4. REMOVAL OF ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE COMPLETED AT THE APPROVAL OF THE OWNER AND ENGINEER. THE COST OF REMOVING THESE MEASURES SHALL ALSO BE INCLUDED IN THE BID PRICE.
5. FOR THE DURATION OF THE PROJECT, THE CONTRACTOR SHALL PROTECT ALL ON-SITE, ADJACENT AND/OR DOWNSTREAM STORM/SANITARY SEWERS, AND/OR OTHER WATER COURSES FROM CONTAMINATION BY WATER BORNE SILTS, SEDIMENTS, FUELS, SOLVENTS, LUBRICANTS OR OTHER POLLUTANTS ORIGINATING FROM ANY WORK DONE ON, OR IN SUPPORT OF THIS PROJECT.
6. DURING CONSTRUCTION NO WET OR FRESH CONCRETE OR LEACHATE SHALL BE ALLOWED TO ESCAPE INTO STORM/SANITARY SEWERS, DITCHES OR OTHER WATERS OF NEW YORK STATE, NOR SHALL WASHINGS FROM CONCRETE TRUCKS, MIXERS OR OTHER DEVICES BE ALLOWED TO ENTER ANY STORM/SANITARY SEWERS, DITCHES, RIVERS, OR WATER COURSES.
7. ALL EXCAVATED OR IMPORTED EARTHEN STOCKPILES SHALL BE SUITABLY STABILIZED AND PROTECTED BY SILT FENCE SO THAT IT CANNOT REASONABLY ENTER ANY WATER BODY, OR STORM OR SANITARY SEWER.
8. ALL METHODS AND EQUIPMENT PROPOSED BY THE CONTRACTOR TO ACCOMPLISH THE WORK FOR EROSION AND POLLUTION CONTROL SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
9. THE CONTRACTOR SHALL BE REQUIRED TO TREAT TRAVELED AREAS TO CONTROL DUST. WATER SHALL BE APPLIED TO SUCH TRAVELED AREAS AS THE ARCHITECT/ENGINEER OR OWNER'S DESIGNATED REPRESENTATIVE MAY DESIGNATE, THE NUMBER OF APPLICATIONS AND THE AMOUNT OF WATER SHALL BE BASED UPON FIELD AND WEATHER CONDITIONS.
10. ALL AREAS OF SOIL DISTURBANCE RESULTING FROM THIS PROJECT WHICH WILL NOT BE SUBJECT TO FURTHER EARTHWORK OR CONSTRUCTION ACTIVITIES SHALL BE PERMANENTLY SEEDED TO ESTABLISH GRASS, AND MULCHED WITH HAY OR STRAW WITHIN ONE WEEK OF FINAL DISTURBANCE. MULCH SHALL BE MAINTAINED UNTIL A SUITABLE VEGETATIVE COVER IS ESTABLISHED.
11. CONTRACTOR STAGING AREAS AND CONSTRUCTION ENTRANCE LOCATIONS SHALL BE COORDINATED WITH THE OWNER PRIOR TO START OF CONSTRUCTION. STABILIZED CONSTRUCTION ENTRANCE(S), AS SHOWN ON THE PLANS SHALL BE PROVIDED. ALL DISTURBED AREAS SHALL BE RESTORED.
12. ALL CATCH BASINS/DRAINAGE INLETS SHALL HAVE STONED INLET PROTECTION AROUND THEM AND GEOTEXTILE FABRIC OVER THE GRATE TO PREVENT SEDIMENTATION FROM ENTERING THE STORM SYSTEM.
13. TILL ALL COMPACTED SOILS LOCATED IN LAWN AREAS TO RESTORE THE ORIGINAL PROPERTIES OF THE SOIL PRIOR TO SEEDING.

## LEGEND

| EXISTING | PROPOSED | DESCRIPTION | EXISTING | PROPOSED | DESCRIPTION |
|---|---|---|---|---|---|
| | | PROJECT BENCHMARK / CONTROL POINTS | | | END SECTION |
| | | WETLAND | | | CATCH BASIN |
| | | WETLAND BUFFER | | | DRAIN BASIN |
| | | BORING LOCATIONS | | | INLET MANHOLE |
| | | OBJECT REMOVAL | | | MANHOLE (SOLID COVER) |
| | | OBJECT REMOVAL_2 | | | INLET DRYWELL |
| | | OBJECT REMOVAL_3 | | | CLEAN OUT |
| | | - REMOVAL UTILITY | | | DOWN SPOUT |
| | | - REMOVAL FENCE | | | HYDRANT |
| | | SAWCUT | | | VALVE |
| | | PROTECTION (OBJECT) | | | SAMPLING TAP |
| | | TREE PROTECTION | | | (OTHER) FLOW ARROW |
| | | FENCE, CHAIN LINK | CTV CTV | CTV CTV | CATV |
| | | FENCE, TYPE 1 | COMM COMM | COMM COMM | COMMUNICATIONS |
| | | FENCE, TYPE 2 | FO FO | FO FO | FIBER OPTICS |
| | | FENCE, GUIDE RAIL | SIG | SIG | SIGNAL LINE |
| | | TREE/VEGETATION LIMIT | T T | T T | TELEPHONE LINE |
| BLDG | BLDG | BUILDING/STRUCTURE | OE OE | OE OE | OVERHEAD ELECTRIC |
| | | PROPERTY LINE | P P | P | POWER LINE |
| | | SETBACK LINE | UE UE | UE UE | UNDERGROUND ELECTRIC |
| PE | PE | EASEMENTS | G | G | GAS LINE |
| ROW | ROW | RIGHT-OF-WAY | SA | SA | SANITARY LINE |
| | | RETAINING WALL | FM FM | FM FM | SANITARY FORCEMAIN |
| | | BOLLARD | ST | ST | STORM LINE |
| | | FLAG POLE | | | STORM UNDERDRAIN PIPE |
| | | SIGN | FS | FS | WATER FIRE SERVICE LINE |
| | | DECIDUOUS TREE | W | W | WATER LINE |
| | | CONIFEROUS TREE | ST-SA | ST-SA | COMBINED SANITARY AND STORM |
| | | TREE STUMP | | | FUEL LINES (DIESEL/UNLEADED) |
| | | OUTLET PROTECTION | 510 | 510 | MAJOR CONTOUR |
| | | BIORETENTION | 509 | 509 | MINOR CONTOUR |
| | | BOLLARD LIGHT POLE | | | ℄ OF DRAINAGE SWALE |
| | | LIGHT POLE SINGLE | | | EROSION FENCE |
| | | LIGHT POLE DOUBLE | | | FLOW/SLOPE DIRECTION |
| | | LIGHT POLE TRIPLE | | | SILT SOCK INLET PROTECTION |
| | | LIGHT POLE QUAD | | | SILT FENCE INLET PROTECTION |
| | | UTILITY POLE | | | CHECK DAM |
| | | UTILITY POLE WITH LIGHT | | | STABILIZED CONSTRUCTION ENTRANCE (TEMPORARY) |
| HH | HH | HANDHOLE | | | |
| E | E | MANHOLE | | | |




LOCATION MAP

N.T.S.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STATE OF NEW YORK BRIAN JOSEPH BENNETT 109807 LICENSED PROFESSIONAL ENGINEER



**SIEMENS SMART INFRASTRUCTURE**
6 BRITISH AMERICAN BLVD
LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708

DRAWN BY: CEC

REVIEWED BY: RFH

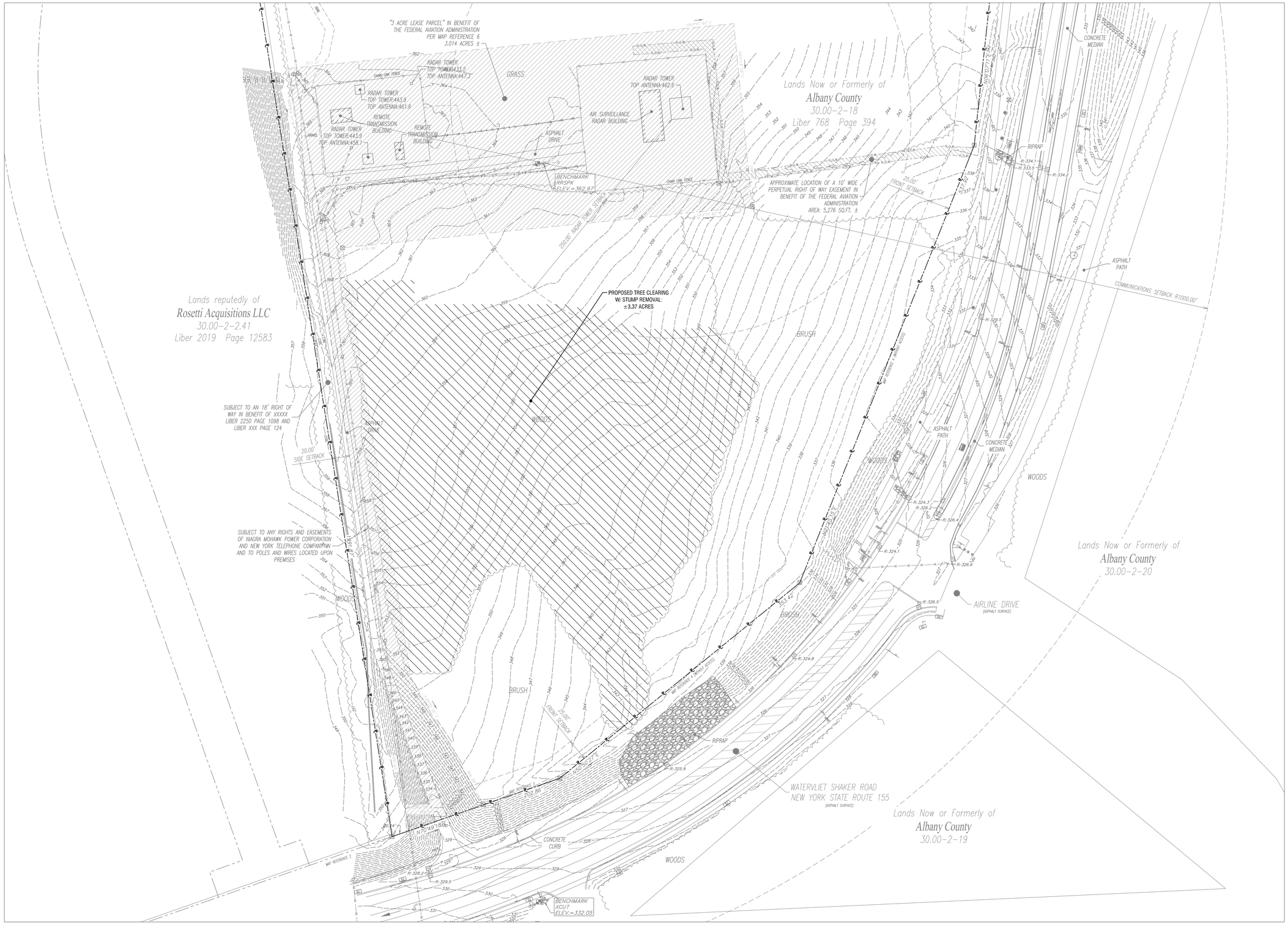
ISSUED FOR: PERMIT ONLY

DATE: 08/05/2022

DRAWING NAME: GENERAL NOTES LEGEND AND DRAWING INDEX

DRAWING NUMBER: C001

VERSION 19.0
6/3/2010 8:47:56 AM




1 CD101 EXISTING CONDITIONS AND DEMOLITION PLAN

SCALE: 1" = 50'

N

0' 50' 100' 150'

VERSION 19.0
6/3/2010 8:47:56 AM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SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708

DRAWN BY: CEC

REVIEWED BY: RFH

ISSUED FOR: PERMIT ONLY

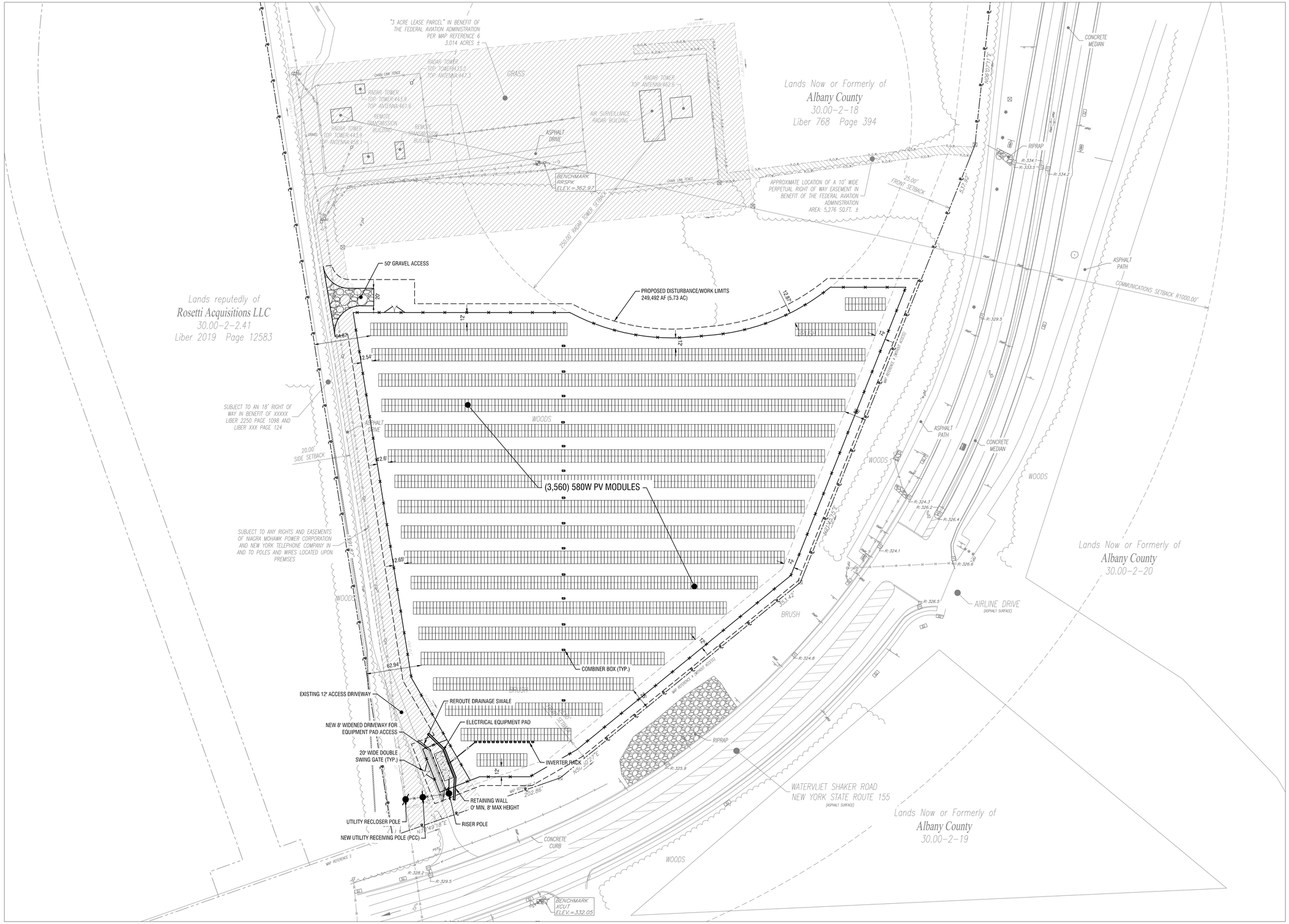
DATE: 08/05/2022

DRAWING NAME:

**EXISTING CONDITIONS AND DEMOLITION PLAN**

DRAWING NUMBER:

# CD101




1 C201 SITE AND UTILITY PLAN
SCALE: 1" = 50'

N

0' 50' 100' 150'

VERSION 19.0
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LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

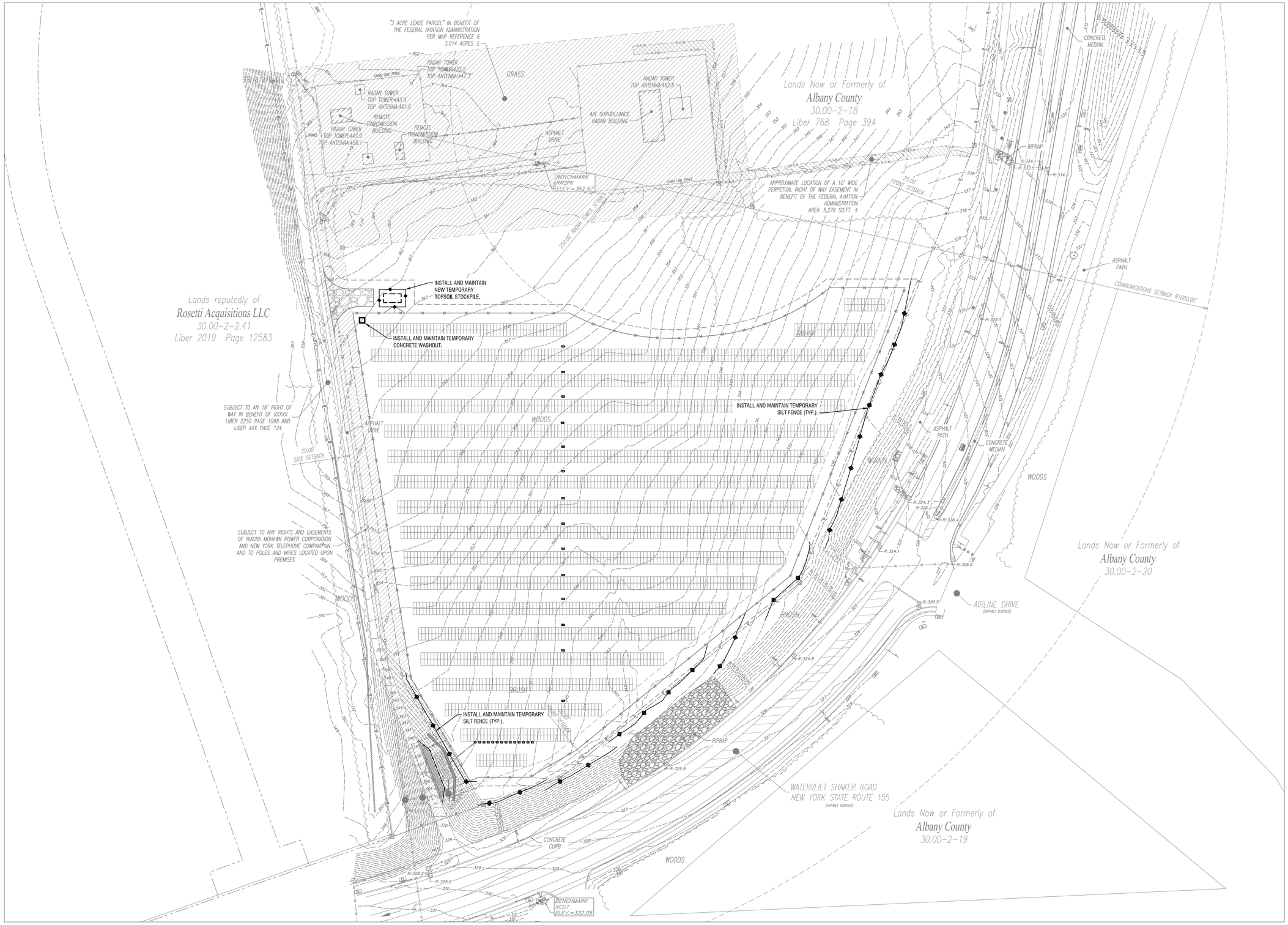
| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: CEC
REVIEWED BY: RFH
ISSUED FOR: PERMIT ONLY
DATE: 08/05/2022
DRAWING NAME:

## SITE AND UTILITY PLAN

DRAWING NUMBER:

# C201




1 / C401 EROSION CONTROL PLAN

SCALE: 1" = 50'

N

VERSION 19.0
6/3/2010 8:47:56 AM

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SIEMENS

**ALBANY RADAR TOWER SOLAR**
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ALBANY, NY 12205

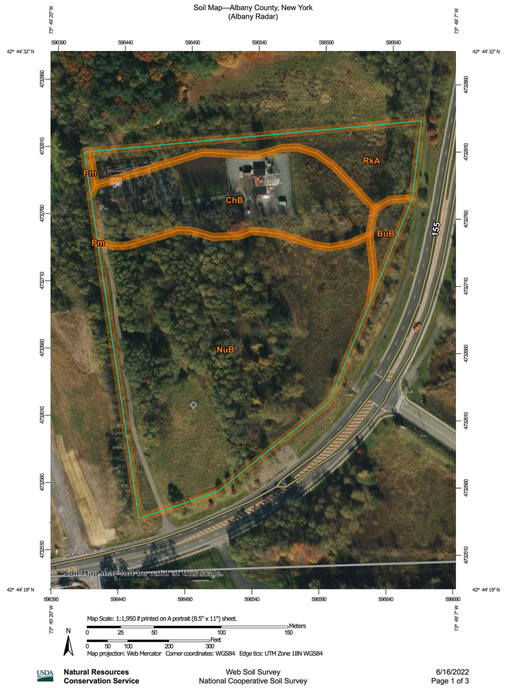
| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: CEC
REVIEWED BY: RFH
ISSUED FOR: PERMIT ONLY
DATE: 08/05/2022
DRAWING NAME:

**EROSION CONTROL PLAN**

DRAWING NUMBER:

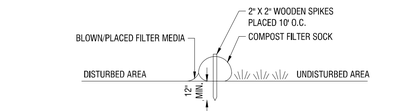
# C401



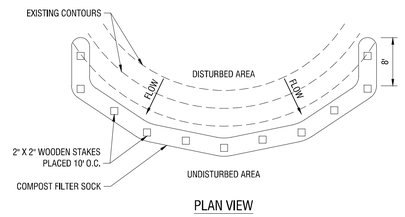

| SOILS MAP LEGEND | |
|---|---|
| BuB | Burdett silt loam, 3 to 8 percent slopes |
| ChB | Chenango gravelly silt loam, loamy substratum, 3 to 8 percent slopes |
| NuB | Nunda silt loam, 3 to 8 percent slopes |
| Pm | Pits, gravel |
| RkA | Riverhead fine sandy loam, 0 to 3 percent slopes |

8 / C501 — USDA SOILS MAP

N.T.S.



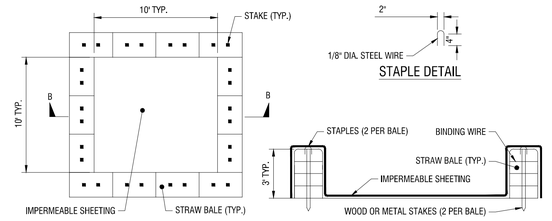

SECTION VIEW




PLAN VIEW

7 / C501 — COMPOST FILTER SOCK

NYS DEC DETAIL: COMPOST FILTER SOCK




PLAN

SECTION B-B

NOTE:

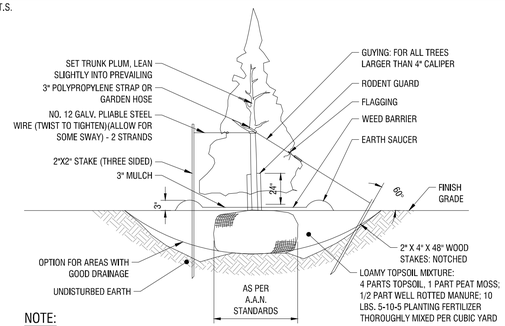
1. CAN BE TWO STACKED BALES OR PARTIALLY EXCAVATED TO REACH 3 FT DEPTH

CONSTRUCTION SPECIFICATIONS

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 100 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD, TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

6 / C501 — CONCRETE WASHOUT AREA WITH STRAW BALES

N.T.S.

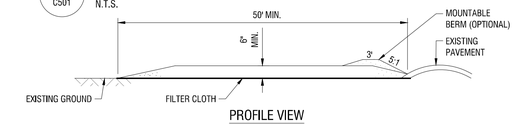



NOTE:

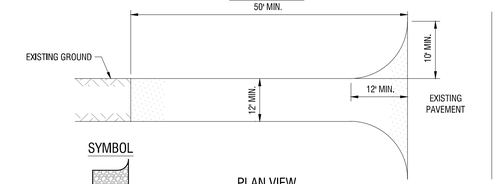
1. STAKING: FOR ALL TREES 4" CALIPER OR LESS. REMOVE STAKES ONE YEAR AFTER PLANTING.
2. USE 8' STAKES DRIVE 4' BELOW GROUND SURFACE.
3. GUYING: FOR ALL EVERGREEN TREES AND ALL TREES TALLER THAN 8'. USE SAME WIRE AS FOR STAKING. USE THREE PER TREE, EQUALLY SPACED. DO NOT TWIST WIRE TO TIGHTEN: USE 1/2"X6" TURNBUCKLE.
4. ROOT COLLAR TO BE SLIGHTLY ABOVE SURROUNDING GRADE.
5. MULCH SHALL BE 3" DOUBLE GROUND HARDWOOD BAR, COLOR DARK BROWN.
6. MULCH CAN NOT BE MORE THAN 1" THICK AT ROOT COLLAR EXTENDING OUT AT LEAST 6" FROM THE BARK, THEN IT CAN BE THICKENED.
7. MULCH IS TO BE PLACED 3 TO 6 INCHES AWAY FROM THE TRUNK.
8. KRAFT WRAP PAPER SHALL NOT BE PERMITTED FOR RODENT GUARD.
9. SEE LANDSCAPING PLAN FOR TREE SPACING AND SPECIES.

5 / C501 — TREE PLANTING

N.T.S.




PROFILE VIEW




SYMBOL

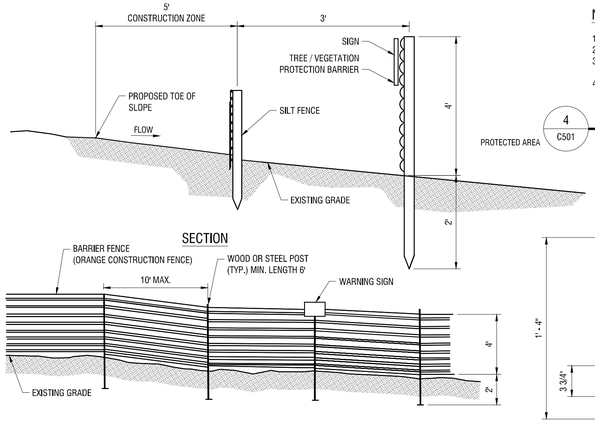
PLAN VIEW

CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN EVENT.

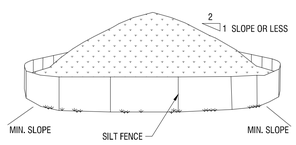
1 / C501 — STABILIZED CONSTRUCTION ENTRANCE

N.YS DEC DETAIL: STABILIZED CONSTRUCTION ACCESS




3 / C501 — TREE/VEGETATION PROTECTION BARRIER

N.T.S.




NOTES:

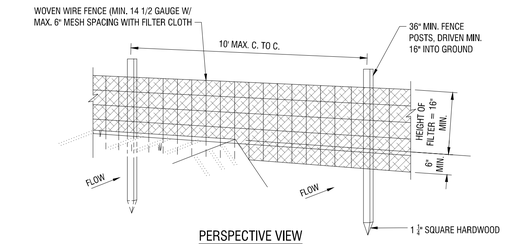
1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1V:2H.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH SILT FENCING, THEN STABILIZED WITH VEGETATION OR COVERED.
4. SEE SPECIFICATIONS AND DETAIL FOR INSTALLATION OF SILT FENCE.

4 / C501 — TEMPORARY SOIL STOCKPILE

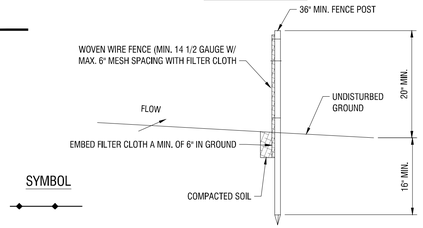
PROTECTED AREA

N.T.S.


WARNING SIGN




PERSPECTIVE VIEW




SYMBOL

SECTION VIEW

NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24' AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABLINKA 140N, OR APPROVED EQUAL.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUAL.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

2 / C501 — SILT FENCE

NYS DEC DETAIL: SILT FENCE

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**SIEMENS SMART INFRASTRUCTURE**
6 BRITISH AMERICAN BLVD
LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: CEC
REVIEWED BY: RFH
ISSUED FOR: PERMIT ONLY
DATE: 08/05/2022
DRAWING NAME:

**CONSTRUCTION DETAILS**

DRAWING NUMBER:

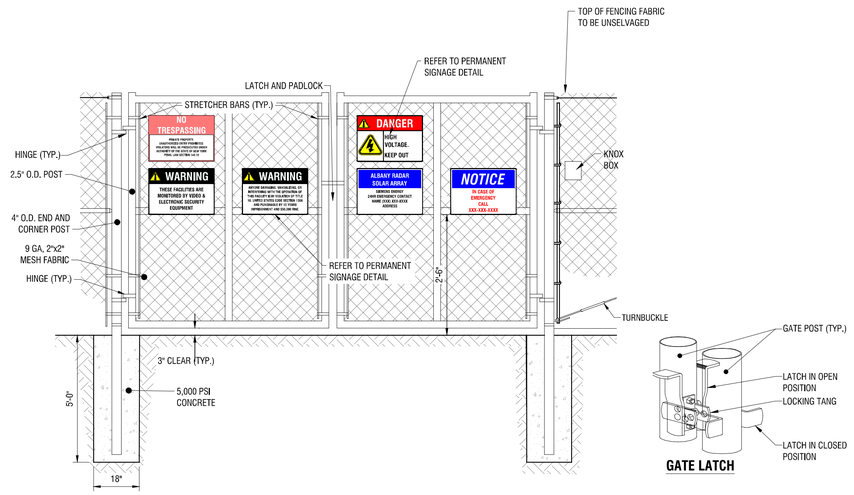
**C501**


NOTES:

1. ALL SIGNS TO BE 18" x 24" IN SIZE
2. SIGNS SHALL BE UV RESISTANT AND IN COLOR. SIGN MATERIAL SHALL BE HDPE OR LIGHT GAGE GALVANIZED STEEL.
3. SIGNS TO BE ATTACHED TO FENCING WITH PERMANENT FASTENERS OR INSTALLED IN SIGN POST

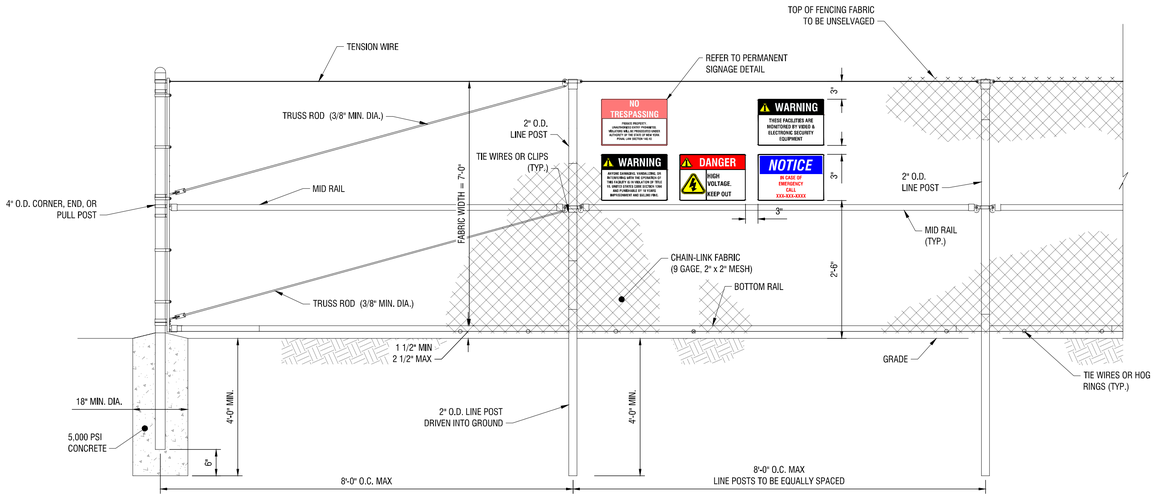
3 / C502 — PERMANENT SIGNAGE

N.T.S.




2 / C502 — 7' TALL 20' WIDE DOUBLE SWING GATE

N.T.S.




NOTES:

1. SIGNS SHALL BE INSTALLED IN GROUPS EVERY 300',

1 / C502 — 7' HIGH SECURITY FENCE

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**SIEMENS SMART INFRASTRUCTURE**
6 BRITISH AMERICAN BLVD
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SIEMENS

**ALBANY RADAR TOWER SOLAR**
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| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: CEC
REVIEWED BY: RFH
ISSUED FOR: PERMIT ONLY
DATE: 08/05/2022
DRAWING NAME:

**CONSTRUCTION DETAILS**

DRAWING NUMBER:

**C502**

VERSION 19.0
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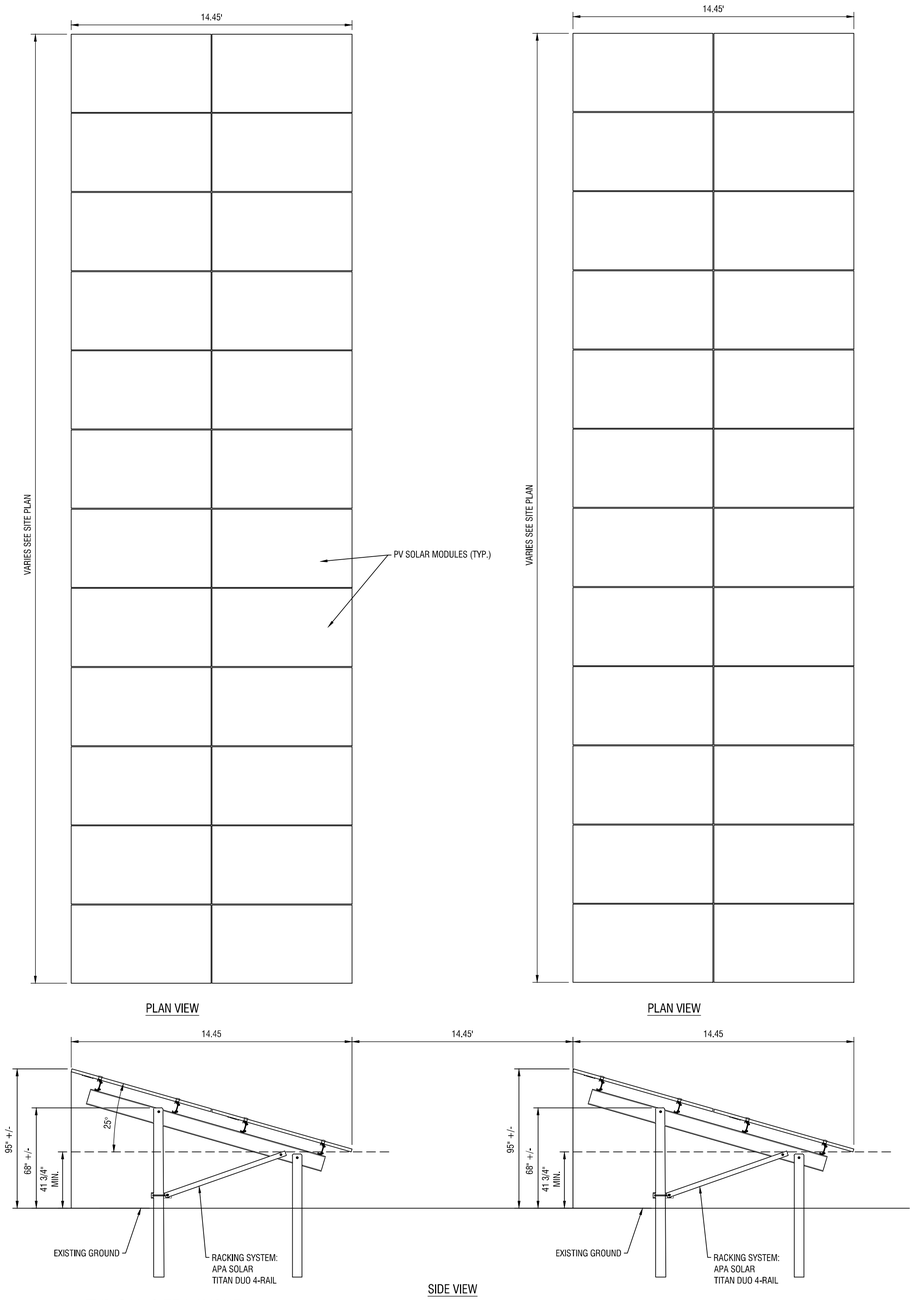
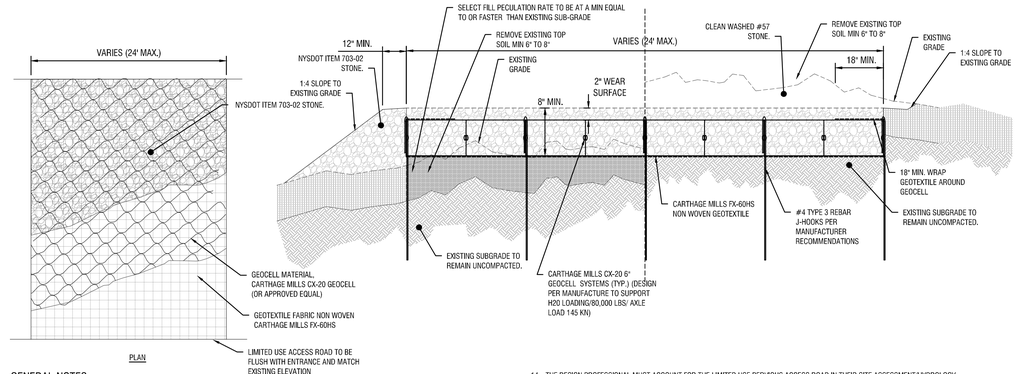



1 C-703 TYPICAL SITE LAYOUT

N.T.S.




## GENERAL NOTES:

1. PROVIDE A 4800 LB/FT ENHANCED WOVEN GEOTEXTILE SEPERATION LAYER AND INSTALL PER MANUFACTURER RECOMMENDATIONS INCLUDING OVERLAPS BASED ON SUB GRADE CBR.
2. THE GEOCELL SHALL BE CONNECTED WITH TYP 3 REBAR J HOOKS.
3. PROVIDE TYP 3 ANCHORS TO KEEP PANELS OPEN FOR INFILL AS REQUIRED.
4. GEOCELL INFILL SHALL BE 3/4" TO 1.5" CRUSHED AGGREGATE WITH FINES LIMITED TO LESS THAN 10% TO ALLOW FREE DRAINAGE.
5. LIMIT THE DROP OF INFILL TO PREVENT PANEL DISTORTION.
6. ASSUME HS-20 LOADING.

