UNIRAC

U-BUILDER PROJECT REPORT

APPLICATION VERSION: 6.3.0
PROJECT VERSION: 0.0.43

PROJECT TITLE	PROJECT ID	LAST UPDATED
GFT	F94C1CD5	Feb. 15, 2024
		ORIGINALLY CREATED
		Nov. 20, 2023

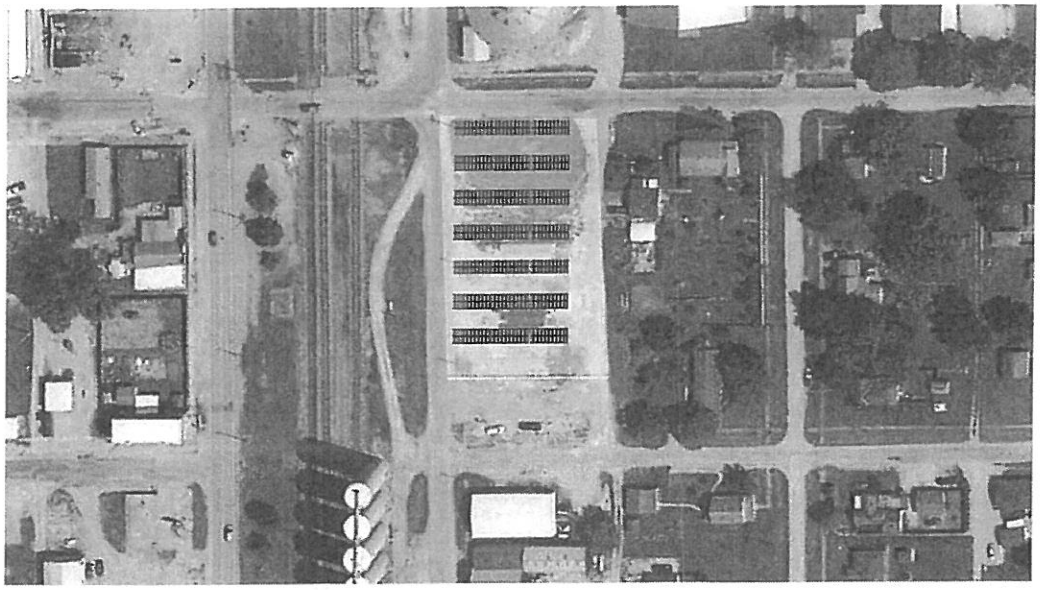
NAME	Christian County FS	Designed by DavidR
ADDRESS	660 Vandevere St, Morrisonville, IL 62546, USA	GFT
CITY, STATE	Morrisonville, IL	VSUN
MODULE	VSUN VSUN570N-144BMH-DG	420 - VSUN570N-144BMH-DG
		239.40 KW

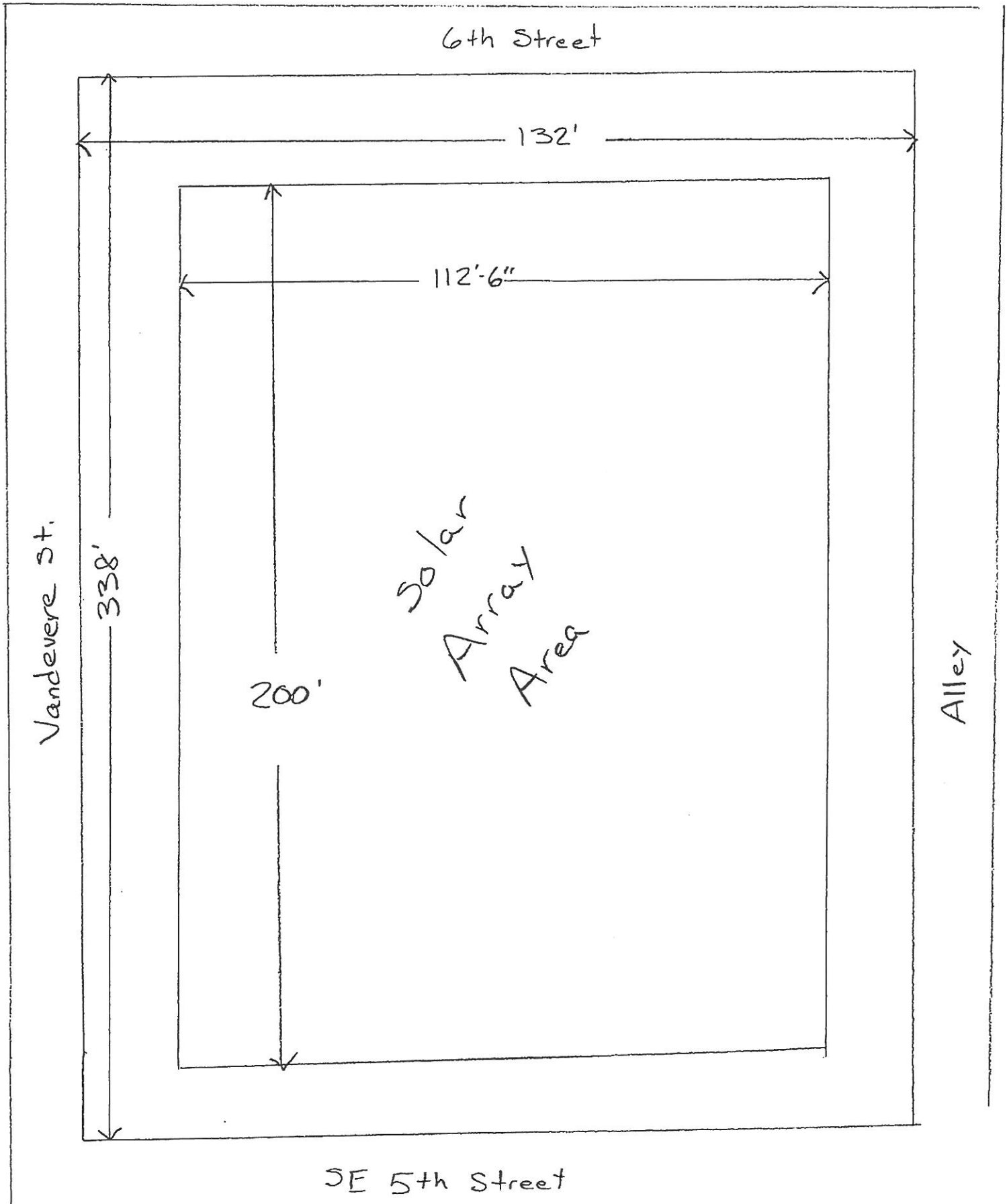
NOTE: Installation of the project is intended to happen within the year of project designed in UBuilder. If it's past one year please rerun the design or contact Unirac Engineering Services.

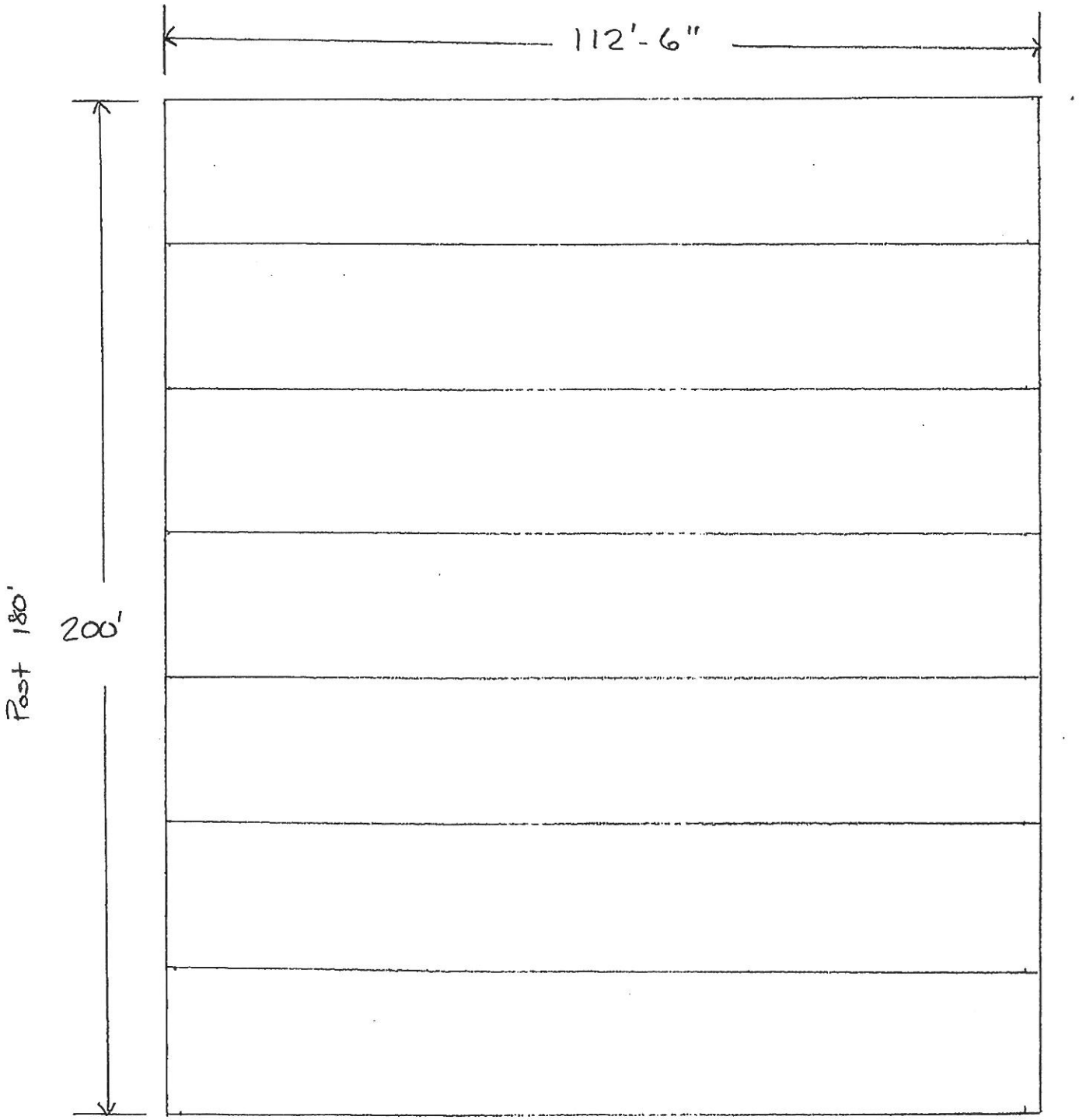
8' of embedment needs to be verified by pile testing or by an engineered pile design

INSTALLATION AND DESIGN PLAN

Site Area 1




6th Street
132'
112'-6"
338'
200'
Solar Array Area
Vandevere St.
Alley
SE 5th Street


112'-6"
200'
Past 180'

STANDARD AGREEMENT FOR INTERCONNECTION OF DISTRIBUTED GENERATION FACILITIES WITH A CAPACITY LESS THAN OR EQUAL TO 10 MVA

This agreement (together with all attachments, the "Agreement") is made and entered into this 11 day of January 2024, by and between _Morrisonville Farmers Co-Op_ ("interconnection customer"), as a _business_ organized and existing under the laws of the State of _Illinois__ and Ameren Illinois Company, ("Electric Distribution Company" or "EDC"), a corporation existing under the laws of the State of Illinois. Interconnection customer and EDC each may be referred to as a "Party", or collectively as the "Parties".

Recitals:

Whereas, interconnection customer is proposing to install or direct the installation of a distributed generation facility, or is proposing a generating capacity addition to an existing distributed generation facility, consistent with the interconnection request application form completed by interconnection customer on __XX/XX/XXXX_; and

Whereas, the interconnection customer will operate and maintain, or cause the operation and maintenance of, the distributed generation facility; and

Whereas, interconnection customer desires to interconnect the distributed generation facility with EDC's electric distribution system.

Now, therefore, in consideration of the premises and mutual covenants set forth in this Agreement, and other good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, the Parties covenant and agree as follows:

Article 1. Scope and Limitations of Agreement

1.1 This Agreement shall be used for all approved interconnection requests for distributed generation facilities that fall under Levels 2, 3 and 4 according to the procedures set forth in Part 466 of the Commission's rules (83 Ill. Adm. Code 466) (referred to as the Illinois Distributed Generation Interconnection Standard).

1.2 This Agreement governs the terms and conditions under which the distributed generation facility will interconnect to, and operate in parallel with, the EDC's electric distribution system.

1.3 This Agreement does not constitute an agreement to purchase or deliver the interconnection customer's power.

1.4 Nothing in this Agreement is intended to affect any other agreement between the EDC and the interconnection customer.

1.5 Terms used in this agreement are defined as in Section 466.30 of the Illinois Distributed Generation Interconnection Standard unless otherwise noted.

1.6 Responsibilities of the Parties

1.6.1 The Parties shall perform all obligations of this Agreement in accordance with all applicable laws and regulations.

1.6.2 The EDC shall construct, own, operate, and maintain its interconnection facilities in accordance with this Agreement.

1.6.3 The interconnection customer shall construct, own, operate, and maintain its distributed generation facility and interconnection facilities in accordance with this Agreement.

1.6.4 Each Party shall operate, maintain, repair, and inspect, and shall be fully responsible for, the facilities that it now or subsequently may own unless otherwise specified in the attachments to this Agreement. Each Party shall be responsible for the safe installation, maintenance, repair and condition of its respective lines and appurtenances on its respective sides of the point of interconnection.

1.6.5 The interconnection customer agrees to design, install, maintain and operate its distributed generation facility so as to minimize the likelihood of causing an adverse system impact on the electric distribution system or any other electric system that is not owned or operated by the EDC.

1.7 Parallel Operation Obligations
Once the distributed generation facility has been authorized to commence parallel operation, the interconnection customer shall abide by all operating procedures established in IEEE Standard 1547 and any other applicable laws, statutes or guidelines, including those specified in Attachment 4 of this Agreement.

1.8 Metering
The interconnection customer shall be responsible for the cost to purchase, install, operate, maintain, test, repair, and replace metering and data acquisition equipment specified in Attachments 5 and 6 of this Agreement.

1.9 Reactive Power

1.9.1 Interconnection customers with a distributed generation facility larger than or equal to 1 MVA shall design their distributed generation facilities to maintain a power factor at the point of interconnection between .95 lagging and .95 leading

at all times. Interconnection customers with a distributed generation facility smaller than 1 MVA shall design their distributed generation facility to maintain a power factor at the point of interconnection between .90 lagging and .90 leading at all times.

1.9.2 Any EDC requirements for meeting a specific voltage or specific reactive power schedule as a condition for interconnection shall be clearly specified in Attachment 4. Under no circumstance shall the EDC's additional requirements for voltage or reactive power schedules exceed the normal operating capabilities of the distributed generation facility.

1.9.3 If the interconnection customer does not operate the distributed generation facility within the power factor range specified in Attachment 4, or does not operate the distribute generation facility in accordance with a voltage or reactive power schedule specified in Attachment 4, the interconnection customer is in default, and the terms of Article 6.5 apply.

1.10 Standards of Operations

The interconnection customer must obtain all certifications, permits, licenses and approvals necessary to construct, operate and maintain the facility and to perform its obligations under this Agreement. The interconnection customer is responsible for coordinating and synchronizing the distributed generation facility with the EDC's system. The interconnection customer is responsible for any damage that is caused by the interconnection customer's failure to coordinate or synchronize the distributed generation facility with the electric distribution system. The interconnection customer agrees to be primarily liable for any damages resulting from the continued operation of the distributed generation facility after the EDC ceases to energize the line section to which the distributed generation facility is connected. In Attachment 4, the EDC shall specify the shortest reclose time setting for its protection equipment that could affect the distributed generation facility. The EDC shall notify the interconnection customer at least 10 business days prior to adopting a faster reclose time on any automatic protective equipment, such as a circuit breaker or line recloser, that might affect the distributed generation facility.

Article 2. Inspection, Testing, Authorization, and Right of Access

2.1 Equipment Testing and Inspection
The interconnection customer shall test and inspect its distributed generation facility including the interconnection equipment prior to interconnection in accordance with IEEE Standard 1547 (2003) and IEEE Standard 1547.1 (2005). The interconnection customer shall not operate its distributed generation facility in parallel with the EDC's electric distribution system without prior written authorization by the EDC as provided for in Articles 2.1.1-2.1.3.

2.1.1 The EDC shall perform a witness test after construction of the distributed generation facility is completed, but before parallel operation, unless the EDC specifically waives the witness test. The interconnection customer shall provide the EDC at least 15 business day notice of the planned commissioning test for the distributed generation facility. If the EDC performs a witness test at a time that is not concurrent with the commissioning test, it shall contact the interconnection customer to schedule the witness test at a mutually agreeable time within 10 business days after the scheduled commissioning test designated on the application. If the EDC does not perform the witness test within 10 business days after the commissioning test, the witness test is deemed waived unless the Parties mutually agree to extend the date for scheduling the witness test, or unless the EDC cannot do so for good cause, in which case, the Parties shall agree to another date for scheduling the test within 10 business days after the original scheduled date. If the witness test is not acceptable to the EDC, the interconnection customer has 30 business days to address and resolve any deficiencies. This time period may be extended upon agreement between the EDC and the interconnection customer. If the interconnection customer fails to address and resolve the deficiencies to the satisfaction of the EDC, the applicable cure provisions of Article 6.5 shall apply. The interconnection customer shall, if requested by the EDC, provide a copy of all documentation in its possession regarding testing conducted pursuant to IEEE Standard 1547.1.

2.1.2 If the interconnection customer conducts interim testing of the distributed generation facility prior to the witness test, the interconnection customer shall obtain permission from the EDC before each occurrence of operating the distributed generation facility in parallel with the electric distribution system. The EDC may, at its own expense, send qualified personnel to the distributed generation facility to observe such interim testing, but it cannot mandate that these tests be considered in the final witness test. The EDC is not required to observe the interim testing or precluded from requiring the tests be repeated at the final witness test.

2.1.3 After the distributed generation facility passes the witness test, the EDC shall affix an authorized signature to the certificate of completion and return it to the interconnection customer approving the interconnection and authorizing parallel operation. The authorization shall not be conditioned or delayed.

2.2 Commercial Operation
The interconnection customer shall not operate the distributed generation facility, except for interim testing as provided in Article 2.1, until such time as the certificate of completion is signed by all Parties.

2.3 Right of Access
The EDC must have access to the disconnect switch and metering equipment of the distributed generation facility at all times. When practical, the EDC shall provide notice to the interconnection customer prior to using its right of access.

Article 3. Effective Date, Term, Termination, and Disconnection

3.1 Effective Date
This Agreement shall become effective upon execution by all Parties.

3.2 Term of Agreement
This Agreement shall become effective on the effective date and shall remain in effect unless terminated in accordance with Article 3.3 of this Agreement.

3.3 Termination

3.3.1 The interconnection customer may terminate this Agreement at any time by giving the EDC 30 calendar days prior written notice.

3.3.2 Either Party may terminate this Agreement after default pursuant to Article 6.5.

3.3.3 The EDC may terminate, upon 60 calendar days' prior written notice, for failure of the interconnection customer to complete construction of the distributed generation facility within 12 months after the in-service date as specified by the Parties in Attachment 2, which may be extended by agreement between the Parties.

3.3.4 The EDC may terminate this Agreement, upon 60 calendar days' prior written notice, if the interconnection customer has abandoned, cancelled, permanently disconnected or stopped development, construction, or operation of the distributed generation facility, or if the interconnection customer fails to operate the distributed generation facility in parallel with the EDC's electric system for three consecutive years.

3.3.5 Upon termination of this Agreement, the distributed generation facility will be disconnected from the EDC's electric distribution system. Terminating this Agreement does not relieve either Party of its liabilities and obligations that are owed or continuing when the Agreement is terminated.

