

CONTRACT

THIS CONTRACT is between the CITY OF ANN ARBOR, a Michigan municipal corporation, 301 East Huron Street, Ann Arbor, Michigan 48104 ("City") and HOMELAND BUILDERS OF MICHIGAN LLC d/b/a HOMELAND SOLAR ("Contractor"), a Michigan limited liability company, located at 4975 Miller Road, Ann Arbor, MI 48103.

Based upon the mutual promises below, the Contractor and the City agree as follows:

ARTICLE I - Scope of Work

The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the project titled **Solar and Battery Storage Installation at City Facilities, ITB No. 4766** in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, all of which are incorporated as part of this Contract:

Non-discrimination and Living Wage	General Conditions
Declaration of Compliance Forms (if applicable)	Standard Specifications
Vendor Conflict of Interest Form	Detailed Specifications
Prevailing Wage Declaration of Compliance	Plans
Form (if applicable)	Addenda
Bid Forms	
Contract and Exhibits	
Bonds	

ARTICLE II - Definitions

Administering Service Area/Unit means Office of Sustainability and Innovations

Project means Solar and Battery Storage Installation at City Facilities, ITB No. 4766

Supervising Professional means the person acting under the authorization of the manager of the Administering Service Area/Unit. At the time this Contract is executed, the Supervising Professional is: Simi Barr, whose job title is Senior Analyst, Municipal Operations. If there is any question concerning who the Supervising Professional is, Contractor shall confirm with the manager of the Administering Service Area/Unit.

Contractor's Representative means Mark Dorogi whose title is Founder and Chief Operating officer.

ARTICLE III - Time of Completion

- (A) The work to be completed under this Contract shall begin immediately on the date specified in the Notice to Proceed issued by the City.
- (B) The entire work for this Contract shall be completed within 18 months, from contract execution.

- (C) Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the Contractor to pay the City, as liquidated damages and not as a penalty, an amount equal to \$500 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

ARTICLE IV - The Contract Sum

- (A) The City shall pay to the Contractor for the performance of the Contract, the lump sum price as given in the Bid Form in the amount of:

Three hundred sixty four thousand, six hundred dollars (\$364,600.00)

- (B) The amount paid shall be equitably adjusted to cover changes in the work ordered by the Supervising Professional but not required by the Contract Documents. Increases or decreases shall be determined only by written agreement between the City and Contractor.

ARTICLE V - Assignment

This Contract, and any portion or any right or obligation thereunder, may not be assigned or subcontracted without the written consent of the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under this contract unless specifically released from the requirement, in writing, by the City.

ARTICLE VI - Choice of Law

This Contract shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this Contract, the Contractor and the City agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this Contract. The parties stipulate that the venue referenced in this Contract is for convenience and waive any claim of non-convenience.

Whenever possible, each provision of the Contract will be interpreted in a manner as to be effective and valid under applicable law. The prohibition or invalidity, under applicable law, of any provision will not invalidate the remainder of the Contract.

ARTICLE VII - Relationship of the Parties

The parties of the Contract agree that it is not a Contract of employment but is a Contract to accomplish a specific result. Contractor is an independent Contractor performing services for the

City. Nothing contained in this Contract shall be deemed to constitute any other relationship between the City and the Contractor.

Contractor certifies that it has no personal or financial interest in the project other than the compensation it is to receive under the Contract. Contractor certifies that it is not, and shall not become, overdue or in default to the City for any Contract, debt, or any other obligation to the City including real or personal property taxes. City shall have the right to set off any such debt against compensation awarded for services under this Contract.

ARTICLE VIII - Notice

All notices given under this Contract shall be in writing, and shall be by personal delivery or by certified mail with return receipt requested to the parties at their respective addresses as specified in the Contract Documents or other address the Contractor may specify in writing. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; or (2) three days after mailing certified U.S. mail.

ARTICLE IX - Indemnification

To the fullest extent permitted by law, Contractor shall indemnify, defend and hold the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney's fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this Contract, by the Contractor or anyone acting on the Contractor's behalf under this Contract. Contractor shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence. The provisions of this Article shall survive the expiration or earlier termination of this contract for any reason.

ARTICLE X - Entire Agreement

This Contract represents the entire understanding between the City and the Contractor and it supersedes all prior representations, negotiations, agreements, or understandings whether written or oral. Neither party has relied on any prior representations in entering into this Contract. No terms or conditions of either party's invoice, purchase order or other administrative document shall modify the terms and conditions of this Contract, regardless of the other party's failure to object to such form. This Contract shall be binding on and shall inure to the benefit of the parties to this Contract and their permitted successors and permitted assigns and nothing in this Contract, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Contract. This Contract may be altered, amended or modified only by written amendment signed by the City and the Contractor.

ARTICLE XI – Electronic Transactions

The City and Contractor agree that signatures on this Contract may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this Contract. This Contract may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

[Signatures on next page]

**HOMELAND BUILDERS OF MICHIGAN
LLC d/b/a HOMELAND SOLAR**

By_____

Name:

Title:

Date:_____

CITY OF ANN ARBOR

By_____

Christopher Taylor, Mayor

By_____

Jacqueline Beaudry, City Clerk

Dated:_____

Approved

By_____

Milton Dohoney Jr., City Administrator

By_____

Missy Stults, Sustainability and
Innovations Director

Approved

By_____

Atleen Kaur, City Attorney

PERFORMANCE BOND

- (1) Homeland Builders of Michigan LLC d/b/a Homeland Solar of 4975 Miller Rd., Ann Arbor, MI 48103 (referred to as "Principal"), a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for \$364,600.00, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.
- (2) The Principal has entered a written Contract with the City entitled Solar and Battery Storage Installation at City Facilities, ITB No. 4766 and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq.
- (3) Whenever the Principal is declared by the City to be in default under the Contract, the Surety may promptly remedy the default or shall promptly:
- (a) complete the Contract in accordance with its terms and conditions; or
 - (b) obtain a bid or bids for submission to the City for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, arrange for a Contract between such bidder and the City, and make available, as work progresses, sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in paragraph 1.
- (4) Surety shall have no obligation to the City if the Principal fully and promptly performs under the Contract.
- (5) Surety agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or the specifications accompanying it shall in any way affect its obligations on this bond, and waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work, or to the specifications.
- (6) Principal, Surety, and the City agree that signatures on this bond may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this bond. This bond may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

SIGNED AND SEALED this _____ day of _____, 202__.

(Name of Surety Company)

By _____
(Signature)

Its _____
(Title of Office)

Approved as to form:

Atleen Kaur, City Attorney

(Name of Principal)

By _____
(Signature)

Its _____
(Title of Office)

Name and address of agent:

LABOR AND MATERIAL BOND

- (1) Homeland Builders of Michigan LLC d/b/a Homeland Solar of 4975 Miller Rd., Ann Arbor, MI 48103 (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq., in the amount of \$364,600.00, for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.
- (2) The Principal has entered a written Contract with the City entitled Solar and Battery Storage Installation at City Facilities, ITB No. 4766; and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended.
- (3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under the Contract, the Surety shall pay those claimants.
- (4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation if the Principal promptly and fully pays the claimants.
- (5) Principal, Surety, and the City agree that signatures on this bond may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this bond. This bond may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

SIGNED AND SEALED this _____ day of _____, 202__

(Name of Surety Company)
By _____
(Signature)
Its _____
(Title of Office)

Approved as to form:

Atleen Kaur, City Attorney

(Name of Principal)
By _____
(Signature)
Its _____
(Title of Office)

Name and address of agent:

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents are complementary and what is called for by any one document shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work described in words which so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

(1) Addenda in reverse chronological order; (2) Detailed Specifications; (3) Standard Specifications; (4) Plans; (5) General Conditions; (6) Contract; (7) Bid Forms; (8) Bond Forms; (9) Bid.

Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Site and Work

The Contractor or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Contractor will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Contractor will not be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission which Contractor was aware of and did not bring to the City's attention before commencing work.

Section 4 - Wage Requirements

Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states "...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section.

Pursuant to Resolution R-16-469 all public improvement contractors are subject to prevailing wage and will be required to provide to the City payroll records sufficient to demonstrate compliance with the prevailing wage requirements. A sample Prevailing Wage Form is provided in the Appendix herein for reference as to what will be expected from contractors. Use of the Prevailing Wage Form provided in the Appendix section or a City-approved equivalent will be required along with wage rate interviews.

Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

If the Contractor is a "covered employer" as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Contract a "living wage," as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Contract are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

Contractor agrees that all subcontracts entered into by the Contractor shall contain similar wage provision covering subcontractor's employees who perform work on this contract.

Section 5 - Non-Discrimination

The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of Title IX of the Ann Arbor City Code, and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the City harmless from loss on account of infringement except that the City shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the City has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The City shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.

Section 10 - Protection of the Public and of Work and Property

The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to its work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or employees of the City. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The City shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the City shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.

Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The City may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

- (1) When work under an extra work order is added to the work under this Contract;
- (2) When the work is suspended as provided in Section 20;
- (3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;
- (4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;
- (5) Delay due to an act of Government;
- (6) Delay by the Supervising Professional in the furnishing of plans and necessary information;
- (7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work - Section 13. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

- (1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;
- (2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;
- (3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;
- (4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;
- (5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City's Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the City will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The City will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than 180 days after the date of delivery of all of the equipment to be furnished, unless testing has been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2.

Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within 10 days after written notice, the City may remove them and, if the removed material has value, may store the material

at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the City may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the City the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the City under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the City:

- (1) The consent of the surety to payment of the final estimate;
- (2) The Contractor's Affidavit in the form required by Section 44.

In case the Affidavit or consent is not furnished, the City may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

The making and acceptance of the final payment shall constitute a waiver of all claims by the City except those arising from:

- (1) unsettled liens;
- (2) faulty work appearing within 12 months after final payment;
- (3) hidden defects in meeting the requirements of the plans and specifications;
- (4) manufacturer's guarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The City may at any time suspend the work, or any part by giving 5 days notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the

written notice from the City to the Contractor to do so. The City shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the City does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and the City's Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the City may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the City may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any excess cost to the City. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the City, terminate this Contract and recover from the City payment for all acceptable work executed plus reasonable profit.

Section 23 - City's Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the City may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the City, shall promptly remove any part or all of its equipment and supplies from the property of the City, failing which the City shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the City and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the City upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the City for damages to materials and equipment from any cause except negligence or willful act of the City. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the City, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the City may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The City may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the City from loss on account of:

- (1) Defective work not remedied;
- (2) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;
- (3) Failure of the Contractor to make payments properly to subcontractors or for material or labor;
- (4) Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the City which will protect the City in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

- (1) The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage that may arise under this Contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor, or anyone employed by them directly or indirectly. Prior to commencement of any work under this contract, Contractor shall provide to the City documentation satisfactory to the City, through City-approved means (currently myCOI), demonstrating it has obtained the required policies and endorsements. The certificates of insurance endorsements and/or copies of

policy language shall document that the Contractor satisfies the following minimum requirements. Contractor shall add registration@mycoitracking.com to its safe sender's list so that it will receive necessary communication from myCOI. When requested, Contractor shall provide the same documentation for its subcontractor(s) (if any).

Required insurance policies include:

- (a) Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

- Bodily Injury by Accident - \$500,000 each accident
 - Bodily Injury by Disease - \$500,000 each employee
 - Bodily Injury by Disease - \$500,000 each policy limit

- (b) Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 04 13 or current equivalent. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements specifically for the following coverages: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further there shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. The following minimum limits of liability are required:

- \$1,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.
 - \$2,000,000 Per Project General Aggregate
 - \$1,000,000 Personal and Advertising Injury
 - \$2,000,000 Products and Completed Operations Aggregate, which, notwithstanding anything to the contrary herein, shall be maintained for three years from the date the Project is completed.

- (c) Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 10 13 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be \$1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

- (d) Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of \$1,000,000.

- (2) Insurance required under subsection (1)(b) and (1)(c) above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute

with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City for any insurance listed herein.

- (3) Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional and un-qualified 30-day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number(s); name of insurance company(s); name and address of the agent(s) or authorized representative(s); name(s), email address(es), and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which may be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) and all required endorsements to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.
- (4) Any Insurance provider of Contractor shall be authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-authorized insurance companies are not acceptable unless approved in writing by the City.
- (5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.
- (6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

Section 29 - Surety Bonds

Bonds will be required from the Contractor as follows:

- (1) A Performance Bond to the City of Ann Arbor for the amount of the proposals/bid(s) accepted;
- (2) A Labor and Material Bond to the City of Ann Arbor for the amount of the proposals/bid(s) accepted.

Bonds shall be executed on forms supplied by the City in a manner and by a Surety Company authorized to transact business in Michigan and satisfactory to the City Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the City or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the City.

Section 33 - Rights of Various Interests

Whenever work being done by the City's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the City. The approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the City may require.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the City or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the City, any additional land and access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the City's property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain City property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

No night or Sunday work (without prior written City approval) will be permitted except in the case of an emergency and then only to the extent absolutely necessary. The City may allow night work which, in the opinion of the Supervising Professional, can be satisfactorily performed at night. Night work is any work between 8:00 p.m. and 7:00 a.m. No Saturday work will be permitted unless the Contractor gives the Supervising Professional at least 48 hours but not more than 5 days notice of the Contractor's intention to work the upcoming Saturday.

Section 42 - Sales Taxes

Under State law the City is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in City projects are not likewise exempt. State Law shall prevail. The Contractor is presumed to know and understand the law and to have prepared its bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance for taxes it must pay.

Section 43

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____, 20____, to _____, 20____, performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled solar and Battery Storage Installation at City Facilities, for which I shall ask, demand, sue for, or claim compensation or extension of time from the City, except as I hereby make claim for additional compensation or extension of time as set forth on the attached itemized statement. I further declare that I have paid all payroll obligations related to this Contract that have become due during the above period and that all invoices related to this Contract received more than 30 days prior to this declaration have been paid in full except as listed below.

There is/is not (Contractor please circle one and strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.

Contractor

Date

By _____
(Signature)

Its _____
(Title of Office)

Past due invoices, if any, are listed below.

Section 44

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor, _____, represents that on _____, 20____, it was awarded a contract by the City of Ann Arbor, Michigan to _____ under the terms and conditions of a Contract titled _____. The Contractor represents that all work has now been accomplished and the Contract is complete.

The Contractor warrants and certifies that all of its indebtedness arising by reason of the Contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the project, as well as all other claims arising from the performance of the Contract, have been fully paid or satisfactorily settled. The Contractor agrees that, if any claim should hereafter arise, it shall assume responsibility for it immediately upon request to do so by the City of Ann Arbor.

The Contractor, for valuable consideration received, does further waive, release and relinquish any and all claims or right of lien which the Contractor now has or may acquire upon the subject premises for labor and material used in the project owned by the City of Ann Arbor.

This affidavit is freely and voluntarily given with full knowledge of the facts.

Contractor

Date

By _____
(Signature)

Its _____
(Title of Office)

Subscribed and sworn to before me, on this _____ day of _____, 20____
_____, _____ County, Michigan

Notary Public

County, MI

My commission expires on:

STANDARD SPECIFICATIONS

All work under this contract shall be performed in accordance with the Public Services Standard Specifications in effect at the date of availability of the contract documents stipulated in the RFP. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

Standard Specifications are available online:

<http://www.a2gov.org/departments/engineering/Pages/Engineering-and-Contractor-Resources.aspx>

DETAILED SPECIFICATIONS

Minimum technical specifications

General

- All power generation and transmission equipment must be UL listed and installed for its designed use.
- Construction must comply with most recent currently adopted State Building Code, which encompasses:
 - International Building Code
 - National Electric Code (NEC)
 - All other relevant state and national codes
- Contractor must transfer all manufacturer warranties for key equipment.
- System Contractor is responsible for conducting all required building, utility, and rebate inspections, and must complete all construction and documentation in a manner necessary to pass such inspections, and in accordance with industry standard best practices.
- System Contractor must possess current state electric and contractor's license from State's Contractors Licensing Board to perform work being proposed.

Solar PV Modules

- System modules shall be UL1703 listed, and CEC-listed.
- Module manufacturer must provide a 10-year warranty on minimum of 90% nameplate energy production and 25-year warranty on minimum of 80% nameplate energy production.
- All warranties must be documented in advance and be fully transferable to City.
- Solar module providers must have a strong track record of performance with a long-term ability to provide service and warranties.

Rooftop Mounted Systems

- All roofing penetrations must be performed in such a way (including sealing) to prevent leakage and maintain the existing rooftop warranty.
- All solar panels must be at least 6 inches above the roofing materials.
- Any newly exposed steel must be protected with marine-grade sealants for corrosion resistance.
- All components must be secured to reduce the potential for damage, vandalism, or theft.
- All City policies regarding installation of solar must be followed.

Carport Structures

- All carport structures shall be designed to have a minimum clearance height of ten (10) feet (although this may need to be higher depending on if the proposed locations need to accommodate buses).
- Structures located in parking lots shall be designed to minimize loss or encumbrance of parking spaces and ADA paths of travel.
- If necessary, painted concrete bollards shall be installed on support posts. The bollards shall extend up to a minimum elevation of 36" above finished grade.

- All structures shall be installed with a fascia surrounding the exposed edge of the structure's purlins with columns, beams, and fascia painted to a color of the Client's approval.
- All carport structures shall include the installation of high efficiency LED lighting with motion sensors and must conform to applicable local and state requirements.
- Carports should be wired with at least one power outlet per array.

Inverters

- Inverters must be located on a concrete pad with proper enclosures to prevent damage or theft.
- Inverters shall be UL1741 listed and IEEE 1547 compliant and must be CEC-listed with an CEC efficiency of 96% or higher.
- The inverter shall be capable of continuous operation with voltage variation of +/- 10% of nominal AC voltage. The inverter shall operate in an ambient temperature range of - 20°C to +50°C.
- PV array design shall maintain DC input voltage within the inverter's specified MPPT window for all expected operating temperatures.
- Inverters shall include all necessary self-protective features and self-diagnostic features to protect the inverter from damage (in the event of component failure or from parameters beyond normal operating range due to internal or external causes).
- Inverters must carry minimum 10-year manufacturer warranty.
- All manufacturer warranties must be documented, in advance, and be fully transferable to City.

Balance of System Equipment

- Each proposed PV system shall include, at a minimum, one fused DC disconnect, and one fused AC disconnect for safety and maintenance concerns.
- String combiner boxes must include properly-sized fusing, and all metal equipment and components must be bonded and grounded as required by NEC.
- All system wiring and conduit must comply with NEC stipulations, and all indoor and outdoor wiring, outdoor-rated or otherwise, must be enclosed in EMT or RIGID conduit or covered raceway, except adjacent panel connections and under-array home run wiring.
- Wall penetrations must be sealed in compliance with NEC and NFPA regulations.
- All wiring materials and methods must adhere to industry-standard best practices, and all inter-module connections must require the use of a specialized tool for disconnecting.
- Lightning arrestors must be used to protect appropriate equipment from lightning strikes.
- Material requirements:
 - Fasteners and hardware throughout system shall be stainless steel or material of equivalent corrosion resistance.
 - Racking components shall be anodized aluminum, hot-dipped galvanized steel, or material of equivalent corrosion resistance.
 - Unprotected steel is not to be used in any components.