## PERMEABLE ACCESS ROAD GENERAL NOTES:

1. USE OF THIS DETAIL/CRITERION IS LIMITED TO ACCESS ROADS USED ON AN OCCASIONAL BASIS ONLY (I.E. PROVIDE ACCESS FOR MOWING EQUIPMENT REPAIR OR MAINTENANCE, ETC.)
2. LIMITED USE PERVIOUS ACCESS ROAD IS LIMITED TO LOW IMPACT IRREGULAR MAINTENANCE ACCESS ASSOCIATED WITH RENEWABLE ENERGY PROJECTS IN NEW YORK STATE.
3. REMOVE STUMPS, ROCKS AND DEBRIS AS NECESSARY, FILL VOIDS TO MATCH EXISTING NATIVE SOILS AND COMPACTION LEVEL.
4. REMOVED TOPSOIL MAY BE SPREAD IN ADJACENT AREAS AS DIRECTED BY THE PROJECT ENGINEER. COMPACT TO THE DEGREE OF THE NATIVE INSITU SOIL. DO NOT PLACE IN AN AREA THAT IMPEDES STORMWATER DRAINAGE.
5. GRADE ROADWAY, WHERE NECESSARY, TO NATIVE SOIL AND DESIRED ELEVATION. MINOR GRADING FOR CROSS SLOPE CUT AND FILL MAY BE REQUIRED.
6. REMOVE 6" TO 8" TOPSOIL AS DIRECTED BY ENGINEER.
7. REMOVE REFUSE SOILS AS DIRECTED BY THE PROJECT ENGINEER. DO NOT PLACE IN AN AREA THAT IMPEDES STORMWATER DRAINAGE.
8. ROADWAY WIDTH TO BE DETERMINED BY CLIENT.
9. THE LIMITED USE PERVIOUS ACCESS ROAD CROSS SLOPE SHALL BE 0% IN MOST CASES AND SHOULD NOT EXCEED 5%. THE LONGITUDINAL SLOPE OF THE ACCESS DRIVE SHOULD NOT EXCEED 5%.
10. LIMITED USE PERVIOUS ACCESS ROAD IS NOT INTENDED TO BE UTILIZED FOR CONSTRUCTION WHICH MAY SUBJECT THE ACCESS TO SEDIMENT TRACKING. THIS SPECIFICATION IS TO BE DEVELOPED FOR POST-CONSTRUCTION USE. SOIL RESTORATION PRACTICES MAY BE APPLICABLE TO RESTORE CONSTRUCTION RELATED COMPACTION TO PRE-EXISTING CONDITIONS AND SHOULD BE VERIFIED BY SOIL PENETROMETER READINGS. THE PENETROMETER READINGS SHALL BE COMPARED TO THE RESPECTIVE RECORDED READINGS TAKEN PRIOR TO CONSTRUCTION, EVERY 100 LINEAR FEET ALONG THE PROPOSED ROADWAY.
11. TO ENSURE THAT SOIL IS NOT TRACKED ONTO THE LIMITED USE PERVIOUS ACCESS ROAD, IT SHALL NOT BE USED BY CONSTRUCTION VEHICLES TRANSPORTING SOIL, FILL MATERIAL, ETC. IF THE LIMITED USE PERVIOUS ACCESS IS COMPLETED DURING INITIAL PHASES OF CONSTRUCTION, A STANDARD NEW YORK STATE STABILIZED CONSTRUCTION ACCESS SHALL BE CONSTRUCTED AND UTILIZED TO REMOVE SEDIMENT FROM CONSTRUCTION VEHICLES AND EQUIPMENT PRIOR TO ENTERING THE LIMITED USE PERVIOUS ACCESS ROAD FROM ANY LOCATION ON, OR OFF SITE. MAINTENANCE OF THE PERVIOUS ACCESS ROAD WILL BE REQUIRED IF SEDIMENT IS OBSERVED WITHIN THE CLEAN STONE.
12. THE LIMITED USE PERVIOUS ACCESS ROAD SHALL NOT BE CONSTRUCTED OR USED UNTIL ALL AREAS SUBJECT TO RUNOFF ONTO THE PERVIOUS ACCESS HAVE ACHIEVED FINAL STABILIZATION.
13. PROJECTS SHOULD AVOID INSTALLATION OF THE LIMITED USE PERVIOUS ACCESS ROAD IN POORLY DRAINED AREAS, HOWEVER IF NO A
14. THE DESIGN PROFESSIONAL MUST ACCOUNT FOR THE LIMITED USE PERVIOUS ACCESS ROAD IN THEIR SITE ASSESSMENT/HYDROLOGY ANALYSIS. IF THE HYDROLOGY ANALYSIS SHOWS THAT THE HYDROLOGY HAS BEEN ALTERED FROM PRE- TO POST-DEVELOPMENT CONDITIONS (SEE APPENDIX A OF GP-0-20-001 FOR THE DEFINITION OF "ALTER THE HYDROLOGY…"), THE DESIGN MUST INCLUDE THE NECESSARY DETENTION/RETENTION PRACTICES TO ATTENUATE THE RATES (10 AND 100 YEAR EVENTS) TO PRE-DEVELOPMENT CONDITIONS.

## GEOCELL MATERIAL NOTES:

1. THE GEOCELL, OR COMPARABLE PRODUCT, IS SUGGESTED FOR USE ON ROAD PROFILES EXCEEDING 5%. THE GEOCELL PRODUCT IS INTENDED TO LIMIT SHIFTING STONE MATERIAL DURING USE.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. WHERE REQUIRED, A NATIVE SOIL WEDGE SHALL BE PLACED TO ACCOMMODATE ROAD CROSS SLOPE OF 2%. NATIVE SOIL SHALL BE COMPACTED TO MATCH EXISTING SOIL CONDITIONS.
4. GRAVEL FILL MATERIAL SHALL CONSIST OF 1-4" CLEAN, DURABLE, SHARP-ANGLED CRUSHED STONE OF UNIFORM QUALITY, MEETING THE SPECIFICATIONS OF NYSDOT ITEM 703-02, SIZE DESIGNATION 3-5 OF TABLE 703-4. STONE MAY BE PLACED IN FRONT OF, AND SPREAD WITH, A TRACKED VEHICLE. GRAVEL SHALL NOT BE COMPACTED.
5. GEOCELL SYSTEM SHALL BE CARTHAGE MILLS CX-20 8" HS20 LOADING OR APPROVED EQUAL. GEOCELL SHALL BE DESIGNED BASED ON EXISTING SOIL CONDITIONS AND PROPOSED HAUL ROAD SLOPES.
6. LIMITED USE PERVIOUS ACCESS ROAD SHALL BE TOP DRESSED AS REQUIRED WITH ONLY 1-4" CRUSHED STONE, SIZE 3A, MEETING NYSDOT ITEM 703-02 SPECIFICATIONS.
7. THE TOP EDGES OF ADJACENT CELL WALLS SHALL BE FLUSH WHEN CONNECTING, ALIGN THE I-SLOTS FOR INTERLEAF AND END TO END CONNECTIONS. THE GEOCELL PANELS SHALL BE CONNECTED WITH TYPE 3 J HOOKS AT EACH INTERLEAD AND END TO END CONNECTIONS. REFER TO MANUFACTURER'S SPECIFICATION FOR PROPER INSTALLATION, TYING AND CONNECTIONS.
8. PREPARE THE SUBGRADE AS SHOWN ON THE CONSTRUCTION DRAWINGS.
9. COMPACT THE SOIL TO A MINIMUM 95% STANDARD PROCTOR.
10. VERIFY THAT THE SUBGRADE STRENGTH, IF UNACCEPTABLE, THE SOILS SHALL BE REMOVED AND REPLACED AS DIRECTED BY THE ENGINEER.
11. WHERE REQUIRED, PROVIDE GEOTEXTILE SEPARATION LAYER.
12. EXPAND THE GEOCELL SECTIONS INTO POSITION AND CONNECT THE END TO END INTERLEAF CONNECTIONS WITH ATRA KEYS.
13. PLACE THE SPECIFIED INFILL MATERIAL TO 2 INCHES ABOVE CELL WALLS AND COMPACT TO A MINIMUM 95% STANDARD PROCTOR.
14. PROVIDE ADDITIONAL SURFACE MATERIAL, AS SPECIFIED.

BASIS OF DESIGN: CARTHAGE MILL

## WOVEN GEOTEXTILE MATERIAL NOTES:

1. GEOTEXTIL WMATERIAL TO B CARTHAGE MILL FX-60HS OR APPROVED EQUAL.

BASIS OF DESIGN: CARTHAGE MILLS

Carthage Mills **Product Data**

Geotextiles | Erosion Control | Geogrids | Geomembranes

## FX®-60HS

Carthage Mills' FX-60HS is a multipurpose nonwoven geotextile made of polypropylene staple fibers which are formed into a random network, needlepunched and heatset for dimensional stability. FX-60HS is part of the Carthage **FX-HS Series** of nonwoven geotextiles, is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

**AASHTO M 288:** FX-60HS exceeds the geotextile requirements for Subsurface Drainage/Class 2 (nonwoven – all soil types), Separation/Class 2 (nonwoven), Stabilization/Class 2 (nonwoven), and Permanent Erosion Control/Class 2 (nonwoven – all soil types / with engineer approval).

| PROPERTY | TEST METHOD | DATA | |
|---|---|---|---|
| | | METRIC | ENGLISH |
| ☐ **Mechanical** | | | |
| Grab Tensile Strength | ASTM D 4632 | 0.71 kN | 160 lbs |
| Grab Tensile Elongation | | 50% | |
| Trapezoidal Tear | ASTM D 4533 | 0.27 kN | 60 lbs |
| CBR Puncture | ASTM D 6241 | 1.82 kN | 410 lbs |
| ☐ **Endurance** | | | |
| UV Resistance | ASTM D 4355 | 70% @ 500 hrs | |
| ☐ **Hydraulics / Filtration** | | | |
| Permittivity [1] | ASTM D 4491 | 1.50 sec$^{-1}$ | |
| Water Flow Rate [1] | | 4278.3 lpm/m$^2$ | 110 gpm/ft$^2$ |
| Apparent Opening Size (AOS) [1] | ASTM D 4751 | 0.212 mm | 70 US Std. Sieve |
| ☐ **Physical** | | | |
| Mass Per Unit Area (Typical) | ASTM D 5261 | 203.4 g/m$^2$ | 6.0 oz/yd$^2$ |
| Standard Roll Sizes / Packaging / Weight | Measured (Typical) | 3.81 m x 109.7 m<br>418 m$^2$<br>105 kg | 12.5 ft x 360 ft<br>500 yd$^2$<br>231 lbs |
| | | 4.57 m x 91.44 m<br>418 m$^2$<br>92 kg | 15.0 ft x 300 ft<br>500 yd$^2$<br>203 lbs |

NOTES: Mullen Burst Strength ASTM D 3786 is no longer recognized by ASTM D35 on Geosynthetics. Puncture Strength ASTM D 4833 is not recognized by AASHTO M 288 and has been replaced with CBR Puncture ASTM D 6241.

[1] At the time of manufacturing. Handling, storage and shipping may change these properties.
- Unless otherwise stated, all values stated here are Minimum Average Roll Values (MARV).
- The properties reported above are effective 11-01-20 and are subject to change without notice.

» **AASHTO M 288: Geotextile Product Selection Guide**



Carthage Mills
4243 Hunt Road
Cincinnati, OH 45241
www.carthagemills.com

513-794-1600 TELEPHONE
800-543-4430 TOLL FREE
513-794-1434 FACSIMILE
info@carthagemills.com

Since 1958: America's *First* Geotextile Company

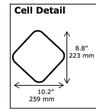
Carthage Mills **Product Data**

Geotextiles | Erosion Control | Geogrids | Geomembranes
**3/4 Cars & Pickup Trucks** (8000 lb. / Axle Loads: 18kN)
**4: Maintenance Trucks** (H10 Loading / 40,000 lb. / Axle Loads: 75kN)
**6: Heavy Trucks & Fire Access** (H20 Loading / 80,000 lb. / Axle Loads: 145kN)

## CX-20 Geocell

**Applications:**
POROUS PAVEMENTS | OVERFLOW PARKING AREAS | ACCESS ROADS | FIRE ACCESS LANES | BOAT RAMPS | PARKING LOTS | GOLF CART PATHS | ROADSIDE SHOULDER REINFORCEMENT | DRIVEWAYS | PORTS AND MARINAS | RV PARKING | TRAILS AND PATHWAYS | PAVEMENT BASE SUPPORT | PERMEABLE PAVER SUPPORT

**Cell Detail**




**Manufactured Cell Depths**
3" 75 mm
4" 100 mm
6" 150 mm
Weld Distance: 14"

**Expanded Unit Dimensions**
9' x 23.92' (2.74 m x 7.3 m)

**Material Specifications**

| Properties | Test Method | Test Value |
|---|---|---|
| Material Composition | ASTM D1505 | Polymer; VIRGIN HDPE Density: 0.9574 g/cm³ |
| Nominal Sheet Thickness | ASTM D5199 | 1.45 mm |
| Environmental Stress Crack Resistance | ASTM D1693 | >6,000 Hrs. |
| Environmental Stress Crack Resistance | ASTM D5397 | >400 Hrs. |
| Stabilizer | ASTM E682 | Hindered amine light stabilizer (HALS) 1.0% by weight |
| Short Term Seam Peel Strength | 3" (75 mm)<br>4" (100 mm)<br>6" (150 mm) | 1065N<br>1542N<br>2170N |
| Long Term Seam Peel Strength | A 100 mm (4 inch) wide section sample shall support a (160 lb.) load for a period of 7 days (168 hrs.) minimum in a temperature controlled environment undergoing a temperature change on a 1 hour cycle from ambient room temperature to (130° F) | |

**Product Description**

| Item Code | Cell Depth | Expanded Unit Dimensions | Area / Unit | Pallet Qty |
|---|---|---|---|---|
| CX20-3 | 3" (75 mm) | 9' x 23.92' (2.74 m x 7.30 m) | 215 SF | 24 |
| CX20-4 | 4" (100 mm) | 9' x 23.92' (2.74 m x 7.30 m) | 215 SF | 18 |
| CX20-6 | 6" (150 mm) | 9' x 23.92' (2.74 m x 7.30 m) | 215 SF | 12 |

012521

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LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: CEC
REVIEWED BY: RFH
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**CONSTRUCTION DETAILS**

DRAWING NUMBER:

**C503**

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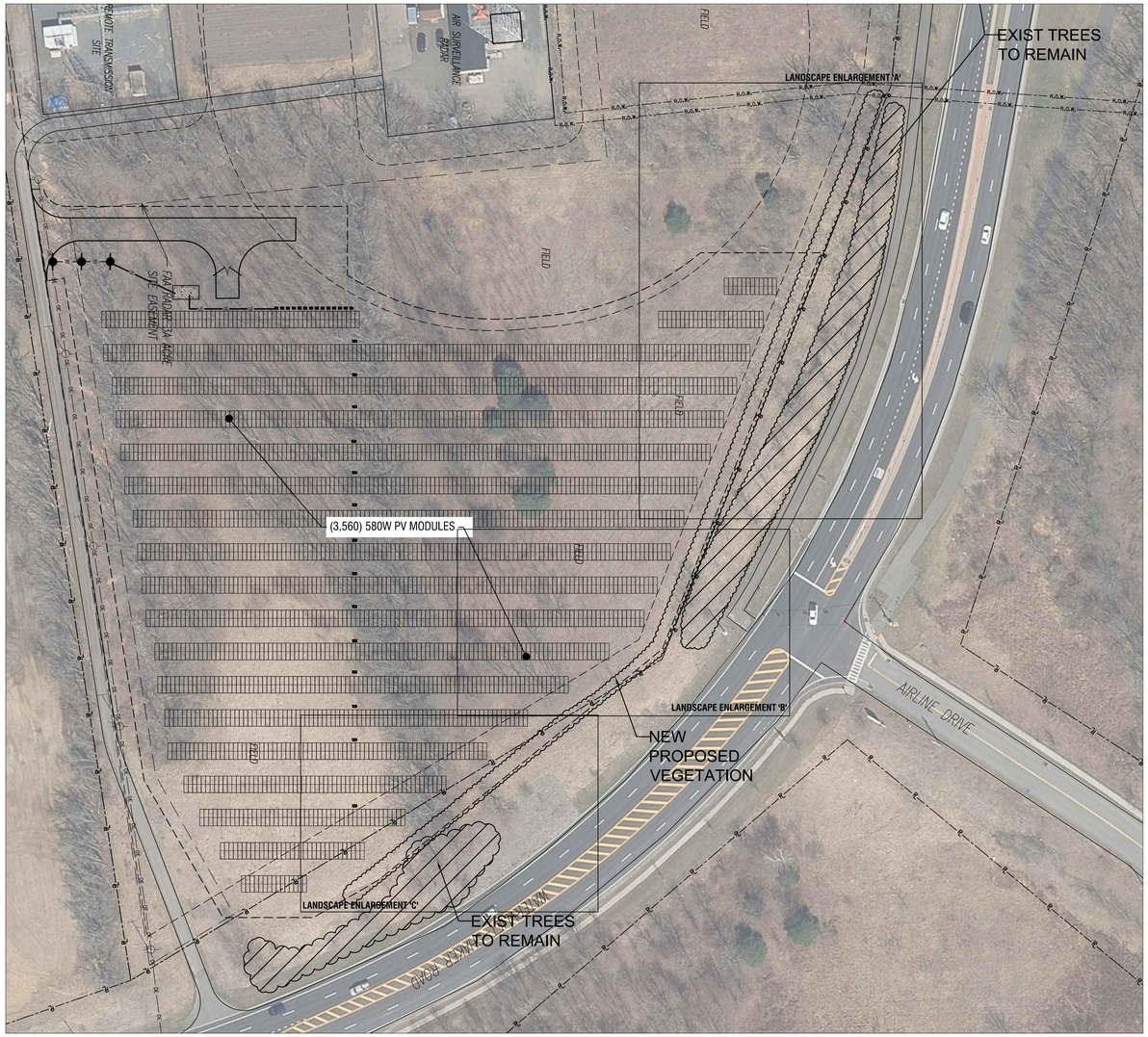
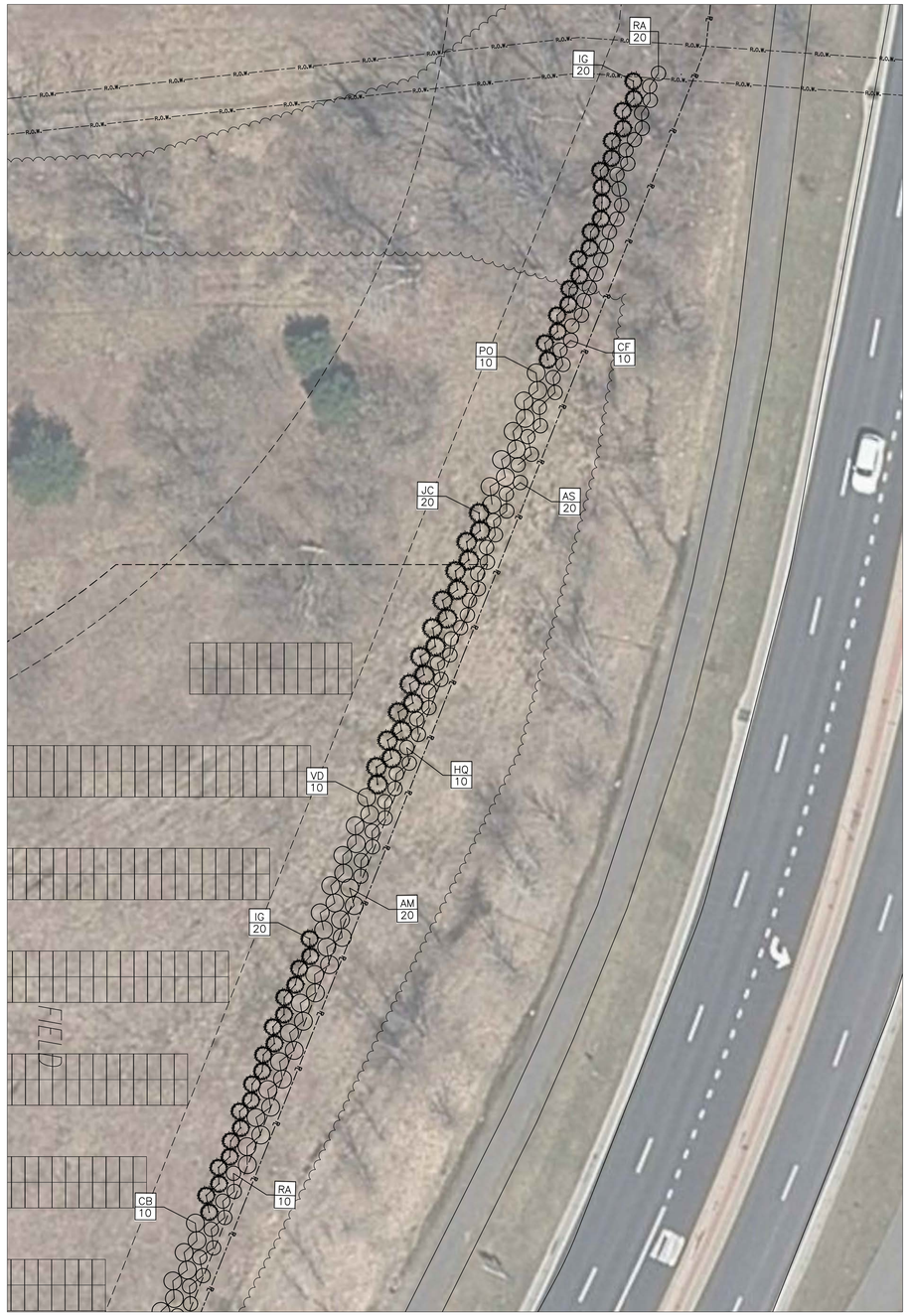



1 / L100 OVREALL LANDSCAPE PLAN

SCALE: 1" = 60'

N




3 / L100 LANDSCAPE PLAN ENLARGEMENT 'A'

SCALE: 1" = 20'

0' 20' 40' 60'

## PLANT LIST

| QUANT. | KEY | LATIN NAME | COMMON NAME | CAL. | ROOTS | HT. OR SP. | REMARKS |
|---|---|---|---|---|---|---|---|
| 80 | IG | Ilex glabra | Inkberry | | B&B | 24" | 5' O.C. |
| 60 | JC | Juniperus communis | Common Juniper | | B&B | 3' Ht. | 6' O.C. |
| | | | | | | | |
| 30 | AM | Aronia melanocarpa | Black Chokeberry | | #3 cont. | 24" | 5' O.C. |
| 50 | AS | Amelanchier stolonifera | Running Serviceberry | | B&B | 5' Ht. | 4 O.C. |
| 10 | CB | Cornus sericea 'Baileyi' | Red-twig Dogwood | | B&B | 24" | 5' O.C. |
| 40 | CF | Cornus sericea 'Flaviramea' | Yellow-twig Dogwood | | B&B | 24" | 4' O.C. |
| 35 | HQ | Hydrangea quercifolia | Oakleaf Hydrangea | | #5 cont. | 24" | 4' O.C. |
| 10 | IT | Itea virginica | Virginia Sweetspire | | #3 cont. | 24" | 5' O.C. |
| 10 | MP | Myrica pensylvanica | Northern Bayberry | | B&B | 30" | 5' O.C. |
| 20 | PO | Physocarpus opulifolius | Eastern Ninebark | | B&B | 24" | 5' O.C. |
| 50 | RA | Rhus aromatica | Fragrant Sumac | | #3 cont. | 24" | 4' O.C. |
| 10 | VD | Viburnum dentatum | Arrowwood Viburnum | | #2 cont. | 24" | 5' O.C. |
| | | | | | | | |

LEGEND: B&B Balled & Burlapped Sp. Spread #2 2 Gallon Container Spr. Spring Planting Only
BR Bare Root Ht. Height Cal. Caliper O.C. On Center

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ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| 1 | 05/06/2022 | CAPACITY DOWNSIZE |
| Revisions | | |

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**LANDSCAPE PLAN**

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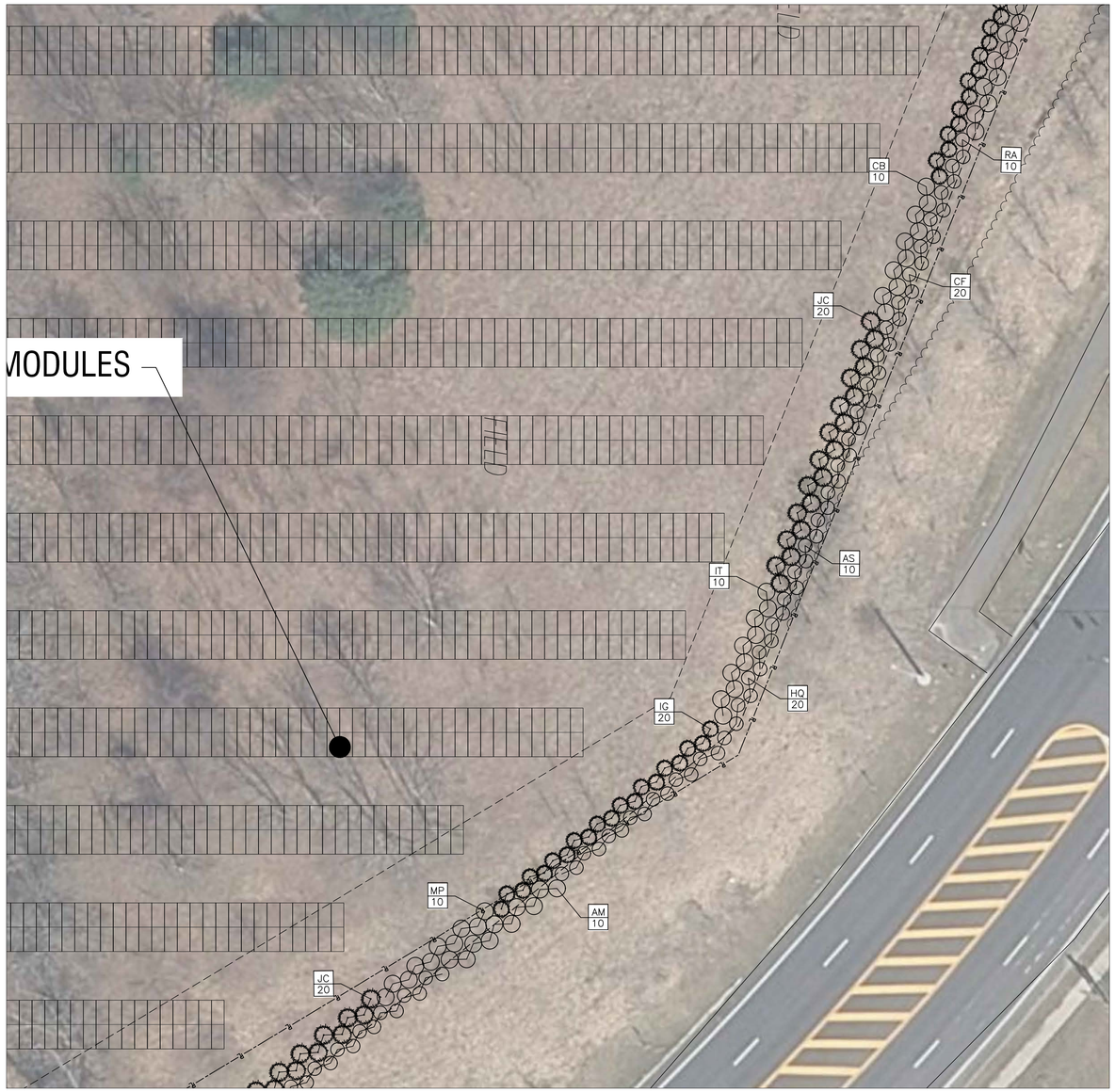
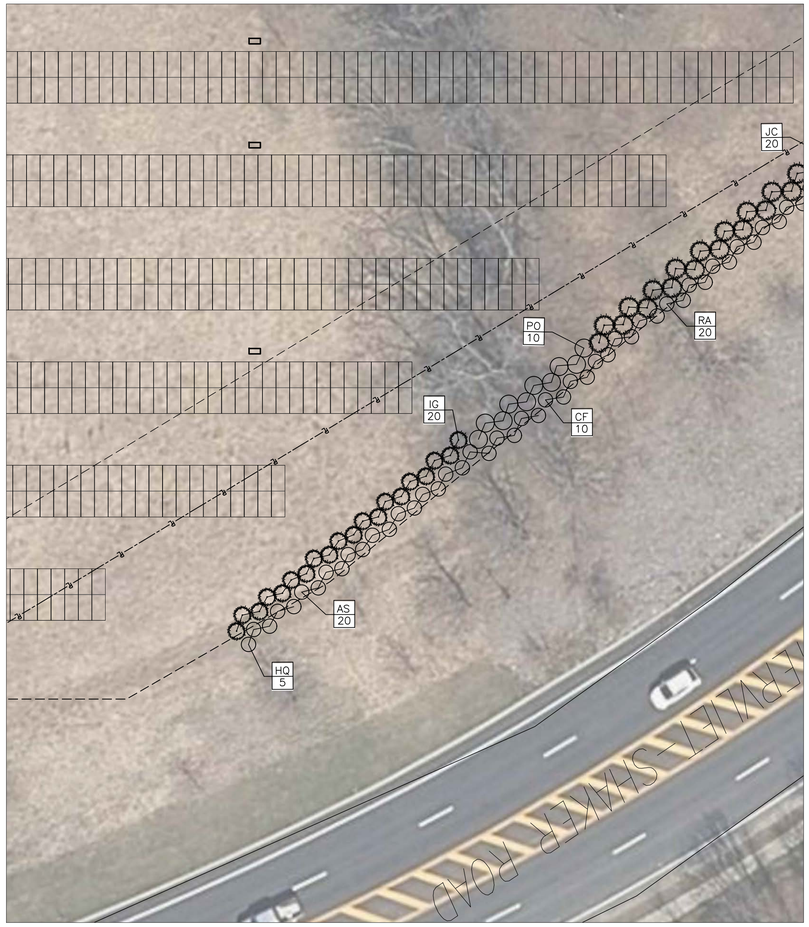
**L100**




1 L101 LANDSCAPE PLAN ENLARGEMENT 'C&D'
SCALE: 1" = 20'

N

0' 20' 40' 60'

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Revisions

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**LANDSCAPE PLAN**

DRAWING NUMBER:

**L101**

# LANDSCAPE NOTES

1. ALL PLANTS SHALL MEET OR EXCEED THE MINIMUM REQUIREMENTS AS NOTED IN THE LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK BY AMERICAN ASSOCIATION OF NURSERYMEN, ANSI Z60.1. ALL PLANTS AND MATERIALS SHALL MEET OR EXCEED THE MINIMUM REQUIREMENTS OF SECTION 611 OF THE NYSDOT STANDARD SPECIFICATIONS. ALL LAWNS, GROUND VEGETATION INCLUDING PREPARATION, ESTABLISHMENT AND MANAGEMENT MATERIALS AND METHODS SHALL MEET OR EXCEED THE MINIMUM REQUIREMENTS OF SECTION 610 OF THE NYSDOT STANDARD SPECIFICATIONS. PRUNING AND REMOVING OF VEGETATION MATERIALS AND METHODS SHALL MEET OR EXCEED THE MINIMUM REQUIREMENTS OF SECTION 610 OF THE NYSDOT STANDARD SPECIFICATIONS.

2. REPLACE, IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS, ALL PLANTS THAT ARE MISSING, DEAD, OR DO NOT DEVELOP FROM PLANTING STOCK, OR AS DETERMINED BY THE CLIENT ARE IN UNHEALTHY OR UNSIGHTLY CONDITION, AND HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES OR OTHER CAUSES DUE TO THE CONTRACTORS NEGLIGENCE. CONTRACTOR SHALL BEAR THE COST OF COMPLETE REPLACEMENT(S). IN CASE OF ANY QUESTIONS REGARDING THE CONDITION AND SATISFACTORY ESTABLISHMENT OF A REJECTED PLANT, THE LANDSCAPE ARCHITECT'S DECISION IS FINAL. PROVIDE A GUARANTEE FOR ALL REPLACEMENT PLANTS FOR AT LEAST ONE FULL GROWING SEASON.

3. REMOVE AND IMMEDIATELY REPLACE ALL PLANTS, AS DETERMINED BY THE CLIENT TO BE UNSATISFACTORY DURING THE INITIAL PLANTING INSTALLATION.

4. CONTRACTOR SHALL RETAIN FOR INSPECTION ALL RECEIPTS FOR PLANTING MATERIAL PLANTING STOCK IS TO BE MADE AVAILABLE IN ORIGINAL PACKAGING AND LABELING FOR INSPECTION BY THE CLIENT PRIOR TO INSTALLATION.

5. SHRUBS SHALL MEET THE REQUIREMENTS FOR HEIGHT INDICATED IN THE PLANT LIST, THE MEASUREMENTS FOR HEIGHT SHALL BE TAKEN FROM THE GROUND LEVEL TO THE AVERAGE HEIGHT OF THE TOP BRANCHES OF THE PLANT, AND NOT THE LONGEST BRANCH. SINGLE STEMMED OR THIN PLANTS WILL NOT BE ACCEPTED. SIDE BRANCHES SHALL BE GENEROUS, WELL TWIGGED, AND THE PLANT AS A WHOLE WELL SEATED IN THE GROUND. PLANTS SHALL BE IN A MOIST, VIGOROUS CONDITION, FREE FROM DEAD WOOD, BRUISES, OR OTHER ROOT OR BRANCH INJURIES.

6. PLANTED AREAS WILL BE INSPECTED AT COMPLETION OF INSTALLATION AND ACCEPTED SUBJECT TO COMPLIANCE WITH SPECIFIED MATERIALS AND INSTALLATION REQUIREMENTS. INSPECTION TO DETERMINE FINAL ACCEPTANCE OF PLANTED AREAS WILL BE MADE BY THE CLIENT UPON CONTRACTORS REQUEST. PROVIDE NOTIFICATION AT LEAST 10 WORKING DAYS BEFORE REQUESTED INSPECTION DATE. PLANTED AREAS WILL BE ACCEPTED PROVIDED ALL MATERIALS ARE ALIVE AND IN A HEALTHY, VIGOROUS CONDITION. UPON FINAL ACCEPTANCE, THE OWNER WILL ASSUME MAINTENANCE.

7. ONE YEAR GUARANTEE SHALL BE PROPERTY ON ALL NEW AND RELOCATED PLANT MATERIALS FROM DATE OF FINAL ACCEPTANCE TO THE OWNER.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN QUANTITY TAKEOFF.

9. THE CONTRACTOR SHALL PERFORM A ROUGH FIELD STAKE OUT OF ALL PLANT MATERIAL AND SHRUB BEDS. CONTACT THE LANDSCAPE ARCHITECT FOR INSPECTION AND APPROVAL. LOCATIONS SHOWN ON THE PLAN CONVEY DESIGN INTENT ONLY. ACTUAL LOCATIONS WILL BE AS DIRECTED BY THE LANDSCAPE ARCHITECT AT THE TIME OF INSTALLATION.

10. NAMES OF WOODY PLANT MATERIAL MUST COMPLY WITH "STANDARDIZED PLANT NAMES" AS ADOPTED BY THE LATEST EDITION OF THE AMERICAN JOINT COMMITTEE OF HORTICULTURAL NOMENCLATURE. PROVIDE STOCK TRUE TO BOTANICAL NAME AND LEGIBLY TAGGED.

11. THE CONTRACTOR IS HEREBY NOTIFIED THAT UNDERGROUND UTILITIES EXIST AND HE SHOULD OBTAIN CURRENT UTILITY RECORD MAPS AND NOTIFY ALL UTILITY COMPANIES PRIOR TO COMMENCING WORK.

12. SHOULD LOCATION OF TREES BE WITHIN 5' OF UNDERGROUND UTILITIES, RELOCATE SAID TREES TO MIN. OF 5' FROM ROOT BALL TO UTILITIES.

13. SHOULD LOCATIONS OF TREES BE WITHIN 20' OF OVERHEAD WIRES, RELOCATE SAID TREES TO MIN. OF 20' TO WIRES.

14. STAKE AND WRAP TREES IMMEDIATELY AFTER PLANTING. STAKES AND WRAPPING ARE TO BE REMOVED BY THE CONTRACTOR AT THE END OF THE GUARANTEE PERIOD.

15. MULCH ALL BEDS WITH 3 INCHES DOUBLE GROUND HARDWOOD BARK MULCH. COLOR: BLACK UNLESS OTHERWISE DIRECTED BY LANDSCAPE ARCHITECT.

16. PLANTING BACK FILL MIXTURE: 4 PARTS TOP SOIL; 1 PART APPROVED ORGANIC MATERIAL; 1/2 PART WELL ROTTED MANURE; 10 LBS. 10-10-10 PLANTING FERTILIZER THOROUGHLY MIXED PER CUBIC YARD.

17. TOPSOIL SHALL BE FURNISHED FROM THE STOCKPILED ON-SITE MATERIAL. IF AN INSUFFICIENT QUANTITY EXISTS, FURNISH FROM OFF-SITE SOURCES IN QUANTITIES SUFFICIENT TO COMPLETE THE REQUIREMENTS AS SPECIFIED. TOPSOIL SHALL BE NATURAL, FRIABLE, FERTILE SOIL, CHARACTERISTIC OF PRODUCTIVE SOIL IN THE VICINITY, REASONABLE FREE FROM STONES, CLAY LUMPS, ROOTS AND OTHER FOREIGN MATTER WITH AN ACIDITY BETWEEN 6.0 AND 6.8 PH, PROPOSED TOPSOIL MATERIAL FROM OFF-SITE SOURCES SHALL BE SUBJECT TO APPROVAL BY THE LANDSCAPE ARCHITECT. SUBMIT A 1 GALLON SAMPLE WITH LABORATORY RESULTS (SIEVE, PH, ORGANIC) FOR APPROVAL.

18. A MINIMUM OF 18" OF PREPARED TOPSOIL SHALL BE PROVIDED IN ALL PROPOSED SHRUB BEDS. ALL EXISTING SOIL AND OTHER MNATERIAL WITHIN THE SHRUB BED AREA IS TO BE REMOVED COMPLETELY FROM THE SITE AND DISPOSED OF IN A LEGAL MANNER.

19. ANTIDESICANT: PROTECTIVE FILM EMULSION, PROVIDING A PROTECTIVE FILM OVER PLANT SURFACES, BUT PERMEABLE TO PERMIT TRANSPIRATION. MIXED AND APPLIED IN ACCORDANCE WITH MANUFACTURE'S INSTRUCTIONS. APPLY TO ALL BROADLEAF EVERGREEN SHRUBS PER MANUFACTURER'S RECOMMENDATIONS.

20. LANDSCAPE MATERIALS SHALL BE INSTALLED BY LOCAL COMPANIES FAMILIAR WITH THE CONDITIONS IN THIS AREA THAT EMPLOY NYS CERTIFIED NURSERY PROFESSIONALS.

21, STACK PLANTS AS INDICATED OR AS APPROVED IN THE FIELD. IF OBSTRUCTIONS ARE ENCOUNTERED THAT ARE NOT SHOWN ON THE DRAWINGS, DO NOT PROCEED PLANTING OPERATIONS UNTIL ALTERNATIVE PLANT LOCATIONS HAVE BEEN SELECTED.

22, MAINTAIN PLANTS UNTIL COMPLETION AND FINAL ACCEPTANCE OF THE ENTIRE PROJECT. MAINTENANCE SHALL INCLUDE PRUNING, CULTIVATING, EDGING, REMULCHING, FERTILIZING, WEEDING, WATERING AS REQUIRED FOR HEALTHY GROWTH, AND APPLICATION OF APPROPRIATE INSECTICIDES AND FUNGICIDES NECESSARY TO MAINTAIN PLANTS FREE OF INSECT AND DISEASE. RESET SETTLED PLANTS TO PROPER GRADE AND POSITION. RESTORE PLANTING SAUCER AND REMOVE DEAD MATERIAL. TIGHTEN AND REPAIR GUIDE WIRES AND DEFICIENCIES WITHIN THE FIRST 24 HOURS OF INITIAL PLANTING, AND NOT LESS THAN TWICE PER WEEK UNTIL FINAL ACCEPTANCE.