3.3.6 If the Agreement is terminated, the interconnection customer loses its position in the interconnection queue.

3.4 Temporary Disconnection

A Party may temporarily disconnect the distributed generation facility from the electric distribution system in the event one or more of the following conditions or events occurs:

3.4.1 Emergency conditions – shall mean any condition or situation: (1) that in the judgment of the Party making the claim is likely to endanger life or property; or (2) that the EDC determines is likely to cause an adverse system impact, or is likely to have a material adverse effect on the EDC's electric distribution system, interconnection facilities or other facilities, or is likely to interrupt or materially interfere with the provision of electric utility service to other customers; or (3) that is likely to cause a material adverse effect on the distributed generation facility or the interconnection equipment. Under emergency conditions, the EDC or the interconnection customer may suspend interconnection service and temporarily disconnect the distributed generation facility from the electric distribution system. The EDC must notify the interconnection customer when it becomes aware of any conditions that might affect the interconnection customer's operation of the distributed generation facility. The interconnection customer shall notify the EDC when it becomes aware of any condition that might affect the EDC's electric distribution system. To the extent information is known, the notification shall describe the condition, the extent of the damage or deficiency, the expected effect on the operation of both Parties' facilities and operations, its anticipated duration, and the necessary corrective action.

3.4.2 Scheduled maintenance, construction, or repair – the EDC may interrupt interconnection service or curtail the output of the distributed generation facility and temporarily disconnect the distributed generation facility from the EDC's electric distribution system when necessary for scheduled maintenance, construction, or repairs on EDC's electric distribution system. To the extent possible, the EDC shall provide the interconnection customer with notice five business days before an interruption. The EDC shall coordinate the reduction or temporary disconnection with the interconnection customer; however, the interconnection customer is responsible for out-of-pocket costs incurred by the EDC for deferring or rescheduling maintenance, construction or repair at the interconnection customer's request.

3.4.3 Forced outages – The EDC may suspend interconnection service to repair the EDC's electric distribution system. The EDC shall provide the interconnection customer with prior notice, if possible. If prior notice is not possible, the EDC shall, upon written request, provide the interconnection customer with written documentation, after the fact, explaining the circumstances of the disconnection.

3.4.4 Adverse system impact – the EDC must provide the interconnection customer with written notice of its intention to disconnect the distributed generation facility, if the EDC determines that operation of the distributed generation facility creates an adverse system impact. The documentation that supports the EDC's decision to disconnect must be provided to the interconnection customer. The EDC may disconnect the distributed generation facility if, after receipt of the notice, the interconnection customer fails to remedy the adverse system impact, unless emergency conditions exist, in which case, the provisions of Article 3.4.1 apply. The EDC may continue to leave the generating facility disconnected until the adverse system impact is corrected.

3.4.5 Modification of the distributed generation facility – The interconnection customer must receive written authorization from the EDC prior to making any change to the distributed generation facility, other than a minor equipment modification. If the interconnection customer modifies its facility without the EDC's prior written authorization, the EDC has the right to disconnect the distributed generation facility until such time as the EDC concludes the modification poses no threat to the safety or reliability of its electric distribution system.

3.4.6 The EDC is not responsible for any lost opportunity or other costs incurred by the interconnection customer as a result of an interruption of service under Article 3.

Article 4. Cost Responsibility for Interconnection Facilities and Distribution Upgrades

4.1 Interconnection Facilities

4.1.1 The interconnection customer shall pay for the cost of the interconnection facilities itemized in Attachment 3. The EDC shall identify the additional interconnection facilities necessary to interconnect the distributed generation facility with the EDC's electric distribution system, the cost of those facilities, and the time required to build and install those facilities, as well as an estimated date of completion of the building or installation of those facilities.

4.1.2 The interconnection customer is responsible for its expenses, including overheads, associated with owning, operating, maintaining, repairing, and replacing its interconnection equipment.

4.2 Distribution Upgrades

The EDC shall design, procure, construct, install, and own any distribution upgrades. The actual cost of the distribution upgrades, including overheads, shall be directly assigned to the interconnection customer whose distributed generation facility caused the need for the distribution upgrades.

Article 5. Billing, Payment, Milestones, and Financial Security

5.1 Billing and Payment Procedures and Final Accounting (Applies to additional reviews conducted under a Level 2 review and Level 4 reviews)

5.1.1 The EDC shall bill the interconnection customer for the design, engineering, construction, and procurement costs of EDC-provided interconnection facilities and distribution upgrades contemplated by this Agreement as set forth in Attachment 3. The billing shall occur on a monthly basis, or as otherwise agreed to between the Parties. The interconnection customer shall pay each bill within 30 calendar days after receipt, or as otherwise agreed to between the Parties.

5.1.2 Within 90 calendar days after completing the construction and installation of the EDC's interconnection facilities and distribution upgrades described in Attachments 2 and 3 to this Agreement, the EDC shall provide the interconnection customer with a final accounting report of any difference between (1) the actual cost incurred to complete the construction and installation of the EDC's interconnection facilities and distribution upgrades; and (2) the interconnection customer's previous deposit and aggregate payments to the EDC for the interconnection facilities and distribution upgrades. If the interconnection customer's cost responsibility exceeds its previous deposit and aggregate payments, the EDC shall invoice the interconnection customer for the amount due and the interconnection customer shall make payment to the EDC within 30 calendar days. If the interconnection customer's previous deposit and aggregate payments exceed its cost responsibility under this Agreement, the EDC shall refund to the interconnection customer an amount equal to the difference within 30 calendar days after the final accounting report. Upon request from the interconnection customer, if the difference between the budget estimate and the actual cost exceeds 20%, the EDC will provide a written explanation for the difference.

5.1.3 If a Party disputes any portion of its payment obligation pursuant to this Article 5, the Party shall pay in a timely manner all non-disputed portions of its invoice, and the disputed amount shall be resolved pursuant to the dispute resolution provisions contained in Article 8. A Party disputing a portion of an Article 5 payment shall not be considered to be in default of its obligations under this Article.

5.2 Interconnection Customer Deposit

Within 15 business days after signing and returning the interconnection agreement to the EDC, the interconnection customer shall provide the EDC with a deposit equal to 100% of the estimated, non-binding cost to procure, install, or construct any such facilities (the "Security Deposit"). However, when the estimated date of completion of the building or installation of facilities exceeds three months from the date of notification, pursuant to Article 4.1.1 of this Agreement, this deposit may be held in escrow by a mutually agreed-upon third-party, with any interest to inure to the benefit of the interconnection customer.

To the extent that this interconnection agreement is terminated for any reason, the EDC shall return all deposits provided by the interconnection customer, less any actual costs incurred by the EDC.

Article 6. Assignment, Limitation on Damages, Indemnity, Force Majeure, and Default

6.1 Assignment

This Agreement may be assigned by either Party. If the interconnection customer attempts to assign this Agreement, the assignee must agree to the terms of this Agreement in writing and such writing must be provided to the EDC. Any attempted assignment that violates this Article is void and ineffective. Assignment shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason of the assignment. An assignee is responsible for meeting the same obligations as the assignor.

6.1.1 Either Party may assign this Agreement without the consent of the other Party to any affiliate (including mergers, consolidations, or transfers, or a sale of a substantial portion of the Party's assets, between the Party and another entity), of the assigning Party that has an equal or greater credit rating and the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement.

6.1.2 The interconnection customer can assign this Agreement, without the consent of the EDC, for collateral security purposes to aid in providing financing for the distributed generation facility.

6.2 Limitation on Damages

Except for cases of gross negligence or willful misconduct, the liability of any Party to this Agreement shall be limited to direct actual damages and reasonable attorney's fees, and all other damages at law are waived. Under no circumstances, except for cases of gross negligence or willful misconduct, shall any Party or its directors, officers, employees and agents, or any of them, be liable to another Party, whether in tort, contract or other basis in law or equity for any special, indirect, punitive, exemplary or consequential damages, including lost profits, lost revenues, replacement power, cost of capital or replacement equipment. This limitation on damages shall not affect any Party's rights to obtain equitable relief, including specific performance, as otherwise provided in this Agreement. The provisions of this Article 6.2 shall survive the termination or expiration of the Agreement.

6.3 Indemnity

6.3.1 This provision protects each Party from liability incurred to third parties as a result of carrying out the provisions of this Agreement. Liability under this provision is exempt from the general limitations on liability found in Article 6.2.

6.3.2 The interconnection customer shall indemnify and defend the EDC and the EDC's directors, officers, employees, and agents, from all damages and expenses resulting from a third party claim arising out of or based upon the interconnection customer's (a) negligence or willful misconduct or (b) breach of this Agreement.

6.3.3 The EDC shall indemnify and defend the interconnection customer and the interconnection customer's directors, officers, employees, and agents from all damages and expenses resulting from a third party claim arising out of or based upon the EDC's (a) negligence or willful misconduct or (b) breach of this Agreement.

6.3.4 Within 5 business days after receipt by an indemnified Party of any claim or notice that an action or administrative or legal proceeding or investigation as to which the indemnity provided for in this Article may apply has commenced, the indemnified Party shall notify the indemnifying Party of such fact. The failure to notify, or a delay in notification, shall not affect a Party's indemnification obligation unless that failure or delay is materially prejudicial to the indemnifying Party.

6.3.5 If an indemnified Party is entitled to indemnification under this Article as a result of a claim by a third party, and the indemnifying Party fails, after notice and reasonable opportunity to proceed under this Article, to assume the defense of such claim, that indemnified Party may, at the expense of the indemnifying Party, contest, settle or consent to the entry of any judgment with respect to, or pay in full, the claim.

6.3.6 If an indemnifying Party is obligated to indemnify and hold any indemnified Party harmless under this Article, the amount owing to the indemnified person shall be the amount of the indemnified Party's actual loss, net of any insurance or other recovery.

6.4 Force Majeure

6.4.1 As used in this Article, a force majeure event shall mean any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A force majeure event does not include an act of gross negligence or intentional wrongdoing by the Party claiming force majeure.

6.4.2 If a force majeure event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the force majeure event ("Affected Party") shall notify the other Party of the existence of the force majeure event within one

business day. The notification must specify the circumstances of the force majeure event, its expected duration, and the steps that the Affected Party is taking and will take to mitigate the effects of the event on its performance. If the initial notification is verbal, it must be followed up with a written notification within one business day. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the force majeure event until the event ends. The Affected Party may suspend or modify its obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the force majeure event cannot be otherwise mitigated.

6.5 Default

6.5.1 No default shall exist when the failure to discharge an obligation (other than the payment of money) results from a force majeure event as defined in this Agreement, or the result of an act or omission of the other Party.

6.5.2 A Party shall be in default ("Default") of this Agreement if it fails in any material respect to comply with, observe or perform, or defaults in the performance of, any covenant or obligation under this Agreement and fails to cure the failure within 60 calendar days after receiving written notice from the other Party. Upon a default of this Agreement, the non-defaulting Party shall give written notice of the default to the defaulting Party. Except as provided in Article 6.5.3, the defaulting Party has 60 calendar days after receipt of the default notice to cure the default; provided, however, if the default cannot be cured within 60 calendar days, the defaulting Party shall commence the cure within 20 calendar days after original notice and complete the cure within six months from receipt of the default notice; and, if cured within that time, the default specified in the notice shall cease to exist.

6.5.3 If a Party has assigned this Agreement in a manner that is not specifically authorized by Article 6.1, fails to provide reasonable access pursuant to Article 2.3, and is in default of its obligations pursuant to Article 7, or if a Party is in default of its payment obligations pursuant to Article 5 of this Agreement, the defaulting Party has 30 days from receipt of the default notice to cure the default.

6.5.4 If a default is not cured as provided for in this Article, or if a default is not capable of being cured within the period provided for in this Article, the non-defaulting Party shall have the right to terminate this Agreement by written notice, and be relieved of any further obligation under this Agreement and, whether or not that Party terminates this Agreement, to recover from the defaulting Party all amounts due under this Agreement, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this Article shall survive termination of this Agreement.

Article 7. Insurance

For distributed generation facilities with a nameplate capacity of 1 MVA or above, the interconnection customer shall carry sufficient insurance coverage so that the maximum comprehensive/general liability coverage that is continuously maintained by the interconnection customer during the term shall be not less than $2,000,000 for each occurrence, and an aggregate, if any, of at least $4,000,000. The EDC, its officers, employees and agents shall be added as an additional insured on this policy. The interconnection customer agrees to provide the EDC with at least 30 calendar days advance written notice of cancellation, reduction in limits, or non-renewal of any insurance policy required by this Article.

Article 8. Dispute Resolution

8.1 Parties shall attempt to resolve all disputes regarding interconnection as provided in this Article in a good faith manner.

8.2 If there is a dispute between the Parties about an interpretation of the Agreement, the aggrieved Party shall issue a written notice to the other Party to the agreement that specifies the dispute and the Agreement articles that are disputed.

8.3 A meeting between the Parties shall be held within ten days after receipt of the written notice. Persons with decision-making authority from each Party shall attend the meeting. If the dispute involves technical issues, persons with sufficient technical expertise and familiarity with the issue in dispute from each Party shall also attend the meeting. The meeting may be conducted by teleconference.

8.4 After the first meeting, each Party may seek resolution through complaint or mediation procedures available at the Commission. The Commission may designate an engineer from the Commission's Energy Division to assist in resolving the dispute. Dispute resolution shall be conducted in a manner designed to minimize costs and delay. Dispute resolution may be conducted by phone.

8.5 Pursuit of dispute resolution may not affect an interconnection request or an interconnection applicant's position in the EDC's interconnection queue.

8.6 If the Parties fail to resolve their dispute under the dispute resolution provisions of this Article, nothing in this Article shall affect any Party's rights to obtain equitable relief, including specific performance, as otherwise provided in this Agreement.

Article 9. Miscellaneous

9.1 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the State of Illinois, without regard to its conflicts of law principles. This Agreement is subject to all applicable laws and regulations. Each Party expressly reserves the right to seek change in, appeal, or otherwise contest any laws, orders or regulations of a governmental authority. The language in all parts of this Agreement shall in all cases be construed as a whole, according to its fair meaning, and not strictly for or against the EDC or interconnection customer, regardless of the involvement of either Party in drafting this Agreement.

9.2 Amendment

Modification of this Agreement shall be only by a written instrument duly executed by both Parties.

9.3 No Third-Party Beneficiaries

This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations in this Agreement assumed are solely for the use and benefit of the Parties, their successors in interest and, where permitted, their assigns.

9.4 Waiver

9.4.1 Except as otherwise provided in this Agreement, a Party's compliance with any obligation, covenant, agreement, or condition in this Agreement may be waived by the Party entitled to the benefits thereof only by a written instrument signed by the Party granting the waiver, but the waiver or failure to insist upon strict compliance with the obligation, covenant, agreement, or condition shall not operate as a waiver of, or estoppel with respect to, any subsequent or other failure.

9.4.2. Failure of any Party to enforce or insist upon compliance with any of the terms or conditions of this Agreement, or to give notice or declare this Agreement or the rights under this Agreement terminated, shall not constitute a waiver or relinquishment of any rights set out in this Agreement, but the same shall be and remain at all times in full force and effect, unless and only to the extent expressly set forth in a written document signed by that Party granting the waiver or relinquishing any such rights. Any waiver granted, or relinquishment of any right, by a Party shall not operate as a relinquishment of any other rights or a waiver of any other failure of the Party granted the waiver to comply with any obligation, covenant, agreement, or condition of this Agreement.

9.5 Entire Agreement

Except as provided in Article 9.1, this Agreement, including all attachments, constitutes the entire Agreement between the Parties with reference to the subject matter of this Agreement, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this Agreement. There are no other agreements, representations, warranties, or covenants that constitute any part of the consideration for, or any condition to, either Party's compliance with its obligations under this Agreement.

9.6 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original, but all constitute one and the same instrument.

9.7 No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties, or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

9.8 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other governmental authority, (1) that portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by the ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

9.9 Environmental Releases

Each Party shall notify the other Party of the release of any hazardous substances, any asbestos or lead abatement activities, or any type of remediation activities related to the distributed generation facility or the interconnection facilities, each of which may reasonably be expected to affect the other Party. The notifying Party shall (1) provide the notice as soon as practicable, provided that Party makes a good faith effort to provide the notice no later than 24 hours after that Party becomes aware of the occurrence, and (2) promptly furnish to the other Party copies of any publicly available reports filed with any governmental authorities addressing such events.

9.10 Subcontractors

Nothing in this Agreement shall prevent a Party from using the services of any subcontractor it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing services and each Party shall remain primarily liable to the other Party for the performance of the subcontractor.

9.10.1 A subcontract relationship does not relieve any Party of any of its obligations under this Agreement. The hiring Party remains responsible to the other Party for the acts or omissions of its subcontractor. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of the hiring Party.

9.10.2 The obligations under this Article cannot be limited in any way by any limitation of subcontractor's insurance.

Article 10. Notices

10.1 General

Unless otherwise provided in this Agreement, any written notice, demand, or request required or authorized in connection with this Agreement ("Notice") shall be deemed properly given if delivered in person, delivered by recognized national courier service, or sent by first class mail, postage prepaid, to the person specified below:

If to Interconnection Customer:

Interconnection Customer: Morrisonville Farmers Co-Op

Attention: Mark Bauman

Address: 403 Vandeveer St

City: Morrisonville State: IL Zip: 62546

Phone: _____ Fax: _____ E-Mail: mbauman@cencomfs.com

If to EDC:

EDC: Ameren Illinois Company

Attention: Ameren Illinois Net Metering Coordinator

Address: 10 Richard Mark Way – Mail Code 910

City: Collinsville State: IL Zip: 62234

Phone: _____ Fax: _____ E-Mail: RenewablesIllinois@ameren.com

Alternative Forms of Notice

Any notice or request required or permitted to be given by either Party to the other Party and not required by this Agreement to be in writing may be given by telephone, facsimile or e-mail to the telephone numbers and e-mail addresses set out above.

10.2 Billing and Payment

Billings and payments shall be sent to the addresses set out below:

If to Interconnection Customer:

Interconnection Customer: Morrisonville Farmers Co-Op

Attention: Mark Bauman

Address: 403 Vandeveer St

City: Morrisonville State: IL Zip: 62546

If to EDC:

EDC: Ameren Illinois

Attention: Ameren Net Metering Coordinator

Address: 10 Richard Mark Way – Mail Code 910

City: Collinsville State: IL Zip: 62234

10.3 Designated Operating Representative

The Parties may also designate operating representatives to conduct the communications that may be necessary or convenient for the administration of this Agreement. This person will also serve as the point of contact with respect to operations and maintenance of the Party's facilities.

Interconnection Customer's Operating Representative: Morrisonville Farmers Co-Op

Attention: Mark Bauman

Address: 403 Vandeveer St

City: Morrisonville State: IL Zip: 62546

EDC's Operating Representative: Ameren Illinois

Attention: Ameren Illinois Net Metering Coordinator

Address: 10 Richard Mark Way – Mail Code 910

City: Collinsville State: IL Zip: 62234

10.4 Changes to the Notice Information

Either Party may change this notice information by giving five business days written notice before the effective date of the change.

Article 11. Signatures

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized representatives.

For the Interconnection Customer: -

Name: Mark Bauman
Mark Bauman (Jan 30, 2024 13:49 CST)

Title: _____

Date: _____

For EDC:

Name: _____

Title: _____

Date: _____

Attachment 1

Definitions

Adverse system impact – A negative effect that compromises the safety or reliability of the electric distribution system or materially affects the quality of electric service provided by the electric distribution company (EDC) to other customers.

Applicable laws and regulations – All duly promulgated applicable federal, State and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any governmental authority, having jurisdiction over the Parties.

Commissioning test – Tests applied to a distributed generation facility by the applicant after construction is completed to verify that the facility does not create adverse system impacts. At a minimum, the scope of the commissioning tests performed shall include the commissioning test specified IEEE Standard 1547 Section 5.4 "Commissioning tests."

Distributed generation facility – The equipment used by an interconnection customer to generate or store electricity that operates in parallel with the electric distribution system. A distributed generation facility typically includes an electric generator, prime mover, and the interconnection equipment required to safely interconnect with the electric distribution system or a local electric power system.

Distribution upgrades – A required addition or modification to the EDC's electric distribution system at or beyond the point of interconnection to accommodate the interconnection of a distributed generation facility. Distribution upgrades do not include interconnection facilities.

Electric distribution company or EDC – Any electric utility entity subject to the jurisdiction of the Illinois Commerce Commission.

Electric distribution system – The facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries from interchanges with higher voltage transmission networks that transport bulk power over longer distances. The voltage levels at which electric distribution systems operate differ among areas but generally carry less than 100 kilovolts of electricity. Electric distribution system has the same meaning as the term Area EPS, as defined in 3.1.6.1 of IEEE Standard 1547.