Interconnection

- The system must comply with all applicable utility interconnection requirements.
- System interconnection must comply with NEC and Utility regulations and must be approved by the applicable utility and the Ann Arbor Building Inspector before any PV system construction begins.

- Emergency back-up generation may exist on-site and must be factored into proposed PV system electrical plans according to building and electrical codes.
- All placards required by Client, the Building Inspector, the Utility, and/or State programs must be provided and installed according to Client and NEC guidelines.

Monitoring and Reporting Systems

- System monitoring and reporting must comply with State solar program requirements and must be provided at no additional cost for a minimum of five years.
- Monitoring shall include revenue-grade metering of PV system production and building consumption; pyranometer; and ambient air temperature sensor.
- Proposals must include Internet hosting of monitoring with on-line access for Client personnel and public display of data.
- Offeror must work with the City to determine best location and technique for monitoring communications interconnection.
- Offeror will be responsible for providing all required monitoring communications and power wiring and conduit, with City guidance on approved locations.

Battery Installations

- Contractor must include an integrated Battery Storage System (BSS) into the proposed Solar PV system that provides, at a minimum, resiliency during grid outages, and potentially other valuable services including load management and grid services. All pertinent details must be provided for the design, construction and interconnection of the BSS that are fully integrated into the Solar PV system and site electrical systems. The BSS must also integrate with any existing systems located on site.

Balance of System Equipment - Battery

Energy Storage Systems must meet the following requirements:

- The maximum sound level generated from the battery system and any associated equipment under any output level shall be limited to 65 dBA at 50 feet in any direction.
- Minimum 80% AC round trip efficiency.
- Chemistry must be lithium-ion; alternative proposals using batteries with lead-acid chemistry will be considered. No other types of energy storage will be considered.
- All components must operate at safe rated sustainable operating temperatures over the required ambient temperature range.
- Monitoring requirements must include: voltage, current, power, system performance alerts, remote and on-site access to data.
- Operation and Maintenance Manual, including recommended corrective action and maintenance procedures for each alert or observed condition.
- The BSS control system shall be designed to provide for automatic, unattended operation and for local manual operation or remote operation.
- Any existing emergency back-up generation connected to the site's electrical systems must be factored into proposed solar PV and BSS electrical plans.
- Interconnection designs and applications must fully document and comply with all utility and local requirements for operation during a grid outage and the safe process for power restoration from the grid.

System Design and Permitting

- Within 30 days of contract being signed, successful offeror shall create a construction plan set which includes at a minimum:
 - Site overview

- Detailed array layout with stringing configuration
- Geotechnical site preparation plans and footing details, as needed
- Mounting and racking details
- Details of electrical transmission showing conduit routing and location of electrical enclosures, conduit support details, and enclosure mounting details
- Electrical single-line diagram
- Monitoring system and recommended monitoring plan
- Documentation regarding how the system design enables efficient repair and maintenance of the arrays
- Construction project plan with timeline
- All proposed system designs and construction techniques must be approved by the City and utility.
- Offeror shall obtain structural PE stamp verifying the integrity of the existing facility to handle the additional weight load of the proposed PV system, if applicable.
- Offeror shall obtain electrical PE stamp verifying the integrity and code compliance of proposed PV system and interconnection with facility.
- Final array layouts shall be designed to minimize or avoid shading. If shading will occur, offeror shall specify the predicted solar access and performance losses.
- Wire loss in DC circuits to be < 1.5% based on STC values.
- Wire loss in AC circuits to be < 1.5% based on nominal voltages.

Construction

- Contractor shall prepare, maintain, and abide by a Site Safety Plan that will include, at a minimum, all applicable OSHA and MIOSHA workplace safety and Personal Protective Equipment (PPE) requirements
- Construction work shall be designed to minimize impact to facility operations. Contractor shall develop a construction plan for site access, staging, and equipment storage and obtain approval from the City prior to beginning construction.
- All asphalt, concrete, landscaping, and other areas that are disturbed during construction shall be remediated and returned to their original condition, or an equivalent condition approved by the City
- After completion of the work, the site shall be left clean and free of any dirt or debris that may have accumulated during construction. All construction equipment, spoils, and other construction byproducts shall be removed from the site.
- All electrical enclosures and equipment shall be installed to be readily accessible to qualified personnel only. Fences or other protection may be required per City specifications both during installation and as part of final design.
- All visible conduits and electrical equipment shall be painted or aesthetically dressed per City specifications.
- Location of existing underground utilities must be marked by MISSDIG and equivalent private service prior to any underground work.
- A goal for construction is zero waste and all recyclable materials must be sorted for proper handling.

Documentation and Process Control

In addition to construction requirements listed above, Contractor is required to:

- Coordinate with and receive appropriate approval from the local DTE Electric for proposed PV systems.
- Obtain Solar rebates and/or Renewable Energy Credits.
- Prepare press releases and a ribbon-cutting ceremony at City request.

- Provide As-Built drawings of PV system, which must include finalized module layout, single line diagram, and stringing chart, ideally in GIS.

Acceptance Testing

Contractor shall perform a complete acceptance test at the system and component level for safety, quality and performance. All testing and commissioning shall be conducted in accordance with the manufacturer's specifications. These tests shall include (but not be limited to) the following:

- Full system performance tests.
- Testing of all sensors of the monitoring system and the on-line presentation of performance.

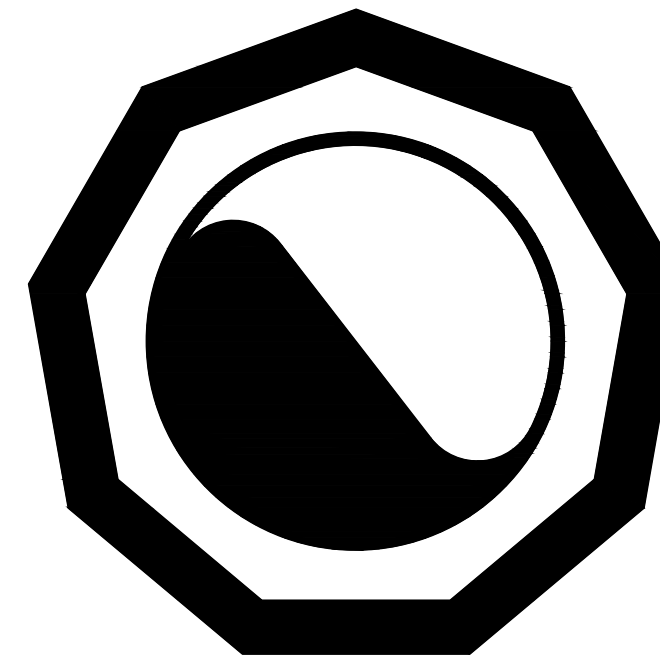
The City (or City's representative) shall be informed, in advance, of testing times and have the opportunity to join in testing procedures. A report of all tests shall document the results of the testing activities and be presented to the City. The report shall include the date and time each test was performed and descriptions of all problems and deficiencies found during testing. Contractor shall be responsible for providing the labor and equipment necessary to conduct these tests and any required troubleshooting.

Owner Training

The Contractor must provide on-site training with accompanying training materials for City personnel in all aspects of operation, routine maintenance, and safety of the systems, and monitoring including:

- PV system safety, including shut-down procedures.
- PV module maintenance and troubleshooting.
- Structural elements maintenance and repair guidelines.
- Inverter overview and maintenance procedures.
- Calibration and adjustment procedures for the inverters and tracking systems (if any).
- Solar panel replacement.
- Monitoring system troubleshooting and reporting.

APPENDIX

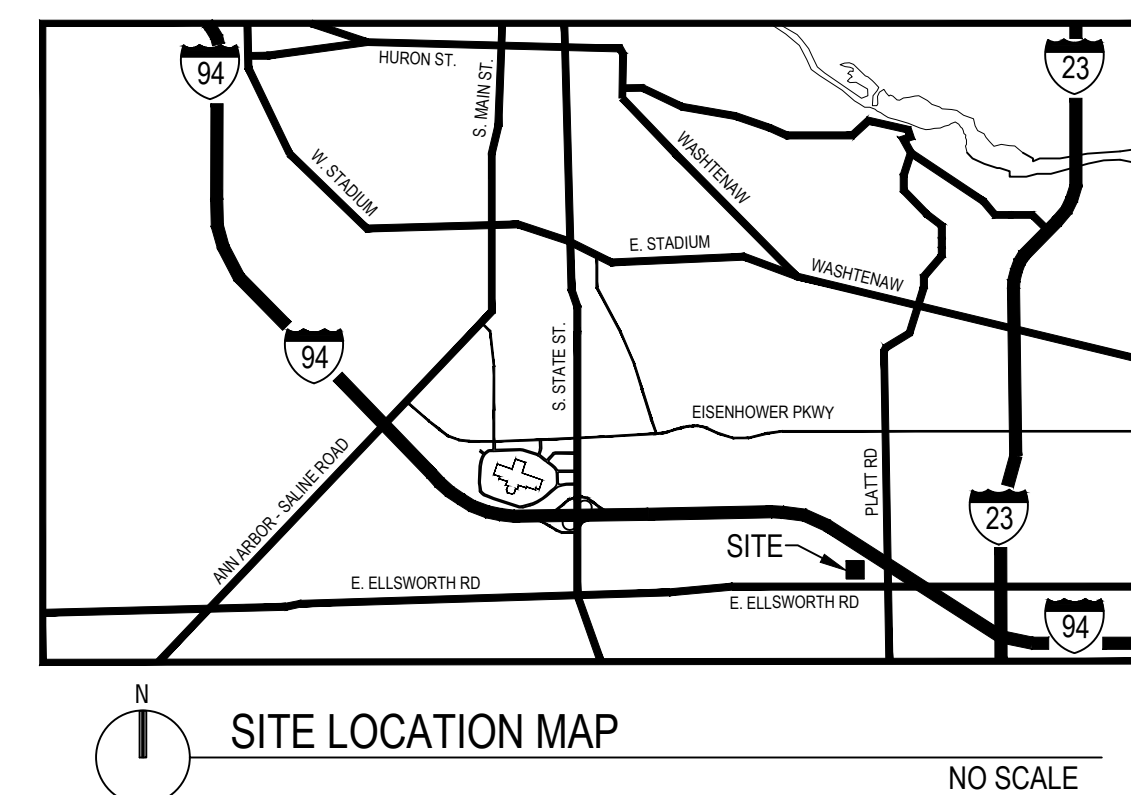
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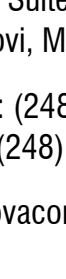
NOVA PROJECT #23-11-1168
50.0 kW AC, 1000 V DC (MAX.), 49.1 kW DC
SOLAR PHOTOVOLTAIC SYSTEM

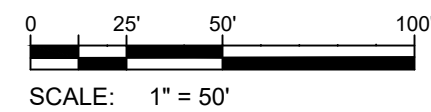
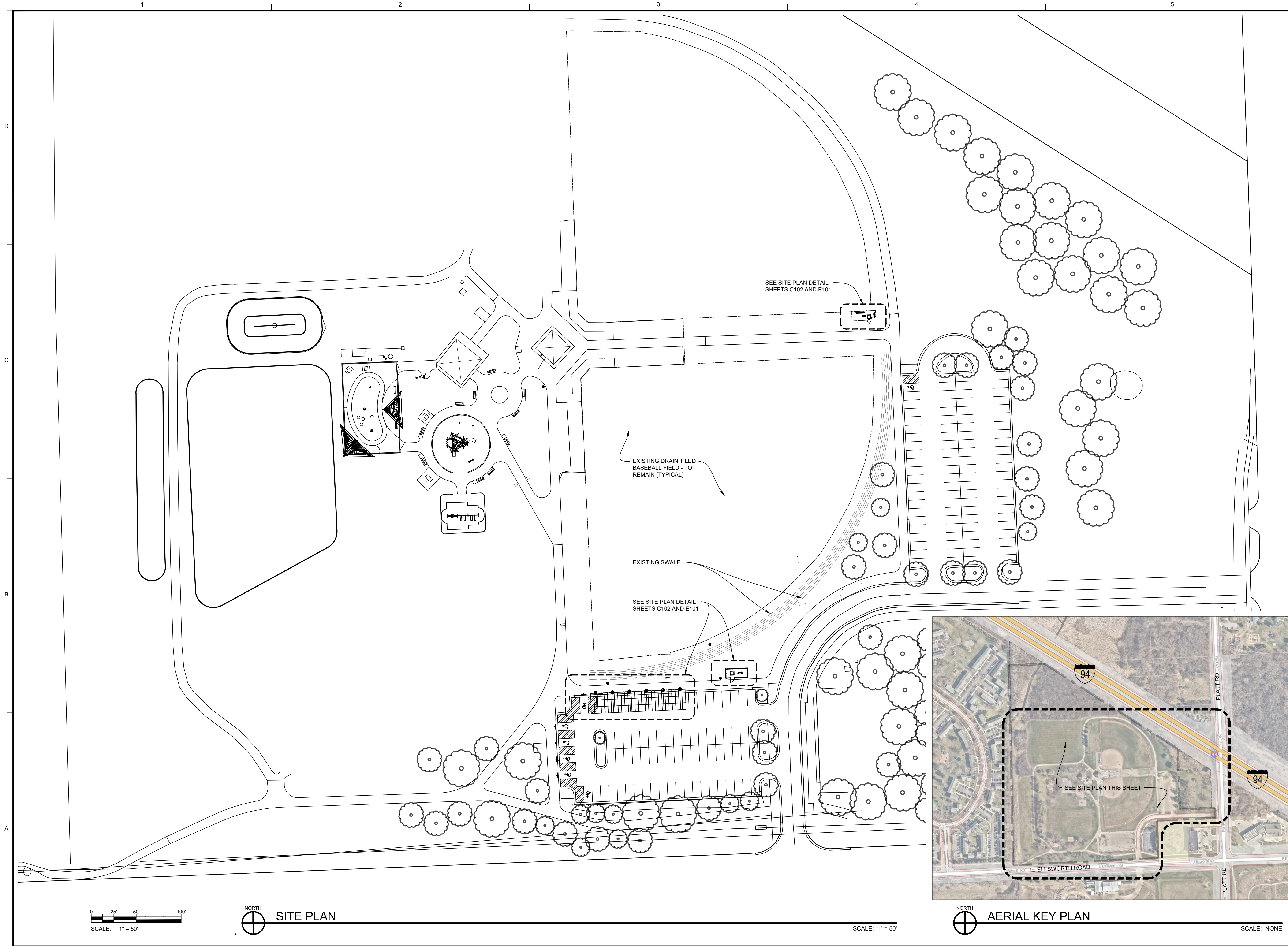
BICENTENNIAL PARK

2945 E. ELLSWORTH
ANN ARBOR, MI 48108

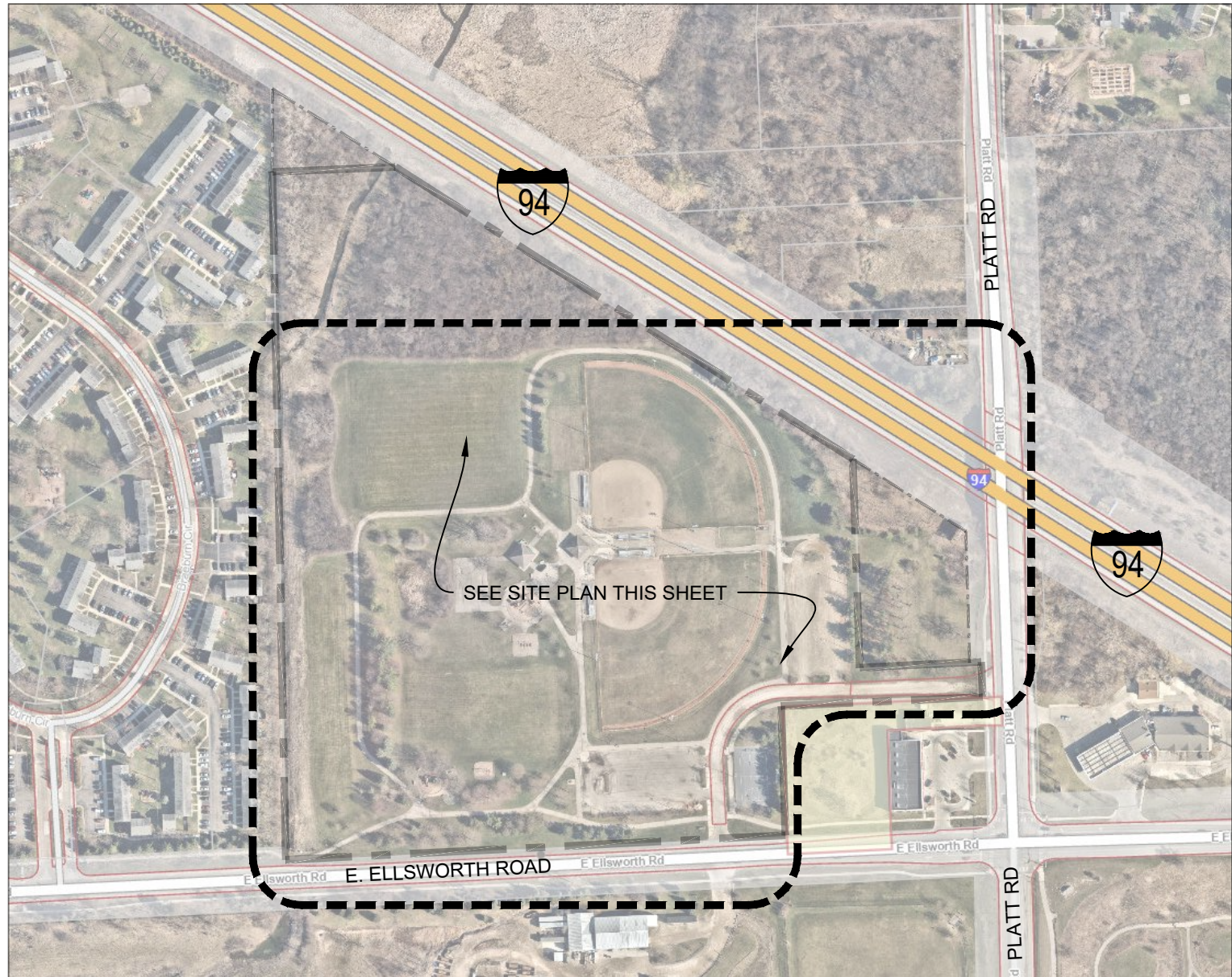
NOVA PROJECT MANAGER: JEFF ECKHOUT



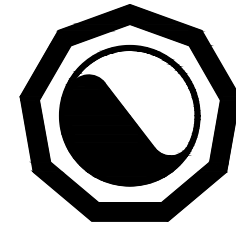
			
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ISSUED			
DATE	DESCRIPTION	APPVD.	
3-22-2024	50% REVIEW	JE	
11-22-2024	90% REVIEW	JE	
1-10-2025	BID REVIEW	JE	
REVISED			
NO.	DATE	DESCRIPTION	APPVD.
CERTIFICATION			
DESIGNED BY		CHECKED BY	
RGM		JE	
CITY OF ANN ARBOR SOLAR FACILITIES BICENTENNIAL PARK 2945 E. ELLSWORTH ANN ARBOR, MI 48108 50.0 kW AC SOLAR ARRAY 49.1 kW DC SOLAR ARRAY			
COVER SHEET			
PROJECT NUMBER			
23-11-1168-PRK			
DRAWN BY		SHEET NUMBER	
GAK		G001	
SCALE			
NONE			
SHEET SIZE			
22x34			



SCALE: 1" = 50'



SCALE: NONE



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1-10-2025	BID REVIEW	JE

REVISED

NO.	DATE	DESCRIPTION	APPVD.