23. A MINIMUM OF 6" OF TOPSOIL SHALL BE PROVIDED ON ALL AREAS TO BE SEEDED.

24. LAWN SEED MIXTURE- APPLY TO ALL DISTURBED AREAS NOT PAVED, PLANTED, DESIGNATED TO REMAIN NATURAL OR OTHERWISE SEEDED. MIX SHALL CONSIST OF THE FOLLOWING:

| | % WEIGHT | % PURITY | % GERMINATION |
|---|---|---|---|
| KEYSTONE PERENNIAL RYE GRASS | 25 | 85 | 85 |
| CHARISMATIC PERENNIAL RYE GRASS | 25 | 85 | 85 |
| CINDY LOU CREEPING RED FESCUE | 20 | 85 | 80 |
| COMMON KENTUCKY BLUEGRASS | 30 | 97 | 80 |

SEEDING RATE: 200 LBS. PER ACRE
FERTILIZER: 18:24:3 GRANULAR RATE: 1,000 LBS. PER ACRE
MULCH ALL SEEDED AREAS WITH APPROVED STRAW AT A RATE OF 4,000 LBS. PER ACRE.

Ilex Glabra- Inkberry

Juniperus communis- Common Juniper

Aronia Melanocarpa- Black Chokeberry

Amelanchier Stolonifera- Serviceberry

Cornus Sericea 'Baileyi'-
Red-Twig Dogwood

Cornus Sericea 'Flaviramea'-
Yellow-Twig Dogwood

Hydrangea Quercifolia- Oakleaf Hydrangea

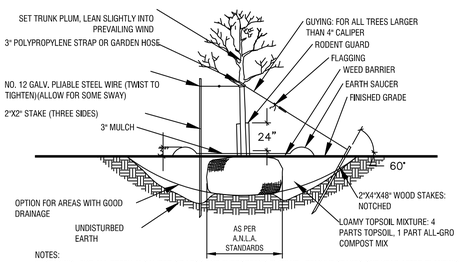
Itea Virginica- Virginia Sweetspire

Myrica Pensylvanica- Northern Bayberry

Physocarpus Opulifolius- Eastern Ninebark

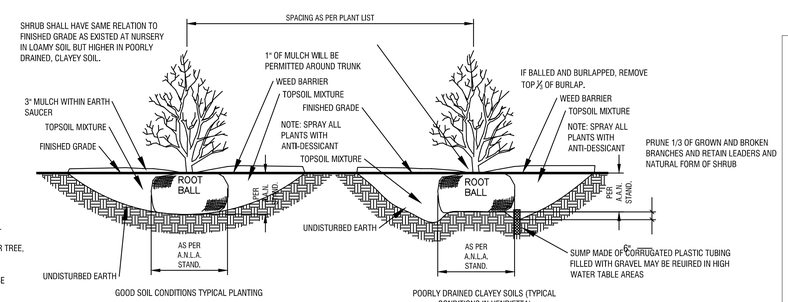
Rhus Aromatica- Fragrant Sumac

Viburnum Dentatum- Arrowwood Viburnum

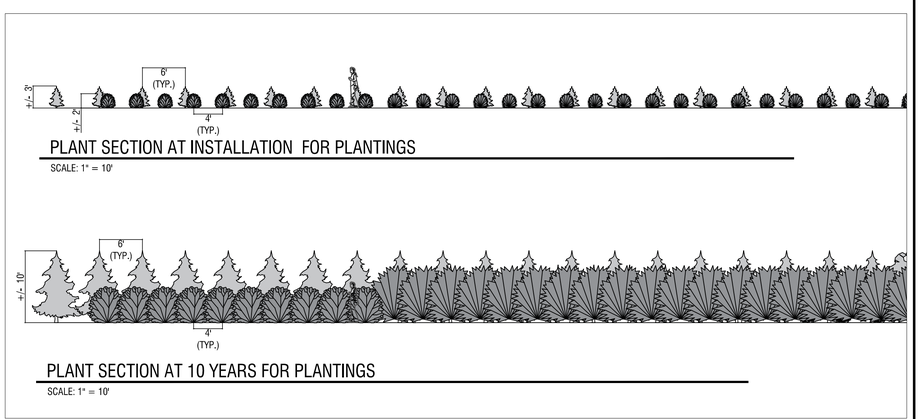



NOTES:
1) STAKING: FOR ALL TREES 4" CALIPER OR LESS AND EVERGREENS 9'-12' HT., REMOVE STAKES ONE YEAR AFTER PLANTING.
2) USE 8' STAKES DRIVE 4' BELOW GROUND SURFACE.
3) GUYING: FOR ALL EVERGREEN TREES AND ALL TREES TALLER THAN 12'. USE SAME WIRE AS FOR STAKING. USE THREE PER TREE, EQUALLY SPACED, DO NOT TWIST WIRE TO TIGHTEN: USE 1.5"X6" TURNBUCKLE.
4) ROOT COLLAR TO BE SLIGHLY ABOVE SURROUNDING GRADE.
5) MULCH CAN NOT BE MORE THAN 1" THICK AT ROOT COLLAR EXTENDING OUT AT LEAST 6" FROM THE BARK, THEN IT CAN BE THICKENED.
6) MULCH IS TO BE PLACED 3 TO 6 INCHES AWAY FROM THE TRUNK.
7) KRAFT WRAP PAPER SHALL NOT BE PERMITTED FOR RODENT GUARD.

1 / L-102 TREE PLANTING DETAIL
N.T.S.




2 / L-102 SHRUB PLANTING DETAIL
N.T.S.

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| NO: | DATE: | DESCRIPTION: |
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| 1 | 05/06/2022 | CAPACITY DOWNSIZE |

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DRAWING NAME:

**LANDSCAPE DETAILS**

DRAWING NUMBER:

**L102**

## GENERAL ELECTRICAL NOTES

1. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM MUST BE IDENTIFIED AND LISTED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS. ALL SOURCE CIRCUITS MUST HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION FOR TESTING (SUCH AS AN ACCESSIBLE TERMINAL BLOCK OR DISCONNECT) AND ISOLATION.
2. INVERTERS MUST BE EQUIPPED WITH DC GROUND FAULT PROTECTION TO REDUCE FIRE HAZARDS.
3. ALL DISCONNECTING COMBINERS, PULL/SPLICE BOXES, AND ENCLOSURES MUST BE LISTED AND LABELED FOR ITS PURPOSE.
4. ALL METALLIC CONDUIT FITTINGS MUST INCLUDE INTERNAL OR EXTERNAL BONDING TO ENSURE CONTINUITY, INCLUDING METALLIC EXPANSION FITTINGS.
5. ANY METAL SHAVINGS RESULTING FROM SITE WORK MUST BE CLEANED FROM ENCLOSURE INTERIORS, TOP SURFACES OF ENCLOSURE, ROOF SURFACE, AND ANY ADDITIONAL AREAS WHERE OXIDATION OR CONDUCTIVE METAL SHAVINGS MAY CAUSE RUST, ELECTRICAL SHORT CIRCUIT OR OTHER DAMAGE.

## WIRING AND WIRING METHODS

1. ALL WIRING METHODS AND INSTALLATION PRACTICES MUST CONFORM TO THE NATIONAL ELECTRIC CODE, LOCAL STATE CODES, AND OTHER APPLICABLE LOCAL CODES.
2. EXPOSED PV SOLAR MODULE WIRING WILL BE 2000 PV WIRE, 90ºC, WET RATED AND UV RESISTANT.
3. ALL FREE-AIR CABLES, SUCH AS MODULE LEADS MUST BE SECURED WITHIN 12" OF CONNECTION POINTS, AND EVERY 24" THEREAFTER, BY A STAINLESS STEEL OR PLASTIC-COATED STAINLESS STEEL CLIP OR TRAY. THE USE OF PLASTIC ZIP TIES IS NOT AN APPROVED METHOD TO SUPPORT OR ATTACH WIRE TO A STRUCTURE. PLASTIC ZIP TIES ARE ONLY PERMITTED FOR SUPPLEMENTAL GROUPING OR BUNDLING OF CONDUCTORS INSIDE OF EQUIPMENT. PV-SPECIFIC STAINLESS STEEL CLIPS AND VINYL JACKETED STEEL CABLE TIES OR AN APPROVED EQUAL ARE ALLOWED FOR USE IN THIS APPLICATION.
4. WIRE COLOR SPECIFICATIONS:
   A. 120 TO 208VAC WIRING:
      I. PHASE : (A) BLACK, (B) RED, (C) BLUE
      II. NEUTRAL: WHITE OR GREY
   B. 600VAC CLASS WIRING (300 TO 600VAC):
      I. PHASE: (A) BROWN, (B) ORANGE, (C) YELLOW
      II. NEUTRAL: WHITE OR GREY
   C. EXPOSED EXTERIOR DC WIRING, 600VDC TO 1500VDC
      I. POSITIVE (NON-ISOLATED): RED
      II. NEGATIVE (NON-ISOLATED): BLACK
      III. POSITIVE (ISOLATED): BLACK W/ RED MARKINGS AT TERMINATIONS
      IV. NEGATIVE (ISOLATED): BLACK
5. COLORED PHASE MARKINGS MUST BE MADE WITH HOT OR COLD SHRINK TUBING, AT LEAST 12" LONG.
6. STRING AND COMBINER CABLE LABELS IN EXTERIOR LOCATIONS MUST BE RATED FOR EXTERIOR USE AND PROTECTED BY SHRINK TUBING.
7. PV STRING HOME RUNS MUST BE LABELED ON BOTH ENDS, AT ARRAY AND AT COMBINER.
8. COMBINER OUTPUT CONDUCTORS MUST BE LABELED AT BOTH ENDS, AT COMBINER AND AT DISCONNECT.
9. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT IS SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SUPPORTS MUST BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 54 INCHES APART (NEC 350.30) MUST BE APPROPRIATELY BONDED.
10. LIQUID TIGHT FLEXIBLE NON-METALLIC IS NOT APPROVED.
11. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM MUST NOT BE CONTAINED IN THE SAME RACEWAY, CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.
12. UNLESS MARKED AS UV RESISTANT, PVC IS NOT APPROVED FOR INSTALLATION IN LOCATIONS SUBJECTED TO DIRECT SUNLIGHT.
13. LONG STRAIGHT EXPOSED METAL CONDUIT (RMC, GRC, EMT) RUNS, 100 FEET OR MORE, MUST HAVE EXPANSION FITTINGS INSTALLED PER NEC 300.7(B). EXPANSION FITTINGS MUST ALSO BE USED WHEN CONDUIT SPANS A ROOF EXPANSION JOINT.
14. FUSES AND WIRES SUBJECT TO TRANSFORMER INRUSH CURRENT MUST BE SIZED ACCORDINGLY.
15. RMC, IMC OR EMT CONDUIT, USE 20 MIL PIPE WRAP TAPE HALF-LAPPED FROM 6" PAST TRANSITION POINT ON PVC TO 6" ABOVE GROUND ON METALLIC CONDUIT. AN EXPANSION JOINT MUST BE USED IN THE TRANSITION TO ABOVE GROUND CONDUIT WHEN REQUIRED BY NEC 300 5(J).
16. CONDUITS LONGER THAN 200 FT WITH NEGATIVE SLOPE TOWARD ELECTRICAL EQUIPMENT MUST HAVE A PULL BOX OR VAULT ADJACENT TO THE ENTRY POINT INTO THE ELECTRICAL EQUIPMENT.
17. WHEN TRANSITIONING FROM FREE AIR TO CONDUCTORS IN CONDUIT A LISTED STRAIN RELIEF FITTING MUST BE USED TO SUPPORT CONDUCTORS. CONDUIT DUCT SEAL MAY BE USED TO PREVENT MOISTURE INGRESS. SPRAY FOAM IS NOT AN APPROVED CONDUIT SEALING METHOD.
18. L AND T CONDUIT BODIES ARE NOT APPROVED FOR DC SYSTEMS OR INVERTER OUTPUT CIRCUITS.
19. ALL AC AND DC COPPER TERMINATIONS MUST HAVE AN ANTI-OXIDANT COMPOUND, KOPR-SHIELD OR EQUIVALENT APPLIED.
20. MEGGER TESTING MUST BE PERFORMED AND DOCUMENTED AT 1000 VDC FOR ALL AC CIRCUITS 600V OR BELOW AND DC CIRCUITS 600V OR BELOW. MEGGER TESTING WILL BE PERFORMED AT 1500 VDC FOR DC CIRCUITS IN 1000 VDC SYSTEMS. DO NOT MEGGER THE PV MODULES AS HIGH VOLTAGES CAN DAMAGE PV MODULES.
21. CONTINUITY TESTING TO BE PERFORMED AND DOCUMENTED ON ALL INSTALLED DC AND AC POWER CABLES.
22. CONDUIT BENDS MUST NOT DAMAGE THE RACEWAY OR SIGNIFICANTLY CHANGE THE INTERNAL DIAMETER OF RACEWAY PER TABLE 2 OF THE NEC.
23. SUPPORT CONDUCTORS IN VERTICAL CONDUITS IN ACCORDANCE WITH THE REQUIREMENTS OF NEC 300 19.
24. TORQUE ALL ELECTRICAL CONNECTORS PER DEVICE LISTING, OR MANUFACTURERS RECOMMENDATIONS CONNECTORS MUST BE MARKED WITH PERMANENT MARKING PAINT AFTER TORQUEING.
25. ALL BARE CU WIRES MUST BE INSTALLED IN A MANNER THAT PROTECTS THEM FROM CONTACT WITH DISSIMILAR METALS, PARTICULARLY ALUMINUM.
26. SPLICES AND CONNECTORS MUST BE INSULATED AND WILL REQUIRE PROJECT ENGINEER APPROVAL. ELECTRICAL TAPE ALONE IS NOT SUITABLE AS THE ONLY INSULATION MEANS. FOLLOW MANUFACTURERS INSTRUCTIONS FOR INSTALLATION, AND APPLICATION OF INSULATING PRODUCT.
27. SPLICES MUST BE AVOIDED WHEREVER POSSIBLE. WHEN NECESSARY DUE TO SPOOL-LENGTH LIMITATIONS, SPLICES MUST BE MADE IN AN ENCLOSURE, PULL BOX OR HAND-HOLE BOX, AND MUST NOT BE BURIED, MADE INSIDE CONDUIT, OR BE OTHERWISE INACCESSIBLE.
28. ALL LV AC WIRING WILL BE TYPE THWN-2 RATED AT 90ºC. XHHW-2 IS AN APPROVED ALTERNATE. THIS NOTE WILL BE SUPERCEDED BY ANY INVERTER SPECIFICATIONS REQUIRING LV AC WIRE TO MEET HIGHER VOLTAGE OR INSULATION STANDARDS.
29. USE MEYERS-TYPE HUBS LISTED TO PROVIDE MOISTURE PROTECTION FOR CONDUIT ENTRANCES IN ALL APPLICABLE LOCATIONS AS REQUIRED BY NEC 314.15.
30. PROTECT WIRE FROM SHARP EDGES WITH UV RATED SPIRAL WRAP, EDGE-GUARD, OR SPLIT LOOM.
31. MODULE LEAD CONNECTORS MUST BE INSTALLED SUCH THAT THEY ARE EASILY ACCESSIBLE AND PROTECTED FROM EXPOSURE TO DIRECT SUNLIGHT OR RAIN. THEY MUST NOT BE INSTALLED WITHIN TUBING, CONDUIT OR MODULE GAPS, OR IN DIRECT CONTACT WITH THE MODULE BACKSHEET.
32. STRING SOURCE CIRCUIT WIRING MUST BE SUPPORTED ADEQUATELY IN LENGTHS NOT TO EXCEED 24". THE MODULE TO MODULE INTERCONNECTION LEADS MUST BE SUPPORTED AT A MINIMUM OF 12" FROM THE J-BOX AND THE MODULE TO MODULE CONNECTION POINT.
33. MODULE TO SOURCE CIRCUIT CONNECTORS MUST BE OF THE SAME MAKE AND MODEL AS THE MODULE TO MODULE CONNECTORS. THE CONNECTION TO SOURCE CIRCUITS MUST BE PER THE MODULE MANUFACTURER AND CONNECTOR MANUFACTURER INSTRUCTIONS. CONTRACTOR TO VERIFY THAT THE STRING CONDUCTOR DIAMETER IS COMPATIBLE WITH THE STRING CIRCUIT HOME-RUN CONNECTORS.
34. ALL EMT MUST USE LISTED AND APPROVED RAIN TIGHT FITTINGS WHEN INSTALLED OUTDOORS OR IN A WET LOCATION.
35. ALL ABOVE GROUND PVC CONDUIT TO BE SCHEDULE 80. ALL BELOW GROUND PVC CONDUIT TO BE SCHEDULE 40 EXCEPT WHERE PASSING UNDER ROADWAYS, IN WHICH CASES SCHEDULE 80 IS TO BE USED.

## ALUMINUM CONDUCTOR INSTALLATION NOTES

1. MINIMUM WIRE SIZE FOR CURRENT CARRYING ALUMINUM CONDUCTORS IS 1/0 STRANDED, COMPACT ELECTRICAL GRADE AA-8000 SERIES ALLOY.
2. ALUMINUM POWER CABLE, WIRE CONNECTORS, AND INSULATING AND CODING TAPE MANUFACTURERS SHALL BE APPROVED BY OWNER PRIOR TO USAGE.
3. WHERE BOLTED CONNECTIONS ARE NOT POSSIBLE, MECHANICAL SCREW STYLE LUGS AND TERMINATIONS ARE APPROVED ONLY WHEN USED IN CONJUNCTION WITH A LISTED COPPER PIGTAIL COMPRESSION ADAPTOR (SOLID CORE PIN ADAPTERS ARE NOT ALLOWE.D).
4. USE OF A "ONE-SHOT" CRIMPER OR "DIE-LESS CRIMPERS" WILL NOT BE ALLOWED.
5. TERMINAL CONNECTIONS TO BE MADE PER GUIDELINES BELOW. CONNECTION HARDWARE SHALL BE RATED FOR, AT A MINIMUM, THE MAXIMUM VOLTAGE OF THE SYSTEM.
   A. MUST BE PRE-FILLED WITH OXIDE INHIBITOR.
   B. WIRE STRIPPING AND BRUSHING OF CONDUCTOR IN ACCORDANCE WITH VENDOR SPECS IS REQUIRED IMMEDIATELY PRIOR TO LUG INSTALLATION
   C. OXIDE INHIBITOR MUST BE APPLIED TO EXPOSED CONDUCTOR IMMEDIATELY AFTER STRIPPING AND BRUSHING AND IMMEDIATELY PRIOR TO INSTALLATION OF THE LUG.
   D. USE COMPRESSION TOOL LISTED FOR USE WITH SELECTED COMPRESSION CONNECTOR.
   E. A MINIMUM 9" LENGTH OF COLD OR HEAT SHRINK WITH A VOLTAGE RATING EQUAL TO OR EXCEEDING THE CONDUCTOR RATING MUST BE APPLIED TO COVER THE CONNECTION BETWEEN CRIMP AND THE CONDUCTOR BEGINNING AT THE STRAIGHT SECTION OF THE CRIMP.
   F. ALL CONNECTORS AND CORRESPONDING CRIMPING TOOLS MUST BE LISTED FOR THE APPLICATION.
6. INSULATING AND COLOR CODING MARKINGS MUST BE HOT OR COLD SHRINK TUBING.
7. FOR ALUMINUM MV CONDUCTORS, WHERE USED, THE GUIDELINES IN THIS SECTION PLUS GENERAL REQUIREMENTS FOR MV CONDUCTOR INSTALLATION APPLY.
8. DIRECT LANDING OF ALUMINUM CONDUCTORS IS ONLY ALLOWED TO BREAKERS WHICH ARE SPECIFICALLY RATED FOR ALUMINUM CONDUCTORS.

## GROUNDING NOTES

SEE ELECTRICAL DIAGRAM AND ELECTRICAL DETAILS FOR MORE GROUNDING INFORMATION.

1. GROUND RESISTANCE TESTING TO BE PERORMED AND DOCUMENTED AT ALL EQUIPMENT (INVERTERS, COMBINER BOXES, DISCONNECTS, ETC...) AND AT THE RACKING SYSTEM (MINIMUM OF 10 LOCATIONS PER 5MW SITE, EVENLY DISTRIBUTED THROUGHOUT THE FIELD). MAXIMUM MEASURED RESISTANCE NOT TO EXCEED 0.25 OHMS.
2. EQUIPMENT GROUNDING CONDUCTORS AND SYSTEM GROUNDING CONDUCTORS WILL HAVE AS SHORT A DISTANCE TO GROUND AS POSSIBLE AND A MINIMUM NUMBER OF TURNS.
3. NON-CURRENT CARRYING METAL PARTS WILL BE CHECKED FOR PROPER GROUNDING. NOTE THAT TERMINAL LUGS BOLTED ON A FINISHED ENCLOSURE SURFACE MAY BE INSULATED BECAUSE OF PAINT/FINISH. PAINT/FINISH AT POINT OF CONTACT MUST BE PROPERLY REMOVED.
4. RACKING COMPONENTS AND STRUCTURAL SUPPORTS MUST BE ELECTRICALLY BONDED.
5. MODULES MUST BE GROUNDED WITH EQUIPMENT GROUNDING METHODS APPROVED BY THE MANUFACTURER WITH A MEANS OF BONDING LISTED FOR THIS PURPOSE, INCLUDING THE USE OF UL 2703 LISTED RACKING SYSTEMS.
6. THE CONNECTION TO THE MODULE MUST BE ARRANGED SUCH THAT REMOVAL OF A MODULE OR A PANEL FROM THE PHOTOVOLTAIC SOURCE CIRCUIT DOES NOT INTERRUPT A GROUNDED CONDUCTOR TO ANOTHER PHOTOVOLTAIC SOURCE CIRCUIT.
7. WHERE USED, LAY-IN GROUND LUGS SHALL BE RATED FOR DIRECT BURIAL (DB RATED).
8. ALL METALLIC RACEWAYS AND ENCLOSURES REQUIRE A PHYSICAL CONNECTION TO THE GROUNDING ELECTRODE CONDUCTOR (GEC) CONTAINED WITHIN.

## DISCONNECTING MEANS NOTES

1. MEANS MUST BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER EXISTING CONDUCTORS.
2. ALL CIRCUIT BREAKERS INSTALLED THAT ARE SUBJECT TO REVERSE POWER FLOW MUST BE LISTED AND LABELED AS BACKFEED COMPATIBLE.
3. THE GROUNDED CONDUCTOR MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.
4. UNLESS A DISCONNECT IS SERVICING A SUPPLY-SIDE CONNECTION, THE DISCONNECTING MEANS IS NOT REQUIRED TO BE SUITABLE AS SERVICE EQUIPMENT AND SHALL BE RATED IN ACCORDANCE WITH NEC 690.17.
5. EQUIPMENT SUCH AS PHOTOVOLTAIC SOURCE CIRCUITS, OVERCURRENT DEVICES, AND BLOCKING DIODES ARE PERMITTED ON THE PHOTOVOLTAIC SIDE OF THE PHOTOVOLTAIC DISCONNECTING MEANS.
6. PROVIDE MEANS TO DISCONNECT EQUIPMENT SUCH AS INVERTERS, BATTERIES, CHARGE CONTROLLERS, AND ANY OTHER ENERGY SOURCES FROM ALL UNGROUNDED CONDUCTORS. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS MUST BE GROUPED AND IDENTIFIED.
7. A SINGLE DISCONNECTING MEANS IS PERMITTED FOR THE COMBINED AC OUTPUT OF ONE OR MORE INVERTERS IN AN INTERACTIVE SYSTEM, PROVIDED EACH INVERTER ASSOCIATED WITH THE DISCONNECT HAS ITS OWN INTERNAL AC DISCONNECT, AND THAT THE COMMON DISCONNECTING MEANS IS READILY ACCESSIBLE FROM THE SAME LOCATION AS THE INVERTERS.
8. PROVIDE MEANS TO DISCONNECT FUSES FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS SUCH A FUSE IN A PHOTOVOLTAIC SOURCE CIRCUIT SHALL BE CAPABLE OF BEING DISCONNECTED INDEPENDENTLY OF FUSES IN OTHER PHOTOVOLTAIC SOURCE CIRCUITS.
9. ALL DISCONNECTS AND COMBINERS MUST BE SECURED FROM UNAUTHORIZED AND UNQUALIFIED PERSONNEL BY EITHER LOCK OR LOCATION.

## DAMAGE PROTECTION

1. ENCLOSURES MUST BE SECURED TO EQUIPMENT RACKS IN ACCORDANCE WITH THE DESIGN DOCUMENTS, AND MUST BE SECURED IN SUCH A WAY AS TO PREVENT ENCLOSURE MOVEMENT OR SLIDING.
2. ALL NEMA 4 BOXES MUST BE EQUIPPED WITH LISTED DRAIN PLUGS INSTALLED TO ALLOW WATER TO DRAIN ANY MODIFICATION TO AS-MANUFACTURED EQUIPMENT SHOULD BE DONE IN SUCH A WAY AS TO MAINTAIN ALL LISTED RATINGS.
3. ALL NEMA 3 BOXES MUST BE EQUIPPED WITH A WEEP HOLE OR LISTED DRAIN PLUGS INSTALLED TO ALLOW WATER TO DRAIN.
4. ALL OUTDOOR ENCLOSURES REQUIRE AN APPROVED MEANS OF DRAINAGE AND VENTILATION.
5. ALL ELECTRICAL CONDUIT, EQUIPMENT AND COMPONENTS MUST BE ADEQUATELY PROTECTED FROM DAMAGE AND VANDALISM BY THE USE OF BOLLARDS, SHIELDS, GUARDS OR OTHER ACCEPTABLE MEANS.

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**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

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**ELECTRICAL NOTES**

DRAWING NUMBER:

**E050**

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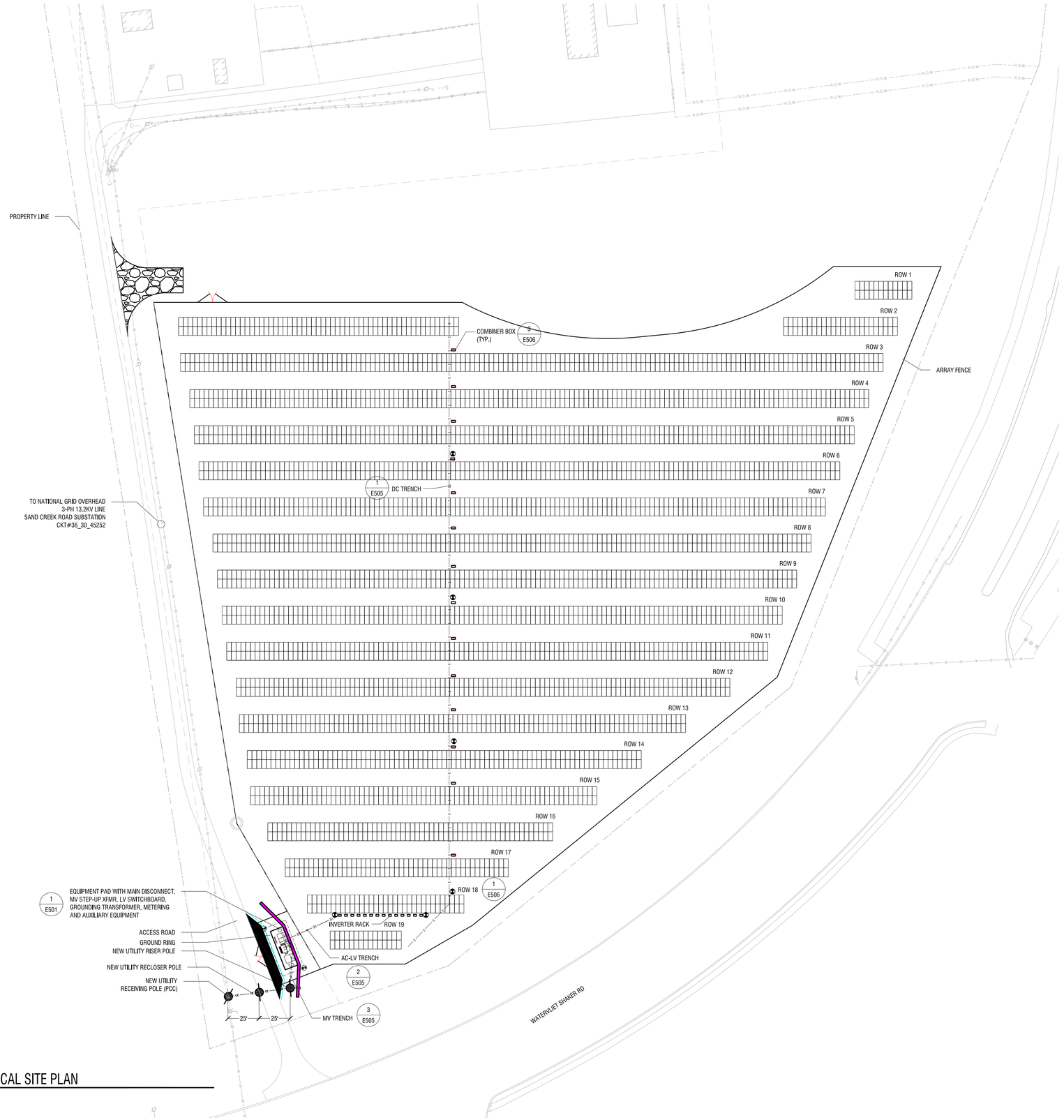


1 E-101 ELECTRICAL SITE PLAN
1"=40'

## GENERAL NOTES:

1. ALL INVERTERS TO BE MOUNTED ON FREE STANDING RACKING (INDEPENDENT OF PV TABLES) AS CALLED FOR IN DETAILS E506 AND STRUCTURAL ENGINEERING DETAILS.
2. PROVIDE PULL CORDS IN ALL SPARE / EMPTY CONDUITS.
4. TRENCHES AND OTHER EXCAVATIONS MAY BE CONSTRUCTED EITHER BEFORE OR AFTER RACKING SUPPORT POLE INSTALLATION. THE HORIZONTAL DISTANCE BETWEEN EXCAVATION AND PROPOSED RACKING SUPPORT POLE LOCATION SHOULD BE 24" OR GREATER.
5. RACKING TABLES NOT SHOWN. REFER TO RACKING MANUFACTURER DRAWING FOR TABLE LOCATIONS AND CONFIGURATION.
6. ELECTRICAL OVERHEAD POLES ARE NOT TO BE INSTALLED UNTIL PROPOSED LOCATIONS ARE REVIEWED AND APPROVED BY UTILITY.

## SYMBOL LIST

- EXISTING DISTRIBUTION CIRCUIT
- NEW OVERHEAD DISTRIBUTION CIRCUIT
- NEW UNDERGROUND AC ELECTRICAL TRENCH
- NEW UNDERGROUND DC ELECTRICAL TRENCH
- EXISTING POLE TO REMAIN
- NEW POLE
- GUY ANCHOR
- DC COMBINER PANEL
- STRING INVERTER
- GROUND ROD LOCATION. REFER TO SHEET E702 FOR GROUNDING SYSTEM DETAILS.

## SITE DATA

| SYSTEM PRODUCTION SUMMARY | |
|---|---|
| AC PLANT PEAK PRODUCTION: | 1.50 MW |
| DC PLANT PEAK PRODUCTION: | 2.065 MW |
| DC/AC POWER RATIO: | 1.38 |

| INTERCONNECTING UTILITY INFORMATION | |
|---|---|
| UTILITY: | NATIONAL GRID |
| SUBSTATION: | SAND CREEK ROAD |
| CIRCUIT #: | 36_30_45252 |
| LINE VOLTAGE: | 13.2 KV |

| EQUIPMENT SUMMARY | |
|---|---|
| SOLAR PV MODULE | |
| MANUFACTURER: | HANWHA QCELLS |
| MODEL: | Q.PEAK DUO XL-G11.3/BFG |
| NOMINAL MAX. DC POWER: | 580 W |
| VOLTAGE (STC), VOC, VMPP: | 53.56 V, 44.88 V |
| CURRENT (STC), ISC, IMPP: | 13.55 A, 12.92 A |
| AZIMUTH: | 180° |
| TOTAL PV MODULE QUANTITY: | 3,560 |
| SOLAR INVERTER | |
| MANUFACTURER: | KACO |
| MODEL: | BLUEPLANET 110 TL3-US |
| NOMINAL MAX. AC POWER: | 110 KW / 110 KVA |
| NOMINAL AC VOLTAGE: | 480 V |
| MAX. AC CURRENT: | 132.3 A |
| TOTAL INVERTER QUANTITY: | 14 |
| GENERATOR STEP-UP TRANSFORMER | |
| MANUFACTURER: | TBD |
| MODEL: | TBD |
| TRANSFORMER SIZE: | 3.2 MVA |
| HIGH SIDE: | 13.2 KV, GROUNDED WYE |
| LOW SIDE: | 480 V, GROUNDED WYE |
| TOTAL TRANSFORMER QUANTITY: | 1 |

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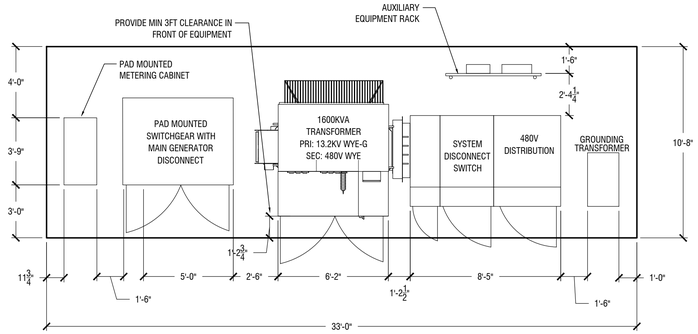
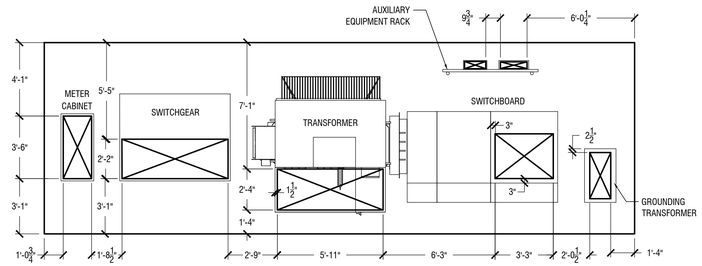
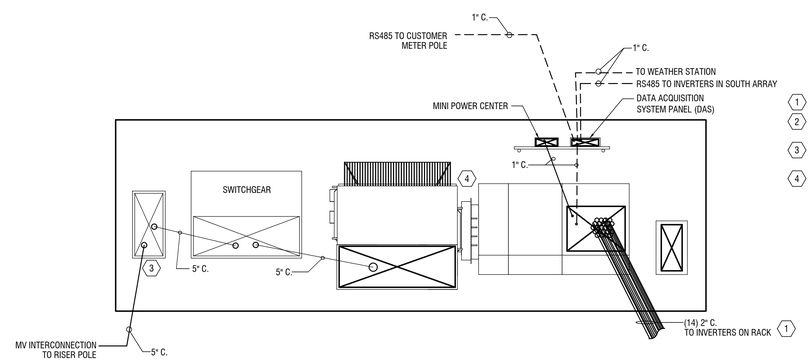
# PRELIMINARY DESIGN - NOT FOR CONSTRUCTION




1 E501 EQUIPMENT PADS - EQUIPMENT LOCATION
1/4" - 1'-0"




2 E501 EQUIPMENT PAD - PENETRATION LOCATIONS
1/4" - 1'-0"




3 E501 EQUIPMENT PAD UNDERGROUND CONNECTIONS
1/4" - 1'-0"

DETAIL KEY NOTES:

1. CONDUITS TO EXTEND 1'-0" BEYOND GROUND RING.
2. SEE AUXILIARY EQUIPMENT RACK DETAILS ON SHEET E-501.
3. PROVIDE SCHEDULE 80 SWEEPS IN EQUIPMENT STUB-UP CONNECTION FROM RISER POLE.
4. CLOSE COUPLED - THROAT CONNECTION BETWEEN TRANSFORMER AND SWITCHBOARD TO BE PROVIDED BY MANUFACTURER. CONNECTIONS SHOWN ARE DIAGRAMMATIC ONLY.

LEGEND
- DATA CONDUIT - 1"C
- POWER CABLING CONDUIT

DRAWING GENERAL NOTES:

A. REFER TO 3-LINE DIAGRAM ON FOR CABLE SIZES AND QUANTITIES OF POWER CABLES.

B. REFER TO DRAWINGS PROVIDED BY OTHERS FOR PAD DIMENSIONS.

C. ALL LOOSE CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH WEATHER-TIGHT FITTINGS WITH STRAIN RELIEF.

D. ALL CONDUIT ENCASED CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH INSULATING BUSHINGS AND DUCT SEAL COMPOUND.

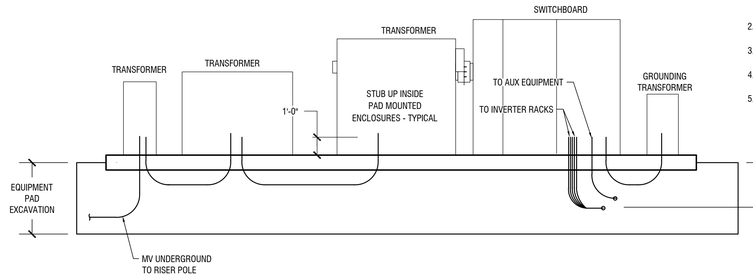
E. PROVIDE A WEATHER HEAD ON EXPOSED CONDUIT ENDS FOR CONDUITS PENETRATING GRADE FROM UNDERGROUND. INSTALL CABLES WITH DUCT SEAL COMPOUND.

F. REFER TO GROUNDING DETAILS SHEET FOR ADDITIONAL GROUNDING INFORMATION.

G. PROVIDE EXPANSION JOINTS FOR ALL PVC CONDUITS PENETRATING GRADE.

H. PROVIDE MINIMUM OF 6" SPACING BETWEEN POWER AND DATA CONDUITS.

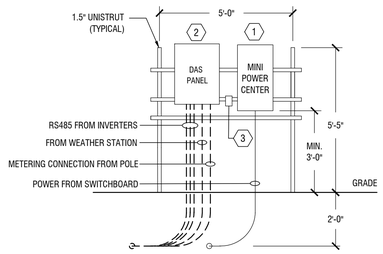
I. PROVIDE A PVC SLEEVE FOR ALL CONDUITS PENETRATING GRADE FROM UNDERGROUND IN AREA OF MOWING. SLEEVE TO EXTEND 1'-0" ABOVE GRADE SO AS TO PROVIDE PROTECTION FROM MOWING AND TRIMMING EQUIPMENT.