Facilities study – An engineering study conducted by the EDC to determine the required modifications to the EDC's electric distribution system, including the cost and the time required to build and install the modifications, as necessary to accommodate an interconnection request.

Force majeure event – Any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any

other cause beyond a Party's control. A force majeure event does not include an act of gross negligence or intentional wrongdoing.

Governmental authority – Any federal, State, local or other governmental regulatory or administrative agency, court, commission, department, board, other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that this term does not include the interconnection customer, EDC or any affiliate of either.

IEEE Standard 1547 – The Institute of Electrical and Electronics Engineers, Inc. (IEEE), 3 Park Avenue, New York NY 10016-5997, Standard 1547 (2003), "Standard for Interconnecting Distributed Resources with Electric Power Systems."

IEEE Standard 1547.1 – The IEEE Standard 1547.1 (2005), "Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems."

Interconnection agreement or Agreement – The agreement between the interconnection customer and the EDC. The interconnection agreement governs the connection of the distributed generation facility to the EDC's electric distribution system and the ongoing operation of the distributed generation facility after it is connected to the EDC's electric distribution system.

Interconnection customer – The entity entering into this Agreement for the purpose of interconnecting a distributed generation facility to the EDC's electric distribution system.

Interconnection equipment – A group of components or an integrated system connecting an electric generator with a local electric power system or an electric distribution system that includes all interface equipment, including switchgear, protective devices, inverters or other interface devices. Interconnection equipment may be installed as part of an integrated equipment package that includes a generator or other electric source.

Interconnection facilities – Facilities and equipment required by the EDC to accommodate the interconnection of a distributed generation facility. Collectively, interconnection facilities include all facilities, and equipment between the distributed generation facility and the point of interconnection, including modification, additions, or upgrades that are necessary to physically and electrically interconnect the distributed generation facility to the electric distribution system. Interconnection facilities are sole use facilities and do not include distribution upgrades.

Interconnection request – An interconnection customer's request, on the required form, for the interconnection of a new distributed generation facility, or to increase the capacity or change the operating characteristics of an existing distributed generation facility that is interconnected with the EDC's electric distribution system.

Interconnection study – Any of the following studies, as determined to be appropriate by the EDC: the interconnection feasibility study, the interconnection system impact study, and the interconnection facilities study.

Illinois standard distributed generation interconnection rules – The most current version of the procedures for interconnecting distributed generation facilities adopted by the Illinois Commerce Commission. See 83 Ill. Adm. Code 466.

Parallel operation or Parallel – The state of operation that occurs when a distributed generation facility is connected electrically to the electric distribution system.

Point of interconnection – The point where the distributed generation facility is electrically connected to the electric distribution system. Point of interconnection has the same meaning as the term "point of common coupling" defined in 3.1.13 of IEEE Standard 1547.

Witness test – For lab-certified equipment, verification (either by an on-site observation or review of documents) by the EDC that the interconnection installation evaluation required by IEEE Standard 1547 Section 5.3 and the commissioning test required by IEEE Standard 1547 Section 5.4 have been adequately performed. For interconnection equipment that has not been lab-certified, the witness test shall also include verification by the EDC of the on-site design tests required by IEEE Standard 1547 Section 5.1 and verification by the EDC of production tests required by IEEE Standard 1547 Section 5.2. All tests verified by the EDC are to be performed in accordance with the test procedures specified by IEEE Standard 1547.1.

Attachment 2

Construction Schedule, Proposed Equipment & Settings

This attachment is to be completed by the interconnection customer and shall include the following:

1. The construction schedule for the distributed generation facility.

2. A one-line diagram indicating the distributed generation facility, interconnection equipment, interconnection facilities, metering equipment, and distribution upgrades.

3. Component specifications for equipment identified in the one-line diagram.

4. Component settings.

5. Proposed sequence of operations.

6. A three line diagram showing current potential circuits for protective relays.

7. Relay tripping and control schematic diagram.

Attachment 3

Description, Costs and Time Required to Build and Install the EDC's Interconnection Facilities

This attachment is to be completed by the EDC and shall include the following:

1. Required interconnection facilities, including any required metering.

   Per the prior studies - EDC shall build the substation facilities as required to support the interconnection of the interconnection customer proposed facility up to the point of disconnect. The interconnection would consist of N/A. The interconnection customer would be responsible for construction to the point of disconnect. All costs shall be paid for and/or reimbursed by the interconnection customer pursuant to Article 5 of this agreement. The interconnection customer is required to construct all facilities which connect to EDC's facilities or otherwise interface with EDC's facilities, all as determined by EDC's final, detailed engineering, in accordance with EDC's published standards.

   Additional required interconnection facilities and system upgrades may be identified while completing Detailed Engineering.

2. An estimate of itemized costs charged by the EDC for interconnection, including overheads, based on results from prior studies.

   Morrisonville Farmers Co-Op: 403 Vandeveer St, Morrisonville, IL- **180 KW** (PowerClerk DER-31380)

   Queue Position: 1

   NOTE: *THE COST ESTIMATE PROVIDED FOR YOUR PROJECT IN THE NEXT SECTION IS CONTINGENT UPON CONSTRUCTION COMPLETION OF ALL SYSTEM UPGRADES REQUIRED OF PROJECT(S) AHEAD OF YOUR PROJECT IN THE QUEUE THAT HAVE AN IMPACT ON THE CONNECTION OF YOUR PROJECT. SHOULD ANY ONE OR MORE OF SUCH PROJECTS WITHDRAW FOR ANY REASON, THE COSTS ASSOCIATED WITH YOUR PROJECT MAY CHANGE TO REFLECT THE COST IMPACT OF SYSTEM UPGRADES THAT NOW MAY BE REQUIRED TO CONNECT YOUR PROJECT AS A RESULT OF THE WITHDRAWAL OF SUCH HIGHER QUEUED PROJECTS.*

An estimate of itemized costs charged by the EDC for interconnection, including overheads, is provided below and you as the applicant have a choice.

Ameren Illinois reserves the right to revise this estimate prior to and during construction based on the requirements of Good Utility practices not foreseen at the time of the original estimate. The revisions to the estimate may include, but are not limited to, changes in the cost of materials and required labor.

☐ Fixed Cost Option

Notwithstanding any terms in the Interconnection Agreement to the contrary, the interconnection customer and the EDC agree that the cost of the Interconnection upgrades shall be fixed at NO COST regardless of the cost actually required for the design and construction to complete the interconnection. The EDC will provide no information to the interconnection customer regarding the actual costs to accomplish the interconnection.

3. An estimate for the time required to build and install the EDC's interconnection facilities based on results from prior studies and an estimate of the date upon which the facilities will be completed.

The final construction timeline will be developed during the scoping meeting which will be held with the applicant after the deposit is paid in full and will continue to be updated as the developer and Ameren Illinois work thru the construction process. That notwithstanding, it is anticipated that Ameren Illinois will initiate procurement activities immediately following the scoping meeting. Any revisions to the current scope of construction activities and their timeline will be provided immediately after that discussion. The requested in-service date is dependent on the availability of any long lead time equipment and weather impacts on construction activities.

Attachment 4

Operating Requirements for Distributed Generation Facilities Operating in Parallel

The EDC shall list specific operating practices that apply to this distributed generation interconnection and the conditions under which each listed specific operating practice applies.

Attachment 5

Monitoring and Control Requirements

This attachment is to be completed by the EDC and shall include the following:

1. The EDC's monitoring and control requirements must be specified, along with a reference to the EDC's written requirements documents from which these requirements are derived.

2. An internet link to the requirements documents.

https://www.ameren.com/service-manual

http://standards.ieee.org

Attachment 6

Metering Requirements

This attachment is to be completed by the EDC and shall include the following:

1. The metering requirements for the distributed generation facility.

   The specific metering requirements and equipment will be specified as part of the Detailed Engineering.

2. Identification of the appropriate tariffs that establish these requirements.

3. An internet link to these tariffs.

https://www.ameren.com/illinois/business/rates/

https://www.ameren.com/illinois/electric-choice/renewables

Attachment 7

As Built Documents

This attachment is to be completed by the interconnection customer and shall include the following:

When it returns the certificate of completion to the EDC, the interconnection customer shall provide the EDC with documents detailing the as-built status of the following:

1. A one-line diagram indicating the distributed generation facility, interconnection equipment, interconnection facilities, and metering equipment.

2. Component specifications for equipment identified in the one-line diagram.

3. Component settings.

4. Proposed sequence of operations.

5. A three-line diagram showing current potential circuits for protective relays.

6. Relay tripping and control schematic diagram.


13-22-08-111-010-00
111-009-00
Sarpy Street (IL 48)
13-22-08-502-001-00
Vandever Street
13-22-08-114-002-00
6th Street
13-22-08-132-001-00
13-22-08-114-001-00
13-22-08-114-007-00
13-22-08-114-006-00
13-22-08-114-005-00
South Street
Southeast
Southeast 5th Street
13-22-08-114-004-00
13-22-08-116-002-00
13-22-08-114-003-00
13-22-08-138-003-00
13-22-08-116-001-00
13-22-08-138-002-00
13-22-08-116-005-00
© All EagleView Technology C

03/19/2023

INNOVA TECHNOLOGIES

December 12, 2023

Unirac, Inc.
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
TEL: (505) 242-6411
FAX: (505)242-6512

Re.: Innova Technologies No.: 122-099-400
Unirac Ground Fixed Tilt (GFT) Design Tool – Illinois

Attn: Engineering Services

Innova Technologies Inc. has reviewed Unirac's GFT design tool and design methodology. The design tool's methodology is approved and acceptable for the code-compliant, ground mount racking structure supporting photovoltaic (PV) modules for residential and commercial uses.

All analysis and information in the GFT design tool's formulas and tables comply with the following:

- 2009-2021 International Building Code by International Code Council Inc. with provisions form SEAOC PV-2 2017
- 2009-2021 International Residential Code, by International Code Council Inc. with provisions form SEAOC PV-2 2017
- ASCE/SEI 7-05 through 7-16 Minimum Design Loads and Other Structures, by American Society of Civil Engineers.
- 2005-2017 Aluminum Design Manual, by the Aluminum Association.

This letter certifies that the structural analysis of the racking members, connections and foundation designs are in compliance with the above codes.

For more information, see the GFT construction drawings. This analysis does not include specific corrosion requirements.

Best Regards,

Steve Moore
Sr. Project Manager
Innova Technologies, Inc.

LICENSED STRUCTURAL ENGINEER
STEVEN E. MOORE
081-004713
Exp.11/30/24
STATE OF ILLINOIS
12/12/2023

UNIRAC

U-BUILDER PROJECT REPORT

APPLICATION VERSION: 6.3.0
PROJECT VERSION: 0.0.43

PROJECT TITLE	PROJECT ID	LAST UPDATED
GFT	F94C1CD5	Feb. 15, 2024
		ORIGINALLY CREATED
		Nov. 20, 2023

NAME	Christian County FS	Designed by DavidR
ADDRESS	660 Vandevere St, Morrisonville, IL 62546, USA	GFT
CITY, STATE	Morrisonville, IL	VSUN
MODULE	VSUN VSUN570N-144BMH-DG	420 - VSUN570N-144BMH-DG
		239.40 KW

NOTE: Installation of the project is intended to happen within the year of project designed in UBuilder. If it's past one year please rerun the design or contact Unirac Engineering Services.

8' of embedment needs to be verified by pile testing or by an engineered pile design

INSTALLATION AND DESIGN PLAN

Site Area 1

UNIRAC

U-BUILDER PROJECT REPORT

APPLICATION VERSION: 6.3.0
PROJECT VERSION: 0.0.43

PROJECT TITLE	PROJECT ID	LAST UPDATED
GFT	F94C1CD5	Feb. 15, 2024
		ORIGINALLY CREATED
		Nov. 20, 2023

NAME	Christian County FS
ADDRESS	660 Vandevere St, Morrisonville, IL 62546, USA
CITY, STATE	Morrisonville, IL
MODULE	VSUN VSUN570N-144BMH-DG

Designed by DavidR

GFT

VSUN

420 - VSUN570N-144BMH-DG

239.40 KW

NOTE: Installation of the project is intended to happen within the year of project designed in UBuilder. If it's past one year please rerun the design or contact Unirac Engineering Services.

8' of embedment needs to be verified by pile testing or by an engineered pile design

ENGINEERING REPORT

Plan Review

TOTAL NUMBER OF MODULES	420
TOTAL KW	239.40 KW

Parameters Used for Design

BUILDING CODE	ASCE 7-10
BASIC WIND SPEED	115.00 mph
GROUND SNOW LOAD	20.00 psf
RISK CATEGORY	I
SEISMIC FACTOR, SS	0.259
SEISMIC FACTOR, S1	0.119
ELEVATION	626.00 ft
WIND EXPOSURE	C
WIND ON ICE	0.00 mph
ICE THICKNESS	0.00"
FROST DEPTH	3.00 ft
VELOCITY PRESSURE, Q_z	24.38 psf

Inspection

PRODUCT	GFT
MODULE MANUFACTURER	VSUN
MODEL	420 - VSUN570N-144BMH-DG
MODULE WATTS	570 watts
MODULE LENGTH	89.68"
MODULE WIDTH	44.64"
MODULE THICKNESS	1.38"
MODULE WEIGHT	72.09 lbs
RAILS DIRECTION	EW
RAILS ARRANGEMENT TYPE	Six Rail
TILT	30 degrees
CLAMP SELECTION	Pro Clamps
FOUNDATION TYPE	Driven
FRONT EDGE HEIGHT	2.50 ft
FOUNDATION LENGTH	12.50 ft
MINIMUM ARRAY TO ARRAY DISTANCE IN NS DIRECTION	240.16"

(Not required for design. Calculated based on latitude, tilt, and no module shading between 10am and 2pm on Dec. 21st. Customer is responsible for final row spacing and energy production.)

Site Area 1 / Table Size 1 (count:21)

NUMBER OF MODULES:	20
TOTAL KW:	11.40 KW

2 X 10 ARRAY RAIL LAYOUT

	246" RAIL	END-OF-RUN-SCRAP
	2 RAIL PER RUN	36.60"
E/W ARRAY DIMENSION (MODULES ONLY)	455.40"	
E/W MAX ARRAY DIMENSION (RAIL OUT-TO-OUT)	455.40"	
N/S ARRAY DIMENSION (HORIZONTAL DISTANCE)	180.36"	
OPTIMUM "Z" DIMENSION (PILE TO PILE)	69.00"	
OPTIMUM "W" DIMENSION (EAST AND WEST CANTILEVERS)	20.70"	

DRIVEN FOUNDATION	No. of Foundations = 7
	Available embedment length = 6.26 ft
	Maximum Lateral Shear Force = 1096.36 lbs
	Maximum Tensile Force = -1289.72 lbs
	Maximum Compression Force = 2241.57 lbs
	Maximum Moment = 7070.25 ft-lbs

**Refer to Unirac GFT Construction Details and Installation Guide for notes and installation details.*
**Foundation lengths may change if a ballasted system is utilized, please contact Unirac Engineering Services for ballasted system design.*

GFT U-BUILDER PRODUCT ASSUMPTIONS

GFT - Ground Fixed Tilt

Limitations of Responsibility: It is the user's responsibility to ensure that inputs are correct for your specific project.
Unirac is not the solar, electrical, or building engineer of record and is not responsible for the solar, electrical, or building design for this project.

Default Dimensions

1. Top chord length: 138.59"
2. Distance from top chord edge to front brace bolt and rear brace bolt: 35.88"
3. Clear gap between modules in North-South & East-West direction
    a. Pro series clamps: 1.00"
    b. Standard clamps: 0.25"
4. Pile offset from centre of module gap: 20.00"
5. Grade to bottom of diagonal brace mount: 6.00"

Design Parameters

1. Wind Design
    a. Basic Wind Speed: 85.00 mph - 210.00 mph (ASCE 7-10/ASCE 7-16)
    b. Risk category: I to IV
    c. Exposure: B or C (ASCE 7-10/ASCE 7-16)
    d. 50-year Design Life
    e. Elevation: Insertion of the project at - grade elevation can result in a reduction of wind pressure. If your project is in a special case study region or in an area where wind studies have been performed, please verify with your jurisdiction to ensure that elevation effects have not already been factored into the wind speed. If elevation effects have been included in your wind speed, please select 0.00 ft as the project site elevation.
2. Snow Design
    a. Ground Snow Load: 0 - 80.00 psf (ASCE 7-10/ASCE 7-16)
3. Seismic Design
    a. Site class D
4. Loads & combinations of loads
    a. Self weight, wind, snow, seismic, ice, wind on ice are considered in design of structure.
    b. Load combinations for allowable stress design: Clause: 2.4 (ASCE 7-10/ASCE 7-16)
5. Assumed Foundation capacities
    a. Lateral bearing capacity: 300.00 psf
    b. Vertical bearing capacity: 1500.00 psf

Site Specific Engineering

Conditions listed below are beyond the current capabilities of U-Builder. Site specific engineering is required.

1. Any deviations from default/ assumed design parameters
2. The following design criteria is excluded from the racking and Foundation design: flood loading, debris loading, dynamic analysis, acts of god (tornado, hurricane, water inundation loading, etc.), erosion, expansive soils, frost heave, soil liquefaction, dynamic loading from seismic events and conditions.

Notes:

*Please contact commercialservices@unirac.com for additional information.