CERTIFICATION

DESIGNED BY RGM	CHECKED BY JE
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CITY OF ANN ARBOR
SOLAR FACILITIES

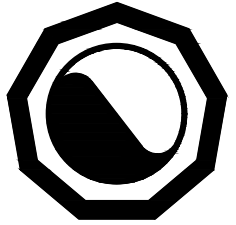
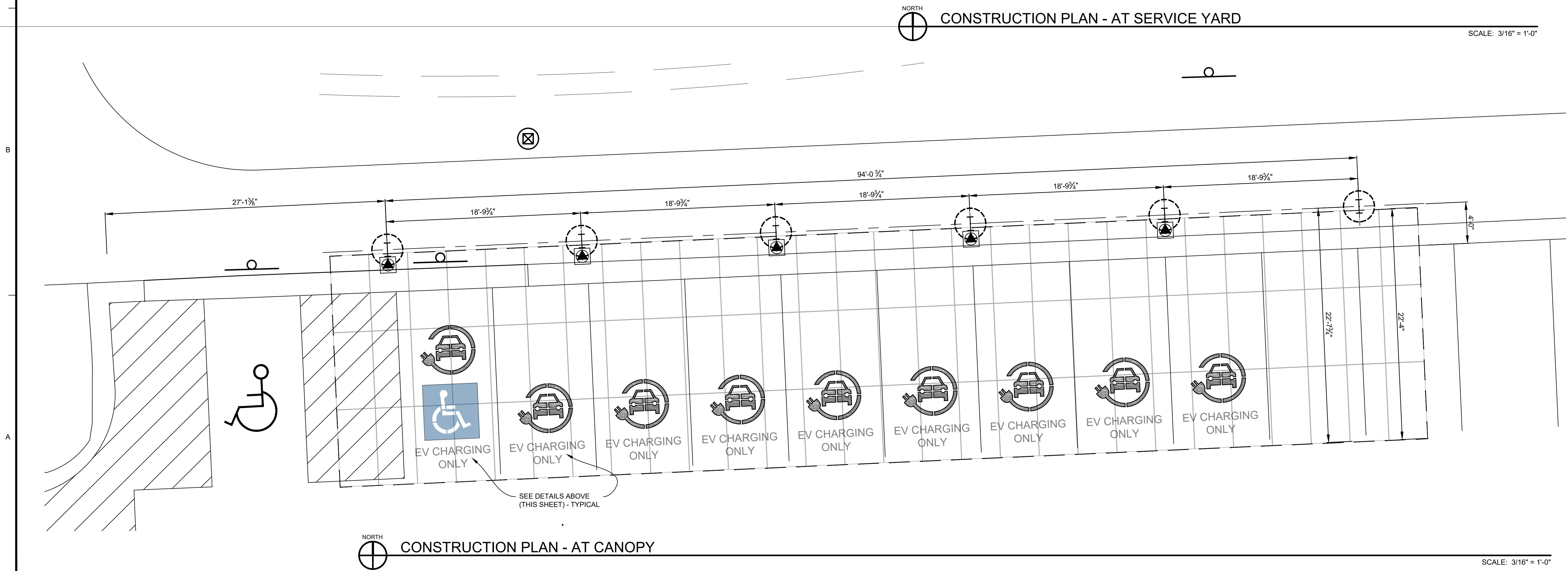
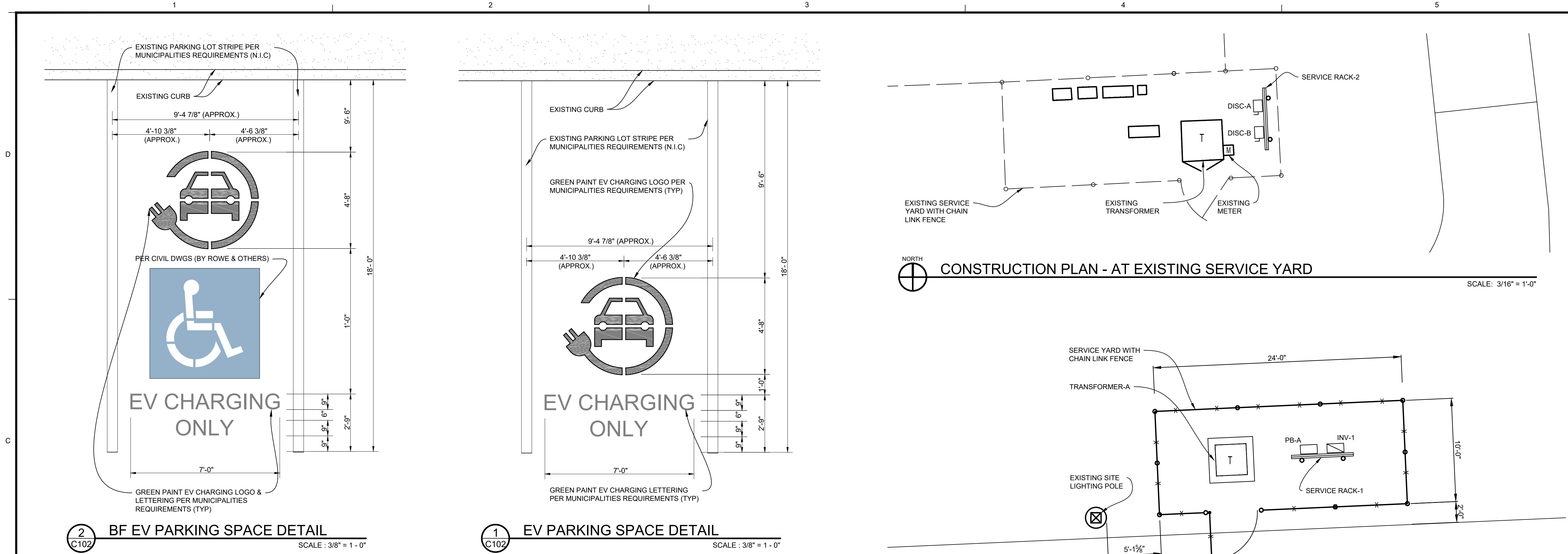
BICENTENNIAL PARK

2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 KW AC SOLAR ARRAY
49.1 KW DC SOLAR ARRAY

SITE PLAN

PROJECT NUMBER 23-11-1168-PRK	
DRAWN BY GAK	SHEET NUMBER C101
SCALE AS NOTED	C101
SHEET SIZE 22x34	



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DATE	DESCRIPTION	APPVD.
3-22-2024	50% REVIEW	JE
11-22-2024	90% REVIEW	JE
1-10-2025	BID REVIEW	JE

REVISED

NO.	DATE	DESCRIPTION	APPVD.

CERTIFICATION

DESIGNED BY RGM	CHECKED BY JE
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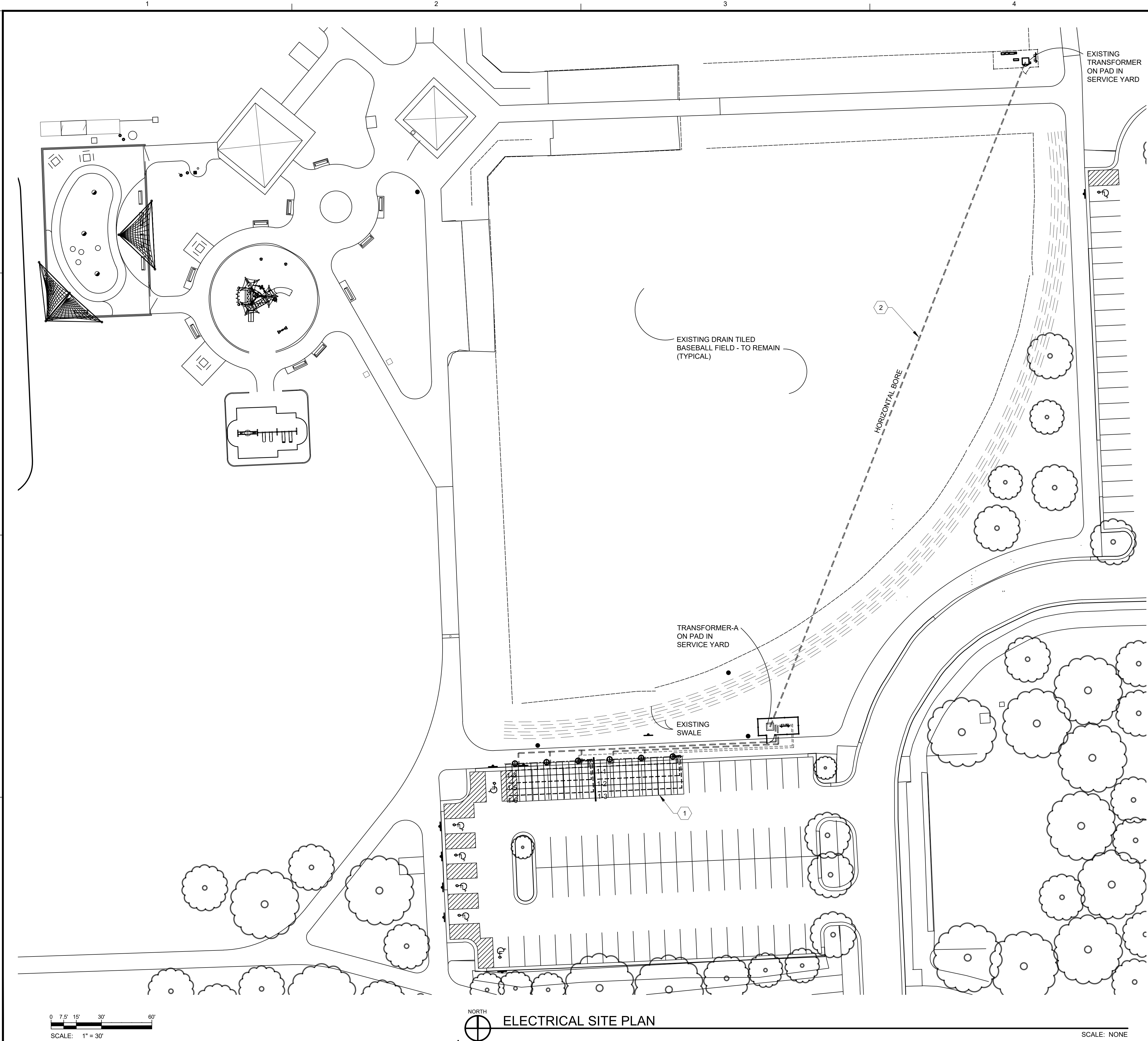
CITY OF ANN ARBOR
SOLAR FACILITIES

BICENTENNIAL PARK
2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

CONSTRUCTION
PLAN

PROJECT NUMBER 23-11-1168-PRK	C102
DRAWN BY GAK	
SCALE AS NOTED	
SHEET SIZE 22x34	



SHEET GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT MICHIGAN ELECTRICAL CODE, 2023 NATIONAL ELECTRICAL CODE (NEC), ALL BUILDING CODES AND ALL APPLICABLE CODES AND STANDARDS.
2. FIELD ADJUST ARRAY LAYOUT BASED ON SITE OBSTRUCTIONS.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY OWNER.
4. CONDUIT FILL TO BE LESS THAT 40%
5. REFER TO SHEET E601 FOR ONE-LINE DIAGRAM FOR INTERCONNECTION BETWEEN EQUIPMENT.
6. REFER TO SHEET E501 FOR TRENCH DETAIL.
7. CONTRACTOR TO FIELD VERIFY THAT ALL LISTED GROUNDING ELECTRODES ARE PRESENT AND PROPERLY TERMINATED ON SITE.
8. CONTRACTOR TO VERIFY THAT ALL CIRCUIT BREAKERS ARE SUITABLE FOR BACKFEED.

SHEET KEY NOTES

1. 50 KW AC CANOPY PV SOLAR ARRAY, WITH 5 DUAL PORT EV CHARGERS
2. FIELD ADJUST HORIZONTAL BORE BASED ON UNDERGROUND UTILITIES AND OBSTRUCTIONS

PV SYSTEM DESCRIPTION

ARRAY TYPE : SOLAR PV CANOPY
AZIMUTH : 177.45 DEGREES
TILT: 7 DEGREES

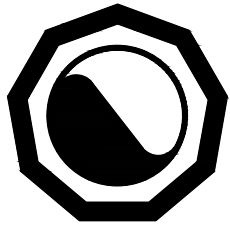
LEGEND

1-1	STRING #	PV STRING DESIGNATION
	INVERTER #	
		INVERTER
		PANEL BOARD
		DISCONNECT
		METER
		TRANSFORMER
		EV CHARGING STATION
		AC WIRING
		AC WIRING UNDERGROUND
		DC WIRING UNDERGROUND
		DC POWER
		CHAIN LINK FENCE



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DATE	DESCRIPTION	APPVD.
3-22-2024	50% REVIEW	JE
11-13-2024	INTERCONNECT	JE
11-22-2024	90% REVIEW	JE
1-10-2025	BID REVIEW	JE

REVISED

NO.	DATE	DESCRIPTION	APPVD.

CERTIFICATION

DESIGNED BY RGM	CHECKED BY JE
--------------------	------------------

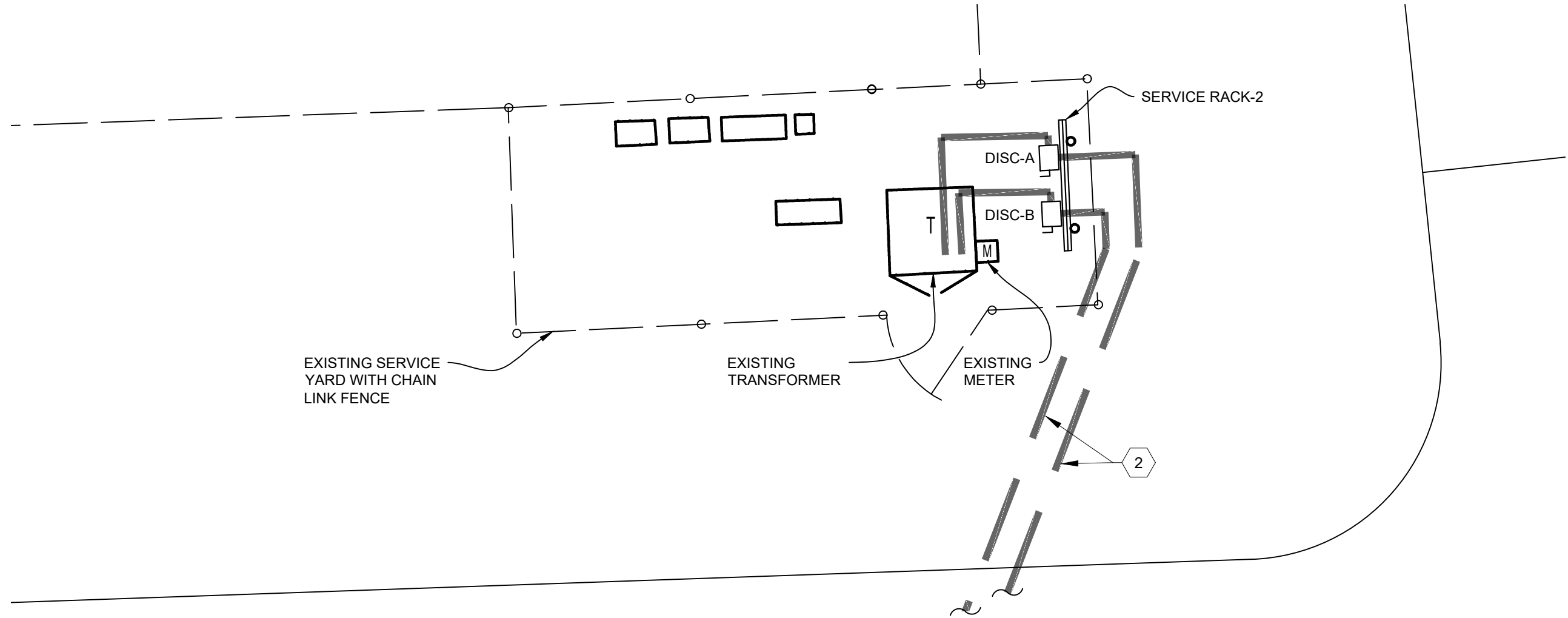
CITY OF ANN ARBOR
SOLAR FACILITIES

BICENTENNIAL PARK
2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 KW AC SOLAR ARRAY
49.1 KW DC SOLAR ARRAY

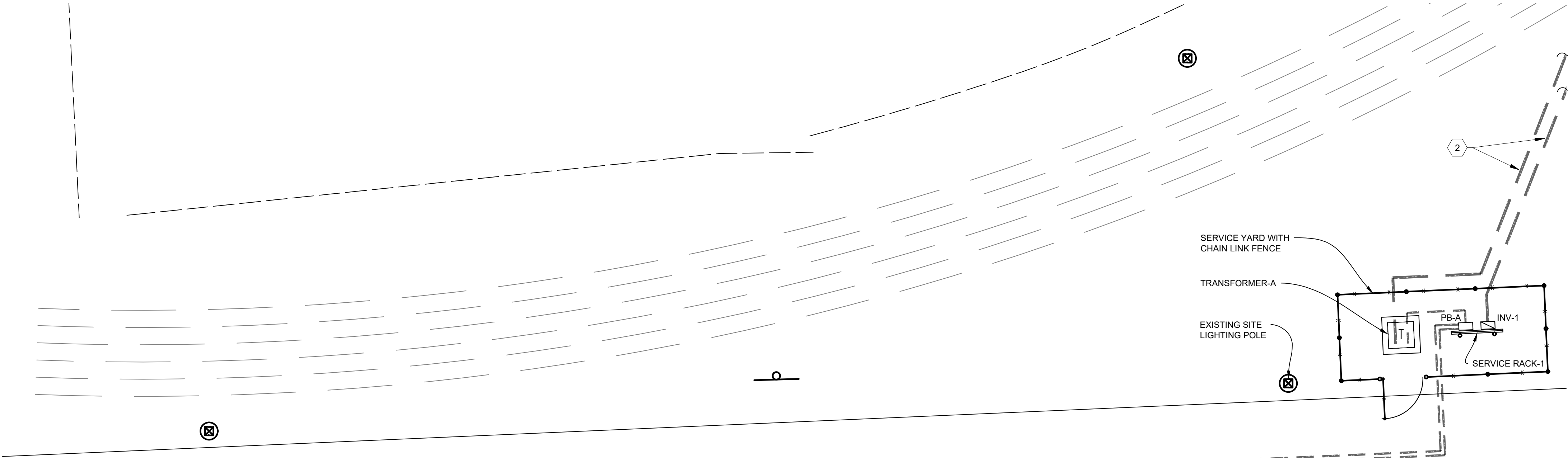
ELECTRICAL
SITE PLAN

PROJECT NUMBER 23-11-1168-PRK	SHEET NUMBER E101
DRAWN BY GAK	
SCALE AS NOTED	
SHEET SIZE 22x34	



2 AC POWER PLAN - CANOPIES

SCALE: NONE



1 AC POWER PLAN - GROUND MOUNT PV ARRAY

SCALE: NONE

SHEET GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT MICHIGAN ELECTRICAL CODE, 2023 NATIONAL ELECTRICAL CODE (NEC), ALL BUILDING CODES AND ALL APPLICABLE CODES AND STANDARDS.
2. FIELD ADJUST ARRAY LAYOUT BASED ON SITE OBSTRUCTIONS.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY OWNER.
4. CONDUIT FILL TO BE LESS THAT 40%
5. REFER TO SHEET E601 FOR ONE-LINE DIAGRAM FOR INTERCONNECTION BETWEEN EQUIPMENT.
6. REFER TO SHEET E501 FOR TRENCH DETAIL.
7. CONTRACTOR TO FIELD VERIFY THAT ALL LISTED GROUNDING ELECTRODES ARE PRESENT AND PROPERLY TERMINATED ON SITE.
8. CONTRACTOR TO VERIFY THAT ALL CIRCUIT BREAKERS ARE SUITABLE FOR BACKFEED.