4 E501 EQUIPMENT PAD REAR ELEVATION
1/4" - 1'-0"

DETAIL GENERAL NOTES:

1. ALL COMMUNICATIONS AND DATA CONDUIT SHOWN TO BE LOCATED AT A DEPTH OF 2'-0" BELOW GRADE. REFER TO TRENCH DETAILS. THIS CONDUIT IS NOT SHOWN ON THE ELEVATION PLANS.
2. VERTICALLY STACKED CONDUIT RUNS RESULT IN DEEPER INSTALLATIONS THAN INDICATED.
3. SCHEDULE 80 SWEEPS TO BE PROVIDED AT TRANSFORMER STUB UP.
4. REFER TO STRUCTURAL PLANS FOR EQUIPMENT PAD DEPTH DETAILS.
5. CLOSE COUPLED - THROAT CONNECTION BETWEEN TRANSFORMER AND SWITCHBOARD TO BE PROVIDED BY MANUFACTURER. CONNECTIONS SHOWN ARE DIAGRAMMATIC ONLY




5 E501 AUXILIARY EQUIPMENT ELEVATION
3/8" - 1'-0"

DETAIL GENERAL NOTES:

1. PROVIDE POWER AND DATA CONNECTIONS BETWEEN WEATHER STATION AND DAS CABINET. REFER TO DAS MANUFACTURER INSTALLATION DOCUMENTS FOR CABLE TYPES AND TERMINATIONS.
2. PROVIDE 480V 1PH SUPPLY TO MINI POWER CENTER FROM SWITCHBOARD.
3. EQUIPMENT SUPPLIED AS PART OF DAS PACKAGE. INSTALLATION, CABLE AND RACEWAY PROVIDED BY ELECTRICAL CONTRACTOR. PROVIDE MOUNTING BRACKET AND HARDWARE. LOCATE AND INSTALL PER MANUFACTURER INSTRUCTIONS.
4. ALL CONDUIT SHOWN IN DETAIL TO BE 1" RIGID PVC UNLESS NOTED OTHERWISE.
5. APPROXIMATE HEIGHTS SHOWN FOR UNISTRUT CROSS-MEMBERS. ADJUST AND INSTALL AT HEIGHTS REQUIRED FOR EQUIPMENT INSTALLATION.

DETAIL KEY NOTES:

1. 5KVA MINI POWER CENTER NEMA 3R ENCLOSURE. 480V MAIN BREAKER. ENCAPSULATED DRY-TYPE TRANSFORMER AND SECONDARY DISTRIBUTION LOAD CENTER WITH 120/240 1PH MAIN BREAKER.
2. PROVIDE COMPLETE DATA ACQUISITION SYSTEM (DAS), MAKE AND MODEL AS DIRECTED BY CONTRACTOR. INSTALL ALL COMPONENTS AND CABLING PER DAS SYSTEM INSTALLATION MANUAL. DAS SYSTEM TECHNICIANS TO PROGRAM AND TEST.
3. 120V 20A NEMA 5-15 GFCI DUPLEX CONVENIENCE RECEPTACLE WITH NEMA 3R WEATHERPROOF ENCLOSURE.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**EQUIPMENT PAD DETAILS**

DRAWING NUMBER:

**E501**

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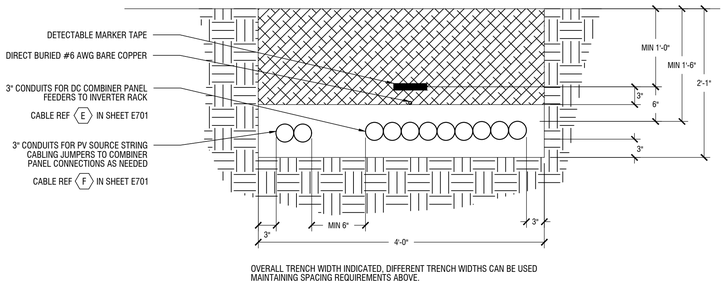
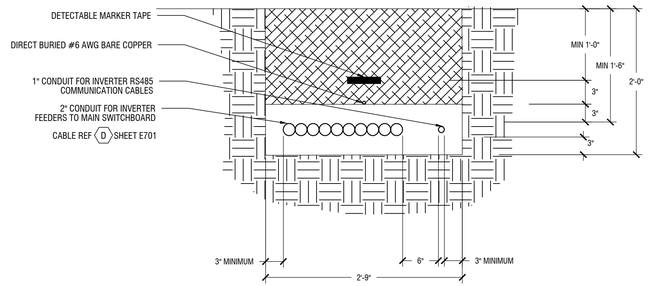



OVERALL TRENCH WIDTH INDICATED, DIFFERENT TRENCH WIDTHS CAN BE USED MAINTAINING SPACING REQUIREMENTS ABOVE.

1 E-505 TYPICAL STRING CABLE AND COMBINER PANEL FEED TRENCH DETAIL

1"=1'-0"

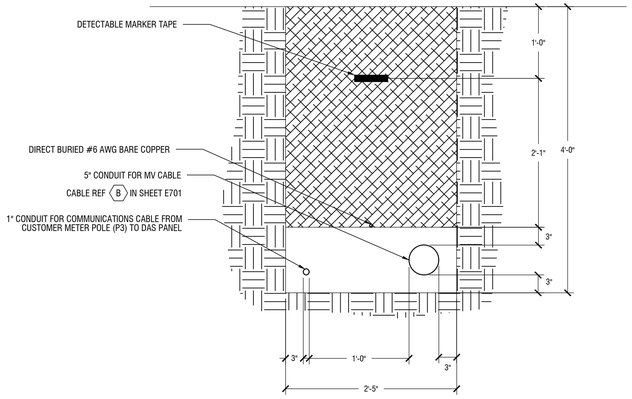



MAXIMUM OVERALL TRENCH WIDTH INDICATED (ALLOWS MAXIMUM NUMBER OF INVERTER FEEDERS PER INVERTER RACK)

DIFFERENT TRENCH WIDTHS CAN BE USED AS LONG AS SPACING REQUIREMENTS ABOVE ARE FOLLOWED.

2 E-505 TYPICAL INVERTER FEEDS TRENCH DETAIL

1"=1'-0"




3 E-505 SERVICE TRENCH DETAIL

1"=1'-0"

## TRENCH DETAIL GENERAL NOTES:

1. ALL TRENCHES PASSING UNDER ROADWAYS TO BE CONCRETE ENCASED AS SHOWN IN DETAILS.
2. TRENCHING MUST COMPLY WITH THE LATEST NYS BUILDING CODE AND NEC STANDARDS.
3. CLEAN FILL REQUIREMENTS: BEDDING SHALL BE SAND OR ROCK-FREE FILL SCREENED TO A MAXIMUM 1/4" SIZE AS A CUSHING (FREE OF SHARP EDGE MATERIAL, ROTTING WOOD OR ORGANIC MATTER THAT MIGHT ATTRACT INSECTS). THE CABLES SHALL BE COVERED WITH "CLEAN FILL" SAND OR SOFT EARTH, FREE FROM STONES, ROCKS OR OTHER MATERIAL THAT MAY DAMAGE THE CABLE DURING BACKFILL.
4. PROVIDE BACKFILLING MATERIAL WITH A MINIMUM BEARING CAPACITY OF 22,000 LB AXLE LOADING FOR ANY TRENCHING SECTIONS SUBJECT TO VEHICULAR TRAFFIC.
5. DIRECT BURIED CABLES TO BE INSTALLED SIDE-BY-SIDE, AS INIDCATED ON DETAILS. CABLES ARE NOT TO BE OVERLAPPED OR BUNDLED.

UNTREATED NATIVE SOIL

CLEAN, DRY BACKFILL CUSHION

EARTH UNDISTURBED

CONCRETE

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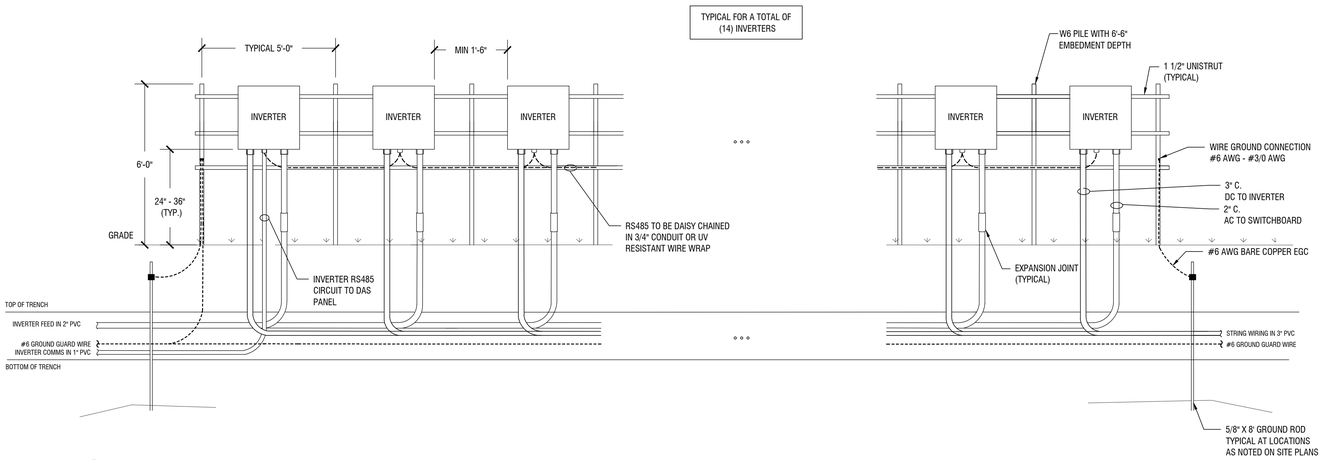
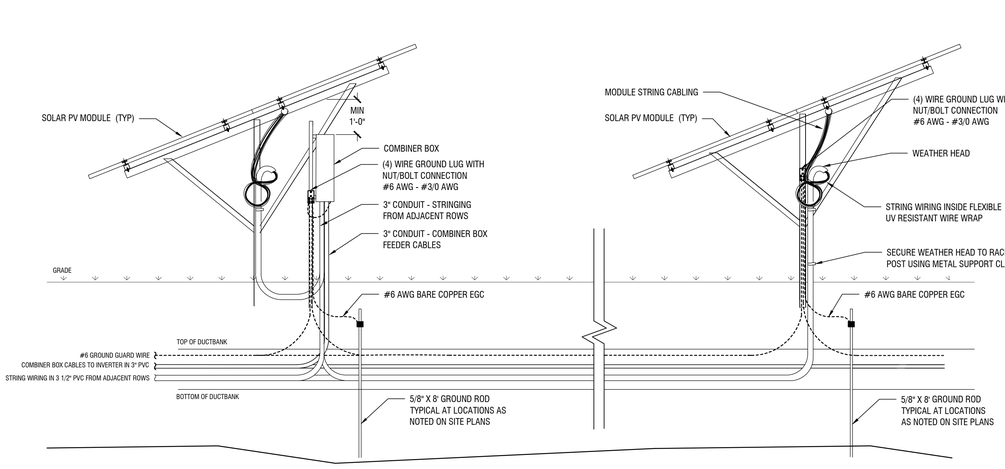


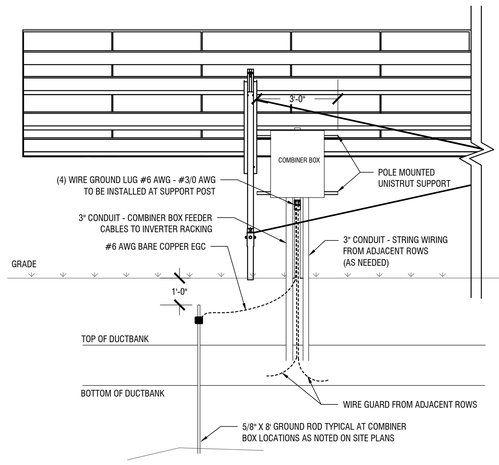

1 E-506 TYPICAL INVERTER RACKING AND CABLING DETAIL

3/8" = 1' 0"



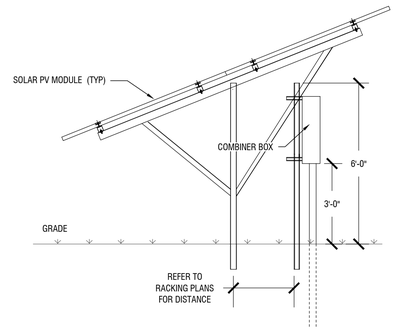

2 E-506 TYPICAL STRING CABLING AND RACKING DETAIL

3/8" = 1' 0"



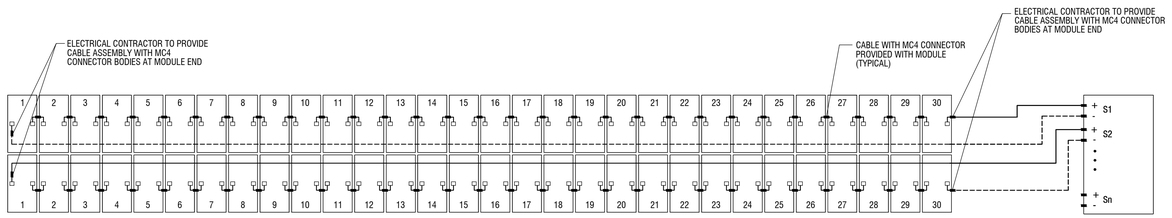

3 E-506 TYPICAL COMBINER BOX RACKING AND CABLING DETAIL

3/8" = 1' 0"




4 E-506 TYPICAL COMBINER BOX SIDE ELEVATION DETAIL

3/8" = 1' 0"




DETAIL NOTES:

A. MODULES INSTALLED IN TOP AND BOTTOM ROWS TO BE ROTATED 180° FROM EACH OTHER. REFER TO NAMEPLATE LOCATIONS SHOWN ABOVE FOR ORIENTATIONS.

5 E-506 TYPICAL 580W MODULES STRING WIRING DETAIL

NOT TO SCALE

## DRAWING GENERAL NOTES

1. MODULE AND INVERTER RACKING DIAGRAMMATICALLY ONLY. REFER TO RACKING MANUFACTURER DRAWINGS FOR ACTUAL DIMENSIONS, CONFIGURATION AND MODULE TILTS.
2. REFER TO 3-LINE DIAGRAM FOR CABLE SIZES AND QUANTITIES OF POWER CABLES.
3. ALL LOOSE CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH WEATHER-TIGHT FITTINGS WITH STRAIN RELIEF.
4. ALL CONDUIT ENCASED CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH INSULATING BUSHINGS AND DUCT SEAL COMPOUND.
5. REFER TO GROUNDING DETAILS SHEET FOR ADDITIONAL GROUNDING INFORMATION.
6. REFER TO TRENCH DETAILS SHEET FOR CABLING TRENCHING DEPTHS.
7. PROVIDE PULL CORDS IN ALL SPARE/EMPTY CONDUITS.
8. PROVIDE WEATHER HEADS AT ALL UPRIGHT CONDUIT ENDS EXPOSED TO WEATHER. INSTALL WITH DUCT SEAL COMPOUND.
9. PROVIDE A PVC SLEEVE FOR ALL CONDUITS PENETRATING GRADE FROM UNDERGROUND, EXTENDING 1'-0" ABOVE GRADE TO PROVIDE PROTECTION FROM MOWING AND TRIMMING EQUIPMENT.
10. PROVIDE EXPANSION JOINTS FOR ALL PVC CONDUITS PENETRATING GRADE.
11. PROVIDE RIGID PVC CONDUIT FOR INVERTER COMMUNICATIONS RS485 AND SENSORS WIRING.
12. PROVIDE SHIELDED CABLE FOR NON FIBER OPTIC COMMUNICATIONS CABLE RUNNING INSIDE CHANNEL WITHOUT CONDUIT. ALLOW A MINIMUM OF 12" SEPARATION FROM LOW VOLTAGE CABLES.
13. GROUND LUG TO BE CONNECTED USING BOLT/NUTS. DO NOT USE TEK SCREWS.

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**SIEMENS SMART INFRASTRUCTURE**
6 BRITISH AMERICAN BLVD
LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708

DRAWN BY:

REVIEWED BY:

ISSUED FOR: PERMIT ONLY

DATE: 07/19/2022

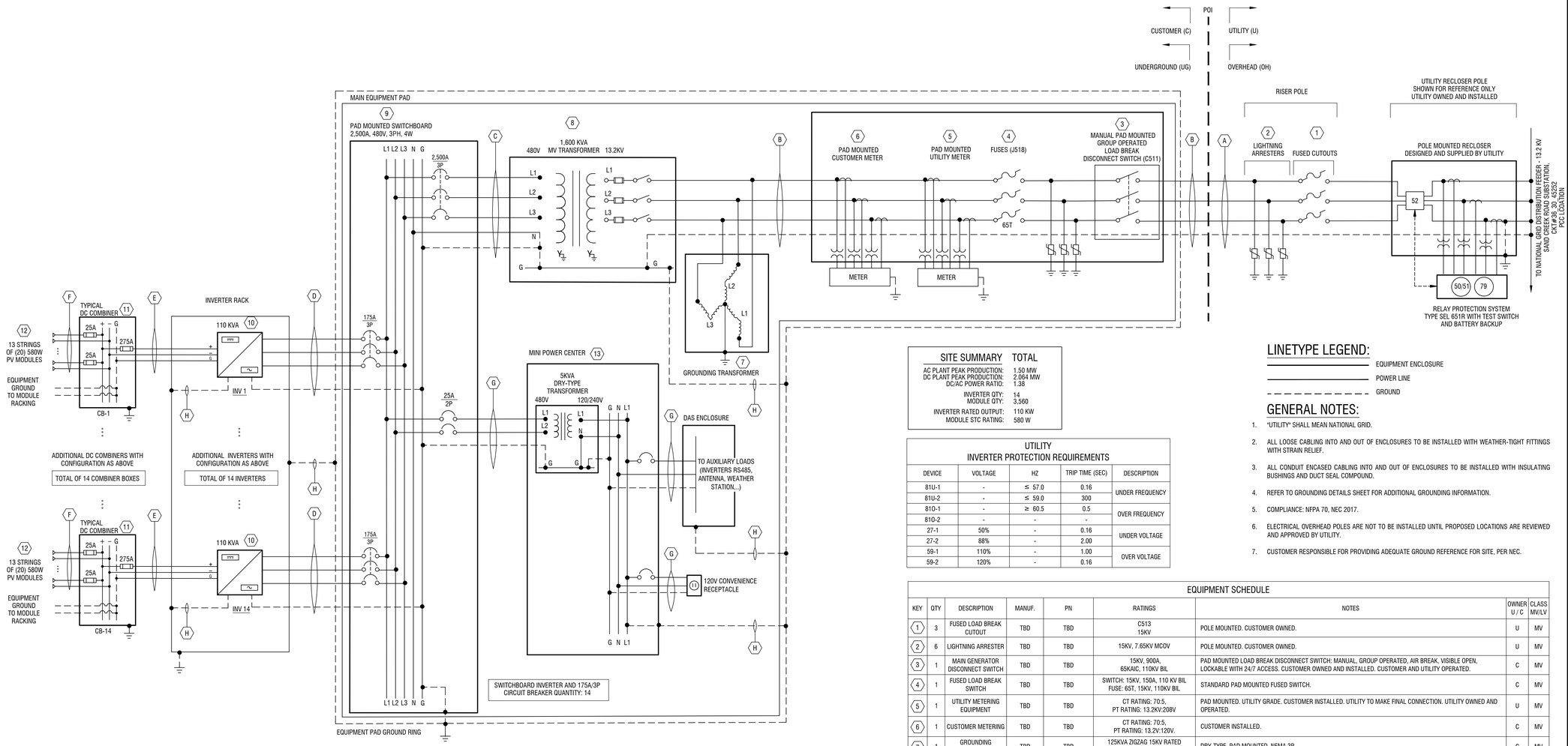
DRAWING NAME:

**RACKING DETAILS**

DRAWING NUMBER:

**E506**

VERSION 19.0
6/3/2010 8:47:56 AM




| SITE SUMMARY | TOTAL |
|---|---|
| AC PLANT PEAK PRODUCTION: | 1.50 MW |
| DC PLANT PEAK PRODUCTION: | 2.064 MW |
| DC/AC POWER RATIO: | 1.38 |
| INVERTER QTY: | 14 |
| MODULE QTY: | 3,560 |
| INVERTER RATED OUTPUT: | 110 KW |
| MODULE STC RATING: | 580 W |

UTILITY
INVERTER PROTECTION REQUIREMENTS

| DEVICE | VOLTAGE | HZ | TRIP TIME (SEC) | DESCRIPTION |
|---|---|---|---|---|
| 81U-1 | - | ≤ 57.0 | 0.16 | UNDER FREQUENCY |
| 81U-2 | - | ≤ 59.0 | 300 | |
| 81O-1 | - | ≥ 60.5 | 0.5 | OVER FREQUENCY |
| 81O-2 | - | - | - | |
| 27-1 | 50% | - | 0.16 | UNDER VOLTAGE |
| 27-2 | 88% | - | 2.00 | |
| 59-1 | 110% | - | 1.00 | OVER VOLTAGE |
| 59-2 | 120% | - | 0.16 | |

## LINETYPE LEGEND:

- EQUIPMENT ENCLOSURE
- POWER LINE
- GROUND

## GENERAL NOTES:

1. "UTILITY" SHALL MEAN NATIONAL GRID.
2. ALL LOOSE CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH WEATHER-TIGHT FITTINGS WITH STRAIN RELIEF.
3. ALL CONDUIT ENCASED CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH INSULATING BUSHINGS AND DUCT SEAL COMPOUND.
4. REFER TO GROUNDING DETAILS SHEET FOR ADDITIONAL GROUNDING INFORMATION.
5. COMPLIANCE: NFPA 70, NEC 2017.
6. ELECTRICAL OVERHEAD POLES ARE NOT TO BE INSTALLED UNTIL PROPOSED LOCATIONS ARE REVIEWED AND APPROVED BY UTILITY.
7. CUSTOMER RESPONSIBLE FOR PROVIDING ADEQUATE GROUND REFERENCE FOR SITE, PER NEC.

EQUIPMENT SCHEDULE

| KEY | QTY | DESCRIPTION | MANUF. | PN | RATINGS | NOTES | OWNER U / C | CLASS MV/LV |
|---|---|---|---|---|---|---|---|---|
| 1 | 3 | FUSED LOAD BREAK CUTOUT | TBD | TBD | C513 15KV | POLE MOUNTED. CUSTOMER OWNED. | U | MV |
| 2 | 6 | LIGHTNING ARRESTER | TBD | TBD | 15KV, 7.65KV MCOV | POLE MOUNTED. CUSTOMER OWNED. | U | MV |
| 3 | 1 | MAIN GENERATOR DISCONNECT SWITCH | TBD | TBD | 15KV, 900A, 65KAIC, 110KV BIL | PAD MOUNTED LOAD BREAK DISCONNECT SWITCH: MANUAL, GROUP OPERATED, AIR BREAK, VISIBLE OPEN, LOCKABLE WITH 24/7 ACCESS. CUSTOMER OWNED AND INSTALLED. CUSTOMER AND UTILITY OPERATED. | C | MV |
| 4 | 1 | FUSED LOAD BREAK SWITCH | TBD | TBD | SWITCH: 15KV, 150A, 110 KV BIL FUSE: 65T, 15KV, 110KV BIL | STANDARD PAD MOUNTED FUSED SWITCH. | C | MV |
| 5 | 1 | UTILITY METERING EQUIPMENT | TBD | TBD | CT RATING: 70:5, PT RATING: 13.2KV:208V | PAD MOUNTED. UTILITY GRADE. CUSTOMER INSTALLED. UTILITY TO MAKE FINAL CONNECTION. UTILITY OWNED AND OPERATED. | U | MV |
| 6 | 1 | CUSTOMER METERING | TBD | TBD | CT RATING: 70:5, PT RATING: 13.2V:120V. | CUSTOMER INSTALLED. | C | MV |
| 7 | 1 | GROUNDING TRANSFORMER | TBD | TBD | 125KVA ZIGZAG 15KV RATED %Z: 4.2 X/R: 4.5 | DRY-TYPE, PAD MOUNTED. NEMA 3R | C | MV |
| 8 | 1 | MV STEP-UP TRANSFORMER | TBD | TBD | 1.60 MVA %Z: 5.75 X/R: 8 PRI: 13.2KV WYE-G SEC: 480V WYE | LIQUID-FILLED, PAD MOUNTED. | C | MV/LV |
| 9 | 1 | PAD MOUNTED SWITCHBOARD | TBD | TBD | 2,500A, 480V, 3PH, 4W, WITH RATED 2500A MCB | PV AC SERVICE ENTRANCE SWITCHGEAR. ENCLOSURE NEMA 3R RATED. | C | LV |
| 10 | 14 | PV INVERTER | KACO | BLUEPLANET 110 TL3-US | AC: 110KW, 132A, 480V. SET 1.0 PF, 110KW MAX OUTPUT. | INVERTERS ARE UL1741 LISTED, IEEE1547 COMPLIANT, RATED TO 1500 VDC. THE INVERTERS HAVE INTEGRAL, MANUAL DC DISCONNECTING MEANS. THE INVERTER IS EQUIPPED WITH UL1741 APPROVED GROUND FAULT DETECTION DEVICE THAT MEETS NFPA 70 ARTICLE 250.122 REQUIREMENTS FOR EQUIPMENT GROUNDING. | C | LV |
| 11 | 14 | DC COMBINER PANEL | TBD | TBD | 2,000V, 275A, 16 STRINGS MIN (1) 25A FUSE PER STRING | NEMA 3R. OUTDOOR RATED. | C | LV |
| 12 | 3,560 | SOLAR MODULE | HANWHA QCELLS | Q.PEAK DUO XL-G11.3/BFG | 580W Imp 12.92A Vmp 44.88V Isc: 13.55 Voc: 53.56V | MODULES ARE UL1703 LISTED, RATED TO 1500 VDC. EACH MODULE INCLUDES OUTDOOR RATED QUICK CONNECTS FOR MODULE INTERCONNECTION. DO NOT REMOVE THE QUICK CONNECTS, OTHERWISE THE MODULE WARRANTY AND UL LISTING MAY BE INVALIDATED. QUICK CONNECTS SHALL COMPLY WITH NFPA 70 ARTICLE 690.33(C). | C | LV |
| 13 | 1 | MINI POWER CENTER | TBD | TBD | PRI MAIN BREAKER: 480V TRANSFORMER: 480V / 120/240V 1PH SEC MAIN BREAKER: 120/240V 1PH | NEMA 3R ENCLOSURE . ENCAPSULATED SINGLE PHASE DRY-TYPE TRANSFORMER AND SECONDARY DISTRIBUTION LOAD CENTER. | C | LV |

STRINGING SUMMARY

| INVERTER NO. | INVERTER AC OUTPUT (KW) | INVERTER DC INPUT (KW) | INVERTER LOAD RATIO (DC/AC) | SOLAR MODULE MODEL | MODULE WATTAGE | MODULES PER STRING | STRINGS PER COMBINER BOX | TOTAL MODULE QTY | STRING MIN FUSE SIZE |
|---|---|---|---|---|---|---|---|---|---|
| #1 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #2 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #3 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #4 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #5 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #6 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #7 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #8 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #9 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #10 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #11 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #12 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #13 | 110.0 | 150.8 | 1.37 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 13 | 20 | 260 | 25 A |
| #14 | 70.0 | 92.8 | 1.33 | HANWHA Q CELL Q.PEAK DUO XL-G11.3/BFG | 580 | 20 | 8 | 160 | 25 A |
| TOTAL | 1,500.0 | 2,053.2 | 1.37 | - | - | - | 268 | 3560 | - |

WIRE AND CONDUIT SCHEDULE

| KEY | CONDUCTORS/ WIRE SCHEDULE | LENGTH (FT) | CABLE RATED AMPACITY (A) | DESIGN AMPACITY (A) | MIN CONDUCTOR INSULATION | CONDUIT SIZE (PER SET) | 90°C RATED CABLE | NOTES |
|---|---|---|---|---|---|---|---|---|
| A | (3) #2 AWG (6/1) ASCR AL (SPARROW) + #8 AWG CU GROUND | 90 | 184 | 67.4 | - | IN FREE AIR | - | |
| B | (3) #4 AWG AL 133% MV-105 EPR WITH FULL CONCENTRIC NEUTRAL | 40 | 98 | 67.4 | 15KV | (1) 5" | - | PROVIDE CONDUIT SWEEPS AT CABLE PENETRATIONS FROM BELOW TO ABOVE GRADE. |
| C | CLOSE-COUPLE CONNECTION. BRAIDED COPPER CONNECTIONS SIZED BY EQUIPMENT SUPPLIER | TBD | - | - | 15KV | IN CONNECTION ENCLOSURE | - | |
| D | (3) 3/0 AWG AL THWN-2 + #4 AL AWG GROUND | TBD | 175 | 165.4 | 600V | (1) 2" | - | |
| E | (2) 350 KCMIL AL PV-WIRE + #4 AWG CU GROUND | TBD | 280 | 254.1 | 2000V | (1) 3" | X | PROVIDE CONDUIT SWEEPS AT ALL CABLE PENETRATIONS FROM BELOW TO ABOVE GRADE. ONLY ONE (1) GROUND CABLE REQUIRED IN TRENCH. MAX BUNDLE SIZE: 3. |
| F | (2) #10 AWG CU PV WIRE | TBD | 40 | 21.17 | 2000V | (1) 3" | X | CABLE TO BE LISTED FOR USE WITH PHOTOVOLTAIC SYSTEMS. CONDUIT SIZE INDICATED IS FOR USE BELOW GRADE. NO CONDUIT REQUIRED FOR RACK MOUNTED SECTIONS OF CABLE. MAX BUNDLE SIZE: 40 CABLES. |
| G | (2) #10 AWG CU THWN + #10 AWG CU GROUND | TBD | 35 | 7.5 | 600V | (1) 1" | - | ALL BELOW GRADE CONDUIT LOCATED OUTSIDE THE EQUIPMENT PAD TO BE RIGID PVC AND A MINIMUM SIZE OF 1". SCH 80. |
| H | REFER TO GROUNDING DIAGRAM | TBD | - | - | - | - | - | VARIOUS GROUND CABLE TYPES AND SIZES |

1. LISTED PIN ADAPTERS OR COMPRESSION LUGS SHALL BE PERMITTED FOR USE WITH ALUMINUM CONDUCTORS. CONDUCTOR SHALL BE PREPARED AND TERMINATED PER MANUFACTURERS GUIDELINES.
2. ELECTRICAL CONTRACTOR SHALL IDENTIFY SOURCE WIRING WITH MARKING TAPE OR OTHER APPROVED METHOD. POSITIVE SHALL BE MARKED RED AND NEGATIVE MARKED BLACK. CONDUCTORS 4 AWG AND LARGER SHALL BE IDENTIFIED AT ALL TERMINATIONS. PROVIDE COMPRESSION LUGS AT BUS TERMINATIONS.
3. ALL PARALLEL CABLE SETS TO BE INSTALLED WITH GROUND CONDUCTORS IN EACH CONDUIT.
4. ALL CABLING EXPOSED TO SUNLIGHT TO BE RATED AS UV RESISTANT.
5. UNLESS NOTED OTHERWISE, ALL UNDERGROUND CONDUIT TO BE PVC SCHEDULE 40; ABOVE GROUND CONDUITS TO BE PVC SCHEDULE 80.
6. CABLES NOT SIZED FOR VOLTAGE DROP.

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LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

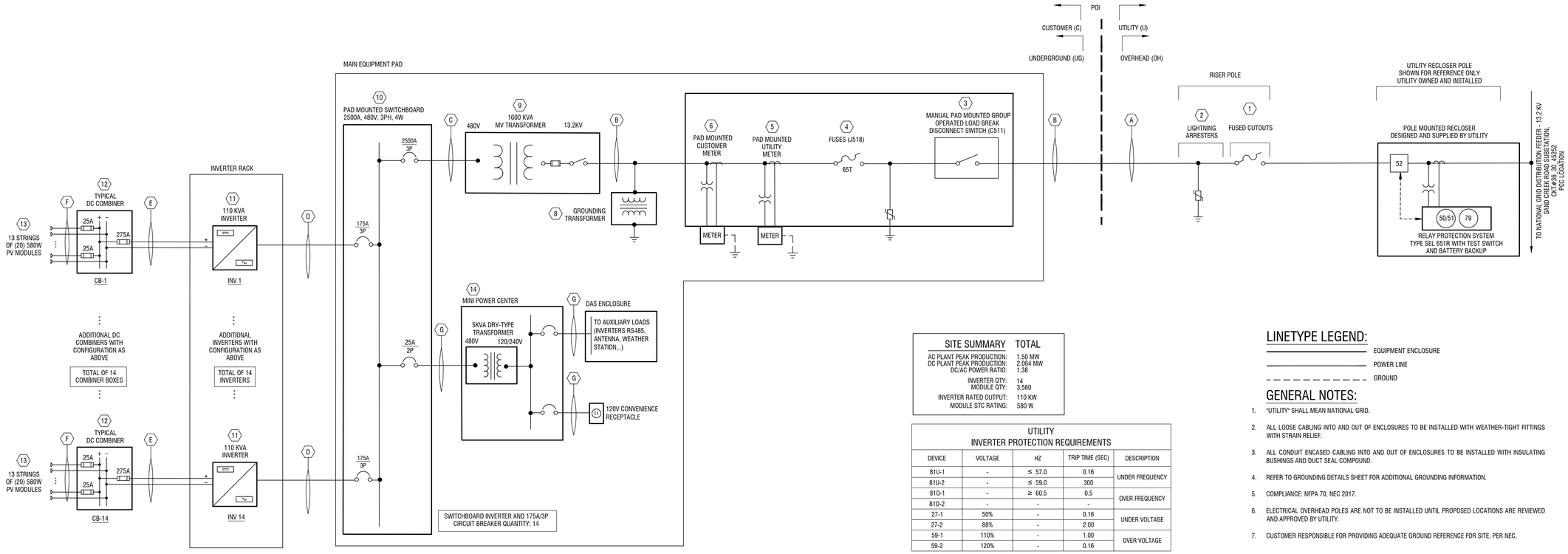
| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: BJB
REVIEWED BY: SJB
ISSUED FOR: PERMIT ONLY
DATE: 07/19/2022
DRAWING NAME:

**THREE LINE DIAGRAM**

DRAWING NUMBER:

**E701**




## SITE SUMMARY

| | TOTAL |
|---|---|
| AC PLANT PEAK PRODUCTION: | 1.50 MW |
| DC PLANT PEAK PRODUCTION: | 2.064 MW |
| DC/AC POWER RATIO: | 1.38 |
| INVERTER QTY: | 14 |
| MODULE QTY: | 3,560 |
| INVERTER RATED OUTPUT: | 110 KW |
| MODULE STC RATING: | 580 W |

## LINETYPE LEGEND:

- EQUIPMENT ENCLOSURE
- POWER LINE
- GROUND

## GENERAL NOTES:

1. "UTILITY" SHALL MEAN NATIONAL GRID.
2. ALL LOOSE CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH WEATHER-TIGHT FITTINGS WITH STRAIN RELIEF.
3. ALL CONDUIT ENCASED CABLING INTO AND OUT OF ENCLOSURES TO BE INSTALLED WITH INSULATING BUSHINGS AND DUCT SEAL COMPOUND.
4. REFER TO GROUNDING DETAILS SHEET FOR ADDITIONAL GROUNDING INFORMATION.
5. COMPLIANCE: NFPA 70, NEC 2017.
6. ELECTRICAL OVERHEAD POLES ARE NOT TO BE INSTALLED UNTIL PROPOSED LOCATIONS ARE REVIEWED AND APPROVED BY UTILITY.
7. CUSTOMER RESPONSIBLE FOR PROVIDING ADEQUATE GROUND REFERENCE FOR SITE, PER NEC.