GENERAL NOTES

1. ALL CONSTRUCTION FOR UNIRAC'S "GROUND FIXED TILT" (GFT) RACKING SYSTEM AND FOUNDATION REQUIREMENTS SHALL CONFORM TO THE 2009, 2012, 2015 & 2018 EDITION OF THE INTERNATIONAL BUILDING CODE (IBC).
2. WHEREVER THE TERM CONTRACTOR IS USED IN THE CONSTRUCTION DOCUMENTS, IT SHALL BE DEFINED TO MEAN THE GENERAL CONTRACTOR AND ANY SUB-CONTRACTOR COLLECTIVELY AS APPLICABLE AND AS REQUIRED.
3. THE CONTRACT "STRUCTURAL RACKING" DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS, METHOD, OR SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND PROVIDE ALL MEASURES NECESSARY TO PROTECT THE RACKING SYSTEM FROM THE POINT OF MATERIAL DELIVERY THROUGH THE COMPLETION OF CONSTRUCTION. UNIRAC AND THE ENGINEER OF RECORD WILL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OF CONSTRUCTION. UNIRAC AND THE ENGINEER OF RECORD WILL NOT BE RESPONSIBLE FOR CONSTRUCTION SITE SAFETY, OR SAFETY PRECAUTIONS AND PROGRAMS INCIDENT HERETO.
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND ENSURE THAT ALL WORK IS IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY STRUCTURAL INSPECTION/OBSERVATION PROVIDED BY OTHERS DOES NOT RELIEVE THE CONTRACTOR OF THIS RESPONSIBILITY.
5. ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS THAT ARE ENCOUNTERED AT A LATER DATE AND ARE DECLARED TO BE SIGNIFICANT BY THE RACKING DISTRIBUTOR SHALL BE CORRECTED BY THE CONTRACTOR (AT THE CONTRACTOR'S EXPENSE).
6. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND COORDINATE SITE CONDITIONS WITH THESE DRAWINGS PRIOR TO BIDDING OR THE START OF CONSTRUCTION. ANY CONFLICTS, DISCREPANCIES, OR OMISSIONS SHALL BE RESOLVED THROUGH YOUR RACKING DISTRIBUTOR PRIOR TO PROCEEDING.
7. DO NOT SCALE OFF OF THESE DRAWINGS. WRITTEN DIMENSIONS SHALL BE USED OR WHERE NO DIMENSION IS PROVIDED CONSULT WITH YOUR RACKING DISTRIBUTOR FOR CLARIFICATION BEFORE PROCEEDING WITH THE BID OR THE WORK.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE EQUIPMENT AND INSTALLATION PROCESS (MEANS AND METHODS) ARE APPROPRIATE FOR THE FOUNDATIONS AND THAT THE PILES ARE INSTALLED TO THE SPECIFIED TOLERANCES. UNIRAC IS NOT RESPONSIBLE FOR DAMAGED AND/OR OUT-OF-TOLERANCE PILES DUE TO IMPROPER INSTALLATION EQUIPMENT, METHODS, AND SOIL RELATED ISSUES INCLUDING DENSE SOILS, GRAVEL, OR BEDROCK.
9. WHERE ANY DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, STRUCTURAL NOTES AND SPECIFICATIONS, THE GREATER (MOST CONSERVATIVE) REQUIREMENTS SHALL GOVERN. WHERE NO SPECIFIC DETAIL IS SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, OR IF THERE IS NO SIMILAR WORK, THEN CONSTRUCTION SHALL CONFORM TO INDUSTRY STANDARDS. CONTRACTOR MUST INFORM UNIRAC OF ANY DISCREPANCIES.
10. REFER TO SITE PLAN, PILE LAYOUT DRAWING, ELECTRICAL DRAWINGS AND/OR OTHER CIVIL DRAWINGS FOR SPECIFIC PILE LOCATIONS, NORTH-SOUTH PILE SPACING, LOCATION AND DETAILS OF CURBS, INVERTER/EQUIPMENT PADS, TRENCHING/CONDUIT LOCATIONS, JUNCTION BOXES, SITE WORK ITEMS, ETC. AND DIMENSIONS NOT SHOWN ON STRUCTURAL RACKING DRAWINGS.
11. CONTRACTOR SHALL INVESTIGATE THE SITE DURING CLEARING AND EARTHWORK OPERATIONS FOR FILLED EXCAVATIONS OR BURIED STRUCTURES, SUCH AS CESSPOOLS, CISTERNS, EXISTING FOUNDATIONS, OR OTHER.
12. ASTM SPECIFICATIONS ON THE DRAWINGS SHALL BE OF THE LATEST ASTM STANDARD SPECIFICATION.
13. ANY ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF A PROFESSIONAL CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF THE LOCAL JURISDICTION.
14. THE FOLLOWING DESIGN CRITERIA IS EXCLUDED FROM THE RACKING AND FOUNDATION DESIGN: FLOOD LOADING, DEBRIS LOADING, DYNAMIC ANALYSIS, ACTS OF GOD (TORNADO, HURRICANE, WATER INUNDATION LOADING, ETC.), EROSION, EXPANSIVE SOILS, FROST HEAVE, SOIL LIQUEFACTION, DYNAMIC LOADING FROM SEISMIC EVENTS AND CONDITIONS. THE DESIGN CAN CONSIDER THIS CRITERIA FOR SPECIFIC PROJECTS IN A SEPARATE DOCUMENT FROM UNIRAC OR BY A THIRD PARTY ENGINEER.
15. DESIGN CRITERIA PER ASCE 7-05, 7-10, OR ASCE 7-16:
    DESIGN WIND SPEED = VARIES (SEE DESIGN PACKAGE AND STATE LETTER)
    GROUND SNOW LOAD = VARIES (SEE DESIGN PACKAGE AND STATE LETTER)
    ICE THICKNESS = VARIES (SEE DESIGN PACKAGE AND STATE LETTER)
    ICE LOAD WIND SPEED = VARIES (SEE DESIGN PACKAGE AND STATE LETTER)
    SEISMIC Ss = VARIES (SEE DESIGN PACKAGE AND STATE LETTER)
    SEISMIC S1 = VARIES (SEE DESIGN PACKAGE AND STATE LETTER)
    SOIL SITE CLASS = D
    WIND EXPOSURE CATEGORY = B OR C (SEE LETTER)
    HURRICANE ZONE = SEE LETTER
    RISK CATEGORY = I OR II (SEE LETTER)
    MINIMUM OF 20' OFFSET FROM NEAREST ADJACENT BUILDING (TO AVOID SNOW DRIFT.)

   "DESIGN WIND PRESSURES PER ASCE 7-05, SECTION 6.5.13,"WIND LOADS ON OPEN BUILDINGS WITH MONOSLOPE, PITCHED OR TROUGHED ROOFS", AND SECTION 6.5.13.3, "COMPONENTS AND CLADDING" FOR MONOSLOPE FREE ROOFS, ASCE 7-10, SECTION 27.4.3, "WIND LOAD ON OPEN BUILDING WITH MONOSLOPE, PITCHED OR TROUGHED FREE ROOFS", AND SECTION 30.7.1, "COMPONENTS AND CLADDING" FOR MONOSLOPED PITCHED OR TROUGHED ROOFS, OR ASCE 7-16, SECTION 27.3.2, "WIND LOAD ON OPEN BUILDING WITH MONOSLOPE, PITCHED OR TROUGHED ROOFS", AND SECTION 30.7.2, "COMPONENTS AND CLADDING" FOR MONOSLOPE, PITCHED OR TROUGHED ROOFS.
16. SOLAR REQUIREMENTS: FROM OWNER
17. CORROSION PROTECTION REQUIREMENTS:
    COLD-FORMED STEEL MEMBERS = SEE MEMBER SECTION TABLE
    HARDWARE = STAINLESS STEEL OR DELTA PROTEKT
18. ABOVE GRADE CORROSION PROTECTION WILL SUFFICE FOR MOST ENVIRONMENTAL CONDITIONS. BELOW GRADE CORROSION PROTECTION WILL SUFFICE FOR MOST SOILS WITH RESISTIVITY VALUES GREATER THAN 10,000 OHM/CM. IT IS THE OWNER'S RESPONSIBILITY TO DETERMINE IF THE SOILS ARE MORE CORROSIVE AND FURTHER CORROSION PROTECTION WILL BE REQUIRED.
19. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SPICE EAST-WEST BEAMS (AS REQUIRED) TO COMPLETE THE TABLE AND AVOID SPLICE CONFLICTS SPECIFIED IN DETAIL 502 ON SHEET SR-500.
20. EACH ROW CANNOT EXCEED 100 FEET IN LENGTH WITHOUT HAVING A THERMAL BREAK.

SPECIAL INSPECTION (PER CHAPTER 17 OF THE IBC):

STRUCTURAL ONLY: SPECIAL INSPECTION IS TO BE PROVIDED FOR THE ITEMS LISTED BELOW IN ADDITION TO THE INSPECTIONS CONDUCTED BY THE BUILDING JURISDICTION. "SPECIAL STRUCTURAL INSPECTION" SHALL NOT RELIEVE THE OWNER OR THEIR AGENT FROM REQUESTING THE BUILDING JURISDICTION INSPECTIONS REQUIRED.

1. DRIVEN DEEP ELEMENTS: PERIODICALLY DURING THE PLACEMENT OF ALL DRIVEN DEEP FOUNDATION ELEMENTS ON STRUCTURAL DRAWINGS.
   A. VERIFICATION OF ELEMENT MATERIALS, SIZES AND LENGTHS.
   B. OBSERVATION AND DOCUMENTATION OF DRIVING OPERATIONS. MAINTAIN A COMPLETE AND ACCURATE RECORD FOR EACH PILE DRIVEN.
   C. VERIFICATION OF PLACEMENT LOCATIONS AND PLUMBNESS, TYPE OF PILE DRIVER, ELEVATION OF TIP AND BUTT, ANY DAMAGE TO FOUNDATION ELEMENT, ETC.
2. BOLTING: VERIFICATION OF TORQUE PER TORQUE TABLE SHOWN.

TORQUE REQUIREMENTS		SOCKET SIZE
1/4"Ø HARDWARE :		
BEAM CLAMP	= 9 - 11 FT-LBS	9/16"
STANDARD MID 7 END CLAMPS	= 9 - 11 FT-LBS	9/16"
PRO-SERIES MID-CLAMPS	= 10 - 12 FT-LBS	1/2"
PRO-SERIES END CLAMP	= 3 FT-LBS	1/2"
5/8"Ø HARDWARE	= 54 - 66 FT-LBS	15/16"
3/4"Ø HARDWARE	= 99 - 121 FT-LBS	1-1/8"

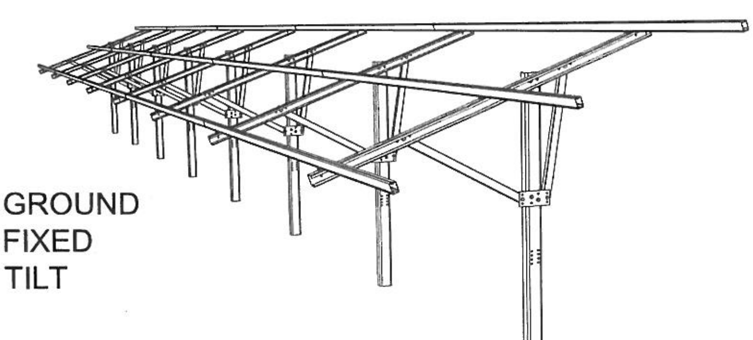
3. CONCRETE: SEE CHAPTER 17 OF MOST CURRENT IBC FOR REQUIRED INSPECTIONS.

ALUMINUM:

1. ALL ALUMINUM EAST-WEST BEAM MEMBERS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE "ALUMINUM DESIGN MANUAL" BY THE ALUMINUM DESIGN ASSOCIATION, CURRENT ADDITION.
2. ALL ALUMINUM EAST-WEST BEAMS CONFORM TO ONE OF THE FOLLOWING:
   ALLOY: 6005A TEMPER: T61 (Ftu = 38 KSI, Fcy = 35 KSI)
   ALLOY: 6351 TEMPER: T5 (Ftu = 38 KSI, Fcy = 35 KSI)
   ALLOY: 6061 TEMPER: T6 (Ftu = 38 KSI, Fcy = 35 KSI)
3. ALL ALUMINUM EAST-WEST BEAMS HAVE A MILL FINISH.
4. WELDING IS NOT REQUIRED OR PERMITTED UNLESS SPECIFICALLY APPROVED BY UNIRAC AND THE ENGINEER OF RECORD.
5. FIELD CUTTING OF ALUMINUM MEMBERS IS PERMITTED WHEN REQUIRED TO ACCOMMODATE PROJECT SPECIFIC MODULE WIDTHS.

HARDWARE:

1. ALL 1/4"Ø HARDWARE SHALL CONFORM TO 18/8 STAINLESS STEEL (AISI 300 SERIES STAINLESS, 304) OF DIMENSIONS PER ASME B18.2.1.
2. ALL 1/4"Ø SELF DRILLING SCREW HARDWARE SHALL CONFORM TO GRADE 5 SAE J429 AND ASTM A449.
3. ALL 5/8"Ø AND 3/4"Ø BOLTS SHALL CONFORM TO GRADE 2 SAE J429 OR ASTM A307.
4. ALL 5/8"Ø AND 3/4"Ø SERRATED FLANGE NUTS SHALL CONFORM TO ASME B.18.16.4.
5. ALL 5/8"Ø AND 3/4"Ø WASHERS SHALL CONFORM TO USS TYPE A WIDE OR ANSI TYPE A WIDE.
6. UNIRAC T-BOLTS, MID CLAMPS, AND END CLAMPS ARE PROPRIETARY. TECHNICAL DATA SHEETS WITH TESTED CAPACITIES CAN BE PROVIDED UPON REQUEST.
7. CORROSION PROTECTION FOR HARDWARE CAN BE FOUND IN THE GENERAL NOTES SECTION OF THIS DOCUMENT, NOTE 17.
8. ALL HARDWARE RECEIVED ON SITE SHALL BE CHECKED BY CONTRACTOR AGAINST THE SPECIFICATIONS ON THIS SHEET SR-100, DIAMETERS AND LENGTHS CALLED OUT ON RACKING DETAILS SHEET SR-500, AS WELL AS THE PROJECT BILL OF MATERIAL. ANY CONFLICTS, DISCREPANCIES, OR OMISSIONS MUST BE RESOLVED WITH THE RACKING DISTRIBUTOR AS SOON AS POSSIBLE AND PRIOR TO PROCEEDING.



NOTE: SEE GFT INSTALLATION GUIDE FOR SYSTEM ADJUSTMENTS AND TOLERANCES

UNIRAC GROUND
GFT FIXED
TILT

COLD FORMED STEEL:

1. ALL COLD FORMED STRUCTURAL STEEL MEMBER CONSTRUCTION SHALL BE IN ACCORDANCE WITH AISI "SPECIFICATIONS FOR DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS" CURRENT EDITION.
2. ALL COLD-FORMED STRUCTURAL MEMBERS SHALL BE PER ICC-ER-4943P.
3. ALL COLD-FORMED STEEL CONFORMS TO ONE OF THE FOLLOWING:
   A653 HSLAS 50 (Fy = 50 KSI, Fu = 60 KSI)
   A653 SS 50 CLASS 4 (Fy = 50 KSI, Fu = 60 KSI)
4. ALL COLD-FORMED STEEL MEMBERS ARE GALVANIZED PER ASTM A653 (MOST RECENT EDITION).
5. WELDING IS NOT REQUIRED OR PERMITTED UNLESS SPECIFICALLY APPROVED BY UNIRAC AND/OR THE ENGINEER OF RECORD.
6. FIELD CUTTING OF COLD-FORMED STEEL MEMBERS IS NOT REQUIRED OR PERMITTED UNLESS THE C-PILE IS BEING MODIFIED DUE TO ALTERNATIVE FOUNDATION REQUIREMENTS PROVIDED ON SHEET 400.
7. ALL CALCULATED COLD-FORMED MEMBER PROPERTIES PER AISI SPECIFICATIONS ARE BASED ON THE FOLLOWING MINIMUM THICKNESSES:
   14 GAGE (0.070" OR 70 MILS)
   11 GAGE (0.120" OR 120 MILS)

UNIRAC CUSTOM RACKING MEMBER SECTIONS				
RACKING MEMBER	DEPTH	WIDTH	THICKNESS	MIN. CORROSION PROTECT
ALUMINUM BEAM	3.25 IN.	2.0 IN.	0.063-0.125 IN	AAMA 611-12
ALUMINUM SPLICE	3.061 IN.	1.818 IN.	0.800-0.110 IN	AA-M12
TOP CHORD CHANNEL	4.1 IN.	3.42 IN.	14 GAGE	G180
DIAGONAL BRACE	3 IN.	2 IN.	14 GAGE	G180
C-PILE	6 IN.	4.5 IN.	11 GAGE	G235

SOLAR DESIGN:

UNIRAC IS NOT THE SOLAR DESIGN ENGINEER OF RECORD AND IS NOT RESPONSIBLE FOR ANY SOLAR DESIGN, OUTPUT EFFICIENCIES, SHADING, ROW SPACING, POWER PRODUCTION, ETC.

ELECTRICAL DESIGN:

UNIRAC IS NOT THE ELECTRICAL ENGINEER OF RECORD AND IS NOT RESPONSIBLE FOR THE ELECTRICAL DESIGN FOR THIS PROJECT. THE UNIRAC GFT RACKING SYSTEM IS CERTIFIED TO UL-2703 WHEN PROPERLY INSTALLED. SEE THE GFT INSTALLATION GUIDE FOR MORE DETAIL.

CIVIL/GRADING/SITE WORK

UNIRAC IS NOT THE CIVIL ENGINEER OF RECORD FOR THIS PROJECT AND IS NOT RESPONSIBLE FOR ANY SITE GRADING, SURVEYING, TRENCHING, EARTHWORK, LAYOUT, SWPPP, SURFACE WATER MITIGATION, PERMITTING, OR EROSION CONTROL PLANS.

MATERIAL MANAGEMENT:

PRIOR TO INSTALLATION, ALL MATERIALS MUST BE STORED PROPERLY. MATERIALS REMAINING IN PLACE FOR MORE THAN ONE WEEK MUST BE IN OPEN AIR CONDITIONS (I.E. OFF THE GROUND). IF TARPS OR OTHER PROTECTIVE COVERS ARE USED, THE ENDS SHALL BE LEFT OPEN FOR VENTILATION. TIGHT FITTING COVERINGS ARE NOT RECOMMENDED AS MATERIAL COATING ARE NOT DESIGNED FOR THIS CONDITION. LONG GOODS STORED HORIZONTALLY FOR MORE THAN ONE WEEK SHOULD NOT REMAINED BUNDLED TO PREVENT ACCELERATED CORROSION. BLOCKING IS REQUIRED BENEATH THE LONG GOODS AT PROPER INTERVALS TO ENSURE THE PRODUCT IS OFF THE GROUND.

FOUNDATION NOTES:

1. SEE THE "COLD FORMED STEEL" SECTION FOR STEEL AND GALVANIZATION REQUIREMENTS FOR FOUNDATIONS.
2. UNIRAC SHALL NOT BE HELD LIABLE FOR ANY UTILITY LINES DAMAGED DURING FOUNDATION INSTALLATION. IT SHALL BE THE RESPONSIBILITIES OF OTHERS TO DETERMINE THE PLACEMENT OF EXISTING AND NEW UTILITY LINES.
3. PILES ARE DESIGNED TO SOIL CONDITIONS STATED IN IBC. IT IS THE CLIENTS RESPONSIBILITY TO VERIFY SOILS MEET THE MINIMUM REQUIREMENTS. UNIRAC AND OR THE ENGINEER OF RECORD WILL NOT BE HELD RESPONSIBLE FOR FOUNDATIONS INSTALLED IN SOILS WITH LOWER CAPACITY OR FOR IMPROPER FOUNDATION INSTALLATION OR CHOICE.

DRIVEN STEEL PILE NOTES:

1. STEEL PILES HAVE BEEN DESIGNED IN ACCORDANCE WITH THE DESIGN CRITERIA STATED IN THE GENERAL NOTES.
2. PILES SHALL BE INSTALLED TO THE PILE TOLERANCES IN THE UNIRAC GFT INSTALLATION GUIDE WITHOUT EXCESSIVE DEFORMATION. EXCESSIVE DEFORMATION IS DEFINED AS DISTORTION PREVENTS THE RACKING FROM CONNECTING FLUSH TO THE PILE.
3. FOUNDATIONS MUST NOT BE INSTALLED IN ORGANIC SOILS OR IN AREAS WITH GROUND WATER WITHIN 12 FEET OF THE SURFACE.
4. IT IS THE OWNER OR CONTRACTORS RESPONSIBILITY TO DETERMINE WHICH FROST ZONE THEIR PROJECT IS LOCATED IN.
5. IF PILE REFUSAL IS ENCOUNTERED, AN ALTERNATE FOUNDATION DESIGN ON SHEET SR-400 CAN BE UTILIZED OR OTHER FOUNDATIONS APPROVED BY A REGISTERED PROFESSIONAL ENGINEER AND UNIRAC.
6. DRAINAGE SHALL BE DIRECTED AWAY FROM PILES. PILES SHALL NOT BE PLACED IN SWALES, DRAINAGE AREAS OR WHERE WATER MAY BE ALLOWED TO FLOW OR STAND WITHOUT SPECIFIC ALLOWANCE IN WRITING FROM UNIRAC. ALL POSSIBLE EFFORTS SHALL BE MADE TO PREVENT WATER FROM FLOWING OR PONDING AROUND OR NEAR TO THE PILES.
7. PILES MAY NOT BE PAINTED PRIOR TO INSTALLATION OF THE RACKING SYSTEM. AFTER INSTALLATION OF THE COMPLETE RACKING SYSTEM, PILES MAY BE PAINTED AT THE CONTRACTORS/CLIENTS DISCRETION. NO ADJUSTMENTS MAY BE MADE AFTER THE PILES HAVE BEEN PAINTED.
8. PILES DRIVEN TOO SHALLOW OR TOO DEEP WILL NEED TO BE ALTERED AT THE CONTRACTORS EXPENSE. UNIRAC HAS PROVIDED TOLERANCES IN THE GFT INSTALLATION GUIDE THAT SHALL BE FOLLOWED.
9. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE MEANS AND METHODS FOR DRIVING PILES. THE PILE INSTALLATION METHOD UTILIZED DURING ONSITE PILE TESTING SHALL BE THE SAME AS INSTALLATION. THE CONTRACTOR MUST INSTALL PILES UTILIZING A PILE DRIVING RIG WITH A PERCUSSION PNEUMATIC HAMMER. A VIBRATORY PILE DRIVER IS NOT RECOMMENDED. SEE PILE TEST PLAN FOR DETAILS.
10. THE RACKING DISTRIBUTOR SHALL NOT BE HELD RESPONSIBLE FOR DAMAGE TO THE PILE AFTER IT ARRIVES TO THE SITE OR THE POINT OF AGREED DROP OFF.
11. IF DAMAGE OCCURS WHERE GALVANIZATION IS REMOVED FROM THE PILE, THE PILE SHALL BE TOUCHED UP WITH GALVANIZATION OF EQUAL THICKNESS PRIOR TO INSTALLATION AT THE CONTRACTOR'S EXPENSE.
12. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT VIBRATIONS FROM DRIVING EQUIPMENT AND PILE INSTALLATION DO NOT AFFECT ANY ADJACENT PROPERTY STRUCTURES. THE CONTRACTOR SHALL BE HELD LIABLE FOR DAMAGE TO THE ADJACENT PROPERTY IF DAMAGE OCCURS.
13. ANY EXCAVATIONS NEAR THE PILE SHALL NOT BE MADE CLOSER THAN 2 FEET FROM PILE OR DEEPER THAN 2 FEET FROM GRADE. IF EXCAVATIONS ARE NECESSARY, THEY SHALL BE ON THE EAST OR WEST SIDE OF THE PILE, TEMPORARY AND SHALL BE COMPACTED PER THE ENGINEER OF RECORD'S RECOMMENDATIONS. NORTH SOUT EXCAVATIONS SHALL BE A MINIMUM OF 3 FEET FROM THE PILE. IF EXCAVATIONS EXCEED THESE DIMENSIONAL REQUIREMENTS, THE CONTRACTOR SHALL NOTIFY UNIRAC. THE ENGINEER OF RECORD SHALL BE INFORMED OF ANY EXCAVATION AND COMPACTION EFFORTS ON THE SITE.
14. PILES MAY NOT BE ALTERED IN ANY WAY WITHOUT UNIRAC WRITTEN APPROVAL. UNLESS IT IS TO CUT A PILE FOR USE IN THE CONCRETE FOUNDATION OPTION.
15. PILES HAVE BEEN DESIGNED FOR STATIC LOADING UNDER THE DESIGN CRITERIA IN GENERAL NOTE 15.