SHEET KEY NOTES

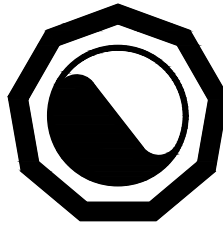
1. 50 kW AC CANOPY PV SOLAR ARRAY, WITH 5 DUAL PORT EV CHARGERS
2. FIELD ADJUST HORIZONTAL BORE BASED ON UNDERGROUND UTILITIES AND OBSTRUCTIONS

PV SYSTEM DESCRIPTION

ARRAY TYPE : SOLAR PV CANOPY
AZIMUTH : 177.45 DEGREES
TILT: 7 DEGREES

LEGEND

- | | |
|--|---------------------|
| | INVERTER |
| | DISCONNECT |
| | METER |
| | TRANSFORMER |
| | EV CHARGING STATION |
| | AC WIRING |
| | AC WIRE UNDERGROUND |
| | CHAIN LINK FENCE |



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DATE	DESCRIPTION	APPVD.
3-22-2024	50% REVIEW	
11-13-2024	INTERCONNECT	
11-22-2024	90% REVIEW	

REVISED

NO.	DATE	DESCRIPTION	APPVD.

CERTIFICATION

DESIGNED BY RGM	CHECKED BY JE
--------------------	------------------

CITY OF ANN ARBOR
SOLAR FACILITIES

BICENTENNIAL PARK

2945 E. ELLSWORTH
ANN ARBOR, MI 48108

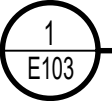
50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

AC POWER
PLAN

PROJECT NUMBER 23-11-1168-PRK	
DRAWN BY GAK	SHEET NUMBER E102
SCALE AS NOTED	
SHEET SIZE 22x34	



SCALE: NONE



SCALE: NONE

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DATE	DESCRIPTION	APPVD
11-22-2024	90% REVIEW	JE
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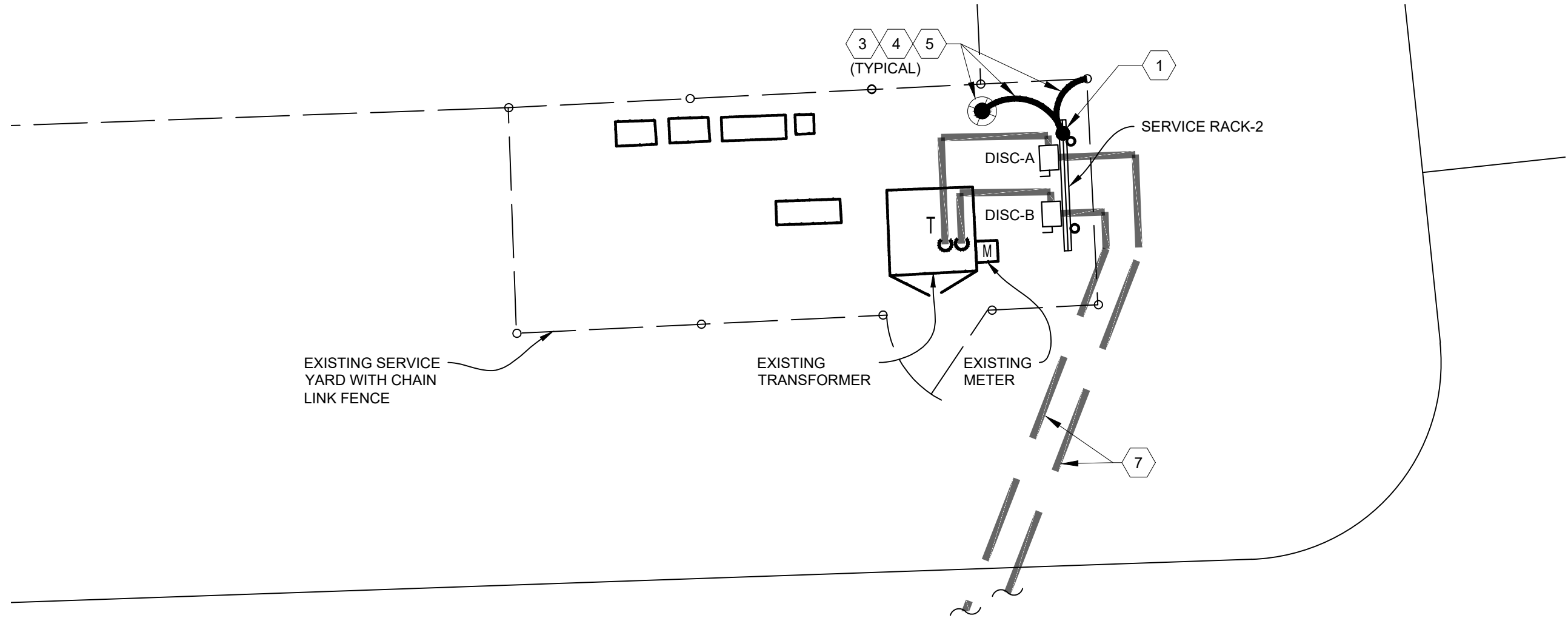
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NORTH



SHEET SIZE
22x34

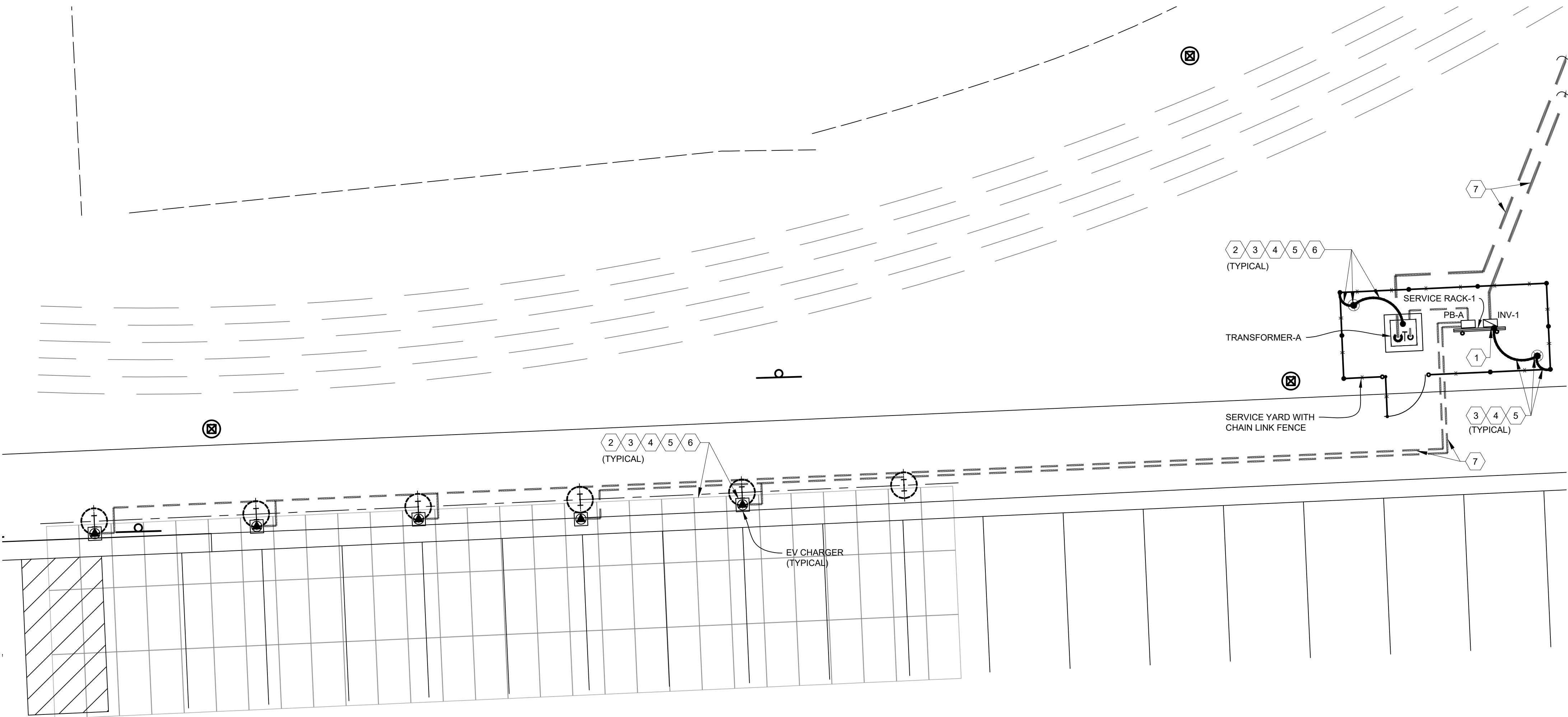
E103



2
E104

GROUNDING PLAN - AT EXISTING SERVICE YARD

SCALE: NONE



1
E104

GROUNDING PLAN - GROUND MOUNT PV ARRAY

SCALE: NONE

SHEET GENERAL NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT MICHIGAN ELECTRICAL CODE, 2017 NATIONAL ELECTRICAL CODE (NEC), 2015 MICHIGAN BUILDING CODE, CURRENT INTERNATIONAL FIRE CODE, AND ALL APPLICABLE LOCAL CODES AND STANDARDS.
- GROUNDING SHALL COMPLY WITH CURRENT MICHIGAN ELECTRICAL CODE REQUIREMENTS.
- ALL EXPOSED METAL SURFACES SHALL BE GROUNDED WITH EQUIPMENT GROUNDED CONDUCTORS.
- SEE SHEET E501 FOR GROUND DETAILS
- PV GROUNDING SHALL COMPLY WITH NEC 690.47

SHEET KEY NOTES

- RACKING SYSTEM SHALL BE BONDED TO THE GROUNDING ELECTRODE SYSTEM.
- GROUND EACH PV MODULE PER MANUFACTURES INSTRUCTION.
- GROUND RODS TO BE 5/8" X 8'-0" LONG COPPER CLAD STEEL.
- ALL GROUNDING CONNECTIONS TO STRUCTURAL FRAME AND NON-CURRENT CARRYING SUPPORTS TO BE MADE USING UL APPROVED GROUNDING CONNECTORS RATED FOR DIRECT BURIAL.
- #6 BARE COPPER WIRE.
- CANOPY GROUNDING PER CANOPY MANUFACTURERS SPECIFICATIONS. SEE SEE DETAIL SHEET E501.
- SEE CONDUIT AND WIRE SIZE CHART ON SHEET E601

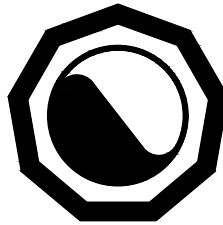
PV SYSTEM DESCRIPTION

ARRAY TYPE : SOLAR PV CANOPY
AZIMUTH : 177.45 DEGREES
TILT: 7 DEGREES

LEGEND

	COPPER CLAD GROUND ROD
	INVERTER
	DISCONNECT
	METER
	TRANSFORMER
	PANEL BOARD
	EV CHARGING STATION
	CONDUIT UNDERGROUND
	GROUND WIRE
	CHAIN LINK FENCE

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1-10-2025	BID REVIEW	JE

REVISED

NO.	DATE	DESCRIPTION	APPVD.

CERTIFICATION

DESIGNED BY RGM	CHECKED BY JE
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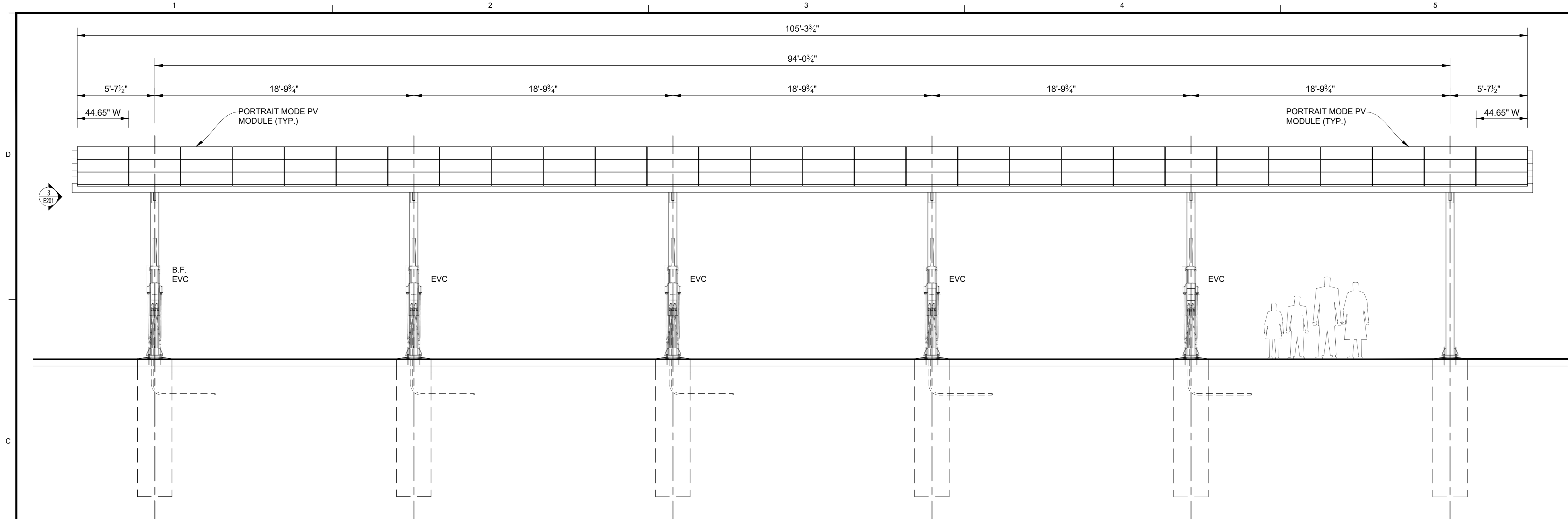
CITY OF ANN ARBOR
SOLAR FACILITIES