## UTILITY INVERTER PROTECTION REQUIREMENTS

| DEVICE | VOLTAGE | HZ | TRIP TIME (SEC) | DESCRIPTION |
|---|---|---|---|---|
| 81U-1 | - | ≤ 57.0 | 0.16 | UNDER FREQUENCY |
| 81U-2 | - | ≤ 59.0 | 300 | |
| 81O-1 | - | ≥ 60.5 | 0.5 | OVER FREQUENCY |
| 81O-2 | - | - | - | |
| 27-1 | 50% | - | 0.16 | UNDER VOLTAGE |
| 27-2 | 88% | - | 2.00 | |
| 59-1 | 110% | - | 1.00 | OVER VOLTAGE |
| 59-2 | 120% | - | 0.16 | |

## EQUIPMENT SCHEDULE

| KEY | QTY | DESCRIPTION | MANUF. | PN | RATINGS | NOTES | OWNER U / C | CLASS MV/LV |
|---|---|---|---|---|---|---|---|---|
| 1 | 3 | FUSED LOAD BREAK CUTOUT | TBD | TBD | C513 15KV | POLE MOUNTED. CUSTOMER OWNED. | U | MV |
| 2 | 6 | LIGHTNING ARRESTER | TBD | TBD | 15KV, 7.65KV MCOV | POLE MOUNTED. CUSTOMER OWNED. | U | MV |
| 3 | 1 | MAIN GENERATOR DISCONNECT SWITCH | TBD | TBD | 15KV, 900A, 65KAIC, 110KV BIL | PAD MOUNTED LOAD BREAK DISCONNECT SWITCH: MANUAL, GROUP OPERATED, AIR BREAK, VISIBLE OPEN, LOCKABLE WITH 24/7 ACCESS. CUSTOMER OWNED AND INSTALLED. CUSTOMER AND UTILITY OPERATED. | C | MV |
| 4 | 1 | FUSED LOAD BREAK SWITCH | TBD | TBD | SWITCH: 15KV, 150A, 110 KV BIL FUSE: 65T, 15KV, 110KV BIL | STANDARD PAD MOUNTED FUSED SWITCH. | C | MV |
| 5 | 1 | UTILITY METERING EQUIPMENT | TBD | TBD | CT RATING: 70:5, PT RATING: 13.2KV:208V | PAD MOUNTED. UTILITY GRADE. CUSTOMER INSTALLED. UTILITY TO MAKE FINAL CONNECTION. UTILITY OWNED AND OPERATED. | U | MV |
| 6 | 1 | CUSTOMER METERING | TBD | TBD | CT RATING: 70:5, PT RATING: 13.2V:120V. | CUSTOMER INSTALLED. | C | MV |
| 7 | 1 | GROUNDING TRANSFORMER | TBD | TBD | 125KVA ZIGZAG 15KV RATED %Z: 4.2 X/R: 4.5 | DRY-TYPE, PAD MOUNTED. NEMA 3R | C | MV |
| 8 | 1 | MV STEP-UP TRANSFORMER | TBD | TBD | 1.60 MVA %Z: 5.75 X/R: 8 PRI: 13.2KV WYE-G SEC: 480V WYE | LIQUID-FILLED, PAD MOUNTED. | C | MV/LV |
| 9 | 1 | PAD MOUNTED SWITCHBOARD | TBD | TBD | 2,500A, 480V, 3PH, 4W, WITH RATED 2500A MCB | PV AC SERVICE ENTRANCE SWITCHGEAR. ENCLOSURE NEMA 3R RATED. | C | LV |
| 10 | 14 | PV INVERTER | KACO | BLUEPLANET 110 TL3-US | AC: 110KW, 132A, 480V. SET 1.0 PF, 110KW MAX OUTPUT. | INVERTERS ARE UL1741 LISTED, IEEE1547 COMPLIANT, RATED TO 1500 VDC. THE INVERTERS HAVE INTEGRAL, MANUAL DC DISCONNECTING MEANS. THE INVERTER IS EQUIPPED WITH UL1741 APPROVED GROUND FAULT DETECTION DEVICE THAT MEETS NFPA 70 ARTICLE 250.122 REQUIREMENTS FOR EQUIPMENT GROUNDING. | C | LV |
| 11 | 14 | DC COMBINER PANEL | TBD | TBD | 2,000V, 275A, 16 STRINGS MIN (1) 25A FUSE PER STRING | NEMA 3R. OUTDOOR RATED. | C | LV |
| 12 | 3,560 | SOLAR MODULE | HANWHA QCELLS | Q.PEAK DUO XL-G11.3/BFG | 580W Imp 12.92A Vmp 44.88V Isc: 13.55 Voc: 53.56V | MODULES ARE UL1703 LISTED, RATED TO 1500 VDC. EACH MODULE INCLUDES OUTDOOR RATED QUICK CONNECTS FOR MODULE INTERCONNECTION. DO NOT REMOVE THE QUICK CONNECTS, OTHERWISE THE MODULE WARRANTY AND UL LISTING MAY BE INVALIDATED. QUICK CONNECTS SHALL COMPLY WITH NFPA 70 ARTICLE 690.33(C). | C | LV |
| 13 | 1 | MINI POWER CENTER | TBD | TBD | PRI MAIN BREAKER: 480V TRANSFORMER: 480V / 120/240V 1PH SEC MAIN BREAKER: 120/240V 1PH | NEMA 3R ENCLOSURE . ENCAPSULATED SINGLE PHASE DRY-TYPE TRANSFORMER AND SECONDARY DISTRIBUTION LOAD CENTER. | C | LV |

## WIRE AND CONDUIT SCHEDULE

| KEY | CONDUCTORS/ WIRE SCHEDULE | LENGTH (FT) | CABLE RATED AMPACITY (A) | DESIGN AMPACITY (A) | MIN CONDUCTOR INSULATION | CONDUIT SIZE (PER SET) | 90°C RATED CABLE | NOTES |
|---|---|---|---|---|---|---|---|---|
| A | (3) #2 AWG (6/1) ASCR AL (SPARROW) + #8 AWG CU GROUND | 90 | 184 | 67.4 | - | IN FREE AIR | - | |
| B | (3) #4 AWG AL 133% MV-105 EPR WITH FULL CONCENTRIC NEUTRAL | 40 | 98 | 67.4 | 15KV | (1) 5" | - | PROVIDE CONDUIT SWEEPS AT CABLE PENETRATIONS FROM BELOW TO ABOVE GRADE. |
| C | CLOSE-COUPLE CONNECTION. BRAIDED COPPER CONNECTIONS SIZED BY EQUIPMENT SUPPLIER | TBD | - | - | 15KV | IN CONNECTION ENCLOSURE | - | |
| D | (3) 3/0 AWG AL THWN-2 + #4 AL AWG GROUND | TBD | 175 | 165.4 | 600V | (1) 2" | - | |
| E | (2) 350 KCMIL AL PV-WIRE + #4 AWG CU GROUND | TBD | 280 | 254.1 | 2000V | (1) 3" | X | PROVIDE CONDUIT SWEEPS AT ALL CABLE PENETRATIONS FROM BELOW TO ABOVE GRADE. ONLY ONE (1) GROUND CABLE REQUIRED IN TRENCH. MAX BUNDLE SIZE: 3. |
| F | (2) #10 AWG CU PV WIRE | TBD | 40 | 21.17 | 2000V | (1) 3" | X | CABLE TO BE LISTED FOR USE WITH PHOTOVOLTAIC SYSTEMS. CONDUIT SIZE INDICATED IS FOR USE BELOW GRADE. NO CONDUIT REQUIRED FOR RACK MOUNTED SECTIONS OF CABLE. MAX BUNDLE SIZE: 40 CABLES. |
| G | (2) #10 AWG CU THWN + #10 AWG CU GROUND | TBD | 35 | 7.5 | 600V | (1) 1" | - | ALL BELOW GRADE CONDUIT LOCATED OUTSIDE THE EQUIPMENT PAD TO BE RIGID PVC AND A MINIMUM SIZE OF 1". SCH 80. |
| H | REFER TO GROUNDING DIAGRAM | TBD | - | - | - | - | - | VARIOUS GROUND CABLE TYPES AND SIZES |

1. LISTED PIN ADAPTERS OR COMPRESSION LUGS SHALL BE PERMITTED FOR USE WITH ALUMINUM CONDUCTORS. CONDUCTOR SHALL BE PREPARED AND TERMINATED PER MANUFACTURERS GUIDELINES.
2. ELECTRICAL CONTRACTOR SHALL IDENTIFY SOURCE WIRING WITH MARKING TAPE OR OTHER APPROVED METHOD. POSITIVE SHALL BE MARKED RED AND NEGATIVE MARKED BLACK. CONDUCTORS 4 AWG AND LARGER SHALL BE IDENTIFIED AT ALL TERMINATIONS. PROVIDE COMPRESSION LUGS AT BUS TERMINATIONS.
3. ALL PARALLEL CABLE SETS TO BE INSTALLED WITH GROUND CONDUCTORS IN EACH CONDUIT.
4. ALL CABLING EXPOSED TO SUNLIGHT TO BE RATED AS UV RESISTANT.
5. UNLESS NOTED OTHERWISE, ALL UNDERGROUND CONDUIT TO BE PVC SCHEDULE 40; ABOVE GROUND CONDUITS TO BE PVC SCHEDULE 80.
6. CABLES NOT SIZED FOR VOLTAGE DROP.

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**SIEMENS SMART INFRASTRUCTURE**
6 BRITISH AMERICAN BLVD
LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY:
REVIEWED BY:
ISSUED FOR: PERMIT ONLY
DATE: 07/19/2022
DRAWING NAME:

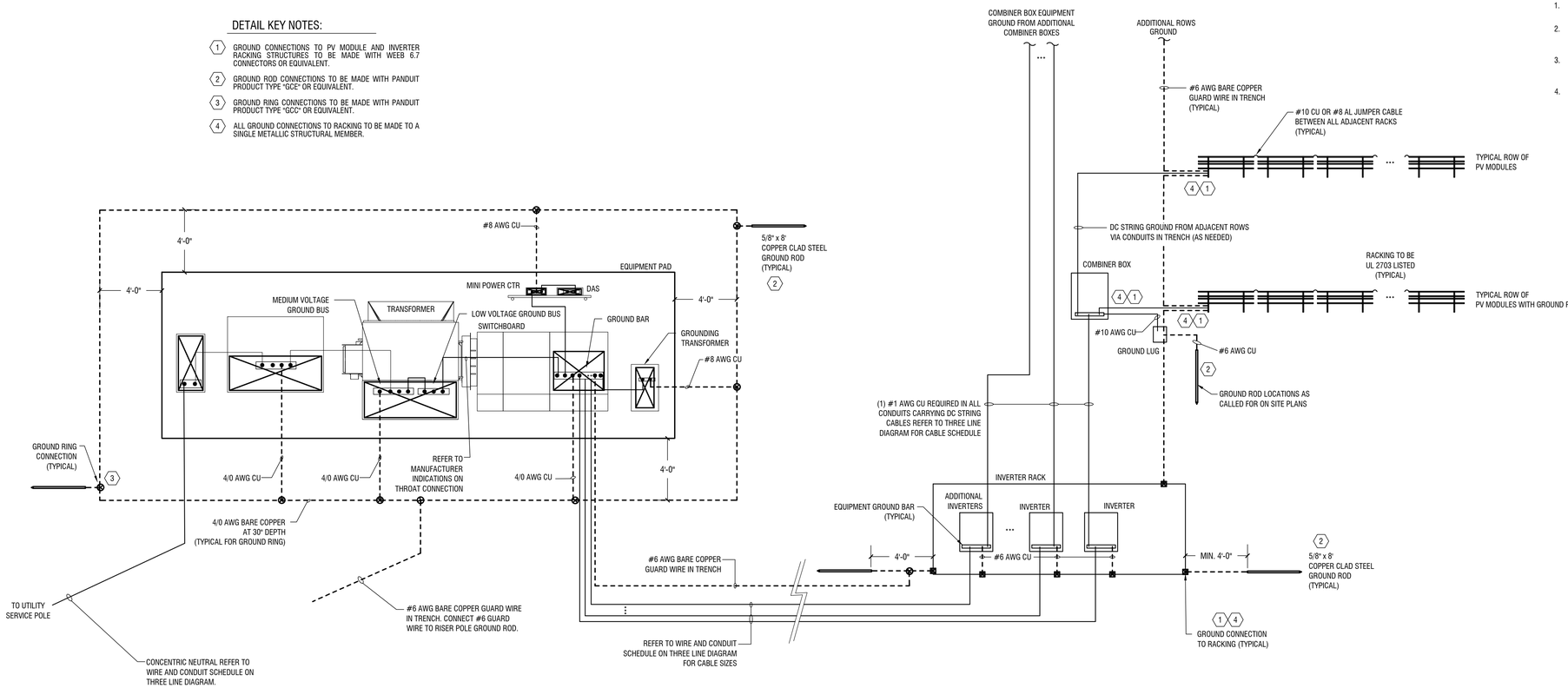
**ONE LINE DIAGRAM**

DRAWING NUMBER:

# E702

## DETAIL KEY NOTES:

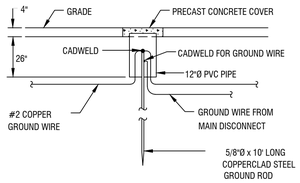
1. GROUND CONNECTIONS TO PV MODULE AND INVERTER RACKING STRUCTURES TO BE MADE WITH WEEB 6.7 CONNECTORS OR EQUIVALENT.
2. GROUND ROD CONNECTIONS TO BE MADE WITH PANDUIT PRODUCT TYPE "GCE" OR EQUIVALENT.
3. GROUND RING CONNECTIONS TO BE MADE WITH PANDUIT PRODUCT TYPE "GCC" OR EQUIVALENT.
4. ALL GROUND CONNECTIONS TO RACKING TO BE MADE TO A SINGLE METALLIC STRUCTURAL MEMBER.



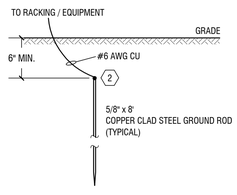

## 1 PV SYSTEM GROUNDING DIAGRAM
E-703 NOT TO SCALE

## DRAWING GENERAL NOTES:

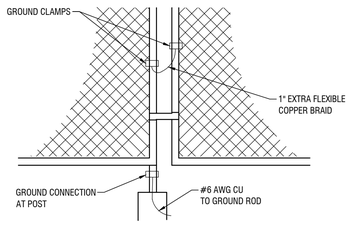
1. ALL CAD WELDS TO BE DIRECT BURIAL RATED AND IRREVERSIBLE IN NATURE.
2. ALL PARALLEL CABLE SETS TO BE INSTALLED WITH GROUND CONDUCTORS IN EACH CONDUIT/CABLE HANGER SPAN.
3. ALL GROUNDING SYSTEM MATERIALS AND WORKMANSHIP TO COMPLY WITH NFPA 70 ARTICLES 250 AND 690, PART IV.
4. HYDRAULICALLY COMPRESSED FITTINGS ACCEPTABLE ALTERNATIVE TO CADWELDS. PROPERLY SIZED FITTINGS AND MATCHING DIES TO BE USED.



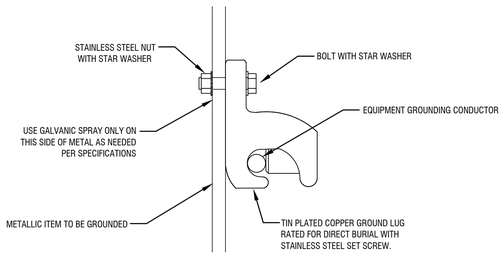

## 6 GROUNDING ELECTRODE TEST WELL DETAIL
E-703 NOT TO SCALE



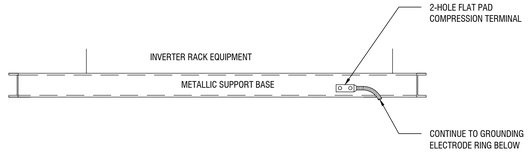

## 2 GROUNDING LUG DETAILS
E-703 NOT TO SCALE




## 3 TYPICAL GATE GROUNDING DETAIL
E-703 NOT TO SCALE




## 4 GROUNDING LUG DETAILS
E-703 NOT TO SCALE




## 5 INVERTER RACK GROUNDING DETAIL
E-703 NOT TO SCALE

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LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
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PROJECT NUMBER: 2222708
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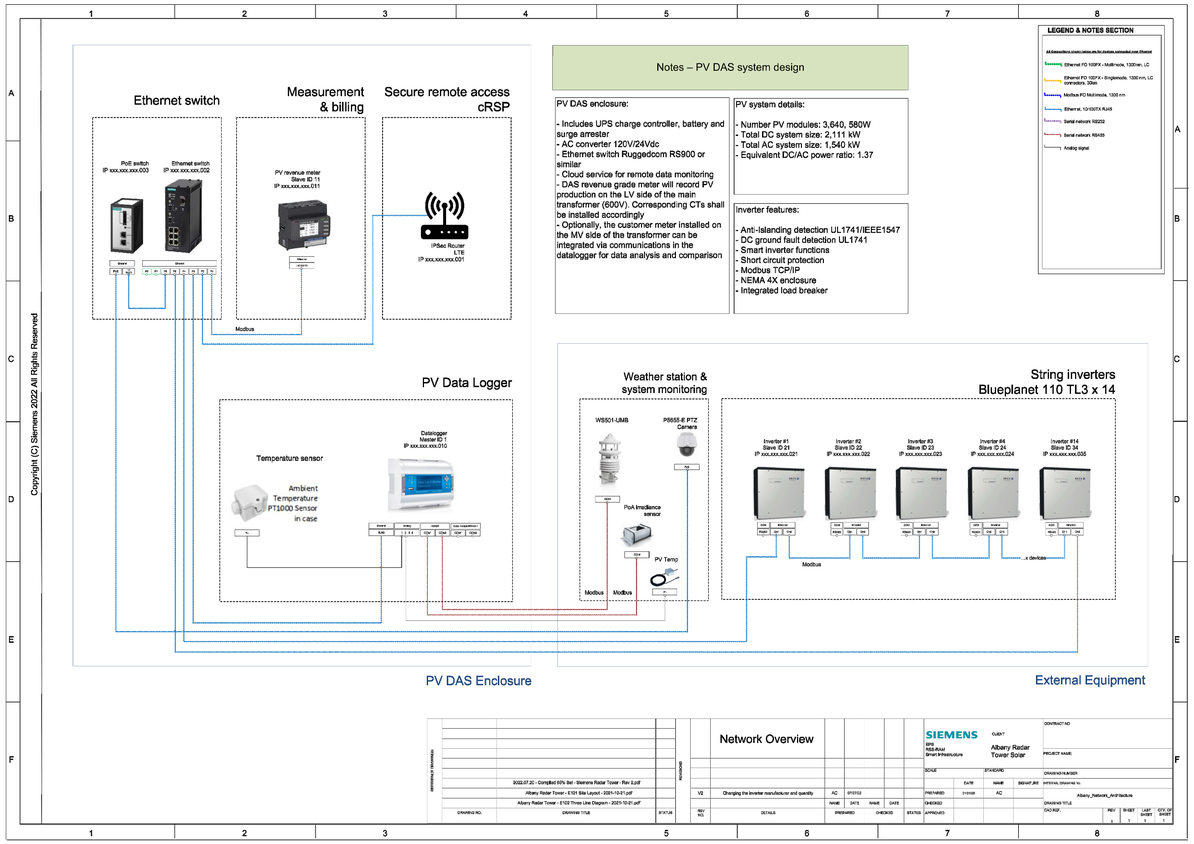
REVIEWED BY:
ISSUED FOR: PERMIT ONLY
DATE: 07/19/2022
DRAWING NAME:

**GROUNDING DIAGRAM & DETAILS**

DRAWING NUMBER:

# E703




## Notes – PV DAS system design

PV DAS enclosure:

- Includes UPS charge controller, battery and surge arrester
- AC converter 120V/24Vdc
- Ethernet switch Ruggedcom RS900 or similar
- Cloud service for remote data monitoring
- DAS revenue grade meter will record PV production on the LV side of the main transformer (600V). Corresponding CTs shall be installed accordingly
- Optionally, the customer meter installed on the MV side of the transformer can be integrated via communications in the datalogger for data analysis and comparison

PV system details:

- Number PV modules: 3,640, 580W
- Total DC system size: 2,111 kW
- Total AC system size: 1,540 kW
- Equivalent DC/AC power ratio: 1.37

inverter features:

- Anti-Islanding detection UL1741/IEEE1547
- DC ground fault detection UL1741
- Smart inverter functions
- Short circuit protection
- Modbus TCP/IP
- NEMA 4X enclosure
- Integrated load breaker

**LEGEND & NOTES SECTION**

All Connections shown below are for devices connected over Ethernet

- Ethernet FO 100FX - Multimode, 1300nm, LC
- Ethernet FO 100FX - Singlemode, 1300 nm, LC connectors, 30km
- Modbus FO Multimode, 1300 nm
- Ethernet, 10/100TX RJ45
- Serial network RS232
- Serial network RS485
- Analog signal

Network Overview

SIEMENS — 6 BRITISH AMERICAN BLVD, LATHAM, NY 12110 — Albany Radar Tower Solar

| REV | DESCRIPTION | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|---|
| V2 | Changing the inverter manufacturer and quantity | AC | SFD/TDJ | | |

DRAWING NO. E704 — DRAWING TITLE: Albany_Network_And Radome — STATUS: PERMIT ONLY



1 DATA ACQUISITION SYSTEM DIAGRAM
E-704 NOT TO SCALE

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LATHAM, NY 12110

SIEMENS

**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: BJB
REVIEWED BY: SJB
ISSUED FOR: PERMIT ONLY
DATE: 08/05/2022
DRAWING NAME:

**DAS DIAGRAM**

DRAWING NUMBER:

# E704

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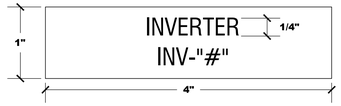
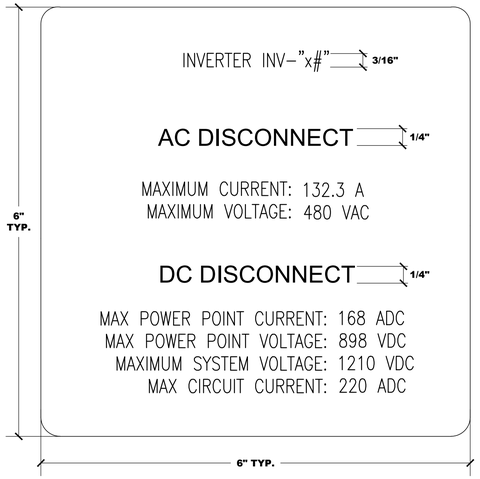
LOCATION: STRING INVERTERS
FROM 1 TO 14

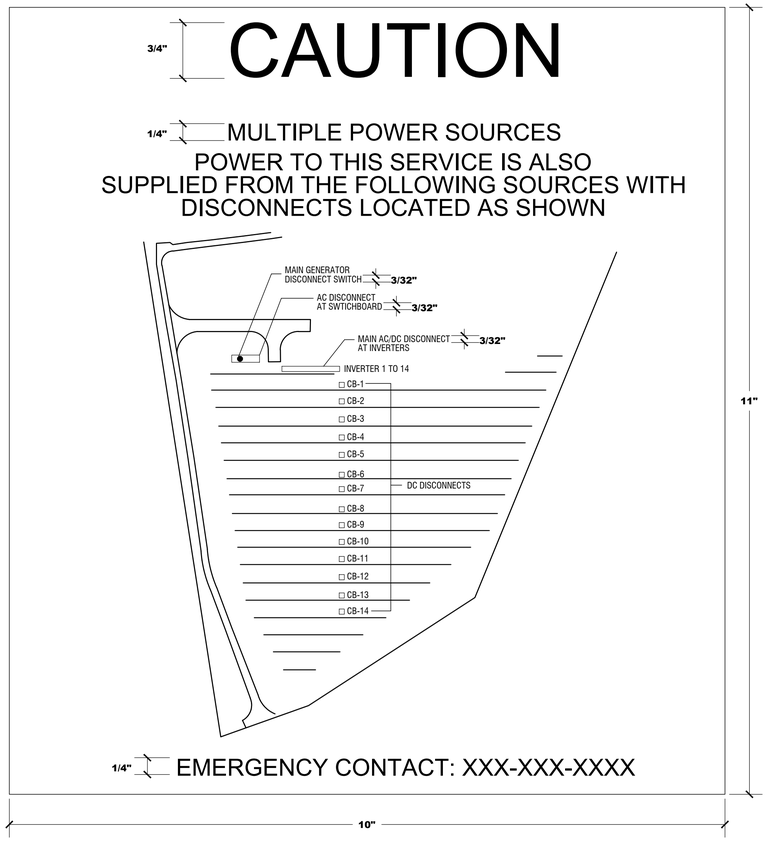


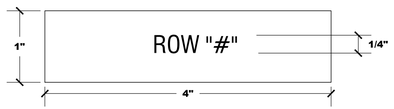

NEC: 690.54
NEC: 690.53


NEC: 690.13 (B)
NEC: 690.35 (F)
NEC: 690.17 (E)

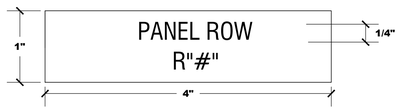
LOCATION: SWITCHBOARD & PAD-MOUNTED DISCONNECT SWITCH



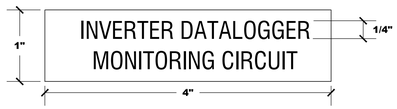

LOCATION: END OF ROW POST
REFER TO SITE LAYOUT




LOCATION: CONDUIT




LOCATION: INVERTER DATALOGGER




LOCATION: GROUNDING
TRANSFORMER


GENERAL NOTES

1. LABELS SHOWN ARE TO BE APPLIED AS A MINIMUM REQUIREMENT. NAMETAGS ARE RECOMMENDED FOR ALL SYSTEM EQUIPMENT.
2. LABELS NEED NOT BE APPLIED FOR CASES WHERE EQUIPMENT IS PROVIDED WITH SIMILAR LABELS AND MARKINGS.
3. TEXT LABELS AND 10"x10" PLACARD TO BE ETCHED WITH WHITE GRAPHICS ONTO 1/16" RED PLASTIC PLACARDS. ATTACH LABEL TO APPROPRIATE COMPONENT ENCLOSURES IN CONSPICUOUS LOCATION USING TWO PART EPOXY.
4. ALL SIGNAGE AND LABELS WILL BE IN COMPLIANCE WITH NFPA 70 - 110.20, ANSI Z535.4 AND UL 969.

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**ALBANY RADAR TOWER SOLAR**
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ALBANY, NY 12205

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PROJECT NUMBER: 2222708
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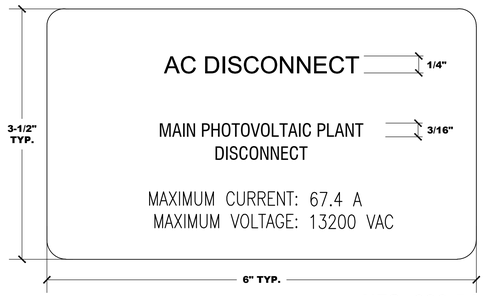
REVIEWED BY:
ISSUED FOR: PERMIT ONLY
DATE: 07/19/2022
DRAWING NAME:

**SYSTEM LABELS**

DRAWING NUMBER:

# E801

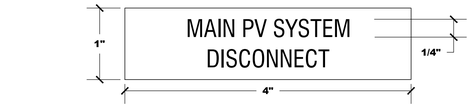
LOCATION: MV TRANSFORMER

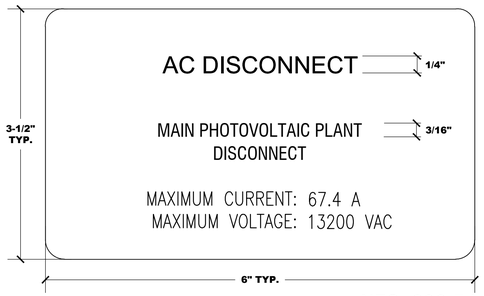




NEC: 690.54


NEC: 690.13 (B)
NEC: 690.35 (F)
NEC: 690.17 (E)

LOCATION: GENERATOR PAD
MOUNTED DISCONNECT

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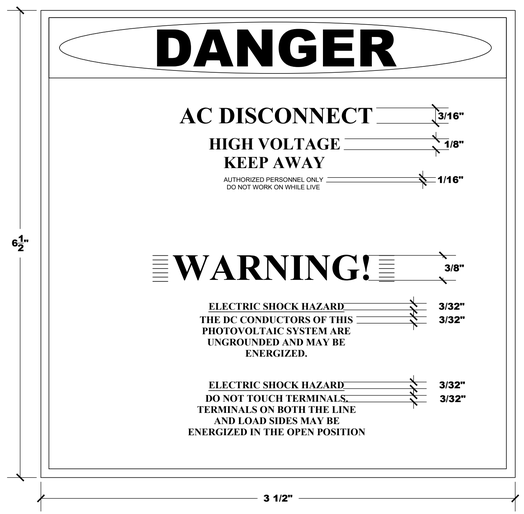


NEC: 690.13 (B)
NEC: 690.35 (F)
NEC: 690.17 (E)

LOCATION: CUSTOMER METER



NEC: 690.35 (F)

GENERAL NOTES

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2. LABELS NEED NOT BE APPLIED FOR CASES WHERE EQUIPMENT IS PROVIDED WITH SIMILAR LABELS AND MARKINGS.
3. TEXT LABELS AND 10"x10" PLACARD TO BE ETCHED WITH WHITE GRAPHICS ONTO 1/16" RED PLASTIC PLACARDS. ATTACH LABEL TO APPROPRIATE COMPONENT ENCLOSURES IN CONSPICUOUS LOCATION USING TWO PART EPOXY.
4. ALL SIGNAGE AND LABELS WILL BE IN COMPLIANCE WITH NFPA 70 - 110.20, ANSI Z535.4 AND UL 969.

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897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
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| Revisions | | |

PROJECT NUMBER: 2222708

DRAWN BY:

REVIEWED BY:

ISSUED FOR: PERMIT ONLY

DATE: 07/19/2022

DRAWING NAME:

**SYSTEM LABELS**

DRAWING NUMBER:

**E802**

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## GENERAL NOTES:

1. THE DESIGN AND CONSTRUCTION OF THIS PROJECT IS GOVERNED BY THE RELATED PROVISIONS OF THE 2020 NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE (NYSBC) AND STATE ENERGY CONSERVATION CONSTRUCTION CODE (ENERGY CODE) AND STANDARDS INCLUDING ASCE STANDARD (ASCE/SEI 7–16) MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.

2. REFER TO ELECTRICAL AND CIVIL DRAWINGS FOR ADDITIONAL INFORMATION INCLUDING BUT NOT LIMITED TO: DIMENSIONS, SLOPES, DRAINS, ELECTRICAL UNIT LOCATIONS, AND OTHER NON–STRUCTURAL ITEMS.

3. CONTRACTOR TO BE RESPONSIBLE FOR COORDINATING DETAILS AND ACCURACY OF WORK WITH OTHER TRADES; FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS; FOR SELECTING FABRICATION PROCESSES; FOR TECHNIQUES, MEANS AND METHODS OF ASSEMBLY; AND FOR PERFORMING WORK IN A SAFE AND SECURE MANNER.

4. CONTRACTOR TO BE RESPONSIBLE FOR STRENGTH AND STABILITY OF STRUCTURE DURING CONSTRUCTION AND SHALL PROVIDE TEMPORARY SHORING, BRACING AND OTHER ELEMENTS REQUIRED TO MAINTAIN STABILITY UNTIL STRUCTURE IS COMPLETE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE FAMILIAR WITH THE WORK REQUIRED IN CONSTRUCTION DOCUMENTS AND REQUIREMENTS FOR EXECUTING IT PROPERLY.

5. LOADS ON STRUCTURES DURING CONSTRUCTION SHALL NOT EXCEED THE DESIGN LOADS AS NOTED IN "DESIGN CRITERIA" OR THE CAPACITY OF PARTIALLY COMPLETED CONSTRUCTION AS DETERMINED BY CONTRACTOR'S SPECIALTY STRUCTURAL ENGINEER (SSE). CONTRACTOR SHALL BE RESPONSIBLE FOR RETAINING THE SERVICES OF THE SSE TO SUPPORT CONSTRUCTION EFFORTS INCLUDING BUT NOT LIMITED TO TEMPORARY SHORING, RIGGING SUPPORT OR MEANS AND METHODS OF CONSTRUCTION.

6. MEANS AND METHODS OF CONSTRUCTION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR INCLUDING BUT NOT LIMITED TO TEMPORARY BRACING/ SHORING, RIGGING, TEMPORARY WORK PLATFORMS, DE–WATERING, CREATING AND MAINTAINING STAGING AND TEMPORARY WORK AREAS ETC. CONTRACTOR SHALL SUBMIT PLANS FOR ALL TEMPORARY EARTH WORK STABILITY INCLUDING BUT NOT LIMITED TO DE–WATERING AND SLOPE/ VERTICAL CUT STABILITY.

7. CONTRACTOR TO HAVE SOLE RESPONSIBILITY TO NOTIFY ENGINEER OF ANY BUILDING SYSTEM, MECHANICAL, ELECTRICAL, OR PLUMBING SYSTEM LOAD IMPOSED ONTO THE STRUCTURE THAT DIFFERS FROM, OR THAT IS NOT DOCUMENTED ON THE ORIGINAL CONTRACT DOCUMENTS (STRUCTURAL OR ELECTRICAL DRAWINGS).

8. IN THE CASE OF DISCREPANCIES BETWEEN GENERAL NOTES, SPECIFICATIONS, PLAN/DETAILS, REFERENCE STANDARDS, OR BETWEEN DISCIPLINES THE ENGINEER SHALL DETERMINE WHICH SHALL GOVERN. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

9. CONTRACTOR TO VERIFY ALL DIMENSIONS AND CONDITIONS AT THE SITE. CONFLICTS BETWEEN DRAWINGS AND ACTUAL SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH WORK.

10. CONTRACTOR SHALL DETERMINE THE LOCATION OF ADJACENT UNDERGROUND UTILITIES PRIOR TO EARTHWORK, FOUNDATIONS, SHORING, AND EXCAVATION. UTILITY INFORMATION SHOWN ON DRAWINGS AND DETAILS IS APPROXIMATE AND NOT NECESSARILY COMPLETE.

11. DETAILS ENTITLED OR NOTED AS "TYPICAL" APPLY NOT ONLY WHERE SPECIFICALLY INDICATED OR REFERENCED, BUT ALSO IN ALL OTHER CASES WHERE THE NATURE OF THE CONSTRUCTION REQUIRES THEIR USE. DETERMINE APPLICABILITY OF TYPICAL DETAILS FROM DESCRIPTIVE TITLES OR FROM THE SIMILARITY OF A CONSTRUCTION CONDITION TO ANOTHER CONDITION WHERE THE DETAIL IS SPECIFICALLY INDICATED OR REFERENCED.

12. USE WATER MIST, TEMPORARY ENCLOSURES AND OTHER SUITABLE METHODS TO LIMIT THE SPREAD OF DUST AND DIRT. COMPLY WITH GOVERNING ENVIRONMENTAL PROTECTION REGULATIONS. DO NOT USE WATER WHEN IT MAY DAMAGE EXISTING CONSTRUCTION; DO NOT CAUSE ICING, FLOODING, OR TRANSPORTATION OF POLLUTANTS.

13. ALL CONSTRUCTION WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE SAFETY CODES. APPLICABLE SAFETY CODES MEAN THE LATEST EDITION INCLUDING ANY AND ALL AMENDMENTS, REVISIONS, AND ADDITIONS THERE TO, TO THE FEDERAL DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA), AND APPLICABLE LOCAL SAFETY AND HEALTH REGULATIONS AND BUILDING CODES FOR CONSTRUCTION IN THE STATE OF MARYLAND IN ADDITION TO ANY AND ALL "HOUSE RULES" AS REQUIRED BY OWNER.

14. TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL SUBMIT A PROPOSED CONSTRUCTION SEQUENCE TO THE ENGINEER OR AS OTHERWISE DIRECTED IN THE PROJECT SPECIFICATIONS FOR APPROVAL.

15. EXPLORATORY EXCAVATIONS SHALL BE PERFORMED AS NEEDED BY THE CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO WORK IN CONGESTED UTILITY AREAS. ALL TEST PIT LOGS SHALL BE SUBMITTED TO THE ENGINEER WITHIN FOURTEEN (14) DAYS FOLLOWING NOTICE TO PROCEED UNLESS OTHERWISE DIRECTED BY THE SPECIFICATIONS OR ENGINEER.

16. ALL HARDWARE TO BE STAINLESS STEEL.

## SOILS AND FOUNDATIONS NOTES:

1. CONFORM TO BUILDING CODE CHAPTER 18 "SOILS AND FOUNDATIONS".

2. FOUNDATION DESIGN IS BASED UPON CONSERVATIVE PRESUMPTIVE VALUES PER BUILDING CODE TABLE 1806.2. ONLINE USDA WEB SOIL SURVEY INDICATES SILT LOAM AT THE PROJECT SITE, WHICH TYPICALLY CORRESPONDS TO A VERTICAL BEARING CAPACITY OF 1500 PSF AND LATERAL BEARING CAPACITY OF 100 PSF/FT. WE HAVE CONSERVATIVELY DESIGNED THE FOUNDATIONS FOR VERTICAL BEARING CAPACITY OF 1500 PSF AND LATERAL BEARING CAPACITY OF 100 PSF/FT. A COMPETENT PERSON SHALL OBSERVE THE BEARING STRATA IN FIELD TO CONFIRM AT LEAST A 1500 PSF VERTICAL BEARING CAPACITY AND 100 PSF/FT OF LATERAL BEARING CAPACITY IS APPROPRIATE.

3. FOUNDATION DRAWINGS SHALL BE USED IN CONJUNCTION WITH CIVIL, MECHANICAL, ELECTRICAL, PLUMBING DRAWINGS AND CIVIL / SITE DRAWINGS. VERIFY THE REQUIREMENTS OF OTHER TRADES AS TO SLEEVES, HOLES, INSERTS, ETC. TO BE INSTALLED IN THE CONCRETE WORK. CONTACT THE STRUCTURAL ENGINEER OF RECORD IF SLEEVES NOT SHOWN ON THE DRAWINGS PENETRATE ANY DRILLED PILE.

4. REFER TO THE DESIGN DOCUMENTS AND SPECIFICATIONS FOR FILL MATERIALS AND REQUIREMENTS. ON SITE SOIL SHALL NOT BE USED AS STRUCTURAL OR GRANULAR FILL.

5. CONTRACTOR SHALL PREVENT SURFACE AND GROUND WATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE AND SURROUNDING AREA. DO NOT PLACE FOUNDATIONS IN WATER OR ON FROZEN GROUND.

## CONCRETE REINFORCEMENT NOTES:

1. CONFORM TO THE FOLLOWING REFERENCE STANDARDS:
   1.1. ACI 301 "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE", SECTION 3 "REINFORCEMENT SUPPORTS"
   1.2. ACI SP–66 "ACI DETAILING MANUAL" INCLUDING ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
   1.3. CRSI MSP–2 "MANUAL OF STANDARD PRACTICE"
   1.4. ANSI/AWS D1.4 "STRUCTURAL WELDING CODE – REINFORCING STEEL"
   1.5. IBC 2012 CHAPTER 19 – CONCRETE
   1.6. ACI 318–14

2. CONFORM TO ACI 301 SECTION 3.1.1 "SUBMITTALS, DATA AND DRAWINGS". SUBMIT PLACING DRAWINGS SHOWING FABRICATION DIMENSIONS AND LOCATIONS FOR PLACEMENT OF REINFORCEMENT AND REINFORCEMENT SUPPORTS.

3. MATERIALS:
   A. REINFORCING BARS.....ASTM A 615, GRADE 60, DEFORMED BARS
   B. BAR SUPPORTS.....CRSI SP–2, CHAPTER 3 – BAR SUPPORTS
   C. TIE WIRE.....4/0 GAGE OR HEAVIER, BLACK ANNEALED
   D. WELDED WIRE REINFORCEMENT.....ASTM A185, SHEET TYPE

4. CONFORM TO ACI 301, SECTION 3.2.2 "FABRICATION" AND ACI SP–66 "ACI DETAILING MANUAL".

5. BARS SHALL NOT BE WELDED UNLESS AUTHORIZED. WHEN AUTHORIZED, CONFORM TO ACI 301, SECTION 3.2.2.2 "WELDING" AND PROVIDE ASTM A706, GRADE 60 REINFORCEMENT.

6. WELDED WIRE REINFORCEMENT SHEET LAPS SHALL BE TIED AND LAPPED ONE FULL MESH SPACING PLUS 2".

7. CONFORM TO ACI 301, SECTION 3.3.2 "PLACEMENT". PLACING TOLERANCES SHALL CONFORM TO SECTION 3.3.2.1 "TOLERANCES".

8. CONFORM TO THE FOLLOWING MINIMUM COVER REQUIREMENTS FROM ACI 301, TABLE 3.3.2.3:
   A. CONCRETE CAST AGAINST EARTH.....3"
   B. CONCRETE EXPOSED TO EARTH OR WEATHER.....2"
   C. SLABS, WALLS AND JOINTS NOT EXPOSED TO WEATHER OR EARTH.....¾"
   D. BEAMS, COLUMNS NOT EXPOSED TO WEATHER OR EARTH.....1½"

9. CONFORM TO ACI 301 SECTION 3.3.2.8 "FIELD BENDING OR STRAIGHTENING". BAR SIZES 3 THROUGH 5 MAY BE FIELD BENT COLD THE FIRST TIME. OTHER BARS REQUIRE PREHEATING. DO NOT TWIST BARS. DO NOT BEND BARS TWICE.

## CAST-IN-PLACE CONCRETE:

1. CONFORM TO THE FOLLOWING REFERENCE STANDARDS:
   1.1. ACI 301 "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE"
   1.2. ACI 302 "GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION"
   1.3. IBC 2018 CHAPTER 19 – CONCRETE
   1.4. ACI 318–14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"

2. CONTRACTOR TO KEEP A COPY OF ACI FIELD REFERENCE MANUAL, SP–15, "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301) WITH SELECTED ACI AND ASTM REFERENCES".

3. CONFORM TO ACI 301 SECTION 4 "CONCRETE MIXTURES".

4. CONFORM TO ACI 301 SECTION 4.2.1 "MATERIALS" FOR REQUIREMENTS FOR CEMENTITIOUS MATERIALS, AGGREGATES, MIXING WATER AND ADMIXTURES.

5. PROVIDE ALL SUBMITTALS REQUIRED BY ACI 301 SECTION 4.1.2. SUBMIT MIX DESIGNS FOR EACH MIX IN THE TABLE BELOW.

| MEMBER TYPE/LOCATION | MIX DESIGN REQUIREMENTS: STRENGTH (PSI) | TEST AGE (DAYS) | MAXIMUM AGGREGATE | MAXIMUM W/C RATIO | AIR CONTENT |
|---|---|---|---|---|---|
| EXTERIOR SLABS | 4500 | 28 | 1" | 0.4 | 6%+/-1% |

SLUMP NOTES
1. 8" MAXIMUM FOR FLOWABLE CONCRETE. CONCRETE CONTAINING HRWR ADMIXTURE (SUPERPLASTICIZER): 3" MAXIMUM BEFORE ADDITION OF HRWR. PLASTICIZER SHALL BE ADDED AND MIXED ON SITE IF TRAVEL TIME IS GREATER THAN 40 MINUTES.
2. WHERE FIELD CONDITIONS REQUIRE SLUMP TO EXCEED THAT SPECIFIED ABOVE, INCREASED SLUMP SHALL BE OBTAINED BY A SUPERPLASTICIZER ADDED ON SITE IN QUANTITIES SPECIFICALLY NOTED IN THE APPROVED MIX DESIGN.
3. NO WATER SHALL BE ADDED ON SITE EXCEPT IN QUANTITIES SPECIFICALLY NOTED IN THE APPROVED MIX DESIGN.
4. SEE SPECIFICATIONS, FOR SLUMP REQUIREMENTS.