QUALITY ASSURANCE AND SPECIAL INSPECTION:

1. TESTING LABORATORY: RETAINED BY OWNER AND SATISFACTORY TO ENGINEER OF RECORD (THROUGH UNIRAC) AND GOVERNING CODE AUTHORITY TO PERFORM REQUIRED TESTS AND INSPECTIONS OF THIS CONTRACT AND APPLICABLE CODE. THE TYPE AND FREQUENCY OF SPECIAL INSPECTION, STRUCTURAL TESTING AND SUBSEQUENT REPORTING SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC).

CONCRETE:

1. ALL ASPECTS OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318-14, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" AND THE LATEST EDITION OF "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" ACI 301, WITH MODIFICATIONS AS NOTED ON THE PROJECT DRAWINGS AND/OR SPECIFICATIONS.
2. HOT WEATHER CONCRETING SHALL CONFORM TO ACI 305, "HOT WEATHER CONCRETING".
3. COLD WEATHER CONCRETING SHALL CONFORM TO ACI 306, "COLD WEATHER CONCRETING".
4. ALL MIX DESIGNS SHALL BE DESIGNED BY A QUALIFIED TESTING LABORATORY AND SHALL BE WET STAMPED BY A CIVIL ENGINEER LICENSED IN THE JURISDICTION OF THE PROJECT, AS STIPULATED IN IBC CHAPTER 19.
5. TYPE II PORTLAND CEMENT SHALL BE USED AT ALL CONCRETE ALTERNATE FOUNDATION LOCATIONS FOR THE RACKING SYSTEM - WHERE CONCRETE IS REQUIRED AS AN ALTERNATE SOLUTION. (TYPE V CEMENT SHALL BE USED WHERE THE CONCRETE IS IN CONTACT WITH SOIL CONTAINING SULFATES IN EXCESS OF 3000 PPM. CONCRETE THAT WILL BE EXPOSED TO SULFATE-CONTAINING SOLUTIONS SHALL COMPLY WITH IBC CHAPTER 19 AND ACI 318 SEVERE AND VERY SEVERE SULFATE EXPOSURES AS IDENTIFIED IN THE PROJECT GEOTECHNICAL REPORT, THE WATER CEMENT RATIO SHALL NOT EXCEED 0.44.)
6. IN THE PRESENCE OF REACTIVE AGGREGATE, CLASS F FLY ASH OR OTHER ASR MITIGATING ADMIXTURE SHALL BE INCORPORATED IN THE MIX SUCH THAT THE EXPANSION PRODUCED BY THE MORTAR-BAR METHOD (ASTM C1567) USING BLENDED AGGREGATES IS LESS THAN 0.1% AT 14 DAYS IMMERSED IN SOLUTION. WHERE CLASS F FLY ASH IS SELECTED AS A SUPPLEMENTAL ADMIXTURE, THE LOSS OF IGNITION SHALL BE LIMITED TO 2%. THE CONTRACTOR SHALL SUBMIT ALL CERTIFICATES SHOWING THE FLY ASH IS IN ACCORDANCE WITH ASTM 6618.
7. DO NOT USE CONCRETE OR GROUT CONTAINING CHLORIDES. WATER SHALL CONTAIN A CHLORIDE CONTENT LESS THAN 1000 PPM AS C1. DO NOT USE CONCRETE CONTAINING ALKALI-CARBONATE AND BICARBONATES PRESENT IN AGGREGATE IN EXCESS OF 1000 PPM. TESTS FOR THEIR EFFECT ON SETTING TIME AND 28 DAY STRENGTH SHALL BE EVALUATED.
8. HARD ROCK CONCRETE AGGREGATE SHALL CONFORM TO ALL REQUIREMENTS AND TESTS OF THE ASTM C33 CLASS DESIGNATION 35 AND PROJECT SPECIFICATIONS. EXCEPTIONS MAY BE USED ONLY WITH APPROVAL OF THE STRUCTURAL ENGINEER. PROVIDE CONCRETE MIX DESIGN WITH PROVEN SHRINKAGE CHARACTERISTICS OF LESS THAN 0.0005 INCHES/INCH.
9. MAXIMUM SIZED AGGREGATE OF 0.75".
10. SLUMP RANGE OF 3" ± 1" PER ASTM C143.
11. CONCRETE PLACEMENT SHALL BE IN ACCORDANCE WITH ACI STANDARD 304 AND PROJECT SPECIFICATIONS.
12. THE UNIRAC PILE SHALL BE CENTERED IN THE HOLE TO MAXIMIZE CONCRETE COVER AND THE HOLE SHALL BE CENTERED IN THE SPECIFIED LOCATION TO ALLOW FOR RACKING INSTALLABILITY.
13. THE TOP OF THE CONCRETE SHALL BE SMOOTHED AND SLOPED AT 2% TO FACILITATE POSITIVE DRAINAGE AWAY FROM THE UNIRAC PILE.
14. CONCRETE CHLORIDE PERMEABILITY SHALL BE CLASSIFIED AS HAVING "NEGLIGIBLE" TO "VERY LOW" CHLORIDE ION PERMEABILITY PER ASTM C1202.
15. CONCRETE SHOULD BE PLACED IN A CONTINUOUS FLOW WITHOUT SEGREGATING THE CONCRETE. DO NOT ALLOW CONCRETE TO FREE FALL MORE THAN 5 FEET UNLESS MEASURES ARE TAKEN TO ENSURE THAT CONCRETE DOES NOT HIT THE SIDES OF THE EXCAVATION DURING FREE FALL.
16. MECHANICALLY VIBRATE THE CONCRETE AT EACH PIER.
17. PRECAUTIONS SHOULD BE TAKEN DURING THE INSTALLATION OF PIERS TO MINIMIZE THE POSSIBILITY OF CAVING. PIER EXCAVATIONS SHOULD BE FILLED WITH CONCRETE AS SOON AFTER DRILLING AND INSPECTION AS POSSIBLE. SONOTUBES (OR EQUIVALENT) CAN BE UTILIZED, AS REQUIRED, ONLY IN THE UPPER 2 FT. OF THE AUGERED/DRILLED HOLE.
18. CONCRETE MIXING OPERATION SHALL CONFORM TO ASTM C-94.
19. AGGREGATE FOR HARDROCK CONCRETE SHALL CONFORM TO ALL REQUIREMENTS AND TESTS OF THE ASTM C-33 AND PROJECT SPECIFICATIONS. EXCEPTIONS MAY BE USED ONLY WITH THE PERMISSION OF THE ENGINEER OF RECORD.
20. THE DENSITY OF CONCRETE SHALL BE BETWEEN 140 PCF TO 150 PCF. THE 28 DAY STRENGTH OF CONCRETE SHALL BE 2500 PSI WITH A MAXIMUM WATER-CEMENT RATIO OF 0.40.

SHEET INDEX

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/22/2019	Rev-1
2	03/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

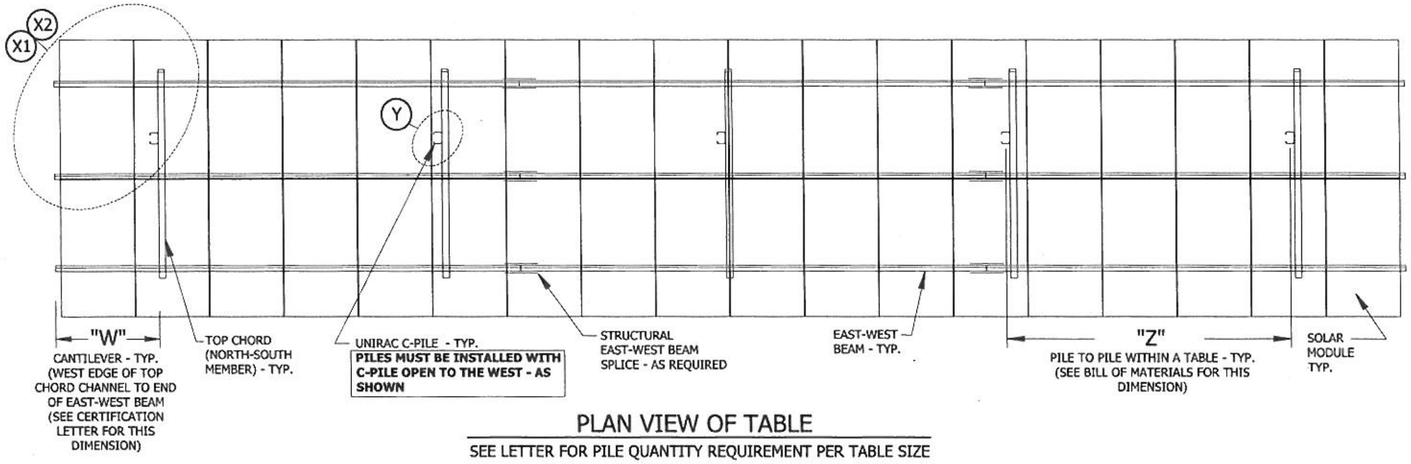
UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 242-6411
Fax: (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JRS
DRAFTED BY:	JRS
REVIEWED BY:	FP
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET SIZE:	'D' - 24x36

SHEET TITLE
GENERAL STRUCTURAL RACKING NOTES

SHEET NUMBER
SR-100

SHEET 1 of 11

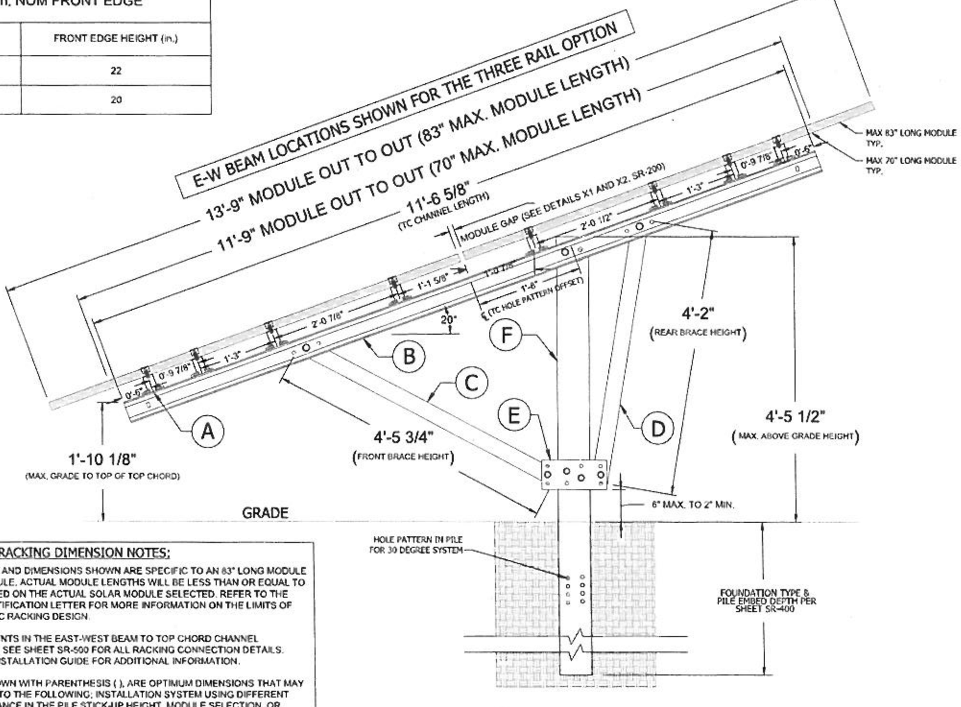


X1
X2
Y
"W"
CANTILEVER - TYP. (WEST EDGE OF TOP CHORD CHANNEL TO END OF EAST-WEST BEAM (SEE CERTIFICATION LETTER FOR THIS DIMENSION)
TOP CHORD (NORTH-SOUTH MEMBER) - TYP.
UNIRAC C-PILE - TYP.
PILES MUST BE INSTALLED WITH C-PILE OPEN TO THE WEST - AS SHOWN
STRUCTURAL EAST-WEST BEAM SPLICE - AS REQUIRED
EAST-WEST BEAM - TYP.
"Z"
PILE TO PILE WITHIN A TABLE - TYP. (SEE BILL OF MATERIALS FOR THIS DIMENSION)
SOLAR MODULE TYP.

PLAN VIEW OF TABLE

SEE LETTER FOR PILE QUANTITY REQUIREMENT PER TABLE SIZE

20° 20-24 in. NOM FRONT EDGE	
MODULE LENGTH (in.)	FRONT EDGE HEIGHT (in.)
77	22
83	20

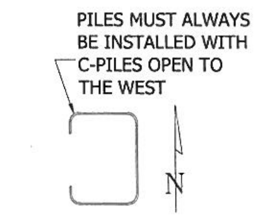


E-W BEAM LOCATIONS SHOWN FOR THE THREE RAIL OPTION
13'-9" MODULE OUT TO OUT (83" MAX. MODULE LENGTH)
11'-9" MODULE OUT TO OUT (70" MAX. MODULE LENGTH)
11'-6 5/8"
(TC CHANNEL LENGTH)
MODULE GAP (SEE DETAILS X1 AND X2, SR-200)
MAX 83" LONG MODULE TYP.
MAX 70" LONG MODULE TYP.
0'-6"
0'-9 7/8"
1'-3"
2'-0 7/8"
1'-1 5/8"
2'-0 1/2"
1'-6"
(TC HOLE PATTERN OFFSET)
20°
4'-2"
(REAR BRACE HEIGHT)
4'-5 1/2"
(MAX. ABOVE GRADE HEIGHT)
4'-5 3/4"
(FRONT BRACE HEIGHT)
1'-10 1/8"
(MAX. GRADE TO TOP OF TOP CHORD)
A
B
C
D
E
F
6" MAX. TO 2" MIN.
GRADE
HOLE PATTERN IN PILE FOR 30 DEGREE SYSTEM
FOUNDATION TYPE & PILE EMBED DEPTH PER SHEET SR-400

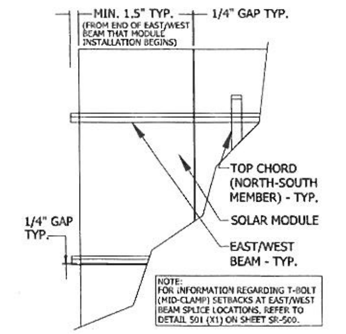
RACKING DIMENSION NOTES:

1. THIS CROSS SECTION AND DIMENSIONS SHOWN ARE SPECIFIC TO AN 83" LONG MODULE AND A 70" LONG MODULE. ACTUAL MODULE LENGTHS WILL BE LESS THAN OR EQUAL TO WHAT IS SHOWN BASED ON THE ACTUAL SOLAR MODULE SELECTED. REFER TO THE STATE SPECIFIC CERTIFICATION LETTER FOR MORE INFORMATION ON THE LIMITS OF THIS REGION SPECIFIC RACKING DESIGN.
2. FINE TUNE ADJUSTMENTS IN THE EAST-WEST BEAM TO TOP CHORD CHANNEL CONNECTIONS EXIST. SEE SHEET SR-500 FOR ALL RACKING CONNECTION DETAILS. REFER TO THE GFT INSTALLATION GUIDE FOR ADDITIONAL INFORMATION.
3. ALL DIMENSIONS SHOWN WITH PARENTHESIS ( ), ARE OPTIMUM DIMENSIONS THAT MAY VARY SLIGHTLY DUE TO THE FOLLOWING; INSTALLATION SYSTEM USING DIFFERENT HOLE OPTIONS, VARIANCE IN THE PILE STICK-UP HEIGHT, MODULE SELECTION, OR VARIANCE IN THE FINISHED/EXISTING GRADE. ALL OTHER DIMENSIONS ARE FIXED.

SECTION VIEW OF GFT TABLE - 20° TILT



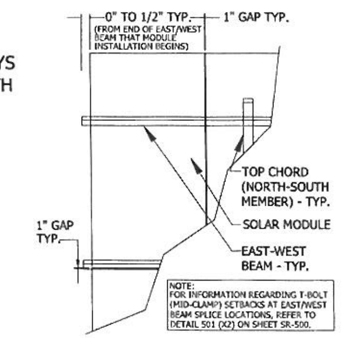
Y DETAILED VIEW



MIN. 1.5" TYP.
(FROM END OF EAST/WEST BEAM THAT MODULE INSTALLATION BEGINS)
1/4" GAP TYP.
1/4" GAP TYP.
TOP CHORD (NORTH-SOUTH MEMBER) - TYP.
SOLAR MODULE
EAST/WEST BEAM - TYP.
NOTE: FOR INFORMATION REGARDING T-BOLT (MID-CLAMP) SETBACKS AT EAST/WEST BEAM SPLICE LOCATIONS, REFER TO DETAIL 501 (X1) ON SHEET SR-500.

X1 DETAILED VIEW STANDARD CLAMPS

(SEE ALSO SHEET SR-500, DETAIL 501 (X1) AND 502 (X1))



0" TO 1/2" TYP.
(FROM END OF EAST/WEST BEAM THAT MODULE INSTALLATION BEGINS)
1" GAP TYP.
1" GAP TYP.
TOP CHORD (NORTH-SOUTH MEMBER) - TYP.
SOLAR MODULE
EAST-WEST BEAM - TYP.
NOTE: FOR INFORMATION REGARDING T-BOLT (MID-CLAMP) SETBACKS AT EAST/WEST BEAM SPLICE LOCATIONS, REFER TO DETAIL 501 (X2) ON SHEET SR-500.