BICENTENNIAL PARK
2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

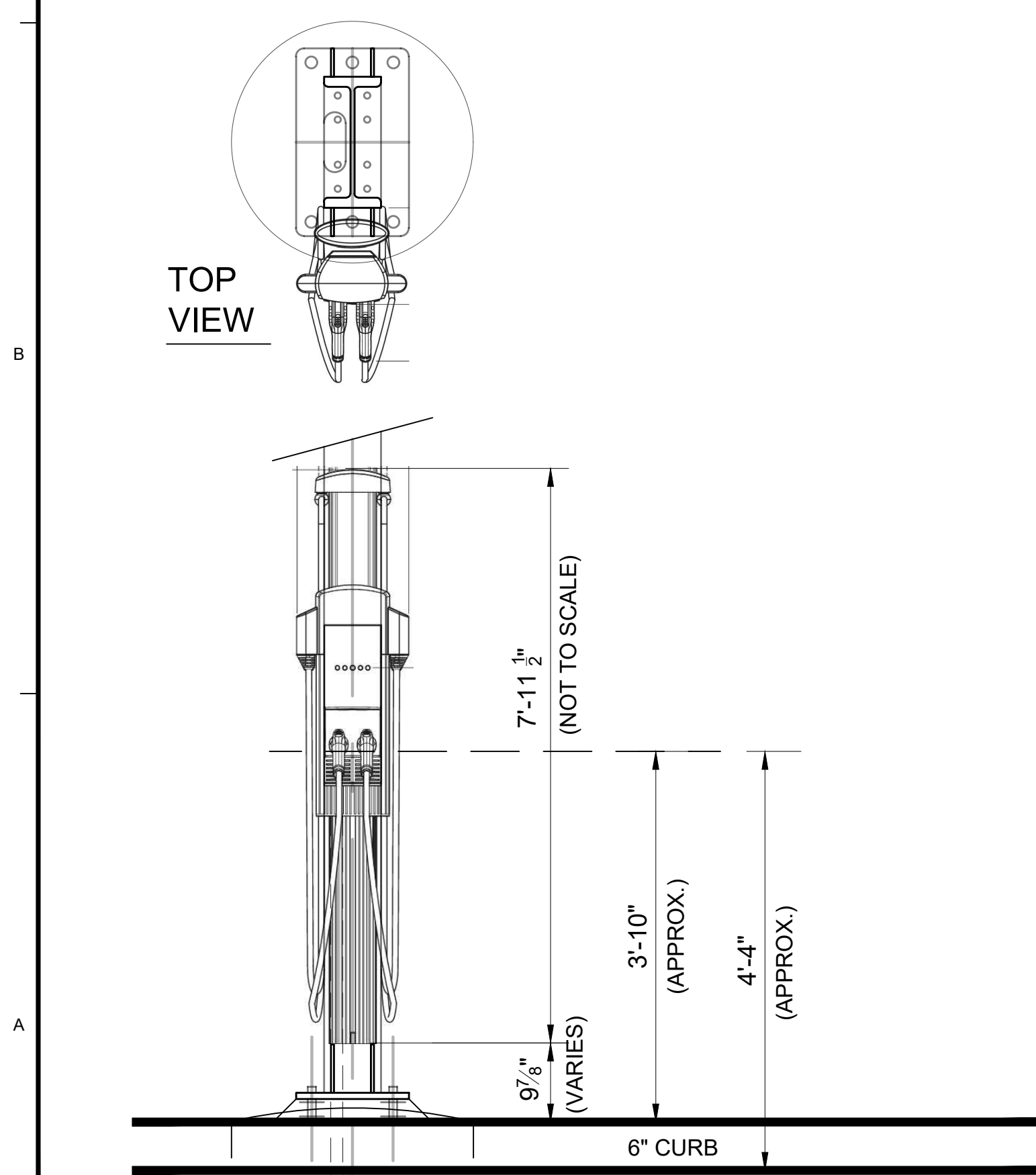
GROUNDING PLAN

PROJECT NUMBER 23-11-1168-PRK	
DRAWN BY GAK	SHEET NUMBER E104
SCALE AS NOTED	E104
SHEET SIZE 22x34	



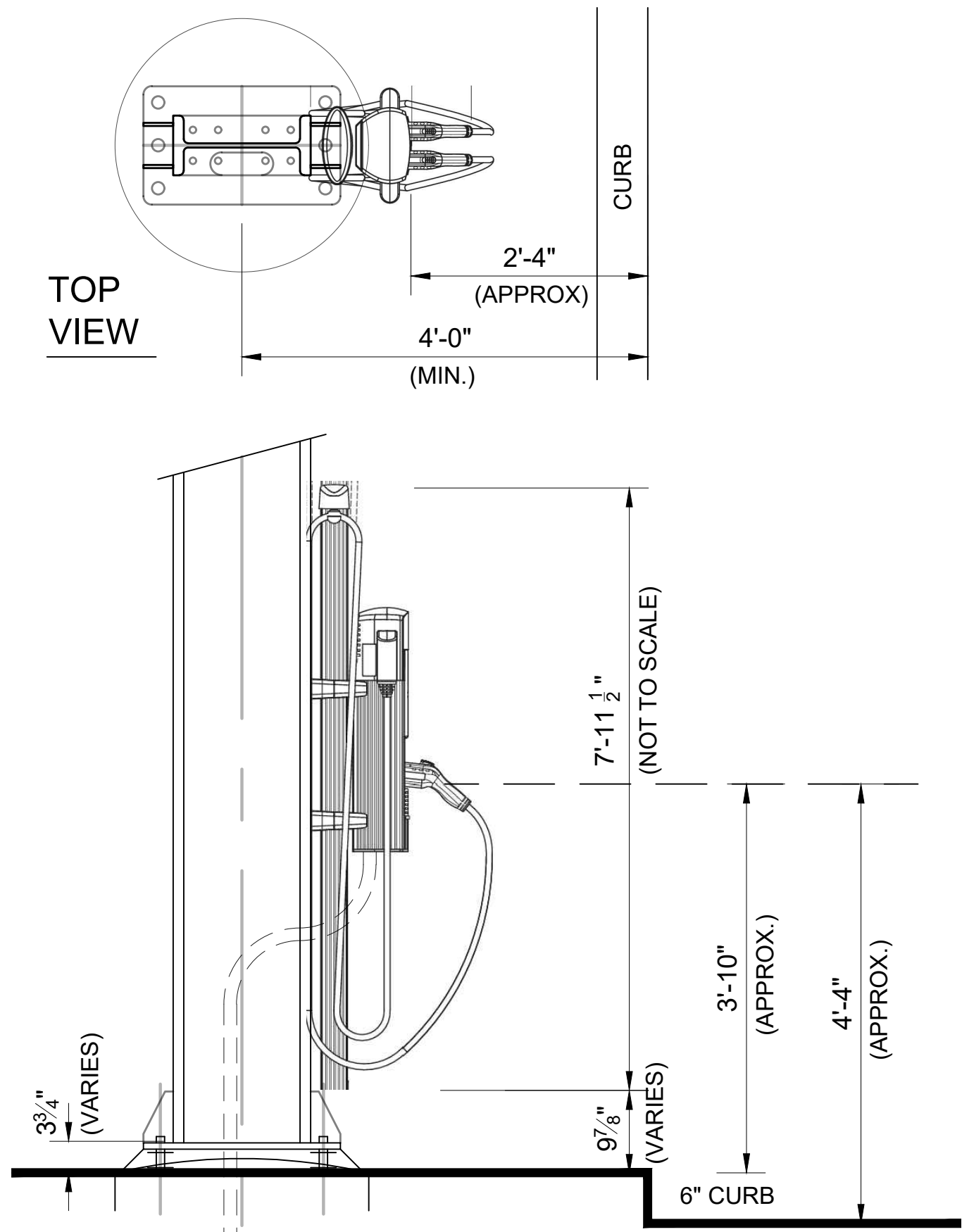
1 SOLAR PV CANOPY SOUTH ELEVATION - FRONT VIEW

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



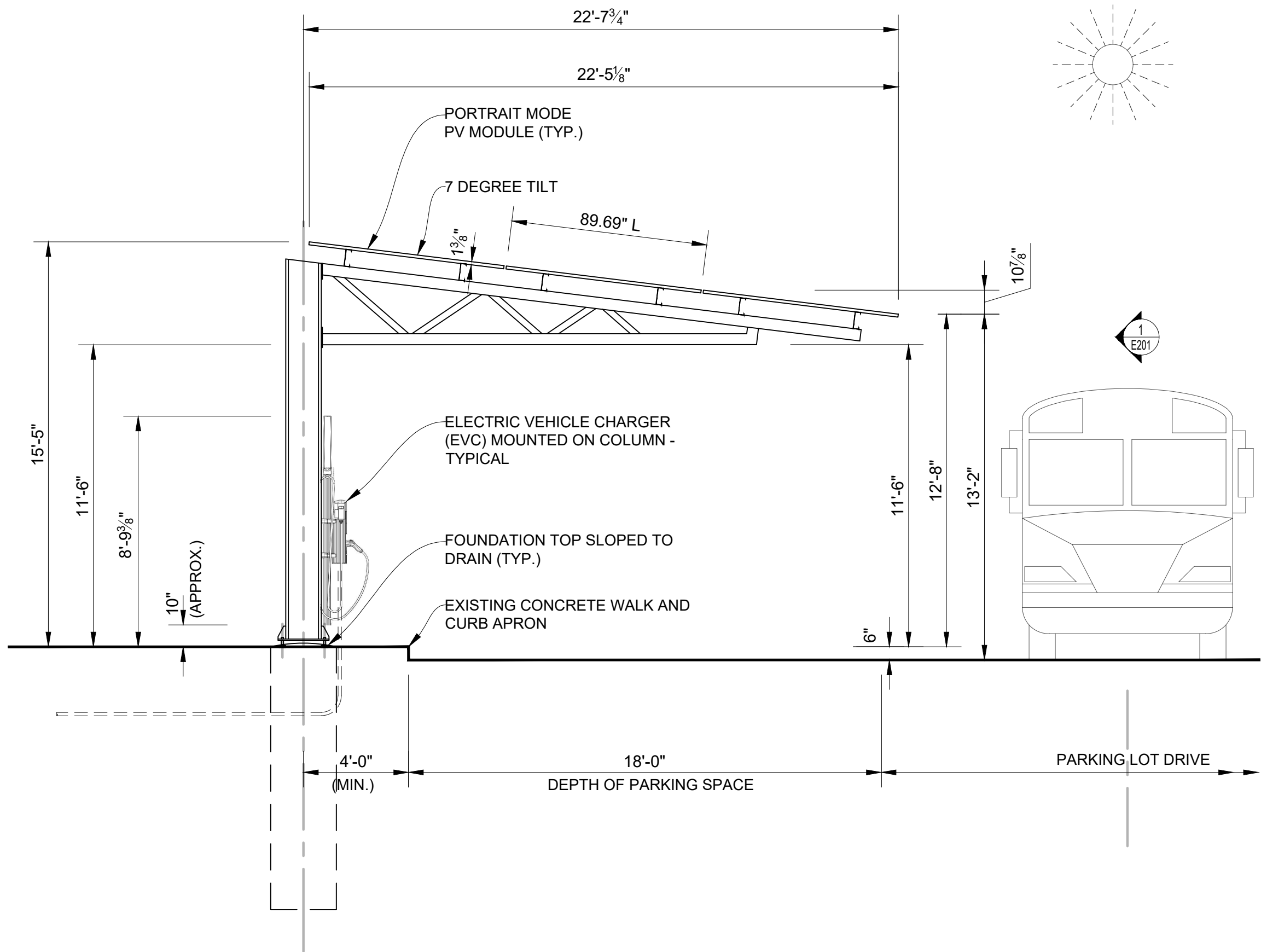
4 EVC FRONT ELEVATION

SCALE: 3/4"= 1'-0"



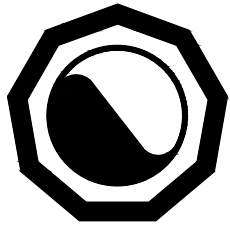
3 EVC SIDE ELEVATION

SCALE: 3/4"= 1'-0"



2 SOLAR PV CANOPY WEST ELEVATION - SIDE VIEW

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



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CITY OF ANN ARBOR
SOLAR FACILITIES