6. MIX DESIGN NOTES:
   6.1. MIX DESIGN SUBMITTED SHALL HAVE DOCUMENTATION OF HISTORICAL BREAK STRENGTHS IN ACCORDANCE WITH ACI 318–11 SECTION 5.3.
   6.2. WATER–CEMENTITIOUS MATERIAL RATIOS SHALL BE BASED ON TOTAL WEIGHT OF CEMENTITIOUS MATERIALS. RATIOS NOT SHOWN IN TABLE ABOVE ARE CONTROLLED BY STRENGTH REQUIREMENTS.
   6.3. CEMENTITIOUS CONTENT:
      6.3.1. THE USE OF FLY ASH, OTHER POZZOLANS, SILICA FUME, OR SLAG SHALL CONFORM TO ACI 301 SECTION 4.2.2.B.b. MAXIMUM AMOUNT OF FLY ASH SHALL BE 20% OF TOTAL CEMENTITIOUS CONTENT UNLESS OTHERWISE REVIEWED AND APPROVED BY ENGINEER.
      6.3.2. FOR CONCRETE USED IN ELEVATED FLOORS, PORTLAND CEMENT CONTENT SHALL CONFORM TO ACI 301 SECTION 4.2.2.1. ACCEPTANCE OF LOWER CEMENT CONTENT IS CONTINGENT ON PROVIDING SUPPORTING DATA TO THE ENGINEER FOR REVIEW AND ACCEPTANCE.
   6.4. AIR CONTENT: CONFORM TO ACI 301 SECTION 4.2.2.4. CONCRETE SURFACES IN CONTACT WITH SOIL REQUIRE ENTRAINED AIR. HORIZONTAL AND VERTICAL EXTERIOR SURFACES REQUIRE "SEVERE EXPOSURE". TOLERANCE IS ±1% AIR CONTENT SHALL BE MEASURED AT POINT OF PLACEMENT.
   6.5. SLUMP: CONFORM TO ACI 301 SECTION 4.2.2.2. SLUMP SHALL BE DETERMINED AT POINT OF PLACEMENT.
   6.6. NO CHLORIDES SHALL BE USED IN ANY CONCRETE MIX DESIGN. ALL AGGREGATES, CEMENT, WATER AND ADDITIVES SHALL BE CHLORIDE FREE.

7. CONCRETE DENSITY SHALL BE NORMAL WEIGHT UNLESS SPECIFICALLY OTHERWISE NOTED.

8. CONCRETE REINFORCING STEEL SHALL BE CONTINUOUS UNLESS OTHERWISE INDICATED. CONTINUOUS REINFORCING STEEL SHALL BE LAPPED IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 318 AND THE CONCRETE REINFORCEMENT SCHEDULE THIS SHEET.

9. ALL EMBEDDED ITEMS SHALL BE PROPERLY PLACED, ACCURATELY POSITIONED, AND MAINTAINED SECURELY IN PLACE PRIOR TO AND DURING CONCRETE PLACEMENT.

10. NO CONCRETE SHALL BE PLACED UNTIL THE CONTRACTING OFFICER HAS INSPECTED ALL EMBEDDED WORK, INCLUDING REINFORCEMENT.

11. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED ¾" OR AS INDICATED.

12. ALUMINUM SHALL NOT BE PLACED IN DIRECT CONTACT WITH CONCRETE UNLESS EFFECTIVELY COATED OR COVERED TO PREVENT ALUMINUM–CONCRETE REACTION AND ELECTROLYTIC ACTION BETWEEN ALUMINUM AND STEEL.

13. CONFORM TO ACI 301 SECTION 2 "FORMWORK AND FORM ACCESSORIES". REMOVAL OF FORMS SHALL CONFORM TO SECTION 2.3.2 EXCEPT STRENGTH INDICATED IN SECTION 2.3.2.5 SHALL BE 0.75 f'c.

14. MEASURING, MIXING AND DELIVERY SHALL CONFORM TO ACI 301 SECTION 4.3.

15. HANDLING, PLACING, CONSTRUCTING AND CURING SHALL CONFORM TO ACI 301 SECTION 5.

16. PROVIDE CURING COMPOUNDS FOR CONCRETE AS FOLLOWS:
   16.1. SPRAY EVAPORATIVE RETARDANTS AS FINISHING AGENT AND TO CONTROL PLASTIC SHRINKAGE.
   16.2. APPLY SPECIFIED CURING COMPOUND TO CONCRETE SLABS AS SOON AS FINAL FINISHING OPERATIONS ARE COMPLETE (WITHIN 2 HOURS AND AFTER SURFACE WATER SHEEN HAS DISAPPEARED). APPLY UNIFORMLY IN CONTINUOUS OPERATION BY POWER SPRAY OR ROLLER IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS. RECOAT AREAS SUBJECTED TO HEAVY RAINFALL WITHIN 3 HOURS AFTER INITIAL APPLICATION. MAINTAIN CONTINUITY OF COATING AND REPAIR DAMAGE DURING CURING PERIOD.
   16.3. USE MEMBRANE CURING COMPOUNDS THAT WILL NOT AFFECT SURFACES TO BE COVERED WITH FINISH MATERIALS APPLIED DIRECTLY TO CONCRETE.
   16.4. APPLY CURING COMPOUND AT RATE EQUIVALENT TO RATE OF APPLICATION AT WHICH CURING COMPOUND WAS ORIGINALLY TESTED FOR CONFORMANCE TO REQUIREMENTS OF ASTM C 309.
   16.5. USE CURING COMPOUND COMPATIBLE WITH AND APPLIED UNDER DIRECTION OF SYSTEM MANUFACTURER OF PROTECTION SEALER.
   16.6. ALL CONCRETE MUST ACHIEVE 1000 PSI COMPRESSIVE STRENGTH BEFORE BEING SUBJECTED TO FREEZING AND THAWING CYCLES.
   16.7. APPLY 2 SEPARATE COATS WITH FIRST ALLOWED TO BECOME TACKY BEFORE APPLYING SECOND. DIRECTION OF SECOND APPLICATION SHALL BE AT RIGHT ANGLES TO DIRECTION OF FIRST.

17. CONSTRUCTION JOINTS SHALL CONFORM TO ACI 301 SECTIONS 2.2.2.5, 5.1.2.3a, 5.2.2.1 AND 5.3.2.6. CONSTRUCTION JOINTS SHALL BE LOCATED AND DETAILED AS ON CONSTRUCTION DRAWINGS. USE OF AN ACCEPTABLE ADHESIVE, SURFACE RETARDANT, PORTLAND CEMENT GROUT OR ROUGHENING THE SURFACE IS NOT REQUIRED UNLESS SPECIFICALLY NOTED ON THE DRAWINGS.

18. POSITION AND SECURE IN PLACE EXPANSION JOINT MATERIAL, ANCHORS AND OTHER STRUCTURAL AND NON–STRUCTURAL EMBEDDED ITEMS BEFORE PLACING CONCRETE. CONTRACTOR SHALL REFER TO MECHANICAL, ELECTRICAL, PLUMBING AND BUILDING SYSTEMS DRAWINGS AND COORDINATE OTHER EMBEDDED ITEMS.

19. USE 7,000 PSI NON–SHRINK GROUT UNDER COLUMN BASE PLATES, ETC.

20. POST–INSTALLED ANCHORS TO CONCRETE: ANCHOR LOCATION, TYPE, DIAMETER AND EMBEDMENT SHALL BE AS INDICATED ON DRAWINGS. ANCHORS SHALL BE INSTALLED AND INSPECTED IN STRICT ACCORDANCE WITH APPLICABLE ICC EVALUATION SERVICE REPORT (ESR). SPECIAL INSPECTION SHALL BE PER THE TESTS AND INSPECTIONS SECTION.

21. FINISH:
   21.1. FLOATED WITH BROOM FINISH.

22. OWNER SHALL RETAIN AN INDEPENDENT TESTING LAB TO OBTAIN SAMPLES AND CONDUCT TESTS IN ACCORDANCE WITH ACI 301 SECTION 1.6.4.2. ADDITIONAL SAMPLES MAY BE REQUIRED TO OBTAIN CONCRETE STRENGTHS AT ALTERNATE INTERVALS THAN SHOWN BELOW.
   22.1. CURE 5 CYLINDERS FOR 28–DAY TEST AGE. TEST 2 CYLINDERS AT 7 DAYS OR AT CONTRACTOR REQUEST, TEST 2 CYLINDERS AT 28 DAYS, AND HOLD 1 CYLINDER IN RESERVE FOR USE AS ENGINEER DIRECTS. AFTER 56 DAYS, UNLESS NOTIFIED BY ENGINEER TO THE CONTRARY, RESERVE CYLINDER MAY BE DISCARDED WITHOUT BEING TESTED FOR SPECIMENS MEETING 28–DAY STRENGTH REQUIREMENTS.
   22.2. ACCEPTABLE STRENGTH IS SATISFACTORY WHEN:
   A. THE AVERAGES OF ALL SETS OF 3 CONSECUTIVE TESTS EQUAL OR EXCEED THE SPECIFIED STRENGTH.
   B. NO INDIVIDUAL TEST FALLS BELOW THE SPECIFIED STRENGTH BY MORE THAN 500 PSI.
   C. A "TEST" FOR ACCEPTANCE IS THE AVERAGE STRENGTH OF 2 CYLINDERS TESTED AT THE SPECIFIED TEST AGE.

23. COLD WEATHER CONCRETE PLACEMENT
   23.1. PLACE CONCRETE IN ACCORDANCE WITH ACI 306.1 AND AS FOLLOWS. PROTECT CONCRETE WORK FROM PHYSICAL DAMAGE OR REDUCED STRENGTH THAT COULD BE CAUSED BY FROST FREEZING ACTIONS, OR LOW TEMPERATURES.
   23.2. WHEN AIR TEMPERATURE HAS FALLEN TO OR IS EXPECTED TO FALL BELOW 40°F UNIFORMLY HEAT WATER AND AGGREGATES BEFORE MIXING TO OBTAIN A CONCRETE MIX TEMPERATURE OF NOT LESS THAN 50°F AND NOT MORE THAN 80° AT POINT OF PLACEMENT.
   23.3. DO NOT USE FROZEN MATERIALS OR MATERIALS CONTAINING ICE OR SNOW. DO NOT PLACE CONCRETE ON FROZEN SUBGRADE OR ON SUBGRADE CONTAINING FROZEN MATERIALS. DO NOT USE CALCIUM CHLORIDE, SALT OR OTHER MATERIALS CONTAINING ANTIFREEZE AGENTS OR CHEMICAL ACCELERATORS, UNLESS OTHERWISE SPECIFIED AND APPROVED IN MIX DESIGNS.

24. HOT WEATHER CONCRETE PLACEMENT SHALL BE IN CONFORMANCE WITH ACI 305R LATEST EDITION "HOT WEATHER CONCRETING".
   24.1. CONCRETE SHALL NOT BE PLACED THAT HAS REACHED OR EXCEEDED 90°F.

25. CONCRETE SHALL BE PLACED WITHIN 90 MINUTES OF BATCH TIME UNLESS SPECIFICALLY APPROVED BY ENGINEER. ENGINEER OR INSPECTOR HAS AUTHORITY TO REJECT TRUCKS NOT MEETING PROJECT SPECIFICATIONS AND/ OR TEMPERATURE/ TIME REQUIREMENTS. CONTRACTOR TAKES FULL RESPONSIBILITY FOR ANY REJECTED TRUCKS.

## DESIGN CRITERIA:

ALL WORK SHALL COMPLY WITH THE RELATED PROVISIONS OF THE CALIFORNIA STATE BUILDING PERFORMANCE STANDARDS AND ITS REFERENCE STANDARDS.

DESIGN BASIS
GOVERNING CODE.....2020 NEW YORK STATE UNIFORM FIRE PREVENTION AND BUILDING CODE (NYSBC)

BUILDING INFORMATION
STRUCTURE USE.....EQUIPMENT PAD
RISK CATEGORY.....II

DESIGN CRITERIA
(ALL LOADS PROVIDED BELOW ARE SERVICE–LEVEL LOADS)

DEAD LOADS:
CONCRETE SLAB.....145 PSF
INVERTER.....172.4 LBS/EA.
COMBINER BOX.....60 LBS/EA.
PV ARRAY.....75.8 LBS/EA.

LIVE LOADS:
SLAB.....150 PSF

RAIN LOADS:
15–MINUTE RAINFALL INTENSITY.....5.49 IN./H
60–MINUTE RAINFALL INTENSITY.....2.44 IN./H

SNOW LOADS:
GROUND SNOW LOAD (Pg).....50 PSF
BUILDING EXPOSURE.....FULLY EXPOSED
EXPOSURE FACTOR (Ce).....0.9
THERMAL FACTOR (Ct).....1.2
IMPORTANCE FACTOR (Ie).....1.0
FLAT ROOF SNOW LOAD (Pf).....N/A
SLOPED ROOF SNOW LOAD (Ps).....N/A

WIND LOADS:
RISK CATEGORY.....II
ULTIMATE WIND SPEED (3–SECOND GUST, $V_{ULT}$).....110 MPH
NOMINAL WIND SPEED ($V_{ASD}$).....85 MPH
EXPOSURE CATEGORY.....B
INTERNAL PRESSURE COEFFICIENT (Cpi).....±0.00(OPEN)
DESIGN WIND LATERAL PRESSURE.....31.5 PSF
DESIGN WIND VERTICAL UPLIFT.....25 PSF

EARTHQUAKE DESIGN DATA
RISK CATEGORY.....II
IMPORTANCE FACTOR (Ip).....1.0
MAPPED SPECTRAL RESPONSE ACCELERATION FOR SHORT PERIODS ($S_s$).....0.205g
MAPPED SPECTRAL RESPONSE ACCELERATION FOR 1–SECOND PERIODS ($S_1$).....0.061g
SITE CLASS.....D (ASSUMED)
SPECTRAL RESPONSE ACCELERATION FOR SHORT PERIODS (Sds).....0.219g
SPECTRAL RESPONSE ACCELERATION FOR 1–SECOND PERIODS (Sd1).....0.098g
SEISMIC DESIGN CATEGORY.....B
BASIC SEISMIC FORCE RESISTING SYSTEM.....GENERATORS, BATTERIES, INVERTERS, MOTORS, TRANSFORMERS, AND OTHER ELECTRICAL COMPONENTS CONSTRUCTED OF HIGH DEFORMABILITY MATERIALS
COMPONENT AMPLIFICATION FACTOR ($a_p$).....1.0
COMPONENT RESPONSE MODIFICATION FACTOR ($R_p$).....2.5
OVERSTRENGTH FACTOR ($\Omega_0$).....2.0
DESIGN BASE SHEAR.....0.105W
VERTICAL SEISMIC FORCE.....0.044W
SEISMIC DESIGN OF NON–STRUCTURAL COMPONENTS.....PER ASC7–16 CHAPTER 13

## CONRETE REINFORCEMENT SCHEDULES:

| TENSION DEVELOPMENT LENGTH / CLASS A SPLICE LENGTH | | | | |
|---|---|---|---|---|
| | f'c IN PSI @28 DAYS | | | |
| BAR SIZE | 3,500 | 4,000 | 4,500 | 5,000 |
| #3 | 20" | 19" | 18" | 17" |
| #4 | 27" | 25" | 24" | 23" |
| #5 | 33" | 31" | 30" | 28" |
| #6 | 40" | 37" | 35" | 34" |

NOTES:
1. TABLE BASED ON ASTM A615 GRADE 60 STEEL
2. INCREASE LENGTH BY 30% WHEN MORE THAN 12" OF FRESH CONCRETE ARE PLACED BELOW HORIZONTAL REINFORCEMENT.
3. TABLE BASED ON NORMAL WEIGHT CONCRETE, UNCOATED OR ZINC–COATED REINFORCEMENT.
4. TABLE INDICATES MINIMUM LAP UNLESS NOTED OTHERWISE.
5. INCREASE LENGTH BY 30% WHEN CLASS B SPLICE IS REQUIRED.

## STRUCTURAL STEEL:

1. STRUCTURAL STEEL FOR THIS PROJECT IS DESIGNED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATIONS PER AISC – "MANUAL OF STEEL CONSTRUCTION" FIFTEENTH EDITION (2017).

2. CONFORM TO THE FOLLOWING REFERENCE STANDARDS:
   2.1. NEW YORK BUILDING CODE, CHAPTER 22 – STEEL.
   2.2. ANSI/AISC 360–16 – SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, HEREAFTER REFERRED TO AS AISC 360.

3. MATERIALS:
   3.1. PIPES.....ASTM A53, GALVANIZED (G90 MIN.)
   3.2. ANCHOR BOLTS.....ASTM F1554 GR. 36, GALVANIZED (G90 MIN.)
   3.3. BOLTS IN STEEL.....ASTM A325, GALVANIZED (G90 MIN.)
   3.4. FASTENERS.....GALVANIZED (G90 MIN.)
   3.5. HARDWARE.....GALVANIZED (G90 MIN.)

4. FABRICATION:
   4.1. CONFORM TO AISC 303, SECTION 8 AND AISC 360 SECTIONS M2 AND M5.

5. ERECTION:
   5.1. CONFORM TO AISC 303, SECTION 7 "ERECTION", SECTION 8 "QUALITY ASSURANCE" AND AISC 380 SECTION 4.
   5.2. ERECTOR SHALL MAINTAIN DETAILED FABRICATION AND ERECTION QUALITY CONTROL PROCEDURES THAT ENSURE WORK IS PERFORMED IN ACCORDANCE WITH AISC 360 SECTION M, AISC 303, AND CONTRACT DOCUMENTS.
   5.3. STEEL WORK SHALL BE CARRIED UP TRUE AND PLUMB WITHIN LIMITS DEFINED IN AISC 303 SECTION 7.11.

6. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND SAFETY PROTECTIONS REQUIRED BY AISC 360 SECTION M4.2 AND AISC 303 SECTION 7.10 AND 7.11.

7. PROTECTIVE AND COATING REQUIREMENTS:
   EXTERIOR STEEL: EXPOSED EXTERIOR STEEL SHALL BE HOT DIPPED GALVANIZE.

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SIEMENS

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| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: JC
REVIEWED BY: LC
ISSUED FOR: FOR PERMIT ONLY
DATE: 06/29/2022
DRAWING NAME: GENERAL NOTES
DRAWING NUMBER: S001

## SPECIAL INSPECTION NOTES:

1. THE OWNER SHALL ENGAGE THE SERVICES OF A QUALIFIED SPECIAL INSPECTOR FOR THE PROJECT, WHO WILL PROVIDE AND/OR COORDINATE INSPECTION AND TESTING REQUIREMENTS AS NECESSARY IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 17 OF THE BUILDING CODE.

2. IN ADDITION TO SPECIAL INSPECTIONS, INSPECTION OF FOUNDATIONS, FOOTINGS, SLABS AND UNDERSLAB SYSTEMS, LOWEST FLOOR ELEVATIONS, FRAMING, LATH AND GYPSUM BOARD, FIRE-RESISTANCE AND PENETRATIONS, ENERGY EFFICIENCY, PRELIMINARY AND FINAL INSPECTIONS MAY BE REQUIRED AND/OR PROVIDED BY THE LOCAL BUILDING OFFICIAL PER THE REQUIREMENTS OF THE NYS UNIFORM CODES. THE LOCAL BUILDING OFFICIAL MAY REQUIRE ADDITIONAL INSPECTIONS TO ASCERTAIN COMPLIANCE WITH THE PROVISIONS OF THE CODE. ALL INSPECTIONS REQUIRED AND/OR PROVIDED BY THE LOCAL BUILDING OFFICIAL SHALL BE AGREED UPON IN WRITING PRIOR TO THE START OF CONSTRUCTION.

3. SPECIAL INSPECTIONS SHALL BE IN ACCORDANCE WITH THE STATEMENT OF SPECIAL INSPECTIONS AND THE SCHEDULE OF SPECIAL INSPECTIONS AND SPECIFICATIONS TO BE SUBMITTED WITH THE CONTRACT DOCUMENTS AND THE APPLICATION FOR BUILDING PERMIT TO THE CODE ENFORCEMENT OFFICIAL. LOCAL BUILDING OFFICIALS CANNOT PROVIDE SPECIAL INSPECTIONS.

4. CONTRACTOR IS RESPONSIBLE FOR NOTIFYING INSPECTION AGENCIES WHEN WORK IS READY FOR INSPECTION WITH AT LEAST 48 HOUR NOTICE OR AS AGREED UPON PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS AND MEANS FOR INSPECTION INCLUDING ACCESS TO THE CONTRACT DOCUMENTS. CONTRACTOR IS RESPONSIBLE FOR DEMOLITION AND REPLACEMENT OF ANY MATERIALS REQUIRED TO ALLOW INSPECTIONS.

5. REFER TO THE SCHEDULE OF SPECIAL INSPECTIONS AND TO THE SPECIFICATIONS FOR REQUIRED SPECIAL INSPECTIONS AND TESTING. SPECIAL INSPECTIONS AND TESTING SHALL BE CONTINUOUS OR PERIODIC DURING THE PERFORMANCE OF THE WORK, AS NOTED.

6. THE CONTRACTOR SHALL HOLD A PRE-CONSTRUCTION MEETING WITH THE ENGINEER, SPECIAL INSPECTOR, TESTING AGENCY, AND AFFECTED SUBCONTRACTORS TO REVIEW THE REQUIRED SPECIAL INSPECTION AND TESTING REQUIREMENTS FOR THE PROJECT. THE CONTRACTOR SHALL DISTRIBUTE CONSTRUCTION SCHEDULES TO EACH ATTENDEE. A SEPARATE MEETING WITH THE LOCAL BUILDING OFFICIAL TO REVIEW INSPECTION REQUIREMENTS, AND TO CONFIRM THE ROLES AND RESPONSIBILITIES OF THE TESTING AGENCIES AND BUILDING OFFICIALS.

7. THE SPECIAL INSPECTOR SHALL SUBMIT INTERIM AND FINAL REPORTS AND, AT COMPLETION OF SPECIAL INSPECTIONS, A FINAL STATEMENT OF SPECIAL INSPECTIONS. REPORTS SHALL BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER. SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS AND FURNISH TO CODE ENFORCEMENT OFFICIALS, AND THE THE ENGINEER OF RECORD. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS DONE IN CONFORMANCE WITH APPROVED CONSTRUCTION DOCUMENTS. THE SPECIAL INSPECTOR SHALL NOTIFY THE CONTRACTOR IMMEDIATELY OF DISCREPANCIES, SUBSEQUENT REPORTS SHALL NOTE WHEN AND HOW DEFICIENCIES WERE CORRECTED. THE SPECIAL INSPECTOR SHALL NOTIFY THE ENGINEER AND THE CODE ENFORCEMENT OFFICIAL OF DISCREPANCIES WHICH HAVE NOT BEEN CORRECTED.

8. THE SPECIAL INSPECTION PROGRAM SHALL IN NO WAY RELIEVE THE CONTRACTOR OF THE OBLIGATION TO PERFORM THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS OR FROM IMPLEMENTING AN EFFECTIVE QUALITY CONTROL PROGRAM.

9. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A MAIN WIND- OR SEISMIC-FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM OR A WIND-OR SEISMIC-RESISTING COMPONENT LISTED IN THE STATEMENT OF SPECIAL INSPECTIONS SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE CODE ENFORCEMENT OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT IN ACCORDANCE WITH BUILDING CODE CHAPTER 17 "CONTRACTOR RESPONSIBILITY".

10. SPECIAL INSPECTIONS NOTED ON STRUCTURAL SHEETS ARE FOR STRUCTURAL SYSTEMS ONLY. SPECIAL INSPECTIONS MAY BE REQUIRED FOR NON-STRUCTURAL COMPONENTS SUCH AS SPRAY-ON FIRE RESISTANCE. NON-STRUCTURAL INSPECTIONS ARE BY OTHERS, SEE ARCHITECTURAL AND OTHER TRADES FOR ADDITIONAL INFORMATION.

## MINIMUM QUALIFICATIONS FOR SPECIAL INSPECTORS

| CATEGORY | MINIMUM QUALIFICATIONS |
|---|---|
| REINFORCED CONCRETE: | 1. CURRENT ICC REINFORCED CONCRETE SPECIAL INSPECTOR OR ACI CONCRETE CONSTRUCTION INSPECTOR.<br>2. CONCRETE FIELD TESTING CAN BE BY AN ACI CONCRETE FIELD TESTING TECHNICIAN WITH GRADE 1 CERTIFICATION.<br>3. ENGINEER-IN-TRAINING (EIT) WITH RELEVANT EXPERIENCE.<br>4. CA STATE LICENCED PROFESSIONAL ENGINEER (P.E) WITH RELEVANT EXPERIENCE. |
| WELDING | 1. CURRENT ICC STRUCTURAL STEEL AND WELDING CERTIFICATE PLUS ONE YEAR OF RELEVANT EXPERIENCE.<br>2. CURRENT ICC STRUCTURAL STEEL AND WELDING CERTIFICATE PLUS ONE YEAR OF RELEVANT EXPERIENCE.<br>3. CURRENT LEVEL II CERTIFICATION FROM THE AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (NDT).<br>4. CURRENT NDT LEVEL III PROVIDED PREVIOUSLY CERTIFIED AS NDT LEVEL II. |
| HIGH-STRENGHT BOLTING & STEEL FRAME INSPECTION | 1. CURRENT ICC STRUCTURAL STEEL AND WELDING CERTIFICATION AND ONE YEAR OF RELEVANT EXPERIENCE.<br>2. EIT WITH RELEVANT EXPERIENCE.<br>3. P.E. WITH RELEVANT EXPERIENCE. |
| EXCAVATION AND FILLING; VERIFICATION OF SOILS; PILING & DRILLED PIERS; MODULAR RETAINING WALLS | 1. CURRENT LEVEL II CERTIFICATION IN GEOTECHNICAL ENGINEERING TECHNOLOGY/ CONSTRUCTION FROM THE NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES (NICET).<br>2. EIT WITH RELEVANT EXPERIENCE.<br>3. P.E. WITH RELEVANT EXPERIENCE |
| SEISMIC RESISTANCE | 1. SEE THE APPLICABLE CATEGORIES IN THIS TABLE. |

NOTES:
1. INSPECTORS MUST MEET REQUIREMENTS ABOVE OR BE APPROVED BY RDP RESPONSIBLE FOR DESIGN.

## SOIL VERIFICATION AND INSPECTION REQUIREMENTS

| VERIFICATION AND INSPECTION TASK | FREQUENCY OF INSPECTION | |
|---|---|---|
| | CONTINUOUS DURING TASK LISTED | PERIODICALLY DURING TASK LISTED |
| 1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY. | – | X |
| 2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL. | – | X |
| 3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS. | – | X |
| 4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL. | X | – |
| 5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE THE SUBGRADE AND VERITY THAT THE SITE HAS BEEN PREPARED PROPERLY. | – | X |

## CONCRETE CONSTRUCTION VERIFICATION AND INSPECTION REQUIREMENTS

| INSPECTION AND TESTING (Continuous & Periodic is as Defined by the 2018 IBC) | CONTINUOUS | PERIODIC | REFERENCE STANDARD | 2018 IBC REFERENCE | CHECK IF REQUIRED |
|---|---|---|---|---|---|
| INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT. | | X | ACI 318: CH. 20, 25.2, 25.3, 26.6.1-26.6.3 | 1908.4 | X |
| INSPECTION OF REINFORCING STEEL WELDING. | | | AWS D1.4; ACI 318: 26.6.4 | | |
| CAST IN CONCRETE ANCHORAGE. | | X | ACI 318: 17.8.2 | | |
| POST INSTALLED CONCRETE MEMBERS. | | X | ACI 318: 17.8.2.4. | | |
| VERIFY USE OF REQUIRED DESIGN MIX. | | X | ACI 318: CH. 19, 26.4.3, 26.4.4 | 1904.1<br>1904.2<br>1908.2<br>1908.3 | X |
| SAMPLING FRESH CONCRETE: SLUMP, AIR CONTENT, TEMPERATURE, STRENGTH TEST SPECIMENS. | X | | ASTM C 172, C 31; ACI 318: 26.5, 26.12 | 1908.10 | X |
| INSPECTION OF PLACEMENT FOR PROPER APPLICATION TECHNIQUES. | X | | ACI, 318: 26.5. | 1908.6<br>1908.7<br>1908.8 | X |
| INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES. | | X | ACI, 318: 26.5.3 – 26.5.5 | 1908.9 | X |
| INSPECTION OF PRESTRESSED CONCRETE. | X | | ACI 318: 26.10 | | |
| ERECTION OF PRECAST CONCRETE MEMBERS. | | X | ACI 318: CH. 26.9 | | |
| VERIFICATION OF IN-SITU CONCRETE STRENGTH PRIOR TO STRESSING OF TENDONS AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND SLABS. | | X | ACI 318: CH. 26.11.2 | | |
| INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED | | X | ACI 318: CH. 26.11.1.2(b) | | X |

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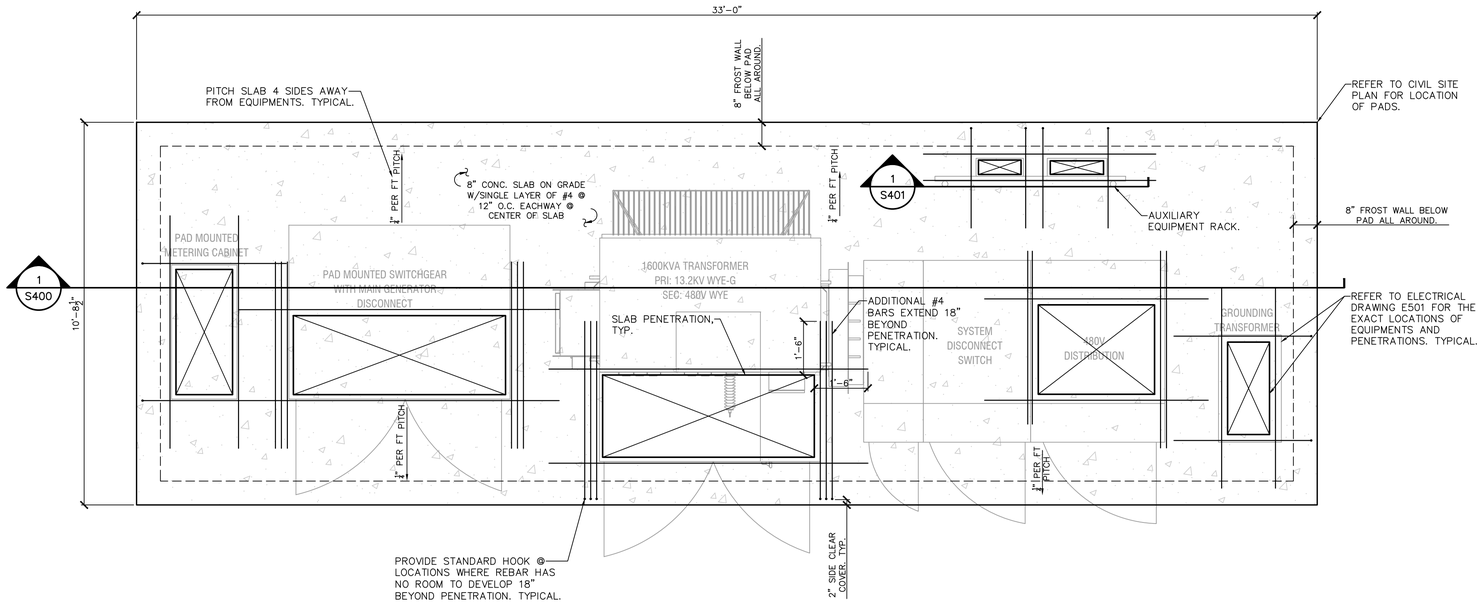
**SIEMENS SMART INFRASTRUCTURE**
6 BRITISH AMERICAN BLVD
LATHAM, NY 12110

SIEMENS

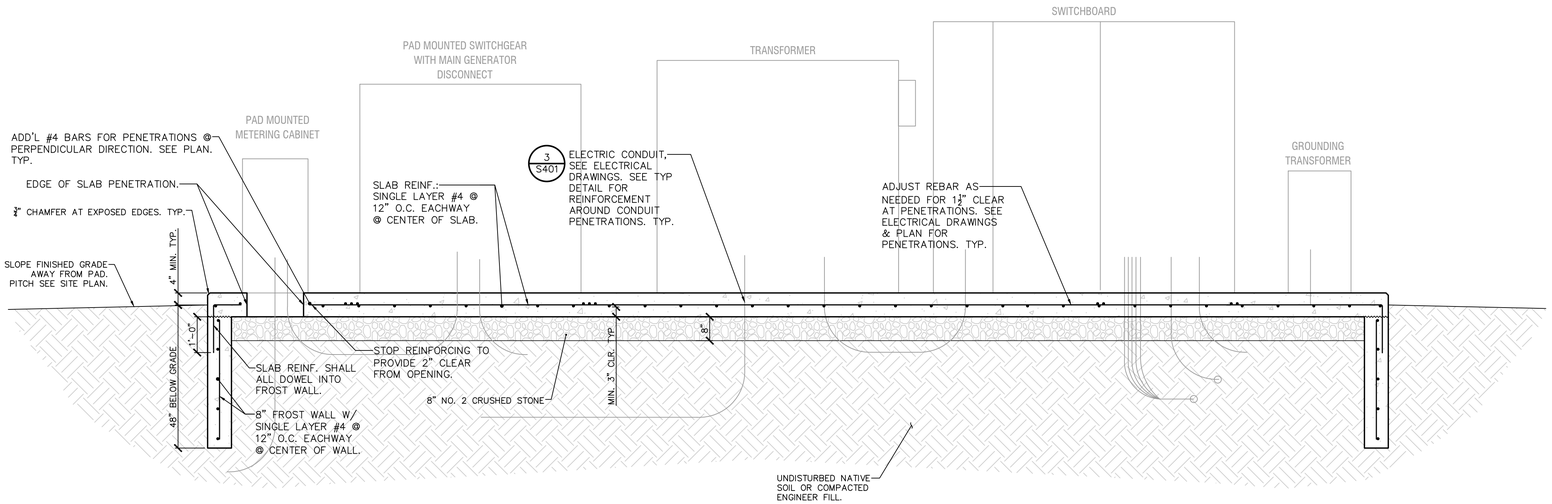
**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY: JC
REVIEWED BY: LC
ISSUED FOR: FOR PERMIT ONLY
DATE: 06/29/2022
DRAWING NAME: SPECIAL INSPECTION NOTES
DRAWING NUMBER: S002




A S400 **EQUIPMENT PAD FRAMING PLAN LAYOUT**
SCALE: 1/2" = 1'-0"




1 S400 **EQUIPMENT PAD CROSS SECTION**
SCALE: 1/2" = 1'-0"

VERSION 19.0
6/3/2010 8:47:56 AM

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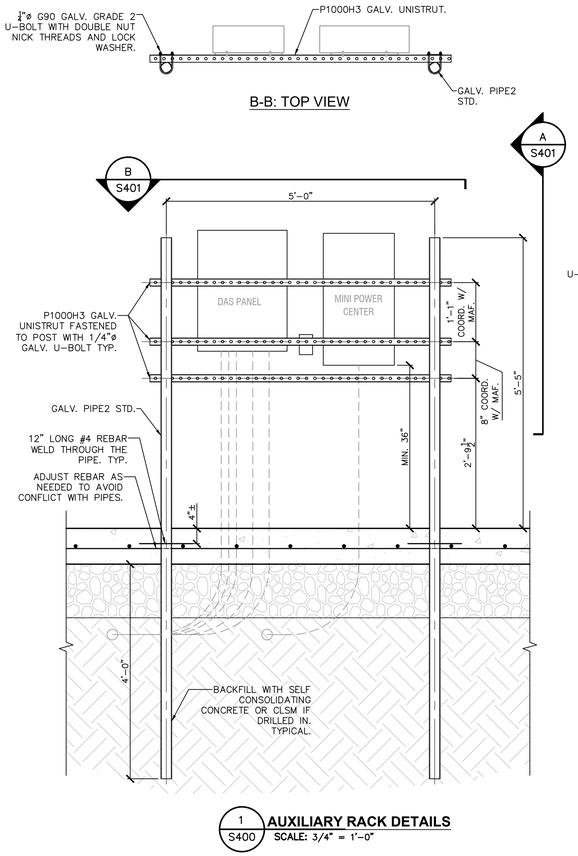
DRAWING NAME:

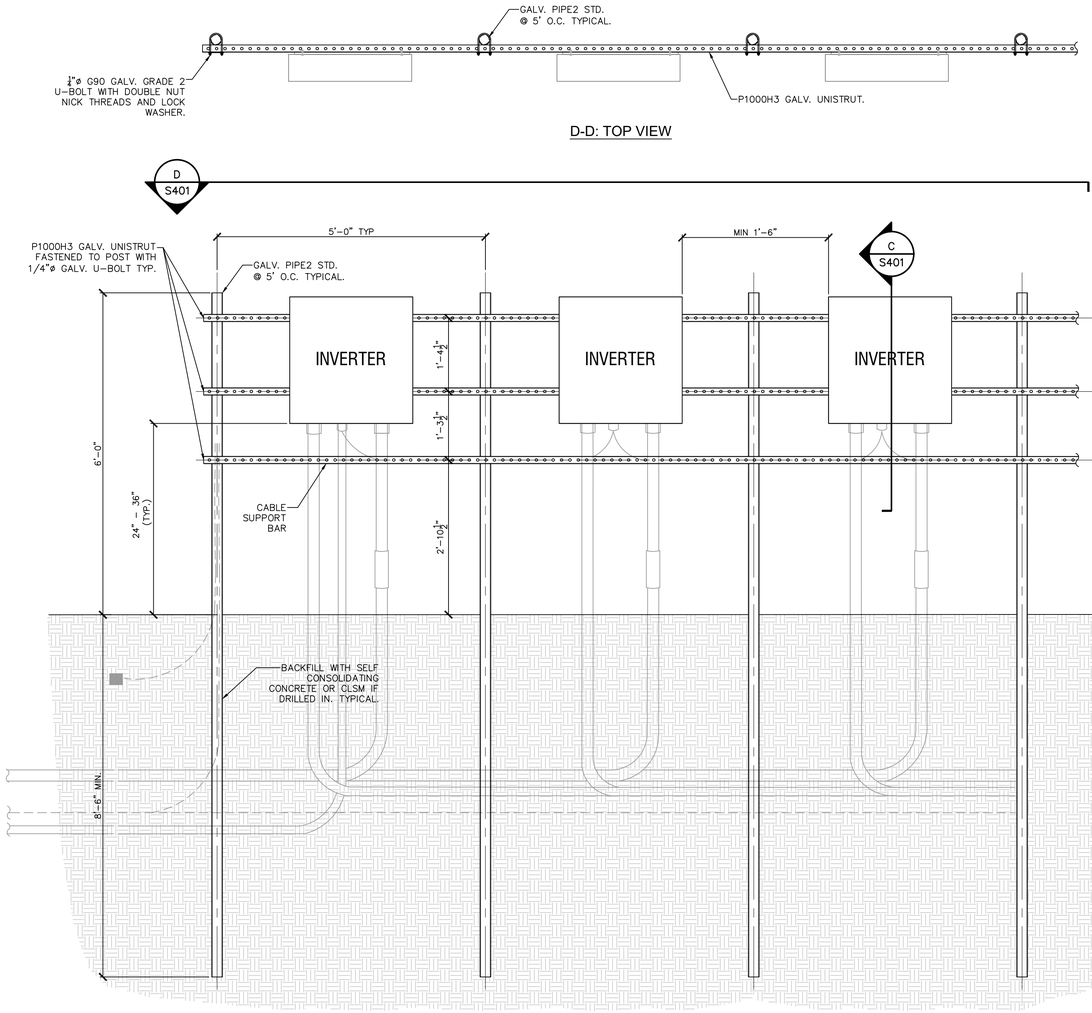
**EQUIPMENT PAD PLAN & SECTION**

DRAWING NUMBER:

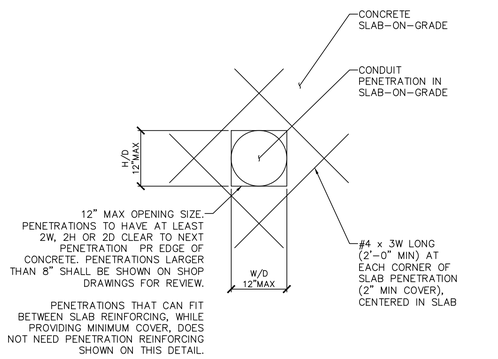
# S400




1 S400 **AUXILIARY RACK DETAILS**
SCALE: 3/4" = 1'-0"




2 S401 **TYPICAL INVERT RACK DETAILS**
SCALE: 3/4" = 1'-0"




3 S401 **TYPICAL SLAB ON GRADE CONDUIT PENETRATION DETAIL**
SCALE: 3/4" = 1'-0"

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6/3/2010 8:47:56 AM

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PROJECT NUMBER: 2222708
DRAWN BY: JC
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ISSUED FOR: FOR PERMIT ONLY
DATE: 06/29/2022
DRAWING NAME:

**DETAILS & SECTIONS**

DRAWING NUMBER:

# S401

# STRUCTURAL PRINT PACKAGE - 210930

## ALBANY, NY 12205

RACKING PROVIDER

APA SOLAR RACKING

20-345 COUNTY ROAD X
RIDGEVILLE CORNERS, OHIO 43555
(P) 419.267.5280
(F) 419.267.5214
WWW.APASOLAR.COM

STRUC. ENGINEER OF RECORD

the jdi group
architects & engineers

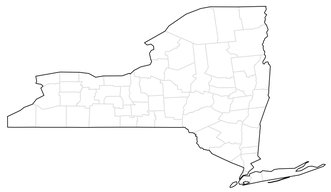
360 W. DUSSEL DR.
MAUMEE, OH 43537
|P| 419.725.7161
|F| 419.725.7160

RACKING PRODUCT LINE

TITAN DUO

USE WITH THE FOLLOWING PRINTS & PACKAGES. INCLUDE WITH SUBMISSION TO PERMIT/INSPECTION AGENCY:

- ☑ CALCULATION PACKAGE: 210930 CALC SET – STAMPED
- ☑ FOUNDATION DESIGN REPORT (SITE SPECIFIC, & ONLY WHERE REQUIRED BY EOR OR AHJ)



SITE ADDRESS: 925 WATERVLIET SHAKER RD
ALBANY, NY 12205

REVISION: A

PERMIT SET/
STRUCTURAL PACKET

APPROVED

SOLAR PHOTOVOLTAIC GROUND MOUNT

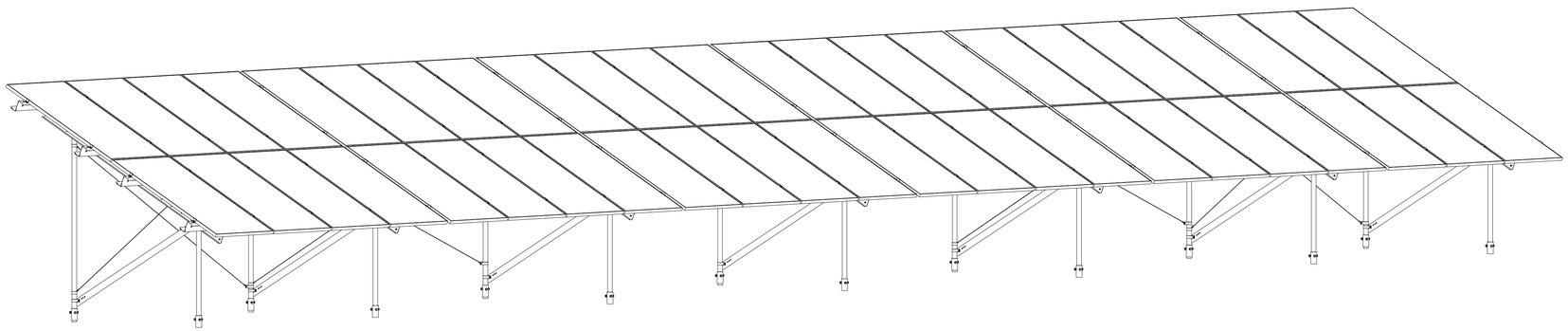


IMAGE FOR REFERENCE ONLY

| SHEET INDEX | | |
|---|---|---|
| STRUCTURAL | | |
| S-000 | A | STRUCTURAL COVER |
| S-100 | A | RACKING OVERVIEW |
| S-101 | A | GROUND SCREW |
| S-200 | A | STRUCTURAL COMPONENTS |
| S-300 | A | CONNECTIONS |
| S-400 | A | STRUCTURAL PURLINS |
| S-500 | A | CLAMPS & BRACES |
| S-600 | A | STRUCTURAL DESIGN & ANALYSIS SUMMARY |

GOVERNING STRUCTURAL CODE/S

2018 INTERNATIONAL BUILDING CODE

PACKAGE COVERAGE – LOADING AND SETUP RANGES & CONSTANTS

| | |
|---|---|
| TILT ANGLES: | 25* |
| MAX GROUND SNOW LOAD (PSF): | 40 |
| MAX WIND LOADS (MPH): | 105 |
| WIND EXPOSURE CATEGORY: | C |
| MAX SEISMIC Ss: | 0.560 g |
| MAX SEISMIC S1: | 0.140 g |
| PV MODULE: | Q CELLS Q.PEAK DUO XL-G11.3/BFG OR SIMILIAR |
| MAX. PANEL WIDTH: | 44.65" |
| MAX. PANEL LENGTH: | 95.12" |
| MAX. PANEL HEIGHT: | 2.00" |
| MAX. PANEL WEIGHT: | 76.00 LBS |
| RISK CATEGORY: | I |
| MAX FRONT LIP CLEARANCE: | 48" |

*PER USGS MIN/MAX DESIGN VALUES FOR REGIONS, VALUES BASED ON MAX VALUES IN PROJECT STATE. SEISMIC DOES NOT CONTROL.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PROJECT NUMBER: 2222708

DRAWN BY:

REVIEWED BY:

ISSUED FOR: FOR PERMIT ONLY

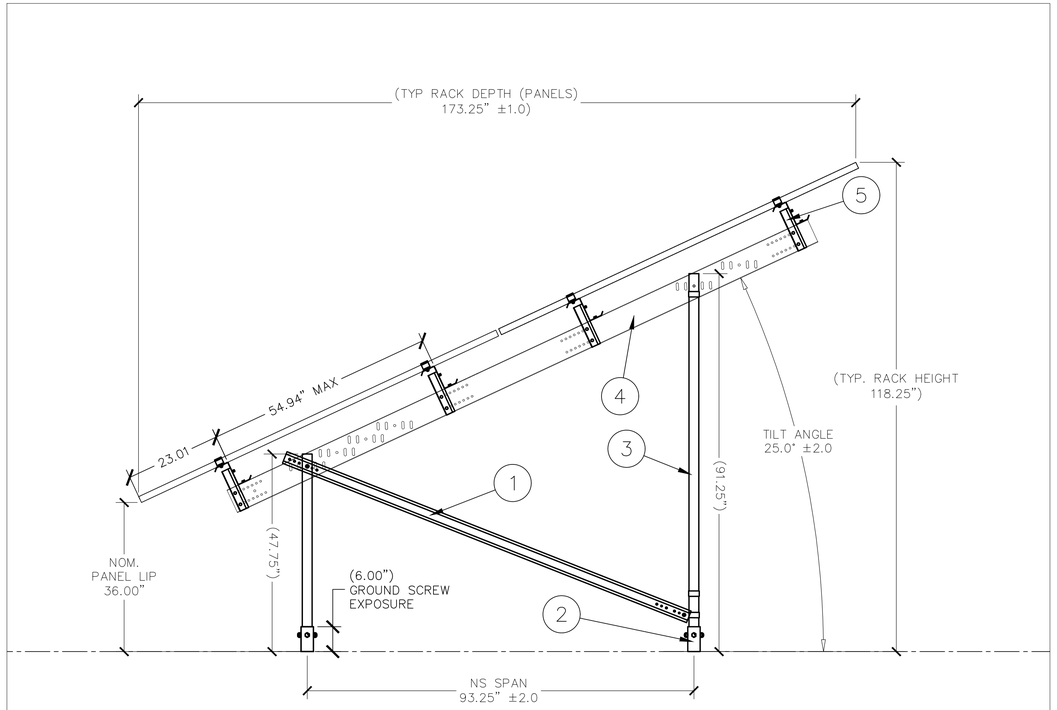
DATE: 07/13/2022

DRAWING NAME:

**STRUCTURAL COVER**

DRAWING NUMBER:

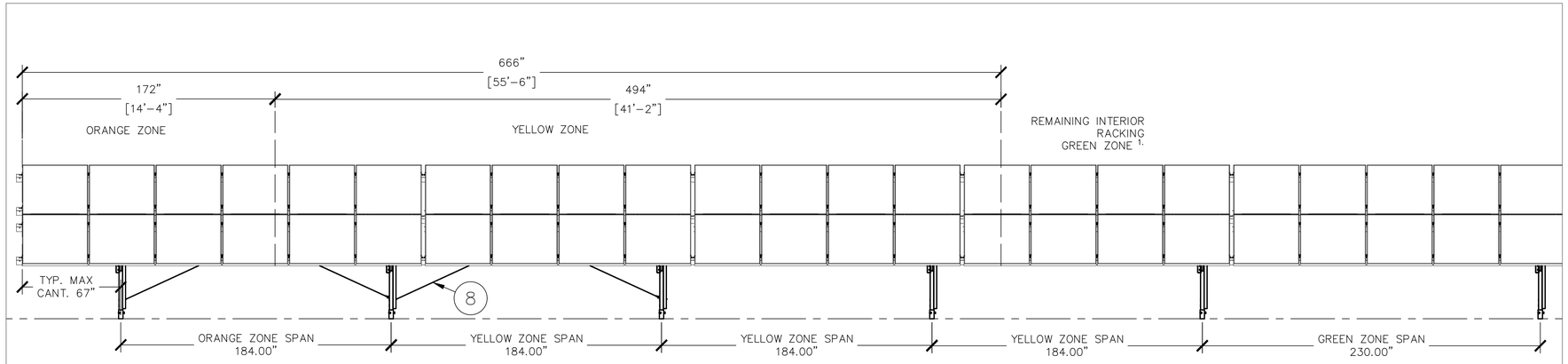
# S000A




NOTES: PV MODULE & MODULE RELATED DIMENSIONS THIS DETAIL ARE MAX ALLOWABLE, UNLESS SPECIFIED SOMEWHERE ELSE IN THIS PACKET.
DIMENSIONS TO GROUND ARE NOMINAL FROM LEVEL GROUND.

C1 | PROFILE VIEW: RACK OVERVIEW

| PARTS LIST (BALLOONS THIS SHEET) | | | |
|---|---|---|---|
| ITEM | DESCRIPTION | SHAPE | DETAIL / SHEET |
| 1 | KNEE BRACE | CEE | B2 / S.200 |
| 2 | GROUND SCREW | POST | D2 / S.101 |
| 3 | FOUNDATION POST | POST | A6 / S.200 |
| 4 | NS CHORD | CEE | D1 / S.200 |
| 5 | ROLL BAR | MIXED | A4 / S.200 |
| 6 | TRANSVERSE BRACE | ZEE | D5 / S.500 |
| 7 | ZEE PURLIN | ZEE | E1 / S.200 |
| 8 | CABLE BRACE | CABLE | D4/ S.500 |




NOTES: MAX CANTILEVER MEASURED FROM EDGE OF PANEL TO POST CENTER.
MAX SPAN MEASURED FROM PILE CENTER TO PILE CENTER.
POST QUANTITY AS REQUIRED TO SATISFY CANTILEVERS, SPANS, ROW LENGTH, & PANEL QUANTITY
1. WHERE ALLOWABLE PER THE CALCULATIONS PACKAGE. PROHIBITED AREAS SHALL REMAIN ZONED YELLOW.

IMAGE REFERENCE ONLY. NOT INDICATIVE OF REQUIRED QUANTITIES.

A1 | ELEVATION VIEW FROM FRONT (NORTH-FACING)

NOTES:

1. STANDARD FRONT LIP HEIGHT AND TILT ANGLES MEASURED FROM LEVEL GROUND
2. FOUNDATION TESTING, WHERE REQUIRED, SHALL BE DONE ACCORDING TO THE "QUICK TEST METHOD" PER ASTM D1143 & D3689.
3. PRINT DIMENSIONS: DIMENSIONS SHOWN REFLECT POST HEIGHTS ON LEVEL GROUND. ON UNEVEN TERRAIN, REAR FOUNDATION POST HEIGHT WILL BE DICTATED BY FRONT LIP HEIGHT, PANEL TILT, AND NORTH/SOUTH POST SPACING.
4. ADDITIONAL TOLERANCES: POST PLUMBNESS SHOULD BE WITHIN ±2°
5. SPECIAL INSPECTIONS (WHERE REQUIRED):

SPECIAL INSPECTIONS ARE NOT REQUIRED BY APA SOLAR OR THE STRUCTURAL ENGINEER OF RECORD, THE JDI GROUP. WHERE REQUIRED BY OWNER, CUSTOMER, AND/OR AUTHORITY HAVING JURISDICTION, MINIMUM INSPECTION SHALL FOLLOW IBC OR LOCAL AHJ SPECIAL INSPECTIONS GUIDELINES, PER NOTES AND TABLE BELOW

5.1. .ALL SPECIAL INSPECTORS SHALL BE RETAINED BY OWNER/CUSTOMER. THE EXTENT OF THE INSPECTION SHALL COMPLY WITH THE CONTRACT DOCUMENTS, THE BUILDING CODE REQUIREMENTS, AND LOCAL JURISDICTION. IT IS THE OWNER/CUSTOMER'S RESPONSIBILITY TO GIVE PROPER NOTIFICATION TO THE SPECIAL INSPECTOR AND PROCEED WITH THE WORK ONLY AFTER THE SPECIAL INSPECTOR'S APPROVAL.

5.2. FAILURE TO NOTIFY THE SPECIAL INSPECTOR MAY RESULT IN OWNER/CUSTOMER HAVING TO REMOVE WORK FOR THE PURPOSE OF INSPECTION AT THE OWNER'S/CUSTOMERS EXPENSE.

5.3. SPECIAL INSPECTORS SHALL KEEP RECORDS OF ALL INSPECTIONS. RECORDS SHALL BE FURNISHED TO THE OWNER, ENGINEER OF RECORD, AND LOCAL JURISDICTION AS REQUIRED.

| SPECIAL INSPECTION & TESTING SCHEDULE (WHEN REQUIRED, SEE ABOVE) | | |
|---|---|---|
| | CONTINUOUS | PERIODIC |
| STRUCTURAL STEEL FABRICATION | | |
| MATERIAL IDENTIFICATION | | X |
| HIGH STRENGTH BOLTS – MATERIAL IDENTIFICATION OF BOLTS, NUTS, & WASHERS | | X |
| WELD FILLER MATERIALS – IDENTIFICATION AND CONFIRMATION OF COMPLIANCE WITH DESIGN DOCUMENTS | | X |
| STRUCTURAL STEEL ERECTION | | |
| MATERIAL IDENTIFICATION | | X |
| INSTALLATION OF HIGH STRENGTH BOLTS | | X |
| WELDED CONNECTIONS | | X |
| MEMBER SIZES AND PLACEMENT | | X |
| GENERAL CONFORMANCE WITH DESIGN DOCUMENTS | | X |
| DRIVEN DEEP FOUNDATION ELEMENTS | | |
| VERIFY ELEMENT MATERIALS, SIZE, LENGTHS COMPLY WITH DESIGN DOCUMENTS | X | |
| DETERMINE CAPACITIES OF TEST ELEMENTS & CONDUCT ADDITIONAL LOAD TESTS, AS REQ. | X | |
| OBSERVE DRIVING OPERATIONS, MAINTAIN RECORDS | X | |
| VERIFY PLACEMENT LOCATIONS & PLUMBNESS | X | |
| HELICAL PILE FOUNDATIONS | | |
| RECORD INSTALLATION EQUIPMENT USED, PILE DIMENSIONS, TIP ELEVATIONS, FINAL DEPTH. | X | |

THIS TABLE PER IBC 2018, SEC. 1705

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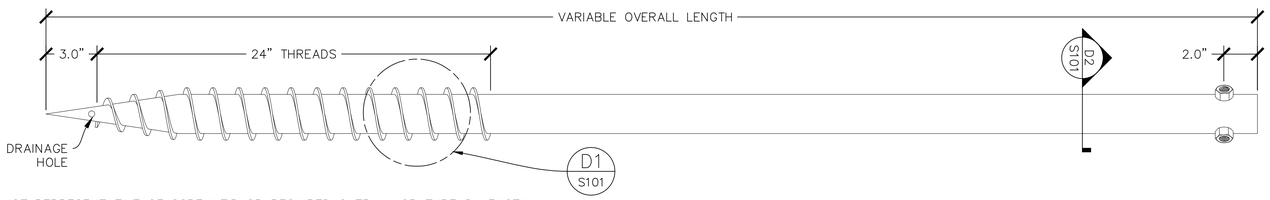
REVIEWED BY:
ISSUED FOR: FOR PERMIT ONLY
DATE: 07/13/2022
DRAWING NAME:

**RACKING OVERVIEW**

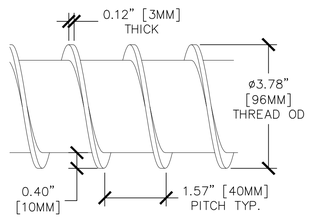
DRAWING NUMBER:

**S100A**

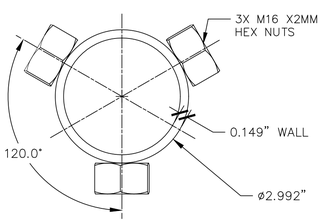



NOTES:
1. VIEW NOT REPRESENTATIVE OF SCREW TIP OR REQUIRED OVERALL OR THREAD LENGTH.

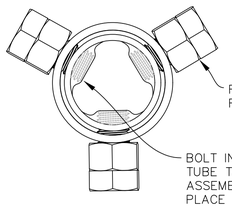
E1 | PART: SCREW PILE



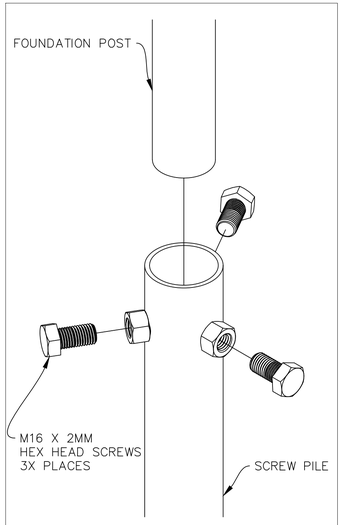

D1 | DETAIL: SCREW PILE



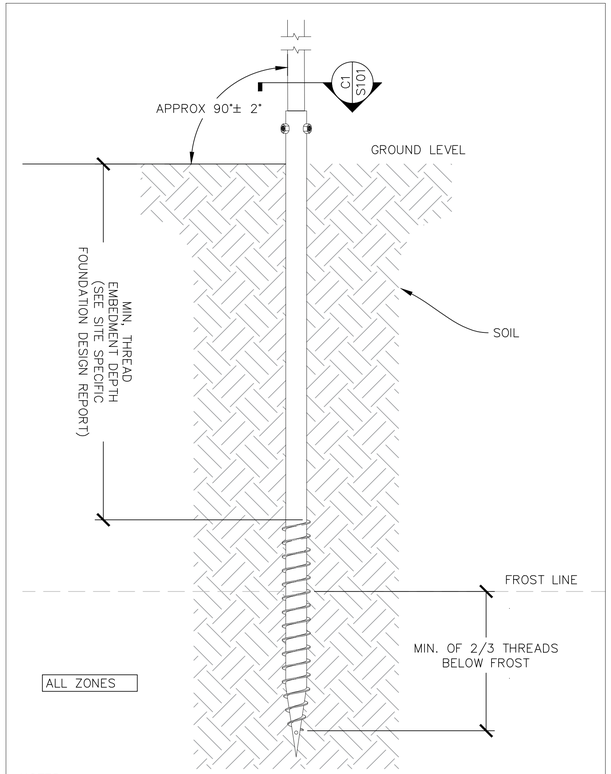

D2 | SECTION: SCREW PILE




C1 | SECTION: PILE ASSEMBLY

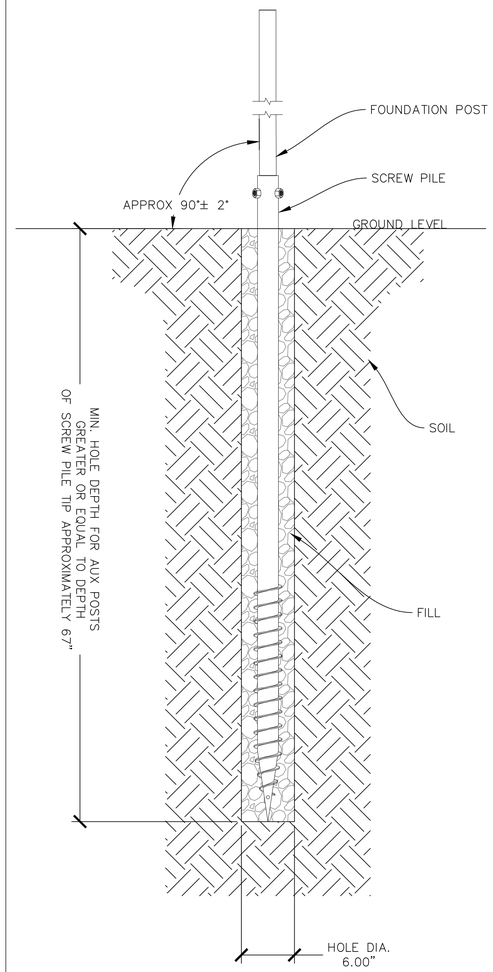



A1 | CONNECTION: POST-TO-PILE




NOTES:
1. LENGTH & THREADS MAY VARY, SEE SHEET NOTES
2. EMBEDMENT DEPTH PER GEOTECHNICAL ENGINEER APPROVED FOUNDATION DESIGN REPORT, NOT BY JDI GROUP.

A2 | VIEW: POST EMBEDMENT




NOTE: EMBEDMENT DEPTH PER GEOTECHNICAL ENGINEER APPROVED FOUNDATION DESIGN REPORT, NOT BY JDI GROUP.

A3 | AUX. FOUNDATION VIEW: PROFILE – SOIL CUTAWAY

NOTES:

1. FOUNDATION POST MATERIAL: 50 KSI MIN YIELD STRENGTH
2. FOUNDATION POST TO BE HOT DIPPED GALVANIZED TO ASTM A123 OR INLINE GALVANIZED TO ASTM A1057.
3. SCREW PILE TUBE MATERIAL: 30 KSI MIN YIELD STRENGTH STEEL.
4. SCREW PILE THREAD MATERIAL: 28 KSI MIN YIELD STRENGTH STEEL.
5. SCREW PILE TO BE HOT DIPPED GALVANIZED TO ASTM A123 OR INLINE GALVANIZED TO ASTM A1057.
6. ALL HARDWARE IS 300 SERIES STAINLESS STEEL, A574 ALLOY STEEL, OR MINIMUM 8.8 CLASS METRIC.
7. BOLTS MUST BE FULLY SET INTO WELDED NUTS.
8. BOLTS SHALL BE 30 MM LONG.
9. SCREW PILE SHALL PENETRATE THE SOIL TO A DEPTH PAST THE FROST LINE, SUCH WHICH LESS THAN 1/3 OF THE TOTAL LENGTH OF THREADS ARE ABOVE THE FROST LINE, OR TO THE DEPTH INDICATED AS MINIMUM PER THE STAMPED FOUNDATION DESIGN REPORT, WHICHEVER IS DEEPER.
10. FOUNDATION POST SHALL EXTEND ABOVE GROUND LEVEL AT MINIMUM OF INDICATED FRONT LIP CLEARANCE, PLUS THE ADDITIONAL LENGTH REQUIRED TO ACHIEVE THE INDICATED TILT ANGLE.
11. MINIMUM ENGAGEMENT BETWEEN SCREW PILE AND FOUNDATION POST SHALL BE 4".
12. INSTALLERS SHALL REFER TO STRUT AND POST SETUP SHEETS FOR LENGTH AND PLACEMENT DETAILS.

FOUNDATION POST INSTALLATION

13. ACCURATELY LOCATE AND INSTALL SCREW PILES BY SUCH METHODS AND EQUIPMENT SO AS NOT TO IMPAIR THE PILE STRENGTH OR DAMAGE POSTS OR ADJACENT CONSTRUCTION.
14. INSTALLATION CONTRACTOR RESPONSIBLE FOR ALL CONSTRUCTION EQUIPMENT, METHODS, AND SEQUENCES.
15. DISTURBED GALVANIZED SURFACES SHALL BE TOUCHED UP WITH AN APPROVED COLD GALVANIZING COMPOUND.
16. INSTALL SCREW PILES TO MINIMUM DEPTH(PER GEOTECHNICAL ENGINEER, NOT JDI-DELEGATED DESIGN PARAMETER) AS INDICATED THIS SHEET OR AS REQUIRED PER THE STAMPED FOUNDATION DESIGN REPORT, WHICHEVER IS GREATER.

AUXILLIARY FOUNDATION NOTES:

1. EMBEDMENT DEPTH(PER GEOTECHNICAL ENGINEER, NOT JDI-DELEGATED DESIGN PARAMETER) CONTINGENT UPON SITE SPECIFIC DATA, INCLUDING BUT NOT LIMITED TO: FROST DEPTH, SOIL PROPERTIES, AND LOCAL BUILDING CODE REQUIREMENTS.
2. AUGERED HOLE SHOULD EXTEND BELOW THE LOCAL FROST LINE, INTO THE STABLE SOIL ZONE.
3. HOLDING PROPERTIES OF THE SCREW PILE IN AGGREGATE DETERMINED BY TESTING CONDUCTED BY APA, PER ASTM D1143
4. STRUCTURAL PROPERTIES OF SCREW PILE TESTED ONLY. CORROSIVITY, AND OTHER GEOTECHNICAL PROPERTIES NOT TESTED.
5. <u>INSTALLATION PROCEDURE</u>

5.1. AUGER HOLE TO REQUIRED DEPTH. HOLE SHOULD BE APPROXIMATELY PLUMB AND A MINIMUM DIAMETER AS INDICATED IN DRAWING.

5.2. REMOVE THE SPOILS AS BEST AS POSSIBLE. THERE SHOULD BE NO LARGE CLUMPS OR ROCKS AT THE BOTTOM OF THE HOLE.

5.3. POUR IN AGGREGATE.

5.4. AGGREGATE SHOULD BE SIZED BETWEEN 1" – 2 1/2".

5.5. KNOWN ACCEPTABLE AGGREGATES (NAMING PER ASTM C33-03):

5.5.A. #2 (2 1/2" – 1 1/2")
5.5.B. #3 (2" – 1"),
5.5.C. A COMBINATION OF BOTH #2 & #3
5.5.D. EQUIVALENT SIZE OF EITHER #2 OR #3.

5.6. DEVIATIONS IN AGGREGATE SIZE, FROM THE ABOVE SPECIFICATIONS, MUST BE APPROVED BY APA SOLAR ENGINEERING BEFORE USING/PURCHASING.

5.7. DRIVE SCREW PILE AS NORMALLY INTO HOLE. ENSURE IT IS PLUMB. ENSURE THE NORTH-SOUTH DIMENSIONS AND EAST-WEST DIMENSIONS ARE CORRECT. ALSO ENSURE BOLT HOLE IN THE POST IS FACING THE CORRECT DIRECTION.

IF NEEDED, RETAMP THE AGGREGATE AT SOIL LEVEL AROUND THE SCREW PILE.

6. <u>QUALITY CONTROL NOTES</u>

1.1. POST HEIGHTS SHOULD BE MEASURED FROM THE GROUND LEVEL, NOT THE TOP OF THE AGGREGATE. IF AGGREGATE IS BELOW GROUND LEVEL, ADDITIONAL GRAVEL SHOULD BE ADDED AND TAMPED TO BRING IT UP TO AT LEAST GROUND LEVEL.

1.2. FOUNDATION POSTS SHOULD NOT BE VERIFIED BY PULLING LATERALLY AT THE TOP OF THE POST (FIGURE 3). THIS CREATES A LARGE AND ARTIFICIAL MOMENT IN THE FOUNDATION. FOUNDATION POSTS SHOULD ALSO NOT BE ROCKED BACK AND FORTH UNTIL IT "FAILS"; THE FOUNDATION POSTS ARE INTENDED TO WORK AS A SYSTEM WITH ALL PARTS INTACT (ADJOINING POSTS, SMALL AND LARGE ZEES, HARD AND CABLE BRACES, AND ALL ADDITIONAL PARTS AND HARDWARE INSTALLED AND TIGHTENED) AND DO NOT REACH FULL CAPACITY UNTIL THAT POINT.

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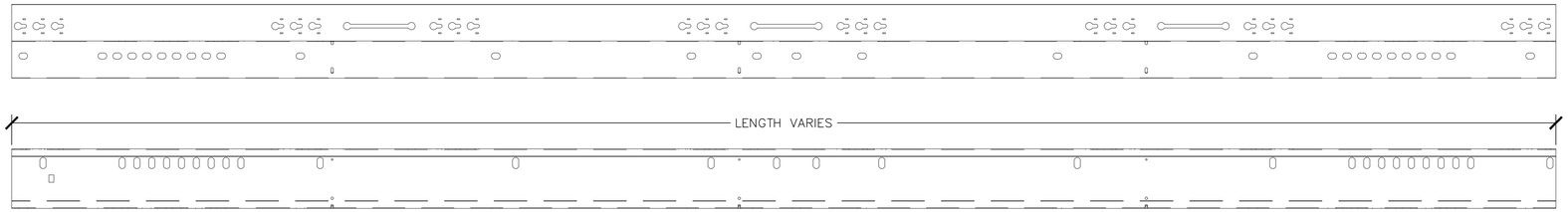
PROJECT NUMBER: 2222708
DRAWN BY:
REVIEWED BY:
ISSUED FOR: FOR PERMIT ONLY
DATE: 07/13/2022
DRAWING NAME:

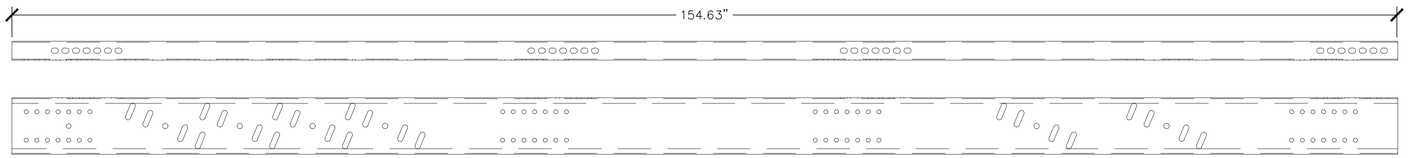
**GROUND SCREW**

DRAWING NUMBER:

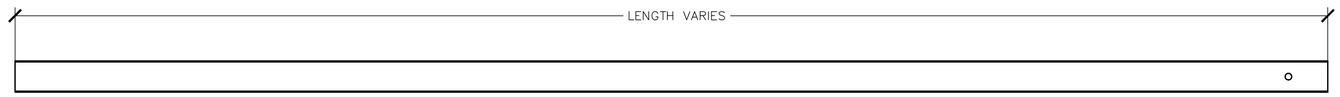
# S101A




E1 | SIDE/TOP: ZEE PURLIN

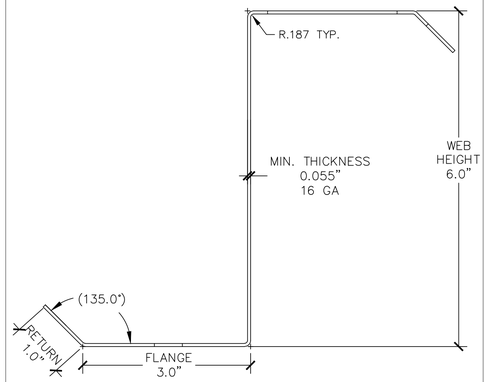



D1 | SIDE/TOP: NS CHORD



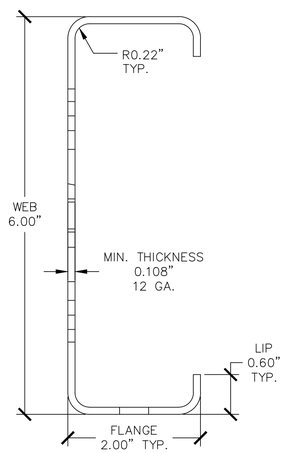

C1 | SIDE: ANCHOR POST

MATERIAL: A653 STR. STL.
STRENGTH: MIN. YIELD (Fy): 80 KSI.

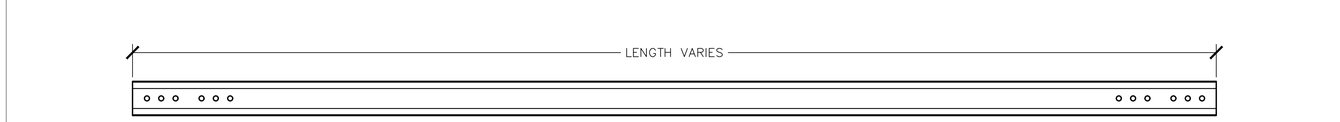



D5 | PART: ZEE PURLIN

MATERIAL: A653 HSLAS
STRENGTH: MIN. YIELD (Fy): 80 KSI.

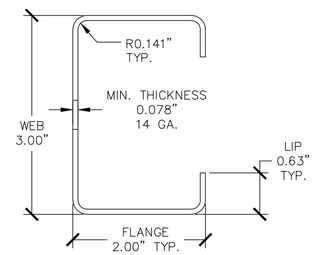



A1 | PROFILE: NS CHORD

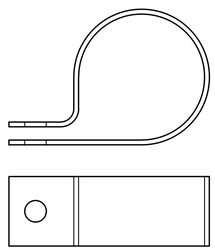



B2 | SIDE: KNEE BRACE

MATERIAL: A653 SS GR 80 CL1
STRENGTH: MIN. YIELD (Fy): 80 KSI.

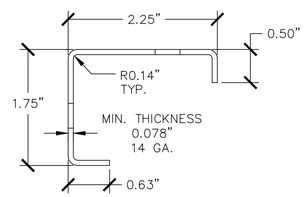



A2 | PROFILE: KNEE BRACE

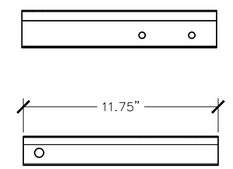


A3 | SIDE: BRACE CLAMP

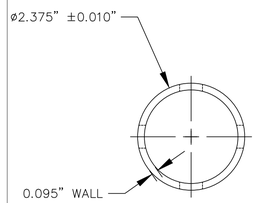
MATERIAL: A572 CF STR. STL.
STRENGTH: MIN. YIELD (Fy): 50 KSI.




A4 | PROFILE: ROLL BAR




A5 | SIDE/TOP: ROLL BAR




A6 | PROFILE: FOUNDATION POST

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**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
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PROJECT NUMBER: 2222708
DRAWN BY:
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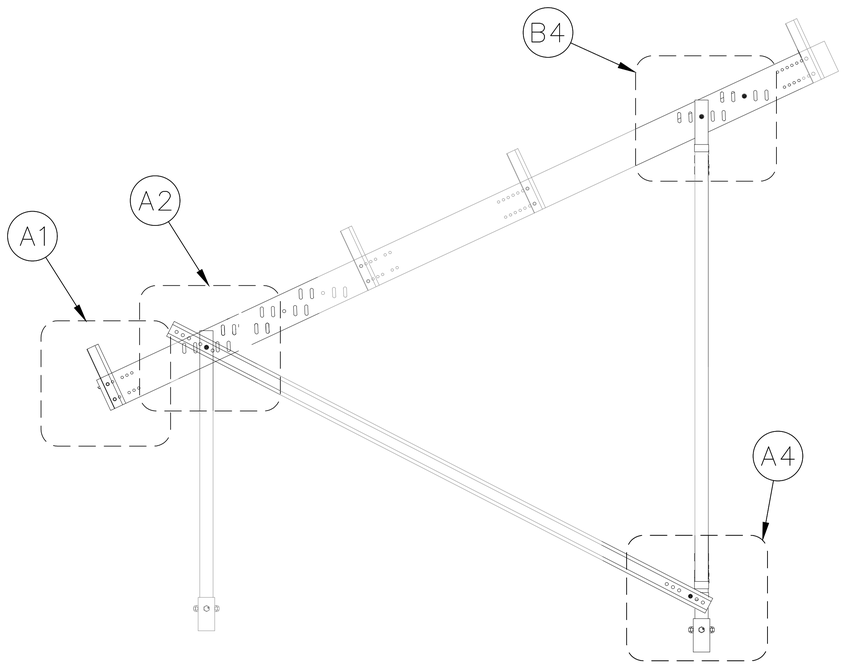
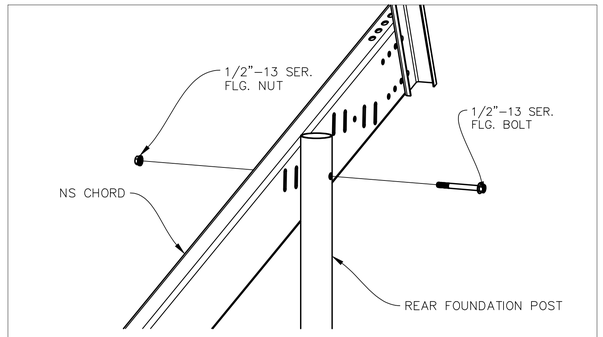
ISSUED FOR: FOR PERMIT ONLY
DATE: 07/13/2022
DRAWING NAME: STRUCTURAL COMPONENTS
DRAWING NUMBER: S200A

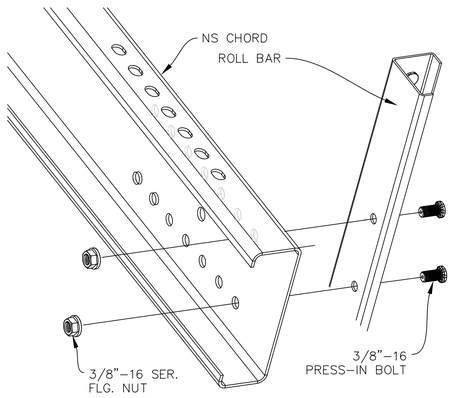
IMAGE FOR REFERENCE ONLY




B1 | FOUNDATION SET CONNECTIONS OVERVIEW

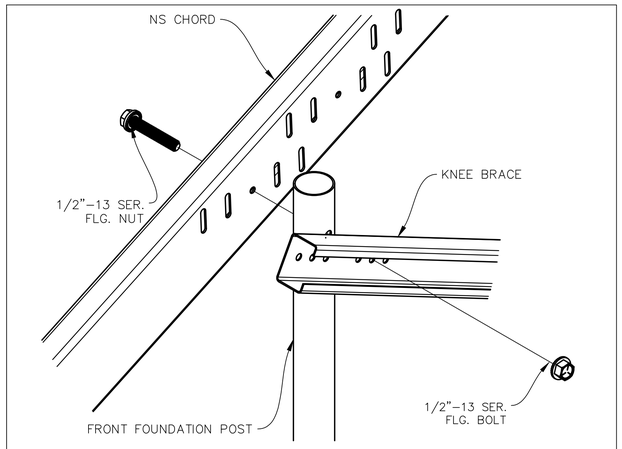



B4 | CONNECTION: REAR POST–TO–NS CHORD

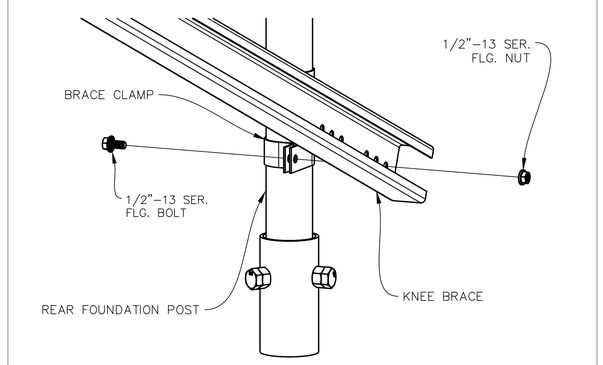



ATTACHED TO OUTER HOLE SET FOR REFERENCE ONLY. SEE NOTES.