X2 DETAILED VIEW PRO SERIES CLAMPS

(SEE ALSO SHEET SR-500, DETAIL 501 (X2) AND 502 (X2))

GFT PARTS LIST				
REF NUMBER	PART DESCRIPTION	CATALOG #	GUAGE/ THICKNESS	FINISH
A	ALUMINUM E-W BEAM (166" OR 246")	411166M OR 411246M	SEE SHEET SR-100	
B	TOP CHORD CHANNEL	404036	SEE SHEET SR-100	
C	FRONT DIAGONAL BRACE (20°)		SEE SHEET SR-100	
D	REAR DIAGONAL BRACE (20°)	404031	SEE SHEET SR-100	
E	DIAGONAL BRACE PLATE		SEE SHEET SR-100	
F	C-PILE (12.5 FT OR 15 FT)	404001 OR 404002	SEE SHEET SR-100	

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	06/14/2019	Original Release
1	08/22/2019	Rev-1
2	03/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®

1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 242-6411
Fax: (505) 242-6412
www.unirac.com

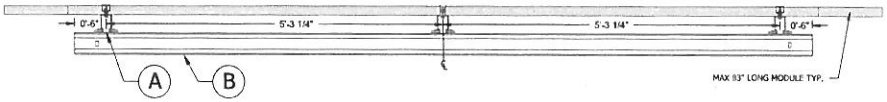
PROJECT NUMBER:	GFT
ENGINEERED BY:	JRS
DRAFTED BY:	JRS
REVIEWED BY:	CP
ORIGINAL RELEASE DATE:	06/14/2019
DRAWING SHEET SIZE:	17" x 11"

SHEET TITLE
GFT TABLE CROSS-SECTION AND PARTS LIST (20 DEGREE TILT)

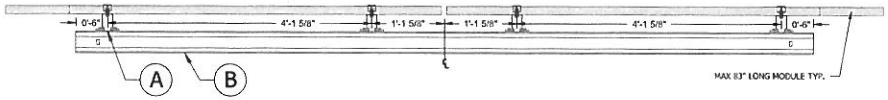
SHEET NUMBER
SR-200

E-W BEAM LOCATION OPTIONS: UP TO 83"

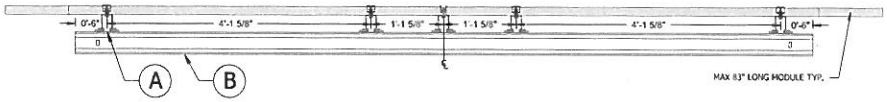
E-W BEAM LOCATIONS FOR THE THREE RAIL OPTION



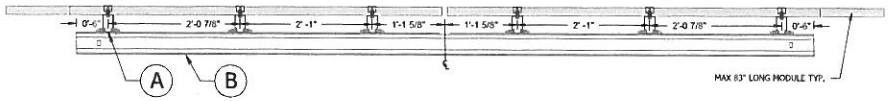
E-W BEAM LOCATIONS FOR THE FOUR RAIL OPTION



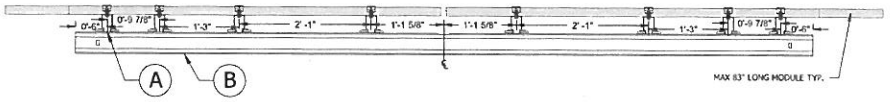
E-W BEAM LOCATIONS FOR THE FIVE RAIL OPTION



E-W BEAM LOCATIONS FOR THE SIX RAIL OPTION

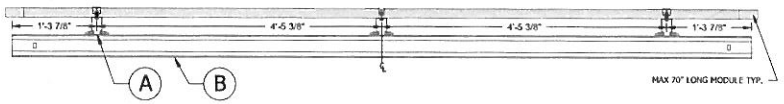


E-W BEAM LOCATIONS FOR THE EIGHT RAIL OPTION

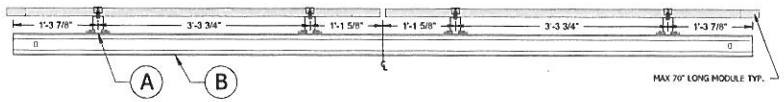


E-W BEAM LOCATION OPTIONS: UP TO 70"

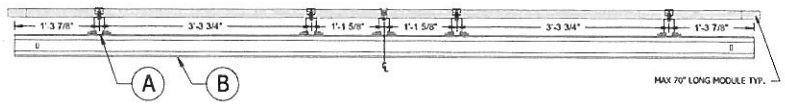
E-W BEAM LOCATIONS FOR THE THREE RAIL OPTION



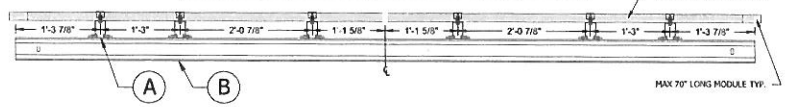
E-W BEAM LOCATIONS FOR THE FOUR RAIL OPTION



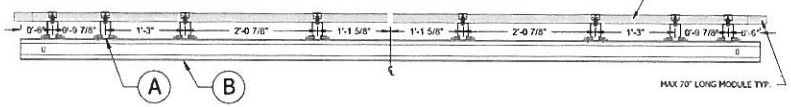
E-W BEAM LOCATIONS FOR THE FIVE RAIL OPTION



E-W BEAM LOCATIONS FOR THE SIX RAIL OPTION



E-W BEAM LOCATIONS FOR THE EIGHT RAIL OPTION



GFT PARTS LIST				
REF NUMBER	PART DESCRIPTION	CATALOG #	GUAGE/ THICKNESS	FINISH
A	ALUMINUM E-W BEAM (166" OR 246")	411166M OR 411246M	SEE SHEET SR-100	
B	TOP CHORD CHANNEL	404036	SEE SHEET SR-100	
C	FRONT DIAGONAL BRACE (20°)	404031	SEE SHEET SR-100	
D	REAR DIAGONAL BRACE (20°)		SEE SHEET SR-100	
E	DIAGONAL BRACE PLATE		SEE SHEET SR-100	
F	C-PILE (12.5 FT OR 15 FT)	404001 OR 404002	SEE SHEET SR-100	

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/22/2019	Rev-1
2	09/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

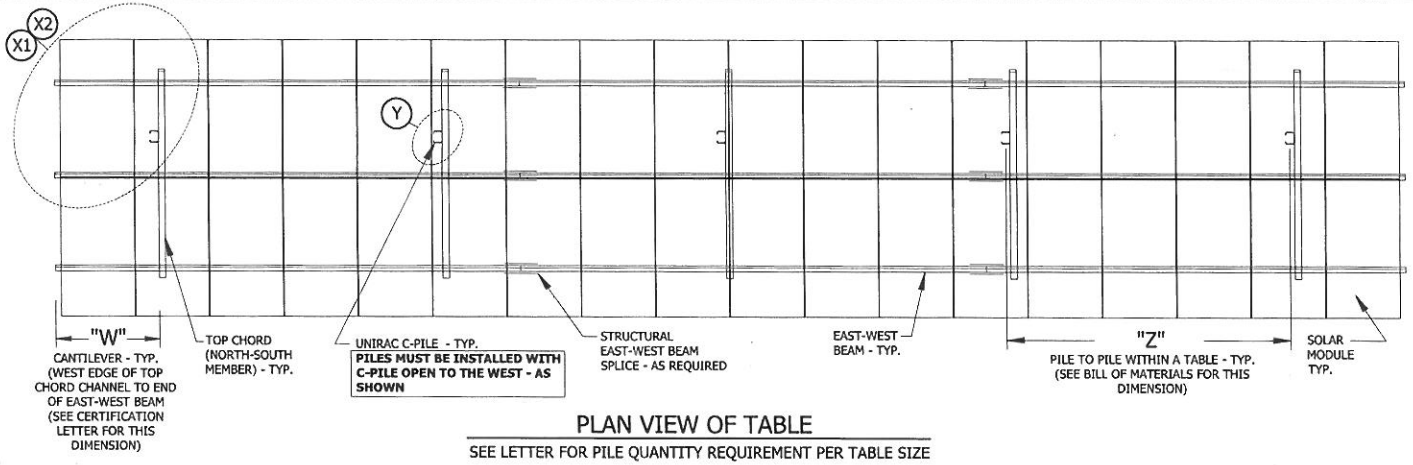
UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone (505) 242-6411
Fax (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JRD
DRAFTED BY:	JRD
REVIEWED BY:	DP
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET SIZE:	17" x 24.00"

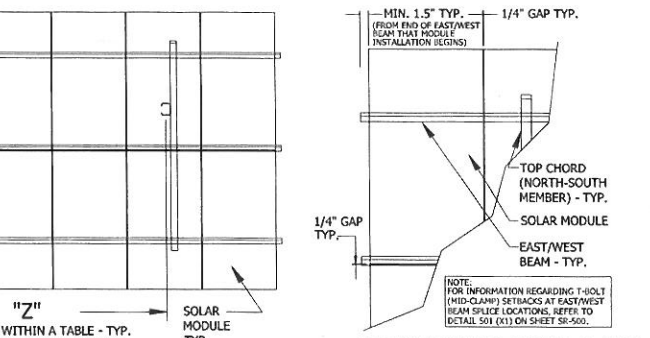
SHEET TITLE
GFT E-W BEAM LOCATION OPTIONS (20 DEGREE TILT)

SHEET NUMBER
SR-201
SHEET 9 of 11



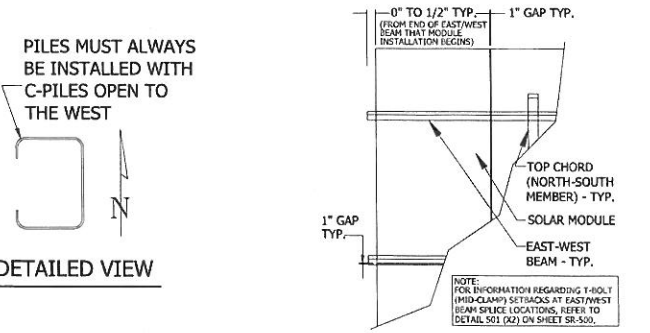
PLAN VIEW OF TABLE

SEE LETTER FOR PILE QUANTITY REQUIREMENT PER TABLE SIZE



X1 DETAILED VIEW STANDARD CLAMPS

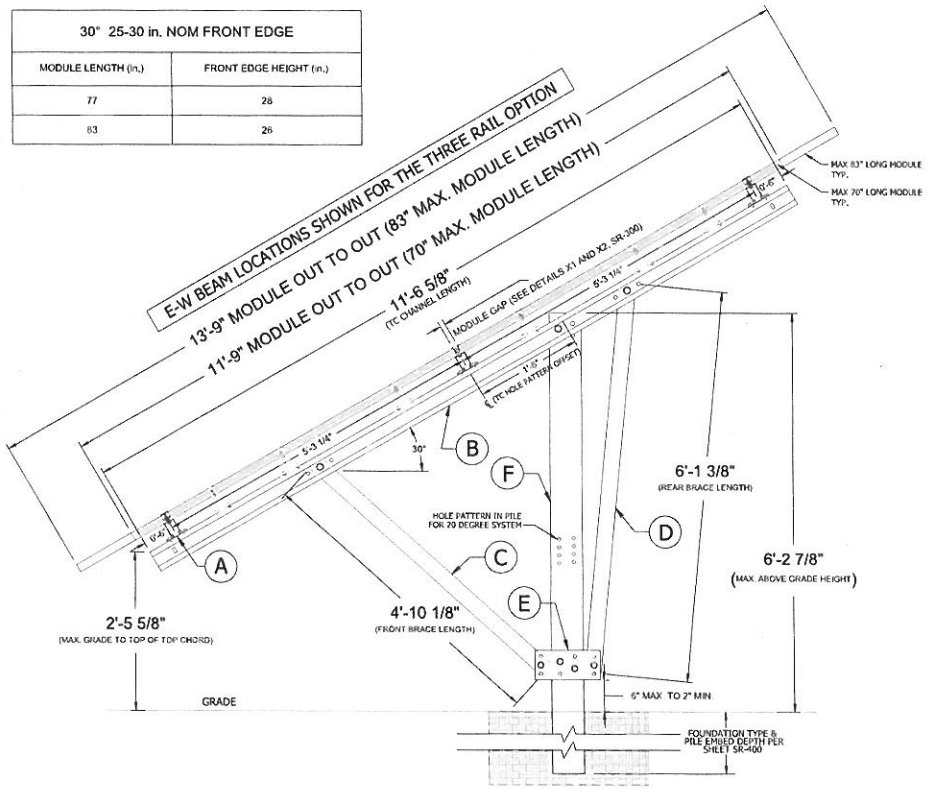
(SEE ALSO SHEET SR-500, DETAIL 501 (X1) AND 502 (X1)



X2 DETAILED VIEW PRO SERIES CLAMPS

(SEE ALSO SHEET SR-500, DETAIL 501 (X2) AND 502 (X2)

30° 25-30 in. NOM FRONT EDGE	
MODULE LENGTH (in.)	FRONT EDGE HEIGHT (in.)
77	28
83	26



SECTION VIEW OF GFT TABLE - 30° TILT

PILES MUST ALWAYS BE INSTALLED WITH C-PILES OPEN TO THE WEST

Y DETAILED VIEW

RACKING DIMENSION NOTES:

1. THIS CROSS SECTION AND DIMENSIONS SHOWN ARE SPECIFIC TO AN 83" LONG MODULE AND A 70" LONG MODULE. ACTUAL MODULE LENGTHS WILL BE LESS THAN OR EQUAL TO WHAT IS SHOWN BASED ON THE ACTUAL SOLAR MODULE SELECTED. REFER TO THE STATE SPECIFIC CERTIFICATION LETTER FOR MORE INFORMATION ON THE LIMITS OF THIS REGION SPECIFIC RACKING DESIGN.
2. FINE TUNE ADJUSTMENTS IN THE EAST-WEST BEAM TO TOP CHORD CHANNEL CONNECTIONS EXIST. SEE SHEET SR-500 FOR ALL RACKING CONNECTION DETAILS. REFER TO THE GFT INSTALLATION GUIDE FOR ADDITIONAL INFORMATION.
3. ALL DIMENSIONS SHOWN WITH PARENTHESIS ( ), ARE OPTIMUM DIMENSIONS THAT MAY VARY SLIGHTLY DUE TO THE FOLLOWING, INSTALLATION SYSTEM USING DIFFERENT HOLE OPTIONS, VARIANCE IN THE PILE STICK-UP HEIGHT, MODULE SELECTION, OR VARIANCE IN THE FINISHED/EXISTING GRADE. ALL OTHER DIMENSIONS ARE FIXED.

GFT PARTS LIST

REF NUMBER	PART DESCRIPTION	CATALOG #	GUAGE/ THICKNESS	FINISH
A	ALUMINUM E-W BEAM (166" OR 248")	411166M OR 411246M		SEE SHEET SD-100
B	TOP CHORD CHANNEL	404036		SEE SHEET SD-100
C	FRONT DIAGONAL BRACE (30°)	404032		SEE SHEET SD-100
D	REAR DIAGONAL BRACE (30°)			SEE SHEET SD-100
E	DIAGONAL BRACE PLATE			SEE SHEET SD-100
F	C-PILE (12.5 FT OR 15 FT)	404001 OR 404002		SEE SHEET SD-100

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/22/2019	Rev-1
2	09/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 242-6411
Fax: (505) 242-6412
www.unirac.com

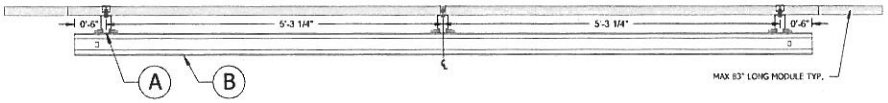
PROJECT NUMBER:	GFT
ENGINEERED BY:	JPS
DRAFTED BY:	JNS
REVIEWED BY:	EP
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET SIZE:	24x36

SHEET TITLE
GFT TABLE CROSS-SECTION AND PARTS LIST (30 DEGREE TILT)

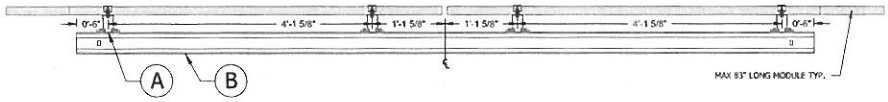
SHEET NUMBER
SR-300
SHEET 4 of 11

E-W BEAM LOCATION OPTIONS: UP TO 83"

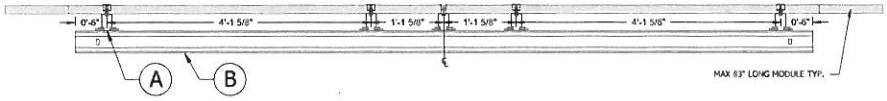
E-W BEAM LOCATIONS FOR THE THREE RAIL OPTION



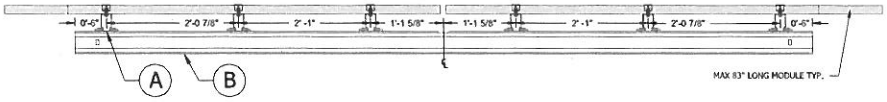
E-W BEAM LOCATIONS FOR THE FOUR RAIL OPTION



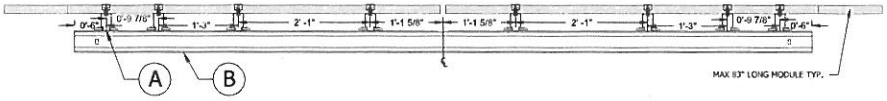
E-W BEAM LOCATIONS FOR THE FIVE RAIL OPTION



E-W BEAM LOCATIONS FOR THE SIX RAIL OPTION

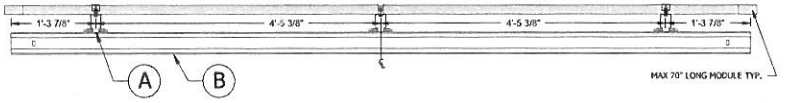


E-W BEAM LOCATIONS FOR THE EIGHT RAIL OPTION

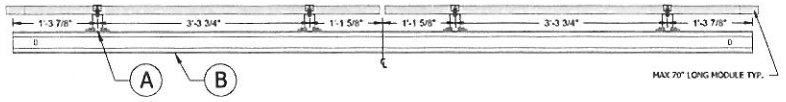


E-W BEAM LOCATION OPTIONS: UP TO 70"

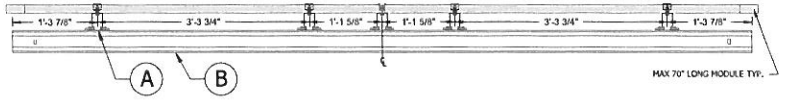
E-W BEAM LOCATIONS FOR THE THREE RAIL OPTION



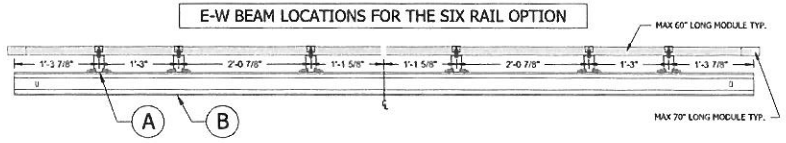
E-W BEAM LOCATIONS FOR THE FOUR RAIL OPTION



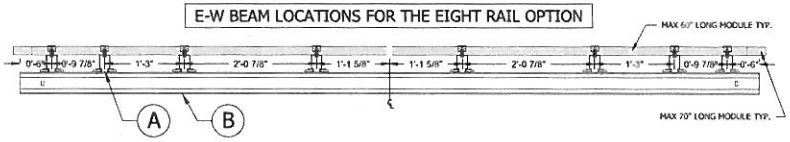
E-W BEAM LOCATIONS FOR THE FIVE RAIL OPTION



E-W BEAM LOCATIONS FOR THE SIX RAIL OPTION



E-W BEAM LOCATIONS FOR THE EIGHT RAIL OPTION



GFT PARTS LIST				
REF NUMBER	PART DESCRIPTION	CATALOG #	GUAGE/ THICKNESS	FINISH
A	ALUMINUM E-W BEAM (156" OR 246")	411166M OR 411246M	SEE SHEET SR-100	
B	TOP CHORD CHANNEL	404036	SEE SHEET SR-100	
C	FRONT DIAGONAL BRACE (20")	404031	SEE SHEET SR-100	
D	REAR DIAGONAL BRACE (20")		SEE SHEET SR-100	
E	DIAGONAL BRACE PLATE		SEE SHEET SR-100	
F	C-PILE (12.5 FT OR 15 FT)	404001 OR 404002	SEE SHEET SR-100	

REVISION BLOCK

MARK	DATE	DESCRIPTION
0	06/14/2019	Original Release
1	08/02/2019	Rev-1
2	08/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (800) instalrac
Fax: (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JRS
DRAFTED BY:	JRS
REVIEWED BY:	EP
ORIGINAL RELEASE DATE:	06/14/2019
DRAWING SHEET SIZE:	12" - 24x36

SHEET TITLE
GFT E-W BEAM LOCATION OPTIONS (30 DEGREE TILT)

SHEET NUMBER
SR-301
SHEET 8 of 11

20 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

(REFER TO SHEET SR-200 FOR PILE STICK-UP HEIGHT) (c)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0" (a)	--	--	6'-0" (a)	--	--	6'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0" (a)	--	--	6'-0"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (b)	402	--	--	--	--	3'-6"	6'-0"	--	5'-0"	--
FULLY DRIVEN PILE (b)	403	--	--	6'-0"	--	--	6'-0"	--	--	10'-0"

(a) THIS 6'-0" EMBEDMENT REQUIRES CUTTING 24" OFF OF THE BOTTOM OF A 12'-0" LONG C-PILE. (DO NOT CUT THE END OF PILE WITH PRE-PUNCHED HOLES.) IF CUTTING IS NOT PREFERRED, AN 8'-0" CONCRETE FOUNDATION IS ACCEPTABLE.