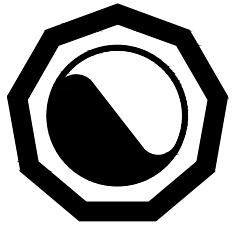
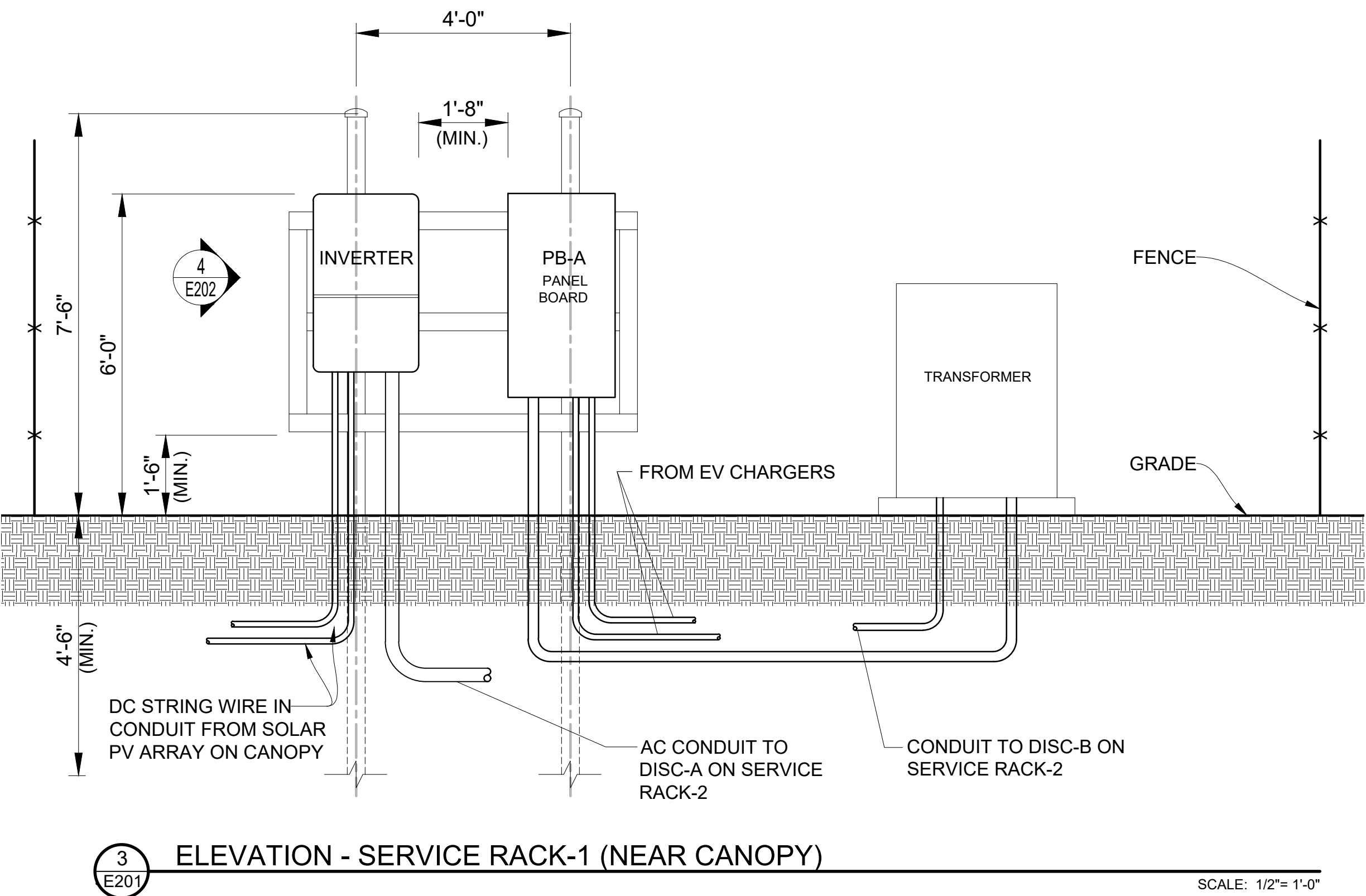
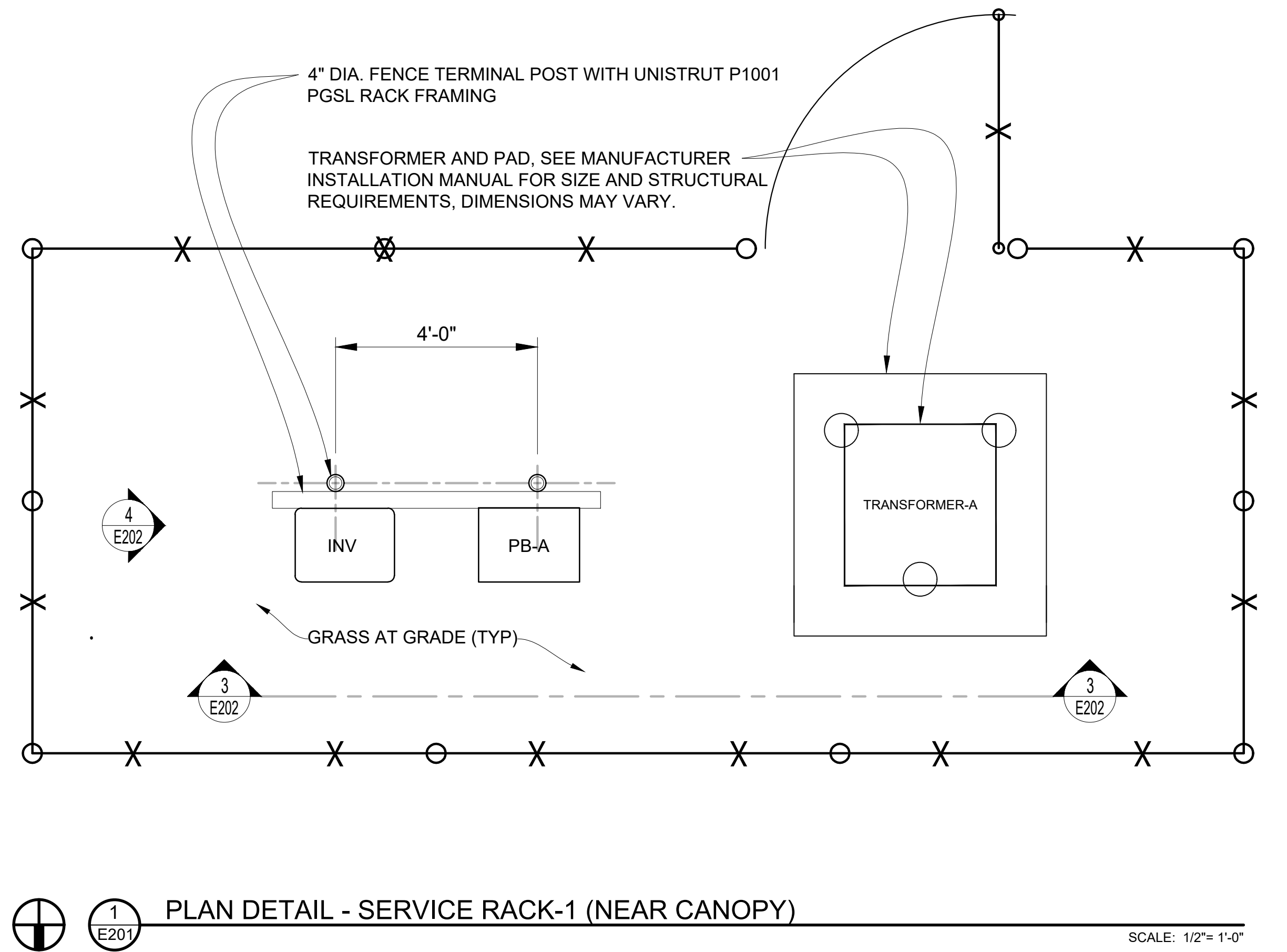
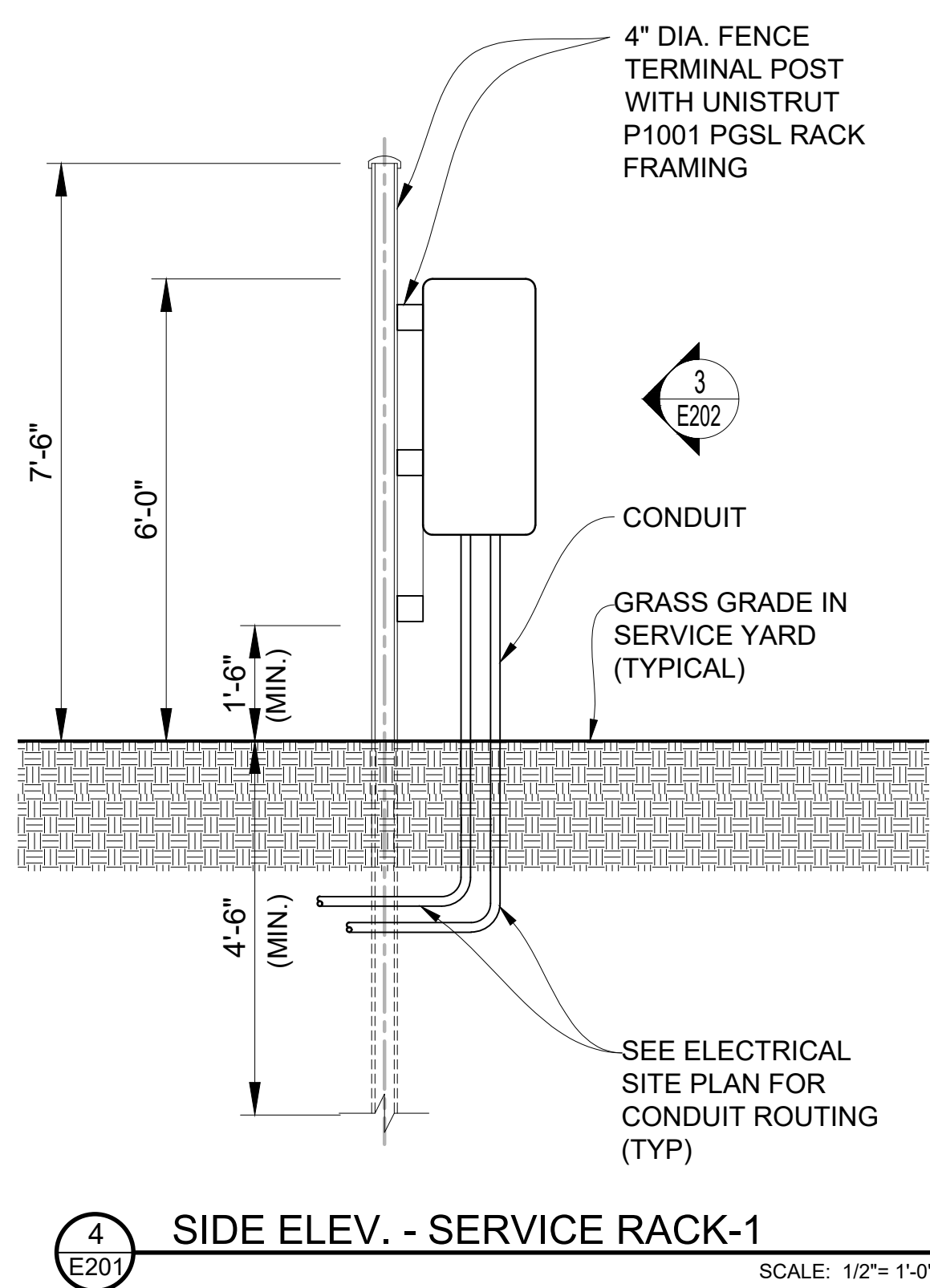
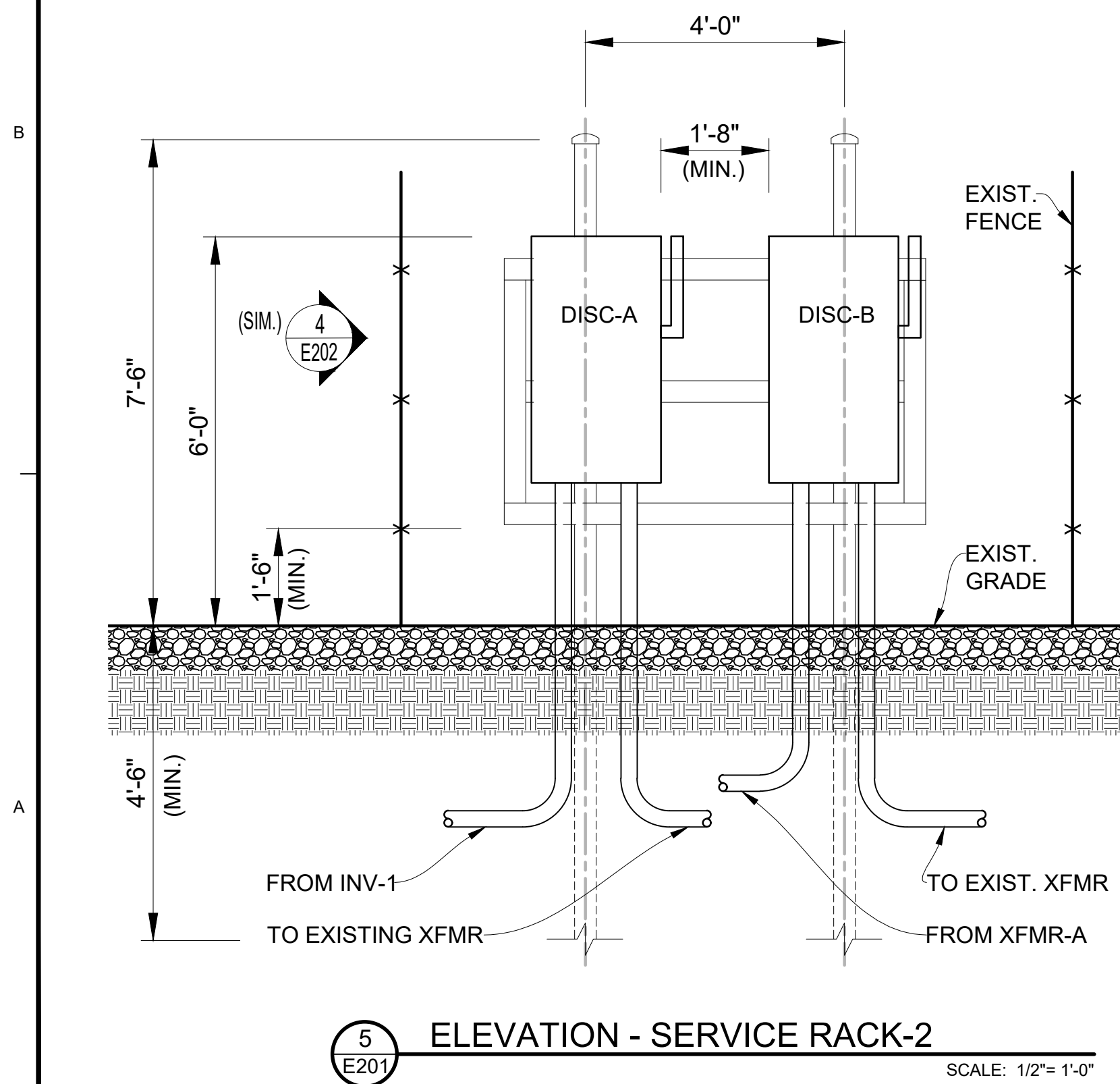
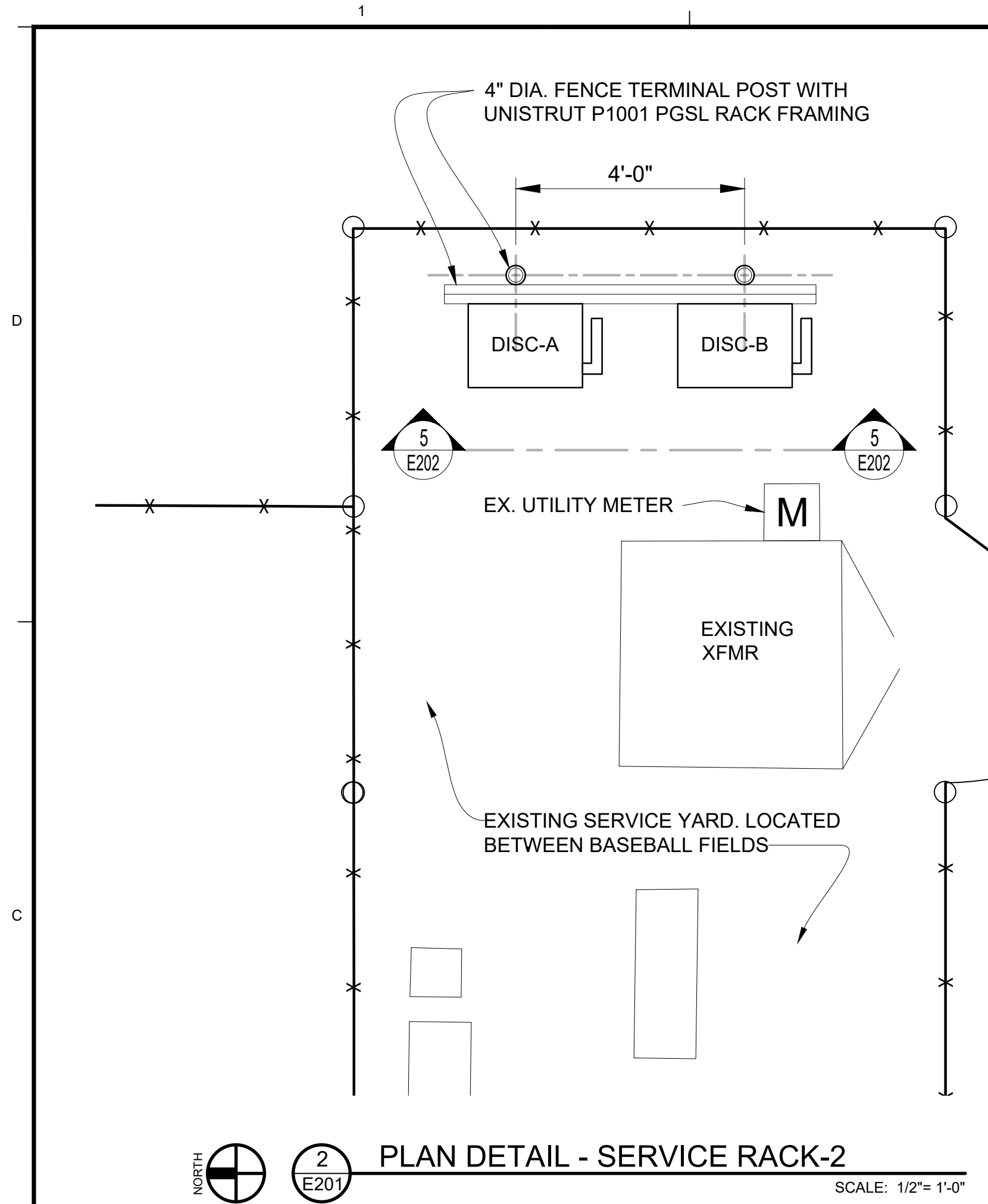
BICENTENNIAL PARK

2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

ELEVATIONS
& SECTIONS
AT CANOPY

PROJECT NUMBER 23-11-1168-PRK	E201
DRAWN BY GAK	
SCALE AS NOTED	
SHEET SIZE 22x34	



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RGM	JE

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SOLAR FACILITIES

BICENTENNIAL PARK

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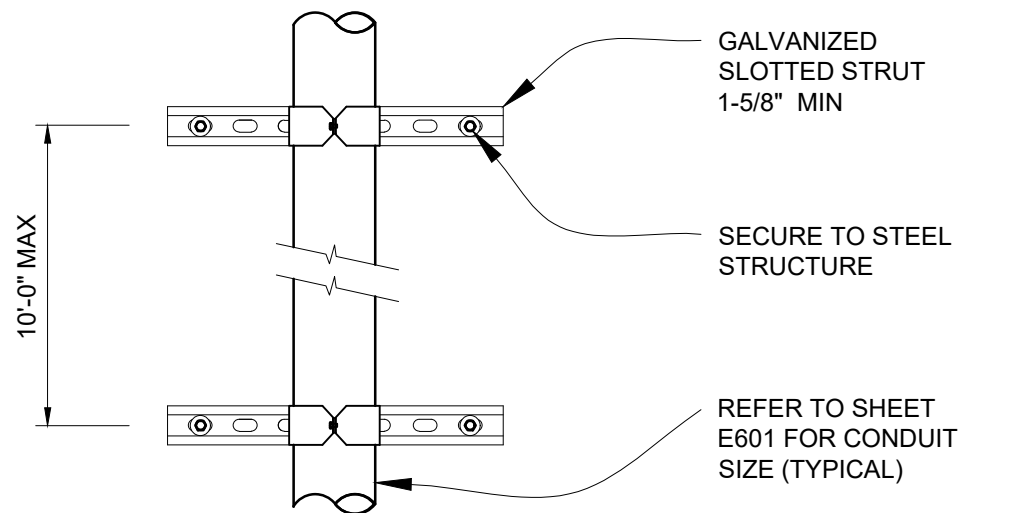
50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

ELEVATIONS
& PLAN DETAILS
AT SERVICE RACK

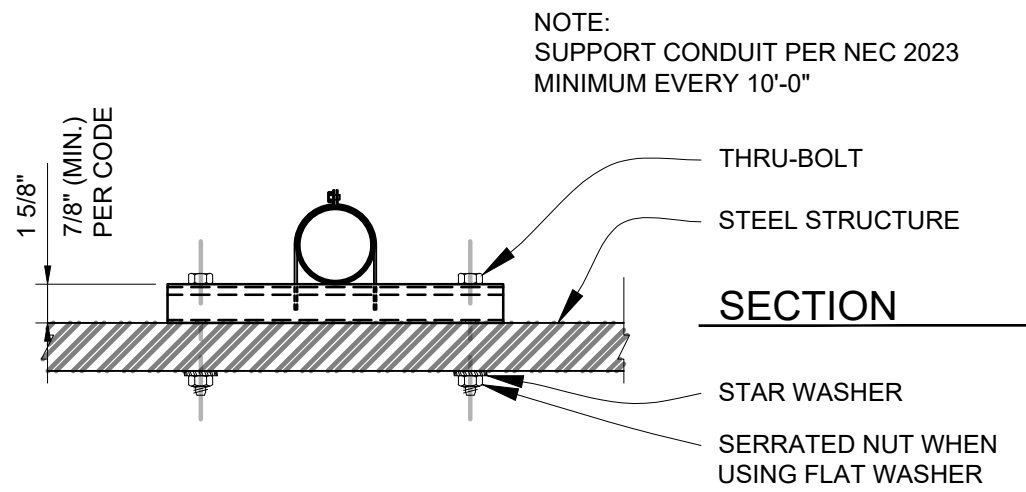
PROJECT NUMBER	23-11-1168-PRK
DRAWN BY	GAK
SCALE	AS NOTED
SHEET SIZE	22x34
SHEET NUMBER	E202



4 E501 POINT OF INTERCONNECT - (P.O.I.)
EXISTING SERVICE YARD - SIDE VIEW
SCALE: NONE

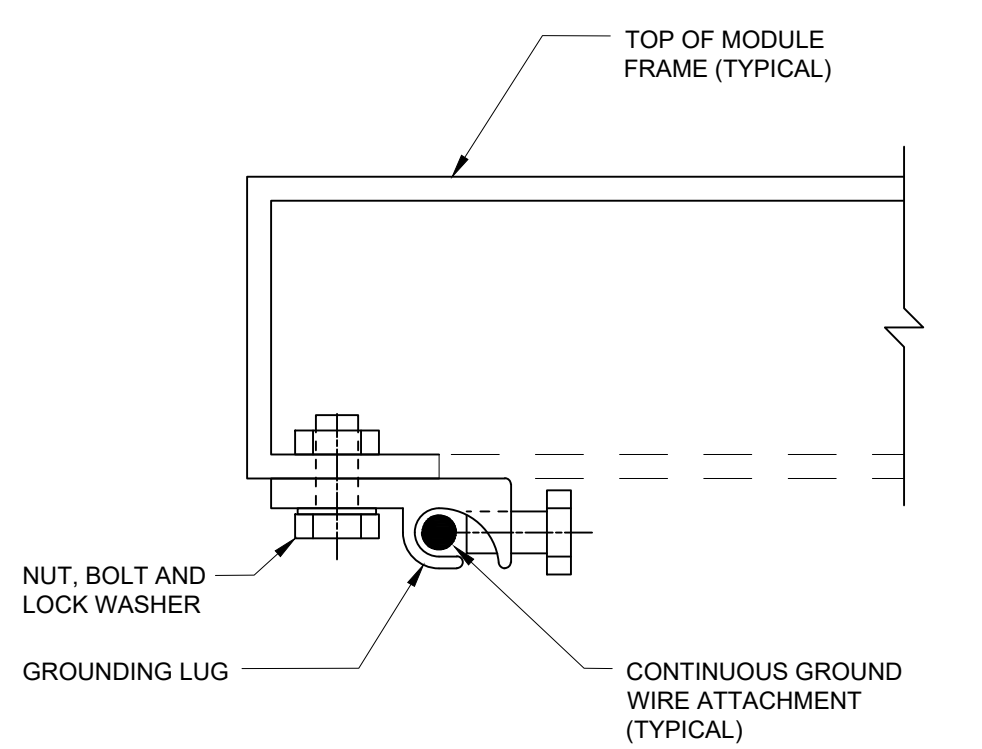


PLAN VIEW



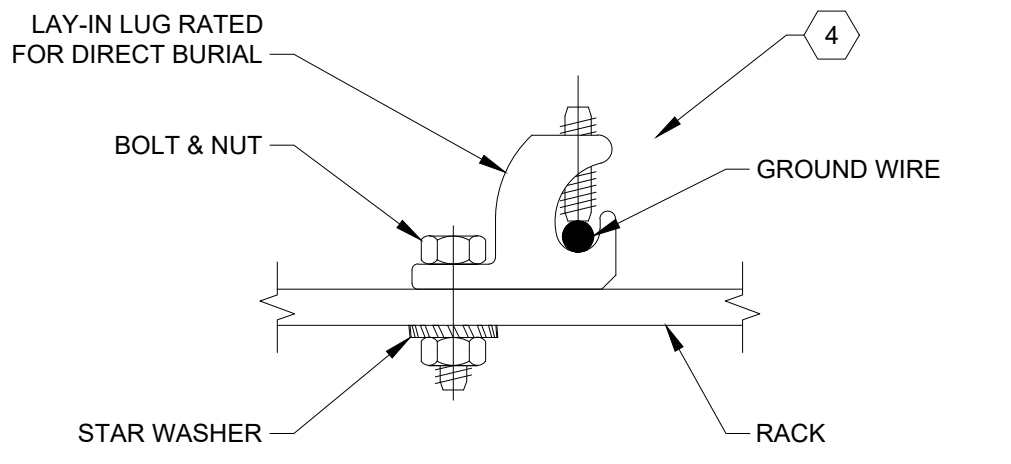
SECTION

3 E501 DETAIL - SECURING CONDUIT TO STEEL
SCALE: NONE

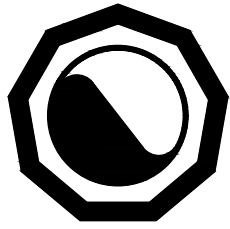


2 E501 MODULE GROUNDING LUG DETAIL
SCALE: NONE

RACK	LUG	HARDWARE
GALVANIZED STEEL	COPPER	GALVANIZED STEEL
ALUMINUM	STAINLESS OR TIN-PLATED COPPER	STAINLESS STEEL
STAINLESS STEEL	COPPER, STAINLESS OR TIN-PLATED COPPER	STAINLESS STEEL