A1 | CONNECTION: ROLL BAR–TO–NS CHORD




A2 | CONNECTION: KNEE BRACE–TO–FRONT POST




A4 | KNEE BRACE–TO–REAR POST

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**ALBANY RADAR TOWER SOLAR**
897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

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PROJECT NUMBER: 2222708
DRAWN BY:
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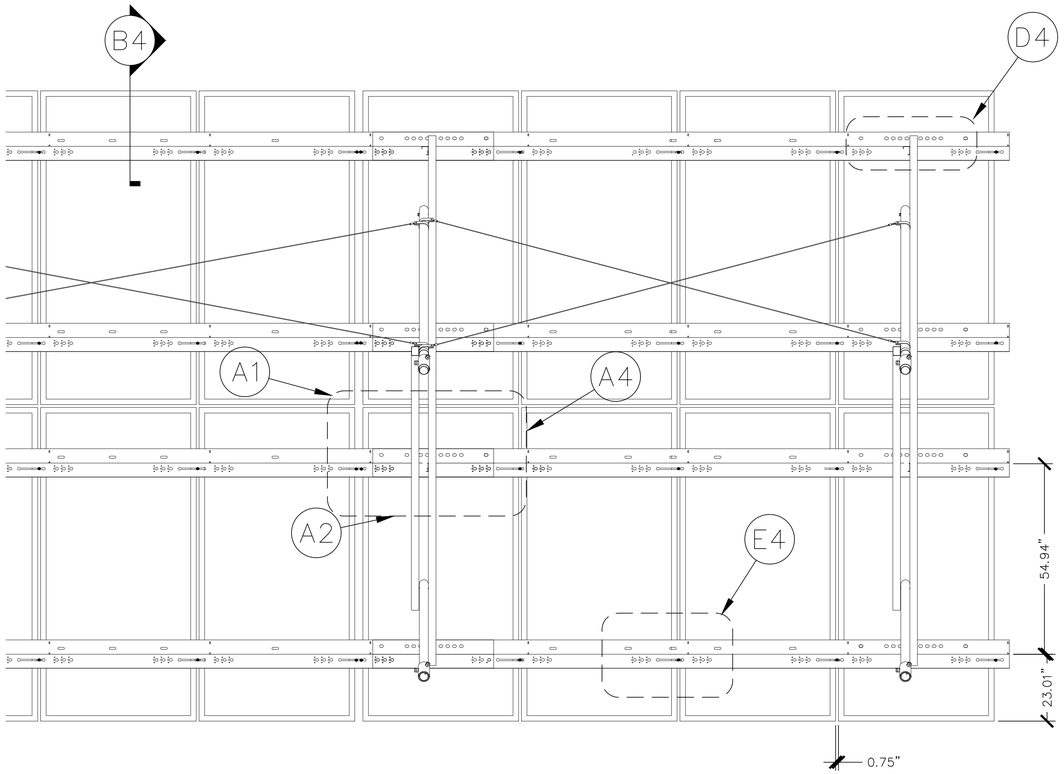
DRAWING NAME:

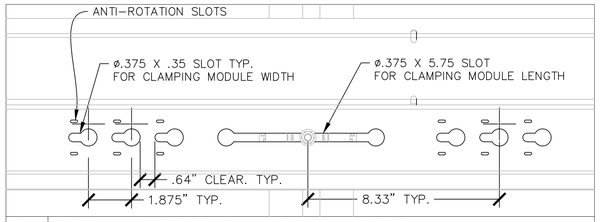
**CONNECTIONS**

DRAWING NUMBER:

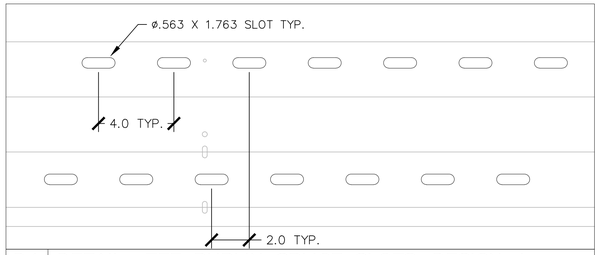
# S300A



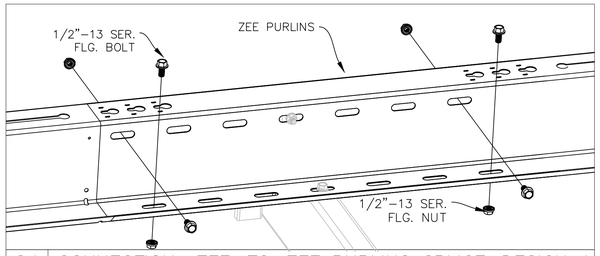

B1 OVERVIEW: ZEE PURLIN CONNECTIONS (RACK UNDERSIDE)



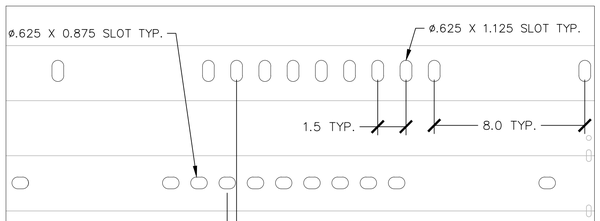

E4 DETAIL: ZEE PURLIN PANEL SLOTS



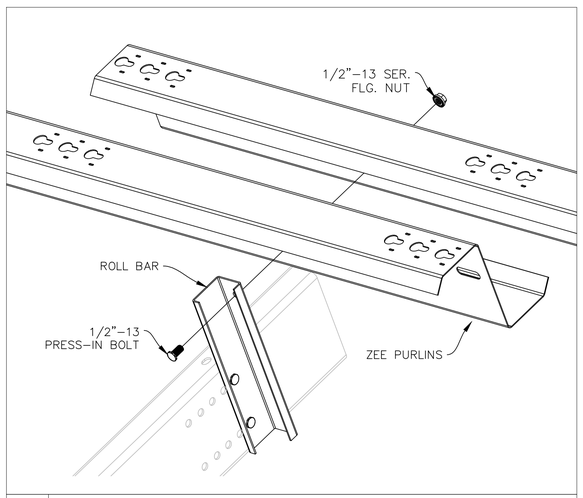

D4 DETAIL: ZEE PURLIN SPLICE SLOTS–DESIGN A



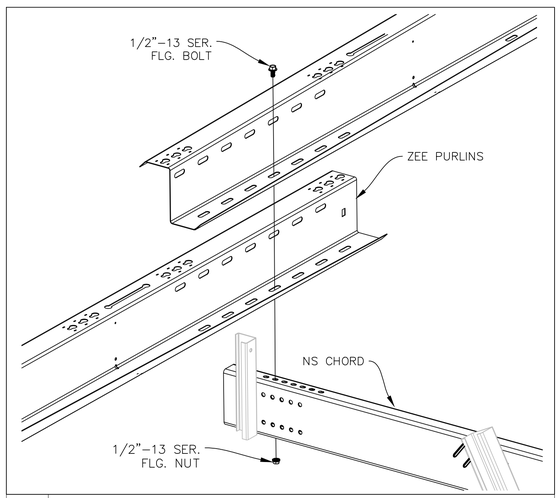

C4 CONNECTION: ZEE–TO–ZEE PURLINS SPLICE–DESIGN A



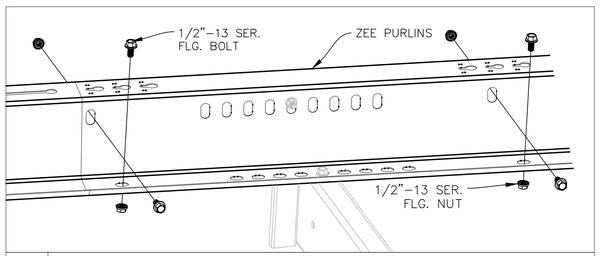

B4 DETAIL: ZEE PURLIN SPLICE SLOTS–DESIGN B




A1 CONNECTION: ZEE PURLINS–TO–ROLL BAR




A2 CONNECTION: ZEE PURLINS–TO–NS CHORD




A4 CONNECTION: ZEE–TO–ZEE PURLINS SPLICE–DESIGN B

NOTES:

1. HARDWARE TORQUE VALUES:

   3/8"–16 STAINLESS STEEL
   MIN.: 17.5 FT–LBS
   NOM.: 19.6 FT–LBS
   MAX.: 50.0 FT–LBS

2. DEPICTED HARDWARE AND PART PLACEMENT NOT INDICATIVE OF PREFERRED OR REQUIRED POSITIONS.
3. HOLE/SLOT PATTERNS IN PARTS ALLOW FOR DEVIATION FROM NOMINAL DIMENSIONS, MULTIPLE PART POSITIONS, AND MULTIPLE TILT ANGLES.
4. SEE INSTALLATION MANUAL FOR SETUP INSTRUCTIONS.
5. SERRATED FLANGED BOLTS MAY BE REPLACED WITH EQUIVALENT PRESS–IN BOLTS.
6. PRESS–IN BOLTS, WHERE PRESENT, TO BE INSTALLED TO MANUFACTURERS RECOMMENDED VALUES.
7. OTHER SPECIFIC CONNECTIONS ELSEWHERE IN PRINT SET.
8. SERRATED HARDWARE MAY BE REPLACED WITH EQUIVALENT HARDWARE WITH WASHERS IF NECESSARY.
9. IN ALL DETAILS, THE PRESENCE OF TWO SETS OF HARDWARE INDICATES THE REQUIREMENT OF TWO SETS OF HARDWARE.
10. STAINLESS STEEL HARDWARE MAY BE REPLACED WITH GALVANIZED STEEL HARDWARE OR CORROSION AND STRENGTH COMPARABLE HARDWARE MATERIALS AND FINISHES.
11. UNLESS NOTED OTHERWISE, ALL HARDWARE MAY BE INSTALLED IN EITHER DIRECTION (NUT/BOLT MAY BE ON EITHER SIDE OF CONNECTION).
12. WHEN NECESSARY, ADDITIONAL HOLES MAY BE DRILLED TO COMPLETE CONNECTION. ENGINEERING SHALL BE CONTRACTED PRIOR TO FIELD MODIFICATIONS OF PARTS.
13. CONNECTION IN DETAIL A1 & A2 SHOWN IN NOMINAL POSITION. ACTUAL CONNECTION MAY BE ±8".
14. WHEN CONNECTIONS IN DETAIL A1 & A2 ARE AT THEIR MAX/MIN POSITIONS (±2") INTERFERING SPLICE HARDWARE MAY BE RELOCATED TO NEXT NEAREST SLOTS.
15. WHERE PRESENT, TRANSVERSE BRACE MAY UTILIZE LOWER SPLICE BOLTS. SEE CONNECTIONS SHEET FOR MORE INFORMATION.
16. ZEE–TO–ZEE SPLICE SHALL ALWAYS OVERLAP APPROXIMATELY 24", AS INDICATED, EXCEPT AT ENDS OF ROW, WHERE NO SPLICE IS REQUIRED.
17. SPLICE MAY OVERLAP IN EITHER DIRECTION.
18. ZEE PURLIN MATERIAL AND FINISH ARE MANUFACTURED TO SPECIFICATIONS THAT MEET OR EXCEED OUR STANDARD PRODUCT WARRANTY.
19. ZEE PURLINS GALVANIZED TO CONFORM TO A MINIMUM THICKNESS DESIGNATION EQUAL TO G90 OR INLINE GALVANIZED TO COMPARABLE THICKNESS AS PER ASTM A1057.
20. TYPICAL ZEE PURLIN RETURN LIP ANGLE SHOWN. ACTUAL ANGLE MAY VARY.
21. SLOT DIMENSIONS FOR REFERENCE ONLY. FINAL SHAPE, FREQUENCY, AND DIMENSIONS MAY VARY.
22. LENGTH OF PURLIN VARIES BY PROJECT AND LOCATION WITHIN ARRAY.

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897 WATERVLIET SHAKER ROAD
ALBANY, NY 12205

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PROJECT NUMBER: 2222708
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ISSUED FOR: FOR PERMIT ONLY
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DRAWING NAME:

**STRUCTURAL PURLINS**

DRAWING NUMBER:

**S400A**

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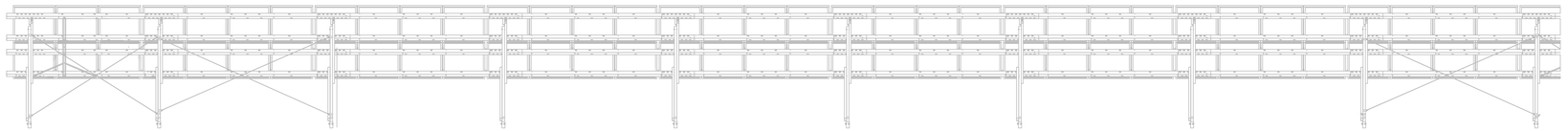
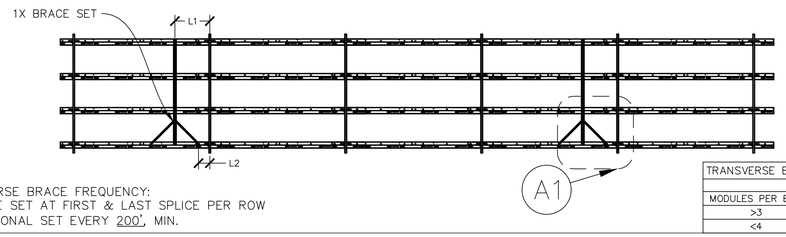


EAST/WEST CABLE BRACE FREQUENCY: OUTSIDE 2 BAYS AND EVERY 7TH BAY

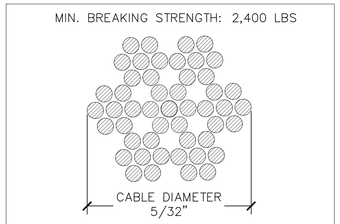
E1 | REAR VIEW: CABLE BRACE FREQUENCY



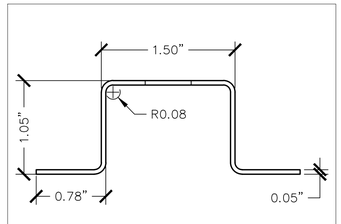

TRANSVERSE BRACE FREQUENCY:
1X BRACE SET AT FIRST & LAST SPLICE PER ROW
1X ADDITIONAL SET EVERY 200', MIN.

| TRANSVERSE BRACE LOCATION FROM CHORD | | |
|---|---|---|
| MODULES PER BAY | L1 | L2 |
| >3 | (70.25") | (12.00") |
| <4 | (52.00") | (14.00") |

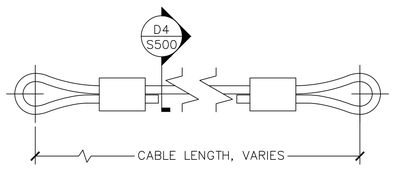
D1 | BOTTOM VIEW: TRANSVERSE BRACE LOCATIONS



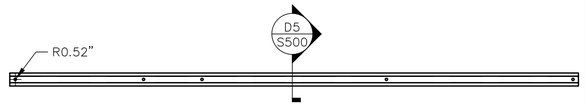

D4 | SEC.: CABLE BRACE



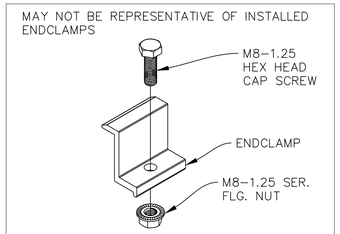

D5 | SECTION: TVS BRACE



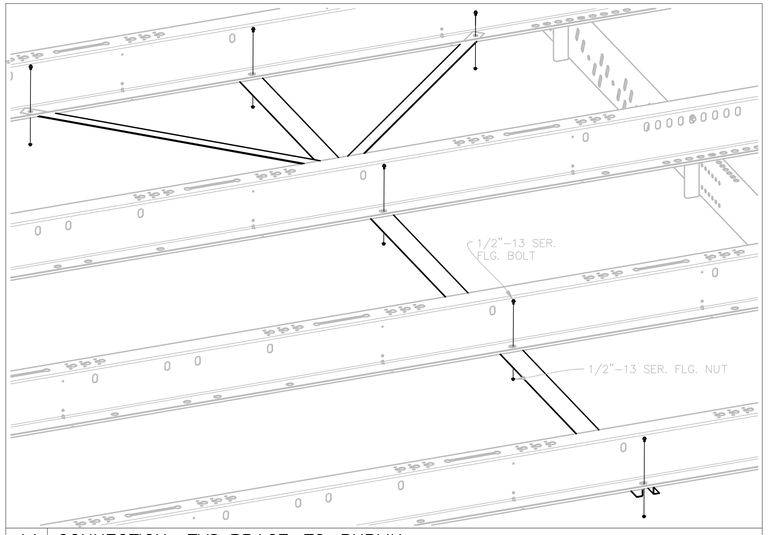

C1 | PART: CABLE BRACE



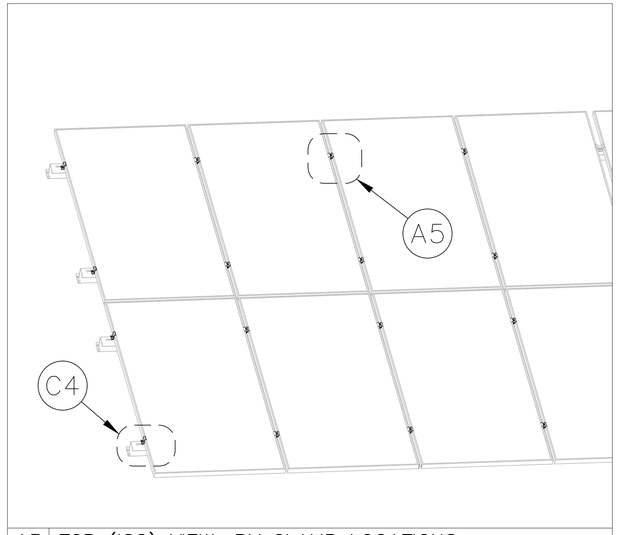

C2 | PART: TRANSVERSE BRACE (TVS BRACE)



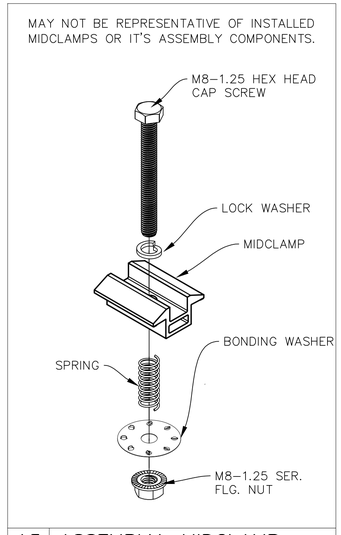

C4 | ASSEMBLY: ENDCLAMP




A1 | CONNECTION: TVS BRACE-TO-PURLIN




A3 | TOP (ISO) VIEW: PV CLAMP LOCATIONS




A5 | ASSEMBLY: MIDCLAMP

NOTES:

1. HARDWARE TORQUE VALUES:

   1/2"-13 STAINLESS STEEL
   MIN.: 40 FT-LBS

   M8-1.25 STAINLESS STEEL
   MIN.: 14.0 FT-LBS
   NOM.: 15.6 FT-LBS
   MAX.: 25 FT-LBS

2. DEPICTED HARDWARE AND PART PLACEMENT NOT INDICATIVE OF PREFERRED OR REQUIRED POSITIONS.
3. HOLE/SLOT PATTERNS IN PARTS ALLOW FOR DEVIATION FROM NOMINAL DIMENSIONS, MULTIPLE PART POSITIONS, AND MULTIPLE TILT ANGLES.
4. SEE INSTALLATION MANUAL FOR SETUP INSTRUCTIONS.
5. SERRATED FLANGED BOLTS MAY BE REPLACED WITH EQUIVALENT PRESS-IN BOLTS.
6. PRESS-IN BOLTS, WHERE PRESENT, TO BE INSTALLED TO MANUFACTURERS RECOMMENDED VALUES.
7. OTHER SPECIFIC CONNECTIONS ELSEWHERE IN PRINT SET.
8. SERRATED HARDWARE MAY BE REPLACED WITH EQUIVALENT HARDWARE WITH WASHERS IF NECESSARY.
9. STAINLESS STEEL HARDWARE MAY BE REPLACED WITH GALVANIZED STEEL HARDWARE OR CORROSION AND STRENGTH COMPARABLE HARDWARE MATERIALS AND FINISHES.
10. UNLESS NOTED OTHERWISE, ALL HARDWARE MAY BE INSTALLED IN EITHER DIRECTION (NUT/BOLT MAY BE ON EITHER SIDE OF CONNECTION).
11. WHEN NECESSARY, ADDITIONAL HOLES MAY BE DRILLED TO COMPLETE CONNECTION. ENGINEERING SHALL BE CONTRACTED PRIOR TO FIELD MODIFICATIONS OF PARTS.
12. EASE/WEST CABLE BRACING (C1) TO BE INSTALLED IN THE SPACE BETWEEN ANCHOR SETS (BAY).
13. MINIMUM CABLE BREAKING STRENGTH DETERMINED BY PROJECT SPECIFIC STRUCTURAL CALCULATIONS.
14. CABLE TO BE STAINLESS STEEL AIRCRAFT CABLE.
15. CABLE MAY BE OF ANY CONFIGURATION (IE. 7X7 OR 7X19) AS LONG AS IT MEETS THE REQUIREMENTS LISTED ON THIS SHEET.
16. LENGTH OF BRACES WILL VARY DEPENDENT ON PROJECT SPECIFICS.
17. TRANSVERSE BRACE SETS SHALL BE INSTALLED AT FREQUENCY INDICATED.
18. TRANSVERSE BRACE SHALL BE FASTENED IN THREE PLACES (ONCE TO EACH ZEE).
19. TRANSVERSE BRACES ARE NOT A REQUIREMENT OF THE STRUCTURAL MODELS. APA REQUIRES THEIR PRESENCE AS AN ASSEMBLY AID ONLY.
20. DUE TO IT'S NON-STRUCTURAL NATURE, TRANSVERSE BRACE PROFILE, THICKNESS, MATERIAL, STRENGTH, COATING, FREQUENCY, AND INSTALLATION MAY CHANGE AT ANY TIME AT THE DISCRETION OF APA, BY APPROVAL OF APA ENGINEERING.
21. WHERE TRANSVERSE BRACE CANNOT BE INSTALLED DUE TO NS CHORD (OUT OF NOMINAL LOCATION), BRACE SHALL BE RELOCATED TO NEXT NEAREST REASONABLE SPLICE.
22. TRANSVERSE BRACE MAY UTILIZE LOWER SPLICE BOLTS, WHERE PRESENT. SEE PURLIN SHEET FOR MORE INFORMATION.
23. EACH PV MODULE SHALL BE CLAMPED IN 4 PLACES.
24. A MAJORITY OF THE CLAMP BOLT FLANGES MUST TERMINATE OVER THE SLOT, AND NOT OVER THE KEYHOLE.
25. SPRING, & PANEL GUIDE MAY NOT BE PRESENT AT ALL LOCATIONS, OR ANY LOCATIONS.
26. ALL PANELS MUST BE GROUNDED/BONDED TO ZEE PURLINS. THIS MAY BE ACCOMPLISHED WITH THE PANEL GUIDE, BONDING WASHERS, DYNOBOND EQUIPMENT OR OTHER APPROVED GROUNDING DEVICE.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PROJECT NUMBER: 2222708
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DRAWING NAME:

**CLAMPS & BRACES**

DRAWING NUMBER:

# S500A

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## 1. MODULE CONSTANTS

| MAX. MODULE DIMS. | | | | |
|---|---|---|---|---|
| WIDTH | 44.65 | IN | 3.72 | FT |
| LENGTH | 95.12 | IN | 7.93 | FT |
| HEIGHT | 2.00 | IN | 0.17 | FT |
| WEIGHT | 76.00 | LBS | | |
| AREA | 29.49 | SQ FT | | |

## 2. DESIGN CONSTANTS

| SNOW LOAD CONSTANTS | | |
|---|---|---|
| TERRAIN TYPE | C | |
| EXPOSURE CONDITION | FULLY EXPOSED | |
| EXPOSURE FACTOR | 0.90 | Ce |
| THERMAL CONDITION | UNHEATED | |
| THERMAL FACTOR | 1.20 | Ct |
| IMPORTANCE CATEGORY | I | |
| IMPORTANCE FACTOR | 0.80 | Is |
| ROOF SURFACE TYPE | SLIPPERY | |
| VENTILATION | VENTILATED | |

| WIND LOAD CONSTANTS | | |
|---|---|---|
| RISK CATEGORY | I | |
| VELOCITY PRESSURE COEFF. | 0.85 | Kd |
| EXPOSURE CATEGORY | C | |
| GUST EFFECT FACTOR | 0.85 | |
| TOPOGRAPHY FACTOR | 1.0 | Kzt |

| SEISMIC LOAD CONSTANTS | | |
|---|---|---|
| RISK CATEGORY | I | |
| RESPONSE MODIFICATION FACTOR | 1.25 | |
| SYSTEM OVERSTRENGTH FACTOR | 1.25 | |
| DEFLECTION AMPLIFICATION FACTOR | 1.25 | |
| SEISMIC FORCE-RESISTING SYSTEM | CANTILEVERED COLUMN SYSTEMS; STEEL ORDINARY CANTILEVER | |
| SEISMIC IMPORTANCE FACTOR | 1.00 | |
| STRUCTURE TYPE | ALL OTHER SYSTEMS | |
| LONG-PERIOD TRANSITION PERIOD | 6.00 | SEC |

## 3. SITE DESIGN LOADS

| DEAD LOADS | | |
|---|---|---|
| PER PANEL | | |
| MODULES WEIGHT | 76.00 | LBS |
| EW STRUTS WEIGHT | 20.46 | LBS |
| MISC HARDWARE WEIGHT | 5.00 | LBS |
| TOTAL DEAD LOAD | 101.46 | LBS |
| PRESSURE | 3.44 | PSF |
| DISTRIBUTED LOAD | 13.63 | LB/FT |

| SNOW LOADS | | |
|---|---|---|
| PER PANEL | | |
| GROUND SNOW LOAD | 40 | PSF |
| TILT ANGLE | 25 | DEGREES |
| WIDTH | 3.72 | FT |
| DEPTH | 7.18 | FT |
| SLOPED SNOW LOAD | 19.79 | PSF |
| AREA | 26.73 | SQ FT |
| RESULTANT FORCE | 529.09 | LBS |
| DISTRIBUTED LOAD | 71.10 | LB/FT |

| WIND LOADS | | |
|---|---|---|
| PER CARTRIDGE | | |
| ENVELOPE WIDTH | 3.72 | FT |
| ENVELOPE HEIGHT | 3.35 | FT |
| AREA | 12.46 | SQ FT |
| WIND SPEED (3-SEC PEAK GUST), Vult | 105 | MPH |
| VELOCITY PRESSURE | 20.37 | PSF |

| SEISMIC LOADS | | |
|---|---|---|
| PER CARTRIDGE | | |
| MAX SHORT PERIOD ACCELERATION, Ss | 0.560 | G |
| MAX 1 SEC PERIOD ACCELERATION, S1 | 0.140 | G |
| SITE COEF. SHORT PERIOD, FA | 1.35 | |
| SITE COEF. 1 SEC. PERIOD, FV | 2.12 | |
| SITE CLASS | D | |
| DESIGN CATEGORY | D | |
| MAX HEIGHT | 10.85 | FT |
| Cs | 0.40 | |
| WEIGHT OF STRUCTURE | 19,485 | LB |
| SEISMIC BASE SHEAR | 7,868 | LBS |
| SEISMIC BASE SHEAR - PER RACK | 7,868 | LBS |
| LOAD PER POST | 357.63 | LBS |

## 4. LOAD COMBOS.

| LOAD COMBINATIONS | |
|---|---|
| LRFD | |
| CODE | FORMULA |
| D1 | 1.4DL |
| D2 | 1.2DL+0.5SL |
| D3 | 1.2DL+1.6SL |
| D4 | 1.2DL+0.5WL1 |
| D5 | 1.2DL+0.5WL2 |
| D6 | 1.2DL+0.5WL3 |
| D7 | 1.2DL+0.5WL4 |
| D8 | 1.2DL+0.5WL5 |
| D9 | 1.2DL+0.5WL6 |
| D10 | 1.2DL+1.6SL+0.5WL1 |
| D11 | 1.2DL+1.6SL+0.5WL2 |
| D12 | 1.2DL+1.6SL+0.5WL3 |
| D13 | 1.2DL+1.6SL+0.5WL4 |
| D14 | 1.2DL+1.6SL+0.5WL5 |
| D15 | 1.2DL+1.6SL+0.5WL6 |
| D16 | 1.2DL+WL1 |
| D17 | 1.2DL+WL2 |
| D18 | 1.2DL+WL3 |
| D19 | 1.2DL+WL4 |
| D20 | 1.2DL+WL5 |
| D21 | 1.2DL+WL6 |
| D22 | 1.2DL+0.5SL+WL1 |
| D23 | 1.2DL+0.5SL+WL2 |
| D24 | 1.2DL+0.5SL+WL3 |
| D25 | 1.2DL+0.5SL+WL4 |
| D26 | 1.2DL+0.5SL+WL5 |
| D27 | 1.2DL+0.5SL+WL6 |
| D28 | 1.2DL+0.2SL |
| D29 | 1.2DL+EL1 |
| D30 | 1.2DL+EL2 |
| D31 | 1.2DL+EL3 |
| D32 | 1.2DL+EL4 |
| D33 | 1.2DL+0.2SL+EL1 |
| D34 | 1.2DL+0.2SL+EL2 |
| D35 | 1.2DL+0.2SL+EL3 |
| D36 | 1.2DL+0.2SL+EL4 |
| D37 | 0.9DL+WL1 |
| D38 | 0.9DL+WL2 |
| D39 | 0.9DL+WL3 |
| D40 | 0.9DL+WL4 |
| D41 | 0.9DL+WL5 |
| D42 | 0.9DL+WL6 |
| D43 | 0.9DL+EL1 |
| D44 | 0.9DL+EL2 |
| D45 | 0.9DL+EL3 |
| D46 | 0.9DL+EL4 |

| LOAD COMBINATIONS | |
|---|---|
| ASD | |
| CODE | FORMULA |
| D1 | DL |
| D2 | DL+SL |
| D3 | DL+0.75SL |
| D4 | DL+0.6WL1 |
| D5 | DL+0.6WL2 |
| D6 | DL+0.7EL1 |
| D7 | DL+0.7EL2 |
| D8 | DL+0.7EL3 |
| D9 | DL+0.7EL4 |
| D10 | DL+0.75SL+0.45WL1 |
| D11 | DL+0.75SL+0.45WL2 |
| D12 | DL+0.75SL+0.525EL1 |
| D13 | DL+0.75SL+0.525EL2 |
| D14 | DL+0.75SL+0.525EL3 |
| D15 | DL+0.75SL+0.525EL4 |
| D16 | 0.6DL+0.6WL1 |
| D17 | 0.6DL+0.6WL2 |
| D18 | 0.6DL+0.7EL1 |
| D19 | 0.6DL+0.7EL2 |
| D20 | 0.6DL+0.7EL3 |
| D21 | 0.6DL+0.7EL4 |
| D22 | DL+0.6WL3 |
| D23 | DL+0.6WL4 |
| D24 | DL+0.6WL5 |
| D25 | DL+0.6WL6 |
| D26 | DL+0.75SL+0.45WL3 |
| D27 | DL+0.75SL+0.45WL4 |
| D28 | DL+0.75SL+0.45WL5 |
| D29 | DL+0.75SL+0.45WL6 |
| D30 | 0.6DL+0.6WL3 |
| D31 | 0.6DL+0.6WL4 |
| D32 | 0.6DL+0.6WL5 |
| D33 | 0.6DL+0.6WL6 |

## 5. FINAL DESIGN LOADS

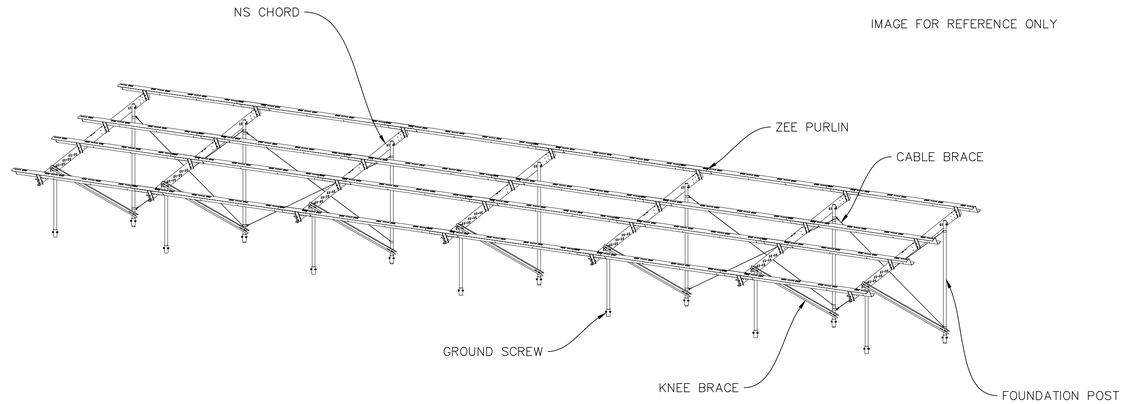
| FORCES | | | | |
|---|---|---|---|---|
| ABBRV. | NAME | RESULTANT LOAD | DISTRIBUTED LOAD (LB/FT/PC.) | DIR. |
| DL | DEAD LOAD | 101.46 | -13.63 | -Y |
| SL | SNOW LOAD | 529.09 | -71.10 | -Y |
| SEE CALC PACKAGE FOR WIND LOADING | | | | |
| | | LB/POST | | |
| EL1 | SEISMIC LEFT | 357.63 | | +X |
| EL2 | SEISMIC RIGHT | -357.63 | | -X |
| EL3 | SEISMIC NORTH | 357.63 | | +Z |
| EL4 | SEISMIC SOUTH | -357.63 | | -Z |

## 6. ANALYSIS RESULTS: LRFD

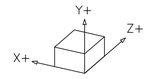
| STEEL CODE CHECK SUMMARY - LRFD | | | | | | |
|---|---|---|---|---|---|---|
| | GREEN ZONE | | YELLOW ZONE | | ORANGE ZONE | |
| DESC. | CTRL EQ. | RATIO | CTRL EQ. | RATIO | CTRL EQ. | RATIO |
| FOUNDATION POST | D13 | 0.56 | D13 | 0.59 | D25 | 0.56 |
| ZEE PURLIN | D14 | 0.97 | D14 | 0.77 | D14 | 0.94 |
| CABLE BRACE | D34 | <0.93 | D34 | 0.93 | D33 | 0.92 |
| KNEE BRACE | D25 | 0.43 | D25 | 0.73 | D25 | 0.76 |
| NS CHORD | D13 | 0.83 | D38 | 0.81 | D34 | 0.78 |

## 7. ANALYSIS RESULTS: ASD

| MAX/MIN SUPPORT REACTIONS - ASD | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | GREEN ZONE | | YELLOW ZONE | | ORANGE ZONE | |
| DIR. | SIGN | LOAD (LBS) | LOAD COMB. | LOAD (LBS) | LOAD COMB. | LOAD (LBS) | LOAD COMB. |
| X | MAX | 0 | D13 | 1404 | D7 | 1394 | D19 |
| | MIN | 0 | D18 | -1404 | D18 | -1394 | D6 |
| Y | MAX | 3714 | D27 | 4055 | D27 | 3667 | D27 |
| | MIN | -2961 | D17 | -4270 | D17 | -4086 | D17 |
| Z | MAX | 1354 | D22 | 1897 | D30 | 1742 | D30 |
| | MIN | -735 | D31 | -1578 | D23 | -1646 | D23 |




| MEMBER SUMMARY | | |
|---|---|---|
| DESCRIPTION | SECTION | MATERIAL |
| KNEE BRACE | CEE 3 X 2 X 0.078 | A653 SS GR 80 CL1 |
| FOUNDATION POST | POST 2.375 X 0.095 | A570 GR50 HOT ROLLED |
| NS CHORD | CEE 6 X 2 X 0.108 | A653 HSLAS GR 80 |
| ZEE PURLIN | ZEE 6 X 3 X 0.055 | A653 SS GR 80-19A |
| CABLE BRACE | CABLE BRACE 5/32 | A36 |




TITAN - DUO
25° TILT
40 PSF SNOW
105 MPH WIND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ALBANY, NY 12205

| NO: | DATE: | DESCRIPTION: |
|---|---|---|
| Revisions | | |

PROJECT NUMBER: 2222708
DRAWN BY:
REVIEWED BY:
ISSUED FOR: FOR PERMIT ONLY
DATE: 07/13/2022
DRAWING NAME:

**STRUCTURAL ANALYSIS**

DRAWING NUMBER:

# S600A