(b) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(c) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 20 DEGREE GFT TABLE, ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-1" OR GREATER, REQUIRE A 15 FT LONG PILE.

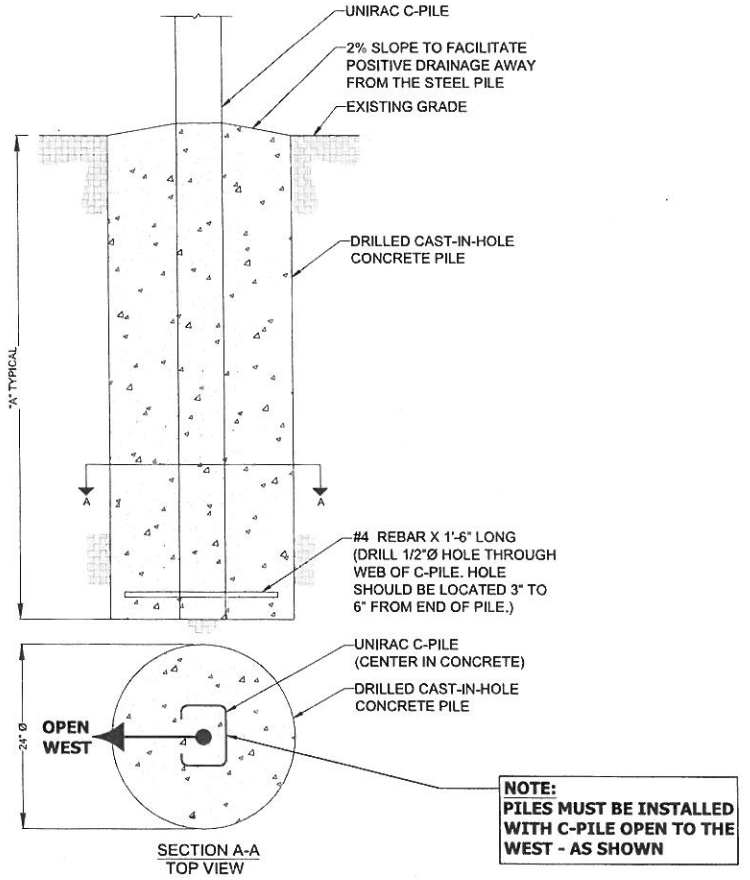
30 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

(REFER TO SHEET SR-300 FOR PILE STICK-UP HEIGHT) (e)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0"	--	--	6'-0"	--	--	6'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0"	--	--	7'-6"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (d)	402	--	--	--	--	3'-6"	6'-6"	--	5'-0"	--
FULLY DRIVEN PILE (d)	403	--	--	6'-6"	--	--	6'-6"	--	--	6'-6"

(d) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(e) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 30 DEGREE GFT TABLE, ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-4" OR GREATER, REQUIRE A 15 FT LONG PILE.



400 DRILLED CAST-IN-HOLE CONCRETE PILE FOUNDATION

(ALTERNATE OPTION)

NOT TO SCALE

FOUNDATION 400: DRILLED CAST-IN-HOLE CONCRETE PILE FOUNDATION

1. THE FOUNDATION MUST BE EXCAVATED WITH LITTLE TO NO LOOSE MATERIAL IN THE BOTTOM.
2. THE FOUNDATION CANNOT BE BELOW THE GROUND WATER UNLESS WRITTEN APPROVAL FROM UNIRAC.
3. IN SOFT OR UNSTABLE SOILS, A TEMPORARY CASING TO STABILIZE THE EXCAVATION IS PERMITTED.
4. THE PILE SHALL HAVE A #4 REBAR PLACED THROUGH THE BOTTOM OF THE PILE.
5. THE PILE MUST BE CENTERED IN THE HOLE WITH EQUAL AMOUNTS OF CONCRETE AROUND THE CASING.
6. CONCRETE SHALL CONFORM TO THE CONCRETE SPECIFICATIONS LISTED ON SR-100.
7. CONCRETE DEPTH SHALL CONFORM TO THE DEPTHS LISTED IN THE TABLE ON THIS SHEET.
8. THE TOP OF THE CONCRETE MUST BE ABOVE GRADE.
9. THE CORE OF THE CONCRETE CAST-IN-DRILLED HOLE PILE WILL CONSIST OF THE UNIRAC C-PILES AS DEPICTED IN THE FIGURE.

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	06/14/2018	Original Release
1	08/23/2018	Rev-1
2	03/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (800) 238-6411
Fax: (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JKG
DRAFTED BY:	JKG
REVIEWED BY:	LF
ORIGINAL RELEASE DATE:	06/14/2018
DRAWING SHEET SIZE:	24" x 36"

SHEET TITLE
FOUNDATION EMBEDMENT AND FOUNDATION DETAILS

SHEET NUMBER
SR-400

SHEET 6 of 11

20 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

(REFER TO SHEET SR-200 FOR PILE STICK-UP HEIGHT) (c)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0" (a)	--	--	6'-0" (a)	--	--	8'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0" (a)	--	--	8'-0"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (b)	402	--	--	--	--	3'-6"	6'-0"	--	5'-0"	--
FULLY DRIVEN PILE (b)	403	--	--	8'-0"	--	--	8'-0"	--	--	10'-6"

(a) THIS 6'-0" EMBEDMENT REQUIRES CUTTING 24" OFF OF THE BOTTOM OF A 12'-6" LONG C-PILE. (DO NOT CUT THE END OF PILE WITH PRE-PUNCHED HOLES.) IF CUTTING IS NOT PREFERRED, AN 8'-0" CONCRETE FOUNDATION IS ACCEPTABLE.

(b) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(c) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 20 DEGREE GFT TABLE. ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-0" OR GREATER, REQUIRE A 15 FT LONG PILE.

30 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

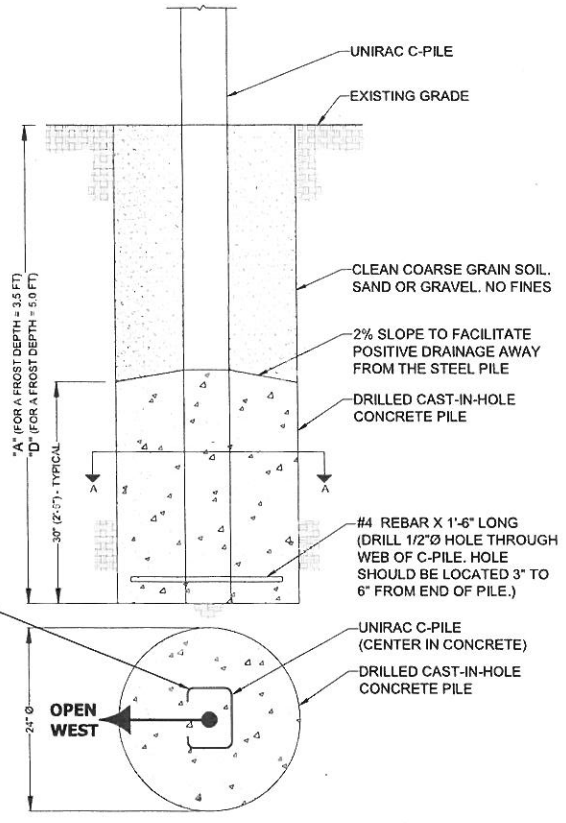
(REFER TO SHEET SR-300 FOR PILE STICK-UP HEIGHT) (e)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0"	--	--	6'-0"	--	--	8'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0"	--	--	7'-6"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (d)	402	--	--	--	--	3'-6"	6'-6"	--	5'-0"	--
FULLY DRIVEN PILE (d)	403	--	--	8'-6"	--	--	8'-6"	--	--	8'-6"

(d) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(e) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 30 DEGREE GFT TABLE. ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-6" OR GREATER, REQUIRE A 15 FT LONG PILE.

NOTE:
PILES MUST BE INSTALLED WITH C-PILE OPEN TO THE WEST - AS SHOWN



401 DRILLED "PARTIAL" CAST-IN-HOLE CONCRETE PILE FOUNDATION (ALTERNATE OPTION)

NOT TO SCALE

FOUNDATION 401: DRILLED "PARTIAL" CAST-IN-HOLE CONCRETE PILE FOUNDATION

1. THE FOUNDATION MUST BE EXCAVATED WITH LITTLE TO NO LOOSE MATERIAL IN THE BOTTOM.
2. THE FOUNDATION CANNOT BE BELOW THE GROUND WATER UNLESS WRITTEN APPROVAL FROM UNIRAC.
3. THE PILE SHALL HAVE A #4 REBAR PLACED THROUGH THE BOTTOM OF THE PILE.
4. THE PILE MUST BE CENTERED IN THE HOLE WITH EQUAL AMOUNTS OF CONCRETE AROUND THE CASING.
5. CONCRETE SHALL CONFORM TO THE CONCRETE SPECIFICATIONS LISTED ON SR-100.
6. CONCRETE DEPTH SHALL CONFIRM TO THE DEPTHS LISTED IN THE TABLE ON THIS SHEET.
7. THE TOP OF THE CONCRETE MUST BE BELOW THE DEPTH OF THE FROST ZONE.
8. THE CORE OF THE CONCRETE CAST-IN-DRILLED HOLE PILE WILL CONSIST OF THE UNIRAC C-PILES AS DEPICTED IN THE FIGURE.
9. THE BACKFILL MATERIAL MUST CONSIST OF MEDIUM TO COARSE SAND OR GRAVEL. NO CLAY OR ORGANICS MAY BE USED IN THE BACKFILL.
10. FOUNDATIONS MUST NOT BE INSTALLED IN ORGANIC SOILS OR IN AREAS WITH GROUNDWATER NEAR THE SURFACE.

REVISION BLOCK

MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/28/2019	Rev-1
2	09/30/2019	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 242-6411
Fax: (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	AHS
DRAFTED BY:	JKS
REVIEWED BY:	EP
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET SIZE:	17 - 24x36

SHEET TITLE
ADDITIONAL FOUNDATION DETAILS

SHEET NUMBER
SR-401

SHEET 7 of 11

20 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

(REFER TO SHEET SR-200 FOR PILE STICK-UP HEIGHT) (c)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0" (a)	--	--	6'-0" (a)	--	--	6'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0" (a)	--	--	6'-0"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (b)	402	--	--	--	--	3'-6"	8'-0"	--	5'-0"	--
FULLY DRIVEN PILE (b)	403	--	--	8'-0"	--	--	8'-0"	--	--	10'-6"

(a) THIS 6'-0" EMBEDMENT REQUIRES CUTTING 24" OFF OF THE BOTTOM OF A 12'-6" LONG C-PILE. (DO NOT CUT THE END OF PILE WITH PRE-PUNCHED HOLES.) IF CUTTING IS NOT PREFERRED, AN 8'-0" CONCRETE FOUNDATION IS ACCEPTABLE.

(b) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(c) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 20 DEGREE GFT TABLE. ALL PILE EMBEDMENT DEPTHS THAT ARE 8'-1" OR GREATER, REQUIRE A 15 FT LONG PILE.

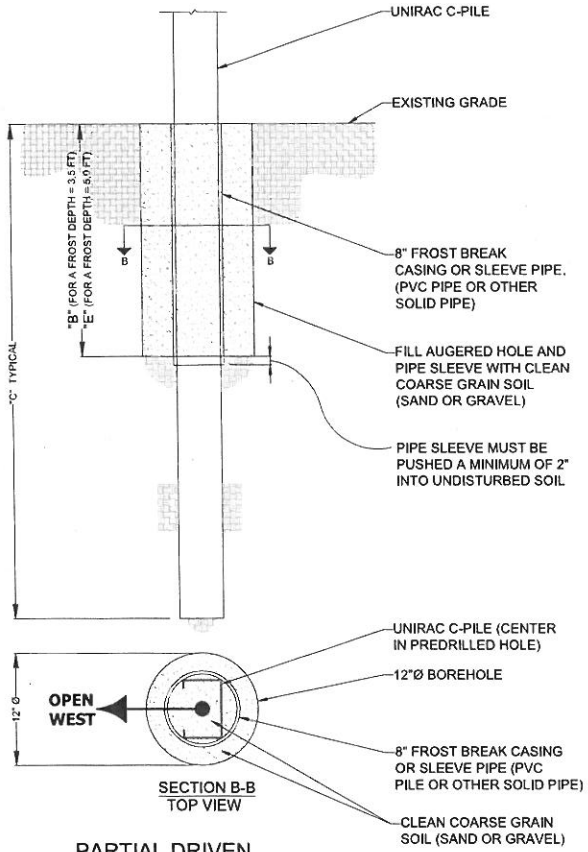
30 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

(REFER TO SHEET SR-300 FOR PILE STICK-UP HEIGHT) (e)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0"	--	--	6'-0"	--	--	6'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0"	--	--	7'-6"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (d)	402	--	--	--	--	3'-6"	8'-6"	--	5'-0"	--
FULLY DRIVEN PILE (d)	403	--	--	8'-6"	--	--	8'-6"	--	--	8'-6"

(d) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(e) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 30 DEGREE GFT TABLE. ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-4" OR GREATER, REQUIRE A 15 FT LONG PILE.



402 PARTIAL DRIVEN PILE WITH CLEAN COARSE BACKFILL (ALTERNATE OPTION)

NOT TO SCALE

FOUNDATION 402: PARTIAL DRIVEN PILE WITH CLEAN COARSE BACKFILL.

1. EACH PILE LOCATION MUST BE EXCAVATED TO A MINIMUM OF THE DIMENSION SHOWN.
2. THE PILE MUST BE CENTERED IN THE HOLE WITH THE FROST BREAK CASING PLACED AROUND THE PILE PRIOR TO BACKFILLING THE EXCAVATION.
3. THE FROST BREAK CASING MUST NOT HAVE ANY CRACKS OR HOLES THAT MAY ALLOW WATER TO SEEP IN. THE CASING MUST BE SET A MINIMUM OF 2 INCHES INTO THE NATIVE SOIL IN THE BOTTOM OF THE EXCAVATION. THE CASING TOP MUST EXTEND TO THE GROUND SURFACE.
4. THE FILL MATERIAL MUST CONSIST OF SAND OR GRAVEL WITH LESS THAN 5 PERCENT SILT CONTENT. NO CLAY OR ORGANICS MAY BE USED IN THE BACKFILL MATERIAL.
5. THE PILE MUST BE INSTALLED TO THE FULL DEPTH INDICATED. PILES NOT DRIVEN TO THE FULL DEPTH ARE CONSIDERED FAILED AND THE CONCRETE OPTION MUST BE UTILIZED.
6. THE CASING MUST BE FILLED WITH THE SAME FILL MATERIAL AFTER THE PILE IS INSTALLED TO THE CORRECT DEPTH.
7. THE FILL SHALL BE FORMED TO DIRECT WATER AWAY FROM THE FOUNDATION.
8. IF THE CASING IS AFFECTED BY FROST HEAVE, THE CASING SHALL BE ATTEMPTED TO BE RE-EMBEDED TO THE PROPER DEPTH IN ORDER TO PROTECT THE C-PILE FROM FUTURE FROST HEAVE.
9. FOUNDATIONS MUST NOT BE INSTALLED IN ORGANIC SOILS OR IN AREAS WITH GROUNDWATER NEAR THE SURFACE.

REVISION BLOCK

MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/22/2019	Rev-1
2	09/20/2019	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone (505) 242-6411
Fax (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JKG
DRAFTED BY:	JKG
REVIEWED BY:	TJT
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET SIZE:	D - 24x36

SHEET TITLE
ADDITIONAL FOUNDATION DETAILS

SHEET NUMBER
SR-402

20 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

(REFER TO SHEET SR-200 FOR PILE STICK-UP HEIGHT) (c)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0" (a)	--	--	6'-0" (a)	--	--	8'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0" (a)	--	--	8'-0"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (b)	402	--	--	--	--	3'-6"	6'-0"	--	5'-0"	--
FULLY DRIVEN PILE (b)	403	--	--	6'-0"	--	--	6'-0"	--	--	10'-6"

(a) THIS 6'-0" EMBEDMENT REQUIRES CUTTING 24" OFF OF THE BOTTOM OF A 12'-6" LONG C-PILE. (DO NOT CUT THE END OF PILE WITH PRE-PUNCHED HOLES.) IF CUTTING IS NOT PREFERRED, AN 8'-0" CONCRETE FOUNDATION IS ACCEPTABLE.

(b) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE. HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(c) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 20 DEGREE GFT TABLE, ALL PILE EMBEDMENT DEPTHS THAT ARE 8'-1" OR GREATER, REQUIRE A 15 FT LONG PILE.

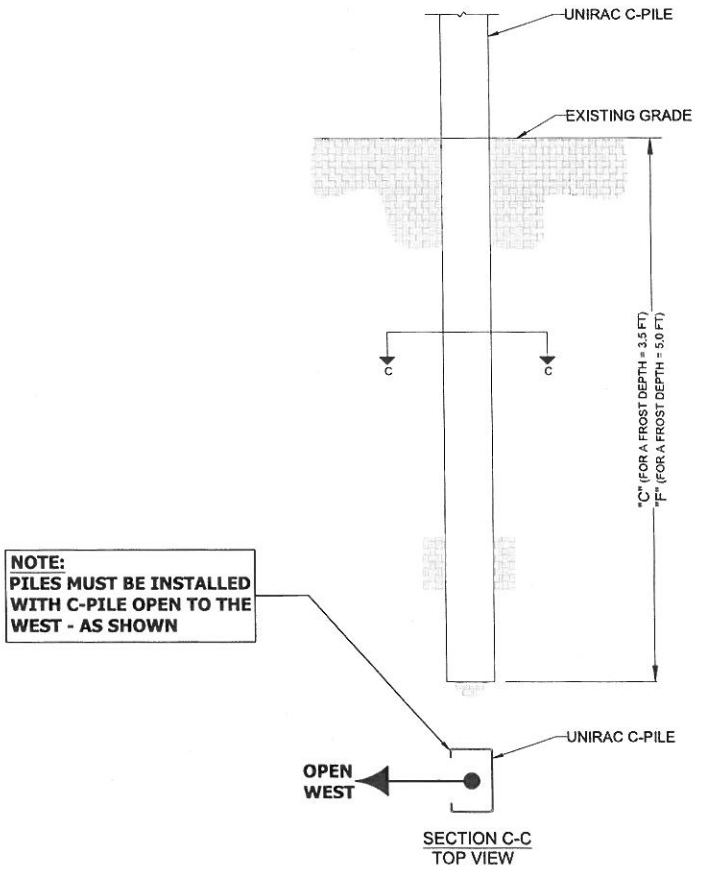
30 DEGREE UNIRAC STEEL C-PILE FOUNDATION DEPTHS

(REFER TO SHEET SR-300 FOR PILE STICK-UP HEIGHT) (e)

FOUNDATION TYPE	DETAIL NUMBER	NO FROST DEPTH			FROST DEPTH = 3.5 FT OR LESS			FROST DEPTH = 5.0 FT		
		DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"	DIMENSION "D"	DIMENSION "E"	DIMENSION "F"
FULL CAST IN-PLACE CONCRETE	400	6'-0"	--	--	6'-0"	--	--	8'-0"	--	--
CAST IN-PLACE CONCRETE	401	--	--	--	6'-0"	--	--	7'-6"	--	--
PARTIAL DRIVEN PILE WITH FROST BREAK (d)	402	--	--	--	--	3'-6"	6'-6"	--	5'-0"	--
FULLY DRIVEN PILE (d)	403	--	--	6'-6"	--	--	6'-6"	--	--	9'-6"

(d) SHALLOWER EMBEDMENT DEPTHS ARE POSSIBLE, HOWEVER, PILE TESTING AND/OR APPROVAL FROM A GEOTECHNICAL OR PROFESSIONAL ENGINEER ARE REQUIRED.