1 E501 GROUNDING DETAIL
SCALE: NONE



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1-10-2025	BID REVIEW	JE

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CERTIFICATION

DESIGNED BY RGM	CHECKED BY JE
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CITY OF ANN ARBOR
SOLAR FACILITIES

BICENTENNIAL PARK

2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

ELECTRICAL
DETAILS

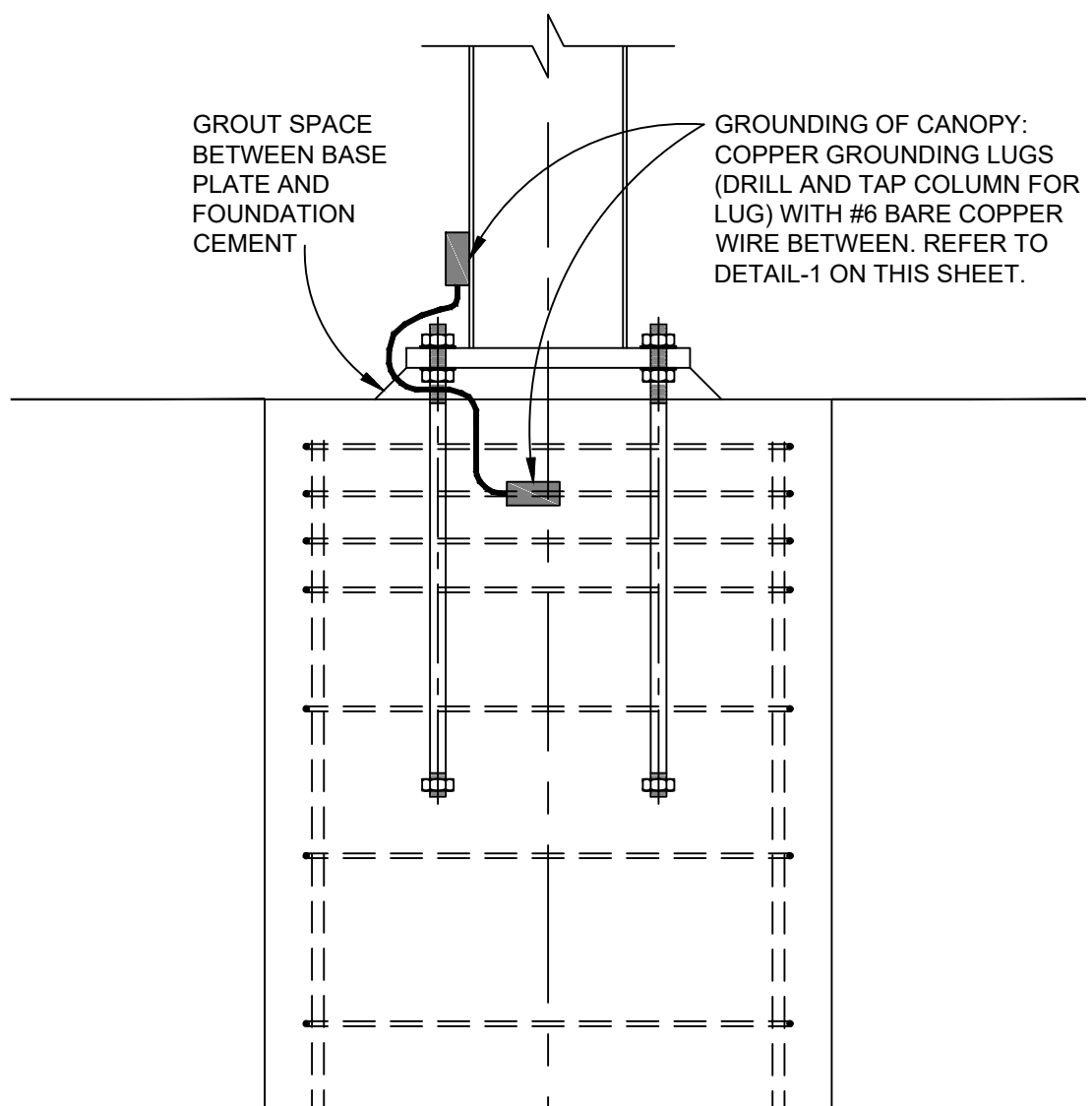
PROJECT NUMBER 23-11-1168-PRK

DRAWN BY GAK	SHEET NUMBER
-----------------	--------------

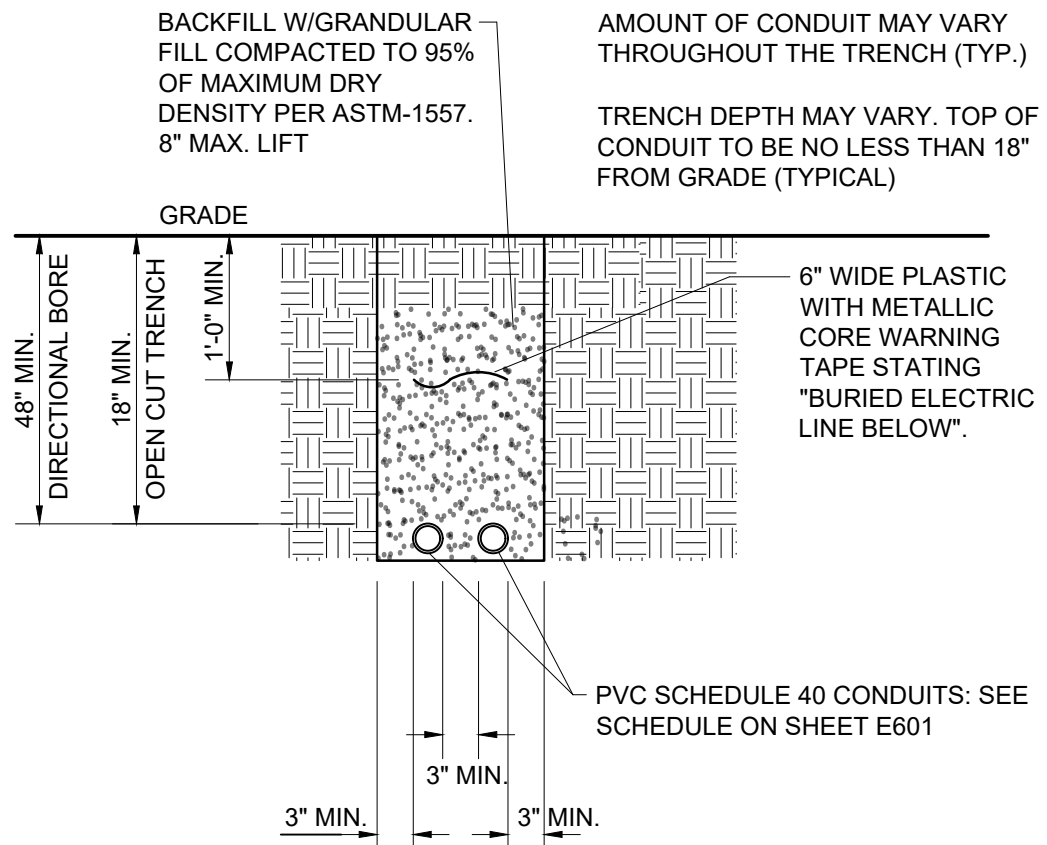
SCALE AS NOTED

SHEET SIZE 22x34

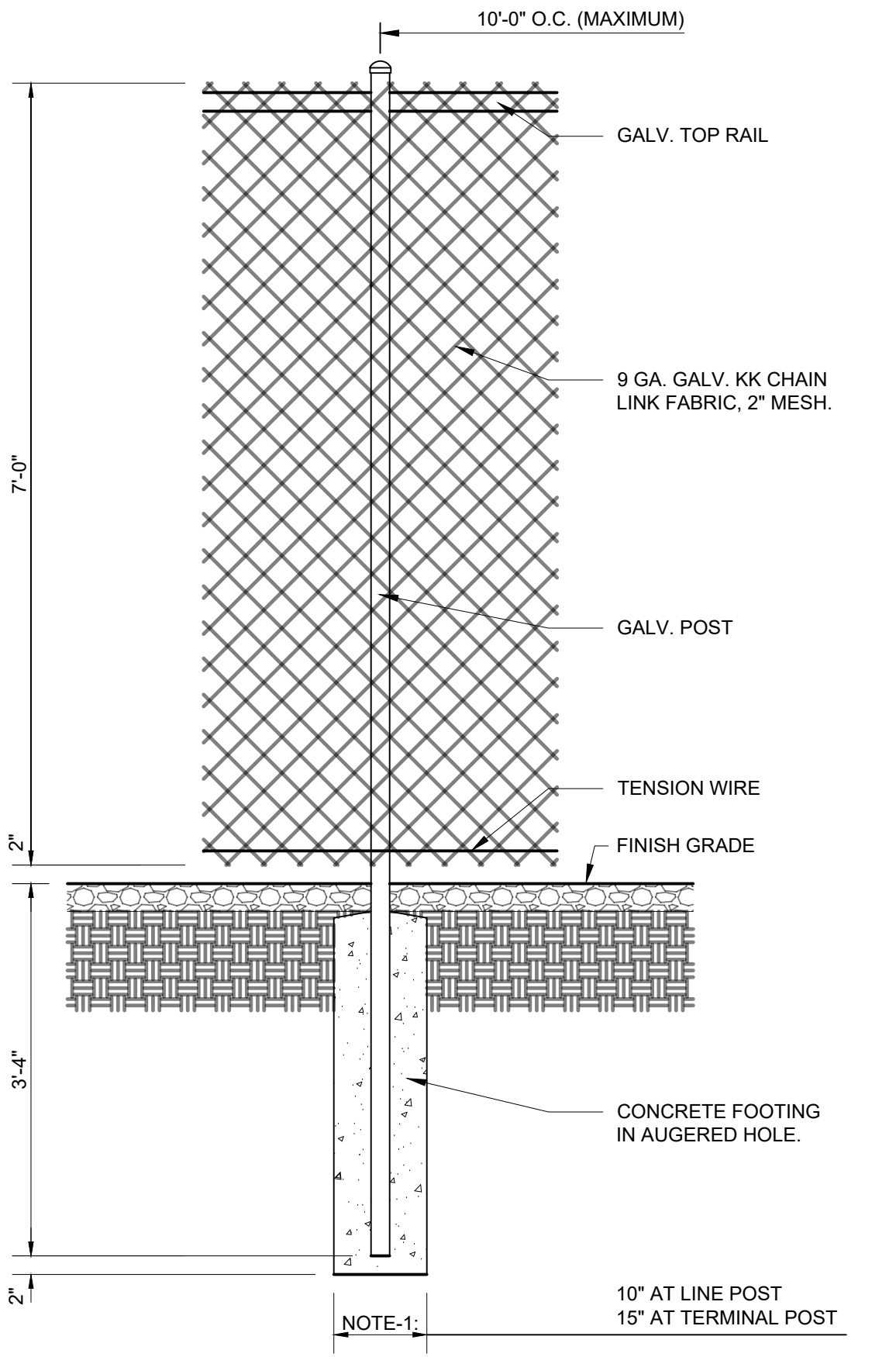
E501



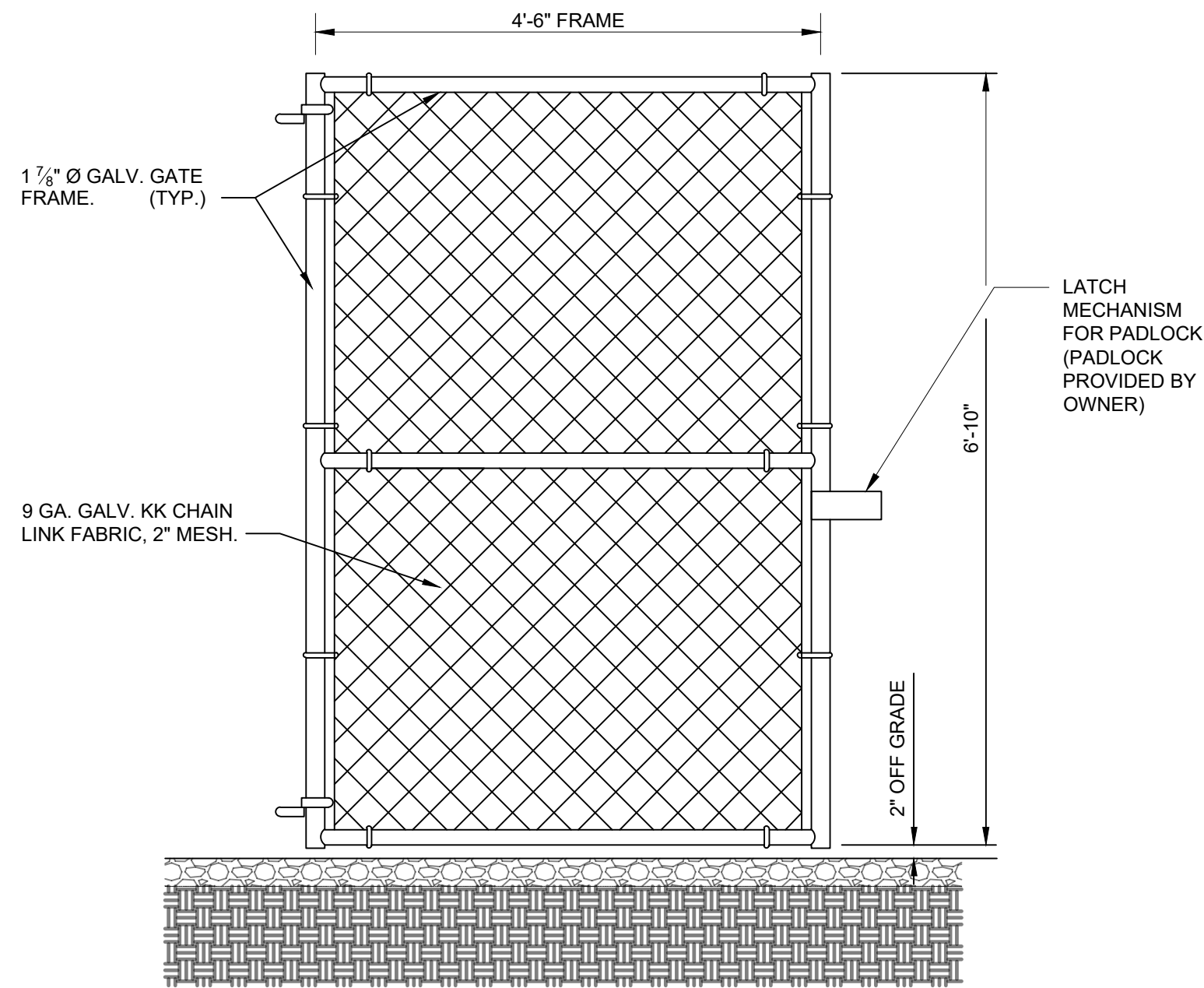
8 E501 GROUNDING @ COLUMN
SCALE: NONE



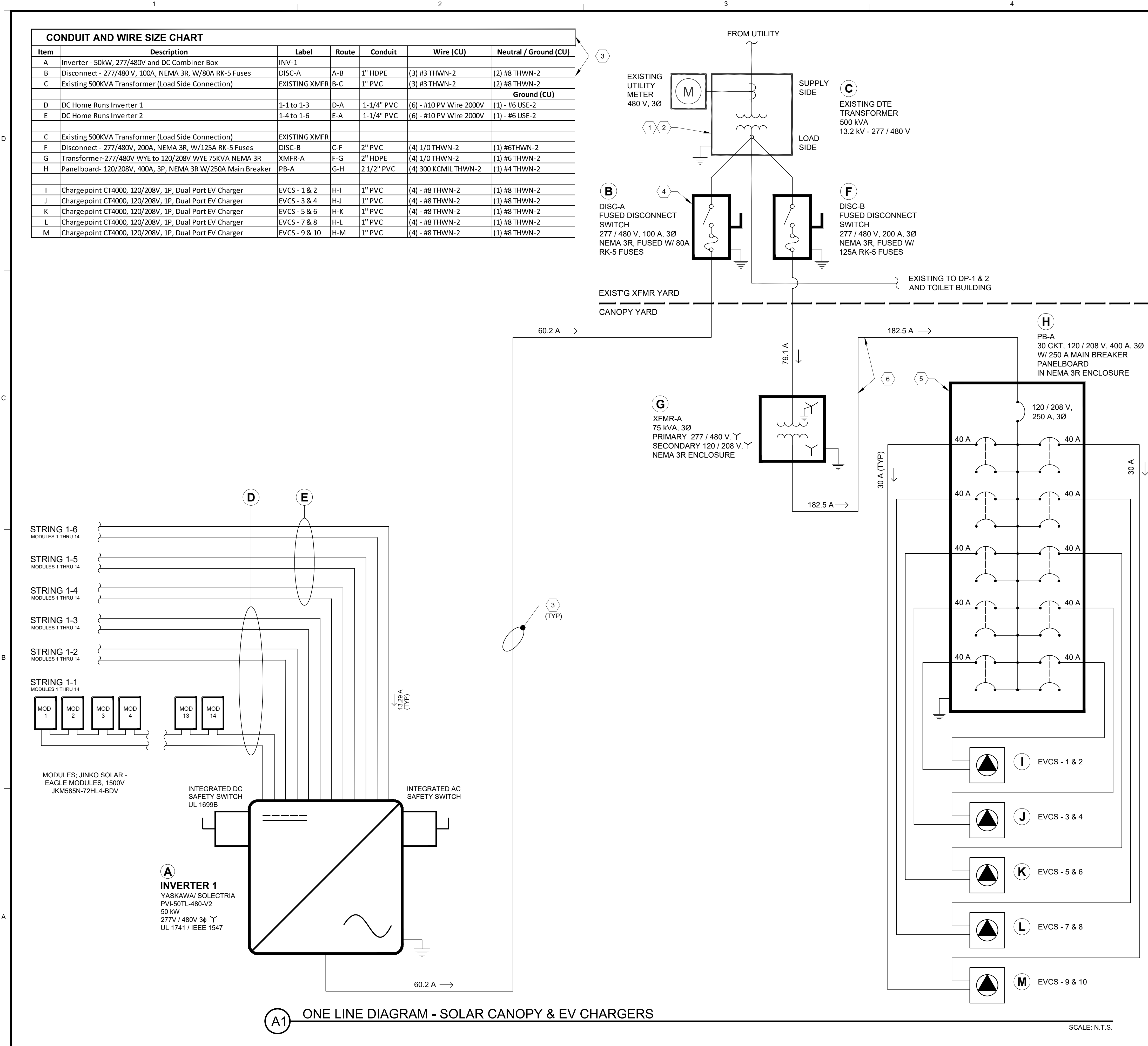
7 E501 TRENCH DETAIL - UNDERGROUND
SCALE: NONE



6 E501 FENCE DETAIL
SCALE: 3/4" = 1'-0"

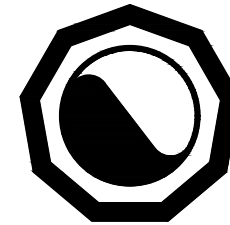


5 E501 GATE DETAIL
SCALE: 3/4" = 1'-0"



SHEET GENERAL NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT MICHIGAN ELECTRICAL CODE, 2023 NATIONAL ELECTRICAL CODE (NEC), ALL BUILDING CODES AND ALL APPLICABLE CODES AND STANDARDS.
- THE INVERTER INCLUDES RESIDUAL CURRENT DETECTION GFCI. AS PART OF THE DC GROUND FAULT DETECTION METHOD REQUIRED BY UL 1741.
- DC CONDUCTORS SHALL BE DERATED PER SECTION 310.15.
- SOLECTRIA INVERTER ARE CERTIFIED UL1699B FOR ARC FAULT PROTECTION PER SECTION 690.11
- INVERTER INCLUDES ANTI-ISLANDING PROTECTION COMPLIANT WITH UL1741 AND IEEE 1547 PER NEC 690.
- PHOTOVOLTAIC SYSTEM LABELS SHALL BE INSTALLED PER NEC 2023.