(e) BASED ON THE PILE STICK-UP HEIGHT FOR A STANDARD 30 DEGREE GFT TABLE, ALL PILE EMBEDMENT DEPTHS THAT ARE 6'-6" OR GREATER, REQUIRE A 15 FT LONG PILE.



403 FULLY DRIVEN PILE

(ALTERNATE OPTION) NOT TO SCALE

FOUNDATION 403: FULLY DRIVEN PILE

1. DRIVEN PILE FOUNDATIONS MAY NOT BE USED IN SOILS THAT CONTAIN SILT OR CLAY WITH GROUNDWATER WITHIN 12 FEET OF THE SURFACE UNLESS APPROVED BY A GEOTECHNICAL ENGINEER. IT IS RECOMMENDED TO VERIFY GROUNDWATER IS NOT PRESENT IF USING THIS FOUNDATION TYPE IN FROST PRONE REGIONS.
2. PILES MUST BE INSTALLED TO THE FULL DEPTH. PILES NOT DRIVEN TO FULL DEPTH ARE CONSIDERED FAILED PILES AND A DIFFERENT FOUNDATION MUST BE UTILIZED.
3. FOUNDATIONS MUST NOT BE INSTALLED IN ORGANIC SOILS OR IN AREAS WITH GROUNDWATER NEAR THE SURFACE.
4. PILE EMBEDMENT MUST BE DETERMINED BY A LICENSED CIVIL ENGINEER OR BY SITE PILE TESTS.

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	08/14/2018	Original Release
1	08/22/2018	Rev-1
2	03/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 242-6411
Fax: (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JWS
DRAFTED BY:	JWS
REVIEWED BY:	DF
ORIGINAL RELEASE DATE:	08/14/2018
DRAWING SHEET SIZE:	17" 24"(D)

SHEET TITLE
FOUNDATION EMBEDMENT AND FOUNDATION DETAILS

SHEET NUMBER
SR-403

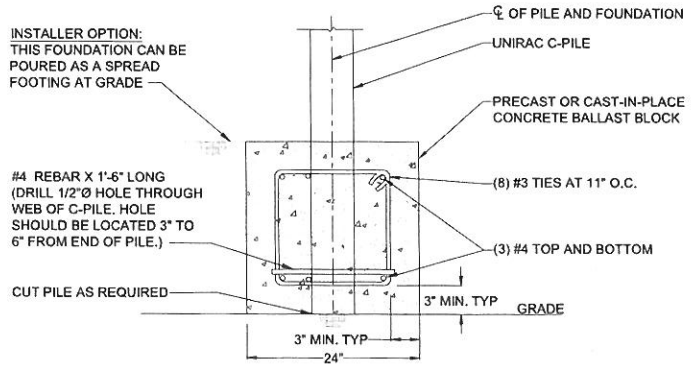
SHEET 9 of 11

NOTE:
PILES MUST BE INSTALLED WITH C-PILE OPEN TO THE WEST - AS SHOWN

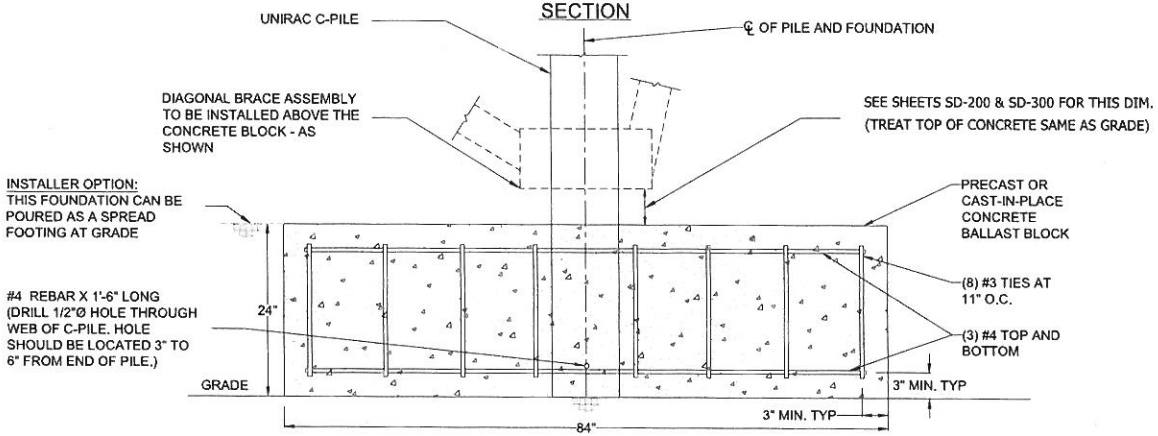
NOTE:
MAINTENANCE REQUIRED WHERE C-PILE ENTERS THE CONCRETE BLOCK. CAULKING OR NON-SHRINK GROUT WILL HELP TO PREVENT MOISTURE FROM ENTERING THIS VOID (THUS AVOIDING CORROSION AND FREEZE-THAW BREAKDOWN.)

NOTE:
PRECAST BLOCK OPTION WILL REQUIRE AN 8" SQUARE LEAVE-OUT AREA FOR THE C-PILE TO BE INSTALLED IN THE FIELD. HIGH STRENGTH GROUT REQUIRED TO SET C-PILE.

NOTE:
FOR PILE QUANTITY AND SPACING (BASED ON TABLE SIZE), SEE TABLES BOM.



SECTION



SIDE VIEW

404 CONCRETE BALLAST OR SPREAD FOOTING (PRECAST OR CAST-IN-PLACE)

(ALTERNATE FOUNDATION OPTION) NOT TO SCALE

1. EXISTING GRADE MAY BE CLEARED/GRADED OR LEFT AS-IS. BLOCK DIMENSIONS SHOWN ABOVE ARE MINIMUM REQUIREMENTS.
2. THE PILE SHALL HAVE A #4 REBAR PLACED THROUGH THE BOTTOM OF THE PILE.
3. CONCRETE SHALL CONFORM TO THE CONCRETE SPECIFICATIONS LISTED ON SR-100.
4. UTILIZING THIS OPTION WILL RESULT IN AN INCREASED FRONT EDGE HEIGHT.
   - 4.1. 20 DEGREE TABLES: WILL NOW HAVE A FRONT EDGE HEIGHT OF APPROX. 4 FT ABOVE GRADE.
   - 4.2. 30 DEGREE TABLES: WILL NOW HAVE A FRONT EDGE HEIGHT OF APPROX. 4.5 FT ABOVE GRADE.
5. UNIRAC AND THE ENGINEER OF RECORD ARE NOT RESPONSIBLE FOR DIFFERENTIAL SETTLEMENT OR DIFFERENTIAL FROST HEAVE FROM ONE PILE FOUNDATION TO THE NEXT. PERIODIC MONITORING OF THE INSTALLED PILES AND CONCRETE FOUNDATION IS RECOMMENDED.

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/22/2019	Rev-1
2	03/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 242-6411
Fax: (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JRS
DRAFTED BY:	JMS
REVIEWED BY:	EP
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET SIZE:	17" x 24.00"

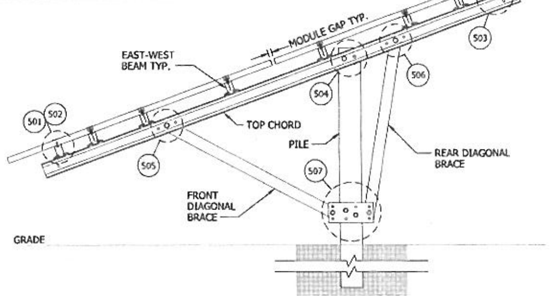
SHEET TITLE
FOUNDATION EMBEDMENT AND FOUNDATION DETAILS

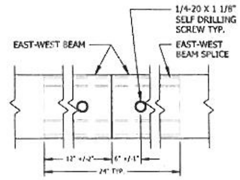
SHEET NUMBER
SR-404

SHEET 10 of 11

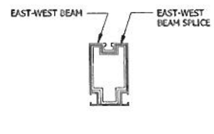
RACKING DETAIL NOTES:

1. SEE INSTALLATION GUIDE FOR PILE TOLERANCES
2. SEE INSTALLATION GUIDE FOR CONNECTION ADJUSTMENT INSTRUCTIONS
3. SEE INSTALLATION GUIDE FOR INSTRUCTIONS TO INSTALL EAST/WEST BEAM SPLICE
4. DETAILS SEEN ON THIS SHEET ARE NOT DRAWN TO SCALE

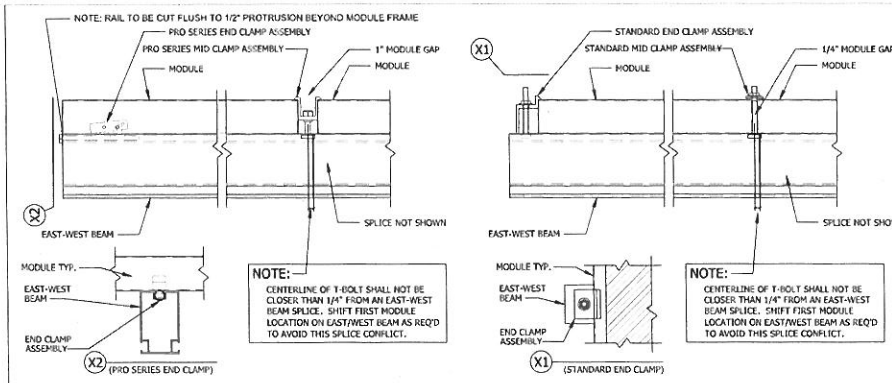




EAST-WEST BEAM WITH SPLICE
(TYPICAL ELEVATION)



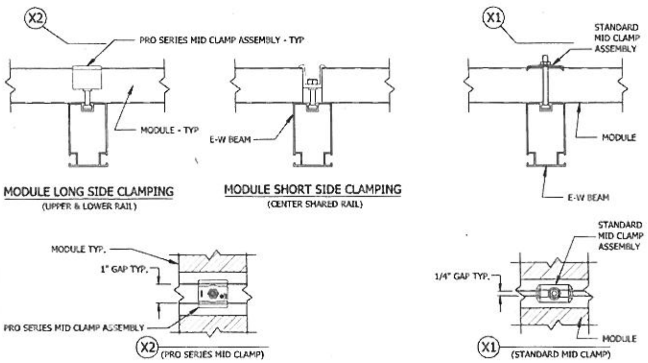
EAST-WEST BEAM WITH SPLICE
(TYPICAL SECTION)


NOTE: RAIL TO BE CUT FLUSH TO 1/2" PROTRUSION BEYOND MODULE FRAME
PRO SERIES END CLAMP ASSEMBLY
PRO SERIES MID CLAMP ASSEMBLY
1" MODULE GAP
MODULE
X2
EAST-WEST BEAM
SPLICE NOT SHOWN
MODULE TYP.
EAST-WEST BEAM
END CLAMP ASSEMBLY
X2 (PRO SERIES END CLAMP)
X1
STANDARD END CLAMP ASSEMBLY
STANDARD MID CLAMP ASSEMBLY
1/4" MODULE GAP
MODULE
EAST-WEST BEAM
SPLICE NOT SHOWN
MODULE TYP.
EAST-WEST BEAM
END CLAMP ASSEMBLY
X1 (STANDARD END CLAMP)

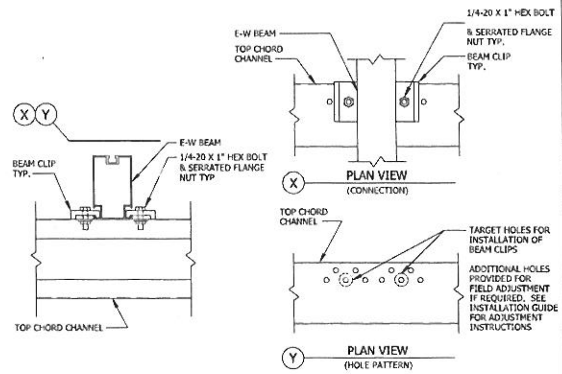
NOTE:
CENTERLINE OF T-BOLT SHALL NOT BE CLOSER THAN 1/4" FROM AN EAST-WEST BEAM SPLICE. SHIFT FIRST MODULE LOCATION ON EAST/WEST BEAM AS REQ'D TO AVOID THIS SPLICE CONFLICT.

NOTE:
CENTERLINE OF T-BOLT SHALL NOT BE CLOSER THAN 1/4" FROM AN EAST-WEST BEAM SPLICE. SHIFT FIRST MODULE LOCATION ON EAST/WEST BEAM AS REQ'D TO AVOID THIS SPLICE CONFLICT.

501 **MODULE TO EAST-WEST BEAM END CLAMP CONNECTION**

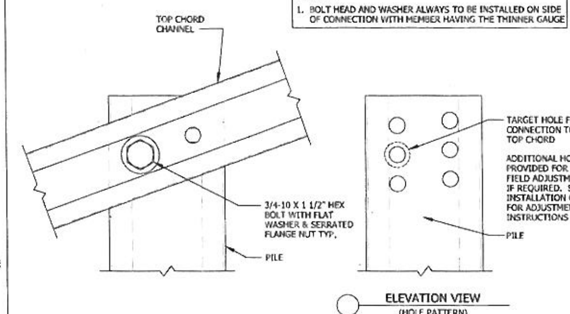

X2
PRO SERIES MID CLAMP ASSEMBLY - TYP
MODULE - TYP
E-W BEAM
MODULE LONG SIDE CLAMPING
(UPPER & LOWER RAIL)
MODULE SHORT SIDE CLAMPING
(CENTER SHARED RAIL)
X1
STANDARD MID CLAMP ASSEMBLY
MODULE
E-W BEAM
MODULE TYP.
1" GAP TYP.
PRO SERIES MID CLAMP ASSEMBLY
X2 (PRO SERIES MID CLAMP)
STANDARD MID CLAMP ASSEMBLY
1/4" GAP TYP.
MODULE
X1 (STANDARD MID CLAMP)

502 **MODULE TO EAST-WEST BEAM MID CLAMP CONNECTION**


X Y
E-W BEAM
1/4-20 X 1" HEX BOLT & SERRATED FLANGE NUT TYP
BEAM CLIP TYP.
TOP CHORD CHANNEL
E-W BEAM
TOP CHORD CHANNEL
1/4-20 X 1" HEX BOLT & SERRATED FLANGE NUT TYP.
BEAM CLIP TYP.
X PLAN VIEW (CONNECTION)
TOP CHORD CHANNEL
TARGET HOLES FOR INSTALLATION OF BEAM CLIPS
ADDITIONAL HOLES PROVIDED FOR FIELD ADJUSTMENT IF REQUIRED. SEE INSTALLATION GUIDE FOR ADJUSTMENT INSTRUCTIONS
Y PLAN VIEW (HOLE PATTERN)

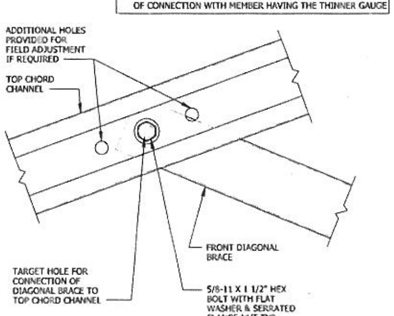
503 **EAST-WEST BEAM TO TOP CHORD CONNECTION**

NOTE:
1. BOLT HEAD AND WASHER ALWAYS TO BE INSTALLED ON SIDE OF CONNECTION WITH MEMBER HAVING THE THINNER GAUGE


TOP CHORD CHANNEL
3/4-10 X 1 1/2" HEX BOLT WITH FLAT WASHER & SERRATED FLANGE NUT TYP.
PILE
TARGET HOLE FOR CONNECTION TO TOP CHORD
ADDITIONAL HOLES PROVIDED FOR FIELD ADJUSTMENT IF REQUIRED. SEE INSTALLATION GUIDE FOR ADJUSTMENT INSTRUCTIONS
PILE
ELEVATION VIEW (HOLE PATTERN)

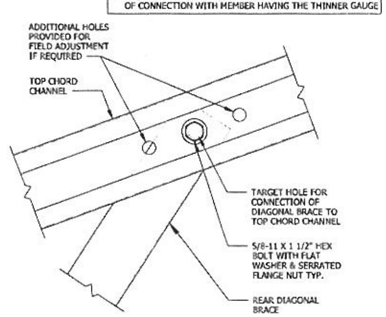
504 **TOP CHORD TO PILE CONNECTION**

NOTE:
1. BOLT HEAD AND WASHER ALWAYS TO BE INSTALLED ON SIDE OF CONNECTION WITH MEMBER HAVING THE THINNER GAUGE



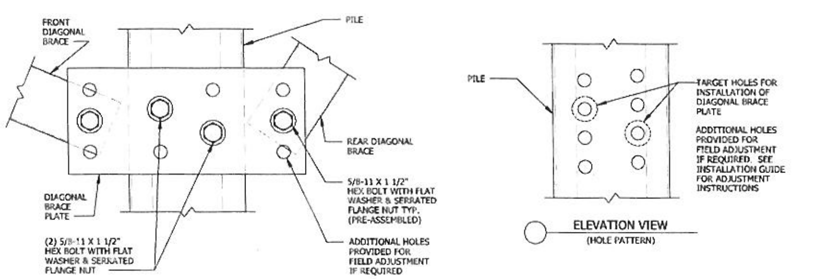
505 **TOP CHORD TO DIAGONAL BRACE CONNECTION**
(FRONT BRACE)

NOTE:
1. BOLT HEAD AND WASHER ALWAYS TO BE INSTALLED ON SIDE OF CONNECTION WITH MEMBER HAVING THE THINNER GAUGE



506 **TOP CHORD TO DIAGONAL BRACE CONNECTION**
(REAR BRACE)

NOTE:
1. BOLT HEAD AND WASHER ALWAYS TO BE INSTALLED ON SIDE OF CONNECTION WITH MEMBER HAVING THE THINNER GAUGE


FRONT DIAGONAL BRACE
PILE
REAR DIAGONAL BRACE
DIAGONAL BRACE PLATE
(2) 5/8-11 X 1 1/2" HEX BOLT WITH FLAT WASHER & SERRATED FLANGE NUT
5/8-11 X 1 1/2" HEX BOLT WITH FLAT WASHER & SERRATED FLANGE NUT TYP. (PRE-ASSEMBLED)
ADDITIONAL HOLES PROVIDED FOR FIELD ADJUSTMENT IF REQUIRED
PILE
TARGET HOLES FOR INSTALLATION OF DIAGONAL BRACE PLATE
ADDITIONAL HOLES PROVIDED FOR FIELD ADJUSTMENT IF REQUIRED. SEE INSTALLATION GUIDE FOR ADJUSTMENT INSTRUCTIONS
ELEVATION VIEW (HOLE PATTERN)

507 **DIAGONAL BRACE TO PILE CONNECTION**

REVISION BLOCK		
MARK	DATE	DESCRIPTION
0	08/14/2019	Original Release
1	08/22/2019	Rev-1
2	03/30/2020	Rev-2

OWNER/CLIENT:

ENGINEERING CONSULTANT:

PROFESSIONAL SEAL

SEE STATE SPECIFIC STAMPED & SIGNED GFT CERTIFICATION LETTER

UNIRAC'S GFT
GROUND FIXED TILT
STRUCTURAL RACKING DRAWINGS

UNIRAC®
1411 Broadway Boulevard NE
Albuquerque, New Mexico 87102
Phone: (505) 242-6411
Fax: (505) 242-6412
www.unirac.com

PROJECT NUMBER:	GFT
ENGINEERED BY:	JRS
DRAFTED BY:	JRS
REVIEWED BY:	EP
ORIGINAL RELEASE DATE:	08/14/2019
DRAWING SHEET SIZE:	'D' - 24x36

SHEET TITLE
RACKING DETAILS

SHEET NUMBER
SR-500
SHEET 11 of 11