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ISSUED

DATE	DESCRIPTION	APPVD.
3-22-2024	50% REVIEW	JE
11-13-2024	INTERCONNECT	JE
11-22-2024	90% REVIEW	JE
1-10-2025	BID REVIEW	JE

REVISED

NO.	DATE	DESCRIPTION	APPVD.

CERTIFICATION

CITY OF ANN ARBOR
SOLAR FACILITIES

BICENTENNIAL PARK

2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

DESIGNED BY	CHECKED BY
RGM	

CITY OF ANN ARBOR
SOLAR FACILITIES

BICENTENNIAL PARK

2945 E. ELLSWORTH
ANN ARBOR, MI 48108

50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

ONE LINE DIAGRAM

PROJECT NUMBER	23-11-1168-PRK
DRAWN BY	GAK
SCALE	
SHEET SIZE	22x34
SHEET NUMBER	E601

SHEET KEY NOTES

- AC GROUNDING CONNECTION TO EXISTING TRANSFORMER PROVIDES CONNECTION TO BUILDING GROUNDING ELECTRODE SYSTEM. GROUNDING CONDUCTORS AND BONDING JUMPERS TO BE INSTALLED TO COMPLY WITH ARTICLE 250.
- NEW LOAD SIDE AC CONNECTION POWER PRODUCTION CONDUCTORS MUST MEET NEC 690 AND 705.12 FOR SERVICE DISCONNECTING MEANS AND OVERCURRENT PROTECTION.
- REFER TO CHART ON E-601 FOR CONDUIT AND WIRE SIZES.
- INSTALL PLACARD SHOWING LOCATIONS OF DISCONNECT AND SOLAR ARRAY.
- MAIN BREAKER SIZED FOR 10 EV CHARGERS.
- CONDUCTORS SIZED FOR 75 KVA TRANSFORMER FULL LOAD

PV SYSTEM DESCRIPTION

FOR TOTAL SYSTEM:

PV MODULE MODEL:	JINKO SOLAR, JKM585N-72HL4-BDV (585 W)
PV MODULE SIZE:	89.69" L X 44.65" W X 1.38" D
NUMBER OF MODULES:	84
PV MODULE P _{MAX} :	585 W
INVERTERS : (1)	YASKAWA/ SOLECTRIA PVI-50TL-480
NO. OF STRINGS PER INVERTER	INV #1 (6 STRINGS)
DC TO AC RATIO:	.98
NUMBER OF STRINGS:	6
TOTAL NAMEPLATE SIZE:	49.1 kW DC 50.0 kW AC

NOTE: PV SYSTEM IS 1000 V DC (MAX.)

LEGEND

	DISCONNECT SWITCH
	GROUND
	PV STRING DESIGNATION
	INVERTER #

PHOTOVOLTAIC
SYSTEM
DISCONNECT

LABEL 1

EACH PV STSTEM DISCONNECTING MEANS MUST BE
LABELED WITH THIS PLACARD

CAUTION

POWER TO THIS FACILITY IS ALSO SUPPLIED FROM THE FOLLOWING
SOURCES WITH DISCONNECTS AS SHOWN:

LABEL 6

INSTALL MAP PLACARD AS PER UTILITY REQUIREMENTS, SIGNAGE SHALL BE RED BACKGROUND
WITH WHITE ENGRAVED LETTERS: CAUTION 3/4", POWER TO... 3/4", CALL OUTS 3/8"

THIS LABEL TO BE INSTALLED ON BOTH FENCED IN ELECTRICAL SERVICE YARDS.

DANGER

HIGH VOLTAGE
NO
TRESPASSING

LABEL 15

LABEL SIZE 14" x10". FIELD INSIDE OVAL RED AND OUTSIDE OVAL BLACK .

THIS LABEL TO BE INSTALLED ON BOTH FENCED IN ELECTRICAL SERVICE YARDS.
USE STAINLESS STEEL HARDWARE.

⚠ WARNING

ELECTRIC SHOCK HAZARD

DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND LOAD SIDES
MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 2

THE UTILITY METERING CABINET, EACH INVERTER, EACH DC AND
AC DISCONNECTING MEANS SWITCHES AND BREAKERS MUST
BE LABELED WITH THIS PLACARD

⚠ WARNING

ELECTRIC SHOCK HAZARD

IF GROUND FAULT IS INDICATED ALL
NORMALLY GROUNDED CONDUCTORS
MAY BE UNGROUNDED AND ENERGIZED

LABEL 3

⚠

DC SYSTEM DC VOLTAGE
SHORT CIRCUIT DC CURRENT

1000 V
163.2 A

50kW INV.

⚠

LABEL 4

INVERTER DC DISCONNECT MUST BE
LABELED WITH THIS PLACARD
TOP OF LABEL IS WHITE ON BLACK, BOTTOM IS BLACK ON WHITE

⚠

AC SYSTEM DC VOLTAGE
SHORT CIRCUIT DC CURRENT

60.2 A
480 VAC

RATED AC OUTPUT CURRENT
NOMINAL OPERATING AC VOLTAGE

⚠

LABEL 5

INTERACTIVE SYSTEM POINT OF INTERCONNECTION
MUST BE LABELED WITH THIS PLACARD
TOP OF LABEL IS WHITE ON BLACK, BOTTOM IS BLACK ON WHITE

⚠ WARNING

DUAL POWER SUPPLY

SOURCES UTILITY GRID AND
PV SOLAR ELECTRIC SYSTEM

LABEL 7

EQUIPMENT BACK FED FROM PHOTOVOLTAIC SYSTEMS
MUST BE LABELED WITH THIS PLACARD INCLUDING BOTH 480 V.
DISCONNECTS AND PRIMARY SWITCH AT SUBSTATION

⚠ WARNING

THIS EQUIPMENT FED BY MULTIPLE
SOURCES. TOTAL RATING OF ALL
OVERCURRENT DEVICE SHALL NOT EXCEED
AMPACITY OF BUSSBAR

LABEL 10

AC
DISCONNECT

LABEL 11

EACH AC DISCONNECTING MEANS MUST BE
LABELED WITH THIS PLACARD

DC
DISCONNECT

LABEL 12

EACH DC DISCONNECTING MEANS MUST BE
LABELED WITH THIS PLACARD

⚠ CAUTION

PV OUTPUT CIRCUIT

LABEL 13

⚠ CAUTION

INVERTER OUTPUT CIRCUIT

LABEL 14

⚠ CAUTION SOLAR CIRCUIT

LABEL 16

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ISSUED			
DATE	DESCRIPTION	APPVD.	
11-22-2024	90% REVIEW	JE	
1-10-2025	BID REVIEW	JE	
REVISED			
NO.	DATE	DESCRIPTION	APPVD.
CERTIFICATION			
DESIGNED BY		CHECKED BY	
CITY OF ANN ARBOR SOLAR FACILITIES			
BICENTENNIAL PARK			
2945 E. ELLSWORTH ANN ARBOR, MI 48108			
50.0 kW AC SOLAR ARRAY 49.1 kW DC SOLAR ARRAY			
LABELS AND PLACARDS			
PROJECT NUMBER 23-11-1168-PRK			
DRAWN BY GAK		SHEET NUMBER	
SCALE		E01	
SHEET SIZE 22x34			

D

C

B

A

Dwg: J:\PROJECTS\23 projs\23-11-1168 City of Ann Arbor - Solar at City Facilities\Bicentennial Park\Drawings\23111168-PRK-E01.dwg Date: Jan 10 2025; 10:44AM User: george kachadoorian

1. BASIC ELECTRICAL REQUIREMENTS

- | | |
|----|---|
| A. | FURNISH AND INSTALL THE MATERIAL, EQUIPMENT AND SYSTEMS COMPLETE AS SPECIFIED AND/OR INDICATED ON THE DRAWINGS. |
| B. | COMPLY WITH THE 2023 NATIONAL ELECTRICAL CODE (NEC) AND ALL APPLICABLE MUNICIPAL, STATE, LOCAL CODES. |
| C. | OBTAIN ALL APPLICABLE PERMITS INCLUDING BUILDING AND ELECTRICAL, LICENSES AND INSPECTIONS AS REQUIRED. |
| D. | ALL MATERIALS AND EQUIPMENT SHALL BE LISTED AND LABELED BY UL OR OTHER NATIONALLY RECOGNIZED TESTING LABORATORY. |
| E. | SUBMIT SHOP DRAWINGS, WIRING DIAGRAMS, SPECIFICATIONS, OPERATING DATA, AND/OR CATALOG CUTS FOR ALL EQUIPMENT. |
| F. | FOLLOW QUALITY ASSURANCE PROJECT PLAN (QAPP), STARTUP AND COMMISSIONING PROTOCOL. |
| G. | UPON COMPLETION OF THE ELECTRICAL INSTALLATION, THE CONTRACTOR SHALL DELIVER TO NOVA ONE (1) SET OF PRINTS OF AS-BUILT CONTRACT DRAWINGS SHOWING ALL ADDITIONS AND CHANGES DURING THE INSTALLATION. THESE DRAWINGS SHALL BE SUITABLE FOR USE IN PREPARATION OF RECORD DRAWINGS. |

2. BASIC ELECTRICAL MATERIALS AND METHODS.

- A. RACEWAYS
- INSTALL ALL WIRING IN CONDUIT EXCEPT AS OTHERWISE INDICATED. MINIMUM CONDUIT SIZE TO BE ½". CONDUIT SHALL BE RIGID GALVANIZED STEEL ABOVE GROUND AND WHERE USED AS ELBOWS AND STUB-UPS UNDERGROUND. ELECTRICAL METALLIC TUBING (EMT) MAY BE INSTALLED ABOVE GROUND WHERE NOT SUBJECT TO DAMAGE. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC. INSTALL CONDUITS PARALLEL AND PERPENDICULAR TO WALLS AND OTHER SURFACES. CLEAN, CAP, AND PROVIDE A PULL STRING IN EACH CONDUIT TO BE LEFT EMPTY.
- B. BOXES
- JUNCTION BOXES AND PULL BOXES SHALL BE STAMPED STEEL OR CAST ALUMINUM, UL LISTED FOR THE APPLICATION.
- C. DISCONNECT SWITCHES
- UNLESS OTHERWISE INDICATED, DISCONNECT SWITCHES USED INDOORS SHALL HAVE A NEMA 12 ENCLOSURE AND DISCONNECT SWITCHES USED OUTDOORS SHALL HAVE A NEMA 3R ENCLOSURE. DISCONNECT SWITCHES SHALL BE PAD LOCKABLE IN THE OPEN POSITION.
- D. GROUNDING
- PROVIDE GROUNDING OF THE ENTIRE ELECTRICAL SYSTEM IN ACCORDANCE WITH NEC ARTICLE 250.
- PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL BRANCH CIRCUITS AND ALL FEEDERS.
- GROUNDING CONDUCTORS SHALL BE CLASS B STRANDED COPPER, GREEN INSULATED. TERMINATE EACH END USING A SUITABLE LISTED CONNECTOR.
- BOND PV MODULES AS SHOWN ON THE DRAWINGS. CONNECT BONDING PIGTAILS TO MODULES PER MANUFACTURER'S INSTRUCTIONS. WHERE USED LUGS SHALL BE UL LISTED FOR DIRECT BURIAL.
- GROUNDING ELECTRODES (GROUND RODS) SHALL BE COPPER-CLAD STEEL, MINIMUM 5/8" DIAMETER AND 8 FT. LONG.
- BOND TOGETHER METAL STRUCTURES PER NEC 250.110.
- E. WIRE AND CABLE
- 1) WIRE FOR AC CIRCUITS SHALL BE RATED 90 DEGREES C WET OR DRY AND SHALL BE STRANDED COPPER WIRES, TYPE THHN/THWN-2 AND RATED 600V.
- 2) WIRE FOR MEDIUM VOLTAGE SHALL BE 1C-15kV CLASS.
- 3) WIRE FOR DC CIRCUITS SHALL BE RATED 90 DEGREES C WET OR DRY AND SHALL BE STRANDED COPPER. ALL DC WIRING NOT IN RACEWAY SHALL BE INSULATED TYPE USE-2 OR PV RATED TO 2000V.
- 4) DC EQUIPMENT GROUNDING CONDUCTOR SHALL BE MINIMUM OF #6 AWG COPPER AND BE MECHANICALLY ATTACHED TO EACH PV RACKING STRUCTURE UNLESS OTHERWISE NOTED.
- 5) NO SPLICES SHALL BE MADE EXCEPT WITHIN BOXES UL LISTED FOR THE PURPOSE.
- F. SENSORS AND SENSOR WIRING
- 1) FURNISH AND INSTALL PYRANOMETERS, TEMPERATURE SENSORS, ETC. AS REQUIRED AND AS SHOWN ON DRAWINGS. ALL WIRING USED FOR CONTROLS AND MONITORING SHALL BE APPROVED BY NOVA.

3. DATA AND COMMUNICATIONS SYSTEMS

- A. ALL DATA AND COMMUNICATIONS WIRING (INCLUDING CELL MODEMS) SHALL BE COORDINATED WITH THE CITY OF ANN ARBOR AND INSTALLED BY ELECTRICAL CONTRACTOR OR AS DIRECTED BY NOVA.

4. IDENTIFICATION AND LABELS

- A. ALL WIRES SHALL BE LABELED AT EACH END.
- B. ALL EQUIPMENT MUST BE LABELED PER NEC ARTICLE 690 AND SHEET E-701.
- C. PROVIDE LABEL ON EACH PIECE OF EQUIPMENT, SUCH AS INVERTER, COMBINER BOXES, DISCONNECT SWITCHES, ETC. THE LABEL SHALL IDENTIFY THE EQUIPMENT BY THE NAME USED ON THE DRAWINGS, SUCH AS INVERTERS, COMBINER BOXES, DISCONNECT SWITCHES.

5. PV SYSTEM EQUIPMENT

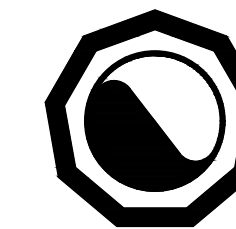
- A. PV MODULES:
- 1) JINKO SOLAR (EAGLE) JKM585N-72HL4-BDV (585W)
 - a. MAX POWER OUTPUT: $P_{max} = 585W$ AT STC
 - b. VOLTAGE AT MAX POWER: $V_{mp} = 44.02V$
 - c. OPEN CIRCUIT VOLTAGE: $V_{oc} = 52.70V$
 - d. CURRENT AT MAX POWER: $I_{mpp} = 13.29A$
 - e. SHORT CIRCUIT CURRENT: $I_{sc} = 14.01A$
 - 2) MODULES PER STRING = 14
 - 3) STRINGS PER INVERTER = 6
 - 4) NUMBER OF STRINGS = 6
 - 5) No. OF MODULES = 84
 - 6) NEG LEAD LENGTH (LANDSCAPE) = 55.12"
 - 7) POS LEAD LENGTH (LANDSCAPE) = 55.12"
- B. TOTAL ARRAY:
- 1) DC NAMEPLATE RATING: $(84 \times 585) = 49.14 \text{ kW}$
- C. RACKING SYSTEM:
- 1) GENMOUNTS SOLAR RACKING SYSTEM / SINCLAIR DESIGN & ENGINEERING SOLAR CARPORT SYSTEM
 - 2) MODULES TILTED 7 DEGREES
- D. INVERTER
- 1) YASKAWA SOLECTRIA SOLAR PVI-50TL-480
 - 2) NUMBER OF INVERTERS = 1
 - 3) MEETS IEEE-1547, RULE 21, RULE 14 (HI)
 - 4) UL LISTED TO UL-1741, UL-1741 SA, UL-1699B. CSA 2.22
 - 5) NOMINAL INPUT VOLTAGE DC+ TO DC- = 330 TO 1000 VDC RANGE (EACH)
 - 6) MAXIMUM INPUT VOLTAGE DC+ TO DC- = 1000 VDC (EACH)
 - 7) MAX INPUT CURRENT: 108A
 - 8) NOMINAL OUTPUT VOLTAGE: 277 / 480 VAC
 - 9) CONTINUOUS CURRENT OUTPUT: 60.2A
 - 10) MAX CONTINUOUS OUTPUT POWER: 50kW

6. INSTALLATION

- 1) STORE MODULES IN MANUFACTURER'S PACKAGING UNTIL READY TO INSTALL.
- 2) PREPARE SURFACE AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- 3) ATTACH MODULE GROUNDING TERMINAL TO GROUNDING SYSTEM PER DRAWINGS.

7. ELECTRIC VEHICLE CHARGERS (EVC)

- A. EVC's:
- 1) SEE SHEET E802 FOR EVC SPECIFICATIONS
 - 2) INSTALL EVC PER MANUFACTURERS INSTALLATION MANUAL



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REVISÉD

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CERTIFICATION

DESIGNED BY	CHECKED BY
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SOLAR FACILITIES

BICENTENNIAL PARK

2945 E. ELLSWORTH
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50.0 kW AC SOLAR ARRAY
49.1 kW DC SOLAR ARRAY

ELECTRICAL SPECIFICATIONS

PROJECT NUMBER		23-11-1168-PRK
DRAWN BY GAK		
SCALE		
SHEET SIZE 22x34		
		SHEET NUMBER E702

